ABS Flash Code (Blink Code) Instructions

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ABS BLINK CODE DIAGNOSTICS

The MUTT can be used to access ABS Blink Codes on trailers equipped with ABS systems. Trailers equipped with ABS feature an ABS Control Unit (ECU) which detects any electrical fault in the trailer ABS. Most trailers with ABS will also have a dedicated ABS lamp on the driver side. Each fault has a code. When a fault occurs, the ECU stores the code for that fault in its memory. This fault code will be displayed on the trailer ABS lamp when the proper access sequence is engaged.

ACCESSING ABS BLINK/FAULT CODES

The MUTT provides a quick method to trigger ABS blink codes without a tractor present. Depending on the system, you will need to selectively power the Auxiliary and/or Brake Light circuit in the correct order. Instructions on how to access several of the most common ABS systems can be found below.

Once the correct manufacturer's specific sequence is performed, you then must assess the trailer ABS lamp. The number of blinks displayed on the trailer ABS lamp will correspond to a specific ABS fault. As each manufacturer uses different access methods and each blink code has different meanings, the remainder of the ABS section will be broken down by the brand of ABS system installed on the trailer you wish to test.

Note: ABS Manufacturer Access Protocols/Blink Codes are subject to change. Please consult specific ABS manufacturer manuals for more detailed information and any discrepancies in their literature shall supersede the following directions.

MERITOR/WABCO BLINK CODES

To access Meritor/WABCO blink codes you must select the Auxiliary Circuit to power ON/OFF/ON in one second intervals using the following directions:

1. Make sure trailer is stationary and wheels are properly chocked.
2. On the MUTT, turn the control knob to the Auxiliary Circuit. Pause one second.
4. Turn the control knob to the Ground Integrity Indicator (one position to the right). Pause one second.
5. Turn the control knob back to the Auxiliary Circuit (one position to the left).
6. Count number of blinks on the trailer ABS lamp. Use the chart below for specific fault information.

Blink Code	Problem Area	Action
3	Sensor BUl	Determine sensor location. Check sensor installation. Make necessary repairs.
4	Sensor YEl	Determine sensor location. Check senor installation. Make necessary repairs.
5	Sensor BU2	Determine sensor location. Check sensor installation. Make necessary repairs.
6	Sensor YE2	Verify proper electrical modulator installation. Check power supply. Make necessary corrections.
7	External ABS Modulator Valve	Verify proper electrical modulator installation. Check power supply. Make necessary corrections.
9	Internal modulator failure inlet valve #2	Verify proper installation. If code continues, contact Meritor WABCO for assistance.
10	Internal modulator failure inlet valve #1	Verify proper installation. If code continues, contact Meritor WABCO for assistance.
11	Internal modulator failure inlet valve	Verify proper installation. If code continues, contact Meritor WABCO for assistance.
14	Power Supply	Verify proper electrical installation. Check power supply. Make necessary corrections.
15	ECU Failure	Verify proper installation. If code continues, contact Meritor WABCO for assistance.
16	SAE JI 708 Failure	Internal failure, contact Meritor WABCO
17	SAE J2497 (PLC) Failure	Internal failure, contact Meritor WABCO
18	Generic I/O Failure	Verify proper electrical installation. Check power supply. Make necessary corrections.

For diagnostic and troubleshooting assistance, call Meritor WABCO at 1-800-535-5560

HALDEX BLINK CODES

To access Haldex Blink Codes you must select the Brake Light circuit and press the control knob to cycle the Auxiliary Circuit the appropriate number of times using the following directions.

See table below for modes and sequences:

Mode	Description	Ignition Cycles (Hold 1 Second ON/OFF)
1	Simple/Wheel Speed Mode	ON, off, ON
2	Active Faults Mode	ON, off, ON, off, ON
3	Stored Faults/Clear Mode	ON, off, ON, off, ON, off, ON
4	Configuration Mode	ON, off, ON, off, ON, off, ON, off, ON

1. Make sure trailer is stationary and wheels are properly chocked.
2. On the MUTT, turn the control knob to select Brake Light Circuit
3. Push the control knob to cycle Auxiliary Circuit ON for each desired ignition cycle. Auxiliary Circuit will flash.
5. Each Ignition Cycle must end with both Brake Light and Auxiliary Circuits simultaneously powered. To do this, press and hold the control knob for 5 seconds during the last ON cycle.
6. Count number of blinks on trailer ABS lamp, see following charts (pg. x-x) for specific fault info.

Item	Flash Count	Actual Fault
System OK	Light Stays On	07
Sensor 1A	1 Flash	01
Sensor 1B	2 Flashes	02
Sensor 2A	3 Flashes	03
Sensor 2B	4 Flashes	04
Sensor 3A	5 Flashes	05
Sensor 3B	6 Flashes	06
Red Valve	7 Flashes	61, 67, 71, 77, 81, & 87
Blue Valve	8 Flashes	62, 68, 72, 78, 82, & 88
Yellow Valve	9 Flashes	63, 69, 73, 79, 83, & 89
Low Voltage	10 Flashes	90
ECU Failure	11 Flashes	93, 99, & E-Codes

Fault Code	Explanation	Possible Causes	PLC Select 1M	PLC Select 2M
00	System OK (with vehicle traveling > 6 mph)	ABS is operational Displays “00” when traveling > 6 MPH	X	X
01	Red channel wheel speed sensor wiring S1A has an Open or Short circuit.	Indicates a wheel speed sensor or its wiring has short or open circuit. Disconnect the relevant sensor and measure the resistance between the two pins in the sensor connector housing. If sensor extensions are used verify extension continuity and connections. Replace sensor and/or extension cable. The Ohm meter reading for the sensor or sensor and extension cable should be between 980 and 2350 Ohm (.98K and 2.35K Ohm) If not, replace sensor and/or extension cable.	X	
02	Red channel wheel speed sensor wiring S1B has an Open or Short circuit.		X	
03	Blue channel wheel speed sensor wiring S2A has an Open or Short circuit.			X
04	Yellow channel wheel speed sensor wiring S2B has an Open or Short circuit.			X
05	Blue channel wheel speed sensor wiring S3A has an Open or Short circuit.			X
06	Yellow channel wheel speed sensor wiring S3B has an Open or Short circuit.			X
07	System OK (No Active Fault)	ABS ECU is fully operational. Displays “07” vehicle is stationary	X	X
11	Red channel speed sensor S1A has low sensor output	Sensor or spring clip is worn or not properly adjusted, wiring open or short circuit, wheel bearing not properly adjusted (these faults will only occur at speeds of greater than 6 mph). Measure the AC voltage at the sensor in question while rotating the wheel at a rate of about one revolution every two seconds. The output should be at least 200 millivolts (0.2 VAC). If this is not the case, push in the sensor until it touches the exciter and rotate the wheel again. If this doesn’t correct the problem, then the sensor and the sensor block clip should be replaced. If sensor extensions are used verify extension continuity and connections. Replace sensor and/or sensor cable. Inspect exciter teeth for minor damage or teeth filled with debris. Verify all exciters have the same number of teeth. Verify sensor and valve wiring/plumbing is correct. See side by side axle by axle configurations.	X	
12	Red channel speed sensor S1B has low sensor output.		X	
13	Blue channel speed sensor S2A has low sensor output.			X
14	Yellow channel speed sensor S2B has low sensor output.			X
15	Blue channel speed sensor S3A has low sensor output.			X
16	Yellow channel speed sensor S3B gap too large. Gap should be kept to a minimum.			X

Fault Code	Explanation	Possible Causes	PLC Select 1M	PLC Select 2M
21	Red channel wheel speed sensor S1A has an erratic output voltage.	Loose sensor, connection , bracket or exciter, damaged exciter, sensor is not properly adjusted or has worn cable insulation, or worn sensor block clip, wheel bearing failure, wheel bearing is not properly adjusted **(these faults will only occur at speeds greater than 6 mph)**. Measure the AC voltage at the sensor in question while rotating the wheel at a rate of about one rotation every two seconds. The output should be at least 200 millivolts (0.2 VAC). If this is not the case, push in the sensor until it touches the exciter and rotate the wheel again. If this doesn't correct the problem, then the sensor should be replaced. Verify the tire and wheel size is large enough for **100** tooth exciter ring. If these faults re-occur at the same speed, inspect the exciter ring for damage. Smaller wheels and tires require 80 tooth exciter rings. Reference Tire Scale Factor Chart. Verify sensor and valve wiring/ plumbing is correct. See side by side and axle by axle configurations.	X	
22	Red channel wheel speed sensor S1B has an erratic output voltage.		X	
23	Blue channel wheel speed sensor S2A has an erratic output voltage			X
24	Yellow channel wheel speed sensor S2B has an erratic output voltage.			X
25	Blue channel wheel speed sensor S3A has an erratic output voltage.			X
26	Yellow channel wheel speed sensor S3B has an erratic output voltage.			X

Occurs Only When Vehicle is Stationary

31	Auxiliary channel 1 fault (digital channel 1) output only	PLC Select 2M Plus (ABS Auxiliary Codes) Note: These Codes are only used with PLC Select 2M Plus ABS that supports trailer Auxiliaries. Auxiliary Channel has an open circuit or the ECU (Electronic Control Unit) has an auxiliary device connected and is not programmed to be. Note: These codes do not affect ABS performance and do not illuminate the tractor trailer ABS warning lamps.		
32	Auxiliary channel 2 fault (digital channel 2) output only			
33	Auxiliary channel 3 fault (digital channel 3) output only			
34	Auxiliary channel 4 fault (digital channel 4) output only			
35	Auxiliary channel 5 fault (digital channel 5) output only			

Fault Code	Explanation	Possible Causes	PLC Select 1M	PLC Select 2M
41	Slow wheel recovery on Red valve channel.	For a 2M System, verify sensor and valve wiring/plumbing is correct. (See Side-By-Side and Axle-By-Axle configurations). Slow brake release, foundation brake mechanical faults, dry bushings, broken ABS valve, restricted piping. Check for kinks and blockage etc., incorrect air-lines, wiring.	X	
42	Slow wheel recovery on Blue valve channel.			X
43	Slow wheel recovery on Yellow valve channel.			X
61	Hold solenoid Open circuit on Red valve channel.	Modulator valve solenoid failure, solenoid connection, or valve cable damage. The most likely causes include: a bad solenoid or a loose solenoid connection. Disconnect the indicated solenoid and check the resistance at the solenoid pins. Check the female terminals on the connector for excessive pin spread or corrosion. Replace defective hardware as required and retest.	X	
62	Hold solenoid Open circuit on Blue valve channel.			X
63	Hold solenoid Open circuit on Yellow valve channel.			X
67	Dump solenoid Open circuit on Red valve channel.		X	
68	Dump solenoid Open circuit on Blue valve channel.			X
69	Dump solenoid Open circuit on Yellow valve channel.			X
71	Hold solenoid Short circuit to ground on Red valve channel.	Modulator valve solenoid failure, or value cable damage. The most likely causes include: a damaged cable or solenoid. An example of this is a worn or chafed cable that has exposed wires contacting the trailer. Disconnect the indicated solenoid and check the resistance at the solenoid pins.	X	
72	Hold solenoid Short circuit to ground on Blue valve channel.			X
73	Hold solenoid Short circuit to ground on Yellow valve channel.			X
77	Dump solenoid Short circuit to ground on Red valve channel.		X	
78	Dump solenoid Short circuit to ground on Blue valve channel.			X
79	Dump solenoid Short circuit to ground on Yellow valve channel.			X

Fault Code	Explanation	Possible Causes	PLC Select 1M	PLC Select 2M
80	Output leakage or poor insulation on any of the valve channels.	Modulator valve solenoid failure or valve cable damage. Indicates that the solenoid or its cable has a short circuit to positive power (12 volts DC). The most likely cause is a damaged cable or solenoid. Disconnect the indicated solenoid and check the resistance at the solenoid pins. If solenoid checks good and 80-89 code still exists, check ECU.	X	X
81	Hold solenoid short circuit to Permanent Power on Red valve channel.		X	
82	Hold solenoid short circuit to Permanent Power on Blue valve channel.			X
83	Hold solenoid short circuit to Permanent Power on Yellow valve channel.			X
87	Dump solenoid out shorted to Permanent Power on Red valve channel.		X	
88	Dump solenoid out shorted to Permanent Power on Blue valve Channel.			X
89	Dump solenoid out shorted to Permanent Power on Yellow valve channel.			X
90	Low supply voltage fault. This code is not stored in memory.	Verify 12 V DC power source. Do Not Use Battery Charger as Power Supply. ECU minimum operating voltage is 8.5 V DC.	X	X
91	No internal ABS ECU solenoid voltage available.	Verify permanent power is present.	X	X
92	Power input over voltage fault.	Verify 12 VDC power source. Do Not Use Battery Charger as Power Supply. ECU maximum operating voltage is 16.0 VDC.	X	X
93	Short circuit on ABS ECU internal relay.	Replace ECU	X	X
99	ABS Corrupt Memory		X	X
9A	ABS Corrupt Memory		X	

BENDIX BLINK CODES

To access Bendix Blink Codes you must select the Auxiliary Circuit and press the control knob to cycle the Brake Light Circuit the appropriate number of times using the following directions.

See table below for modes and sequences:

Mode	Cycle Brake Light Power
Display Active DTCs	3 times
Display Inactive DTCs	4 times
Clear Active DTCs	5 times
Display Configuration	6 times
Display Odometer Mileage	7 times
Reset Configuration	8 times

1. Make sure trailer is stationary and wheels are properly chocked.

2. On the MUTT, turn the control knob to select the Auxiliary Circuit

3. Push the control knob to cycle the Brake Light Circuit for each desired Cycle in one second intervals. The Brake Light Circuit will flash.

4. Count number of blinks on Trailer ABS Lamp, see chart below for specific fault info.

1st Digit	2nd Digit	Fault Description	Repair Information	J1587 (SID)	J1587 (FMI)
10	10	No Faults	ABS system fully operational - no faults detected	1	0
		WHEEL SPEED SENSORS (WSS)			
2	1	SL Sensor signal valid -large gap		1	0
3	1	SR Sensor signal valid - large air gap		2	0
4	1	SAL Sensor signal valid - large air gap		3	0
5	1	SAR Sensor signal valid - large air gap		4	0
2	2	SL Sensor signal valid - loss of signal		1	1
3	2	SR Sensor signal valid - loss of signal	Dynamic Wheel Speed Sensor Fault.	2	1
4	2	SAL Sensor signal valid - loss of signal	Go to Section G, on Page 29.	3	1
5	2	SAR Sensor signal valid - loss of signal		4	1
2	3	SL Sensor signal valid – noisy		1	2
3	3	SR Sensor signal valid – noisy		2	2
4	3	SAL Sensor signal valid – noisy		3	2
5	3	SAR Sensor signal valid – noisy		4	2
2	4	SL Sensor shorted or open		1	4 or 5
3	4	SR Sensor shorted or open	Static Wheel Speed Sensor Fault.	2	4 or 5
4	4	SAL Sensor shorted or open	Go to Section G, on Page 29.	3	4 or 5
5	4	SAR Sensor shorted or open		4	4 or 5
2	5	SL Tire diameter out of range	Verify correct tire size as desired.	1	13
3	5	SR Tire diameter out of range	Verify proper tire inflation.	2	13
4	5	SAL Tire diameter out of range	Verify correct number of excitering teeth.	3	13
5	5	SAR Tire diameter out of range	Verify that the ECU has the proper tire size settings.	4	13

4	6	SAL Sensor configuration error	Verify correct ABS configuration using blink codes or other diagnostic tools.	3	13
5	6	SAR Sensor configuration error	If needed, reset to the default ABS configuration and power-up to initiate auto-configuration.	4	13

POWER

6	1	Over-voltage	Power supply diagnostic trouble code. Go to Section F, page 28.	251	3
6	2	Low-voltage	Power supply diagnostic trouble code. Go to Section F, page 28.	251	4
6	3	Excessive power line resistance	Power supply diagnostic trouble code. Go to Section F, page 28.	251	13

MODULATOR (MOD)

7	1	MOD1 Hold solenoid shorted or open	Clear faults. If faults return, replace the TABS-6 Module.	42	3,4,5 6 or 12
7	2	MOD1 Release solenoid shorted or open		48	3,4,5 6 or 12
8	1	MOD2 Hold solenoid shorted or open	Static ABS Modulator Fault. Go to Section H, on Page 30.	43	3,4,5 6 or 12
9	1	MOD3 Hold solenoid shorted or open		44	3,4,5 6 or 12
8	2	MOD2 Release solenoid shorted or open		49	3,4,5 6 or 12
9	2	MOD3 Release solenoid shorted or open		50	3,4,5 6 or 12
7	3	MOD1 ABS modulator dynamic error	Dynamic ABS Modulator Fault. Go to Section H, on Page 30.	7	7
8	3	MOD2 ABS modulator dynamic error		8	7
9	3	MOD3 ABS modulator dynamic error		9	7
8	4	MOD2 Valve configuration error	Verify correct ABS configuration using blink codes or other diagnostic tools. If needed, reset to the default ABS configuration and power-up to initiate auto-configuration.	8	13
9	4	MOD3 Valve configuration error		9	13

COMMON

10	1	Valve MOD1/2 low-side switch shorted to ground	Check for corroded/damaged wiring or connectors between the ECU and MOD. At the MOD harness connector, verify: No continuity from modulator/AUX leads to ground. After repairs or if no issues found, then clear faults If faults return, replace the TABS-6 Module.	7	4
10	2	Valve MOD3 low-side switch shorted to ground		9	4
10	3	ABS modulator dynamic error - all valves	Dynamic ABS Modulator Fault. Go to Section H, on Page 30.	7	7
10	4	Excessive ABS activity	Dynamic Wheel Speed Sensor Fault. Go to Section G, on Page 29.	1	7

ELECTRONIC CONTROL UNIT (ECU)

11	1	ECU internal error	Check for damaged or corroded connectors. Check for damaged wiring After repairs or if no issues found, then clear faults. If faults return, replace the TABS-6 Module.	254	12
11	2	ECU configuration error	Verify correct ABS configuration using blink codes, PC-diagnostics or other off-board diagnostic tools. If needed, reset to the default ABS configuration and power-up to initiate auto-configuration.	254	13

J1587 DIAGNOSTIC

12	1	J1587	Check for corroded/damaged wiring or connectors between the ECU and J1587 Diagnostic. Verify the following: -At the 18-pin ECU harness connector: (a) Continuity of the J1587 Diagnostic wiring to the lamp (auxiliary device). (b) +12V is not measured at J1587 Diagnostic lead. -At J1587 Diagnostic connector: (a) No continuity of the J1587 Diagnostic lead to ground. (b) No continuity from J1587 Diagnostic lead to any other ECU pin(s). (c) Replace/repair J1587 Diagnostic wiring or components as required.	250	3,4,5 or 12

TRAILER-MOUNTED ABS INDICATOR LAMP

13	1	ABS lamp shorted or open	Check for corroded/damaged wiring or connectors between the ECU and ABS Indicator Lamp. Verify the following: -At the 5-pin or 18-pin ECU harness connector: (a) Continuity of the ABS Indicator Lamp wiring to the lamp auxiliary device). (b) +12V is not measured at ABS Indicator Lamp lead to any other ECU pin(s). -At ABS Indicator Lamp connector: (a) No continuity of the ABS Indicator Lamp lead to ground (b) No continuity from ABS Indicator Lamp lead to any other ECU pin(s). (c) Replace/repair ABS Indicator Lamp wiring or components as required.	81	3,4,5 or 12

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