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## GUIDELINES FOR LIQUID LEVEL INDICATORS

**Foreword**—This reaffirmed document has been changed only to reflect the new SAE Technical Standards Board format.

1. **Scope**—This SAE Recommended Practice pertains to liquid level determination for any compartment of off-road machinery as defined in SAE J1116 and J1057.

1.1 **Purpose**—SAE Recommended Practice to outline preferred methods of indicating liquid levels.

### 2. References

2.1 **Applicable Publications**—The following publications form a part of this specification to the extent specified herein. The latest issue of SAE publications shall apply.

2.1.1 SAE PUBLICATIONS—Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

SAE J371—Drain, Fill, and Level Plugs for Off-Road, Self-Propelled Work Machines

SAE J531—Automotive Pipe, Filler, and Drain Plugs

SAE J532—Automotive Straight Thread Filler and Drain Plugs

SAE J614—Engine and Transmission Dipstick Marking

SAE J829—Fuel Tank Filler Cap and Cap Retainer

SAE J1057—Identification Terminology of Earthmoving Machines

SAE J1116—Categories of Off-Road, Self-Propelled Work Machines

3. **Priority**—Priority of method is assigned on the basis of service convenience.

3.1 Sight gage.

3.2 Mechanical or electrical indicators.

3.3 Dipstick.

3.4 Plug, cap, or cover.

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**4. General Requirements**

- 4.1 Indicator reading should be consistent with compartment level.
- 4.2 The indicator shall be read with the machine level, in the machine manufacturer's recommended parked position.
- 4.3 The indicator should be marked "FULL" and "ADD" (except fuel indicator).
- 4.4 Fuel indicator should show the fraction of container capacity remaining (in increments of one-fourth container capacity).
- 4.5 The full level mark should be at a point at least 1/2 L above the add mark on compartments with less than 4 L capacity. On large compartments, the full level mark should be a whole number of liters above the add mark.
- 4.6 Special instructions should be avoided; however, if necessary for checking liquid level, the instructions should be located on or near the indicator.
- 4.7 Liquid level indicators should be mounted in a protected, easily accessible location.

**5. Recommendations**

- 5.1 Sight gages should use reflector backed level gage for readability.
- 5.2 Mechanical or electrical gages.
  - 5.2.1 Use green for allowable ranges and red for add when colors are used.
  - 5.2.2 The marking on the right side of the gage face represents full, the left side represents empty, or the top of gage represents full, the bottom represents empty.
- 5.3 **Dipstick**—See SAE J614.
  - 5.3.1 Where "CHECK ENGINE RUNNING" is used, the opposite side of the dipstick should show the starting range "CHECK ENGINE STOPPED."
  - 5.3.2 Where "CHECK HOT" is used, the opposite side of the dipstick should show the starting range "CHECK COLD."
  - 5.3.3 The dipstick cap should prevent contaminant entry.
  - 5.3.4 The dipstick bayonet guide should be designed to prevent false readings due to interference, oil drippage, pressure, or suction.
  - 5.3.5 The dipstick should be restrained from vibrating or rattling in the bayonet guide.
  - 5.3.6 The dipstick and guide should be rust resistant.
  - 5.3.7 The dipstick should be removable without tools.

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**5.4 Plug, Cap, or Cover**—See SAE J371, J531, J532, and J829.

- 5.4.1 Liquid level checks by plug should be used only on machines with engine(s) stopped.
- 5.4.2 To avoid injury to fingers, if inserted, make hole sizes for level check plugs larger than 25 mm or smaller than 12 mm.
- 5.4.3 Level check caps on pressurized compartments shall provide a method to vent the compartment before the cap is free to be removed.
- 5.4.4 Level check caps should be removable by hand (preferred) or by common hand tools.

**PREPARED BY THE SAE OFF-ROAD MACHINERY TECHNICAL COMMITTEE SC16—SERVICEABILITY**

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