



Mining haulage for the 21st century



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 Inflation 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



Mining haulage for the 21st century.



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



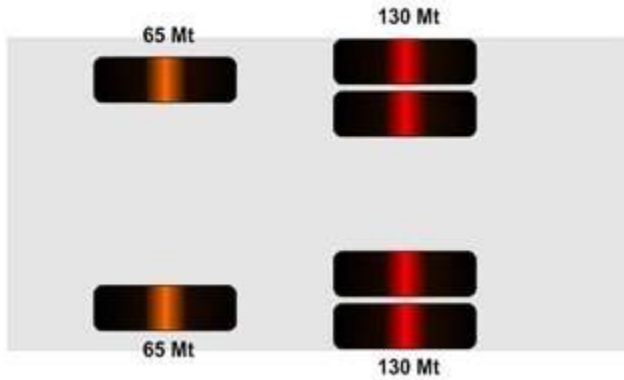
Tire costs addressed by:

- 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

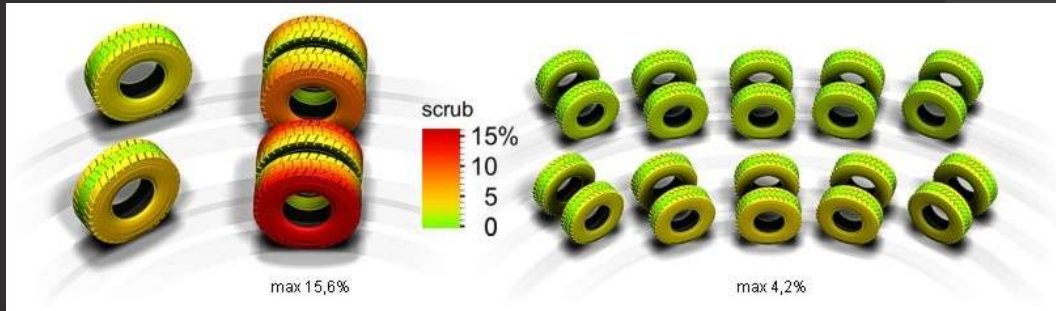
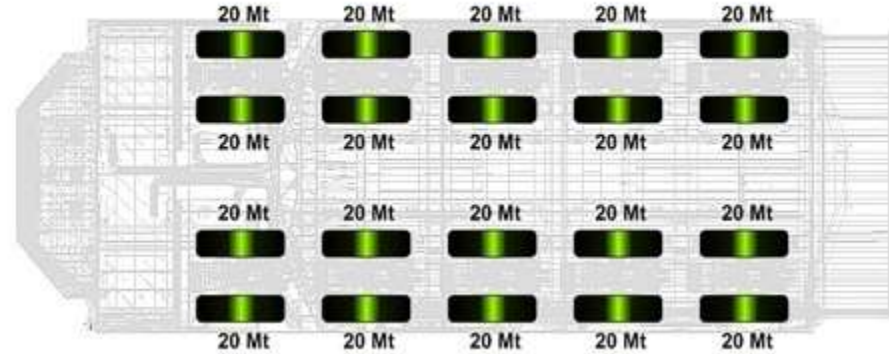


Wheel load spread:

CAT 793D



ETF MT-240



OETF
MINING TRUCKS
MADE IN AUSTRALIA





ETFO

ETFO



MINI

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



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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**



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Automatic Axle Lift



Empty haulage

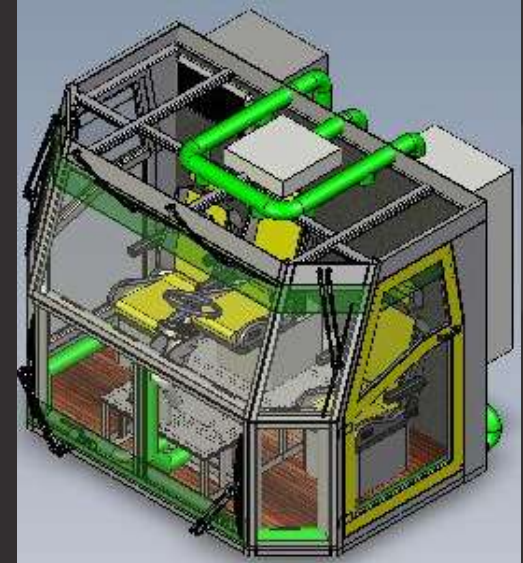
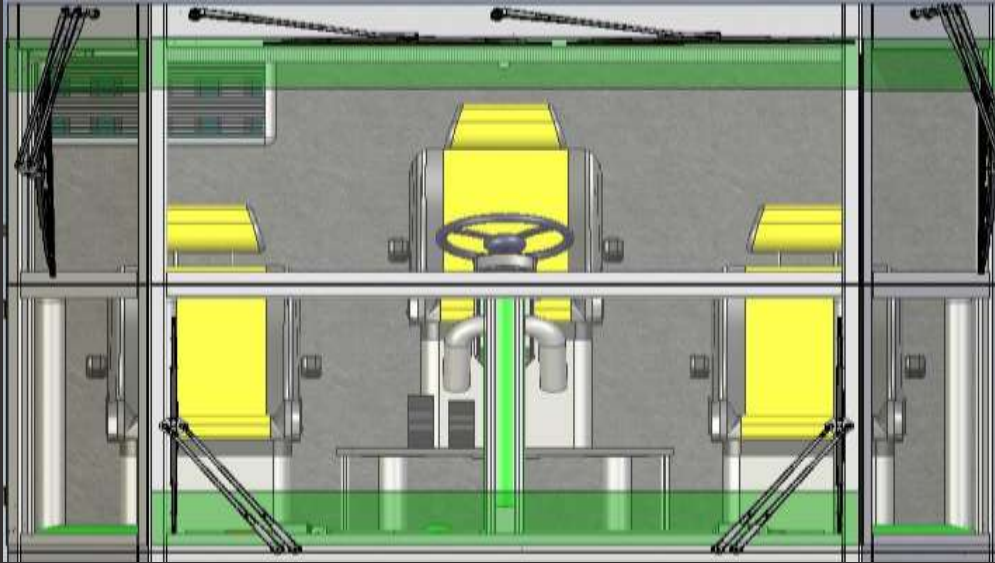


Flat tyre



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Cabin (ROPS & FOPS)



Three seat cab offers unrivalled visibility and unique operator training facility



Mining haulage for the 21st century.

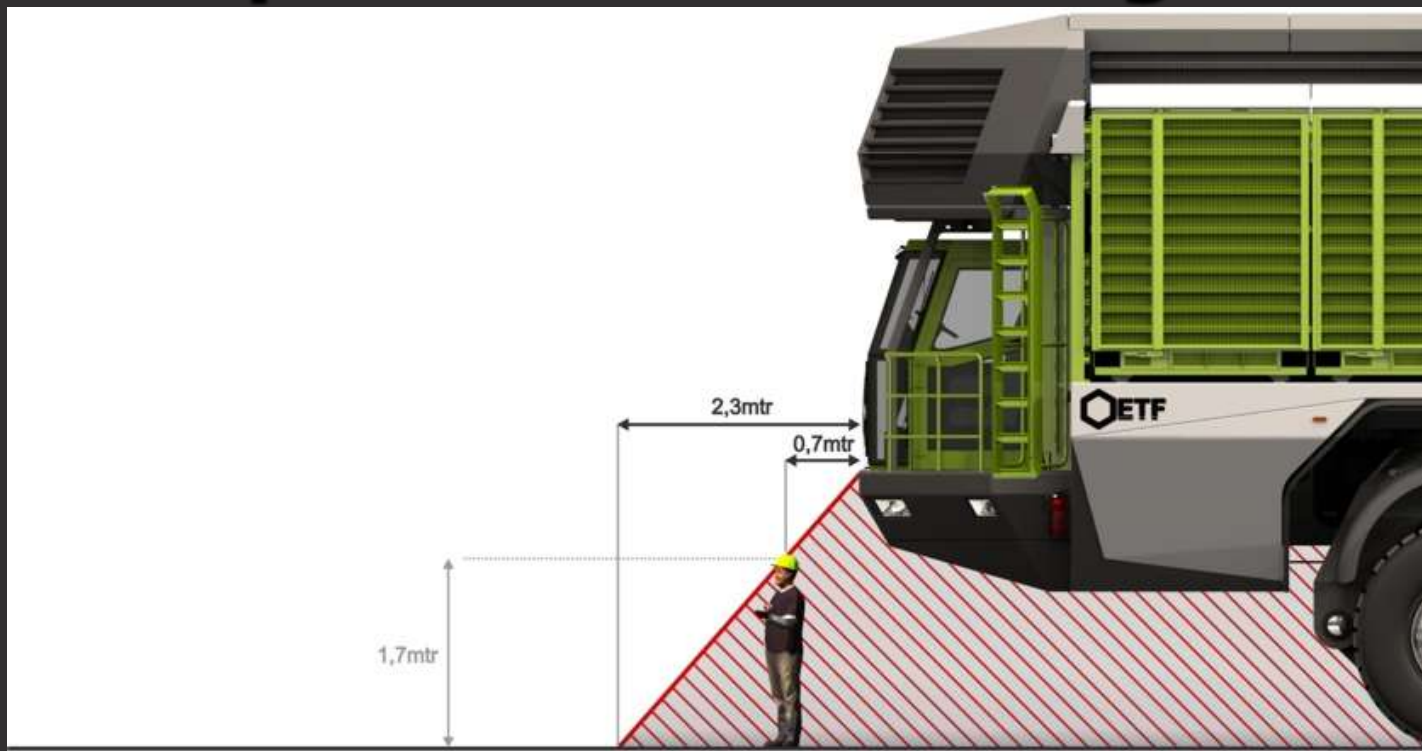


Cabin features

- 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



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View from mirror camera's



Left mirror camera



Right mirror camera



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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 CO₂ 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)



Mining haulage for the 21st century.

ETF Haul Trains (One operator!)



Simultaneous tipping of 870 tons
(Individual tipping also possible)



Mining haulage for the 21st century.

ETF Haul Trains (One operator!)



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



Mining haulage for the 21st century.

ETF Haul Trains (One operator!)



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



Mining haulage for the 21st century.

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** ^(USD)
 - **Ultra-Class: 6 x 70,000 = 420,000**
 - **ETF: 32 x 7,500 = 240,000**



Self-loading Mining Trucks



Driving



Loading



Mining haulage for the 21st century.

Innovative Mining

Self-loading Mining Trucks



Mining haulage for the 21st century.

Innovative Mining

Self-loading Mining Haul Train



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



(One operator!)



Mining haulage for the 21st century.

Innovative Mining

Self-loading Mining Haul Train



Driving with one operator



Side-Tipping



Mining haulage for the 21st century.

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 21st century



Thank you!

www.etftrucks.eu



Made in Germany