

(यह परीक्षण रिपोर्ट 31/10/2023 तक वैध है। / THIS TEST REPORT IS VALID UP TO : 31/10/2023)



**INTERNATIONAL TRACTORS LIMITED, DI-745 III HDM**



सत्यमेव जयते

भारत सरकार

कृषि एवं किसान कल्याण मंत्रालय  
कृषि, सहकारिता एवं किसान कल्याण विभाग  
मशीनीकरण एवं प्रौद्योगिकी प्रभाग

GOVERNMENT OF INDIA

MINISTRY OF AGRICULTURE AND FARMERS WELFARE

(Department of Agriculture, Cooperation & Farmers Welfare, Mechanization & Technology Division)

केन्द्रीय कृषि मशीनरी प्रशिक्षण एवं परीक्षण संस्थान  
ट्रेक्टर नगर, बुदनी (म.प्र.) ४६६ ४४५

**CENTRAL FARM MACHINERY TRAINING & TESTING INSTITUTE**

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T- 1486/2013/2020	INTERNATIONAL TRACTORS LIMITED, DI-745 III HDM TRCATOR – Commercial (Variant)
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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 gm/cc** at 15°C was used.
- 2.2 Lubricants:**

S. No.	Particulars	As recommended by the manufacturer	As used during the test
1.	Air Cleaner oil & Engine oil	SAE 20W40	As recommended
2.	Transmission, Hydraulic and brake systems oil	EP-80	Oil originally filled in the tractor was not changed
3.	Steering oil	DEXRON II D	
4.	Grease	Servo grease MP	Servo grease MP

## 3. ESSENTIAL TEST

### 3.1. SPECIFICATIONS

- 3.1.1 Tractor:**
- |                             | Base Model  | Variant Model                  |
|-----------------------------|---|--------------------------------|
| Make                        | International Tractors Limited  | International Tractors Limited |
| Model                       | Sonalika International DI-745 III Power Plus  | DI-745 III HDM                 |
| Brand name, if any          | Sonalika  |                                |
| Type                        | Four wheeled, Rear-wheels driven, Unit construction, General purpose, Agricultural Tractor. |                                |
| Month & Year of manufacture | 2016  | 03 & 2020                      |
| Chassis number              | AZCSF547474S3   | AZCDH922721S3                  |
| Country of Origin           | India   |                                |
- 3.1.2 Engine:**
- |               | Sonalika  |
|---------------|---|
| Make          | Sonalika  |
| Model         | 3102IL   3105ELU  |
| Type          | Four stroke, naturally aspirated, liquid cooled, direct injection, diesel engine. |
| Serial number | 3102II 63C542965F5   3105ELU04C918210F20  |
- Engine speed (Manufacturer's recommended production setting), (rpm):**
- |                             |                |              |
|-----------------------------|----------------|--------------|
| - Maximum speed at no load, | : 2250 to 2350 | 2050 to 2150 |
| - Low idle speed            | : 600 to 700   | 700 to 800   |
| - Speed at maximum torque   | : 1100 to 1300 | 1000 to 1200 |

**7. SUMMARY OF OBSERVATIONS, COMMENTS & RECOMMENDATIONS**

**7.1** 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 the tractor for the purpose of subsidies/NABARD financing are summarized as under:

Sl. No.	Characteristic	Category (Evaluative / Non-Evaluative)	Requirements as per IS: 12207-2019	Values declared by the applicant/ requirement				Whether Variant model meets the requirements (Yes/No)
				Base model	Variant Model	Base model	Variant model	
1	2	3	4	5a	5b	6a	6b	7
<b>7.1.1 PTO Performance:</b>								
a)	Maximum power under 2 h test, (kW) (Natural ambient condition)	Evaluative	Declared value to be achieved with a tolerance of +5 percent for PTO power and engine power >26kW ±10 percent for PTO power and or engine ≤ 25 kW.	30.0 (D)	33.05 (D)	31.2	33.2	Yes
b)	Power at rated engine speed, (kW)	Non Evaluative	-do-	30.0 (D)	33.1 (D)	31.2	33.2	Yes
c)	Specific fuel consumption corresponding to maximum power, (g/kWh)	Evaluative	+10 %	272 (D)	255 (D)	251	258	Yes
d)	Maximum equivalent crankshaft torque, (Nm)	Non Evaluative	- 8%	130 (D)	200 (D)	170.9	200.3	Yes
e)	Back-up torque percent	Evaluative	12 percent, min.	12 %, min(R)	12 %, min(R)	20.4	19.9	Yes
h)	Smoke level	Evaluative	Maximum light absorption coefficient of 3.25 per meter or equivalent BOSCH No. 6.2 or 75 Haldige value (As per CMVR)	3.25 per meter (R)	3.25 per meter (R)	0.19	0.27	Yes
<b>7.1.2 Brake performance at 25 kmph:</b>								
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)	10(R)	7.79	7.72	Yes
	2) Hot brake	Evaluative	10	10(R)	10 (R)	7.82	8.19	Yes
b)	Maximum force exerted on the brake pedal to achieve a deceleration of 2.5 m/s <sup>2</sup> (N)	Evaluative	600	600 (R)	600 (R)	282 to 286	292 to 299	Yes



7.1.4 Labelling of tractors (Provision of labelling plate):						
1)	Make	Evaluative	Should conform to the requirements of CMVR along with maximum PTO Power in kW and year of manufacture in numerical form.	--	International Tractors Limited	Yes
2)	Model	Evaluative		--	DI-745 III HDM	Yes
3)	Month & Year of manufacture	Evaluative		--	03 / 20	Yes
4)	Engine number	Evaluative		--	3:05ELU04C9 18210F20	Yes
5)	Chassis number	Evaluative	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.	--	ADCIDH922721S3	Yes
6)	Declaration of PTO power, (kW)	Evaluative		--	33 1	Yes

7.1.5 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
7.1.6	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	Provided	Not fitted	Not applicable
7.1.7	Standard accessories	Evaluative	Trailer hitch, front tow hook, linkage drawbar should be provided with tractor	Provided	Provided	Yes
7.1.8	Accessories (Optional)	Non Evaluative	Ballast weights if fitted should meet the requirement of CMVR.	Provided	Provided	Yes

7.2 CATEGORY OF BREAKDOWNS / DEFECTS : (As per clause 5.0 of IS-12207-2019)						
Sl. No.	Category of breakdowns	Category (Evaluative / Non Evaluative)	Requirements as per IS: 12207-2019	As observed	Whether meets the requirement (Yes/No)	
1.	Critical	Evaluative	No critical breakdown	None	Yes	
2.	Major	Evaluative	Not more than one and neither of them should be repetitive in nature	None	Yes	
3.	Minor	Evaluative	Not more than three 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 four, that is, (1 major + 3 minor) or 4 minor breakdowns.	None	Yes	

**7.3 Salient Observations:****7.3.1 Laboratory tests:****7.3.1.1 PTO performance:**

- i) The maximum PTO power was recorded as **33.2 kW** against the declaration of **33.1 kW** & which meets the evaluative requirement of IS: 12207-2019.
- ii) The specific fuel consumption corresponding to maximum power was recorded as **258 g/kWh** against the declaration of **255 g/kWh** & which meets the evaluative requirement of IS: 12207-2019.
- iii) The maximum equivalent crankshaft torque was recorded as **200.3 N-m** against the declaration of **200 N-m** & which meet the non-evaluative requirement of IS: 12207-2019.
- iv) The backup torque was observed 19.9% & meets the evaluative requirement of IS: 12207-2019.

**7.3.1.2 Operator's seat:**

The "Inclination of back rest" of seat does not meet the requirement of IS: 12343-1998(Re-affirmed in 2014). This should be looked into for necessary corrective action.

**7.3.1.3 PTO master shield:**

PTO master shield not provided on tractor as per the requirements of IS: 4931-1995(Reaffirmed in 2004). This should be looked into for necessary corrective action.

**7.3.1.4 Engine model :**

The engine model is not embossed or etched or punched on engine. It is essential things for identification of engine model. This should be looked into for necessary corrective action.

**7.3.1.5 Three point linkage :**

- i) The lateral distance from lower hitch point to centre line of tractor does not meet the requirement of IS: 4468 (part 1):1997 (Reaffirmed in Oct., 2017). This may be looked into for necessary corrective action.
- ii) Some of the parameters conform to Cat I and some of them conform to Cat. II. Keeping in view the spirit of standardization, necessary improvements may be incorporated.

**7.3.1.6 Operator's work place:**

Operator's work place meets the requirements of IS: 12239 (Part-1 & Part-2) 1996, **except the following:**

- i) Provision of spark arresting device in the exhaust system.
- ii) Vertical retainness is not provided on both sides of clutch pedals.
- iii) The working clearance between draft control lever and mudguard is less than the requirement.
- iv) Provision of subsequent step.
- v) Minimum Cautionary notice as per clause 11.2 of above referred standard has not been provided.

**7.3.1.7 Symbols of operator's controls and other displays:**

All controls are identifiable with the symbols as per IS: 6283 (Part 1&2)-1998, except the oil lubricant type & frequency and Greasing lubricant frequency chart has not been provided. This needs to be looked into for necessary corrective action.

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**7.3.1.8 Location of operator's controls with regard to safety:**

Location of operator's controls with regard to safety meets the requirements of IS: 8133-1983(Reaffirmed 2014), **except the following:**

- i) Fuel shut-off knob does not remain in stop position.
- ii) Provision of differential lock in the tractor.

**7.4 Maintenance / Service problems:**

No noticeable maintenance and service problems was observed during the test.

**7.5 Recommendation with regard to safety on tractor:**

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

- i) Provision for spark arresting device in exhaust system.
- ii) Vertical retainness at both sides of clutch pedals should be provided as per relevant standard.
- iii) Fuel shut-off knob should remain in "STOP" position
- iv) The working clearance between draft control lever and mudguard should be as per the minimum requirements of relevant Indian Standard for easy operating the lever.
- v) Provision of PTO shaft master shield on tractor to avoid the accident.
- vi) Grease lubricant, oil lubricant type and frequency chart should be provided on the tractor.
- vii) Differential lock may be provided

**7.6 Adequacy of Literature:**

**7.6.1**

The following literatures were not supplied with the test tractor for reference during the test and does not meet the evaluative requirement of IS: 12207-2019. This should be looked into for necessary corrective action.

- a) Operator's manual of International Tractors Ltd., DI-745 III HDM tractor.
- b) Parts catalogue of International Tractors Ltd., DI-745 III HDM tractor.
- c) Service Manual of International Tractors Ltd., DI-745 III HDM tractor.

The results of the tests carried out on variant model "**International Tractors Ltd., DI-745 III HDM**" Tractor have been compared with those on base model "**International Tractors Limited, Sonalika International DI-745 III Power Plus**" Tractor tested vide test report **No. T- 1143/1669/2018 (April, 2018)** and found within the limit, as specified in Indian Standard: 12207-2019.



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INTERNATIONAL TRACTORS LIMITED, DI-745 III HDM  
TRCATOR – Commercial (Variant)

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### 8. CITIZEN CHARTER

Time frame for Testing & Evaluation as per Citizen Charter	Duration of Test	Whether the Test Report is released within the time frame given in Citizen Charter	Remarks
10 Months	4 Month (June, 2020 to September, 2020)	Yes	None

#### TESTING AUTHORITY:

**SHWETABH SINGH**  
**AGRICULTURAL ENGINEER**

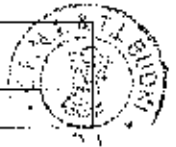
**C.V. CHIMOTE**  
**TEST ENGINEER**

**J.J.R. NARWARE**  
**DIRECTOR**

The report compiled by: Shri Vilhato Keyho, **Senior Technical Assistant**

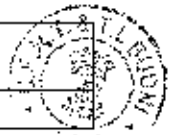
### 9. APPLICANT COMMENT'S

Para No.	Our Reference	Applicant's comments
9.1	7.3.1.4	Engine model is mentioned name along with the engine serial no. on RHS of engine.

**ANNEXURE -I****TRACTOR RUN HOURS DURING TEST**

<b>A. LABORATORY AND TRACK TESTS:</b>		<b>HOURS</b>
1.	Running-in	--
2.	PTO performance test	6.8
3.	Brake performance test	2.3
4.	Nominal speed test	2.0
5.	Turning ability	0.2
6.	Location of centre of gravity	0.2
<b>B</b>	Miscellaneous test and other run hours including idle r.n, transportation, preparation for test and trial runs.	1.18
<b>TOTAL:</b>		<b>12.7</b>



**ANNEXURE - I****TRACTOR RUN HOURS DURING TEST**

<b>A. LABORATORY AND TRACK TESTS:</b>		<b>HOURS</b>
1.	Running-in	--
2.	PTO performance test	6.8
3.	Brake performance test	2.3
4.	Nominal speed test	2.0
5.	Turning ability	0.2
6.	Location of centre of gravity	0.2
<b>B</b>	Miscellaneous test and other run hours including idle run, transportation, preparation for test and trial runs.	1.18
<b>TOTAL:</b>		<b>12.7</b>