

व्यावसायिक परीक्षण रिपोर्ट
COMMERCIAL TEST REPORT

संख्या/ No.: PS-452/2569/2020

माह/Month: November, 2020

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



**GAJRAJ, GT-204
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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PS-452/2569/2020	GAJRAJ, GT-204 ENGINE OPERATED KNAPSACK SPRAYER (COMMERCIAL)
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5112	14	1.	5540	NIL	5527.5	5527.5	0.13
		2.	5520				
		3.	5550				
		4.	5500				
4975	16	1.	5430	NIL	5430.0	5430.0	0.14
		2.	5450				
		3.	5400				
		4.	5440				

Minimum discharge rate = 5430 ml/min at 16 kg/cm²
Maximum discharge rate = 5805 ml/min at 10 kg/cm²
Discharge at rated pressure = 5805 ml/min at 10 kg/cm²

4. TEST FOR VOLUMETRIC EFFICIENCY OF PUMP [vide clause 8.4 of IS: 11313-2007]

Date : 28.11.2020
 Rated pressure, kg/cm² : 10
 Engine speed corresponding to rated pressure (rpm) : 5427
 Theoretical cubic capacity of pump, ml : 6350.40
 Actual volume at rated pressure, ml : 5840.00
 Volumetric efficiency, % : 92

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 0.75 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, 4 stroke, air cooled, Petrol engine.
ii	Bore,(mm)	: 39
iii	Stroke (mm)	: 26
iv	Displacement,(cc)	: 31.1
v	Net power out put	: 0.75 kW @ 6500 rpm
vi	Max Torque	: 1.1 Nm @ 5000 rpm

7. PRESSURE ADJUSTMENT TEST
(Vide clause 8.7.1 of IS: 11313-2007)

1. Date of test : 28.11.2020
2. Atmospheric conditions
 - a. Temperature : 23.1 °C
 - b. Relative humidity : 36.2 %
 - c. Pressure : 99.3 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 : 28.11.2020
Type of gun : Screw type

8.1 TEST FOR DISCHARGE RATE OF SPRAY GUN

The discharge rate for fine cone spray & jet spray pattern as 2977.5 ml/min & 5125 ml/min at the pressure of 600 kPa was declared by the applicant. The discharge rate corresponding to 600 kPa pressure was observed as under

- For fine cone spray pattern : 1485.0 ml/min
- For jet spray pattern : 4542.5 ml/min

Remarks – The observed discharge rate for fine cone spray pattern & jet spray pattern was not within limit specified by the relevant code/Standard.

8.2 TEST FOR SPRAY ANGLE OF SPRAY GUN

The spray angle for fine cone spray pattern at a pressure of 600 kPa was declared as 70 degree by the applicant. The same was observed as 78.5 degree.

Remark: The spray angle for fine cone spray pattern at a pressure of 600 kPa was observed not within the limit specified by the relevant code/standards.

8.3 STRENGTH OF GUN

Sr. No	Details	Condition
1	Condition of nozzle tip	Closed
2	Hydraulic pressure	1500 kPa
3	Duration of pressure	5 Minute
4	Result	No leak, crack or burst of gun was observed during test.

8.4 SPRAY GUN DESIGNATION : Not Specified

8.5 MARKING

Manufacturer's name or recognized trade mark : Not marked

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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-204 Agriculture power sprayer	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 : **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 : **Conforms**
joint are not made on the threads-dimensions, tolerance and designation
- 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

17. COMMENTS AND RECOMMENDATIONS


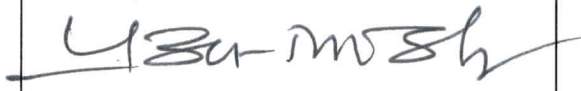
- 17.1 Serial number and year of manufacture of sprayer is not specified. It **MUST** be looked into.
- 17.2 Serial number of engine is not specified. It **MUST** be looked into.
- 17.3 Manufacturing year, serial number and country of origin of pump is not specified. It **MUST** be looked into.
- 17.4 The spray angle for fine cone spray pattern of spray 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 discharge rate for fine cone spray pattern & 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.
- 17.6 The make and model of sprayer, Engine and pump all are given as "GAJRAJ, GT-204"
For the sake of clarity this may be looked into for necessary amendment.
- 17.7 The spray gun is not designated and marked by its identification mark. The identification mark as per specified by Indian Standard. It **MUST** be looked into.

- 17.8 The discharge rate for fine cone spray pattern & 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 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.
- 17.10 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.
- 17.11 At rated pressure of 10 Kg/cm² the pump discharge was observed as 5805 ml/min. against the minimum requirement of 8000.0 ml/min. This **MUST** be examined.
- 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 strainer in nozzle is not provided. It may be considered for providing.
- 17.15 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.
- 17.16 A suitable labeling plate (not sticker) needs to be provided with "inter alia, following information :
- Manufacturer's name.
 - Make
 - Model
 - Month & years of manufacturer.
 - Rated speed
 - Rated pressure
 - Discharge rate
 - Power rating of engine
 - SFC of engine.

18. TECHNICAL LITERATURE

One leaflet entitled "Back pack 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 amount 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"

