Brake Fluid Level Sensor

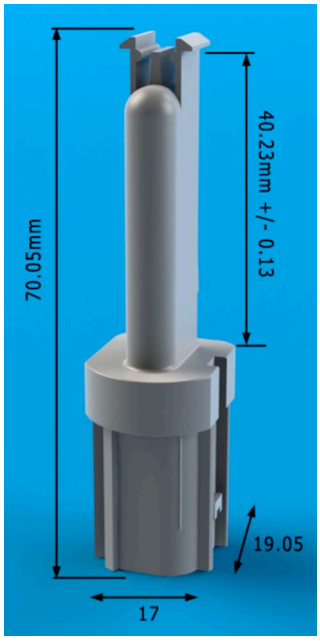

Figure 1. Sensor physical layout

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.

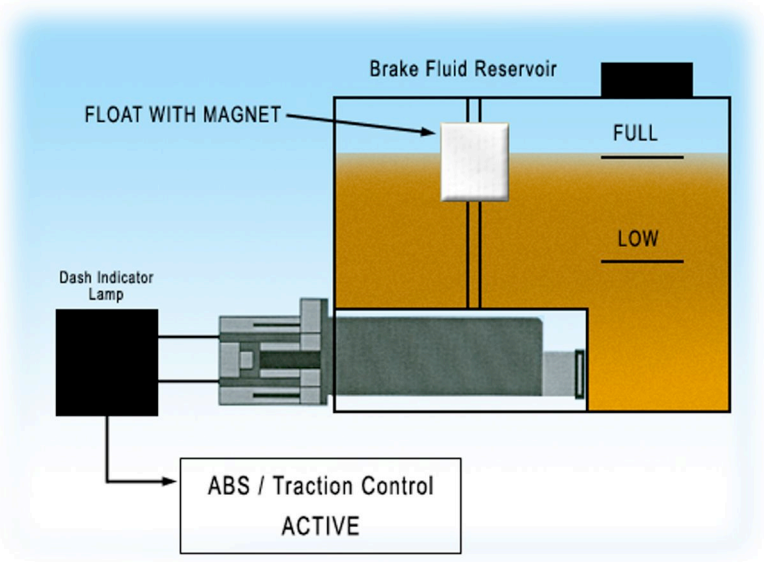

Figure 2. Brake Fluid Level Sensor in the un-activated state with a full reservoir

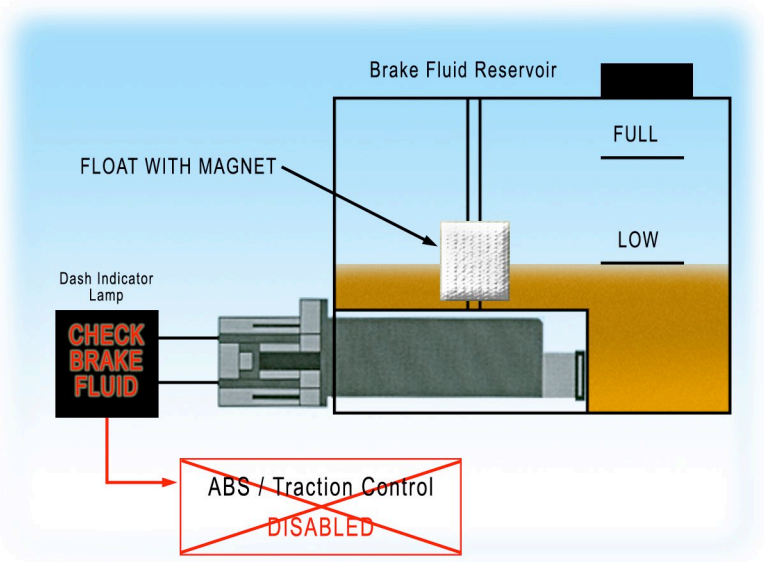

Figure 3. Brake Fluid Level Sensor activated disabling ABS and dash indicator lamp

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

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Specifications (@ 20°C)
LSS Series

Operate specs	Min	Max	Units
Must close distance	3.3	5.7	mm
Must open distance	4.3	12.2	mm
Hysteresis			

Load Characteristics	Min	Max	Units
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

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. 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.

Another critical element is the acknowledgement that during assembly problems can occur. 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. 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.

Consult our engineering group with your specific applications.