



Your Competitive Edge Starts Here

EATON

Powering Business Worldwide

An aerial, high-angle photograph of a multi-lane highway stretching into the distance. The sun is low on the horizon, creating a dramatic sunset sky with orange, yellow, and blue tones. A large white semi-truck is in the foreground, moving away from the viewer. Several cars are visible in the distance on the highway. The highway is flanked by a concrete barrier and a fence on the left side.

Drive On.

With more than 100 years of proven success in on-highway and off-highway applications, Eaton® is a global leader in vehicle transmissions. Original equipment manufacturers around the globe count on Eaton's extensive experience in tailor-made solutions that enhance overall vehicle efficiency, reliability, safety and drivability.

This guide details many of Eaton's heavy-duty automated and manual transmissions for Linehaul, Performance and Vocational applications, in addition to the all-new Procision™ 7-speed dual-clutch automatic transmission for medium-duty applications.

Eaton has an impressive portfolio of transmissions — a comprehensive and proven product lineup unmatched in the marketplace.

All Eaton commercial powertrain products are backed by the support, solutions and expertise of the Roadranger® network — North America's most experienced powertrain support network, with more than 200 dedicated professionals providing a complete spectrum of support for Eaton components, from spec'ing to service to aftermarket support.

Read on to learn why our family of world-class transmissions is the right choice for your fleet and the preferred choice of drivers.

WHAT'S INSIDE	
Segment Definitions	4
General Information	6
GearLogic™ Technology	8
Heavy-Duty	10
Linehaul	10
Comparison Overview	11
Fuller Advantage® Series	12
Fuller Advantage Automated	14
Fuller Advantage Manual	20
FR-10	22
Performance	24
Comparison Overview	25
UltraShift® PLUS MHP/MXP/VXP	26
UltraShift® PLUS LSE	28
AutoShift® 18	30
RT-13/RT-18	32
Vocational	34
Comparison Overview	35
Fuller Advantage Automated	36
UltraShift PLUS VCS/VMS	38
RT-8LL/RT-9ALL/RT-15	40
Medium-Duty	42
Procision	44
Reference	
Eaton Transmissions Overview	46



Segment Definitions

Eaton® transmissions have been engineered to give you the competitive edge you desire. Whether you're spec'ing a transmission for heavy-duty or medium-duty applications, Eaton's got you covered.



Heavy-Duty

Linehaul

Over-the-road driving, with focus on fuel economy, comfort and performance.

10 speeds

Integrated OEM options

Small-step overdrive, standard overdrive and direct drive

Up to 110,000 lbs. GCW



Performance

Specialty and Linehaul trucks needing superior performance on grades, higher resale value and the ability to haul higher weight to get the job done.

13 – 18 speeds

Unlimited GCW options



Vocational

Specializing in off-highway applications, with emphasis on low-speed maneuverability, control and safety.

10 – 15 speeds

Up to 110,000 lbs. GCW



Medium-Duty



Truck

Pickup and delivery, towing and recovery, and beverage vehicles, with focus on reliability, fuel efficiency, ease of operation and cost of ownership.

7 speeds

Up to 35,000 lbs. GCW



School Bus

Type C and Type D buses looking for safety, comfort, reliability and serviceability.

7 speeds

Up to 33,000 lbs. GVW

Transmission General Information

How to Use the Tables

Locate the appropriate model in the far left-hand column of the tables and follow that row horizontally across the page to find information pertaining to that model.

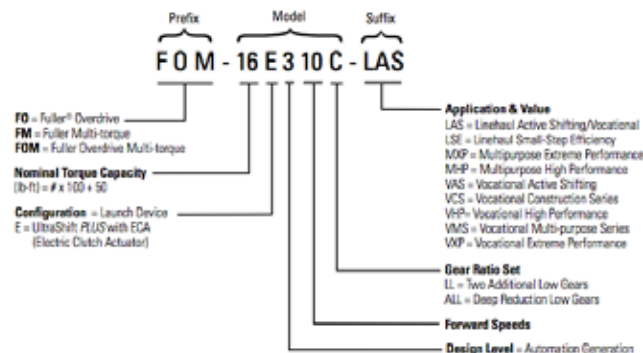
Specifications, features and benefits can also be found at www.roadranger.com.

The models, options and specifications listed in this document were current at the time of publication. Model availability, options and specifications are subject to change without notice.

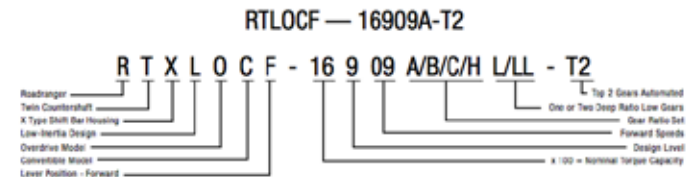
General Transmission Notes

- Length:** Listed lengths are installation dimensions from face of clutch housing to front bottoming surface of companion flange or yoke, except AT-1202 and 2-A-92, which are from bottoming surface of input yoke to bottoming surface of output yoke.
- Weight:** Listed weights are without clutch housing, controls and lubricant unless otherwise specified. All weights are approximate. Add 7 lbs. [3.15 kg] to models with internal oil pump.
- Oil Capacity:** Oil capacities are approximate, depending on inclination of transmission. Always fill transmission to level of filler opening or center of sight glass. Refer to Form TCMT0020 and TCMT0021 Lubrication Requirements for more information.
- Oil Cooler:** Recommended – With engines 350 HP and above.
Required – With engines 400 HP and above and GCWs over 90,000 lbs. [40,823 kg] With engines 400 HP and above and 1400 lb.-ft. [1898 Nm] or greater torque.
With engines 450 HP and above.
With engines 1500 lb.-ft. [2034 Nm] and above.
Excluded – With Fuller Advantage® Series transmissions.
- Shift Control Systems:** A variety of direct-mounted shift lever configurations and mechanical remote controls is readily available for all Medium- and Heavy-Duty Transmissions. Shift bar housings for forward gear shift lever location are available for all heavy-duty models, with the exception of RT-6609A and automated products. A variety of automatic-style shift controls is available, both shift lever and push button, for automated transmissions. For specific applications, contact your OEM.
- Oil Filters:** Recommended – With 13- and 18-speed transmissions.

Heavy-Duty UltraShift® PLUS Nomenclature (reference item RRSL0002 for further nomenclature explanations)



Heavy-Duty Manual Nomenclature



Clutch Housing Weights & Availability

Model Series	SAE NO. 1			SAE NO. 2		
	Housing Type	Aluminum [kg]	Iron [kg]	Housing Type	Aluminum [kg]	Iron [kg]
FA-Series, RT- & FR-Series ¹	Standard	23 lbs. [10]	76 lbs. [34]	Standard	21 lbs. [10]	68 lbs. [31]
	Nodal	36 lbs. [16]	92 lbs. [42]	Nodal	N/A	88 lbs. [40]

¹No SAE NO. 2 clutch housing on 13- and 18-speed models or automated 10-speed models rated 1450 lb.-ft. or above. Note: No cast-iron clutch housings on UltraShift *PLUS* models.

Model Series	SAE NO. 1			SAE NO. 2		
	Housing Type	Aluminum [kg]	Iron [kg]	Housing Type	Aluminum [kg]	Iron [kg]
All other FA-Series Manual, RT and FR-Series, except for FR with internal oil cooler	Standard	Integral ²				Multi-Piece ³
	Nodal	Multi-Piece ³				
	Nodal Forced Lube	Multi-Piece ³				
	Standard Forced Lube	Integral ²				

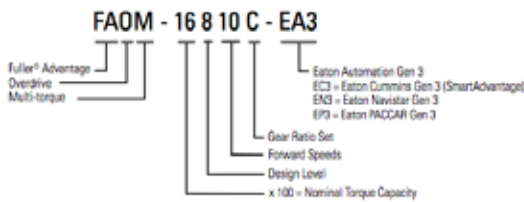
²Integral Hydraulic Clutch Release System

- Clutch housing weight is 27 lbs. [12.24 kg] (without Clutch Release Components)
- Clutch housing weight is 34 lbs. [15.42 kg] (with Clutch Release Components)
- UltraShift *PLUS* clutch weight is 150 lbs. [68 kg]. Electronic Clutch Actuator (ECA) is 16 lbs. [7.3 kg].
- AutoShift clutch weight is 150 lbs. [68 kg].

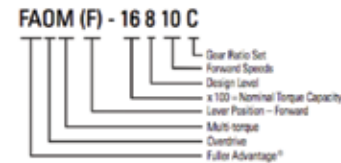
³Multi-Piece Hydraulic Clutch Release Design

- Aluminum clutch housing weight is 21 lbs. [9.52 kg] (without Clutch Release Components)
- Aluminum clutch housing weight is 38 lbs. [17.23 kg] (with Clutch Release Components)
- Cast-iron clutch housing weight is 68 lbs. [30.8 kg] (without Clutch Release Components)

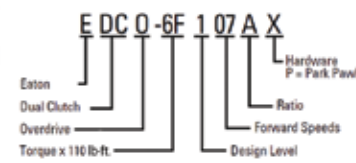
Fuller Advantage® Series Automated Nomenclature

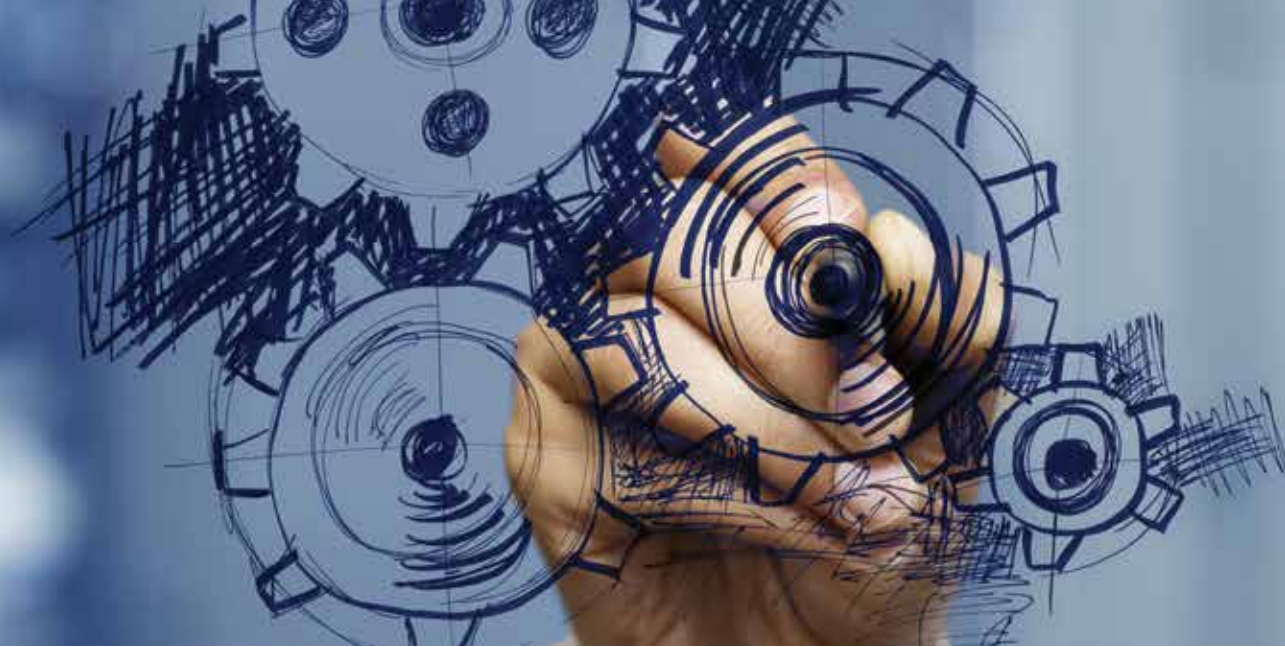


Fuller Advantage® Series Manual Nomenclature



Precision™ Nomenclature





Introducing GearLogic™ Technology

A suite of intelligent technology features for automated transmissions that improve performance, fuel efficiency and driver confidence. Learn about these impressive features and discover what they can do for you.

GearLogic Features

Feature	Definition
Hill Start Aid	Prevents unintended roll back or roll forward. When the grade exceeds the programmed threshold, foundation brakes hold the truck for a controlled launch. It works when pointing uphill in Drive or facing downhill in Reverse.
Auto Neutral	Automatically switches the transmission into Neutral once the parking brake is engaged to prevent potential movement. Safety features like these not only reduce accidents, they can also help meet the latest CSA regulations.
Engine Overspeed Protection	The transmission system upshifts if necessary to prevent engine overspeed in Drive, Manual and Low modes.
Enhanced Engine Braking	Downshifts the transmission to help slow the truck on long, steep descents and increases brake pad life.
Load-Based Shifting	Selects appropriate starting gear and makes shift decisions based on grade, vehicle weight, engine torque and throttle position.
Urge to Move	Drivers simply release the brake pedal to automatically inch forward, similar to the feel of a passenger car.
Blended Pedal	Drivers can use the throttle to feather the clutch for seamless low-speed control.
Creep Mode	Enables drivers to “creep” at low speeds and offers ultimate control for curbing, spreading and paving.
Neutral Coast	Fuel-saving feature that disengages the driveline on slight downhill grades.
Smart Gear Selection	The appropriate starting gear is selected and makes shift decisions based on grade, vehicle weight, engine torque and throttle position — skip shifting when appropriate, making the most efficient shift changes based on those conditions.



More choices to give you more time on the road.

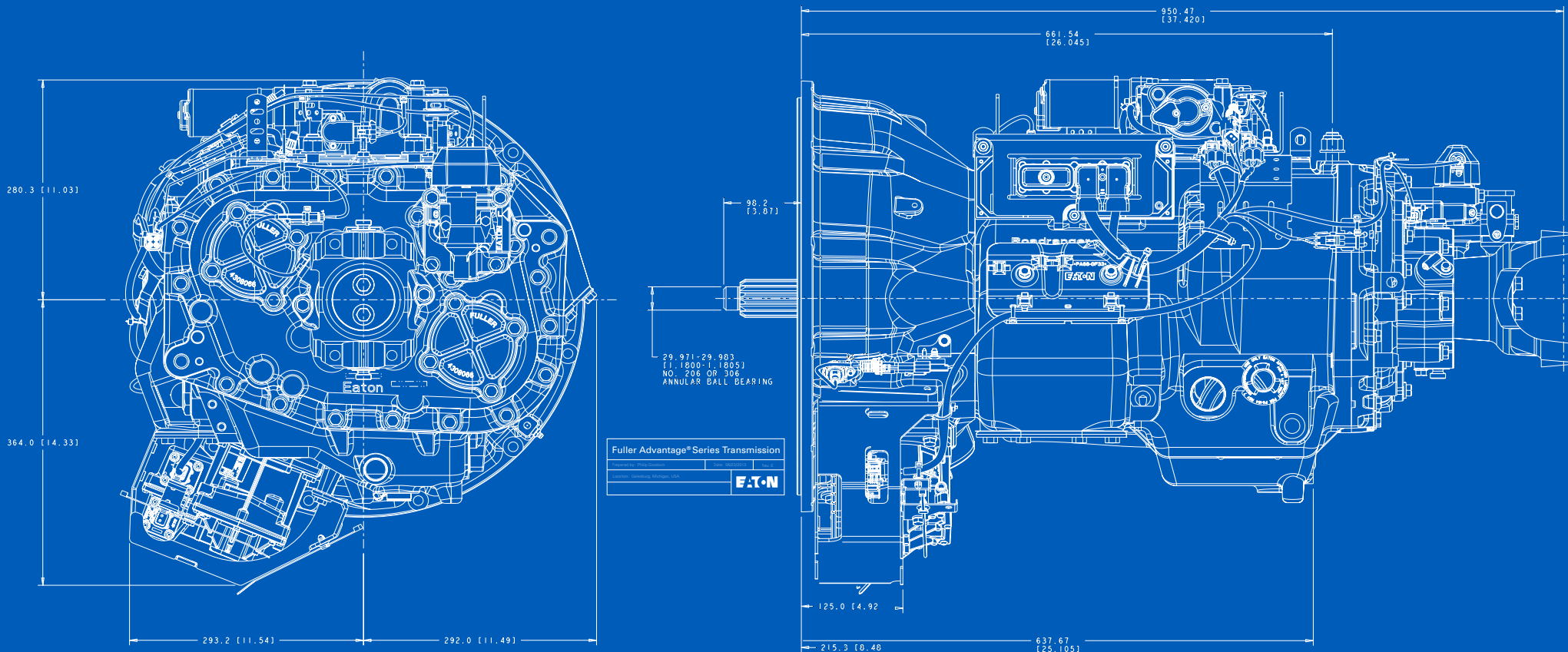
Priorities. When you're on the road, there are a lot of them. Fuel economy, comfort, performance. It's hard to decide what should come first. Luckily, with Eaton, you don't have to decide. Our portfolio is as diverse as your fleet, with choices that give you the power to equip your trucks with transmissions and clutches that sacrifice nothing. Whether you want the best in manual transmissions for your most experienced drivers or the newest automated options to standardize fuel economy across the board and reduce driver stress, we've got you covered like no one else.



Linehaul Transmission Product Comparison

Use this table to quickly identify which product best suits your needs.

	Fuller Advantage	Fuller Advantage	FR-10C	FR-10B
Type	Automated	Manual	Manual	Manual
# of speeds	10	10	10	10
Small-Step (S-Ratio)	✓	--	--	--
Direct Drive (B-Ratio)	✓	✓	--	✓
Overdrive (C-Ratio)	✓	✓	✓	--
Max. Torque (lbs.-ft. [Nm])	1850 [2508]	1850 [2508]	1850 [2508]	1550 [2101]
Max. GCW (lbs. [kg])	110,000 [49,895]	110,000 [49,895]	110,000 [49,895]	110,000 [49,895]
Oil capacity (pints [liters])	16 [7.57]	16 [7.57]	23.5 [11.12]	23.5 [11.12]
Lubrication Interval (miles [km])	500,000 [804,672]	500,000 [804,672]	500,000 [804,672]	500,000 [804,672]
Precision Lubrication	✓	✓	--	--
Oil-level sight glass	✓	✓	--	--
Skip Shift	✓	--	--	--
GearLogic™ technology	✓	--	--	--



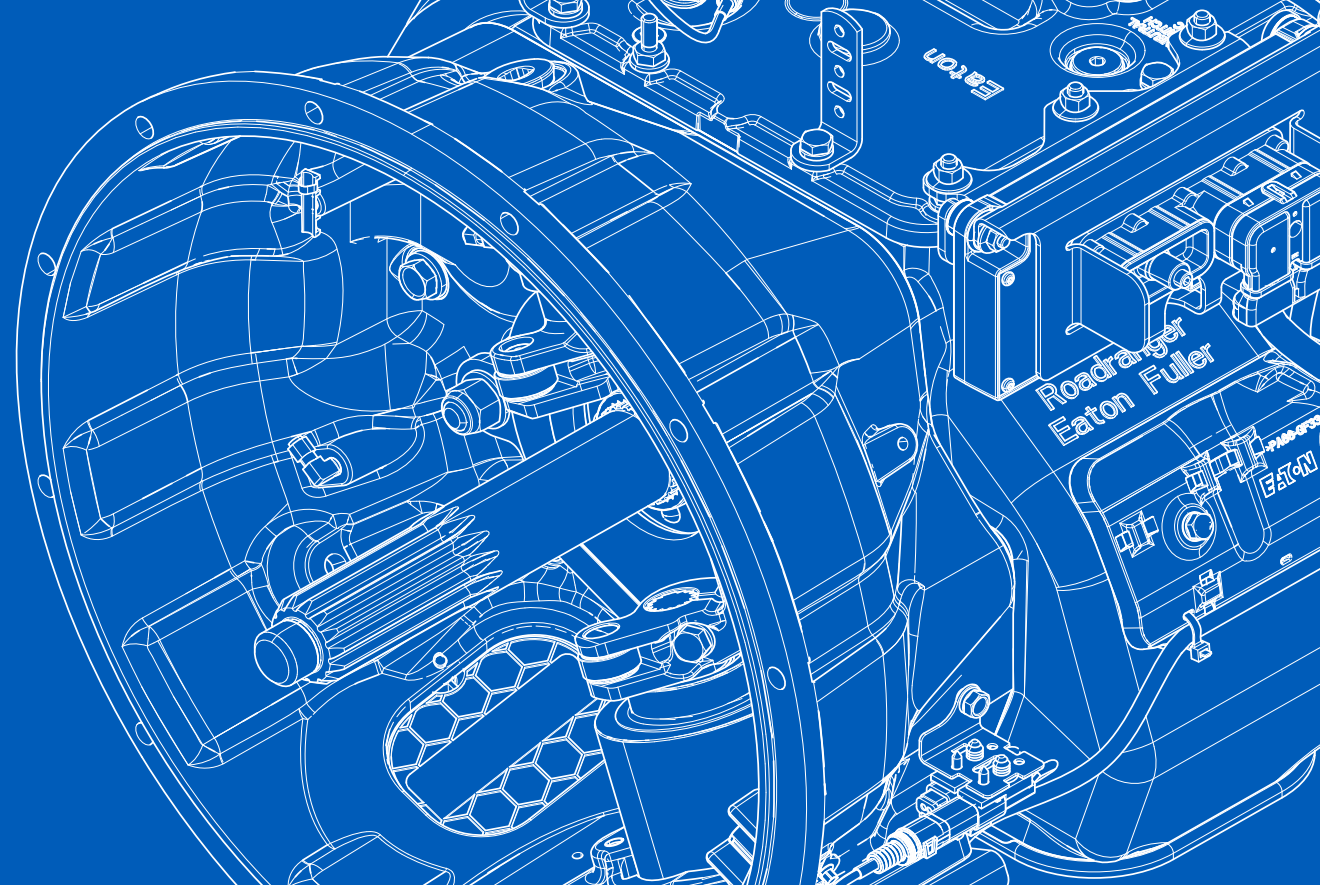
Fuller Advantage® Series Overview

Eaton Fuller Advantage series manual and automated transmissions are specifically designed to meet the growing demand for greater efficiency, productivity and cost savings. Using extensive customer input, our engineers looked for ways to bring innovation and technology to our classic twin-countershaft design. The result is the most efficient heavy-duty transmissions available.

Available in direct-drive, overdrive and small-step ratios, the Fuller Advantage series features several design upgrades:

- Reduced weight
- Increased efficiency
- Lower preventative maintenance costs
- Improved fuel economy

The new Precision Lubrication System cuts oil churn-related parasitic losses to improve powertrain efficiency. With less heat generated, Fuller Advantage transmissions do not require a cooler, and corresponding lines and fittings. The result is less preventative maintenance required, while engine fans cycle less, further reducing horsepower demand.





The strategic use of aluminum components, combined with a durable, sculpted-iron case and the elimination of the oil cooler and lines, shaves off up to 82 pounds from the system.


The innovative design improvements mean that owners and operators will enjoy the long-term benefits of reduced maintenance costs with every mile. At the 500,000-mile service interval, only 16 pints of oil are required — about one-third less than what's needed in traditional transmission designs — saving you money every time a transmission fluid change is required. A new oil-level sight glass allows for routine oil checks to be performed in a fraction of the time previously required.


HIGHLIGHTS

Here's a closer look at the high-level benefits of spec'ing a Fuller Advantage series transmission:

Optimized Performance
 Precision Lubrication, semi-dry sump design and other innovations optimize performance and reduce inefficiency by nearly one-third.

Reduced Maintenance
 It's so efficient, there's no need for oil coolers. No coolers means no cooler line leaks. Plus, an oil-level sight glass makes preventative maintenance inspections quicker.

Improved Fuel Efficiency
 Up to 1.6% better fuel economy, thanks to the strategic use of aluminum components, which reduces weight by up to 82 pounds, and the Precision Lubrication system.

Coverage and Confidence
 Enjoy peace of mind with a standard 5-year or 750,000-mile warranty for linehaul applications and the support, solutions and expertise of the Roadranger® network.



Fuller Advantage[®] Automated

The Fuller Advantage series automated 10-speed transmission is the newest in automation and is built on the industry's most iconic transmission. Fuller Advantage automated is available in direct-drive and overdrive ratios in some of the most fuel-efficient powertrains on the linehaul market. Here's a closer look:

- Electronic Clutch Actuator provides faster shifting, smoother engagement and improved low-speed maneuverability
- GearLogic™ technology provides the ultimate in control and fuel economy
- Customizable software can tailor features and performance to your specific needs

Linehaul fleets search for ways to improve efficiency. Neutral Coast Mode helps to boost fuel economy by up to 1%. Here's how it works:



- Fuel-saving feature that disengages the drive line on slight downhill grades
- Drops engine speed to idle
- Improves fuel consumption by up to 1%
- Ensures safe operation regardless of driving conditions

Fuller Advantage Series Automated Applications

Model Family	Forward Speed	Max. GCW Lbs. [kg]	Automated or Manual	Linehaul	Heavy Haul	Severe Duty						Construction	Pickup & Delivery	Bus & Coach		
						Logging	Mining	Oil Field	Refuse	Agricultural	Off-Highway			School Bus	Transit Coach	Recreational
Fuller Advantage Series Automated (FASA) S-Ratio	10	80,000 [36,287]	A	✓	--	--	--	--	--	--	--	--	--	--	--	--
Fuller Advantage Series Automated (FASA) C-Ratio	10	110,000 [49,895]	A	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	--	✓	✓
Fuller Advantage Series Automated (FASA) B-Ratio	10	110,000 [49,895]	A	✓	--	--	--	--	--	--	--	--	✓	--	✓	✓



Fuller Advantage Series Automated Models

Fuller Advantage Series Model	Transmission	Lb.-Ft. Max. TQ [Nm]	Sales Sheet TRSLXXXX	Integral Oil Pump	Oil Cap. Pints [liters]	Length ¹ Inches [mm]	Weight ² Lbs. (kg)	PTO Speed (% of Engine)	Combined PTO Torque (lb.-ft.)
FASA 10B/C	FAO-14810C-EA3	1450 [1966]	2542	A	16 [7.57]	31.8 [807.7]	850 [385]	79%	500
	FAO-16810C-EA3	1650 [2237]							
	FAOM-15810C-EA3 ³	1550 [2102]							
	FAOM-16810C-EA3 ³	1650 [2237]						70%	
	FAM-14810B-EA3 ³	1450 [1966]							
	FAM-15810B-EA3 ³	1550 [2102]							

A = Available option. ¹Standard install length. ²Dry weight including clutch. ³+200 lb.-ft. [271 Nm] in top two gears.

Fuller Advantage Series Automated Gear Ratios

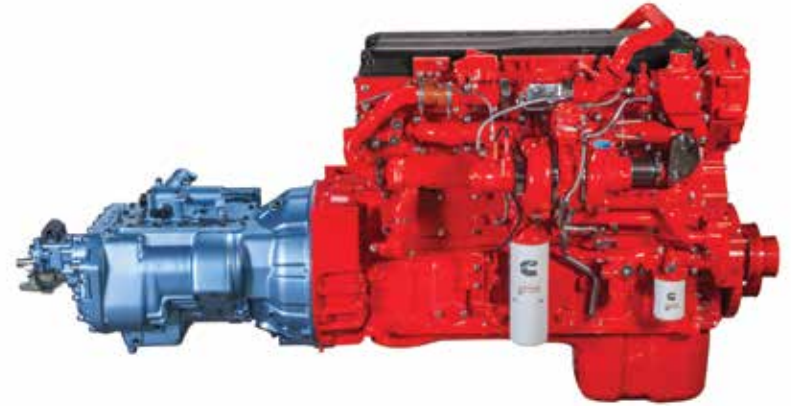
Fuller Advantage Series Models	Reverse		Overall Ratio	Forward Gears									
Model	R2	R1		1	2	3	4	5	6	7	8	9	10
FAO-14810C-EA3	2.78	13.63	17.53	12.80	9.25	6.76	4.90	3.58	2.61	1.89	1.38	1.00	0.73
FAO-16810C-EA3			% Step	38	37	38	37	36	40	37	38	37	
FAOM-15810C-EA3													
FAOM-16810C-EA3	3.89	18.18	15.42	15.42	11.52	8.55	6.28	4.67	3.30	2.46	1.83	1.34	1.00
FAM-14810B-EA3			% Step	34	35	36	34	42	34	34	37	34	
FAM-15810B-EA3													

Cummins + Eaton® | SmartAdvantage™ Powertrain

Cummins and Eaton have joined together to deliver fully integrated powertrains with unprecedented performance and fuel economy. The SmartAdvantage Powertrain takes the efficiency of the Cummins ISX15 with SmartTorque2 (ST2), and combines it with the smooth-shifting Eaton Fuller Advantage series 10-speed automated transmission. The engine and transmission share critical data, determining the torque required to deliver the power level drivers need. Error-free, guess-proof shifting makes every driver in your fleet as efficient as your best driver — so you save more money on every haul.

The result? The most fuel-efficient powertrain you can buy, up to 7% better than competitive integrated powertrains.

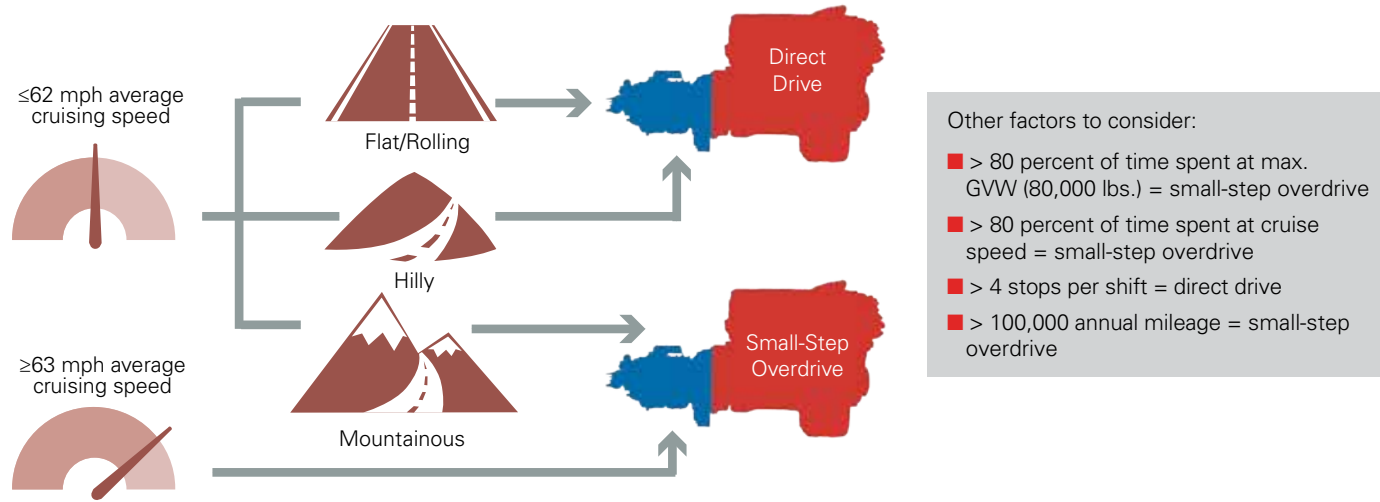
For more information, visit www.smartadvantagepowertrain.com.



Transmission Top Gear	Cummins Engine	Power HP [kW]	Peak Torque lb.-ft. [Nm] @ RPM	Eaton Transmission Model
Small-Step Overdrive	ISX15 400 SA	400 [298]	1450/1650 [1968/2240] @ 1000	FAOM-14810S-EC3
	ISX15 400 SA	400 [298]	1550/1750 [2103/2375] @ 1000	FAOM-15810S-EC3
	ISX15 420 SA	420 [313]	1550/1750 [2103/2375] @ 1000	
	ISX15 450 SA	450 [336]	1550/1750 [2103/2375] @ 1000	
	ISX15 450 SA ¹	450 [336]	1550/1850 [2103/2508] @ 1000	FAOM-18810S-EC3
Direct Drive	ISX15 400 SA	400 [298]	1550/1750 [2103/2375] @ 1000	FAM-15810B-EA3
	ISX15 450 SA	450 [336]	1550/1750 [2103/2375] @ 1000	

¹Available in Q3 2016.

Use this quick reference guide to determine which SmartAdvantage Powertrain is right for you



Cummins and Eaton SmartAdvantage Powertrain Models

Fuller Advantage Series Model	Engine/Transmission	Lb.-Ft. Max. TQ [Nm]	Sales Sheet TRSLXXXX	Integral Oil Pump	Thru-Shaft PTO	Oil Capacity Pints [liters]	Length ¹ Inches [mm]	Weight ² Lbs. [kg]	PTO Speed (% of Engine)	Combined PTO Torque (lb.-ft.)
FASA 10S	Cummins ISX12/FAOM-13810S-EC3 ³	1350 [1830] -- 1650 [2237]	2526	A	Pending	16 [7.57]	31.8 [807.7]	850 [385]	79%	500
	Cummins ISX15/FAOM-14810S-EC3 ⁴	1450 [1966] -- 1650 [2237]								
	Cummins ISX15/FAOM-15810S-EC3 ⁴	1550 [2102] -- 1750 [2373]								

¹Standard install length. ²Dry weight including clutch. ³300 lb.-ft. [407 Nm] in top two gears. ⁴+200 lb.-ft. [271 Nm] in top two gears.

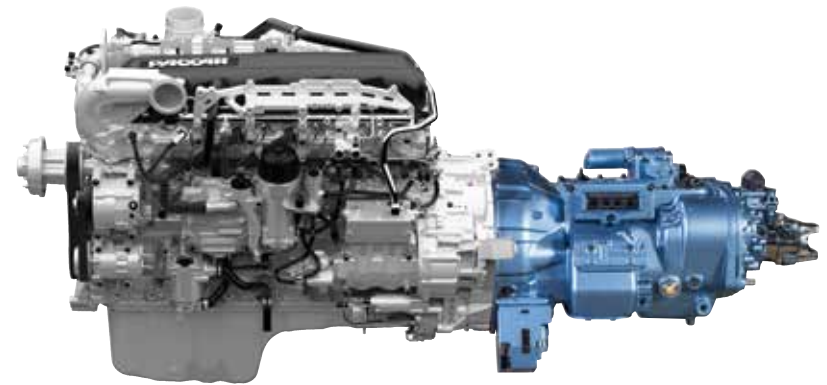
Cummins and Eaton SmartAdvantage Powertrain Gear Ratios

	Reverse		Overall Ratio	Forward Gears									
	R2	R1		1	2	3	4	5	6	7	8	9	10
Small-Step Overdrive	3.43	17.12	17.70	14.11	10.12	7.06	4.98	3.97	2.83	2.03	1.42	1.00	.796
			% Step	39	43	42	26	40	39	43	42	26	
Direct Drive	3.89	18.18	15.42	15.43	11.52	8.55	6.28	4.57	3.30	2.45	1.83	1.34	1.00
			% Step	34	35	36	34	42	34	34	37	34	



PACCAR + Eaton® | Integrated Powertrain

PACCAR and Eaton have collaborated to create a fully integrated powertrain that delivers superior performance and provides a 4% improvement in fuel economy. The PACCAR MX-13 engine and Eaton Fuller Advantage automated transmission share critical data, including engine torque and operating gear. Precise engine and transmission communications are combined with proprietary control logic to further enhance downspeeding in both overdrive and direct drive, which maximizes fuel economy. This powertrain simplifies operation for both new and experienced drivers with smooth, automated shifting that makes driving easier.



PACCAR and Eaton Integrated Powertrain Models

Fuller Advantage Series Model	Engine Transmission	Lb.-Ft. Max. TQ (Nm)	Sales Sheet TRSLXXXX	Integral Oil Pump	Thru-Shaft PTO	Oil Cap. Pints (liters)	Length ¹ Inches (mm)	Weight ² Lbs. (kg)	PTO Speed (% of Engine)	Combined PTO Torque (lb.-ft.)
FASA 10S	PACCAR MX-13 FAO-16810S-EP3	1650 [2237]	2533KW/2533PB	A	Pending	16 (7.57)	31.8 (807.7)	850 [385]	79%	500
	PACCAR MX-13 FAOM-15810S-EP3 ³	1550 [2102] - 1750 [2373]								
	PACCAR MX-11 FAOM-15810S-EP3	1550 [2102]								

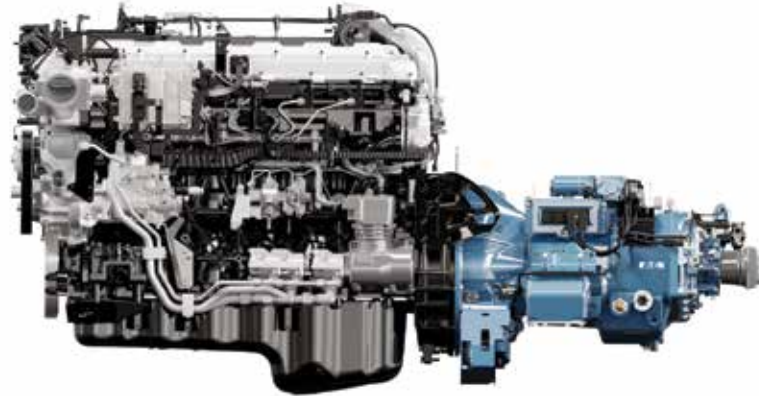
PACCAR and Eaton Integrated Powertrain Gear Ratios

Fuller Advantage Series Model	Engine	Reverse	Overall Ratio	Forward Gears										
				R1	R2	1	2	3	4	5	6	7	8	9
FAO-16810S-EP3	PACCAR MX-13 405	3.43	17.2	17.70	14.11	10.12	7.06	4.98	3.97	2.83	2.03	1.42	1.00	0.796
	PACCAR MX-13 455													
	PACCAR MX-13 485													
FAOM-15810S-EP3	PACCAR MX-13 430	3.43	17.2	% Step	39	43	42	26	40	39	43	42	26	
	PACCAR MX-13 455													
	PACCAR MX-11 430													

A = Available option. ¹Standard install length. ²Dry weight including clutch. ³+200 lb.-ft. [271 Nm] in top two gears.

Navistar + Eaton | Integrated Powertrain

The Navistar N13 and Eaton Fuller Advantage series automated powertrain, available in ProStar® linehaul and regional haul tractors, is built for your individual needs. Optimized engine and transmission communications, intelligent shifting and downspeeding allow the engine to operate at lower revolutions per minute (RPM) and use less fuel without sacrificing performance.



Navistar and Eaton Integrated Powertrain Models

Fuller Advantage Series Model	Engine Transmission	Lb.-Ft. Max. TQ [Nm]	Sales Sheet TRSLXXXX	Integral Oil Pump	Thru-Shaft PTO	Oil Cap. Pints [liters]	Length ¹ Inches [mm]	Weight ² Lbs. [kg]	PTO Speed (% of Engine)	Combined PTO Torque (lb.-ft.)
FASA 10S	Navistar N13 FAOM-15810S-EN3 ³	1550 [2102] - 1750 [2373]	2536	A	Pending	16 [7.57]	31.8 [807.7]	850 [385]	79%	500

A = Available option. ¹Standard install length. ²Dry weight including clutch. ³+200 lb.-ft. [271 Nm] in top two gears.

Navistar and Eaton Integrated Powertrain Gear Ratios

Fuller Advantage Series Models	Engine	Reverse	Overall Ratio	Forward Gears										
				1	2	3	4	5	6	7	8	9	10	
FAOM-15810S-EN3	Navistar N13 450	R2	R1		1	2	3	4	5	6	7	8	9	10
		3.43	17.12	17.70	14.11	10.12	7.06	4.98	3.97	2.83	2.03	1.42	1.00	0.796
			% Step	39	43	42	26	40	39	43	42	26		



Fuller Advantage[®] Manual

Eaton's Fuller Advantage series 10-speed transmission is the most efficient heavy-duty manual transmission available. Available in direct-drive and overdrive models, it's lighter, more efficient and has better ratio coverage than FR Series manuals. That's why you'll find it as standard position at several truck OEMs.

- Precision Lubrication technology reduces oil-churning losses
- Oil-level sight glass decreases preventative maintenance time
- Aluminum components include range cylinder, rear plate, shift tower and shift bar housing
- Low-, Mid- and High-shift towers available
- Standard 8- and 6-bolt PTO openings
- Two-bolt output yoke/flange retainer improves seal life
- Improved shift feel



Fuller Advantage Series Manual Applications

Model Family	Forward Speed	Max. GCW Lbs. [kg]	Automated or Manual	Heavy Duty			Construction					Pickup & Delivery	Bus & Coach		
				Linehaul	Severe Duty	Logging	Mining	Oil Field	Refuse	Agricultural	Off-Highway		School Bus	Transit Coach	Recreational
Fuller Advantage Series Manual (FASM)	10	110,000 [49,895]	M	✓		--	--	--	--	--	--	✓	--	--	--

Fuller Advantage Series Manual Models

Fuller Advantage Series Models	Lb.-Ft. Max. TO ¹ [Nm]	Sales Sheet TRSLXXXX	Integral Oil Pump	Thru-Shaft PTO	Oil Cap. Pints [liters]	Length Inches [mm]	Weight ² Lbs. [kg]	PTO Speed (% of Engine)	Combined PTO Torque (lb.-ft.)
FA(F) -14810B	1450 [1966]	0303	R	A	16 [7.57]	29.9 [760.22]	541 [245]	70%	500
FA(F) -15810B	1550 [2102]								
FAM(F) -15810B ³	1550 [2102]								
FAO(F) -14810C	1450 [1966]								
FAO(F) -15810C	1550 [2102]								
FAO(F) -16810C	1650 [2237]								
FAOM(F) -15810C ³	1550 [2102]								
FAOM(F) -16810C ³	1650 [2237]								

R = Required option. A = Available option. ¹Max. power rating is 505 HP. ²Less clutch housing, lubricant and end yoke. ³This transmission can be rated at an additional 200 lb.-ft. [271 Nm] above the stated limit in the top two gears only.

Fuller Advantage Series Manual Gear Ratios

Fuller Advantage Series Models	Reverse		Overall Ratio Forward Gears											
	R2	R1		1	2	3	4	5	6	7	8	9	10	
FA(F) -14810B	3.89	18.18	15.42	15.42	11.52	8.55	6.28	4.67	3.30	2.46	1.83	1.34	1.00	
FA(F) -15810B			% Step	34	35	36	34	42	34	34	34	37	34	
FAM(F) -15810B														
FAO(F) -14810C	2.78	13.63	17.53	12.8	9.25	6.76	4.9	3.58	2.61	1.89	1.38	1.00	0.73	
FAO(F) -15810C														
FAO(F) -16810C			% Step	38	37	38	34	37	38	37	38	37	37	
FAOM(F) -15810C														
FAOM(F) -16810C														



FR-10

Known for its reliability, the Eaton FR series is one of the most popular transmissions on the road. Available in direct-drive and overdrive models, this 10-speed manual transmission can handle both on-highway and vocational applications.

- Large-diameter mainshaft and washer design protect against driver abuse
- Patented SynchroSaver™ feature protects against range synchronizer damage caused by improper operation
- Integrated air module improves reliability by eliminating separate components and external air hoses
- Exclusive output seal design improves seal life and eliminates potential for seal damage during yoke removal
- Enhanced PTO options, with relocated side opening and option for two thru-shaft PTOs



FR Series Applications

Model Family	Forward Speed	Max. GCW Lbs. [kg]	Automated or Manual	Linehaul	Heavy Haul	Severe Duty						Construction	Pickup & Delivery	Bus & Coach		
						Logging	Mining	Oil Field	Refuse	Agricultural	Off-Highway			School Bus	Transit Coach	Recreational
FR-10	10	110,000 [49,895]	M	✓	--	--	--	--	✓	✓	✓	✓	✓	--	--	✓

FR Series Models

10-Speed Models	Lb.-Ft. Max. TQ [Nm]	Sales Sheet TRSLXXXX	Integral Oil Pump	Thru-Shaft PTO	Internal Oil Cooler	External Oil-to-Water Cooler ¹	External Oil Filter ¹	Oil Capacity Pints [liters]	Length Inches [mm]	Weight ² Lbs. [kg]	PTO Speed (% of Engine)	Combined PTO Torque (lb.-ft.)			
FR-9210B ³	950 [1288]	0261	A	A ⁴	A	A	A	23.5 [11]	29.93 [760.2]	592 [269]	65%	500			
FR-14210B ³	1450 [1966]														
FR-15210B ³	1550 [2102]		R												
FRM-15210B ⁵	1550 [2102]														
FRW-15210B ⁶	1550 [2102]														
FRO-14210C ³	1450 [1966]		A		A	A	A				23.5 [11]		29.93 [760.2]	592 [269]	84%
FRO-15210C ³	1550 [2102]														
FRO-16210C ³	1650 [2237]		R												
FRO-17210C ³	1750 [2373]														
FRO-18210C	1850 [2508]														

A = Available Option. R = Required Option. ¹Oil pump required. ²Less clutch housing, lubricant and end yoke. ³This transmission can be rated at an additional 100 lb.-ft. [136 Nm] torque above the stated limit in the top two gears only. ⁴Two thru-shaft PTO provisions available. ⁵This transmission can be rated at an additional 200 lb.-ft. [271 Nm] torque above the stated limit in the top two gears only. ⁶FRW - Fuller Roadranger Twin - Countershaft without Cooler.

FR Series Gear Ratios

10-Speed Models	Reverse		Overall Ratio	Forward Gears												
	L	H		LL	L	1	2	3	4	5	6	7	8	9	10	
FR-9210B	16.21	3.63	14.80			14.80	10.95	8.09	5.97	4.46	3.32	2.45	1.81	1.34	1.00	
FR-14210B			% Step			35	35	35	34	35	35	35	35	34		
FRM-15210B																
FRW-15210B																
FRO-14210C			13.75	2.80	17.15			12.69	9.29	6.75	4.90	3.62	2.59	1.90	1.38	1.00
FRO-15210C	% Step					37	38	38	35	40	37	38	38	35		
FRO-16210C																0.74
FRO-17210C	17.49					12.94	9.29	6.75	4.90	3.62	2.64	1.90	1.38	1.00		
FRO-18210C	% Step					39	38	38	35	37	39	38	38	35		

Heavy-duty capability for heavy-duty loads.

Our rugged manual transmissions have been the industry standard for decades. Our UltraShift® PLUS automated transmissions have Automatic, Manual and Low modes to provide drivers with complete vehicle control, no matter the weight or road surface. So if you're looking for superior ratio coverage, higher torque capability and superior fuel economy, look no further than Eaton.®





Performance Transmission Product Comparison

Use this table to quickly identify which product best suits your needs.

	UltraShift PLUS MHP	UltraShift PLUS LSE	UltraShift PLUS MXP	UltraShift PLUS VXP	AutoShift 18	RT-13	RT-18
Type	Automated	Automated	Automated	Automated	Automated	Manual	Manual
# of speeds	13	16	18	18	18	13	18
Max. Torque (lb.-ft. [Nm])	2050 [2779]	1750 [2373]	2250 [3051]	2250 [3051]	2250 [3051]	2250 [3051]	2250 [3051]
Max. GCW (lbs. [kg])	140,000 [63,503]	110,000 [49,895]	Unlimited	Unlimited	110,000 [49,895]	Unlimited	Unlimited
Oil capacity (pints [liters])	28 [13.2]	28 [13.2]	28 [13.2]	28 [13.2]	28 [13.2]	28 [13.2]	28 [13.2]
Lubrication Interval (miles [km])	500,000 [804,672]	500,000 [804,672]	500,000 [804,672]	500,000 [804,672]	500,000 [804,672]	500,000 [804,672]	500,000 [804,672]
Precision Lubrication	--	--	--	--	--	--	--
Oil-level sight glass	✓	✓	✓	✓	--	--	--
Skip Shift	✓	✓	✓	✓	--	--	--
GearLogic™ technology	✓	✓	✓	✓	--	--	--



UltraShift® PLUS MHP/MXP/VXP

The UltraShift PLUS MHP, MXP and VXP are the workhorses of our automated transmission lineup. Need a transmission capable of hauling 168,000 pounds on steep grades? Look no further than here. With world-class startability and ratio coverage, and built upon the robust Fuller 13- and 18-speed manuals, these transmissions are capable of handling high torque and high GVWs, making them popular in some of the most rigorous vocations you'll find — logging, oil field and other heavy-haul applications. In fact, the 18-speed UltraShift PLUS MXP and VXP have no gross vehicle weight limitations. Fleet managers and drivers alike will appreciate the improved safety and greater fleet-wide fuel efficiency these automated transmissions deliver compared to their manual counterparts.

- GearLogic™ technology for improved performance, fuel efficiency and driver confidence
- Compatible with two-speed axles for enhanced gear reduction to maximize on-/off-road capabilities
- Compatible with split-shaft power take-off (PTO)
 - Allows for transmission gear selection and clutch control from a panel outside of the vehicle's cab along with the remote throttle
 - Eliminates the need for operators to enter and exit the cab to change transmission gears



UltraShift PLUS Applications

Model Family	Forward Speed	Max. GCW Lbs. [kg]	Automated or Manual	Linehaul	Heavy Haul	Severe Duty	Construction						Pickup & Delivery	Bus & Coach		
							Logging	Mining	Oil Field	Refuse	Agricultural	Off-Highway		School Bus	Transit Coach	Recreational
UltraShift PLUS MHP	13	140,000 [63,503]	A	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	--	✓	✓
UltraShift PLUS MXP	18	Unlimited	A	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	--	✓	✓
UltraShift PLUS VXP	18	Unlimited	A	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	--	✓	✓



UltraShift PLUS Models

	UltraShift PLUS Models	Lb.-Ft. Max. TQ [Nm]	Sales Sheet TRSLXXXX	Integral Oil Pump	Thru-Shaft PTO	External Oil-to-Water Cooler ¹	External Oil Filter ¹	Oil Cap. Pints [liters]	Length ² Inches [mm]	Weight ³ Lbs. [kg]	PTO Speed (% of Engine)	Combined PTO Torque (lb.-ft.)
MHP	FO-16E313A-MHP	1650 [2237]	2501	R	--	A	A	28 [13]	34.98 [888.4]	978 [444]	79	500
	FO-18E313A-MHP	1850 [2509]										
	FO-20E313A-MHP	2050 [2779]										
MXP	FO-18E318A-MXP	1850 [2509]										
	FO-20E318A-MXP	2050 [2779]										
	FO-16E318B-MXP	1650 [2237]										
	FO-18E318B-MXP	1850 [2509]										
	FO-20E318B-MXP	2050 [2779]										
VXP	FO-22E318B-MXP	2250 [3051]										
	FO-18E318B-VXP	1850 [2509]										
	FO-20E318B-VXP	2050 [2779]										
FO-22E318B-VXP	2250 [3051]											

R = Required option. A = Available option. ¹Oil pump required. ²Standard install length or measured from yoke end-to-end of rear bearing cover. ³Dry weight including clutch.

UltraShift PLUS Gear Ratios

UltraShift PLUS Models	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	
MHP		4.03	12.85	15.06	16.84	12.29	8.51	6.05	4.38	3.20	2.29	1.95	1.62	1.38	1.17	1.00	0.86	0.73						
	% Step					44	41	38	37	40	17	20	17	18	17	16	17							
MXP 18A	2.99	3.50	11.17	13.09	16.70	12.19	10.40	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	17	17	18	17	20	17	20	17	17	17	18	17	20	17	22	17		
MXP 18B	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	17		
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	17		



UltraShift® PLUS LSE

It knows the roads your trucks drive as well as you do. Built for Canadian applications (including LCV) with up to 110,000-pound GCW loads, the UltraShift *PLUS* LSE has small ratio steps between all 16 gears, to spend more time in the most fuel-efficient RPM band, resulting in 2% – 4% better fuel economy. Gear changes are short and smooth for increased driver comfort, and it's based on Eaton's proven 13- and 18-speed platform for enhanced resale value. The 16-speed direct-drive UltraShift *PLUS* LSE is available in International, Peterbilt and Kenworth trucks behind the Cummins ISX15 and PACCAR MX-13 engines.

- GearLogic™ technology for improved performance, fuel efficiency and driver confidence

UltraShift PLUS LSE Applications

Model Family	Forward Speed	Max. GCW Lbs. [kg]	Automated or Manual	Linehaul	Heavy Haul	Severe Duty					Construction	Pickup & Delivery	Bus & Coach		
						Logging	Mining	Oil Field	Refuse	Agricultural			Off-Highway	School Bus	Transit Coach
UltraShift PLUS LSE	16	110,000 [49,895]	A	✓	--	--	--	--	--	--	--	--	--	--	--



UltraShift PLUS LSE Models

	UltraShift PLUS Model	Lb-Ft. Max. TQ [Nm]	Sales Sheet TRSLXXX	Integral Oil Pump	Thru-Shaft PTO	External Oil-to-Water Cooler ¹	External Oil Filter ¹	Oil Cap. Pints [liters]	Length ² Inches [mm]	Weight ³ Lbs. [kg]	PTO Speed (% of Engine)	Combined PTO Torque (lb.-ft.)
LSE	F-14E316B-LSE	1450 [1966]	2527	R	--	A	A	28 [13]	34.98 [888.4]	978 [444]	79%	500
	F-15E316B-LSE	1550 [2101]										
	F-17E316B-LSE	1750 [2373]										
	FM-15E316B-LSE	1550 [2101] ⁴										

R = Required option. A = Available option. ¹Oil pump required. ²Standard install length or measured from yoke end-to-end of rear bearing cover. ³Dry weight including clutch. ⁴+200 lb.-ft. in top two gears.

UltraShift PLUS LSE Gear Ratios

UltraShift PLUS 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
LSE			12.85	15.06	14.40	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		
					% Step	17	44	17	20	17	38	17	17	17	20	17	20	17	18	17			



AutoShift® 18

The Eaton® AutoShift transmission, based on the RT-18 manual transmission, is a shift-by-wire system that communicates with the engine utilizing the SAE-J1939 protocol for precise control of the engine and transmission functions for legacy engine applications.

Using a three-pedal system, the Solo Advantage® self-adjusting clutch is used only for starting and stopping. Once the vehicle is in motion, AutoShift operates like an automatic transmission, with the efficiency of a manual transmission.

This transmission is currently only available in Australia, Mexico and South America. Roadranger® warranties are available for a wide variety of applications.

AutoShift 18 Applications

Model Family	Forward Speed	Max. GCW Lbs. [kg]	Automated or Manual	Linehaul	Heavy Haul	Severe Duty						Construction	Pickup & Delivery	Bus & Coach		
						Logging	Mining	Oil Field	Refuse	Agricultural	Off-Highway			School Bus	Transit Coach	Recreational
AutoShift 18	18	110,000 [49,895]	A	✓	✓	--	✓	--	✓	--	--	✓	--	--	--	--



AutoShift 18 Models

AutoShift Models	Lb.-Ft. Max. TQ [Nm]	Sales Sheet TRSLXXXX	Integral Oil Pump	Thru-Shaft PTO	External Oil-to-Water Cooler ¹	External Oil Filter ¹	Oil Cap. Pints [liters]	Length ² Inches [mm]	Weight ³ Lbs. [kg]	PTO Speed (% of Engine)	Combined PTO Torque (lb.-ft.)
AS 18 RTLO-16918A-AS3	1650 [2237]	0285	R	--	R	A	28 [13]	33.15 [842.15]	969 [440]	79%	350 ⁴
AS 18 RTLO-18918A-AS3	1850 [2509]										
AS 18 RTLO-20918A-AS3	2050 [2779]										
AS 18 RTLO-22918A-AS3	2250 [3051]										500

R = Required option. A = Available option. ¹Oil pump required. ²Standard install length. ³Dry weight including clutch. ⁴Transmissions can be ordered with heavy-duty input bearing (4301417) to allow 500 lb.-ft. of combined PTO output torque.

AutoShift 18 Gear Ratios

AutoShift 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
18A-AS3	2.99	3.50	11.17	13.09	16.70	12.19	10.40	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	17	17	18	17	20	17	20	17	17	17	17	18	17	20	17	22	17



RT-13/RT-18

With the Eaton RT-13/RT-18, drivers will experience versatility and low shift effort in these premium 13- or 18-speed transmissions. The innovative, patented design features a simple mainshaft, which is not splined to the auxiliary gear. This unique design eliminates the added mass, drag and inertia of the entire auxiliary section.

During upshifts, where both the lever and splitter button are moved together, the low-inertia mainshaft is quickly brought to synchronous, resulting in fast, easy shifts.



RT-13/RT-18 Applications

Model Family	Forward Speed	Automated or Manual	Linehaul	Heavy Haul	Severe Duty						Construction	Pickup & Delivery	Bus & Coach		
					Logging	Mining	Oil Field	Refuse	Agricultural	Off-Highway			School Bus	Transit Coach	Recreational
RT-13	13	M	✓	✓	✓	✓	✓	✓	✓	✓	✓	--	--	--	--
RT-18	18	M	✓	✓	✓	✓	✓	✓	✓	✓	✓	--	--	--	--

RT-13/RT-18 Models

Models		Lb.-Ft. Max. TO [Nm]	Sales Sheet TRSLXXXX	Integral Oil Pump	Thru-Shaft PTO	Internal Oil Cooler	External Oil-to-Water Cooler ¹	External Oil Filter ¹	Oil Cap. Pints [liters]	Length Inches [mm]	Weight ² Lbs. [kg]	PTO Speed (% of Engine)	Combined PTO Torque (lb.-ft.)
13-Speeds	RTLO-16913A	1650 [2237]	0249										350 ³
	RTLO-18913A	1850 [2508]											
	RTLO-20913A	2050 [2779]											
18-Speeds	RTLO-16918B	1650 [2237]	0250	R	--	--	A	A	28 [13]	33.1 [841]		79%	500
	RTLO-18918B	1850 [2509]											
	RTLO-20918B	2050 [2780]											
	RTLO-22918B	2250 [3051]											

R = Required option. A = Available option. ¹Oil pump required. ²Less clutch housing, lubricant and end yoke. ³Transmission can be ordered with heavy-duty input bearing (4301417) to allow 500 lb.-ft. of combined PTO output torque.

RT-13 Gear Ratios

13-Speed Models	Reverse		Overall Ratio	Forward Gears												
	LL	H		L	1	2	3	4	5	6	7	8	9	10	11	
RTLO-16913A	13.22	3.50	16.86	12.31	8.64	6.11	4.43	3.23	2.29	1.95	1.62	1.38	1.17	1.00	0.86	0.73
RTLO-18913A			% Step	42	42	38	37	41	17	21	17	18	17	17	17	
RTLO-20913A	13.22	3.50	16.86	12.31	8.59	6.11	4.43	3.23	2.28	1.94	1.62	1.38	1.17	1.00	0.86	0.73
			% Step	43	41	38	37	42	17	20	17	18	17	17	17	

RT-18 Gear Ratios

18-Speed Models	Reverse				Overall Ratio	Forward Gears																		
	R1	R2	R3	R4		LL	L	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
RTLO-16918B	15.06	12.85	4.03	3.43	19.72	14.4	12.29	8.56	7.3	6.05	5.16	4.38	3.74	3.2	2.73	2.29	1.95	1.62	1.38	1.17	1.00	0.86	0.73	
					% Step	17	44	17	21	17	18	17	17	17	17	17	19	17	20	17	18	17	17	17
RTLO-18918B	15.06	12.85	4.03	3.43	19.72	14.4	12.29	8.51	7.26	6.05	5.16	4.38	3.74	3.2	2.73	2.28	1.94	1.62	1.38	1.17	1.00	0.86	0.73	
RTLO-20918B					% Step	17	44	17	20	17	18	17	17	17	17	20	17	20	17	18	17	17	17	
RTLO-22918B																								



Transmissions that get the job done.

There are two things we know: The job site is tough and no two are alike. That's why we feature an entire portfolio of manual and automated transmissions and clutches that can be spec'd for your fleet's unique need. All backed by the solutions, support and expertise of the Roadranger® network. That's something you can't find anywhere else.



Vocational Transmission Product Comparison

Use this table to quickly identify which product best suits your needs.

	Fuller Advantage	UltraShift PLUS VCS	UltraShift PLUS VMS	RT-8LL	RT-9ALL	RT-15
Type	Automated	Automated	Automated	Manual	Manual	Manual
# of speeds	10	10	11	10	11	15
Max. Torque (lb.-ft. [Nm])	1750 [2373]	1750 [2373]	1750 [2373]	1650 [2237]	1650 [2237]	1850 [2508]
Max. GCW (lbs. [kg])	110,000 [49,895]	110,000 [49,895]	110,000 [49,895]	110,000 [49,895]	110,000 [49,895]	110,000 [49,895]
Oil capacity (pints [liters])	16 [7.57]	28 [13.2]	28 [13.2]	28 [13.2]	28 [13.2]	28 [13.2]
Lubrication interval (miles [km])	500,000 [804,672]	500,000 [804,672]	500,000 [804,672]	500,000 [804,672]	500,000 [804,672]	500,000 [804,672]
Precision Lubrication	✓	--	--	--	--	--
Oil-level sight glass	✓	✓	✓	--	--	--
Active Shifting	✓	✓	✓	--	--	--
Skip Shift	✓	✓	✓	--	--	--
GearLogic™ technology	✓	✓	✓	--	--	--

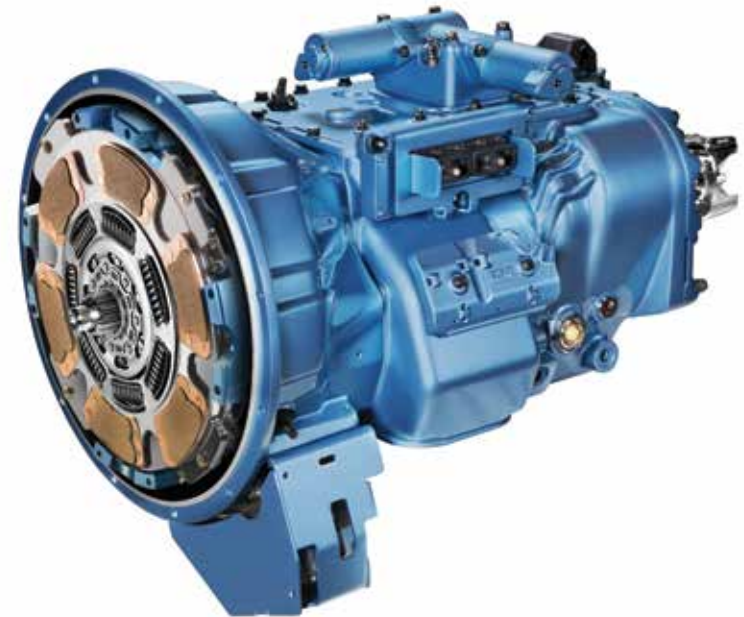


Fuller Advantage[®] Series Automated

The Fuller Advantage series automated overdrive models are now approved for vocational applications. With a 110,000-pound GCW capability, 6- and 8-bolt PTO openings, and GearLogic™ technology for improved performance, fuel efficiency and driver confidence, it's perfect for dumps and municipal trucks.

Thanks to its Precision Lubrication system, it's the first cooler-less transmission in the vocational segment. Preventative maintenance is improved due to an oil-level sight glass that allows for quick routine oil checks. All totaled, the lube system uses only 16 pints of oil — nearly half the amount used in traditional transmissions.

This transmission is ideal for vocational fleets currently operating an Eaton FR series manual transmission considering an automated transmission for their next truck.



Fuller Advantage Series Applications

Model Family	Forward Speed	Max. GCW Lbs.[kg]	Automated or Manual	Linehaul	Heavy Haul	Severe Duty						Construction	Pickup & Delivery	Bus & Coach		
						Logging	Mining	Oil Field	Refuse	Agricultural	Off-Highway			School Bus	Transit Coach	Recreational
Fuller Advantage Series Automated (FASA) C-Ratio	10	110,000 [49,895]	A	✓	--	✓	✓	✓	✓	✓	✓	✓	✓	--	✓	✓



Fuller Advantage Series Models

Fuller Advantage Series Model	Transmission	Lb.-Ft. Max. TQ [Nm]	Sales Sheet TRSLXXXX	Integral Oil Pump	Thru-Shaft PTO	Oil Cap. Pints [liters]	Length ¹ Inches [mm]	Weight ² Lbs. [kg]	PTO Speed (% of Engine)	Combined PTO Torque (lb.-ft.)
FASA 10C	FAO-14810C-EA3	1450 [1966]	2542	A	Pending	16 [7.57]	31.8 [807.7]	850 [385]	79%	500
	FAO-16810C-EA3	1650 [2237]								
	FAOM-15810C-EA3 ³	1550 [2102]								
	FAOM-16810C-EA3 ³	1650 [2237]							70%	

A = Available option. ¹Standard install length. ²Dry weight including clutch. ³+200 lb.-ft. [271 Nm] in top two gears.

Fuller Advantage Gear Ratios

Fuller Advantage Series Model	Reverse		Overall Ratio	Forward Gears									
	R2	R1		1	2	3	4	5	6	7	8	9	10
FAO-14810C-EA3	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
FAO-16810C-EA3				12.80	9.25	6.76	4.90	3.58	2.61	1.89	1.38	1.00	0.73
FAOM-15810C-EA3				12.80	9.25	6.76	4.90	3.58	2.61	1.89	1.38	1.00	0.73
FAOM-16810C-EA3			% Step	34	35	36	34	42	34	34	34	37	34

UltraShift® PLUS VCS/VMS

Vehicle control is vital on the jobsite, and the UltraShift PLUS VCS/VMS is the ultimate choice, thanks to its low-speed maneuverability. Through extended low- and reverse-gear ratio coverage, these automated transmissions provide the lowest ground speed for curbing, creeping, spreading and paving. For highway construction and dump operations, deep reduction and fast, flexible reverse-gearing make getting in and out of tough places a breeze. And the patented shift logic and controls constantly adapt, based on changes in weight of load, grade and power, making adjustments to maximize efficiency.

With its 36:1 overall ratio, UltraShift PLUS VMS is a great transmission for mixer, spreader, pump and crane applications. Dumps, block trucks and other construction trucks will find UltraShift PLUS VCS a nice alternative to a torque converter automatic transmission.

Both have 6-, 8- and thru-shaft PTO openings.

- GearLogic™ technology for improved performance, fuel efficiency and driver confidence
- Compatible with two-speed axles for enhanced gear reduction, to maximize on-/off-road capabilities
- Compatible with split-shaft power take-off (PTO)
 - Allows for transmission gear selection and clutch control from a panel outside the vehicle's cab along with the remote throttle
 - Eliminates the need for operators to enter and exit the cab to change transmission gears



With the Blended Pedal feature, drivers can use the throttle to feather the clutch for seamless low-speed control.

UltraShift PLUS VCS/VMS Applications

Model Family	Forward Speed	Max. GCW Lbs. [kg]	Automated or Manual	Linehaul	Heavy Haul	Severe Duty						Construction	Pickup & Delivery	Bus & Coach		
						Logging	Mining	Oil Field	Refuse	Agricultural	Off-Highway			School Bus	Transit Coach	Recreational
UltraShift PLUS VCS	10	110,000 [49,895]	A	✓	--	✓	✓	✓	✓	✓	✓	✓	✓	--	✓	✓
UltraShift PLUS VMS	11	110,000 [49,895]	A	✓	--	✓	✓	✓	✓	✓	✓	✓	✓	--	✓	✓



UltraShift PLUS VCS/VMS Models

	UltraShift PLUS Models	Lb.-Ft. Max. TQ [Nm]	Sales Sheet TRSLXXXX	Integral Oil Pump	Thru-Shaft PTO	External Oil-to-Water Cooler ¹	External Oil Filter ¹	Oil Cap. Pints [liters]	Length ² Inches [mm]	Weight ³ Lbs. [kg]	PTO Speed (% of Engine)	Combined PTO Torque (lb.-ft.)
VCS	FO-10E308LL-VCS	1050 [1424]	2500	R	A	A	A	28 [13]	34.98 [888.4]	975 [442]	79%	500
	FO-11E308LL-VCS	1150 [1559]										
	FO-12E308LL-VCS	1250 [1695]										
	FO-14E308LL-VCS	1450 [1966]										
	FO-16E308LL-VCS	1650 [2237]										
	FO-17E308LL-VCS	1750 [2373]										
VMS	FO-10E309ALL-VMS	1050 [1424]	2500	R	A	A	A	28 [13]	34.98 [888.4]	975 [442]	79%	500
	FO-11E309ALL-VMS	1150 [1559]										
	FO-12E309ALL-VMS	1250 [1695]										
	FO-14E309ALL-VMS	1450 [1966]										
	FO-16E309ALL-VMS	1650 [2237]										
	FO-17E309ALL-VMS	1750 [2373]										

R = Required option. A = Available option. ¹Oil pump required. ²Standard install length or measured from yoke end-to-end of rear bearing cover. ³Dry weight including clutch.

UltraShift PLUS VCS/VMS Gear Ratios

	UltraShift PLUS Models				Overall Ratio	Forward Gears											
	Reverse	R4	R3	R2		R1	1	2	3	4	5	6	7	8	9	10	11
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	36	34	38	35	36	34		
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	37	60	38	38	37	42	42	38	37	



RT-8LL/RT-9ALL/RT-15

RT-8LL — The 8LL transmissions provide drivers with the versatility they need for a mix of on- and off-highway applications. These transmissions offer eight road-speed gears and two additional deep-reduction ratios in Low and Reverse.

RT-9ALL — High reduction transmissions for special-purpose, low-speed applications. Ideal for concrete or asphalt spreading operations.

RT-15 — For high-performance applications in on-highway and on/off-highway vocations. Ten road speeds plus five deep-reduction gears for versatility. Proven helical gearing in the auxiliary section for quieter operation and increased gear strength and life.



RT Series Applications

Model Family	Forward Speed	Max. GCW Lbs.[kg]	Automated or Manual	Linehaul	Heavy Haul	Severe Duty						Construction	Pickup & Delivery	Bus & Coach		
							Logging	Mining	Oil Field	Refuse	Agricultural			Off-Highway	School Bus	Transit Coach
RT-8LL	8+2 Low	110,000 [49,895]	M	--	--	--	--	✓	✓	✓	✓	✓	✓	--	--	--
RT-9ALL	9+2 Low	110,000 [49,895]	M	--	--	--	--	--	✓	✓	✓	✓	--	--	--	--
RT-15	15	110,000 [49,895]	M	--	--	✓	✓	✓	✓	✓	✓	✓	--	--	--	--

RT Series Models

Models		Lb.-Ft. Max. TQ [Nm]	Sales Sheet TRSLXXXX	Integral Oil Pump	Thru-Shaft PTO	Internal Oil Cooler	External Oil-to-Water Cooler ¹	External Oil Filter ¹	Oil Cap. Pints [liters]	Length Inches [mm]	Weight ² Lbs. [kg]	PTO Speed (% of Engine)	Combined PTO Torque (lb.-ft.)
10-Speeds	RT-8908LL	860 [1166]	0116	--	--	--	--	--	28 [13]	33.1 [841]	690 [313]	70%	500
	RTO-14908LL	1450 [1966]		A	A ³		A	A				94%	
	RTO-16908LL	1650 [2237]		R	A ³								
11-Speeds	RTO-14909ALL	1450 [1966]	0253	--	--	--	--	--	33.15 [842]	671 [304]	79%		
	RTO-16909ALL	1650 [2237]		R	A		A	A			698 [317]		
15-Speeds	RT-14915	1250 [1695]	0215	R	--	--	A	A	33.1 [841]	696 [316]	70%		
	RTO-16915	1650 [2237]									89%		

R = Required option. A = Available option. ¹Oil pump required. ²Less clutch housing, lubricant and end yoke. ³Two thru-shaft PTO provisions available.

RT Series Gear Ratios

10-Speed Models	Reverse			Overall Ratio	Forward Gears									
	LL	L	H		LL	L	1	2	3	4	5	6	7	8
RT-8908LL	20.47	13.24	3.89	19.58	19.58	12.67	8.39	6.23	4.58	3.41	2.46	1.83	1.35	1.00
				% Step	55	51	35	36	34	38	35	36	34	
RTO-14908LL	15.22	9.85	2.89	19.68	14.56	9.42	6.24	4.63	3.40	2.53	1.83	1.36	1.00	0.74
RTO-16908LL				% Step	55	51	35	36	34	38	35	36	34	

11-Speed Models	Reverse			Overall Ratio	Forward Gears										
	LL	L	H		LL1	L	LL2	1	2	3	4	5	6	7	8
RTO-14909ALL	20.84	13.03	3.43	35.71	26.08	16.30	11.85	7.41	5.23	3.79	2.77	1.95	1.38	1.00	0.73
RTO-16909ALL				% Step	60	38	60	42	38	37	42	42	38	37	

15-Speed Models	Reverse			Overall Ratio	Forward Gears														
	DR	L	H		DR1	DR2	DR3	DR4	DR5	1	2	3	4	5	6	7	8	9	10
RT-14915	16.73	9.84	2.76	16.94	16.94	12.98	10.03	7.73	6.07	9.96	7.63	5.9	4.54	3.57	2.79	2.14	1.65	1.27	1.00
				% Step	31	29	30	27	39	31	29	30	27	28	30	30	30	27	
RTO-16915	13.14	7.73	2.17	16.94	13.31	10.20	7.88	6.07	4.77	7.83	6.00	4.64	3.57	2.81	2.19	1.68	1.30	1.00	0.79
				% Step	31	29	30	27	39	31	29	30	27	28	30	30	30	27	

Meet your new business partner.

Drivers of medium-duty trucks and school buses don't think about transmissions. And they shouldn't have to. What they want is a driving experience that's easy, comfortable and cost-effective. That's why Eaton® designed Procision™ with input from customers in various vocations at every stage of development, resulting in the ultimate medium-duty transmission solution.





Procision™ Proof Point

“Customers are a little reluctant to try new technology until they see it proven in other forms. We point out that dual-clutch transmissions have been in passenger cars for quite some time. It’s proven. We’re simply scaling it up and making it more durable for the commercial vehicle and bus market.”

– Jeff Carpenter, Procision Chief Engineer

Procision

After 100 years of proven success in on-highway and off-highway applications, Eaton® has developed yet another engineering breakthrough. The Procision 7-speed dual-clutch automatic transmission boasts the latest in transmission technology.

Dual-clutch transmissions have a solid, proven history in the passenger vehicle market, which has established a precedent for evaluating and developing new technologies that are transferred into commercial vehicle markets.

The smart features in the all-new Eaton Procision dual-clutch automatic transmission deliver more driver confidence and savings than the torque converter automatic used by many of today’s medium-duty fleets. On top of that, Procision has the full support and expertise of the Roadranger® network. That’s a winning combination.



Procision 7-Speed Dual-Clutch Transmission Key Specifications and Capacities

Length	30.1 in. (765 mm)	
Weight	364 lbs. (165 kg)	
Oil Capacity	3.2 gal. (12 L)	
Operating Weights (GVW/GCW)	With Park Pawl 26,000 lbs. (11,793 kg)	Without Park Pawl 33,000 lbs. (14,969 kg) 35,000 lbs. (15,875 kg)
B10 Life-Design	400,000 miles (643,738 km)	
Torque	660 lb.-ft. (895 Nm)	

Gear Ratios

Ratio	1st	2nd	3rd	4th	5th	6th	7th	R Low	R High	Overall Ratio
	6.50	4.17	2.53	1.55	1.00	.77	.64	6.15	3.95	10.13



Smart

Innovative dual-clutch technology preselects the correct gear, resulting in a smooth delivery of torque.

Eaton Dynamic Shifting uses grade, load and driver demand to select optimum shift points to balance performance and fuel economy.

Three standard Power Take-Off (PTO) openings can be enabled via software upgrades as a nominal purchase after initial buy, enhancing value to both first owners and the secondary market.

Easy to spec — choose from two standard models.

Savings

8% – 10% better fuel economy than a torque converter automatic.

Optimized 7-speed design, with a double-overdrive for additional fuel economy.

150,000-mile or 4-year lube and filter changes for reduced maintenance costs.

Confidence

Urge to Move and Creep Mode control forward and reverse speeds better than a torque converter automatic and provide best-in-class low-speed maneuverability.

Hill Helper prevents roll back or roll forward, depending on grade and weight, for a controlled launch.

Brake-pedal-actuated Tap Down Shifting gives the driver more control and increases brake pad life.

Lower engine noise creates a better operating environment.

Peace of Mind

3-year, unlimited-mile warranty on commercial vehicles; 5-year, unlimited-mile warranty on school buses.

Extended protection plans are available: 2, 3 or 4 years for commercial vehicles; 2 years for school buses.

Service can be performed at dealership to get vehicles back on the road more quickly.

Backed by the solutions, support and expertise of the Eaton Roadranger® network.





Eaton® Transmissions Overview

Heavy-Duty											
Linehaul											
Model	FAS EC3/EN3/EP3	FAS (EA3) Direct Drive	FAS (EA3) Overdrive	FAS 10B	FAS 10C	FR Series 10C	FR Series 10B	UltraShift PLUS MHP	UltraShift PLUS MXP	UltraShift PLUS VXP	UltraShift PLUS LSE
Type	Automated	Automated	Automated	Manual	Manual	Manual	Manual	Automated	Automated	Automated	Automated
Description	10 Forward Spds 2 Reverse First Gear Ratio: 14.11 Overall Ratio: 17.73	10 Forward Spds 2 Reverse First Gear Ratio: 15.42 Overall Ratio: 15.42	10 Forward Spds 2 Reverse First Gear Ratio: 12.80 Overall Ratio: 17.53	10 Forward Spds 2 Reverse First Gear Ratio: 15.42 Overall Ratio: 15.42 (10B)	10 Forward Spds 2 Reverse First Gear Ratio: 12.80 Overall Ratio: 17.53 (10C)	10 Forward Spds 2 Reverse First Gear Ratio: 12.69 Overall Ratio: 17.15 (10C)	10 Forward Spds 2 Reverse First Gear Ratio: 14.80 Overall Ratio: 14.80 (10B)	13 Forward Spds 3 Reverse First Gear Ratio: 12.29 Overall Ratio: 16.84	18 Forward Spds 4 Reverse First Gear Ratio: 12.19 Overall Ratio: 16.70 (18A) ----- 18 Forward Spds 4 Reverse First Gear Ratio: 14.4 Overall Ratio: 19.73 (18B)	18 Forward Spds 4 Reverse First Gear Ratio: 14.4 Overall Ratio: 19.73	16 Forward Spds 2 Reverse First Gear Ratio: 14.40 Overall Ratio: 14.40
Max. GVW/GCW	Up to 80,000 lbs.	Up to 110,000 lbs.	Up to 110,000 lbs.	Up to 110,000 lbs.	Up to 110,000 lbs.	Up to 140,000 lbs.	Up to 140,000 lbs.	Up to 140,000 lbs.	Unlimited	Unlimited	Up to 110,000 lbs.
Typical Vehicle Types	Linehaul							General Freight, Bulk Hauler, Doubles/Triples, Steel Hauler, Tanker, Livestock Hauler	Doubles/Triples, Equipment Hauler, Lowboy, Logging, Mining, Construction	Mining, Logging, Agriculture, Military	General Freight, Bulk Hauler, Doubles/Triples, Steel Hauler, Tanker, Livestock Hauler
Transmission Nomenclature	FAOM-13810S-EC3	FAM-14810B-EA3	FAO-14810C-EA3	FA-14810B	FAO-14810C	FRO-14210C	FR-9210B	FO-16E313A-MHP	FO-16E318B-MXP	FO-18E318B-VXP	F-14E316B-LSE
	FAOM-14810S-EC3	FAM-15810B-EA3	FAO-16810C-EA3	FA-15810B	FAO-15810C	FRO-15210C	FR-14210B	FO-18E313A-MHP	FO-18E318B-MXP	FO-20E318B-VXP	F-15E316B-LSE
	FAOM-15810S-EC3		FAOM-15810C-EA3	FAM-15810B	FAO-16810C	FRO-16210C	FR-15210B	FO-20E313A-MHP	FO-20E318B-MXP	FO-22E318B-VXP	F-17E316B-LSE
	FAOM-15810S-EN3		FAOM-16810C-EA3		FAOM-15810C	FRO-17210C	FRM-15210B		FO-22E318B-MXP		FM-15E316B-LSE
	FAO-16810S-EP3				FAOM-16810C	FRO-18210C	FRW-15210B		FO-18E318A-MXP		
	FAOM-15810S-EP3								FO-20E318A-MXP		



Performance										Medium-Duty
Performance				Vocational						Truck and Bus
AutoShift 18	RT-13	RT-18	Convertible 9-13	FAS (EA3) Overdrive	UltraShift PLUS VCS	UltraShift PLUS VMS	RT-8LL	RT- 9ALL	RT-15	Procision
Automated	Manual	Manual	Manual	Automated	Automated	Automated	Manual	Manual	Manual	Automatic
18 Forward Spds 4 Reverse First Gear Ratio: 12.19 Overall Ratio: 16.70	13 Forward Spds 3 Reverse First Gear Ratio: 12.31 Overall Ratio: 16.86	18 Forward Spds 4 Reverse First Gear Ratio: 14.4 Overall Ratio: 19.73 (18B)	9 Forward Spds 2 Reverse First Gear Ratio: 10.50 Overall Ratio: 14.38	10 Forward Spds 2 Reverse First Gear Ratio: 12.80 Overall Ratio: 17.53	10 Forward Spds 3 Reverse First Gear Ratio: 14.56 Overall Ratio: 19.68	11 Forward Spds 3 Reverse First Gear Ratio: 26.08 Overall Ratio: 35.73	10 Forward Spds 3 Reverse First Gear Ratio: 14.56 Overall Ratio: 19.68	11 Forward Spds 3 Reverse First Gear Ratio: 26.08 Overall Ratio: 35.73	15 Forward Spds 3 Reverse First Gear Ratio: 16.94 Overall Ratio: 16.94 (Direct drive) ----- 15 Forward Spds 3 Reverse First Gear Ratio: 13.31 Overall Ratio: 16.85 (Overdrive)	7 Forward Spds 2 Reverse
Up to 110,000 lbs.	Unlimited	Unlimited	Up to 140,000 lbs.	Up to 110,000 lbs.	Up to 110,000 lbs.	Up to 110,000 lbs.	Up to 110,000 lbs.	Up to 110,000 lbs.	Up to 110,000 lbs.	Up to 35,000 lbs.
Linehaul (Australia, Mexico, South Africa & South America)	General Freight, Bulk Hauler, Doubles/ Triples, Steel Hauler, Tanker, Livestock Hauler	Doubles/Triples, Equipment Hauler, Lowboy, Logging, Mining, Construction	General Freight, Bulk Hauler, Doubles/Triples, Steel Hauler, Tanker, Livestock Hauler	Dump, Oil Field, Asphalt Truck, Block Truck, Fire Pumper/Tanker	Dump, Roll-off, Asphalt Truck, Municipality, Utility	Mixer, Pumper, Crane, Dump	Dump, Roll-off, Asphalt Truck, Municipality, Utility	Mixer, Pumper, Crane, Dump	Roll-off, Tipper	Pickup & Delivery, Towing, Straight Beverage, School Bus
AS 18 RTLO-16918A-AS3	RTLO-16913A	RTLO-16918B	RTOC-16909A	FAO-14810C-EA3	FO-10E308LL-VCS	FO-10E309ALL-VMS	RT-8908LL	RTO-14909ALL	RT-14915	EDCO-6F107A-P
AS 18 RTLO-18918A-AS3	RTLO-18913A	RTLO-18918B	RTOCM-16909A	FAO-16810C-EA3	FO-11E308LL-VCS	FO-11E309ALL-VMS	RTO-14908LL	RTO-16909ALL	RTO-16915	EDCO-6F107A
AS 18 RTLO-20918A-AS3	RTLO-20913A	RTLO-20918B	RTOC-18909A	FAOM-15810C-EA3	FO-12E308LL-VCS	FO-12E309ALL-VMS	RTO-16908LL			
AS 18 RTLO-22918A-AS3		RTLO-22918B		FAOM-16810C-EA3	FO-14E308LL-VCS	FO-14E309ALL-VMS				
					FO-16E308LL-VCS	FO-16E309ALL-VMS				
					FO-17E308LL-VCS	FO-17E309ALL-VMS				



Peace of Mind

Backed by the support and expertise of the Roadranger® network

Eaton® products come with built-in peace of mind. Here's a closer look at support, service and warranty.

Dedicated Support. America's most experienced powertrain support network provides a complete spectrum of support for Eaton components, from spec'ing to service to aftermarket support. There is also training available through the Roadranger Academy. Visit www.roadranger.com for all the details.

Convenient Service. With Eaton transmissions, service can be performed at a local dealer. Our modular designs minimize cost and repair time, and widely available parts get your vehicles back on the road faster.

Impressive Warranty. Eaton's comprehensive warranties vary by application. For specific coverage, check the Eaton Warranty Guide (TCWY0900).

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Powering Business Worldwide



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