FOTON

SELLING POINTS OF PURE ELECTRIC LIGHT-DUTY TRUCK

New Energy Vehicle Division of
Overseas Business Department

January 2023

INTRODUCTION TO FOTON PURE ELECTRIC LIGHT-DUTY TRUCK

Foton Overseas

e-AUMARK		SPECIFICATION	
Wheelbase		3360	3360
Vehicle dimensions (mm)	Cargo box	5995*2100/2240/2160*2980/3180/2800	5995*2100/2240/2160*2980/3180/2800
	Flat-bed truck	5995*2060/2200*2330	5995*2060/2200*2330
Cargo compartment dimensions (mm)	Cargo box	4140*1960/2100/2190*1900/2100/1780	4140*1960/2100/2190*1900/2100/1780
	Flat-bed truck	4180*1960/2100*400	4180*1960/2100*400
GVW (kg)		6000	7000
Curb weight (kg)		2990	3120
Payload (kg)		3010	3880
Driving mileage per charge * (km)		208	180
Brake system		Front disc and rear drum hydraulic brakes	Front drum and rear drum hydraulic brakes
Battery			
Battery brand		CATL	
Type of the battery		Lithium iron phosphate	
Capacity of the battery (KW.h)		81.14	
Voltage (V)		540.96	
Charging mode		fast charging/slow charging	
Charging time (normal temperature) SOC20%-80%		0.67h/6h	
Charging time (normal temperature)) SOC20%-100%		1.2h/8h	
Motor			
Motor type		Permanent magnet synchronous motor	Permanent magnet synchronous motor
Rated/peak power (kW)		64/115	65/130
Rated/peak torque (N.m)		430/920	550/1200

* : The actual driving range may vary depending on the environmental temperature, road condition, vehicle load, and driver's driving habits.

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RELIABILITY
POWERTRAIN
HIGH EFFICIENCY
COMFORT
SAFETY

RELIABILITY

- **R**eliable components
- **R**eliable systems
- **R**eliable quality
- **R**eliable verification

Reliable Components

Components are reliable: the EIC, rear axle, body, brakes and other systems are products from well-known suppliers at home and abroad with excellent reliability to guarantee high use rate

- CATL , the leader in the battery industry in China. They are designed with various frontier technologies such as multi-specific energy, long service life and automatic temperature control, ensuring worry-free travel.
- The permanent magnet EH+ grade motor (2 grades higher than those of competitors) is designed with aluminum + epoxide dual corrosion protection;
- Position and speed sensors: TAMAGAWA resolver; bearing: SKF, Sweden; insulating paint, enameled wire, insulating layer: DuPont, America; shafting: CrNiMo materials meeting American standards, plus carbonitriding, ensuring no shaft breakage forever.

Reliable Vcu

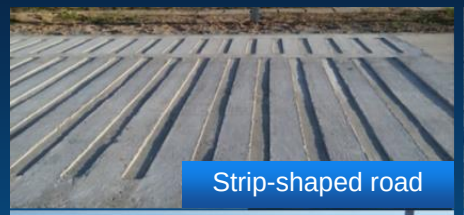
High stability

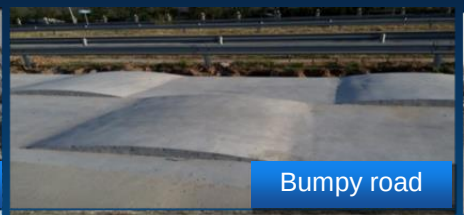
● The most advanced Autosar architecture for developed vehicle software at present is adopted. The VCU has passed the functional safety process certification successfully, being in line with international high and new technologies.

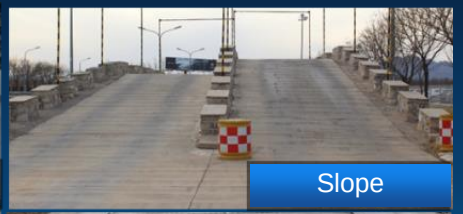
High reliability

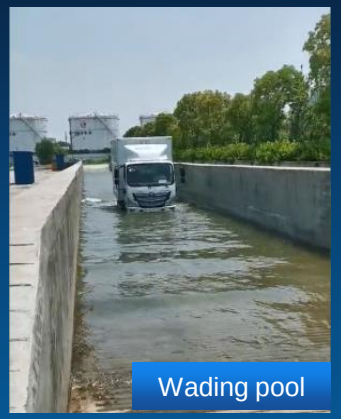
● Part-level test: the internationally recognized mechanical performance test, electrical performance test and EMC test are passed.
● Vehicle-level test: the test mileage of various models exceeds 300,000 km

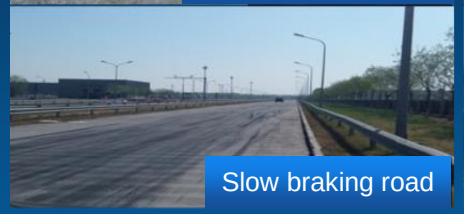
Reliable Quality

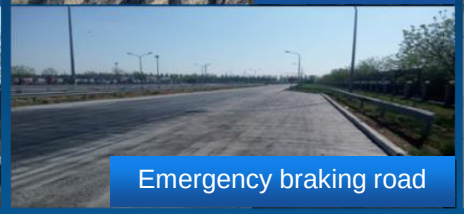


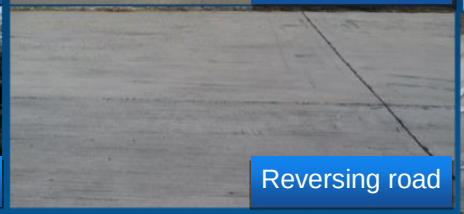












Automatic production equipment and intelligent test equipment ensure the high quality of trucks

- For process inspection, there are 19 quality gates, 14 sets of special inspection equipment, and 883 process inspection items, which cover function tests such as environmental protection conformity test, regulation item test, static function test, safety test and AC charging test ranging from incoming inspections to production processes of parts including VCU, motor/accelerator, traction battery, etc., which meet the inspection and control requirements for electric vehicles
- Rain test line: the complete vehicle is subject to a 360° rain test with a total of 204 water nozzles and rain intensity ≥ 25L/min · ㎡ (much heavier than 100ml/h in a rainstorm) for more than 6min, which is the most stringent water tightness test for vehicles
- Road test: all-round inspections on the complete vehicle in controlling, braking, lane departure, reversing, jitter, abnormal noise, etc. are conducted under 16 kinds of road conditions; for new energy vehicles, a waterlogged road section is set up to ensure that batteries of pure electric vehicles conform to safety standards

Reliable Verification

All-scene all-weather verification ensures reliable travel up to **300,000km**

Energy consumption test

ABS test

Pass-by noise test

Reliability test - public road

Durability test - stone block road

Rain test

EMC test

Rollover test

Durability test - pebble road

Durability test – twisted road

- The truck has passed more than 30 performance tests such as power performance test, energy consumption test, braking performance test, rain test/wading test, NVH test, EMC test, and stable and smooth maneuvering test, as well as high/low-temperature extreme environment test;

- The truck has passed multi-round intensified-loop durability verifications on the proving ground, which are equivalent to 300,000km B10 life verification of the complete vehicle, and 300,000km small fleet reliability verification on public roads;

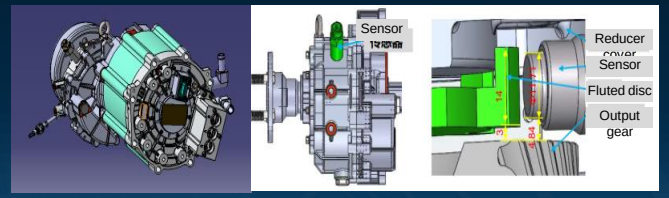
POWERTRAIN

- **S**trong power

Reliable Power

- **High-power motor allowing for much cargo and high speed:** the permanent magnet synchronous single-reduction motor has small own weight, which allows for higher efficiency. The motor coil is excited by permanent magnet instead of coil, which saves the electrical energy consumed during operation of excitation coils, improves the electromechanical conversion efficiency of the motor, reduces the driving current, and **extends the driving range. The maximum peak power is up to 115kw, which is 10kw higher than that of similar models in the market,** ensuring strong power and high efficiency.

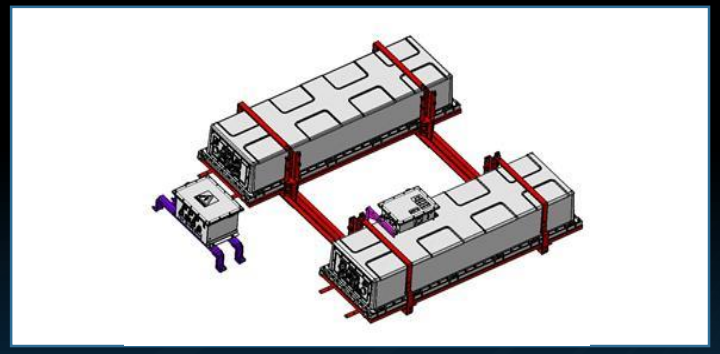
- The 0-50km/h acceleration time is only 8s, the maximum vehicle speed is 95km/h, and the gradeability can be **more than 23%.**

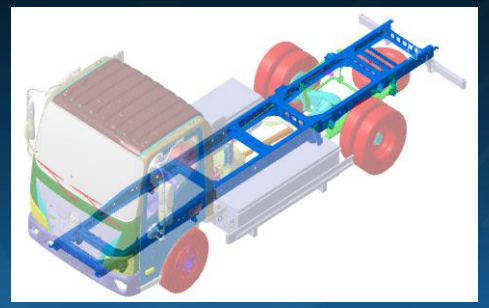
Name		Single-reduction motor
Illustration		
Specification	Type	Permanent magnet synchronous motor
	Rated/peak torque	430/920Nm
	Rated/peak speed	1410/3940rpm
	Rated/peak power	64/115kw
	Voltage platform	540VDC
	Speed ratio	3.045
Performance	Maximum vehicle speed	95km/h (at a speed ratio of 5.125)
	Gradeability	23%
	0-50km/h acceleration time	8s under full load

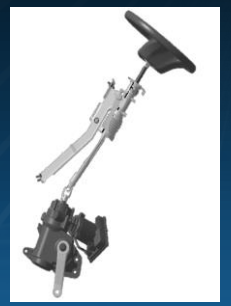
HIGH EFFICIENCY

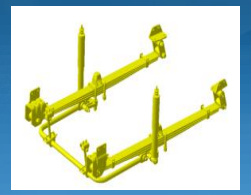
- **N**ew materials
- Integration
- **L**ow energy consumption
- **T**CO
- **S**tandardized design and production

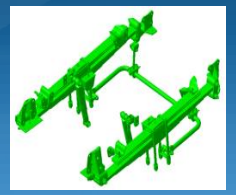
New Materials











Battery

- New generation LFP battery cores from CATL with high energy density are adopted. The battery box comes with a lower **aluminum alloy** housing, and a **high-strength lightweight** upper **alloy** cover, with an energy density of 151.96kWh/kg. The battery bracket is made of high-strength steel, which is 15% lighter than ordinary steel;

Chassis

- The high-strength frame is adopted, which improves the bearing capacity and significantly reduces the own weight of the truck.
- The **electric steering gear with cast aluminum housing** is 30% lighter than a cast iron one.
- The application of variable-section few-leaf springs improves the bearing capacity and optimizes the driving comfort, and such springs are 25% lighter than multi-leaf springs.
- **Aluminum alloy rims** are adopted, in total more than 60kg lighter than steel rims.

Integration

Integration

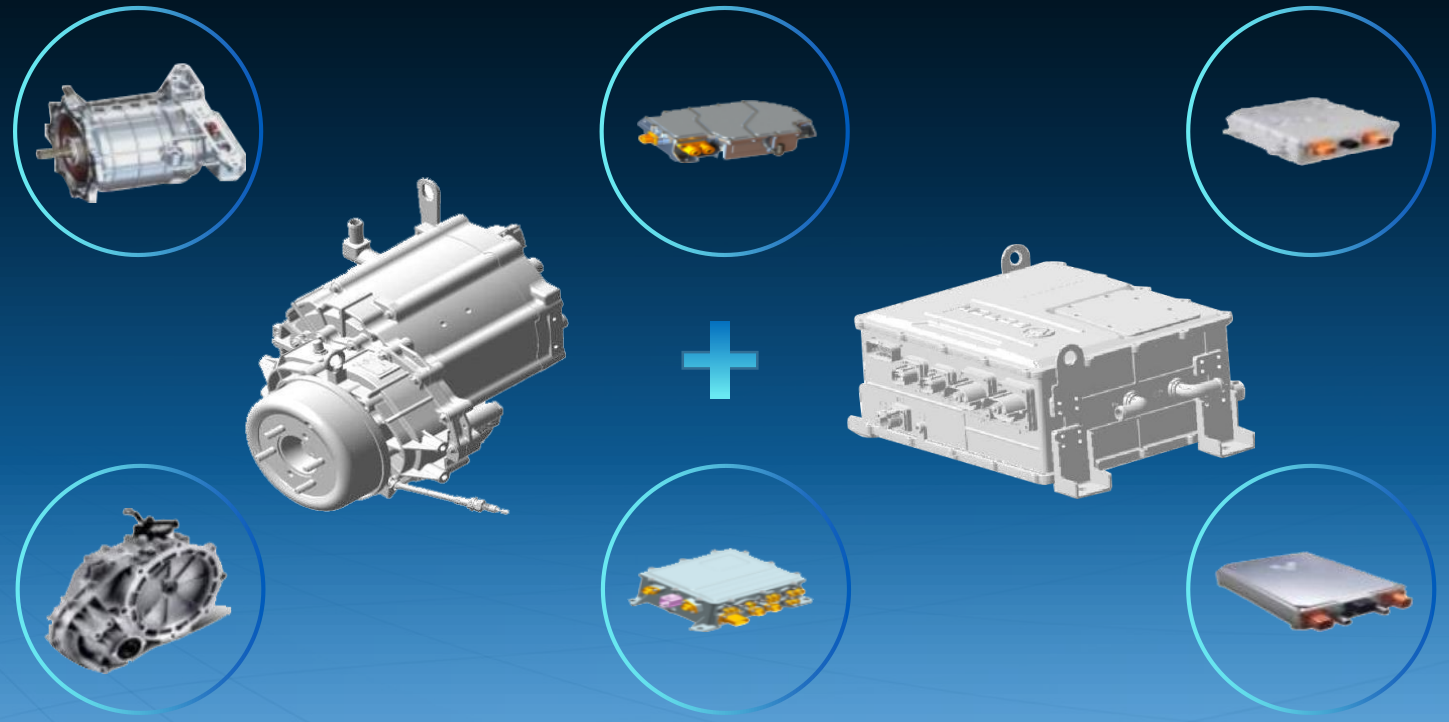
- The motor and reducer are integrated into a motor system; the all-in-one controller is integrated, which effectively reduces the volume and weight of the system and the quantity of high-voltage harnesses;

Motor system

- High efficiency: 0.25mm silicon steel sheet
- High rotation speed: 12000rpm;

All-in-one electronic control system

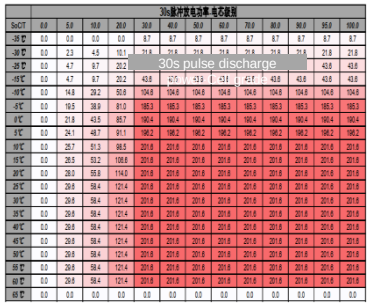
- High integration: four-in-one
- Platformization



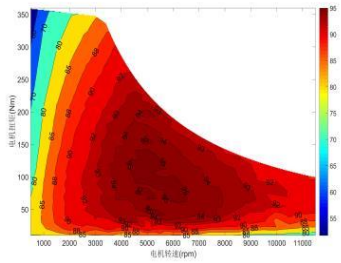
Low energy consumption

Low wind drag

Efficient controller



Battery efficiency



Motor efficiency

Low energy consumption

- The wind deflector with low wind drag has a contribution rate of 12% in drag coefficient and 3% in energy consumption, bringing a significant economic advantage under high-speed conditions;

- The truck is designed with various functions such as ECO mode and regenerative braking as standard configuration, which reduces the energy consumption by 8% and extends the driving range by 15-20km;

- The safe high-power heating film achieves a heating rate exceeding 0.4°C/min, which improves the battery performance rapidly in low temperature environments;

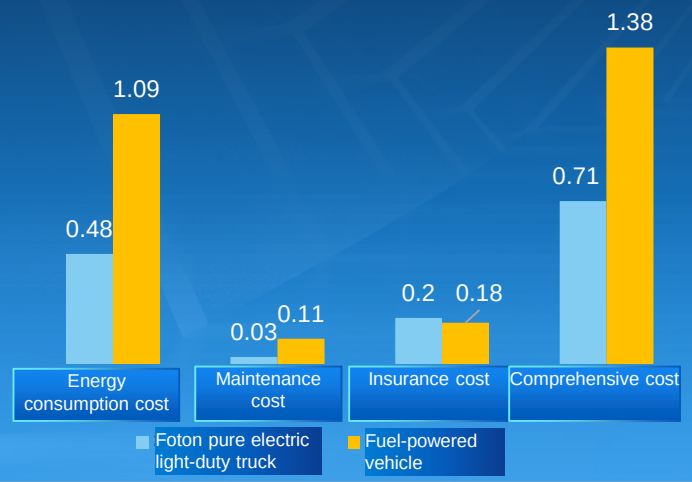
- The optimized motor technology reduces the power consumption, so the efficiency of the motor system is further improved to 97%;

Tco

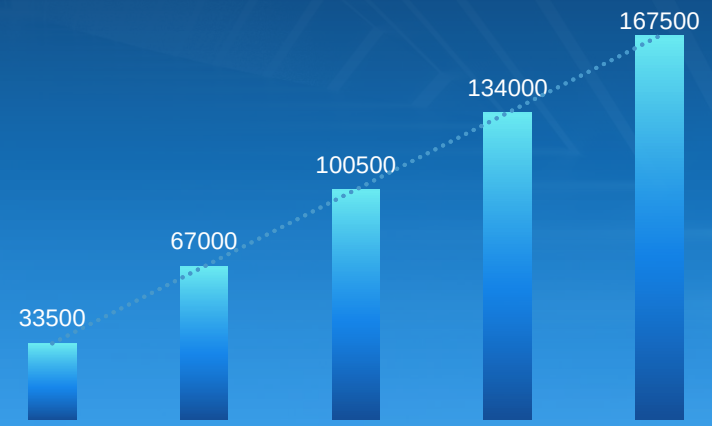
Energy Consumption

Less than 0.5kwh per km

Total cost of ownership per km(￥)



Operators can see estimated total savings of up to ￥167500 within their first five years of ownership



Standardized Design and Production

Standardized design

- The hole position is standardized, and no rivets are on the upper wing surface, which facilitates the modification accessibility;
- With ePTO port of 10 kw, adapting to wide choices;
- The standard 2100mm-wide cargo compartment contains 2 cargo pallets side by side;
- The standard CCS TYPE 2 DC charging power is 80kw, and the AC charging power of OBC is 11kw, achieving efficient charging
- The seamless welding robot and advanced coating technology ensure no corrosion within ten years. Our multiple factories with fully automatic assembly lines at home and abroad take the lead in lean manufacturing.

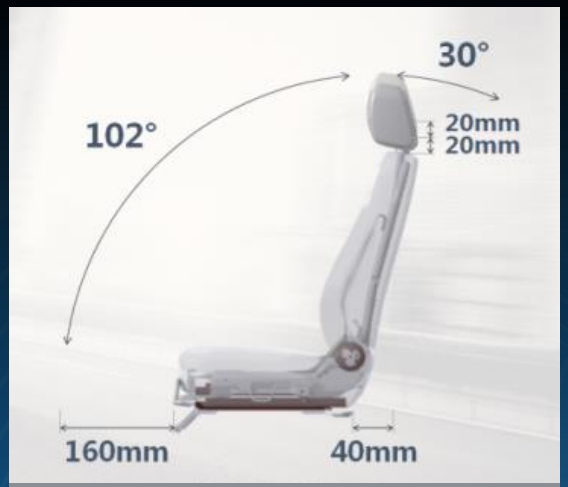
COMFORT

- Ergonomic design
- Low noise

Ergonomic Design

1880mm ultra-wide cab

Comfortable seat



Double locking slide, core disc type recliner

Shift knob, storage space, cup holder, and overhead file cabinet

Ergonomic design

- The cab features all-inclusive interiors, and all of them use scrubbable hot-pressed inner guard plates for ease of cleaning.
- The LCD instrument cluster displays vehicle information such as battery power and driving range. The cab features Bluetooth and cruise control functions as standard configuration, which brings more enjoyment in driving.
- Ergonomic seats, retractable parking brake lever and multiple storage spaces meet driving comfort and various personalized needs.
- The shift knob is fashionable, light and flexible, increasing the cab space.

Low Noise

NVH performance index	Standard value	Measured value
Noise during acceleration (dB(A))	ECE ≤ 77	ECE ≤ 70
Noise around the driver (constant speed driving) (dB(A))	≤56	45

Shopping mall: 60-80 dB(A)

Library: 40-60 dB(A)

Double positive pressure sealing of body doors, achieving sound insulation, heat insulation and leakage prevention

Low noise

- Thanks to excellent NVH characteristics of the motor, the measured noise around the driver is **45dB, equivalent to the noise in a quiet library.**
- Special-shaped double sealing strips are installed on door frames and side walls of the cab, **which greatly improves the rainproof and dustproof capabilities.**
- The fully wrapped cab effectively isolates outdoor noise.

SAFETY

- **S**afe power distribution
- **S**afe steering
- **S**afe braking
- **P**assive safety

Safe power Distribution

Safe battery materials

The battery cores and battery packs of the battery system have passed 16 safety tests, and the battery pack of the battery system has been installed on the truck and completed 300,000km reliability verification

✓ Collision test

✓ Extrusion test

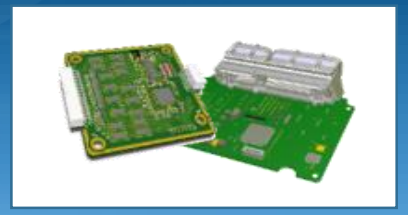
✓ Water immersion test

✓ Fire test

✓ Salt spray test

Safe battery system

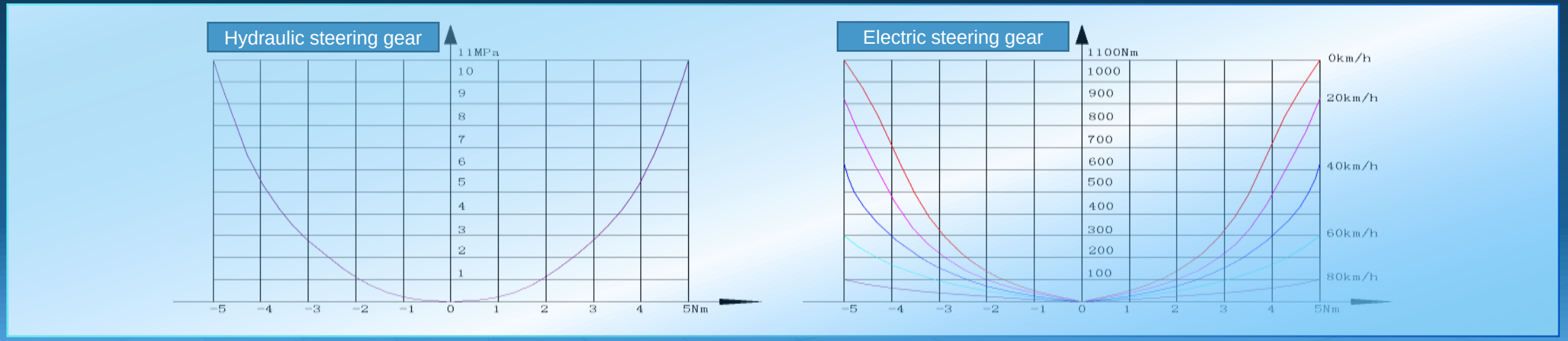
According to the characteristics of the battery, the intelligent BMS is used to achieve active safety protection, effectively ensuring the battery safety.



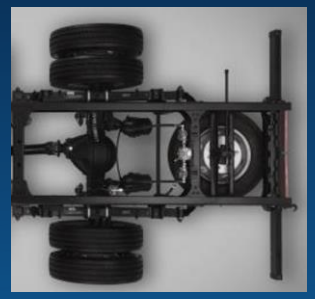
steering

The EPS is adopted, ensuring easy steering at a low speed and stable steering at a high speed; the residual angle of active return-to-center is small;

Index	Hydraulic steering gear	Electric steering gear
Large-angle return-to-center	Residual angle ≤90°, poor consistency	0
Small-angle return-to-center	Return-to-center trend at 40km/h, poor consistency	10km/h
Return-to-center linearity	Poor	Good



Safe Braking



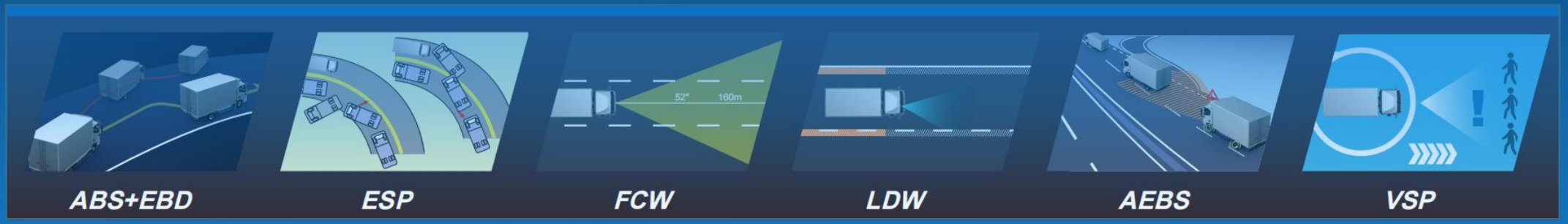
4S4M

4S/4M: 4 wheel speed sensors and 4 solenoid valves can accurately control the braking force of each wheel, so the braking stability is better than that of conventional 4S/3M (4 wheel speed sensors and 3 solenoid valves) structure.

Front disc brake

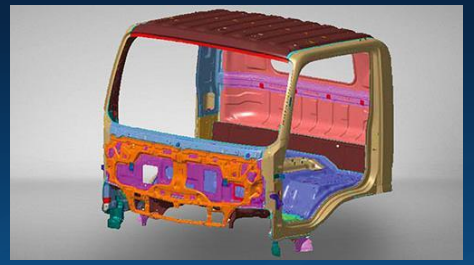
Rear drum brake

- There are two options, namely front disc brake and front drum brake, which are suitable for plain and mountain conditions respectively.
- The braking distance in cold state is 20m, which is 5m shorter than that of competitors, thus greatly improving the safety factor.



Active safety - abundant electronic auxiliary equipment

Passive Safety



The cab is designed with frame structure

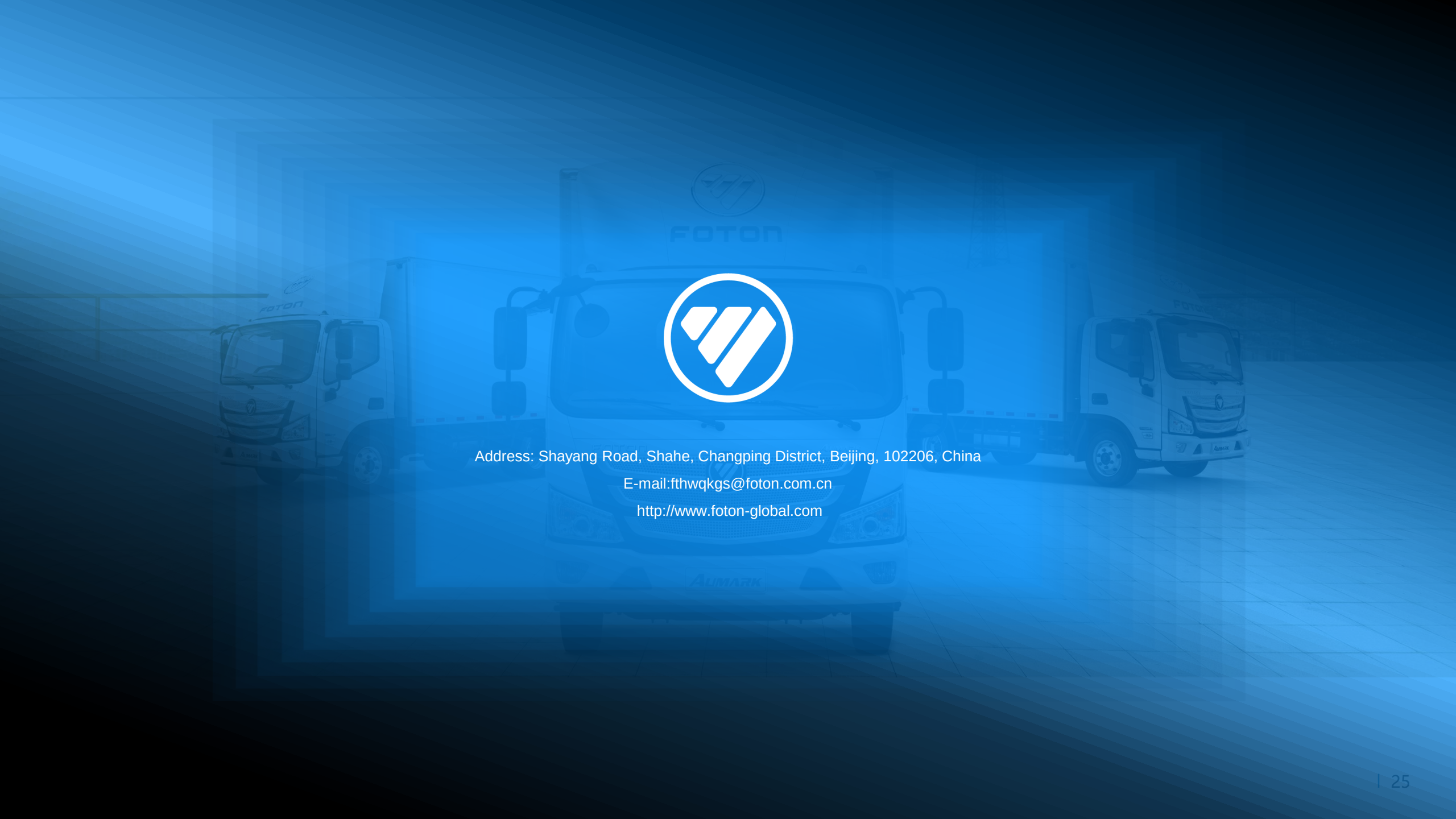
- The cab is designed with mechanical transmission structure against frontal impact and top crushing
- The cab is formed via stamping as a whole, and more than 80% of the cab structure is welded with double-sided galvanized sheets at high precision, which protects the driver and passengers at all time

Hinge-reinforced plate and M-shaped buffer beam

- The tensile strength and yield strength of high-strength steel are more than 400MPa and more than 300MPa respectively
- They can maximize the resistance to accidental impacts from sides

Airbag (optional)

- It gives the most protection in accidents



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