Wastegate flap position

at what speed is the wastegate flap closed at full load?

This question often comes up in discussions about lack of power.
This goes hand in hand with the assumption that the wastegate flap can no longer close properly due to distortion.

The following table [1)] was determined on the test bench. Here, at full load (115% throttle valve) with the reduction of the engine speed, it was determined when the wastegate valve is completely closed, i.e. has reached the 100% position and the specified airbox pressure is no longer reached.

You can see that this has only happened at an engine speed of just over 4000 rpm [2)].
These are of course only „laboratory values“.

Speed(1/min)	Load %	Amb. press. (hPa)	Airbox Press. (hPa)	Nominal Press. (hPa)	Servo Position %	Airbox Temp. C
5784	115.0	956	1373	1370	71.7	65.5
5784	115.0	956	1374	1370	71.6	65.5
5784	115.0	956	1371	1370	71.7	65.6
5783	115.0	956	1373	1370	71.6	65.6
5783	115.0	956	1372	1370	71.6	65.6
5509	115.0	957	1365	1370	73.8	68.3
5509	115.0	957	1367	1370	73.8	68.3
5508	115.0	957	1373	1370	74.0	68.3
5507	115.0	957	1373	1370	73.4	68.3
5506	115.0	957	1369	1370	72.7	68.3
5085	115.0	956	1371	1370	77.5	69.3
5083	115.0	956	1373	1370	77.5	69.3
5080	115.0	956	1373	1370	77.4	69.3
5078	115.0	956	1369	1370	77.5	69.3
5075	115.0	956	1370	1370	77.4	69.3
4555	115.0	957	1368	1370	83.7	69.4
4554	115.0	957	1368	1370	83.8	69.4
4553	115.0	956	1369	1370	83.8	69.4
4553	115.0	956	1370	1370	83.8	69.4
4552	115.0	956	1368	1370	83.8	69.4
4068	115.0	957	1366	1370	88.5	69.4
4067	115.0	957	1367	1370	88.5	69.4
4066	115.0	957	1367	1370	88.6	69.4
4065	115.0	957	1365	1370	88.5	69.4
4064	**115.0**	**957**	**1365**	**1370**	**88.5**	**69.4**
3564	115.0	956	1289	1370	100.0	68.3
3564	115.0	956	1289	1370	99.8	68.3

Speed(1/min)	Load %	Amb. press. (hPa)	Airbox Press. (hPa)	Nominal Press. (hPa)	Servo Position %	Airbox Temp. C
3563	115.0	956	1286	1370	100.0	68.3
3563	115.0	956	1286	1370	99.8	68.3
3563	115.0	956	1284	1370	100.0	68.3

1)

excerpt from log file

2)

red line

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