

657G

Wheel Tractor-Scraper

CATERPILLAR®



Engine

Tractor Engine
Scraper Engine

Cat® C18 ACERT™
Cat C15 ACERT

Tractor Engine

Net Power

421/447 kW 564/600 hp

Scraper Engine

Net Power

306/337 kW 410/451 hp

Scraper Bowl

Capacity Heaped
Rated Load

33.6 m³ 44 yd³
47 174 kg 104,000 lb

657G Features

Economical Hauling System

The wheel tractor-scraper, with its ability to load quickly, haul at high speeds and dump on the go, has the potential to be the most profitable hauling system on the job site. This efficiency can result in fewer machines on the job, reduced operating costs and jobs delivered in a shorter period of time.

Power Train

Cat designed and manufactured power train components deliver the power necessary for fast loading and quick hauls. Dual power ratings increase component life in gears 1-2 and deliver maximum productivity in gears 3-8.

Operator Station

Single joystick control of implements, adjustable arm rests, seat, steering column and room to maneuver all reduce fatigue and increase operator comfort and productivity throughout the shift.

Cushion Hitch

Cushion hitch is a Caterpillar proven system for improving ride quality, dampening loads that might otherwise be carried through the frame to the operator. Cushion hitch offers operators a more comfortable haul portion of the work cycle.

Durability

Cat 657G wheel tractor-scrapers have a history of robust structural design, tested and validated to last in the most rugged loading and hauling conditions.

Contents

Operator Station.....3

Power Train – Engine4

Power Train – Transmission5

Electronic Controls6

Structures.....7

Scraper Bowl.....8

Coal Bowl9

Push-Pull10

Serviceability11

Support12

657G Wheel Tractor-Scraper Specifications.....13

657G Standard Equipment18

657G Optional Equipment.....19



Quick loading, high travel speeds and the ability to load and dump on the run yield fast cycle times, allowing Cat® Wheel Tractor-Scrapers to deliver a high rate of productivity.

Operator Station

Redesigned for enhanced operator comfort and productivity

Operator Comfort

- Ergonomic layout with plenty of room to work.
- Fatigue fighting low-effort controls with convenient auto-kickouts and detents
- Air suspension Cat Comfort Seat adjusts and rotates for more comfortable machine operation
- HVAC, defroster, radio ready are standard

Productivity

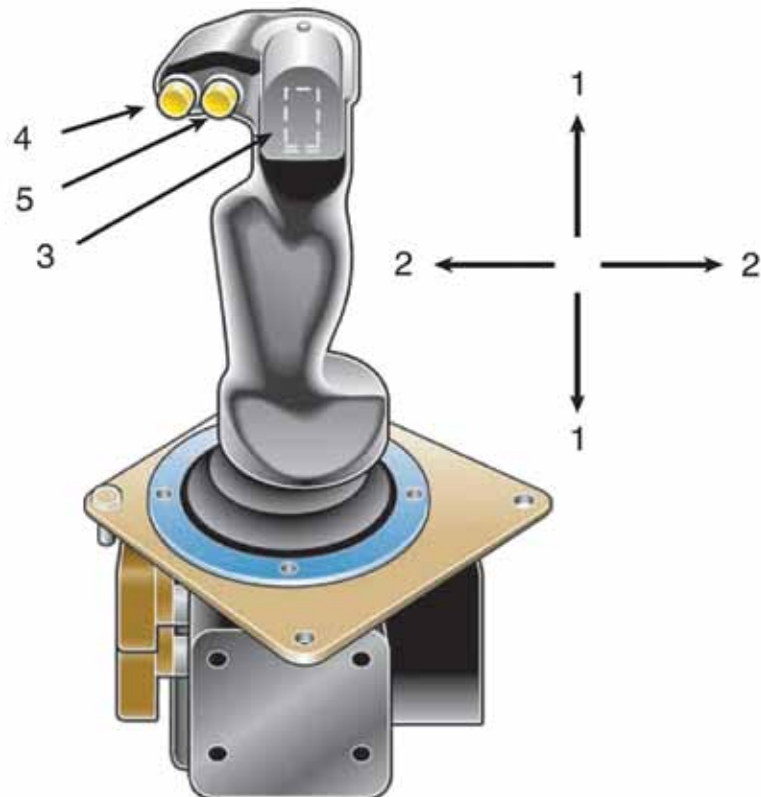
- Excellent visibility to bail, cutting edge and bowl
- Transmission hold maintains gear selection for optimum loading performance
- Dual throttle pedals for independent front and rear engine control
- Single joystick control replaces three implement levers in previous models
- Differential lock improves traction, reducing tire slip, wear, and operating costs
- Hydraulic retarding for braking on grades

Safety

- Hand rails strategically placed for three points of contact
- Seat adjusts for best visibility and access to controls; integrated seat belt
- ROPS/FOPS integrated into cab structure
- Front and rear windshield wipers
- Optional secondary steering helps maneuver the machine when primary steering is inoperable
- Four braking systems: primary, secondary, parking and hydraulic retarding (optional)

Instruments

- 1) Bowl (up/down), 2) Ejector (forward/back), 3) Thumb rocker switch, apron, 4) Transmission hold, 5) Cushion hitch, Trigger switch (not shown) bail control
- Simple gauge cluster is easy to read
- 657G dash can display either front or rear engine data
- Backlit switches are close at hand
- Messaging alerts technicians and operator to service needs



Power Train – Engine

Heavy duty diesel technology for performance and efficiency



ACERT™ Technology

- U.S. EPA Tier 3, EU Stage III emissions compliant
- Controlled combustion using proven systems, components
- Cross flow cylinder heads for clean air, better circulation
- Delivers fuel at the right time and pressure
- Rate shaping manages emissions in the combustion cycle

Cat C18 Engine – Tractor

- Excellent power density, load response across the curve
- High compression ratio improves cold start and performance
- MEUI fuel injection matches quantity and timing to load
- Matched to the high efficiency torque converter and electronically controlled power shift transmission, it has the torque rise to power through tough material and provide years of dependable service

Cat C15 Engine – Scraper

- Strong block and head – 18:1 compression ratio improves cold start performance
- Coolant, oil flow design improves heat transfer for durability
- Articulated two-piece piston with forged steel crown improves thermal stability and strength
- ADEM A4 ECM cold start strategy protects the engine, reduces white smoke and warm up time
- Automatic altitude compensation
- Mechanical Hydraulic Electronic Unit Fuel Injectors (MEUI) improve combustion with precise injection and atomization

Engine Speed Lock

Allows the operator to maintain a given engine speed without using the accelerator pedal.



Power Train – Transmission

Integrated electronics monitor the power train extending component life

Planetary Powershift Transmission Is Electronically Controlled

- Tractor gears 1-2 – converter drive for increased torque, tractor gears 3-8 – direct-drive for drive train efficiency. Scraper gears stay in converter drive for optimum torque
- Transmission Hold maintains converter drive for max rimpull, or holds current gear for best control
- Programmable Top Gear manually sets top gear available (3rd-8th) to match conditions or speed
- Neutral Coast Inhibitor prevents power train overspeeding by synchronizing engine rpm, pump lubrication and drive train speed, preventing under-lubrication
- Hydraulic Retarder (optional) reduces service brake wear and enhances machine control

Final Drives

- Outboard-mounted, planetary design reduces torque loads within the power train
- Double-row roller bearings and Duo-Cone™ seals assure reliability
- Differential Lock improves traction in slippery conditions, reducing tire wear

Brake Performance

- Wide brake shoes and brake drums improve brake performance and reduce brake and drum wear
- Separate front and rear circuits. Secondary brakes engage automatically if service pressure drops
- Parking Brake features a spring-applied, air-released mechanism that operates the service brakes

Torque Converter

Increases rimpull and shortens load times, and eliminates engine stall to efficiently deliver power to the ground and move more dirt.

Electronic Controls

Optimized machine performance and advanced diagnostic capabilities



Benefits of Electronic Control Modules (ECMs)

ECMs (3 on the tractor, 2 on rear-powered scrapers) offer:

- Better fuel economy by optimizing engine settings
- Greater reliability with operator warnings if problems arise
- Combining tractor and rear powered-scraper monitoring systems, easy access diagnostics, more durable components improves serviceability
- Reduced exhaust smoke by optimizing the fuel/air ratio during cranking, starting and acceleration
- Air filter restriction indicator alerts operator if filter exceeds allowable limit
- Periodically raises engine rpm during low idle to keep the batteries fully charged

Combined Electronic Monitoring System (EMS III)

Monitors both the tractor and scraper status on the 657G; access fault codes from one location. The tractor and powered scraper use the same controller for parts commonality and easier servicing.

Product Link Ready

This wireless system lets the customer track location, service meter hours and machine health information. Can also issue alerts if the machine is operated beyond owner defined time and location limits.

Easy Access Diagnostics Means Faster Problem Solving

Diagnostic codes, via the Electronic Technician (Cat ET), and a radio call can often let the service technician know which tools, manuals, and possibly even replacement parts to bring.





Structures

Superior design and construction delivers long term durability

Cushion Hitch

The electronically actuated cushion hitch has a parallelogram-type linkage for exceptional strength. Vertically mounted hydraulic cylinder transfers road shocks to nitrogen accumulators. Nitrogen accumulator absorbs and dampens road shocks, thus preventing these loads from being transmitted to the operator.

- controlled oil flow dampens rebound oscillation
- leveling valve applies pressure via an orifice to automatically center piston in the load cylinder
- steel castings are used to eliminate many welded joints and increase strength
- double-kingbolt design withstands high external forces and simplifies installation and removal

Lockout Switch

An operator-selectable lockout switch, located on the joystick, locks the cushion hitch down for improved cutting edge control when loading or dumping.

Scraper Bowl

Designed for fast and precise loading and controlled ejection



Bowl Design

Excellent productivity, improved draft arm protection, and better load retention. Low profile design offers less resistance to incoming materials, while cellular construction adds strength and dent resistance to bowl sides and floor.

Bulldozer Ejection System

Combines constant spreading control with minimum carryback.

Overflow Guard

An available overflow guard on the scraper bowl helps retain material, and limits spills onto the rear of the scraper.

Push-Loading

Where material types include rocky/abrasive material, or become traction-limited, push loading a 657G with a Cat D10 or D11 will optimize tire wear and productivity.

Cutting Edges and Cat Ground Engaging Tools (GET)

May be adjusted according to job conditions. Smooth and serrated cutting edges with available tip options can be applied to match job site conditions. For most efficient loading, use the thinnest cutting edge that provides satisfactory wear life and impact resistance.

Tandem Engines

Tandem engine machines improve cycle times on grades and in slippery underfoot conditions. Also improves the machine's loading characteristics in tough materials like clay.

Material Appetite

Well suited to handle a wide variety of material from clay to shot rock.



Coal Bowl

Purpose-built to meet application specific needs

Bowl Capacity

High-capacity bowls, built longer and taller than earth-moving bowls, allow the 657G to achieve rated load in light weight coal.

Wheel Tractor-Scraper Benefits

- High speed, self-loading productivity for stockpile and feeder management
- Coal pile compaction
- Bowl capacity 56 m³ (73 yd³) heaped
- All-wheel drive allows the machine to work in poor underfoot conditions and operate on piles of loose coal

Push-Pull

Two machines acting as a single self-loading system



Combined Power Increases Production

Push-pull applies the power of four engines to a single cutting edge. The benefit is realized in tough-to-load material and fast loading of both machines. Push-pull applications have the potential to produce the lowest cost per unit volume, and a high rate of production.



Hydraulically Actuated Bail

The push-pull arrangement uses a hydraulically actuated bail and cushioned plate to push, and a hook that is attached to the rear of the scraper to pull.





Serviceability

Easy to Maintain – Easy to Service

Engine Service Points

- Maintenance/service points grouped on the right side
- Grouping fluid fill and check points, filters and sampling ports shortens maintenance times
- Electronic Monitoring System (EMS) provides real-time information to the operator of system warnings
- Electronic Technician (Cat ET) displays real-time system data to better inform the service technician

Implement Valve Relocation

The implement valve is relocated from the tractor to the top of the scraper draft tube, reducing the number of hoses and tubes crossing over the gooseneck. This reduces potential leak points and improves service access.

Scraper Electrical Harness and One Piece Power Block

The flexible ribbon wiring harness oscillates with the machine, and polyurethane boots offer better protection against the elements. The jumpstart receptacle and disconnect switch are integrated into a one-piece power block, with a lockable cover, for better electrical integrity and serviceability.

Electro-Hydraulic Implement Control Simplifies Serviceability

Removing the cab pilot valve and associated lines improves reliability and reduces noise. The high efficiency electro-hydraulic pilot oil filter provides cleaner oil for the pilot system.

Support

Cat Dealer services



Product Support

You will find nearly all parts at your dealer parts counter. Cat dealers use a world-wide computer network to find in-stock parts to minimize machine down time. Save money with genuine Cat Reman parts. You receive the same warranty and reliability as new products at substantial cost savings.

Operation

Better operating techniques can help maximize your machine investment. Cat dealers have resources to help you increase productivity, and Caterpillar offers certified operator training classes on most machines.

Machine Selection

Compare machines under consideration before purchase. Cat dealers can estimate component life, preventive maintenance cost, and the true cost of lost production.

Purchase

Consider the financing options available as well as day-to-day operating costs. Look at dealer services that can be included in the cost of the machine to yield lower equipment owning and operating costs over time.

Maintenance Services

Talk to your dealer about the range of available maintenance services like S·O·SSM Analysis and Coolant Sampling. Repair option programs guarantee the cost of repairs up front.

Customer Support Agreements

Cat dealers offer a variety of product support agreements that can meet customers' specific needs. These plans can cover the entire machine, including attachments, to help protect your investment.

Replacement

Repair, rebuild or replace? Your Cat dealer can help you evaluate the cost involved so you can make the right choice.

657G Wheel Tractor-Scraper Specifications

Engine

Tractor Engine	Cat® C18 ACERT™	
Scraper Engine	Cat C15 ACERT	

Tractor Engine

Net Power	421/447 kW 564/600 hp	
Gross Power – Gears 1-2	445 kW	596 hp
Gross Power – Gears 3-8	471 kW	632 hp
Net Power – Gears 1-2	421 kW	564 hp
Net Power – Gears 3-8	447 kW	600 hp
Bore	145 mm	5.7 in
Stroke	183 mm	7.2 in
Displacement	18.1 L	1,105 in ³
Net Power – Tractor/Scraper	421 kW (564 hp)/ 306 kW (410 hp)	

- Net power advertised is the power available at rated speed of 1,800 rpm, measured at flywheel when the engine is equipped with fan, air cleaner, muffler and alternator.
- Gross power and net power ratings apply at 1,800 rpm when tested under the specified standard conditions for ISO 9249 and EEC 80/1269.

Scraper Engine

Net Power	306/337 kW 410/451 hp	
Gross Power – Gears 1-2	326 kW	437 hp
Gross Power – Gears 3-8	356 kW	478 hp
Net Power – Gears 1-2	306 kW	410 hp
Net Power – Gears 3-8	337 kW	451 hp
Bore	140 mm	5.5 in
Stroke	165 mm	6.5 in
Displacement	15.2 L	928 in ³

- Net power advertised is the power available at rated speed of 1,800 rpm, measured at flywheel when the engine is equipped with fan, air cleaner, muffler and alternator.
- Gross power and net power ratings apply at 1,800 rpm when tested under the specified standard conditions for ISO 9249 and EEC 80/1269.

Scraper Bowl

Capacity Heaped	33.6 m ³	44 yd ³
Rated Load	47 174 kg	104,000 lb
Capacity Struck	24.5 m ³	32 yd ³
Depth of Cut – max.	440 mm	17 in
Width of Cut, to Router Bits	3846 mm	12.7 in
Ground Clearance – max.	580 mm	23 in
Cutting Edge – thickness	45 mm	1.8 in
Hyd. Penetration Force – 657G	542 kN	121,000 lb
Depth of Spread – max.	660 mm	26 in
Apron Opening	2337 mm	92 in
Apron Closure Force	176 kN	39,200 lb

Transmission

1 Forward	5.6 km/h	3.5 mph
2 Forward	10.2 km/h	6.3 mph
3 Forward	12.5 km/h	7.8 mph
4 Forward	17 km/h	10.6 mph
5 Forward	22.7 km/h	14.1 mph
6 Forward	30.6 km/h	19 mph
7 Forward	41.2 km/h	25.6 mph
8 Forward	55.7 km/h	34.6 mph
Reverse	9.8 km/h	6.1 mph

Hydraulics

Bowl Cylinder Bore	235 mm	9.25 in
Bowl Cylinder Stroke	950 mm	37.4 in
Apron Cylinder Bore	235 mm	9.25 in
Apron Cylinder Stroke	760 mm	29.92 in
Ejector Cylinder Bore	260 mm	10.24 in
Ejector Cylinder Stroke	1946 mm	76.61 in
Steering Circuit	378 L/min	99.9 gal/min
Scraper Circuit	579 L/min	153 gal/min
Cushion Hitch Circuit	48 L/min	12.7 gal/min
Secondary Steering Circuit	243 L/min	64.2 gal/min
Relief Valve – Steering Circuit	13 500 kPa	1,959 psi
Relief Valve – Implement Circuit	13 780 kPa	1,999 psi
Compensator Setting – Cushion Hitch Circuit	20 700 kPa	3,002 psi

- Steering circuit, Scraper implement circuit and Cushion hitch circuit measured at 2,000 rpm.
- Optional secondary steering circuit measured at 24 km/h (14.9 mph).

Steering

Width – 180° Turn, right	13.6 m	44 ft 7 in
Width – 180° Turn, left	14.5 m	47 ft 7 in
Steering Angle – right	90°	
Steering Angle – left	85°	

- Optional secondary steering system meets SAE J1511 (OCT 90) and ISO 5010 (1992) requirements.

657G Wheel Tractor-Scraper Specifications

Service Refill Capacities – Tractor

Crankcase	64 L	17 gal
Transmission	136 L	36 gal
Differential	136 L	36 gal
Final Drive (per side)	23 L	6 gal
Cooling System	125 L	33 gal
Hydraulic Reservoir	303 L	80 gal
Wheel Coolant (each)	130 L	34.3 gal
Windshield Washer	2 L	0.5 gal

Service Refill Capacities – Scraper

Fuel Tank	1597 L	421.9 gal
Crankcase	38 L	10 gal
Transmission	121 L	32 gal
Differential	168 L	44 gal
Final Drive (per side)	30 L	7.9 gal
Wheel Coolant (each)	130 L	34.3 gal
Cooling System	89 L	24 gal

Standards

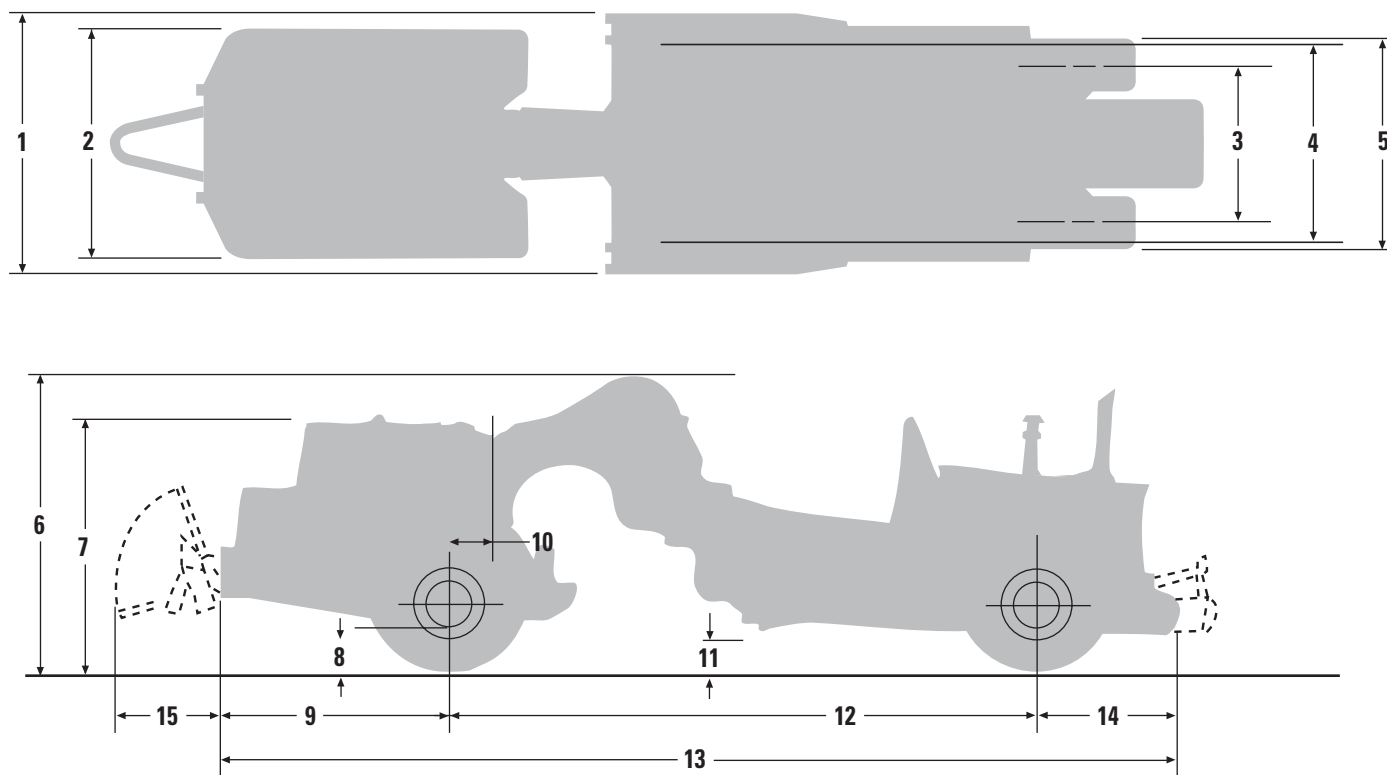
Cab

Brakes

- Standard Rollover Protective Structure (ROPS) which meets SAE J320a, SAE J1040 MAY 94, ISO 3471-1986 and ISO 3471-1994.
- Falling Object Protective Structure (FOPS) which meets SAE J231 JAN 81 and ISO 3449-1992.
- Cab meets OSHA and MSHA limits for operator and sound exposure with doors and windows closed (according to ANSI/SAE J1166 MAY 90). The operator sound pressure level is less than 85 dB(A) when measured per ISO 6394 or 86/662/EEC.
- Standard air conditioning system contains environmentally friendly R134a refrigerant.
- Brakes meet ISO 3450:1998.

Dimensions

All dimensions are approximate.



	mm	in
1 Width – overall machine	4344	171.02
2 Width – tractor	3601	141.77
3 Width – rear tire center lines	2813	110.75
4 Width – inside of bowl	3683	145
5 Width – outside bowl (shipping width)	3914	154
6 Height – overall shipping	4710	185.43
7 Height – top of cab	3712	146.14
8 Ground clearance, tractor	645	25.39
9 Front of tractor to front axle	3770	148.42
10 Axle to vertical hitch pin	608	23.94
11 Height – scraper blade maximum	680	26.77
12 Wheelbase	9956	391.97
13 Length – overall machine	16 164	636.38
14 Rear axle to rear of machine	2438	95.98
15 Bail length – maximum (push-pull)	1836	72.28

657G Wheel Tractor-Scraper Specifications

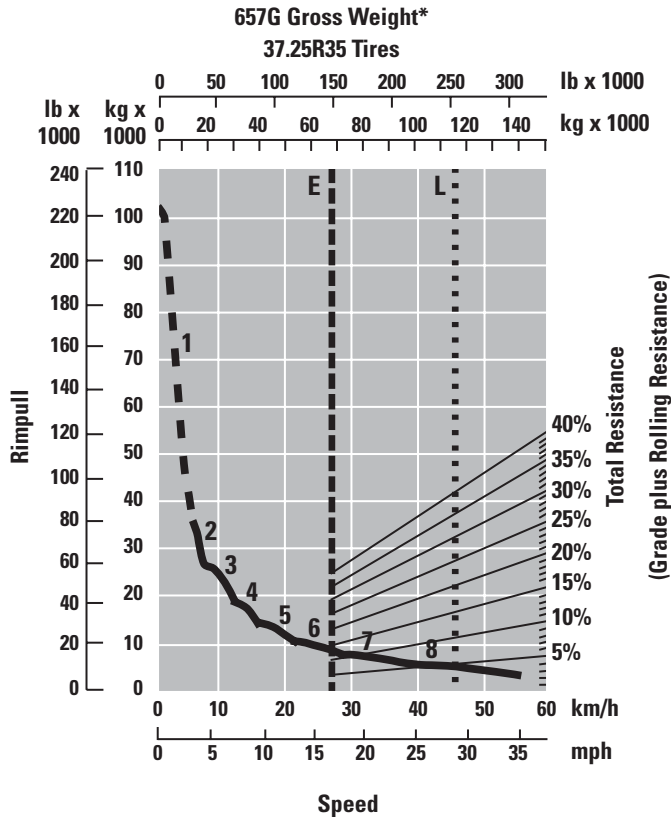
Weights

(approximate)

Model	657G		657G	
	Standard		Push-Pull	
	kg	lb	kg	lb
Shipping, with ROPS cab and 10% fuel				
Tractor	59%		59%	
	39 788	87,717	42 472	93,635
Scraper	41%		41%	
	27 325	60,242	29 061	64,068
Total 100%	67 113	147,959	71 533	157,703
Operating empty, with ROPS cab, full fuel tanks and no operator				
Front axle	58%		58%	
	39 881	87,924	42 566	93,842
Rear axle	42%		42%	
	28 503	62,837	30 238	66,663
Total 100%	68 384	150,761	72 804	160,505
Loaded, based on a rated load of 47 174 kg (104,000 lb)				
Front axle	50%		51%	
	58 172	128,246	60 856	134,165
Rear axle	50%		49%	
	57 386	126,515	59 121	130,340
Total 100%	115 558	254,761	119 978	264,505

Gradeability/Speed/Rimpull

To determine gradeability performance: Read from gross weight down to the percent of total resistance. Total resistance equals actual percent grade plus 1% for each 9 kg/t (20 lb/ton) of rolling resistance. From this weight-resistance point, read horizontally to the curve with the highest obtainable gear, then down to maximum speed. Usable rimpull will depend upon traction available and weight on drive wheels.

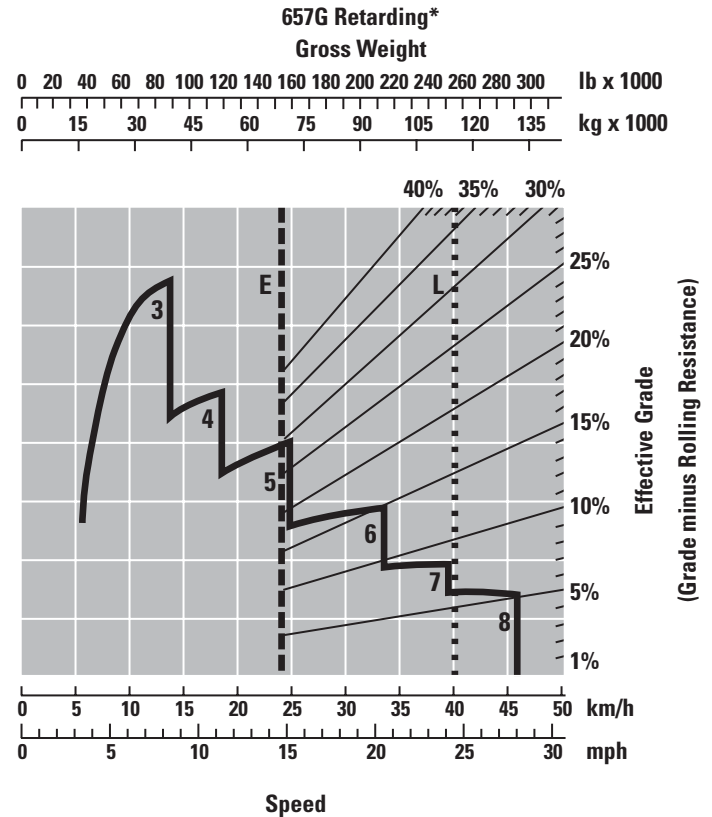


* at sea level

- 1 - 1st Gear Torque Converter Drive
- 2 - 2nd Gear Torque Converter Drive
- 3 - 3rd Gear Direct Drive
- 4 - 4th Gear Direct Drive
- 5 - 5th Gear Direct Drive
- 6 - 6th Gear Direct Drive
- 7 - 7th Gear Direct Drive
- 8 - 8th Gear Direct Drive

Retarding

To determine retarding performance: Read from gross weight down to the percent effective grade. (Effective grade equals actual percent grade minus 1% for each 9 kg/t (20 lb/ton) of rolling resistance). From this weight-effective grade point, read horizontally to the curve with the highest obtainable speed range, then down to maximum descent speed the retarder can properly handle.



* at sea level

- 3 - 3rd Gear Direct Drive
- 4 - 4th Gear Direct Drive
- 5 - 5th Gear Direct Drive
- 6 - 6th Gear Direct Drive
- 7 - 7th Gear Direct Drive
- 8 - 8th Gear Direct Drive

657G Standard Equipment

Standard equipment may vary. Consult your Cat dealer for details.

ELECTRICAL

Alarm, backup
Alternator, 80 amp – tractor engine
Alternator, 50 amp – scraper engine
Batteries Tractor (4), 12V Maintenance
Free, High Output
Batteries Scraper (4), 12V Maintenance
Free, High Output
Electrical System, 24V
Lighting System – Tractor
Directional Signals
Hazard Lights
Headlights, halogen with dimmer
Floodlight, cutting edge
Lights, side vision
Lighting System – Scraper
Directional Signals
Hazard Lights
Stop/Tail
Starting Receptacle – tractor and
scraper engines

OPERATOR ENVIRONMENT

Air Conditioner (includes heater
and defroster)
Automotive style fuse panel with fuse puller
Cigarette Lighter and Ashtray
Coat Hook
Cup holder
Diagnostic Connection Port (12V)
Dome Courtesy Light
Engine speed lock
Fan defroster
Gauge Group
Air Pressure
Converter/Retarder temperature
Electronic Monitoring System (EMS III)
Engine coolant temperature
Actual Transmission Gear Indicator
Fuel
Speedometer
Tachometer
Transmission gear indicator
Horn
Implement Control Joystick
Rearview Mirrors

Radio Ready

2 radio openings, speakers,
and 5-amp converter
ROPS Cab with Sound Suppression
and Pressurization
Static Seatbelt
Scraper Engine Controls
Seat, Air Suspension,
Caterpillar Comfort, cloth
Steering Wheel – tilt and telescoping
Storage Compartment
Transmission Hold
Windows – sliding side, swing out
Windshield – laminated glass
Windshield Wiper/Washer – front and rear
Wrist Rest/Grab Handle

POWER TRAIN

Tractor
Engine
Cat C18, ACERT™ Technology
6-cylinder, turbocharged diesel
Mechanically-actuated Electronic Unit
Injection (MEUI)
Air cleaner, dry-type with pre-cleaner
Electric start, 24V
Fan, suction
Heater, engine coolant, 120V
Radiator, NGMR (9 fins per inch)
Ground level engine shutdown
Guard, crankcase
Guard, power train
Muffler
Starting Aid, ether
Braking System
Parking/Primary/Secondary/Hydraulic
retarder
Shields – brake
Transmission
8-speed automatic powershift
with electronic control
Control throttle shifting
Differential lock-up
Downshift Inhibitor
Neutral Coast Inhibitor
Programmable top-gear selection
Transmission hold

Scraper

Engine
Cat C15, ACERT Technology
6-cylinder, turbocharged diesel
Mechanically-actuated Electronic Unit
Injection (MEUI)
Electric start from the cab, 24V
Fan, suction
Radiator, NGMR (9 fins per inch)
Ground level engine shutdown
Heater, engine coolant, 120V
Muffler
Starting Aid, ether
Thermo-shield, laminated
Braking System
Parking/Primary/Secondary/Hydraulic
retarder
Shields-brake
Transmission
8-speed Automatic Power shift
with Electronic Control

OTHER STANDARD EQUIPMENT

Tractor
Air dryer
Auto ether aid
Cushion hitch
Extended Life Coolant, –36° C (–33° F)
Fast Oil Change
Fenders
Guard, bottom
Guard, crankcase
Hydraulic retarder
Locks, vandalism protection
Product Link Ready
Tires, 40.5/75 R39 radial
Tow pins – front and rear
Scraper
Extended Life Coolant, –36° C (–33° F)
Engine coolant heater
Fuel system, fast fill
(meets EEC regulations)
Fast Oil Change
Fenders
Hydraulic Retarder
Locks, vandalism protection
Overflow guard
Tires, 40.5/75 R39 radial

Optional equipment may vary. Consult your Cat dealer for details.

Push-pull arrangement Steering, secondary	Extended Life Coolant, -50° C (-58° F) Lock, Steering	Push-Pull Arrangement with Rear Radiator Guard Product Link
--	--	---

657G Wheel Tractor-Scraper

For more complete information on Cat products, dealer services, and industry solutions, visit us on the web at www.cat.com

© 2010 Caterpillar Inc.
All rights reserved

Materials and specifications are subject to change without notice. Featured machines in photos may include additional equipment. See your Caterpillar dealer for available options.

CAT, CATERPILLAR, SAFETY.CAT.COM, their respective logos, "Caterpillar Yellow" and the "Power Edge" trade dress, as well as corporate and product identity used herein, are trademarks of Caterpillar and may not be used without permission.

AEHQ6044 (06-2010)

Replaces AEHQ5652

