

(यह परीक्षण रिपोर्ट 30/09/2023 तक वैध है। / THIS TEST REPORT IS VALID UP TO : 30/09/2023)



JOHN DEERE 5310 V6 TRACTOR



सत्यमेव जयते

भारत सरकार

कृषि एवं किसान कल्याण मंत्रालय
कृषि, सहकारिता एवं किसान कल्याण विभाग
मशीनीकरण एवं प्रौद्योगिकी प्रभाग

GOVERNMENT OF INDIA

MINISTRY OF AGRICULTURE AND FARMERS WELFARE

(Department of Agriculture, Cooperation & Farmers Welfare, Mechanization & Technology Division)

केन्द्रीय कृषि मशीनरी प्रशिक्षण एवं परीक्षण संस्थान
ट्रैक्टर नगर, बुदनी (म.प्र.) ४६६ ४४५

CENTRAL FARM MACHINERY TRAINING & TESTING INSTITUTE

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T- 1473/2000/2020

JOHN DEERE 5310 V6 TRACTOR - Commercial (Initial)

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- Manufacturer** : M/s. John Deere India Private Limited
Gat No . 166 - 167 & 271 - 291,
Off Pune - Nagar Road, Sanaswadi,
Pune- 412 208
- Location of manufacturing plant** : i) M/s. John Deere India Private Limited
Gat No . 166 - 167 & 271 - 291,
Off Pune - Nagar Road, Sanaswadi,
Pune- 412 208
- ii) M/s. John Deere India Private Limited
Survey No. 501, Village – Khatamba
Jamgod, Dewas Bhopal Highway,
Dewas (Madhya Pradesh) 455115
- Test requested by (applicant)** : The manufacturer
Selected for test by : The testing authority
Place of running-in : At manufacturer's work place
Duration of said running-in, (h):
- Engine : 12
- Transmission : 12
Method of Selection : The test sample was selected randomly out
of Five tractors from the production line by
the representative of testing authority.

Details of tractors made available for random selection :

| Sr. No. | Chassis Number |
|---------|-------------------|
| i) | 1PY5310EALA046650 |
| ii) | 1PY5310EJLA046644 |
| iii) | 1PY5310ELLA046648 |
| iv) | 1PY5310ELLA046645 |
| v) | 1PY5310EHLA046649 |

1. SPECIFICATIONS

- 1.1 Tractor:**
Make : John Deere
Model : 5310 V6
Brand Name : None
Variants, if any : None
Type : Four wheeled, Four wheel driven (4WD), Unit
Construction, General purpose, Agricultural
tractor.
Month & Year of manufacture : 02 / 20
Chassis number : 1PY5310EALA046650
Country of origin : India
- 1.2 Engine:**
Make : John Deere
Model : 3029HPY60
Type : Four stroke, Liquid cooled, turbocharged,
Direct injection, Diesel engine.
Serial number : PY3029H136078



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JOHN DEERE 5310 V6 TRACTOR - Commercial (Initial)

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16. SUMMARY OF OBSERVATIONS, COMMENTS & RECOMMENDATIONS

16.1 On the basis of tests conducted the performance results have been summarized as evaluative (mandatory) and non-evaluation (not-mandatory) parameter applicable for qualifying Minimum Performance Criteria as per Clause-4 (Table-1) of IS: 12207-2019 for acceptance of the tractor for the purpose of subsidies/NABARD financing are summarized as under:-

| S. No. | Characteristic | Category (Evaluative / Non Evaluative) | Requirements as per IS: 12207-2019 | Values declared by the applicant (D) / Requirement (R) | As observed | Whether meets the requirements (Yes/No) |
|---------------|---|--|---|--|-------------|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 16.1.1 | PTO Performance : | | | | | |
| a) | Max. power under 2 h test, (kW) (Natural ambient condition) | Evaluative | Declared value to be achieved with a tolerance of: $\pm 5\%$ for PTO power or engine power >26 kW, $\pm 10\%$ for PTO power or Engine power ≤ 26 kW. | 36.4 (D) | 34.7 | Yes |
| b) | Power at rated engine speed, (kW) | Non Evaluative | -do- | 36.4 (D) | 34.4 | No |
| c) | Specific fuel consumption corresponding to maximum power, (g/kWh) | Evaluative | + 10% Max. | 325 (D) | 296 | Yes |
| d) | Maximum equivalent crankshaft torque, (Nm) | Non Evaluative | $\pm 8\%$ | 231 (D) | 194.0 | No |
| e) | Back-up torque, percent | Evaluative | 12 percent, min. | 12 % (R) | 41.6 | Yes |
| f) | Maximum operating temperature($^{\circ}$ C) | | | | | |
| | 1) Engine oil | Evaluative | The declared value should not exceed the max. value specified by the oil company and the observed value under high ambient condition should not exceed the declaration. | 135 (D) | 120 | Yes |
| | 2) Coolant (liquid) | Evaluative | The declared value should not exceed the boiling temperature of coolant under the pressurized or otherwise and the observed value under high ambient condition should not exceed the declaration. | 118 (D) | 105 | Yes |
| g) | Engine oil consumption, (g/kWh) | Evaluative | Not exceeding 1% of SFC at max. power under High ambient conditions | 2.96 (Maximum) (R) | 0.39 | Yes |
| h) | Smoke level, (m^{-1}) | Evaluative | Maximum light absorption coefficient of 3.25 per metre or equivalent BOSCH No. 5.2 or 75 Hatridge value (As per CMVR) | 3.25 (Maximum) (R) | 0.63 | Yes |



| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---------------|---|----------------|---|-------------------------------------|-------|-----|
| 15.1.2 | Drawbar performance: | | | | | |
| a) | Maximum drawbar pull with ballast corresponding to 15 percent wheel slip, (kN) | Non Evaluative | Minimum 70% of static mass with ballast | 22.58 (D) 22.52 Minimum (R) | 28.38 | Yes |
| b) | Maximum drawbar pull with unballast corresponding to 15 percent wheel slip, (kN) | Evaluative | Minimum 70% of static mass of tractor without / standard ballast | 16.54 (D) 16.52 (Minimum) (R) | 22.35 | Yes |
| c) | Maximum drawbar power without ballast, or with standard ballast as the case may be, kW | Evaluative | Minimum 80 % of PTO power as referred in SI No. i) a) of PTO performance in case of tractors having total static mass > 1500 kg Minimum 75 % of PTO power as referred in SI No. i) a) of PTO performance in case of light weight tractors having 1500 kg total static mass of tractor Minimum 75 % of the engine power as referred in SI No. i) a) of engine performance in case of tractors which do not have a PTO shaft. | 29.12 (D) 27.8 Minimum (R) | 27.8 | Yes |
| d) | Maximum transmission oil temperature (°C) | Evaluative | The declared value should not exceed the maximum value specified by oil company | 110 (D) | 103 | Yes |
| 16.1.3 | Power lift and hydraulic pump performance : | | | | | |
| a) | Maximum lifting capacity throughout the range of lift, (kN): | | | | | |
| 1) | At hitch points | Evaluative | ±10 percent | 17.50 (D) | 18.54 | Yes |
| 2) | With the standard frame | Evaluative | The lift capacity should at least be 24 kg/PTO kW. and it should be 21.5 kg/engine kW where the tractor is not provided with a PTO shaft | 12.90 (D) 8.17 Minimum (R) | 15.31 | Yes |
| b) | Maximum drop in the height of the point of application of the force after each 5 minutes interval for a total duration of 30 minute, (mm) | Non Evaluative | The observed value should not exceed 50 mm | 50 (D) 50 Maximum (R) | 00 | Yes |
| 16.1.4 | Brake performance at 25 kmph: | | | | | |
| a) | Maximum stopping distance at a force, equal to or less than 600 N on brake pedal with unballast, (m): | | | | | |
| 1) | Cold brake | Evaluative | 10 | 10 (R) | 8.16 | Yes |
| 2) | Hot brake | Evaluative | 10 | 10 (R) | 8.21 | Yes |



| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|----------------|---|--|---|-----|
| b) | Maximum force exerted on the brake pedal to achieve a deceleration of 2.5 m/s ² (N) | Evaluative | 600 | 600 (R) | 252 to 314 | Yes |
| c) | Whether parking brake is effective at a force of 600 N at foot pedal(s) or 400 N at hand lever, N | Evaluative | Yes / No | Yes (R) | 277 | Yes |
| 16.1.5 Noise measurement : | | | | | | |
| a) | Maximum ambient noise emitted by the tractor dB(A) | Evaluative | As per CMVR | 88 (R) | 81 | Yes |
| b) | Maximum noise at operator's ear level dB(A) | Evaluative | As per CMVR | 96 (R) | 94 | Yes |
| 16.1.6 Amplitude of mechanical vibrations at : | | | | | | |
| 1) | Left foot rest | Non Evaluative | 100 microns (max) | 100(R) | 175 | No |
| 2) | Right foot rest | | -do- | | 237 | No |
| 3) | Seat (with driver seated) | | -do- | | 99 | Yes |
| 4) | Steering wheel | | do- | | 43 | Yes |
| 16.1.7 Air cleaner oil pull over: | | | | | | |
| | Maximum air cleaner oil pull over | Evaluative | 0.25 % (max.) | Dry type air cleaner is fitted | Not applicable | |
| 16.1.8 Haulage requirements: | | | | | | |
| a) Gross mass of the trailers, (tones): | | | | | | |
| 1) | Two wheel | Non | -- | 5.0 (D) | 5.0 | Yes |
| 2) | Four wheel | Evaluative | -- | 7.0(D) | 7.0 | Yes |
| b) Distance travelled / litre of fuel consumption, (km/l): | | | | | | |
| 1) | Two wheel | Non Evaluative | -- | 4.0 to 6.0 (D) | 3.34 to 3.38 | No |
| 2) | Four wheel | | -- | 4.0 to 6.0 (D) | 3.05 to 3.16 | No |
| c) Fuel consumption (ml/km/tonne): | | | | | | |
| 1) | Two wheel | Non Evaluative | -- | 30 to 40 (D) | 59.2 to 60.0 | No |
| 2) | Four wheel | | -- | 30 to 40 (D) | 45.3 to 46.8 | No |
| 16.1.9 Wetland cultivation : | | | | | | |
| | Sealing for the following assemblies: | Evaluative | The identified assemblies should essentially meet the requirement of IS: 11082. No water ingress in the identified assembly given in column-2. If tractor does not meet the requirements of wetland cultivation, it may be recommended for dry land operation only. | There should be no ingress of water and / or mud (R) | No ingress of water and / or mud was observed | Yes |
| 1) | Clutch assembly | -do- | | | | |
| 2) | Brake housings | -do- | | | | |
| 3) | Front axle housing & final drive portal oil | -do- | | | | |
| 4) | Engine Oil | -do- | | | | |
| 5) | Transmission Oil | -do- | | | | |



| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|--|---|----------------|---|---|---|-----------------------------|
| 16.1.10 Safety features : | | | | | | |
| a) | Guards against moving and hot parts | Evaluative | Belt drives, pullies, silencer, hydraulics pipes(as per IS-12239 Part 2) | | Meet the requirements | Yes |
| b) | Lighting arrangement | Evaluative | As per CMVR | | Meet the requirements | Yes |
| c) | Seating requirements (Tractors having more than 1150 mm rear track width) | Non Evaluative | Should meet the requirements of IS: 12343 (As amended from time to time) | | Does not meets the requirements | No |
| d) | Technical requirements for PTO shaft | Evaluative | Should meet the requirements of IS: 4931 (As amended from time to time) | | Meet the requirements | Yes |
| e) | Dimensions of three point linkage | Non Evaluative | Should meet the requirements of IS: 4468 (Part-I) (As amended from time to time) | | Meet the requirements | Yes |
| f) | Specifications of linkage drawbar | Evaluative | Should meet the requirements of IS 12953 (As amended from time to time) | | Meet the requirements | Yes |
| g) | Specifications of Swinging drawbar (wherever fitted) | Evaluative | Should meet the requirements of IS 12362 (Part 3) (As amended from time to time) | | Not provided | Not applicable |
| h) | 1) Maximum travelling speed at rated engine speed in reverse gears, kmph | Evaluative | Should not exceed 20 kmph | | 22.37 kmph | Audible warning is provided |
| | 2) Audible warning signal on tractor. | Evaluative | As soon as the travelling speed in reverse gear reaches to 20 kmph, an audible warning signal on tractor shall be activated. | | Audible warning signal is activated, when C-R gear selection combination is engaged | Yes |
| 16.1.11 Labelling of tractors (Provision of labelling plate): | | | | | | |
| | 1) Make | Evaluative | Should conform to the requirements of CMVR along with maximum declared value of PTO power in kW and for month & year of manufacture in numerical MM YY Digit 01-12 in box No.1 for MM will represent the month and next two digit in the box No.2 for YY will represent the year of manufacturing | | John Deere | Yes |
| | 2) Model | Evaluative | | | 5310 V6 | Yes |
| | 3) Month & Year of manufacture | Evaluative | | | 02 / 20 | Yes |
| | 4) Engine number | Evaluative | | | PY3029H136 078 | Yes |
| | 5) Chassis number | Evaluative | | | 1PY5310EAL A046650 | Yes |
| | 6) Declaration of PTO power, kW | Evaluative | | | 36.4 | Yes |



| | |
|--------------------------|---|
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|--------------------------|---|

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|----------------|---|----------------|--|---|--------------------|----------------|
| 16.1.12 | Discard limit for: | | | | | |
| (a) | Cylinder bore diameter, (mm) | Evaluative | To be specified by Manufacturer | 106.62(D) | 106.490 to 106.499 | Yes |
| (b) | Clearance between piston & cylinder liner at skirt, (mm) | Non Evaluative | | 0.32 (D) | 0.138 to 0.144 | Yes |
| (c) | Piston diameter at skirt, (mm) | Non Evaluative | | 106.30 (D) | 106.355 to 106.360 | Yes |
| (d) | Ring end gap (mm): | | | | | |
| | - Top comp. ring. | Evaluative | -do- | 0.75 (D) | 0.45 to 0.50 | Yes |
| | - 2 nd comp. ring. | | -do- | 2.00 (D) | 0.70 to 0.75 | Yes |
| | - Oil ring. | | -do- | 0.75 (D) | 0.55 | Yes |
| (e) | Ring groove clearance (mm): | | | | | |
| | - Top comp. ring. | Evaluative | -do- | -- | --Tapered-- | Not applicable |
| | - 2 nd comp. ring. | | -do- | 0.25 (D) | 0.025 to 0.050 | Yes |
| | - Oil ring. | | -do- | 0.92 (D) | 0.047 to 0.055 | Yes |
| (f) | Diametrical clearance of main bearings (mm): | Evaluative | -do- | 0.65 (D) | 0.087 to 0.125 | Yes |
| (g) | Clearance of big end bearings, (mm): | | | | | |
| | - Diametrical | Evaluative | -do- | 0.65 (D) | 0.117 to 0.142 | Yes |
| | - Axial | Evaluative | -do- | 0.85 (D) | 0.30 to 0.35 | Yes |
| (h) | Crankshaft end float, mm | Evaluative | -do- | 0.85 (D) | 0.30 | Yes |
| (j) | Clearance between king pin and bush, (mm) | Non Evaluative | -do- | Tapered roller bearings of size 725.06.009.01-1 is provided | | Not applicable |
| (k) | Clearance between center pin and bush, (mm) | Non Evaluative | -do- | 0.80 (D) | 0.05 to 0.06 | Yes |
| 16.1.13 | Literature (Submission to test agency) | | | | | |
| (a) | Operator manual | Evaluative | Provided / Not Provided | Provided | Provided | Yes |
| (b) | Parts Catalogue | Evaluative | Provided / Not Provided | Provided | Provided | Yes |
| (c) | Workshop/ Service manual | Evaluative | Provided / Not Provided | Provided | Provided | Yes |
| 16.1.14 | Fitment of Roll Over Protective Structure (ROPS): for tractors having more than 1150 mm rear track width | Evaluative | ROPS should meet the requirement of IS:11821 or OECD code or equivalent International Standard | Provided | Not Fitted | Not Applicable |
| 16.1.15 | Standard accessories | Evaluative | Trailer hitch, front tow hook, linkage drawbar should be provided with tractor | Provided | Provided | Yes |
| 16.1.16 | Accessories (Optional) | Non Evaluative | Ballast weights if fitted should meet the requirement of CMVR. | Provided | Provided | Yes |



| 16.2 CATEGORY OF BREAKDOWNS / DEFECTS (As per clause 5.0 of IS:12207-2019): | | | | | |
|---|-----------------------|--|---|-------------|---|
| S. No. | Category of Breakdown | Category (Evaluative / Non Evaluative) | Requirements as per IS: 12207-2019 | As observed | Whether meets the requirement (Yes/No.) |
| 1. | Critical breakdown | Evaluative | There is no 'critical breakdown' during the course of testing | None | Yes |
| 2. | Major breakdowns | Evaluative | There are not more than 2 major breakdowns and neither of them is of repetitive nature | None | Yes |
| 3. | Minor breakdowns | Evaluative | There are not more than 3 minor defects during the test and the frequency of each is not be more than two | None | Yes |
| 4. | Total breakdowns | Evaluative | In no case, the total number of breakdowns should exceed five that is, (2 major + 3 minor) or (1 major + 4 minor) or 5 minor breakdowns | None | Yes |

16.2 Conformity with following IS:

- i) Guide lines for declaration of power and specific fuel consumption and labelling of agricultural tractors [IS10273: 1987 (Reaffirmed 2014)] : Conforms
- ii) Agricultural tractors - Rear mounted power take-off - Types 1, 2 and 3 [IS:4931-1995 (Reaffirmed 2014)] : Conforms
- iii) Agricultural wheeled tractors - Rear mounted three-point linkage: Part 1 Categories 1, 2, 3 & 4 (fourth revision) [IS 4468(Part-I):1997/ISO 730-1:1994 (Reaffirmed in Oct.,2017)] : Conforms
- iv) Drawbar for agricultural tractors – Link type [IS 12953:1990 (Reaffirmed 2007)] : Conforms
- v) Agricultural tractors - Operator's seat technical requirement [IS 12343 –1998 (Reaffirmed 2014)] : **Does not conform**
- vi) Guide for safety & comfort of operator of agricultural tractors: Part 1 General requirements: [IS 12239 (PT-1) 1996/ISO 4254-1:1989 (Reaffirmed Oct., 2017)] : Conforms
- vii) Tractors and machinery for agriculture and forestry – Technical means for ensuring safety Part 2: Tractors (IS 12239 (PT-2) 1999) (Reaffirmed- 2014)] : **Does not conform**
- viii) Guide lines for location and operation of operator controls on agricultural tractors and machinery (IS: 8133-1983 (Reaffirmed 2014)] : Conforms
- ix) Tractors and machinery for agriculture and forestry, powered lawn and garden equipment - Symbols for operator controls and other displays Part 2 Symbols for agricultural tractors and machinery [IS:6283 (Part-1)- 2006 and IS: 6283 (Part-2)-2007 (Reaffirmed 2014)] : Conforms
- x) Agricultural Tractors and Machinery - Lighting device for travel on public roads (IS: 14683-1999) (Reaffirmed 2014)] : Conforms



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16.3 Salient Observations:

16.3.1 Laboratory tests:

16.3.1.1 PTO Performance Test:

- i) The maximum PTO power was recorded as **34.7 kW** against the declaration of **36.4 kW**, which meets the requirement of IS: 12207-2019 with regard to tolerance limit.
- ii) The rated PTO power was recorded as **34.4 kW** against the minimum requirement of **34.6 kW** and hence does not meet the requirement of IS:12207-2019 with regard to tolerance limit. Therefore, this should be looked into for necessary corrective action.
- iii) The maximum PTO power was located at **2200 rpm** of engine speed, which is **8.3%** lower than the declared rated engine speed of **2400 rpm**. This indicates that, the setting of fuel injection pump is not proper and should be looked into at production level.
- iv) The specific fuel consumption corresponding to maximum power was recorded as **296 g/kWh** against the declaration of **325 g/kWh**, which is within the tolerance limit of IS: 12207-2019.
- v) The maximum equivalent crankshaft torque was recorded as **194.0 N-m** against the declaration **231.0 N-m**, which does not meet the requirement of IS:12207-2019 with regards to tolerance limit. Therefore, this should be looked into for necessary corrective action.
- vi) The backup torque is **41.6 %** and meets the evaluative requirement of IS: 12207-2019.
- vii) The drop in maximum PTO Power of **6.1 %** was recorded between natural and high ambient condition, which is considered to be on higher side. Therefore, this should be looked into for necessary corrective action.

16.3.1.2 Drawbar performance test:

During ten hours drawbar performance test, creeping of LHS & RHS rear tyre over the rims was recorded as **10 mm & 20 mm** respectively. This should be looked into for necessary corrective action.

16.3.1.3 Hydraulic performance test:

- i) The lifting capacity with coupled frame was recorded as **15.31 kN** and the moment about rear axle was computed as **24.42 kN-m**, whereas moment about front axle is computed as **20.11 kN**. The moment about rear axle at with coupled frame is on higher side as compared to moment about front axle. It is therefore recommended that the lifting capacity of hydraulic system may be reduced suitably or standard ballast recommendation may be reviewed to avoid front lifting of tractor.
- ii) The rotation of standard frame mast has been recorded as **9 degree** against the minimum requirement **10 degree** over the full range of lift. This should be looked into for necessary corrective action while designing three point linkage geometry.

16.3.1.4 Mechanical Vibration:

The amplitude of mechanical vibration on various assemblies / components marked as (*) in Chapter – 8 of this test report is on higher side. This calls for dampening down of vibrations especially on left & right foot rest to improve the operational comfort and service life of components.

**16.3.1.5 Three point linkage:**

Some of the parameters of three point linkage conform to Cat. I and some of them conform to Cat.II. Keeping in view the spirit of standardization, necessary improvement may be incorporated.

16.3.1.6 Haulage test:

- i) Distance travelled / litre of fuel consumption with two wheel and four wheel trailer has been recorded as **3.34 to 3.38** and **3.05 to 3.16 km/l** against the declaration of **4.0 to 6.0** and **4.0 to 6.0 km/l** respectively and does not meet the requirement of IS: 12207-2019 with regards to tolerance limit. This should be looked into for necessary corrective action at production level.
- ii) Specific fuel consumption with two wheel and four wheel trailer has been recorded as **59.2 to 60.0** and **45.3 to 46.8 ml/km/tonne** against the declaration of **30 to 40** and **30 to 40 ml/km/tonne** respectively and does not meet the requirement of IS: 12207-2019 as regards to tolerance limit. This should be looked into for necessary corrective action at production level.

16.4 Maintenance / Service Problems:

No noticeable maintenance / service problem was observed during the test.

16.5 Recommendation with regard to safety on tractor:

The following requirements, inter alia, may be considered for incorporation on the tractor:

- i) Working clearance between hydraulic position control lever and mudguard is less than the minimum requirement
- ii) Longitudinal distance from seat index point to differential lock pedal should be as per relevant standard.

16.6 Adequacy of Literature supplied with machine:

Following literatures of tractor models was supplied with the test sample for reference during the test.

- i) Operator's Manual of John Deere 5310 V1, 5310 V3, 5310 V4, 5310 V5, 5310 V6, 5050E, 5120, 5055E, 5060E, 5065E, 5075E and 5405 tractor models
- ii) Parts Catalogue Part-1 & Part-2 of John Deere 5310 V1, 5310 V3, 5310 V4, 5310 V5 and 5310 V6 tractor models
- iii) Workshop Service / Technical Manual Part-1, Part-2 & Part-3 of John Deere 5310 V1, 5310 V3, 5310 V4, 5310 V5, 5310 V6, 5050E, 5120, 5055E, 5060E, 5065E, 5075E and 5405 tractor models

16.6.1 The supplied literature was found adequate, except the following:-

- i) Oil change period of transmission, hydraulic, brake, steering and front axle housing is very frequent, whereas different oil grades are available in the market which has more oil change period.

16.7 However, these literatures should be brought out in other vernacular languages of India for guidance of users



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17. CITIZEN CHARTER

| Time frame for testing & evaluation as per citizen charter | Duration of Test | Whether the report released within time frame given in the citizen charter | Remark |
|--|--|--|--------|
| 10 Months | 06 Months (March, 2020 to August, 2020) | Yes | --- |

TESTING AUTHORITY:RAJNEESH PATEL
AGRICULTURAL ENGINEERC.V. CHIMOTE
TEST ENGINEER
J.J.R. NARWARE
DIRECTOR**18. APPLICANT'S COMMENTS**

| Para No. | Our Reference | Applicant's comments |
|----------|-----------------------------------|--|
| 18.1 | 16.3.1.1 (ii), (iii), (v) & (vii) | Your valuable comments and suggestions for improvements are well taken under our policy of continuous product improvement. These aspects are further being looked into and will try to eliminate these deviations soon wherever necessary. |

**ANNEXURE - I****BRIEF SPECIFICATION OF IMPLEMENTS USED DURING FIELD TEST**

| S.No. | Item | Disc Plough | Rotavator |
|-------|----------------------------------|---------------|-----------------|
| 1. | Make | Mahindra | Agristar |
| 2. | Type | Mounted | Mounted |
| 3. | No. of bottom/blades | Three | 36, in 7 flange |
| 4. | Type of bottom/blades | Plain concave | Hatchet shape |
| 5. | Size of bottom/blades, (mm) | 660 | 280 x 86 x 7 |
| 6. | Spacing of bottom/flanges, (mm) | 505 | 245 |
| 7. | Lower hitch point span, (mm) | 780 | 840 |
| 8. | Mast height, (mm) | 460 | 600 |
| 9. | Overall dimensions, (mm): | | |
| | - Length | 1950 | 1070 |
| | - Width | 1340 | 1795 |
| | - Height | 1190 | 1075 |
| 10. | Gross mass, (kg) | 355 | 435 |

Annexure- II**BRIEF SPECIFICATION OF FULL CAGE WHEEL**

| S. No. | Items | Specifications |
|--------|---------------------------------|---|
| 1. | Type | Full cage wheel |
| 2. | Dia, (mm) | 1160 |
| 3. | Width, (mm) | 850 |
| 4. | No. and types of lugs | 12, straight lugs made up of MS-angle section welded to angle iron frame. |
| 5. | Size of angle section, (mm) | 50 x 45 x 5 |
| 6. | Length of lugs, (mm) | 420 |
| 7. | Spacing of lugs, (mm) | 325 |
| 8. | Weight of each cage wheels (kg) | 135 |

ANNEXURE -III**TRACTOR RUN HOURS DURING TEST**

| A. | LABORATORY AND TRACK TESTS: | HOURS |
|---------------|--|---------------|
| 1. | Running-in | 24.00 |
| 2. | PTO performance test | 13.50 |
| 3. | Drawbar performance test | 19.17 |
| 4. | Power lift and hydraulic pump performance test | 3.00 |
| 5. | Turning ability | 0.33 |
| 6. | Location of centre of gravity | 0.33 |
| 7. | Operator's field of vision | 0.17 |
| 8. | Brake test | 2.33 |
| 9. | Noise measurement | 2.00 |
| 10. | Mechanical vibration test | 1.16 |
| 11. | Theoretical speed test | 1.00 |
| B. | FIELD TEST: | |
| 1. | M. B. ploughing | 10.42 |
| 2. | Rotavation | 10.08 |
| 3. | Puddling | 15.33 |
| C. | HAULAGE TEST: | 5.48 |
| D. | Miscellaneous test and other run hours including idle run, transportation, trials and preparation for test | 10.96 |
| TOTAL: | | 119.26 |