



ARTISAN VEHICLES

TRANSITIONING TO ZERO-EMISSION EQUIPMENT

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Current Status of the Zero Emission Mine

- Very Active in Northern Ontario
- New generation lithium battery equipment in service since 2011
- All major mining companies in Canada are planning a full conversion to zero emission equipment underground





KL Gold - Macassa BEV Fleet - Since 2011

34 machines, 38 chargers, 80 batteries

187,000 operating hours

80% of production from BEV

85% availability

- Artisan 2.7 tonne LHD conversion
- Artisan A4 - 4 tonne LHD
- Artisan Z40 - 40 tonne HT
- Epiroc ST7 - 7 tonne LHD
- Epiroc ST2G - 3.6 tonne LHD
- Epiroc MT2010 - 20 tonne HT
- RDH 3 yd - 5 tonne LHD

ALL have Artisan's Powertrain





Why use battery powered equipment?

- **Ventilation Reduction**
 - No emissions (H₂O/DPM/NO_x/etc.)
 - 88% reduction in heat
 - Less dust (no tailpipe)
- **Cooling/Heating reduction**
 - Less airflow = less cooling or heating
- **Time to Production**
 - Expand with no new shafts
- **Productivity**
 - Higher power and smaller
- **Health Concerns**
 - DPM/Dust/Noise/Vibration
- **Possible New Regulations**





Managing the Transition

Infrastructure

- Electrical Requirements
- Underground Shop Requirements

Charging Logistics

- Fast Charge or Swap

Personnel

- Operators
- Technicians
- Supply Chain
- Mine Management
- New service personnel type -
Battery equipment technician





Infrastructure Transformation



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Infrastructure Transformation

Facilities - Swapping Bay

- Purpose built cut out
- Swapping Bay requires:
 - Higher back height
 - Level floor
 - Overhead crane
 - Room for machine
 - Room for 2-3 packs
 - Room for charger





Artisan Products



- Battery-Electric
- 4 tonne LHD

[ArtisanVehicles.com/A4](https://www.ArtisanVehicles.com/A4)



MUCKING VIDEO ▶





Artisan Products



- Battery-Electric
- 40 tonne Truck

[ArtisanVehicles.com/Z40](https://www.ArtisanVehicles.com/Z40)



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Artisan Products



- Battery-Electric
- 10 tonne LHD

ArtisanVehicles.com/A10



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Artisan announces that it is to be acquired by Sandvik



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SANDVIK

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