

TAKE OFF V SPEED CHARTS:

FLAPS 1 TAKE OFF MODE: T/O-1

| PRESSURE ALTITUDE (ft) | | STATIC AIR TEMPERATURE (°C) | | | | | | | | | | | |
|------------------------|---|-----------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| SL | → | -40 to 38 | 39 to 48 | 49 to 50 | | | | | | | | | |
| 1000 | → | -40 to 36 | 37 to 47 | 48 to 48 | | | | | | | | | |
| 2000 | → | -40 to 33 | 34 to 44 | 45 to 46 | | | | | | | | | |
| 3000 | → | -40 to 28 | 29 to 42 | 43 to 44 | | | | | | | | | |
| 4000 | → | | -40 to 39 | 40 to 42 | | | | | | | | | |
| 5000 | → | | -40 to 35 | 36 to 40 | | | | | | | | | |
| 6000 | → | | -40 to 31 | 32 to 38 | | | | | | | | | |
| 7000 | → | | -40 to 26 | 27 to 32 | 33 to 36 | | | | | | | | |
| 8000 | → | | | -40 to 19 | 20 to 34 | | | | | | | | |
| | | ↓ | ↓ | ↓ | ↓ | | | | | | | | |
| WEIGHT (kg) | | V ₁ | V _R | V ₂ | V ₁ | V _R | V ₂ | V ₁ | V _R | V ₂ | V ₁ | V _R | V ₂ |
| 24000 | | 106 | 118 | 125 | 111 | 120 | 125 | 114 | 121 | 125 | 116 | 122 | 125 |
| 24500 | | 108 | 120 | 126 | 112 | 122 | 126 | 115 | 123 | 126 | 117 | 124 | 126 |
| 25000 | | 110 | 121 | 127 | 114 | 123 | 127 | 117 | 124 | 127 | 119 | 125 | 127 |
| 25500 | | 112 | 123 | 128 | 116 | 125 | 128 | 119 | 126 | 128 | 121 | 127 | 129 |
| 26000 | | 113 | 124 | 130 | 118 | 126 | 130 | 120 | 127 | 130 | 122 | 128 | 130 |
| 26500 | | 115 | 126 | 131 | 119 | 128 | 131 | 122 | 129 | 131 | 124 | 130 | 131 |
| 27000 | | 117 | 127 | 132 | 121 | 129 | 132 | 124 | 130 | 132 | 126 | 131 | 132 |
| 27500 | | 119 | 129 | 133 | 123 | 130 | 133 | 125 | 131 | 133 | 127 | 132 | 134 |
| 28000 | | 120 | 130 | 135 | 124 | 132 | 135 | 127 | 133 | 135 | 129 | 134 | 135 |
| 28500 | | 122 | 131 | 136 | 126 | 133 | 136 | 128 | 134 | 136 | 130 | 135 | 136 |
| 29000 | | 124 | 133 | 137 | 128 | 134 | 137 | 130 | 135 | 137 | 132 | 136 | 137 |
| 29500 | | 125 | 134 | 138 | 129 | 136 | 138 | 132 | 137 | 138 | 133 | 137 | 138 |
| 30000 | | 127 | 136 | 139 | 131 | 137 | 139 | 133 | 138 | 139 | 135 | 139 | 140 |
| 30500 | | 128 | 137 | 141 | 132 | 138 | 141 | 135 | 139 | 141 | 136 | 140 | 141 |
| 31000 | | 130 | 138 | 142 | 134 | 140 | 142 | 136 | 141 | 142 | 137 | 141 | 142 |
| 31500 | | 131 | 140 | 143 | 135 | 141 | 143 | 137 | 142 | 143 | 139 | 142 | 143 |
| 32000 | | 133 | 141 | 144 | 137 | 142 | 144 | 139 | 143 | 144 | 140 | 144 | 144 |
| 32500 | | 134 | 142 | 145 | 138 | 144 | 145 | 140 | 144 | 145 | 141 | 145 | 145 |
| 33000 | | 136 | 143 | 146 | 139 | 145 | 146 | 142 | 145 | 146 | 143 | 146 | 146 |
| 33500 | | 137 | 145 | 147 | 141 | 146 | 147 | 143 | 147 | 147 | 144 | 147 | 148 |
| 34000 | | 139 | 146 | 148 | 142 | 147 | 148 | 144 | 148 | 148 | 145 | 148 | 149 |
| 34500 | | 140 | 147 | 149 | 144 | 148 | 149 | 145 | 149 | 149 | 147 | 149 | 150 |
| 35000 | | 141 | 148 | 151 | 145 | 150 | 151 | 147 | 150 | 151 | 148 | 151 | 151 |
| 35500 | | 143 | 150 | 152 | 146 | 151 | 152 | 148 | 151 | 152 | 149 | 152 | 152 |
| 36000 | | 144 | 151 | 153 | 147 | 152 | 153 | 149 | 152 | 153 | 149 | 153 | 153 |
| 36500 | | 145 | 152 | 154 | 149 | 153 | 154 | 150 | 153 | 154 | 148 | 154 | 154 |
| 37000 | | 147 | 153 | 155 | 150 | 154 | 155 | 152 | 154 | 155 | 147 | 155 | 155 |
| 37500 | | 148 | 154 | 156 | 151 | 155 | 156 | 153 | 156 | 156 | 146 | 156 | 156 |

FLAPS 2 TAKE OFF MODE: T/O-1

| PRESSURE ALTITUDE (ft) | STATIC AIR TEMPERATURE (°C) | | | | | | | | | | | |
|------------------------------|-----------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| | | | | | | | | | | | | |
| SL → | -40 | to | 36 | 37 | to | 44 | 45 | to | 50 | | | |
| 1000 → | -40 | to | 36 | 37 | to | 43 | 44 | to | 48 | | | |
| 2000 → | -40 | to | 33 | 34 | to | 40 | 41 | to | 46 | | | |
| 3000 → | -40 | to | 28 | 29 | to | 37 | 38 | to | 44 | | | |
| 4000 → | | | | -40 | to | 34 | 35 | to | 42 | | | |
| 5000 → | | | | -40 | to | 30 | 31 | to | 40 | | | |
| 6000 → | | | | -40 | to | 25 | 26 | to | 37 | 38 | to | 38 |
| 7000 → | | | | | | | -40 | to | 33 | 34 | to | 36 |
| 8000 → | | | | | | | -40 | to | 29 | 30 | to | 34 |
| | ↓ | | | ↓ | | | ↓ | | | ↓ | | |
| WEIGHT (kg) | V ₁ | V _R | V ₂ | V ₁ | V _R | V ₂ | V ₁ | V _R | V ₂ | V ₁ | V _R | V ₂ |
| 24000 | 99 | 110 | 121 | 102 | 113 | 121 | 106 | 114 | 121 | 108 | 116 | 121 |
| 24500 | 100 | 112 | 122 | 104 | 114 | 122 | 107 | 116 | 122 | 110 | 117 | 122 |
| 25000 | 102 | 114 | 123 | 106 | 116 | 123 | 109 | 117 | 123 | 112 | 119 | 123 |
| 25500 | 104 | 115 | 124 | 108 | 117 | 124 | 111 | 119 | 124 | 114 | 120 | 124 |
| 26000 | 106 | 117 | 125 | 109 | 119 | 125 | 113 | 120 | 125 | 115 | 122 | 126 |
| 26500 | 107 | 118 | 127 | 111 | 120 | 127 | 114 | 122 | 127 | 117 | 123 | 127 |
| 27000 | 109 | 120 | 128 | 113 | 122 | 128 | 116 | 123 | 128 | 119 | 125 | 128 |
| 27500 | 111 | 121 | 129 | 114 | 123 | 129 | 117 | 125 | 129 | 120 | 126 | 129 |
| 28000 | 112 | 122 | 130 | 116 | 125 | 130 | 119 | 126 | 130 | 122 | 128 | 130 |
| 28500 | 114 | 124 | 131 | 118 | 126 | 131 | 121 | 128 | 131 | 123 | 129 | 131 |
| 29000 | 115 | 125 | 132 | 119 | 127 | 132 | 122 | 129 | 132 | 125 | 130 | 133 |
| 29500 | 117 | 127 | 134 | 121 | 129 | 134 | 124 | 130 | 134 | 127 | 132 | 134 |
| 30000 | 119 | 128 | 135 | 122 | 130 | 135 | 125 | 132 | 135 | 128 | 133 | 135 |
| 30500 | 120 | 130 | 136 | 124 | 132 | 136 | 127 | 133 | 136 | 130 | 134 | 136 |
| 31000 | 122 | 131 | 137 | 125 | 133 | 137 | 128 | 134 | 137 | 132 | 135 | 137 |
| 31500 | 123 | 132 | 138 | 127 | 134 | 138 | 130 | 135 | 138 | 133 | 137 | 138 |
| 32000 | 125 | 134 | 139 | 128 | 136 | 139 | 131 | 137 | 139 | 135 | 138 | 139 |
| 32500 | 126 | 135 | 140 | 130 | 137 | 140 | 133 | 138 | 140 | 136 | 139 | 140 |
| 33000 | 128 | 136 | 141 | 131 | 138 | 141 | 135 | 139 | 141 | 138 | 140 | 141 |
| 33500 | 129 | 138 | 142 | 133 | 139 | 142 | 136 | 140 | 142 | 139 | 142 | 143 |
| 34000 | 131 | 139 | 143 | 134 | 141 | 143 | 138 | 142 | 143 | 140 | 143 | 144 |
| 34500 | 132 | 140 | 144 | 136 | 142 | 144 | 139 | 143 | 144 | 142 | 144 | 145 |
| 35000 | 133 | 141 | 146 | 137 | 143 | 146 | 141 | 144 | 146 | 143 | 145 | 146 |
| 35500 | 135 | 143 | 147 | 138 | 144 | 147 | 142 | 145 | 147 | 144 | 146 | 147 |
| 36000 | 136 | 144 | 148 | 140 | 145 | 148 | 143 | 146 | 148 | 146 | 147 | 148 |
| 36500 | 137 | 145 | 149 | 141 | 146 | 149 | 145 | 147 | 149 | 147 | 149 | 149 |
| 37000 | 139 | 146 | 150 | 143 | 147 | 150 | 146 | 149 | 150 | 148 | 150 | 150 |
| 37500 | 140 | 147 | 151 | 144 | 149 | 151 | 147 | 150 | 151 | 149 | 151 | 151 |

FLAPS 4 TAKE OFF MODE: T/O-1

| PRESSURE ALTITUDE (ft) | STATIC AIR TEMPERATURE (°C) | | | | | | | | | | | |
|------------------------------|-----------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| | | | | | | | | | | | | |
| SL → | -40 | to | 32 | 33 | to | 40 | 41 | to | 48 | 49 | to | 50 |
| 1000 → | -40 | to | 29 | 30 | to | 40 | 41 | to | 47 | 48 | to | 48 |
| 2000 → | | | | -40 | to | 38 | 39 | to | 45 | 46 | to | 46 |
| 3000 → | | | | -40 | to | 34 | 35 | to | 43 | 44 | to | 44 |
| 4000 → | | | | -40 | to | 30 | 31 | to | 41 | 42 | to | 42 |
| 5000 → | | | | | | | -40 | to | 37 | 38 | to | 40 |
| 6000 → | | | | | | | -40 | to | 33 | 34 | to | 38 |
| 7000 → | | | | | | | -40 | to | 28 | 29 | to | 36 |
| 8000 → | | | | | | | -40 | to | 23 | 24 | to | 34 |
| | ↓ | | | ↓ | | | ↓ | | | ↓ | | |
| WEIGHT (kg) | V ₁ | V _R | V ₂ | V ₁ | V _R | V ₂ | V ₁ | V _R | V ₂ | V ₁ | V _R | V ₂ |
| 24000 | 92 | 98 | 110 | 89 | 94 | 104 | 92 | 96 | 104 | 95 | 98 | 104 |
| 24500 | 92 | 97 | 109 | 91 | 96 | 105 | 94 | 98 | 105 | 97 | 99 | 105 |
| 25000 | 92 | 97 | 107 | 92 | 97 | 106 | 96 | 99 | 106 | 98 | 101 | 106 |
| 25500 | 92 | 97 | 108 | 94 | 98 | 107 | 97 | 101 | 107 | 100 | 102 | 107 |
| 26000 | 93 | 98 | 108 | 95 | 100 | 108 | 99 | 102 | 108 | 102 | 104 | 108 |
| 26500 | 94 | 99 | 109 | 97 | 101 | 109 | 100 | 103 | 109 | 103 | 105 | 109 |
| 27000 | 96 | 101 | 110 | 98 | 103 | 110 | 102 | 105 | 110 | 105 | 106 | 110 |
| 27500 | 97 | 102 | 111 | 100 | 104 | 111 | 104 | 106 | 111 | 106 | 108 | 111 |
| 28000 | 99 | 104 | 112 | 101 | 105 | 112 | 105 | 107 | 112 | 108 | 109 | 112 |
| 28500 | 100 | 105 | 113 | 103 | 107 | 113 | 107 | 109 | 113 | 109 | 110 | 113 |
| 29000 | 102 | 106 | 114 | 104 | 108 | 114 | 108 | 110 | 114 | 110 | 111 | 114 |
| 29500 | 103 | 108 | 115 | 106 | 109 | 115 | 109 | 111 | 115 | 112 | 113 | 115 |
| 30000 | 105 | 109 | 116 | 107 | 111 | 116 | 111 | 113 | 116 | 113 | 114 | 116 |
| 30500 | 106 | 110 | 117 | 109 | 112 | 117 | 112 | 114 | 117 | 114 | 115 | 117 |
| 31000 | 108 | 111 | 118 | 110 | 113 | 118 | 114 | 115 | 118 | 116 | 116 | 118 |
| 31500 | 109 | 113 | 119 | 112 | 114 | 119 | 115 | 116 | 119 | 117 | 118 | 119 |
| 32000 | 111 | 114 | 120 | 113 | 116 | 120 | 116 | 117 | 120 | 118 | 119 | 120 |
| 32500 | 112 | 115 | 121 | 115 | 117 | 121 | 118 | 119 | 121 | 119 | 120 | 121 |
| 33000 | 113 | 116 | 122 | 116 | 118 | 122 | 119 | 120 | 122 | 121 | 121 | 122 |
| 33500 | 115 | 118 | 123 | 117 | 119 | 123 | 120 | 121 | 123 | 122 | 122 | 123 |
| 34000 | 116 | 119 | 124 | 118 | 120 | 124 | 121 | 122 | 124 | 123 | 123 | 124 |
| 34500 | 117 | 120 | 125 | 120 | 121 | 125 | 122 | 123 | 125 | 124 | 124 | 125 |
| 35000 | 119 | 121 | 125 | 121 | 123 | 125 | 124 | 124 | 125 | 125 | 126 | 126 |
| 35500 | 120 | 122 | 126 | 122 | 124 | 126 | 125 | 125 | 126 | 126 | 127 | 127 |
| 36000 | 121 | 123 | 127 | 123 | 125 | 127 | 126 | 126 | 127 | 127 | 128 | 128 |
| 36500 | 122 | 124 | 128 | 124 | 126 | 128 | 127 | 128 | 128 | 128 | 129 | 129 |
| 37000 | 123 | 125 | 129 | 125 | 127 | 129 | 128 | 129 | 129 | 129 | 130 | 130 |
| 37500 | 125 | 126 | 130 | 127 | 128 | 130 | 129 | 130 | 130 | 130 | 131 | 131 |

FLAPS 1 TAKE OFF MODE: T/O-2

| PRESSURE ALTITUDE (ft) | STATIC AIR TEMPERATURE (°C) | | | | | | | | | | | |
|------------------------------|-----------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| | | | | | | | | | | | | |
| SL → | -40 | to | 39 | 40 | to | 50 | | | | | | |
| 1000 → | -40 | to | 38 | 39 | to | 48 | | | | | | |
| 2000 → | -40 | to | 34 | 35 | to | 45 | 46 | to | 46 | | | |
| 3000 → | -40 | to | 29 | 30 | to | 41 | 42 | to | 44 | | | |
| 4000 → | | | | -40 | to | 36 | 37 | to | 42 | | | |
| 5000 → | | | | -40 | to | 31 | 32 | to | 40 | | | |
| 6000 → | | | | -40 | to | 27 | 28 | to | 38 | | | |
| 7000 → | | | | | | | -40 | to | 31 | 32 | to | 36 |
| 8000 → | | | | | | | -40 | to | 18 | 19 | to | 34 |
| | ↓ | | | ↓ | | | ↓ | | | ↓ | | |
| WEIGHT (kg) | V ₁ | V _R | V ₂ | V ₁ | V _R | V ₂ | V ₁ | V _R | V ₂ | V ₁ | V _R | V ₂ |
| 24000 | 109 | 119 | 125 | 112 | 121 | 125 | 116 | 122 | 125 | 118 | 123 | 125 |
| 24500 | 111 | 121 | 126 | 114 | 122 | 126 | 117 | 124 | 126 | 120 | 125 | 126 |
| 25000 | 113 | 122 | 127 | 116 | 124 | 127 | 119 | 125 | 127 | 122 | 126 | 127 |
| 25500 | 114 | 124 | 128 | 118 | 125 | 128 | 121 | 126 | 129 | 123 | 128 | 129 |
| 26000 | 116 | 125 | 130 | 119 | 127 | 130 | 122 | 128 | 130 | 125 | 129 | 130 |
| 26500 | 118 | 127 | 131 | 121 | 128 | 131 | 124 | 129 | 131 | 126 | 130 | 131 |
| 27000 | 120 | 128 | 132 | 123 | 130 | 132 | 125 | 131 | 132 | 128 | 132 | 132 |
| 27500 | 121 | 130 | 133 | 124 | 131 | 133 | 127 | 132 | 133 | 129 | 133 | 134 |
| 28000 | 123 | 131 | 135 | 126 | 132 | 135 | 129 | 133 | 135 | 131 | 134 | 135 |
| 28500 | 124 | 132 | 136 | 128 | 134 | 136 | 130 | 135 | 136 | 132 | 135 | 136 |
| 29000 | 126 | 134 | 137 | 129 | 135 | 137 | 132 | 136 | 137 | 134 | 137 | 137 |
| 29500 | 128 | 135 | 138 | 131 | 136 | 138 | 133 | 137 | 138 | 135 | 138 | 138 |
| 30000 | 129 | 137 | 139 | 132 | 138 | 139 | 135 | 139 | 139 | 137 | 139 | 140 |
| 30500 | 131 | 138 | 141 | 134 | 139 | 141 | 136 | 140 | 141 | 138 | 140 | 141 |
| 31000 | 132 | 139 | 142 | 135 | 140 | 142 | 137 | 141 | 142 | 139 | 142 | 142 |
| 31500 | 134 | 140 | 143 | 136 | 142 | 143 | 139 | 142 | 143 | 141 | 143 | 143 |
| 32000 | 135 | 142 | 144 | 138 | 143 | 144 | 140 | 143 | 144 | 142 | 144 | 144 |
| 32500 | 137 | 143 | 145 | 139 | 144 | 145 | 141 | 145 | 145 | 143 | 145 | 145 |
| 33000 | 138 | 144 | 146 | 141 | 145 | 146 | 143 | 146 | 146 | 144 | 146 | 146 |
| 33500 | 139 | 146 | 147 | 142 | 146 | 147 | 144 | 147 | 147 | 146 | 148 | 148 |
| 34000 | 141 | 147 | 148 | 143 | 148 | 148 | 145 | 148 | 148 | 147 | 149 | 149 |
| 34500 | 142 | 148 | 149 | 145 | 149 | 149 | 147 | 149 | 150 | 148 | 150 | 150 |
| 35000 | 144 | 149 | 151 | 146 | 150 | 151 | 148 | 150 | 151 | 149 | 151 | 151 |
| 35500 | 145 | 150 | 152 | 147 | 151 | 152 | 149 | 151 | 152 | 150 | 152 | 152 |
| 36000 | 146 | 151 | 153 | 148 | 152 | 153 | 150 | 153 | 153 | 150 | 153 | 153 |
| 36500 | 147 | 153 | 154 | 150 | 153 | 154 | 151 | 154 | 154 | 149 | 154 | 154 |
| 37000 | 149 | 154 | 155 | 151 | 154 | 155 | 153 | 155 | 155 | 148 | 155 | 155 |
| 37500 | 150 | 155 | 156 | 152 | 155 | 156 | 154 | 156 | 156 | 147 | 157 | 157 |

FLAPS 2 TAKE OFF MODE: T/O-2

| PRESSURE ALTITUDE (ft) | | STATIC AIR TEMPERATURE (°C) | | | | | | | | | | | |
|------------------------|---|-----------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| SL | → | -40 | to | 38 | 39 | to | 48 | 49 | to | 50 | | | |
| 1000 | → | -40 | to | 36 | 37 | to | 46 | 47 | to | 48 | | | |
| 2000 | → | -40 | to | 31 | 32 | to | 42 | 43 | to | 46 | | | |
| 3000 | → | | | | -40 | to | 37 | 38 | to | 44 | | | |
| 4000 | → | | | | -40 | to | 32 | 33 | to | 42 | | | |
| 5000 | → | | | | -40 | to | 27 | 28 | to | 38 | 39 | to | 40 |
| 6000 | → | | | | | | | -40 | to | 34 | 35 | to | 38 |
| 7000 | → | | | | | | | -40 | to | 29 | 30 | to | 36 |
| 8000 | → | | | | | | | -40 | to | 25 | 26 | to | 34 |
| | | ↓ | | | ↓ | | | ↓ | | | ↓ | | |
| WEIGHT (kg) | | V ₁ | V _R | V ₂ | V ₁ | V _R | V ₂ | V ₁ | V _R | V ₂ | V ₁ | V _R | V ₂ |
| 24000 | | 102 | 112 | 121 | 105 | 114 | 121 | 107 | 115 | 121 | 111 | 117 | 121 |
| 24500 | | 104 | 114 | 122 | 107 | 116 | 122 | 109 | 117 | 122 | 113 | 119 | 122 |
| 25000 | | 105 | 115 | 123 | 109 | 117 | 123 | 111 | 118 | 123 | 115 | 120 | 123 |
| 25500 | | 107 | 117 | 124 | 110 | 119 | 124 | 112 | 120 | 124 | 116 | 122 | 124 |
| 26000 | | 109 | 118 | 125 | 112 | 120 | 125 | 114 | 121 | 125 | 118 | 123 | 126 |
| 26500 | | 110 | 120 | 127 | 114 | 122 | 127 | 116 | 123 | 127 | 119 | 124 | 127 |
| 27000 | | 112 | 121 | 128 | 115 | 123 | 128 | 117 | 124 | 128 | 121 | 126 | 128 |
| 27500 | | 114 | 123 | 129 | 117 | 124 | 129 | 119 | 125 | 129 | 123 | 127 | 129 |
| 28000 | | 115 | 124 | 130 | 119 | 126 | 130 | 121 | 127 | 130 | 125 | 128 | 130 |
| 28500 | | 117 | 126 | 131 | 120 | 127 | 131 | 122 | 128 | 131 | 126 | 130 | 131 |
| 29000 | | 119 | 127 | 132 | 122 | 129 | 132 | 124 | 130 | 132 | 128 | 131 | 133 |
| 29500 | | 120 | 128 | 134 | 123 | 130 | 134 | 125 | 131 | 134 | 130 | 132 | 134 |
| 30000 | | 122 | 130 | 135 | 125 | 131 | 135 | 126 | 132 | 135 | 131 | 134 | 135 |
| 30500 | | 123 | 131 | 136 | 126 | 133 | 136 | 128 | 133 | 136 | 133 | 135 | 136 |
| 31000 | | 125 | 132 | 137 | 128 | 134 | 137 | 130 | 135 | 137 | 134 | 136 | 137 |
| 31500 | | 126 | 134 | 138 | 129 | 135 | 138 | 132 | 136 | 138 | 136 | 137 | 138 |
| 32000 | | 128 | 135 | 139 | 131 | 136 | 139 | 133 | 137 | 139 | 137 | 139 | 139 |
| 32500 | | 129 | 136 | 140 | 132 | 138 | 140 | 135 | 138 | 140 | 139 | 140 | 140 |
| 33000 | | 131 | 138 | 141 | 134 | 139 | 141 | 136 | 140 | 141 | 140 | 141 | 141 |
| 33500 | | 132 | 139 | 142 | 135 | 140 | 142 | 138 | 141 | 142 | 141 | 142 | 143 |
| 34000 | | 134 | 140 | 143 | 137 | 141 | 143 | 139 | 142 | 143 | 143 | 143 | 144 |
| 34500 | | 135 | 141 | 144 | 138 | 142 | 144 | 141 | 143 | 144 | 144 | 145 | 145 |
| 35000 | | 136 | 143 | 146 | 140 | 144 | 146 | 142 | 144 | 146 | 145 | 146 | 146 |
| 35500 | | 138 | 144 | 147 | 141 | 145 | 147 | 143 | 146 | 147 | 146 | 147 | 147 |
| 36000 | | 139 | 145 | 148 | 143 | 146 | 148 | 145 | 147 | 148 | 147 | 148 | 148 |
| 36500 | | 140 | 146 | 149 | 144 | 147 | 149 | 146 | 148 | 149 | 149 | 149 | 149 |
| 37000 | | 142 | 147 | 150 | 145 | 148 | 150 | 147 | 149 | 150 | 150 | 150 | 150 |
| 37500 | | 143 | 148 | 151 | 147 | 149 | 151 | 148 | 150 | 151 | 151 | 151 | 151 |

FLAPS 4 TAKE OFF MODE: T/O-2

| PRESSURE ALTITUDE (ft) | | STATIC AIR TEMPERATURE (°C) | | | | | | | | | | | |
|------------------------|---|-----------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| SL | → | -40 | to | 37 | 38 | to | 46 | 47 | to | 50 | | | |
| 1000 | → | -40 | to | 35 | 36 | to | 44 | 45 | to | 48 | | | |
| 2000 | → | -40 | to | 30 | 31 | to | 39 | 40 | to | 46 | | | |
| 3000 | → | | | | -40 | to | 35 | 36 | to | 44 | | | |
| 4000 | → | | | | -40 | to | 30 | 31 | to | 39 | 40 | to | 42 |
| 5000 | → | | | | | | | -40 | to | 35 | 36 | to | 40 |
| 6000 | → | | | | | | | -40 | to | 30 | 31 | to | 38 |
| 7000 | → | | | | | | | -40 | to | 26 | 27 | to | 36 |
| 8000 | → | | | | | | | -40 | to | 21 | 22 | to | 34 |
| | | ↓ | | | ↓ | | | ↓ | | | ↓ | | |
| WEIGHT (kg) | | V ₁ | V _R | V ₂ | V ₁ | V _R | V ₂ | V ₁ | V _R | V ₂ | V ₁ | V _R | V ₂ |
| 24000 | | 90 | 95 | 104 | 93 | 97 | 104 | 95 | 98 | 104 | 99 | 100 | 104 |
| 24500 | | 92 | 96 | 105 | 95 | 98 | 105 | 97 | 99 | 105 | 100 | 102 | 105 |
| 25000 | | 94 | 98 | 106 | 96 | 100 | 106 | 99 | 101 | 106 | 102 | 103 | 106 |
| 25500 | | 95 | 99 | 107 | 98 | 101 | 107 | 100 | 102 | 107 | 103 | 104 | 107 |
| 26000 | | 97 | 101 | 108 | 99 | 102 | 108 | 102 | 104 | 108 | 105 | 106 | 108 |
| 26500 | | 98 | 102 | 109 | 101 | 104 | 109 | 103 | 105 | 109 | 106 | 107 | 109 |
| 27000 | | 100 | 103 | 110 | 103 | 105 | 110 | 105 | 106 | 110 | 108 | 108 | 110 |
| 27500 | | 101 | 105 | 111 | 104 | 106 | 111 | 106 | 108 | 111 | 109 | 110 | 111 |
| 28000 | | 103 | 106 | 112 | 106 | 108 | 112 | 108 | 109 | 112 | 110 | 111 | 112 |
| 28500 | | 104 | 107 | 113 | 107 | 109 | 113 | 109 | 110 | 113 | 112 | 112 | 113 |
| 29000 | | 106 | 109 | 114 | 109 | 110 | 114 | 111 | 112 | 114 | 113 | 113 | 114 |
| 29500 | | 107 | 110 | 115 | 110 | 112 | 115 | 112 | 113 | 115 | 114 | 115 | 115 |
| 30000 | | 109 | 111 | 116 | 111 | 113 | 116 | 113 | 114 | 116 | 116 | 116 | 116 |
| 30500 | | 110 | 112 | 117 | 113 | 114 | 117 | 115 | 115 | 117 | 117 | 117 | 117 |
| 31000 | | 112 | 114 | 118 | 114 | 115 | 118 | 116 | 116 | 118 | 118 | 118 | 118 |
| 31500 | | 113 | 115 | 119 | 115 | 116 | 119 | 117 | 118 | 119 | 119 | 119 | 119 |
| 32000 | | 114 | 116 | 120 | 117 | 118 | 120 | 118 | 119 | 120 | 120 | 121 | 121 |
| 32500 | | 116 | 117 | 121 | 118 | 119 | 121 | 119 | 120 | 121 | 122 | 122 | 122 |
| 33000 | | 117 | 118 | 122 | 119 | 120 | 122 | 121 | 121 | 122 | 123 | 123 | 123 |
| 33500 | | 118 | 120 | 123 | 120 | 121 | 123 | 122 | 122 | 123 | 124 | 124 | 124 |
| 34000 | | 119 | 121 | 124 | 122 | 122 | 124 | 123 | 123 | 124 | 125 | 125 | 125 |
| 34500 | | 121 | 122 | 125 | 123 | 123 | 125 | 124 | 125 | 125 | 126 | 126 | 126 |
| 35000 | | 122 | 123 | 125 | 124 | 125 | 125 | 125 | 126 | 126 | 127 | 127 | 127 |
| 35500 | | 123 | 124 | 126 | 125 | 126 | 126 | 126 | 127 | 127 | 128 | 128 | 128 |
| 36000 | | 124 | 125 | 127 | 126 | 127 | 127 | 127 | 128 | 128 | 129 | 129 | 129 |
| 36500 | | 125 | 126 | 128 | 127 | 128 | 128 | 128 | 129 | 129 | 130 | 130 | 130 |
| 37000 | | 126 | 127 | 129 | 128 | 129 | 129 | 130 | 130 | 130 | 131 | 132 | 132 |
| 37500 | | 127 | 128 | 130 | 129 | 130 | 130 | 131 | 131 | 131 | 132 | 133 | 134 |

LANDING V SPEED CHARTS:

NO ICING CONDITIONS

| WEIGHT (kg) | V _{AC} - FLAP 2 (KIAS) | V _{AC} - FLAP 4 (KIAS) | V _{FS} (KIAS) | V _{REF} - FLAP 5 (KIAS) | V _{REF} - FLAP FULL (KIAS) |
|----------------|---------------------------------------|---------------------------------------|---------------------------|--|--|
| 22000 | 128 | 113 | 155 | 108 | 102 |
| 23000 | 131 | 116 | 158 | 110 | 104 |
| 24000 | 134 | 118 | 162 | 112 | 106 |
| 25000 | 137 | 120 | 165 | 115 | 108 |
| 26000 | 139 | 123 | 168 | 117 | 110 |
| 27000 | 142 | 125 | 172 | 119 | 112 |
| 28000 | 145 | 127 | 175 | 122 | 114 |
| 29000 | 147 | 130 | 178 | 124 | 116 |
| 30000 | 150 | 132 | 181 | 126 | 118 |
| 31000 | 152 | 134 | 184 | 128 | 120 |
| 32000 | 155 | 136 | 187 | 130 | 122 |
| 33000 | 157 | 138 | 190 | 132 | 124 |
| 34000 | 160 | 141 | 193 | 134 | 126 |
| 35000 | 162 | 143 | 196 | 136 | 127 |
| 36000 | 164 | 145 | 198 | 138 | 128 |
| 37000 | 166 | 147 | 201 | 140 | 129 |

ICING CONDITIONS

| WEIGHT (kg) | V_{AC} – FLAP 2 (KIAS) | V_{AC} -FLAP 4 (KIAS) | V_{FS} (KIAS) | V_{REF} – FLAP 5 (KIAS) | V_{REF} -FLAP FULL (KIAS) |
|----------------|--------------------------------|-------------------------------|--------------------|---------------------------------|--------------------------------------|
| 22000 | 128 | 113 | 155 | 117 | 107 |
| 23000 | 131 | 116 | 158 | 119 | 110 |
| 24000 | 134 | 118 | 162 | 122 | 112 |
| 25000 | 137 | 120 | 165 | 124 | 114 |
| 26000 | 139 | 123 | 168 | 127 | 116 |
| 27000 | 142 | 125 | 172 | 129 | 118 |
| 28000 | 145 | 127 | 175 | 132 | 121 |
| 29000 | 147 | 130 | 178 | 134 | 123 |
| 30000 | 150 | 132 | 181 | 136 | 125 |
| 31000 | 152 | 134 | 184 | 139 | 127 |
| 32000 | 155 | 136 | 187 | 141 | 129 |
| 33000 | 157 | 138 | 190 | 143 | 131 |
| 34000 | 160 | 141 | 193 | 145 | 132 |
| 35000 | 162 | 143 | 196 | 147 | 134 |
| 36000 | 164 | 145 | 198 | 149 | 134 |
| 37000 | 166 | 147 | 201 | 152 | 135 |

FINAL SEGMENT SPEEDS

| WEIGHT (kg) | V _{F3} (KIAS) |
|----------------|---------------------------|
| 21000 | 151 |
| 22000 | 155 |
| 23000 | 158 |
| 24000 | 162 |
| 25000 | 165 |
| 26000 | 168 |
| 27000 | 172 |
| 28000 | 175 |
| 29000 | 178 |
| 30000 | 181 |
| 31000 | 184 |
| 32000 | 187 |
| 33000 | 190 |
| 34000 | 193 |
| 35000 | 196 |
| 36000 | 198 |
| 37000 | 201 |
| 38000 | 204 |

FINAL SEGMENT SPEEDS (Lbs)

| Final Segment Speed -- V_{FS} | |
|--|------------|
| Wt. (lbs) | VFS |
| 48000 | 154 |
| 49000 | 156 |
| 50000 | 157 |
| 51000 | 159 |
| 52000 | 160 |
| 53000 | 162 |
| 54000 | 163 |
| 55000 | 165 |
| 56000 | 166 |
| 57000 | 168 |
| 58000 | 169 |
| 59000 | 171 |
| 60000 | 172 |
| 61000 | 174 |
| 62000 | 175 |
| 63000 | 177 |
| 64000 | 178 |
| 65000 | 180 |
| 66000 | 181 |
| 67000 | 182 |
| 68000 | 183 |
| 69000 | 185 |
| 70000 | 186 |
| 72000 | 189 |
| 74000 | 191 |
| 76000 | 194 |
| 78000 | 196 |
| 80000 | 199 |
| 82000 | 201 |

Note: You will find disparity between the Lbs and Kg speeds on the above charts. The reason for this is simply that each chart is from a different carrier, and each has its own set of numbers that remain within safety parameters of the aircraft.