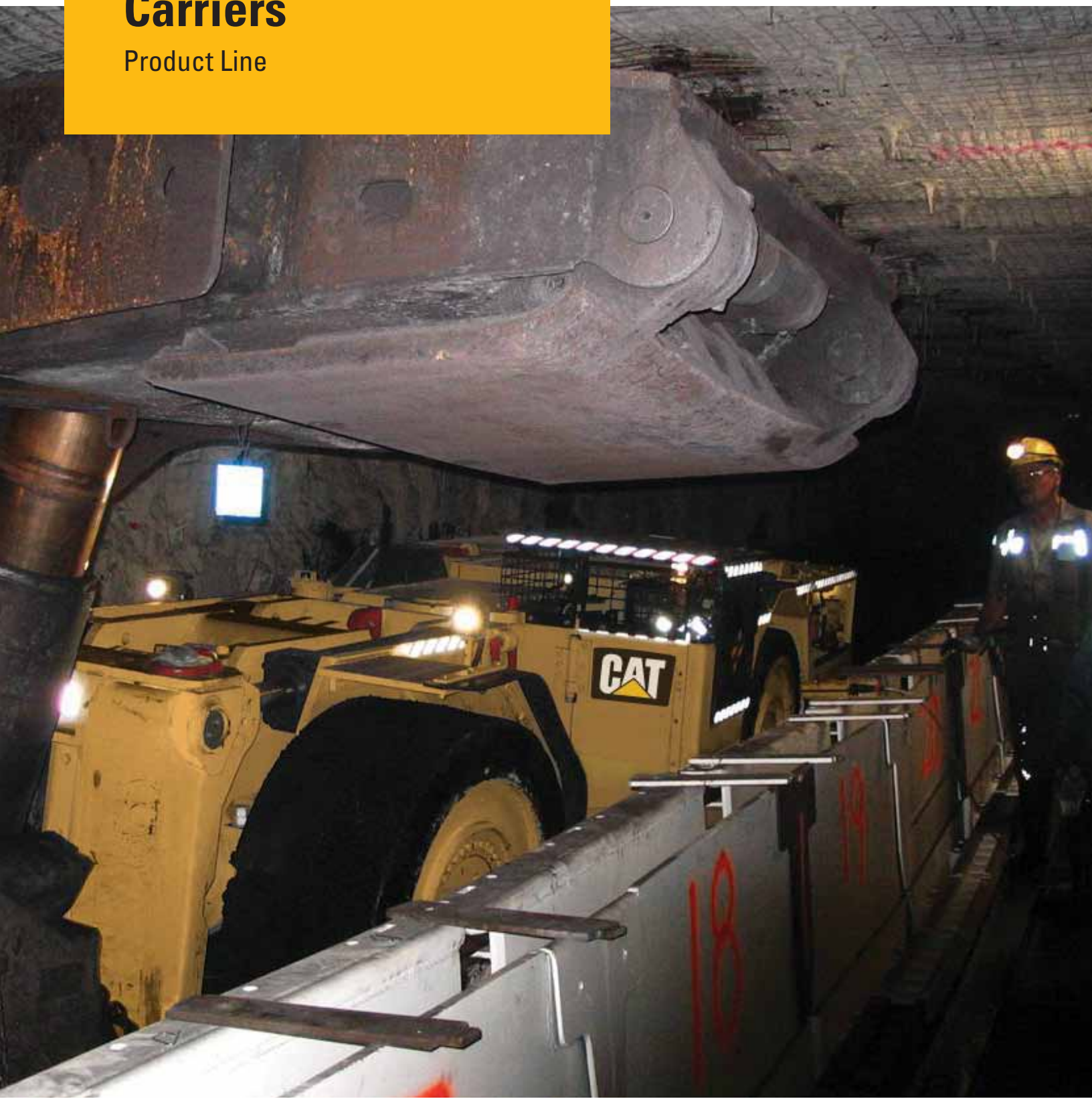
Roof Support Carriers

Product Line



Packed with Power

Longwall moves represent an enormous challenge to underground transportation logistics due to many variables, such as the height and width of roadways, the radius of bends, and the various types of ground conditions. Caterpillar offers a full range of roof support carriers to meet the needs of our customers' operations.

Development and Design

As the world's leading supplier of longwall technology, Caterpillar has always taken great care to design and manufacture the best longwall movers available. Our outstanding experience in the development and design of rubber-tired vehicles has contributed to the success of our four-wheel roof support carriers.

After studying operations all over the world, we have selected the best concepts and designs for the varying conditions and regulations encountered in underground coal mines.

Caterpillar offers a range of roof support carriers designed to provide maximum lift and carrying capacity at dimensions adequate for our customers' different mine layouts and for various transportation tasks such as maneuvering and positioning roof supports in the longwall face and transporting roof supports from one face to another.

SH650 – Every Cat® roof support carrier is capable of carrying loads heavier than its own weight.

Smart Move

The Cat® range of battery- and diesel-powered roof support carriers meets all the requirements that could be encountered in longwall moves around the world.

Each vehicle focuses on specific conditions of mine layouts, geology, the load to be carried, and safety and emissions regulations.

All Cat roof support carriers have one thing in common: They are built to meet both current and future requirements in longwall moving by providing a combination of compact power, capacity, maneuverability, long-term availability, and efficiency.

The Clean Air Act

Cat battery-powered roof support carriers do not burden your mine's ventilation with emissions or heat. Due to infinitely variable power control, they are the ideal vehicle for the installation or removal of longwall roof supports where heat, emissions and noise would impact work and where a flexible vehicle is needed.

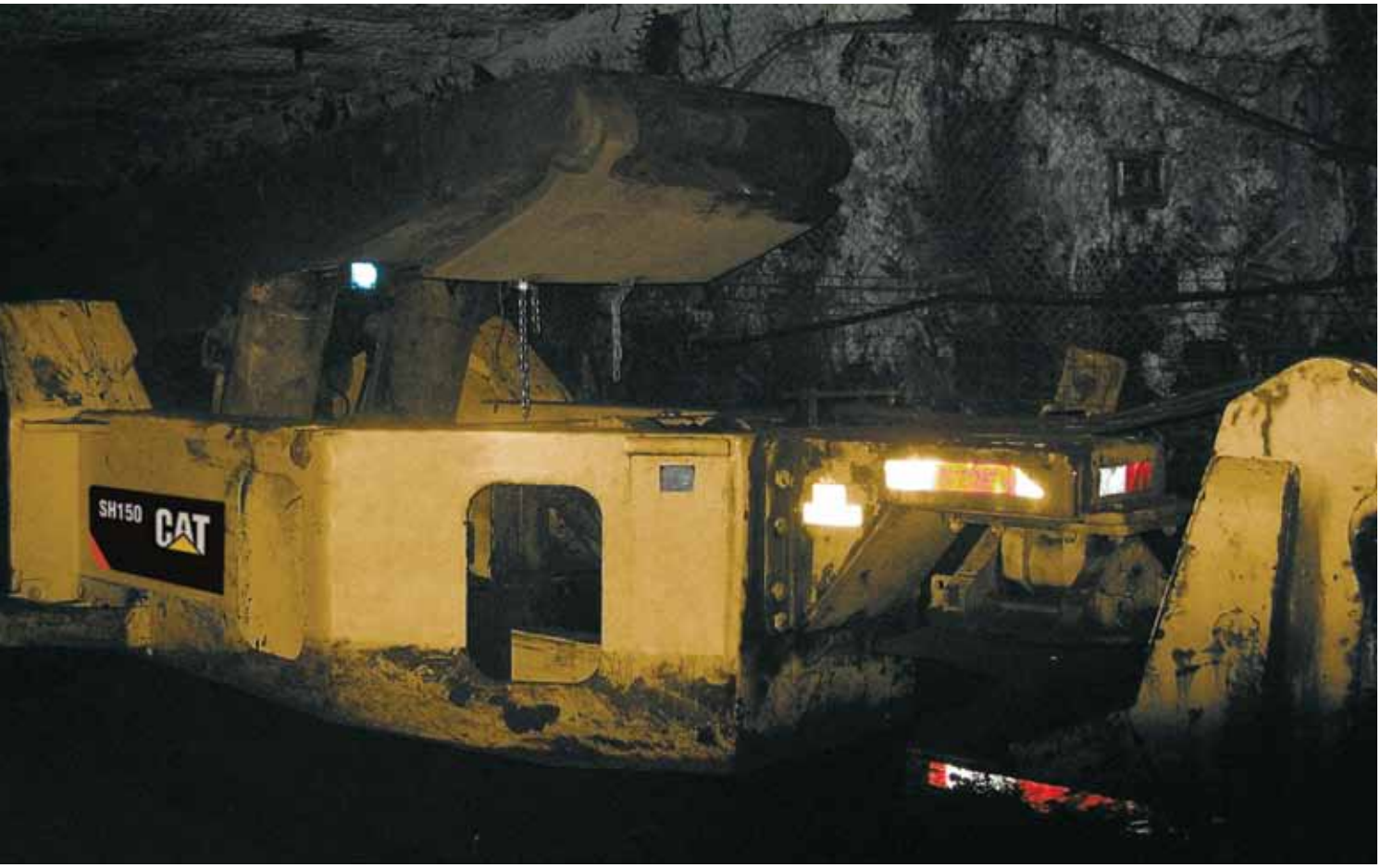
As the world leader in battery-powered vehicles and longwall systems for the underground mining industry, we take pride in providing the world's most advanced battery-powered roof support carriers. Innovative solutions in power control and transmission contribute to utilizing battery power to the max.

The battery-powered SH630

Diesel for Endurance

Cat diesel roof support carriers incorporate the most efficient engines and powertrains available while boasting the lowest level of general body air emissions amongst underground diesel vehicles. Many proprietary developments – such as dry scrubber and wet bath exhaust systems with diesel particulate filtration and horizontal or vertical configuration cooling radiators – make Cat diesel roof support carriers a safe and powerful solution for your longwall move. They can move any roof support over any distance and over various roadway conditions with speed and efficiency.

Diesel roof support carrier SH660 D



The Power You Need

A combination of Cat battery- and diesel-powered vehicles can offer the ideal solution for longwall installations and moves.

Battery-powered roof support carriers can position or remove roof supports from old and new faces. The operator benefits from their superior versatility, tight cornering, tractive effort control and maneuverability on uneven ground. Battery-powered vehicles do not negatively impact the working environment with emissions or noise.

Diesel-powered roof support carriers carry your roof supports the full distance at maximum speed and lowest cost. Diesel equipment is a good option for new longwall installations as they do not require electrical infrastructure such as cabling and charging stations and can operate at higher speeds over long distances, up steeper gradients and over rougher terrain – conditions not suitable for battery-powered vehicles.

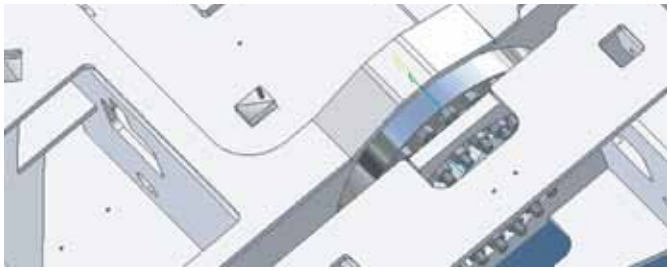
Battery Power for Versatility

Cat battery-powered roof support carriers make longwall face moves simpler and less costly. The specially engineered ultra-heavy-duty vehicle range builds on the knowledge of many years of operational experience. The electric drive concept gives operators the best control of power and maximum torque capabilities at low speeds. Zero emission of noxious gases and low emissions of heat and noise make the carrier range operator-friendly and easy to work with. They are the ideal utility vehicle for longwall moves.

SH650

Stability and Traction

Cat roof support carriers have a tri-sectional chassis with dual motors located near the axles. The rear drive axle and the battery lift are incorporated into a single oscillating entity at the rear. This gives the carrier extra stability, even when handling loads equal to the empty vehicle weight. As load motion is independent of the rear frame, this design provides extra load handling stability, especially on uneven ground or while maneuvering and positioning roof supports. It also improves traction, as wheels remain in contact with the ground with the weight of the battery over them.



Tri-sectional chassis

Dual Tram Motors

The dual-motor concept eliminates 33% of driveline components, meaning there is no troublesome driveline through the articulation joint.

Battery Competence

Caterpillar has developed unparalleled experience and expertise in the design of batteries and battery changing systems. Current 2 000 Ah batteries enable maximum performance at peak loads as well as lasting performance throughout the shift. Battery capacities and vehicle designs are field-proven and are adapted to actual work schedules and longwall move experience.

The Cat East Penn battery is built for the long run, providing the lowest cost of ownership in the industry. Specially formulated premium-grade lead oxide is used in the flat plate design and each plate is individually formed prior to cell assembly. This ensures uniform performance and maximization of amp-hour capacity. State-of-the-art computerized equipment is utilized in every phase of the production process and stringent quality checks are made on each battery to ensure the highest level of performance.

Maximum Battery Efficiency

The Cat IGBT control makes the most of battery power. It translates to variable speed and tractive effort at the varying intervals. This allows battery power to be controlled with maximum precision and efficiency.

Optional VFD

The latest Caterpillar innovation is the HiPAC 10 VFD control system, which drives the motive traction and hydraulic systems and provides the operator with machine management information.

The HiPAC 10 is a DC-to-AC variable frequency inverter control that drives high-performance AC electric motors, which have superior speed-torque characteristics. It is up to 14% more efficient than traditional DC motors. This means higher loaded tram speeds, more responsive hydraulic functions and more material hauled per battery charge. The HiPAC 10 machine management system speeds fault diagnosis, allowing rapid repairs and maximizing uptime. The new user interface can display information such as drive unit temperatures and distance traveled per battery charge.

The optional Cat control stick gives the operator intuitive control over steering and other functions. It also gives quick access to monitoring and self-diagnosis of the vehicle's functions.

Battery-powered Roof Support Carriers

SH620

The new 20-tonne (22 ton) SH620 is the smallest model. It provides customers with more options to ensure the right size vehicle for their operation.

SH620

SH630

The SH630 is a versatile and reliable solution for loads up to 33 tonnes (36 tons). It has been the market leader in capability for many years. The SH630 is in service in major mining operations in the United States and China.

SH630

SH650

With its 45-tonne (50-ton) lift capacity, the SH650 can handle almost any piece of equipment in a longwall move, including heavier ancillary equipment. The enhanced design provides 140% of the lift capacity of its predecessors in the same dimensions.

In addition to the tri-sectional frame and 100-degree articulation for enhanced traction and maneuverability, the SH650 offers improved range of motion of the lift, allowing easier engagement of the load.

SH650

SH650 D

The new SH650 D provides the same tri-sectional design, lift and carry capacity, and maneuverability of the battery powered SH650 with the added power of a diesel power pack.

- Cummins 8.3 179 kW (240 hp) engine
- MSHA Par 7E-A approved

SH650 with optional VFD Drive

- Features Cat HiPAC 10 VFD control system
- Traction motor HP increased by 100%
- Hydraulic drive motor capacity increased by 300%
- Regenerative braking which supplies battery capacity and increases mechanical brake life
- Speed and gradeability increased over the DC powered version brake

SH680

SH680

The SH680 is the latest addition to the Cat battery-powered family. With a payload of 88 tonnes (80 tons) it sets the bar in the market of battery-powered roof support carriers. Powered by 373 kW (500 hp) and variable-frequency drives, this is the largest battery-powered vehicle available for underground applications.

- Minimum operating height: 2 134 mm (84 in)
- Tri-sectional chassis supports superior load handling stability
- Dual four gearhead complete with 74.5 kW (100 hp) tram motors
- Hydraulically operated ground based integral battery change system
- HiPAC 10 dashboard display for battery discharge, machine motor monitoring and diagnostics

Optional Features

- UVR trip circuit breaker
- Hydraulically adjustable cab assembly
- Motor RPM monitoring
- Quick-attach 5 m^3/175 ft^3 utility bucket
- Quick-attach lift plate
- 1 830 mm (72 in) or 2 130 mm (84 in) forged fork assembly
- 20 400 kg (45,000 lb), hydraulic, variable-speed winch
- Cat control stick

Diesel Power for the Long Haul

Diesel-powered equipment is used in nearly all underground mines in various tasks and functions around the world. There are many technical features of Cat diesel vehicles that make them unique in the underground mining industry. Their general body air emissions are one of the lowest in the field, and the fact that they are compact, powerful machines with a small roadway presence and the capability to be used for multiple tasks means a high return on investment.

Proven Yet Improved

Cat diesel vehicles across the product range share industry-proven drive units; diesel engines and other major components from the world's leading OEM manufacturers. We combine this with our own expertise in developing low-emission solutions:

- Particulate filtration system
- Inline purifier catalytic converter
- Zero-smoke dry particulate exhaust system
- New wet scrubber exhaust system
- Posistop brakes for extra safety
- Positorque axles for superior traction
- 4-speed power shift transmission for smooth operation

Flexibility

Cat diesel-powered roof support carriers offer independence and flexibility when you need it most – during longwall moves and reinstallation.

The four-wheel drive and rear engine arrangement are designed to offer high stability and high tractive effort whether loaded or unloaded on the roadway or installing roof supports at the longwall face.

Easy Operation – Easy Service

Easily accessible components such as the flame trap, exhaust filter and check points ensure that regular maintenance is a simple and trouble-free five-minute job for the operator.

Made for mines – Cat Diesel vehicles

Operator's cabin

SH640 D

There are few roof support carriers rated at 40 tonnes (44 tons) capacity. Only one carries this load at these speeds while maintaining flexibility and a small roadway presence. The SH640 D is a compact yet powerful roof support carrier that negotiates tight bends as well as steep gradients and uneven floor conditions.

The compact Cat SH640 D diesel roof support carrier was developed to suit cramped mine conditions. It carries a massive 40 tonnes (44 tons) on standard forks. The design focuses on haulage of longwall roof supports and heavier ancillary components of the longwall.

The SH640 D comes ready to operate with heavy-duty forks as standard. A range of attachments is available to turn the SH640 D into a utility vehicle between longwall moves.

Features

- 40 tonnes (44 tons) lift capacity – high capacity in a compact vehicle
- Max. speed of 8 km/h (5 mph) with 40 tonnes load for fast and efficient moves
- Only 2.6 m (8 ft 8 in) wide at a minimum height of 1.9 m (6 ft 3 in) for great maneuverability
- Proven 6-cylinder turbocharged 4-cycle diesel engine for power and reliability

SH660 D

The SH660 D has been designed to carry 55 tonnes (60 tons) on standard forks, the highest lift capacity in its class.

Features

- 55 tonnes (60 tons) lift capacity for world-beating performance
- Proven 6-cylinder turbocharged 4-cycle diesel engine for high reliability

SH660 D

SH660 HD

The SH660 HD is the current heavy capacity Shield Hauler and has been developed to carry 60 tonnes on the cookie plate. The design has been focused on the haulage of roof supports and the heavier ancillary components of the longwall. Vehicle dimensions are crucial in underground roadways, so the SH660 HD is designed to be compact, with a minimum profile and roadway presence.

SH660 HD

Features

- 60 tonnes (66.14 tons) lift capacity – class-leading standard
- Proven 6-cylinder turbocharged 4-cycle diesel engine for power and high reliability
- Shares dimension envelope with 55 tonnes (60.63 tons) machine

SH150 roof support trailer for CL10 and CL15 models

SH150 Roof Support Trailer

- Used in combination with the CL10 and CL15 tractor machines
- Floor-mounted hydraulic cylinders load and unload the roof supports
- Fifth wheel option ensures your longwall moves stay on track
- Carries roof supports up to 2 meters wide and up to 50 tonnes (55 tons) in weight

RAS – Rapid Attachment System

The Rapid Attachment System available for the CL10 and CL15 makes an accessory change a one-man operation, allowing a broad range of accessories to be fitted in moments without removing the backing plate. Utilizing the LHD with RAS attachments during longwall relocations can greatly reduce lost production time. Each attachment is tested and performance rated:

- Ejector plate bucket
- Side shift forks
- AFC chain reeler
- Belt reeler
- Cable reeler
- Jib crane [static and slewing]
- Work baskets
- Fuel and lubrication module
- Materials pod system
- Concrete hopper

RAS: Quick pick up and release of attachments

	SH620	SH630	SH650**	SH680	SH640 D	SH660 D	SH660 HD	SH150
Motor/engine	DC/AC	DC/AC	DC/AC/Diesel	5x 100 HP AC Motor	Diesel	Diesel	Diesel	Trailer
Power rated at	74 kW (100 hp)	74 kW (100 hp)	74 kW (100 hp) 149 kW (200 hp) 176 kW (240 hp)	375 kW (500 hp)	172 kW (234 hp)	172 kW to 202 kW (234 hp to 260 hp)	173 kW (235 hp)	N/A
Torque/tractive effort	26 072 kg (57,480 lb)	31 750 kg (69,996 lb)	40 256 kg (88,749 lb)	97 535 kg (215,030 lb)	28 500 kg (62,832 lb)	36 000 kg (79,366 lb)	48 000 kg (105,821 lb)	N/A
Max. speed/ with load	6.4/5.3 km/h (4/3.3 mph)	6.3/3.6 km/h (3.9/2.2 mph)	6.2/3.5 km/h (3.8/2.2 mph) 6.6(km/h (4.1 mph) 19.3 km/h (12 mph)	6.12/3.22 km/h (3.8/2 mph)	19.0/8 km/h (11.8/5.0 mph)	19.0/8 km/h (11.8/5.0 mph)	16.2 km/h (10.07 mph)	25/15 km/h (15.5/9.3 mph)
Carry capacity	20 tonnes (22 tons)	33 tonnes (36 tons)	45 tonnes (50 tons)	80 tonnes (88 tons)	40 tonnes (44 tons)	55 tonnes (60 tons)	60 tonnes (66 tons)	50 tonnes (55 tons)
Pull winch rated at	13.6 tonnes (15 tons)	21 tonnes (23 tons)	34 tonnes (38 tons)	45 tonnes (50 tons)	20 tonnes (22 tons)/ 30 tonnes (33 tons)	20 tonnes (22 tons)/ 30 tonnes (33 tons)	20 tonnes (22 tons)/ 30 tonnes (33 tons)	20 tonnes (22 tons)/ 30 tonnes (33 tons)
Wheel base	4.32 m (14 ft 2 in)	5.13 m (16 ft 10 in)	5.16 m (16 ft 11 in)	5.49 m (18 ft)	3.60 m (11 ft 10 in)	3.60 m (11 ft 10 in)	3.60 m (11 ft 10 in)	–
Vehicle length	9.5 m (31 ft 2 in)	10.88 m (35 ft 8 in)	11.68 m (38 ft 4 in)	13.8 m (45 ft 3 in)	9.2 m (30 ft 2 in)	10.07 m (33 ft)	10.07 m (33 ft)	4.70 m (15 ft 5 in)
Vehicle width	2.85 m (9 ft 4 in)	2.90 m (9 ft 6 in)	3.03 m (9 ft 11 in)	3.95 m (11 ft 4 in)	2.65 m (8 ft 8 in)	3.10 m (10 ft 2 in)	3.10 m (10 ft 2 in)	3.85 m (12 ft 8 in)
Turn radius (outside)	7.37 m (24 ft 2 in)	7.21 m (23 ft 8 in)	7.27 m (23 ft 10 in)		6.20 m (20 ft 4 in)	6.40 m (21 ft)	6.40 m (21 ft)	7.5 m (24 ft 7 in)
Steering articulation	50°	50°	50°	50°	45°	45°	45°	45°
Frame oscillation	40°	40°	40°	15°	8°	8°	8°	8°
Ground clearance	356 mm (14 in)	381 mm (15 in)	483 mm (19 in)	356 mm (14 in)	350 mm (13.7 in)	350 mm (13.7 in)	350 mm (13.7 in)	280 mm (11 in)
Gradients possible*	20°	20°	25°	25°	14.5° continuous	14.5° continuous	14.5° continuous	14.5° continuous
Steering	Control stick	Control stick	Control stick	Control Stick	Steering wheel	Steering wheel	Steering wheel	N/A

* Gradient data short-term only.

Roof Support Carriers – Product Line

For more complete information on Cat products, dealer services, and industry solutions, visit us on the web at **mining.cat.com** and **www.cat.com**

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