

**Transport Canada Approved Flight Manual Supplement  
For**

**WIPLINE/FLUIDYNE/FEDERAL  
C3600 SKIS**

This supplemental manual is applicable to C3600 ski equipped FBA-2C2 airplanes or C3600 ski equipped FBA-2C1 airplanes with Mod 1043 installed. Mod 1043 replaces the plain flap system on the model FBA-2C1 airplane with a slotted Fowler-type flap system (commonly referred to as "Fowler Flaps"). Therefore where 2C2 is used in this manual it is acceptable to read 2C1 with Mod 1043 installed.

This Supplement must be attached to the Transport Canada Approved Airplane Flight Manual when the airplane is modified by the installation of C3600 skis in accordance with Found Aircraft Canada drawing D222 Issue 2 or later approved revision.

The information contained herein supplements or supersedes the basic flight manual, airplane markings and/or placards only in those areas listed herein.

For Limitations, Procedures, and Performance information not contained in this Supplement, consult the airplane markings and placards and/or basic Airplane Flight Manual, (P/N: FAC2-M400).

**Approved:**




**Date:**

15 DEC 2004

**P/N M400-S06**

### LOG OF REVISIONS

Rev. No.	Approved	
	Date	Name
(Original)	APR. 15, 2004	

### LIST OF EFFECTIVE PAGES

Page	Date	Page	Date
1	APR. 15, 2004		
2	APR. 15, 2004		
3	APR. 15, 2004		
4	APR. 15, 2004		
5	APR. 15, 2004		
6	APR. 15, 2004		
7	APR. 15, 2004		
8	APR. 15, 2004		
9	APR. 15, 2004		
10	APR. 15, 2004		
11	APR. 15, 2004		
12	APR. 15, 2004		
13	APR. 15, 2004		
14	APR. 15, 2004		
15	APR. 15, 2004		
16	APR. 15, 2004		
17	APR. 15, 2004		
18	APR. 15, 2004		

## TABLE OF CONTENTS

<b>TITLE</b>	<b>PAGE</b>
<b>LOG OF REVISIONS.....</b>	<b>2</b>
<b>LIST OF EFFECTIVE PAGES .....</b>	<b>2</b>
<b>SECTION 1: GENERAL .....</b>	<b>5</b>
INTRODUCTION.....	5
DESCRIPTIVE DATA .....	5
<b>SECTION 2: LIMITATIONS .....</b>	<b>7</b>
INTRODUCTION.....	7
AIRSPEED LIMITATIONS .....	7
WEIGHT LIMITS.....	8
CENTER-OF-GRAVITY LIMITS .....	8
PLACARDS .....	8
<b>SECTION 3: EMERGENCY PROCEDURES .....</b>	<b>9</b>
<b>SECTION 4: NORMAL PROCEDURES .....</b>	<b>9</b>
AIRSPEEDS FOR NORMAL OPERATION .....	9
<b>NORMAL PROCEDURES CHECKLISTS .....</b>	<b>10</b>
PREFLIGHT INSPECTION .....	10
PRIOR TO TAKEOFF .....	10
BEFORE LANDING .....	10
<b>AMPLIFIED NORMAL PROCEDURES .....</b>	<b>11</b>
TAXIING .....	11
<b>SECTION 5: PERFORMANCE .....</b>	<b>12</b>
HEIGHT LOSS IN STALLS .....	12
AIRSPEED CALIBRATION.....	13
STALL SPEEDS .....	13
TAKEOFF PERFORMANCE .....	13

CLIMB PERFORMANCE .....	13
LANDING PERFORMANCE.....	13
<b>SECTION 6: WEIGHT AND BALANCE .....</b>	<b>14</b>
SKIPLANE REFERENCE DATUM .....	14
WEIGHING PROCEDURES.....	14
WEIGHT AND BALANCE PROCEDURES .....	14
ADDITIONAL EQUIPMENT LIST .....	14
CENTER OF GRAVITY MOMENT ENVELOPE .....	15
CENTER OF GRAVITY RANGE ENVELOPE .....	16
<b>SECTION 7: AIRPLANE &amp; SYSTEMS DESCRIPTION.....</b>	<b>17</b>
RETRACTABLE MAIN WHEEL SKIS .....	17

## **SECTION 1 GENERAL**

### **INTRODUCTION**

This supplemental manual is applicable to C3600 ski equipped FBA-2C2 airplanes or C3600 ski equipped FBA-2C1 airplanes with Mod 1043 installed. Mod 1043 replaces the plain flap system on the model FBA-2C1 airplane with a slotted Fowler-type flap system (commonly referred to as “Fowler Flaps”). Therefore where 2C2 is used in this manual it is acceptable to read 2C1 with Mod 1043 installed.

This supplement provides information and limitations not included in the Transport Canada approved markings and placards, and/or Airplane Flight Manual (P/N: FAC2-M400).

The aircraft is to be operated under the “NORMAL CATEGORY” only.

### **DESCRIPTIVE DATA**

#### **MAXIMUM CERTIFICATED WEIGHTS**

Maximum Operational Weight:	
Takeoff:	3500 lbs
Landing:	3500 lbs

#### **STANDARD AIRPLANE WEIGHTS**

Standard Empty Weight:	2075 lbs *
Maximum Useful Load:	1425 lbs *

\* the above weights may vary depending on configuration.

#### **SPECIFIC LOADINGS**

Wing Loading:	19.4 lbs/sq.ft.
Power Loading:	11.7 lbs/hp.

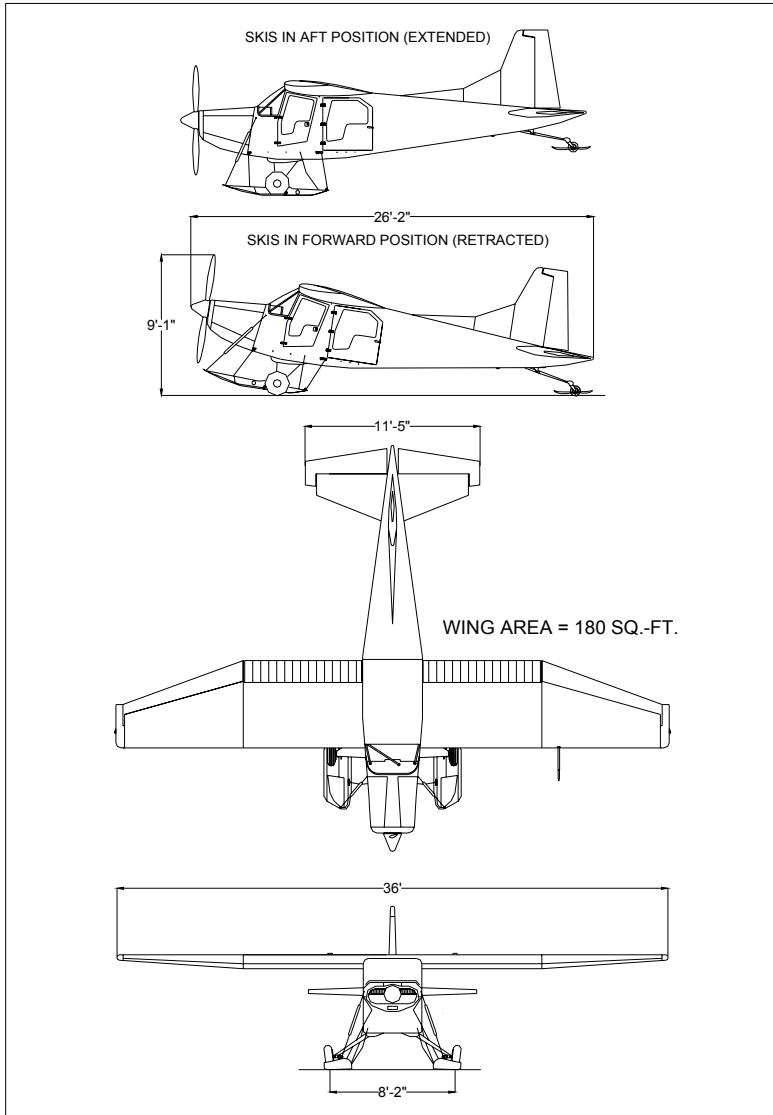


Figure 1 Three View - Normal Ground Attitude

## SECTION 2 LIMITATIONS

### INTRODUCTION

The FBA-2C2 Bush Hawk-XP equipped with the Wipline/FluiDyne/Federal C3600 skis must be operated in accordance with the limitations contained in this section. These include operating limitations, instrument markings, colour coding and basic placards, systems and equipment limitations. The limitations shown in this section apply only to operations of the FBA-2C2 Bush Hawk-XP skiplane.

### AIRSPPEED LIMITATIONS

Airspeed limitations are essentially unchanged from the FBA-2C2 landplane except for the following additional limitation due to the skis. See Airplane Flight Manual P/N: FAC2-M400 for the landplane.

	SPEED	KCAS	KIAS	REMARKS
V <sub>LO</sub>	Maximum Landing Gear Operating Speed	124	125	Do not extend or retract skis above this speed.

#### NOTE

Since the operating speeds for the ski installation are within 3 knots of those for the standard wheel installation, no changes to the airspeed indicator markings have been made.

## WEIGHT LIMITS

Maximum Takeoff Weight:	3500 lbs.
Maximum Landing Weight:	3500 lbs.
Maximum Weight in Baggage Compartment:	250 lbs.

## CENTER-OF-GRAVITY LIMITS

Center-of-Gravity

Range:

Forward: 17.0 inches aft of datum at 2750 lbs or less.  
20.5 inches aft of datum at 3500 lbs. maximum  
gross weight with linear variation with weight in  
between.

Aft: 23.5 inches aft of datum at all weights.

Reference Datum: Main wheel axle.

## PLACARDS

The following information is displayed in the form of composite or individual placards.

1. Located on the instrument panel in clear view of the pilot.

<p>DO NOT EXTEND OR RETRACT SKIS AT SPEEDS ABOVE 125 KIAS. DO NOT EXTEND OR RETRACT SKIS WHILE IN MOTION ON THE GROUND</p>
--



## **SECTION 3 EMERGENCY PROCEDURES**

Unchanged from the landplane, see Airplane Flight Manual P/N: FAC2-M400.

## **SECTION 4 NORMAL PROCEDURES**

### **NOTE**

These items supplement the FBA-2C2 normal procedures given in the basic Airplane Flight Manual P/N: FAC2-M400. Be sure to follow the FBA-2C2 procedures except as noted below.

### **AIRSPEDS FOR NORMAL OPERATION**

Airspeeds for normal operation of the skiplane are the same as the FBA-2C2 Bush Hawk-XP landplane. Refer to speeds in section 4 of Airplane Flight Manual P/N: FAC2-M400.

## **NORMAL PROCEDURES CHECKLISTS**

### **PREFLIGHT INSPECTION**

1. Skiplane Approved Flight Manual Supplement should be available in the airplane.
2. Ski Hydraulic Pump..... PUMP skis to desired position
  - a) For Wheel Landing..... RETRACT
  - b) For Ski Landing..... EXTEND
3. Skis ..... INSPECT for condition.  
..... CHECK that they are not frozen to the surface.
4. Hydraulic System..... INSPECT system for quantity and leakage.
5. Weight and Balance Data ..... CHECK and load the skiplane to maintain the CG within the prescribed limits.

#### **WARNING**

A SIGNIFICANT FORWARD SHIFT IN CG IS CAUSED BY THE INSTALLATION OF SKIS OR RETRACTION OF THE SKIS TO THE FORWARD POSITION. BALLAST MAYBE REQUIRED UNDER CERTAIN LOADING CONDITIONS.

### **PRIOR TO TAKEOFF**

1. Skis ..... CHECK against desired stop.
2. Selector Valve..... NEUTRAL

### **BEFORE LANDING**

1. Ski Hydraulic Pump ..... PUMP skis to desired position
  - a) For Wheel Landing..... RETRACT
  - b) For Ski Landing..... EXTEND
2. Selector Valve..... NEUTRAL
3. Ski Position..... CONFIRM VISUALLY

## **AMPLIFIED NORMAL PROCEDURES**

### **TAXIING**

Normal skiplane taxiing techniques are used. Due to the characteristics of the tail ski steering, the minimum turning radius is increased as compared to landplane taxiing with the use of brakes.

#### **WARNING**

DO NOT EXTEND OR RETRACT SKIS WHILE IN MOTION ON THE GROUND. LANDING GEAR DRAG, CAUSED BY ONE SKI PRECEDING THE OTHER DURING THE RETRACTION OR EXTENSION CYCLE, WILL RESULT IN A GROUND LOOPING TENDENCY.

## **SECTION 5 PERFORMANCE**

### **HEIGHT LOSS IN STALLS**

A height loss of up to 100 ft may occur in stalls.

## **AIRSPPEED CALIBRATION**

Airspeed calibrations are unchanged from the landplane. Refer to airspeed calibration presented in section 5 of the Airspeed Flight Manual P/N: FAC2-M400 for the landplane.

## **STALL SPEEDS**

Stall speeds are essentially unchanged from the landplane. Refer to stall speeds presented in section 5 of the Airplane Flight Manual P/N: FAC2-M400.

## **TAKEOFF PERFORMANCE**

Under the most favourable conditions of smooth packed snow at temperatures approximating 32°F (0°C), the skiplane takeoff distance is approximately 10% greater than that shown for the landplane.

## **CLIMB PERFORMANCE**

Climb performance of the skiplane may be reduced by as much as 140 ft/min (13%) from the landplane climb performance shown in section 5 of the Airplane Flight Manual P/N: FAC2-M400.

## **LANDING PERFORMANCE**

Under the most favourable conditions of smooth packed snow at temperatures approximating 32°F (0°C), the skiplane takeoff distance is approximately 20% greater than that shown for the landplane.

## SECTION 6 WEIGHT AND BALANCE

The Bush Hawk-XP equipped with Wipline/FluiDyne/Federal C3600, must be loaded in accordance with the limitations in Section 2. These are shown as an aircraft weight/moment envelope or an aircraft weight versus c.g. locations chart on the following pages.

**WARNING**  
IT IS THE RESPONSIBILITY OF THE AIRPLANE OWNER AND PILOT TO INSURE THAT THE AIRPLANE IS LOADED PROPERLY.

### SKIPLANE REFERENCE DATUM

Unchanged from the landplane (main wheel axle), see Airplane Flight Manual P/N: FAC2-M400.

### WEIGHING PROCEDURES

Unchanged from the landplane, see Airplane Flight Manual P/N: FAC2-M400.

### WEIGHT AND BALANCE PROCEDURES

Unchanged from the landplane, see Airplane Flight Manual P/N: FAC2-M400.

### ADDITIONAL EQUIPMENT LIST

Item	Wt. [lbs]	Arm [in]
Wipline/FluiDyne/Federal C3600 Ski (One main ski, ski down) *	68.0	-18.0
Wipline/FluiDyne/Federal C3600 Ski (One main ski, ski up) *	68.0	-34.2
Magnum 3400-10-23 Tail Ski *	7.8	232.0
Wipline/FluiDyne/Federal CT3600 Tail Ski *	8.5	232.0
Hydraulic pump *	7.0	18.0

\* Nominal weight. Accurate weight of each installation must be determined.

Figure 2 C3600 Skiplane Additional Equipment List

### CENTER OF GRAVITY MOMENT ENVELOPE

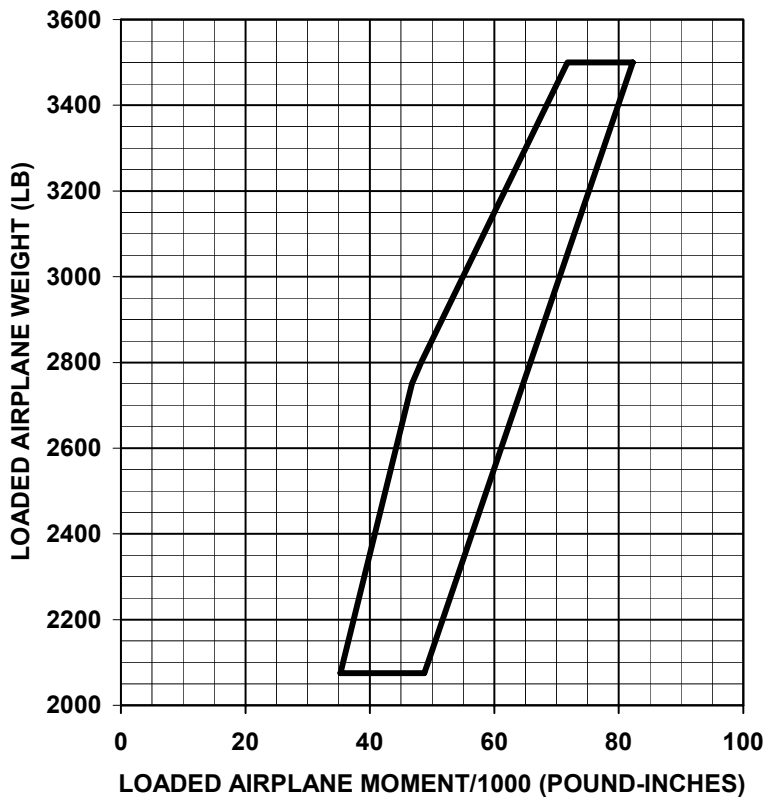


Figure 3 CG Moment Envelope for 300hp Fowler Flap C3600 Skiplane

### CENTER OF GRAVITY RANGE ENVELOPE

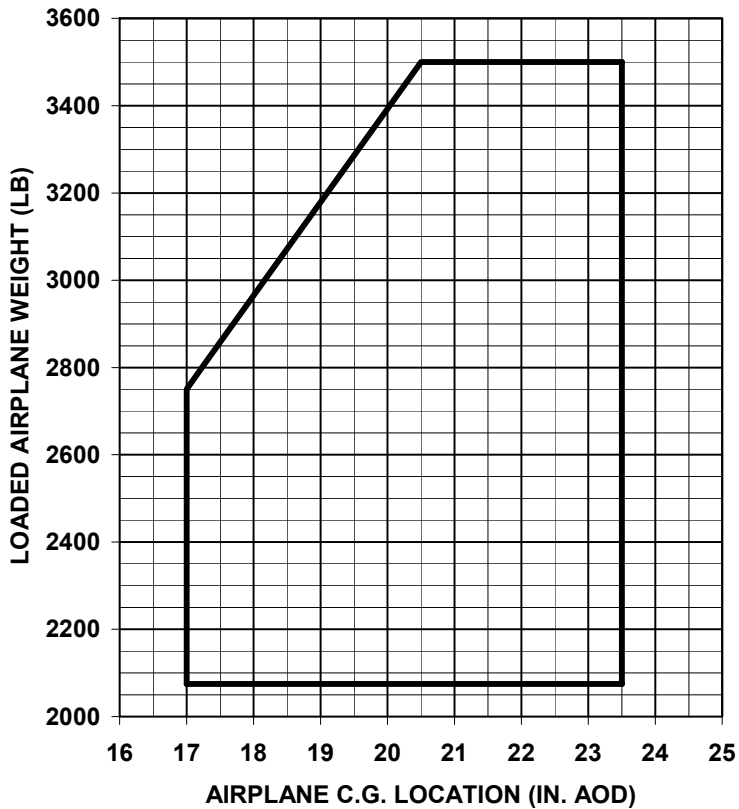


Figure 4 CG Range Envelope for 300hp Fowler Flap C3600 Skiplane



## **SECTION 7**

### **AIRPLANE & SYSTEMS DESCRIPTION**

This section contains a description of the modifications and equipment associated specifically with the installation of Wipline/FluiDyne/Federal C3600 skis on FBA-2C2 Bush-Hawk-XP.

The Bush Hawk-XP C3600 skiplane is identical to the Bush Hawk-XP landplane with the following modifications:

1. The airplane is fitted with retractable main wheel skis and a tail wheel ski.
2. A ski axle assembly for each main gear.
3. Shock chords and limit cables to support the ski installation.
4. Hydraulic system to support the retractable main wheel skis (Figure 5).
5. Skiplane placards.

#### **RETRACTABLE MAIN WHEEL SKIS**

The main wheel skis are attached to a special ski axle assembly by means of a link. This allows the skis to be moved back and down (extended) which tucks the skis under the wheel for ski operation. The skis need to be moved forward and up (retracted) which allows the main wheel to protrude below the bottom of the ski for bare surface operation.

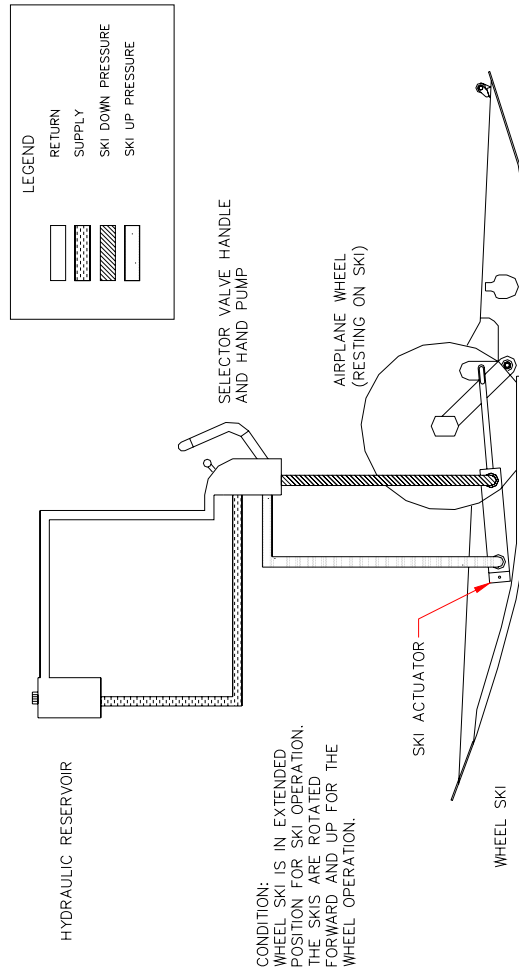


Figure 5 Retractable Wheel Ski Hydraulic System