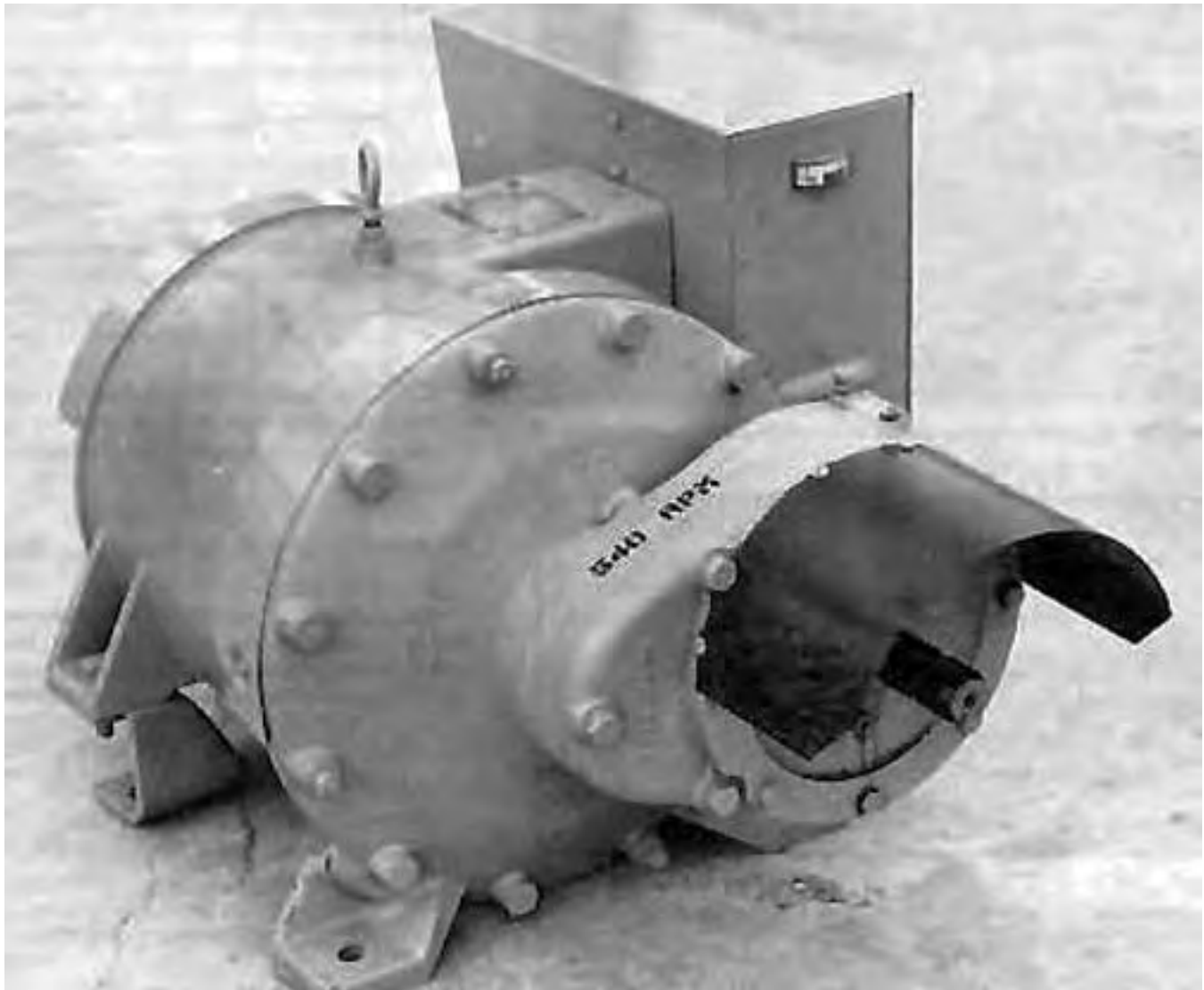


# EVALUATION REPORT

# 399



## **AIRCRAFT APPLIANCES & EQUIPMENT G2068-502 26 kW ALTERNATOR**

A Co-operative Program Between



# AIRCRAFT APPLIANCES AND EQUIPMENT G2068-502 26 kW ALTERNATOR

**MANUFACTURER & DISTRIBUTOR:**  
 Aircraft Appliances & Equipment Ltd.  
 152 East Drive  
 Bramalea, Ontario

**RETAIL PRICE:**  
 \$3,100.00 (December 1984, f.o.b. Toronto, Ontario).



FIGURE 1. Aircraft Appliances & Equipment G2068-502 26 kW Alternator.

## SUMMARY AND CONCLUSIONS

**Performance Characteristics:** Maximum continuous power output of the AAE alternator was 25 kW, Efficiency ranged from 66% to 90%. 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 60 hp (45 kW) would have sufficient power to operate the AAE 26 kW alternator.

**Durability:** No durability problems occurred during the test.

## RECOMMENDATIONS

No recommendations are made  
 Senior Engineer -- G.M. Omichinski  
 Project Engineer -- C. W. Chapman

## GENERAL DESCRIPTION

The AAE 26 kW alternator is a 540 rpm power take-off driven alternator. It is a brushless alternator consisting of a stationary armature and a rotating field coil operating at a speed of 1800 rpm to produce a 60 Hz voltage.

It is equipped with two 120V (15 AMP) receptacles, one 240 V (50 AMP) receptacle. Full power output of the alternator is available through a direct connection to the main circuit breaker. It is equipped with a calibrated voltmeter to indicate proper output voltage. The alternator is protected with a 100 AMP circuit breaker.

Detailed specifications are given in APPENDIX I.

## SCOPE OF TEST

The AAE 26 kW alternator was operated for 14 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 25 kW. At this output, voltage was 225 volts. Further loading usually resulted in tripping the 100 AMP main breaker.

Efficiency of the alternator, as shown in FIGURE 2, varied from 66 to 90%. Peak efficiency of 90% occurred at a load of 13.3 kW.

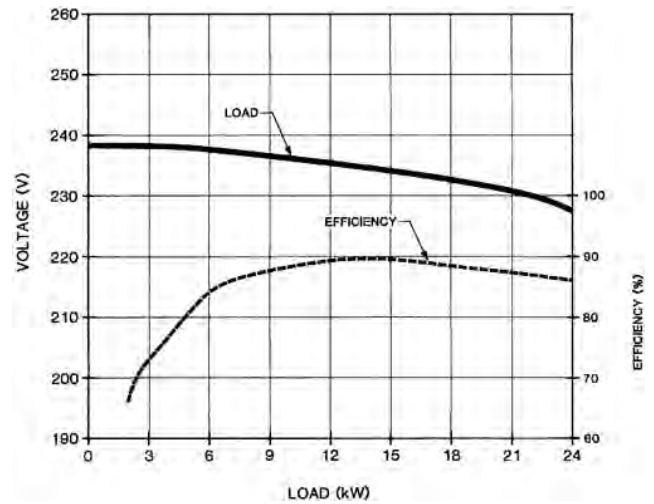


FIGURE 2. Performance Characteristics.

**Motor Starting:** The AAE 26 kW alternator was capable of starting and running a 5 hp, 240 V (3.75 kW) 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 156 volts from 226 volts but recovered to 212 volts in 2 seconds.

The peak power output of the AAE 26 kW alternator during the motor starting tests was 40 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 143 minutes of continuous operation the voltage was constant at 226 volts. The voltage drop from cold to normal operating temperature was 14 volts.

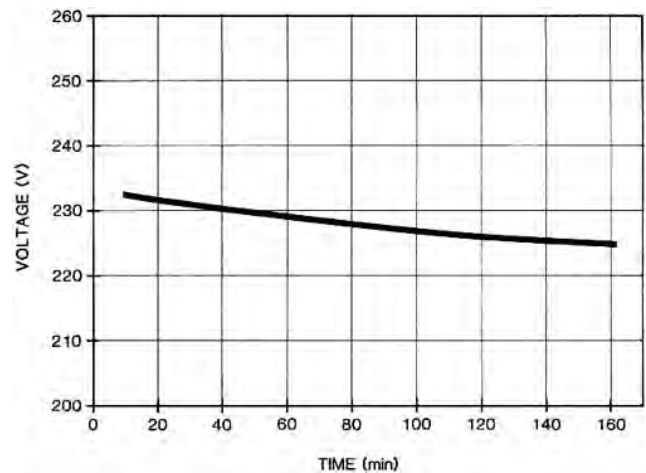


FIGURE 3. Endurance Test.

**Power requirements:** Peak power requirement of the AAE 26 kW alternator was 60 hp (45 kW). This occurred when starting a 5 hp (3.75 kW) induction motor. Average power requirement with alternator loaded at 100% of rated capacity was 39 hp (29 kW). A tractor with a minimum power take-off rating of 60 hp (45 kW) would have sufficient power to operate the AAE 26 kW alternator.

## EASE OF OPERATION

**Installation:** The manufacturer recommended the alternator be installed in a location that is free from dust and 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.

Full power output of AAE 26 kW alternator was available by direct connection to the main circuit breaker.

The AAE 26 kW alternator was equipped with a 540 rpm 1-3/8 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 colour band of the voltmeter could be easily seen from the tractor seat.

**Lubrication:** The gearbox oil level should be checked each 50 hrs of operation.

**Wiring:** The manufacturer recommended that the alternator be operated at least once a month. Additional maintenance to the wiring or related components was not necessary.

#### OPERATOR SAFETY

The AAE 26 kW alternator was safe to operate if normal safety procedures were observed. The AAE 26 kW alternator was CSA approved.

#### 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.

#### DURABILITY RESULTS

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

#### APPENDIX I SPECIFICATIONS

<b>MAKE:</b>	Aircraft Appliances and Equipment
<b>MODEL:</b>	G2068-502 26 kW
<b>SERIAL NUMBER:</b>	43244
<b>DIMENSIONS:</b>	
-- Width	23.6 in (600 mm)
-- Length	31.9 in (810 mm)
-- Height	17.5 in (445 mm)
-- Weight	378 lb (172 kg)
<b>NOMINAL RATINGS:</b>	
-- Power	26 kW
-- Voltage	120/240V
-- Current	108 AMPS, circuit breaker
-- Service factor	100%
-- Speed	540/1800 rpm
-- Receptacles	two, 120V at 15 AMPS one, 240V at 50 AMPS
<b>DRIVE SHAFT:</b>	1-3/8 in (34 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



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