

प्रारंभिक व्यावसायिक परीक्षण रिपोर्ट
INITIAL COMMERCIAL TEST REPORT

संख्या/No. : T-1748/2279/2023
माह/Month : July, 2023

Application Reference No. 28/2022-23/86

(यह परीक्षण रिपोर्ट 31/07/2028 तक वैध है / THIS TEST REPORT IS VALID UPTO 31/07/2028)



Make of Agricultural Tractor : MAHINDRA
Model : JIVO 225 DI 4WD V1
Manufactured by : Mahindra & Mahindra Limited
(Farm Equipment Sector)
Mahindra Research Valley, Mahindra
World City, Plot no. 41/1, Anjur P.O.,
District Chengalpattu - 603004.



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: July	Test Report No.: T-1748/2279/2023	Year: 2023
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[C]	Tractor manufacturer's name and address	:	Mahindra & Mahindra Limited (Farm Equipment Sector) Mahindra Research Valley, Mahindra World City, Plot no. 41/1, Anjur P.O., District Chengalpattu - 603004. Deepak Diesel Pvt. Ltd. Survey no. 287/1, Shapar Village Main Road, Shapar (Veraval), Dist: Rajkot – 360024 (M/s. DDP Ltd. is contract manufacturer of M&M Ltd.)
[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	:	30
	-Transmission	:	30
[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	:	Mahindra
[C]	Model (trade name)	:	JIVO 225 DI 4WD V1
[C]	Type	:	Four-Wheel Drive, Standard Agricultural Tractor.
[C]	Month & year of manufacture	:	07/22
[D]	Country of origin	:	India

1.1.2 Numbers:

[D]	1 st Serial No. or prototype	:	MBNZKGALFNGD01246
[C]	Serial No.	:	MBNZKGALFNGD01249

1.2 Engine:

[D]	Manufacturer's address	:	M/s Mahindra & Mahindra Ltd., FES at M/s Deepak Diesels Pvt. Ltd. (DDPL) Survey no. 287/1, Shapar Village Main Road, Shapar (Veraval), Dist: Rajkot – 360024 (M/s. DDPL is the contract manufacturer for Mahindra & Mahindra Ltd.)
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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.	13.7 (D)	13.7	Yes
b)	Power at rated engine speed, (kW)	Non Evaluative	-do-	13.7 (D)	13.7	Yes
c)	Specific fuel consumption corresponding to maximum power, (g/kWh)	Evaluative	+ 10% max.	275 (D)	259	Yes
d)	Maximum equivalent crankshaft torque, (Nm)	Non Evaluative	$\pm 8\%$	66.5 (D)	69.1	Yes
e)	Back-up torque, percent	Evaluative	12% min.	18 (D) 12 (R)	21.4	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 natural ambient/high ambient condition should not exceed the declaration.	130 (D)	94	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.	112 (D)	100	Yes
g)	Engine oil consumption, (g/kWh)	Evaluative	Not exceeding 1% of SFC at max. Power under natural ambient conditions.	2.59 (R) Maximum	0.06	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	0.05	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 by applicant	Not ascertained	--
b)	Max. drawbar pull without ballasted 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.	7.40 (D) 6.98 (R) Minimum	8.76	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.	10.96 (D) 10.3 (R) Minimum	11.2	Yes
d)	Maximum transmission oil temperature, (°C)	Evaluative	The declared value should not exceed the maximum value specified by oil company.	120 (D)	64	Yes
* Applicant vide letter no. FD/BVH/ICT/JIVO2254WDV1/23-24/08 dated 28.06.2023 has requested not to conduct the ballasted drawbar performance & ten-hour drawbar test which was allowed as per the additional guidelines for testing of tractors as per new regime of testing of tractors vide a OM No. 13-32/2023-M&T(I&P) (FTS-125476) dated 16.05.2023. Accordingly, only unballasted drawbar performance test was 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.	7.35 (D) 6.62 (R) Minimum	6.67	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.	4.41 (D) 3.22 (R) Minimum	5.19	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	40	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)	7.97	Yes
2)	Hot brake	Evaluative	10	10 (R)	8.12	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	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)	Meets the requirement	Yes		
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. <table border="1" style="margin: 5px auto;"><tr><td>MM</td><td>YY</td></tr></table> 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.	MM	YY	MAHINDRA	Yes
MM	YY						
	2) Model	Evaluative		JIVO 225 DI 4WD V1	Yes		
	3) Month & Year of manufacture	Evaluative		07/22	Yes		
	4) Engine number	Evaluative		GNC6GAA3542	Yes		
	5) Chassis number	Evaluative		MBNZKGALFNG	Yes		
	6) Maximum PTO power, (kW)	Evaluative		D01249	Yes		
	7) Specific fuel consumption, g/kWh	Evaluative	13.7	Yes			
			275	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 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: Part 2 Categories 1, 2, 3 & 4 (fourth revision) [IS:4468 (Part-2) – 1993 (Reaffirmed in Jan., 2019)] : Conforms
- 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:

PTO performance:

Applicant vide letter no. FD/BVH/ICT/JIVO2254WDV1/23-24/07 dated 14.06.2023 has recommended that tractor operating range is from 1250 rpm to rated engine rpm under full load condition. Hence during PTO performance test, varying speed test was conducted upto 1250 rpm of engine only under natural and high ambient condition.

6.4.1.1 Drawbar performance test:

Applicant vide letter no. FD/BVH/ICT/JIVO2254WDV1/23-24/08 dated 28.06.2023 have requested to restrict the drawbar performance test to 1250 engine rpm as per minimum operating range of tractor under full load condition. Hence Drawbar performance test was conducted upto 1250 rpm of engine only.

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.

6.4.1.4 PTO master shield:

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

6.5 Specification of Tractor:

Discrepancies in the specification between the Specification sheet and Operator's manual are as under:

S. No.	Description	As per Specification Sheet	As per Operator's manual
a)	Coolant	BASF	Mahindra m-STAR Coolz / JIS K – 2234 Grade.

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 engine stop control, engine speed control, transmission control, parking brake, differential lock pedal & PTO engaging lever by colour has not been provided as per the requirement as laid down in Table - 5 of IS: 8133-2021.
- ii) Colour code for engine revolution, fuel level & water temperature gauge should be provided as per IS: 6283 Part – 2 2017
- iii) The working clearance between position control and draft control lever, range selection lever & position control lever were measured 45 mm and 40 mm respectively against the minimum requirement of 70 mm.

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- iv) Fuel shutoff knob does not remain in stop position as per the requirement of IS: 8133-2021.
- v) 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 "Mahindra JIVO" tractor model.
- b) Parts catalogue for "Mahindra JIVO 225 DI 4WD V1" tractor model.
- c) Service manual Part-I & II for "Mahindra JIVO 225 DI 4WD V1" 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) Hydraulic lifting capacity.
- iii) Detail specification of tractor related to tractor model, engine model, rated engine rpm, etc. should be included in the technical specification of the tractor for the guidance of users.
- iv) Recommended matching implements of tractor for wet land operation.

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

TESTING AUTHORITY

C. V. CHIMOTE TEST ENGINEER	
A. K. UPADHYAY DIRECTOR (I/C)	

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

7. APPLICANT'S COMMENTS

Para No.	Our reference	Applicant's comments
7.1	6.5 & 6.8.2	Parameters in product literature will be studied & necessary action will be initiated.

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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	12.3
3.	Power lift and hydraulic pump performance test	0.8
4.	Drawbar performance test	2.3
5.	Brake performance test	1.0
6.	Nominal speed test	1.9
B.	Miscellaneous test and other run hours including idle run, transportation, trials and preparation for test.	3.5
TOTAL:		21.8