

Appendix B

Vehicle Classification

Vehicles are assigned MLC numbers, which represent the loading effects they have on a bridge. The MLC does not represent the actual weight of a vehicle. It represents a combination of factors that include gross weight, axle spacing, weight distribution to the axles, and speed. All standard Army vehicles and special equipment that are active in the TO and that use bridges of military importance have an MLC. Trailers that are rated with a payload of 1 1/2 tons or less are exceptions. They have a combined classification with their towing vehicle. Classifying vehicles, trailers, or vehicle combinations with a gross weight of 3 tons or less is optional. *FM 5-170* lists classification numbers for most standard US military vehicles. To get the classification numbers for unlisted and nonstandard vehicles, submit load and dimensional information to the US Army Research and Development Center according to the instructions in *FM 5-170*. Expedient classification procedures for emergency situations are explained in this appendix.

HYPOTHETICAL VEHICLES

B-1. *Table B-1, pages B-2 through B-5*, shows 16 standard classes of hypothetical vehicles ranging from 4 to 150. The weight of the tracked vehicle in short tons was chosen as the classification number. A single-wheeled vehicle has a weight greater than its classification number. Each classification number has a specified maximum single-axle load. Also specified are the maximum tire load, the minimum tire size, and the maximum tire pressure. The classification numbers were originally developed from studies of the hypothetical vehicles having characteristics about the same as those actual military vehicles of NATO nations.

B-2. The moment and shear forces produced by the hypothetical vehicles or single-axle loads are provided in *Tables B-2 and B-3, pages B-6 through B-13*. These figures are based on the assumption that the nearest ground contact points of two different vehicles (wheeled or tracked) are 100 feet apart. *Table B-1* gives critical tire loads and tire sizes.

Table B-1. Standard Classes of Hypothetical Vehicles

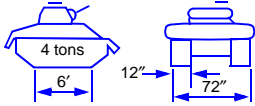
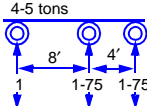

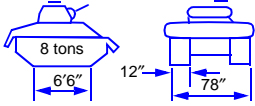
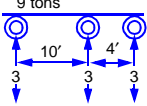

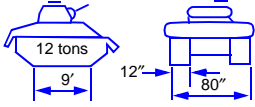
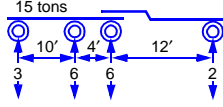

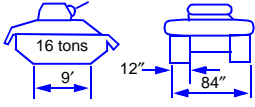
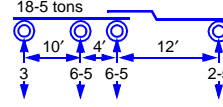

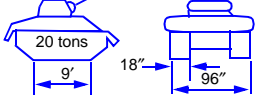
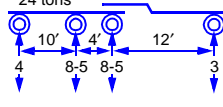

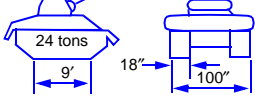
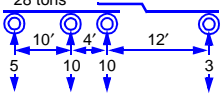

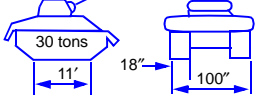
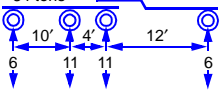
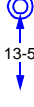
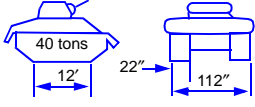
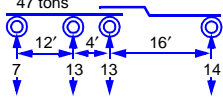

Hypothetical Vehicles for Classification of Actual Vehicles and Bridges			
1	2	3	4
Class	Tracked Vehicles	Wheeled Vehicles	
		Axle Loads and Spacing	Maximum Single-Axle Load (in Short Tons)
4			
8			
12			
16			
20			
24			
30			
40			
NOTES: 1. The single-axle tire sizes shown in Columns 5, 6, and 7 refer to the maximum single-axle loads given in Column 4. 2. The bogie-axle tire sizes shown in Columns 5, 6, and 7 refer to the maximum bogie-axle loads shown on the diagrams in Column 3. 3. The maximum tire pressure for all tires shown in Column 8 should be taken as 75 psi. The first dimension of tire size refers to the overall width of the tire and the second dimension is the rim diameter of the tire.			

Table B-1. Standard Classes of Hypothetical Vehicles (continued)

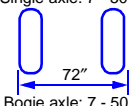
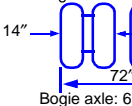

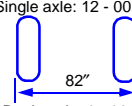
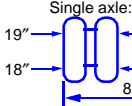

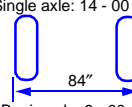
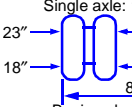

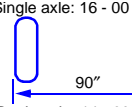
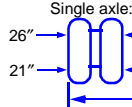
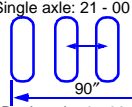

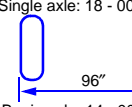
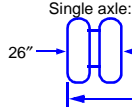
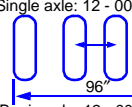

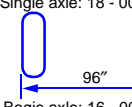

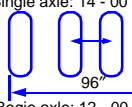

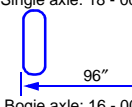
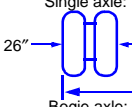
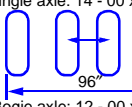

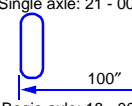
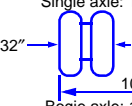
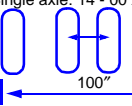

Hypothetical Vehicles for Classification of Actual Vehicles and Bridges				
1	5	6	7	8
Class	Wheeled Vehicles			
	Minimum Wheel Spacing and Tire Sizes of Critical Axles			Maximum Tire Load and Minimum Tire Size
4	Single axle: 7 - 50 x 20  72" Bogie axle: 7 - 50 x 20	Single axle: 6 - 00 x 20  14" 72" Bogie axle: 6 - 00 x 16		 2,500 lb on 7 - 50 x 20
8	Single axle: 12 - 00 x 20  82" Bogie axle: 9 - 00 x 20	Single axle: 8 - 25 x 20  19" 82" Bogie axle: 7 - 50 x 20		 5,500 lb on 12 - 00 x 20
12	Single axle: 14 - 00 x 20  84" Bogie axle: 9 - 00 x 20	Single axle: 10 - 00 x 20  23" 84" Bogie axle: 7 - 50 x 20		 8,000 lb on 14 - 00 x 20
16	Single axle: 16 - 00 x 24  90" Bogie axle: 14 - 00 x 20	Single axle: 12 - 00 x 20  26" 90" Bogie axle: 9 - 00 x 20	Single axle: 21 - 00 x 20  90" Bogie axle: 9 - 00 x 20	 10,000 lb on 16 - 00 x 24
20	Single axle: 18 - 00 x 24  96" Bogie axle: 14 - 00 x 24	Single axle: 12 - 00 x 20  26" 96" Bogie axle: 12 - 00 x 20	Single axle: 12 - 00 x 20  96" Bogie axle: 12 - 00 x 20	 11,000 lb on 18 - 00 x 24
24	Single axle: 18 - 00 x 24  96" Bogie axle: 16 - 00 x 24	Single axle: 14 - 00 x 20  32" 96" Bogie axle: 12 - 00 x 20	Single axle: 14 - 00 x 20  96" Bogie axle: 12 - 00 x 20	 12,000 lb on 18 - 00 x 24
30	Single axle: 18 - 00 x 24  96" Bogie axle: 16 - 00 x 24	Single axle: 12 - 00 x 20  26" 96" Bogie axle: 12 - 00 x 20	Single axle: 14 - 00 x 20  96" Bogie axle: 12 - 00 x 20	 13,500 lb on 18 - 00 x 24
40	Single axle: 21 - 00 x 24  100" Bogie axle: 18 - 00 x 24	Single axle: 14 - 00 x 24  32" 100" Bogie axle: 14 - 00 x 20	Single axle: 14 - 00 x 24  100" Bogie axle: 14 - 00 x 20	 17,000 lb on 21 - 00 x 24
NOTES: 1. The single-axle tire sizes shown in Columns 5, 6, and 7 refer to the maximum single-axle loads given in Column 4. 2. The bogie-axle tire sizes shown in Columns 5, 6, and 7 refer to the maximum bogie-axle loads shown on the diagrams in Column 3. 3. The maximum tire pressure for all tires shown in Column 8 should be taken as 75 psi. The first dimension of tire size refers to the overall width of the tire and the second dimension is the rim diameter of the tire.				

Table B-1. Standard Classes of Hypothetical Vehicles (continued)

Hypothetical Vehicles for Classification of Actual Vehicles and Bridges			
1	2	3	4
Class	Tracked Vehicles	Wheeled Vehicles	
		Axle Loads and Spacing	Maximum Single-Axle Load (in Short Tons)
50			
60			
70			
80			
90			
100			
120			
150			
NOTES: 1. The single-axle tire sizes shown in Columns 5, 6, and 7 refer to the maximum single-axle loads given in Column 4. 2. The bogie-axle tire sizes shown in Columns 5, 6, and 7 refer to the maximum bogie-axle loads shown on the diagrams in Column 3. 3. The maximum tire pressure for all tires shown in Column 8 should be taken as 75 psi. The first dimension of tire size refers to the overall width of the tire and the second dimension is the rim diameter of the tire.			

Table B-1. Standard Classes of Hypothetical Vehicles (continued)

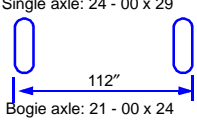
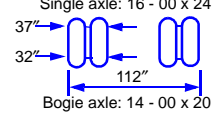
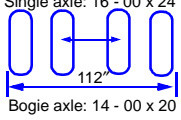

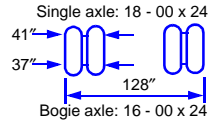
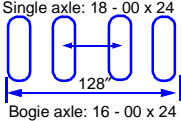

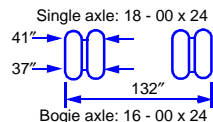
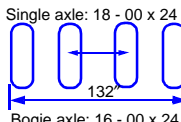

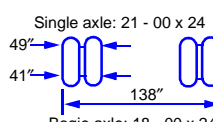
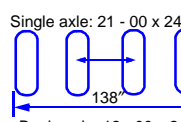

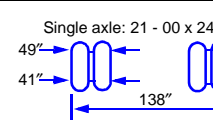
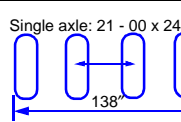

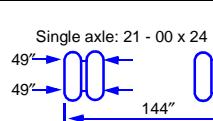
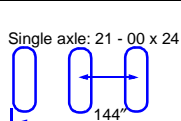

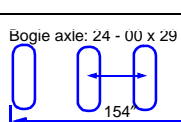

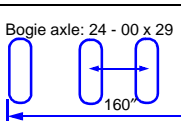

Hypothetical Vehicles for Classification of Actual Vehicles and Bridges				
1	5	6	7	8
Class	Wheeled Vehicles			
	Minimum Wheel Spacing and Tire Sizes of Critical Axles			Maximum Tire Load and Minimum Tire Size
50	 <p>Single axle: 24 - 00 x 29 Bogie axle: 21 - 00 x 24</p>	 <p>Single axle: 16 - 00 x 24 Bogie axle: 14 - 00 x 20</p>	 <p>Single axle: 16 - 00 x 24 Bogie axle: 14 - 00 x 20</p>	 <p>20,000 lb on 24 - 00 x 29</p>
60		 <p>Single axle: 18 - 00 x 24 Bogie axle: 16 - 00 x 24</p>	 <p>Single axle: 18 - 00 x 24 Bogie axle: 16 - 00 x 24</p>	 <p>20,000 lb on 24 - 00 x 29</p>
70		 <p>Single axle: 18 - 00 x 24 Bogie axle: 16 - 00 x 24</p>	 <p>Single axle: 18 - 00 x 24 Bogie axle: 16 - 00 x 24</p>	 <p>20,000 lb on 24 - 00 x 29</p>
80		 <p>Single axle: 21 - 00 x 24 Bogie axle: 18 - 00 x 24</p>	 <p>Single axle: 21 - 00 x 24 Bogie axle: 18 - 00 x 24</p>	 <p>20,000 lb on 24 - 00 x 29</p>
90		 <p>Single axle: 21 - 00 x 24 Bogie axle: 18 - 00 x 24</p>	 <p>Single axle: 21 - 00 x 24 Bogie axle: 18 - 00 x 24</p>	 <p>20,000 lb on 24 - 00 x 29</p>
100		 <p>Single axle: 21 - 00 x 24 Bogie axle: 21 - 00 x 24</p>	 <p>Single axle: 21 - 00 x 24 Bogie axle: 21 - 00 x 24</p>	 <p>20,000 lb on 24 - 00 x 29</p>
120			 <p>Bogie axle: 24 - 00 x 29</p>	 <p>20,000 lb on 24 - 00 x 29</p>
150			 <p>Bogie axle: 24 - 00 x 29</p>	 <p>21,000 lb on 24 - 00 x 29</p>
NOTES: 1. The single-axle tire sizes shown in Columns 5, 6, and 7 refer to the maximum single-axle loads given in Column 4. 2. The bogie-axle tire sizes shown in Columns 5, 6, and 7 refer to the maximum bogie-axle loads shown on the diagrams in Column 3. 3. The maximum tire pressure for all tires shown in Column 8 should be taken as 75 psi. The first dimension of tire size refers to the overall width of the tire and the second dimension is the rim diameter of the tire.				

Table B-2. Wheeled- and Tracked-Vehicle Moment (in kip-feet)

Class	Wheeled/ Tracked	Span Length (feet)										
		4	6	8	10	12	14	16	18	20	25	30
4	W	4.96	7.44	9.92	12.40	14.88	17.92	21.40	25.60	30.00	41.00	52.20
	T	2.64	6.00	9.92	14.00	18.00	22.10	25.90	29.90	34.00	44.00	54.00
8	W	10.96	16.44	21.90	27.40	32.90	38.30	43.60	49.30	54.80	71.00	93.60
	T	4.88	11.04	19.04	27.00	35.00	43.10	50.90	59.00	66.80	87.00	106.80
12	W	16.00	24.00	32.00	40.00	48.00	56.00	64.00	72.00	80.80	112.50	145.20
	T	5.44	12.00	21.30	33.00	44.90	57.10	69.10	81.00	92.80	123.00	153.00
16	W	20.00	30.00	40.00	50.00	60.00	70.00	80.00	92.50	105.20	144.00	184.20
	T	7.12	15.96	28.50	44.00	60.00	75.90	91.80	108.00	124.00	164.00	204.00
20	W	22.00	33.00	44.00	55.00	70.80	87.40	104.00	121.00	137.60	188.50	241.00
	T	8.88	20.00	35.50	55.00	74.90	94.90	114.90	135.00	154.80	205.00	255.00
24	W	24.00	36.00	48.00	64.00	83.30	102.80	122.60	142.20	162.00	223.00	285.00
	T	10.64	24.00	42.70	66.00	90.00	114.00	137.90	162.00	186.00	246.00	306.00
30	W	26.70	40.40	53.90	70.40	91.70	113.10	134.70	156.60	178.00	246.00	316.00
	T	10.88	24.50	43.70	68.20	97.40	127.40	157.40	187.60	218.00	293.00	367.00
40	W	34.00	51.00	68.00	85.00	108.30	133.80	159.40	185.00	210.00	277.00	359.00
	T	13.36	30.00	53.30	83.40	120.00	158.90	200.00	240.00	280.00	380.00	480.00
50	W	40.00	60.00	80.00	100.00	125.00	154.30	183.70	213.00	243.00	320.00	415.00
	T	15.36	34.60	61.60	96.20	138.50	187.60	237.00	288.00	338.00	463.00	587.00
60	W	46.00	69.00	92.00	115.00	138.00	170.00	205.00	240.00	276.00	365.00	474.00
	T	17.12	38.50	68.60	107.20	154.30	210.00	270.00	330.00	390.00	540.00	690.00
70	W	51.00	76.40	101.90	127.40	157.90	198.20	239.00	280.00	322.00	426.00	557.00
	T	18.64	42.00	74.70	116.60	168.00	229.00	298.00	368.00	438.00	613.00	787.00
80	W	56.00	84.00	112.00	140.00	180.50	227.00	273.00	320.00	368.00	486.00	636.00
	T	20.00	45.00	80.00	125.00	180.00	245.00	320.00	400.00	480.00	680.00	880.00
90	W	60.00	90.00	120.00	151.80	203.00	225.00	308.00	360.00	414.00	547.00	716.00
	T	21.20	47.60	84.60	132.40	190.60	259.00	339.00	427.00	518.00	743.00	967.00
100	W	64.00	96.00	128.00	160.00	203.00	259.00	317.00	375.00	434.00	581.00	765.00
	T	22.20	50.00	89.00	138.80	199.90	272.00	356.00	450.00	550.00	800.00	1,050.00
120	W	72.00	108.00	144.00	180.00	243.00	311.00	380.00	450.00	520.00	697.00	918.00
	T	24.00	54.00	96.00	150.00	216.00	294.00	384.00	486.00	600.00	900.00	1,200.00
150	W	84.00	126.00	168.00	210.00	253.00	331.00	410.00	491.00	572.00	777.00	1,032.00
	T	25.00	56.30	100.00	156.20	225.00	306.00	400.00	506.00	625.00	975.00	1,350.00

Table B-2. Wheeled- and Tracked-Vehicle Moment (in kip-feet) (continued)

Class	Wheeled/ Tracked	Span Length (feet)									
		35	40	45	50	55	60	70	80	90	100
4	W	63.70	75.20	86.40	97.00	108.90	120.00	142.80	164.80	187.20	210.00
	T	63.70	73.80	83.70	94.00	103.40	114.00	134.40	153.60	174.60	194.00
8	W	116.20	138.40	161.10	183.00	206.00	228.00	273.00	318.00	364.00	408.00
	T	126.70	147.20	167.40	187.00	207.00	227.00	267.00	307.00	347.00	386.00
12	W	180.60	218.00	256.00	293.00	331.00	368.00	444.00	518.00	592.00	668.00
	T	182.70	213.00	243.00	273.00	303.00	332.00	393.00	453.00	513.00	572.00
16	W	229.00	275.00	321.00	367.00	414.00	460.00	552.00	645.00	736.00	830.00
	T	244.00	284.00	324.00	364.00	404.00	444.00	524.00	603.00	684.00	764.00
20	W	299.00	359.00	419.00	479.00	539.00	599.00	718.00	838.00	958.00	1,078.00
	T	305.00	355.00	405.00	455.00	505.00	554.00	655.00	755.00	855.00	954.00
24	W	353.00	422.00	492.00	562.00	633.00	702.00	843.00	982.00	1,121.00	1,262.00
	T	366.00	426.00	486.00	546.00	606.00	666.00	785.00	906.00	1,026.00	1,146.00
30	W	398.00	482.00	567.00	652.00	737.00	822.00	991.00	1,162.00	1,130.00	1,500.00
	T	442.00	518.00	592.00	667.00	743.00	817.00	967.00	1,117.00	1,267.00	1,418.00
40	W	442.00	553.00	671.00	788.00	905.00	1,022.00	1,257.00	1,493.00	1,728.00	1,962.00
	T	580.00	680.00	780.00	880.00	980.00	1,080.00	1,280.00	1,480.00	1,679.00	1,880.00
50	W	511.00	656.00	800.00	945.00	1,090.00	1,235.00	1,525.00	1,814.00	2,100.00	2,390.00
	T	713.00	838.00	962.00	1,087.00	1,212.00	1,338.00	1,588.00	1,837.00	2,090.00	2,340.00
60	W	584.00	740.00	914.00	1,089.00	1,263.00	1,438.00	1,786.00	2,140.00	2,490.00	2,840.00
	T	840.00	990.00	1,140.00	1,290.00	1,440.00	1,590.00	1,890.00	2,190.00	2,490.00	2,790.00
70	W	688.00	856.00	1,057.00	1,257.00	1,458.00	1,658.00	2,060.00	2,460.00	2,870.00	3,270.00
	T	963.00	1,138.00	1,312.00	1,478.00	1,662.00	1,837.00	2,190.00	2,540.00	2,890.00	3,240.00
80	W	786.00	936.00	1,103.00	1,332.00	1,561.00	1,790.00	2,250.00	2,710.00	3,170.00	3,630.00
	T	1,080.00	1,280.00	1,480.00	1,680.00	1,880.00	2,080.00	2,480.00	2,880.00	3,280.00	3,680.00
90	W	884.00	1,053.00	1,242.00	1,499.00	1,757.00	2,010.00	2,530.00	3,050.00	3,560.00	4,080.00
	T	1,193.00	1,418.00	1,643.00	1,867.00	2,090.00	2,320.00	2,770.00	3,220.00	3,670.00	4,120.00
100	W	953.00	1,140.00	1,328.00	1,543.00	1,828.00	2,110.00	2,690.00	3,260.00	3,830.00	4,410.00
	T	1,300.00	1,550.00	1,800.00	2,050.00	2,300.00	2,550.00	3,050.00	3,550.00	4,050.00	4,550.00
120	W	1,143.00	1,368.00	1,593.00	1,851.00	2,195.00	2,540.00	3,230.00	3,910.00	4,600.00	5,290.00
	T	1,500.00	1,800.00	2,100.00	2,400.00	2,700.00	3,000.00	3,600.00	4,200.00	4,800.00	5,400.00
150	W	1,297.00	1,562.00	1,827.00	2,092.00	2,405.00	2,830.00	3,670.00	4,520.00	5,560.00	6,210.00
	T	1,725.00	2,100.00	2,478.00	2,850.00	3,230.00	3,600.00	4,350.00	5,100.00	5,850.00	6,600.00

Table B-2. Wheeled- and Tracked-Vehicle Moment (in kip-feet) (continued)

Class	Wheeled/ Tracked	Span Length (feet)									
		110	120	130	140	150	160	170	180	190	200
4	W	233	254	278	270	321	346	367	389	414	448
	T	213	233	255	274	294	314	333	353	391	428
8	W	453	499	543	588	633	678	724	767	813	880
	T	427	468	507	546	588	627	666	706	775	852
12	W	744	818	892	969	1,044	1,117	1,193	1,267	1,341	1,416
	T	634	694	754	812	873	934	993	1,051	1,136	1,248
16	W	922	1,015	1,108	1,198	1,293	1,386	1,476	1,570	1,661	1,752
	T	845	924	1,004	1,084	1,164	1,245	1,323	1,404	1,516	1,664
20	W	1,199	1,318	1,438	1,557	1,677	1,798	1,918	2,040	2,160	2,280
	T	1,054	1,154	1,256	1,355	1,455	1,555	1,656	1,753	1,896	2,080
24	W	1,401	1,543	1,682	1,823	1,962	2,100	2,240	2,380	2,520	2,660
	T	1,265	1,385	1,505	1,627	1,746	1,866	1,986	2,110	2,280	2,500
30	W	1,670	1,841	2,010	2,180	2,350	2,520	2,690	2,860	3,030	3,200
	T	1,566	1,718	1,867	2,020	2,170	2,310	2,470	2,620	2,790	3,070
40	W	2,200	2,430	2,670	2,900	3,140	3,370	3,610	3,840	4,080	4,310
	T	2,080	2,280	2,480	2,680	2,880	3,080	3,280	3,480	3,680	4,050
50	W	2,680	2,970	3,260	3,550	3,840	4,130	4,420	4,710	5,000	5,290
	T	2,590	2,840	3,090	3,340	3,590	3,840	4,090	4,340	4,590	5,020
60	W	3,190	3,540	3,880	4,230	4,580	4,930	5,280	5,630	5,990	6,330
	T	3,090	3,390	3,690	4,000	4,290	4,590	4,890	5,190	5,490	5,970
70	W	3,670	4,070	4,470	4,880	5,280	5,680	6,080	6,490	6,890	7,290
	T	3,590	3,940	4,290	4,640	4,990	5,340	5,690	6,040	6,390	6,900
80	W	4,090	4,550	5,010	5,460	5,930	6,380	6,840	7,300	7,760	8,820
	T	4,080	4,480	4,880	5,280	5,680	6,080	6,480	6,880	7,280	7,810
90	W	4,600	5,110	5,630	6,150	6,670	7,180	7,700	8,220	8,730	9,250
	T	4,570	5,020	5,470	5,920	6,370	6,820	7,270	7,720	8,170	8,700
100	W	4,980	5,560	6,130	6,710	7,280	7,860	8,430	9,000	9,580	10,160
	T	5,050	5,550	6,050	6,550	7,050	7,550	8,050	8,550	9,050	9,570
120	W	5,980	6,670	7,360	8,050	8,740	9,430	10,120	10,810	11,500	12,180
	T	6,000	6,600	7,200	7,800	8,400	9,000	9,600	10,200	10,800	11,400
150	W	7,060	7,910	8,760	9,600	10,450	11,300	12,150	13,000	13,850	14,700
	T	7,350	8,100	8,850	9,600	10,350	11,100	11,850	12,600	13,350	14,100

Table B-2. Wheeled- and Tracked-Vehicle Moment (in kip-feet) (continued)

Class	Wheeled/ Tracked	Span Length (feet)									
		210	220	230	240	250	260	270	280	290	300
4	W	491	532	579	619	665	733	799	868	934	1,002
	T	466	502	538	586	645	707	767	823	887	948
8	W	966	1,052	1,136	1,224	1,310	1,414	1,550	1,686	1,821	1,956
	T	924	1,003	1,076	1,162	1,285	1,404	1,523	1,641	1,763	1,884
12	W	1,491	1,593	1,734	1,877	2,020	2,160	2,310	2,450	2,660	2,890
	T	1,361	1,474	1,587	1,704	1,855	2,040	2,220	2,400	2,580	2,750
16	W	1,848	1,958	2,130	2,390	2,490	2,660	2,840	3,020	3,290	3,570
	T	1,814	1,967	2,120	2,270	2,480	2,710	2,950	3,200	3,430	3,680
20	W	2,400	2,540	2,770	3,000	3,230	3,460	3,690	3,920	4,270	4,630
	T	2,270	2,460	2,650	2,840	3,100	3,400	3,690	3,990	4,290	4,600
24	W	2,800	2,970	3,240	3,500	3,700	4,040	4,310	4,580	4,990	5,410
	T	2,720	2,950	3,170	3,400	3,720	4,070	4,430	4,790	5,160	5,510
30	W	3,370	3,590	3,910	4,240	4,570	4,890	5,220	5,550	6,020	6,530
	T	3,350	3,630	3,910	4,200	4,510	4,960	5,410	5,860	6,310	6,760
40	W	4,550	4,780	5,140	5,590	6,040	6,490	6,940	7,400	7,850	8,310
	T	4,430	4,800	5,180	5,560	5,940	6,520	7,120	7,720	8,320	8,920
50	W	5,580	5,870	6,370	6,930	7,480	8,030	8,590	9,150	9,710	10,270
	T	5,490	5,950	6,430	6,900	7,380	8,040	8,790	9,540	10,290	11,040
60	W	6,680	7,030	7,410	8,070	8,740	9,410	10,050	10,760	11,430	12,110
	T	6,530	7,090	7,650	8,220	8,800	9,510	10,410	11,310	12,210	13,110
70	W	7,690	8,100	8,500	9,260	10,030	10,800	11,570	12,350	13,130	13,910
	T	7,550	8,200	8,860	9,530	10,200	10,940	11,990	13,040	14,090	15,140
80	W	8,680	9,140	9,600	10,180	11,060	11,940	12,830	13,720	14,610	15,500
	T	8,550	9,300	10,060	10,810	11,580	12,340	13,520	14,720	15,920	17,120
90	W	9,770	10,290	10,810	11,450	12,450	13,440	14,430	15,440	16,440	17,440
	T	9,530	10,380	11,220	12,080	12,940	13,800	15,010	16,360	17,710	19,060
100	W	10,730	11,300	11,880	12,450	13,480	14,580	15,690	16,800	17,910	19,030
	T	10,500	11,440	12,380	13,330	14,280	15,230	16,450	17,950	19,450	21,000
120	W	12,870	13,570	14,260	14,940	16,170	17,490	18,820	20,200	21,500	22,800
	T	12,380	13,500	14,630	15,760	16,910	18,050	19,200	21,000	22,800	24,600
150	W	15,550	16,400	17,250	18,100	19,300	20,900	22,500	24,200	25,800	27,500
	T	14,910	16,320	17,720	19,140	20,600	22,000	23,400	24,700	27,200	29,400

Table B-3. Wheeled- and Tracked-Vehicle Shear (in tons)

Class	Wheeled/ Tracked	Span Length (feet)									
		4	6	8	10	12	14	16	18	20	25
4	W	2.50	2.50	2.63	2.80	2.92	3.14	3.31	3.44	3.55	3.74
	T	1.33	2.00	2.50	2.80	3.00	3.14	3.25	3.33	3.40	3.52
8	W	5.50	5.50	5.50	5.50	5.50	5.50	5.63	6.00	6.30	6.84
	T	2.46	3.69	4.75	5.40	5.83	6.14	6.38	6.56	6.70	6.96
12	W	8.00	8.00	8.00	8.00	8.33	8.57	9.13	9.56	9.90	10.52
	T	2.67	4.00	5.33	6.60	7.50	8.14	8.62	9.00	9.30	9.84
16	W	10.00	10.00	10.00	10.40	10.83	11.14	11.75	12.22	12.60	13.28
	T	3.56	5.33	7.11	8.80	10.00	10.86	11.50	12.00	12.40	13.12
20	W	11.00	11.33	12.75	13.60	14.17	14.57	15.38	16.00	16.50	17.40
	T	4.44	6.67	8.89	11.00	12.50	13.57	14.38	15.00	15.50	16.40
24	W	12.00	13.33	15.00	16.00	16.67	17.14	18.13	18.89	19.50	20.60
	T	5.53	8.00	10.67	13.20	15.00	16.28	17.25	18.00	18.60	19.68
30	W	13.50	14.67	16.50	17.60	18.33	18.86	20.00	20.89	21.60	22.88
	T	5.46	8.18	10.91	13.64	16.25	18.22	19.69	20.83	21.75	23.40
40	W	17.00	17.33	19.50	20.80	21.67	22.29	22.75	23.89	24.80	26.72
	T	6.67	10.00	13.33	16.67	20.00	22.86	25.00	26.67	28.00	30.40
50	W	20.00	20.00	22.50	24.00	25.00	25.71	26.25	27.56	28.60	31.60
	T	7.69	11.54	15.38	19.23	23.08	26.78	29.69	31.94	33.75	37.00
60	W	23.00	23.00	24.75	27.00	28.50	29.57	30.38	31.44	32.70	35.52
	T	8.57	12.86	17.14	21.43	25.72	30.00	33.75	36.67	39.00	43.20
70	W	25.50	25.50	28.88	31.50	33.25	34.50	35.44	36.75	38.33	41.16
	T	9.33	14.00	18.67	23.33	28.00	32.67	37.19	40.83	43.75	49.00
80	W	28.00	28.00	33.00	36.00	38.00	39.43	40.50	42.00	43.80	47.04
	T	10.00	15.00	20.00	25.00	30.00	35.00	40.00	44.44	48.00	54.40
90	W	30.00	31.50	37.13	40.50	42.75	44.36	45.56	47.25	49.28	52.92
	T	10.59	15.88	21.18	26.47	31.76	37.06	42.35	47.50	51.75	59.40
100	W	32.00	32.00	37.50	42.00	45.00	47.14	48.75	50.00	52.50	57.00
	T	11.11	16.67	22.22	27.78	33.33	38.89	44.44	50.00	55.00	64.00
120	W	36.00	36.00	45.00	50.40	54.00	56.57	58.50	60.00	63.00	68.40
	T	12.00	18.00	24.00	30.00	36.00	42.00	48.00	54.00	60.00	72.00
150	W	42.00	42.00	47.25	54.60	59.50	63.00	65.63	67.67	70.40	77.52
	T	12.50	18.75	25.00	31.25	37.50	43.75	50.00	56.25	62.50	78.00

Table B-3. Wheeled- and Tracked-Vehicle Shear (in tons) (continued)

Class	Wheeled/ Tracked	Span Length (feet)										
		30	35	40	45	50	55	60	70	80	90	100
4	W	3.87	3.96	4.03	4.08	4.12	4.15	4.18	4.23	4.26	4.29	4.31
	T	3.60	3.66	3.70	3.73	3.76	3.78	3.80	3.83	3.85	3.87	3.88
8	W	7.20	7.46	7.65	7.80	7.92	8.02	8.10	8.23	8.33	8.40	8.46
	T	7.13	7.26	7.35	7.42	7.48	7.53	7.57	7.63	7.68	7.71	7.74
12	W	10.93	11.23	11.45	11.62	11.76	11.87	12.13	12.54	12.85	13.09	13.28
	T	10.20	10.46	10.65	10.80	10.92	11.02	11.10	11.23	11.32	11.40	11.46
16	W	13.73	14.06	14.30	14.49	14.64	14.76	14.87	15.34	15.74	16.04	16.29
	T	13.60	13.94	14.20	14.40	14.56	14.69	14.80	14.97	15.10	15.20	15.28
20	W	18.00	18.43	18.75	19.00	19.20	19.36	19.50	19.97	20.48	20.87	21.18
	T	17.00	17.43	17.75	18.00	18.20	18.36	18.50	18.72	18.88	19.00	19.10
24	W	21.33	21.86	22.25	22.56	22.80	23.00	23.17	23.46	24.03	24.47	24.82
	T	20.40	20.92	21.30	21.60	21.84	22.04	22.20	22.46	22.65	22.80	22.92
30	W	23.73	24.34	24.80	25.16	25.60	26.36	27.00	28.00	28.75	29.33	29.80
	T	24.50	25.28	25.88	26.33	26.70	27.00	27.25	27.64	27.94	28.17	28.35
40	W	28.93	30.51	31.70	32.62	33.36	34.42	35.47	37.11	38.35	39.31	40.08
	T	32.00	33.14	34.00	34.67	35.20	35.64	36.00	36.57	37.00	37.33	37.60
50	W	34.67	36.86	38.50	40.31	42.08	43.53	44.73	46.63	48.05	49.16	50.04
	T	39.17	40.72	41.88	42.78	43.50	44.09	44.58	45.36	45.94	46.39	46.75
60	W	39.93	42.09	45.45	47.29	48.76	49.96	51.43	54.09	56.08	57.62	58.86
	T	46.00	48.00	49.50	50.67	51.60	52.36	53.00	54.00	54.75	55.33	55.60
70	W	45.97	49.40	51.98	53.98	55.58	56.89	58.22	61.40	63.79	65.64	67.13
	T	52.50	55.00	56.88	58.33	59.50	60.46	61.25	62.50	63.44	64.17	64.75
80	W	49.20	53.26	56.60	59.20	61.28	62.98	64.40	66.63	69.70	72.18	74.16
	T	58.67	61.72	64.00	65.78	67.20	68.36	69.33	70.86	72.00	72.89	73.60
90	W	55.35	59.91	63.68	66.60	68.94	70.85	72.45	74.96	78.41	81.20	83.43
	T	64.50	68.14	70.88	73.00	74.70	76.09	77.25	79.07	80.44	81.50	82.35
100	W	60.02	64.57	69.00	72.44	75.20	77.45	79.33	82.29	84.69	88.06	90.75
	T	70.00	74.28	77.50	80.00	82.00	83.64	85.00	87.14	88.75	90.00	91.00
120	W	72.02	77.49	82.80	86.93	90.24	92.94	95.20	98.74	101.60	105.70	108.90
	T	80.00	85.71	90.00	93.33	96.00	98.18	100.00	102.90	105.00	106.70	108.00
150	W	82.98	85.66	89.45	95.76	101.20	105.40	109.00	114.70	121.60	127.00	131.30
	T	90.00	98.57	105.00	110.00	114.00	117.30	120.00	124.30	127.50	130.00	132.00

Table B-3. Wheeled- and Tracked-Vehicle Shear (in tons) (continued)

Class	Wheeled/ Tracked	Span Length (feet)									
		110	120	130	140	150	160	170	180	190	200
4	W	4.33	4.52	4.83	5.13	5.39	5.61	5.81	5.99	6.15	6.29
	T	3.94	4.27	4.56	4.80	5.01	5.20	5.36	5.51	5.64	5.76
8	W	8.51	8.75	9.28	9.90	10.44	10.91	11.33	11.70	12.03	12.33
	T	7.83	8.47	9.05	9.54	9.97	10.35	10.68	10.98	11.24	11.48
12	W	13.44	13.57	13.77	14.21	15.13	16.04	16.86	17.59	18.24	18.83
	T	11.52	12.20	13.10	13.89	14.56	15.15	15.67	16.13	16.55	16.92
16	W	16.50	16.65	16.89	17.41	18.55	19.67	20.69	21.59	22.41	23.14
	T	15.35	16.27	17.48	18.51	19.41	20.20	20.89	21.51	22.06	22.56
20	W	21.44	21.65	21.95	22.63	24.12	25.58	26.89	28.07	29.12	30.06
	T	19.19	20.33	21.85	23.14	24.27	25.25	26.12	26.89	27.58	28.20
24	W	25.11	25.35	25.71	26.51	28.28	29.98	31.51	32.87	33.67	35.18
	T	23.03	24.40	26.22	27.77	29.12	30.30	31.34	32.27	33.09	33.84
30	W	30.18	30.50	30.95	31.91	33.92	35.98	37.36	39.53	41.03	42.38
	T	28.50	29.55	31.85	33.86	35.60	37.13	38.47	39.67	40.74	41.70
40	W	40.71	41.23	41.68	42.86	44.24	46.75	49.36	51.84	54.06	56.06
	T	37.82	38.89	41.85	44.57	46.93	49.00	50.82	52.44	53.89	55.20
50	W	50.76	51.37	51.88	53.46	55.29	58.40	61.60	64.62	67.33	69.76
	T	47.04	48.08	51.54	55.00	58.00	60.63	62.94	65.00	66.84	68.50
60	W	59.87	60.71	61.43	62.41	63.57	67.18	70.99	74.74	78.17	81.26
	T	56.18	57.14	60.92	65.14	68.80	72.00	74.82	77.33	79.58	81.60
70	W	68.35	69.36	70.22	71.35	73.88	76.65	80.99	85.31	89.31	92.89
	T	65.23	66.11	70.00	75.00	79.33	83.13	86.47	89.44	92.10	94.50
80	W	75.78	77.13	78.28	79.26	81.71	84.35	87.95	92.62	97.43	101.80
	T	74.18	75.00	78.85	84.57	89.60	93.89	97.77	101.20	104.30	107.10
90	W	85.25	86.77	88.06	89.16	91.92	94.89	98.85	104.20	109.60	114.50
	T	83.04	83.82	87.56	93.86	99.60	104.60	109.10	113.00	116.50	119.70
100	W	92.95	94.79	96.35	97.68	100.00	103.50	106.90	112.20	117.90	123.50
	T	91.82	92.59	96.15	102.90	109.30	115.00	120.00	124.40	128.40	132.00
120	W	111.50	113.80	115.60	117.20	120.00	124.20	128.20	134.60	141.50	148.20
	T	109.10	110.00	113.10	120.00	128.00	135.00	141.20	146.70	151.60	156.00
150	W	134.80	137.70	140.20	142.30	144.80	149.80	154.80	160.30	168.20	176.30
	T	133.60	135.00	137.00	142.90	152.00	161.30	169.40	176.70	183.20	189.00

Table B-3. Wheeled- and Tracked-Vehicle Shear (in tons) (continued)

Class	Wheeled/ Tracked	Span Length (feet)									
		210	220	230	240	250	260	270	280	290	300
4	W	6.42	6.54	6.70	6.96	7.22	7.47	7.69	7.90	8.09	8.27
	T	5.87	6.05	6.31	6.55	6.77	6.97	7.16	7.33	7.49	7.64
8	W	12.60	12.84	13.10	13.53	14.04	14.54	15.00	15.43	15.83	16.20
	T	11.70	12.03	12.55	13.02	13.46	13.87	14.24	14.59	14.92	15.22
12	W	19.36	19.85	20.29	20.69	21.06	21.50	22.15	22.91	23.67	24.38
	T	17.26	17.58	18.23	18.97	19.66	20.28	20.87	21.41	21.91	22.38
16	W	23.80	24.40	24.94	25.45	25.91	26.43	27.22	28.16	29.10	29.98
	T	23.01	23.43	24.31	25.30	26.21	27.05	27.82	28.54	29.21	29.84
20	W	30.91	31.69	32.40	33.05	33.65	34.32	35.36	36.58	37.80	38.94
	T	28.76	29.29	30.39	31.62	32.76	33.81	34.78	35.68	36.52	37.30
24	W	36.17	37.07	37.90	38.65	39.34	40.14	41.36	42.79	44.21	45.54
	T	34.51	35.15	36.47	37.95	39.31	40.57	41.73	42.81	43.82	44.76
30	W	43.60	44.71	45.72	46.65	47.50	48.48	49.91	51.60	53.34	54.96
	T	42.57	43.36	44.47	46.31	48.06	49.67	51.17	52.55	53.84	55.05
40	W	57.87	59.51	61.01	62.38	63.65	64.82	66.21	67.70	69.81	72.04
	T	56.38	57.45	58.70	61.00	63.36	65.54	67.56	69.43	71.17	72.80
50	W	71.96	73.96	75.79	77.47	79.01	80.43	82.19	84.11	86.73	89.48
	T	70.00	71.36	72.74	75.31	78.30	81.06	83.61	85.98	88.19	90.25
60	W	84.06	86.60	88.92	91.05	93.01	94.82	96.49	98.60	100.92	103.87
	T	83.43	85.09	86.65	89.29	92.88	96.23	99.33	102.20	104.90	107.40
70	W	96.13	99.08	101.80	104.20	106.50	108.60	110.60	113.00	115.60	118.90
	T	96.67	98.64	100.40	103.10	107.10	111.10	114.70	118.10	121.30	124.30
80	W	105.70	109.20	112.50	115.50	118.20	120.70	123.10	125.30	128.10	131.00
	T	109.60	112.00	114.10	116.70	121.00	125.50	129.80	133.70	137.40	140.80
90	W	118.90	122.90	126.60	129.90	133.00	135.80	138.50	140.90	144.10	147.40
	T	122.60	125.20	127.60	130.10	134.50	139.70	144.50	149.00	153.20	157.10
100	W	128.60	133.20	137.40	141.30	144.80	148.10	151.10	153.90	156.80	160.60
	T	135.20	138.20	140.90	143.50	147.70	153.50	158.90	163.90	168.60	173.00
120	W	154.30	159.80	164.90	169.50	173.80	177.70	181.40	184.70	188.20	192.70
	T	160.00	163.60	167.00	170.00	174.00	180.00	186.70	192.90	198.60	204.00
150	W	184.10	191.20	197.77	203.60	209.10	214.40	218.80	223.10	227.10	231.50
	T	194.30	199.10	203.50	207.50	211.30	216.30	223.40	231.40	239.00	246.00

STANDARD CLASSIFICATION CURVES

B-3. Standard classification curves were developed for classifying vehicles, for designing nonstandard bridges, and for estimating the capacity of existing bridges. Each standard class has a moment and a shear curve (*Figure B-1* and *Figures B-2* through *B-4*, *pages B-16* through *B-18*). The maximum moment and shear forces were induced against the simple-span lengths by the hypothetical vehicles for each standard class. These forces were plotted to determine the curves. The actual values for the curves are found in *Tables B-2* and *B-3*, *pages B-6* through *B-13*. Note that in the curves, shear is represented in units of kips; however, in *Table B-3*, shear is represented in units of tons. No allowance is made for impact, and the assumption is made that all vehicles will maintain the normal convoy spacing of 100 feet between ground contact points.

ANALYTICAL CLASSIFICATION PROCEDURE

B-4. Use the analytical method for classifying nonstandard or enemy vehicles in the TO. Standard vehicles are normally classified using *FM 5-170*, but if necessary, use the analytical method to classify standard vehicles.

B-5. To classify a vehicle using the analytical method, the following dimensional and weight-distribution data are needed:

- Weight (empty and loaded).
- Load on each axle (empty and loaded).
- Load on the fifth wheel, pintle, and so forth (empty and loaded).
- Tire size and pressure per axle.
- Number of tires per axle.
- Distance between the axles.
- Distance from the pintle or fifth wheel to the nearest wheel.
- Width (outside-to-outside) of the tires or tracks and width (inside-to-inside) of the tires or tracks.
- Length of the track that is in contact with the ground.

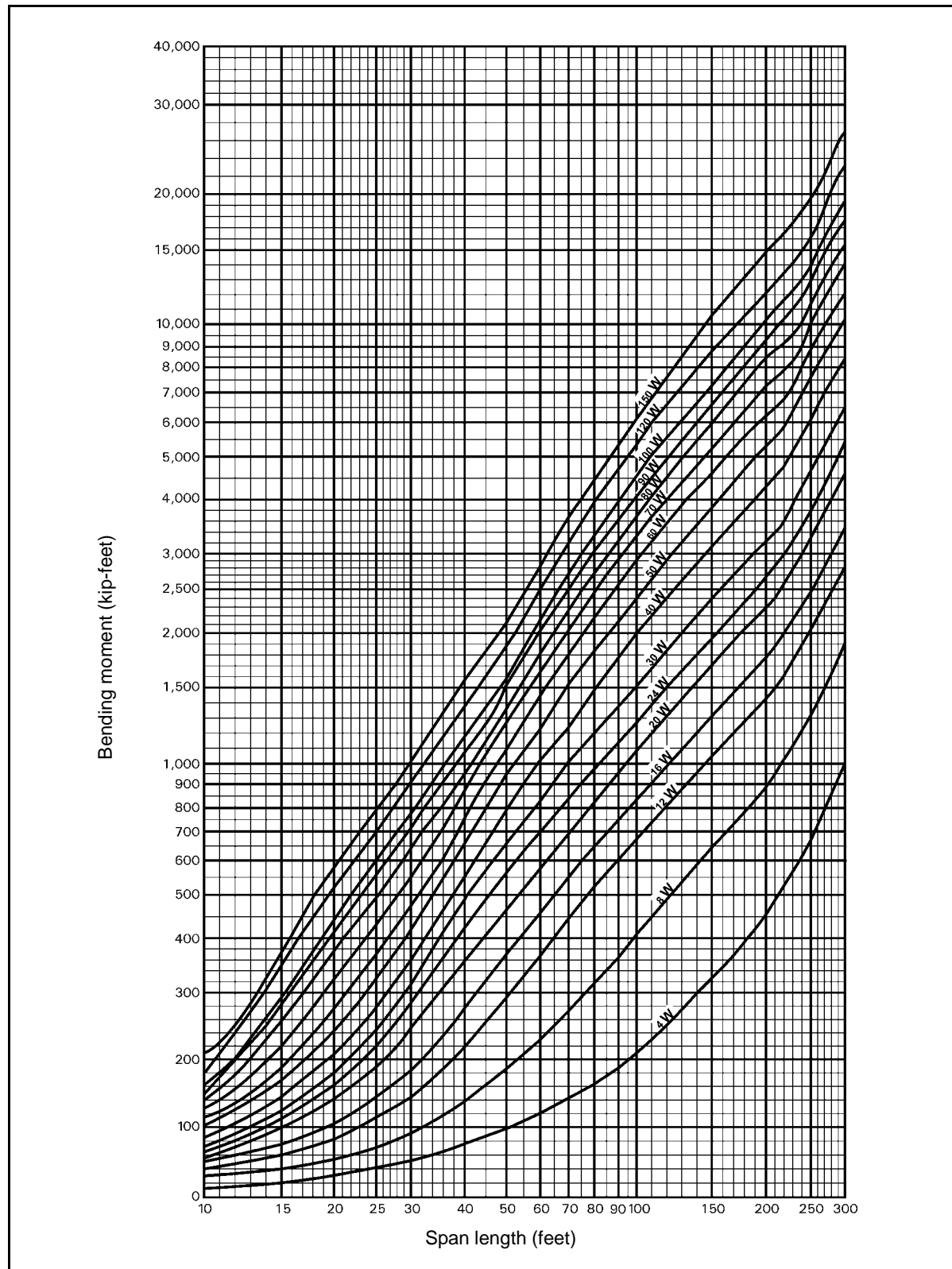


Figure B-1. Wheeled Bending Moment

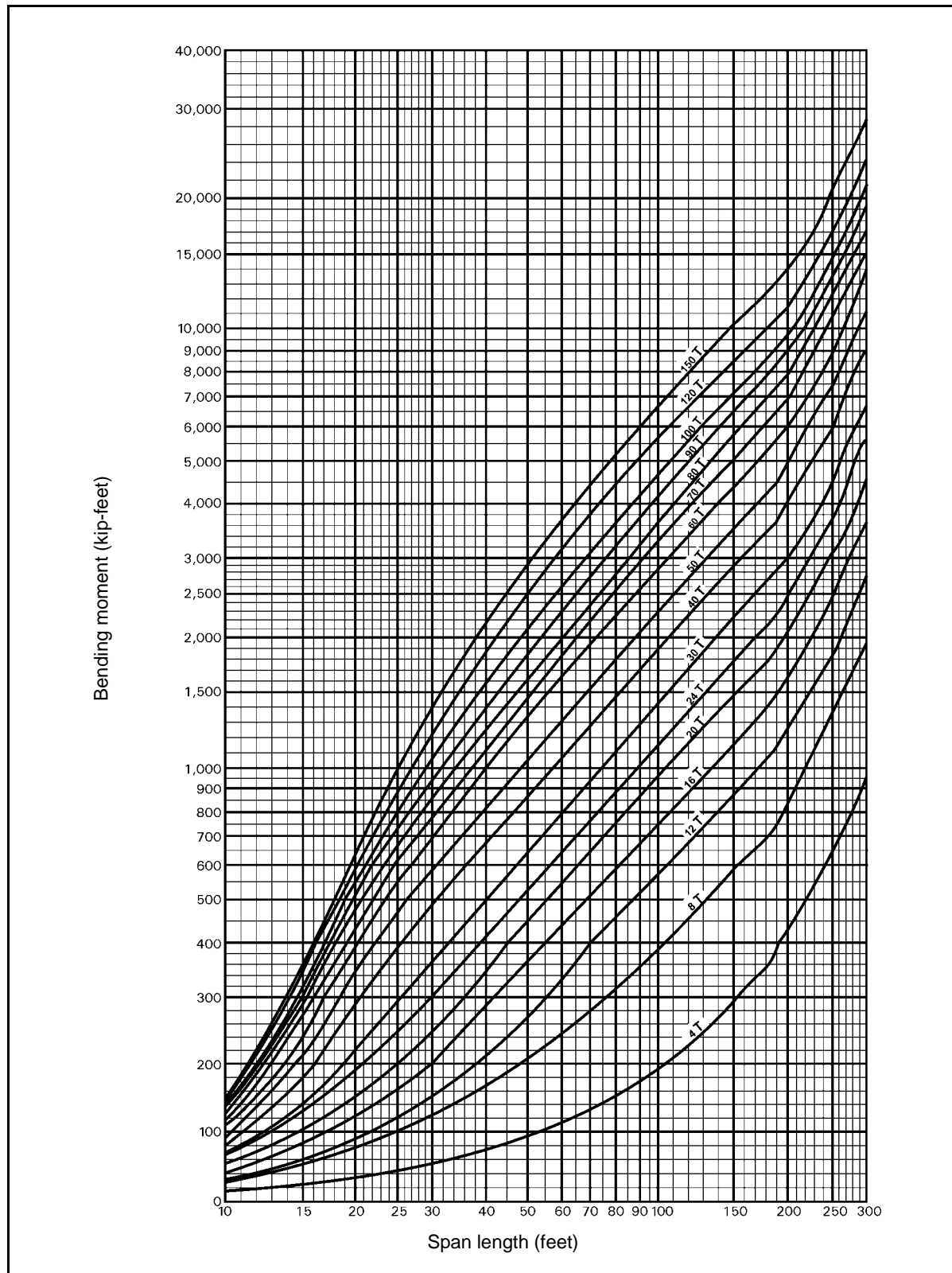


Figure B-2. Tracked Bending Moment

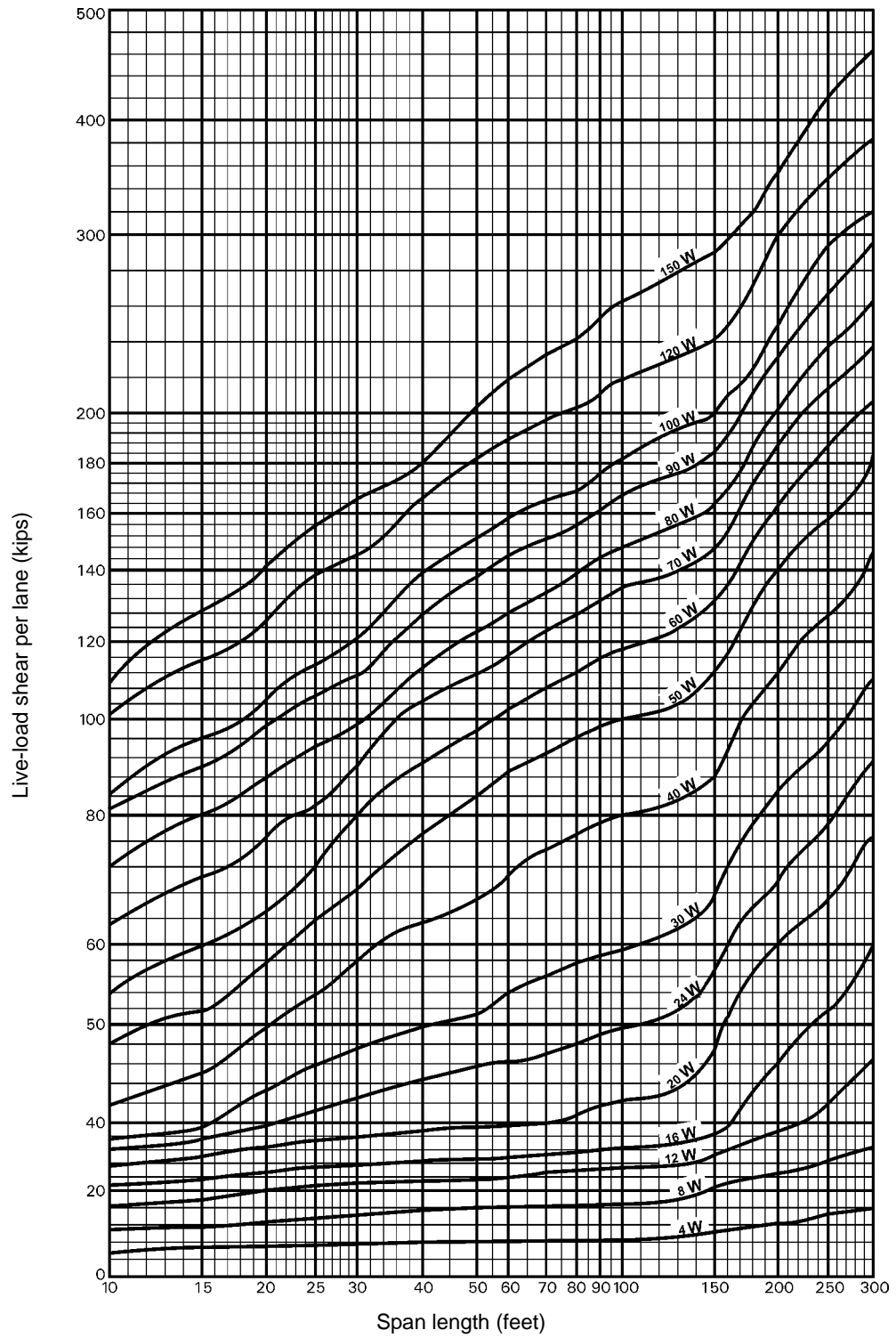


Figure B-3. Wheeled Shear

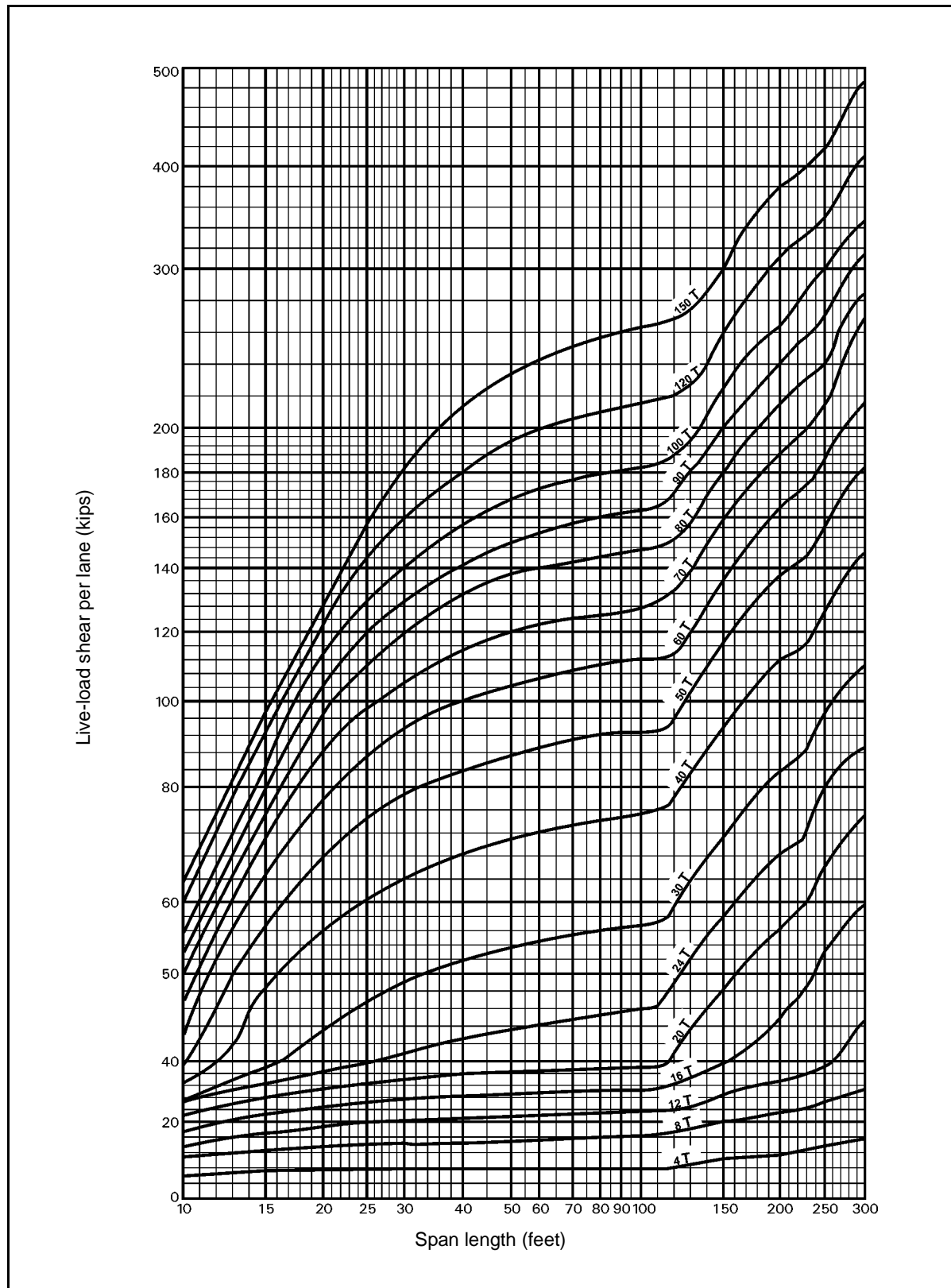


Figure B-4. Tracked Shear

B-6. As a wheeled vehicle moves over a span, the wheel loads are fixed in position relative to each other (they travel over the span as a group). For this type of loading, determine which position produces the largest moment. For maximum moment, the vehicle's center of gravity and the wheel nearest the center of gravity must be equal distances from the center of the span. Follow these steps to classify a given vehicle:

Step 1. Compute the maximum moment (in kip-feet) produced by the vehicle on each of five or six simple spans of different lengths between 10 and 300 feet.

Step 2. Use *Figure B-1, page B-15*, to plot the moment and span length of a wheeled vehicle, and use *Figure B-2, page B-16*, to plot the moment and span length of a tracked vehicle. Assign a class number by interpolating between the curves at the point where the class number is the largest.

Step 3. Compute and plot the shear points on the curves in *Figure B-3, page B-17*, or *Figure B-4*. Assign a new class number if the class is higher because of the shear.

Step 4. Use *Table B-1, pages B-2 through B-5*, to compute the hypothetical width by linear interpolation between standard hypothetical vehicles.

Step 5. Compare the actual and the hypothetical widths. Then increase or decrease the class number by the percentage given in *Figure B-5*.

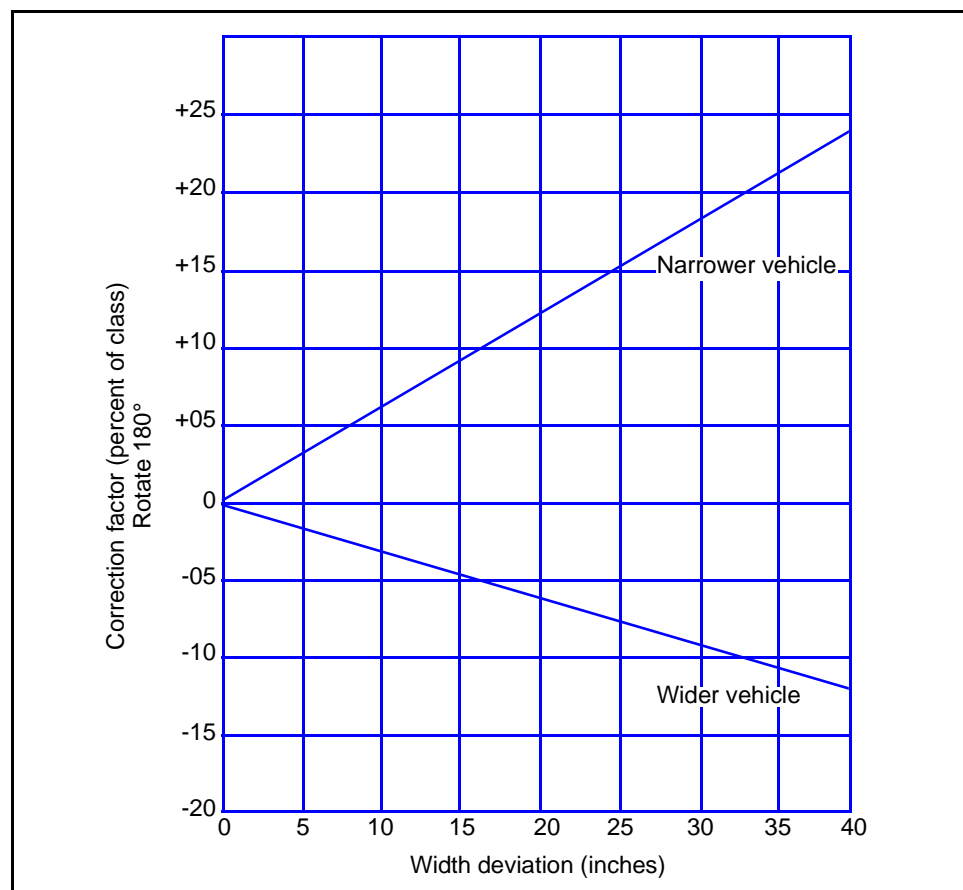


Figure B-5. Width Correction Factor

B-7. Increase the classification if the vehicle's outside-to-outside track or tire width is narrower than the corresponding hypothetical vehicle. Decrease the classification if the vehicle's outside-to-outside width is wider than the corresponding hypothetical vehicle. The maximum axle or tire load of the vehicle may exceed that given in the hypothetical vehicle chart (*Table B-1, pages B-2 through B-5*). If it does, increase the class to that of the hypothetical vehicle of the same maximum axle or tire load, interpolating between the values in the chart if necessary. Round the final classification up to the nearest whole number.

EXPEDIENT CLASSIFICATION PROCEDURE

B-8. Use expedient methods to classify vehicles in an emergency. To obtain a permanent classification, however, reclassify by using the analytical method as soon as possible. *FM 5-170* provides guidance for this purpose.

VEHICLE-CLASSIFICATION SIGNS

B-9. Vehicles are divided into two categories for classification purposes—single and combination.

SINGLE VEHICLES

B-10. A single vehicle has only one frame or chassis (*Figure B-6*). Examples are trucks, tanks, trailers, and gun carriages. Single vehicles are assigned a class number that is rounded up to the nearest whole number. All vehicles except trailers have front signs to show their classifications when loaded to the rated capacity. For unloaded or overloaded vehicles, adjust the front sign to show the actual load classification.

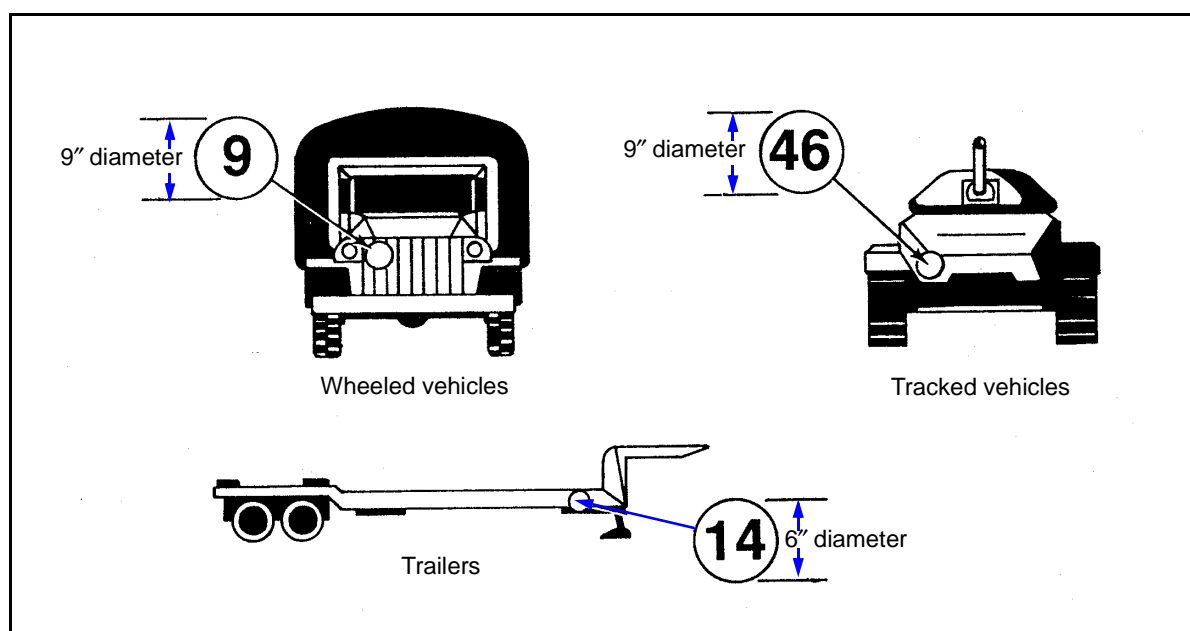


Figure B-6. Classification Markings for Single Vehicles

COMBINATION VEHICLES

B-11. A combination vehicle is two or more single vehicles operating as one unit (such as prime movers pulling semitrailers). One vehicle towing another less than 100 feet behind is also a combination vehicle (nonstandard). The sign on the front of the combination vehicle (towing vehicle or prime mover) has the letter “C” above the classification number of the combination (*Figure B-7*).

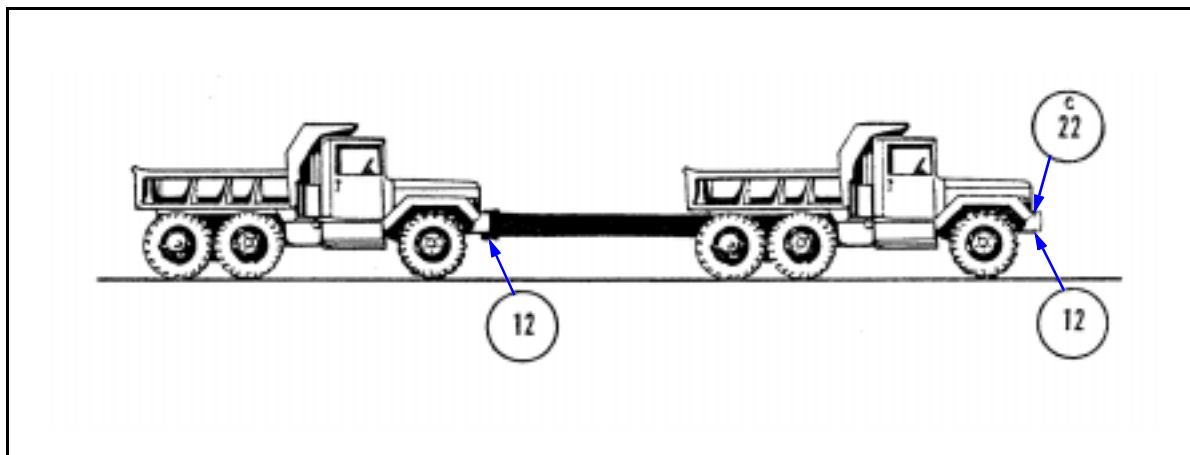


Figure B-7. Classification Markings of Nonstandard Combination Vehicles

SHAPE, COLOR, AND SIZE

B-12. The front and the side signs are circular and are marked in contrasting colors consistent with camouflage requirements. Black figures on a yellow background are normally used. The front signs are 9 inches in diameter, and the side signs are 6 inches in diameter. The figures should be as large as the sign allows.

LOCATION

B-13. Place or paint the front sign on or above the bumper, below the driver's line of vision. When possible, place it on the right front (passenger side) of the vehicle. Place or paint the side signs on the right side of the vehicle facing outward (*Figure B-7*).

