



सत्यमेव जयते



**TRACTOR MOUNTED DISC HARROW
(DELUXE-7×7)**

TESTED AT

**STATE LEVEL FARM MACHINERY TRAINING AND TESTING
INSTITUTE, RAHMANKHERA, 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 26.09.2022 TO 25.09.2029

| TEST REPORT NO. | NAME OF THE MACHINE/IMPLEMENT, MODEL NO. | MONTH | YEAR |
|-----------------|--|-----------|------|
| IMP-2011/381 | TRACTOR MOUNTED DISC HARROW (DELUXE-7×7) | SEPTEMBER | 2022 |



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| | | |
|--------------------|---|---|
| TYPE OF TEST | : | COMMERCIAL |
| NAME OF MACHINE | : | TRACTOR MOUNTED DISC HARROW (DELUXE-7×7) |
| TEST CODE REFERRED | : | IS: 7640-1999 – Test Code For Disc Harrows IS: 6695-2001 – Specification For Tractor Operated Disc Harrow. IS: 4366-2001- Specification For Agricultural Tillage Discs IS: 7230-2001- Specification For Plain Spool For Tractor Operated Disc Harrows. Is: 4468-2007 -Dimension Of Three Point Linkage IS: 6690-1996 Disc For Hardness & Chemical. |
| TEST REQUESTED BY | : | M/S- DELUX AGRO TECH PRIVATE LIMITED, HALLU SARAI OPP. ALLAHABAD BANK, SAMBHAL- UTTAR PRADESH- 244302 |
| TESTING AUTHORITY | : | STATE LEVEL FARM MACHINERY TRAINING AND TESTING INSTITUTE, REHMANKHERA, HARDOI ROAD, LUCKNOW, U.P. - 226101 |
| PERIOD OF TEST | : | JANUARY 2022 TO SEPTEMBER 2022 |

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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.
-

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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| IMP-2011/381 | TRACTOR MOUNTED DISC HARROW, (DELUXE-7×7) | COMMERCIAL | 1 |
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1. SCOPE OF TEST

The objective of test was to check and assess the following:-

- (a) Specification of implement.
- (b) Conformity to relevant Indian Standards.
- (c) Rate and quality of works.
- (d) Ease of handling and adjustment.
- (e) Wear of critical components.
- (f) Breakdown & repair.

2. TEST CODES/ PROCEDURE

The sample was tested in accordance with the relevant clause of Indian Standards.

1. IS: 7640-1999- Test code for Disc harrows
2. IS: 6695-2001- Specification for Tractor operated Disc harrow.
3. IS: 4366-2001- Specification for Agricultural tillage discs.
4. IS: 7230-2001- Specification for plain spool for tractor operated Disc harrow.
5. IS: 4468-2007- Dimension Of Three Point Linkage.
6. IS: 6690-1996- Disc For Hardness & Chemical.

3. METHOD OF SELECTION

The test sample was directly submitted for test by the applicant at the Institute.

4. SPECIFICATIONS

4.1 General

| | |
|---|---|
| Name of the Machine | : Tractor Mounted Type Disc Harrow-7×7 |
| Name & address of The Manufacturer/applicant | : M/S- Deluxe Agro Tech Private Limited, Hallu Sarai, Opp. Allahabad Bank, Sambhal- Uttar Pradesh- 244302 |
| Make | : Deluxe |
| Model | : DLX-HRW |
| Type | : Tractor Mounted type |
| Serial No. | : 001 |
| Year of Manufacture | : 2021-22 |
| Nominal Size | : Adjustable |
| Power Source | : 4 Wheel agriculture tractors |
| Power source as a used | : TAFE-241 |

4.2 Gang Frame

| | |
|------|--|
| Type | : Welded angle iron frame separated for each gang. |
|------|--|

| | | | |
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| | | |
|------------|--|--|
| | Size of angle section (mm) | : 90×88.5 |
| | (a) Front gang | |
| | Length (mm) | : 925 |
| | Width (mm) | : 1745 |
| | (b) Rear gang | |
| | Length (mm) | : 585 |
| | Width (mm) | : 1750 |
| 4.3 | Scraper assembly | |
| | Type | : Curved flat. |
| | Number | : 14 |
| | Size of scraper (mm) | : 290×50×8 |
| | Location and method of fixing | : The Scraper are welded main frame. |
| 4.4 | Gang Shaft | |
| | Type & Material | : M.S. circular section. |
| | Length of shaft (mm) | : 178 |
| | Diameter of shaft (mm) | : 60 |
| | No. and size of the bearing | : Four in each shaft. |
| 4.5 | Disc Gang | |
| | Number | : Two |
| | No. & type of disc in each gang | : 07, plain, concave |
| | Method of mounting of each disc | : By bearing hub and bracket with two bolts on both sides. |
| | Size of bolt (mm) | |
| | Length | : 39.25 |
| | Diameter | : 15.21 Ø |
| | Pitch | : 2.5 |
| | Method of changing the gang angle | : By pulling out the lock lever, moving the gang forward and putting the lock lever into the desired hole of off- setting bar which is attached to rear gang frame by means of nut and bolt. |
| 4.6 | Gang angling mechanism | |
| | Type of material | : M.S. angle and M. S. rod |
| | Angle made between axis of the Gang and the line perpendicular to The direction of motion (deg.) | : 0-45° |
| | Length of threaded portion (mm) | : 280 |
| | Diameter of threaded portion (mm) | : 30.21 |
| | Pitch (mm) | : 3.0 |

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4.7 Off- Setting Bar

| | |
|---|-------------------|
| Type | : M.S. structure |
| No. of bar | : One |
| Length of off- setting bar (mm) | : 1485 |
| Size of off – setting bar (mm) | : 90×90×4.0 |
| No. of hole for gang angle setting | : Three |
| Diameter of holes (mm) | : 22.15 |
| Hole to hole distance, (mm) | : 74.42 |
| Method of fixing off setting bar to rear Frame | : By nut and bolt |
| Size of bolt (mm) | |
| Length | : 65.16 |
| Diameter | : 18.67 |
| Pitch | : 2.5 |

4.8 Spool

| | |
|--------------------------------|--|
| Type & no. of spool | : Plain, 6 in each gang |
| Length, mm | : 220 |
| Diameter, (mm) | |
| Big end (outer) | : 150.27 |
| Small end (outer) | : 119.76 |
| Internal | : 70.10 |
| Middle of spool | : 80.20 |
| Material | : Cast Iron |
| Dia. of spool with collar,(mm) | |
| Big end (inner) | : 128 |
| Small end (inner) | : 98.3 |
| Method of mounting | : Mounted on axle housing and held In position by cotter. |
| Type of key | : Solid Rod. |
| Size of axel shaft key, (mm) | |
| Length | : 1375 |
| Width | : 17 |

| | | | |
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4.9 Three Point Linkage

Dimension of Three Point Linkage as per IS: 4468- 2007 (Pt.1)

| SI No. | Specifications | Dimensions (mm) | | Remarks |
|---|---|-----------------------------|-------------|------------------|
| | | As per IS: 4468-2007 (Pt.1) | As measured | |
| 1 | 2 | 3 | 4 | 5 |
| Upper Hitch Point (Cat. II) | | | | |
| a | Dia. of hitch pin, mm | 25.27 to 25.40 | 27.40 | Does not Conform |
| d ₁ | Diameter of Hitch Pin Hole, mm | 25.70 to 25.91 | 28.86 | Does not Conform |
| b ₁ | Width between inner surfaces of yoke, mm | 52.0 (min.) | 55.64 | Conforms |
| b ₂ | Width between outer surfaces of yoke, mm | 86.0 (max.) | 86.8 | Conforms |
| b ₃ | Linch pin hole distance (as used during test), mm | 93.0 (min.) | 104 | Conforms |
| d | Dia of linch pin hole,mm | 12.0 (min.) | 10.0 | Does not Conform |
| Lower Hitch Point (Cat. II)29.23 | | | | |
| d ₂ | Hitch pin hole diameter, mm | 28.70 to 29.03 | 27.55 | Does not Conform |
| b | Dia. of hitch pin | 27.79 to 28.0 | 27.12 | Does not Conform |
| b ₃ | Linch pin hole distance (as used during test), mm | 49.0(min,) | 76 | Conforms |
| l | Lower Hitch Point Spam, mm | 823.5 to 826.5 | 690 | Does not Conform |
| d | Dia of linch pin hole,mm | 12.0(min.) | 11 | Does not Conform |
| Other Dimension | | | | |
| h | Mast height | 510 (min.) | 670 | Conforms |

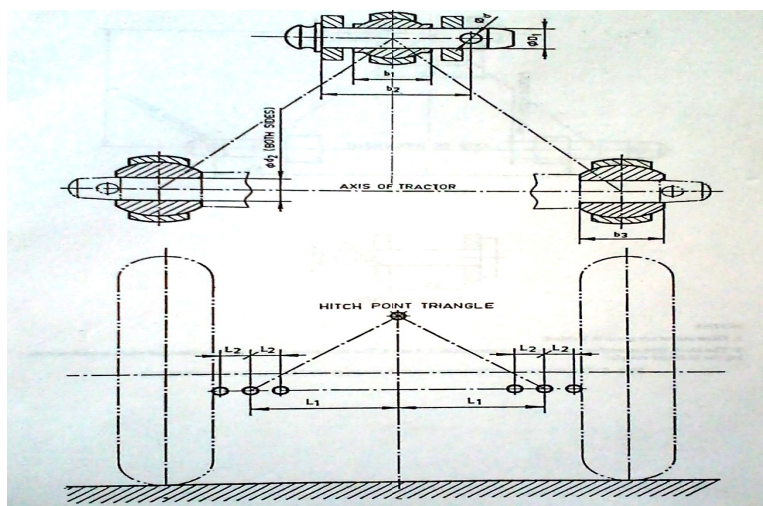


Fig. 1 Dimension of Hitch Pyramid

| | | | |
|--------------|--|------------|---|
| IMP-2011/381 | TRACTOR MOUNTED DISC HARROW, (DELUXE-7×7) | COMMERCIAL | 5 |
|--------------|--|------------|---|

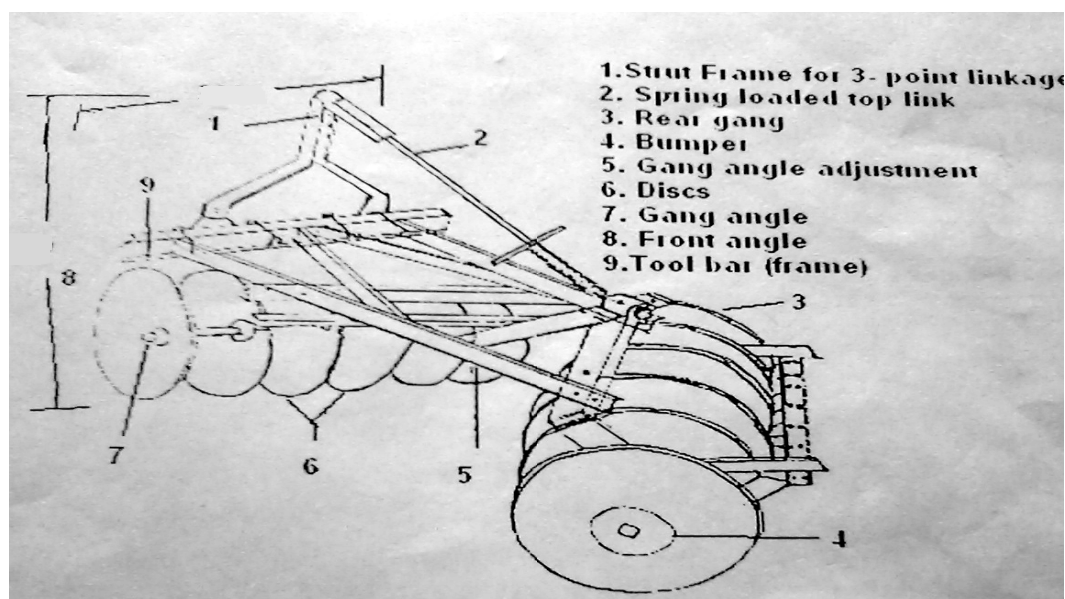


Fig. 2 Overall Dimensions of Disc Harrow (7×7)

4.10 Bumper

| | |
|--------------------|------------------------------------|
| Type | : Circular with central round hole |
| Material | : Mild Steel |
| Size of bumper, mm | |
| Diameter | : 220 |
| Thickness | : 8.0 |
| Method of fixing | : Welded to axle frame |

4.11: Disc

| Sl. No. | Specification | As per IS: 4366-Part I- 2001 | As observed | Remark |
|---------|-----------------------------|------------------------------------|--------------|-------------------------|
| 1 | Type | Concave | Concave | Conforms |
| 2 | Make | - | John Deere | ---- |
| 3 | Material | Carbon steel | Carbon steel | Conforms |
| 4 | Diameter of disc, mm | 455 to 660 | 572 | Conforms |
| 5 | Concavity, mm | 82.2±5 | 75.12 | Does not Conform |
| 6 | Bevel angle | 30 ⁰ or 40 ⁰ | 30° | Conforms |
| 7 | Length of bevel edge, mm | 22 (max.) | 14.06 | Conforms |
| 8 | Thickness of disc, mm | 4.0 (min.) | 4.6 | Conforms |
| 9 | Thickness at bevel edge, mm | 0.5 to 1.5 | 1.2 | Conforms |
| 10 | Type of centre hole | Square | Round shape | Does not Conform |
| 11 | Size of centre hole, mm | 31×31 33×33±2 | 65.96 Ø | ----- |

| | | | |
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| IMP-2011/381 | TRACTOR MOUNTED DISC HARROW, (DELUXE-7×7) | COMMERCIAL | 6 |
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|----|------------------|---|---|-------|
| 12 | Method of fixing | - | Disc are fixed on The gang shaft and kept in position with The help of spool. | ----- |
|----|------------------|---|---|-------|

4.12 Overall dimensions (mm)

Length : 2500

Width : 1835

Height : 1075

4.13 Mass (kg) : 430

5. Running – In

The disc harrow was directly operated in the field however nut and bolts were tightened and lubrication done before actual test.

6. LABORATORY TEST

6.1 Hardness of the Disc

The hardness of the disc was measured by using hardness testing machine. The results of the hardness are given in Table.

| Sl. No. | Hardness (HB) | | | Conformity to IS |
|---------|---------------|------------------------------------|-------------|------------------|
| | Portion | As per IS: 6690-1996 (Ref.) (%) | As observed | |
| 1 | DISC | 350 to 450 | 358 | Conforms |
| 2 | | | 380 | Conforms |
| 3 | | | 410 | Conforms |
| 4 | | | 372 | Conforms |

6.2 Chemical composition of the disc

A piece of disc was analyzed for chemical composition. The result of chemical analysis is given as under:-

| Material | Requirement as per IS 6690-1996 (Ref.) (%) | As observed (%) | Remarks |
|-------------|---|-----------------|------------------|
| Carbon | 0.50 to 0.60 | 0.74 | Does not Conform |
| Sulphur | 0.05 (Max.) | 0.021 | Conforms |
| Phosphorous | 0.05 (Max.) | 0.019 | Conforms |
| Silicon | 1.50 to 2.0 | 0.28 | Does not Conform |
| Manganese | 0.50 to 1.0 | 0.93 | Conforms |

| | | | |
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6.3 Other requirement as per IS : 4366 (Part-I) -2001

| Clause | Requirement as per IS :4366-2001 | Results observed | Remarks |
|---------|---|---|-------------------------|
| Cl. 6.4 | The Thickness of cutting edge shall be reasonably uniform. The edge thickness for the disc below 560mm nominal size shall be between 0.2 to 0.1 mm & disc of nominal size 560mm and above shall be between 0.5 to 1.5 | Dia. of disc 572 mm and thickness of the edges 1.2 mm. | Conforms |
| Cl. 6.5 | The cutting edge of disc shall be beveled on one side or both sides as specified by the purchaser. | Beveled on one side only. | Conforms |
| Cl. 6.6 | The radius of concavity shall be a true radius. | Satisfactory | Conforms |
| Cl. 6.7 | Square holes shall be square and smooth. The corners of the square holes shall be rounded. | Circular hole with key Notch is provided. | Does not Conform |
| Cl. 6.8 | A disc shall be designated by its type, nominal size and thickness. | Not Provided. | Does not Conform |
| Cl. 6.9 | Both the surfaces of the disc shall be free from cracks and shall be reasonably free from flaws such as seams, scales, pits etc. | Both Surfaces are smooth and well finished without any visual defects and cracks. | Conforms |
| Cl.6.10 | The disc shall be free from rust and shall have a protective coating which will prevent surface deterioration in transit and storage. | Protective coating is Provided to prevent surface deterioration. | Conforms |
| Cl.6.11 | Marking : Each disc shall be punched or stamped on non-wearing portion. a. Manufacture name or trade mark b. Batch / Code no. | Only manufacture Name and Trade mark provided. | Partially Conforms |

7.0 CONFORMITY TO RELEVANT BIS

| Clause No. | Requirement as per IS : 6695-2001 | Observations | Remarks |
|------------|---|-----------------|---------|
| Cl. 7.1 | The disc harrows may be of the following types : a) Single Action : i) Mounted ii) Trailed | Not applicable. | ----- |

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| | | | | |
|-------------|--|--|--------------------|-------------------------|
| | b) 1) Double Action : i) Tandem ii) Trailed 2) Off-set : i) Mounted ii) Trailed | Off- Set: mounted type. | Conforms | |
| Cl. 7.2 | Size of harrow shall be determined by the number & dia. of the discs and the width of cut. | 7×7 Disc and Dia. 572 mm Width of cut 1.2 mm. | Conforms | |
| Cl.8 | Materials | | | |
| | Name of part | Material as per IS 6695-2001 | As observed | Remarks |
| | 1. Frame | Mild Steel | Mild Steel | Conforms |
| | 2. Gang axle | Mild Steel | Mild Steel | Conforms |
| | 3. Spool | Cast Iron | Cast Iron | Conforms |
| | 4. Gang angle adjustment mechanism | Mild steel | Mild steel | Conforms |
| | 5. Draw bar/hitch | Mild Steel | Mild steel | Conforms |
| | 6. Gang bearing casing | Cast iron | Mild steel | Does not Conform |
| | 7. Hitch pin | Carbon steel | Carbon steel | Conforms |
| | 8. Discs. | Carbon steel | Carbon steel | Conforms |
| | 9. Scraper | Mild steel | Mild steel | Conforms |

| | | | |
|--|---|---------------------------------|-------------------------|
| Cl.9 Essential Requirements Cl. 9.1 | The disc harrow shall fulfill the following requirements : a) No. of gangs -Two (in case of offset and single action) Four (in case of tandem) | Two (offset) and double action. | Conforms |
| | b) Type of disc – plain or notched | Plain. | Conforms |
| | c) Number of disc – Minimum four (in each gang) | 7×7 Nos. in each gang. | Conforms |
| | d) Disc size 455 to 660 mm | 572 | Conforms |
| | e) Length of spool – 175 mm or 225± 2 mm | 220 | Does not Conform |
| | f) Gang angle (upto 24°) | 40° | Conforms |
| | g) Ground clearance,(mm) | 215 | Conforms |

| | | | |
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| IMP-2011/381 | TRACTOR MOUNTED DISC HARROW, (DELUXE-7×7) | COMMERCIAL | 9 |
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| Cl. 10 | Other Requirements | | |
|--|---|--|--------------------|
| Cl. 10.1 | Discs – The disc used in harrow shall conform to all requirements as per IS:4366(pt-I)-2001 | Refer Cl.9 disc of the test report. | Partially Conforms |
| Cl. 10.2 | Frame –The frame should be rigid and strong | The frame is rigid and strong. | Conforms |
| Cl. 10.3 | Gangs – Gangs should be so attached that its angle can be easily changed to desired position. | Gangs angle can be easily changed to the desired position. | Conforms |
| Cl. 10.3.1 | The rear gangs in offset type harrow should be so arranged that the discs of rear gang should not make the same path formed by front gang. | Satisfactory | Conforms |
| Cl. 10.3.2 | The discs (in each gang) of the assembled harrow shall be firmly fixed among themselves by spools and there should not be any relative movement between disc and axle. | Disc are firmly fixed among themselves and do not have relative movement between disc and axle. | Conforms |
| Cl. 10.3.3 (As per IS : 6635-1972 | Bumpers may be provided in the inside end of the front gangs of the single action and tandem harrows to prevent the inside disc from rubbing each other at any gang angle at which the gangs are set. | Bumper is provided | Conforms |
| Cl. 10.4 | Scrapers- The scrapers should be set in such away they should not touch the face of disc & should be able to scrape the soil effectively. Arrangement for adjusting the scrapers shall be made. | Scrapers are bolted & welded to the frame and working was found satisfactory. | Conforms |
| Cl. 10.5 | Bearings- Adequate arrangement for lubrication of bearings shall be provided. The bearings should be reasonably dust proof and shall be properly aligned. | Arrangement for lubrication of bearings is provided and The bearings are reasonably dust proof and properly aligned. | Conforms |

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| Cl. 10.6 | Spools , As per IS :7230 :2001 (Refer fig. 2) (Plain Spool) | | |
| | Both faces of spool coming in contact with disc face shall be finished for proper gripping (For type B spool) | Both faces of spool coming in contact with disc faces are properly finished. | Conforms |
| A | 175, 225 ± 2 | 220 | Does not Conform |
| B | 150, 160 ± 2 | 150.27 | Conforms |
| C | 95 ± 2 | 80.20 | Does not Conform |
| D | 66 ± 1 | 70.10 | Does not Conform |
| E | 12 ± 2 | 13.75 | Conforms |
| F | 20, 30± 2 | 31.0 | Conforms |
| G | 15, 16 | 16 | Conforms |
| H | 15, 18 | 18 | Conforms |
| J | 130, 140 ± 2 | 128 | Conforms |
| Cl. 10.7 | Operation & maintenance manual and set of tools including adjustable wrench and grease gun should be provided. | Provided. | Conforms |
| Cl. 10.8 | Finish & workmanship | | |
| Cl. 10.8.1 | Welding of various parts shall be satisfactory in all respect. | Welding is rigid and satisfactory in all respect. | Conforms |
| Cl. 10.8.2 | The components should be free from pits and other visual defects. | The components are free from pits and other visual defects. | Conforms |
| Cl. 10.8.3 | The exposed metallic parts shall be free from rust and shall have protective coating. | Exposed parts are painted. | Conforms |

| | | | |
|-------------------|---|------------------|-------------------------|
| Cl. 10.9 | Marking | | |
| Cl. 10.9.1 | Each harrow shall be marked with the following particulars :- | | |
| | a) Manufacturer's name & trade mark if any | Marked | Conforms |
| | b) Type and size | Only type Marked | Partially Conforms |
| | c) Batch and code number | Not Marked | Does not Conform |

| | | | |
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| IMP-2011/381 | TRACTOR MOUNTED DISC HARROW, (DELUXE-7×7) | COMMERCIAL | 11 |
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8. FIELD PERFORMANCE TEST

The field test of mounted disc harrow was operated at Institute Farm for 25.0 hrs. Tractor was used TAFE-241 DI for operated the harrow. The working of disc harrow was observed to be satisfactory. During the field test, data was collected and analyzed for quality of work, rate of work and fuel consumption of prime mover and draft of implement. The details of test results are given in **Annexure- II and summarized in Table I. The brief specifications of Tractor are given in Annexure- I.**

Table- I

Summary of field performance test

| Sl. No. | Parameter | Range |
|---------|--------------------------------------|----------------------------------|
| 1 | Soil moisture (%) | 18.5 to 19.2 |
| 2 | Av. Wheel sleep (%) | 3.76 to 4.93 |
| 3 | Av. Speed of operation (kmph) | 3.82 to 4.08 |
| 4 | Av. Depth of cut (cm) | 14.53 to 16.70 |
| 5 | Av. Working Width (m) | 1.97 to 2.05 |
| 6 | Area covered (ha/hr) | 0.660 to 0.686 |
| 7 | Fuel consumption (l/hr) (l/ha) | 4.600 to 4.950 6.969 to 7.439 |
| 8 | Soil type | Sandy loam |
| 9 | Field efficiency (%) | 83.01 to 88.94 |

8.1 Rate of work

The average area covered was recorded as 0.660 to 0.686 ha/hr. at average operating speed 3.82 to 4.08 kmph. The field efficiency of disc harrow was recorded as 83.01 to 88.94 %.

8.2 Quality of work

Field performance of the harrow was observed to be satisfactory. Average depth of cut was recorded as 14.53 to 16.70 cm.

8.3 Rate of wear of disc (on mass basis) for 25.0 hour of field operation

| Sl. No. | Initial weight, gm | Final weight after 25.0 h, gm | Weight loss, gm | Wear after 25.0 h, % | Wear (%) per hour |
|---------|--------------------|-------------------------------|-----------------|----------------------|-------------------|
| 1 | 6635 | 6615 | 20 | 0.30 | 0.01 |
| 2 | 6700 | 6675 | 25 | 0.37 | 0.01 |
| 3 | 6675 | 6655 | 20 | 0.29 | 0.01 |
| 4 | 6715 | 6700 | 15 | 0.22 | 0.88 |
| 5 | 6690 | 6650 | 40 | 0.59 | 0.02 |
| 6 | 6672 | 6622 | 50 | 0.74 | 0.02 |

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| IMP-2011/381 | TRACTOR MOUNTED DISC HARROW, (DELUXE-7×7) | COMMERCIAL | 12 |
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8.4 Labor requirement

One skilled labor required to operate the tractor and implement.

9.0 EASE OF OPERATION, ADJUSTMENT AND SAFETY

- i) The gang angle can be adjusted easily and no difficulty was observed in operation and Adjustment of harrow for field operation.
- ii) Overall operation and adjustment of disc harrow was observed to be satisfactory.

10.0 LUBRICATION AND SERVICING

Before starting for field tests, the nut and bolts were tightened and greasing done to keep the machine in proper running condition in the absence of any literature.

11. DEFECTS, BREAKDOWNS AND REPAIRS

No breakdown observed during 25.0 h field test.

12. COMMENTS AND RECOMMENDATIONS

- 12.1 Specification of three point linkage does not conform to IS: 4468- 2001 (Pt.1). This should Be made as per relevant Indian Standard.
- 12.2 Specification for plain spool does not conform to IS: 7230- 2001. This should be made as per relevant Indian Standard.
- 12.3 Specification of disc partially conform to IS: 4366-2001 (pt.1)
- 12.4 The schedule of servicing and maintenance of harrow should be supplied with the machine.
- 12.5 Maneuverability of tractor with harrow and quality of work were observed to be satisfactory.
- 12.6 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.

13. LITERATURE

Literature was not supplied with the machine. Therefore, a manual literature containing operating instruction and maintenance, service schedule, part catalogue etc. Should be developed for user as per the relevant IS: 8132-1983.


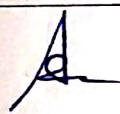



14. APPLICANT'S COMMENTS:

1- we will improve the dimensions and specification as per the requirement of IS :4468 - 2001 (pt.1) .

2- we will improve the dimensions and specifications, for plain spool as per the requirement of IS : 30-2001 .

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- |  |

THIS TEST REPORT IS VALID FROM 26.09.2022 TO 25.09.2029

| | | | |
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| IMP-2011/381 | TRACTOR MOUNTED DISC HARROW, (DELUXE-7×7) | COMMERCIAL | 14 |
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ANNEXURE-1

BRIEF SPECIFICATIONS OF THE TRACTOR USED DURING FIELD TEST

| | | |
|----|---|---|
| 1 | Make, model and type | TAFE- 241 DI , Four wheel, Agricultural tractor |
| 2 | Number of cylinders | 3 |
| 3 | Maximum PTO power, Kw | 28.5 |
| 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 | 1940 |
| 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, 6.00 - 16.8PR |
| | Rear | Two, 13.6 - 28.12 PR |
| 11 | Standard track width, mm : | |
| | - Front | 1380 |
| | - Rear | 1420 |
| 12 | Wheel base, mm | 1810 |
| 13 | Ballast condition | Used as Un ballast |
| 14 | Total Operational Mass, kg : | |
| | - Front | 740 |
| | - Rear | 1200 |

| | | | |
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| IMP-2011/381 | TRACTOR MOUNTED DISC HARROW, (DELUXE-7×7) | COMMERCIAL | 15 |
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| | | |
|--|---------|------|
| | | |
| | - Total | 1940 |

ANNEXURE: II

FIELD PERFORMANCE TESTS RESULTS

| | | |
|-------------------|---|------------------------------------|
| Name of implement | : | Tractor mounted disc harrow- (7×7) |
| Place of test | : | Institute farm |
| Type of soil | : | Sandy loam |

| Sl. No | Parameter/operation | TEST TRIALS | | | |
|--------|------------------------------|-------------|----------|----------|----------|
| | | I | II | III | IV |
| 1 | Date of test | 17-02-22 | 18-02-22 | 19-02-22 | 21-02-22 |
| 2 | Duration of test, hr | 6.0 | 6.0 | 7.0 | 6.0 |
| 3 | Gear used | L-2 | | | |
| 5 | Type of soil | Sandy loam | | | |
| 6 | Soil moisture, % | 18.5 | 19.2 | 18.8 | 19.2 |
| 9 | Av. speed of operation, kmph | 3.88 | 4.08 | 3.82 | 4.00 |
| 10 | Av. Wheel slippage, % | 4.56 | 3.76 | 4.93 | 4.16 |
| 11 | Av. Depth of cut, cm | 16.70 | 15.30 | 15.50 | 14.53 |
| 12 | Av. Working width, m | 2.05 | 2.04 | 1.99 | 1.97 |
| 13 | Area covered, ha/hr | 0.660 | 0.686 | 0.676 | 0.660 |
| 14 | Time required for one ha/ h | 1.515 | 1.503 | 1.470 | 1.515 |
| 15 | Field efficiency, % | 83.01 | 82.45 | 88.94 | 83.75 |
| 16 | Fuel consumption | | | | |
| | - l/hr | 4.600 | 4.950 | 4.800 | 4.650 |
| | - l/ha | 6.969 | 7.439 | 7.056 | 7.044 |

| | | | |
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| IMP-2011/381 | TRACTOR MOUNTED DISC HARROW, (DELUXE-7×7) | COMMERCIAL | 16 |
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ANNEXURE: III

SYMBOL AND ABBREVIATION

SYMBOLS

I- Symbols assigned to basis SI unit

| Sl. No. | Physical quantity | Name of SI unit | Symbol |
|---------|-------------------|-----------------|--------|
| 1 | Length | Meter | m |
| | | Millimeter | mm |
| 2 | Mass | Kilogram | kg |
| | | Gram | g |
| | | Ton | t |
| 3 | Time | Second | s |

II - Symbols assigned to some derived units

| Sl. No. | 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 | hr |
| 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. |

| | | | |
|---------------------|--|-------------------|-----------|
| IMP-2011/381 | TRACTOR MOUNTED DISC HARROW, (DELUXE-7×7) | COMMERCIAL | 17 |
|---------------------|--|-------------------|-----------|

| | | | | | |
|--------------|---|------|-----------------------|---|-----|
| Not Recorded | : | N.R. | Percent | : | % |
| Reference | : | Ref. | Revolution per minute | : | rpm |
| Diameter | : | Ø | | | |