

SEM  
WHEEL LOADER

# SEM 656F



A Caterpillar Brand



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SEM 656F payload is increased by 10%, from 5 tons to 5.5 tons. The machine design is new SEM F series styling, and the stability is improved through an extended wheelbase of 3,350 mm. An operator can work with less stress because 656F cab space increased by 20%. Moreover, there is a 15% increase in fuel tank capacity which enable for longer work hours on a single filling. The new generation 656F provides superior performance and advanced features.

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## 10% Productivity Boost

- Increased payload by 10%, from 5 tons to 5.5 tons.
- Improved stability through an extended wheelbase of 3,350 mm.
- Joystick/single lever pilot control and mechanical control.
- High-performance bucket with a 10% larger fill factor.
- Various work tools available, including a rock bucket, side dump bucket and more.

## New SEM Signature Styling

- The new generation of SEM models feature a signature series styling tailored by the American CID team, which emphasizes toughness and visual appeal.
- Engine hood made from high-quality carbon plate molds for improved reliability and durability.
- Hood gull-wing design offers ample space for maintenance and servicing.

## F Series Cab: 20% Additional Space

- The F series cab now offers 20% more space, providing useful features like 24V power, fuel gauge, visor and much more.
- Improved lighting with LED beams and work lamps for nighttime operations.
- Protective bucket leveler design safeguards tilt cylinder and its rod from damage;
- 15% increase in fuel tank capacity for extended operational hours.



# 1 Enhanced Reliability

- Articulated frame center design reduces workspace demand and rear tire track, decreasing fuel consumption and tire wear. Double tape bearings withstand radius and axis loads, while a longer wheelbase enhances reliability.
- Lube cap prevents dust ingress, improving reliability.
- Double-sealed pins connecting the bucket and lift arm prevent dust and water entry.
- Lubricated passage for increased pin reliability, especially in heavy-duty applications.
- New dust prevention pilot valve ensures enhanced reliability.
- End face tooth design for more reliable connections and improved torque transfer capacity.
- World class hydraulic components ensure reliability and higher efficiency.
- Optimized driveshaft layout to double the durability of the main drive shaft.
- Cooling package frame damping design for enhanced reliability on rough roads.
- Metal hose capable of withstanding high temperatures for reduced failure rates and improved reliability.
- 6-ton heavy duty axle delivers superior reliability and durability.





# 2

## Excellent Performance

- Increased ground-level bucket rack angle for larger material loads.
- Linkage offering the same dump clearance, enabling one-side truck loading with longer dump reach.
- Auto-to-Ready function for linkage after dumped material at maximum height.
- Low-speed engine delivers better noise control, improved fuel economy and high torque.
- 5% fuel efficiency improvement with E-fan.
- Shunt tank extends the durability of equipment seals and prevents the water pump from running dry.
- Countershaft transmission for enhanced reliability, higher efficiency and easy maintenance.
- The first gear with high draw bar and second gears with high speed. These two work together for more productivity and fuel efficiency.
- Larger circulation diameter torque convertor for an improved transfer ratio and higher efficiency.
- Cat® shift cushion for smoother gear shifts.
- Hydraulic cycle time achieved to 9.3s for handling more material within same timeframe.
- Finger control pilot system make operation easier and precision.



# 3

## Reduced Operation and Owned Cost

- Grease lube points for easy maintenance.
- Highly compatible engine parts for easier and more economical replacement.
- Cab opening at the bottom for service and repair.
- New, easily replaceable fresh air filter, requiring no special tools.
- Centralized No Engine End Frame (NEEF) lube points for ground servicing.
- 15% increase in fuel tank capacity for extended working hours.
- Separated calipers for easier disc replacement.

# 4

## First-Class Safety

- Internal expanding drum parking brake automatically engages when air pressure falls below a set level.
- Slope switch ensures safe operation on slopes while maintaining power output.
- Certified backup alarm and frame lock bar for safety.
- Air tank with adaptor for tire charging and interior cab cleanliness.
- Soft first-step ladder to prevent damage.



# 5

## Enhanced Operating Comfort

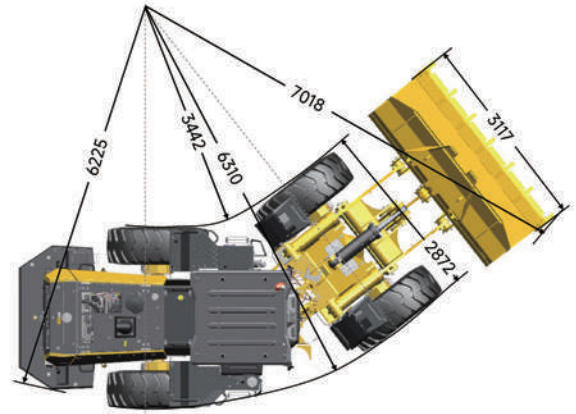
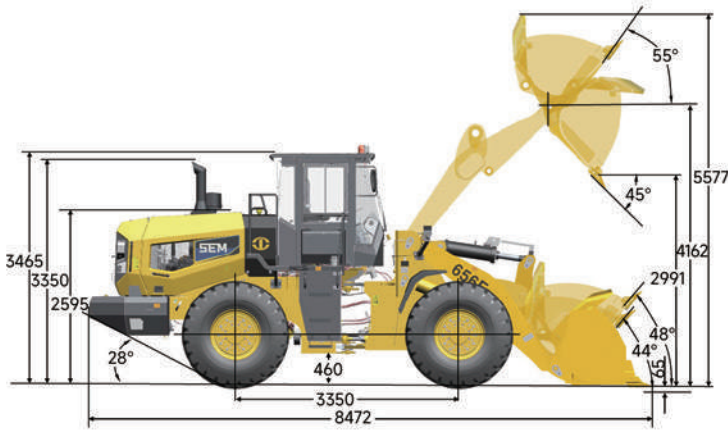
- Step-free cab design for easy cleaning.
- Soft-trim build for a comfortable environment.
- Front-reverse slide window for easy ventilation.
- Multiple adjustable seat and steering column supports a comfortable operating environment.
- Improved front view with a rearward-opening cab door.
- Micro-pressured cab to prevent dust ingress.
- Auto Heating, Ventilation, and Air Conditioning (HVAC) for a more comfortable environment.
- Adjustable pilot armrest for reduced fatigue and enhanced comfort.

## Main Specifications


Items		656F	Items		656F
<b>Main Specifications</b>			<b>Engine</b>		
Rated Load	kg	5,500	Model		WD10G220E23
Operating Weight with Standard Bucket	kg	17,385	Rated Power	kW	162
Bucket Capacity	m <sup>3</sup>	2.6-5	Rated Speed	r/min	2,000
Wheelbase	mm	3,350	Displacement	L	9.7
Overall Dimension	mm	8,472*3,117*3,465	<b>Implement Hydraulic</b>		
Max. Drawbar Force	kN	170	Implement System Type		Open center flow sharing
Breakout Force	kN	161	Boom Raise Time	s	5.13
Dump Clearance	mm	2,991	Hydraulic Cycle Time	s	9.3
B-Pin Height	mm	4,162	System Pressure Setting	MPa	17
<b>Transmission</b>			<b>Brake System</b>		
Transmission Type		Countershaft, power shift	Service Brake		Dry&caliper, air to oil control
Transmission Gears		F4/R4	Parking Brake		Drum/Shoe
Torque Converter Type		Single stage, 3 elements	<b>Steering System</b>		
Maker & Type		TR200	System Type		Load sensing
Forward I/Reverse I	km/h	7.6/7.6	Steering Pump Type		Gear pump
Forward II/Reverse II	km/h	14/14	System Pressure Setting	MPa	16
Forward III/Reverse III	km/h	22/22	Steering Angle (L/R)	°	38±1
Forward IV/Reverse IV	km/h	39/39	<b>Tires</b>		
<b>Axle</b>			Size		23.5-25
Main Drive Type		Spiral bevel gear, single stage	Type		Bias
Final Drive Reduction Type		Planetary type, single stage	Layer		16
Rear - Oscillating +/-	°	±11	Textured Type		L-3



## Dimensions



## WORK TOOLS

Capacity (m <sup>3</sup> )	Description	Lift Arm	Image (mm)	Dump Hight (mm)	B Pin Height (mm)	Dump Reach (mm)	Work Tool W*L*H (mm)	Work Tool Weight (mm)	Note
2.5	BKTA SD 3074 mm	STD		4,283	4,162	150	3,074*1,956*1,578	2,758	Side Dump, With Tips & Segment
2.6	BKTA RSP ST 3100 mm	STD		2,858	4,162	1,484	3,100*1,677*1,293	1,986	Spade Nose Rock Bucket With Tips & Segment
2.7	BKTA FF ST 2963 mm	STD/HL		3,102/3,447	4,162/4,468	1,332	2,963*1,496*1,245	1,332	PS Bucket With Tooth
3.5	BKTA FF ST 3200 mm	SHL		3,734	4,855	1,355	3,200*1,484*1,348	1,592	Flat Floor, With Bolt-on Edges
4.1	BKTA FF ST 3180 mm	STD/HL		2,917/3,272	4,162/4,468	1,435/1,414	3,180*1,759*1,376	1,796	Flat Floor, Bare, Without Tooth Or Bolt-on Edges
4.5	BKTA FF ST 3180 mm	STD/HL		2,864/3,380	4,162/4,468	1,447/1,280	3,180*1,658*1,378	1,901	Coal Bucket, Flat Floor With Cutting Edge
5	BKTA FF ST 2963 mm	HL		3,185	4,468	1,462	3,180*1,704*1,501	1,914	Coal Bucket, With Bolt-on Edges



**COAL APPLICATION**

- Available in 4.5 cum and 5 cum bucket sizes with high fill factor.

**QUARRY AND AGGREGATION**

- 2.7 cum rock bucket and 2.6 spade nose rock bucket for quarry applications.
- 3.5 cum bucket offers high productivity for aggregation purposes.

**IRON ORE MINING**

- High drawbar to support mining applications.

**LOG GRAPPLE**

- Corresponding log grapple.
- Crossed log grapple available.

**SIDE DUMP BUCKET**

- Exchangeable 2.5 cum side dump bucket.



# Standard Equipment

## ENGINE

- Weichai WD10 Engine EPA Tier 2 / EU Stage II engine output net 148 kW (198 hp), 6 cylinders, 4 stroke
- Mechanical direct fuel injection system
- Pre-filter with water separator
- Fuel filter
- E-fan

## TRANSMISSION

- Countershaft transmission
- One stage, 3 elements torque convertor

## AXLE

- SEM dry axle without limited slip differentials
- Caliper discs service brake system
- Parking brake service

## HYDRAULIC SYSTEM

- Two pump flow sharing system
- Single joystick control
- Lift arm kick-out, automatic
- Bucket positioner, automatic
- Plugs for pressure check and sample oil
- Emergency lift arm lower via pilot accumulator

## STEERING SYSTEM

- Load sensing system with coaxial flow amplification and steering priority

## TIRE & RIM

- 23.5-25/L3 bias tire
- Normal fender with plastic plate

## CHASSIS FRAME

- Spacious central articulation arrangement with conic bearing
- Articulation locking bar
- Tow hitch

## LINKAGE & ATTACHMENTS

- Z-bar linkage

## ELECTRIC SYSTEM

- Two front lights with high/low beam
- Two front headlights on top of cab
- Two rear headlight sides of hood
- Turn signals with flasher
- Batteries, free of maintenance
- 24V power outlet
- Electric horn
- Front windshield wiper
- Back-up alarm
- Radio/player with USB port
- Reversing warning light, automatic
- Rotating beacon

## DASHBOARD

- Engine coolant temperature
- Transmission oil temperature
- Fuel level
- Hour meter
- Voltage

## ALARM SYSTEM

- Intake air filter alert
- Battery charging
- Braking air pressure
- Parking brake applied
- Power cut-off
- Turning lights
- Transmission oil pressure alarm

## CAB

- Seat - mechanical suspension with seat belt
- Adjustable steering column
- Cab marco mounts
- Cab fresh air filter
- One interior & dual exterior rear-view mirrors
- HVAC

## OTHERS

- Manual central lubrication

# Optional Equipment

## ENGINE

- Oil bath double air filter

## TIRE & RIM

- Radia tire
- Desert pattern tire

## CAB

- Front windshield screen
- Rear-view camera display
- Cab rear wiper and washer
- Cab top protection Guard

## LINKAGE & ATTACHMENTS

- Quick coupler
- Additional counterweight
- High/Super-high linkage
- Rock bucket
- Log grapple with corresponding or crossed teeth
- Pallet fork
- Snow blade

## OTHERS

- License-plate bracket and light
- Transmission protective guard
- GPS
- Hose sleeve
- Brake air drier

## CONTROL

- Single level pilot control

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