BAE SYSTEMS
INSPIRED WORK

MTS
(Modular Traction System)

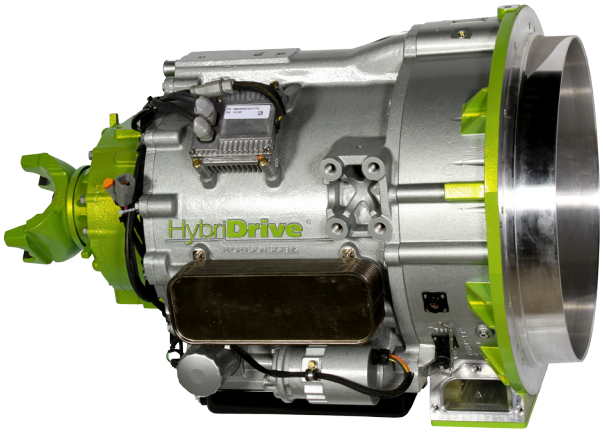
The Modular Traction System (MTS) is composed of a traction motor/reduction gear and a traction generator to provide propulsion and power for the vehicle. The liquid-cooled, high power density ratio AC induction electric traction motor and reduction gear connect directly to a standard drive shaft and rear axle to provide traction power and regenerative braking.

The traction motor incorporates a fixed ratio planetary reduction gear, eliminating the need for a shifting transmission. This provides smooth, jerk-free propulsion, resulting in a noticeably more comfortable ride for passengers, especially standees, compared to conventional diesel or parallel hybrid buses. The traction motor is the sole source of propulsion for the vehicle and is sized accordingly, providing high power and superior low-end starting torque.

Our electrically-driven system, along with electric accessories, enables Stop/Start, Depot Drive, and Extended-Range modes of travel. What's more, our electric propulsion delivers exceptional acceleration, performance on steep grades, and efficiency of energy re-capture during regenerative braking—since the energy is returned to the batteries for subsequent use.

The traction generator is coupled directly to the engine crankshaft, resulting in a compact bearingless design. The generator is sized to convert all engine crankshaft power to electrical power for use by the system, providing sufficient power for sustained highway operation at 65 mph. The high efficiency, permanent magnet generator also provides ample power for all electric accessories with Series-E and Series-ER. The compact MTS occupies an equivalent space claim of a typical conventional automatic transmission.

This system's design and packaging makes it easily adaptable to multiple bus models and easy to install. the MTS can be installed "in-line" (T-drive) or "transverse" (V-drive). The simple design of the MTS reduces the cost of maintenance as well as the overall life cycle cost. MTS models are available for HDS100, HDS200, and HDS300 systems.



Features

- Meets all transit industry standard performance requirements
- Mechanically simple; long life
- Integrated starter generator – eliminates conventional starter wear
- Sensorless for improved reliability
- Superior low-end torque and high power-to-weight ratio
- AC induction motor/Permanent Magnet generator — eliminates brush maintenance
- Traction Motor and PlanetarySpeed Reducer (PSR) are the same in pure EV installations

Benefits

- Superior acceleration and gradeability
- Reduced maintenance
- Fits in conventional transmission space claim, installs either T-drive or V-drive.
- Reliable with low lifecycle cost
- Supports more-electric and all-electric drive modes
- Easy installation
- Available for HD shuttle, transit, articulated, and double-deck buses
- Completely high-voltage protected for safety
- WEG cooled for MTS heat removal, no separate oil cooler required
- Sensorless ISG for improved reliability

	Traction Motor Ratings		
	HDS100	HDS200	HDS300
Power Peak Intermittent Continuous	 255 hp (190 kW) 500 – 2485 rpm 235 hp (175 kW) 455 – 2485 rpm 161 hp (120 kW) 630 – 2485 rpm	 270 hp (200 kW) 520 – 2000 rpm 240 hp (180 kW) 460 – 2400 rpm 215 hp (160 kW) 640 – 2485 rpm	 310 hp (230 kW) 430 – 1680 rpm 270 hp (200 kW) 370 – 2640 rpm 240 hp (180 kW) 510 – 2640 rpm
Torque Peak Intermittent Continuous	 2435 ft-lbs (3300 Nm) 0 – 200 rpm 1780 ft-lbs (2415 Nm) 0 – 455 rpm 1190 ft-lbs (1610 Nm) 0 – 630 rpm	 3800 ft-lbs (5200 Nm) 0 – 185 rpm 2700 ft-lbs (3700 Nm) 0 – 460 rpm 1800 ft-lbs (2400 Nm) 0 – 640 rpm	 4700 ft-lbs (6400 Nm) 0 – 200 rpm 3800 ft-lbs (5200 Nm) 0 – 370 rpm 2500 ft-lbs (3400 Nm) 0 – 510 rpm
Speed Operational Overspeed	 0–2485 rpm 2730 rpm	 0–2485 rpm 2730 rpm	 0–2640 rpm 2810 rpm
Physical Length (end of shaft) Width Height Weight (wet)	 21.8 in (554 mm) 24.1 in (613 mm) 22.4 in (569 mm) 654 lbs (297 kg)	 24.8 in (629 mm) 24.1 in (613 mm) 22.4 in (569 mm) 804 lbs (352 kg)	 25.7 in (653 mm) 24.1 in (613 mm) 22.4 in (569 mm) 855 lbs (388 kg)
Cooling	Jacket water ethylene (or propylene) -glycol, 167°F (75°C) max, 10 gpm (38 lpm) / Internal ATF, electric oil pump, filter, cooler, oil sump	Jacket water ethylene (or propylene) -glycol, 167°F (75°C) max, 10 gpm (38 lpm) / Internal ATF, electric oil pump, filter, cooler, oil sump	Jacket water ethylene (or propylene) -glycol, 149°F (65°C) max, 10 gpm (38 lpm) / Internal ATF, electric oil pump, filter, cooler, oil sump
Operating Temperature	-40° to 185°F (-40° to 85°C) / Local external ambient		
Vehicle GVWR up to	41,000 lbs (18.6 mT) @ 45 mph (72 kph)	43,000 lbs (19.5 mT) @ 65 mph (104 kph)	63,000 lbs (28.6 mT) @ 65 mph (104 kph)

	Traction Generator Ratings		
	HDS100	HDS200	HDS300
Power Continuous	 194 hp (145 kW) @ 2100 rpm	 280 hp/(200 kW) @ 2300 rpm	 330 hp/(230 kW) @ 2000 rpm
Torque Continuous	 486 ft-lbs (660 Nm) 0 – 2100 rpm	 640 ft-lbs (870 Nm) 0 – 2300 rpm	 865 ft-lbs (1175 Nm) 0 – 2000 rpm
Speed	0–2100 rpm 2700 rpm	0–2300 rpm 2700 rpm	0–2000 rpm 2700 rpm
Physical Length (beyond FWH) Width Weight (wet)	6 in (155 mm) 23.6 in (600 mm) 23.6 in (600 mm) 237 lbs (107 kg) /+26 lbs (12 kg) for Ring Gear	6 in (155 mm) 23.6 in (600 mm) 23.6 in (600 mm) 251 lbs (114 kg) /+26 lbs (12 kg) for Ring Gear	6.3 in (160 mm) 23.6 in (600 mm) 23.6 in (600 mm) 300 lbs (136 kg) /+26 lbs (12 kg) for Ring Gear
Cooling	Jacket water ethylene (or propylene) -glycol, 185°F (85°C) max, 10 gpm (38 lpm)		
Operating Temperature	-40° to 185°F (-40° to 85°C) / Local external ambient		

BAE Systems Propulsion Systems	HDS100	HDS200	HDS300
Bus Configuration – Specifications			
30ft – North America	X	X	
40ft – North America		X	
60ft – North America			X
10-12m – European	X		
18m – European		X	
Double-decker – European	X	X	

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