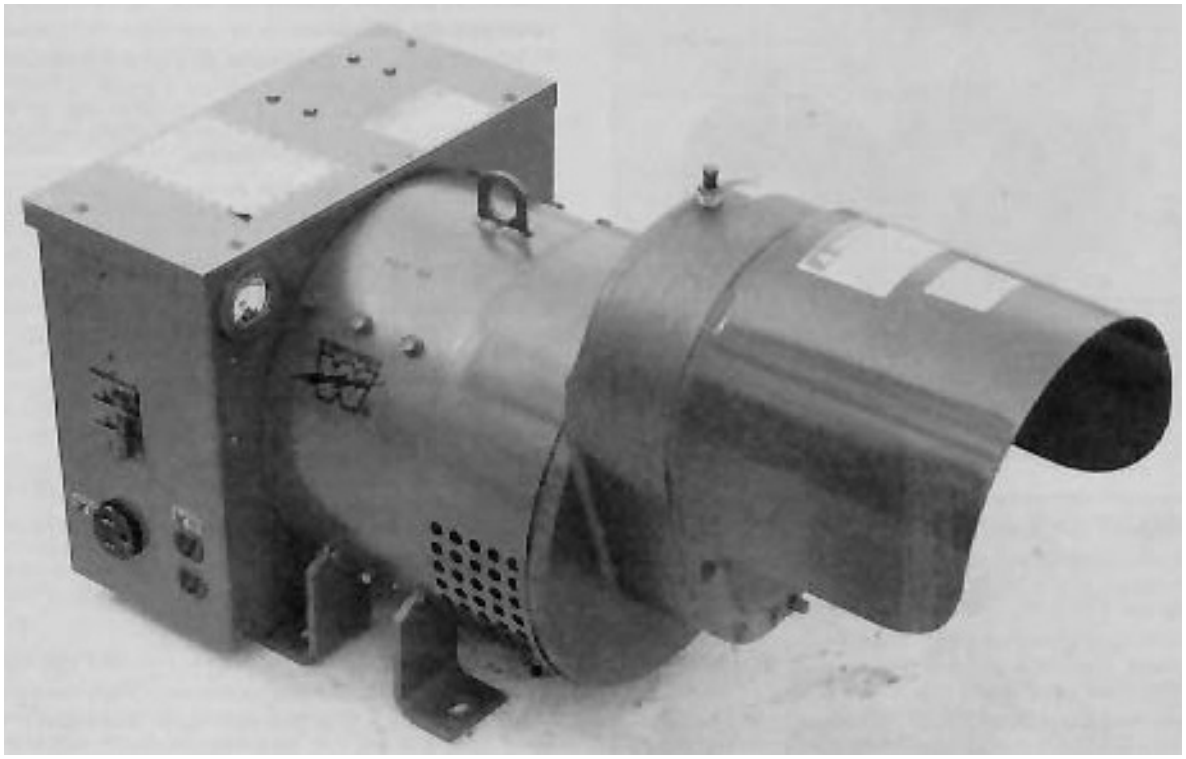
Printed: July, 1984
Tested at: Portage la Prairie
ISSN 0383-3445
Group 2d

EVALUATION REPORT 371



WINPOWER MODEL 50/30 PTCD ALTERNATOR

A Co-operative Program Between

ALBERTA FARM MACHINERY RESEARCH CENTRE

PAMI
PRAIRIE AGRICULTURAL MACHINERY INSTITUTE

WINPOWER MODEL 50/30 PTCD ALTERNATOR

MANUFACTURER:

Winpower Corporation
1207 First Avenue East
Newton, Iowa
50208

DISTRIBUTOR:

Mandem, Industrial Division of Asamera Inc.
21 Murray Park Road
Winnipeg, Manitoba
R3J 3S2

RETAIL PRICE: $3,965 (June 1984, f.o.b. Portage la Prairie, Manitoba)

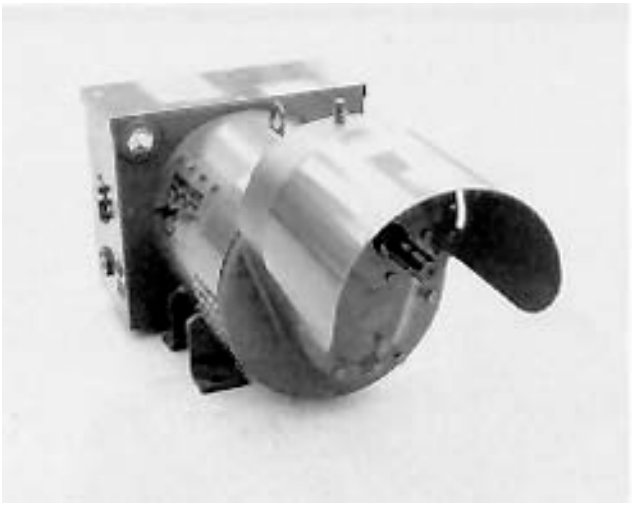


FIGURE 1. Winpower 50/30.

SUMMARY AND CONCLUSIONS

Performance Characteristics: Maximum continuous power output of the Winpower 50/30 was 36 kW. Efficiency ranged from 83% to 96%. Motor starting ability was *very good.*

Ease of Operation and Adjustment: Ease of operation and adjustment was *very good.* A voltmeter indicated proper operating speed and voltage.

Power Requirements: A tractor with a power take-off rating of 75 hp (56 kW) would have sufficient power to operate the Winpower 50/30 alternator.

Durability: No durability problems occurred during the test.

RECOMMENDATIONS

It is recommended that the manufacturer consider:

1. Including safety instructions in the operator manual.
2. Having the alternator CSA approved.

Senior Engineer -- G. M. Omichinski
Project Engineer -- C. W. Chapman

THE MANUFACTURER STATES THAT

With regard to recommendation number:

1. A new manual with specific attention to correct application, safety and usage is being revised.
2. The unit tested was CSA approved under File No. LR8477; however, since that time CSA has revised their standards and Winpower has pending application for approval under the new Standard Bulletin 1033F.

GENERAL DESCRIPTION

The Winpower Model 50/30 PTCD is a 540 rpm power take-off driven alternator. It is a brush type alternator consisting of a stationary field coil and a rotating armature, operating at a speed of 1800 rpm to produce a 60 Hz voltage.

It is equipped with one 120V (15 AMP) duplex receptacle and one 240 V (50 AMP) receptacle. Full power output of the alternator is available through a 120/240V (175 AMP) Anderson™ Electric receptacle. It is equipped with a calibrated voltmeter to indicate proper output voltage.

The alternator is protected with a 125 AMP circuit breaker.

Detailed specifications are given in APPENDIX I.

SCOPE OF TEST[1]

The Winpower 50/30 was operated for 15 hours while powering a variety of resistive and motor loads. It was evaluated for performance characteristics, ease of operation and adjustment, safety and suitability of the operator manual.

RESULTS AND DISCUSSION

QUALITY OF WORK

Performance characteristics: Alternator performance characteristics for various resistive loads are shown in FIGURE 2. Maximum continuous output of the alternator was 36 kW. At this output, voltage was 230 volts. Further loading usually resulted in tripping the 125 AMP main breaker.

Efficiency of the alternator, as shown in FIGURE 2, varied from 83 to 96%. Peak efficiency of 96% occurred at a load of 11.6 kW.

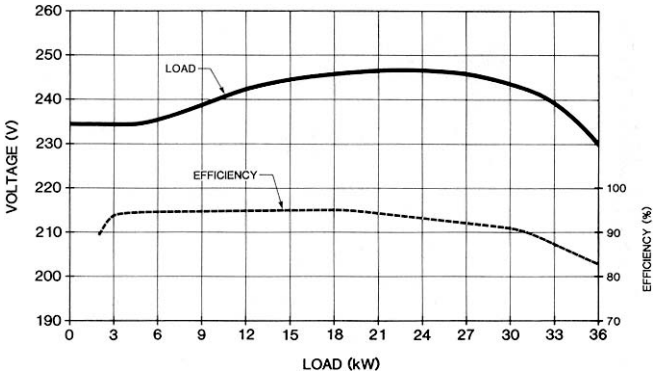


FIGURE 2. Performance characteristics.

Motor starting: The Winpower 50/30 was capable of starting and running a 240 V, 5 hp induction motor, with the alternator operating at 100% of rated load. Starting and running currents of the motor were 120 and 28 AMPS respectively.

During the motor starting period the output voltage of the alternator dipped to 176 volts from 244 volts but recovered to 243 volts in 2 seconds.

The peak power output of the Winpower 50/30 during the motor starting tests was 49 kW.

FIGURE 3 shows the results of an endurance test. The test was performed to determine the effect of heating of the armature on output voltage with the alternator operated at 100% of rated load. After 140 minutes of continuous operation the voltage was constant at 238 volts. The voltage drop from cold to normal operating temperature was 15 volts.

Power requirements: Peak power requirements of the Winpower 50/30 was 75 hp (56 kW). This occurred when starting heavy motor loads. Average power requirements with alternator loaded at 100% of rated capacity was 45 hp (34 kW). A tractor with a minimum power take-off rating of 75 hp (56 kW) would have sufficient power to operate the Winpower 50/30.

1Prairie Agricultural Machinery Institute Detailed Test Procedure for Power Take-off Alternators.

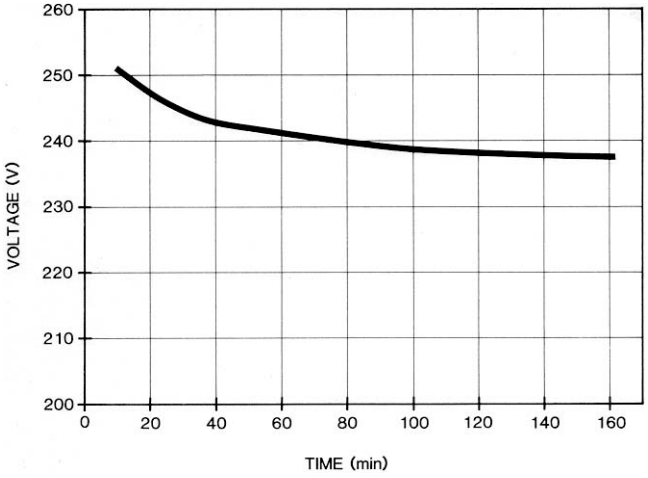


FIGURE 3. Endurance Test.

EASE OF OPERATION

Installation: The manufacturer recommended the alternator be installed in a location that is free from dust and rodents and would allow sufficient ventilation when in operation. The alternator should be secured to a concrete pad or a suitable trailer. If the alternator is to be wired to the main distribution panel, a transfer switch must be installed to isolate the alternator from the utility company's service.

The Winpower 50/30 was equipped with an Anderson™ Electric receptacle, which allowed the alternator to be quickly disconnected for portability.

The Winpower 50/30 was equipped with a 540 rpm 13/8 in (35 mm) spline shaft. The alternator should be installed to allow proper alignment of the power take-off shaft.

Voltmeter: The alternator was equipped with a voltmeter to indicate proper operating speed and output voltage. The needle and green colour band of the voltmeter could be easily seen from the tractor seat.

Lubrication: The drive chain case required filling with oil, and should be checked before each operation.

Brushes and wiring: The manufacturer recommended the alternator brushes, slip rings and internal wiring be frequently inspected for wear and loose connections. The alternator should be operated at full load at least twice annually.

OPERATOR SAFETY

The Winpower 50/30 was safe to operate if normal safety procedures were observed. No safety information was included in the operator manual. It is recommended the manufacturer include comprehensive safety information in the operator manual.

The Winpower 50/30 was not CSA approved. It is recommended the manufacturer have the alternator certified by CSA.

OPERATOR MANUAL

The operator manual was well written and illustrated and contained information on installation, operation and maintenance. A complete wiring diagram and parts list was included. No safety information was included in the manual.

DURABILITY RESULTS

The intent of the test was evaluation of the functional performance. No mechanical problems occurred during the test. An extended durability evaluation was not conducted.

APPENDIX I

SPECIFICATIONS

MAKE:	Winpower	
MODEL:	50/30 PTCD	
SERIAL NUMBER:	MO-6019-6	
DIMENSIONS:		
--Width	15.1 in	(460 mm)
--Length	38.2 in	(970 mm)
--Height	20.5 in	(520 mm)
--Weight	484 lb	(220 kg)
NOMINAL RATINGS:		
--Power	30 kW	
--Voltage	120/240V	
--Current	125 AMPS, circuit breaker	
--Service factor	100%	
--Speed	540/1800 rpm	
--Receptacles	1 duplex, 120V at 15 AMPS 1, 240V at 50 AMPS 1 full power, 85 AMPS, Anderson connector	
DRIVE SHAFT:	1-3/8in (35 mm) power take-off spline	

APPENDIX II

MACHINE RATINGS

The following rating scale is used in Machinery Institute Evaluation Reports:

Excellent	Fair
Very Good	Poor
Good	Unsatisfactory

APPENDIX III

CONVERSION TABLE

Horsepower (hp) x 0.746	= Kilowatt (kW)

ALBERTA FARM MACHINERY RESEARCH CENTRE

3000 College Drive South
Lethbridge, Alberta, Canada T1K 1L6
Telephone: (403) 329-1212
FAX: (403) 329-5562
http://www.agric.gov.ab.ca/navigation/engineering/afmrc/index.html

Prairie Agricultural Machinery Institute
Head Office: P.O. Box 1900, Humboldt, Saskatchewan, Canada S0K 2A0
Telephone: (306) 682-2555

Test Stations:
P.O. Box 1060
Portage la Prairie, Manitoba, Canada R1N 3C5
Telephone: (204) 239-5445
Fax: (204) 239-7124

P.O. Box 1150
Humboldt, Saskatchewan, Canada S0K 2A0
Telephone: (306) 682-5033
Fax: (306) 682-5080