



**INTERNATIONAL TRACTORS LIMITED,
DI - 35 HDM (BRAND NAME : RX) 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, CO-OPERATION & 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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T-1441/1968/2020

INTERNATIONAL TRACTORS LIMITED, DI-35 HDM
(BRAND NAME: RX) TRACTOR- Commercial (Technical Extension)

1. SCOPE OF TEST

The "International Tractors Limited, Sonalika DI- 35 HDM (Brand Name: RX)" tractor had undergone "Initial Commercial Test" at this Institute vide test report No. T- 1089/1614 /2017 was released in May, 2017. The performance results in Chapter-16 of said test report were evaluated on the basis of IS: 12207-2014.

Subsequently, the fourth revision of IS: 12207-2019 was established on dated 25th July, 2019. Therefore, the performance results of the said tractor has to be evaluated as per IS: 12207-2019. It was observed that, some of the parameters are not meeting the evaluative requirements applicable for "Qualifying Minimum Performance Criteria" as per clause-4 Table-1 of the said Indian Standard for acceptance of tractor for the purpose of subsidies / NABARD financing. The parameters which were not meeting the evaluative requirements has been modified & permanently incorporated in the production of said tractor model by the manufacturer.

Subsequently, the applicant has submitted the said model for inspection / test and same has been tested / evaluated. The performance results are reproduced as per IS: 12207-2019 under Chapter-5 of this report.

The applicant has informed that the last cut off chassis and engine number of tractor model "International Tractors Limited, DI- 35 HDM (Brand Name: RX)" generated on production line as under:-

S. No.	Parameters Modified	Chassis Number	Engine Number
1.	Back up torque (%)	AYASH920109S3	3100FLU04C915668F18
2.	Re-declaration of Maximum drawbar pull with unballasted condition corresponding to 15% wheel slip, (kN)		
3.	Re-declaration of Maximum lifting force capacity throughout the range of lift, at hitch points, (kN)		
4.	Labelling plate		

The above tabulated features were added on the earlier test sample tested vide test report No. T-1089/1614 /2017 (May, 2017) in the firm premises itself. Subsequent to the examination of case in the light of Clause 6 of Indian Standard 12207: 2019, the following tests were considered to be carried out:

- Specification checking
- Nominal speed test
- PTO performance test

Manufacturer : M/s. International Tractors Limited,
Vill.- Chak Gujran, P.O.- Piplanwala,
Jalandhar Road, Hoshiarpur-146 022
(Punjab) India

Test requested by (Applicant) : The manufacturer

2. ESSENTIAL TESTS

2.1. SPECIFICATIONS

The following are the brief specifications of the tractor. However, for detail specifications of the tractor, the test report No. T-1089/1614/2017 was released in May, 2017 and T-1240/1767/2019 released in May, 2019 should be referred.

2.1.1 Tractor:

Make : International Tractors Limited
Model : DI- 35 HDM
Brand Name : RX
Type : Four wheeled, Rear wheel driven, Unit construction, General purpose, Agricultural tractor
Month & Year of manufacture : 03 | 20
Chassis Serial number : AYASH920109S3
Country of Origin : India



5. SUMMARY OF OBSERVATIONS, COMMENTS & RECOMMENDATIONS

5.1 The performance results have been reproduced from Initial Commercial Test report No. T-1089/1614/2017 (May, 2017) and Supplementary (Technical Extension) Test report No. T-1240/1767/2019 (May, 2019). 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 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 meets the requirements (Yes/No)
1	2	3	4	5	6	7
5.1.1 PTO Performance:						
a)	Maximum power under 2 h test, (kW) (Natural ambient condition)	Evaluative	Declared value to be achieved with a tolerance of: $\pm 5\%$ for PTO power and or Engine power >26 kW. $\pm 10\%$ for PTO power and or engine ≤ 26 kW	26.0 (D)	25.5	Yes
b)	Power at rated engine speed, (kW)	Non Evaluative	-do-	26.0 (D)	25.5	Yes
c)	Specific fuel consumption corresponding to maximum power, (g/kWh)	Evaluative	+ 10%	250 (D)	243	Yes
d)	Maximum equivalent crankshaft torque, (Nm)	Non Evaluative	$\pm 8\%$	150 (D)	161.6	Yes
e)	Back-up torque, percent	Evaluative	12 percent, min.	12 % (D) 12 % (R)	19.4	Yes
f)	Maximum operating temperature, ($^{\circ}$ C)					
	1) Engine oil	Evaluative	The declared value should not exceed the max. value specified by the oil company and the observed value under high ambient condition should not exceed the declaration.	132 (D)	101	Yes
	2) Coolant	Evaluative	The declared value should not exceed the boiling temperature of coolant under the pressurized or otherwise and the observed value under high ambient condition should not exceed the declaration.	118 (D)	104	Yes
g)	Engine oil consumption, (g/kWh)	Evaluative	Not exceeding 1% of SFC at max. power under High ambient conditions	2.48 (Maximum) (R)	0.88	Yes
h)	Smoke level, m^{-1}	Evaluative	Maximum light absorption coefficient of 3.25 per meter or equivalent BOSCH No. 5.2 or 75 Hatridge value.	3.25 (Maximum) (R)	0.07	Yes



1441/1968/2020		INTERNATIONAL TRACTORS LIMITED, DI-35 HDM (BRAND NAME: RX) TRACTOR- Commercial (Technical Extension)				
1	2	3	4	5	6	7
5.1.2 Drawbar performance : (*)						
a)	Max. drawbar pull with ballast corresponding to 15 percent wheel slip or 7 percent track slip, (kN)	Non Evaluative	Minimum 70% of static mass with ballast	17.65 (D)	19.07	Yes
				17.65 (R) Minimum		
b)	Max. drawbar pull without ballast corresponding to 15 percent wheel slip or 7 percent track slip, (kN)	Evaluative	Minimum 70% of static mass of tractor without ballast or with standard ballast, as the case may be	13.52 (D)	15.05	Yes
				13.52 (R) Minimum		
c)	Maximum drawbar power without ballast as in case may be, (kW)	Evaluative	Minimum 80 % of PTO power as referred in SI No. i) a) of PTO performance in case of tractors having total static mass > 1500 kg Minimum 75 % of PTO power as referred in SI No. i) a) of PTO performance in case of light weight tractors having 1500 kg total static mass of tractor Minimum 75 % of the engine power as referred in SI No. i) a) of engine performance in case of tractors which do not have a PTO shaft.	20.8 (D)	20.6	Yes
				20.4 (R) Minimum		
d)	Maximum transmission oil temperature (°C)	Evaluative	To be declared by the manufacturer.	130	77	Yes
5.1.3 Power lift and hydraulic pump performance : (*)						
a) Maximum lifting capacity throughout the range of lift, (kN):						
1)	At hitch points	Evaluative	Tolerance of $\pm 10\%$	13.0 (D)	13.0	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	8.0 (D)	11.15
6.0 (R) Minimum						
b)	Maximum drop in the height of the point of application of the force after each 5 minutes interval for a total duration of 30 Minutes, (mm)	Non Evaluative	The observed value should not exceed 50 mm	50 (D)	Nil	Yes
				50(R) Maximum		

1	2	3	4	5	6	7	
5.1.4 Brake performance at 25 kmph: (*)							
a)	Maximum stopping distance at a force, equal to or less than 600 N on brake pedal with standard ballast, (m):						
	1)	Cold brake	Evaluative	10 m	10 (R)	8.61	Yes
	2)	Hot brake	Evaluative	10 m	10 (R)	8.65	Yes
b)	Maximum force exerted on the brake pedal to achieve a deceleration of 2.5 m/s ² (N)		Evaluative	600 N	600 (R) Maximum	257 to 305	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
5.1.5 Noise measurement : (*)							
a)	Maximum ambient noise emitted by the tractor dB(A)		Evaluative	88 dB (A) for >1.5 tonne GVW and 85 dB (A) for <1.5 tonne GVW (as per CMVR)		80	Yes
b)	Maximum noise at operator's ear level dB(A)		Evaluative	96 (as per CMVR)		90	Yes
5.1.6 Amplitude of mechanical vibrations at: (*)							
	1)	Left foot rest	Non Evaluative	100 microns (max)		160	No
	2)	Right foot rest				180	No
	3)	Seat (with driver seated)				90	Yes
	4)	Steering wheel				130	No
5.1.7 Air cleaner oil pull over test :							
	Maximum air cleaner oil pull over test		Non Evaluative	0.25 % (Max)		Dry type air cleaner is fitted	Not applicable
5.1.8 Haulage requirements : (*)							
a)	Gross mass of the trailers, (tones):						
	1)	Two wheel	Non Evaluative	To be specified by manufacturer	5.5 (D)	5.5	Yes
	2)	Four wheel	Non Evaluative	-do-	6.0 (D)	6.0	Yes
b)	Distance travelled / liter of fuel consumption, (km/l):						
	1)	Two wheel	Non Evaluative	To be specified by manufacturer	4.50 to 6.00 (D)	6.36 to 6.51	No
	2)	Four wheel	Non Evaluative	-do-	4.50 to 6.00 (D)	5.91 to 6.22	No
c)	Fuel consumption (ml/km/tonne):						
	1)	Two wheel	Non Evaluative	To be specified by manufacturer	28 to 38 (D)	27.9 to 28.6	Yes
	2)	Four wheel	Non Evaluative	-do-	28 to 38 (D)	26.8 to 28.2	Yes
5.1.9 Wetland cultivation (Puddling Operation): (*)							
	Sealing for the following assemblies:		Evaluative	The identified assemblies should essentially meet the requirement of IS: 11082. No water ingress in the identified assembly given in column-2. If tractor does not meet the requirements of wetland cultivation, it may be recommended for dry land operation only.	There should be no ingress of water and / or mud (R)	No ingress of water and / or mud was observed during ICT test vide test report no. 1089/1614 /2017 released in May, 2017	Yes
1)	Clutch assembly		-do-				
2)	Brake housings		-do-				
3)	Front axle hubs		-do-				
4)	Engine oil		-do-				
5)	Transmission oil		-do-				



1	2	3	4	5	6	7
5.1.10 Safety features:						
a)	Guards against moving and hot parts	Evaluative	Belt drives, pulleys, silencer, hydraulic pipes (As per IS: 12239 (Part-2))		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)		Does not Meet the requirement	No
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)		Does not Meet the requirement	No
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 requirements 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		12.03 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 warring signal on tractor 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
5.1.11 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 & 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 (Brand Name : RX)	Yes
	3) Month & Year of manufacture	Evaluative			03/20	Yes
	4) Engine number	Evaluative			3100FLU04C9156 68F18	Yes
	5) Chassis number	Evaluative			AYASH920109S3	Yes
	6) Declaration of PTO power, (kW)	Evaluative			26	Yes



1	2	3	4	5	6	7
5.1.12	Discard limit for, (mm) : (*)					
(a)	Cylinder bore diameter, (mm)	Evaluative	To be specified by the manufacturer and supported by the printed literature	100.346	100.03 to 100.09	Yes
(b)	Clearance between piston & cylinder liner at skirt, (mm)	Non Evaluative		0.45	0.148 to 0.149	Yes
(c)	Piston diameter at skirt, (mm)	Non Evaluative	-do-	99.2	99.913 to 99.916	Yes
(d)	Ring end gap (mm):					
	- Top comp. ring	Evaluative	--do--	2.00	0.55 to 0.60	Yes
	- 2 nd comp. ring			2.00	0.80 to 0.85	Yes
	- Oil ring.			2.00	0.60 to 0.70	Yes
(e)	Ring groove clearance (mm):					
	- Top comp. ring	Evaluative	-do-	--Taper rings--		Not applicable
	- 2 nd comp. ring		-do-	0.150	0.045 to 0.054	Yes
	- Oil ring.		-do-	0.130	0.039 to 0.060	Yes
(f)	Clearance of main bearings (mm):					
	- Diametrical clearance	Evaluative	-do-	0.35	0.051 to 0.94	Yes
	- Crankshaft end float	Evaluative		0.70	0.20	Yes
(g)	Clearance of big or small end bearings, (mm):					
	- Diametrical	Evaluative	-do-	0.35	0.042 to 0.082	Yes
	- Axial	Evaluative	-do-	1.00	0.45	Yes
(h)	Clearance between king pin and bush, (mm)	Non Evaluative	-do-	1.00	0.08 to 0.56	Yes
(i)	Clearance between centre pin and bush, (mm)	Non Evaluative	-do-	1.00	0.11 to 0.18	Yes
5.1.13	Literature (Submission to test agency): (*)					
(a)	Operator manual	Evaluative	The printed literature in booklet form should be provided as per IS 8132 & should submit along with the test sample	Provided		Yes
(b)	Parts Catalogue	Evaluative		Provided		Yes
(c)	Workshop / Service manual	Evaluative		Provided		Yes
5.1.14	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
5.1.15	Standard Accessories	Evaluative	Trailer hitch, front tow hook, linkage drawbar should be provided with the tractor.	Provided		Yes
5.1.16	Accessories (optional)	Non Evaluative	Ballast weights, if fitted, should meet the requirement of CMVR	Provided		Yes

Remark (*):- Data has been taken from Initial Commercial Test report of Sonalika DI-35 HDM (Brand Name: RX) Tractor model tested vide Test report No. T- 1089/1614/2017 released in May, 2017.



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INTERNATIONAL TRACTORS LIMITED, DI-35 HDM
(BRAND NAME: RX) TRACTOR- Commercial (Technical Extension)

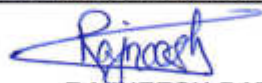
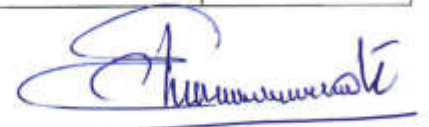
5.2 CATEGORY OF BREAKDOWNS / DEFECTS (As per Clause 5.0 of IS:12207-2019) :					
S. No.	Category of breakdowns	Category (Evaluative / Non Evaluative)	Requirements as per IS: 12207-2019	As observed	Whether meets the Requirements (Yes/No)
1.	Critical	Evaluative	No critical breakdown	None	Yes
2.	Major	Evaluative	Not more than two and neither of them should be repetitive in nature	None	Yes
3.	Minor	Evaluative	Not more than 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 5 minor breakdowns.	None	Yes

5.3 Salient Observations:**5.3.1 Laboratory tests:****5.3.1.1 PTO Performance:**

- The maximum power was recorded as **25.5 kW** against the declaration of **26.0 kW**, which meets the requirement of IS: 12207-2019 with regard to tolerance limit.
- The specific fuel consumption corresponding to maximum power was recorded as **243 g/kWh** against the declaration of **250 gm/kWh**, which meets the requirement of IS: 12207-2019 with regard to tolerance limit.
- The maximum equivalent crankshaft torque was recorded as **161.6 Nm** against the declaration of **150 Nm**, which meets the requirement of IS: 12207-2019 with regard to tolerance limit.
- The backup torque was observed as **19.4 %**, which meets the requirement of IS: 12207-2019 with regard to tolerance limit.
- The drop in maximum PTO power was observed as **7.5 %** between natural and high ambient condition, which is considered on higher side. This should be looked into for necessary corrective action.

5.3.1.2 This tractor model meets the evaluative requirements of IS: 12207-2019.**6. 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	03 Months (March, 2020 to May, 2020)	Yes	--None--

TESTING AUTHORITY:
RAJNEESH PATEL
AGRICULTURAL ENGINEER**C.V. CHIMOTE**
TEST ENGINEER
J.J.R. NARWARE
DIRECTORThe report compiled by Smt. **Poonam Khurasia**, Senior Technical Assistant**7. APPLICANT COMMENT'S**

Para No.	Our Reference	Applicant's comments
		--Nil--

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

A.	LABORATORY AND TRACK TESTS:	HOURS
1.	Running-in	--
2.	Nominal speed	0.62
3.	PTO performance test	9.72
B.	Miscellaneous test and other run hours including idle run, transportation, trials and preparation for test	3.00
TOTAL:		13.34