

Specifications and Cost Savings for Refuse Vehicles



Items to Consider for Building a New Specification

- ❖ Chassis Type
 - Low Entry, Medium Entry, Conventional Cab
- ❖ Chassis Specifications
 - Frame Rail
 - Engine
 - Rear End Ratio
 - Warranty
 - Transmission Type
 - Life Cycle of the Fleet



Low Entry Cab Chassis



- Front or Sideloader Body Install
- Heavy Duty Application
- 11 L or greater engine
- Allison 4000 series transmission



Medium Rise Cab



- Front or Sideload Body Install
- Heavy Duty Application
- 11 L or greater engine
- Allison 4000 series transmission



Conventional Cab



- Tractor or Roll off Body Install
- Heavy Duty Application
- 11 L or greater engine
- Allison 4000 series transmission



Fleet Lifecycle

- ▶ Industry standard of Front loading and Automatic Side Loading is 5 - 7 years in larger municipal markets and private fleets.
- ▶ Wyoming is a much different market.
 - ▶ Longer Lifecycle
 - ▶ Lower miles and hours
- ▶ Balance between Operating expenses outweighing Capital Expense.

Frame Rail Size and Liner

FRAME SPECIFICATIONS

LR SERIES

FRAME SECTION	FRAME SECTION (IN.)						REINFORCEMENT TYPE	ELEMENTS					RBM (LBS. IN.)	SECTION MODULUS (IN. ²)	AREA (IN. ²)	WEIGHT (LB./IN. of length)	FRAME WIDTH TO OUTSIDE ELEMENT AT REAR AXLE (IN.)
	MAIN			REINFORCEMENT				NUMBER	TYPES								
	WEB	FLANGE	THICKNESS	WEB	FLANGE	THICKNESS			MAIN	INSIDE REINF.	9 mm O/UTSIDE REINF.	8.5 mm O/UTSIDE REINF.					
A	13.37" x 3.25" x .375"			NONE			—	1	X				2,818,800	23.49	6.97	1.97	—
				9.93" x 2.87" x .250"			INSIDE	2	X	X			3,530,400	29.42	10.67	3.02	—
B	10.75" x 3.25" x .375"			NONE			—	1	X				2,037,600	16.98	5.99	1.70	33.50
				9.93" x 2.87" x .250"			INSIDE	2	X	X			3,122,400	26.02	9.69	2.74	33.50

RBM, SECTION MODULUS, AREA, & WEIGHT INFORMATION ARE PER RAIL AND INCLUDE THE COMBINATION OF ALL PERTINENT ELEMENTS

LR SERIES (OPTIONAL DROPFRAME)*																	
A	10.75" x 3.75" x .375"			NONE			—	1	X				2,263,200	18.86	6.36	1.72	—
B	10.75" x 3.25" x .375"			NONE			—	1	X				2,037,600	16.98	5.99	1.70	33.50

* Available 250" Wheelbase only.

Based on 120ksi yield strength material

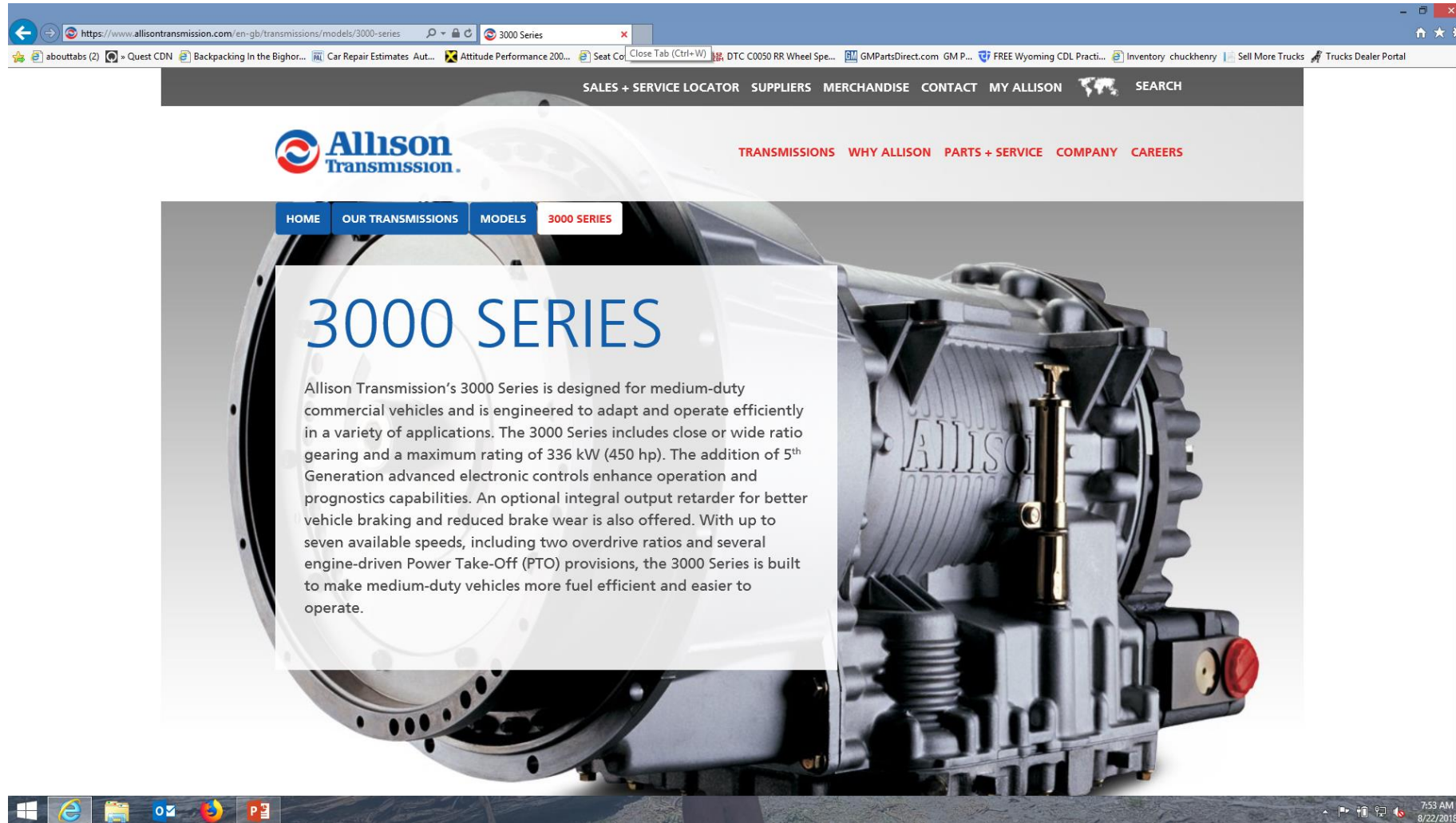


Engine Specifications

- ▶ Cummins ISL - 8.9 L 260-380 HP Medium Duty Applications
 - ▶ Allison 3000 Series Medium Duty Transmission
- ▶ PAACAR PX-9 - 8.9 L 260-450 HP Medium Duty Applications
 - ▶ Allison 3000 Series Medium Duty Transmission
- ▶ MACK MP-7 - 11 L 325 - 405 HP Heavy Duty Applications
 - ▶ Allison 4000 series Heavy Duty Transmission
- ▶ Cummins X12 - 12L 350 - 500 HP Heavy Duty Applications
 - ▶ Allison 4000 Series Heavy Duty Transmission



Automatic Transmission - Allison 3000



The screenshot shows a web browser window displaying the Allison Transmission website. The address bar shows the URL <https://www.allisontransmission.com/en-gb/transmissions/models/3000-series>. The page features a navigation menu with links for SALES + SERVICE LOCATOR, SUPPLIERS, MERCHANDISE, CONTACT, MY ALLISON, and SEARCH. Below the navigation is the Allison Transmission logo and a secondary menu with links for TRANSMISSIONS, WHY ALLISON, PARTS + SERVICE, COMPANY, and CAREERS. The main content area has a breadcrumb trail: HOME > OUR TRANSMISSIONS > MODELS > 3000 SERIES. A large image of the Allison 3000 Series transmission is shown, with a white text box overlaid on the left side containing the following text:

3000 SERIES

Allison Transmission's 3000 Series is designed for medium-duty commercial vehicles and is engineered to adapt and operate efficiently in a variety of applications. The 3000 Series includes close or wide ratio gearing and a maximum rating of 336 kW (450 hp). The addition of 5th Generation advanced electronic controls enhance operation and prognostics capabilities. An optional integral output retarder for better vehicle braking and reduced brake wear is also offered. With up to seven available speeds, including two overdrive ratios and several engine-driven Power Take-Off (PTO) provisions, the 3000 Series is built to make medium-duty vehicles more fuel efficient and easier to operate.



Automatic Transmission - Allison 4000

The screenshot shows the Allison Transmission website for the 4000 Series. The browser address bar displays <https://www.allisontransmission.com/en-gb/transmissions/models/4000-series>. The website header includes navigation links: SALES + SERVICE LOCATOR, SUPPLIERS, MERCHANDISE, CONTACT, MY ALLISON, and SEARCH. The Allison Transmission logo is prominently displayed on the left, with a menu of TRANSMISSIONS, WHY ALLISON, PARTS + SERVICE, COMPANY, and CAREERS on the right. Below the logo, a navigation bar contains buttons for HOME, OUR TRANSMISSIONS, MODELS, and 4000 SERIES. The main content area features a large image of an Allison 4000 Series transmission and a text box with the following description:

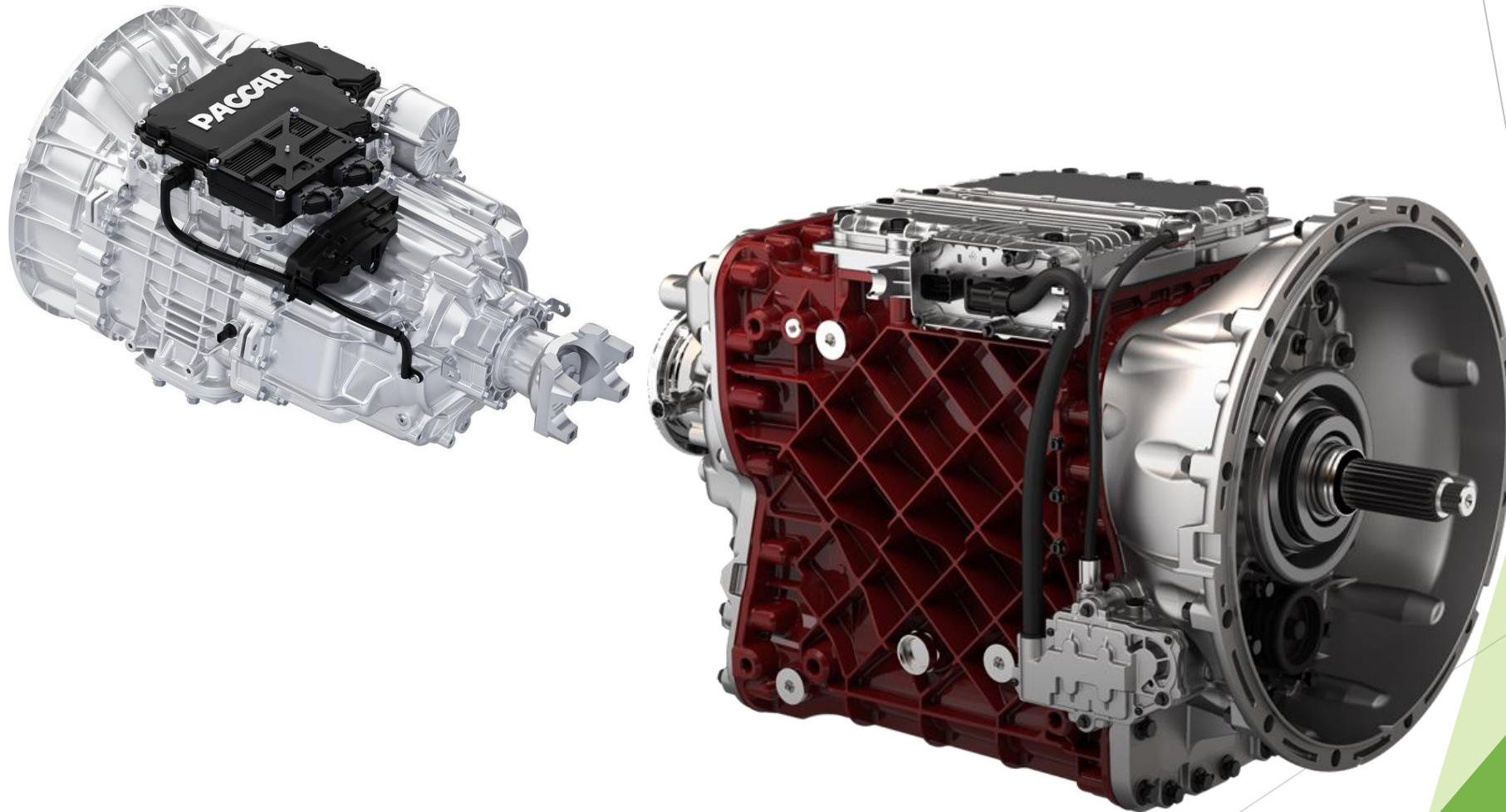
4000 SERIES

Allison Transmission's 4000 Series is designed to make heavy-duty vehicles operate smoothly and efficiently. With close or wide ratio gearing and up to seven speeds available including two overdrive ratios and a second reverse gear, Allison's 4000 Series is built for productivity and reliability. Ratings up to a maximum of 597 kW (800 hp) are offered. An engine-driven Power Take-Off (PTO) provision and integral output retarder that provides enhanced vehicle braking and reduces brake wear are optional. Allison's 4000 Series includes 5th Generation advanced electronic controls enhance operation and prognostics capabilities. The 4000 Series delivers both performance and fuel efficiency.

The Windows taskbar at the bottom shows the system tray with the time 7:56 AM and date 8/22/2018.



Automated Manual - OEM Manufactures



Startability (355HP / 4500RDS / 5.04)

VEHICLE SPECIFICATION SUMMARY			
Gradeability		Recommended Min. Gradeability in Top Gear	
Maximum in Top Gear (Concrete)	2.6%	1.9%	OK
Maximum in Top Gear (Asphalt)	2.6%	1.9%	OK
Startability		Recommended Min. Startability	
In Lowest Gear	30.8%	12.0%	OK
Loading/Unloading Surface Type	CONCRETE LOADING AND / OR UNLOADING SURFACE		
		Recommended Speed on 1.5% Grade	
Speed on a 1.5% Grade (Concrete)	68.3 MPH	>67 MPH	OK
	@1925 rpm in 7th gear	PL5	
Suggested Value for Gear Down Vehicle Speed	RSL - 10		
Driveability Rating	Status		
100% Max Power available after shift	CAUTION!		
>95% Very Good >90% Acceptable			
Performance Level	Recommended Speed on 1.5% Grade	Min Gradeability in Top Gear	
PL5 - High Performance	>67 MPH	1.9%	
PL4 - Performance	61 - 67 MPH	1.7%	
PL3 - Economy	54 - 60 MPH	1.5%	
PL2 - Fleet / Construction	47 - 53 MPH	1.3%	
PL1 - Heavy Haul	40 - 46 MPH	1.1%	



Startability (355HP / 4500RDS / 3.56)

VEHICLE SPECIFICATION SUMMARY			
Gradeability		Recommended Min. Gradeability in Top Gear	
Maximum in Top Gear (Concrete)	1.6%	1.9%	CHECK!
Maximum in Top Gear (Asphalt)	1.5%	1.9%	CHECK!
Startability		Recommended Min. Startability	
In Lowest Gear	21.5%	12.0%	OK
Loading/Unloading Surface Type	CONCRETE LOADING AND / OR UNLOADING SURFACE		
		Recommended Speed on 1.5% Grade	
Speed on a 1.5% Grade (Concrete)	56.5 MPH	>67 MPH	CHECK!
	@1125 rpm in 7th gear	PL5	
Suggested Value for Gear Down Vehicle Speed	RSL - 10		
Driveability Rating	Status		
100% Max Power available after shift	CAUTION!		
>95% Very Good >90% Acceptable			
Performance Level	Recommended Speed on 1.5% Grade	Min Gradeability in Top Gear	
PL5 - High Performance	>67 MPH	1.9%	
PL4 - Performance	61 - 67 MPH	1.7%	
PL3 - Economy	54 - 60 MPH	1.5%	
PL2 - Fleet / Construction	47 - 53 MPH	1.3%	
PL1 - Heavy Haul	40 - 46 MPH	1.1%	



Engine / EATS / Towing Warranty - 60, 72, 84 Months

Protection Plan Breakdown and Pricing.pdf - Adobe Acrobat Reader DC

Home Tools Protection Plan Bre... x Sign In

Mack U.S. Pricing for Engine Plan 1 and Engine Plan 2
Effective Date 2/19/2018

MP7/MP8 <460	Engine Plan 1		Engine Plan 2		Exhaust Aftertreatment System		Engine Towing		
	Months	Miles	Plan 1	PID Code	Plan 2	PID Code	Price	PID Code	Price
36	300,000	\$922	M51D91	\$1,150	M51DX1	\$515	M53023	\$780	M58048
	400,000	\$1,298	M51DA1	\$1,881	M51DY1	\$773	M53033	\$1,040	M58068
	500,000	\$1,839	M51DB1	\$2,874	M51DZ1	\$1,030	M53043	\$1,300	M58058
	600,000	\$2,431	M51EP1	\$3,793	M51EZ1	\$1,236	M531M3	\$1,560	M580U8
48	250,000	\$1,030	M51ER1	\$1,463	M51F11	\$515	M531Q3	\$750	M580Y8
	300,000	\$1,236	M51DC1	\$1,750	M51E01	\$618	M53053	\$900	M58078
	400,000	\$1,700	M51DD1	\$2,508	M51E11	\$876	M53063	\$1,200	M58088
	500,000	\$2,060	M51DE1	\$3,527	M51E21	\$1,133	M53073	\$1,500	M58118
	600,000	\$2,719	M51EN1	\$4,572	M51EL1	\$1,360	M53163	\$1,800	M58138
60	750,000	\$3,399	M51ET1	\$5,721	M51F31	\$1,700	M531W3	\$2,250	M58168
	250,000	\$1,236	M51DF1	\$1,986	M51E31	\$696	M53083	\$800	M580E8
	300,000	\$1,406	M51DG1	\$2,195	M51E41	\$721	M53093	\$960	M58098
	400,000	\$2,009	M51DH1	\$3,187	M51E51	\$979	M530A3	\$1,280	M580A8
	500,000	\$2,472	M51DI1	\$4,389	M51E61	\$1,339	M530B3	\$1,600	M580B8
	600,000	\$3,265	M51EV1	\$5,267	M51F51	\$1,607	M53203	\$1,920	M581A8
	750,000	\$4,079	M51EX1	\$6,584	M51F71	\$2,009	M53233	\$2,400	M581D8
72	250,000	\$2,266	M51DJ1	\$3,971	M51E71	\$850	M530Y3	Not Available	
84	250,000	\$2,596	M51DK1	\$4,494	M51E81	\$979	M53103		

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Questions?

