High Efficiency Excavator - Official Technical Overview & Datasheet

EXECUTIVE SUMMARY

The global construction, mining, and agricultural sectors face persistent pressure to reduce operating costs while maximizing throughput. The new High Efficiency Excavator series directly addresses this challenge through an integrated design philosophy that merges high-strength structural platforms with variable-speed electro-hydraulic control logic. Targeting contractors, quarry operators, and large-scale agricultural developers, this machine line delivers a documented 18-24% reduction in fuel consumption per cubic meter moved compared to previous generation excavators.

Built upon a fully optimized powertrain and smart hydraulic management system, the High Efficiency Excavator provides consistent breakout force and cycle times without wasteful energy dissipation. Whether loading haul trucks at a mine site, digging foundations in urban construction, or maintaining drainage networks on farmland, the platform adapts its power delivery in real time. The result is lower total cost of ownership, extended component life, and measurable emissions reduction without sacrificing operator productivity or machine durability.

STRUCTURAL INTEGRITY & POWERTRAIN

The chassis utilizes high-tensile HB400 and HB500 steel grades for the upper frame, track frames, and boom mounting brackets, with reinforced casting nodes at all high-stress pivot points. Undercarriage components feature induction-hardened pins, double-flanged track rollers, and sealed-and-lubricated track chains rated for 12,000 hours of severe-duty service life. ROPS/FOPS certified cab structure integrates with the main frame via viscous isolation mounts to reduce vibration transmission.

Power is supplied by a turbocharged diesel engine meeting EPA Tier 4 Final / EU Stage V emission standards (Isuzu 6HK1 or Cummins QSB6.7, market dependent). The engine operates at a reduced rated speed of 1,850 rpm while maintaining net power of 210 kW (282 hp) through advanced common-rail

injection and a maintenance-free diesel particulate filter (DPF) with passive regeneration. The variable displacement axial piston main pumps deliver 2 x 280 L/min at 34.3 MPa, coupled with a load-sensing closed-center hydraulic system that reduces flow when no control input is detected. An electronically controlled cooling package with on-demand fan drive further reduces parasitic power loss by up to 8% under partial loads.

KEY FEATURES & OPERATOR COMFORT

- LOAD-SENSING HYDRAULICS WITH AUTO IDLE STOP: The hydraulic control valves monitor actuator demand across all circuits. When joysticks are in neutral for more than 4 seconds, engine speed automatically drops to 950 rpm. After 10 minutes of inactivity, the system initiates auto shutdown. This reduces fuel consumption by up to 14% in typical mixed-cycle digging.

- ROPS/FOPS CERTIFIED INTELLIGENT CAB: The pressurised cab (ISO 12117-2) features dual-pane bonded glass, a heated air-suspension seat with adjustable armrests, and a 10-inch high-brightness touchscreen display. Full-color camera views (rear, right side, and bucket camera options) eliminate blind spots, and automatic climate control maintains cab pressure to repel dust.

- SMART WORK MODE MANAGER: Operators select from six preset modes (Power, Standard, Economy, Lift, Breaker, and Attachment) or allow the machine

to self-select using the Auto Power Optimizer. The system monitors boom, arm, bucket pressures, and swing acceleration, then continuously adjusts pump flow and engine torque curve match without operator intervention.

- GREENSHOOT TELEMETRY & DIAGNOSTICS: Factory-installed telematics module transmits real-time fuel rate, hydraulic oil temperature, filter restriction, and productivity data (cycles per hour, idle time percentage). Fleet managers receive predictive maintenance alerts, geofence violation reports, and component wear trends via web dashboard or mobile app.

- MODULAR SERVICE ACCESS: All daily service points (engine oil dipstick, fuel/water separator, coolant reservoir, and air filter restriction indicator) are grouped at ground level on the right-side service platform. Swing-out coolers and a hydraulically assisted tilting cab provide unrestricted access to main pumps, control valves, and DPF for major servicing.

COMPLIANCE & SAFETY STANDARDS

The High Efficiency Excavator series holds full certification for global markets: CE marking (European Directive 2006/42/EC), EPA Tier 4 Final (USA), EU Stage V (Europe), ISO 9001:2015 manufacturing quality system, and ISO 14001 environmental management. Safety certifications include ROPS/FOPS cab to

ISO 12117-2:2008, operator protective guard (OPG) Level II to ISO 10262, and falling object protective structure (FOPS) Level I. The machine also complies with AS 2958.1 (Australia) and GB/T 9139 (China) for hydraulic excavator technical requirements.

Additional safety systems include: secondary pilot-operated parking brake, boom and arm hydraulic holding valves, swing brake with automatic engagement, travel alarm (reversing camera with object detection optional), and emergency engine stop at ground level. All hydraulic hoses meet SAE 100R2 and ISO 18752 specifications with burst protection sleeves on all boom and arm circuits.

TECHNICAL SPECIFICATIONS

The following standard specifications refer to the HE400 model (40 metric ton class) with standard 6.5 m boom, 3.0 m arm, and 1.8 m3 heavy-duty bucket. Values may vary by configuration, track shoe width, and attachment type.

<table border='1' style='border-collapse: collapse; width: 100%;'><tr><th style='padding: 8px; text-align: left; background-color: #f2f2f2;'>Parameter</th><th style='padding: 8px; text-align: left; background-color: #f2f2f2;'>Specification</th></tr><tr><td style='padding:

8px; border: 1px solid #ddd;'>Engine Model</td><td style='padding: 8px; border: 1px solid #ddd;'>Isuzu 6HK1 (or Cummins QSB6.7)</td></tr><tr><td style='padding: 8px; border: 1px solid #ddd;'>Net Power</td><td style='padding: 8px; border: 1px solid #ddd;'>210 kW / 282 hp @ 1,850 rpm</td></tr><tr><td style='padding: 8px; border: 1px solid #ddd;'>Operating Weight</td><td style='padding: 8px; border: 1px solid #ddd;'>38,200 - 41,500 kg</td></tr><tr><td style='padding: 8px; border: 1px solid #ddd;'>Bucket Capacity (SAE heaped)</td><td style='padding: 8px; border: 1px solid #ddd;'>1.6 - 2.1 m³</td></tr><tr><td style='padding: 8px; border: 1px solid #ddd;'>Main Pump Flow</td><td style='padding: 8px; border: 1px solid #ddd;'>2 x 280 L/min</td></tr><tr><td style='padding: 8px; border: 1px solid #ddd;'>Max Pressure (Implement / Travel)</td><td style='padding: 8px; border: 1px solid #ddd;'>34.3 MPa / 34.3 MPa</td></tr><tr><td style='padding: 8px; border: 1px solid #ddd;'>Swing Speed</td><td style='padding: 8px; border: 1px solid #ddd;'>9.8 rpm</td></tr><tr><td style='padding: 8px; border: 1px solid #ddd;'>Travel Speed (High / Low)</td><td style='padding: 8px; border: 1px solid #ddd;'>5.5 / 3.3 km/h</td></tr><tr><td style='padding: 8px; border: 1px solid #ddd;'>Fuel Tank Capacity</td><td style='padding: 8px; border: 1px solid #ddd;'>620 L</td></tr><tr><td style='padding: 8px; border: 1px solid #ddd;'>Hydraulic Tank Capacity</td><td style='padding: 8px; border: 1px solid #ddd;'>210 L</td></tr><tr><td style='padding: 8px; border: 1px solid

#ddd;'>Ground Clearance</td><td style='padding: 8px; border: 1px solid #ddd;'>510 mm</td></tr><tr><td style='padding: 8px; border: 1px solid #ddd;'>Tail Swing Radius</td><td style='padding: 8px; border: 1px solid #ddd;'>3,030 mm</td></tr></table>

For metric ton class variants (HE300 - 30 ton, HE500 - 50 ton), dimensions and capacities scale proportionally with identical powertrain architecture and operator environment.