Hydraulic Brake and ABS Components

General Service Information

COMPONENT REFERENCE

Fluid Type

| CAUTION |
|-----------------
| MICO hydraulic brake system components are designed to be compatible with mineral-based hydraulic fluid and DOT 5. DO NOT USE DOT 3, DOT 4 or DOT 5.1 Fluid. |

Hydraulic Pump
The hydraulic pump draws fluid from the reservoir to generate pressurized fluid. When the engine is running, it supplies flow to the accumulator charge valve.

- Supplied by vehicle manufacturer

Reservoir
The reservoir holds the hydraulic brake fluid.

- Supplied by vehicle manufacturer

Filter
The low-pressure filter is used to filter the hydraulic brake fluid that is sent to the pump from the reservoir.

- Supplied by vehicle manufacturer

Accumulators
Two hydraulic accumulators store energy supplied by the pump and accumulator charging valve.

- Supplied by vehicle manufacturer

Speed Sensors
These sensors send electrical pulses, proportional to the speed of each wheel being monitored, to the Electronic Control Unit (ECU).

- Supplied by vehicle manufacturer

Accumulator Charge Valve
The accumulator charge valve gives priority flow to the brake system allowing excess pump flow to be used for other functions. It controls the pressure in the accumulators between a high and low limit. The switch port provides a convenient location for a low pressure warning switch.

- Contact MICO, Inc. for installation print, service instructions or part number.

Low Pressure Warning Switch
A low pressure warning switch, used with a low brake pressure warning lamp, warns the operator that the pressure in the accumulators has fallen below the switch transition level.

- Contact MICO, Inc. for installation print or part number. Serviced by replacement.

Pedal Actuated Tandem Modulating Valve
The tandem modulating valve isolates front and back brakes by providing two individual pressure outputs within a single valve. In the event of failure in either half of the brake system the other portion of the valve will continue to function.

- Contact MICO, Inc. for installation print, service instructions or part number.

Pressure Transducers
Two transducers are used to monitor the pressure of each brake port of the tandem pressure modulating valve. The ECU uses these signals for control and diagnostics.

- Contact MICO, Inc. for installation print or part number. Serviced by replacement.

Electrohydraulic ABS Valves
These valves are normally open allowing hydraulic fluid to pass from the tandem modulating valve to the brakes. When supplied with current, they block pressure to the brakes from the tandem modulating valve and reduce the pressure in the brakes proportional to the current supplied.

- Contact MICO, Inc. for installation print or part number. Serviced by replacement.

Electronic Control Unit
The Electronic Control Unit (ECU) processes sensor signals and sends current to the ABS valves to reduce the pressure in brakes during an ABS event. In addition, the ECU controls indicator lamps and logs diagnostic information.

- Contact MICO, Inc. for installation print or part number. Serviced by replacement.

Brake Light Panelette
Three lamps indicate the status of the brake system. The red Brake Warning lamp is illuminated when the low pressure warning switch indicates that the pressure in one of the accumulators has fallen below the set point level of the switch. The Front and Rear lamps are used to indicate which side of the brake system has low pressure or pressure sensor problem.

- Contact MICO, Inc. for installation print or part number. Serviced by replacement.

ABS Light & Switch Panelette
The ABS function can be turned ON or OFF with this switch. When ABS is turned ON the amber lamp in the switch illuminates. If a fault in the ABS system occurs the ABS WARNING lamp will illuminate.

- Contact MICO, Inc. for installation print or part number. Serviced by replacement.

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TROUBLESHOOTING AND TESTING
This section contains information for testing the Hydraulic Brake System with ABS using Diagnostic Interface Software and for performing standard component and electrical tests.

WARNING
Exhaust gas is harmful. When testing a vehicle with the engine running, make sure that the vehicle’s exhaust gas is discharged to a well-ventilated area.
To prevent serious eye injury, always wear safe eye protection when you perform vehicle maintenance or service.
To avoid serious injury, keep body parts and test equipment away moving and high temperature parts.

Always read and follow the vehicle manufacturer’s service procedures. Pay close attention to Warnings and Cautions.
When testing any vehicle, place the vehicle in PARK (automatic transmission) or NEUTRAL (manual transmission) and set the parking brake unless otherwise directed.

MICO ABS - Diagnostic Interface Software
The MICO - ABS Diagnostic Interface (DI) software application is a diagnostic tool that will allow for ABS system variable adjustments, diagnostic investigation through real time variable monitoring, fault code downloading, and software uploads. The DI application is installed on a notebook computer and interfaces with the Electronic Control Unit with a dongle and a diagnostic interface cable to a connector in the wiring harness.

The MICO - ABS DI has the following features:
- Monitor inputs/outputs (I/O), ABS control variables, J1939, ABS system variables, ABS fault codes
- ABS system component testing
- ABS system variable adjustment
- ABS fault code log download and reset
- Upload ABS software updates to Electronic Control Unit

The MICO - ABS DI requires the following hardware, software, and system requirements to operate successfully:

Hardware requirements:
- Dongle*
  NOTE: This device connects a CAN Bus through a 9-pin SUB-D-plug connector to a PC through a USB connector.
- Diagnostic Interface Cable
  NOTE: This cable connects between Dongle and Diagnostic Interface Connector in the vehicle wiring harness.
- Electronic Control Unit

Additional software requirements:
- Dongle drivers*
- Dongle CAN drivers*
  * Included with purchase of MICO ABS – Diagnostic Interface Software

Minimum system requirements:
- IBM-PC or 100% compatible unit with USB support
- Windows 2000 or XP operating system
- Minimum 400 MHz Celeron CPU or better
- 128 MB RAM
- Minimum 2 MB free disk space

NOTE: For complete instructions on using this program, refer to the Diagnostic Interface User Guide for Full Power Brake System with ABS (MICO Form No. 81-585-015).

STANDARD TESTING PROCEDURES

Test Equipment: Multimeter
A multimeter is required for testing. It is recommended that a multimeter with automatic polarity sensing be used. This will eliminate any concern regarding polarity of the meter leads during testing.

ECU Supply Voltage Check
DC voltage to the ECU must meet the following specification for the Hydraulic ABS to operate properly:

<table>
<thead>
<tr>
<th>Specification</th>
<th>Vehicle Battery Type</th>
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<tbody>
<tr>
<td>10 to 16 Vdc</td>
<td>12 Volt</td>
</tr>
<tr>
<td>20 to 32 Vdc</td>
<td>24 Volt</td>
</tr>
</tbody>
</table>

To check the voltage, follow these steps:
1. Turn the ignition ON.
2. Check for the specified voltage:

42-Pin Connector
- Pins 16 and 1 for ignition and ground respectively
- Pins 14 and 1 for battery and ground respectively
- Pins 28 and 1 for battery and ground respectively
- Pins 30 and 1 for battery and ground respectively
- Pins 42 and 1 for battery and ground respectively

Indicator Lamps
When the ECU is initially powered-up it turns on the indicator lamps for three to five seconds for a lamp verification test. If the lamps do not come on, check the power to the ECU and verify voltage at the harness connector that plugs into the panelette connector. If the lamp is getting voltage but does not illuminate when first powered up, replace the panelette. If the lamp is not getting voltage, check all ABS fuses or circuit breaker and wiring. Make repairs as required.
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