



# Mining haulage for the 21st century

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**First significant change in rigid haul truck design for 50 years**

# Mining Haulage for the 21st century:

1. Increased mine production
2. Increased truck utilization
3. Reduced haulage costs
4. Reduced haul road costs
5. Improved Safety
6. Environmental care
7. Operators care
8. Innovative Mining methods



# Increased Mine Production

- Trucks can operate in all weather conditions
  - All-Wheel-Drive & ABS
- 95% Guaranteed Technical Availability
  - 8,322 hrs p/year
- Reduced walk-around checks at shift change
  - Automatic top-up of oils
  - Automatic cleaning of windows, lights and camera's
  - Central Tyre Inflations System
- Results in 24 % increased production!



# New M & R system with fast major component exchange

- Integrated Predictive Maintenance Program
- M & R work is done in the workshop without the truck!  
Components are exchanged and truck returns to production within 15-45 min
- Components are tested before re-use!  
Repair mistakes corrected without extra truck downtime

**Wheels, Engines & Cabin:** 15 minutes  
**Axles:** 45 minutes



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# F-1 pit stop approach:

1. **Message displayed in case of fault**  
for Operator & Workshop (in the local language!)
2. **Operator returns to workshop**  
truck can always return to workshop: No tow truck needed!
3. **Informed workshop is ready with new component**
4. **Truck arrives in workshop and component is exchanged**
5. **Truck back in production between 15 and 45 minutes!**  
Minimal Loss of Revenue



# Fuel Costs addressed by:

- Multiple engines, power on demand
- Lifting of axles on empty haul
- All Wheel Steering, no tire scrubbing
- Electronic power management



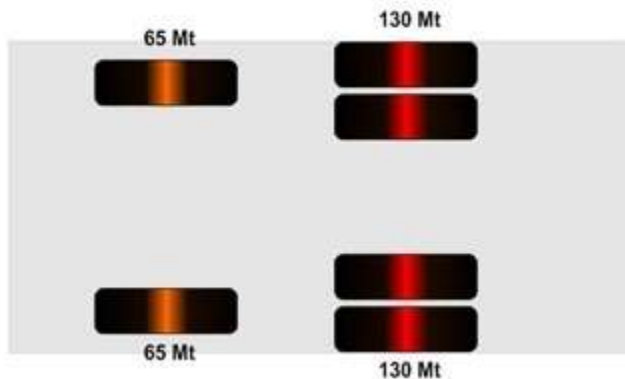
# Tire costs addressed by:

- All-Wheel-Steering
- Oscillating axles and unique suspension
- Central tire inflation system
- Automatic axle lift
- Equal load spread over all wheels
- Automatic 'on the fly' wheel alignment
- Pressure and temperature sensors
- No vehicle swaying, Load spillage prevented

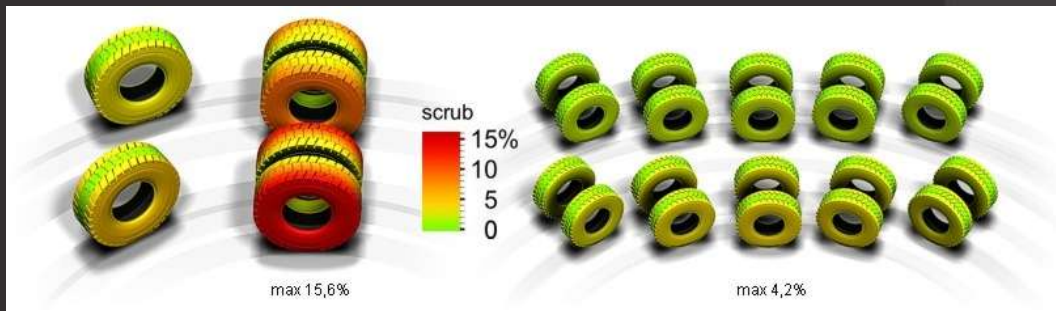
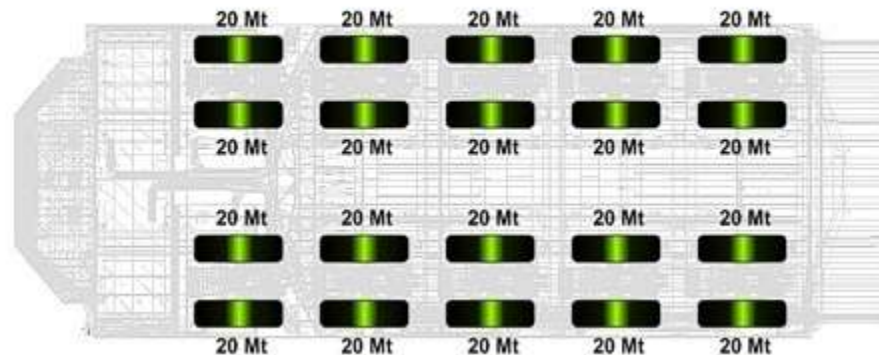


# Wheel load spread:

CAT 793D



ETF MT-240





**OETF**  
MINING TRUCKS  
MAKING THE DIFFERENCE





# Oscillating axles and exceptionally long wheel travel



**Reduces spillage during driving, preventing vehicle oscillation, while eliminating frame racking**

# Rough Terrain Suspension



**Not so sensitive for haul road condition**

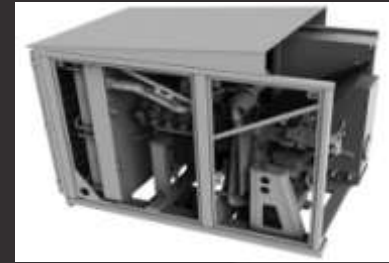


# All-Wheel-Steering



- Reduced tire wear
- Reduced road maintenance
- Lower fuel consumption
- Greatly improved maneuverability

# Multiple engines



**Unique removable power-pack design for easy maintenance**



**Swap in  
15 minutes !**

# Interchangeable axles for easy maintenance



**Swap in 45 minutes !**



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# Unique testing facility for power packs and axles



**After repairs all components  
are fully tested before being re-used**



# Fast Tire Changes in 15 minutes!



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# Oscillating axles advantages



**Equal tyre loading, optimal traction, increased stability,  
prevents vehicle swaying, reduces spillage while  
eliminating frame racking**

# Automatic Axle Lift

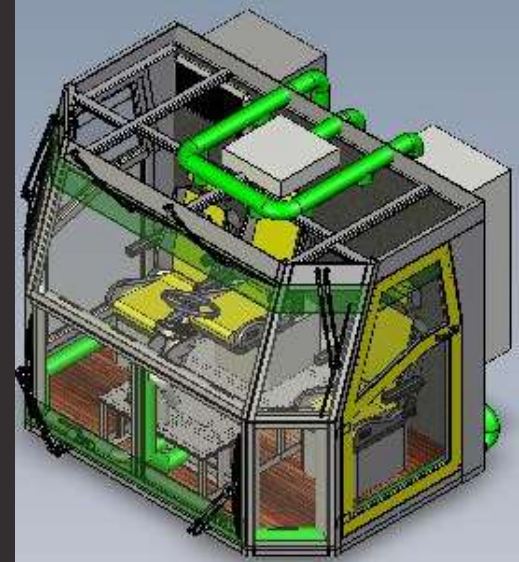
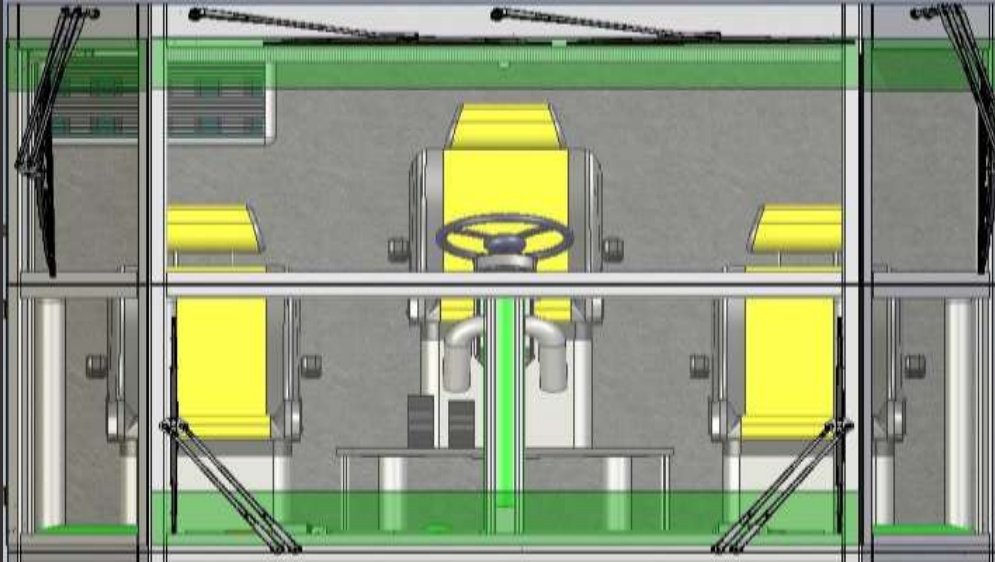


Empty haulage



Flat tyre

# Cabin (ROPS & FOPS)



**Three seat cab offers unrivalled visibility and unique operator training facility**



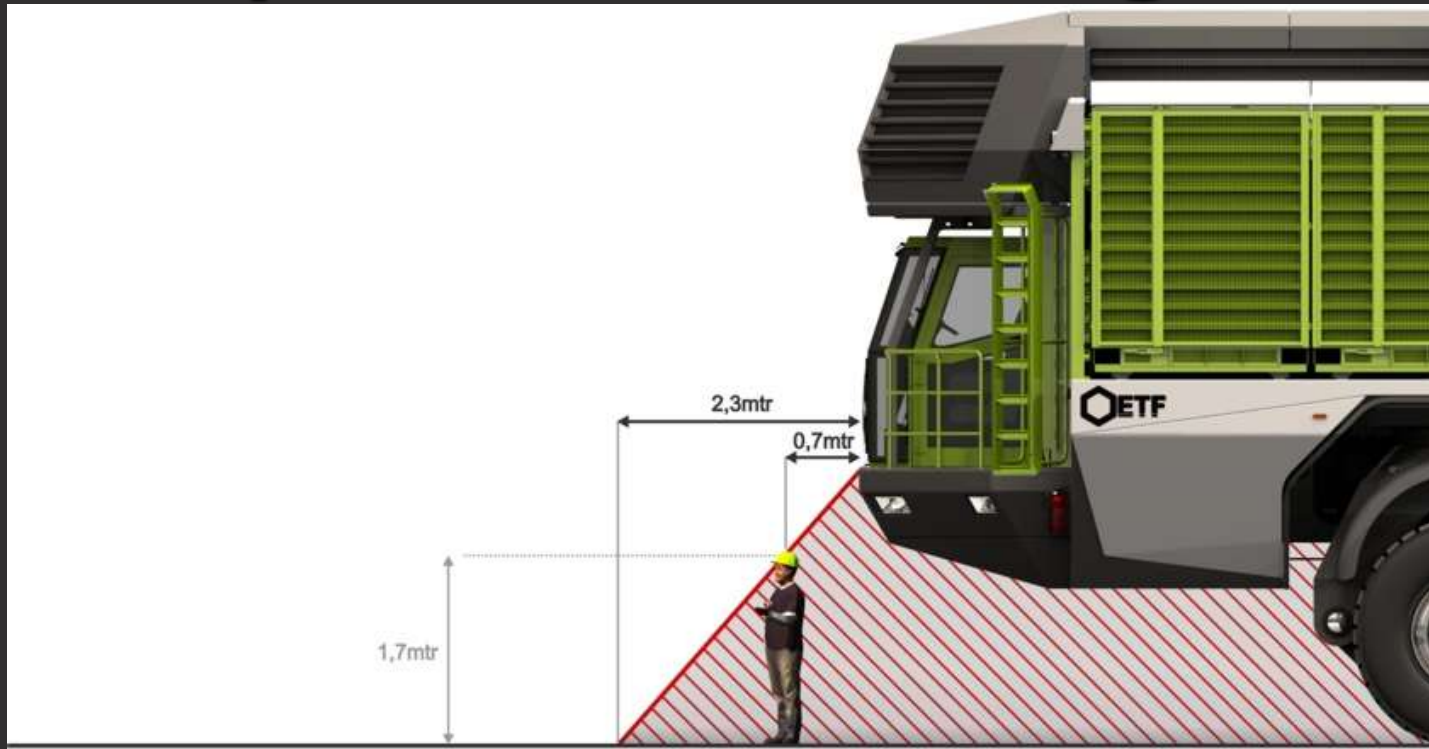


# Cabin features

- Unique AC & Heating
- Fully pressurized cabin
- Insulated glazing
- Left & Right entrance
- Safe operator training during production
  - Extra steering wheel & brake handle for trainer
  - Simulator not needed
- Heated & Ventilated seats
  - Operator, Trainer & Trainee



# Operator's line of sight



**Natural view within 1 meter from cabin (180 degrees)**

# Operator's visibility

Unrivalled natural line of sight plus:

- 2 Mirror camera's
- 1 Forward camera
- 1 Reversing camera
- Dual Range Radar for Operator Assistance  
(Lane assist & approaching dump site)

**Total visibility complies with ISO 5006**



# Camera view Front & Rear



**Forward camera**



**Reverse camera**





# View from mirror camera's



**Left mirror camera**



**Right mirror camera**



# Safety features

- **Unrivalled Visibility**
  - aided by 4 camera's & Radar for Operator Assistance
- **Sleep Deterrent System**
- **Collision Warning System**
- **ABS & Traction Control**
- **Electronic Stability Control**
- **Optical Safety System**
- **Enhanced vehicle lights**
- **Factory fitted Fire Suppression System**
- **Head-up display**



# Environmental impact

- 56 % lower NOx + HC emissions
- 63 % lower PM
- 15 -25 % lower CO<sub>2</sub> emissions
  - due to lower fuel consumption
- 85 % waste oils reduction
  - special filter systems; far fewer oil changes necessary
- 47 % lower tire waste
- Considerable reductions in raw material use
  - fuel, oil and rubber



# Haul Roads

**ETF Trucks & Haul Trains allow for:**



- **Narrower roads**
- **Smaller radius on road curves and switchbacks**
- **Lighter haul road construction & lower maintenance costs**

# ETF Haul Trains (One operator!)



**Payloads from 437 to 873 US tons (397 to 794 Metric tons)**



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# ETF Haul Trains (One operator!)



**Simultaneous tipping of 870 tons**  
**(Individual tipping also possible)**



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# ETF Haul Trains (One operator!)



Individual dumping of 4 trucks in 3.5 minutes! (870 tons)



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# ETF Haul Trains (One operator!)



**Simultaneous dumping of 4 trucks in 1.5 minutes! (870 tons)**



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# ETF Haul Trains versus Ultra-Class

**1 x Ultra-Class**



**1.5 x Ultra-Class**



**2 x Ultra-Class**



**(One operator!)**

# ETF Haul Trains versus Ultra-Class

- **Standard Haul Roads**
- **Standard loading equipment**
- **Standard operators**
- **Easy mix with existing trucks**
- **Considerably cheaper per ton**
- **Much higher payloads possible**



# ETF Haul Trains versus Ultra-Class Tires



Ultra-class 56/80R63

ETF 24.00R35

- **Ultra-Class: 56/80R63**
  - expensive – supply problems
  - difficult to transport
  - tire change takes long
  - risks of severe accidents
- **ETF: 24.00R35**
  - cheap – no supply issues
  - transported in ISO container
  - change in 15 minutes
  - in use: laden 40, empty 24= Average 32
- **Prices** <sup>(USD)</sup>
  - **Ultra-Class:**  $6 \times 70,000 = 420,000$
  - **ETF:**  $32 \times 7,500 = 240,000$



# Self-loading Mining Trucks



**Driving**



**Loading**



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**Innovative Mining**

# Self-loading Mining Trucks



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**Innovative Mining**



# Self-loading Mining Haul Train



**Simultaneous staggered self-loading of 870 MT in 3 minutes !**



**(One operator!)**



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**Innovative Mining**

# Self-loading Mining Haul Train



**Driving with one operator**



**Side-Tipping**



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**Innovative Mining**

# Economic benefits

- 24 % less trucks required, result:
  - 24 % lower fuel costs
  - 24 % lower operator costs
  - 24 % lower tyres costs
  - 24 % lower M & R costs
  - Lower Capital cost P.M.
- Lower road construction & road maintenance costs

**Millions and Millions per Year !**





# ETF Trucks

- Highest productivity
- Lowest cost p/ton
- Safest trucks to operate
- Ultimate care for operators & environment
- Innovative mining methods
- **Made in Germany, assembled on site**



# **We don't sell → We Rent: Life Cycle Contracts**

- **83,000 hours rental contracts (10 years)**
- **95 % Guaranteed Technical Availability incl. Tires (during the full contract period)**
- **Competitive pricing**
- **Paid for by hour or per ton/km**
- **Zero capital expenditure**



# ***ETF:*** ***Mining haulage for the 21<sup>st</sup> century***



## **Thank you!**

[www.etftrucks.eu](http://www.etftrucks.eu)