

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



**INTERNATIONAL TRACTORS LIMITED,
DI - 42 RX HDM S3 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)**

Tractor Nagar, Budni (M.P.) 466 445

E-mail fmti-mn@nic.in

Website : <http://www.fmttibudni.gov.in>

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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 & Engine	SAE 20 W 40	SAE 20 W 40
2.	Gearbox, differential, rear axle, final drive, brake, Steering housing & hydraulic system oil	SAE EP-80	Oil originally filled in the tractor systems was not changed
3.	Grease	MP Grease	MP Grease

3. ESSENTIAL TEST

3.1. SPECIFICATIONS

3.1.1 Tractor:	<u>Base Model</u>	<u>Variant Model</u>
Make	: Sonalika	International Tractors Limited
Model	: DI- 42 HDM	DI- 42 RX HDM S3
Type	: Four wheeled, rear-wheels driven, standard agricultural tractor.	
Month & Year of manufacture	: * 03 / 2020	05 / 2020
Chassis number	: FYZSG744175S3	FYZSG926898S3
Country of Origin	: India	
3.1.2 Engine:		
Make	: Sonalika	
Model	: 3102FLU	
Type	: Four strokes, liquid cooled, naturally aspirated, direct ignition, diesel engine.	
Serial number	: 3102FLU 83E736815F19	3102FLU 04C918869F19
Engine speed (Manufacturer's recommended production setting), (rpm):		
- Maximum speed at no load	: 1900 to 2000	
- Low idle speed	: 750 to 850	
- Speed at maximum torque	: 1000 to 1200	
Rated speed, (rpm):		
- For PTO use	: 1800	
- For drawbar use	: 1800	
3.1.3 Cylinder & Cylinder Head:		
Number	: Three	
Disposition	: Vertical, inline	
Bore/stroke, (mm)	: 102 / 118	
Capacity as specified by the applicant, (cc)	: 2891	
Compression ratio	: 20 (±0.2) : 1	
Type of cylinder head	: Individual	
Type of cylinder liners	: Wet, replaceable	
Type of combustion chamber	: Direct injection, open chamber in piston crown	
Arrangement of valves	: Over head, inline	

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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)
				<u>Base model</u>	<u>Variant Model</u>	<u>Base model</u>	<u>Variant model</u>	
1	2	3	4	5a	5b	6a	6b	7
7.1.1	PTO Performance:							
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 > 26 kW. ±10 percent for PTO power and or engine ≤ 26 kW.	29.5 (D)	29.5 (D)	29.9	29.6	Yes
b)	Power at rated engine speed, (kW)	Non Evaluative	-do-	29.5 (D)	29.5 (D)	29.9	29.2	Yes
c)	Specific fuel consumption corresponding to maximum power, (g/kWh)	Evaluative	+10 %	245 (D)	245 (D)	242	244	Yes
d)	Maximum equivalent crankshaft torque, (Nm)	Non Evaluative	± 8%	197 (D)	197 (D)	190.6	185.5	Yes
e)	Back-up torque, percent	Evaluative	12 % Minimum	12 % (R) Minimum	12 % (R) Minimum	20.4	19.8	Yes
7.1.2	Brake performance at 25 kmph:							
a)	Maximum stopping distance at a force, equal to or less than 600 N on brake pedal with Un ballast, (m):							
	1) Cold brake	Evaluative	10 m	10 (R)	10(R)	7.13	8.36	Yes
	2) Hot brake	Evaluative	10 m	10 (R)	10(R)	7.49	8.56	Yes
b)	Maximum force exerted on the brake pedal to achieve a deceleration of 2.5 m/s ² (N)	Evaluative	600	600 (R)	600 (R)	218 to 223	337 to 399	Yes
c)	Whether parking brake is effective at a force of 600 N at foot pedal (s) or 400 N at hand lever, N	Evaluative	Yes / No	Yes	Yes	Yes	Yes	Yes

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1	2	3	4	5a	5b	6a	6b	7
7.1.3	Safety features:							
a)	Guards against moving and hot parts	Evaluative	Belt drives, pullies, silencer, hydraulic pipes (As per IS 12239 (Part2))	Provided		Meets the requirements		Yes
b)	Lighting arrangement	Evaluative	As per CMVR	Provided		Meets 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)	Did not conform		Does not meets the requirements		No
d)	Technical requirements for PTO shaft	Evaluative	Should meet the requirements of IS: 4931 (As amended from time to time)	Did not conform		Meets 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)	Did not conform		Does not meets the requirements		No
f)	Specifications of linkage drawbar	Evaluative	Should meet the requirements of IS: 12953 (As amended from time to time)	Conformed		Meets the requirements		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 Provided		Not applicable
h)	1) Maximum travelling speed at rated engine speed in reverse gear, (kmph)	Evaluative	Should not exceed 20 kmph	Conformed		10.90 kmph (Meets the requirement)		Yes

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1	2	3	4	5a	5b	6a				
	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.	Not applicable	Not applicable	Not applicable			
7.1.5	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. Digit <table border="1" style="display: inline-table; vertical-align: middle;"><tr><td>MM</td><td>YY</td></tr></table> 01 – 12 in <table border="1" style="display: inline-table; vertical-align: middle;"><tr><td> </td><td> </td></tr></table> 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 – 42 RX HDM S3	Yes				
	3)	Month & Year of manufacture	Evaluative		05 / 2020	Yes				
	4)	Engine number	Evaluative		3102FLU04C9 18869F19	Yes				
	5)	Chassis number	Evaluative	FYZSG92689 8S3	Yes					
	6)	Declaration of PTO power, (kW)	Evaluative	29.5	Yes					
7.1.6	Literature (Submission to test agency):									
	(a)	Operator manual	Evaluative	Provided / Not Provided	Provided	Yes				
	(b)	Parts Catalogue	Evaluative	Provided / Not Provided	Provided	Yes				
	(c)	Workshop/ Service manual	Evaluative	Provided / Not Provided	Provided	Yes				
7.1.7	Fitment of roll Over protective structures (ROPS): for tractor having more than 1150 mm rear track width		Evaluative	ROPS should meet the requirement of IS 11821 or OECD code or equivalent International standard	ROPS not fitted	Not applicable				
7.1.8	Standard Accessories		Evaluative	Trailer hitch, front tow hook, linkage drawbar should be provided with the tractor.	Provided	Yes				
7.1.9	Accessories (optional)		Non Evaluative	Ballast weights, if fitted, should meet the requirement of CMVR	Not fitted	Not applicable				

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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 Requirements (Yes/No.)
1.	Critical breakdown	Evaluative	No critical breakdown.	None	Yes
2.	Major breakdowns	Evaluative	Not more than two major breakdowns and neither of them of repetitive nature.	None	Yes
3.	Minor breakdowns	Evaluative	Not more than five 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 five, that is, (2 major + 3 minor) or (1 major + 4 minor) or 5 minor breakdowns.	None	Yes

7.3 Salient Observations:

7.3.1 Laboratory tests:

7.3.1.1 PTO performance test:

- i) The maximum PTO power was recorded as **29.6 kW** against the declaration of **29.5 kW**, which meets the requirement of IS: 12207-2019 with regard to tolerance limit.
- ii) The specific fuel consumption corresponding to maximum power was recorded as **244 g/kWh** against the declaration of **245 g/kWh**, which is within the tolerance limit of IS: 12207-2019.
- iii) The maximum equivalent crankshaft torque was recorded as **185.5 Nm** against the declaration of **197 Nm**, which meets the requirement of IS: 12207-2019 with regard to tolerance limit.
- iv) The backup torque was observed as **19.8 %**, which meets the requirement of IS: 12207-2019 with regard to tolerance limit.

7.3.1.2 Operator's seat:

Inclination of back rest of seat from the vertical plane. Does not meet the requirement of IS: 12343-1998 (Re-affirmed in 2014). This is recommended to look into for necessary corrective action.

7.3.1.3 Three point linkage:

Lateral distance from lower hitch point to centre line of tractor (lower link in horizontal position) 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) Vertical retainers on both side of clutch pedal should be provided.
- ii) The fuel shut-off knob should remain in stop position.
- iii) PTO shaft master shield should be provided.
- iv) Working clearance between draft control lever and RHS fender is less than the minimum requirement.
- v) Vertical distance from seat index point to the centre of clutch pedal is less than the minimum requirement.

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- vi) Grease lubricant type and frequency chart should be provided on the tractor.
- vii) Colour code on engine revolution gauge.
- viii) Differential lock is not provided.

7.6 Adequacy of Literature supplied with machine:

- 7.6.1** The following literature was supplied with tractor for reference during the test.
- i) Operator's manual for International Tractor Ltd, DI-42 RX HDM S3 tractor model.
 - ii) Spare part's catalogue Part - I & Part - II for International Tractor Ltd, DI-42 RX HDM S3 tractor model.
 - iii) Service manual for International Tractor Ltd, DI-42 RX HDM S3 tractor model.

- 7.6.2** The literatures should also be brought out in national as well as other regional languages for the guidance of users and service personnel.

The results of the tests carried out on variant model "International Tractor Limited, DI-42 RX HDM S3" tractor has been compared with those on base model "Sonalika, DI-42 HDM" 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	04 Months (July, 2020 to October, 2020)	Yes	--None--

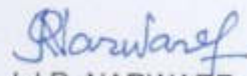
TESTING AUTHORITY:



**PRAMOD YADAV
AGRICULTURAL ENGINEER**



**C.V. CHIMOTE
TEST ENGINEER**



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

The report compiled by: **Shri Dev Vrat Kumar**, Senior Technical Assistant

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9. APPLICANTS COMMENTS

Para No.	Our reference	Applicant's comments
9.1	7.5 (vi) & (vii)	They are under development and will be regularized in production of tractor accordingly.
9.2	7.6.3	We are already supplying tractor literature in national as well as regional languages.

ANNEXURE- I

TRACTOR RUN HOURS DURING TEST

A.	LABORATORY AND TRACK TESTS:	<u>HOURS</u>
1.	Running-in	--
2	PTO Performance Test	4.0
3	Brake test	1.1
4	Theoretical speed test	0.9
5	Turing ability test	0.3
6	Steering effort test	0.1
B.	Miscellaneous test and other run hours including idle run, transportation, preparation for test and trial runs.	1.0
TOTAL:		7.4