(12)

ENGINEERING ANALYTICAL REPORT

Class 1

WOODWARD GOVERNOR COMPANY
Aircraft Controls Group

CUSTOMER NAME	CAR NO	REPORT NO. (S/N - DATE)
HONEYWELL ENGINES & SYSTEMS	**N/A**	**1812152-050509**

CUSTOMER ORDER	WOODWARD ORDER NO.
NTSB ID: DEN05FA034	**2090067**

ENGINE TYPE	ENGINE SERIAL NUMBER	MODEL RECEIVED	ENGINE MFR. MODEL RECEIVED
TPE 331	**N/A**	**8210-263**	

CONTROL TYPE	MODEL SHIPPED	ENGINE MFR. MODEL SHIPPED
83344 SML		

AIRCRAFT TYPE	AIRCRAFT TAIL NUMBER
MU-2B-60	**N538EA**

TSN	TSO	TSR
N/A	**N/A**	**N/A**

LAST SHIPPED	REPORT COMPLETION DATE
2002-06-27	**2005-9-15**

REPORTED BY:
DL Bark

SENIOR ENGINEER:
Steve Krugler

1. PROBLEM DESCRIPTION

The unit was returned for investigation pertaining to a reported incident in Englewood, Colorado on December 10, 2004. The installation was on the right engine.

2. CONCLUSIONS

There were no anomalies found. The unit functioned properly.

3. CORRECTIVE ACTION

No corrective action is required.

4. INVESTIGATION DETAILS

The visual as-received report:

- The unit had non-Woodward seals and lockwire.
- The unit was received without shipping caps and port covers.
- The wiring for the magnetic pickup has been cut.
- The overall appearance was that it was very dirty.
- The pump shaft rotated smoothly.

Functional test results:
Maximum and minimum speeds were found to be out of tolerance as was the travel between them, 18 degrees versus 10 degrees nominal, on the initial testing. It was determined that Mitsubishi routinely trims the governor settings to "fine tune" the system. Minor readjustments indicate the governor performance was fine. No other discrepancies were found.

During the readjustment phase of the investigation it was noted that the speeds appeared unstable in the form of a speed drift. This occurs do to variations in the amount of oil present in the ballhead cavity. This is typical of all our propeller governor products. Some of our products are mounted vertically on the gear box(es) and some, like this one, are mounted horizontally. The vertical mounted

units tend to run "dry" and the horizontal ones tend to run "wet". Either has shown to be innocuous to the system because they all stabilize within a few minutes and no further speed drift is seen.

There have been two arguments as to the true nature of this phenomena (1) due to buoyancy of the flyweights in the oil meaning they need a higher speed to obtain the weight for the same "null" position when wet versus dry and (2) since Newtonian Physics states mass not weight is appropriate for the force equation it is most probably due to the shape of the flyweights as they pass through the oil medium where the oil "pushes" them toward the center of rotation thus requiring a higher speed. Both arguments give the same results. The former is present in many of Woodward's older documents, the later is the most plausible to the author, a student of Physics. Exactly which is true is academic.