637

Coal Bowl

Technical Specifications

Configurations and features may vary by region. Please consult your Cat® dealer for availability in your area.

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CAT®

637 Coal Bowl Specifications

Engine

Engine Model: Tractor	Cat® C18	
Rated Engine Speed: Tractor	2,000 rpm	
Engine Power (ISO 14396:2002)	425 kW	570 hp

- Meets U.S. EPA Tier 4 Final and EU Stage V emission standards, or equivalent to U.S. EPA Tier 2, or equivalent to U.S. EPA Tier 3 and EU Stage IIIA.

Engine – Scraper

Engine Model: Tractor	Cat C9.3	
Rated Engine Speed: Tractor	2,150 rpm	
Engine Power (ISO 14396:2002) – Tier 4 Final/EU Stage V	200 kW	269 hp
Engine Power (ISO 14396:2002) – Tier 3/EU Stage IIIA	215 kW	289 hp

- Meets U.S. EPA Tier 4 Final and EU Stage V emission standards, or equivalent to U.S. EPA Tier 2, or equivalent to U.S. EPA Tier 3 and EU Stage IIIA.
- Net power available at the flywheel when the engine is equipped with fan, air cleaner, aftertreatment, and alternator with engine speed specified.

General Data

Fuel Tank Refill Capacity: Scraper	763 L	201 gal
Overall Width	3.94 m	12'11"
Overall Shipping Height	3.89 m	12'9"
Scraper Capacity:		
Struck	18.3 m^3	24.0 yd^3
Heaped	26.0 m^3	34.0 yd^3
Rated Load	37 200 kg	82,200 lb
	37.2 tonnes	41.1 tons
Width of Cut	3.51 m	17'7"
Maximum Depth of Cut	450 mm	12.4"
Maximum Depth of Spread	535 mm	21.1"
Top Speed (Loaded)	55.8 km/h	34.7 mph
180° Curb-to-Curb Turning Width	12.23 m	40'2"
Tires:		
Tractor Drive	33.25R29**E3	
Scraper	33.25R29**E3	

Non Push-Pull

Operating Weight (Empty)	46 600 kg	102,750 lb
Overall Length	15.04 m	49'4"

Transmission

Forward 1	5.5 km/h	3.4 mph
Forward 2	10.0 km/h	6.2 mph
Forward 3	12.4 km/h	7.7 mph
Forward 4	16.9 km/h	10.5 mph
Forward 5	22.7 km/h	14.1 mph
Forward 6	30.6 km/h	19.0 mph
Forward 7	41.4 km/h	25.7 mph
Forward 8	55.8 km/h	34.7 mph
Reverse 1	9.9 km/h	6.2 mph

Service Refill Capacities

Differential	158.0 L	41.7 gal
Final Drive (Each)	19.0 L	5.0 gal
Rear Wheels (Each)	4.0 L	1.0 gal
Brake Cooling (Scraper)	33.0 L	8.7 gal
Windshield Washer	5.0 L	1.3 gal
Crankcase (Tractor)	52.0 L	13.7 gal
Transmission System	110 L	29 gal
Cooling System	75 L	19.8 gal
Fuel Tank	874 L	231 gal
Hydraulic System	142 L	37.5 gal
Diesel Exhaust Fluid (DEF)*	30.5 L	8 gal

*When equipped

Safety Criteria Compliance Standards

Rollover Protective Structure (ROPS)	ISO 3471:2008 for up to 21 282 kg (46,919 lb)
Falling Objects Protective Structure (FOPS)	ISO 3449:2005 Level II
Brakes	ISO 3450:2011
Steering System	ISO 5010:2007
Seat Belt	ISO 6683:2005, SAE J386
Reverse Alarm	ISO 9533:2010

Weights

Standard

Shipping Weight – 10% fuel	52 091 kg	114,841 lb
Operating Weight – full fuel empty load	53 133 kg	117,138 lb
Loaded, based on rated load	87 606 kg	193,138 lb

Implement Cycle Times

Bowl Raise	3.5 seconds
Bowl Lower	3.5 seconds
Apron Raise	4.0 seconds
Apron Lower	3.8 seconds
Ejector Extend	8.5 seconds
Ejector Retract	8.5 seconds
Bail Raise	1.5 seconds
Bail Lower	2.1 seconds

Sound

- The exterior sound pressure level for the standard machine (ISO 6395:2008) is 119 dB(A).
- The interior sound pressure level for the standard machine (ISO 6396:2008) is 77 dB(A).
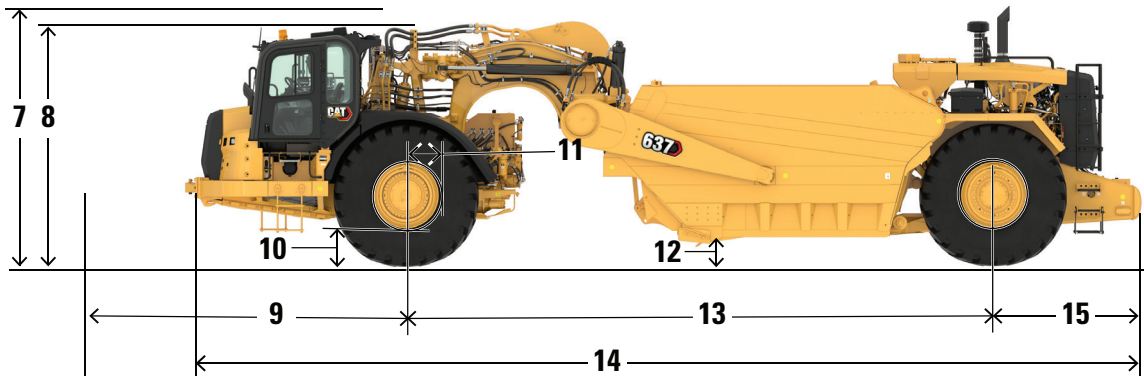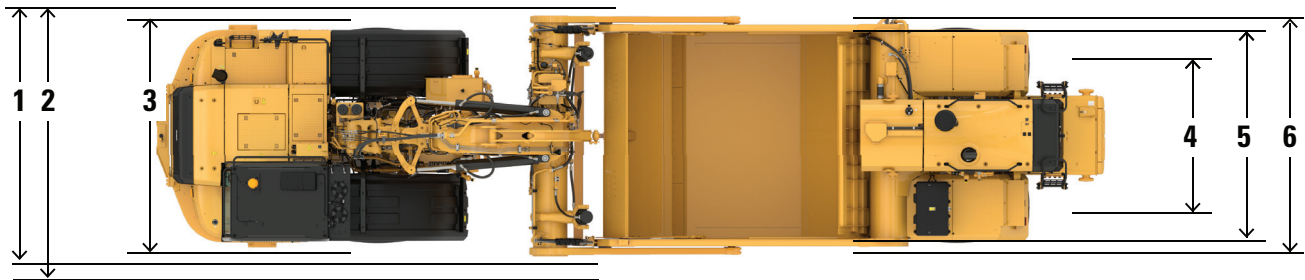
Air Conditioning System

The air conditioning system on this machine contains the fluorinated greenhouse gas refrigerant R134a (Global Warming Potential = 1430). The system contains 1.9 kg (4.2 lb) of refrigerant which has a CO_2 equivalent of 2.71 metric tonnes (2.674 tons).

Dimensions

All dimensions are approximate.

		637	
1	Overall Machine Width	3937 mm	155 in
2	Overall Machine Width – Ladder Down	3878 mm	152.7 in
3	Tractor Width	3499 mm	137.8 in
4	Rear Tire Centers Width	2462 mm	96.9 in
5	Inside of Bowl Width	3404 mm	134 in
6	Outside Bowl Width	3937 mm	155 in
7	Overall Shipping Height	4145 mm	163.2 in
8	Height to Top of Cab	3733 mm	147 in
9	Front of Tractor to Front Axle	3612 mm	142.2 in
10	Ground Clearance – Tractor	664 mm	26.1 in
11	Axle to Vertical Hitch Pin	509 mm	20 in
12	Scraper Blade Height – Maximum	510 mm	20 in
13	Wheelbase	8808 mm	346.8 in
14	Overall Machine Length – Standard	15 164 mm	597 in
15	Rear Axle to Rear of Machine	2292 mm	90.2 in

Typical Fixed Times Retarder Curves

TYPICAL FIXED TIMES FOR SCRAPERS
(Times may vary depending on job conditions)

Model	Loaded By	Load Time (Min.)	Maneuver and Spread or Maneuver and Dump (Min.)
613G	Self	0.9	0.7
623K	Self	0.9	0.7
621K	One D8	0.5	0.7
627K	One D8	0.5	0.6
621K	One D9	0.4	0.7
627K	One D9	0.4	0.6
627K/PP	Self	0.9*	0.6
631K	One D9	0.6	0.7
637K	One D9	0.6	0.6
631K	One D10	0.5	0.7
637K	One D10	0.5	0.6
637K/PP	Self	1.0*	0.6
657G	One D11	0.6	0.6
657G	Push Pull Self	1.1*	0.6
637K	Coal	0.8	0.7
657G	Coal	0.8	0.6

*Load time per pair, including transfer time.

Note: Empty weights shown on the wheel tractor-scraper charts include ROPS cab. When calculating TMPH loadings, any additional weight must be considered in establishing mean tire loads.

USE OF RETARDER CURVES

The following explanation applies to retarder curves for wheel tractor-scrapers and articulated trucks.

The speed that can be maintained (without use of service brake) when the machine is descending a grade with retarder fully on can be determined from the retarder curves in this section if gross machine weight and total effective grade are known.

Total effective grade (or total resistance) is grade assistance minus rolling resistance.

10 kg/metric ton (20 lb/U.S. ton) = 1% adverse grade

Example:

15% favorable grade with 5% rolling resistance. Find total effective grade.

Total effective grade = 15% grade assistance – 5%

Rolling resistance = 10% total effective grade assistance

Example Problem:

A 637 with an estimated payload of 47 175 kg (104,000 lb) descends a 10% total effective grade. Find constant speed and gear range with maximum retarder effort. Find travel time if the slope is 610 m (2,000 ft) long.

Empty weight + payload = gross weight = 60 950 kg + 47 175 kg = 108 125 kg (134,370 lb + 104,000 lb = 238,370 lb)

637 Coal Bowl Specifications

Rimpull-Speed-Gradeability Curves

USE OF RIMPULL-SPEED-GRADEABILITY CURVES

The following explanation applies to Rimpull-Speed-Gradeability curves for wheel tractor-scrapers, construction and mining trucks/tractors, and articulated trucks.

Maximum speed attainable, gear range, and available rimpull can be determined from curves on the following pages when machine weight and total effective grade (or total resistance) are known.

Rimpull is the force (in kg, lb, or kN) available between the tire and the ground to propel the machine (limited by traction).

Weight is defined as gross machine weight (kg or lb) = machine + payload

Total effective grade (or total resistance) is grade resistance plus rolling resistance expressed as percent grade.

Grade is measured or estimated.

Rolling resistance is estimated (see tables section for typical values).

10 kg/metric ton (20 lb/U.S. ton) = 1% adverse grade

Example:

With a 6% grade and a rolling resistance of 40 kg/metric ton (80 lb/U.S. ton), find total resistance.

Rolling resistance = 40 kg/t ÷ 10 = 4% effective grade (English: 80 lb ÷ 20 = 4%)

Total resistance = 4% rolling + 6% grade = 10%

Altitude Derating

Rimpull force and speed must be derated for altitude similar to flywheel horsepower. The percentage loss in rimpull force approximately corresponds to the percentage loss in flywheel horsepower. See tables section for altitude derations.

Rimpull-Speed-Gradeability

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

Example Problem:

A 637 with an estimated payload of 37 013 kg (81,600 lb) is operating on a total effective grade of 10%. Find the available rimpull and maximum attainable speed.

Empty weight + payload = gross weight

47 628 kg + 37 013 kg = 84 641 kg
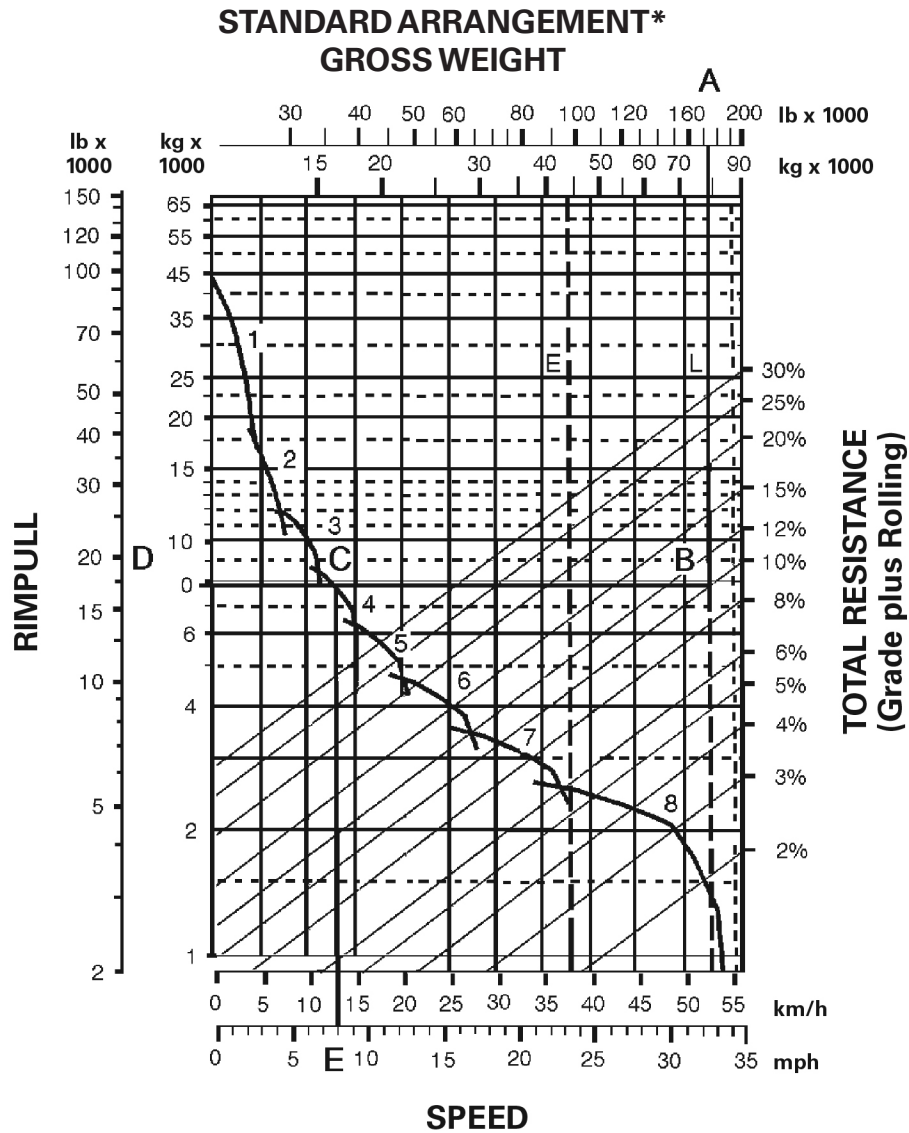
(105,002 lb + 81,600 lb = 186,602 lb)

Solution: Using graph on the next page, read from 84 641 kg (186,602 lb) (point A) on top of gross weight scale down the line to the intersection of the 10% total resistance line (point B).

Go across horizontally from B to the rimpull scale on the left (point D). This gives the required rimpull: 7756 kg (17,100 lb).

Where the line cuts the speed curve (point C), read down vertically (point E) to obtain the maximum speed attainable for the 10% effective grade: 12.9 km/h (8 mph).

Answer: The machine will climb the 10% effective grade at a maximum speed of 12.9 km/h (8 mph) in 4th gear. Available rimpull is 7756 kg (17,100 lb).

Rimpull-Speed-Gradeability Curves

STANDARD ARRANGEMENT*
GROSS WEIGHT

KEY
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

KEY
A — Loaded 84 641 kg (186,602 lb)
B — Intersection with 10% total resistance line
C — Intersection with rimpull curve (4th gear)
D — Required rimpull 7756 kg (17,100 lb)
E — Speed 12.9 km/h (8 mph)

*At sea level

Retarder Curves

Solution: Using the retarder curve below, read from 108 125 kg (238,370 lb) (point A) on top of gross weight scale down the line to the intersection of the 10% effective grade line (point B).

Go across horizontally from point B to the intersection of the retarder curve (point C). Point C intersects at the 5 (5th gear) range.

Where point C intersects the retarder curve, read down vertically to point D on the bottom scale to obtain the constant speed: 21.7 km/h (13.5 mph).

Answer: The 637 will descend the slope at 21.7 km/h (13.5 mph) in 5th gear. Travel time is 1.68 minutes.
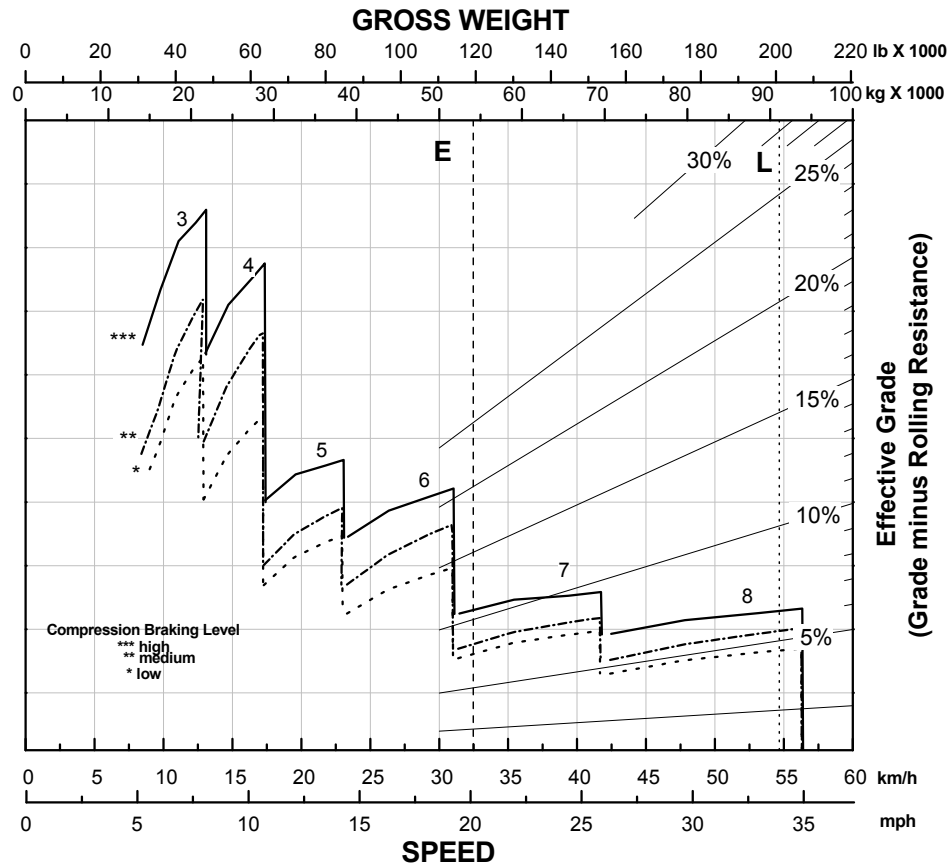
$$\frac{610 \text{ m}}{363 \text{ m/min}} = 1.68 \text{ min}$$

* (mph x 88 = F.P.M.)

$$\frac{2{,}000 \text{ ft}}{13.5 \text{ mph x } 88^*} = 1.68 \text{ min}$$

Note: The basic distance-speed-time formula is 60 D ÷ S = T (or "60 D Street"), where 60 is minutes, D is distance, S is speed, and T is time. In the above problem, 60 × 610 m ÷ 21.7 km/h × 1000 = T.

$$\frac{60 \text{ x } 610}{21.7 \text{ x } 1000} = T = (1.68)$$

GROSS WEIGHT

SPEED

KEY	
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	

KEY	
A — Loaded 108 125 kg (238,370 lb)	
B — Intersection with 10% effective grade line	
C — Intersection with retarder curve (5th gear)	
D — Constant speed 21.7 km/h (13.5 mph)	

Rimpull-Speed-Gradeability – 33.25R29 Tires

GROSS WEIGHT

SPEED

RIMPULL

TOTAL RESISTANCE (Grade Plus Rolling)

E

L

30%
25%
20%
15%
10%
5%

1
2
3
4
5
6
7
8

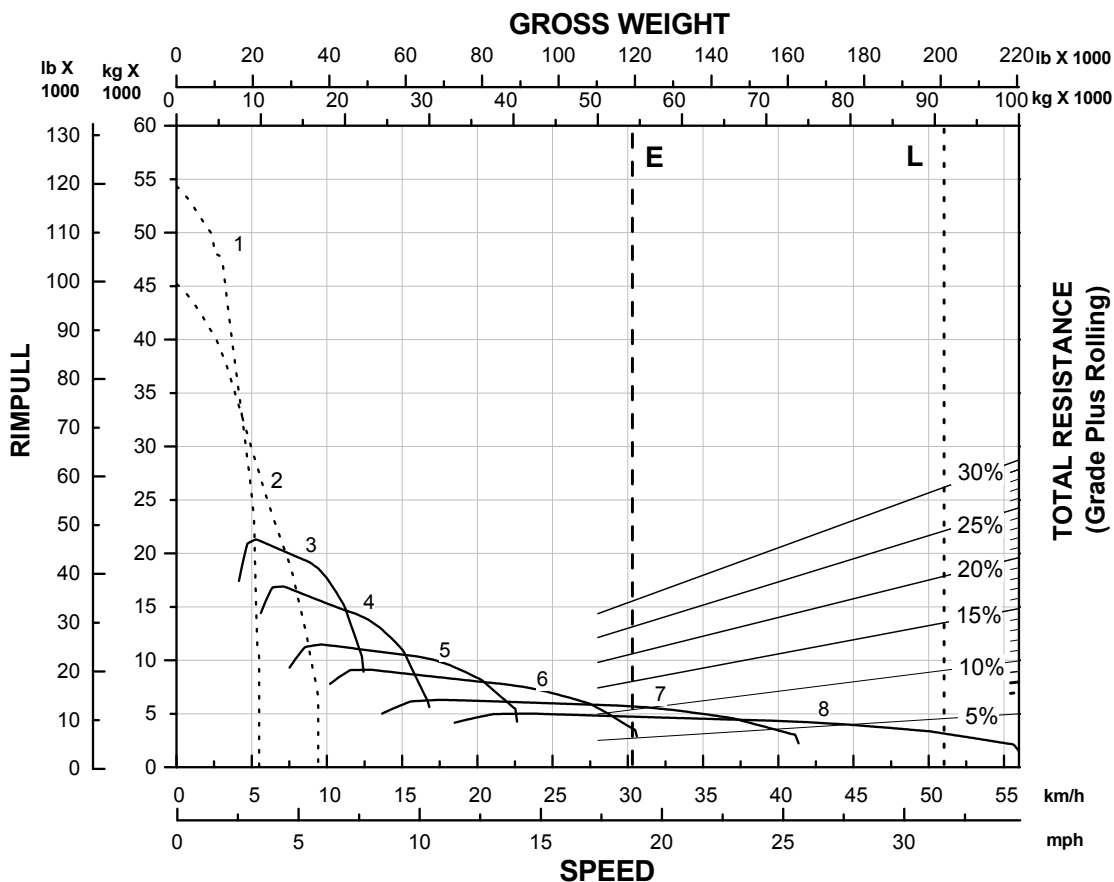KEY

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

KEY

E — Empty 35 808 kg (78,943 lb)
L — Loaded 61 935 kg (136,553 lb)

Standard Equipment and Optional Attachments

Standard equipment and optional attachments may vary. Consult your Cat® dealer for details.

	Standard	Optional
POWERTRAIN – TRACTOR		
Cat C18 engine with Mechanically Actuated Electronic Unit Injection (MEUI™)	✓	
Cat engine brake	✓	
Electric start, 24V	✓	
Fan, hydraulic	✓	
Ground level engine shutdown	✓	
Guard, crankcase	✓	
Starting aid, ether	✓	
Braking system: primary and secondary, wet disc, hydraulic; parking, hydraulic-released, spring-applied	✓	
Transmission: 8-speed planetary powershift, Electronic Clutch Pressure Control (ECPC), Advanced Productivity Electronic Control Strategy (APECS) software, programmable top gear selection, transmission hold, differential lock, transmission guard, ground speed control, machine speed limit	✓	
POWERTRAIN – SCRAPER		
Cat C9.3 engine with high pressure common rail fuel	✓	
Cat engine brake	✓	
Electric start, 24V	✓	
Fan, driveline	✓	
Ground engine shutdown	✓	
Muffler (U.S. EPA Tier 2 or U.S. EPA Tier 3 only)	✓	
Starting aid, ether	✓	
Braking system: primary and secondary, dry disc, hydraulic; 4 speed (torque converter drive), transmission planetary powershift	✓	
ELECTRICAL – TRACTOR		
Alternator, 115 amp	✓	
Batteries (4), 12V, 1,000 CCA, maintenance free	✓	
Electrical system, 24V	✓	
Lighting system: LED low beam, high beam, and work lights	✓	
Starting/charging receptacle	✓	
ELECTRICAL – SCRAPER		
Alarm, backup	✓	
Lighting system: brake lights – LED, turn signals with hazard function – LED	✓	
OPERATOR ENVIRONMENT – TRACTOR		
HVAC powered air precleaner	✓	
HVAC system, heat, AC, defrost	✓	
Thermostat control of HVAC system	✓	
Coat hook	✓	
Lunchbox platform with holding strap	✓	
Diagnostic connection (2)	✓	
Dome courtesy light	✓	
Horn, electric	✓	
T-handle implement control	✓	
Radio ready	✓	
Rollover protective structure (ROPS)/falling objects protective structure (FOPS) cab, pressurized	✓	

	Standard	Optional
OPERATOR ENVIRONMENT – TRACTOR *(continued)*		
Keypad switches: throttle lock, wipers/washers, hazard lights, retarding level select, work lights on/off, information mode on messenger display	✓	
Powered access		✓
Safety tab rocker switches	✓	
Seat – Cat Advanced Ride Management (ARM), Cat Comfort Series III, rotates 30 degrees	✓	
Steering wheel, tilt, telescoping, padded	✓	
Windows, right side emergency egress	✓	
Messenger display	✓	
FLUIDS		
Extended life coolant to -37° C (-34° F)	✓	
OTHER STANDARD EQUIPMENT – TRACTOR		
Advanced cushion hitch	✓	
Accumulators (cushion hitch and brake) with Canadian registration number (CRN)	✓	
Fast oil change (engine)	✓	
Fenders, non-metallic	✓	
Heater, engine coolant 120V	✓	
Tow pin, front	✓	
OTHER STANDARD EQUIPMENT – SCRAPER		
Coal Bowl: 31.3 m^3 (41.0 yd^3) – struck, 37.8 m^3 (49.4 yd^3) – heaped	✓	
Hydraulic position sensing cylinders (bowl lift and apron)	✓	
STEERING ARRANGEMENTS		
Secondary steering (ground driven)	✓	
INTEGRATED TECHNOLOGIES		
Product Link™		✓
Sequence Assist		✓
OTHER ATTACHMENTS		
Fast-fill fuel tank	✓	
Camera arrangement – Work Area Vision System (WAVS)	✓	
Steering lock – external	✓	
Cab beacon with air horn		✓
Year of manufacture plate		✓
SERVICE INSTRUCTIONS		
Film arrangement – U.S. (ANSI)		✓
Film arrangement – International (ISO)		✓

The following information applies to the machine at the time of final manufacture as configured for sale in the regions covered in this document. The content of this declaration is valid as of the date issued; however, content related to machine features and specifications are subject to change without notice. For additional information, please see the machine's Operation and Maintenance Manual.

For more information on sustainability in action and our progress, please visit https://www.caterpillar.com/en/company/sustainability.

Engine

- The Cat® C13 engine is available in configurations that meet U.S. EPA Tier 4 Final and EU Stage V emission standards or equivalent to U.S. EPA Tier 2, or equivalent to U.S. EPA Tier 3 and EU Stage IIIA.
- Cat U.S. EPA Tier 4 Final and EU Stage V diesel engines are required to use ULSD (ultra-low sulfur diesel fuel with 15 ppm of sulfur or less) or ULSD blended with the following lower-carbon intensity fuels*** up to:
  - ✓ 20% biodiesel FAME (fatty acid methyl ester)*
  - ✓ 100% renewable diesel, HVO (hydrotreated vegetable oil) and GTL (gas-to-liquid) fuels
- Cat engines meeting equivalent to U.S. EPA Tier 2, or equivalent to U.S. EPA Tier 3 and EU Stage IIIA, are compatible with diesel fuel blended with the following lower-carbon intensity fuels*** up to:
  - ✓ 100% biodiesel FAME (fatty acid methyl ester)**
  - ✓ 100% renewable diesel, HVO (hydrotreated vegetable oil) and GTL (gas-to-liquid) fuels

Refer to guidelines for successful application. Please consult your Cat dealer or "Caterpillar Machine Fluids Recommendations" (SEBU6250) for details.

Engines with no aftertreatment devices can use higher blends, up to 100% biodiesel (for use of blends higher than 20% biodiesel, consult your Cat dealer).

**For use of blends higher than 20% biodiesel, consult your Cat dealer.*

***Tailpipe greenhouse gas emissions from lower-carbon intensity fuels are essentially the same as traditional fuels.*

Air Conditioning System

- The air conditioning system on this machine contains the fluorinated greenhouse gas refrigerant R134a (Global Warming Potential = 1430). The system contains 1.9 kg (4.2 lb) of refrigerant which has a CO_2 equivalent of 2.71 metric tonnes (2.674 tons).

Paint

- Based on best available knowledge, the maximum allowable concentration, measured in parts per million (PPM), of the following heavy metals in paint are:
  - Barium < 0.01%
  - Cadmium < 0.01%
  - Chromium < 0.01%
  - Lead < 0.01%

Sound Performance

The exterior sound pressure level for the standard machine (ISO 6395:2008) is 119 dB(A).

The interior sound pressure level for the standard machine (ISO 6396:2008) is 77 dB(A).

Oils and Fluids

- Caterpillar factory fills with ethylene glycol coolants. Cat Diesel Engine Antifreeze/Coolant (DEAC) and Cat Extended Life Coolant (ELC) can be recycled. Consult your Cat dealer for more information.
- Cat Bio HYDO Advanced is an EU Ecolabel approved biodegradable hydraulic oil.
- Additional fluids are likely to be present, please consult the Operations and Maintenance Manual or the Application and Installation guide for complete fluid recommendations and maintenance intervals.

Features and Technology

- The following features and technology contribute to fuel savings and/or carbon reduction. Features may vary. Consult your Cat dealer for details.
  - Ground speed control helps lower fuel burn by allowing the operator to set the desired top speed and the machine will find the optimal gear for the engine and transmission
  - Optional Load Assist helps shorten the learning curve for inexperienced operators
  - Advanced Productivity Electronic Control System (APECS) allows the engines and transmission to communicate on a high level to better utilize the power and torque
  - Optional Cat Grade Control helps operators of all skill levels avoid costly rework, wasteful fuel burn, and greenhouse gas emissions to execute the design plan with greater speed and accuracy
  - Reduced chain wear with the enhanced elevator drive sprocket
  - Decreased sprocket wear, chain wear, and chain jumping with improved scissor-style chain
  - On-demand hydraulic fan helps reduce fuel consumption and under-hood heat for longer component life
  - Improve jobsite efficiency with lower operating costs with Product Link™ and VisionLink® insights

CAT ®