N55GJ EC130 B4 S/N: 3745;
Weight and Balance, Performance, H/V

Weight and Balance

The subject aircraft had an empty weight of 3175.2 lbs. with an empty longitudinal CG location of 141.76 inches. Lateral CG location is estimated at 0.0 inches. (A standard configured EC130 typically has an empty lateral CG very close to center.) Loading consisted of a pilot, two front seat passengers, a rear passenger, and approximately 75 US gallons of fuel. 75 US gallons is an estimate. The helicopter launched with 120 US gallon of fuel and flew for one hour. Reasonable fuel consumption for estimating purposes is 45 US gallons per hour.

The following chart shows the longitudinal and lateral weight and CG calculations.

LONGITUDINAL CG

	Weight	Arm	Moment
Aircraft EEW	**3175.2**	**141.76**	450116.4
Pilot	170	61.02	10373.40
Front Center	170	61.02	10373.40
Front Right	230	61.02	14034.60
Rear Left	185	95.08	17589.80
Rear Left Middle	0	95.08	0
Rear Right Middle	0	95.08	0
Rear Right	0	95.08	0
Zero Fuel Condition	3930.2	127.85	502487.55
Fuel*	510	136.81	69773.1
Fueled Condition	**4440.2**	**128.88**	572260.7

LATERAL CG

	Weight	Arm	Moment
Aircraft EEW	**3175.2**	**0.00**	0.00
Pilot	170	-23.62	-4015.40
Front Center	170	0.79	134.30
Front Right	230	23.62	5432.60
Rear Left	185	-28.94	-5353.90
Rear Left Middle	0	-9.65	0
Rear Right Middle	0	9.65	0
Rear Right	0	28.94	0
Zero Fuel Condition	3930.2	-0.97	-3802.40
Fuel*	510	0	0
Fueled Condition	**4440.2**	**-0.86**	-3802.40

*75 US Gal @ 6.8 lbs/gal

This excerpt from the Rotorcraft Flight Manual shows the limitations related to weight, longitudinal CG and lateral CG. The subject helicopter was well under the maximum weight limit of 5350 lbs. The longitudinal CG location has been plotted here. Loading condition is with limits. Lateral CG is well within limits of +/- 3.94 inches.

SECTION 2.2

WEIGHT AND BALANCE LIMITS

1 WEIGHT LIMITS

- Maximum weight ..... : 2427 kg (5350 lb)
- Minimum weight ..... : 1500 kg (3307 lb)

2 LONGITUDINAL CG

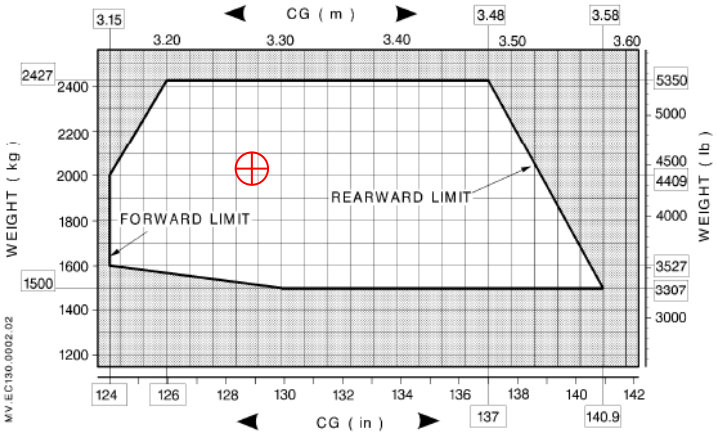


Figure 1: Longitudinal CG Chart

NOTE

The datum is located 3.40 m (133.8 in) forward of the main rotor head center line.

3 LATERAL CG

- Maximum left CG ..... : 0.10 m (3.94 in)
- Maximum right CG ..... : 0.10 m (3.94 in)

NOTE

The datum is located in the plane of symmetry of the helicopter.

Hover Performance

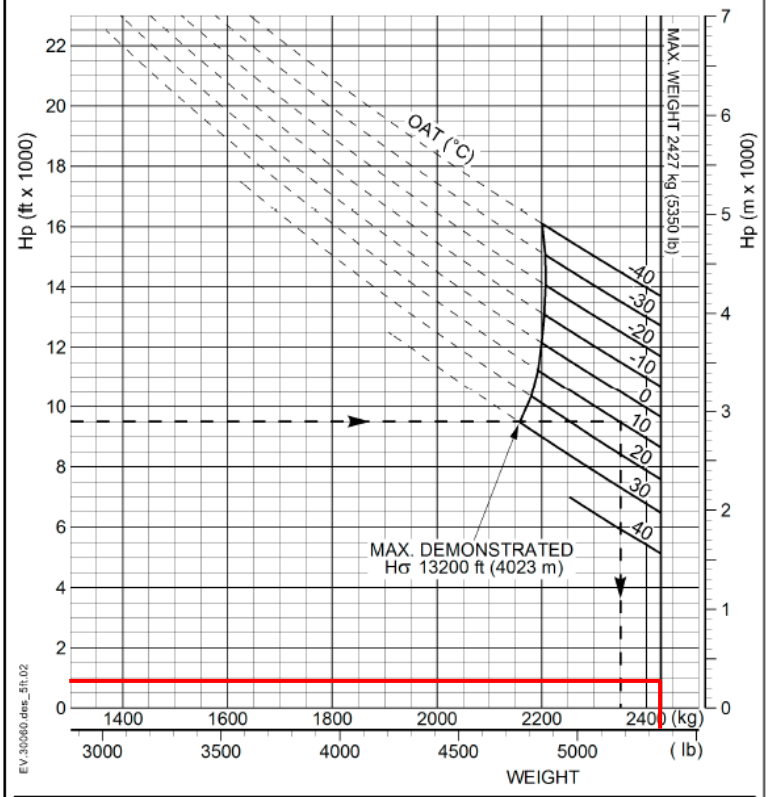
Subject helicopter was approximately at a pressure altitude of 980 feet. The closest airport METAR reported a temperature of 33 degrees Celsius.

This excerpt from the Rotorcraft Flight Manual shows Hover In Ground Effect Performance. Referencing the above conditions, it is shown that the helicopter has HIGE performance at a weight well above its AUW of 4440 lbs. (HIGE Performance at 980' PA, 33 degrees is 5350 lbs.)

6 HOVER IN GROUND EFFECT

CONDITIONS
- NO WIND
- NO P2 AIR BLEED
- MAX. TAKEOFF POWER
- -40°C ≤OAT ≤ISA+35°C
- HP≤23000 ft
- HEIGHT 5 ft (1,5 m)

IGE HOVERING FLIGHT PERFORMANCE



SAFE WIND HAS BEEN DEMONSTRATED UP TO 25 kt AND MAX. WEIGHT FROM ALL DIRECTIONS FROM SEA LEVEL TO Hσ = 7500 ft (2286 m)

EXAMPLE : OAT = 10°C
Hp = 9500 ft (2896 m) ⇒ HIGE WEIGHT 2350 kg (5180 lb)

Figure 5

This excerpt from the Rotorcraft Flight Manual shows Hover Out of Ground Effect Performance. Referencing the above conditions, it is shown the helicopter has HOGE performance at a weight well above its AUW of 4440 lbs. (HOGE Performance at 980' PA, 33 degrees is 5350 lbs. for internal loads and 6173 lbs. for external loads)

7 HOVER OUT OF GROUND EFFECT

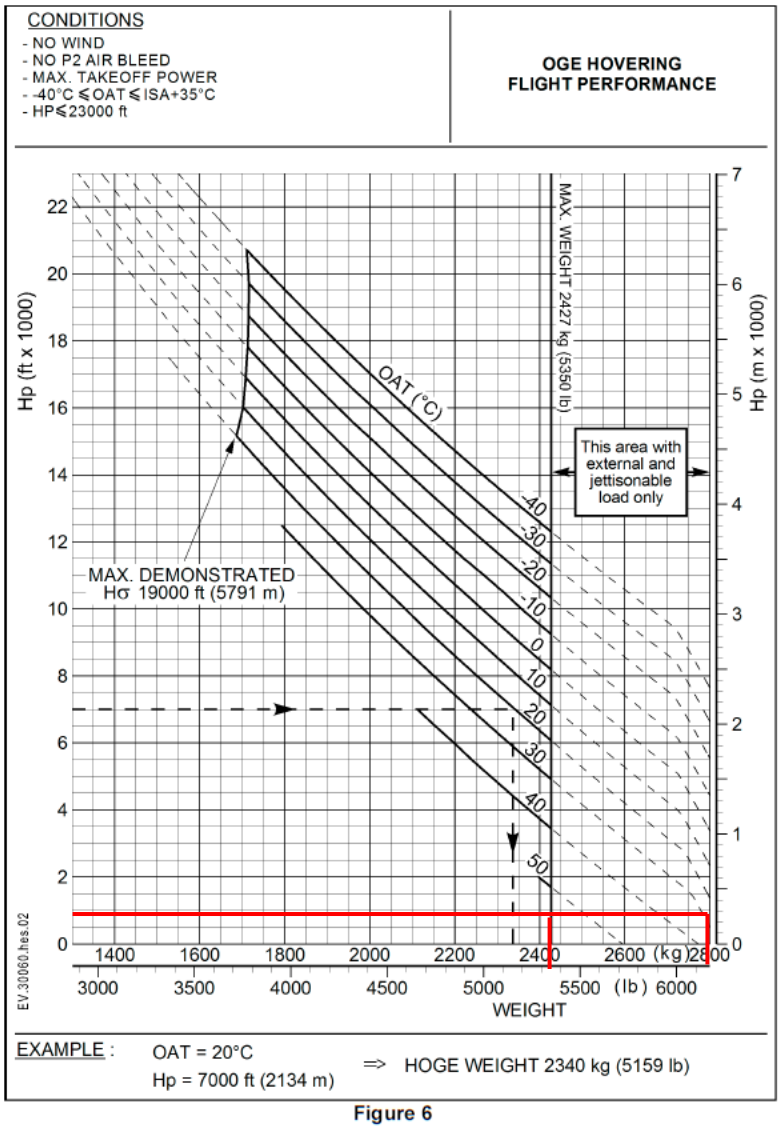


Figure 6

Height/Velocity Diagram

Subject helicopter was approximately at a pressure altitude of 980 feet. The closest airport METAR reported a temperature of 33 degrees Celsius.

This excerpt from the Rotorcraft Flight Manual shows the Height/Velocity Diagram. Using the above conditions and the helicopter's AUW of 4440.2 lbs (2018 kg), the avoidance zone can be plotted.

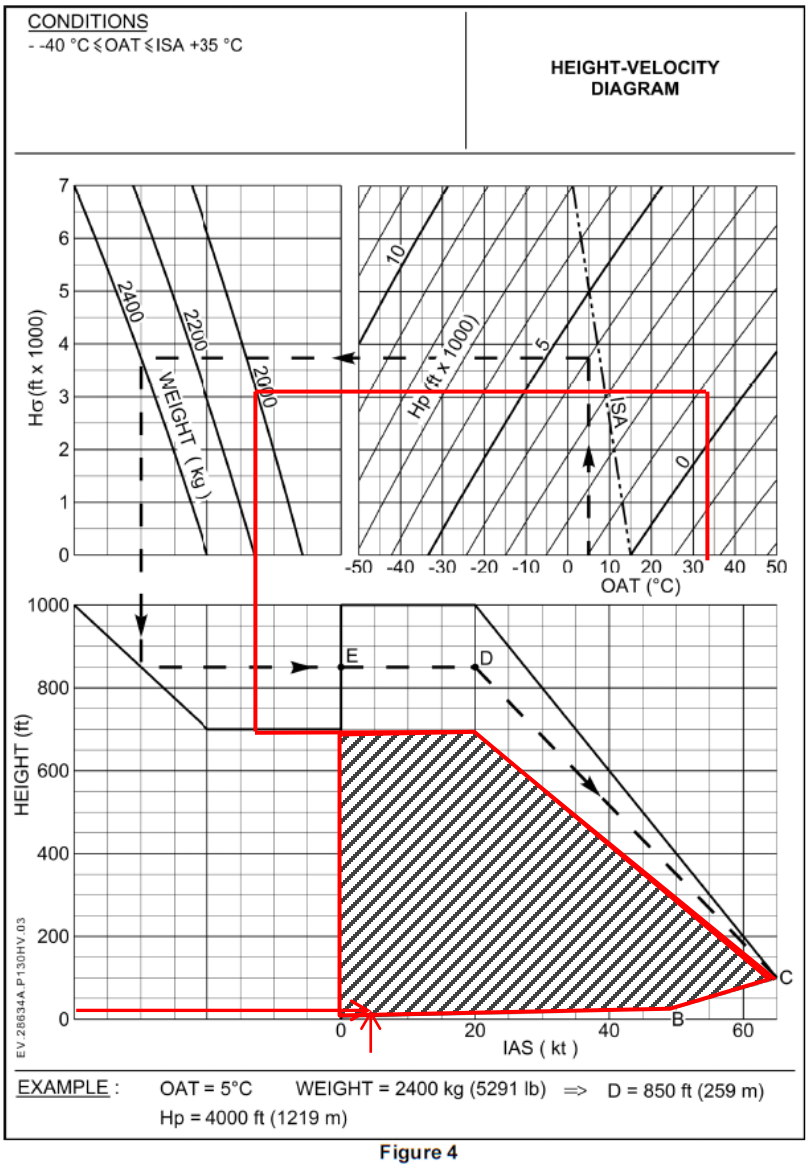


Figure 4