

प्रारंभिक व्यावसायिक परीक्षण रिपोर्ट
INITIAL COMMERCIAL TEST REPORT

संख्या/No. : T-1861/2392/2024
माह/Month : June, 2024

Application Reference No. 28/2022-23/106

(यह परीक्षण रिपोर्ट 30/06/2029 तक वैध है / THIS TEST REPORT IS VALID UPTO 30/06/2029)



Make of Agricultural Tractor : CAPTAIN
Model : CAPTAIN 280 DX PLUS
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

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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: June	Test Report No.: T-1861/2392/2024	Year: 2024
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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	:	18.0
	-Transmission	:	8.0
[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)	:	CAPTAIN 280 DX PLUS
[C]	Type	:	Rear Wheel Drive, Standard Agricultural Tractor.
[C]	Month & year of manufacture	:	11/22
[D]	Country of origin	:	India

1.1.2 Numbers:

[D]	1 st Serial No. or prototype	:	D222107729
[C]	Serial No.	:	D222107729

1.2 Engine:

[D]	Manufacturer's address	:	M/s. Simpson & Co. Ltd. 861/862 Anna Salai, Chennai - 600 002
[C]	Make	:	M/s. Simpson & Co. Ltd
[C]	Model	:	T IIIA SC213-F20.1
[C]	Type	:	Four stroke, naturally aspirated, liquid cooled, direct injection, diesel engine.
[C]	Serial No.	:	SC21324098

1.2.1 Cylinders:

[C]	Number/disposition	:	Two/ vertical, inline
[D]	Bore / Stroke, (mm)	:	95 / 91
[D]	Capacity, cm ³	:	1290
[D]	Compression ratio	:	18.3 (±0.3) : 1
[D]	Arrangement of valves	:	Overhead
[D]	Cylinder liners	:	Dry, replaceable
[D]	Type of combustion chamber	:	Direct injection

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6. SUMMARY OF OBSERVATIONS, COMMENTS & RECOMMENDATIONS

6.1 On the basis of test conducted the performance results have been summarized as evaluative (mandatory) / Non-evaluative (Non-mandatory) parameters applicable for Qualifying Minimum Performance criteria as per Clause-4 (Table-1) of **IS: 12207-2022** for acceptance of the tractor for the purpose of subsidies/NABARD financing are summarized as under:

Sl. No.	Characteristic	Category (Evaluative / Non Evaluative)	Requirements as per IS: 12207-2022	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.	16.8 (D)	15.8	Yes
b)	Power at rated engine speed, (kW)	Non Evaluative	-do-	16.8 (D)	15.8	Yes
c)	Specific fuel consumption corresponding to maximum power, (g/kWh)	Evaluative	+ 10% max.	275 (D)	256	Yes
d)	Maximum equivalent crankshaft torque, (Nm)	Non Evaluative	$\pm 8\%$	68 (D)	70.1	Yes
e)	Back-up torque, percent	Evaluative	12% min.	12 (D) 12 (R)	16.4	Yes
f)	Maximum operating temperature, ($^{\circ}\text{C}$):					
	1) Engine oil	Evaluative	The declared value should not exceed the max. value specified by the oil company and the observed value under natural ambient/high ambient condition should not exceed the declaration.	130 (D)	120	Yes
	2) Coolant	Evaluative	Observed value should not exceed the declared value or boiling point of the coolant at radiator cap pressure whichever is lower. The boiling point of the coolant at radiator pressure shall be provided by the applicant.	118 (D)	111	Yes
g)	Engine oil consumption, (g/kWh)	Evaluative	Not exceeding 1% of SFC at max. Power under natural ambient conditions.	2.56 (R) Maximum	0.81	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	0.28	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.	*	*	*
b)	Max. drawbar pull without ballast corresponding to 15 percent wheel slip, (kN)	Evaluative	Minimum 65% of static mass of tractor without ballast or with standard ballast, as the case may be.	7.00 (D) 6.53 (R) Minimum	8.39	Yes
c)	Maximum drawbar power without ballast/ with standard 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.	12.6 (D) 11.9 (R) Minimum	12.5	Yes
d)	Maximum transmission oil temperature, (°C)	Evaluative	The declared value should not exceed the maximum value specified by oil company.	120 (D)	80	Yes
*Applicant has not recommended ballasting for drawbar test. Hence, drawbar performance test under ballasted condition was not conducted.						
6.1.3	Power lift and hydraulic pump performance:					
a)	Maximum lifting capacity throughout the range of lift, (kN):					
1)	At hitch points	Evaluative	Should not be less than 90% of declared value.	4.5 (D) 4.05 (R) Minimum	5.96	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.	4.0 (D) 3.72 (R) Minimum	3.73	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	00	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)	7.49	Yes
2)	Hot brake	Evaluative	10	10 (R)	7.68	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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1	2	3	4	5	6	7
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	Non 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	Non 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)	Non Evaluative	Should meet the requirement of IS: 12362 (Part 3) (As amended from time to time)	Not provided	Not applicable	
h)	Audible warning signal on tractor	Evaluative	If tractor travel speed in reverse gear exceeds 20 kmph, an audible warning signal on tractor shall get activated. A sticker to the effect that "operating the tractor beyond 20 kmph speed in reverse gear is not safe" should be prominently displayed.	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. Digit 01 – 12 in box No.1 for MM will represent the months and next two digits in box No.2 for YY will represent the year of Manufacturing.	Captain	Yes	
	2) Model	Evaluative		280 DX PLUS	Yes	
	3) Month & Year of manufacture	Evaluative		11/22	Yes	
	4) Engine number	Evaluative		SC21324098	Yes	
	5) Chassis number	Evaluative		D222107729	Yes	
	6) Maximum PTO power, (kW)	Evaluative		16.8	Yes	
	7) Specific fuel consumption, g/kWh	Evaluative		275	Yes	

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1	2	3	4	5	6	7
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 if fitted	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:12207-2022):					
S. No.	Category of breakdowns	Category (Evaluative / Non Evaluative)	Requirements as per IS: 12207-2022	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 neither of them should be repetitive in nature.	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: Categories 1N,1,2N, 2, 3N, 3,4N & 4 [IS: 17231:2019] : **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)] : **Does not conform**
- 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:

During hydraulic lifting capacity test at standard frame, maximum corrected lifting force throughout the full range of lift was recorded as 3.53 kN against the minimum requirement of 3.72 kN, which does not meet the evaluative requirement of IS: 12207-2022 with regard to tolerance limit. Upon this, the applicant vide letter no. R&D/CFMT&TI/122023/42 dated 13.03.2024 has requested to carry out the following works on tractor, to rectify the defect and repeat the hydraulic performance test, which was allowed.

- i) Cleaning of hydraulic oil
- ii) Cleaning of suction strainer
- iii) Replacement of hydraulic oil filter (Part Number – 11201246).

Thereafter, as per the request of the applicant **“Repeat test”** was conducted.

6.4.1.2 Dimensions of three point linkage:

The following parameters does not meet the requirements of IS: 17231-2019 and needs to be looked into for necessary corrective actions:

- i) Diameter of upper hitch pin hole has been measured as 20.55 mm against the requirement of 19.30 to 19.50 mm.
- ii) Distance from end of power take-off to centre of lower hitch point (lower links in horizontal position) has been measured as 385 mm against the requirement of 300 to 375 mm.
- iii) Movement range has been measured as 460 mm against the minimum requirement of 610 mm.

6.4.1.3 PTO master shield:

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

6.4.1.4 Operator’s work place:

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

- i) Hand holds for easy mounting and dismounting of the operator has not been 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.

6.5 Maintenance / Service Problems:

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

6.6 Recommendation with regard to safety on tractor:

- i) Identification of Fuel shut off knob by symbol has not been provided as per the requirement as laid down in IS: 6283 (Part 1).
- ii) Identification of hand controls by colour has not been provided as per the requirement as laid down in Table – 5 of IS: 8133-2021.
- iii) Following are the working clearance around the controls against the minimum requirement of 70 mm.
 - Position control & draft control lever has been measured as 65 mm.
 - Position control lever and mudguard has been measured as 40 mm

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- iv) The hand accelerator lever, when moved away from the operator (i.e. forward) decreases the engine speed, which does not meet the requirement as per IS: 8133-2021.
- v) Distance between engine start & stop control was measured 420 mm against the maximum requirement of 150 mm.
- vi) Differential lock has not been provided.

Above parameters should be looked into for necessary corrective action.

6.7 Adequacy of Literature supplied with machine:

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

- a) Operator's Manual for "Captain, 280 DX Plus" tractor model.
- b) Parts catalogue for "Captain, 280 DX Plus" tractor model.
- c) Service manual for "Captain, 280 DX Plus" tractor model.




6.7.2 Essential information about the engine have not been provided in any of the manuals. This should be looked into for immediate corrective action.

6.7.3 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) Technical information related to PTO, Drawbar, Hydraulic, etc. should be included in the technical specification of the tractor for the guidance of users.
- iii) Declaration that "**the tractor is not suitable for wet land operation**".
- iv) Brand name of coolant and it's ratio.
- v) Matching implements of tractor for different field operations.
- vi) Recommended gross mass of trailer for haulage operation.
- vii) Fuel saving tips, etc.

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 **Partha Lodh**, Senior Technical Assistant.

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7. APPLICANT'S COMMENTS

Para no.	Our reference	Applicant comments
7.1	6.4, 6.4.1, 6.4.1.1, 6.4.1.2, 6.4.1.3, 6.4.1.4, 6.5, 6.6, 6.7, 6.7.1, 6.7.2, 6.7.3	We will take corrective action.

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	12.2
3.	Power lift and hydraulic pump performance test	8.9
4.	Drawbar performance test	3.1
5.	Brake performance test	1.0
6.	Nominal speed test	0.8
B.	Miscellaneous test and other run hours including idle run, transportation, trials and preparation for test.	1.2
TOTAL:		27.2