SECTION 5A

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OFF-HIGHWAY DUMP TRUCKS

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- **High maneuverability:** Exceptionally small turning radius makes the Dump Trucks just as maneuverable as one-class lower dump trucks.
- **Low loading height:** Lower loading height makes loading easy.
- **Efficient power train:** Komatsu diesel engine is reknowned for rugged power, long life and low fuel consumption. Komatsu TORQFLOW transmission features several speeds forward and one speed reverse with torque converter and automatic lockup mechanism for optimum speed and rimpull.
- **Durable brakes:** Oil-cooled multiple-disc brakes in the rear wheels are designed for extended operation;these large capacity brakes are full-sealed against dirt and water, and require no internal adjustment. They also act as retarder brakes and will not fade, even after repeated stops. Two, independent brake lines are installed on all brakes for sure stops. The parking brake is automatically applied should air pressure drop abnormally.
- **Great comfort and high stability:** Sound suppressed cab, hydropneumatic suspension, low center of gravity, long wheelbase and wide tread combine to assure excellent traveling stability and greater operator comfort.
- **Extra sturdiness:** High-tensile-strength steel is used in body construction to assure high resistance to impact and wear. Box-type frame construction, also of high-tensile-strength steel plate, makes for rugged durability even under the severest operating conditions.
- **Easy maintenance:** Filters(full-flow, fuel, transmission, hydraulic)are concentrated on the left side of the machine for easy replacement.

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Item	Model	HD180-4	HD200-2	HD325-5
WEIGHT:	kg(lb)			
Empty vehicle weight		16790 (37,020)	18500 (40,780)	27200 (59,970)
Distributed weight (front)		7070 (15,590)	8800 (19,400)	13060 (28,790)
(rear)		9720 (21,430)	9700 (21,390)	14140 (31,170)
Gross vehicle weight		34900 (76,940)	38555 (85,000)	59255 (130,630)
Distributed gross weight (front)		8720 (19,220)	11600 (25,570)	18960 (41,800)
(rear)		26180 (57,720)	26955 (59,430)	40295 (88,830)
Gross horsepower	HP(kW)/RPM	250(184)/2100	300(224)/2100	487(363)/2100
Flywheel horsepower	HP(kW)/RPM	230(169)/2100	280(209)/2100	463(346)/2100
HAULING CAPACITY:				
Maximum load	kg(U.S.ton)	18000 (20)	20000 (22)	32000 (3.5)
Heaped capacity(2:1)	m^3(cu.yd)	14.2 (18.6)	15.2 (19.9)	24 (31.4)
PERFORMANCE:				
Maximum speed	km/h(MPH)	52 (32.3)	50 (31.1)	70 (43.5)
Turning radius	m(ft.in)	9.0 (29'6")	7.0 (23')	7.2 (23'7")
ENGINE:		KOMATSU-CUMMINS	KOMATSU-CUMMINS	KOMATSU
Model		NTO-6	NTC-743	SA6D140
No.of cylinders		6	6	6
Bore × Stroke	mm(in)	130.2 × 152.4 (5.13" × 6")	130.2 × 152.4 (5.13" × 6")	140 × 165 (5.51" × 6.50")
Displacement	ltr.(cu.in)	12.17 (743)	12.17 (743)	15.2 (928)
DIMENSION:	mm(ft.in)			
Overall length		7295 (23' 11")	7450 (24' 5")	7650 (25' 1")
Overall width		3000 (9' 10")	3200 (10' 6")	3670 (12')
Overall height		3300 (10' 10")	3450 (11' 4")	3950 (13')
Ground clearance		385 (1' 3")	420 (1' 5")	500 (1' 8")
Loading height		2800 (9' 2")	2650 (8' 8")	3150 (10' 4")
Height of body top (when dumped)		6100 (20')	6400 (21')	7620 (25')
Wheelbase		4000 (13' 2")	3750 (12' 4")	3750 (12' 4")
Tread (front)		2010 (6' 7")	2540 (8' 4")	3150 (10' 4")
(rear)		2030 (6' 8")	2030 (6' 8")	2550 (8' 4")
TIRES:				
Front tire		14.00 – 25 – 20PR × 2	16.00 – 25 – 24PR × 2	18.00 – 33 – 28PR × 2
Rear tire		16.00 – 25 – 24PR × 4	16.00 – 25 – 24PR × 4	18.00 – 33 – 28PR × 4
CAPACITY:	ltr.(U.S.Gal)			
Fuel tank		400 (105.7)	380 (100)	500 (132.0)

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Item	Model	HD465-3	*HD465-3	HD785-2
WEIGHT:	kg(lb)			
Empty vehicle weight		36770 (81,060)	37770 (83,270)	55000 (121,250)
Distributed weight (front)		17650 (38,910)	18130 (39,970)	26400 (58,200)
Distributed weight (rear)		19120 (42,150)	19640 (43,300)	28600 (63,050)
Gross vehicle weight		82825 (182,600)	83825 (182,600)	133055 (293,330)
Distributed gross weight (front)		26500 (58,420)	26825 (59,140)	42580 (93,870)
Distributed gross weight (rear)		56325 (124,180)	57000 (125,660)	90475 (199,460)
Gross horsepower	HP(kW)/RPM	730(544)/2100	730(544)/2100	931(694)/2100
Flywheel horsepower	HP(kW)/RPM	702(524)/2100	702(524)/2100	890(664)/2100
HAULING CAPACITY:				
Maximum load	kg(U.S.ton)	46000 (51)	46000 (51)	78000 (85)
Heaped capacity(2:1)	m^3(cu.yd)	34.2 (44.7)	34.2 (44.7)	52 (68)
PERFORMANCE:				
Maximum speed	km/h(MPH)	62 (38.5)	65 (40.4)	66 (41.0)
Turning radius	m(ft.in)	8.5 (27'11")	9.5 (31'2")	9.9 (32'6")
ENGINE:		KOMATSU	KOMATSU	KOMATSU
Model		SA6D170	SA6D170	SA8V170
No.of cylinders		6	6	8
Bore × Stroke	mm(in)	170 × 170 (6.7" × 6.7")	170 × 170 (6.7" × 6.7")	170 × 170 (6.7" × 6.7")
Displacement	ltr.(cu.in)	23.1 (1410)	23.1 (1410)	30.9 (1886)
DIMENSION:	mm(ft.in)			
Overall length		9000 (29' 6")	9000 (29' 6")	10130 (33' 3")
Overall width		4050 (13' 3")	4050 (13' 3")	5700 (18' 8")
Overall height		4250 (13'11")	4310 (14' 2")	4920 (16' 2")
Ground clearance		565 (1'10")	625 (2' 1")	725 (2' 5")
Loading height		3350 (11')	3410 (11' 2")	4080 (13' 5")
Height of body top (when dumped)		8500 (27'11")	8560 (28' 1")	9055 (29' 9")
Wheelbase		4250 (13'11")	4250 (13'11")	4750 (15' 7")
Tread (front)		3470 (11' 5")	3470 (11' 5")	4200 (13' 9")
Tread (rear)		2770 (9' 1")	2770 (9' 1")	3400 (11' 2")
TIRES:				
Front tire		21.00 – 35 – 32PR × 2	24.00 – 35 – 30PR × 2	24.00 – 49 – 42PR × 2
Rear tire		21.00 – 35 – 32PR × 4	24.00 – 35 – 30PR × 4	24.00 – 49 – 42PR × 4
CAPACITY:	ltr.(U.S.Gal)			
Fuel tank		780 (206.1)	780 (206.1)	1240 (327.6)

* With large tires.

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Specifications

OFF-HIGHWAY DUMP TRUCKS

Item	Model	*HD785-2	**HD1200-1	HD1200-1
WEIGHT:	kg(lb)			
Empty vehicle weight		58240 (128,400)	87960 (193,920)	89460 (197,220)
Distributed weight (front)		27955 (61,630)	39406 (86,880)	41046 (90,490)
(rear)		30285 (66,770)	48554 (107,040)	48414 (106,730)
Gross vehicle weight		136295 (300,480)	208015 (458,590)	209515 (461,900)
Distributed gross weight (front)		43615 (96,150)	66773 (147,210)	68416 (150,830)
(rear)		92680 (204,320)	141242 (311,380)	141099 (311,070)
Gross horsepower	HP(kW)/RPM	931(694)/2100	1331(993)/2100	1331(993)/2100
Flywheel horsepower	HP(kW)/RPM	890(664)/2100	1144(854)/2100	1290(962)/2100
HAULING CAPACITY:				
Maximum load	kg(U.S.ton)	78000 (85)	120000 (132)	120000 (132)
Heaped capacity(2:1)	m^3(cu.yd)	52 (68)	70 (91.6)	70 (91.6)
PERFORMANCE:				
Maximum speed	km/h(MPH)	62 (38.5)	57.5 (35.7)	57.5 (35.7)
Turning radius	m(ft.in)	9.9 (32'6")	10.3 (33'10")	10.3 (33'10")
ENGINE:		KOMATSU	CUMMINS	KOMATSU
Model		SA8V170	KTA-2300	SA12V170
No.of cylinders		8	12	12
Bore × Stroke	mm(in)	170 × 170 (6.7" × 6.7")	158.8 × 158.8 (6.25" × 6.25")	170 × 170 (6.7" × 6.7")
Displacement	ltr.(cu.in)	30.9 (1886)	37.7 (2300)	46.3 (2825)
DIMENSION:	mm(ft.in)			
Overall length		10130 (33' 3")	10885 (35' 9")	10885 (35' 9")
Overall width		5700 (18' 8")	6565 (21' 6")	6565 (21' 6")
Overall height		5010 (16' 5")	5170 (17')	5170 (17')
Ground clearance		815 (2' 8")	715 (2' 4")	715 (2' 4")
Loading height		4170 (13' 8")	4530 (14'10")	4530 (14'10")
Height of body top (when dumped)		9140 (30' 1")	10615 (34'10")	10615 (34'10")
Wheelbase		4750 (15' 7")	5400 (17' 9")	5400 (17' 9")
Tread (front)		4124 (13' 6")	4965 (16' 3")	4965 (16' 3")
(rear)		3400 (11' 2")	4020 (13' 2")	4020 (13' 2")
TIRES:				
Front tire		27.00 – 49 – 42PR × 2	30.00 – 51 – 46PR × 2	30.00 – 51 – 46PR × 2
Rear tire		27.00 – 49 – 42PR × 4	30.00 – 51 – 46PR × 4	30.00 – 51 – 46PR × 4
CAPACITY:	ltr.(U.S.Gal)			
Fuel tank		1240 (327.6)	1900 (502.0)	1900 (502.0)

* With large tires

** With CUMMINS engine

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Specifications

OFF-HIGHWAY DUMP TRUCKS

Item	Model	HD1200M-1	HD1600M-1	
WEIGHT:	kg(lb)			
Empty vehicle weight		85800 (189,150)	107500 (236,990)	
Distributed weight				
(front)		40730 (89,790)	48105 (106,050)	
(rear)		45070 (99,360)	59450 (131,060)	
Gross vehicle weight		205855 (453,820)	267555 (589,850)	
Distributed gross weight (front)		68930 (151,960)	87260 (192,370)	
(rear)		136925 (301,860)	180295 (397,480)	
Gross horsepower	HP(kW)/RPM	1232(919)/2100	1600(1194)/2100	
Flywheel horsepower	HP(kW)/RPM	1177(878)/2100	1496(1116)/2100	
HAULING CAPACITY:				
Maximum load	kg(U.S.ton)	120000 (132)	160000 (176)	
Heaped capacity(2:1)	m^3(cu.yd)	70 (91.6)	90 (117.7)	
PERFORMANCE:				
Maximum speed	km/h(MPH)	60 (37.3)	62 (38.5)	
Turning radius	m(ft.in)	10.3 (33'10")	10.9 (35'9")	
ENGINE:		KOMATSU	CUMMINS	
Model		SA12V170	KTA-3067	
No.of cylinders		12	16	
Bore × Stroke	mm(in)	170 × 170 (6.69" × 6.69")	158.8 × 158.8 (6.25" × 6.25")	
Displacement	ltr.(cu.in)	46.3 (2825)	50.3 (3067)	
DIMENSION:	mm(ft.in)			
Overall length		10980 (36')	11640 (38' 2")	
Overall width		6565 (21' 6")	7100 (23' 4")	
Overall height		5090 (16' 8")	5685 (18'8")	
Ground clearance		820 (2' 8")	850 (2' 9")	
Loading height		4530 (14'10")	4979 (16' 4")	
Height of body top (when dumped)		10790 (35' 5")	11635 (38' 2")	
Wheelbase		5400 (17' 9")	6000 (19' 8")	
Tread (front)		5015 (16' 5")	5570 (18' 3")	
(rear)		4020 (13' 2")	4380 (14' 4")	
TIRES:				
Front tire		30.00 – 51 – 46PR × 2	36.00 – 51 – 50PR × 2	
Rear tire		30.00 – 51 – 46PR × 4	36.00 – 51 – 50PR × 4	
CAPACITY:	ltr.(U.S.Gal)			
Fuel tank		1900 (502.0)	1900 (502.0)	

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SELECTION OF TIRES

1. Dump Truck

Komatsu Dump Trucks employ the tubeless tire only.
Every tire size is classified into E3 and E4 codes.
Either E3 or E4 code has CR, GP or HR characteristics to meet specific operating conditions. The relation between the tire characteristics and operating conditions is shown in the bottom table.

TIRE SELECTION TABLE

Machine Model	Applicable Size	Standard Tire
HD180 (Front)	14.00-25-20PR	E3 - CR
HD180 (Rear) HD200	16.00-25-25PR	E3 - CR
HD325	18.00-33-28PR 18.00-33-32PR	E3 - CR
HD465	21.00-35-32PR 21.00-35-36PR	E3 - CR
HD465 (Large size)	24.00-35-42PR 24.00-35-48PR	E3 - CR
HD785	24.00-49-42PR 27.00-49-42PR	E3 - CR
HD1200 & HD1200M	30.00-51-46PR 30.00-51-50PR	E3 - CR
HD1600M	36.00-51-50PR	E3 - CR

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TIRE CHARACTERISTICS AND OPERATING CONDITIONS

Charact-eris tics	Haul Distance and Payload			Surface Condition							
	Low TMPH	Middle TMPH	High TMPH	Rocks Scatter-ed on Surface			Surface Ruggedness			Subbase	
				Thin	Norm-al	Thick	Good	Norm-al	Bad	Norm-al	Soft
CR	o				o	o		o	o	o	o
GP		o			o			o		o	
HR SHR			o	o			o			o	

TMPH RATING AT AMBIENT TEMPERATURE °C (°F)

Where the ambient temperature in an operating environment is high or where a long haul or high-speed drive is required, the standard tires cannot sometimes be suitable because of its small TMPH.

TMPH should vary depending on the atmospheric temperature. Thus, under the above operating conditions, it is recommended that the optimum tires to determined after obtaining TMPH by applying the previously stated formulas and referring to the table below.

NOTES: 1. The TMPH Rating varies depending on the tire manufacturer.
2. The TMPH Rating is based on U.S. ton. (not on metric ton)

1. Dump Truck

$$<\Delta TMPH = 1.46 \times \Delta TKPH>$$

Model	Size	Code	Charac-teristics	TMPH at various ambient temperatures			
				16°C (60°F)	27°C (80°F)	38°C (100°F)	49°C (120°F)
HD180 (Front)	14.00-25	E3	CR	75	70	65	60
			GP	85	80	74	69
			HR	–	–	–	–
		E4	CR	57	53	50	46
			GP	74	70	65	60
			HR	–	–	–	–
HD180 (Rear) HD200	16.00-25	E3	CR	97	91	85	79
			GP	109	102	95	88
			HR	–	–	–	–
		E4	CR	80	75	70	64
			GP	92	86	80	74
			HR	–	–	–	–

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Model	Size	Code	Charac-teristics	TMPH at various ambient temperatures			
				16°C (60°F)	27°C (80°F)	38°C (100°F)	49°C (120°F)
HD325	18.00-33	E3	CR	155	145	135	124
			GP	172	161	150	139
			HR	229	215	193	185
		E4	CR	132	123	115	107
			GP	149	140	130	120
			HR	195	182	170	157
HD465	21.00-35	E3	CR	195	182	170	157
			GP	212	198	185	171
			HR	281	263	263	226
		E4	CR	167	156	145	134
			GP	178	166	155	143
			HR	234	220	205	183
HD785	24.00-49	E3	CR	–	–	–	–
			GP	339	317	329	273
			HR	407	381	355	329
		E4	CR	242	226	210	194
			GP	281	263	245	226
			HR	344	322	300	277
HD785	27.00-49	E3	CR	–	–	–	–
			GP	413	387	367	333
			HR	436	408	380	352
		E4	CR	287	268	250	231
			GP	339	317	295	273
			HR	413	387	360	333
			SHR	454	424	395	365
HD1200 HD1200M	30.00-51 -46PR	E4	CR	–	–	–	–
			GP	391	370	350	329
			HR	470	444	420	395
			SHR	520	492	465	437
	33.00-51 -50PR	E4	CR	369	350	330	310
			GP	431	407	385	362
			HR	514	487	460	432
			SHR	576	546	515	484

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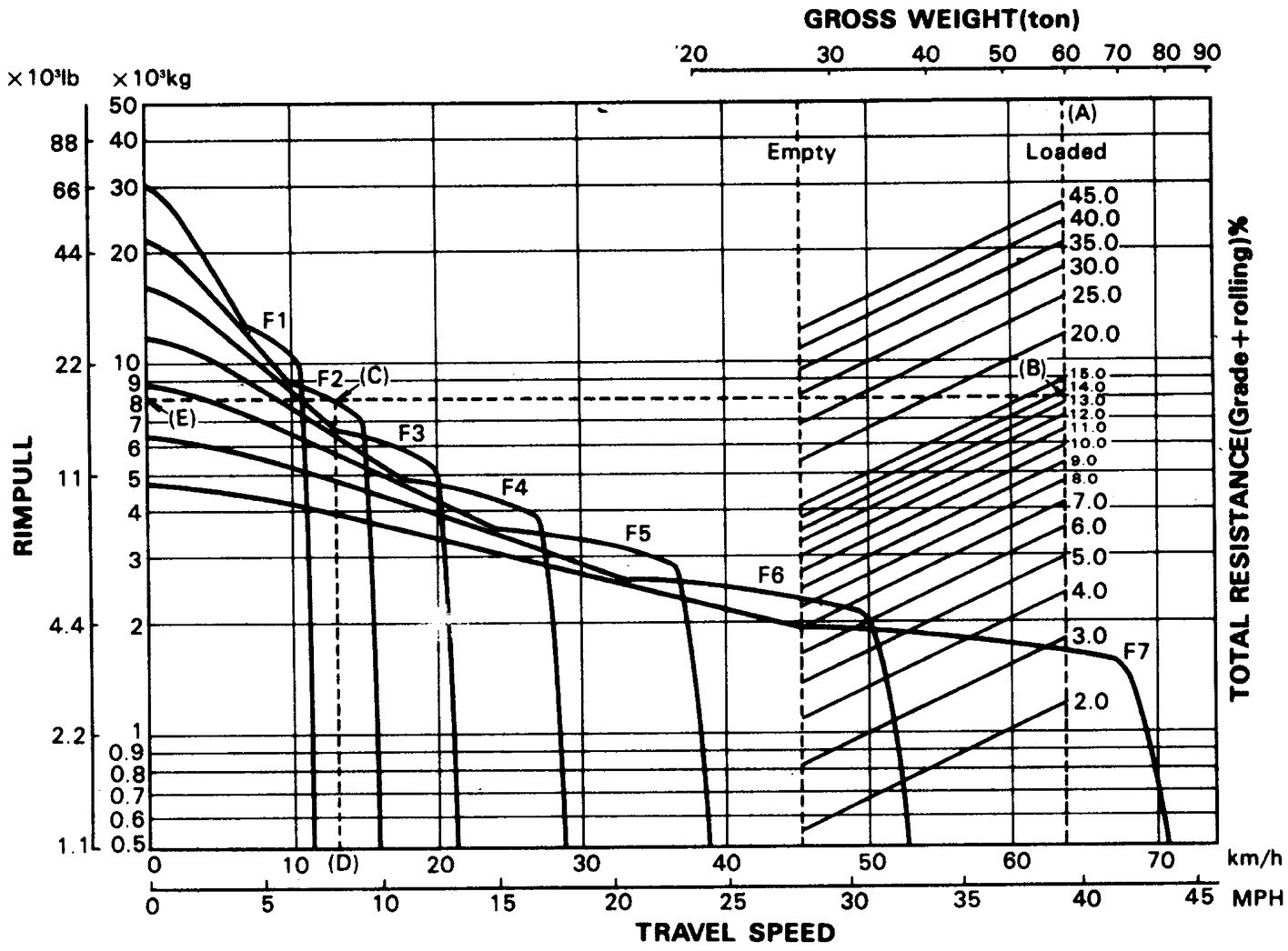
Use of travel performance curve

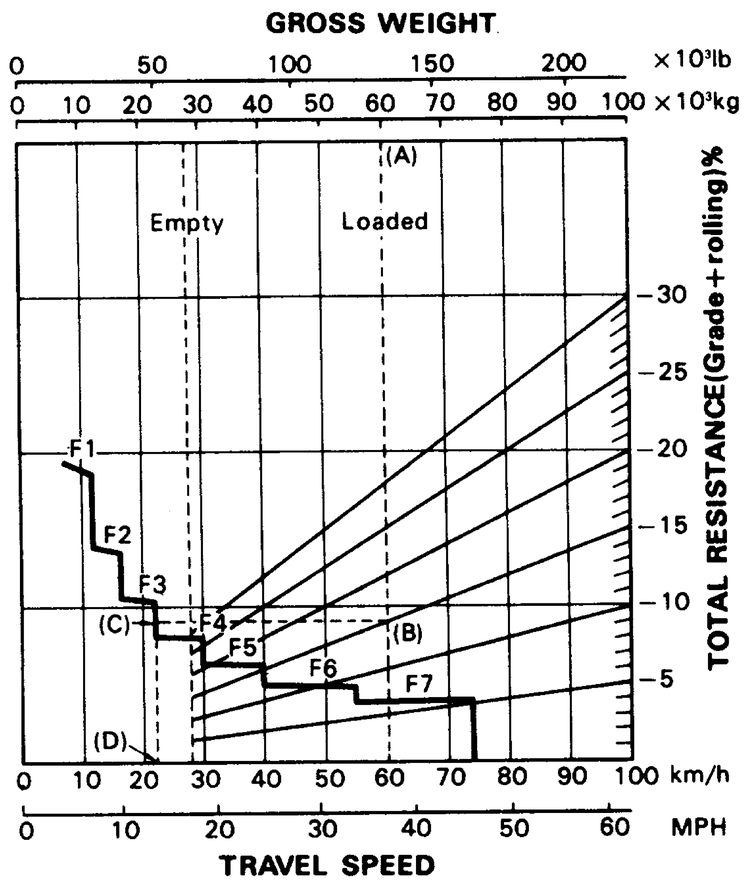
For assessing a vehicle's gradeability, travel speed, rimpull, etc. First, draw a vertical line according to the vehicle's weight (A) and mark the point (B) corresponding to total resistance (the sum of rolling resistance and grade resistance). Next, draw a horizontal line from (B), then mark (C) where the line intersects the rimpull curve and read (E) for the rimpull. For travel speed (D), draw a vertical line downward from (C). For instance, when traveling an 8% gradient and encountering a 5% rolling resistance, a vehicle with a 32-ton (35-U.S. ton) payload should have a rimpull of 8 tons (17,640 lb) and travel at a speed of 13 km/h (8.1 MPH) in forward 2nd gear.



Use of brake performance curve

These curves are provided for establishing the maximum speed and gearshift position for safe descent of a road with a given gradient at a given distance.
For example, let us assume the total resistance is −15% (gradient resistance −16% plus rolling resistance +1%) on the "1500 m (1,480 ft) graph. First, draw a vertical line from the total vehicle weight (A) so that it crosses the slanted line of 15% total resistance (B). From (B), draw a horizontal line to the left and it will cross the stair curve (C). Finally, draw a vertical line from (C) and read (D) the maximum speed for driving safely down the slope. In this case, a vehicle with a 32-ton payload should travel at approximately 22 km/h (13.7 MPH) with the F3 gear.

Grade distance: 1500 m (4,920 ft)



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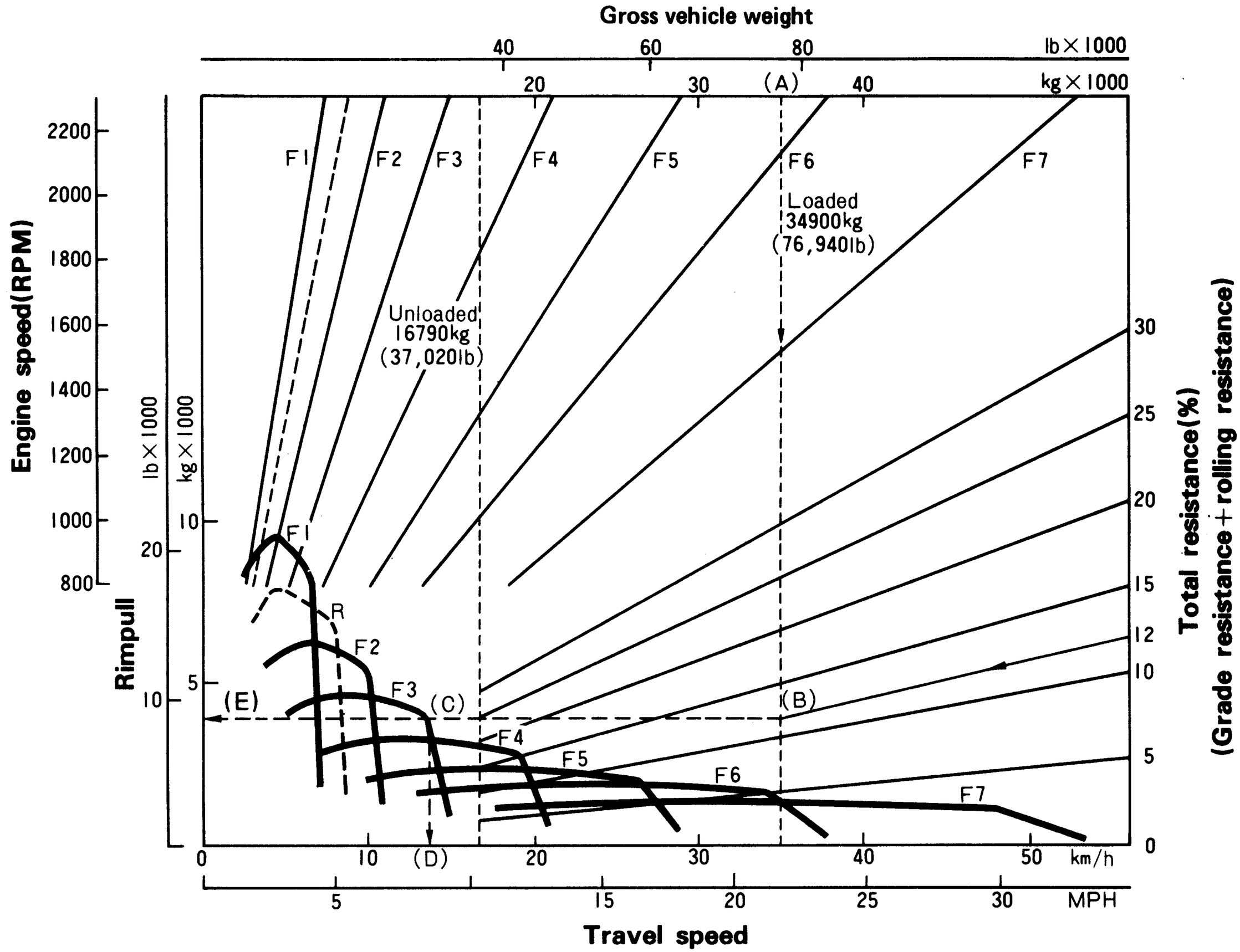

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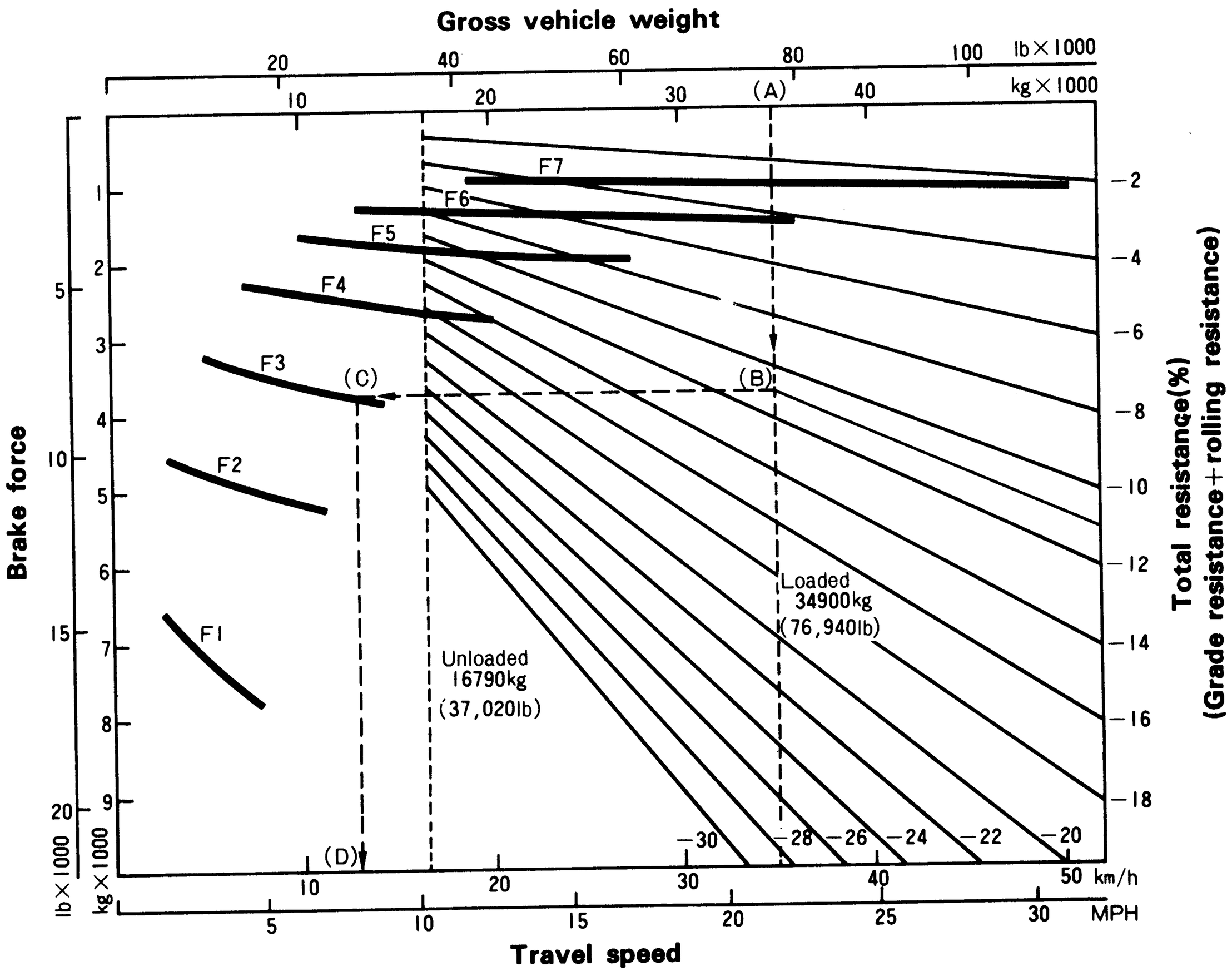

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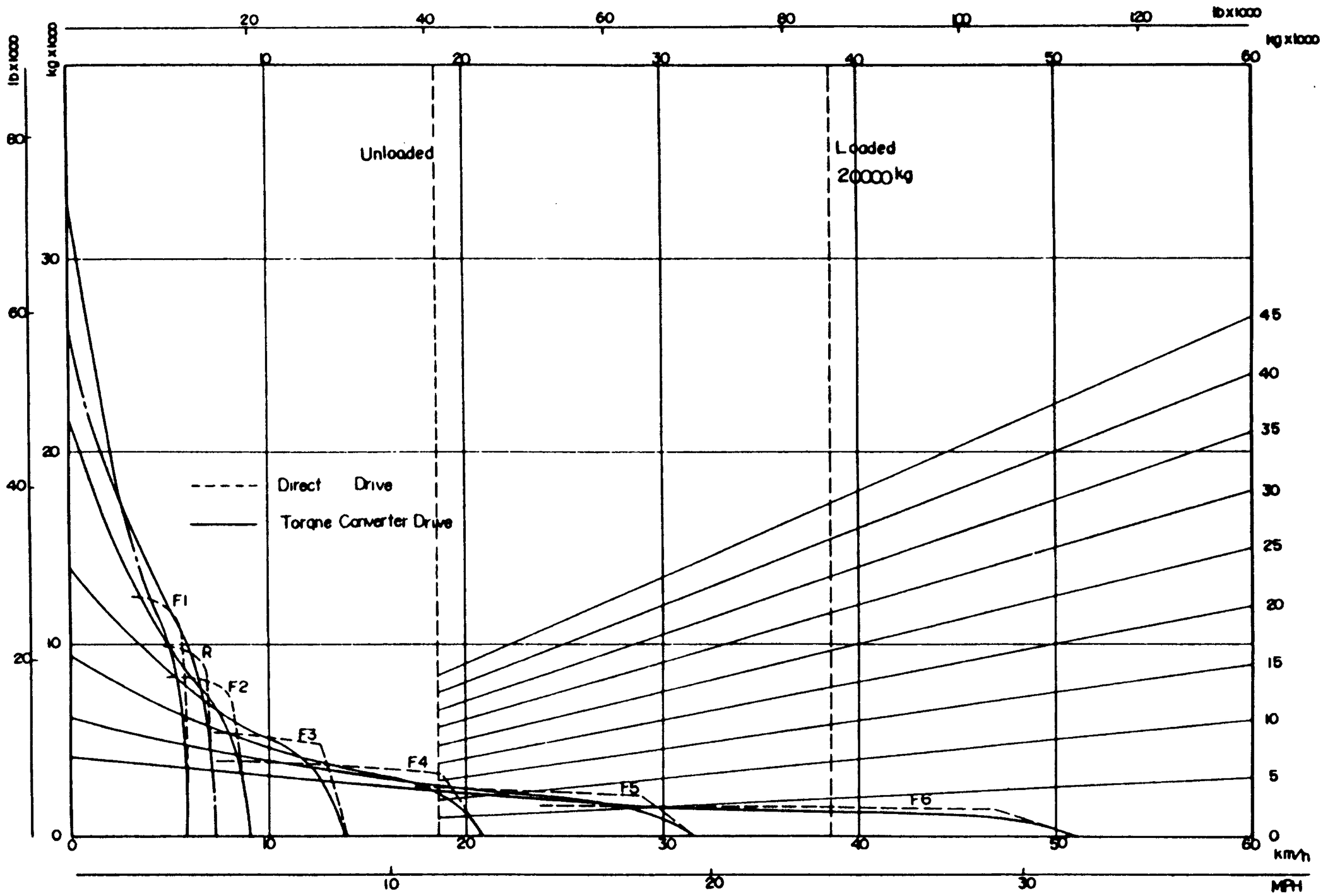
Gross Vehicle Weight



TRAVEL SPEED

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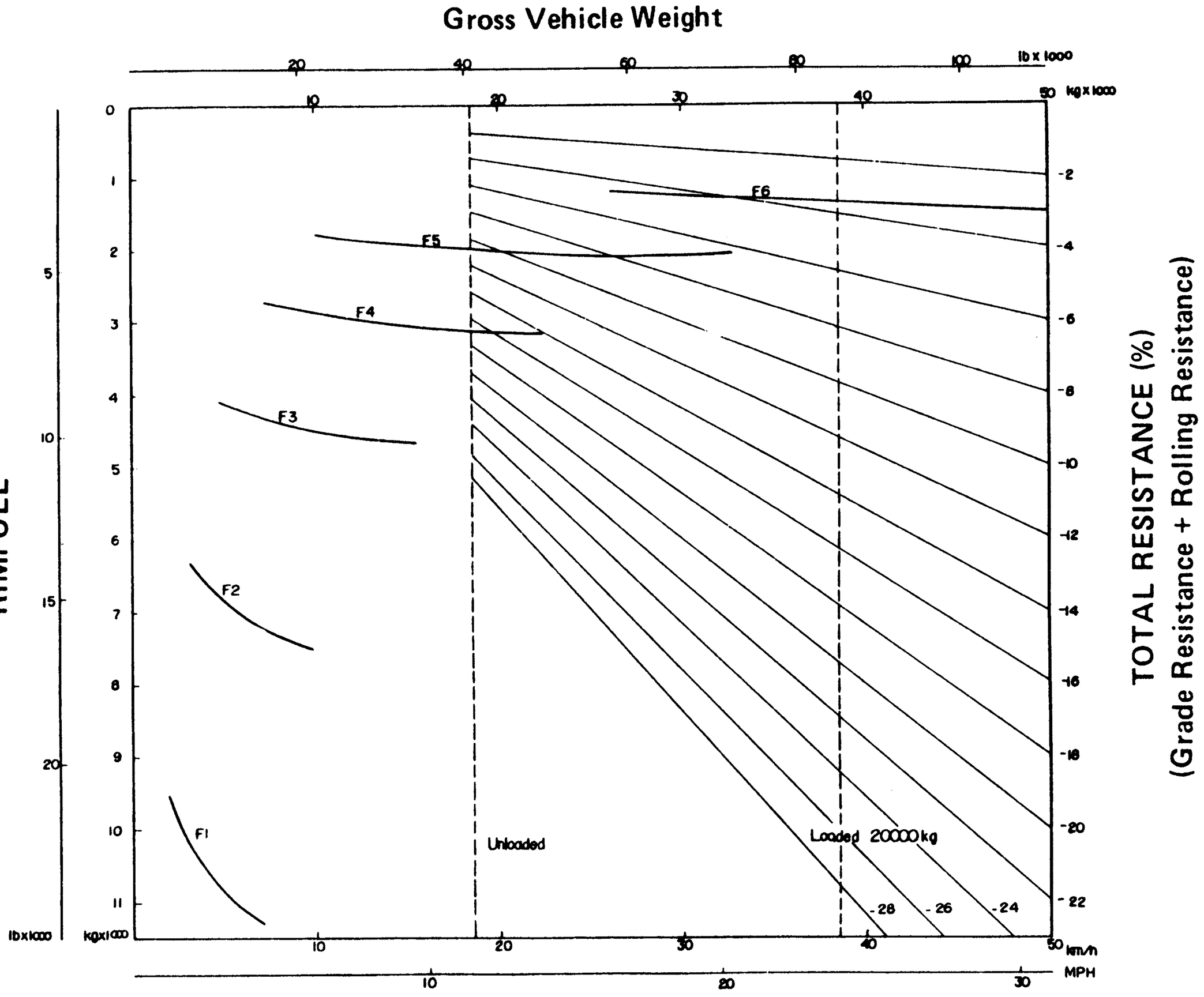

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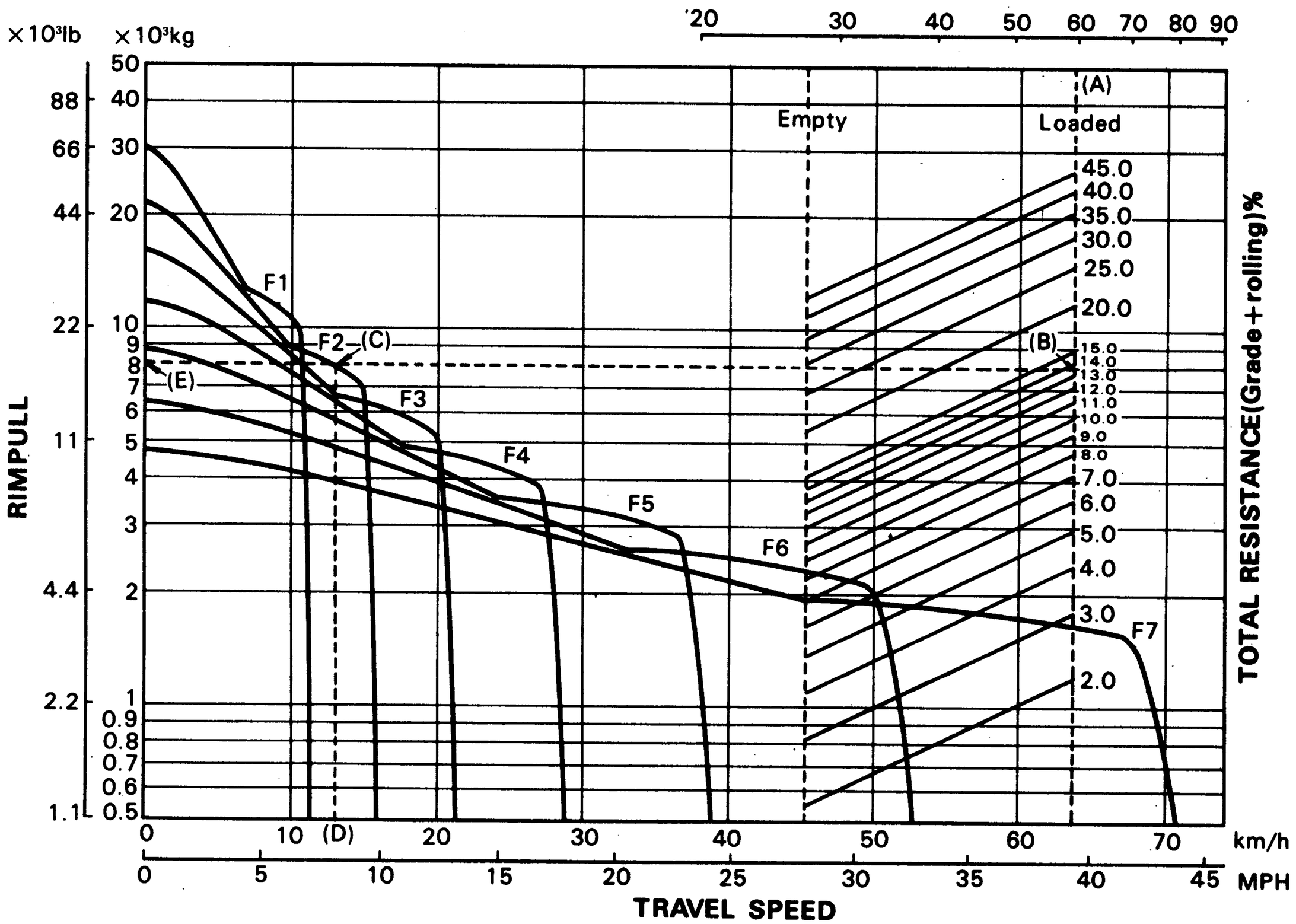

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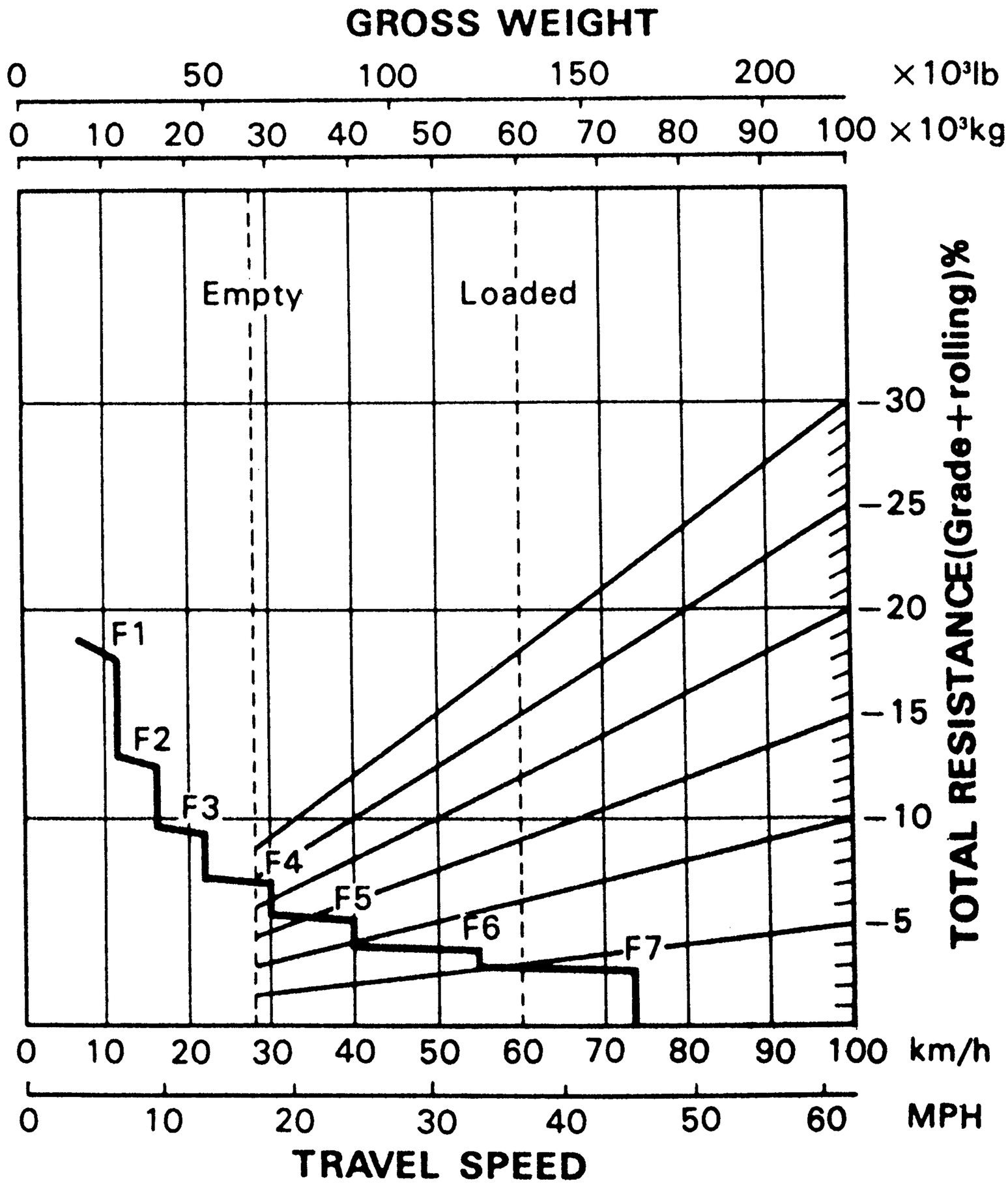
Grade distance: Continuous descent



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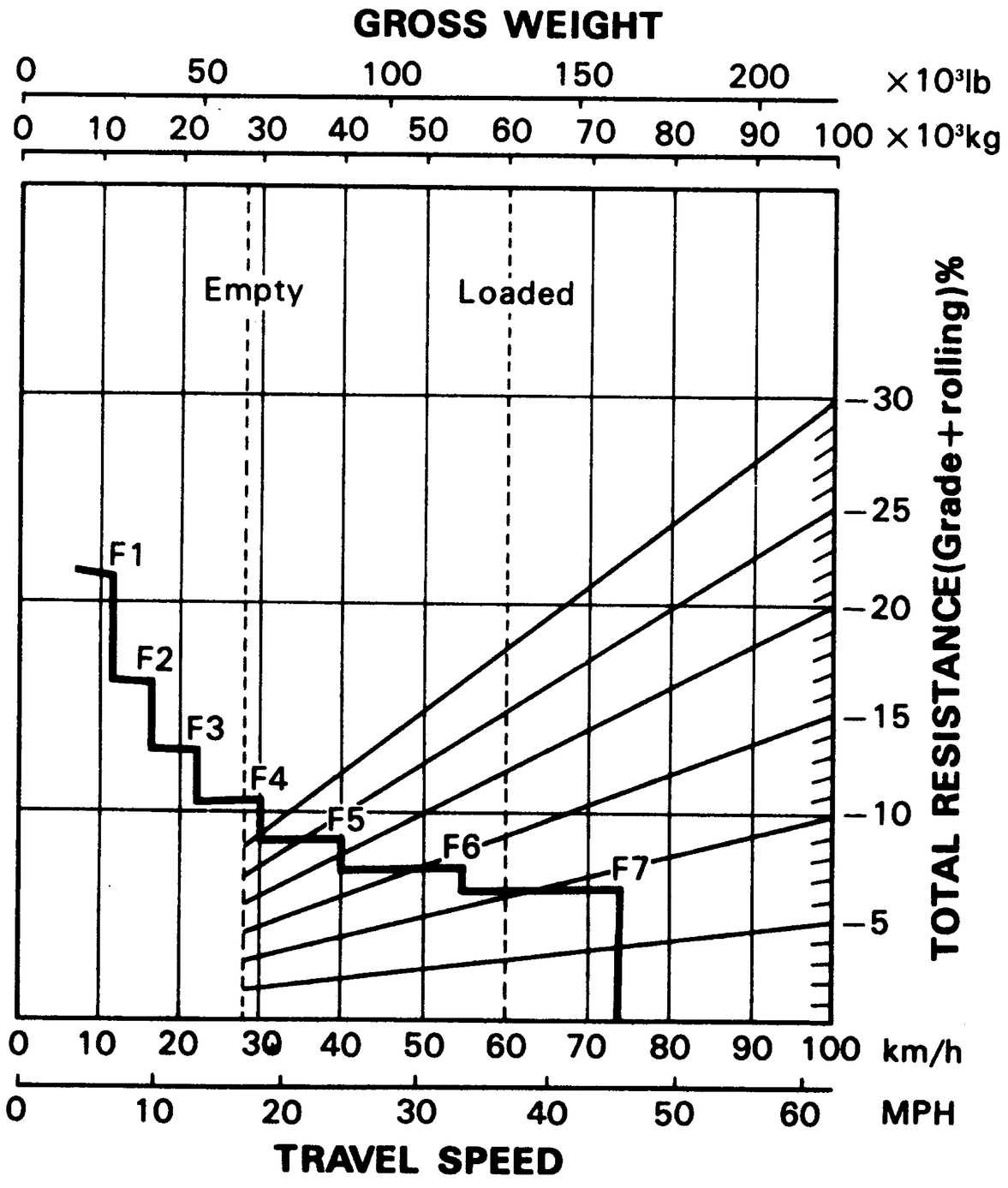
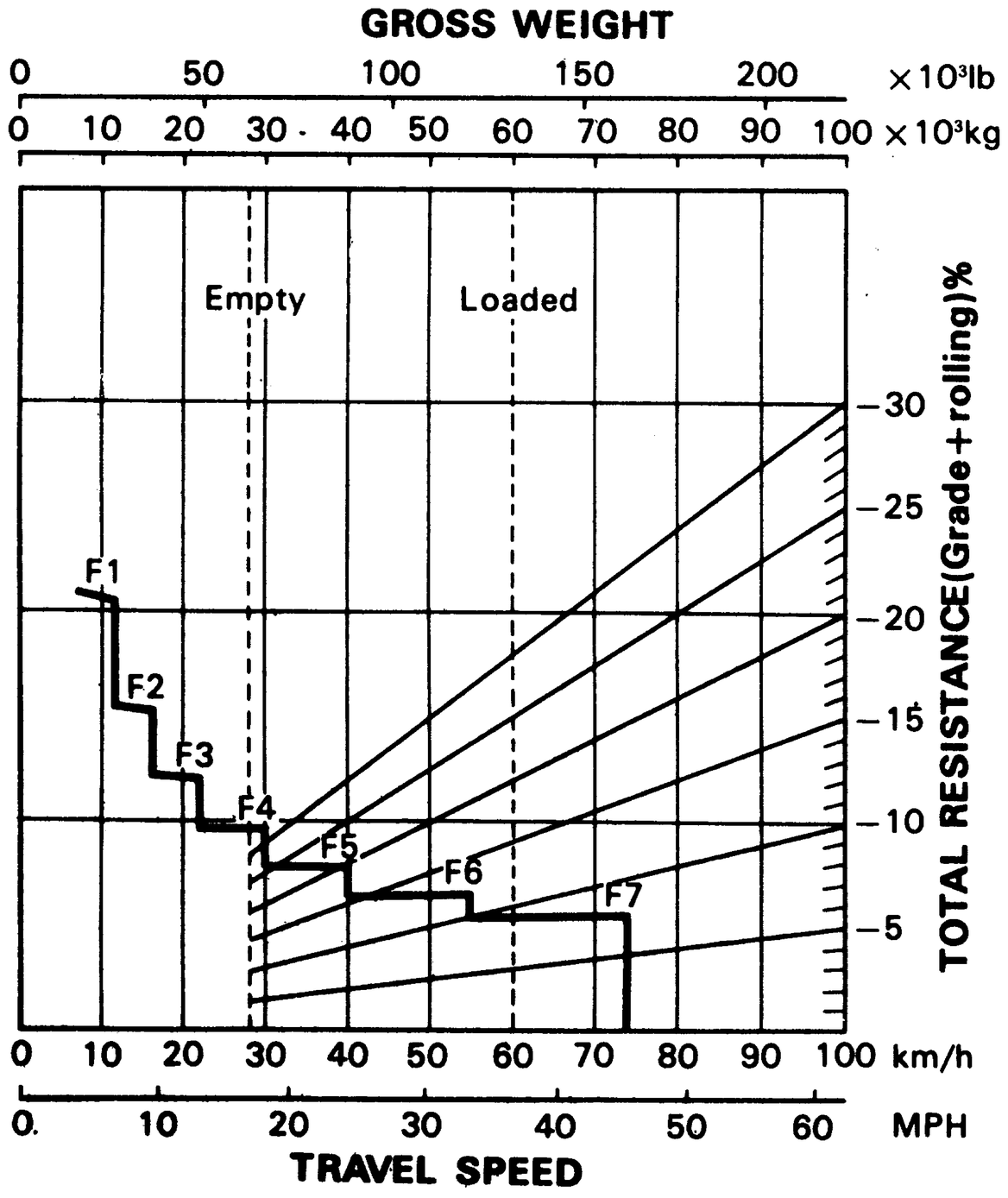
Grade distance: 450 m (1,480 ft)



Grade distance: 600 m (1,970 ft)



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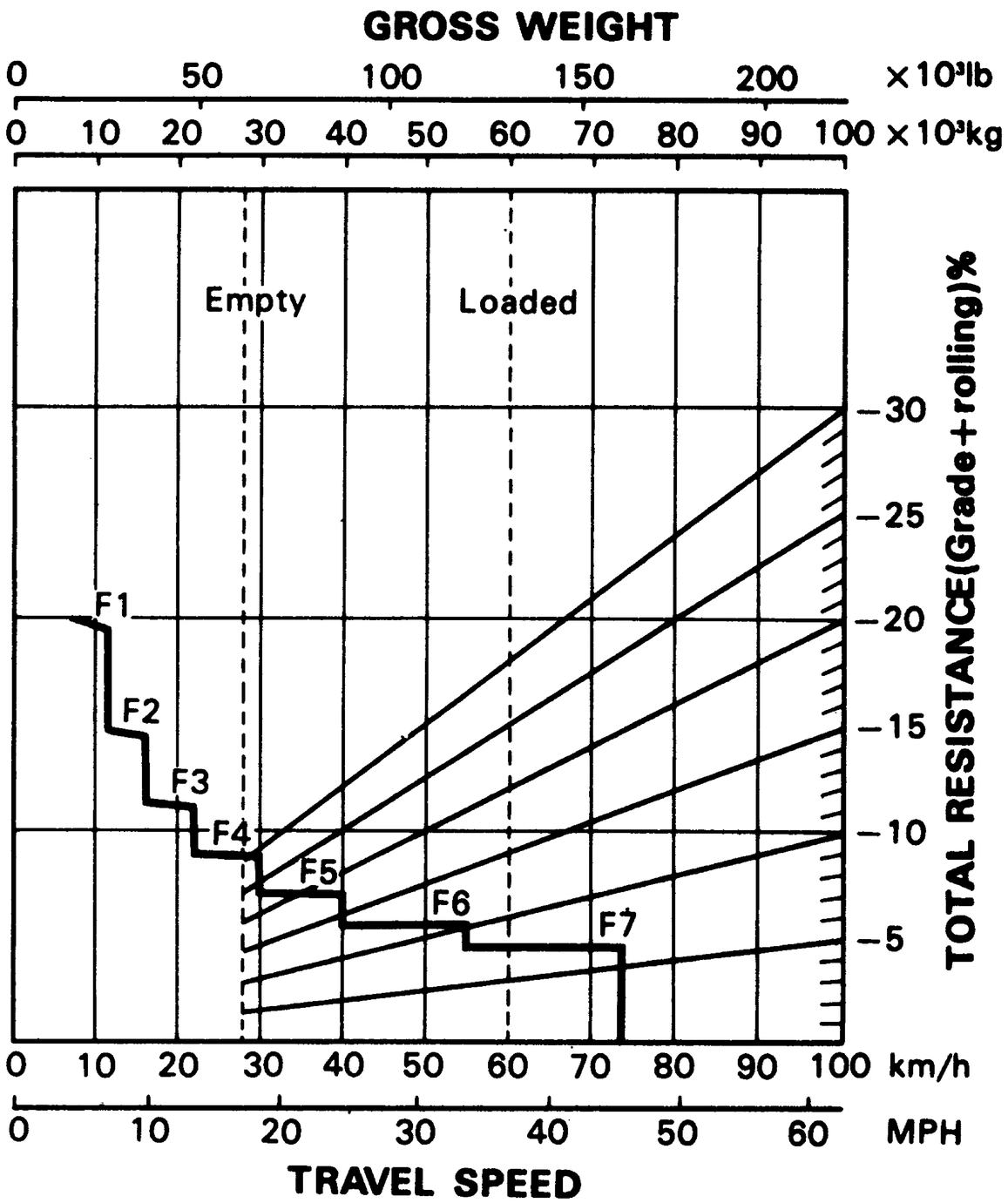
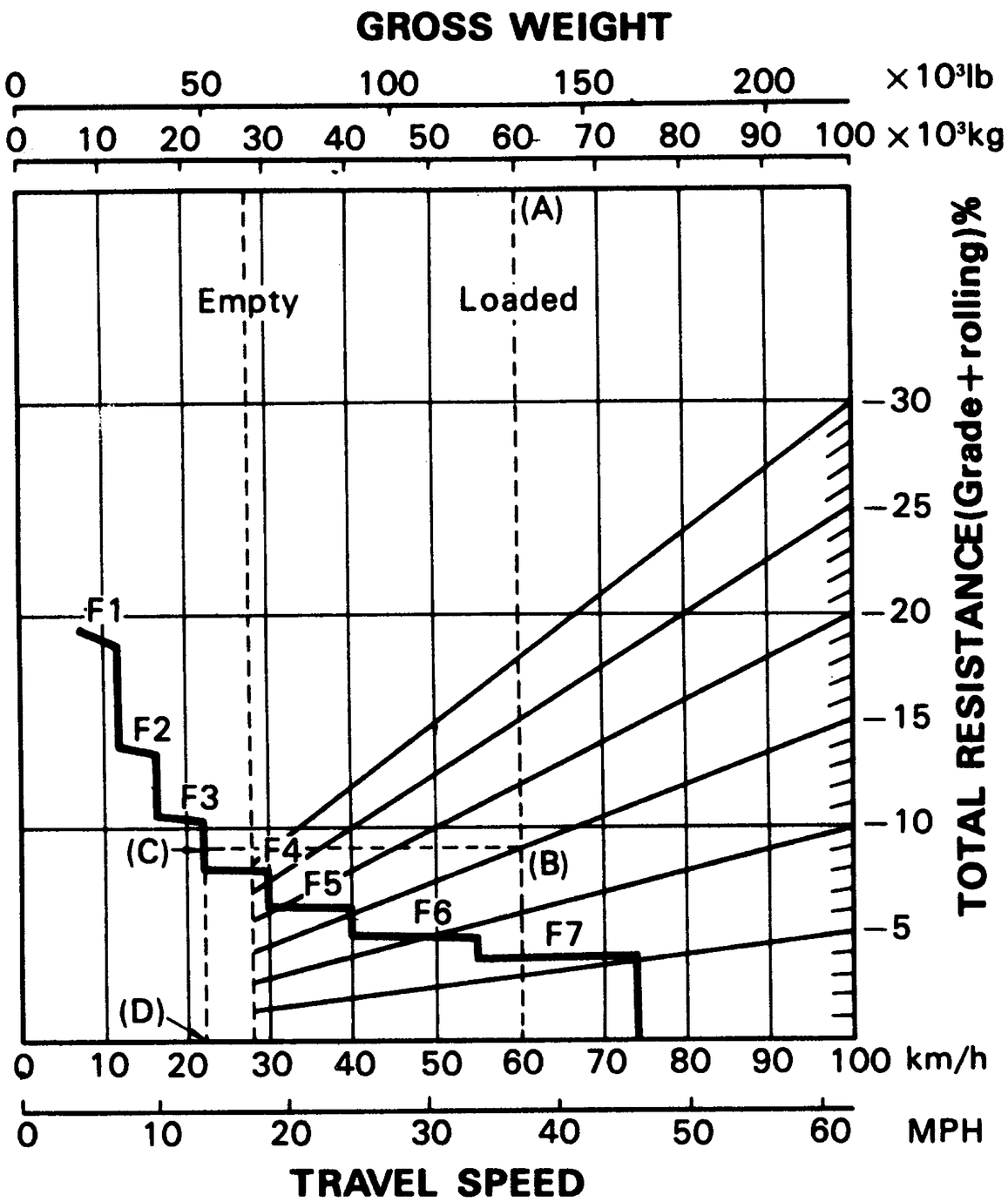
Grade distance: 900 m (2,950 ft)



Grade distance: 1500 m (4,920 ft)



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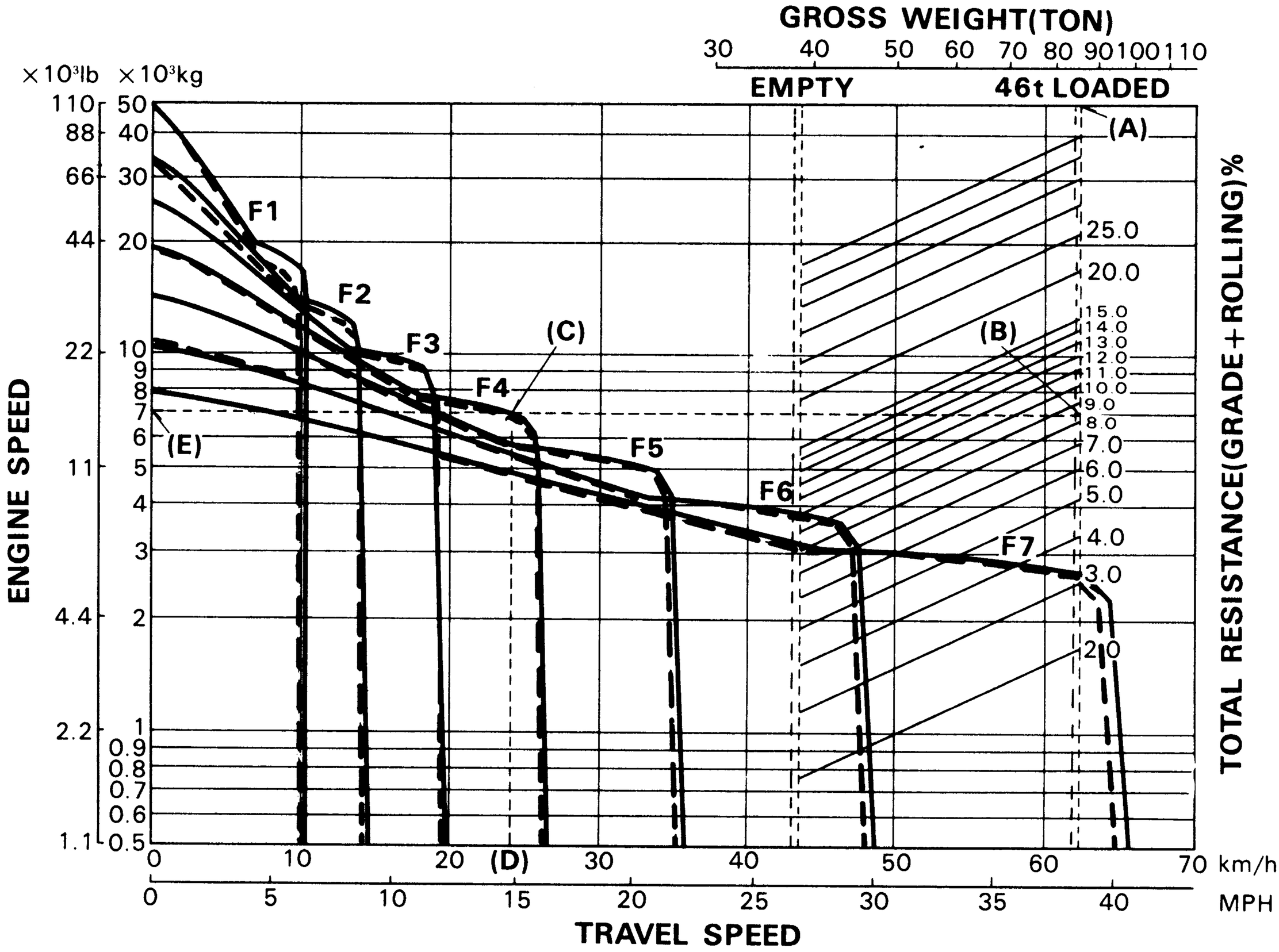

Broken lines indicate performance with a machine equipped with 24.00-35-30PR large-diameter tires.

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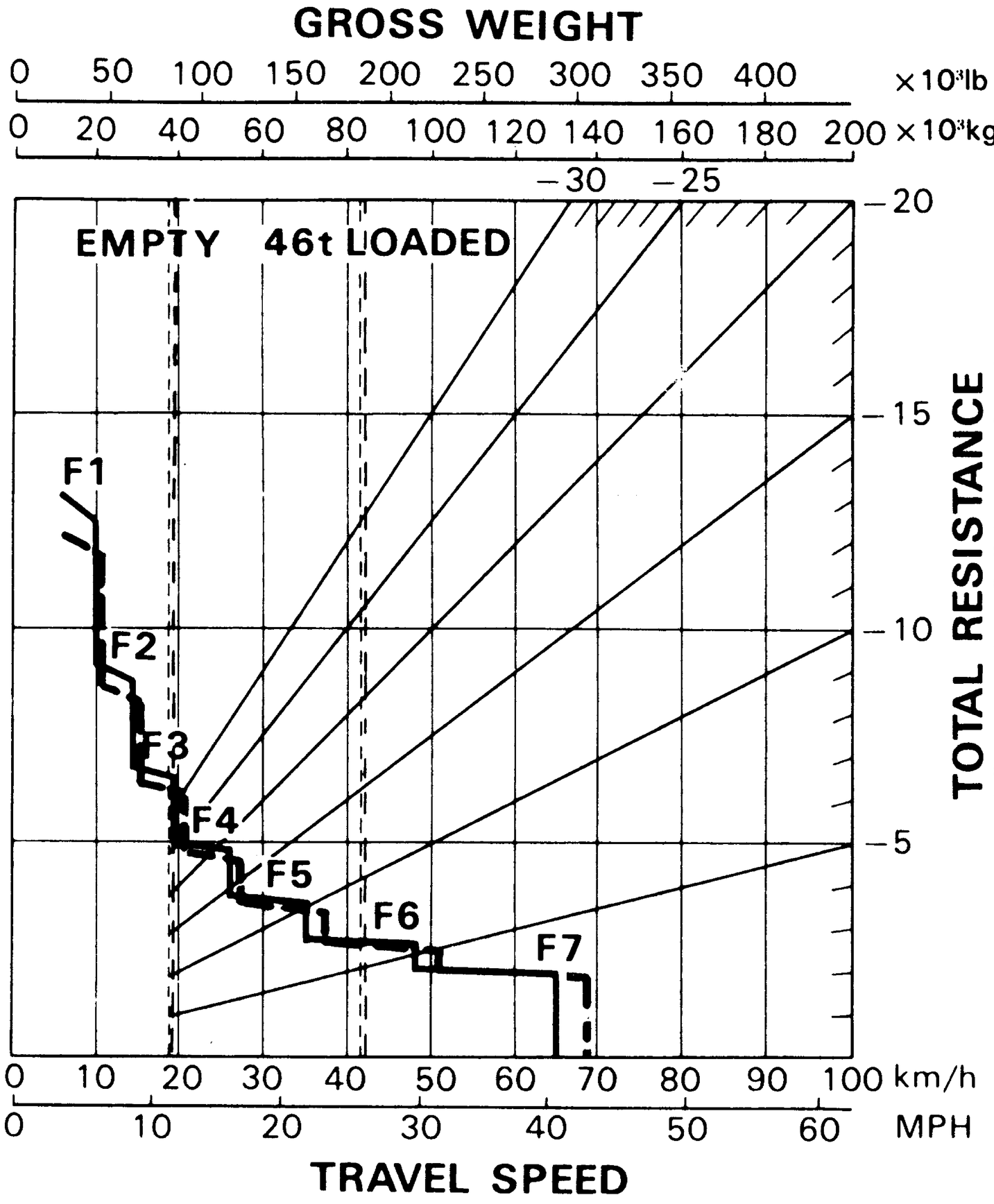
Grade distance: Continuous descent



Broken lines indicate performance with a machine equipped with 24.00-35-30PR large-diameter tires.

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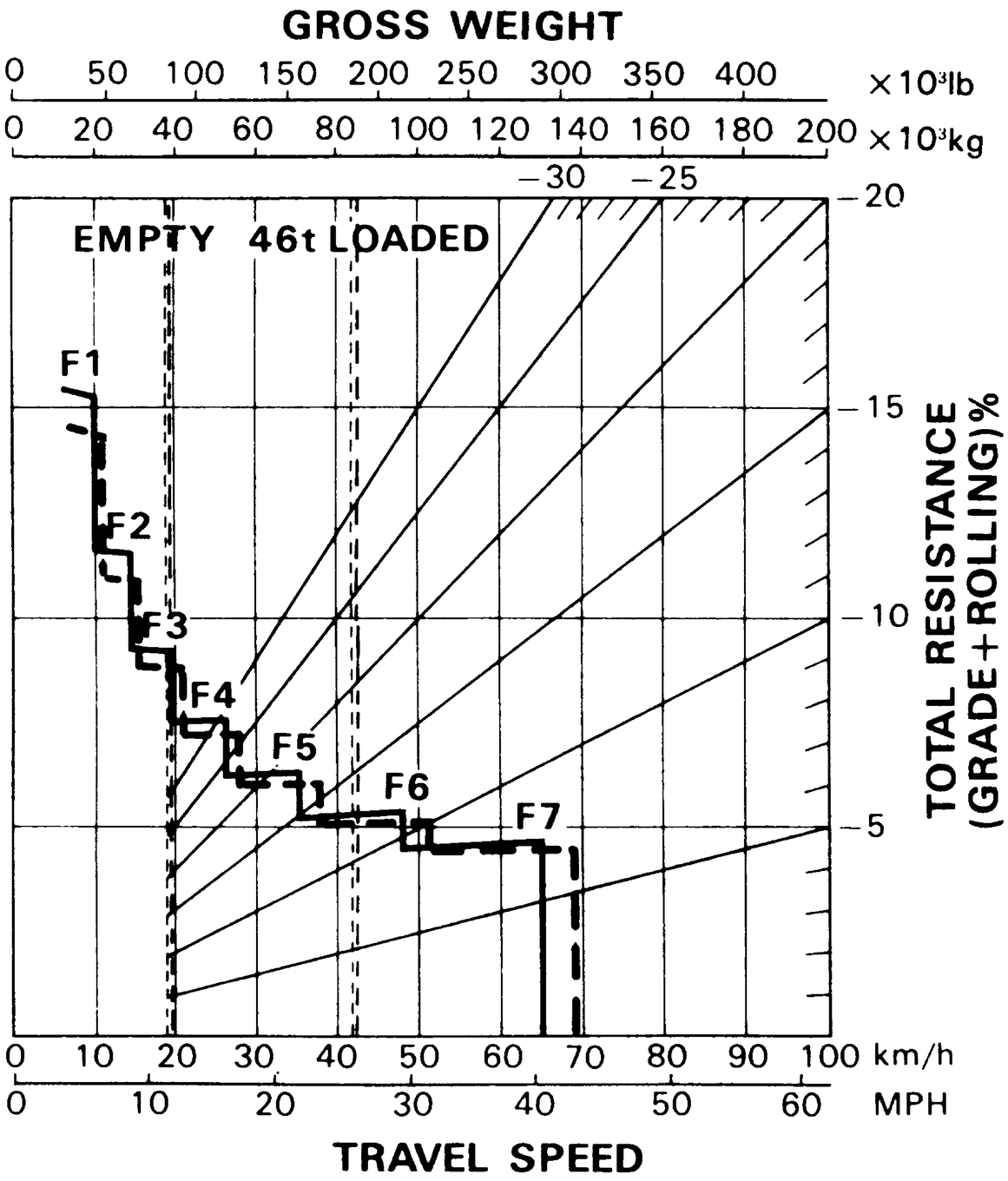
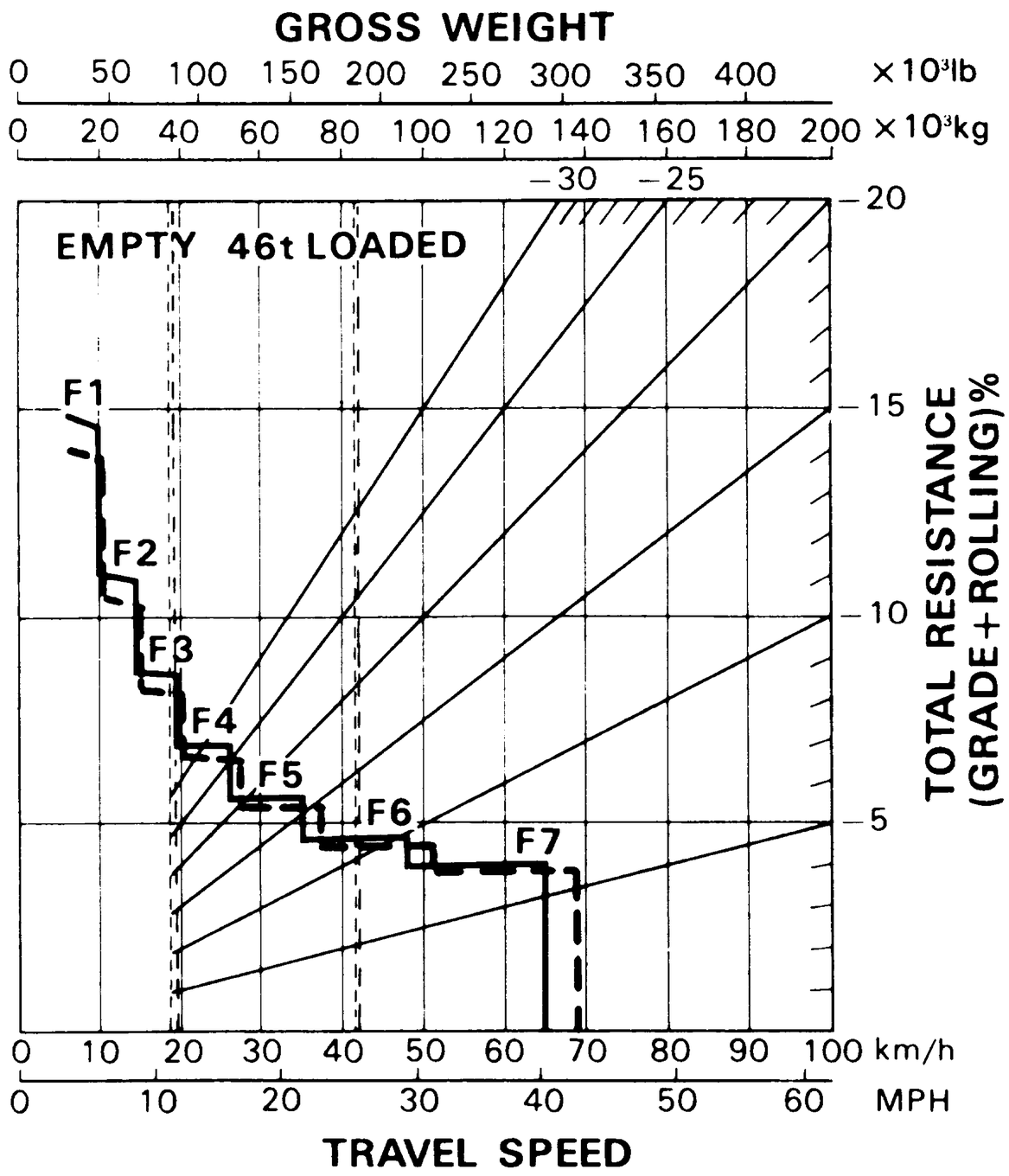
Grade distance: 450 m (1,480 ft)



Grade distance: 600 m (1,970 ft)



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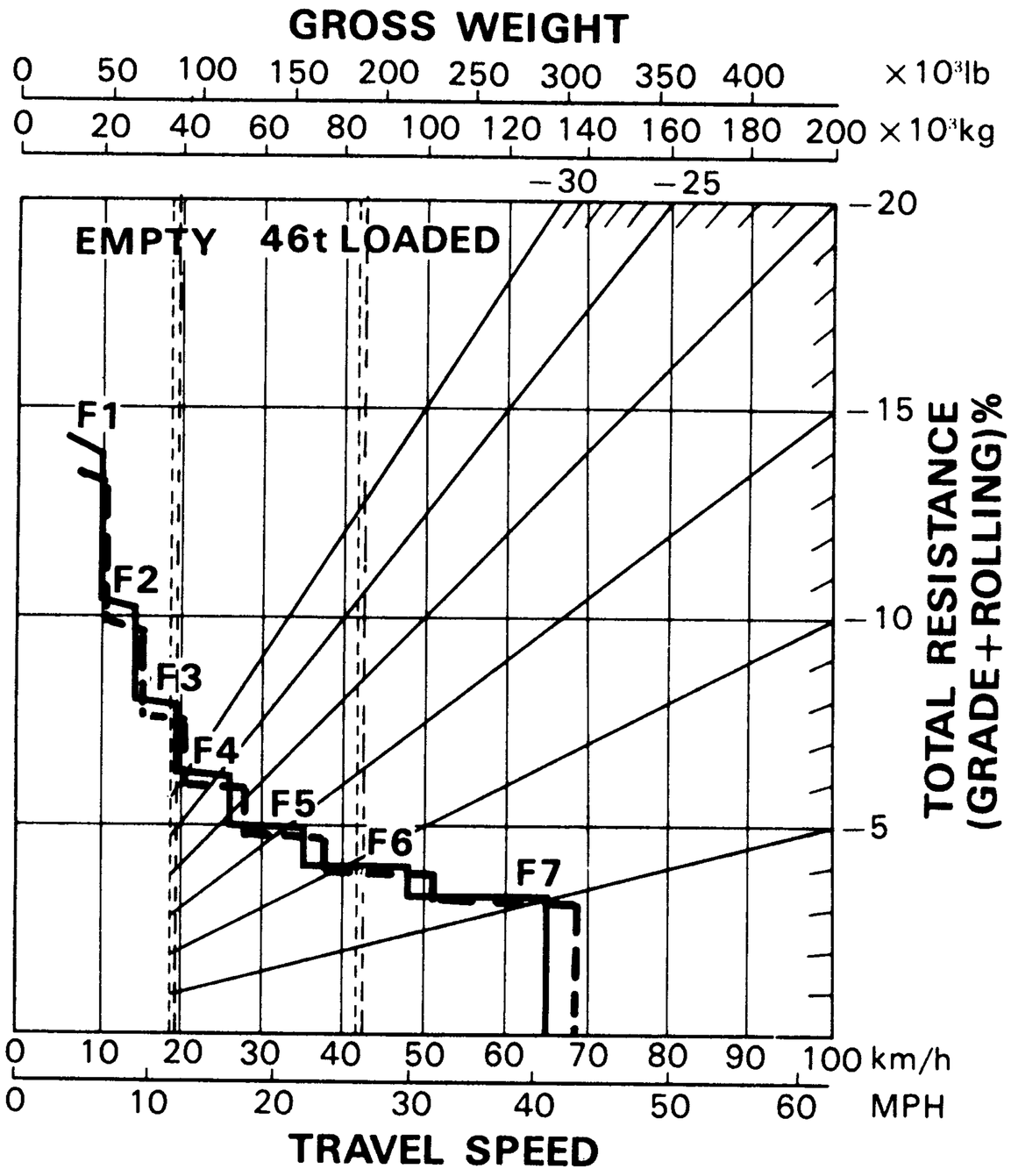

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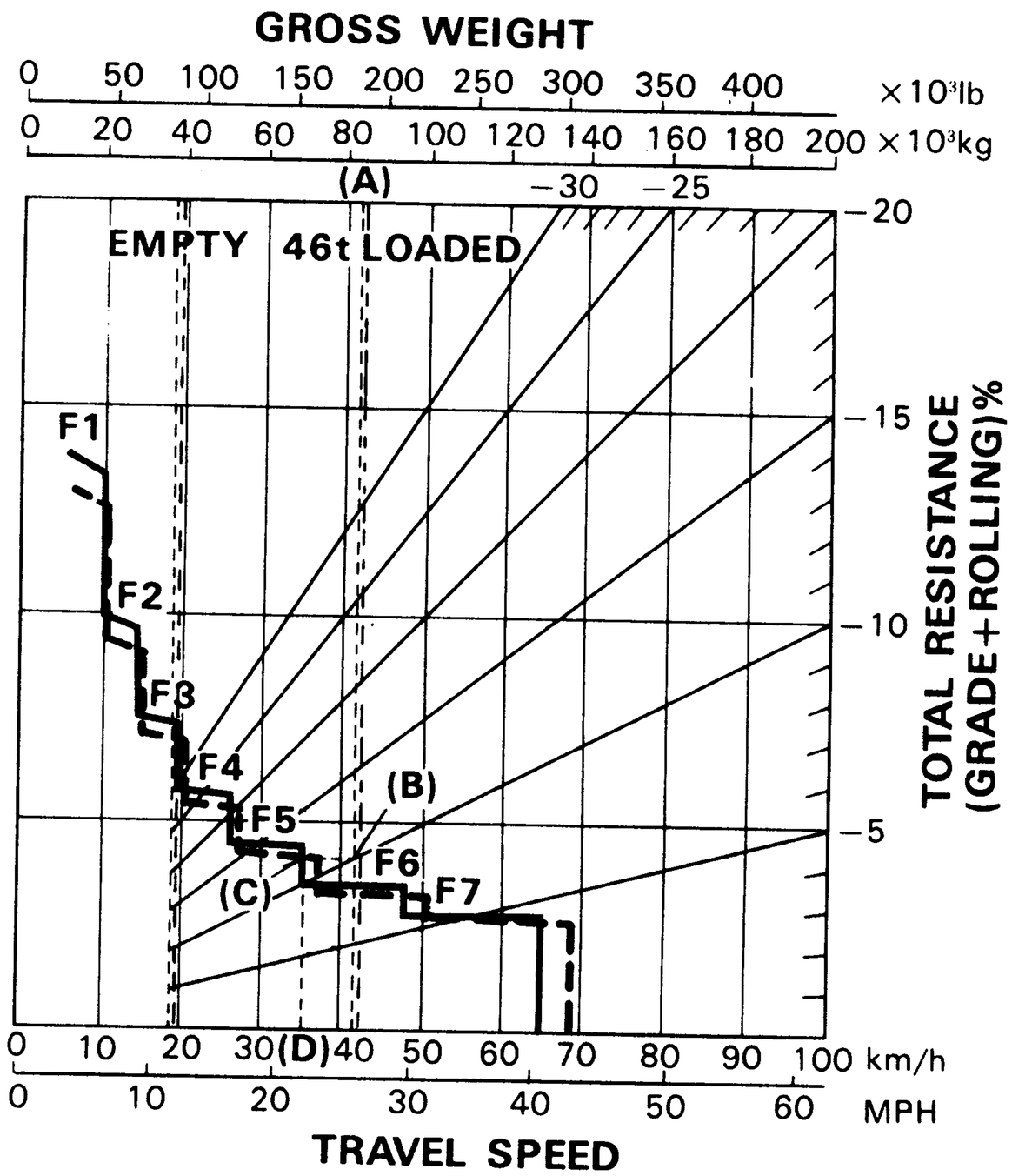

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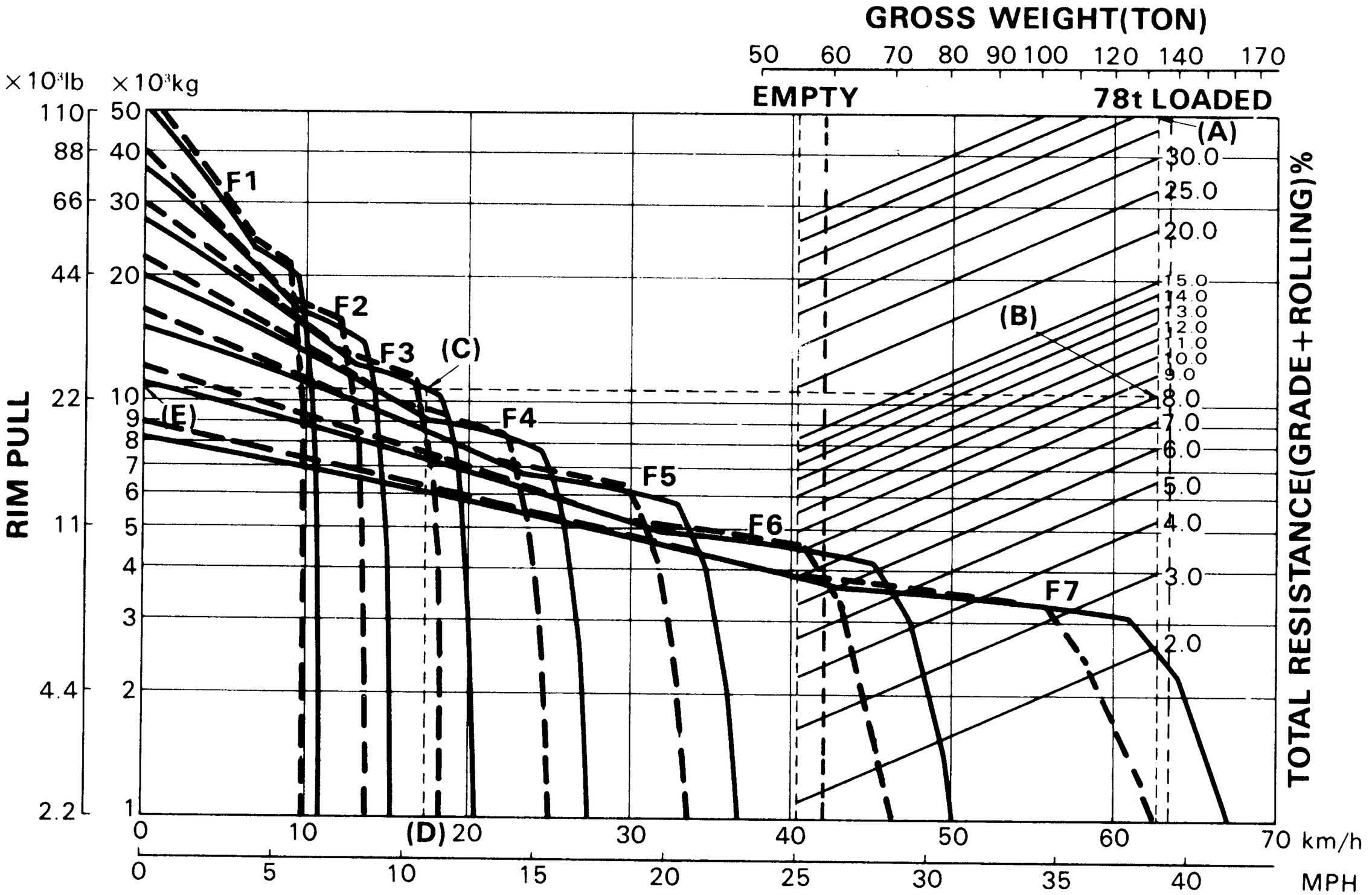

TRAVEL SPEED

Broken lines indicate performance with a machine equipped with 27.00-49-42PR large-diameter tires.

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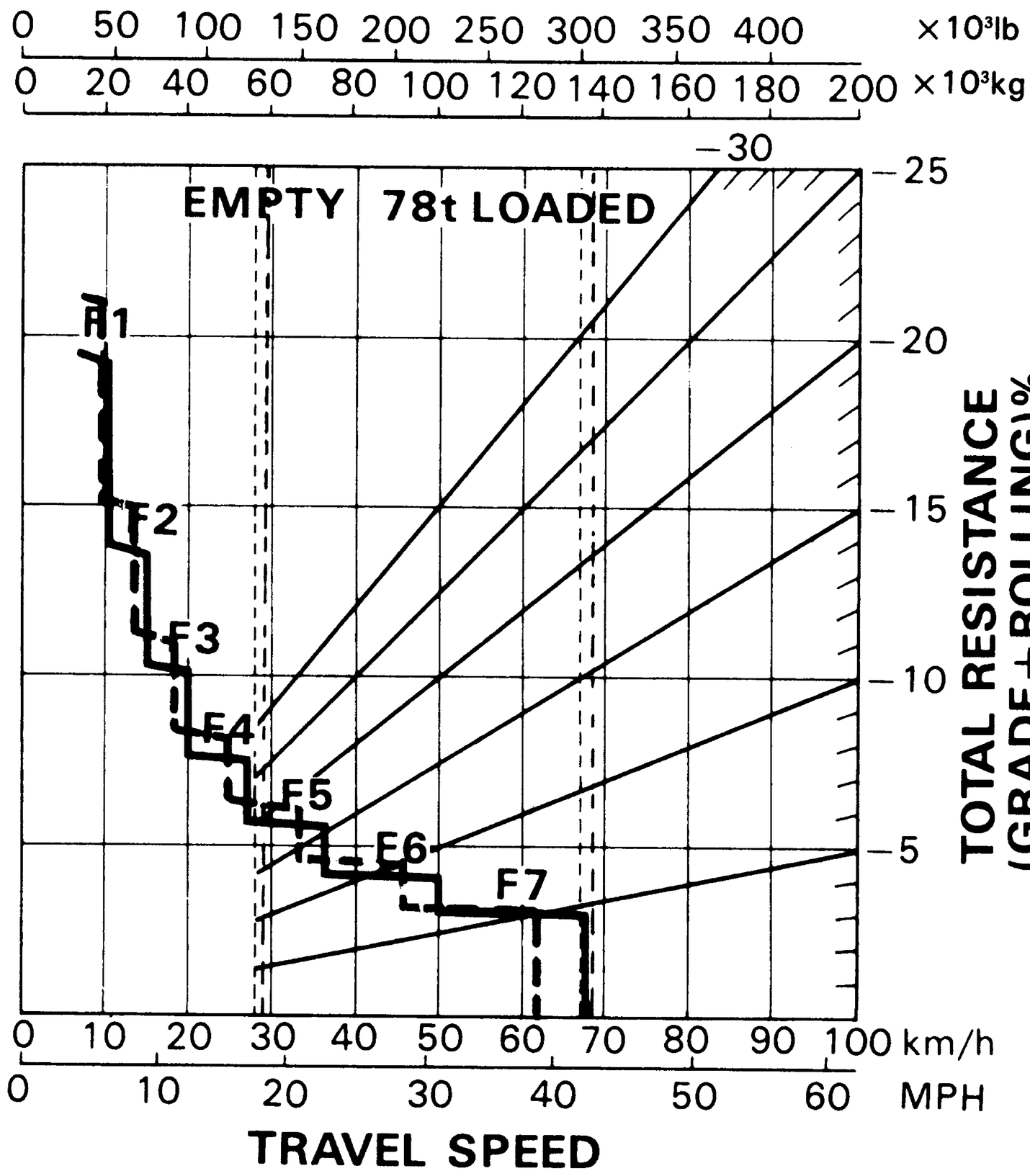
Grade distance: Continuous descent



Broken lines indicate performance with a machine equipped with 27.00-49-42PR large-diameter tires.

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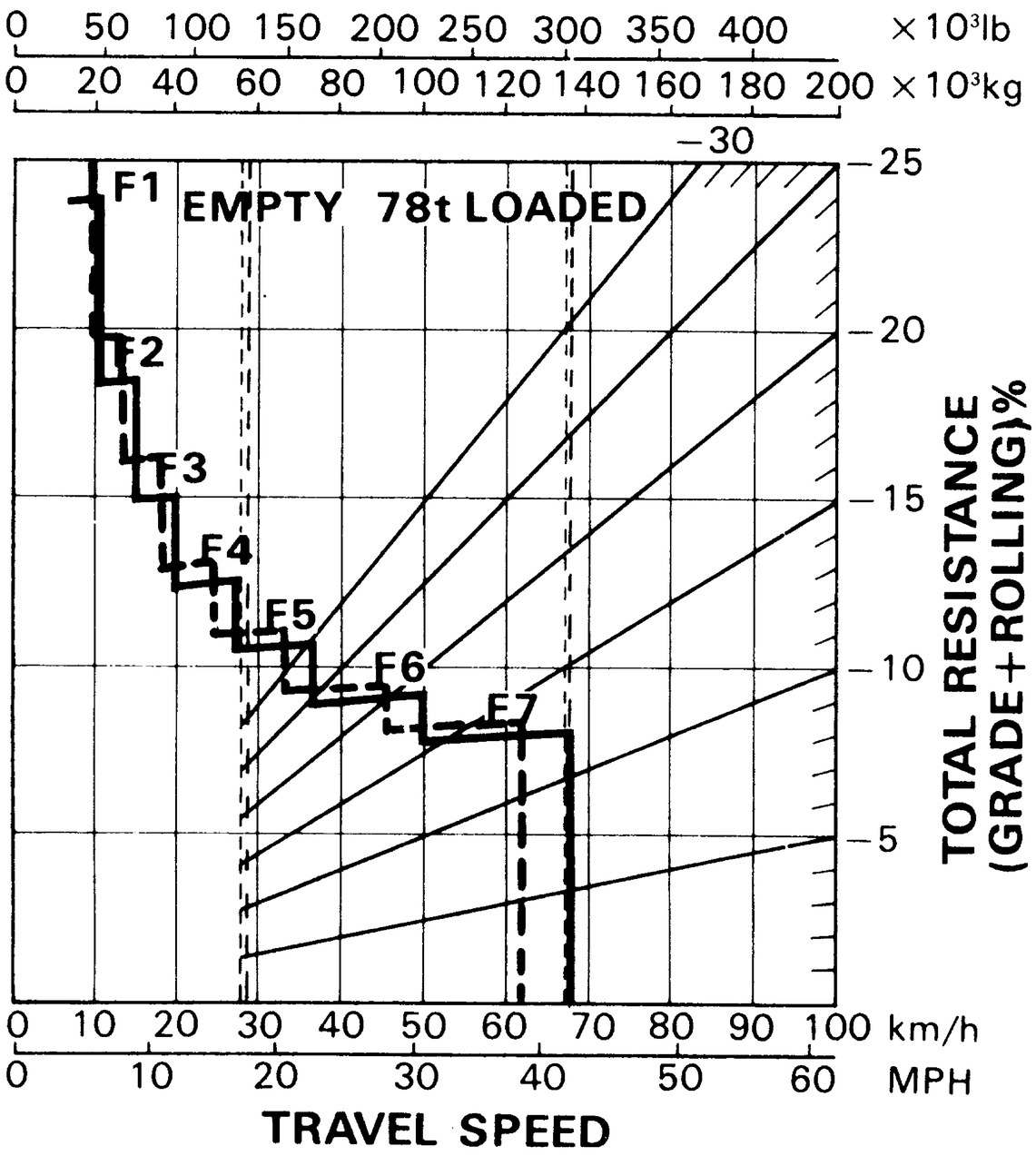
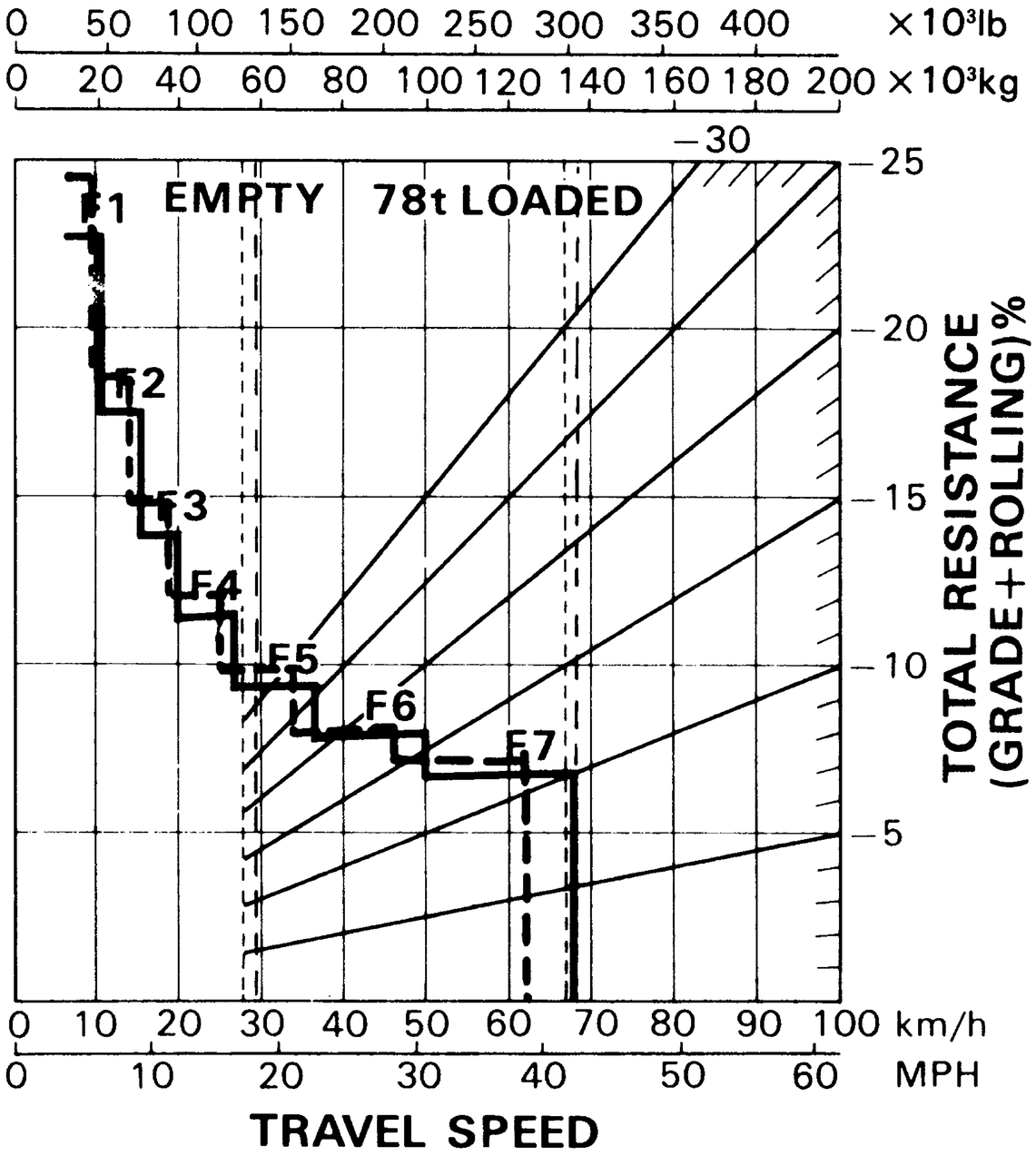
Grade distance: 450 m (1,480 ft)



Grade distance: 600 m (1,970 ft)



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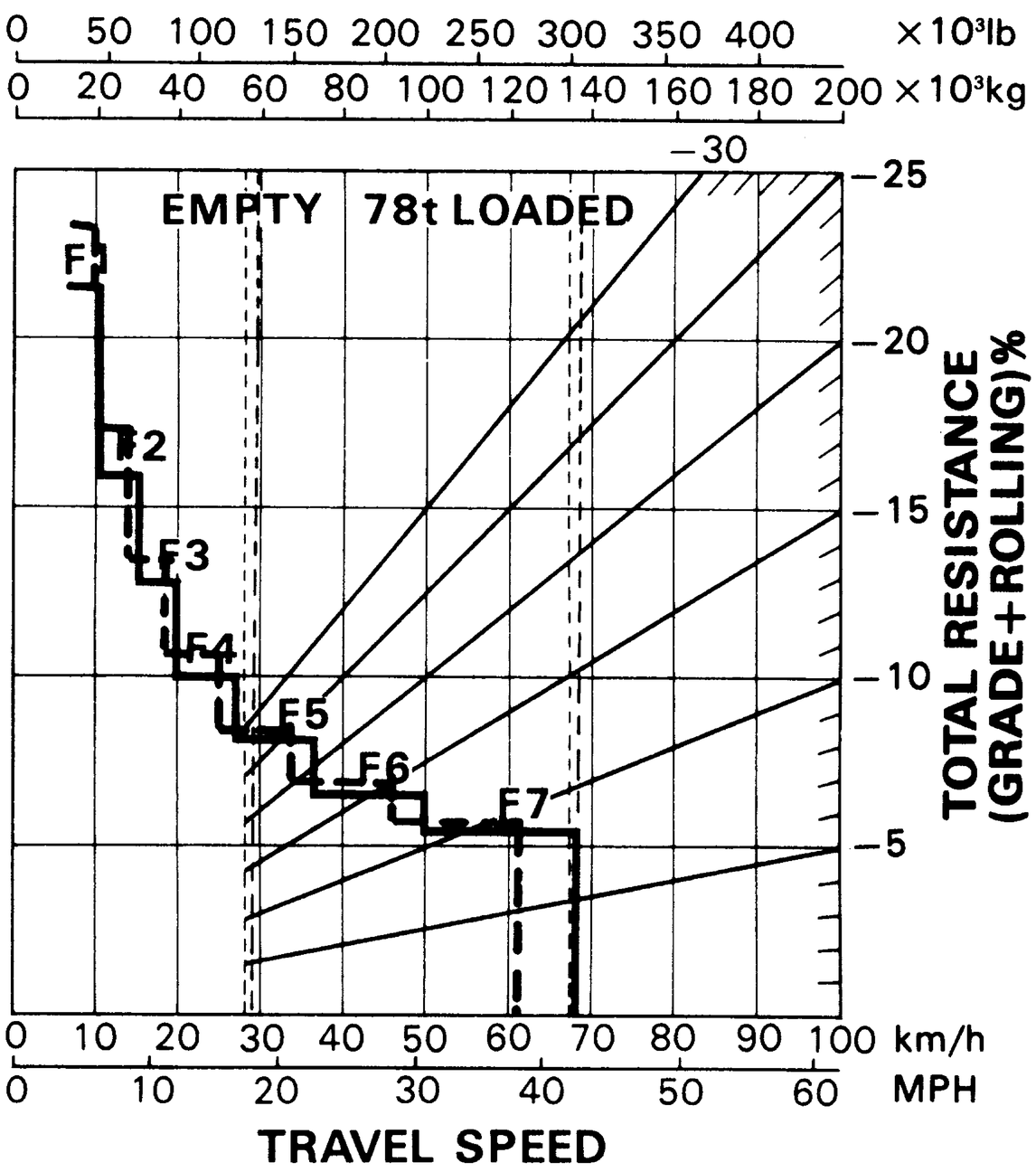
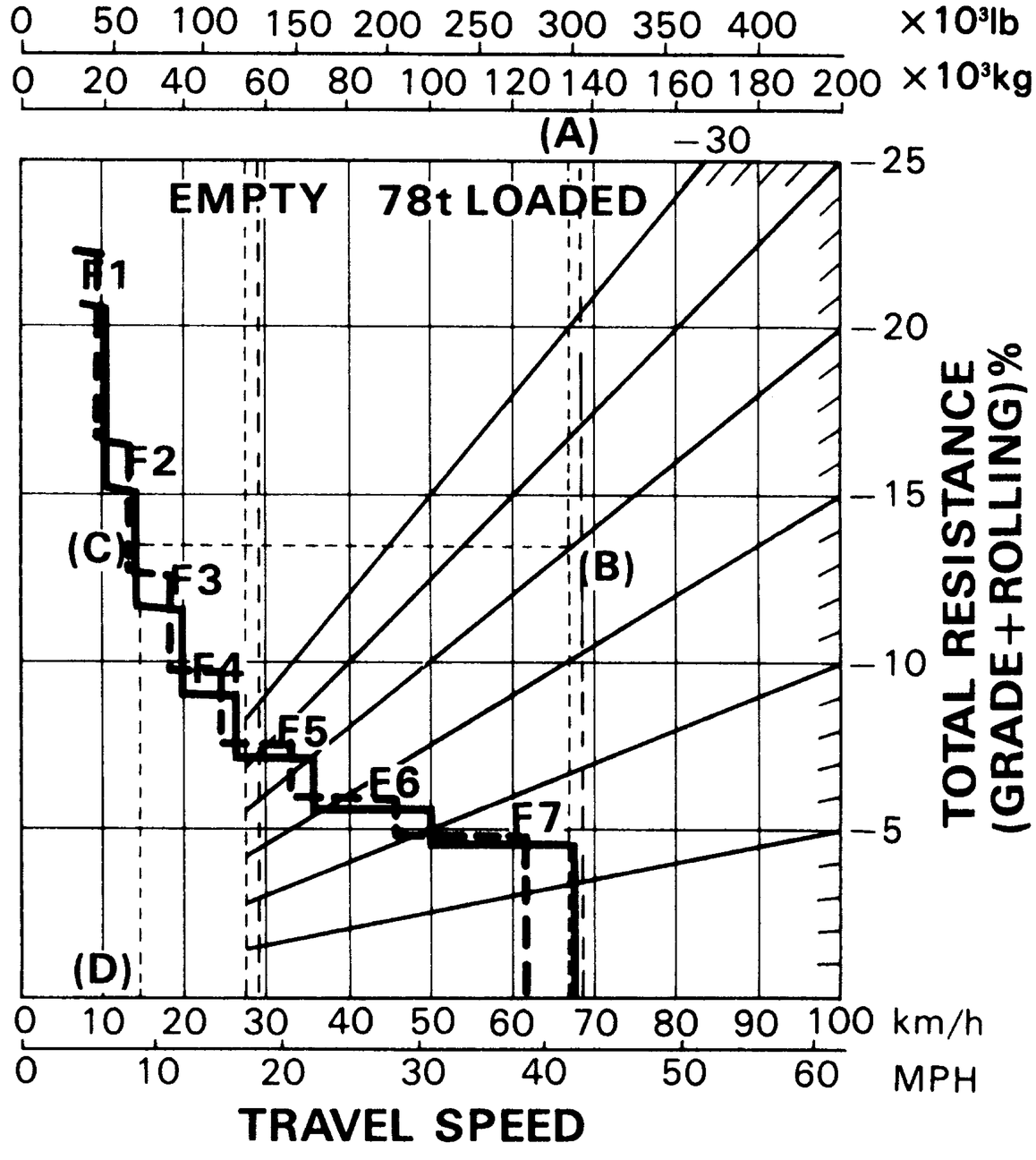
Grade distance: 900 m (2,950 ft)



Grade distance: 1500 m (4,920 ft)



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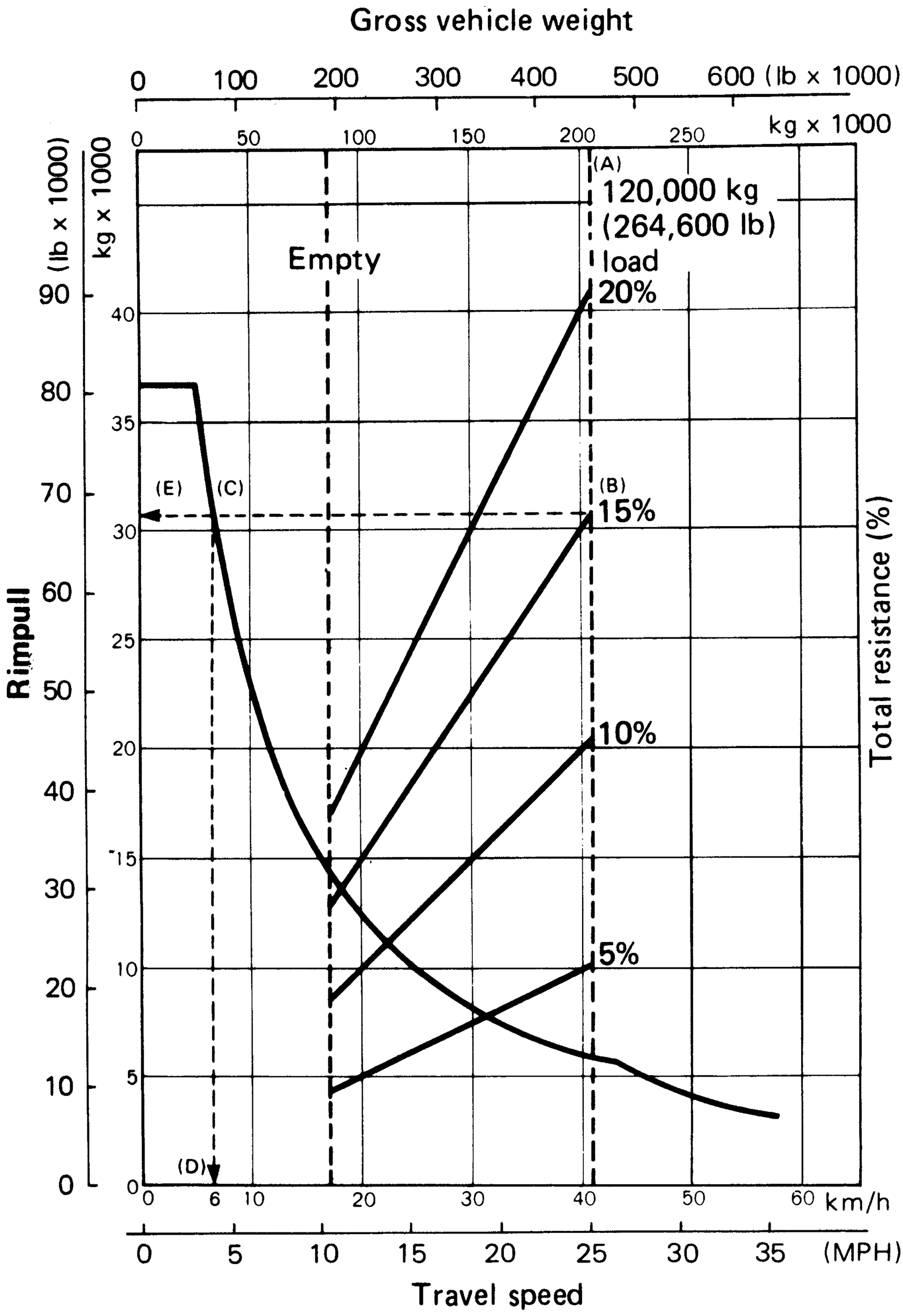

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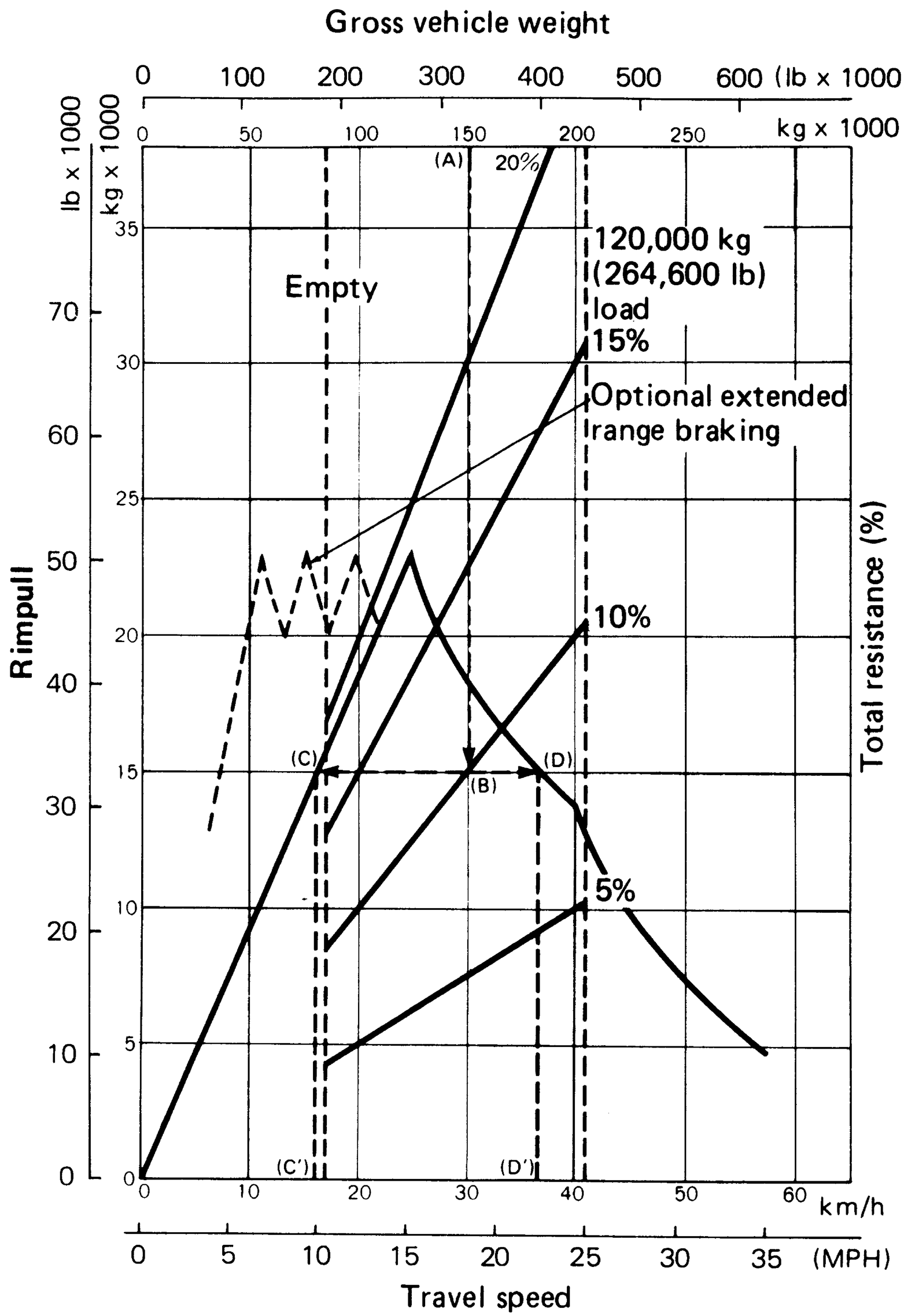

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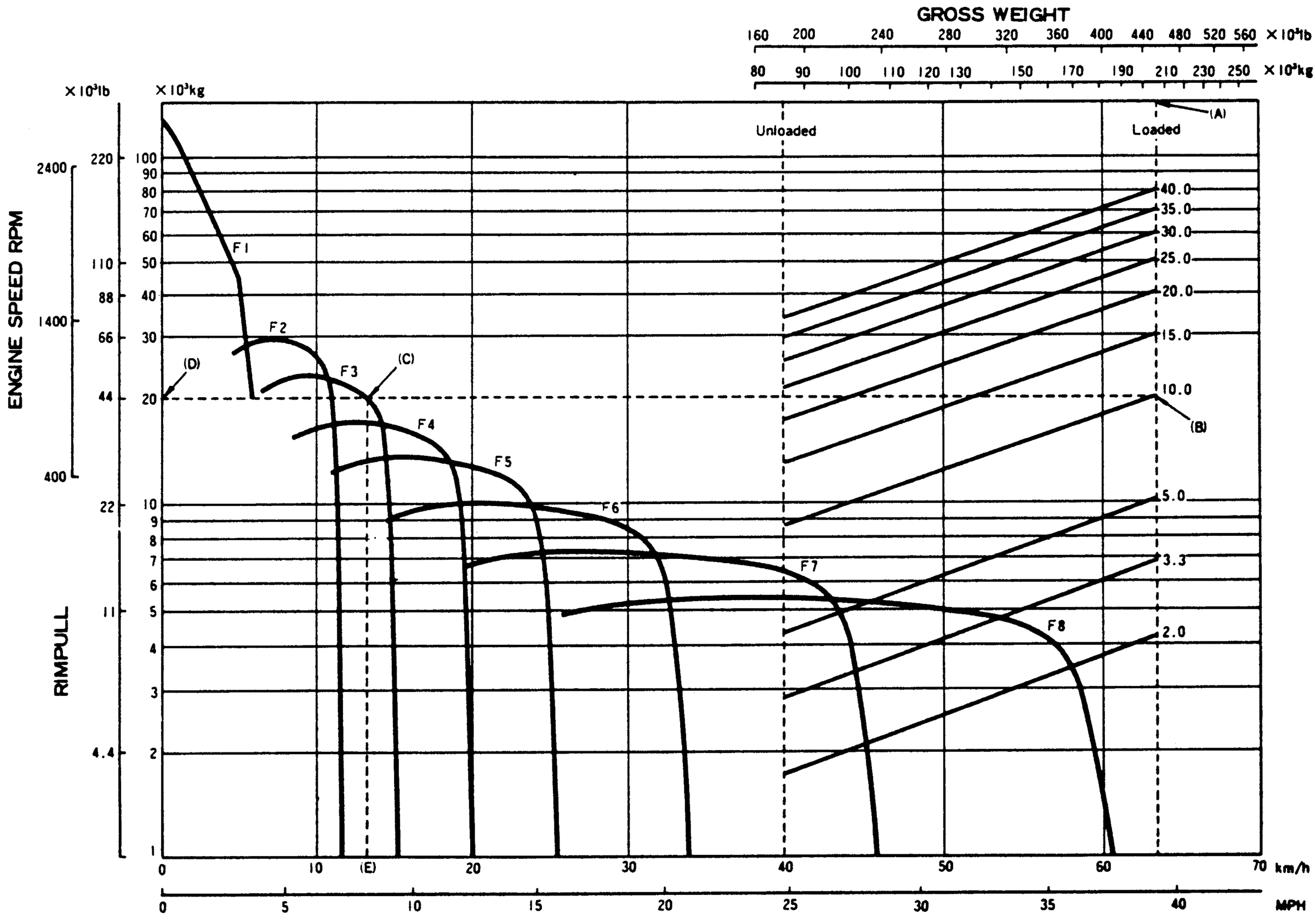

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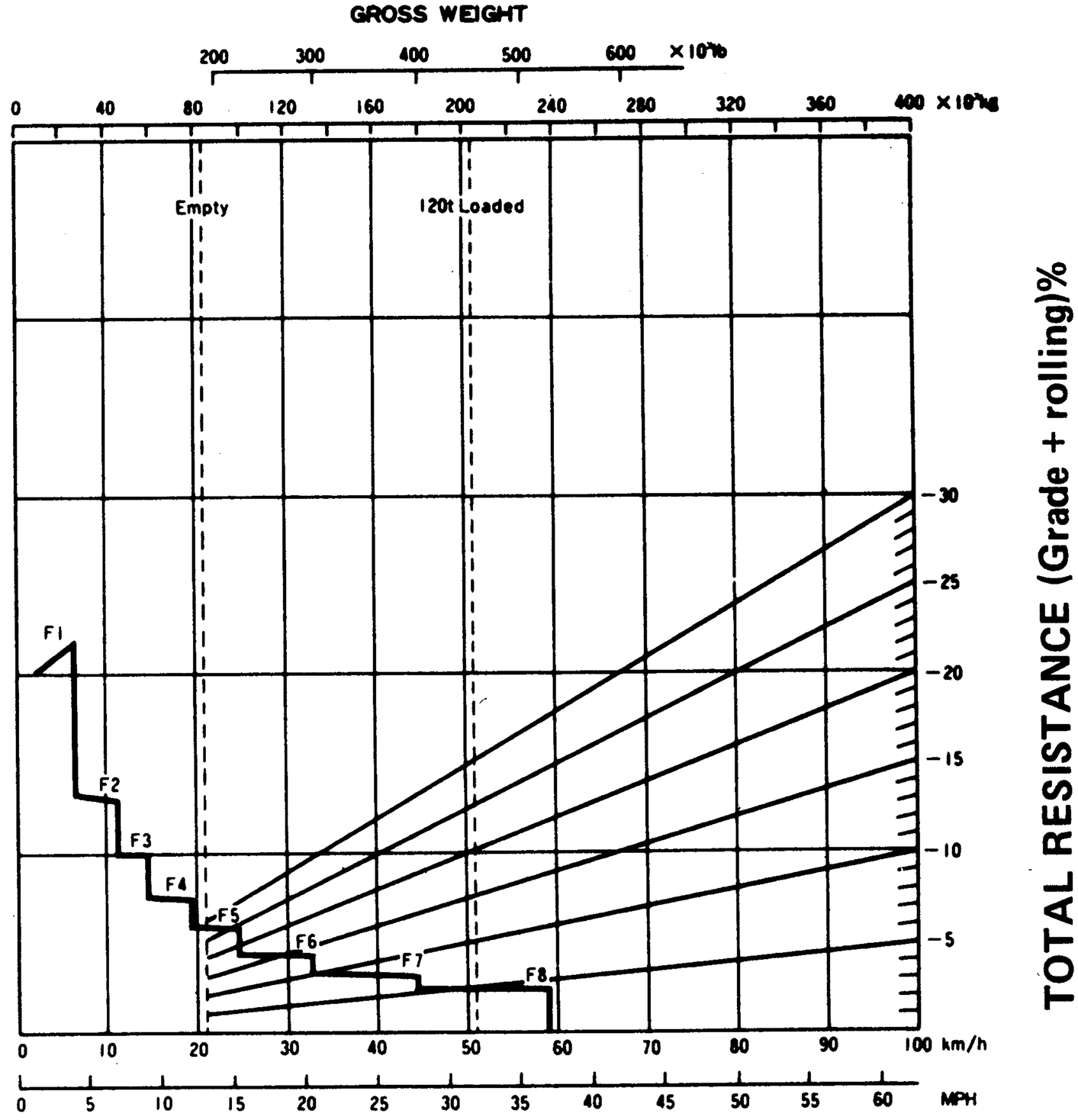
Grade distance: Continuous descent



TRAVEL SPEEDS

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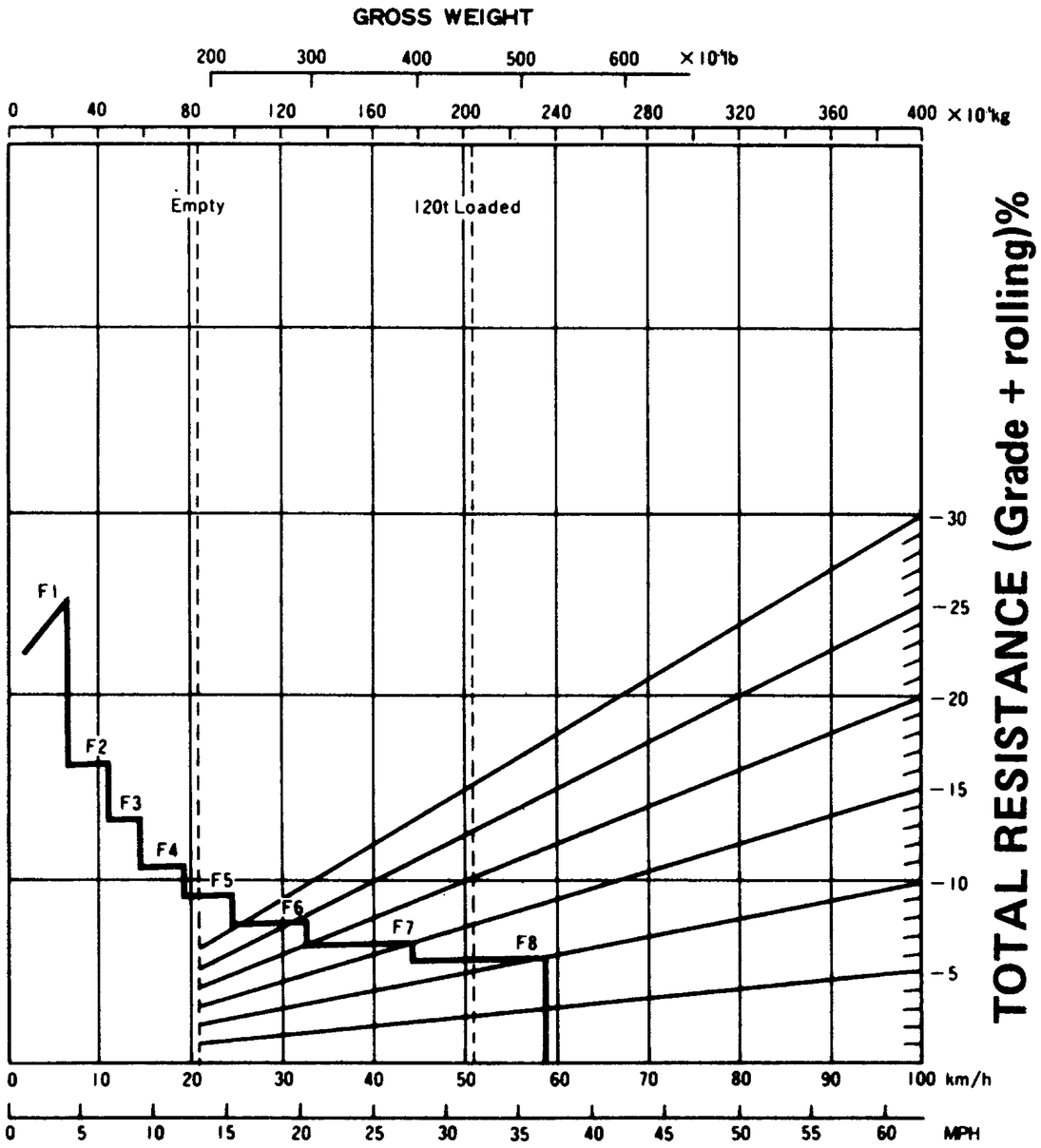
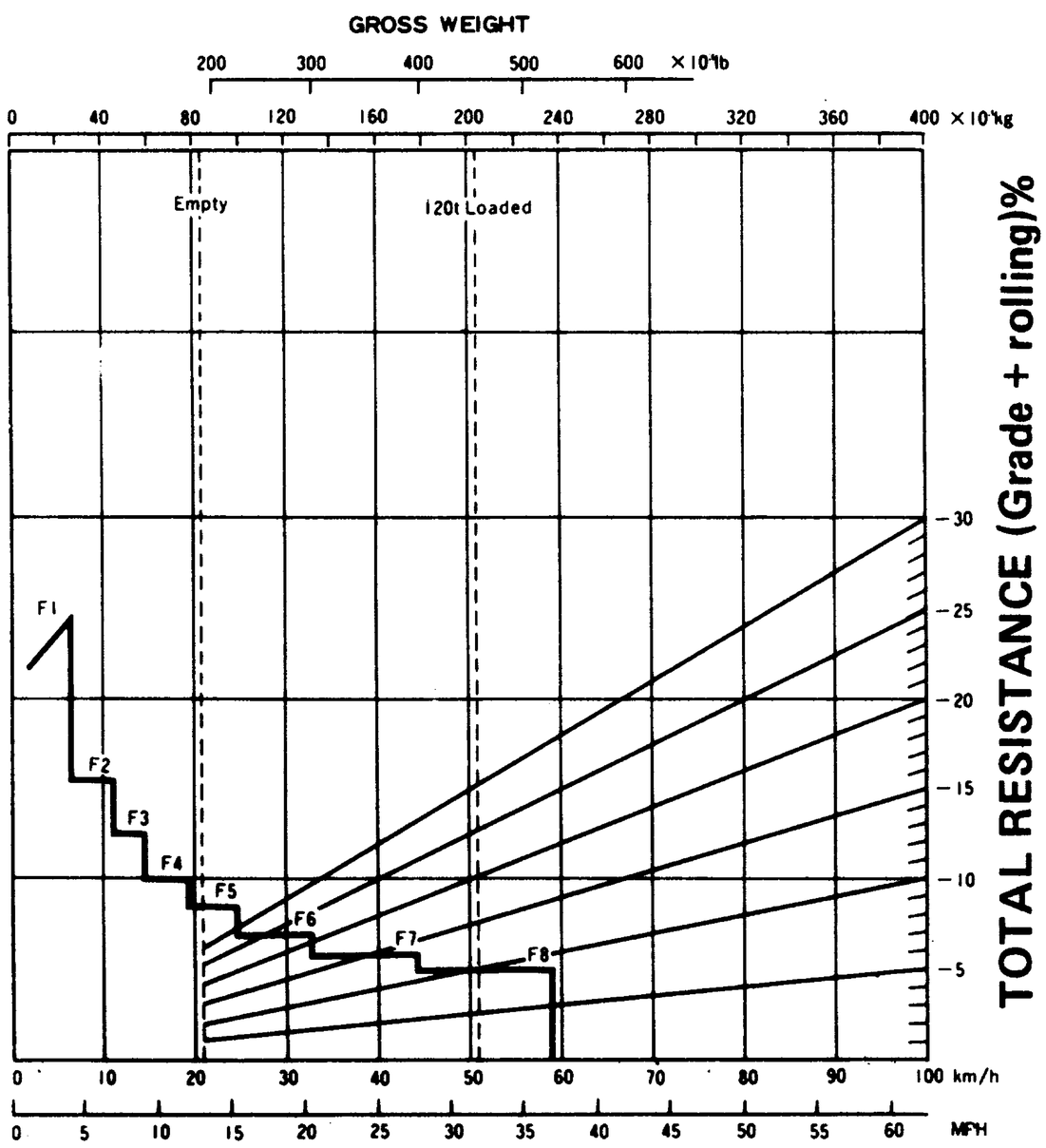
Grade distance: 450 m (1,480 ft)



Grade distance: 600 m (1,970 ft)



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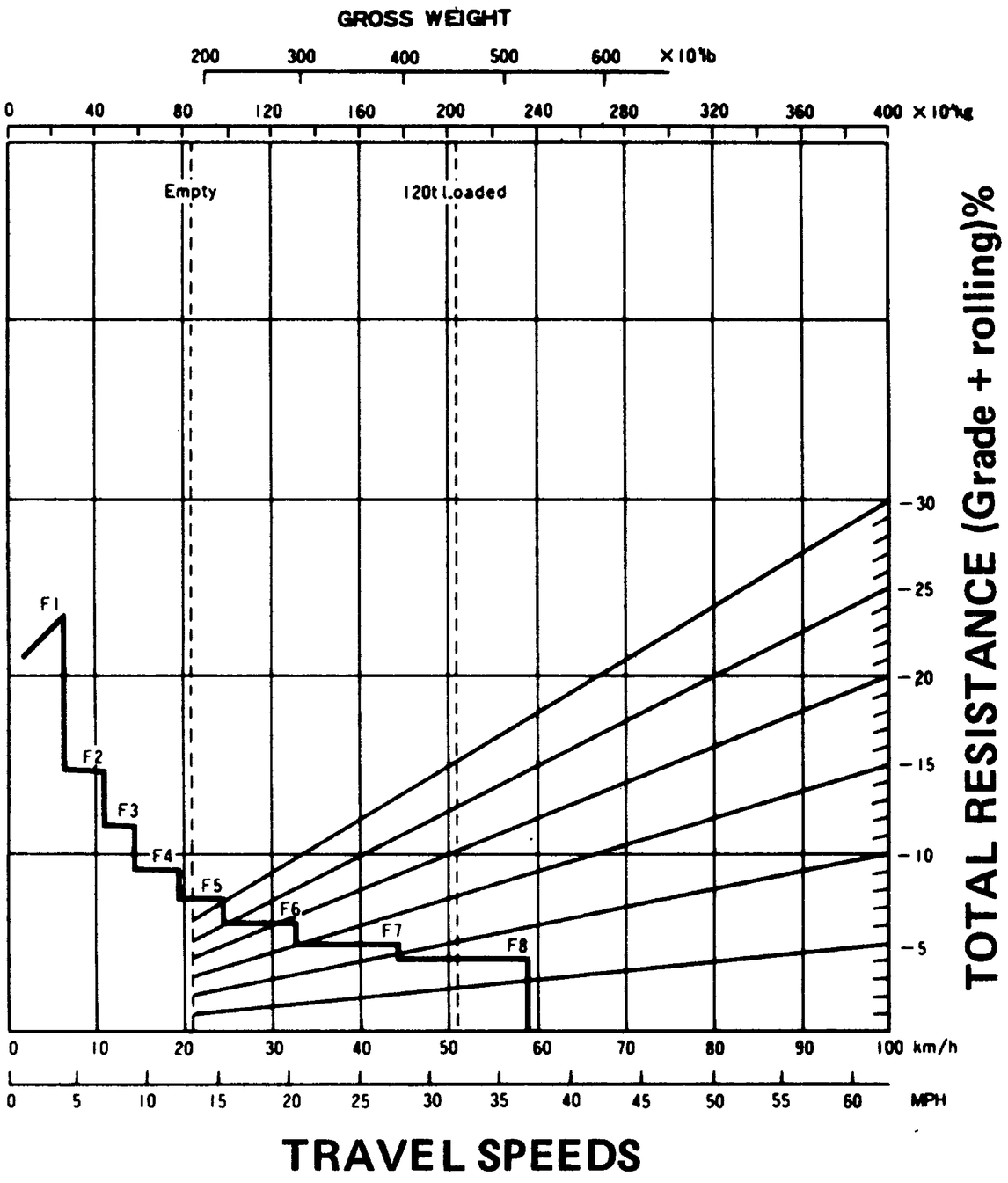
Grade distance: 900 m (2,950 ft)



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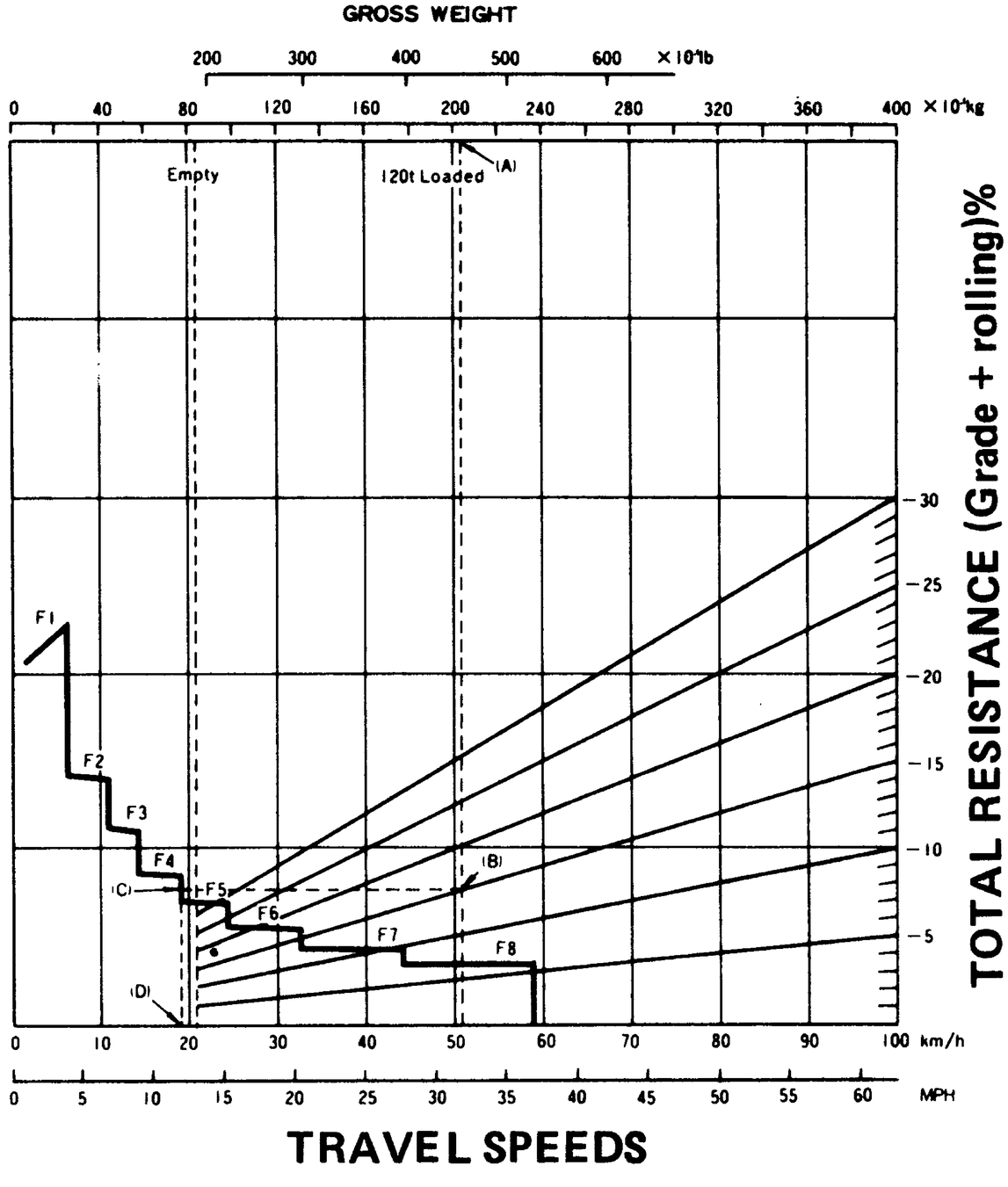

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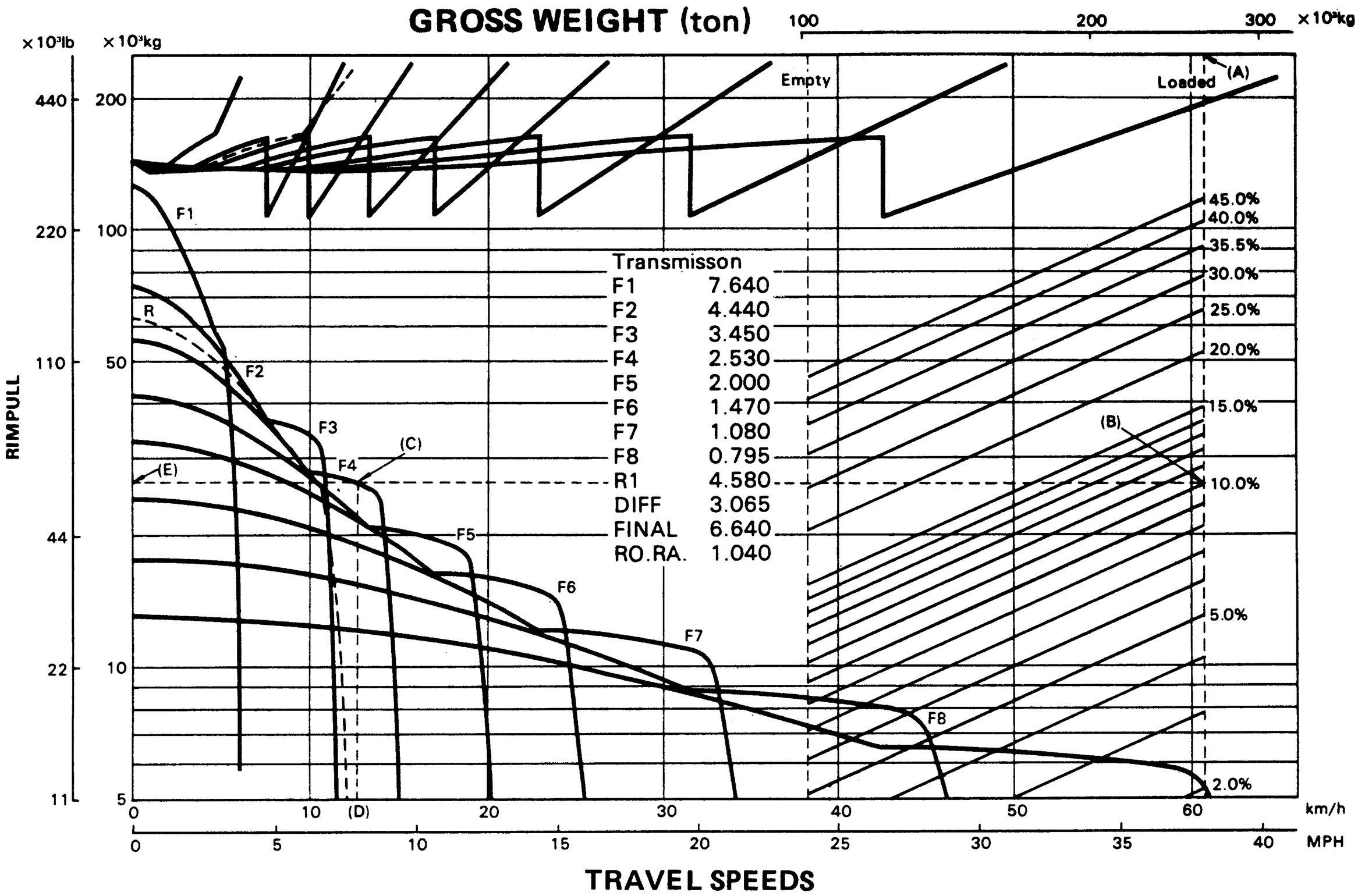

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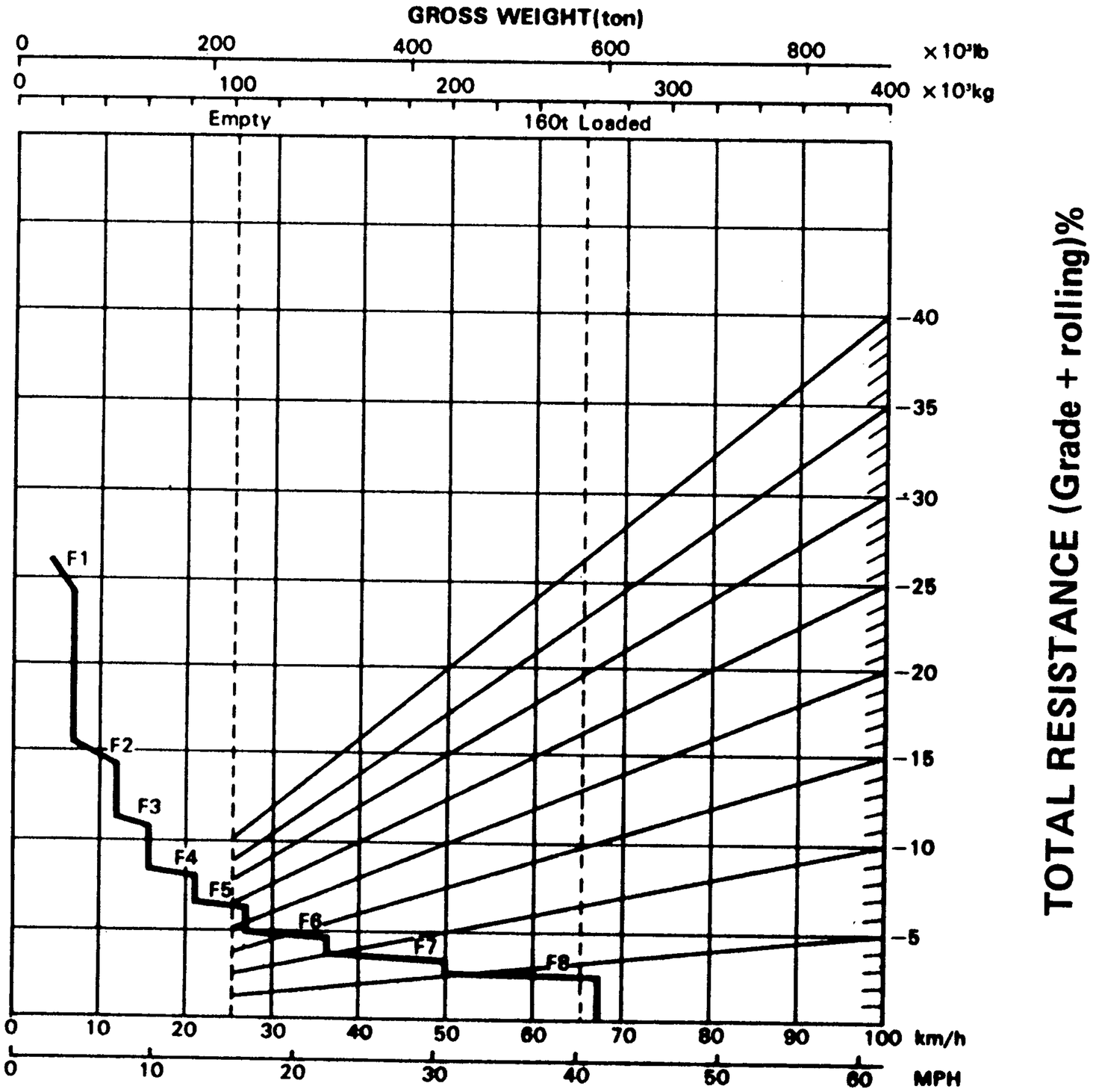
Grade distance: Continuous decent



TRAVEL SPEEDS

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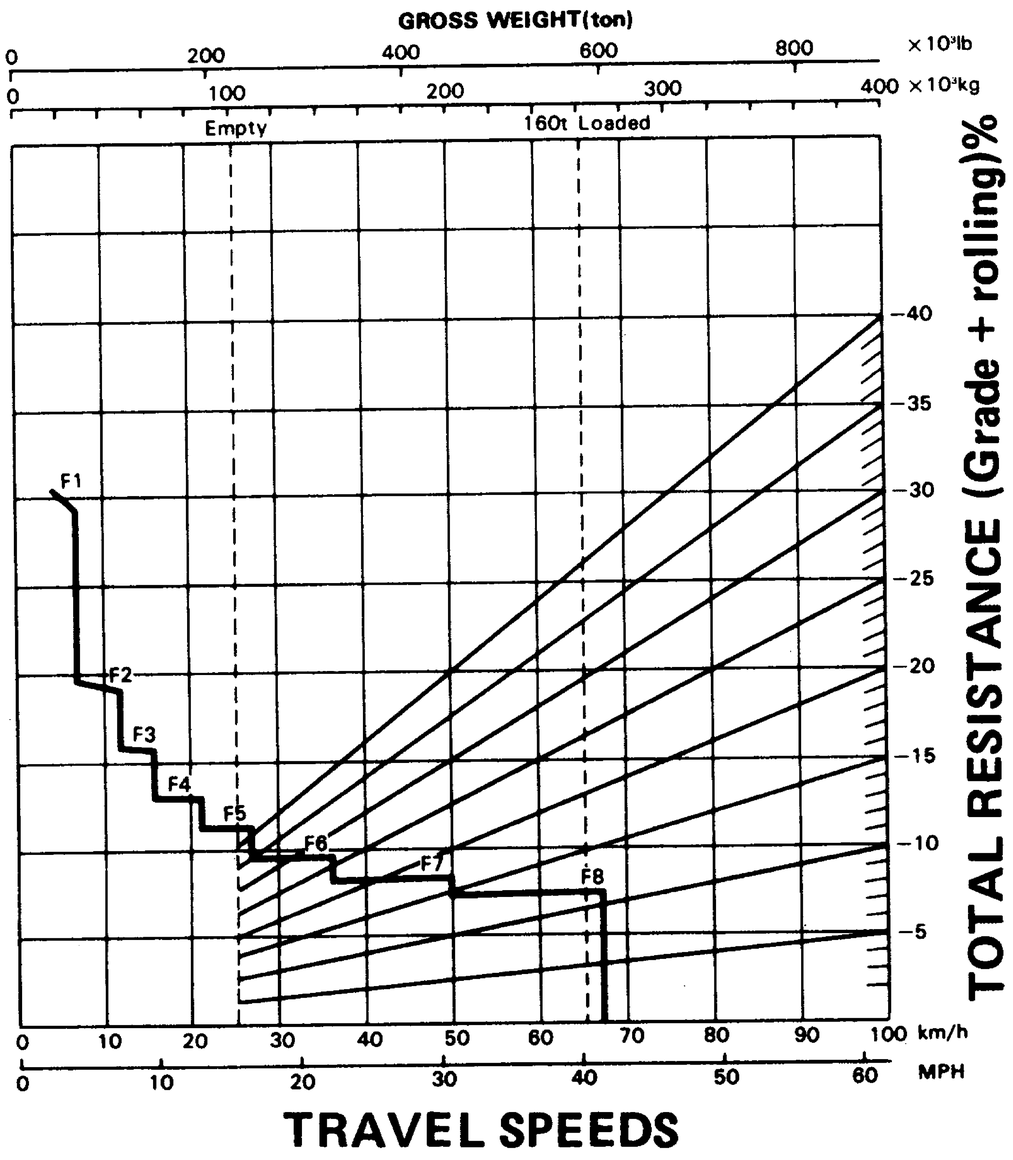
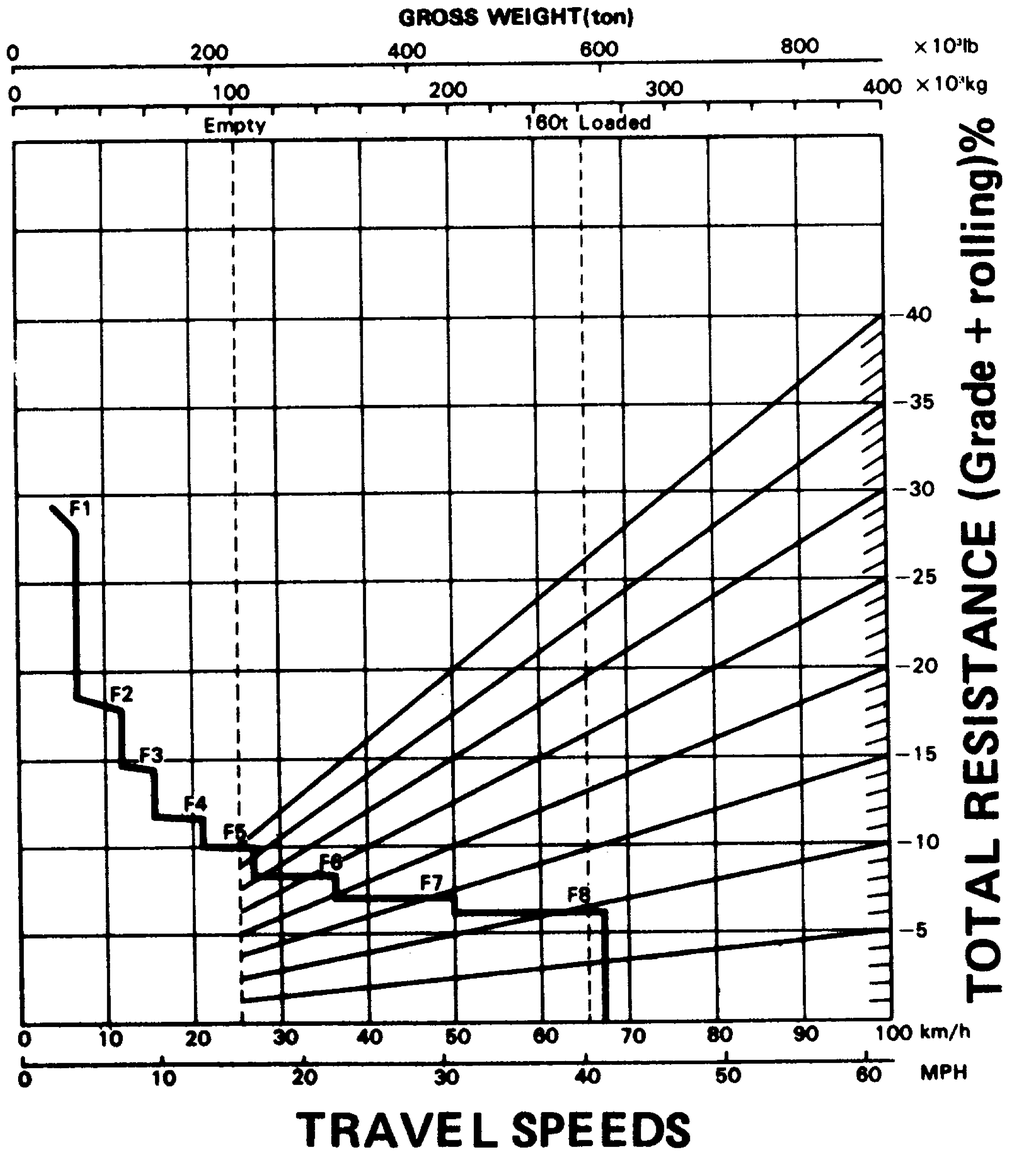
Grade distance: 450 m (1,480 ft)



Grade distance: 600 m (1,970 ft)



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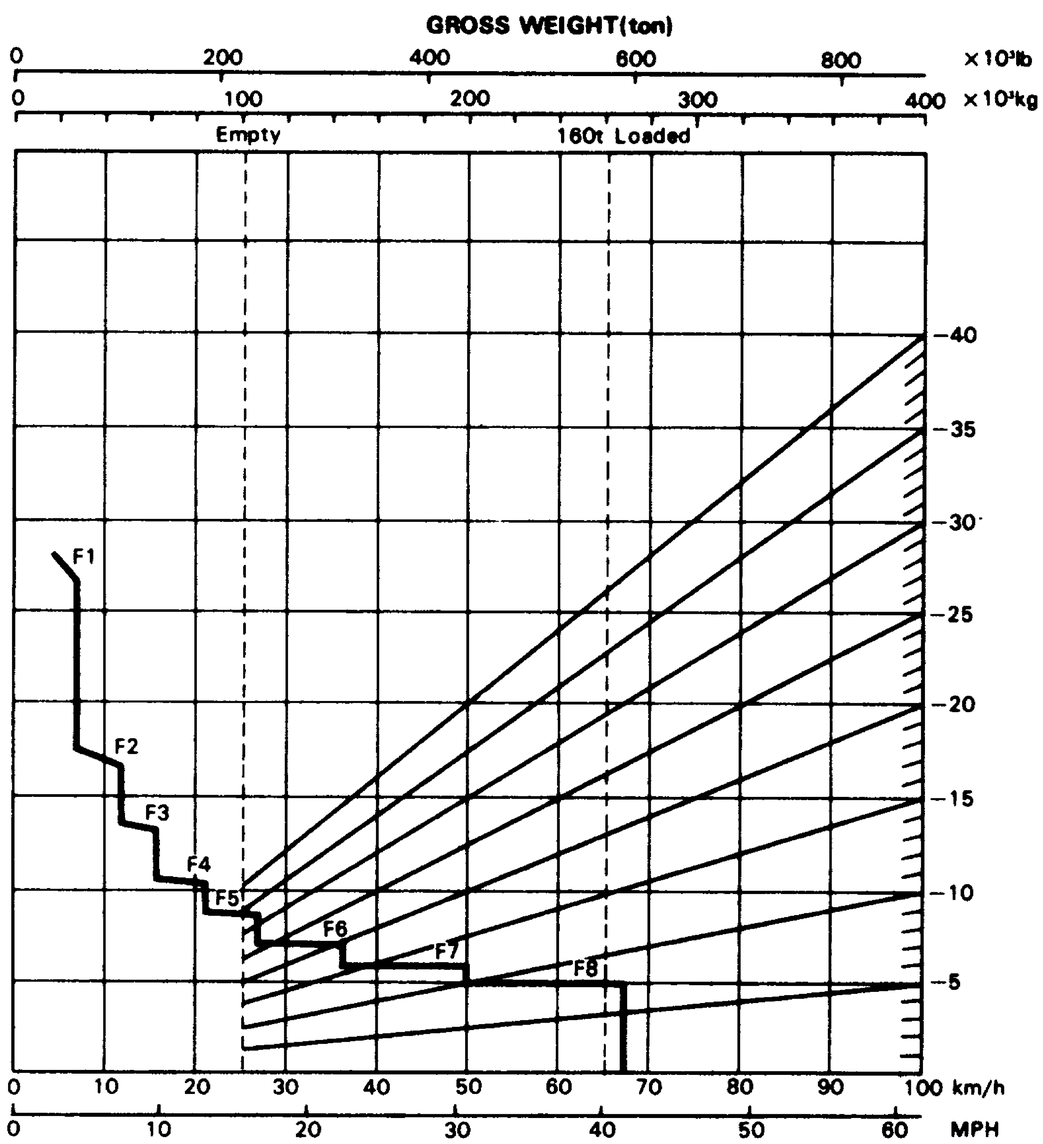
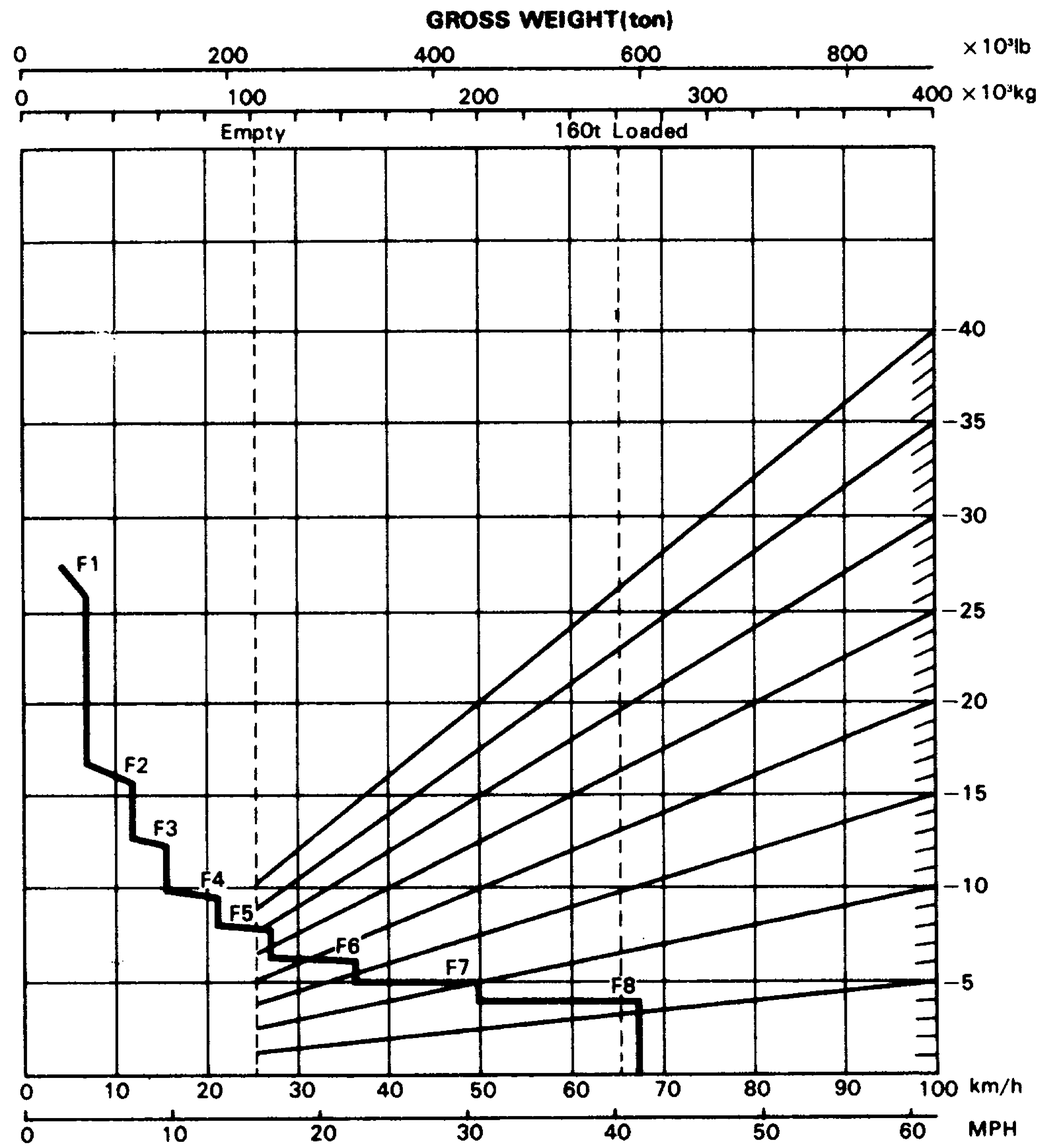
Grade distance: 900 m (2,950 ft)



TRAVEL SPEEDS

Grade distance: 1500 m (4,410 ft)



TRAVEL SPEEDS

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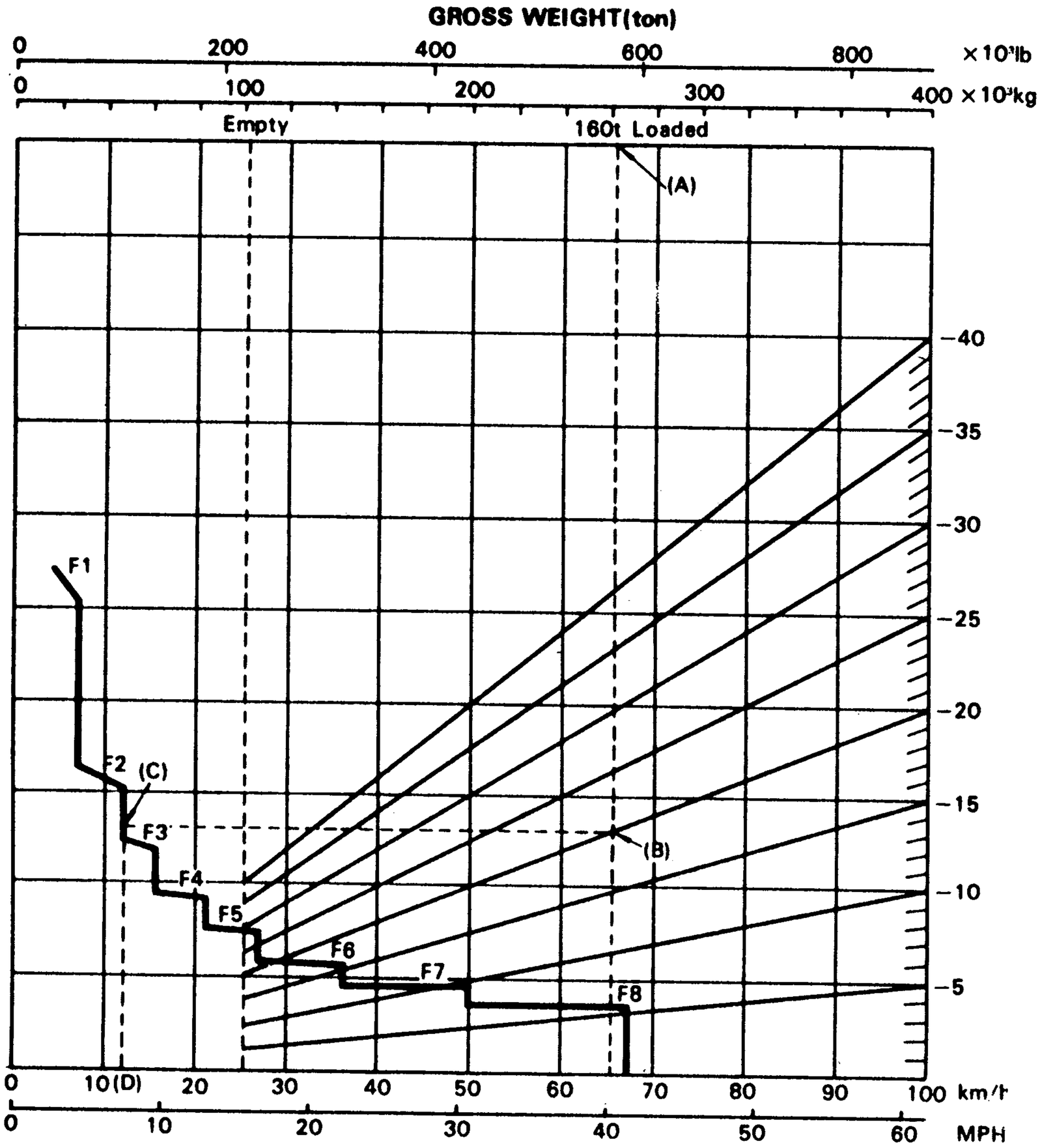
Grade distance: 2000 m (4,410 ft)



TRAVEL SPEEDS

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TRAVEL TIME (One way)

UNIT : MIN.

DISTANCE ONE WAY		AVERAGE TRAVEL SPEED KM/HR (MPH)											
METERS	FEET	5 (3.1)	10 (6.2)	15 (9.3)	20 (12.4)	25 (15.5)	30 (18.6)	35 (21.7)	40 (24.9)	45 (28.0)	50 (31.1)	55 (34.2)	60 (37.3)
50	160	0.60	0.30	0.20	0.15	0.12	0.10	0.09	0.88	0.07	0.06	0.05	0.05
100	330	1.20	0.60	0.40	0.30	0.24	0.20	0.17	0.15	0.13	0.12	0.11	0.10
200	660	2.40	1.20	0.80	0.60	0.48	0.40	0.34	0.30	0.27	0.24	0.22	0.20
300	980	3.60	1.80	1.20	0.90	0.72	0.60	0.51	0.45	0.40	0.36	0.33	0.30
500	1640	6.00	3.00	2.00	1.50	1.20	1.00	0.86	0.75	0.67	0.60	0.55	0.50
1000	3280	12.00	6.00	4.00	3.00	2.40	2.00	1.71	1.50	1.33	1.20	1.09	1.00
1500	4920	18.00	9.00	6.00	4.50	3.60	3.00	2.57	2.25	2.00	1.80	1.64	1.50
2000	6560	24.00	12.00	8.00	6.00	4.80	4.00	3.43	3.00	2.67	2.40	2.18	2.00
3000	9840	36.00	18.00	12.00	9.00	7.20	6.00	5.14	4.50	4.00	3.60	3.27	3.00
5000	16410	60.00	30.00	20.00	15.00	12.00	10.00	8.57	7.50	6.67	6.00	5.45	5.00

Cycle time = Loading time + Hauling time + Dumping time + Return time + Spot & delay time

- ○ Determine hauling and return time from the above table respectively.
- ○ Loading time = (Loader cycle time) x (No. of cydes to fill dump truck)
- ○ Average fixed time (dumping, spot & delay): 1.25 ~ 1.65 min.

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Estimated Production (Metric ton per hour)

ESTIMATED CYCLE TIME (MIN.)	PAYLOAD (METRIC TON)								
	18	20	32	46	68	78	120	160	180
3	360	400	640	920	1360	1560	2400	3200	3600
6	180	200	320	460	680	780	1200	1600	1800
9	120	133	213	307	453	520	800	1067	1200
12	90	100	160	230	340	390	600	800	900
15	72	80	128	184	272	312	480	640	720
18	60	67	107	153	227	260	400	533	600
21	51	57	91	131	194	223	343	457	514
24	45	50	80	115	170	195	300	400	450
27	40	44	71	102	151	173	267	356	400
30	36	40	64	92	136	156	240	320	360
35	31	34	55	79	117	134	206	274	309
40	27	30	48	69	102	117	180	240	270
45	24	27	43	61	91	104	160	213	240
50	22	24	38	55	82	94	144	192	196
55	20	22	35	50	74	85	131	175	196
60	18	20	32	46	68	78	120	160	180

Estimated Production (U.S. ton per hour)

ESTIMATED CYCLE TIME (MIN.)	PAYLOAD (U.S. TON)								
	20	22	35	51	75	86	132	176	198
3	400	440	700	1020	1500	1720	2640	3520	3960
6	200	220	350	510	750	860	1320	1760	1980
9	133	147	233	340	500	573	880	1173	1320
12	100	110	175	255	375	430	660	880	990
15	80	88	140	204	300	344	528	704	792
18	67	73	117	170	250	287	440	587	660
21	57	63	100	146	214	246	377	503	566
24	50	55	88	128	188	215	330	440	495
27	44	49	78	113	167	191	293	391	440
30	40	44	70	102	150	172	264	352	396
35	34	38	60	87	129	147	226	302	339
40	30	33	53	77	113	129	198	264	297
45	27	29	47	68	100	115	176	235	264
50	24	26	42	61	90	103	158	211	238
55	22	24	38	56	82	94	144	192	216
60	20	22	35	51	75	86	132	176	198

* Actual production = (Estimated production)
x (Job efficiency)

Job efficiency (E)

Operation conditions	E
Good	0.83
Average	0.80
Rather poor	0.75
Poor	0.70