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IS 6149 (1984): Single-ended Open-jaw Adjustable Wrenches
[PGD 5: Assembly Hand Tools]



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Bhartrhari—Nitiśatakam

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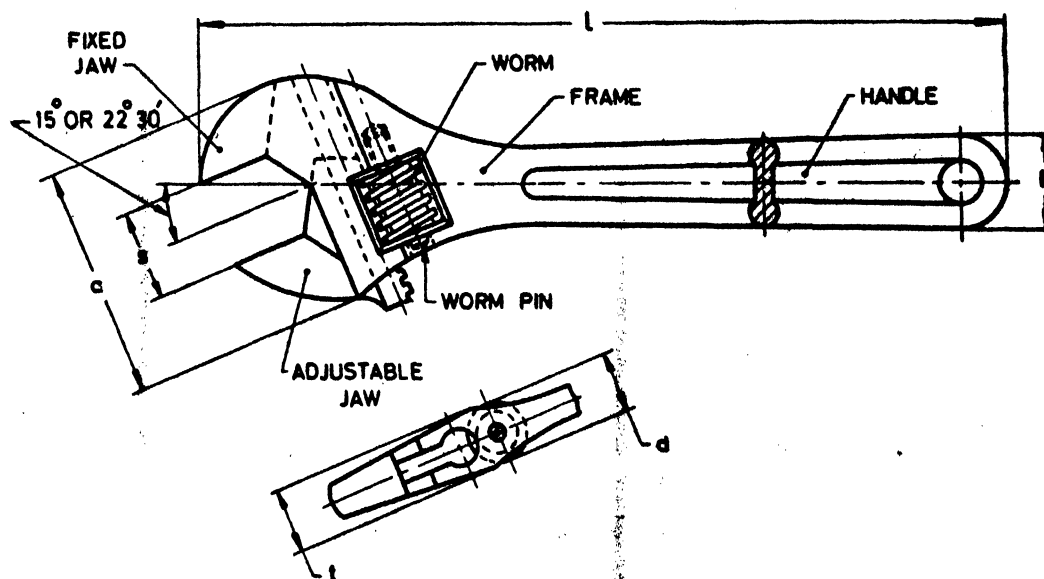


Indian Standard
SPECIFICATION FOR
SINGLE-ENDED OPEN-JAW ADJUSTABLE WRENCHES
(First Revision)

1. **Scope** — Covers the requirements for single-ended open-jaw adjustable wrenches.
2. **Types** — The wrenches shall be of the following two types :
 Type A — with jaws at an angle of 15° off-set; and
 Type B — with jaws at an angle of 22° 30' off-set.
3. **Grades** — The wrenches shall be of the following three grades :
 Grade 1 (Heavy Duty)
 Grade 2 (Normal Duty)
 Grade 3 (Light Duty)
4. **Dimensions** — Shall be as given in Table 1. The illustrations shown in Table 1 are only for guidance and the manufacturers are free to adopt any suitable shape as long as the test requirements laid down in 8 are met by the wrenches.

TABLE 1 DIMENSIONS FOR SINGLE-ENDED OPEN-JAW ADJUSTABLE WRENCHES

All dimensions in millimetres.



Nominal Size	<i>l</i>	Tolerance on <i>l</i>	<i>s</i>	<i>a</i>	<i>b</i>	<i>t</i>	
100	100	+10 0	13	32	15	8.5	8
150	150		18	45	18	11.5	11
200	200		24	58	22	14.0	14
250	250		27	65	25	17.0	17
300	300	+15 0	34	80	30	20.0	19
375	375		41	90	35	21.0	21
450	450		55	120	40	22.5	21

Adopted 24 January 1984

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Gr 2

IS : 6149 - 1984

4.1 The maximum opening of adjustable jaw shall be as given below :

Nominal size mm	100	150	200	250	300	375	450
Maximum opening mm	13^{+3}_0	18^{+3}_0	24^{+3}_0	27^{+3}_0	34^{+3}_0	41^{+3}_0	55^{+3}_0

5. Material — Shall be made of suitable material, meeting the requirements laid down at 6 and 8.3.

Suitable Examples :

Grade of Wrench

Material

Grade 1	Steel conforming to IS : 963-1958 'Specification for chrome-molybdenum steels bars and rods for aircraft purposes'.
Grade 2	Steel conforming to designation 45 C 8 of IS : 1875-1978 'Specification for carbon steel billets, blooms, slabs and bars for forgings (fourth revision)'.
Grade 3	
Frame	Cast iron conforming to Grade BM 310 of IS : 2108-1977 'Specification for blackheart malleable iron castings (first revision)'.
Adjustable jaws	Steel conforming to Designation 45 C8 of IS : 1875-1978.

6. Hardness — The hardness range for wrenches of Grade 1 and 2 shall be as given below :

Frame, handle and jaw	40 — 48 HRC
Worm	35 — 45 HRC
Worm pin	25 — 30 HRC

7. Manufacture, Workmanship and Finish

7.1 The single ended open jaw adjustable wrench shall consist of fixed jaw, adjustable jaw, worm, frame and handle. The opening of the jaws shall be easily and conveniently adjustable at any opening up to the maximum opening of the wrench and shall remain in the required position till further adjustment. The worm shall rotate freely and the jaw shall slide smoothly for the entire range of the wrench. The play of the moving components shall be within the limits specified in 8.1 and 8.2.

7.2 Wrenches shall not have forging defects, such as overheating, unfilling, scales, pits, laps and cracks. In case of cast iron wrenches, the casting shall be of uniform quality and reasonably smooth finish free from casting defects, such as blow holes, porosity, shrinkage, cold shut and cracks.

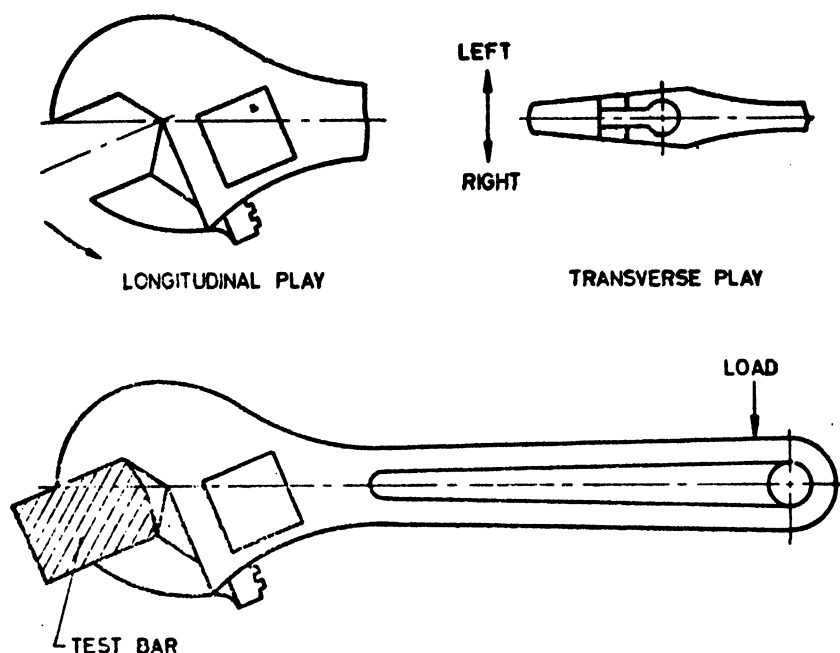
7.3 All parts of the wrenches shall be adequately protected against corrosion and rust. In case these are nickel and chromium plated the coating shall be according to grade 1 of IS : 1063-1958 'Specification for electroplated coatings of nickel and chromium on iron and steel'. The plating shall be uniform and shall not peel off. In case of the phosphate finish wrenches, these shall uniformly phosphated and subsequently protected with preservative. The phosphate coating shall conform to IS : 3618-1966 'Specification for phosphate treatment of iron and steel for protection against corrosion' and the class of coating shall be as agreed to between the manufacturer and the purchaser.

8. Tests

8.1 *Longitudinal Play of Adjustable Jaw* — The longitudinal play of the adjustable jaw shall be determined by holding the worm tightly with finger tip so that it does not move in the direction of axis of rotation and by measuring the backlash at the tip of jaw when the jaw is rocked in the manner indicated in the figure in Table 2. The longitudinal play shall not exceed the specified values given in Table 2.

8.2 *Transverse Play of Adjustable Jaw* — The transverse play of the adjustable jaw shall be determined by measuring the amount of movement at the tip of the jaw when the jaw is moved right and left with the finger tip as indicated in the figure in Table 2. The transverse play shall not exceed the specified values given in Table 2.

TABLE 2 LONGITUDINAL AND TRANSVERSE PLAYS, AND TORQUE TEST
(Clauses 8.1, 8.2 and 8.3)



Nominal Size mm	Longitudinal Play, Max, mm	Transverse Play Max, mm	Width Across Flats of Test Bar, mm	Torsional Moment Nm (kgf. m)		
				Grade 1	Grade 1	Grade 3
100	1.0	1.2	10±0.3	49 (5)	29 (3)	22 (2.2)
150	1.0	1.2	17±0.3	118 (12)	78 (8)	52 (5.3)
200	1.2	1.2	21±0.3	255 (26)	176 (18)	118 (12)
250	1.2	1.2	26±0.5	422 (43)	294 (30)	196 (20)
300	1.5	1.5	32±0.5	687 (70)	480 (49)	314 (32)
375	1.5	1.5	41±0.5	1275 (130)	883 (90)	569 (58)
450	1.5	1.5	52±0.5	1600 (194)	1300 (132)	830 (85)

8.3 Torque — The test bar shall be held by the wrench as indicated in the figure in Table 2 and the appropriate torsional moment as specified shall be applied at the end of the handle. The torque shall be applied for about one minute. The wrench shall withstand the specified torque test without permanent deformation or formation of cracks and deep dent marks at the loaded portion. The parts of the wrench, frame, jaw, worm and worm pins shall not show any sign of damage. The wrench shall work as smoothly as it has been before the test.

8.3.1 The test bar may be either square or hexagon with width across flats as specified in Table 2 and shall be positioned for testing as indicated in the figure in the table. The hardness of test bar shall be within the range of 50 to 60 HRC.

IS : 6149 - 1984

9. Designation — An adjustable wrench of Type A nominal size 200 and grade one shall be designated as :

Wrench A 200 IS : 6149 Grade 1

10. Marking — The wrenches shall be marked with the nominal size, grade and manufacturer's name, initials or recognized trade-mark.

10.1 Certification Marking — Details available with the Bureau of Indian Standards.

11. Packing — According to the best prevalent trade practices.

12. Sampling — Unless otherwise agreed to between the supplier and the purchaser, the sampling inspection procedure as given in IS : 2500 (Part 1)-1973 'Sampling inspection tables : Part 1 Inspection by attributes and by count of defects' shall be followed. The inspection level and AQL for various characteristics shall be as given in 12.1 and 12.2.

12.1 For measurement of dimensions and maximum opening, single sampling plan with inspection level III and acceptable quality level (AQL) of 2.5 percent given in Tables 1 and 2 of IS : 2500 (Part 1)-1973 shall be adopted.

12.2 For hardness, longitudinal and transverse plays, and torquetest, single sampling plan with inspection level I and acceptable quality level (AQL) of 2.5 percent given in Tables 1 and 2 of IS : 2500 (Part 1)-1973 shall be adopted.

EXPLANATORY NOTE

This standard was first published in 1971. The revision of this standard has been taken up to bring it in line with the present manufacturing practices prevalent in the Indian industry. In this revision the nominal size 450 mm has also been included and the dimensional requirements have been modified.

While preparing this standard assistance has been derived from JIS B 4704-1976 'Adjustable angle wrenches' issued by Japanese Industrial Standard (JIS), and DIN 3117-1978 'Adjustable wrenches, open end' issued by Deutsches Institut für Normung.

AMENDMENT NO. 1 APRIL 1986
TO
IS:6149-1984 SPECIFICATION FOR SINGLE-ENDED
OPEN-JAW ADJUSTABLE WRENCHES

(First Revision)

*(Page 3, Table 2, second column under the heading
'Torsional Moment') - Substitute 'Grade 2' for 'Grade 1'.*

(EDC 12)

Reprography Unit, BIS, New Delhi, India

AMENDMENT NO. 2 JANUARY 2012
TO
IS 6149 : 1984 SPECIFICATION FOR SINGLE-ENDED
OPEN-JAW ADJUSTABLE WRENCHES

(First Revision)

(Page 2, clause 6, second line) — Substitute ‘Frame, handle and jaw 38 – 48 *HRC*’ for ‘Frame, handle and jaw 40 – 48 *HRC*’.

(PGD 34)

Reprography Unit, BIS, New Delhi, India