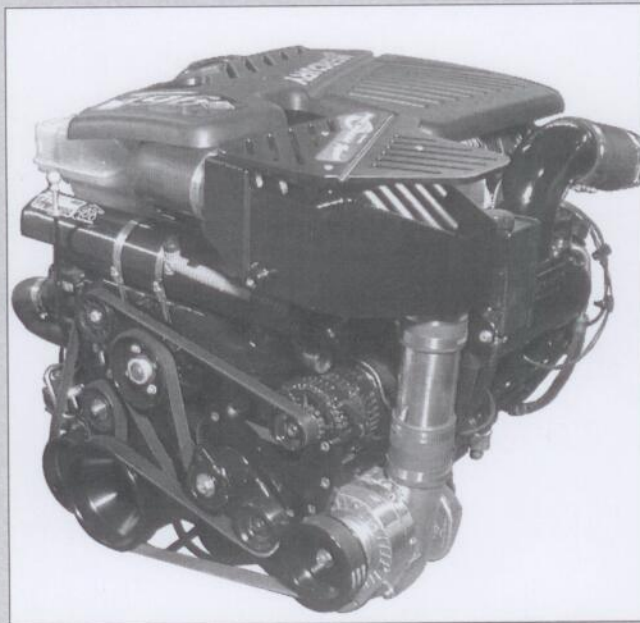


# OWNER'S MANUAL

MERCUISER 496 MAGNUM, MAGNUM H.O.

## **PROCHARGER**<sup>®</sup> *Marine*

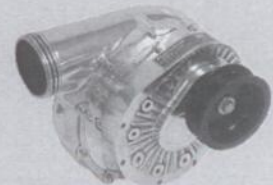
*Centrifugal Supercharger Systems*

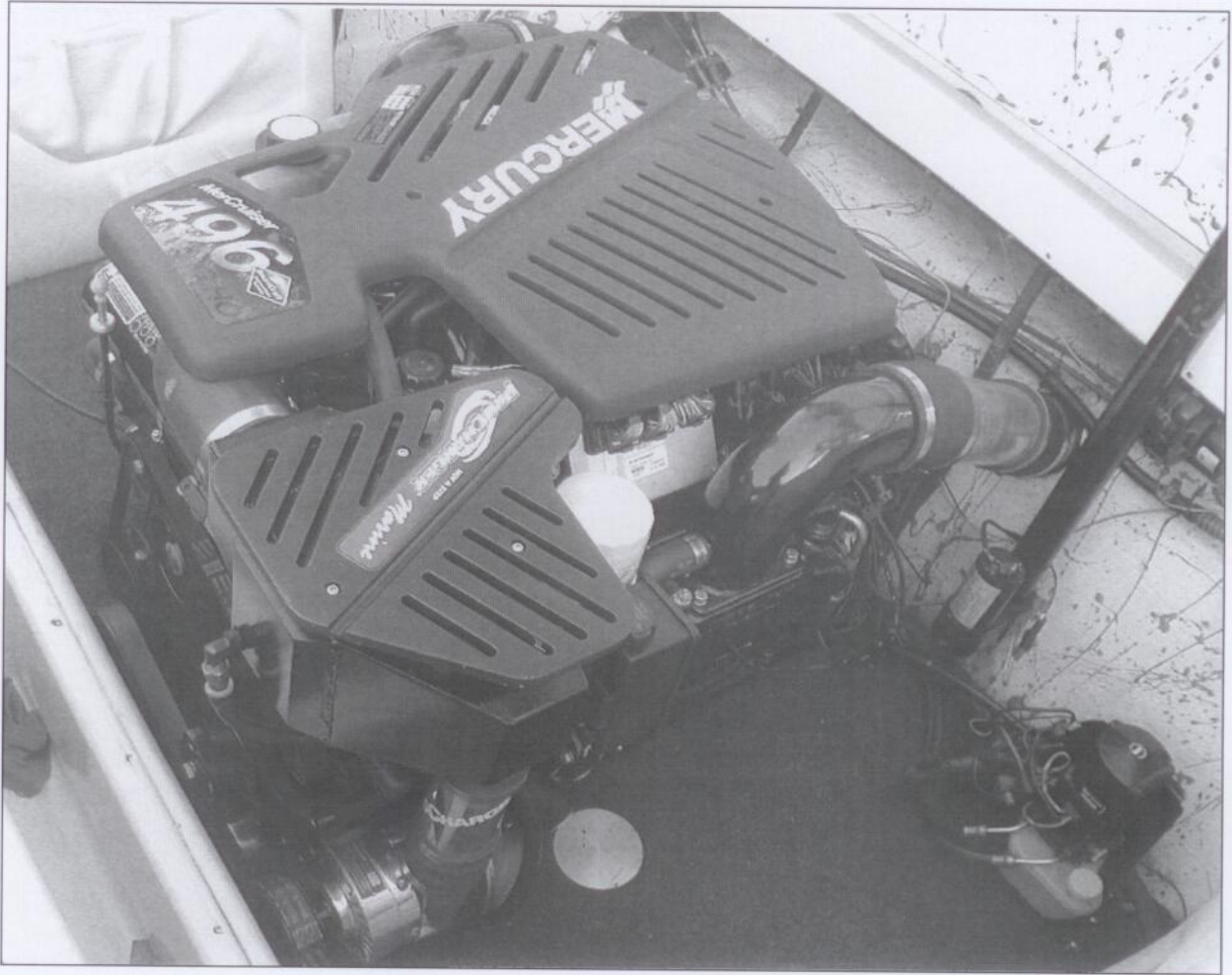


*The Intercooled Supercharging Experts!*<sup>®</sup>



ACCESSIBLE TECHNOLOGIES, INC.  
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1MG182-NN







## INSTALLATION OVERVIEW

Congratulations on the purchase of your ProCharger™ centrifugal supercharger system, and welcome to the world of centrifugal supercharging. You are now the owner of the most powerful and reliable supercharger system available, and the latest technology in supercharging!

This Owner's Manual contains the following sections:

- **INTRODUCTION**
- **INSTALLATION INSTRUCTIONS**
- **OPERATION AND MAINTENANCE**
- **WARRANTY**

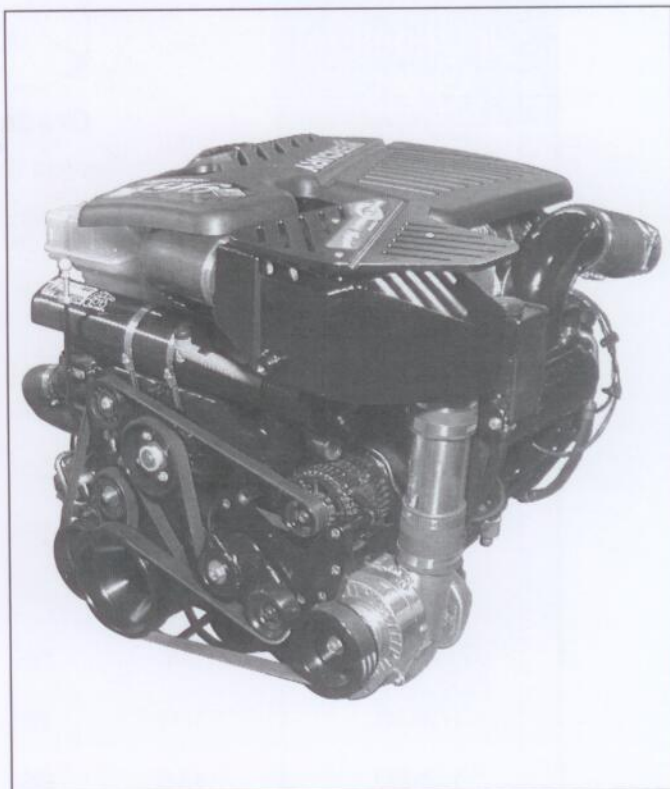
If you are performing the installation of this system and this is your first ProCharger installation, you will likely benefit from reading the entire installation instructions prior to proceeding, and then reviewing each section as you go.



**Warning: Read and understand all safety precautions in this manual before installation.**

**Failure to comply with instructions in this manual could result in personal injury, property damage, and/or voiding of your warranty.**



- A. ENGINE PREPARATION**
- B. ENGINE ACCESSORY AND PROCHARGER INSTALLATION**
- C. INTERCOOLER INSTALLATION**
- D. FUEL SYSTEM INSTALLATION**
- E. PROCHARGER SC MAINTENANCE**
- F. INSTALLATION REVIEW AND SAFETY CHECK**
- G. GENERAL TUNING AND THEORY**



## IMPORTANT INFORMATION FOR RELIABLE OPERATION!

**Use 91 OCTANE OR BETTER FUEL AT ALL TIMES (PREMIUM)**

**MERCUISER EFI/MPI REV LIMITER LIMITS RPM BY CUTTING OFF FUEL, WHICH CAN CAUSE A DANGEROUS LEAN CONDITION. ENSURE THAT BOAT IS PROPPED SO THAT MAXIMUM RPM IS BELOW FACTORY REV LIMITER. REPEATEDLY BUMPING/RIDING REV LIMITER CAN RESULT IN SERIOUS ENGINE DAMAGE.**

| Torque Specification Chart | <br>Grade 5<br>Torque (lb. ft.) |    |    | <br>Grade 8<br>Torque (lb.ft.) |     |    |
|----------------------------|--|----|----|---|-----|----|
|                            | Thread Size  |    |    |   |     |    |
| 1/4-20                     | 11   | 8  | 7  | 16  | 12  | 10 |
| 1/4-26                     | 13   | 10 | 8  | 18  | 14  | 11 |
| 5/16-18                    | 23   | 17 | 14 | 33  | 25  | 20 |
| 5/16-24                    | 26   | 19 | 15 | 36  | 27  | 22 |
| 3/8-16                     | 41   | 31 | 25 | 58  | 44  | 35 |
| 3/8-24                     | 47   | 35 | 28 | 66  | 49  | 39 |
| 7/16-14                    | 66   | 49 | 40 | 93  | 70  | 56 |
| 7/16-20                    | 74   | 55 | 44 | 104   | 78  | 62 |
| 1/2-13                     | 101  | 75 | 60 | 142   | 106 | 85 |
| 1/2-20                     | 113  | 85 | 68 | 160   | 120 | 96 |



## INSTALLATION OVERVIEW

For best results we recommend that you review the installation instructions beforehand, and follow the installation instructions closely and in sequence. A detailed packing list is provided (inside box) to help you identify the components of your ProCharger Marine system. The following tools will be required to install your ProCharger Marine supercharger system:

### REQUIRED TOOLS & SUPPLIES

- 3/8" SOCKET SET (STANDARD & METRIC)
- SCREWDRIVER SET
- RAZOR BLADE OR CARPET KNIFE
- NUT DRIVER SET (OPTIONAL)
- 8 SPARK PLUGS\*\*
- SPARK PLUG SOCKET\*\*
- PULLEY REMOVAL TOOL\*
- WRENCH SET (STANDARD & METRIC)
- HEX BIT SET (STANDARD & METRIC)
- TORX BIT SET
- ELECTRIC DRILL
- 7/8" SPADE DRILL OR HOLE SAW

You should also have the following gauges available to properly check the finished installation and monitor your vessel's performance (especially for high performance applications):

- manifold pressure boost gauge (plumbed into any manifold vacuum source)
- fuel pressure gauge (0-100 psig) (plumbed into ATI fuel pressure regulator)

Both gauges should be of a type that can be read from the cockpit while performing a W.O.T. performance test. Cockpit-mounted gauges are preferable, although use of a shop fuel pressure gauge (connected to a hose long enough to be read during testing) is an option.

The motor on which the ProCharger is installed should retain the stock compression ratio. If your engine has been modified in any way, please check with ATI or your dealer before proceeding. This supercharger system is intended for use on strong, well maintained engines. Installation on a worn or troublesome engine should be reconsidered. **Accessible Technologies is not responsible for damage to an engine.**



**Warning: Motor and propeller should be configured so that maximum speed does not exceed boat manufacturer's recommendations for your hull**

Note: There are subtle variations in Mercruiser motors across model years (such as water hose routing for coolers) which may not *specifically* be addressed in these installation instructions. Please contact an ATI service technician should you have any questions.

\* GM press-on power steering pulley removal tools are available at most auto parts stores.

\*\*if current plugs have more than 100 hours, or are more than 1 yr old



## INSTALLATION INSTRUCTIONS

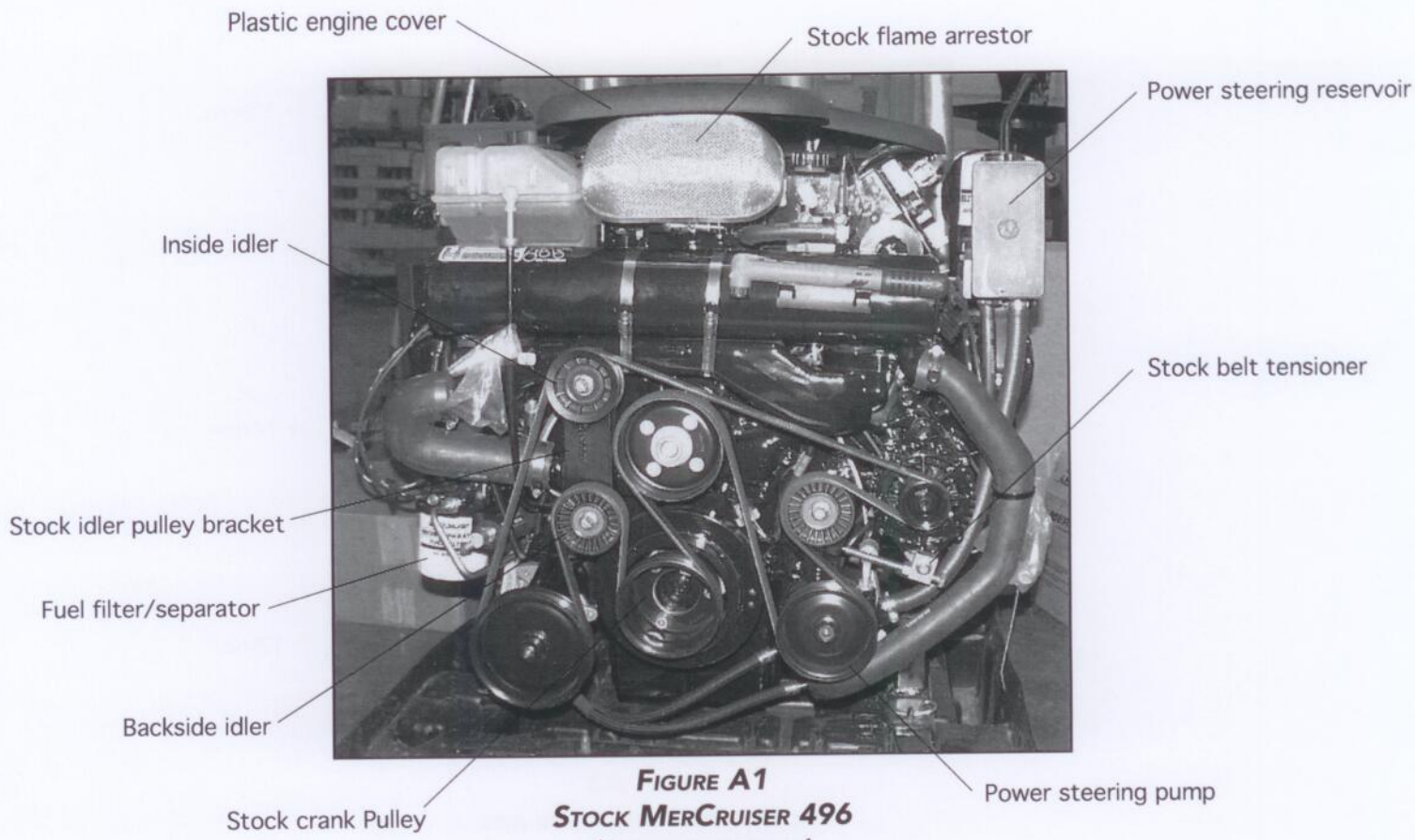
### A. ENGINE PREPARATION

Completion of this section will configure the Mercruiser motor for installation of the ProCharger system components. Refer to Figure A1 for engine parts identification.

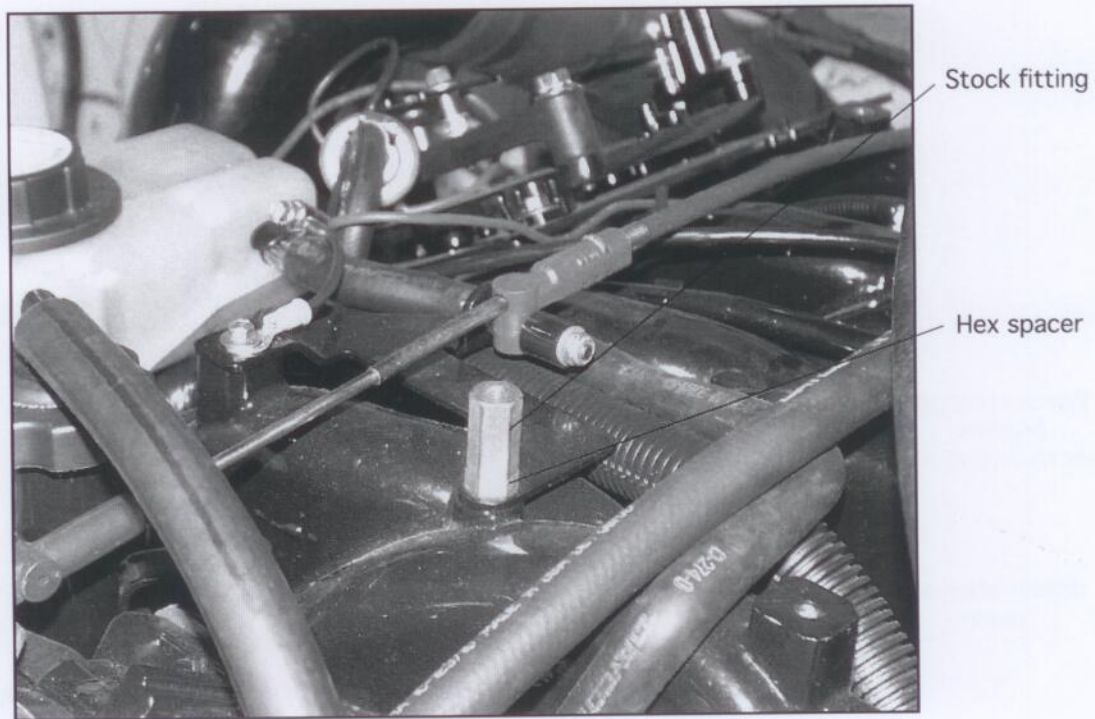
*Note: Disconnect the battery cable before proceeding.*

1. Using a T30 Torx bit, remove the three bolts holding down the plastic engine cover and set bolts and cover aside (these will be reinstalled later). Using a 9/16 wrench, remove the brass fitting that the forward most engine cover bolt threads into. Reinstall this fitting with the supplied brass hex spacer between the fitting and the intake manifold. *See figure A2.*
2. Using a 10mm socket, remove the flame arrestor from the throttle body and set aside for re-installation later. Tape or cover throttle body to prevent accidental parts ingestion.
3. Using a 16mm wrench, loosen the jam nut on the factory belt tensioner. Then, using a 17mm wrench, back out the tensioner adjusting bolt and remove the accessory belt (this belt will be reused). Using a 10mm wrench, remove the bolt and belt tensioner assembly from the engine. (These parts will not be reused) *Refer to figure A3.*
4. Using a 13mm socket and wrench, remove the upper alternator bolt and nut (these will be re-used). It is not necessary to disconnect the alternator wires or remove it from the engine. Carefully support it in its general location using a few plastic wire ties (supplied).
5. Using a 13 mm socket and extension, remove the two bolts that hold the alternator bracket to the engine and remove bracket (these bolts and bracket will no be reused).
6. Using a 8 mm or 5/16" hex bit, remove the three bolts securing the stock crank pulley and remove (the pulley and bolts will not be re-used).
7. Remove the factory oil cap and replace it with the ATI supplied oil cap. An oil vent line will be connected to it later in the installation.
8. Loosen the hose clamp on the power steering return hose (the 5/8" hose that runs between the power steering reservoir and the power steering pump) at the power steering pump. Using a catch pan to catch the power steering fluid, remove the hose from the pump.
9. Using a 16 mm or 5/8" wrench and catch pan, disconnect the high-pressure power steering hose from the pump.
10. Using a pulley puller, remove the factory power steering pump pulley from the pump. *See figure A6.* Using a 10 mm socket, remove the three bolts holding the power steering pump to it's bracket and remove power steering pump (This pump may be returned to ATI for a core charge credit). Install the ATI supplied power steering pump and return line and the factory high pressure line in reverse order, but do not install pulley at this time.
11. Using a 13 mm socket & extension, remove the two lower bolts that hold the power steering pump bracket to the engine. *See figure A4.*
12. Using the two supplied 10mm x 110mm long bolts, attach the supplied "T" shaped support bracket inserting the bolts through the "T" bracket then the power steering pump bracket then into the engine. *See figure A5.* Note: Position the "T" bracket so that the slot in the bracket clears the webbing on the power steering pump bracket. Tighten all bolts.
13. Reinstall the power steering pump pulley. *Refer to figure A7.*
14. Install ATI supplied crank pulley using the three 10mm-1.5x40mm bolts supplied. Tighten all bolts.

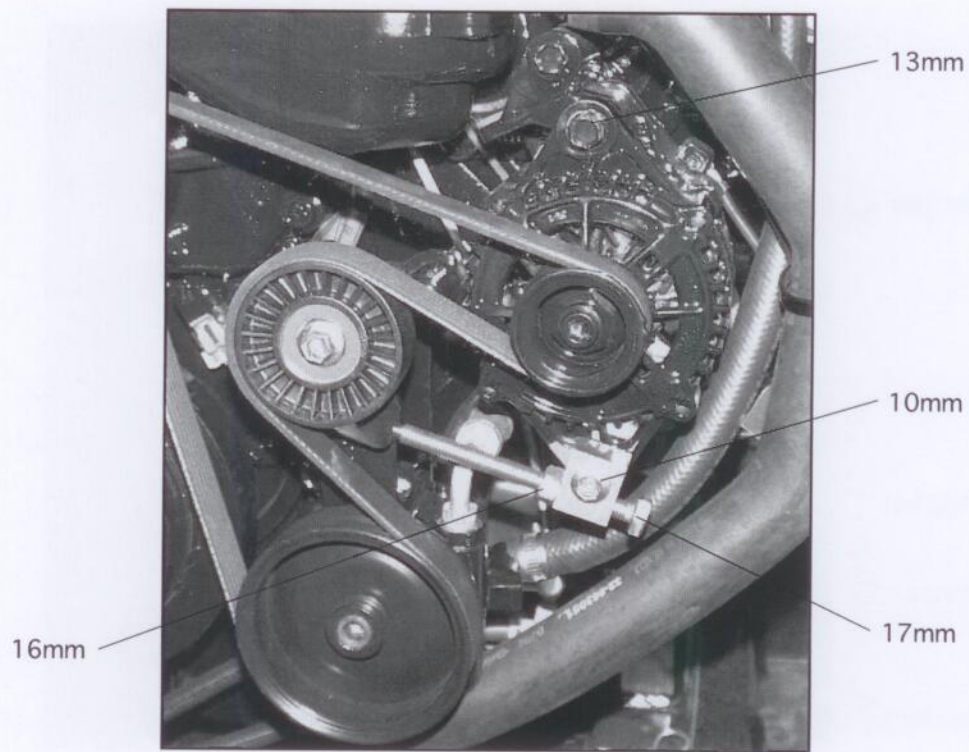




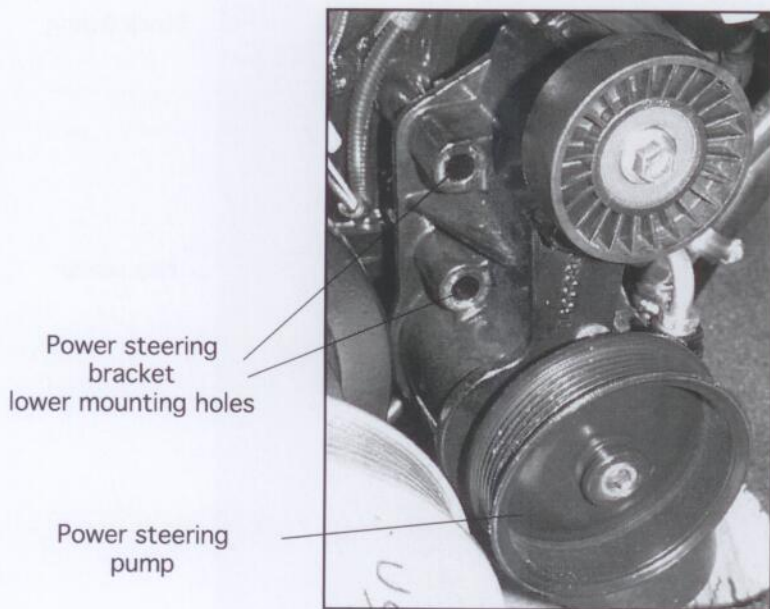
**FIGURE A1**  
**STOCK MERCRUISER 496**  
**(PARTS REFERENCE)**



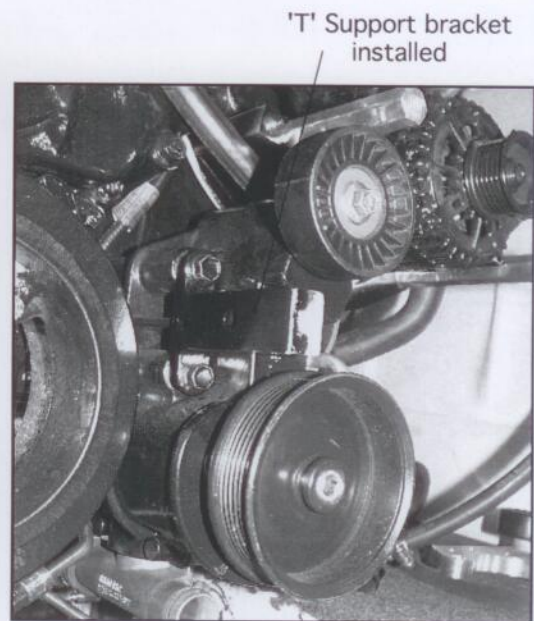
**FIGURE A2**  
**FRONT HEX FITTING FOR ENGINE COVER**



**FIGURE A3**  
**FACTORY BELT TENSIONER AND**  
**ALTERNATOR LOCATION**

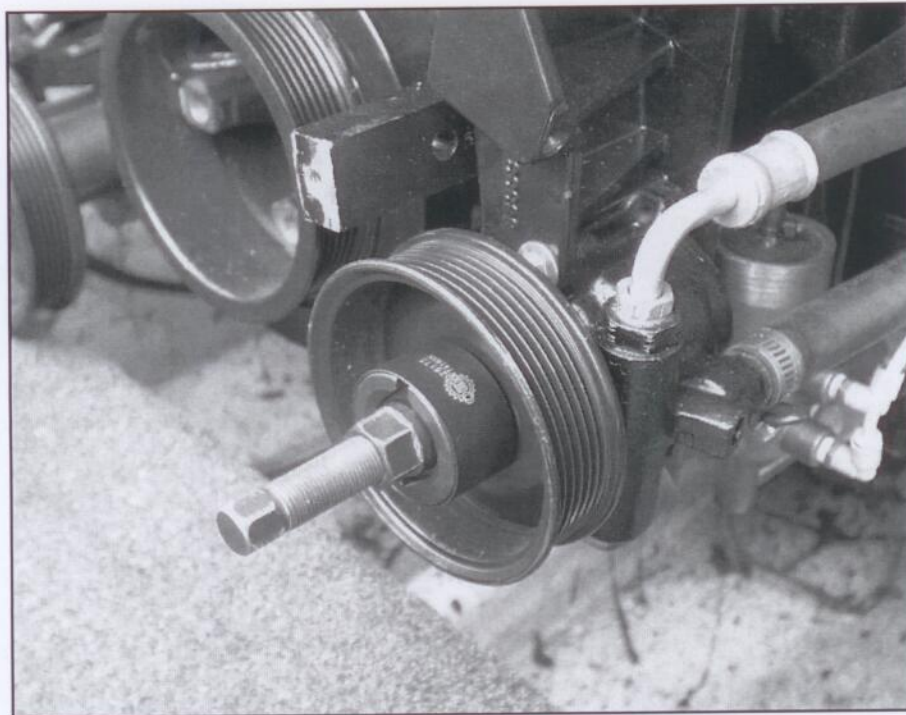


**FIGURE A4**  
**POWER STEERING PUMP**



**FIGURE A5**  
**TEE SUPPORT BRACKET**

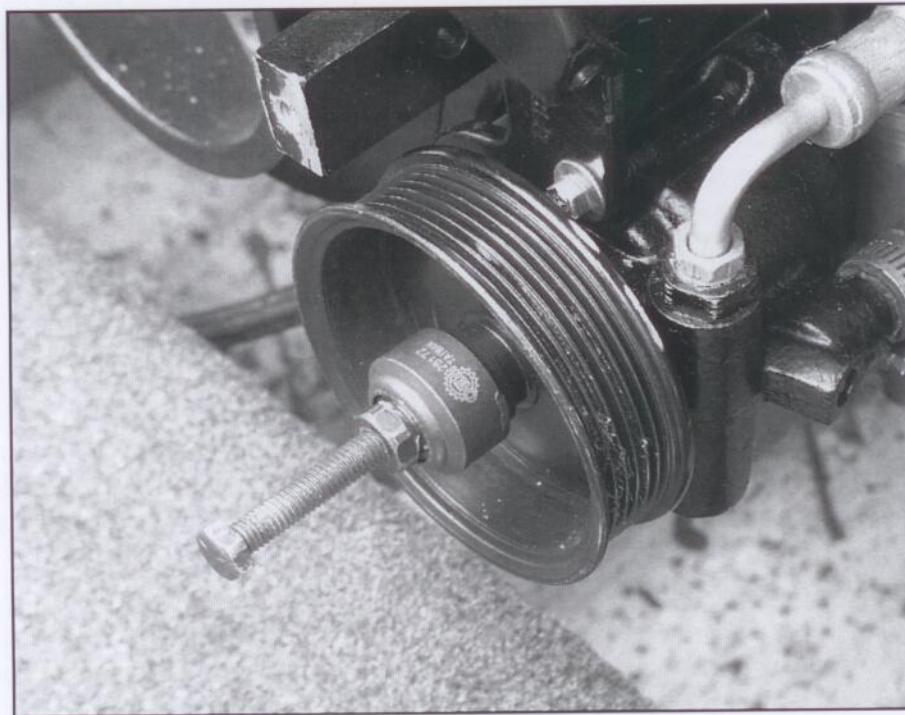




**FIGURE A6**

**PULLEY REMOVAL TOOL**

With this particular pulley removal tool, two halves clamp around the protruding lip of the pulley and the bolt is screwed in to remove the pulley



**FIGURE A7**

**PULLEY INSTALL TOOL**

With this particular pulley install tool, the nut forces the pulley on as the bolt is screwed into the pulley shaft.



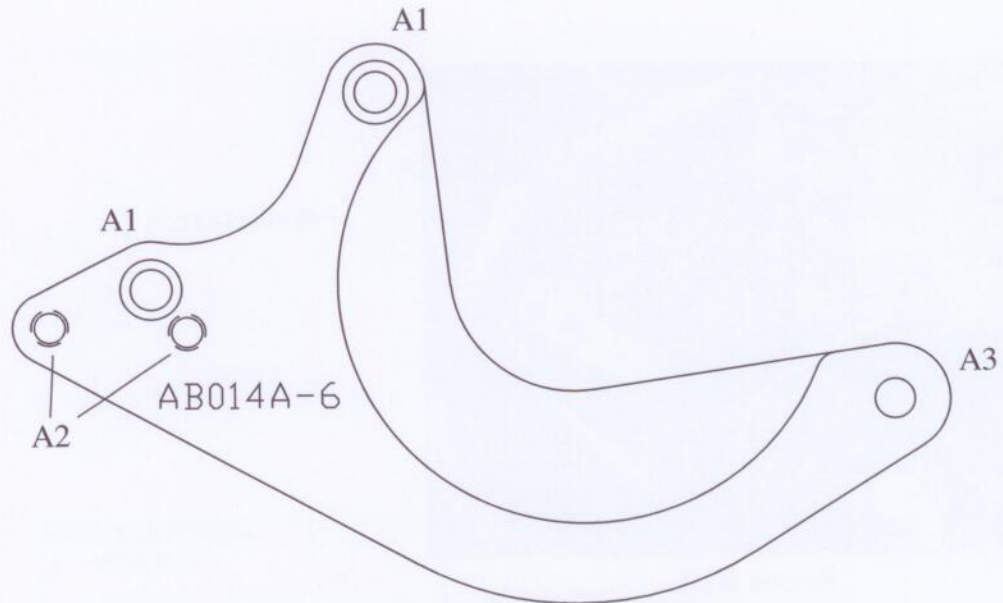
## B. ENGINE ACCESSORIES AND PROCHARGER INSTALLATION

### DESCRIPTION AND OPERATION

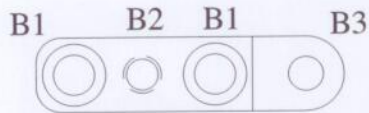
The main components of the ProCharger system are the ProCharger, ProCharger mounting bracket, and bracket supports/spacers. The ProCharger is a gear-driven centrifugal compressor, driven by an 8 rib serpentine belt. It uses a billet aluminum impeller, super precision bearings and carburized gears. The impeller speed is dictated by engine rpm, crank pulley-to-driven pulley ratio and the final internal gear ratio. As engine speed is increased both airflow and boost (resulting from engine back-pressure) are increased. The quoted boost levels of the kit can be exceeded if the factory-set redline is surpassed. The mounting bracket is a flat billet aluminum type which utilizes a series of spacers to properly locate the ProCharger.

1. Using a 8 mm hex bit, install the ATI supplied alternator aft bracket using the two supplied 10mm-1.5 x 25 mm bolts. Tighten both bolts. *Refer to figure B1, holes A1 and figure B1A.*
2. Using the previously removed alternator bolt & nut assembly, attach the alternator to the alternator/main bracket support (hole B3 in figure B2), but do not fully tighten yet. *See figures B2 & B2A*
3. Using a 5/16" hex bit, attach the alternator/main bracket support to the alternator aft bracket with the two 3/8-16 x 2 1/2" bolts supplied. Bolts will go through holes B1 in Figure B2 and into holes A2 in Figure B1. Tighten all bolts. *Refer to figure B1 and B2.*
4. If not already done, thread a 3/8-16 x 1-1/2" stud into the supplied 3.675" long hex spacer. Thread the other end of the stud into hole B2 of figure B2. *See figure B2 & B5.*
5. If not already done, thread the supplied 8mm-1.25 x 40mm stud into the supplied 1.95" long hex spacer. Thread the other end of the stud into the right hand side threaded bolt hole of the alternator. Ensure that there is good thread engagement in both the spacer and the alternator. *See figure B5.*
6. From behind the alternator aft bracket, insert a 3/8-16 x 1-1/2" hex bolt and flat washer through the lowermost outer hole and thread into the supplied 6.35" long hex spacer and tighten. *See figure B5.*
7. On the front starboard side of the motor, remove the two stock idler pulleys (the pulleys will be re-used but the attaching hardware will not). *See figure A1 for location.*
8. Using a 15 mm deep well socket on the (2) nuts and a 13 mm socket on the bolt, remove the stock idler bracket (the bracket, top bolt and (2) nuts will not be re-used, but the the two lower studs will be re-used).
9. Attach the stock inside idler (the one with grooves) to the upper most hole in the supplied fixed tensioner bracket using a 3/8-16 x 2-1/4" hex bolt, 3/8" thick washer, 3/8" flat washer, brass lock nut and 1.11" long idler shaft. (Note: Prior to fully tightening the idler bolt, insert one of the supplied 10mm-1.5 x 20 mm shcs int the upper tensioner bracket mounting hole.) Insert the bolt through the thick washer, then idler pulley, then idler shaft, then bracket then flat washer then lock nut. *See figure B6.*
10. Attach the stock backside idler (the one without grooves) to the supplied sliding tensioner bracket as shown in figure B6 using a 3/8-16 x 1-1/2" hex bolt, 3/8" thick washer, brass lock nut and .82" long idler shaft. Insert the bolt through the bracket (from the side with the counterbore), then through the idler shaft, then pulley, then thick washer then lock nut.
11. Attach the sliding tensioner bracket to the fixed tensioner bracket by inserting the threaded end of the swing bolt through the bracket and securing with a 3/8" flat washer and brass lock nut. Tighten nut only enough to take out play but still allow the swing bolt to rotate. Install the 3/8-16 x 1-3/4" hex bolt through a flat washer then through both sliding and fixed tensioner brackets then flat washer then lock nut. (2) 3/8" flat washers and brass lock nut. *See figure B6.*

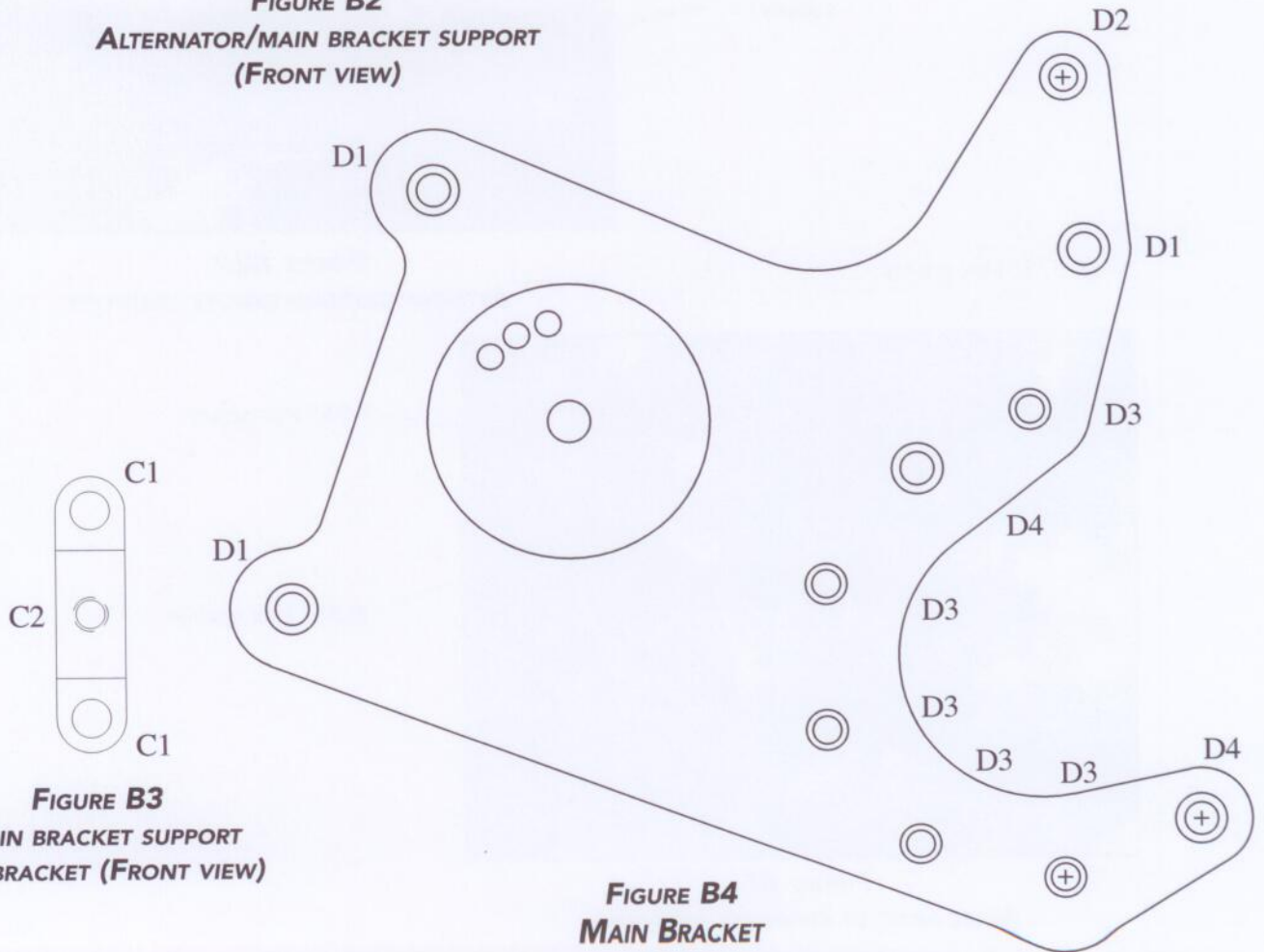




**FIGURE B1**  
**ALTERNATOR AFT BRACKET**

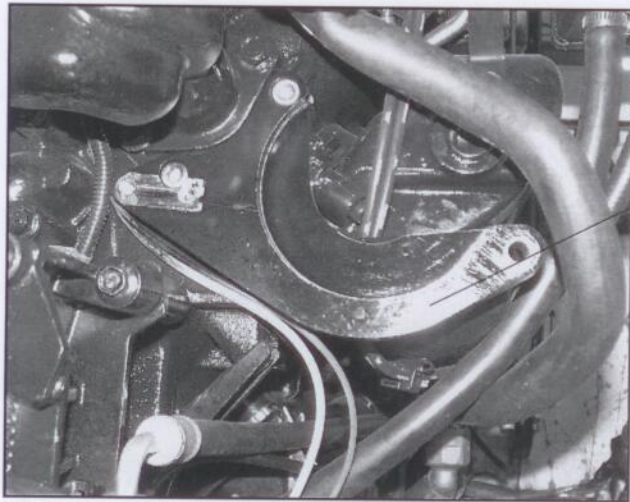


**FIGURE B2**  
**ALTERNATOR/MAIN BRACKET SUPPORT**  
**(FRONT VIEW)**



**FIGURE B3**  
**MAIN BRACKET SUPPORT**  
**"T" BRACKET (FRONT VIEW)**

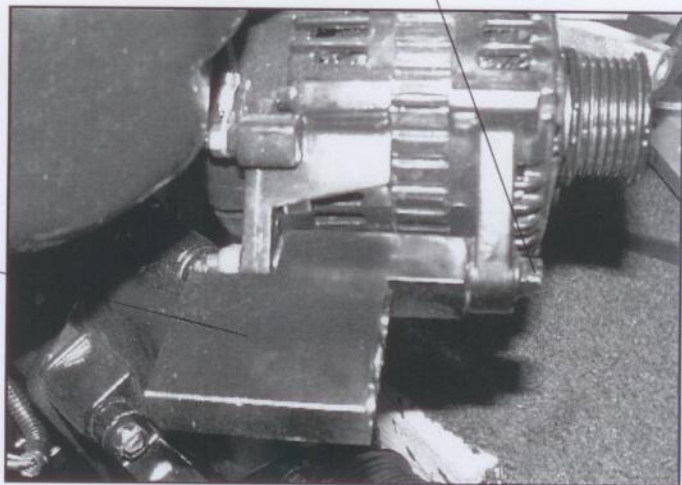
**FIGURE B4**  
**MAIN BRACKET**



Installed bracket

**FIGURE B1A**  
**ALTERNATOR AFT BRACKET**

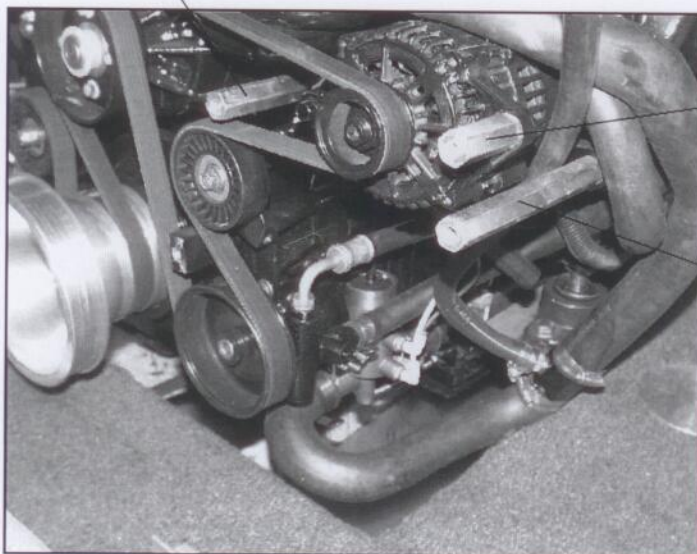
Stock nut and bolt assembly



Installed bracket support

**FIGURE B2A**  
**ALTERNATOR/MAIN BRACKET SUPPORT**

3.675" Hex spacer

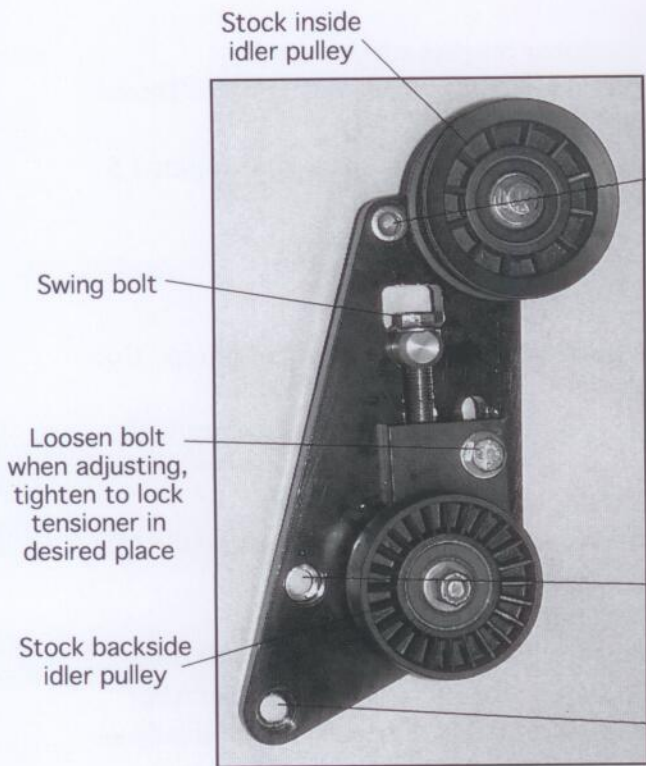


1.95" Hex spacer

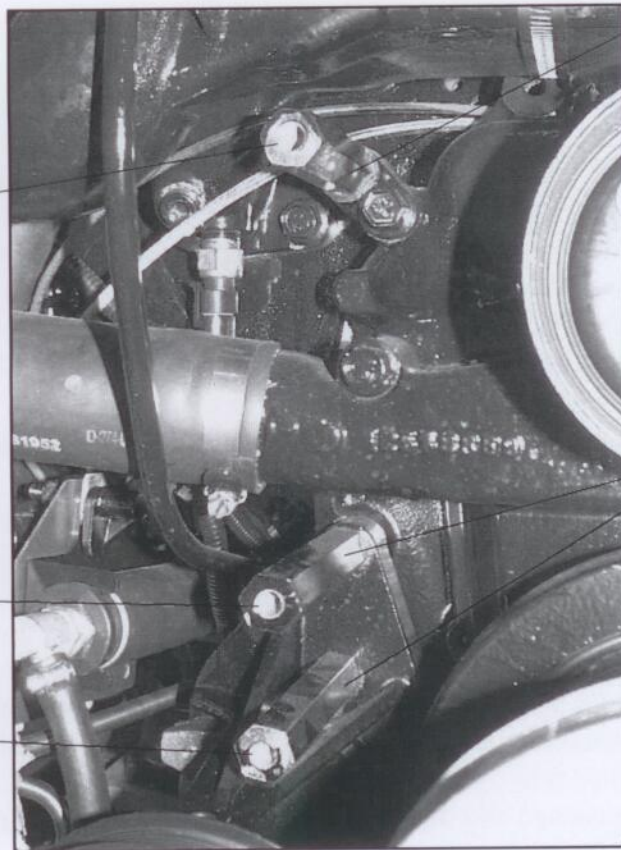
6.35" Hex spacer

**FIGURE B5**  
**MAIN BRACKET SUPPORTS INSTALLED**



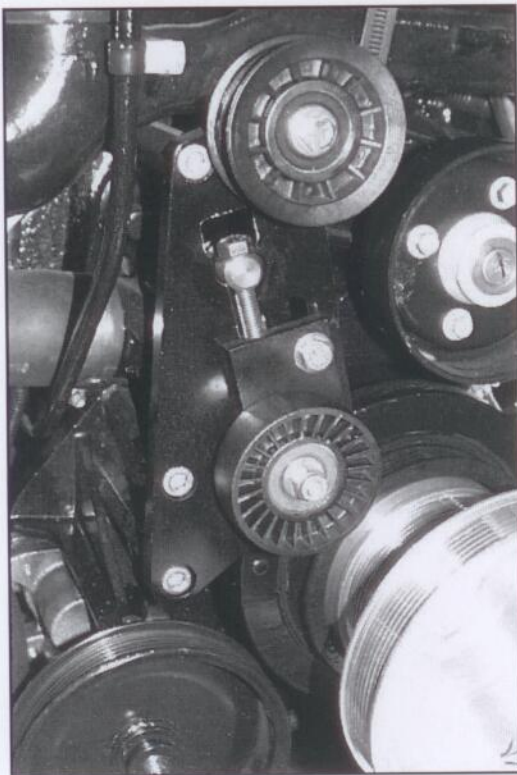


**FIGURE B6**  
**BELT TENSIONER BRACKET WITH IDLER**  
**PULLEYS INSTALLED**

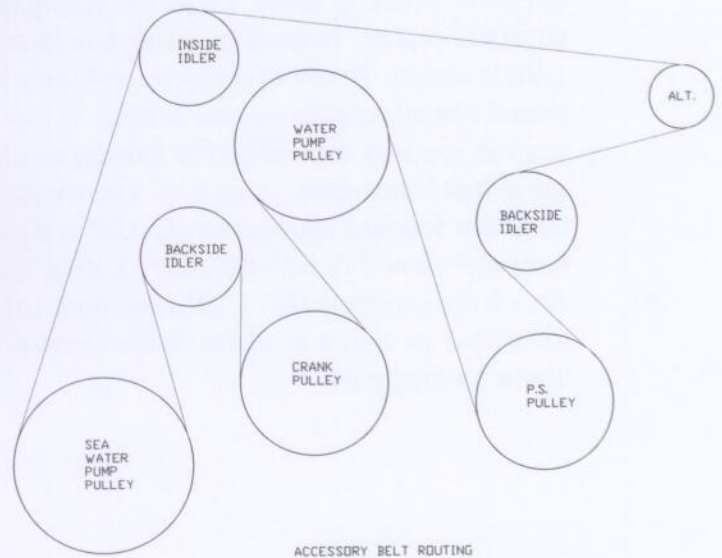


Idler bracket top bolt hole location. (3.00" Hex spacer)

Lower idler bracket stud locations (3.99" Hex spacers)



**FIGURE B8**  
**TENSIONER BRACKET INSTALLED**

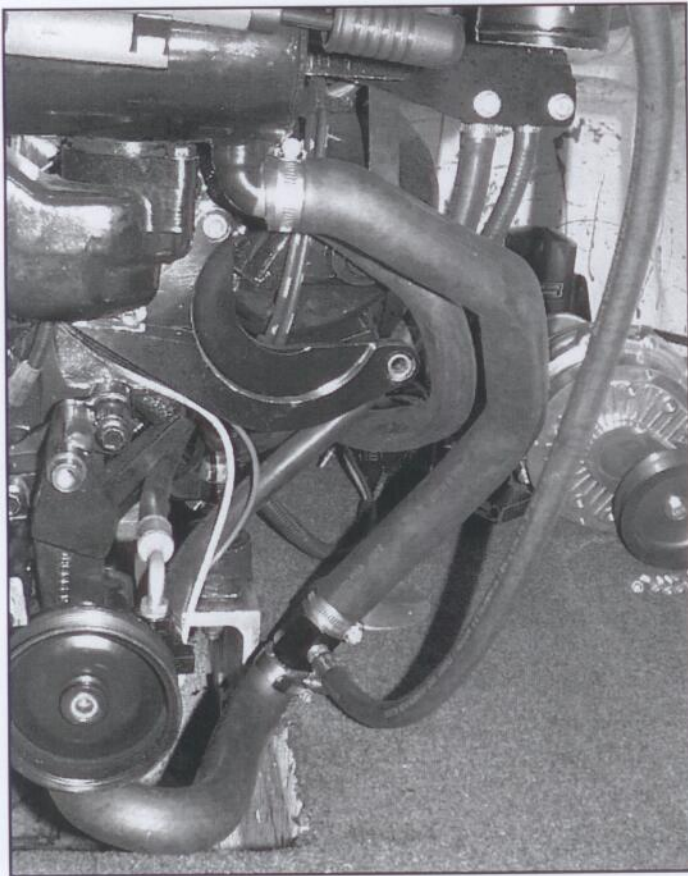




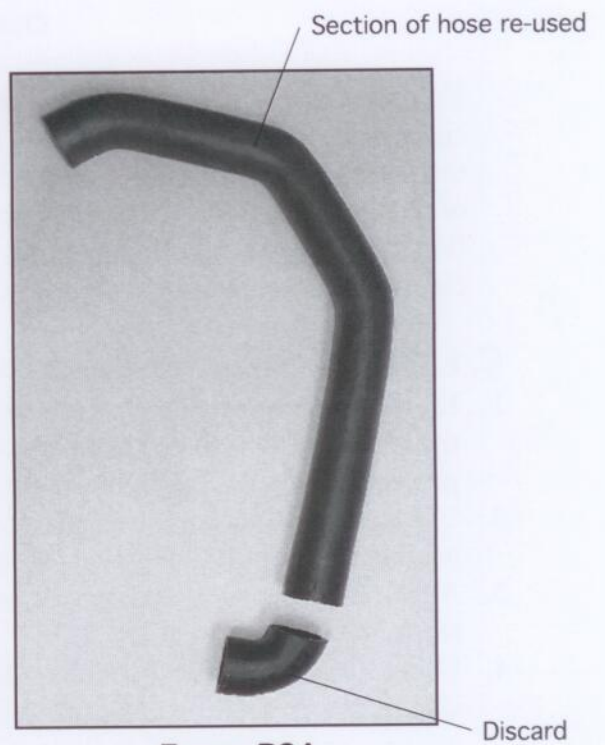
Refer to figure B7 for steps 12-13.

12. Thread the (2) 3.99 hex spacers onto the (2) lower tensioner bracket support studs.
13. If not already done, thread a 10 mm-1.5 x 40 mm stud into the 3.00" long hex spacer. Thread the other end of the stud into the upper tensioner bracket vacated hole.
14. Attach the tensioner assembly to the previously installed hex spacers with the (3) 10 mm-1.5 x 20 mm socket head cap screws (schs). Tighten all (3) schs.
15. Re-install factory accessory belt, loosening the swing bolt in figure B6 as necessary to install belt. *Refer to the belt routing diagram on page 13.*  
Do not tension belt at this time.
16. Disconnect factory water hose from water valve located below the power steering pump. Cut factory water hose as shown in figure B9A.
17. Install supplied water hose and intercooler tee fitting as shown in figure B9 and secure with clamps.
18. Attach one end of the supplied 1/2" x 30" hose and secure with hose clamp.
19. Attach main bracket to engine, attaching to the (3) previously installed supports using the (3) 3/8-16 x 1-1/4" schs. *See figure B5 and B10.*
20. Attach factory flame arrestor to inlet of Procharger. Do not tighten at this time.
21. Installing from behind the bracket, attach the Procharger to the main bracket using (5) 5/16-18 x 3/4" schs and (2) 3/8-16 x 1" schs, rotating the flame arrestor as needed. Note: After installing the first (2) schs, check to ensure the outlet of the Procharger is pointing vertically as shown in figure B11. If necessary, the compressor housing bolts on the Procharger may be loosened and the compressor housing rotated. Make sure to retighten the compressor housing bolts or damage to the Procharger can occur.
22. Tighten the flame arrestor clamp.
23. Thread the 8 mm-1.25 x 25 mm schs through the main bracket and into the alternator support hex spacer and tighten. *Refer to hole location D2 in figure B4.*
24. Using a 9/16" wrench, tension the factory belt and secure all tensioner bolts.
25. Install the Procharger belt over the crank pulley and drive pulley. Using a 3/8" square drive ratchet or break-over bar, rotate the spring tensioner to allow installation of belt under tensioner pulley. Note: The spring tensioner has (3) setting locations. It is initially set in the middle setting. If you experience problems installing the belt, the tensioner may be repositioned counter-clockwise one setting. If you lose belt tension over time and need more tension you may reposition the tension clockwise one setting. To reposition tensioner, remove belt if installed, using 3/4" wrench and 3/8" hex wrench, remove center bolt, pull tensioner forward approximately 1/2" and rotate direction desired, applying light aft force the tensioner should fit into the next locating hole. Re-install tensioner bolt and secure.
26. Attach the supplied 1/2" x 32" long hose to the previously install oil filler cap fitting and route over to within 2" of the flame arrestor. Using wire ties, secure hose to keep away from hot or moving parts.

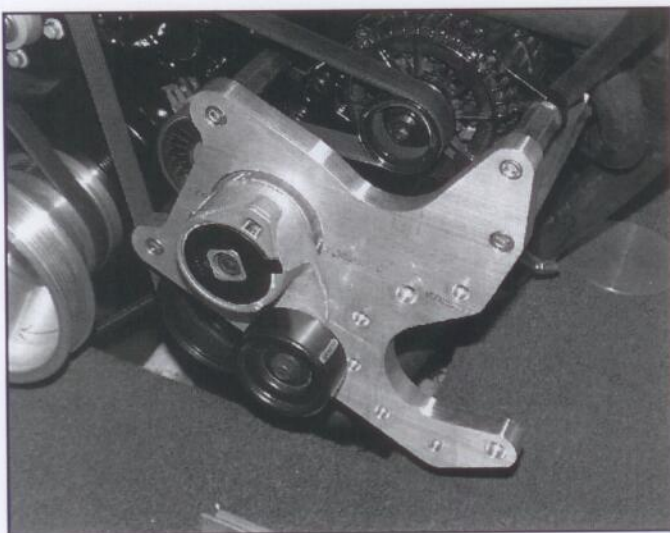




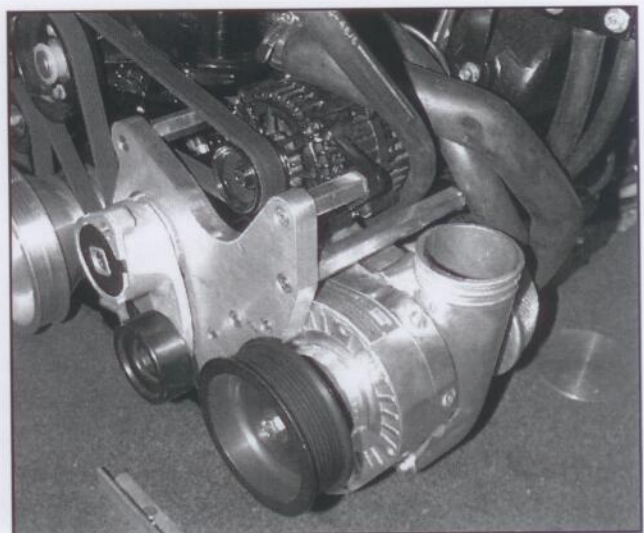
**FIGURE B9**  
**INTERCOOLER TEE & WATER HOSE ROUTING**



**FIGURE B9A**  
**MODIFIED FACTORY WATER HOSE**



**FIGURE B10**  
**MAIN BRACKET INSTALLED**



**FIGURE B11**  
**MAIN BRACKET AND ProCHARGER**  
**INSTALLED**



## C. INTERCOOLER INSTALLATION SECTION

### DESCRIPTION AND OPERATION

The intercooler system main components consist of the intercooler and tubing. The intercooler is a custom designed, bar & plate style, air-to-water heat exchanger. The charge air (compressed and therefore heated) discharged by the ProCharger enters the intercooler plenum, passes thru a series of passages and exits the opposite plenum. Fresh lake/seawater taken from the seawater pump, flows through the crossflow passages in the intercooler, thereby cooling the charge air. The cooled charge air is then routed to the throttle body where it enters the intake manifold.

#### C.1. Power Steering Reservoir Relocation

1. Lift up on the power steering reservoir and remove it from it's bracket. Temporarily wire tie it to the aft support on the oil filter bracket. Note: If there is not enough slack in the reservoir lines, proceed to step 2. *See figure A1 for location.*
2. Using a 13 mm socket (or wrench if step 1 was omitted), remove the (2) bolts holding the reservoir bracket to the oil filter bracket. Set aside bracket, as it will be re-used.
3. Attach the ATI supplied reservoir bracket to the oil filter bracket as shown in figure C1 using the stock bolts.
4. Using a 1/2" socket and wrench, attach the factory power steering reservoir bracket to the back side of the bracket installed in step 3 with the supplied 5/16-18 x 1" bolts, flat washers, lock washers and lock nuts. *See figure C2.*
5. Re-install the factory reservoir onto the newly relocated reservoir bracket.

#### C.2. Throttle Body Modification

1. Disconnect the throttle cable from the throttle body.
2. Using a 10mm socket, remove the (3) nuts that attach the throttle body to the intake manifold and remove the (3) mounting studs.
3. Careful not to tear the gasket, separate the throttle body from the intake manifold. With the stock gasket against the intake manifold, insert the supplied block off plate and gasket between the stock gasket and linkage support plate. The block off plate should be located between the stock gasket and the supplied gasket. *See figure C3.*

#### C.3. Intercooler Installation

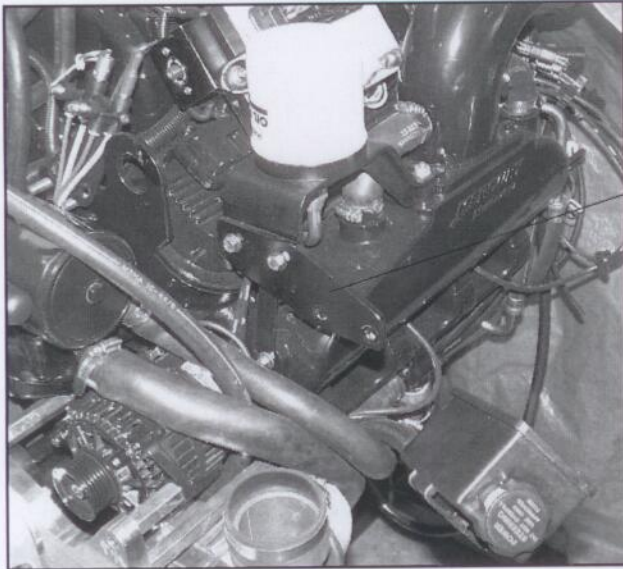
1. Disconnect the rubber retaining strap from the drive lube reservoir and set aside reservoir - no need to disconnect anything from the reservoir.
2. Using a 15 mm wrench, remove the (2) nuts from the front of the drive lube reservoir bracket/ air service valve mounting studs (below the air service valves). *See figure C4 and C5.*
3. Slide the air service valve bracket and drive lube reservoir bracket off of the studs.
4. Slide the supplied aft intercooler bracket onto the studs and then re-install the drive lube reservoir bracket and air service valve bracket. Thread on the stock nuts, but do not yet fully tighten .



**Note: If you are installing this kit on a engine that is not in a boat, skip to the next section and perform steps 5 thru 12 and section C.4. after installing engine.**

5. Using a 9/16" wrench and the supplied 3/8-16 x 1" bolt and washer, bolt the intercooler retaining washer to the backside of the engine lifting bracket and into the intercooler aft bracket. *See figure C6.*

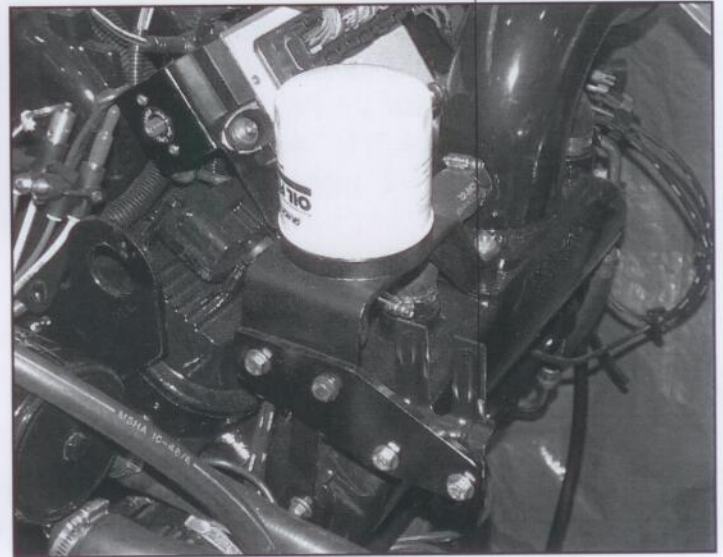




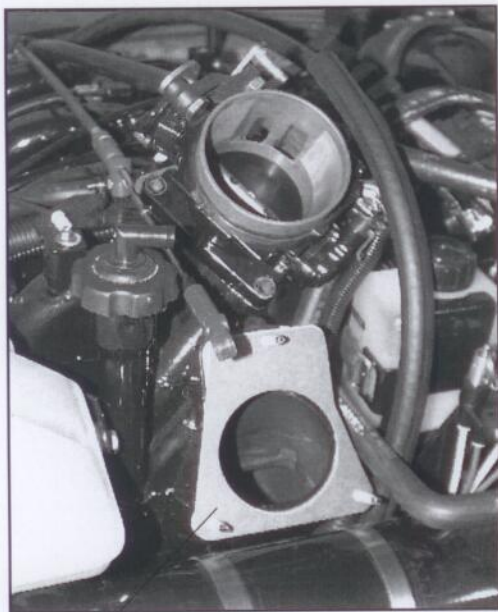
**FIGURE C1**  
**POWER STEERING RESERVOIR**  
**RELOCATION BRACKET INSTALLED**

Power steering reservoir  
 relocation bracket

Factory power steering  
 reservoir bracket



**FIGURE C2**  
**POWER STEERING RESERVOIR RELOCATION**  
**BRACKET INSTALLED ALONG WITH FACTORY**  
**BRACKET**

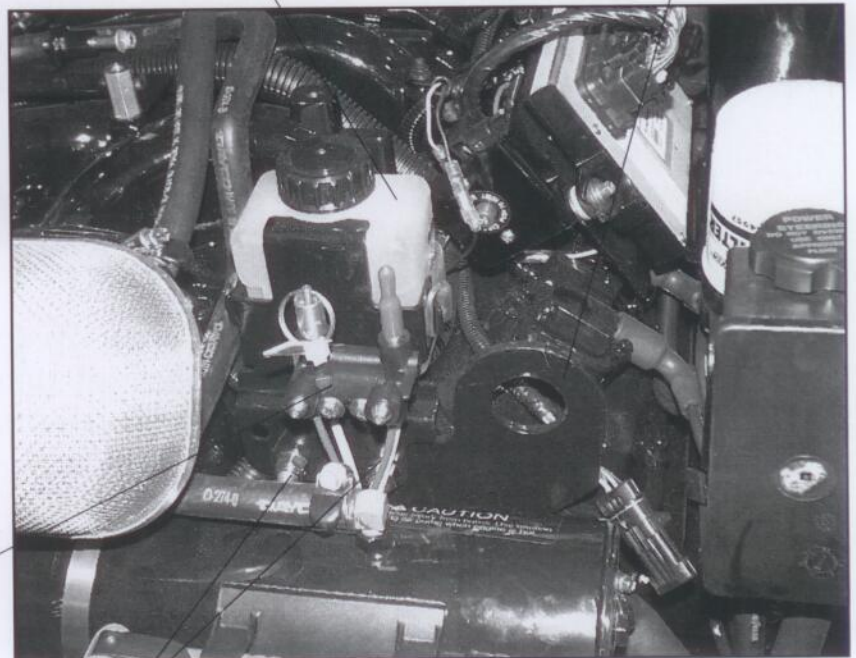


**FIGURE C3**  
**THROTTLE BODY BLOCK OFF**  
**PLATE AND GASKET INSTALLED**

Block off  
 plate

Drive lube reservoir

Engine lifting bracket



Air service valves

Mounting studs

**FIGURE C4**  
**(REFERENCE PHOTO)**



6. Tighten the (2) nuts and bolt that attach the intercooler aft bracket.
7. Insert the two supplied 3/8-16 x 1-1/2" bolts with flat washers through the slot in the intercooler aft bracket from the back side. *See figure C7.*
8. Place the intercooler against the intercooler aft bracket, inserting the two previously installed bolts thru the (2) holes in the intercooler bracket. Install a flat washer and brass lock nut on each bolt, but do not fully tighten at this time.
9. Position the intercooler inlet so that it is directly above the Procharger outlet. Install the 8" tube section between the Procharger and intercooler using the (2) 3" rubber couplers and (4) #52 hose clamps using a 5/16" socket. *See figure C8.*
10. Install the 3-1/2" rubber elbow between the intercooler outlet and the throttle body (attach the shorter leg to the throttle body) and secure with the (2) #56 clamps using a 5/16" socket. *See figure C9.*



**Note: Check the clearance between the throttle linkage shoulder bolt and the rubber inlet elbow. You may need to remove the shoulder bolt and remove material from the head to obtain ample clearance.**

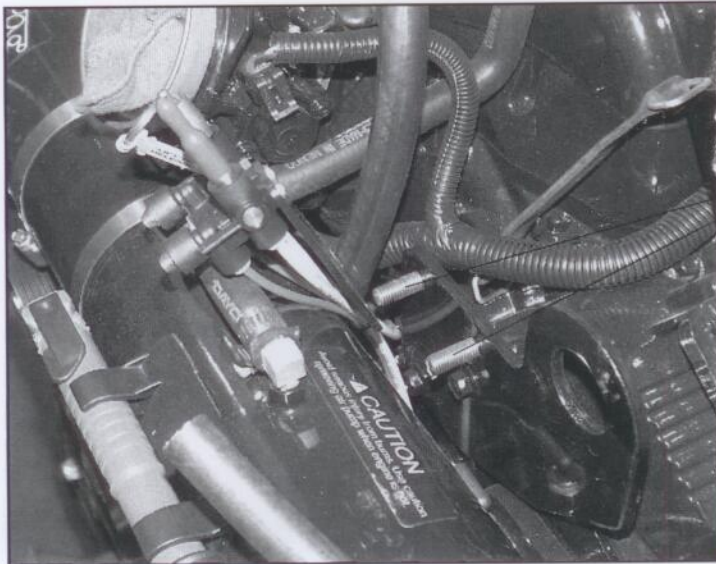
11. Tighten the (2) bolts holding the intercooler to the intercooler aft bracket.
12. Attach the hose coming from the intercooler tee fitting (previously installed) to the fitting on the lower front side of the intercooler.
13. Refill power steering reservoir.
14. Attach intercooler cover plate to top of intercooler.

#### **C.4. Overboard Fitting Installation**

The intercooler overboard fitting can be installed in either of (2) locations: 1) On the driver side of the boat back near the transom (usually where the bilge overboard is located; or 2) Above the drive unit for cooling of the lower unit if not using a drive shower. The driver side mount is preferable so the driver can verify water flow through the intercooler.

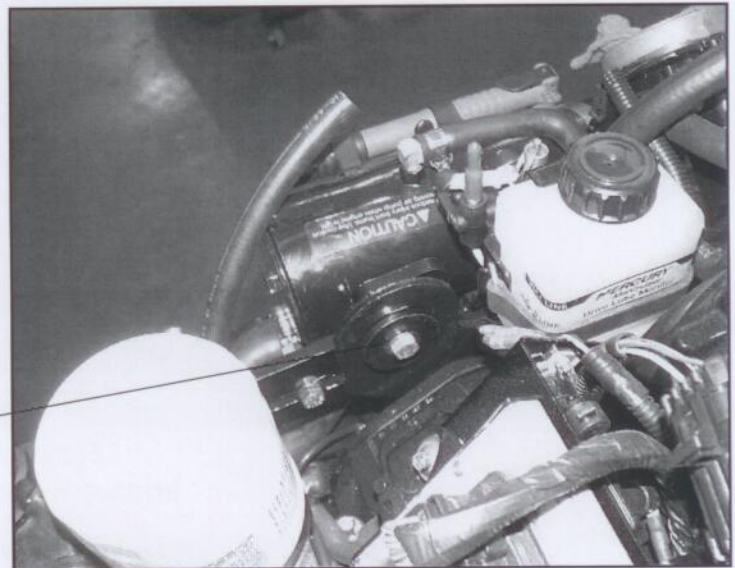
1. Locate and mark your overboard fitting location.
2. Using a 7/8" spade/paddle drill bit or hole saw, drill a hole in the desired location.
3. Apply silicone sealant to the threads and flange of the supplied overboard fitting. From Outside the boat, insert the overboard fitting thru the hull and secure with the supplied nut. Wipe off any excess sealant.
4. Using the supplied #12 hose clamp, attach the 1/2" x 10' long water hose. Route hose over to intercooler outlet (upper backside of intercooler) and attach to intercooler outlet. Trim excess hose as necessary. Use wire ties to secure hose away from hot or moving parts.





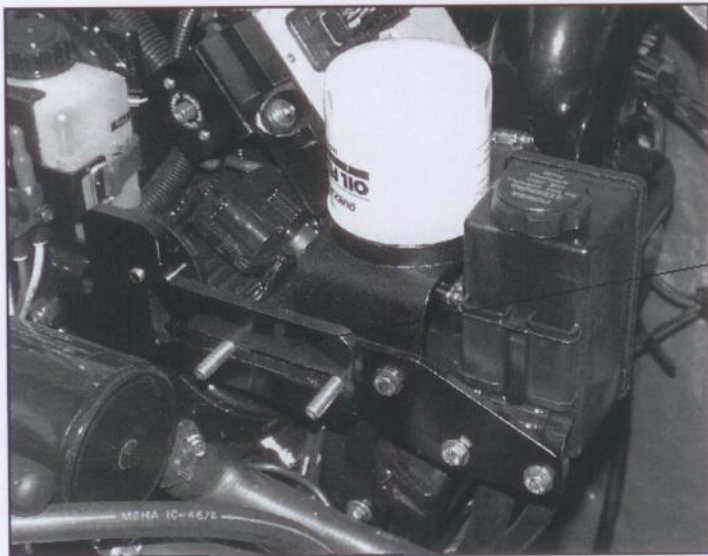
Studs used for mounting  
aft intercooler bracket

**FIGURE C5**  
**AFT INTERCOOLER BRACKET LOCATION**  
**(AIR SERVICE VALVE AND DRIVE LUBE**  
**RESERVOIR BRACKET STUD LOCATION)**



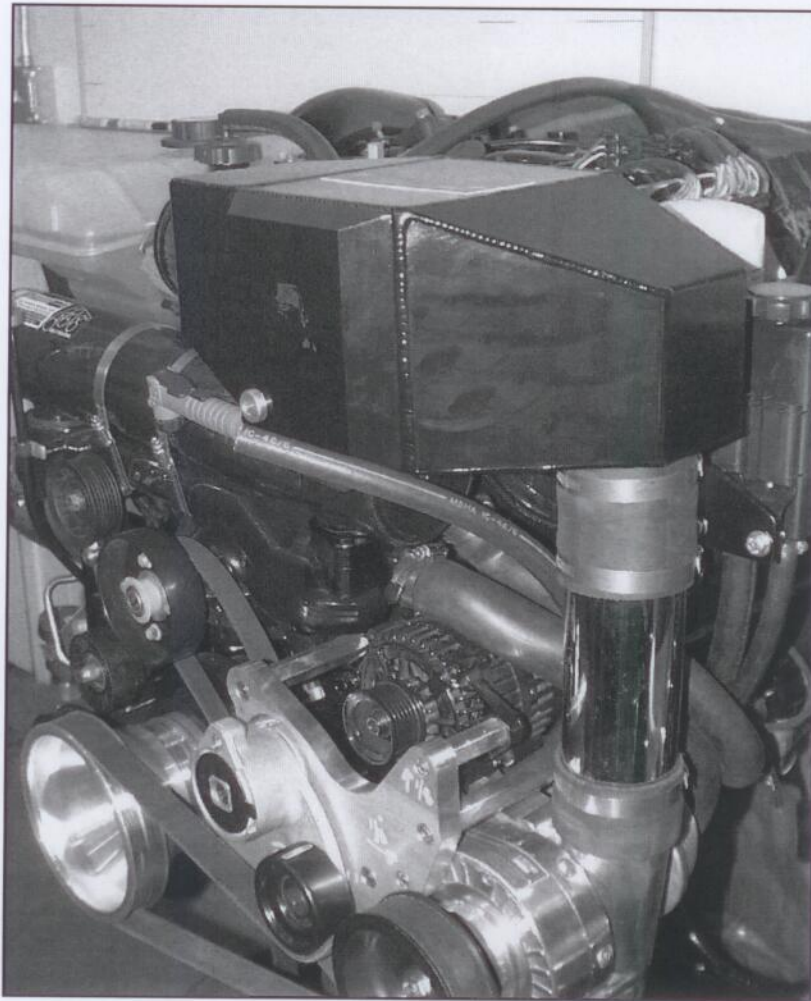
Retaining washer

**FIGURE C6**  
**RETAINING WASHER INSTALLED**

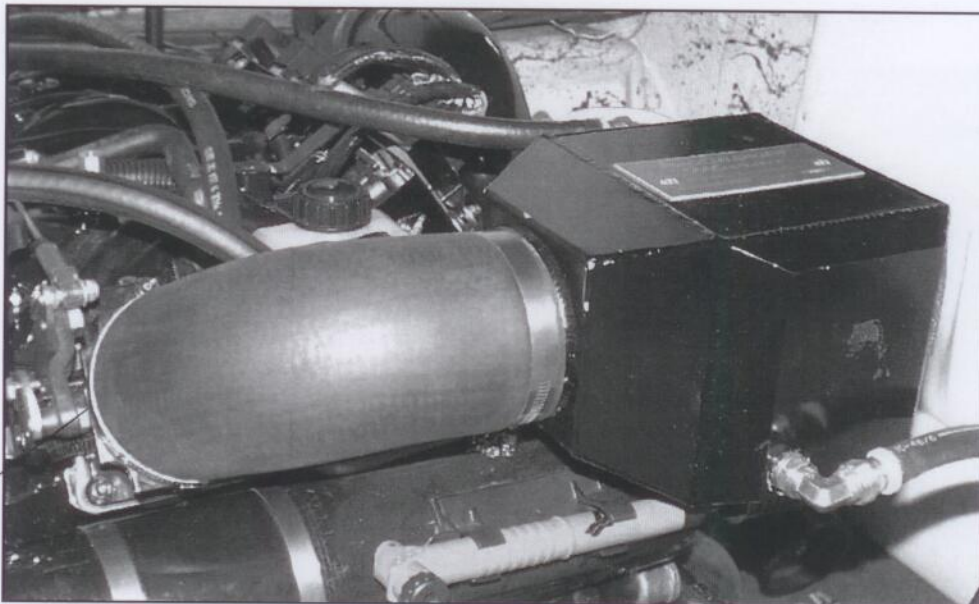


Aft intercooler bracket

**FIGURE C7**  
**INTERCOOLER AFT BRACKET INSTALLED**



**FIGURE C8**  
**INTERCOOLER INSTALLED**



**FIGURE C9**  
**RUBBER ELBOW AND INTERCOOLER INSTALLED**

Shoulder bolt:  
check for clearance



## D. FUEL SYSTEM INSTALLATION

### DESCRIPTION AND OPERATION

The Mercruiser fuel system has a low pressure electric fuel pump which draws fuel from the tank and pumps it through the fuel filter/separator. The fuel then flows to a high-pressure pump to the fuel rail, while excess fuel flows through the fuel cooler, regulator and back to the fuel filter/separator. ATI supplies a boost sensitive regulator to increase the fuel pressure when operating under boost. The supplied regulator installs between the factory regulator and the filter/separator and is controlled by intake manifold pressure. Under no load (no boost) conditions, the ATI regulator simply bypasses fuel. Under load/boost conditions, the ATI regulator closes down the return line proportionately with boost, therefore increasing fuel pressure and supplying the engine with more fuel for each pulse of the injectors. *See figure D3 for reference.*



**Warning/Caution:** This is a high pressure EFI fuel system. When working on the fuel system, there will be a small amount of pressurized fuel discharged when opening the system. Proper precautions should be taken to contain or minimize spillage (i.e. catching fuel in a container and soaking up spilled fuel with a rag) and avoid exposure to spark or flame (i.e. disconnect battery, no smoking, etc.).



**Warning/Caution:** Ensure that all fuel lines are correctly sized for the supercharged horsepower rating of the engine. This includes the anti-siphon valve, fuel filters, etc. . Please contact an ATI service technician if you have any questions.

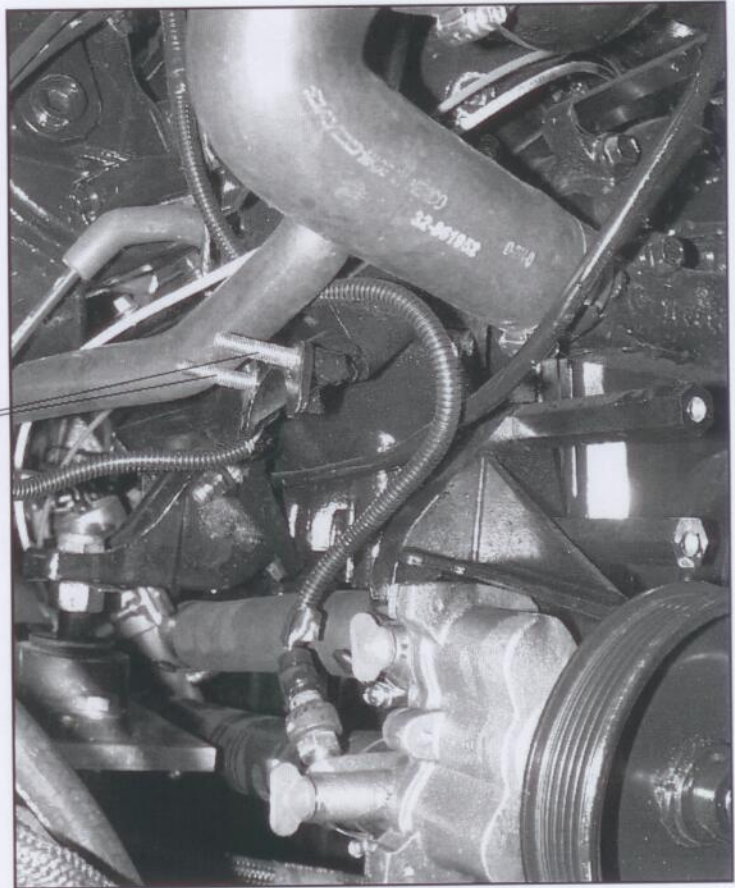
1. Using a 10 mm socket, remove the (2) nuts that attach the fuel filter/separator to its bracket. Remove the filter/separator from the bracket. *See figure A1 and D1.*
2. Using the two supplied 8 mm speed nuts and a 10 mm socket and wrench, remove the (2) studs from the factory filter/separator bracket.
3. Using a 6 mm hex bit, install the (2) supplied 8 mm-1.25 x 50 mm studs and tighten.
4. Install the ATI regulator bracket onto the studs and re-install the filter/separator. Secure with the factory nuts. *See figure D2.*
5. Disconnect the factory fuel return line (coming from the factory regulator) from the filter/separator. Re-connect this line to the fitting on the side of the ATI regulator.
6. Connect the line coming from the bottom of the ATI regulator to the port on the filter/separator vacated by relocating the return line.
7. Connect the 36" long air-lock line to the top of the regulator and route to the top of the engine.
8. On the top of the engine, disconnect the vacuum line (coming from the regulator near the fuel pump/cooler assembly) from the vacuum tee and remove the vacuum line assembly running between the intake manifold and the fuel pressure regulator/dampner. Install the supplied vacuum tee assembly in place of the previously removed line and re-connect the vacuum line coming from the stock regulator. Attach the air lock line into the fitting on the vacuum line assembly. *See figure D4.*
9. It is highly recommended that you install a fuel pressure gage to monitor your fuel pressure. The fuel pressure sending unit may be installed in any one of the (3) remaining ports on the side of the ATI regulator.



10. Re-connect your battery and test for leaks by turning the key to the "ON" position. You should hear the fuel pump momentarily run. Before operating the boat, start the engine and check again for fuel leaks.
11. **5 PSI applications only. 3.5 PSI applications skip to step 12.**  
Remove the four M6 bolts that hold the fuel rail to the intake manifold. Following the instructions in your factory service manual, remove the injectors from the fuel rail and set aside. Install the supplied 38#/hr fuel injectors to the fuel rail and intake manifold injector bores. Attach the fuel rail using the supplied M6-1.0 x 30 hex head bolts, washers and the four supplied aluminum spacers (the spacers are necessary to adjust for the longer fuel injector bodies). Refer to Illustration D6 for this step. Remove the factory injector harness and replace with supplied harness.
12. Using a T30 Torx bit, re-install the plastic engine cover with the (3) stock bolts.
13. Before operating boat, see paragraph F.9. for fuel pressure settings/requirements.
14. To prevent the possible setting of computer codes, it is necessary to vent the Manifold Air Pressure (MAP) Sensor during boost conditions. To accomplish this, remove the bolt and washer that holds the MAP sensor in the intake manifold. Remove the MAP sensor by firmly pulling upward, being careful not to damage the sensor or sensor seal. Remove the rubber seal from the MAP sensor neck and place over the neck of the supplied billet bypass fitting.
15. Now insert the supplied billet bypass fitting w/factory seal into the MAP sensor hole in the intake manifold. Secure the bypass fitting in place using the factory hardware.
16. Attach the Map sensor and check valve to the bypass fitting as shown in Illustration D7, making sure the check valve is oriented such that it is closed during manifold vacuum conditions. Wire tie all connections.



Fuel regulator mounting location  
(Replace studs with longer supplied studs)



Boost reference line  
(Air lock line)



**FIGURE D1**  
**FUEL REUGLATOR LOCATION**  
**(LOCATED WHERE FUEL**  
**FILTER/SEPARATOR IS**  
**MOUNTED)**

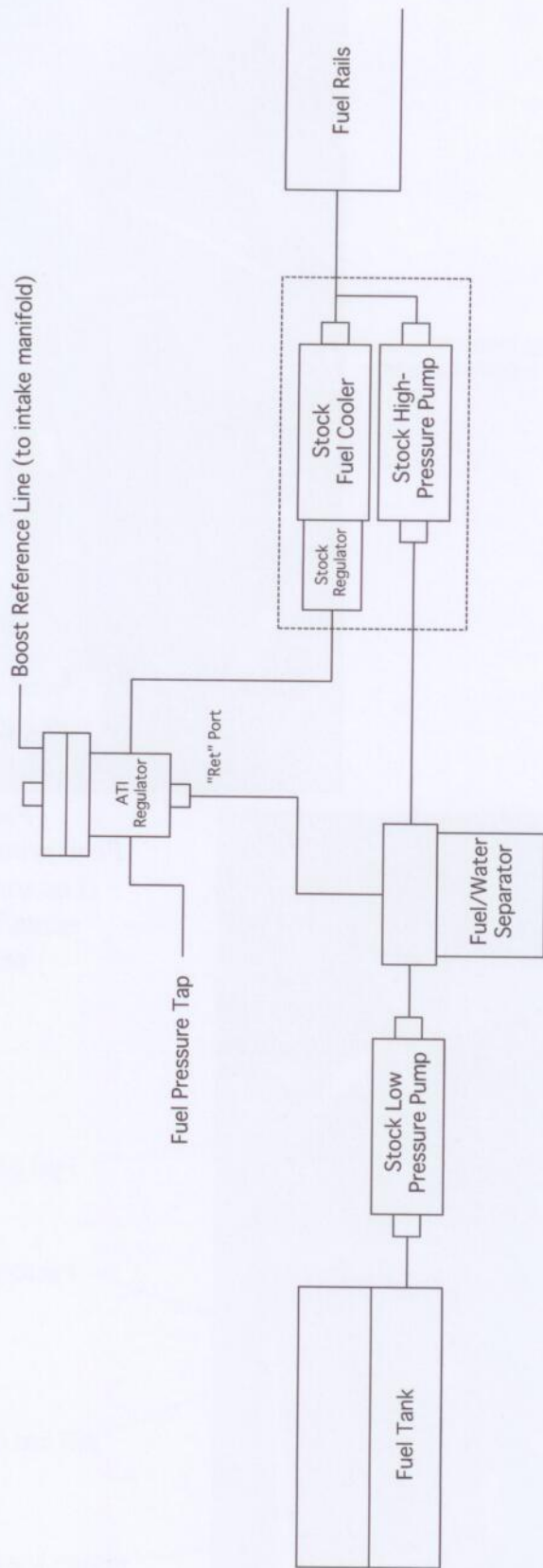
Fuel pressure adjusting bolt

Factory fuel return line

ATI fuel regulator

Return line (to fuel water separator)

**FIGURE D2**  
**FUEL PRESSURE REGULATOR INSTALLATION**



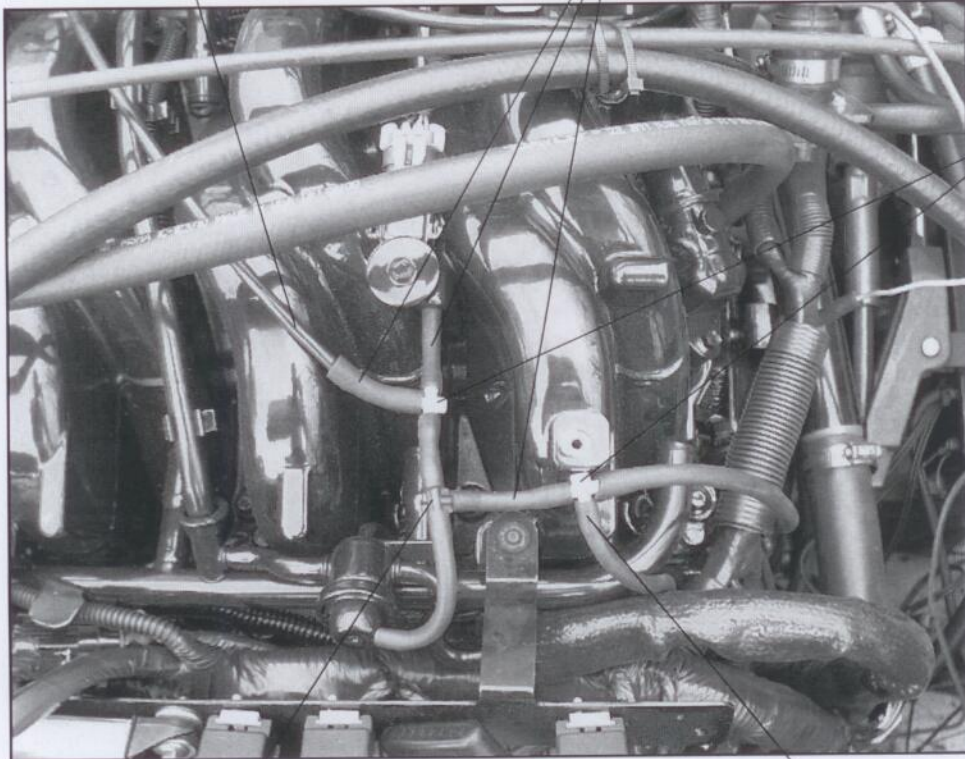
**FIGURE D3**  
**MERC 496 MPI**  
**REGULATOR INSTALLATION**



Front Of Engine

From ATI regulator

Supplied 2" sections of vacuum line



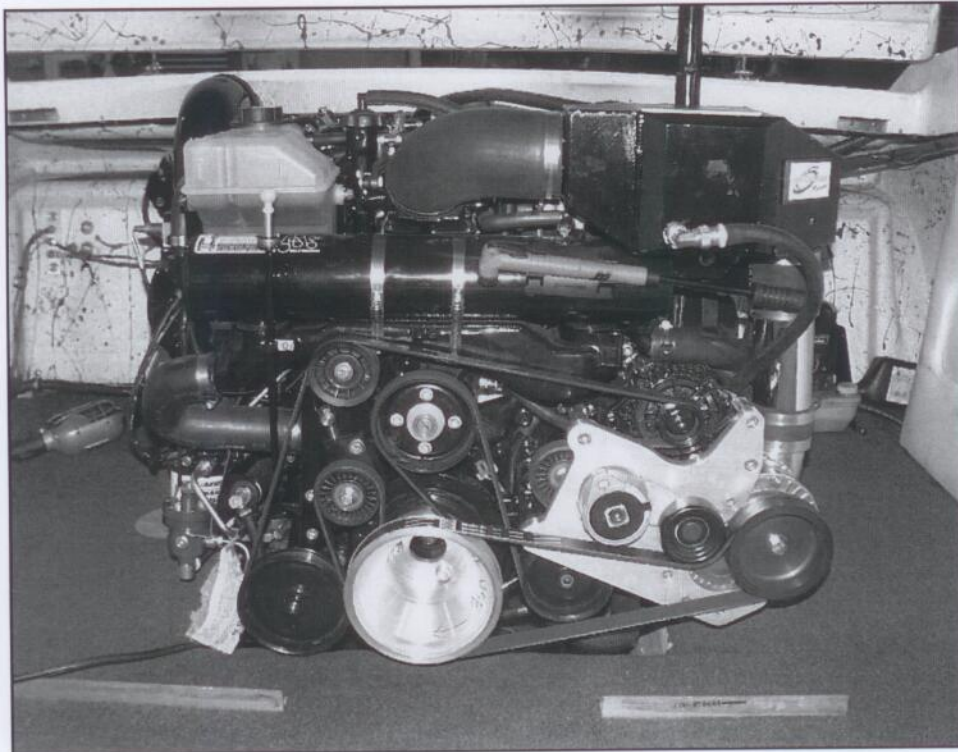
Supplied 'T' fittings

Rear Of Engine

Factory 'T' fitting

Boost gauge (if installed)

**FIGURE D4**  
**VACUUM LINE CONFIGURATION**  
**(TOP OF ENGINE)**

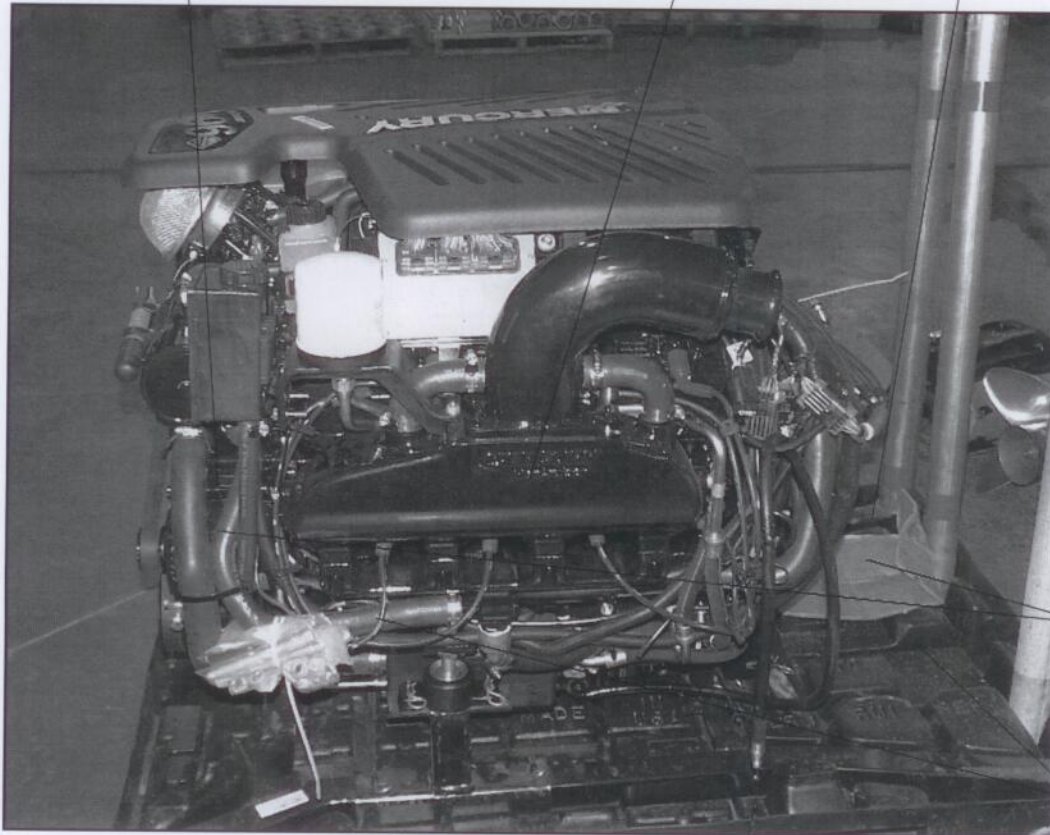


**FIGURE D5**  
**FINISHED INSTALLATION**  
**(MINUS TOP PLASTIC COVER)**

M6-1.0 x 30  
Hex Bolt and  
Flat Washer

Fuel Rail

M6-1.0 x 30  
Hex Bolt and  
Flat Washer



Supplied  
Aluminum  
Fuel Rail  
Spacers

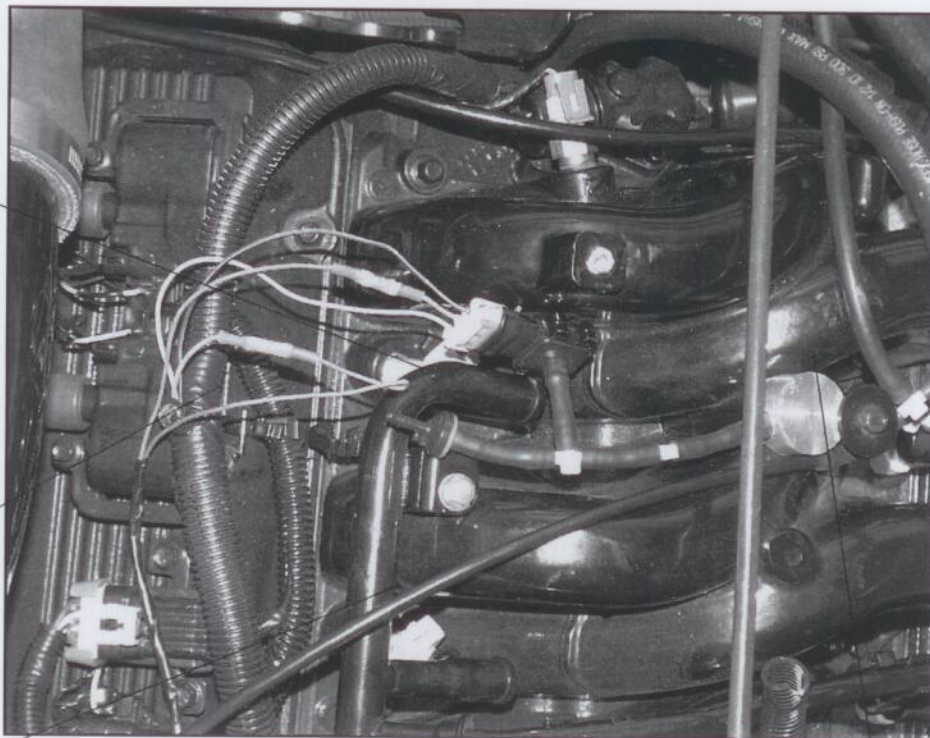
Supplied Fuel  
Injectors!

**FIGURE D6**  
**FUEL RAIL WITH SUPPLIED 38 LB./HR INJECTORS INSTALLED**  
**(PORT -SIDE OF ENGINE, MINUS TOP PLASTIC COVER)**

Vacuum Tee  
Fitting

Check Valve

MAP Sensor



Billet Bypass Fitting

**FIGURE D7**  
**MAP SENSOR BOOST BYPASS INSTALLED**



## E. SUPERCHARGER MAINTENANCE

### • WARNING:



**ALL SC SUPERCHARGERS CONTAIN NO OIL FROM THE FACTORY. YOU MUST ADD THE SUPPLIED PROCHARGER OIL PRIOR TO USE.**

Use only ATI supplied oil in your SC ProCharger. The ATI oil has been specially formulated for the bearings in the ProCharger and use of oil other than that supplied by ATI will void your warranty.

### • OIL CHANGE INTERVALS

The first oil change should be performed at 15 hours and at 100 hour intervals thereafter. Clean drain plug after every oil change. Drain oil by removing the magnetic drain plug. Clean off the magnetic drain plug before reinstalling. *See figure below, left*

### • OIL LEVEL

The oil level must be checked periodically (when cold) to ensure the proper oil level in the ProCharger. The dipstick can be loosened using a flat blade screwdriver or a coin. When installed, the oil level should be between the min and max levels (See fig. below). If the oil level falls below min, fill the ProCharger, through the dipstick hole, until the proper oil level is reached. **Warning: Filling the ProCharger higher than the "max" level on the dipstick will lead to bearing and/or seal damage.** The SC ProChargers are sealed units and normally will not require the addition of oil between service intervals. If excessive consumption is noted, the unit should be sent to ATI for inspection/repair. Disassembly of the supercharger will void your warranty.

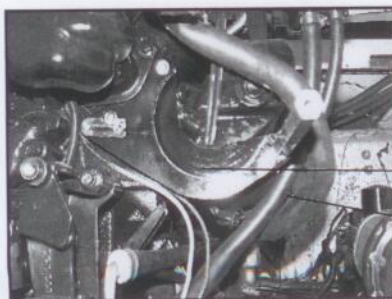
### • GENERAL

When removing the dipstick, be sure to retain the nylon washer. A spare washer is provided with each box of SC oil (a box is included with each system). Do not remove or replace either the nylon washer on the dipstick, or the rubber o-ring on the drain plug with anything other than ATI supplied replacements. **Evidence of either case may void factory warranty.** A discoloration of the oil and residue on the drain plug will be noticed during initial oil changes. This is no cause for concern and will eventually diminish. The serial tag on your SC ProCharger must be pointing upwards for proper orientation. Installing the supercharger in another orientation will result in inadequate oiling and supercharger failure. If you have any questions about the maintenance of your SC ProCharger they should be directed to an ATI service technician or dealer.



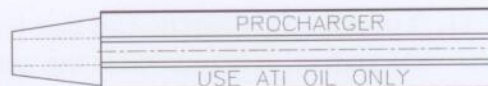
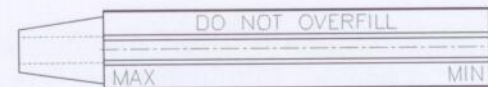
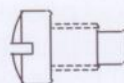
SEALED PLUG  
(SOCKET HEAD)

MAGNETIC  
DRAIN PLUG  
(HEX HEAD)



SEALED PLUG  
(SOCKET HEAD)

DIPSTICK  
(FLAT HEAD)





## F. INSTALLATION REVIEW AND SAFETY CHECK

1. Carefully review the entire installation, checking oil and fuel lines near moving parts and the exhaust system to ensure that these lines are safe, secure and not twisted or kinked. All wires and hoses should be firmly secured with clamps or wire ties. Also, confirm that the inlet screen is installed firmly secured to the ProCharger.



2. Check all fluid levels. Your tank should be filled with **91 octane** or higher fuel before hard running. **For SC ProCharger models, you must add oil to the supercharger before operation.**

3. Start engine and idle for a few minutes. You should be running stock Mercruiser timing. Check and adjust if necessary.

4. Shut off engine and check for fluid leakage, signs of rubbing parts, and other potential problems

5. Your motor should display a significant increase in performance when you are hard into the throttle, with no detonation. If this is not so, review your installation, then contact your dealer or ATI for assistance. Mercruiser EFI engines run slightly rich by design to provide maximum reliability.



6. For best performance and reliability, **always use premium grade fuel (91 octane or higher)** and listen for signs of detonation. Back off throttle should detonation occur. With a properly installed ProCharger and appropriate timing, detonation should not be an issue.

7. Never race your engine (and ProCharger) when the engine is cold. Allow water temperature to climb into operating range before revving above 2,500 rpm.

8. Be sure you have purchased and properly installed a fuel pressure gauge and/or fuel/air ratio meter to monitor fuel delivery. Installation of a boost pressure gauge is also recommended. The fuel pressure gauge should be plumbed into the ATI fuel pressure regulator (one of the ports is already reduced to 1/8" fpt for installation of a fuel pressure gauge). A boost gauge can be plumbed (tee'd) into any port on the intake runners.



9. **After the system is installed, set idle fuel pressure.** The stock idle fuel pressure is approximately 38 - 42 psi. On 3.5 psi kit, set idle fuel pressure to 3 -4 psi above stock. On 5 psi kits, set idle fuel pressure to 1 psi above stock. Under full boost conditions fuel pressure should increase to 65 - 75 psi. Fuel pressure can be adjusted by tuning the regulator. Regulator tuning is accomplished by loosening the jam nut on the regulator with a 3/4" open end wrench, and then using a 1/4" allen wrench to adjust fuel pressure. Clockwise raises fuel pressure; counterclockwise reduces pressure. Remember that leaning the fuel pressure will increase HP but can create an extremely dangerous lean condition. **Be careful and ensure that you always maintain adequate fuel pressure!** Contact ATI for special applications requiring regulator modifications for higher rates of gain.



10. Mercruiser EFI/MPI rev limiters cut off fuel to limit rpm, which can cause a dangerous lean condition. Ensure that boat is propped so that maximum rpm is below factory rev limiter. **Repeatedly "bumping"/riding rev limiter can result in serious engine damage.**

11. It is very important that all fuel lines are sized according to the supercharged horsepower rating of the engine. This includes the anti-siphon valve, fuel filters, etc. . Please contact an ATI service technician if you have any questions.

12. Review the maintenance and warranty sections within this owner's manual.



## **G.TUNING**

### **Fuel Pressure**

**On a fuel injected motor, adequate fuel pressure is the key factor in maintaining the correct fuel-air ratio.** When supercharging a fuel injected motor, extra fuel beyond that supplied by the Mercruiser computer and fuel system is required, due to the additional oxygen present in the cylinder. This extra fuel is provided by increasing the fuel pressure when under boost. After the system is installed, fuel pressure should be checked. Refer to section F9. for fuel pressure specifications and adjustments. It is extremely important to check the pressure as the motor may run seemingly fine, but due to insufficient pressure is running dangerously lean. Fuel pressure can be increased or decreased by adjusting the regulator. If your engine is not completely stock, check with ATI for fuel pressure recommendations prior to operation.

### **Plugs**

As to reading the plugs, the following information should help identify what to look for: What we want to focus on is the threads. The threads are directly connected to the cylinder, and so when the plug is removed, essentially part of the combustion chamber is removed. On almost all cases the appearance of the top of the plug threads is also what the chamber and pistons look like. We want the threads and the chamber to be blackened with soot deposits. This indicates a rich supercharged condition and therefore will see cooler exhaust temperatures. The ground strap should be clean and show no signs of blue discoloration. The electrode should be clean and white; this indicates good combustion. The following are signs of problems: If the negative ground is discolored, it indicates high temperatures. If the electrode is fuel soaked or black this indicates a misfire or fouled plug condition. If any of the 1st thread is not completely black, there is not enough fuel in the cylinder. Even if only a small part of the thread's circumference is clean, this condition may produce excellent power, but will likely produce excessive (unsafe) cylinder temperatures.

# OPERATION AND MAINTENANCE

- **COLD STARTING**

Never race your engine (and ProCharger) when your engine is cold. Allow the water temperature to climb into operating range before revving above 2,500 rpm.

- **FUEL QUALITY**

For best performance and reliability, **always use at least 91 octane fuel (or premium for your altitude)**. Always listen for signs of detonation after refueling, and after replacement or modification of any fuel system components. Back off of the throttle if detonation should occur. With a properly installed ProCharger intercooled supercharger system, detonation should not be an issue

- **IGNITION SYSTEM MAINTENANCE**

If your spark plugs are more than two years old or have more than 100 hours use, you should change your plugs before operating your boat under load. Additionally, spark plug wires should be changed every 200 hours of use, or whenever resistance exceeds factory specifications.

- **AIR INLET**

**Your motor and ProCharger should never be run without an air inlet screen, failure to do so could result in serious personal injury!**

- **BELT TENSIONING AND REPLACEMENT**

The belt which turns your ProCharger will stretch after initial run-in, and may need retightening after the first few hours, if not sooner. Should you throw a belt and find that it needs constant retightening, the belt is damaged and should be replaced. 8-rib belts can be bought from ATI or your local parts store. Gates Micro-V belts (P/N K080525 for 3 psi systems) are recommended ; these belts are available at CarQuest™, NAPA™ and other auto parts stores. Your nearest CarQuest store can be found by dialing 800-492-7278, the nearest NAPA store at 800-538-6272.

- **IMPELLER SPEED**

Maximum impeller speed should not exceed the redline stated for each model in the table below. Maximum impeller speed = crankshaft pulley diameter (N1) divided by supercharger pulley diameter (N2), multiplied by the step-up ratio (4.10:1), multiplied by engine rpm at redline.

$$\text{Impeller RPM} = (N1/N2) \times (4.10) \times \text{engine RPM}$$



## **CHECKING YOUR EGT'S AND/OR READING YOUR PLUGS IS EXTREMELY IMPORTANT!**

Many activities that are good for you are usually not too enjoyable. Fortunately, when it comes to your marine engine, the simple process of monitoring your exhaust gas temperatures (EGT's) or reading your plugs can save thousands of dollars of unnecessary engine repairs and provide many enjoyable hours of trouble free service.

Monitoring EGT's requires the installation of EGT probes and gauges. If you are not familiar with this process, contact your dealer or an ATI service technician. Reading your plugs is a relatively simple alternative to monitoring EGT's, but is not as precise.

As for reading plugs, we must first start by saying that **when** a plug is read is as important as **what** is observed. If a spark plug is removed & read at the wrong time, not only will a misdiagnosis occur, but in many cases the tuner may actually mistakenly tune the engine in the wrong direction and unintentionally create a lean engine-damaging condition. Therefore, the only real way to read plugs is to remove the spark plugs immediately following a wide open throttle, full power condition. This is done by accelerating the boat at wide open throttle to full operating range for a few seconds, or until it is clear that rapid acceleration has ceased ( in most marine engines a good plug reading can be taken from 4500 to 5500 rpm) and then immediately shutting off engine and coasting to a stop. Although many spark plugs may only require less than 60 seconds each to be read & completely reinstalled, this previously described simple process provides a tremendous opportunity to literally take a snapshot of the combustion process and what is happening inside the engine.

If a hundred engine builders were asked to estimate what it would require to properly tune your engine there may be a hundred different answers since no two engines are exactly alike. It is called the cumulative tolerances theorem, a half a percent difference in total valve lift, a slight variance in piston ring gap, a small amount of unremoved casting flashing in a cooling passageway, and hundreds of other minute differences can lead to identical engines requiring some differences in fuel pressure to produce proper and uniform combustion. To properly read a spark plug we must first have the correct spark plug. Most Champion, AC & other GM spark plugs are easy to read; however, many Ford Motorcraft are black in color & therefore difficult to read. It is suggested for best results that a brand new set of spark plugs be installed before any attempts to gather information. Let us remind you the following tuning tips are based on unleaded pump gas operations in the stock compression ratio range. Since today's pump fuels register significantly lower octane ratings, and therefore are significantly more susceptible to engine knock or ping, than yesterdays high octane fuels, it is important that some additional fuel be placed in the cylinder - not intended to be burned, but just to act as a cooling medium. This simply means that a richer than "ideal" air fuel ratio is now highly desired for maximum performance on today's pump gas engines. After the system is installed, fuel pressure should be checked. Refer to section H. for specifications and adjustments. It is extremely important to check the fuel pressure as the motor may run seemingly fine, but due to insufficient pressure is running dangerously lean. Remember that leaning the fuel pressure will increase HP but can create an extremely dangerous lean condition. Contact ATI for special applications requiring regulators with higher rates of gain.



## **THE PROCHARGER® AND PROCHARGER INSTALLATION SYSTEM LIMITED WARRANTY**

Accessible Technologies, Inc. ("ATI") is proud to offer a twelve-month limited warranty on its ProCharger products. ATI's warranty obligations are limited to the terms set below:

ATI warrants the ProCharger and ProCharger installation system (together "product") against defects in materials and workmanship for a period of TWELVE (12) months from the date of original purchase from your local dealer, or date of shipment from the factory if purchased directly from ATI. If the product is used in its intended manner, ATI will repair or replace any component found to be defective at no charge to the customer. **SHOULD THE CONSUMER ELECT TO USE A DRIVEN PULLEY OTHER THAN THE ORIGINAL PULLEY SHIPPED WITH THE SYSTEM, THIS TWELVE-MONTH LIMITED WARRANTY IS VOID.** This warranty coverage is extended only to the original consumer purchaser, and excludes hoses, sleeves and electronic support components manufactured by other companies.

To obtain service under this warranty you must do the following during the warranty period:

1. Phone ATI (913-338-3086) and provide us with the following information:
  - ProCharger serial number
  - vehicle year, make, model, engine modifications and other modifications
  - description of perceived problem
2. If no solution to your problem can be found after the above phone conversation, you will be assigned a warranty claim number. You must then properly ship your product, at your expense, to the ATI factory. The product should be carefully packaged in a rugged box so that none of the components being shipped could strike each other or the side of the box during shipping. The box should be strong enough to safely contain the weight of the components being shipped.
3. Include the following information inside the box with your product:
  - copy of your original invoice or receipt
  - name, address and daytime telephone number
  - warranty claim number
  - vehicle year, make, model, engine modifications and other modifications
  - description of perceived problem
4. Clearly mark the warranty claim number on the top and one side of the box in characters no less than 2" tall. Ship the properly packaged product, prepaid and insured for the retail value of the component(s) being returned, to the following address:  
Accessible Technologies, 14801 West 114th Terrace, Lenexa, Kansas 66215.

ATI agrees to honor a warranty claim at its sole discretion and only after inspection by engineers at the ATI factory. No warranty will be honored if any product subassembly is found to have been improperly installed, tampered with, mis-handled or misused in any way. **DISASSEMBLY OF THE PROCHARGER OR REMOVAL OF THE PROCHARGER SERIAL PLATE VOIDS ALL WARRANTIES.** Claims for freight damages should be directed to the freight company.

If ATI's limited warranty applies, your product will be repaired or replaced at ATI's option and shipped back to you, freight prepaid, via UPS ground service. If the limited warranty does not apply, we will advise you of the specific reason for denial, and advise you of repair expense and timing. After advising you of this information we will, at your option, either proceed with repairs or return your product to you in the state in which it was received. In either case the product will be shipped to you COD, insured at replacement value. This means that you would pay the return shipping and insurance charges if ATI's limited warranty does not apply to your product.

THE WARRANTY AND REMEDIES SET FORTH ABOVE ARE EXCLUSIVE AND IN LIEU OF ALL OTHERS, WHETHER ORAL OR WRITTEN, EXPRESS OR IMPLIED. THE DURATION OF ANY AND ALL WARRANTIES ON THE PRODUCTS DISCUSSED ARE LIMITED TO TWELVE MONTHS. ATI IS NOT RESPONSIBLE IN ANY EVENT FOR DIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES. No ATI dealer, agent, or employee is authorized to make any modification, extension, or addition to this warranty.



# **THE PROCHARGER SC EXTENDED COVERAGE PROGRAM**

## **DESCRIPTION**

- The ProCharger Extended Coverage Program extends the warranty coverage for your M-1SCB ProCharger an additional TWENTY-FOUR (24) months, for a total of thirty-six months. This extended coverage applies to parts and labor for the ProCharger centrifugal supercharger unit only, and does not include other system components.
- Under the extended coverage program, ATI will repair or replace any component within the ProCharger which is found to be defective.
- Service under the extended coverage program is obtained through the same process as described in The ProCharger Twelve Month Limited Warranty.

## **QUALIFICATION**

- Only the original consumer purchaser of the ProCharger is eligible, so long as this purchaser qualifies under the terms described below.
- Completion of the Extended Coverage Registration Form is required, along with a \$49 registration fee. In return for the \$49 registration fee, your system record will be updated to reflect the extended warranty and you will receive (6) additional bottles of ATI SC oil. This form must be completed in its entirety, and must be submitted along with payment within 30 days from the date of original purchase from your local dealer, or date of shipment from the factory if purchased directly from ATI.
- **PARTICIPANTS MUST HAVE ORDERED THE PROCHARGER WITH AN 8 RIB DRIVE SYSTEM**, and must agree to maintain this original pulley, and not remove this pulley or disassemble or modify the ProCharger unit in any manner. With respect to the ProCharger itself, all terms and conditions within the ProCharger Twelve-Month Limited Warranty apply. Tampering with the driven pulley and any other modification of the ProCharger unit will disqualify an owner from participating in the Extended Coverage Program. Acts resulting in disqualification include but are not limited to the following:
  - Removal or attempted removal of the ProCharger driven pulley
  - Removal or attempted removal of the ProCharger serial plate
  - Removal or attempted removal of the compressor housing or transmission case
- **PARTICIPANTS MUST AGREE TO PROPERLY MAINTAIN THE PROCHARGER, AND PROVIDE PROOF OF COMPLIANCE WITH THE FOLLOWING REQUIRED MAINTENANCE:**
  - Only ATI supplied oil must be used in the ProCharger.
  - ProCharger oil level must always remain within the specified limits.
  - ProCharger oil change every 100 hours using the ATI supplied oil. (After initial oil change at 15 hours)
  - See special notes on SC applications page.

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