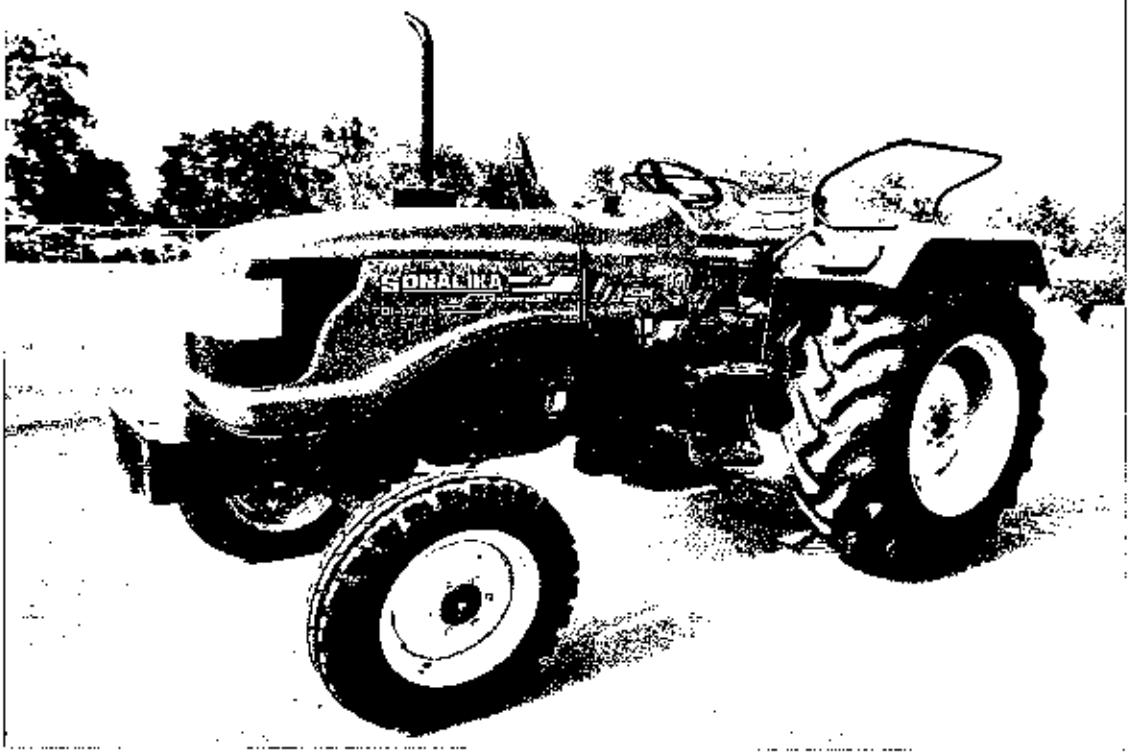


(यह परीक्षण रिपोर्ट 31/10/2023 तक वैध है। / THIS TEST REPORT IS VALID UP TO : 31/10/2023)



**INTERNATIONAL TRACTORS LIMITED,  
DI-47 HDM 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**

(An ISO : 9001 - 2015 Certified Institute)

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**INTERNATIONAL TRACTORS LIMITED, DI - 47 HDM  
TRACTOR - COMMERCIAL (VARIANT)**

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1	2	3	4
10	<b>Steering system :</b> Make & type	Rane & mechanical	Danfoss & Hydrostatic
11	<b>Brake system :</b> Make, type & no. of disc  Area of brake lining (cm <sup>2</sup> )	Excel , Mechanical dry disc & two (on each wheel side) 805.7	Sonalika , Wet type ,oil immersed disc & Four (on each wheel side) 960.2
12	Size & ply rating of rear tyres Wheel base, (mm):	13.8-28 & 12 PR 1980	14.9-28 & 12 PR 2075
13	Style of bonnet	Compound (Refer Annexure I)	Mono (Refer Annexure- I)
14	Max declared PTO power, kW	30.0	33.1

Subsequent to the examination of the case in the light of **Indian Standard IS: 12207- 2019 clause no.8.2** Table-2- Sr. no. (i),(v),(vii) & (xiii) & Table -3 following tests were considered to be carried out:-

- Specification checking
- Nominal speed test
- PTO performance test under natural ambient condition
- Hydraulic performance test
- Brake performance test
- Turning Ability
- Location of Centre of Grav.ty

**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 oil	SAE 20W-40	SAE 20W-40
2.	Transmission, rear axle and final drive oil , Hydraulic, Steering housing & brake system	SAE-80 (Sonalika maxima gear oil)	Oil originally filled in the tractor was not changed
3.	Grease	Multipurpose grease	Servo grease MP

**3. ESSENTIAL TESTS**

**3.1. SPECIFICATIONS**

3.1.1 Tractor:	Base Model	Variant Model
Make	: International Tractors Limited	
Model	: Sonalika International DI - 745 III Power Plus	DI 47 HDM
Type	: Four wheeled, rear wheel driven, General purpose, Unit construction Agricultural Tractor	
Month & Year of manufacture	: 2016	03/20
Chassis number	: AZCSF547474S3	AZVDH919107S3
Country of Origin	: India	India



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

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:-

#### 7.1 Evaluative & Non-Evaluative Parameters:

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. 7)
				Base model	Variant Model	Base model	Variant model	
1	2	3	4	5 a	5 b	6 a	6 b	7
<b>7.1.1 PTO Performance:</b>								
a)	Max. power under 2 h test, (kW) (Natural ambient condition)	Evaluative	Declared value to be achieved with a tolerance of: ±5% for PTO power and or engine power >26 kW. +10% for PTO power and or engine < 26 kW.	30.0 (D)	33.1 (D)	31.2	31.8	Yes
b)	Power at rated engine speed, (kW)	Non Evaluative	-do-	30.0 (D)	33.1 (D)	31.2	31.8	Yes
c)	Specific fuel consumption corresponding to maximum power, (g/kWh)	Evaluative	+ 10% max.	272 (D)	250 (D)	251	245	Yes
d)	Maximum equivalent crankshaft torque, (Nm)	Non Evaluative	- 8%	130 (D)	200 (D)	170.9	194.2	Yes
e)	Back-up torque, percent	Non Evaluative	12 percent, min.	12 (D)	12 (D)	20.4	21.4	Yes
<b>7.1.2 Power lift and hydraulic pump performance :</b>								
<b>a) Maximum lifting capacity throughout the range of lift, (kN):</b>								
1)	At hitch points	Non Evaluative	[Tolerance of ±10%]	13.5 (D)	16.0 (D)	13.83	16.79	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	7.22 (D)	12.0 (D)	11.33	14.14	Yes
				7.35 (R)	7.48 (R)			
<b>7.1.3 Brake performance at 25 kmph:</b>								
<b>a) Maximum stopping distance at a force, equal to or less than 600 N on brake pedal with road ballast, (m):</b>								
1)	Cold brake	Evaluative	10	10 (R)	10 (R)	7.79	7.50	Yes
2)	Hot brake	Evaluative	10			7.82	7.61	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	233 to 291	Yes
c)	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	Yes	Yes



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**TRACTOR - COMMERCIAL (VARIANT)**  
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1	2	3	4	5	6	7
<b>7.1.4 Safety features :</b>						
a)	Guards against moving and hot parts	Evaluative	Roll drives, pulleys, silencer, hydraulic pipes (As per IS 12239 (Part2))		Meets the requirement	Yes
b)	Lighting arrangement	Evaluative	As per CMVR		Meets the requirement	Yes
c)	Sealing 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	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)		Not Provided	Not applicable
h)	1) Maximum traveling speed at rated engine speed in reverse gear, Kmph	Evaluative	Should not exceed 20 Kmph		12.11 kmph Meets the requirement	Yes
	2) Audible warning signal on tractor	Evaluative	As soon as the traveling 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.		Not applicable	Not applicable
<b>7.1.5 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.  MM    YY 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.		INTERNATIONAL TRACTORS LTD.	Yes
2)	Model	Evaluative		DI-47 HDM	Yes	
3)	Month & Year of manufacture	Evaluative		03    20	Yes	
4)	Engine number	Evaluative		3105ELU93J884943F	Yes	
5)	Chassis number	Evaluative		AZVDH019107S3	Yes	
6)	Declaration of PTO power, (kW)	Evaluative		33.1 (44.32)	Yes	
<b>7.1.6 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>7.1.7 Fitment of Roll Over Protective Structures (ROPS):</b>						
(a)	For tractor having more than 1150 mm rear track width	Evaluative	ROPS should meet the requirement of IS:1182 or OPCI) code or equivalent International Standard	Provided	Not fitted	Not Applicable

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1	2	3	4	5	6	7
7.1.8	Standard Accessories	Evaluative	Trailer hitch, front tow hook, linkage drawbar should be provided with tractor	Provided	Provided	Yes
7.1.9	Accessories (optional)	Non Evaluative	Ballast weight, if fitted, should meet the requirement of CMVR	Provided	Provided	Yes

7.2 CATEGORY OF BREAKDOWNS / DEFECTS :					
Sl. No.	Category of breakdowns	Category (Evaluative / Non Evaluative)	Requirements as per IS: 12207-2019	As observed	Whether meets the Requirements (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 in case of base and variant model were observed as 31.2 & 31.8 kW respectively against the declaration of 30.0 & 33.1 kW which meets the requirement of IS:12207-2019 as regard to tolerance limit.
- ii) The specific fuel consumption in case of base and variant models corresponding to maximum power were observed as 251 & 245 g/kWh respectively against the declaration of 272 & 250 g/kWh which meets the requirement of IS:12207-2019 as regard to tolerance limit.
- iii) The backup torque observed as 21.4 % which meets the evaluative requirement of IS:12207-2019.

**7.3.1.2 Hydraulic performance:**

- i) The lifting capacity at hitch points through out the range of lift was recorded as 16.79 kN against the declaration of 16.0 kN , which is within the tolerance limit as specified in IS:12207-2019.

**7.3.1.3 Three point linkage:**

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.

**7.4 Maintenance / Service Problems:**

No noticeable maintenance or service problem 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) The spark arrester has not been provided in the exhaust system.
- ii) PTO master shield may be provided.
- iii) Vertical retainness at inner side of clutch and brake pedal has not been provided.
- iv) Colour codes for engine revolution gauge & fuel level indication have not been provided.
- v) Fuel shut off lever does not remain in stop position.



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

**7.6.1** The following literatures were submitted with the test tractor for reference during the test:-

- Operator's manual for International Tractors Ltd., DI-42 HDM, DI-42 HDM S3, DI-42 HDM 4WD, DI -42 HDM POWER PLUS, DI-47 HDM, DI-745 III HDM , DI-50 & DI-55 tractor models.
- Spare Parts Catalogue for International Tractors Ltd., DI-42 HDM, DI-42 HDM S3, DI-42 HDM 4WD, DI -42 HDM POWER PLUS, DI-17 HDM, DI-745 III HDM , DI-50 & DI-55 tractor models.
- Service manual for International Tractors Ltd., DI-42 HDM, DI-42 HDM S3, DI-42 HDM 4WD, DI- 42 HDM POWER PLUS, DI-47 HDM, DI-745 III HDM , DI-50 & DI-55 tractor models.

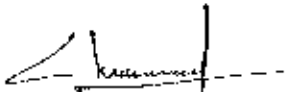
**7.6.2** The supplied literature was found adequate. However, these literatures should be brought out in national as well as other regional languages of India for guidance of users.


The results of the tests carried out on variant model "INTERNATIONAL TRACTOR LTD., DI -47 HDM " have been compared with those on base model" INTERNATIONAL TRACTOR LTD., SONALIKA INTERNATIONAL DI-745 III POWER PLUS" and found within the limit, as specified in Indian Standard:12207-2019.

**8. CITIZEN CHARTER**

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

**TESTING AUTHORITY:**

  
**C.S. RAGHUWANSHI**  
AGRICULTURAL ENGINEER

  
**C.V. CHIMOTE**  
TEST ENGINEER

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

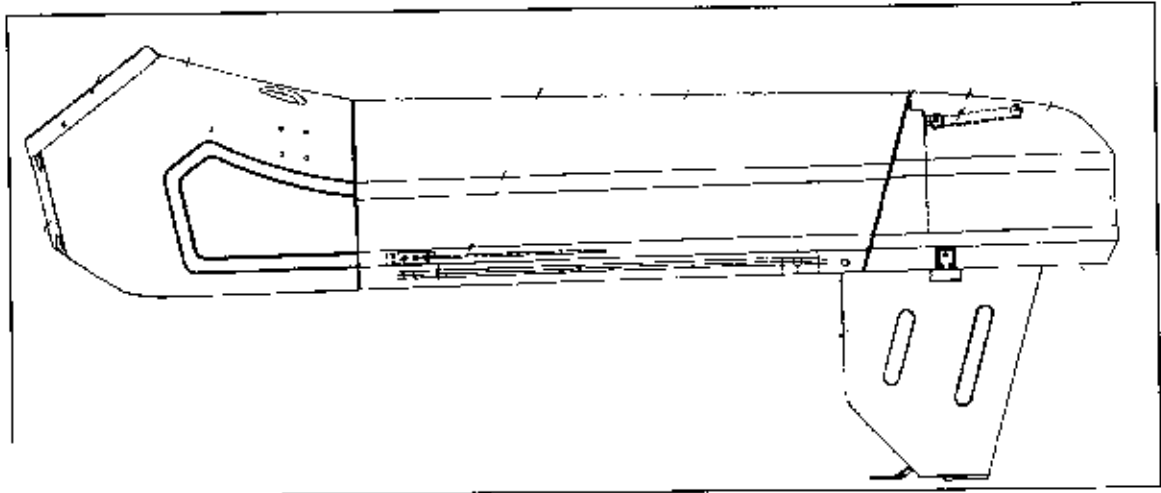
The report compiled by: **Shri Shivkumar Sharma**, Senior Technical Assistant

**9. APPLICANT COMMENT'S**

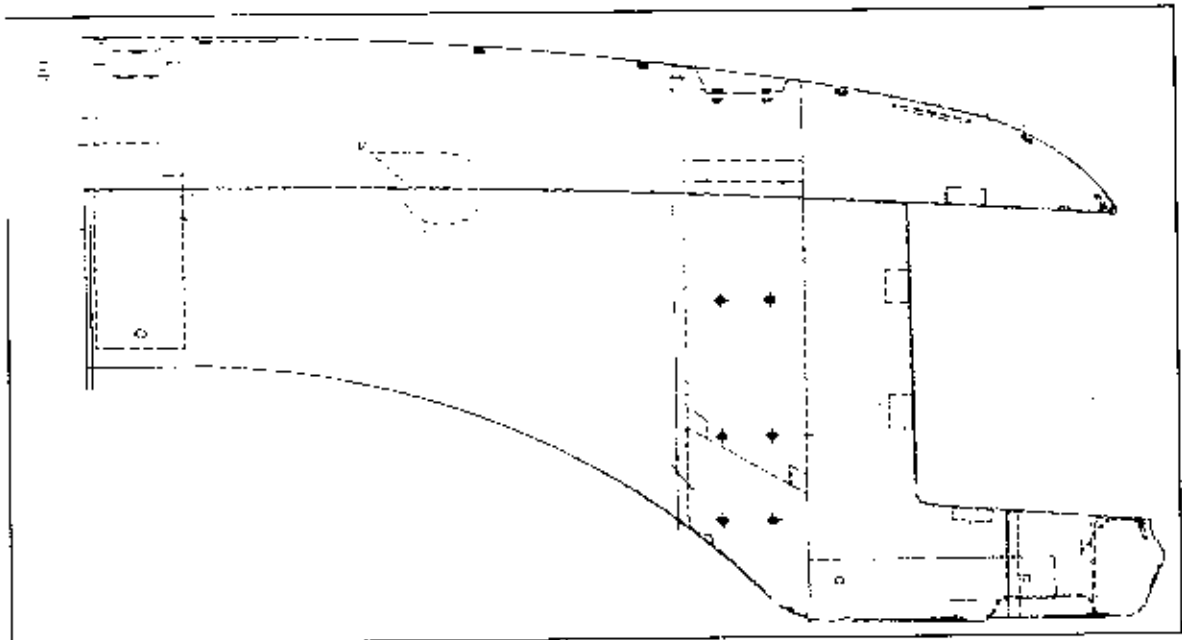
Para No.	Our Reference	Applicant's comments
9.1	7.5 (iv)	This will be updated in our production tractor .
9.2	7.6.2	We always publish the tractor literature in national as well as regional language.



ANNEXURE-I



COMPOUND STYLE BONNET OF INTERNATIONAL TRACTORS LIMITED, DI-745 III POWER PLUS  
[BASE MODEL]



MONO STYLE BONNET OF INTERNATIONAL TRACTORS LIMITED, DI-47 HDM  
[VARIANT MODEL]



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ANNEXURE-II

## TRACTOR RUN HOURS DURING TEST

<u>LABORATORY AND TRACK TESTS</u>		<u>HOURS</u>
A.		
1.	Running-in	6.7
2.	PTO performance test	3.0
3.	Power lift and hydraulic pump performance test	0.7
4.	Brake test	0.7
5.	Steering effort test	1.3
6.	Nominal speed test	0.3
7.	Turning Ability	0.4
8.	Center of gravity test	1.5
B.	Miscellaneous test and other run hours, including idle run transportation, trial and preparation for test.	
<b>Total</b>		<b>14.6</b>



