

**THIS TEST REPORT VALID UP TO: 31<sup>st</sup> JANUARY, 2026**



**ASPEE, ASP-767 (UB002B/TU26)  
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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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	Conforms
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**3. TEST FOR DISCHARGE RATE OF PUMP**

[vide Clause 8.3 of IS- 11313: 2007]

1. Date of test : 05.01.2019

2. Atmospheric conditions :

a) Temperature : 17.6° C

b) Relative humidity : 59 %

c) Pressure : 99.0 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)
6155	8	1	6570	Nil	6587.5	6587.5	0.09
		2	6600				
		3	6580				
		4	6600				
6090	10	1	6420	Nil	6462.5	6462.5	0.11
		2	6490				
		3	6480				
		4	6460				
6040	12.0	1	6400	Nil	6375	6375	0.13
		2	6410				
		3	6390				
		4	6300				
5978	14	1	6220	Nil	6245	6245	0.14
		2	6220				
		3	6280				
		4	6260				

Minimum discharge rate = 6245.0 ml/min at 14 kg/cm<sup>2</sup>Maximum discharge rate = 6587.5 ml/min at 8 kg/cm<sup>2</sup>Discharge at rated pressure = 6587.5 ml/min at 8 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>	:	8
Engine speed corresponding to rated pressure (rpm)	:	6155
Theoretical cubic capacity of pump, ml	:	6958.1
Actual volume at rated pressure, ml	:	6587.5
Volumetric efficiency, %	:	95

**5. POWER REQUIREMENT**

During the pump operation from minimum to maximum pressure range, the max. hydraulic power was observed as 0.14 kW against the declared net power output of engine as 0.72kW.

**6. ENGINE PERFORMANCE TEST**

In pursuance of Ministry's order No. 7-23/2011-M&T (I&P) dated 20.04.2011 the engine performance test has not been conducted and the specifications/performance as specified by the applicant/ declared in the manual have been endorsed.

S.No.	Parameter	Declaration
i	Engine Type	: Single cylinder 2 stroke air cooled spark ignition engine.
ii	Bore,(mm)	: 31
iii	Stroke (mm)	: 30
iv	Displacement,(cc)	: 25.6
v	Net power out put	: 0.72 kW @ 6200 rpm
vi	Max Torque, Nm	: 1.0 @ 5000 rpm

**7. PRESSURE ADJUSTMENT TEST**

(Vide clause 8.7.1 of IS: 11313-2007)

- Date of test : 05.01.2019
- Atmospheric conditions :
  - Temperature : 17.6 °C
  - Relative humidity : 59 %
  - Pressure : 99.0 kPa
- Data recorded

S. No.	Working pressure(kg/cm <sup>2</sup> )	Fluctuation range (kg/cm <sup>2</sup> )	Pressure drop (kg/cm <sup>2</sup> )	Ratio
1.	8	NIL	NIL	--
2.	10	NIL	NIL	--
3.	12	NIL	NIL	--
4.	14	NIL	NIL	--

- Resistance of pressure: Yes

**8. TEST FOR HYDRAULIC SPRAY GUN**

[vide Clause 7.3(b) of IS- 11313: 2007 &amp; Annex E of IS- 3652; 1995]

Date of test	:	05.01.2019
Type of gun	:	Screw type

**15. CONFORMITY TO INDIAN STANDARDS**

- i) IS:11313-2007 (Reaffirmed 2012)-Hydraulic : **Does not conform in toto**  
power sprayer-specification
- ii) Spray nozzle and spray gun as per IS:3652-1995 : **Does not conform in toto**  
(Reaffirmed 2011)
- 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 : **Conforms**
- v) IS: 7347-1974 (Reaffirmed 2006)-Specification : **Could not be ascertained**  
for performance of small size spark ignition engines for agricultural water pumps, sprayers, tillers, reapers and other similar applications

**16. COMMENTS AND RECOMMENDATIONS**

- 16.1 The sprayer year of manufacture is not specified . It should be specified.
- 16.2 The spray gun is not designated and marked by identification mark. The identification mark as specified by relevant Indian Standard, **MUST** be provided.
- 16.3 The prime mover serial number is not specified. It should be specified.
- 16.4 The pump make, model and year of manufacture and serial No. is not specified. It **MUST** be specified.
- 16.5 The spray nozzle is not designated and marked by its identification mark. The identification mark as specified by relevant Indian Standard, **MUST** be provided.
- 16.6 The strainer in nozzle is not provided. It may be considered for providing
- 16.7 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.
- 16.8 The discharge rate for fine cone spray pattern and jet 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.
- 16.9 During endurance test of gun, the percentage variation of discharge for fine cone spray pattern and jet spray pattern at 600 kPa pressure was not within limit specified by the relevant code/Standard. It **MUST** be looked into.

- 16.10 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.
- 16.11 The pump spreader material does not meet the requirement of Indian Standard. It **MUST** be looked into.
- 16.12 The spray angle for fine cone spray pattern of nozzle at a pressure of  $300 \pm 30$  kPa does not conform to the requirement of IS : 3652-1995. It **MUST** be looked into.
- 16.13 The pump inlet port end fitting material does not meet the requirement of Indian Standard. It **MUST** be looked into.
- 16.14 As an important thing as pressure regulator was found "not working". It **MUST** be looked into.
- 16.15 A suitable pressure gauge **MUST** be provided on sprayer as per the specifications specified by Indian standard.
- 16.16 At rated pressure of  $8 \text{ Kg/cm}^2$  the pump discharge was observed as 6587.5 ml/min. against the minimum requirement of 8000 ml/min. This must be examined.
- 16.17 During the endurance test of sprayer the leakage of pump through the plunger rings was observed. The plunger rings was replaced with new one. This **MUST** be looked into.
- 16.18 At the rated pressure of  $8 \text{ kg/cm}^2$ , the engine speed dropped up to 6155 rpm against the rated engine speed of 6200 rpm. This **MUST** be looked into for necessary action.
- 16.19 The suction strainer aperture size does not meet the requirement of Indian Standard. It **MUST** be looked into.
- 16.20 The diameter of connecting rod of the gun does not conform to the requirement of Indian Standard. It **MUST** be looked into.
- 16.21 The percentage variation of discharge rate of pump was not within limit specified by the relevant code/Standard. It **MUST** be looked into.
- 16.22 The thickness of the wall of the barrel does not conform to the requirement of Indian Standard. It **MUST** be looked into.
- 16.23 A suitable labeling plate (not sticker) needs to be provided with, inter alia, following information:-
- i. Manufacturer's name
  - ii. Make
  - iii. Model
  - iv. Month & year of manufacture
  - v. Rated speed
  - vi. Rated pressure
  - vii. Discharge rate
  - viii. Power rating of engine
  - ix. SFC of engine



**16.24 Safety provision/safety wear**

- i) Safety instructions regarding handling poisonous agrochemicals before, during, and after spraying operation should be provided on sprayer.

**17. TECHNICAL LITERATURE**

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

- i) Operator's manual cum parts catalogue of sprayer.

The following literatures **MUST** be provided with sprayer.

- i) Operator's manual of engine  
ii) Service manual of sprayer and engine.  
iii) Parts catalogue of engine

The operator's instruction book of sprayer needs to be updated as per IS: 8132-1999

**TESTING AUTHORITY**

R. K. NEMA SENIOR AGRICULTURAL ENGINEER	<i>Ran</i>
P. K. PANDEY DIRECTOR	<i>Y. S. N. - M. S. S.</i>

**18. APPLICANT'S COMMENTS**

Para No	Our reference	Applicant's comments
18.1	16.1	We will specify year of manufacture.
18.2	16.3	Noted; will specify in regular production.
18.3	16.4	We will specify year of manufacture.
18.4	16.7,16.8,16.9,16.10, 16.11,16.13,16.14, 16.17,16.19,16.20	We will improve.
18.5	16.18	Noted.
18.6	16.20,16.21,16.22	We will improve.
18.7	16.23	We will provide stickers providing complete information.
18.8	16.24	We will improve & will provide in regular production.

