



CATERPILLAR

637E Wheel Tractor-Scraper

- 700 HP/522 kW flywheel power with two Cat Engines.
- 31 yd³/23.7 m³ heaped capacity (21 yd³/16.1 m³ struck).



Machine shown may have optional equipment.



Caterpillar Engines

	Tractor	Scraper
Flywheel power	450 HP/336 kW	250 HP/186 kW
Rated engine RPM	2000	2200

(Kilowatts (kW) is the International System of Units equivalent of horsepower.)

Net power at the flywheel of the vehicle engine is based on SAE J1349 standard conditions of 77° F/25° C and 29.61" Hg/100 kPa. Fuel is 35° API (60° F/15.6° C) gravity having an LHV of 18,390 Btu/lb (42 780 kJ/kg) when used at 85° F/29.4° C and weighing 7.001 lb/U.S. gal (838.9 g/L). Engine is equipped with fan, air cleaner, alternator, water pump, fuel pump, muffler, and lubricating oil pump. No derating is required up to 5,000 ft./1500 m altitude.

Tractor engine:

Caterpillar four-stroke-cycle 3408 turbocharged diesel Engines, 65° V-8 with 5.4"/137 mm bore, 6.0"/152 mm stroke and 1,099 cu. in./18.0 liters displacement.

Jacket water aftercooled. Integral inlet manifold porting with two intake and two exhaust valves per cylinder. Valves are actuated by a pushrod mechanism. Single camshaft is mounted in "V" of engine.

24-volt direct electric starting system. Ether starting aid for cold weather is standard.

Scraper engine:

Caterpillar four-stroke-cycle 3306 turbocharged diesel Engine with six cylinders 4.75"/121 mm bore, 6.0"/152 mm stroke and 638 cu. in./10.5 liters displacement.



standard equipment NOTE: Standard and optional equipment may vary outside U.S.A. Consult your Caterpillar dealer for specifics.

24-volt direct electric starting. Two 35-amp alternators. Backup alarm. Two 220-amp-hour, 12-volt batteries on tractor. Two 172-amp-hour, 12-volt batteries on scraper. Suction fan. Muffler. Crankcase guard. Dry-type air cleaner with automatic dust ejector. 7-speed semiautomatic power shift transmission. Downshift inhibitor. Differential lock. Coolant flow indicator. Cushion hitch. Quick-drop bowl control valve. Combination bowl-apron control lever. Parking brake. Secondary braking system. Brake shields. Horn. ROPS cab. ROPS mounting. Hydraulically adjustable suspension seat. Seat belt. Operator's station with vibration isolators. Electric hour meter. Windshield wiper. Dash lights. Headlights. Rear-mounted floodlight. Vandalism protection group. Ether starting aid. 37.25-35, 30 PR (E-3) tires. Laminated Thermo-Shield. Hydraulic retarder.

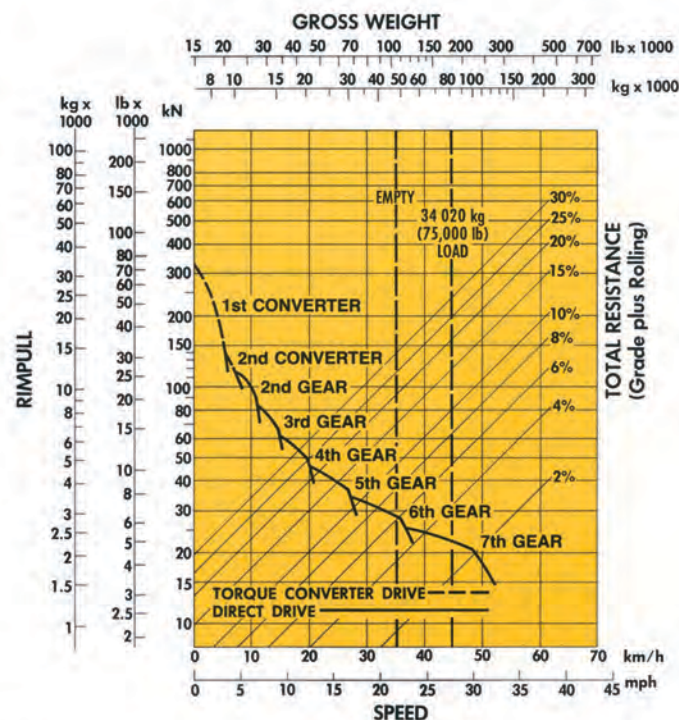


optional equipment

(with approximate change in operating weight)

	Lb	Kg
Air conditioner/heater (includes 50-amp alternator)	176	80
Air-line dryer	52	24
Alternator, 50-amp	6.5	3
Cab, ROPS, sound suppressed (removed)	-904	-410
Canopy, ROPS (removed)	-622	-292
Cold weather fuel transfer pump	7	3
Crankcase guard (heavy-duty)	225	102
Cutting edges,		
Router bits (clip on)	-190	-86
Three section (stinger and ends) 1-5/8"/413 mm	134	61
Fast-fill fuel system, automatic	31	14
Fast oil change system	10	5
Fuel heater	10	5
Heater, cab	53	24
Heater, engine coolant, tractor	5	2
For scraper	3	1
Hood door, right side	51	23
Laminated Thermo-Shield (scraper)	55	25
Lighting group:		
Tractor - Side	5	2
Tractor - Road	2	1
Scraper - Road	18	8
Scraper - Load	2	1
Power train guard	397	180
Push-Pull arrangement	3400	1542
Retarder, scraper	240	109
Starting aids:		
Starting receptacle	20	9
Coolant heater	7	3
Supplemental steering system	165	75
Tires, set of two, tractor and scraper:		
33.25-35, radial steel cord	-454	-206
33.25-35, radial steel cord	-838	-380
37.25-35, radial steel cord	110	50
Tool kit	23	10
Travel brackets	633	287
Windshield washer (front)	5.5	2.5
Windshield washer (front & rear)	10	4.5
Windshield wiper (rear)	11	5

gradeability/speed/rimpull



To determine gradeability performance: Read from gross weight down to % of total resistance. (Total resistance equals actual % grade plus 1% for each 20 lb./ton/10 kg/t of rolling resistance.) From this weight-resistance point, read horizontally to the curve with the highest obtainable speed range, then down to maximum speed. Usable rimpull depends upon traction available and weight on drive wheels.

Materials and specifications are subject to change without notice.



capacity

Rated load	75,000 lb./34 020 kg
Heaped, SAE rating	31 cu. yd./23.7 m ³
Struck, SAE rating	21 cu. yd./16.1 m ³



design

Low, wide scraper bowl is operated by high-speed hydraulics. Cutting edge near center of bowl for minimum material travel. Power-closing apron. Hydraulic dozer-type ejector. Reinforced box-section construction with extensive use of high-tensile-strength steel. Wide-mounted bowl lift cylinders. Minimum transporting width from inside-mounted apron arms and removable draft arms. Cantilever-mounted wheels with Lifetime Lubricated bearings and Duo-Cone Floating Ring Seals.



operating data

Maximum depth of cut	17"/437 mm
Width of cut (outside router bits)	11'6"/3512 mm
Cutting edge dimensions:	
Standard, center section	1.38"×16"×62.2"/35×406×1.580 m
Each end section	1.38"×13"×35.4"/35×330×900 mm
Optional, center section	available in thickness up to 1.62"/42 mm
Each end section	available in thickness up to 1.62"/42 mm
Maximum available hydraulic penetration force @ cutting edge (approximate), empty	81,000 lb/360 kN
Maximum depth of spread	18.8"/480 mm
Apron opening — bowl 6"/150 mm	
off ground level	6'7"/2007 mm
Apron closure force with cutting edge fully raised and apron opened	
12"/300 mm, approximate	38,250 lb/170 kN
Ground clearance	21"/533 mm



hydraulics

Bowl, apron and ejector individually controlled. Bowl lever has raise, hold, power down and quick-drop positions. Trigger on bowl lever allows simultaneous apron closure with bowl actuation. Apron lever has open, hold, positive close and detented float positions. Ejector lever has forward, hold and detented return positions. Automatic kickout on return.

Bowl uses two 7.2"/184 mm bore and 34.4"/873 mm stroke, double-acting cylinders with special quick-drop valves. Carry check valves isolate circuit from load in hold position. Low, wide bowl for large payloads and excellent loadability.

Apron uses one 8.2"/209.5 mm bore and 28.6"/727 mm stroke, double-acting cylinder with multiplier linkage controlling force, speed and length of travel. Closure force regulated by relief valve protecting apron and bowl. Sequence relief valve protects circuit when bowl is raised with apron closed.

Ejector uses one 8.2"/209.5 mm bore and 74"/1880 mm stroke, double-acting cylinder.

Hydraulic circuits are filtered, open center systems. Single reservoir with separate pumps for scraper-steering control and cushion hitch:

Output @ rated tractor RPM:

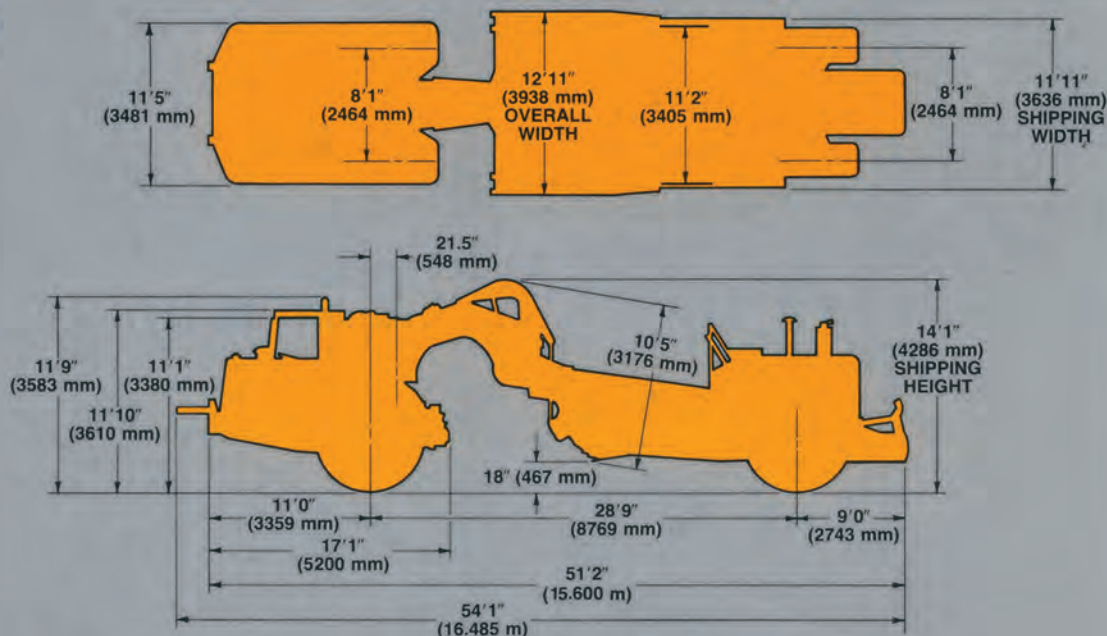
Steering	103 gpm/389 liters/min
Scraper	91 gpm/344 liters/min
Cushion hitch	9 gpm/34.5 liters/min
Supplemental	77 gpm/291 liters/min

Relief valve setting:

Scraper	2000 psi/138 bar/13 790 kPa
Steering	1925 psi/133 bar/13 270 kPa
Cushion hitch	2600 psi/179 bar/17 925 kPa



dimensions (approximate)

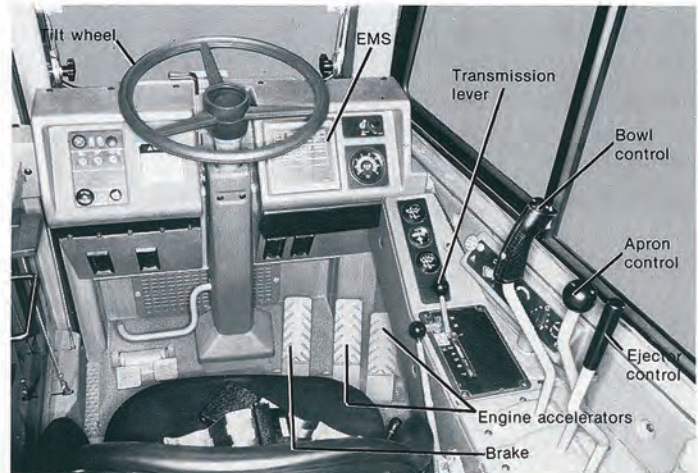


Built-in convenience and comfort



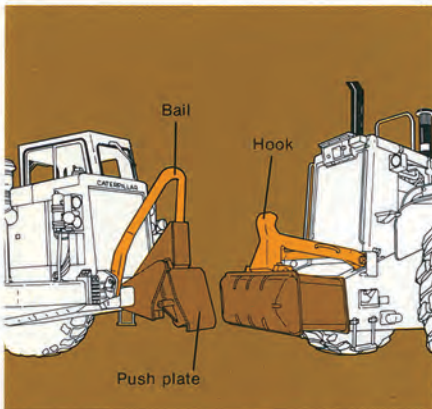
Machine and operator protection is designed in. Standard ROPS sound-suppressed cab and optional ROPS canopy rest entirely on rubber mountings, with no metal-to-metal contact. Sound is further suppressed with insulated right and back walls, roof headliner and positive seals around windows and door. Seat belt, windshield, windshield wiper are standard. Air conditioner and heater are available options.

Seat belt, windshield, windshield wiper and backup alarm are standard . . . supplemental steering optional.



Convenient controls are designed to improve operator efficiency:

- Bowl-apron trigger control enables operator to position bowl and lower apron with one lever.
- Apron "float" and ejector "return" positions are detent-held to free operator's hand for other controls.
- Manually applied lock holds throttle in high idle position during long hauls or when climbing grades.
- Familiar location of transmission console and scraper controls at operator's right.
- Secondary braking system designed so that failure of a single component on the line will not cause total loss of brakes — control button located on dash.



Push-Pull Arrangement allows two 637E Wheel Tractor-Scrapers to assist one another in self-loading. That means no push tractor with operator required . . . no pusher downtime . . . no scraper-pusher mismatch . . . no bunching. You get a balanced, more flexible spread with less investment and fewer machines. The arrangement includes a hydraulically actuated bail and cushion push plate bolted to the front of the tractor and a hook on the rear of the scraper.

Operating protection.

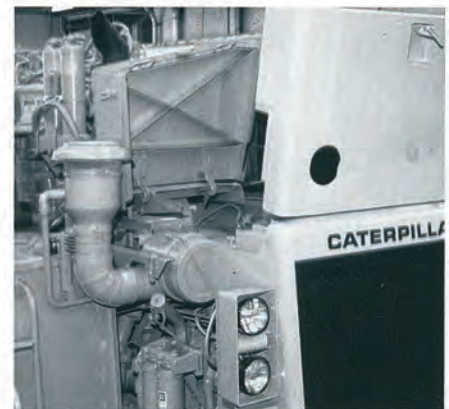


Electronic Monitoring System (EMS) shows status of important machine systems with three different warning signals. Each indicates status of system and appropriate operator response.

- I **Operator Awareness:** LED light on instrument panel indicates a potential but not critical problem.
- II **Operator Response Required:** Main warning light in front of operator indicates continued operation could cause eventual component failure.
- III **Immediate Operator Shut-Down Required:** Flashing light and horn warn that continued operation may cause immediate failure of a component.

A circuit test switch verifies system reliability.

More work time.



Servicing ease reduces downtime on the 637E:

- Two-piece hinged hood with access door on left front of tractor for easy engine access.
- Independent removal of major components.
- Central location of filters.
- Easily accessible hydraulic lines and wiring.
- Hydraulic tank mounted on right front deck for easy access.
- Sight gauges for transmission and differential.
- Hinged crankcase guard.
- Push-button air tank drains.

VALUE ANALYSIS

Power train

- Direct injection Cat diesel Engines with high torque rise for tough loading applications
- Semi-automatic, 7-speed planetary power shift transmission with individual clutch modulation (ICM) for smooth on-the-go shifting
- Cat differential lock, operator-engaged, for positive traction in poor underfooting
- Fuel efficient direct injection with performance proven reliability

Operator's compartment

- Precise, low-effort controls
- Good visibility to cutting edge
- Comprehensive Electronic Monitoring System
- Integral, vibration-isolated ROPS cab
- Tilt steering wheel for easy entrance and exit

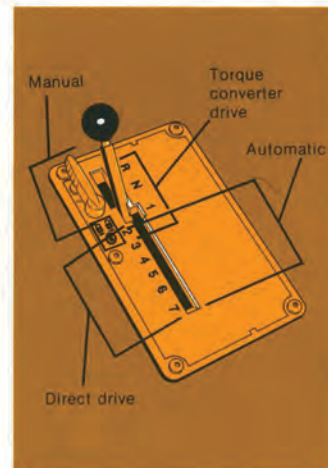
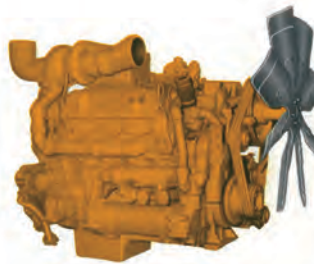
Durability

- Cushion hitch for smooth hauling, less lobe, high haul speeds
- Large capacity, wide, low bowl design for easy loadability — designed for tough applications
- Hydraulic retarders extend brake life
- Large brakes and wheel bearings provide long life

Serviceability

- Relocated fuel tank for easy service access and improved weight distribution
- Serviceable wiring connectors for easy component removal and assembly
- Diagnostic connectors and electrical service center aid troubleshooting and repair
- Clustered service points for quick, more complete service
- Folded core radiators provide reliability and easy servicing
- Independent removal of major components

Reliable Cat power train — power you can depend on.



Reliability and durability ... that's what you get from Cat diesel Engines. The 450 flywheel horsepower/336 kW 3408, a 65° V-8 with 1,099 cu. in./18.0 liters displacement, powers the tractor. Turbocharged and aftercooled for efficient fuel combustion, the 3408 offers performance with serviceability, long component life, simplified rebuild procedures.

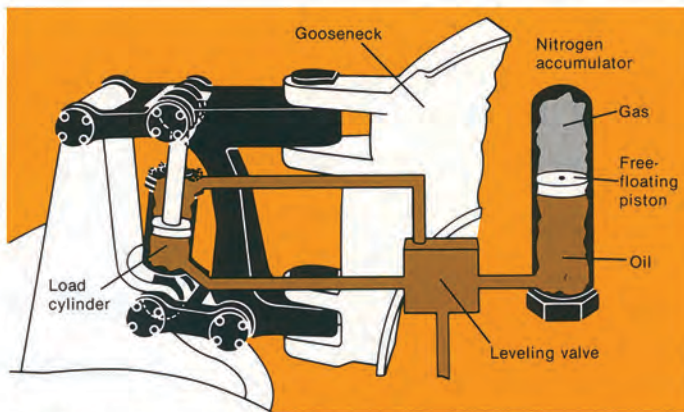
The scraper uses the six cylinder 3306, with 638 cu. in./10.5 liters displacement. Generating 250 flywheel horsepower/186 kW, it is turbocharged and aftercooled.

Cat 7-speed transmission combines automatic shifting with high torque multiplication and direct drive efficiency. The transmission shifts up and down automatically between 2nd and the highest selected gear. Reverse and Gears 1 and 2 are torque converter drive for powerful rimpull needed for loading and dumping. Gears 3 through 7 are direct drive for quick acceleration and efficient hauling speeds.

Scraper transmission is four speed planetary, with broad range torque converter synchronized to tractor transmission by electronic switching.



Large capacity, low, wide bowl design ... coupled with 700 HP/522 kW and all wheel drive adds up to excellent loadability, maximum loads and high productivity. Angle and height of ejector are designed for optimum load retention and material rolling action. Positive bulldozer ejection, powerful double-acting hydraulics with quick-drop valves for pump loading. Carry check valves isolate bowl cylinders from the rest of the circuit allowing lift cylinders to carry load rather than hydraulic lines. Wheels are cantilever-mounted.



Cushion hitch provides smoother hauling and higher usable speeds. It connects two separate tractor and scraper castings at the top and bottom by mechanical links, forming a pivoting parallelogram arrangement which allows vertical movement between the two sections. A hydraulic cylinder connects the links from the bottom tractor pivot to the top scraper pivot. When the machine hits a bump, the load cylinder forces oil into two nitrogen-over-oil accumulators. The accumulators cushion the bump like a shock absorber. The system can handle several shocks at the same time to reduce machine bounce. And that means greater productivity ... longer machine life ... reduced haul road maintenance ... less operator fatigue.

637E

Wheel Tractor-Scraper

engines (continued)

Both engines:

Direct injection Cat fuel system with individual, adjustment-free injection pumps and valves, and variable injection timing. Stellite-faced valves, hard alloy steel seats and valve rotators. Integral inlet manifold porting with two intake and two exhaust valves per cylinder. Cam-ground and tapered aluminum alloy pistons with three-ring design, cooled by oil spray. Steel-backed aluminum bearings, Hardened crankshaft journals. Pressure lubrication with full-flow filtered and cooled oil. Dry-type air cleaner with primary and safety elements and automatic dust ejector. Independent 24-volt direct electric starting for each engine with ether starting aid for cold weather starting standard.



transmissions

Tractor — Caterpillar, 7-speed semi-automatic. Single-lever shift control. Torque converter multiplies torque in 1st and 2nd for high rimpull and fast hydraulics during loading and dumping. Second lock-up through 7th gear are direct drive for maximum efficiency on the haul. All shifts up or down from 2nd to the gear selected are automatic. Transmission will not shift upward from any gear selected. A new foot control holds transmission in any gear. A microprocessor monitors the transmission output shaft speed and can override the foot control to shift up or down one gear to ensure proper engine RPM.

Electronic Transmission Control System features electronically controlled shifting and replaces the former hydraulic-mechanical control. Fewer moving parts reduces complexity and downtime. Individual Clutch Modulation (ICM) permits controlled pressure release on the clutch being disengaged while gradually increasing pressure on the clutch being engaged. The main benefit is faster, yet smoother shifts, and improved serviceability.

Scraper — Planetary type, full torque converter drive with four ranges. Shifting is synchronized to tractor transmission by solid-state electronic switching.



differential controls

Tractor:
Cat differential lock, engaged by foot pedal, positively prevents either drive wheel from spinning free in poor traction conditions. Allows normal differential action when not engaged.

Scraper:

NoSPIN differential.



final drives

Compact planetary design and full-floating axles, independently removable from wheel mounting. Service-free double-row roller bearings. Assemblies protected with Duo-Cone Floating Ring Seals.



steering

Two double-acting hydraulic cylinders. Hydraulic follow-up system for automotive feel. Positive, well-modulated flow control for constant steering response. Full 90° right or left.

Width required for curb-to-curb turn 40'1"/12.217 m



brakes

(System meets OSHA regulations and SAE J1152 April 80 brake performance standards.)

Service brakes are air-applied, spring-released, cam operated expanding shoe type. Mounted on each wheel, two per axle.

Parking — Uses service brakes. Spring-applied, air released. Apply manually with button on dash.

Secondary Braking System — Uses service brakes. Spring-applied, air released. Can be applied with button on dash. If service air pressure drops to 60 psi/2.07 bar/206 kPa, audible and visual alarms warn operator. Brakes apply automatically when air pressure drops to 40 psi/2.76 bar/276 kPa.



tires

Productive capabilities of the 637E are such that, under certain job conditions, Ton-MPH/tkm/h capabilities of standard or optional tires could be exceeded and therefore limit production. Caterpillar recommends the user evaluate all job conditions in order to make proper tire selection. Consult tire manufacturer for specific data.

Standard for tractor and scraper:

37.25-35, 30 PR (E-3)

Optional for tractor and scraper:

33.25-35 radial steel cord

37.25-35, 30 PR (E-3)

37.25-35, radial steel cord



cushion hitch and gooseneck

Parallelogram-type linkage connects two-piece hitch. Vertically mounted hydraulic cylinder transfers road shocks to two nitrogen accumulators. Controlled oil flow dampens "rebound" oscillation. Leveling valve automatically centers piston in cylinder for all scraper loads. Cushion ride lockout control retains positive cutting edge down-pressure for scraper loading and fill spreading. Cushion hitch makes extensive use of steel castings, eliminating many welded joints. Double kingbolt design withstands high external forces, allows easy installation and removal. Box-section gooseneck reduces plate and weld stresses. One-piece fabricated draft tube and wide-mounted bowl lift cylinders reduce stress in draft frame.



ROPS

(ROPS cab is standard in U.S.A.)

ROPS (Rollover Protective Structure) offered by Caterpillar for this machine meet ROPS criteria SAE J320a, SAE J1040c and ISO 3471. They also meet FOPS (Falling Object Protective Structure) criteria SAE J231 and ISO 3449. When properly installed and maintained, cab equipped with climatizing equipment meets OSHA and MSHA requirements for operator sound exposure limits in effect at time of manufacture when tested according to ANSI/SAE J1166 SEP80.



service refill capacities

	Tractor		Scraper	
	U.S. Gallons	Liters	U.S. Gallons	Liters
Fuel tank	—	—	322	1220
Crankcase	12	45	7.2	27
Transmission	33.5	127	12.9	49
Differential	36	136	45	17
Final drive				
(each side)	6.5	24.6	6.5	22
Cooling system	37	140	20	76
Hydraulic system	50	190	—	—



weights (approximate)

Weight Distribution:

Shipping — with ROPS cab and 10% fuel

	Standard	Lb	Kg	Push Pull	Lb	Kg
Tractor		44,006	19 961		47,405	21 503
Scraper		60,098	29 982		66,098	29 982
Total		110,104	49 943		113,503	51 485

Operating — with ROPS cab, full fuel tanks, and operator

	Standard	Lb	Kg	Push Pull	Lb	Kg
Empty						
Front axle	59%	66,186	30 022	60%	69,356	31 460
Rear axle	41%	45,902	20 821	40%	46,131	20 925
Total		112,088	50 843		115,487	52 385

Loaded — based on 75,000 lb/34 000 kg rated load

	Standard	Lb	Kg	Push Pull	Lb	Kg
Front axle	49%	92,002	41 732	50%	95,551	43 342
Rear axle	51%	95,082	43 129	50%	94,936	43 063
Total		187,084	84 861		190,487	86 405