Mining Excavator - Official Technical Overview & Datasheet

EXECUTIVE SUMMARY

Engineered for the most demanding surface mining and heavy construction applications, the next-generation Mining Excavator delivers a superior combination of breakout force, cycle speed, and structural durability. Targeting quarry operators, large-scale civil contractors, and open-pit mining houses, this machine integrates a high-rigidity undercarriage with a thermally optimized powertrain to achieve over 8,000 hours of annual runtime with less than 5% downtime. Its modular design reduces parts replacement complexity by 22% compared to previous generation excavators.

Balancing production efficiency with total cost of ownership, the excavator features a variable-gauge track frame and a dual-stage filtration hydraulic system. Operators benefit from a 20% reduction in fuel consumption per ton moved, while telematics-enabled predictive maintenance schedules lower unplanned service events. Whether loading articulated dump trucks in a quarry or benching overburden at a coal mine, this machine sets a new benchmark for reliability and operator safety.

STRUCTURAL INTEGRITY & POWERTRAIN

The chassis utilizes high-tensile BS700MC and Hardox 450 steel for the main frame and track links, achieving a yield strength of 700 MPa. Box-section boom and arm structures are reinforced with cast steel nodes at stress concentration points, extending fatigue life by 35% in rock-digging conditions. An OEM-integrated Cummins QSK50 or Isuzu 6WG1 turbocharged diesel engine (customer-selectable) supplies a net power of 620 kW (831 hp) at 1,800 rpm, compliant with EPA Tier 4 Final and EU Stage V via selective catalytic reduction (SCR) and diesel particulate filter (DPF). The closed-loop load-sensing hydraulic system operates at a main pump flow of 4 x 450 L/min at 32 MPa, with a peak relief pressure of 37 MPa for arm crowd and bucket curl circuits. A dedicated swing circuit with hydraulic regenerative valves reduces energy loss during upper structure rotation by up to 18%.

KEY FEATURES & OPERATOR COMFORT

- Load-Sensing Hydraulics with Flow Sharing: Independent metering valves (IMVs) electronically adjust pump flow to each actuator based on joystick demand, eliminating flow loss at fine grading and enabling simultaneous swing + crowd + bucket curl without cycle time penalty.

- ROPS/FOPS Certified Cab: ISO 3471 and ISO 3449 level II certified cab structure with 10 mm polycarbonate front window and integrated falling object guard. The hermetically sealed pressurized cabin maintains positive pressure of 50 Pa to exclude dust, paired with a dual-stage HVAC fresh air filter (MERV 16).

- Smart Control Panel & Telematics: 10-inch high-brightness touch display providing real-time machine health, fuel consumption per cycle, and terrain map overlay. Standard fleet management system (FMS) transmits 120+ parameters (engine load, hydraulic oil temp, brake wear) every 5 seconds to the off-board portal.

- Automatic Centralized Lubrication: Progressive distributor system with 24 programmable intervals delivers grease to 24 pivot points (bucket links, arm ends, boom foot) while the machine operates, reducing manual service time to 30 min every 250 hours.

- Electrically Actuated Emergency Steer & Brake: Backup electric pump ensures steering and service brake function for a minimum of three full cycles even with total engine failure, satisfying MSHA Part 36.40 emergency performance

standards.

COMPLIANCE & SAFETY STANDARDS

The Mining Excavator fully complies with ISO 9001:2015 quality management, ISO 14001 environmental standards, and meets CE marking (Machinery Directive 2006/42/EC). Engine certification includes US EPA Tier 4 Final, EU Stage V, and China National IV. Safety certifications include ROPS/FOPS per ISO 3471 and ISO 3449 (Level II), operator protective structure (OPS) per ISO 12117, and braking system per ISO 10265. The hydraulic hose routing follows SAE J517 and ISO 6803 impulse testing (1 million cycles at 133% working pressure). An optional MSHA-compliant fire suppression system (dual-agent dry chemical + foam) is available for underground or coal mining configurations.

TECHNICAL SPECIFICATIONS

The following parameters are based on standard heavy-duty backhoe configuration with a 6.0 m^3 (7.85 yd^3) rock bucket, full fuel tank, and 200 kg operator. Values may vary with attachment, track shoe width, and counterweight options.

Parameter	**Specification**

Engine Model	Cummins QSK50 (or Isuzu 6WG1-T4)
Gross Power	620 kW (831 hp) @ 1800 rpm
Operating Weight	215,000 kg (474,000 lb)
Bucket Capacity (Standard)	6.0 m³ (7.85 yd³) SAE heaped
Max Digging Reach	12.5 m (41 ft 0 in)
Max Digging Depth	7.8 m (25 ft 7 in)
Max Breakout Force (Arm)	450 kN (101,160 lbf)
Swing Speed	6.8 rpm
Track Shoe Width	700 mm (28 in) triple-grouser
Ground Pressure (std)	168 kPa (24.4 psi)
Hydraulic Main Pump Flow	4 x 450 L/min (119 gal/min each)
Hydraulic Operating Pressure	32 MPa (4,640 psi)
Fuel Tank Capacity	1,800 L (476 gal)