

व्यावसायिक वैरिएंट परीक्षण रिपोर्ट (प्रथम बैच)

संख्या/No. : T-1619/2150/2022

COMMERCIAL VARIANT TEST REPORT (1st Batch)

माह/Month : January, 2022

[ONLINE TESTING]

(यह परीक्षण रिपोर्ट 31.01.2027 तक वैध है | THIS TEST REPORT IS VALID UPTO: 31.01.2027)



CAPTAIN 200 DI TRACTOR



भारत सरकार

कृषि एवं किसान कल्याण मंत्रालय
(कृषि, सहकारिता एवं किसान कल्याण विभाग)

GOVERNMENT OF INDIA

MINISTRY OF AGRICULTURE AND FARMERS WELFARE

(DEPARTMENT OF AGRICULTURE, CO-OPERATION AND FARMERS WELFARE)

केन्द्रीय कृषि मशीनरी प्रशिक्षण एवं परीक्षण संस्थान

ट्रैक्टर नगर, बुदनी (म.प्र.)-466 445

CENTRAL FARM MACHINERY TRAINING & TESTING INSTITUTE

(An ISO 9001: 2015 Certified Institute)

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Page 1 of 32

| | |
|------------------|--|
| T-1619/2150/2022 | CAPTAIN 200 DI TRACTOR –Commercial Variant (1st Batch) |
| | THIS TEST REPORT IS VALID UPTO: 31.01.2027 |

3. SPECIFICATIONS

- 3.1.1 Tractor:**
- Make : CAPTAIN
Model : 200 DI
Type : Rear wheel drive, Agricultural Tractor
Month & Year of manufacture : 07 / 21
Chassis number : C2210612846
Country of origin : India
- 3.1.2 Engine:**
- Manufacturer's address : M/s. Marshal Motors, 80 feet road, Rajkot (Gujarat), India
Make : Marshal motor
Model : FMW-165M
Type : Four stroke, Liquid cooled, Naturally aspirated, Direct injection, Diesel engine.
Serial number : QG17531
Country of origin : India
- 3.1.2.1 Engine speed (rpm), (Manufacturer's recommended production settings):**
- Maximum speed at no load : 2600 to 2800
- Low idle speed : 900 to 1200
- Speed at maximum torque : 1000 to 1400
- Rated speed, (rpm):**
- For PTO use : 2300
- For drawbar use : 2300
- 3.1.3 Cylinder & Cylinder Head:**
- Number : One
Disposition : Vertical
Bore/stroke, (mm) : 100/114
Capacity as specified by the applicant, (cc) : 895
Compression ratio : 17.5 (±1.0):1
Type of cylinder head : Individual
Type of cylinder liners : Dry, replaceable
Type of combustion chamber : Direct combustion, re-entrant cavity on piston crown.
Arrangement of valves : Overhead
- Valve clearance (cold/hot):**
- Inlet valve, (mm) : 0.10/0.10
- Exhaust valve, (mm) : 0.10/0.10
- 3.1.4 Fuel System:**
- Type of fuel feed system : Gravity
- 3.1.4.1 Fuel tank:**
- Capacity, (l) : 19.7
Location : Above clutch housing
Provision for draining of sediments/ water : Not provided
Material of fuel tank : Metallic (CRC sheet)

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|------------------|--|
| T-1619/2150/2022 | CAPTAIN 200 DI TRACTOR –Commercial Variant (1st Batch) |
| | THIS TEST REPORT IS VALID UPTO: 31.01.2027 |

8. SUMMARY OF OBSERVATIONS, COMMENTS & RECOMMENDATIONS

8.1 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 |
| 8.1.1 | 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. | 10 (D) | 9.5 | Yes |
| b) | Specific fuel consumption corresponding to maximum power, (g/kWh) | Evaluative | + 10% Max. | 285 (D) | 297 | Yes |
| 8.1.2 | Drawbar performance: | | | | | |
| a) | Max. drawbar pull without ballasted corresponding to 15 percent wheel slip, (kN) | Evaluative | Minimum 70% of static mass of tractor without ballast or with standard ballast, as the case may be. | 5.48 (D) 5.9 (R) Minimum | 7.20 | Yes |
| b) | Maximum drawbar power without ballast, (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. | 7.5 (D) 7.1(R) Minimum | 8.6 | Yes |
| c) | For tractors fitted with air conditioned /heated cabin: Maximum drawbar power without ballast, or with standard ballast as the case may be, kW | Evaluative | Minimum 70 % of PTO power as referred in SI No. i) a) of PTO performance in case of tractors having total static mass > 1500 kg | Not fitted | Not applicable | Not applicable |

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|------------------|--|
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| | THIS TEST REPORT IS VALID UPTO: 31.01.2027 |

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|--|---|----------------|---|---------------------------------------|----------------|-----|
| d) | Maximum transmission oil temperature (°C) | Evaluative | The declared value should not exceed the maximum value specified by oil company | 120 (D) | 69 | Yes |
| 8.1.3 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) | Meet the requirements | Not applicable | |
| 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-2) (As amended from time to time) | Does not meet the requirements | No | |
| 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 | 3.60 kmph (Meets the requirement) | Yes | |
| | 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. | Not fitted | Not applicable | |
| 8.1.4 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 | CAPTAIN | Yes | |
| | 2) Model | Evaluative | | 200 DI | Yes | |
| | 3) Month & Year of manufacture | Evaluative | | 07 / 21 | Yes | |
| | 4) Engine number | Evaluative | | QG17531 | Yes | |
| | 5) Chassis number | Evaluative | | C2210612846 | Yes | |
| | 6) Declaration of PTO power, kW | Evaluative | | 10 | Yes | |

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| | THIS TEST REPORT IS VALID UPTO: 31.01.2027 |

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|--------------|---|----------------|--|--------------|------------|----------------|
| 8.1.5 | 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 |
| 8.1.6 | 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 | Not Provided | Not Fitted | Not Applicable |
| 8.1.7 | Standard accessories | Evaluative | Trailer hitch, front tow hook, linkage drawbar should be provided with tractor | Provided | Provided | Yes |
| 8.1.8 | Accessories (Optional) | Non Evaluative | Ballast weights if fitted should meet the requirement of CMVR. | Provided | Provided | Yes |

| 8.2 | 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 1 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 four that is, (1 major + 3 minor) or 4 minor breakdowns | None | Yes |

8.3 Salient Observations:

8.3.1 Laboratory tests:

8.3.1.1 Three point linkage:

- i) The diameter of hitch pin hole of upper hitch point does not meet the requirement of IS:4468-1997(Part-I) (Reaffirmed in 2017). This should be looked into for necessary corrective action. This observation was also made in the previous test report No. T-997/1521/2015 (December, 2015) and no improvement have been made as regards to its conformity so far.
- ii) Lateral distance from of lower hitch point to centre line of tractor does not meet the requirement of IS:4468-1997(Part-I) (Reaffirmed in 2017). This should be looked into for necessary corrective action.

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|-------------------------|--|
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| | THIS TEST REPORT IS VALID UPTO: 31.01.2027 |

- 8.4 Maintenance / Service Problems:**
No noticeable maintenance or service problem was observed during the test.
- 8.5 Recommendation with regard to safety on tractor:**
The following requirements, inter alia, may be considered for incorporation on the tractor:
- i) Hand holds for easy mounting & dismounting of the operator & Spark arrester should be provided in the exhaust system as per the requirement of IS:12239 (Part-2)-1999 (Re-affirmed in January, 2019). This observation was also made in the previous test report No. T-997/1521/2015 (December, 2015) and no improvement have been made as regards to its conformity so far.
 - ii) Fuel shut-off knob does not remain in "STOP" position as per requirement of IS: 8133-1983 (Re-affirmed in 2019). This observation was also made in the previous test report No. T-997/1521/2015 (December, 2015) and no improvement have been made as regards to its conformity so far.
 - iii) Master shield around the PTO shaft should be provided as per the requirement of IS:4931-1995 (Re-affirmed in January, 2019). This observation was also made in the previous test report No. T-997/1521/2015 (December, 2015) and no improvement have been made as regards to its conformity so far.
 - iv) Provision of differential lock as per IS: 12239 (Part-2) – 1999 (Reaffirmed in January, 2019).
 - v) The working clearance between position control lever of hydraulic system and mudguard was observed as 10 mm against the minimum requirement 70 mm as per IS: 12239 (Part-2)-1999 (Re-affirmed in January, 2019). This observation was also made in the previous test report No. T-997/1521/2015 (December, 2015) and no improvement have been made as regards to its conformity so far.
- 8.6 Adequacy of Literature:**
- 8.6.1** Following literature of following tractor models were supplied with the test sample for reference during the test.
- a) Operator's Manual (Captain 200 DI, Captain DI 200 4WD tractors)
 - b) Service Manual (Captain 200 DI, Captain DI 200 4WD tractors)
 - c) Parts catalogue (Captain 200 DI, Captain DI 200 4WD tractors)
- 8.6.2** The manual may be brought out for the guidance of users and service personnel as per IS:8132-1999 incorporating, inter alia, the following:
- i) Engine components details in (Operator's manual, parts catalogue & service manual).
 - ii) Discard limit of all components.
 - iii) Fuel saving tips.

TESTING AUTHORITY:

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| C.V. CHIMOTE TEST ENGINEER |  |
| P. K. PANDEY DIRECTOR |  |

Draft test report compiled by **Pratyush Satya**, Senior Technical Assistant.

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| T-1619/2150/2022 | CAPTAIN 200 DI TRACTOR –Commercial Variant (1st Batch) |
| | THIS TEST REPORT IS VALID UPTO: 31.01.2027 |

9. APPLICANT'S COMMENTS

| Para No. | Our Reference | Applicant's comments |
|-----------------|----------------------|---------------------------------|
| 9.1 | 8.3.1.1, 8.5 & 8.6 | We will take corrective action. |

ANNEXURE – I

TRACTOR RUN HOURS DURING TEST

| A. | LABORATORY AND TRACK TESTS | HOURS |
|--------------|--|--------------|
| 1. | Running-in | 26.0 |
| 2. | PTO performance test | 3.3 |
| 3. | Nominal speed test | 1.7 |
| 4. | Drawbar performance test | 2.5 |
| B. | Miscellaneous test and other run hours including idle run, transportation, trials and preparation for test | 2.5 |
| TOTAL | | 36.0 |