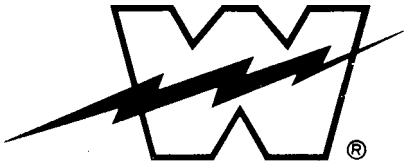


WINPOWER CORPORATION

TRACTOR DRIVEN ALTERNATOR

Instruction Manual

Winpower Corporation
Newton, Iowa 50208
PHONE: 515/792-1301

Printed U.S.A.

LIMITED WARRANTY

Winpower Corporation hereby warranties for a period of one year as hereinafter stated, the Winpower Tractor-Driven Alternator described herein to be free from defects in material and workmanship if properly installed, serviced and operated under normal conditions according to our instructions. This warranty is limited to repairing or replacing any part or parts found by Winpower Corporation or its authorized service outlet to be defective in material or workmanship within one year from the purchase date.

After one year and for a period of 20 years, this alternator will be factory repaired and reconditioned at actual labor and material cost, f.o.b. factory. Note: If this alternator is used for standby service, this warranty is void unless a multi-pole, double throw switch is installed in the main service line between the alternator and service entrance switch.

All transportation charges on parts or units submitted for replacement or repair under this warranty must be born by the purchaser.

Winpower Corporation hereby disclaims any and all implied warranties, including but not limited to, warranties of merchantability and fitness for any particular purpose, if and to the extent, but only if and to the extent, that such disclaimer is not forbidden by any applicable law and any implied warranties, including, bu not limited to warranties of merchantability and fitness for any particular purpose which Winpower Corporation is so forbidden to disclaim by any applicable law, are warranted one year from date of purchase.

This is the exclusive remedy and liability for consequential, incidental or special damages and/or expenses under any and all warranties are excluded to the extent exclusion is permitted by law.

Form #WTDA-7/75

IMPORTANT!

Follow the instructions in the owner's manual specifically when putting this alternator into service. When writing about service or ordering repairs, always show model number and serial number of alternator.

INTRODUCTION

This manual covers the installation, operating and maintenance instructions for the Winpower line of tractor driven alternators. Included with this manual is a parts list and wiring diagram covering the particular model you have purchased.

GENERAL

The tractor driven alternators covered by this manual are made to be driven from the power take-off of the tractor. The conversion from the speed of the power take-off to the speed of the alternator is done by either a gear drive or chain drive on the alternator.

All alternators have been thoroughly tested at the factory at full rated output. They are shipped with oil in the gear case or chain drive housing.

The alternator should be carefully inspected on delivery for evidence of possible shipping damage. If damage has occurred, a notation should be made on the freight bill so that a claim can be filed if necessary. If the damage appears to be of a major nature the set should not be operated until the fault has been corrected.

The model number and serial number of the set must be given when contacting the dealer or the factory.

INSTALLATION

LOCATION

It is difficult to determine the many different types of installation and location that an alternator of this type may be operated in. There are two important factors that must be kept in mind:

1. Moisture Moisture is an enemy of electrical insulation and electrical equipment. Therefore, if the unit is kept in the open it should be covered with a canvas cover when not running.
2. Dirt Foreign materials can have different effects. Abrasive dust can effect brush life, bearings and gears. Dust and dirt can clog ventilating openings. Dust and dirt can build up on components such as transformers, rectifiers and field coils and reduce their heat dissipation to the point of causing component failure.

There are two general categories for tractor drive alternator applications: (1) Mobile and (2) Stationary.

MOBILE MOUNTING

For mobile use the tractor drive alternator is mounted on a trailer. The trailers are optional equipment and the following are the Winpower model numbers:

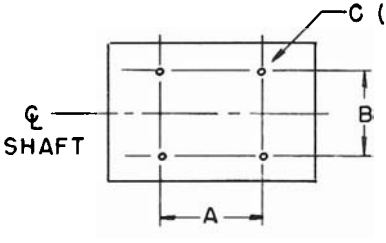
Alternator Model	Trailer Model
12/7	TT10
25/15	TDM
45/25	TDM
80/40	TDM

A typical trailer installation is shown in Figure 1.

The power take-off shaft should have as good alignment as possible. While it is possible to operate with appreciable misalignment, it is damaging to the power take-off and the alternator transmission.

STATIONARY MOUNTING

A foundation should be constructed of reinforced concrete for stationary mounting. Subtract the distance of the alternator shaft centerline from the bottom of its mounting feet from the distance of the center line of the tractor power take-off shaft from the ground to obtain the required height of the mounting platform. Provisions should be made for inserting anchor bolts or "J" bolts in the concrete for securing the alternator. The size and location are as follows:



MODEL	A	B	C
12/7	8	10	3/8
25/15	3-1/2	14	5/8
45/25	6-1/2	14	5/8
80/40	10-5/8	14	5/8

A typical stationary installation is shown in Figure 2. As with mobile mounting, the alignment should be as good as possible as misalignment can cause damaging effects to the power take-off shaft and the alternator transmission, as well as the universal joints on the tumbling bar.

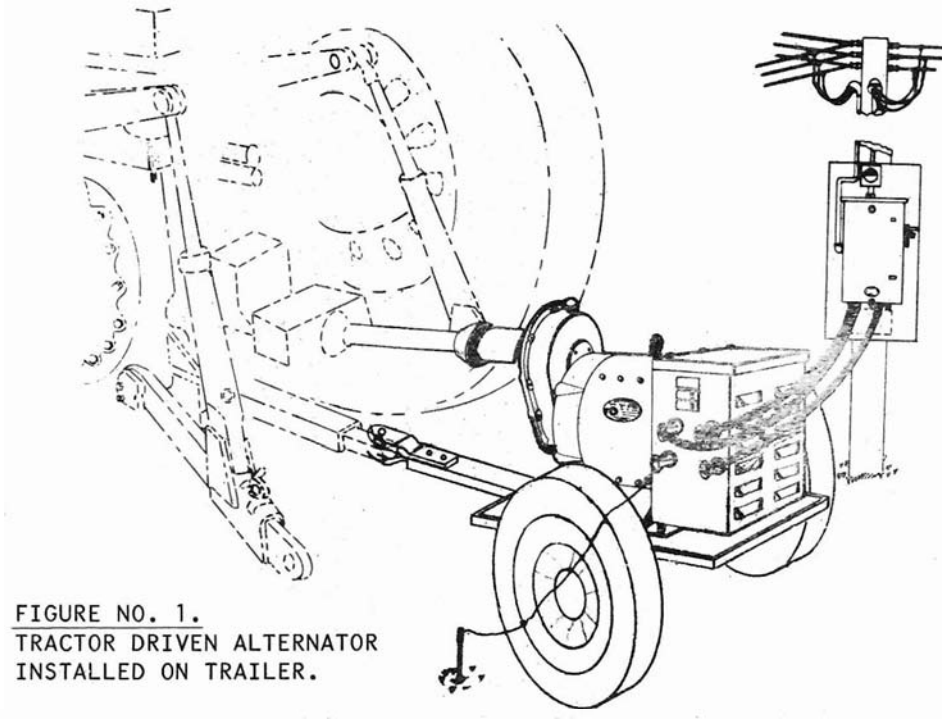


FIGURE NO. 1.
TRACTOR DRIVEN ALTERNATOR
INSTALLED ON TRAILER.

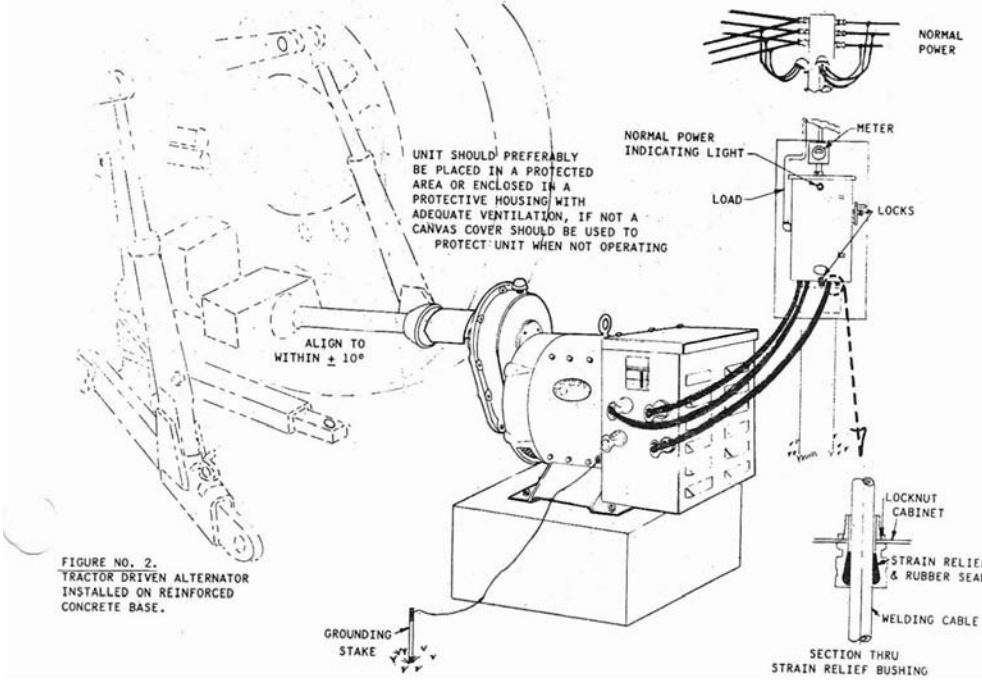


FIGURE NO. 2.
TRACTOR DRIVEN ALTERNATOR
INSTALLED ON REINFORCED
CONCRETE BASE.

LUBRICATION

The alternator transmission case is filled to the level of the small pipe plug when alternator leaves the factory. The grade of oil is as follows:

Alternator Model	Grade Of Oil
12/7	AGMA #2C (mild E.P.) Gear Oil
25/15	AGMA #3 (E.P.) Gear Oil
45/25	" " " " "
80/40	" " " " "

GROUNDING

The alternator frame and panel must be grounded by connecting them to a grounding stake driven in moist earth or to a water pipe. This is a must for safety reasons. The connection should be #6 wire or heavier.

TRACTOR HORSEPOWER

The alternator requires 2.2 horsepower per KW. A 45/25 tractor drive alternator, for example, would require a tractor to have 99 horsepower minimum available at the power take-off in order to utilize the full intermittent rating of the alternator.

CONNECTION

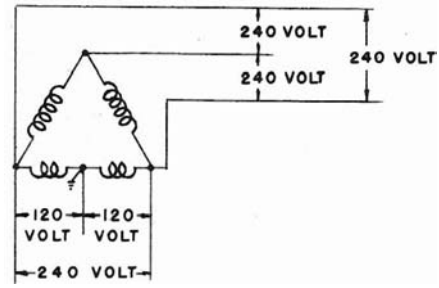
The following voltage and phase combinations are available in the Winpower line of tractor driven alternators:

Model	Phase	Voltage
12/7 PT2	1	120/240
25/15 PT2	1	120/240
25/15 PT3J	1	120/240
25/15 PT3J	3	240
45/25 PT3J	1	120/240
45/25 PT3J	3	240
80/40 PT3JD	1	120/240
80/40 PT3JD	3	240
80/40 PT3JM	1	120/240
80/40 PT3JM	3	240

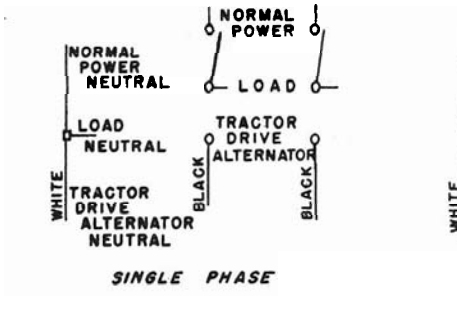
SPEED

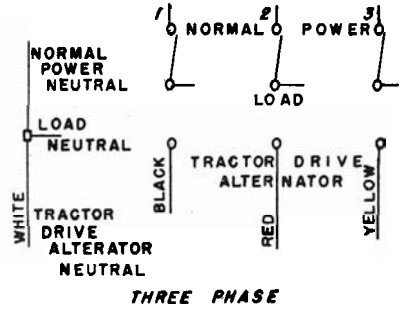
All models are 540 RPM except 80/40 PT3JM which is 1000 RPM.

All models with a J as a suffix can be operated with single phase and three phase loads at the same time within the ratings of the individual windings. It is compatible with the most common type of three phase system in agricultural areas. This system is shown.



If used as a standby generator the electrical connection to the tractor drive alternator must be made through a transfer switch. This is to prevent any possible direct connection between the tractor drive alternator and the power line which could be disastrous. A double pole, double throw (DPDT) switch is used for a single phase connection and a triple pole, double throw (TPDT) switch is used for three phase. The schematic representation is as follows:





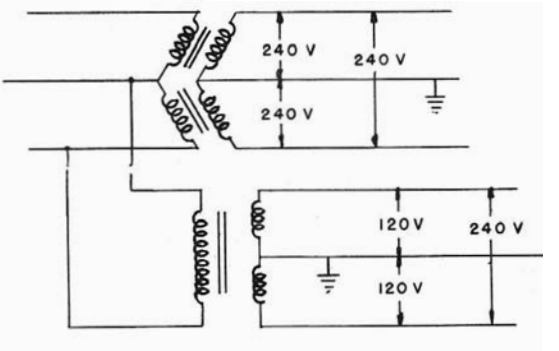
Special care must be taken when using tractor drive alternators with a J as a suffix in the model number as a single phase generator that no use is made of the L3 (yellow terminal). The voltage between that terminal (sometimes referred to as the "wild phase") and neutral is over 200 volts.

When used as a standby for a three phase system the phase rotation of the load lines when energized from the tractor drive alternator must be checked to determine if it is the same as when they are energized from normal power. To determine this, all three phase motors should be turned off. Refer to a later section on operating the unit. With the tractor running the transfer switch should be switched to the emergency position. One of the three phase motors, whose load is such that it would not be damaging to run in the wrong direction, should be turned on to determine the correctness of rotation.

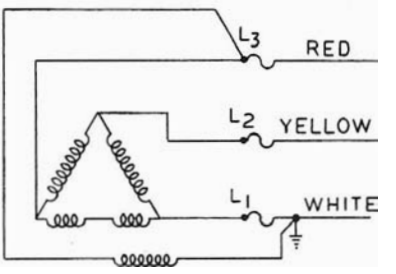
If the direction of rotation is wrong, reverse leads L1 and L2 (black & red plug sockets) coming to the transfer switch from the tractor drive alternator.

CORNER GROUNDED DELTA

A few areas have a three phase delta with one of the three corners grounded. A separate transformer is used for the single phase system. A schematic representation of this system is shown below.



In order to use a tractor drive alternator with this type of system it will be necessary to use a transformer as shown below:



SINGLE PHASE
LOAD

It is necessary to remove L1 from the black post and put it on the white post as L1 becomes the grounded lead. **The neutral line which** was on the white post must be removed and taped up. L1 must be connected to the grounded load line.

OPERATION

1. Place the load circuit breaker on the alternator panel in the off position.
2. Start the tractor and adjust power take-off speed to maximum, then reduce the speed gradually until the voltage indicator is on the high side on the green at no load.

OPERATION (con't)

3. Place plugs in their proper receptacles. Place transfer switch in the emergency position.
4. Place the load circuit breaker in the on position. The tractor drive alternator is now delivering power to the connected load. The voltage indicator should be on the green portion of the scale.
5. The return of normal power will be indicated by the lamp on the front of the transfer switch. Allow sufficient time to assure that the power restoration is sustained and then return the transfer switch to the normal power position.
6. Place the load circuit breaker in the off position. Do not remove feed jacks before opening breaker.
7. **Slowly reduce the power take-off speed to a minimum and disengage** the power take-off. Warning--Do not place in brake position during shutdown.

MAINTENANCE

1. Maintain proper oil level in power take-off gear case. Fill to the small pipe plug. Do not overfill. Use only oil previously specified. The oil should be changed after 100 hours or every 12 months, whichever comes first, except for model 12/7 which should have its first oil change after 10 hours of operation and normal schedule after that.
2. Inspect the brushes periodically if being used steadily. Brushes should move freely in the holders. When lifted from the surface of the collector ring by the brush shunt and released, the brush should snap back in contact with collector ring. Inspect brushes for wear. Replace with brushes of the same grade if they are 1/2" or shorter in length.
3. Inspect collector rings and if dirty remove all the brushes and wrap 00 sandpaper for one quarter to one half of the periphery of the ring. Start tractor and sand the rings by applying pressure on both ends of paper. An even brown film on the rings is not an undesirable condition. Clean only if uneven and dirty.
4. Clean machine. It is especially important that there should be no accumulation of dirt on the air inlet or the air outlet.
5. The ball bearings require no lubrication as they are prelubricated sealed bearings.
6. The alternator should be run every six months for two hours if it stands idle most of the time.

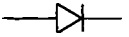
TROUBLE SHOOTING CHART

TROUBLE	CAUSE	REMEDY
No output voltage	Lack of residual	Restore residual
	Open circuit	Locate open and repair
	Short circuit	If in armature, armature must be replaced.
	Defective diode (see section on testing rectifiers and diodes)	Replace rectifier assembly
	Brushes not making contact	Free brushes
	Excessive film on collector rings	Clean rings
Low voltage at no-load	Low speed	Increase speed
	Defective diode in shunt field bridge	Replace rectifier assembly
Low voltage under load	Defective series field diode	Replace rectifier assembly
	Too much speed change with load	Check tractor engine
Excessive heating	Overload	Remove part of load
	Armature striking on field poles	Tighten screws holding field poles to field frame
	Clogged ventilating inlets and/or outlets	Clean machine

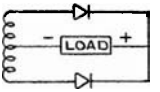
TESTING RECTIFIERS AND DIODES

DEFINITIONS

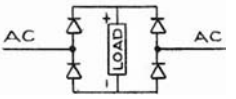
A diode is a single rectifying element represented graphically as shown below:



When a diode is used alone such as in half wave rectification it can also be called a rectifier. Two diodes are used in full wave rectification as shown:



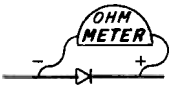
Four diodes are used in a single phase rectifier bridge as shown:



TESTING

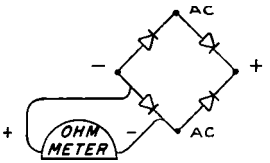
An ohmmeter is required for testing a diode or rectifier assembly. It is necessary to remove the leads going to the rectifier for testing it. A single diode will show a very high resistance in one direction and low resistance in the other direction.

Low Reading

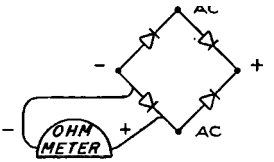


Very High Reading

A shorted diode will have a low reading in both directions. An open diode will have a high reading in both directions. Each diode in an assembly can be tested as shown below:



Low Reading



Very High Reading

This reading has to be repeated on every diode. If the rectifier assembly is a molded assembly test + - - AC

AC - — -

between + and both of the AC terminals. The reading again should be low in one direction and very high in the other direction. The readings should be repeated between the negative terminal and the two AC terminals.