व्यावसायिक परीक्षण रिपोर्ट
**COMMERCIAL TEST REPORT**

संख्या/ **No.: Power weeder-184/3097/2023**
माह/**Month: October, 2023**

**THIS TEST REPORT VALID UP TO : 31st October, 2028**


# VELMOC AGRO, CW750P HD
# POWER WEEDER

सत्यमेव जयते

भारत सरकार
**Government of India**
कृषि एवं किसान कल्याण मंत्रालय
**Ministry of Agriculture and Farmers Welfare**
कृषि एवं किसान कल्याण विभाग
**Department of Agriculture and Farmers Welfare**
उत्तरी क्षेत्र कृषि मशीनरी प्रशिक्षण एवं परीक्षण संस्थान
**Northern Region Farm Machinery Training and Testing Institute**
ट्रैक्टर नगर, सिरसा रोड, हिसार, (हरियाणा) - 125 001
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## 10. HARDNESS & CHEMICAL COMPOSITION OF BLADES

Hardness & chemical analysis of primary element of the blade were carried out as per IS: 6690–1981. The details of same is given in table 2 & 3.

### 10.1 Table 2: Hardness of blades

| | Requirement as per IS: 6690–1981 (HRC) | Hardness (HRC) as observed | Remarks |
|---|---|---|---|
| At edge portion | 56 ± 3 | 45.8 (Average) | **Does not conform** |
| At shank portion | 37 to 45 | 42.0 (Average) | Conforms |

### 10.2 Table 3: Chemical analysis of rotary blade

| Elements | Requirements as per IS: 6690-1981 (%) | As observed (%) | Remarks |
|---|---|---|---|
| Carbon | 0.50 to 0.60 | 0.610 | **Does not conform** |
| Manganese | 0.50 to 1.00 | 1.33 | **Does not conform** |
| Silicon | 1.50 to 2.00 | 0.283 | **Does not conform** |
| Phosphorous | 0.05 (Max.) | 0.0091 | Conforms |
| Sulfur | 0.05 (Max.) | 0.0349 | Conforms |

## 11. RUNNING – IN

The power weeder was run-in for 1.00 hour before field performance test as recommended by the applicant. All the fasteners were checked and tightened thereafter.

## 12. FIELD TEST

The field tests under dry land condition were conducted for 25.87 hours. The field tests were conducted at the speed 3600 engine rpm recommended for field work. In all, 5 tests trials were conducted in sandy loam soil at N.R.F.M.T.T.I farm, Hisar. The summary of the field test for dry land operation is given in table-4.

**Crop parameters**

i) Type of weed - Seasonal weeds
ii) Height of weed, cm - 10 to 16

### Table 4: SUMMARY OF FIELD PERFORMANCE TEST

| Sr. No. | Parameter | | Range |
|---|---|---|---|
| i) | Type of soil | : | Sandy loam |
| ii) | Soil moisture, % | : | 12.0 to 12.6 |
| iii) | Bulk density of soil, g/cc | : | 1.59 to 1.64 |
| iv) | Speed of operation, kmph | : | 2.33 to 2.41 |
| v) | Depth of cut, cm | : | 5.80 to 7.70 |
| vi) | Width of cut, m | : | 1.13 to 1.16 |
| vii) | Area covered, ha/h | : | 0.213 to 0.240 |
| viii) | Time required for one, h/ha | : | 4.17 to 4.69 |
| ix) | Fuel consumption | | |
| | l/h | : | 1.30 to 1.60 |
| | l/ha | : | 5.42 to 7.35 |

| | | | |
|---|---|---|---|
| x) | Weeding efficiency, % | : | 86.36 to 90.00 |
| xi) | Field efficiency, % | : | 79.89 to 85.05 |

## 13. ADJUSTMENT, DEFECTS, BREAKDOWNS & REPAIR

No noticeable defect/breakdown was observed during test.

## 14. COMPONENTS/ASSEMBLY INSPECTION AND ASSESSMENT OF WEAR

### 14.1 Engine:

The engine and other assemblies were dismantled after 38.87 hours of engine operation.

### 14.1.1 Cylinder:

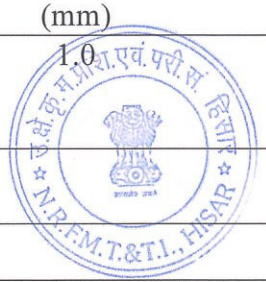
| Cylinder bore dia. (mm) | | | | | | |
|---|---|---|---|---|---|---|
| Top position | | Middle position | | Bottom position | | Max. permissible wear limit |
| Thrust | Non-thrust | Thrust | Non-thrust | Thrust | Non-thrust | |
| 77.01 | 77.00 | 77.02 | 77.02 | 77.03 | 77.02 | 77.17 |

### 14.1.2 Piston:

| Piston diameter (mm) | | | | | | |
|---|---|---|---|---|---|---|
| Top position | | At skirt | | | Max. permissible wear limit (mm) | |
| Thrust side | Non-thrust side | Thrust side | Non-thrust side | Piston to cylinder clearance (mm) | Piston dia. at skirt | Piston to cylinder clearance |
| 76.93 | 76.94 | 77.95 | Not measured due to piston design constraint | 0.07 | 76.85 | -- |

### 14.1.3 Piston Rings end gap:

| Ring No. | Ring end gap (mm) | | | Max. permissible wear limit (mm) |
|---|---|---|---|---|
| | At top | At middle | At bottom | |
| 1st compression ring | 0.35 | 0.30 | 0.35 | 1.0 |
| 2nd compression ring | 0.30 | 0.35 | 0.40 | |
| Oil ring | Not measured due to ring design constraint | | | |




### 14.1.4 Big end bearing

| Dia. of crank pin (mm) | Dia. of bearing (mm) | Clearance (mm) | | Max. permissible wear limit (mm) | |
|---|---|---|---|---|---|
| | | Diametrical | Axial | Diametrical | Axial |
| 32.99 | 33.04 | 0.05 | 0.40 | 33.07 | 32.92 |

| | | | | | |
|---|---|---|---|---|---|
| 6 | 383.2 | 379.0 | 4.2 | 1.10 | 0.04 |
| 7 | 375.1 | 372.3 | 2.8 | 0.75 | 0.03 |
| 8 | 356.3 | 353.2 | 3.1 | 0.87 | 0.03 |

## 15. CRITICAL TECHNICAL SPECIFICATIONS

| Sr. No. | Parameters | Specifications | Observed | Remarks |
|---|---|---|---|---|
| 1. | Type | Self-propelled, walk behind | Self propelled, walk behind type | Conforms |
| 2. | Working width, mm | 300-1500 | 1195 | Conforms |
| 3. | Type of engine | Compression/Spark ignition | Spark ignition | Conforms |
| 4. | Starting method | Manual/recoil/self-starting | Recoil | Conforms |
| 5. | Type of clutch | Dry/Wet/Tensioner pulley | Wet | Conforms |
| 6. | Type of primary gear box | Sliding/constant mesh or combination of both | Sliding mesh | Conforms |
| 7. | Type of secondary gear box | Gear type, chain & sprocket type | Gear type | Conforms |
| 8. | Material for rotor shaft | SAE 1045 (CRS) / EN8 / EN9 | EN9 | Conforms |
| 9. | No. of flanges | 4 - 10 | 8 | Conforms |
| 10. | Types of flanges | Square/circular/rectangular | Square | Conforms |
| 11. | Distance between consecutive flanges, mm | 80 to 150 | 135 | Conforms |
| 12. | No. of blades in each flange | 3-6 | 4 | Conforms |
| 13. | No. of rotor blade | 12 (Min.) | 32 | Conforms |
| 14. | Thickness of rotor blade, mm | 5 (Min.) | 5.60 | Conforms |
| 15. | Material of blade | Boron (28MnCrB5) / High carbon steel EN 42J | EN 42J | Conforms |
| 16. | Hardness of Blade, HRC | 38 (Min.) | 45.8 (Average) | Conforms |
| 17. | Shape of rotor blade | C / J shape | J shape | Conforms |
| 18. | Provision for handle height adjustment | Must be provided | Provided | Conforms |
| 19. | Provision for handle rotation | Must be provided | Movement of machine in only one direction | -- |
| 20. | Provision for emergency stop of engine | Must be provided | Provided | Conforms |
| 21. | Provision for easy start of engine | Must be provided | Provided | Conforms |
| 22. | Provision for shield/cover to prevent flying of mud & stone from rotor | Must be provided | Provided | Conforms |

| | | | | |
|---|---|---|---|---|
| 23. | Depth control mechanism | Must be provided | Provided | Conforms |
| 24. | Provision for transport wheels | Must be provided | Provided | Conforms |
| 25. | Provision for cover on exhaust | Must be provided | Provided | Conforms |
| 26. | Direction of exhaust emission away from operator | Must be provided | Provided | Conforms |
| 27. | Marking/labeling machine | The labeling plate should be riveted on the body of machine having Name and address of manufacturer & Applicant, Country of origin, Make, Model, Year of manufacturer, Serial number, Engine number, Engine HP, rated rpm & SFC. | Not provided in full | Partially conforms |
| 28. | Literature | Operator manual, service manual and Parts catalogue should be provided. | Provided | Conforms |

## 16. COMMENTS & RECOMMENDATIONS

**16.1 Mechanical vibration**

The amplitude of mechanical vibration marked as (*) on the relevant chapter, are on higher side. In view of above, this deserve to be given top priority for corrective action.

**16.2** The chemical composition of blades does not conform to the requirements of IS: 6690-1981. This needs to be looked into for corrective action.

**16.3** Labeling plate provided on the power weeder does not contain the complete information of machine and manufacturer.

**16.4** The maximum power obtained during the engine performance test at rated engine speed is 6.03 kW.

**16.4 Field performance**

No noticeable defect was observed during the field test.

i) The area covered was observed from 0.213 to 0.240 ha/hr.

ii) Time required to cover one ha was from 4.17 to 4.69 h.

iii) Fuel consumption was observed from 1.300 to 1.600 l/h and 5.420 to 7.350 l/ha.

iv) Weeding efficiency was observed from 86.36 to 90.00 % and field efficiency was observed from 79.89 to 85.05 %.

## 17. TECHNICAL LITERATURE

The following literatures were provided by the applicant.

i) Operator's manual
ii) Parts catalogue
iii) Service manual

However, the manual needs to be updated as per IS: 8132–1999

## TESTING AUTHORITY

| | |
|---|---|
| **Er. SANJAY KUMAR**<br>**AGRICULTURAL ENGINEER** | |
| **DR. MUKESH JAIN**<br>**DIRECTOR** | 17.10.2023 |

## 18. APPLICANT'S COMMENTS

We will carefully deliberate upon your recommendations and implement appropriate actions accordingly.