4-26-89 DC

DUMP TRUCK

HD785-1

MAX. PAYLOAD: 78000 kg (85 U.S. tons)
GROSS HORSEPOWER: 900 HP (671 kW)/2100 RPM
FLYWHEEL HORSEPOWER: 877 HP (654 kW)/2100 RPM

- **Job-proven Cummins KT-2300 diesel engine:** The popular prime mover for various heavy-duty construction equipment offers rugged power, low-fuel consumption and longer life.
- **Full-automatic TORQFLOW transmission:** A microcomputer built into the shift controller automatically selects the optimum gear position according to travel speed, load and road conditions, assuring effortless and precise operation.
- **High traveling stability:** Hydropneumatic suspension, low center of gravity, long wheelbase and wide treads all insure excellent stability and greater operator comfort.
- **High-performance, durable brakes:** Oil-cooled, multiple-disc rear brakes are free from fading even during continuous or repeated use. Due to ample capacity, the rear brakes also act as retarder brakes. When the engine runs over rated revolutions, the retarder brakes automatically actuate to prevent engine overrunning.
- **Extra sturdiness:** High-tensile-strength steel rated at 130 kg/mm^2 (184,900 PSI) is used in body construction to assure effective resistance to impact and wear. Box-type frame construction of high-tensile-strength steel plate offers durability for long service.
- **Low loading height:** With its extra-low loading height, small-class loaders or mining shovels can dump loads easily onto the HD785 body.
- **Light-touch steering controls:** Due to the sophisticated hydraulic system, the operator can enjoy light-touch steering control. Komatsu's excellent A-frame design offers an extra-small turning radius of 8.8 m (28'10"), making the HD785 highly maneuverable even in confined area.
- **Maximum operator comfort:** Room-to-space cab, adjustable operator's seat, excellent visibility, well-arranged instrument panel combine to give maximum operating comfort.
- **Easy maintenance:** Remote-located engine bypass filter. Concentrated filters and grease nipples. Low positioned fuel and hydraulic tanks, etc. They all add up to reduce maintenance and increase productivity.

KOMATSU LTD.

HD785 SPECIFICATIONS

ENGINE

Cummins KT2300-C, 4-cycle, V-type, water-cooled, turbocharged diesel engine. 12 cylinders with 6.25" (158.8 mm) stroke x 6.25" (158.8 mm) bore and 2300 cu.in. (37.8 ltr.) piston displacement.
Gross horsepower . . . . . 900 HP (671 kW)/2100 RPM
Flywheel horsepower . . . . . 877 HP (654 kW)/2100 RPM
Max. torque . . . 339 kg-m (2415 ft-lb/3324 N-m)/1500 RPM
Standard engine equipped with fan, air cleaner, alternator, water pump, lubricating oil pump and fuel pump, under SAE standard ambient temperatures (85°F, 29.4°C) and barometric conditions (29.38"Hg, 745 mmHg).
Direct injection for fuel economy. Mechanical, centrifugal. speed control governor. Gear-pump-driven force lubrication with full-flow and bypass filters (double filtering system). Dry and horizontal type air cleaner for longer element service. 24-volt electrical starting system.

TORQFLOW TRANSMISSION

Komatsu's unique full-automatic TORQFLOW transmission consists of a water-cooled, 3-element, single-stage, two-phase torque converter and a planetary-gear, multiple-disc clutch transmission which is hydraulically actuated and force-lubricated for optimum heat dissipation. Six forward speeds and one reverse speed with 5-shift-position shift lever. A microcomputer built into the shift controller automatically selects the optimum gear position according to travel speed, load and road conditions. Selected gear position is numerically indicated by a shift indicator. A lockup system, consisting of a wet, double-disc clutch, is automatically actuated in F1 ~ F6 gears for higher fuel savings. Neutral safety switch prevents accidental machine starts. Downshift inhibitor and kickdown memory device for easy control.
Max. travel speed . . . . . 70 km/h (43.5 MPH)
[66 km/h (41.0 MPH)]

AXLES AND FINAL DRIVES

Independent suspension type front axle and full-floating-type rear axle. Hydropneumatic suspensions are installed on the lateral end of the axles. Planetary gear-type final drive. Straight bevel gear for differential and spiral bevel gear for reduction gear.
Reduction ratio:
Reduction gear . . . . . 3.071 : 1 / [3.462 : 1]
Final . . . . . 7.235 : 1

TIRES

24.00-49-42PR (E3) tubeless tires are standard equipment (front and rear). [27.00-49-42PR (E3) tubeless tires are also available upon request.]
Inflation pressure . . . . . 6.65 kg/cm^2 (94.6 PSI/652 kPa)/
[4.9 kg/cm^2 (69.7 PSI/480 kPa)]
Komatsu recommends that the user consults the tire manufacturer and evaluates all job conditions in order to make the proper tire selection.

STEERING

Separated, full-hydraulic power steering with follower. Tandem gear pumps power the steering/hoisting circuits. A demand valve between these two circuits assures sufficient oil flow to the steering circuits regardless of engine revolutions for light-touch steering. A-frame offers a large wheel turning angle for small turning radius. Emergency steering system is standard equipment.
Min. turning radius . . . . . 8.8 m (28'10")/[9.9 m (32'6")]

BRAKES

Front: Air-over-hydraulic, internal-expanding brakes.
Rear: Air-over-hydraulic, oil-cooled, multiple-disc type brakes act as both service and retarder brakes. They are sealed from water and abrasive materials for maintenance-free operation between overhauls. Retarder brakes automatically actuate when the engine exceeds the rated revolutions of the shift position.
Parking: Spring-loaded, internal-expanding type parking brake actuates on drive shaft.
Emergency: An emergency relay valve actuates the rear brakes automatically should air pressure in the air tank drop abnormally. Manual operation is possible with a lever.

MAIN FRAME

Straight ladder type, box-sectioned construction. Main frame is made of 60 kg/mm^2 (85,340 PSI) high-tensile-strength steel. Cast steel are welded on important parts for maximum strength.

BODY

The body is made of 130 kg/mm^2 (184,900 PSI) high-tensile-strength steel and rib reinforcement for maximum body strength. V-shape body with rounded corners and flat bottom, and exhaust gas body heating for smooth dumping.
Target area . . . . . 6600 mm x 4750 mm (21'8" x 15'7")
Max. body depth . . . . . 1740 mm (5'9")
Capacity: Max. payload . . . . . 78000 kg (85 U.S. tons)
Struck . . . . . 37 m^3 (48.4 cu.yd)
Heaped (2:1) . . . . . 52 m^3 (68 cu.yd)

HYDRAULIC CONTROL UNIT

The steering/hoisting and retarder cooling circuits are independently designed for sure control.
- **Hydraulic pumps:** Tandem gear steering/body boisting pumps. 270 ltr. (71.3 U.S. Gal)/min. from the total 676 ltr. (178.6 U.S. Gal)/min. oil flow is supplied to the steering circuits in prior to the hoisting circuit by the demand valve, enabling the operator to enjoy light-touch steering controls.
- **Control valve (for hoisting)** . . . . Spool type control valve
Position . . . . . Raise, hold, lower and float
- **Hydraulic cylinders**

Hydraulic cylinders	Type	No.	Bore
Hoisting	3-stage piston	2	1st: 230 mm (9.06")
			2nd: 190 mm (7.48")
			3rd: 160 mm (6.30")
Steering	Double acting piston	2	140 mm (5.5")

- **Relief valve setting** . . . . 155 kg/cm^2 (2200 PSI/15.2 MPa)

Note: Data shown within the square brackets [ ] are for machines equipped with 27.00-49-42PR (E3) large-diameter tires.

COOLANT & LUBRICANT CAPACITY (refilling)

Coolant	120 ltr. (31.7 U.S. Gal)
Fuel tank	1240 ltr. (327.6 U.S. Gal)
Engine oil	125 ltr. (33.0 U.S. Gal)
Torque converter and transmission	70 ltr. (18.5 U.S. Gal)
Reduction	100 ltr. (26.4 U.S. Gal)
Final drive (left and right)	180 ltr. (47.6 U.S. Gal)
Hydraulic system	225 ltr. (59.4 U.S. Gal)
Steering system	0.8 ltr. (0.2 U.S. Gal)
Suspension (total)	80 ltr. (21.1 U.S. Gal)
Front brake oil reservoir	3 ltr. (0.8 U.S. Gal)
Retarder brake oil tank	320 ltr. (84.5 U.S. Gal)

WEIGHT (approximate)

- Net weight (unloaded) ..... 53500 kg (117,950 lb)/ [55500 kg (122,360 lb)]

Weight distribution:

Front axle	26220 kg (57,800 lb)/ [27190 kg (59,940 lb)]
Rear axle	27280 kg (60,140 lb)/ [28310 kg (62,410 lb)]

- Gross weight (including full load and an operator of 55 kg) ..... 131555 kg (29,030 lb)/[133555 kg (294,440 lb)]

Weight distribution:

Front axle	43185 kg (95,210 lb)/ [43845 kg (96,660 lb)]
Rear axle	88370 kg (194,820 lb)/ [89710 kg (197,770 lb)]

STANDARD EQUIPMENT

Rear-view mirrors (left and right), under-view mirror, front and rear turn signal lamps (left and right), speedometer, windshield washer and wiper, seat belt, rock ejector, engine oil pan protector, transmission oil pan protector, fire extinguisher, spill guards (on tip of body top end), cab guard, cab step and safety guard, backup alarm, cab floor mat, ashtray, backup light, marker lamps, tachometer, emergency brake, emergency steeering, sun visor , starting aid (ether spray), car radio, cigarette lighter, full-automatic transmission, car heater, defroster, centralized warning device, kickdown memory, shift indicator and tool kit.

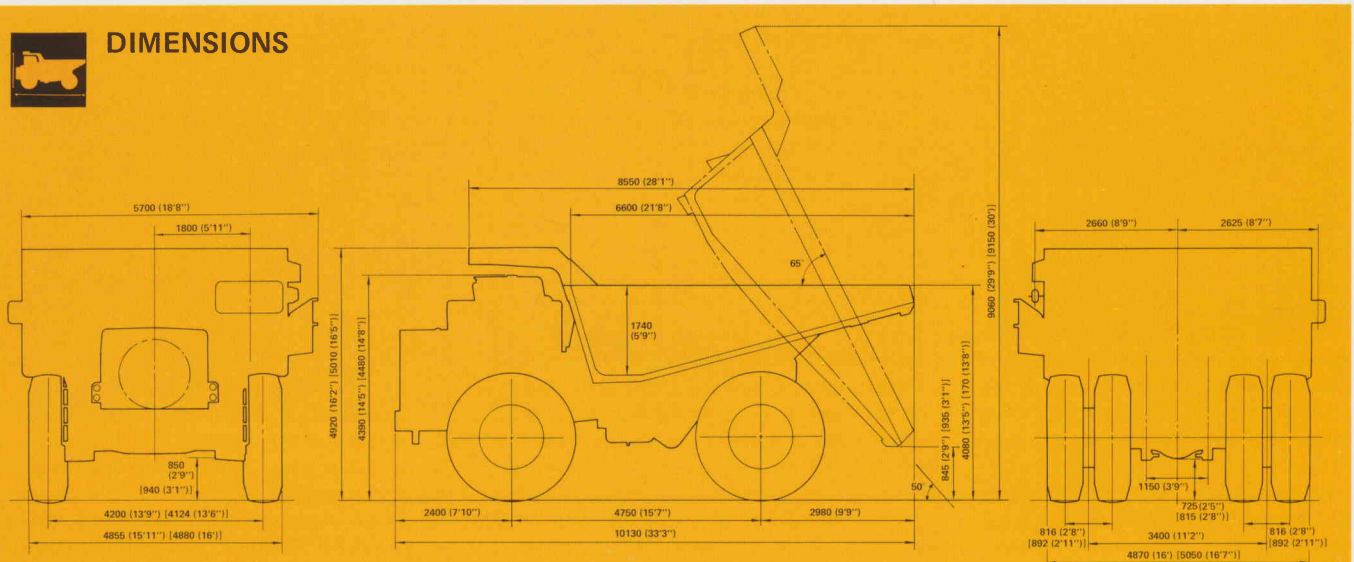
OPTIONAL EQUIPMENT

Radiator curtain, air conditioner, air dryer, vandalism protection kit, various types of heat-resistant and cut-resistant tires, dumping buzzer, assistant operator's seat, engine side covers, yellow rotating lamp, auxiliary backup light, ROPS cab, jack, nitrogen gas refilling tool, non-spin differential.

CONTROLS

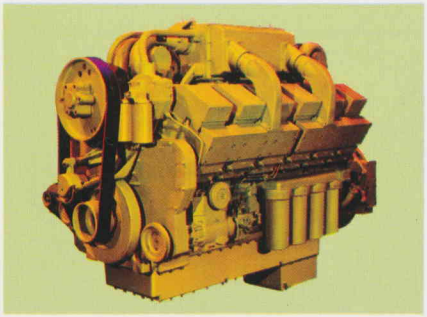
Cab guard protects the cab from falling objects. Human-engineered layout of instrument panel for smooth, easy control. All meters and gauges are illuminated by backlighting for easy reading. Centralized warning lamp and pilot lamps warn of vehicle abnormalities. Engine starts only when the shift lever is positioned in neutral, to prevent accidental machine starts. Operator seat with a reclinable backrest is fore/aft and up/down adjustable. Seat cushion hardness is also adjustable depending on operator weight.

DIMENSIONS

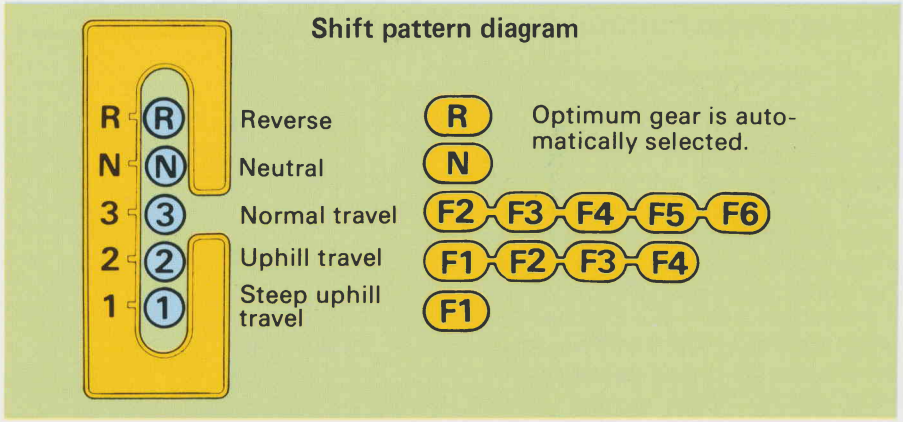


Ground clearance ..... 725 mm (2'5")/ [815 mm (2'8")]

Unit: mm (ft.in)



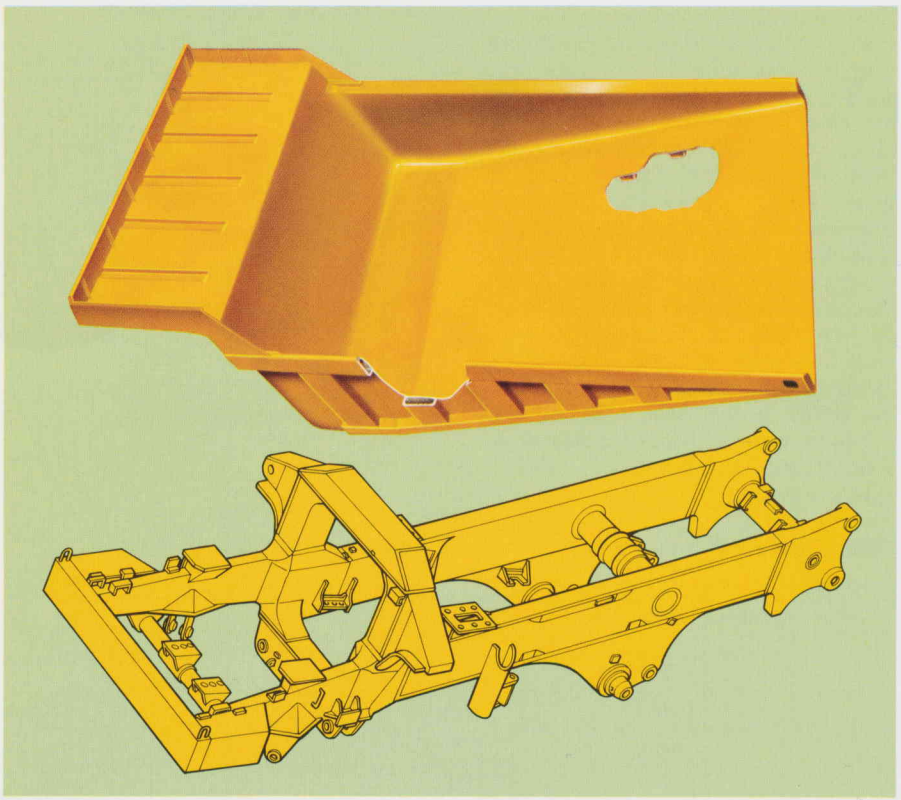
Job-proven high-power engine: The Cummins KT2300-C diesel engine with turbocharger delivers a huge 877 HP (654 kW) flywheel horsepower, offering a powerful HP-to-weight ratio to make the HD785-1 highly maneuverable. Fuel adjustment is unnecessary up to an altitude of 2700 m (8,860 ft). With its direct-injection system, fuel consumption is minimized for maximum economy.



Downshift inhibitor: The computer-controlled downshift inhibitor prevents downshifting by inappropriate operation and protects the engine from being damaged by overruning. Transmission never shifts down when the engine runs over the rated revolutions for the selected gear position, even if the operator shifts the lever down. On the contrary, incorrect shift up is also prevented. When engine runs over the rated revolutions, retarder brakes are automatically actuated, thus protecting the engine from overrunning.

Computer-controlled full-automatic transmission: Full-automatic TORQFLOW transmission with 5 shift positions provides 6 forward speeds and 1 reverse speed. Once the shift position is determined, a microcomputer built into the shift controller selects the optimum gear to match load, road and traveling conditions, eliminating troublesome gearshifting. The auto-lockup clutch is automatically applied for all forward gears, switching torque-converter drive to direct drive to save fuel.

Shift indicator: The shift indicator allows the operator to know which gear has been engaged. Lockup clutch engagement is indicated by a lamp. Kickdown is possible by depressing the accelerator pedal fully. Kickdown memory mechanism keeps the transmission at the selected gear position untill the accelerator pedal is released fully and quickly. So, it is unnecessary to continue depressing the pedal fully.

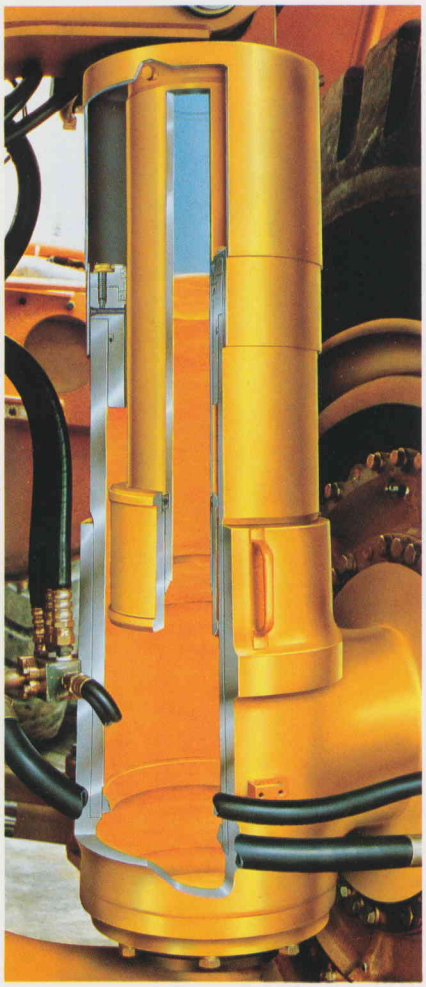


Tough V-shape body: The body is made of 130 kg/mm^2 (184,900 PSI) high-tensile-strength steel to withstand heavy impact from bounding rocks. Box-sectioned ribs are welded to both sides, bottom and front of the body for reinforcement. Cast steel bar is welded onto the top rail of the body's sides to protect them from deformation. Rubber mounted on the body not only minimizes shocks due to body lowering but also enhances the durability of both the body and main frame.
V-shaped body design, straight bottom floor and rounded-corner design assure smooth dumping. In addition, body exhaust heating prevents soil from sticking to the body for less vehicle dead weight.

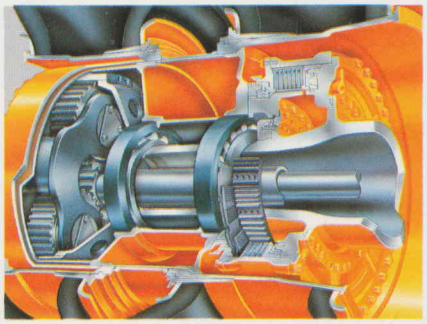
Easy loading: A wide target area of 31.4 m^2 (338 sq.ft) and a low loading height of 4.08 m (13'5") [4.17 m (13'8") for 27.00-49 PR tires] to facilitate loading onto the HD785's body.

Sturdy main frame: The main frame is the backbone of the machine and must be built rugged. The HD785 main frame is a box-sectioned, straight ladder type and made of 60 kg/mm^2 (85,340 PSI) high-tensile-strength steel. Cast steel is welded on important parts for reinforcement.

Exclusive Komatsu A-frame design: Komatsu hauler has a one-class-lower turning radius when compared to other makes. The secret of the shorter turning radius lies in the unique design of the front wheel assembly. The A-frame positioned between the main frame and front wheel assures a wider wheel-to-main frame clearance, resulting in a larger front wheel turning angle for a short turning radius of 8.8 m (28'10") [9.9 m (32'6") for large tires].



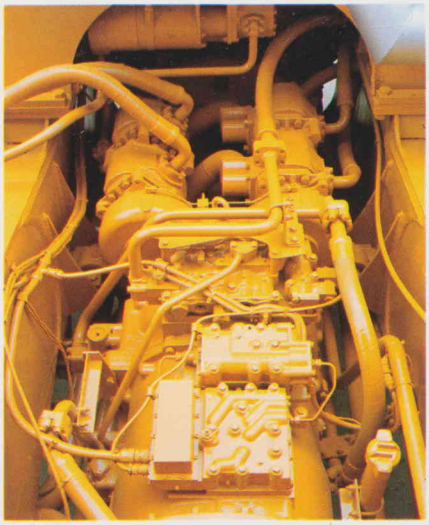
Hydropneumatic suspension: Employed on all four wheels. Each hydropneumatic suspension has an upper chamber containing high-pressure nitrogen gas and a lower chamber filled with fluid. When a wheel hits a bump, the fluid is pushed upwards, compressing the gas. This gas displacement action creates the cushioning effect, assuring high vehicle maneuverability on rough terrain.



Oil-cooled, multiple-disc brakes: The air-over-hydraulic rear brake system employs oil-cooled, multiple-disc brakes that are sealed off from external abrasive and water, assuring maintenance-free operations between overhauls. As brakes are force-lubricated to dissipate generated heat, ample braking capacity is maintained for sure stops. The slack adjuster maintains the optimum clearance for rear brake discs, assuring responsive braking. These brakes also act as retarders to prevent engine from overrunning during descents on inclines. Front and rear brake pipings are independent to maintain braking performance. Emergency brake system automatically actuates on rear brakes should air pressure in the tank abnormally drop below the rated level. The emergency brake is also applied manually with a lever.

High machine stability: Long wheelbase of 4750 mm (15'7"), wide front tread of 4200 mm (13'9") [or 4124 mm (13'6")] and rear tread of 3400 mm (11'2") give the HD785-1 excellent machine balance. This, plus the low center of gravity make the HD785-1 a highly stable machine.

Simple maintenance: Grease fittings are concentrated. Bypass filter is mounted apart from the engine. A group of low-pressure filters are installed on the hydraulic tank for easy replacement. Transmission oil level can be confirmed through the window. All contribute to simplify maintenance and reduce downtime.



Light-touch steering controls: A demand valve installed in the steering circuits adjusts oil flow to the hoisting and steering circuit insuring a constant quantity of oil regardless of engine revolutions. As a result, the operator can enjoy stable, light-touch steering control. Since hydraulic circuits for steering and retarder controls are independent, positive steering control can be maintained.
Even when the engine stops or the pump is out of order, an electric motor drives the steering pump to supply sufficient oil to the steering circuits.

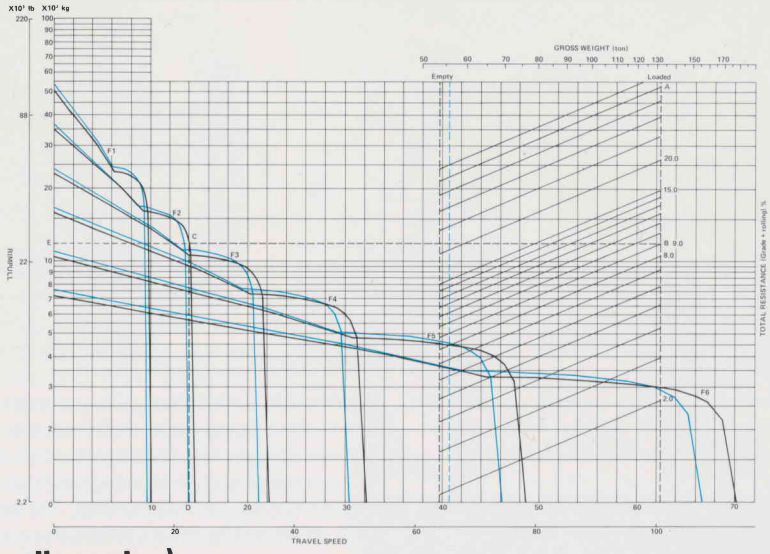
Centralized warning devices: Sophisticated warning devices detect malfunctions that may occur throughout the machine and immediately sound an alarm. Pilot lamps inform the operator of the points in which trouble occurs.

Checking points: ● Radiator coolant level ● Engine coolant temperature ● Engine oil pressure ● Torque converter oil temperature ● Rear brake oil temperature ● Air pressure ● Parking brake actuation ● Hydraulic oil filter clogging.

Travel performance curve

To assess vehicle travel speed, rimpull, etc., first draw a vertical line depending on vehicle weight (A) and mark point (B) corresponding to total resistance (sum of grade and rolling resistance). Next, draw a horizontal line from (B), mark (C) where the lines intersect the rimpull curve and read (E) for rimpull. For travel speed (D), draw a vertical line downward from (C). For example, when traveling a 6% gradient encountered with a 3% rolling resistance, a vehicle with a 78-ton payload should have a rimpull of 12 tons and a travel speed of 12 km/h (7.5 MPH) in forward 2nd gear.

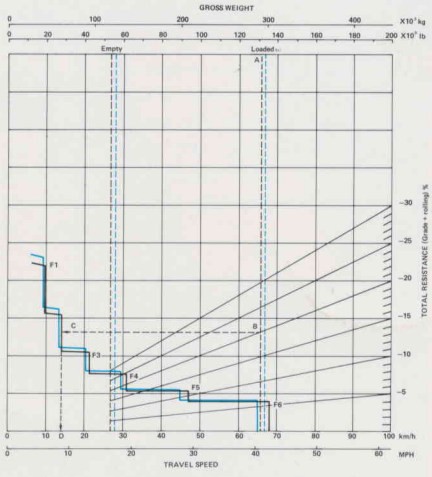
Blue lines indicate performance with a machine equipped with 27.00-49-42PR (E3) large-diameter tires.



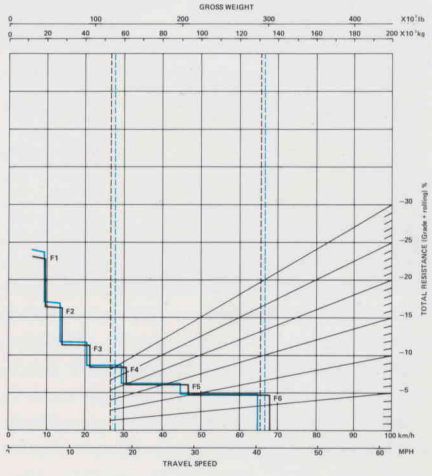
Brake performance curve (with oil cooler)

These curves are provided to establish the maximum speed and gearshift position for safe descents on roads with a given distance. For example, assume the total resistance is -20% (gradient resistance is -25% plus rolling resistance +5%) on the "1500 m (4,920 ft)" graph. First, draw a vertical line from the total vehicle weight (A) so that it crosses the slanted line of -20% 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 78-ton payload should travel at approximately 10.4 km/h (6.5 MPH) in forward 2nd gear.

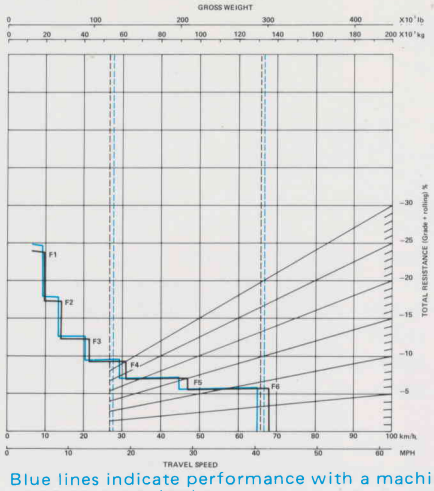
Grade distance: 1500 m (4,920 ft)



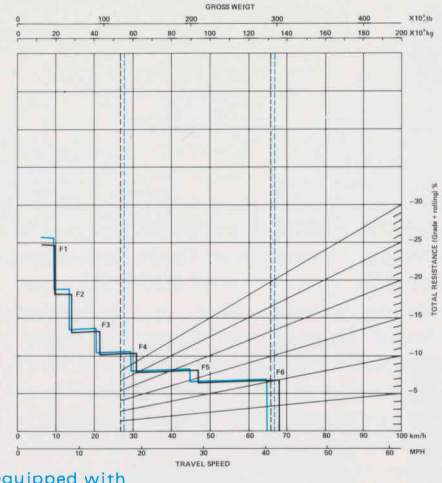
Grade distance: 900 m (2,950 ft)



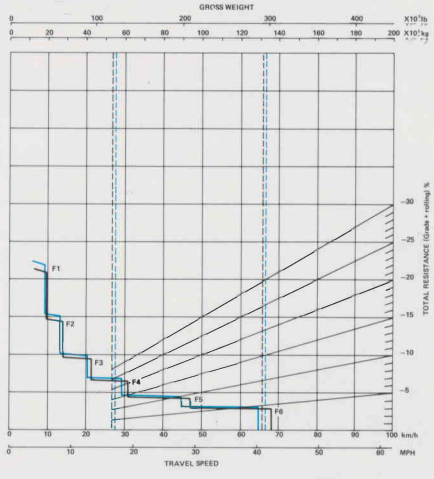
Grade distance: 600 m (1,970 ft)



Grade distance: 450 m (1,480 ft)



Grade distance: Continuous descent



Blue lines indicate performance with a machine equipped with 27.00-49-42PR (E3) large-diameter tires.

Materials and specifications are subject to change without notice.

KOMATSU LTD. Tokyo, Japan

Form No. HD785-011-311 (E2500780501-1)

Printed in Japan 3710B