# **KOMATSU**

## D375A-8



Crawler dozer

### **Engine power**

Forward: 474 kW / 636 HP @ 1800 rpm Reverse: 578 kW / 775 HP @ 1800 rpm

### Operating weight

72900 kg

#### **Blade capacity**

Semi-U blade: 18.5 m<sup>3</sup> U blade: 22.0 m<sup>3</sup>

### D375A-8



Engine power

Forward: 474 kW / 636 HP @ 1800 rpm Reverse: 578 kW / 775 HP @ 1800 rpm Operating weight **72900 kg** 

Blade capacity

Semi-U blade: 18.5 m<sup>3</sup> U blade: 22.0 m<sup>3</sup>

### Outstanding productivity,

# reliability & durability

# Powerful and environmentally friendly

- Fuel efficient high performance Komatsu SAA6D170E-7 engine
- EU Stage V compliant
- Torque converter with auto lockup
- Selectable working modes
- Adjustable idle shutdown

### First-class operator comfort

- Fully adjustable air-suspended seat
- · Wide, spacious cab with excellent visibility
- Superior visibility on blade and ripper

#### State-of-the-art controls

- · High resolution LCD colour monitor
- Gearshift preset function
- Automatic blade pitch and ripper return

## Reliability & maintenance features

- · Sturdy, rugged design
- Modular power train
- · Central service points
- Reversible radiator fan

### Safety features

- Rear-view camera system
- · Secondary engine shutdown switch
- · Seat belt caution indicator
- Power ladder (optional)

#### **Komtrax Plus**

· Increased operational data and fuel savings



A maintenance program for Komatsu customers



## 20% more power in reverse

A powerful and fuel-efficient engine, compliant to EU Stage V emissions regulations, makes the D375A-8 an outstanding performer, both for dozing and ripping. Engine output is increased by 1.2 times when in reverse, with a faster climbing speed in downhill dozing. Cycle times are reduced and production is improved drastically.

#### **Gearshift preset function**

To reduce the frequency of gear shifting and for comfortable machine operation, a shift preset mode is provided as standard equipment. The preset switch lets the operator select a combination of forward/reverse gear shifts by using the UP/DOWN shift switch on the steering lever. Once the shift pattern is selected, only forward/reverse direction control selection is required for a correct gear shift.

#### **Automatic transmission**

Set by default, the D375A-8 has a highly efficient transmission that automatically matches the best gear mode in all dozing operations and includes a travel speed preset function to reduce work time and fatigue for the operator. With Komatsu's ECMV (Electronic Controlled Modulation Valves) gear changes are smoothly timed to always keep the power transfer at maximum efficiency.

#### **Auto-downshift**

The engine controller continuously monitors the engine speed, travel gear and travel speed. When a load is applied and the machine slows, the controller automatically downshifts, optimising the gear speed for the best dozing performance. This function enables comfortable operation and high productivity without manual downshifting. It can be deactivated by a cancel switch on the monitor panel.

## Torque converter with auto lock-up

Combined with the automatic transmission, the Komatsu automatic lock-up torque converter reduces fuel consumption by up to 10% by eliminating unnecessary power loss. When required, the powertrain control system engages the torque converter, or locks it up to send full engine power directly to the transmission during less torque demanding applications.

#### Selectable working modes

Working mode can be set to either "Power" for maximum power or to "Economy" for energy saving operations. Combined with a choice between automatic or manual working mode, this lets the operator select the optimum machine power configuration for the work at hand.

### Powerful and environmentally friendly

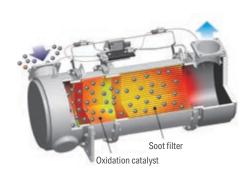
#### **Heavy-duty aftertreatment**

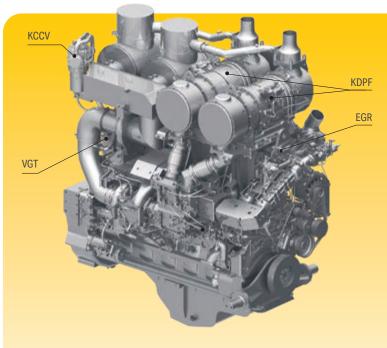
The Komatsu Diesel Particulate Filter (KDPF) captures more than 90% of Particulate Matter (PM). Special oxidation catalyst and extra fuel injection in the exhaust stream can decompose accumulated soot in the KDPF filter by either active or passive regeneration. This system doesn't require operator intervention, and won't interrupt normal operation.



To reduce unnecessary fuel consumption and exhaust emissions, and for lower operating costs, the Komatsu auto idle shutdown automatically turns off the engine after it idles for a set period of time, which can be easily programmed from 5 to 60 minutes. An Eco-gauge and Eco guidance tips on the cab monitor further encourage efficient operations.







#### Exhaust Gas Recirculation (EGR)

Cooled EGR is a technology well-proven in current Komatsu engines. The increased capacity of the EGR cooler now ensures very low NOx emissions and a better engine performance.

#### High-Pressure Common Rail (HPCR)

To achieve complete fuel burn and lower exhaust emissions, the heavy-duty High-Pressure Common Rail fuel injection system is computer controlled to deliver a precise quantity of pressurised fuel into the redesigned engine combustion chamber by multiple injections.

#### Komatsu Closed Crankcase Ventilation (KCCV)

Crankcase emissions (blow-by gas) are passed through a CCV filter. The oil mist trapped in the filter is returned back to the crankcase while the filtered gas is returned to the air intake.

#### Variable Geometry Turbo (VGT)

The VGT provides optimal airflow to the engine combustion chamber under all speed and load conditions. Exhaust gas is cleaner, fuel economy is improved while machine power and performance are maintained.

### **Optimised work equipment**

#### Komatsu blades

For increased blade performance and better machine balance, Komatsu uses a box blade design, with the highest resistance for a light weight blade. Special Komatsu highly wear resistant steel is used for the front and sides of the blade to increase durability. The deep curved design of the blade makes it easy to handle a wide range of materials, with good penetration and a large capacity, optimising high dozing performance with excellent fuel efficiency.

#### Semi-U blade

The Komatsu Semi-U blade will stand up to the toughest applications. The shape of the blade improves carrying capacity, minimizes shoe slippage and increases productivity. Its two side wings prevent material spillage and offer a class-leading performance when dozing.

#### U blade

The Komatsu U blade was specially designed to handle large quantities of material with a minimum of spillage. Along with a large capacity this outstanding blade also has a good rolling performance, and helps to get the best out of the machine.

#### Komatsu rippers

Komatsu's patented ripper concept, with all cylinders connected to the ripper shank holder, allows maximum pry-out force. Its key feature is the ripper point movement that lifts the material during the ripper shank operation to greatly improve overall performance. The shank supplies great penetration into various types of materials and is fitted with special wear parts for increased longevity.

#### Automatic blade pitch and ripper return

To reduce operator effort and increase efficiency while dozing, a new "auto pitch" mode, triggered by a simple switch, sets the blade pitch between "digging" and "dump" positions. Additionally, a new ergonomic ripper control lever with an auto-return function automatically raises the ripper when moved into reverse.

#### High efficiency blade and end bit design

To maximize your productivity, this new generation machine uses the high efficiency blade and end bit design already available on the D375A-6.







### **First-class comfort**

### Quiet and comfortable cab

Operator comfort is essential for safe and productive work. The newly designed cab on the D375A-8 is quiet and comfortable, an ideal environment to concentrate on the job. Its hexagonal design and large tinted glass windows offer excellent panoramic visibility. The high capacity climate control system pressurises the cab to keep dust out. A high quality soundabsorbent lining covers the interior to minimise noise levels for the operator.

## Superior visibility on blade and ripper

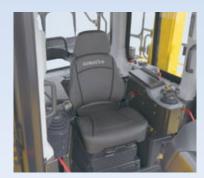
The redesigned ROPS/FOPS integrated cab and the well-located operator seat give optimal blade visibility to the left and right and make both dozing and grading easy, safe and fast. Thanks to the new ripper arm structure, the visible area of the ripper shank is drastically enlarged. The operator can accurately position the front edge of the shank and hard rock is ripped easily.











The seat is now fixed at a 12° angle to allow highest comfort for dozing and ripping

#### **Fully adjustable** suspension seat and travel-control console

A comfortable, heavy-duty and fully adjustable heated and ventilated air-suspended seat is at the centre of the operator's safe and cosy work space. The position of the travel control console can be independently adjusted forwards, backwards and in height to fit each operator's preference. An electronic height adjuster for the steering console is standard.



### State-of-the-art controls





Palm Command Control System (PCCS)

### Large TFT colour multi monitor

A large user-friendly colour monitor enables safe, accurate and smooth work. It provides on-hand data to continuously improve productivity and fuel consumption. Multilingual and with all essential information available at a glance, it features simple and easy to operate switches and multifunction keys that provide the operator with fingertip access to a wide range of functions and operating information.

## Finger Command Control System (FCCS) (optional)

Minimize operator efforts with a fixed-position travel control lever. Travel direction and transmission speed is selected with thumb-positioned controls while steering is controlled with fingertip paddles. The fixed-position lever provides operators additional support while operating on grade and over rough ground.

#### **Easy operation control**

The ergonomic Palm Command Control System (PCCS) provides efficient and comfortable steering of the machine. The blade's electronic control joystick provides precise control. Its reactivity can be customized to the operator's preference, for maximum productivity in any type of application.

## Track shoe slip control system

This system removes the need to continuously control the engine power output with the decelerator pedal while ripping: the output automatically adjusts to the optimum level. This substantially reduces fatigue, letting the operator concentrate on the ripping without having to monitor track shoe slippage. Less track shoe slippage also means lower undercarriage operating cost and lower fuel consumption.



Blade control lever with auto-pitch and new ripper control lever with auto-return function



Fully integrated rear-view camera system

### Safety features

#### **Optimal jobsite safety**

Safety features on the Komatsu D375A-8 comply with the latest industry standards and work in synergy to minimise risks to people in and around the machine. Highly durable anti-slip plates – with additional high friction covering – maintain long term traction performance. A seat belt caution indicator and an audible travel alarm further increase jobsite safety.



Battery and starter isolator box (optional with mining spec) with jump start receptacle



Power ladder (optional)
Provides safer access and
egress to and from the cabin.







## Heavy duty steps and large hand rails

Strategically placed grab handles with non-slip steps help to get on and off the machine.



## **Emergency engine stop** switches

These switches instantly stop the engine. One is installed in the cab, the other at the right rear of the machine.



#### One side platform

Allows safe access to rear maintenance points. Check and refilling of fuel and washer fluid, cleaning of cab window glass and air conditioner condenser, cab lights, etc., can be safely performed.



#### **Lower operating costs**

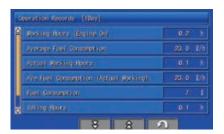
Komatsu ICT contributes to the reduction of operating costs by assisting to comfortably and efficiently manage operations. It raises the level of customer satisfaction and the competitive edge of our products.

#### **Widescreen monitor**

Conveniently customisable and with a choice of 26 languages, the widescreen monitor with simple switches and multifunction keys gives fingertip access to a large range of functions and operating info.

#### An evolutionary interface

Helpful information is now easier than ever to find and understand with the upgraded monitor interface. The main screen can be simply optimised to the operator's preference by just pressing one button.



Quick view on the operation logs



Eco-gauge, Eco guidance and fuel consumption gauge



All information at a glance



Fuel consumption history



Operator identification function



Adjustable idle shutdown automatically turns off the engine after it idles for a set period of time

### Information & communication technology

#### What

- Komtrax is Komatsu's remote equipment monitoring and management system
- Komtrax is standard equipment on all Komatsu construction products
- Komtrax continuously monitors and records machine health and operational data
- Information such as fuel consumption, utilisation, and a detailed history aids in making repair or replacement decisions

#### When

- Know when your machines are running or idling and make decisions that will improve your fleet utilisation
- Detailed movement records ensure you know when and where your equipment is moved
- Up to date records allow you to know when maintenance was done and help you plan for future maintenance needs

#### Where

- Komtrax data can be accessed virtually anywhere through your computer, the web or your smart phone
- Automatic alerts keep fleet managers up to date on the latest machine notifications

#### Why

- Knowledge is power make informed decisions to manage your fleet better
- Knowing your idle time and fuel consumption will help maximise your machine efficiency
- Take control of your equipment any time, anywhere



## **KØMTRAX Plus**

#### **Equipment management support**

Komtrax Plus enables expanded monitoring of the fleet via satellite and wireless LAN. Users can analyze "machine health" and performance from a remote location, on a near-real time basis. This includes component condition and trend data. By making this critical information readily accessible, Komtrax Plus is an effective tool in maximizing productivity and lowering operating cost.

### **Easy maintenance**

#### **Komatsu Care**

Komatsu Care is a maintenance program that comes as standard with your new Komatsu machine. It covers factory-scheduled maintenance, performed with Komatsu Genuine parts by Komatsu-trained technicians. Depending on your machine's engine, it also offers extended coverage of the Komatsu Diesel Particulate Filter (KDPF). Please contact your local Komatsu distributor for terms and conditions.

#### **Modular power train**

All the power train components are enclosed in a sealed module. This eliminates oil spills during mounting and dismounting, and prevents dust and dirt polluting individual components. Servicing is much cleaner, smoother and easier.



#### Reversible radiator fan

The radiator can be easily cleaned by utilisation of the reversible, hydraulically driven cooling fan from a touch on the monitor panel. This cleaning reduces fuel consumption and increases overall machine performance.



#### **Self-diagnostic monitor**

The multifunction monitor panel displays the running time, engine revs, fuel level and water coolant temperature in real time. It also provides the operator with maintenance and service information, if oil filters need replacing or any abnormality occurs. In addition, it supplies Komatsu mechanics with detailed information, with no need for external service tools.



Service center (optional with mining spec)
Remote drain ports with couplings and a fast fuel fill connector eliminates the need to get on/off the machine and to remove/install covers to perform fluid maintenance.



Canister-type breathers facilitate checking and cleaning (optional)



Komatsu designed the D375A-8 with centralised and conveniently located service points to make necessary inspections and maintenance quick and easy

#### Sturdy, rugged design

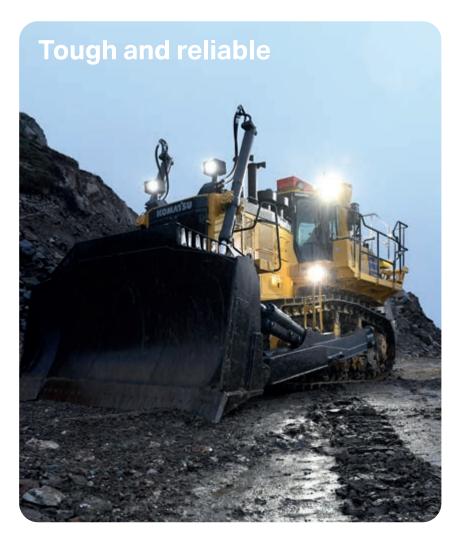
A high-rigidity hull structure main frame improves durability and reduces stress concentration at critical areas. The track frame with a large cross section utilises pivot shaft mounting for greater reliability. All hydraulic piping is robustly protected by cover and inner route to ensure damage protection from materials.

#### Low drive undercarriage

Komatsu's undercarriage is extraordinarily tough and offers excellent grading ability and stability. The centre of gravity of the whole machine remains low for safe and stable machine usage on slopes. The low drive undercarriage also greatly reduces the noise levels around the dozer. The heavy-duty link assemblies with large-diameter bushings, substantial track link height and superior oil seals are the basis for a high durable undercarriage - and a drastically lower cost of ownership.

## K-Bogie undercarriage system

The K-bogie undercarriage is built with an oscillating idler and with flexible mounted bogie systems that allow a high vertical track roller movement. The oscillating idler combined with the 8 track roller/K-bogie design supports and guides the undercarriage on all ground conditions for a much smoother drive and a longer undercarriage life.





## New mono blade linkage

This structure provides less blade sway movement and extends maintenance interval of blade joint.



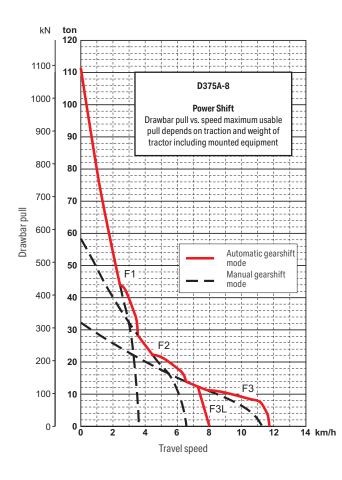
#### **Main frame strength**

D375A-8's main frame enhances its durability drastically with 125% stiffness increase compared with previous machine.

### **Specifications**

#### **Engine**

Komatsu SAA6D170E-7
4-cycle, water-cooled,
direct injection, turbocharged, air-to-air
charge air cooler, cooled EGR
1800 rpm
Forward: 474 kW / 636 HP
Reverse: 578 kW / 775 HP
Forward: 455 kW / 609 HP
Reverse: 558 kW / 748 HP
6
170 × 170 mm
23.15
Mid-range, electronic
Hydraulic
Gear pump, force lubrication
Full flow
Diesel fuel, conforming to EN590 Class 2/
Grade D. Paraffinic fuel capability (HVO,
GTL, BTL), conforming to EN 15940:2016
Forward: 432 kW / 580 HP
Reverse: 536 kW / 719 HP



#### **Steering system**

Steering control	PCCS-lever
Service brakes	Wet, multiple-disc, pedal-controlled, spring-actuated and hydraulically released
Minimum turning radius (counter-rotation) (as measured by track marks on ground)	4.2 m

#### Max. travel speeds

	Forward	Reverse
1st	3.5 km/h	4.6 km/h
2nd	6.8 km/h	8.9 km/h
3rd L	8.0 km/h	9.7 km/h
3rd	11.8 km/h	15.8 km/h

#### **TORQFLOW transmission**

Туре	Komatsu TORQFLOW
Torque converter	3-element, 1-stage, 1-phase, water-cooled, automatic lock-up
Transmission	Planetary gear, multiple-disc clutch hydraulically actuated, force-lubricated
Gearshift lock lever and neutral safety switch prevent accidental starts	

#### Undercarriage

Suspension	Oscillating equaliser bar with shoulder pad and pivot shaft
Track roller frame	Cylindrical, high-tensile-strength steel construction
K-Bogie undercarriage	Lubricated track rollers are resiliently mounted on the track frame with a bogie suspension system
Tracks	Lubricated tracks, fully sealed
Number of shoes (each side)	41
Grouser height (single grouser)	93 mm
Shoe width (standard)	610 mm
Ground contact area	48560 cm <sup>2</sup>
Track rollers (each side)	8
Carrier rollers (each side)	2

#### **Final drive**

Туре	Planetary gear, double-reduction
Sprocket	Segmented sprocket teeth are bolt-on
	for easy replacement

#### Ripper equipment

Multishank ripper	
Туре	Hydraulically controlled parallelogram ripper
No. of shanks	3
Weight (including hydraulic control unit)	6430 kg
Beam length	2910 mm
Maximum lift above ground	1155 mm
Maximum digging depth	1485 mm
Giant ripper	
Туре	Hydraulically controlled variable parallelogram ripper
No. of shanks	1
Weight (including hydraulic control unit)	5210 kg
Beam length	1600 mm
Maximum lift above ground	1120 mm
Maximum digging depth	1485 mm

#### Service refill capacities

Fuel tank	1200
Radiator	1451
Engine oil	861
Torque converter, transmission, bevel gear and steering system	150 l
Dozer blade hydraulics	130
Giant ripper (additional capacity)	451
Multishank ripper (additional capacity)	451
Final drive (each side)	651

#### **Environment**

Engine emissions	EU Stage V compliant	
Noise levels		
LpA operator ear	78 dB(A) (ISO 6396 dynamic test)	
Vibration levels (EN 12096:1997)		
Hand/arm	$\leq$ 2.5 m/s <sup>2</sup> (uncertainty K = 0.9 m/s <sup>2</sup> )	
Body	$\leq$ 0.5 m/s <sup>2</sup> (uncertainty K = 0.3 m/s <sup>2</sup> )	
Contains fluorinated greenhouse gas HFC-134a (GWP 1430). Quantity of gas 1.1 kg, $CO_2$ equivalent 1.57 t		

#### **Hydraulic system**

Туре	CLSS (closed-centre load sensing system)	
All spool valves externally mounted beside the hydraulic tank		
Main pump	Variable displacement piston pump	
Maximum steering pump flow	366 l/min	
Relief valve setting	for implement 29.8 MPa 304 kg/cm²	
Spool control valve positions		
Blade lift	Raise, hold, lower, and float	
Blade tilt	Right, hold, and left	
Additional control valve positions for ripper		
Ripper lift	Raise, hold and lower	
Ripper tilt	Increase, hold and decrease	
Hydraulic cylinders	Double-acting, piston	
No. of cylinders × bore		
Blade lift	2 × 140 mm	
Blade tilt (single tilt)	1 × 200 mm	
Blade tilt (dual tilt)	2 × 200 mm	
Ripper lift	2 × 200 mm	
Ripper tilt	2 × 180 mm	

#### Operating weight (appr.)

Including Semi-U tilt dozer, giant ripper, cab, ROPS (ISO 3471), operator, standard equipment, rated capacity of lubricant, coolant, and full fuel tank

Operating weight	72840 kg
Ground pressure	1.5 kg/cm <sup>2</sup>
Tractor weight	56340 kg

Including rated capacity of lubricant, coolant, full fuel tank, operator, and standard equipment

Extreme service shoes	Additional weight	Ground contact area	Ground pressure*
710 mm	680 kg	56520 cm <sup>2</sup>	1.0 kg/cm <sup>2</sup>
810 mm	1360 kg	64480 cm <sup>2</sup>	0.87 kg/cm <sup>2</sup>

<sup>\*</sup> Tractor

### **Specifications**

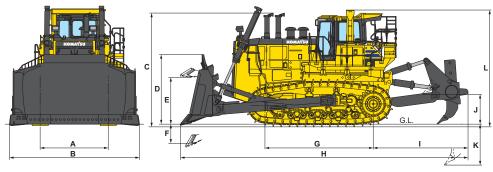
#### **Dozer equipment**

	Overall length with blade	Blade capacity	Blade width × height	Max. lift above ground	Max. drop below ground	Max. tilt adjustment	Additional weight
Strengthened Semi-U dozer	7855 mm	18.5 m <sup>3</sup>	4775 × 2525 mm	1690 mm	734 mm	950 mm	11280 kg
Strengthened U dozer	8215 mm	22.0 m <sup>3</sup>	5215 × 2525 mm	1690 mm	734 mm	1040 mm	12330 kg
Strengthened dual tilt Semi-U dozer	7855 mm	18.5 m <sup>3</sup>	4775 × 2525 mm	1690 mm	734 mm	1170 mm	11440 kg
Strengthened dual tilt U dozer with spill guard	8215 mm	22.0 m <sup>3</sup>	5215 × 2525 mm	1690 mm	734 mm	1280 mm	12490 kg

Blade capacities are based on the SAE recommended practice J1265.

#### **Machine dimensions**

	D375A-8 Semi-U dozer
Α	2500 mm
В	4775 mm
С	4160 mm
D	2525 mm
Е	1690 mm
F	734 mm
G	3980 mm
Н	10560 mm
I	3460 mm
J	1120 mm*1
K	1485 mm* <sup>2</sup>
L	4278 mm



Semi-U dozer with giant ripper

<sup>\*1</sup> Maximum lift above ground \*2 Maximum drop below ground Ground clearance: 610 mm

Notes			





### **Standard and optional equipment**

#### **Engine and related parts**

Komatsu SAA6D170E-7 turbocharged common rail direct injection diesel engine	•
EU Stage V compliant	•
Adjustable auto idle shutdown	•
Starting motor 2 × 24 V / 7.5 kW	•
Alternator 24 V / 140 A	•
Batteries 2 × 12 V / 200 Ah	•
Radiator reserve tank	•
Cooling fan, hydrostatic driven with reversing function	•
Two mufflers with rain cap	•
Hinged front mask	•
Hinged fan support	•
Starting motor 2 × 24 V / 11 kW	0

#### Undercarriage

Single grouser heavy-duty shoes (610 mm)	•
Eight-roller track frames	•
Segmented sprockets	•
Hinged underguards with front pull hook	•
Hydraulic track adjusters	•
Track shoe slip control system	•
Track roller guard	•
Full length track roller guards	0
Single grouser heavy-duty shoes (710 mm, 810 mm)	0

#### **Service and maintenance**

Dry type air cleaner, double element with mechanical dust indicator and evacuator	•
Electrical dust indicator	•
Multifunction video compatible colour monitor with Equipment Management and Monitoring System (EMMS) and efficiency guidance	•
Provisions for fast fueling system	•
Komtrax Plus with Iridium	•
Komatsu Care – a maintenance program for Komatsu customers	•
Tool kit	•
Cold area arrangement	0

#### **Hydraulic system**

Hydraulics for dozing blades	•
Hydraulics for ripper	•
Mono lever blade control	•

#### Cabin

Suspension seat: heated, ventilated, fabric, reclining, high backrest, with headrest	•
2 point seat belt with visible alert	•
Air conditioner	•
Radio	•
Uninterrupted power source for 3rd party system	•
Auxiliary input (MP3 jack)	•
2 × 12 Volt power supply (120 W)	•
1 × 24 Volt power supply	•
Wiper front and rear window	•
Wipers doors	•
Rear-view mirror (inside cab)	•
Lunch box holder	•
Heated rear window	•
Cup holder	•

#### **Transmission and brakes**

Final drive case wear guard	•
Torque converter with automatic lock-up	•
TORQFLOW transmissions	•
Wet steering clutches	•
Decelerator pedal	•
Palm lever steering control (PCCS)	•
Finger Command Control Steering (FCCS)	0

#### Safety equipment

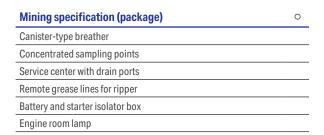
Steel cab, meets ISO 3471 and SAE J1040, APR88 ROPS standards, as well as ISO 3449 FOPS standards	•
Rear view camera system	•
Back-up alarm	•
Warning horn	•
Battery main switch	•
Secondary engine shutdown switch	•
Perforated side covers	•
Platform with hand rails and toe boards	•
Lockable fuel cap and covers	•
2 × emergency engine stop switch	•
Fire extinguisher	0
First aid kit	0
Power ladder	0

#### **Lighting system**

LED lighting system	•
4 front and 2 rear lights (LED)	•
2 head lights	•
1 ripper working light (halogen)	•
Inspection light (portable)	•
Step lights	•

#### **Dozer equipment**

Strengthened dual tilt Semi-U dozer 18.5 m <sup>3</sup>	
Strengthened Semi-U dozer 18.5 m <sup>3</sup>	0
Strengthened U dozer 22.0 m <sup>3</sup>	0
Strengthened dual tilt U dozer with spill guard 22.0 m <sup>3</sup>	0
Multishank variable angle ripper	0
Giant variable angle ripper	0



#### **Attachments**

Hitch	•
Counterweight	0

Further equipment on request

standard equipmentoptional equipment



A wide range of attachments is available. Your Komatsu distributor is ready to assist you with the selection of suitable options.

		<b>OMATSU</b>
Your Komatsu partner:		natsu.eu