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# INSTALLATION MANUAL

## AEROFLOW PERFORMANCE

### ALTERNATOR

#### WARNING!

BEFORE PROCEEDING WITH INSTALLATION PLEASE READ INSTRUCTIONS CAREFULLY. THIS PRODUCT REQUIRES DETAILED KNOWLEDGE OF AUTOMOTIVE SYSTEMS. WE RECOMMEND THAT THIS INSTALLATION BE CARRIED OUT BY A QUALIFIED AUTOMOTIVE TECHNICIAN.

*These instructions must be read and fully understood before beginning the installation. Failure to follow these instructions may result in poor performance, vehicle damage, personal injury or death. If these instructions are not fully understood, installation should not be attempted.*

#### INTRODUCTION

Congratulations on your purchase of the Aeroflow Performance 150-amp Mitsubishi alternator. Aeroflow Performance products cannot and will not be responsible for any damage, or other conditions resulting from misapplication of the parts described herein. However, it is our intention to provide the best possible products for our customer, products that perform properly and satisfy your expectations. Should you have any questions? Please call technical support at +61 2 8825 1900 and have the product part number on hand when calling.

Aeroflow Performance would like to introduce this direct bolt on high amp Mitsubishi Lancer Evolution (4 to 9) alternator. This will suit the 4G63 engine platform only. It is rated for up to 150 amp compared to the factory unit of only 75 amp. This is useful for producing the maximum charging power in a vehicle. They're particularly good for motorsports where the demands on an alternator can be very high. Where more amperage is needed, a high output alternator can make for the ideal solution so the car isn't continually undercharged. Aeroflow Performance alternators are assembled with top quality components and factory load tested to meet or exceed OEM specifications and ensure the highest output possible at low RPM. So, whether you need an alternator for your truck, hot rod, muscle car or sport compact don't waste big dollars on having your original alternator rebuilt.

The gauge wire that is used for the charge wire varies depending on the battery location and the current your vehicle will require. This chart provides the gauge recommended based on current demands and the length of the charge wire. Also, be sure to use quality terminals and connections. A wire size too small can allow the wire to overheat, melt the insulation and cause a fire or worse. Contact an auto electrician for recommendations of wire thickness.

	WIRE LENGTH		
AMPS	5' - 10'	11' - 19'	20' - 28'
30-70	10 - 8g	8 - 6g	6 - 4g
70-100	8 - 6g	6 - 4g	4 - 2g
100-150	6 - 4g	4 - 2g	2 - 0g
150-200	4 - 2g	2 - 0g	0 - 1/0g

In order for an alternator to charge properly, an alternator must be grounded to the engine block. If an alternator has paint or clear coat on the mounting surfaces, it may not be grounded and will not charge. Many mounting brackets are also powder coated, clear coated, painted, or plated. The alternator will not ground properly without a ground wire from the alternator housing to the engine block. (This wire should match charge wire size).

A fully charged battery is at least 12.6V, not 12.0V. A weak/defective battery will cause premature failure. Never disconnect the battery with engine running! This causes voltage spikes that will damage the alternator.

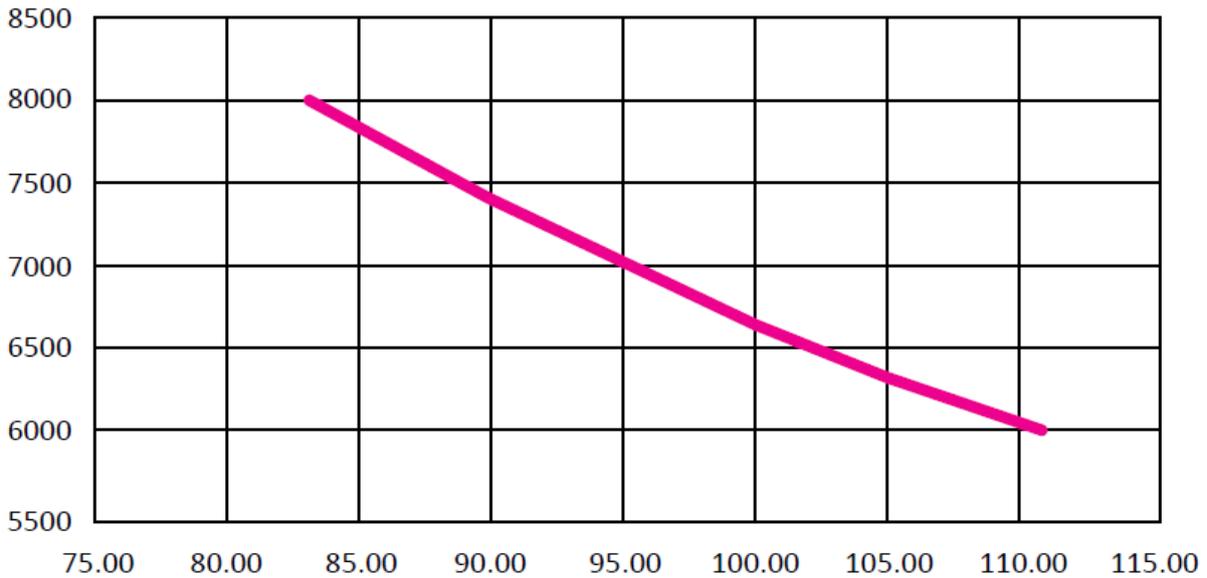
Aeroflow Performance alternators spin at approximately 2.5 times that of crankshaft RPM, so an engine at a 700 RPM idle would spin the alternator at 1,750 RPM. The maximum RPM of this alternator should not exceed 15,000 RPM which typically allows for a maximum of 6000 engine rpm. For engines that turn past 6000rpm it is recommended to check pulley sizes carefully to ensure the alternator stays under the 15000rpm maximum at all times. The alternator pulley supplied is 1.75" / 44.45mm diameter. The internal bearings and components are not designed for extremely high RPM's. We strongly recommend that you calculate your pulley ratio to determine if your alternator will operate within the safe RPM range.

To calculate your alternator pulley ratio, divide the engine crankshaft pulley diameter by the alternator pulley diameter. Using the ratio that you calculated, multiply that number by the highest anticipated engine RPM to determine the maximum alternator RPM.

Crank pulley diameter divided by alternator pulley diameter multiplied by maximum engine rpm = maximum alternator rpm.

Alternator Pulley (Diameter)			Crank Pulley (Diameter)		
Inch	mm	RPM	Inch	mm	RPM
1.75	44.45	15000	4.38	111.13	6000
1.75	44.45	15000	4.04	102.58	6500
1.75	44.45	15000	3.75	95.25	7000
1.75	44.45	15000	3.28	83.34	8000

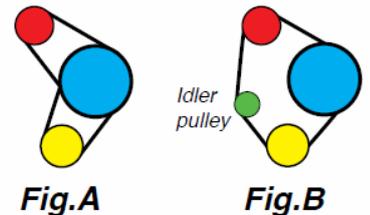
### ENGINE RPM TO MAXIMUM CRANK PULLEY DIAMETER (mm)



If your max calculation is greater than 15000 alternator RPM's, increase the alternator pulley diameter or decrease the crank pulley diameter to compensate. If changing the alternator pulley is not possible, use an engine rev limiter to control maximum engine RPM's.

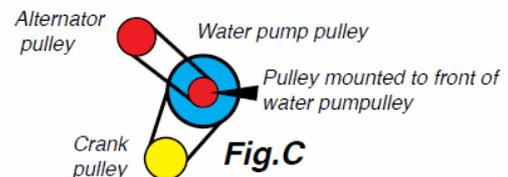
**Alternator RPM**  
Two belts, one driving intermediate accessory pulley **Fig.A**  
One belt drives all accessories **Fig. B**

$$= \frac{\text{Crank Pulley O.D.}}{\text{Alternator Pulley O.D.}} \times \text{Engine RPM (Tach)}$$



**Alternator RPM**  
One belt, drives crankshaft and accessory pulley.  
Accessory changes O.D. and drives alternator **Fig.C**

$$= \frac{\text{Water Pump Pulley O.D.}}{\text{Alternator Pulley O.D.}} \times \text{Water Pump RPM}$$



$$\frac{\text{Crank Pulley O.D.}}{\text{Water Pump Pulley O.D.}} \times \text{Engine RPM (Tach)} = \text{Water Pump RPM}$$

## **INSTALLATION INSTRUCTIONS**

Proper installation of this alternator is the responsibility of the installer. Improper modification or installation will void your warranty and may result in vehicle damage or personal injury.

Always use correct safety equipment when working on or underneath the vehicle. Ensure all electrical components are off and the battery has been disconnected.

Below is a basic guideline of removal and installation of this new alternator. It is recommended to follow the factory service manual for this direct bolt on alternator.

1. Disconnect the ground cable from the battery.
2. Remove passenger side wheel
3. Locate the belt tensioner. At the top of the tensioner is a 1/2 socket slot. Notice the hole/slot on the bottom of the tensioner. You'll want to slide an Allen key slightly into that hole. Twist the tensioner counter clockwise until you can slide the Allen key into the rear hole to lock the tensioner.
4. Remove alternator belt
  - I. Inspect belt for signs of cracking or glazing. Replace if needed. A loose belt will cause intermittent charging and generate excessive heat resulting in premature unit/bearing failure.
5. Release the tensioner back to its original position as it blocks the large bottom alternator bolt.
6. Remove the top alternator bracket, one bolt will be into the alternator itself and 2 into the block. One of the bolts is out of view under the intake manifold.
7. Disconnect all wire connections from the alternator and label wires for future replacement.
8. Next remove the large lower alternator bolt. You should be able to move the alternator forward to better access the nut on the driver side of the alt. Now push the large bolt out towards the passenger side. The tensioner will have to be back in normal operating position in order to pull the bolt out.
9. Remove the alternator from the vehicle.
10. Install new alternator and replace all mounting bolts and spacers. Do not fully tighten bolts.
11. Install alternator drive belt.
  - I. Adjust tensioner which should have 1/2" to 3/4" play as light pressure is applied at the midway point between pulleys.
  - II. Loose or worn belts allow for movement and deflection which will decrease the gap between the fan and belt.
12. Tighten all alternator and bracket bolts.
  - I. It is important to check the alignment of the pulleys. Place a straight edge on the water pump or crank pulley to the alternator pulley. If they are not aligned, the alternator may require shimming.
  - II. Check all bracket and mounting points are secure and withstand the weight of the new replacement alternator. If necessary, a support brace can be installed. An extra mounting hole is provided in the back of the alternator case housing.
  - III. Mounting brackets that only have a one solid mounting point such as systems that incorporate a turnbuckle or heim joint for tension adjustments. It is recommended to install a secondary support to dampen vibration.
13. Wire in the alternator positive and ground wires according to above text written earlier in this instruction sheet
14. Start the engine and using a volt meter, verify that the alternator is charging at least 13.8 volts @ 1,000 engine RPM's. This 'wakes up' the alternator for it to begin charging as needed. Check the voltage across the battery terminals. Voltage should be from 13 – 14.5 volts. Next, check the voltage at the output terminal of the alternator to engine ground. Compare this value to that from the battery terminals. There should not be more than a .40 volt drop between the two measurements. If there is, check for poor connections or replace the charge wire with a larger diameter wire. If you are not seeing proper charging values, it is recommended to run a ground wire from the alternator housing to the engine block.



*For more information or technical enquires*

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