0 feet 16 feet 59 feet 134 feet 241 feet
Start

0 sec 1 sec 2 sec 3 sec 4 sec

+ 3.5 ft
3000 ft
- 9.3 ft

- 30.3 ft   - 30.3 ft

Heavy Lift Drone Fuel Use Considerations
Note: Ascent rate and HP values are from the
Pump and Motor Calculations Pages

Altitude 0000ft 1765 rpm 2.94 m/sec 550 HP

Altitude 3000ft 1845 rpm 3.08 m/sec 575 HP

Altitude 6000ft 1930 rpm 3.22 m/sec 599 HP

Altitude 9000ft 2022 rpm 3.37 m/sec 627 HP

Engine SFC = 0.7 lbs fuel/HP-Hr 0.7÷(60x60)=0.000194 lbs/HP-Sec

Using averaging:

0000ft → 3000ft (2.94+3.08)=6.02÷2= 3.01 m/sec = 9.87 ft/sec
(550+575)= 1125÷2= 562.5 HP   3000ft @ 9.87 ft/sec = 304 sec
(304 sec x.000194 Lbs fuel/Hp-sec x 562.5 HP)= 33.2 lbs fuel

3000ft → 6000ft (3.08+3.22)=6.3÷2=3.15 m/sec = 10.33 ft/sec
(575+599)=1174÷2= 587 HP   3000ft @ 10.33 ft/sec = 290.4 sec
(290.4 sec x 0.000194 lbs fuel/Hp-sec x 587 HP)= 33 lbs fuel

6000ft → 9000ft (3.22+3.37)=6.59÷2=3.295 m/sec = 10.81 ft/sec
(599+627)=1226÷2= 613 HP   3000ft @ 10.81 ft/sec = 277.5 sec
(277.5 sec x 0.000194 lbs fuel/HP-sec x 613 HP)= 33 lbs fuel

Level Flying at 9000ft Altitude, at 108 ft/sec = 70.63 mph:

needs from the engine 111.8 Nm @5789.8 rpm=67.7 kW = 90.8 HP
(0.7 lbs fuel/HP-Hr)(90.8 HP) = 63.56 lb/hr

Take-off fuel load 600lbs - 100lbs ascent =500 lbs remaining
(500lbs fuel)x(63.56 lbs fuel/hr level flying) = 7.86 Hrs level flying

(7.86Hrs)x(70.64 mph)= range at 9000ft altitude = 555 miles