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# B-767-300ER GE Operational Data Manual

Revision Number: 57  
Revision Date: September 23, 2016

Issued by  
Performance Engineering - Dept 088 ATG  
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## **FUNCTION**

The Aircraft Operational Data Manual (ODM) serves to provide trained Delta Flight Operations and Operations Control personnel with some of the information and instructions necessary for safe and economical operation of the aircraft.

## **AUTHORITY**

This manual is published by the General Manager – Performance Engineering, Dept. 088, ATL under the authority of the Vice President – Operations Reliability and Control.

The procedures and data contained in this manual include those in the FAA Approved Airplane Flight Manual and aircraft manufacturer's data.

## **RESPONSIBILITY**

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**DELTA**  
*Revision Notification*

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**Date:** 23 Sep 16

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| <b>QUICK REFERENCE</b><br>Pages: All            | <b>QUICK REFERENCE</b><br>Pages: All            | Changed the table title and eliminated fair nomenclature to make it consistent with new FAA policy |

*\*Pages not displaying a revision date of 23 Sep 16 were unchanged and included only for filing purposes.*



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# 767-300ER GE QUICK REFERENCE CHART

## OPERATIONAL LANDING DISTANCES

### RUNWAY CONDITION ASSESSMENT MATRIX

For additional guidance regarding the classification of the braking action based on existing contaminant types and the ICAO/Runway Condition Code values, please refer to Airway Manual, Supplemental, 4 – Weather, Braking Action.

| Reported Braking Action   |                                                                                                                                     | Reported Runway Surface Conditions                                                                                                                                                                                                                                                                                                                |                            |                   |            |
|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|-------------------|------------|
| PIREP                     | Definition                                                                                                                          | Runway Contaminant                                                                                                                                                                                                                                                                                                                                | ICAO/Runway Condition Code | Mu <sup>(2)</sup> | RCR        |
| --                        | --                                                                                                                                  | • Dry                                                                                                                                                                                                                                                                                                                                             | 6                          |                   | --         |
| <b>Good</b>               | Braking deceleration is normal for the wheel braking effort applied AND directional control is normal                               | <ul style="list-style-type: none"> <li>Frost</li> <li>Wet or Damp</li> </ul> 1/8" or less depth of: <ul style="list-style-type: none"> <li>Water</li> <li>Slush</li> <li>Dry Snow</li> <li>Wet Snow</li> </ul>                                                                                                                                    | 5                          | 40 or higher      | 19 & above |
| <b>Good to Medium</b>     | Braking deceleration OR directional control is between Good and Medium.                                                             | -15°C and colder OAT: <ul style="list-style-type: none"> <li>Compacted Snow</li> </ul>                                                                                                                                                                                                                                                            | 4                          | 39                |            |
| <b>Medium</b>             | Braking deceleration is noticeably reduced for the wheel braking effort applied OR directional control is noticeably reduced.       | <ul style="list-style-type: none"> <li>Wet ("slippery when wet" runway)</li> <li>Dry Snow or Wet Snow (any depth) over Compacted Snow</li> </ul> Greater than 1/8" depth of: <ul style="list-style-type: none"> <li>Dry Snow</li> <li>Wet Snow</li> </ul> Warmer than -15°C OAT: <ul style="list-style-type: none"> <li>Compacted Snow</li> </ul> | 3                          | 30 to 29          | 13 – 18    |
| <b>Medium to Poor</b>     | Braking deceleration OR directional control is between Medium and Poor.                                                             | Greater than 1/8" depth of: <ul style="list-style-type: none"> <li>Water</li> <li>Slush</li> </ul>                                                                                                                                                                                                                                                | 2                          | 21 to 20 or lower |            |
| <b>Poor</b>               | Braking deceleration is significantly reduced for the wheel braking effort applied OR directional control is significantly reduced. | • Ice                                                                                                                                                                                                                                                                                                                                             | 1                          |                   | 6 – 12     |
| <b>Nil <sup>(1)</sup></b> | Braking deceleration is minimal to non-existent for the wheel braking effort applied OR directional control is uncertain.           | <ul style="list-style-type: none"> <li>Wet Ice</li> <li>Water on top of Compacted Snow</li> <li>Dry Snow or Wet Snow over Ice</li> </ul>                                                                                                                                                                                                          | 0                          |                   | 5 & below  |
| --                        | --                                                                                                                                  | • Unreliable                                                                                                                                                                                                                                                                                                                                      | 9 (ICAO only)              | N/A               | N/A        |

<sup>(1)</sup> Operations on any runway with a PIREP or runway contaminant of nil are prohibited.

<sup>(2)</sup> The overlapping Mu scales reflect the inherent inaccuracies of ground based Mu devices. Do not base the calculation of a landing distance solely on runway friction meter readings.

Braking actions "GOOD TO MEDIUM (4)" and "MEDIUM TO POOR (2)" are not displayed on the following pages. It is acceptable to interpolate between the provided data to calculate the desired landing performance when these conditions are present.

### CROSSWIND

On slippery runways, crosswind guidelines are a function of runway surface condition, airplane loading and assume proper pilot technique.

|                             | DRY    | GOOD   | MEDIUM | POOR  |
|-----------------------------|--------|--------|--------|-------|
| <b>Crosswind Guidelines</b> | 40 kt  | 40 kt  | 35 kt  | 17 kt |
| <b>Tailwind Limit</b>       | 10 kt* | 10 kt* | 5 kt   | 0 kt  |

\*Or as permitted by Delta 10-0 special pages.

# 767-300ER GE QUICK REFERENCE CHART

## OPERATIONAL LANDING DISTANCES FEET

### FLAPS 25

| Landing Weight<br>(lb) | NOTE: Interpolate for GOOD-TO-MEDIUM (4) or MEDIUM-TO-POOR (2). |        |       |       |        |            |          |       |        |            |
|------------------------|-----------------------------------------------------------------|--------|-------|-------|--------|------------|----------|-------|--------|------------|
|                        | DRY (6)                                                         |        |       |       |        |            | GOOD (5) |       |        |            |
|                        | AB 1                                                            | AB 2   | AB 3  | AB 4  | Max AB | Max Manual | AB 3     | AB 4  | Max AB | Max Manual |
| 410,000                | 12,100                                                          | 11,000 | 9,800 | 8,600 | 8,300  | 5,400      | 9,800    | 8,600 | 8,300  | 7,000      |
| 400,000                | 11,900                                                          | 10,800 | 9,700 | 8,500 | 8,200  | 5,300      | 9,700    | 8,500 | 8,200  | 6,800      |
| 390,000                | 11,600                                                          | 10,600 | 9,500 | 8,300 | 8,000  | 5,200      | 9,500    | 8,300 | 8,000  | 6,700      |
| 380,000                | 11,400                                                          | 10,400 | 9,300 | 8,200 | 7,900  | 5,100      | 9,300    | 8,200 | 7,900  | 6,600      |
| 370,000                | 11,100                                                          | 10,100 | 9,100 | 8,000 | 7,700  | 4,900      | 9,100    | 8,000 | 7,700  | 6,500      |
| 360,000                | 10,800                                                          | 9,900  | 8,900 | 7,800 | 7,600  | 4,800      | 8,900    | 7,800 | 7,600  | 6,300      |
| 350,000                | 10,600                                                          | 9,700  | 8,700 | 7,700 | 7,400  | 4,700      | 8,700    | 7,700 | 7,400  | 6,200      |
| 340,000                | 10,300                                                          | 9,500  | 8,600 | 7,500 | 7,300  | 4,600      | 8,600    | 7,500 | 7,300  | 6,100      |
| 330,000                | 10,100                                                          | 9,300  | 8,400 | 7,400 | 7,100  | 4,500      | 8,400    | 7,400 | 7,100  | 6,000      |
| 320,000                | 9,800                                                           | 9,100  | 8,200 | 7,200 | 7,000  | 4,400      | 8,200    | 7,200 | 7,000  | 5,800      |
| 310,000                | 9,600                                                           | 8,800  | 8,000 | 7,000 | 6,800  | 4,400      | 8,000    | 7,000 | 6,800  | 5,700      |
| 300,000                | 9,300                                                           | 8,600  | 7,800 | 6,900 | 6,700  | 4,300      | 7,800    | 6,900 | 6,700  | 5,600      |
| 290,000                | 9,100                                                           | 8,400  | 7,600 | 6,700 | 6,500  | 4,200      | 7,600    | 6,700 | 6,500  | 5,500      |
| 280,000                | 8,800                                                           | 8,200  | 7,500 | 6,500 | 6,400  | 4,100      | 7,500    | 6,500 | 6,400  | 5,400      |
| 270,000                | 8,600                                                           | 8,000  | 7,300 | 6,400 | 6,200  | 4,100      | 7,300    | 6,400 | 6,200  | 5,300      |
| 260,000                | 8,300                                                           | 7,700  | 7,100 | 6,200 | 6,100  | 4,000      | 7,100    | 6,200 | 6,100  | 5,200      |

**BASIS:** Zero wind • Two Engine Full Reverse Thrust • Touchdown Speed = VREF25 - 5 •

Data is advisory and includes 15% safety margin and 1,500 ft. air distance from threshold to touchdown.

**REFERENCE DISTANCES BASED UPON PRESSURE ALTITUDE OF 2,000 FEET AND ARE CONSERVATIVE FOR ALL LOWER ALTITUDES.**

 Shaded region corresponds to Max Landing Weight (MLW)

### ALTITUDE ADJUSTMENT

| ALTITUDE (FEET) | DRY (6) |       |       |       |       |      | GOOD (5) |       |       |      |
|-----------------|---------|-------|-------|-------|-------|------|----------|-------|-------|------|
| 0               | -600    | -500  | -400  | -400  | -300  | -200 | -400     | -400  | -300  | -300 |
| 2,000           | 0       | 0     | 0     | 0     | 0     | 0    | 0        | 0     | 0     | 0    |
| 4,000           | 600     | 500   | 400   | 400   | 300   | 200  | 400      | 400   | 300   | 300  |
| 6,000           | 1,200   | 1,000 | 900   | 700   | 700   | 400  | 900      | 700   | 700   | 600  |
| 8,000           | 1,700   | 1,500 | 1,300 | 1,100 | 1,000 | 600  | 1,300    | 1,100 | 1,000 | 800  |

### CORRECTIONS

|                     | DRY (6) |      |      |      |      |      | GOOD (5) |      |      |      |
|---------------------|---------|------|------|------|------|------|----------|------|------|------|
| PER 1 KT HEADWIND   | -50     | -50  | -50  | -50  | -50  | 0    | -50      | -50  | -50  | 0    |
| PER 1 KT TAILWIND   | 150     | 150  | 100  | 100  | 100  | 50   | 100      | 100  | 100  | 100  |
| PER 5 KTS ADD'L SPD | 350     | 350  | 400  | 350  | 350  | 150  | 400      | 350  | 350  | 200  |
| PER 10°C ABOVE ISA  | 300     | 250  | 200  | 200  | 200  | 100  | 200      | 200  | 200  | 150  |
| PER 10°C BELOW ISA  | -250    | -250 | -200 | -200 | -200 | -100 | -200     | -200 | -200 | -150 |
| PER 1% UP SLOPE     | -250    | -150 | 0    | 0    | 0    | -50  | 0        | 0    | 0    | -150 |
| PER 1% DOWN SLOPE   | 200     | 50   | 0    | 0    | 0    | 50   | 0        | 0    | 0    | 150  |
| 1 REVERSER INOP     | 600     | 100  | 0    | 0    | 0    | 100  | 0        | 0    | 0    | 300  |
| 2 REVERSERS INOP    | 700     | 100  | 0    | 0    | 0    | 200  | 0        | 100  | 100  | 700  |
| MANUAL SPOILERS     | 0       | 0    | 0    | 0    | 0    | 500  | 0        | 0    | 0    | 500  |

Note: Do not operate when Braking Action is Nil.

# 767-300ER GE QUICK REFERENCE CHART

## OPERATIONAL LANDING DISTANCES FEET

**FLAPS 25**

| Landing Weight<br>(lb) | NOTE: Interpolate for GOOD-TO-MEDIUM (4) or MEDIUM-TO-POOR (2). |       |        |            |          |        |        |            |
|------------------------|-----------------------------------------------------------------|-------|--------|------------|----------|--------|--------|------------|
|                        | MEDIUM (3)                                                      |       |        |            | POOR (1) |        |        |            |
|                        | AB 3                                                            | AB 4  | Max AB | Max Manual | AB 3     | AB 4   | Max AB | Max Manual |
| 410,000                | 10,400                                                          | 9,700 | 9,600  | 9,500      | 12,400   | 12,400 | 12,400 | 12,400     |
| 400,000                | 10,200                                                          | 9,500 | 9,400  | 9,400      | 12,200   | 12,100 | 12,100 | 12,100     |
| 390,000                | 10,000                                                          | 9,300 | 9,200  | 9,200      | 11,900   | 11,800 | 11,800 | 11,800     |
| 380,000                | 9,800                                                           | 9,100 | 9,000  | 9,000      | 11,600   | 11,500 | 11,500 | 11,500     |
| 370,000                | 9,600                                                           | 8,900 | 8,800  | 8,800      | 11,300   | 11,300 | 11,300 | 11,300     |
| 360,000                | 9,400                                                           | 8,700 | 8,600  | 8,600      | 11,100   | 11,000 | 11,000 | 11,000     |
| 350,000                | 9,200                                                           | 8,500 | 8,400  | 8,400      | 10,800   | 10,700 | 10,700 | 10,700     |
| 340,000                | 9,000                                                           | 8,300 | 8,200  | 8,200      | 10,500   | 10,400 | 10,400 | 10,400     |
| 330,000                | 8,800                                                           | 8,100 | 8,000  | 8,000      | 10,300   | 10,200 | 10,200 | 10,200     |
| 320,000                | 8,600                                                           | 7,900 | 7,800  | 7,800      | 10,000   | 9,900  | 9,900  | 9,900      |
| 310,000                | 8,400                                                           | 7,700 | 7,700  | 7,600      | 9,800    | 9,600  | 9,600  | 9,600      |
| 300,000                | 8,200                                                           | 7,500 | 7,500  | 7,400      | 9,500    | 9,400  | 9,400  | 9,400      |
| 290,000                | 8,000                                                           | 7,400 | 7,300  | 7,300      | 9,200    | 9,100  | 9,100  | 9,100      |
| 280,000                | 7,800                                                           | 7,200 | 7,100  | 7,100      | 9,000    | 8,800  | 8,800  | 8,800      |
| 270,000                | 7,600                                                           | 7,000 | 6,900  | 6,900      | 8,700    | 8,600  | 8,600  | 8,600      |
| 260,000                | 7,400                                                           | 6,800 | 6,700  | 6,700      | 8,500    | 8,300  | 8,300  | 8,300      |

**BASIS:** Zero wind • Two Engine Full Reverse Thrust • Touchdown Speed = VREF25 - 5 •

Data is advisory and includes 15% safety margin and 1,500 ft. air distance from threshold to touchdown.

**REFERENCE DISTANCES BASED UPON PRESSURE ALTITUDE OF 2,000 FEET AND ARE CONSERVATIVE FOR ALL LOWER ALTITUDES.**



Shaded region corresponds to Max Landing Weight (MLW)

### ALTITUDE ADJUSTMENT

| ALTITUDE (FEET) | MEDIUM (3) |       |       |       | POOR (1) |       |       |       |
|-----------------|------------|-------|-------|-------|----------|-------|-------|-------|
| 0               | -500       | -400  | -400  | -400  | -600     | -600  | -600  | -600  |
| 2,000           | 0          | 0     | 0     | 0     | 0        | 0     | 0     | 0     |
| 4,000           | 500        | 400   | 400   | 400   | 600      | 600   | 600   | 600   |
| 6,000           | 900        | 900   | 900   | 900   | 1,200    | 1,200 | 1,200 | 1,200 |
| 8,000           | 1,400      | 1,300 | 1,300 | 1,300 | 1,800    | 1,800 | 1,800 | 1,800 |

| CORRECTIONS         | MEDIUM (3) |       |       |       | POOR (1) |       |       |       |
|---------------------|------------|-------|-------|-------|----------|-------|-------|-------|
| PER 1 KT HEADWIND   | -50        | -50   | -50   | -50   | -50      | -50   | -50   | -50   |
| PER 1 KT TAILWIND   | 150        | 150   | 150   | 150   | 200      | 200   | 200   | 200   |
| PER 5 KTS ADD'L SPD | 400        | 350   | 350   | 250   | 400      | 300   | 300   | 300   |
| PER 10°C ABOVE ISA  | 250        | 200   | 200   | 200   | 300      | 300   | 300   | 300   |
| PER 10°C BELOW ISA  | -250       | -200  | -200  | -200  | -250     | -250  | -250  | -250  |
| PER 1% UP SLOPE     | -100       | -150  | -200  | -250  | -400     | -500  | -500  | -500  |
| PER 1% DOWN SLOPE   | 200        | 300   | 300   | 350   | 700      | 750   | 750   | 750   |
| 1 REVERSER INOP     | 400        | 600   | 700   | 800   | 1,500    | 1,700 | 1,700 | 1,700 |
| 2 REVERSERS INOP    | 1,300      | 1,700 | 1,800 | 1,900 | 4,300    | 4,500 | 4,500 | 4,500 |
| MANUAL SPOILERS     | 0          | 0     | 0     | 500   | 0        | 0     | 0     | 500   |

Note: Do not operate when Braking Action is Nil.

# 767-300ER GE QUICK REFERENCE CHART

## OPERATIONAL LANDING DISTANCES FEET

### FLAPS 30

| Landing Weight<br>(lb) | NOTE: Interpolate for GOOD-TO-MEDIUM (4) or MEDIUM-TO-POOR (2). |        |        |       |        |            |          |       |        |            |
|------------------------|-----------------------------------------------------------------|--------|--------|-------|--------|------------|----------|-------|--------|------------|
|                        | DRY (6)                                                         |        |        |       |        |            | GOOD (5) |       |        |            |
|                        | AB 1                                                            | AB 2   | AB 3   | AB 4  | Max AB | Max Manual | AB 3     | AB 4  | Max AB | Max Manual |
| 410,000                | 12,600                                                          | 11,600 | 10,500 | 9,100 | 8,800  | 5,700      | 10,500   | 9,100 | 8,900  | 7,300      |
| 400,000                | 12,300                                                          | 11,300 | 10,200 | 8,900 | 8,600  | 5,500      | 10,200   | 8,900 | 8,600  | 7,100      |
| 390,000                | 11,900                                                          | 10,900 | 9,900  | 8,600 | 8,400  | 5,300      | 9,900    | 8,600 | 8,400  | 7,000      |
| 380,000                | 11,600                                                          | 10,600 | 9,600  | 8,400 | 8,100  | 5,200      | 9,600    | 8,400 | 8,100  | 6,800      |
| 370,000                | 11,200                                                          | 10,300 | 9,300  | 8,100 | 7,900  | 5,000      | 9,300    | 8,100 | 7,900  | 6,600      |
| 360,000                | 10,900                                                          | 10,000 | 9,000  | 7,900 | 7,600  | 4,800      | 9,000    | 7,900 | 7,700  | 6,400      |
| 350,000                | 10,500                                                          | 9,700  | 8,700  | 7,600 | 7,400  | 4,700      | 8,700    | 7,600 | 7,400  | 6,200      |
| 340,000                | 10,200                                                          | 9,300  | 8,400  | 7,400 | 7,200  | 4,500      | 8,400    | 7,400 | 7,200  | 6,000      |
| 330,000                | 9,900                                                           | 9,100  | 8,200  | 7,200 | 7,000  | 4,400      | 8,200    | 7,200 | 7,000  | 5,900      |
| 320,000                | 9,700                                                           | 8,900  | 8,000  | 7,000 | 6,800  | 4,400      | 8,000    | 7,000 | 6,800  | 5,800      |
| 310,000                | 9,400                                                           | 8,600  | 7,800  | 6,900 | 6,700  | 4,300      | 7,800    | 6,900 | 6,700  | 5,700      |
| 300,000                | 9,200                                                           | 8,400  | 7,600  | 6,700 | 6,500  | 4,200      | 7,600    | 6,700 | 6,500  | 5,500      |
| 290,000                | 8,900                                                           | 8,200  | 7,400  | 6,500 | 6,400  | 4,100      | 7,400    | 6,500 | 6,400  | 5,400      |
| 280,000                | 8,700                                                           | 8,000  | 7,200  | 6,400 | 6,200  | 4,000      | 7,200    | 6,400 | 6,200  | 5,300      |
| 270,000                | 8,400                                                           | 7,700  | 7,000  | 6,200 | 6,000  | 4,000      | 7,000    | 6,200 | 6,000  | 5,200      |
| 260,000                | 8,200                                                           | 7,500  | 6,800  | 6,100 | 5,900  | 3,900      | 6,800    | 6,100 | 5,900  | 5,000      |

**BASIS:** Zero wind • Two Engine Full Reverse Thrust • Touchdown Speed = VREF30 - 5 •

Data is advisory and includes 15% safety margin and 1,500 ft. air distance from threshold to touchdown.

**REFERENCE DISTANCES BASED UPON PRESSURE ALTITUDE OF 2,000 FEET AND ARE CONSERVATIVE FOR ALL LOWER ALTITUDES.**

 Shaded region corresponds to Max Landing Weight (MLW)

### ALTITUDE ADJUSTMENT

| ALTITUDE (FEET) | DRY (6) |       |       |       |       |      | GOOD (5) |       |       |      |
|-----------------|---------|-------|-------|-------|-------|------|----------|-------|-------|------|
| 0               | -600    | -500  | -400  | -300  | -300  | -200 | -400     | -300  | -300  | -300 |
| 2,000           | 0       | 0     | 0     | 0     | 0     | 0    | 0        | 0     | 0     | 0    |
| 4,000           | 600     | 500   | 400   | 300   | 300   | 200  | 400      | 300   | 300   | 300  |
| 6,000           | 1,100   | 1,000 | 800   | 700   | 700   | 400  | 800      | 700   | 700   | 600  |
| 8,000           | 1,700   | 1,400 | 1,200 | 1,000 | 1,000 | 600  | 1,200    | 1,000 | 1,000 | 800  |

### CORRECTIONS

|                     | DRY (6) |      |      |      |      |      | GOOD (5) |      |      |      |
|---------------------|---------|------|------|------|------|------|----------|------|------|------|
| PER 1 KT HEADWIND   | -50     | -50  | -50  | -50  | -50  | 0    | -50      | -50  | -50  | 0    |
| PER 1 KT TAILWIND   | 150     | 150  | 100  | 100  | 100  | 50   | 100      | 100  | 100  | 100  |
| PER 5 KTS ADD'L SPD | 350     | 350  | 400  | 350  | 350  | 150  | 400      | 350  | 350  | 200  |
| PER 10°C ABOVE ISA  | 300     | 250  | 200  | 200  | 150  | 100  | 200      | 200  | 150  | 150  |
| PER 10°C BELOW ISA  | -250    | -250 | -200 | -200 | -150 | -100 | -200     | -200 | -150 | -150 |
| PER 1% UP SLOPE     | -250    | -150 | 0    | 0    | 0    | -50  | 0        | 0    | 0    | -150 |
| PER 1% DOWN SLOPE   | 200     | 50   | 0    | 0    | 0    | 50   | 0        | 0    | 0    | 150  |
| 1 REVERSER INOP     | 500     | 100  | 0    | 0    | 0    | 100  | 0        | 0    | 0    | 300  |
| 2 REVERSERS INOP    | 600     | 100  | 0    | 0    | 0    | 200  | 0        | 100  | 100  | 600  |
| MANUAL SPOILERS     | 0       | 0    | 0    | 0    | 0    | 500  | 0        | 0    | 0    | 500  |

Note: Do not operate when Braking Action is Nil.

# 767-300ER GE QUICK REFERENCE CHART

## OPERATIONAL LANDING DISTANCES FEET

### FLAPS 30

| Landing Weight<br>(lb) | NOTE: Interpolate for GOOD-TO-MEDIUM (4) or MEDIUM-TO-POOR (2). |        |        |            |          |        |        |            |
|------------------------|-----------------------------------------------------------------|--------|--------|------------|----------|--------|--------|------------|
|                        | MEDIUM (3)                                                      |        |        |            | POOR (1) |        |        |            |
|                        | AB 3                                                            | AB 4   | Max AB | Max Manual | AB 3     | AB 4   | Max AB | Max Manual |
| 410,000                | 11,100                                                          | 10,200 | 10,100 | 10,000     | 13,100   | 12,900 | 12,900 | 12,900     |
| 400,000                | 10,700                                                          | 9,900  | 9,900  | 9,700      | 12,700   | 12,500 | 12,500 | 12,500     |
| 390,000                | 10,400                                                          | 9,600  | 9,600  | 9,400      | 12,300   | 12,200 | 12,200 | 12,200     |
| 380,000                | 10,100                                                          | 9,400  | 9,300  | 9,200      | 12,000   | 11,800 | 11,800 | 11,800     |
| 370,000                | 9,800                                                           | 9,100  | 9,000  | 8,900      | 11,600   | 11,500 | 11,500 | 11,500     |
| 360,000                | 9,500                                                           | 8,800  | 8,700  | 8,700      | 11,200   | 11,100 | 11,100 | 11,100     |
| 350,000                | 9,100                                                           | 8,500  | 8,400  | 8,400      | 10,800   | 10,700 | 10,700 | 10,700     |
| 340,000                | 8,800                                                           | 8,200  | 8,100  | 8,100      | 10,400   | 10,400 | 10,400 | 10,400     |
| 330,000                | 8,600                                                           | 8,000  | 7,900  | 7,900      | 10,200   | 10,100 | 10,100 | 10,100     |
| 320,000                | 8,400                                                           | 7,800  | 7,700  | 7,700      | 9,900    | 9,900  | 9,900  | 9,900      |
| 310,000                | 8,200                                                           | 7,600  | 7,500  | 7,500      | 9,600    | 9,600  | 9,600  | 9,600      |
| 300,000                | 8,000                                                           | 7,400  | 7,400  | 7,300      | 9,400    | 9,300  | 9,300  | 9,300      |
| 290,000                | 7,800                                                           | 7,200  | 7,200  | 7,100      | 9,100    | 9,100  | 9,100  | 9,100      |
| 280,000                | 7,600                                                           | 7,000  | 7,000  | 6,900      | 8,800    | 8,800  | 8,800  | 8,800      |
| 270,000                | 7,400                                                           | 6,800  | 6,800  | 6,800      | 8,600    | 8,500  | 8,500  | 8,500      |
| 260,000                | 7,200                                                           | 6,600  | 6,600  | 6,600      | 8,300    | 8,300  | 8,300  | 8,300      |

**BASIS:** Zero wind • Two Engine Full Reverse Thrust • Touchdown Speed = VREF30 - 5 •

Data is advisory and includes 15% safety margin and 1,500 ft. air distance from threshold to touchdown.

**REFERENCE DISTANCES BASED UPON PRESSURE ALTITUDE OF 2,000 FEET AND ARE CONSERVATIVE FOR ALL LOWER ALTITUDES.**



Shaded region corresponds to Max Landing Weight (MLW)

### ALTITUDE ADJUSTMENT

| ALTITUDE (FEET) | MEDIUM (3) |       |       |       | POOR (1) |       |       |       |
|-----------------|------------|-------|-------|-------|----------|-------|-------|-------|
| 0               | -500       | -400  | -400  | -400  | -600     | -600  | -600  | -600  |
| 2,000           | 0          | 0     | 0     | 0     | 0        | 0     | 0     | 0     |
| 4,000           | 500        | 400   | 400   | 400   | 600      | 600   | 600   | 600   |
| 6,000           | 900        | 900   | 900   | 900   | 1,200    | 1,200 | 1,200 | 1,200 |
| 8,000           | 1,400      | 1,300 | 1,300 | 1,300 | 1,800    | 1,800 | 1,800 | 1,800 |

| CORRECTIONS         | MEDIUM (3) |       |       |       | POOR (1) |       |       |       |
|---------------------|------------|-------|-------|-------|----------|-------|-------|-------|
| PER 1 KT HEADWIND   | -50        | -50   | -50   | -50   | -50      | -50   | -50   | -50   |
| PER 1 KT TAILWIND   | 150        | 150   | 150   | 150   | 200      | 200   | 200   | 200   |
| PER 5 KTS ADD'L SPD | 400        | 350   | 300   | 250   | 400      | 300   | 300   | 300   |
| PER 10°C ABOVE ISA  | 250        | 200   | 200   | 200   | 300      | 300   | 300   | 300   |
| PER 10°C BELOW ISA  | -200       | -200  | -200  | -200  | -250     | -250  | -250  | -250  |
| PER 1% UP SLOPE     | -100       | -150  | -200  | -300  | -400     | -500  | -500  | -500  |
| PER 1% DOWN SLOPE   | 200        | 300   | 300   | 350   | 750      | 800   | 800   | 800   |
| 1 REVERSER INOP     | 400        | 600   | 700   | 700   | 1,500    | 1,600 | 1,600 | 1,600 |
| 2 REVERSERS INOP    | 1,200      | 1,600 | 1,700 | 1,800 | 4,000    | 4,200 | 4,200 | 4,100 |
| MANUAL SPOILERS     | 0          | 0     | 0     | 500   | 0        | 0     | 0     | 500   |

Note: Do not operate when Braking Action is Nil.



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## DEFINITIONS AND ASSUMPTIONS

**AIR DISTANCE** – The ground distance adjusted for wind. A headwind results in a longer air distance than the actual ground distance and a tailwind results in a shorter air distance than the actual ground distance.

**BLOCK FUEL** – Sum of Trip Fuel plus Taxi Fuel.

**EQUAL TIME POINT (ETP)** – Where it would take an equal amount of time, accounting for wind, to go on to the next suitable airport or destination as it would to go back to the last suitable airport or origin.

**ISA** - International Standard Atmosphere temperature, in °C, for a given pressure altitude. ISA temperature for Sea Level is 15°C (59°F).

**ISA DEVIATION** - The difference between the standard ISA temperature and the ambient temperature in °C.

**NET DRIFTDOWN PROFILE** – Altitude as a function of distance as an aircraft descends following the loss of one or two engines. Actual altitude is degraded for conservatism.

**NET LEVEL OFF ALTITUDE** – Altitude for a given weight at which the aircraft can achieve a 1.1% climb gradient with one or two engines inoperative.

**STATIC AIR TEMPERATURE (SAT)** - The ambient still air temperature outside of the aircraft. Sometimes known as the Outside Air Temperature (OAT).

**TOTAL AIR TEMPERATURE (TAT)** - The total of the ambient air temperature (SAT) plus the increase in temperature due to compression heating.

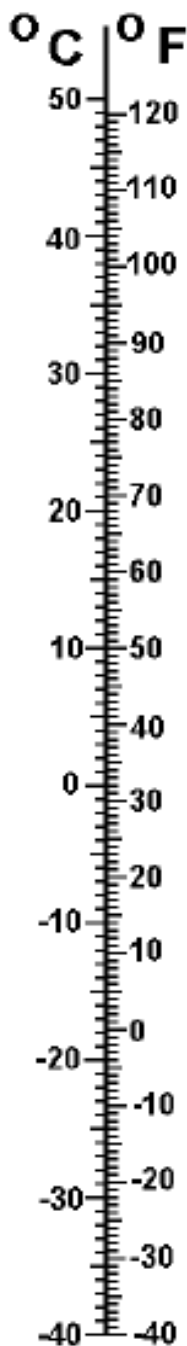
**TRIP FUEL** – Fuel burn from brake release to landing.

**V<sub>mo</sub>/M<sub>mo</sub>** - Maximum allowable operating indicated airspeed or Mach number.



# TEMPERATURE CONVERSION AND STATIC AIR TEMPERATURE

°C



| ALTITUDE<br>- FEET | ISA DEVIATION |          |       |          |          |          |
|--------------------|---------------|----------|-------|----------|----------|----------|
|                    | ISA-20°C      | ISA-10°C | ISA   | ISA+10°C | ISA+20°C | ISA+30°C |
| 36,000 & Higher    | -76.5         | -66.5    | -56.5 | -46.5    | -36.5    | -26.5    |
| 35,000             | -74.2         | -64.2    | -54.2 | -44.2    | -34.2    | -24.2    |
| 34,000             | -72.3         | -62.3    | -52.3 | -42.3    | -32.3    | -22.3    |
| 33,000             | -70.3         | -60.3    | -50.3 | -40.3    | -30.3    | -20.3    |
| 32,000             | -68.3         | -58.3    | -48.3 | -38.3    | -28.3    | -18.3    |
| 31,000             | -66.3         | -56.3    | -46.3 | -36.3    | -26.3    | -16.3    |
| 30,000             | -64.3         | -54.3    | -44.3 | -34.3    | -24.3    | -14.3    |
| 29,000             | -62.4         | -52.4    | -42.4 | -32.4    | -22.4    | -12.4    |
| 28,000             | -60.4         | -50.4    | -40.4 | -30.4    | -20.4    | -10.4    |
| 27,000             | -58.4         | -48.4    | -38.4 | -28.4    | -18.4    | -8.4     |
| 26,000             | -56.5         | -46.5    | -36.5 | -26.5    | -16.5    | -6.5     |
| 25,000             | -54.5         | -44.5    | -34.5 | -24.5    | -14.5    | -4.5     |
| 24,000             | -52.5         | -42.5    | -32.5 | -22.5    | -12.5    | -2.5     |
| 23,000             | -50.5         | -40.5    | -30.5 | -20.5    | -10.5    | -0.5     |
| 22,000             | -48.5         | -38.5    | -28.5 | -18.5    | -8.5     | +1.5     |
| 21,000             | -46.6         | -36.6    | -26.6 | -16.6    | -6.6     | +3.4     |
| 20,000             | -44.6         | -34.6    | -24.6 | -14.6    | -4.6     | +5.4     |
| 19,000             | -42.6         | -32.6    | -22.6 | -12.6    | -2.6     | +7.4     |
| 18,000             | -40.6         | -30.6    | -20.6 | -10.6    | -0.6     | +9.4     |
| 17,000             | -38.7         | -28.7    | -18.7 | -8.7     | +1.3     | +11.3    |
| 16,000             | -36.7         | -26.7    | -16.7 | -6.7     | +3.3     | +13.3    |
| 15,000             | -34.7         | -24.7    | -14.7 | -4.7     | +5.3     | +15.3    |
| 14,000             | -32.7         | -22.7    | -12.7 | -2.7     | +7.3     | +17.3    |
| 13,000             | -30.7         | -20.7    | -10.7 | -0.7     | +9.3     | +19.3    |
| 12,000             | -28.8         | -18.8    | -8.8  | +1.2     | +11.2    | +21.2    |
| 11,000             | -26.8         | -16.8    | -6.8  | +3.2     | +13.2    | +23.2    |
| 10,000             | -24.8         | -14.8    | -4.8  | +5.2     | +15.2    | +25.2    |
| 5000               | -14.9         | -4.9     | +5.1  | +15.1    | +25.1    | +35.1    |
| 0                  | -5.0          | +5.0     | +15.0 | +25.0    | +35.0    | +45.0    |

RULE OF THUMB: For standard temperature (ISA) at or below 36,000 feet:

Double altitude (in thousands of feet), subtract 15, change sign.

|           |            |                   |                    |                    |
|-----------|------------|-------------------|--------------------|--------------------|
| EXAMPLES: | <u>ALT</u> | <u>DOUBLE ALT</u> | <u>SUBTRACT 15</u> | <u>CHANGE SIGN</u> |
|           | 0          | 0                 | -15                | +15                |
|           | 33         | 66                | 51                 | -51                |

# TOTAL AIR TEMPERATURE vs STATIC AIR TEMPERATURE

°C

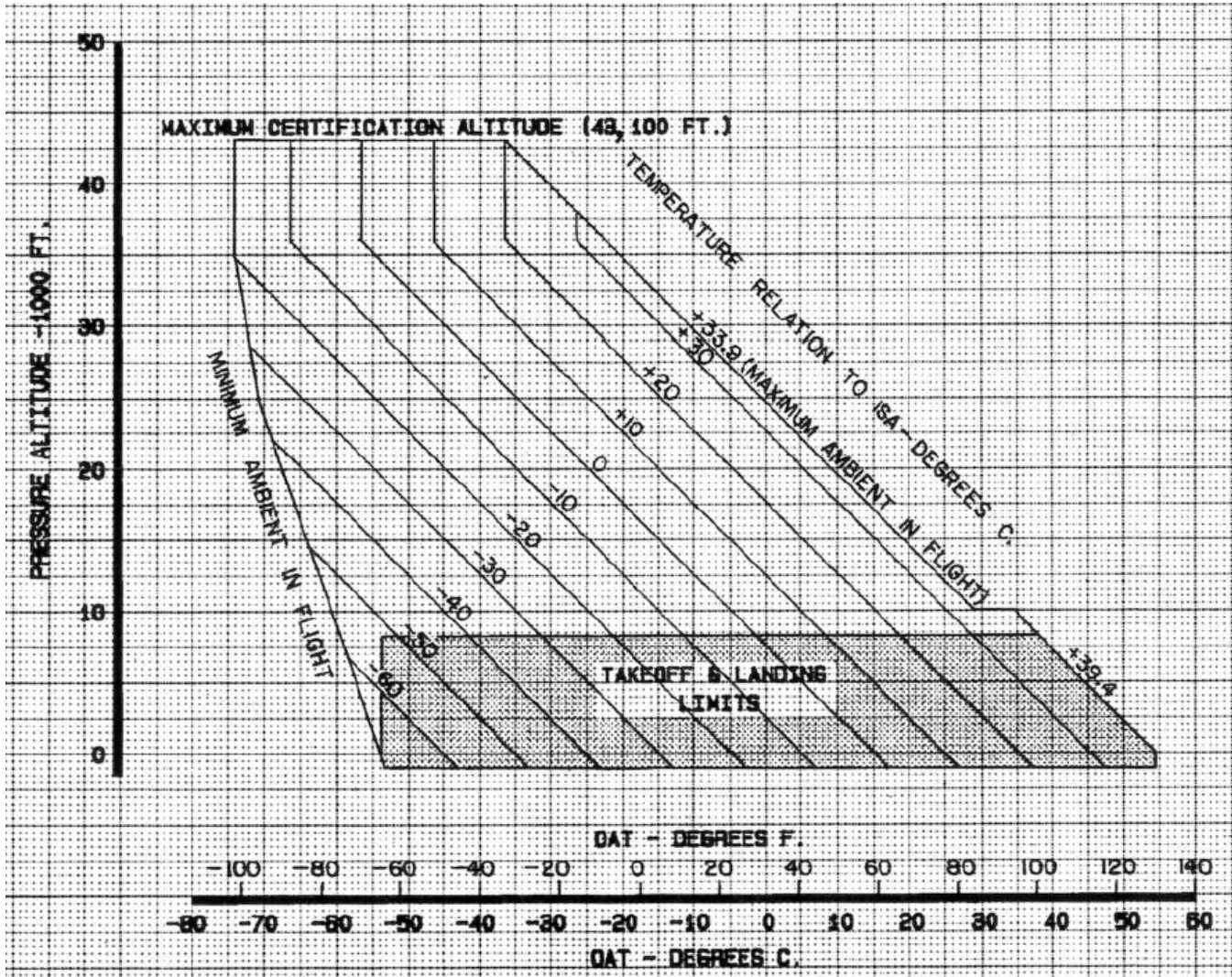
| IND<br>TAT<br>°C | INDICATED MACH NUMBER |     |     |     |     |     |     |     |     |     |     |     |     |     |
|------------------|-----------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|                  | .40                   | .50 | .60 | .70 | .74 | .75 | .76 | .77 | .78 | .80 | .82 | .84 | .86 | .88 |
| 75               | 64                    | 58  | 52  | 44  | 41  | 40  | 39  | 38  | 37  | 35  | 34  | 32  | 30  | 28  |
| 70               | 59                    | 54  | 47  | 39  | 36  | 35  | 34  | 33  | 33  | 31  | 29  | 28  | 26  | 24  |
| 65               | 55                    | 49  | 42  | 35  | 32  | 31  | 30  | 29  | 28  | 27  | 25  | 23  | 21  | 20  |
| 60               | 50                    | 44  | 38  | 30  | 27  | 26  | 25  | 24  | 24  | 22  | 21  | 19  | 17  | 15  |
| 55               | 45                    | 39  | 33  | 26  | 23  | 22  | 21  | 20  | 19  | 18  | 16  | 14  | 13  | 11  |
| 50               | 40                    | 35  | 28  | 21  | 18  | 17  | 16  | 15  | 14  | 13  | 12  | 10  | 8   | 7   |
| 45               | 35                    | 30  | 24  | 17  | 14  | 13  | 12  | 11  | 10  | 9   | 7   | 6   | 4   | 2   |
| 40               | 30                    | 25  | 19  | 12  | 9   | 8   | 7   | 6   | 6   | 4   | 3   | 1   | 0   | -2  |
| 35               | 25                    | 20  | 14  | 7   | 5   | 4   | 3   | 2   | 1   | 0   | -1  | -3  | -5  | -6  |
| 30               | 21                    | 16  | 10  | 3   | 0   | -1  | -2  | -3  | -3  | -4  | -6  | -7  | -9  | -11 |
| 25               | 16                    | 11  | 5   | -2  | -4  | -5  | -6  | -7  | -7  | -9  | -10 | -12 | -13 | -15 |
| 20               | 11                    | 6   | 0   | -6  | -9  | -10 | -11 | -12 | -12 | -13 | -15 | -16 | -18 | -19 |
| 15               | 6                     | 1   | -4  | -11 | -13 | -14 | -15 | -16 | -16 | -18 | -19 | -21 | -22 | -24 |
| 10               | 1                     | -3  | -9  | -15 | -18 | -19 | -20 | -21 | -21 | -22 | -23 | -25 | -27 | -28 |
| 5                | -4                    | -8  | -14 | -20 | -22 | -23 | -24 | -25 | -25 | -27 | -28 | -29 | -31 | -32 |
| 0                | -8                    | -13 | -18 | -24 | -27 | -28 | -29 | -30 | -30 | -31 | -32 | -34 | -35 | -37 |
| -5               | -13                   | -18 | -23 | -29 | -31 | -32 | -33 | -34 | -34 | -35 | -37 | -38 | -40 | -41 |
| -10              | -18                   | -23 | -28 | -33 | -36 | -37 | -38 | -39 | -39 | -40 | -41 | -43 | -44 | -45 |
| -15              | -23                   | -27 | -32 | -38 | -40 | -41 | -42 | -43 | -43 | -44 | -46 | -47 | -48 | -50 |
| -20              | -28                   | -32 | -37 | -43 | -45 | -46 | -47 | -48 | -48 | -49 | -50 | -51 | -53 | -54 |
| -25              | -33                   | -37 | -42 | -47 | -49 | -50 | -51 | -52 | -52 | -53 | -54 | -56 | -57 | -58 |
| -30              | -38                   | -42 | -46 | -52 | -54 | -54 | -55 | -55 | -56 | -58 | -59 | -60 | -61 | -63 |
| -35              | -42                   | -46 | -51 | -56 | -58 | -59 | -60 | -61 | -61 | -62 | -63 | -64 | -66 | -67 |
| -40              | -47                   | -51 | -56 | -61 | -63 | -63 | -64 | -64 | -65 | -66 | -68 | -69 | -70 | -71 |
| -45              | -52                   | -56 | -60 | -65 | -67 | -68 | -69 | -70 | -70 | -71 | -72 | -73 | -74 | -76 |
| -50              | -57                   | -61 | -65 | -70 | -72 | -72 | -73 | -73 | -74 | -75 | -76 | -78 | -79 | -80 |
| -55              | -62                   | -65 | -70 | -74 | -76 | -77 | -78 | -79 | -79 | -80 | -81 | -82 | -83 | -84 |

## NORMAL OPERATING SPEED LIMIT

$V_{MO} / M_{MO}$

| PRESSURE<br>ALTITUDE | INDICATED<br>V <sub>mo</sub> (KIAS) | MACH<br>M <sub>mo</sub>                |
|----------------------|-------------------------------------|----------------------------------------|
| 0                    | 360 (Non-Winglet)<br>340 (Winglet)  | 0.544 (Non-Winglet)<br>0.514 (Winglet) |
| 5,000                | 360 (Non-Winglet)<br>340 (Winglet)  | 0.593 (Non-Winglet)<br>0.560 (Winglet) |
| 10,000               | 360 (Non-Winglet)<br>340 (Winglet)  | 0.647 (Non-Winglet)<br>0.612 (Winglet) |
| 15,000               | 360 (Non-Winglet)<br>340 (Winglet)  | 0.707 (Non-Winglet)<br>0.669 (Winglet) |
| 17,000               | 360 (Non-Winglet)<br>340 (Winglet)  | 0.733 (Non-Winglet)<br>0.694 (Winglet) |
| 19,000               | 360 (Non-Winglet)<br>340 (Winglet)  | 0.760 (Non-Winglet)<br>0.720 (Winglet) |
| 21,000               | 360 (Non-Winglet)<br>340 (Winglet)  | 0.788 (Non-Winglet)<br>0.747 (Winglet) |
| 23,000               | 360 (Non-Winglet)<br>340 (Winglet)  | 0.818 (Non-Winglet)<br>0.775 (Winglet) |
| 25,000               | 360 (Non-Winglet)<br>340 (Winglet)  | 0.848 (Non-Winglet)<br>0.805 (Winglet) |
| 27,000               | 351 (Non-Winglet)<br>340 (Winglet)  | 0.860 (Non-Winglet)<br>0.836 (Winglet) |
| 29,000               | 336                                 | 0.860                                  |
| 31,000               | 322                                 | 0.860                                  |
| 33,000               | 308                                 | 0.860                                  |
| 35,000               | 294                                 | 0.860                                  |
| 37,000               | 282                                 | 0.860                                  |
| 39,000               | 269                                 | 0.860                                  |
| 41,000               | 256                                 | 0.860                                  |
| 43,000               | 244                                 | 0.860                                  |

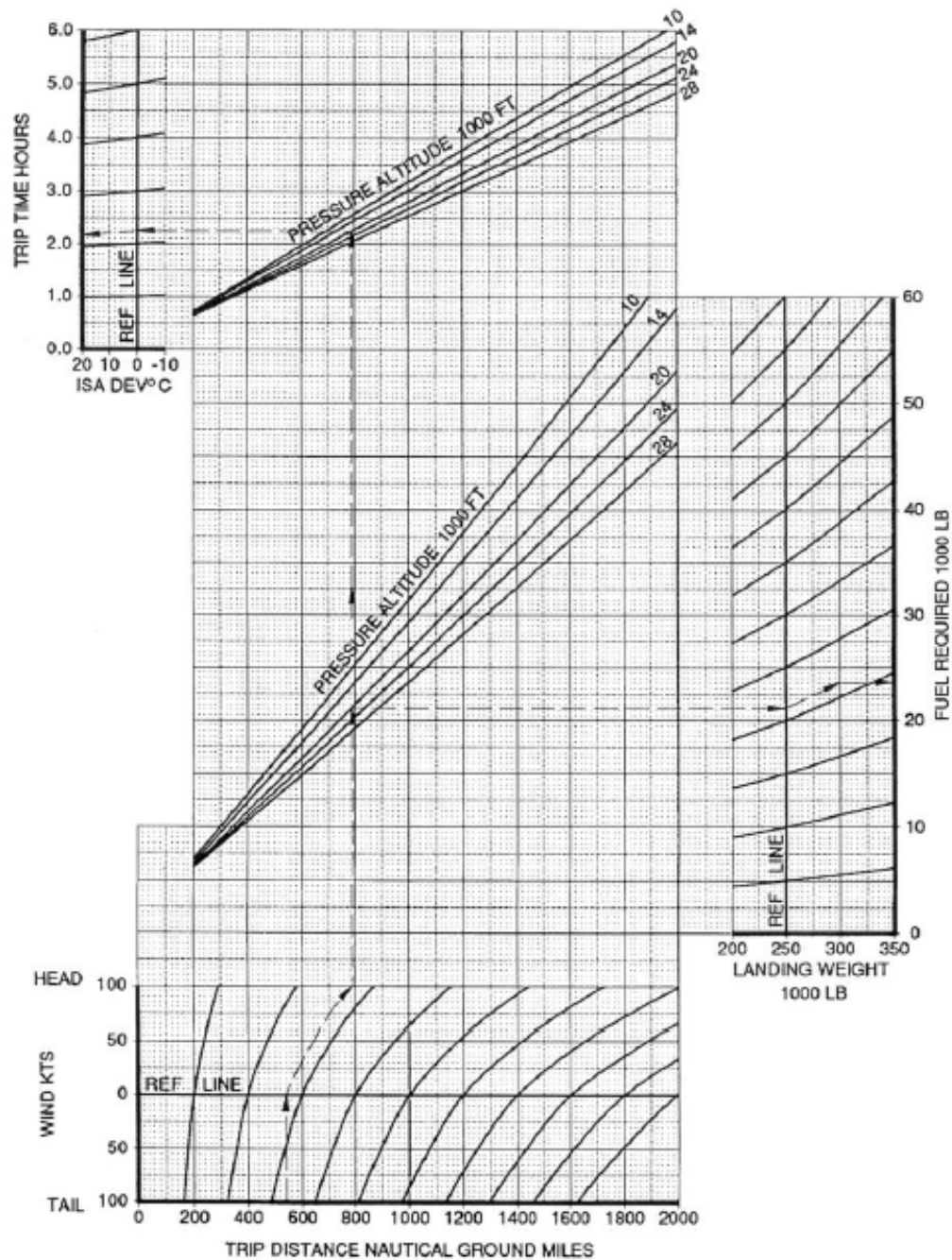
## ENVIRONMENT ENVELOPE





## TRIP FUEL ESTIMATE

0 – 2,000 NM TRIP

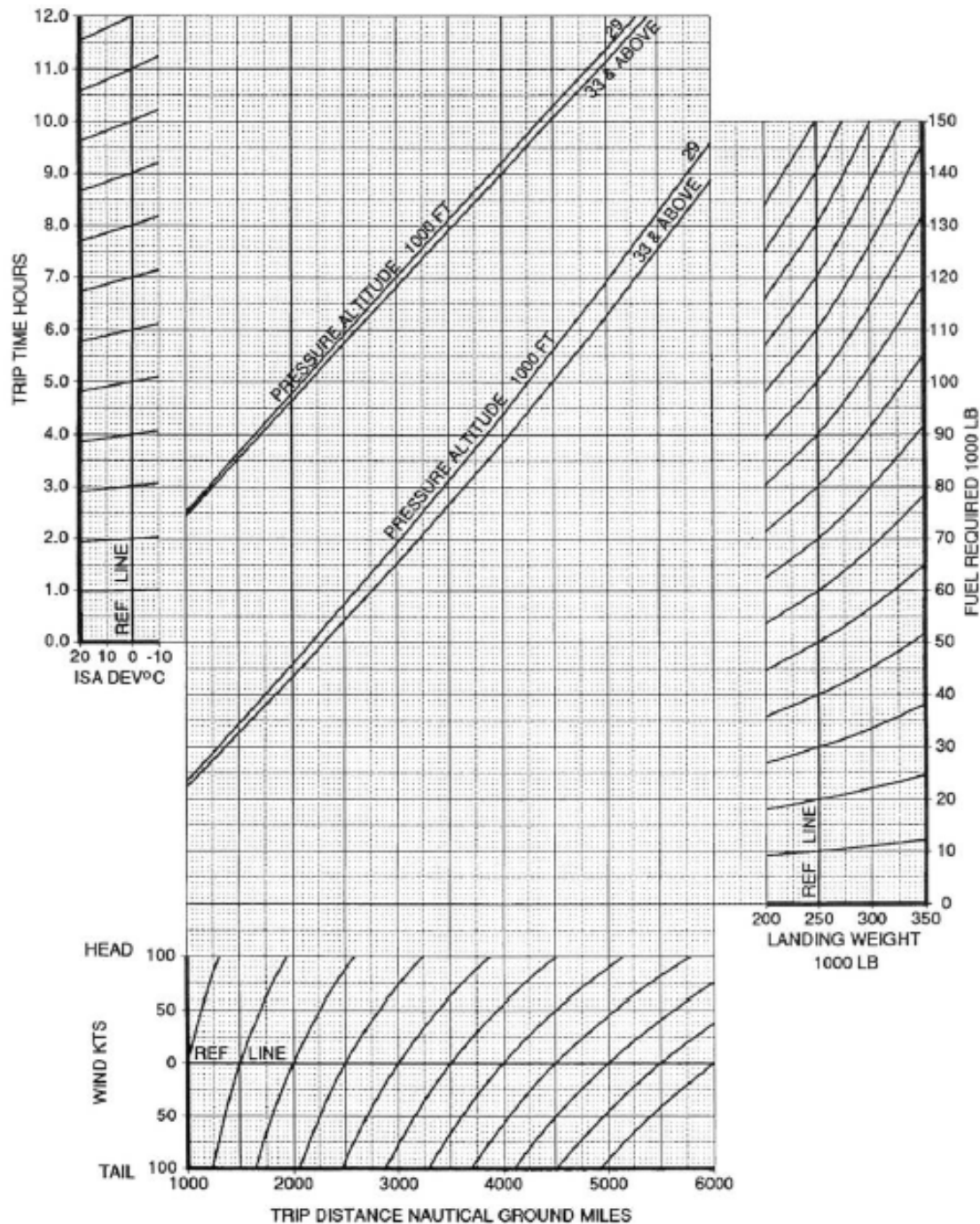


### BASIS:

- 290 / 0.78M Climb
- Long Range Cruise
- 0.78M / 290 / 250 Descent

## TRIP FUEL ESTIMATE

1,000 – 6,000 NM TRIP



### BASIS:

- 290 / 0.78M Climb
- Long Range Cruise
- 0.78M / 290 / 250 Descent

## SHORT RANGE FLIGHTS FUEL CONSUMPTION TABLE

Standard Day

| Block Time<br>(minutes) | Block Fuel<br>(pounds) |
|-------------------------|------------------------|
| 30                      | 3,340                  |
| 35                      | 4,300                  |
| 40                      | 5,260                  |
| 45                      | 6,220                  |
| 50                      | 7,050                  |
| 55                      | 7,880                  |
| 60                      | 8,710                  |
| 65                      | 9,510                  |
| 70                      | 10,310                 |
| 75                      | 11,110                 |
| 80                      | 11,910                 |

**BASIS:**

- Standard day
- IFR reserves
- Climb @ 250 KIAS / 310 KIAS / Minimum Cost Cruise Mach
- Cruise @ Minimum Cost Cruise Mach
- Descent @ Cruise Mach / 300 KIAS / 250 KIAS
- Block Time = Trip Time + 15 minutes Ground Maneuver Time
- Block Fuel = Trip Fuel + 720 pounds Ground Maneuver Fuel
- Operational Landing Weight – 260,000 pounds

## ENROUTE FUEL TEMPERATURE

FOR DETERMINING DISPATCH CAPABILITY BASED ON FUEL FREEZE POINT

| FUEL TYPE                       |              | JET A                      | JP-5 | JET A1 | JET B | TS-1         |
|---------------------------------|--------------|----------------------------|------|--------|-------|--------------|
| ADJUSTED FUEL FREEZE TEMP. - °C |              | -37                        | -43  | -44    | -47   | -57          |
| MACH                            | FLIGHT LEVEL | MAXIMUM ISA DEVIATION - °C |      |        |       | NOT LIMITING |
| 0.80                            | 330          | -13                        | -19  | -20    | -22   |              |
|                                 | 350          | -9                         | -15  | -16    | -18   |              |
|                                 | 370 & HIGHER | -7                         | -13  | -14    | -16   |              |
| 0.81                            | 330          | -14                        | -19  | -20    | -23   |              |
|                                 | 350          | -10                        | -15  | -16    | -19   |              |
|                                 | 370 & HIGHER | -8                         | -13  | -14    | -17   |              |
| 0.82                            | 330          | -15                        | -20  | -21    | -23   |              |
|                                 | 350          | -11                        | -16  | -17    | -20   |              |
|                                 | 370 & HIGHER | -8                         | -14  | -15    | -17   |              |
| 0.83                            | 330          | -15                        | -20  | -21    | -24   |              |
|                                 | 350          | -11                        | -17  | -17    | -20   |              |
|                                 | 370 & HIGHER | -9                         | -14  | -15    | -18   |              |

NOTE: For in flight reference, consult the POM, Transoceanic Operations section.

### INSTRUCTIONS:

1. Locate the type of fuel being used.  
NOTE: The Adjusted Fuel Freezing Temperature is the Basic Fuel Freezing Temperature + 3°C (per the Approved Aircraft Flight Manual).
2. Move down to the Mach Number and Altitude expected en route and read the Maximum ISA Deviation.
3. Do not dispatch aircraft into en route temperatures colder than the Maximum ISA Deviation obtained in Step 2 above.

### EXAMPLE:

Fuel Type = Jet A (adjusted freeze point -37°C)  
Expected Flight Level = 350  
Expected Mach Number = 0.82

1. Enter the top of the chart under JET A.
2. Move down the chart to the flight conditions of Mach 0.82 and FL350 and read the Maximum ISA Deviation (-11°C).
3. Do not dispatch aircraft into temperatures colder than ISA-11°C at FL350.



## DRIFTDOWN NET LEVEL OFF ALTITUDE (FOR FLIGHT PLANNING PURPOSES)

### MAXIMUM CONTINUOUS THRUST CF6-80C2B6 Engines

#### ENGINE ANTI-ICE OFF

| GROSS WEIGHT – POUNDS |                       | APPROX GROSS LEVEL OFF ALTITUDE – FEET |                     |            |            |
|-----------------------|-----------------------|----------------------------------------|---------------------|------------|------------|
| AT ENGINE FAILURE     | AT LEVEL OFF (APPROX) | OPTIMUM DRIFTDOWN SPEED - KIAS         | ISA + 10°C & COLDER | ISA + 15°C | ISA + 20°C |
| 420,000               | 404,000               | 272                                    | 12,300              | 10,700     | 8,900      |
| 400,000               | 385,000               | 267                                    | 14,100              | 12,600     | 10,800     |
| 380,000               | 367,000               | 260                                    | 15,600              | 14,500     | 12,800     |
| 360,000               | 347,000               | 254                                    | 17,000              | 16,500     | 14,800     |
| 340,000               | 328,000               | 247                                    | 18,900              | 18,300     | 17,000     |
| 320,000               | 310,000               | 240                                    | 20,500              | 20,000     | 19,100     |
| 300,000               | 291,000               | 233                                    | 21,900              | 21,400     | 20,700     |
| 280,000               | 271,500               | 225                                    | 23,400              | 22,900     | 22,100     |
| 260,000               | 252,000               | 217                                    | 25,100              | 24,500     | 23,600     |

#### ENGINE ANTI-ICE ON

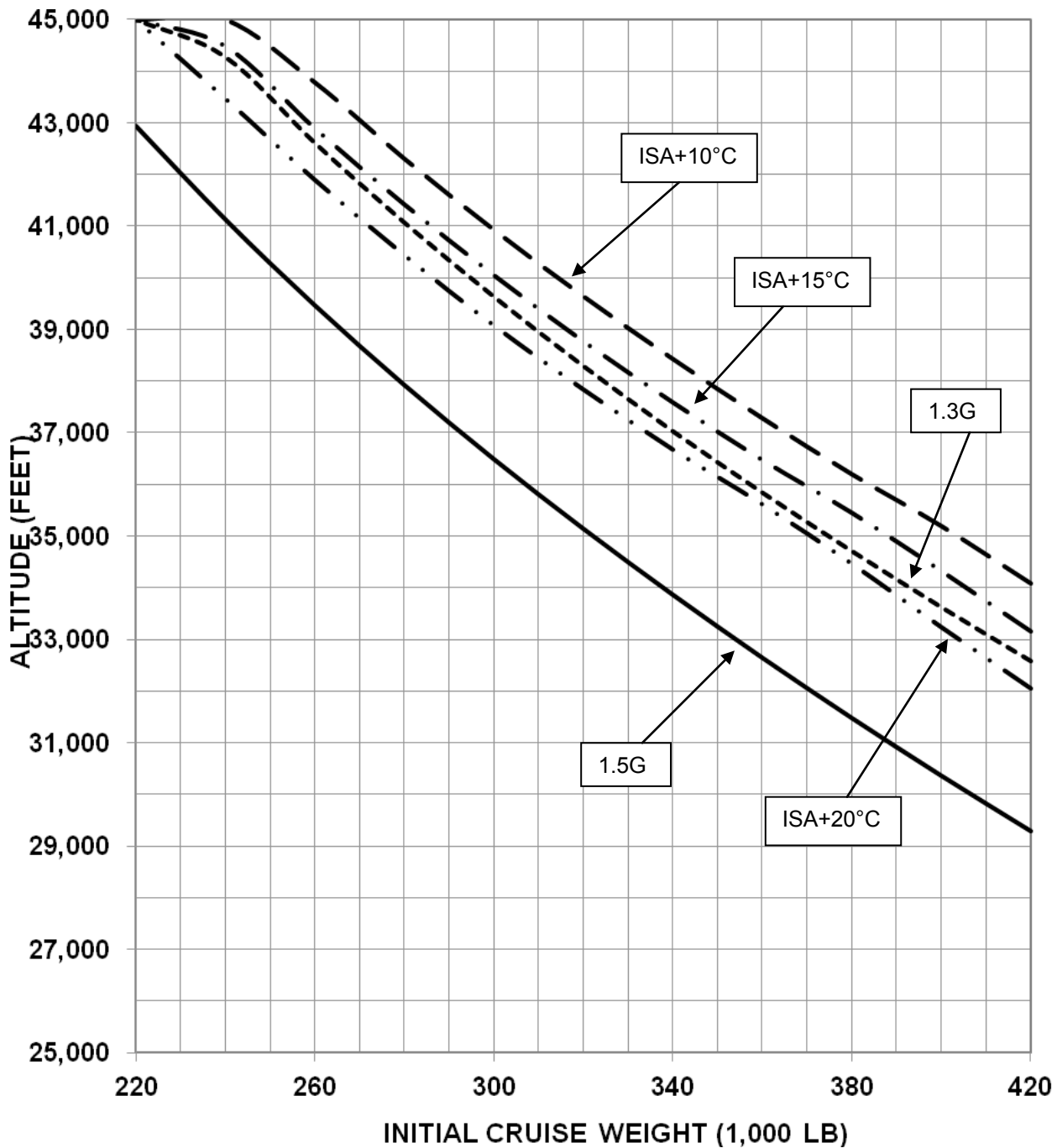
| GROSS WEIGHT – POUNDS |                       | APPROX GROSS LEVEL OFF ALTITUDE – FEET |                     |            |            |
|-----------------------|-----------------------|----------------------------------------|---------------------|------------|------------|
| AT ENGINE FAILURE     | AT LEVEL OFF (APPROX) | OPTIMUM DRIFTDOWN SPEED - KIAS         | ISA + 10°C & COLDER | ISA + 15°C | ISA + 20°C |
| 420,000               | 403,000               | 272                                    | 11,500              | 9,600      | 7,700      |
| 400,000               | 385,000               | 266                                    | 13,300              | 11,600     | 9,700      |
| 380,000               | 367,000               | 260                                    | 15,100              | 13,600     | 11,800     |
| 360,000               | 347,000               | 254                                    | 16,500              | 15,600     | 13,900     |
| 340,000               | 329,000               | 247                                    | 18,400              | 17,500     | 16,100     |
| 320,000               | 310,000               | 240                                    | 20,000              | 19,300     | 18,100     |
| 300,000               | 291,000               | 233                                    | 21,500              | 20,800     | 19,900     |
| 280,000               | 272,000               | 225                                    | 23,000              | 22,300     | 21,400     |
| 260,000               | 252,000               | 217                                    | 24,700              | 24,000     | 23,000     |

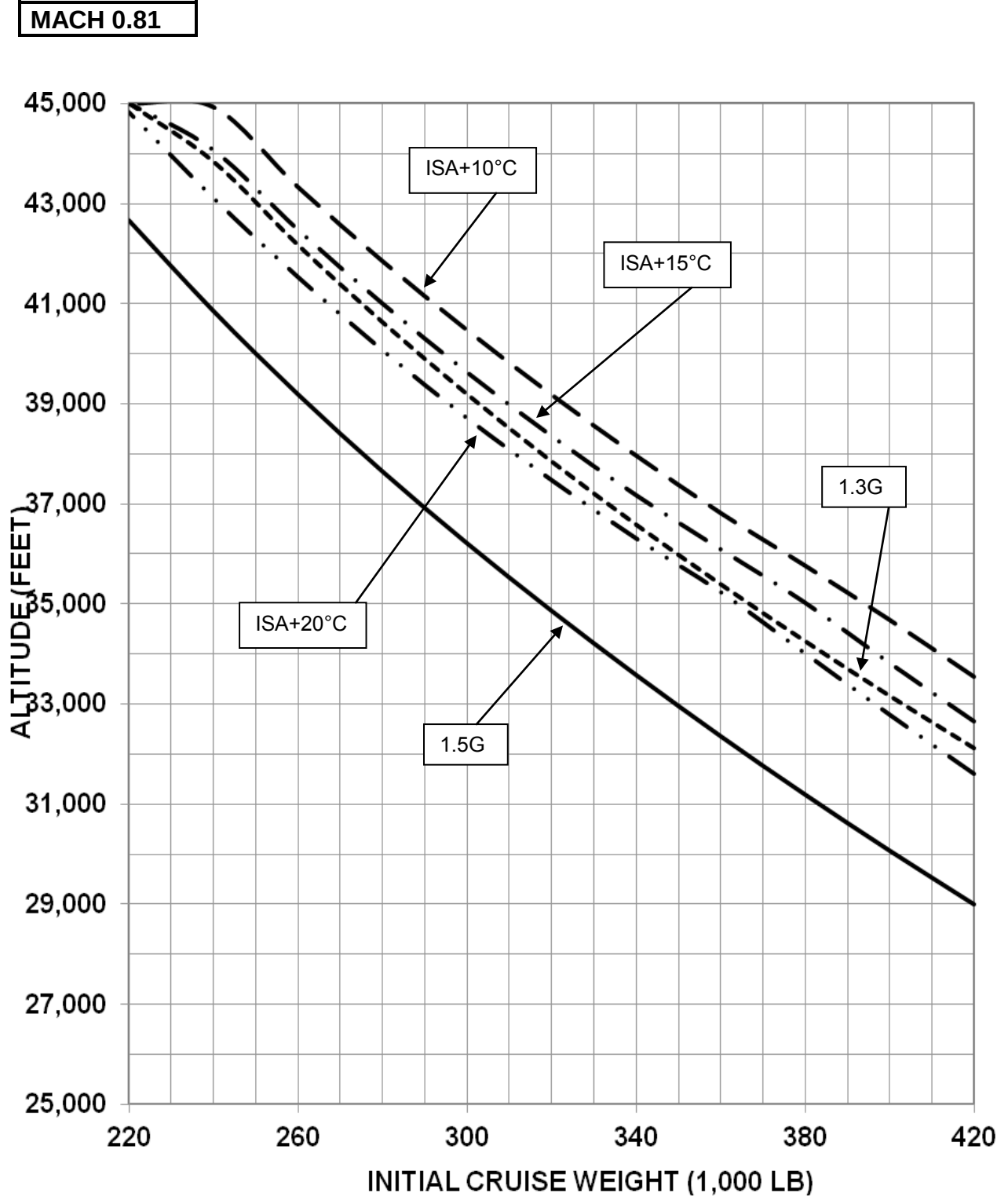
#### ENGINE & WING ANTI-ICE ON

| GROSS WEIGHT – POUNDS |                       | APPROX GROSS LEVEL OFF ALTITUDE – FEET |                     |            |            |
|-----------------------|-----------------------|----------------------------------------|---------------------|------------|------------|
| AT ENGINE FAILURE     | AT LEVEL OFF (APPROX) | OPTIMUM DRIFTDOWN SPEED - KIAS         | ISA + 10°C & COLDER | ISA + 15°C | ISA + 20°C |
| 420,000               | 403,000               | 271                                    | 10,200              | 8,400      | 6,600      |
| 400,000               | 384,000               | 265                                    | 12,100              | 10,300     | 8,500      |
| 380,000               | 365,000               | 259                                    | 13,900              | 12,200     | 10,500     |
| 360,000               | 347,000               | 253                                    | 15,800              | 14,200     | 12,600     |
| 340,000               | 328,000               | 246                                    | 17,600              | 16,300     | 14,600     |
| 320,000               | 310,000               | 240                                    | 19,400              | 18,300     | 16,900     |
| 300,000               | 291,000               | 232                                    | 20,900              | 20,100     | 19,000     |
| 280,000               | 272,000               | 224                                    | 22,400              | 21,700     | 20,700     |
| 260,000               | 252,000               | 216                                    | 24,100              | 23,300     | 22,300     |

#### BASIS:

- A/C Packs ON
- Maximum Continuous Thrust Limits
- 1.1% gradient decrement (net driftdown)
- 100 ft./min. residual rate of climb
- 35,000 ft. initial altitude

**MAXIMUM RECOMMENDED INITIAL CRUISE ALTITUDE****LRC**

**MAXIMUM RECOMMENDED INITIAL CRUISE ALTITUDE**

## BUFFET ONSET BOUNDARY SPEEDS (KIAS)

| FLIGHT<br>LEVEL | CRUISE<br>WEIGHT -<br>POUNDS | V <sub>b</sub> * -<br>KIAS<br>(Mach) | G / BANK ANGLE - DEGREES |      |            |      |           |      |
|-----------------|------------------------------|--------------------------------------|--------------------------|------|------------|------|-----------|------|
|                 |                              |                                      | 1.0 / 0°                 |      | 1.15 / 30° |      | 1.5 / 48° |      |
|                 |                              |                                      | LOW                      | HIGH | LOW        | HIGH | LOW       | HIGH |
| 430             | 400,000                      | 218<br>(0.78)                        |                          |      |            |      |           |      |
|                 | 360,000                      |                                      |                          |      |            |      |           |      |
|                 | 320,000                      |                                      | 200                      | 233  |            |      |           |      |
|                 | 280,000                      |                                      | 184                      | 240  | 203        | 234  |           |      |
|                 | 240,000                      |                                      | 166                      | 240  | 182        | 240  |           |      |
|                 | 200,000                      |                                      | 150                      | 240  | 165        | 240  | 193       | 238  |
| 410             | 400,000                      | 229<br>(0.78)                        |                          |      |            |      |           |      |
|                 | 360,000                      |                                      | 200                      | 240  |            |      |           |      |
|                 | 320,000                      |                                      | 196                      | 250  | 225        | 236  |           |      |
|                 | 280,000                      |                                      | 182                      | 251  | 197        | 249  |           |      |
|                 | 240,000                      |                                      | 165                      | 256+ | 180        | 251  | 218       | 240  |
|                 | 200,000                      |                                      | 150                      | 256+ | 160        | 251  | 188       | 251  |
| 390             | 400,000                      | 241<br>(0.78)                        | 229                      | 250  |            |      |           |      |
|                 | 360,000                      |                                      | 210                      | 260  |            |      |           |      |
|                 | 320,000                      |                                      | 179                      | 269+ | 194        | 266  |           |      |
|                 | 280,000                      |                                      | 164                      | 269+ | 178        | 266  |           |      |
|                 | 240,000                      |                                      | 164                      | 269+ | 178        | 266  | 210       | 260  |
|                 | 200,000                      |                                      | 148                      | 269+ | 160        | 266  | 187       | 269+ |
| 370             | 400,000                      | 252<br>(0.78)                        | 222                      | 269  |            |      |           |      |
|                 | 360,000                      |                                      | 207                      | 278  | 228        | 266  |           |      |
|                 | 320,000                      |                                      | 194                      | 281+ | 210        | 273  |           |      |
|                 | 280,000                      |                                      | 178                      | 281+ | 191        | 281+ | 229       | 266  |
|                 | 240,000                      |                                      | 164                      | 281+ | 176        | 281+ | 206       | 278  |
|                 | 200,000                      |                                      | 148                      | 281+ | 158        | 281+ | 185       | 278  |
| 350             | 400,000                      | 264<br>(0.78)                        | 218                      | 290  | 217        | 290  |           |      |
|                 | 360,000                      |                                      | 204                      | 292+ | 222        | 289  |           |      |
|                 | 320,000                      |                                      | 191                      | 292+ | 207        | 292+ | 249       | 275  |
|                 | 280,000                      |                                      | 176                      | 292+ | 190        | 292+ | 223       | 286  |
|                 | 240,000                      |                                      | 162                      | 292+ | 175        | 292+ | 203       | 292+ |
|                 | 200,000                      |                                      | 162                      | 292+ | 175        | 292+ | 203       | 292+ |
| 330             | 400,000                      | 277<br>(0.78)                        | 214                      | 308+ | 215        | 306  |           |      |
|                 | 360,000                      |                                      | 202                      | 308+ | 219        | 306  | 270       | 281  |
|                 | 320,000                      |                                      | 189                      | 308+ | 205        | 306  | 242       | 299  |
|                 | 280,000                      |                                      | 176                      | 308+ | 176        | 306  | 221       | 305  |
|                 | 240,000                      |                                      | 161                      | 308+ | 161        | 306  | 202       | 305  |
|                 | 200,000                      |                                      | 156                      | 308+ | 155        | 306  | 182       | 305  |
| 310             | 400,000                      | 289<br>(0.78)                        | 213                      | 322+ | 231        | 320  |           |      |
|                 | 360,000                      |                                      | 200                      | 322+ | 211        | 320  | 258       | 308  |
|                 | 320,000                      |                                      | 188                      | 322+ | 203        | 320  | 237       | 319  |
|                 | 280,000                      |                                      | 175                      | 322+ | 188        | 320  | 219       | 321  |
|                 | 240,000                      |                                      | 161                      | 322+ | 173        | 320  | 201       | 321  |
|                 | 200,000                      |                                      | 156                      | 322+ | 158        | 320  | 181       | 321  |

\*V<sub>b</sub> – Severe turbulence target speed.

+ NOTE: Buffet Speeds shown with a **following + sign** are higher than the aircraft V<sub>mo</sub>/M<sub>mo</sub>.  
The displayed speed is V<sub>mo</sub>/M<sub>mo</sub>.

Aircraft is above buffet onset ceiling at this weight and altitude.

*End of Section*

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## DEFINITIONS AND ASSUMPTIONS

**AWABS** Automated Weight and Balance System - The computerized system for determining the weight, balance, and airport performance.

**AIRPORT PRESSURE ALTITUDE** The altitude read from the altimeter while sitting on the airport and adjusting the altimeter setting to 29.92 inches mercury.

**GWT** Gross Weight for Takeoff - Weight at the start of the takeoff roll.

**V<sub>1</sub>** Takeoff decision speed. Speed above which, with one engine failed at V<sub>1</sub> and inoperative, it will take less distance to complete the takeoff than to stop on the runway.

**V<sub>R</sub>** Rotation Speed.

**V<sub>2</sub>** Takeoff Safety Speed - Target speed to achieve at 35 feet above ground during takeoff with one engine failed at V<sub>1</sub> and inoperative.

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## DRY RUNWAY TAKEOFF SPEEDS – $V_1$ / $V_R$ / $V_2$

### KIAS

**CAUTION:** Crews are not authorized to perform manual weight and balance computations without coordination and approval from Flight Control and the LCC. Refer to FOM Ch 5, Manual WDR.

**DRY**  
TO / 15

| TAKEOFF<br>WEIGHT<br>LBS | AIRPORT<br>PRESSURE<br>ALTITUDE<br>FT | AMBIENT TEMPERATURE – °C |             |             |             |             |
|--------------------------|---------------------------------------|--------------------------|-------------|-------------|-------------|-------------|
|                          |                                       | 10 & below               | 20          | 30          | 40          | 50          |
| 440,000                  | 8000                                  | 168/171/174              | 168/171/174 | 173/173/175 | 174/174/176 | 174/174/176 |
|                          | 6000                                  | 164/170/174              | 165/170/174 | 169/171/175 | 172/173/175 | 174/174/175 |
|                          | 4000                                  | 161/169/173              | 161/169/173 | 164/170/174 | 169/171/173 | 171/171/174 |
|                          | 2000                                  | 163/168/173              | 160/168/173 | 160/168/173 | 165/169/174 | 170/171/173 |
|                          | S.L.                                  | 166/168/173              | 166/168/173 | 163/168/173 | 161/168/173 | 165/169/174 |
| 420,000                  | 8000                                  | 163/166/170              | 164/166/170 | 168/168/170 | 169/169/171 | 169/169/171 |
|                          | 6000                                  | 160/165/169              | 160/165/169 | 164/166/170 | 167/168/171 | 168/169/170 |
|                          | 4000                                  | 161/164/169              | 158/164/169 | 159/165/170 | 164/166/169 | 166/166/170 |
|                          | 2000                                  | 162/163/169              | 162/163/169 | 161/164/169 | 160/165/170 | 165/166/169 |
|                          | S.L.                                  | 161/163/169              | 161/163/169 | 161/163/169 | 162/164/169 | 163/165/169 |
| 400,000                  | 8000                                  | 158/161/165              | 159/161/165 | 163/163/166 | 164/164/166 | 164/164/166 |
|                          | 6000                                  | 158/160/165              | 156/160/165 | 159/161/165 | 163/163/166 | 163/164/166 |
|                          | 4000                                  | 158/160/165              | 158/160/165 | 158/160/165 | 160/161/165 | 162/162/165 |
|                          | 2000                                  | 157/159/164              | 157/159/164 | 158/159/164 | 160/160/165 | 161/161/165 |
|                          | S.L.                                  | 156/158/164              | 156/158/164 | 156/158/164 | 157/159/164 | 160/160/165 |
| 380,000                  | 8000                                  | 155/156/161              | 155/157/161 | 158/158/161 | 159/159/162 | 159/159/162 |
|                          | 6000                                  | 154/156/160              | 155/156/160 | 156/157/161 | 158/158/161 | 158/158/161 |
|                          | 4000                                  | 153/155/160              | 153/155/160 | 154/156/160 | 157/157/161 | 157/157/161 |
|                          | 2000                                  | 152/154/160              | 152/154/160 | 153/154/160 | 155/156/160 | 157/157/161 |
|                          | S.L.                                  | 151/153/160              | 151/153/160 | 151/154/160 | 152/155/160 | 156/156/160 |
| 360,000                  | 8000                                  | 150/152/156              | 151/152/156 | 153/153/157 | 153/154/157 | 153/154/157 |
|                          | 6000                                  | 149/151/156              | 149/151/156 | 151/152/156 | 153/153/157 | 153/153/157 |
|                          | 4000                                  | 148/150/156              | 148/150/156 | 149/151/156 | 152/152/156 | 153/153/156 |
|                          | 2000                                  | 147/149/156              | 147/149/156 | 147/150/156 | 150/151/156 | 152/152/156 |
|                          | S.L.                                  | 145/149/156              | 145/149/156 | 146/149/156 | 147/150/156 | 150/151/156 |
| 340,000                  | 8000                                  | 145/147/151              | 146/147/152 | 148/148/152 | 148/149/152 | 148/149/152 |
|                          | 6000                                  | 144/146/151              | 144/146/151 | 145/147/152 | 148/148/152 | 148/148/152 |
|                          | 4000                                  | 142/145/151              | 143/145/151 | 144/146/151 | 147/147/151 | 148/148/152 |
|                          | 2000                                  | 141/144/151              | 141/144/151 | 142/145/151 | 145/146/151 | 147/147/152 |
|                          | S.L.                                  | 140/144/151              | 140/144/151 | 140/144/151 | 142/145/151 | 145/146/151 |



# DRY RUNWAY TAKEOFF SPEEDS – $V_1$ / $V_R$ / $V_2$

## KIAS

**CAUTION:** Crews are not authorized to perform manual weight and balance computations without coordination and approval from Flight Control and the LCC. Refer to FOM Ch 5, Manual WDR.

**DRY**  
TO / 15

| TAKEOFF<br>WEIGHT<br>LBS | AIRPORT<br>PRESSURE<br>ALTITUDE<br>FT | AMBIENT TEMPERATURE – °C |              |              |              |             |
|--------------------------|---------------------------------------|--------------------------|--------------|--------------|--------------|-------------|
|                          |                                       | 10 & below               | 20           | 30           | 40           | 50          |
| 320,000                  | 8000                                  | 139/141/147              | 140/142/147  | 143/143/147  | 144/144/147  | 144/144/147 |
|                          | 6000                                  | 138/141/147              | 138/141/147  | 140/142/147  | 143/143/147  | 143/143/147 |
|                          | 4000                                  | 137/140/147              | 137/140/147  | 138/141/147  | 141/142/147  | 142/143/147 |
|                          | 2000                                  | 136/139/147              | 136/139/147  | 136/139/147  | 139/141/147  | 141/142/147 |
|                          | S.L.                                  | 134/138/147              | 134/138/147  | 134/138/147  | 136/140/147  | 139/141/147 |
| 300,000                  | 8000                                  | 134/136/142              | 134/137/142  | 137/137/142  | 138/138/142  | 138/138/142 |
|                          | 6000                                  | 132/135/142              | 133/136/142  | 134/136/142  | 137/138/142  | 137/138/142 |
|                          | 4000                                  | 131/135/142              | 131/135/142  | 132/135/142  | 135/136/142  | 136/137/142 |
|                          | 2000                                  | 130/134/142              | 130/134/142  | 130/134/142  | 133/135/142  | 135/137/142 |
|                          | S.L.                                  | 128/133/142              | 128/133/142  | 129/133/142  | 130/134/142  | 133/135/142 |
| 280,000                  | 8000                                  | 128/131/137              | 128/131/137  | 131/132/137  | 132/133/137  | 132/133/137 |
|                          | 6000                                  | 126/130/137              | 127/130/137  | 128/131/137  | 131/132/137  | 131/132/137 |
|                          | 4000                                  | 125/129/137              | 125/129/137  | 126/130/137  | 129/131/137  | 130/132/137 |
|                          | 2000                                  | 124/128/137              | 124/128/137  | 124/129/138  | 127/130/137  | 129/131/137 |
|                          | S.L.                                  | 122/127/137              | 122/127/137  | 123/127/137  | 124/129/137  | 127/130/137 |
| 260,000                  | 8000                                  | 121/125/132              | 122/125/132  | 124/126/132  | 126/127/132  | 126/127/132 |
|                          | 6000                                  | 120/124/132              | 120/124/132  | 122/125/132  | 124/126/132  | 125/127/132 |
|                          | 4000                                  | 119/123/132              | 119/123/132  | 120/124/132  | 122/125/132  | 123/126/132 |
|                          | 2000                                  | 117/122/132              | 117/122/132  | 118/123/132  | 120/124/132  | 122/125/132 |
|                          | S.L.                                  | 117/121/132              | 117/121/132  | 117/121/133  | 118/123/132  | 121/124/132 |
| 230,000                  | 8000                                  | 112/116/125              | 112/116/125  | 114/117/124  | 116/118/124  | 116/118/124 |
|                          | 6000                                  | 110/115/125              | 111/115/125  | 112/116/125  | 114/117/124  | 115/118/124 |
|                          | 4000                                  | 110/114/125              | 110/114/125  | 110/115/125  | 113/116/125  | 114/117/124 |
|                          | 2000                                  | 110/113/125              | 110/113/125  | 110/113/125  | 111/115/125  | 113/116/125 |
|                          | S.L.                                  | *109/112/125             | 110/112/125  | 110/112/125  | 110/113/125  | 111/115/125 |
| 200,000                  | 8000                                  | 103/106/117              | 103/107/117  | 104/108/117  | 105/109/117  | 105/109/117 |
|                          | 6000                                  | 103/105/117              | 103/105/117  | 103/106/117  | 104/108/117  | 105/108/117 |
|                          | 4000                                  | *104/105/118             | *104/104/117 | 103/105/117  | 103/106/117  | 104/107/117 |
|                          | 2000                                  | *107/109/121             | *107/108/120 | *105/106/119 | 103/105/117  | 103/107/117 |
|                          | S.L.                                  | *109/112/125             | *109/111/124 | *109/110/123 | *106/107/119 | 102/105/117 |

Speeds marked with an asterisk (\*) are limited by  $V_{mcg}$ .

## DRY RUNWAY TAKEOFF SPEEDS – $V_1$ / $V_R$ / $V_2$

### KIAS

**CAUTION:** Crews are not authorized to perform manual weight and balance computations without coordination and approval from Flight Control and the LCC. Refer to FOM Ch 5, Manual WDR.

**DRY**  
TO / 5

| TAKEOFF<br>WEIGHT<br>LBS | AIRPORT<br>PRESSURE<br>ALTITUDE<br>FT | AMBIENT TEMPERATURE – °C |             |             |             |             |
|--------------------------|---------------------------------------|--------------------------|-------------|-------------|-------------|-------------|
|                          |                                       | 10 & below               | 20          | 30          | 40          | 50          |
| 440,000                  | 8000                                  | 176/179/181              | 177/180/181 | 179/180/183 | 180/182/184 | 180/182/184 |
|                          | 6000                                  | 169/176/180              | 170/177/181 | 174/178/182 | 180/181/182 | 179/180/183 |
|                          | 4000                                  | 166/176/180              | 166/176/180 | 169/176/181 | 174/178/182 | 179/180/182 |
|                          | 2000                                  | 164/175/180              | 163/175/180 | 165/176/180 | 170/177/181 | 175/178/182 |
|                          | S.L.                                  | 168/174/180              | 165/174/180 | 162/174/180 | 165/176/180 | 171/177/181 |
| 420,000                  | 8000                                  | 171/174/176              | 172/175/177 | 174/175/178 | 175/176/179 | 175/176/179 |
|                          | 6000                                  | 164/172/176              | 165/172/177 | 169/173/177 | 174/176/177 | 174/175/178 |
|                          | 4000                                  | 162/171/176              | 162/171/176 | 164/172/176 | 170/173/177 | 173/175/177 |
|                          | 2000                                  | 165/171/176              | 163/171/176 | 161/171/176 | 166/172/176 | 170/173/177 |
|                          | S.L.                                  | 166/170/175              | 166/170/175 | 165/170/175 | 164/171/176 | 166/172/176 |
| 400,000                  | 8000                                  | 166/169/172              | 167/169/172 | 169/170/173 | 170/171/174 | 170/171/174 |
|                          | 6000                                  | 160/167/172              | 160/168/172 | 164/169/172 | 169/170/173 | 169/170/173 |
|                          | 4000                                  | 162/167/171              | 161/167/171 | 160/167/172 | 165/168/172 | 168/170/173 |
|                          | 2000                                  | 162/166/171              | 162/166/171 | 162/166/171 | 162/167/172 | 166/168/172 |
|                          | S.L.                                  | 161/165/171              | 161/165/171 | 161/165/171 | 162/166/171 | 165/167/172 |
| 380,000                  | 8000                                  | 161/164/167              | 162/164/167 | 164/165/168 | 165/166/169 | 165/166/169 |
|                          | 6000                                  | 159/163/167              | 159/163/167 | 159/164/168 | 164/165/168 | 164/165/168 |
|                          | 4000                                  | 158/162/167              | 158/162/167 | 159/162/167 | 160/164/167 | 163/165/168 |
|                          | 2000                                  | 157/161/167              | 157/161/167 | 157/162/167 | 161/163/167 | 162/164/167 |
|                          | S.L.                                  | 156/160/167              | 156/160/167 | 156/160/167 | 157/161/167 | 161/163/167 |
| 360,000                  | 8000                                  | 155/158/163              | 156/159/163 | 158/159/163 | 159/161/164 | 159/161/164 |
|                          | 6000                                  | 154/158/162              | 154/158/162 | 156/159/163 | 159/160/163 | 159/160/163 |
|                          | 4000                                  | 153/157/162              | 153/157/162 | 154/158/162 | 157/159/163 | 158/159/163 |
|                          | 2000                                  | 152/156/162              | 152/156/162 | 152/156/162 | 155/158/162 | 157/159/163 |
|                          | S.L.                                  | 150/155/162              | 150/155/162 | 151/155/163 | 152/156/162 | 155/158/162 |
| 340,000                  | 8000                                  | 150/153/158              | 150/154/158 | 153/154/158 | 154/155/159 | 154/155/159 |
|                          | 6000                                  | 148/152/158              | 149/153/158 | 150/153/158 | 153/154/158 | 153/155/158 |
|                          | 4000                                  | 147/152/158              | 147/152/158 | 148/152/158 | 151/153/158 | 152/154/158 |
|                          | 2000                                  | 146/151/158              | 146/151/158 | 147/151/158 | 149/152/158 | 151/154/158 |
|                          | S.L.                                  | 145/150/158              | 145/150/158 | 145/150/158 | 147/151/158 | 149/153/158 |

# DRY RUNWAY TAKEOFF SPEEDS – $V_1$ / $V_R$ / $V_2$

## KIAS

**CAUTION:** Crews are not authorized to perform manual weight and balance computations without coordination and approval from Flight Control and the LCC. Refer to FOM Ch 5, Manual WDR.

**DRY**  
TO / 5

| TAKEOFF<br>WEIGHT<br>LBS | AIRPORT<br>PRESSURE<br>ALTITUDE<br>FT | AMBIENT TEMPERATURE – °C |              |              |              |             |
|--------------------------|---------------------------------------|--------------------------|--------------|--------------|--------------|-------------|
|                          |                                       | 10 & below               | 20           | 30           | 40           | 50          |
| 320,000                  | 8000                                  | 144/148/153              | 145/148/153  | 147/149/153  | 149/150/153  | 149/150/153 |
|                          | 6000                                  | 143/147/153              | 143/147/153  | 144/148/153  | 147/149/153  | 148/149/153 |
|                          | 4000                                  | 141/146/153              | 142/146/153  | 143/147/153  | 145/148/153  | 146/149/153 |
|                          | 2000                                  | 140/145/153              | 140/145/153  | 141/146/153  | 143/147/153  | 145/148/153 |
|                          | S.L.                                  | 139/145/153              | 139/145/153  | 139/145/153  | 141/146/153  | 143/147/153 |
| 300,000                  | 8000                                  | 138/142/148              | 139/143/148  | 141/144/148  | 143/145/148  | 143/145/148 |
|                          | 6000                                  | 137/141/148              | 137/142/148  | 138/143/148  | 141/144/148  | 141/144/148 |
|                          | 4000                                  | 135/141/148              | 135/141/148  | 137/141/148  | 139/143/148  | 140/143/148 |
|                          | 2000                                  | 134/140/148              | 134/140/148  | 135/140/148  | 137/141/148  | 139/143/148 |
|                          | S.L.                                  | 132/139/148              | 133/139/148  | 133/139/148  | 135/140/148  | 137/142/148 |
| 280,000                  | 8000                                  | 132/137/143              | 133/137/143  | 135/138/143  | 136/139/143  | 136/139/143 |
|                          | 6000                                  | 131/136/143              | 131/136/143  | 133/137/143  | 135/138/143  | 135/138/143 |
|                          | 4000                                  | 129/135/143              | 129/135/143  | 130/136/143  | 133/137/143  | 134/138/143 |
|                          | 2000                                  | 127/134/143              | 128/134/143  | 128/134/143  | 131/136/143  | 133/137/143 |
|                          | S.L.                                  | 126/133/143              | 126/133/143  | 126/133/143  | 128/134/143  | 131/136/143 |
| 260,000                  | 8000                                  | 125/130/138              | 126/131/138  | 128/132/138  | 130/133/138  | 130/133/138 |
|                          | 6000                                  | 124/130/138              | 124/130/138  | 126/131/138  | 128/132/138  | 129/132/138 |
|                          | 4000                                  | 122/129/138              | 122/129/138  | 124/130/138  | 127/131/138  | 128/132/138 |
|                          | 2000                                  | 121/128/138              | 121/128/138  | 122/128/138  | 124/130/138  | 126/131/138 |
|                          | S.L.                                  | 120/127/138              | 120/127/138  | 120/127/138  | 122/128/138  | 125/130/138 |
| 230,000                  | 8000                                  | 115/121/130              | 116/121/130  | 118/122/130  | 120/123/130  | 120/123/130 |
|                          | 6000                                  | 113/120/130              | 114/120/130  | 116/121/130  | 118/122/130  | 119/123/130 |
|                          | 4000                                  | 112/119/130              | 112/119/130  | 113/120/130  | 116/121/130  | 117/122/130 |
|                          | 2000                                  | 112/118/130              | 112/118/130  | 112/118/130  | 114/120/130  | 116/121/130 |
|                          | S.L.                                  | 110/117/130              | 111/117/130  | 112/117/130  | 112/118/130  | 114/120/130 |
| 200,000                  | 8000                                  | 105/111/121              | 105/111/121  | 107/112/121  | 109/114/121  | 109/114/121 |
|                          | 6000                                  | 105/110/121              | 105/110/121  | 105/111/121  | 107/113/121  | 108/113/121 |
|                          | 4000                                  | *104/109/122             | 105/108/121  | 105/110/121  | 106/111/121  | 107/112/121 |
|                          | 2000                                  | *107/113/126             | *107/111/125 | *105/109/123 | 105/110/121  | 106/111/121 |
|                          | S.L.                                  | *109/116/130             | *109/115/129 | *109/114/127 | *106/111/124 | 104/110/121 |

Speeds marked with an asterisk (\*) are limited by  $V_{mcg}$ .

## TAKEOFF STABILIZER SETTINGS

**CAUTION:** Crews are not authorized to perform manual weight and balance computations without coordination and approval from Flight Control and the LCC. Refer to FOM Ch 5, Manual WDR.

| GROSS<br>WEIGHT<br>LBS | CENTER OF GRAVITY – % MAC |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|------------------------|---------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|                        | 8                         | 10  | 12  | 14  | 16  | 18  | 20  | 22  | 24  | 26  | 28  | 30  | 32  | 34  | 36  |
| 420,000                |                           |     |     | 7.0 | 6.5 | 6.0 | 5.5 | 5.0 | 4.5 | 4.0 | 4.0 | 3.5 | 3.0 | 2.5 | 2.0 |
| 400,000                |                           |     | 7.0 | 6.5 | 6.0 | 6.0 | 5.5 | 5.0 | 4.5 | 4.0 | 3.5 | 3.0 | 3.0 | 2.5 | 2.0 |
| 380,000                |                           | 7.0 | 7.0 | 6.5 | 6.0 | 5.5 | 5.0 | 4.5 | 4.5 | 4.0 | 3.5 | 3.0 | 2.5 | 2.0 | 1.5 |
| 360,000                |                           | 7.0 | 6.5 | 6.0 | 5.5 | 5.5 | 5.0 | 4.5 | 4.0 | 3.5 | 3.0 | 3.0 | 2.5 | 2.0 | 1.5 |
| 340,000                | 7.0                       | 6.5 | 6.0 | 6.0 | 5.5 | 5.0 | 4.5 | 4.0 | 3.5 | 3.5 | 3.0 | 2.5 | 2.0 | 1.5 | 1.0 |
| 320,000                | 6.5                       | 6.5 | 6.0 | 5.5 | 5.0 | 4.5 | 4.0 | 4.0 | 3.5 | 3.0 | 2.5 | 2.0 | 2.0 | 1.5 | 1.0 |
| 300,000                | 6.0                       | 5.5 | 5.0 | 5.0 | 4.5 | 4.0 | 3.5 | 3.0 | 3.0 | 2.5 | 2.0 | 1.5 | 1.5 | 1.0 | 0.5 |
| 280,000                | 5.5                       | 5.0 | 4.5 | 4.0 | 4.0 | 3.5 | 3.0 | 2.5 | 2.5 | 2.0 | 1.5 | 1.0 | 1.0 | 0.5 |     |
| 260,000                | 5.0                       | 4.5 | 4.0 | 4.0 | 3.5 | 3.0 | 2.5 | 5.5 | 2.0 | 1.5 | 1.0 | 1.0 | 0.5 |     |     |
| 240,000                | 4.5                       | 4.0 | 3.5 | 3.5 | 3.0 | 2.5 | 2.0 | 2.0 | 1.5 | 1.0 | 1.0 | 0.5 |     |     |     |
| 220,000                | 4.0                       | 3.5 | 3.0 | 3.0 | 2.5 | 2.0 | 2.0 | 1.5 | 1.0 | 1.0 | 0.5 |     |     |     |     |
| 200,000                | 3.5                       | 3.0 | 3.0 | 2.5 | 2.0 | 2.0 | 1.5 | 1.0 | 1.0 | 0.5 |     |     |     |     |     |

END OF SECTION

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## DEFINITIONS AND ASSUMPTIONS

|                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>ACTUAL LANDING DISTANCE</b>     | The actual distance required to land starting at 50 feet above the runway (usually at the threshold) to a complete stop on the runway. This distance is based on a 1.3 $V_S$ speed at 50 feet and assumes maximum braking and NO reverse thrust.                                                                                                                                                                                                                                             |
| <b>APPROACH CLIMB LIMIT WEIGHT</b> | Approach Climb Limit Weight is defined in FAR 25.121 as the maximum weight at which a missed approach climb meets the FAR prescribed climb gradient (2.1% for a two engine aircraft). This gradient is determined with the critical engine inoperative, remaining engine at takeoff thrust, landing gear retracted, and approach flap setting (as defined in the FAA Approved Flight Manual). This weight takes into account an air conditioning pack ON and operated from engine bleed air. |
| <b>F.A.R. LANDING FIELD LENGTH</b> | This is the landing field length as defined in the Federal Air Regulations Part 121, and is the actual landing distance plus an additional safety margin of 67%. Dispatch is based on F.A.R. Landing Field Length at the destination airport.                                                                                                                                                                                                                                                |
| <b>GO-AROUND THRUST</b>            | Maximum thrust setting available for use during a missed approach.                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>LANDING CLIMB LIMIT WEIGHT</b>  | Landing Climb Limit Weight is defined in FAR 25.119 as the maximum weight at which the aircraft meets the FAR prescribed climb gradient (3.2%). This gradient is determined with all engines operating, landing gear extended, and landing flap setting.                                                                                                                                                                                                                                     |
| <b><math>V_S</math></b>            | Indicated stall speed for the aircraft weight and configuration. 1.3 $V_S$ is 1.3 times the stall speed, or an increase of 30% above stall speed.                                                                                                                                                                                                                                                                                                                                            |

**PATTERN AND APPROACH SPEEDS****KIAS**

## NORMAL CONFIGURATION

| GROSS<br>WEIGHT<br>LBS | Vref | APPROACH – GEAR UP   |                      |                      |                          | LANDING        |             |
|------------------------|------|----------------------|----------------------|----------------------|--------------------------|----------------|-------------|
|                        |      | SLATS RET.           | SLATS EXTENDED       |                      |                          | SLATS EXTENDED |             |
|                        |      | FLAPS 0<br>Vref + 80 | FLAPS 1<br>Vref + 60 | FLAPS 5<br>Vref + 40 | FLAPS 20/15<br>Vref + 20 | FLAPS<br>25    | FLAPS<br>30 |
| 410,000                | 176  | 256                  | 236                  | 216                  | 196                      | 169            | 176         |
| 400,000                | 172  | 252                  | 232                  | 212                  | 192                      | 166            | 172         |
| 390,000                | 169  | 249                  | 229                  | 209                  | 189                      | 164            | 169         |
| 380,000                | 166  | 246                  | 226                  | 206                  | 186                      | 162            | 166         |
| 370,000                | 163  | 243                  | 223                  | 203                  | 183                      | 160            | 163         |
| 360,000                | 159  | 239                  | 219                  | 199                  | 179                      | 158            | 159         |
| 350,000                | 155  | 235                  | 215                  | 195                  | 175                      | 156            | 155         |
| 340,000                | 151  | 231                  | 211                  | 191                  | 171                      | 153            | 151         |
| 330,000                | 148  | 228                  | 208                  | 188                  | 168                      | 151            | 148         |
| 320,000                | 145  | 225                  | 205                  | 185                  | 165                      | 149            | 145         |
| 310,000                | 143  | 223                  | 203                  | 183                  | 163                      | 147            | 143         |
| 300,000                | 140  | 220                  | 200                  | 180                  | 160                      | 144            | 140         |
| 290,000                | 138  | 218                  | 198                  | 178                  | 158                      | 142            | 138         |
| 280,000                | 135  | 215                  | 195                  | 175                  | 155                      | 139            | 135         |
| 270,000                | 133  | 213                  | 193                  | 173                  | 153                      | 137            | 133         |
| 260,000                | 130  | 210                  | 190                  | 170                  | 150                      | 134            | 130         |
| 250,000                | 127  | 207                  | 187                  | 167                  | 147                      | 132            | 127         |
| 240,000                | 124  | 204                  | 184                  | 164                  | 144                      | 129            | 124         |
| 230,000                | 122  | 202                  | 182                  | 162                  | 142                      | 126            | 122         |
| 220,000                | 119  | 199                  | 179                  | 159                  | 139                      | 123            | 119         |
| 210,000                | 116  | 196                  | 176                  | 156                  | 136                      | 120            | 116         |
| 200,000                | 113  | 193                  | 173                  | 153                  | 133                      | 117            | 113         |



**STALL SPEEDS - V<sub>S</sub>****KIAS**

| <b>GROSS<br/>WEIGHT<br/>LBS</b> | <b>GEAR UP</b>               |                              |                              |                               |                               | <b>GEAR DOWN</b>              |                               |
|---------------------------------|------------------------------|------------------------------|------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|
|                                 | <b>FLAPS 0<br/>SLATS RET</b> | <b>FLAPS 1<br/>SLATS EXT</b> | <b>FLAPS 5<br/>SLATS EXT</b> | <b>FLAPS 15<br/>SLATS EXT</b> | <b>FLAPS 20<br/>SLATS EXT</b> | <b>FLAPS 25<br/>SLATS EXT</b> | <b>FLAPS 30<br/>SLATS EXT</b> |
| <b>410,000</b>                  | 198                          | 164                          | 150                          | 146                           | 144                           | 137                           | 135                           |
| <b>400,000</b>                  | 195                          | 162                          | 148                          | 144                           | 142                           | 135                           | 133                           |
| <b>390,000</b>                  | 192                          | 159                          | 146                          | 142                           | 140                           | 133                           | 132                           |
| <b>380,000</b>                  | 189                          | 157                          | 143                          | 140                           | 138                           | 131                           | 130                           |
| <b>370,000</b>                  | 187                          | 154                          | 142                          | 138                           | 136                           | 129                           | 128                           |
| <b>360,000</b>                  | 184                          | 152                          | 139                          | 136                           | 134                           | 128                           | 126                           |
| <b>350,000</b>                  | 181                          | 150                          | 137                          | 134                           | 132                           | 126                           | 124                           |
| <b>340,000</b>                  | 178                          | 147                          | 135                          | 132                           | 129                           | 124                           | 122                           |
| <b>330,000</b>                  | 175                          | 144                          | 133                          | 130                           | 127                           | 122                           | 120                           |
| <b>320,000</b>                  | 172                          | 141                          | 130                          | 127                           | 125                           | 120                           | 119                           |
| <b>310,000</b>                  | 169                          | 138                          | 128                          | 125                           | 123                           | 118                           | 116                           |
| <b>300,000</b>                  | 165                          | 136                          | 127                          | 123                           | 120                           | 116                           | 114                           |
| <b>290,000</b>                  | 162                          | 134                          | 123                          | 121                           | 118                           | 114                           | 112                           |
| <b>280,000</b>                  | 159                          | 131                          | 121                          | 118                           | 115                           | 111                           | 110                           |
| <b>270,000</b>                  | 156                          | 128                          | 117                          | 116                           | 113                           | 109                           | 108                           |
| <b>260,000</b>                  | 152                          | 125                          | 115                          | 113                           | 110                           | 107                           | 106                           |
| <b>250,000</b>                  | 149                          | 122                          | 112                          | 110                           | 108                           | 104                           | 104                           |
| <b>240,000</b>                  | 145                          | 119                          | 110                          | 107                           | 105                           | 102                           | 101                           |
| <b>230,000</b>                  | 142                          | 116                          | 107                          | 104                           | 102                           | 99                            | 99                            |
| <b>220,000</b>                  | 137                          | 112                          | 104                          | 102                           | 99                            | 97                            | 97                            |
| <b>210,000</b>                  | 133                          | 109                          | 101                          | 99                            | 96                            | 94                            | 94                            |
| <b>200,000</b>                  | 128                          | 106                          | 98                           | 96                            | 93                            | 91                            | 91                            |

**F.A.R. DRY LANDING FIELD LENGTH****FEET****CF6-80C2B6****FLAPS 25**

| AIRCRAFT<br>WEIGHT<br><br>LBS | AIRPORT PRESSURE ALTITUDE - FEET |       |       |       |       |       |
|-------------------------------|----------------------------------|-------|-------|-------|-------|-------|
|                               | 0                                | 1,000 | 2,000 | 4,000 | 6,000 | 8,000 |
| 410,000                       | 7,320                            | 7,520 | 7,700 | 8,100 | 8,540 | 9,010 |
| 390,000                       | 6,830                            | 7,010 | 7,180 | 7,550 | 7,950 | 8,390 |
| 370,000                       | 6,340                            | 6,510 | 6,670 | 7,010 | 7,370 | 7,780 |
| 350,000                       | 5,890                            | 6,040 | 6,190 | 6,520 | 6,830 | 7,230 |
| 330,000                       | 5,610                            | 5,750 | 5,900 | 6,200 | 6,510 | 6,870 |
| 320,000                       | 5,470                            | 5,610 | 5,750 | 6,040 | 6,350 | 6,690 |
| 310,000                       | 5,330                            | 5,470 | 5,600 | 5,890 | 6,180 | 6,520 |
| 300,000                       | 5,200                            | 5,330 | 5,460 | 5,730 | 6,020 | 6,340 |
| 290,000                       | 5,060                            | 5,190 | 5,310 | 5,580 | 5,860 | 6,170 |
| 280,000                       | 4,920                            | 5,040 | 5,160 | 5,420 | 5,690 | 5,990 |
| 270,000                       | 4,780                            | 4,900 | 5,020 | 5,270 | 5,530 | 5,820 |
| 260,000                       | 4,640                            | 4,750 | 4,870 | 5,110 | 5,370 | 5,650 |
| 250,000                       | 4,500                            | 4,610 | 4,720 | 4,960 | 5,210 | 5,470 |
| 240,000                       | 4,360                            | 4,460 | 4,570 | 4,800 | 5,050 | 5,300 |
| 230,000                       | 4,220                            | 4,320 | 4,420 | 4,650 | 4,890 | 5,130 |
| 220,000                       | 4,070                            | 4,170 | 4,270 | 4,490 | 4,730 | 4,950 |

**NOTE:**

Actual Landing Distance is:

- 60 percent of the F.A.R. Landing Field Lengths above.
- The distance to a complete stop from 50 feet above the runway threshold at  $V_{Ref}$ .
- Based on maximum manual braking, speed brakes extended and NO reverse thrust.

**CORRECTIONS:**

| CONDITION                    | CORRECTION                    |
|------------------------------|-------------------------------|
| Headwind                     | - 20 ft. per knot             |
| Tailwind                     | + 140 ft. per knot            |
| Manual Spoilers              | Refer to ODM Abnormal Section |
| Wet runway and/or Low Minima | increase distance by 15%      |

**F.A.R. DRY LANDING FIELD LENGTH****FEET****CF6-80C2B6****FLAPS 30**

| <b>AIRCRAFT<br/>WEIGHT<br/><br/>LBS</b> | <b>AIRPORT PRESSURE ALTITUDE - FEET</b> |              |              |              |              |              |
|-----------------------------------------|-----------------------------------------|--------------|--------------|--------------|--------------|--------------|
|                                         | <b>0</b>                                | <b>1,000</b> | <b>2,000</b> | <b>4,000</b> | <b>6,000</b> | <b>8,000</b> |
| <b>410,000</b>                          | 7,690                                   | 7,900        | 8,090        | 8,510        | 8,960        | 9,460        |
| <b>390,000</b>                          | 7,040                                   | 7,230        | 7,410        | 7,790        | 8,210        | 8,650        |
| <b>370,000</b>                          | 6,420                                   | 6,570        | 6,740        | 7,080        | 7,450        | 7,840        |
| <b>350,000</b>                          | 5,800                                   | 5,930        | 6,100        | 6,410        | 6,750        | 7,090        |
| <b>330,000</b>                          | 5,330                                   | 5,450        | 5,590        | 5,880        | 6,180        | 6,490        |
| <b>320,000</b>                          | 5,200                                   | 5,310        | 5,440        | 5,720        | 6,010        | 6,310        |
| <b>310,000</b>                          | 5,060                                   | 5,170        | 5,290        | 5,570        | 5,850        | 6,140        |
| <b>300,000</b>                          | 4,920                                   | 5,030        | 5,150        | 5,420        | 5,690        | 5,970        |
| <b>290,000</b>                          | 4,780                                   | 4,890        | 5,000        | 5,260        | 5,530        | 5,800        |
| <b>280,000</b>                          | 4,640                                   | 4,750        | 4,860        | 5,110        | 5,370        | 5,630        |
| <b>270,000</b>                          | 4,500                                   | 4,600        | 4,710        | 4,950        | 5,200        | 5,460        |
| <b>260,000</b>                          | 4,360                                   | 4,460        | 4,560        | 4,800        | 5,040        | 5,290        |
| <b>250,000</b>                          | 4,220                                   | 4,320        | 4,420        | 4,640        | 4,880        | 5,120        |
| <b>240,000</b>                          | 4,080                                   | 4,180        | 4,270        | 4,490        | 4,720        | 4,950        |
| <b>230,000</b>                          | 3,940                                   | 4,040        | 4,120        | 4,330        | 4,560        | 4,780        |
| <b>220,000</b>                          | 3,800                                   | 3,890        | 3,970        | 4,180        | 4,390        | 4,610        |

**NOTE:**

Actual Landing Distance is:

- 60 percent of the F.A.R. Landing Field Lengths above.
- The distance to a complete stop from 50 feet above the runway threshold at  $V_{Ref}$ .
- Based on maximum manual braking, speed brakes extended and NO reverse thrust.

**CORRECTIONS:**

| <b>CONDITION</b>             | <b>CORRECTION</b>             |
|------------------------------|-------------------------------|
| Headwind                     | - 20 ft. per knot             |
| Tailwind                     | + 140 ft. per knot            |
| Manual Spoilers              | Refer to ODM Abnormal Section |
| Wet runway and/or Low Minima | increase distance by 15%      |

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# APPROACH AND LANDING CLIMB LIMITS

## POUNDS

**APPROACH FLAPS 20  
LANDING FLAPS 25 or 30**

| OAT<br>°F  | PRESSURE ALTITUDE - FEET |         |         |                       |         |          |         |         |         |
|------------|--------------------------|---------|---------|-----------------------|---------|----------|---------|---------|---------|
|            | 0                        | 1,000   | 2,000   | 3,000                 | 4,000   | 5,000    | 6,000   | 7,000   | 8,000   |
| 120        | 364,000                  | 350,000 | 337,000 | OUTSIDE ENVIRONMENTAL |         |          |         |         |         |
| 115        | 373,000                  | 360,000 | 345,500 | 332,500               | 319,000 | ENVELOPE |         |         |         |
| 110        | 382,500                  | 368,000 | 354,500 | 340,500               | 327,000 | 314,000  |         |         |         |
| 105        | 390,500                  | 376,500 | 362,500 | 349,000               | 335,000 | 321,500  | 309,000 | 297,500 |         |
| 100        | 398,500                  | 385,000 | 371,000 | 357,000               | 343,000 | 330,000  | 316,500 | 305,000 | 293,000 |
| 95         | 407,000                  | 393,000 | 379,500 | 364,500               | 351,000 | 337,000  | 324,000 | 312,000 | 300,000 |
| 90         | 416,000                  | 402,000 | 387,000 | 373,000               | 359,000 | 345,000  | 332,000 | 320,000 | 307,500 |
| 85         | 420,000                  | 410,000 | 395,500 | 381,000               | 366,500 | 352,500  | 339,000 | 327,000 | 314,500 |
| 80         | 420,000                  | 414,000 | 404,000 | 390,000               | 375,000 | 361,000  | 347,000 | 333,500 | 322,000 |
| 75         | 420,000                  | 414,000 | 405,500 | 396,500               | 383,000 | 368,000  | 354,500 | 341,000 | 328,000 |
| 70         | 420,000                  | 414,000 | 405,500 | 396,500               | 387,000 | 374,500  | 360,500 | 347,500 | 334,500 |
| 65         | 420,000                  | 414,000 | 405,500 | 396,500               | 387,000 | 377,000  | 366,500 | 353,000 | 340,000 |
| 60         | 420,000                  | 414,000 | 405,500 | 396,500               | 387,000 | 377,000  | 366,500 | 357,000 | 345,000 |
| 55         | 420,000                  | 414,000 | 405,500 | 396,500               | 387,000 | 377,000  | 366,500 | 357,000 | 347,000 |
| 50 & BELOW | 420,000                  | 414,000 | 405,500 | 396,500               | 387,000 | 377,000  | 366,500 | 357,000 | 347,000 |

### NOTES:

1. AFM Maximum Structural Landing Weight should not be exceeded (unless overweight landing is deemed necessary in flight).
2. Reduce Gross Weight by 33,800 lbs. when operating in icing conditions during any part of the flight when the forecast landing temperature is below 50°F.
3. Apply the following Gross Weight Corrections for applicable bleed configuration:

| CONFIGURATION             | CORRECTION - POUNDS |              |
|---------------------------|---------------------|--------------|
|                           | A/C PACKS OFF       | A/C PACKS ON |
| Engine Anti-Ice OFF       | +3,800              | 0            |
| Engine Anti-Ice ON        | -2,000              | -5,500       |
| Engine & Wing Anti-Ice ON | -7,100              | -10,100      |

### BASIS:

The limit weights shown are the more restrictive of:

- |                                                                                                                                                                                                         |                                                                                                                                                                                                     |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p style="text-align: center;"><u>Approach</u></p> <ul style="list-style-type: none"> <li>• One engine inoperative.</li> <li>• Flaps at approach setting.</li> <li>• Landing gear retracted.</li> </ul> | <p style="text-align: center;"><u>Landing</u></p> <ul style="list-style-type: none"> <li>• All engines operating.</li> <li>• Flaps at landing setting.</li> <li>• Landing gear extended.</li> </ul> |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## OPERATIONAL LANDING DISTANCES FEET

### FLAPS 25

| Landing Weight<br>(lb) | NOTE: Interpolate for GOOD-TO-MEDIUM (4) or MEDIUM-TO-POOR (2). |        |       |       |        |            |          |       |        |            |
|------------------------|-----------------------------------------------------------------|--------|-------|-------|--------|------------|----------|-------|--------|------------|
|                        | DRY (6)                                                         |        |       |       |        |            | GOOD (5) |       |        |            |
|                        | AB 1                                                            | AB 2   | AB 3  | AB 4  | Max AB | Max Manual | AB 3     | AB 4  | Max AB | Max Manual |
| 410,000                | 12,100                                                          | 11,000 | 9,800 | 8,600 | 8,300  | 5,400      | 9,800    | 8,600 | 8,300  | 7,000      |
| 400,000                | 11,900                                                          | 10,800 | 9,700 | 8,500 | 8,200  | 5,300      | 9,700    | 8,500 | 8,200  | 6,800      |
| 390,000                | 11,600                                                          | 10,600 | 9,500 | 8,300 | 8,000  | 5,200      | 9,500    | 8,300 | 8,000  | 6,700      |
| 380,000                | 11,400                                                          | 10,400 | 9,300 | 8,200 | 7,900  | 5,100      | 9,300    | 8,200 | 7,900  | 6,600      |
| 370,000                | 11,100                                                          | 10,100 | 9,100 | 8,000 | 7,700  | 4,900      | 9,100    | 8,000 | 7,700  | 6,500      |
| 360,000                | 10,800                                                          | 9,900  | 8,900 | 7,800 | 7,600  | 4,800      | 8,900    | 7,800 | 7,600  | 6,300      |
| 350,000                | 10,600                                                          | 9,700  | 8,700 | 7,700 | 7,400  | 4,700      | 8,700    | 7,700 | 7,400  | 6,200      |
| 340,000                | 10,300                                                          | 9,500  | 8,600 | 7,500 | 7,300  | 4,600      | 8,600    | 7,500 | 7,300  | 6,100      |
| 330,000                | 10,100                                                          | 9,300  | 8,400 | 7,400 | 7,100  | 4,500      | 8,400    | 7,400 | 7,100  | 6,000      |
| 320,000                | 9,800                                                           | 9,100  | 8,200 | 7,200 | 7,000  | 4,400      | 8,200    | 7,200 | 7,000  | 5,800      |
| 310,000                | 9,600                                                           | 8,800  | 8,000 | 7,000 | 6,800  | 4,400      | 8,000    | 7,000 | 6,800  | 5,700      |
| 300,000                | 9,300                                                           | 8,600  | 7,800 | 6,900 | 6,700  | 4,300      | 7,800    | 6,900 | 6,700  | 5,600      |
| 290,000                | 9,100                                                           | 8,400  | 7,600 | 6,700 | 6,500  | 4,200      | 7,600    | 6,700 | 6,500  | 5,500      |
| 280,000                | 8,800                                                           | 8,200  | 7,500 | 6,500 | 6,400  | 4,100      | 7,500    | 6,500 | 6,400  | 5,400      |
| 270,000                | 8,600                                                           | 8,000  | 7,300 | 6,400 | 6,200  | 4,100      | 7,300    | 6,400 | 6,200  | 5,300      |
| 260,000                | 8,300                                                           | 7,700  | 7,100 | 6,200 | 6,100  | 4,000      | 7,100    | 6,200 | 6,100  | 5,200      |

**BASIS:** Zero wind • Two Engine Full Reverse Thrust • Touchdown Speed = VREF25 - 5 •

Data is advisory and includes 15% safety margin and 1,500 ft. air distance from threshold to touchdown.

**REFERENCE DISTANCES BASED UPON PRESSURE ALTITUDE OF 2,000 FEET AND ARE CONSERVATIVE FOR ALL LOWER ALTITUDES.**

Shaded region corresponds to Max Landing Weight (MLW)

### ALTITUDE ADJUSTMENT

| ALTITUDE (FEET) | DRY (6) |       |       |       |       |      | GOOD (5) |       |       |      |
|-----------------|---------|-------|-------|-------|-------|------|----------|-------|-------|------|
| 0               | -600    | -500  | -400  | -400  | -300  | -200 | -400     | -400  | -300  | -300 |
| 2,000           | 0       | 0     | 0     | 0     | 0     | 0    | 0        | 0     | 0     | 0    |
| 4,000           | 600     | 500   | 400   | 400   | 300   | 200  | 400      | 400   | 300   | 300  |
| 6,000           | 1,200   | 1,000 | 900   | 700   | 700   | 400  | 900      | 700   | 700   | 600  |
| 8,000           | 1,700   | 1,500 | 1,300 | 1,100 | 1,000 | 600  | 1,300    | 1,100 | 1,000 | 800  |

### CORRECTIONS

|                     | DRY (6) |      |      |      |      |      | GOOD (5) |      |      |      |
|---------------------|---------|------|------|------|------|------|----------|------|------|------|
| PER 1 KT HEADWIND   | -50     | -50  | -50  | -50  | -50  | 0    | -50      | -50  | -50  | 0    |
| PER 1 KT TAILWIND   | 150     | 150  | 100  | 100  | 100  | 50   | 100      | 100  | 100  | 100  |
| PER 5 KTS ADD'L SPD | 350     | 350  | 400  | 350  | 350  | 150  | 400      | 350  | 350  | 200  |
| PER 10°C ABOVE ISA  | 300     | 250  | 200  | 200  | 200  | 100  | 200      | 200  | 200  | 150  |
| PER 10°C BELOW ISA  | -250    | -250 | -200 | -200 | -200 | -100 | -200     | -200 | -200 | -150 |
| PER 1% UP SLOPE     | -250    | -150 | 0    | 0    | 0    | -50  | 0        | 0    | 0    | -150 |
| PER 1% DOWN SLOPE   | 200     | 50   | 0    | 0    | 0    | 50   | 0        | 0    | 0    | 150  |
| 1 REVERSER INOP     | 600     | 100  | 0    | 0    | 0    | 100  | 0        | 0    | 0    | 300  |
| 2 REVERSERS INOP    | 700     | 100  | 0    | 0    | 0    | 200  | 0        | 100  | 100  | 700  |
| MANUAL SPOILERS     | 0       | 0    | 0    | 0    | 0    | 500  | 0        | 0    | 0    | 500  |

Note: Do not operate when Braking Action is Nil.

## OPERATIONAL LANDING DISTANCES

### FEET

**FLAPS 25**

| Landing Weight<br>(lb) | NOTE: Interpolate for GOOD-TO-MEDIUM (4) or MEDIUM-TO-POOR (2). |       |        |            |          |        |        |            |
|------------------------|-----------------------------------------------------------------|-------|--------|------------|----------|--------|--------|------------|
|                        | MEDIUM (3)                                                      |       |        |            | POOR (1) |        |        |            |
|                        | AB 3                                                            | AB 4  | Max AB | Max Manual | AB 3     | AB 4   | Max AB | Max Manual |
| 410,000                | 10,400                                                          | 9,700 | 9,600  | 9,500      | 12,400   | 12,400 | 12,400 | 12,400     |
| 400,000                | 10,200                                                          | 9,500 | 9,400  | 9,400      | 12,200   | 12,100 | 12,100 | 12,100     |
| 390,000                | 10,000                                                          | 9,300 | 9,200  | 9,200      | 11,900   | 11,800 | 11,800 | 11,800     |
| 380,000                | 9,800                                                           | 9,100 | 9,000  | 9,000      | 11,600   | 11,500 | 11,500 | 11,500     |
| 370,000                | 9,600                                                           | 8,900 | 8,800  | 8,800      | 11,300   | 11,300 | 11,300 | 11,300     |
| 360,000                | 9,400                                                           | 8,700 | 8,600  | 8,600      | 11,100   | 11,000 | 11,000 | 11,000     |
| 350,000                | 9,200                                                           | 8,500 | 8,400  | 8,400      | 10,800   | 10,700 | 10,700 | 10,700     |
| 340,000                | 9,000                                                           | 8,300 | 8,200  | 8,200      | 10,500   | 10,400 | 10,400 | 10,400     |
| 330,000                | 8,800                                                           | 8,100 | 8,000  | 8,000      | 10,300   | 10,200 | 10,200 | 10,200     |
| 320,000                | 8,600                                                           | 7,900 | 7,800  | 7,800      | 10,000   | 9,900  | 9,900  | 9,900      |
| 310,000                | 8,400                                                           | 7,700 | 7,700  | 7,600      | 9,800    | 9,600  | 9,600  | 9,600      |
| 300,000                | 8,200                                                           | 7,500 | 7,500  | 7,400      | 9,500    | 9,400  | 9,400  | 9,400      |
| 290,000                | 8,000                                                           | 7,400 | 7,300  | 7,300      | 9,200    | 9,100  | 9,100  | 9,100      |
| 280,000                | 7,800                                                           | 7,200 | 7,100  | 7,100      | 9,000    | 8,800  | 8,800  | 8,800      |
| 270,000                | 7,600                                                           | 7,000 | 6,900  | 6,900      | 8,700    | 8,600  | 8,600  | 8,600      |
| 260,000                | 7,400                                                           | 6,800 | 6,700  | 6,700      | 8,500    | 8,300  | 8,300  | 8,300      |

**BASIS:** Zero wind • Two Engine Full Reverse Thrust • Touchdown Speed = VREF25 - 5 •

Data is advisory and includes 15% safety margin and 1,500 ft. air distance from threshold to touchdown.

**REFERENCE DISTANCES BASED UPON PRESSURE ALTITUDE OF 2,000 FEET AND ARE CONSERVATIVE FOR ALL LOWER ALTITUDES.**



Shaded region corresponds to Max Landing Weight (MLW)

#### ALTITUDE ADJUSTMENT

| ALTITUDE (FEET) | MEDIUM (3) |       |       |       | POOR (1) |       |       |       |
|-----------------|------------|-------|-------|-------|----------|-------|-------|-------|
| 0               | -500       | -400  | -400  | -400  | -600     | -600  | -600  | -600  |
| 2,000           | 0          | 0     | 0     | 0     | 0        | 0     | 0     | 0     |
| 4,000           | 500        | 400   | 400   | 400   | 600      | 600   | 600   | 600   |
| 6,000           | 900        | 900   | 900   | 900   | 1,200    | 1,200 | 1,200 | 1,200 |
| 8,000           | 1,400      | 1,300 | 1,300 | 1,300 | 1,800    | 1,800 | 1,800 | 1,800 |

| CORRECTIONS         | MEDIUM (3) |       |       |       | POOR (1) |       |       |       |
|---------------------|------------|-------|-------|-------|----------|-------|-------|-------|
| PER 1 KT HEADWIND   | -50        | -50   | -50   | -50   | -50      | -50   | -50   | -50   |
| PER 1 KT TAILWIND   | 150        | 150   | 150   | 150   | 200      | 200   | 200   | 200   |
| PER 5 KTS ADD'L SPD | 400        | 350   | 350   | 250   | 400      | 300   | 300   | 300   |
| PER 10°C ABOVE ISA  | 250        | 200   | 200   | 200   | 300      | 300   | 300   | 300   |
| PER 10°C BELOW ISA  | -250       | -200  | -200  | -200  | -250     | -250  | -250  | -250  |
| PER 1% UP SLOPE     | -100       | -150  | -200  | -250  | -400     | -500  | -500  | -500  |
| PER 1% DOWN SLOPE   | 200        | 300   | 300   | 350   | 700      | 750   | 750   | 750   |
| 1 REVERSER INOP     | 400        | 600   | 700   | 800   | 1,500    | 1,700 | 1,700 | 1,700 |
| 2 REVERSERS INOP    | 1,300      | 1,700 | 1,800 | 1,900 | 4,300    | 4,500 | 4,500 | 4,500 |
| MANUAL SPOILERS     | 0          | 0     | 0     | 500   | 0        | 0     | 0     | 500   |

Note: Do not operate when Braking Action is Nil.

## OPERATIONAL LANDING DISTANCES FEET

### FLAPS 30

| Landing Weight<br>(lb) | NOTE: Interpolate for GOOD-TO-MEDIUM (4) or MEDIUM-TO-POOR (2). |        |        |       |        |            |          |       |        |            |
|------------------------|-----------------------------------------------------------------|--------|--------|-------|--------|------------|----------|-------|--------|------------|
|                        | DRY (6)                                                         |        |        |       |        |            | GOOD (5) |       |        |            |
|                        | AB 1                                                            | AB 2   | AB 3   | AB 4  | Max AB | Max Manual | AB 3     | AB 4  | Max AB | Max Manual |
| 410,000                | 12,600                                                          | 11,600 | 10,500 | 9,100 | 8,800  | 5,700      | 10,500   | 9,100 | 8,900  | 7,300      |
| 400,000                | 12,300                                                          | 11,300 | 10,200 | 8,900 | 8,600  | 5,500      | 10,200   | 8,900 | 8,600  | 7,100      |
| 390,000                | 11,900                                                          | 10,900 | 9,900  | 8,600 | 8,400  | 5,300      | 9,900    | 8,600 | 8,400  | 7,000      |
| 380,000                | 11,600                                                          | 10,600 | 9,600  | 8,400 | 8,100  | 5,200      | 9,600    | 8,400 | 8,100  | 6,800      |
| 370,000                | 11,200                                                          | 10,300 | 9,300  | 8,100 | 7,900  | 5,000      | 9,300    | 8,100 | 7,900  | 6,600      |
| 360,000                | 10,900                                                          | 10,000 | 9,000  | 7,900 | 7,600  | 4,800      | 9,000    | 7,900 | 7,700  | 6,400      |
| 350,000                | 10,500                                                          | 9,700  | 8,700  | 7,600 | 7,400  | 4,700      | 8,700    | 7,600 | 7,400  | 6,200      |
| 340,000                | 10,200                                                          | 9,300  | 8,400  | 7,400 | 7,200  | 4,500      | 8,400    | 7,400 | 7,200  | 6,000      |
| 330,000                | 9,900                                                           | 9,100  | 8,200  | 7,200 | 7,000  | 4,400      | 8,200    | 7,200 | 7,000  | 5,900      |
| 320,000                | 9,700                                                           | 8,900  | 8,000  | 7,000 | 6,800  | 4,400      | 8,000    | 7,000 | 6,800  | 5,800      |
| 310,000                | 9,400                                                           | 8,600  | 7,800  | 6,900 | 6,700  | 4,300      | 7,800    | 6,900 | 6,700  | 5,700      |
| 300,000                | 9,200                                                           | 8,400  | 7,600  | 6,700 | 6,500  | 4,200      | 7,600    | 6,700 | 6,500  | 5,500      |
| 290,000                | 8,900                                                           | 8,200  | 7,400  | 6,500 | 6,400  | 4,100      | 7,400    | 6,500 | 6,400  | 5,400      |
| 280,000                | 8,700                                                           | 8,000  | 7,200  | 6,400 | 6,200  | 4,000      | 7,200    | 6,400 | 6,200  | 5,300      |
| 270,000                | 8,400                                                           | 7,700  | 7,000  | 6,200 | 6,000  | 4,000      | 7,000    | 6,200 | 6,000  | 5,200      |
| 260,000                | 8,200                                                           | 7,500  | 6,800  | 6,100 | 5,900  | 3,900      | 6,800    | 6,100 | 5,900  | 5,000      |

**BASIS:** Zero wind • Two Engine Full Reverse Thrust • Touchdown Speed = VREF30 - 5 •

Data is advisory and includes 15% safety margin and 1,500 ft. air distance from threshold to touchdown.

**REFERENCE DISTANCES BASED UPON PRESSURE ALTITUDE OF 2,000 FEET AND ARE CONSERVATIVE FOR ALL LOWER ALTITUDES.**

Shaded region corresponds to Max Landing Weight (MLW)

### ALTITUDE ADJUSTMENT

| ALTITUDE (FEET) | DRY (6) |       |       |       |       |      | GOOD (5) |       |       |      |
|-----------------|---------|-------|-------|-------|-------|------|----------|-------|-------|------|
| 0               | -600    | -500  | -400  | -300  | -300  | -200 | -400     | -300  | -300  | -300 |
| 2,000           | 0       | 0     | 0     | 0     | 0     | 0    | 0        | 0     | 0     | 0    |
| 4,000           | 600     | 500   | 400   | 300   | 300   | 200  | 400      | 300   | 300   | 300  |
| 6,000           | 1,100   | 1,000 | 800   | 700   | 700   | 400  | 800      | 700   | 700   | 600  |
| 8,000           | 1,700   | 1,400 | 1,200 | 1,000 | 1,000 | 600  | 1,200    | 1,000 | 1,000 | 800  |

### CORRECTIONS

|                     | DRY (6) |      |      |      |      |      | GOOD (5) |      |      |      |
|---------------------|---------|------|------|------|------|------|----------|------|------|------|
| PER 1 KT HEADWIND   | -50     | -50  | -50  | -50  | -50  | 0    | -50      | -50  | -50  | 0    |
| PER 1 KT TAILWIND   | 150     | 150  | 100  | 100  | 100  | 50   | 100      | 100  | 100  | 100  |
| PER 5 KTS ADD'L SPD | 350     | 350  | 400  | 350  | 350  | 150  | 400      | 350  | 350  | 200  |
| PER 10°C ABOVE ISA  | 300     | 250  | 200  | 200  | 150  | 100  | 200      | 200  | 150  | 150  |
| PER 10°C BELOW ISA  | -250    | -250 | -200 | -200 | -150 | -100 | -200     | -200 | -150 | -150 |
| PER 1% UP SLOPE     | -250    | -150 | 0    | 0    | 0    | -50  | 0        | 0    | 0    | -150 |
| PER 1% DOWN SLOPE   | 200     | 50   | 0    | 0    | 0    | 50   | 0        | 0    | 0    | 150  |
| 1 REVERSER INOP     | 500     | 100  | 0    | 0    | 0    | 100  | 0        | 0    | 0    | 300  |
| 2 REVERSERS INOP    | 600     | 100  | 0    | 0    | 0    | 200  | 0        | 100  | 100  | 600  |
| MANUAL SPOILERS     | 0       | 0    | 0    | 0    | 0    | 500  | 0        | 0    | 0    | 500  |

Note: Do not operate when Braking Action is Nil.



## OPERATIONAL LANDING DISTANCES

### FEET

#### FLAPS 30

| Landing Weight<br>(lb) | NOTE: Interpolate for GOOD-TO-MEDIUM (4) or MEDIUM-TO-POOR (2). |        |        |            |          |        |        |            |
|------------------------|-----------------------------------------------------------------|--------|--------|------------|----------|--------|--------|------------|
|                        | MEDIUM (3)                                                      |        |        |            | POOR (1) |        |        |            |
|                        | AB 3                                                            | AB 4   | Max AB | Max Manual | AB 3     | AB 4   | Max AB | Max Manual |
| 410,000                | 11,100                                                          | 10,200 | 10,100 | 10,000     | 13,100   | 12,900 | 12,900 | 12,900     |
| 400,000                | 10,700                                                          | 9,900  | 9,900  | 9,700      | 12,700   | 12,500 | 12,500 | 12,500     |
| 390,000                | 10,400                                                          | 9,600  | 9,600  | 9,400      | 12,300   | 12,200 | 12,200 | 12,200     |
| 380,000                | 10,100                                                          | 9,400  | 9,300  | 9,200      | 12,000   | 11,800 | 11,800 | 11,800     |
| 370,000                | 9,800                                                           | 9,100  | 9,000  | 8,900      | 11,600   | 11,500 | 11,500 | 11,500     |
| 360,000                | 9,500                                                           | 8,800  | 8,700  | 8,700      | 11,200   | 11,100 | 11,100 | 11,100     |
| 350,000                | 9,100                                                           | 8,500  | 8,400  | 8,400      | 10,800   | 10,700 | 10,700 | 10,700     |
| 340,000                | 8,800                                                           | 8,200  | 8,100  | 8,100      | 10,400   | 10,400 | 10,400 | 10,400     |
| 330,000                | 8,600                                                           | 8,000  | 7,900  | 7,900      | 10,200   | 10,100 | 10,100 | 10,100     |
| 320,000                | 8,400                                                           | 7,800  | 7,700  | 7,700      | 9,900    | 9,900  | 9,900  | 9,900      |
| 310,000                | 8,200                                                           | 7,600  | 7,500  | 7,500      | 9,600    | 9,600  | 9,600  | 9,600      |
| 300,000                | 8,000                                                           | 7,400  | 7,400  | 7,300      | 9,400    | 9,300  | 9,300  | 9,300      |
| 290,000                | 7,800                                                           | 7,200  | 7,200  | 7,100      | 9,100    | 9,100  | 9,100  | 9,100      |
| 280,000                | 7,600                                                           | 7,000  | 7,000  | 6,900      | 8,800    | 8,800  | 8,800  | 8,800      |
| 270,000                | 7,400                                                           | 6,800  | 6,800  | 6,800      | 8,600    | 8,500  | 8,500  | 8,500      |
| 260,000                | 7,200                                                           | 6,600  | 6,600  | 6,600      | 8,300    | 8,300  | 8,300  | 8,300      |

**BASIS:** Zero wind • Two Engine Full Reverse Thrust • Touchdown Speed = VREF30 - 5 •

Data is advisory and includes 15% safety margin and 1,500 ft. air distance from threshold to touchdown.

**REFERENCE DISTANCES BASED UPON PRESSURE ALTITUDE OF 2,000 FEET AND ARE CONSERVATIVE FOR ALL LOWER ALTITUDES.**

Shaded region corresponds to Max Landing Weight (MLW)

#### ALTITUDE ADJUSTMENT

| ALTITUDE (FEET) | MEDIUM (3) |       |       |       | POOR (1) |       |       |       |
|-----------------|------------|-------|-------|-------|----------|-------|-------|-------|
| 0               | -500       | -400  | -400  | -400  | -600     | -600  | -600  | -600  |
| 2,000           | 0          | 0     | 0     | 0     | 0        | 0     | 0     | 0     |
| 4,000           | 500        | 400   | 400   | 400   | 600      | 600   | 600   | 600   |
| 6,000           | 900        | 900   | 900   | 900   | 1,200    | 1,200 | 1,200 | 1,200 |
| 8,000           | 1,400      | 1,300 | 1,300 | 1,300 | 1,800    | 1,800 | 1,800 | 1,800 |

| CORRECTIONS         | MEDIUM (3) |       |       |       | POOR (1) |       |       |       |
|---------------------|------------|-------|-------|-------|----------|-------|-------|-------|
| PER 1 KT HEADWIND   | -50        | -50   | -50   | -50   | -50      | -50   | -50   | -50   |
| PER 1 KT TAILWIND   | 150        | 150   | 150   | 150   | 200      | 200   | 200   | 200   |
| PER 5 KTS ADD'L SPD | 400        | 350   | 300   | 250   | 400      | 300   | 300   | 300   |
| PER 10°C ABOVE ISA  | 250        | 200   | 200   | 200   | 300      | 300   | 300   | 300   |
| PER 10°C BELOW ISA  | -200       | -200  | -200  | -200  | -250     | -250  | -250  | -250  |
| PER 1% UP SLOPE     | -100       | -150  | -200  | -300  | -400     | -500  | -500  | -500  |
| PER 1% DOWN SLOPE   | 200        | 300   | 300   | 350   | 750      | 800   | 800   | 800   |
| 1 REVERSER INOP     | 400        | 600   | 700   | 700   | 1,500    | 1,600 | 1,600 | 1,600 |
| 2 REVERSERS INOP    | 1,200      | 1,600 | 1,700 | 1,800 | 4,000    | 4,200 | 4,200 | 4,100 |
| MANUAL SPOILERS     | 0          | 0     | 0     | 500   | 0        | 0     | 0     | 500   |

Note: Do not operate when Braking Action is Nil.

END OF SECTION



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## DEFINITIONS AND ASSUMPTIONS

|                                        |                                                                                                                                                                                                                                                                                                                                         |
|----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>GROSS LEVEL OFF ALTITUDE</b>        | Altitude at which the aircraft is expected to level off after the loss of one engine. No conservatism is built into this value. For use during flight, not for flight planning.                                                                                                                                                         |
| <b>LONG RANGE CRUISE</b>               | The speed of the aircraft that will result in 99% of the maximum range of the aircraft in no wind conditions for a given weight and altitude.                                                                                                                                                                                           |
| <b>MAXIMUM CONTINUOUS THRUST (MCT)</b> | The maximum thrust level for which the engine is rated with no time constraint.                                                                                                                                                                                                                                                         |
| <b>SPECIFIC AIR RANGE (SAR)</b>        | The gas mileage range an aircraft can fly per 1,000 lbs of fuel for a given weight, altitude, Mach number, and temperature. The SAR changes as the weight of the aircraft changes, all other parameters remaining constant. Fuel burn required for a given flight segment is the segment length divided by the average SAR for the leg. |
| <b>STATIC AIR TEMPERATURE (SAT)</b>    | The static air temperature outside of the aircraft. Also referred to as the Outside Air Temperature or OAT.                                                                                                                                                                                                                             |
| <b>TOTAL AIR TEMPERATURE (TAT)</b>     | The sum of both the ambient air temperature plus the total increase in temperature due to compression heating.                                                                                                                                                                                                                          |

## MEL RELATED PERFORMANCE ABBREVIATIONS DISPLAYED ON WDR

|            |                                                                                                                                                                              |
|------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>ASI</b> | AWABS has automatically corrected the allowable weights and V1 speeds due to a completely inoperative anti-skid braking system.                                              |
| <b>BKI</b> | AWABS has automatically corrected the allowable weights and V1 speeds due to an inoperative brake or one anti-skid channel inoperative.                                      |
| <b>GRD</b> | AWABS has automatically corrected the allowable weights and V1 speeds due to gear down dispatch. Used when an MEL item requires delayed gear retraction or gear down flight. |

INTENTIONALLY BLANK

## THRUST SETTINGS – ALL ENGINES

### TAKEOFF

% N<sub>1</sub>

**TO**

**CF6-80C2B6F**

BASED ON FULL RATING  
NORMAL BLEED – PACKS ON, EEC NORM or ALTN, ANTI-ICE ON or OFF

| AIRPORT OAT |     | TAT<br>(°C) | AIRPORT PRESSURE ALTITUDE (FT) |       |       |       |       |       |       |
|-------------|-----|-------------|--------------------------------|-------|-------|-------|-------|-------|-------|
| °F          | °C  |             | -1,000                         | 0     | 2,000 | 4,000 | 6,000 | 8,000 | 9,000 |
| 131         | 55  | 58          | 106.1                          | 106.1 | 105.9 | 105.5 | 105.1 | 104.9 | 104.7 |
| 122         | 50  | 53          | 106.8                          | 106.9 | 106.8 | 106.5 | 106.1 | 105.9 | 105.7 |
| 113         | 45  | 48          | 107.5                          | 107.5 | 107.5 | 107.3 | 107.0 | 106.9 | 106.6 |
| 104         | 40  | 43          | 108.2                          | 108.2 | 108.2 | 108.0 | 107.9 | 107.8 | 107.7 |
| 95          | 35  | 38          | 109.0                          | 108.9 | 109.0 | 108.8 | 108.7 | 108.7 | 108.6 |
| 86          | 30  | 33          | 109.1                          | 109.8 | 109.8 | 109.7 | 109.6 | 109.7 | 109.6 |
| 77          | 25  | 28          | 108.2                          | 108.9 | 110.3 | 110.6 | 110.5 | 110.6 | 110.6 |
| 68          | 20  | 23          | 107.3                          | 108.0 | 109.4 | 110.6 | 111.3 | 111.4 | 111.3 |
| 59          | 15  | 18          | 106.4                          | 107.1 | 108.5 | 109.7 | 111.0 | 112.0 | 112.1 |
| 50          | 10  | 13          | 105.5                          | 106.2 | 107.5 | 108.8 | 110.0 | 111.3 | 112.1 |
| 32          | 0   | 3           | 103.6                          | 104.3 | 105.7 | 106.9 | 108.1 | 109.4 | 110.1 |
| 14          | -10 | -7          | 101.7                          | 102.4 | 103.8 | 104.9 | 106.1 | 107.4 | 108.1 |
| -4          | -20 | -17         | 99.8                           | 100.4 | 101.8 | 103.0 | 104.2 | 105.4 | 106.1 |
| -22         | -30 | -27         | 97.9                           | 98.5  | 99.8  | 101.0 | 102.2 | 103.4 | 104.0 |
| -40         | -40 | -37         | 95.9                           | 96.4  | 97.8  | 99.0  | 100.1 | 101.3 | 102.0 |
| -58         | -50 | -47         | 93.8                           | 94.4  | 95.8  | 96.9  | 98.0  | 99.2  | 99.8  |

#### CORRECTIONS:

| Bleed Configuration | PRESSURE ALTITUDE (1000 FT) |      |       |       |       |       |       |
|---------------------|-----------------------------|------|-------|-------|-------|-------|-------|
|                     | -1000                       | 0    | 2,000 | 4,000 | 6,000 | 8,000 | 9,000 |
| Packs OFF           | +0.3                        | +0.3 | +0.3  | +0.4  | +0.5  | +0.5  | +0.5  |

**THRUST SETTINGS – ALL ENGINES****MAXIMUM CLIMB**% N<sub>1</sub>**CLB****CF6-80C2B6F**

NORMAL BLEED – PACKS ON, ANTI-ICE OFF

| TAT<br>°C | PRESSURE ALTITUDE (1000 FT) / SPEED (KIAS OR MACH) |       |       |       |       |       |       |       |       |
|-----------|----------------------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|
|           | 0                                                  | 5     | 10    | 15    | 20    | 25    | 30    | 35    | 40    |
|           | 250                                                | 250   | 250   | 290   | 290   | 290   | 290   | 0.78  | 0.78  |
| 60        | 96.5                                               | 97.2  | 97.0  | 97.4  | 96.7  | 95.1  | 96.1  | 95.1  | 94.7  |
| 50        | 97.6                                               | 98.7  | 99.0  | 99.6  | 98.9  | 97.3  | 98.2  | 95.0  | 93.8  |
| 40        | 98.8                                               | 99.8  | 100.4 | 101.2 | 101.0 | 99.3  | 100.1 | 97.0  | 95.8  |
| 30        | 99.1                                               | 101.1 | 101.6 | 102.4 | 102.5 | 101.2 | 101.9 | 98.8  | 97.7  |
| 20        | 97.5                                               | 101.3 | 103.3 | 103.8 | 104.1 | 102.8 | 103.4 | 100.5 | 99.4  |
| 10        | 95.8                                               | 99.6  | 102.9 | 104.4 | 105.6 | 104.6 | 104.7 | 102.6 | 100.9 |
| 0         | 94.2                                               | 97.8  | 101.1 | 102.6 | 105.0 | 106.9 | 106.5 | 104.3 | 102.4 |
| -10       | 92.5                                               | 96.1  | 99.4  | 100.8 | 103.0 | 105.3 | 107.1 | 106.3 | 104.3 |
| -20       | 90.8                                               | 94.3  | 97.6  | 99.0  | 101.5 | 103.4 | 105.1 | 106.5 | 106.4 |
| -30       | 89.1                                               | 92.4  | 95.7  | 97.1  | 99.7  | 101.5 | 103.2 | 104.4 | 104.4 |
| -40       | 87.3                                               | 90.5  | 93.9  | 95.2  | 97.8  | 99.5  | 101.2 | 102.2 | 102.2 |
| -50       | 85.5                                               | 88.6  | 91.9  | 93.3  | 95.8  | 97.5  | 99.1  | 100.1 | 100.1 |

**CORRECTIONS:**

| Bleed Configuration       | PRESSURE ALTITUDE (1000 FT) |      |      |      |      |      |      |      |      |
|---------------------------|-----------------------------|------|------|------|------|------|------|------|------|
|                           | 0                           | 5    | 10   | 15   | 20   | 25   | 30   | 35   | 40   |
| Packs OFF                 | 0.0                         | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Engine Anti-Ice ON        | -0.6                        | -0.6 | -0.6 | -0.6 | -0.8 | -0.9 | -1.1 | -1.4 | -1.9 |
| Engine & Wing Anti-Ice ON | -0.9                        | -0.9 | -1.0 | -1.1 | -1.3 | -1.4 | -1.7 | -2.2 | -2.4 |



**THRUST SETTINGS – ALL ENGINES****MAXIMUM CRUISE**% N<sub>1</sub>**CRZ****CF6-80C2B6F**

| TAT<br>°C | PRESSURE ALTITUDE (1000 FT) |      |       |       |       |       |       |       |       |       |
|-----------|-----------------------------|------|-------|-------|-------|-------|-------|-------|-------|-------|
|           | 10                          | 15   | 20    | 25    | 30    | 35    | 37    | 39    | 41    | 43    |
| 45        | 96.1                        |      |       |       |       |       |       |       |       |       |
| 40        | 96.9                        |      |       |       |       |       |       |       |       |       |
| 35        | 97.6                        | 97.5 |       |       |       |       |       |       |       |       |
| 30        | 98.2                        | 98.3 |       |       |       |       |       |       |       |       |
| 25        | 98.8                        | 99.0 | 100.3 | 98.2  |       |       |       |       |       |       |
| 20        | 98.1                        | 99.7 | 101.0 | 99.3  |       |       |       |       |       |       |
| 15        | 97.3                        | 99.5 | 101.6 | 100.3 | 101.0 |       |       |       |       |       |
| 10        | 96.4                        | 98.6 | 100.9 | 101.3 | 101.6 |       |       |       |       |       |
| 5         | 95.6                        | 97.7 | 100.0 | 102.2 | 102.3 | 99.8  | 98.8  | 98.7  | 98.6  | 98.6  |
| 0         | 94.7                        | 96.8 | 99.1  | 102.0 | 103.1 | 100.7 | 99.6  | 99.5  | 99.5  | 99.4  |
| -5        | 93.8                        | 95.9 | 98.1  | 101.1 | 103.5 | 101.5 | 100.5 | 100.4 | 100.3 | 100.3 |
| -10       | 93.0                        | 95.0 | 97.2  | 100.1 | 102.5 | 102.5 | 101.4 | 101.3 | 101.3 | 101.2 |
| -15       | 92.1                        | 94.1 | 96.3  | 99.2  | 101.5 | 103.4 | 102.4 | 102.3 | 102.3 | 102.3 |
| -20       | 91.2                        | 93.2 | 95.4  | 98.2  | 100.5 | 102.4 | 102.4 | 102.4 | 102.3 | 102.3 |
| -25       |                             | 92.3 | 94.4  | 97.2  | 99.5  | 101.3 | 101.4 | 101.4 | 101.3 | 101.3 |
| -30       |                             | 91.4 | 93.5  | 96.2  | 98.5  | 100.3 | 100.3 | 100.3 | 100.3 | 100.3 |
| -35       |                             |      | 92.5  | 95.2  | 97.5  | 99.3  | 99.3  | 99.3  | 99.3  | 99.2  |
| -40       |                             |      | 91.5  | 94.2  | 96.5  | 98.2  | 98.3  | 98.2  | 98.2  | 98.2  |
| -45       |                             |      |       |       | 95.5  | 97.2  | 97.2  | 97.2  | 97.2  | 97.1  |
| -50       |                             |      |       |       | 94.4  | 96.1  | 96.1  | 96.1  | 96.1  | 96.1  |
| -55       |                             |      |       |       |       | 95.0  | 95.0  | 95.0  | 95.0  | 95.0  |
| -60       |                             |      |       |       |       | 93.9  | 93.9  | 93.9  | 93.9  | 93.9  |

**CORRECTIONS:**

| Bleed Configuration       | PRESSURE ALTITUDE (1000 FT) |      |      |      |      |      |      |      |      |      |
|---------------------------|-----------------------------|------|------|------|------|------|------|------|------|------|
|                           | 10                          | 15   | 20   | 25   | 30   | 35   | 37   | 39   | 41   | 43   |
| Engine Anti-Ice ON        | -0.6                        | -0.6 | -0.9 | -0.9 | -1.1 | -1.5 | -1.5 | -2.2 | -2.2 | -2.2 |
| Engine & Wing Anti-Ice ON | -1.1                        | -1.1 | -1.4 | -1.4 | -1.7 | -2.3 | -2.3 | -3.4 | -3.4 | -3.4 |

**THRUST SETTINGS – ALL ENGINES****GO AROUND**% N<sub>1</sub>**CF6-80C2B6F**

BASED ON FULL INFLIGHT TAKEOFF RATING  
PACKS ON, EEC NORM or ALTN, ANTI-ICE ON or OFF

| AIRPORT OAT |     | TAT<br>°C | AIRPORT PRESSURE ALTITUDE (FT) |       |       |       |       |       |       |
|-------------|-----|-----------|--------------------------------|-------|-------|-------|-------|-------|-------|
| °F          | °C  |           | -1,000                         | 0     | 2,000 | 4,000 | 6,000 | 8,000 | 9,000 |
| 131         | 55  | 58        | 106.1                          | 106.1 | 105.9 | 105.5 | 105.1 | 104.9 | 104.7 |
| 122         | 50  | 53        | 106.8                          | 106.9 | 106.8 | 106.5 | 106.1 | 105.9 | 105.7 |
| 113         | 45  | 48        | 107.5                          | 107.5 | 107.5 | 107.3 | 107.0 | 106.9 | 106.6 |
| 104         | 40  | 43        | 108.2                          | 108.2 | 108.2 | 108.0 | 107.9 | 107.8 | 107.7 |
| 95          | 35  | 38        | 109.0                          | 108.9 | 109.0 | 108.8 | 108.7 | 108.7 | 108.6 |
| 86          | 30  | 33        | 109.1                          | 109.8 | 109.8 | 109.7 | 109.6 | 109.7 | 109.6 |
| 77          | 25  | 28        | 108.2                          | 108.9 | 110.3 | 110.6 | 110.5 | 110.6 | 110.6 |
| 68          | 20  | 23        | 107.3                          | 108.0 | 109.4 | 110.6 | 111.3 | 111.4 | 111.3 |
| 59          | 15  | 18        | 106.4                          | 107.1 | 108.5 | 109.7 | 111.0 | 112.0 | 112.1 |
| 50          | 10  | 13        | 105.5                          | 106.2 | 107.5 | 108.8 | 110.0 | 111.3 | 112.1 |
| 32          | 0   | 3         | 103.6                          | 104.3 | 105.7 | 106.9 | 108.1 | 109.4 | 110.1 |
| 14          | -10 | -7        | 101.7                          | 102.4 | 103.8 | 104.9 | 106.1 | 107.4 | 108.1 |
| -4          | -20 | -17       | 99.8                           | 100.4 | 101.8 | 103.0 | 104.2 | 105.4 | 106.1 |
| -22         | -30 | -27       | 97.9                           | 98.5  | 99.8  | 101.0 | 102.2 | 103.4 | 104.0 |
| -40         | -40 | -37       | 95.9                           | 96.4  | 97.8  | 99.0  | 100.1 | 101.3 | 102.0 |
| -58         | -50 | -47       | 93.8                           | 94.4  | 95.8  | 96.9  | 98.0  | 99.2  | 99.8  |

**CORRECTIONS:**

| Bleed Configuration | PRESSURE ALTITUDE (1000 FT) |      |       |       |       |       |       |
|---------------------|-----------------------------|------|-------|-------|-------|-------|-------|
|                     | -1,000                      | 0    | 2,000 | 4,000 | 6,000 | 8,000 | 9,000 |
| Packs OFF           | +0.3                        | +0.3 | +0.3  | +0.4  | +0.5  | +0.5  | +0.5  |

# ONE ENGINE INOPERATIVE

## MAXIMUM CONTINUOUS THRUST

### %N<sub>1</sub>

MCT

BASED ON 250 / 290 KIAS / 0.78M

NORMAL BLEED - PACKS ON / ANTI-ICE OFF

CF6-80C2B6

| TAT -<br>°C | PRESSURE ALTITUDE – FEET |       |       |       |        |        |        |        |
|-------------|--------------------------|-------|-------|-------|--------|--------|--------|--------|
|             | S.L.                     | 1000  | 2000  | 3000  | 10,000 | 20,000 | 30,000 | 39,000 |
| 50          | 102.4                    | 102.5 | 102.5 | 102.5 | 103.4  | 102.2  | 99.2   | 94.9   |
| 48          | 102.7                    | 102.7 | 102.8 | 102.8 | 103.6  | 102.5  | 99.5   | 95.2   |
| 46          | 102.9                    | 103.0 | 103.0 | 103.0 | 103.8  | 102.9  | 99.8   | 95.5   |
| 44          | 103.2                    | 103.2 | 103.3 | 103.3 | 104.0  | 103.2  | 100.0  | 95.9   |
| 42          | 103.4                    | 103.5 | 103.5 | 103.5 | 104.2  | 103.6  | 100.3  | 96.2   |
| 40          | 103.7                    | 103.8 | 103.8 | 103.8 | 104.4  | 103.9  | 100.6  | 96.5   |
| 38          | 104.1                    | 103.9 | 104.0 | 104.0 | 104.7  | 104.3  | 100.9  | 96.8   |
| 36          | 104.6                    | 104.1 | 104.3 | 104.3 | 105.0  | 104.7  | 101.2  | 97.1   |
| 34          | 105.0                    | 104.3 | 104.5 | 104.5 | 105.4  | 105.0  | 101.4  | 97.4   |
| 32          | 104.6                    | 104.4 | 104.8 | 104.8 | 105.7  | 105.4  | 101.7  | 97.7   |
| 30          | 104.1                    | 104.6 | 105.0 | 105.0 | 106.0  | 105.8  | 102.0  | 98.0   |
| 28          | 103.7                    | 104.2 | 104.7 | 105.7 | 106.2  | 106.2  | 102.2  | 98.3   |
| 26          | 103.4                    | 103.9 | 104.5 | 105.4 | 106.4  | 106.6  | 102.5  | 98.6   |
| 24          | 103.0                    | 103.6 | 104.2 | 105.1 | 106.6  | 107.1  | 102.7  | 99.0   |
| 22          | 102.7                    | 103.3 | 104.0 | 104.7 | 106.8  | 107.5  | 103.0  | 99.3   |
| 20          | 102.3                    | 103.0 | 103.7 | 104.4 | 107.0  | 107.9  | 103.2  | 99.6   |
| 18          | 101.9                    | 102.6 | 103.3 | 104.0 | 106.8  | 108.2  | 103.5  | 99.8   |
| 16          | 101.6                    | 102.3 | 103.0 | 103.6 | 106.7  | 108.6  | 103.7  | 100.1  |
| 14          | 101.2                    | 101.9 | 102.6 | 103.3 | 106.5  | 108.9  | 104.0  | 100.3  |
| 12          | 100.9                    | 101.6 | 102.3 | 102.9 | 106.4  | 109.3  | 104.2  | 100.6  |
| 10          | 100.5                    | 101.2 | 101.9 | 102.5 | 106.2  | 109.6  | 104.5  | 100.8  |
| 8           | 100.1                    | 100.8 | 101.5 | 102.1 | 105.8  | 110.0  | 104.9  | 101.1  |
| 6           | 99.8                     | 100.5 | 101.2 | 101.8 | 105.5  | 110.4  | 105.3  | 101.4  |
| 4           | 99.4                     | 100.1 | 100.8 | 101.4 | 105.1  | 110.0  | 105.8  | 101.7  |
| 2           | 99.1                     | 99.8  | 100.5 | 101.1 | 104.7  | 109.7  | 106.2  | 102.0  |
| 0           | 98.7                     | 99.4  | 100.1 | 100.7 | 104.3  | 109.3  | 106.6  | 102.3  |
| -2          | 98.4                     | 99.1  | 99.8  | 100.4 | 104.0  | 108.9  | 107.1  | 102.7  |
| -4          | 98.0                     | 98.7  | 99.4  | 100.0 | 103.6  | 108.4  | 107.6  | 103.1  |
| -6          | 97.6                     | 98.4  | 99.1  | 99.7  | 103.2  | 108.0  | 107.3  | 103.5  |
| -8          | 97.3                     | 98.0  | 98.7  | 99.3  | 102.8  | 107.5  | 107.1  | 103.9  |
| -10         | 96.9                     | 97.7  | 98.4  | 99.0  | 102.5  | 107.1  | 106.8  | 104.3  |
| -12         | 96.6                     | 97.3  | 98.0  | 98.6  | 102.1  | 106.6  | 106.4  | 104.8  |
| -14         | 96.2                     | 96.9  | 97.7  | 98.3  | 101.7  | 106.2  | 106.0  | 105.2  |
| -16         | 95.9                     | 96.6  | 97.3  | 97.9  | 101.3  | 105.7  | 105.6  | 105.7  |
| -18         | 95.5                     | 96.2  | 97.0  | 97.6  | 101.0  | 105.3  | 105.3  | 106.1  |
| -20         | 95.2                     | 95.9  | 96.6  | 97.2  | 100.6  | 104.9  | 104.9  | 106.6  |
| -22         | 94.8                     | 95.5  | 96.2  | 96.8  | 100.2  | 104.4  | 104.5  | 106.1  |
| -24         | 94.4                     | 95.2  | 95.9  | 96.5  | 99.9   | 104.0  | 104.1  | 105.7  |

## NOTES:

|               |       |       |       |       |       |      |      |      |
|---------------|-------|-------|-------|-------|-------|------|------|------|
| ENG A/I ON :  | - 0.6 | - 0.6 | - 0.6 | - 0.6 | - 0.6 | -0.7 | -1.1 | -1.8 |
| WING A/I ON : | - 0.6 | - 0.6 | - 0.6 | - 0.6 | -0.8  | -0.8 | -1.1 | -1.8 |

## ONE ENGINE INOPERATIVE DRIFTDOWN PROCEDURES

### IN THE EVENT OF AN ENGINE FAILURE OR SHUTDOWN DURING CRUISE:

1. Immediately set Maximum Continuous Thrust (MCT) from previous page.
2. Allow aircraft to decelerate in level flight to driftdown speed prior to initiating descent.
  - Aircraft will level off at or above altitudes shown in DRIFTDOWN GROSS LEVEL-OFF ALTITUDE chart.
  - Cross-check FMS engine-out level-off altitude if so equipped. Otherwise, cross-check with level-off altitude in ODM.
3. If driftdown terrain clearance is critical, consult Flight Plan Remarks to determine:
  - Recommended en route alternate airports, if required.
  - ISA temperature deviation at 18,000 feet.
4. If terrain clearance is a factor, select a suitable alternate airport as follows:
  - Terrain clearance is assured for flight to any flight plan alternate airport listed.
  - Comply with Unrestricted/Restricted Critical Terrain Procedures as described in Airway Manual – Section 6.
  - Use flight plan recommended en route alternate airport, or:
  - Determine aircraft position on appropriate Jeppesen Low Level or High/Low Level enroute chart and locations of other suitable alternates.
  - Check terrain clearance for flight via MEA / MOCA on airway or Grid MORA for a non-flight-plan suitable enroute alternate.
  - Maintain MCT / driftdown speed after level-off and allow aircraft to climb until at/above MEA / MOCA on airway or Grid MORA.
  - Maintain airway MEA / MOCA until established on the arrival to selected alternate airport.
5. Proceed to selected nearest suitable alternate.
6. Except as specified in Step 4, maintain Maximum Continuous Thrust (MCT) and allow aircraft to accelerate to engine-out Long Range Cruise speed at level-off altitude.

### DRIFTDOWN SPEED SCHEDULE KIAS

| GROSS<br>WEIGHT<br>POUNDS | ALTITUDE - FEET   |        |        |        |        |        |                   |
|---------------------------|-------------------|--------|--------|--------|--------|--------|-------------------|
|                           | 10,000 &<br>below | 15,000 | 20,000 | 25,000 | 31,000 | 35,000 | 39,000 &<br>above |
| 420,000                   | 274               | 276    | 278    | 281    | 285    |        |                   |
| 400,000                   | 268               | 270    | 271    | 275    | 278    |        |                   |
| 380,000                   | 261               | 263    | 264    | 267    | 270    |        |                   |
| 360,000                   | 254               | 256    | 257    | 260    | 263    | 267    | 271               |
| 340,000                   | 247               | 249    | 250    | 253    | 255    | 260    | 264               |
| 320,000                   | 239               | 241    | 242    | 245    | 247    | 251    | 255               |
| 300,000                   | 232               | 233    | 234    | 236    | 238    | 242    | 246               |
| 280,000                   | 224               | 225    | 226    | 228    | 230    | 233    | 236               |
| 260,000                   | 215               | 216    | 217    | 218    | 220    | 223    | 226               |
| 240,000                   | 206               | 207    | 208    | 209    | 211    | 213    | 216               |

# ONE ENGINE INOPERATIVE

## DRIFTDOWN SPEED AND GROSS LEVEL OFF ALTITUDE

### FEET

**ENGINE ANTI-ICE OFF**

| GROSS WEIGHT – POUNDS |                       | APPROX GROSS LEVEL OFF ALTITUDE – FEET |                     |            |            |
|-----------------------|-----------------------|----------------------------------------|---------------------|------------|------------|
| AT ENGINE FAILURE     | AT LEVEL OFF (APPROX) | OPTIMUM DRIFTDOWN SPEED - KIAS         | ISA + 10°C & COLDER | ISA + 15°C | ISA + 20°C |
| 420,000               | 405,000               | 275                                    | 18,500              | 17,600     | 15,900     |
| 400,000               | 387,000               | 269                                    | 20,100              | 19,300     | 17,900     |
| 380,000               | 369,000               | 263                                    | 21,200              | 20,700     | 19,800     |
| 360,000               | 349,000               | 256                                    | 22,400              | 21,900     | 20,900     |
| 340,000               | 330,000               | 249                                    | 23,700              | 23,100     | 22,100     |
| 320,000               | 311,000               | 242                                    | 25,100              | 24,400     | 23,500     |
| 300,000               | 291,000               | 234                                    | 26,800              | 26,100     | 24,800     |
| 280,000               | 272,000               | 227                                    | 28,300              | 28,000     | 27,200     |
| 260,000               | 253,000               | 219                                    | 30,000              | 30,000     | 29,700     |
| 240,000               | 234,000               | 211                                    | 31,900              | 31,900     | 31,500     |

**ENGINE ANTI-ICE ON**

| GROSS WEIGHT – POUNDS |                       | APPROX GROSS LEVEL OFF ALTITUDE – FEET |                     |            |            |
|-----------------------|-----------------------|----------------------------------------|---------------------|------------|------------|
| AT ENGINE FAILURE     | AT LEVEL OFF (APPROX) | OPTIMUM DRIFTDOWN SPEED - KIAS         | ISA + 10°C & COLDER | ISA + 15°C | ISA + 20°C |
| 420,000               | 405,000               | 275                                    | 17,900              | 16,700     | 14,900     |
| 400,000               | 387,000               | 269                                    | 19,300              | 18,400     | 16,800     |
| 380,000               | 369,000               | 262                                    | 20,500              | 19,800     | 18,700     |
| 360,000               | 349,000               | 255                                    | 21,700              | 21,000     | 20,100     |
| 340,000               | 330,000               | 248                                    | 23,100              | 22,300     | 21,300     |
| 320,000               | 310,000               | 241                                    | 24,600              | 23,800     | 22,700     |
| 300,000               | 290,000               | 234                                    | 26,400              | 25,300     | 24,300     |
| 280,000               | 272,000               | 227                                    | 28,100              | 27,600     | 26,300     |
| 260,000               | 253,000               | 219                                    | 29,800              | 29,700     | 28,800     |
| 240,000               | 234,000               | 211                                    | 31,500              | 31,400     | 30,800     |

**ENGINE & WING ANTI-ICE ON**

| GROSS WEIGHT – POUNDS |                       | APPROX GROSS LEVEL OFF ALTITUDE – FEET |                     |            |            |
|-----------------------|-----------------------|----------------------------------------|---------------------|------------|------------|
| AT ENGINE FAILURE     | AT LEVEL OFF (APPROX) | OPTIMUM DRIFTDOWN SPEED - KIAS         | ISA + 10°C & COLDER | ISA + 15°C | ISA + 20°C |
| 420,000               | 405,000               | 274                                    | 16,700              | 15,200     | 13,500     |
| 400,000               | 386,000               | 268                                    | 18,300              | 17,200     | 15,400     |
| 380,000               | 368,000               | 262                                    | 19,900              | 18,800     | 17,400     |
| 360,000               | 349,000               | 255                                    | 21,100              | 20,200     | 19,200     |
| 340,000               | 330,000               | 248                                    | 22,400              | 21,700     | 20,700     |
| 320,000               | 310,000               | 241                                    | 23,900              | 23,100     | 22,000     |
| 300,000               | 290,000               | 234                                    | 25,600              | 24,500     | 23,500     |
| 280,000               | 271,000               | 226                                    | 27,500              | 26,600     | 24,900     |
| 260,000               | 253,000               | 219                                    | 29,500              | 28,900     | 27,600     |
| 240,000               | 234,000               | 210                                    | 31,200              | 30,800     | 30,100     |

**BASIS:**

- APU operating
- Maximum Continuous Thrust Limits
- 100 ft/min residual rate of climb
- 35,000 ft initial altitude

## ONE ENGINE INOPERATIVE

### LONG RANGE CRUISE ALTITUDE CAPABILITY

| GROSS WEIGHT -<br>POUNDS | PRESSURE ALTITUDE - FT |            |            |
|--------------------------|------------------------|------------|------------|
|                          | ISA + 10°C & BELOW     | ISA + 15°C | ISA + 20°C |
| 420,000                  | 15,300                 | 12,900     | 10,100     |
| 410,000                  | 16,100                 | 14,000     | 11,200     |
| 400,000                  | 17,000                 | 15,000     | 12,300     |
| 390,000                  | 17,800                 | 16,100     | 13,500     |
| 380,000                  | 18,700                 | 17,100     | 14,600     |
| 370,000                  | 19,500                 | 18,100     | 15,700     |
| 360,000                  | 20,300                 | 19,000     | 16,900     |
| 350,000                  | 20,900                 | 20,000     | 18,100     |
| 340,000                  | 21,500                 | 20,600     | 19,300     |
| 330,000                  | 22,100                 | 21,200     | 20,300     |
| 320,000                  | 22,800                 | 21,900     | 20,900     |
| 310,000                  | 23,500                 | 22,500     | 21,500     |
| 300,000                  | 24,200                 | 23,200     | 22,100     |
| 290,000                  | 24,900                 | 23,900     | 22,800     |
| 280,000                  | 25,700                 | 24,600     | 23,400     |
| 270,000                  | 26,700                 | 25,500     | 24,100     |
| 260,000                  | 27,600                 | 26,800     | 24,800     |
| 250,000                  | 28,600                 | 28,000     | 26,200     |
| 240,000                  | 29,600                 | 29,300     | 27,700     |
| 230,000                  | 30,600                 | 30,400     | 29,300     |
| 220,000                  | 31,500                 | 31,400     | 30,600     |

**CORRECTIONS:**

| CONFIGURATION               | ALT. CORRECTION (FT) |
|-----------------------------|----------------------|
| Engine Anti-Ice ON          | - 1,800              |
| Engine and Wing Anti-Ice ON | - 3,800              |

**BASIS:**

- Max continuous thrust.
- Long range cruise speed.
- 100 ft/min residual rate of climb

## ONE ENGINE INOPERATIVE LONG RANGE CRUISE

| FL<br>ISA  |            | GROSS WEIGHT - 1000 POUNDS                                      |            |            |            |            |            |            |            |            |            |            |
|------------|------------|-----------------------------------------------------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
|            |            | 300                                                             | 290        | 280        | 270        | 260        | 250        | 240        | 230        | 220        | 210        | 200        |
| 330<br>-50 | SAR        |                                                                 |            |            |            |            |            |            |            |            | 53.0       | 55.4       |
|            | N1         |                                                                 |            |            |            |            |            |            |            |            | 101.1      | 99.0       |
|            | FF         |                                                                 |            |            |            |            |            |            |            |            | 7088       | 6661       |
|            | MN         |                                                                 |            |            |            |            |            |            |            |            | 0.646      | 0.635      |
|            | IAS<br>TAS |                                                                 |            |            |            |            |            |            |            |            | 225<br>376 | 221<br>369 |
| 310<br>-46 | SAR        |                                                                 |            |            |            |            | 46.7       | 48.6       | 50.6       | 52.7       | 54.8       |            |
|            | N1         |                                                                 |            |            |            |            | 103.9      | 101.7      | 99.8       | 98.1       | 96.5       |            |
|            | FF         |                                                                 |            |            |            |            | 8243       | 7794       | 7367       | 6960       | 6570       |            |
|            | MN         |                                                                 |            |            |            |            | 0.656      | 0.646      | 0.635      | 0.625      | 0.614      |            |
|            | IAS<br>TAS |                                                                 |            |            |            |            | 240<br>385 | 236<br>379 | 232<br>373 | 228<br>367 | 223<br>360 |            |
| 290<br>-42 | SAR        | THRUST REQUIRED<br><br>EXCEEDS MAXIMUM<br><br>CONTINUOUS THRUST |            |            | 43.3       | 44.9       | 46.6       | 48.4       | 50.2       | 52.0       | 53.9       |            |
|            | N1         |                                                                 |            |            | 103.9      | 102.0      | 100.3      | 98.7       | 97.3       | 95.8       | 94.4       |            |
|            | FF         |                                                                 |            |            | 8925       | 8485       | 8059       | 7646       | 7251       | 6879       | 6531       |            |
|            | MN         |                                                                 |            |            | 0.653      | 0.644      | 0.635      | 0.625      | 0.615      | 0.605      | 0.595      |            |
|            | IAS<br>TAS |                                                                 |            |            | 249<br>386 | 246<br>381 | 242<br>376 | 238<br>370 | 234<br>364 | 230<br>358 | 226<br>352 |            |
| 280<br>-41 | SAR        |                                                                 |            | 41.8       | 43.3       | 44.8       | 46.5       | 48.1       | 49.8       | 51.6       | 53.4       |            |
|            | N1         |                                                                 |            | 103.8      | 102.1      | 100.5      | 99.0       | 97.6       | 96.2       | 94.9       | 93.5       |            |
|            | FF         |                                                                 |            | 9263       | 8825       | 8400       | 7988       | 7591       | 7218       | 6869       | 6520       |            |
|            | MN         |                                                                 |            | 0.651      | 0.642      | 0.634      | 0.624      | 0.615      | 0.605      | 0.596      | 0.586      |            |
|            | IAS<br>TAS |                                                                 |            | 254<br>387 | 250<br>382 | 247<br>377 | 243<br>371 | 239<br>365 | 235<br>360 | 231<br>354 | 227<br>348 |            |
| 270<br>-39 | SAR        |                                                                 |            | 40.4       | 41.8       | 43.2       | 44.7       | 46.2       | 47.8       | 49.4       | 51.0       | 52.8       |
|            | N1         |                                                                 |            | 103.7      | 102.1      | 100.6      | 99.2       | 97.9       | 96.5       | 95.2       | 93.9       | 92.5       |
|            | FF         |                                                                 |            | 9597       | 9162       | 8740       | 8329       | 7932       | 7558       | 7208       | 6861       | 6508       |
|            | MN         |                                                                 |            | 0.649      | 0.641      | 0.632      | 0.624      | 0.614      | 0.605      | 0.596      | 0.587      | 0.576      |
|            | IAS<br>TAS |                                                                 |            | 259<br>388 | 255<br>383 | 252<br>378 | 248<br>372 | 244<br>367 | 240<br>361 | 236<br>356 | 232<br>350 | 228<br>344 |
| 260<br>-37 | SAR        |                                                                 | 39.1       | 40.3       | 41.7       | 43.0       | 44.5       | 45.9       | 47.4       | 48.9       | 50.5       | 52.2       |
|            | N1         |                                                                 | 103.6      | 102.1      | 100.7      | 99.4       | 98.1       | 96.8       | 95.6       | 94.3       | 93.0       | 91.7       |
|            | FF         |                                                                 | 9929       | 9496       | 9078       | 8668       | 8272       | 7898       | 7548       | 7201       | 6848       | 6506       |
|            | MN         |                                                                 | 0.647      | 0.639      | 0.631      | 0.622      | 0.613      | 0.605      | 0.596      | 0.587      | 0.577      | 0.567      |
|            | IAS<br>TAS |                                                                 | 263<br>388 | 260<br>383 | 256<br>378 | 253<br>373 | 249<br>368 | 245<br>362 | 242<br>357 | 238<br>352 | 233<br>346 | 229<br>340 |

**DEFINITIONS:**

IAS: Indicated airspeed in knots.

ISA: Standard Day temperature in °C.

TAS: True airspeed in knots.

SAR: Specific Air Range (nm per 1,000 lbs of fuel).

N<sub>1</sub>: Target N<sub>1</sub> Setting.

FF: Fuel Flow (lb per hr).

**TEMPERATURE TRADE FACTORS:**

- SAR decreases 0.7% for every +10°C and increases 0.7% for every -10°C difference from ISA.
- N<sub>1</sub> decreases 1.0% for every +5°C and increases 1.0% for every -5°C difference from ISA.
- FF increases 2% for every +10°C and decreases 2% for every -10°C difference from ISA.
- TAS increases 1 knot per 1°C above ISA and decreases 1 knot per 1°C below ISA.

## ONE ENGINE INOPERATIVE LONG RANGE CRUISE

| FL<br>ISA  |                                     | GROSS WEIGHT - 1000 LB                                  |     |     |     |                                               |                                               |                                               |                                               |                                               |                                               |                                               |
|------------|-------------------------------------|---------------------------------------------------------|-----|-----|-----|-----------------------------------------------|-----------------------------------------------|-----------------------------------------------|-----------------------------------------------|-----------------------------------------------|-----------------------------------------------|-----------------------------------------------|
|            |                                     | 410                                                     | 400 | 390 | 380 | 370                                           | 360                                           | 350                                           | 340                                           | 330                                           | 320                                           | 310                                           |
| 250<br>-35 | SAR<br>N1<br>FF<br>MN<br>IAS<br>TAS |                                                         |     |     |     |                                               |                                               |                                               |                                               |                                               |                                               |                                               |
| 240<br>-33 | SAR<br>N1<br>FF<br>MN<br>IAS<br>TAS |                                                         |     |     |     |                                               |                                               |                                               |                                               |                                               |                                               | 36.7<br>103.3<br>10583<br>0.642<br>273<br>388 |
| 230<br>-31 | SAR<br>N1<br>FF<br>MN<br>IAS<br>TAS | THRUST REQUIRED<br>EXCEEDS MAXIMUM<br>CONTINUOUS THRUST |     |     |     |                                               |                                               |                                               |                                               |                                               | 35.6<br>103.2<br>10905<br>0.64<br>277<br>388  | 36.6<br>102.0<br>10487<br>0.633<br>274<br>384 |
| 220<br>-29 | SAR<br>N1<br>FF<br>MN<br>IAS<br>TAS |                                                         |     |     |     |                                               |                                               |                                               | 34.6<br>103.1<br>11227<br>0.637<br>282<br>388 | 35.5<br>101.9<br>10815<br>0.63<br>278<br>384  | 36.5<br>100.8<br>10409<br>0.623<br>275<br>380 |                                               |
| 210<br>-27 | SAR<br>N1<br>FF<br>MN<br>IAS<br>TAS |                                                         |     |     |     |                                               | 32.8<br>104.0<br>11968<br>0.641<br>289<br>392 | 33.6<br>102.9<br>11549<br>0.634<br>286<br>388 | 34.5<br>101.8<br>11142<br>0.628<br>283<br>384 | 35.4<br>100.8<br>10739<br>0.621<br>279<br>380 | 36.3<br>99.7<br>10345<br>0.613<br>276<br>375  |                                               |
| 200<br>-25 | SAR<br>N1<br>FF<br>MN<br>IAS<br>TAS |                                                         |     |     |     | 31.9<br>103.8<br>12284<br>0.638<br>293<br>392 | 32.7<br>102.7<br>11874<br>0.631<br>290<br>388 | 33.5<br>101.7<br>11469<br>0.625<br>287<br>384 | 34.3<br>100.7<br>11068<br>0.618<br>284<br>380 | 35.2<br>99.7<br>10680<br>0.611<br>281<br>375  | 36.0<br>98.7<br>10304<br>0.604<br>277<br>371  |                                               |

**DEFINITIONS:**

IAS: Indicated airspeed in knots.  
 ISA: Standard Day temperature in °C.  
 TAS: True airspeed in knots.

SAR: Specific Air Range (nm per 1,000 lbs of fuel).  
 N<sub>1</sub>: Target N<sub>1</sub> Setting.  
 FF: Fuel Flow (lb per hr).

**TEMPERATURE TRADE FACTORS:**

- SAR decreases 0.7% for every +10°C and increases 0.7% for every -10°C difference from ISA.
- N<sub>1</sub> decreases 1.0% for every +5°C and increases 1.0% for every -5°C difference from ISA.
- FF increases 2% for every +10°C and decreases 2% for every -10°C difference from ISA.
- TAS increases 1 knot per 1°C above ISA and decreases 1 knot per 1°C below ISA.



## ONE ENGINE INOPERATIVE LONG RANGE CRUISE

| FL<br>ISA  |     | GROSS WEIGHT – 1,000 POUNDS |       |       |       |       |       |       |       |       |       |       |
|------------|-----|-----------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|            |     | 300                         | 290   | 280   | 270   | 260   | 250   | 240   | 230   | 220   | 210   | 200   |
| 250<br>-35 | SAR | 37.8                        | 39.0  | 40.2  | 41.5  | 42.8  | 44.1  | 45.5  | 46.9  | 48.4  | 49.9  | 51.6  |
|            | N1  | 103.5                       | 102.1 | 100.8 | 99.5  | 98.3  | 97.1  | 95.9  | 94.6  | 93.4  | 92.1  | 90.8  |
|            | FF  | 10257                       | 9828  | 9413  | 9005  | 8611  | 8238  | 7889  | 7541  | 7187  | 6844  | 6496  |
|            | MN  | 0.645                       | 0.637 | 0.629 | 0.621 | 0.612 | 0.604 | 0.596 | 0.587 | 0.577 | 0.568 | 0.557 |
|            | IAS | 268                         | 265   | 261   | 258   | 254   | 250   | 247   | 243   | 239   | 234   | 230   |
|            | TAS | 388                         | 384   | 379   | 374   | 369   | 364   | 359   | 353   | 348   | 342   | 335   |
| 240<br>-33 | SAR | 37.8                        | 38.9  | 40.1  | 41.3  | 42.5  | 43.7  | 45.0  | 46.4  | 47.8  | 49.4  | 51.0  |
|            | N1  | 102.0                       | 100.8 | 99.6  | 98.4  | 97.3  | 96.1  | 94.9  | 93.7  | 92.5  | 91.2  | 89.9  |
|            | FF  | 10158                       | 9746  | 9340  | 8950  | 8579  | 8230  | 7880  | 7525  | 7181  | 6833  | 6479  |
|            | MN  | 0.635                       | 0.627 | 0.619 | 0.611 | 0.603 | 0.595 | 0.587 | 0.578 | 0.568 | 0.558 | 0.547 |
|            | IAS | 269                         | 266   | 262   | 259   | 255   | 252   | 248   | 244   | 240   | 235   | 230   |
|            | TAS | 384                         | 379   | 374   | 369   | 365   | 360   | 355   | 349   | 344   | 337   | 331   |
| 230<br>-31 | SAR | 37.7                        | 38.7  | 39.8  | 41.0  | 42.1  | 43.3  | 44.6  | 45.9  | 47.3  | 48.8  | 50.4  |
|            | N1  | 100.8                       | 99.7  | 98.5  | 97.4  | 96.3  | 95.2  | 94.0  | 92.9  | 91.6  | 90.4  | 89.1  |
|            | FF  | 10078                       | 9675  | 9288  | 8920  | 8571  | 8218  | 7862  | 7518  | 7170  | 6814  | 6474  |
|            | MN  | 0.625                       | 0.617 | 0.61  | 0.602 | 0.595 | 0.586 | 0.578 | 0.569 | 0.559 | 0.548 | 0.538 |
|            | IAS | 270                         | 267   | 263   | 260   | 257   | 253   | 249   | 245   | 240   | 236   | 231   |
|            | TAS | 380                         | 375   | 370   | 365   | 361   | 356   | 351   | 345   | 339   | 333   | 326   |
| 220<br>-29 | SAR | 37.5                        | 38.5  | 39.5  | 40.6  | 41.7  | 42.9  | 44.1  | 45.4  | 46.8  | 48.2  | 49.7  |
|            | N1  | 99.7                        | 98.6  | 97.6  | 96.5  | 95.4  | 94.3  | 93.2  | 92.0  | 90.8  | 89.5  | 88.3  |
|            | FF  | 10010                       | 9627  | 9261  | 8912  | 8555  | 8199  | 7854  | 7506  | 7150  | 6809  | 6476  |
|            | MN  | 0.615                       | 0.608 | 0.601 | 0.594 | 0.586 | 0.577 | 0.569 | 0.559 | 0.549 | 0.539 | 0.529 |
|            | IAS | 272                         | 268   | 265   | 262   | 258   | 254   | 250   | 246   | 241   | 236   | 232   |
|            | TAS | 375                         | 371   | 366   | 362   | 357   | 352   | 346   | 341   | 335   | 328   | 322   |
| 210<br>-27 | SAR | 37.2                        | 38.2  | 39.2  | 40.2  | 41.3  | 42.4  | 43.6  | 44.9  | 46.2  | 47.6  | 49.1  |
|            | N1  | 98.7                        | 97.7  | 96.7  | 95.6  | 94.5  | 93.4  | 92.3  | 91.1  | 89.9  | 88.7  | 87.5  |
|            | FF  | 9966                        | 9602  | 9251  | 8892  | 8536  | 8191  | 7842  | 7486  | 7144  | 6811  | 6479  |
|            | MN  | 0.606                       | 0.599 | 0.593 | 0.585 | 0.576 | 0.568 | 0.559 | 0.549 | 0.54  | 0.53  | 0.52  |
|            | IAS | 273                         | 270   | 266   | 263   | 259   | 255   | 251   | 246   | 242   | 237   | 232   |
|            | TAS | 371                         | 367   | 363   | 358   | 353   | 348   | 342   | 336   | 330   | 324   | 318   |
| 200<br>-25 | SAR | 36.9                        | 37.9  | 38.8  | 39.8  | 40.9  | 42.0  | 43.2  | 44.4  | 45.6  | 47.0  | 48.4  |
|            | N1  | 97.8                        | 96.8  | 95.7  | 94.7  | 93.7  | 92.6  | 91.4  | 90.3  | 89.2  | 87.9  | 86.7  |
|            | FF  | 9943                        | 9588  | 9228  | 8874  | 8529  | 8179  | 7822  | 7479  | 7146  | 6814  | 6486  |
|            | MN  | 0.598                       | 0.591 | 0.583 | 0.576 | 0.568 | 0.559 | 0.55  | 0.54  | 0.531 | 0.521 | 0.511 |
|            | IAS | 274                         | 271   | 267   | 264   | 260   | 256   | 251   | 247   | 242   | 238   | 233   |
|            | TAS | 367                         | 363   | 358   | 354   | 349   | 343   | 338   | 332   | 326   | 320   | 314   |

**DEFINITIONS:**

IAS: Indicated airspeed in knots.  
 ISA: Standard Day temperature in °C.  
 TAS: True airspeed in knots.

SAR: Specific Air Range (nm per 1,000 lbs of fuel).  
 N<sub>1</sub>: Target N<sub>1</sub> Setting.  
 FF: Fuel Flow (lb per hr).

**TEMPERATURE TRADE FACTORS:**

- SAR decreases 0.7% for every +10°C and increases 0.7% for every -10°C difference from ISA.
- N<sub>1</sub> decreases 1.0% for every +5°C and increases 1.0% for every -5°C difference from ISA.
- FF increases 2% for every +10°C and decreases 2% for every -10°C difference from ISA.
- TAS increases 1 knot per 1°C above ISA and decreases 1 knot per 1°C below ISA.

# ONE ENGINE INOPERATIVE

## LONG RANGE CRUISE

| FL<br>ISA  |     | GROSS WEIGHT – 1,000 LB |       |       |       |       |       |       |       |       |       |       |
|------------|-----|-------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|            |     | 410                     | 400   | 390   | 380   | 370   | 360   | 350   | 340   | 330   | 320   | 310   |
| 190<br>-23 | SAR |                         |       |       |       | 31.1  | 31.8  | 32.5  | 33.3  | 34.1  | 34.9  | 35.8  |
|            | N1  |                         |       |       |       | 103.6 | 102.6 | 101.6 | 100.6 | 99.7  | 98.7  | 97.8  |
|            | FF  |                         |       |       |       | 12602 | 12197 | 11794 | 11397 | 11013 | 10641 | 10283 |
|            | MN  |                         |       |       |       | 0.635 | 0.628 | 0.622 | 0.615 | 0.609 | 0.602 | 0.596 |
|            | IAS |                         |       |       |       | 298   | 295   | 292   | 288   | 285   | 282   | 279   |
|            | TAS |                         |       |       |       | 391   | 388   | 384   | 379   | 375   | 371   | 368   |
| 180<br>-21 | SAR |                         |       | 29.6  | 30.2  | 30.9  | 31.6  | 32.3  | 33.1  | 33.8  | 34.6  | 35.4  |
|            | N1  |                         |       | 104.3 | 103.3 | 102.4 | 101.5 | 100.6 | 99.6  | 98.7  | 97.8  | 96.9  |
|            | FF  |                         |       | 13330 | 12923 | 12519 | 12117 | 11726 | 11346 | 10979 | 10625 | 10264 |
|            | MN  |                         |       | 0.637 | 0.631 | 0.625 | 0.619 | 0.613 | 0.606 | 0.6   | 0.594 | 0.588 |
|            | IAS |                         |       | 305   | 302   | 299   | 296   | 293   | 290   | 287   | 284   | 280   |
|            | TAS |                         |       | 394   | 391   | 387   | 383   | 379   | 375   | 372   | 368   | 364   |
| 160<br>-17 | SAR | 28.1                    | 28.7  | 29.3  | 29.9  | 30.6  | 31.2  | 31.9  | 32.6  | 33.3  | 34.0  | 34.7  |
|            | N1  | 103.8                   | 102.9 | 102.0 | 101.2 | 100.4 | 99.5  | 98.7  | 97.8  | 97.0  | 96.1  | 95.2  |
|            | FF  | 13964                   | 13560 | 13157 | 12767 | 12385 | 12016 | 11659 | 11300 | 10938 | 10582 | 10236 |
|            | MN  | 0.630                   | 0.624 | 0.618 | 0.613 | 0.607 | 0.601 | 0.596 | 0.59  | 0.583 | 0.577 | 0.57  |
|            | IAS | 313                     | 310   | 307   | 304   | 301   | 299   | 296   | 293   | 289   | 286   | 282   |
|            | TAS | 393                     | 390   | 386   | 382   | 379   | 375   | 372   | 368   | 364   | 360   | 356   |
| 140<br>-13 | SAR | 27.9                    | 28.4  | 29.0  | 29.5  | 30.1  | 30.7  | 31.3  | 31.9  | 32.6  | 33.3  | 34.0  |
|            | N1  | 101.7                   | 100.9 | 100.1 | 99.4  | 98.6  | 97.8  | 96.9  | 96.1  | 95.3  | 94.4  | 93.5  |
|            | FF  | 13807                   | 13421 | 13052 | 12695 | 12338 | 11976 | 11616 | 11267 | 10922 | 10566 | 10206 |
|            | MN  | 0.612                   | 0.606 | 0.601 | 0.596 | 0.591 | 0.585 | 0.578 | 0.572 | 0.566 | 0.559 | 0.552 |
|            | IAS | 316                     | 313   | 310   | 307   | 305   | 301   | 298   | 295   | 292   | 288   | 284   |
|            | TAS | 385                     | 381   | 378   | 375   | 371   | 368   | 364   | 360   | 356   | 352   | 347   |
| 120<br>-9  | SAR | 27.5                    | 28.0  | 28.5  | 29.0  | 29.5  | 30.1  | 30.7  | 31.3  | 31.9  | 32.6  | 33.2  |
|            | N1  | 99.9                    | 99.2  | 98.4  | 97.6  | 96.9  | 96.1  | 95.3  | 94.5  | 93.6  | 92.8  | 91.9  |
|            | FF  | 13733                   | 13378 | 13017 | 12655 | 12302 | 11953 | 11600 | 11240 | 10879 | 10532 | 10192 |
|            | MN  | 0.595                   | 0.59  | 0.585 | 0.579 | 0.573 | 0.568 | 0.562 | 0.555 | 0.548 | 0.541 | 0.535 |
|            | IAS | 318.5                   | 316   | 313   | 310   | 307   | 304   | 300   | 297   | 293   | 289   | 286   |
|            | TAS | 377                     | 374   | 371   | 367   | 363   | 360   | 356   | 352   | 347   | 343   | 339   |
| 100<br>-5  | SAR | 26.9                    | 27.4  | 27.9  | 28.4  | 28.9  | 29.5  | 30.0  | 30.6  | 31.2  | 31.8  | 32.4  |
|            | N1  | 98.2                    | 97.5  | 96.7  | 96.0  | 95.2  | 94.4  | 93.7  | 92.9  | 92.1  | 91.2  | 90.4  |
|            | FF  | 13699                   | 13339 | 12988 | 12635 | 12275 | 11912 | 11559 | 11215 | 10878 | 10540 | 10205 |
|            | MN  | 0.579                   | 0.573 | 0.568 | 0.563 | 0.556 | 0.55  | 0.544 | 0.538 | 0.531 | 0.525 | 0.518 |
|            | IAS | 321                     | 318   | 315   | 312   | 309   | 305   | 302   | 298   | 295   | 291   | 287   |
|            | TAS | 370                     | 366   | 363   | 359   | 355   | 351   | 347   | 343   | 339   | 335   | 331   |

## DEFINITIONS:

IAS: Indicated airspeed in knots.

SAR: Specific Air Range (nm per 1,000 lbs of fuel).

ISA: Standard Day temperature in °C.

N<sub>1</sub>: Target N<sub>1</sub> Setting.

TAS: True airspeed in knots.

FF: Fuel Flow (lb per hr).

## TEMPERATURE TRADE FACTORS:

- SAR decreases 0.7% for every +10°C and increases 0.7% for every -10°C difference from ISA.
- N<sub>1</sub> decreases 1.0% for every +5°C and increases 1.0% for every -5°C difference from ISA.
- FF increases 2% for every +10°C and decreases 2% for every -10°C difference from ISA.
- TAS increases 1 knot per 1°C above ISA and decreases 1 knot per 1°C below ISA.

## ONE ENGINE INOPERATIVE LONG RANGE CRUISE

| FL<br>ISA          |            | GROSS WEIGHT – 1,000 LB |       |       |       |       |       |       |       |       |       |       |
|--------------------|------------|-------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|                    |            | 300                     | 290   | 280   | 270   | 260   | 250   | 240   | 230   | 220   | 210   | 200   |
| <b>190<br/>-23</b> | <b>SAR</b> | 36.6                    | 37.5  | 38.5  | 39.4  | 40.4  | 41.5  | 42.6  | 43.8  | 45.1  | 46.4  | 47.7  |
|                    | <b>N1</b>  | 96.9                    | 95.9  | 94.9  | 93.9  | 92.8  | 91.7  | 90.6  | 89.5  | 88.3  | 87.2  | 86.0  |
|                    | <b>FF</b>  | 9926                    | 9566  | 9213  | 8869  | 8517  | 8159  | 7816  | 7482  | 7150  | 6821  | 6497  |
|                    | <b>MN</b>  | 0.589                   | 0.582 | 0.574 | 0.567 | 0.558 | 0.549 | 0.54  | 0.532 | 0.522 | 0.513 | 0.503 |
|                    | <b>IAS</b> | 276                     | 272   | 268   | 265   | 261   | 256   | 252   | 248   | 243   | 239   | 234   |
|                    | <b>TAS</b> | 364                     | 359   | 354   | 350   | 344   | 339   | 333   | 328   | 322   | 316   | 310   |
| <b>180<br/>-21</b> | <b>SAR</b> | 36.3                    | 37.1  | 38.0  | 39.0  | 40.0  | 41.0  | 42.1  | 43.3  | 44.5  | 45.7  | 47.1  |
|                    | <b>N1</b>  | 96.0                    | 95.0  | 94.0  | 93.0  | 91.9  | 90.9  | 89.8  | 88.7  | 87.6  | 86.4  | 85.2  |
|                    | <b>FF</b>  | 9903                    | 9553  | 9209  | 8855  | 8497  | 8154  | 7820  | 7486  | 7156  | 6831  | 6512  |
|                    | <b>MN</b>  | 0.58                    | 0.573 | 0.566 | 0.558 | 0.549 | 0.54  | 0.532 | 0.523 | 0.514 | 0.504 | 0.495 |
|                    | <b>IAS</b> | 277                     | 273   | 270   | 266   | 261   | 257   | 253   | 248   | 244   | 239   | 235   |
|                    | <b>TAS</b> | 359                     | 355   | 350   | 345   | 340   | 335   | 329   | 324   | 318   | 312   | 306   |
| <b>160<br/>-17</b> | <b>SAR</b> | 35.5                    | 36.3  | 37.2  | 38.1  | 39.0  | 40.0  | 41.0  | 42.1  | 43.2  | 44.4  | 45.7  |
|                    | <b>N1</b>  | 94.3                    | 93.3  | 92.3  | 91.4  | 90.4  | 89.3  | 88.3  | 87.2  | 86.1  | 84.9  | 83.6  |
|                    | <b>FF</b>  | 9889                    | 9532  | 9174  | 8831  | 8496  | 8161  | 7829  | 7502  | 7180  | 6861  | 6543  |
|                    | <b>MN</b>  | 0.563                   | 0.555 | 0.547 | 0.539 | 0.531 | 0.523 | 0.515 | 0.506 | 0.497 | 0.488 | 0.479 |
|                    | <b>IAS</b> | 279                     | 275   | 271   | 267   | 263   | 259   | 254   | 250   | 246   | 241   | 236   |
|                    | <b>TAS</b> | 351                     | 346   | 341   | 336   | 332   | 326   | 321   | 316   | 310   | 305   | 299   |
| <b>140<br/>-13</b> | <b>SAR</b> | 34.8                    | 35.5  | 36.3  | 37.2  | 38.0  | 39.0  | 39.9  | 40.9  | 42.0  | 43.1  | 44.3  |
|                    | <b>N1</b>  | 92.6                    | 91.7  | 90.8  | 89.8  | 88.8  | 87.8  | 86.8  | 85.7  | 84.5  | 83.3  | 82.1  |
|                    | <b>FF</b>  | 9852                    | 9511  | 9175  | 8839  | 8506  | 8178  | 7855  | 7534  | 7214  | 6896  | 6568  |
|                    | <b>MN</b>  | 0.545                   | 0.537 | 0.53  | 0.522 | 0.515 | 0.507 | 0.499 | 0.49  | 0.482 | 0.473 | 0.463 |
|                    | <b>IAS</b> | 280                     | 276   | 272   | 268   | 264   | 260   | 256   | 252   | 247   | 242   | 237   |
|                    | <b>TAS</b> | 342                     | 338   | 333   | 329   | 324   | 319   | 314   | 308   | 303   | 297   | 291   |
| <b>120<br/>-9</b>  | <b>SAR</b> | 33.9                    | 34.7  | 35.4  | 36.2  | 37.0  | 37.9  | 38.8  | 39.7  | 40.7  | 41.8  | 42.9  |
|                    | <b>N1</b>  | 91.0                    | 90.1  | 89.2  | 88.3  | 87.4  | 86.3  | 85.3  | 84.2  | 83.0  | 81.8  | 80.5  |
|                    | <b>FF</b>  | 9856                    | 9520  | 9188  | 8859  | 8535  | 8213  | 7892  | 7573  | 7246  | 6914  | 6580  |
|                    | <b>MN</b>  | 0.528                   | 0.521 | 0.514 | 0.506 | 0.499 | 0.491 | 0.483 | 0.475 | 0.466 | 0.456 | 0.446 |
|                    | <b>IAS</b> | 282                     | 278   | 274   | 270   | 266   | 262   | 257   | 253   | 248   | 243   | 237   |
|                    | <b>TAS</b> | 334                     | 330   | 325   | 321   | 316   | 311   | 306   | 301   | 295   | 289   | 283   |
| <b>100<br/>-5</b>  | <b>SAR</b> | 33.1                    | 33.8  | 34.5  | 35.2  | 36.0  | 36.8  | 37.7  | 38.6  | 39.5  | 40.5  | 41.6  |
|                    | <b>N1</b>  | 89.6                    | 88.7  | 87.8  | 86.8  | 85.8  | 84.8  | 83.8  | 82.7  | 81.5  | 80.0  | 78.6  |
|                    | <b>FF</b>  | 9873                    | 9544  | 9219  | 8896  | 8574  | 8254  | 7928  | 7596  | 7259  | 6926  | 6594  |
|                    | <b>MN</b>  | 0.512                   | 0.505 | 0.498 | 0.491 | 0.484 | 0.476 | 0.468 | 0.459 | 0.449 | 0.44  | 0.43  |
|                    | <b>IAS</b> | 283                     | 280   | 276   | 272   | 268   | 263   | 259   | 254   | 248   | 243   | 238   |
|                    | <b>TAS</b> | 327                     | 322   | 318   | 313   | 309   | 304   | 299   | 293   | 287   | 281   | 275   |

**DEFINITIONS:**

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TAS: True airspeed in knots.

FF: Fuel Flow (lb per hr).

**TEMPERATURE TRADE FACTORS:**

- SAR decreases 0.7% for every +10°C and increases 0.7% for every -10°C difference from ISA.
- N<sub>1</sub> decreases 1.0% for every +5°C and increases 1.0% for every -5°C difference from ISA.
- FF increases 2% for every +10°C and decreases 2% for every -10°C difference from ISA.
- TAS increases 1 knot per 1°C above ISA and decreases 1 knot per 1°C below ISA.

## **LANDING GEAR EXTENDED REVENUE OPERATIONS PROCEDURES**

### **OPERATIONAL LIMITATIONS**

The following are the FAA Airplane Flight Manual mandated limitations for gear down operations. Limitations are unchanged from normal except as listed below.

1. All components required for a landing gear extended operation must be functional in accordance with the appropriate maintenance manual.
2. The use of speed increase for improved climb performance in order to increase maximum takeoff weight is prohibited.
3. Dispatch into known icing conditions is prohibited.
4. The airplane is not eligible for extended over-water operation when landing gear down lock pins are installed. "Extended over-water operation" includes any operation over water at a horizontal distance of more than 50 nautical miles from the nearest shoreline.
5. Use of reduced thrust for takeoff is prohibited.
6. Limitations relating to engine-out drift down are contained in the FLIGHT PLANNING and ABNORMAL sections of this Operational Data Manual (ODM).
7. Takeoff is limited to Flaps 5.
8. VMO and MMO are reduced to 270 KIAS and .73 Mach.
9. The airspeed indicator and Mach-airspeed warning switch must be reprogrammed for VMO and MMO.
10. Alternate EEC Mode operation is prohibited.

### **PREPARATION OF AIRCRAFT**

Maintenance will prepare the aircraft in accordance with the appropriate Maintenance Manual Procedures and make the appropriate log book entries.

### **EMERGENCY PROCEDURES**

Procedures are unchanged for Emergency Procedures except as follows:

Emergency Descent: Target speed - 270 KIAS

### **NORMAL PROCEDURES**

Operating Procedures are unchanged except as follows:

Severe Turbulent Air Penetration - The conditions for severe turbulence penetration are unchanged except the recommended airspeed for flight is  $V_{REF}+70$  KIAS.

## LANDING GEAR EXTENDED REVENUE OPERATIONS

### DRIFTDOWN PERFORMANCE

| WEIGHT<br>LBS          |              | OPTIMUM<br>DRIFT<br>DOWN<br>SPEED<br>(KIAS) | GROSS<br>LEVEL OFF ALTITUDE - FT |               |               |
|------------------------|--------------|---------------------------------------------|----------------------------------|---------------|---------------|
| START<br>DRIFT<br>DOWN | LEVEL<br>OFF |                                             | ISA + 10°C<br>&<br>COLDER        | ISA<br>+ 15°C | ISA<br>+ 20°C |
| 380,000                | 363,000      | 233                                         | 7,300                            | 5,700         |               |
| 360,000                | 345,000      | 227                                         | 9,400                            | 8,000         | 6,200         |
| 340,000                | 326,000      | 220                                         | 11,400                           | 10,200        | 8,700         |
| 320,000                | 307,000      | 214                                         | 13,400                           | 12,600        | 11,200        |
| 300,000                | 289,000      | 208                                         | 15,400                           | 15,000        | 13,800        |
| 280,000                | 269,000      | 200                                         | 17,100                           | 17,000        | 16,300        |
| 260,000                | 250,000      | 193                                         | 19,200                           | 19,200        | 18,600        |
| 240,000                | 232,000      | 185                                         | 21,200                           | 21,100        | 20,700        |

**BASIS:**

- One engine inoperative, APU operating
- Maximum Continuous Thrust Limits
- No Anti-Ice
- 100 ft/min residual rate of climb

## LANDING GEAR EXTENDED REVENUE OPERATIONS

### LONG RANGE CRUISE ALTITUDE CAPABILITY

| GROSS<br>WEIGHT<br>LBS | PRESSURE ALTITUDE - FT |            |            |
|------------------------|------------------------|------------|------------|
|                        | ISA + 10°C & COLDER    | ISA + 15°C | ISA + 20°C |
| 370,000                | 1,800                  |            |            |
| 360,000                | 3,300                  |            |            |
| 350,000                | 4,700                  | 2,100      |            |
| 340,000                | 6,100                  | 3,600      |            |
| 330,000                | 7,500                  | 5,100      | 2,600      |
| 320,000                | 8,800                  | 6,700      | 4,100      |
| 310,000                | 10,100                 | 8,200      | 5,700      |
| 300,000                | 11,400                 | 9,600      | 7,400      |
| 290,000                | 12,700                 | 11,200     | 9,000      |
| 280,000                | 14,000                 | 12,800     | 10,600     |
| 270,000                | 15,200                 | 14,500     | 12,400     |
| 260,000                | 16,100                 | 15,800     | 14,200     |
| 250,000                | 17,100                 | 17,000     | 15,800     |
| 240,000                | 18,200                 | 18,100     | 17,400     |
| 230,000                | 19,300                 | 19,200     | 18,500     |
| 220,000                | 20,300                 | 20,200     | 19,700     |

#### CORRECTIONS:

|                             |         |
|-----------------------------|---------|
| Engine Anti-Ice ON          | - 1,200 |
| Engine and Wing Anti-Ice ON | - 2,500 |

#### BASIS:

- One engine inoperative
- Maximum Continuous Thrust Limits
- 100 ft/min residual rate of climb

## LANDING GEAR EXTENDED REVENUE OPERATIONS

### LONG RANGE CRUISE

| PRESSURE<br>ALTITUDE<br>FT | GROSS WEIGHT<br>CRUISE SPEED (KIAS)<br>TARGET %N <sub>1</sub> (%) |                                                         |              |              |              |              |              |              |
|----------------------------|-------------------------------------------------------------------|---------------------------------------------------------|--------------|--------------|--------------|--------------|--------------|--------------|
|                            | 360,000                                                           | 340,000                                                 | 320,000      | 300,000      | 280,000      | 260,000      | 240,000      | 220,000      |
| 20,000                     |                                                                   |                                                         |              |              |              |              |              | 189<br>102.7 |
| 19,000                     |                                                                   |                                                         |              |              |              |              | 194<br>105.0 | 189<br>100.9 |
| 18,000                     |                                                                   | THRUST REQUIRED<br>EXCEEDS MAXIMUM<br>CONTINUOUS THRUST |              |              |              |              | 194<br>102.9 | 189<br>99.4  |
| 17,000                     |                                                                   |                                                         |              |              |              | 200<br>105.0 | 195<br>101.3 | 189<br>98.1  |
| 16,000                     |                                                                   |                                                         |              |              |              | 202<br>103.4 | 196<br>100.1 | 190<br>97.0  |
| 15,000                     |                                                                   |                                                         |              |              | 208<br>105.4 | 203<br>102.0 | 197<br>99.0  | 191<br>96.0  |
| 14,000                     |                                                                   |                                                         |              |              | 209<br>103.8 | 204<br>100.8 | 198<br>97.9  | 191<br>95.1  |
| 13,000                     |                                                                   |                                                         |              | 215<br>105.5 | 211<br>102.5 | 205<br>99.7  | 199<br>96.9  | 192<br>94.2  |
| 12,000                     |                                                                   |                                                         |              | 217<br>104.1 | 212<br>101.3 | 206<br>98.6  | 199<br>96.0  | 192<br>93.3  |
| 11,000                     |                                                                   |                                                         |              | 218<br>102.8 | 213<br>100.2 | 207<br>97.7  | 200<br>95.1  | 193<br>92.4  |
| 10,000                     |                                                                   |                                                         | 224<br>104.2 | 219<br>101.6 | 214<br>99.2  | 207<br>96.7  | 200<br>94.2  | 193<br>91.6  |

**NOTE:** For estimated fuel burn, increase ABNORMAL One Engine Inoperative LRC fuel burn data by approximately 50%.

## ABNORMAL CONFIGURATION ACTUAL LANDING DISTANCES AND APPROACH SPEEDS

### APPLICABILITY

The tables on the following pages provide landing distances and approach speeds to be used in the event of in-flight system failures. **The values in this section are not to be used for dispatch purposes.**

Refer to the “MEL Support” pages at the end of this section of the ODM for dispatch landing distances with the following MELs applied:

- Anti-skid Inoperative
- One Brake Deactivated
- Auto Spoilers Inoperative

The landing distances provided in this section are classified by runway braking action. These classifications include “DRY,” “GOOD,” “MEDIUM,” or “POOR.” Refer to the Airway Manual – Section 4 (Weather) to find the relationship between these terms, the current environmental conditions, and runway friction values.

### Assumptions

The data within this section was generated based on a set of assumed conditions:

- Standard day conditions
- Operating engines at maximum reverse thrust, except for hydraulic system failures
- Maximum manual braking (more aggressive than Max Autobrakes)
- Includes distance from 50 feet above threshold to stop (1,500 feet of air distance)
- Based on demonstrated landing performance produced by the manufacturer during certification process

In addition, the data within this section were also calculated with certain baseline conditions. There are corrections provided for each abnormal configuration accounting for any variances from the following:

- Sea level altitude
- No wind
- No slope
- Each abnormal configuration landing distance table is based on the approach speed stated within each table.



## ABNORMAL CONFIGURATION ACTUAL LANDING DISTANCES AND APPROACH SPEEDS

**FEET  
KIAS**

### AIR GROUND LOGIC IN AIR MODE, FLAPS 30

| RWY COND. &<br>APPCH SPEED                     | LANDING WEIGHT - POUNDS |         |         |         |         |         |         |         |         |
|------------------------------------------------|-------------------------|---------|---------|---------|---------|---------|---------|---------|---------|
|                                                | 420,000                 | 400,000 | 380,000 | 360,000 | 340,000 | 320,000 | 300,000 | 260,000 | 220,000 |
| <b>DRY</b>                                     | 5,960                   | 5,660   | 5,360   | 5,060   | 4,760   | 4,580   | 4,400   | 4,040   | 3,680   |
| <b>GOOD</b>                                    | 8,560                   | 8,120   | 7,680   | 7,240   | 6,800   | 6,520   | 6,240   | 5,680   | 5,120   |
| <b>MEDIUM</b>                                  | 13,110                  | 12,450  | 11,790  | 11,130  | 10,470  | 10,190  | 9,910   | 9,350   | 8,790   |
| <b>POOR</b>                                    | 20,260                  | 19,400  | 18,540  | 17,680  | 16,820  | 16,400  | 15,980  | 15,140  | 14,300  |
| <b>V<sub>app</sub> -<br/>V<sub>Ref30</sub></b> | 179                     | 172     | 166     | 159     | 151     | 145     | 140     | 130     | 119     |

| CORRECTIONS    |                       | DRY  | Good | MEDIUM | POOR  |
|----------------|-----------------------|------|------|--------|-------|
| Altitude       | Per 1,000 feet        | +90  | +150 | +270   | +520  |
| Wind           | Per 10 kt. headwind   | -160 | -280 | -520   | -1170 |
|                | Per 10 kt. tailwind   | +550 | +970 | +1950  | +5140 |
| Slope          | Per 1% downhill       | +100 | +250 | +1000  | +9500 |
|                | Per 1% uphill         | -50  | -200 | -600   | -2050 |
| Approach Speed | Per 10 kt. Above VREF | +420 | +610 | +820   | +1000 |

### AIRSPEED UNRELIABLE

| RWY COND. &<br>APPCH SPEED                     | LANDING WEIGHT - POUNDS |         |         |         |         |         |         |         |         |
|------------------------------------------------|-------------------------|---------|---------|---------|---------|---------|---------|---------|---------|
|                                                | 420,000                 | 400,000 | 380,000 | 360,000 | 340,000 | 320,000 | 300,000 | 260,000 | 220,000 |
| <b>DRY</b>                                     | 5,070                   | 4,810   | 4,550   | 4,290   | 4,030   | 3,890   | 3,750   | 3,470   | 3,190   |
| <b>GOOD</b>                                    | 6,720                   | 6,440   | 6,160   | 5,880   | 5,600   | 5,360   | 5,120   | 4,640   | 4,160   |
| <b>MEDIUM</b>                                  | 9,700                   | 9,260   | 8,820   | 8,380   | 7,940   | 7,560   | 7,180   | 6,420   | 5,660   |
| <b>POOR</b>                                    | 13,380                  | 12,720  | 12,060  | 11,400  | 10,740  | 10,160  | 9,580   | 8,420   | 7,260   |
| <b>V<sub>app</sub> -<br/>V<sub>Ref20</sub></b> | 179                     | 174     | 169     | 164     | 159     | 154     | 149     | 139     | 128     |

| CORRECTIONS    |                       | DRY  | Good | MEDIUM | POOR  |
|----------------|-----------------------|------|------|--------|-------|
| Altitude       | Per 1,000 feet        | +70  | +120 | +190   | +280  |
| Wind           | Per 10 kt. headwind   | -120 | -200 | -340   | -530  |
|                | Per 10 kt. tailwind   | +440 | +750 | +1280  | +2150 |
| Slope          | Per 1% downhill       | +50  | +140 | +380   | +1000 |
|                | Per 1% uphill         | -50  | -110 | -280   | -570  |
| Approach Speed | Per 10 kt. Above VREF | +260 | +370 | +500   | +610  |

## ABNORMAL CONFIGURATION ACTUAL LANDING DISTANCES AND APPROACH SPEEDS

FEET  
KIAS

### ANTI-SKID INOPERATIVE, FLAPS 30

| RWY COND. &<br>APPCH SPEED                     | LANDING WEIGHT - POUNDS |         |         |         |         |         |         |         |         |
|------------------------------------------------|-------------------------|---------|---------|---------|---------|---------|---------|---------|---------|
|                                                | 420,000                 | 400,000 | 380,000 | 360,000 | 340,000 | 320,000 | 300,000 | 260,000 | 220,000 |
| <b>DRY</b>                                     | 8,080                   | 7,680   | 7,280   | 6,880   | 6,480   | 6,200   | 5,920   | 5,360   | 4,800   |
| <b>GOOD</b>                                    | 9,070                   | 8,610   | 8,150   | 7,690   | 7,230   | 6,910   | 6,590   | 5,950   | 5,310   |
| <b>MEDIUM</b>                                  | 11,470                  | 10,850  | 10,230  | 9,610   | 8,990   | 8,530   | 8,070   | 7,150   | 6,230   |
| <b>POOR</b>                                    | 15,120                  | 14,260  | 13,400  | 12,540  | 11,680  | 11,020  | 10,360  | 9,040   | 7,720   |
| <b>V<sub>app</sub> -<br/>V<sub>Ref30</sub></b> | 179                     | 172     | 166     | 159     | 151     | 145     | 140     | 130     | 119     |

| CORRECTIONS    |                       | DRY  | Good  | MEDIUM | POOR  |
|----------------|-----------------------|------|-------|--------|-------|
| Altitude       | Per 1,000 feet        | +130 | +160  | +210   | +290  |
| Wind           | Per 10 kt. headwind   | -260 | -300  | -440   | -690  |
|                | Per 10 kt. tailwind   | +950 | +1160 | +1750  | +3060 |
| Slope          | Per 1% downhill       | +160 | +250  | +560   | +2960 |
|                | Per 1% uphill         | -120 | -190  | -350   | -730  |
| Approach Speed | Per 10 kt. Above VREF | +400 | +440  | +500   | +550  |

### FLAPS UP

| RWY COND. &<br>APPCH SPEED                          | LANDING WEIGHT - POUNDS |         |         |         |         |         |         |         |         |
|-----------------------------------------------------|-------------------------|---------|---------|---------|---------|---------|---------|---------|---------|
|                                                     | 420,000                 | 400,000 | 380,000 | 360,000 | 340,000 | 320,000 | 300,000 | 260,000 | 220,000 |
| <b>DRY</b>                                          | 6,750                   | 6,370   | 5,990   | 5,610   | 5,230   | 5,030   | 4,830   | 4,430   | 4,030   |
| <b>GOOD</b>                                         | 8,740                   | 8,280   | 7,820   | 7,360   | 6,900   | 6,620   | 6,340   | 5,780   | 5,220   |
| <b>MEDIUM</b>                                       | 12,010                  | 11,410  | 10,810  | 10,210  | 9,610   | 9,150   | 8,690   | 7,770   | 6,850   |
| <b>POOR</b>                                         | 15,940                  | 15,080  | 14,220  | 13,360  | 12,500  | 11,840  | 11,180  | 9,860   | 8,540   |
| <b>V<sub>app</sub> -<br/>V<sub>Ref30</sub> + 50</b> | 229                     | 222     | 216     | 209     | 201     | 195     | 190     | 180     | 169     |

| CORRECTIONS    |                       | DRY  | Good | MEDIUM | POOR  |
|----------------|-----------------------|------|------|--------|-------|
| Altitude       | Per 1,000 feet        | +100 | +160 | +250   | +360  |
| Wind           | Per 10 kt. headwind   | -140 | -220 | -350   | -520  |
|                | Per 10 kt. tailwind   | +510 | +800 | +1300  | +1980 |
| Slope          | Per 1% downhill       | +60  | +140 | +340   | +760  |
|                | Per 1% uphill         | -50  | -110 | -260   | -490  |
| Approach Speed | Per 10 kt. Above VREF | +260 | +340 | +450   | +550  |

## ABNORMAL CONFIGURATION ACTUAL LANDING DISTANCES AND APPROACH SPEEDS

FEET  
KIAS

### HYDRAULIC SYSTEM C INOP

| RWY COND. &<br>APPCH SPEED                     | LANDING WEIGHT - POUNDS |         |         |         |         |         |         |         |         |
|------------------------------------------------|-------------------------|---------|---------|---------|---------|---------|---------|---------|---------|
|                                                | 420,000                 | 400,000 | 380,000 | 360,000 | 340,000 | 320,000 | 300,000 | 260,000 | 220,000 |
| <b>DRY</b>                                     | 5,520                   | 5,320   | 5,120   | 4,920   | 4,720   | 4,560   | 4,400   | 4,080   | 3,760   |
| <b>GOOD</b>                                    | 7,510                   | 7,190   | 6,870   | 6,550   | 6,230   | 5,970   | 5,710   | 5,190   | 4,670   |
| <b>MEDIUM</b>                                  | 10,140                  | 9,660   | 9,180   | 8,700   | 8,220   | 7,820   | 7,420   | 6,620   | 5,820   |
| <b>POOR</b>                                    | 12,980                  | 12,320  | 11,660  | 11,000  | 10,340  | 9,780   | 9,220   | 8,100   | 6,980   |
| <b>V<sub>app</sub> -<br/>V<sub>Ref20</sub></b> | 179                     | 174     | 169     | 164     | 159     | 154     | 149     | 139     | 128     |

| CORRECTIONS    |                       | DRY  | Good | MEDIUM | POOR  |
|----------------|-----------------------|------|------|--------|-------|
| Altitude       | Per 1,000 feet        | +90  | +130 | +200   | +270  |
| Wind           | Per 10 kt. headwind   | -140 | -220 | -330   | -480  |
|                | Per 10 kt. tailwind   | +500 | +790 | +1250  | +1880 |
| Slope          | Per 1% downhill       | +60  | +140 | +330   | +720  |
|                | Per 1% uphill         | -50  | -110 | -240   | -440  |
| Approach Speed | Per 10 kt. Above VREF | +360 | +460 | +560   | +620  |

### HYDRAULIC SYSTEM C+L or C+R INOP

| RWY COND. &<br>APPCH SPEED                          | LANDING WEIGHT - POUNDS |         |         |         |         |         |         |         |         |
|-----------------------------------------------------|-------------------------|---------|---------|---------|---------|---------|---------|---------|---------|
|                                                     | 420,000                 | 400,000 | 380,000 | 360,000 | 340,000 | 320,000 | 300,000 | 260,000 | 220,000 |
| <b>DRY</b>                                          | 6,910                   | 6,570   | 6,230   | 5,890   | 5,550   | 5,350   | 5,150   | 4,750   | 4,350   |
| <b>GOOD</b>                                         | 9,310                   | 8,810   | 8,310   | 7,810   | 7,310   | 6,990   | 6,670   | 6,030   | 5,390   |
| <b>MEDIUM</b>                                       | 12,340                  | 11,640  | 10,940  | 10,240  | 9,540   | 9,060   | 8,580   | 7,620   | 6,660   |
| <b>POOR</b>                                         | 15,430                  | 14,530  | 13,630  | 12,730  | 11,830  | 11,190  | 10,550  | 9,270   | 7,990   |
| <b>V<sub>app</sub> -<br/>V<sub>Ref30</sub> + 20</b> | 199                     | 192     | 186     | 179     | 171     | 165     | 160     | 150     | 139     |

| CORRECTIONS    |                       | DRY  | Good | MEDIUM | POOR  |
|----------------|-----------------------|------|------|--------|-------|
| Altitude       | Per 1,000 feet        | +110 | +170 | +240   | +320  |
| Wind           | Per 10 kt. headwind   | -160 | -250 | -370   | -520  |
|                | Per 10 kt. tailwind   | +560 | +870 | +1350  | +2000 |
| Slope          | Per 1% downhill       | +90  | +190 | +410   | +830  |
|                | Per 1% uphill         | -70  | -150 | -300   | -520  |
| Approach Speed | Per 10 kt. Above VREF | +480 | +580 | +650   | +700  |

## ABNORMAL CONFIGURATION ACTUAL LANDING DISTANCES AND APPROACH SPEEDS

FEET  
KIAS

### HYDRAULIC SYSTEM R & L INOP

| RWY COND. &<br>APPCH SPEED                    | LANDING WEIGHT - POUNDS |         |         |         |         |         |         |         |         |
|-----------------------------------------------|-------------------------|---------|---------|---------|---------|---------|---------|---------|---------|
|                                               | 420,000                 | 400,000 | 380,000 | 360,000 | 340,000 | 320,000 | 300,000 | 260,000 | 220,000 |
| DRY                                           | 5,900                   | 5,620   | 5,340   | 5,060   | 4,780   | 4,600   | 4,420   | 4,060   | 3,700   |
| GOOD                                          | 8,140                   | 7,720   | 7,300   | 6,880   | 6,460   | 6,180   | 5,900   | 5,340   | 4,780   |
| MEDIUM                                        | 11,120                  | 10,500  | 9,880   | 9,260   | 8,640   | 8,200   | 7,760   | 6,880   | 6,000   |
| POOR                                          | 14,170                  | 13,350  | 12,530  | 11,710  | 10,890  | 10,290  | 9,690   | 8,490   | 7,290   |
| V <sub>app</sub> -<br>V <sub>Ref30</sub> + 20 | 199                     | 192     | 186     | 179     | 171     | 165     | 160     | 150     | 139     |

| CORRECTIONS    |                       | DRY  | Good | MEDIUM | POOR  |
|----------------|-----------------------|------|------|--------|-------|
| Altitude       | Per 1,000 feet        | +90  | +150 | +220   | +300  |
| Wind           | Per 10 kt. headwind   | -140 | -220 | -340   | -490  |
|                | Per 10 kt. tailwind   | +500 | +790 | +1270  | +1910 |
| Slope          | Per 1% downhill       | +70  | +160 | +360   | +760  |
|                | Per 1% uphill         | -60  | -130 | -270   | -470  |
| Approach Speed | Per 10 kt. Above VREF | +360 | +460 | +540   | +600  |

### LE SLAT ASYMMETRY, FLAPS > 20

| RWY COND. &<br>APPCH SPEED                    | LANDING WEIGHT - POUNDS |         |         |         |         |         |         |         |         |
|-----------------------------------------------|-------------------------|---------|---------|---------|---------|---------|---------|---------|---------|
|                                               | 420,000                 | 400,000 | 380,000 | 360,000 | 340,000 | 320,000 | 300,000 | 260,000 | 220,000 |
| DRY                                           | 5,560                   | 5,240   | 4,920   | 4,600   | 4,280   | 4,140   | 4,000   | 3,720   | 3,440   |
| GOOD                                          | 7,150                   | 6,810   | 6,470   | 6,130   | 5,790   | 5,550   | 5,310   | 4,830   | 4,350   |
| MEDIUM                                        | 9,890                   | 9,370   | 8,850   | 8,330   | 7,810   | 7,430   | 7,050   | 6,290   | 5,530   |
| POOR                                          | 12,840                  | 12,120  | 11,400  | 10,680  | 9,960   | 9,440   | 8,920   | 7,880   | 6,840   |
| V <sub>app</sub> -<br>V <sub>Ref30</sub> + 20 | 199                     | 192     | 186     | 179     | 171     | 165     | 160     | 150     | 139     |

| CORRECTIONS    |                       | DRY  | Good | MEDIUM | POOR  |
|----------------|-----------------------|------|------|--------|-------|
| Altitude       | Per 1,000 feet        | +80  | +130 | +190   | +260  |
| Wind           | Per 10 kt. headwind   | -120 | -200 | -320   | -460  |
|                | Per 10 kt. tailwind   | +450 | +740 | +1190  | +1810 |
| Slope          | Per 1% downhill       | +50  | +120 | +290   | +650  |
|                | Per 1% uphill         | -40  | -100 | -220   | -420  |
| Approach Speed | Per 10 kt. Above VREF | +250 | +340 | +430   | +490  |

## ABNORMAL CONFIGURATION ACTUAL LANDING DISTANCES AND APPROACH SPEEDS

FEET  
KIAS

### LE SLAT ASYMMETRY, FLAPS 20 or LESS

| RWY COND. &<br>APPCH SPEED                          | LANDING WEIGHT - POUNDS |         |         |         |         |         |         |         |         |
|-----------------------------------------------------|-------------------------|---------|---------|---------|---------|---------|---------|---------|---------|
|                                                     | 420,000                 | 400,000 | 380,000 | 360,000 | 340,000 | 320,000 | 300,000 | 260,000 | 220,000 |
| <b>DRY</b>                                          | 6,040                   | 5,720   | 5,400   | 5,080   | 4,760   | 4,600   | 4,440   | 4,120   | 3,800   |
| <b>GOOD</b>                                         | 8,050                   | 7,650   | 7,250   | 6,850   | 6,450   | 6,190   | 5,930   | 5,410   | 4,890   |
| <b>MEDIUM</b>                                       | 10,990                  | 10,410  | 9,830   | 9,250   | 8,670   | 8,250   | 7,830   | 6,990   | 6,150   |
| <b>POOR</b>                                         | 14,080                  | 13,300  | 12,520  | 11,740  | 10,960  | 10,380  | 9,800   | 8,640   | 7,480   |
| <b>V<sub>app</sub> -<br/>V<sub>Ref30</sub> + 30</b> | 209                     | 202     | 196     | 189     | 181     | 175     | 170     | 160     | 149     |

| CORRECTIONS    |                       | DRY  | Good | MEDIUM | POOR  |
|----------------|-----------------------|------|------|--------|-------|
| Altitude       | Per 1,000 feet        | +90  | +150 | +220   | +300  |
| Wind           | Per 10 kt. headwind   | -140 | -220 | -340   | -480  |
|                | Per 10 kt. tailwind   | +400 | +780 | +1250  | +1890 |
| Slope          | Per 1% downhill       | +60  | +140 | +330   | +700  |
|                | Per 1% uphill         | -50  | -120 | -250   | -440  |
| Approach Speed | Per 10 kt. Above VREF | +290 | +380 | +460   | +520  |

### LE SLAT DISAGREE

| RWY COND. &<br>APPCH SPEED                     | LANDING WEIGHT - POUNDS |         |         |         |         |         |         |         |         |
|------------------------------------------------|-------------------------|---------|---------|---------|---------|---------|---------|---------|---------|
|                                                | 420,000                 | 400,000 | 380,000 | 360,000 | 340,000 | 320,000 | 300,000 | 260,000 | 220,000 |
| <b>DRY</b>                                     | 5,000                   | 4,740   | 4,480   | 4,220   | 3,960   | 3,820   | 3,680   | 3,400   | 3,120   |
| <b>GOOD</b>                                    | 6,370                   | 6,110   | 5,850   | 5,590   | 5,330   | 5,110   | 4,890   | 4,450   | 4,010   |
| <b>MEDIUM</b>                                  | 8,890                   | 8,470   | 8,050   | 7,630   | 7,210   | 6,850   | 6,490   | 5,770   | 5,050   |
| <b>POOR</b>                                    | 11,570                  | 10,990  | 10,410  | 9,830   | 9,250   | 8,750   | 8,250   | 7,250   | 6,250   |
| <b>V<sub>app</sub> -<br/>V<sub>Ref20</sub></b> | 179                     | 174     | 169     | 164     | 159     | 154     | 149     | 139     | 128     |

| CORRECTIONS    |                       | DRY  | Good | MEDIUM | POOR  |
|----------------|-----------------------|------|------|--------|-------|
| Altitude       | Per 1,000 feet        | +70  | +110 | +170   | +240  |
| Wind           | Per 10 kt. headwind   | -120 | -190 | -300   | -440  |
|                | Per 10 kt. tailwind   | +430 | +700 | +1140  | +1760 |
| Slope          | Per 1% downhill       | +40  | +110 | +270   | +620  |
|                | Per 1% uphill         | -40  | -90  | -200   | -380  |
| Approach Speed | Per 10 kt. Above VREF | +240 | +340 | +430   | +500  |

## ABNORMAL CONFIGURATION ACTUAL LANDING DISTANCES AND APPROACH SPEEDS

FEET  
KIAS

### ONE ENGINE INOPERATIVE

| RWY COND. &<br>APPCH SPEED               | LANDING WEIGHT - POUNDS |         |         |         |         |         |         |         |         |
|------------------------------------------|-------------------------|---------|---------|---------|---------|---------|---------|---------|---------|
|                                          | 420,000                 | 400,000 | 380,000 | 360,000 | 340,000 | 320,000 | 300,000 | 260,000 | 220,000 |
| DRY                                      | 5,070                   | 4,810   | 4,550   | 4,290   | 4,030   | 3,890   | 3,750   | 3,470   | 3,190   |
| GOOD                                     | 6,720                   | 6,440   | 6,160   | 5,880   | 5,600   | 5,360   | 5,120   | 4,640   | 4,160   |
| MEDIUM                                   | 9,700                   | 9,260   | 8,820   | 8,380   | 7,940   | 7,560   | 7,180   | 6,420   | 5,660   |
| POOR                                     | 13,380                  | 12,720  | 12,060  | 11,400  | 10,740  | 10,160  | 9,580   | 8,420   | 7,260   |
| V <sub>app</sub> -<br>V <sub>Ref20</sub> | 179                     | 174     | 169     | 164     | 159     | 154     | 149     | 139     | 128     |

| CORRECTIONS    |                       | DRY  | GOOD | MEDIUM | POOR  |
|----------------|-----------------------|------|------|--------|-------|
| Altitude       | Per 1,000 feet        | +70  | +120 | +190   | +280  |
| Wind           | Per 10 kt. headwind   | -120 | -200 | -340   | -530  |
|                | Per 10 kt. tailwind   | +440 | +750 | +1280  | +2150 |
| Slope          | Per 1% downhill       | +50  | +140 | +380   | +1000 |
|                | Per 1% uphill         | -50  | -110 | -280   | -570  |
| Approach Speed | Per 10 kt. Above VREF | +260 | +370 | +500   | +610  |

### TE FLAP ASYMMETRY, FLAPS 20 or GREATER

| RWY COND. &<br>APPCH SPEED               | LANDING WEIGHT - POUNDS |         |         |         |         |         |         |         |         |
|------------------------------------------|-------------------------|---------|---------|---------|---------|---------|---------|---------|---------|
|                                          | 420,000                 | 400,000 | 380,000 | 360,000 | 340,000 | 320,000 | 300,000 | 260,000 | 220,000 |
| DRY                                      | 5,000                   | 4,740   | 4,480   | 4,220   | 3,960   | 3,820   | 3,680   | 3,400   | 3,120   |
| GOOD                                     | 6,370                   | 6,110   | 5,850   | 5,590   | 5,330   | 5,110   | 4,890   | 4,450   | 4,010   |
| MEDIUM                                   | 8,890                   | 8,470   | 8,050   | 7,630   | 7,210   | 6,850   | 6,490   | 5,770   | 5,050   |
| POOR                                     | 11,570                  | 10,990  | 10,410  | 9,830   | 9,250   | 8,750   | 8,250   | 7,250   | 6,250   |
| V <sub>app</sub> -<br>V <sub>Ref20</sub> | 179                     | 174     | 169     | 164     | 159     | 154     | 149     | 139     | 128     |

| CORRECTIONS    |                       | DRY  | GOOD | MEDIUM | POOR  |
|----------------|-----------------------|------|------|--------|-------|
| Altitude       | Per 1,000 feet        | +70  | +110 | +170   | +240  |
| Wind           | Per 10 kt. headwind   | -120 | -190 | -300   | -440  |
|                | Per 10 kt. tailwind   | +430 | +700 | +1140  | +1760 |
| Slope          | Per 1% downhill       | +40  | +110 | +270   | +620  |
|                | Per 1% uphill         | -40  | -90  | -200   | -380  |
| Approach Speed | Per 10 kt. Above VREF | +240 | +340 | +430   | +500  |

## ABNORMAL CONFIGURATION ACTUAL LANDING DISTANCES AND APPROACH SPEEDS

FEET  
KIAS

### TE FLAP ASYMMETRY, 5 < FLAPS < 20

| RWY COND. &<br>APPCH SPEED                          | LANDING WEIGHT - POUNDS |         |         |         |         |         |         |         |         |
|-----------------------------------------------------|-------------------------|---------|---------|---------|---------|---------|---------|---------|---------|
|                                                     | 420,000                 | 400,000 | 380,000 | 360,000 | 340,000 | 320,000 | 300,000 | 260,000 | 220,000 |
| <b>DRY</b>                                          | 5,720                   | 5,360   | 5,000   | 4,640   | 4,280   | 4,140   | 4,000   | 3,720   | 3,440   |
| <b>GOOD</b>                                         | 7,250                   | 6,890   | 6,530   | 6,170   | 5,810   | 5,570   | 5,330   | 4,850   | 4,370   |
| <b>MEDIUM</b>                                       | 10,030                  | 9,490   | 8,950   | 8,410   | 7,870   | 7,490   | 7,110   | 6,350   | 5,590   |
| <b>POOR</b>                                         | 13,050                  | 12,310  | 11,570  | 10,830  | 10,090  | 9,570   | 9,050   | 8,010   | 6,970   |
| <b>V<sub>app</sub> -<br/>V<sub>Ref30</sub> + 20</b> | 199                     | 192     | 186     | 179     | 171     | 165     | 160     | 150     | 139     |

| CORRECTIONS    |                       | DRY  | GOOD | MEDIUM | POOR  |
|----------------|-----------------------|------|------|--------|-------|
| Altitude       | Per 1,000 feet        | +80  | +130 | +190   | +270  |
| Wind           | Per 10 kt. headwind   | -120 | -200 | -320   | -460  |
|                | Per 10 kt. tailwind   | +450 | +740 | +1190  | +1820 |
| Slope          | Per 1% downhill       | +50  | +120 | +290   | +650  |
|                | Per 1% uphill         | -40  | -100 | -220   | -400  |
| Approach Speed | Per 10 kt. Above VREF | +250 | +340 | +430   | +510  |

### TE FLAP ASYMMETRY, FLAPS 5 or LESS

| RWY COND. &<br>APPCH SPEED                          | LANDING WEIGHT - POUNDS |         |         |         |         |         |         |         |         |
|-----------------------------------------------------|-------------------------|---------|---------|---------|---------|---------|---------|---------|---------|
|                                                     | 420,000                 | 400,000 | 380,000 | 360,000 | 340,000 | 320,000 | 300,000 | 260,000 | 220,000 |
| <b>DRY</b>                                          | 6,100                   | 5,700   | 5,300   | 4,900   | 4,500   | 4,340   | 4,180   | 3,860   | 3,540   |
| <b>GOOD</b>                                         | 7,580                   | 7,220   | 6,860   | 6,500   | 6,140   | 5,880   | 5,620   | 5,100   | 4,580   |
| <b>MEDIUM</b>                                       | 10,510                  | 9,970   | 9,430   | 8,890   | 8,350   | 7,950   | 7,550   | 6,750   | 5,950   |
| <b>POOR</b>                                         | 13,710                  | 12,950  | 12,190  | 11,430  | 10,670  | 10,110  | 9,550   | 8,430   | 7,310   |
| <b>V<sub>app</sub> -<br/>V<sub>Ref30</sub> + 30</b> | 209                     | 202     | 196     | 189     | 181     | 175     | 170     | 160     | 149     |

| CORRECTIONS    |                       | DRY  | GOOD | MEDIUM | POOR  |
|----------------|-----------------------|------|------|--------|-------|
| Altitude       | Per 1,000 feet        | +90  | +140 | +210   | +290  |
| Wind           | Per 10 kt. headwind   | -130 | -210 | -320   | -470  |
|                | Per 10 kt. tailwind   | +460 | +760 | +1220  | +1860 |
| Slope          | Per 1% downhill       | +50  | +130 | +300   | +670  |
|                | Per 1% uphill         | -40  | -100 | -230   | -420  |
| Approach Speed | Per 10 kt. Above VREF | +240 | +330 | +430   | +500  |

## ABNORMAL CONFIGURATION ACTUAL LANDING DISTANCES AND APPROACH SPEEDS

FEET  
KIAS

### TE FLAP DISAGREE

| RWY COND. &<br>APPCH SPEED                     | LANDING WEIGHT - POUNDS |         |         |         |         |         |         |         |         |
|------------------------------------------------|-------------------------|---------|---------|---------|---------|---------|---------|---------|---------|
|                                                | 420,000                 | 400,000 | 380,000 | 360,000 | 340,000 | 320,000 | 300,000 | 260,000 | 220,000 |
| <b>DRY</b>                                     | 5,000                   | 4,740   | 4,480   | 4,220   | 3,960   | 3,820   | 3,680   | 3,400   | 3,120   |
| <b>GOOD</b>                                    | 6,370                   | 6,110   | 5,850   | 5,590   | 5,330   | 5,110   | 4,890   | 4,450   | 4,010   |
| <b>MEDIUM</b>                                  | 8,890                   | 8,470   | 8,050   | 7,630   | 7,210   | 6,850   | 6,490   | 5,770   | 5,050   |
| <b>POOR</b>                                    | 11,570                  | 10,990  | 10,410  | 9,830   | 9,250   | 8,750   | 8,250   | 7,250   | 6,250   |
| <b>V<sub>app</sub> -<br/>V<sub>Ref20</sub></b> | 179                     | 174     | 169     | 164     | 159     | 154     | 149     | 139     | 128     |

| CORRECTIONS    |                       | DRY  | GOOD | MEDIUM | POOR  |
|----------------|-----------------------|------|------|--------|-------|
| Altitude       | Per 1,000 feet        | +70  | +110 | +170   | +240  |
| Wind           | Per 10 kt. headwind   | -120 | -190 | -300   | -440  |
|                | Per 10 kt. tailwind   | +430 | +700 | +1140  | +1760 |
| Slope          | Per 1% downhill       | +40  | +110 | +270   | +620  |
|                | Per 1% uphill         | -40  | -90  | -200   | -380  |
| Approach Speed | Per 10 kt. Above VREF | +240 | +340 | +430   | +500  |

### THRUST REVERSER UNLOCKED

| RWY COND. &<br>APPCH SPEED                          | LANDING WEIGHT - POUNDS |         |         |         |         |         |         |         |         |
|-----------------------------------------------------|-------------------------|---------|---------|---------|---------|---------|---------|---------|---------|
|                                                     | 420,000                 | 400,000 | 380,000 | 360,000 | 340,000 | 320,000 | 300,000 | 260,000 | 220,000 |
| <b>DRY</b>                                          | 6,160                   | 5,840   | 5,520   | 5,200   | 4,880   | 4,700   | 4,520   | 4,160   | 3,800   |
| <b>GOOD</b>                                         | 8,530                   | 8,110   | 7,690   | 7,270   | 6,850   | 6,570   | 6,290   | 5,730   | 5,170   |
| <b>MEDIUM</b>                                       | 12,220                  | 11,580  | 10,940  | 10,300  | 9,660   | 9,200   | 8,740   | 7,820   | 6,900   |
| <b>POOR</b>                                         | 16,480                  | 15,580  | 14,680  | 13,780  | 12,880  | 12,200  | 11,520  | 10,160  | 8,800   |
| <b>V<sub>app</sub> -<br/>V<sub>Ref30</sub> + 30</b> | 209                     | 202     | 196     | 189     | 181     | 175     | 170     | 160     | 149     |

| CORRECTIONS    |                       | DRY  | GOOD | MEDIUM | POOR  |
|----------------|-----------------------|------|------|--------|-------|
| Altitude       | Per 1,000 feet        | +100 | +160 | +250   | +350  |
| Wind           | Per 10 kt. headwind   | -140 | -230 | -380   | -580  |
|                | Per 10 kt. tailwind   | +510 | +840 | +1400  | +2220 |
| Slope          | Per 1% downhill       | +70  | +180 | +460   | +1120 |
|                | Per 1% uphill         | -60  | -140 | -330   | -650  |
| Approach Speed | Per 10 kt. Above VREF | +310 | +420 | +540   | +630  |



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## EMERGENCY LANDING DISTANCES

### FEET

**NOTE:** TO BE USED ONLY UNDER CAPTAIN'S EMERGENCY AUTHORITY. PROVIDES ACTUAL LANDING DISTANCES ON CONTAMINATED RUNWAYS.

#### FLAPS 25

DATA IS ADVISORY AND DOES NOT INCLUDE 15% SAFETY MARGIN.

| Landing Weight<br>(lb) | NOTE: Interpolate for GOOD-TO-MEDIUM (4) or MEDIUM-TO-POOR (2). |       |       |       |        |            |          |       |        |            |
|------------------------|-----------------------------------------------------------------|-------|-------|-------|--------|------------|----------|-------|--------|------------|
|                        | DRY (6)                                                         |       |       |       |        |            | GOOD (5) |       |        |            |
|                        | AB 1                                                            | AB 2  | AB 3  | AB 4  | Max AB | Max Manual | AB 3     | AB 4  | Max AB | Max Manual |
| 410,000                | 10,500                                                          | 9,600 | 8,600 | 7,500 | 7,200  | 4,700      | 8,600    | 7,500 | 7,300  | 6,100      |
| 400,000                | 10,300                                                          | 9,400 | 8,400 | 7,400 | 7,100  | 4,600      | 8,400    | 7,400 | 7,100  | 5,900      |
| 390,000                | 10,100                                                          | 9,200 | 8,200 | 7,200 | 7,000  | 4,500      | 8,200    | 7,200 | 7,000  | 5,800      |
| 380,000                | 9,900                                                           | 9,000 | 8,100 | 7,100 | 6,900  | 4,400      | 8,100    | 7,100 | 6,900  | 5,700      |
| 370,000                | 9,700                                                           | 8,800 | 7,900 | 7,000 | 6,700  | 4,300      | 7,900    | 7,000 | 6,700  | 5,600      |
| 360,000                | 9,400                                                           | 8,600 | 7,800 | 6,800 | 6,600  | 4,200      | 7,800    | 6,800 | 6,600  | 5,500      |
| 350,000                | 9,200                                                           | 8,400 | 7,600 | 6,700 | 6,500  | 4,100      | 7,600    | 6,700 | 6,500  | 5,400      |
| 340,000                | 9,000                                                           | 8,300 | 7,400 | 6,500 | 6,300  | 4,000      | 7,400    | 6,500 | 6,300  | 5,300      |
| 330,000                | 8,800                                                           | 8,100 | 7,300 | 6,400 | 6,200  | 3,900      | 7,300    | 6,400 | 6,200  | 5,200      |
| 320,000                | 8,600                                                           | 7,900 | 7,100 | 6,300 | 6,100  | 3,800      | 7,100    | 6,300 | 6,100  | 5,100      |
| 310,000                | 8,300                                                           | 7,700 | 7,000 | 6,100 | 5,900  | 3,800      | 7,000    | 6,100 | 6,000  | 5,000      |
| 300,000                | 8,100                                                           | 7,500 | 6,800 | 6,000 | 5,800  | 3,700      | 6,800    | 6,000 | 5,800  | 4,900      |
| 290,000                | 7,900                                                           | 7,300 | 6,600 | 5,800 | 5,700  | 3,700      | 6,600    | 5,800 | 5,700  | 4,800      |
| 280,000                | 7,700                                                           | 7,100 | 6,500 | 5,700 | 5,600  | 3,600      | 6,500    | 5,700 | 5,600  | 4,700      |
| 270,000                | 7,500                                                           | 6,900 | 6,300 | 5,600 | 5,400  | 3,500      | 6,300    | 5,600 | 5,400  | 4,600      |
| 260,000                | 7,200                                                           | 6,700 | 6,200 | 5,400 | 5,300  | 3,500      | 6,200    | 5,400 | 5,300  | 4,500      |

**BASIS:** Zero wind • Two Engine Full Reverse Thrust • Touchdown Speed = VREF25 - 5 •

Data is advisory and includes 1,500 ft. air distance from threshold to touchdown.

**REFERENCE DISTANCES BASED UPON PRESSURE ALTITUDE OF 2,000 FEET AND ARE CONSERVATIVE FOR ALL LOWER ALTITUDES.**

 Shaded region corresponds to Max Landing Weight (MLW)

#### ALTITUDE ADJUSTMENT

| ALTITUDE (FEET) | DRY (6) |       |       |       |      |      | GOOD (5) |       |      |      |
|-----------------|---------|-------|-------|-------|------|------|----------|-------|------|------|
| 0               | -500    | -400  | -400  | -300  | -300 | -200 | -400     | -300  | -300 | -200 |
| 2,000           | 0       | 0     | 0     | 0     | 0    | 0    | 0        | 0     | 0    | 0    |
| 4,000           | 500     | 400   | 400   | 300   | 300  | 200  | 400      | 300   | 300  | 200  |
| 6,000           | 1,000   | 900   | 800   | 600   | 600  | 300  | 800      | 600   | 600  | 500  |
| 8,000           | 1,500   | 1,300 | 1,100 | 1,000 | 900  | 500  | 1,100    | 1,000 | 900  | 700  |

#### CORRECTIONS

|                     | DRY (6) |      |      |      |      |     | GOOD (5) |      |      |      |
|---------------------|---------|------|------|------|------|-----|----------|------|------|------|
| PER 1 KT HEADWIND   | -50     | -50  | -50  | -50  | -50  | 0   | -50      | -50  | -50  | 0    |
| PER 1 KT TAILWIND   | 150     | 100  | 100  | 100  | 100  | 50  | 100      | 100  | 100  | 50   |
| PER 5 KTS ADD'L SPD | 300     | 300  | 350  | 300  | 300  | 150 | 350      | 300  | 300  | 150  |
| PER 10°C ABOVE ISA  | 250     | 200  | 200  | 150  | 150  | 100 | 200      | 150  | 150  | 100  |
| PER 10°C BELOW ISA  | -250    | -200 | -200 | -150 | -150 | -50 | -200     | -150 | -150 | -100 |
| PER 1% UP SLOPE     | -200    | -100 | 0    | 0    | 0    | -50 | 0        | 0    | 0    | -100 |
| PER 1% DOWN SLOPE   | 150     | 50   | 0    | 0    | 0    | 50  | 0        | 0    | 0    | 100  |
| 1 REVERSER INOP     | 500     | 100  | 0    | 0    | 0    | 100 | 0        | 0    | 0    | 300  |
| 2 REVERSERS INOP    | 600     | 100  | 0    | 0    | 0    | 200 | 0        | 100  | 100  | 600  |
| MANUAL SPOILERS     | 0       | 0    | 0    | 0    | 0    | 400 | 0        | 0    | 0    | 400  |

## EMERGENCY LANDING DISTANCES

### FEET

**NOTE:** TO BE USED ONLY UNDER CAPTAIN'S EMERGENCY AUTHORITY. PROVIDES ACTUAL LANDING DISTANCES ON CONTAMINATED RUNWAYS.

DATA IS ADVISORY AND DOES NOT INCLUDE 15% SAFETY MARGIN.

**FLAPS 25**

| Landing Weight<br>(lb) | NOTE: Interpolate for GOOD-TO-MEDIUM (4) or MEDIUM-TO-POOR (2). |       |        |            |          |        |        |            |
|------------------------|-----------------------------------------------------------------|-------|--------|------------|----------|--------|--------|------------|
|                        | MEDIUM (3)                                                      |       |        |            | POOR (1) |        |        |            |
|                        | AB 3                                                            | AB 4  | Max AB | Max Manual | AB 3     | AB 4   | Max AB | Max Manual |
| 410,000                | 9,000                                                           | 8,400 | 8,300  | 8,300      | 10,800   | 10,800 | 10,800 | 10,800     |
| 400,000                | 8,900                                                           | 8,200 | 8,200  | 8,100      | 10,600   | 10,500 | 10,500 | 10,500     |
| 390,000                | 8,700                                                           | 8,100 | 8,000  | 8,000      | 10,300   | 10,300 | 10,300 | 10,300     |
| 380,000                | 8,500                                                           | 7,900 | 7,800  | 7,800      | 10,100   | 10,000 | 10,000 | 10,000     |
| 370,000                | 8,300                                                           | 7,700 | 7,600  | 7,600      | 9,900    | 9,800  | 9,800  | 9,800      |
| 360,000                | 8,100                                                           | 7,500 | 7,500  | 7,500      | 9,600    | 9,600  | 9,600  | 9,600      |
| 350,000                | 8,000                                                           | 7,400 | 7,300  | 7,300      | 9,400    | 9,300  | 9,300  | 9,300      |
| 340,000                | 7,800                                                           | 7,200 | 7,100  | 7,100      | 9,100    | 9,100  | 9,100  | 9,100      |
| 330,000                | 7,600                                                           | 7,000 | 7,000  | 7,000      | 8,900    | 8,800  | 8,800  | 8,800      |
| 320,000                | 7,400                                                           | 6,900 | 6,800  | 6,800      | 8,700    | 8,600  | 8,600  | 8,600      |
| 310,000                | 7,300                                                           | 6,700 | 6,700  | 6,600      | 8,500    | 8,400  | 8,400  | 8,400      |
| 300,000                | 7,100                                                           | 6,600 | 6,500  | 6,500      | 8,300    | 8,200  | 8,200  | 8,200      |
| 290,000                | 6,900                                                           | 6,400 | 6,300  | 6,300      | 8,000    | 7,900  | 7,900  | 7,900      |
| 280,000                | 6,800                                                           | 6,200 | 6,200  | 6,200      | 7,800    | 7,700  | 7,700  | 7,700      |
| 270,000                | 6,600                                                           | 6,100 | 6,000  | 6,000      | 7,600    | 7,500  | 7,500  | 7,500      |
| 260,000                | 6,400                                                           | 5,900 | 5,900  | 5,800      | 7,400    | 7,200  | 7,200  | 7,200      |

**BASIS:** Zero wind • Two Engine Full Reverse Thrust • Touchdown Speed = VREF25 - 5 •  
Data is advisory and includes 1,500 ft. air distance from threshold to touchdown.

**REFERENCE DISTANCES BASED UPON PRESSURE ALTITUDE OF 2,000 FEET AND ARE CONSERVATIVE FOR ALL LOWER ALTITUDES.**

Shaded region corresponds to Max Landing Weight (MLW)

#### ALTITUDE ADJUSTMENT

| ALTITUDE (FEET) | MEDIUM (3) |       |       |       | POOR (1) |       |       |       |
|-----------------|------------|-------|-------|-------|----------|-------|-------|-------|
| 0               | -400       | -400  | -400  | -400  | -500     | -500  | -500  | -500  |
| 2,000           | 0          | 0     | 0     | 0     | 0        | 0     | 0     | 0     |
| 4,000           | 400        | 400   | 400   | 400   | 500      | 500   | 500   | 500   |
| 6,000           | 800        | 800   | 800   | 800   | 1,000    | 1,000 | 1,000 | 1,000 |
| 8,000           | 1,200      | 1,100 | 1,100 | 1,100 | 1,600    | 1,600 | 1,600 | 1,600 |

| CORRECTIONS         | MEDIUM (3) |       |       |       | POOR (1) |       |       |       |
|---------------------|------------|-------|-------|-------|----------|-------|-------|-------|
| PER 1 KT HEADWIND   | -50        | -50   | -50   | -50   | -50      | -50   | -50   | -50   |
| PER 1 KT TAILWIND   | 150        | 100   | 100   | 100   | 200      | 200   | 200   | 200   |
| PER 5 KTS ADD'L SPD | 350        | 300   | 300   | 200   | 350      | 250   | 250   | 250   |
| PER 10°C ABOVE ISA  | 200        | 200   | 200   | 200   | 250      | 250   | 250   | 250   |
| PER 10°C BELOW ISA  | -200       | -200  | -150  | -150  | -250     | -200  | -200  | -200  |
| PER 1% UP SLOPE     | -100       | -150  | -150  | -250  | -350     | -450  | -450  | -450  |
| PER 1% DOWN SLOPE   | 150        | 250   | 250   | 300   | 600      | 650   | 650   | 650   |
| 1 REVERSER INOP     | 400        | 500   | 600   | 700   | 1,300    | 1,500 | 1,500 | 1,500 |
| 2 REVERSERS INOP    | 1,100      | 1,500 | 1,600 | 1,700 | 3,800    | 3,900 | 3,900 | 3,900 |
| MANUAL SPOILERS     | 0          | 0     | 0     | 400   | 0        | 0     | 0     | 400   |

## EMERGENCY LANDING DISTANCES

### FEET

**NOTE:** TO BE USED ONLY UNDER CAPTAIN'S EMERGENCY AUTHORITY. PROVIDES ACTUAL LANDING DISTANCES ON CONTAMINATED RUNWAYS.

#### FLAPS 30

DATA IS ADVISORY AND DOES NOT INCLUDE 15% SAFETY MARGIN.

| Landing Weight<br>(lb) | <b>NOTE: Interpolate for GOOD-TO-MEDIUM (4) or MEDIUM-TO-POOR (2).</b> |        |       |       |        |            |                 |       |        |            |
|------------------------|------------------------------------------------------------------------|--------|-------|-------|--------|------------|-----------------|-------|--------|------------|
|                        | <b>DRY (6)</b>                                                         |        |       |       |        |            | <b>GOOD (5)</b> |       |        |            |
|                        | AB 1                                                                   | AB 2   | AB 3  | AB 4  | Max AB | Max Manual | AB 3            | AB 4  | Max AB | Max Manual |
| 410,000                | 11,000                                                                 | 10,100 | 9,100 | 7,900 | 7,700  | 4,900      | 9,100           | 7,900 | 7,700  | 6,400      |
| 400,000                | 10,700                                                                 | 9,800  | 8,800 | 7,700 | 7,500  | 4,800      | 8,800           | 7,700 | 7,500  | 6,200      |
| 390,000                | 10,400                                                                 | 9,500  | 8,600 | 7,500 | 7,300  | 4,600      | 8,600           | 7,500 | 7,300  | 6,100      |
| 380,000                | 10,100                                                                 | 9,200  | 8,300 | 7,300 | 7,100  | 4,500      | 8,300           | 7,300 | 7,100  | 5,900      |
| 370,000                | 9,800                                                                  | 9,000  | 8,100 | 7,100 | 6,900  | 4,400      | 8,100           | 7,100 | 6,900  | 5,700      |
| 360,000                | 9,500                                                                  | 8,700  | 7,800 | 6,800 | 6,600  | 4,200      | 7,800           | 6,800 | 6,700  | 5,600      |
| 350,000                | 9,200                                                                  | 8,400  | 7,500 | 6,600 | 6,400  | 4,100      | 7,500           | 6,600 | 6,400  | 5,400      |
| 340,000                | 8,900                                                                  | 8,100  | 7,300 | 6,400 | 6,200  | 3,900      | 7,300           | 6,400 | 6,200  | 5,300      |
| 330,000                | 8,600                                                                  | 7,900  | 7,100 | 6,300 | 6,100  | 3,900      | 7,100           | 6,300 | 6,100  | 5,100      |
| 320,000                | 8,400                                                                  | 7,700  | 6,900 | 6,100 | 5,900  | 3,800      | 6,900           | 6,100 | 6,000  | 5,000      |
| 310,000                | 8,200                                                                  | 7,500  | 6,800 | 6,000 | 5,800  | 3,700      | 6,800           | 6,000 | 5,800  | 4,900      |
| 300,000                | 8,000                                                                  | 7,300  | 6,600 | 5,800 | 5,700  | 3,700      | 6,600           | 5,800 | 5,700  | 4,800      |
| 290,000                | 7,800                                                                  | 7,100  | 6,400 | 5,700 | 5,500  | 3,600      | 6,400           | 5,700 | 5,500  | 4,700      |
| 280,000                | 7,500                                                                  | 6,900  | 6,300 | 5,600 | 5,400  | 3,500      | 6,300           | 5,600 | 5,400  | 4,600      |
| 270,000                | 7,300                                                                  | 6,700  | 6,100 | 5,400 | 5,200  | 3,400      | 6,100           | 5,400 | 5,300  | 4,500      |
| 260,000                | 7,100                                                                  | 6,500  | 5,900 | 5,300 | 5,100  | 3,400      | 5,900           | 5,300 | 5,100  | 4,400      |

**BASIS:** Zero wind • Two Engine Full Reverse Thrust • Touchdown Speed = VREF30 - 5 •  
Data is advisory and includes 1,500 ft. air distance from threshold to touchdown.

**REFERENCE DISTANCES BASED UPON PRESSURE ALTITUDE OF 2,000 FEET AND ARE CONSERVATIVE FOR ALL LOWER ALTITUDES.**

 Shaded region corresponds to Max Landing Weight (MLW)

#### ALTITUDE ADJUSTMENT

| ALTITUDE (FEET) | <b>DRY (6)</b> |       |       |      |      |      | <b>GOOD (5)</b> |      |      |      |
|-----------------|----------------|-------|-------|------|------|------|-----------------|------|------|------|
| 0               | -500           | -400  | -400  | -300 | -300 | -200 | -400            | -300 | -300 | -200 |
| 2,000           | 0              | 0     | 0     | 0    | 0    | 0    | 0               | 0    | 0    | 0    |
| 4,000           | 500            | 400   | 400   | 300  | 300  | 200  | 400             | 300  | 300  | 200  |
| 6,000           | 1,000          | 800   | 700   | 600  | 600  | 300  | 700             | 600  | 600  | 500  |
| 8,000           | 1,400          | 1,300 | 1,100 | 900  | 900  | 500  | 1,100           | 900  | 900  | 700  |

| CORRECTIONS         | <b>DRY (6)</b> |      |      |      |      |     | <b>GOOD (5)</b> |      |      |      |
|---------------------|----------------|------|------|------|------|-----|-----------------|------|------|------|
| PER 1 KT HEADWIND   | -50            | -50  | -50  | -50  | 0    | 0   | -50             | -50  | -50  | 0    |
| PER 1 KT TAILWIND   | 150            | 100  | 100  | 100  | 100  | 50  | 100             | 100  | 100  | 50   |
| PER 5 KTS ADD'L SPD | 300            | 300  | 350  | 300  | 300  | 150 | 350             | 300  | 300  | 200  |
| PER 10°C ABOVE ISA  | 250            | 200  | 200  | 150  | 150  | 100 | 200             | 150  | 150  | 100  |
| PER 10°C BELOW ISA  | -250           | -200 | -200 | -150 | -150 | -50 | -200            | -150 | -150 | -100 |
| PER 1% UP SLOPE     | -200           | -100 | 0    | 0    | 0    | -50 | 0               | 0    | 0    | -100 |
| PER 1% DOWN SLOPE   | 150            | 50   | 0    | 0    | 0    | 50  | 0               | 0    | 0    | 100  |
| 1 REVERSER INOP     | 400            | 100  | 0    | 0    | 0    | 100 | 0               | 0    | 0    | 200  |
| 2 REVERSERS INOP    | 500            | 100  | 0    | 0    | 0    | 200 | 0               | 100  | 100  | 500  |
| MANUAL SPOILERS     | 0              | 0    | 0    | 0    | 0    | 400 | 0               | 0    | 0    | 400  |

## EMERGENCY LANDING DISTANCES

### FEET

**NOTE:** TO BE USED ONLY UNDER CAPTAIN'S EMERGENCY AUTHORITY. PROVIDES ACTUAL LANDING DISTANCES ON CONTAMINATED RUNWAYS.

DATA IS ADVISORY AND DOES NOT INCLUDE 15% SAFETY MARGIN.

**FLAPS 30**

| Landing Weight<br>(lb) | NOTE: Interpolate for GOOD-TO-MEDIUM (4) or MEDIUM-TO-POOR (2). |       |        |            |          |        |        |            |
|------------------------|-----------------------------------------------------------------|-------|--------|------------|----------|--------|--------|------------|
|                        | MEDIUM (3)                                                      |       |        |            | POOR (1) |        |        |            |
|                        | AB 3                                                            | AB 4  | Max AB | Max Manual | AB 3     | AB 4   | Max AB | Max Manual |
| 410,000                | 9,600                                                           | 8,900 | 8,800  | 8,700      | 11,400   | 11,200 | 11,200 | 11,200     |
| 400,000                | 9,300                                                           | 8,600 | 8,600  | 8,400      | 11,100   | 10,900 | 10,900 | 10,900     |
| 390,000                | 9,100                                                           | 8,400 | 8,300  | 8,200      | 10,700   | 10,600 | 10,600 | 10,600     |
| 380,000                | 8,800                                                           | 8,100 | 8,100  | 8,000      | 10,400   | 10,300 | 10,300 | 10,300     |
| 370,000                | 8,500                                                           | 7,900 | 7,800  | 7,800      | 10,100   | 10,000 | 10,000 | 10,000     |
| 360,000                | 8,200                                                           | 7,600 | 7,600  | 7,500      | 9,700    | 9,700  | 9,700  | 9,700      |
| 350,000                | 7,900                                                           | 7,400 | 7,300  | 7,300      | 9,400    | 9,300  | 9,300  | 9,300      |
| 340,000                | 7,700                                                           | 7,100 | 7,100  | 7,100      | 9,100    | 9,000  | 9,000  | 9,000      |
| 330,000                | 7,500                                                           | 7,000 | 6,900  | 6,900      | 8,800    | 8,800  | 8,800  | 8,800      |
| 320,000                | 7,300                                                           | 6,800 | 6,700  | 6,700      | 8,600    | 8,600  | 8,600  | 8,600      |
| 310,000                | 7,100                                                           | 6,600 | 6,600  | 6,600      | 8,400    | 8,300  | 8,300  | 8,300      |
| 300,000                | 6,900                                                           | 6,500 | 6,400  | 6,400      | 8,200    | 8,100  | 8,100  | 8,100      |
| 290,000                | 6,800                                                           | 6,300 | 6,200  | 6,200      | 7,900    | 7,900  | 7,900  | 7,900      |
| 280,000                | 6,600                                                           | 6,100 | 6,100  | 6,000      | 7,700    | 7,700  | 7,700  | 7,700      |
| 270,000                | 6,400                                                           | 5,900 | 5,900  | 5,900      | 7,500    | 7,400  | 7,400  | 7,400      |
| 260,000                | 6,200                                                           | 5,800 | 5,700  | 5,700      | 7,200    | 7,200  | 7,200  | 7,200      |

**BASIS:** Zero wind • Two Engine Full Reverse Thrust • Touchdown Speed = VREF30 - 5 •  
Data is advisory and includes 1,500 ft. air distance from threshold to touchdown.

**REFERENCE DISTANCES BASED UPON PRESSURE ALTITUDE OF 2,000 FEET AND ARE CONSERVATIVE FOR ALL LOWER ALTITUDES.**



Shaded region corresponds to Max Landing Weight (MLW)

#### ALTITUDE ADJUSTMENT

| ALTITUDE (FEET) | MEDIUM (3) |       |       |       | POOR (1) |       |       |       |
|-----------------|------------|-------|-------|-------|----------|-------|-------|-------|
| 0               | -400       | -400  | -400  | -400  | -500     | -500  | -500  | -500  |
| 2,000           | 0          | 0     | 0     | 0     | 0        | 0     | 0     | 0     |
| 4,000           | 400        | 400   | 400   | 400   | 500      | 500   | 500   | 500   |
| 6,000           | 800        | 800   | 800   | 800   | 1,000    | 1,000 | 1,000 | 1,000 |
| 8,000           | 1,200      | 1,100 | 1,100 | 1,100 | 1,600    | 1,600 | 1,600 | 1,600 |

#### CORRECTIONS

|                     | MEDIUM (3) |       |       |       | POOR (1) |       |       |       |
|---------------------|------------|-------|-------|-------|----------|-------|-------|-------|
| PER 1 KT HEADWIND   | -50        | -50   | -50   | -50   | -50      | -50   | -50   | -50   |
| PER 1 KT TAILWIND   | 150        | 100   | 100   | 100   | 200      | 200   | 200   | 200   |
| PER 5 KTS ADD'L SPD | 350        | 300   | 300   | 250   | 350      | 250   | 250   | 250   |
| PER 10°C ABOVE ISA  | 200        | 200   | 200   | 200   | 250      | 250   | 250   | 250   |
| PER 10°C BELOW ISA  | -200       | -200  | -150  | -150  | -250     | -200  | -200  | -200  |
| PER 1% UP SLOPE     | -100       | -150  | -150  | -250  | -350     | -450  | -450  | -450  |
| PER 1% DOWN SLOPE   | 150        | 250   | 300   | 300   | 650      | 700   | 700   | 700   |
| 1 REVERSER INOP     | 400        | 500   | 600   | 700   | 1,300    | 1,400 | 1,400 | 1,400 |
| 2 REVERSERS INOP    | 1,100      | 1,400 | 1,500 | 1,500 | 3,500    | 3,600 | 3,600 | 3,600 |
| MANUAL SPOILERS     | 0          | 0     | 0     | 400   | 0        | 0     | 0     | 400   |

## OPERATION WITHOUT AIRSPEED INDICATION

Use the following body attitude and N1 Setting data to estimate airspeed and rate of climb/descent, if the airspeed system becomes unreliable or unusable enroute. ***If the damage to the airspeed indication system is detected during early stages of the flight (takeoff or initial climb), return to departure airport.***

| CLIMB                          |                        |                       |         |                   |         |         |
|--------------------------------|------------------------|-----------------------|---------|-------------------|---------|---------|
| SPEED: 290/0.78                |                        |                       |         | THRUST: MAX CLIMB |         |         |
|                                |                        | FLAPS: UP             |         |                   |         |         |
| PRESSURE<br>ALTITUDE -<br>FEET |                        | GROSS WEIGHT - POUNDS |         |                   |         |         |
|                                |                        | 397,000               | 353,000 | 309,000           | 265,000 | 220,000 |
| 40,000                         | PITCH ATTITUDE         |                       |         | +3.9              | +4.0    | +4.1    |
|                                | RATE OF CLIMB (FT/MIN) |                       |         | +400              | +1,000  | +1,700  |
| 30,000                         | PITCH ATTITUDE         | +3.9                  | +3.9    | +3.9              | +4.0    | +4.3    |
|                                | RATE OF CLIMB (FT/MIN) | +1,000                | +1,300  | +1,700            | +2,100  | +2,700  |
| 20,000                         | PITCH ATTITUDE         | +5.7                  | +5.8    | +6.0              | +6.3    | +7.0    |
|                                | RATE OF CLIMB (FT/MIN) | +1,900                | +2,300  | +2,700            | +3,400  | +4,200  |
| 10,000                         | PITCH ATTITUDE         | +7.6                  | +7.9    | +8.3              | +9.1    | +10.3   |
|                                | RATE OF CLIMB (FT/MIN) | +2,700                | +3,200  | +3,700            | +4,500  | +5,600  |
| 0                              | PITCH ATTITUDE         | +9.1                  | +9.6    | +10.3             | +11.4   | +13.2   |
|                                | RATE OF CLIMB (FT/MIN) | +3,100                | +3,600  | +4,300            | +5,100  | +6,300  |

| CRUISE                         |                  |                       |         |                                          |         |         |
|--------------------------------|------------------|-----------------------|---------|------------------------------------------|---------|---------|
| SPEED: 0.78/290                |                  |                       |         | THRUST: %N <sub>1</sub> FOR LEVEL FLIGHT |         |         |
| FLAPS: UP                      |                  |                       |         |                                          |         |         |
| PRESSURE<br>ALTITUDE -<br>FEET |                  | GROSS WEIGHT - POUNDS |         |                                          |         |         |
|                                |                  | 397,000               | 353,000 | 309,000                                  | 265,000 | 220,000 |
| 40,000                         | PITCH ATTITUDE   |                       | +4.1    | +3.4                                     | +2.7    | +2.0    |
|                                | % N <sub>1</sub> |                       | 108     | 98                                       | 92      | 88      |
| 35,000                         | PITCH ATTITUDE   | +3.5                  | +2.9    | +2.4                                     | +1.8    | +1.3    |
|                                | % N <sub>1</sub> | 98                    | 93      | 90                                       | 87      | 85      |
| 30,000                         | PITCH ATTITUDE   | +2.7                  | +2.2    | +1.8                                     | +1.3    | +0.8    |
|                                | % N <sub>1</sub> | 92                    | 89      | 87                                       | 86      | 84      |

| DESCENT                        |                        |                       |         |                           |         |         |
|--------------------------------|------------------------|-----------------------|---------|---------------------------|---------|---------|
| SPEED: 0.78/290                |                        |                       |         | THRUST: IDLE<br>FLAPS: UP |         |         |
| PRESSURE<br>ALTITUDE -<br>FEET |                        | GROSS WEIGHT - POUNDS |         |                           |         |         |
|                                |                        | 397,000               | 353,000 | 309,000                   | 265,000 | 220,000 |
| 40,000                         | PITCH ATTITUDE         |                       | +0.5    | 0.0                       | -0.5    | -1.3    |
|                                | RATE OF CLIMB (FT/MIN) |                       | -2,800  | -2,700                    | -2,600  | -2,600  |
| 30,000                         | PITCH ATTITUDE         | +0.1                  | -0.4    | -1.1                      | -1.8    | -2.5    |
|                                | RATE OF CLIMB (FT/MIN) | -2,000                | -2,100  | -2,200                    | -2,400  | -2,700  |
| 20,000                         | PITCH ATTITUDE         | +0.3                  | -0.2    | -0.9                      | -1.7    | -2.6    |
|                                | RATE OF CLIMB (FT/MIN) | -1,800                | -1,900  | -2,000                    | -2,100  | -2,400  |
| 10,000                         | PITCH ATTITUDE         | +0.3                  | -0.3    | -1.0                      | -1.8    | -2.6    |
|                                | RATE OF CLIMB (FT/MIN) | -1,600                | -1,700  | -1,700                    | -1,900  | -2,100  |

## OPERATION WITHOUT AIRSPEED INDICATION

Use the following body attitude and N1 Setting data to estimate airspeed and rate of climb/descent, if the airspeed system becomes unreliable or unusable enroute. ***If the damage to the airspeed indication system is detected during early stages of the flight (takeoff or initial climb), return to departure airport.***

| HOLDING                        |                                    |                       |                                                       |             |             |             |
|--------------------------------|------------------------------------|-----------------------|-------------------------------------------------------|-------------|-------------|-------------|
| SPEED: $V_{Ref30} + 80$        |                                    |                       | THRUST: %N <sub>1</sub> FOR LEVEL FLIGHT<br>FLAPS: UP |             |             |             |
| PRESSURE<br>ALTITUDE -<br>FEET |                                    | GROSS WEIGHT - POUNDS |                                                       |             |             |             |
|                                |                                    | 397,000               | 353,000                                               | 309,000     | 265,000     | 220,000     |
| 10,000                         | PITCH ATTITUDE<br>% N <sub>1</sub> | + 5.4<br>76           | +5.4<br>72                                            | + 5.3<br>68 | + 4.9<br>64 | + 4.5<br>59 |

| TERMINAL AREA                  |                               |                               |                                                             |            |             |             |             |
|--------------------------------|-------------------------------|-------------------------------|-------------------------------------------------------------|------------|-------------|-------------|-------------|
| SPEED: AS REQ'D                |                               |                               | THRUST: %N <sub>1</sub> FOR LEVEL FLIGHT<br>FLAPS: AS REQ'D |            |             |             |             |
| PRESSURE<br>ALTITUDE -<br>FEET | FLAPS,<br>SPEED               |                               | GROSS WEIGHT - POUNDS                                       |            |             |             |             |
|                                |                               |                               | 397,000                                                     | 353,000    | 309,000     | 265,000     | 220,000     |
| 5,000                          | UP<br>V <sub>Ref30</sub> + 80 | PITCH ATT<br>% N <sub>1</sub> | + 5.3<br>71                                                 | +5.3<br>68 | + 5.3<br>67 | + 4.9<br>60 | + 4.5<br>55 |
| 5,000                          | 1<br>V <sub>Ref30</sub> + 60  | PITCH ATT<br>% N <sub>1</sub> | + 6.9<br>73                                                 | +7.0<br>69 | + 7.0<br>65 | + 6.6<br>61 | + 6.2<br>56 |
| 5,000                          | 5<br>V <sub>Ref30</sub> + 40  | PITCH ATT<br>% N <sub>1</sub> | + 4.9<br>75                                                 | +5.1<br>72 | + 5.3<br>68 | + 5.0<br>63 | + 4.6<br>58 |
| 5,000                          | 15<br>V <sub>Ref30</sub> + 20 | PITCH ATT<br>% N <sub>1</sub> | + 5.5<br>77                                                 | +6.0<br>74 | + 6.4<br>70 | + 6.2<br>65 | + 6.0<br>60 |
| 5,000                          | 20<br>V <sub>Ref30</sub> + 20 | PITCH ATT<br>% N <sub>1</sub> | + 3.9<br>78                                                 | +4.3<br>75 | + 4.7<br>71 | + 4.6<br>66 | + 4.4<br>61 |

| FINAL APPROACH                 |                               |                               |                                                              |            |            |            |            |
|--------------------------------|-------------------------------|-------------------------------|--------------------------------------------------------------|------------|------------|------------|------------|
| SPEED: AS REQ'D                |                               |                               | THRUST: %N <sub>1</sub> FOR 3° GLIDESLOPE<br>FLAPS: AS REQ'D |            |            |            |            |
| PRESSURE<br>ALTITUDE -<br>FEET | FLAPS,<br>SPEED               |                               | GROSS WEIGHT - POUNDS                                        |            |            |            |            |
|                                |                               |                               | 397,000                                                      | 353,000    | 309,000    | 265,000    | 220,000    |
| 1,500                          | 25<br>V <sub>Ref25</sub> + 10 | PITCH ATT<br>% N <sub>1</sub> | +1.2<br>70                                                   | +1.1<br>66 | +1.0<br>63 | +0.9<br>58 | +0.7<br>54 |
| 1,500                          | 30<br>V <sub>Ref30</sub> + 10 | PITCH ATT<br>% N <sub>1</sub> | -0.3<br>75                                                   | +0.4<br>70 | +1.0<br>66 | +0.9<br>62 | +0.9<br>57 |

## BRAKE COOLING FOLLOWING LANDING

### GOVERNING CONDITIONS

**NOTE:** Maximum Quick Turnaround Landing Weight (QTLW) is not limiting for most normal operations.

If any of the following conditions apply, accomplish the procedures below to determine QTLW and Brake Cooling requirements.

- “QTLW Warning Remark” appears on the WDR or
- Landing above MLW or
- Landing within 5,000 lbs of MLW using Flaps 30 at an altitude of 7,000 feet or above or
- Landing within 10,000 lbs of MLW using Flaps 25 at an altitude of 6,000 feet or above.
- Landing with non-standard aircraft configurations (flaps inoperative, brake deactivated,...etc.)

### PROCEDURES

- A) Determine if the Maximum Quick Turn Landing Weight has been exceeded.
- B) Obtain a Landing Brake Cooling time.
- C) **Wait the longer of the two times** once the aircraft is parked at the gate with the parking brake off.

### QUICK TURNAROUND LANDING WEIGHT

#### 1. BTMS OPERATIVE

Check the BTMS display on EICAS no sooner than 10 minutes and no later than 15 minutes after parking.

If any brake temperature value is 5 or higher or BRAKE TEMP light is on then:

A **75 minute** ground cooling period is required.

**NOTE:** If any brake temperature display is blank or indicates 0, the BTMS INOPERATIVE Method must be used.

#### 2. BTMS INOPERATIVE

Determine the Maximum Quick Turnaround Landing Weight from Page 4-39.

If the Actual Landing Weight is greater than the Maximum Quick Turnaround Landing Weight then:

A **75 minute** ground cooling period is required.

**NOTE:** Check that wheel thermal plugs have not melted before executing a takeoff.

### LANDING BRAKE COOLING

#### 1. BTMS OPERATIVE

- a) Check the BTMS display on EICAS no sooner than 10 minutes and no later than 15 minutes after parking.
- b) Use the highest value to enter the BTMS Operative Brake Cooling table for ground from Page 4-40.
- c) Wait the specified time associated with the value from the BTMS indicator.

**NOTE:** If any brake temperature display is blank or indicates 0, the BTMS INOPERATIVE Method must be used.

#### 2. BTMS INOPERATIVE

Determine the Cooling Time and associated action if applicable from the Brake Cooling Time and AutoBrake Adjustment tables on Page 4-41. Comply with the specified procedures for the Caution Zone and Fuse Plug Melt Zone.



# BRAKE COOLING FOLLOWING LANDING

## MAXIMUM QUICK TURNAROUND LANDING WEIGHT

### POUNDS

#### FLAPS 30

| AIRPORT<br>PRESSURE<br>ALTITUDE - FT. | AMBIENT TEMPERATURE - °C |         |         |         |         |         |         |         |
|---------------------------------------|--------------------------|---------|---------|---------|---------|---------|---------|---------|
|                                       | -20                      | -10     | 0       | 10      | 20      | 30      | 40      | 50      |
| -1,000                                | 352,000                  | 346,000 | 342,000 | 338,000 | 333,000 | 328,000 | 323,000 | 318,000 |
| 0                                     | 347,000                  | 342,000 | 338,000 | 333,000 | 328,000 | 323,000 | 318,000 | 313,000 |
| 1,000                                 | 342,000                  | 338,000 | 333,000 | 327,000 | 322,000 | 317,000 | 312,000 | 307,000 |
| 2,000                                 | 338,000                  | 333,000 | 327,000 | 322,000 | 317,000 | 312,000 | 307,000 | 302,000 |
| 3,000                                 | 333,000                  | 327,000 | 322,000 | 316,000 | 311,000 | 306,000 | 301,000 | 296,000 |
| 4,000                                 | 327,000                  | 321,000 | 316,000 | 310,000 | 305,000 | 300,000 | 295,000 | ----    |
| 5,000                                 | 322,000                  | 316,000 | 310,000 | 305,000 | 299,000 | 294,000 | 300,000 | ----    |
| 6,000                                 | 316,000                  | 310,000 | 304,000 | 299,000 | 294,000 | 289,000 | 284,000 | ----    |
| 7,000                                 | 310,000                  | 304,000 | 299,000 | 293,000 | 288,000 | 283,000 | 279,000 | ----    |
| 8,000                                 | 304,000                  | 298,000 | 293,000 | 288,000 | 283,000 | 278,000 | 274,000 | ----    |
| 9,000                                 | 298,000                  | 293,000 | 287,000 | 282,000 | 277,000 | 273,000 | ----    | ----    |

#### FLAPS 25

| AIRPORT<br>PRESSURE<br>ALTITUDE - FT. | AMBIENT TEMPERATURE - °C |         |         |         |         |         |         |         |
|---------------------------------------|--------------------------|---------|---------|---------|---------|---------|---------|---------|
|                                       | -20                      | -10     | 0       | 10      | 20      | 30      | 40      | 50      |
| -1,000                                | 351,000                  | 344,000 | 338,000 | 338,000 | 326,000 | 321,000 | 316,000 | 311,000 |
| 0                                     | 344,000                  | 338,000 | 332,000 | 332,000 | 321,000 | 316,000 | 310,000 | 305,000 |
| 1,000                                 | 338,000                  | 332,000 | 326,000 | 326,000 | 315,000 | 310,000 | 304,000 | 299,000 |
| 2,000                                 | 332,000                  | 326,000 | 320,000 | 320,000 | 309,000 | 304,000 | 298,000 | 294,000 |
| 3,000                                 | 326,000                  | 320,000 | 314,000 | 314,000 | 303,000 | 298,000 | 293,000 | 288,000 |
| 4,000                                 | 320,000                  | 314,000 | 308,000 | 308,000 | 298,000 | 292,000 | 288,000 | ----    |
| 5,000                                 | 314,000                  | 308,000 | 303,000 | 303,000 | 292,000 | 287,000 | 282,000 | ----    |
| 6,000                                 | 308,000                  | 302,000 | 297,000 | 297,000 | 286,000 | 282,000 | 277,000 | ----    |
| 7,000                                 | 303,000                  | 297,000 | 292,000 | 292,000 | 281,000 | 276,000 | 272,000 | ----    |
| 8,000                                 | 297,000                  | 291,000 | 286,000 | 286,000 | 295,000 | 271,000 | 266,000 | ----    |
| 9,000                                 | 291,000                  | 286,000 | 280,000 | 280,000 | 290,000 | 266,000 | ----    | ----    |

**NOTE:** Weights in shaded area are above the maximum landing weight.

#### CORRECTIONS:

|                       |                         |         |
|-----------------------|-------------------------|---------|
| Wind                  | per 1 kt. of headwind   | + 750   |
|                       | per 1 kt. of tailwind   | - 3,650 |
| Runway slope          | per 0.1% uphill slope   | + 290   |
|                       | per 0.1% downhill slope | - 460   |
| One brake deactivated | Flaps 30                | 20,500  |
|                       | Flaps 25                | 22,800  |

**BRAKE COOLING FOLLOWING LANDING****BTMS OPERATIVE BRAKE COOLING****(minutes)**

|                                  | BTMS Indication |    |    |    |    |                         |                  |
|----------------------------------|-----------------|----|----|----|----|-------------------------|------------------|
|                                  | Up to 1         | 1  | 2  | 3  | 4  | 5 - 6                   | 7 +              |
| <b>Ground</b>                    | 0               | 16 | 31 | 44 | 56 | <b>Caution<br/>Zone</b> | <b>Fuse Plug</b> |
| <b>In-Flight<br/>Gear Down *</b> | 0               | 2  | 3  | 4  | 5  |                         | <b>Melt Zone</b> |

**NOTE:** A BTMS indication of 5 or higher will cause the Brake Temp Light to illuminate. This light will extinguish when the temperature decreases to 4.

- The In-Flight Gear Down cooling times are for use **ONLY** after waiting the duration of the ground cooling time and BTMS indicates overheating on the subsequent takeoff.
- The values above also pertain to Rejected Takeoff.

## BRAKE COOLING FOLLOWING LANDING

### LANDING BRAKE COOLING

(BTMS INOPERATIVE)

#### LANDING USING MAX MANUAL BRAKING:

Obtain a brake cooling time from the following table. A quick assessment can be made by using the next highest weight and speed. If the resulting wait time has the potential of causing a delay or is in the Caution or Fuse Plug Melt Zones, interpolation may be used to determine a more precise wait time with the associated zone action. Zones are indicated in the table for quicker identification. Refer to the time ranges for Caution and Fuse Plug Melt Zones below.

#### BRAKE COOLING TIME (h:mm)

| WEIGHT<br>(1,000 lbs) | Brakes on Speed (Ground Speed KTS) |               |               |               |               |               |
|-----------------------|------------------------------------|---------------|---------------|---------------|---------------|---------------|
|                       | 80                                 | 100           | 120           | 140           | 160           | 180           |
| Reverse               | 0 Eng / 2 Eng                      | 0 Eng / 2 Eng | 0 Eng / 2 Eng | 0 Eng / 2 Eng | 0 Eng / 2 Eng | 0 Eng / 2 Eng |
| 420                   | 0:00 / 0:00                        | 0:27 / 0:22   | 0:50 / 0:44   | 1:16C / 1:09C | 1:44F / 1:35F | 2:17F / 2:07F |
| 400                   | 0:00 / 0:00                        | 0:24 / 0:20   | 0:46 / 0:41   | 1:11C / 1:04C | 1:37F / 1:28F | 2:09F / 1:59F |
| 375                   | 0:00 / 0:00                        | 0:21 / 0:17   | 0:41 / 0:36   | 1:05C / 0:58  | 1:29F / 1:20F | 1:59F / 1:49F |
| 350                   | 0:00 / 0:00                        | 0:17 / 0:13   | 0:37 / 0:32   | 0:59 / 0:52   | 1:20F / 1:13C | 1:48F / 1:39F |
| 325                   | 0:00 / 0:00                        | 0:14 / 0:10   | 0:32 / 0:28   | 0:52 / 0:46   | 1:12C / 1:04C | 1:38F / 1:29F |
| 300                   | 0:00 / 0:00                        | 0:11 / 0:00   | 0:28 / 0:23   | 0:46 / 0:40   | 1:03C / 0:56  | 1:28F / 1:20F |
| 275                   | 0:00 / 0:00                        | 0:00 / 0:00   | 0:23 / 0:19   | 0:40 / 0:35   | 0:54 / 0:48   | 1:18C / 1:10C |
| 250                   | 0:00 / 0:00                        | 0:00 / 0:00   | 0:18 / 0:14   | 0:34 / 0:29   | 0:45 / 0:40   | 1:08C / 1:01C |
| 225                   | 0:00 / 0:00                        | 0:00 / 0:00   | 0:13 / 0:00   | 0:27 / 0:23   | 0:36 / 0:32   | 0:57 / 0:51   |
| 200                   | 0:00 / 0:00                        | 0:00 / 0:00   | 0:00 / 0:00   | 0:21 / 0:17   | 0:28 / 0:23   | 0:47 / 0:41   |

**C - CAUTION ZONE (1:00-1:19)** – Fuse plugs may melt. Wait the specified time. After the landing gear assembly has cooled, visually inspect for tire damage and seal leakage.

**F - FUSE PLUG MELT ZONE (Shaded Region, 1:20 +)** – Under these conditions, consider that the fuse plugs will likely melt and deflate the tires. Unless required, do not set the parking brake. The possibility of tire, grease or hydraulic fluid fires should also be considered. Maintenance inspection of tires, wheels and brakes is recommended.

#### LANDING USING AUTOBRAKES:

- 1) Determine the time from the table above. This is the reference time.
- 2) Subtract the times in the adjustment table below from the reference time in the table above to get proper cooling time for the respective brake setting. **Any resulting wait time of 1:20 or above is in the Fuse Plug Melt Zone.**

#### AUTOBRAKE ADJUSTMENT

NW INDICATES NO WAITING REQUIRED

|         | Brakes on Speed (Ground Speed KTS) |               |               |               |               |               |
|---------|------------------------------------|---------------|---------------|---------------|---------------|---------------|
|         | 80                                 | 100           | 120           | 140           | 160           | 180           |
| Reverse | 0 Eng / 2 Eng                      | 0 Eng / 2 Eng | 0 Eng / 2 Eng | 0 Eng / 2 Eng | 0 Eng / 2 Eng | 0 Eng / 2 Eng |
| MaxAuto | NW / NW                            | 0:06 / NW     | 0:06 / 0:13   | 0:07 / 0:16   | 0:09 / 0:19   | 0:12 / 0:23   |
| Auto 4  | NW / NW                            | 0:07 / NW     | 0:08 / 0:23   | 0:11 / 0:24   | 0:13 / 0:30   | 0:17 / 0:35   |
| Auto 3  | NW / NW                            | 0:11 / NW     | 0:11 / NW     | 0:15 / 0:39   | 0:21 / 0:47   | 0:24 / 0:50   |
| Auto 2  | NW / NW                            | 0:13 / NW     | 0:14 / NW     | 0:19 / NW     | 0:26 / 0:56   | 0:30 / 1:11   |
| Auto 1  | NW / NW                            | 0:05 / NW     | 0:20 / NW     | 0:25 / NW     | 0:31 / NW     | 0:40 / 1:27   |

## BRAKE COOLING FOLLOWING REJECTED TAKEOFF

### REJECTED TAKEOFF BRAKE COOLING

#### PROCEDURES

##### BTMS OPERATIVE:

- 1) Check the brake temperature indication on EICAS no sooner than 10 minutes and no later than 15 minutes after parking.
- 2) Use the highest value to enter the following BTMS Operative Brake Cooling table from Page 4-40.
- 3) Wait the specified time associated with the value from the BTMS indicator prior to subsequent takeoff.

##### BTMS INOPERATIVE:

Use the table below. A quick assessment can be made by using the next highest weight and speed. If the resulting wait time has the potential of causing a delay or is in the Caution or Fuse Plug Melt Zones, interpolation may be used to determine a more precise wait time with the associated zone action. Zones are indicated in the table for quicker identification. Refer to the time ranges for Caution and Fuse Plug Melt Zones below.

**NOTE:** All wait times begin once the aircraft is parked at the gate or other designated area.

#### BRAKE COOLING TIME (h:mm)

| WEIGHT<br>(1,000 lbs) | Brakes on Speed (Ground Speed KTS) |      |       |       |       |       |
|-----------------------|------------------------------------|------|-------|-------|-------|-------|
|                       | 80                                 | 100  | 120   | 140   | 160   | 180   |
| 420                   | 0:15                               | 0:37 | 1:01C | 1:29F | 2:00F | 2:35F |
| 400                   | 0:13                               | 0:34 | 0:57  | 1:24F | 1:52F | 2:26F |
| 375                   | 0:11                               | 0:31 | 0:52  | 1:17C | 1:43F | 2:15F |
| 350                   | 0:00                               | 0:27 | 0:48  | 1:11C | 1:34F | 2:04F |
| 325                   | 0:00                               | 0:24 | 0:43  | 1:04C | 1:24F | 1:53F |
| 300                   | 0:00                               | 0:20 | 0:38  | 0:57  | 1:15C | 1:42F |
| 275                   | 0:00                               | 0:17 | 0:33  | 0:51  | 1:06C | 1:31F |
| 250                   | 0:00                               | 0:14 | 0:28  | 0:44  | 0:56  | 1:20F |
| 225                   | 0:00                               | 0:10 | 0:23  | 0:37  | 0:47  | 1:09C |
| 200                   | 0:00                               | 0:00 | 0:18  | 0:31  | 0:38  | 0:58  |

**C - CAUTION ZONE (1:00 – 1:19)** – Fuse plugs may melt. Wait the specified time. After the landing gear assembly has cooled, visually inspect for tire damage and seal leakage.

**F - FUSE PLUG MELT ZONE (Shaded Region, 1:20 +)** – Under these conditions, consider that the fuse plugs will likely melt and deflate the tires. Unless required, do not set the parking brake. The possibility of tire, grease or hydraulic fluid fires should also be considered. Maintenance inspection of tires, wheels and brakes is recommended.

**MEL SUPPORT****V<sub>MCG</sub> - MINIMUM CONTROL SPEED, GROUND****KIAS****CF6-80C2B6**

NO NOSEWHEEL STEERING

| AIRPORT<br>PRESSURE<br>ALTITUDE<br>FT | AMBIENT TEMPERATURE - °C |     |     |     |     |     |     |
|---------------------------------------|--------------------------|-----|-----|-----|-----|-----|-----|
|                                       | -10                      | 0   | 10  | 20  | 30  | 40  | 50  |
| 0                                     | 111                      | 110 | 110 | 110 | 110 | 106 | 101 |
| 1,000                                 | 109                      | 109 | 109 | 108 | 108 | 104 | 99  |
| 2,000                                 | 107                      | 107 | 107 | 107 | 105 | 102 | 97  |
| 4,000                                 | 104                      | 104 | 104 | 104 | 101 | 98  | 93  |
| 6,000                                 | 101                      | 101 | 101 | 100 | 97  | 94  | 90  |
| 8,000                                 | 98                       | 98  | 98  | 96  | 94  | 90  | 87  |

# MEL SUPPORT

## ENGINE OPERATION WITH EEC OFF

### TAKEOFF THRUST - %N<sub>1</sub>

BASED ON FULL RATING AT 50° ASSUMED TEMP

40 TO 80 KNOTS  
NORMAL BLEED - PACKS ON / ANTI-ICE OFF

**AT50**  
**ALTERNATE**

**CF6-80C2B6**

| OAT<br>°C | ALTITUDE - FT |       |       |       |       |       |                                      |       |       |       |
|-----------|---------------|-------|-------|-------|-------|-------|--------------------------------------|-------|-------|-------|
|           | -1,000        | 0     | 1,000 | 2,000 | 3,000 | 4,000 | 5,000                                | 6,000 | 7,000 | 8,000 |
| 50        | 106.3         | 106.3 | 106.3 | 106.3 |       |       |                                      |       |       |       |
| 48        | 106.0         | 106.0 | 106.0 | 106.0 |       |       |                                      |       |       |       |
| 46        | 105.6         | 105.6 | 105.6 | 105.6 |       |       |                                      |       |       |       |
| 44        | 105.3         | 105.3 | 105.3 | 105.3 |       |       |                                      |       |       |       |
| 42        | 105.0         | 105.0 | 105.0 | 105.0 |       |       |                                      |       |       |       |
| 40        | 104.6         | 104.6 | 104.6 | 104.6 |       |       |                                      |       |       |       |
| 38        | 104.3         | 104.3 | 104.3 | 104.3 |       |       |                                      |       |       |       |
| 36        | 104.0         | 104.0 | 104.0 | 104.0 |       |       |                                      |       |       |       |
| 34        | 103.6         | 103.6 | 103.6 | 103.6 |       |       |                                      |       |       |       |
| 32        | 103.3         | 103.3 | 103.3 | 103.3 |       |       |                                      |       |       |       |
| 30        | 103.0         | 103.0 | 103.0 | 103.0 |       |       | OUTSIDE<br>ENVIRONMENTAL<br>ENVELOPE |       |       |       |
| 28        | 102.6         | 102.6 | 102.6 | 102.6 |       |       |                                      |       |       |       |
| 26        | 102.3         | 102.3 | 102.3 | 102.3 |       |       |                                      |       |       |       |
| 24        | 101.9         | 101.9 | 101.9 | 101.9 |       |       |                                      |       |       |       |
| 22        | 101.6         | 101.6 | 101.6 | 101.6 |       |       |                                      |       |       |       |
| 20        | 101.2         | 101.2 | 101.2 | 101.2 |       |       |                                      |       |       |       |
| 18        | 100.9         | 100.9 | 100.9 | 100.9 |       |       |                                      |       |       |       |
| 16        | 100.6         | 100.6 | 100.6 | 100.6 |       |       |                                      |       |       |       |
| 14        | 100.2         | 100.2 | 100.2 | 100.2 |       |       |                                      |       |       |       |
| 12        | 99.9          | 99.9  | 99.9  | 99.9  |       |       |                                      |       |       |       |
| 10        | 99.5          | 99.5  | 99.5  | 99.5  |       |       |                                      |       |       |       |
| 8         | 99.2          | 99.2  | 99.2  | 99.2  |       |       |                                      |       |       |       |
| 6         | 98.8          | 98.8  | 98.8  | 98.8  |       |       |                                      |       |       |       |
| 4         | 98.4          | 98.4  | 98.4  | 98.4  |       |       |                                      |       |       |       |
| 2         | 98.1          | 98.1  | 98.1  | 98.1  |       |       |                                      |       |       |       |
| 0         | 97.7          | 97.7  | 97.7  | 97.7  |       |       |                                      |       |       |       |
| -2        | 97.4          | 97.4  | 97.4  | 97.4  |       |       |                                      |       |       |       |
| -4        | 97.0          | 97.0  | 97.0  | 97.0  |       |       |                                      |       |       |       |
| -6        | 96.7          | 96.7  | 96.7  | 96.7  |       |       |                                      |       |       |       |
| -8        | 96.3          | 96.3  | 96.3  | 96.3  |       |       |                                      |       |       |       |
| -10       | 95.9          | 95.9  | 95.9  | 95.9  |       |       |                                      |       |       |       |
| -15       | 95.0          | 95.0  | 95.0  | 95.0  |       |       |                                      |       |       |       |
| -20       | 94.1          | 94.1  | 94.1  | 94.1  |       |       |                                      |       |       |       |
| -25       | 93.2          | 93.2  | 93.2  | 93.2  |       |       |                                      |       |       |       |
| -30       | 92.2          | 92.2  | 92.2  | 92.2  |       |       |                                      |       |       |       |
| -35       | 91.3          | 91.3  | 91.3  | 91.3  |       |       |                                      |       |       |       |
| -40       | 90.3          | 90.3  | 90.3  | 90.3  |       |       |                                      |       |       |       |

#### CORRECTIONS:

|           |     |  |
|-----------|-----|--|
| Packs OFF | 0.3 |  |
|-----------|-----|--|

Apply the following Corrections if Airport OAT greater than 10°C.

|               |      |  |
|---------------|------|--|
| Engine A-I ON | -0.5 |  |
| Wing A-I ON   | -0.2 |  |

# MEL SUPPORT

## ENGINE OPERATION WITH EEC OFF

### TAKEOFF THRUST - %N<sub>1</sub>

**AT45****ALTERNATE**

BASED ON FULL RATING AT 45° ASSUMED TEMP

**CF6-80C2B6**40 TO 80 KNOTS  
NORMAL BLEED - PACKS ON / ANTI-ICE OFF

| OAT<br>°C  | ALTITUDE - FT     |       |       |       |       |       |       |                                      |       |       |
|------------|-------------------|-------|-------|-------|-------|-------|-------|--------------------------------------|-------|-------|
|            | -1,000            | 0     | 1,000 | 2,000 | 3,000 | 4,000 | 5,000 | 6,000                                | 7,000 | 8,000 |
| <b>50</b>  | USE NORMAL THRUST |       |       |       |       |       |       |                                      |       |       |
| <b>48</b>  |                   |       |       |       |       |       |       |                                      |       |       |
| <b>45</b>  |                   |       |       |       |       |       |       |                                      |       |       |
| <b>44</b>  |                   |       |       |       |       |       |       |                                      |       |       |
| <b>42</b>  | 107.1             | 107.1 | 107.1 | 107.1 | 107.1 | 107.0 | 106.9 |                                      |       |       |
| <b>40</b>  | 106.9             | 106.9 | 106.9 | 106.9 | 106.9 | 106.8 | 106.7 |                                      |       |       |
| <b>38</b>  | 106.6             | 106.6 | 106.6 | 106.6 | 106.6 | 106.5 | 106.4 |                                      |       |       |
| <b>36</b>  | 106.3             | 106.3 | 106.3 | 106.3 | 106.3 | 106.2 | 106.1 |                                      |       |       |
| <b>34</b>  | 105.9             | 105.9 | 105.9 | 105.9 | 105.9 | 105.8 | 105.7 |                                      |       |       |
| <b>32</b>  | 105.6             | 105.6 | 105.6 | 105.6 | 105.6 | 105.5 | 105.4 |                                      |       |       |
| <b>30</b>  | 105.2             | 105.2 | 105.2 | 105.2 | 105.2 | 105.1 | 105.0 |                                      |       |       |
| <b>28</b>  | 104.9             | 104.9 | 104.9 | 104.9 | 104.9 | 104.8 | 104.7 |                                      |       |       |
| <b>26</b>  | 104.5             | 104.5 | 104.5 | 104.5 | 104.5 | 104.4 | 104.3 |                                      |       |       |
| <b>24</b>  | 104.2             | 104.2 | 104.2 | 104.2 | 104.2 | 104.1 | 104.0 |                                      |       |       |
| <b>22</b>  | 103.9             | 103.9 | 103.9 | 103.9 | 103.9 | 103.8 | 103.7 |                                      |       |       |
| <b>20</b>  | 103.5             | 103.5 | 103.5 | 103.5 | 103.5 | 103.4 | 103.3 |                                      |       |       |
| <b>18</b>  | 103.2             | 103.2 | 103.2 | 103.2 | 103.2 | 103.1 | 103.0 |                                      |       |       |
| <b>16</b>  | 102.8             | 102.8 | 102.8 | 102.8 | 102.8 | 102.7 | 102.6 | OUTSIDE<br>ENVIRONMENTAL<br>ENVELOPE |       |       |
| <b>14</b>  | 102.5             | 102.5 | 102.5 | 102.5 | 102.5 | 102.4 | 102.3 |                                      |       |       |
| <b>12</b>  | 102.1             | 102.1 | 102.1 | 102.1 | 102.1 | 102.0 | 101.9 |                                      |       |       |
| <b>10</b>  | 101.7             | 101.7 | 101.7 | 101.7 | 101.7 | 101.7 | 101.6 |                                      |       |       |
| <b>8</b>   | 101.4             | 101.4 | 101.4 | 101.4 | 101.4 | 101.3 | 101.2 |                                      |       |       |
| <b>6</b>   | 101.0             | 101.0 | 101.0 | 101.0 | 101.0 | 100.9 | 100.8 |                                      |       |       |
| <b>4</b>   | 100.7             | 100.7 | 100.7 | 100.7 | 100.7 | 100.6 | 100.5 |                                      |       |       |
| <b>2</b>   | 100.3             | 100.3 | 100.3 | 100.3 | 100.3 | 100.2 | 100.1 |                                      |       |       |
| <b>0</b>   | 100.0             | 100.0 | 100.0 | 100.0 | 100.0 | 99.9  | 99.8  |                                      |       |       |
| <b>-2</b>  | 99.6              | 99.6  | 99.6  | 99.6  | 99.6  | 99.5  | 99.4  |                                      |       |       |
| <b>-4</b>  | 99.2              | 99.2  | 99.2  | 99.2  | 99.2  | 99.1  | 99.1  |                                      |       |       |
| <b>-6</b>  | 98.9              | 98.9  | 98.9  | 98.9  | 98.9  | 98.8  | 98.7  |                                      |       |       |
| <b>-8</b>  | 98.5              | 98.5  | 98.5  | 98.5  | 98.5  | 98.4  | 98.3  |                                      |       |       |
| <b>-10</b> | 98.1              | 98.1  | 98.1  | 98.1  | 98.1  | 98.0  | 98.0  |                                      |       |       |
| <b>-15</b> | 97.8              | 97.8  | 97.8  | 97.8  | 97.8  | 97.7  | 97.6  |                                      |       |       |
| <b>-20</b> | 97.4              | 97.4  | 97.4  | 97.4  | 97.4  | 97.3  | 97.2  |                                      |       |       |
| <b>-25</b> | 96.5              | 96.5  | 96.5  | 96.5  | 96.5  | 96.4  | 96.3  |                                      |       |       |
| <b>-30</b> | 95.5              | 95.5  | 95.5  | 95.5  | 95.5  | 95.4  | 95.4  |                                      |       |       |
| <b>-35</b> | 94.6              | 94.6  | 94.6  | 94.6  | 94.6  | 94.5  | 94.4  |                                      |       |       |
| <b>-40</b> | 93.6              | 93.6  | 93.6  | 93.6  | 93.6  | 93.5  | 93.5  |                                      |       |       |
| <b>-40</b> | 92.7              | 92.7  | 92.7  | 92.7  | 92.7  | 92.6  | 92.5  |                                      |       |       |
| <b>-40</b> | 91.7              | 91.7  | 91.7  | 91.7  | 91.7  | 91.6  | 91.5  |                                      |       |       |

**CORRECTIONS:**

|           |     |     |     |     |     |     |     |  |  |  |
|-----------|-----|-----|-----|-----|-----|-----|-----|--|--|--|
| Packs OFF | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.4 | 0.5 |  |  |  |
|-----------|-----|-----|-----|-----|-----|-----|-----|--|--|--|

Apply the following Corrections if Airport OAT greater than 10°C.

|               |      |      |      |      |      |      |      |  |  |  |
|---------------|------|------|------|------|------|------|------|--|--|--|
| Engine A-I ON | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.6 | -0.7 |  |  |  |
| Wing A-I ON   | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.3 | -0.3 |  |  |  |

# MEL SUPPORT

## ENGINE OPERATION WITH EEC OFF

### TAKEOFF THRUST - %N<sub>1</sub>

BASED ON FULL RATING AT 40° ASSUMED TEMP

40 TO 80 KNOTS  
NORMAL BLEED - PACKS ON / ANTI-ICE OFF

**AT40**  
**ALTERNATE**

**CF6-80C2B6**

| OAT<br>°C | ALTITUDE - FEET |       |       |       |       |       |       |       |       |       |
|-----------|-----------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|           | -1,000          | 0     | 1,000 | 2,000 | 3,000 | 4,000 | 5,000 | 6,000 | 7,000 | 8,000 |
| 40        | 107.9           | 107.9 | 107.9 | 107.9 | 107.9 | 107.8 | 107.7 | 107.6 | 107.8 | 107.9 |
| 38        | 107.6           | 107.6 | 107.6 | 107.6 | 107.6 | 107.5 | 107.4 | 107.3 | 107.5 | 107.6 |
| 36        | 107.2           | 107.2 | 107.2 | 107.2 | 107.2 | 107.1 | 107.0 | 106.9 | 107.1 | 107.2 |
| 34        | 106.9           | 106.9 | 106.9 | 106.9 | 106.9 | 106.8 | 106.7 | 106.6 | 106.8 | 106.9 |
| 32        | 106.5           | 106.5 | 106.5 | 106.5 | 106.5 | 106.4 | 106.3 | 106.2 | 106.4 | 106.5 |
| 30        | 106.2           | 106.2 | 106.2 | 106.2 | 106.2 | 106.1 | 106.0 | 105.9 | 106.1 | 106.2 |
| 28        | 105.8           | 105.8 | 105.8 | 105.8 | 105.8 | 105.7 | 105.6 | 105.5 | 105.7 | 105.8 |
| 26        | 105.5           | 105.5 | 105.5 | 105.5 | 105.5 | 105.4 | 105.3 | 105.2 | 105.4 | 105.5 |
| 24        | 105.1           | 105.1 | 105.1 | 105.1 | 105.1 | 105.0 | 104.9 | 104.8 | 105.0 | 105.1 |
| 22        | 104.8           | 104.8 | 104.8 | 104.8 | 104.8 | 104.7 | 104.6 | 104.5 | 104.7 | 104.8 |
| 20        | 104.4           | 104.4 | 104.4 | 104.4 | 104.4 | 104.3 | 104.2 | 104.1 | 104.3 | 104.4 |
| 18        | 104.0           | 104.0 | 104.0 | 104.0 | 104.0 | 103.9 | 103.8 | 103.8 | 104.0 | 104.1 |
| 16        | 103.7           | 103.7 | 103.7 | 103.7 | 103.7 | 103.6 | 103.5 | 103.4 | 103.6 | 103.7 |
| 14        | 103.3           | 103.3 | 103.3 | 103.3 | 103.3 | 103.2 | 103.1 | 103.0 | 103.2 | 103.3 |
| 12        | 103.0           | 103.0 | 103.0 | 103.0 | 103.0 | 102.9 | 102.8 | 102.7 | 102.9 | 103.0 |
| 10        | 102.6           | 102.6 | 102.6 | 102.6 | 102.6 | 102.5 | 102.4 | 102.3 | 102.5 | 102.6 |
| 8         | 102.2           | 102.2 | 102.2 | 102.2 | 102.2 | 102.1 | 102.0 | 102.0 | 102.2 | 102.3 |
| 6         | 101.9           | 101.9 | 101.9 | 101.9 | 101.9 | 101.8 | 101.7 | 101.6 | 101.8 | 101.9 |
| 4         | 101.5           | 101.5 | 101.5 | 101.5 | 101.5 | 101.4 | 101.3 | 101.2 | 101.4 | 101.5 |
| 2         | 101.1           | 101.1 | 101.1 | 101.1 | 101.1 | 101.0 | 101.0 | 100.9 | 101.1 | 101.2 |
| 0         | 100.8           | 100.8 | 100.8 | 100.8 | 100.8 | 100.7 | 100.6 | 100.5 | 100.7 | 100.8 |
| -2        | 100.4           | 100.4 | 100.4 | 100.4 | 100.4 | 100.3 | 100.2 | 100.1 | 100.3 | 100.4 |
| -4        | 100.0           | 100.0 | 100.0 | 100.0 | 100.0 | 99.9  | 99.8  | 99.8  | 100.0 | 100.1 |
| -6        | 99.7            | 99.7  | 99.7  | 99.7  | 99.7  | 99.6  | 99.5  | 99.4  | 99.6  | 99.7  |
| -8        | 99.3            | 99.3  | 99.3  | 99.3  | 99.3  | 99.2  | 99.1  | 99.0  | 99.2  | 99.3  |
| -10       | 98.9            | 98.9  | 98.9  | 98.9  | 98.9  | 98.8  | 98.7  | 98.6  | 98.8  | 98.9  |
| -15       | 98.0            | 98.0  | 98.0  | 98.0  | 98.0  | 97.9  | 97.8  | 97.7  | 97.9  | 98.0  |
| -20       | 97.0            | 97.0  | 97.0  | 97.0  | 97.0  | 96.9  | 96.8  | 96.7  | 96.9  | 97.0  |
| -25       | 96.1            | 96.1  | 96.1  | 96.1  | 96.1  | 96.0  | 95.9  | 95.8  | 96.0  | 96.1  |
| -30       | 95.1            | 95.1  | 95.1  | 95.1  | 95.1  | 95.0  | 94.9  | 94.8  | 95.0  | 95.1  |
| -35       | 94.1            | 94.1  | 94.1  | 94.1  | 94.1  | 94.0  | 93.9  | 93.8  | 94.0  | 94.1  |
| -40       | 93.1            | 93.1  | 93.1  | 93.1  | 93.1  | 93.0  | 92.9  | 92.8  | 93.0  | 93.1  |

#### CORRECTIONS:

|           |     |     |     |     |     |     |     |     |     |     |
|-----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Packs OFF | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.4 | 0.5 | 0.6 | 0.6 | 0.6 |
|-----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|

Apply the following Corrections if Airport OAT greater than 10°C.

|               |      |      |      |      |      |      |      |      |      |      |
|---------------|------|------|------|------|------|------|------|------|------|------|
| Engine A-I ON | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.6 | -0.7 | -0.9 | -0.8 | -0.8 |
| Wing A-I ON   | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.3 | -0.3 | -0.4 | -0.4 | -0.4 |



# MEL SUPPORT

## ENGINE OPERATION WITH EEC OFF

### TAKEOFF THRUST - %N<sub>1</sub>

**AT35**  
**ALTERNATE**

BASED ON FULL RATING AT 35° ASSUMED TEMP

**CF6-80C2B6**

40 TO 80 KNOTS  
NORMAL BLEED - PACKS ON / ANTI-ICE OFF

| OAT<br>°C | ALTITUDE - FT     |       |       |       |       |       |       |       |       |       |
|-----------|-------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|           | -1,000            | 0     | 1,000 | 2,000 | 3,000 | 4,000 | 5,000 | 6,000 | 7,000 | 8,000 |
| 40        | USE NORMAL THRUST |       |       |       |       |       |       |       |       |       |
| 38        |                   |       |       |       |       |       |       |       |       |       |
| 36        |                   |       |       |       |       |       |       |       |       |       |
| 35        |                   |       |       |       |       |       |       |       |       |       |
| 34        | 108.8             | 108.8 | 108.8 | 108.8 | 108.8 | 108.7 | 108.6 | 108.5 | 108.7 | 108.8 |
| 32        | 108.6             | 108.6 | 108.6 | 108.6 | 108.6 | 108.5 | 108.4 | 108.3 | 108.5 | 108.6 |
| 30        | 108.2             | 108.3 | 108.3 | 108.3 | 108.2 | 108.2 | 108.1 | 108.0 | 108.2 | 108.3 |
| 28        | 107.9             | 107.9 | 107.9 | 107.9 | 107.9 | 107.8 | 107.7 | 107.6 | 107.8 | 107.9 |
| 26        | 107.5             | 107.6 | 107.6 | 107.6 | 107.5 | 107.5 | 107.4 | 107.3 | 107.5 | 107.6 |
| 24        | 107.2             | 107.2 | 107.2 | 107.2 | 107.2 | 107.1 | 107.0 | 106.9 | 107.1 | 107.2 |
| 22        | 106.8             | 106.8 | 106.8 | 106.8 | 106.8 | 106.7 | 106.6 | 106.5 | 106.7 | 106.8 |
| 20        | 106.5             | 106.5 | 106.5 | 106.5 | 106.4 | 106.4 | 106.3 | 106.2 | 106.4 | 106.5 |
| 18        | 106.1             | 106.1 | 106.1 | 106.1 | 106.1 | 106.0 | 105.9 | 105.8 | 106.0 | 106.1 |
| 16        | 105.7             | 105.8 | 105.8 | 105.8 | 105.7 | 105.7 | 105.6 | 105.5 | 105.7 | 105.8 |
| 14        | 105.4             | 105.4 | 105.4 | 105.4 | 105.3 | 105.3 | 105.2 | 105.1 | 105.3 | 105.4 |
| 12        | 105.0             | 105.0 | 105.0 | 105.0 | 105.0 | 104.9 | 104.8 | 104.7 | 104.9 | 105.0 |
| 10        | 104.6             | 104.7 | 104.7 | 104.7 | 104.6 | 104.6 | 104.5 | 104.4 | 104.6 | 104.7 |
| 8         | 104.3             | 104.3 | 104.3 | 104.3 | 104.2 | 104.2 | 104.1 | 104.0 | 104.2 | 104.3 |
| 6         | 103.9             | 103.9 | 103.9 | 103.9 | 103.9 | 103.8 | 103.7 | 103.6 | 103.8 | 103.9 |
| 4         | 103.5             | 103.6 | 103.6 | 103.6 | 103.5 | 103.5 | 103.4 | 103.3 | 103.5 | 103.6 |
| 2         | 103.2             | 103.2 | 103.2 | 103.2 | 103.1 | 103.1 | 103.0 | 102.9 | 103.1 | 103.2 |
| 0         | 102.8             | 102.8 | 102.8 | 102.8 | 102.8 | 102.7 | 102.6 | 102.5 | 102.7 | 102.8 |
| -2        | 102.4             | 102.4 | 102.4 | 102.4 | 102.4 | 102.3 | 102.2 | 102.2 | 102.4 | 102.5 |
| -4        | 102.0             | 102.1 | 102.1 | 102.1 | 102.0 | 102.0 | 101.9 | 101.8 | 102.0 | 102.1 |
| -6        | 101.7             | 101.7 | 101.7 | 101.7 | 101.6 | 101.6 | 101.5 | 101.4 | 101.6 | 101.7 |
| -8        | 101.3             | 101.3 | 101.3 | 101.3 | 101.3 | 101.2 | 101.1 | 101.0 | 101.2 | 101.3 |
| -10       | 100.9             | 100.9 | 100.9 | 100.9 | 100.9 | 100.8 | 100.7 | 100.6 | 100.8 | 100.9 |
| -15       | 100.5             | 100.5 | 100.5 | 100.5 | 100.5 | 100.5 | 100.4 | 100.3 | 100.5 | 100.6 |
| -20       | 99.6              | 99.6  | 99.6  | 99.6  | 99.5  | 99.5  | 99.4  | 99.3  | 99.5  | 99.6  |
| -25       | 98.6              | 98.6  | 98.6  | 98.6  | 98.6  | 98.5  | 98.4  | 98.3  | 98.5  | 98.6  |
| -30       | 97.6              | 97.6  | 97.6  | 97.6  | 97.6  | 97.5  | 97.5  | 97.4  | 97.6  | 97.7  |
| -35       | 96.6              | 96.6  | 96.6  | 96.6  | 96.6  | 96.6  | 96.5  | 96.4  | 96.6  | 96.7  |
| -40       | 95.6              | 95.6  | 95.6  | 95.6  | 95.6  | 95.6  | 95.5  | 95.4  | 95.6  | 95.7  |
|           | 94.6              | 94.6  | 94.6  | 94.6  | 94.6  | 94.6  | 94.5  | 94.4  | 94.6  | 94.7  |

#### CORRECTIONS:

|           |     |     |     |     |     |     |     |     |     |     |
|-----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Packs OFF | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.4 | 0.5 | 0.6 | 0.6 | 0.6 |
|-----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|

Apply the following Corrections if Airport OAT greater than 10°C.

|               |      |      |      |      |      |      |      |      |      |      |
|---------------|------|------|------|------|------|------|------|------|------|------|
| Engine A-I ON | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.6 | -0.7 | -0.9 | -0.8 | -0.8 |
| Wing A-I ON   | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.3 | -0.3 | -0.4 | -0.4 | -0.4 |

# MEL SUPPORT

## ENGINE OPERATION WITH EEC OFF

### TAKEOFF THRUST - %N<sub>1</sub>

BASED ON FULL RATING

40 TO 80 KNOTS  
NORMAL BLEED - PACKS ON / ANTI-ICE OFF

**TO  
NORMAL**

**CF60-80C2B6**

| OAT<br>°C | ALTITUDE - FT |       |       |       |       |       |       |       |       |       |
|-----------|---------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|           | -1,000        | 0     | 1,000 | 2,000 | 3,000 | 4,000 | 5,000 | 6,000 | 7,000 | 8,000 |
| 40        | 107.9         | 107.9 | 107.9 | 107.9 | 107.9 | 107.8 | 107.7 | 107.6 | 107.8 | 107.9 |
| 38        | 108.3         | 108.3 | 108.3 | 108.3 | 108.2 | 108.2 | 108.1 | 108.0 | 108.2 | 108.3 |
| 36        | 108.6         | 108.6 | 108.6 | 108.6 | 108.6 | 108.5 | 108.4 | 108.3 | 108.5 | 108.6 |
| 34        | 109.0         | 109.0 | 109.0 | 109.0 | 108.9 | 108.9 | 108.8 | 108.7 | 108.9 | 109.0 |
| 32        | 109.3         | 109.3 | 109.3 | 109.3 | 109.3 | 109.2 | 109.1 | 109.0 | 109.2 | 109.3 |
| 30        | 109.0         | 109.7 | 109.7 | 109.7 | 109.7 | 109.6 | 109.5 | 109.4 | 109.6 | 109.7 |
| 28        | 108.6         | 109.3 | 110.0 | 109.8 | 110.0 | 110.0 | 109.9 | 109.7 | 109.9 | 110.0 |
| 26        | 108.2         | 108.9 | 109.5 | 110.0 | 110.4 | 110.4 | 110.2 | 110.1 | 110.3 | 110.4 |
| 24        | 107.9         | 108.6 | 109.2 | 110.1 | 110.7 | 110.7 | 110.6 | 110.4 | 110.6 | 110.7 |
| 22        | 107.5         | 108.2 | 108.9 | 109.8 | 110.4 | 111.1 | 110.9 | 110.8 | 111.0 | 111.1 |
| 20        | 107.1         | 107.8 | 108.6 | 109.4 | 110.1 | 110.7 | 111.3 | 111.1 | 111.3 | 111.4 |
| 18        | 106.7         | 107.4 | 108.2 | 109.0 | 109.7 | 110.3 | 110.9 | 111.5 | 111.7 | 111.8 |
| 16        | 106.4         | 107.1 | 107.9 | 108.6 | 109.3 | 110.0 | 110.5 | 111.1 | 112.2 | 112.3 |
| 14        | 106.0         | 106.7 | 107.5 | 108.3 | 108.9 | 109.6 | 110.2 | 110.8 | 111.7 | 112.5 |
| 12        | 105.6         | 106.4 | 107.1 | 107.9 | 108.5 | 109.2 | 109.8 | 110.4 | 111.3 | 112.1 |
| 10        | 105.3         | 106.0 | 106.8 | 107.5 | 108.2 | 108.8 | 109.4 | 110.0 | 110.9 | 111.7 |
| 8         | 104.9         | 105.6 | 106.4 | 107.1 | 107.8 | 108.5 | 109.0 | 109.6 | 110.5 | 111.3 |
| 6         | 104.5         | 105.3 | 106.0 | 106.7 | 107.4 | 108.1 | 108.7 | 109.2 | 110.1 | 110.9 |
| 4         | 104.1         | 104.9 | 105.6 | 106.4 | 107.0 | 107.7 | 108.3 | 108.9 | 109.7 | 110.5 |
| 2         | 103.8         | 104.6 | 105.3 | 106.0 | 106.7 | 107.3 | 107.9 | 108.5 | 109.3 | 110.1 |
| 0         | 103.4         | 104.2 | 104.9 | 105.6 | 106.3 | 107.0 | 107.5 | 108.1 | 109.0 | 109.7 |
| -2        | 103.0         | 103.8 | 104.5 | 105.2 | 105.9 | 106.6 | 107.2 | 107.7 | 108.6 | 109.3 |
| -4        | 102.7         | 103.5 | 104.2 | 104.8 | 105.5 | 106.2 | 106.8 | 107.3 | 108.2 | 108.9 |
| -6        | 102.3         | 103.1 | 103.8 | 104.5 | 105.2 | 105.8 | 106.4 | 107.0 | 107.8 | 108.5 |
| -8        | 101.9         | 102.8 | 103.4 | 104.1 | 104.8 | 105.5 | 106.0 | 106.6 | 107.4 | 108.1 |
| -10       | 101.6         | 102.4 | 103.1 | 103.7 | 104.4 | 105.1 | 105.7 | 106.2 | 107.0 | 107.7 |
| -15       | 100.6         | 101.4 | 102.1 | 102.7 | 103.4 | 104.1 | 104.6 | 105.2 | 106.0 | 106.7 |
| -20       | 99.6          | 100.4 | 101.1 | 101.7 | 102.4 | 103.1 | 103.6 | 104.2 | 105.0 | 105.7 |
| -25       | 98.6          | 99.5  | 100.1 | 100.8 | 101.4 | 102.1 | 102.6 | 103.2 | 104.0 | 104.7 |
| -30       | 97.7          | 98.5  | 99.1  | 99.8  | 100.4 | 101.1 | 101.6 | 102.1 | 103.0 | 103.7 |
| -35       | 96.7          | 97.5  | 98.1  | 98.8  | 99.4  | 100.1 | 100.6 | 101.1 | 102.0 | 102.7 |
| -40       | 95.7          | 96.5  | 97.2  | 97.8  | 98.5  | 99.1  | 99.6  | 100.1 | 101.0 | 101.7 |

#### CORRECTIONS:

|           |     |     |     |     |     |     |     |     |     |     |
|-----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Packs OFF | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.4 | 0.5 | 0.6 | 0.6 | 0.6 |
|-----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|

Apply the following Corrections if Airport OAT greater than 10°C.

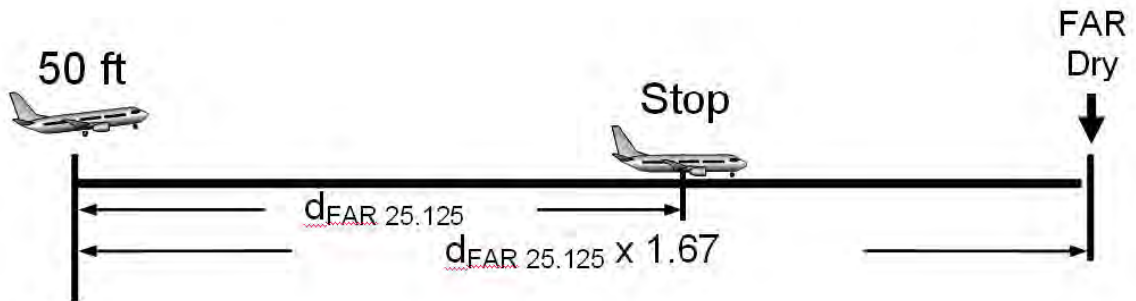
|               |      |      |      |      |      |      |      |      |      |      |
|---------------|------|------|------|------|------|------|------|------|------|------|
| Engine A-I ON | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.6 | -0.7 | -0.9 | -0.8 | -0.8 |
| Wing A-I ON   | -0.2 | -0.2 | -0.2 | -0.2 | -0.2 | -0.3 | -0.3 | -0.4 | -0.4 | -0.4 |

## MEL SUPPORT

### FAR LANDING DISTANCES (FACTORED)

#### DEFINITION

All given distances in this section are FAR (Factored) Landing Distances. These distances represent the actual (or demonstrated) landing distances – designated as  $d_{FAR}$  in the diagram below – multiplied by a factor of 1.67.



FAR Landing Distance Diagram

This is in accordance with FAR 121.195, requiring the aircraft to be able to come to a complete stop within 60% of the effective length of the runway.

#### APPLICABILITY

The tables on the following pages provide landing distances and approach speeds to be used for dispatch with the given conditions and the associated MEL applied. For landing distances in the event of an in-flight system failure or abnormality not detected at or prior to dispatch, please refer to the “Abnormal Configuration Actual Landing Distances and Approach Speeds” pages in this section of the ODM.

#### ASSUMPTIONS

The data within this section was generated based on a set of assumed conditions:

- Standard day conditions
- No wind
- No slope
- No reverse thrust credit factored in FAR Landing Distances
- Maximum manual braking
- Includes distance from 50 feet above threshold to stop (1,000 feet of air distance)

**MEL SUPPORT****FAR LANDING DISTANCES (FACTORED)****ANTI-SKID INOP – DRY RUNWAY****FLAPS 30**

| AIRCRAFT<br>WEIGHT<br>LBS | AIRPORT PRESSURE ALTITUDE - FEET |        |        |        |        |        |        |        |        |
|---------------------------|----------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|
|                           | 0                                | 1,000  | 2,000  | 3,000  | 4,000  | 5,000  | 6,000  | 7,000  | 8,000  |
| 410,000                   | 14,880                           | 15,240 |        |        |        |        |        |        |        |
| 400,000                   | 14,360                           | 14,710 | 15,080 | 15,480 |        |        |        |        |        |
| 390,000                   | 13,860                           | 14,210 | 14,570 | 14,940 | 15,330 |        |        |        |        |
| 380,000                   | 13,380                           | 13,720 | 14,070 | 14,430 | 14,800 | 15,170 | 15,570 |        |        |
| 370,000                   | 12,950                           | 13,260 | 13,590 | 13,940 | 14,310 | 14,660 | 15,030 | 15,410 |        |
| 360,000                   | 12,560                           | 12,870 | 13,200 | 13,520 | 13,860 | 14,230 | 14,610 | 14,980 | 15,360 |
| 350,000                   | 12,230                           | 12,560 | 12,910 | 13,210 | 13,520 | 13,900 | 14,290 | 14,670 | 15,040 |
| 340,000                   | 11,950                           | 12,270 | 12,630 | 12,930 | 13,240 | 13,590 | 13,960 | 14,330 | 14,700 |
| 330,000                   | 11,700                           | 12,000 | 12,340 | 12,650 | 12,970 | 13,290 | 13,630 | 13,990 | 14,360 |
| 320,000                   | 11,460                           | 11,740 | 12,050 | 12,350 | 12,650 | 12,970 | 13,300 | 13,650 | 14,010 |
| 310,000                   | 11,190                           | 11,460 | 11,750 | 12,040 | 12,340 | 12,640 | 12,960 | 13,300 | 13,650 |
| 300,000                   | 10,900                           | 11,170 | 11,450 | 11,730 | 12,020 | 12,320 | 12,630 | 12,960 | 13,290 |
| 290,000                   | 10,620                           | 10,880 | 11,150 | 11,420 | 11,700 | 11,990 | 12,300 | 12,610 | 12,940 |
| 280,000                   | 10,340                           | 10,590 | 10,850 | 11,110 | 11,380 | 11,660 | 11,960 | 12,260 | 12,580 |
| 270,000                   | 10,050                           | 10,290 | 10,550 | 10,800 | 11,060 | 11,340 | 11,630 | 11,920 | 12,220 |
| 260,000                   | 9,770                            | 10,000 | 10,240 | 10,490 | 10,750 | 11,020 | 11,290 | 11,570 | 11,860 |
| 250,000                   | 9,480                            | 9,700  | 9,940  | 10,180 | 10,440 | 10,690 | 10,950 | 11,220 | 11,510 |
| 240,000                   | 9,190                            | 9,410  | 9,630  | 9,870  | 10,110 | 10,360 | 10,620 | 10,880 | 11,150 |

**ANTI-SKID INOP - WET RUNWAY**

| AIRCRAFT<br>WEIGHT<br>LBS | AIRPORT PRESSURE ALTITUDE - FEET |        |        |        |        |        |        |        |        |
|---------------------------|----------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|
|                           | 0                                | 1,000  | 2,000  | 3,000  | 4,000  | 5,000  | 6,000  | 7,000  | 8,000  |
| 410,000                   | 17,120                           | 17,530 |        |        |        |        |        |        |        |
| 400,000                   | 16,520                           | 16,920 | 17,350 | 17,810 |        |        |        |        |        |
| 390,000                   | 15,940                           | 16,350 | 16,760 | 17,190 | 17,630 |        |        |        |        |
| 380,000                   | 15,390                           | 15,780 | 16,190 | 16,600 | 17,020 | 17,450 | 17,910 |        |        |
| 370,000                   | 14,900                           | 15,250 | 15,630 | 16,040 | 16,460 | 16,860 | 17,290 | 17,730 |        |
| 360,000                   | 14,450                           | 14,810 | 15,180 | 15,550 | 15,940 | 16,370 | 16,810 | 17,230 | 17,670 |
| 350,000                   | 14,070                           | 14,450 | 14,850 | 15,200 | 15,550 | 15,990 | 16,440 | 16,880 | 17,300 |
| 340,000                   | 13,750                           | 14,120 | 14,530 | 14,870 | 15,230 | 15,630 | 16,060 | 16,480 | 16,910 |
| 330,000                   | 13,460                           | 13,800 | 14,200 | 14,550 | 14,920 | 15,290 | 15,680 | 16,090 | 16,520 |
| 320,000                   | 13,180                           | 13,510 | 13,860 | 14,210 | 14,550 | 14,920 | 15,300 | 15,700 | 16,120 |
| 310,000                   | 12,870                           | 13,180 | 13,520 | 13,850 | 14,200 | 14,540 | 14,910 | 15,300 | 15,700 |
| 300,000                   | 12,540                           | 12,850 | 13,170 | 13,490 | 13,830 | 14,170 | 14,530 | 14,910 | 15,290 |
| 290,000                   | 12,220                           | 12,520 | 12,830 | 13,140 | 13,460 | 13,790 | 14,150 | 14,510 | 14,890 |
| 280,000                   | 11,900                           | 12,180 | 12,480 | 12,780 | 13,090 | 13,410 | 13,760 | 14,100 | 14,470 |
| 270,000                   | 11,560                           | 11,840 | 12,140 | 12,420 | 12,720 | 13,050 | 13,380 | 13,710 | 14,060 |
| 260,000                   | 11,240                           | 11,500 | 11,780 | 12,070 | 12,370 | 12,680 | 12,990 | 13,310 | 13,640 |
| 250,000                   | 10,910                           | 11,160 | 11,440 | 11,710 | 12,010 | 12,300 | 12,600 | 12,910 | 13,240 |
| 240,000                   | 10,570                           | 10,830 | 11,080 | 11,360 | 11,630 | 11,920 | 12,220 | 12,520 | 12,830 |

**CORRECTIONS:**

|                 |          |
|-----------------|----------|
| Headwind per kt | - 30 ft  |
| Tailwind per kt | + 280 ft |

**MEL SUPPORT****FAR LANDING DISTANCES (FACTORED)****ONE BRAKE DEACTIVATED – DRY RUNWAY****FLAPS 30**

| AIRCRAFT<br>WEIGHT<br>LBS | AIRPORT PRESSURE ALTITUDE - FEET |       |       |       |       |       |       |        |        |
|---------------------------|----------------------------------|-------|-------|-------|-------|-------|-------|--------|--------|
|                           | 0                                | 1,000 | 2,000 | 3,000 | 4,000 | 5,000 | 6,000 | 7,000  | 8,000  |
| 410,000                   | 8,480                            | 8,690 | 8,920 | 9,160 | 9,410 | 9,660 | 9,900 | 10,160 | 10,450 |
| 400,000                   | 8,110                            | 8,320 | 8,530 | 8,750 | 8,970 | 9,220 | 9,480 | 9,730  | 9,970  |
| 390,000                   | 7,740                            | 7,930 | 8,130 | 8,340 | 8,550 | 8,780 | 9,020 | 9,270  | 9,520  |
| 380,000                   | 7,390                            | 7,590 | 7,780 | 7,970 | 8,160 | 8,380 | 8,610 | 8,830  | 9,060  |
| 370,000                   | 7,120                            | 7,320 | 7,520 | 7,700 | 7,870 | 8,080 | 8,300 | 8,510  | 8,730  |
| 360,000                   | 6,900                            | 7,080 | 7,280 | 7,460 | 7,650 | 7,840 | 8,040 | 8,260  | 8,480  |
| 350,000                   | 6,660                            | 6,820 | 6,980 | 7,190 | 7,400 | 7,590 | 7,770 | 7,980  | 8,200  |
| 340,000                   | 6,380                            | 6,520 | 6,680 | 6,870 | 7,060 | 7,240 | 7,430 | 7,630  | 7,830  |
| 330,000                   | 6,130                            | 6,280 | 6,430 | 6,580 | 6,730 | 6,920 | 7,110 | 7,300  | 7,490  |
| 320,000                   | 5,920                            | 6,080 | 6,240 | 6,360 | 6,500 | 6,660 | 6,850 | 7,030  | 7,210  |
| 310,000                   | 5,760                            | 5,920 | 6,080 | 6,200 | 6,330 | 6,470 | 6,640 | 6,810  | 6,990  |
| 300,000                   | 5,610                            | 5,770 | 5,930 | 6,060 | 6,190 | 6,330 | 6,470 | 6,630  | 6,810  |
| 290,000                   | 5,480                            | 5,630 | 5,780 | 5,920 | 6,060 | 6,200 | 6,330 | 6,480  | 6,640  |
| 280,000                   | 5,340                            | 5,480 | 5,620 | 5,770 | 5,920 | 6,060 | 6,190 | 6,330  | 6,490  |
| 270,000                   | 5,180                            | 5,310 | 5,450 | 5,590 | 5,740 | 5,880 | 6,020 | 6,170  | 6,320  |
| 260,000                   | 5,010                            | 5,140 | 5,270 | 5,410 | 5,560 | 5,690 | 5,840 | 5,980  | 6,140  |
| 250,000                   | 4,850                            | 4,970 | 5,100 | 5,230 | 5,370 | 5,510 | 5,640 | 5,790  | 5,940  |
| 240,000                   | 4,700                            | 4,810 | 4,930 | 5,050 | 5,180 | 5,320 | 5,450 | 5,590  | 5,740  |

**ONE BRAKE DEACTIVATED - WET RUNWAY**

| AIRCRAFT<br>WEIGHT<br>LBS | AIRPORT PRESSURE ALTITUDE - FEET |        |        |        |        |        |        |        |        |
|---------------------------|----------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|
|                           | 0                                | 1,000  | 2,000  | 3,000  | 4,000  | 5,000  | 6,000  | 7,000  | 8,000  |
| 410,000                   | 9,760                            | 10,000 | 10,260 | 10,540 | 10,830 | 11,110 | 11,390 | 11,690 | 12,020 |
| 400,000                   | 9,330                            | 9,570  | 9,810  | 10,070 | 10,320 | 10,610 | 10,910 | 11,190 | 11,470 |
| 390,000                   | 8,910                            | 9,120  | 9,350  | 9,600  | 9,840  | 10,100 | 10,380 | 10,670 | 10,950 |
| 380,000                   | 8,500                            | 8,730  | 8,950  | 9,170  | 9,390  | 9,640  | 9,910  | 10,160 | 10,420 |
| 370,000                   | 8,190                            | 8,420  | 8,650  | 8,860  | 9,060  | 9,300  | 9,550  | 9,790  | 10,040 |
| 360,000                   | 7,940                            | 8,150  | 8,380  | 8,580  | 8,800  | 9,020  | 9,250  | 9,500  | 9,760  |
| 350,000                   | 7,660                            | 7,850  | 8,030  | 8,270  | 8,510  | 8,730  | 8,940  | 9,180  | 9,430  |
| 340,000                   | 7,340                            | 7,500  | 7,690  | 7,910  | 8,120  | 8,330  | 8,550  | 8,780  | 9,010  |
| 330,000                   | 7,050                            | 7,230  | 7,400  | 7,570  | 7,740  | 7,960  | 8,180  | 8,400  | 8,620  |
| 320,000                   | 6,810                            | 7,000  | 7,180  | 7,320  | 7,480  | 7,660  | 7,880  | 8,090  | 8,300  |
| 310,000                   | 6,630                            | 6,810  | 7,000  | 7,130  | 7,280  | 7,450  | 7,640  | 7,840  | 8,040  |
| 300,000                   | 6,460                            | 6,640  | 6,820  | 6,970  | 7,120  | 7,280  | 7,450  | 7,630  | 7,840  |
| 290,000                   | 6,310                            | 6,480  | 6,650  | 6,810  | 6,970  | 7,130  | 7,280  | 7,460  | 7,640  |
| 280,000                   | 6,150                            | 6,310  | 6,470  | 6,640  | 6,810  | 6,970  | 7,120  | 7,280  | 7,470  |
| 270,000                   | 5,960                            | 6,110  | 6,270  | 6,430  | 6,610  | 6,770  | 6,930  | 7,100  | 7,270  |
| 260,000                   | 5,770                            | 5,920  | 6,070  | 6,230  | 6,400  | 6,550  | 6,720  | 6,880  | 7,070  |
| 250,000                   | 5,580                            | 5,720  | 5,870  | 6,020  | 6,180  | 6,340  | 6,490  | 6,660  | 6,840  |
| 240,000                   | 5,410                            | 5,540  | 5,670  | 5,810  | 5,960  | 6,120  | 6,270  | 6,430  | 6,610  |

**CORRECTIONS:**

|                 |          |
|-----------------|----------|
| Headwind per kt | - 20 ft  |
| Tailwind per kt | + 140 ft |

## MEL SUPPORT

### FAR LANDING DISTANCES (FACTORED)

**AUTO SPOILERS INOP – DRY RUNWAY**
**FLAPS 30**

| AIRCRAFT<br>WEIGHT<br>LBS | AIRPORT PRESSURE ALTITUDE - FEET |       |        |        |        |        |        |        |        |
|---------------------------|----------------------------------|-------|--------|--------|--------|--------|--------|--------|--------|
|                           | 0                                | 1,000 | 2,000  | 3,000  | 4,000  | 5,000  | 6,000  | 7,000  | 8,000  |
| 410,000                   | 9,650                            | 9,960 | 10,320 | 10,570 | 10,800 | 11,040 | 11,290 | 11,620 | 11,970 |
| 400,000                   | 9,300                            | 9,580 | 9,900  | 10,150 | 10,390 | 10,620 | 10,880 | 11,190 | 11,520 |
| 390,000                   | 8,950                            | 9,210 | 9,500  | 9,740  | 9,980  | 10,210 | 10,470 | 10,770 | 11,070 |
| 380,000                   | 8,610                            | 8,850 | 9,110  | 9,340  | 9,580  | 9,810  | 10,060 | 10,350 | 10,640 |
| 370,000                   | 8,270                            | 8,490 | 8,730  | 8,950  | 9,180  | 9,410  | 9,660  | 9,930  | 10,200 |
| 360,000                   | 7,930                            | 8,140 | 8,350  | 8,570  | 8,790  | 9,020  | 9,260  | 9,510  | 9,770  |
| 350,000                   | 7,600                            | 7,790 | 7,990  | 8,200  | 8,410  | 8,630  | 8,860  | 9,100  | 9,340  |
| 340,000                   | 7,260                            | 7,440 | 7,640  | 7,830  | 8,030  | 8,250  | 8,470  | 8,690  | 8,920  |
| 330,000                   | 6,920                            | 7,100 | 7,280  | 7,460  | 7,650  | 7,860  | 8,070  | 8,280  | 8,490  |
| 320,000                   | 6,630                            | 6,800 | 6,990  | 7,150  | 7,330  | 7,520  | 7,730  | 7,920  | 8,130  |
| 310,000                   | 6,410                            | 6,580 | 6,770  | 6,930  | 7,090  | 7,280  | 7,470  | 7,670  | 7,870  |
| 300,000                   | 6,220                            | 6,370 | 6,530  | 6,700  | 6,890  | 7,060  | 7,240  | 7,440  | 7,640  |
| 290,000                   | 6,000                            | 6,130 | 6,260  | 6,440  | 6,630  | 6,790  | 6,960  | 7,150  | 7,350  |
| 280,000                   | 5,730                            | 5,870 | 6,010  | 6,160  | 6,320  | 6,480  | 6,650  | 6,820  | 7,000  |
| 270,000                   | 5,510                            | 5,660 | 5,810  | 5,930  | 6,060  | 6,220  | 6,380  | 6,550  | 6,710  |
| 260,000                   | 5,340                            | 5,490 | 5,630  | 5,750  | 5,880  | 6,020  | 6,180  | 6,330  | 6,490  |
| 250,000                   | 5,200                            | 5,350 | 5,490  | 5,610  | 5,730  | 5,870  | 6,010  | 6,160  | 6,310  |
| 240,000                   | 5,080                            | 5,220 | 5,350  | 5,480  | 5,610  | 5,740  | 5,870  | 6,010  | 6,160  |

**AUTO SPOILERS INOP - WET RUNWAY**

| AIRCRAFT<br>WEIGHT<br>LBS | AIRPORT PRESSURE ALTITUDE - FEET |        |        |        |        |        |        |        |        |
|---------------------------|----------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|
|                           | 0                                | 1,000  | 2,000  | 3,000  | 4,000  | 5,000  | 6,000  | 7,000  | 8,000  |
| 410,000                   | 11,100                           | 11,460 | 11,870 | 12,160 | 12,420 | 12,700 | 12,990 | 13,370 | 13,770 |
| 400,000                   | 10,700                           | 11,020 | 11,390 | 11,680 | 11,950 | 12,220 | 12,520 | 12,870 | 13,250 |
| 390,000                   | 10,300                           | 10,600 | 10,930 | 11,210 | 11,480 | 11,750 | 12,050 | 12,390 | 12,740 |
| 380,000                   | 9,910                            | 10,180 | 10,480 | 10,750 | 11,020 | 11,290 | 11,570 | 11,910 | 12,240 |
| 370,000                   | 9,520                            | 9,770  | 10,040 | 10,300 | 10,560 | 10,830 | 11,110 | 11,420 | 11,730 |
| 360,000                   | 9,120                            | 9,370  | 9,610  | 9,860  | 10,110 | 10,380 | 10,650 | 10,940 | 11,240 |
| 350,000                   | 8,740                            | 8,960  | 9,190  | 9,430  | 9,680  | 9,930  | 10,190 | 10,470 | 10,750 |
| 340,000                   | 8,350                            | 8,560  | 8,790  | 9,010  | 9,240  | 9,490  | 9,750  | 10,000 | 10,260 |
| 330,000                   | 7,960                            | 8,170  | 8,380  | 8,580  | 8,800  | 9,040  | 9,290  | 9,530  | 9,770  |
| 320,000                   | 7,630                            | 7,820  | 8,040  | 8,230  | 8,430  | 8,650  | 8,890  | 9,110  | 9,350  |
| 310,000                   | 7,380                            | 7,570  | 7,790  | 7,970  | 8,160  | 8,380  | 8,600  | 8,830  | 9,060  |
| 300,000                   | 7,160                            | 7,330  | 7,510  | 7,710  | 7,930  | 8,120  | 8,330  | 8,560  | 8,790  |
| 290,000                   | 6,900                            | 7,050  | 7,200  | 7,410  | 7,630  | 7,810  | 8,010  | 8,230  | 8,460  |
| 280,000                   | 6,590                            | 6,760  | 6,920  | 7,090  | 7,270  | 7,460  | 7,650  | 7,850  | 8,050  |
| 270,000                   | 6,340                            | 6,510  | 6,690  | 6,820  | 6,970  | 7,160  | 7,340  | 7,540  | 7,720  |
| 260,000                   | 6,150                            | 6,320  | 6,480  | 6,620  | 6,770  | 6,930  | 7,110  | 7,280  | 7,470  |
| 250,000                   | 5,980                            | 6,160  | 6,320  | 6,460  | 6,590  | 6,760  | 6,920  | 7,090  | 7,260  |
| 240,000                   | 5,850                            | 6,010  | 6,160  | 6,310  | 6,460  | 6,610  | 6,760  | 6,920  | 7,090  |

**CORRECTIONS:**

|                 |          |
|-----------------|----------|
| Headwind per kt | - 20 ft  |
| Tailwind per kt | + 140 ft |

*End of Section*

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## AUTHORIZATION AND FLIGHT PLANNING

Authorization, procedures, and applicability of data for ferry operations are described the Flight Operations Manual (Chapters 9 and 35) and the Technical Operations Policies and Procedures Manual (TOPP chapter 40-60-05). Procedures outlined in those manuals must be strictly adhered to.

Ferry operational data is available for the following configurations:

- Winglet(s) Removed
- Landing Gear Extended

The following method should be used for ferry flight planning and certain revenue flight planning (as noted) and operations:

1. Obtain a normal aircraft configuration (computerized or manual) unfilled flight plan using Long Range Cruise (LRC) at the proposed cruise altitude. (The following FERRY pages contain recommended cruise altitude under the Flight Planning heading.)

NOTE: If a computerized flight plan is available for the aircraft configuration, the computerized flight plan should be used in lieu of FERRY data. Data contained in this section is conservative compared to the optimized data contained in the computerized flight plan.

2. Calculate the trip time and fuel load based on the values in the flight plan by multiplying the time and fuel values obtained in Step 1 by the factors listed under the appropriate ferry configuration. Enter this data either in the Dispatcher Remarks section of the Computerized Flight Plan.
3. Add remarks containing the ferry speed, speed limit, altitude limit, total time, leg times if appropriate, and engine-out altitude capability.

Note: Suggested cruise altitudes are for reference, and reasonable adjustments may be made to accommodate ATC and direction of flight.

4. Assure adequate terrain clearance by referring to the One Engine Inoperative Altitude Capability table, if applicable (see ferry configuration page, Enroute heading).
5. Adjust the a) Runway Allowable Weight  
b) Climb Limit Takeoff Weight  
c) Landing Climb Limit Weight  
as follows:

From the appropriate ferry configuration page, subtract the weight decrements indicated under the Takeoff and Landing headings, from the NORMAL Thrust takeoff weights and the Landing Climb weight, respectively, obtained from the ARM (Airport Section).

The following limitations should be applied to all ferry flights:

1. Do not combine both ferry configurations.
2. All ferry flight takeoffs will be done at full (TO) thrust (TMC TO) and climb out will be made at Maximum Climb thrust (TMC CLB) unless otherwise specified on ferry configuration data page.
3. Observe additional limitations and restrictions as listed for each ferry configuration on the following data pages.

## WINGLET REMOVAL

Use the following conditions and factors for one winglet or both winglets removed.

### Restrictions:

- Airplane must be flown during daytime hours since the positions and anti-collision lights on the removed winglet(s) will be missing.
- Approval to ferry must be obtained through local regulating authorities.
- Ballast weight(s), if part of the winglet installation, shall remain in place.  
**Note:** Ballast weight(s) are installed in the wing leading edge(s). Disassembly of the wing leading edge(s) is not required for ferry flight without winglets(s).
- Maximum airspeed is 250 KIAS or 0.65 Mach whichever is lower.
- Avoid turbulence. Avoid abrupt control inputs.
- Additional requirements for Ferry Flight with One Winglet:
  - Avoid icing conditions.
  - Maximum crosswind at takeoff and landing.

### Configuration combinations of winglet and wing extension installation.

| 767-300ER Winglet and Wing Extension Component Removal Matrix * |            |                                        |
|-----------------------------------------------------------------|------------|----------------------------------------|
| LH Winglet                                                      | RH Winglet | Configuration Status                   |
|                                                                 |            | STC Baseline: All Components Installed |
| Removed                                                         |            | Ferry Allowed                          |
|                                                                 | Removed    | Ferry Allowed                          |
| Removed                                                         | Removed    | Ferry Allowed                          |

### Ferry flights are allowed for the indicated configurations:

- A winglet is removed from one wing and a winglet is installed on the other wing.
- Both winglets and both wing extensions are removed.

## WINGLET REMOVAL

### FLIGHT PLANNING

Increase trip fuel by 20%

Reduce all climb performance limited weights, i.e., takeoff climb and obstacle clearance, enroute climb, approach climb, and landing climb weight limits by 35,000 pounds

### TAKEOFF

Maximum crosswind (one winglet): 15 knots.

RATOW & Climb limit weight: Reduce by 35,000 lbs

### ENROUTE

Trim with rudder if/as required during cruise flight so the autopilot can be used.

Max Climb Speed: Lower of 250 KIAS or 0.65 Mach

Maximum Cruise Altitude: Normal

Max Cruise Speed: Lower of 250 KIAS or 0.65 Mach

Climb limit weight: Reduce by 35,000 lbs

### LANDING

Cat. I landing approaches only.

Maximum crosswind (one winglet): 15 knots.

Landing Speed restrictions: No additional restrictions

Flap Setting Restrictions: No additional restrictions

Approach & Landing Climb Limit Weights: Reduce by 35,000 lbs

## LANDING GEAR EXTENDED

### LIMITATIONS:

Refer to "Landing Gear Extended Revenue Operations" in the Abnormal section of the ODM for a list of operational limitations.

### FLIGHT PLANNING

Fuel Required / Trip Time (1,000 lb / hours):

| PRESSURE<br>ALTITUDE - FEET | RANGE – NAUTICAL GROUND MILES |             |             |             |
|-----------------------------|-------------------------------|-------------|-------------|-------------|
|                             | 400                           | 800         | 1,200       | 1,600       |
| 8,000                       | 23.0 / 1.80                   | 46.0 / 3.40 | 70.0 / 4.95 | 95.0 / 6.50 |
| 12,000                      | 21.0 / 1.65                   | 43.0 / 3.25 | 65.0 / 4.75 | 88.5 / 6.20 |
| 16,000                      | 20.5 / 1.60                   | 40.5 / 3.10 | 61.0 / 4.50 | 83.0 / 5.90 |
| 20,000                      | 19.5 / 1.55                   | 38.0 / 2.95 | 58.0 / 4.30 | 78.5 / 5.60 |
| 24,000                      | 18.8 / 1.50                   | 37.0 / 2.80 | 55.5 / 4.10 | 75.0 / 5.30 |
| 28,000 and Above            | 18.5 / 1.45                   | 35.5 / 2.70 | 53.5 / 3.85 | 72.5 / 5.05 |

**NOTE:** Based on Long Range Cruise, VREF30 + 70 climb/descent, standard day conditions, zero winds.

### TAKEOFF

RATOW & Takeoff climb limit weight:

Use GRD TPI in AWABS

Takeoff V Speeds:

Use GRD TPI in AWABS

Takeoff Thrust Settings:

Use NORMAL only, ALTERNATE thrust NOT approved.

Takeoff Flap Settings:

Flaps 5 only.

Operation from Contaminated Runway:

DRY and WET runways only. No cluttered or icy runways allowed. Use GRD TPI.

## LANDING GEAR EXTENDED (cont.)

### ENROUTE

Long Range Cruise Table – All Engine

| GROSS WEIGHT - 1000 LB | PRESSURE ALTITUDE - 1,000 FEET<br>CRUISE SPEED - KIAS<br>%N1<br>FUEL FLOW / ENGINE - LB/HR |                      |                      |                       |                       |                       |                      |                      |                      |                      |                      |                      |
|------------------------|--------------------------------------------------------------------------------------------|----------------------|----------------------|-----------------------|-----------------------|-----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
|                        | 10                                                                                         | 15                   | 17                   | 19                    | 21                    | 23                    | 25                   | 27                   | 29                   | 31                   | 33                   | 35                   |
| 420,000                | 262<br>91.7<br>10536                                                                       | 261<br>96.1<br>10684 | 261<br>98.2<br>10829 | 260<br>100.3<br>10981 |                       |                       |                      |                      |                      |                      |                      |                      |
| 400,000                | 256<br>90.2<br>9983                                                                        | 255<br>94.6<br>10090 | 255<br>96.5<br>10194 | 254<br>98.6<br>10333  | 254<br>100.9<br>10508 |                       |                      |                      |                      |                      |                      |                      |
| 380,000                | 250<br>88.8<br>9452                                                                        | 249<br>93.0<br>9516  | 249<br>94.9<br>9578  | 249<br>96.9<br>9704   | 248<br>99.0<br>9835   | 247<br>101.6<br>10042 |                      |                      |                      |                      |                      |                      |
| 360,000                | 244<br>87.3<br>8927                                                                        | 243<br>91.4<br>8956  | 242<br>93.2<br>8996  | 242<br>95.1<br>9073   | 242<br>97.1<br>9201   | 241<br>99.42<br>9336  | 241<br>102.3<br>9566 |                      |                      |                      |                      |                      |
| 340,000                | 237<br>85.6<br>8407                                                                        | 236<br>89.7<br>8397  | 236<br>91.5<br>8436  | 236<br>93.3<br>8481   | 236<br>95.3<br>8577   | 235<br>97.4<br>8692   | 234<br>99.8<br>8853  | 233<br>103.0<br>9071 |                      |                      |                      |                      |
| 320,000                | 231<br>83.9<br>7885                                                                        | 230<br>88.0<br>7861  | 229<br>89.7<br>7880  | 229<br>91.4<br>7914   | 229<br>93.3<br>7967   | 229<br>95.4<br>8075   | 228<br>97.5<br>8179  | 228<br>100.2<br>8365 | 226<br>103.7<br>8564 |                      |                      |                      |
| 300,000                | 224<br>82.1<br>7380                                                                        | 223<br>86.2<br>7342  | 222<br>87.8<br>7338  | 222<br>89.6<br>7363   | 222<br>91.3<br>7395   | 222<br>93.2<br>7455   | 222<br>95.3<br>7562  | 221<br>97.6<br>7668  | 220<br>100.5<br>7863 |                      |                      |                      |
| 280,000                | 218<br>80.4<br>6918                                                                        | 216<br>84.3<br>6829  | 216<br>85.9<br>6820  | 215<br>87.5<br>6818   | 215<br>89.3<br>6845   | 215<br>91.1<br>6878   | 214<br>93.1<br>6945  | 214<br>95.2<br>7041  | 213<br>97.6<br>7159  | 213<br>100.8<br>7348 |                      |                      |
| 260,000                | 210<br>78.2<br>6445                                                                        | 208<br>82.1<br>6314  | 208<br>83.9<br>6310  | 208<br>85.5<br>6301   | 207<br>87.2<br>6300   | 207<br>89.0<br>6329   | 207<br>90.8<br>6361  | 207<br>92.8<br>6432  | 206<br>95.0<br>6522  | 206<br>97.5<br>6654  | 205<br>100.9<br>6817 |                      |
| 240,000                | 202<br>75.8<br>5948                                                                        | 201<br>80.0<br>5828  | 200<br>81.6<br>5798  | 200<br>83.4<br>5794   | 200<br>85.0<br>5785   | 199<br>86.7<br>5785   | 199<br>88.5<br>5813  | 199<br>90.4<br>5843  | 199<br>92.4<br>5914  | 198<br>94.6<br>6005  | 198<br>97.3<br>6136  | 196<br>100.9<br>6293 |
| 220,000                | 194<br>73.4<br>5476                                                                        | 194<br>77.7<br>5380  | 193<br>79.3<br>5316  | 192<br>80.9<br>5286   | 192<br>82.6<br>5280   | 192<br>84.3<br>5272   | 191<br>86.0<br>5272  | 191<br>87.8<br>5296  | 191<br>89.7<br>5325  | 191<br>91.8<br>5397  | 190<br>94.0<br>5486  | 190<br>96.8<br>5613  |

Refer to "Landing Gear Extended Revenue Operations" in the Abnormal section of the ODM for driftdown performance and One Engine Inoperative Long Range Cruise speeds, N1 settings, and altitude capability.

## LANDING GEAR EXTENDED (cont.)

### LANDING

Landing Speed restrictions:

No additional restrictions

Flap Setting Restrictions:

No additional restrictions

Approach & Landing climb limit weights:

Use GRD LPI data if available, otherwise reduce standard landing climb limit by 105,000 lbs

### HOLDING SPEED / THRUST (KIAS / %N1)

| WEIGHT -<br>POUNDS | ALTITUDE - FEET |            |
|--------------------|-----------------|------------|
|                    | 10,000          | 15,000     |
| 420,000            | 249 / 90.2      | 249 / 94.7 |
| 400,000            | 242 / 88.6      | 242 / 93.0 |
| 380,000            | 236 / 87.1      | 236 / 91.4 |
| 360,000            | 229 / 85.4      | 229 / 89.7 |
| 340,000            | 221 / 83.5      | 221 / 87.8 |
| 320,000            | 215 / 81.8      | 215 / 86.1 |
| 300,000            | 210 / 80.2      | 210 / 84.4 |
| 280,000            | 205 / 78.3      | 205 / 82.6 |
| 260,000            | 200 / 76.4      | 200 / 80.8 |
| 240,000            | 194 / 74.4      | 194 / 79.0 |
| 220,000            | 189 / 72.5      | 189 / 76.8 |

*End of Section*

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## ETOPS PERFORMANCE PROCEDURES

This section provides performance data for use in the event of an ETOPS enroute diversion and for flight planning to assure availability of engine-out terrain clearance and ETOPS fuel requirements. The performance levels in this section are based upon the following thrust setting and speed criteria:

1. Maximum Continuous Thrust.
2. Mach 0.78/290 KIAS driftdown speeds.
3. 290 KIAS engine-out cruise speed.

In the event of pressurization loss in addition to or independent of an engine shutdown, cruise at 290 KIAS (engine-out) or LRC (all-engines) following emergency descent to 10,000 feet or to 14,000 feet over terrain - critical areas of Greenland. Refer to the Airway Manual and QRH for driftdown and emergency descent procedures.

Refer to ABNORMAL Section for one engine operating LRC data.

## FLIGHT PLANNING CONSIDERATIONS

Flight Planning data provided in ETOPS CRITICAL FUEL RESERVES reflects the analysis used by Flight Control to assure availability of required ETOPS fuel reserves. Critical Fuel Reserves are shown on the flight plan as "ETP Diversion Fuel" and are provided for both icing conditions and non-icing conditions.. The ETOPS Critical Fuel Reserves are based upon the greater of engine-out or all-engines fuel consumption and reflect the following flight profile:

- Pressurization Inoperative
- Emergency descent to 10,000 feet
- Cruise at 10,000 feet/290 KIAS (engine-out) or LRC (all engines)
- 250 KIAS descent to 1,500 feet
- Missed approach, approach and land
- 5000 lb. of hold fuel(approximately double AC120-42 requirement)
- 5% fuel added for wind errors

- APU operating
- 5% fuel added for weather avoidance (180 minute ETOPS)

For icing conditions, eighteen percent additional fuel is added to account for both engine and wing anti-ice and ice accumulation on unheated surfaces. The normal mode of transatlantic operation assumes icing conditions. The flight planning system applies appropriate adjustment to these Reserves to account for performance deterioration of each specific ship number. These adjustments are updated weekly based upon Delta's aircraft/engine trend monitoring system.

Use of these procedures and Critical Fuel Reserves allows the following ETOPS Area of Operation (still air operating radius):

120 minutes - 808 NM  
180 minutes - 1207 NM



## CRITICAL FUEL RESERVES

ANTI-ICE NOT REQUIRED

ISA + 10°C &amp; BELOW

ANTI-ICE OFF

| INITIAL<br>GROSS WT<br>(1,000 LB) | CRITICAL FUEL RESERVES – 1,000 LB |      |      |      |      |      |      |      |       |       |       |       |
|-----------------------------------|-----------------------------------|------|------|------|------|------|------|------|-------|-------|-------|-------|
|                                   | DISTANCE TO ALTERNATE - NAM       |      |      |      |      |      |      |      |       |       |       |       |
|                                   | 400                               | 500  | 600  | 700  | 800  | 808  | 809* | 900  | 1,000 | 1,100 | 1,200 | 1,300 |
| 400                               | 20.2                              | 24.1 | 27.8 | 31.3 | 35.1 | 35.4 | 36.9 | 40.7 | 44.5  | 48.3  | 52.1  | 56.0  |
| 390                               | 20.0                              | 23.8 | 27.4 | 31.0 | 34.7 | 35.0 | 36.5 | 40.1 | 43.9  | 47.6  | 51.4  | 55.2  |
| 380                               | 19.7                              | 23.5 | 27.1 | 30.6 | 34.2 | 34.6 | 36.0 | 39.5 | 43.3  | 47.0  | 50.7  | 54.3  |
| 370                               | 19.5                              | 23.2 | 26.7 | 30.3 | 33.8 | 34.1 | 35.5 | 39.1 | 42.7  | 46.3  | 49.9  | 53.5  |
| 360                               | 19.2                              | 22.9 | 26.4 | 29.9 | 33.4 | 33.7 | 35.1 | 38.4 | 42.1  | 45.6  | 49.2  | 52.7  |
| 350                               | 19.0                              | 22.6 | 26.0 | 29.6 | 32.9 | 33.2 | 34.6 | 37.8 | 41.5  | 44.9  | 48.4  | 51.9  |
| 340                               | 18.8                              | 22.3 | 25.7 | 29.2 | 32.5 | 32.8 | 34.2 | 37.4 | 40.9  | 44.4  | 47.8  | 51.3  |
| 330                               | 18.6                              | 22.1 | 25.4 | 28.8 | 32.1 | 32.4 | 33.7 | 37.0 | 40.4  | 43.8  | 47.2  | 50.6  |
| 320                               | 18.5                              | 21.8 | 25.0 | 28.5 | 31.7 | 32.0 | 33.3 | 36.5 | 39.9  | 43.2  | 46.6  | 49.9  |
| 310                               | 18.3                              | 21.6 | 24.7 | 28.1 | 31.3 | 31.6 | 32.9 | 36.1 | 39.4  | 42.7  | 46.0  | 49.2  |
| 300                               | 18.1                              | 21.3 | 24.4 | 27.7 | 30.9 | 31.1 | 32.4 | 35.6 | 38.9  | 42.1  | 45.3  | 48.5  |
| 290                               | 18.0                              | 21.2 | 24.2 | 27.5 | 30.6 | 30.9 | 32.2 | 35.3 | 38.5  | 41.7  | 44.9  | 48.1  |
| 280                               | 17.8                              | 21.1 | 24.1 | 27.4 | 30.4 | 30.7 | 32.0 | 35.0 | 38.2  | 41.3  | 44.5  | 47.7  |
| 270                               | 17.7                              | 21.0 | 24.0 | 27.2 | 30.2 | 30.5 | 31.7 | 34.7 | 37.8  | 40.9  | 44.1  | 47.3  |
| 260                               | 17.6                              | 20.9 | 23.9 | 27.0 | 30.0 | 30.3 | 31.5 | 34.4 | 37.4  | 40.5  | 43.7  | 46.9  |

### NOTES

1. Based upon the greater of fuel burn for one-engine inoperative or for all-engines operating using the following flight profile:
  - a. Emergency descent to 10,000 ft.
  - b. Cruise @ 10,000 ft @ 290 KIAS.
  - c. 250 KIAS descent to landing.
  - d. 5,000 lb. hold fuel.
  - e. Missed approach, approach and land.
  - f. APU Operating.
2. Includes the following fuel allowances:
  - a. 5% for wind forecast errors.
  - \* b. **5% for weather avoidance (180 minute ETOPS).**
3. This data reflects ETOPS data used by FLIGHT CONTROL for ETP Diversion Fuel analysis.
4. The flight planning system adjusts Critical Fuel Reserve data to account for individual ship number performance deterioration
5. Increase fuel burns by 0.5% per 10°C above ISA + 10°C.

## CRITICAL FUEL RESERVES

FORECAST ICING CONDITIONS  
ISA + 10°C & BELOW

**ENG & WING ANTI-ICE ON**

| INITIAL<br>GROSS WT<br>(1,000 LB) | CRITICAL FUEL RESERVES – 1,000 LB |      |      |      |      |      |      |      |       |       |       |       |
|-----------------------------------|-----------------------------------|------|------|------|------|------|------|------|-------|-------|-------|-------|
|                                   | DISTANCE TO ALTERNATE - NAM       |      |      |      |      |      |      |      |       |       |       |       |
|                                   | 400                               | 500  | 600  | 700  | 800  | 808  | 809* | 900  | 1,000 | 1,100 | 1,200 | 1,300 |
| 400                               | 22.9                              | 27.5 | 31.9 | 36.1 | 40.5 | 40.7 | 42.1 | 46.5 | 51.0  | 55.4  | 59.8  | 64.3  |
| 390                               | 22.7                              | 27.2 | 31.5 | 35.7 | 40.0 | 40.1 | 41.6 | 45.8 | 50.3  | 54.6  | 59.0  | 63.4  |
| 380                               | 22.4                              | 26.8 | 31.1 | 35.3 | 39.5 | 39.6 | 41.1 | 45.2 | 49.6  | 53.8  | 58.1  | 62.4  |
| 370                               | 22.1                              | 26.5 | 30.7 | 34.8 | 39.0 | 39.1 | 40.5 | 44.5 | 48.9  | 53.0  | 57.5  | 61.5  |
| 360                               | 21.8                              | 26.1 | 30.2 | 34.4 | 38.5 | 38.6 | 40.0 | 43.9 | 48.1  | 52.2  | 56.4  | 60.5  |
| 350                               | 21.5                              | 25.8 | 29.8 | 34.0 | 37.9 | 38.1 | 39.4 | 43.2 | 47.1  | 51.5  | 55.6  | 59.6  |
| 340                               | 21.3                              | 25.5 | 29.4 | 33.6 | 37.5 | 37.6 | 38.9 | 42.7 | 46.8  | 50.8  | 54.8  | 58.8  |
| 330                               | 21.1                              | 25.2 | 29.0 | 33.1 | 37.0 | 37.1 | 38.4 | 42.2 | 46.2  | 50.2  | 54.1  | 58.1  |
| 320                               | 20.9                              | 24.9 | 28.7 | 32.7 | 36.5 | 36.6 | 37.9 | 41.7 | 45.6  | 49.5  | 53.4  | 57.2  |
| 310                               | 20.7                              | 24.6 | 28.3 | 32.2 | 36.0 | 36.1 | 37.4 | 41.1 | 45.1  | 48.8  | 52.7  | 56.5  |
| 300                               | 20.5                              | 24.3 | 27.9 | 31.8 | 35.5 | 35.6 | 36.9 | 40.6 | 44.5  | 48.2  | 51.9  | 55.7  |
| 290                               | 20.3                              | 24.2 | 27.7 | 31.6 | 35.3 | 35.4 | 36.6 | 40.3 | 44.0  | 47.7  | 51.5  | 55.2  |
| 280                               | 20.2                              | 24.0 | 27.6 | 31.4 | 35.0 | 35.1 | 36.3 | 39.9 | 43.6  | 47.3  | 51.0  | 54.7  |
| 270                               | 20.0                              | 23.9 | 27.4 | 31.2 | 34.8 | 34.9 | 36.1 | 39.6 | 43.2  | 46.8  | 50.5  | 54.3  |
| 260                               | 19.8                              | 23.8 | 27.3 | 31.0 | 34.5 | 34.6 | 35.8 | 39.2 | 42.7  | 46.4  | 50.1  | 53.8  |

### NOTES:

1. Based upon the greater of fuel burn for one-engine inoperative or, all-engines operating using the following flight profile:
  - a. Emergency descent to 10,000 ft
  - b. Cruise @ 290 KIAS @ 10,000 ft.
  - c. 250 KIAS descent to landing.
  - d. 5,000 lb. hold fuel.
  - e. Missed approach, approach and land.
  - f. APU Operating .
2. Includes the following fuel allowances.
  - a. 5% for wind forecast errors.
  - \* b. **5% for weather avoidance (180 minute ETOPS).**
  - c. 18% for Engine/Wing Anti-Ice ON and ice accumulation.
3. This data reflects data used by FLIGHT CONTROL for ETP Diversion Fuel analysis.
4. The flight planning system adjusts this critical fuel data to account for individual ship number performance deterioration.
5. For ambient temperatures above ISA + 10°C, increase fuel required by 0.5% for each 10 °C above ISA + 10°C.

*End of Section*