

**THIS TEST REPORT VALID UP TO : 31<sup>st</sup> DECEMBER, 2025**



**CHAKRADHAR 804, FOUR STROKE SAMPOORTI  
ENGINE OPERATED KNAPSACK SPRAYER**



भारत सरकार

Government of India

कृषि एवं किसान कल्याण मंत्रालय

Ministry of Agriculture and Farmers Welfare

कृषि, सहकारिता एवं किसान कल्याण विभाग

Department of Agriculture, Cooperation and Farmers Welfare

उत्तरी क्षेत्र कृषि मशीनरी प्रशिक्षण एवं परीक्षण संस्थान

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**3. TEST FOR DISCHARGE RATE OF PUMP**

[vide Clause 8.3 of IS- 11313: 2007]

1. Date of test : 13/11/2018
2. Atmospheric conditions :
  - a) Temperature : 30.0° C
  - b) Relative humidity : 42%
  - c) Pressure : 98.6 kPa
3. Data recorded

Speed of engine (rpm)	Working pressure (kg/cm <sup>2</sup> )	Test No.	Delivery from the discharge line (ml/min)	Overflow (ml/min)	Average delivery from the discharge line (ml/min)	Discharge rate of pump (ml/min)	Hydraulic Power (kW)
5598	10.0	1	6000	NIL	5987.5	5987.5	0.10
		2	6050				
		3	6100				
		4	5800				
5513	11.0	1	5350	NIL	5375.0	5375.0	0.10
		2	5350				
		3	5350				
		4	5450				
5495	12.0	1	5000	NIL	4987.5	4987.5	0.10
		2	4850				
		3	5100				
		4	5000				
5485	13.0	1	4650	NIL	4492.5	4492.5	0.10
		2	4470				
		3	4400				
		4	4450				

**Minimum discharge rate** = 4492.3 ml/min at 13 kg/cm<sup>2</sup>

**Maximum discharge rate** = 5987.5 ml/min at 10 kg/cm<sup>2</sup>

**Discharge at rated pressure** = 5987.5 ml/min at 10 kg/cm<sup>2</sup>

**4. TEST FOR VOLUMETRIC EFFICIENCY OF PUMP**

[vide clause 8.4 of IS: 11313-2007]

Rated pressure, kg/cm <sup>2</sup>	:	10
Engine speed corresponding to rated pressure (rpm)	:	5598
Theoretical cubic capacity of pump, ml	:	6533.9
Actual volume at rated pressure, ml	:	5987.5
Volumetric efficiency, %	:	92

## 16. COMMENTS AND RECOMMENDATIONS

- 16.1 The sprayer serial number is not specified. It **MUST** be specified.
- 16.2 The sprayer year of manufacture is not specified. It should be specified.
- 16.3 The Engine serial number is not specified. It must be specified.
- 16.4 The magneto connect breaker point gap is not specified. It should be specified.
- 16.5 The grade of lubrication oil is not specified. It should be specified.
- 16.6 The material used for different components are not declared. It should be declared.
- 16.7 The spray gun is not designated and marked by identification mark. The identification mark as specified by relevant Indian Standard **MUST** be provided.
- 16.8 The pump make, model, manufacturing year, Serial No & country of origin are not specified. It **MUST** be specified.
- 16.9 The spray nozzle is not designated and marked by its identification mark. The identification mark as specified by relevant Indian Standard **MUST** be provided.
- 16.10 The strainer in nozzle is not provided. It may be considered for providing
- 16.11 The manufacture's name or recognized trade mark and batch or code number on nozzle is not provided. It **MUST** be provided.
- 16.12 The spray gun manufacturer's name or recognized trade mark & batch or code number is not marked on gun. It **MUST** be marked.
- 16.13 The discharge rate for fine cone spray pattern and jet spray pattern of spray gun at the pressure of 600 kPa does not conform to the requirement of IS: 3652:1995. It **MUST** be looked into for appropriate improvement.
- 16.14 The discharge rate for fine cone spray of nozzle at a pressure of 300 kPa does not conform to the requirement of IS: 3652-1995. It **MUST** be looked into.
- 16.15 The spray angle for fine cone spray pattern of gun at a pressure of 600 kPa does not conform to the requirement of IS: 3652-1995. It **MUST** be looked into for further improvement.
- 16.16 The diameter of connecting rod of gun does not meet the requirement of Indian Standard. It **MUST** be looked into.
- 16.17 The spray angle for fine cone spray pattern of nozzle at a pressure of 300 kPa does not conform to the requirement of IS: 3652-1995. It **MUST** be looked into.
- 16.18 At rated pressure of 10Kg/cm<sup>2</sup> the pump discharge was observed as 5987.5 ml/min. against the minimum requirement of 8000 ml/min. This must be examined.
- 16.19 At the rated pressure of 10kg/cm<sup>2</sup>, the engine speed dropped up to 5598 rpm against the rated engine speed of 6500 rpm. This **MUST** be looked into for necessary action.
- 16.20 The pressure gauge with fuel scale reading 120 bars is provided, thus it does not conform to requirement of IS: 11313-2007. It **MUST** be looked into.
- 16.21 Though a pressure regulator provided but that was not in working condition therefore its conformity to IS: 11313-2007 could not be ascertained. It **MUST** be looked into for corrective action.
- 16.22 The pump inlet port end fitting material does not meet the requirement of Indian Standard. It **MUST** be looked into.
- 16.23 The necessary tools are not provided during the test. It **MUST** be provided.

- 16.24 Percentage variation of discharge for pump at rated pressure was not within in limit specified by the relevant code/standard. It **MUST** be looked into.
- 16.25 Percentage variation of discharge for cone spray pattern at 600 KPa pressure was not within in limit specified by the relevant code/standard. It **MUST** be looked into.
- 16.26 A suitable labeling plate (not sticker) needs to be provided with, inter alia, following information;-
- Manufacturer's name
  - Make
  - Model
  - Month & year of manufacture
  - Rated speed
  - Rated pressure
  - Discharge rate
  - Power rating of engine
  - SFC of engine
- 16.27 **Safety provision/safety wear**
- Accessories for operators safety against pesticides is not provided. It **MUST** be provided.
  - Safety instructions regarding handling poisonous agro-chemical, safety precautions before, during and after spraying **MUST** be added in operators manual.

#### 17. TECHNICAL LITERATURE

The following literature was provided with sprayer .

- Instruction manual and parts catalogue of sprayer.

The following literature **MUST** be provided with the sprayer :-

- Service manual of Engine

The instruction manual should be updated as per IS 8132-1999

#### TESTING AUTHORITY

R. K. NEMA SENIOR AGRICULTURAL ENGINEER	<i>Ren</i>
P. K. PANDEY DIRECTOR	<i>U S - Jansh</i>

#### 18. APPLICANT'S COMMENTS

No specific comments received from applicant.