

THIS TEST REPORT VALID UP TO : 30th November, 2027



**GAJRAJ, GT-767
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

Northern Region Farm Machinery Training and Testing Institute

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[ISO 9001:2015 CERTIFIED]

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3. TEST FOR DISCHARGE RATE OF PUMP

[vide Clause 8.3 of IS- 11313: 2007]

1. Date of test : 26/11/2020
2. Atmospheric conditions :
 - a) Temperature : 23° C
 - b) Relative humidity : 49.7 %
 - c) Pressure : 98.8 kpa
3. Data recorded

Speed of engine (rpm)	Working pressure (kg/cm ²)	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)
5977	10	1.	6800	NIL	6795.0	6795.0	0.11
		2.	6770				
		3.	6790				
		4.	6820				
5837	12	1.	6520	NIL	6510.0	6510.0	0.13
		2.	6480				
		3.	6540				
		4.	6500				
5582	14	1.	6250	NIL	6275.0	6275.0	0.15
		2.	6300				
		3.	6290				
		4.	6260				
5415	16	1.	5730	NIL	5700.0	5700.0	0.15
		2.	5690				
		3.	5710				
		4.	5670				

Minimum discharge rate = 5700.0 ml/min at 16 kg/cm²
 Maximum discharge rate = 6795.0 ml/min at 10 kg/cm²
 Discharge at rated pressure = 6795.0 ml/min at 10 kg/cm²

4. TEST FOR VOLUMETRIC EFFICIENCY OF PUMP

[vide clause 8.4 of IS: 11313-2007]

Date : 26.11.2020
 Rated pressure, kg/cm² : 10
 Engine speed corresponding to rated pressure (rpm) : 5950
 Theoretical cubic capacity of pump, ml : 6963.84
 Actual volume at rated pressure, ml : 6800.0
 Volumetric efficiency, % : 97.7

3. TEST FOR DISCHARGE RATE OF PUMP

[vide Clause 8.3 of IS- 11313: 2007]

1. Date of test : 26/11/2020
2. Atmospheric conditions :
- a) Temperature : 23° C
- b) Relative humidity : 49.7 %
- c) Pressure : 98.8 kpa

3. Data recorded

Speed of engine (rpm)	Working pressure (kg/cm ²)	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)
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Minimum discharge rate = 5700.0 ml/min at 16 kg/cm²

Maximum discharge rate = 6795.0 ml/min at 10 kg/cm²

Discharge at rated pressure = 6795.0 ml/min at 10 kg/cm²

4. TEST FOR VOLUMETRIC EFFICIENCY OF PUMP

[vide clause 8.4 of IS: 11313-2007]

Date : 26.11.2020

Rated pressure, kg/cm² : 10

Engine speed corresponding to rated pressure (rpm) : 5950

Theoretical cubic capacity of pump, ml : 6963.84

Actual volume at rated pressure, ml : 6800.0

Volumetric efficiency, % : 97.7

5. POWER REQUIREMENT

During the pump operation from minimum to maximum pressure range, the max. hydraulic power was observed as 0.15 kW against the declared net power output of engine as 0.65 kW.

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, Petrol engine.
ii	Bore,(mm)	:	33
iii	Stroke (mm)	:	30
iv	Displacement,(cc)`	:	26
v	Net power out put	:	0.65 kW @ 6500 rpm
vi	Max Torque	:	1.1 Nm @ 6000 rpm

7. PRESSURE ADJUSTMENT TEST

(Vide clause 8.7.1 of IS: 11313-2007)

1. Date of test : 26.11.2020
2. Atmospheric conditions
 - a. Temperature : 23 °C
 - b. Relative humidity : 48.7 %
 - c. Pressure : 98.8 Kpa
3. Data recorded

S. No.	Working pressure(kg/cm ²)	Fluctuation range (kg/cm ²)	Pressure drop (kg/cm ²)	Ratio
1.	10	NIL	NIL	--
2.	12	NIL	NIL	--
3.	14	NIL	NIL	--
4.	16	NIL	NIL	--

4. Resistance of pressure: Yes

8. TEST FOR HYDRAULIC SPRAY GUN

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

Date of test : 26.11.2020
Type of gun : Screw type

Cl.10. MARKING AND PACKING (Cl.10 IS:11313-2007)			
Cl.10.1 Marking	Each sprayer shall be marked with the following particulars :-		
a)	Manufacturer's name & his registered trade mark, Sl. No. and batch or code No.	Just a sticker and not proper labeling plate is provided on the sprayer with following information. GAJRAJ GT-767 Knapsack power sprayer Engine : Air cooled, 2 stroke, single cylinder Plunger diameter : 18 mm Stroke : 8 mm Working pressure : 2.5 Mpa Air displacements : 26 cc Require power : 0.65 kW Capacity : 6 L/min RPM : 6500 r/min	Does not Conform in spirit and also in toto

15. CRITICAL TECHNICAL SPECIFICATIONS

(Deferred till 31.12.2020 vide Ministry's O.M. No 13-13/2020 M & T (I & P) dated 24.04.2020)

16. CONFORMITY TO INDIAN STANDARDS

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

17. COMMENTS AND RECOMMENDATIONS

- 17.1 The strainer in nozzle is not provided. It may be considered for providing.
- 17.2 The serial number and year of manufacture of sprayer is not specified. It **MUST** be looked into.
- 17.3 The serial number and compression ratio of engine is not specified. It **MUST** be looked into.

- 17.4 The discharge rate for jet 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.
- 17.5 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.
- 17.6 The spray gun is not designated and marked by its identification mark, the identification mark as specified by relevant Indian standard. It **MUST** be looked into.
- 17.7 The spray nozzle is not designated and marked by its identification mark, the identification mark as specified by relevant Indian standard. It **MUST** be looked into.
- 17.8 The discharge rate for 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.
- 17.9 The manufacturing year, serial number and country of Origin of pump is not specified. It **MUST** be looked into.
- 17.10 At rated pressure of 10 Kg/cm² the pump discharge was observed as 6795.0 ml/min. against the minimum requirement of 8000.0 ml/min. This **MUST** be examined.
- 17.11 The pressure gauge with full scale reading 100 bar is provided, thus it does not conform to requirement of IS:11313-2007.. It **MUST** be looked into.
- 17.12 The necessary tools are not provided. It **MUST** be looked into.
- 17.13 The diameter of connecting rod of the gun does not meet the requirement of Indian standard. It **MUST** be looked into.
- 17.14 The make and Model of sprayer, engine and pump all are given as “GAJRAJ, GT-767”. For the sake of clarity this may be looked into for necessary amendment.
- 17.15 A suitable labeling plate (not sticker) needs to be provided with “inter alia” following information
- i) Manufacturere 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


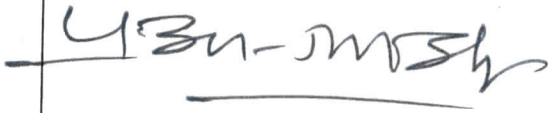


18. TECHNICAL LITERATURE

One leaflet entitled "Knapsack Power Sprayer operator's manual" has been provided. The same, however, does not indicate the make and model of the sprayer it is related to. It amounts to not providing the relevant literature.

It is therefore recommended that the literature be brought out as per IS: 8132-1999.

TESTING AUTHORITY

MAAN SINGH SENIOR TECHNICAL ASSISTANT	
P. K. PANDEY DIRECTOR	

19. APPLICANT'S COMMENTS

"We will inform all your recommendations to our manufacturer to make all possible and necessary changes for our future products"

