

ABS System Troubleshooting

Troubleshooting Tables

Using the following tables, troubleshoot the ABS system by MID-SID.

J1587 Fault Code Cross-Reference		
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J1587 Fault Code Cross-Reference		
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Table 1, J1587 Fault Code Cross Reference

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.

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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 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	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.

Table 2, Left Front Wheel Sensor Troubleshooting (SID 001)

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.

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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.

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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.

Table 3, Right Front Wheel Sensor Troubleshooting (SID 002)

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.

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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.

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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.

Table 4, Left Rear Wheel Sensor Troubleshooting (SID 003)

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.

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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.

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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.

Table 5, Right Rear Wheel Sensor Troubleshooting (SID 004)

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.

Table 6, Left Front Modulator Valve Troubleshooting (SID 007)

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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 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 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.

Table 7, Right Front Modulator Valve Troubleshooting (SID 008)

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 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 378LRI, 378LRO, and 378LR-.
					Resistance in both circuits is not within 4 to 8 ohms.	Replace the modulator valve.

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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.

Table 8, Left Rear Modulator Valve Troubleshooting (SID 009)

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.

Table 9, Right Rear Modulator Valve Troubleshooting (SID 010)

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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.

Table 10, Ground Faults Troubleshooting (SID 014)

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.

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Ground Faults Troubleshooting (SID 015)						
MID	SID	FMI	Problem	Test	Test Result	Action
136	015	07	Internal relay fault			If fault repeats, replace the ABS ECU.

Table 11, Ground Faults Troubleshooting (SID 015)

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.	

Table 12, ATC Valve Troubleshooting (SID 018)

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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.
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.

Table 13, Auxiliary Output Troubleshooting (SID 019)

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.

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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.
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.

Table 14, J1939 Datalink Troubleshooting (SID 231)

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.

Table 15, Voltage Troubleshooting (SID 251)

ABS System Troubleshooting

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.

Table 16, Configuration Errors Troubleshooting (SID 253)

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.

ABS System Troubleshooting

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)			

Table 17, Miscellaneous Faults Troubleshooting (SID 254)

PLC Troubleshooting

Special tools to test PLC are currently in development and will be available soon. It is anticipated that these tools will have the capability to do the following:

- Simulate a trailer ABS PLC message to the tractor ABS ECU to turn on the trailer ABS warning lamp. This tests the functionality of the vehicle portion of the system.
- Detect a PLC message from the trailer ABS. This tests the functionality of the trailer portion of the system.

At present, the only way to test the trailer ABS warning lamp system with PLC is to connect the vehicle to a trailer with PLC. When the ignition is turned on, the trailer ABS lamp should come on for a few seconds, then go out. This indicates that there is PLC communications, the warning lamp works, and there are no faults in the trailer ABS. If the trailer ABS lamp remains on, there is a fault in the trailer ABS. Refer to the trailer ABS manufacturer's literature for troubleshooting the trailer ABS system.

NOTE: It is also possible that the trailer ABS lamp circuit is shorted to ground, causing the lamp to stay on.

PLC Filter Testing

Testing of the PLC filter is possible. Before performing these tests make sure the ignition is OFF. Disconnect the 2-wire connector (green/yellow wires) and the 2-wire connector (blue wires) from the filter.

The PLC filter is located near the trailer receptacle on the frame rail or crossmember. Follow the single blue wire from the PLC filter to the primary or supplemental receptacle. Whichever trailer receptacle the blue wire is connected to carries the PLC signal.

NOTE: For the following steps, you will need a digital multimeter (DMM) with capacitance measuring capability.

1. At the 2-pin connector with the green and yellow wires, use a DMM to measure the resistance across the green and yellow wires.
 - If the reading is less than 0.5 ohms, go to the next step.
 - If the reading is more than 0.5 ohms, the tractor ABS power circuit is open in the PLC filter. Replace the filter.
2. Determine the receptacle (primary or supplemental) that supplies power to the trailer ABS. Using a DMM, connect one lead to pin 7 of the receptacle that supplies power to the trailer ABS and the other lead to the 2-pin connector on the PLC filter that has the two blue wires. Measure the resistance at both pins on the 2-pin connector.
 - If the reading is less than 1.0 ohm, go to the next step.
 - If the reading is more than 1.0 ohm, there is an open circuit either between the 7-way trailer receptacle and the PLC filter, or in the PLC filter itself. Repair the harness or replace the PLC filter as necessary.

ABS System Troubleshooting

3. At the PLC filter, connect one lead of the DMM to the green wire (at the 2-pin connector with the green and yellow wires) and the other lead to one of the blue wires (at the 2-pin connector with the two blue wires). Measure the capacitance.
 - If the reading is 4.8 to 7.2 μF , go to the next step.
 - If the reading is less than 4.8 or more than 7.2 μF , one or more of the internal capacitors is faulty. This may affect PLC functionality and/or noise in the electrical system. Replace the PLC filter.
4. At the PLC filter, connect one lead of the DMM to one of the blue wires (at the 2-pin connector that has the two blue wires) and connect the other lead to the ground where the white wire terminates. Measure the capacitance.
 - If the reading is 9.91 to 11.91 μF , the PLC filter is functioning properly.
 - If the reading is less than 9.91 or more than 11.91 μF , check and clean the ground connection where the white wire terminates and retest. If the reading is still unsatisfactory, one or more of the internal capacitors is faulty. This may affect PLC functionality and/or noise in the electrical system. Replace the PLC filter.

ABS System Troubleshooting

Trailer ABS Warning Lamp Troubleshooting		
Symptom	Possible Cause	Action
Trailer ABS lamp does not come on when the ignition is turned on.	There is no trailer connected or the trailer is not equipped with PLC.	The trailer ABS lamp will not illuminate at start-up unless a trailer equipped with PLC is connected to the vehicle. Trailers manufactured on or after March 1, 2001 are equipped with PLC.
	The vehicle is not equipped with PLC.	Verify that the vehicle has PLC. Check the vehicle ABS ECU: <ul style="list-style-type: none"> • WABCO E-Version ABS ECUs have PLC. • Bendix ABS EC-30 ECUs have PLC unless there is a label on it that says "ECU does not control trailer ABS warning lamp." • Eaton Gen 5 ABS ECU has PLC. Check if vehicle was manufactured on or after March 1, 2001.
	The trailer ABS warning lamp bulb is burned-out.	Replace the bulb.
	There is a circuit fault between the tractor ABS ECU and the trailer ABS warning lamp in the dash.	Check and correct, if necessary. The trailer ABS warning lamp circuit can be tested at the tractor ABS ECU by grounding the pin to that circuit. This should cause the lamp to illuminate.
	There is faulty wiring (power or ground).	Check and correct as necessary.
	The PLC filter is faulty.	Check and replace as necessary.
	The tractor ABS ECU is faulty.	Be sure to check the trailer ABS lamp circuit and try connecting vehicle to a trailer where PLC is known to work. If the tractor ABS ECU is still faulty, replace.
	The trailer ABS ECU is faulty.	Be sure to check the trailer ABS lamp circuit and try connecting trailer to a vehicle where PLC is known to work. If the trailer ABS ECU is still faulty, replace.
Trailer ABS lamp stays on.	There is a trailer ABS fault.	Refer to the trailer ABS manufacturers literature for troubleshooting. Repair as necessary.
	Trailer ABS lamp circuit shorted to ground.	Repair as necessary.

Table 18, Trailer ABS Warning Lamp Troubleshooting