		(2)		The supporting structure of the tail wheel, bumper, or energy absorption device must be designed to withstand the loads established in paragraph (c)(1) of this section.				
.499				Supplementary conditions for nose wheels. In determining the ground loads on nose wheels and affected supporting structures, and assuming that the shock absorbers and tires are in their static positions, the following conditions must be met:	keine			keine Fahrwerkauslegung
	(a)			For aft loads, the limit force components at the axle must be--				
		(1)		A vertical component of 2.25 times the static load on the wheel; and				
		(2)		A drag component of 0.8 times the vertical load.				
	(b)			For forward loads, the limit force components at the axle must be--				
		(1)		A vertical component of 2.25 times the static load on the wheel; and				
		(2)		A forward component of 0.4 times the vertical load.				
	(c)			For side loads, the limit force components at ground contact must be--				
		(1)		A vertical component of 2.25 times the static load on the wheel; and				
		(2)		A side component of 0.7 times the vertical load.				
	(d)			For airplanes with a steerable nose wheel that is controlled by hydraulic or other power, at design takeoff weight with the nose wheel in any steerable position, the application of 1.33 times the full steering torque combined with a vertical reaction equal to 1.33 times the maximum static reaction on the nose gear must be assumed. However, if a torque limiting device is installed, the steering torque can be reduced to the maximum value allowed by that device.				
	(e)			For airplanes with a steerable nose wheel that has a direct mechanical connection to the rudder pedals, the mechanism must be designed to withstand the steering torque for the maximum pilot forces specified in Sec. 23.397(b).				
.507				[Jacking loads.]	Lastvielfache	2	kritische Fälle	Manöverlastvielfache und Böenlastvielfache sind größer als Jacking load factor;damit geklärt
	(a)			The airplane must be designed for the loads developed when the aircraft is supported on jacks at the design maximum weight assuming the following load factors for landing gear jacking points at a three-point attitude and for primary flight structure jacking points in the level attitude:				
		(1)		Vertical-load factor of 1.35 times the static reactions.				
		(2)		Fore, aft, and lateral load factors of 0.4 times the vertical static reactions.				
	(b)			The horizontal loads at the jack points must be reacted by inertia forces so as to result in no change in the direction of the resultant loads at the jack points.				
	(c)			The horizontal loads must be considered in all combinations with the vertical load.				
.509				[Towing loads.] **[The towing loads of this section must be applied to the design of tow fittings and their immediate attaching structure.**	Lastvielfache für Abschleppen des Flugzeugs			All diese Lastvielfache sind unkritisch weil Manöver und Böenlastvielfache größer sind
	(a)			The towing loads specified in paragraph (d) of this section must be considered separately. These loads must be applied at the towing fittings and must act parallel to the ground. In addition--				
		(1)		A vertical load factor equal to 1.0 must be considered acting at the center of gravity; and				
		(2)		The shock struts and tires must be in their static positions.				
	(b)			For towing points not on the landing gear but near the plane of symmetry of the airplane, the drag and side tow load components specified for the auxiliary gear apply. For towing points located outboard of the main gear, the drag and side tow load components specified for the main gear apply. Where the specified angle of swivel cannot be reached, the maximum obtainable angle must be used.		2		
	(c)			The towing loads specified in paragraph (d) of this section must be reacted as follows:				
		(1)		The side component of the towing load at the main gear must be reacted by a side force at the static ground line of the wheel to which the load is applied.				
		(2)		The towing loads at the auxiliary gear and the drag components of the towing loads at the main gear must be reacted as follows:				
			(i)	A reaction with a maximum value equal to the vertical reaction must be applied at the axle of the wheel to which the load is applied. Enough airplane inertia to achieve equilibrium must be applied.		2	kritische Fälle	
			(ii)	The loads must be reacted by airplane inertia.				
	(d)			The prescribed towing loads are as follows, where W is the design maximum weight:				
.511				[Ground load; unsymmetrical loads on multiple-wheel units.]	Lastvielfache	2	kritische Fälle	Manöverlastvielfache und Böenlastvielfache sind größer als Jacking load factor; also ist es gedeckt
	(a)			*Pivoting loads.* The airplane is assumed to pivot about on side on the main gear with--				
		(1)		The brakes on the pivoting unit locked; and				
		(2)		Loads corresponding to a limit vertical load factor of 1, and coefficient of friction of 0.8, applied to the main gear and its supporting structure.				
	(b)			*Unequal tire loads.* The loads established under Secs. 23.471 through 23.483 must be applied in turn, in a 60/40 percent distribution, to the dual wheels and tires in each dual wheel landing gear unit.				
	(c)			*Deflated tire loads.* For the deflated tire condition-				
		(1)		60 percent of the loads established under Secs. 23.471 through 23.483 must be applied in turn to each wheel in a landing gear unit; and				
		(2)		60 percent of the limit drag and side loads, and 100 percent of the limit vertical load established under Secs. 23.485 and 23.493 or lesser vertical load obtained under subparagraph (1) of this paragraph, must be applied in turn to each wheel in the dual wheel landing gear unit				
.523				Design weights and center of gravity positions.	keine			kein Seaplane Design
	(a)			*Design weights.* The water load requirements must be met at each operating weight up to the design landing weight except that, for the takeoff condition prescribed in Sec. 23.531, the design water takeoff weight (the maximum weight for water taxi and takeoff run) must be used.				
	(b)			*Center of gravity positions.* The critical centers of gravity within the limits for which certification is requested must be considered to reach maximum design loads for each part of the seaplane structure.				
.525				Application of loads.	keine			kein Seaplane Design
	(a)			Unless otherwise prescribed, the seaplane as a whole is assumed to be subjected to the loads corresponding to the load factors specified in Sec. 23.527.				
	(b)			In applying the loads resulting from the load factors prescribed in Sec. 23.527, the loads may be distributed over the hull or main float bottom (in order to avoid excessive local shear loads and bending moments at the location of water load application) using pressures not less than those prescribed in Sec. 23.533(c).				
	(c)			For twin float seaplanes, each float must be treated as an equivalent hull on a fictitious seaplane with a weight equal to one-half the weight of the twin float seaplane.				
				Except in the takeoff condition of Sec. 23.531, the aerodynamic lift on the seaplane during the impact is assumed to be 2/3 of the weight of the seaplane.				
				Hull and main float landing conditions.			Aufgabenstellung gibt kein Seaplane v	
	(a)			*Symmetrical step, bow, and stern landing.* For symmetrical step, bow, and stern landings, the limit water reaction load factors are those computed under Sec. 23.527. In addition--				
		(1)		For symmetrical step landings, the resultant water load must be applied at the keel, through the center of gravity, and must be directed perpendicularly to the keel line;				
		(2)		For symmetrical bow landings, the resultant water load must be applied at the keel, one-fifth of the longitudinal distance from the bow to the step, and must be directed perpendicularly to the keel line; and				
		(3)		For symmetrical stern landings, the resultant water load must be applied at the keel, at a point 85 percent of the longitudinal distance from the step to the stern post, and must be directed perpendicularly to the keel line.				