

KES

Testing Method for Apparent Viscosity of Engine Oil at Low Temperature

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1. Scope of application

This standard should be applied to the testing method for apparent viscosity of engine oil, its apparent viscosity is from 6P to 84P, by means of cold cranking simulator(CCS) method at the temperature of -17.8°C .

2. Summary of testing method

Assemble the equipment, fill a test material between a stator maintained with a regulated temperature and a rotator, and measure the speed of the rotator revolved by the universal motor.

Because the speed of the rotator and viscosity has a functional relation, draw the relation beforehand, and obtain the apparent viscosity by reading the scale of the speedometer of rotator using the this figure.

3. Equipment

CCS should be same as shown Figure 1 or have the performance more than this. The principal parts are described as follows.

(1) Simulator

It is consist of stator, rotator, universal motor for revolving the rotator and speedometer of rotator. (Refer to Figure1 and Figure2)

(2) Cold object

It should be a calibrated thermostat, thermocouple or other cold object. It should be attached to inner wall of a stator to control the testing temperature.

(3) Recurring equipment for cold material

It should be equipment for recurring a cold material. It should be used to maintain the testing temperature of a stator.

4. Standard viscous oil

Use a turbid mineral oil as same viscosity as shown Table 1.

Table 1. Standard viscous oil

Number of standard viscous oil	Outline of viscosity	
	-17.8°C	-28.9°C
N – 17L	5.5	20
N – 26L	12	48
N – 38L	24	100
N – 56L	48	230
N – 69L	72	
N – 81L	96	

Note (3) Viscosity P is determined by multiplying dynamic viscosity St by density.

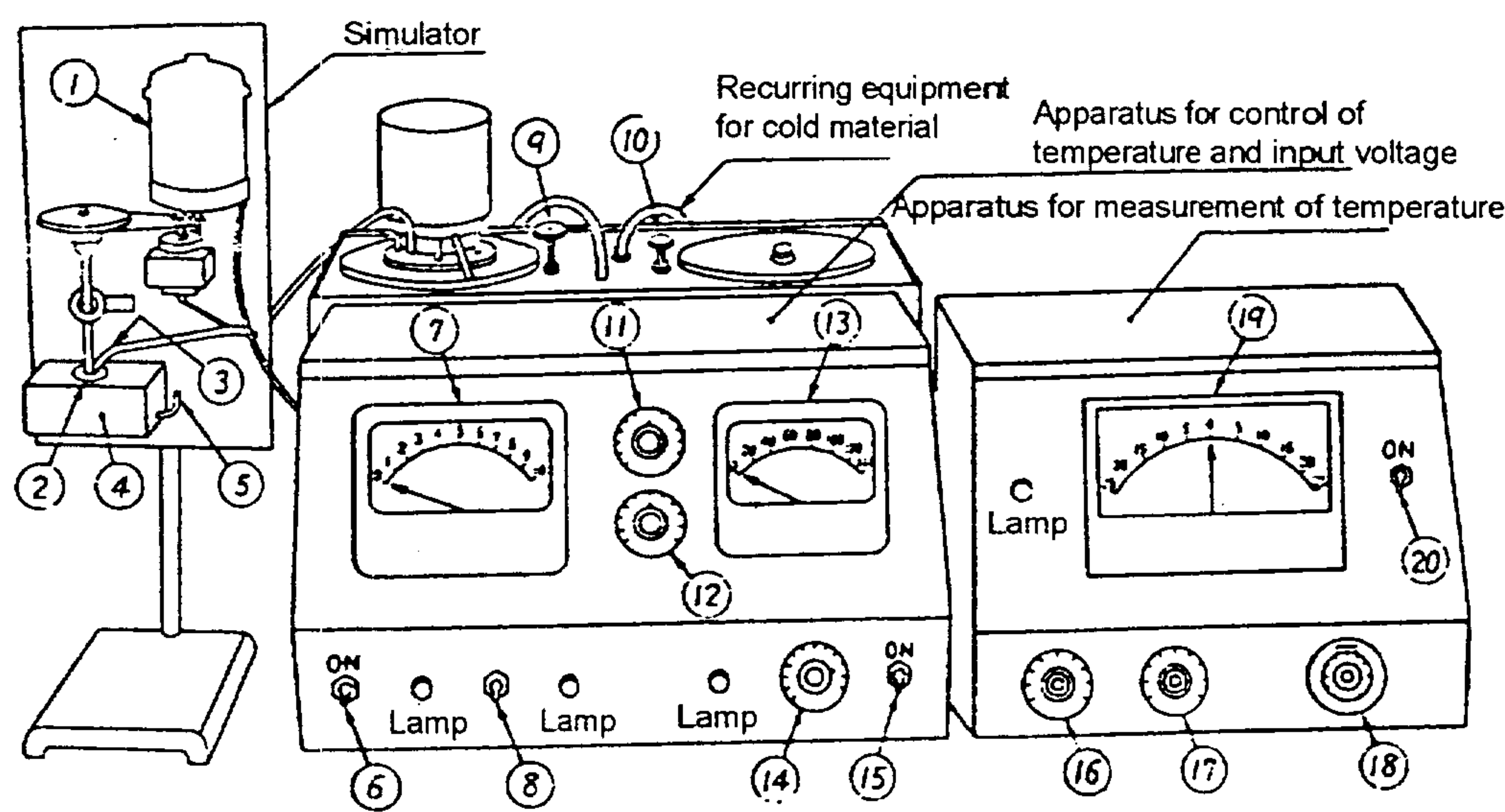


Figure1. Cold cranking simulator

- ① Motor for revolving a rotor
- ② Rotor and stator
- ③ Cold object
- ④ Measuring part (Refer to Figure2)
- ⑤ Injection of testing material
- ⑥ Solenoid valve switch
- ⑦ Speedometer of rotor
- ⑧ Power switch
- ⑨ Control valve for cold material
- ⑩ Bypass valve for cold material
- ⑪ Control dial for solenoid valve
- ⑫ Control dial for solenoid valve
- ⑬ Indicator for input voltage
- ⑭ Control dial for Input
- ⑮ Motor switch for driving rotor
- ⑯ Setting dial for measuring temperature($1000\ \Omega$)
- ⑰ Setting dial for measuring temperature($100\ \Omega$)
- ⑱ Setting dial for measuring temperature($20\ \Omega$)
- ⑲ Temperature indicator
- ⑳ Switch for equipment of measuring temperature

Figure1. Cold cranking simulator

5. Preparation of test

5.1 Preparation of testing material

Testing material that does not contain suspension and moisture is needed for an available measuring result. If the temperature of test material is below the dew point, leave it alone to the room temperature and then open.