Mining Truck

T 282 C

Gross Vehicle Weight (GVW):	600 t / 661 ton
Payload Class:	363 t / 400 ton
Empty Vehicle Weight (EVW):	237 t / 261 ton





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Productivity

The Liebherr T 282 C mining truck is designed for reduced cycle time and to have the highest payload to empty vehicle weight (EVW) in its class. After years of research and innovation, this mining truck operates with less down time than other trucks in its class.

Reliability

Engineered to be strong, durable, and lightweight, the Liebherr T 282 C is custom built for the mining environment and is designed to endure and excel in extreme conditions.

Safety

Liebherr promotes a safe, healthy, and incident-free work environment for both equipment and personnel.

Low Operating Cost

Hauling for less maximizes profitability. This mining truck utilizes the most current technologies in components and software to minimize the overall cost of ownership.

Customer Support

Liebherr provides customers with a complete range of services that deliver the lowest cost of ownership. The company implements the right combination of scheduled and preventative maintenance to allow customers to achieve availability goals.

Vertical Integration

The T 282 C is a Liebherr integrated truck. For optimum reliability and availability, the new T 282 C features many custom-built, in-house systems specifically designed for the mining environment. The vertical integration advances supply chain coordination and facilitates the allocation of resources according to customer needs.



Litronic Plus Control Box

The IGBT technology offers numerous advantages for high power applications. It optimizes the performance and efficiency of the truck, while increasing reliability.



Front Wheels

Designed to work in conjunction with the front suspensions, the front wheels offer superior maneuverability and reduced tire wear.



Front Suspension System

The T 282 C features "Double A-Frame" front suspensions. This concept provides longer vertical wheel travel and less strut travel, resulting in shorter suspension struts. The "Double A-Frame" design contributes to the reduction of operating costs by increasing tire life. The suspension design eliminates side loading on the struts allowing immediate and accurate payload monitoring.



Frame

Welded steel structure with cast components in strategic areas:

- Designed according to international Institute of Welding (IIW) fatigue guidelines
- Hollow box rails with fully welded internal stiffeners
- Critical welds ultrasonically inspected based on American Welding Society (AWS) D1.1
- Lightweight design supports low empty vehicle weight

Vertical Integration





Wheel motors

The AC wheel motors have been specifically designed for mining applications to provide the highest truck reliability.



Rear suspension

The quality of design attenuates loading impact and improves ride with a 20 % longer stroke and 33 % reduction in internal pressure.



Axle box

Designed for durability, the axle box features include front and rear axle doors for service convenience.



Planetary Gear Sets

The planetary gear sets have been utilized on Liebherr trucks since 2004. This proven system has performed in a variety of applications. Its efficient design maximizes the energy transmitted into torque and reduces mechanical losses inside the gearbox.





Litronic Plus Wheel Motors and Planetary Gears

The wheel motors deliver up to 4.474 kW or 6,000 hp. Reduced pressure drops across the motors enhance their cooling capabilities for operation at higher altitudes or at higher ambient temperatures. Multiple gear ratios are available to optimize performance for specific mining applications.





Productivity

The Liebherr T 282 C mining truck combines a high horsepower diesel engine with an efficient Litronic Plus AC drive system to maximize productivity and minimize fuel consumption.

Main components:

- Diesel engine
- Main alternator
- Litronic Plus control box with integrated rectifier and main blower
- Litronic Plus wheel motors and planetary gear sets
- Litronic Plus grid box

Engine

Multiple engine options allow customers the choice to either minimize fuel consumption or meet emissions standards.

Litronic Plus Control Box

Due to its superior cooling capability, the Litronic Plus Control Box outperforms air-cooled circuits in warmer climates and higher altitudes while still providing three-phase AC current to each wheel motor. The engine-speed independent main blower is controlled by a liquid-cooled inverter positioned in the control box for immediate cooling needs. This efficient design reduces fuel consumption and increases reliability.

Litronic Plus Grid Box

The horizontal orientation of the AC blower motor provides better accessibility and increases airflow.

This motor is powered by a liquid-cooled inverter located inside the Litronic Plus control box.



Trolley Capable

A package is available upon request. Consult factory for additional details.





Climate Control

Liebherr automatic climate control provides a comfortable environment for operators:

- Internal cab temperature of 25° C (77° F) can be maintained under a maximum ambient temperature of 50° C (122° F)
- Internal cab temperature of 15° C (59° F) can be maintained under a minimum ambient temperature of -40° C (-40° F)



Reliability

The Liebherr T 282 C is engineered to be strong, durable, and lightweight. This mining truck enables reduced cycle times and offers the highest payload to empty vehicle weight (EVW) ratio in its class.

Litronic Plus Drive System

The IGBT drive system provides a smoother voltage variation which reduces power losses in heat. The reliability of the drive system is enhanced with the use of fewer electrical parts. The unique gate sequencing of the grid box allows an even wear of the grid resistors.

Diagnostics

The Litronic Plus diagnostics system integrates all vital truck components. Engine, drive, and truck diagnostics can be accessed via a single USB or Ethernet "OPC" port. A data storage system is included and can be used for advanced diagnostics. The stored data is accessible through Wi-Fi or remotely via cellular and Low Earth Orbit (LEO) satellites.

A 12-inch color touch screen is provided in the cab for the display of critical systems data, fault codes, and startup sequences. The Litronic Plus diagnostics program detects the exact cause of each fault for greater maintainability.

The Liebherr T 282 C utilizes CANopen operator gauges instead of digital displays. In the event of individual non-vital gauge replacement, the truck is able to continue its operation until service is completed.

Additional space and mounting brackets are available to accommodate optional equipment, such as: dispatch systems, rearview monitor, and two-way radio.



- Dual access to axle box via service and maintenance doors
- AC grid box blower motor accessible from the deck
- Easy access to both sides of engine and main alternator
- Centralized service station conveniently located at ground level
- Sampling points located at or near ground level



Serviceability and Maintainability

- Individually routed fixed piping reducing the length and number of hydraulic hoses
- Single access point for all vital truck systems via in-dash color touch screen
- Litronic Plus diagnostics
- Lighter components
- Multiple tie off points





* Dynamic braking from 64 km/h (40 mph) to 0 km/h (0 mph)
 ** Service brake blending begins at 0,8 km/h (0.5 mph)

Brake Blending

The Litronic Plus IGBT AC drive system utilizes dynamic braking to bring the T 282 C to an almost complete standstill of 0,8 km/h (0.5 mph).

The brake blending system automatically applies the hydraulic dry disc service brakes to bring the truck to a complete stop.



Safety

Liebherr promotes a safe, healthy, and incident-free work environment for both product and personnel.

Operator Cab

The ergonomically designed wide cab offers functionality, visibility, and comfort to the operator. The cab complies with all operator seat vibration and noise exposure standards: vibration ISO 2631 and noise ISO 6394.

Visual and audible alarms are activated when the operator door is opened and the parking brake is not applied.

Increased operator protection is achieved with the addition of a safety plate underneath the cab. The cab design includes an ISO 3471 compliant integrated ROPS.

Braking System

The braking of the truck is performed by dynamic braking. The system is virtually wearfree, resulting in less replacement parts.

The emergency braking is performed by hydraulic dry disc brakes. The hydraulic braking system is split into two separate circuits for front and rear with independent accumulators for each circuit. The system complies with ISO 3450 braking standard. A separate pedal for the service brake is provided for emergency situations.



(*) Service brakes and dynamic braking - actual performance depends on specific conditions such as ground adhesion and truck speed



Park Brake

The spring applied / pressure released park brake is capable of holding a 100% loaded truck on a $\,\pm$ 15% grade.

Speed Control

Speed limits can be set for loaded, unloaded, and dump body up conditions. These include mine-determined speed limits, which are independent of operator input. Dynamic braking speed control is available for downhill operation. It allows the use of operator-set limits to maintain a safe operation.

Anti-Rollback

The anti-rollback function automatically applies the service brakes in forward or reverse when zero speed is required on an incline.

Slip-Slide Control

The Litronic Plus IGBT drive system offers highly advanced slip-slide control. It utilizes a front wheel speed sensor that prevents lock up of rear wheels and allows for reliable dry disc brake blending.





Frame

Liebherr load-management design philosophy increases durability and minimizes Empty Vehicle Weight (EVW). Low EVW is primarily achieved by utilizing castings only in high stress areas of the frame, such as the integrated hoist carriage, cross member, and dump body pivot.

Castings in high stress areas







Low Operating Cost

Hauling more for less is Liebherr's trademark to achieve maximum profitability. Liebherr allows for higher output at a lower operating cost by offering durable, yet lighter equipment.

Less Fuel Consumption

The T 282 C is a fuel efficient truck. Its AC drive system is coupled with a main alternator powered by a high horsepower engine. The drive system provides continuous acceleration and dynamic braking without shifting gears.

By incorporating an efficient load management, the T 282 C requires less operating hours to meet production targets. As a consequence, associated costs are minimized, such as: fuel, tires, labor, spare parts, lubricants and maintenance. The chart below illustrates the operating hours and fuel required of two leading competitors to equal the production seen of the T 282 C at 60,000 hours.



Low Empty Vehicle Weight (EVW)

The new Litronic Plus AC drive system weighs less than both mechanical drive systems and old versions of AC drives. It requires the use of lighter components, which reduces the EVW.

The T 282 C innovative "Stress Flow" design requires lighter steel structures and castings, than other conventional truck frames, while maintaining durability.

Cost Effectiveness of Dry vs. Wet Brake Systems

The T 282 C utilizes dynamic braking. Dry disc brakes are available for emergency situations. The air-cooled dry disc brakes do not require additional oil, pumps, filters, and cooling circuits to operate. Liebherr braking systems comply with ISO 3450 standard and offer the lowest cost per tonne.



Differential Wheel Torque Control

When traveling through a curve, the drive system will automatically adjust the torque of the rear wheel motors in order to maximize traction and minimize tire wear during low speed handling.





On-Site Support

Liebherr provides on-site service support, as well as training for customer maintenance groups. Training classes can be customized to suit specific needs.



LIEBHERR



Liebherr provides customers with a complete range of services that deliver the lowest cost of ownership. The company implements the right combination of scheduled, preventative, and planned maintenance to allow customers to achieve availability goals.



Product Support

Liebherr product support provides the vital interface between the customer and Liebherr. There are different levels of product support available:

- Assembly
 - Maintenance advice
- Troubleshooting assistance
- Technical expertise

Product support personnel work with customers from the assembly of a truck throughout its operating life. Liebherr understands the importance of proper service and support, and will be there for the life of the equipment.



On-Line Support

A LinkOne user-friendly, accurate, and complete electronic parts catalog gives customers access to the original configuration of the truck. This publication viewing system makes information available to assist customers with finding the right part, the first time, every time.

Technical Publications

The technical publications department offers both printed and online manuals. Additional options are available for online manuals.





Performance Indicators

- Liebherr provides key performance indicators (KPIs) to communicate truck fleet performance
- The KPIs are customized to site requirements



Customer Support

Operator and Field Service Technician Training

The training program consists of a three-level competency-based blended training.

- Level 1 General web-based technical skills training
- Level 2 Product-specific web-based technical training
- Level 3 Product-specific hands-on troubleshooting technical training

Advantages of Liebherr's technical training strategy:

- Customer focused 24/7 access to technical training (just-in-time training)
- Minimizes employee time off the job
- Maximizes effectiveness of classroom training time
- Reduces customer's overall training costs
- Provides customers with mechanism for recording and tracking employee training

Parts Support and Logistics

The proactive forecasting for global fleet requirements optimizes inventories and logistics to ensure prompt response to any parts requirements:

- · Continuous two-year forecasting
- 24/7 on-call service
- Inventory planning and management
- · Global and real-time inventory data tracking system

Component Rebuild Program

Condition-based monitoring maximizes major component life while avoiding unplanned failures. Rebuilds are conducted by certified repair shops using best practices, ensuring that the life and reliability of rebuilt components match new component performance expectations.

Product Upgrade Programs

The operating life of the Liebherr T 282 C can be extended and optimized by upgrading any of its systems or components as advances in technology, innovations in design, and improvements in manufacturing techniques occur.



Forecasting Tool

- Continually updates the estimated life of a major component based on algorithm analyses of hours at the time of replacement
- Provides accurate forecasted life to ensure that a major component's spare is available when needed
- Inventory planning takes in consideration the spare parts needed for scheduled maintenance and component rebuild projects

Technical Data



Model

Gross horsepower @ 1,800 rpm
No. of cylinders
Displacement
Wet weight
Crankcase
Cooling system

Model

Model

Gross horsepower @ 1,900 rpm
No. of cylinders
Displacement
Wet weight
Crankcase
Cooling system
Fan clutch Air cleaners
Radiator
Starter
Roll out power module
Batteries

MTU 20V4000 C23 Tier II 2.800 kW / 3,750 hp 20 95.4 I / 5822 in³ 12.020 kg / 26,5000 lbs

335 I / 88 gal 1.060 I / 280 gal MTU 20V4000 C22 Tier 1

2.722 kW / 3,650 hp 20 90 l / 5,490 in³ 10.480 kg / 23,100 lbs 390 l / 103 gal 870 l / 230 gal

Cummins QSK 78 2.610 kW / 3,500 hp

18 78 | / 4,735 in³ 11.300 kg / 24,912 lbs 295 | / 78 gal 721 | / 191 gal

Variable speed, temperature controlled Two units with 2 elements per unit with electronic restriction monitoring in the cab Mesabi flexible core Electric

Radiator, engine and main alternator, mounted on roll out sub frame 6 x 12 Volt, (3 series of 2), 1,200 CCA each at -18° C (0° F), 1,475 CCA at 0° C (32° F) Braking Systems

Electric dynamic braking , forced air over quiet stainless steel resistor grids with dry disc service and secondary braking system.

Electric dynamic braking	Max: 4.500 kW / 6,035 hp
Extended speed range	Full dynamic braking down to Zero. Automatic brake blending with service brakes from 0.8 kmh / 0.5 mph to zero
Dynamic braking speed control	Operator adjustable, automatically limits truck speed on downhill grade when set
Adjustable speed limits	Automatic speed limits for empty and loaded truck adjustable for site requirements
Traction control	Computer controlled in propel and dynamic braking, forward and reverse, all wheel speed sensing
Service brakes front	Single disc, wheel speed, five calipers per wheel
Service brakes rear	Dual discs per side, one caliper per disc, armature speed
Hydraulic accumulators	2 x 7.6 I / 2 gal, separate accumulator for front and rear axle (Piston type)
Park brakes	Spring applied, pressure released, one caliper per each rear disc
Filtration	Cleanliness level ISO 15/13/11

Steering

Ackermann center point lever system, full hydraulic power steering with accumulator safety backup. Isolated from dump hydraulic system. Two double acting hydraulic cylinders.

Hydraulic accumulator	170 l / 45 gal (Piston type)
Filtration	Cleanliness level ISO 15/13/11
Turning radius (ISO 7457) -	
Tire centerline	15.81 m / 51' 10"
Vehicle clearance radius (ISO 5010) _	19,95 m / 65' 5"

Dump System

Two double stage, double acting hoist cylinders with inter stage and end cushioning in both directions. Electronic joystick with full modulating control in both extend and retract.

Dump angle	49° (45° with optional kick-out switch)
Cycle times	56 seconds
Remote dump	Quick disconnects for external power dumping (buddy dump) accessible from ground level
Filtration	High pressure filtration and return line filtration. Cleanliness level ISO 18/16/13

Suspensions

Front _____

Rear _____

Double A-Arm with inclined king pin pivot, spindle, and nitrogen over oil suspension struts with integral damping

Three bar linkage comprised of triangular upper link plus two bottom drag links and nitrogen over oil suspension struts with integral damping

Consult factory for other engine options

Electric Drive System

Manufacturer	Liebherr - Litronic Plus AC drive system (IGBT)
Main alternator	AC brushless, direct drive
Wheel motors	Litronic Plus AC induction motors
Gear ratio	Standard 43.7 to 1 - haul profile dependant
	Optional 37.33 to 1 - haul profile dependant
	Optional 53.33 to 1 - haul profile dependant
Max Speed	Standard 54 km/h / 34 mph
Cooling fan	Optional 64 km/h / 40 mph
	Optional 45 km/h / 28 mph
	Variable speed AC motor with twin impeller radial cooling fans



41" x 63" bolt on rims Michelin 56/80 R63 or Bridgestone 59/80 R63

Body

Body Sizes are custom designed to fit customer requirements and specific application. Please contact factory for options.

Tires

Technical Data





Payload	363 t / 400 ton
Gross Vehicle Weight (GVW)	600 t / 661 ton
Chassis weight *	195 t / 215 ton
Body weight	Custom for each mine
Frame capacity **	412 t / 454 ton
Weight distribution	Empty - front 50 % / rear 50 % Loaded - front 33 % / rear 67 %

* depends on options fitted

** total weight of body and payload, subject to chassis weight



Deluxe cab with intergrated ROPS and double wall design for optimum insulation. Fully adjustable air suspension operator seat with double lumbar support and full size second seat for training requirements. Operator comfort controls include a tilt and telescoping steering wheel, heater, defroster and standard AC. Real-time vital truck information is easily displyed to the operator and also recorded for download.



Cab designed to ISO 6394 1998 - 75 dB(A)





Fuel tank	5.351 I / 1,414 gal
Hydraulic dump circuit - Tank - System	1.302 /344 gal 1.514 / 400 gal
Hydraulic brake and steering - Tank - System	924 I / 244 gal 1.060 I / 280 gal
Planetary gear sets, each (2)	280 I / 74 gal
Front wheels, each (2)	60 I / 16 gal
Grease tank	54 kg / 120 lb



Note: All measurements assuming unloaded using 56/80R63 tires. Loading height dependent on final dump body design.

Performance Curves



Performance Chart Parameters

Gross Power	_ 2.796 kW (3,750 hp)
New Power	_ 2.610 kW (3,500 hp)
Tire size	_ 56/80 R63
Gear ratio	_ 43.7 to 1
Reference curves	A: Propulsion B: Retard

Note

The propulsion curve is calculated using net horsepower therefore site specific and climatic variables will have an effect on the parasitic loss estimations.

Standard Equipment



Standard Equipment

- Access ladders 45° diagonal stair (drivers side access) with two side ladders with flexible step
- Access lights 3 x ladder, 1 x superstructure
- Accumulators 1 x steering 170 L / 45 gal.
 2 x brakes 7,6 L / 2 gal (split front & rear brake system)
- Air cleaner dust ejectors automatic
- Air cleaner indicators
- Anti-roll back in forward and reverse
- Axle box dual entry service access and rear air exhaust
- Batteries 6 x 12 V wired in series / parallel
- Battery box lockouts ground level, battery, propel and starter
- Brake warning lights (cab mounted) dynamic brake and service brake (LED)
- Brakes dynamic braking with automatic hydraulic brake blending and emergency hydraulic service brakes
- Catwalk right and left side of engine
- · Centralized service station ground level, driver side, with fuel gauge
- Climate control combined heater and air conditioner with multiple air ducts and filtered air
- Color white / grey
- Cup holder 2 x center console mounted
- Drive system Litronic Plus liquid-cooled IGBT and grid box control w/ Litronic Plus AC wheel motors
- Electric starter
- Electrical system 24 VDC
- Emergency stops in-cab and ground level
- Engine fan low rpm with clutch
- Exhaust side mounted mufflers with insulated exhaust pipes
- Fire extinguishers 2 x hand held extinguishers
- Gear ratio 43.7 to 1
- Grease system automatic lubrication system
- Litronic Plus Grid box resistor grid control system and variable AC grid box blower motor
- Headlights (HID) 4 x high beam, 4 x low beam
- Hydraulic coolers 1 x hoist system, 2 x planetary gear sets gear oil
- Hydraulic filters high pressure and return line brake,
- steering and hoist with electronic monitoring

Optional Equipment

Optional Equipment

- Access ladder retractable stair
- Accumulators MDG 15 certified
- Battery isolation double pole with critical system bypass
- Centralized service station off driver side mounted
- Cold climate engine heater
- Color Liebherr yellow/grey
- Cornering lights (HID) 2 x forward facing superstructure mounted
- Dump body liners, heated, tailgates, rock deflectors
- Fire suppression system
- Fog lights (HID) 4 x bottom radiator mounted
- Gear ratio 37.33 to 1
- High altitude / high cooling package
- Hoist limit 45° hoist kick out switch
- Protection plates belly pan, hydraulic tank, steering idler lower grease line

- Mirrors driver side (flat), off driver side (convex) and access ladder (convex)
- · Mud flaps front and rear of hydraulic and fuel tanks
- Park brake spring applied pressure release
- Payload display 2 x superstructure mounted
- Power outlets 12 VDC and 115 VAC
- · Power windows driver and passenger
- Pressurized cab with fan on
- Radiator with header tank level gauge
- Radio ready wiring, speakers and DIN fitting
- Rear Wheel Drive Litronic Plus planetary gears and wheel motors
- Recovery points front and rear
- Recovery system auxiliary connectors for brake, steering and hoist "buddy system"
- Reverse alarm
- Reverse lights 2 x axle box, 1 x drivers side superstructure
- Rims bolt on front and rear
- Rock ejectors bar type
- ROPS integrated
- Seat belt 3 point 50mm / 2 inch wide
- Seats fully adjustable driver and passenger seats with air suspension
- Service access ladders right and left engine bay ladders
- Service lights 2 x engine bay and 2 x axle box (LED)
- Shut off valves brake and steering, hoist and fuel tank with electronic monitoring
- Sight gauges brake, steering, hoist, radiator tanks and front wheel hub
- Steering wheel tilting and telescopic with center operated horn
- Sun visors 2 x windshield sun visors and 1 x driver door mounted pull-down blind
- Systems interface Can Open, Ethernet (OPC), Wi-Fi, USB
- Tie off points multiple personnel tie off points
- Touch screen Large 12" dimmable color touch screen with operator information and warning
- Truck lights tail, brake, dynamic brake and indicators (LED)
- Windows tempered and tinted glass
- Windshield laminated and tinted glass
- Wipers two speed electric and intermittent with self park and dual wiper arms

- Reverse light (HID) off driver side superstructure
- Rims double gutter bolt on
- Rise topper lights (HID) 2 x top radiator mounted
- Rock ejectors chain type
- Service access ladders Off driver side and driver side engine bay and hydraulic tank ladders with fold up
- Service lights 2 x rear engine bay (LED)
- Sound attenuation package
- Special language decals
- Trolley capable
- Video cameras and monitors Off driver side and reverse

Standard and optional equipment subject to change at the discretion of the manufacturer.

Please contact your local representative for further information.

The Liebherr Group of Companies



Wide Product Range

The Liebherr Group is one of the largest construction equipment manufacturers in the world. Liebherr's high-value products and services enjoy a high reputation in many other fields. The wide range includes domestic appliances, aerospace and transportation systems, machine tools and maritime cranes.

Exceptional Customer Benefit

Every product line provides a complete range of models in many different versions. With both their technical excellence and acknowledged quality, Liebherr products offer a maximum of customer benefits in practical application.

State-of-the-art Technology

To provide consistent, top quality products, Liebherr attaches great importance to each product area, its components and core technologies. Important modules and components are developed and manufactured in-house, for instance the entire drive and control technology for construction equipment and mining trucks.

Worldwide and Independent

Hans Liebherr founded the Liebherr family company in 1949. Since that time, the enterprise has steadily grown to a group of more than 120 companies with over 35,000 employees located on all continents. The corporate headquarters of the Group is Liebherr-International AG in Bulle, Switzerland. The Liebherr family is the sole owner of the company.

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