

PROCEDURE FOR ADJUSTING
AEROMATIC PROPELLERS TO PROPERLY CONTROL REPM
ON PROTOTYPE INSTALLATIONS

INTRODUCTION

When an Aeromatic propeller is shipped from the factory, it is set up and adjusted as close as possible to fit the installation for which it is designed. The setting of the stops, the counterweight angle, and the weight used has been arrived at by our Engineering and Flight Test Sections. Sometimes the propeller has actually been flown and adjusted on a plane having comparable performance characteristics to the one for which it is designed. The following instructions have been written to cover the adjustment procedure for a propeller that controls the engine RPM very poorly. Often the adjustment changes that have to be made in the field will be nil or very small.

STATIC ADJUSTMENT

1. The engine manufacturer's normal rated RPM is indicated on engine name plate. Check static full throttle RPM with counterweights removed from counterweight arms. Static RPM should be 50 RPM below rated RPM. Static RPM is obtained by adjustment of low pitch stops as described in Field Service Instruction Manual for appropriate propeller model. Re-install the counterweights in their original position on the counterweight arms. A slight decrease in static RPM will then be noted. This is normal; therefore, no other static RPM adjustment should be made.

FLIGHT ADJUSTMENT

1. In order to achieve the proper automatic functioning of the Aeromatic propeller, the following flight adjustments are recommended to obtain the best horsepower available conditions in flight. To simplify the flight range, the two principle points, namely, full throttle best climb speed and full throttle level flight maximum airspeed are to be considered.
2. Record full throttle RPM in a climb at best climb speed immediately after the take-off. Flying as close to field elevation as practical, record RPM in full throttle level flight at maximum airspeed.
3. If both of the RPM values (paragraph 2) are higher than rated RPM (Fig. 1), add sufficient weight (see Weight Effectiveness table) to the counterweight arms so that either the climb RPM or the full throttle level flight RPM is reduced below rated RPM. (Fig. 3 and 4)
4. If both of the RPM values (paragraph 2) are lower than rated RPM (Fig. 2), remove sufficient weight (see Weight Effectiveness table) from the counterweight arms so that either the climb RPM or the full throttle level flight RPM is raised above rated engine RPM (Fig. 3 and 4).

2721-7=5 oz.
 2965-7=5 oz.
 2965-8=10 oz.

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WEIGHT EFFECTIVENESS			
Propeller Model	Weight Part No.	Weight	Approximate RPM Change
200	2965-1	.25 ounce	25
	-2	.50	50
	-3	1.00	100
	-4	2.00	200
F200	2721-1	.25	50
	-2	.50	100
	-3	1.00	175
	-4	2.00	250

5. ~~If there is a difference in full throttle climb and level flight RPM, it is necessary to make a slight change in counterweight arm angle.~~
 If maximum airspeed level flight RPM is higher than full throttle climb RPM, ~~lower the counterweight arm angle~~ as shown in Fig. 7 and add weight to the counterweight arm in the proportion of one ounce for each 1/2 degree of angle change. If the climb RPM is higher than the full throttle level flight RPM, it is necessary to ~~increase the counterweight angle and remove weight~~ in the proportion of one ounce for each 1/2 degree of angle change.

A 1/2 degree angle change will change the full throttle level flight RPM about 50 on Model 220 and 100 on Model F200.

6. ~~After the climb RPM and level flight RPM are brought within 50 RPM of each other, the engine manufacturer's engine RPM as in Fig. 5.~~ It is then necessary to ~~adjust~~ in accordance with Weight Effectiveness table following paragraph 4 in order to bring the RPM within 50 RPM of engine rating.
7. ~~After the climb RPM and level flight RPM are brought within 50 RPM of each other, these may be compared engine RPM as in Fig. 6.~~ It is then necessary to ~~remove weight~~ in accordance with Weight Effectiveness table following paragraph 4 in order to bring the RPM within 50 RPM of engine rating.
8. A good RPM adjustment for prototype installations exists when the RPM lies within 50 RPM of engine rating in a climb at best climb speed immediately after take-off and in full throttle level flight at maximum airspeed flying as close to field elevation as practical.
9. The full throttle adjustments that have been made insure the proper functioning of the Aeromatic propeller. This setting will also produce the proper control of the propeller at a cruising power, that is, when closing the throttle part way for cruising, the propeller will allow the RPM to drop and follow the engine manufacturer's propeller load curve. The RPM will vary directly in proportion to the cube root of the engine power output.

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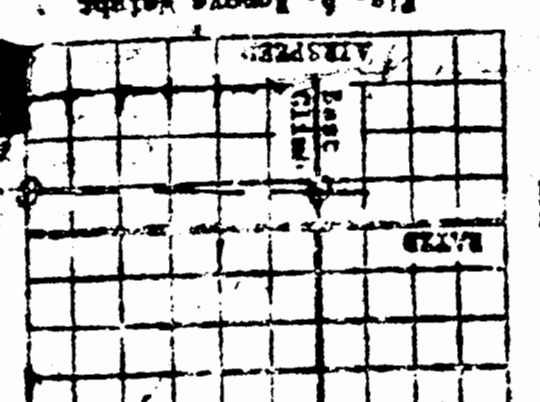
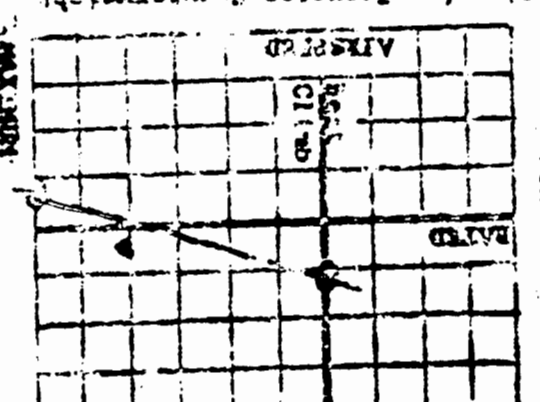
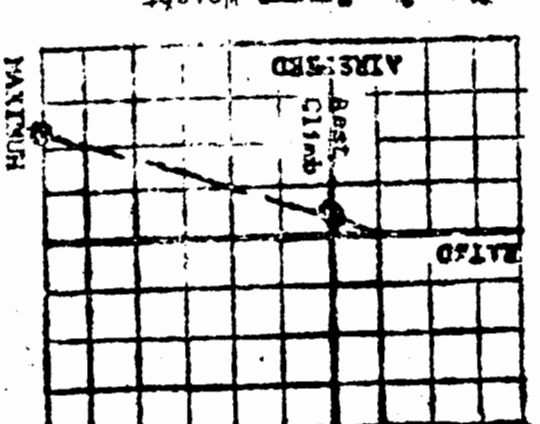
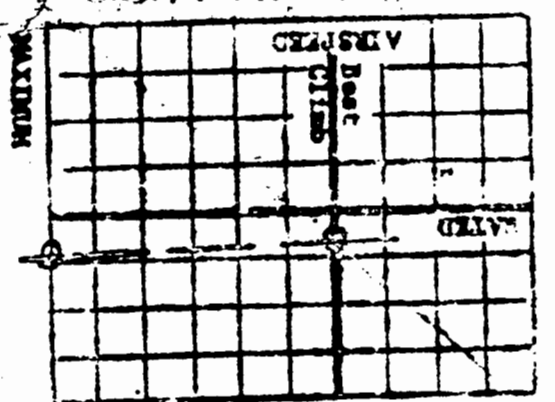
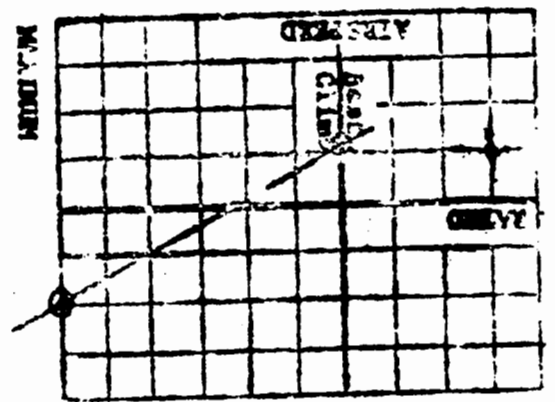
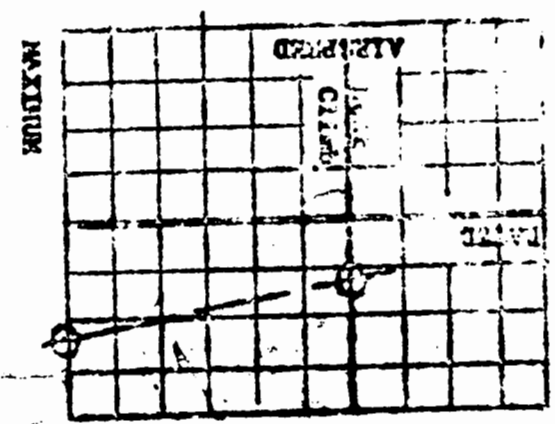


Fig. 7. End View Looking From
Propeller Blade Tip
PLANE OF ROTATION
LEADING EDGE
ANGLE
COUNTERWEIGHT
LOWER

Fig. 8. Add Weight
INCREASE
COUNTERWEIGHT
ANGLE

Fig. 9. Remove Weight