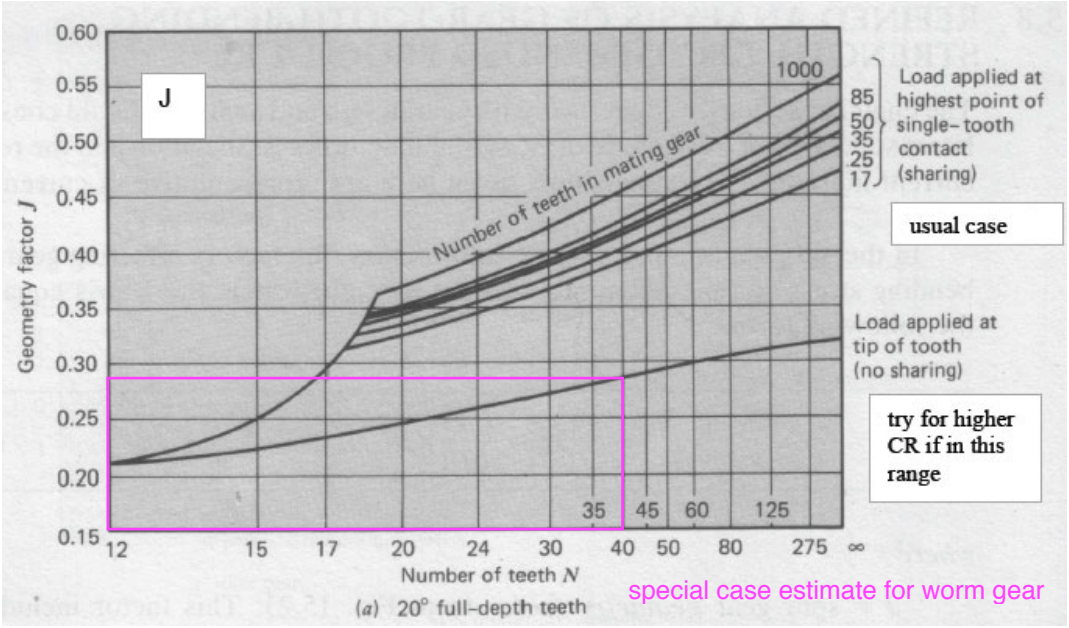
A worst case loading condition has F_t at the highest point of the tooth when only one tooth in contact. However, the geometry factor J depends upon the number of teeth in the gear. For precision gears, the number of teeth in the mating (other) gear is also important. This is because gears with a greater number of teeth tend to have more teeth in contact (on average).



Lewis factor J for 20° pressure angle gears. Worst case if l is full tooth length (F_t at tip).

AGMA uses a modified version of the Lewis formula, adjusting for things like speed (higher speeds produce larger dynamic loads), mounting rigidity, and shock and overload conditions.

Modified Lewis formula

$$\sigma = \frac{F_t\, P}{b\, J} K_m\, K_o\, K_v$$

K_m ***Mounting factor***: If gears are poorly mounted, load will be unevenly shared between teeth or across the face-width of the tooth. K_m depends on face-width and mounting accuracy.

TABLE 15.2
Mounting Correction Factor K_m

	Face Width (in.)			
Characteristics of Support	**0 to 2**	**6**	**9**	**16 up**
Accurate mountings, small bearing clearances, minimum deflection, precision gears	1.3	1.4	1.5	1.8
Less rigid mountings, less accurate gears, contact across the full face	1.6	1.7	1.8	2.2
Accuracy and mounting such that less than full-face contact exists			Over 2.2	

K_o ***Overload factor***: Shock loading can dislodge pinned dislocations and seriously shorten the fatigue life. Thus if the gears are subject to shock loads, this should be taken into account.

TABLE 15.1
Overload Correction Factor K_o

	Driven Machinery		
Source of Power	**Uniform**	**Moderate Shock**	**Heavy Shock**
Uniform	1.00	1.25	1.75
Light shock	1.25	1.50	2.00
Medium shock	1.50	1.75	2.25