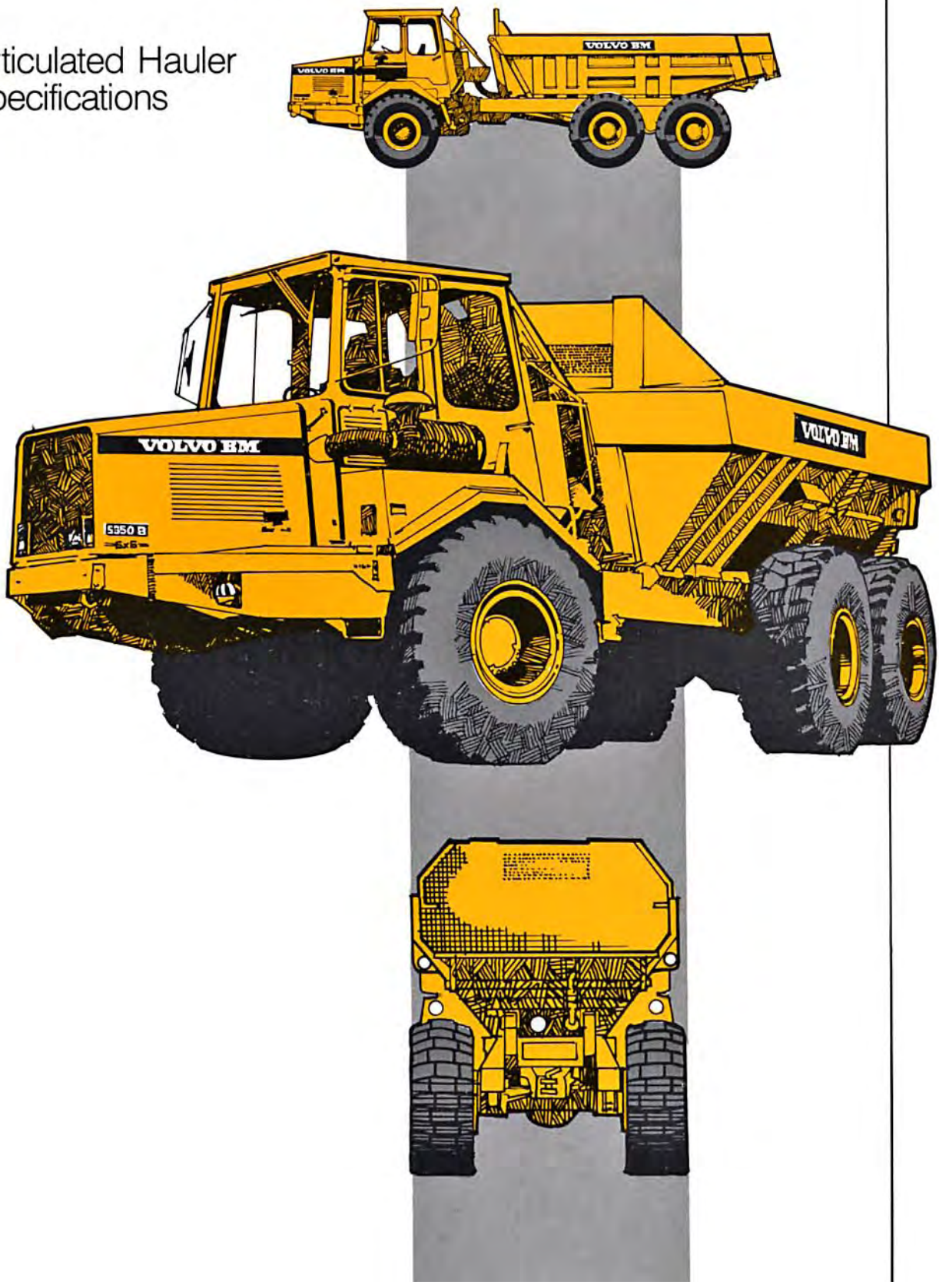
VOLVO BM
5350 B 6x6

Articulated Hauler
Specifications



VOLVO BM 5350 B 6x6

ENGINE

Make	Volvo
Model	TD 71 GA
Type	4 Cycle
Aspiration	Turbocharged
Rated Output (SAE J1349)	157 kW @ 2400 rpm (213 bhp)
Flywheel Output* (SAE J1349)	155 kW @ 2400 rpm (210 bhp)
Number Cylinders	6
Bore & Stroke	105mm x 130mm (4⅛" x 5⅛")
Compression Ratio	15.5:1
Displacement	6.7 litres (411 in³)
Maximum Torque	710 N•m @ 1800 rpm (524 lb-ft)

*With radiator fan working at 2400 rpm, output is 140 kW (190 bhp).

TRANSMISSION

ZF 5 HP 500. Planetary Type, automatic shift, integral torque converter with automatic lock-up. Direct mounted, 5 forward speeds, 1 reverse. Dropbox contains high/low gear unit providing a total of 10 forward, 2 reverse speeds.

Maximum Speeds @ 2400 RPM Governed Engine Speed

Range	Gear Ratio	Low Range km/h	Low Range (mph)	High Range km/h	High Range (mph)
1	5.60	6.0	(3.7)	9.0	(5.6)
2	3.43	9.0	(5.6)	15.0	(9.3)
3	2.01	15.0	(9.3)	25.0	(15.5)
4	1.42	22.0	(13.7)	36.0	(22.4)
5	1.00	31.0	(19.3)	51.0	(31.7)
R	4.84	7.0	(4.4)	11.0	(6.8)

Dropbox
Volvo BM Model FL 652 contains high/low gear unit to distribute power between front axle and bogie axles.

DRIVE AXLES

Full floating axle shafts and planetary gear type hub reduction. Continuous drive on all axles with longitudinal differential lock engaged. The third axle can be disengaged for 6x4 operation.

Front

Make	Volvo BM
Model	AH 54 E
Differential Lock	100%
Lock-up	Yes

Leading Bogie

Make	Volvo BM
Model	AH 54 C
Differential Lock	100%
Lock-up	Yes

Trailing Bogie

Make	Volvo BM
Model	AH 54 D
Differential Lock	100%
Lock-up	Yes

AIR

Compressor
Volvo TD 71 @ 2060 rpm ..... 7.1 l/s (15.0 cfm)

Service Air

Pressure	765 kPa (111 psi)
Reservoir Capacity	66 litres (17 ft³)

TIRES

Standard — Front and Bogie — **Rim Width**
Michelin 23.5R25• Radials ..... 495mm (19.5")

GROUND PRESSURE

At 15% slump of unladen diameter and standard weights and tires. Cone penetrometer value at a depth of 250 mm (9.8 in).

	kg/cm²	(lb/in²)
Empty Vehicle		
Front Axle	0.95	(13.50)
Bogie Axle	0.44	(6.26)
Loaded Vehicle		
Front Axle	1.24	(17.70)
Bogie Axle	1.51	(21.34)
Cone Penetrometer Value	62	

LOAD CAPACITY

22.5 metric tonne (25 short ton)

	m³	(yd³)
Struck (SAE)	10.4	(13.6)
Heap 2:1 (SAE)	13.0	(17.0)

WEIGHTS

Body with wear plates.

	kg	(lb)
Chassis with Hoist	13 745	(30,302)
Body	3 455	(7,617)
Net Weight	17 200	(37,919)
Front Axle	8 800	(19,400)
Bogie Axle	8 400	(18,519)
Payload	22 500	(49,603)
Gross Weight	39 700	(87,522)
Front Axle	11 200	(24,691)
Bogie Axle	28 500	(62,831)

STEERING

Closed center, hydromechanical articulated steering using two, double-acting cylinders and piston pump. The steering gear is of rack and pinion type. Emergency steering provided by ground-driven piston pump in accordance with SAE J53 is standard.

Steering Angle	45°
Lock-to-Lock Turns	3.4
Turning Diameter (SAE)	15.7m (51' 6")
Steering Pump Output (@ 2,400 rpm)	100 l/m (26 g/m)
System Relief Pressure	18 996 kPa (2,755 psi)

HOIST

One Volvo BM 6-stage single-acting hoist cylinder, inverted and inboard mounted, piston pump. Body hoist kick-out standard.

Body Raise Time	16 sec.
Body Lower Time	22 sec.
Hoist Pump Output (@ 2,400 rpm)	100 l/m (26 g/m)
System Relief Pressure	18 966 kPa (2,755 psi)

ELECTRICAL

Number Batteries	2
Voltage	24 volts
Battery Capacity	135 Ah
Generator Rating	1260 watts/55 amps
Starter Motor Power	5 kW (6.8 bhp)

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BRAKES

Service
Air/oil actuated disc brakes with two calipers per disc on the front axle, one caliper per disc on the leading and trailing bogie axles. Dual circuit system; one circuit front axle, one circuit rear axle. System conforms to SAE J1224.

Front Axle
Disc Diameter Each ..... 47cm (18.5 in)
Lining Area Per Axle ..... 1 584cm² (245.5 in²)

Leading and Trailing Bogie Axle (Each)
Disc Diameter Each ..... 47cm (18.5 in)
Lining Area Per Axle ..... 792cm² (122.8 in²)

Secondary
Two independent circuits within the service brake system provide secondary stopping capability conforming to SAE J1224. System is manually or automatically applied to stop vehicle within prescribed braking distance.

Parking
Spring-actuated disc brake on driveline out of dropbox. Automatically applied if air pressure is lost. Manually controlled from instrument panel.

Disc Diameter ..... 37cm (14.6 in)
Lining Area ..... 282cm² (43.2 in²)

Retarder
Foot activated button controls air-operated diaphragm on exhaust side of turbo for improved braking. Exhaust brake can also be used at idling speed for faster machine warm-up.

BODY

Flat floor, sloped tailchute. Sides are reinforced externally with pressed channel sections welded to the body. High yield strength 1100 N/mm² (160,000 psi) alloy steel used for floor and side plates. Front plate utilizes 640 N/mm² (92,800 psi) yield strength steel. Plate thicknesses:

Floor ..... 10mm (0.39")
Front ..... 6mm (0.24")
Sides ..... 6mm (0.24")

Wear plates with yield strength of 883 N/mm² (128,000 psi) and hardness of 360-440 BHN are standard to extend the life of the body and reduce maintenance costs. Floor and side wear plates are 8mm (0.31") and front wear plate is 6mm (0.24") thick. A grill window in the front part of the body helps the driver spot easily next to the loading tool.

CAB

Volvo BM safety cab, ROPS/FOPS tested and approved in accordance with SAE J1040c and SAE J231 respectively. Mounted in the middle on rubber pads enabling the driver to remain comfortable and safe from vibrations in rough terrain. Filtered air and pressurized, safety and tinted glass throughout. The cab is spacious with low noise levels (77 dBA) and has well arranged controls and instrumentation for safe, effortless driving. Passenger seat and belt standard.

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STANDARD EQUIPMENT

General

- Air horns
- Body hoist kickout
- Body liner plates
- Body prop strut
- Electric start
- Fan guard
- Mirrors, right and left
- Mud flaps
- Radiator grille guard
- Reverse alarm
- Steering joint locking assembly
- Supplementary steering system
- Tool box
- Tow hooks, front
- Work platform fender step

Cab

- Ash tray
- Cab interior light
- Cigar lighter
- Downshift inhibitor
- Heater and defroster
- Operator seat, adjustable
- Operator seat belt
- Passenger seat and belt
- Roof hatch
- ROPS/FOPS
- Rubber floor mat
- Sun visor
- Tinted glass
- Windshield washer
- Windshield wiper

Gauges and Lights

Gauges:
- Fuel level
- Service air pressure
- Speedometer
- Tachometer

Indicator Lights:
- Charging
- Turn signals
- Engine preheating
- Emergency steer pump
- Headlights
- Longitudinal diff-locks
- Steering function

Warning Lights

- Air filter restriction
- High engine rpm's
- High gearbox temperature
- Hydraulic pump malfunction
- Low brake fluid level
- Low brake pressure
- Low coolant level
- Low engine oil pressure
- Low hydraulic oil level
- Park brake applied
- Steer system malfunction

Exterior Vehicle Lights

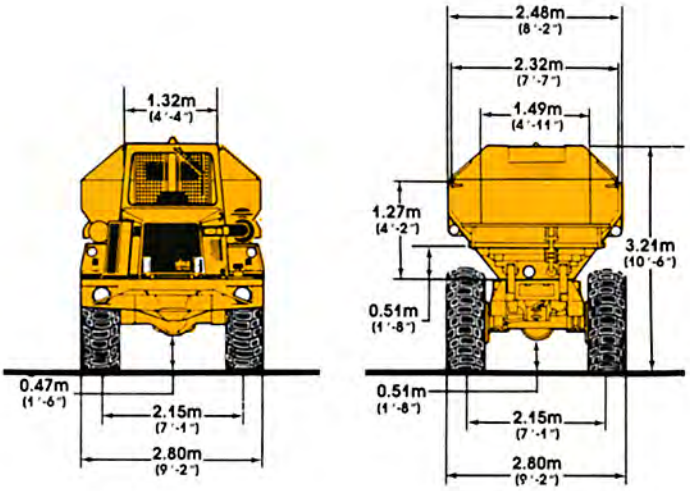
- Back-up light
- Dual combination stop and taillights
- Headlights, two
- Turn signals
- Work lights

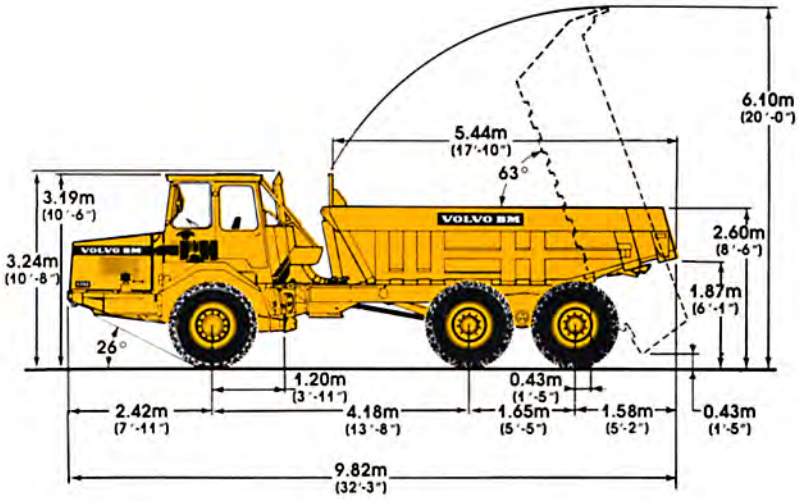
OPTIONAL EQUIPMENT

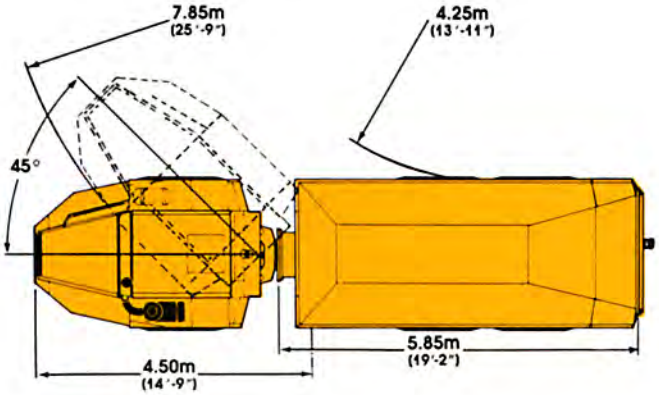
- Air conditioning
- Exhaust heated body
- Radio
- Rotating beacon light

SERVICE CAPACITIES

	litres	(gallons)
Crankcase (incl. filters)	18.5	(4.9)
Transmission	23.0	(6.1)
Dropbox	6.0	(1.6)
Cooling System	30.0	(8.0)
Fuel Tank	280.0	(74.0)
Hydraulic System	160.0	(42.0)
Hydraulic Tank	135.0	(35.7)
Front Axle	35.0	(9.2)
Leading Bogie Axle	38.0	(10.0)
Trailing Bogie Axle	35.0	(9.2)
Brake Fluid Reservoir	1.5	(0.4)







Note: Illustration may include optional equipment. **Note:** Dimensions shown are for empty vehicle with 23.5R25 tires.

Standard and optional equipment may vary from country to country. Product improvement is a continuing Clark Michigan Company project. Therefore, all specifications are subject to change without notice.

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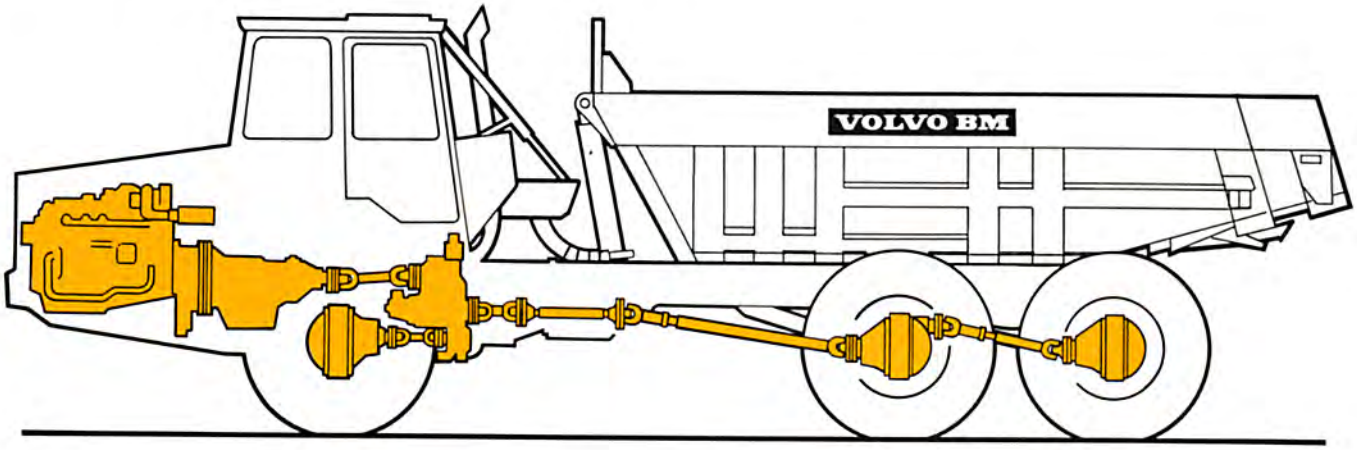

POWERTRAIN

ENGINE
The Volvo BM 5350B is powered by the Volvo TD 71 GA turbo-diesel. This engine is a six cylinder, direct-injected, turbo-charged, four-stroke with overhead valves and in-line cylinders. The replaceable cylinder liners are the wet type, in direct contact with the coolant, improving heat removal. The split cylinder heads with separate gaskets allow for easy servicing and provide large heat dissipation. The TD 71 GA is a modern, lightweight engine combining high power with low fuel consumption.

TRANSMISSION
The transmission in the 5350B is the automatic ZF 5 HP 500 Ecomat utilizing a hydrodynamic torque converter with lock-up clutch for direct drive and a rear-mounted planetary gearbox. The lock-up clutch provides a direct mechanical link between the engine and planetary gearbox after the vehicle start-up phase, eliminating the power losses encountered in converter drive and providing improved fuel consumption. The closely spaced ratios in the five (5) forward, one (1) reverse speed transmission also contribute to low fuel consumption. The transmission output propeller drives a Volvo BM dropbox with built-in differential, lock-up and high/low gear unit. This arrangement provides a total of ten (10) forward and two (2) reverse gear selections.

Gear shifts are performed automatically on receipt of signals from an electronic control unit. This unit responds to engine output by position of the accelerator, position of the speed range selector, and vehicle speed. Signals are then transmitted to the electro-hydraulic valves which actuate the corresponding clutches.

The modular design of the ZF 5 HP 500 transmission guarantees simple, cost-saving servicing routines. The Volvo TD 71 GA engine and the ZF 5 HP 500 transmission combine for a very economical, proven powertrain package.

DRIVE AXLES — 6x6
The 5350B 6x6 has constant four-wheel drive with the added provision for six-wheel drive in difficult terrain. The axle shafts are fully floating and drive planetary hub reductions in each wheel. Each axle contains an air-operated dog clutch type differential lock with 100% lock-up. Drive to the trailing bogie axle, together with the longitudinal differential lock, can be engaged and disengaged as required.

The longitudinal differential lock is located in the dropbox and allows an equal amount of tractive effort to be transferred to the front axle and bogie axles. This longitudinal lock is used mainly in very slippery and muddy conditions.

The transverse differential locks are located on each axle. When applied in extremely difficult terrain, they transmit 100% of the tractive force to the wheel that is in contact with the ground.

FRAME

Front power frame constructed of two tapered box sections connected at the rear by the steering joint and at the front by an integral bumper. The rear load carrying frame is made up of two longitudinal box section rails bridged by three welded cross members. The frame joint, designed to withstand severe stresses, consists of a steering joint and rotational joint. Because the load carrying frame unit can rotate in relation to the power unit, the frames are not subjected to torsional stresses.

SUSPENSION

FRONT
Suspended in an A-frame and fixed laterally by tie rods. Each side consists of two rubber springs, two shock absorbers and one anti-sway rubber pad.

BOGIE
Two oscillating axles connected by two bogie arms located outside the frame members. Shock absorbing rubber pads are mounted between the axles and the bogie arms. The bogie axles oscillate independently, reducing stresses on the machine in rough terrain.

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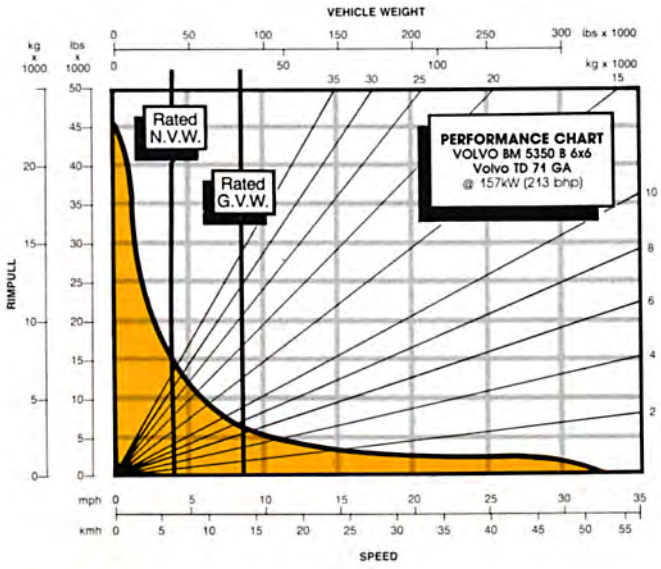

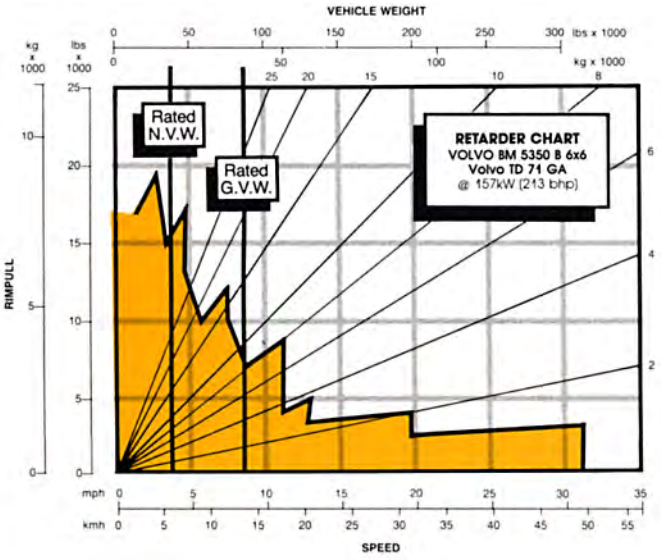

INSTRUCTIONS:

Diagonal lines represent total resistance (Grade % plus rolling resistance %). Charts based on 0% rolling resistance, standard tires and gearing unless otherwise stated.

1. Find the total resistance on diagonal lines on right-hand border of performance or retarder chart.
2. Follow the diagonal line downward and intersect the NVW or GVW weight line.
3. From intersection, read horizontally right or left to intersect the performance or retarder curve.
4. Read down for vehicle speed.

Clark Michigan Company

A subsidiary of VME Group N. V.

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216/383-5000 • CABLE ADDRESS EUCINC

FORM No. 19-011

Printed in U.S.A. (1/86)