

# 988K

## Millyard Arrangement



### Engine

Engine Model	Cat® C18 ACERT™	
Emissions	U.S. EPA Tier 4 Final/EU Stage IV Technology or Tier 2 Equivalent	
Gross (ISO 14396)	432 kW	580 hp
Net Power – SAE J1349	403 kW	541 hp

### Forks

Fork End Area	6.4 m <sup>2</sup>	69 ft <sup>2</sup>
---------------	--------------------	--------------------

### Operating Specifications

Tipping Load – Straight	35 500 kg	78,115 lb
Tipping Load – Articulated 37°	30 910 kg	68,005 lb
Operating Weight	63 600 kg	139,920 lb

# Lower your cost per ton with industry leading efficiency.



## Contents

- Efficiency.....4
- Structures.....6
- Power Train.....8
- Hydraulics .....10
- Operator Station.....12
- Technology Solutions .....14
- Serviceability .....15
- Customer Support.....15
- Safety .....16
- Sustainability .....18
- Versatility.....19
- Specifications.....20
- Standard Equipment.....23
- Optional Equipment.....24
- Mandatory Attachments.....25
- Notes.....26



**Introduced in 1963, the 988 has been the industry leader for 50 years. Focused on helping our customers succeed, we have continued to build upon each new series. The 988K continues our legacy of reliability, performance, safety, operator comfort, serviceability, and efficiency.**

**The 988K Millyard Arrangement is designed to meet the demands of millyard applications. The features of the 988K Millyard work together to provide a durable and reliable machine to meet the needs of the modern millyard.**

# Efficiency

Delivering fuel efficiency you demand through integrated machine systems.



## Economy Mode

Enabling maximum productivity and efficiency, all day every day.



The 988K systems work hard to save you fuel through advanced technologies. Utilizing On Demand Throttle, operators maintain normal operation with the left pedal and implements while the 988K manages the engine speed.

- Provides similar control and feel to our traditional throttle lock feature.
- Efficiency of manual throttle and the ergonomics of throttle lock.
- Reduced fuel consumption by up to 20% compared to the 988H.

## Cat® C18 ACERT Engine

The Cat C18 ACERT engine is built and tested to meet your most demanding applications while meeting U.S. EPA Tier 4 Final/ EU Stage IV Technology, Tier 2 Equivalent emission standards.

- Fully integrated electronic engine controls works in concert with the entire machine to make your fuel go farther.
- Use less fuel idling with Engine Idle Shutdown.
- Maximized durability with Delayed Engine Shutdown.



## Cat Planetary Powershift Transmission

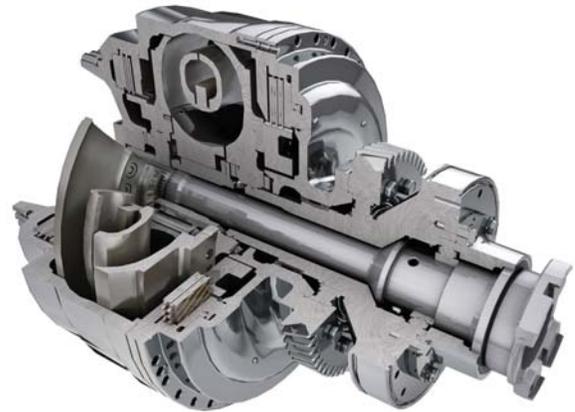
Featuring all new Advanced Productivity Electronic Control Shifting (APECS) transmission controls provides greater momentum on grades and fuel savings by carrying that momentum through the shift points.



## Impeller Clutch Torque Converter (ICTC)

Enable your operators to maximize efficiency by varying machine rimpull while putting more horsepower to hydraulics.

- Reduced tire wear
- Enables full throttle shifts for faster cycle times
- Provides smooth approach to the dump target for less spillage and faster cycle times.



## Cat Torque Converter with Lock-up Clutch

- Eliminates TC losses while lowering system heat
- Improves travel speeds
- Reduces cycle times in load and carry operations



# Structures

Best built for the toughest conditions.



## Lift Arms

- High load stresses are absorbed by the solid steel lift arms.
- Enhance strength in key pin areas through the use of one piece castings.
- Stress relieved lift arms increase durability and lengthen time to repair.



### **Robust Structures**

Your bottom line is improved by highly durable structures that achieve multiple life cycles and withstand the toughest loading conditions.

- Full box-section rear frame resists torsional shock and twisting forces.
- Heavy-duty steering cylinder mounts efficiently transmit steering loads into the frame.
- Axle mounting has been optimized for increased structural integrity.
- Lower hitch pin, frame plate, and bearing size have been increased for longer life.



### **Front Linkage**

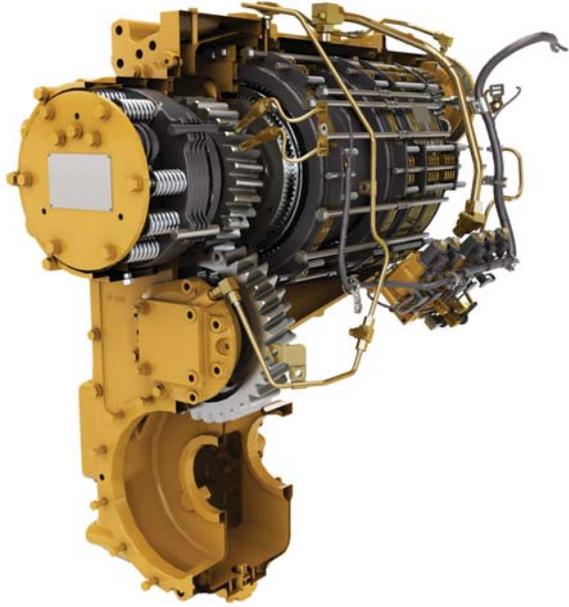
To ensure long life and reliability, the linkage pin joints feature a greased pin design with an auto lube system attachment available from the factory.



### **Steering and Transmission Integrated Control System (STIC™)**

Experience maximum responsiveness and control with STIC that combines directional selection, gear selection and steering into a single lever.

- Simple side-to-side motion turns machine right or left, minimizing operator movements.
- Easy to operate finger controlled gear selection.
- Smoother, faster cycles and less operator fatigue through the use of low effort integrated controls.



### **Cat Planetary Powershift Transmission**

Building your success begins with a best-in-class transmission designed specifically for mining applications.

- Consistent, smooth shifting and efficiency through integrated electronic controls that utilize Advanced Productivity Electronic Control Strategy (APECS).
- Long life and reliability through heat treat gear and metallurgy.
- Four forward and three reverse speeds to match your application.

### **Cat C18 ACERT Engine**

Durability and efficiency at the heart of your 988K comes from the Cat C18 ACERT Engine. Optimum performance is built in through the use of a 6 cylinder, four-stroke design.

- Optimized performance and quick engine response with an electronic control module.
- Reliable efficiency with complete control over injection timing, duration and pressure with Mechanically Actuated Electronic Unit Injection (MEUI™).
- Extended engine life and improved fuel efficiency with reduced rated speed.
- Designed to meet U.S. EPA Tier 4 Final/EU Stage IV emission standards, Tier 2 Equivalent emission standards.



# Power Train

Move material more efficiently with improved power and control.



## **Impeller Clutch Torque Converter (ICTC) and Rimpull Control System (RCS)**

Lower your cost per ton utilizing advanced ICTC and RCS for modulated rimpull.

- Reduce tire slippage and wear by modulating rimpull from 100 to 25 percent while depressing left pedal. After 25 percent rimpull is achieved the left pedal applies the brake.
- Reduce the potential for wheel slippage without reducing hydraulic efficiency with RCS.
- Improve fuel efficiency in certain applications with our lock-up clutch torque converter providing direct drive.

# Hydraulics

Productivity enabling you to move more and make more.



## Positive Flow Control Hydraulics

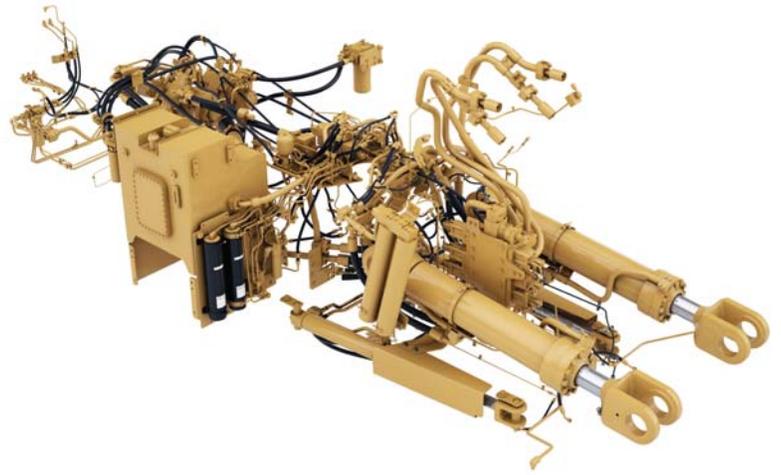
Increase efficiency through our Positive Flow Control (PFC) Hydraulic System. PFC has concurrent pump and valve control. By optimizing pump control, hydraulic oil flow is proportionate to implement lever movement.

- Fast, productive cycles are enabled by the fully variable implement pump.
- Increase bucket feel and control through increased hydraulic response.
- Consistent performance and efficiency with lower system heat.
- Full hydraulic flow down to 1,400 engine rpm enabled by flow sharing technology.

## Electro Hydraulic Controls

Operators increase productivity with our responsive implements feature.

- Operate comfortably through electronically controlled hydraulic cylinder stops.
- Handle easy-to-use soft detent controls.
- Conveniently set automatic implement kickouts from inside the cab.



## Steering System

Confident loader operation starts with precise machine control enabled by the 988K's load sensing hydraulic steering system.

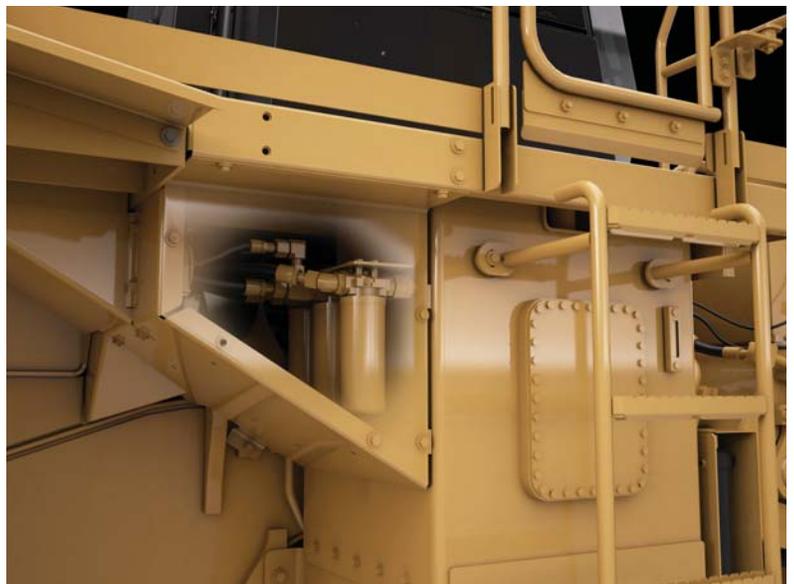
- Increase efficiency with our variable displacement piston pumps.
- Achieve precise positioning for easy loading in tight areas with 37 degrees of steering articulation.
- Enhance operator comfort with integrated steering and transmission control functions.



## Filtration System

Benefit from extended performance and reliability of your hydraulic system with our advanced filtration system.

- Case drain screens.
- Hydraulic oil cooler return filter.
- Pilot filter.
- Return screens inside hydraulic tank.
- Axle oil cooler screens if equipped.





**Your operators can work more efficiently and stay comfortable with our customer-inspired cab features.**

### **Entry and Exit**

Enter and exit the cab easily and safely with these newly designed, ergonomic features.

- Fold up STIC steer/armrest.
- Reduced access stairway angles.
- Standard stairway lighting.

### **Cat Comfort Series III Seat**

Enhance comfort and reduce operator fatigue with Cat Comfort Series III seat.

- Mid back design and extra thick, contoured cushions.
- Air suspension system.
- Easy-to-reach seat levers and controls for six way adjustments.
- Seat-mounted implement pod and STIC steer that moves with the seat.
- 76 mm (3 in) wide retractable seat belt.



### **Control Panel**

Ergonomic placement of switches and Information display keep your operators comfortable all day every day.

- Large backlit membrane switches feature LED activation indicators.
- Switches feature ISO symbols for quick function identification.
- Two position rocker switch activates the electro hydraulic park brake.

### **Environment**

Your operator's productivity is enhanced with our clean, comfortable cab environment.

- Experience reduced vibrations from isolation cab mounts and seat air suspension.
- Maintain desired cab temperature with automatic temperature controls.
- Pressurized cab with filtered air.
- Sound level reduced to a quiet 71 dB(A).
- Convenient floor storage tray/lunch box.



# Operator Station

Best-in-class operator comfort and ergonomics.





## Technology Solutions

Greater productivity through  
Integrated Electronic Systems.

**The 988K electronic systems have been completely integrated to function as one machine. This integration creates a smart machine and more informed operator, maximizing the productivity of both.**

### **Cat Product Link™**

Cat Product link allows remote monitoring of equipment to improve overall fleet management effectiveness. Events and diagnostic codes, as well as hours, fuel, idle time and other information are transmitted to a secure web based application, VisionLink®. VisionLink includes powerful tools to convey information to users and dealers, including mapping, working and idle time, fuel level and more.

### **VIMS™ 3G**

We have worked hard to help our customers and operators perform at their best through our Vital Information Management System (VIMS 3G).

- Easy-to-view graphical information display features a large touch screen interface.
- Intuitive operation and easy navigation with our enhanced user interface.
- Decrease service time by keeping operators informed about machine system malfunction or operation.

# Serviceability

Enabling high uptime by reducing your service time.

**The 988K has many design features that help you succeed by reducing your downtime.**

- Safe and convenient service with ground level or platform access and grouped service points.
- Swing-out doors on both sides of the engine compartment provide easy access to important daily service checks.
- Swing-out radiator system with 6 fins per inch cores for easier cleaning.
- Auto-reversing fan to keep the cooling system clear of debris.
- Ecology drains for ease of service and prevention of spilling potential environmental contaminants.
- Reduce downtime with VIMS system notifications so your operators and technicians can resolve any problems before failure.
- Ground level access to transmission control valves.



## Customer Support

Your Cat dealers know how to keep your machines productive.



### Legendary Cat Dealer Support

A valued partner, your Cat dealer is available whenever you need them.

- Preventive maintenance programs and guaranteed maintenance contracts.
- Best-in-class parts availability.
- Improve your efficiency with operator training.
- Genuine Cat Remanufactured parts.

# Safety

Making your safety our priority.



**We are constantly improving our products in an effort to provide a productive and safe work environment for the operator and those who work on your job site.**

## **Machine Access**

- Left and right hand stairs with 45 degree angle allow operators to safely get on and off the 988K.
- Continuous walkway with metallic non-skid surfaces are designed into the service areas.
- Maintain three points of contact at all times through ground level or platform accessible service areas.



### Visibility

- Optional heated mirrors ensure good visibility for safe operation.
- Standard Cat Vision or optional Cat Detect with radar increase operator awareness around the machine.
- Optional HID or LED lights provide excellent workspace visibility.
- Optional cab mounted LED warning beacons.

### Operator Environment

- Reduced vibrations to the operator with isolated cab mounts and seat mounted implement and steering controls.
- Low interior sound levels down to 70 dB(A) on standard machine.
- Pressurized cab with filtered air.
- Standard 76 mm (3 in) seat belts on the operator seat.

# Sustainability

Making sustainable progress possible.



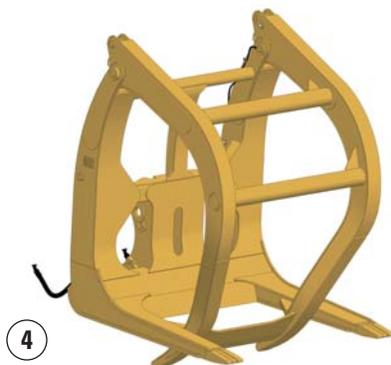
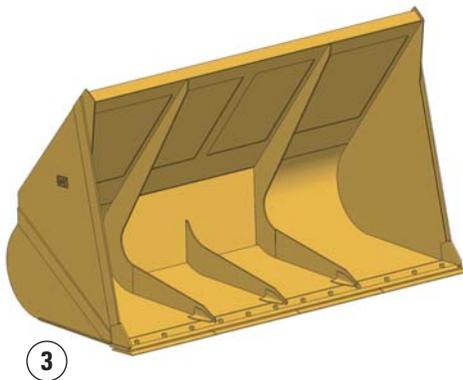
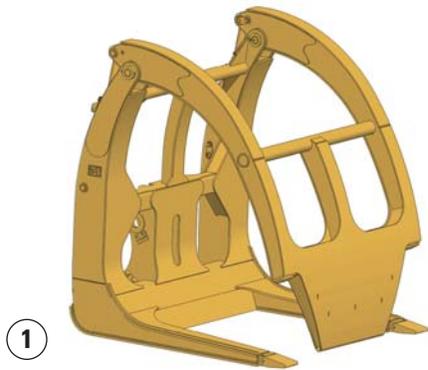
## Sustainable Benefits

The 988K is designed to maximize efficiency and productivity while conserving natural resources.

- Burns up to 20% less fuel than the previous model to minimize your carbon footprint.
- Engine Idle Shutdown can help you save fuel by avoiding unnecessary idling.
- Reduce waste with our maintenance free batteries.
- Built for multiple lives, the Cat 988 is one of the most rebuilt products. To assist with maximizing machine life, Caterpillar provides a number of sustainable options such as our Reman and Certified Rebuild programs. In these programs, reused or remanufactured components can deliver cost savings of 40 to 70 percent, which lowers operating cost while benefiting the environment.
- Caterpillar offers retrofit packages to bring new features to older machines, maximizing your resource. And, when you go through the Cat Certified Rebuild program, these retrofit kits are part of the rebuild process.

# Versatility

Work Tool options to meet your needs.



## Forks and Buckets

Available for both the 988H and 990H, Millyard and Logging Forks are designed to move wood in the millyard. Woodchip Buckets are designed with performance characteristics to bring productivity and fuel efficiency to load-and-carry work in the yard.

- ① **Millyard Forks:** A single top clamp closes down between the tines, allowing individual logs to be picked and placed with ease. An open, high visibility design allows operators to see the job at hand, work faster and more efficiently.
- ② **Logging Forks:** Dual top clamps close down to the tine tips, their curvature maximizes carry capacity. Built to match the task of unloading trucks. An open, high visibility design allows operators to see the job at hand, work faster and more efficiently.
- ③ **Woodchip Buckets:** Extra capacity and loading characteristics make this bucket style perfect for handling woodchips. Available in direct pin on models or for use with the Cat Quick Coupler System.
- ④ **Cat Full Width Forks:** Dual top clamps are connected to allow maximum capacity while still closing between the tines allowing partial loads to be handled.

# 988K Millyard Arrangement Specifications

## Engine

Engine Model	Cat C18 ACERT	
Emissions	U.S. EPA Tier 4 Final/ EU Stage IV Technology or Tier 2 Equivalent	
Rated Speed	1,700 rpm	
Peak Power Speed	1,500 rpm	
Gross – ISO 14396	432 kW	580 hp
Gross – SAE J1995	439 kW	588 hp
Net Power – SAE J1349	403 kW	541 hp
Bore	145 mm	5.7 in
Stroke	183 mm	7.2 in
Displacement	18.1 L	1,105 in <sup>3</sup>
Peak Torque @ 1,200 rpm	2852 N·m	2,104 lb-ft
Torque Rise	58%	

## Operating Specifications

Operating Weight	63 619 kg	139,962 lb
Tipping Load:		
Straight	35 500 kg	78,100 lb
Articulated 37°	29 375 kg	64,625 lb

## Transmission

Transmission Type	Cat planetary power shift	
Forward 1	6.5 km/h	4.0 mph
Forward 2	11.6 km/h	7.2 mph
Forward 3	20.4 km/h	12.7 mph
Forward 4	34.7 km/h	21.6 mph
Reverse 1	7.5 km/h	4.7 mph
Reverse 2	13.3 km/h	8.3 mph
Reverse 3	23.2 km/h	14.4 mph
Direct Drive Forward 1	Lock-up disabled	
Direct Drive Forward 2	12.5 km/h	7.8 mph
Direct Drive Forward 3	22.3 km/h	13.9 mph
Direct Drive Forward 4	39.3 km/h	24.4 mph
Direct Drive Reverse 1	8.0 km/h	5.0 mph
Direct Drive Reverse 2	14.3 km/h	8.9 mph
Direct Drive Reverse 3	25.5 km/h	15.8 mph

• Travel speeds based on 35/65-R33 tire.

## Hydraulic System – Lift/Tilt

Lift/Tilt System – Circuit	EH- Positive Flow Control, Flow Sharing	
Lift/Tilt System	Variable displacement piston	
Maximum Flow at 1,400-1,860 rpm	580 L/min	153 gal/min
Relief Valve Setting – Lift/Tilt	32 000 kPa	4,641 psi
Cylinders, Double Acting: Lift, Bore and Stroke	235 mm × 976 mm	9.25 in × 38.4 in
Cylinders, Double Acting: Tilt, Bore and Stroke	292 mm × 671 mm	11.5 in × 26.4 in
Pilot System	Variable displacement piston	
Maximum Flow	52 L/min	13.7 gal/min
Relief Valve Setting	4000 kPa	580 psi

## Hydraulic System – Steering

Steering System – Circuit	Pilot, load sensing	
Steering System – Pump	Piston, variable displacement	
Maximum Flow	270 L/min	71.3 gal/min
Relief Valve Setting – Steering	30 000 kPa	4,351 psi
Total Steering Angle	74°	
Steering Cycle Time (high idle)	3.4 sec	
Steering Cycle Time (low idle)	5.6 sec	

# 988K Millyard Arrangement Specifications

## Service Refill Capacities

Fuel Tank	712 L	188 gal
Cooling System	120 L	31.7 gal
Crankcase	60 L	15.9 gal
Diesel Exhaust Fluid Tank	33 L	8.7 gal
Transmission	120 L	31.7 gal
Differentials and Final Drives – Front	186 L	49.1 gal
Differentials and Final Drives – Rear	186 L	49.1 gal
Hydraulic System Factory Fill	475 L	125.5 gal
Hydraulic System (tank only)	240 L	63.4 gal

- All non-road Tier 4 Final/Stage IV, and Japan (MLIT) Step 4 diesel engines are required to use:
  - Ultra Low Sulfur Diesel (ULSD) fuels containing 15 ppm (mg/kg) sulfur or less. Biodiesel blends up to B20 are acceptable when blended with 15 ppm (mg/kg) sulfur or less ULSD and when the biodiesel feedstock meets ASTM D7467 specifications.
  - Cat DEO-ULS™ or oils that meet the Cat ECF-3, API CJ-4, and ACEA E9 specifications are required.
  - Diesel Exhaust Fluid which meets ISO 22241-1 is required.

## Axles

Front	Fixed
Rear	Trunnion
Oscillation Angle	13°

## Brakes

Brakes	SAE J1473 OCT90, ISO 3450:1992
--------	-----------------------------------

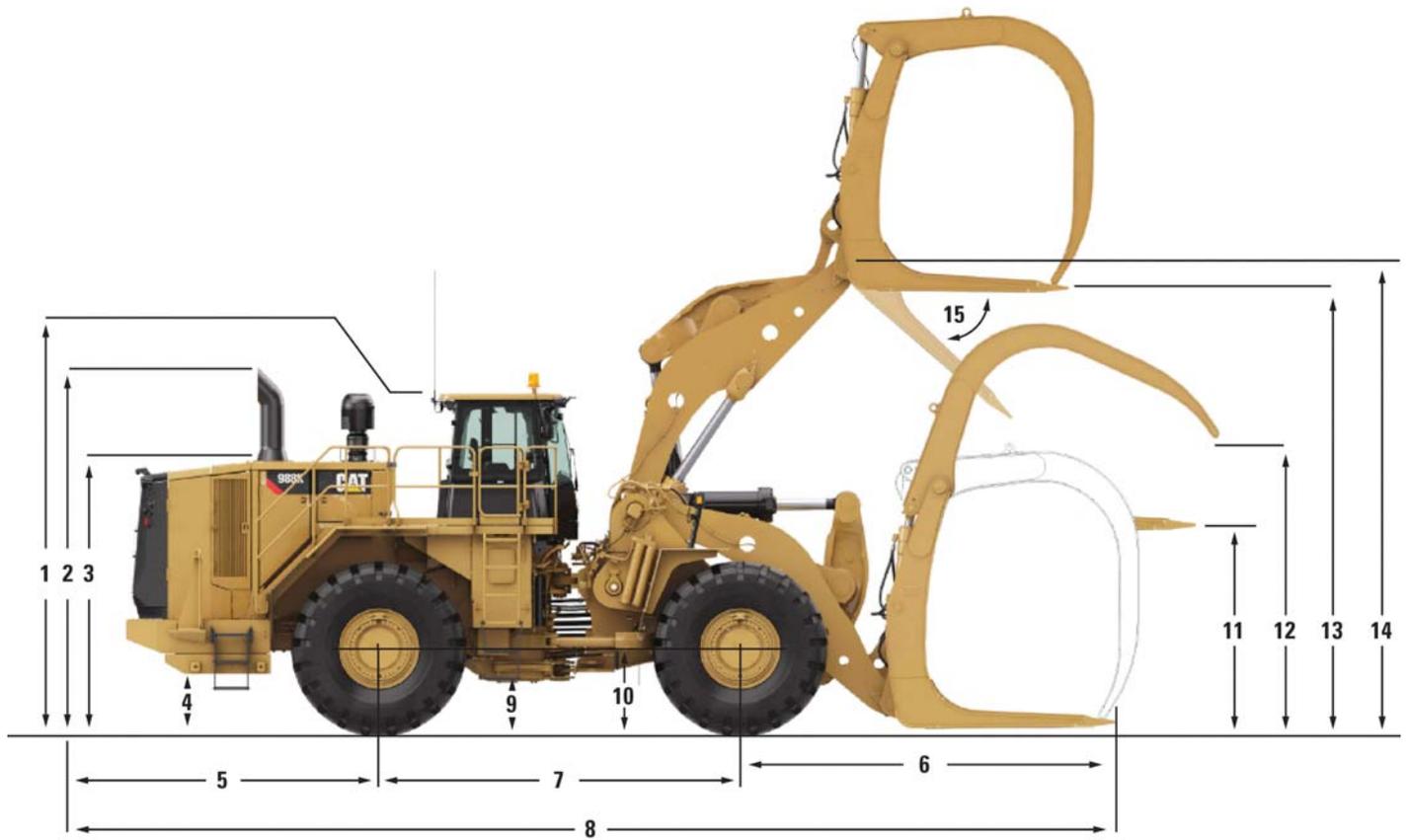
## Sound Performance

	Standard	Suppression
Operator Sound Level (ISO 6396)	71 dB(A)	70 dB(A)
Machine Sound Level (ISO 6395)	111 dB(A)	109 dB(A)

# 988K Millyard Arrangement Specifications

## Dimensions

All dimensions are approximate.



	<b>Millyard Linkage</b>	
<b>1</b> Ground to Top of ROPS	4221 mm	13.8 ft
<b>2</b> Ground to Top of Exhaust Stack	4214 mm	13.8 ft
<b>3</b> Ground to Top of Hood	3334 mm	10.9 ft
<b>4</b> Ground to Bumper Clearance	933 mm	3.1 ft
<b>5</b> Rear Axle Center Line to Bumper	3187 mm	10.5 ft
<b>6</b> Front Axle Center Line to Fork Tip	4765 mm	15.6 ft
<b>7</b> Wheelbase	4550 mm	14.9 ft
<b>8</b> Maximum Overall Length	12 502 mm	41.0 ft
<b>9</b> Ground to Lower Hitch Clearance	568 mm	1.9 ft
<b>10</b> Ground to Center of Front Axle	978 mm	3.2 ft
<b>11</b> Fork Height with Level Arms	2468 mm	8.1 ft
<b>12</b> Fork Top Clamp Opening	3741 mm	12.3 ft
<b>13</b> Fork Height at Maximum Lift	4660 mm	15.3 ft
<b>14</b> Hinge Pin Height at Maximum Lift	4918 mm	16.1 ft
<b>15</b> Dump Angle at Maximum Lift	39.4 degrees	

## Standard Equipment

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

### ELECTRICAL

- Alarm, back-up
- Alternator, single 150 amp
- Batteries, dry
- Converter, 10/15 amp, 24V to 12V
- Lighting system (halogen, work lights, access and service platform lighting)
- Starting and charging system, 24V
- Starter emergency start receptacle
- Starter lockout in bumper
- Transmission lockout in bumper

### OPERATOR ENVIRONMENT

- Graphical Information Display, displays real time operating information, performs calibrations and customizes operator settings
- Air conditioner
- Cat Detect Vision, rear vision camera system
- Cab, sound suppressed and pressurized, integrated rollover protective structure (ROPS/FOPS) radio ready for entertainment, includes antenna, speakers and converter (12-volt 5-amp) and power port
- Controls, lift and tilt function
- Heater, defroster
- Horn, electric
- Instrumentation, gauges
  - Coolant temperature
  - Engine hour meter
  - Hydraulic oil temperature
  - Power train oil temperature
- Light, cab, dome
- Lunchbox, beverage holders
- Mirrors, rearview (externally mounted)
- Rimpull Control System
- Seat, Cat Comfort (cloth), air suspension, six-way adjustable
- Seat belt, retractable, 76 mm (3 in) wide
- STIC Control System
- UV glass
- Transmission gear indicator
- Vital Information Management System (VIMS) with Graphical Information Display: External Data Port, Customizable Operator Profiles, Cycle Timer, Integrated Payload Control System
- Wet-Arm wipers/washers (front and rear)
  - Intermittent front and rear wipers
- Lights, directional

### POWER TRAIN

- Swing out radiator system with 6 fpi radiator cores
- Auto-reversing fan with adjustable controls and manual cycle
- Hinged, perforated side doors
- Brakes, oil-cooled, multi-disc, service/secondary
- Case drain screens
- Crankcase guard
- Electro hydraulic parking brake
- Engine, C18 MEUI diesel, turbocharged/aftercooled
- Ground level engine shutoff
- Turbine precleaner, engine air intake
- Radiator, Next Generation Modular (NGMR)
- Starting aid, ether, automatic
- Throttle lock, electronic
- Torque converter, Impeller Clutch (ICTC) with Lock up clutch (LUC), Rimpull Control System
- Transmission, planetary powershift, 4F/3R electronic control

### OTHER

- Automatic bucket lift kickout/positioner
- Base machine price includes a rim allowance
- Hydraulically driven demand fan
- Couplings, Cat O-ring face seals
- Doors, service access (locking)
- Ecology drains for engine, radiator, hydraulic tank
- Fuel tank, 731 L (188 gal)
- Hitch, drawbar with pin
- Hoses, Cat XT™
- Hydraulic, steering and brake filtration/screening system
- Cat Clean Emission Module
- Oil sampling valves
- Premixed 50% concentration of extended life coolant with freeze protection to -34° C (-29° F)
- Rear access to cab and service platform
- Steering, load sensing
- Toe kicks
- Vandalism protection caplocks

# 988K Optional Equipment

## Optional Equipment

With approximate changes in operating weights. Optional equipment may vary. Consult your Cat dealer for specifics.

### POWER TRAIN

- -50° C (-58° F) antifreeze
- Engine oil change system, high speed, Wiggins
- Engine block heater 120V or 240V
- High ambient cooling – software

### OPERATOR ENVIRONMENT

- Cab precleaner
- AM/FM/CD/MP3 radio
- Satellite Sirius radio with bluetooth
- LED warning strobe
- CB radio ready
- Window pull down visor

### MISCELLANEOUS ATTACHMENTS

- Front and rear roading fenders
- Fast fill fuel system (Shaw-Aero)

## Mandatory Attachments

Select one from each group. Mandatory and optional equipment may vary. Consult your Cat dealer for specifics.

### LINKAGE

- Millyard optimized with three valves
- Autolube
- Manual grease pins

### ELECTRICAL

- No Product Link
- Product Link (Satellite)
- Product Link (Cellular)

### STEERING

- Standard steering
- Secondary steering

### POWER TRAIN

- Axle oil cooler
- Standard axles
- Standard fuel lines
- Heated fuel lines
- Standard axle
- No spin axle
- Extreme temperature axle
- Standard engine air turbine precleaner
- Dual stage precleaner
- No engine brake
- Engine brake

### LIGHTING

- LED lighting

### OPERATOR ENVIRONMENT

- No suppression arrangement
- Sound suppression
- Standard seat
- Heated seat
- Standard seat belt
- Seat belt minder
- Standard cab glass
- Rubber mounted cab glass
- Fixed glass door, standard
- Sliding glass door
- Standard cab air cleaner
- RESPA cab air cleaner
- Standard mirror
- Heated mirror
- Vision Display

### HYDRAULICS

- Ride control
- No ride control
- Standard hydraulic oil
- Fire resistant (EcoSafe) hydraulic oil
- Cold weather hydraulic oil

### FUEL SYSTEM

- Conventional fuel arrangement
- Cold weather starting





For more complete information on Cat products, dealer services, and industry solutions, visit us on the web at [www.cat.com](http://www.cat.com)

AEHQ7210 (01-2014)  
(Global)

© 2014 Caterpillar  
All rights reserved

Materials and specifications are subject to change without notice. Featured machines in photos may include additional equipment. See your Cat 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.

VisionLink is a trademark of Trimble Navigation Limited, registered in the United States and in other countries.

