



**“AGRIZONE MULTISPEED ROTAVATOR-6 FEET”
GRIZO J TYPE (175 MS)**

TESTED AT

**STATE LEVEL FARM MACHINERY TRAINING AND TESTING
INSTITUTE, REHMANKHERA, HARDOI ROAD
LUCKNOW, U.P. – 226101**

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(The Institute is approved Testing Centre by Department of Agriculture & Cooperation, Ministry of Agriculture, GOI vide letter no. 8-1/2004-My (I&P) dated September 14,2010 and subsequent letters)

THIS TEST REPORT IS VALID FROM 19.06.2023 TO 18.06.2030

TEST REPORT NO.	NAME OF THE MACHINE/IMPLEMENT, MODEL NO.	MONTH	YEAR
IMP- 2011/411	“AGRIZONE MULTISPEED ROTAVATOR-6 FEET” GRIZO J TYPE (175 MS)	JUNE	2023



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Type of test	:	COMMERCIAL
Name of machine	:	“AGRIZONE MULTISPEED ROTAVATOR-6 FEET” GRIZO J TYPE (175 MS)
Test Code referred	:	IS: 11531-1995 (Reaffirmed) Test code for Puddler. IS: 4468-2007 (Pt.-I)-Agricultural wheeled tractors- Rear mounted three point linkage. IS: 4931-1996 (Reaffirmed)-Technical requirements for Power Take-Off shaft of Agricultural Tractors. IS: 6690-2007 (Reaffirmed)-Blades for Rotavator and Power Tillers.
Test requested by	:	M/S- GSA INDUSTRIES VILL- DAULATPUR, RASULPUR, JAURAN ROAD , DISTT-PATIALA, PUNJAB-147001
Testing Authority	:	STATE LEVEL FARM MACHINERY TRAINING AND TESTING INSTITUTE, REHMANKHERA, HARDOI ROAD, LUCKNOW, U.P. - 226101
Period of test	:	JANUARY 2023 TO JUNE 2023

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1. This Test Report should not be reproduced in part or full without prior permission of the Incharge Testing Centre.
 2. The data given in the Test Report pertain to the particular machine submitted for test by the Applicant.
 3. The data collected during the test do not in any way attribute to the durability of the machine.
 4. The results reported in this report are observed values and no corrections have been applied for atmospheric and site conditions.
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Selected Conversions

S. No	Units	Conversion Factor
1	Force	
	1 kgf	9.80665 N
		2.20462 lbf
2	Power	
	1 hp.	1.01387 metric hp. (Ps)
		745.7 W
	1 Ps	735W
	1 kW	1.35962 Ps
3	Pressure	
	1 psi	6.895 kPa
	1 kgf/cm ²	98.067 kPa = 735.56 mm of Hg
	1 bar	100 kPa = 10 N/cm ²
	1 mm of Hg	1.3332 m-bar

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1. SCOPE OF TEST

The scope of the test was to check and assess the followings.

- i) Specification
- ii) Hardness & chemical analysis of material of rotavator blades
- iii) Field performance under dry and wet land condition with regard to
 - a) Rate of work.
 - b) Quality of work.
 - c) Ease of operation, maintenance & adjustments.
 - d) Wear of soil engaging components.

2. TEST PROCEDURE / CODES

- i) IS: 11531-1995 (Reaffirmed) Test code for Puddler.
- ii) IS: 4468- 2007 (Pt.-I)-Agricultural wheeled tractors-Rear mounted three point linkages.
- iii) IS: 4931-1996 (Reaffirmed)-Technical requirements for power take-off shaft of Agricultural Tractors.
- iv) IS: 6690-2007 (Reaffirmed)-Blades for Rotavator and power tillers.

3. METHOD OF SELECTION

The machine was Randomly selected by representative of the testing authority out of 05 machines made available for selection from their periodical production line at manufacturer’s site. Machines of Sr. No.4210 to 4214 were available and Sr. No. 4211 was selected for testing.

4. SPECIFICATION

4.1	General	
	Name of manufacturer/applicant	: M/S- Gsa Industries Vill- Daulatpur, Rasulpur, Jauran Road, Distt-Patiala, Punjab-147001
	Type	: Tractor Mounted Type.
	Make	: GSA Industries.
	Model	: GRIZO J TPYE 175 MS
	Brand	: AGRIZONE
	Year of manufacture	: 2022-23
	Serial No.	: 4211
	Tractor horse power required (apa.)	: 45 and above.
	Type of blade	: J Type
	Working width of implement, mm	: 1750
4.2	PRIME MOVER USED	
	Tractor	: Mahindra Arjun-605 (DI)
	Chassis No.	: NCRB139
	Max. PTO Power Kw	: 42.5
	Year of manufacture	: 2011
	Rated Engine speed recommended for field test (RPM) apa	: 1700/1800
4.3	CHASSIS	
	Type	: M.S. Square pipe.
	Size of pipe, mm	: 1840×60×60
	Size of supporting flat, mm	: 562×115×8
	Type of mounting of pipe	: Fixed to side support with the help of nut and bolt size (34.70×11.75×1.5 mm)
4.3.1	SIDE SUPPORT	
	Type	: M.S. flat.

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	Thickness of plate, mm	:	8 & 10.0
	Method of fixing, mm	:	Fixed to the frame with nuts bolts size (34.50×11.67×1.5 mm) and welded with chassis frame.
4.3.2	SHIELD (COVER)		
	Type	:	M.S. Flat.
	Curved width, Length mm	:	540×1840
	Thickness of sheet, mm	:	4.0
	Method of mounting	:	Welded with supporting plate of chassis.
4.4	TRAILING BOARD		
	Type & material	:	M.S. sheet supported with M.S. flat.
	Size of board, mm	:	2055×520
	Thickness of sheet, mm	:	3.0
	Locking system	:	03 clamps welded to chassis frame. The board is held in position by locking the fixing bracket through spring loaded rod.
	Method of mounting plate sector	:	Bolted to flat of chassis frame.
	Type of hinge	:	Spring Loaded Rod.
	No. of hinges	:	04
	Method of fixing	:	M.S. rod is passing through M.S. bush and fixed at both the end with main chassis frame.
4.5	ROTOR SHAFT		
	Material	:	M.S. pipe.
	Type of rotor axle	:	Tubular section with disc flanges for mounting the blades.
	Size of shaft, mm		
		Length	: 1750
		Dia.	: 73.0
	No. of flanges	:	12
	Type of flange	:	M.S. circular plate.
	Dia. of flange, mm	:	215
	Thickness of flange, mm	:	12.0
	No. of blades on each flange	:	06 in each flange.
	Method of mounting blades on flanges, mm	:	Each blade is mounted with two nuts bolts size (34.70×11.75 Ø×1.5 mm).
	Distance of between two flanges, mm	:	140
	Total no. of blades	:	72
	Dia. of rotor with blades, mm	:	487
	Method of fixing	:	Rotor shaft is bolted with hubs on both ends. These hubs are centrally mounted with two ball bearings on each ends.
4.5.1	ROTOR BLADE		
	Number	:	72
	Type	:	J-shape hatched.
	Material	:	High Carbon steel.
	Overall thickness, mm	:	7.0
	Speed of rotor shaft (rpm)	:	220 (Corresponding to 540 rpm of PTO shaft.)
	Thickness at the beveled edge, mm	:	2.0

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	Length of the beveled edge, mm	:	17.28
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4.6	DEPTH OF CONTROL MECHANISM		
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4.6.1	Skid		
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	Type & Material	:	Curved shape, M.S. doubles flat.
	Size, mm	:	595×50×10 & 595×50×10 Respectively.
	No. of skid	:	02
	Method of fixing	:	Skid is bolted to side plate and adjusting rack at the front & rear side respectively with the help of bolt & nut size (39.60×11.70 Ø×1.5 mm).

4.6.2	ADJUSTING RACK		
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	Type	:	M.S. casting having.
	Size, mm	:	137×45×10
	No. and size of locking bolt, mm	:	One and size of bolt (39.60×11.68Ø×1.5 mm)
	Range of depth adjustment, mm	:	0 to 55
	Method of fixing, mm	:	M.S flat is fixed to upper end of the rack fixed to the side support on both sides and lower ends with the skids. This is fit to side plate with nut and bolts size (39.60×11.65 Ø×1.5 mm)

4.7	THREE POINT LINKAGE (Cat. II) (Refer fig.1)			
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Sl. No.		As per IS:4468-2007 (pt.- I) (mm)	As measured mm	Remarks
I	Upper hitch points			
(a)	Diameter of hitch pin (A)	25.27 to 25.40	25.38	Conforms
(b)	Diameter of hitch pin hole (B)	25.70 to 25.91	25.90	Conforms
(c)	Width between outer faces of yoke (E)	86 (Max.)	72.26	Conforms
(d)	Width between inner faces of yoke (F).	52 (min)	55.82	Conforms
(e)	Linch pin hole distance (D)	93 (min)	106.15	Conforms
II	Lower hitch points			
(a)	Dia. of hitch pin	27.79 to 28.0	27.15	Does not Conform
(b)	Linch pin hole distance (K)	49 (Min.)	105.86	Conforms
III	Diameter of linch pin hole			
(a)	Upper hitch pin (L)	12 (min)	11.26	Does not Conform
(b)	Lower hitch pin	12 (min)	11.53	Does not Conform
IV	Mast height (M)	510 (min.)	530	Conforms
V	Lower hitch point span (N)	823.5 to 826.5	855 (but adjustable)	Conforms

4.7.1	Mast		
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	Type	:	M.S. flat fabrication.
	Size of flat, mm	:	Front- 630×170×8 & Rear- 650×295×8 Respectively.
	Shape	:	Pyramid.

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4.8	POWER TRANSMISSION SYSTEM:		
	Method of transmission	:	Propeller shaft receives drive from PTO and transmits power to rotary shaft through two spur gear & one Pinion beveled gear reduction units, primary and secondary, consisting of gear reduction respectively.
4.8.1	DIMENSIONS OF POWER INPUT SHAFT (Ref. Fig. 2)		
Notation	As per IS:4931-1996 (mm)	As observed (mm)	Remarks
D ϕ	34.79 \pm 0.06	34.82	Conforms
d ϕ	28.91 \pm 0.05	28.87	Conforms
S	8.69 (max.)	8.50	Conforms
R	6.7 \pm 0.25	5.08	Does not Conform
α	30°	30°	Conforms
Q	7.0	7.0	Conforms
H	38.0	38.0	Conforms
A	54.0 (min.)	60.80	Conforms
B	76.0 (min.)	77.20	Conforms

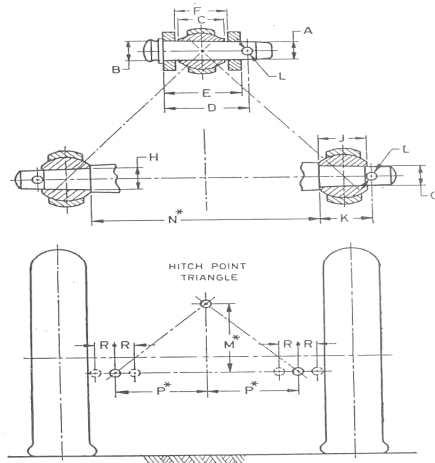


FIG. 1- DIMENSIONS OF HITCH POINTS

Fig.:1 Dimension of Hitch Points

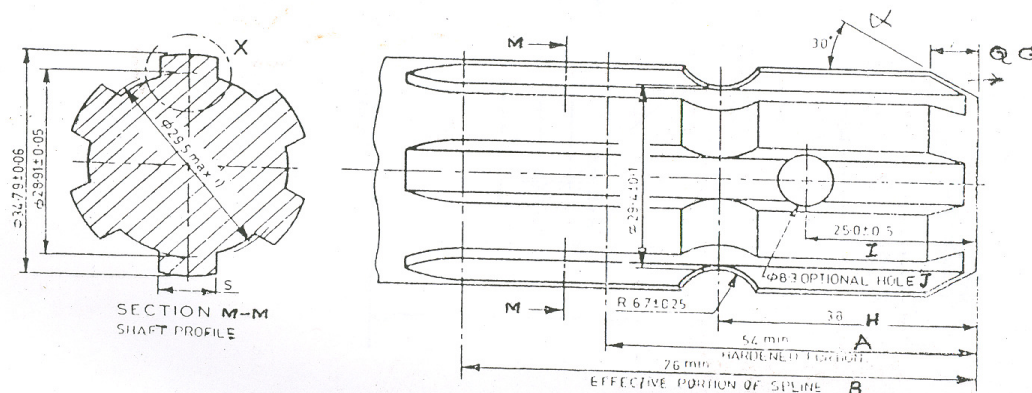


Fig. 2: Dimensions of Rotavator Power Input Shaft, mm

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4.8.2	Gear box Assembly (primary reduction) Multispeed gear box		
	Type	:	Bevel pinion gear.
	No. of teeth on pinion	:	13
	No. of teeth on bevel gear	:	23
	Reduction ratio at gear box	:	1:0.56
	Oil capacity, l	:	4.0
	Oil change period hours	:	After every 200 hrs.
	Recommended grade of oil	:	EP-140
	Length of power transmission shaft, mm (from gear box to secondary reduction unit)	:	830
	Dia. of shaft, mm	:	45.70
	No. of bearing	:	05-Tapper Roller bearing, (Three-30209), (One- 32212), (One- 32214)
4.8.2.1	Gear drive (secondary reduction)		
	Type	:	Gear Drive
	No. of teeth drive gear	:	20
	No. of teeth driven idler spur gear	:	35
	No. of teeth driven spur gear	:	28
	Reduction ratio at gear box	:	1:0.71
	Oil capacity, l	:	4.0
	Recommended grade of oil, apa	:	EP-140
	Oil change period, h (apa)	:	After every 200 hrs.
	Provision for oil level checking	:	Dipstick Provided.
	Provision for dipstick/breather	:	Provided.
	Oil filling arrangement	:	Nut and bolt Provided.
	No. of bearing	:	04- (03) Tapper Roller 30210 (Two), 32210 (One) ball bearing 6311, (One)
4.8.3	Propeller shaft		
	Type	:	Telescopic (in two segments having 6 splines at both ends).
	Length of shaft (mm)		
	-- Minimum	:	805
	-- Maximum	:	970
	Mass of shaft, kg	:	13.790
	Provision for locking	:	Spring loaded locking pins on both sides are provided and shear bolt also provided.
8.3.1	Propeller shaft hub dimensions (Ref. Fig.3)		
Notation	As per IS:4931-1996 (mm)	As observed (mm)	Remarks
D ϕ	34.93 \pm 0.03	34.91	Conforms
d ϕ	29.7 \pm 0.1	29.74	Conforms
W	8.69 (min)	8.89	Conforms
B	54 (min)	54.38	Conforms

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4.8.4	Safety clutch/device	:	Provided
4.9	Rotavator Stand	:	N.A
4.10	Furrow wheel	:	Provided

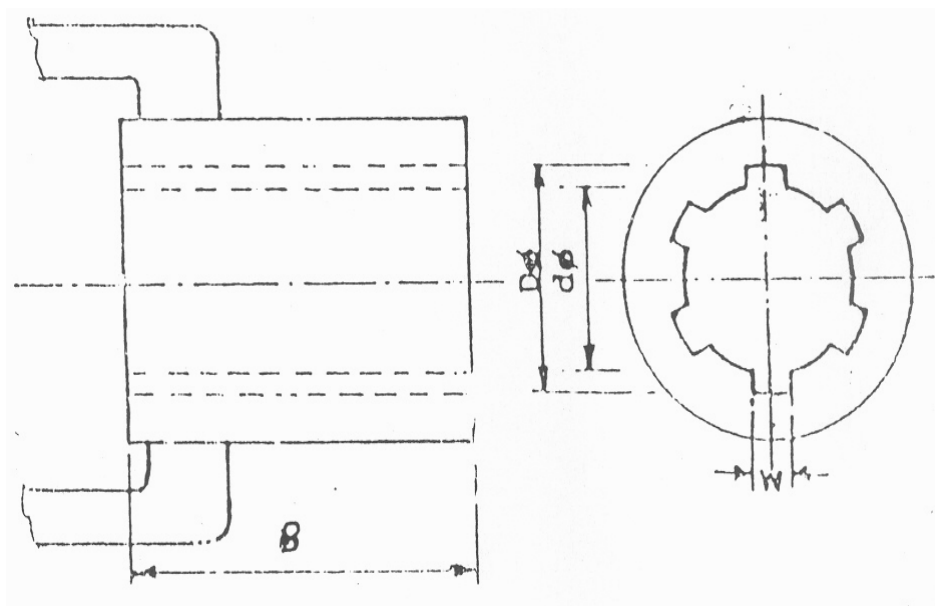


Fig. 3: Propeller Shaft Insert Dimensions, (mm)

4.11	Overall Dimensions, mm (Ref. Fig.4)		
	Length	:	1210
	Width	:	2100
	Height	:	1040
	Weight, Kg (apa)	:	420 (Approx)
4.12	Color	:	Red

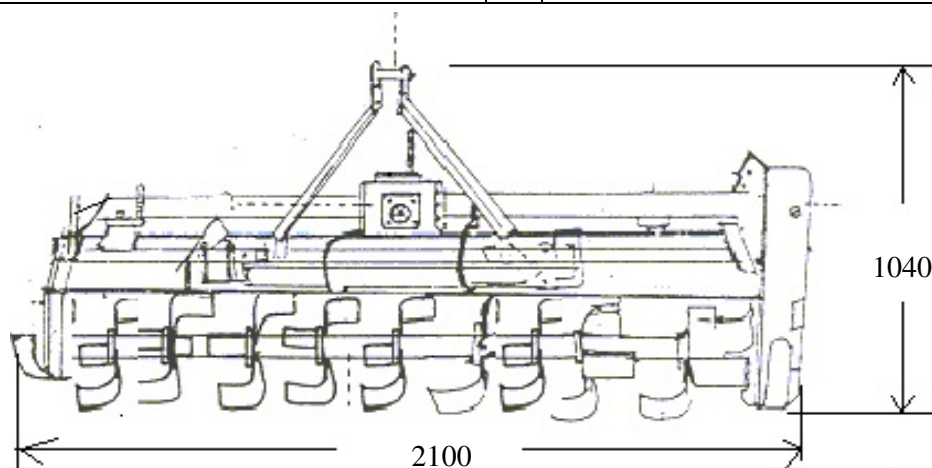


Fig. 4: Overall Dimensions of Rotavator, mm

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5. LABORATORY TEST

5.1 The hardness of blades was determined at edge and shank portion. The results of hardness test are tabulated in Table-I.

TABLE-1

S. No	Portion of blade	Hardness (HRC)		Remark
		As per IS: 6690-2007	As observed	
1-	On Edge Portion	53±3	50.8,52.9,54.9	Conforms
2-	On Shank Portion	37-45	40.2,42.7,43.8	Conforms

Sl. No.	Material	Requirement as per IS:6690-2007 (Reaffirmed) (% by weight)	As observed (% by weight)	Remark
1.	Carbon (C)	0.50 to 0.60	0.55	Conforms
2.	Silicon (Si)	1.50 to 2.0	1.83	Conforms
3.	Manganese (Mn)	0.50 to 1.0	0.81	Conforms
4.	Sulphur (S)	0.05 (max.)	0.026	Conforms
5.	Phosphorous (P)	0.05 (max.)	0.048	Conforms

6 FIELD PERFORMANCE TEST

The field tests of the implement comprising of dry and wet land operation were conducted for 20.5 and 16.5 hours each in different soil moisture conditions to assess the performance of the implement. The details of tractor used for field operations are given in annexure I.

The tractor PTO speed was maintained at 540±10 rpm. The performance of implement is reported in Annexure-II and summarized in Table-3.

TABLE-3

Summary of field performance

Sl. No.	Parameters	Dry land operation	Wet land operation
i	Tractor used	Mahindra Arjun-605 (DI)	
ii	Type of soil	Red	
iii	Av. Soil moisture, %	9.75 to 10.95	-----
iv	Av. Depth of standing water, cm	-----	7.57 to 8.50
v	Puddling Index, %	----	86.4 to 89.0
vi	Av. Speed of operation, kmph	2.59 to 2.64	2.51 to 2.56
vii	Field efficiency, %	73.92 to 80.94	----
viii	Av. Depth of cut/depth of puddle, cm	7.23 to 8.03	11.6 to 13.67
ix	Av. Working width, m	1.85 to 1.86	---
x	Area covered, ha/h	0.360 to 0.395	----
xi	Time required for one hectare, h	2.53 to 2.78	-----
xii	Fuel consumption		
	- l/h	5.800 to 6.200	6.200 to 6.350
	- l/ha	14.674 to 17.097	----

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6.1 Rate of Work

6.1.1 Dry Land Operation

-The rate of work in Red soil was recorded as 0.360 to 0.395 ha/h and the forward speed as 2.59 to 2.64 kmph.

-The time required to cover one hectare area was recorded as 2.53 to 2.78 h.

6.1.2 Wet Land Operation

-Speed of operation varied from 2.51 to 2.56 kmph.

6.2 Quality of Work

6.2.1 Dry land operation

-The depth of operation was recorded as 7.23 to 8.03 cm.

-The field efficiency was recorded as 73.92 to 80.94 %.

6.2.2 Wet Land Operation

-Depth of puddle was recorded as 11.6 to 13.67 cm.

-Puddling index was recorded as 86.4 to 89.0 %

6.2.3 Fuel consumption

- l/h	5.800 to 6.200	6.200 to 6.350
- l/ha	14.674 to 17.097	----

6.3 WEAR OF BLADES

6.3.1 On Mass basis

Wear of hatchet blades on mass basis after 37.0 hrs. Of field operation are tabulated in Table-4.

Table-4

Sl. No.	Initial mass of blade (g)	Mass after 37.0 h of operation	Loss in mass		Wear / h
			g	%	
1.	530	518	12	2.26	0.06
2.	525	514	11	2.09	0.05
3.	515	502	13	2.52	0.06
4.	520	508	12	2.30	0.06
5.	530	510	10	1.88	0.05
6.	515	498	17	3.30	0.08
7.	555	542	13	2.34	0.06
8.	520	510	10	1.92	0.05
9.	535	518	17	3.17	0.08
10.	510	494	16	3.13	0.08
11.	525	510	15	2.85	0.07
12.	515	494	21	4.07	0.11

Remark:- Rate of hourly wear (%) on mass basis was observed as 0.05 to 0.11

6.3.2 Wear On Dimensions basis Fig. 5: (J-Type hatched Blade)

Sl. No.	Initial Width at, mm		Width after 37.0 hrs at, mm		Wear, (mm)		Wear, %	
	A (at tip)	B (65 mm from edge)	A (at tip)	B (65 mm from edge)	A (at tip)	B (65 mm from edge)	A (at tip)	B (65 mm from edge)
1.	44.08	46.36	41.98	44.76	2.10	1.60	4.76	3.45
2.	43.37	46.33	42.12	44.93	1.25	1.40	2.88	3.02
3.	43.42	45.82	41.47	43.52	1.95	1.50	4.49	3.33
4.	43.96	45.72	41.66	44.07	2.30	1.65	5.25	3.60

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5.	43.97	45.68	41.97	44.38	2.00	1.30	4.54	2.84
6.	43.68	45.99	40.53	43.99	3.15	2.0	7.21	4.37
7.	44.78	47.23	42.68	45.73	2.18	1.50	4.86	3.17
8.	43.51	45.68	41.41	44.15	2.10	1.45	4.81	3.21
9.	43.76	46.71	41.16	45.11	2.60	1.60	5.94	3.42
10.	44.58	45.63	41.48	44.21	3.10	1.42	6.95	3.11
11.	44.00	45.40	41.95	43.86	2.05	1.51	4.65	3.39
12.	43.05	44.92	40.51	43.42	2.54	1.50	5.90	3.33

Remark: The wear percentage of blade on dimension basis in wet & dry land opreated was recorded as 2.88 to 7.21 & 2.84 to 4.37 (%) at 65mm from edge respectively.

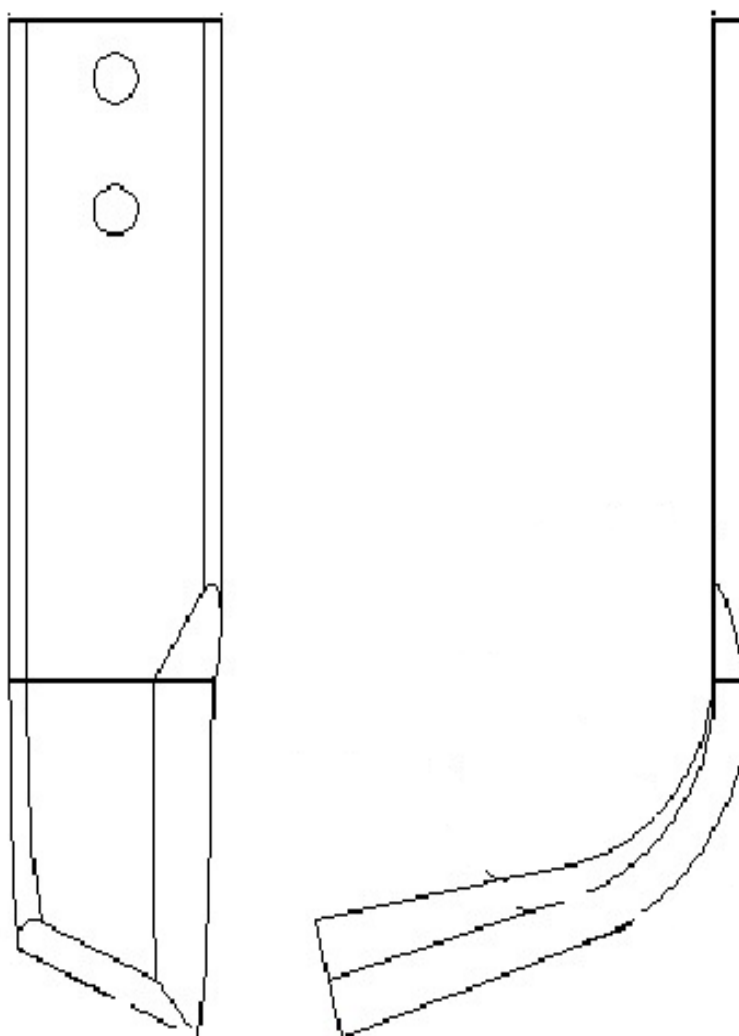


Fig. 5: Dimensions for Wear Analysis (J-Type hatched Blade)

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7. EFFECTIVENESS OF SEALINGS

After completion of field test in wet land operation for 16.5 hrs. The implement was dismantled for checking effectiveness of sealing provided against ingress of dust and water/mud in various sub-assemblies and also to check the conditions of components of the Rotavator.

Sl. No.	Location	Whether ingress of mud and/or water was observed
1.	Primary reduction gear box.	No
2.	Secondary reduction gear; drive	No
3.	Hub of rotor assembly	No

8. EASE OF OPERATION, ADJUSTMENTS & SAFETY

- 8.1 The propeller shaft has telescopic sections with universals joints, to adjust the length of drive shaft which is adequate.
- 8.2 Depth adjustment can be made by raising or lowering the skids.
- 8.3 The drive shaft (universal coupling shaft) is provided with shear bolt for safety.
- 8.4 Operator has to get down from tractor for making adjustment in rotavator.

9. DEFECTS, BREAKDOWNS AND REPAIRS

- 9.1 No breakdown occurred during 37.0 h operation in the field.

10. COMMENTS & RECOMMENDATIONS

- i) The dimensions of three point linkage system Lower hitch point (a) and Diameter of linch pin hole point (a, b) are not conforming to the requirement of As per IS:4468-2007 (pt.- I) (mm)
- ii) Dimensions of power input shaft hub (Notation R) have not been provided as per requirements IS:4931-1996 (mm).
- iii) Arrangement should be made to permanently display the quality and parameters obtained in the test in all commercially manufactured (agriculture machines by putting engraved seals or plates) on the machines, so that the farmers can get proper information about the quality of the equipment.

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11. LITERATURE :





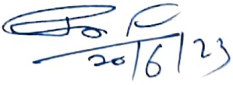
The specification of the implement operating manual, maintenance, safety instruction and spare parts catalogue provided in English. The literature developed is found to be adequate for the guidance of user and service personal. However, it need to developed (as per IS: 8132: 1999) in other regional languages.

12. APPLICANTS'S COMMENTS :

- We will Change the Dia of Lower Hitch pin (a) per IS: (4468-2007)
- We will Change the Dia of Linch pin (a) & (b) hole per IS: (4468-2007)
- We will modify the Dimensions of power input shaft (R) to comply with IS :4931-1996
- We will make all Arrangement permanently display the quality and parameters obtained in the test in all commercial production level.

This report is being issued with the condition that the tested implement will be rectified as per recommendation and comments given by the Institute and applicant respectively and after rectification the implement should be manufactured on commercial basis.

TESTING AUTHORITY

(UPENDRA KUMAR) -SENIOR TECHNICAL ASSISTANT-	
(ANAND CHAUDHARI) -TEST ENGINEER-	
(VIJAY KUMAR SINGH) -ASSOCIATE PROFESSOR – ENGG.	
(DR. PRAMOD KUMAR GUPTA) -ADDITIONAL DIRECTOR-	
(DR. PANKAJ TRIPATHI) - DIRECTOR-	 20/6/23

THIS TEST REPORT IS VALID FROM 19.06.2023 TO 18.06.2030

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ANNEXUR- 1

BRIEF SPECIFICATIONS OF THE TRACTOR USED DURING FIELD TEST

1	Make, model and type	Mahindra Arjun- 605 (DI) (Agriculture purpose tractor)
2	Number of cylinders	4
3	Maximum PTO power, Kw	42.5
4	Power at standard Power Take-Off speed, 540± 10 rpm, Kw	27.0
5	Rated engine speed, rpm	2000
6	No load engine speed during field test, rpm	1800
7	Drawbar power, Kw	23.4
8	Drawbar pull, kN :	
	- Without ballast	15.4
	- With ballast	22.3
9	Type of wheel equipment	Pneumatic
10	Number & size of tyre :	
	Front	Two, 275/70 R 16
	Rear	Two, 16.9-28.00 (12 PR)
11	Standard track width, mm :	
	- Front	1380
	- Rear	1420
12	Wheel base, mm	1810
13	Ballast condition	Used as un-ballasted
14	Total Operational Mass, kg :	
	- Front	740
	- Rear	1200
	- Total	1940

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ANNEXURE- II

OBSERVATION SHEET OF FIELD TESTING (DRY LAND OPERATION)

Type of soil : Red Soil
Place of test : Vill- Daulatpur, Patiala (Punjab)
Tractor used : Mahindra Arjun- 605 (DI)
Gear used : L-1 Gear used

Test No.	Date of test	Duration of test, (h)	Length of furrow, (m)	Av. Soil moisture (%)	Av. Speed of operation (kmph)	Wheel slip (%)	Av. Depth of cut (cm)	Av. Working width (m)	Area covered (ha./h)	Field efficiency (%)	Time required for one hectare, (h)	Fuel consumption	
												(l/h)	(l/ha)
1	2	3	4.	5	6	7	8	9	10	11	12	13	14
1.	29.04.2023	6.5	100.00	10.15	2.64	2.57	7.27	1.85	0.395	80.94	2.53	5.800	14.674
2.	30.04.2023	7.0	92.00	9.75	2.59	2.83	7.23	1.86	0.386	80.08	2.59	6.200	16.058
3.	01.05.2023	7.0	80.00	10.95	2.62	3.00	8.03	1.86	0.360	73.92	2.78	6.150	17.097

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ANNEXURE-III

OBSERVATION SHEET OF FIELD TESTING (PUDDLING OPERATION)

Type of soil : Red Soil
Place of test : Vill- Daulatpur, Patiala (Punjab)
Tractor used : Swaraj 735 (XT)
Gear used : L-1 Gear used

Test No.	Date of test	Duration of test (h)	Av. Depth of standing water (cm)	Puddling Index (%)	Av. Depth of puddle (cm)	Av. Speed of operation (kmph)	Wheel slip (%)	Fuel consumption	Engine speed (rpm)	
								(l/h)	On load	No load
1	2	3	4	5	6	7	8	9	10	11
1.	02.05.2023	6.0	7.57	88.5	13.67	2.51	3.73	6.350	1700	1800
2.	03.05.2023	6.5	8.50	86.4	12.13	2.56	3.37	6.200	1700	1800
3.	04.05.2023	4.0	8.43	89.0	11.6	2.55	3.5	6.300	1700	1800

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ANNEXURE -IV

SYMBOL AND ABBREVIATIONS

SYMBOLS:

I- SYMBOLS ASSIGNED TO BASIC SI UNITS			
S.N.	PHYSICAL QUANTITY	NAME OF SI UNIT	SYMBOL
1	Length	Meter	m
		Millimeter	mm
2	Mass	Kilogram	kg
		Gram	g
		Tone	t
3	Time	Second	s

II- SYMBOLS ASSIGNED TO SOME DERIVED UNITS			
S.N.	PHYSICAL QUANTITY	NAME OF SI UNIT	SYMBOL
1.	Area	Square centimeter	cm ²
		Square meter	m ²
		Hectare	ha
2	Speed/Velocity	Meter per second	m/s
		Kilometer per hour	kmph
3	Pressure	Newton per square millimeter	N/mm ²
4	Time	Minute	min
		Hour	h
5	Volume	Cubic centimeter	cm ³
		Milliliter	ml
		Liter	l
6	Minimum	Min	mi
7	Maximum	Max	ma

ABBREVIATIONS:

As per applicant	:	apa	Clause	:	Cl
Degree	:	deg	Figure	:	Fig
Indian Standard	:	IS	Kilowatt	:	kW
Number	:	No.	Not available	:	N.A.
Not Recorded	:	N.R.	Percent	:	%
Reference	:	Ref.	Revolution	:	rpm