

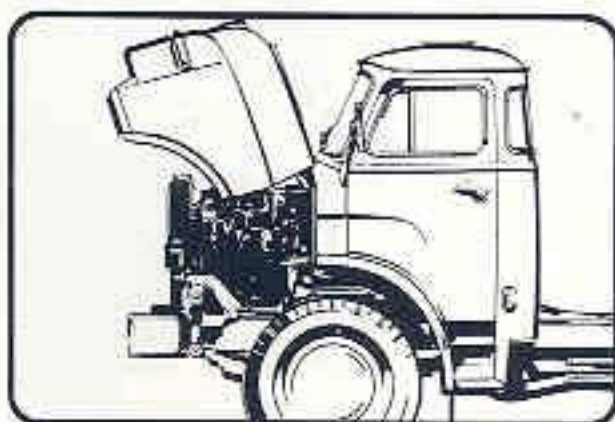
M·A·N

13.230 HK

Semi-Forward Control Three-Way Tipper

Easy access to engine
through extra-wide winged bonnet

254 HP (SAE) M.A.N.-HM-Engine
Permissible g.v.w. 19 tons
Permissible g.c.w. 38 tons



New model designation 13.230 HK

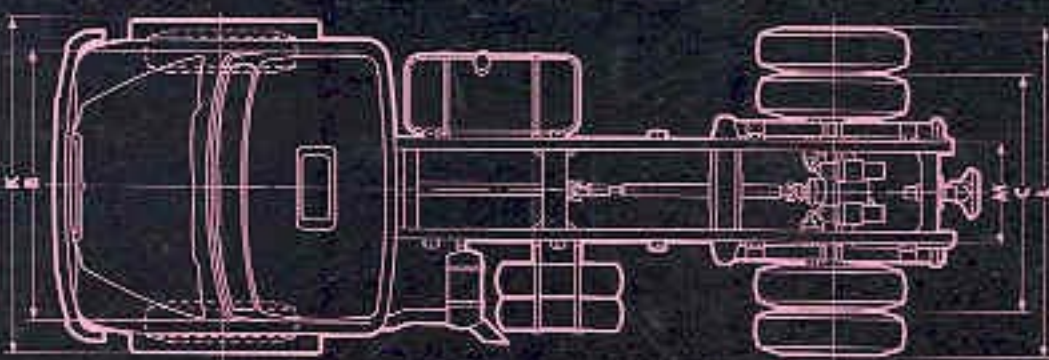
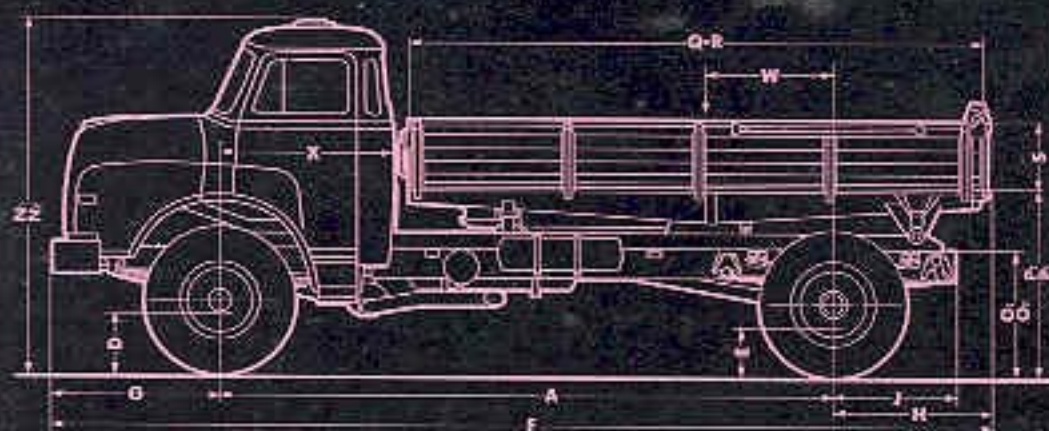
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M.A.N

13.230 HK



DIMENSIONS in mm. (in.)

A - Wheelbase	4102 (162)	4800 (189)	
C - Track	front	2050 (81)	2070 (81)
	rear	1881 (74)	1811 (72)
	Ground clearance, front, approx.	472 (19)	472 (19)
	Ground clearance, rear, approx.	340 (13)	340 (13)
	Minimum track circle dia. in m. (ft.)	14.6 (48)	14.0 (46)
F - Minimum turning circle dia. in m. (ft.)	18.0 (59)	17.5 (57)	
J - Overall length	6730 (265)	7160 (281)	
H - Front vehicle overhang	1705 (67)	1235 (49)	
I - Rear frame overhang	500 (20)	960 (38)	
K - Width over driver's cab	2490 (98)	2490 (98)	
L - Width over outer rear tyres	2180 (86)	2400 (94)	
M - Width of frame	780 (31)	700 (28)	

N - Height over cab, unladen, approx.	2710 (107)	2710 (107)
N - Height over cab, laden, approx.	2670 (105)	2610 (103)
O - Height of frame ¹⁾ , unladen, approx.	1080 (43)	1080 (43)
O - Height of frame ¹⁾ , laden, approx.	950 (38)	981 (39)
P - Height of platform ¹⁾ , unladen, approx.	1570 (62)	1520 (60)
P - Height of platform ¹⁾ , laden, approx.	1410 (55)	1490 (58)
Clear body dimensions:		
Q - Length	4002 (158)	4400 (173)
R - Width	2030 (80)	2200 (87)
S - Height of sideboards	600 (24)	600 (24)
W - Loading capacity in cu. m. (cu. ft.)	3.5 (124)	6.1 (216)
X - Centre of gravity for body and payload (measured from centre of rear axle), approx.	680 (27)	815 (32)
X - Front axle centre to cab rear wall	1250 (50)	1280 (50)

¹⁾ Measured above centre of rear axle.

WEIGHTS in kgs. (lbs.)

Chassis with cab, not including driver, tools and spare wheel, approx.	5540 (12235)	5480 (12071)
Chassis axle load, front	3090 (6817)	3370 (7430)
Chassis axle load, rear	2540 (5600)	3370 (7430)
Chassis carrying capacity with normal cab, approx.	13360 (29464)	13070 (29103)

Permissible gross vehicle weight	19000 (41887)	19000 (41887)
Permissible axle load, front	6500 (14348)	6500 (14348)
Permissible axle load, rear	13000 (28697)	13000 (28697)
Permissible trailer weight	19000 (41887)	19000 (41887)
Permissible combination weight	38000 (83774)	38000 (83774)

SPEEDS, RATIOS AND CLIMBING ABILITY (For gearbox without splitter box - standard)

Gross vehicle weight	kgs. (lbs.)		19000 (41887)			19000 (41887)							
Gross trailer weight	kgs. (lbs.)					19000 (41887)							
Gross combination weight	kgs. (lbs.)					38000 (83774)							
Gearbox ratios	Speed k.p.h.						Climbing ability % up to 50 m. above S.L.						
	at max. r.p.m.		at max. torque										
Rear axle ratios	5.44	6.26	6.78	5.41	6.26	6.78	5.44	6.26	6.78				
1st speed	9.00	8.4	8.2	7.6	6.8	6.8	5.3	35.8 ¹⁾	33.2 ¹⁾	27.7 ¹⁾	15.9	15.7	15.4
2nd speed	12.15	11.4	11.0	10.2	9.0	9.0	7.0	29.7	28.0	23.1	8.2	10.8	11.8
3rd speed	15.30	14.1	13.5	12.5	11.0	11.0	8.5	23.1	21.6	17.6	6.1	8.1	8.7
4th speed	18.45	17.0	16.2	15.0	13.0	13.0	10.0	18.4	17.3	13.6	4.8	6.4	6.9
5th speed	21.60	20.0	19.0	17.5	15.0	15.0	11.5	15.3	14.4	11.0	3.4	4.5	4.8
6th speed	24.75	22.8	21.6	20.0	17.0	17.0	13.0	13.6	12.8	9.5	2.8	3.7	3.9
Reverse	0.55	10.1	8.7	8.1	7.1	7.1	6.7	84.0 ¹⁾	40.1 ¹⁾	44.1 ¹⁾	15.8	18.4	20.1

¹⁾ Only applicable to axle vehicle at rated engine speed. - ²⁾ Maximum gradeability as specified by manufacturer 30%. - Subject to modification without previous notice.

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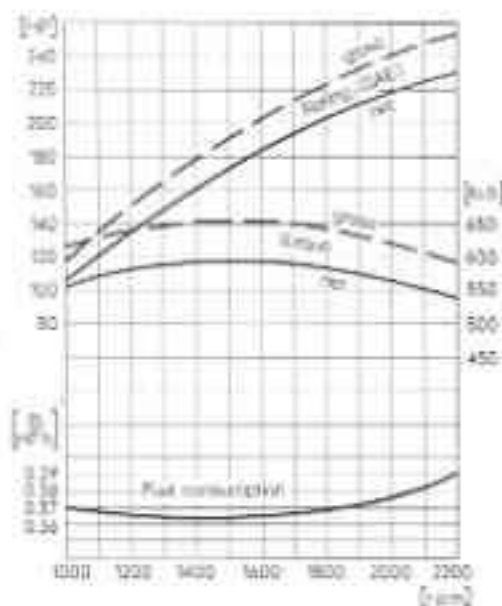
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Leading Data Model 13.230 HK



The bonnet with mudguard and radiator grill can easily be raised far enough to allow quick access to the engine and its accessories all around. The closed bonnet is supported by the longitudinal cab member through a lightweight tubular construction. The completely even front surface of the engine compartment and the interior engine cover, which can easily be removed, are effectively insulated from noise and heat. This further enhances the operating comfort of the new M.A.N. semi-forward control cab.



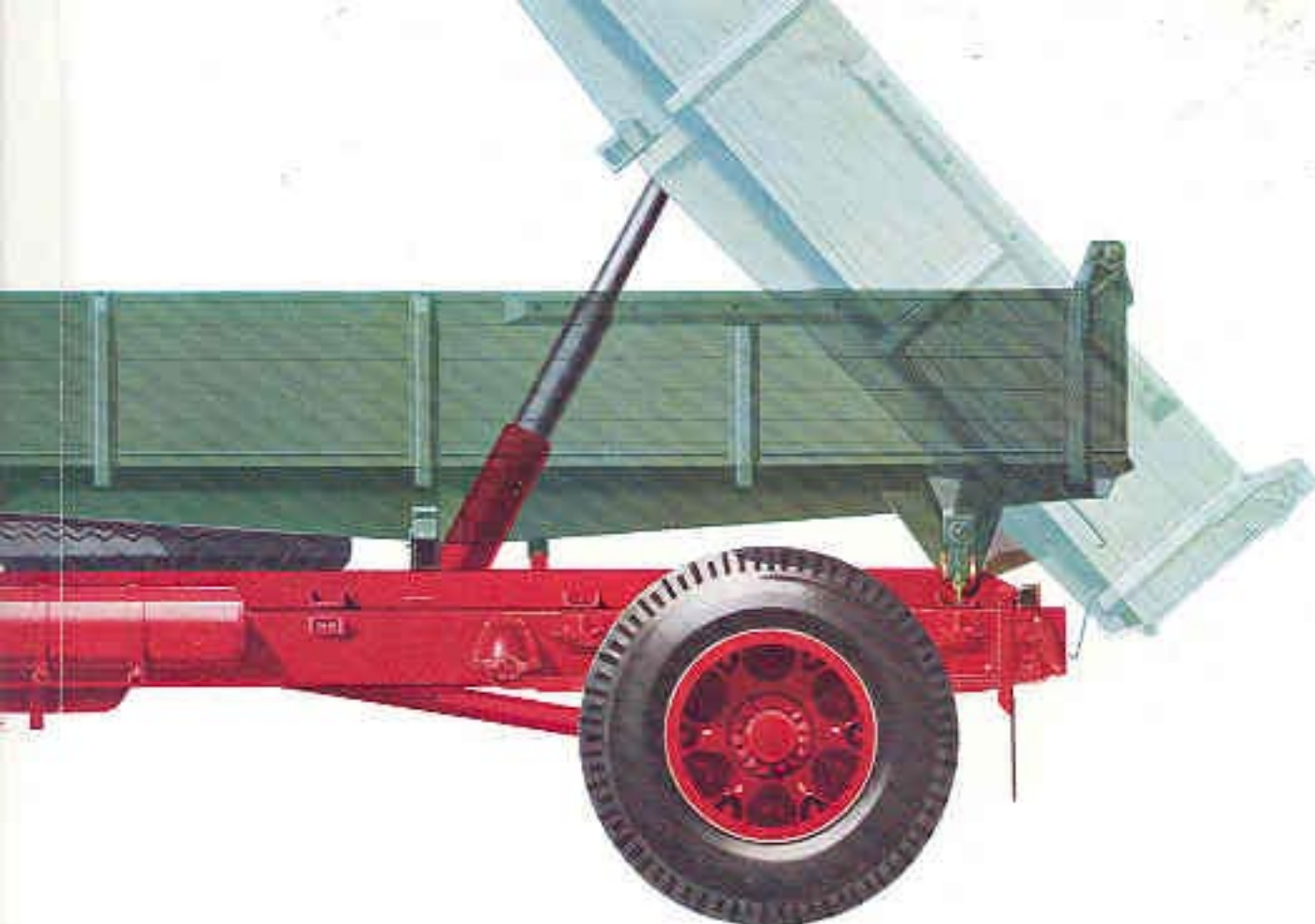
ENGINE

Water-cooled 6-cylinder, four-stroke in-line M.A.N. Diesel μ engine, type D 2356 HM X, using the noiseless M.A.N. combustion system — μ System — with direct fuel injection into a spherical combustion chamber.

Bore	123 mm. (4.84")
Stroke	150 mm. (5.90")
Piston displacement	10 680 cm. (653 cu.in.)
Rating (SAE)	254 HP gross, 230 HP net at 2200 r.p.m.
Max. torque	90 mkg (650 ft. lb.) gross, 82 mkg (594 ft. lb.) net at 1600 r.p.m.

Easily replaceable, wear-resistant dry cylinder liners.





CHASSIS

Frame: Main members made of pressed U-sections with riveted cross members.

Clutch: F & S single-plate dry clutch, hydraulically operated.

Gearbox: ZF 6-speed (dog-clutch constant-mesh gearbox AK 5-60, Splinter box GV 60 against extra charge.

Steering gear: ZF hydro steering gear.

Front axle: Slightly offset.

Rear axle: M.A.N. design, separate dead and live axles, final drives with spur wheel reduction, built-in oil pump for lubrication of axle drive, gears and bearings. Differ-

ential lock against extra charge. Rear axle ratios: 6.44, 6.26, 6.78, 7.22.

Suspension: Front: semi-elliptic leaf springs. Rear: progressive springs.

Wheels: 7 Trilox wheels with rims 8.5-20.

Tyres: 7 tyres: 12.00-20, super.

Foot brake: Two-circuit system. Front wheels: hydraulic, air-assisted brakes. Rear wheels: air brakes.

Hand brake: Parking brake acting mechanically on rear wheels and assisted by a spring-loaded safety brake cylinder.

Exhaust brake: Air-actuated.

Fuel tank: One tank, 200 litres capacity (additional tank against extra charge).

SPEEDS, RATIOS AND CLIMBING ABILITY

(For gear box with splinter box — optional extra)

Gross vehicle weight	19000 (41887)		18000 (39677)									
	kg (lbs.)		kg (lbs.)									
Gross trailer weight	kg (lbs.)		kg (lbs.)									
Gross combination weight	kg (lbs.)		kg (lbs.)									
Gearbox ratios	Speed k.p.h.						Climbing ability % up to 500 m. above 5 l.					
	at max. r.p.m.		at max. torque									
Rear axle ratios	6.26	6.78	7.22	6.26	6.78	7.22	6.26	6.78	7.22	6.26	6.78	7.22
1st gear	8.0	7.8	7.1	5.8	5.3	5.0	43.25	47.77	51.75	19.7	25.5	23.0
2nd gear	9.6	9.1	8.0	6.9	6.4	6.0	36.95	38.47	41.35	16.2	17.7	18.9
3rd gear	14.3	13.8	12.6	10.0	9.2	8.7	23.0	25.1	26.9	10.3	11.0	12.0
4th gear	17.1	16.6	14.8	12.0	11.1	10.4	18.5	20.0	22.1	8.5	8.8	10.3
5th gear	25.4	24.7	20.4	16.5	15.2	14.3	13.3	14.8	16.6	6.1	6.7	7.2
6th gear	28.2	27.0	24.4	19.5	18.3	17.7	10.9	11.9	12.8	4.9	5.4	5.8
7th gear	35.5	33.8	30.8	24.9	23.0	21.6	8.4	9.2	9.9	3.7	4.1	4.4
8th gear	42.8	40.9	38.0	29.5	27.5	25.9	6.8	7.5	8.1	2.9	3.2	3.5
9th gear	51.3	47.4	44.2	35.0	33.2	31.2	5.5	6.1	6.5	2.3	2.5	2.8
10th gear	61.6	55.8	53.1	43.2	39.9	37.5	4.4	4.9	5.2	1.7	1.9	2.1
11th gear	73.8	66.9	64.0	51.8	47.9	44.9	3.5	3.9	4.2	1.3	1.4	1.6
12th gear	88.5	81.7	78.7	62.1	57.8	55.5	2.8	3.1	3.4	0.9	1.0	1.2
1st reverse	8.45	8.1	7.5	6.1	5.7	5.3	40.17	44.17	47.77	13.4	19.1	21.5
2nd reverse	7.05	6.7	6.1	5.0	4.6	4.4	32.07	35.07	38.37	10.1	16.5	17.7

1) Only applicable to solo vehicle at rated engine speed. — 2) Maximum gradability as specified by manufacturer 30%.

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