

(यह परीक्षण रिपोर्ट 30/11/2023 तक वैध है। / THIS TEST REPORT IS VALID UP TO : 30/11/2023)



**INTERNATIONAL TRACTORS LIMITED, DI-50 TRACTOR**



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  
ट्रैक्टर नगर, बुदनी (म.प्र.) ४६६ ४४५

**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 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

<b>3.1.1 Tractor:</b>	<b>Base Model</b>	<b>Variant Model</b>
Make	: International Tractors Limited	International Tractors Limited
Model	: Sonalika International DI-47 RX Heavy Duty	DI-50
Brand name, if any	: None	
Type	: Four wheeled, Rear-wheels driven, Unit construction, General purpose, Agricultural Tractor.	
Month & Year of manufacture	: 05 & 2019	06 & 2020
Chassis number	: FZVSS 847949S3	HZGDH930352S3
Country of Origin	: India	
<b>3.1.2 Engine:</b>		
Make	: International Tractors Limited	
Model	: 3102IL	3105NH
Type	: Four stroke, naturally aspirated, liquid cooled, direct injection, diesel engine.	
Serial number	: 3102IL93D844914F5	3105NH04E925666F29
<b>Engine speed (Manufacturer's recommended production setting), (rpm):</b>		
- Maximum speed at no load,	: 2200 to 2400	2150 to 2250
- Low idle speed	: 650 to 750	750 to 850
- Speed at maximum torque	: 1100 to 1300	1000 to 1200
<b>Rated speed, (rpm):</b>		
- For PTO use	: 2100	2000
- For drawbar use	: 2100	2000

## 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		As observed		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</b>	<b>PTO Performance:</b>							
<b>a)</b>	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 ≤ 26 kW.	30.5 (D)	34.2 (D)	31.7	35.0	Yes
<b>b)</b>	Power at rated engine speed, (kW)	Non Evaluative	-do-	30.5 (D)	34.2 (D)	31.7	34.7	Yes
<b>c)</b>	Specific fuel consumption corresponding to maximum power, (g/kWh)	Evaluative	+10 %	247 (D)	250 (D)	265	248	Yes
<b>d)</b>	Maximum equivalent crankshaft torque, (Nm)	Non Evaluative	± 8%	130 (D)	194 (D)	172.6	198.4	Yes
<b>e)</b>	Back-up torque percent	Evaluative	12 percent, min.	12 %, min(R)	12 %, min(R)	19.9	19.7	Yes
<b>h)</b>	Smoke level	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)	3.25 per meter (R)	0.31	0.32	Yes
<b>7.1.2</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 with road ballast, (m):							
	1) Cold brake	Evaluative	10	10(R)	10(R)	8.30	7.90	Yes
	2) Hot brake	Evaluative	10	10(R)	10 (R)	8.42	8.08	Yes
<b>b)</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)	306 to 402	380 to 414	Yes

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1	2	3	4	5 a	5 b	6 a	6 b	7
<b>7.1.3</b>	<b>Safety features :</b>							
a)	Guards against moving and hot parts	Evaluative	Belt drives, pullies, silencer, hydraulic pipes (As per IS 12239 (Part2))	--	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)	--	Meets the requirement			Yes
d)	Technical requirements for PTO shaft	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-I) (As amended from time to time)	--	<b>Does not meet the requirement</b>			<b>No</b>
f)	Specifications of linkage drawbar	Evaluative	Should meet the requirements of IS: 12953 (As amended from time to time)	--	Meets the requirement			Yes
g)	Swinging drawbar (wherever fitted)	Evaluative	Should meet the requirement of IS: 12362 (Part 3) (As amended from time to time)	--	<b>Not Provided</b>			<b>Not applicable</b>
h)	1)	Maximum travelling speed at rated engine speed in reverse gears, Kmph	Evaluative	Should not exceed 20 Kmph	--	12.04 kmph (Meets the requirement)		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. The safety aspects about the operation of shuttle technology shall be brought in operation and manufacturer/dealer shall ensure the training on this aspect to operator before the delivery of tractor.	--	<b>Not applicable</b>		<b>Not applicable</b>

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<b>7.1.4</b>	<b>Labelling of tractors (Provision of labelling plate):</b>								
	1)	Make	Evaluative	Should conform to the requirements of CMVR along with maximum PTO Power in kW and year of manufacture in numerical form. <table border="1" style="width: 100px; height: 20px; margin: 5px 0;"><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	--	International Tractors Limited	Yes
MM	YY								
	2)	Model	Evaluative		--	DI-50	Yes		
	3)	Month & Year of manufacture	Evaluative		--	06 / 2020	Yes		
	4)	Engine number	Evaluative		--	3105NH04E92 5666F29	Yes		
	5)	Chassis number	Evaluative		--	HZGDH930352S3	Yes		
	6)	Declaration of PTO power, (kW)	Evaluative	--	34.2	Yes			
<b>7.1.5</b>	<b>Literature (Submission to test agency):</b>								
	(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		
<b>7.1.6</b>		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	<b>Not fitted</b>	<b>Not applicable</b>		
<b>7.1.7</b>		Standard accessories	Evaluative	Trailer hitch, front tow hook, linkage drawbar should be provided with tractor	Provided	Provided	Yes		
<b>7.1.8</b>		Accessories (Optional)	Non Evaluative	Ballast weights if fitted should meet the requirement of CMVR.	Provided	Provided	Yes		
<b>7.2</b>	<b>CATEGORY OF BREAKDOWNS / DEFECTS :(As per clause 5.0 of IS-12207-2019)</b>								
<b>Sl. No.</b>	<b>Category of breakdowns</b>	<b>Category (Evaluative / Non Evaluative)</b>	<b>Requirements as per IS: 12207-2019</b>		<b>As observed</b>	<b>Whether meets the requirement (Yes/No)</b>			
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			

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### 7.3 Salient Observations:

#### 7.3.1 Laboratory tests:

##### 7.3.1.1 PTO performance:

- i) The maximum PTO power was recorded as **35.0 kW** against the declaration of **34.2 kW**, which meets the evaluative requirement of IS: 12207-2019.
- ii) The specific fuel consumption corresponding to maximum power was recorded as **248 g/kWh** against the declaration of **250 g/kWh**, which meets the evaluative requirement of IS: 12207-2019.
- iii) The maximum equivalent crankshaft torque was recorded as **198.4 N-m** against the declaration of **194 N-m**, which meets the non-evaluative requirement of IS: 12207-2019.
- iv) The backup torque was observed 19.7% & meets the evaluative requirement of IS: 12207-2019.

##### 7.3.1.2 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.

##### 7.3.1.3 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 for distinct identification of engine model.

##### 7.3.1.4 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.

##### 7.3.1.5 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.

##### 7.3.1.6 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.

##### 7.3.1.7 Maximum actuating forces for control:

The maximum actuating force for hand lever operated hydraulic power lift system was recorded as 103 N against the maximum requirement of 70 N as per IS: 10703:1992 (Reaffirmed in 2017). This should be looked into for necessary corrective action.

### 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) Differential lock may be provided

**7.6 Adequacy of Literature:**

- 7.6.1** The following literatures were supplied with the test tractor for reference during the test:-
- a) Operator's manual of International Tractors Ltd., DI-50 tractor.
  - b) Parts catalogue of International Tractors Ltd., DI-50 tractor.
  - c) Service Manual of International Tractors Ltd., DI-50 tractor.

The results of the tests carried out on variant model "International Tractors Ltd., DI-50" Tractor have been compared with those on base model "International Tractors Limited, Sonalika International DI-47 RX HEAVY DUTY" Tractor tested vide test report No. T- 1433/1960/2020 (April) and found within the limit, as specified in Indian Standard: 12207-2019.

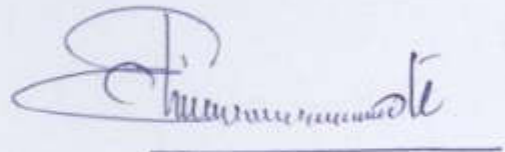
**8. CITIZEN CHARTER**

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	5 Month (July, 2020 to November,2020)	Yes	None

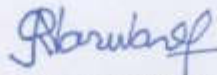
**TESTING AUTHORITY:**



**SHWETABH SINGH**  
AGRICULTURAL ENGINEER



**C.V. CHIMOTE**  
TEST ENGINEER



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

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### 9. APPLICANT COMMENT'S

<b>Para No.</b>	<b>Our Reference</b>	<b>Applicant's comments</b>
9.1	7.3.1.3	Engine model is mentioned name along with the engine serial no. on RHS of engine.
9.2	7.3.1.5(ii) & (v)	They are under development and will be regularized in production of tractor accordingly.
9.3	7.3.1.7	The maximum actuating force for hand lever has been improved and will be implemented on production tractors.

### ANNEXURE -I

#### TRACTOR RUN HOURS DURING TEST

<b>A.</b>	<b>LABORATORY AND TRACK TESTS:</b>	<b><u>HOURS</u></b>
1.	Running-in	--
2.	PTO performance test	4.5
3.	Brake performance test	2.0
4.	Nominal speed test	0.8
5.	Turning ability	0.3
6.	Location of centre of gravity	0.3
<b>B</b>	Miscellaneous test and other run hours including idle run, transportation, preparation for test and trial runs.	4.7
<b>TOTAL:</b>		<b>12.6</b>