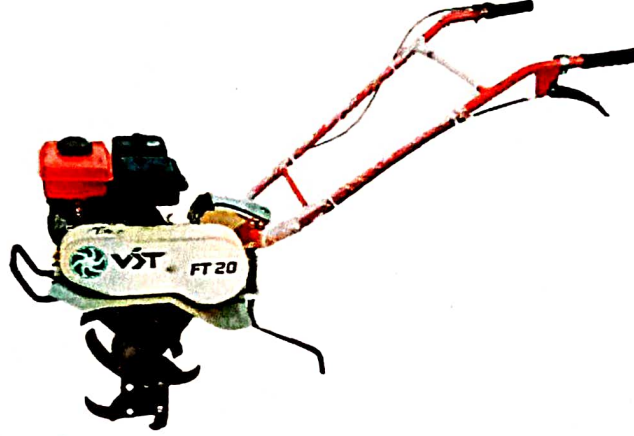


## INCOMPLETE REPORT



FT 20 VST POWER WEEDER



सत्यमेव जयते

भारत सरकार  
GOVT OF INDIA

कृषि एवं किसान कल्याण मंत्रालय

MINISTRY OF AGRICULTURE & FARMERS WELFARE

कृषि एवं किसान कल्याण विभाग

DEPARTMENT OF AGRICULTURE AND FARMERS WELFARE

उत्तर पूर्वी क्षेत्र कृषि यंत्र प्रशिक्षण एवं परीक्षण संस्थान

NORTH EASTERN REGION FARM MACHINERY TRAINING & TESTING INSTITUTE

विश्वनाथ चारिआलि, जिला- शोणितपुर (असम)

BISWANATH CHARIALI: SONITPUR: ASSAM, PIN - 784 176

[AN ISO 9001:2015 CERTIFIED INSTITUTION]

## 1. SCOPE OF TEST

The scope of test was limited to check and assess the following:

- 1.1 Specification and other data furnished by the applicant.
- 1.2 Engine performance
- 1.3 Vibration Measurement
- 1.4 Noise level measurement
- 1.5 Hardness & chemical composition
- 1.6 Field Performance
- 1.7 Wear analysis of rotor blades
- 1.8 Ease of operation and adjustments
- 1.9 Defects, breakdowns and repairs

## 2. METHOD OF SELECTION

As per Govt. of India, OM No. 13-1/2021-M&T (I&P), dated 03.02.2022, the selection of sample for test was exempted. Hence, the machine was directly submitted by the applicant at this Institute for test.

## 3. TEST CODE AND PROCEDURE

There is no Indian standard/test code available for testing of power weeder as such. The guidelines, however, have been taken from the following.

- |                                     |   |   |
|-------------------------------------|---|---|
| IS 9935 : 2002<br>(Reaffirmed 2012) | : | Power Tiller - Test code  |
| IS 9980 : 1999<br>(Reaffirmed 2004) | : | Guidelines for field performance and haulage tests of power tillers |
| IS: 7347-1974<br>(Reaffirmed 2006)  | : | Specification for Performance of Small Size Spark Ignition Engines. |
| IS 1976 : 1976<br>(Reaffirmed 2009) | : | Specification for Rotary paddy weeder, manually operated            |
| IS 6690 : 1981<br>(Reaffirmed 2012) | : | Specification for Blades for Rotavator for Power Tillers            |

## 4. SPECIFICATIONS

### 4.1 General:

- |                                  |   |  |
|----------------------------------|---|--|
| Make                             | : | VST  |
| Model                            | : | FT 20  |
| Name and address of manufacturer | : | <b>VST TILLERS TRACTORS LTD</b><br>Plot No-1, Dyavasandra Industrial Layout,<br>Whitefield Road, Mahadevapura Post,<br>Bengaluru, Karnataka- 560 048 |



Name and address of applicant : VST TILLERS TRACTORS LTD  
Plot No 222-224 & 229-232, 3<sup>rd</sup> Phase,  
KIADB Industrial Area, Malur, Kolar  
District, Karnataka, 563 130

Name of machine : Power Weeder

Type of machine : Self-propelled, Walk behind

Working size of machine (mm) : 450

Year of manufacture : 2022

Serial no. of machine : 000001

**4.2 Details of prime mover:**

Make : CHAMP

Model : CH87/01

Type : Single cylinder, four stroke, air cooled,  
Inclined Spark ignition engine.

Year of manufacture : 2022

Engine serial No. : 13201004

Recommended high idle speed (rpm) :  $3800 \pm 100$

Recommended low idle speed (rpm) :  $1800 \pm 150$

Recommended rated speed (rpm) :  $3600 \pm 50$

Rated power observed, kW : As requested by the applicant, machine  
was withdrawn from testing & hence  
engine test was not conducted.

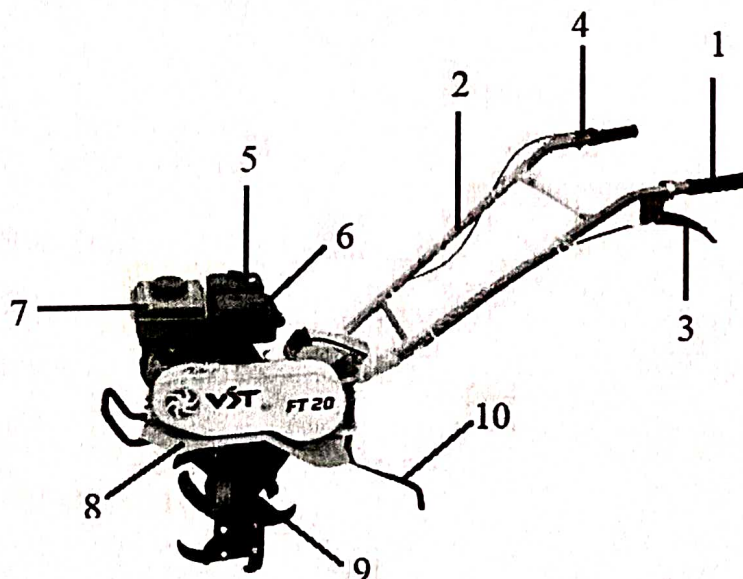


Fig.1 FT 20 VST Power Weeder

## 10. HARDNESS AND CHEMICAL COMPOSITION

### 10.1 Hardness of rotor blades :

The surface hardness of blade was recorded as under :

	As per IS 6690:1981 (Reaffirmed 2012)	As observed (HRC)	Remarks
At edge portion	56 ±3 HRC	44.7	Does not conform
At shank portion	37 to 45 HRC	43.4	Conforms

### 10.2 Chemical composition of rotor blades :

Constituents	As per IS 6690:1981 (Reaffirmed 2012)		Composition as observed (% by weight)	Remarks
	Carbon Steel (%)	Silico Manganese Steel (%)		
Carbon ( C )	0.70 -0.85	0.50-0.60	0.567	Conforms
Silicon (Si)	0.10 -0.40	1.50-2.00	0.217	Conforms
Manganese (Mn)	0.50 -1.0	0.50-1.00	1.184	Does not conform
Sulphur (S)	0.05(max)	0.05(max)	0.008	Conforms
Phosphorous (P)	0.05(max)	0.05(max)	0.013	Conforms

## 11. FIELD PERFORMANCE TEST

The field tests were conducted for 26.28 hours of field operation for testing the said Power Weeder. The field tests were conducted at rated engine rpm of 3600±50. The detailed test results are presented in the Annexure and summarized in the ensuing table:

Sl.No.	Parameters	Observations	
1	Type of soil	: Medium	
2	Soil moisture (%)	: 12.6 to 15.3	
3	Bulk density of soil (g/cc)	: 1.52 to 1.6	
4	Forward Speed of operation (kmph)	: 1.2 to 1.42	
5	Depth of cut (cm)	: 4.9 to 5.9	
6	Width of cut (m)	: 0.45 to 0.46	
7	Area covered (ha/h)	: 0.044 to 0.051	
8	Time required for one ha (h)	: 19.72 to 22.52	
9	Field efficiency (%)	: 75.78 to 80.43	
10	Weeding efficiency (%)	: 80.12 to 82.22	
11	Fuel consumption		
		l/h	: 0.693 to 0.747
		l/ha	: 13.98 to 16.24



Machine 87/458	(INCOMPLETE REPORT) FT 20 VST POWER WEEDER	COMMERCIAL (INITIAL)
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#### 11.1 Rate of work:

- Rate of work was recorded as 0.044 to 0.051 ha/h and the forward speed of operation varied from 1.2 to 1.42 kmph.
- Time required to cover one hectare was recorded as 19.72 to 22.52 hours.

#### 11.2 Quality of work:

- Depth of cut was recorded as 4.9 to 5.9 cm.
- Av. working width was observed as 0.45 to 0.46 m.
- Field efficiency was found as 75.78 to 80.43 %.
- Weeding efficiency was found as 80.12 to 82.22 %.

#### 11.4 Wear Analysis of rotor blades:

Sl. No	Initial mass(g)	Final mass (g)	Loss of mass (g)	Percentage wear of rotor blades	
				After 26.25 h	Per hour
R-1	212.0	208.5	3.5	1.65	0.06
R-2	231.0	229.5	1.5	0.65	0.02
L-1	229.0	222.5	6.5	2.84	0.11
L-2	209.0	207.5	1.5	0.72	0.03

### 12. EASE OF OPERATION & ADJUSTMENTS

Machine maneuverability at turns during field operation was not comfortable.

### 13. DEFECTS, BREAKDOWNS AND REPAIRS

During engine performance test, it was observed that engine rpm was continuously increased with increase of load and further it was observed that speed of the engine was not come down upto the speed of rated rpm, which was declared by applicant. On request of the applicant, carburetor was cleaned, governor spring was changed & governor setting was done. Even though engine rpm were increased with load and rated rpm was not observed, hence engine performance test could not be completed. Accordingly incomplete test report is released.

### 14. COMMENTS & RECOMMENDATIONS

14.1 During engine performance test, it was observed that engine rpm was continuously increased with increase of load and further it was observed that speed of the engine was not come down upto the speed of rated rpm, which was declared by applicant. On request of the applicant, carburetor was cleaned, governor spring was changed & governor setting was done. Even though engine rpm were increased with load and rated rpm was not observed, hence engine performance test could not be completed. Accordingly incomplete test report is released, as per the request of applicant.

14.2 Transport wheel was not provided with the machine. However, it is recommended to provide it for easy transportation of the machine.

- 14.3 The hardness and chemical composition of rotary blades does not conform to the requirement of IS 6690:1981 (Reaffirmed 2012). This may be looked into for corrective action.
- 14.4 Noise at operator's ear level was observed on higher side against warning limits of 85 dB(A) as specified by International Labour Organization (ILO) for continuous exposure of 8 hours per day. This calls for reduction in noise level to improve the operational comfort and safety.
- 14.5 The amplitude of mechanical vibration marked as (\*) is on drastically higher side and is directly concerned with operator's health, safety and comfort. Besides, it is also adversely affect the useful life of the component in view of above this deserves to be given top priority for corrective action.
- 14.6 The engine was not marked with Manufacturer name or trade-mark, Serial No of engine, Rated power, Rated speed, and type of fuel used which does not fulfill the requirement of IS 7347-1974 (Amended 2011). This may be looked into
- 14.7 **Technical literature:**

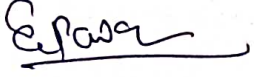
The following literature in English language was provided for reference during testing:


- Operator's/ Service manual
- Parts catalogue

It is recommended to bring out the manual in Hindi and other vernacular languages as per IS: 8132-1999.

TESTING AUTHORITY

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AGRICULTURAL ENGINEER

  
(S.G. PAWAR)  
AGRICULTURAL ENGINEER

  
(Dr. P.P. RAO)  
DIRECTOR

Draft test report compiled by - **Shri Khagendra Bora**  
Sr. Technical Assistant