

PHOTOS MAY INCLUDE OPTIONAL EQUIPMENT

# WALK-AROUND



2

### **HM400-3** Tier 4 Interim Engine

**GROSS HORSEPOWER 473 HP** 353 kW @ 2000 rpm NET HORSEPOWER 469 HP 350 kW @ 2000 rpm **MAXIMUM 6VW 162,569 lb** 73740 kg



### INCREASED PRODUCTIVITY AND BODY CAPACITY

**Komatsu Traction Control System (KTCS)** Automatically engages the inter axle differential locks and the KTCS braking to provide optimal traction in soft ground conditions. **Increased body capacity** yields a 40 metric ton **44.1 US ton** payload.

#### High performance and environmentfriendly SAA6D140E-6 engine:

- EPA Tier 4 Interim and EU Stage 3B emissions certified.
- Engine power mode selection system realizes both greater productivity and improved fuel economy.



### **KØMTRAX**®

Komtrax equipped machines can send location, SMR and operation maps to a secure website utilizing wireless technology. Machines also relay error codes, cautions, maintenance items, fuel levels, and much more.

#### Komatsu Variable Geometry

**Turbocharger (KVGT)** uses a hydraulic actuator to provide optimum air flow under all speed and load conditions.

**Komatsu Diesel Particulate Filter (KDPF)** captures 90% of particulate matter and provides automatic regeneration that does not interfere with daily operation.

#### Advanced diagnostic system

continuously monitors machine operation and vital systems to identify machine issues and assist with troubleshooting.

#### Large LCD color monitor panel:

- 7" high resolution screen
- Provides "Eco-Guidance" for fuel efficient operation

### Wide, spacious cab with excellent visibility:

- Center-located operator's seat
- Short nose design
- The rounded engine hood provides improved front visibility
- Color rearview monitoring system
- The wide cab offers a comfortable operator and passenger environment

#### For operator comfort:

- Low noise cab through improved sealing with integrated floor. Interior noise level 72 dB(A)
- Air suspension seat
- Radio with AUX terminal

# Komatsu designed, electronically controlled transmission for a comfortable ride.

F6-R2 counter-shaft type transmission with K-ATOMiCS (Komatsu Advanced Transmission with Optimum Modulation Control System).



#### High capacity, reliable, continuously cooled, wet type multiple-disc brakes and retarder:

- Fully hydraulic controlled wet multiple-disc brakes
- Retarder absorbing capacity (continuous descent)
  510 kW 693 HP

# Hydro-pneumatic suspension for all terrains.

The hydro-pneumatic suspension on both front and rear suspensions assures a comfortable ride even over rough terrain.

#### Easy-to-load body:

- Heaped capacity 24 m<sup>3</sup> 34.1 yd<sup>3</sup>
- Low loading height 3164 mm 10'5"
- High strength body constructed of thick wear-resistant steel having 400 Brinell hardness

#### HM400

### **PERFORMANCE FEATURES**

#### **Environment Friendly Engine**

The Komatsu SAA6D140E-6 engine is EPA Tier 4 Interim and EU Stage 3B emissions certified and provides exceptional performance while reducing fuel consumption. Based on Komatsu proprietary technologies developed over many years, this new diesel engine reduces exhaust gas particulate matter (PM) by more than 90% and nitrogen oxides (NOx) by more than 45% when compared to Tier 3 levels.

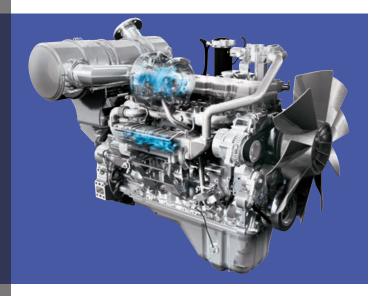
Through the in-house development and production of engines, electronics and hydraulic components, Komatsu has achieved great advancements in technology, providing high levels of performance and efficiency in virtually all applications.

#### **Advanced Electronic Control System**

The engine control system has been upgraded to effectively manage a variety of parameters such as the air flow rate, EGR gas flow rate, fuel injection parameters and after treatment functions. The new control system also provides enhanced diagnostic capabilities.

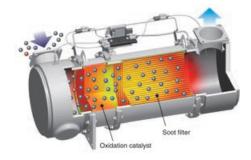
#### Low noise

New hydraulically driven fans and redesigned layout of the cooling system helps achieve a low noise level that meets the EU regulation.



#### Komatsu Diesel Particulate Filter (KDPF)

Komatsu has developed a high efficiency diesel particulate filter that captures more than 90% of particulate matter. Both passive and active regeneration are automatically initiated by the engine controller depending on the soot level of the KDPF. A special oxidation catalyst with a fuel injection system is used to oxidize and remove particulate matter while the machine is running so the regeneration process will not interfere with daily operation. The operator can also initiate regeneration manually or disable regeneration depending on the work environment.



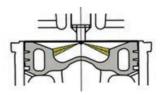


KDPF

#### Redesigned Combustion Chamber

The combustion chamber located at the top of the

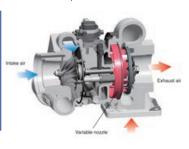
engine piston has a new shape designed to improve combustion and further reduce NOx, PM, fuel consumption, and noise levels.



# Komatsu Variable Geometry Turbocharger (KVGT)

Using Komatsu proprietary technology, a newly designed variable geometry turbocharger with a hydraulic actuator is used to manage and deliver optimum air flow to the combustion chamber under all speed and load

conditions. The robust hydraulic actuator provides power and precision, resulting in cleaner exhaust gas and improved fuel economy while maintaining performance.



#### **Closed Crankcase Ventilation (CCV)**

Crankcase emissions (blow-by-gas) are passed through

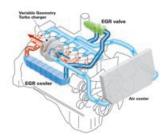
a CCV filter. The CCV filter traps oil mist which is returned back to the crankcase while the filtered gas is returned to the air intake.



#### **Cooled Exhaust Gas Recirculation (EGR)**

Cooled EGR, a technology that has been well proven in Komatsu Tier 3 engines, reduces NOx emission to

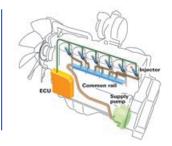
meet Tier 4 levels. The hydraulically-actuated EGR system has increased capacity and uses larger and more robust components to ensure reliability for demanding work conditions.



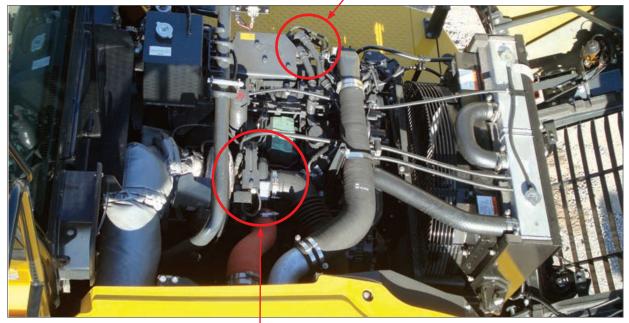
# Heavy Duty High Pressure Common Rail (HPCR) Fuel Injection System

The heavy duty HPCR system is electronically controlled to deliver a precise quantity of pressurized fuel into

the combustion chamber using multiple injection events to achieve complete fuel burn and reduce exhaust gas emissions. Fuel injector reliability has been improved by using ultra-hard wear resistant materials.



**CCV** Filter



**KVGT** 

### **PERFORMANCE FEATURES**

#### Low fuel consumption

The fuel consumption for the HM400-3 has been lowered through energy saving improvements in the transmission, axles and advanced electronic engine control. All combined the HM400-3 realizes up to 14% better fuel economy in the field compared to the HM400-2.

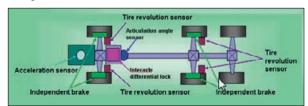
### Fuel consumption 14% reduction

\*Compared with the HM400-2 fuel consumption. Varies depending on job conditions.

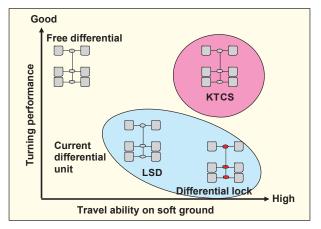
#### Komatsu Traction Control System (KTCS)

The new KTCS system was developed by Komatsu to allow for maximum machine performance in soft ground conditions. Komatsu leveraged its prior experience with traction control systems in bulldozers and rigid trucks to develop this system for use in articulated trucks.

When operating in soft ground conditions, if the machine detects a rapid slowdown in movement it will check to see that the front and middles axle shafts are rotating at the same speed. If they are not then automatically it will engage the inter axle differential lock to improve machine performance. If the machine then detects wheel slip it will employ the KTCS. The KTCS system monitors the wheel speed on the front and middle axles and begins to control the wheel speed that slip was detected on. KTCS continually monitors the wheel speed during operation to provide optimal machine performance in soft ground conditions.



KTCS is automatically engaged and disengaged. This allows the operator to concentrate on operating the HM400-3 and not worry about using switches or buttons to get maximum machine performance.



#### **Selectable Working Modes**

The operator can choose between two working modes, Economy Mode or Power Mode, according to their work demand and conditions.

#### Economy mode

Appropriate for lighter work on flat ground. The economy modes lowers the engine maximum output along with lowering the upshift and downshift points during operation.

#### Power mode

Appropriate for higher production jobs and uphill hauling applications. The power mode increases the engine maximum output and raises the upshift and downshift points during operation.



# Komatsu designed electronically controlled countershaft transmission

The Komatsu designed electronically controlled transmission called K-ATOMiCS has been a success in Komatsu's rigid dump trucks. The electronic clutch modulation system ensures proper clutch pressure when the clutch is engaged. The total control system controls both the engine and transmission by monitoring the vehicle conditions. This high technology system assures smooth shifts without shock and maximizes power train life.

## Increased body capacity and box section frame structure

The loading capacity is increased from 36.5 to 40 metric tons **40 to 44.1 U.S. tons** through increased body heaped capacity to 24 m<sup>3</sup> **34.1 yd**<sup>3</sup>. The low loading height of 3164 mm **10'5"** enables easy loading. The body is built of high strength wear-resistant steel with a Brinell hardness of 400 and the body shapes provides excellent load stability.

## **MAINTENANCE FEATURES**

#### **KDPF** Regeneration Notification

The LCD color monitor panel provides the operator with the status of the KDPF regeneration, without interfering with daily operation.

When the machine initiates active regeneration an icon will appear to notify the operator.



#### **Manual Stationary Regeneration**

Under most conditions, active regeneration will occur automatically with no effect on machine operation. In case the operator needs to disable active regeneration or initiate a manual stationary regeneration, this can be easily accomplished through the monitor panel.

A soot level indicator is displayed to show how much soot is trapped in the KDPF.



# Multi-monitor with Troubleshooting Function to Help Prevent Critical Machine Trouble

Various meters, gauges and warning functions are centrally arranged on the multi-monitor. The monitor simplifies start-up inspection and promptly warns the operator with a lamp and buzzer if any abnormalities should occur. In addition, countermeasures are indicated in 4 levels to help prevent major problems.



#### **Maintenance Function**

When the machine reaches the replacement intervals for oil and filters, the monitor panel will display lights to inform the operator.

Mai	ntenance	Interval	Remain
test (	Air Cleaner Cleaning / Change	-	—
Q	Dengine Oil	500 h	500
\$	Engine Oil Filter	500 h	500 1
ß	Fuel Pre Filter	500 h	500
- 0	Transmission Oil & Brake Oil	1000 h	1000

# Ground access to the filters

The oil filters of the transmission and the brake systems offer servicing from the ground.

# Easy draining of transmission oil

Two drain ports are added to facilitate drain of oil in the piping.

#### Tiltable cab

The cab can be tilted rearward 32 degrees to provide easy maintenance/ service for the engine and transmission.

#### **Electric priming pump**

The manual priming pump is replaced with the electric priming pump.

#### Battery disconnect switch

A standard disconnect switch allows a technician to disconnect the power supply before servicing the machine.

#### Hydraulically driven fans

Two hydraulically driven cooling fans are used for the radiator and charge air cooler. Both fans are reversible and are controlled separately.



M400-3

### WORKING ENVIRONMENT

#### **Center-located operator seat**

Placing the seat at the center of the operator's cabin provides a wide view of the working area.



#### New air suspension seat

A new high capacity air suspension seat with headrest is now standard. The air suspension seat dampens vibrations transmitted from the machine and reduces operator fatigue.

#### 3 point seat belt

A three-point seat belt is standard equipment. The seat belt can be converted to a two-point lap belt.

#### **Training seat**

The cushion and back rest of the training seat are foldable. Folding the cushion allows the operator to come in and out of the cab and allows easy access to the

recirculation filter of the air conditioner. Folding the backrest allows access to storage at the rear of the seat.

#### Low Noise Design

Operator's ear noise level : 72 dB(A)

Dynamic noise level (outside): 110 dB(A)

The large cab is mounted with Komatsu's unique ROPS/FOPS viscous mounts. The low-noise engine, hydraulically driven fan, and hydraulic pumps are mounted with rubber cushions, and the cab sealing is designed to provide a quiet, low-vibration, dustproof, and comfortable operating environment.





#### Tilt-away steering column

The tiltable steering column and telescopic steering wheel allow the operator to set the steering wheel to the desired position. The tilt mechanism incorporates a spring-assist for easy adjustment.



#### Radio with AUX terminal

By connecting an auxiliary device to this plug, the operator can hear sound through the speakers in the cab.





DC12V electrical outlet AUX terminal



#### **Two 12V electrical outlets**

Two 12 volt DC outlets are included as standard in the operators cabin. A 12 volt cigarette lighter is installed on the front right side console and an additional 12 volt outlet is located in the rear right side behind the operator seat.

**New air** A new his suspensi headrest The air su dampensi transmitt

### **INFORMATION & COMMUNICATION TECHNOLOGY**

#### **ECO Guidance**

The monitor panel provides guidance to the operator to help promote energy saving operation. The ECO Guidance function displays six (6) messages:

- Avoid Excessive Engine Idling
- Release the Hoist Lever
- Operating the Accelerator Pedal with Brake Actuated Lowers Fuel Economy
- Shift Up
- Avoid Operating the Accelerator Pedal with the Body Moving Down
- Avoid Hard Use of Steering



#### ECO gauge

The ECO gauge indicates the instantaneous fuel consumption rate during operation.

Operating the machine by keeping the gauge within the green zone leads to the energy-saving operation.

\* Fuel consumption rate depends on the work load and accelerator pedal operation.





Fuel consumption gauge

#### Energy saving operation guide

The operator can check the operation record, ECO Guidance record, and fuel consumption record.

The Operation Records indicate the status of the machine for the current day.

The ECO Guidance Records displays the number of occurrences of each guidance message. During operation, it is requested to reduce the number of occurrences of each guidance message in order to achieve energy-saving operation.

The Average Fuel Consumption Logs graph the fuel consumption for the previous 12 hours (based on service meter reading) and daily fuel consumption for the previous 7 days.

	Working Hours (Engine On)	0.0	h
I	Average Fuel Consumption	0.0	¢/h
I	Actual Working Hours	0.0	h
I	Ave. Fuel Consumption (Actual Working)	0.0	Ø/h
	Fuel Consumption	0	Ê
	Idling Hours	0.0	h

**Operation Records** 



ECO Guidance Records



Average Fuel Consumption Logs

# INFORMATION & COMMUNICATION TECHNOLOGY

#### **Machine Monitor**

The machine monitor displays various machine information and allows for various settings of the machine.

#### Switch panel

The switch panel is used to select various LCD unit screens and the air conditioner control screen.

By using the switch panel, you can display various user menus on the LCD unit screen and perform the settings of the machine.

#### Large Multi-Lingual LCD Monitor

A large user-friendly color monitor provides excellent screen visibility through the use of a TFT liquid crystal display that can easily be read at various angles and lighting conditions. A keypad provides simple and easy navigation to machine operation information.



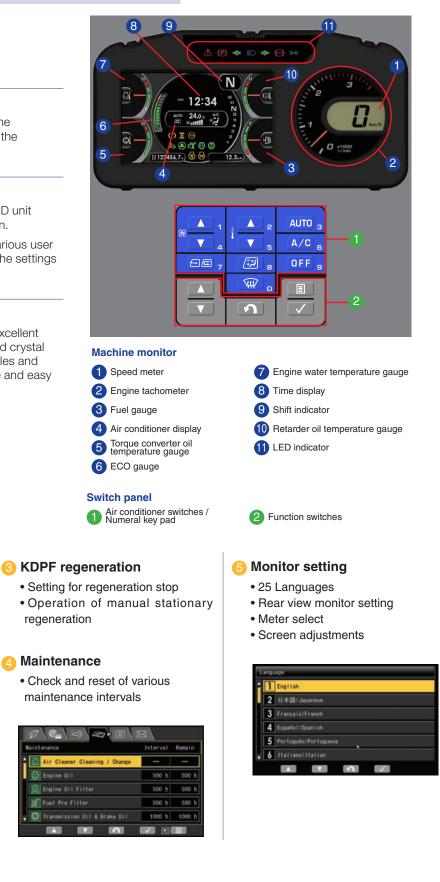
#### ECO Guidance

- Operation Records
- ECO guidance Records
- Average Fuel Consumption LogsConfigurations

#### 2 Machine setting / information

- Radiator fan reverse mode
- CAC fan reverse mode
- TCS setting etc.





### **GENERAL FEATURES**

#### Color rear view monitoring system

The operator can view the rear of the machine with a full color monitor that is located on the right side of the cab. This monitor can be always on or only on when the loader goes into reverse. Visual guidelines can also be added for more convenience.



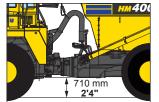


#### Hydro-pneumatic suspension

The front axle hydro-pneumatic suspension employs "De Dion" type design, allowing the machine to ride more smoothly over rough terrain. The rear-axles are mounted on a dynamic equalizer structure equipped with hydropneumatic suspension. The entire vehicle's suspension delivers a comfortable ride and maximizes productivity.

#### Increase hitch height above ground

The bottom face of the hitch is higher than the bottom face of the differential gear of the front axle. The hitch height above ground is increased over the HM400-2.



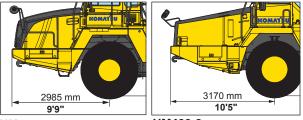


HM400-3

HM400-2

#### Short nose

A new layout of the cooling system allows for a shorter nose shape compared to the previous model, increasing the field of view to the operator.



HM400-3

HM400-2

# Hydraulically controlled wet multiple-disc brakes and retarder

The large-capacity, continuously cooled, wet-multiple disc brakes also function as a highly responsive retarder which gives the operator greater confidence at higher speeds when travelling downhill.

Retarder Absorbing Capacity (continuous descent):

510 kW 693 HP

#### HM400

### **KOMATSU PARTS & SERVICE SUPPORT**

#### Komatsu CARE – Complimentary Scheduled Maintenance

- PM services for the earlier of 3 years / 2000 hours
- Performed by factory certified technicians
- Komatsu Genuine parts and fluids
- Significantly lowers your cost of ownership while maintaining high uptime and reliability
- Increases resale value and provides detailed maintenance records
- Extended PM services can be purchased beyond the complimentary period to provide additional peace of mind and maximize uptime



#### Komatsu CARE – Extended Coverage

- Extended Coverage can provide peace of mind by protecting customers from unplanned expenses that effect cash flow
- Purchasing extended coverage locks-in the cost of covered parts and labor for the coverage period and helps turn these into fixed costs





#### Komatsu Parts Support

- 24/7/365 to fulfill your parts needs
- 9 parts Distribution Centers strategically located across the U.S. and Canada
- Distributor network of more than 300 locations across U.S. and Canada to serve you
- Online part ordering through Komatsu eParts
- Remanufactured components with same-as-new warranties at a significant cost reduction



#### Komatsu Oil and Wear Analysis (KOWA)

- KOWA detects fuel dilution, coolant leaks, and measures wear metals
- Proactively maintain your equipment
- Maximize availability and performance
- Can identify potential problems before they lead to major repairs
- Reduce life cycle cost by extending component life



### HM400-3

### KOMTRAX EQUIPMENT MONITORING



- KOMTRAX is Komatsu's remote equipment monitoring and management system
- KOMTRAX continuously monitors and records machine health and operational data
- Information such as fuel consumption, utilization, and a detailed history aids in making repair or replacement decisions



 KOMTRAX is standard equipment on all Komatsu construction products



- Know when your machines are running or idling and make decisions that will improve your fleet utilization
- 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





- 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



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

Monthly Operationa	al Analysis	Location/Hours/Working
Model DE1752 Type S ( ) (2011 - 2) Same ( 10) Sile Stando Loud Graph	23 Soreji Na Markiyi Operates Name	
	Fleet Working Status	No. 44.521     VEX.56 (2)       NO. 60     102.521 (2)
	Mart     P     Mat     Bal     Bal     Bal     Bal     Bal       Mat     0     Bal     Bal     Bal     Bal     Bal       Mat     0     Bal     Bal     Bal     Bal     Bal       Mat     0     Bal     Bal     Bal     Bal     Bal     Bal       Mat     0     Bal     Bal	







For construction and compact equipment.

For production and mining class machines.

#### HM400

### **SPECIFICATIONS**



Model Type Aspiration Komatsu variable g	Water-cooled, 4-cycle
Number of cylinders	
Bore	140 mm <b>5.51"</b>
Stroke	
Piston displacement	15.24 ltr <b>928 in</b> <sup>3</sup>
Horsepower:	
SAE J1995	
ISO 9249 / SAE J1349	
Rated rpm	2000 rpm
Fan drive type	Hydraulic
Maximum torque 2263 N•	
Fuel system	Direct injection
Governor	. Electronically controlled
Lubrication system:	
MethodGea	r pump, force-lubrication
Filter	
Air cleaner Dry type w	vith double elements and
precleaner (cyclonpack	type), plus dust indicator

\*EPA Tier 4 Interim and EU stage 3B emissions certified

# 

Reverse.......Torque converter drive and direct drive in all gear Shift control ......Electronic shift control with automatic clutch modulation in all gear

Maximum travel speed...... 55.9 km/h 34.7 mph

### 

Full time all wheel drive	
Final drive type	Planetary gear
Ratios:	
Differential	
Planetary	
-	

SUSPENSION SYSTEM

Front ......Hydro-pneumatic suspension Rear .....Combined hydro-pneumatic and rubber suspension system

### 

Type Articulated ty	ype, fully hydraulic power steering
	with two double-acting cylinders
Supplementary steering	Automatically actuated,
	electrically powered
Standard	ISO5010, SAE J1511
Minimum turning radius, wall	to wall 8.8 m <b>28' 10"</b>
Articulation angle	



Standard .....ISO3449 (FOPS) ISO3471 (ROPS)



Service brakes	Full-hydraulic control, oil-cooled
mu	Itiple-disc type on front and center axles
Standard	ISO3450
Parking brake	
Retarder Fro	nt and center axle brakes act as retarder
	ME

Type ...... Articulated type, box-sectioned

construction on front and rear Connected by strong torque tubes.



Capacity:	
Struck	18.2 m <sup>3</sup> 23.8 yd <sup>3</sup>
Heaped (2:1, SAE)	24 m <sup>3</sup> <b>31.4 yd<sup>3</sup></b>
Payload40	
Material	130 kg/mm² <b>184,925 psi</b>
	high tensile strength steel
Material thickness:	
Bottom	14 mm <b>0.55"</b>
Front	8 mm <b>0.31"</b>
Sides	12 mm <b>0.47"</b>
Target area	
(inside length x width) 5667 mm	n x 3194 mm <b>18' 7" x 10' 6"</b>
Heating	Exhaust heating (option)
Heating	Exhaust neating (option)

HYDRAULIC SYSTEM

Hoist cylinder	Twin, telescopic type
Relief pressure	. 27 MPa 275 kg/cm <sup>2</sup> 4264 psi
Hoist time	

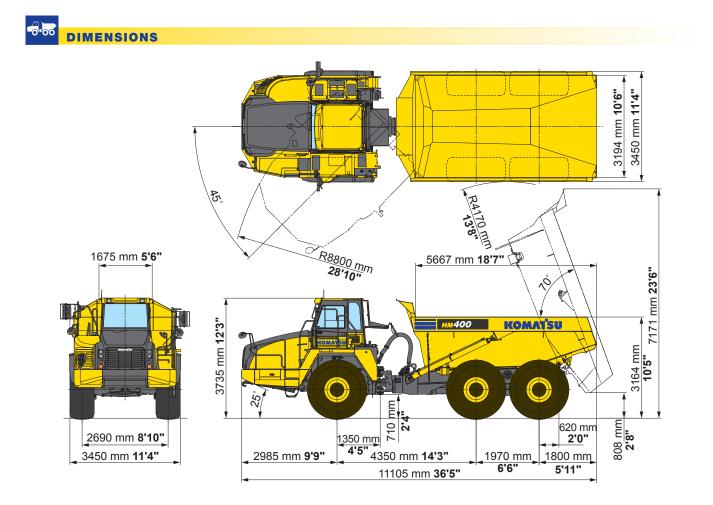
### WEIGHT (APPROXIMATE)

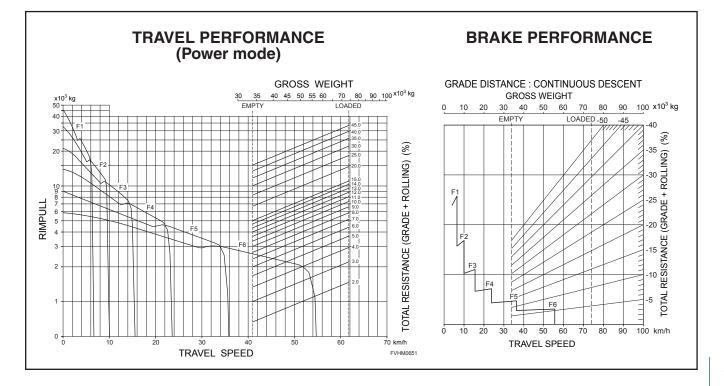
Empty weig	ght	33,660 kg <b>74,207 lbs</b>
Gross vehi	cle weight	73,740 kg <b>162,569 lbs</b>
Weight dist	tribution:	
Empty:	Front axle	
	Center axle	
	Rear axle	
Loaded	Front axle	
	Center axle	

Rear axle ...... 35.2%

SERVICE REFILL CAPACITIES

Fuel tank	518 L <b>136.8 U.S. gal</b>
Engine oil	35 L 9.3 U.S. gal
Torque converter, transmission and	
retarder cooling	125 L <b>33 U.S. gal</b>
Differentials (total)	108 L 28.5 U.S. gal
Final drives (total)	32 L 8.5 U.S. gal
Hydraulic system	167 L <b>44.1 U.S. gal</b>
Suspension (total)	21.4 L <b>5.7 U.S. gal</b>







- Air cleaner, dry type, double elements
- Air cleaner dust level indicator
- Air pre-cleaner
- Alternator, 60 A, 24 V
- Alarm, backup
- Anti-slip material on fenders
- Auxiliary steering system, automatic, electric
- Back-up lamp
- Batteries, 2 x 12 V/170 Ah
- Battery disconnect
- Body, 24 m<sup>3</sup> 34.1 yd<sup>3</sup>
- Centralized greasing
- Color rear view camera and monitor
- Coolant temperature alarm and lamp
- Dump counter
- ECO Guidance
- Electronic hoist control system
- Electric circuit breaker, 24 V
- Electric priming fuel pump
- Engine, Komatsu SAA6D140E-6
- Engine underguard
- Engine shutdown secondary switch
- Front view mirror
- Hazard lamps
- Hand rails for platform and ladder
- Headlights, front (high and low)

- Horn, electric
- Hydraulic driven cooling fan, for after cooler
- Hydraulic driven cooling fan, for radiator
- Hydropneumatic suspension front and rear
- Interaxle lockup, wet disc clutch type, controlled by KTCS
- Komatsu Traction Control System (KTCS)
- Komatsu Diesel Particulate Filter (KDPF)
- Komatsu Variable Geometry Turbocharger (KVGT)
- KOMTRAX® Level 4
- Ladders LH side
- Mud guards
- Parking brake
- Protective grille for rear window
- Propeller shaft guards, front and rear
- Provision for tailgate
- Rearview mirrors, LH and RH side
- Retarder/brake system
- Rims for 29.5 x 25, set of 6
- ROPS/FOPS cab Level 2
- 2 x DC12V electrical outlets
- 12V cigarette lighter
- Air conditioner/Heater/Defroster
- AM/FM radio with AUX terminal
- Ashtray

- Color LCD/TFT multi-monitor
- Cup holder
- Floor mat
- Operator seat, reclining, air suspension type with 3-point retractable seat belt, 76 mm 3" width lap belt. 50 mm 2" width shoulder belt
- Passenger seat with 2-point retractable seat belt, 76 mm 3" width
- Power window (LH)
- Space for lunch box
- Sliding window (RH)
- Steering wheel, tilt and telescopic
- Sun visor, front window
- Tiltable ROPS cab with FOPS, sound suppression type
- Windshield washer and wiper, front and rear Starting motor, 11.0 kW
- Steering joint locking assembly
- Step (right side)
- Stop and tail lamps and turn signal lamps
- Tool box
- Transmission underguard
- Two mode engine power system (Economy and Power)
- Work lamps, LH and RH side

**OPTIONAL EQUIPMENT** 

- Body exhaust heating
- Body liner
- Hydraulic tilt for cab
- Tail gate, scissors type



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