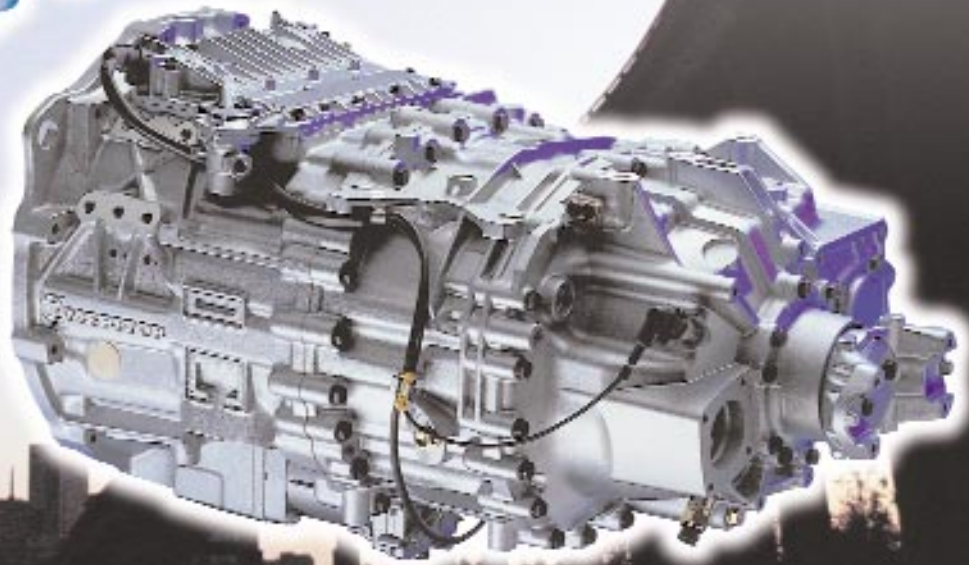
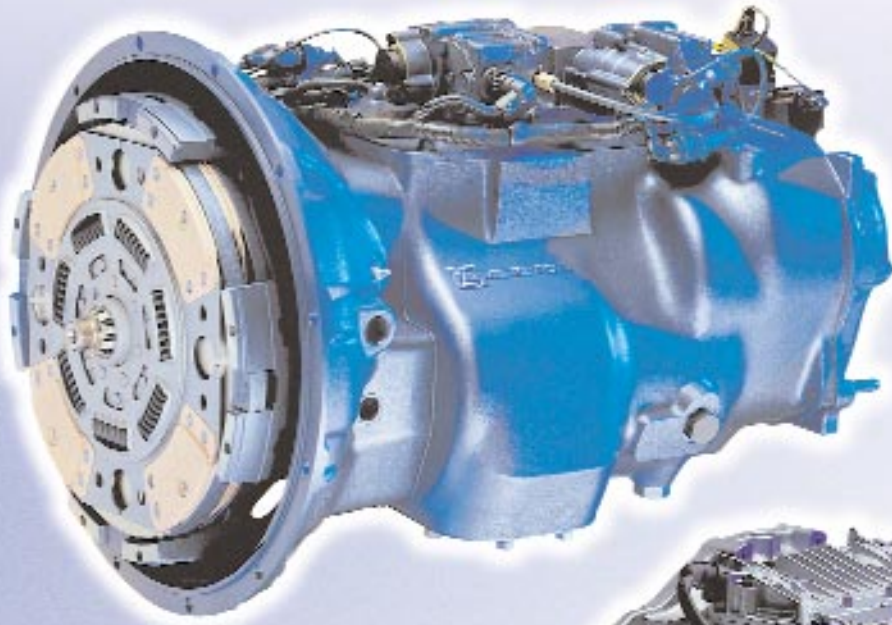



Transmissions

Condensed Specifications





ZF Meritor™ is a joint venture between two premier automotive component and systems suppliers, the ZF Group and ArvinMeritor.

The global ZF Group, based in Friedrichshafen, Germany, is a leading supplier of driveline technology, steering and suspension components, and is a leading global independent manufacturer of transmission products.

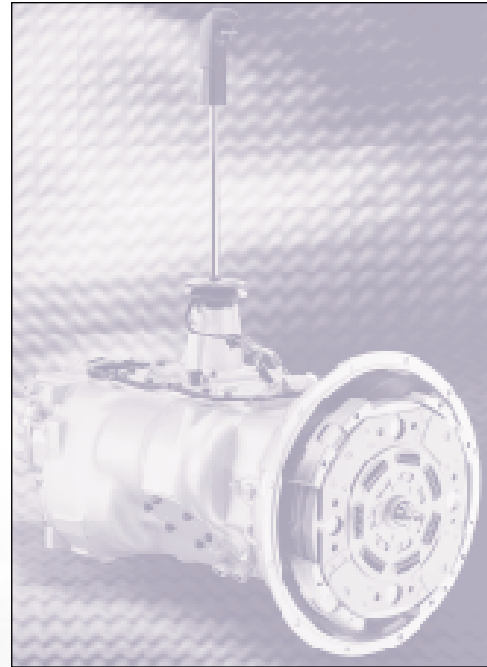
ArvinMeritor, Inc., based in Troy, Mich., is also a leading supplier for the global transportation industry, supplying a broad range of integrated systems, modules and components, serving light vehicle, commercial truck, trailer, and specialty original equipment manufacturers and related aftermarkets.

As ZF Meritor, we are dedicated to providing commercial vehicle drivers and fleet owners with cost-effective, technologically advanced transmissions and shift systems.

Product Overview

Manual Transmission

ZF Meritor offers constant mesh manual transmissions in 9-, 10- and 13-speed with a full line of torque ratings from 1,150 to 2,050 lb.-ft. Transmissions are available with multiple shift system options and with ZF Meritor's Torq-2™ and Shift-n-Cruise™. Torq-2 provides an extra 100 lb.-ft or 200 lb.-ft of increased torque in the top two gears without a significant cost premium. The Shift-n-Cruise option is a shift knob with integrated cruise control switches. The pause, set and resume switches are also conveniently located in the knob, eliminating the need for drivers to reach for dashboard controls.



SureShift™

The SureShift option is an electronic shift system that significantly reduces the effort required to safely and accurately shift a constant mesh manual transmission. With the ZF Meritor SureShift interface, gear shifts are accomplished by simply tapping the joystick on the ZF Meritor shift module. The SureShift system allows the driver complete control over which gear the vehicle is in at any given time. The clutch pedal is only used for starting and stopping. The SureShift System can be spec'd on whichever 9- or 10-speed transmission best suits your application needs.



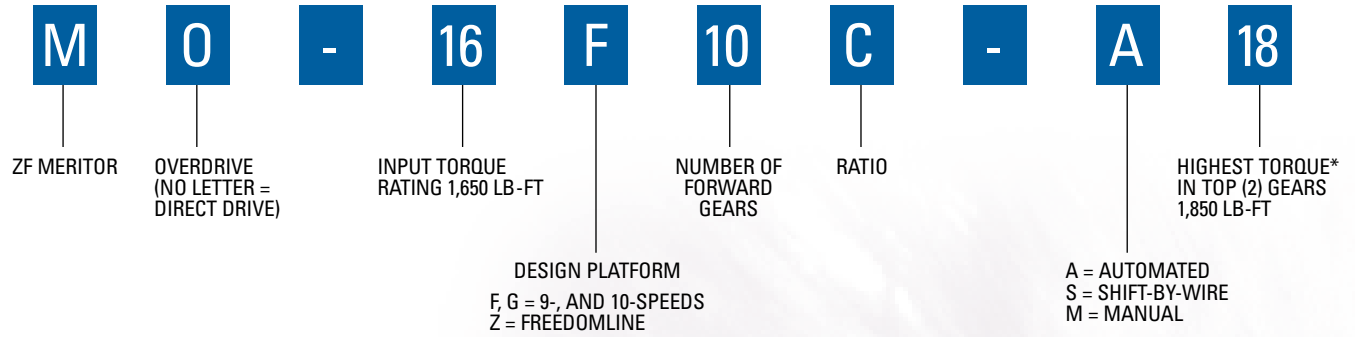
FreedomLine™

The FreedomLine is a two-pedal automated transmission that eliminates the clutch pedal for shifting, starting and stopping. The system allows the driver to select automatic mode or manual operation. A self-adjusting clutch is part of the FreedomLine system. This eliminates the need for clutch or linkage adjustments. The FreedomLine can be spec'd in either 12- or 16-speed configurations.

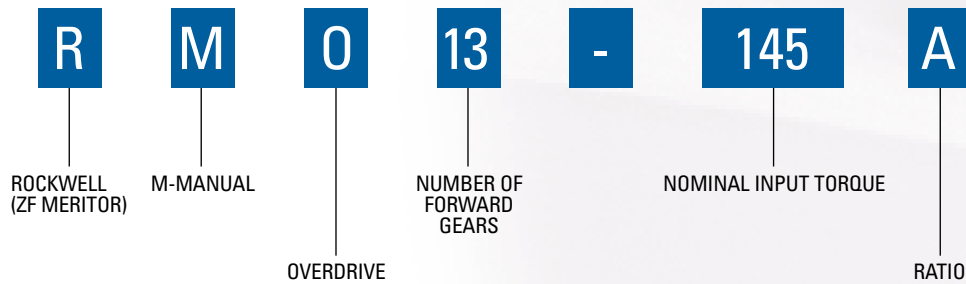


Nomenclature

9-, 10-, 12- and 16-Speed



13-Speed



*IN MODELS NOT FEATURING MULTI-TORQUE RATINGS, THIS NUMBER WILL BE THE SAME AS THE INPUT TORQUE RATING.

General Notes

Length – Listed lengths are installation dimensions from face of clutch housing to front bottoming surface of companion flange or yoke.

Oil Capacity – Oil capacities are approximate, depending on inclination of transmission. Always fill transmission to level of filler opening.

Lube Recommendation –

- For 9-, 10- and 13-speed transmissions, SAE 50 petroleum lubricant or SAE 50 synthetic base lubricant, which conforms to ZF Meritor Spec 0-81.
- For 12- and 16-speed transmissions, SAE 50 synthetic base lubricant, which conforms to ZF Meritor Spec 0-81.
- Refer to publication TP-90114 for more details. Extended warranty requires lubricants which meet Spec 0-81.

Oil Cooler – Requirements for 9-, 10-, and 13-speeds Required

- when transmissions are above 1,500 lb-ft
- when engine horsepower is 399 or greater
- when GCW exceeds 90,000 lbs.

Recommended

- when engine horsepower is 350 or greater

Shift Control Systems –

- A variety of shift lever configurations are available on all manual transmissions.
- Forward shift bar housings are available on all manual transmissions.
- On Sureshift and Freedomline transmissions, a seat-mounted shift system is available. Other configurations are available that are unique to an OEM. Contact your OEM for details.

End Yoke Compatibility

Transmission Model Series		Yoke Series
MO Series	9- and 10-Speeds	1710
RMX	13-Speeds	1760
		1810
		RPL20
		RPL25
		SPL170
		SPL250
MO Series	12- and 16-Speeds	1710
		1760
		1810
		RPL20
		RPL25

Clutch Housing for 9-, 10- and 13-Speed Transmissions

	Nodal	Non-Nodal
SAE#1	ALUM. 36 lbs. IRON 92 lbs.	ALUM. 23 lbs. IRON 76 lbs.
SAE#2	–	IRON 68 lbs.

Warranty Information

ZF Meritor transmissions are covered by an industry-competitive warranty. For complete details, refer to publication SP-95155.

10-Speed Manual

Transmission Description	Model Number	Torque Rating lb-ft	Overall Ratio		Rev. L	Rev. H	Ratio and Percent Step																		
			FWD.	REV.			1 %	2 %	3 %	4 %	5 %	6 %	7 %	8 %	9 %	10									
10-Speed Direct Drive, A Ratio	M-11G10A-M11	1,150																							
	M-12G10A-M12	1,250																							
	M-13G10A-M13	1,350	15.02	16.71	16.71	3.73	15.02	35	11.14	35	8.26	37	6.02	34	4.48	34	3.35	35	2.48	35	1.84	37	1.34	34	1.00
	M-14G10A-M14	1,450																							
	M-15G10A-M15	1,550																							
	M-14G10A-M16 ¹	1,450																							
10-Speed Overdrive, A Ratio	MO-11G10A-M11	1,150																							
	MO-12G10A-M12	1,250																							
	MO-13G10A-M13	1,350																							
	MO-14G10A-M14	1,450	15.02	16.71	12.45	2.78	11.19	35	8.30	35	6.15	37	4.48	34	3.34	34	2.50	35	1.85	35	1.37	37	1.00	34	0.74
	MO-15G10A-M15	1,550																							
	MO-14G10A-M16 ¹	1,450																							
	MO-16G10A-M16	1,650																							
MO-16G10A-M18 ¹	1,650																								
10-Speed Overdrive, C Ratio	MO-11G10C-M11	1,150																							
	MO-12G10C-M12	1,250																							
	MO-13G10C-M13	1,350																							
	MO-14G10C-M14	1,450																							
	MO-15G10C-M15	1,550																							
	MO-16G10C-M16	1,650	17.53	19.49	14.15	2.88	12.72	38	9.23	37	6.75	37	4.92	38	3.57	38	2.58	38	1.88	37	1.37	37	1.00	38	0.73
	MO-14G10C-M16 ¹	1,450																							
	MO-16G10C-M18	1,650																							
	MO-17G10C-M17	1,750																							
	MO-17G10C-M19	1,750																							
	MO-18G10C-M18	1,850																							
MO-18G10C-M20 ¹	1,850																								

¹ Other Torq-2 combinations are available, call your OEM representative for details.

10-Speed Manual — Additional Specifications

Model	Optional Internal Oil Pump	Oil Capacity (pints)	Length (inches)	Weight (lbs.*)	PTO Speed (% of engine)
M-11G10A-M11		20.5	29.5	605	75.8
M-12G10A-M12		20.5	29.5	605	75.8
M-13G10A-M13		20.5	29.5	605	75.8
M-14G10A-M14		20.5	29.5	605	75.8
M-15G10A-M15	STD.	20.5	29.5	608	75.8
M-14G10A-M16	STD.	20.5	29.5	608	75.8
MO-11G10A-M11		20.5	29.5	605	75.8
MO-12G10A-M12		20.5	29.5	605	75.8
MO-13G10A-M13		20.5	29.5	605	101.7
MO-14G10A-M14		20.5	29.5	605	101.7
MO-15G10A-M15	STD.	20.5	29.5	608	101.7
MO-14G10A-M16	STD.	20.5	29.5	608	101.7
MO-16G10A-M16	STD.	20.5	29.5	608	101.7
MO-16G10A-M18	STD.	20.5	29.5	608	101.7
MO-11G10C-M11		20.5	29.5	605	98.2
MO-12G10C-M12		20.5	29.5	605	98.2
MO-13G10C-M13		20.5	29.5	605	98.2
MO-14G10C-M14		20.5	29.5	605	98.2
MO-15G10C-M15	STD.	20.5	29.5	608	98.2
MO-16G10C-M16	STD.	20.5	29.5	608	98.2
MO-14G10C-M16	STD.	20.5	29.5	608	98.2
MO-16G10C-M18	STD.	20.5	29.5	608	98.2
MO-17G10C-M17	STD.	20.5	29.5	608	98.2
MO-17G10C-M19	STD.	20.5	29.5	608	98.2
MO-18G10C-M18	STD.	20.5	29.5	608	98.2
MO-18G10C-M20	STD.	20.5	29.5	608	98.2

*Weights are approximate, less clutch housing, shift controls, output yoke and lubricant.

SureShift™ Automated Transmissions (All J1939 Engines)

9-Speed SureShift

Transmission Description	Model Number	Torque Rating lb-ft	Overall Ratio		Rev. L	Rev. H	Ratio and Percent Step																	
			FWD.	REV.			L %	1 %	2 %	3 %	4 %	5 %	6 %	7 %	8									
9-Speed Direct Drive, A Ratio	M-11G9A-S11	1,150																						
	M-12G9A-S12	1,250																						
	M-13G9A-S13	1,350	13.41	13.17	13.17	3.73	13.41	48	9.05	39	6.51	37	4.74	34	3.53	38	2.56	39	1.84	37	1.34	34	1.00	
	M-14G9A-S14	1,450																						
	M-15G9A-S15	1,550																						
9-Speed Overdrive, A Ratio	MO-12G9A-S12	1,250																						
	MO-13G9A-S13	1,350	13.41	13.17	9.81	2.78	9.99	48	6.74	39	4.85	37	3.53	34	2.63	38	1.91	39	1.37	37	1.00	34	0.74	
	MO-14G9A-S14	1,450																						
9-Speed Overdrive, B Ratio	MO-11G9B-S11	1,150																						
	MO-12G9B-S12	1,250																						
	MO-13G9B-S13	1,350	17.74	17.42	12.60	3.24	12.83	67	7.69	40	5.48	41	3.89	38	2.81	42	1.98	40	1.41	41	1.00	38	0.72	
	MO-14G9B-S14	1,450																						
	MO-15G9B-S15	1,550																						

9-Speed SureShift — Additional Specifications

Model	Optional Internal Oil Pump	Oil Capacity (pints)	Length (inches)	Weight (lbs.*)	PTO Speed (% of engine)
M-11G9A-S11		20.5	29.5	620	75.8
M-12G9A-S12		20.5	29.5	620	75.8
M-13G9A-S13		20.5	29.5	620	75.8
M-14G9A-S14		20.5	29.5	620	75.8
M-15G9A-S15	STD.	20.5	29.5	623	75.8
MO-12G9A-S12		20.5	29.5	620	101.7
MO-13G9A-S13		20.5	29.5	620	101.7
MO-14G9A-S14		20.5	29.5	620	101.7
MO-11G9B-S11		20.5	29.5	620	87.1
MO-12G9B-S12		20.5	29.5	620	87.1
MO-13G9B-S13		20.5	29.5	620	87.1
MO-14G9B-S14		20.5	29.5	620	87.1
MO-15G9B-S15	STD.	20.5	29.5	623	87.1

*Weights are approximate, less clutch housing, shift controls, output yoke and lubricant.

10-Speed SureShift

Transmission Description	Model Number	Torque Rating lb-ft	Overall Ratio		Rev. L	Rev. H	Ratio and Percent Step																		
			FWD.	REV.			1 %	2 %	3 %	4 %	5 %	6 %	7 %	8 %	9 %	10									
10-Speed Direct Drive, A Ratio	M-11G10A-S11	1,150																							
	M-12G10A-S12	1,250																							
	M-13G10A-S13	1,350	15.02	16.71	16.71	3.73	15.02	35	11.14	35	8.26	37	6.02	34	4.48	34	3.35	35	2.48	35	1.84	37	1.34	34	1.00
	M-14G10A-S14	1,450																							
	M-15G10A-S15	1,550																							
	M-14G10A-S16 ¹	1,450																							
10-Speed Overdrive, A Ratio	MO-11G10A-S11	1,150																							
	MO-12G10A-S12	1,250																							
	MO-13G10A-S13	1,350																							
	MO-14G10A-S14	1,450	15.02	16.71	12.45	2.78	11.19	35	8.30	35	6.15	37	4.48	34	3.34	34	2.50	35	1.85	35	1.37	37	1.00	34	0.74
	MO-15G10A-S15	1,550																							
	MO-14G10A-S16 ¹	1,450																							
	MO-16G10A-S16	1,650																							
	MO-16G10A-S18 ¹	1,650																							
10-Speed Overdrive, C Ratio	MO-11G10C-S11	1,150																							
	MO-12G10C-S12	1,250																							
	MO-13G10C-S13	1,350																							
	MO-14G10C-S14	1,450																							
	MO-15G10C-S15	1,550	17.53	19.49	14.15	2.88	12.72	38	9.23	37	6.75	37	4.92	38	3.57	38	2.58	38	1.88	37	1.37	37	1.00	38	0.73
	MO-16G10C-S16	1,650																							
	MO-14G10C-S16 ¹	1,450																							
	MO-16G10C-S18 ¹	1,650																							
	MO-17G10C-S17	1,750																							
	MO-17G10C-S19	1,750																							
	MO-18G10C-S18	1,850																							
	MO-18G10C-S20 ¹	1,850																							

¹ Other Torq-2 combinations are available, call your OEM representative for details.

10-Speed SureShift — Additional Specifications

Model	Optional Internal Oil Pump	Oil Capacity (pints)	Length (inches)	Weight (lbs.*)	PTO Speed (% of engine)
M-11G10A-S11		20.5	29.9	620	75.8
M-12G10A-S12		20.5	29.9	620	75.8
M-13G10A-S13		20.5	29.5	620	75.8
M-14G10A-S14		20.5	29.5	620	75.8
M-15G10A-S15	STD.	20.5	29.5	623	75.8
M-14G10A-S16	STD.	20.5	29.5	623	75.8
MO-11G10A-S11		20.5	29.9	620	75.8
MO-12G10A-S12		20.5	29.9	620	75.8
MO-13G10A-S13		20.5	29.5	620	101.7
MO-14G10A-S14		20.5	29.5	620	101.7
MO-15G10A-S15	STD.	20.5	29.5	623	101.7
MO-14G10A-S16	STD.	20.5	29.5	623	101.7
MO-16G10A-S16	STD.	20.5	29.5	623	101.7
MO-16G10A-S18	STD.	20.5	29.5	623	101.7
MO-11G10C-S11		20.5	29.5	620	98.2
MO-12G10C-S12		20.5	29.5	620	98.2
MO-13G10C-S13		20.5	29.5	620	98.2
MO-14G10C-S14		20.5	29.5	620	98.2
MO-15G10C-S15	STD.	20.5	29.5	623	98.2
MO-16G10C-S16	STD.	20.5	29.5	623	98.2
MO-14G10C-S16	STD.	20.5	29.5	623	98.2
MO-16G10C-S18	STD.	20.5	29.5	623	98.2
MO-17G10C-S17	STD.	20.5	29.5	623	98.2
MO-17G10C-S19	STD.	20.5	29.5	623	98.2
MO-18G10C-S18	STD.	20.5	29.5	623	98.2
MO-18G10C-S20	STD.	20.5	29.5	623	98.2

*Weights are approximate, less clutch housing, shift controls, output yoke and lubricant.

FreedomLine™ Automated Transmissions

12-Speed FreedomLine

Transmission Description	Model Number	Torque Rating lb-ft	Overall Ratio		Rev. L	Rev. H	Ratio and Percent Step																						
			FWD.	REV.			1 %	2 %	3 %	4 %	5 %	6 %	7 %	8 %	9 %	10 %	11 %	12 %											
12-Speed Direct Drive	M-13Z12A-A13	1,350	15.86	14.68	14.68	11.41	15.86	29	12.33	29	9.57	29	7.44	27	5.87	28	4.57	32	3.47	28	2.70	29	2.10	29	1.63	26	1.29	29	1.00
	M-14Z12A-A14	1,450																											
12-Speed Overdrive	MO-13Z12A-A13	1,350																											
	MO-14Z12A-A14	1,450	15.81	14.62	11.41	8.88	12.33	29	9.59	29	7.44	29	5.78	26	4.57	29	3.55	31	2.70	29	2.10	29	1.63	28	1.27	27	1.00	28	.78
	MO-15Z12A-A15	1,550																											
	MO-16Z12A-A16	1,650																											

12-Speed FreedomLine — Additional Specifications

Model	Optional Internal Oil Pump	Oil Capacity (pints)	Length (inches)	Weight (lbs.*)
M-13Z12A-A13	STD.	23.25	31.7	565
M-14Z12A-A14	STD.	23.25	31.7	565
MO-14Z12A-A14	STD.	23.25	31.7	565
MO-15Z12A-A15	STD.	23.25	31.7	565
MO-16Z12A-A16	STD.	23.25	31.7	565

*Weights are approximate, less shift controls, output yoke and lubricant.

16-Speed FreedomLine

Transmission Description	Model Number	Torque Rating lb-ft	Overall Ratio		Rev. L	Rev. H	Ratio and Percent Step																														
			FWD.	REV.			1 %	2 %	3 %	4 %	5 %	6 %	7 %	8 %	9 %	10 %	11 %	12 %	13 %	14 %	15 %	16 %															
16-Speed Overdrive	MO-13Z16A-A13	1,350																																			
	MO-14Z16A-A14	1,450	17.01	15.75	13.07	10.81	14.12	21	11.68	22	9.54	21	7.89	21	6.52	21	5.39	18	4.57	21	3.78	22	3.09	21	2.56	22	2.09	21	1.73	21	1.43	21	1.18	18	1.00	20	0.83
	MO-15Z16A-A15	1,550																																			
	MO-16Z16A-A16	1,650																																			

16-Speed FreedomLine — Additional Specifications

Model	Optional Internal Oil Pump	Oil Capacity (pints)	Length (inches)	Weight (lbs.*)	PTO
MO-14Z16A-A14	STD.	25.0	33.4	604	Available
MO-15Z16A-A15	STD.	25.0	33.4	604	Available
MO-16Z16A-A16	STD.	25.0	33.4	604	Available

*Weights are approximate, less shift controls, output yoke and lubricant.

FREEDOMLINE™ TRANSMISSIONS

The Driver's Story

ZF Meritor's FreedomLine™ transmission helps drivers by enabling them to stay focused on the road and not on shifting. Physical effort is reduced with its "no clutch pedal" design. Drivers can choose between worry-free automatic or manual shifting with the FreedomLine lever. Drivers who use FreedomLine transmissions stay more alert throughout their driving day and enjoy a quieter ride because of the transmission's twin countershafts and full helical gearing. Every driver deserves a nice ride. Every driver deserves a little freedom on the road.

The Fleet's Story

Fleets are looking for reduced fuel costs, less maintenance and more drivers. ZF Meritor's FreedomLine transmission is designed to address these exact needs. In automatic mode, FreedomLine maximizes fuel economy by automatically recognizing the ideal points for making shifts, even allowing the transmission to skip up to four gears to ensure optimal shifting. It also weighs less — up to 132 pounds less than competitive transmissions — and lighter vehicles often use less fuel.

Because FreedomLine determines the proper starting gear and continues to select the proper gears for changing conditions, it prevents possible damage to the powertrain from over- or under-revving. Reduced wear and tear equals less time and money spent on maintenance and more time spent on the road.

Finally, FreedomLine's automated operation allows fleets to choose drivers from a wider pool of applicants. Eliminating the clutch pedal in the cab makes learning to drive a heavy vehicle easier. The least experienced drivers are able to shift as effortlessly as the most seasoned veteran with FreedomLine in automatic mode. Fleet training costs are also reduced, as drivers-in-training are able to perform routine vehicle operations earlier, and more safely.

The Bottom Line

No matter if you are a driver or a fleet manager, FreedomLine gives you the freedom you deserve.

"It makes for safer driving, since I'm not looking down to shift and taking my eyes off the road."

— 30-year Veteran Driver

"The FreedomLine promotes safer driving ... you just have to steer your vehicle and drive. It does the work for you."

— Driver

"Having the FreedomLine in my trucks will attract and keep my drivers."

— Fleet Owner

"We are always looking for technology that will improve our fuel savings. When we heard that FreedomLine would eliminate clutching and allow skip-shifts, we knew we had a winner."

— Fleet Owner

ArvinMeritor Customer Service is available 24 hours a day, to answer all your product and service questions. For more information, or to order product literature, call our Customer Service Center at 800-535-5560.

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ZF Meritor, LLC
22021 Skyway Church Road
Maxton, NC 28364 USA
800-535-5560
www.arvinmeritor.com



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Revised 2-02
SP-20189 (465089/29547)