

# **B & C Specialty Products Inc**

123 East 4th St, P.O. Box "B", Newton KS 67114-0894

Telephone (316) 283-8000 \*\*\*\*\* Fax (316) 283-7400

---

**Manufacturer of Lightweight Electrical Systems**

## **Instructions for Continued Airworthiness for**

**B&C Specialty Products Models 200G Alternator  
with PMR1-14 Regulator  
and  
BC433-H Alternator with PMR3 Regulator**

The B&C Model 200G and BC433-H alternators incorporate a Type Certified Continental drive gear assembly.

The alternators, excluding the drive gear assembly, require no recurrent maintenance during their service life of 2000 hours. It is recommended that at 2000 hours time in service or during engine overhaul (which ever is sooner) the alternator and drive gear assembly be returned to B&C for factory evaluation/overhaul.

Every 500 hours time in service or less the drive gear assembly should be checked for backlash per Continental service instructions. This may be done by manual manipulation of the external magnetic housing that rotates with the gear. The drive gear assembly may be serviced in the field by replacement of any required parts per Continental service instructions. Refer to Continental service bulletin SB#95-3A.

The B&C PMR1 or PMR3 regulator furnished with the alternator requires no recurrent maintenance and has an indefinite service life. Failure due to broken wires or damaged connectors may be corrected in the field using repair procedures complying with the latest revision of AC43.13-xx. Field adjustment of the regulating voltage may be accomplished on the PMR1 only by use of the external adjustment screw if required. All other repairs are by replacement only.

**THESE UNITS CARRY NO STC OR PMA APPROVAL AND MUST BE  
ACCOMPANIED BY A ONE TIME FIELD APPROVAL FOR USE ON A TYPE  
CERTIFICATED AIRCRAFT**

# B & C Specialty Products Inc

123 East 4th St, P.O. Box "B", Newton KS 67114-0894

Telephone (316) 283-8000 \*\*\*\*\* Fax (316) 283-7400

---

## A Comparative Study for Structural Suitability and Electrical suitability of the B&C Model BC433-H Alternator on Continental C-75 thru O-300-A, B, & C Engines

### 1.0 Introduction

1.1 The Continental C-75 through O-300-A, B, & C accessory cases are capable of carrying a number of Type Certified generators and alternators. In this study a type certified, 60 amp, Ford built alternator (Cessna P/N C611501-0204) will be compared to the B&C BC433-H alternator to determine the BC433-H's structural suitability for applications involving these engines.

### 2.0 Shaft strength

2.1 The BC433-H alternator incorporates the same Type Certified gear drive assembly used on the Cessna alternator. This gear drive assembly defines the dimensional characteristics of the shaft on which it is mounted. The portion of the BC433-H shaft that is cantilevered into the engine is designed with the same dimensions as the Cessna alternator.

2.2 Chemical analysis of four shafts from alternators and generators used in this application revealed that the material used in three shafts was SAE 1144 steel and in the fourth shaft SAE 1117 steel. The chemical analysis of SAE 1144 steel is the same as "Stressproof" steel. "Stressproof" steel was chosen as the material for the BC433-H shaft to assure material properties equal to the Type Certified shafts.

### 3.0 Rotational Inertia

3.1 An approximate comparison of rotational inertia may be made by comparing the weight and diameters of the two rotors.

3.2 The weight of the rotor of the Cessna alternator is 4.5 Lbs. Its outside diameter is 3.56 inches and its mass is fairly evenly distributed in the diameter. Its rotational inertia is approximately  $(M * R^2)/2 = 6.9 \text{ Lb-in}^2$ .

3.3 The weight of the BC433-H rotor is 1.3 Lbs. Its primary mass is concentrated between an outside diameter of 4.10 inches and an inside diameter of 3.5 inches. Its rotational inertia is approximately  $M * (R^2 + r^2)/2 = 3.0 \text{ Lb-in}^2$ .

3.4 Therefore the rotational inertia for the BC433-H is less than half of the rotational inertia for the previously certified Cessna alternator.

