

BROUGHT TO YOU BY PRO GEAR &
TRANSMISSION.

FOR PARTS OR SERVICE CALL:

877-776-4600

407-872-1901



WWW.PGTTRUCKPARTS.COM

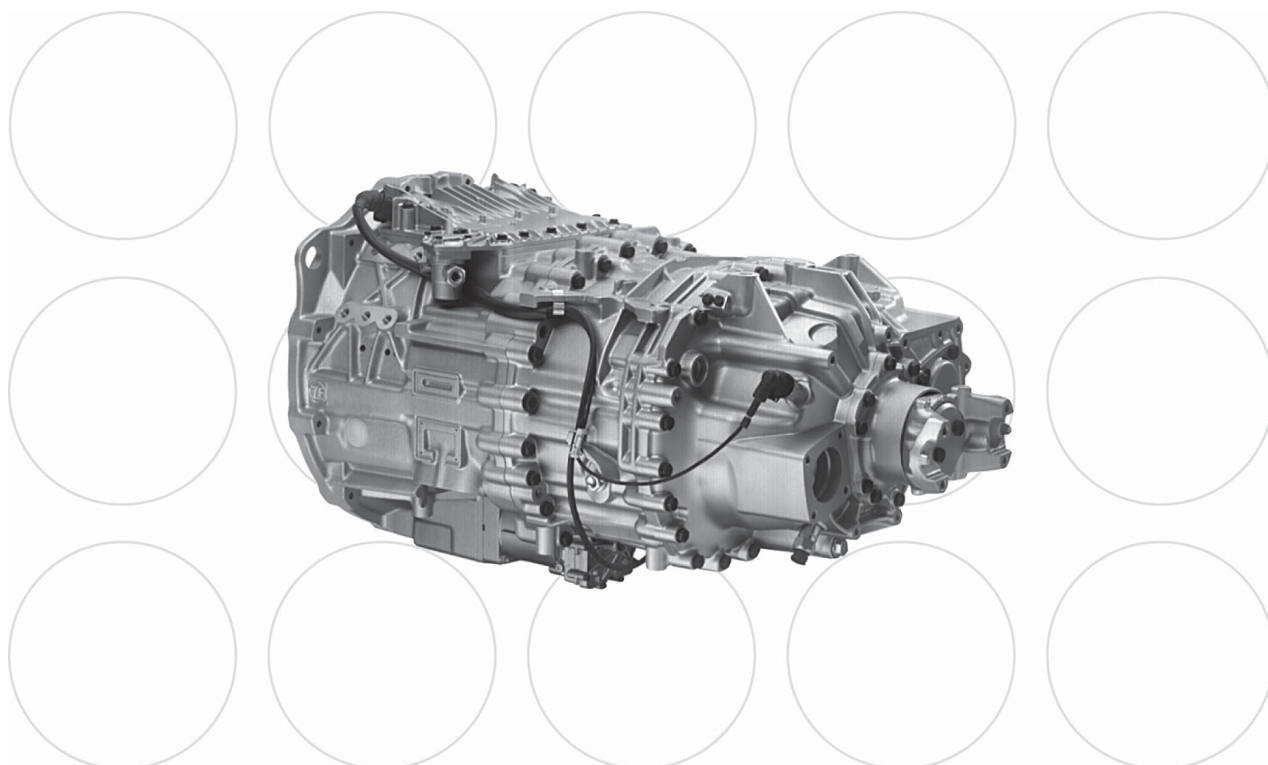
906 W. GORE ST. ORLANDO, FL 32805
PARTS@EPROGEAR.COM



Parts Book PB-0127

ZF-FreedomLine Transmission

Revised 03-2009



How to Use This Parts Book

This parts book contains information for ZF-FreedomLine transmission.

Each component table in this catalog contains the following information:

- ① Item..... The numbers in the Item column correspond to the numbers in the illustration that identify parts.
- ② Quantity (Qty.) The numbers in the Quantity column indicate the parts required in each component.
- ③ Aftermarket Designates the ArvinMeritor 's aftermarket part number.
- ④ ZF Friedrichshafen AG Part Number..... Designates the manufacturer's part number.
- ⑤ Description Designates the part name.

Transmission Case

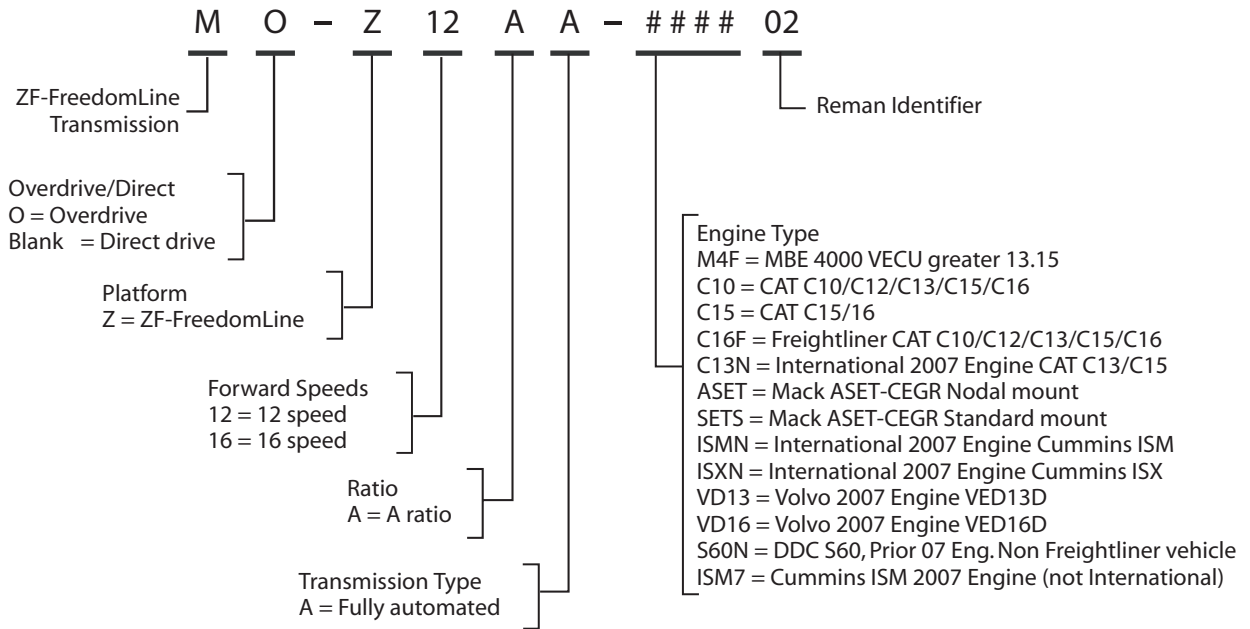
① Item	② Qty.	③ ArvinMeritor 's Aftermarket Part Number	④ ZF Friedrichshafen AG Part Number	⑤ Description
1	2	R970001	0768 409 063 01	Fill Plug Assembly
2	2	R970002	1328 301 047 01	Tag, Oil
3	2	R970003	0736 304 145 01	Plug, Fill
4	2	R970004	0730 008 637 01	Sealing Ring
5	2	—	—	Adaptor, Air Line
6	1	2297-Y-8293	2297-Y-8293 01	Tag, Transmission Serial Number
7	1	R970005	0768 409 499 01	Drain Plug Assembly
8	1	R970006	0736 305 070 01	Plug, Drain
9	1	R970004	0730 008 637 01	Sealing Ring

Table of Contents

How to Use This Parts Book	inside cover
Transmission Case	inside cover
Model Nomenclature	1
12-Speed ZF-FreedomLine Transmission	2
16-Speed ZF-FreedomLine Transmission	2
ZF-FreedomLine Transmission Reman Quick Reference	2
ZF-FreedomLine Transmission TCU Quick Reference	3
Main Case	4
Transmission Case	4
Transmission Sensors	5
Driveline and Output Shaft Seal	6
Clutch Release	7
Clutch Release Assembly	8
Controls	9
Shift Lever	9
Configuration 1 – Kenworth, International	10
Configuration 2 – Peterbilt	11
Configuration 4 – Volvo	12
Configuration 5 – Freightliner	13
Configuration 6 – Mack	14
Configuration 7, 2007 Engine International Only (Pre 2007 Eng. Intern. See config 1)	15
Transmission Controller Unit (TCU)	16
Transmission Controller Unit (TCU) <i>Complete Unit!</i>	17
Transmission Controller Unit (TCU) Non warranty repair Kits.	19
Transmission Controller Unit (TCU) <i>Top half only!</i> Kit includes gasket, O-ring and 2 screws.	21
Display Gauge	23
Oil Cooler	24
Oil Cooler and Bypass Valve	24
Clutch	25
Clutch Assembly	25
Labels	26
Label Freightliner Only	26
Label Volvo/Mack Only	26
Label Peterbilt, Kenworth and International	27
Label „Warning“ Language English	27
Label „Warning“ Language French	28

Notes

ZF-FreedomLine Transmission Aftermarket Part Numbers



4004246b

Model Nomenclature

12-Speed ZF-FreedomLine Transmission

Transmission Type	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 M-14Z12A-A14	1,350 1,450	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	11.29	29	1.00
12-Speed Overdrive	MO-13Z12A-A13 MO-14Z12A-A14 MO-15Z12A-A15 MO-16Z12A-A16	1,350 1,450 1,550 1,650	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	1.68	28	1.27	27	1.00	28	0.78

16-Speed ZF-FreedomLine Transmission

Transmission Type	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 MO-14Z16A-A14 MO-15Z16A-A15 MO-16Z16A-A16	1,350 1,450 1,550 1,650	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

ZF-FreedomLine Transmission Reman Quick Reference

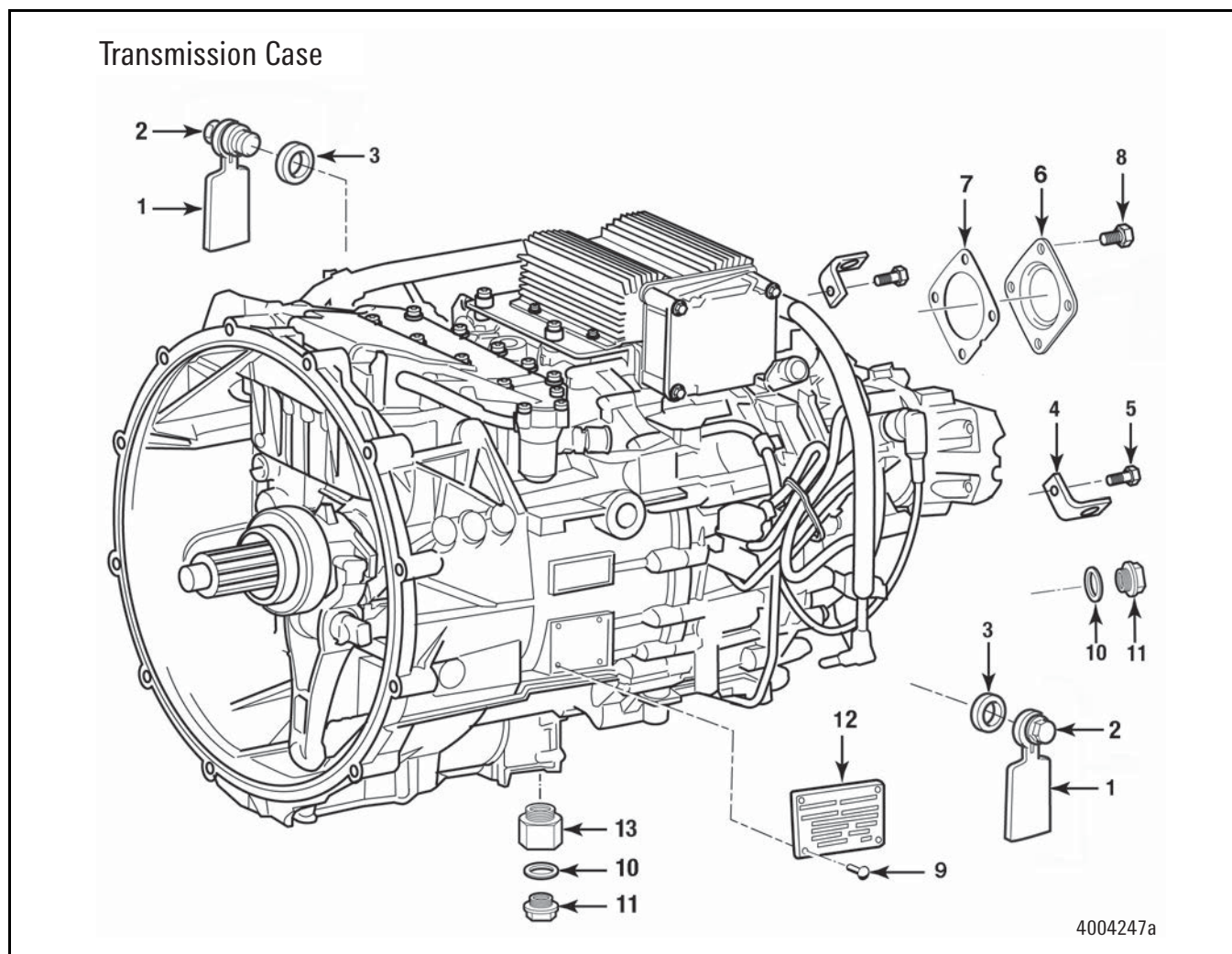
Engine Type: Only Compatible with Pre 2007 Emissions											
	Freightliner only	Freightliner only	Freightliner only	Freightliner only	Freightliner only				Volvo only	Volvo only	Volvo/Mack only
Transmission Type	Detroit Diesel Series 60	Mercedes Benz MBE4000 with an exhaust brake prior to VECU 13.15	Mercedes Benz MBE4000 with a turbo brake prior to VECU 13.15	Mercedes Benz MBE4000	Requires VECU 13.15 or later	Caterpillar C10/C12/C13/C15/C16	Caterpillar C10/C12/C13/C15/C16	Cummins ISM	Cummins ISX without a Volvo VECU	Cummins ISX with a Volvo VECU	Mack ASET-CEGR
12-Speed Direct Drive	MZ126 DS6002	MZ126 DMEB02	MZ126 DMTB02	MZ126 DM4F02	MZ126 DC16F02	MZ126 DC1002	MZ126 DISM02	MZ126 DISX02	N/A	MZ126 DVED02	MZ126 DASET02
12-Speed Overdrive	MOZ126 DS6002	MOZ126 DMEB02	MOZ126 DMTB02	MOZ126 DM4F02	MOZ126 DC16F02	see table below	MOZ126 DISM02	see table below	see table below	MOZ126 DVED02	MOZ126DASET02 (Nodal Mgt) MOZ12AASETS 02 (Standard Mgt)
16-Speed Overdrive	MOZ166 DS6002	MOZ166 DMEB02	MOZ166 DMTB02	MOZ166 DM4F02	MOZ166 DC16F02	MOZ166 DC1002	N/A	MOZ166 DISX02	MOZ166 DSXE02	MOZ166 DVED02	N/A

Engine Type: Compatible with 2007 and Pre 2007 Emissions											
	International with 2007 Emmissions Eng. only	International with 2007 Emmissions Eng. only	International with 2007 Emmissions Eng. only						Volvo only	Volvo only with 2007 Emmissions Eng. only	Volvo only with 2007 Emmissions Eng. only
Transmission Type	Caterpillar C13/C15	Cummins ISM	Cummins ISX			Caterpillar C10/C12/C13/C15/C16		Cummins ISX without a Volvo VECU	Cummins ISX with a Volvo VECU	Volvo VED13D	Volvo VED16D
12-Speed Overdrive	MOZ126 DC13N02	MOZ126 DISMN02	MOZ126 DISXN02			MOZ126 DC1002		MOZ126 DISX02	MOZ126 DSXE02	MOZ126 DVD1302	MOZ126 DVD1602

ZF-FreedomLine Transmission TCU Quick Reference

Engine Type: Only Compatible with <i>Pre 2007</i> Emissions											
	Freightliner only	Freightliner only	Freightliner only	Freightliner only	Freightliner only				Volvo only	Volvo only	Volvo/Mack only
Transmission Type	Detroit Diesel Series 60	Mercedes Benz MBE4000 with an exhaust brake prior to VECU 13.15	Mercedes Benz MBE4000 with a turbo brake prior to VECU 13.15	Mercedes Benz MBE4000 Requires VECU 13.15 or later	Caterpillar C10/C12/C13/C15/C16	Caterpillar C10/C12/C13/C15/C16	Cummins ISM	Cummins ISX without a Volvo VECU	Cummins ISX with a Volvo VECU	Volvo VED12D/VED16	Mack ASET-CEGR
12-Speed Direct Drive	6009 V74 134 01	6009 V74 136 01	6009 V74 137 01	6009 V74 135 01	6009 V74 131 01	6009 V74 130 01	6009 V74 132 01	6009 V74 133 01	N/A	6009 V74 138 01	N/A
12-Speed Overdrive	6009 V74 148 01	6009 V74 151 01	6009 V74 152 01	6009 V74 150 01	6009 V74 139 01	see table below	6009 V74 143 01	see table below	see table below	6009 V74 154 01	6009 V74 149 01
16-Speed Overdrive	6009 V74 160 01	6009 V74 162 01	6009 V74 163 01	6009 V74 161 01	6009 V74 156 01	6009 V74 157 01	N/A	6009 V74 158 01	6009 V74 159 01	6009 V74 164 01	N/A

Engine Type: Compatible with <i>2007 and Pre 2007</i> Emissions											
	International only	International only	International only						Volvo only	Volvo only	Volvo only
Transmission Type	Caterpillar C13/C15	Cummins ISM (J1939: Shifter & Display)	Cummins ISX (J1939: Shifter & Display)			Caterpillar C10/C12/C13/C15/C16	Cummins ISM	Cummins ISX without a Volvo VECU	Cummins ISX with a Volvo VECU	Volvo VED13D	Volvo VED16
12-Speed Overdrive	6009 V74 141 01	6009 V74 144 01	6009 V74 145 01			6009 V74 140 01	6009 V74 142 01	6009 V74 146 01	6009 V74 147 01	6009 V74 153 01	6009 V74 155 01



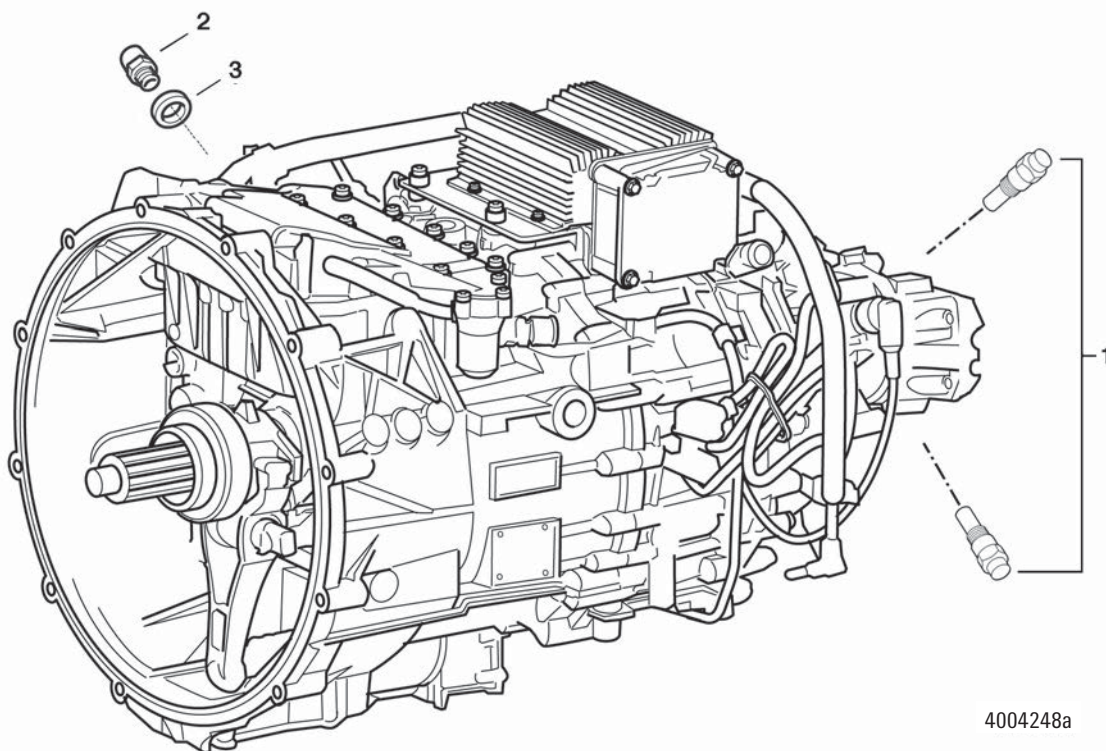
Transmission Case

Item	Quantity	Part Number	ZF Part Number	Description
1	2	—	1328 301 047 01	Plate
2	2	—	0736 304 145 01	Screw plug (See note below for additional info)
3	2	—	0730 008 637 01	Sealing ring
4	2	2297G8301	1338 390 015 01	Lifting hook
5	2	0636 011 335	0636 011 335 01	M12*35 bolt — lifting hook to housing
6	1	3266R1474	1304 301 034 01	PTO cover
7	1	—	1238 308 201 01	Gasket
8	4	0636 011 335	0636 011 335 01	M12*35 bolt — PTO cover to case
9	4	—	0731 101 047 01	Rivets
10	2	0730 008 637	0730 008 637 01	Sealing ring
11	2	0736 305 070	0736 305 070 01	M24*1.5 drain plug (See note below for additional info)
12	1	22978293	0730 365 147 01	Transmission identification tag
13	1	A 3268T1814	0501 321 504 01	M24*1.5 1/2 — 14 NPFT adapter, oil temp sensor

NOTE:

Service solution for stripped drain or fill plug. 0736 303 025 01 Tapered fill plug. 0736 305 016 01 Tapered drain plug with magnet. Torque at 44 lb-ft!

Transmission Sensors

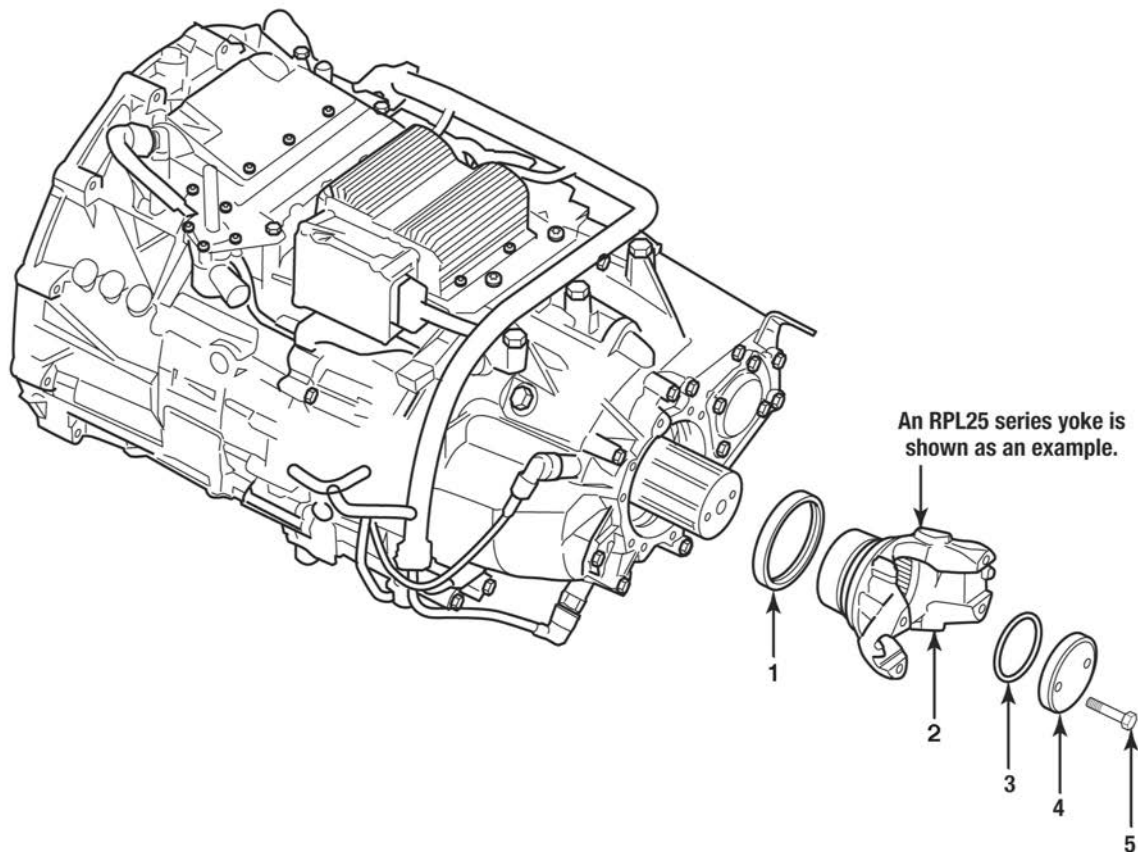


4004248a

Transmission Sensors

Item	Quantity	Part Number	ZF Part Number	Description
1	2	0501 210 859	0501 210 859 01	Output shaft speed sensor
2	1	—	1328 298 007 01	Neutral switch kit
3	1	—	1328 306 024 01	Neutral switch pin

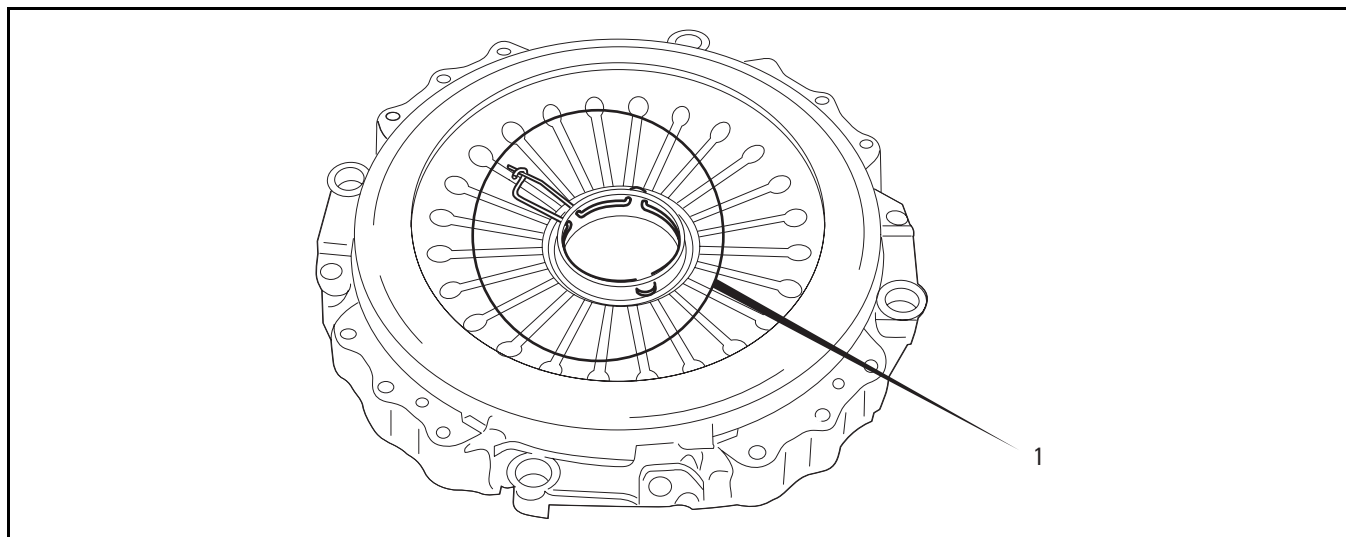
Driveline and Output Shaft Seal



4004369a

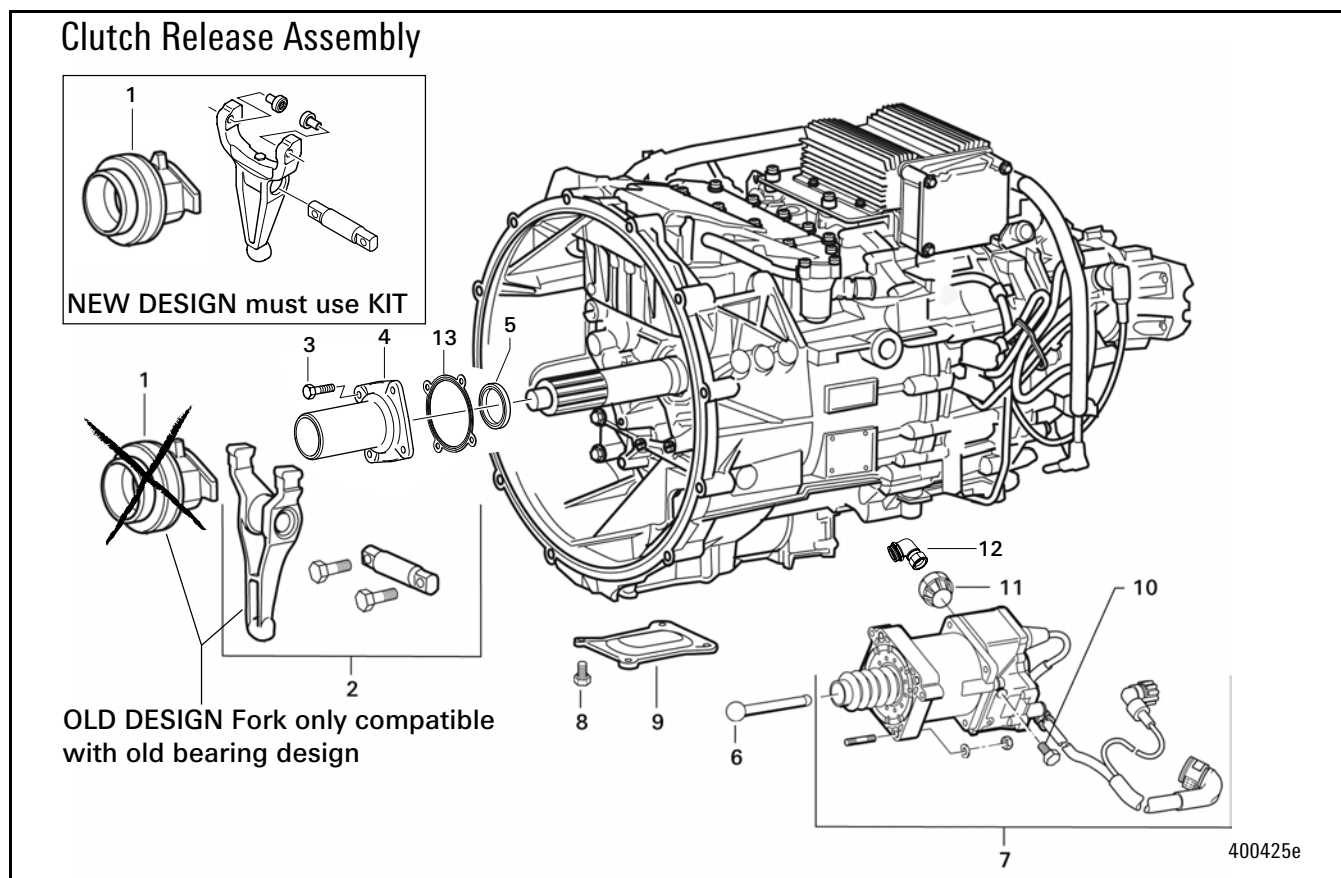
Driveline and Output Shaft Seal

Item	Quantity	Part Number	ZF Part Number	Description
1	1	0734 319 459	0734 319 459 01	Output shaft seal
2	1	176TYS57-1	0501 320 467 01	176T series 1/2 round yoke
2	1	176NYS57-1	0501 321 503 01	1760 series, Full round yoke
2	1	18NYS57-1	0501 321 467 01	18N series full round yoke
2	1	0501 319 866	1348 322 001 01	18T series 1/2 round yoke
2	1	1314 332 054	1314 332 054 01	Output Flange — European Style
2	1	20WYS57-1	0501 321 466 01	RPL20 series yoke
2	1	25WYS57-1	0501 321 464 01	RPL25 series yoke
2	1	250-4-921-1	2504921101	SPL250 series yoke
2	1	170-4-1761-1	17041761101	SPL170 series yoke
3	1	0634 313 805	0634 313 805 01	Yoke retaining plate O-ring
4	1	1312 332 028	1312 332 028 01	Yoke retaining plate
5	2	0636 011 540	0636 011 540 01	M12*60 bolt, yoke retaining plate to output shaft



Clutch release

Item	Quantity	Part Number	ZF Part Number	Description
1	1		3475 000 008 01	Clutch retaining ring

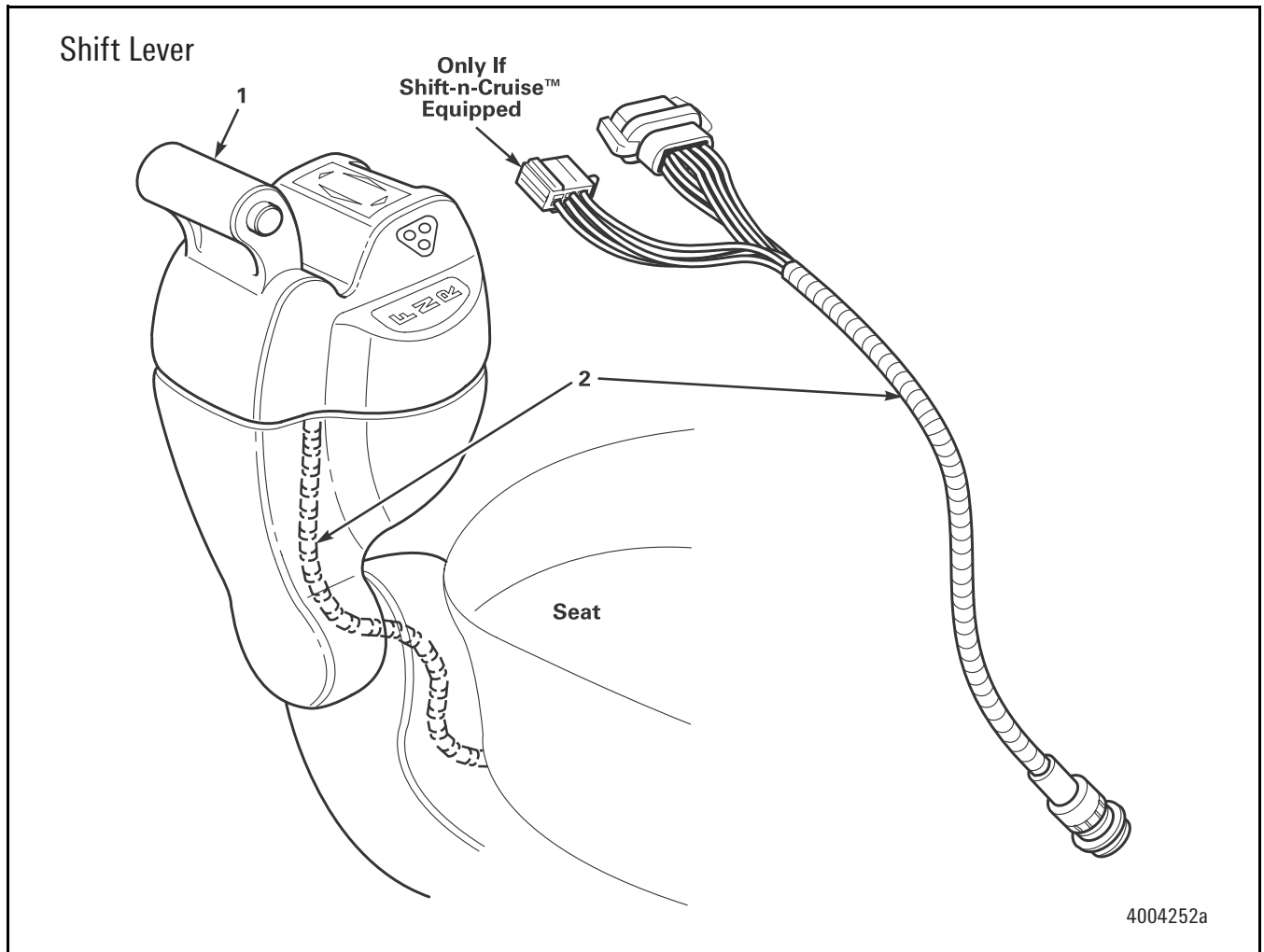


Clutch Release Assembly

Item	Quantity	OEM	Part Number	ZF Part Number	Description
1	1		—	1328 298 008 01	Release bearing and Roller fork kit
1	1		—	0501 215 566 01	Bearing only
1	1		—	1328 268 011 01	Roller Fork only
2	1		—	1328 298 004 01	Release fork kit
3	4		0636 015 257	0636 015 257 01	M8*25 bolt, quill tube to front cover
4	1		1314 302 096	1314 302 096 01	Quill tube
5	1		0750 111 348	0750 111 348 01	Input shaft seal
6	1		1328 368 009	1328 368 009 01	Clutch actuator rod (all engines except the MBE 4000 and Mack/Volvo)
6	1		1328 368 004	1328 368 004 01	Clutch actuator rod (MBE 4000, Mack, Volvo engines only)
7	1		—	1328 298 010 01	Clutch Actuator Kit
8	4		0636 015 299	0636 015 299 01	Inspection cover bolt
9	1		1328 301 008	1328 301 008 01	Inspection cover
10	1		0636 305 072	0636 305 072 01	Screw plug
10	1		0634 801 205	0634 801 205 01	Sealing ring
11	1		0501 322 365	0501 322 365 01	Clutch Actuator filter
12	1	Kenworth	A 3268P1810	0501 321 507 01	Air fittings (90 Degree Quick Disconnect)
12	1	International	2206L1442	0501 321 489 01	Air fittings (90 Degree Quick Disconnect)
12	1	Mack	2206L1442	0501 321 489 01	Air fittings (90 Degree Quick Disconnect)
12	1		OEM supply	OEM supply	Freightliner, Peterbilt, Volvo
13				0501 321 451 01	Gasket*

Note New Design: When changing the release bearing, all parts in the kit 1328 298 008 01 must be used. The part 1328 298 004 01 (old design) is not compatible with the bearing 1328 298 008 01 kit.

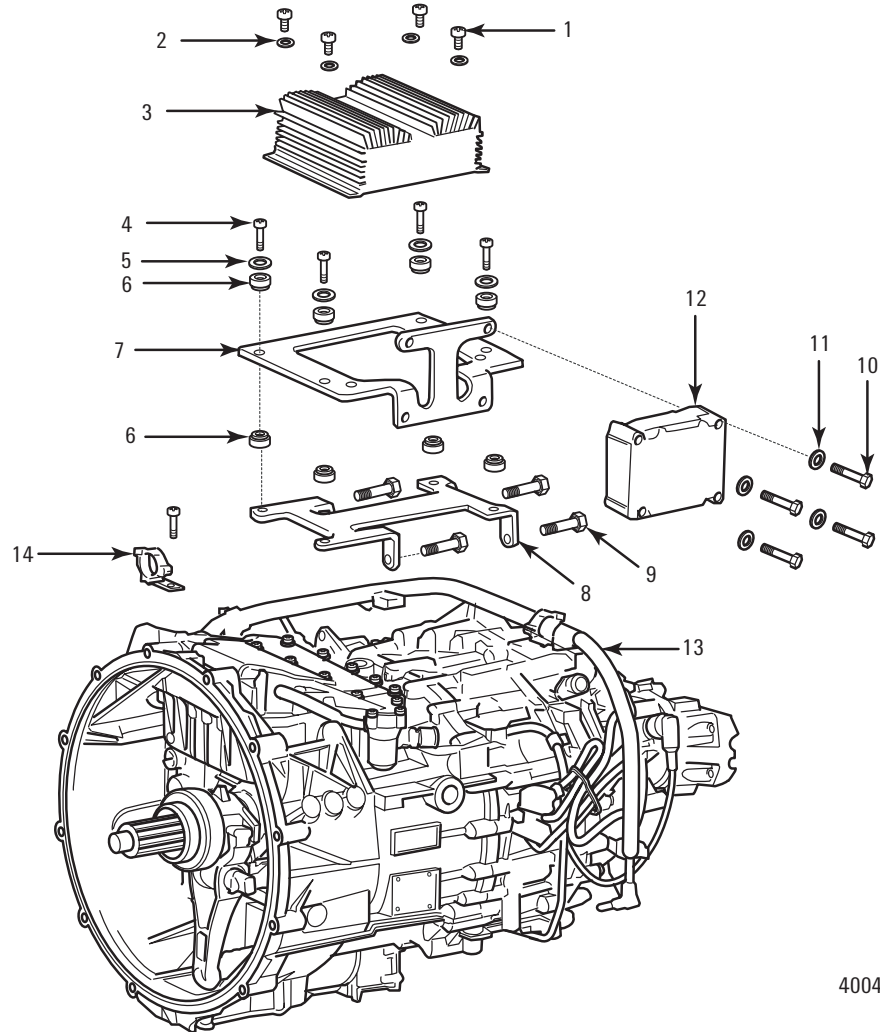
* This gasket is made of metal and can thus be used more than once.



Shift Lever

Item	Quantity	Part Number	ZF Part Number	Description
1	1	A 2297E8273	1338 390 027 01	Shift lever assembly with Shift-n-Cruise™
1	1	A 2297P8284	1338 390 021 01	Shift lever assembly without Shift-n-Cruise™
2	1	A 2297T8288	1338 290 003 01	Seat mounted shift lever harness with Shift-n-Cruise™
2	1	A 2297U8289	1338 290 004 01	Seat mounted shift lever harness without Shift-n-Cruise™

Configuration 1, Kenworth, Pre 2007 Engine International Only

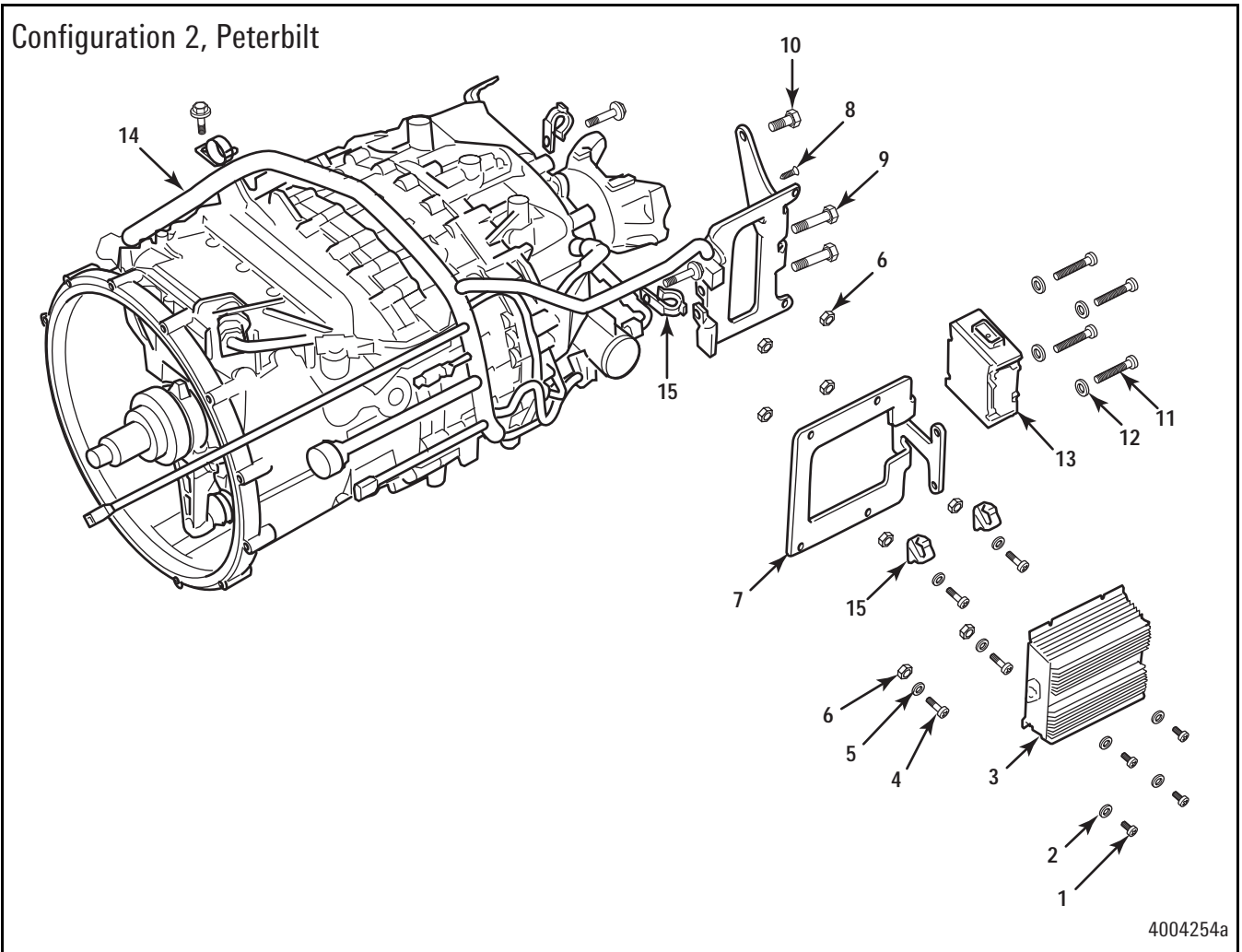


4004253a

Configuration 1, Kenworth, Pre 2007 Engine International Only (2007 Eng. Intern. See config 7)

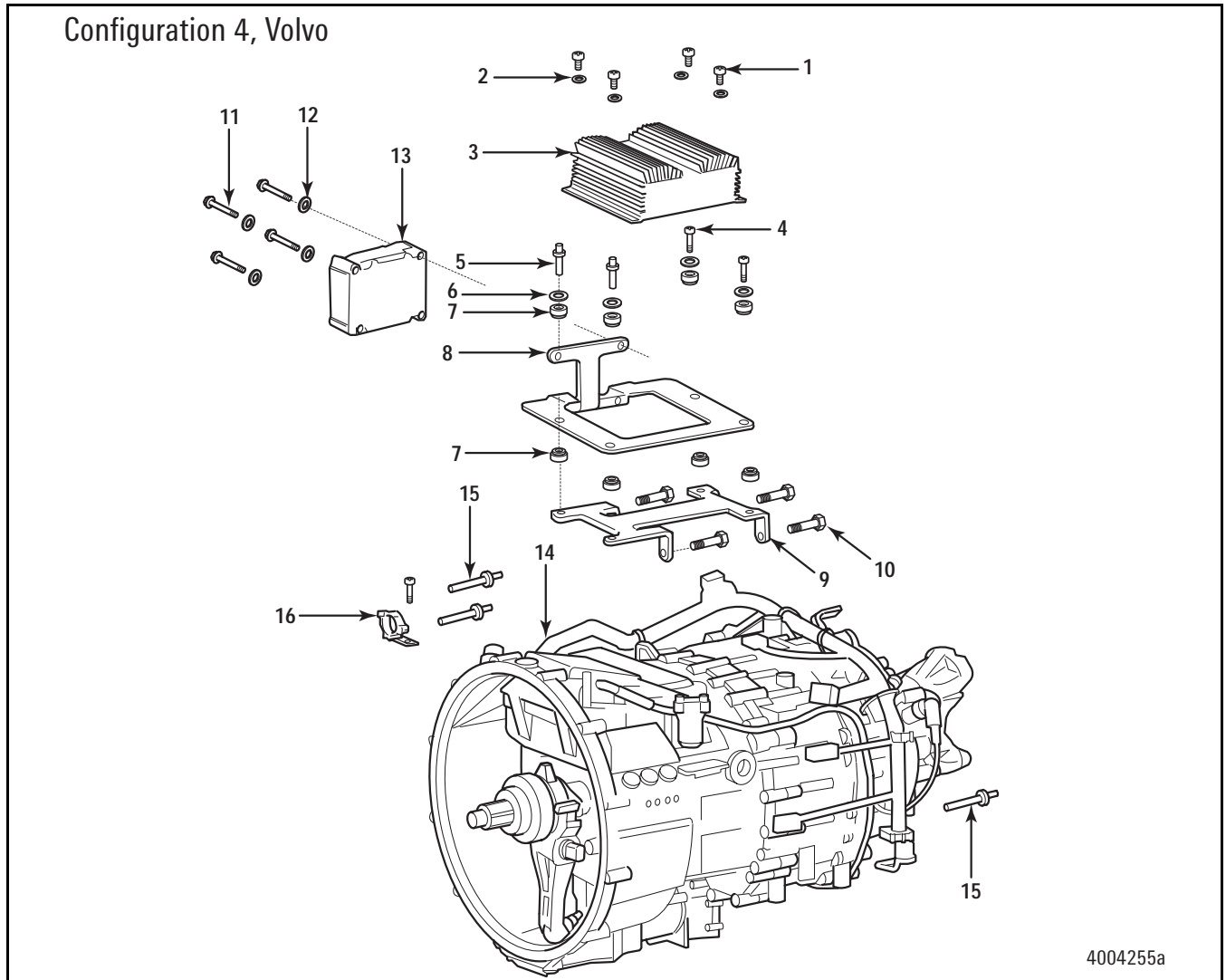
Item	Quantity	Part Number	ZF Part Number	Description
1	4	S244A1	0501 321 516 01	1/4 - 20 bolt, Voltage doubler to top accessory plate
2	8	WA34	0501 321 518 01	1/4 washer, Voltage doubler to top accessory plate
3	1	1338 290 010 01	1338 390 054 01	Voltage doubler
4	4	15X1812	1338 390 018 01	5/16 - 18 bolt, top accessory to bottom accessory bracket
5	4	1229B1666	0501 321 510 01	5/16 washer
6	8	1225F1306	1338 390 017 01	Isolator bushings
7	1	3305A1457	1338 390 001 01	Top accessory bracket, 12 & 16 speed
8	1	3305D1460	1338 390 004 01	Bottom accessory bracket, 12 speed
8	1	3305C1459	1338 390 003 01	Bottom accessory bracket, 16 speed
9	6	0636 015 601	0636 015 601 01	M10*65 bolt
10	4	S2422A2	0501 321 515 01	1/4 - 20 bolt, ZMTEC to top accessory plate
11	8	WA34	0501 321 518 01	1/4 washer, ZMTEC to top accessory plate
12	1	R970036	1338 390 036 01	ZMTEC KIT (ZF-FreedomLine Transmission Electronic Controller)
13	1	A 2297A8295	1338 290 002 01	Wire harness
14	4	A 2257C1277	0501 321 501 01	Wire harness clip

Configuration 2, Peterbilt



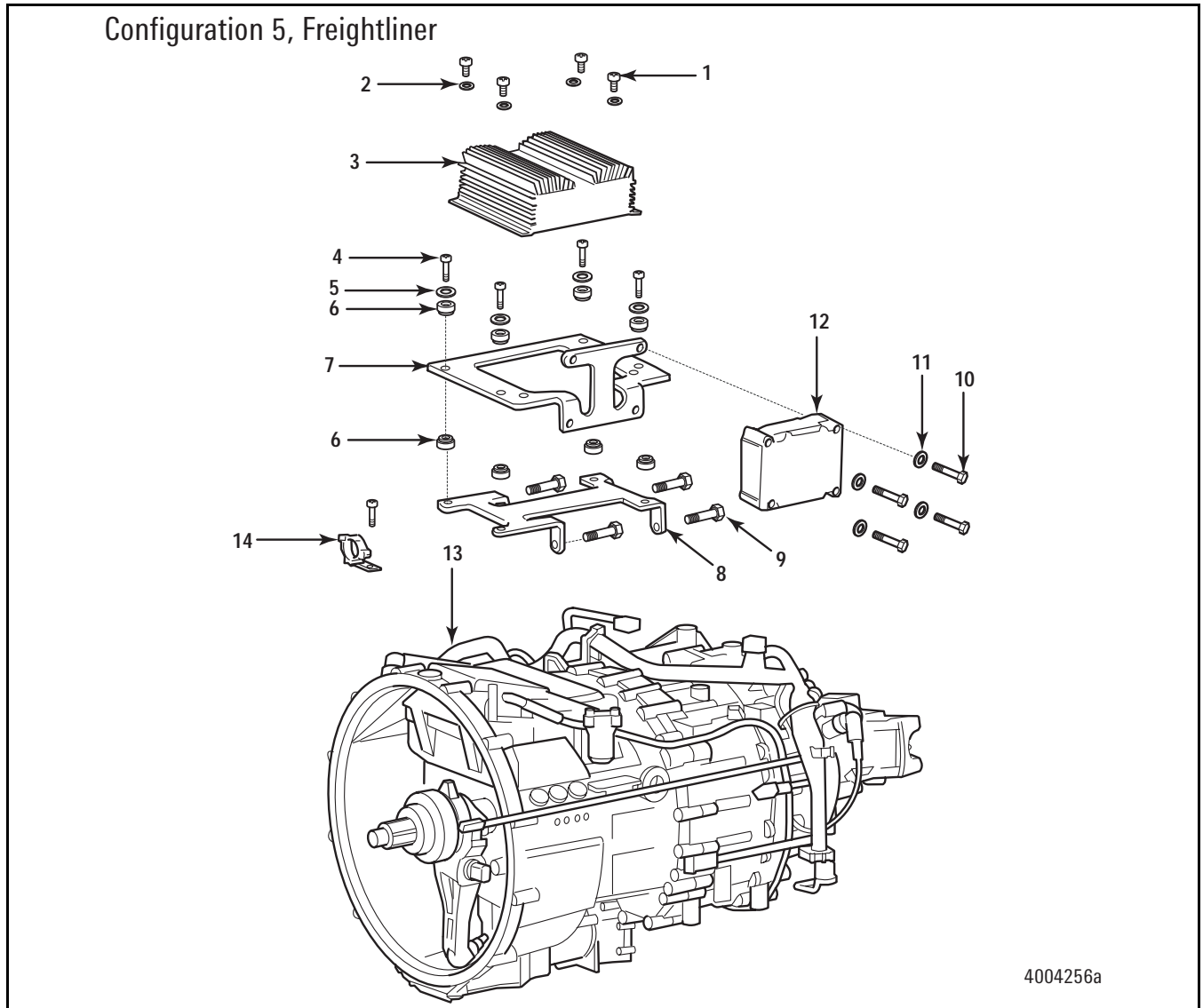
Configuration 2 – Peterbilt

Item	Quantity	Part Number	ZF Part Number	Description
1	4	S244A1	0501 321 516 01	1/4 - 20 bolt, Voltage doubler to top accessory plate
2	8	WA34	0501 321 518 01	1/4 washer, Voltage doubler to top accessory plate
3	1	1338 290 010 01	1338 390 054 01	Voltage doubler
4	4	15X1812	1338 390 018 01	5116 - 18 bolt, top accessory to bottom accessory bracket
5	4	1229B1666	0501 321 510 01	5/16 washer
6	8	1225F1306	1338 390 017 01	Isolator bushings
7	1	3305A1457	1338 390 001 01	Top accessory bracket, 12 & 16 speed
8	1	3305N1548	1338 390 006 01	Bottom accessory bracket (S/N LB03043343 and greater)
9	6	0636 015 601	0636 015 601 01	M10*65 bolt
10	1	0636 011 335	0636 011 335 01	M12*35 bolt
11	4	S2422A2	0501 321 515 01	1/4 - 20 bolt, ZMTEC to top accessory plate
12	8	WA34	0501 321 518 01	1/4 washer, ZMTEC to top accessory plate
13	1	R970036	1338 390 036 01	ZMTEC KIT (ZF-FreedomLine Transmission Electronic Controller)
14	1	A 2297X8266	1338 290 001 01	Wire harness
15	5	A 2257C1277	0501 321 501 01	Wire harness clip



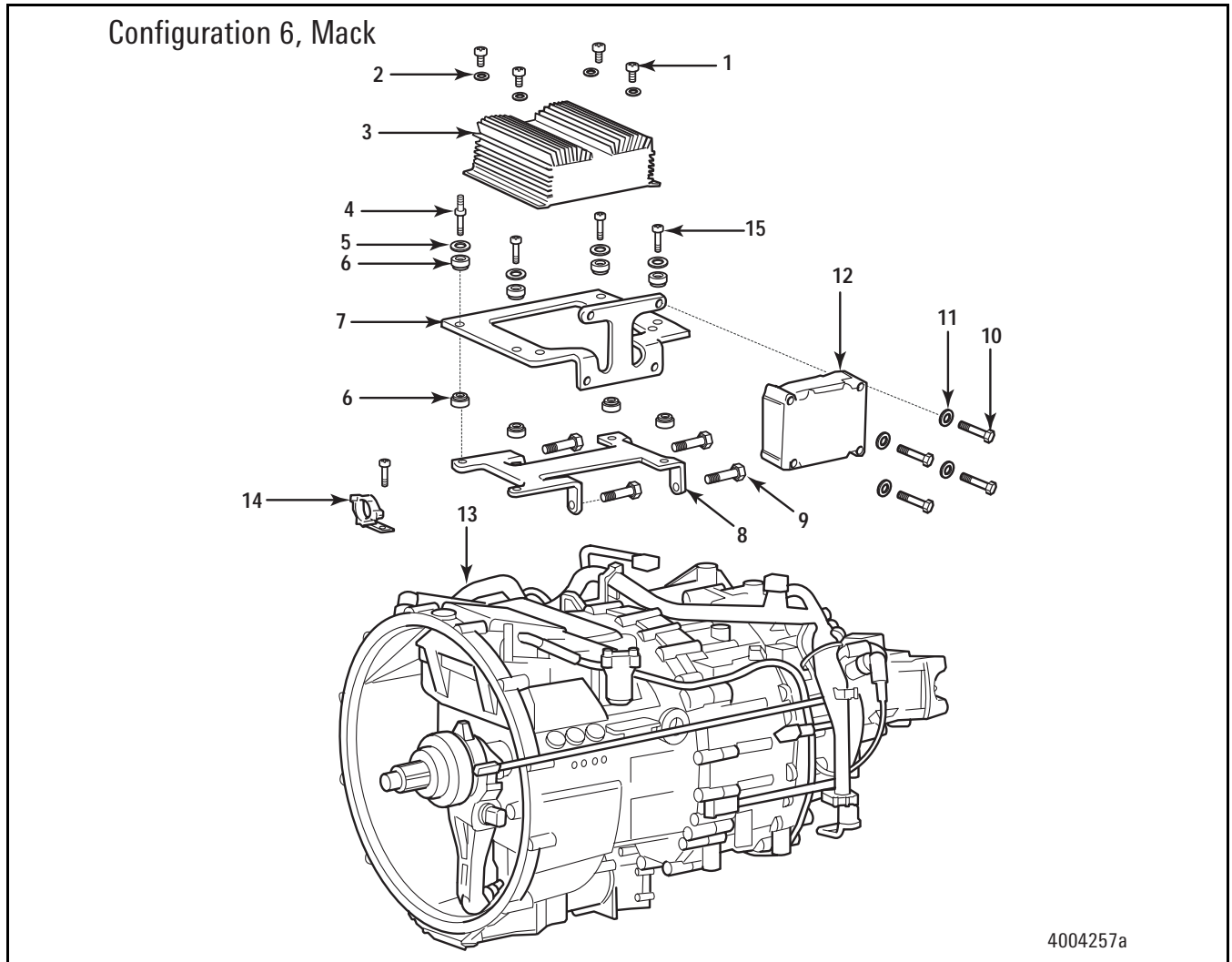
Configuration 4 – Volvo

Item	Quantity	Part Number	ZF Part Number	Description
1	4	S244A1	0501 321 516 01	1/4 - 20 bolt, Voltage doubler to top accessory plate
2	8	WA34	0501 321 518 01	1/4 washer, Voltage doubler to top accessory plate
3	1	1338 290 010 01	1338 390 054 01	Voltage doubler
4	2	15X1812	1338 390 018 01	5/16 - 18 bolt, top accessory to bottom accessory bracket
5	2	4X1909	1338 390 012 01	5/16 - 18 M8*16 stud, top accessory to bottom accessory bracket
6	4	1229B1666	0501 321 510 01	5/16 washer
7	8	1225F1306	1338 390 017 01	Isolator bushings
8	1	3305X1636	1338 390 007 01	Top accessory bracket, 12 & 16 speed
9	1	3305D1460	1338 390 004 01	Bottom accessory bracket, 12 speed
9	1	3305C1459	1338 390 003 01	Bottom accessory bracket, 16 speed
10	6	0636 015 601	0636 015 601 01	M10*65 bolt
11	4	S2422A2	0501 321 515 01	1/4 - 20 bolt, ZMTEC to top accessory plate
12	8	WA34	0501 321 518 01	1/4 washer, ZMTEC to top accessory plate
13	1	R970036	1338 390 036 01	ZMTEC KIT (ZF-FreedomLine Transmission Electronic Controller)
14	1	A 2297U8419	1338 290 005 01	Wire harness
15	3	4X1910	1338 390 010 01	Stud — Special
16	1	A 2257C1277	0501 321 501 01	Wire harness clip



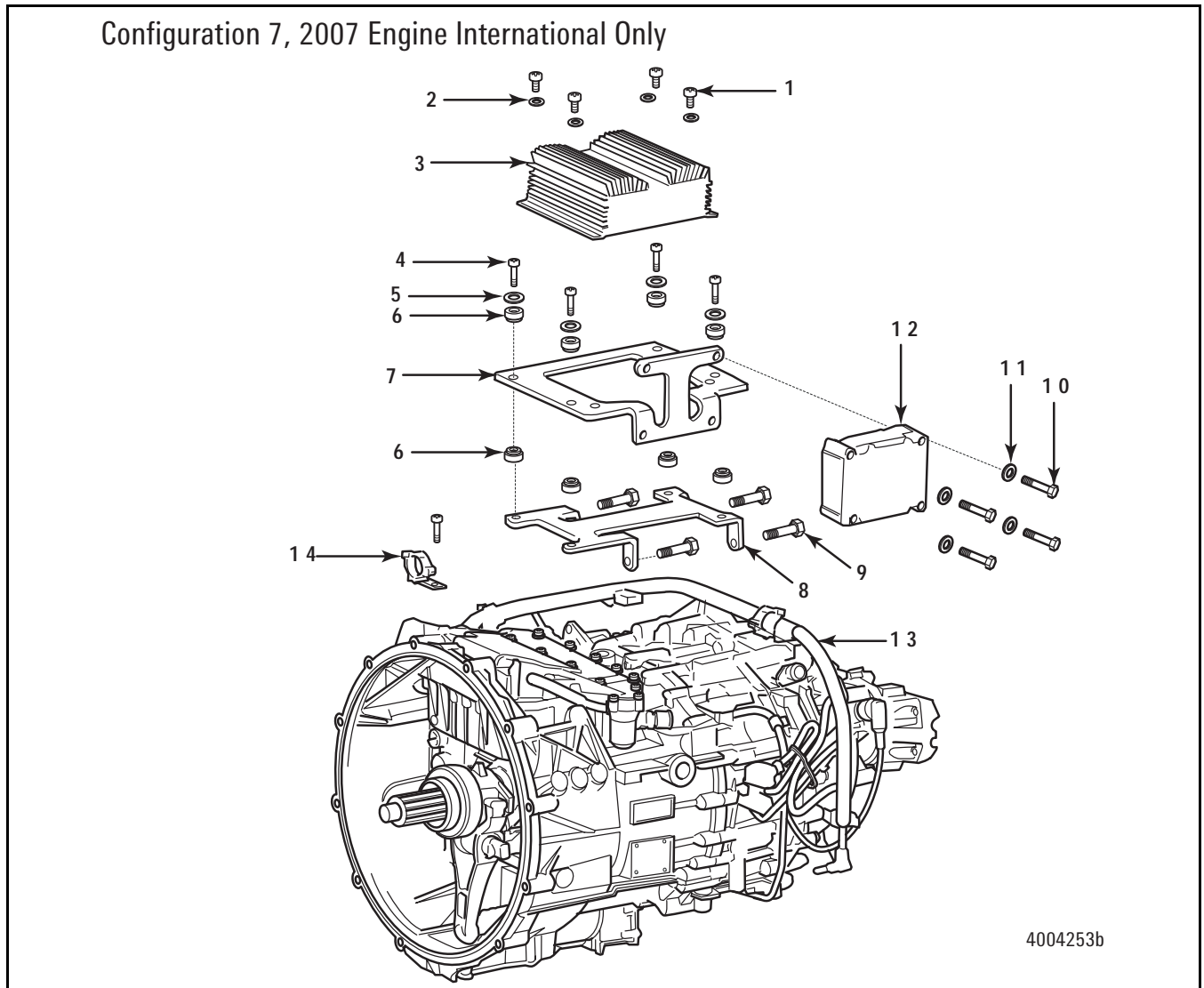
Configuration 5 – Freightliner

Item	Quantity	Part Number	ZF Part Number	Description
1	4	S244A1	0501 321 516 01	1/4 - 20 bolt, Voltage doubler to top accessory plate
2	8	WA34	0501 321 518 01	1/4 washer, Voltage doubler to top accessory plate
3	1	1338 290 010 01	1338 390 054 01	Voltage doubler
4	4	15X1812	1338 390 018 01	5/16 - 18 bolt, top accessory to bottom accessory bracket
5	4	1229B1666	0501 321 510 01	5/16 washer
6	8	1225F1306	1338 390 017 01	Isolator bushings
7	1	3305A1457	1338 390 001 01	Top accessory bracket, 12 & 16 speed
8	1	3305D1460	1338 390 004 01	Bottom accessory bracket, 12 speed
8	1	3305C1459	1338 390 003 01	Bottom accessory bracket, 16 speed
9	6	0636 015 601	0636 015 601 01	M10*65 bolt
10	4	S2422A2	0501 321 515 01	1/4 - 20 bolt, ZMTEC to top accessory plate
11	8	WA34	0501 321 518 01	1/4 washer, ZMTEC to top accessory plate
12	1	R970036	1338 390 036 01	ZMTEC KIT (ZF-FreedomLine Transmission Electronic Controller)
13	1	A 2297A8295	1338 290 002 01	Wire harness
14	5	A 2257C1277	0501 321 501 01	Wire harness clip



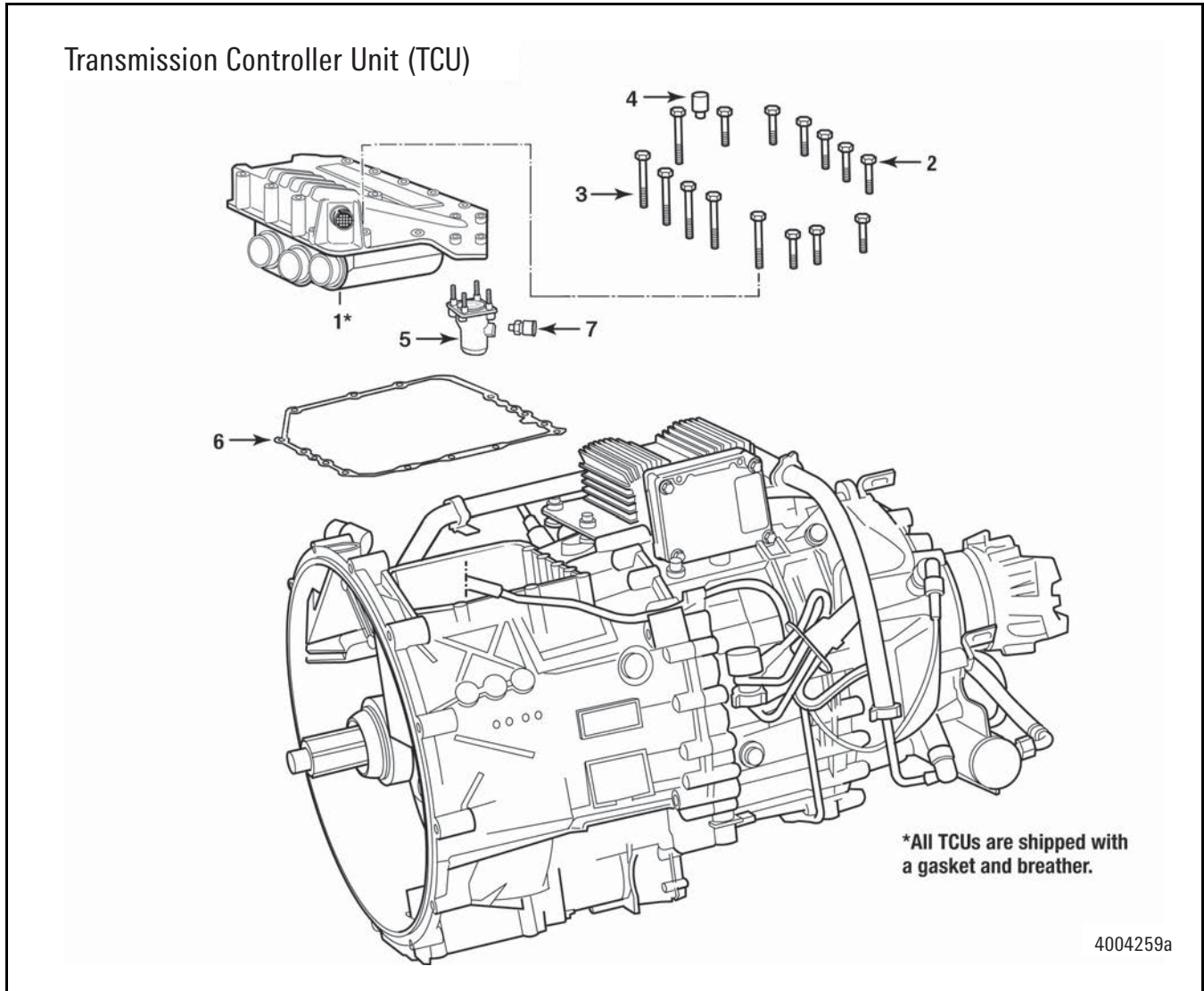
Configuration 6 – Mack

Item	Quantity	Part Number	ZF Part Number	Description
1	4	S 244A1	0501 321 516 01	1/4-20 bolt, voltage doubler to top accessory plate
2	8	WA34	0501 321 518 01	1/4 washer, voltage doubler to top accessory plate
3	1	1338 290 010 01	1338 390 054 01	Voltage doubler
4	1	4X 1909	1338 390 012 01	5/16-18 M8*16 stud, top accessory to bottom accessory bracket
5	4	1229B1666	0501 321 510 01	5/16 washer
6	8	1225F1306	1338 390 017 01	Isolator bushings
7	1	3305A1457	1338 390 001 01	Top accessory bracket, 12 & 16 speeds
8	1	3305D1460	1338 390 004 01	Bottom accessory bracket, 12 speed
8	1	3305C1459	1338 390 003 01	Bottom accessory bracket, 16 speed
9	6	0636 015 601	0636 015 601 01	M10*65 bolt
10	4	S2422A2	0501 321 515 01	1/4-20 bolt, ZMTEC to top accessory plate
11	8	WA34	0501 321 518 01	1/4 washer, ZMTEC to top accessory plate
12	1	R970036	1338 390 036 01	ZMTEC KIT (ZF-FreedomLine Transmission Electronic Controller)
13	1	A 2297W8473	1338 290 006 01	Wire harness
14	3	A 2257C1277	0501 321 501 01	Wire harness clip
15	3	15X 1812	1338 390 018 01	5/16-18 bolt, top accessory to bottom accessory bracket



Configuration 7, 2007 Engine International Only (Pre 2007 Eng. Intern. See config 1)

Item	Quantity	Part Number	ZF Part Number	Description
1	4	S244A1	0501 321 516 01	1/4 - 20 bolt, Voltage doubler to top accessory plate
2	8	WA34	0501 321 518 01	1/4 washer, Voltage doubler to top accessory plate
3	1	1338 290 010 01	1338 390 054 01	Voltage doubler
4	4	15X1812	1338 390 018 01	5/16 - 18 bolt, top accessory to bottom accessory bracket
5	4	1229B1666	0501 321 510 01	5/16 washer
6	8	1225F1306	1338 390 017 01	Isolator bushings
7	1	3305A1457	1338 390 001 01	Top accessory bracket, 12 & 16 speed
8	1	3305D1460	1338 390 004 01	Bottom accessory bracket, 12 speed
8	1	3305C1459	1338 390 003 01	Bottom accessory bracket, 16 speed
9	6	0636 015 601	0636 015 601 01	M10*65 bolt
10	4	S2422A2	0501 321 515 01	1/4 - 20 bolt, ZMTEC to top accessory plate
11	8	WA34	0501 321 518 01	1/4 washer, ZMTEC to top accessory plate
12	1	R970036	1338 390 036 01	ZMTEC KIT (ZF-FreedomLine Transmission Electronic Controller)
13	1		1338 390 038 01	Wire harness
14	4	A 2257C1277	0501 321 501 01	Wire harness clip



Transmission Controller Unit (TCU)

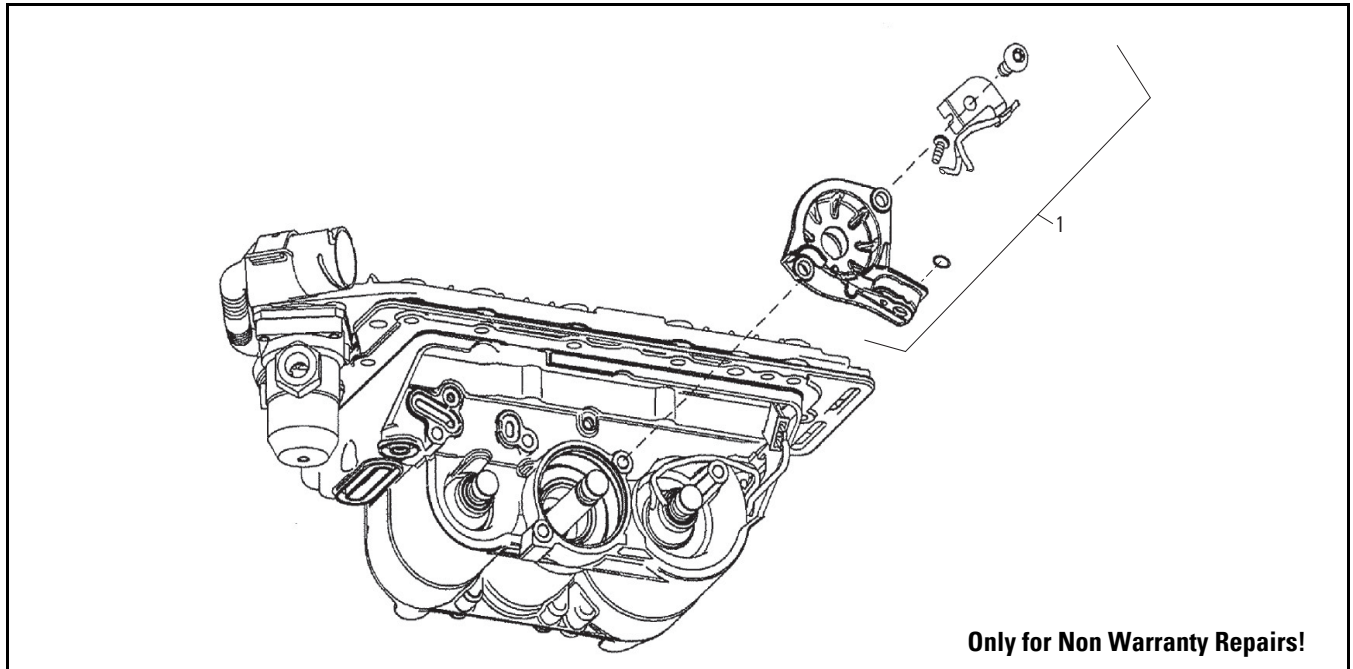
Item	Quantity	OEM	Part Number	ZF Part Number	Description
1	1			See next page	
2	9			0736 010 185 01	M8*45 bolt, GS3 to case
3	6			0736 010 188 01	M8*70 bolt, GS3 to case
4	1			0501 202 797 01	Breather, TCU
5	1			0501 320 849 01	Air regulator
6	1			0501 316 322 01	Gasket, GS3 to case
7	1	Kenworth	A 3268N1808	0501 321 506	Air line fitting (Straight Compression)
7	1	International	2206K1441	0501 321 490	Air line fitting (Straight Quick Disconnect)
7	1	Mack	2206K1441	0501 321 490	Air line fitting (Straight Quick Disconnect)
7	1		OEM supply	OEM supply	Freightliner, Peterbilt, Volvo

Transmission Controller Unit (TCU) *Complete unit!*

Item	Part Number	NEW Part Number	Description
1	6009 V74 065 01	6009V7413601	12 Spd DD MBE 4000 EB prior to VECU 13.15; Prior to 07 Eng. Only; Freightliner Only
1	6009 V74 066 01	6009V7413701	12 Spd DD MBE 4000 TB prior to VECU 13.15; Prior to 07 Eng. Only; Freightliner Only
1	6009 V74 041 01	6009V7413401	12 Spd DD Detroit Diesel S60; Prior to 07 Eng. Only; Freightliner Only
1	6009 V74 083 01	6009V7413101	12 Spd DD Caterpillar C10/C12/C13/C15/C16; Prior to 07 Eng. Only; Freightliner Only
1	6009 V74 084 01	6009V7413501	12 Spd DD MBE 4000 VECU 13.15 or later; Prior to 07 Eng. Only; Freightliner Only
1	6009 V74 085 01	6009V7413801	12 Spd DD Volvo VE D12 D Prior to 07 Eng. Only; Volvo Only
1	6009 V74 086 01	-	12 Spd DD Mack ASET-CEGR Prior to 07 Eng. Only
1	6009 V74 087 01	6009V7413001	12 Spd DD Caterpillar C10/C12/C13/C15/C16; Prior to 07 Eng. Only
1	6009 V74 088 01	6009V7413301	12 Spd DD Cummins ISX Prior to 07 Eng. Only
1	6009 V74 089 01	6009V7413201	12 Spd DD Cummins ISM Prior to 07 Eng. Only
1	6009 V74 055 01	6009V7415201	12 Spd OD MBE 4000 TB prior to VECU 13.15; Prior to 07 Eng. Only; Freightliner Only
1	6009 V74 056 01	6009V7415101	12 Spd OD MBE 4000 EB prior to VECU 13.15; Prior to 07 Eng. Only; Freightliner Only
1	6009 V74 111 01	6009V7415401	12 Spd OD Volvo VE D12 D, VE D16 Prior to 07 Eng. Only
1	6009 V74 090 01	-	12 Spd OD Detroit Diesel S60 Prior to 07 Eng. Only; Non Freightliner
1	6009 V74 091 01	6009V7414801	12 Spd OD Detroit Diesel S60; Prior to 07 Eng. Only; Freightliner Only
1	6009 V74 092 01	6009V7413901	12 Spd OD Caterpillar C10/C12/C13/C15/C16; Prior to 07 Eng. Only; Freightliner Only
1	6009 V74 093 01	6009V7415001	12 Spd OD MBE 4000 VECU 13.15 or later; Prior to 07 Eng. Only; Freightliner Only
1	6009 V74 094 01	6009V7414101	12 Spd OD Caterpillar C13/C15 (J1939: Shifter & Display); 07 Eng. Only; International Only
1	6009 V74 095 01	6009V7414401	12 Spd OD Cummins ISM (J1939: Shifter & Display); 07 Eng. Only; International Only
1	6009 V74 096 01	6009V7414501	12 Spd OD Cummins ISX (J1939: Shifter & Display); 07 Eng. Only; International Only
1	6009 V74 097 01	6009V7415301	12 Spd OD Volvo D13 (13 Liter) 07 Eng. Only; Volvo Only
1	6009 V74 098 01	6009V7414701	12 Spd OD Cummins ISX VECU 2007 Eng. + Prior; Volvo Only
1	6009 V74 099 01	6009V7414901	12 Spd OD Mack ASET-CEGR Prior to 07 Eng. Only
1	6009 V74 110 01	6009V7414301	12 Spd OD Cummins ISM 07 Prior to 07 Eng. Only
1	6009 V74 101 01	6009V7414601	12 Spd OD Cummins ISX 2007 Eng. + Prior
1	6009 V74 102 01	6009V7414001	12 Spd OD Caterpillar C10/C12/C13/C15/C16 2007 Eng. + Prior
1	6009 V74 100 01	6009V7414201	12 Spd OD Cummins ISM 07 Eng. Only
1	6009 V74 112 01	6009V7415501	12 Spd OD Volvo VE D16 (16 Liter; New for '07)
1	6009 V74 075 01	6009V7416301	16 Spd OD MBE 4000 TB prior to VECU 13.15; Prior to 07 Eng. Only; Freightliner Only
1	6009 V74 076 01	6009V7416201	16 Spd OD MBE 4000 EB prior to VECU 13.15; Prior to 07 Eng. Only; Freightliner Only
1	6009 V74 103 01	6009V7416001	16 Spd OD Detroit Diesel S60; Prior to 07 Eng. Only; Freightliner Only
1	6009 V74 104 01	6009V7416101	16 Spd OD MBE 4000 VECU 13.15 or later; Prior to 07 Eng. Only; Freightliner Only
1	6009 V74 105 01	6009V7415601	16 Spd OD Caterpillar C10/C12/C13/C15/C16; Prior to 07 Eng. Only; Freightliner Only
1	6009 V74 106 01	6009V7416401	16 Spd OD Volvo VE D12 D Prior to 07 Eng. Only; Volvo Only
1	6009 V74 107 01	6009V7415701	16 Spd OD Caterpillar C10/C12/C13/C15/C16; Prior to 07 Eng. Only
1	6009 V74 108 01	6009V7415901	16 Spd OD Cummins ISX VECU Prior to 07 Eng. Only; Volvo Only
1	6009 V74 109 01	6009V7415801	16 Spd OD Cummins ISX Prior to 07 Eng. Only

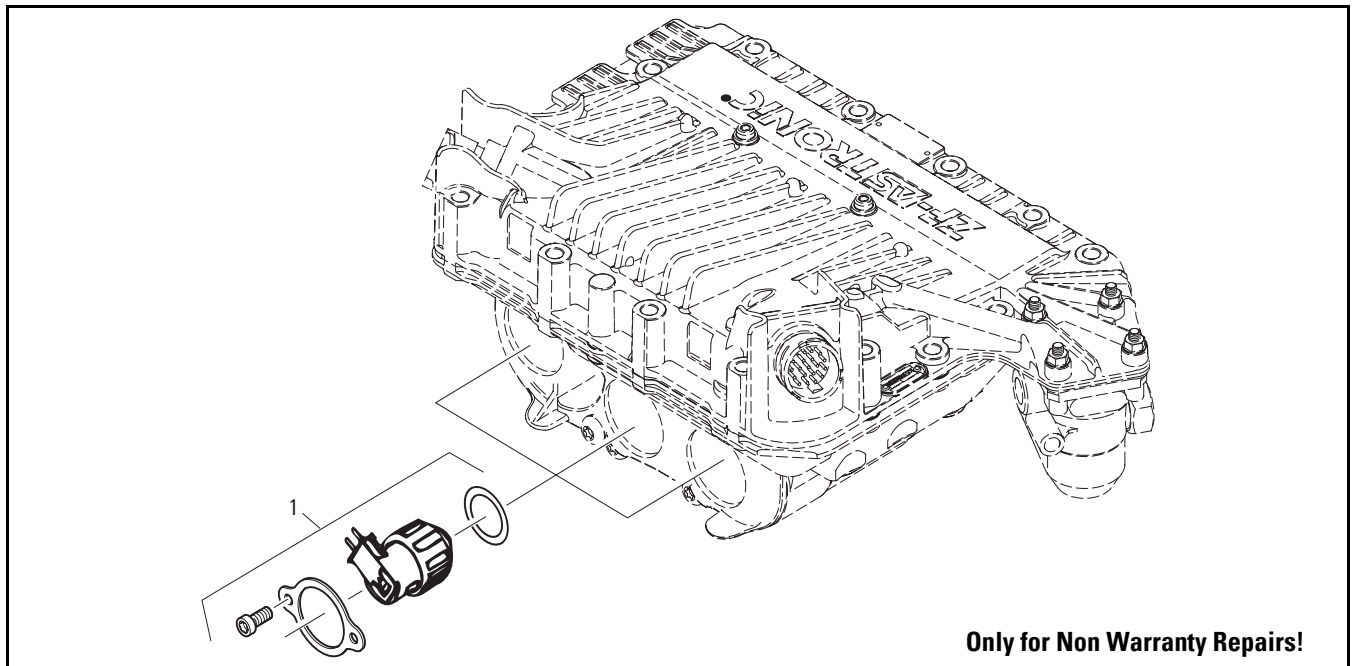
* ZF-FreedomLine TCU software is specific not only to ZF-FreedomLine transmission model, but to engine, truck, and possibly other configuration considerations. Never guess the part number to a ZF-FreedomLine aftermarket TCU.

NOTE: Each kit includes items 4, 5 and 6.



Transmission Controller Unit (TCU)

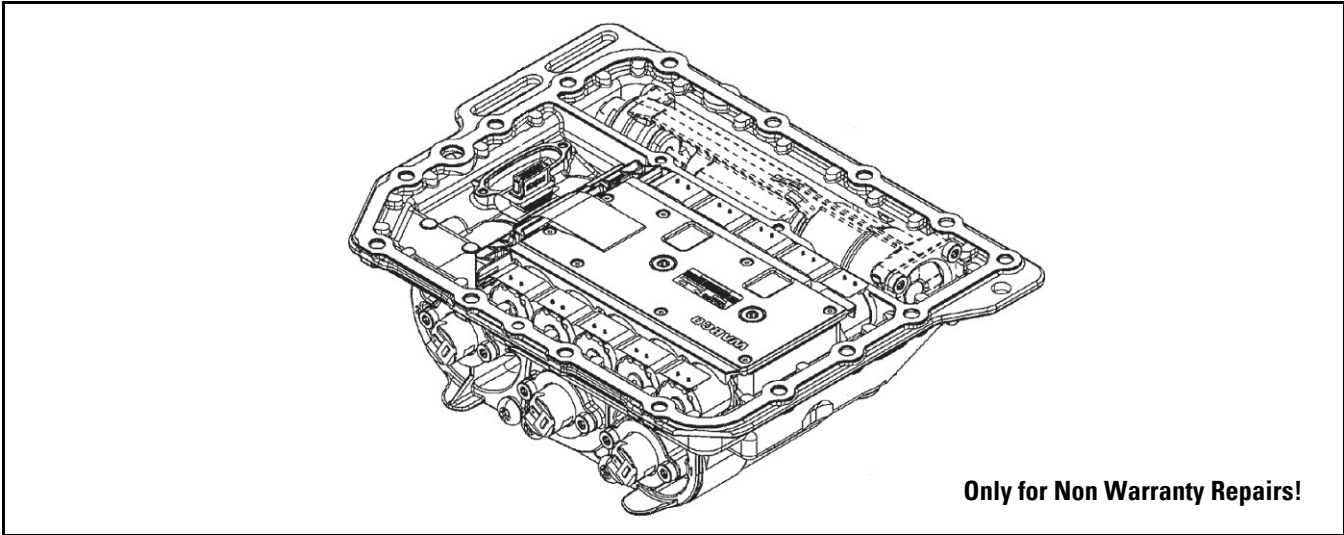
Item	Quantity	Part Number	ZF Part Number	Description
1	1		0501 322 661 01	Speed & oil temp sensor



Transmission Controller Unit (TCU)

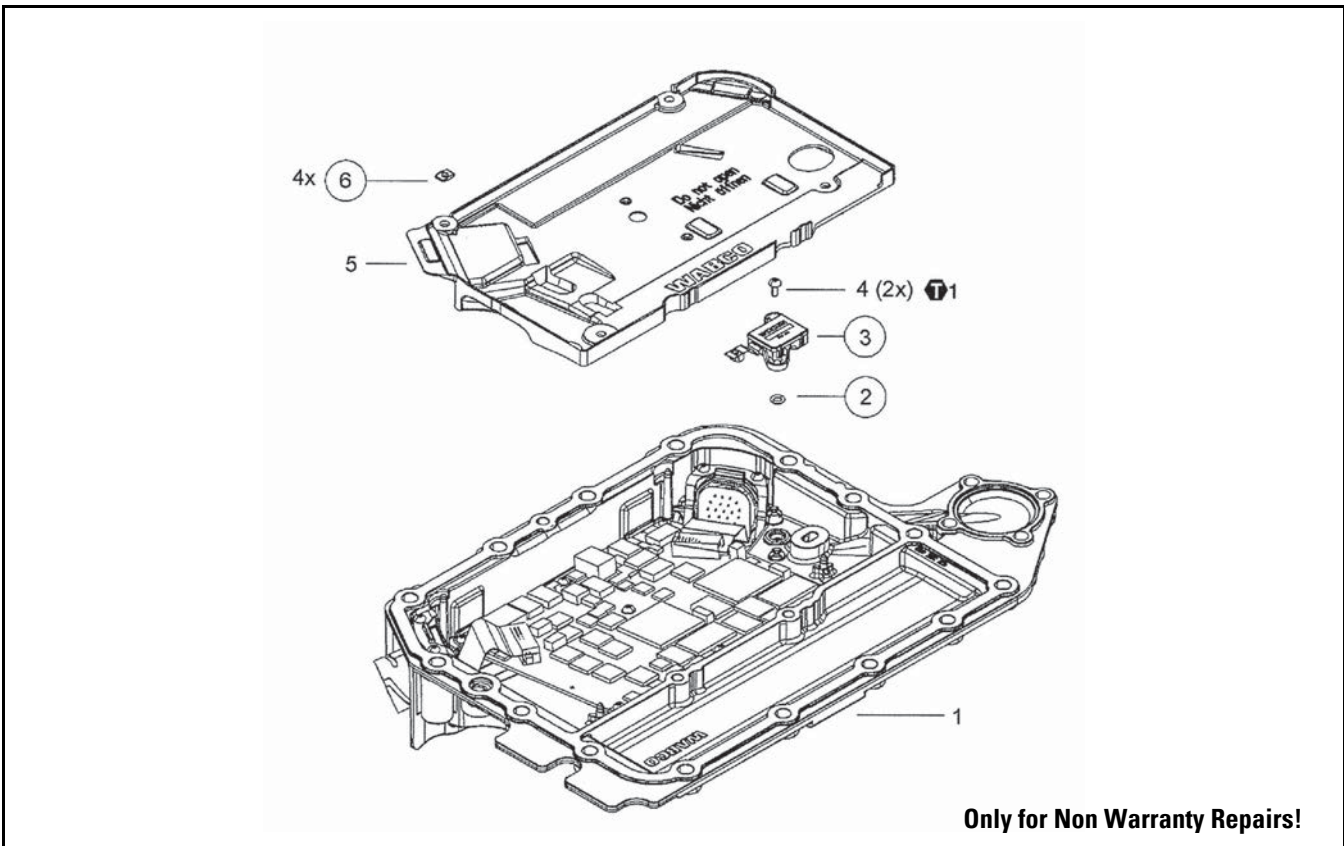
Item	Quantity	Part Number	ZF Part Number	Description
1	1		0501 321 148 01	Position sensor

Controls



Transmission Controller Unit (TCU) Kit includes gaskets to TCU top and to Trans case

Item	Quantity	Part Number	ZF Part Number	Description
1	1		6009 298 006 01	TCU lower half kit



Transmission Controller Unit (TCU) Kit includes gaskets to TCU top and to Trans case

Item	Quantity	Part Number	ZF Part Number	Description
2, 3, 6	1		0501 323 627 01	Pressure sensor Kit (Circled parts included)

! = Les pièces sont dans la pochette
 ○ = Particolare contenuto nel corredo

! = Diese Teile sind im Reparatursatz enthalten
 ○ = These parts are included in the repair kit
 ○ = Estas piezas están incluidas en el conji. de reparación

T M = 18 ± 1,5 Nm

NOTE
 Fetten Sie die Dicht- und Gleitflächen mit **GLK 112** (830 502 087 4) ein.
 Sealing and sliding surfaces have to be lubricated with **GLK 112** (830 502 087 4)
 Les surfaces d'étanchéité et de frottement doivent être graissées avec **GLK 112** (830 502 087 4)
 Superfici (di tenuta e di scorrimento) utilizzare il lubrificante **GLK 112** (830 502 087 4)

Only for Non Warranty Repairs!

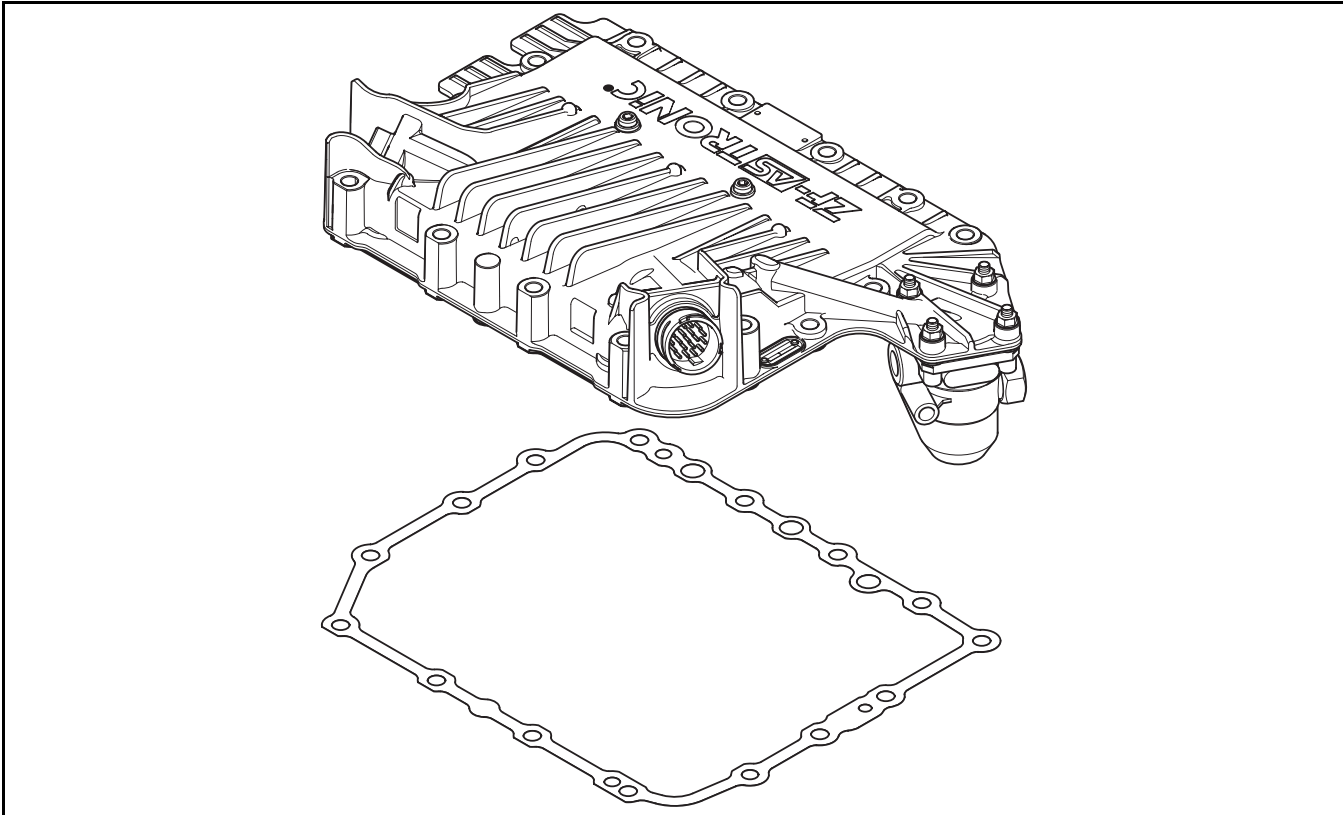
Transmission Controller Unit (TCU) Kit includes gaskets to TCU top and to Trans case

Kit	Quantity	If valve block # is	ZF Part Number	Description
A	1	6009 274 058	0501 322 388 01	Main piston Kit (Circled parts included)
B	1	6009 274 008	0501 324 254 01	Main piston Kit (Circled parts included)

If part number on valve block in circled area is 6009 247 058 use Kit „A“

If it is 6009 247 008 use Kit „B“

Controls



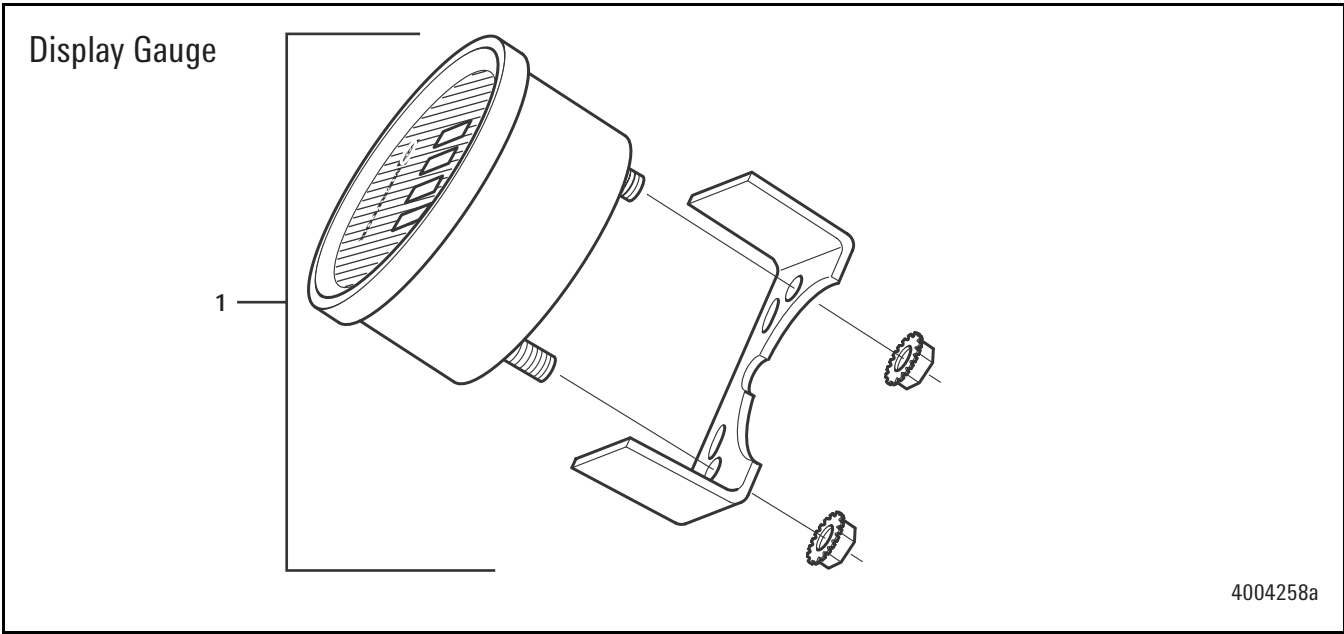
Transmission Controller Unit (TCU) *Top half only!* Kit includes gasket, O-ring and 2 screws

Item	Part Number	NEW Part Number	Description
1	6009 L74 065 01	6009L7413601	12 Spd DD MBE 4000 EB prior to VECU 13.15; Prior to 07 Eng. Only; Freightliner Only
1	6009 L74 066 01	6009L7413701	12 Spd DD MBE 4000 TB prior to VECU 13.15; Prior to 07 Eng. Only; Freightliner Only
1	6009 L74 041 01	6009L7413401	12 Spd DD Detroit Diesel S60; Prior to 07 Eng. Only; Freightliner Only
1	6009 L74 083 01	6009L7413101	12 Spd DD Caterpillar C10/C12/C13/C15/C16; Prior to 07 Eng. Only; Freightliner Only
1	6009 L74 084 01	6009L7413501	12 Spd DD MBE 4000 VECU 13.15 or later; Prior to 07 Eng. Only; Freightliner Only
1	6009 L74 085 01	6009L7413801	12 Spd DD Volvo VE D12 D Prior to 07 Eng. Only; Volvo Only
1	6009 L74 086 01	-	12 Spd DD Mack ASET-CEGR Prior to 07 Eng. Only
1	6009 L74 087 01	6009L7413001	12 Spd DD Caterpillar C10/C12/C13/C15/C16; Prior to 07 Eng. Only
1	6009 L74 088 01	6009L7413301	12 Spd DD Cummins ISX Prior to 07 Eng. Only
1	6009 L74 089 01	6009L7413201	12 Spd DD Cummins ISM Prior to 07 Eng. Only
1	6009 L74 055 01	6009L7415201	12 Spd OD MBE 4000 TB prior to VECU 13.15; Prior to 07 Eng. Only; Freightliner Only
1	6009 L74 056 01	6009L7415101	12 Spd OD MBE 4000 EB prior to VECU 13.15; Prior to 07 Eng. Only; Freightliner Only
1	6009 L74 111 01	6009L7415401	12 Spd OD Volvo VE D12 D, VE D16 Prior to 07 Eng. Only; Volvo Only
1	6009 L74 090 01	-	12 Spd OD Detroit Diesel S60; Prior to 07 Eng. Only; Non Freightliner
1	6009 L74 091 01	6009L7414801	12 Spd OD Detroit Diesel S60; Prior to 07 Eng. Only; Freightliner Only
1	6009 L74 092 01	6009L7413901	12 Spd OD Caterpillar C10/C12/C13/C15/C16; Prior to 07 Eng. Only; Freightliner Only
1	6009 L74 093 01	6009L7415001	12 Spd OD MBE 4000 VECU 13.15 or later; Prior to 07 Eng. Only; Freightliner Only
1	6009 L74 094 01	6009L7414101	12 Spd OD Caterpillar C13/C15 (J1939: Shifter & Display); 07 Eng. Only; International Only
1	6009 L74 095 01	6009L7414401	12 Spd OD Cummins ISM (J1939: Shifter & Display); 07 Eng. Only; International Only
1	6009 L74 096 01	6009L7414501	12 Spd OD Cummins ISX (J1939: Shifter & Display); 07 Eng. Only; International Only
1	6009 L74 097 01	6009L7415301	12 Spd OD Volvo D13 (13 Liter) 07 Eng. Only; Volvo Only
1	6009 L74 098 01	6009L7414701	12 Spd OD Cummins ISX VECU 2007 Eng. + Prior Only; Volvo Only

Transmission Controller Unit (TCU) *Top half only!* Kit includes gasket, O-ring and 2 screws

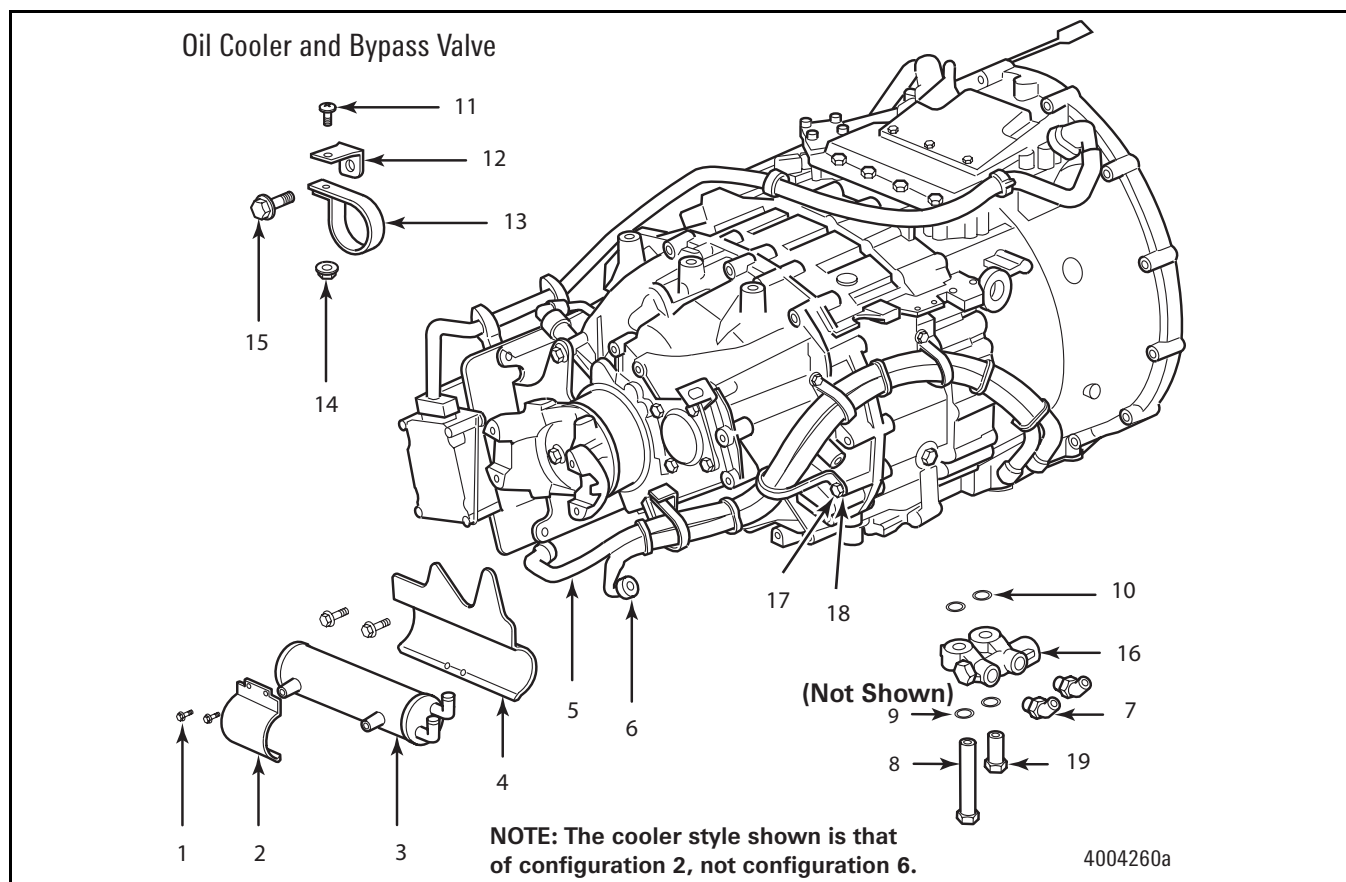
Item	Part Number	NEW Part Number	Description
1	6009 L74 099 01	6009L7414901	12 Spd OD Mack ASET-CEGR Prior to 07 Eng. Only
1	6009 L74 110 01	6009L7414301	12 Spd OD Cummins ISM Prior to 07 Eng. Only
1	6009 L74 101 01	6009L7414601	12 Spd OD Cummins ISX 2007 Eng. + Prior
1	6009 L74 102 01	6009L7414001	12 Spd OD Caterpillar C10/C12/C13/C15/C16 2007 Eng. + Prior
1	6009 L74 100 01	6009L7414201	12 Spd OD Cummins ISM 07 Eng. Only
1	6009 L74 112 01	6009L7415501	12 Spd OD Volvo VE D16 (16 Liter; New for '07)
1	6009 L74 075 01	6009L7416301	16 Spd OD MBE 4000 TB prior to VECU 13.15; Prior to 07 Eng. Only; Freightliner Only
1	6009 L74 076 01	6009L7416201	16 Spd OD MBE 4000 EB prior to VECU 13.15; Prior to 07 Eng. Only; Freightliner Only
1	6009 L74 103 01	6009L7416001	16 Spd OD Detroit Diesel S60; Prior to 07 Eng. Only; Freightliner Only
1	6009 L74 104 01	6009L7416101	16 Spd OD MBE 4000 VECU 13.15 or later; Prior to 07 Eng. Only; Freightliner Only
1	6009 L74 105 01	6009L7415601	16 Spd OD Caterpillar C10/C12/C13/C15/C16; Prior to 07 Eng. Only; Freightliner Only
1	6009 L74 106 01	6009L7416401	16 Spd OD Volvo VE D12 D Prior to 07 Eng. Only; Volvo Only
1	6009 L74 107 01	6009L7415701	16 Spd OD Caterpillar C10/C12/C13/C15/C16; Prior to 07 Eng. Only
1	6009 L74 108 01	6009L7415901	16 Spd OD Cummins ISX VECU Prior to 07 Eng. Only; Volvo Only
1	6009 L74 109 01	6009L7415801	16 Spd OD Cummins ISX Prior to 07 Eng. Only

Controls



Display Gauge

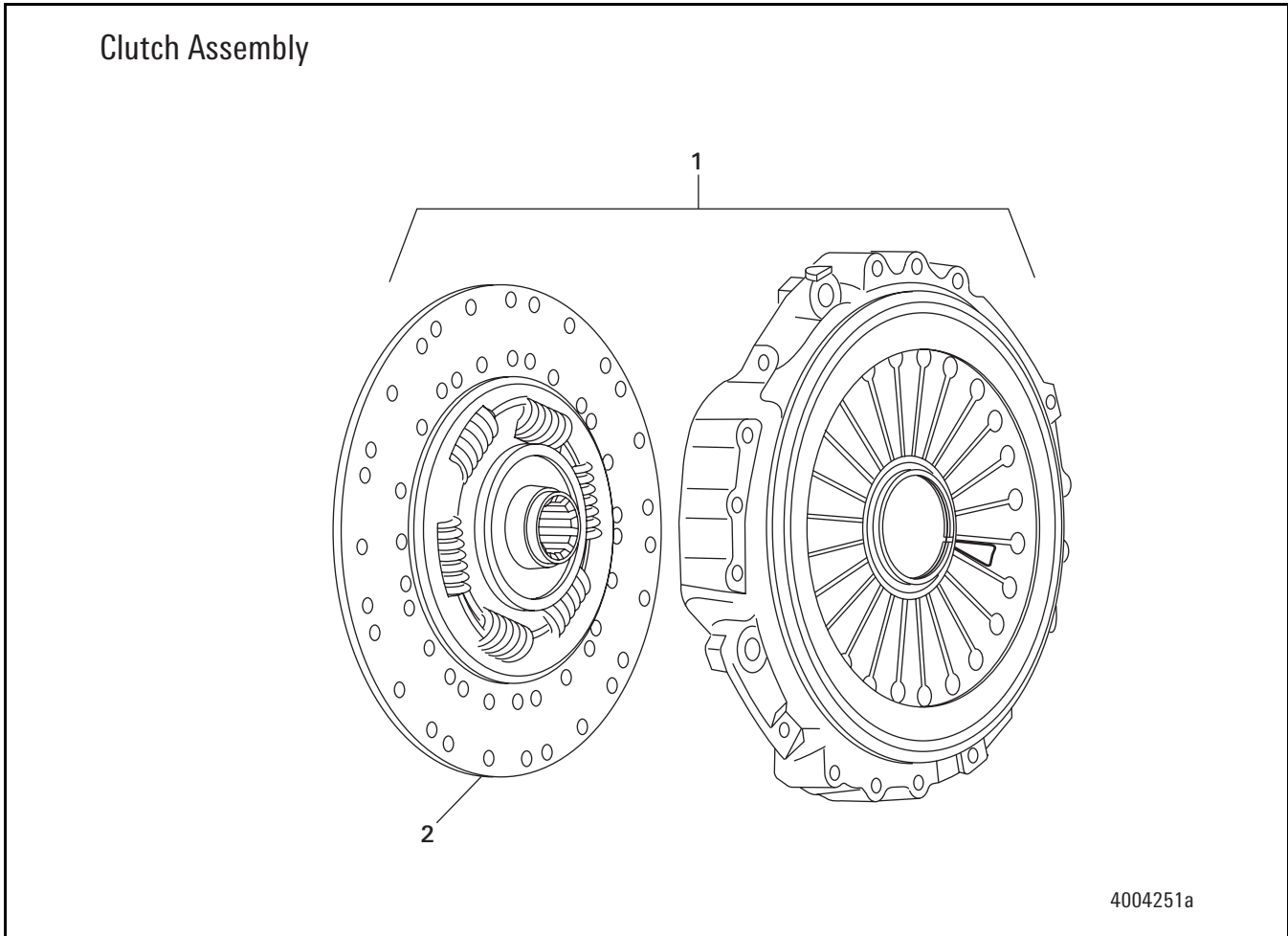
Item	Quantity	Part Number	ZF Part Number	Description
1	1	A 6002Q1005	1338 390 028 01	Display with a black bezel
1	1	A 6002S1007	1338 390 029 01	Display with a chrome bezel



Oil Cooler and Bypass Valve

Item	Qty.	Part Number	ZF Part Number	Description
1	2	S244A1	0501 321 516 01	1/4 - 20 bolt, Oil cooler top mounting bracket bolt
2	1	3305H1464	1338 390 009 01	Oil cooler top mounting bracket
3	1	3280P9922	1338 290 009 01	Oil cooler, 3/4 BIB
3	1	3280Z9776	1338 290 007 01	Oil cooler, 5/8 BIB
3	1	3380H1022	1338 290 008 01	Oil cooler, 5/8 BIB, Mack only
4	1	3305Y1481	1338 390 002 01	Oil cooler bottom mounting bracket
5	1	A 3196V1192	0501 214 585 01	Hose assembly, 48 inch
6	1	A 3196Y1195	0501 214 586 01	Hose assembly, 42 inch
7	2	3268J1830	0501 321 488 01	Oil cooler adapters, 45 degree bend — cooler bypass valve
7	2	3268K1805	0501 321 508 01	Oil cooler adapters, 90 degree bend — cooler bypass valve
7	2	2206J1440	0501 321 020 01	Oil cooler adapters, straight — cooler bypass valve
8	1	—	1328 301 014 01	Union screw
9	2	0634 801 073	0634 801 073 01	Cooler bypass valve crush washers
10	2	0634 313 886	0634 313 886 01	Cooler bypass valve O-rings
11	4	S-246-2	0501 321 517 01	1/4 - 20 bolt, oil cooler hose bracket
12	4	3155N1340	1338 390 032 01	Oil cooler hose L bracket
13	4	2255G1333	0501 321 509 01	Oil cooler hose clip
14	4	1227C1615	0501 321 499 01	1/4 - 20 locknut
15	3	0636 015 601	0636 015 601 01	M10*60 bolt, L bracket to housing
15	1	0636 011 335	0636 011 335 01	M12*35 bolt — L bracket to housing
16	1	1328 247 001	1328 247 001 01	Cooler bypass valve
17	1	0736 010 180	0736 010 180 01	M10 bolt, L bracket to housing
18	1	1244V2466	1338 390 019 01	Spacer
19	1	—	0737 835 131 01	Union screw

Clutch



Clutch Assembly

Item	Quantity	OEM	Part Number	ZF Part Number	Description
1	1		R171558		Clutch cover and disk assembly, 1350-1650 lb-ft
2	1		R160203		Clutch disc only, 1350-1650 lb-ft


NOTE: Purchased this part from ArvinMeritor CVA US: 888-725-9355 or Canada 800-387-3889 and not from ZF Sales and Service North America, LLC.

All other parts to be purchased via your PDC from ZF Sales and Service North America, LLC, Vernon Hills IL. USA.

Operating ZF-FreedomLine Automated Transmission

To Prevent the Vehicle from Rolling BACKWARDS on a HILL or Grade at a Stop: Press the brake pedal.
When Starting from a STOP: Quickly move your foot from the brake pedal and firmly press the accelerator pedal.

<p>SHIFTING IN AUTOMATIC MODE Shift into Neutral at any Time: Press and release the NEUTRAL button. Shift into a Forward Gear from Neutral at a Stop: Move the joystick FORWARD. Shift into Reverse from Neutral at a Stop: Press and hold the FUNCTION button. Move the joystick BACKWARDS. Release the FUNCTION button.</p>	<p>SHIFTING IN MANUAL MODE Shift into Neutral at any Time: Press and release NEUTRAL button. Shift into a Forward Gear from Neutral at a Stop: Move the joystick FORWARD. Shift into Reverse from Neutral at a Stop: Same as automatic mode. Upshift One Gear: Move the joystick FORWARD. Downshift One Gear: Move the joystick BACKWARDS. Skip Shift: Press the FUNCTION button while moving the joystick.</p>
--	--



Also refer to ZF-FreedomLine Operator Manuel TP-20170 2297-M-8281

1338_390_023_1


Label Freightliner Only

Item	Quantity	Part Number	ZF Part Number	Description
1	1		1338 390 023 01	Label Freightliner Only

Operating ZF-FreedomLine Automated Transmission

To Prevent the Vehicle from Rolling BACKWARDS on a HILL or Grade at a Stop: Press the brake pedal.
When Starting from a Stop: Quickly move your foot from the brake pedal and firmly press the accelerator pedal.

<p>SHIFTING IN AUTOMATIC MODE Shift into Neutral at any Time: Press and release the NEUTRAL button. Shift into a Forward Gear from Neutral at a Stop: Press and hold the brake pedal. Move the joystick FORWARD. Shift into Reverse from Neutral at a Stop: Press and hold the brake pedal. Press and hold the FUNCTION button. Move the joystick BACKWARDS. Release the FUNCTION button.</p>	<p>SHIFTING IN MANUAL MODE Shift into Neutral at any Time: Press and release the NEUTRAL button. Shift into a Forward Gear from Neutral at a Stop: Press and hold the brake pedal. Move the joystick FORWARD. Shift into Reverse from Neutral at a Stop: Same as automatic mode. Upshift One Gear: Move the joystick FORWARD. Downshift One Gear: Move the joystick BACKWARDS. Skip Shift: Press the FUNCTION button while moving the joystick.</p>
--	--



Also refer to ZF-FreedomLine Operator Manuel TP-20170 2297-M-8463

1338_390_030_1

Label Volvo/Mack Only


Item	Quantity	Part Number	ZF Part Number	Description
1	1		1338 390 030 01	Label Volvo/Mack Only

Labels

Operating ZF-FreedomLine Automated Transmission

To Prevent the Vehicle from Rolling BACKWARDS on a HILL or Grade at a Stop: Press the brake pedal.
When Starting from a STOP: Quickly move your foot from the brake pedal and firmly press the accelerator pedal.

<p>SHIFTING IN AUTOMATIC MODE</p> <p>Shift into Neutral at any Time: Press and release the NEUTRAL button.</p> <p>Shift into a Forward Gear from Neutral at a Stop: Move the joystick FORWARD.</p> <p>Shift into Reverse from Neutral at a Stop: Press and hold the FUNCTION button. Move the joystick BACKWARDS. Release the FUNCTION button.</p>	<p>SHIFTING IN MANUAL MODE</p> <p>Shift into Neutral at any Time: Press and release the NEUTRAL button.</p> <p>Shift into a Forward Gear from Neutral at a Stop: Move the joystick FORWARD.</p> <p>Shift into Reverse from Neutral at a Stop: Same as automatic mode.</p> <p>Upshift One Gear: Move the joystick FORWARD.</p> <p>Downshift One Gear: Move the joystick BACKWARDS.</p> <p>Skip Shift: Press the FUNCTION button while moving the joystick.</p>
--	--




Also refer to ZF-FreedomLine Operator Manual TP-20170 2297-L-8280

1338_390_024_1

Label Peterbilt, Kenworth and International

Item	Quantity	Part Number	ZF Part Number	Description
1	1		1338 390 024 01	Label Peterbilt, Kenworth and International



WARNING

This vehicle is equipped with a ZF-FreedomLine fully-automated manual transmission. The vehicle can roll **BACKWARDS** when stopped on a hill or grade, or when starting from a stop on a hill or grade. Serious personal injury and damage to components can result.

WHEN STOPPED ON A HILL OR GRADE: Press the brake pedal.

WHEN STARTING FROM A STOP ON A HILL OR GRADE: Quickly move your foot from the brake pedal and firmly press the accelerator pedal.

For more information, or to order ZF-FreedomLine Operator Manual TP-20170 call ArvinMeritor's Customer Service Center at 800-535-5560.




2297-Z-8346 (03-01)

1338_390_025_1

Label „Warning“ Language English

Item	Quantity	Part Number	ZF Part Number	Description
1	1		1338 390 025 01	Label „Warning“ Language English




AVERTISSEMENT

Ce véhicule est équipé d'une boîte manuelle automatisée ZF-FreedomLine. Le véhicule peut **RECULER** lorsqu'il est arrêté en côté ou dans une pente ou lorsque vous démarrez en côté ou dans une pente, comportant des blessures corporelles ou des dommages matériels importants.

LORSQUE LE VÉHICULE EST ARRÊTÉ EN CÔTE OU DANS UNE PENTE:
Appuyez sur la pédale de frein.

LORSQUE VOUS DÉMARREZ EN CÔTE OU DANS UNE PENTE:
Relâchez rapidement la pédale de frein et appuyez sur la pédale d'accélérateur.

Pour des plus amples informations ou pour commander le Manuel d'utilisation ZF-FreedomLine TP-20170, appelez l'ArvinMeritor's Customer Service Center au 800 535 5560.



1338 390 043

1338_390_043_1

Label „Warning“ Language French

Item	Quantity	Part Number	ZF Part Number	Description
1	1		1338 390 043 01	Label „Warning“ Language French



ZF Friedrichshafen AG
Commercial Vehicle and Special
Driveline Technology
D-88038 Friedrichshafen
www.zf.com

Information contained in this publication was in effect at the time the publication was approved for printing and is subject to change without notice or liability. ZF Friedrichshafen AG reserves the right to revise the information presented or discontinue the production of parts described at any time.

Copyright 2009 by ZF
All Rights Reserved

Printed in the USA

1338 752 001