

Mini Excavator - Official Technical Overview & Datasheet

EXECUTIVE SUMMARY

Engineered for the intersection of brute force and spatial economy, the new-generation Mini Excavator series redefines expectations for the 0.8 to 6.0 metric ton compact class. Designed specifically for urban construction, residential grading, narrow agricultural trenching, and underground mining support, this platform delivers dig forces traditionally reserved for larger machines while maintaining the ability to pass through standard doorways or load into a pickup bed. The primary value proposition is simple: maximum material moving capacity per square inch of jobsite footprint.

For fleet managers and owner-operators, this series eliminates the historical trade-off between compact size and breakout power. Advanced variable displacement piston pumps couple with a power-boost function to provide instantaneous hydraulic response when bucketing into hard clay or fractured rock. Whether excavating foundation footings in a city alley, clearing orchards, or backfilling utility lines, the machine achieves zero-tail-swing (ZTS) or reduced-tail-swing (RTS) configurations to protect operators and adjacent structures. This is not merely a scaled-down excavator; it is a purpose-built precision tool.



STRUCTURAL INTEGRITY & POWERTRAIN

The chassis begins with high-tensile strength DOMEX 700 MC or equivalent wear-resistant steel (yield strength up to 700 MPa) for the upper frame, undercarriage track frames, and boom foot. All pivot points feature induction-hardened bushings with chromium carbide overlay to prevent ovalization after 5,000+ hours of hard digging. The main track frame uses a box-section design with internal cross-members, eliminating flex during heavy offset digging or crane lifting operations.

Engine options center on liquid-cooled, turbocharged diesel units meeting EPA Tier 4 Final / EU Stage V: either the Isuzu 4LE2X (power range 35–55 HP) or the Perkins 403F-15T for global markets. Each engine integrates a self-regenerating diesel particulate filter (DPF) requiring zero parked regens during normal duty

cycles. The hydraulic powertrain deploys a dual-pump, closed-center load sensing system (maximum pressure 3,650 PSI / 251 bar) with separate swing and travel circuits. A variable displacement axial piston pump delivers primary flow up to 23.8 GPM (90 L/min) for arm and bucket functions, while a gear pump supplies pilot control and cooling circuits. This architecture reduces hydraulic fluid operating temperature by 15 °C compared to open-center competitors.

KEY FEATURES & OPERATOR COMFORT

- Load-Sensing Hydraulic with Auto Power Boost: Electronic horsepower control continuously matches pump flow to engine load. When digging resistance exceeds preset threshold, the system automatically increases relief pressure to 3,800 PSI for 8 seconds, delivering 12% more breakout force without engine stall.

- ROPS/FOPS Level II Certified Cab: Four-post reinforced canopy (ISO 3471:2008 for ROPS, ISO 3449:2005 Level II for FOPS) protects against overhead falling debris and rollover. Cab interior includes adjustable wrist rest, proportional auxiliary thumbwheel, and a suspended vinyl/cloth seat with three-dimensional isolation. Available sealed pressurized cab option with hot gas defrost and 12V DC power port.

- Smart Control Panel & Telematics: 5-inch LCD full-color display with anti-glare glass provides real-time fuel rate, hydraulic temperature, active DPF soot load, and maintenance countdowns. Integrated modem transmits machine health, geofence alerts, and unauthorized usage to fleet portal. Bluetooth connectivity for smartphone audio and hands-free calling.

- Angled Boom & Dozer Blade Synchronization: Boom swing of 80° left / 60° right (without repositioning tracks) allows digging flush against walls. Proportional control of 10.6-inch (270mm) hydraulic dozer blade with float position — blade pressure sensors link to implement hydraulics to stabilize machine during offset digging, reducing track lifting by 40%.

- Retractable Under carriage & Track Options: Steel tracks with triple grousers standard; rubber track pads or full rubber bands optional for pavement work. Telescoping under carriage (expandable from 980mm to 1,280mm track width on select 3.5T models) provides transport width stability combined with job site stability.

COMPLIANCE & SAFETY STANDARDS

The Mini Excavator series is fully certified to ISO 9001:2015 manufacturing

standards and CE marked (Machinery Directive 2006/42/EC). Engine emissions compliance: EPA Tier 4 Final (USA), EU Stage V (Europe), and Korea Tier 4, with equivalents for China Non-Road Stage IV and Japan MLIT. Operator safety certifications include ISO 12100:2010 risk assessment, ISO 21281:2015 for ingress/egress, and SAE J1659 hand control reference points. All European market units feature audible travel alarm, reversing camera with night vision, and automatic swing brake engagement when pilot pressure drops below 250 PSI. A secondary retention system (SAE J386) is standard for the operator seat. Fire suppression system ready ports integrated into the engine bay wiring harness (no drilling required for aftermarket systems). The machine meets ANSI/SAE standard for hydraulic fitting burst resistance at 4x working pressure.

TECHNICAL SPECIFICATIONS

The following parameters represent the nominal values for the mid-size model (nominal 3.5 metric ton class) within the Mini Excavator series. Actual values may vary with track type, cab configuration, and optional attachments.

Parameter	Specification
Engine Model	Isuzu 4LE2X (Turbocharged, Intercooled)
Gross Power	48.2 HP (35.9 kW) @ 2,200 rpm

Operating Weight (Cab)	7,716 lb (3,500 kg)
Operating Weight (Canopy)	7,385 lb (3,350 kg)
Bucket Digging Force (SAE)	6,812 lbf (30.3 kN)
Arm Digging Force	4,269 lbf (19.0 kN)
Hydraulic Flow (Main)	23.8 GPM (90 L/min) @ 2,200 rpm
Max Breakout Pressure (Boost)	3,800 PSI (262 bar)
Max Dig Depth	11 ft 2 in (3,405 mm)
Max Dump Height	12 ft 1 in (3,685 mm)
Tail Swing Radius (ZTS config)	0 in (0 mm) - zero tail
Ground Clearance	9.8 in (250 mm)
Fuel Tank Capacity	11.2 gal (42.5 L)
Hydraulic Tank Capacity	6.6 gal (25 L)
Swing Speed	9.3 rpm
Travel Speed (High / Low)	2.8 / 1.5 mph (4.5 / 2.4 km/h)