
# SECTION VI
# OPERATIONAL DATA

The operational data charts on the following pages are presented for two purposes; first, so that you may know what to expect from your airplane under various conditions; and second, to enable you to plan your flights in detail and with reasonable accuracy.

A power setting selected from the range charts usually will be more efficient than a random setting, since it will permit accurate fuel flow settings and your fuel consumption can be estimated closely. You will find that using the charts and your Cessna Model 310 Power Computer will pay dividends in over-all efficiency.

The data in the charts has been compiled from actual flight tests with the airplane and engines in good condition, and using average piloting techniques. Note also that the range charts make no allowances for wind, navigational errors, warm-up, takeoff, climb, etc. You must estimate these variables for yourself and make allowances accordingly.

## AIRSPEED CORRECTION TABLE

| Flaps 0° | | Flaps 15°* | | Flaps 35° ** | |
|---|---|---|---|---|---|
| IAS, MPH | CAS, MPH | IAS, MPH | CAS, MPH | IAS, MPH | CAS, MPH |
| 80 | 78 | 80 | 78 | 70 | 68 |
| 100 | 98 | 90 | 88 | 80 | 78 |
| 120 | 118 | 100 | 98 | 90 | 88 |
| 140 | 138 | 110 | 108 | 100 | 98 |
| 160 | 158 | 120 | 118 | 110 | 107 |
| 180 | 177 | 130 | 128 | 120 | 117 |
| 200 | 197 | 140 | 138 | 130 | 127 |
| 220 | 216 | 150 | 148 | 140 | 137 |
| 240 | 235 | 160 | 158 | 150 | 146 |
| | | 170 | 168 | 160 | 156 |
| | | 180 | 177 | | |

* Maximum Flap Speed 180 MPH (15°) ** Maximum Flap Speed 160 MPH (35°)

Figure 6-1

## STALL SPEED CHART

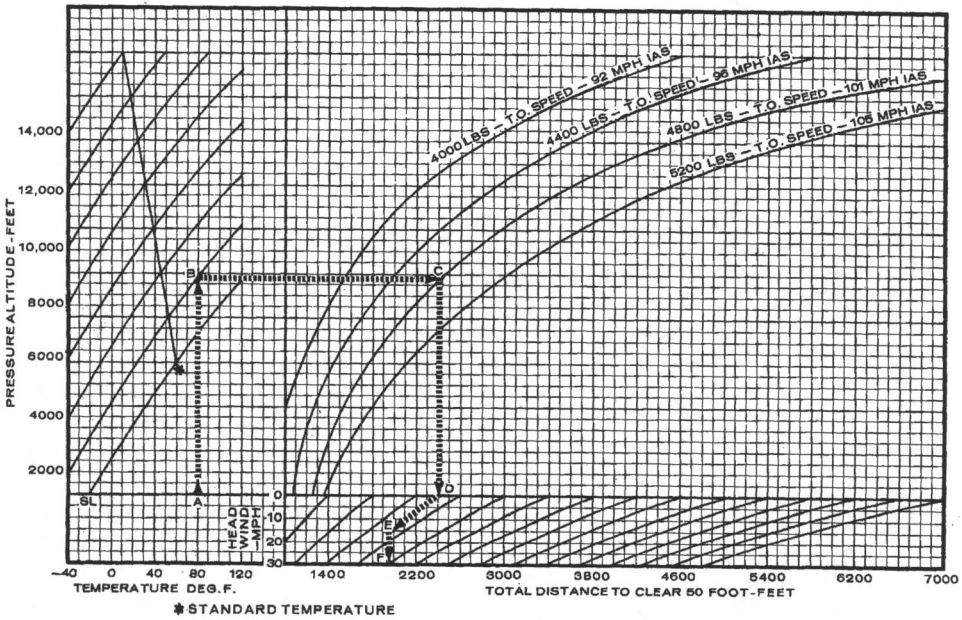
MPH

5200 POUNDS GROSS WEIGHT, IDLE POWER

| CONFIGURATION | ANGLE OF BANK | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 0° | | 20° | | 40° | | 60° | |
| | IAS | CAS | IAS | CAS | IAS | CAS | IAS | CAS |
| Gear and Flaps Up | 84 | 82 | 87 | 85 | 96 | 94 | 117 | 116 |
| Gear Down and Flaps 15° | 79 | 77 | 82 | 80 | 90 | 88 | 111 | 109 |
| Gear Down and Flaps 35° | 75 | 73 | 77 | 75 | 85 | 83 | 105 | 103 |

Figure 6-2

# NORMAL TAKEOFF DISTANCE




CONDITIONS:

1. Level Hard Surface Runway.
2. Wing Flaps UP.
3. Full Throttle and 2625 RPM Before Releasing Brakes.
4. Mixture at Recommended Fuel Flow.
5. Maintain Speed to 50 Feet.

NOTE: Ground Run Is 80% of Total Distance.

NOTE: Increase total distance by 3.5% for operation on firm dry sod runways.

EXAMPLE:

A. Temperature - 80° F.
B. Pressure Altitude - 2000 Ft.
C. Gross Weight - 4800 Lbs.
D. Total Distance to Clear 50 Ft. (No Wind) - 2410 Ft.
E. Headwind - 15 MPH.
F. Total Distance to Clear 50 Ft. (15 MPH Headwind) - 1960 Ft.

Figure 6-3

# ACCELERATE STOP DISTANCE

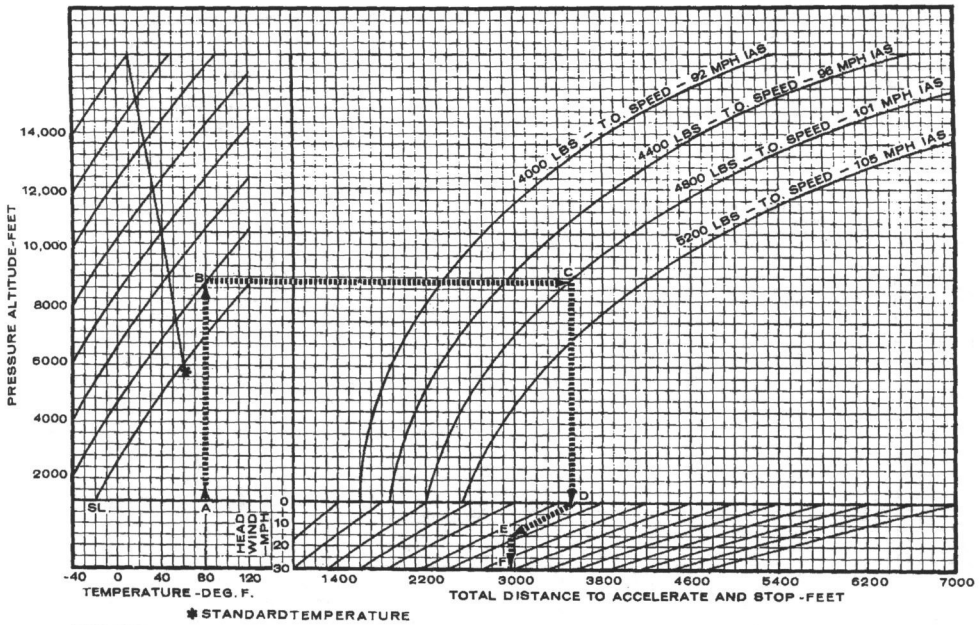



Figure 6-4

CONDITIONS:

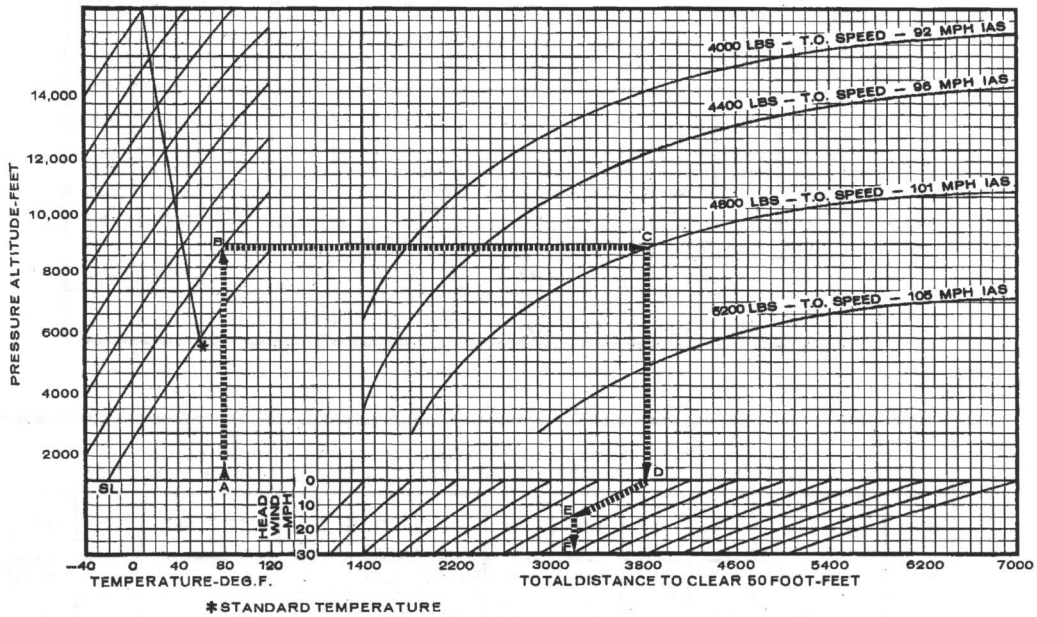
1. Level Hard Surface Runway.
2. Wing Flaps UP.
3. Full Throttle and 2625 RPM Before Releasing Brakes.
4. Mixture at Recommended Fuel Flow.
5. Engine Failure at Takeoff Speed.
6. Heavy Braking After Engine Failure.

NOTE: Accelerating Distance is Approximately 59% of the Total Distance.

EXAMPLE:

A. Temperature - 80°F.
B. Pressure Altitude - 2000 Ft.
C. Gross Weight - 4800 Lbs.
D. Total Distance to Stop (No Wind) - 3525 Ft.
E. Headwind - 15 MPH.
F. Total Distance to Stop (15 MPH Headwind) - 2960 Ft.

# SINGLE ENGINE TAKEOFF DISTANCE




*STANDARD TEMPERATURE

CONDITIONS:

1. Level Hard Surface Runway.
2. Wing Flaps UP.
3. Full Throttle and 2625 RPM Before Releasing Brakes.
4. Mixture at Recommended Fuel Flow.
5. Engine Failure at Takeoff Speed.
6. Propeller Feathered and Gear Retracted During Climb.
7. Maintain Speed to 50 Feet.

EXAMPLE:

A. Temperature - 80° F.
B. Pressure Altitude - 2000 Ft.
C. Gross Weight - 4800 Lbs.
D. Total Distance to Clear 50 Ft. (No Wind) - 3830 Ft.
E. Headwind - 15 MPH.
F. Total Distance to Clear 50 Ft. (15 MPH Headwind) - 3200 Ft.

Figure 6-5

# TWIN ENGINE CLIMB DATA AT 5200 POUNDS

## MAXIMUM PERFORMANCE

| SEA LEVEL 59°F | | | 5000 FT. 41°F | | | 10000 FT. 23°F | | | 15000 FT. 5°F | | | 20000 FT. -12°F | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Best Climb IAS MPH | Rate of Climb Ft/Min | Gal of Fuel Used | Best Climb IAS MPH | Rate of Climb Ft/Min | From S.L. Fuel Used | Best Climb IAS MPH | Rate of Climb Ft/Min | From S.L. Fuel Used | Best Climb IAS MPH | Rate of Climb Ft/Min | From S.L. Fuel Used | Best Climb IAS MPH | Rate of Climb Ft/Min | From S.L. Fuel Used |
| 125 | 1542 | 4 | 123 | 1178 | 6.3 | 122 | 818 | 9.0 | 121 | 458 | 12.7 | 120 | 93 | 20.5 |

NOTE: FULL THROTTLE, 2625 RPM, MIXTURE AT RECOMMENDED FUEL FLOW, FLAPS AND GEAR UP. FUEL USED INCLUDES WARM-UP AND TAKEOFF ALLOWANCE

Figure 6-6

## CRUISE CLIMB

2450 RPM, 24" MP to 5000 FT. FULL THROTTLE AFTERWARDS

| POWER SETTING | | Climb IAS MPH | 5000 FT. 41°F FROM SEA LEVEL | | | 10000 FT. 23°F FROM SEA LEVEL | | | 15000 FT. 5°F FROM SEA LEVEL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| RPM | M.P. | | Dist. Miles | Time Min. | Fuel Used Gal. | Dist. Miles | Time Min. | Fuel Used Gal. | Dist. Miles | Time Min. | Fuel Used Gal. |
| 2450 | 24 | 140 | 11.0 | 4.8 | 6.5 | 25.9 | 11.3 | 9.7 | 56.4 | 24.7 | 15.0 |

NOTE: WARM-UP AND TAKEOFF ALLOWANCE 4 GALLONS AT SEA LEVEL. MIXTURE AT RECOMMENDED FUEL FLOW, FLAPS AND GEAR UP.

## MAXIMUM PERFORMANCE TAKEOFF 15° FLAPS

| Gross Weight Pounds | IAS at Takeoff MPH | IAS at Obstacle MPH | Head Wind MPH | DENSITY ALTITUDE: SEA LEVEL Ground Run | SEA LEVEL Total Distance over 50 Ft Obstacle | 2500 FT. Ground Run | 2500 FT. Total Distance over 50 Ft Obstacle | 5000 FT. Ground Run | 5000 FT. Total Distance over 50 Ft Obstacle | 7500 FT. Ground Run | 7500 FT. Total Distance over 50 Ft Obstacle |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5200 | 93 | 93 | 0 | 1451 | 1716 | 1808 | 2119 | 2340 | 2711 | 3061 | 3509 |
| | | | 15 | 1120 | 1345 | 1410 | 1676 | 1842 | 2162 | 2435 | 2823 |
| | | | 30 | 824 | 1009 | 1050 | 1272 | 1392 | 1660 | 1864 | 2193 |

Figure 6-7

## SINGLE ENGINE CLIMB DATA

| Gross Weight Pounds | SEA LEVEL 59°F Best Climb IAS MPH | SEA LEVEL 59°F Rate of Climb Ft/Min | 2500 FT 50°F Best Climb IAS MPH | 2500 FT 50°F Rate of Climb Ft/Min | 5000 FT 41°F Best Climb IAS MPH | 5000 FT 41°F Rate of Climb Ft/Min | 7500 FT 32°F Best Climb IAS MPH | 7500 FT 32°F Rate of Climb Ft/Min | 10000 FT 23°F Best Climb IAS MPH | 10000 FT 23°F Rate of Climb Ft/Min |
|---|---|---|---|---|---|---|---|---|---|---|
| 4400 | 114 | 534 | 113 | 420 | 111 | 303 | 110 | 188 | 108 | 72 |
| 4800 | 117 | 433 | 115.5 | 325 | 114 | 215 | 112 | 106 | 111 | -5 |
| 5200 | 119 | 330 | 117 | 227 | 116 | 125 | 114 | 22 | 113 | -80 |

NOTE: Flaps and gear up, inoperative propeller-feathered, wing banked 5° toward operating engine, full throttle, 2625 RPM and mixture at recommended leaning schedule. Decrease rate of climb 10 FT/MIN for each 10°F above standard temperature for particular altitude.

Figure 6-8

## INDICATED ENROUTE TERRAIN CLEARANCE ALTITUDES
### BEST CLIMB SPEED APPROXIMATELY 120 MPH IAS

| Gross Weight Pounds | OUTSIDE AIR TEMPERATURE °F: -10 | 0 | 10 | 20 | 30 | 40 | 50 |
|---|---|---|---|---|---|---|---|
| | ALTITUDE-FEET | | | | | | |
| 5200 | 8600 | 8100 | 7500 | 6800 | 6300 | 5700 | 5250 |
| 4800 | 10200 | 9600 | 9100 | 8500 | 7900 | 7300 | 6800 |
| 4400 | 11500 | 10900 | 10300 | 9750 | 9200 | 8700 | 8100 |

NOTE: The terrain clearance altitude as defined by FAR 121.181 is the highest ground elevation that can be cleared by 1000 feet on single engine with rate-of-climb of 50 ft/min.

Increase indicated enroute terrain clearance altitudes 100 feet for each 0.10 inch Hg. altimeter setting greater than 29.92 for new indicated altitudes.

Decrease indicated enroute terrain clearance altitudes 100 feet for each 0.10 inch Hg. altimeter setting less than 29.92 for new indicated altitudes.

Figure 6-9

## CRUISE PERFORMANCE WITH NORMAL LEAN MIXTURE AT 2,500 FT.

| RPM | MP | % BHP | TAS | Total Gals./Hr. | Endurance 100 Gals. | Range 100 Gals. | Endurance 140 Gals. | Range 140 Gals. |
|---|---|---|---|---|---|---|---|---|
| 2450 | 24 | 74 | 210 | 28.0 | 3.6 | 750 | 5.0 | 1050 |
| | 23 | 70 | 204 | 26.3 | 3.8 | 775 | 5.3 | 1085 |
| | 22 | 66 | 198 | 24.5 | 4.1 | 808 | 5.7 | 1131 |
| | 21 | 62 | 193 | 23.2 | 4.3 | 833 | 6.0 | 1164 |
| 2300 | 24 | 68 | 202 | 25.5 | 3.9 | 789 | 5.5 | 1109 |
| | 23 | 64 | 196 | 23.8 | 4.2 | 823 | 5.9 | 1152 |
| | 22 | 60 | 190 | 22.5 | 4.4 | 836 | 6.2 | 1182 |
| | 21 | 56 | 184 | 21.2 | 4.7 | 869 | 6.6 | 1214 |
| 2200 | 23 | 58 | 187 | 21.8 | 4.6 | 858 | 6.4 | 1201 |
| | 22 | 55 | 182 | 20.7 | 4.8 | 878 | 6.8 | 1230 |
| | 21 | 50 | 175 | 19.3 | 5.2 | 907 | 7.3 | 1269 |
| | 20 | 47 | 169 | 18.3 | 5.5 | 923 | 7.7 | 1293 |
| 2100 | 22 | 49 | 172 | 18.8 | 5.3 | 915 | 7.5 | 1281 |
| | 21 | 46 | 166 | 17.8 | 5.6 | 933 | 7.9 | 1306 |
| | 20 | 43 | 158 | 16.8 | 5.9 | 941 | 8.3 | 1316 |
| | 19 | 40 | 151 | 16.2 | 6.2 | 932 | 8.6 | 1306 |
| | 18 | 37 | 140 | 15.0 | 6.7 | 932 | 9.3 | 1306 |

CRUISE PERFORMANCE IS BASED ON STANDARD CONDITIONS, ZERO WIND, NORMAL LEAN MIXTURE, 100 AND 140 GALLONS OF FUEL (NO RESERVE), AND 5200 POUNDS GROSS WEIGHT.

## CRUISE PERFORMANCE WITH NORMAL LEAN MIXTURE AT 5,000 FT.

| RPM | MP | % BHP | TAS | Total Gals./Hr. | Endurance 100 Gals. | Range 100 Gals. | Endurance 140 Gals. | Range 140 Gals. |
|---|---|---|---|---|---|---|---|---|
| 2450 | 24 | 77 | 218 | 29.0 | 3.4 | 752 | 4.8 | 1053 |
| | 23 | 73 | 212 | 27.3 | 3.7 | 777 | 5.1 | 1085 |
| | 22 | 68 | 208 | 25.7 | 3.9 | 809 | 5.5 | 1134 |
| | 21 | 64 | 202 | 24.2 | 4.1 | 834 | 5.8 | 1170 |
| 2300 | 24 | 70 | 208 | 26.2 | 3.8 | 797 | 5.3 | 1111 |
| | 23 | 66 | 204 | 24.7 | 4.0 | 825 | 5.7 | 1157 |
| | 22 | 62 | 197 | 23.2 | 4.3 | 851 | 6.0 | 1188 |
| | 21 | 58 | 192 | 21.8 | 4.6 | 877 | 6.4 | 1233 |
| 2200 | 23 | 61 | 196 | 22.7 | 4.4 | 866 | 6.2 | 1209 |
| | 22 | 57 | 189 | 21.3 | 4.7 | 886 | 6.6 | 1242 |
| | 21 | 53 | 184 | 20.2 | 5.0 | 914 | 6.9 | 1275 |
| | 20 | 50 | 177 | 19.2 | 5.2 | 924 | 7.3 | 1290 |
| 2100 | 22 | 51 | 180 | 19.7 | 5.1 | 914 | 7.1 | 1280 |
| | 21 | 48 | 173 | 18.5 | 5.4 | 934 | 7.6 | 1310 |
| | 20 | 45 | 167 | 17.7 | 5.7 | 943 | 7.9 | 1321 |
| | 19 | 42 | 157 | 16.5 | 6.1 | 951 | 8.5 | 1331 |
| | 18 | 39 | 148 | 15.7 | 6.4 | 943 | 8.9 | 1320 |

CRUISE PERFORMANCE IS BASED ON STANDARD CONDITIONS, ZERO WIND, NORMAL LEAN MIXTURE, 100 AND 140 GALLONS OF FUEL (NO RESERVE), AND 5200 POUNDS GROSS WEIGHT.

Figure 6-10 (Sheet 1 of 3)

## CRUISE PERFORMANCE WITH NORMAL LEAN MIXTURE AT 7,500 FT.

| RPM | MP | %BHP | TAS | Total Gals./Hr. | Endurance 100 Gals. | Range 100 Gals. | Endurance 140 Gals. | Range 140 Gals. |
|---|---|---|---|---|---|---|---|---|
| 2450 | 22 | 71 | 214 | 26.5 | 3.8 | 807 | 5.3 | 1130 |
| | 21 | 67 | 209 | 25.0 | 4.0 | 837 | 5.6 | 1170 |
| | 20 | 63 | 203 | 23.5 | 4.3 | 865 | 6.0 | 1210 |
| | 19 | 58 | 196 | 22.0 | 4.5 | 891 | 6.4 | 1247 |
| 2300 | 22 | 64 | 204 | 24.0 | 4.2 | 852 | 5.8 | 1189 |
| | 21 | 60 | 199 | 22.7 | 4.4 | 878 | 6.2 | 1228 |
| | 20 | 56 | 192 | 21.2 | 4.7 | 907 | 6.6 | 1267 |
| | 19 | 53 | 186 | 20.2 | 4.9 | 921 | 6.9 | 1289 |
| 2200 | 22 | 58 | 196 | 22.0 | 4.5 | 891 | 6.4 | 1247 |
| | 21 | 55 | 191 | 21.0 | 4.8 | 910 | 6.7 | 1274 |
| | 20 | 52 | 185 | 19.8 | 5.1 | 934 | 7.1 | 1308 |
| | 19 | 48 | 177 | 18.7 | 5.4 | 947 | 7.5 | 1326 |
| 2100 | 21 | 50 | 181 | 19.2 | 5.2 | 944 | 7.3 | 1319 |
| | 20 | 47 | 175 | 18.3 | 5.5 | 957 | 7.7 | 1339 |
| | 19 | 44 | 166 | 16.8 | 5.9 | 988 | 8.3 | 1383 |
| | 18 | 40 | 155 | 16.2 | 6.2 | 958 | 8.6 | 1339 |
| | 17 | 37 | 132 | 15.3 | 6.5 | 862 | 9.1 | 1208 |

CRUISE PERFORMANCE IS BASED ON STANDARD CONDITIONS, ZERO WIND, NORMAL LEAN MIXTURE, 100 AND 140 GALLONS OF FUEL (NO RESERVE), AND 5200 POUNDS GROSS WEIGHT.

## CRUISE PERFORMANCE WITH NORMAL LEAN MIXTURE AT 10,000 FT.

| RPM | MP | % BHP | TAS | Total Gals./Hr. | Endurance 100 Gals. | Range 100 Gals. | Endurance 140 Gals. | Range 140 Gals. |
|---|---|---|---|---|---|---|---|---|
| 2450 | 20 | 65 | 211 | 24.4 | 4.1 | 865 | 5.7 | 1211 |
| | 19 | 61 | 204 | 22.8 | 4.4 | 892 | 6.1 | 1253 |
| | 18 | 57 | 197 | 21.5 | 4.7 | 915 | 6.5 | 1282 |
| | 17 | 53 | 189 | 20.0 | 5.0 | 945 | 7.0 | 1323 |
| 2300 | 20 | 59 | 201 | 22.0 | 4.5 | 913 | 6.4 | 1278 |
| | 19 | 55 | 194 | 20.8 | 4.8 | 931 | 6.7 | 1306 |
| | 18 | 51 | 186 | 19.7 | 5.1 | 944 | 7.1 | 1322 |
| | 17 | 48 | 179 | 18.5 | 5.4 | 966 | 7.6 | 1355 |
| 2200 | 20 | 54 | 191 | 20.5 | 4.9 | 932 | 6.8 | 1305 |
| | 19 | 50 | 185 | 19.3 | 5.2 | 958 | 7.3 | 1341 |
| | 18 | 47 | 176 | 18.2 | 5.5 | 967 | 7.7 | 1353 |
| | 17 | 44 | 167 | 17.3 | 5.8 | 964 | 8.1 | 1351 |
| 2100 | 20 | 49 | 181 | 18.8 | 5.3 | 963 | 7.5 | 1348 |
| | 19 | 46 | 172 | 17.8 | 5.6 | 967 | 7.9 | 1354 |
| | 18 | 43 | 163 | 16.8 | 5.9 | 970 | 8.3 | 1358 |
| | 17 | 40 | 146 | 16.0 | 6.3 | 913 | 8.7 | 1278 |

CRUISE PERFORMANCE IS BASED ON STANDARD CONDITIONS, ZERO WIND, NORMAL LEAN MIXTURE, 100 AND 140 GALLONS OF FUEL (NO RESERVE), AND 5200 POUNDS GROSS WEIGHT.

Figure 6-10 (Sheet 2 of 3)

## CRUISE PERFORMANCE WITH NORMAL LEAN MIXTURE AT 15,000 FT.

| RPM | MP | % BHP | TAS | Total Gals./Hr. | Endurance 100 Gals. | Range 100 Gals. | Endurance 140 Gals. | Range 140 Gals. |
|---|---|---|---|---|---|---|---|---|
| 2450 | 16 | 53 | 196 | 20.2 | 5.0 | 972 | 6.9 | 1358 |
| | 15 | 48 | 183 | 18.7 | 5.4 | 979 | 7.5 | 1371 |
| | 14 | 44 | 168 | 17.3 | 5.8 | 972 | 8.1 | 1359 |
| 2300 | 16 | 48 | 183 | 18.7 | 5.4 | 979 | 7.5 | 1371 |
| | 15 | 44 | 165 | 17.3 | 5.8 | 952 | 8.1 | 1335 |
| 2200 | 16 | 44 | 168 | 17.3 | 5.8 | 972 | 8.1 | 1359 |

CRUISE PERFORMANCE IS BASED ON STANDARD CONDITIONS, ZERO WIND, NORMAL LEAN MIXTURE, 100 AND 140 GALLONS OF FUEL (NO RESERVE), AND 5200 POUNDS GROSS WEIGHT.

## CRUISE PERFORMANCE WITH NORMAL LEAN MIXTURE AT 20,000 FT.

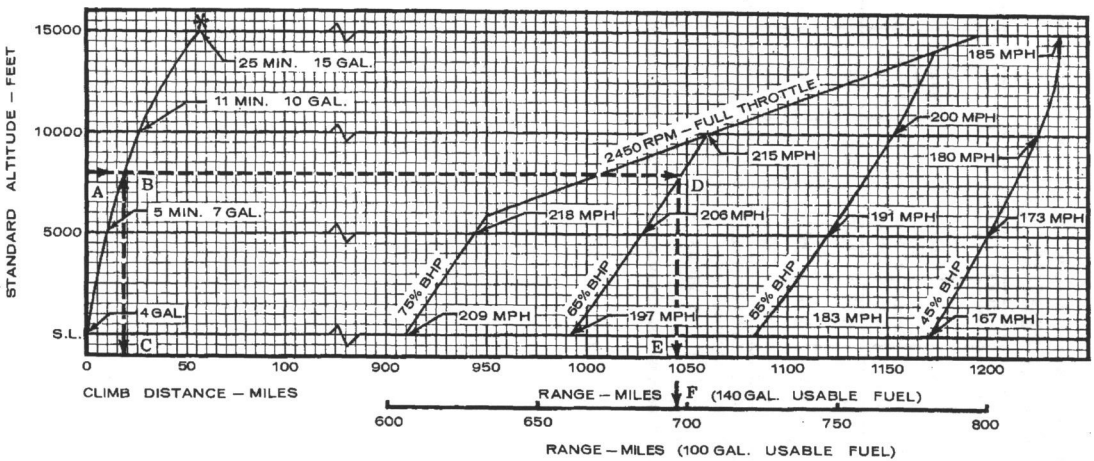
| RPM | MP | % BHP | TAS | Total Gals./Hr. | Endurance 100 Gals. | Range 100 Gals. | Endurance 140 Gals. | Range 140 Gals. |
|---|---|---|---|---|---|---|---|---|
| 2450 | 13.5 | 46 | 171 | 18.0 | 5.6 | 949 | 7.8 | 1330 |

CRUISE PERFORMANCE IS BASED ON STANDARD CONDITIONS, ZERO WIND, NORMAL LEAN MIXTURE, 100 AND 140 GALLONS OF FUEL (NO RESERVE), AND 5200 POUNDS GROSS WEIGHT.

Figure 6-10 (Sheet 3 of 3)

# RANGE PROFILE

*Cruise Climb at 2450 RPM, 24.0 In. Hg. MP (Full Throttle Above 5000 Ft.) and 140 MPH IAS




NOTES:

1. Maximum range is not changed appreciably with variations in climb power setting and climb speed.
2. Range includes distance to alternate destination.

CONDITIONS:

1. Starting Weight - 5200 Lbs.
2. Cruise Climb to Desired Cruise Altitude
3. Cruise Fuel Flow Normal Lean Mixture
4. Zero Wind
5. 45 Min. Reserve Fuel (13 Gals.) at 45% BHP

EXAMPLE:

A. Cruising Altitude - 8000 Ft.
B. Time and Fuel Used to Climb From Sea Level to 8000 Ft. - 8.5 Min, and 9 Gals.
C. Climb Distance - 18 Miles
D. Cruise Power and Speed - 65% and 211 MPH TAS
E. Range - 1045 Mi. (140 Gals. Usable Fuel - Optional)
F. Range - 697 Mi. (100 Gals. Usable Fuel - Standard)

Figure 6-11

## LANDING PERFORMANCE

| Gross Weight Pounds | IAS at Obstacle MPH | SEA LEVEL 59° F | | 2500 FT. 50° F | | 5000 FT. 41° F | | 7500 FT. 32° F | |
|---|---|---|---|---|---|---|---|---|---|
| | | Ground Run | Total Distance Over 50 Foot Obstacle | Ground Run | Total Distance Over 50 Foot Obstacle | Ground Run | Total Distance Over 50 Foot Obstacle | Ground Run | Total Distance Over 50 Foot Obstacle |
| 4400 | 97 | 693 | 1276 | 748 | 1327 | 806 | 1385 | 872 | 1448 |
| 4800 | 101 | 840 | 1420 | 902 | 1483 | 973 | 1552 | 1052 | 1632 |
| 5200 | 105 | 1002 | 1582 | 1077 | 1631 | 1160 | 1743 | 1254 | 1842 |

NOTE: WING FLAPS 35°, POWER OFF, HARD SURFACE RUNWAY, ZERO WIND, MAXIMUM BRAKING EFFORT. REDUCE LANDING DISTANCE 10% FOR EACH 10 MPH HEADWIND.

NOTE: INCREASE DISTANCE BY 25% OF THE GROUND RUN FOR OPERATION ON FIRM DRY SOD RUNWAYS.

Figure 6-12