SVENSK STANDARD
SS-ISO 4113:2010

Fastställd/Approved: 2010-06-10
Publicerad/Published: 2010-08-18
Utgåva/Edition: 3
Språk/Language: engelska/English
ICS: 43.180

SWEDISH STANDARDS INSTITUTE

Vägfordon – Dieselmotorer – Kalibreringsvätskor för insprutningsutrustning (ISO 4113:2010, IDT)

Road vehicles – Calibration fluids for diesel injection equipment (ISO 4113:2010, IDT)

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Den internationella standarden ISO 4113:2010 gäller som svensk standard. Detta dokument innehåller den officiella engelska versionen av ISO 4113:2010.

Denna standard ersätter SS-ISO 4113, utgåva 2.

The International Standard ISO 4113:2010 has the status of a Swedish Standard. This document contains the official English version of ISO 4113:2010.

This standard supersedes the Swedish Standard SS-ISO 4113, edition 2.

Upplysningar om sakinnehållet i standarden lämnas av SIS, Swedish Standards Institute, telefon 08-555 520 00. Standarder kan beställas hos SIS Förlag AB som även lämnar allmänna upplysningar om svensk och utländsk standard.

Information about the content of the standard is available from the Swedish Standards Institute (SIS), telephone +46 8 555 520 00. Standards may be ordered from SIS Förlag AB, who can also provide general information about Swedish and foreign standards.

Denna standard är framtagen av kommittén för Motorer i bilar, SIS/TK 220.

Har du synpunkter på innehållet i den här standarden, vill du delta i ett kommande revideringsarbete eller vara med och ta fram andra standarder inom området? Gå in på www.sis.se - där hittar du mer information.

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 4113 was prepared by Technical Committee ISO/TC 22, *Road vehicles*, Subcommittee SC 7, *Injection equipment and filters for use on road vehicles*.

This third edition cancels and replaces the second edition (ISO 4113:1988), which has been technically revised.

Road vehicles — Calibration fluids for diesel injection equipment

1 Scope

This International Standard specifies the requirements for calibration fluids, i.e. a basic fluid and a closer value (CV) fluid, intended for testing and calibrating diesel fuel injection equipment in production, in service, and in laboratories. The CV calibration fluid requires a closer tolerance range for kinematic viscosity and density, and can be specified to enhance the accuracy of the calibration setting.

This International Standard also allows the specification of an anti-wear (AW) requirement in order to aid the running-in of diesel fuel injection equipment.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 2049, *Petroleum products — Determination of colour (ASTM scale)*

ISO 2160, *Petroleum products — Corrosiveness to copper — Copper strip test*

ISO 2719, *Determination of flash point — Pensky-Martens closed cup method*

ISO 3015, *Petroleum products — Determination of cloud point*

ISO 3104, *Petroleum products — Transparent and opaque liquids — Determination of kinematic viscosity and calculation of dynamic viscosity*

ISO 3405, *Petroleum products — Determination of distillation characteristics at atmospheric pressure*

ISO 3675, *Crude petroleum and liquid petroleum products — Laboratory determination of density — Hydrometer method*

ISO 12937, *Petroleum products — Determination of water — Coulometric Karl Fischer titration method*

ASTM D665-06, *Standard test method for rust-preventing characteristics of inhibited mineral oil in the presence of water*

ASTM D892-06, *Standard test method for foaming characteristics of lubricating oils*

ASTM D1748-02(2008), *Standard test method for rust protection by metal preservatives in the humidity cabinet*

ASTM D2140-08, *Standard practice for calculating carbon-type composition of insulating oils of petroleum origin*

ASTM D2783-03(2009), *Standard test method for measurement of extreme-pressure properties of lubricating fluids (four-ball method)*

IP 306-82, *Oxidation stability of straight mineral oil*

3 Requirements

3.1 General

The calibration fluids shall be refined and deodorized mineral oils and may contain additives to inhibit undesirable characteristics such as foaming, ageing, corrosion and wear.

The calibration fluids shall not contain components in such a concentration that adversely affects human health, e.g. causing skin irritation, etc.

The calibration fluids shall be such that, without cleaning of the fuel injection equipment after calibration, proper functioning of the equipment is ensured after storage of the equipment for a period of one year minimum, in normal conditions.

The calibration fluids shall have the properties specified in Table 1.

3.2 Anti-wear

The anti-wear property of calibration fluid defined in this International Standard refers to the ability of the fluid to form a thin chemical layer between the sliding surfaces of moving parts under the initial high loading of the residual surface peaks, formed during the machining processes, in order to prevent these asperities from welding during the running-in procedure. This property is tested by means of the modified four-ball-test device. The ASTM D2783-03(2009) test procedure shall be modified as follows:

— number of test runs: 3;

— duration of each test run: 10 s;

— rotational speed: $(1\,450 \pm 40)\ \text{min}^{-1}$;

— load: 500 N.

None of the lower-ball wear-scar diameters from each of the three test runs shall exceed the maximum value given in Table 1.

NOTE The lubricity requirement of diesel fuel refers to the ability of the fluid to form a film between the moving parts in order to prevent them from wear and abrasion during normal loading conditions and lifetime operation of the fuel injection equipment. This property is tested by means of the high-frequency reciprocating rig (HFRR) defined in ISO 12156-1.

4 Designation

A calibration fluid that meets the requirements of this International Standard shall be designated by the following, in the order given:

a) the term “Calibration Fluid”;

b) reference to this International Standard, “ISO 4113”;

c) the designation “CV” if the closer tolerances for kinematic viscosity and for density are required;

d) the designation “AW” if the specification for wear protection is required.