

ENDURANT 101

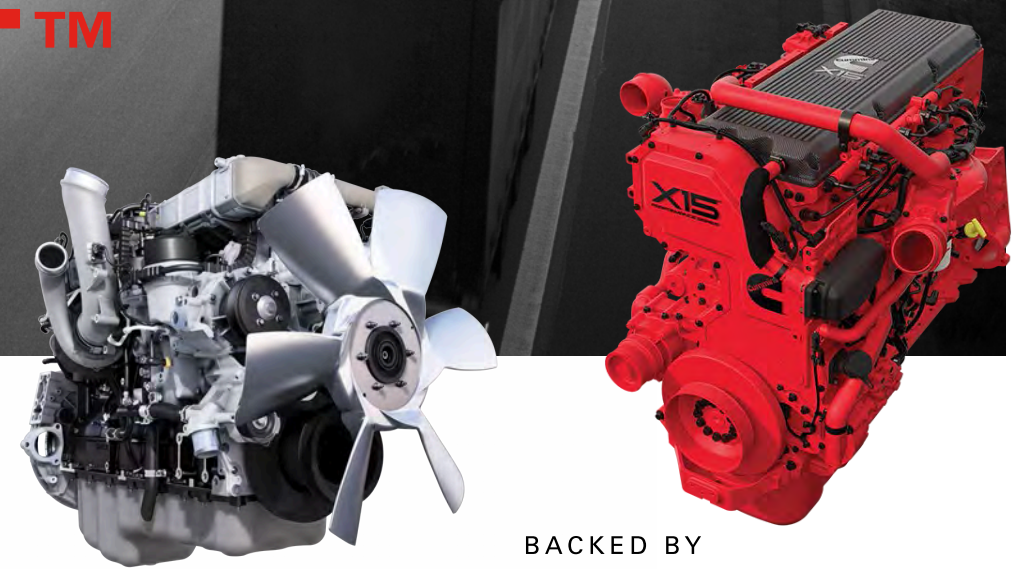
PRODUCT HIGHLIGHTS

- Strong Partnerships
- Features Overview
- Competitive Advantages
- GearLogic
- IntelliConnect

RESOURCES

- Websites
- Videos
- PDFs

ENDURANT™ PLAYBOOK



AUTOMATED
TRANSMISSION
TECHNOLOGIES™

BACKED BY
Roadranger
SUPPORT

ENDURANT 101

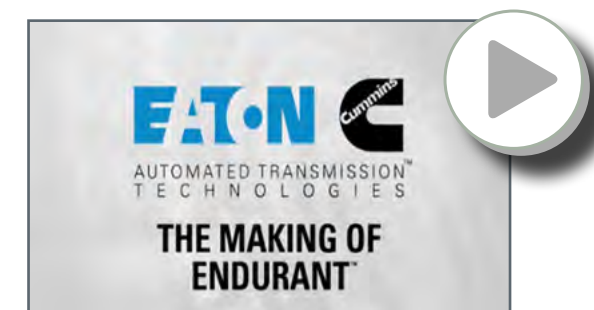
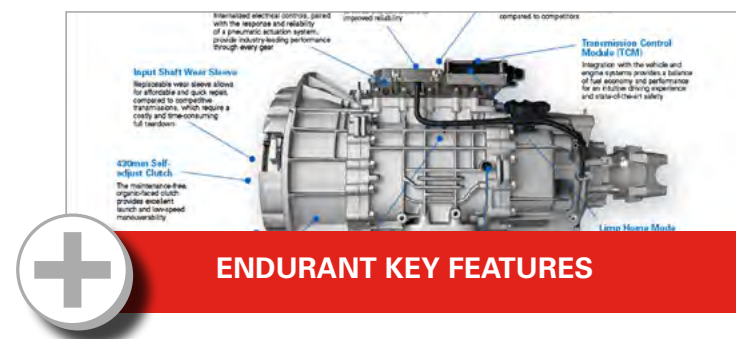
Did You Know?

A key point to consider when spec'ing a truck with the Endurant, is that it's not an automated variant that's been adapted from a manual transmission. Endurant is an all-new automated transmission that's been designed, engineered and built from the ground up.

The first product to launch from the newly formed Eaton Cummins Automated Transmission Technologies joint venture, Endurant leverages the capabilities of two leaders in powertrain technology and sets the bar for heavy-duty automated transmissions. This all-new automated transmission has been intelligently engineered from the ground up with features that protect your investment and make it easy to maintain. With a host of new features such as a transmission fluid pressure sensor and clutch life prognostics, Endurant is the lightest, most efficient 1,850 ft.-lb. capable heavy-duty transmission. Plus, it delivers industry-leading downspeeding and maintenance intervals, all while hauling up to 110,000 pounds Gross Vehicle Weight (GVW).

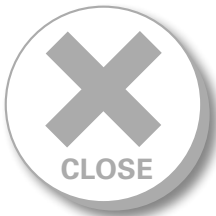
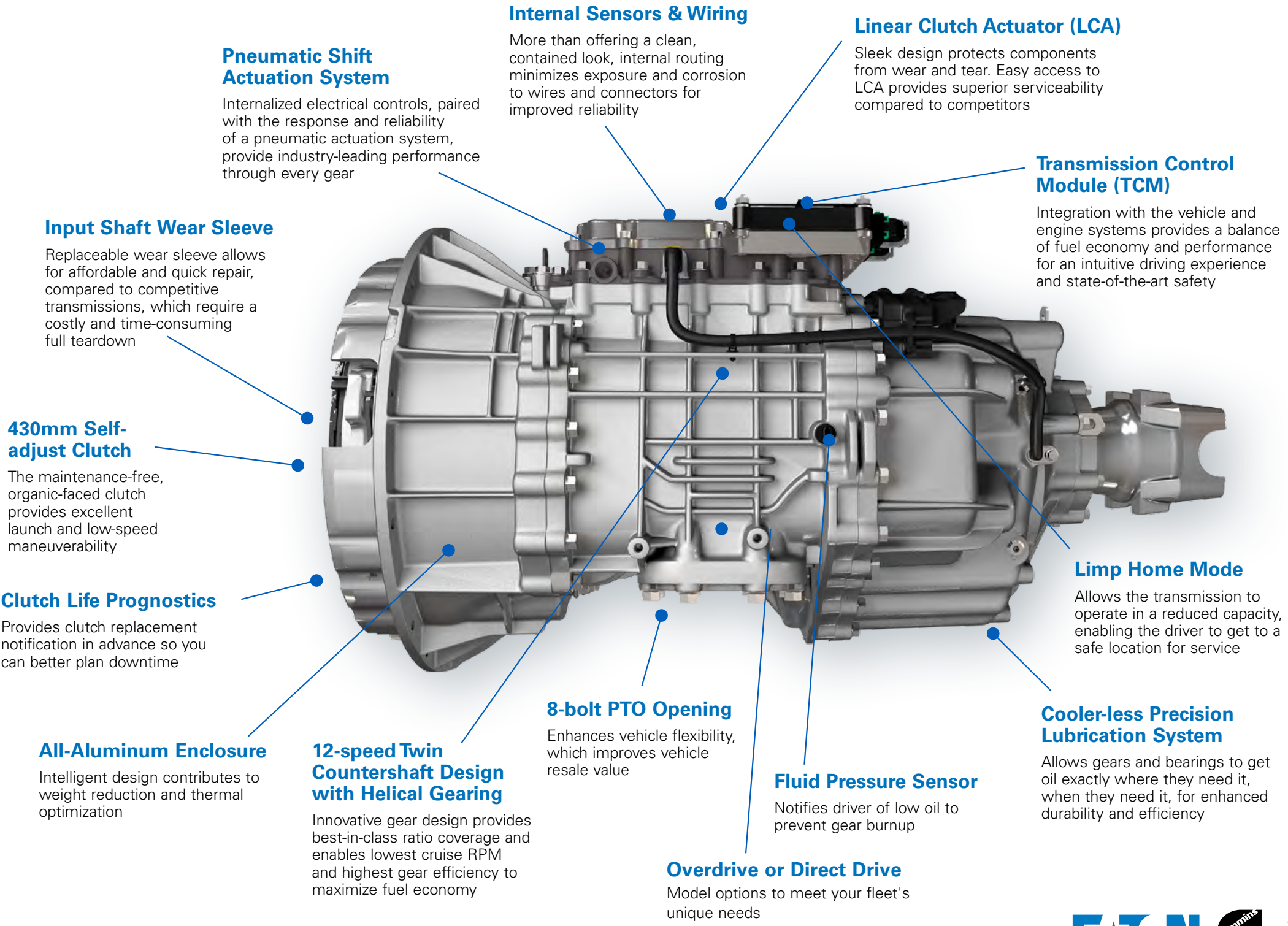
While we are confident this transmission sets the new industry standard, that's not what's driven our team. Throughout the research and development phase, Eaton has been focused on finding out what heavy-duty linehaul customers need and want in a transmission. This real-world input combined with extensive testing, has resulted in a world-class product. One that we're extremely proud of.

Along with enhanced GearLogic features that benefit fleet managers and drivers alike, Endurant has the full support and expertise of the Roadranger® network. That's a winning combination. This Playbook focuses on the features and benefits of our newest transmission and what makes Endurant the right choice for customers. Read on to learn more.



The Making of Endurant

ENDURANT KEY FEATURES



STRONG OEM PARTNERSHIPS: Eaton Cummins + International

Strong Partnerships

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GearLogic

IntelliConnect

We have a long history with International of building world-class powertrain systems that are truly more than the sum of their parts. And we're joining forces again with Endurant.

- Scheduled to begin production in 2018, Endurant will be paired with the International A26 engine.
- It will also be available in the new Cummins powertrain, paired with the Cummins X15 Efficiency Series engine.



FEATURES OVERVIEW

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There's something refreshing about starting with a clean slate. Endless possibilities to create a product that's better than anything currently available. And that's just what we did with Endurant. The competition is tough, and we benchmarked the best of what is out there today to make a better product. Unlike other heavy duty transmissions on the market, the Endurant was designed, engineered and created to be an automated transmission ... not a manual transmission that's been updated to be an AMT.

We factored in all of the customer inputs — the key characteristics and features fleets expect from their heavy-duty driving experience — when we created Endurant. Even the product name speaks to this transmission's ability to endure the rigors of day-to-day, heavy-duty linehaul driving. We put Endurant through its paces at testing facilities across the country. Beyond the 600-acre Eaton Proving Grounds in Marshall, Michigan, we took Endurant to the scorching desert of Death Valley and then on to a cold chamber in Minnesota for extreme temperature testing at minus 40 degrees. Throughout this process, Endurant passed test after test.



Customer Insights

To ensure we captured the demands of heavy-duty fleets, we formed a Customer Council, a Driving Council and a Service Council — a group of real-world experts, to look at all aspects of heavy-duty transmission technology and help us take it to new heights. These councils featured a mix of customers in various locations with different wants and needs in a transmission. They helped identify features that are most important and useful to them in their day-to-day jobs. When we asked a few council members to sum up their impression of Endurant after extensive test drives, here's what they had to say.

***"Everything's great,** everything feels good and the improvements are noticeable. It's like driving a car!"*

*"This is how I would want my truck to handle, **I love it.**"*

*"There is a very high bar in the marketplace ... and **you've delivered on every feature** we asked for."*



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We've learned what Endurant can do, but there are others out there who haven't yet. These are the key messages, or value propositions for Endurant. Use them with potential customers to explain what makes Endurant the best heavy-duty automated transmission.





INTELLIGENTLY ENGINEERED





PROTECTS YOUR INVESTMENT




EASY TO MAINTAIN

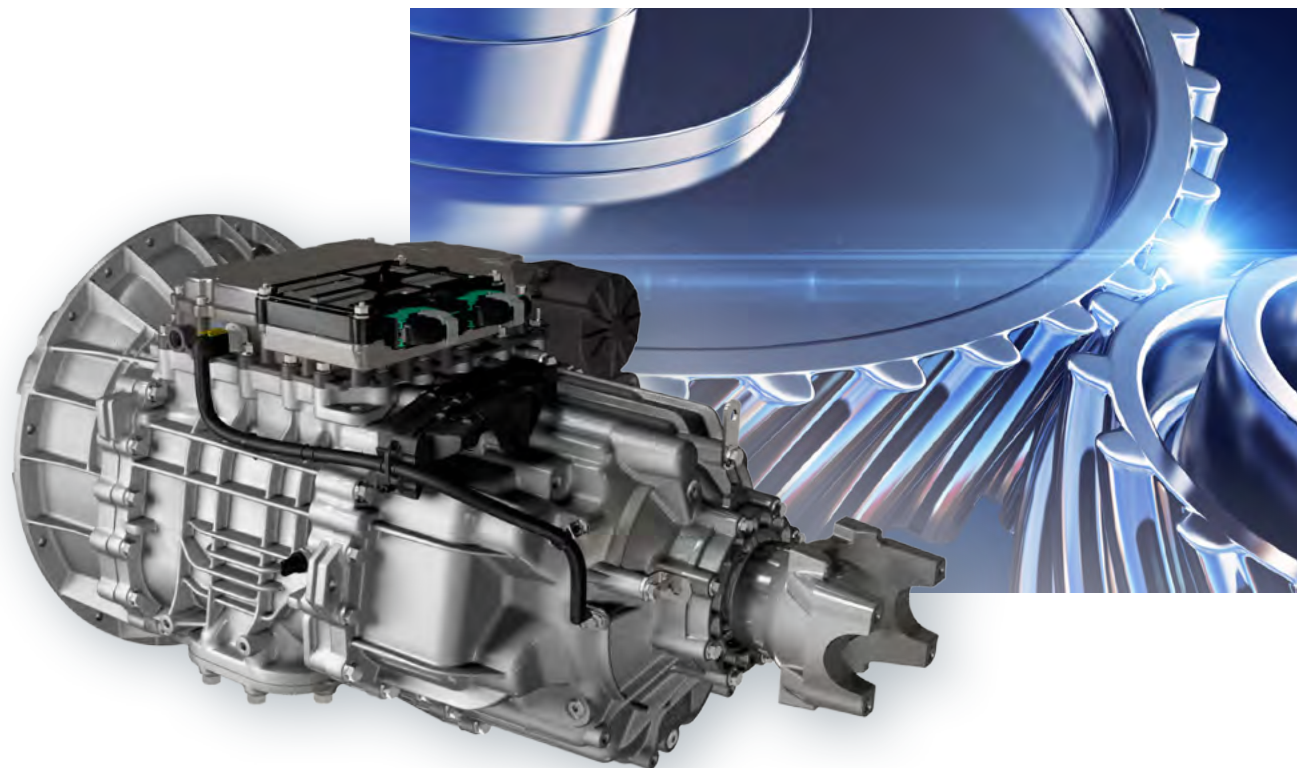
PEACE OF MIND





INTELLIGENTLY ENGINEERED

- The **lightest, most efficient** 1,850 lb.-ft. capable heavy-duty transmission system on the market. It's **over 100 pounds lighter than comparable AMTs** and over 200 pounds less than Fuller Advantage automated
- **Integrated communication** between the engine and transmission improves efficiency and performance
- **Smooth and intuitive** shift strategies for an enhanced driver experience
- Standard **8-bolt PTO** mounting location improves future resale value
- **Predictive shifting** uses look-ahead technology to execute shift decisions that improve fuel economy and driver comfort
- Integrated with **GearLogic™** intelligent technology features that **improve performance, fuel efficiency and driver confidence**



Endurant: Intelligently Engineered

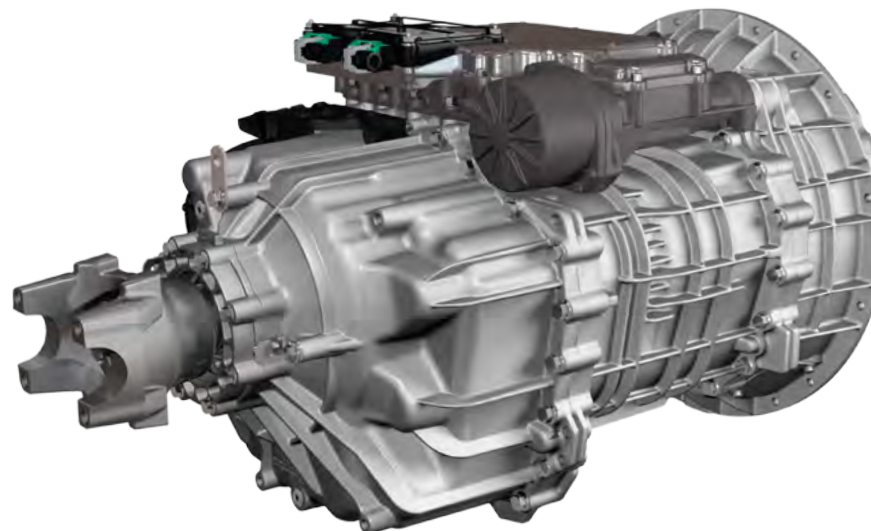


PROTECTS YOUR INVESTMENT

- **Industry-exclusive transmission fluid pressure sensor** notifies driver of low oil to prevent gear burn-up and is backed by industry-exclusive burn-up warranty coverage
- **Smart prognostics** provide clutch replacement notification so you can better plan downtime
- **Internal electrical system** routing minimizes exposure and corrosion to wires and connectors for **improved reliability**
- **Vehicle oil-coalescing air filter** protects the transmission system from contamination



Endurant: Protects Your Investment



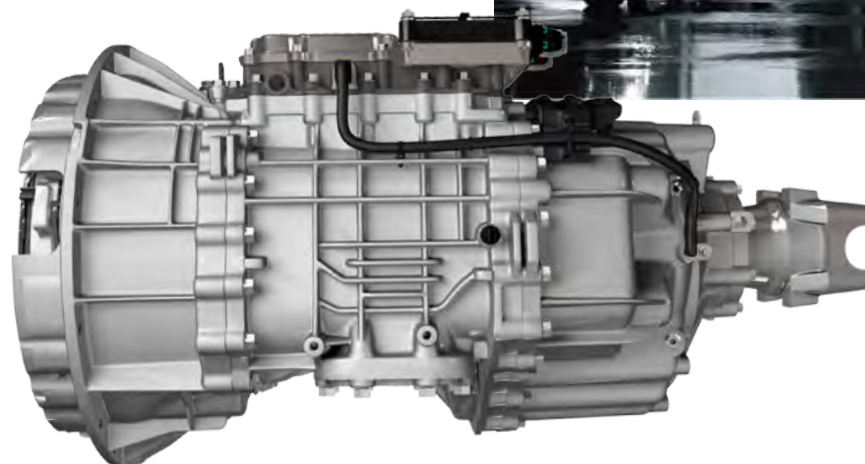
EASY TO MAINTAIN

- **750,000-mile lube change interval** – 450,000 miles longer than DT12 – reduces downtime and maintenance cost
- The **maintenance-free 430mm self-adjust clutch** requires no grease
- Requires **16 pints of oil** (same amount/type as Fuller Advantage - PS386) – about half of what DT12 requires
- Telematics capable with **IntelliConnect™** which enables information sharing between the transmission, Eaton and the fleet for **increased uptime**
- **Replaceable input shaft wear sleeve** allows for affordable and quick repair, compared to competitive transmissions which require a costly and time-consuming full teardown



Endurant: Easy to Maintain

Input shaft wear sleeve



PEACE OF MIND

If servicing of Endurant is needed, you're backed by the Support, Solutions & Expertise of the Roadranger® network.

- Standard warranty
 - Transmission: **5-year, 750,000-mile warranty** for linehaul commercial vehicles
 - Clutch: 3-year, 350,000-mile warranty
- **Extended protection plans**
 - Transmission: 1-year, 2-year, and 2-year 100,000-miles
 - Clutch: 1-year 100,000-miles, 2-year 150,000-miles
- The Roadranger network has **representatives throughout North America and our 24/7/365 accessible call center** ready to support you - call 1-800-826-HELP (4357)
- Roadranger Academy offers **in-depth computer-based training** from our industry experts to best maintain and service your drivetrain systems
- Plus, International has nearly twice as many dealers as the competition - so no matter where your customers drive, they are not far from one of 720 dealers



COMPETITIVE HIGHLIGHTS

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Wondering how the all-new Endurant stacks up against the competition? Let's just say we're able to use a lot of words like "best," "lightest" and "most efficient." Take a look!

- The **most advanced** automated transmission in the industry
- The **lowest cruise RPM** among competitive automated transmissions
- The **best overall ratio coverage** among linehaul automated transmissions
- Among linehaul transmissions, it has the **deepest reverse ratio** in the industry for slow speed maneuvering
- The **lightest, most efficient** 1,850 ft. lb. of torque capable transmission in the industry
- The only transmission to offer a **fluid pressure sensor** that notifies the driver of low oil level to prevent gear burnup
- The **longest transmission oil change interval** for linehaul applications (750,000 miles vs. 500,000 miles)
- The transmission uses **half as much oil** as competitive automated transmissions

COMPETITIVE COMPARISON

	EATON CLIMBER AUTOMATED TRANSMISSION TECHNOLOGIES LINEHAUL TRANSMISSIONS		VOLVO/MACK LINEHAUL TRANSMISSIONS		DETROIT LINEHAUL TRANSMISSIONS		ALLISON LINEHAUL TRANSMISSIONS	
	Endurant 101	Other Advantage (1000CC 8P1)	Other Advantage (Overdrive 6)	Other Advantage (Overdrive 6)	Other Advantage (Overdrive 6)	Other Advantage (Overdrive 6)	Other Advantage (Overdrive 6)	Other Advantage (Overdrive 6)
Type	Automated	AMT	AMT	AMT	AMT	AMT	AMT	Automated
Forward Speeds	12	10	10	10	12	12	10	10
Reverse Speeds	2	2	2	2	2 (Standard) + 4 (Optional)	4	2	2
First Gear Ratio	14.43	14.11	C: 12.86 B: 15.42 A: 15.42	14.56	13.87	14.0	14.0	14.0
Overall Ratio	16.8	17.71	17.50 (2.07)	16.84	16.84	16.84	16.84	16.84
Max Torque (ft. lb.)	1864 (2500)	1850 (2500)	1750 (2500)	1860 (2500)	1800 (2500)	1800 (2500)	1750 (2500)	1750 (2500)
Max. Oil Chg. Int. (Miles)	750,000 (2500)	500,000 (2500)	500,000 (2500)	500,000 (2500)	500,000 (2500)	500,000 (2500)	500,000 (2500)	500,000 (2500)

COMPETITIVE COMPARISON

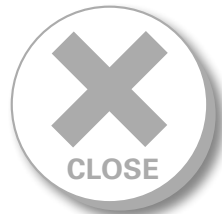
KEY SPECIFICATIONS AND CAPACITIES

FEATURE	DEFINITION	RATIOS	
Gears	12 forward / 2 reverse	1 st	14.43
Lower Cruise Speed Limit	1,000 RPM	2 nd	11.05
Torque Capacity	1,850 lb.-ft.	3 rd	8.44
Oil Capacity	16 pints	4 th	6.46
System Weight	857 lbs.	5 th	4.95

KEY SPECIFICATIONS AND CAPACITIES

COMPETITIVE COMPARISON

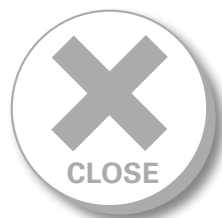
	EATON CUMMINS AUTOMATED TRANSMISSION TECHNOLOGIES CLASS 8 ON-HIGHWAY TRANSMISSIONS			VOLVO/MACK CLASS 8 ON-HIGHWAY TRANSMISSIONS	DETROIT CLASS 8 ON-HIGHWAY TRANSMISSIONS	ALLISON CLASS 8 ON-HIGHWAY TRANSMISSIONS
	Endurant	Fuller Advantage Small- Step OD (EC3/EN3)	Fuller Advantage Overdrive (C) and Direct Drive (B) (EA3)	I-Shift XE / mDrive	DT-12 Overdrive A-B	TC-10
Type	Automated	AMT	AMT	AMT	AMT	Automatic
Forward Speeds	OD: 12 DD: 11	10	10	12	12	10
Reverse Speeds	2	2	2	2 (standard – up to 4 available)	4	2
First Gear Ratio	14.43	14.11	C: 12.80 B: 15.42	14.94	11.67	7.40
Overall Ratio	18.85	17.73	C: 17.53 B: 15.42	15.04	14.96	8.60
Max. Torque (lb.-ft. [Nm])	1850 [2508]	1850 [2508]	1750 [2373]	1900 [2576]	A: 1900 [2576] B: 1650 [2237]	1700 [2305]
Max. GCW (lbs. [kg])	110,000 [49,895]	80,000 [36,288]	110,000 [49,895]	110,000 [49,895]	110,000 [49,895]	80,000 [36,288]
Wet Weight (lbs. [kg])	657 [298]	864 [392]	864 [392]	762 [346]	660 [299]	1074 [487]
Oil Capacity (pints [liters])	16 [7.57]	16 [7.57]	16 [7.57]	32 [15]	30.8 [14.6]	116.8 [55.27]
Lubrication Interval (miles)	750,000	500,000	500,000	125-500,000	300,000	500,000
Transmission PTO Provisions	8-bolt Bottom	6-bolt / 8-bolt / Thru-shaft	6-bolt / 8-bolt / Thru-shaft	Rear Mount	Rear Mount	Rear Mount
Transmission Fluid Cooler	No	No	No	Yes	Yes	Yes
Grade Assist	Hill Start Aid (standard)	Hill Start Aid (standard)	Hill Start Aid (standard)	Optional	Standard	N/A
Eco-Roll or E-Coast	Standard	Standard	Standard	Optional	Standard	N/A
Auto Launch / Urge to Move	Standard	Standard	Standard	Optional	Standard	Standard
Manual Mode	Standard	Standard	Standard	Optional	Standard	N/A
Downspeed with Cruise RPM Below 1150	Yes	No	No	No	No	No
Hill Descent Control	Standard	Standard	Standard	Standard	Standard	N/A
Look-Ahead Cruise Control	Standard	Standard	Standard	Predictive	Predictive	N/A
Engine Overspeed Protection	+++	+++	+++	++	++	+
Prognostics	Standard	N/A	N/A	Optional	Optional	Optional
In-Cab Low Oil Alert	Standard	N/A	N/A	N/A	N/A	N/A



KEY SPECIFICATIONS AND CAPACITIES

FEATURE	DEFINITION
Gears	OD: 12 forward / 2 reverse
Lower Cruise Speed Limit	1,000 RPM
Max Torque Capacity & HP	1,850 lb.-ft. & 510 HP
Oil Capacity	16 pints
System Weight <i>(Transmission, Clutch & Oil)</i>	657 lbs.
Maximum Operating Weight	110,000 lbs.
PTO Maximum Capacity	8 bolt, bottom mount, 95 HP
Oil Sensing	Protection from burnup
Warranty Coverage <i>Transmission</i> <i>Clutch</i>	5 years / 750,000 miles 3 years / 350,000 miles
Maintenance Intervals <i>Transmission</i> <i>Clutch</i>	750,000 mile oil change Maintenance free

RATIOS	
1 st	14.43
2 nd	11.05
3 rd	8.44
4 th	6.46
5 th	4.95
6 th	3.79
7 th	2.91
8 th	2.23
9 th	1.70
10 th	1.30
11 th	1.00
12 th	0.77
Reverse 1	16.92
Reverse 2	12.95
Overall	18.85



GEARLOGIC TECHNOLOGY

A suite of intelligent technology features for automated transmissions that improve performance, fuel efficiency and driver confidence. Here’s a look at these impressive features and what they can do for you.

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, but can also help meet the latest CSA regulations.
Engine Overspeed Protection	The transmission system upshifts if necessary to prevent engine over-speed 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.
Predictive Shifting	Uses look-ahead technology to execute shift decisions that improve fuel economy and driver comfort.
Creep Mode	Enables the driver to “creep” at low speeds, offering ultimate control.
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.

Strong Partnerships

Features Overview

Competitive Advantages

GearLogic

IntelliConnect

EATON INTELLICONNECT REMOTE DIAGNOSTICS

Strong Partnerships

Features Overview

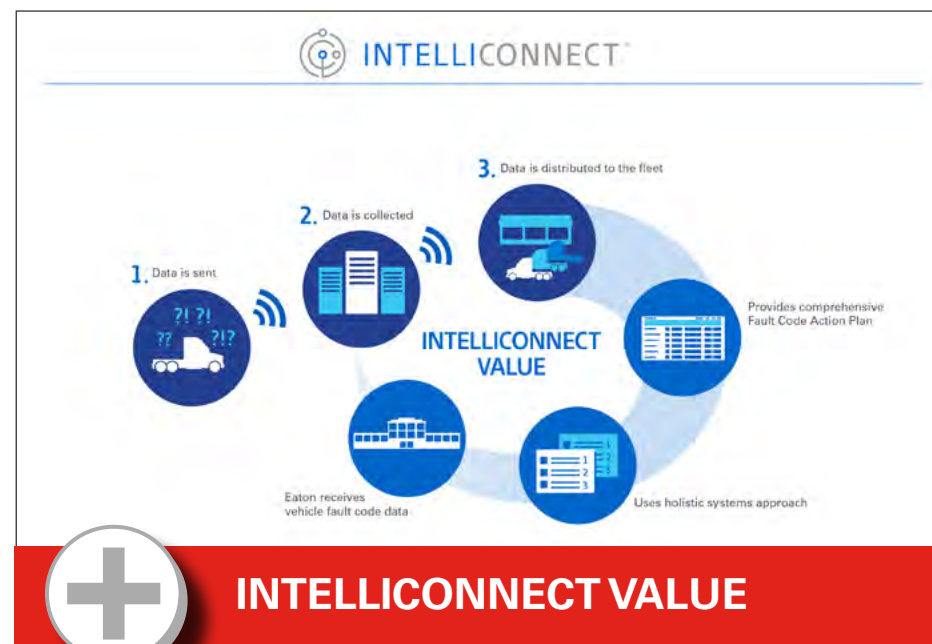
Competitive Advantages

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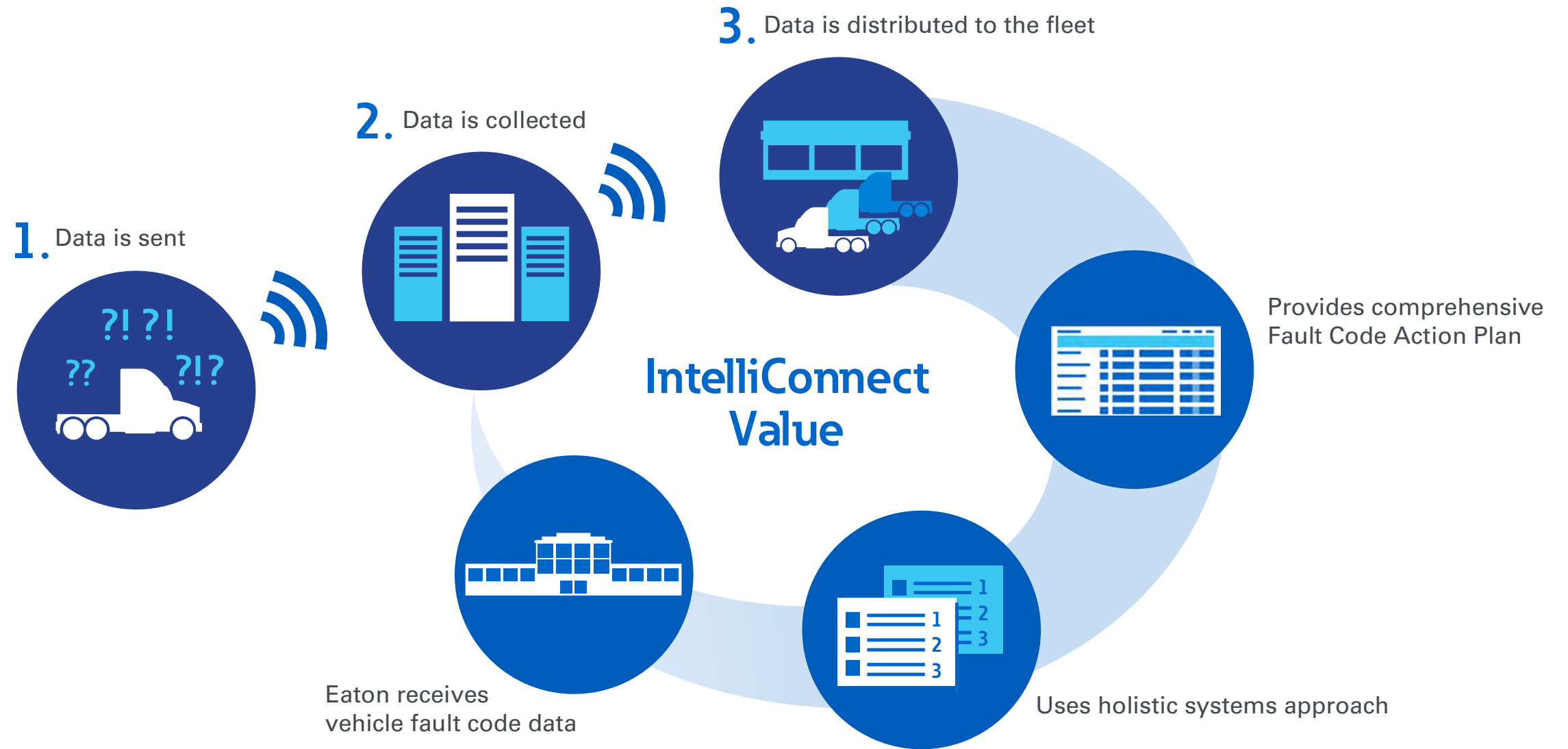
Stay connected to your fleet like never before with IntelliConnect, a suite of connected solutions designed to increase vehicle uptime by reducing unplanned downtime through faster repair diagnosis.

- Near real-time monitoring of vehicle fault codes
- Customized delivery of information through email alerts, the Navistar OnCommand™ Connection portal, an existing telematics portal or through our IntelliConnect portal
- Included with Eaton Cummins automated and automatic transmissions



Did You Know?

IntelliConnect is just one more way Eaton is working to lower your operating costs and make your business run more smoothly. [Learn more.](#)



LOOKING FOR MORE?

We've collected all resources included within the sections of this Playbook in one convenient spot. We plan to add more information and helpful links to build this section in the months leading up to the launch of the Endurant. Reference this section for helpful websites, along with informational videos, job aids and more.

Websites

Video

PDFs

Websites



EatoncumminsJV.com/endurant



[Find Your Rep](#)



[Eaton Product Toolkit](#)



[Eaton IntelliConnect](#)



EATON RESOURCES

Websites

Video

PDFs

Video



[The Making of Endurant](#)



[Endurant: Intelligently Engineered](#)



[Video Gallery](#)



[Endurant: Easy to Maintain](#)



[Endurant: Protects Your Investment](#)



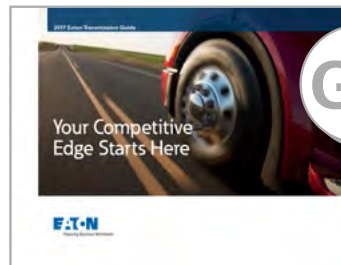
EATON RESOURCES

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2017 Eaton Transmission Guide



Endurant Launch Brochure



Endurant Press Release



Endurant Service Manual

