

COJO Technology

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A-60 Alternator

Class 1 Division 2

Owners manual rev1.0

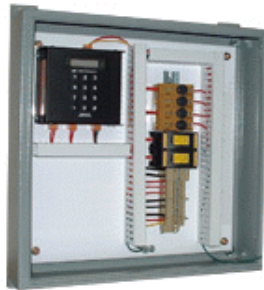
models:

A-6024, A-6012, A-6024S, A-6012S

Hazardous Location

Generator and Power Products

Specialists



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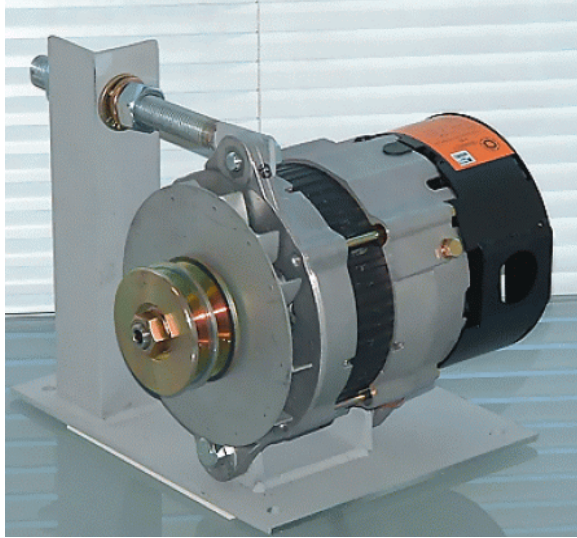
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1. OVERVIEW

This alternator has been developed specifically for industrial equipment, which demand a high level of durability. In order to decrease maintenance, the brushes and slip rings, which wear in time, have been eliminated from the brushless alternator.

To generate electricity, this alternator adopts a system in which the alternator's internal residual magnetism is used for initial activation. Once the alternator starts operating, the electrical power that the alternator itself generates is supplied to the exciting coil, which is used for self-excitation.

This alternator is equipped with an internal voltage regulator. The voltage regulator monitors the voltage that is generated during operation of the alternator, and regulates the current that is supplied to the exciting coil, thus maintaining the constant output voltage.



For Hazardous locations:

Listed as CLASS 1; DIV 2; GROUP C, D for use in hazardous locations.

Cast Aluminum Housing:

Corrosion resistant housing and rotor in a compact and lightweight design.

SAE J180 mounting standard:

Upgrades existing alternators which utilize this standard.

Heavy Duty bearings :

Aligned in precision castings for optimum alignments and protection from debris.

Specifications	A-6024	A-6012	A-60**S
rated voltage	24 Vdc	12 Vdc	** 12/24
rated output	60A	60A	30A
starting RPM	1200	1200	1200
Max RPM	8000	8000	8000
regulated voltage	27-29 Vdc	13-14.5 Vdc-	
weight	23 lbs	23 lbs	23 lbs
Length	11 1/8"	11 1/8"	10 3/8"
operating temperature	-40 - + 90C	-40 - + 90C	-40 - + 90C
Area classification	Class1 Div2	Class1 Div2	Class1 Div2
mounting kit	AIK / CIK	AIK / CIK	AIK / CIK

2. CONSTRUCTION

The interior of the alternator is self cooled by a rotating fan. The alternator consists of the following parts: a stator, rotor, exciting coil, regulator, rectifier, frames, etc.

(1) Stator

The stator consists of a laminated steel core. The core contains a coil providing a three-phase stator connection. The stator coil receives magnetism from the rotor which generates an alternating current.

(2) Exciting Coil

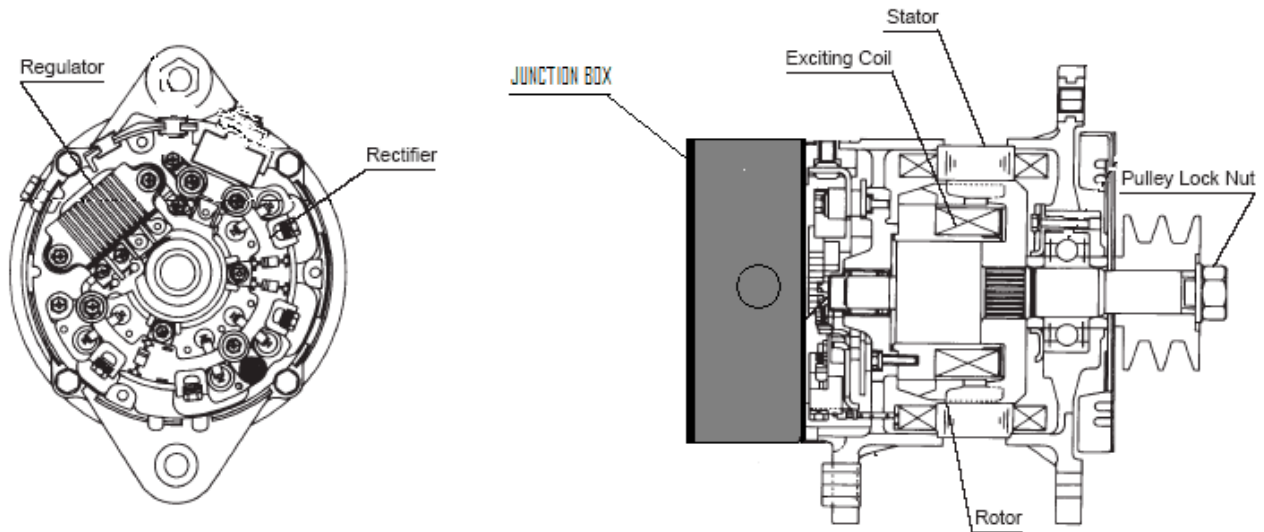
The exciting coil consists of a coil that is wound over a donut shaped insulated core. An electric current flows through the coil to produce a magnetic field.

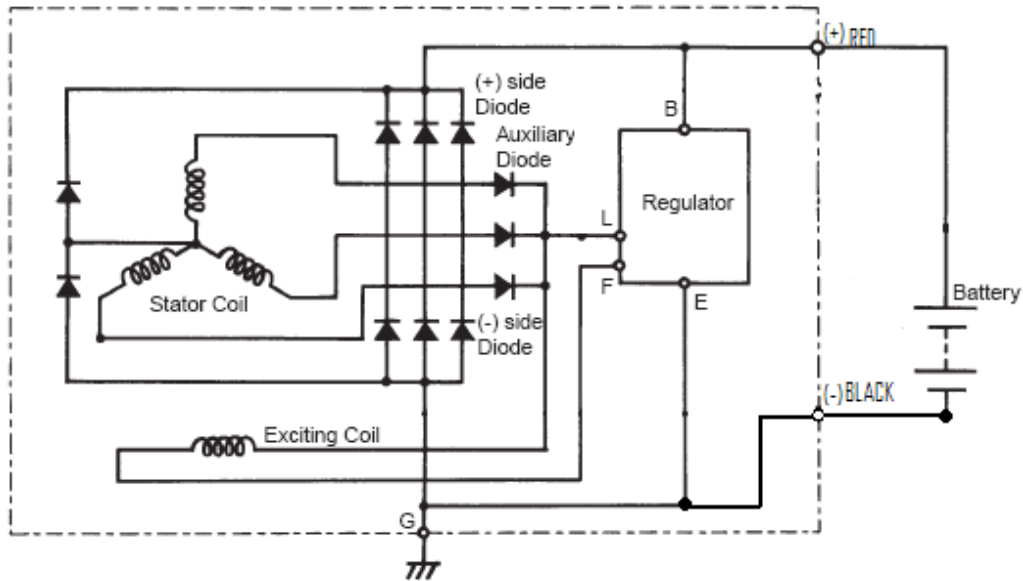
(3) Rotor

The rotor is two claw shaped cores which face each other. The rotor rotates in the space between the exciting coil and the stator in order to transfer the magnetic field that is generated in the exciting coil to the stator in the form of magnetic flux.

4) Junction Box

The junction box comes in two sizes, **LJB** - 2 3/4" depth with 1 1/4" trade size KO for applications of up to 60 amps. **SJB** ('S' models) - 1 3/4" depth with 3/4" trade size KO for applications up to 30 amps. The junction box contains 2 battery connection posts. Polarity is indicated by colour, red (+), and black (-).





3-1. SELF-EXCITING AND CHARGING

- (1) When the engine is started, the alternator's rotor rotates, and the residual magnetic field generates voltage in the stator coil.
- (2) As generated voltage increases with the increase in the engine rpm, the electric current flows from the auxiliary diode to the exciting coil. Thus, a strong magnetic field is created by the exciting coil, causing the voltage that is generated in the stator coil to increase suddenly to the battery voltage.

NOTE:

The excitation by residual magnetism changes over to that of self-generated excitation. This is called self excited starting, and the alternator rpm at this time is called "turn on speed".

- (3) Simultaneously with self-excited starting, the charging current flows from the alternator's B terminal to the battery, and starts the charging of the battery.

3-2. REGULATING THE OUTPUT VOLTAGE

- (1) As the charging of the battery advances and the battery terminal voltage reaches the regulator's regulating voltage, the regulator shuts off the current that flows to the exciting coil.
- (2) When the current that flows to the exciting coil is shut off, the magnetic field that is generated in the exciting coil weakens, causing the voltage that is generated in the stator coil to decrease (which reduces the alternator's output voltage).
- (3) When the voltage that is generated in the stator coil becomes lower than the regulator's regulated voltage, the regulator allows the current to flow to the exciting coil. As a result, the magnetic field that is generated in the exciting coil strengthens, causing the voltage in the stator coil to increase.

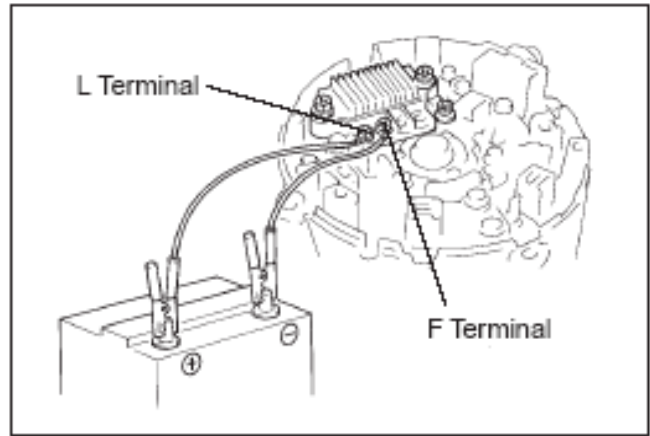
3-3. Loss of magnetization

In the event that the A-60 Alternator loses magnetism, it will be unable to self start. To re-magnetize the alternator you must "flash" the alternator.

(1) Magnetizing (Flashing)

- disconnect the battery(s) from the alternator terminal posts
 - using a ½" socket remove the nuts holding the wires to the alternators terminal posts
 - lift the alternator wires from the terminal posts
 - using a 8mm socket remove the 3 screws that fasten the junction box to the alternator housing.
 - remove the junction box from the rear of the alternator,
 - Momentarily connect an appropriate battery (12V or 24V) to the L terminal (plus) and F terminal (minus)
- of the regulator as shown in the figure.

12V type alternator: 12V battery
24V type alternator: 24V battery

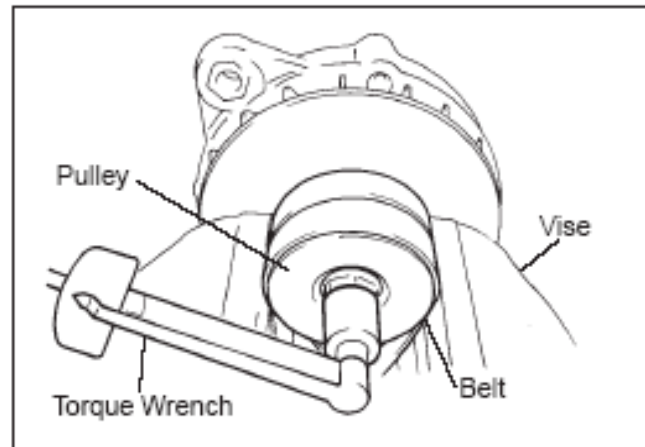


Magnetizing

3-4 Tightening the pulley

- Insert the collar and fan onto the rotor shaft.
- Insert the pulley shim onto the rotor shaft between the pulley and fan.
- Secure the pulley with belt using a vise as shown in the figure, tighten the pulley lock nut with specified torque.

Tightening torque: 117.6-137.2N·m (1200 1400kgf·cm)



4. PRECAUTIONS

(1) Precautions during operation

- Do not disconnect the battery while the alternator is rotating.
- Do not operate the alternator with the alternator's + terminal (output terminal) disconnected.

(2) Other precautions

- Make sure to disconnect the battery terminal before inspecting the alternator.
- Do not interchange the polarity of the battery cables when replacing the battery.
- Make sure to disconnect the cables and charge the battery separately when using a charger.
- Never use a Mega-Ohm tester on the alternator.
- Make sure to disconnect the wiring to the alternator when performing a Mega ohm test on other wiring.

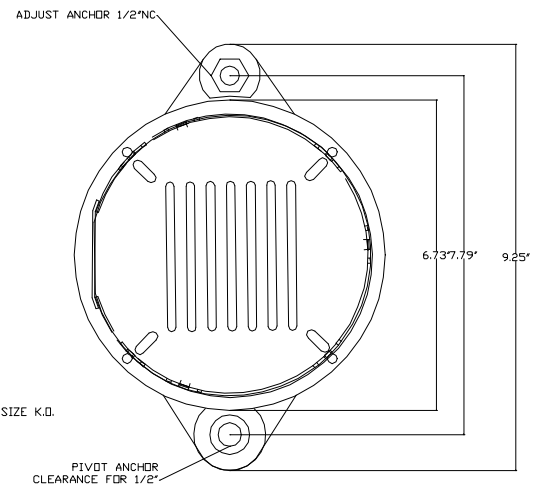
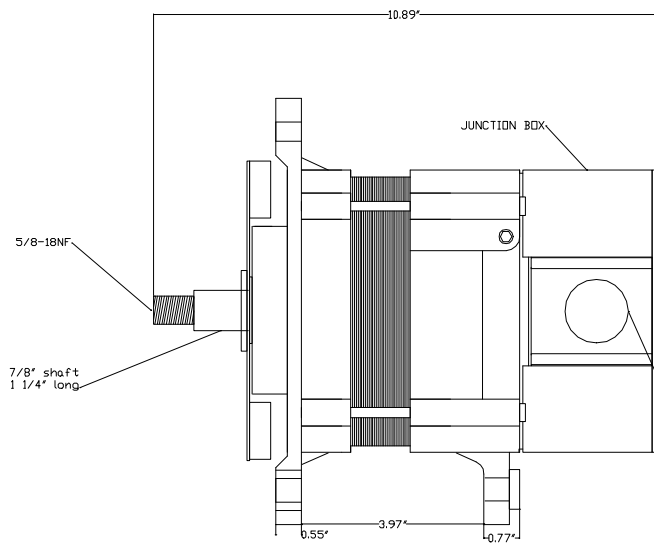
5. TROUBLESHOOTING

Additional trouble shooting notes:

Another cause of undercharged batteries is cable length and wire size. It is recommended to use no less than #2 AWG and keep wire runs between the alternator and the batteries no more than 30 feet of one way wire length.

No charging can also be caused by the rotor having no residual magnetism. - refer to "flash" magnetizing method in this document.

Symptom	Location of Malfunction	Possible Cause	Action
No charging	Alternator	Faulty regulator	Replace regulator
		Faulty stator coil (open or short circuit)	Replace stator
		Faulty exciting coil (open or short circuit)	Replace exciting coil
		Faulty rectifier (diode open or short circuit)	Replace rectifier
		Poor contact at connections	Repair or replace
	Wiring	Open circuit in wiring	Repair or replace
		Blown fuse or fusible link	Replace
Constantly undercharging (battery becomes discharged)	Alternator	Faulty stator coil (1 phase open or short circuit)	Replace stator
		Faulty rectifier (diode open or short circuit)	Replace rectifier
		Poor contact at connections	Repair or replace
	Electric load	Excessive current demand A large electric load is used	Increase alt output Reduce the electric load
	Belt	Insufficient tension	Tighten or replace
Constantly overcharging (battery electrolyte is depleted in a short time)	Alternator	Faulty regulator	Replace regulator
		Poor contact at voltage detection portion	Repair or replace
	Battery	Faulty battery	Replace battery
Abnormal noise	Alternator	Faulty stator coil (short)	Replace stator
		Faulty bearing(s)	Replace
	Belt	Improper belt tension	Repair



AIK - A-60 UNIVERSAL MOUNT

