

[ONLINE TESTING]



**FORCE MOTORS LIMITED,
OX 25 ORCHARD DLX LT 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

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CENTRAL FARM MACHINERY TRAINING & TESTING INSTITUTE

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2. FUEL AND LUBRICANTS

2.1 Fuel : The High-speed diesel oil supplied by M/s Indian Oil Corporation Limited having density of 0.836 g/cc at 15°C was used.

2.2 Lubricants:

S. No.	Particulars	As recommended by the manufacturer	As used during the test
1.	Engine	SAE 15W40	As recommended
2.	Transmission and brake system	EP 90/ HD 90	Oil originally filled in the tractor systems were not changed
3.	Hydraulic System	SAE 20W40	
4.	Steering housing oil		
	- Mechanical Steering	EP – 90	-do-
	- Power Steering	ATF	
	Grease	Servo Grease MP-2	As recommended

3. SPECIFICATIONS

	<u>Previous sample</u>	<u>Present sample</u>
3.1. Tractor:		
Make	: M/s. Force Motors Ltd.	
Model	: OX 25 ORCHARD DLX LT	
Type	: Rear Wheel Drive, Standard Agricultural Tractor	
Month & Year of manufacture	: 06 / 17	: 12/21
Chassis number	: T08015580F17	: T08028284M21
Country of origin	: India	
3.2 Engine:		
Manufacturers address	: M/s. Force Motors Limited, Mumbai – Pune Road Akurdi, Pune (M.S.) – 411035	
Make	: M/s. Force Motors Ltd.	
Model	: TD1950F(27)	
Type	: Four stroke, liquid cooled, naturally aspirated, direct injection diesel engine	
Serial number	: D10039368	: D10053316
3.2.1 Engine speed(Manufacturer’s recommended production setting), (rpm):		
- Maximum speed at no load	: 2400 to 2500	
- Low idle speed	: 700 to 750	
- Speed at maximum torque	: 1300 to 1500	
Rated speed, (rpm):		
- For PTO use	: 2200	
- For drawbar use	: 2200	
3.3 Cylinder & Cylinder Head:		
Number	: Three	
Disposition	: Vertical, Inline	
Bore/stroke, (mm)	: 90.9/100 (apa)	
Capacity as specified by the applicant, (cc)	: 1947	
Compression ratio	: 18.3:1 to 18.8:1 (apa)	
Type of cylinder head	: Monoblock	
Type of cylinder liners	: Dry, replaceable	

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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) and non – evaluative (not mandatory) parameters applicable for qualifying Minimum Performance Criteria as per clause-4 table-1 of Indian Standard **12207: 2019** for acceptance of tractor for the purpose of subsidies/NABARD financing for the applicable features for this tractor model.

Sl. No.	Characteristic	Category (Evaluative / Non Evaluative)	Requirements as per IS: 12207-2019	Values declared by the applicant/ requirement		As observed		Whether present model meets the requirements (Yes/No.)
				Previous sample	Present sample	Previous sample	Present sample	
1	2	3	4	5 a	5 b	6 a	6 b	7
6.1.1	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.	17.0 (D)	17.0 (D)	17.3	17.4	Yes
b)	Specific fuel consumption corresponding to maximum power, (g/kWh)	Evaluative	+ 10% Max.	260 (D)	260 (D)	272	268	Yes
6.1.2	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)		Not applicable as rear track width have been measured as 1130 mm.		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-I) (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	

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1	2	3	4	5	6	7	
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		11.51 kmph (Meet the requirements)	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	
6.1.3	Labeling of tractors (Provision of labeling plate):						
	1) Make	Evaluative	Should conform to the requirements of CMVR along-with declared value of PTO in kW and 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		FORCE MOTORS LTD.	Yes	
	2) Model	Evaluative				OX-25 ORCHARD DLX LT	Yes
	3) Month & Year of manufacture	Evaluative				12/21	Yes
	4) Engine number	Evaluative				D10053316	Yes
	5) Chassis number	Evaluative				T08028284M21	Yes
	6) Declaration of maximum PTO power, kW	Evaluative				17 kW	Yes
6.1.4	Literature (Submission to test agency)						
(a)	Operator manual	Evaluative	The printed literature in booklet form should be provided as per IS 8132 and should submit along with the test sample		Provided	Yes	
(b)	Parts Catalogue	Evaluative				Provided	Yes
(c)	Workshop/ Service manual	Evaluative				Provided	Yes
6.1.5	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 Fitted	Not applicable	
6.1.6	Standard accessories	Evaluative	Trailer hitch, front tow hook, linkage drawbar should be provided with tractor		Provided	Yes	
6.1.7	Accessories (Optional)	Non Evaluative	Ballast weights if fitted should meet the requirement of CMVR.		Provided	Yes	

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6.2 Conformity with following IS:	<u>Previous sample</u>	<u>Present sample</u>
i) Guide lines for declaration of power and specific fuel consumption and labelling of agricultural tractors (First revision) [IS10273: 1987 (Reaffirmed in January, 2019)]	: Conformed	Conforms
ii) Agricultural tractors - Rear mounted power take-off - Types 1, 2 and 3 (third revision) [IS:4931-1995 (Reaffirmed in January, 2019)]	: Did not conform	Conforms
iii) Agricultural wheeled tractors - Three-point linkage: Part 2 Category 1N (Narrow Hitch) (Third Revision) [IS 4468 (Part-2):1993/ ISO 730-2:1979 (Reaffirmed in January, 2019)]	: Did not conform	Does not conform
iv) Drawbar for agricultural tractors – Link type [IS 12953:1990 (Reaffirmed in 2017)]	: Conformed	Conforms
v) Agricultural tractors - Operator's seat technical requirement [IS 12343 –1998 (First revision) (Reaffirmed in January, 2019)]	: Did not conform	Not applicable
vi) Guide for safety & comfort of operator of agricultural tractors: Part 1 General requirements (first revision): [IS 12239 (PT-1) 1996/ISO 4254-1:2018]	: Did not conform	Does not conform
vii) Tractors and machinery for agriculture and forestry – Technical means for ensuring safety Part 2: Tractors (first revision) (IS 12239 (PT-2) 1999) (Reaffirmed in January, 2019)]	: Did not conform	Does not conform
viii) Guide lines for location and operation of operator controls on agricultural tractors and machinery (first revision) IS: 8133-1983 (Reaffirmed in January, 2019)]	: Did not conform	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 in January, 2019)]	: Did not conform	Conforms
x) Agricultural Tractors and Machinery - Lighting device for travel on public roads (IS: 14683-1999) (Reaffirmed in January, 2019)]	: Conformed	Conforms

6.3 Salient Observations:

6.3.1 Laboratory tests:

6.3.1.1 Three-point linkage:

- i) The transport height of tractor does not meet the requirement of IS: 4468- 1997 (Part-I) (Reaffirmed in October, 2017). This should be looked into for necessary corrective action at production level.
- ii) 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.

6.3.1.2 Recommendation with regard to safety on tractor:

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

- i) Vertical retainers at both sides of clutch pedal should be provided as per IS: 12239 (Part-1) – 2018.

- ii) Width of foot step has been measured as 180 mm against the requirement of minimum 200 mm as per IS: 12239 (Part-1) – 2018. This should be looked into.
- iii) Spark arrester should be provided in the exhaust system as per the requirement of IS: 12239 (Part-1)-1999 (Re-affirmed in January, 2019).
- iv) The working clearance between position control lever and RHS fender has been observed as 25 mm against the requirement of minimum 70 mm as per IS: 12239 (Part-2)-1999 (Re-affirmed in January, 2019). This should be looked into.

6.4 Adequacy of Literature supplied with machine:

6.4.1 The following literature was supplied with test sample for reference during the test.

- a) Owner’s manual for OX 25 Orchard DLX / DLX LT tractor model
- b) Workshop Manual for OX 25 Orchard DLX / DLX LT tractor model
- c) Spare Part’s Catalogue for OX 25 Orchard DLX / DLX LT tractor model

In view of the above observations, this tyre size i.e. 9.50 - 24, 8 PR also may be declared as optional tyre size for the tractor model “FORCE MOTORS LIMITED, OX 25 ORCHARD DLX LT” and 2nd Technical Extension is awarded on the above lines.

TESTING AUTHORITY:

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

Draft test report compiled by: **Partha Lodh, Senior Technical Assistant**

7. APPLICANT'S COMMENTS

Para no.	Our reference	Applicant comments
7.1	6.3.1.1 & 6.3.1.2	We have noted the non-conformances and we will work towards establishing the compliance.

ANNEXURE- I

TRACTOR RUN HOURS DURING TEST

A.	LABORATORY AND TRACK TESTS	HOURS
1.	Running-in	44.5
2.	PTO performance test	2.9
3.	Nominal speed test	0.6
B.	Miscellaneous test and other run hours including idle run, transportation, trials and preparation for test	0.2
TOTAL:		48.2