

प्रारंभिक व्यावसायिक परीक्षण रिपोर्ट
INITIAL COMMERCIAL TEST REPORT

संख्या/No. : T-1851/2382/2024
माह/Month : May, 2024

Application Reference No. 28/2022-23/64

(यह परीक्षण रिपोर्ट 31/05/2029 तक वैध है / THIS TEST REPORT IS VALID UPTO 31/05/2029)



Make of Agricultural Tractor : CAPTAIN
Model : 223 4WD
Manufactured by : Captain Tractors Pvt. Ltd.
Padavla Road, Tal.: Kotda Sangani,
Veraval (Shapar)
Dist.: Rajkot – 360 024, Gujarat, India



भारत सरकार

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

GOVERNMENT OF INDIA

MINISTRY OF AGRICULTURE AND FARMERS' WELFARE

(DEPARTMENT OF AGRICULTURE & FARMERS' WELFARE)

केन्द्रीय कृषि मशीनरी प्रशिक्षण एवं परीक्षण संस्थान

ट्रैक्टर नगर, बुदनी (म.प्र.) 466 445

CENTRAL FARM MACHINERY TRAINING & TESTING INSTITUTE

TRACTOR NAGAR, BUDNI (M.P.) 466 445

(An ISO 9001:2015 Certified Institute)

E-mail: fmti-mp@nic.in

Web site: <http://www.fmttibudni.gov.in>

Telephone: 07564-299003

Disclaimer: During hydraulic performance test, the maximum lifting capacity at hitch point throughout the range of lift was observed as 7.80 kN against the declaration of 6.8 kN, which does not meet the evaluative requirement of IS: 12207-2019 with regard to tolerance limit and hence shall not be accepted for subsidies/financing as per clause 3.3.1 of IS: 12207-2019.

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IMPORTANT INFORMATION

The Government of India, Ministry of Agriculture and Farmers' Welfare has directed, vide a OM No. 13-17/2021-M&T(I&P) dated 28.07.2022, that since 15th August, 2022, only mandatory tests will be carried out on a tractor unless applicant has expressly requested for optional tests as well, mentioned in the above captioned OM.

In the instant case, there is no request from the applicant to carry out the optional tests hence only Mandatory Tests, as given below, have been conducted and reported in this report:-

1. PTO performance
2. Hydraulic performance
3. Drawbar performance
4. Brake performance

Month: May	Test Report No.: T-1851/2382/2024	Year: 2024
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TRACTOR NAGAR, BUDNI (MADHYA PRADESH) 466445, INDIA

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[C]	Tractor manufacturer's name and address	:	Captain Tractors Pvt. Ltd. Padavla Road, Tal.: Kotda Sangani, Veraval (Shapar) Dist.: Rajkot - 360 024, Gujarat, India
[C]	Submitted for test by (Applicant)	:	The Manufacturer
[C]	Selected for test by	:	The Ministry vide OM No. 13-17/2021 - M&T (I&P) dated 28.07.2022, has allowed the applicant to submit the test sample directly to the Institute without requiring any random selection for Initial Commercial Testing. Thus, the applicant directly submitted the test sample to the Institute for test.
[D]	Place of running-in	:	At manufacturer's works
[D]	Duration of running-in, (h):		
	-Engine	:	18
	-Transmission	:	09
[C]	Location of test	:	Government of India, Central Farm Machinery Training and Testing Institute, P.O. - Tractor Nagar, BUDNI - 466445 (M.P.), INDIA

1. SPECIFICATIONS OF TRACTOR

1.1 Identification:

1.1.1 Denomination

[C]	Make of tractor	:	Captain
[C]	Model (trade name)	:	223 4WD
[C]	Type	:	Four-Wheel Driven, Standard Agricultural Tractor.
[C]	Month & year of manufacture	:	12/22
[D]	Country of origin	:	India

1.1.2 Numbers:

[D]	1 st Serial No. or prototype	:	G121110001
[C]	Serial No.	:	G122110010

1.2 Engine:

[D]	Manufacturer's address	:	MITSUBISHI HEAVY INDUSTRIES VST Diesel Engines Pvt. Ltd. Plot no. 305, Hebbal Indi. Area Metagalli, Mysuru - 570 - 016
[C]	Make	:	MITSUBISHI HEAVY INDUSTRIES VST Diesel Engines Pvt. Ltd.
[C]	Model	:	MVL3E - T3CC
[C]	Type	:	Four stroke, naturally aspirated, liquid cooled, indirect injection, diesel engine.
[C]	Serial No.	:	A79193

1.2.1 Cylinders:

[C]	Number/disposition	:	Three, vertical, in-line
[D]	Bore / Stroke, (mm)	:	76 / 70
[D]	Capacity, cm ³	:	952

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6. SUMMARY OF OBSERVATIONS, COMMENTS & RECOMMENDATIONS

6.1 On the basis of test results, this tractor viz. CAPTAIN, 223 4WD tractor does not satisfy the evaluative requirement of maximum lifting capacity throughout the range of lift at lower hitch point. The summary of the test results are given in the ensuing table.

Sl. 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
MANDATORY TESTS: (As per Ministry's Office Memorandum No. 13-17/2021-M&T (I&P) dated 28th of July, 2022).						
6.1.1	PTO Performance:					
a)	Maximum power under 2 h test, (kW) (Natural ambient condition)	Evaluative	Declared value to be achieved with a tolerance of: $\pm 5\%$ for PTO power and or engine power > 26 kW. $\pm 10\%$ for PTO power and or engine ≤ 26 kW.	12.2 (D)	11.5	Yes
b)	Power at rated engine speed, (kW)	Non Evaluative	-do-	12.2 (D)	11.5	Yes
c)	Specific fuel consumption corresponding to maximum power, (g/kWh)	Evaluative	+ 10% max.	350 (D)	321	Yes
d)	Maximum equivalent crankshaft torque, (Nm)	Non Evaluative	$\pm 8\%$	46 (D)	44.7	Yes
e)	Back-up torque, percent	Evaluative	12% min.	12 (D) 12 (R)	22.1	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.	130 (D)	115	Yes
	2) Coolant	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)	98	Yes
g)	Engine oil consumption, (g/kWh)	Evaluative	Not exceeding 1% of SFC at max. Power under high ambient conditions.	3.22 (R) maximum	0.33	Yes
h)	Smoke level, m^{-1}	Evaluative	Maximum light absorption coefficient of 3.25 per meter or equivalent BOSCH No. 5.2 or 75 Hatridge value (As per CMVR).	3.25 per meter (R) maximum	0.64	Yes

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1	2	3	4	5	6	7
6.1.2 Drawbar performance:						
a)	Max. drawbar pull with ballast corresponding to 15 percent wheel slip, (kN)	Non Evaluative	Minimum 70% of static mass of tractor with ballast.	Not recommended	Not applicable	Not applicable
b)	Max. drawbar pull without ballasted or with standard ballast, as the case may be 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.	5.86 (D) 6.01 (R) minimum	8.63	Yes
c)	Maximum drawbar power without ballast/ 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.	9.76 (D) 8.6 (R) minimum	9.9	Yes
d)	Maximum transmission oil temperature, (°C)	Evaluative	The declared value should not exceed the maximum value specified by oil company.	120 (D)	100	Yes
6.1.3 Power lift and hydraulic pump performance:						
a)	Maximum lifting capacity throughout the range of lift, (kN):					
	1) At hitch points	Evaluative	Tolerance of ± 10%	6.8 (D) 6.12 to 7.48 (R)	7.80	No
	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.	5.0 (D) 2.71 (R) minimum	6.01	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 minutes, (mm)	Non Evaluative	The observed value should not exceed 50 mm.	50 (D) maximum	10	Yes
6.1.4 Brake performance at 25 kmph:						
a)	Maximum stopping distance at a force, equal to or less than 600 N on brake pedal with road ballast, (m):					
	1) Cold brake	Evaluative	10	10 (R)	6.88	Yes
	2) Hot brake	Evaluative	10	10 (R)	7.14	Yes
b)	Whether parking brake is effective at a force of 600 N at foot pedal (s) or 400 N at hand lever	Evaluative	Yes / No	Yes	Yes	Yes

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6.1.5	OPTIONAL TESTS: As the applicant has not applied for any optional tests, therefore no optional tests was conducted.						
6.1.6	Safety features :						
a)	Guards against moving and hot parts	Evaluative	Belt drives, pulleys, silencer, hydraulic pipes [As per IS 12239 (Part 2)]	Meets the requirement	Yes		
b)	Lighting arrangement	Evaluative	As per CMVR	Meets the requirement	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)	Not applicable (Tractors rear track width is less than 1150 mm)	--		
d)	Technical requirements for PTO shaft	Evaluative	Should meet the requirements of IS: 4931 (As amended from time to time)	Meets the requirement	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 requirement	No		
f)	Specifications of linkage drawbar	Evaluative	Should meet the requirements of IS: 12953 (As amended from time to time)	Meets the requirement	Yes		
g)	Specifications of swinging drawbar (wherever fitted)	Evaluative	Should meet the requirement 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	10.03 (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. The safety aspects about the operation of shuttle technology shall be brought in operation and manufacturer /dealer shall ensure the training on this aspect to operator before the delivery of tractor.	Not fitted	Not applicable		
6.1.7	Labelling of tractors (Provision of labelling plate):						
	1) Make	Evaluative	Should conform to the requirements of CMVR along with maximum PTO Power in kW, specific fuel consumption (SFC) corresponding to maximum power in g/kWh and year of manufacture in numerical form. <table border="1" style="display: inline-table; vertical-align: middle;"><tr><td>MM</td><td>YY</td></tr></table>	MM	YY	Captain	Yes
MM	YY						
	2) Model	Evaluative		223 4WD	Yes		
	3) Month & Year of manufacture	Evaluative		12/22	Yes		
	4) Engine number	Evaluative		A79193	Yes		
	5) Chassis number	Evaluative		G122110010	Yes		
	6) Maximum PTO power, (kW)	Evaluative		12.2	Yes		
	7) Specific fuel consumption, g/kWh	Evaluative	350	Yes			

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6.1.8	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
6.1.9	Fitment of Roll Over Protective Structures (ROPS):					
	For tractor having more than 1150 mm rear track width	Evaluative	ROPS should meet the requirement of IS:1182 or OECD code or equivalent International Standard	Not fitted (Tractors rear track width is less than 1150 mm)		Not applicable
6.1.10	Standard Accessories	Evaluative	Trailer hitch, front tow hook, linkage drawbar should be provided with tractor	Provided		Yes
6.1.11	Accessories (optional)	Non Evaluative	Ballast weight, if fitted, should meet the requirement of CMVR	Not fitted		Not applicable

6.2	CATEGORY OF BREAKDOWNS / DEFECTS (As per clause 5.0 of IS:12207-2019):				
S. No.	Category of breakdowns	Category (Evaluative / Non Evaluative)	Requirements as per IS: 12207-2019	As observed	Whether meets the Requirements (Yes/No)
1.	Critical	Evaluative	No critical breakdown	None	Yes
2.	Major	Evaluative	Not more than two and neither of them should be repetitive in nature.	None	Yes
3.	Minor	Evaluative	Not more than five and frequency of each should 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

6.3 Conformity with following IS:

- i)** Guidelines for declaration of power and specific fuel consumption and labeling of agricultural tractors (First revision) [IS:10273 -1987 (Reaffirmed Year 2019)] : **Conforms**
- ii)** Agricultural tractors - Rear mounted power take-off - Types 1, 2 and 3 (third revision) [IS:4931-1995 (Reaffirmed Year 2019)] : **Conforms**
- iii)** Agricultural wheeled tractors – Rear mounted three-point linkage: Part 2 Categories 1, 2, 3 & 4 (fourth revision) [IS:4468 (Part-2) – 1993 (Reaffirmed in Jan., 2019)] : **Does not conform**
- iv)** Drawbar for agricultural tractors – Link type [IS 12953:1990 (Reaffirmed Year 2022)] : **Conforms**
- v)** Agricultural tractors- Operator's seat technical requirement [IS12343 - 2021] : **Not applicable**
(Tractors rear track width is less than 1150 mm)
- vi)** Guide for safety & comfort of operator of agricultural tractors:Part 1 General requirements (first revision):[IS 12239 (Part 1) - 2018] : **Does not conform**
- vii)** Tractors and machinery for agriculture and forestry – Technical means for ensuring safety Part 2: Tractors (first revision) (IS 12239 (Part 2) 1999) (Reaffirmed Year 2019)] : **Does not conform**

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- viii) Guide lines for location and operation of operator controls on agricultural tractors and machinery [IS: 8133 - 2021] : **Does not conform**
- ix) Tractors and machinery for agriculture and forestry, powered lawn and garden equipment - Symbols for operator controls and other displays Part2 Symbols for agricultural tractors and machinery [IS: 6283 (Part-1) - 2006 (Reaffirmed Year 2019) and IS: 6283 (Part-2) – 2007 (Reaffirmed Year 2019)] : **Conforms**
- x) Agricultural Tractors and Machinery-Lighting device for travel on public roads (IS:14683-1999) (Reaffirmed Year 2019)] : **Conforms**

6.4 Salient Observations:

6.4.1 Laboratory tests:

6.4.1.1 Hydraulic Performance Test:

- i) **During hydraulic performance test, the maximum lifting capacity at hitch point throughout the range of lift was observed as 7.80 kN against the declaration of 6.8 kN (required range 6.12 to 7.48 kN), which does not meet the evaluative requirement of IS: 12207-2019 with regard to tolerance limit.**
- ii) **During the maximum lifting capacity test at coupled frame throughout the range of lift, there was no considerable drop in force and hydraulic pressure. This should be looked into for corrective action.**

6.4.1.2 Operator's work place:

The following parameters does not meet the requirement of IS: 12239 (Part-I) 2018.

- i) Vertical retainer on inner side of clutch pedal was not provided.
- ii) Spark arresting device has not been provided in the exhaust system.

Therefore, all of the above should be looked into for necessary corrective action.

6.4.1.3 Three point linkage:

The dimension viz. lateral distance from lower hitch point to centre line of tractor, distance from end of power take-off to centre of lower hitch point (lower links in horizontal position) & movement range does not meet the requirements of IS:4468 (Part-2) - 1993. This should be looked into for corrective action.

6.4.1.4 PTO master shield:

PTO master shield has not been provided on tractor. This should be looked into for necessary corrective action.

6.5 Tractor Specification:

The power of the generator has been specified as 40A. This should be looked into for necessary corrective action.

6.6 Maintenance / Service Problems:

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

6.7 Recommendation with regard to safety on tractor:

- i) Identification of control lever by colour has not been provided as per the requirement as laid down in Table - 5 of IS: 8133-2021.
- ii) Colour codes on illuminated display has not been provided as per the requirement as laid down in IS: 6283 (Part 2): 2007.
- iii) The working clearance between position control and draft control lever, PTO engaging lever and range selection gear lever were measured 40 mm and 35 mm respectively against the minimum requirement of 70 mm.
- iv) Fuel shutoff knob does not remain in stop position as per the requirement of IS: 8133-2021.
- v) The distance between engine stop control and start control was measured 400 mm against the maximum requirement of 150 mm.

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- vi) The hand accelerator lever, when moved away from the operator (i.e. forward) decreases the engine speed, which does not meet the requirement as laid down in Table - 1 of IS: 8133-2021.

Above parameters should be looked into for necessary corrective action.

6.8 Adequacy of Literature supplied with machine:

6.8.1 The following literatures were supplied with the test tractor for reference during the test: -




- a) Operator's Manual for "Captain 223 4WD" tractor model.
- b) Parts catalogue for "Captain 223 4WD" tractor model.
- c) Service manual for "Captain 223 4WD" tractor model.

6.8.2 The operator 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 to PTO speed ratio.
- ii) Brand name of coolant and its ratio.
- iii) Matching implements of tractor for different field operations.
- iv) Recommended gross mass of trailer for haulage operation.
- v) Fuel saving tips.
- vi) Detail specification of tractor with max. PTO power, hydraulic lifting capacity, hydraulic power, maximum drawbar pull and maximum drawbar power.
- vii) Declaration that "the tractor is not suitable for wet land operation".

TEST CARRIED OUT AT C.F.M.T. & T.I., BUDNI (M.P.), INDIA

TESTING AUTHORITY

B.N. DIXIT AGRICULTURAL ENGINEER	
R.P. PANDEY S.I.E.(TESTING HEAD)	
A. K. UPADHYAY DIRECTOR (I/C)	

Draft Test Report compiled by Vithato Keyho, Senior Technical Assistant.

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7. APPLICANT'S COMMENTS

Para No.	Our reference	Applicant's comments
7.1	Clause no. 6.4.1.1, 6.4.1.2, 6.4.1.3, 6.4.1.4, 6.5, 6.7, 6.8.1 & 6.8.2	We will take corrective actions.

ANNEXURE-I

TRACTOR RUN HOURS DURING TEST

A.	LABORATORY AND TRACK TESTS:	HOURS
1.	Running-in	Applicant has declared it to be conducted on their work place.
2.	PTO performance test	12.7
3.	Power lift and hydraulic pump performance test	1.2
4.	Drawbar performance test	4.4
5.	Brake performance test	1.0
6.	Nominal speed test	2.8
B.	Miscellaneous test and other run hours including idle run, transportation, trials and preparation for test.	6.7
TOTAL:		28.8