Standard Aircraft Characteristics

B-36B

Consolidated-Vultee

BY AUTHORITY OF
COMMANDING GENERAL
AIR MATERIEL COMMAND
U.S. AIR FORCE

20 OCTOBER 1950

SIX R-4360-41
PRATT-WHITNEY

B-36 B
Wing Area .......... 4772 sq ft
Aspect ................ 11.08
M. A. C. ............ 280.7"
Wing Section
(root) ............... NACA 63,4-422A
(tip) ................ NACA 63,4-517A
a = 1.0 (mod.)

Fuel

Water/alcohol (6x9 gal. tanks)

Oil

200 gal
2246 gal
4067 gal
4192 gal
3000 gal
3000 gal
3000 gal
4192 gal
200 gal
4067 gal
200 gal
200 gal
200 gal
200 gal
200 gal

B-36 B
RESTRICTED

20 OCTOBER 1950
POWER PLANT

No. & Model: (6) R-4360-41
Mfr: Pratt-Whitney
Spec No: A-7063-D
Sup. (turbo): (2) BH-1
Turbo Mfr: General Electric
Red. Gear Ratio: 0.375
Prop. Mfr: Curtiss
Blade Design No: 1129-3C6-24
Prop. Type: CS, FF, Reverse
Blades: 3
Prop. Dia: 19'-0"
Augmentation: Water/alcohol

ENGINE RATINGS

BHP - RPM - ALT
T. O: *3500 - 2700 - S. L.
3250 - 2700 - S. L.
Mil: *3500 - 2700 - 500
Nor: 2650 - 2550 - 5500
*Wet

DIMENSIONS

Wing
Span: 230.0'
Incidence (root): 30°
(Tip): 10°
Dihedral: 29°
Sweepback (LE): 159°39"
Length: 162.1'
Height: 46.8'
Tread: 46.0'
Prop. Grd Clearance: 4.46'

BOMBS

No. Size Type
2 43,000 G. P.
3 22,000 D. P.
4 12,000 D. P.
12 4000 G. P.
20000 G. P.
44 1600 A. P.
72 1000 G. P.
132 500 G. P.
Max Bomb Load: 86,000 lb

Missions and Description

The B-36B is a long range, high altitude, very heavy bombardment type aircraft. The crew of 15 consists of the pilot, co-pilot, engineer, navigator, radar-bombardier, nose turret operator, radio operator, two upper forward gunners, two upper aft gunners, two lower aft gunners, APG-3 operator and auxiliary crew member. Crew compartments are pressurized, heated and ventilated. A pressurized tunnel permits crew movement between the forward and aft compartments. A low pressure oxygen system is provided. Portable oxygen units are utilized in case of emergency or for crew movement in nonpressurized parts of the airplane.

Cabin heating, defrosting of blisters and enclosures, and anti-icing of the propeller, wing and tail are accomplished by heated air.

The defensive armament consists of three remotely controlled retractable twin turrets, a nose turret and an APG-3 controlled tail turret. There are provisions in (18) B-36B aircraft for two remotely controlled VB-13 "Tarzon" bombs. Bombing-navigation is accomplished by APG-24 radar.

The CO2 purging systems are provided; two for the wing tanks and one for the bomb bay tanks. Later aircraft have provisions for single-point refueling.

The Curtiss propeller incorporates a pitch changing mechanism which derives power from the propeller shaft through a hydraulically operated clutch. Final stages of feathering and initial stages of unfeathering are accomplished by an electric motor.

Major differences from the B-36A include change from R-4360-25 engines to -41 engines with fluid injection; provisions for larger bombs and additional equipment.

Development

First flight: 8 July 48
First service use: Nov 48
Production completed: Sep 50

ELECTRONICS

VHF Command: AN/ARC-3
Liaison: AN/ARC-8
Radio Compass: AN/ARN-7
Interphone: USAF Combat IPP
Glide Path: AN/ARN-5A or -5B
Bomb. - Nav. Radar: AN/APQ-24
Blind Approach: RC-103A
Marker Beacon: RC-193A or B
Loran: AN/APN-9 or -9A
Gun-Laying Radar: AN/APG-3
Range Receiver: BC-453B
Radar Altimeter: SCR-718
ECM: See page 7, General Data, note "c"

OIL

Capacity (gal): 1200
Grade: W-1100, S-1120

WEIGHTS

Loading Lb L. F.
Empty: 140,640(A)
Basic: 144,068(A)
Design: 278,000 2.45
Combat: *227,700(C)
Max T.O.: #328,000 2.05
Max Land: #328,000 2.05
(A) Actual
(C) Calculated
* For Basic Mission
† Limited by performance
(See page 7, Note "f")
† Limited by take-off weight

FUEL

Location No. Tanks Gal
Wg, outbd**: 2 4492
Wg, inbd**: 2 6384
Wg, ct**: 2 8134
Bomb Bay*: 4 712,000
Self-sealing 35,010
**Partial self-sealing
† See page 7, General Data, note "b"
Grade: 115/145
Water/alcohol (gal): 54

20 OCTOBER 1950
# Loading and Performance-Typical Mission

## Conditions

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Take-off Weight</td>
<td>lb</td>
<td>328,000</td>
<td>328,000</td>
<td>328,000</td>
<td>328,000</td>
<td>328,000</td>
<td>328,000</td>
</tr>
<tr>
<td>Fuel at 6.0 lb/gal (grade 115/145)</td>
<td>lb</td>
<td>157,304</td>
<td>82,831</td>
<td>157,304</td>
<td>157,304</td>
<td>165,775</td>
<td></td>
</tr>
<tr>
<td>Military Load (Bombs)</td>
<td>lb</td>
<td>10,000</td>
<td>80,000</td>
<td>10,000</td>
<td>10,000</td>
<td>10,000</td>
<td>None</td>
</tr>
<tr>
<td>Wing Loading (lb/sq ft)</td>
<td>lb</td>
<td>68.73</td>
<td>68.73</td>
<td>68.73</td>
<td>68.73</td>
<td>68.73</td>
<td>68.73</td>
</tr>
<tr>
<td>Stall Speed (power off, land config.)</td>
<td>kn</td>
<td>100.4</td>
<td>100.4</td>
<td>100.4</td>
<td>100.4</td>
<td>100.4</td>
<td>100.4</td>
</tr>
<tr>
<td>Take-off ground run at SL</td>
<td>ft</td>
<td>6030</td>
<td>6030</td>
<td>6030</td>
<td>6030</td>
<td>6030</td>
<td>6030</td>
</tr>
<tr>
<td>Take-off to clear 50 ft</td>
<td>ft</td>
<td>8520</td>
<td>8520</td>
<td>8520</td>
<td>8520</td>
<td>8520</td>
<td>8520</td>
</tr>
<tr>
<td>Rate of climb at SL</td>
<td>fpm</td>
<td>500</td>
<td>500</td>
<td>500</td>
<td>500</td>
<td>500</td>
<td>500</td>
</tr>
<tr>
<td>Time: SL to 10,000 ft</td>
<td>min</td>
<td>21.5</td>
<td>21.5</td>
<td>21.5</td>
<td>21.5</td>
<td>21.5</td>
<td>21.5</td>
</tr>
<tr>
<td>Time: SL to 20,000 ft</td>
<td>min</td>
<td>48.7</td>
<td>48.7</td>
<td>48.7</td>
<td>48.7</td>
<td>48.7</td>
<td>48.7</td>
</tr>
<tr>
<td>Service Ceiling (100 fpm)</td>
<td>ft</td>
<td>28,500</td>
<td>28,500</td>
<td>28,500</td>
<td>28,500</td>
<td>28,500</td>
<td>28,500</td>
</tr>
<tr>
<td>Service Ceiling (one engine out)</td>
<td>ft</td>
<td>29,100</td>
<td>29,100</td>
<td>29,100</td>
<td>29,100</td>
<td>29,100</td>
<td>29,100</td>
</tr>
<tr>
<td>COMBAT RANGE (n. mi.)</td>
<td>7098</td>
<td>2957</td>
<td>6668</td>
<td>5800</td>
<td>3438</td>
<td>7659</td>
<td></td>
</tr>
<tr>
<td>Average Speed (kn)</td>
<td>176</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Initial Cruising Altitude</td>
<td>ft</td>
<td>10,000</td>
<td>10,000</td>
<td>10,000</td>
<td>10,000</td>
<td>32,400</td>
<td>10,000</td>
</tr>
<tr>
<td>Final Cruising Altitude</td>
<td>ft</td>
<td>25,000</td>
<td>25,000</td>
<td>40,000</td>
<td>40,000</td>
<td>40,000</td>
<td>21,800</td>
</tr>
<tr>
<td>Total Mission Time</td>
<td>hr</td>
<td>40.55</td>
<td>17.24</td>
<td>37.68</td>
<td>31.08</td>
<td>12.26</td>
<td>43.63</td>
</tr>
<tr>
<td>COMBAT RADIUS (n. mi.)</td>
<td>3740</td>
<td>1757</td>
<td>3600</td>
<td>3300</td>
<td>1875</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average Speed (kn)</td>
<td>177.5</td>
<td>185.5</td>
<td>288.5</td>
<td>188/265.5</td>
<td>188/265</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Initial Cruising Altitude</td>
<td>ft</td>
<td>10,000</td>
<td>10,000</td>
<td>10,000</td>
<td>10,000</td>
<td>32,400</td>
<td></td>
</tr>
<tr>
<td>Bombing Altitude</td>
<td>ft</td>
<td>25,000</td>
<td>25,000</td>
<td>40,000</td>
<td>40,000</td>
<td>40,000</td>
<td></td>
</tr>
<tr>
<td>Bomb Run Speed</td>
<td>kn</td>
<td>278</td>
<td>283</td>
<td>307</td>
<td>308.5</td>
<td>304</td>
<td></td>
</tr>
<tr>
<td>Total Mission Time</td>
<td>hr</td>
<td>42.43</td>
<td>19.70</td>
<td>37.87</td>
<td>33.57</td>
<td>13.24</td>
<td></td>
</tr>
</tbody>
</table>

## Combat Weight

| Combat Altitude | ft | 25,000 | 25,000 | 40,000 | 40,000 | 39,300 | 25,000 |
| Combat Speed | kn | 308 | 312 | 314 | 314.5 | 307 | 313.5 |
| Combat Climb (fpm) | 1110 | 1545 | 380 | 385 | 450 | 1700 |
| Combat Ceiling (500 fpm) | ft | 38,800 | 41,700 | 38,900 | 39,100 | 38,300 | 42,400 |
| Service Ceiling (100 fpm) | ft | 42,500 | 43,500 | 42,600 | 42,650 | 42,350 | 44,100 |
| Service Ceiling (one engine out) | ft | 40,200 | 42,200 | 40,400 | 40,500 | 40,000 | 42,700 |
| Max Radio of Climb at SL | fpm | 1510 | 1920 | 1540 | 1555 | 1465 | 2070 |
| Max Speed at 34,500 ft | kn | 331 | 333 | 332 | 332 | 330 | 340 |

## Landing Weight

| Ground Roll at SL | ft | 2220 | 2130 | 2220 | 2220 | 2220 | 2400 |
| Ground Roll | ft | 1700 | 1630 | 1700 | 1700 | 1700 | 1830 |
| Total from 50 ft | ft | 3320 | 3230 | 3320 | 3320 | 3320 | 3320 |
| Total from 50 ft | ft | 2800 | 2750 | 2800 | 2800 | 2800 | 2800 |

### Notes:

1. Take-off power
2. Max power
3. Normal power
4. Detailed descriptions of RADIUS & RANGE missions are given on page 6.
5. For Radius Mission if radius is shown
6. Based on 3250 BHP at 2700 RPM

### Performance Basis:

(a) Data source: Flight tests
(b) Performance is based on powers shown on page 7

---

**B-36 B**

**RESTRICTED**

20 October 1950
FORMULA: RADIUS MISSION I

Start engines, warm-up, take-off, climb on course with normal power to 10,000 feet, cruise at long range speeds at altitudes for best range (10,000 feet minimum). Climb so as to arrive at 25,000 feet 30 minutes prior to target. Cruise long range speeds for 15 minutes, conduct 15 minute normal power bomb-run, drop bombs, conduct 5 minute evasive action plus 10 minutes escape at normal power. Return to base at altitudes for best range using long range cruise climb technique. Range free allowances include 10 minutes normal power fuel consumption for warm-up and take-off, 5 minutes evasive action at normal power fuel consumption and 5% initial fuel for landing and endurance reserve.

FORMULA: RADIUS MISSION II

Same as RADIUS Mission I except for bomb load.

FORMULA: RADIUS MISSION III & IV

Start engines, warm-up, take-off, climb on course with normal power to 10,000 feet, cruise at long range speeds at altitude for best range (10,000 feet minimum). Climb so as to arrive at 40,000 feet 500 (or 1000) nautical miles prior to target. Cruise long range speeds at 40,000 feet, conduct 15 minute normal power bomb-run, drop bombs, conduct 5 minute evasive action plus 10 minute escape at normal power. Cruise back 500 (or 1000) nautical miles from target at 40,000 feet at long range speeds. Return to base at altitudes for best range using cruise climb technique. Range free allowances include 10 minutes normal power fuel consumption for warm-up and take-off, 5 minutes evasive action at normal power fuel consumption and 5% initial fuel for landing and endurance reserve.

FORMULA: RADIUS MISSION III & IV

Same as outward leg of Radius Mission continued until 90% of fuel has been used. Range free allowances include 10 minutes normal power fuel consumption for warm-up and take-off plus 10% of initial fuel for landing and endurance reserve.

FORMULA: RANGE MISSION V

Start engines, warm-up, take-off, climb on course to 32,400 feet using normal power, cruise to target at altitude and powers for best speed, conduct 15 minute normal power bomb run to target, drop bombs, conduct 5 minute evasive action and 10 minute escape from target at normal power. Return to base using cruising altitude (approx. 40,000 feet) and powers for best speed. Range free allowances include 10 minutes normal power fuel consumption for warm-up and take-off, 5 minutes evasive action at normal power fuel consumption plus 5% of initial fuel load for landing and endurance reserve.

FORMULA: RANGE MISSION V

Same as outward leg of Radius Mission continued until 90% of fuel has been used. Range free allowances include 10 minutes normal power fuel consumption for warm-up and take-off plus 10% of initial fuel for landing and endurance reserve.

FORMULA: RANGE MISSION VI

Start engines, warm-up, take-off, climb on course with normal power to 10,000 feet, cruise at long range speeds at altitudes for best range (10,000 feet minimum) to point where 90% of initial fuel has been used. Range free allowances include 10 minutes normal power fuel consumption for warm-up and take-off plus 10% of initial fuel for landing and endurance reserve.

GENERAL DATA

(a) For detailed planning refer to Tech Order AN 01-5EUB-1.

(continued)
GENERAL DATA (continued)

(b) The B-36B may be field modified to carry a total of four bomb bay tanks; however, the present weight restriction of 328,000 pounds limits usage to 7393 gallons bomb bay fuel requiring three bomb bay tanks.

(c) For computing all radius and range missions the aircraft is flown at speeds corresponding to 99% of maximum miles per pounds at instantaneous gross weight and altitude. Where analysis indicates an improvement in miles per lb by using a cruising climb, the procedure has been utilized.

(d) Engine ratings shown on page 3 are guaranteed ratings. Power values used for performance calculations are as follows:

<table>
<thead>
<tr>
<th>R-4360-41</th>
</tr>
</thead>
<tbody>
<tr>
<td>BHP</td>
</tr>
<tr>
<td>T. O:</td>
</tr>
<tr>
<td>Max:</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Nor:</td>
</tr>
<tr>
<td>*Wet</td>
</tr>
<tr>
<td>†War emergency (Military power, 2400 rpm, high BMEP)</td>
</tr>
<tr>
<td>**With turbos</td>
</tr>
</tbody>
</table>

(e) ECM equipment consists of the following sets:

- AN/APT-1, -4, -5A
- AN/ARP-4
- AN/ARQ-8
- AN/APA-38

(f) The following restriction is based on the strength of the landing gear: Max take-off gross weight equals 328,000 lb for B-36B aircraft with serial numbers 44-92068 thru -92070, 44-92076, 44,92082 thru -92087. All other B-36B's are limited to 278,000 lb gross weight for take-off except by special permission of AMC.
The above plot is provided to supplement typical missions of 500 and 1000 nautical miles presented and defined in foregoing pages. Distance and average speed at 40,000 ft in the combat zone are plotted to indicate total mission radius within the limitations listed. Fuel is off-loaded if necessary to assure a 500 ft per minute rate of climb with max continuous power for six engines at 40,000 ft when entering the combat zone; otherwise loading is the same as for basic mission combat radius.