

THIS TEST REPORT VALID UP TO : 30th June, 2028



**JAYANT AGRICULTURE, CAMEL
SELF PROPELLED HIGH CLEARANCE BOOM SPRAYER**



भारत सरकार

Government of India

कृषि एवं किसान कल्याण मंत्रालय

Ministry of Agriculture and Farmers Welfare

कृषि एवं किसान कल्याण विभाग

Department of Agriculture and Farmers Welfare

उत्तरी क्षेत्र कृषि मशीनरी प्रशिक्षण एवं परीक्षण संस्थान

Northern Region Farm Machinery Training and Testing Institute

ट्रेक्टर नगर, सिरसा रोड, हिसार, (हरियाणा) - 125 001

Tractor Nagar, Sirsa Road, Hisar (Haryana)-125 001

[ISO 9001:2015 CERTIFIED]

Website: <http://nrfmtti.gov.in/>

E-mail: fnti-nr@nic.in

Tele./FAX: 01662-276984

		base white metal	base white metal	
xxix)	Small end bush	Gunmetal	Gun metal	Conforms
xxx)	The material used for different components shall be declared by the manufacturer all the components mentioned in the table-I may not be present in a particular sprayer.		Declared by the Manufacturer	Conforms

5. RUNNING-IN

The sprayer was run-in for 1.0 hours as recommended by the applicant before starting of test.

6. TEST FOR DISCHARGE RATE OF PUMP [vide Clause 8.3 of IS:11313-2007]

1. Date of test : 24.04.2023
2. Atmospheric conditions
 - a) Temperature : 36.4 °C
 - b) Relative humidity : 18.7 %
 - c) Pressure : 98.2 kPa

3. Data recorded

Avg. Speed of Pump (rpm)	Working pressure (kg/cm ²)	Test No.	Delivery from the discharge line (ml/min)	Overflow (ml/min)	Avg. over flow (ml/min)	Average discharge from the discharge line (ml/min)	Discharge rate of pump (ml/min)	Hydraulic power (kW)
873	36.0	1	31500	NIL	NIL	31875.0	31875.0	1.87
		2	32000	NIL				
		3	31800	NIL				
		4	32200	NIL				
844	38.0	1	30500	NIL	NIL	30150.0	30150.0	1.87
		2	30250	NIL				
		3	30000	NIL				
		4	29850	NIL				
836	41.0	1	28500	NIL	NIL	28345.0	28345.0	1.90
		2	28000	NIL				
		3	28600	NIL				
		4	28280	NIL				
830	45.0	1	27800	NIL	NIL	27962.5	27962.5	2.06
		2	28000	NIL				
		3	27950	NIL				
		4	28100	NIL				

Minimum discharge rate : 27962.5 ml/min at 45 kg/cm²
Maximum discharge rate : 31875.0 ml/min at 36 kg/cm²
Discharge at rated pressure : 30150.0 ml/min at 38 kg/cm²



7 TEST FOR VOLUMETRIC EFFICIENCY OF PUMP
(Vide clause 8.4 of IS:11313-2007)

Date of Test	:	24.04.2023
Rated pressure, kg/cm ²	:	38
Rated rpm of pump	:	844
Theoretical volume, ml	:	41.33
Actual volume at rated rpm & rated pressure, ml	:	35.72
Volumetric efficiency, %	:	86.43

8. PRESSURE ADJUSTMENT TEST
(Vide Clause 8.7.1 of IS: 11313-2007)

1. Date of test : 24.04.2023
2. Atmospheric conditions
 - a. Temperature : 36.4 °C
 - b. Relative humidity : 18.7 %
 - c. Pressure : 98.2 kPa
3. Data recorded

Sr. No.	Working pressure (kg/cm ²)	Fluctuation range (kg/cm ²)	Pressure drop (kg/cm ²)	Ratio
1.	36.0	NIL	NIL	--
2.	38.0	NIL	NIL	--
3.	41.0	NIL	NIL	--
4.	45.0	NIL	NIL	--

4. Resistance to different pressure: Yes

9. POWER REQUIREMENT

During the pump operation from minimum pressure range, the max. hydraulic power was observed as 2.06 kW against the declared net power output of engine 2.21 kW

10. ENGINE PERFORMANCE TEST

Date	:	06.04.2022 to 07.04.2022
Dynamometer	:	AG-10, Eddy current dynamometer
Dynamometer constant	:	9549.305

Applicant has submitted a copy of the engine test report No. E-126/2855/2022 dated 30.05.2022 of Greaves-1510 engine issued by this institute. Hence, again engine is not tested again at this institute. However, for the sake of information of reader, test results of engine performance test and fuel consumption test is given from said report without correction.



11. TEST FOR NOZZLE

[vide Clause 5.15 of IS:11313-2007 & Annex F of IS: 3652-1995]

Date of test : 23.04.2023
 Type of nozzle (apa) : Fixed, Solid cone

11.1 TEST FOR DISCHARGE RATE OF NOZZLE

The discharge rate for fine cone spray pattern as 650 ml/min at a pressure of 300 kPa was declared by the applicant. However, the discharge rate corresponding to 300 kPa was observed as below:-

- For fine cone spray pattern – 656.67 ml/min

11.2 TEST FOR SPRAY ANGLE OF NOZZLE

The spray angle for fine cone spray pattern at the pressure of 300 kPa was declared by the applicant as 60 degree for fine cone spray pattern. However, the spray angle corresponding to 300 kPa pressure was observed as 61.6 degree for fine cone spray pattern.

11.3 ENDURANCE TEST OF NOZZLE

1. Date of test : 15.04.2023 to 22.04.2023
2. Total running hours : 48
3. Quantity of liquid collected and spray angle observed during endurance test.

Sr. No.	No. of Collection	Avg. discharge, ml/min. (Fine cone spray pattern)	Spray angle, degree.
a)	First collection	9670.0	60.8
b)	Second collection	9880.0	62.4
c)	Third collection	9655.0	61.6
d)	Fourth collection	9717.5	60.1
e)	Fifth collection	9785.0	62.4
f)	Sixth collection	9735.0	60.8
g)	Seventh collection	9760.0	59.3
h)	Eight collection	9847.5	62.4

Remark:

- i) Percentage variation of discharge at fine cone spray pattern from first to last collection is 1.83 %
- ii) The variation in spray angle of nozzle at fine cone spray pattern from first to last collection is 1.6 degree.

11.4 SPRAY DISTRIBUTION PATTERN OF NOZZLE

The liquid discharge from nozzle at 300 kPa pressure was collected in glass tube of patternator. The spray pattern as per the quantity of liquid collected is represented in tabular form in Fig. 5.



11.5 **NOZZLE DESIGNATION** : Marked as AN-C 60-650
Provision of strainer in nozzle : Provided

11.6 **MARKING**

Manufacturer's name or : Marked as Prime
recognized trade mark
Batch or code number : Marked as ASJ 60 HCI

12. AIR PRESSURE CHAMBER TEST
[vide Clause 8.7.2 of IS:11313-2007]

12.1

Date of test : 23.04.2023		
Sr. No	Details	Condition
1.	Hydraulic pressure	95 kg/cm ²
2.	Duration of pressure application	30 second
3.	Result	No leakage or deformation of pressure chamber was found during the test



DATA OF SPRAY DISTRIBUTION PATTERNATOR TEST OF NOZZLE (HOLLOW CONE)

No. of tube	7	6	5	4	3	2	1	Centre	1	2	3	4	5	6	7
Discharge in ml.	03	05	10	26	55	123	163	206	137	94	54	18	06	04	02

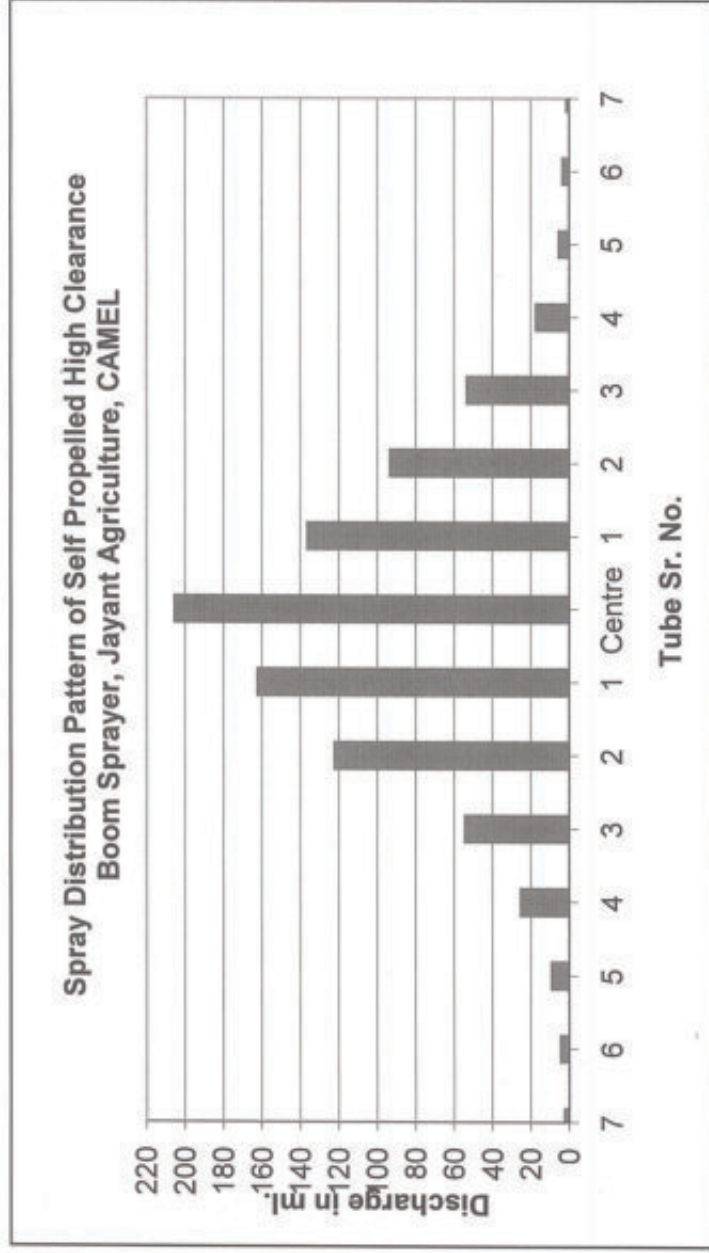


FIG. 5. SPRAY DISTRIBUTION PATTERN



13. ENDURANCE TEST OF SPRAYER

[vide Clause 8.8 of IS:11313-2007]

1. Date(s) of test : 06.04.2023 to 14.04.2023
2. Total running hours : 50
3. Quantity of liquid Collected (ml/min.):-
 - a) First Collection - 29412.5
 - b) Second Collection - 30462.5
 - c) Third Collection - 30475.0
 - d) Fourth Collection - 30565.0
 - e) Fifth Collection - 30487.5
 - f) Sixth Collection - 30037.5
 - g) Seventh Collection - 30150.0
4. Percentage variation of discharge rate from first to last collection was observed to be 2.51 %.

14. TEST FOR HOSE AND HOSE CONNECTION

[vide Clause 5.14.3 of IS:11313-2007 & Clause 7.2 of IS:10134-1994]

Date of test – 23.04.2023		
Sr. No	Details	Condition
1	Test Condition	Hose outlet end closed
2	Hydraulic pressure applied	1.5 MPa
3	Duration of pressure	1 Minute
4	Result	No leakage, crack or breakage was observed in hose and hose connection during the test.

15 NOISE MEASUREMENT**15.1 Noise at by-stander's position**

- Date of test : 24.04.2023
 Type of test track : Concrete
 Background noise level, dB(A) : 51.8
- Atmospheric condition**
- Temperature, °C : 43.8
 Relative humidity, % : 27.4
 Atmospheric pressure, kPa : 98.5
 Wind velocity, m/s : 0.4 to 0.6
 Height of microphone from the ground level, cm : 120
 Max. travel speed, km/h : 18.00
 Max. noise level at travel speed for field operation, dB(A) : 82.2

15.2 Noise at operator's ear level:

- Date of test : 24.04.2023
 Type of test track : Concrete
 Background noise level, dB(A) : 49.8



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14	Literature	Operator manual, service manual & parts catalogue should be provided	Operator manual, parts catalogue & service manual are provided	Conforms
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26. CONFORMITY TO INDIAN STANDARDS			
i)	IS:11313-2007 (Reaffirmed 2012)-Hydraulic power sprayer-specification	:	Partially conform
ii)	Spray nozzle and spray gun as per IS:3652-1995 (Reaffirmed 2011)	:	Conforms
iii)	Hose and hose connection as per IS:10134-1994	:	Conforms
iv)	IS: 2643-2005-Pipe threads where pressure-tight joint are not made on the threads-dimensions, tolerance and designation.	:	Partially conform

27. COMMENTS AND RECOMMENDATIONS

- 27.1 The tank indicating level & level graduations is not provided. It **MUST** be provided.
- 27.2 A suitable drain plug at the bottom of the tank for cleaning is not provided. It **MUST** be looked into.
- 27.3 The engaged threaded length of inlet port does not meet the requirement of relevant code/Standards in toto. It **MUST** be looked into.
- 27.4 The amplitude of mechanical vibration of components marked as (*) in chapter 16 of this report are observed on higher side. This calls for providing suitable remedial measure to dampen the vibration to improve the operator comfort and service life of the various components & sub assemblies.
- 27.5 The discharge rate of pump at rated pressure (@38 kg/cm²) is observed as 30150 ml/min which is within the specified range.
- 27.6 **Safety provision/safety wear**
- i) Safety instructions regarding handling poisonous agro-chemical before, during and after spraying operation should be provided on sprayer.





28. TECHNICAL LITERATURE

The following literatures are provided with sprayer for guidance to the user.

- i) Operator manual
- ii) Service manual
- iii) Parts catalogue

However, the manuals of sprayers should be updated as per IS:8132-1999.

TESTING AUTHORITY

Er. SANJAY KUMAR AGRICULTURAL ENGINEER	
Dr. MUKESH JAIN DIRECTOR	 14.06.2023

The draft test report is compiled by Sh. Abhishek Chourey, MTS (Technical)

29. APPLICANT'S COMMENTS

No specific comments received from the applicant.

