

व्यावसायिक परीक्षण रिपोर्ट (वैरिएंट)
COMMERCIAL TEST REPORT (Variant)

संख्या / No. : T-1522/2049/2021
माह / Month : March, 2021

(यह परीक्षण रिपोर्ट 31/03/2024 तक वैध है। / THIS TEST REPORT IS VALID UP TO : 31/03/2024)



**INTERNATIONAL TRACTORS LIMITED,
DI-35 HDM POWER PLUS (BRAND NAME : SONALIKA) 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

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1	2	3	4
4.	Fuel system:		
	Model/Group combination No. of Fuel Injection pump	F002 A3Z F19	E040359700
	Model/Group combination No. of Governor	RSV350...900A1C1821R	E042 294 000
	Governor range of engine speed	700 to 2000	750 to 2050
5.	PTO Performance:		
	Declared maximum PTO power, kW	26.0	28.6
	Declared maximum equivalent crankshaft torque, Nm	160	175
	Declared equivalent crankshaft torque at maximum power, (Nm)	140	152
6.	Front axle	Fixed	Adjustable

Subsequent to the examination of the case in light of clause 8.4 & serial no. (iii) of Table-3 of Indian Standard :**12207-2019**, the following tests were carried out:

- Specification checking
- Nominal speed test
- Two hours maximum PTO Power performance test, under natural ambient condition

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:

	Particulars	As recommended by the manufacturer	As used during the test
1.	Engine lubricating oil	SAE 20W40	As recommended
2.	Gearbox, differential, final drive, hydraulic, steering and brake system	SAE-EP-80	Oil originally filled in the tractor system was not changed
3.	Grease	Multipurpose grease	MP Grease

3. ESSENTIAL TEST

3.1. SPECIFICATIONS

3.1.1	Tractor:	Base Model	Variant Model
	Make	: International Tractors Limited	
	Model	: DI- 35 HDM	DI- 35 HDM Power Plus
	Brand name	: RX	Sonalika
	Type	: Four wheeled, Rear wheel driven, Unit construction, General purpose, Agricultural tractor	
	Month & Year of manufacture	: 07/2015*	09/2020
	Chassis number	: EYASU509437S3*	DYASH971767S3
	Country of Origin	: India	

*From ICT report No. T-1089/1614/2017

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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 (D)/Requirement (R)		As observed		Whether Variant model meets the require- ments (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 >26kW. ±10 percent for PTO power and or engine ≤ 26 kW.	26.0** (D)	28.6 (D)	25.5**	28.3	Yes
b)	Power at rated engine speed, (kW)	Non Evaluative	-do-	26.0** (D)	28.6 (D)	25.5**	28.3	Yes
c)	Specific fuel consumption corresponding to maximum power, (g/kWh)	Evaluative	+10 % Max.	250** (D)	250 (D)	243**	242	Yes
d)	Maximum equivalent crankshaft torque, (Nm)	Non Evaluative	± 8%	150** (D)	175 (D)	161.6**	173.8	Yes
e)	Back-up torque, percent	Evaluative	12 percent, min.	12 %, min (R)	12%, min(R)	19.4**	17.9	Yes
**Declaration and observations have been reported from supplementary test report No. T-1240/1767/2019.								
7.1.3	Safety features:							
a)	Guards against moving and hot parts	Evaluative	Belt drives, pulleys, silencer, hydraulic pipes (As per IS 12239 (Part 2)			Meets the requirements		Yes
b)	Lighting arrangement	Evaluative	As per CMVR		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)		Meets the requirements		Yes	

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1	2	3	4	5	6	7	
d)	Technical requirements for PTO shaft	Evaluative	Should meet the requirements of IS: 4931 (As amended from time to time)		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)		Does not Meet the requirements	No	
f)	Specifications of linkage drawbar	Evaluative	Should meet the requirements of IS: 12953 (As amended from time to time)		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 fitted	Not applicable	
h)	1) Maximum travelling speed at rated engine speed in reverse gear, (kmph)	Evaluative	Should not exceed 20 kmph		12.02 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.		Not applicable	Not applicable	
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. 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 Limited		Yes
	2)	Model	Evaluative		-	DI-35 HDM POWER PLUS	Yes
	3)	Month & Year of manufacture	Evaluative		-	09 /20	Yes
	4)	Engine number	Evaluative		-	3100MN04 G941346F3 1	Yes
	5)	Chassis number	Evaluative		--	DYASH9717 67S3	Yes
	6)	Declaration of PTO power, kW	Evaluative		-	28.62	Yes
	7)	Specific fuel consumption, g/kWh	Evaluative		-	250	Yes

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1	2	3	4	5	6	7	
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 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	
7.1.7	Standard Accessories	Evaluative	Trailer hitch, front tow hook, linkage drawbar should be provided with the tractor.	Provided		Yes	
7.1.8	Accessories (optional)	Non Evaluative	Ballast weights, if fitted, should meet the requirement of CMVR	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 Requirements (Yes/No)
1.	Critical	Evaluative	No critical breakdown	None	Yes
2.	Major	Evaluative	Not more than two 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 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:

- i) The maximum power in case of variant model was observed as **28.3 kW** against the declaration of **28.6 kW** which is within the tolerance limit specified as per **IS: 12207-2019**.
- ii) The specific fuel consumption in variant model corresponding to maximum power was observed as **242 g/kWh** against the declaration of **250 g/kWh** which is within the tolerance limit as per **IS: 12207-2019**.
- iii) The maximum equivalent crankshaft torque was recorded as **173.8 Nm** against the declaration of **175 Nm**, which meets the requirement of **IS: 12207-2019** with regard to tolerance limit.
- iv) The backup torque is recorded as **17.9 %** which meets the evaluative requirement as per **IS: 12207-2019**.

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- v) During PTO performance test under natural ambient condition, Maximum PTO power was recorded as **27.0 kW** against the minimum requirement of **28.6 kW**. On the request of applicant, following works were carried out:
- i) Hydraulic filter & strainer were cleaned.
 - ii) Radiator was cleaned.
 - iii) Coolant was replaced .
 - iv) Cooling fan belt tension was checked & found correct.
 - v) Air cleaner filters were cleaned.
 - vi) Transmission oil was cleaned & refilled.
 - vii) Both fuel filters were replaced with new one.
 - viii) Engine oil filter was replaced with new one.
 - ix) Injector pressure was checked & found correct.
 - x) Tappet clearance on inlet & exhaust valve was measured was adjusted as per technical specifications of the engine.

7.4 Recommendation with regard to safety on tractor:

The following requirements, inter alia, may be considered for incorporation on the tractor as per relevant Indian Standards:

- i) Fuel shut-off knob does not remain in “STOP” position as per requirement of IS:8133-1983 Reaffirmed in 2014.
- ii) The colour code of engine revolution gauge should be as per as per requirement of IS:6283(Part 1&2)-1998 Reaffirmed in 2014.
- iii) There should be provision for spark arresting device in exhaust system as per IS: 12239 (Part-1)-1996 (Reaffirmed in October,2017).
- iv) There should be Provision of PTO master shield as per IS: 12239 (Part-1)-1996 (Reaffirmed in October,2017),
- v) There should be provision of differential lock and Fuel shut off knob should be remain in STOP position as per IS: 8133-1983 (Re-affirmed in 2014).
- vi) The working clearance between position control lever & mudguard should be provided as per IS:12239 (Part-2)-1999 (Re-affirmed in 2014).

7.5 Adequacy of Literature:

Operator manual, Spare parts catalogue (Part I&II) and Service manual (Part I&II) of **International Tractors Limited, DI-35 HDM Power Plus (BRAND NAME – SONALIKA)** tractor model was supplied for reference.

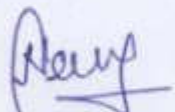
The results of the tests carried out on variant model “**International Tractors Limited, DI-35 HDM Power Plus (BRAND NAME – SONALIKA)**” Tractor have been compared with base model “**International Tractors Limited, DI-35 HDM (Brand Name: RX)**” and found within the limit as specified in Indian Standard: **12207-2019**.

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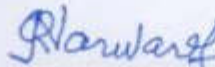
8. CITIZEN CHARTER

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	3 Months (December, 2020 to February, 2021)	Yes	None

TESTING AUTHORITY:


NITESH KUMAR VERMA
 AGRICULTURAL ENGINEER


C.V. CHIMOTE
 TEST ENGINEER


J.J.R. NARWARE
 DIRECTOR

This test report is compiled by Sh. P.Satya, Senior Technical Assistant

9. Applicant's comments

Nil

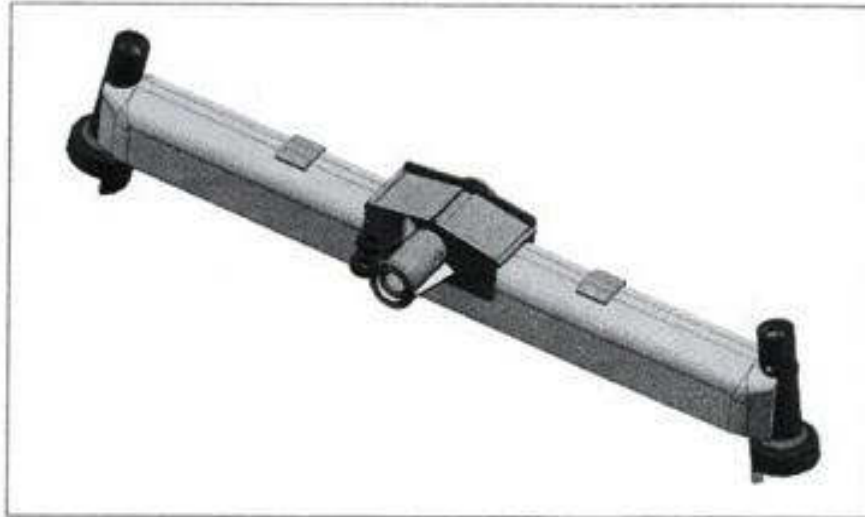
ANNEXURE- I

TRACTOR RUN HOURS DURING TEST

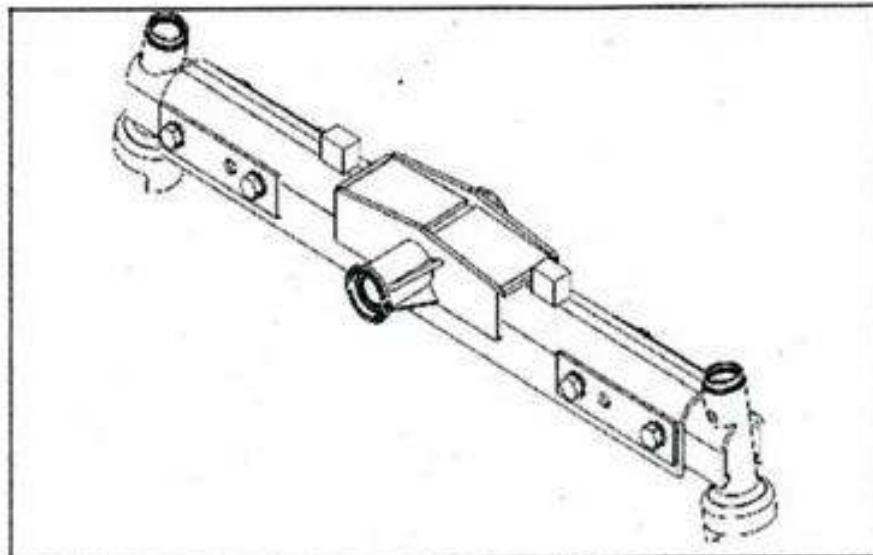
A.	LABORATORY AND TRACK TESTS:	HOURS
1.	Running-in	--
2.	PTO performance test under natural ambient condition	5.47
3.	Turning ability test	0.5
3.	Nominal speed test	0.8
B.	Miscellaneous test and other run hours including idle run, transportation, preparation for test and trial runs.	0.75
TOTAL		7.52

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ANNEXURE- II



Front axle design of base model " International Tractors Limited, DI-35 HDM (Brand Name: RX)



Front axle design of variant model " International Tractors Limited, DI-35 HDM Power Plus (Brand Name: Sonalika)