



**Make of Agricultural Tractor** : Indo Farm  
**Model** : 1020 DI  
**Manufactured by** : M/s. Indo Farm Equipment Ltd.  
Export Promotion Industrial Park,  
Phase-II, Village-Thana, Baddi – 173 205,  
Distt. Solan, Himachal Pradesh



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)**

T-1805/2336/2023	<b>INDO FARM, 1020 DI TRACTOR– Commercial (Initial)</b>
	<b>THIS TEST REPORT IS VALID UPTO: 31/12/2028</b>

[C]	Manufacturer	:	M/s. Indo Farm Equipment Ltd. Export Promotion Industrial Park, Phase-II, Village-Thana, Baddi – 173 205, Distt. Solan, Himachal Pradesh
[D]	Location of other manufacturing plants	:	Not announced
[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	:	05
	-Transmission	:	10
[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	:	Indo Farm
[C]	Model (trade name)	:	1020 DI
[C]	Type	:	Rear Wheel Drive, Standard Agricultural Tractor.
[C]	Month & year of manufacture	:	08/22
[D]	Country of origin	:	India

#### 1.1.2 Numbers:

[D]	1 <sup>st</sup> Serial No. or prototype	:	EPN102000001
[C]	Serial No.	:	HPP102000043

### 1.2 Engine:

[D]	Manufacturer's address	:	Marshal Motors, Rajkot
[C]	Make	:	Marshal Motors
[C]	Model	:	FMW165M
[C]	Type	:	Four stroke, naturally aspirated, liquid cooled, direct injection, diesel engine.
[C]	Serial No.	:	RB19919

#### 1.2.1 Cylinders:

[C]	Number/disposition	:	One / Vertical
[D]	Bore / Stroke, (mm)	:	100 / 114
[D]	Capacity, (cm <sup>3</sup> )	:	895
[D]	Compression ratio	:	17.5 ±1.0 : 1
[D]	Arrangement of valves	:	Overhead
[D]	Cylinder liners	:	Dry, replaceable
[D]	Type of combustion chamber	:	Re-entrant type

1.2.2	<b>Supercharging</b>	:	<b>Not Available</b>
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T-1805/2336/2023	<b>INDO FARM, 1020 DI TRACTOR– Commercial (Initial)</b>
	<b>THIS TEST REPORT IS VALID UPTO: 31/12/2028</b>

## 6. SUMMARY OF OBSERVATIONS, COMMENTS & RECOMMENDATIONS

6.1 On the basis of tests 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:

S. 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
<b>MANDATORY TESTS: (As per Ministry's Office Memorandum No. 13-17/2021-M&amp;T (I&amp;P) dated 28<sup>th</sup> of July, 2022).</b>						
<b>6.1.1 PTO Performance:</b>						
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 $\leq 26$ kW.	9.5 (D)	10.3	Yes
b)	Power at rated engine speed, (kW)	Non Evaluative	-do-	9.5 (D)	10.3	Yes
c)	Specific fuel consumption corresponding to maximum power, (g/kWh)	Evaluative	Should not be more than 10% of declared value	320 (D)	342	Yes
d)	Maximum equivalent crankshaft torque, (Nm)	Non Evaluative	$\pm 8\%$	49 (D)	51.9	Yes
e)	Back-up torque, percent	Evaluative	Should be minimum 12 percent	15(D) 12 (R)	21.8	Yes
f)	Maximum operating temperature, ( $^{\circ}$ C):					
	1) Engine oil	Evaluative	The declared value should not exceed the <i>Max</i> value specified by the oil company and the observed value under natural ambient/high ambient condition should not exceed the declaration	140 (D)	104	Yes
	2) Coolant	Evaluative	Observed value should not exceed the declared value or boiling point of coolant at radiator cap pressure whichever is lower. The boiling point of the coolant at radiator pressure shall be provided by the applicant.	115(D)	112	Yes
g)	Engine oil consumption, (g/kWh)	Evaluative	The value would be based on the test conducted under natural ambient condition	3.42 Maximum (R)	0.63	Yes
h)	Smoke level, $m^{-1}$	Evaluative	Max Smoke level shall be reported out of 6 readings tested as per IS 12062 and observed value should be well within the required limits.	3.25 per meter Maximum (R)	0.46	Yes

T-1805/2336/2023	<b>INDO FARM, 1020 DI TRACTOR– Commercial (Initial)</b>
	<b>THIS TEST REPORT IS VALID UPTO: 31/12/2028</b>

1	2	3	4	5	6	7
<b>6.1.2</b>	<b>Drawbar performance:</b>					
<b>a)</b>	Maximum drawbar pull with ballast or with standard ballast corresponding to 15% wheel slip or 7% track slip, (kN)	Non Evaluative	Min 70% of static mass of tractor with ballast	*	*	*
<b>b)</b>	Maximum drawbar pull without ballast or with standard ballast corresponding to 15% wheel slip or 7% track slip, (kN)	Evaluative	In case of tractors having total static mass $\geq 1500$ kg, Min 70% of static mass of tractor without ballast or with standard ballast, as the case may be. In case of light weight tractors having $\leq 1500$ kg total static mass of tractor, Min. 65% of static mass of tractor without ballast or with standard ballast, as the case may be.	4.84 (D) 4.81 (R) Minimum	5.41	Yes
<b>c)</b>	Maximum drawbar power without ballast or with standard ballast as the case may be, kW	Evaluative	Min 80% of PTO power as referred in SI No. i) a) of PTO performance in case of tractors having total static mass $> 1500$ kg. Min 75% of PTO power as referred in SI No. i) a) of PTO performance in case of light weight tractors having $\leq 1500$ kg total static mass of tractor. Min 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.	7.125 (D) 7.7 (R) Minimum	9.2	Yes
<b>d)</b>	Maximum transmission oil temperature, ( $^{\circ}$ C)	Evaluative	The declared value should not exceed the recommendation by the oil manufacturer. The observed value should not exceed the declared value throughout the drawbar test.	125 (D)	55	Yes
Remark*: Applicant vide letter no. IF/1020DI/ICT/803 dated 19.09.2023 has requested to conduct the testing as per the additional guideline for testing of tractors vide OM No. 13-32/2023-M&T (I&P) (FTS-125476) dated 16.05.2023. Accordingly, drawbar performance test under unballasted condition was conducted only.						
<b>6.1.3</b>	<b>Power lift and hydraulic pump performance:</b>					
<b>a)</b>	Maximum lifting capacity throughout the range of lift, (kN):					
	1) At hitch points	Evaluative	Should not be less than 90% of declared value.	4.9 (D)	10.08	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.	3.67 (D) 2.42 (R) Minimum	5.89	Yes
<b>b)</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	30 (D) 50 (R) Maximum	0	Yes

T-1805/2336/2023	<b>INDO FARM, 1020 DI TRACTOR– Commercial (Initial)</b>
	<b>THIS TEST REPORT IS VALID UPTO: 31/12/2028</b>

1	2	3	4	5	6	7	
<b>6.1.4</b>	<b>Brake performance at 25 kmph:</b>						
<b>a)</b>	Maximum stopping distance at a force, equal to or less than 600 N on brake pedal without ballast, (m):						
	1)	Cold brake	Evaluative	10	10 (R)	7.36	Yes
	2)	Hot brake	Evaluative	10	10 (R)	7.86	Yes
<b>b)</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	
<b>6.1.5</b>	<b>OPTIONAL TESTS:</b> <b>As the applicant has not applied for any optional tests, therefore no optional tests was conducted.</b>						
<b>6.1.6</b>	<b>Safety features:</b>						
<b>a)</b>	Guards against moving and hot parts	Evaluative	Belt drives, pulleys, silencer, hydraulic pipes [As per IS 12239 (Part2)]	Meets the requirement	Yes		
<b>b)</b>	Lighting arrangement	Evaluative	As per CMVR	Meets the requirement	Yes		
<b>c)</b>	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 the rear track width of tractor is less than 1150 mm.	Not applicable		
<b>d)</b>	Technical requirements for PTO shaft	Non Evaluative	Should meet the requirements of IS: 4931 (As amended from time to time)	Meets the requirement	Yes		
<b>e)</b>	Dimensions of three-point linkage	Non Evaluative	Should meet the requirements of IS: 17231-2019 (As amended from time to time)	<b>Does not meet the requirement</b>	<b>No</b>		
<b>f)</b>	Specifications of linkage drawbar	Non Evaluative	Should meet the requirements of IS: 12953 (As amended from time to time)	<b>Does not meet the requirement</b>	<b>No</b>		
<b>g)</b>	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		
<b>h)</b>	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 (11.69 kmph in HR gear)	Not applicable		
<b>6.1.7</b>	<b>Labelling of tractors (Provision of labelling plate):</b>						
1)	Make	Evaluative	Should conform to the requirements of CMVR along-with declared value of PTO in kW, Specific fuel consumption (SFC) corresponding to maximum power in g/kWh and year of manufacture in numerical form 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	INDO FARM	Yes		
	2)	Model		Evaluative	1020 DI	Yes	
	3)	Month & Year of manufacture		Evaluative	08/22	Yes	
	4)	Engine number		Evaluative	RB19919	Yes	
	5)	Chassis number		Evaluative	HPP102000043	Yes	
	6)	Maximum PTO power, (kW)		Evaluative	9.5	Yes	
	7)	Specific fuel consumption, g/kWh		Evaluative	320	Yes	

T-1805/2336/2023	<b>INDO FARM, 1020 DI TRACTOR– Commercial (Initial)</b>
	<b>THIS TEST REPORT IS VALID UPTO: 31/12/2028</b>

1	2	3	4	5	6	7
<b>6.1.8</b>	<b>Literature (Submission to test agency):</b>					
(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	
<b>6.1.9</b>	<b>Fitment of Roll Over Protective Structures (ROPS):</b>					
	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	Not applicable	
<b>6.1.10</b>	Standard Accessories	Evaluative	Trailer hitch, front tow hook, linkage drawbar should be provided with tractor	Provided	Yes	
<b>6.1.11</b>	Accessories (optional)	Non Evaluative	Ballast weight, if fitted, should meet the requirement of CMVR	Not fitted	Not applicable	

<b>6.2 CATEGORY OF BREAKDOWNS / DEFECTS ( As per clause 5.0 of IS:12207-2022):</b>					
S. No.	Category of break-downs	Category (Evaluative / Non Evaluative)	Requirements as per IS: 12207-2022	As observed	Whether meets the Requirements (Yes/No)
1.	Critical	Evaluative	There is no 'critical breakdown' during the course of testing.	None	Yes
2.	Major	Evaluative	There are not more than 1 major breakdown.	None	Yes
3.	Minor	Evaluative	There are not more than 3 minor defects during the test and neither of them should of repetitive nature.	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

**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 1 Categories 1N, 1, 2N, 2, 3N, 3, 4 & 4N [IS:17321-2019] : **Does not conform**
- iv) Drawbar for agricultural tractors – Link type [IS 12953:1990 (Reaffirmed Year 2022)] : **Does not conform**
- v) Agricultural tractors- Operator's seat technical requirement [IS12343 - 2021] : Not applicable as the rear track width of tractor 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**

T-1805/2336/2023	<b>INDO FARM, 1020 DI TRACTOR– Commercial (Initial)</b>
	<b>THIS TEST REPORT IS VALID UPTO: 31/12/2028</b>

- 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 PTO performance test:**

During PTO performance full load at varying speed test under high ambient conditions the maximum coolant temperature was recorded as 118°C against the declaration of 115 °C, which did not meet the evaluative requirement of IS:12207-2022 and hence the test was suspended. Upon which applicant vide letter No. IF/1020DI/ICT/06 dated 07.11.2023 has requested for calibration of coolant temperature sensor, which was allowed by the competent authority and coolant temperature sensor was checked & found correct. The applicant vide email dated 21.11.2023 further requested to change the position of radiator as radiator had fitted in such a way that fan was almost inside the cowl. After getting approval of the competent authority the radiator was shifted to next slot by 5mm forward. Thereafter, PTO performance full load at varying speed test under high ambient conditions was re-conducted. This should be looked into for necessary corrective action.

**6.4.2 Brake test:**

During the parking brake test, the welding of the locking rod of parking brake got broken. The name and part number of the component has not been specified by the applicant in the submitted literatures. The applicant has requested to allow welding the same rod so that the remaining test could be completed which was allowed after getting approval of competent authority. This breakdown has not been classified in IS: 12207-2022 under any category. This should be looked into for necessary corrective action.

**6.4.3 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 hitch pin hole & width of ball of upper hitch points
- ii) Lateral distance from lower hitch point to centre line of tractor
- iii) Lateral movement of lower hitch points
- iv) Transport height
- v) Movement range
- vi) Leveling adjustment
- vii) Lower hitch clearance point

**6.4.4 Specification of linkage drawbar**

The dimension of “A” of linkage drawbar has been measured 477 mm against the non evaluative requirement of 681.5 to 684.5 mm, which does not meet the non evaluative requirement of IS: 12953-1990(Cat-1) . This should be looked into for necessary corrective action.

**6.4.5 Operator’s work place:**

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

- i) Vertical retainers on inner side of clutch pedal are 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.

**6.4.6 PTO master shield:**

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

T-1805/2336/2023	<b>INDO FARM, 1020 DI TRACTOR– Commercial (Initial)</b>
	<b>THIS TEST REPORT IS VALID UPTO: 31/12/2028</b>

#### 6.4.7 Specification of Tractor:

i) 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.	Specific fuel consumption, g/kWh	320	275 (P. No. 42)
b.	Type of brake	Oil immersed disc brake	Mechanical, Expandable shoe and drum type (P. No. 43)
c.	Total capacity of cooling system, (l)	5.0	4.0 (P. No. 43)
d.	Recommended inflation pressure of front tyre, (kgf/cm <sup>2</sup> )	for field work:1.8 for road work:1.83	for field work:1.6 for road work:1.0 (P. No. 43)
e.	Recommended inflation pressure of rear tyre, (kgf/cm <sup>2</sup> )	for road work:1.63	for road work:1.1 (P. No. 30)
f.	Front track width	Track width: 850(Std.)  Method of changing track width : None	Track width: 845(Std.)& 895 mm  Method of changing track width : By reversing the tyre (P. No. 58)
g.	Rear track width	Track width: 840(Std.)	Track width: 840(Std.)& 885 mm
		Method of changing track width : By changing the position of wheel disc over rim lugs and reversing the wheel disc	Method of changing track width : By reversing the tyre (P. No. 58)
h.	Engine oil change period	First change after 40 hours and subsequent change after every 250 hours of operation.	First change after 50 hours and subsequent change after every 200 hours of operation. (P. No. 77)
i.	Engine oil filter change period	First change after 40 hours and subsequent change after every 250 hours of operation.	Replace lube oil filter element after 200 working hour.(P. No. 77)

ii) Capacity of air cleaner oil is specified as 0.25±0.05 l in application format No. 2. The capacity of oil should be specified in exact value and not in range. This should be looked into for necessary corrective action.

iii) The coolant water ratio is given as 3:1 in application format No. 2, submitted by applicant. Generally ratio of coolant is less than that of water. This should be looked into for necessary corrective action.

#### 6.8 Maintenance / Service Problems:

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

#### 6.9 Recommendation with regard to safety on tractor:

- i) Identification of hand controls by colour has not been provided as per the requirement as laid down in Table – 5 of IS: 8133-2021.
- ii) Stop control does not automatically remain in stop position without application of sustained manual efforts and which is located 170 mm from the engine start control against the minimum requirement of 150 mm, which does not meet the requirement as laid down in Table – 1 of IS: 8133-2021.



T-1805/2336/2023	INDO FARM, 1020 DI TRACTOR– Commercial (Initial)
	THIS TEST REPORT IS VALID UPTO: 31/12/2028

- iii) 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.
  - iv) The working clearance between position control lever & draft control lever has been measured as 45 mm against the minimum requirement of 70 mm as per the requirement of IS: 12239 (Part II) - 2019.
  - v) Safety switch has not been provided to prevent the engine start from accidental engaging as per the requirement laid down in Table-1 of IS: 8133-2021.
  - vi) Provision for mounting a canopy above driver's seat has not been provided.
- Above parameters should be looked into for necessary corrective action.

**6.10 Adequacy of Literature supplied with machine:**

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




- a) Operator's Manual for Indo Farm 1020 DI tractor model.
- b) Spare parts catalogue for Indo Farm 1020 DI tractor model.
- c) Workshop manual for Indo Farm 1020 DI tractor model.

**6.10.2** 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) Coolant recommended and coolant-water ratio.
- ii) Transmission, Steering & brake oil change period
- iii) Safe hitch height for trailer.

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

**TESTING AUTHORITY**

<b>C.K. TIJARE</b> AGRICULTURAL ENGINEER	
<b>R.P. PANDEY</b> SENIOR INSTRUMENTATION ENGINEER	
<b>A. K. UPADHYAY</b> DIRECTOR (I/C)	

Draft Test Report compiled by **C.K. Tijare**, Agricultural Engineering & **Poonam Khurasia**, Senior Technical Assistant.

T-1805/2336/2023	INDO FARM, 1020 DI TRACTOR– Commercial (Initial)
	THIS TEST REPORT IS VALID UPTO: 31/12/2028

#### 7. APPLICANT'S COMMENTS

Para no.	Our reference	Applicant comments
7.1	6.3 (iii, iv, vi, vii, viii & ix)	We are looking into these points for future improvements.
7.2	6.4.1, 6.4.2, 6.4.6. 6.4.7, 6.9 & 6.10.2	We are looking into these points for future improvements.

#### 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	12.6
3.	Power lift and hydraulic pump performance test	6.3
4.	Drawbar performance test	2.8
5.	Brake performance test	1.3
6.	Nominal speed test	0.3
<b>B.</b>	Miscellaneous test and other run hours including idle run, transportation, trials and preparation for test.	9.4
<b>TOTAL:</b>		<b>32.7</b>