



THIS TEST REPORT IS VALID UPTO 31.10.2027



ICS-PHD 500 POST HOLE DIGGER



सत्यमेव जयते

भारत सरकार
GOVT OF INDIA

कृषि एवं किसान कल्याण मंत्रालय

MINISTRY OF AGRICULTURE & FARMERS WELFARE

कृषि एवं किसान कल्याण विभाग

DEPARTMENT OF AGRICULTURE AND FARMERS WELFARE

उत्तर पूर्वी क्षेत्र कृषि यंत्र प्रशिक्षण एवं परीक्षण संस्थान

NORTH EASTERN REGION FARM MACHINERY TRAINING & TESTING INSTITUTE

विश्वनाथ चारिआलि, जिला-विश्वनाथ (असम)

BISWANATH CHARIALI: BISWANATH: ASSAM, PIN - 784 176

[AN ISO 9001:2015 CERTIFIED INSTITUTION]

1. SCOPE OF TEST

ICS-PHD 500 post hole digger engine powered manually operated is the cleared by the applicant to dig holes for plantation etc. on the one end, it is fitted with a 2-stroke petrol engine, whereas on the other end auger attachments are fitted. Here are five sizes of the auger attachments provided with the machine the sizes of auger are 95, 150, 190, 250 & 300 mm.

1.1 LABORATORY TEST

- a) Checking of specifications
- b) Mechanical vibration measurement
- c) Noise measurement
- d) Hardness & Chemical Analysis
- e) Wear assessment of critical components
- f) Engine performance test

1.2 FIELD TEST

- a) Rate of work
- b) Quality of work
- c) Labour requirement
- d) Adequacy of prime mover power
- e) Ease of operation, adjustment & safety provisions
- f) Defects, breakdowns and repairs

2. METHOD OF SELECTION

As per Govt. of India, OM No. 13-1/2021-M&T (I&P), dated 03.02.2022, the selection of sample for test was exempted. Hence, the machine was directly submitted by the applicant at this Institute for test.

3. TEST CODE AND PROCEDURE

There is no Indian Standard Test Code available for testing of Post hole digger as such. However, for engine performance test, IS 7347-1974 (Amended 2011) was referred.

4. SPECIFICATIONS**4.1 General**

- | | | |
|--------------------------------------|---|---|
| Name of the Machine | : | Post Hole Digger |
| Name and address of the manufacturer | : | CHANGZHOU MACHINERY & EQUIPMENT IMP. & EXP. CO., LTD.
No.62, Xinggang Road, Changzhou, Jiangsu, China |
| Name & Address of Applicant | : | M/s ICS MERCHANDISE PRIVATE LIMITED #31, Rudra's Arcade, 60 Feet Mallathahallilake road, NGEF layout, Mallathahalli Bangalore 560056 Karnataka |

Machine 77/448	ICS-PHD 500 POST HOLE DIGGER	COMMERCIAL (INITIAL)
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Model : ICS-PHD 500
 Make : ICS
 Serial No. : 2021102
 Type : Engine Powered Manually Operated
 Year of manufacture : 2021
 Country of origin : CHINA
 Recommended use (apa) : Digging holes for plantation

4.2 Constructional details :

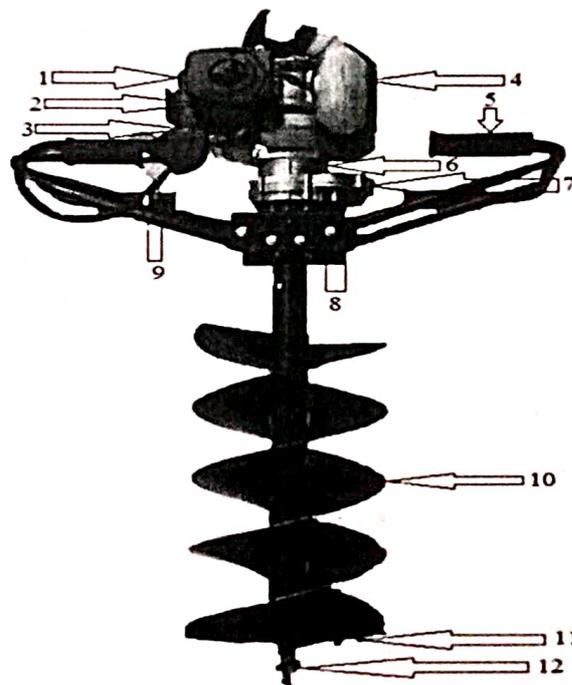


Fig. 1: ICS POST HOLE DIGGER MODEL: ICS-PHD 500

Keywords:

- | | |
|------------------------------|--------------------------------|
| 1. Engine | 7. Secondary reduction gearbox |
| 2. Air cleaner | 8. Clutch Unit |
| 3. Engine Stop switch | 9. Accelerator |
| 4. Fuel Tank | 10. Auger |
| 5. Handle Bar | 11. Auger blade |
| 6. Primary reduction gearbox | 12. Removal impact bit |

10.2.3 Chemical composition of Auger Bit

The results of chemical analysis test of Auger Bit

Constituents	As per IS: 6025 - 1982 (%)	Composition As observed (% by weight)	Remarks
Carbon (C)	0.70 to 0.95	0.530	Does not conform
Manganese (Mn)	0.3 to 0.5	0.578	Does not conform
Silicon (Si)	-----	0.235	--
Sulphur (S)	-----	0.011	--
Phosphorous (P)	-----	0.023	--

11. WEAR ANALYSIS OF CRITICAL COMPONENTS

Critical Component Auger:

Auger size	Duration of operation (h)	Initial mass (g)	Mass after operation (g)	Loss of mass (g)	Percentage of wear	Percentage of wear on hourly basis
95 mm	6.76	2382.5	2350.0	32.5	1.36	0.20
150 mm	5.08	3790.8	3766.2	24.6	0.64	0.13
190 mm	5.99	4869.2	4845.5	23.7	0.49	0.08
250 mm	5.60	6320.0	6306.3	13.7	0.21	0.04
300 mm	5.44	7759.3	7739.8	19.5	0.25	0.05

12. FIELD PERFORMANCE TEST

Field tests were conducted for 27.87 hours duration with auger attachment of size 95, 150, 190, 250 & 300 mm respectively. A total of Ten test trials were conducted at rated speed of 8000 rpm. Detailed results of field tests are shown in ANNEXURE and summarized in the ensuing table.

SUMMARY OF FIELD PERFORMANCE TEST

Sl. No.	Parameters	Observations	
1	Size of Auger (mm)	95 to 300	
2	Avg. Bulk density (g/cc)	1.64 to 1.72	
3	Avg. soil moisture (%)	5.9 to 10.7	
4	Avg. dia. of hole (mm)	104.8 to 311.8	
5	Avg. depth of hole (mm)	357 to 524	
6	Avg. no. of holes drilled per hour	38 to 242	
7	Time required for one hole (sec)	10.77 to 44.25	
8	Fuel consumption		
		-l/h	0.734 to 1.027
		-l/ha	0.004 to 0.019

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16. COMMENTS & RECOMMENDATIONS

- 16.1** The average rated power in rating test of engine was observed as 0.44 kW against declared value of 1.5 kW by the manufacturer. This should be looked into for corrective action.
- 16.2** The specific fuel consumption (SFC) in rating test of engine was observed as 1981.7 g/kWh against declared value of 580 g/kWh by the manufacturer which exceeded by more than 5 percent of that declared by the manufacturer and hence does not fulfill the requirement of IS 7347-1974 (Amended 2011). This should be looked into for corrective action.
- 16.3** The engine was not marked with Manufacturer name or trade-mark, Rated power, Rated speed and type of fuel used which does not fulfill the requirement of IS 7347-1974 (Amended 2011). This may be looked into.
- 16.4** Noise at operator's ear level was observed on much higher side against danger limit of 90 dB(A) as specified by International Labour Organization (ILO) for continuous exposure of 8 hours per day. This calls for reduction in noise level to improve the operational comfort and safety.
- 16.5** The amplitude of mechanical vibration marked as (*) was on drastically higher side and is directly concerned with operator's health, safety and comfort. Besides, it is also adversely affect the useful life of machine components. In view of above, this deserves to be given top priority for corrective action.
- 16.6** The Hardness & Chemical composition of Auger blade, Auger & Auger Bit does not conform to Indian Standard IS: 6690 – 1981 (Reaffirmed 2012) & IS 6025:1982. This should be looked into for corrective action.
- 16.7** The mentioned value of rated power of engine on the labeling sticker of the machine was not matching with the observed value during engine test. This may be looked into.
- 16.8** The mentioned size of auger on the labelling sticker of the machine was not matching with the observed size. This shall be looked into for corrective action.
- 16.9** It was observed that during field performance test engine exhaust emission gases directly come on operator face. This shall be looked into for corrective action.
- 16.10** As the machine is imported, country of origin shall be mentioned on the labelling sticker.



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16.11 As a safety wear, only safety shoes, goggles (safety glass) & hand gloves were provided with the machine. The applicant has strictly advised to provide the remaining safety wears also viz. helmet, ear plug, mask etc. along with each machine for the safety of operator.

16.12 Adequacy of Literature

The following literature in English language was provided for reference during testing:

- Operator's/ Service manual
- Parts catalogue

It is recommended to bring out the manual in Hindi and other vernacular languages as per IS: 8132-1999.

TESTING AUTHORITY



(M. R. PATIL)
AGRICULTURALENGINEER



(S.G.PAWAR)
AGRICULTURALENGINEER



(Dr. P.P. RAO)
DIRECTOR

Draft test report compiled by - **Shri Khagendra Bora**
Sr. Technical Assistant

17. APPLICANT'S COMMENTS

With immediate effect we will inform to the production unit to must & should provide safety kit in each unit (Safety shoes, goggles, helmet, hand gloves, ear plug & mask) & take care the corrective actions according to the recommendations of testing authority before dispatch from the factory to the sales unit.

