



Gear Selection Logic and low-speed maneuverability make UltraShift *PLUS* the smartest transmission for the job.

**Platforms:**

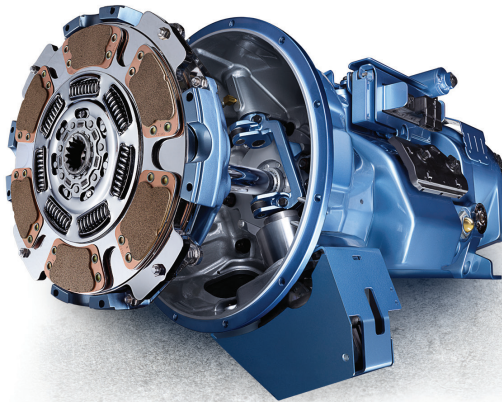
- Vocational Active Shifting (VAS)
- Vocational Construction Series (VCS)
- Vocational High Performance (VHP)
- Vocational Multipurpose Series (VMS)
- Vocational Extreme Performance (VXP)

For low-speed maneuverability, a necessity for challenging worksites, the UltraShift *PLUS* Vocational Series of automated transmissions is the ultimate transmission choice. Through extended low and reverse gear ratio coverage, it provides the lowest ground speed for curbing, creeping, spreading, and paving. For highway construction and dump operations, it is designed with deep reduction and fast, flexible reverse gearing. And the patented shift logic and controls within every UltraShift *PLUS* constantly adapt based on changes in weight of load, grade, and power, making adjustments to maximize efficiency.

**Technical Features**

- Fully automated two-pedal design (no clutch pedal)
- Electronic Clutch Actuator (ECA) provides smooth engagement
- On/Off-highway performance design
- Safety features include auto neutral and Intelligent Hill Start Aid, which prevents roll-back and roll-forward while launching on grades using foundation wheel brakes
- Automatic, Manual and Low modes offer driver full control
- Creep Mode allows the vehicle to be driven at constant speed (optional)
- Paired to the highest torque engines available today with torque capacities ranging from 1050 lb-ft (1424 Nm) through 2250 lb-ft (3050 Nm)
- World class startability and ratio coverage

**The Downside of Alternative Transmissions:**  
Cost and performance



European Automated Manuals		Torque Converter Automatics
<b>Expensive maintenance</b> <ul style="list-style-type: none"> <li>• Organic clutch replacement costs</li> <li>• Organic clutch durability/life</li> <li>• Limited service network</li> </ul>	<div>↑ COST</div>	<b>Inefficient design, waste fuel</b> <ul style="list-style-type: none"> <li>• Expensive maintenance                             <ul style="list-style-type: none"> <li>- More oil changes</li> <li>- Shorter brake life</li> <li>- Other drivetrain damage</li> </ul> </li> <li>• Limited service network</li> <li>• Higher initial cost</li> </ul>
<b>Lack overall ratio</b> <ul style="list-style-type: none"> <li>• Organic clutch is less tolerant of heat and is often compromised at heavy weights</li> <li>• Limited engine options available</li> </ul>	<div>↓ PERFORMANCE</div>	<b>Low speed handling</b> <ul style="list-style-type: none"> <li>• Urge to move</li> <li>• Less control on grade/slopes – tendency to “freewheel”</li> <li>• Tendency to overheat in certain conditions</li> </ul>

# UltraShift® PLUS Vocational Automated Transmissions

## Total System Installed Specifications (Dry)

SPECIFICATIONS	CAPACITY	WEIGHT*	LENGTH**	SPEEDS
FO-10E310C-VAS	1050 lb.-ft. [1424 Nm]	915 lbs. [415 kg]	31.80 in. [807.7 mm]	10 forward, 2 reverse
FO-12E310C-VAS	1250 lb.-ft. [1695 Nm]	915 lbs. [415 kg]	31.80 in. [807.7 mm]	10 forward, 2 reverse
FO-14E310C-VAS	1450 lb.-ft. [1424 Nm]	915 lbs. [415 kg]	31.80 in. [807.7 mm]	10 forward, 2 reverse
FO-16E310C-VAS	1650 lb.-ft. [2237 Nm]	915 lbs. [415 kg]	31.80 in. [807.7 mm]	10 forward, 2 reverse
FOM-14E310C-VAS <sup>1</sup>	1450 lb.-ft. [1966 Nm]	915 lbs. [415 kg]	31.80 in. [807.7 mm]	10 forward, 2 reverse
FOM-15E310C-VAS <sup>1</sup>	1550 lb.-ft. [2101 Nm]	915 lbs. [415 kg]	31.80 in. [807.7 mm]	10 forward, 2 reverse
FOM-16E310C-VAS <sup>1</sup>	1650 lb.-ft. [2237 Nm]	915 lbs. [415 kg]	31.80 in. [807.7 mm]	10 forward, 2 reverse
FO-10E308LL-VCS	1050 lb.-ft. [1424 Nm]	975 lbs. [442 kg]	34.90 in. [886.5 mm]	10 forward, 3 reverse
FO-11E308LL-VCS	1150 lb.-ft. [1559 Nm]	975 lbs. [442 kg]	34.90 in. [886.5 mm]	10 forward, 3 reverse
FO-12E308LL-VCS	1250 lb.-ft. [1695 Nm]	975 lbs. [442 kg]	34.90 in. [886.5 mm]	10 forward, 3 reverse
FO-14E308LL-VCS	1450 lb.-ft. [1966 Nm]	975 lbs. [442 kg]	34.90 in. [886.5 mm]	10 forward, 3 reverse
FO-16E308LL-VCS	1650 lb.-ft. [2237 Nm]	975 lbs. [442 kg]	34.90 in. [886.5 mm]	10 forward, 3 reverse
FO-17E308LL-VCS	1750 lb.-ft. [2373 Nm]	975 lbs. [442 kg]	34.90 in. [886.5 mm]	10 forward, 3 reverse
FO-16E313A-VHP	1650 lb.-ft. [2237 Nm]	978 lbs. [444 kg]	34.90 in. [886.5 mm]	13 forward, 3 reverse
FO-18E313A-VHP	1850 lb.-ft. [2509 Nm]	978 lbs. [444 kg]	34.90 in. [886.5 mm]	13 forward, 3 reverse
FO-20E313A-VHP	2050 lb.-ft. [2779 Nm]	978 lbs. [444 kg]	34.90 in. [886.5 mm]	13 forward, 3 reverse
FO-10E309ALL-VMS	1050 lb.-ft. [1424 Nm]	975 lbs. [442 kg]	34.90 in. [886.5 mm]	11 forward, 3 reverse
FO-11E309ALL-VMS	1150 lb.-ft. [1559 Nm]	975 lbs. [442 kg]	34.90 in. [886.5 mm]	11 forward, 3 reverse
FO-12E309ALL-VMS	1250 lb.-ft. [1695 Nm]	975 lbs. [442 kg]	34.90 in. [886.5 mm]	11 forward, 3 reverse
FO-14E309ALL-VMS	1450 lb.-ft. [1966 Nm]	975 lbs. [442 kg]	34.90 in. [886.5 mm]	11 forward, 3 reverse
FO-16E309ALL-VMS	1650 lb.-ft. [2237 Nm]	975 lbs. [442 kg]	34.90 in. [886.5 mm]	11 forward, 3 reverse
FO-17E309ALL-VMS	1750 lb.-ft. [2373 Nm]	975 lbs. [442 kg]	34.90 in. [886.5 mm]	11 forward, 3 reverse
FO-14E318B-VXP	1450 lb.-ft. [1966 Nm]	978 lbs. [444 kg]	34.90 in. [886.5 mm]	18 forward, 4 reverse
FO-16E318B-VXP	1650 lb.-ft. [2237 Nm]	978 lbs. [444 kg]	34.90 in. [886.5 mm]	18 forward, 4 reverse
FO-18E318B-VXP	1850 lb.-ft. [2508 Nm]	978 lbs. [444 kg]	34.90 in. [886.5 mm]	18 forward, 4 reverse
FO-20E318B-VXP	2050 lb.-ft. [2779 Nm]	978 lbs. [444 kg]	34.90 in. [886.5 mm]	18 forward, 4 reverse
FO-22E318B-VXP	2250 lb.-ft. [3051 Nm]	978 lbs. [444 kg]	34.90 in. [886.5 mm]	18 forward, 4 reverse

\* Dry weight, including clutch \*\* Standard install length <sup>1</sup> +200 lb.-ft. [271 Nm] in top two gears

## Ratios and Steps

Model	Reverse				Overall Ratio	Forward Gears																	
	R4	R3	R2	R1		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
VAS			2.78	13.63	17.53	12.80	9.25	6.76	4.90	3.58	2.61	1.89	1.38	1.00	0.73								
					% Step	38	37	38	34	37	38	37	38	37									
VCS		2.89	9.85	15.22	19.68	14.56	9.42	6.24	4.63	3.40	2.53	1.83	1.36	1.00	0.74								
					% Step	55	51	35	37	34	38	35	36	35									
VHP		4.03	12.85	15.06	16.84	12.29	8.51	6.05	4.38	3.20	2.28	1.94	1.62	1.38	1.17	1.00	0.86	0.73					
					% Step	44	41	38	37	40	17	20	17	18	17	16	18						
VMS		3.43	13.03	20.84	35.73	26.08	16.30	11.85	7.41	5.23	3.79	2.77	1.95	1.38	1.00	0.73							
					% Step	60	38	60	36	38	37	42	41	38	37								
VXP	3.43	4.03	12.85	15.06	19.73	14.40	12.29	8.51	7.26	6.05	5.16	4.38	3.74	3.20	2.73	2.28	1.94	1.62	1.38	1.17	1.00	0.86	0.73
					% Step	17	44	17	20	17	18	17	17	17	20	18	20	17	18	17	16	18	

## Driver Interface Simple and Intuitive

- Manual override available
- Low mode
- Button shifting in drive, reverse, manual and low modes

## Driveline Protection Features

- Stall prevention
- Engine Overspeed Protection
- Clutch Abuse Protection
- Auto gear select
- Hill Start Aid

## Supported by the Roadranger Network

- OEM dealer, fleet familiarity
- Parts and service widely available
- Does not require service by a dedicated service network
- Modular design minimizes cost and time of service
- Roadranger field service force provides training and support at dealership and fleet level
- Advanced electronics facilitate comprehensive diagnostic capabilities

## Warranties

Three-year unlimited mileage system warranty for most applications.  
Two-year unlimited mileage warranty for Severe Service applications. You can find your specific vocation coverage on [www.eaton.com/roadranger](http://www.eaton.com/roadranger). Select the vocational warranty guide.

BACKED BY

**Roadranger**

SUPPORT

For spec'ing or service assistance,  
call 1-800-826-HELP (4357) or visit  
[www.eaton.com/roadranger](http://www.eaton.com/roadranger).  
In Mexico, call 001-800-826-4357.

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### Eaton

Vehicle Group  
P.O. Box 4013  
Kalamazoo, MI 49003 USA  
800-826-HELP (4357)  
[www.eaton.com/roadranger](http://www.eaton.com/roadranger)

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