

SB Ford F-1R/F-2 Reverse Installation Guide



PROCHARGER[®]
SUPERCHARGER SYSTEMS

The Intercooled Supercharging Experts![®]

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Torque Specification Chart	 Grade 5			 Grade 8		
	Thread Size	Torque (lb. ft.)			Torque (lb.ft.)	
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

INTRODUCTION

Congratulations on purchasing your ProCharger® SB Ford F-1R/F-2 Reverse Kit. Read this entire manual before you attempt to install your ProCharger kit. It is imperative that you follow all of the instructions in the order they appear in this installation guide. If you have any questions regarding any aspect of this installation, call us at (913) 338-2886.

For best results, we recommend reviewing the installation instructions beforehand, and following the installation instructions closely and in sequence. A detailed packing list has been provided to assist you in identifying the components of your ProCharger system.

Required Tools and Supplies

- 1/2" Socket Set (standard & metric)
- 3/8" Socket Set (standard & metric)
- 1/2" Breaker Bar and 4" Extension
- Open End Wrench Set (standard & metric)
- 3/8" Hex Bit Set
- Adjustable Wrench



Warning: Your supercharged Ford must always be run on 91 octane or higher gas.

You should have the following gauges available to properly check the finished installation and monitor your vehicle's performance (especially for testing):

- Manifold Boost Pressure Gauge
- Fuel Pressure Gauge
- Wide Band Oxygen Sensor and Gauge

Gauges should be of a type that can be read from the cockpit while performing a wide-open throttle road test. Cockpit or hood-mounted gauges are preferable. In order to obtain usable readings, the gauges should measure pressure at the intake manifold and fuel rail. IF VEHICLE DOES NOT MAINTAIN PROPER FUEL PRESSURE, DECREASE THROTTLE APPLICATION IMMEDIATELY. If your vehicle has difficulty retaining adequate fuel pressure, contact ATI ProCharger about the advisability of an upgraded fuel system.

The engine on which the ProCharger® is to be installed should utilize an appropriate compression ratio. If you have any questions or concerns regarding the suitability of your engine for supercharging, please call ATI Technical Service before proceeding. This supercharger system is intended for use on strong, well-maintained engines/transmissions. Installation on a worn or troublesome powertrain should be reconsidered. ATI PROCHARGER WILL NOT BE HELD RESPONSIBLE FOR DAMAGE TO A VEHICLE'S POWERTRAIN.

TABLE OF CONTENTS

Introduction i

Table of Contents.....ii

Lubrication 1

ProCharger and Brackets 2

Installed Dimensions 8

Operating Speeds 9

Supercharger Inlet/Intercooler..... 10

Operation and Maintenance 11

Limited Warranty 13

Notes 14

 **Warning:** *Never use a mechanical fuel pressure gauge inside the vehicle without a fluid separator, which will keep the fuel isolated to the engine compartment. Serious bodily injury or death could result from fuel inside the vehicle passenger compartment.*

 **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 your warranty.**

LUBRICATION

Your self-contained ProCharger supercharger utilizes an exclusive compound bearing assembly which allows it to operate at previously unobtainable levels of speed and load. In order to function correctly, ATI's proprietary synthetic oil blend must be utilized. Failure to use this oil will cause abnormal wear of the supercharger bearings, ultimately resulting in supercharger failure.

! WARNING: Superchargers are shipped dry, and must be filled with one 4oz bottle of ATI supercharger oil prior to operation!

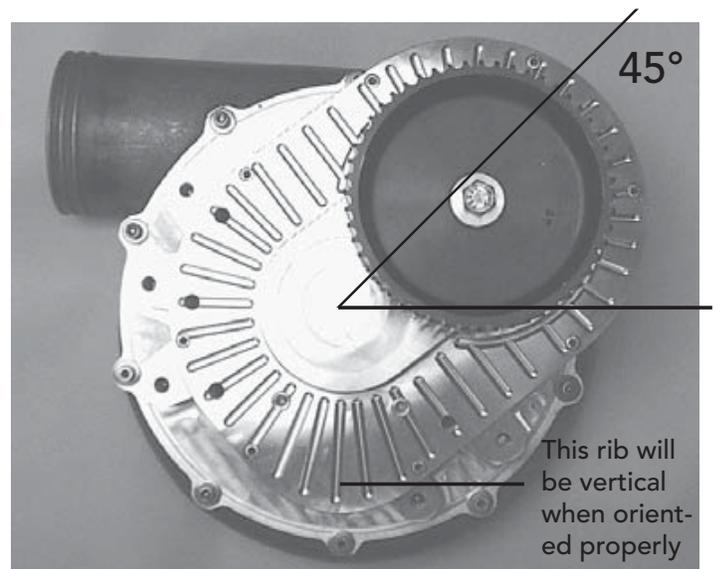
If you do not have additional oil on hand, it is recommended that you contact ATI's technical service department to obtain a carton of pre-measured 4oz bottles. When used in a short duration application such as drag racing, oil changes should be performed at the beginning of each racing season, or semi-annually. However, the oil level should be checked prior to each competition.

The oil level may be verified with the supercharger on the vehicle, using the dipstick located to the left of and below the drive pulley. As long as the oil level registers on the black plastic indicator, the supercharger is operable. If the dipstick indicates a low level, oil should be added to the supercharger approximately 1oz at a time until the desired level is obtained.

! WARNING: If the supercharger is overfilled, excess oil must be drained using the drain plug located in the bottom of the supercharger's front cover.

If you have reason to believe that the supercharger has been operated at an excessively low oil level for an extended period of time, contact ATI's technical service department for a return authorization and schedule a supercharger inspection. This form of maintenance is generally cost effective in the long run, as excessively worn components can be repaired or replaced before they cause any serious damage to the supercharger.

! Warning: If the SC supercharger is rotated more than a few degrees from it's intended position (below), the oil pump will not function properly. Failure to maintain the correct supercharger orientation will result in supercharger failure.



SC Supercharger Orientation

PROCHARGER AND BRACKETS

! **WARNING:** Never strike the ProCharger pulley with a hammer or other tool under any circumstance! Evidence of such force will void the warranty, as serious damage to the precision bearings within the ProCharger could occur.

✓ **Note:** All fasteners should be Grade 8.

1 **Jesel front cover:** Install the adapter bracket (part #AB003A-055) to the engine using four 5/16 - 18 x 2-1/2" SHCS (socket head cap screws).

Stock timing chain cover: Install the adapter bracket (part #AB003A-055) to the engine using four 5/16 - 18 x 3-1/4" SHCS. The belt drive will have an o-ring to seal around the water pump holes, but make sure to seal between the engine and the bracket around the water pump holes if using a stock cover.

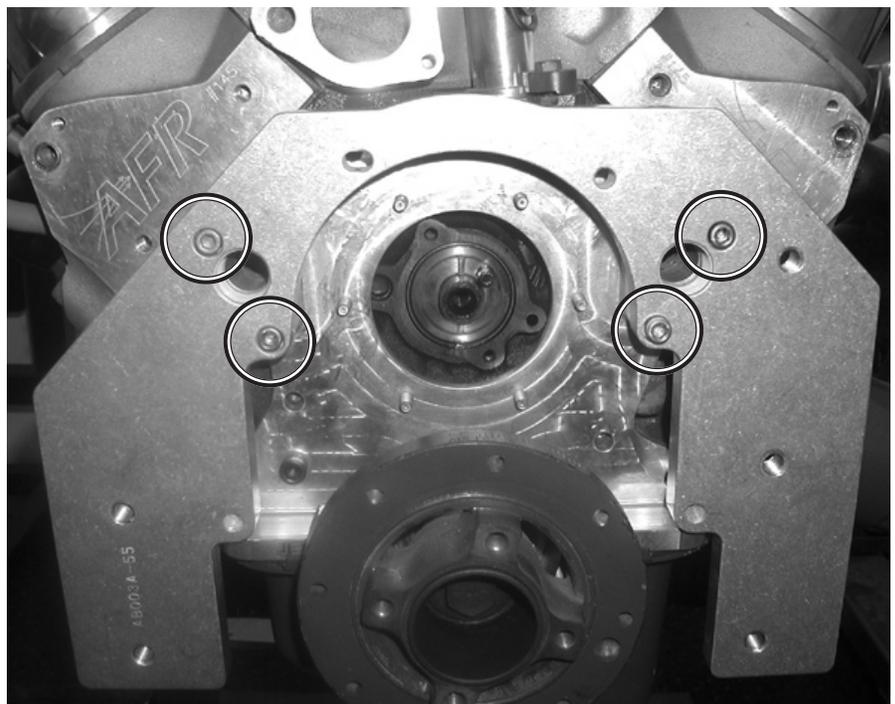
2 **Jesel:** The lower two mounting holes require 1.00" spacers between the adapter bracket and the belt drive cover, secured with 3/8 - 16 x 3" HHCS (hex head cap screws) and flat washers

Stock: The lower two mounting holes require a .750" spacer on the driver's side and a .600" spacer on the passenger's side, secured with 3/8 - 16 x 3-3/4" HHCS and flat washers.

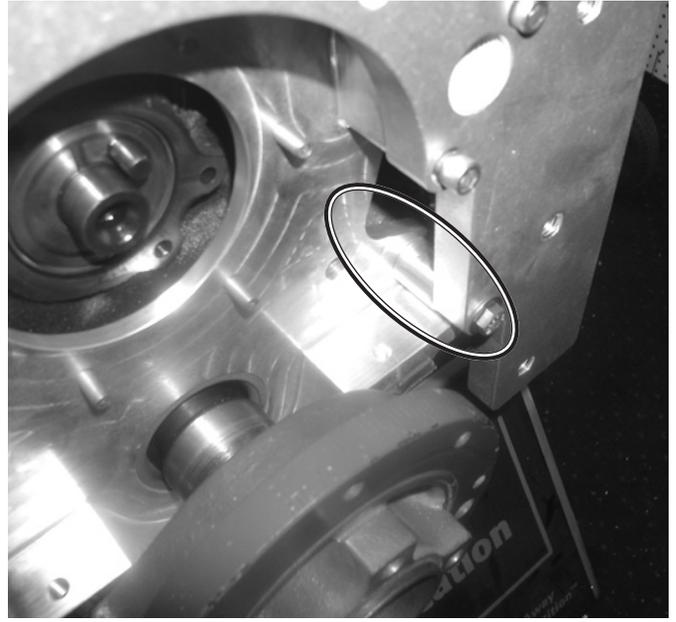
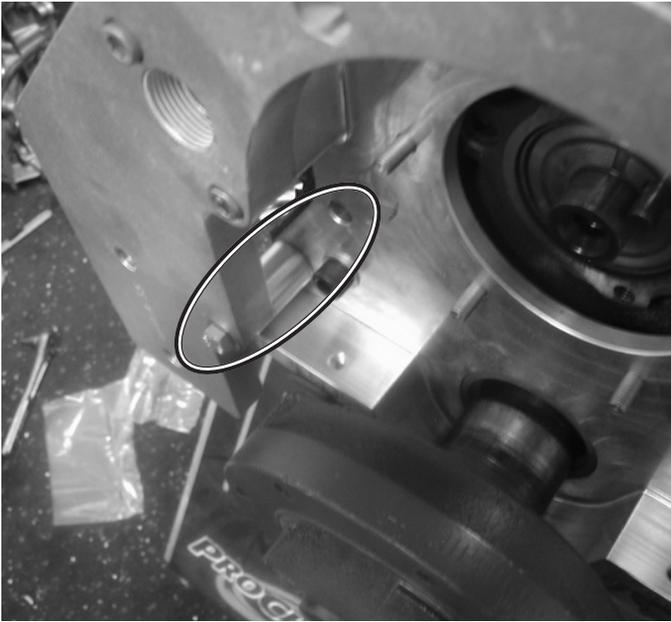
Note: Some blocks may have 5/16 - 18 mounting holes at these two locations.

3 **Jesel:** Install 1.00" spacers between the adapter bracket and the belt drive cover at the upper two mounting holes, securing with 5/16 - 18 x 2-3/4" HHCS and flat washers.

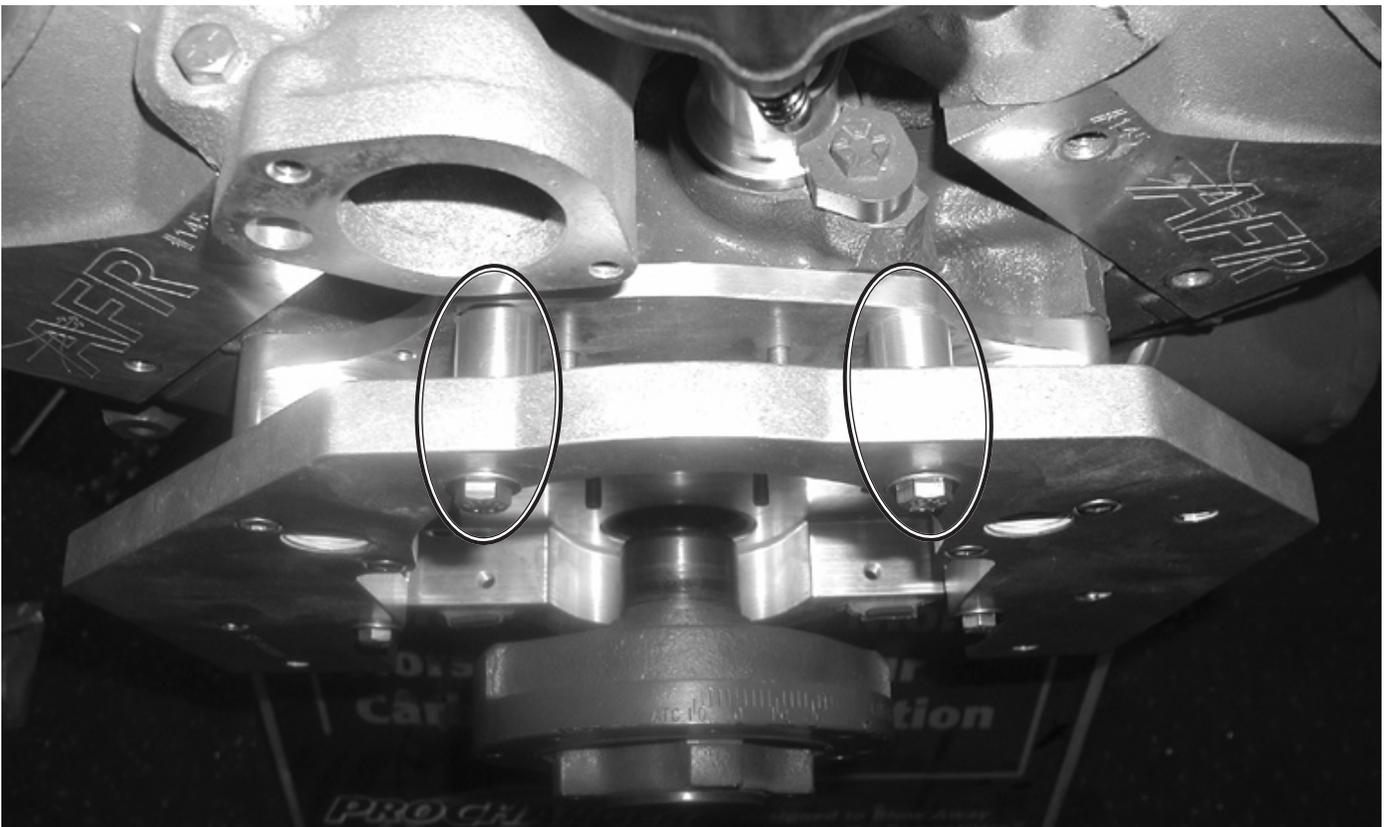
Stock: You will need to drill through the cover at the upper mounting holes and secure the bracket with two 5/16 - 18 x 3" HHCS and flat washers (no spacers).



Adapter Bracket



Main Bracket Lower Spacers



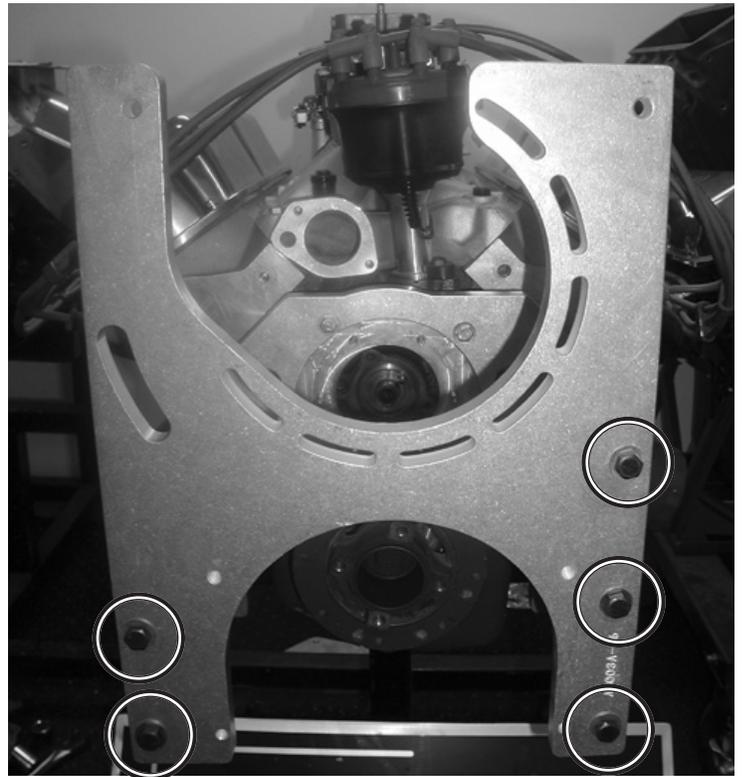
Main Bracket Upper Spacers (Jesel Front Cover Only)

ProCharger and Brackets

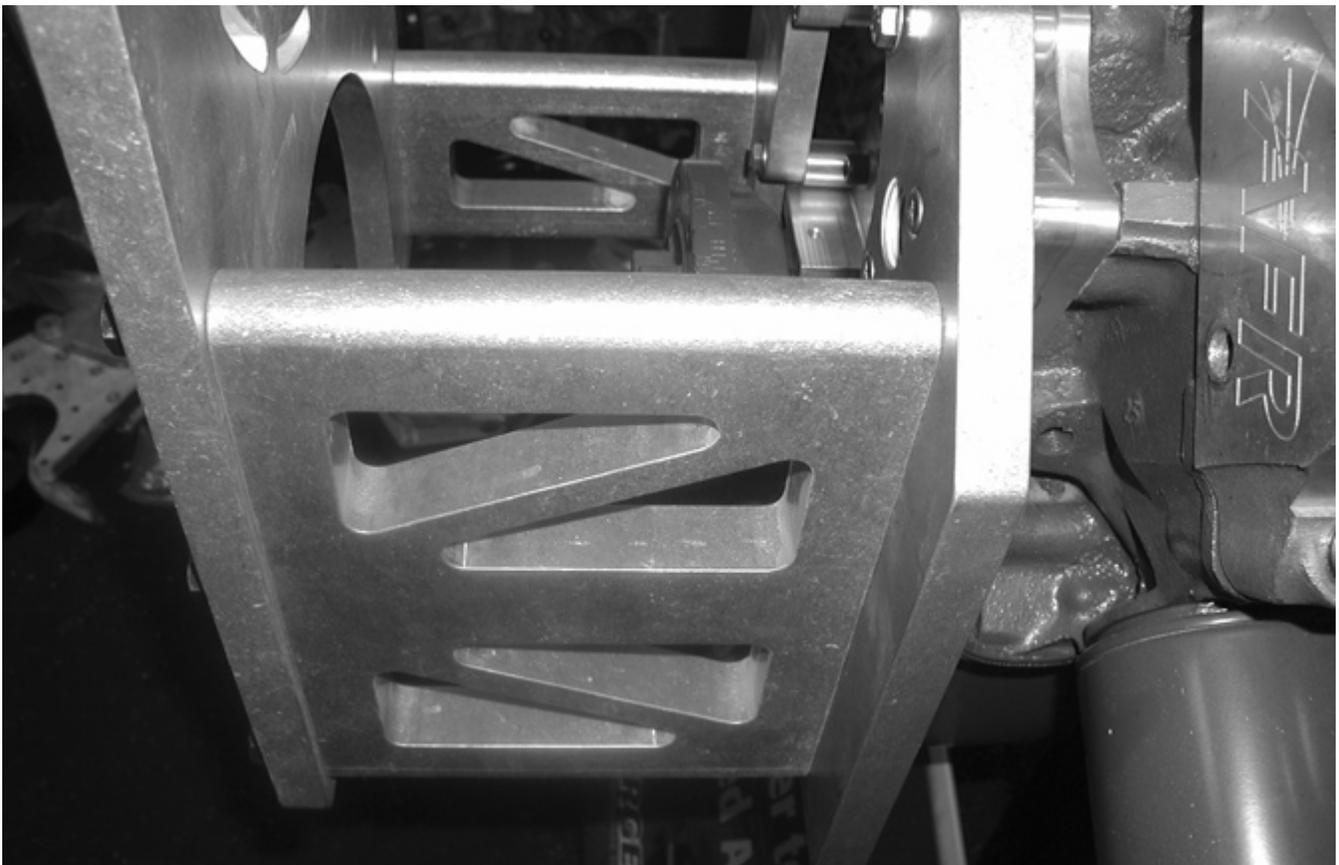
4 Jesel: Install the main bracket (AB003A-056) to the adapter bracket using 7" spacers (AB003A-074 & AB003A-078) secured with five 7/16 - 14 x 8-1/2" Grade 8 HHCS and flat washers.

Stock: Install the main bracket (AB003A-056) to the adapter bracket using 6.25" spacers (AB003A-072 & AB003A-076), secured with five 7/16 - 14 x 8" Grade 8 HHCS and flat washers.

Note: Depending on your overall setup, your spacers may need to be modified to align the crank pulley and the blower pulley. If required, remove an equal amount of material from each side of the spacer until pulleys align. Both spacers should remain the same length.

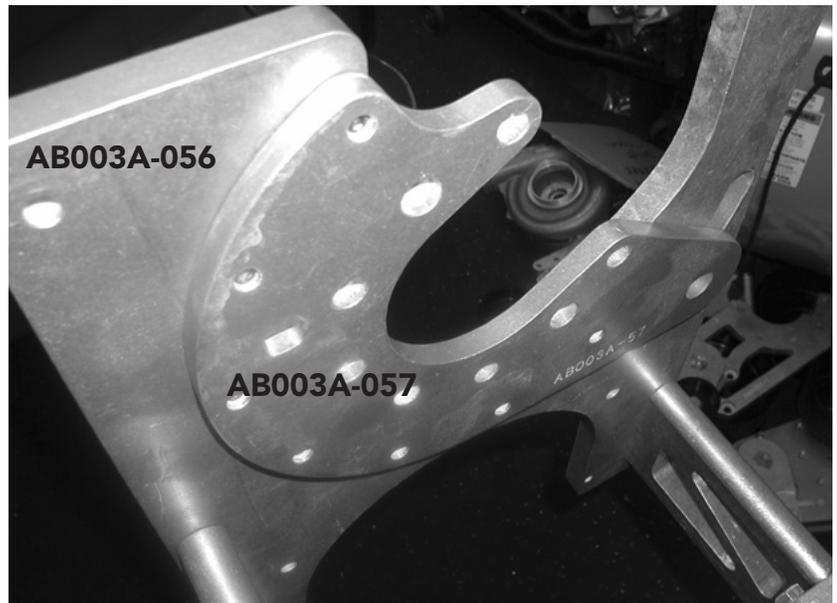


Main Bracket



Main Bracketn Spacers

- 5 Position the swivel plate (AB003A-057) on the back of the main bracket and the washer plate (AB003A-058) on the front of the main bracket as shown. Secure using seven 3/8 - 16 x 1-1/2" HHCS and flat washers. Leave fasteners loose until tightening the belt.



Swivel Plate Installed on Back of Main Bracket

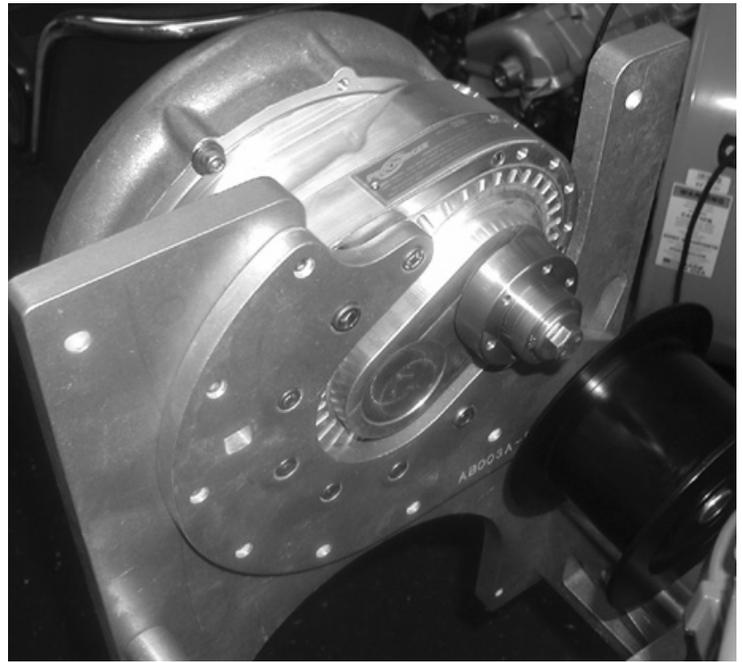


Swivel Plate & Washer Plate Installed

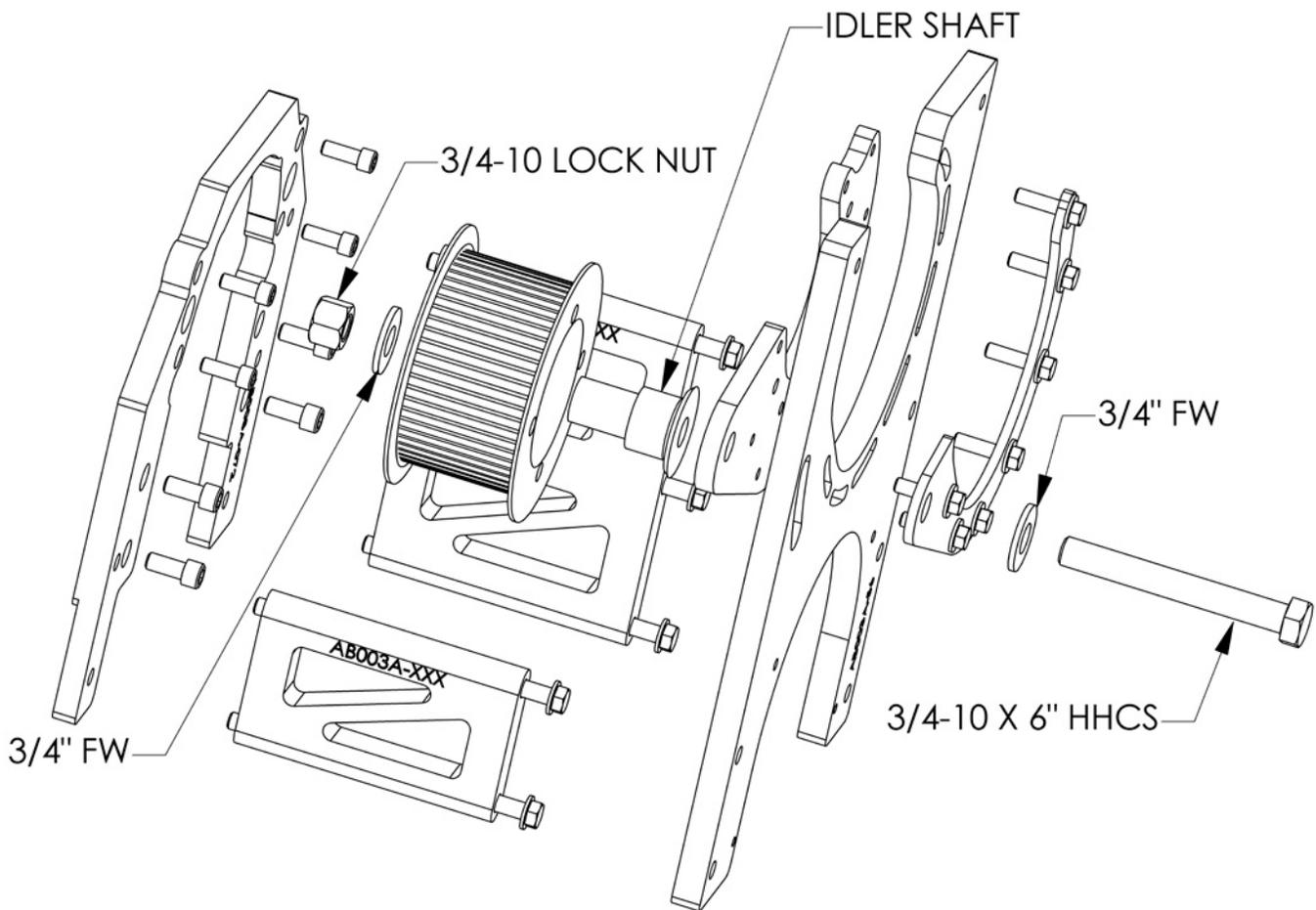
6 Install the idler pulley as shown below. You will need to leave this bolt loose until the belt has been tightened.

7 Install the blower to the swivel plate using two 3/8 - 16 x 1" SHCS and six 5/16 - 18 x 5/8" SHCS.

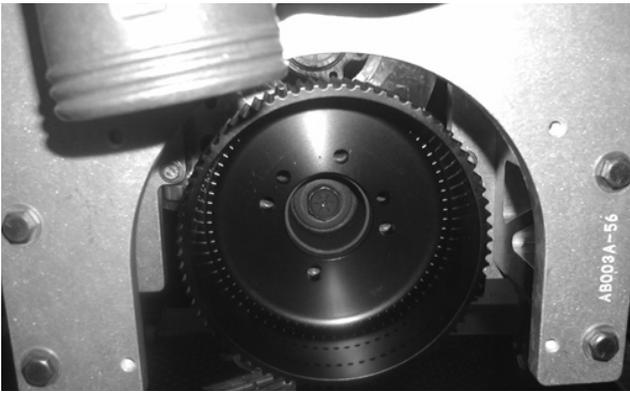
8 Install the crank pulley to the harmonic balancer. Fasteners are supplied, but depending on your set-up (i.e. you are running a crank trigger) you may need longer fasteners. Make sure to use grade 8 fasteners with ample thread engagement. If using a crank support, install the mandrel at this time.



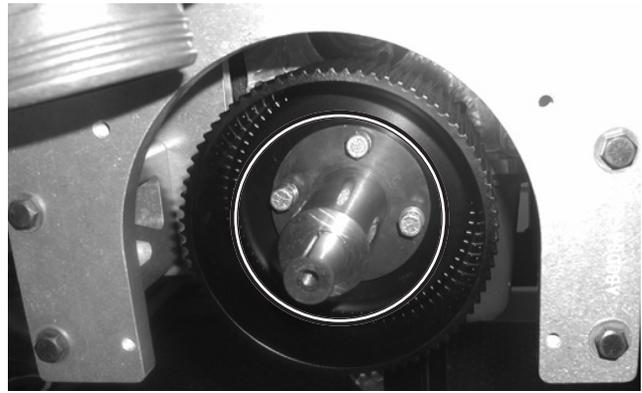
Blower Installed



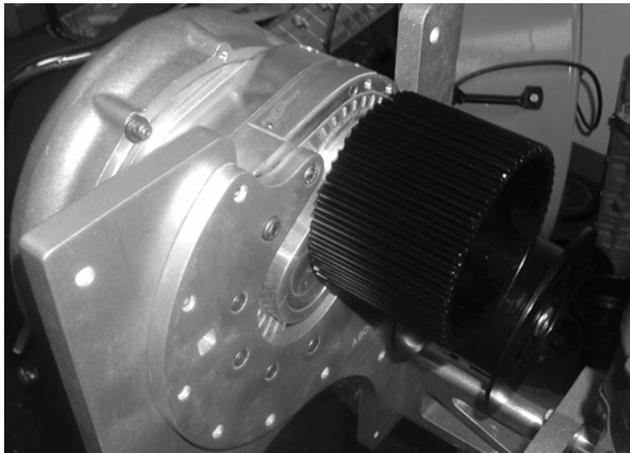
Idler Pulley Schematic



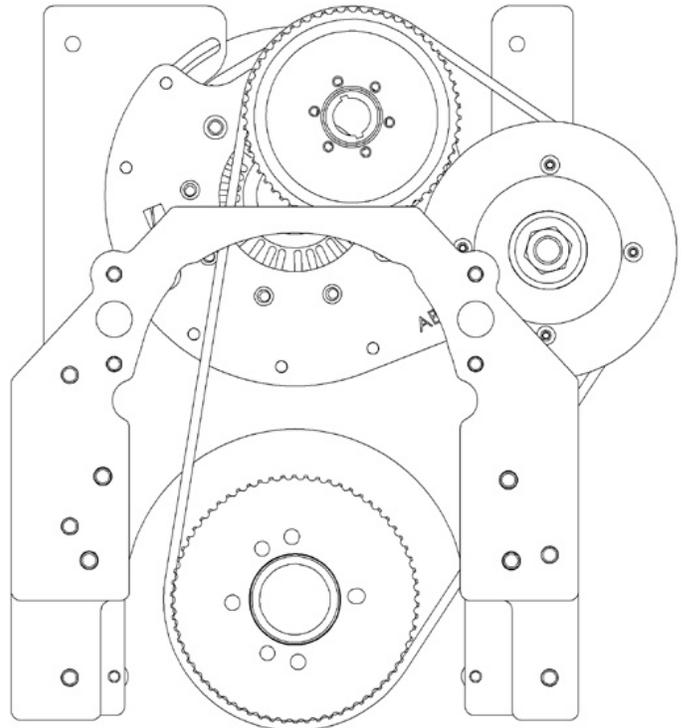
Crank Pulley



Crank Support Mandrel (optional)



Blower Pulley Installed

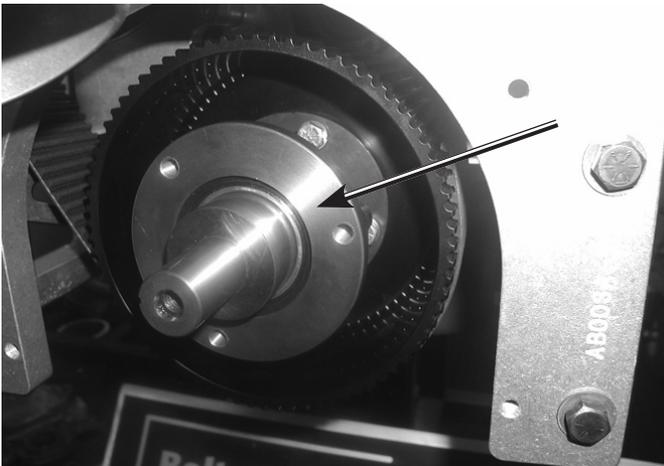


Blower Belt Routing Diagram

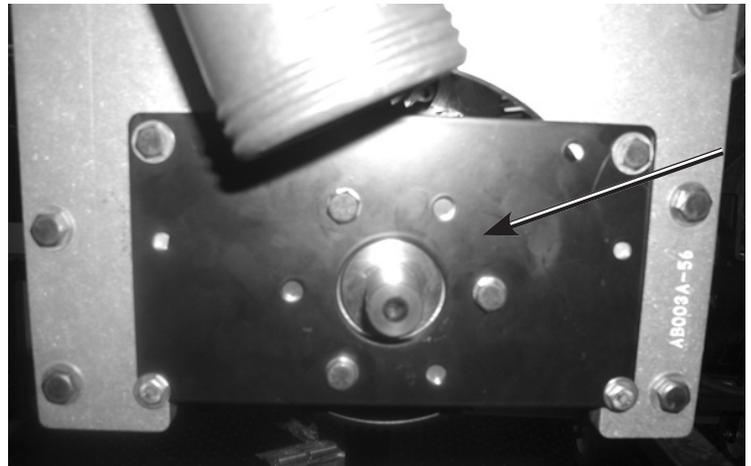
- 9 Install the blower pulley onto the hub (the hub will already be installed on the blower). Use six 1/4 - 20 x 1-1/4" SHCS and lock washers to hold the pulley to the hub.
- 10 Install the belt as shown at right. Make sure that the crank pulley is aligned with the blower pulley. Use a straight edge to check alignment. If necessary, adjust the length of your billet spacers as detailed in step 4, ensuring that the spacers remain the same length.

11 If not installing a crank support, skip to step 12. Slide the bearing support over the crank mandrel. Bolt the bearing plate to the bearing support using three 3/8 - 16 x 1-1/4" HHCS and lock washers. Bolt the bearing plate to the main bracket using two 3/8 - 16 x 1-1/4" HHCS & flat washers on the upper holes and two 5/16 - 18 x 1-1/4" HHCS and flat washers on the lower holes.

12 Tighten the belt using a 1/2" drive ratchet (there is a cut-out on the blower bracket for the ratchet). The blower will swivel in the clockwise direction and tighten the belt. While holding tension on the belt, tighten a few of the swivel plate fasteners. Tighten the remaining swivel plate fasteners and the idler pulley 3/4" bolt.



Bearing Support



Bearing Plate

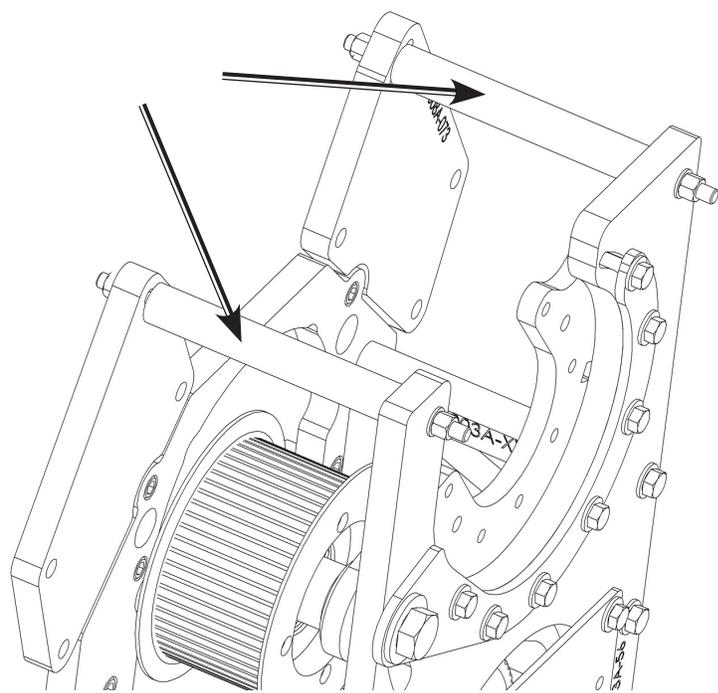


Head Brackets Installed

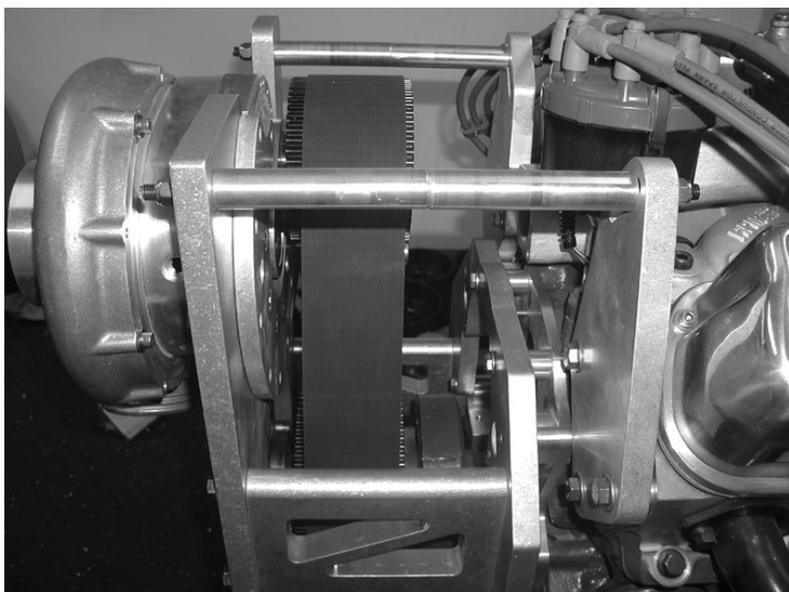
13 Install the head brackets (AB003A-054) to both the driver's and passenger's sides. One side will use three 0.25" spacers between the head and the bracket and will fasten with three 7/16 - 14 x 1-3/4" HHCS with flat washers. The other side will use three 0.25" spacers and will attach with two 3/8 - 16 x 1-3/4" HHCS with flat washers and one 7/16 - 14 x 1-3/4" HHCS with flat washer.

14 Cut the universal tube spacer to the appropriate length to fit between each head bracket and the main bracket. Then cut the 3/8 - 16 all thread to length to go from the front of the main bracket to the back of the head bracket. You will need to leave room on each side for a lock nut and flat washer.

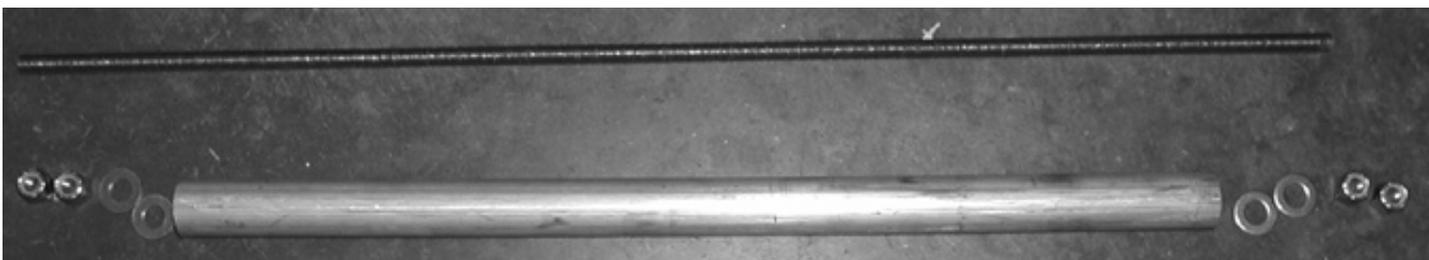
15 Review the entire installation and make sure all fasteners have been tightened.



Universal Tube Spacer (cut to fit)



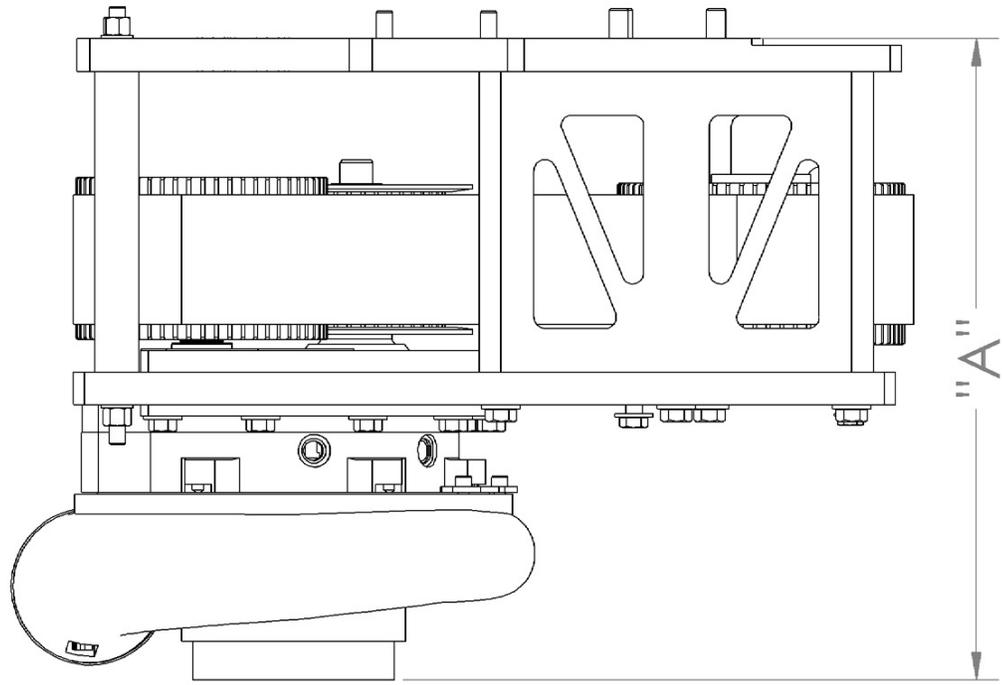
Universal Tube Spacers Installed



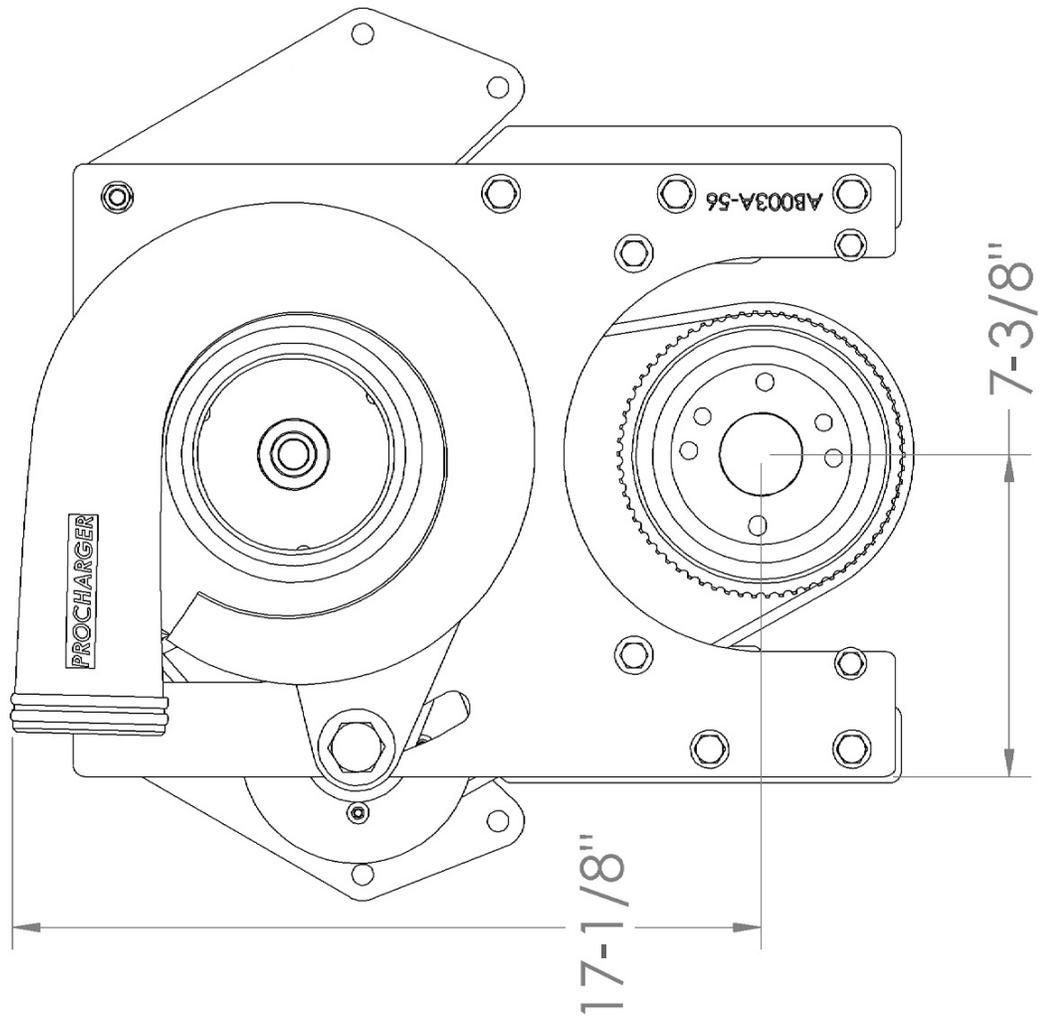
Universal Tube Spacer & All Thread

APPROXIMATE INSTALLED DIMENSIONS

F2 REVERSE OUTLINE



SBF : "A" = 14-3/4"



MAXIMUM SAFE OPERATING SPEEDS

Never spin your supercharger beyond its designed operating range. ATI's engineering staff has established limiting impeller speeds for each supercharger model. Failure to adhere to these published redlines is certain to result in eventual, if not immediate supercharger failure.

It is often easier to change supercharger pulleys for additional power than it is to find the power elsewhere. However, the consequences can be prohibitive. Just as too much timing or too little fuel can damage your engine, excessive impeller speeds will damage your supercharger.

Always calculate the impeller speed when making a pulley swap. If you feel that your supercharger is incapable of sustaining the airflow you need without exceeding the published redline, you should move up to the next larger supercharger model. For safe operation, ATI recommends selecting a peak operating speed 5% below the published redline. Doing so will allow a margin of safety in cases where actual engine rpm's exceed the expected rpm's (traction loss, transmission or driveshaft failure).

Impeller speeds can be calculated as follows:
 Impeller rpm = engine rpm x (crank pulley/ blower pulley) x gear ratio, where the size of the crank pulley and blower pulley are measured in teeth (cog drive).

$$\text{Impeller RPM} = (\text{N1/N2}) \times \text{Step-up Ratio} \times \text{engine RPM}$$

Model	Max RPM	Step-Up Ratio
F-1C	74,000	5.40:1
F-1R	68,000	5.40:1
F-2	65,000	5.40:1

SUPERCHARGER INLET/INTERCOOLING CONSIDERATIONS

Supercharger Inlet

If the inlet of the supercharger is left open, all loose items (i.e.: spark plug wires) near the supercharger inlet must be secured in order to prevent them from being drawn into the supercharger inlet.

Alternatively, some sort of screened or filtered inlet may be utilized. When selecting a source for blower inlet air, remember that drawing air from lower on the vehicle will increase the possibility of the blower ingesting debris off of the racing surface. If any such debris is drawn into the supercharger, it will damage the impeller surface, resulting in decreased performance.

To get the most power output from your supercharger, ATI recommends the use of a cold air induction, preferably via a forward facing scoop. However, when a forward facing inlet is impractical, a vertical hood mounted inlet may prove sufficient.

In applications where the inlet of the supercharger would otherwise be located near the engine's exhaust, the use of a forward facing cold air induction has been shown to provide a net increase of 6 psi of boost for a given pulley combination due to the decreased temperature and increased pressure present at the supercharger's inlet.

By providing an additional 1 psi of pressure at the blower inlet, a 2-3 psi gain can be recognized at the intake manifold. An effective ram-air system will allow you to achieve greater power levels at lower supercharger speeds, increasing the durability of your ProCharger.

To get the most out of a ram air system, air should be drawn from a forward facing scoop located near a high pressure area on the front of the vehicle. On some vehicles, an airbox fed using the high pressure area at the base of a windshield as an air source may also serve as an effective means of inlet pressurization.

If you choose not to equip your vehicle with ram-air, you should consider providing the smoothest possible transition for air traveling into the supercharger. On extreme high horsepower applications, the installation of a bell-mouth or other velocity stack type of device has resulted in an additional 5 psi of boost at the intake manifold. This can result in an increase in peak horsepower exceeding 10%.

Intercooling and Surge Valves

ATI strongly recommends the use of intercooling. For a high boost, racing only application, an air-to-water intercooler offers the ultimate in charge air temperature reductions when used in conjunction with a mixture of ice and water. When plumbing the air side of your intercooler, use as large diameter of tubing as possible and minimize bends and tubing length. This will help prevent pressure drops in the system.

The use of at least one ATI race bypass valve with your F-series supercharger is also recommended. Failure to use a bypass valve can result in harmful compressor surge during deceleration. Use of undersized, inferior valves will likely result in decreased vehicle performance, and possible supercharger damage.

OPERATION AND MAINTENANCE

Cold Starting

Never race your engine and ProCharger supercharger when your engine is cold. Allow the water temperature to climb into operating range for several minutes before driving above 2,500 rpm, to ensure adequate oil lubrication.

Fuel Quality

With a properly installed intercooled ProCharger supercharger system, detonation should not occur. For the best performance and reliability, use premium grade fuel (91 octane or higher). Listen for signs of detonation after refueling, and after replacement or modification of any fuel system component(s). If detonation occurs, reduce the throttle and locate the source.

Ignition System Maintenance

If your spark plugs are more than a year old or have more than 10,000 miles logged, you should consider changing them before driving your vehicle under load. Spark plug wires should be changed if visibly damaged or when resistance exceeds factory specifications.

Air Filter Maintenance

Your air filter(s) should be cleaned periodically, potentially as often as every 10,000 miles or 6 months, even though a service interval of 50,000 - 100,000 miles is quoted by the manufacturer under normal driving conditions. A clogged air filter will result in decreased boost levels and vehicle performance. Be sure to re-oil the cleaned filter before re-installing. Always operate your vehicle with an air filter; failure to do so may result in damage to your ProCharger supercharger and personal injury!

ProCharger Oil Change Intervals

For self-contained blowers, the first oil change should be performed at 500 miles and at the beginning of each race season or semi-annually thereafter. Clean the drain plug after every oil change. Drain oil by removing the drain plug. Clean off the drain plug before re-installing.



Note: The SHCS securing the volute to the supercharger transmission may be loosened, enabling the supercharger discharge to be rotated for tubing alignment. Retighten these bolts after the tubing is installed.

ProCharger Oil Level

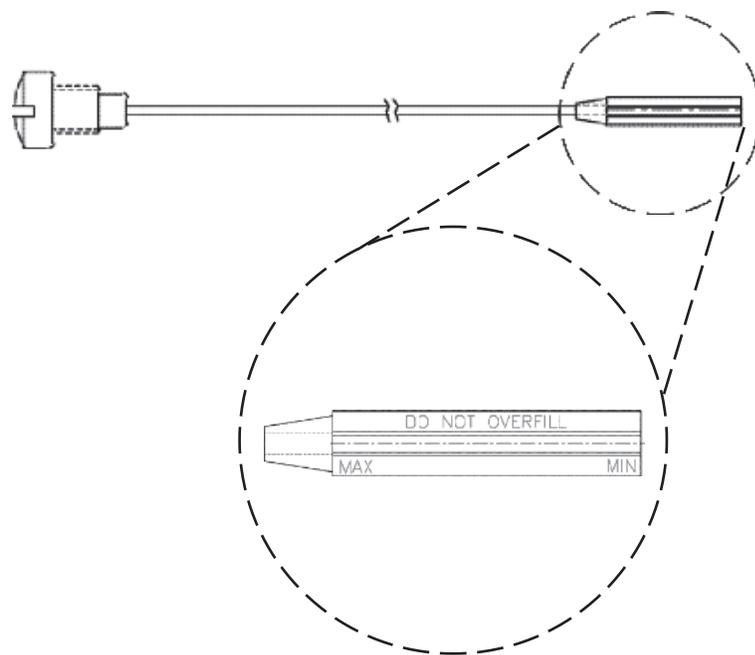
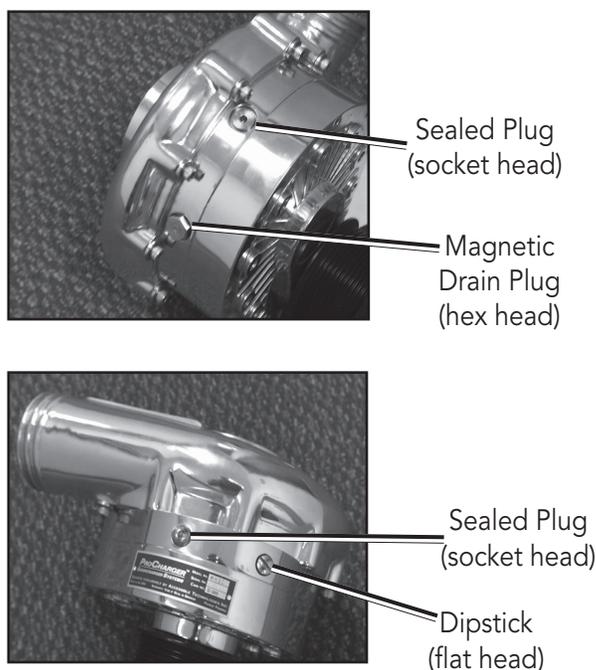
The ProCharger supercharger's oil level must be checked periodically to ensure the proper lubrication. The dipstick can be loosened using a flat blade screwdriver or a coin. When installed, the oil level should remain between the minimum (MIN) and maximum (MAX) indicators at all times.

! **Warning:** Filling the ProCharger higher than the maximum level on the dipstick can lead to bearing and seal damage. The supercharger is a sealed unit and should not normally require the addition of oil between service intervals. If excessive usage is noted, the unit should be sent to ATI for inspection and repair. The dipstick fitting should be firmly tightened after changing or checking the oil level.

General

When removing the dipstick, be sure to retain the nylon washer. A spare nylon washer and o-ring is included. Use only the ATI supplied nylon washer and o-ring when servicing the oil dipstick and drain plug. A discoloration of the oil and residue on the drain plug may occur during the initial oil changes. This is normal and will gradually decrease. For the proper positioning of the ProCharger supercharger, the serial tag should be pointing upwards. Installing the ProCharger supercharger in another position will cause inadequate oiling and supercharger failure. If you have any questions about the maintenance of your supercharger, contact ATI.

! **Warning:** The supercharger contains no oil from the factory. The unit must be filled prior to use. Use only ATI supplied oil in your 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.



LIMITED WARRANTY

Accessible Technologies, Inc. (ATI) provides a limited warranty on the ProCharger supercharger against defects in materials and workmanship unless otherwise specified. This limited warranty starts on the date of original purchase from your local dealer, or date of shipment from the factory. This limited warranty coverage is extended only to the original owner and excludes hoses, sleeves, and electronic components manufactured by other companies. ATI's warranty obligations are limited to the terms below:

ATI agrees to honor a warranty claim at its sole discretion and only after inspection at the ATI factory. No warranty will be honored if any part of the product is found to have been improperly installed, tampered with, mishandled, or misused in any way. Disassembly of the ProCharger supercharger or removal of the ProCharger supercharger's 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 discretion and shipped back. If the limited warranty does not apply, ATI will advise you of the specific reason, cost of the repair, and delivery time. 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, insured at replacement value. Therefore, you will 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, ORAL OR WRITTEN, EXPRESS OR IMPLIED. 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.

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

Phone ATI (913-338-2886) and provide us with the following information:

- ProCharger supercharger serial number.
- Vehicle year, make, model, engine modifications, and other modifications.
- Description of perceived issue.

If a solution to your issue can not be found after the above phone consultation, you will be assigned a return authorization number (RMA). You must then properly package and ship your product, at your expense, to the ATI factory. The product should be carefully packaged in a rugged box.

Include the following information inside the box with your product:

- Copy of your original invoice or receipt.
- Name, address, and daytime telephone number.
- Return authorization number (RMA).
- Vehicle year, make, model, engine modifications, and other modifications.
- Description of perceived issue.

Clearly mark the warranty claim number on the top and one side of the box in characters at least 2" tall. Properly package the product and ship it, 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**



Accessible Technologies, Inc.
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Lenexa, KS 66215
Phone: 913.338.2886
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Part Number PMFA1A-007 Rev. B

