व्यावसायिक परीक्षण रिपोर्ट

COMMERCIAL TEST REPORT

संख्या/ **No.: MTB – 15/2965/2023**

माह/**Month: January, 2023**

THIS TEST REPORT VALID UP TO : 31st January, 2028

SHREE CHAMUNDA ENGINEERING, CHAMUNDA RIDE ON SELF PROPELLED MULTI PURPOSE TOOL BAR

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

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[ISO 9001:2015 CERTIFIED]

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14.5 Chemical composition

Sr. No.	Material	Requirement as per IS: 9813-2002	As observed	Remark
1.	Carbon (C)	0.4 to 0.7	0.43	Conforms
2.	Silicon (Si)	--	0.26	-
3.	Manganese (Mn)	--	0.93	-
4.	Sulphur (S)	--	0.002	-
5.	Phosphorous (P)	--	0.02	-
6.	Chromium	-	0.04	-
7.	Molybdenum	-	0.01	-
8.	Copper	-	0.001	-
9.	Boron	-	0.03	-
10.	Nickel	-	<0.002	-
11.	Aluminum	-	<0.001	-
12.	Magnesium	-	<0.005	-

15. RUNNING-IN

The Ride On Self Propelled Tool Bar was run-in for 1.0 hour before field performance test. All the fasteners were checked and tightened thereafter

16. FIELD TEST

The field performance test under dry land condition was conducted with cultivator attachment for 13.55 hours at no load engine speed of 3000 rpm and with flat blade attachment for 14.18 hours at no load engine speed of 3000 rpm. In all, 6 tests trials were conducted in black soil at the Gondal, Gujarat. The results of the field test for dry land operation is summarized as below

SUMMARY OF FIELD PERFORMANCE TEST

Sr. No.	Parameter		Cultivator	Flat blade
i)	Type of soil	:	Black	Black
ii)	Soil moisture, %	:	12.0 to 13.0	12.0 to 13.0
iii)	Bulk density of soil, g/cc	:	1.59 to 1.63	1.62 to 1.65
iv)	Speed of operation, kmph	:	4.53 to 4.76	4.67 to 4.86
v)	Depth of cut, cm	:	6.00 to 6.33	6.17 to 6.33
vi)	Width of cut, m	:	0.867 to 0.893	0.883 to 0.893
vii)	Area covered, ha/h	:	0.265 to 0.304	0.321 to 0.335
viii)	Time required for one ha	:	3.29 to 3.77	2.99 to 3.12
ix)	Fuel consumption			
	l/h	:	0.812 to 0.840	0.602 to 0.634
	l/ha	:	2.11 to 3.11	1.87 to 1.89
x)	Field efficiency, %	:	64.63 to 73.61	75.18 to 80.34
xi)	Draft, kgf	:	20.50	10.60

16.1 Field operation

16.1.1 Rate of work

- Time required to cover one hectare with cultivator and flat blade was recorded as 3.29 to 3.77 and 2.99 to 3.12 hours, respectively.
- The average area covered was recorded as 0.265 to 0.304 ha/h for cultivator and 0.321 to 0.335ha/h for flat blade.

16.1.2 Quality of work

- The average depth of cut was recorded as 6.00 to 6.33 cm for cultivator and 6.17 to 6.33 cm for flat blade.
- The hourly fuel consumption was recorded as 0.812 to 0.840 l/h for cultivator and 0.602 to 0.634 l/h for flat blade. Fuel consumption to complete 1 ha was recorded 2.11 to 3.11 l/ha for cultivator and 1.87 to 1.89 l/ha for flat blade.

17. ADJUSTMENT, DEFECTS, BREAKDOWNS & REPAIR

No noticeable breakdown occurred during test was observed.

18. COMPONENTS/ASSEMBLY INSPECTION AND ASSESSMENT OF WEAR

18.1 Engine :

The Engine and other assemblies were dismantled after 37.5 hours of operation.

18.1.1 Cylinder :

Cylinder bore dia. (mm)						
Top Position		Middle position		Bottom Position		Max. permissible wear limit
Thrust	Non-thrust	Thrust	Non-thrust	Thrust	Non-thrust	
85.01	85.01	85.01	85.00	85.01	85.00	85.17

18.1.2 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
84.57	84.46	84.87	Not measured due to piston design constraint	0.14	Not measured due to piston design constraint	84.79

Sl. No.	Initial mass (g)	Mass after 13.55 hrs. (g)	Loss of mass (g)	Percent wear (%)	Percent wear per hour
1	2103	2045	58.00	2.76	0.20
2	2106	2060	46.00	2.18	0.16
3	2104	2055	49.00	2.33	0.17

18.6.2 Mass basis:

The wear of the Flat blade was measured after 14.18 h. of field operation and the observations are as under:

Sl. No.	Initial mass (g)	Mass after 14.18 hrs. (g)	Loss of mass (g)	Percent wear (%)	Percent wear per hour
1	2305	2248	57	2.47	0.17

19. COMMENTS & RECOMMENDATIONS

19.1 Mechanical vibration

The amplitude of mechanical vibration marked as (*) on the relevant chapter, are on drastically higher side. It is not just directly concerned with operator's health, safety and comfort, but also adversely affect the useful life of the components. In view of above, this deserve to be given top priority for corrective action.

19.2 Spark arresting device is not provided. It **MUST** be provided.

19.3 The model of governor is not specified. It **MUST** be specified.

19.4 Valve guide clearance and valve spring stiffness discard limit is not specified. It **MUST** be specified.

19.5 Field Test

19.5.1 Ride on self propelled multi-purpose tool bar was operated in varying field condition.

- The average depth of cut was recorded as 6.27 to 6.47 cm for cultivator and 6.1 to 6.3 cm for flat blade..
- The hourly fuel consumption was recorded as 0.74 to 0.76 l/h for cultivator and 0.65 to 0.68 l/h for flat blade. Fuel consumption to complete 1 ha was recorded 1.95 to 2.12 l/ha for cultivator and 1.77 to 1.96 l/ha for flat blade.
- Time required to cover one hectare with cultivator and flat blade was recorded as 2.61 to 2.96 and 2.73 to 3.53 hours, respectively.
- The average area covered was recorded as 0.337 to 0.383 ha/h for cultivator and 0.346 to 0.365 ha/h for flat blade.

19.6 Overall, the performance was found to be satisfactory.

20. TECHNICAL LITERATURE

The following literatures were provided by the applicant during the test.

a) Operator manual
b) Parts catalogue
c) Service manual

However, the manuals need to be updated as per IS: 8132-1999.

TESTING AUTHORITY

Er. SANJAY KUMAR AGRICULTURAL ENGINEER	
Dr. MUKESH JAIN **DIRECTOR**	18.01.2023

The test report is compiled by Er. V.S Shinde, Senior Technical Assistant

21. APPLICANT'S COMMENTS

Para No.	Our Reference	Applicant's Comments
21.1	19.1, 19.2, 19.3 19.4, 19.5 & 19.6	We will incorporate all the suggestions in our future regular production.