Anti-Lock Braking System (ABS)

TROUBLESHOOTING AND SERVICE MANUAL

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Introduction

Anti-lock braking systems (ABS) are designed to improve stability of the trailer during severe braking events. When ABS is not active, the driver brake command is passed through the module, directly to the brakes, the same as a trailer without ABS. When an individual wheel is about to lock, the ABS control module will temporarily reduce braking below the driver command on individual wheels to preserve trailer and wheel stability. When the wheel is stable, the wheel brake command will be the same as the driver command. If there is no power to the ABS module, or if a DTC is active, the trailer's brake outputs will follow the driver brake command, but the ABS will not be functional.

For additional support on this product, please visit: https://support.lci1.com/lippert-anti-lock-braking-abs-system

NOTE: Images used in this document are for reference only when assembling, installing and/or operating this product. Actual appearance of provided and/or purchased parts and assemblies may differ.

Safety

Read and understand all instructions before installing or operating this product. Adhere to all safety labels.

This document provides general instructions. Many variables can change the circumstances of any procedure, i.e. the degree of difficulty involved in the service operation and the ability level of the individual performing the operation. This document cannot begin to plot out procedures for every possibility, but will provide the general instructions for effectively installing, removing or servicing the system. In the event the skill level required is too advanced or the procedure too difficult, a certified technician should be consulted before performing the necessary operation. Failure to correctly install, remove or service the system may result in voiding the warranty, inflicting injury or even death.

⚠WARNING

The "WARNING" symbol above is a sign that a procedure has a safety risk involved and may cause death or serious personal injury if not performed safely and within the parameters set forth in this manual.

⚠WARNING

Trailer MUST be supported per manufacturer's recommendations before working underneath. Failure to do so may result in death or serious personal injury.

⚠WARNING

Failure to follow instructions provided in this manual may result in death, serious personal injury and/or severe product and property damage, including voiding of the component warranty.

⚠ CAUTION

The "CAUTION" symbol is a sign that a procedure has a risk involved that may cause personal injury or property damage if not performed safely and within the parameters set forth in this manual.

⚠ CAUTION

Moving parts can pinch, crush or cut. Keep clear and use caution.

Resources Required

- Mobile smart device
- Lippert Diagnostics App

NOTE: Lippert Diagnostics App is currently available only for Android™ smart devices on Google Play™.

Definitions

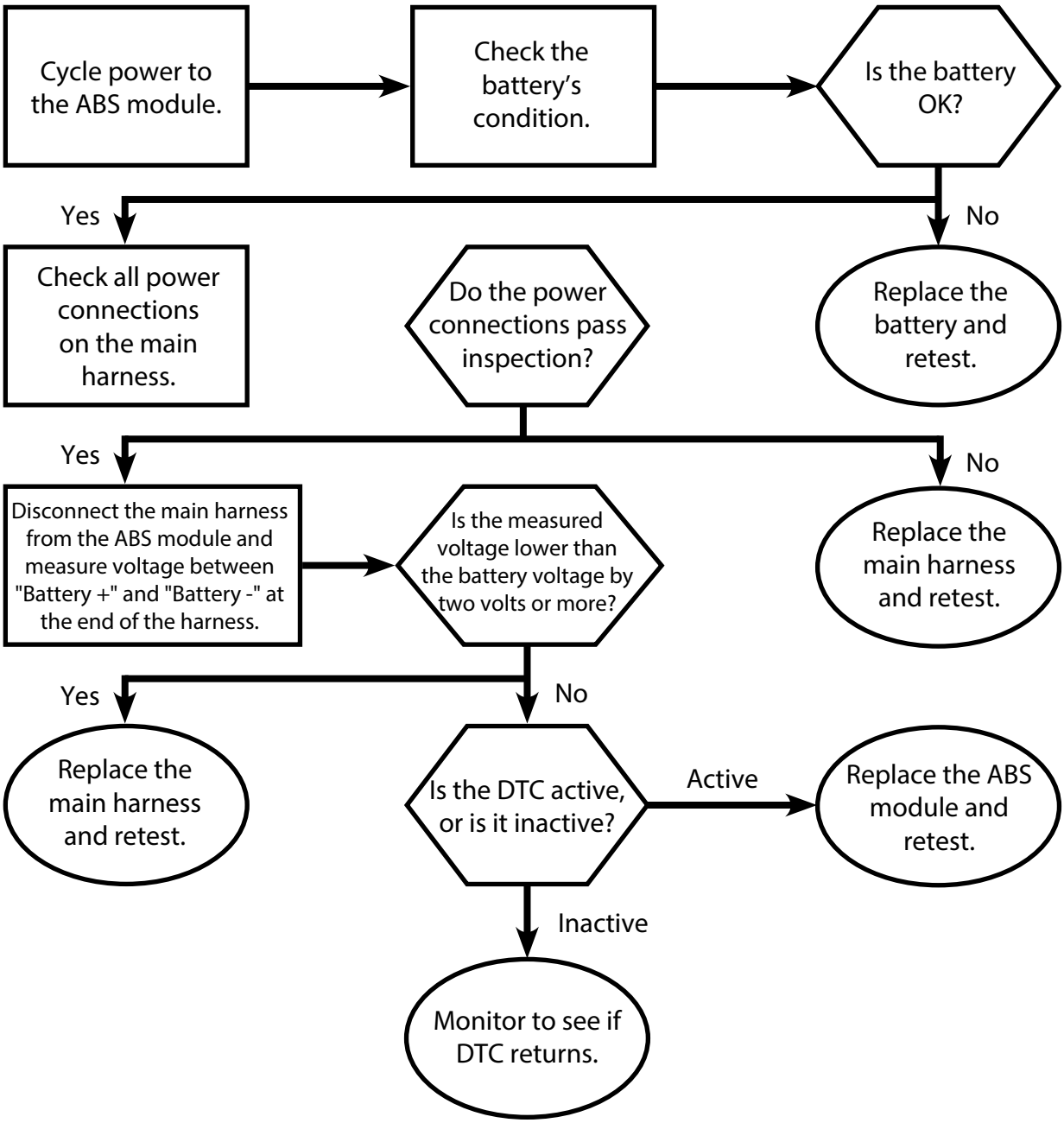
- **Actuator:** Another term for brake magnets.
- **Axle Harness:** Wire harness that contains the 23-pin connector at the ABS control module and is routed to the wheel ends of the axle. This harness also contains the two-pin factory diagnostic port.
- **Brake Magnet Main Ground:** This is the point where all brake magnets connect to the trailer chassis ground. This is either through a grounding lug directly to the frame near the module, or a wire that is routed to the front of the trailer and connected to the trailer's main battery ground.
- **Drive-Off Test:** This test checks the continuity of the brake magnets and wire harness. The ABS module will automatically run this test at power up.
- **Main Harness:** Wire harness that contains the 14-pin connector at the ABS control module and is routed to the front of the trailer where connections are made with power (12V+), ground (12V-) and the 7-way tow vehicle connector.
- **Power Cycle:** Disconnect the 12V source of power and make sure there is no other source of power connected, such as power from the 7-way, shore power, solar, etc. Wait 10 seconds. Reconnect power.
- **Wheel Speed Sensor (WSS):** The sensor placed on the backing plate of each brake to monitor the rotational speed of the wheel. The sensor contains a 24" pigtail with a two-pin connector.

Troubleshooting

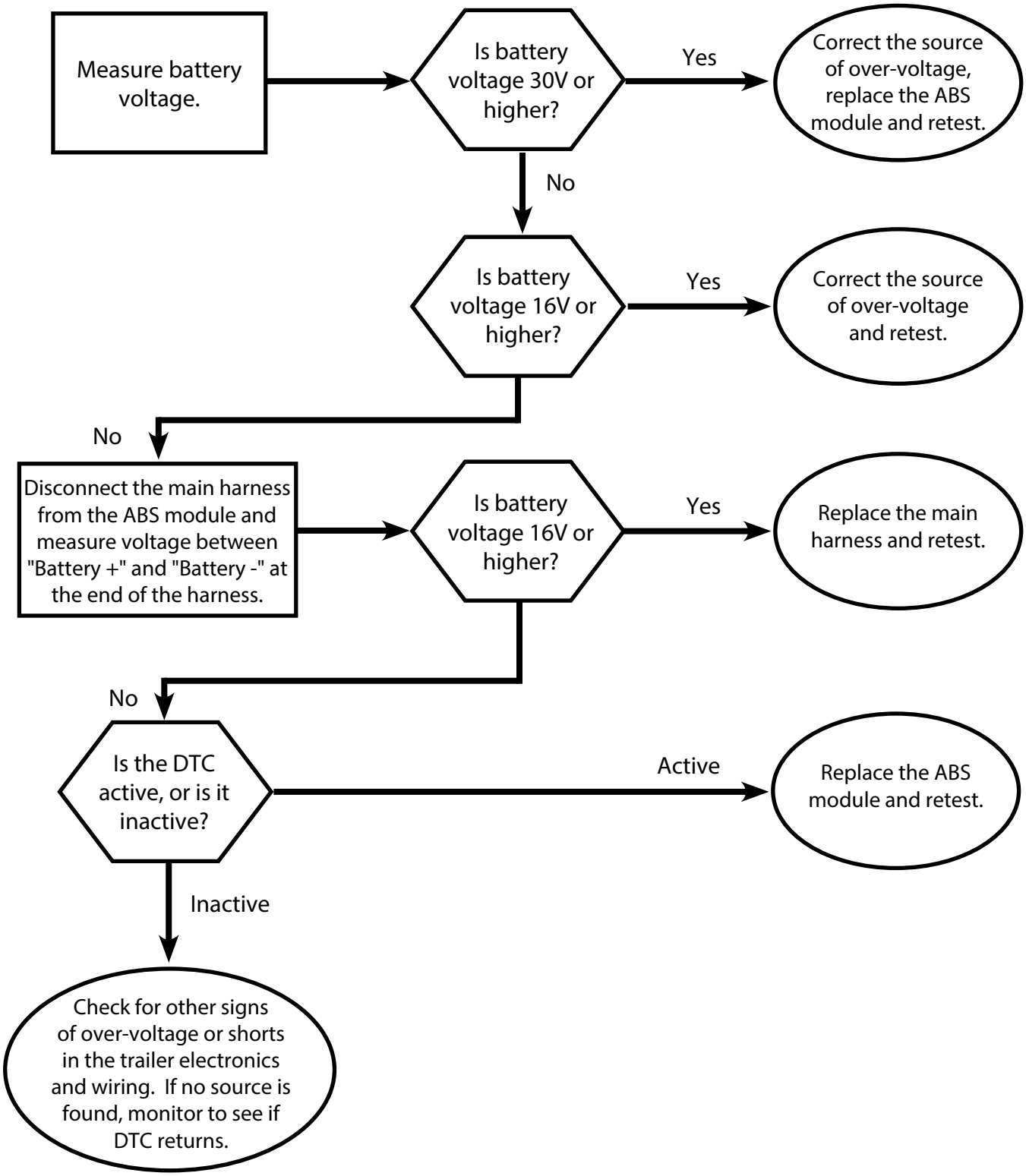
Specific Diagnostic Trouble Codes (DTC) are stored in the memory of the Lippert ABS controller and can be viewed using the Lippert Diagnostics Mobile App.

1. Install app on mobile smart device and proceed through setup prompts.
2. Scan QR code of Lippert anti-lock brake controller. Controller will be located on either the inside left or inside right frame rail within 12" of the first axle. A QR code sticker may also have been placed in an interior cupboard or on support documentation to permit the end user to scan the code for the OneControl app connection.
3. Take note of Diagnostic Trouble Code (DTC) or codes shown and see the chart below.

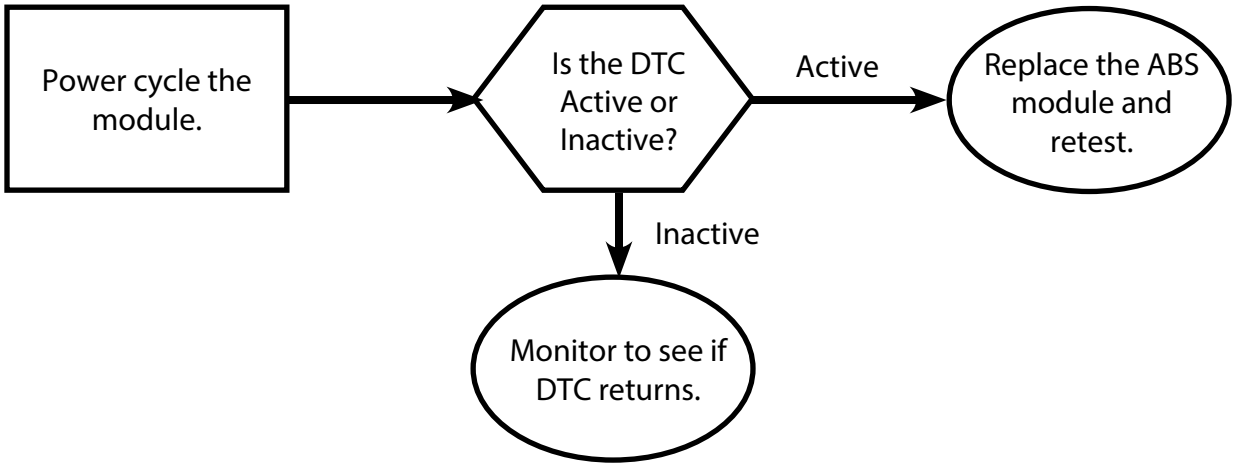
DTC #	DTC Name	Description
068Ah	BATTERY_TOO_LOW_TO_OPERATE	Input battery voltage to the module is too low for proper operation.



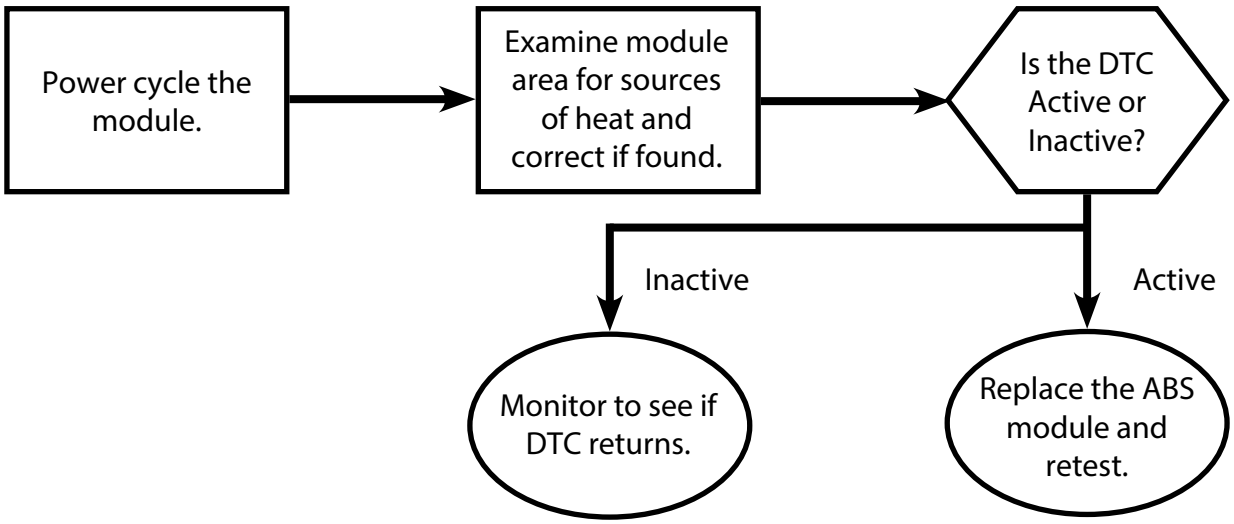
DTC #	DTC Name	Description
0006h	BATTERY_VOLTAGE_HIGH	Input battery voltage to the module is too high for proper operation.



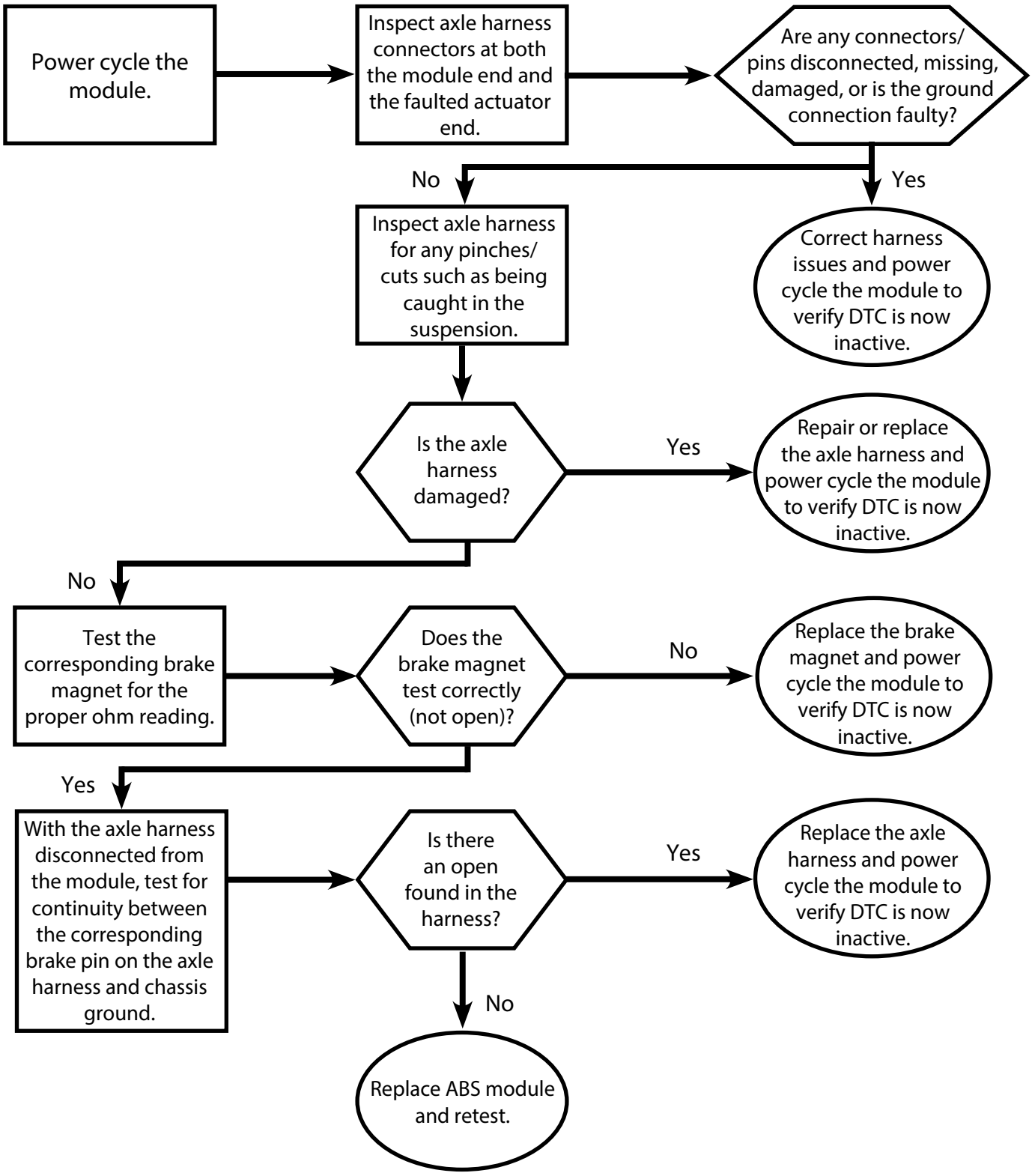
DTC #	DTC Name	Description
071Fh	BRAKE_CONTROLLER_MODULE_FAILURE	Module has had an internal component failure.



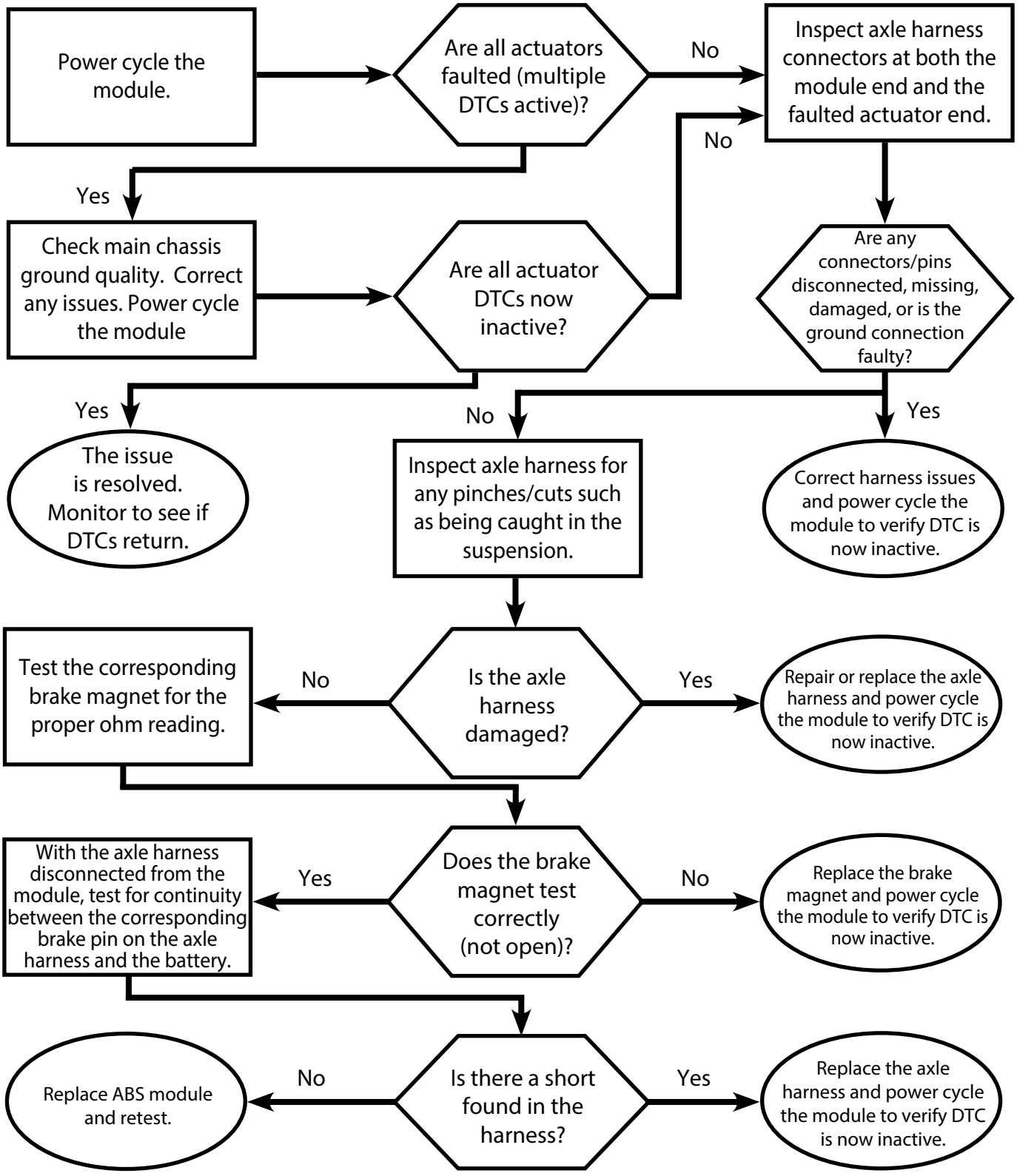
DTC #	DTC Name	Description
0726h	BRAKE_CONTROLLER_MODULE_OVER_TEMPERATURE	Module temperature is too high for proper operation.



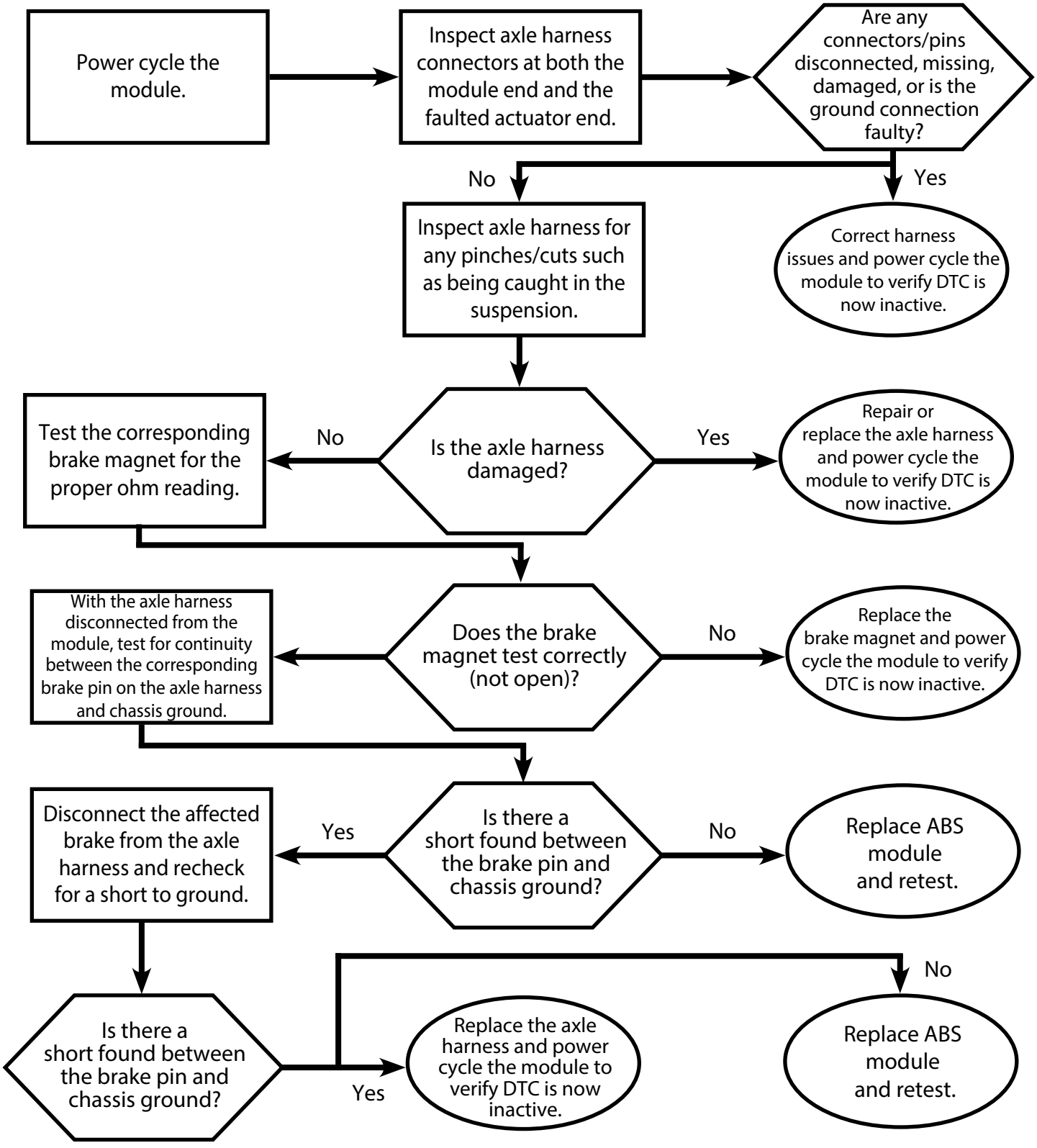
DTC #	DTC Name	Description
06DBh	AXLE_1_LEFT_ACTUATOR_OPEN	The corresponding brake magnet actuator circuit is open.
06E2h	AXLE_1_RIGHT_ACTUATOR_OPEN	
06E9h	AXLE_2_LEFT_ACTUATOR_OPEN	
06F0h	AXLE_2_RIGHT_ACTUATOR_OPEN	
06F7h	AXLE_3_LEFT_ACTUATOR_OPEN	
06FEh	AXLE_3_RIGHT_ACTUATOR_OPEN	



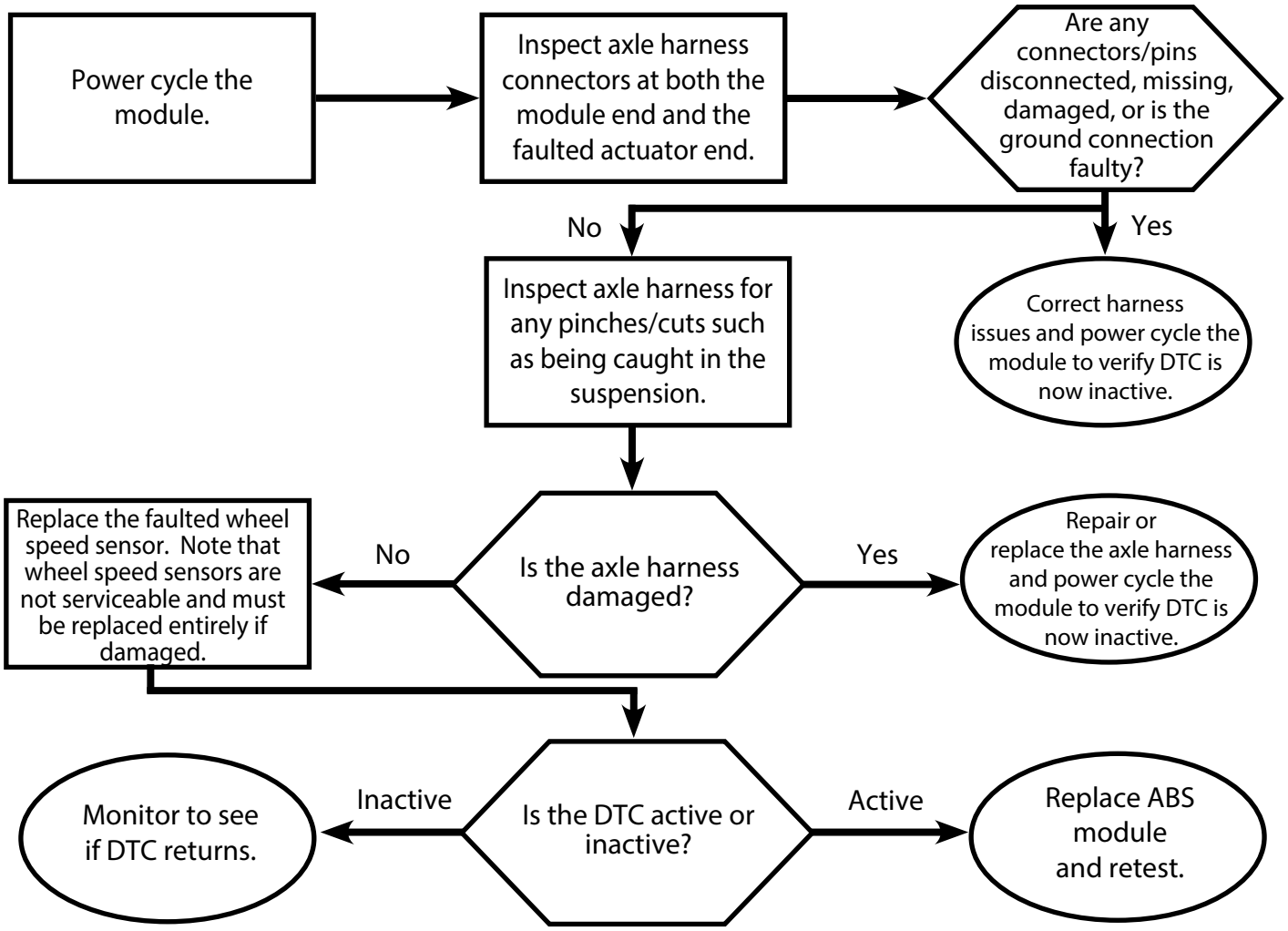
DTC #	DTC Name	Description
06DCh	AXLE_1_LEFT_ACTUATOR_SHORT_TO_BATT	The corresponding brake magnet actuator circuit is shorted to the battery.
06E3h	AXLE_1_RIGHT_ACTUATOR_SHORT_TO_BATT	
06EAh	AXLE_2_LEFT_ACTUATOR_SHORT_TO_BATT	
06F1h	AXLE_2_RIGHT_ACTUATOR_SHORT_TO_BATT	
06F8h	AXLE_3_LEFT_ACTUATOR_SHORT_TO_BATT	
06FFh	AXLE_3_RIGHT_ACTUATOR_SHORT_TO_BATT	



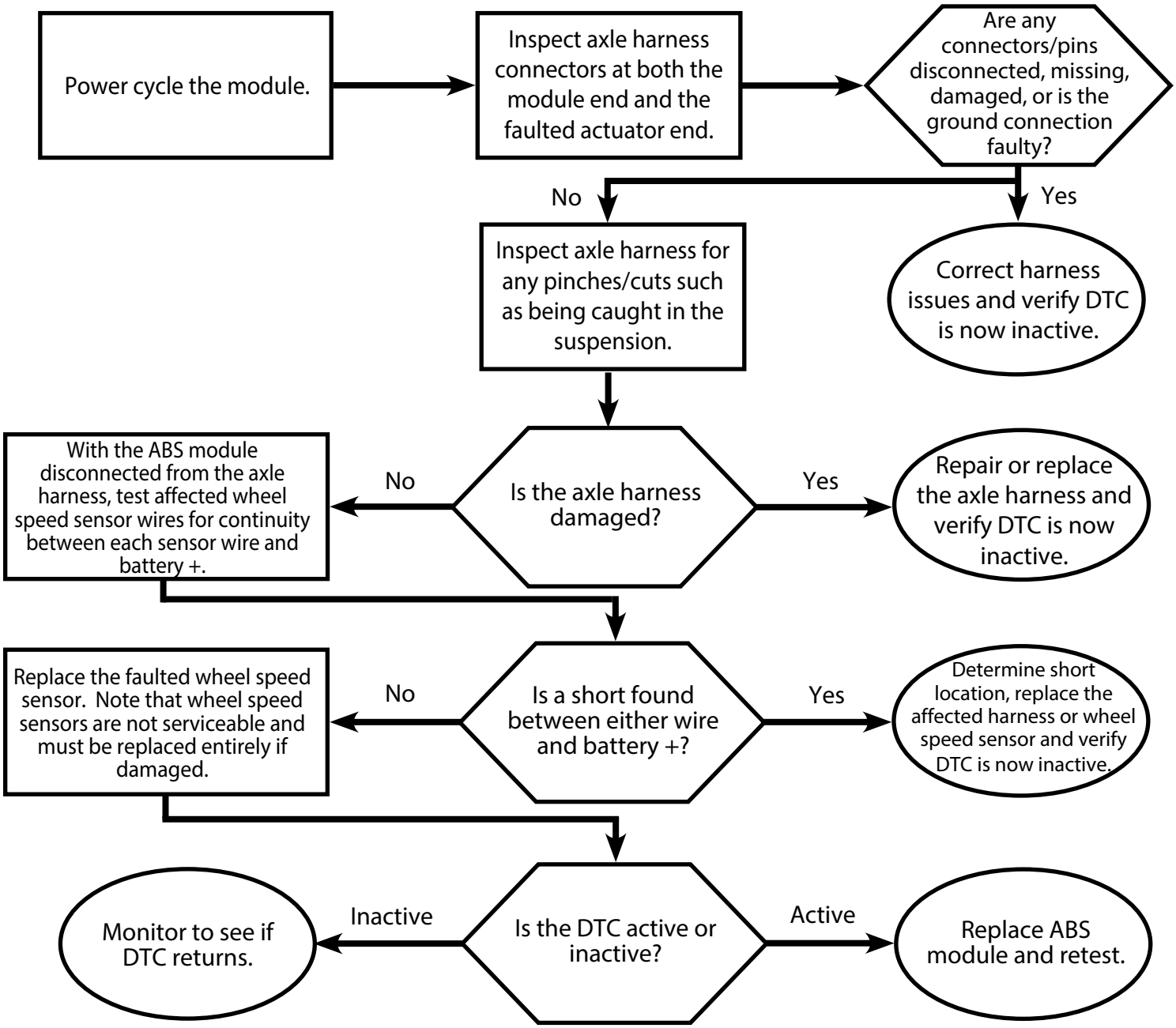
DTC #	DTC Name	Description
06DDh	AXLE_1_LEFT_ACTUATOR_SHORT_TO_GROUND	The corresponding brake magnet actuator circuit is shorted to ground.
06E4h	AXLE_1_RIGHT_ACTUATOR_SHORT_TO_GROUND	
06EBh	AXLE_2_LEFT_ACTUATOR_SHORT_TO_GROUND	
06F2h	AXLE_2_RIGHT_ACTUATOR_SHORT_TO_GROUND	
06F9h	AXLE_3_LEFT_ACTUATOR_SHORT_TO_GROUND	
0700h	AXLE_3_RIGHT_ACTUATOR_SHORT_TO_GROUND	



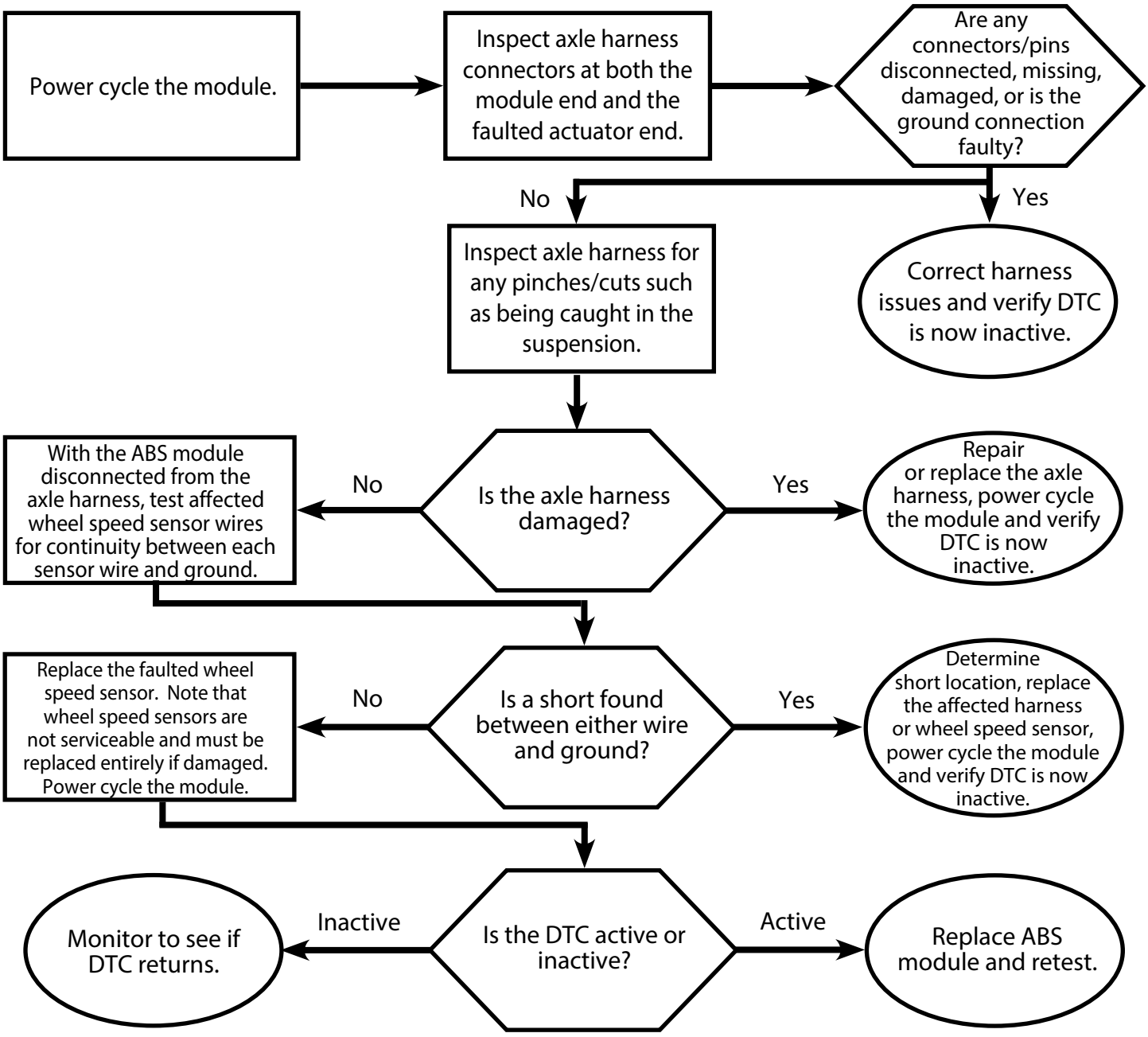
DTC #	DTC Name	Description
06DFh	AXLE_1_LEFT_WSS_OPEN	The corresponding wheel speed sensor circuit is open.
06E6h	AXLE_1_RIGHT_WSS_OPEN	
06EDh	AXLE_2_LEFT_WSS_OPEN	
06F4h	AXLE_2_RIGHT_WSS_OPEN	
06Fbh	AXLE_3_LEFT_WSS_OPEN	
0702h	AXLE_3_RIGHT_WSS_OPEN	



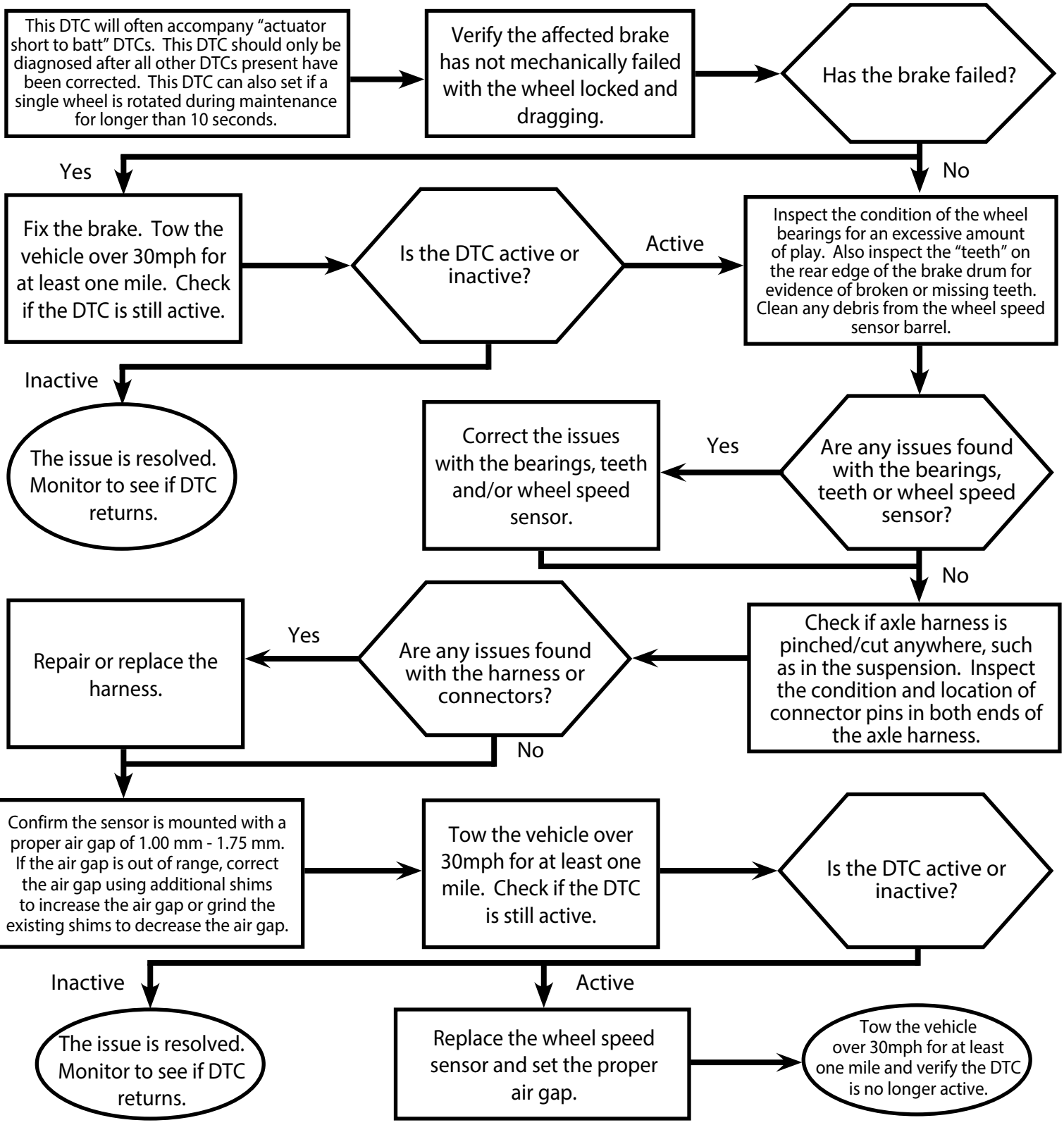
DTC #	DTC Name	Description
06E0h	AXLE_1_LEFT_WSS_SHORT_TO_BATT	The corresponding wheel speed sensor circuit is shorted to battery.
06E7h	AXLE_1_RIGHT_ WSS_SHORT_TO_BATT	
06EEh	AXLE_2_LEFT_ WSS_SHORT_TO_BATT	
06F5h	AXLE_2_RIGHT_ WSS_SHORT_TO_BATT	
06FCh	AXLE_3_LEFT_ WSS_SHORT_TO_BATT	
0703h	AXLE_3_RIGHT_ WSS_SHORT_TO_BATT	



DTC #	DTC Name	Description
06E1h	AXLE_1_LEFT_WSS_SHORT_TO_GROUND	The corresponding wheel speed sensor circuit is shorted to ground.
06E8h	AXLE_1_RIGHT_ WSS_SHORT_TO_ GROUND	
06Efh	AXLE_2_LEFT_ WSS_SHORT_TO_ GROUND	
06F6h	AXLE_2_RIGHT_ WSS_SHORT_TO_ GROUND	
06Fdh	AXLE_3_LEFT_ WSS_SHORT_TO_ GROUND	
0704h	AXLE_3_RIGHT_ WSS_SHORT_TO_ GROUND	



DTC #	DTC Name	Description
0720h	WSS_A1L_MECHANICAL_FAILURE	The corresponding wheel speed sensor circuit has experienced a mechanical failure.
0721h	WSS_A1R_MECHANICAL_FAILURE	
0722h	WSS_A2L_MECHANICAL_FAILURE	
0723h	WSS_A2R_MECHANICAL_FAILURE	
0724h	WSS_A3L_MECHANICAL_FAILURE	
0725h	WSS_A3R_MECHANICAL_FAILURE	



Connector Pinout Tables

NOTE: The order of the harness wires in the diagrams is viewed from the perspective of the wires coming from the back of the harness connectors.

Main Harness Pinout		
Pin	Function	Color/Stripe
1	Battery +	Black
2	Battery +	Black
3	Right turn and stop light In	Brown
4	Right turn and stop light out	Brown/White
5	Left turn and stop light In	Red
6	Battery +	Black
7		Plug
8	Backup light	Yellow
9	Left turn and stop light out	Red/White
10	(Tow) Brake	Blue
11	(Tow) Brake	Blue
12	(Tow) Brake	Blue
13		Plug
14	Battery -	White

View Looking Into Harness Connector

Double Axle Harness Pinout		
Pin	Function	Color/Stripe
GND WIRE	Ground	White (Spliced)
1		Plug
2		Plug
3	Axle 1 far side brake	Blue/Green
4	Axle 1 module side brake	Blue/Orange
5	Axle 2 far side brake	Blue/Violet
6	Axle 2 module side brake	Blue/Yellow
7		Plug
8		Plug
9		Plug
10	Axle 1 far side WSS return	Red/Green
11	Axle 1 module side WSS return	Red/Orange
12	Axle 2 far side WSS return	Red/Violet
13	Axle 2 module side WSS return	Red/Yellow
14		Plug
15		Plug
16	CAN low	Pink
17	CAN high	Brown
18	Axle 1 far side WSS signal	Green
19	Axle 1 module side WSS signal	Orange
20	Axle 2 far side WSS signal	Violet
21	Axle 2 module side WSS signal	Yellow
22		Plug
23		Plug

View Looking Into Harness Connector

Triple Axle Harness Pinout		
Pin	Function	Color/Stripe
GND WIRE	Ground	White (Spliced)
1		Plug
2		Plug
3	Axle 1 far side brake	Blue/Green
4	Axle 1 module side brake	Blue/Orange
5	Axle 2 far side brake	Blue/Violet
6	Axle 2 module side brake	Blue/Yellow
7	Axle 3 far side brake	Blue/White
8	Axle 3 module side brake	Blue/Black
9		Plug
10	Axle 1 far side WSS return	Red/Green
11	Axle 1 module side WSS return	Red/Orange
12	Axle 2 far side WSS return	Red/Violet
13	Axle 2 module side WSS return	Red/Yellow
14	Axle 3 far side WSS return	Red/White
15	Axle 3 module side WSS return	Red/Black
16	CAN low	Pink
17	CAN high	Brown
18	Axle 1 far side WSS signal	Green
19	Axle 1 module side WSS signal	Orange
20	Axle 2 far side WSS signal	Violet
21	Axle 2 module side WSS signal	Yellow
22	Axle 3 far side WSS signal	White
23	Axle 3 module side WSS signal	Black

View Looking Into Harness Connector

Please recycle all obsolete materials.

For all concerns or questions, please contact Lippert
Ph: 432-LIPPERT (432-547-7378) | Web: lippert.com | Email: customerservice@lci1.com