3. Air Charge (-2 and -5 Propellers)

CAUTION 1: INSTRUCTIONS AND PROCEDURES IN THIS SECTION MAY INVOLVE PROPELLER CRITICAL PARTS. REFER TO THE INTRODUCTION CHAPTER OF THIS MANUAL FOR INFORMATION ABOUT PROPELLER CRITICAL PARTS. REFER TO THE ILLUSTRATED PARTS LIST CHAPTER OF THE APPLICABLE OVERHAUL MANUAL(S) FOR THE IDENTIFICATION OF SPECIFIC PROPELLER CRITICAL PARTS.

A. Charging the Propeller

WARNING: EXCEPT FOR THE HC-C3YF-5F PROPELLER, DO NOT AIR CHARGE THE CYLINDER OR MEASURE THE AIR CHARGE ON A PROPELLER THAT IS IN FEATHER POSITION.

(1) Examine the propeller to make sure that it is positioned on the start locks.

(2) Using proper control, charge the cylinder with dry air or nitrogen.

(a) The air charge valve is located on the cylinder as indicated in Figure 6-1.

(b) Nitrogen is the preferred charging medium.

CAUTION: MAKE SURE THAT THE GAUGE IS CALIBRATED BEFORE CHARGING THE CYLINDER OR MEASURING THE AIR PRESSURE.

(c) Use an appropriate tool that has a calibrated gauge to charge the cylinder or measure air pressure in the propeller.

(d) The correct charge pressure is identified in Table 6-1 through Table 6-8 in this chapter.

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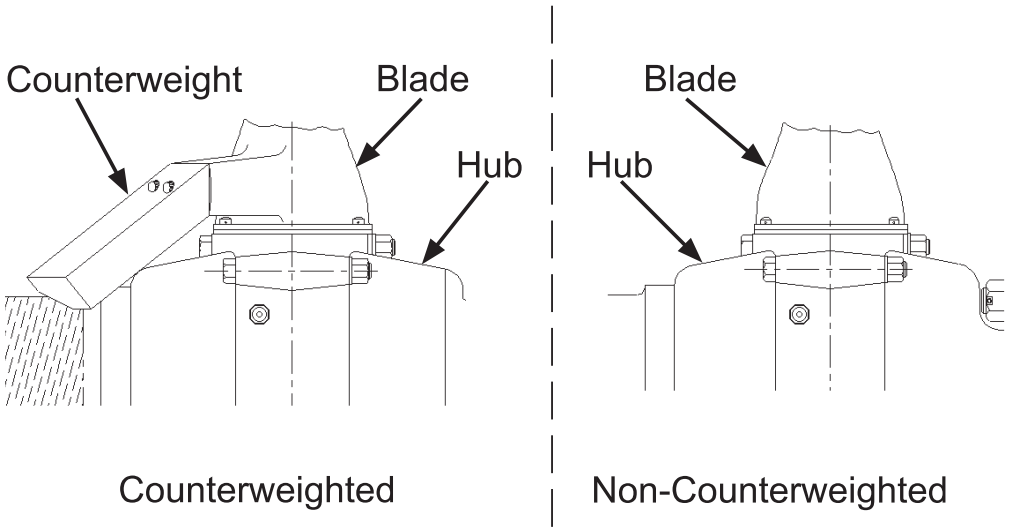

Counterweighted vs Non-Counterweighted Blades
Figure 6-4

(3) The following instructions may be used to determine the correct pressure.

(a) To use these instructions, the propeller model number must be known, and it must be determined if the propeller blades are counterweighted.

(b) The propeller model number is recorded in the log book, and is also stamped on the propeller hub. The propeller model number indicates the presence of a spring kit by an "S," "U," or "T" after the dash number. For example: HC-C3YR-2LUF indicates a "U" spring kit.

(c) To determine if the blades are counterweighted, remove the spinner dome and examine the base of the blade. Compare the blades to those shown in the Figure 6-4.

B. Basic pressures:

NOTE: Propellers on certain aircraft and engine combinations have experienced instances of inadvertant feathering. These events occurred either at the time of shut down or at low engine RPM. Hartzell Propeller Inc. has determined that this tendency to feather may be reduced or eliminated by lowering the air charge within the propeller cylinder. Those propellers authorized for operation with a reduced air charge are listed in this section.

(1) All four-blade compact propellers - Table 6-5

Except: HC-C4YR-2(L)/F(J)C7663DB-6Q - Table 6-6

(2) All propellers with no counterweights and no spring - Table 6-1

(3) All propellers with no counterweights and an “S” spring - Table 6-2

Except: HC-E2Y(K,R)-2RBS( ) - Table 6-3

(4) All propellers with counterweights and no spring - Table 6-4

Except: BHC-C2YF-2CKF/FC8459-8R(B) or BHC-C2YF-2CLKF/FJC8459-8R(B) when installed on the Piper PA-34-200T with Continental TSIO-360-E(B) or LTSIO-360-(B) engines - Refer to Table 6-10.

NOTE: For BHC-C2YF-2CKF/FC8459-8R(B) or BHC-C2YF-2CLKF/FJC8459-8R(B) model propellers that have been upgraded with the installation of a feather assist spring - Refer to Table 6-6.

NOTE: Propeller models indicated by * in the exceptions below have a "U" spring installed, which is not indicated in the part number.

Except: HC-C3YF-5F* - Table 6-8
HC-C3YN-5A* - Table 6-5
HC-H3YF-3LF - Table 6-4
PHC-I3YF-2AL* - Table 6-5
PHC-J3YF-2(F) - Table 6-9

(5) All propellers with counterweights and a “T” spring -Table 6-5

Except: HC-E3YR-2ATF on Fuji Model 700 Commander - Table 6-7

(6) All propellers with counterweights and a “U” spring - Table 6-5

Except: See Note under (4), above.
(B)HC-C2YF-2(C)(L)(K)U( ) - Table 6-6
PHC-C3YF-2(L)KUF - Table 6-6

PHC-H3YF-2KUF when installed on the Avia Accord - Refer to Table 6-6.

PHC-C3YF-2UF/FC7663( )-2R when installed on the Beech 95-(A,B)55(A,B) Baron with IO-470-L engines - Refer to Table 6-6.

HC-C2YL-2CUF/FC7663-4 when installed on the Piper PA-23, PA-23-160 with O-320 engines - Refer to Table 6-6.

HC-C3YR-2UF/FC8468( )-6R when installed on the Aero Commander 500B, 500S, 500U with Lycoming IO-540-B1(A,C)5, IO-540-E1(A,B)5, or TIO-540-J2B(D) engines - Refer to Table 6-6.

HC-C2YF-2CUF/FC8468( )-3 when installed on the Cessna 310(A,B,C,D,E,F,G,H), or E310H, with O-470-M or IO-470-D engines- Refer to Table 6-6.

HC-C2YK-2CUF/FC7666C(B)-4 when installed on the Beech 95, B95, B95A, D95A, or E95 Travel Air with O-360 or IO-360 engines- Refer to Table 6-6.

HC-C4YR-2(L)/F(J)C7663DB-6Q propellers on PA-31 aircraft (Colemill Panther). Refer to Table 6-6.

HC-M2YR-2C(L)EUF/F(J)C7666A when installed on the Beech 76 Duchess with (L)O-360-A1G6D engines - Refer to Table 6-6.

°F	°C	P.S.I	Bar
100	38	188 ± 2	12.96 ± 0.13
90	32	185 ± 2	12.75 ± 0.13
80	27	182 ± 2	12.54 ± 0.13
70	21	178 ± 2	12.27 ± 0.13
60	16	175 ± 2	12.06 ± 0.13
50	10	172 ± 2	11.85 ± 0.13
40	4	168 ± 2	11.58 ± 0.13
30	1	165 ± 2	11.37 ± 0.13
20	-7	162 ± 2	11.16 ± 0.13
10	-12	159 ± 2	10.96 ± 0.13
0	-18	154 ± 2	10.61 ± 0.13
-10	-23	152 ± 2	10.48 ± 0.13
-20	-29	149 ± 2	10.27 ± 0.13
-30	-34	146 ± 2	10.06 ± 0.13

Table 6-1
Air Charge Pressure

°F	°C	P.S.I	Bar
100	38	53 ± 2	3.65 ± 0.13
70	21	50 ± 2	3.44 ± 0.13
40	4	47 ± 2	3.24 ± 0.13
10	-12	44 ± 2	3.03 ± 0.13
-20	-29	42 ± 2	2.89 ± 0.13

Table 6-2
Air Charge Pressure

°F	°C	P.S.I	Bar
100	38	74 ± 2	5.10 ± 0.13
70	21	70 ± 2	4.82 ± 0.13
40	4	66 ± 2	4.55 ± 0.13
10	-12	62 ± 2	4.27 ± 0.13
-20	-29	58 ± 2	3.99 ± 0.13

Table 6-3
Air Charge Pressure

°F	°C	P.S.I	Bar
100	38	86 ± 2	5.92 ± 0.13
90	32	84 ± 2	5.79 ± 0.13
80	27	82 ± 2	5.65 ± 0.13
70	21	80 ± 2	5.51 ± 0.13
60	16	78 ± 2	5.37 ± 0.13
50	10	76 ± 2	5.24 ± 0.13
40	4	74 ± 2	5.10 ± 0.13
30	1	72 ± 2	4.96 ± 0.13
20	-7	70 ± 2	4.82 ± 0.13
10	-12	68 ± 2	4.68 ± 0.13
0	-18	66 ± 2	4.55 ± 0.13
-10	-23	64 ± 2	4.41 ± 0.13
-20	-29	62 ± 2	4.27 ± 0.13
-30	-34	60 ± 2	4.13 ± 0.13

Table 6-4
Air Charge Pressure

°F	°C	P.S.I	Bar
100 to 70	38 to 21	41 ± 2	2.82 ± 0.13
40 to 70	4 to 21	38 ± 2	2.62 ± 0.13
0 to 40	-18 to 4	36 ± 2	2.48 ± 0.13
-30 to 0	-34 to -18	33 ± 2	2.27 ± 0.13

Table 6-5
Air Charge Pressure

°F	°C	P.S.I	kPa
100 to 70	38 to 21	22 ± 2	152 ± 13
40 to 70	4 to 21	17 ± 2	118 ± 13
0 to 40	-18 to 4	14 ± 2	97 ± 13
-30 to 0	-34 to -18	9 ± 2	62 ± 13

Table 6-6
Air Charge Pressure

°F	°C	P.S.I	Bar
100 to 70	38 to 21	66 ± 2	4.55 ± 0.13
40 to 70	4 to 21	62 ± 2	4.27 ± 0.13
0 to 40	-18 to 4	58 ± 2	3.99 ± 0.13
-30 to 0	-34 to -18	53 ± 2	3.65 ± 0.13

Table 6-7
Air Charge Pressure

°F	°C	P.S.I	kPa
100 to 70	38 to 21	27 ± 2	187 ± 13
40 to 70	4 to 21	25 ± 2	173 ± 13
0 to 40	-18 to 4	24 ± 2	166 ± 13
-30 to 0	-34 to -18	22 ± 2	152 ± 13

Table 6-8
Air Charge Pressure

°F	°C	P.S.I	Bar
100	38	104 ± 2	7.17 ± 0.13
70	21	98 ± 2	6.75 ± 0.13
40	4	92 ± 2	6.34 ± 0.13
10	-12	87 ± 2	5.99 ± 0.13
-20	-29	81 ± 2	5.58 ± 0.13

Table 6-9
Air Charge Pressure

°F	°C	P.S.I	kPa
100 to 70	38 to 21	62 ± 2	428 ± 13
40 to 70	4 to 21	57 ± 2	394 ± 13
0 to 40	-18 to 4	54 ± 2	373 ± 13
-30 to 0	-34 to -18	49 ± 2	338 ± 13

Table 6-10
Air Charge Pressure