

	LOADING WEIGHT and BALANCE	2.01.40	P 1
		SEQ 001	REV 17

LOAD AND TRIM SHEET

This chart allows to determine the aircraft CG (% MAC) function of dry operating weight, pantry adjustment, cargo loads, passengers and fuel on board.

The operational limits shown on the load and trim sheet are more restrictive than the certified limits because error margins have been taken into account.

The load and trim sheet needs to be updated when :

- a modification which changes the aircraft certified limits is included or
- a modification (cabin layout, cargo arrangement...) which influences the operational limits is made.

It is the airline's responsibility to define a load and trim sheet and to keep it up to date.

Hereafter is a description of the load and trim sheet utilization in the standard Airbus Industrie format (see example 2.01.40 p3) and for a typical passenger cabin arrangement.

DATA FOR GENERIC EXAMPLE

Dry operating weight = 119 000 kg and CG = 32%

Deviation or adjustment = + 100 kg in zone F

Cargo = 16 500 kg as : cargo 1 = 3 500 kg ; cargo 2 = 4 000 kg ;

cargo 3 = 4 000 kg ; cargo 4 = 2 000 kg ; cargo 5 = 3 000 kg

Passengers (75 kg/PAX) = 295 PAX with the following distribution :

cabin OA = 25 ; cabin OB = 160 ; cabin OC = 110

Fuel = 83 000 kg

	LOADING		2.01.40	P 2
	WEIGHT and BALANCE		SEQ 001	REV 20

DESCRIPTION

- a) Enter master data in (1).
- b) Compute dry operating weight index using the formula indicated in (2) and report in (3). Dry operating index = 124.16.
- c) Enter weight deviation in (4) and read corresponding index in (5) : – 0.51.
- d) Calculate corrected index and report in (6) : CORRECTED INDEX = 123.65.
- e) Enter cargo weight and PAX number in (7).
- f) Enter index scale (8) with corrected index and proceed through cargo and passengers scales as shown in (9). Then, from the final point (cabin OC), draw a vertical line down to the zero fuel line (10) : 157 725 kg.
- g) Check that the intersection with zero fuel line determined in table (11) is within the maximum zero fuel weight and zero fuel operational limits. If not rearrange cargo loading.
- h) Read in table 2.01.40 p5 fuel index correction. Fuel on Board : 83 000 kg.
Fuel density : 0.780.
Read in fuel index table. This example will be continued assuming that FUEL INDEX = + 6 was found. Carry in scale (12). From this point draw a vertical line down to takeoff weight line (13) at 240 725 kg.
- i) Check that intersection with takeoff line determined in table (11) is within maximum takeoff weight and takeoff operational limits. If not rearrange cargo loading.
- j) Read takeoff CG on CG scale (14) : CG = 30.2 %

CAUTION

When the takeoff CG is more forward than 28 % MAC use a RTOW computed with basic CG.

CAUTION

If there is no customized trim sheet for your airline in this section 2.01.40
do not use the information enclosed herein for day to day operation as margins and load CG vary with cabin and cargo layout.



LOAD and TRIM SHEET
STANDARD

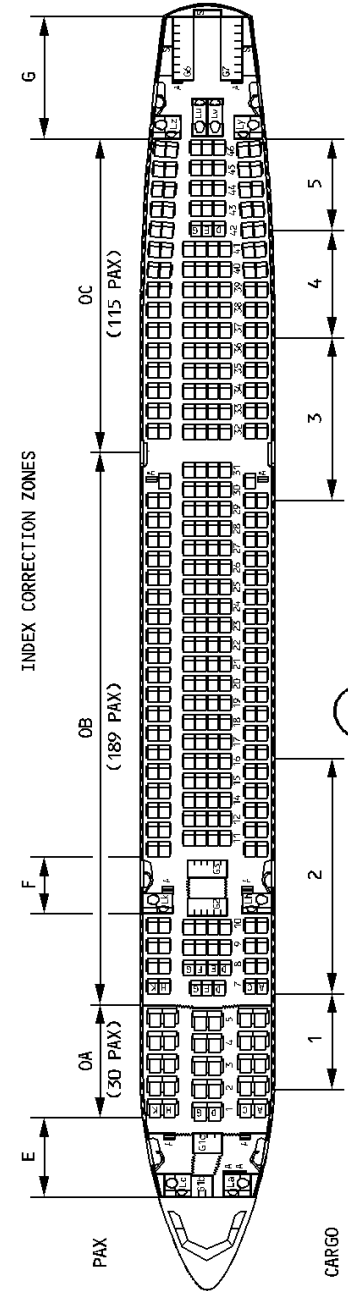
A340 - XXX
VERSION : 30 F/C 304 Y/C

DRY OPERATING WEIGHT CONDITIONS	
WEIGHT (1000 KG)	CG(%MAC)
119	32
I = [(CG-25) x W x 0.029] + 100	
DRY OPER WEIGHT INDEX	124.16

AIRCRAFT REGISTR :	
DATE :	PREPARED BY :
FLT Nbr :	
FROM :	TO :

DRY OPERATING WEIGHT	119000
WEIGHT DEVIATION (PANTRY)	+ 100
CORRECTED DRY OPER WEIGHT	= 119100
CARGO	+ 16500
PASSENGERS 2,9,5 x 7,5 =	= 22125
ZERO FUEL WEIGHT	= 157725
TOTAL FUEL	+ 83000
TOTAL WEIGHT	= 240725

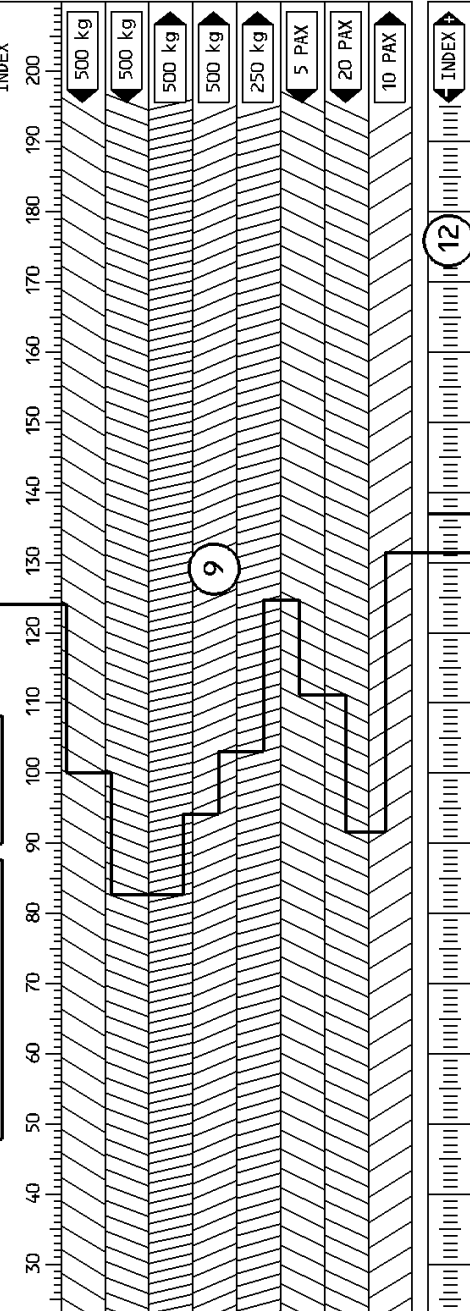
ZONES	E	F	G
WEIGHT (kg) DEVIATION		+	
			100



BASIC INDEX CORRECTION	
DRY OPER WEIGHT DEVIATION	ZONES
	E F G
+ 100 kg	- 0.99 - 0.51 + 0.92
- 100 kg	+ 0.99 + 0.51 - 0.92

ZONES	Nbr	WEIGHT (kg)
CARGO 1		3500
CARGO 2		4000
CARGO 3		4000
CARGO 4		2000
CARGO 5		3000
CABIN OA	25	
CABIN OB	160	
CABIN OC	110	

8 **123.65** **CORRECTED INDEX**



FUEL INDEX	+ 6
SEE TABLE OVERLEAF	

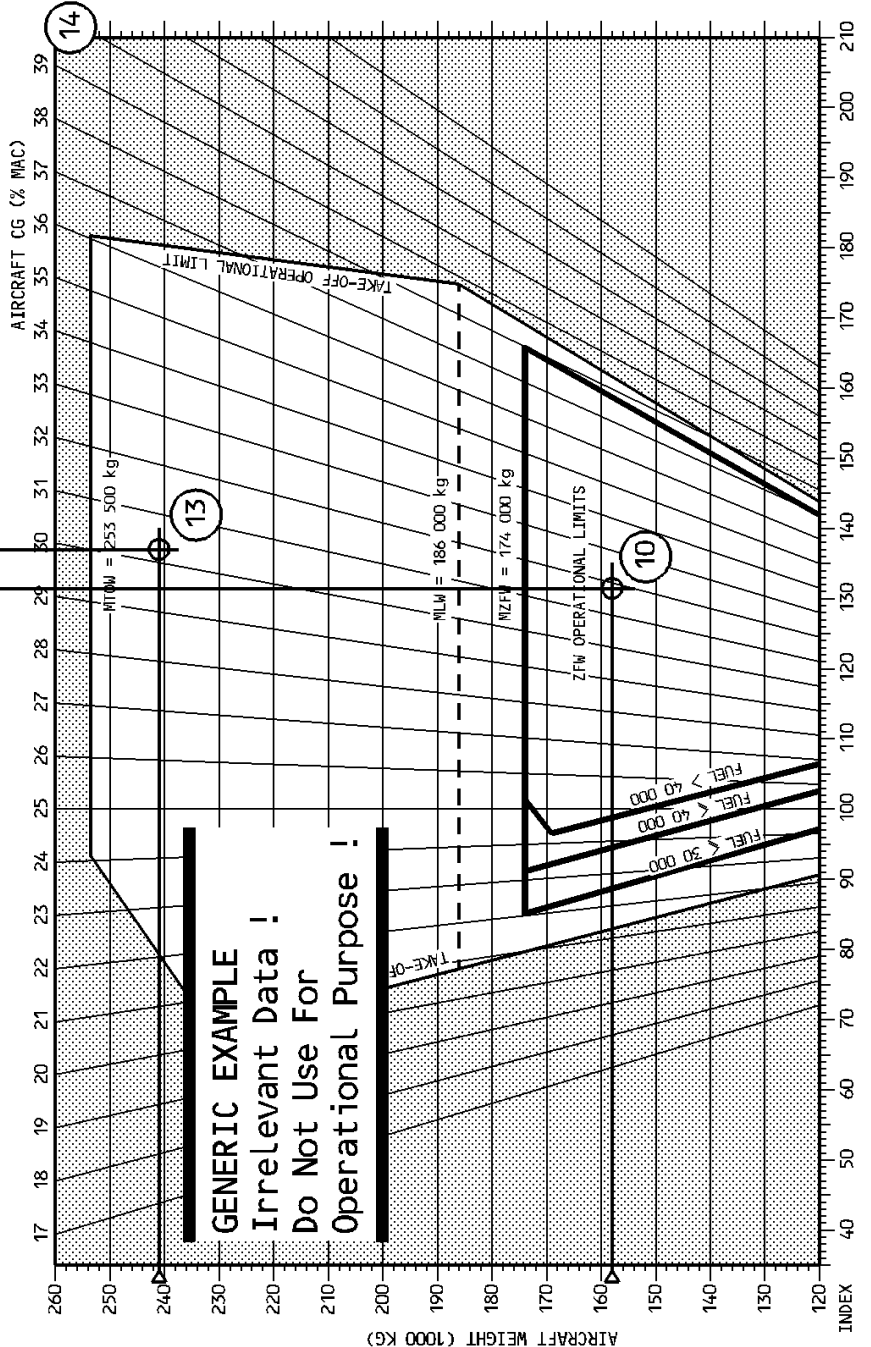
NOTA
ZERO FUEL ALLOWED AREAS
(FUNCTION OF TOTAL FUEL)

≤ 30 000

FUEL > 40 000

TAKE OFF	
CG	
% MAC	310.13

ZFW CDU INPUT	
WEIGHT tons	115.717
CG % MAC	311.8



LOADING		2.01.40	P 4
WEIGHT and BALANCE		SEQ 001	REV 09

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LOADING		2.01.40	P 5
WEIGHT and BALANCE		SEQ 115	REV 19

FUEL INDEX TABLE

To be issued later

FUEL INDEX TABLE CONT'D

To be issued later

	LOADING		2.01.40	P 7
	WEIGHT and BALANCE		SEQ 115	REV 20

FUEL INDEX TABLE PER TANK

The fuel index table has been established assuming a fuel distribution in accordance with refuel distribution chart as given in section 2.01.30 of this volume (for a single specific gravity only).

If after refueling the actual distribution deviates from the chart values, the actual and the load sheet CG will show a discrepancy. The following tables allow to determine the fuel index taking into account the actual fuel quantity in each tank. To determine the actual takeoff CG enter the tables with the actual fuel quantities in each tank, read the fuel index for each tank and use their sum to enter the load sheet. Check that the actual CG is inside the operational limits. If CG is outside the limits transfer fuel to achieve a distribution in accordance with the chart or rearrange the load.

Note : These tables are valid only when used with the following formulae for the index :

$$I = W \times (H_{arm} - 43.1365) / 5000 + K \text{ or } I = [(CG - 25) \times W \times 0.000017] + K$$

(Weight in kg, Harm in m)

Example

DATA	:	Fuel density =	0.795 kg/l
		Fuel in inner fuel tanks 1 + 4 =	FULL
		Fuel in inner fuel tanks 2 =	11500 kg
		Fuel in inner fuel tanks 3 =	12000 kg
		Fuel in outer fuel tanks =	FULL
		Fuel in trim tank =	4250 kg
		Fuel in center tank =	33000 kg

		Weight (kg)	Index	
Inner tank 1 + 4	1	10271	+	3
	4	10271	+	3
Inner tank 2 + 3	2	11500	—	6
	3	12000	—	6
Outer tank	Left	5056	+	6
	Right	5056	+	6
Center tank		33000	—	22
Trim tank		4250	+	27
TOTAL		91404	+	11

Enter the load sheet with a fuel index of + 11.

FUEL INDEX TABLE FOR INNER TANKS 1 + 4

WEIGHT (kg)	DENSITY (kg/l)														
	0.760	0.765	0.770	0.775	0.780	0.785	0.790	0.795	0.800	0.805	0.810	0.815	0.820	0.825	0.830
1000	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0
2000	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0
3000	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0
4000	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0
5000	+1	+1	+1	+1	+1	+1	+1	+1	+1	+1	+1	+1	+1	+0	+0
6000	+1	+1	+1	+1	+1	+1	+1	+1	+1	+1	+1	+1	+1	+1	+1
7000	+1	+1	+1	+1	+1	+1	+1	+1	+1	+1	+1	+1	+1	+1	+1
8000	+2	+2	+2	+2	+2	+2	+2	+2	+2	+1	+1	+1	+1	+1	+1
9000	+2	+2	+2	+2	+2	+2	+2	+2	+2	+2	+2	+2	+2	+2	+2
10000				+3	+3	+3	+3	+3	+3	+3	+3	+3	+2	+2	+2
FULL	+3	+3	+3	+3	+3	+3	+3	+3	+3	+3	+3	+3	+3	+3	+3

virgin atlantic A340-600 <i>Flight Crew Operating Manual</i>	LOADING WEIGHT and BALANCE										2.01.40	P 8a
											SEQ 115	REV 20

FUEL INDEX TABLE FOR INNER TANKS 2 + 3

WEIGHT (kg)	DENSITY (kg/l)														
	0.760	0.765	0.770	0.775	0.780	0.785	0.790	0.795	0.800	0.805	0.810	0.815	0.820	0.825	0.830
1000	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
2000	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
3000	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2
4000	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2
5000	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3
6000	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3
7000	-4	-4	-4	-4	-4	-4	-4	-4	-4	-4	-4	-4	-4	-4	-4
8000	-4	-4	-4	-4	-4	-4	-4	-4	-4	-4	-4	-4	-4	-4	-4
9000	-5	-5	-5	-5	-5	-5	-5	-5	-5	-5	-5	-5	-5	-5	-5
10000	-5	-5	-5	-5	-5	-5	-5	-5	-5	-5	-5	-5	-5	-5	-5
11000	-6	-6	-6	-6	-6	-6	-6	-6	-6	-6	-6	-6	-6	-6	-6
12000	-6	-6	-6	-6	-6	-6	-6	-6	-6	-6	-6	-6	-6	-6	-6
13000						-7	-7	-7	-7	-7	-7	-7	-7	-7	-7
FULL	-7	-7	-7	-7	-7	-7	-7	-7	-7	-7	-7	-7	-7	-7	-7

FUEL INDEX TABLE FOR OUTER TANKS

WEIGHT (kg)	DENSITY (kg/l)														
	0.760	0.765	0.770	0.775	0.780	0.785	0.790	0.795	0.800	0.805	0.810	0.815	0.820	0.825	0.830
500	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0
1000	+1	+1	+1	+1	+1	+1	+1	+1	+1	+1	+1	+1	+1	+1	+1
1500	+2	+2	+2	+2	+2	+2	+2	+2	+2	+2	+2	+2	+1	+1	+1
2000	+2	+2	+2	+2	+2	+2	+2	+2	+2	+2	+2	+2	+2	+2	+2
2500	+3	+3	+3	+3	+3	+3	+3	+3	+3	+3	+3	+3	+3	+3	+3
3000	+3	+3	+3	+3	+3	+3	+3	+3	+3	+3	+3	+3	+3	+3	+3
3500	+4	+4	+4	+4	+4	+4	+4	+4	+4	+4	+4	+4	+4	+4	+4
4000	+4	+4	+4	+4	+4	+4	+4	+4	+4	+4	+4	+4	+4	+4	+4
4500	+5	+5	+5	+5	+5	+5	+5	+5	+5	+5	+5	+5	+5	+5	+5
5000							+6	+6	+6	+6	+6	+6	+6	+6	+6
FULL	+6	+6	+6	+6	+6	+6	+6	+6	+6	+6	+6	+6	+6	+6	+6

 LOADING WEIGHT and BALANCE	2.01.40 P 10	
	SEQ 115	REV 20

FUEL INDEX TABLE FOR TRIM TANK

WEIGHT (kg)	DENSITY (kg/l)														
	0.760	0.765	0.770	0.775	0.780	0.785	0.790	0.795	0.800	0.805	0.810	0.815	0.820	0.825	0.830
250	+2	+2	+2	+2	+2	+2	+2	+2	+2	+2	+2	+2	+2	+2	+2
500	+3	+3	+3	+3	+3	+3	+3	+3	+3	+3	+3	+3	+3	+3	+3
750	+5	+5	+5	+5	+5	+5	+5	+5	+5	+5	+5	+5	+5	+5	+5
1000	+6	+6	+6	+6	+6	+6	+6	+6	+6	+6	+6	+6	+6	+6	+6
1250	+8	+8	+8	+8	+8	+8	+8	+8	+8	+8	+8	+8	+8	+8	+8
1500	+9	+9	+9	+9	+9	+9	+9	+9	+9	+9	+9	+9	+9	+9	+9
1750	+11	+11	+11	+11	+11	+11	+11	+11	+11	+11	+11	+11	+11	+11	+11
2000	+13	+13	+13	+13	+13	+13	+13	+13	+13	+13	+13	+13	+13	+13	+13
2250	+14	+14	+14	+14	+14	+14	+14	+14	+14	+14	+14	+14	+14	+14	+14
2500	+16	+16	+16	+16	+16	+16	+16	+16	+16	+16	+16	+16	+16	+16	+16
2750	+17	+17	+17	+17	+17	+17	+17	+17	+17	+17	+17	+17	+17	+17	+17
3000	+19	+19	+19	+19	+19	+19	+19	+19	+19	+19	+19	+19	+19	+19	+19
3250	+21	+21	+21	+21	+21	+21	+21	+21	+21	+21	+21	+21	+21	+21	+21
3500	+22	+22	+22	+22	+22	+22	+22	+22	+22	+22	+22	+22	+22	+22	+22
3750	+24	+24	+24	+24	+24	+24	+24	+24	+24	+24	+24	+24	+24	+24	+24
4000	+26	+26	+26	+26	+26	+26	+26	+26	+26	+26	+26	+26	+26	+26	+26
4250	+27	+27	+27	+27	+27	+27	+27	+27	+27	+27	+27	+27	+27	+27	+27
4500	+29	+29	+29	+29	+29	+29	+29	+29	+29	+29	+29	+29	+29	+29	+29
4750	+31	+31	+31	+31	+31	+31	+31	+31	+31	+31	+31	+31	+31	+31	+31
5000	+32	+32	+32	+32	+32	+32	+32	+32	+32	+32	+32	+32	+32	+32	+32
5250	+34	+34	+34	+34	+34	+34	+34	+34	+34	+34	+34	+34	+34	+34	+34
5500	+36	+36	+36	+36	+36	+36	+36	+36	+36	+36	+36	+36	+36	+36	+36
5750	+37	+37	+37	+37	+37	+37	+37	+37	+37	+37	+37	+37	+37	+37	+37
6000	+39	+39	+39	+39	+39	+39	+39	+39	+39	+39	+39	+39	+39	+39	+39
6250	+41	+41	+41	+41	+41	+41	+41	+41	+41	+41	+41	+41	+41	+41	+41
6500							+42	+42	+42	+42	+42	+42	+42	+42	+42
6750													+44	+44	+44
FULL	+41	+41	+41	+42	+42	+42	+42	+43	+43	+43	+43	+44	+44	+44	+45

	LOADING										2.01.40		P 11	
	WEIGHT and BALANCE										SEQ 115		REV 20	

FUEL INDEX TABLE FOR CENTER TANK

WEIGHT (kg)	DENSITY (kg/l)														
	0.760	0.765	0.770	0.775	0.780	0.785	0.790	0.795	0.800	0.805	0.810	0.815	0.820	0.825	0.830
1000	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0
2000	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
3000	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
4000	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2
5000	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3
6000	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3
7000	-4	-4	-4	-4	-4	-4	-4	-4	-4	-4	-4	-4	-4	-4	-4
8000	-5	-5	-5	-5	-4	-4	-4	-4	-4	-4	-4	-4	-4	-4	-4
9000	-5	-5	-5	-5	-5	-5	-5	-5	-5	-5	-5	-5	-5	-5	-5
10000	-6	-6	-6	-6	-6	-6	-6	-6	-6	-6	-6	-6	-6	-6	-6
11000	-7	-7	-7	-7	-7	-7	-7	-7	-7	-7	-7	-7	-7	-7	-7
12000	-7	-7	-7	-7	-7	-7	-7	-7	-7	-7	-7	-7	-7	-7	-7
13000	-8	-8	-8	-8	-8	-8	-8	-8	-8	-8	-8	-8	-8	-8	-8
14000	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
15000	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
16000	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10
17000	-11	-11	-11	-11	-11	-11	-11	-11	-11	-11	-11	-11	-11	-11	-11
18000	-12	-11	-11	-11	-11	-11	-11	-11	-11	-11	-11	-11	-11	-11	-11
19000	-12	-12	-12	-12	-12	-12	-12	-12	-12	-12	-12	-12	-12	-12	-12
20000	-13	-13	-13	-13	-13	-13	-13	-13	-13	-13	-13	-13	-13	-13	-13
21000	-14	-14	-14	-14	-14	-14	-14	-14	-14	-14	-14	-14	-14	-14	-14
22000	-14	-14	-14	-14	-14	-14	-14	-14	-14	-14	-14	-14	-14	-14	-14
23000	-15	-15	-15	-15	-15	-15	-15	-15	-15	-15	-15	-15	-15	-15	-15
24000	-16	-16	-16	-16	-16	-16	-16	-16	-16	-16	-16	-16	-16	-16	-16
25000	-16	-16	-16	-16	-16	-16	-16	-16	-16	-16	-16	-16	-16	-16	-16
26000	-17	-17	-17	-17	-17	-17	-17	-17	-17	-17	-17	-17	-17	-17	-17
27000	-18	-18	-18	-18	-18	-18	-18	-18	-18	-18	-18	-18	-18	-18	-18
28000	-19	-18	-18	-18	-18	-18	-18	-18	-18	-18	-18	-18	-18	-18	-18
29000	-19	-19	-19	-19	-19	-19	-19	-19	-19	-19	-19	-19	-19	-19	-19
30000	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20
31000	-21	-21	-21	-21	-21	-21	-21	-21	-21	-21	-21	-21	-21	-21	-21
32000	-21	-21	-21	-21	-21	-21	-21	-21	-21	-21	-21	-21	-21	-21	-21
33000	-22	-22	-22	-22	-22	-22	-22	-22	-22	-22	-22	-22	-22	-22	-22
34000	-23	-23	-23	-23	-23	-23	-23	-23	-23	-23	-23	-23	-23	-23	-23
35000	-23	-23	-23	-23	-23	-23	-23	-23	-23	-23	-23	-23	-23	-23	-23
36000	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24
37000	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25
38000	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25	-25
39000	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26
40000	-27	-27	-27	-27	-27	-27	-27	-27	-27	-27	-27	-27	-27	-27	-27
41000	-28	-28	-28	-28	-28	-28	-27	-27	-27	-27	-27	-27	-27	-27	-27
42000	-28	-28	-28	-28	-28	-28	-28	-28	-28	-28	-28	-28	-28	-28	-28
43000			-29	-29	-29	-29	-29	-29	-29	-29	-29	-29	-29	-29	-29
44000							-30	-30	-30	-30	-30	-30	-30	-30	-30
45000										-30	-30	-30	-30	-30	-30
46000														-31	-31
FULL	-29	-29	-29	-29	-29	-30	-30	-30	-30	-30	-31	-31	-31	-31	-31