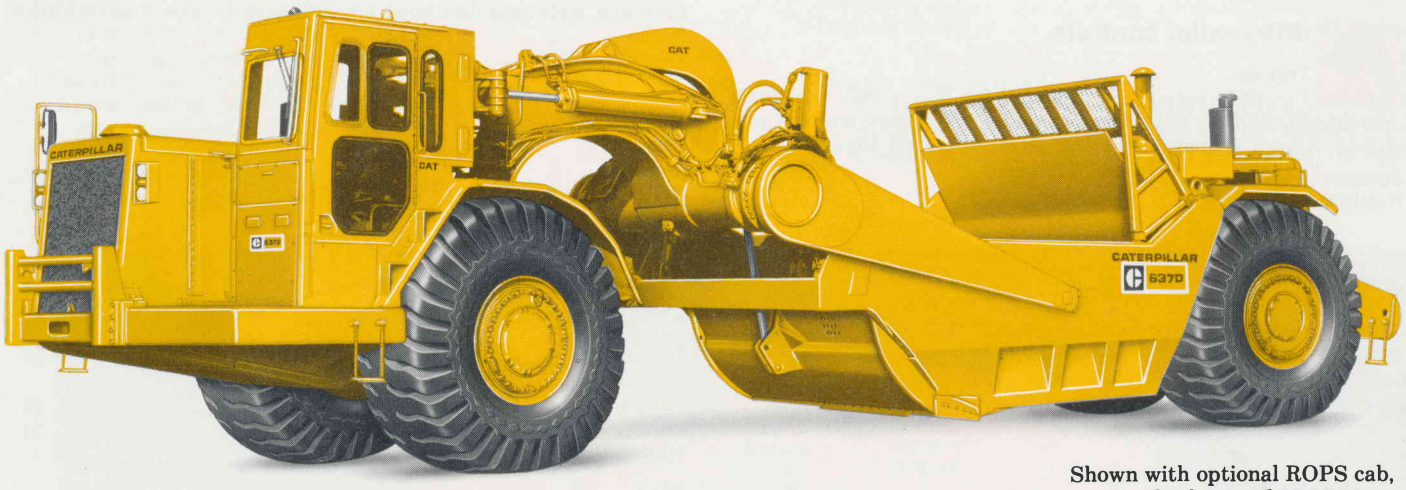
CATERPILLAR 637D Wheel Tractor-Scraper

Summary of features

- **Positive-action scraper** with 21/31 cu. yd. (16.1/23.7 m^3) capacity. Double-acting hydraulics for positive cutting edge penetration, apron closure and material ejection.
- **700 flywheel horsepower** (522 kW) with two Cat diesel Engines.
- **Eight forward speeds** up to 30 MPH (48.3 km/h) with Cat semi-automatic power shift transmission.
- **Cushion hitch** absorbs haul road shocks, stabilizes machine travel, substantially increases usable working speeds.
- **90° steering** both right and left, even with ROPS . . . for maximum maneuverability.
- **Push-Pull Arrangement** . . . allows two 637D Wheel Tractor-Scrapers to assist one another in self-loading.
- **Differential lock** . . . operator controlled, rigidly connects both tractor drive wheels for positive traction.
- **Servicing ease** . . . easy access . . . localized service area . . . independent removal of major components.
- **CAT PLUS** . . . from your Caterpillar Dealer . . . the most comprehensive, total customer support system in the industry.



Shown with optional ROPS cab, scraper fenders and 37.25-35, 30 PR (E-3) tires.

Caterpillar Engines

	Tractor	Scraper
Horsepower	450	250
Kilowatts	335	187
Rated engine RPM	2000	2200

The net power at the flywheel of the vehicle engines operating under SAE standard ambient temperature and barometric conditions, 85° F (29° C) and 29.38" Hg (995 mbar), using 35 API gravity fuel oil at 60° F (15.6° C). Vehicle engine equipment includes fan, air cleaner, water pump, lubricating oil pump, fuel pump, air compressor, muffler and alternator. Engines will maintain specified power up to 5,000 ft. (1500 m) altitude.

Tractor engine:
Caterpillar four-stroke-cycle 3408 diesel Engine, 65° V-8 with 5.4" (137 mm) bore, 6.0" (152 mm) stroke and 1,099 cu. in. (18.0 liters) displacement.

Turbocharged and jacket water aftercooled. Precombustion chamber fuel injection system. Valves are actuated by a pushrod mechanism. Single camshaft is mounted into "V" of engine.

Scraper engine:
Caterpillar four-stroke-cycle 3306 diesel Engine with six cylinders, 4.75" (121 mm) bore, 6.0" (152 mm) stroke and 638 cu. in. (10.5 liters) displacement.

Turbocharged and jacket water aftercooled. Precombustion chamber fuel injection system.

Self contained starting system including batteries and alternator.

AEHQ9369

637D

Wheel Tractor-Scraper

engines (continued)

Both engines:
Variable timing fuel systems. Individual adjustment-free fuel injection pumps and non-clogging valves. 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, Hi-Electro 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 glow plugs for preheating precombustion chambers.

transmissions

Tractor — Cat eight-speed, semi-automatic power shift. First, second and reverse gears are torque converter drive; remaining six are direct drive. Single lever shift control provides automatic shifting in ranges 2 through 8, up to the gear selected by the control lever. A foot operated hold control, when engaged, prevents automatic shifting up or down. Reverse, first and second are manually selected. Standard downshift inhibitor reduces possibility of engine overspeeding should operator improperly downshift in automatic range.

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, unrestricted by ROPS.
Width required for curb-to-curb turn . . . . . 40'1" (12.2 m)

brakes

(System meets OSHA regulations.)
Service — Air-actuated, cam-operated, expanding-shoe type (sequenced to brake scraper first).

Parking — Spring engaged, oil pressure disengaged oil disc, mounted on bevel gear case. Transmission cannot be shifted from neutral while parking brake is applied.

Emergency — Uses separate air supply and is applied by operator with button on dash. If service air pressure drops to 60 psi (4.14 bar), audible and visual alarms warn operator. Brake will automatically apply when air pressure drops to 40 psi (2.76 bar).

tires

Productive capabilities of the 637D 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:
33.25-35, 38 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.

service refill capacities

	Tractor		Scraper	
	U.S. Gallons	Liters	U.S. Gallons	Liters
Fuel tank	250	946	170	643
Crankcase	12	45	7.2	27
Transmission	33.5	126	19	72
Differential	36	136	4.5	17
Final drive (each side)	6.5	24.6	7	26
Cooling system	37	140	20	76
Hydraulic reservoir	90	340	—	—

weights (approximate)

	Lb	Kg
Shipping — ROPS canopy and 10% fuel		
Tractor	64,240	29 140
Scraper	39,180	17 770
Operating — ROPS canopy, full fuel tanks and operator		
Empty — Tractor — 62%	66,050	29 960
Scraper — 38%	40,275	18 270
Total	106,325	48 230
Loaded, based on 75,000 lb. (34 020 kg) rated load:		
Tractor — 50.6%	91,850	41 660
Scraper — 49.4%	89,475	40 590
Total	181,325	82 250

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, extra-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 ..... 19″ (483 mm)
Width of cut (outside router bits) ..... 11′5.5″ (3490 mm)
Cutting edge dimensions:
Standard, center section ..... 0.88″×16″×62.2″ (22×406×1580 mm)
Each end section ..... 0.88″×13″×35.4″ (22×330×900 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 ..... 70,000 lb. (31 750 kg)
Maximum depth of spread ..... 16.7″ (424 mm)
Apron opening — bowl 6″ (150 mm) off ground level ..... 6′7″ (2010 mm)
Apron closure force with cutting edge fully raised and apron opened 12″ (300 mm), approximate ..... 38,000 lb. (17 240 kg)

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″ (183 mm) bore and 34.4″ (870 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″ (208 mm) bore and 28.6″ (730 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″ (208 mm) bore and 74″ (1880 mm) stroke, double-acting cylinder.

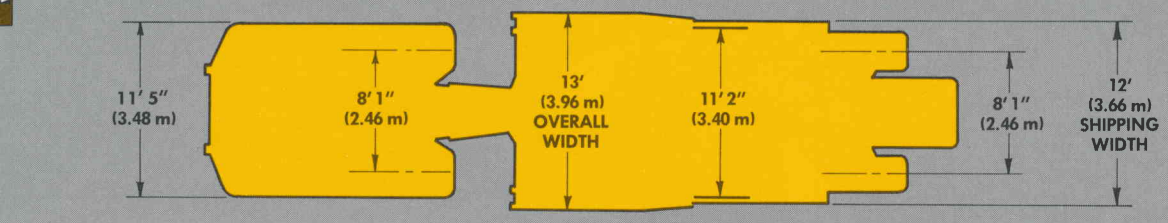
Hydraulic circuits are filtered closed systems. Single reservoir with separate pumps for scraper-steering control and cushion hitch:

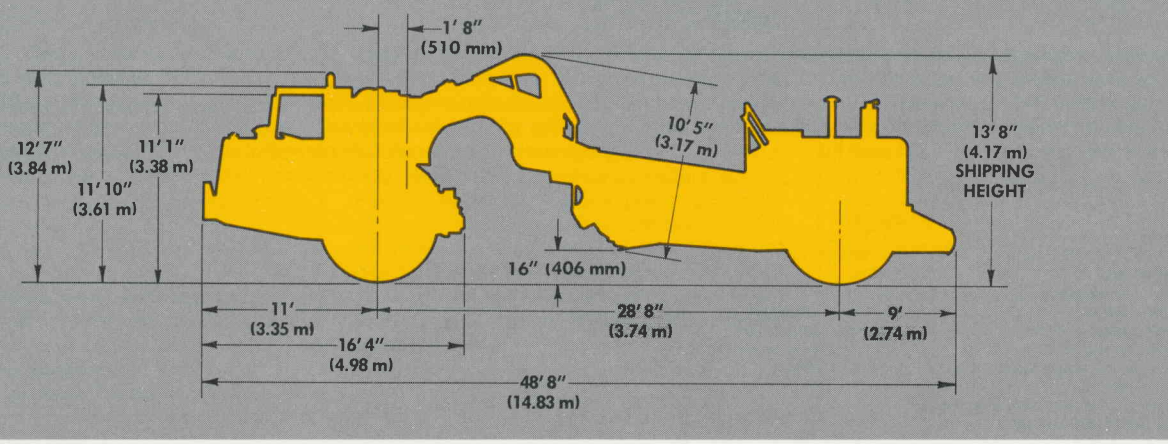
Output @ rated tractor RPM:

Steering ..... 99 gpm (384 liters/min)
Scraper ..... 91 gpm (352 liters/min)
Cushion hitch ..... 16 gpm (63 liters/min)

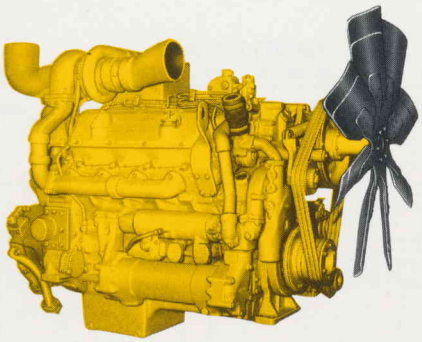
Relief valve setting:
Scraper ..... 2000 psi (138 bar) (13 790 kPa)
Steering ..... 1925 psi (133 bar) (13 270 kPa)
Cushion hitch ..... 2300 psi (158 bar) (15 860 kPa)

dimensions



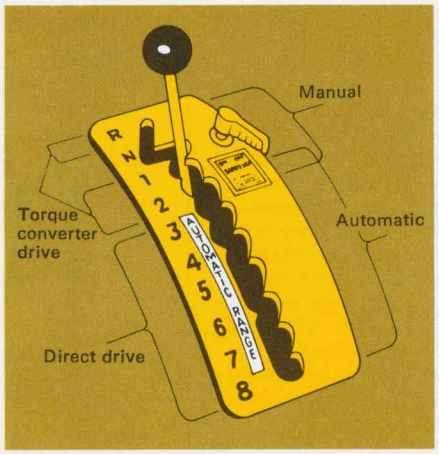


Reliable Cat power train—power you can depend on.



Reliability and durability . . . that's what you get from Cat diesel Engines. The 450 flywheel horsepower 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, it is turbocharged and aftercooled.



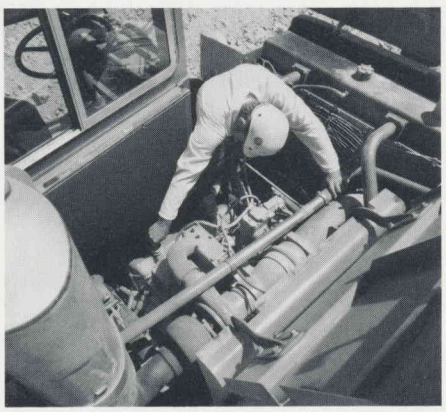
Cat 8-speed transmission combines automatic shifting with high torque multiplication and direct drive efficiency. The transmission shifts up and down automatically between 2nd and the highest selected gear. Reverse and Gears 1 and 2 are torque converter drive for powerful rimpull needed for loading and dumping. Gears 3 through 8 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.

Built-in convenience, comfo

Optional ROPS sound-suppressed cab rests 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 optional.

More work time.



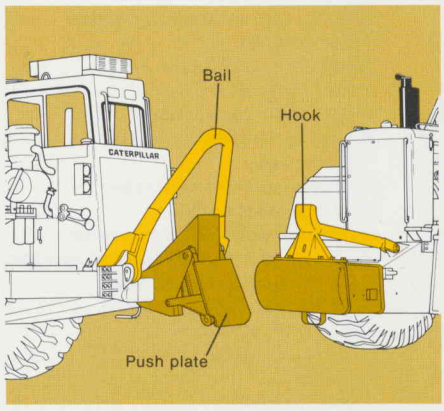
Servicing ease reduces downtime on the 637D:

- 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.
- Two-piece hinged hood with access door on left front of tractor for easy engine access.
- Hinged crankcase guard.
- Push-button air tank drains.

Full capacity loads fast.

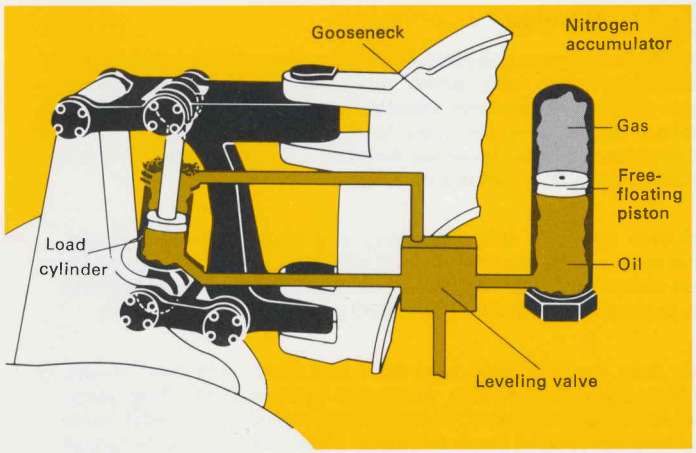
Large capacity, low, wide bowl design . . . coupled with low weight-to-power ratio adds up to excellent loadability, maximum loads and high productivity. Angle and height of ejector are designed for optimum load retention and material rolling action. Positive bulldozer ejection, powerful double-acting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

Versatile Push-Pull.

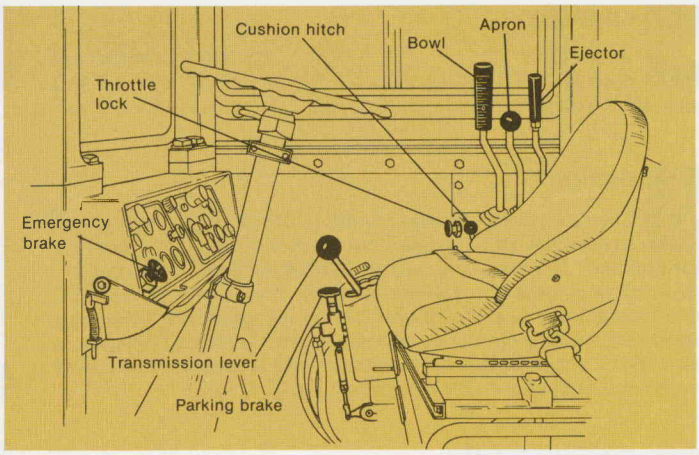


Push-Pull Arrangement allows two 637D Wheel Tractor-Scrapers to assist one another in self-loading. That means no push tractor with operator required . . . no pusher downtime . . . no scraper-pusher mismatch . . . no bunching. You get a balanced, more flexible spread with less investment and fewer machines. 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.

ort and protection mean more operator efficiency.



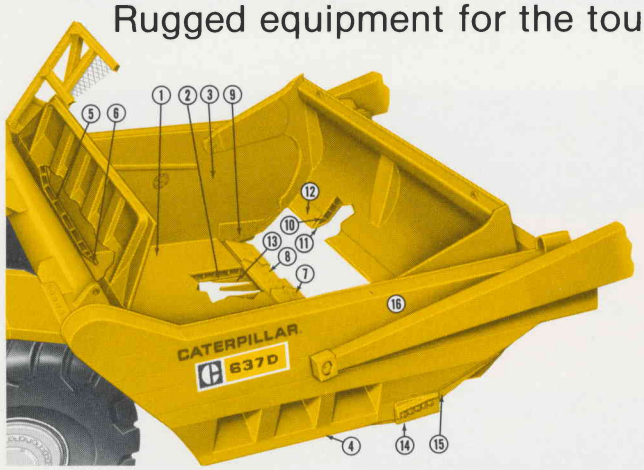
Cushion hitch provides smoother hauling and higher usable speeds. It connects two separate tractor and scraper castings at the top and bottom by mechanical links, forming a pivoting parallelogram arrangement which allows vertical movement between the two sections. A hydraulic cylinder connects the links from the bottom tractor pivot to the top scraper pivot. When the 637D 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.



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.
- Emergency brake button control located on dash.
- Familiar location of transmission console and scraper controls at operator's right.
- Emergency braking system designed so that no failure of a single component on the line will cause total loss of brakes.
- Oil-disc parking brake . . . separate from emergency braking system.

Rugged equipment for the tough applications.



For rock application, a Special Application Scraper is available. Complete bowl is box sectioned for maximum strength, and high-tensile steel is used in high wear and stress areas. Extensive heat treatment is used in bowl bottom plates, side bottom rails, cutting edge support, router bit support and apron front sheet and lip.

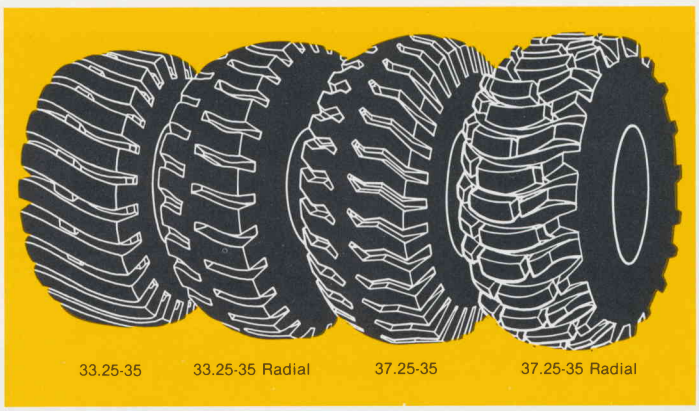
Strengthened for rock service:

Bowl
1. Bottom — top plate.*
2. Bottom — bottom plate.*
3. Side sheets.
4. Side bottom rails.*
7. Cutting edges.*
8. Cutting edge support.*
9. Router bit support.*
13. More cutting edge support ribs.
14. Router bits.
15. Router bit support reinforcement.
16. Side reinforcement plate.

Ejector
5. Front sheet.
6. Bottom rail.

Apron
10. Lip — channels.*
11. Lip — large plate.*
12. Apron front sheet.*

*Heat treated.



Choose the tires that match your job. Standard 33.25-35, 38 PR (E-3) for good performance on many jobs. Optional radial steel cords in this size are also available. Optional wider tire, 37.25-35, 30 PR (E-3), provides greater load capacity and has a larger contact area to reduce ground pressure and increase flotation. Machines equipped with this tire can negotiate poorer underfoot conditions and travel faster on soft materials.

standard equipment

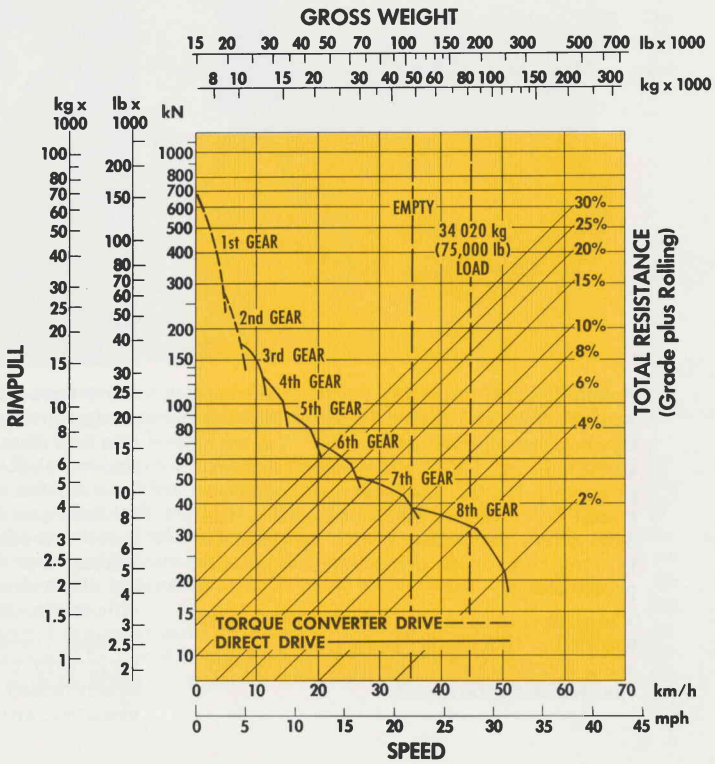
24-volt direct electric starting. Two 35-amp alternators. Back up alarm. Two 220-amp-hour, 12-volt batteries on tractor. Two 172-amp-hour, 12-volt batteries on scraper. Suction fan. Muffler. Crankcase guard. Dry-type air cleaner with automatic dust ejector. 8-speed semiautomatic power shift transmission. Downshift inhibitor. Differential lock. Coolant flow indicator. Cushion hitch. Quick-drop bowl control valve. Combination bowl-apron control lever. Parking brake. Emergency braking system. Brake shields. Horn. ROPS canopy. 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. Water separator (scraper). 33.25-35, 38 PR (E-3) tires.

optional equipment

(with approximate change in operating weight)

	Lb	Kg
Air conditioner/heater	262	119
Air-line dryer	85	39
Alternator, 50-amp	11	5
Cab, ROPS, sound suppressed	825	374
Canopy, ROPS (removed)	−600	−272
Crankcase guard (heavy-duty)	170	77
Cutting edge and bits	150	68
	173	78
	253	115
	423	192
Fast-fill fuel system, automatic or manual shutoff, tractor	7	3
For scraper	19	9
Fast oil change system	10	5
Fenders, scraper	140	64
Heater, cab, roof-mounted	212	96
Heater, engine coolant, tractor	5	2
For scraper	3	1
Hood door, right side	21	10
Power train guard	340	154
Push-Pull arrangement	3400	1542
Retarder, hydraulic, tractor	371	168
For scraper	240	109
Special Application scraper	3000	1361
Starting receptacle	20	9
Supplemental steering system	225	102
Tires, set of two, tractor and scraper:		
33.25-35, radial steel cord	124	56
33.25-35, radial steel cord	−470	−213
37.25-35, 30 PR (E-3)	490	222
37.25-35, radial steel cord	720	327
Tool kit	23	10
Travel brackets	550	249

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.

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