CAT® ROOF SUPPORTS

Reference Catalogue

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Introduction

Caterpillar is one of the leading global suppliers for complete longwall mining systems. All over the world, Cat® equipment and systems are meeting the demands of underground mining under the most stringent conditions. Caterpillar delivers a customer's system of choice, from low to high seam heights, for the longest longwalls and highest production demands. Adapted to the mining challenges faced by customers today, Cat systems for longwall mining include hydraulic roof supports, high-horsepower shearers, automated plow systems and face conveyors – controlled and supported by intelligent automation.

Hydraulic roof supports (shields) are an essential component of longwall mining systems. They prevent the longwall from caving and allow a safe working environment for the miners at the coal face. Furthermore, the roof supports push the conveyor system forward for the next cut and follow the mining progress. Cat roof supports operate in the range of from 0.6 m to 7.5 m and above. For both low-seam and high-seam applications, Caterpillar has vast experience and is able to tailor the roof support design to geological conditions and specific customer requirements.

With more than 70 years in the longwall business, Caterpillar Global Mining and its predecessors have developed state-of-the-art solutions to meet those challenging demands with the overall goal of minimizing the operational costs for the operators. During the last two decades, Caterpillar has delivered nearly 30,000 high quality shields to the following countries: Australia, Belgium, Bulgaria, China, Czech Republic, France, Germany, India, Italy, Japan, Kazakhstan, Mexico, Poland, Russia, Slovenia, South Africa, Spain, Turkey, Ukraine, United States of America.

This catalogue will provide an overview of the design and the specifications of selected Cat roof support models for shearer, plow and LTTC longwalls, which have been in operation at leading longwall mines around the world – delivering maximum performance and system availability, long service life, and lowest possible cost of ownership.

Cat® Roof Supports

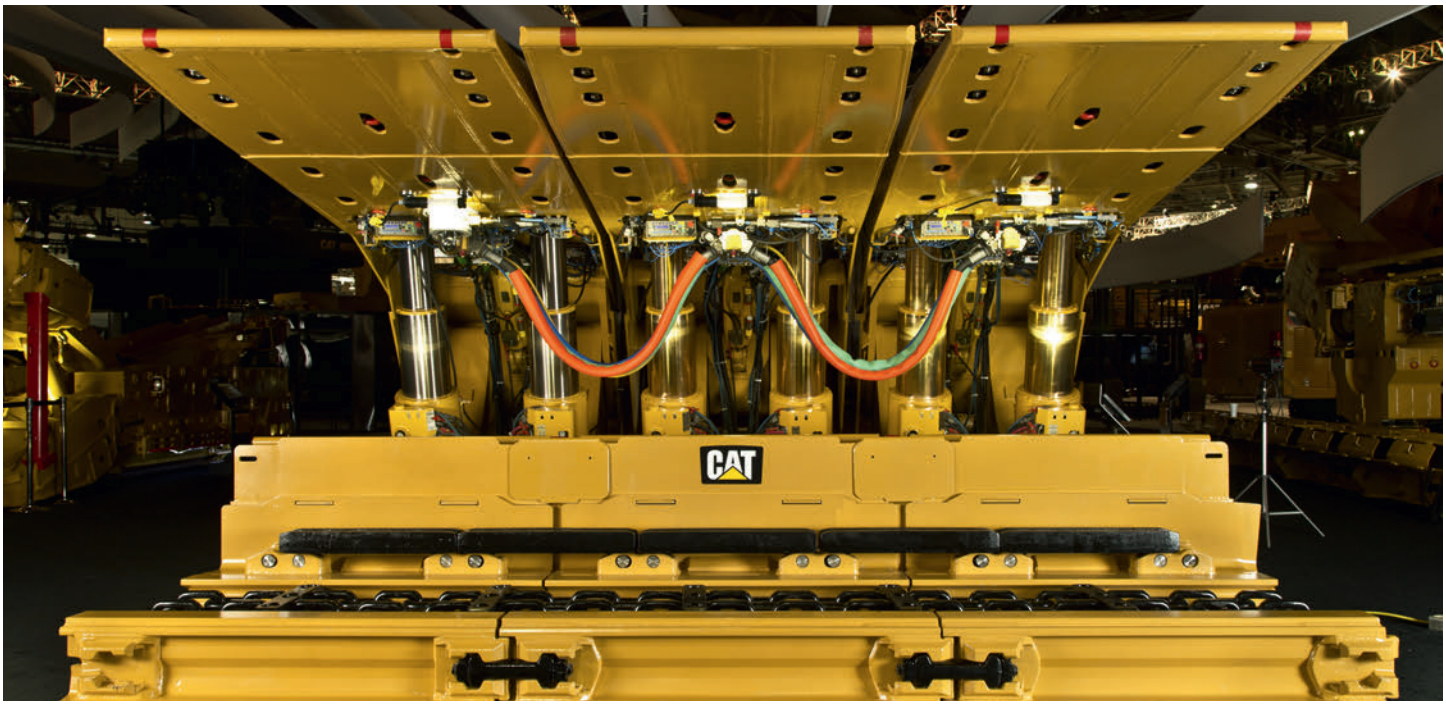
Caterpillar is the world leader in longwall roof support technology. Cat roof supports are world-renowed for their reliability under the most extreme conditions.

STATE-OF-THE-ART TECHNOLOGY

In the early 1970s, demanding mining conditions in German coal mines set the stage for extensive R&D in roof support technology. Steeply inclined coal seams both thick and thin, weak roofs and massive sandstone roofs, soft floors, and geological faults called for a high degree of customization.

The resulting expertise has been deployed and applied to all mining areas of the world and provides customers with state-of-the-art technology customized to maximize control of the roof and floor of their longwalls. This not only eliminates downtime resulting from control of the strata surrounding the coal seam, but also facilitates automation of roof support systems, even in very difficult geological conditions.

- Seam ranges from 0.8–7.5 m (1.8–24.5 ft)
- Widths from 1.50 m | 1.75 m | 2.05 m / (59 in | 69 in | 81 in)
- Support Capacity up to 1,750 tonnes / (1,929 tons)
- Tested up to 90,000 cycles



CUSTOMIZED DESIGN

Steep grades, very thick and very thin seams, unstable roofs and massive sandstone plates, soft ground and geological faults. These varying conditions require a high level of adaptation to specific requirements. Cat roof supports are world-renowned for their reliability under the most extreme conditions, including steep grades, very thick and very thin seams, unstable roofs and massive sandstone plates, soft ground and geological faults. These varying conditions require a high level of adaptation to specific requirements. With superior availability and unparalleled quality in design and production, Cat roof supports set the standard in longwall mining.

TWO-METER ROOF SUPPORTS

The two meter (6.56 ft) wide roof support offers several advantages over conventional 1.50 or 1.75 meter (4.92 or 5.74 ft) wide shields. Fewer shields mean lower investment and less maintenance – and fewer parts to malfunction. With fewer shields to move, longwall relocation can be done much faster.

CONTROL SYSTEMS

Caterpillar manufactures a complete range of shield support control systems ranging from manual hydraulic controls to the highly acclaimed PMC-R electronic control system, which offers the most advanced face automation and equipment monitoring for achieving fast cycle times.

The Cat PMC-R electro-hydraulic longwall face control system represents the cutting edge in longwall automation technology and facilitates full automation, monitoring and remote diagnostics for all face equipment. All information can be transferred to the surface in real time to maximize longwall performance.

CONTROL SYSTEM BENEFITS:

- Control flexibility
- Intuitive, user friendly controls
- Ease of maintenance
- Reliability and safety
- Cycle time < 10 sec (lower advance set)

LEGS AND CYLINDERS

Legs and cylinders are designed and manufactured to the highest quality and performance standards.

Double- and triple-stage systems are available with equal yield rating in all stages. Materials and designs are selected to ensure long service life. Plating is applied to meet the most corrosive environments.

SPECIAL APPLICATIONS

Caterpillar has extensive experience in the design of shield supports for specific mining conditions and for soft-rock longwall applications other than coal. Steep seam supports and supports with articulated forepole extension canopies and high tip loads have been developed for extreme geological situations.

The Longwall Top Coal Caving (LTCC) roof support allows mining to a total seam height of more than 10 m (33 ft) by using a longwall shearer to cut the bottom and then caving the top coal behind the roof supports onto a rear AFC.

SERVICE

- Technical service and spare parts provided by Cat Dealer network
- Installation commissioning service
- Hydraulic retrofits

QUALITY

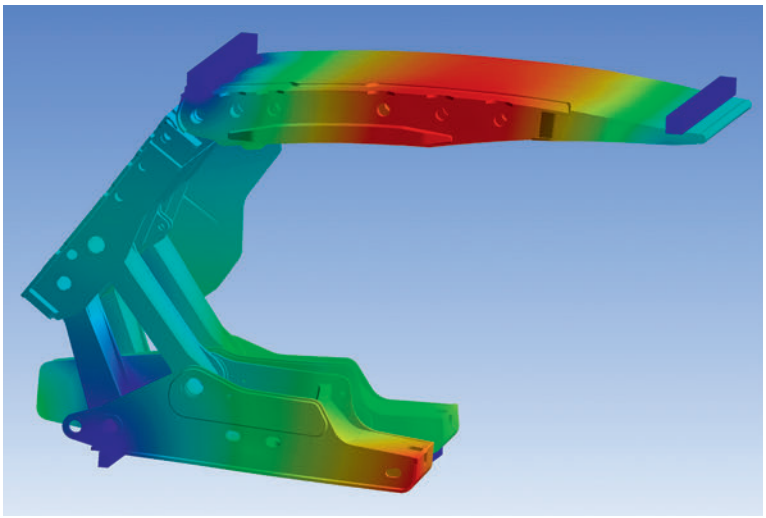
Before shields are shipped to customers, Caterpillar carries out an extensive series of tests on all structural, hydraulic and control components at its test center. Sophisticated tests check the fatigue strength and load bearing capacity of individual products. Caterpillar has all test systems required for roof supports and their components:

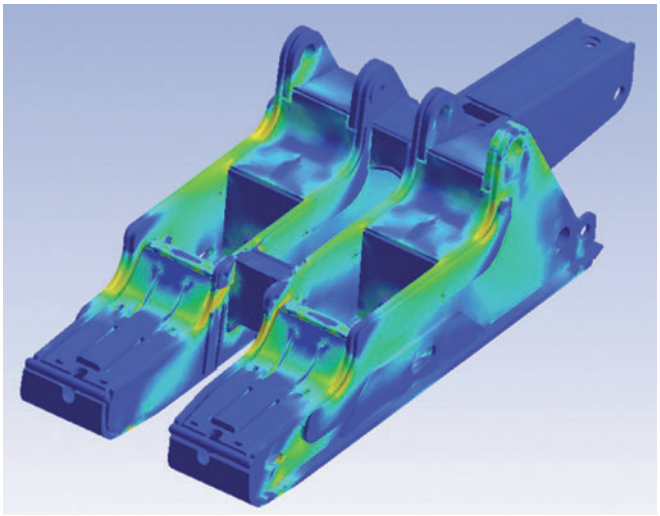
- Three shield test rigs with a force resistance of up to 20 000 kN (4,496,179 lbf) and a test height of more than 5.0 m (197 in)
- Leg and cylinder test machines up to 15 000 kN (3,372,134 lbf)
- Hydraulic test rigs with pressures of up to 1000 bar (14,504 psi) and a volumetric flow rate of more than 500 L/min (132.09 gal/min)

SAFETY

Caterpillar develops roof support systems that meet safety standards around the world:

- Advanced design of critical parts prevents major failures
- Designed for the requirements of the customer and the individual geological condition
- Extensive tests on all structural, hydraulic and control components
- FEA Analysis for complete shield
- Ergonomic design for human needs





Caterpillar has developed a variety of features over time to continually improve operator safety:

- Diffusion sleeving
- Hose labeling
- Staple retention
- Enhanced staple design (D-shape)
- Rotatable couplings for inter-shield hose connections
- Manifold for hydraulic supply inside the shield

Clear Hose Arrangement

- Clear view
- Superior access to hydraulic components
- Highest safety due to less bending of hoses
- Compact main manifold designs

Shearer Face Roof Suports

Main Data & Specifications

Shearer Face Roof Suports

Structural design features

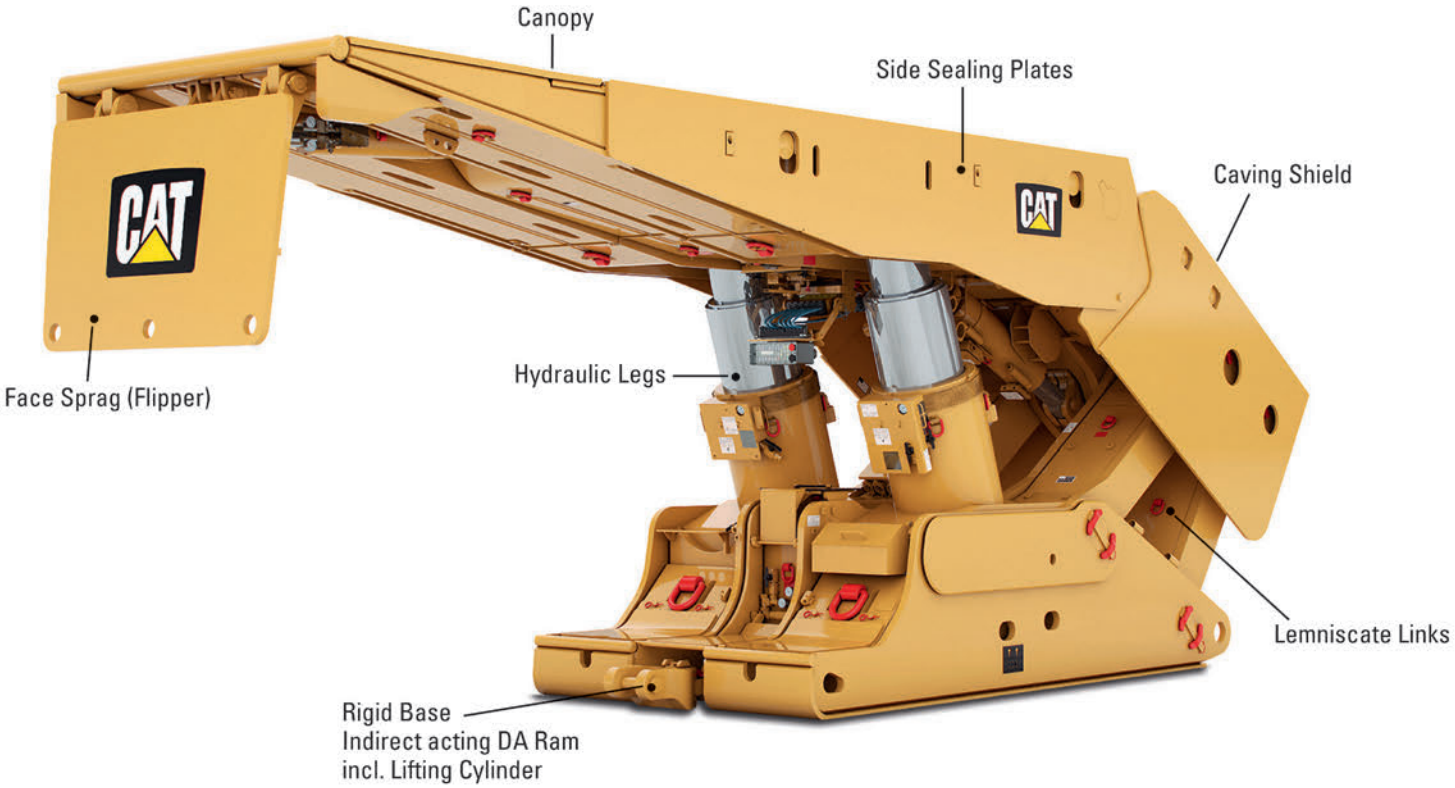
- Predominant use of “high strength” steels to reduce weight and component thickness
- Steel plate connections made with “full penetration” welds in all high stress locations
- FEA analysis performed at high stress locations
- Canopy design utilizes “continuous stringers” to achieve long fatigue life
- Base design includes rear structural “doghouse” provided to protect D.A. ram from damage and additional strength
- Base lift design that provides long cylinder life

Standard Features

- Main structural components designed to withstand up to 90,000 load cycles @ 112% yield load
- Rigid base with base lifting device
- Canopy water sprays
- Legs “gun drilled” to eliminate external supply tubes
- Moveable side sealing plates
- Electro-hydraulically controlled
- Rear side plate
- Two piece overlap construction
- Rear “doghouse” with gob deflector plate (protection for D.A. ram)

Hydraulic Design Features

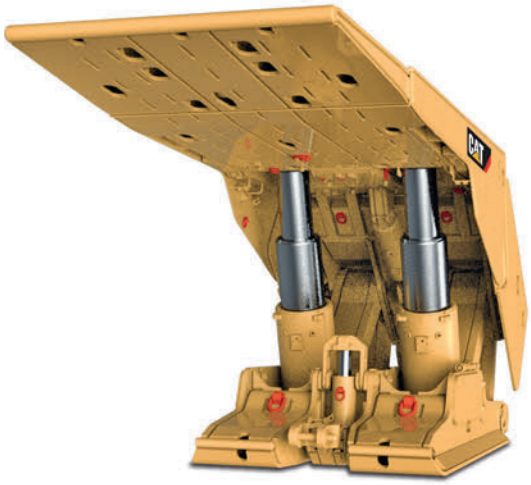
- Optimized circuit design to guarantee fastest cycle times
- Automatic cartridge type backflush filters
- Complete range of forged staple lock adapters
- Mechanical and nitrogen charged high capacity yield valves (up to 3000 L/min)
- Optimized advancing circuit to allow automated target positioning of roof support and conveyor
- Compact stainless steel inter-shield manifolds including rotatable couplings for inter-shield hosing
- Compensating valve to prevent “tip-toe” loading
- Optimized leg cylinder designs for extreme operating life (up to 90,000 cycles)
- Various plating options to suit all environmental requirements
- Monolithic forged leg cylinder components (free of weldments)



CAT ROOF SUPPORTS FOR SHEARER LONGWALL SYSTEMS

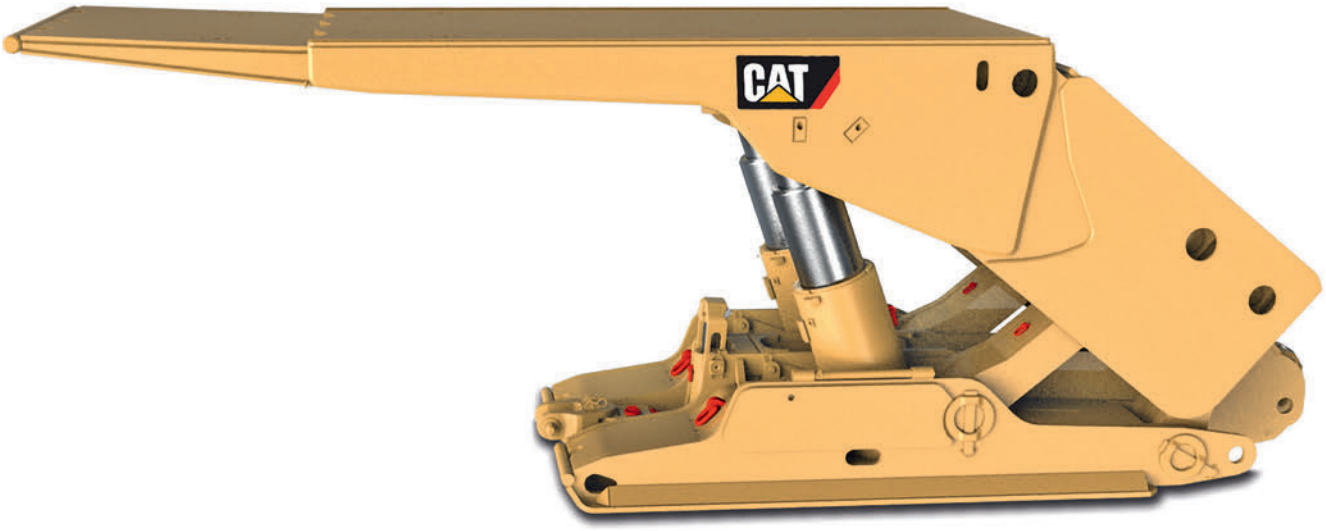
MAIN COMPONENTS

2-Leg Roof Support 1082/2305-2x3926-1750 for Shearer application



Front View

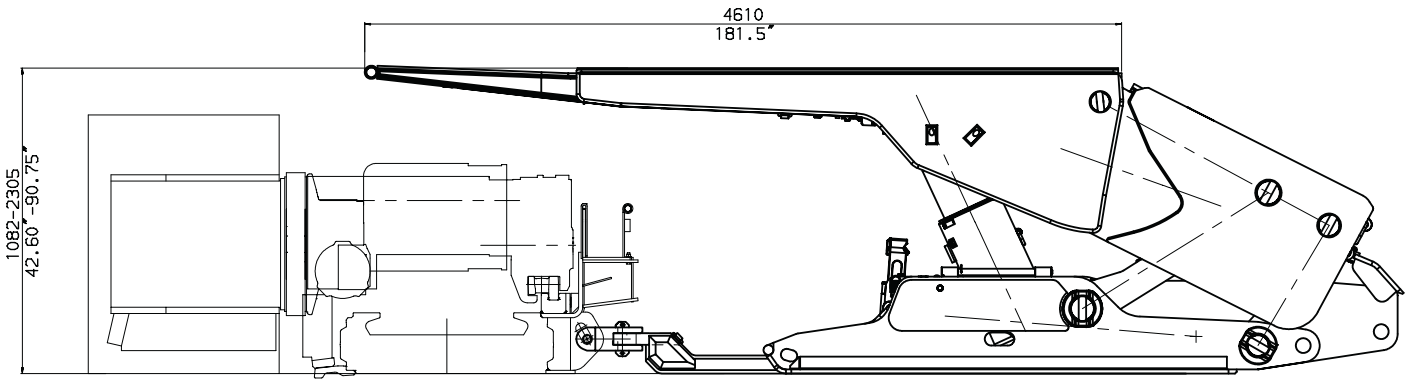
Rear View



Side View

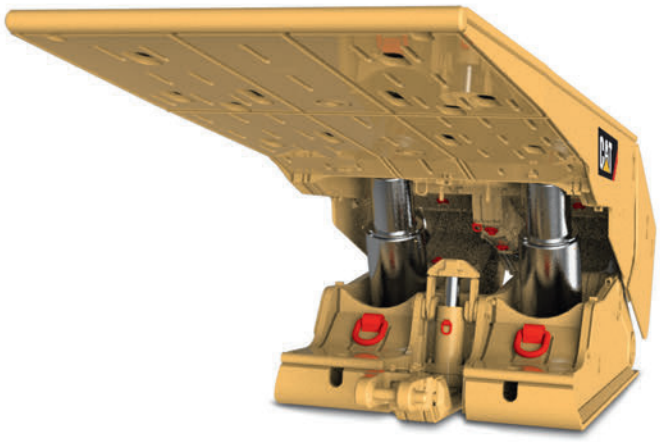
Technical Data

	Metric	Imperial
Closed height:	1082 mm	42.6 in
Extended height:	2305 mm	90.8 in
Shield centres:	1750 mm	68.9 in
Hydraulic leg:	double telescopic	double telescopic
Leg piston diameter:	345 mm	13.58 in
Nominal leg forces:	2 x 3926 kN at 420 bar	2 x 441.3 tons at 6091 psi
Shield resistance:	6863 kN at 420 bar at 1651 mm height	771.9 tons at 6091 psi at 65.0 in height
Shield density:	756 kN/m² at 1651 mm height	7.89 tons/ft² at 65.0 in height
Canopy type:	rigid design	rigid design
Canopy length:	4610 mm	181.50 in
Base type:	rigid catamaran type	rigid catamaran type
Advancing system:	1067 mm effective web	42.0 in
Shield pull force:	444 kN	49.9 tons
Conveyor push force:	246 kN	27.6 tons
Side shields:	on canopy and caving shield, both sides fixed	
Weight:	18.5 metric tons	20.4 tons



Face Cross Section

2-Leg Roof Support 1295/2286-2x5529-1750 for Shearer application



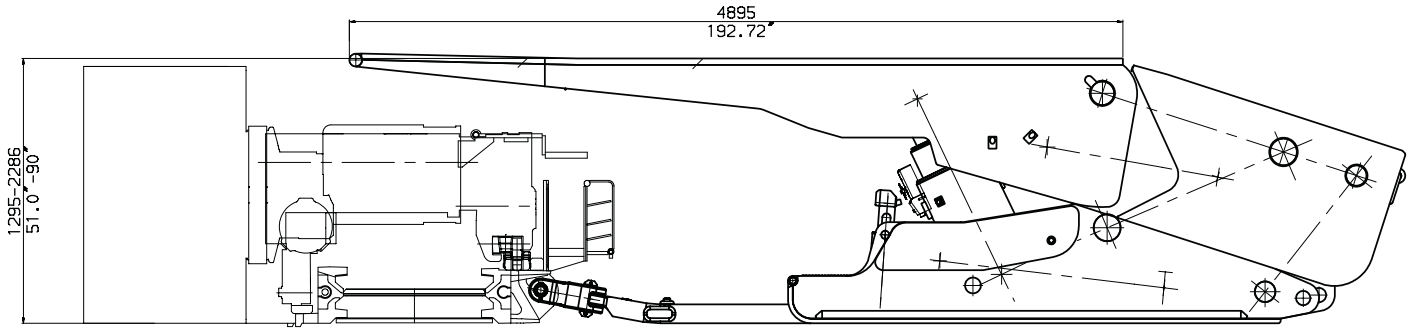
Front View

Rear View

Side View

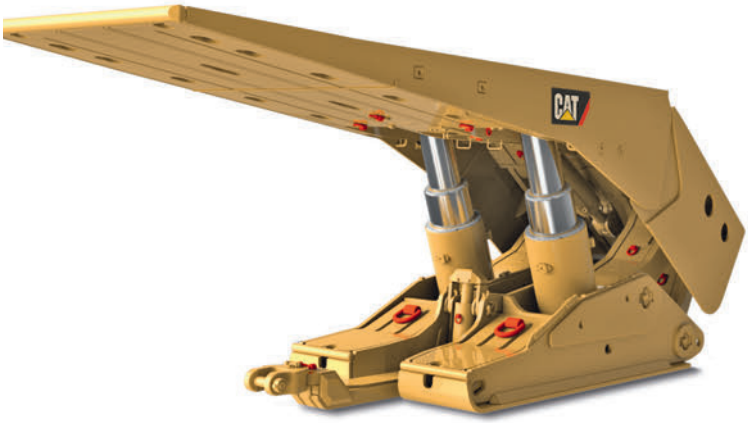
Technical Data

	Metric	Imperial
Closed height:	1295 mm	51.0 in
Extended height:	2286 mm	90.0 in
Shield centres:	1750 mm	68.9 in
Hydraulic leg:	double telescopic	double telescopic
Leg piston diameter:	400 mm	15.75 in
Nominal leg forces:	2 x 5529 kN at 440 bar	2 x 621.4 tons at 6381 psi
Shield resistance:	9974 kN at 440 bar at 1676 mm height	1121.1 tons at 6381 psi at 66.0 in height
Shield density:	1003 kN/m² at 1676 mm height	10.47 tons/ft² at 66.0 in height
Canopy type:	rigid design	rigid design
Canopy length:	4895 mm	192.72 in
Base type:	rigid catamaran type	rigid catamaran type
Advancing system:	914 mm effective web	36.0 in
Shield pull force:	565 kN	63.5 tons
Conveyor push force:	362 kN	40.7 tons
Side shields:	on canopy and caving shield, both sides fixed	
Weight:	26.6 metric tons	29.3 tons

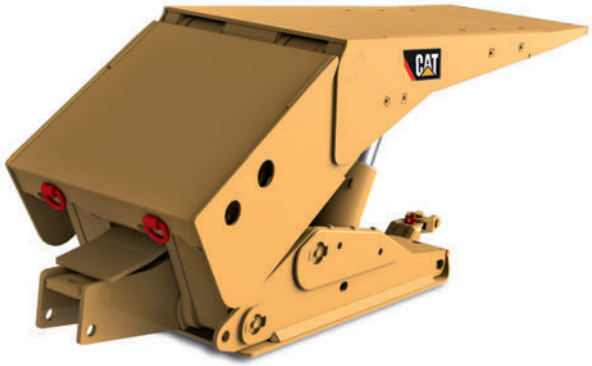


Face Cross Section

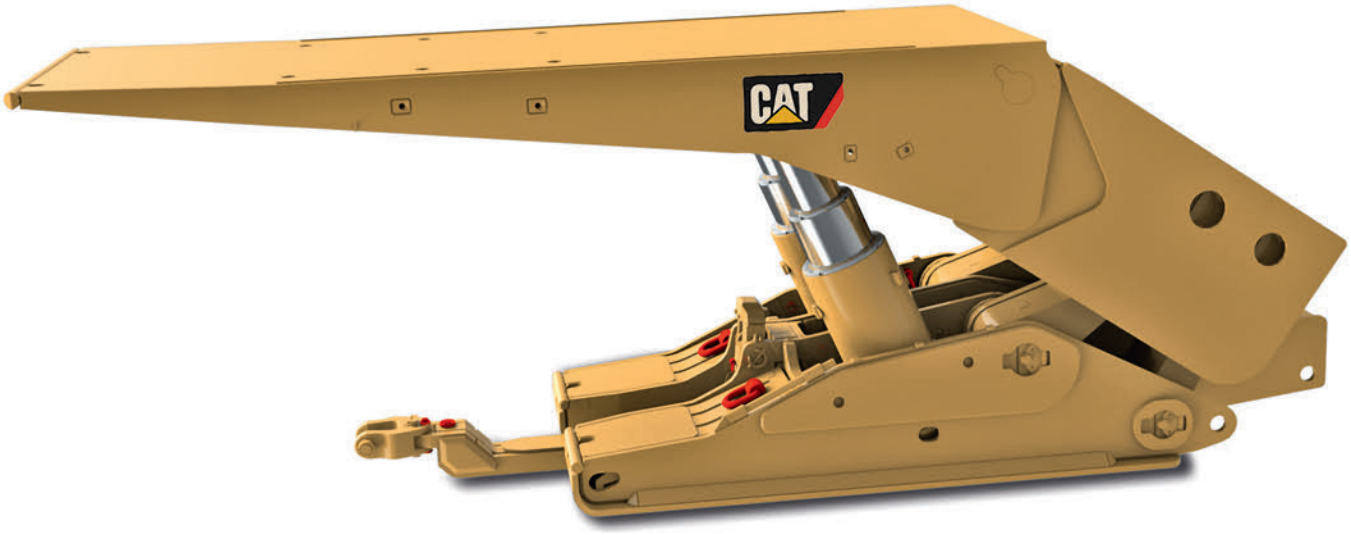
2-Leg Roof Support 1295/2743-2x4310-1750 for Shearer application



Front View



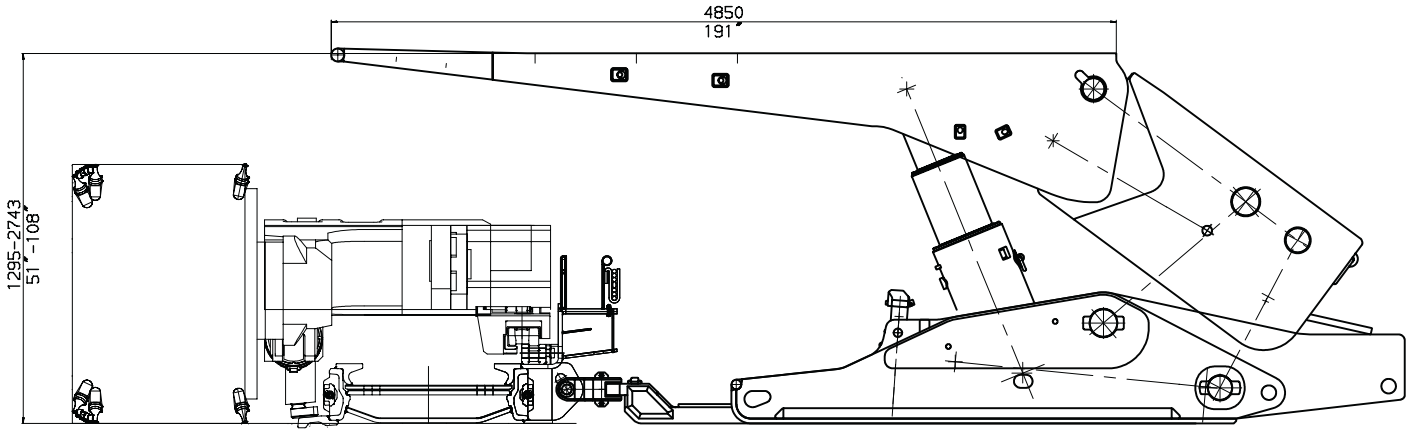
Rear View



Side View

Technical Data

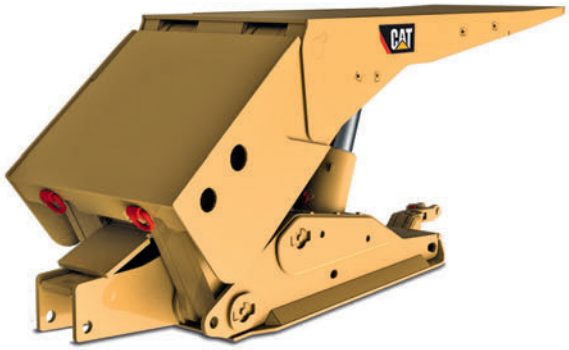
	Metric	Imperial
Closed height:	1295 mm	51.0 in
Extended height:	2743 mm	108.0 in
Shield centres:	1750 mm	68.9 in
Hydraulic leg:	double telescopic	double telescopic
Leg piston diamet	380 mm	14.96 in
Nominal leg forces:	2 x 4310 kN at 380 bar	2 x 484.4 tons at 5511 psi
Shield resistanc	7156 kN at 410 bar at 2286 mm height	804.3 tons at 5946 psi at 90.0 in height
Shield density:	846 kN/m² at 2286 mm height	8.83 tons/ft² at 90.0 in height
Canopy type:	rigid design	rigid design
Canopy length:	4850 mm	190.9 in
Base type:	rigid catamaran type	rigid catamaran type
Advancing system:	1067 mm effective web	42.0 in
Shield pull force:	488 kN	54.8 tons
Conveyor push force:	312 kN	35.1 tons
Side shields:	on canopy and caving shield, both sides fixed	
Weight:	25.2 metric tons	27.8 tons



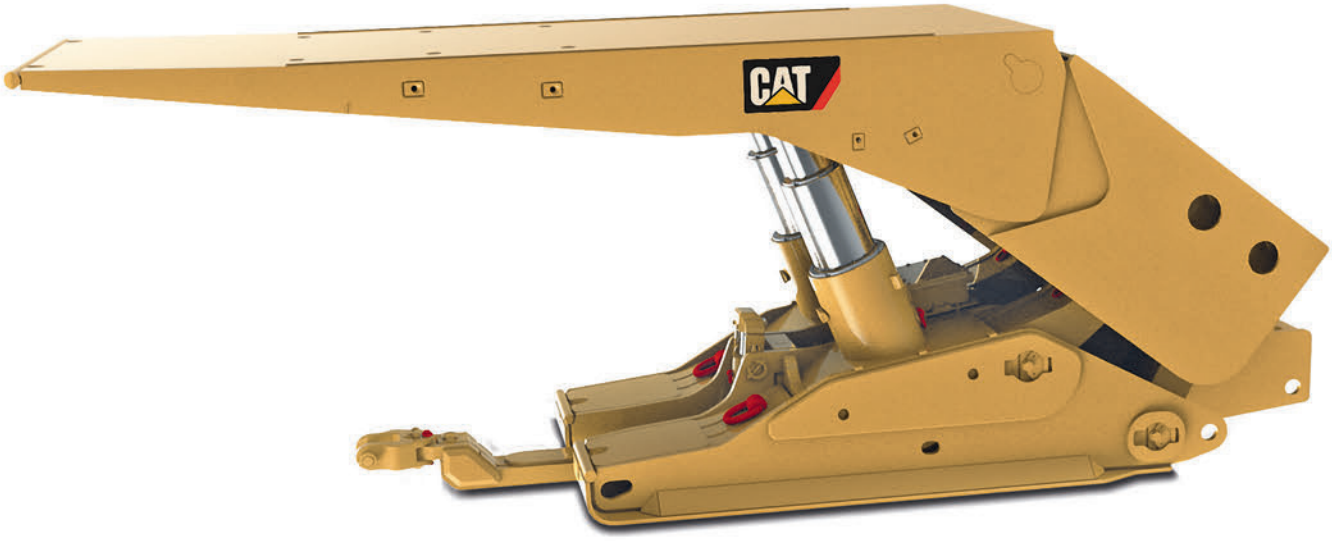
Face Cross Section

2-Leg Roof Support 1245/2743-2x3833-1750 for Shearer application

Front View



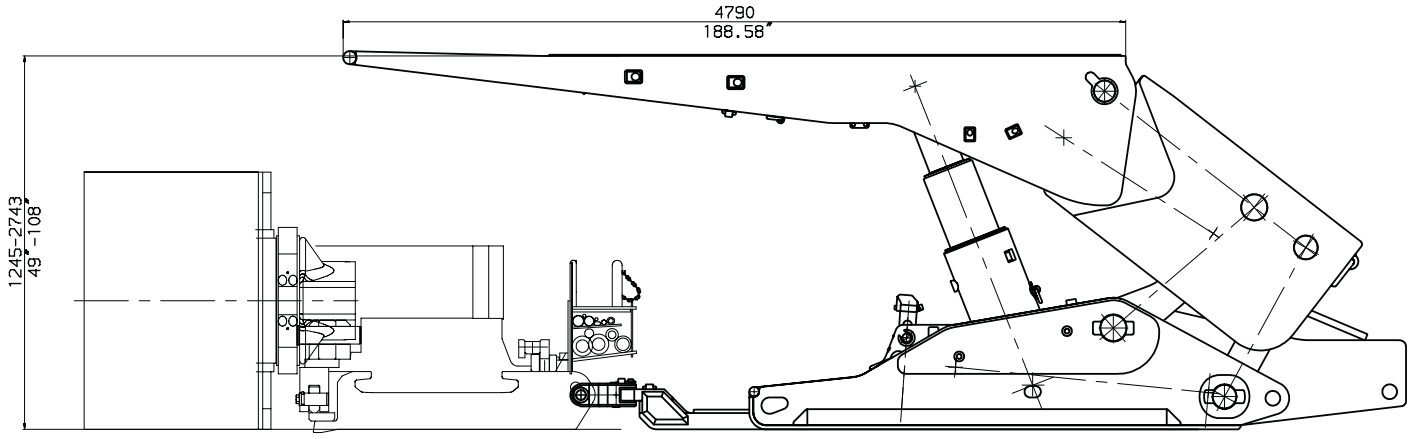
Rear View



Side View

Technical Data

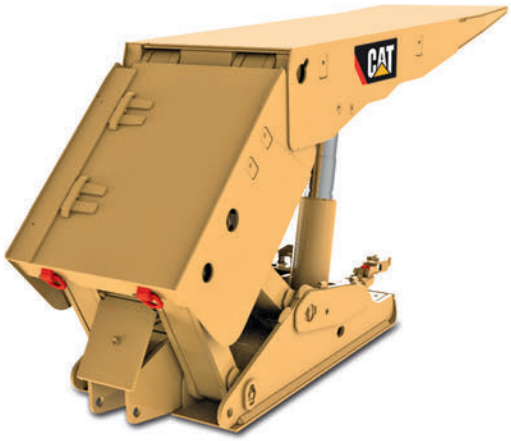
	Metric	Imperial
Closed height:	1245 mm	49.0 in
Extended height:	2743 mm	108.0 in
Shield centres:	1750 mm	68.9 in
Hydraulic leg:	double telescopic	double telescopic
Leg piston diameter:	345 mm	13.58 in
Nominal leg forces:	2 x 3833 kN at 410 bar	2 x 430.8 tons at 5946 psi
Shield resistance:	7963 kN at 380 bar at 2286 mm height	895.2 tons at 5511 psi at 90.0 in height
Shield density:	768 kN/m² at 2286 mm height	8.02 tons/ft² at 90.0 in height
Canopy type:	rigid design	rigid design
Canopy length:	4790 mm	188.58 in
Base type:	rigid catamaran type	rigid catamaran type
Advancing system:	1067 mm effective web	42.0 in
Shield pull force:	488 kN	54.8 tons
Conveyor push force:	312 kN	35.1 tons
Side shields:	on canopy and caving shield, both sides fixed	
Weight:	23.0 metric tons	25.4 tons



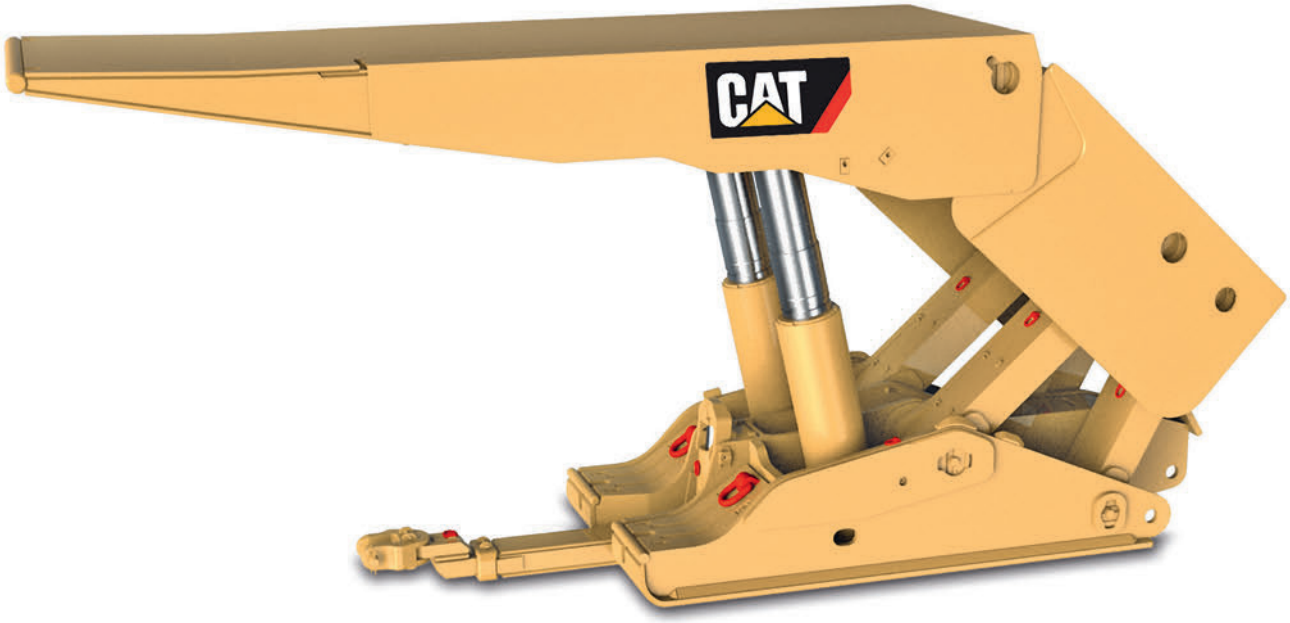
Face Cross Section

2-Leg Roof Support 1750/3300-2x5404-1750 for Shearer application

Front View



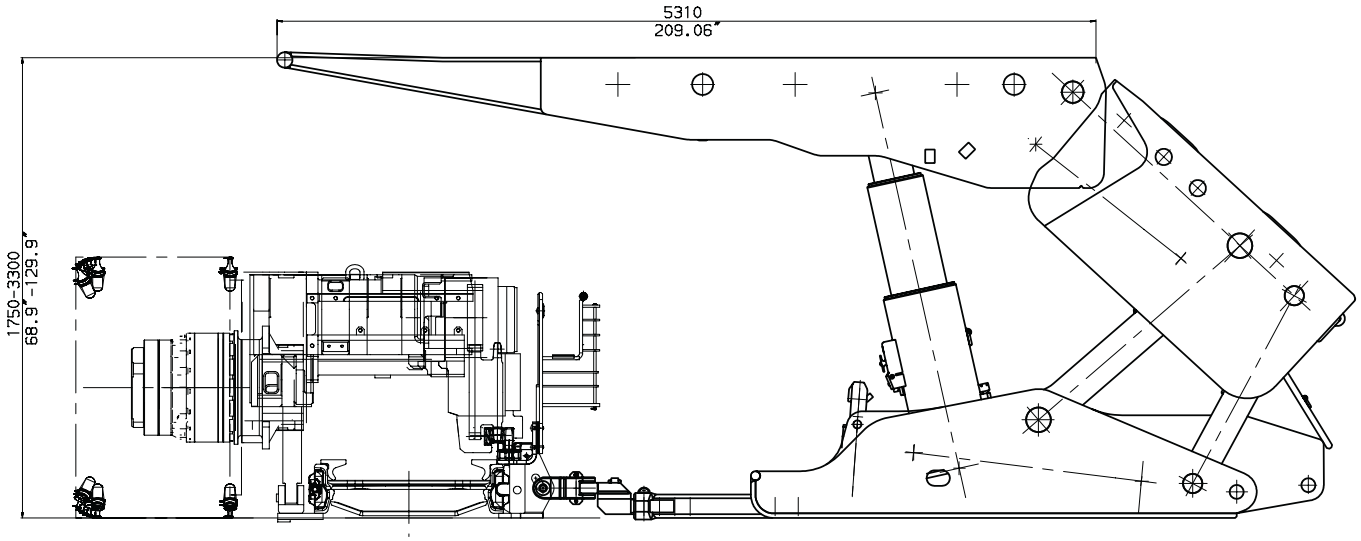
Rear View



Side View

Technical Data

	Metric	Imperial
Closed height:	1750 mm	68.9 in
Extended height:	3300 mm	129.9 in
Shield centres:	1750 mm	68.9 in
Hydraulic leg:	double telescopic	double telescopic
Leg piston diameter:	400 mm	15.75 in
Nominal leg forces:	2 x 5404 kN at 430 bar	2 x 607.4 tons at 6236 psi
Shield resistance:	10393 kN at 430 bar at 3000 mm height	1168.1 tons at 6236 psi at 118.1 in height
Shield density:	1044 kN/m² at 3000 mm height	10.90 tons/ft² at 118.1 in height
Canopy type:	rigid design	rigid design
Canopy length:	5310 mm	209.06 in
Base type:	rigid catamaran type	rigid catamaran type
Advancing system:	1000 mm effective web	39.4 in
Shield pull force:	592 kN	66.5 tons
Conveyor push force:	329 kN	37.0 tons
Side shields:	on canopy and caving shield, one side moveable, one side fixed, not rehandable	
Weight:	31.2 metric tons	34.4 tons

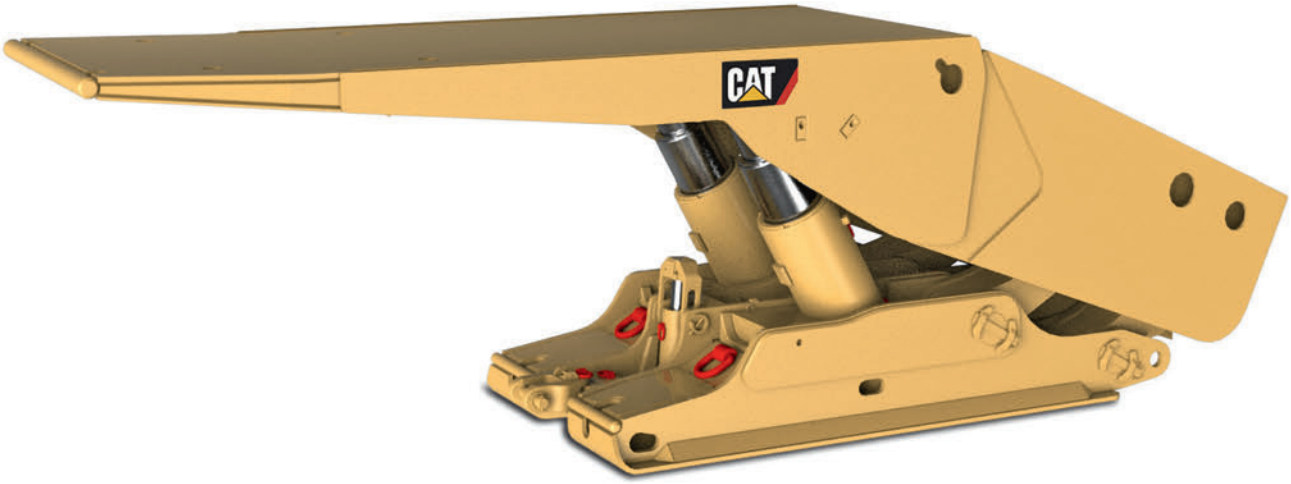


Face Cross Section

2-Leg Roof Support 1092/2845-2x3852-1750 for Shearer application

Front View

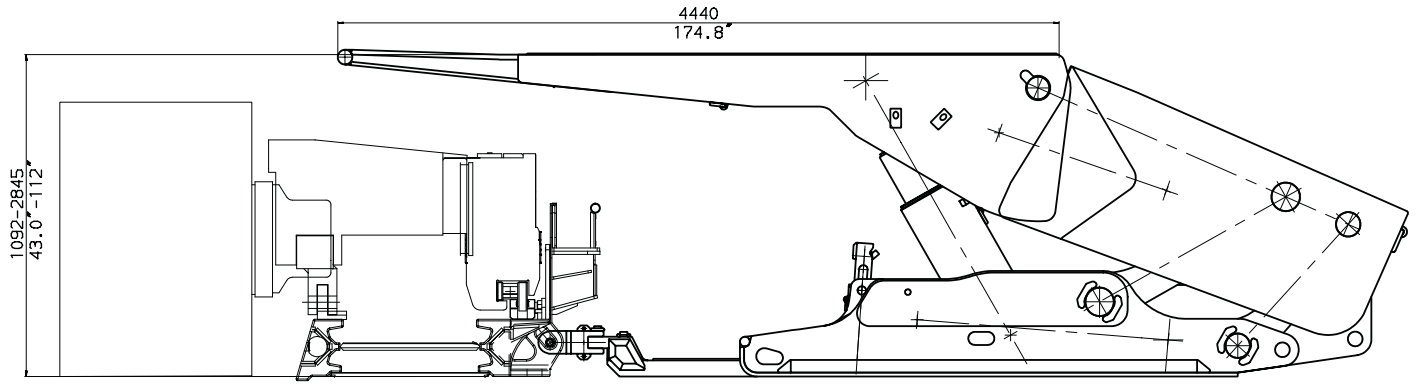
Rear View



Side View

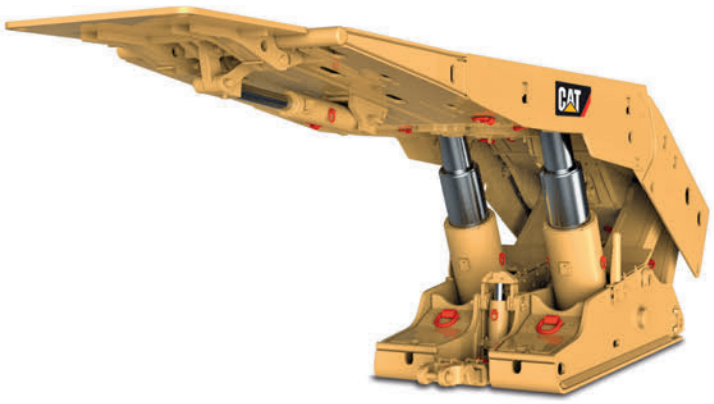
Technical Data

	Metric	Imperial
Closed height:	1092 mm	43.0 in
Extended height:	2845 mm	112.0 in
Shield centres:	1750 mm	68.9 in
Hydraulic leg:	double telescopic	double telescopic
Leg piston diameter:	345 mm	13.58 in
Nominal leg forces:	2 x 3852 kN at 412 bar	2 x 433.0 tons at 5975 psi
Shield resistance:	6624 kN at 412 bar at 1981 mm height	744.5 tons at 5975 psi at 78.0 in height
Shield density:	745 kN/m² at 1981 mm height	7.78 tons/ft² at 78.0 in height
Canopy type:	rigid design	rigid design
Canopy length:	4440 mm	174.80 in
Base type:	rigid catamaran type	rigid catamaran type
Advancing system:	1067 mm effective web	42.0 in
Shield pull force:	444 kN	49.9 tons
Conveyor push force:	246 kN	27.6 tons
Side shields:	on canopy and caving shield, both sides fixed	
Weight:	22.1 metric tons	24.4 tons

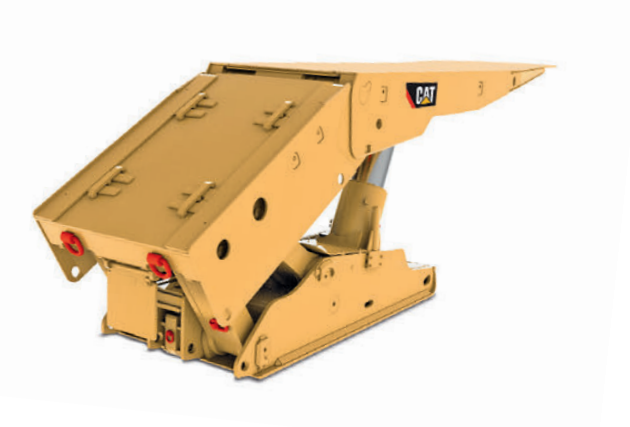


Face Cross Section

2-Leg Roof Support 1300/3100-2x5104-1750 for Shearer application



Front View

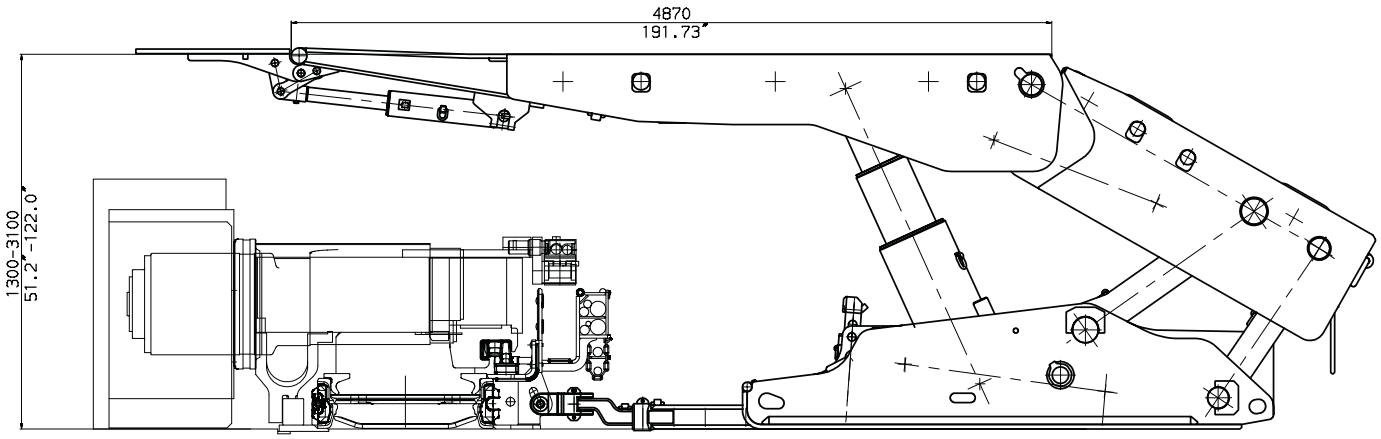


Rear View

Side View

Technical Data

	Metric	Imperial
Closed height:	1300 mm	51.2 in
Extended height:	3100 mm	122.0 in
Shield centres:	1750 mm	68.9 in
Hydraulic leg:	double telescopic	double telescopic
Leg piston diameter:	380 mm	14.96 in
Nominal leg forces:	2 x 5104 kN at 450 bar	2 x 573.7 tons at 6526 psi
Shield resistance:	9230 kN at 450 bar at 2400 mm height	1037.4 tons at 6526 psi at 94.5 in height
Shield density:	997 kN/m² at 2400 mm height	10.41 tons/ft² at 94.5 in height
Canopy type:	rigid design with face sprag	rigid design with face sprag
Canopy length:	4870 mm	191.73 in
Base type:	rigid catamaran type with pusher	rigid catamaran type with pusher
Advancing system:	850 mm effective web	33.4 in
Shield pull force:	684 kN	76.9 tons
Conveyor push force:	433 kN	48.7 tons
Side shields:	on canopy and caving shield, one side moveable, one side fixed, rehandable	
Weight:	26.7 metric tons	29.4 tons



Face Cross Section

2-Leg Roof Support 1700/3500-2x4412-1750 for Shearer application

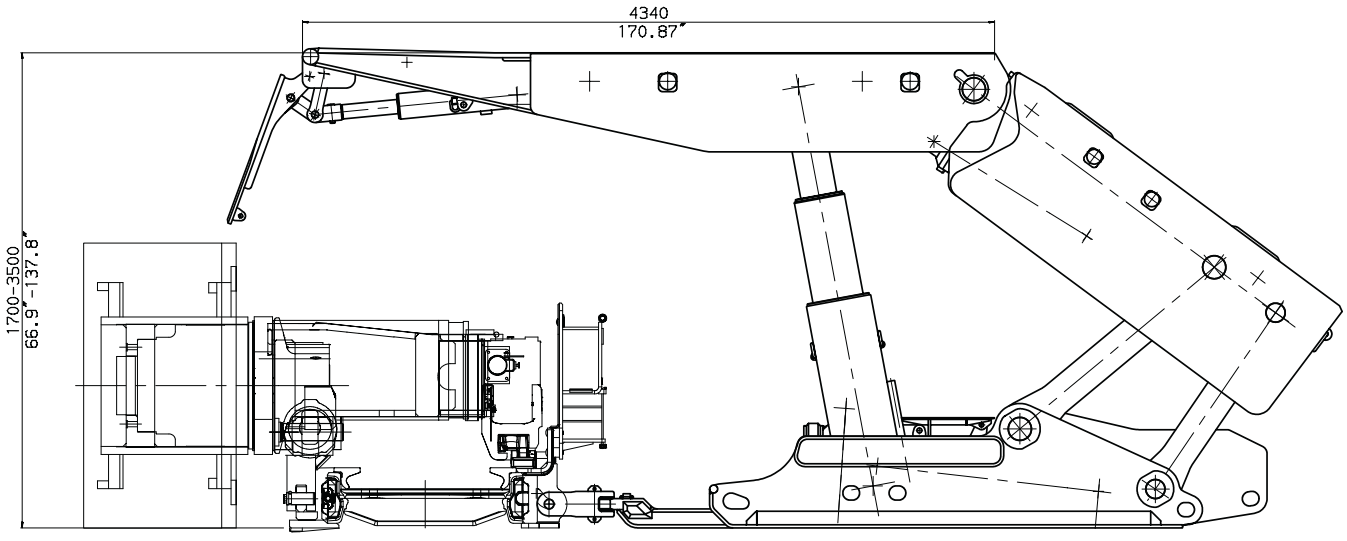
Front View

Rear View

Side View

Technical Data

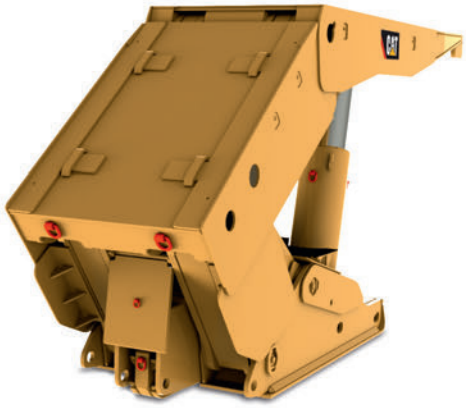
	Metric	Imperial
Closed height:	1700 mm	66.9 in
Extended height:	3500 mm	137.8 in
Shield centres:	1750 mm	68.9 in
Hydraulic leg:	double telescopic	double telescopic
Leg piston diameter:	345 mm	13.58 in
Nominal leg forces:	2 x 4412 kN at 472 bar	2 x 495.9 tons at 6845 psi
Shield resistance:	8673 kN at 472 bar at 3000 mm height	974.8 tons at 6845 psi at 118.1 in height
Shield density:	1030 kN/m² at 3000 mm height	10.76 tons/ft² at 118.1 in height
Canopy type:	rigid design with face sprag	rigid design with face sprag
Canopy length:	4340 mm	170.87 in
Base type:	rigid catamaran type	rigid catamaran type
Advancing system:	865 mm effective web	34.1 in
Shield pull force:	556 kN	62.5 tons
Conveyor push force:	309 kN	34.7 tons
Side shields:	on canopy and caving shield, one side moveable, one side fixed, rehandable	
Weight:	25.5 metric tons	28.1 tons



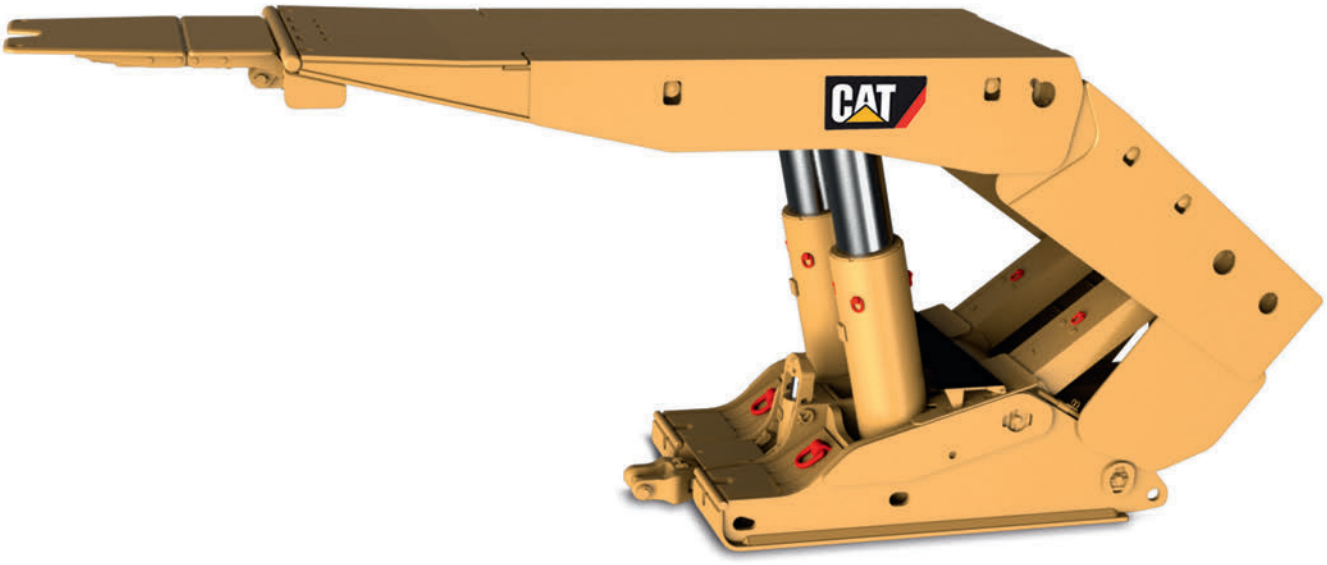
Face Cross Section

2-Leg Roof Support 2400/3900-2x5655-1750 for Shearer application

Front View



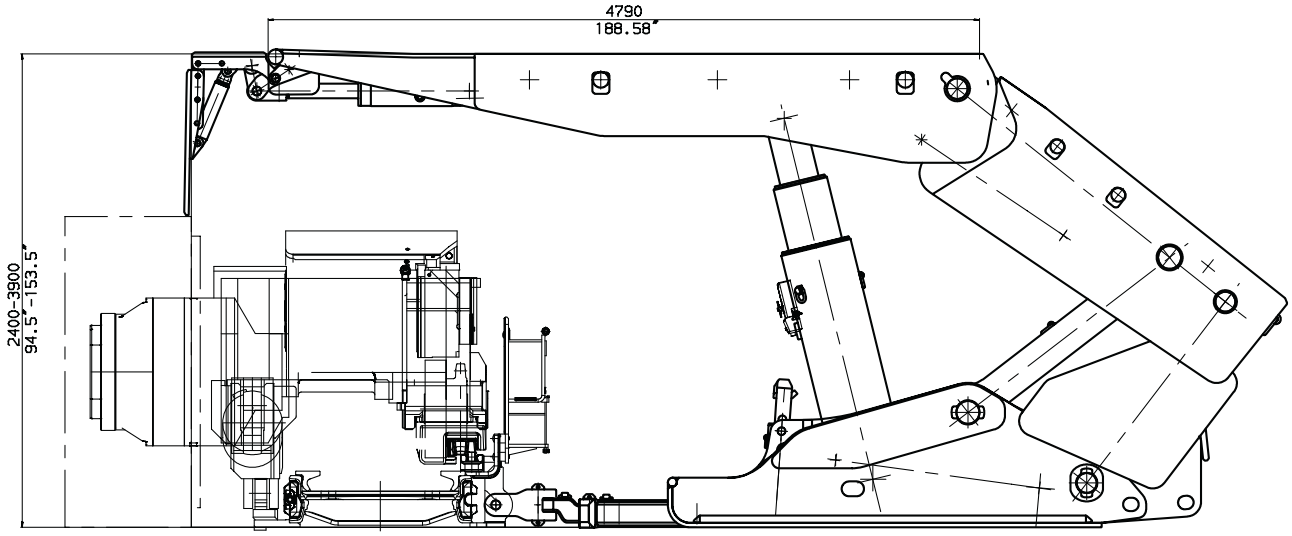
Rear View



Side View

Technical Data

	Metric	Imperial
Closed height:	2400 mm	94.5 in
Extended height:	3900 mm	153.5 in
Shield centres:	1750 mm	68.9 in
Hydraulic leg:	double telescopic	double telescopic
Leg piston diameter:	400 mm	15.75 in
Nominal leg forces:	2 x 5655 kN at 450 bar	2 x 635.6 tons at 6526 psi
Shield resistance:	10974 kN at 450 bar at 3200 mm height	1233.4 tons at 6526 psi at 126.0 in height
Shield density:	1181 kN/m² at 3200 mm height	12.33 tons/ft² at 126.0 in height
Canopy type:	rigid design with face sprag	rigid design with face sprag
Canopy length:	4790 mm	188.58 in
Base type:	rigid catamaran type	rigid catamaran type
Advancing system:	850 mm effective web	33.5 in
Shield pull force:	684 kN	76.9 tons
Conveyor push force:	432 kN	48.6 tons
Side shields:	on canopy and caving shield, one side moveable, one side fixed, rehandable on rear links, both sides fixed	
Weight:	33.4 metric tons	36.8 tons

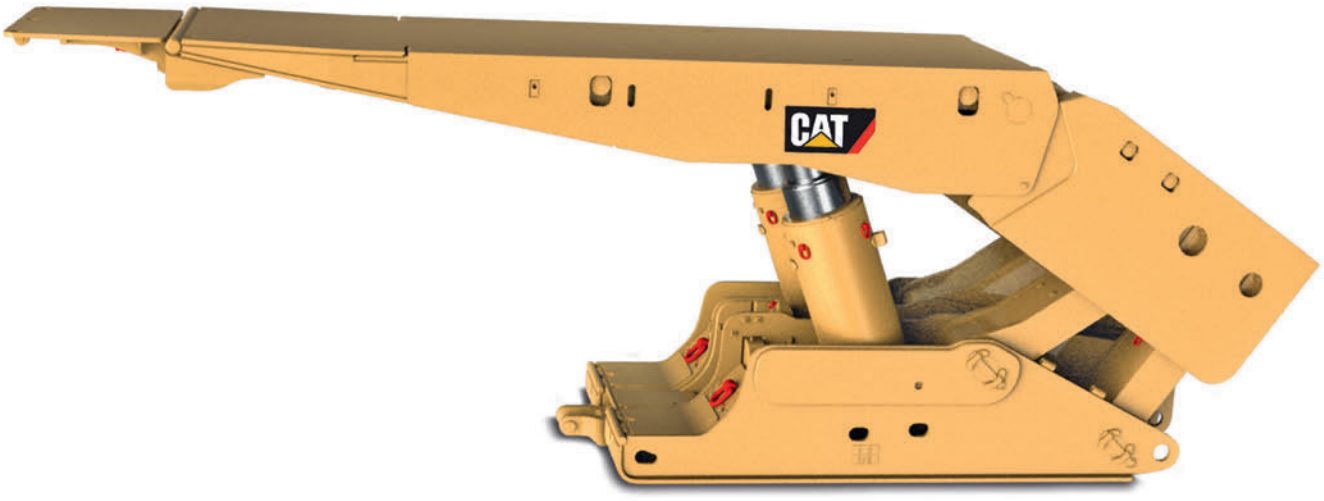


Face Cross Section

2-Leg Roof Support 2000/3600-2x6876-2050 for Shearer application

Front View

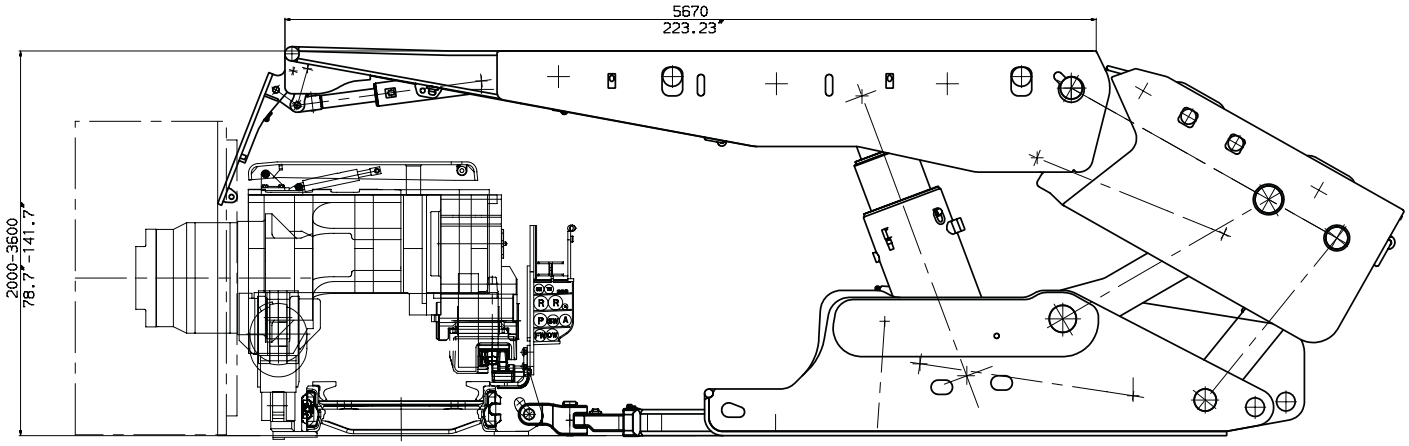
Rear View



Side View

Technical Data

	Metric	Imperial
Closed height:	2000 mm	78.7 in
Extended height:	3600 mm	141.7 in
Shield centres:	2050 mm	80.71 in
Hydraulic leg:	double telescopic	double telescopic
Leg piston diameter:	480 mm	18.90 in
Nominal leg forces:	2 x 6876 kN at 380 bar	2 x 772.8 tons at 5511 psi
Shield resistance:	13027 kN at 380 bar at 3000 mm height	1464.2 tons at 5511 psi at 118.1 in height
Shield density:	1034 kN/m² at 3000 mm height	10.80 tons/ft² at 118.1 in height
Canopy type:	rigid design with face sprag	rigid design with face sprag
Canopy length:	5670 mm	223.23 in
Base type:	rigid catamaran type	rigid catamaran type
Advancing system:	1000 mm effective web	39.4 in
Shield pull force:	1005 kN	113.0 tons
Conveyor push force:	612 kN	68.8 tons
Side shields:	on canopy and caving shield, one side moveable, one side fixed, rehandable	
Weight:	48.5 metric tons	53.5 tons



Face Cross Section

2-Leg Roof Support 2100/3800-2x6521-2050 for Shearer application

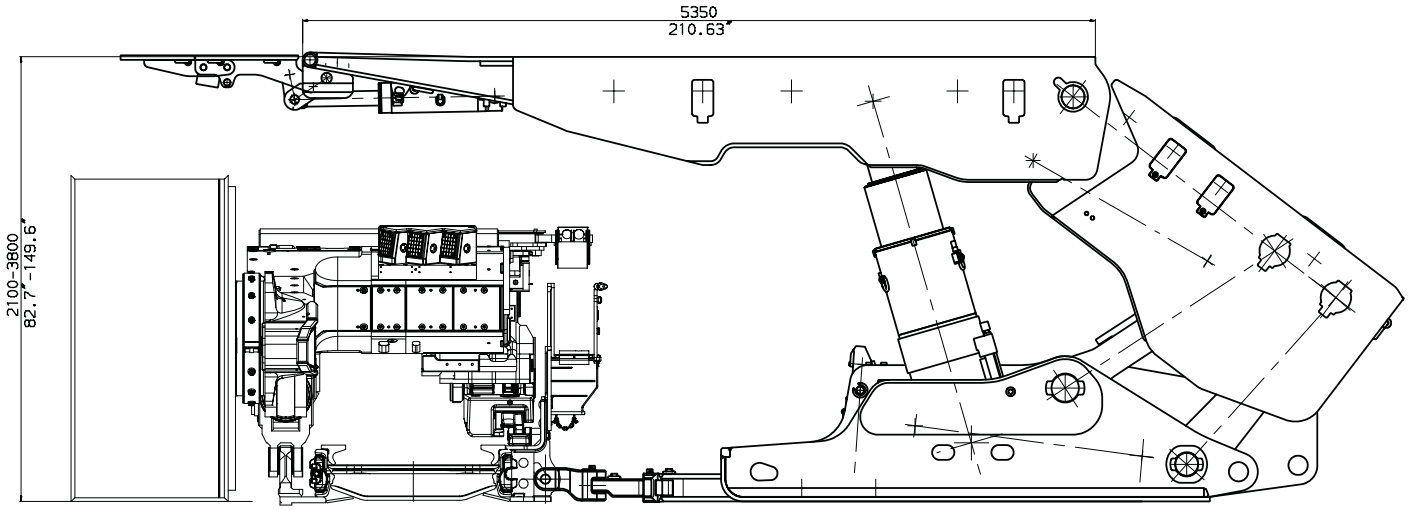
Front View

Rear View

Side View

Technical Data

	Metric	Imperial
Closed height:	2100 mm	82.7 in
Extended height:	3800 mm	149.6 in
Shield centres:	2050 mm	80.71 in
Hydraulic leg:	double telescopic	double telescopic
Leg piston diameter:	450 mm	17.72 in
Nominal leg forces:	2 x 6521 kN at 410 bar	2 x 732.9 tons at 5946 psi
Shield resistance:	10761 kN at 410 bar at 3000 mm height	1209.5 tons at 5946 psi at 118.1 in height
Shield density:	1040 kN/m² at 3000 mm height	10.86 tons/ft² at 118.1 in height
Canopy type:	rigid design with face sprag	rigid design with face sprag
Canopy length:	5350 mm	210.63 in
Base type:	rigid catamaran type	rigid catamaran type
Advancing system:	1000 mm effective web	39.4 in
Shield pull force:	814 kN	91.5 tons
Conveyor push force:	562 kN	63.2 tons
Side shields:	on canopy and caving shield, one side moveable, one side fixed, not rehandable	
Weight:	44.2 metric tons	48.7 tons

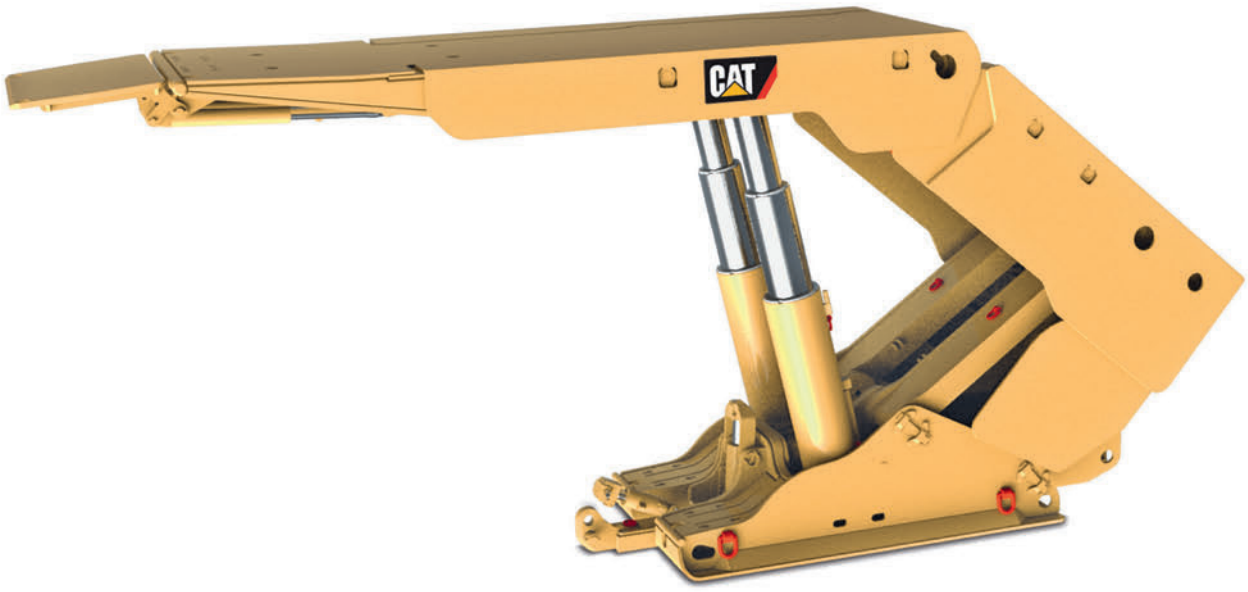


Face Cross Section

2-Leg Roof Support 2000/4000-2x2898-1750 for Shearer application

Front View

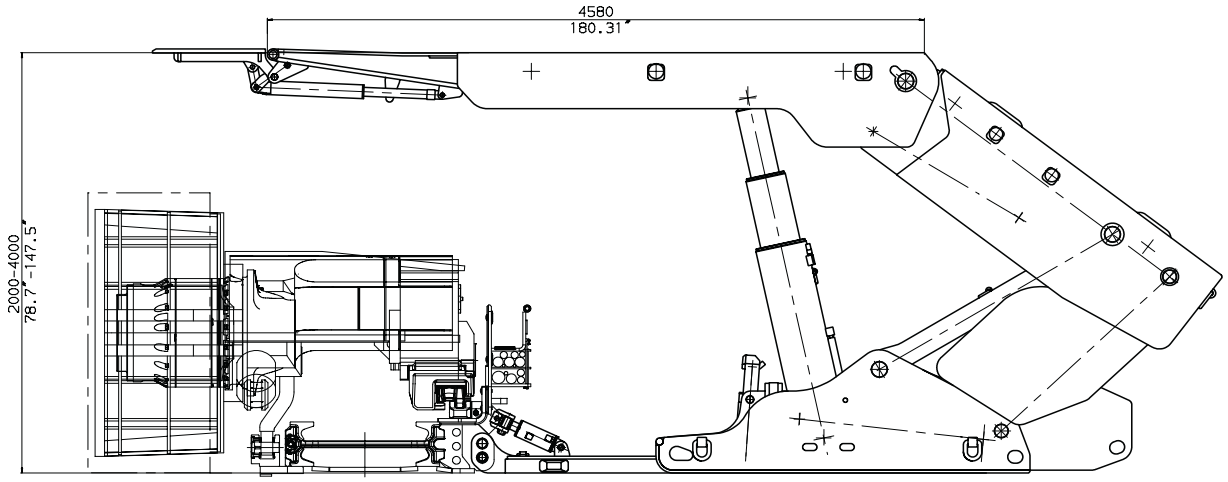
Rear View



Side View

Technical Data

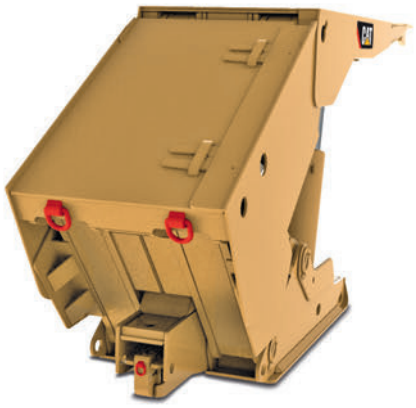
	Metric	Imperial
Closed height:	2000 mm	78.7 in
Extended height:	4000 mm	157.5 in
Shield centres:	1750 mm	68.90 in
Hydraulic leg:	double telescopic	double telescopic
Leg piston diameter:	300 mm	11.81 in
Nominal leg forces:	2 x 2898 kN at 410 bar	2 x 325.7 tons at 5946 psi
Shield resistance:	5688 kN at 410 bar at 3000 mm height	639.3 tons at 5946 psi at 118.1 in height
Shield density:	653 kN/m² at 3000 mm height	6.82 tons/ft² at 118.1 in height
Canopy type:	rigid design with face sprag	rigid design with face sprag
Canopy length:	4580 mm	180.31 in
Base type:	rigid catamaran type	rigid catamaran type
Advancing system:	850 mm effective web	33.5 in
Shield pull force:	449 kN	50.5 tons
Conveyor push force:	258 kN	29.0 tons
Side shields:	on canopy and caving shield, one side moveable, one side fixed, rehandable on rear links, both sides fixed	
Weight:	21.0 metric tons	23.2 tons



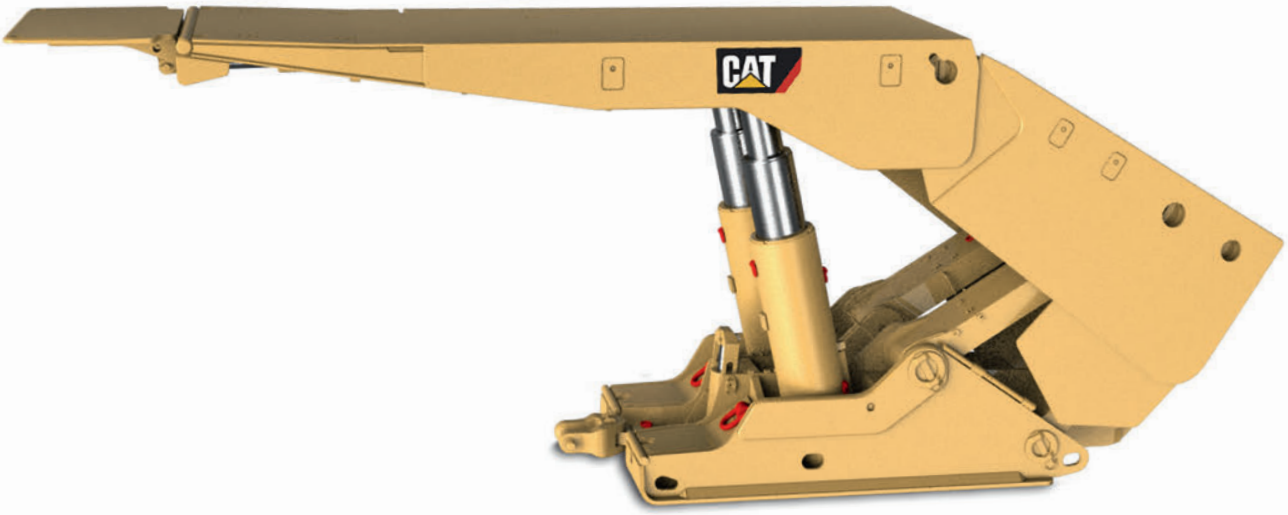
Face Cross Section

2-Leg Roof Support 1981/4115-2x4123-1750 for Shearer application

Front View



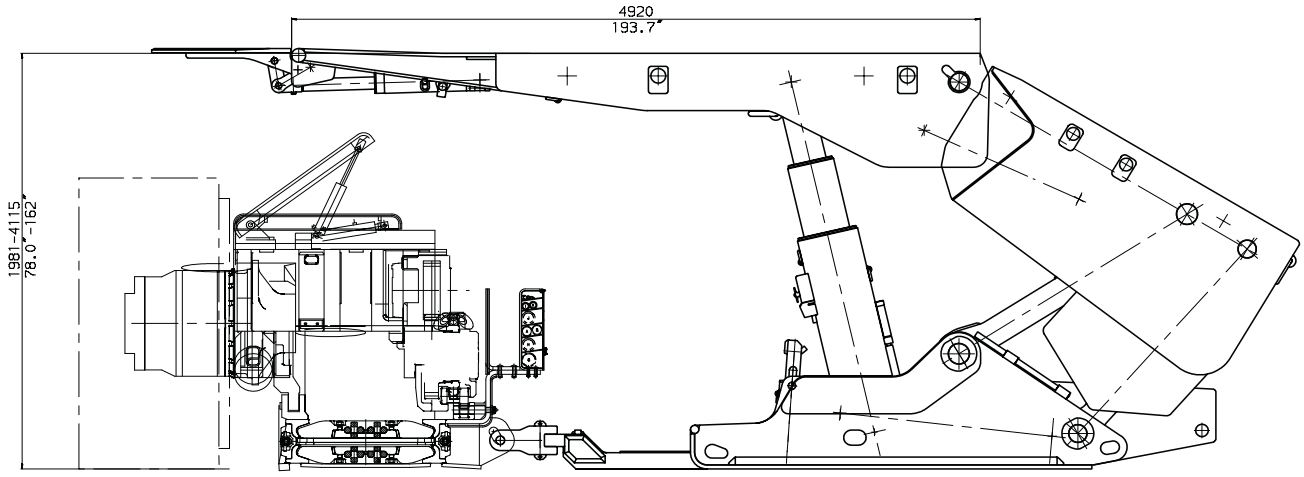
Rear View



Side View

Technical Data

	Metric	Imperial
Closed height:	1981 mm	78.0 in
Extended height:	4115 mm	162.0 in
Shield centres:	1750 mm	68.90 in
Hydraulic leg:	double telescopic	double telescopic
Leg piston diameter:	360 mm	14.17 in
Nominal leg forces:	2 x 4123 kN at 405 bar	2 x 463.4 tons at 5874 psi
Shield resistance:	7953 kN at 405 bar at 2800 mm height	893.9 tons at 5874 psi at 110.2 in height
Shield density:	836 kN/m² at 2800 mm height	8.73 tons/ft² at 110.2 in height
Canopy type:	rigid design with face sprag	rigid design with face sprag
Canopy length:	4920 mm	193.70 in
Base type:	rigid catamaran type	rigid catamaran type
Advancing system:	1000 mm effective web	39.4 in
Shield pull force:	547 kN	61.5 tons
Conveyor push force:	351 kN	39.5 tons
Side shields:	on canopy and caving shield, one side moveable, one side fixed, not rehandable on rear links, both sides fixed	
Weight:	29.0 metric tons	32.0 tons

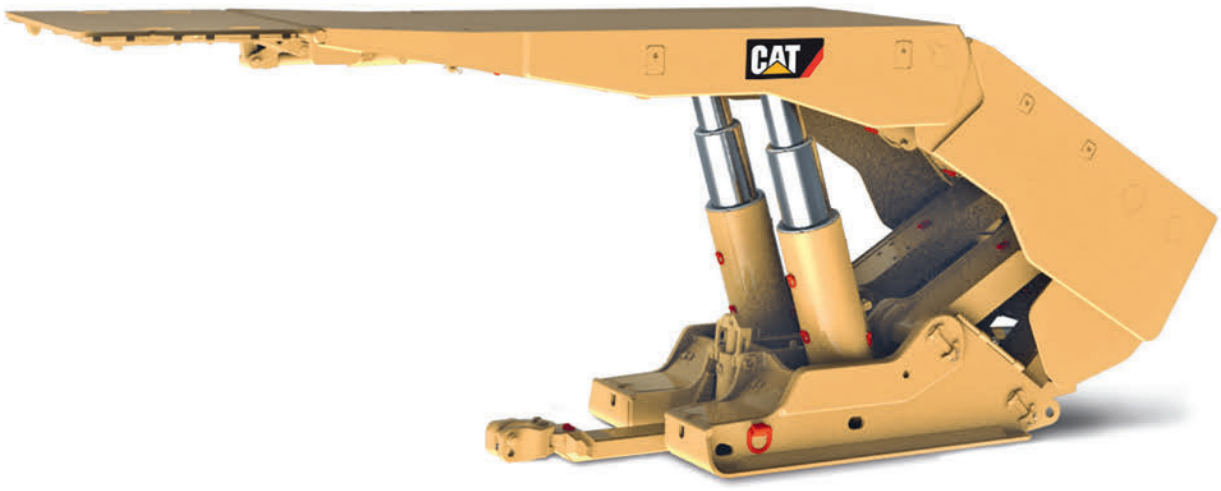


Face Cross Section

2-Leg Roof Support 1920/4420-2x5655-2050 for Shearer application

Front View

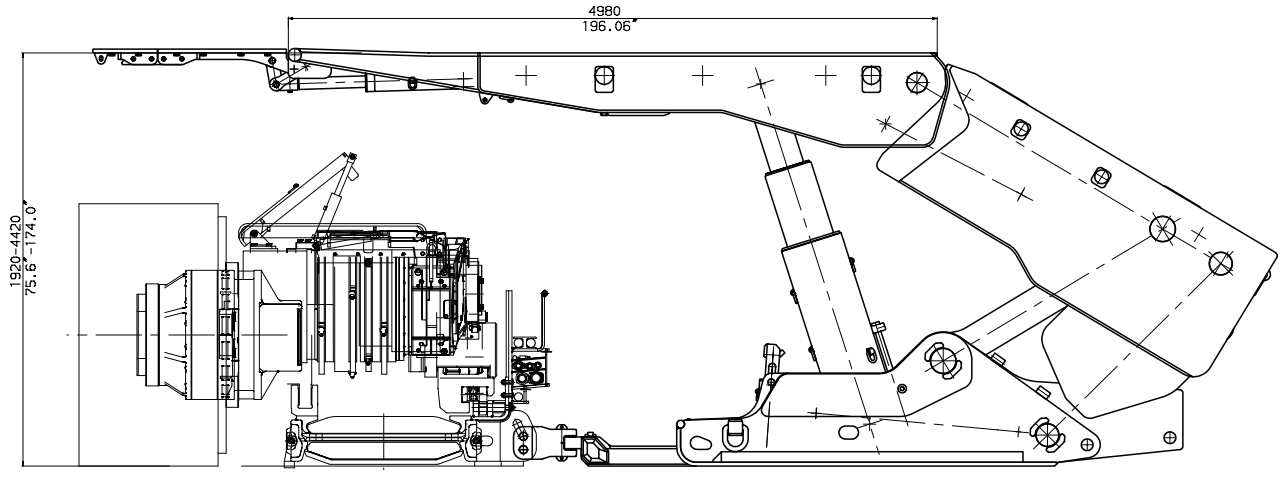
Rear View



Side View

Technical Data

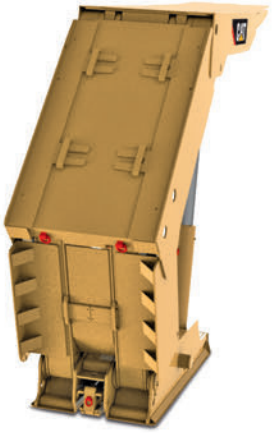
	Metric	Imperial
Closed height:	1920 mm	75.6 in
Extended height:	4420 mm	174.0 in
Shield centres:	2050 mm	80.71 in
Hydraulic leg:	double telescopic	double telescopic
Leg piston diameter:	400 mm	15.75 in
Nominal leg forces:	2 x 5655 kN at 450 bar	2 x 635.6 tons at 6526 psi
Shield resistance:	10751 kN at 450 bar at 3200 mm height	1208.4 tons at 6526 psi at 126.0 in height
Shield density:	958 kN/m² at 3200 mm height	10.0 tons/ft² at 126.0 in height
Canopy type:	rigid design with face sprag	rigid design with face sprag
Canopy length:	4980 mm	196.06 in
Base type:	rigid catamaran type	rigid catamaran type
Advancing system:	1067 mm effective web	42.0 in
Shield pull force:	663 kN	74.5 tons
Conveyor push force:	419 kN	47.1 tons
Side shields:	on canopy and caving shield, one side moveable, one side fixed, not rehandable on rear links, both sides fixed	
Weight:	38.0 metric tons	41.9 tons



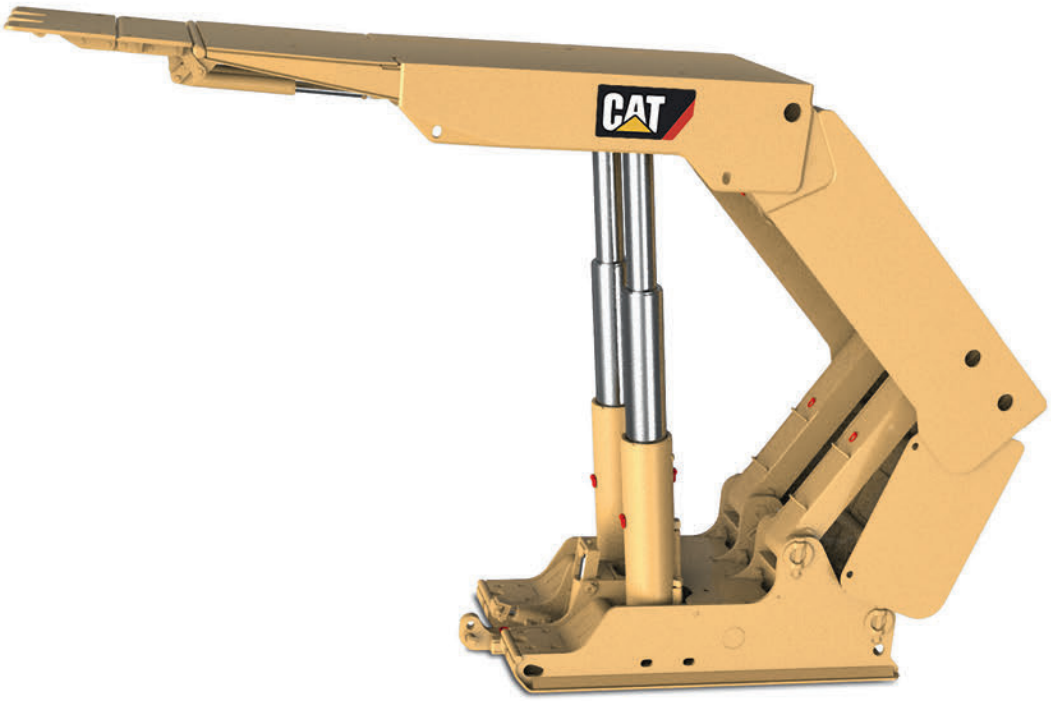
Face Cross Section

2-Leg Roof Support 2200/4800-2x3297-1750 for Shearer application

Front View



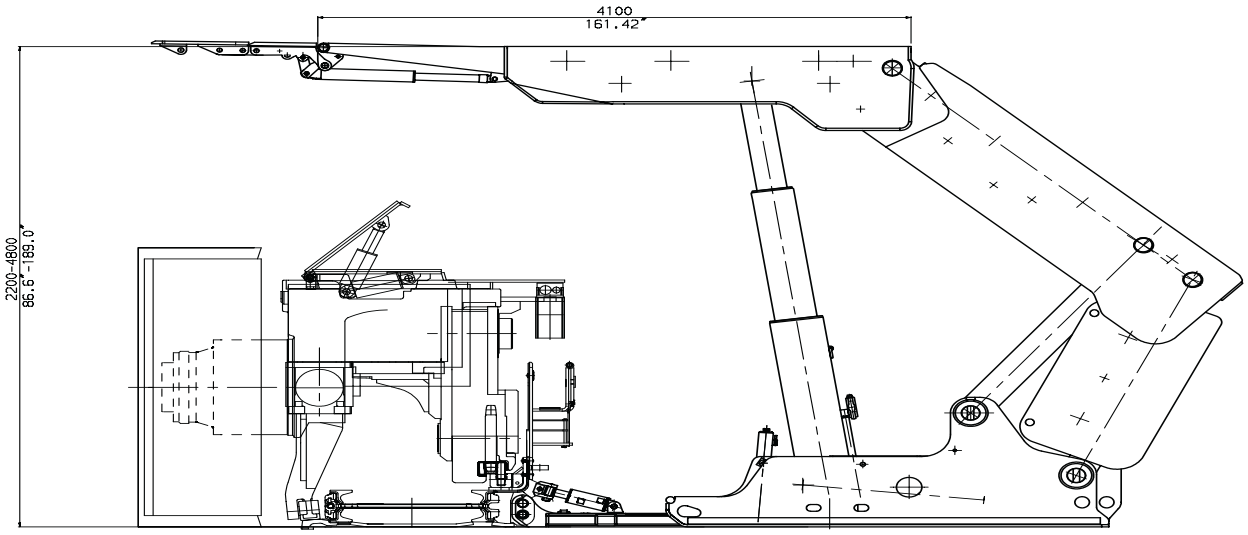
Rear View



Side View

Technical Data

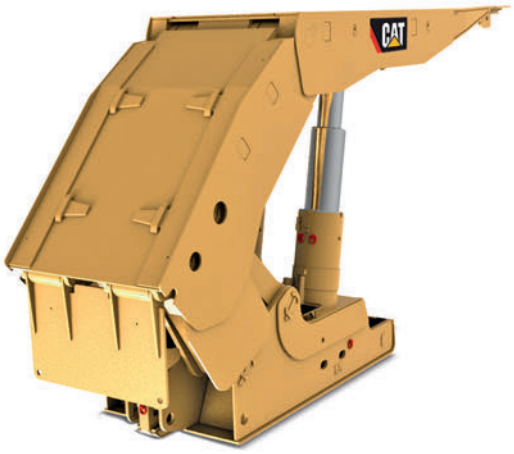
	Metric	Imperial
Closed height:	2200 mm	86.6 in
Extended height:	4800 mm	189.0 in
Shield centres:	1750 mm	68.90 in
Hydraulic leg:	double telescopic	double telescopic
Leg piston diameter:	320 mm	12.60 in
Nominal leg forces:	2 x 3297 kN at 410 bar	2 x 370.6 tons at 5946 psi
Shield resistance:	6479 kN at 410 bar at 4300 mm height	728.2 tons at 5946 psi at 169.3 in height
Shield density:	825 kN/m² at 4300 mm height	8.61 tons/ft² at 169.3 in height
Canopy type:	rigid design with face sprag	rigid design with face sprag
Canopy length:	4100 mm	161.42 in
Base type:	rigid catamaran type with pusher	rigid catamaran type with pusher
Advancing system:	800 mm effective web	31.5 in
Shield pull force:	458 kN	51.5 tons
Conveyor push force:	254 kN	28.5 tons
Side shields:	on canopy, caving shield and rear links, one side moveable, one side fixed, rehandable	
Weight:	21.7 metric tons	23.9 tons



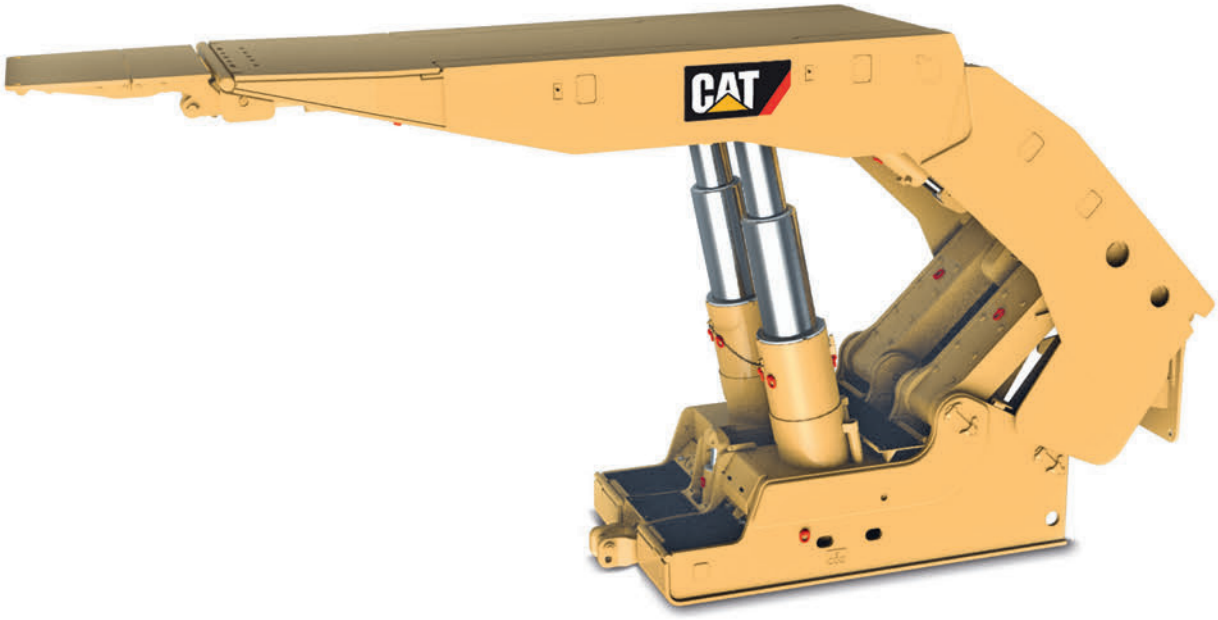
Face Cross Section

2-Leg Roof Support 2250/4700-2x6759-2050 for Shearer application

Front View



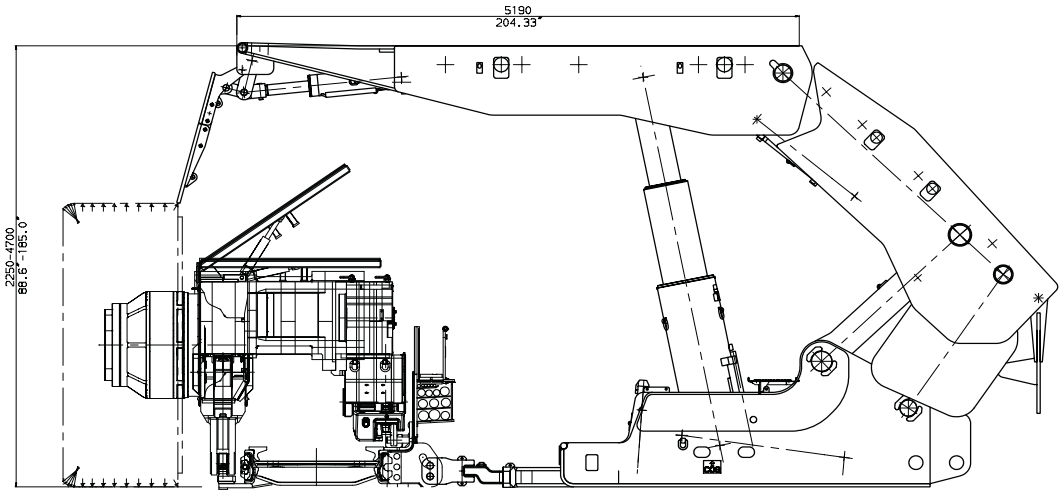
Rear View



Side View

Technical Data

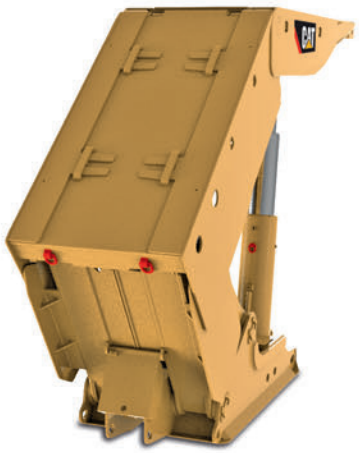
	Metric	Imperial
Closed height:	2250 mm	88.6 in
Extended height:	4700 mm	185.0 in
Shield centres:	2050 mm	80.71 in
Hydraulic leg:	double telescopic	double telescopic
Leg piston diameter:	450 mm	17.72 in
Nominal leg forces:	2 x 6759 kN at 425 bar	2 x 759.7 tons at 6164 psi
Shield resistance:	13428 kN at 425 bar at 4000 mm height	1509.3 tons at 6164 psi at 157.5 in height
Shield density:	1138 kN/m² at 4000 mm height	11.88 tons/ft² at 157.5 in height
Canopy type:	rigid design with face sprag	rigid design with face sprag
Canopy length:	5190 mm	204.33 in
Base type:	rigid catamaran type	rigid catamaran type
Advancing system:	1000 mm effective web	39.4 in
Shield pull force:	1004 kN	112.8 tons
Conveyor push force:	612 kN	68.8tons
Side shields:	on canopy and caving shield, both sides moveable at the same time on rear links, both sides fixed	
Weight:	50.5 metric tons	55.7 tons



Face Cross Section

2-Leg Roof Support 2400/5000-2x4412-1750 for Shearer application

Front View

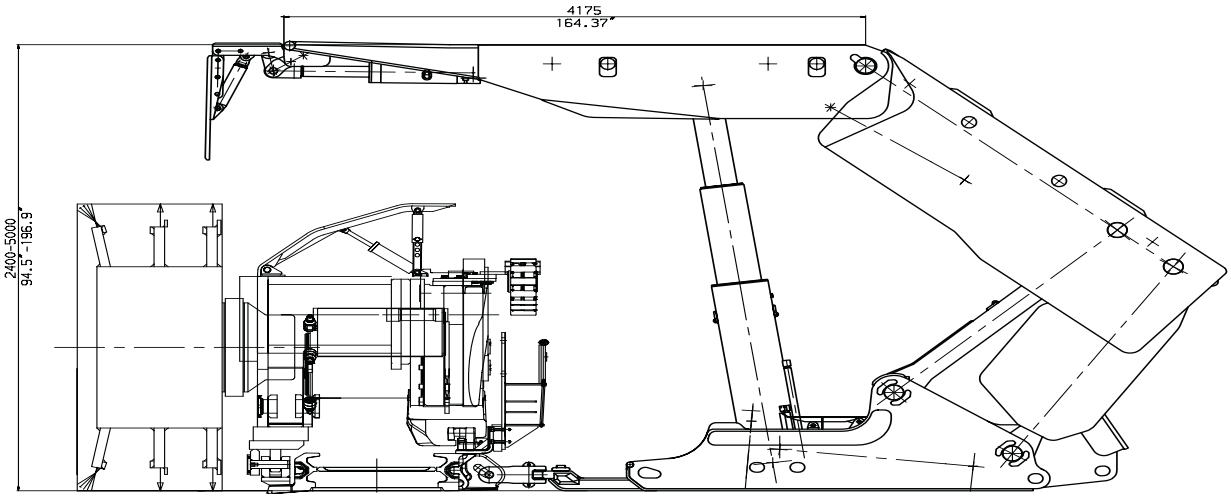


Rear View

Side View

Technical Data

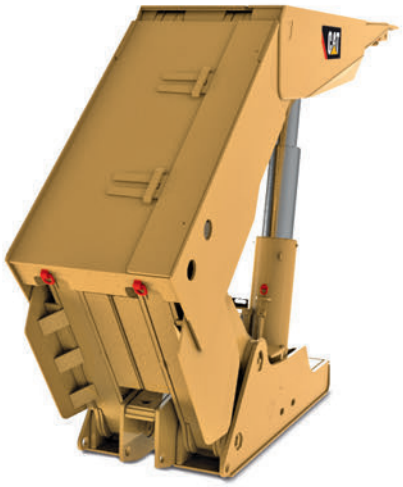
	Metric	Imperial
Closed height:	2400 mm	94.5 in
Extended height:	5000 mm	196.9 in
Shield centres:	1750 mm	68.90 in
Hydraulic leg:	double telescopic	double telescopic
Leg piston diameter:	345 mm	13.58 in
Nominal leg forces:	2 x 4412 kN at 472 bar	2 x 495.9 tons at 6845 psi
Shield resistance:	8761 kN at 472 bar at 4200 mm height	984.7 tons at 6845 psi at 165.4 in height
Shield density:	1044 kN/m² at 4200 mm height	10.90 tons/ft² at 165.4 in height
Canopy type:	rigid design with face sprag	rigid design with face sprag
Canopy length:	4175 mm	164.4 in
Base type:	rigid catamaran type	rigid catamaran type
Advancing system:	865 mm effective web	34.1 in
Shield pull force:	556 kN	62.5 tons
Conveyor push force:	309 kN	34.7 tons
Side shields:	on canopy and caving shield, one side moveable, one side fixed, rehandable on rear links, both sides fixed	
Weight:	28.3 metric tons	31.2 tons



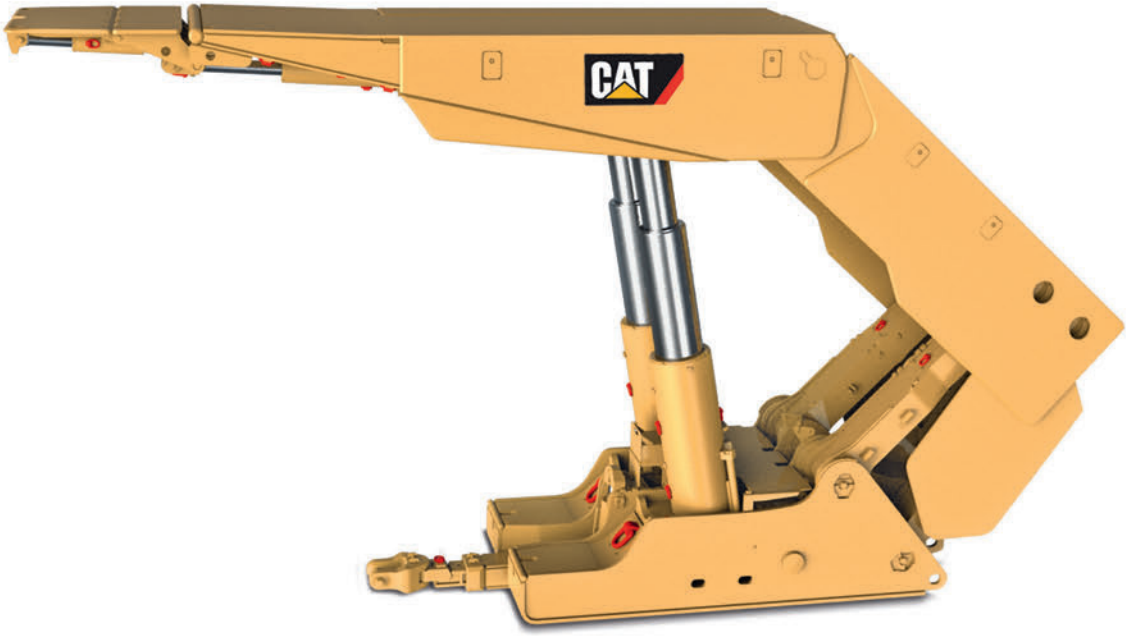
Face Cross Section

2-Leg Roof Support 2400/5200-2x5655-1750 for Shearer application

Front View



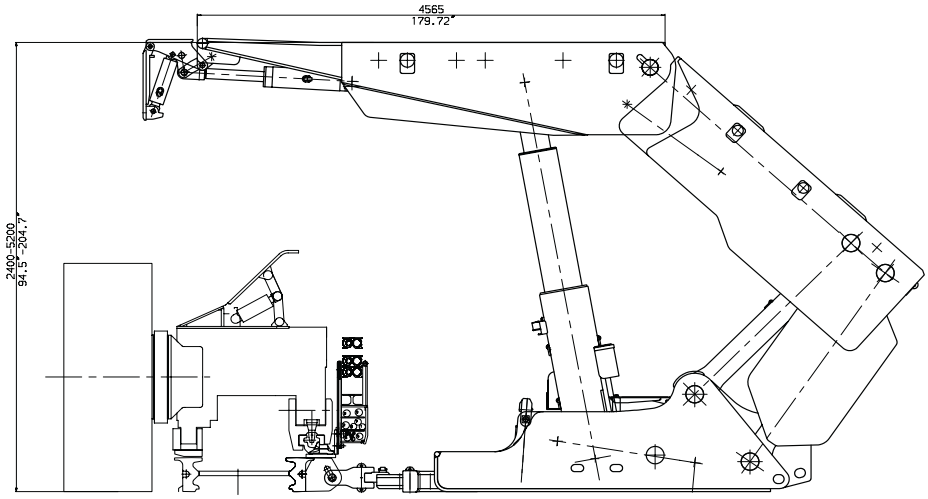
Rear View



Side View

Technical Data

	Metric	Imperial
Closed height:	2400 mm	94.5 in
Extended height:	5200 mm	204.7 in
Shield centres:	1750 mm	68.90 in
Hydraulic leg:	double telescopic	double telescopic
Leg piston diameter:	400 mm	15.75 in
Nominal leg forces:	2 x 5655 kN at 450 bar	2 x 635.6 tons at 6526 psi
Shield resistance:	11129 kN at 450 bar at 4500 mm height	1250.9 tons at 6526 psi at 177.2 in height
Shield density:	1255 kN/m² at 4500 mm height	13.10 tons/ft² at 177.2 in height
Canopy type:	rigid design with face sprag	rigid design with face sprag
Canopy length:	4565 mm	179.72 in
Base type:	rigid catamaran type	rigid catamaran type
Advancing system:	800 mm effective web	31.5 in
Shield pull force:	684 kN	76.9 tons
Conveyor push force:	432 kN	48.6 tons
Side shields:	on canopy and caving shield, one side moveable, one side fixed, not rehandable on rear links, both sides fixed	
Weight:	38.2 metric tons	42.1 tons

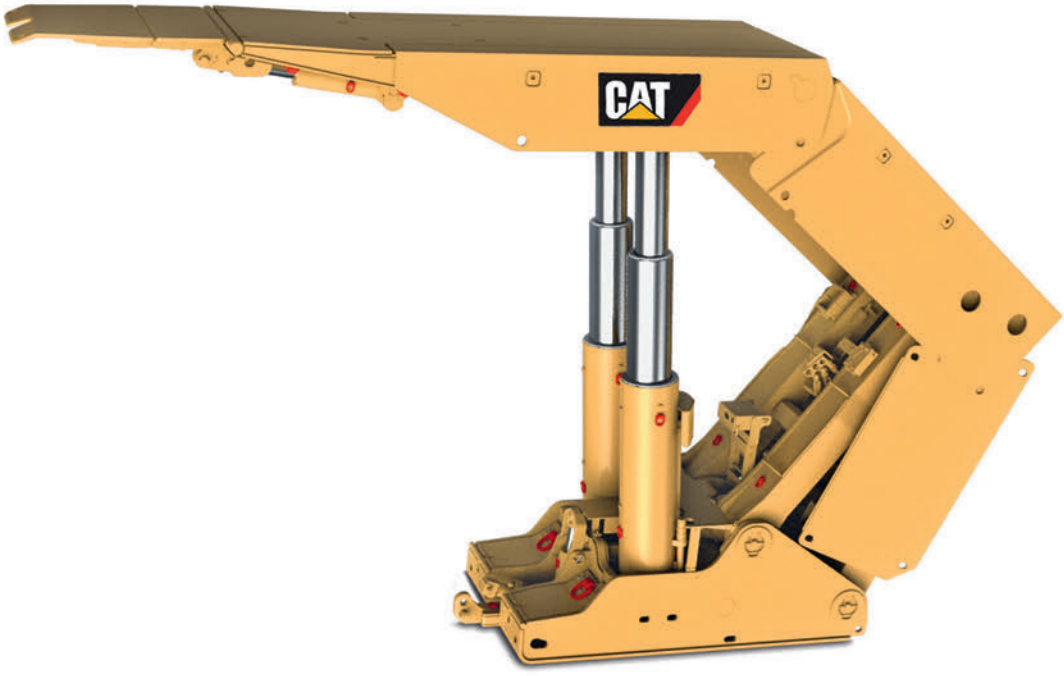


Face Cross Section

2-Leg Roof Support 2900/6100-2x5655-1750 for Shearer application

Front View

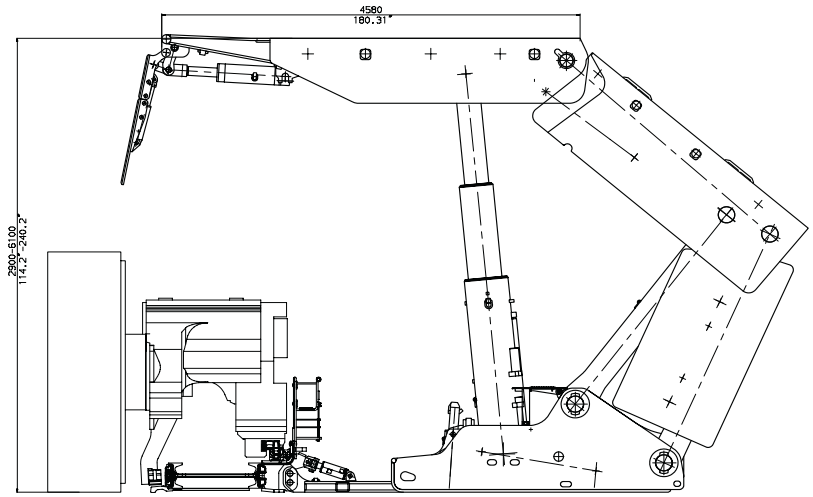
Rear View



Side View

Technical Data

	Metric	Imperial
Closed height:	2900 mm	114.2 in
Extended height:	6100 mm	240.2 in
Shield centres:	1750 mm	68.90 in
Hydraulic leg:	double telescopic	double telescopic
Leg piston diameter:	400 mm	15.75 in
Nominal leg forces:	2 x 5655 kN at 450 bar	2 x 635.6 tons at 6526 psi
Shield resistance:	11264 kN at 450 bar at 5000 mm height	1266.0 tons at 6526 psi at 196.9 in height
Shield density:	1280 kN/m² at 5000 mm height	13.37 tons/ft² at 196.9 in height
Canopy type:	rigid design with face sprag	rigid design with face sprag
Canopy length:	4580 mm	180.31 in
Base type:	rigid catamaran type	rigid catamaran type
Advancing system:	800 mm effective web	31.5 in
Shield pull force:	814 kN	91.5 tons
Conveyor push force:	563 kN	63.3 tons
Side shields:	on canopy, caving shield and rear links one side moveable, one side fixed, rehandable	
Weight:	38.5 metric tons	42.5 tons



Face Cross Section

2-Leg Roof Support 2550/5500-2x4319-1750 for Shearer application

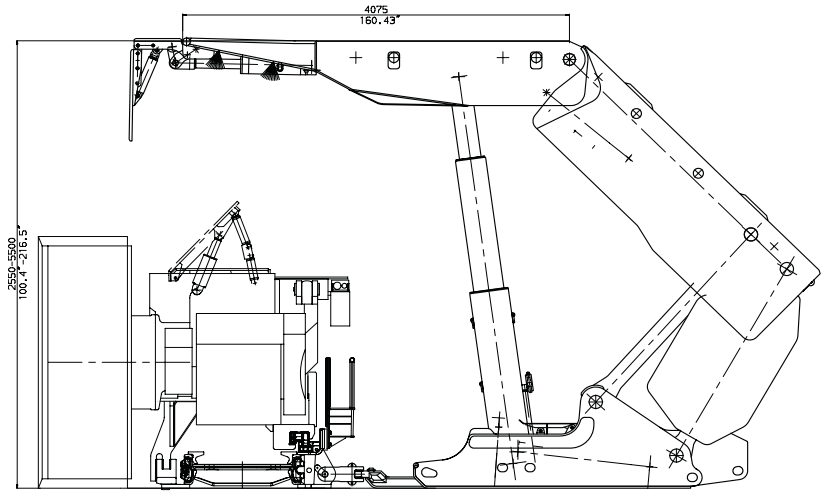
Front View

Rear View

Side View

Technical Data

	Metric	Imperial
Closed height:	2550 mm	100.4 in
Extended height:	5500 mm	216.5 in
Shield centres:	1750 mm	68.90 in
Hydraulic leg:	double telescopic	double telescopic
Leg piston diameter:	345 mm	13.58 in
Nominal leg forces:	2 x 4319 kN at 462 bar	2 x 485.4 tons at 6700 psi
Shield resistance:	8534 kN at 462 bar at 4800 mm height	959.2 tons at 6700 psi at 189.0 in height
Shield density:	1053 kN/m² at 4800 mm height	11.00 tons/ft² at 189.0 in height
Canopy type:	rigid design with face sprag	rigid design with face sprag
Canopy length:	4075 mm	160.43 in
Base type:	rigid catamaran type	rigid catamaran type
Advancing system:	865 mm effective web	34.5 in
Shield pull force:	556 kN	62.5 tons
Conveyor push force:	309 kN	34.7 tons
Side shields:	on canopy and caving shield, one side moveable, one side fixed, rehandable on rear links, both sides fixed	
Weight:	28.1 metric tons	31.0 tons



Face Cross Section

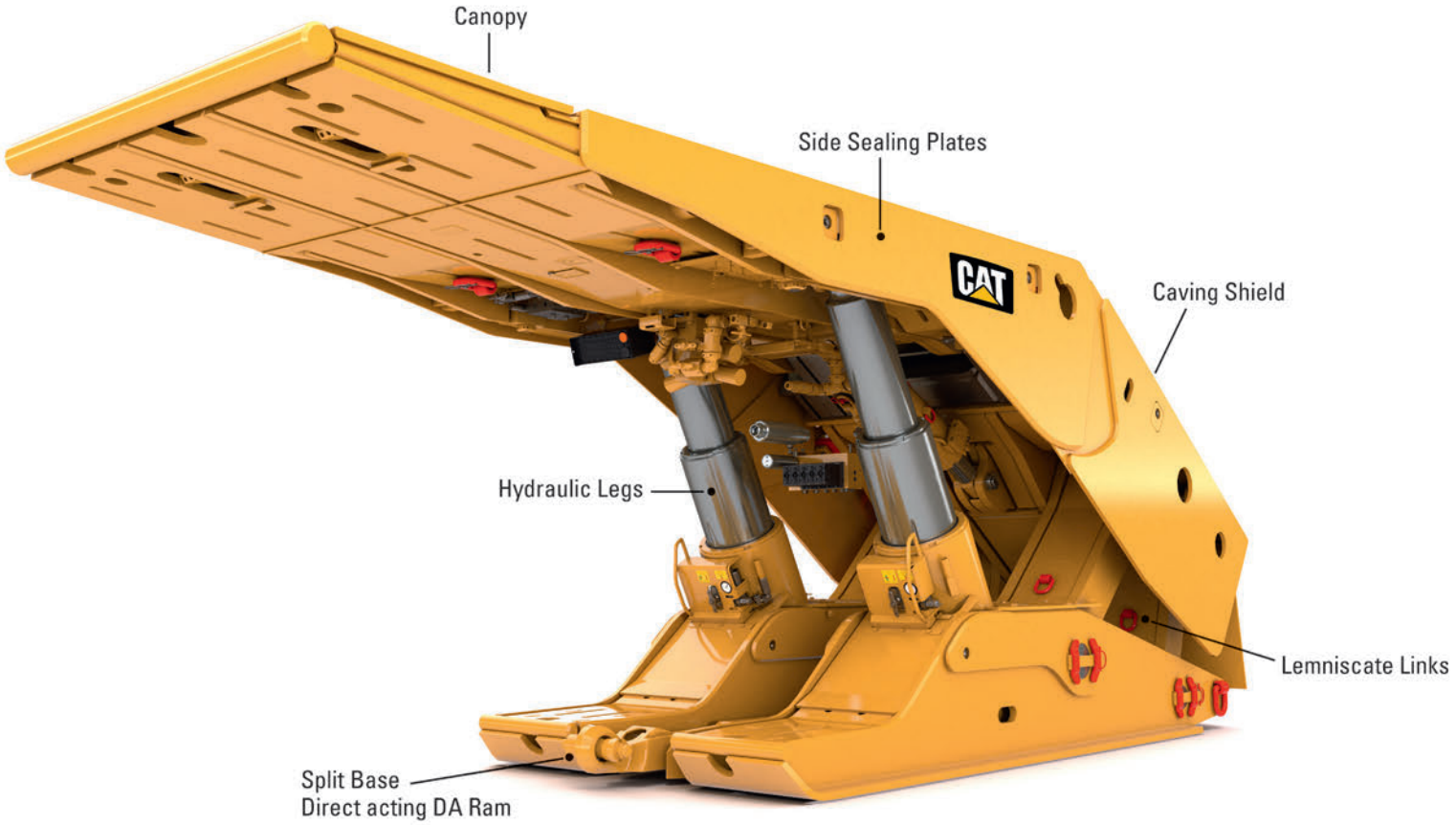
Plow Face Roof Supports

Main Data & Specifications

Plow Face Roof Supports

Roof supports for Cat plow systems incorporate the same structural and hydraulic features as the roof supports for shearer longwalls. However, the plow roof supports have the following special requirements and restrictions for working in thin and medium seam heights:

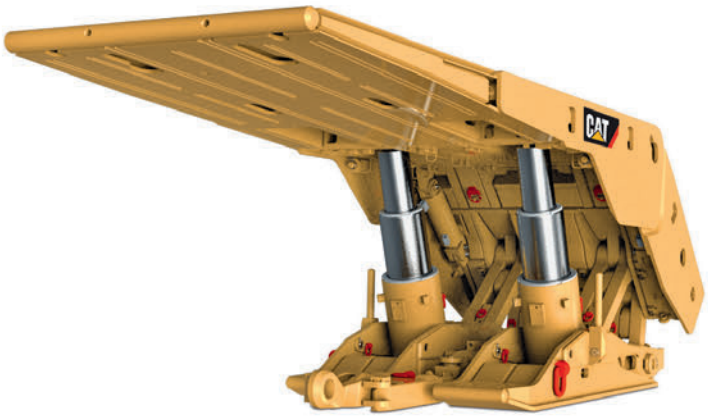
- Direct-acting DA ram allows the use of shorter roof supports to cope with undulating seams
- Only high-strength steel is used for structural components to ensure minimum canopy thickness and maximum travel way height
- A split base allows the vertical movement of the relay bar necessary for effective horizon control and access to the DA ram for maintenance
- “Elephant step” is available to prevent dirt accumulation and overcome soft floor conditions



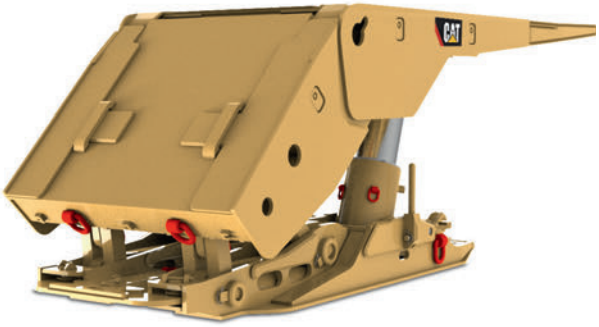
CAT ROOF SUPPORTS FOR PLOW LONGWALL SYSTEMS

MAIN COMPONENTS

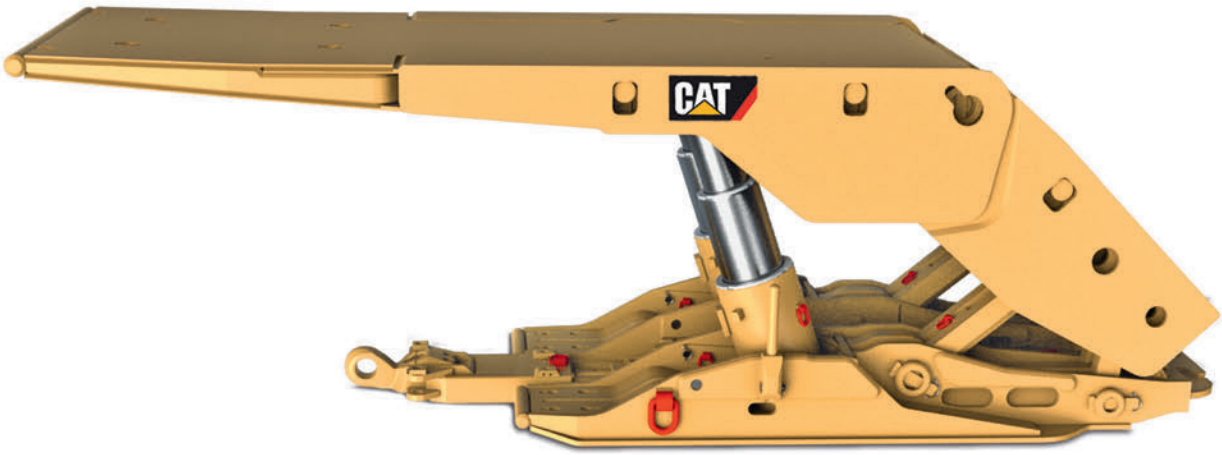
2-Leg Roof Support
600/1400-2x2283-1500
For Plow application



Front View



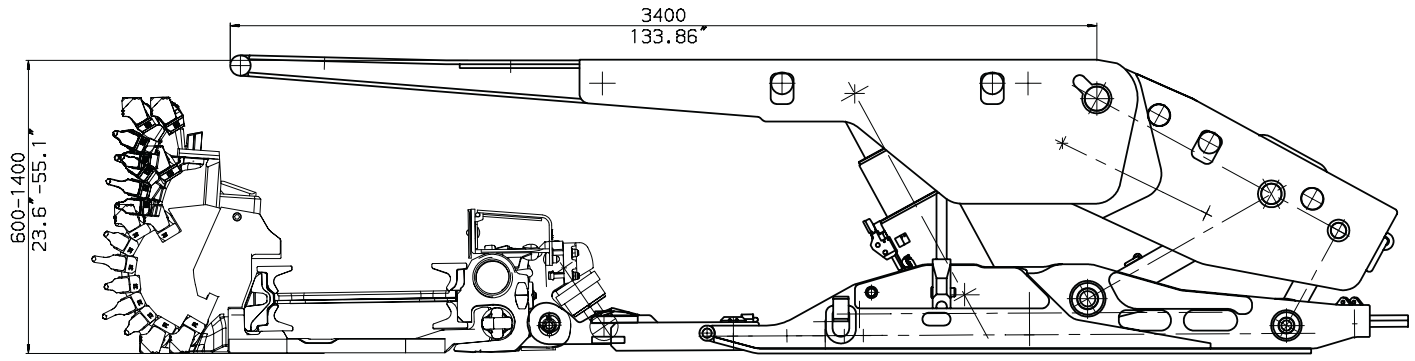
Rear View



Side View

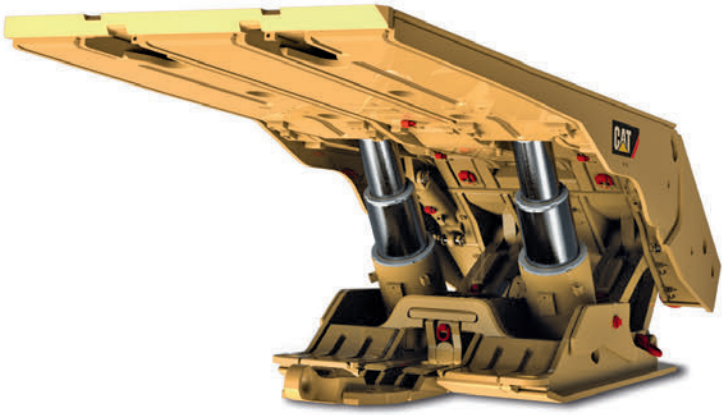
Technical Data

	Metric	Imperial
Closed height:	600 mm	23.6 in
Extended height:	1400 mm	55.1 in
Shield centres:	1500 mm	59.1 in
Hydraulic leg:	double telescopic	double telescopic
Leg piston diameter:	260 mm	10.24 in
Nominal leg forces:	2 x 2283 kN at 430 bar	2 x 256.6 tons at 6236 psi
Shield resistance:	3809 kN at 430 bar at 1100 mm height	428.1 tons at 6236 psi at 43.3 in height
Shield density:	685 kN/m² at 1100 mm height	7.15 tons/ft² at 43.3 in height
Canopy type:	rigid design	rigid design
Canopy length:	3400 mm	133.86 in
Base type:	split type	split type
Advancing system:	800 mm effective web	31.5 in
Shield pull force:	297 kN	33.4 tons
Conveyor push force:	161 kN	18.1 tons
Side shields:	on canopy and caving shield, one side moveable, one side fixed, rehandable	
Weight:	9.4 metric tons	10.4 tons

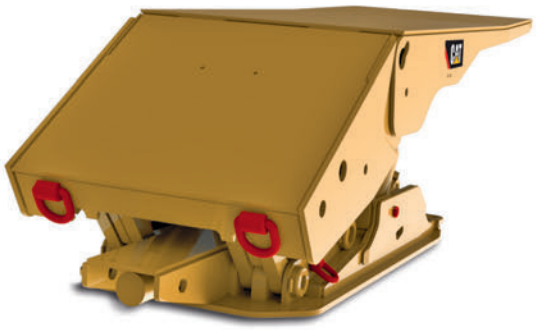


Face Cross Section

2-Leg Roof Support 580/1450-2x2071-1500 for Plow application



Front View

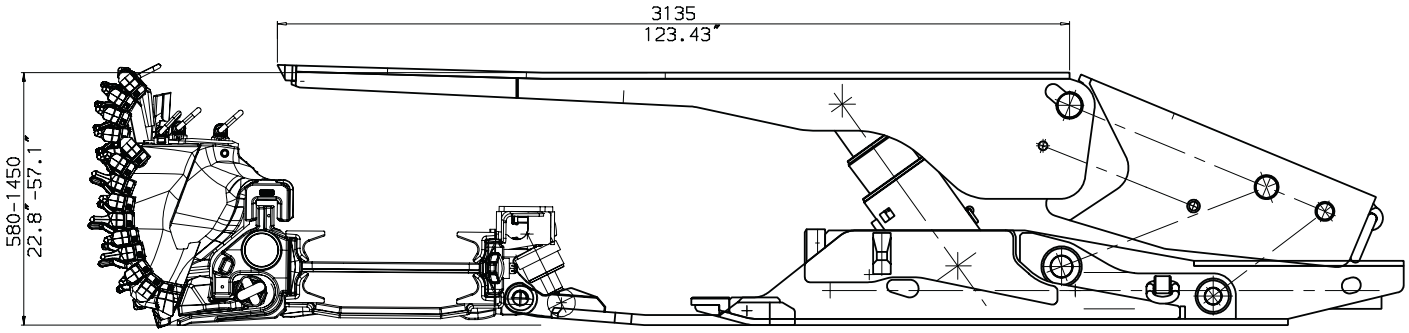


Rear View

Side View

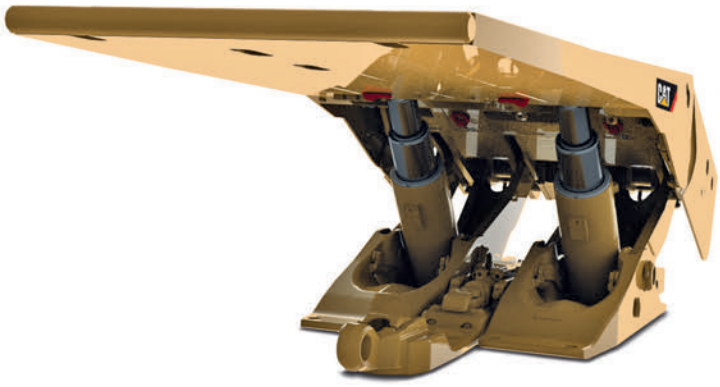
Technical Data

	Metric	Imperial
Closed height:	580 mm	22.8 in
Extended height:	1450 mm	57.1 in
Shield centres:	1500 mm	59.1 in
Hydraulic leg:	double telescopic	double telescopic
Leg piston diameter:	260 mm	10.24 in
Nominal leg forces:	2 x 2071 kN at 390 bar	2 x 232.8 tons at 5656 psi
Shield resistance:	3304 kN at 390 bar at 1000 mm height	371.4 tons at 5656 psi at 39.4 in height
Shield density:	623 kN/m² at 1000 mm height	6.51 tons/ft² at 39.4 in height
Canopy type:	rigid design	rigid design
Canopy length:	3135 mm	123.43 in
Base type:	rigid type with relay bar	rigid type with relay bar
Advancing system:	850 mm effective web	33.5 in
Shield pull force:	362 kN	40.7 tons
Conveyor push force:	158 kN	17.8 tons
Side shields:	on canopy and caving shield, both sides fixed	
Weight:	8.15 metric tons	9.0 tons

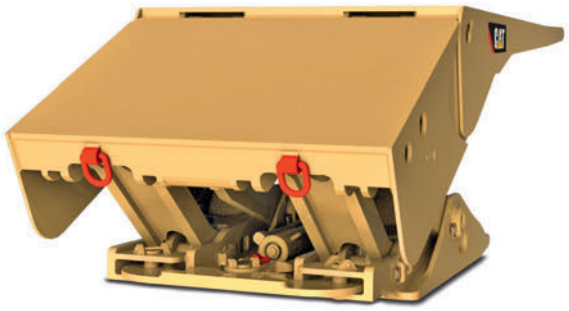


Face Cross Section

2-Leg Roof Support 800/1800-2x2686-1500 for Plow application



Front View

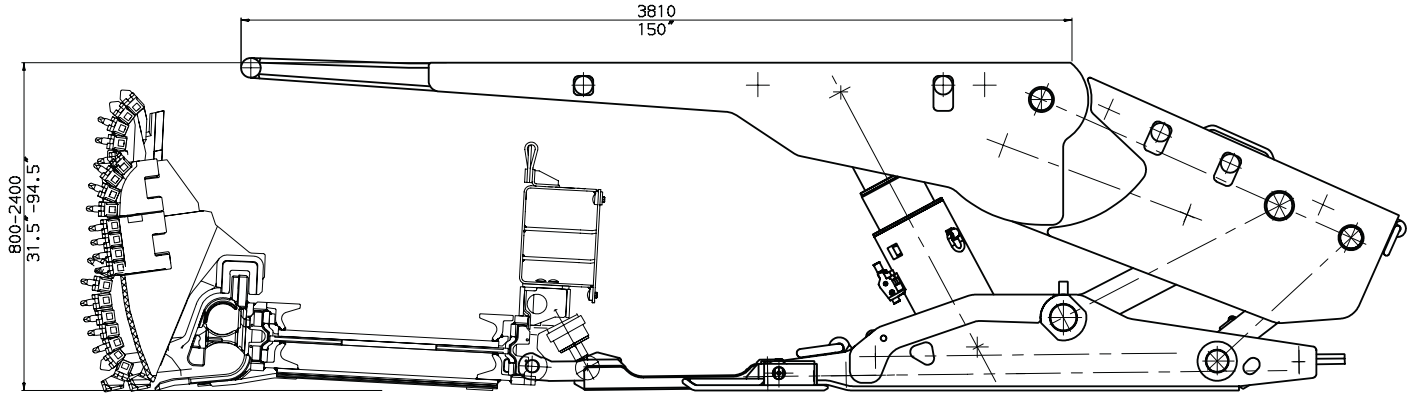


Rear View

Side View

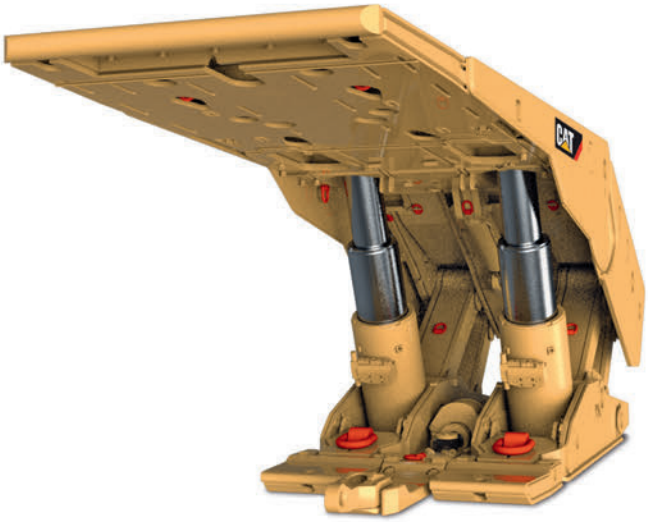
Technical Data

	Metric	Imperial
Closed height:	800 mm	31.5 in
Extended height:	2400 mm	94.5 in
Shield centres:	1500 mm	59.1 in
Hydraulic leg:	double telescopic	double telescopic
Leg piston diameter:	300 mm	11.81 in
Nominal leg forces:	2 x 2686 kN at 380 bar	2 x 301.9 tons at 5511 psi
Shield resistance:	4585 kN at 380 bar at 1300 mm height	515.3 tons at 5511 psi at 51.2 in height
Shield density:	726 kN/m² at 1300 mm height	7.58 tons/ft² at 51.2 in height
Canopy type:	rigid design	rigid design
Canopy length:	3810 mm	150.0 in
Base type:	split type	split type
Advancing system:	850 mm effective web	33.5 in
Shield pull force:	279 kN	31.4 tons
Conveyor push force:	151 kN	17.0 tons
Side shields:	on canopy and caving shield, one side moveable, one sides fixed, rehandable	
Weight:	12.2 metric tons	13.5 tons



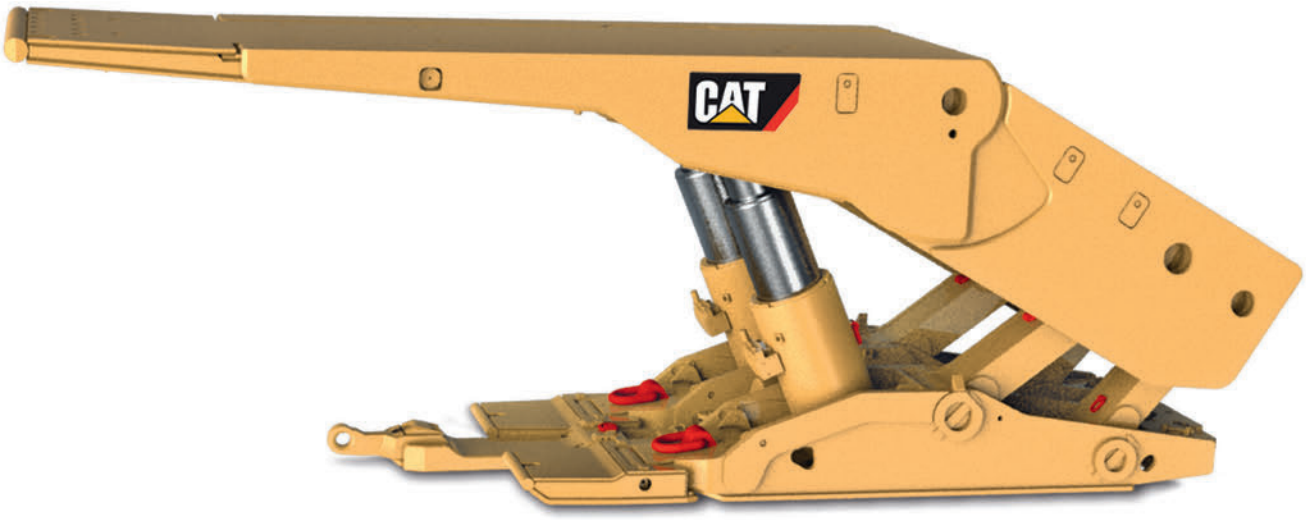
Face Cross Section

2-Leg Roof Support 550/1650-2x1414-1500 for Plow application



Front View

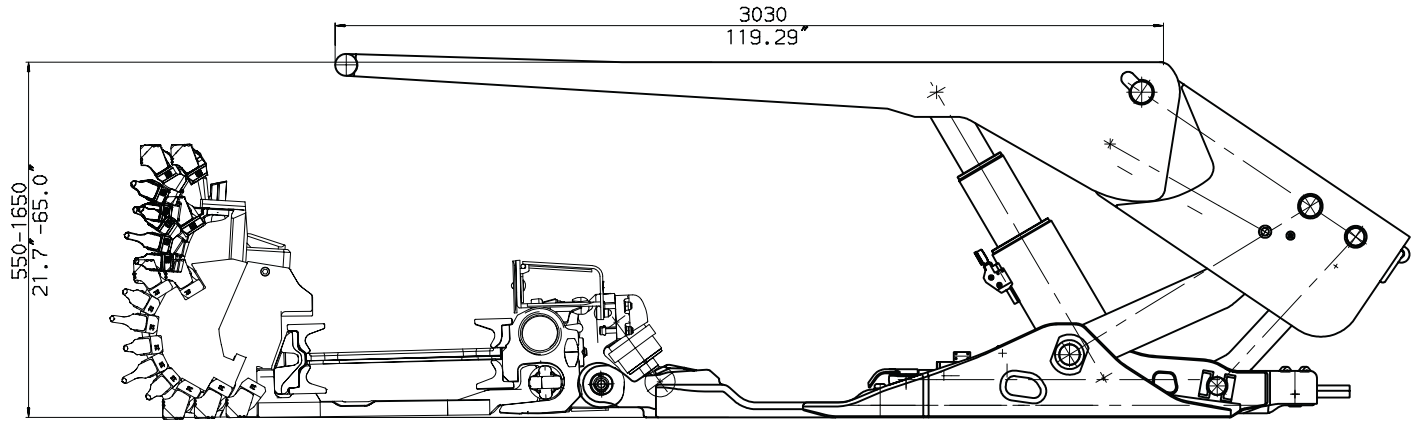
Rear View



Side View

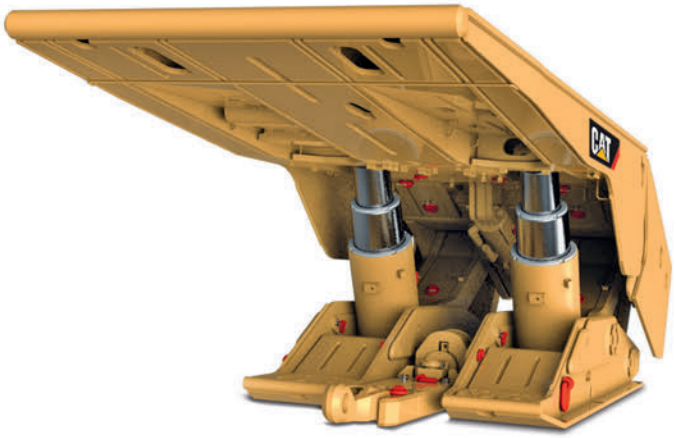
Technical Data

	Metric	Imperial
Closed height:	550 mm	21.7 in
Extended height:	1650 mm	65.0 in
Shield centres:	1500 mm	59.1 in
Hydraulic leg:	double telescopic	double telescopic
Leg piston diameter:	200 mm	7.87 in
Nominal leg forces:	2 x 1414 kN at 450 bar	2 x 158.9 tons at 6526 psi
Shield resistance:	2411 kN at 450 bar at 1300 mm height	271.0 tons at 6526 psi at 51.2 in. height
Shield density:	477 kN/m² at 1300 mm height	4.98 tons/ft² at 51.2 in. height
Canopy type:	rigid design	rigid design
Canopy length:	3030 mm	119.29 in
Base type:	split type	split type
Advancing system:	650 mm effective web	25.6 in
Shield pull force:	184 kN	20.7 tons
Conveyor push force:	89 kN	10.0 tons
Side shields:	on canopy and caving shield, both sides fixed	
Weight:	6.6 metric tons	7.3 tons

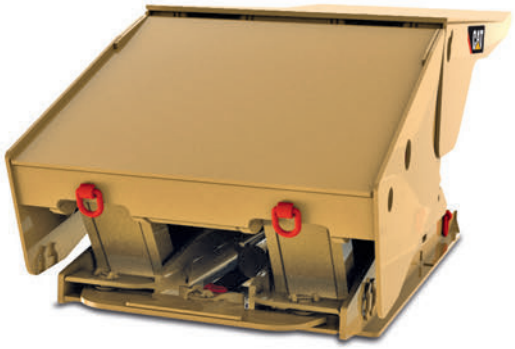


Face Cross Section

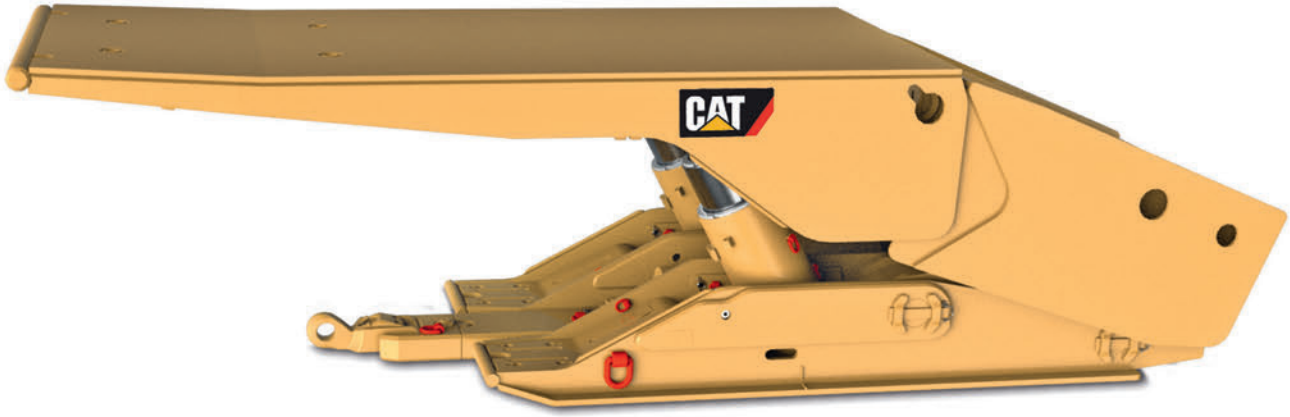
2-Leg Roof Support 885/1970-2x3181-1750 for Plow application



Front View



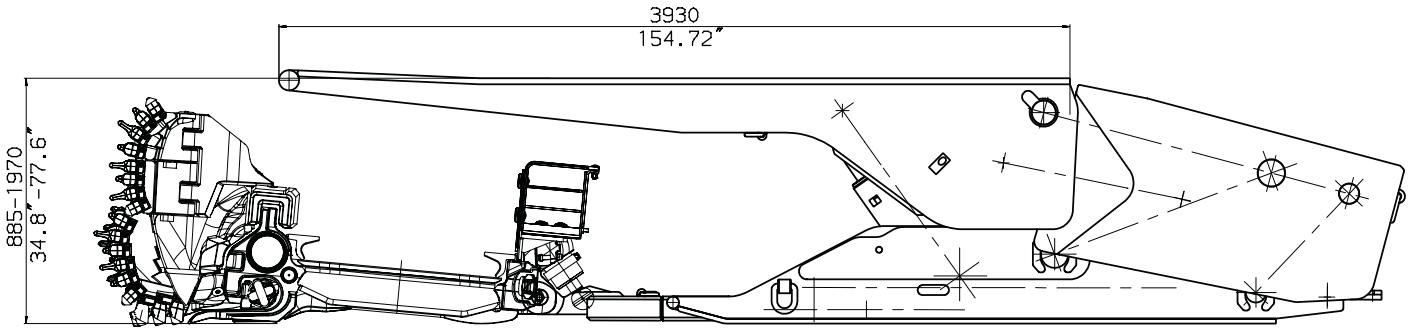
Rear View



Side View

Technical Data

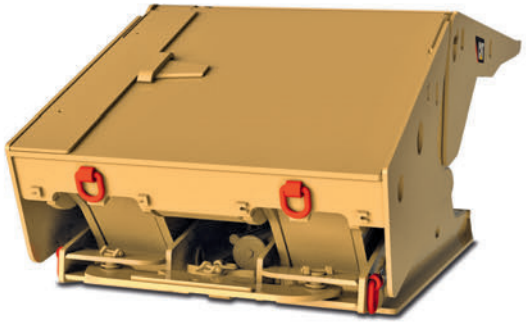
	Metric	Imperial
Closed height:	885 mm	34.8 in
Extended height:	1970 mm	77.6 in
Shield centres:	1750 mm	68.9 in
Hydraulic leg:	double telescopic	double telescopic
Leg piston diameter:	300 mm	11.81 in
Nominal leg forces:	2 x 3181 kN at 450 bar	2 x 357.5 tons at 6526 psi
Shield resistance:	5168 kN at 450 bar at 1219 mm height	580.9 tons at 6526 psi at 48.0 in. height
Shield density:	643 kN/m² at 1219 mm height	6.71 tons/ft² at 48.0 in. height
Canopy type:	rigid design	rigid design
Canopy length:	3930 mm	154.72 in
Base type:	split type	split type
Advancing system:	1219 mm effective web	48.0 in
Shield pull force:	379 kN	42.6 tons
Conveyor push force:	151 kN	17.0 tons
Side shields:	on canopy and caving shield, both sides fixed	
Weight:	15.0 metric tons	16.5 tons



Face Cross Section

2-Leg Roof Support 950/1900-2x3619-1750 for Plow application

Front View

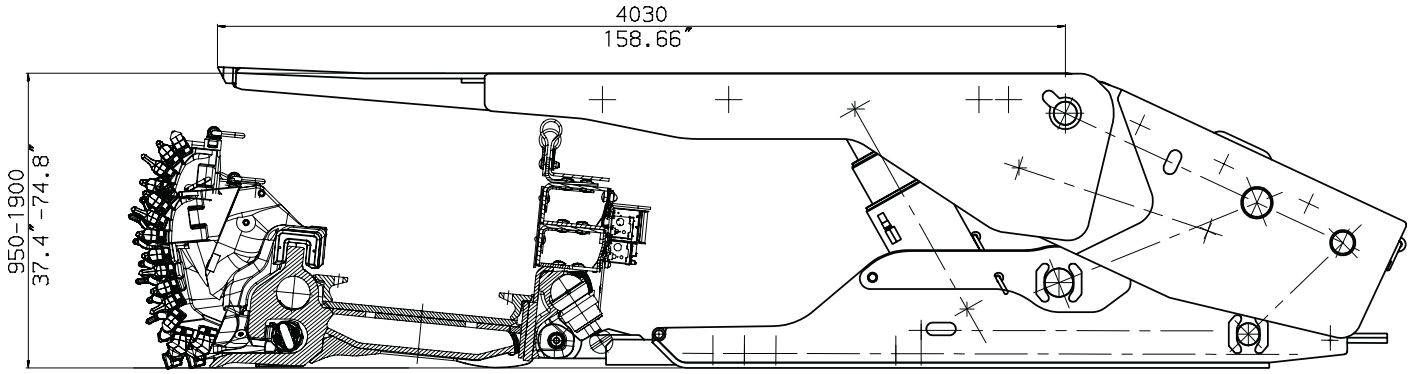


Rear View

Side View

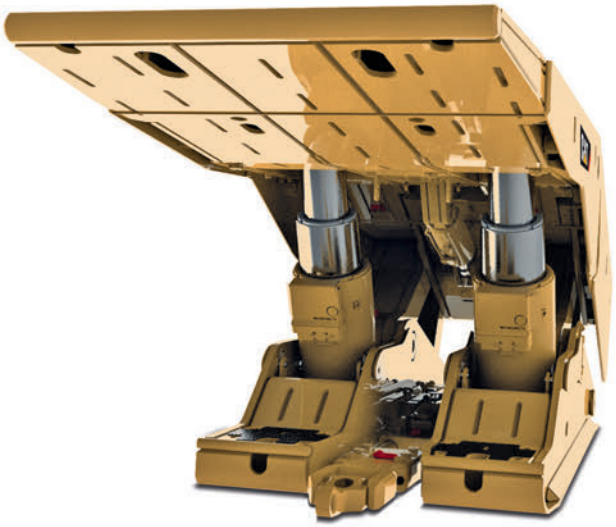
Technical Data

	Metric	Imperial
Closed height:	950 mm	37.4 in
Extended height:	1900 mm	74.8 in
Shield centres:	1750 mm	68.9 in
Hydraulic leg:	double telescopic	double telescopic
Leg piston diameter:	320 mm	12.60 in
Nominal leg forces:	2 x 3619 kN at 450 bar	2 x 406.8 tons at 6526 psi
Shield resistance:	6302 kN at 450 bar at 1400 mm height	708.3 tons at 6526 psi at 55.1 in height
Shield density:	841 kN/m² at 1400 mm height	8.78 tons/ft² at 55.1 in height
Canopy type:	rigid design	rigid design
Canopy length:	4030 mm	158.66 in
Base type:	split type	split type
Advancing system:	850 mm effective web	33.5 in
Shield pull force:	405 kN	45.5 tons
Conveyor push force:	161 kN	18.1 tons
Side shields:	on canopy and caving shield, one side moveable, one side fixed, not rehandable	
Weight:	15.2 metric tons	16.8 tons

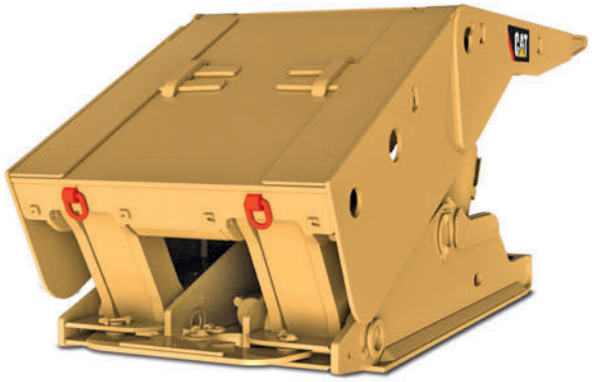


Face Cross Section

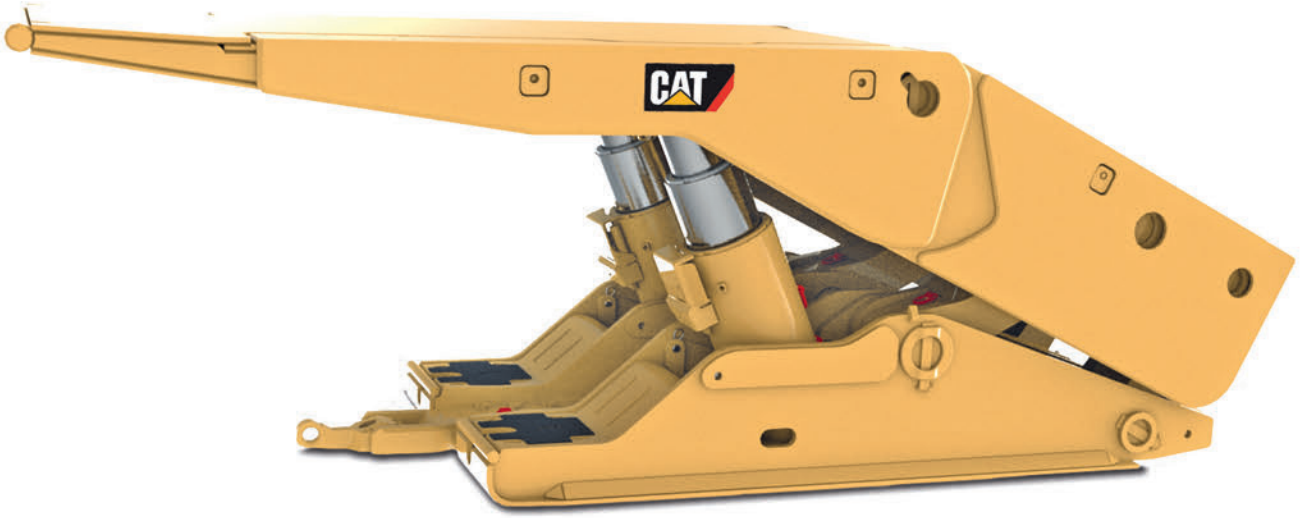
2-Leg Roof Support 1100/2300-2x4206-1750 for Plow application



Front View



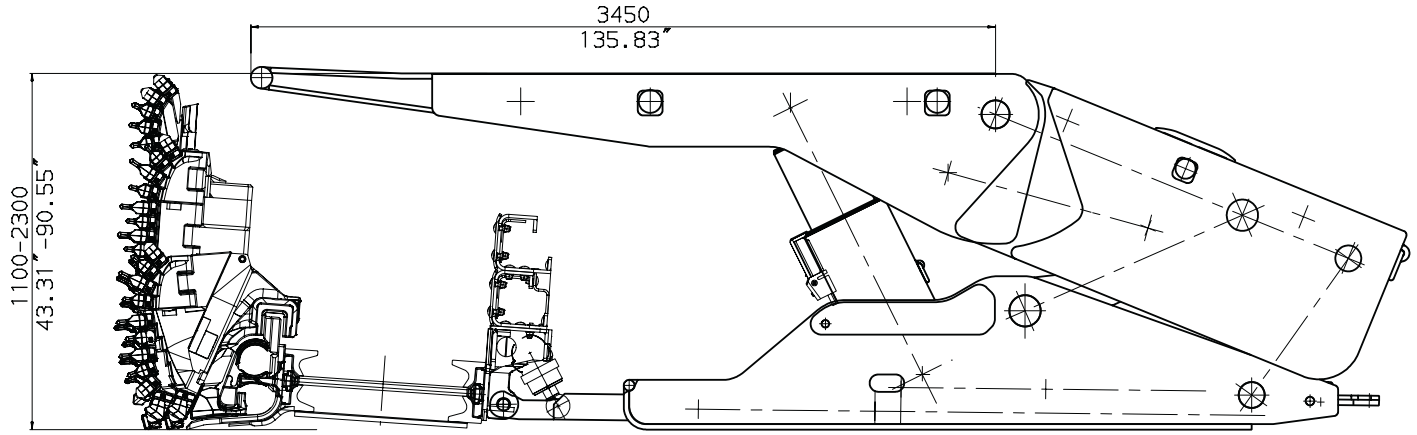
Rear View



Side View

Technical Data

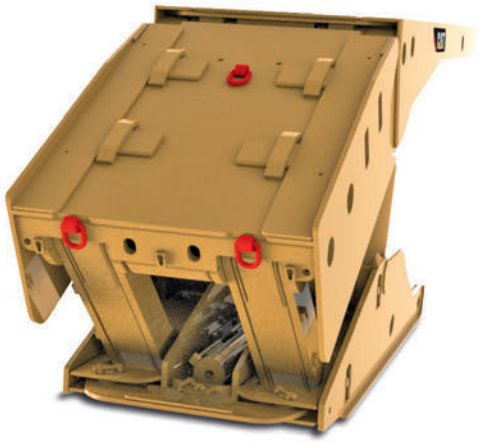
	Metric	Imperial
Closed height:	1100 mm	43.3 in
Extended height:	2300 mm	90.6 in
Shield centres:	1750 mm	68.9 in
Hydraulic leg:	double telescopic	double telescopic
Leg piston diameter:	345 mm	13.58 in
Nominal leg forces:	2 x 4206 kN at 450 bar	2 x 472.7 tons at 6526 psi
Shield resistance:	7485 kN at 450 bar at 1700 mm height	841.3 tons at 6526 psi at 66.9 in height
Shield density:	1141 kN/m² at 1700 mm height	11.91 tons/ft² at 66.9 in height
Canopy type:	rigid design	rigid design
Canopy length:	3450 mm	135.83 in
Base type:	split type	split type
Advancing system:	850 mm effective web	33.46 in
Shield pull force:	405 kN	45.5 tons
Conveyor push force:	161 kN	18.1 tons
Side shields:	on canopy and caving shield, one side fixed, one side moveable, rehandable	
Weight:	18.2 metric tons	20.1 tons



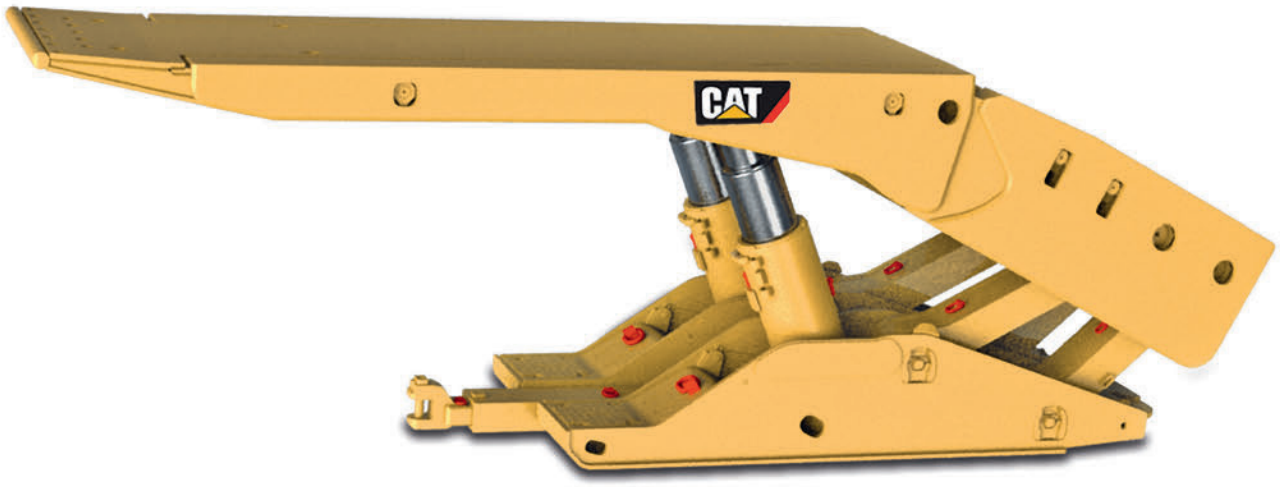
Face Cross Section

2-Leg Roof Support 1150/2700-2x3056-1750 for Plow application

Front View



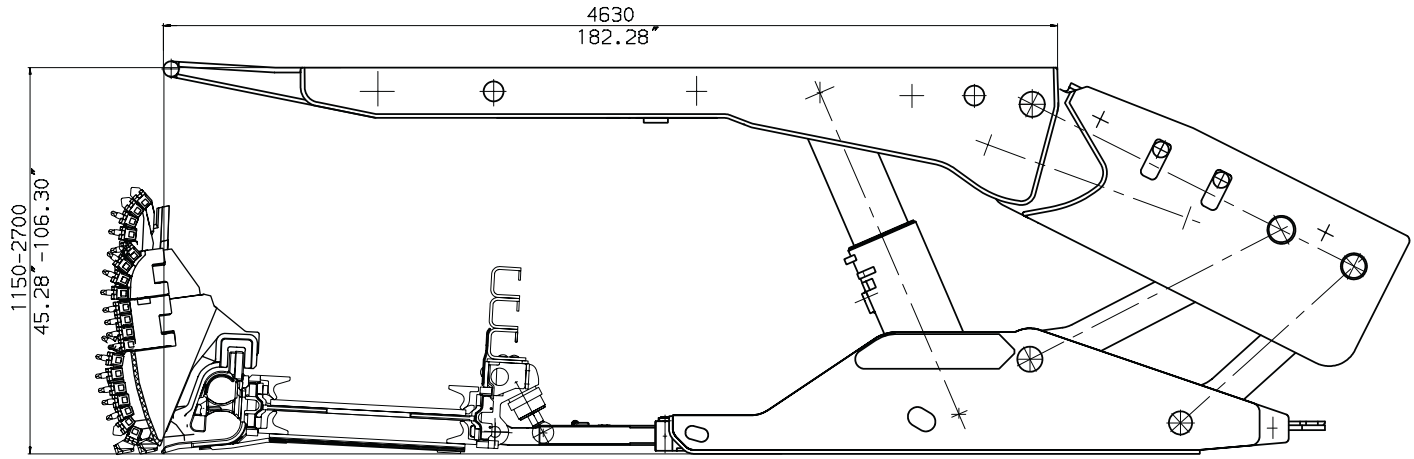
Rear View



Side View

Technical Data

	Metric	Imperial
Closed height:	1150 mm	45.3 in
Extended height:	2700 mm	106.3 in
Shield centres:	1500 mm	59.1 in
Hydraulic leg:	double telescopic	double telescopic
Leg piston diameter:	320 mm	12.60 in
Nominal leg forces:	2 x 3056 kN at 380 bar	2 x 343.5 tons at 5511 psi
Shield resistance:	5492 kN at 380 bar at 1800 mm height	617.3 tons at 5511 psi at 70.9 in height
Shield density:	789 kN/m² at 1800 mm height	8.24 tons/ft² at 70.9 in height
Canopy type:	rigid design	rigid design
Canopy length:	4630 mm	182.28 in
Base type:	split type	split type
Advancing system:	850 mm effective web	33,5 in
Shield pull force:	380 kN	42.7 tons
Conveyor push force:	151 kN	17.0 tons
Side shields:	on canopy and caving shield, one side fixed, one side moveable, rehandable	
Weight:	16.8 metric tons	18.5 tons



Face Cross Section

LTCC Face Roof Support

Main Data & Specifications

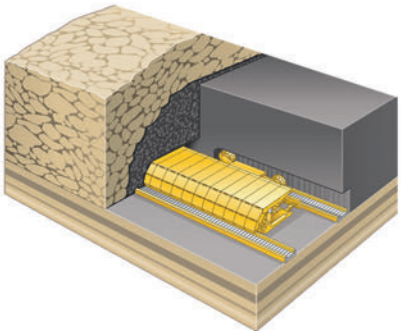
LTCC Face Roof Support

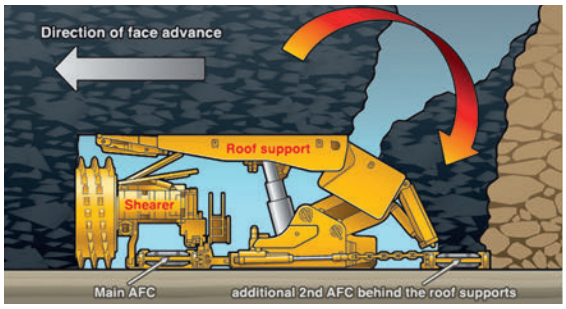
The Principle of Longwall Top Coal Caving (LTCC)

Longwall Top Coal Caving (LTCC) is an enhanced form of the conventional longwall recovery system, whereby a rear Armoured Face Conveyor (AFC) is utilized to extract coal from behind the roof supports that would otherwise be left unrecovered in thick seam environments.

The LTCC method is applicable to very thick seams - greater than 6m (19.7 ft) - where good quality coal is being left because currently "conventional" longwall equipment cannot operate successfully beyond 8 m mining height, so far.

The major benefit of LTCC is the ability to safely optimize resource recovery in thick seam deposits. This is achieved by operating a retractable rear canopy at the back of each shield that allows for recovery of the otherwise wasted of top coal that usually enters the goaf.



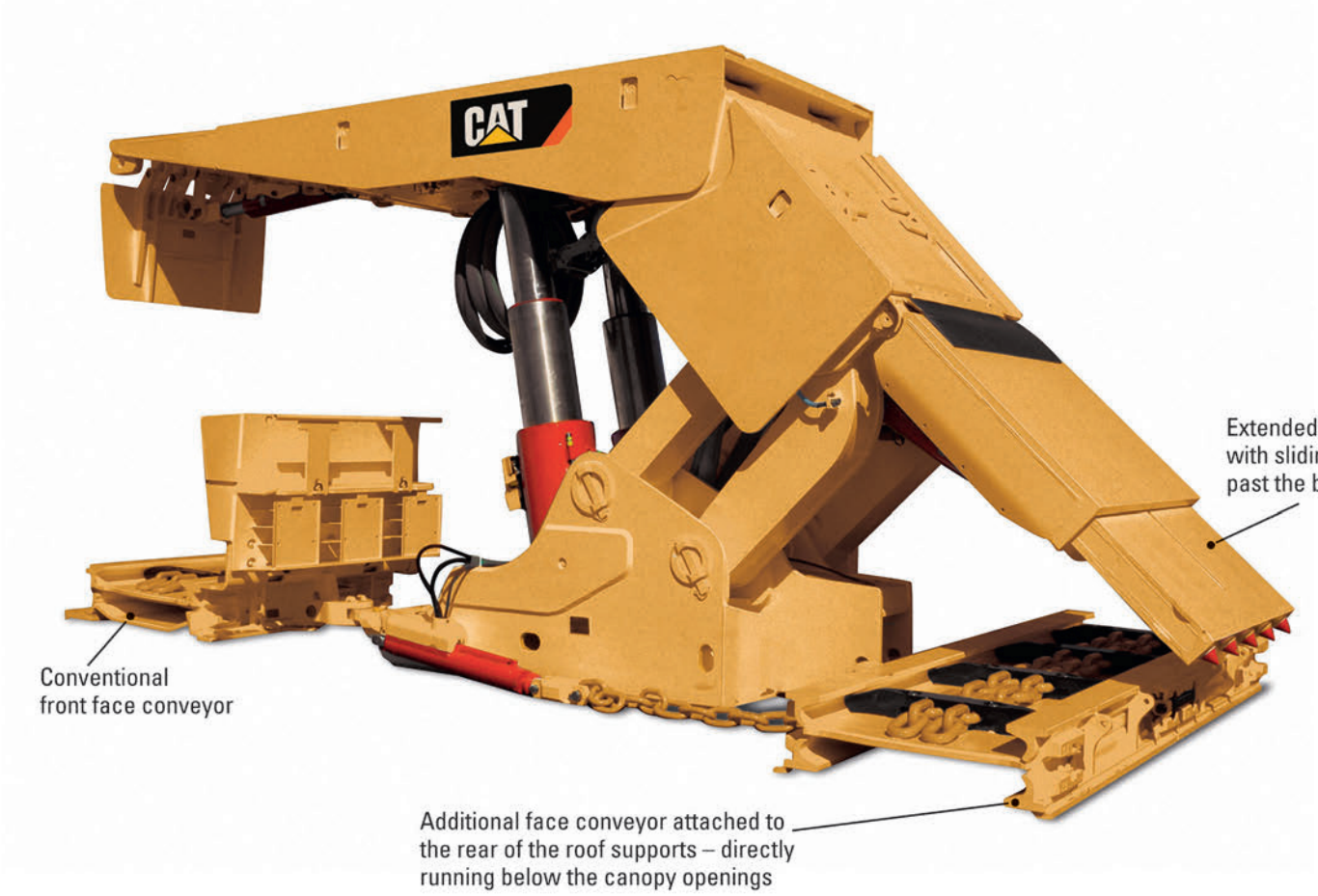


It is very similar to a conventional longwall system in that the shearer mines coal conventionally at for example 2.9 m (9.5 ft) on the floor of the seam. The top coal is then caved over the rear of each shield onto a second AFC.

The system has seen a significant increase in resource recovery with coal recovery in excess of 85-90 % of the entire seam.

Further advantages to increased resource recovery include:

- Lower face extraction height: This provides a more stable longwall face with less strata failure delays than is typically experienced with extraction heights greater than 6 m (19.7 ft) in this type of geological environment.
- Operating cost reductions: The LTCC method enables potentially double (or greater) returns of longwall recoverable tonnes, per metre of gateroad development. This reduces the development cost/tonne significantly and reduces the potential for development rate shortfalls leading to longwall production disruption.



CAT ROOF SUPPORTS FOR SPECIAL LONGWALL APPLICATIONS

MAIN COMPONENTS

2-Leg Roof Support 2100/4500-2x7157-2050 for Shearer application

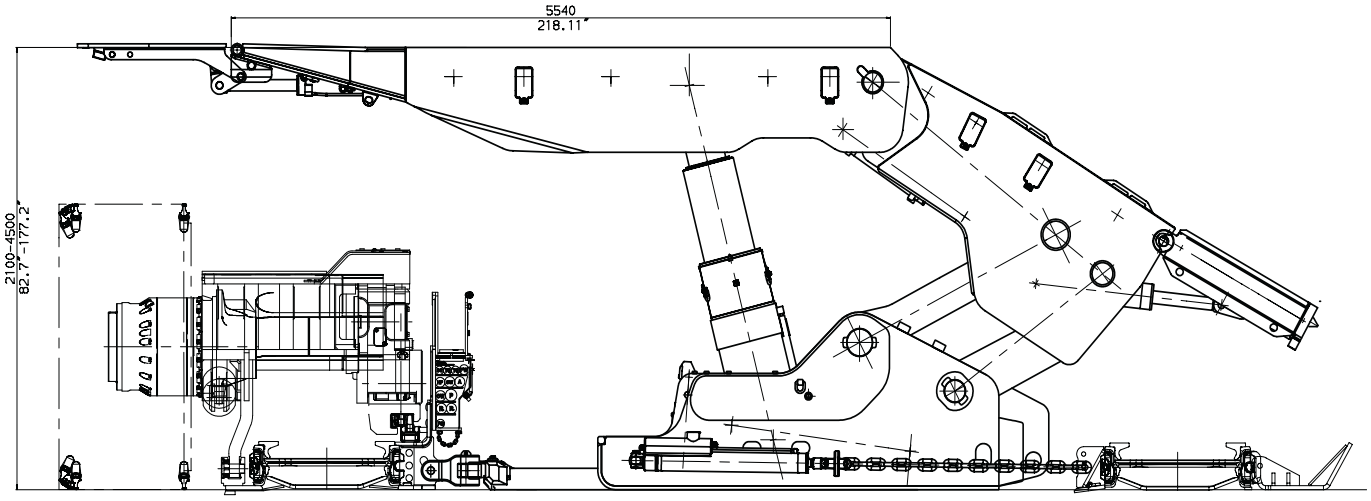
Front View

Rear View

Side View

Technical Data

	Metric	Imperial
Closed height:	2100 mm	82.7 in
Extended height:	4500 mm	177.2 in
Shield centres:	2050 mm	80.71 in
Hydraulic leg:	double telescopic	double telescopic
Leg piston diameter:	450 mm	17.71 in
Nominal leg forces:	2 x 7157 kN at 450 bar	2 x 804.4 tons at 6526 psi
Shield resistance:	14003 kN at 450 bar at 3500 mm height	1573,9 tons at 6526 psi at 137.8 in height
Shield density:	1141 kN/m² at 3500 mm height	11.91 tons/ft² at 137.8 in height
Canopy type:	rigid design with face sprag	rigid design with face sprag
Canopy length:	5540 mm	218.11 in
Base type:	rigid catamaran type	rigid catamaran type
Advancing system:	1000 mm effective web	39.4 in
Shield pull force:	1010 kN	113.5 tons
Conveyor push force:	608 kN	68.3 tons
Side shields:	on canopy and caving shield, one side moveable, one side fixed, not rehandable	
Weight:	56.5 metric tons	62.3 tons



Face Cross Section

Product Support

CAT DEALERS DEFINE WORLD–CLASS PRODUCT SUPPORT

Caterpillar offers you the best longwall systems and components for your specific operation, and the Cat dealers provide you with service solutions, when and where you need them.

The Cat Dealer network of highly trained experts keeps your entire longwall up and running to maximize your equipment investment.

CAT DEALER NETWORK

The Cat product line is unmatched in the industry and backed up by the best product and parts distribution and support system in the world. When it comes to service and support, the global Cat dealer network is unparalleled.

Supporting longwall mining operations is primary the role of our world-class Cat dealer network, backed by the best tools, processes and expertise in the industry.

The one-of-a-kind, on-site support network delivers expert service, integrated solutions, after-sales support, fast and efficient parts fulfillment, world-class remanufacturing capabilities and more.

Cat Dealers partner with longwall mining customers to help them improve operations, maximize system productivity and minimize costs.

The availability of a longwall system is vital to meeting production targets. Cat dealer technicians help deliver that critical uptime by providing expert maintenance and repair services, or technical assistance and training for sites that choose to do their own. In addition, dealers leverage information gained from machine health systems, preventive maintenance programs and other initiatives to predict maintenance and repair needs and anticipate the parts and components that will be required.

Cat Dealers operate as nearly 200 local businesses – each one fully embedded in and committed to the geographic area it serves.

For more information on Cat longwall mining equipment and product support, contact your local Cat dealer.

www.cat.com/mining

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

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