Battery Electric 10 Tonne LHD

Zero-Emission Battery Electric Powertrain

Traction Motors		
Torque, Peak	3870 Nm	2854 ft-lb
Power		
Peak Combined	600 kW	805 hp
Continuous Combined	480 kW	643 hp

Auxiliary Motor		
Torque, Peak	700 Nm	516 ft-lb
Power	125 kW	167 hp

Batteries ($LiFePO_4$)	
Primary Pack	
Nominal Energy	265 kWh
Nominal Capacity	432 Ah
Tramming Pack	
Nominal Energy	24 kWh
Nominal Capacity	72 Ah

• A10 FEATURES

High Performance Powertrain

The A10 is powered by 2 electric motors generating 600 kW and 3870 Nm of torque. We use Lithium-Iron Phosphate chemistry ($LiFePO_4$) for our patented battery system. Our power is not constrained by ventilation limitations and therefore we use the most powerful electric motors available which directly improves productivity.

Regenerative Braking

SAHR with electric regeneration allows for the battery to recharge during the braking process by converting mechanical energy into electrical energy. This feature is making the industry rethink their mine designs in order to support this valuable technology. In the right environment, a battery electric vehicle could potentially operate for an entire shift on a single charge. This directly translates to added production and increased revenue for the mine.

Zero-Emissions

All of our vehicles have zero-emissions which provide a healthier environment for the operator. The implementation of battery electric vehicles will have a significant reduction in ventilation, heat and overall operating cost resulting in a positive impact on the mine's bottom line.

Innovative Design

Designed to offer the most power in the smallest footprint. The A10 is the size of a standard 7 yd. LHD yet moves 10 tonnes per bucket. This vehicle has a self loading battery swapping system which speeds up swapping time and directly translates to added production.

The A10 LHD is by far the smallest LHD capable of carrying 10 tonnes. Its compact stance allows for the best line of sight visibility - far better than any machine in its class. It has more horsepower and far more torque than its diesel rival while producing only 1/8th of the heat. All of this translates to higher productivity, more tonnes moved per shift and a greater return on your investment.

The A10 produces zero diesel emissions thereby reducing demand on your mine's ventilation and cooling systems and makes deep mining possible. Our battery electric vehicles improve working conditions across the board and enables the incalculable benefits of a healthier underground environment.

• A10 LOW PROFILE FEATURES

Alternate Bucket Sizes for Different Ore Densities

Heavy Duty Hoist and Dump Cylinders with Load Sensors

ROPS / FOPS Operator Cab with Remote Control Capability

LiFePO4 354 kWh Battery Pack

Self Loading Battery Swapping System

Spring Applied Hydraulically Released (SAHR) Brakes with Electric Regeneration

Dana Axles

Peak Combined / Continuous 540 / 360 kW Liquid Cooled Brushless Electric Motors

• A10 LOW PROFILE FEATURES

The A10 LHD is the same size as a 7 tonne machine while carrying a full 3 tonnes more per bucket, that's a 40% increase per load! Operators prefer the A10 for its powerful and productive mucking capability as well as its cool, quiet performance with zero diesel fumes.

- 7.5 second raising time
- 2 second dump time
- 3.5 second lowering time

A10 SPECIFICATIONS - LOW PROFILE

General Information

Main Dimensions

Overall Length	9,900 mm	390 in
Overall Width	2,200 mm	86.5 in
Wheelbase	3,400 mm	133.9 in
Ground Clearance	320 mm	12.5 in
Cab Height	2,160 mm	85 in

Empty Weights

Total Operating Weight	33,315 kg	73,447 lb
Front Axle	11,611 kg	25,598 lb
Rear Axle	21,703 kg	47,847 lb

Loaded Weights

Total Loaded Weight	43,314 kg	95,491 lb
Front Axle	27,216 kg	60,001 lb
Rear Axle	16,098 kg	35,490 lb

Capacities

Bucket (Low Profile)	3.5 m^3 struck	4.6 yd^3 struck
	4.3 m^3 heaped	5.6 yd^3 heaped
Bucket (Large)	6 m^3 heaped	7.8 yd^3 heaped

Motion Times

Raise	7.5 sec.
Dump	2 sec.
Lower	3.5 sec.
Total Cycle	13 sec.

Powertrain

Primary Battery

Chemistry	$LiFePO_4$	
Voltage	600 V DC	
Energy	265 kWh	
Dimensions (L x W x H)	93 x 218 x 152 cm	76 x 86 x 60 in
Approximate Weight (including frame structure)	6804 kg	15,000 lb

Tramming Battery

Chemistry	$LiFePO_4$
Voltage	345 V DC
Energy	24 kWh

Axles

Front	Dana 20D, Fixed
Rear	Dana 20D, Oscillating

Differentials

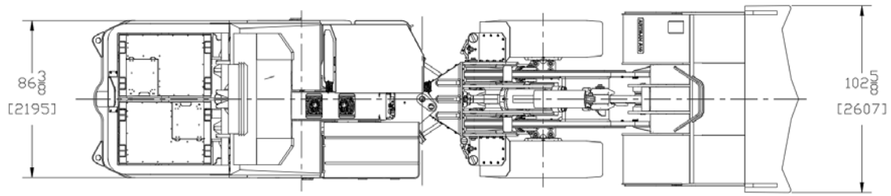
Front	Limited Slip
Rear	Limited Slip

Brakes

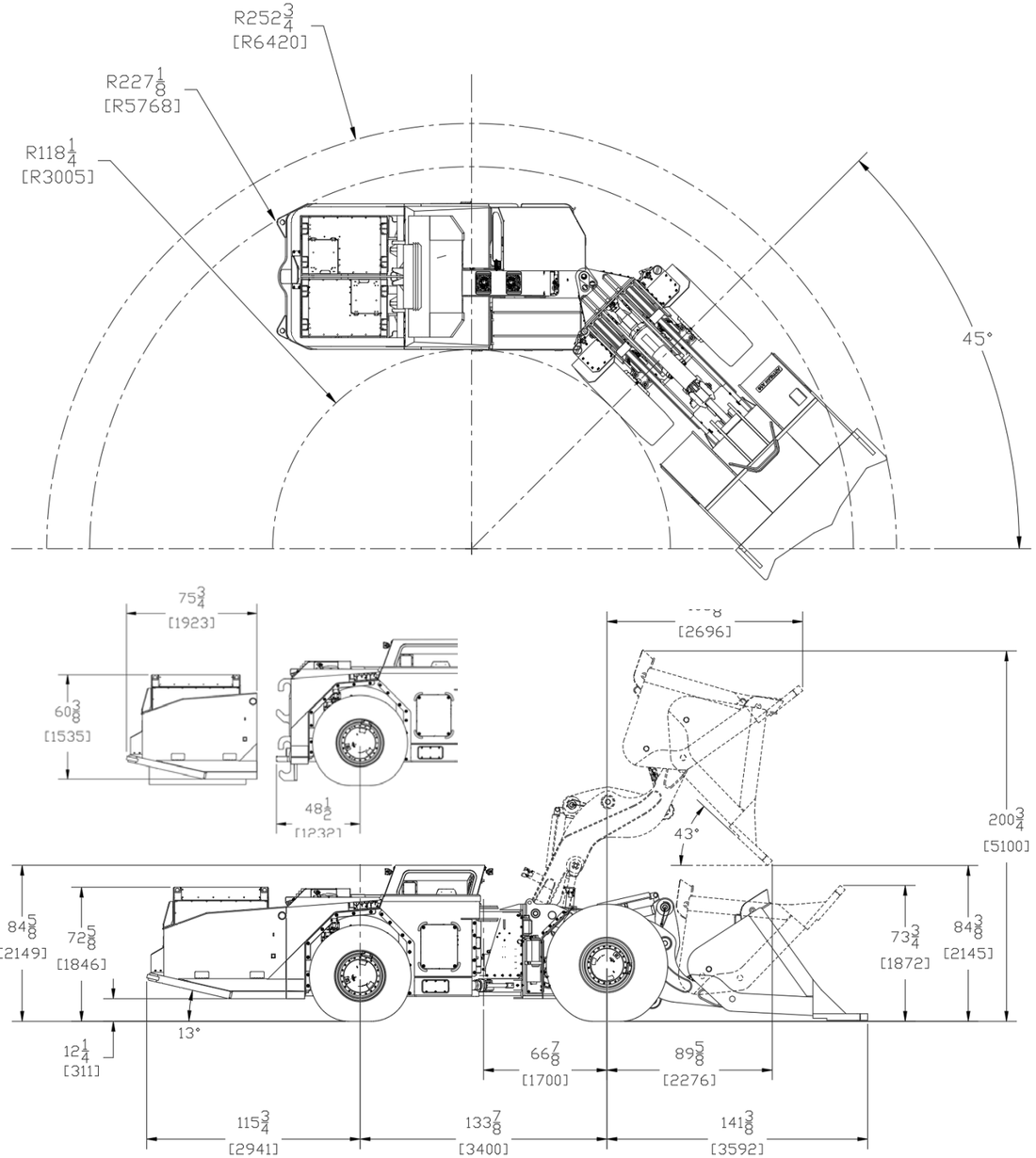
Emergency, Park	SAHR
Service	SAHR with Electric Regeneration

Tires

Front	18.00R25 L5-S
Rear	17.5R25 L5-S



A10 SPECIFICATIONS - LOW PROFILE



SERVICEABILITY

Keeping your A10 available for continuous production

Our highly skilled Field Service Team is specifically trained to work on our moderately complex electro-mechanical and hydraulic systems to provide our customers with on-site diagnosis, maintenance, repair and all installations needed to ensure your vehicle is available for continuous production.

Comprehensive hands-on training by members of our engineering and leadership team on all computer and battery systems including:

- Powertrain Control Module (PCM)
- Artisan Control Interface (ACI)
- Battery System Controller (BSC)
- Battery Management System (BMS)
- Human Machine Interface (HMI) Systems

Artisan Vehicles delivers underground battery loaders and trucks with zero exhaust emissions. With over 300,000 operating hours underground and 10 years of experience, today, most battery loaders and trucks operating underground use Artisan Vehicles technology.

Artisan Vehicles is part of Sandvik Mining and Rock Technology, Load and Haul division.