Application Alley

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Automotive - Fluid Level

Brake Fluid Level Sensor

Standex MEDER ELECTRONICS

Custom Engineered Solutions for Tomorrow

Introduction

When applying one's foot to the brake pedal, it is taken for granted that the braking mechanism will begin to slow or stop the vehicle. A hermetically sealed reed switch plays a key reliability role by monitoring that the brake fluid level is maintained at its proper level. Low brake fluid level could mean the loss of the vehicle braking system.

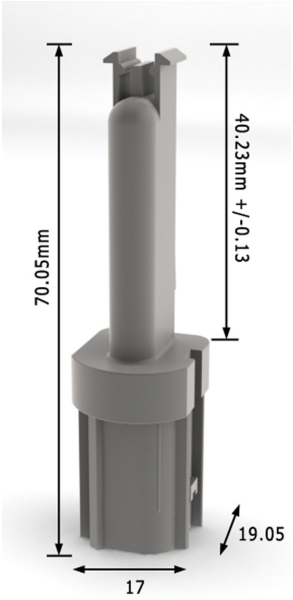

Figure 1. KSS-BV50685 Sensor physical layout

Features

- Hermetically sealed
- Dynamically tested contacts
- Reliable switching
- Accurate control of the open and closure points
- Wide differential preventing on/off cycling
- Designed for under the hood environment
- Ability to operate up to 150 C
- Low cost
- Housing vapor sealed
- Different headers and sleeves available
- Millions of hot switching operations
- Use of PCB assembly preventing potential cracking with other assembly technologies
- 10 year proven technology

Applications

- Sensing the fluid level in brake fluid reservoirs
- Sensing fluid level in gasoline, oil and other liquid reservoirs
- Air conditioner system condensate: detecting high water levels
- Coolant overflow fluid system sensing

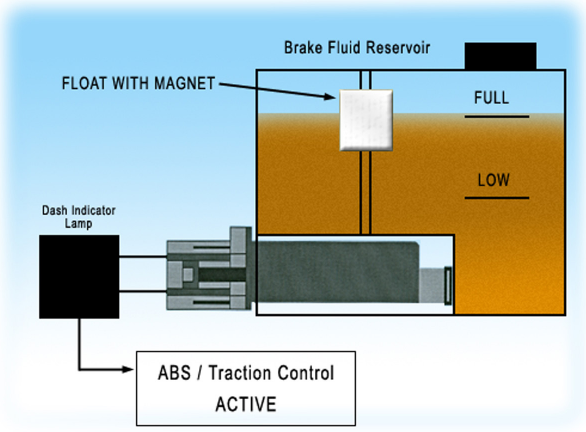

Figure 2. Brake Fluid Level Sensor in the un-activated state with a full reservoir

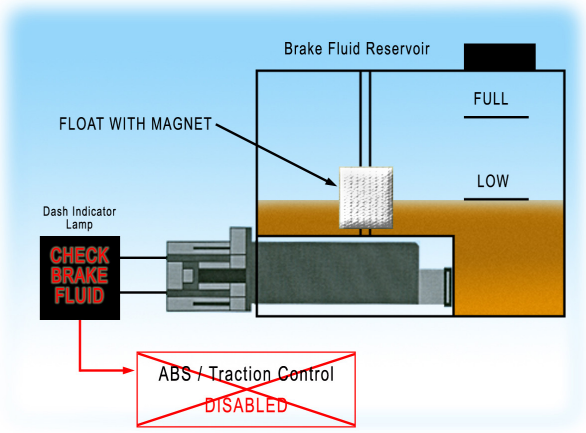

Figure 3. Brake Fluid Level Sensor activated disabling ABS and dash indicator lamp

Standex-Meder's Reliable Reed Approach To Brake Fluid Level Sensing Systems

Designing a sensing system for under the hood of a vehicle presents difficult requirements. The sensor must operate at extreme temperatures that are as low as -40°C and as high as 125°C. This dirty environment is typically visited by oil, gasoline, brake fluid, salt water and a host of solid particulates. Standex-Meder's approach has been to use only the most reliable technology to insure quality operation and long reliability in the field for the life of the vehicle.
Since this sensor requires some electrical circuitry, using a printed circuit board with plated thru solder holes guarantees reliable connections using an automated wave soldering system. Others have chosen welding technology which can guarantee a good connection, but can also damage the delicate hermetic seal of the reed switch with its high temperature point contact and its tough mechanical approach. This poses an even bigger problem in the field if a slight crack of the reed switch seal occurs during assembly, as it could take up to a year or more for enough gas and/or moisture to leak into the capsule to oxidize the contacts. Then if the brake fluid drops below acceptable limits the contacts would fail to close; therefore, not alerting the driver that a critical situation has developed. Figures 2 and 3 show the proper operating sequence.

Also, part of our design criteria is to build sufficient hysteresis into the operation of the sensor. This insures once the sensor activates, it will not go on and off with every sway of the vehicle or bump in the road.

Specifications (@ 20°C) KSS Series

	Min	Max	Units
Operate Specifications			
Must close distance	3.3	5.7	mm
Must open distance	4.3	12.2	mm
Hysteresis			
Load characteristics			
Switching voltage		200	V
Switching current		0.5	Amps
Carry current		1.0	Amps
Contact rating		10	Watts
Static contact resistance		150	mΩ
Dynamic contact resistance	200		mΩ
Breakdown voltage	200		V
Operate time		0.4	msec
Release time		0.05	msec
Operate temp	-40	125	°C
Storage temp	-65	150	°C

Another critical element is the acknowledgement that during assembly problems can occur. Standex-Meder tests all sensors 100% for all operating conditions, but in addition tests for dynamic contact resistance (DCR). Essentially this test is a guard against the many faults that can occur during assembly. If the reed contacts have any internal contaminations; or the reed capsule has been stressed or a slight crack has occurred, this DCR will detect these conditions and reject the sensor. This testing is all carried out in an automated testing system that is independent of any operator, and rejected parts are automatically placed in a lock box. Standex-Meder's design for manufacturing approach provides a long reliable life in the field.

The header and sleeve shown in the dimensional diagram have several other potential options allowing different connectors to be used, as well as the ability to fit into several other types of brake fluid reservoirs.

Consider some of the below level sensor options for similar brake fluid sensor applications.

Single Point Liquid Level Series				
	Dimenstions	mm	inches	Illustration
Series				
KSS-BV50685	W	17	0.669	
	H	19	0.748	
	L	70	2.756	
LS01	W	19	0.748	
	H	24	0.945	
	L	42	1.654	
LS02	W	19	0.748	
	H	24	0.945	
	L	75	2.953	
LS03	W	25	0.948	
	H	25	0.948	
	L	80	3.150	

**Consult the factory for more options not listed above.

Find out more about our ability to propel your business with our products by visiting www.standexmeder.com or by giving us a hello@standexelectronics.com today! One of our brilliant engineers or solution selling sales leaders will listen to you immediately.

About Standex-Meder Electronics

Standex-Meder Electronics is a worldwide market leader in the design, development and manufacture of standard and custom electro-magnetic components, including magnetics products and reed switch-based solutions.

Our magnetic offerings include planar, Rogowski, current, and low- and high-frequency transformers and inductors. Our reed switch-based solutions include Meder, Standex and OKI brand reed switches, as well as a complete portfolio of reed relays, and a comprehensive array of fluid level, proximity, motion, water flow, HVAC condensate, hydraulic pressure differential, capacitive, conductive and inductive sensors.

We offer engineered product solutions for a broad spectrum of product applications in the automotive, medical, test and measurement, military and aerospace, as well as appliance and general industrial markets.

Standex-Meder Electronics has a commitment to absolute customer satisfaction and customer-driven innovation, with a global organization that offers sales support, engineering capabilities, and technical resources worldwide.

Headquartered in Cincinnati, Ohio, USA, Standex-Meder Electronics has eight manufacturing facilities in six countries, located in the United States, Germany, China, Mexico, the United Kingdom, and Canada.

For more information on Standex-Meder Electronics, please visit us on the web at www.standexmeder.com.

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