

Calculating Take-off V-speeds for the SimCheck A300

In the A300's Airspeed indicator you can click on the hidden clickzone to get the actual V-Speeds based on the 8500ft RWY in reference to weight!
But what if you want to Take-Off at a different Rwy e.g. at a RWY with 4000m length not 2600?

You have to calculate the V-speeds!

In reality there are charts for every airport available where you can read them out easily!

According to the A300 FCOM section 8.09.20 you don't need these charts as its filled with tables and graphs how to calculate them by yourself!

Now I must admit that it took me half a day to figure out how to work with and if my calculated values would make sense but I compared to the Airspeed Indicator's V-Speed automatically set for 2600m RWY and they fit quiet well except a failure margin of 2-3% which is good enough for Simming 😊

Now into detail.....

What do we need?

- The weight of the Aircraft of course!
- The corrected RWY length...this is the T.O.R (Take-off Range) corrected for wind and Slope --> As FSX has no slope we may disregard that /// Wind Correction is a factor and I'll explain in the next topic for the wind correction 😊
- The pressure altitude ---> the pressure altitude you should calculate like this:

E.g.

QNH = 1030

QNE = 1013 (std allways)

➔ as the standard value is 17 hPa lower then the QNH multiply it with 28 as per hPa difference the altitude changes 28 feet!
This gives a difference of 476ft! As the standard pressure is lower than actual QNH subtract it from your field altitude!

So to sum up the field is at 1300 ft, QNH 1030 ! Difference to 1013 = $17 \times 28 = 476\text{ft}$ this subtracted from 1300 = 824ft!

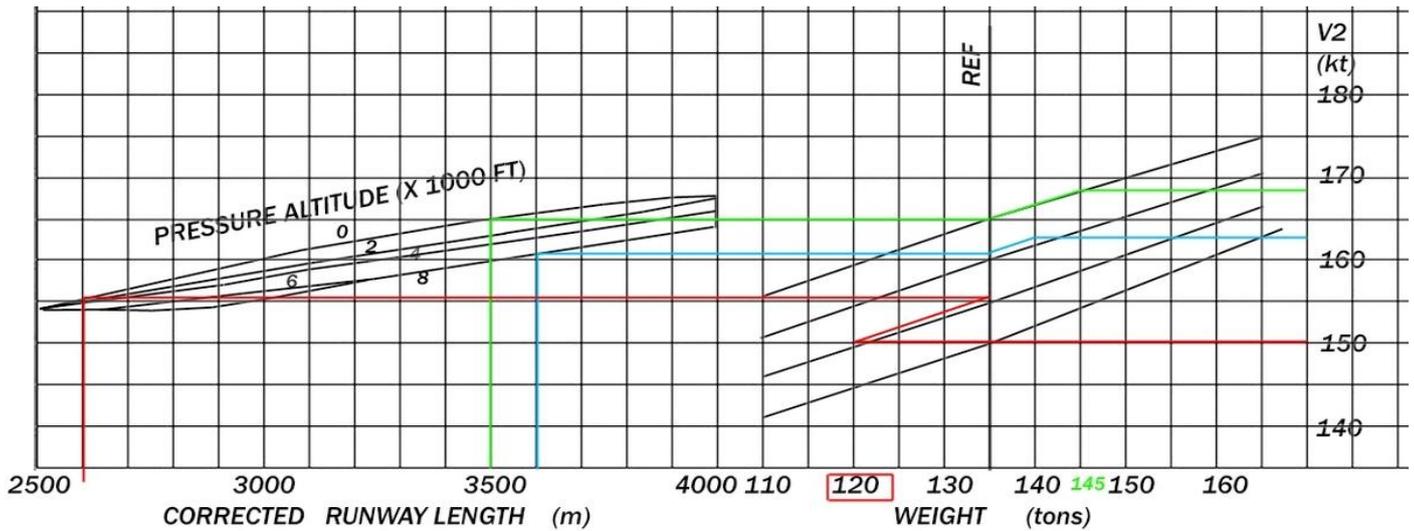
Pressure alt is 824ft! Easy, hm?

Now with this value we are ready to enter the charts!

A few word about the charts....

As the manual printed charts would be far too small and unreadable I created them with Photoshop all alone with the original layered below to ensure they are correct!!!

To give you some examples I entered three examples in the colours red blue and green so don't worry because of the colours.....



What do we see??

Red example

RWY length 2600m , Pressure Altitude 0ft, Weight 120t...

How to proceed:

- Connect the RWY length with the Pressure altitude and move all to the right to the REF line!
- From there either move left or right to your weight parallel to the black lines!
- At the intersection of the weight and your line draw right to the V2 scale!

In Red example 150 kts! --> Note: the Indicator of the A300 gave me here 149 kts! So the difference in my drawing to the calculated by Simcheck is less than 1% 😊

Green example

RWY length 3500m, Pressure Altitude = 0ft, Weight= 145t ----->>> after entering this into the chart V₂ = 168 kts!

Blue example

RWY : 3600m, pressure alt =8000ft, weight = 140t ----->> V₂ = 163 kts!

Hope it's not too complicated?

Don't worry, it will get easier from here

Now we have the V₂...cool isn't it ? And we had no Airport specific chart aboard, airlines had hundreds of 😊. OK now we want to know V₁ and V_r and the Pitch angle for Take Off!

Here we go, from the FCOM:

CORRECTED RUNWAY LENGTH (m)								
WEIGHT (TONS)	2500	3000	3500	4000	V3	V4	V _{FTO}	
165	–	5/13.7	9/13.4	11/12.8	170	214	249	
160	6/14.0	5/13.7	9/13.0	11/12.5	168	211	245	
155	6/14.2	4/13.7	7/13.6	10/12.1	165	208	241	
150	6/14.2	4/13.4	4/12.5	7/12.0	162	204	237	
145	6/14.2	4/13.3	4/12.1	6/11.9	160	201	233	
140	6/14.2	4/13.1	4/12.1	6/11.7	157	197	229	
135	5/14.1	4/13.0	4/12.1	4/11.6	155	194	225	
130	5/14.1	4/13.2	3/12.1	4/11.5	152	190	221	
125	5/14.1	4/13.3	3/12.0	4/11.5	149	187	216	
120	5/14.1	4/13.6	3/12.0	4/11.5	147	183	212	
115	5/14.1	4/13.7	–	–	144	179	208	
					V ₂ -V ₁ /Pitch	V ₂ = 150 kts -> V ₂ -V ₁ = 5 kts -> V ₁ = 145 kts V _r = 147 kts	V ₂ = 168 kts -> V ₂ -V ₁ = 4 kts -> V ₁ = 164 kts V _r = 165 kts	V ₂ = 163 -> V ₁ = 159 V _r = 160 kts

$$V_R = V_2 - 3 \text{ kt}$$

If = V_R lower than V₁ take V_R = V₁

To make it easier...colours!

Red example RWY was 2600m long so we take here 2500 as the interpolation would also take 2500 as reference.

Weight 120 tons and we can see the difference between V₁ and V₁ and the pitch Angle!

Thus we can calculate the V₁ and V_r according the table!

In summary.....

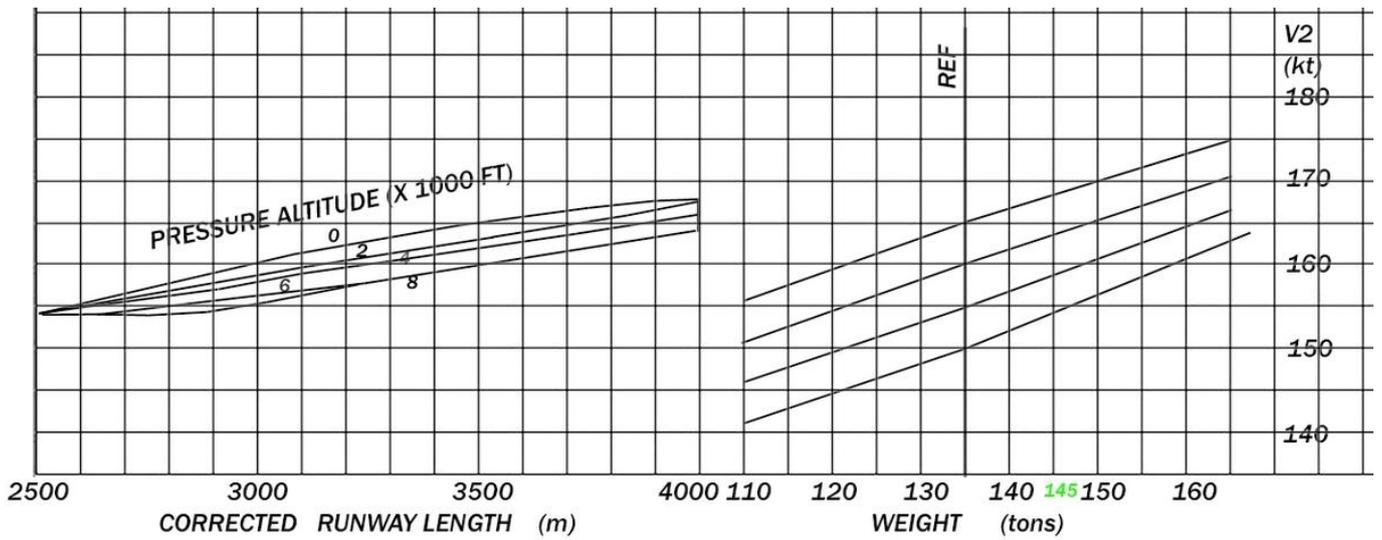
Given the weight the RWY length and the pressure altitude we were able to determine V-Speeds and Pitch angle! If you practise a bit it doesn't take approximately 1 minute or 2 😊

Together with the UTOPIA Tool we have a complete performance calculation now for A300 Take Off!

On the next page you can find empty tables so you can make your own calculations.

Patrick Claussnitzer

SimCheck A300 Support team



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160	6/14.0	5/13.7	9/13.0	11/12.5	168	211	245
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120	5/14.1	4/13.6	3/12.0	4/11.5	147	183	212
115	5/14.1	4/13.7	—	—	144	179	208
				V2-V1 /Pitch			

$$V_R = V_2 - 3 \text{ kt}$$

If V_R lower than V_1 take $V_R = V_1$