

DETERMINATION OF MAXIMUM TAKEOFF WEIGHT AND SPEEDS

GENERAL

The takeoff chart is computed for a given runway under a set of conditions, which are :

- OAT
- Wind
- Configuration
- QNH, air conditioning, anti ice...

Two configurations are produced on the chart. This enables the crew to select that giving the highest permissible takeoff weight. In case of equivalent performance, retain the configuration giving the lower takeoff speeds.

MTOW DETERMINATION

Enter the chart with the first configuration and actual wind column reading the temperature value. This temperature value stands for the OAT. Read the maximum takeoff weight corresponding to the actual OAT. Note that it is allowed to interpolate between two consecutive lines to obtain the maximum takeoff weight.

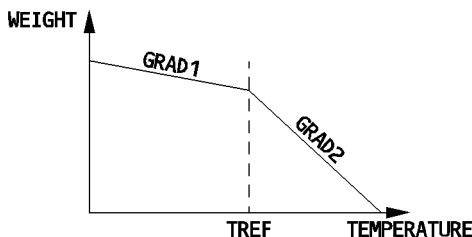
It is reminded that the takeoff weight is the sum of the weight entry and the delta weight. Similarly determine the takeoff speeds associated with the maximum takeoff weight.

In some cases, it may happen that the first temperature value (displayed for the highest weight entry) is higher than OAT. In this case, it is allowed to extrapolate the weight value to avoid unnecessary penalty. Use the Grad 1/Grad 2 gradients provided at the bottom of the corresponding column.

Correction to weight

Grad 1/Grad 2 are gradients provided for both sides of the flat rating temperature (TREF). Grad 1 applies to temperatures below TREF and Grad 2 applies above TREF.

Read the lowest temperature of the column (corresponding to the highest weight entry).



- If the lowest temperature and OAT are above TREF.
Obtain weight increment by multiplying Grad 2 by the difference in temperature between OAT and lowest temperature. Add this weight increment to the maximum takeoff weight calculated for the lowest temperature.

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- If the lowest temperature and OAT are below TREF.
Obtain weight increment by multiplying Grad 1 by the difference in temperature between OAT and lowest temperature. Add this weight increment to the maximum takeoff weight calculated for the lowest temperature.
 - If OAT is below TREF and lowest temperature is above TREF.
The weight increment is calculated in two steps. Step one is multiplying Grad 2 by temperature difference between lowest temperature and TREF. Step two is multiplying Grad 1 by temperature difference between TREF and OAT. Add results from step one and two to maximum takeoff weight calculated for lowest temperature.
- Note :** Use the weight gradients only to extrapolate above the maximum weight shown in the RTOW chart. They are not valid for interpolation between two boxes, between filled boxes or between one filled and one blank box.
- Repeat the above process for the other available configuration and retain the configuration giving the highest takeoff weight.

CORRECTIONS DUE TO DIFFERENT TAKEOFF CONDITIONS

Retain the maximum takeoff weight, associated configuration and speeds from above.
For conditions different from those of the chart, apply relevant corrections.

CONSERVATIVE CORRECTIONS FOR QNH AND BLEEDS FROM FCOM 2.02.24 p 1

Corrections are given for QNH $\neq$ 1013 hPa, air conditioning ON, anti ice ON.

1. For the given wind and temperature conditions, determine the maximum takeoff weight (choose the configuration giving the highest weight).
2. Apply the published weight correction(s) to the maximum takeoff weight (for each correction) to determine the maximum permissible takeoff weight.
3. Read the speeds associated with the maximum permissible takeoff weight by entering the chart with the retained configuration and weight value.

Example A

TO BE ISSUED LATER

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Example (Cont'd)

TO BE ISSUED LATER

CORRECTIONS FOR WET OR CONTAMINATED RUNWAYS FROM FCOM 2.04.10

(Refer to FCOM 2.04.10)

CORRECTIONS PRODUCED ON THE RTOW CHART (SEE EXAMPLE ON 2.02.16 P6)

A description of this correction is given on 2.02.16 P3. The list of corrections is not exhaustive, however the most commonly used corrections are wet runway, QNH, air conditioning and/or anti ice. A maximum of three corrections can be produced on one chart.

To apply the corrections, proceed as follows :

1. Determine the maximum takeoff weight before correction for the given OAT and wind condition.
2. Apply the first correction :

If OAT is less than or equal to TVMC (line 3), apply ΔW correction from line 1 and $\Delta V1/\Delta VR/\Delta V2$ corrections from line 2.

Else, (for OAT greater than TVMC), apply ΔW correction from line 3 and $\Delta V1/\Delta VR/\Delta V2$ corrections from line 4.

3. To combine a second (and third, as applicable) correction :

If OAT is less than or equal to TVMC (line 3), apply ΔW correction from line 1 and $\Delta V1/\Delta VR/\Delta V2$ corrections from line 2.

Check that the resulting speeds are higher than the minimum speeds displayed on the RTOW chart and that V2 is higher than the VMU limited speed (FCOM 2.02.25).

If OAT is higher than TVMC (line3) or if the above speed check is not fulfilled, apply ΔW correction from line 3 and $\Delta V1/\Delta VR/\Delta V2$ corrections from line 4. No speed check is required.

Note : – QNH correction is given for ± 10 hPa. It is allowed to extrapolate linearly for greater QNH deviation.

- When using a takeoff chart with failure cases, it is not allowed to combine two failure cases.
- Corrections from the chart must be applied from top to bottom, i.e. in the RTOW on 2.02.16 p6, apply the wet correction first.
- If asterisk or dotted lines appear in the correction boxes, refer to more conservative corrections provided in the FCOM.
- No speed check is required for the first correction. However, if the first influence correction follows a conservative FCOM correction, a speed check is required.

Example B

To be issued later

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COMBINING CORRECTIONS FROM FCOM AND CHART

Proceed as follows :

1. Determine the maximum takeoff weight by entering the chart with selected configuration, OAT and wind.
2. Apply corrections from FCOM to determine an intermediate weight. Interpolate associated speeds for intermediate weight in the same column (same wind and configuration).
3. Apply corrections from RTOW chart as explained above.

Example C

To be issued later

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Example (Cont'd)

TO BE ISSUED LATER

VMU CHECK

On 2.02.25 are given the V2 limited by VMU/VMCA values per configuration. For each pressure altitude and weight combination, two speed values are given. The first value applies to all temperatures less than or equal to ISA + 15. The second value applies to ISA + 40. For a temperature between ISA + 15 and ISA + 40, interpolate linearly between the two given speeds.

The speeds in the tables are checked for VMCA limitation.

Note : *The minimum V2 speed due to VMCA is given on the RTOW chart.*

EXTRAPOLATION

For OAT lower than the lowest temperature value of a wind column, it is possible to obtain a higher maximum permissible takeoff weight by using Grad 1/Grad 2 values. See page 1 for more details.

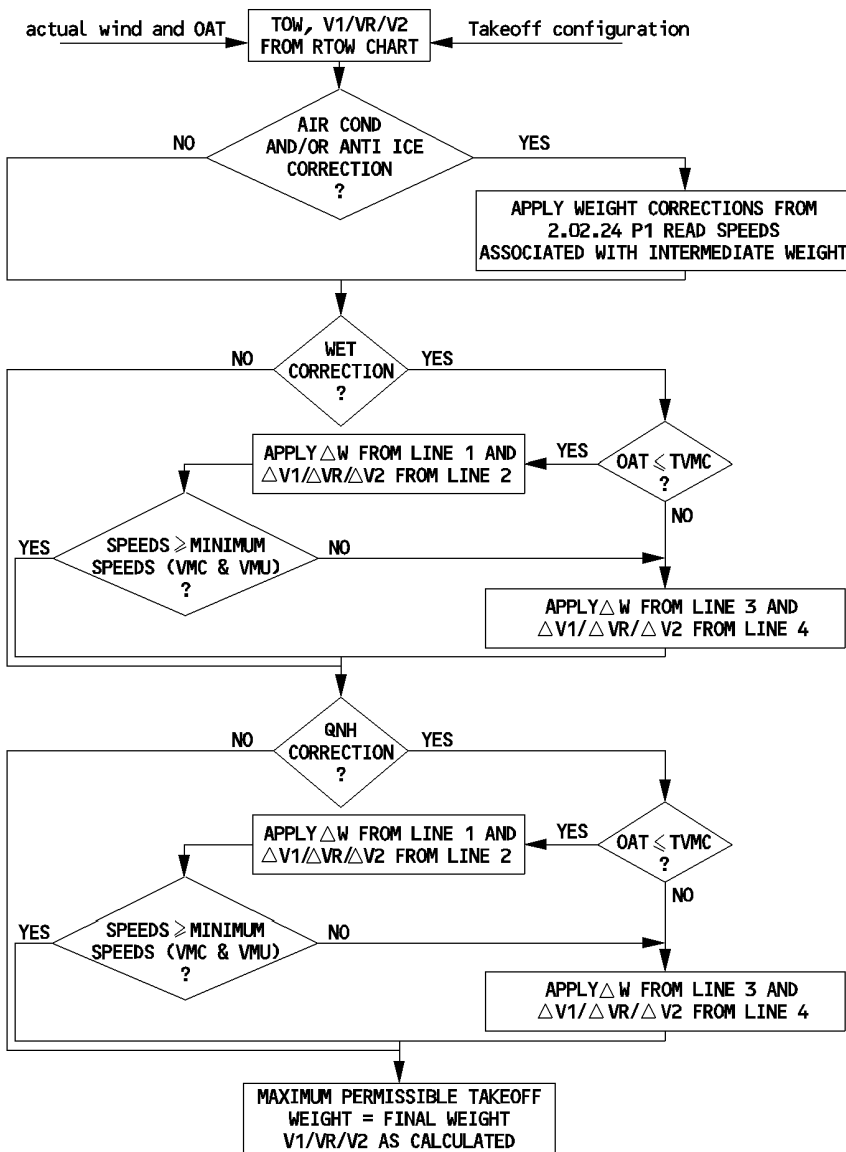
MAXIMUM STRUCTURAL TAKEOFF WEIGHT

The maximum structural takeoff weight is a weight limitation depending on the aircraft. This limitation is provided in the Flight Manual and in the chapter Limitation of FCOM 3.

Compare the maximum structural takeoff weight to the maximum permissible takeoff weight computed for given conditions and retain the lower of the two values.

SUMMARY

The following flow diagram gives the different steps to follow.



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