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Freightliner Business Class M2 Fault Codes List - ABS System Troubleshooting

Meritor WABCO Pneumatic Antilock Braking System (ABS) – Table of DTCs

Left Front Wheel Sensor Troubleshooting (SID 001)						
MID	SID	FMI	Problem	Test	Test Result	Action
136	001	01	Incorrect sensor air gap	1. Adjust the sensor. Check the AC voltage across pins 7 and 8 of the black X2 ECU connector while rotating the LF wheel 30 rpm.	Voltage is 0.2 Vac or greater	Sensor adjustment solved the problem.
					Voltage is less than 0.2 Vac	Check for excessive wheel bearing end play and hub runout. Repair as needed.
136	001	02	Incorrect tire size			Check for correct tire size and mixed tire sizes. Check for correct number of teeth on tone wheel. Correct as needed.
136	001	03	Sensor shorted to power	2. Measure the voltage across pins 7 of the X2 (black) connector and a good chassis ground. Repeat the test between pin 8 and ground.	Measurable voltage at either pin	Repair short to power in circuit(s) 377LF+ and 377LF– in chassis harness and sensor cable. If problem is in the sensor harness, replace the sensor.
					No voltage at either pin	Repeat the test and check for intermittent short to power in circuits 377LF+ and 377LF–. Suspect ECU is at fault if the problem persists.

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Left Front Wheel Sensor Troubleshooting (SID 001)						
MID	SID	FMI	Problem	Test	Test Result	Action
136	001	04	Short to ground	3. Measure the resistance between pin 7 of the X2 (black) connector and a good chassis ground. Repeat the test between pin 8 and ground.	Resistance between either pin and ground is less than 100,000 ohms	Repair the short to ground in circuit(s) 377LF+ and 377LF- in chassis harness or sensor cable. If problem is in sensor harness, replace the sensor.
					Resistance between either pin and ground is greater than 100,000 ohms	Repeat the test for intermittent short to ground in circuits 377LF+ and 377LF-. Suspect ECU is at fault if the problem persists.
136	001	05	Open circuit	4. Measure the resistance between pins 7u and 8 of the X2 (black) connector.	Resistance is 900–2000 ohms	Repeat the test and check for intermittent open or short in circuits 377LF+ and 377LF-. Suspect ECU at fault if the problem persists.
					Resistance is greater than 2000 ohms OR less than 900 ohm.	Perform test 5.
136	001	05	Open circuit	5. Disconnect the sensor connector from the chassis harness. Measure the resistance between the pins on the sensor connector.	Resistance is 900–2000 ohms	Repair open or short in circuit(s) 377LF+ and 377LF- in chassis harness.
					Resistance is greater than 2000 ohms OR less than 900 ohms	Replace the sensor.
136	001	06	Short circuit			Perform tests 4 and 5.
136	001	07	Damaged tone ring			Inspect tone ring for damage and missing teeth. Make sure correct tooth wheel is installed (100-tooth is normal application). Repair as needed.
136	001	08	Excessive wheel slip			Check sensor adjustment. This fault usually occurs when there is excessive tire spin for more than 16 seconds.
136	001	09	Wire mismatch	6. Check for mixed sensor connection. Using Meritor PC Diagnostics, spin each wheel individually. Check that output is from the correct sensor.		Correct wiring connections, as needed.

Left Front Wheel Sensor Troubleshooting (SID 001)						
MID	SID	FMI	Problem	Test	Test Result	Action
136	001	10	Intermittent signal	7. Adjust the sensor. Using the wheel sensor output screen in Meritor PC	Signal output OK	Adjustment solved the problem. Make sure brake chatter is not causing the problem.

				Diagnostics, spin the wheel or drive the vehicle and check for intermittent or erratic signal.	Signal output incorrect	Check for intermittent wheel sensor circuit connections. Cause could be due to brake chatter. Repair as needed.
136	001	11	Erratic signal			Perform test 7.
136	001	12	Frequency too high	8. Check sensor wiring and connectors for intermittent contact.	Wiring OK	Suspect ECU at fault if problem persists.
					Wiring incorrect	Repair wheel sensor circuit, as needed.

Right Front Wheel Sensor Troubleshooting (SID 002)						
MID	SID	FMI	Problem	Test	Test Result	Action
136	002	01	Incorrect sensor air gap	1. Adjust the sensor. Check the AC voltage across pins 5 and 6 of the black X2 ECU connector while rotating the RF wheel 30 rpm.	Voltage is 0.2 Vac or greater	Sensor adjustment solved the problem.
					Voltage is less than 0.2 Vac	Check for excessive wheel bearing end play and hub runout. Repair as needed.
136	002	02	Incorrect tire size			Check for correct tire size and mixed tire sizes. Check for correct number of teeth on tone wheel. Correct as needed.
136	002	03	Sensor shorted to power	2. Measure the voltage across pin 5 of the X2 (black) connector and a good chassis ground. Repeat the test between pin 8 and ground.	Measurable voltage at either pin	Repair short to power in circuit(s) 377RF+ and 377RF- in chassis harness and sensor cable. If problem is in the sensor harness, replace the sensor.
					No voltage at either pin	Repeat the test and check for intermittent short to power in circuits 377RF+ and 377RF-. Suspect ECU is at fault if the problem persists.

Right Front Wheel Sensor Troubleshooting (SID 002)						
MID	SID	FMI	Problem	Test	Test Result	Action
136	002	04	Short to ground	3. Measure the resistance between pin 5 of the X2 (black) connector and a good chassis ground. Repeat the test between pin 6 and ground.	Resistance between either pin and ground is less than 100,000 ohms	Repair the short to ground in circuit(s) 377RF+ and 377RF- in chassis harness or sensor cable. If problem is in sensor harness, replace the sensor.
					Resistance between either pin and ground is greater than 100,000 ohms	Repeat the test for intermittent short to ground in circuits 377RF+ and 377RF-. Suspect ECU is at fault if the problem persists.
136	002	05	Open circuit	4. Measure the resistance between pins 5 and 6 of the X2 (black) connector.	Resistance is 900–2000 ohms	Repeat the test and check for intermittent open or short in circuits 377RF+ and 377RF-. Suspect ECU at fault if the problem persists.
					Resistance is greater than 2000 ohms OR less than 900 ohm.	Perform test 5.
				5. Disconnect the sensor connector from the chassis harness. Measure the resistance between the pins on the sensor connector.	Resistance is 900–2000 ohms	Repair open or short in circuit(s) 377RF+ and 377RF- in chassis harness.
					Resistance is greater than 2000 ohms OR less than 900 ohms	Replace the sensor.
136	002	06	Short circuit			Perform tests 4 and 5.
136	002	07	Damaged tone ring			Inspect tone ring for damage and missing teeth. Make sure correct tooth wheel is installed (100-tooth is normal application). Repair as needed.
136	002	08	Excessive wheel slip			Check sensor adjustment. This fault usually occurs when there is excessive tire spin for more than 16 seconds.
136	002	09	Wire mismatch	6. Check for mixed sensor connection. Using Meritor PC Diagnostics, spin each wheel individually. Check that output is from the correct sensor.		Correct wiring connections, as needed.

Left Rear Wheel Sensor Troubleshooting (SID 003)						
MID	SID	FMI	Problem	Test	Test Result	Action
136	003	01	Incorrect sensor air gap	1. Adjust the sensor. Check the AC voltage across pins 1 and 2 of the black X2 ECU connector while rotating the LR wheel 30 rpm.	Voltage is 0.2 Vac or greater	Sensor adjustment solved the problem.
					Voltage is less than 0.2 Vac	Check for excessive wheel bearing end play and hub runout. Repair as needed.
136	003	02	Incorrect tire size			Check for correct tire size and mixed tire sizes. Check for correct number of teeth on tone wheel. Correct as needed.
136	003	03	Sensor shorted to power	2. Measure the voltage across pin 1 of the X3 (green) connector and a good chassis ground. Repeat the test between pin 2 and ground.	Measurable voltage at either pin	Repair short to power in circuit(s) 377LR+ and 377LR- in chassis harness and sensor cable. If problem is in the sensor harness, replace the sensor.
					No voltage at either pin	Repeat the test and check for intermittent short to power in circuits 377LR+ and 377LR-. Suspect ECU is at fault if the problem persists.

Right Front Wheel Sensor Troubleshooting (SID 002)						
MID	SID	FMI	Problem	Test	Test Result	Action
136	002	10	Intermittent signal	7. Adjust the sensor. Using the wheel sensor output screen in Meritor PC Diagnostics, spin the wheel or drive the vehicle and check for intermittent or erratic signal.	Signal output OK	Adjustment solved the problem. Make sure brake chatter is not causing the problem.
					Signal output incorrect	Check for intermittent wheel sensor circuit connections. Cause could be due to brake chatter. Repair as needed.
136	002	11	Erratic signal			Perform test 7.
136	002	12	Frequency too high	8. Check sensor wiring and connectors for intermittent contact.	Wiring OK	Suspect ECU at fault if problem persists.
					Wiring incorrect	Repair wheel sensor circuit, as needed.

Left Rear Wheel Sensor Troubleshooting (SID 003)						
MID	SID	FMI	Problem	Test	Test Result	Action
136	003	04	Short to ground	3. Measure the resistance between pin 1 of the X3 (green) connector and a good chassis ground. Repeat the test between pin 2 and ground.	Resistance between either pin and ground is less than 100,000 ohms	Repair the short to ground in circuit(s) 377LR+ and 377LR- in chassis harness or sensor cable. If problem is in sensor harness, replace the sensor.
					Resistance between either pin and ground is greater than 100,000 ohms	Repeat the test for intermittent short to ground in circuits 377LR+ and 377LR-. Suspect ECU is at fault if the problem persists.
136	003	05	Open circuit	4. Measure the resistance between pins 1 and 2 of the X3 (green) connector.	Resistance is 900-2000 ohms	Repeat the test and check for intermittent open or short in circuits 377LR+ and 377LR-. Suspect ECU at fault if the problem persists.
					Resistance is greater than 2000 ohms OR less than 900 ohm.	Perform test 5.
				5. Disconnect the sensor connector from the chassis harness. Measure the resistance between the pins on the sensor connector.	Resistance is 900-2000 ohms	Repair open or short in circuit(s) 377LR+ and 377LR- in chassis harness.
					Resistance is greater than 2000 ohms OR less than 900 ohms	Replace the sensor.
136	003	06	Short circuit			Perform tests 4 and 5.
136	003	07	Damaged tone ring			Inspect tone ring for damage and missing teeth. Make sure correct tooth wheel is installed (100-tooth is normal application). Repair as needed.
136	003	08	Excessive wheel slip			Check sensor adjustment. This fault usually occurs when there is excessive tire spin for more than 16 seconds.
136	003	09	Wire mismatch	6. Check for mixed sensor connection. Using Meritor PC Diagnostics, spin each wheel individually. Check that output is from the correct sensor.		Correct wiring connections, as needed.

Left Rear Wheel Sensor Troubleshooting (SID 003)						
MID	SID	FMI	Problem	Test	Test Result	Action
136	003	10	Intermittent signal	7. Adjust the sensor. Using the wheel sensor output screen in Meritor PC Diagnostics, spin the wheel or drive the vehicle and check for intermittent or erratic signal.	Signal output OK	Adjustment solved the problem. Make sure brake chatter is not causing the problem.
					Signal output incorrect	Check for intermittent wheel sensor circuit connections. Cause could be due to brake chatter. Repair as needed.
136	003	11	Erratic signal			Perform test 7.
136	003	12	Frequency too high	8. Check sensor wiring and connectors for intermittent contact.	Wiring OK	Suspect ECU at fault if problem persists.
					Wiring incorrect	Repair wheel sensor circuit, as needed.

Right Rear Wheel Sensor Troubleshooting (SID 004)						
MID	SID	FMI	Problem	Test	Test Result	Action
136	004	01	Incorrect sensor air gap	1. Adjust the sensor. Check the AC voltage across pins 3 and 4 of the black X2 ECU connector while rotating the RR wheel 30 rpm.	Voltage is 0.2 VAC or greater	Sensor adjustment solved the problem.
					Voltage is less than 0.2 VAC	Check for excessive wheel bearing end play and hub runout. Repair as needed.
136	004	02	Incorrect tire size			Check for correct tire size and mixed tire sizes. Check for correct number of teeth on tone wheel. Correct as needed.
136	004	03	Sensor shorted to power	2. Measure the voltage across pin 3 of the X3 (green) connector and a good chassis ground. Repeat the test between pin 4 and ground.	Measurable voltage at either pin	Repair short to power in circuit(s) 377RR+ and 377RR- in chassis harness and sensor cable. If problem is in the sensor harness, replace the sensor.
					No voltage at either pin	Repeat the test and check for intermittent short to power in circuits 377RR+ and 377RR-. Suspect ECU is at fault if the problem persists.

Right Rear Wheel Sensor Troubleshooting (SID 004)						
MID	SID	FMI	Problem	Test	Test Result	Action
136	004	04	Short to ground	3. Measure the resistance between pin 3 of the X3 (green) connector and a good chassis ground. Repeat the test between pin 4 and ground.	Resistance between either pin and ground is less than 100,000 ohms	Repair the short to ground in circuit(s) 377RR+ and 377RR- in chassis harness or sensor cable. If problem is in sensor harness, replace the sensor.
					Resistance between either pin and ground is greater than 100,000 ohms	Repeat the test for intermittent short to ground in circuits 377RR+ and 377RR-. Suspect ECU is at fault if the problem persists.
136	004	05	Open circuit	4. Measure the resistance between pins 3 and 4 of the X3 (green) connector.	Resistance is 900–2000 ohms	Repeat the test and check for intermittent open or short in circuits 377RR+ and 377RR-. Suspect ECU at fault if the problem persists.
					Resistance is greater than 2000 ohms OR less than 900 ohm.	Perform test 5.
				5. Disconnect the sensor connector from the chassis harness. Measure the resistance between the pins on the sensor connector.	Resistance is 900–2000 ohms	Repair open or short in circuit(s) 377RR+ and 377RR- in chassis harness.
					Resistance is greater than 2000 ohms OR less than 900 ohms	Replace the sensor.
136	004	06	Short circuit			Perform tests 4 and 5.
136	004	07	Damaged tone ring			Inspect tone ring for damage and missing teeth. Make sure correct tooth wheel is installed (100-tooth is normal application). Repair as needed.
136	004	08	Excessive wheel slip			Check sensor adjustment. This fault usually occurs when there is excessive tire spin for more than 16 seconds.
136	004	09	Wire mismatch	6. Check for mixed sensor connection. Using Meritor PC Diagnostics, spin each wheel individually. Check that output is from the correct sensor.		Correct wiring connections, as needed.

Right Rear Wheel Sensor Troubleshooting (SID 004)						
MID	SID	FMI	Problem	Test	Test Result	Action
136	004	10	Intermittent signal	7. Adjust the sensor. Using the wheel sensor output screen in Meritor PC Diagnostics, spin the wheel or drive the vehicle and check for intermittent or erratic signal.	Signal output OK	Adjustment solved the problem. Make sure brake chatter is not causing the problem.
					Signal output incorrect	Check for intermittent wheel sensor circuit connections. Cause could be due to brake chatter. Repair as needed.
136	004	11	Erratic signal			Perform test 7.
136	004	12	Frequency too high	8. Check sensor wiring and connectors for intermittent contact.	Wiring OK	Suspect ECU at fault if problem persists.
					Wiring incorrect	Repair wheel sensor circuit, as needed.

Left Front Modulator Valve Troubleshooting (SID 007)						
MID	SID	FMI	Problem	Test	Test Result	Action
136	007	03	Short to power <i>Inlet or outlet circuit shorted to battery supply or another modulator valve wire.</i>	1. Measure the voltage between pins 2, 10, and 11 of the X2 (black) connector and a good chassis ground.	No voltage at either pin	Repeat test. Check circuits 378LFI, 378LFO, and 378LF– for intermittent short to power. Check above circuits for shorts to other modulator valve wires. Repair as necessary. If problem persists, the suspect ECU is at fault.
					Measurable voltage at either pin	Repair short to power in circuit 378LFI, 378LFO, or 378LF–.
136	007	05	Open circuit Inlet or outlet circuit open.	2. Check the modulator valve inlet and outlet circuit resistance. Disconnect the connector from the valve and perform the modulator valve resistance test.	Resistance in both circuits is within 4 to 8 ohms.	Check harness wiring circuits 378LFI, 378LFO, or 378LF–.
					Resistance in both circuits is not within 4 to 8 ohms.	Replace the modulator valve.
136	007	06	Short to ground <i>Inlet or outlet circuit shorted to ground.</i>	3. Check the modulator valve inlet and outlet circuit resistance. Disconnect the connector from the valve and perform the modulator valve test.	Resistance in both circuits is within 4 to 8 ohms.	Check harness wiring circuits 378LFI, 378LFO, or 378LF– for short to ground. Repair as necessary.
					Resistance in both circuits is not within 4 to 8 ohms.	Replace modulator valve.

Right Front Modulator Valve Troubleshooting (SID 008)						
MID	SID	FMI	Problem	Test	Test Result	Action
136	008	03	Short to power <i>Inlet or outlet circuit shorted to battery supply or another modulator valve wire.</i>	1. Measure the voltage between pins 3, 4, and 9 of the X2 (black) connector and a good chassis ground.	No voltage at either pin	Repeat test. Check circuits 378RFO, 378RFI, and 378RF– for intermittent short to power. Check above circuits for shorts to other modulator valve wires. Repair as necessary. If problem persists, the suspect ECU is at fault.
					Measurable voltage at either pin	Repair short to power in circuit 378RFO, 378RFI, or 378RF–.
136	008	05	Open circuit <i>Inlet or outlet circuit open.</i>	2. Check the modulator valve inlet and outlet circuit resistance. Disconnect the connector from the valve and perform the modulator valve resistance test.	Resistance in both circuits is within 4 to 8 ohms.	Check harness wiring circuits 378RFO, 378RFI, or 378RF–.
					Resistance in both circuits is not within 4 to 8 ohms.	Replace the modulator valve.
136	008	06	Short to ground <i>Inlet or outlet circuit shorted to ground.</i>	3. Check the modulator valve inlet and outlet circuit resistance. Disconnect the connector from the valve and perform the modulator valve test.	Resistance in both circuits is within 4 to 8 ohms.	Check harness wiring circuits 378RFO, 378RFI, or 378RF– for short to ground. Repair as necessary.
					Resistance in both circuits is not within 4 to 8 ohms.	Replace modulator valve.

Left Rear Modulator Valve Troubleshooting (SID 009)						
MID	SID	FMI	Problem	Test	Test Result	Action
136	009	03	Short to power <i>Inlet or outlet circuit shorted to battery supply or another modulator valve wire.</i>	1. Measure the voltage between pins 10, 11, and 12 of the X3 (green) connector and a good chassis ground.	No voltage at either pin	Repeat test. Check circuits 378LRI, 378LRO, and 378LR– for intermittent short to power. Check above circuits for shorts to other modulator valve wires. Repair as necessary. If problem persists, the suspect ECU is at fault.
					Measurable voltage at either pin	Repair short to power in circuit 378LRI, 378LRO, or 378LR–.
136	009	05	Open circuit <i>Inlet or outlet circuit open.</i>	2. Check the modulator valve inlet and outlet circuit resistance. Disconnect the connector from the valve and perform the modulator valve resistance test.	Resistance in both circuits is within 4 to 8 ohms.	Check harness wiring circuits 378LRI, 378LRO, and 378LR–.
					Resistance in both circuits is not within 4 to 8 ohms.	Replace the modulator valve.

Left Rear Modulator Valve Troubleshooting (SID 009)						
MID	SID	FMI	Problem	Test	Test Result	Action
136	009	06	Short to ground <i>Inlet or outlet circuit shorted to ground.</i>	3. Check the modulator valve inlet and outlet circuit resistance. Disconnect the connector from the valve and perform the modulator valve test.	Resistance in both circuits is within 4 to 8 ohms.	Check harness wiring circuits 378LRI, 378LRO, and 378LR– for short to ground. Repair as necessary.
					Resistance in both circuits is not within 4 to 8 ohms.	Replace modulator valve.

Right Rear Modulator Valve Troubleshooting (SID 010)						
MID	SID	FMI	Problem	Test	Test Result	Action
136	010	03	Short to power <i>Inlet or outlet circuit shorted to battery supply or another modulator valve wire.</i>	1. Measure the voltage between pins 7, 8, and 9 of the X3 (green) connector and a good chassis ground.	No voltage at either pin	Repeat test. Check circuits 378RRO, 378RR–, and 378RRI for intermittent short to power. Check above circuits for shorts to other modulator valve wires. Repair as necessary. If problem persists, the suspect ECU is at fault.
					Measurable voltage at either pin	Repair short to power in circuit 378RRO, 378RR–, or 378RRI.
136	010	05	Open circuit <i>Inlet or outlet circuit open.</i>	2. Check the modulator valve inlet and outlet circuit resistance. Disconnect the connector from the valve and perform the modulator valve test.	Resistance in both circuits is within 4 to 8 ohms.	Check harness wiring circuits 378RRO, 378RRI, and 378RR–.
					Resistance in both circuits is not within 4 to 8 ohms.	Replace the modulator valve.
136	010	06	Short to ground <i>Inlet or outlet circuit shorted to ground.</i>	3. Check the modulator valve inlet and outlet circuit resistance. Disconnect the connector from the valve and perform the modulator valve test.	Resistance in both circuits is within 4 to 8 ohms.	Check harness wiring circuits 378RRI, 378RRO, and 378RR– for short to ground. Repair as necessary.
					Resistance in both circuits is not within 4 to 8 ohms.	Replace modulator valve.

Ground Faults Troubleshooting (SID 014)						
MID	SID	FMI	Problem	Test	Test Result	Action
136	014	04	Low voltage or open circuit	1. Disconnect the X1 (gray) connector at the ABS ECU. With the ignition ON, measure the voltage between pins 1 and 12.	Voltage is 9.5 to 14 volts.	System voltage is acceptable. Check for intermittent low voltage. Check the batteries and charging system. Voltage may have been temporarily too low. Repair as necessary.
					Voltage is less than 9.5 volts.	Check vehicle batteries and charging system. Check ABS ECU power and ground circuits for open or high resistance. Repair as necessary.
136	014	05	Central group open or high resistance	2. Disconnect the X1 (gray) connector at the ABS ECU. Check the ground circuit (pin 11) for high resistance or open circuit.	Ground is okay	Verify the fault. Check the ground circuits for open or high resistance. Repair as necessary.
					Ground is open or has high resistance	Repair ground circuit as necessary.
136	014	06	Internal relay does not open			If fault repeats, replace the ABS ECU.

Ground Faults Troubleshooting (SID 015)						
MID	SID	FMI	Problem	Test	Test Result	Action
136	015	03	ATC valve grounded to power.	1. Disconnect the X3 (green) connector, check for voltage between pin 6 and ground.	Voltage at pin 6.	Circuit 378T- is shorted to power. Locate fault and repair as necessary.
					No voltage at pin 6.	Verify fault. Check for intermittent fault in circuit 378-, repair as necessary.
136	015	04	Low voltage or open circuit	2. Disconnect the X1 (gray) connector at the ABS ECU. With the ignition ON, measure the voltage between pin 2 and a good ground.	Voltage is 9.5 to 14 volts	System voltage is acceptable. Check for intermittent low voltage. Check the batteries and charging system. Voltage may have been temporarily too low. Repair as necessary.
					Voltage is less than 9.5 volts	Repair voltage supply to ECU.
136	015	05	ATC Valve - High Impedance			Replace ABS ECU if fault persists.
		06	ATC Valve circuit shorted to ground	Disconnect the X3 (green) connector, check resistance between pin 6 and a good ground.	Resistance is less than 10,000 ohms	Verify fault. Check for intermittent fault in circuit 378-, repair as necessary.
					Resistance is great than 10,000 ohms	Verify fault. Check for intermittent fault in circuit 378T-, repair as necessary.

Ground Faults Troubleshooting (SID 015)						
MID	SID	FMI	Problem	Test	Test Result	Action

ATC Valve Troubleshooting (SID 018)						
MID	SID	FMI	Problem	Test	Test Result	Action
136	018	03	Short to power.	1. Disconnect the X3 (green) connector from the ABS ECU. Disconnect the ATC valve connector. Measure the voltage between pin 5 of the X3 (green) connector and a good chassis harness.	Voltage	Circuit 378T+ is shorted to power. Repair as necessary.
					No voltage	Check circuit 378+ for intermittent short to power. Repair as necessary. If fault persists, suspect ECU at fault.
136	018	05	Open circuit	2. Disconnect the ATC Valve connector. Measure the resistance across the two pins of the ATC valve. NOTE If the vehicle does not have an ATC valve, reconfigure the ECU.	Resistance is 7 to 14 ohms.	Go to step 3.
					Resistance is not 7 to 14 ohms.	Replace ATC Valve.
				3. Reconnect the ATC valve connector. Measure the resistance across pins 5 and 6 of the X3 connector.	Resistance is 7 to 14 ohms.	Verify fault. Check for intermittent open circuit in 376T+ and 376 T-. Repair as necessary.
					Resistance is not 7 to 14 ohms.	Repair circuit 376T+ or 376T-.
136	018	07	Short to ground.	4. Disconnect the X3 (green) connector, check resistance between pin 6 and a good ground.	Continuity	Circuit 376T+ is shorted to ground. Repair as necessary.
					No continuity	Verify fault. Check circuit 376T+ for intermittent short to ground. Repair as necessary.
136	015	07	Internal relay fault			If fault repeats, replace the ABS ECU.

Auxiliary Output Troubleshooting (not currently used) (SID 019)						
MID	SID	FMI	Problem	Test	Test Result	Action
136	019	03	Short to power.			This fault should not appear. Reconfigure the ECU. If fault continues to appear, check the wiring in the X2 (black) connector. This ABS ECU connector should be unused. Make sure there are no connections to these pins. If incorrect wiring is found, correct it and reconfigure the ECU. If this does not correct the problem, contact Meritor.
136	019	05	Open circuit			Verify fault. Contact Meritor WABCO if fault persists.

J1939 Datalink Troubleshooting (SID 231)						
MID	SID	FMI	Problem	Test	Test Result	Action
136	231	02	J1939 speed plausibility error. NOTE: This fault indicates a discrepancy between vehicle speed reported on J1939 and ABS sensed vehicle speed.			Check the speedometer calibration. Check for the tire size mismatch. The vehicle speed reported on the J1939 databus does not agree with the wheel sensor speeds.
136	231	05	J1939 open/short	Refer to SB 54-133 for troubleshooting J1939.		Repair J1939 datalink as necessary.
136	231	06	J1939 open/short Code 13s231 05 may be active as well.	Check the driveline retarder ECU and wires. Check the J1939 Datalink. Freightliner SB 54-133		Repair J1939 datalink as necessary.
136	019	06	Short to ground			This fault should not appear. Reconfigure the ECU. If fault continues to appear, check the wiring in the X2 (black) connector. This ABS ECU connector should be unused. Make sure there are no connections to these pins. If incorrect wiring is found, correct it and reconfigure the ECU. If this does not correct the problem, contact Meritor.

J1939 Datalink Troubleshooting (SID 231)						
MID	SID	FMI	Problem	Test	Test Result	Action
136	231	07	J1939 time out NOTE: Fault occurs if engine retarder sends message incorrectly.	Check the driveline retarder ECU and wires. Freightliner SB 54-133		Check J1939 datalink and driveline retarder ECU. Repair as necessary.
136	231	08	J1939 time out NOTE: Fault occurs if engine retarder sends message incorrectly.	Check engine ECU and wires. Check J1939 datalink. Freightliner SB 54-133		Check J1939 datalink and engine ECU. Repair as necessary.
136	231	09	J1939 time out NOTE: Fault occurs if engine retarder sends message incorrectly.	Check engine and transmission ECUs and wires. Check J1939 datalink. Freightliner SB 54-133		Check J1939 datalink, engine ECU, transmission ECU, and wiring. Repair as necessary.

Voltage Troubleshooting (SID 251)						
MID	SID	FMI	Problem	Test	Test Result	Action
136	251	03	Overvoltage Voltage to ECU was too high for more than 5 seconds.	Using Meritor PC Diagnostics, check the diagonal voltages with the engine running at governed speed, or measure the voltage at the batteries with the engine running at governed speed.	Voltage is 9.5 to 14 volts	Check for intermittent sources of high voltage. Check condition of charging system and batteries. Verify fault.
					Voltage is greater than 14 volts.	Check charging system. Repair as necessary.
136	231	10	J1939 time out NOTE: Fault occurs if the exhaust retarder sends a message incorrectly.	Check the engine ECU and wires. Check the J1939 datalink. Freightliner SB 54-133		Check J1939 datalink and engine ECU. Repair as necessary.
136	231	12	J1939 internal error			Verify fault. Clear code from the ECU memory. If fault persists, replace the ABS ECU.

Configuration Errors Troubleshooting (SID 253)						
MID	SID	FMI	Problem	Test	Test Result	Action
136	253	01	ATC configuration error NOTE: ATC valve is detected without engine datalink (J1939).			Check J1939 for proper wiring. Check engine ECU for communication. Repair as necessary, then reconfigure ECU.
136	253	02	ABS configuration/ wheel parameter incorrect.			Reconfigure ECU. If fault repeats then the wrong ECU is installed. Replace with the correct ECU.
136	253	12	Check sum error.			Check parameter setting. Check if diagnostic device was disconnected during active diagnosis.

Miscellaneous Faults Troubleshooting (SID 254)						
MID	SID	FMI	Problem	Test	Test Result	Action
136	254	05	ABS/ATC ECU, no loads			No modulator valve connected. Fault may have resulted from end of line test at factory.

136	254	08	Excessive wheel slip.			Check wheel speed sensor air gaps. One wheel was much faster than the other. May have been caused by testing vehicle on a dynamometer.
136	254	09	Modulator valve actuated too long.			Modulator valve was activated too long (more than 75% of 5 minutes). After a delay, function will return to normal.
136	254	12	Internal error			If fault persists, replace the ABS ECU.
136	254	13	Accelerometer out of range			If fault persists, replace the ABS ECU.

Miscellaneous Faults Troubleshooting (SID 254)						
MID	SID	FMI	Problem	Test	Test Result	Action
136	254	14	ECU Mounting			Check ECU mounting. Replace the ECU if fault persists.
			Extreme banked road (measured acceleration not plausible)			No correction required. This fault is for reporting only.
			Accelerometer linearity (measured acceleration not plausible)			

MeritorWABCOHydraulicAntilockBrakingSystem(ABS) – Table of DTCs

Fault Codes

J1587 Fault Code (MID-SID)	Description
136-001	Left Front Wheel Sensor *
136-002	Right Front Wheel Sensor
136-003	Left Rear Wheel Sensor
136-004	Right Rear Wheel Sensor
136-013	Retarder
136-014	Power
136-023	ABS Warning Light
136-030	Recirculation Pump Relay
136-042	Left Front Inlet Solenoid Valve
136-043	Right Front Inlet Solenoid Valve
136-044	Left Rear Inlet Solenoid Valve
136-045	Right Rear Inlet Solenoid Valve
136-048	Left Front Outlet Solenoid Valve
136-049	Right Front Outlet Solenoid Valve
136-050	Left Rear Outlet Solenoid Valve
136-051	Right Rear Outlet Solenoid Valve
136-054	Recirculation Pump
136-055	ECU
136-251	Low Voltage
136-253	Internal Tire Parameter
136-254	ECU Internal Fault

* Blink codes 5-1, 5-3 and 5-4 indicate a fault with the right front, right rear and left rear wheel sensors respectively.

Troubleshooting Tables

J1587 Fault 136-001 Left Front Wheel Sensor						
MID	SID	FMI	Problem	Test	Test Result	Action
136	001	01	Incorrect sensor air gap	1. Adjust the sensor. Check the AC voltage across Pins 5 and 8 of the green X3 ECU connector (Circuits 377LF+ and 377 LF-) while rotating the left front wheel 30 rpm.	Voltage greater than 0.2 VAC	Sensor adjustment solved the problem. Clear the stored faults and drive the vehicle 4 mph (6 km/h).
					Voltage less than 0.2 VAC	Check for excessive wheel bearing end play. Repair as necessary.

J1587 Fault 136-001 Left Front Wheel Sensor						
MID	SID	FMI	Problem	Test	Test Result	Action
136	001	02	Intermittent open circuit or incorrect sensor resistance NOTE: This SAE J1587 fault code can also be caused by incorrect or mixed tire size. Also see test 4.	2. Measure the resistance across Pins 5 and 8 of the green X3 ECU connector (Circuits 377LF- and 377 LF+).	Resistance reading between 500 and 2000 ohms	Check for intermittent, loose or poor connections in Circuits 377LF+ and 377LF- and repair as necessary. If the problem persists, suspect the ECU is at fault.
					Resistance reading below 500 or above 2000 ohms	Go to Test 3.
				3. Disconnect the sensor at the sensor connector. Measure the resistance at the sensor connector (on the sensor side).	Resistance reading between 500 and 2000 ohms	Check the wiring between the ECU and the wheel sensor (Circuits 377LF+ and 377LF-). Repair as necessary. Go to Test 4.
					Resistance reading below 500 or above 2000 ohms	Replace the wheel sensor.
136	001	02	Incorrect or mixed tire size NOTE: This SAE J1587 fault code can also be caused by an intermittent open circuit or incorrect sensor resistance. Also, see tests 2 and 3.	4. Check for tire size deviation in excess of 16 percent. Mixed tire sizes can cause this fault.	Correct tire size and size variation does not exceed 16 percent	Perform Test 2 and Test 3 if not already done. If the problem is not found, verify the fault and check the ECU.
					Incorrect tire size or size variation exceeds 16 percent	Install the correct size tires.

J1587 Fault 136-001 Left Front Wheel Sensor						
MID	SID	FMI	Problem	Test	Test Result	Action
136	001	05	Open circuit	5. Measure the resistance across Pins 5 and 8 of the green X3 ECU connector (Circuits 377LF– and 377LF+).	Resistance reading between 500 and 2000 ohms	Check for intermittent, loose or poor connections in Circuits 377LF+ and 377LF– and repair as necessary. If the problem persists, suspect the ECU is at fault.
					Resistance reading below 500 or above 2000 ohms	Go to Test 6.
				6. Disconnect the sensor at the sensor connector. Measure the resistance at the sensor connector (on the sensor side).	Resistance reading between 500 and 2000 ohms	Check the wiring between the ECU and the wheel sensor (Circuits 377LF+ and 377LF–). Repair as necessary.
					Resistance reading below 500 or above 2000 ohms	Replace the wheel sensor.

J1587 Fault 136-002 Right Front Wheel Sensor						
MID	SID	FMI	Problem	Test	Test Result	Action
136	002	01	Incorrect sensor air gap	1. Adjust the sensor. Check the AC voltage across Pins 4 and 9 of the green X3 ECU connector (Circuits 377RF+ and 377RF–) while rotating the right front wheel 30 rpm.	Voltage greater than 0.2 VAC	Sensor adjustment solved the problem. Clear the stored faults and drive the vehicle 4 mph (6 km/h).
					Voltage less than 0.2 VAC	Check for excessive wheel bearing end play. Repair as necessary.

J1587 Fault 136-002 Right Front Wheel Sensor						
MID	SID	FMI	Problem	Test	Test Result	Action
136	002	02	Intermittent open circuit or incorrect sensor resistance	2. Measure the resistance across Pins 4 and 9 of the green X3 ECU connector (Circuits 377RF– and 377RF+).	Resistance reading between 500 and 2000 ohms	Check for intermittent, loose or poor connections in Circuits 377RF+ and 377RF– and repair as necessary. If the problem persists, suspect the ECU is at fault.
					Resistance reading below 500 or above 2000 ohms	Go to Test 3.
				3. Disconnect the sensor at the sensor connector. Measure the resistance at the sensor connector (on the sensor side).	Resistance reading between 500 and 2000 ohms	Check the wiring between the ECU and the wheel sensor (Circuits 377RF+ and 377RF–). Repair as necessary.
					Resistance reading below 500 or above 2000 ohms	Replace the wheel sensor.
136	002	05	Open circuit	4. Measure the resistance across Pins 4 and 9 of the green X3 ECU connector (Circuits 377RF– and 377RF+).	Resistance reading between 500 and 2000 ohms	Check for intermittent, loose or poor connections in Circuits 377RF+ and 377RF– and repair as necessary. If the problem persists, suspect the ECU is at fault.
					Resistance reading below 500 or above 2000 ohms	Go to Test 5.
				5. Disconnect the sensor at the sensor connector. Measure the resistance at the sensor connector (on the sensor side).	Resistance reading between 500 and 2000 ohms	Check the wiring between the ECU and the wheel sensor (Circuits 377RF+ and 377RF–). Repair as necessary.
					Resistance reading below 500 or above 2000 ohms	Replace the wheel sensor.

J1587 Fault 136-003 Left Rear Wheel Sensor						
MID	SID	FMI	Problem	Test	Test Result	Action
136	003	01	Incorrect sensor air gap	1. Adjust the sensor. Check the AC voltage across Pins 3 and 10 of the green X3 ECU connector (Circuits 377LR+ and 377LR-) while rotating the left rear wheel 30 rpm.	Voltage greater than 0.2 VAC	Sensor adjustment solved the problem. Clear the stored faults and drive the vehicle 4 mph (6 km/h).
					Voltage less than 0.2 VAC	Check for excessive wheel bearing end play. Repair as necessary.
136	003	02	Intermittent open circuit or incorrect sensor resistance	2. Measure the resistance across Pins 3 and 10 of the green X3 ECU connector (Circuits 377LR- and 377LR+).	Resistance reading between 500 and 2000 ohms	Check for intermittent, loose or poor connections in Circuits 377LR+ and 377LR- and repair as necessary. If the problem persists, suspect the ECU is at fault.
					Resistance reading below 500 or above 2000 ohms	Go to Test 3.
				3. Disconnect the sensor at the sensor connector. Measure the resistance at the sensor connector (on the sensor side).	Resistance reading between 500 and 2000 ohms	Check the wiring between the ECU and the wheel sensor (Circuits 377LR+ and 377LR-). Repair as necessary.
					Resistance reading below 500 or above 2000 ohms	Replace the wheel sensor.
136	003	05	Open circuit	4. Measure the resistance across Pins 3 and 10 of the green X3 ECU connector (Circuits 377LR- and 377LR+).	Resistance reading between 500 and 2000 ohms	Check for intermittent, loose or poor connections in Circuits 377LR+ and 377LR- and repair as necessary. If the problem persists, suspect the ECU is at fault.
					Resistance reading below 500 or above 2000 ohms	Go to Test 5.
				5. Disconnect the sensor at the sensor connector. Measure the resistance at the sensor connector (on the sensor side).	Resistance reading between 500 and 2000 ohms	Check the wiring between the ECU and the wheel sensor (Circuits 377LR+ and 377LR-). Repair as necessary.
					Resistance reading below 500 or above 2000 ohms	Replace the wheel sensor.

J1587 Fault 136-004 Right Rear Wheel Sensor						
MID	SID	FMI	Problem	Test	Test Result	Action
136	004	01	Incorrect sensor air gap	1. Adjust the sensor. Check the AC voltage across Pins 6 and 7 of the green X3 ECU connector (Circuits 377RR+ and 377RR-) while rotating the right rear wheel 30 rpm.	Voltage greater than 0.2 VAC	Sensor adjustment solved the problem. Clear the stored faults and drive the vehicle 4 mph (6 km/h).
					Voltage less than 0.2 VAC	Check for excessive wheel bearing end play. Repair as necessary.
136	004	02	Intermittent open circuit or incorrect sensor resistance	2. Measure the resistance across Pins 6 and 7 of the green X3 ECU connector (Circuits 377RR- and 377RR+).	Resistance reading between 500 and 2000 ohms	Check for intermittent, loose or poor connections in Circuits 377RR+ and 377RR- and repair as necessary. If the problem persists, suspect the ECU is at fault.
					Resistance reading below 500 or above 2000 ohms	Go to Test 3.
				3. Disconnect the sensor at the sensor connector. Measure the resistance at the sensor connector (on the sensor side).	Resistance reading between 500 and 2000 ohms	Check the wiring between the ECU and the wheel sensor (Circuits 377RR+ and 377RR-). Repair as necessary.
					Resistance reading below 500 or above 2000 ohms	Replace the wheel sensor.
136	004	05	Open circuit	4. Measure the resistance across Pins 6 and 7 of the green X3 ECU connector (Circuits 377RR- and 377RR+).	Resistance reading between 500 and 2000 ohms	Check for intermittent, loose or poor connections in Circuits 377RR+ and 377RR- and repair as necessary. If the problem persists, suspect the ECU is at fault.
					Resistance reading below 500 or above 2000 ohms	Go to Test 5.
				5. Disconnect the sensor at the sensor connector. Measure the resistance at	Resistance reading between 500 and 2000 ohms	Check the wiring between the ECU and the wheel sensor (Circuits 377RR+ and 377RR-). Repair as necessary.

J1587 Fault 136-013 Retarder						
MID	SID	FMI	Problem	Test	Test Result	Action
136	013	03	Short to power	1. Disconnect the black X2 connector at the ECU. Disconnect the retarder relay. With the ignition ON, measure the voltage between Pin 7 of the black X2 ECU connector and a good chassis ground.	Voltage zero	Check for an intermittent short to power in Circuit 376R. If okay, ECU may be at fault.
					Voltage not zero	Check for a short to power in Circuit 376R. Repair as necessary.
136	013	05	Open circuit	2. Disconnect the black X2 connector at the ECU. Disconnect the retarder relay. Measure the resistance between Pin 7 of the black X2 ECU connector and relay connector cavity that corresponds to pin 85 of the relay.	Resistance less than 1 ohm	Check relay coil resistance (should be 60-85 Ohms). If okay, check circuit 81C (power to relay coil) for open. Repair as necessary.
					Resistance more than 1 ohm	Repair open in circuit 376R.
136	013	06	Short to ground	3. Disconnect the black X2 connector at the ECU. Disconnect the retarder relay. Measure the resistance between pin 7 of the X2 connector and a good chassis ground.	Resistance is less than 10 Ohms	Check circuit 376R for short to ground. Repair as necessary.
					Resistance is much greater than 10 Ohms	Check for intermittent short to ground in circuit 376R. If okay, ECU may be at fault.

				the sensor connector (on the sensor side).	Resistance reading below 500 or above 2000 ohms	Replace the wheel sensor.
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J1587 Fault 136-014 Power						
MID	SID	FMI	Problem	Test	Test Result	Action
136	014	03	Voltage supplied to ECU with ignition OFF	1. Check for voltage backfeeding to ECU with the ignition off, especially to pins 7/X2 and 10/X2.	Voltage zero	Repair as necessary.
			No voltage supplied to	2. With the ignition ON, measure the voltage between Pin 3 of the black X2 ECU connector and a	Voltage between 9.5 and 14 volts at both pins.	Check Circuit 376A for an intermittent open circuit. If the problem persists, suspect the ECU is at fault.

136	014	04	ECU with ignition ON	good chassis ground. Repeat between pin 11 and ground.	Voltage below 9.5 volts at one or both pins.	Check Circuit 376A for an open circuit and check Fuse F16. Repair as necessary.
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J1587 Fault 136-023 ABS Warning Light						
MID	SID	FMI	Problem	Test	Test Result	Action
136	023	05	Open circuit or low current	1. Disconnect the black X2 connector from the ECU. Turn the ignition ON.	ABS light illuminates	Check circuit 376L for open circuit between splice S22 and X2/8 at the ABS connector. Repair as necessary.
					ABS light does not illuminate	Check the bulb and wire (circuit 376L between splice S22 and ICU pin B11. If okay, replace the ICU.

J1587 Fault 136-030 Recirculation Pump Relay						
MID	SID	FMI	Problem	Test	Test Result	Action
136	030	03	Relay shorted to power	1. Disconnect the black X2 ECU connector. With the ignition ON, measure the voltage between Pin 6 and a good chassis ground.	Voltage zero	If the problem persists, suspect the ECU is at fault.
					Voltage not zero	Circuit 376H is shorted to power. Repair as necessary.
136	030	05	Relay open circuit	2. Disconnect the black X2 ECU connector. Measure the resistance between Pin 6 and a good chassis ground.	Resistance between 50 and 200 ohms	If the problem persists, suspect the ECU is at fault.
					Resistance below 50 or above 200 ohms	Check the relay coil, relay coil ground circuit, and Circuit 376H for an open circuit. Repair as necessary.
136	030	06	Relay short to ground	3. Disconnect the black X2 ECU connector. Measure the resistance between Pin 6 and a good chassis ground.	Resistance between 50 and 200 ohms	If the problem persists, suspect the ECU is at fault.
					Resistance below 50 or above 200 ohms	Check Circuit 376H for a short to ground. Repair as necessary.

J1587 Fault 136-030 Recirculation Pump Relay						
MID	SID	FMI	Problem	Test	Test Result	Action
136	030	07	Pump relay sticks, pump continues to run when ECU deactivates the relay NOTE: The problem may	4. If the fault is active, disconnect the black X2 connector from the ECU. With the ignition ON, check	Pump OFF	The ABS pump relay (located in the chassis harness, near the ABS valve) may be intermittently sticking. Try a new relay and verify that the problem is solved.

			be intermittent and a new relay may be required to correct the fault.	to see if the recirculation pump is running.	Pump ON	The ABS pump relay (located in the chassis harness, near the ABS valve) is sticking. Replace the relay.
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J1587 Fault 136-042 Left Front Inlet Solenoid Valve						
MID	SID	FMI	Problem	Test	Test Result	Action
136	042	03 05 06	Shorted to power (inlet valve) Open circuit (inlet valve) Shorted to ground (inlet valve) NOTE: Check for an open circuit in the wiring between the ECU and the modulator valve. Check the ground circuit to the modulator valve.	1. Measure the resistance across Pins 3 and 2 of the gray X1 ECU connector (Circuits 378LFI and GRDE).	Resistance reading 6.5 ± 0.5 ohms	Check for intermittent wiring connections. If the wiring is OK, suspect the ECU is at fault.
					Resistance reading not 6.5 ± 0.5 ohms	Go to Test 2.
				2. Check the ground circuit by measuring the resistance between Pin 2 of the gray X1 ECU connector and a good chassis ground.	Resistance reading close to zero	Go to Test 3.
					Resistance reading not close to zero	Check and repair the ground circuit.
				3. With the modulator valve connector removed, measure the resistance between Pin 8 on the modulator connector and a good chassis ground.	Resistance reading close to zero	Go to Test 4.
					Resistance reading not close to zero	Check the modulator ground circuit, repair as necessary.
				4. Measure the resistance in Circuit 378LFI between modulator connector Pin 12 and connector Pin 3 on the gray X1 ECU connector.	Resistance reading close to zero	Go to Test 5.
					Resistance reading not close to zero	Repair Circuit 378LFI.
				5. With the modulator valve connector removed, measure the resistance across Pins 12 and 8 on the modulator connector.	Resistance reading 6.5 ± 0.5 ohms	Repeat Tests 1 through 5. The problem may be intermittent. If the wiring is OK, suspect the ECU is at fault.
					Resistance reading not 6.5 ± 0.5 ohms	Replace the modulator valve.

J1587 Fault 136-043 Right Front Inlet Solenoid Valve						
MID	SID	FMI	Problem	Test	Test Result	Action
136	043	03 05 06	Shorted to power (inlet valve) Open circuit (inlet valve) Shorted to ground (inlet valve) NOTE: Check for an open circuit in the wiring between the ECU and the modulator valve. Check the ground circuit to the modulator valve.	1. Measure the resistance across Pins 4 and 2 of the gray X1 ECU connector (Circuits 378RFI and GRDE).	Resistance reading 6.5 ± 0.5 ohms	Check for intermittent wiring connections. If the wiring is OK, suspect the ECU is at fault.
					Resistance reading not 6.5 ± 0.5 ohms	Go to Test 2.
				2. Check the ground circuit by measuring the resistance between Pin 2 of the gray X1 ECU connector and a good chassis ground.	Resistance reading close to zero	Go to Test 3.
					Resistance reading not close to zero	Check and repair the ground circuit.
				3. With the modulator valve connector removed, measure the resistance between Pin 8 on the modulator connector and a good chassis ground.	Resistance reading close to zero	Go to Test 4.
					Resistance reading not close to zero	Check the modulator ground circuit, repair as necessary.
				4. Measure the resistance in Circuit 378RFI between modulator connector Pin 4 and connector Pin 4 on the gray X1 ECU connector.	Resistance reading close to zero	Go to Test 5.
					Resistance reading not close to zero	Repair Circuit 378RFI.
				5. With the modulator valve connector removed, measure the resistance across Pins 4 and 8 on the modulator connector.	Resistance reading 6.5 ± 0.5 ohms	Repeat Tests 1 through 5. The problem may be intermittent. If the wiring is OK, suspect the ECU is at fault.
					Resistance reading not 6.5 ± 0.5 ohms	Replace the modulator valve.

J1587 Fault 136-044 Left Rear Inlet Solenoid Valve						
MID	SID	FMI	Problem	Test	Test Result	Action
136	044	03 05 06	Shorted to power (inlet valve) Open circuit (inlet valve) Shorted to ground (inlet valve) NOTE: Check for an open circuit in the wiring between the ECU and the modulator valve. Check the ground circuit to the modulator valve.	1. Measure the resistance across Pins 5 and 2 of the gray X1 ECU connector (Circuits 378LRI and GRDE).	Resistance reading 6.5 ± 0.5 ohms	Check for intermittent wiring connections. If the wiring is OK, suspect the ECU is at fault.
					Resistance reading not 6.5 ± 0.5 ohms	Go to Test 2.
				2. Check the ground circuit by measuring the resistance between Pin 2 of the gray X1 ECU connector and a good chassis ground.	Resistance reading close to zero	Go to Test 3.
					Resistance reading not close to zero	Check and repair the ground circuit.
				3. With the modulator valve connector removed, measure the resistance between Pin 8 on the modulator connector and a good chassis ground.	Resistance reading close to zero	Go to Test 4.
					Resistance reading not close to zero	Check the modulator ground circuit, repair as necessary.
				4. Measure the resistance in Circuit 378LRI between modulator connector Pin 2 and connector Pin 5 on the gray X1 ECU connector.	Resistance reading close to zero	Go to Test 5.
					Resistance reading not close to zero	Repair Circuit 378LRI.
				5. With the modulator valve connector removed, measure the resistance across Pins 2 and 8 on the modulator connector.	Resistance reading 6.5 ± 0.5 ohms	Repeat Tests 1 through 5. The problem may be intermittent. If the wiring is OK, suspect the ECU is at fault.
					Resistance reading not 6.5 ± 0.5 ohms	Replace the modulator valve.

J1587 Fault 136-045 Right Rear Inlet Solenoid Valve						
MID	SID	FMI	Problem	Test	Test Result	Action
136	045	03 05 06	Shorted to power (inlet valve) Open circuit (inlet valve) Shorted to ground (inlet valve) NOTE: Check for an open circuit in the wiring between the ECU and the modulator valve. Check the ground circuit to the modulator valve.	1. Measure the resistance across Pins 6 and 2 of the gray X1 ECU connector (Circuits 378RRI and GRDE).	Resistance reading 6.5 ± 0.5 ohms	Check for intermittent wiring connections. If the wiring is OK, suspect the ECU is at fault.
					Resistance reading not 6.5 ± 0.5 ohms	Go to Test 2.
				2. Check the ground circuit by measuring the resistance between Pin 2 of the gray X1 ECU connector and a good chassis ground.	Resistance reading close to zero	Go to Test 3.
					Resistance reading not close to zero	Check and repair the ground circuit.
				3. With the modulator valve connector removed, measure the resistance between Pin 8 on the modulator connector and a good chassis ground.	Resistance reading close to zero	Go to Test 4.
					Resistance reading not close to zero	Check the modulator ground circuit, repair as necessary.
				4. Measure the resistance in Circuit 378RRI between modulator connector Pin 11 and connector Pin 6 on the gray X1 ECU connector.	Resistance reading close to zero	Go to Test 5.
					Resistance reading not close to zero	Repair Circuit 378RRI.
				5. With the modulator valve connector removed, measure the resistance across Pins 11 and 8 on the modulator connector.	Resistance reading 6.5 ± 0.5 ohms	Repeat Tests 1 through 5. The problem may be intermittent. If the wiring is OK, suspect the ECU is at fault.
					Resistance reading not 6.5 ± 0.5 ohms	Replace the modulator valve.

J1587 Fault 136-048 Left Front Outlet Solenoid Valve						
MID	SID	FMI	Problem	Test	Test Result	Action
136	048	03 05 06	Shorted to power (outlet valve) Open circuit (outlet valve) Shorted to ground (outlet valve) NOTE: Check for an open circuit in the wiring between the ECU and the modulator valve. Check the ground circuit to the modulator valve.	1. Measure the resistance across Pins 10 and 2 of the gray X1 ECU connector (Circuits 378LFO and GRDE).	Resistance reading 3.5 ± 0.5 ohms	Check for intermittent wiring connections. If the wiring is OK, suspect the ECU is at fault.
					Resistance reading not 3.5 ± 0.5 ohms	Go to Test 2.
				2. Check the ground circuit by measuring the resistance between Pin 2 of the gray X1 ECU connector and a good chassis ground.	Resistance reading close to zero	Go to Test 3.
					Resistance reading not close to zero	Check and repair the ground circuit.
				3. With the modulator valve connector removed, measure the resistance between Pin 8 on the modulator connector and a good chassis ground.	Resistance reading close to zero	Go to Test 4.
					Resistance reading not close to zero	Check the modulator ground circuit, repair as necessary.
				4. Measure the resistance in Circuit 378LFO between modulator connector Pin 13 and connector Pin 10 on the gray X1 ECU connector.	Resistance reading close to zero	Go to Test 5.
					Resistance reading not close to zero	Repair Circuit 378LFO.
				5. With the modulator valve connector removed, measure the resistance across Pins 13 and 8 on the modulator connector.	Resistance reading 3.5 ± 0.5 ohms	Repeat Tests 1 through 5. The problem may be intermittent. If the wiring is OK, suspect the ECU is at fault.
					Resistance reading not 3.5 ± 0.5 ohms	Replace the modulator valve.

J1587 Fault 136-049 Right Front Outlet Solenoid Valve						
MID	SID	FMI	Problem	Test	Test Result	Action
136	049	03 05 06	Shorted to power (outlet valve) Open circuit (outlet valve) Shorted to ground (outlet valve) NOTE: Check for an open circuit in the wiring between the ECU and the modulator valve. Check the ground circuit to the modulator valve.	1. Measure the resistance across Pins 9 and 2 of the gray X1 ECU connector (Circuits 378RFO and GRDE).	Resistance reading 3.5 ± 0.5 ohms	Check for intermittent wiring connections. If the wiring is OK, suspect the ECU is at fault.
					Resistance reading not 3.5 ± 0.5 ohms	Go to Test 2.
				2. Check the ground circuit by measuring the resistance between Pin 2 of the gray X1 ECU connector and a good chassis ground.	Resistance reading close to zero	Go to Test 3.
					Resistance reading not close to zero	Check and repair the ground circuit.
				3. With the modulator valve connector removed, measure the resistance between Pin 8 on the modulator connector and a good chassis ground.	Resistance reading close to zero	Go to Test 4.
					Resistance reading not close to zero	Check the modulator ground circuit, repair as necessary.
				4. Measure the resistance in Circuit 378RFO between modulator connector Pin 5 and connector Pin 9 on the gray X1 ECU connector.	Resistance reading close to zero	Go to Test 5.
					Resistance reading not close to zero	Repair Circuit 378RFO.
				5. With the modulator valve connector removed, measure the resistance across Pins 5 and 8 on the modulator connector.	Resistance reading 3.5 ± 0.5 ohms	Repeat Tests 1 through 5. The problem may be intermittent. If the wiring is OK, suspect the ECU is at fault.
					Resistance reading not 3.5 ± 0.5 ohms	Replace the modulator valve.

J1587 Fault 136-050 Left Rear Outlet Solenoid Valve						
MID	SID	FMI	Problem	Test	Test Result	Action
136	050	03 05 06	Shorted to power (outlet valve) Open circuit (outlet valve) Shorted to ground (outlet valve) NOTE: Check for an open circuit in the wiring between the ECU and the modulator valve. Check the ground circuit to the modulator valve.	1. Measure the resistance across Pins 8 and 2 of the gray X1 ECU connector (Circuits 378LRO and GRDE).	Resistance reading 3.5±0.5 ohms	Check for intermittent wiring connections. If the wiring is OK, suspect the ECU is at fault.
					Resistance reading not 3.5±0.5 ohms	Go to Test 2.
				2. Check the ground circuit by measuring the resistance between Pin 2 of the gray X1 ECU connector and a good chassis ground.	Resistance reading close to zero	Go to Test 3.
					Resistance reading not close to zero	Check and repair the ground circuit.
				3. With the modulator valve connector removed, measure the resistance between Pin 8 on the modulator connector and a good chassis ground.	Resistance reading close to zero	Go to Test 4.
					Resistance reading not close to zero	Check the modulator ground circuit, repair as necessary.
				4. Measure the resistance in Circuit 378LRO between modulator connector Pin 1 and connector Pin 8 on the gray X1 ECU connector.	Resistance reading close to zero	Go to Test 5.
					Resistance reading not close to zero	Repair Circuit 378LRO.
				5. With the modulator valve connector removed, measure the resistance across Pins 1 and 8 on the modulator connector.	Resistance reading 3.5±0.5 ohms	Repeat Tests 1 through 5. The problem may be intermittent. If the wiring is OK, suspect the ECU is at fault.
					Resistance reading not 3.5±0.5 ohms	Replace the modulator valve.

J1587 Fault 136-051 Right Rear Outlet Solenoid Valve						
MID	SID	FMI	Problem	Test	Test Result	Action
136	051	03 05 06	Shorted to power (outlet valve) Open circuit (outlet valve) Shorted to ground (outlet valve) NOTE: Check for an open circuit in the wiring between the ECU and the modulator valve. Check the ground circuit to the modulator valve.	1. Measure the resistance across Pins 7 and 2 of the gray X1 ECU connector (Circuits 378RRO and GRDE).	Resistance reading 3.5 ± 0.5 ohms	Check for intermittent wiring connections. If the wiring is OK, suspect the ECU is at fault.
					Resistance reading not 3.5 ± 0.5 ohms	Go to Test 2.
				2. Check the ground circuit by measuring the resistance between Pin 2 of the gray X1 ECU connector and a good chassis ground.	Resistance reading close to zero	Go to Test 3.
					Resistance reading not close to zero	Check and repair the ground circuit.
				3. With the modulator valve connector removed, measure the resistance between Pin 8 on the modulator connector and a good chassis ground.	Resistance reading close to zero	Go to Test 4.
					Resistance reading not close to zero	Check the modulator ground circuit, repair as necessary.
				4. Measure the resistance in Circuit 378RRO between modulator connector Pin 10 and connector Pin 7 on the gray X1 ECU connector.	Resistance reading close to zero	Go to Test 5.
					Resistance reading not close to zero	Repair Circuit 378RRO.
				5. With the modulator valve connector removed, measure the resistance across Pins 10 and 8 on the modulator connector.	Resistance reading 3.5 ± 0.5 ohms	Repeat Tests 1 through 5. The problem may be intermittent. If the wiring is OK, suspect the ECU is at fault.
					Resistance reading not 3.5 ± 0.5 ohms	Replace the modulator valve.

J1587 Fault 136-054 Recirculation Pump						
MID	SID	FMI	Problem	Test	Test Result	Action
136	054	03	Recirculation pump on without being activated by ECU NOTE: In this case the ECU is sensing voltage on the pump monitor circuit (Pin 10 of the black X2 connector) when the pump relay was not activated by the ECU (Pin 6 of the black X2 connector).	1. Remove the black X2 connector from the ECU. With the ignition ON, measure the voltage between Pin 10 and a good chassis ground.	Voltage zero	Check the ECU and verify the fault.
					Voltage not zero	Go to Test 2.
				2. Remove the ABS pump relay (R17) and repeat Test 1.	Voltage zero	Check the ABS pump relay R17; it may be sticking or shorted.
					Voltage not zero	Check for a short to power in Circuit 376B causing the pump to run when it should not be. Repair as necessary.
136	054	04	Recirculation pump does not switch on when activated by the ECU NOTE: In this case the ECU does not sense voltage on the pump monitor circuit (Pin 10 of the black X2 ECU connector) when the pump relay was activated by the ECU (Pin 6 of the black X2 ECU connector).	3. Remove the black X2 connector from the ECU. With the ignition ON, link Pins 6 and 3 while measuring the voltage between Pin 10 and a good chassis ground. The pump should run (do not hold for more than 1 minute).	Voltage between 9.5 and 14 volts	Check for intermittent connections in Circuit 376B and check the ABS pump relay for intermittent operation. Repair as necessary.
					Voltage below 9.5 or above 14 volts	Check Circuit 376A and check Relay R17. Repair as necessary.
136	054	07	Recirculation pump sticks or is locked NOTE: In this case, the ECU senses high current on the pump monitor circuit (Pin 10 of the black X2 ECU connector) indicating the pump motor is locked.	4. Remove the black X2 connector from the ECU. With the ignition ON, momentarily link Pins 6 and 3. The pump should run (do not hold for more than 1 minute).	Pump runs	Repeat the test to verify. If the fault persists, suspect a problem with the ECU.
					Pump does not run	Replace the recirculation pump.

J1587 Fault 136-055 ECU						
MID	SID	FMI	Problem	Test	Test Result	Action
136	055	02	Reference to ground interrupted	1. With the ignition OFF, measure the voltage between Pin 2 of the gray X1 ECU connector (Circuit GND) and a good chassis ground.	Voltage zero volts	Go to Test 2.
					Voltage not zero volts	Check the ground circuit for a short to positive voltage.
				2. Measure the resistance between Pin 2 of the gray X1 ECU connector and a good chassis ground.	Resistance near zero ohms	Check the ECU ground circuit (GND) for an intermittent or loose connection. Check ground Splice S10. If the problem persists, suspect the ECU is at fault.
					Resistance above zero ohms	Check the ECU ground circuit (GND). Repair as necessary.

J1587 Fault 136-251 Low Voltage						
MID	SID	FMI	Problem	Test	Test Result	Action
136	251	03	Voltage too high NOTE: Voltage to the ABS ECU must be between 9.5 and 14 volts to function properly.	1. Disconnect the black X2 ECU connector. Start the engine and run it at governed speed while measuring the voltage between Pins 3 and 9.	Voltage between 9.5 and 14 volts	Check the electrical system. If the problem persists, suspect the ECU is at fault.
					Voltage below 9.5 or above 14 volts	Check the batteries and charging system for malfunction. Repair as necessary.
136	251	04	Low voltage to ABS solenoid valves NOTE: Voltage to the ABS ECU must be between 9.5 and 14 volts to function properly.	2. Disconnect the black X2 ECU connector. Start the engine and run it at idle while measuring the voltage between Pins 3 and 9 of the black X2 ECU connector.	Voltage between 9.5 and 14 volts	Verify that the batteries were not drained or the charging system was not overloaded when the fault occurred. If the problem persists, suspect the ECU is at fault.
					Voltage below 9.5 or above 14 volts	Check the batteries and charging system for malfunction. Repair as necessary.

J1587 Fault 136-253 Internal Tire Parameter						
MID	SID	FMI	Problem	Test	Test Result	Action
136	253	02	Incorrect internal tire parameter	—	—	Contact Meritor WABCO (1-800-535-5560).

J1587 Fault 136-254 ECU Internal Fault						
MID	SID	FMI	Problem	Test	Test Result	Action
136	254	12	Internal ECU Fault	—	—	Replace the ECU.

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