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JAPANESE INDUSTRIAL STANDARD

Test Code for Performance and Accuracy of Gear Hobbing Machines

JIS B 6216 -1979

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Test Code for Performance and Accuracy
of Gear Hobbing Machines

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1. Scope

This Japanese Industrial Standard specifies test code for performance and accuracy of vertical gear hobbing machines, hereinafter referred to as "hobbing machines", which have tables 2500 mm or less in diameter.

- Remarks 1. In this standard, the longitudinal and transverse directions shall be specified: the former shall mean the direction from the column to the table; the latter, the left-right direction, facing the machine.
2. This standard applies to horizontal gear hobbing machines, as appropriate.

2. Running Test Methods

2.1 Function Tests The function tests for hobbing machines shall conform to Table 1.

Table 1

No.	Test item	Test method	Reference: corresponding number in 3.2 of JIS B 6201
1	Starting, stopping, and operation of the hob spindle	For one suitable speed, start and stop the hob spindle 10 times to test the smoothness and accuracy of operation.	1-11
2	Changing operation of hob spindle speeds	Test all marked speeds by changing the hob spindle speed for smoothness of operation and accuracy of command. For machines with stepless transmissions or pick-off gears, measure at the maximum, minimum, and middle speeds in the same manner.	1-12
3	Changing operation of hob saddle feed	Test the smoothness of the operation and accuracy of command by changing the hob saddle feed to maximum, minimum, and middle speeds.	1-23
4	Engaging/disengaging of the automatic feed and operation of the automatic stopping device	Test the smoothness of operation and accuracy of engaging/disengaging of the hob saddle automatic feed and quick feed, and of the setting and operation of the hob saddle automatic stopping device.	1-31
5	Tightening of hob head	Test the smoothness and accuracy of tightening at the mid-point and both extremes of the hob head motion.	1-33

Applicable Standards and Reference Standard: See page 18.



Documents

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Table 1 (Cont'd)

No.	Test item	Test method	Reference: corresponding number in 3.2 of JIS B 6201
6	Operation of hob shift device ⁽¹⁾	Test the smoothness of operation over the entire length of motion by operating the hob shift device and the accuracy of tightening at any two points.	1-33
7	Changing operation of table or column feeding rate	Test the smoothness of operation and accuracy of command by changing the table or column longitudinal feeding rate at max., min., and middle.	1-23
8	Operation of the table or column manual feed	Test the smoothness and uniformity of motion over the entire length of table or column by manual operation. Test the accuracy of the micrometer collar function at the mid-point and both extremes of the motion and tightening at the above-mentioned three points.	1-27 1-33
9	Engaging/disengaging of the table or column automatic feed and quick feed ⁽¹⁾	Test the smoothness and accuracy of the setting and the operation of the table or column automatic feed and quick feed.	1-31
10	Operation of the work arbor support manual feed	Test the smoothness and uniformity of motion over the entire range of motion by moving and spinning the work arbor support by manual operation. Also test the accuracy of each tightening point.	1-27 1-33
11	Meshing of master worm and master worm wheel	Test the smoothness and uniformity of motion by manually rotating the master worm for one complete revolution of the table both clockwise and counterclockwise. For hobbing machines with tables of over 1000 mm in diameter, the revolutions each of the master worm both clockwise and counterclockwise at four points symmetrically distributed by about 90° on the table may be substituted.	1-32
12	Electrical system	Test the insulation once both before and after the test run.	1-51
13	Safety devices	Test the accuracy of function of protective devices for both the worker and the machine.	1-52
14	Lubrication system	Test the accuracy of functions of sealing, oil feeding, and others.	1-53
15	Oil hydraulic system ⁽¹⁾	Test the accuracy of functions of sealing, oil pressure regulation, and others.	1-54
16	Attachments	Test the accuracy of their functions.	1-55

Note ⁽¹⁾ Carry out the operation when such functions are present.

2.2 Running Performance Test Under No Load

2.2.1 Hob Spindle Starting at the lowest hob spindle speed, run the hobbing machine stepwise up to the top speed and let it run at top speed, as a rule, for 120 minutes. Measure each item specified in Report Form 1-1 of Table 2 while running.

In this case, the indexing ratio shall, as a rule, be $1/2$, and the value be described in Remarks column.

For hobbing machines with pick-off gears, start with the lowest speed, shift to an intermediate one, and then to the highest [Refer to 3.3 of JIS B 6201].

Also observe vibration and noise. If the vibration and noise are in question particularly, refer to JIS B 6003 and JIS B 6004.

Table 2 Report Form 1-1

Time of measurement h:min	Hob spindle speed (rpm)		Temperature (°C)				Power required (frequency of power source Hz)			Remarks
			Hob spindle bearing		Master worm bearing	Room temperature	Voltage (V)	Current (A)	Input power (kW)	
	Marked value	Measured value	Hob spindle bearing	Hob arbor support						

2.2.2 Feed Measure each item specified in Report Form 1-2 of Table 3 and Report Form 1-3 of Table 4 for the vertical feed of the hob saddle at the maximum hob spindle speed and the longitudinal feed of the column or table at max., min., middle, and quick feed speeds.

Also observe vibration and noise. If the vibration and noise are in question particularly, refer to JIS B 6003 and JIS B 6004.