



**INTERNATIONAL TRACTORS LIMITED,
SONALIKA INTERNATIONAL DI 35 DS CM SERIES 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)

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

E-mail fmti-mp@nic.in Website : <http://www.fmttibudni.gov.in> Telephone : 07564 - 234729, 234743



T-1475/2002/2020

**INTERNATIONAL TRACTORS LIMITED,
SONALIKA INTERNATIONAL DI 35 DS CM SERIES TRACTOR -
Commercial - (Technical Extension)**

1. SCOPE OF TEST

The "International Tractors Limited, Sonalika International DI-35 DS CM Series" tractor had undergone "Commercial Variant (Batch) Test" at this Institute vide test report No. T-1057/1582/2016 released in December, 2016. The performance results in Chapter-7 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 26th July, 2019. Therefore, the performance results of the said tractor have 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 "International Tractors Limited, Sonalika International DI-35 DS CM Series" tractor for inspection / test after test, the results are summarized under Chapter-3 of this test report.

Details of Base & Variant Model

Table-A

S.No.	Make & Model of Tractor	Base / Variant	Nature of test	Test report No.
i)	International Tractors Limited Sonalika International DI-39 RX (*)	Base	Commercial (Initial)	T-684/1190/2009 (August, 2009)
ii)	International Tractors Limited, Sonalika International DI-35 DS CM Series	Variant	Commercial Variant (Batch)	T-1057/1582/2016 (December, 2016)

Remark (*):- The manufacturer has declared that base model "International Tractors Limited Sonalika International DI-39 RX" tractor is not in production and has been obsolete. The applicant has informed that modified parameters as per this test report have been implemented in the variant model "International Tractors Limited, Sonalika International DI-35 DS CM Series". These modifications have been incorporated in all tractors of this model beginning from chassis and engine serial number as tabulated under:

S. No.	Parameters Modified	Chassis Number	Engine Number
1.	Labelling plate	FZJSH926920S3	3100FLC4F-921984F3

Manufacturer : M/s. International Tractors Limited,
Vill.- Chak Gurjan, P.O.- Piplanwala,
Jalandhar Road, Dist.- 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 detailed technical specifications of this model, test report No. T-1057/1582/2016 released in December, 2016, may be referred.

The major features of base and variant models are tabulated as under:

S. No.	Parameters	Base Model	Variant Model
1	2	3	4
1.	Model of tractor	Sonalika International DI-39 RX	Sonalika International DI 35 DS CM Series
2.	Model of Prime Mover	3100 FLI	3100 FL



3. SUMMARY OF OBSERVATIONS, COMMENTS & RECOMMENDATIONS

3.1 The performance results based on Initial Commercial Test report no. T-684/1190/2009, Commercial Variant (Batch) test report no. T-1057/1582/2016 (December, 2016) and on the basis of tests/observations conducted on present sample summarized here. 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
3.1.1	PTO Performance:					
a)	Maximum power under 2 h test, (kW) (Natural ambient condition)	Evaluative	Declared value to be achieved with a tolerance of: + 5 % for PTO power and or Engine power >26 kW. +10% for PTO power and or engine ≤ 26 kW	24.6 (D)	24.4	Yes
b)	Power at rated engine speed, (kW)	Non-Evaluative	-do-	24.6 (D)	24.2	Yes
c)	Specific fuel consumption corresponding to maximum power, (g/kWh)	Evaluative	+ 10%	265 (D)	243	Yes
d)	Maximum equivalent crankshaft torque, (Nm)	Non-Evaluative	+ 8%	153 (D)	155.1	Yes
e)	Back-up torque, percent %	Evaluative	12 percent, min.	12 % (D) 12 % (R)	34.4	Yes
f)	Maximum operating temperature, (°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)	102	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)	98	Yes
g)	Engine oil consumption, (g/kWh) (%)	Evaluative	Not exceeding 1% of SFC at max. power under High ambient conditions	2.57 (Maximum) (R)	0.65	Yes
h)	Smoke level, m ³	Evaluative	Maximum light absorption coefficient of 3.25 per meter or equivalent BOSCH No. 5.2 or 75 Hatridge value.	3.25 (Maximum) (R)	0.15	Yes



1	2	3	4	5	6	7
3.1.2	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	18.67 (D) 18.67 (R) Minimum	19.72	Yes
b)	Max. drawbar pull with Standard 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	14.28 (D) 14.28 (R) Minimum	14.30	Yes
c)	Maximum drawbar power with Standard ballast, as the 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.	19.80 (D) 19.67 (R) Minimum	20.7	Yes
d)	Maximum transmission oil temperature (°C)	Evaluative	To be declared by the manufacturer.	130 (D)	64	Yes
3.1.3	Power lift and hydraulic pump performance (*) :					
a)	Maximum lifting capacity throughout the range of lift, (kN):					
	1) At hitch points	Evaluative	Tolerance of $\pm 10\%$	10.78 (D)	10.52	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	5.93 (D) 5.80 (R) Minimum	7.98	yes
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) 50(R) Maximum	25	Yes
3.1.4	Brake performance at 25 kmph (*) :					
a)	Maximum stopping distance at a force, equal to or less than 600 N on brake pedal with road ballast ballast, (m):					
	1) Cold brake	Evaluative	10 m	10 (R)	6.10	Yes
	2) Hot brake	Evaluative	10 m	10 (R)	6.90	Yes



75/2002/2020

**INTERNATIONAL TRACTORS LIMITED,
SONALIKA INTERNATIONAL DI 35 DS CM SERIES TRACTOR -
Commercial - (Technical Extension)**

1	2	3	4	5	6	7
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	152 to 245	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
3.1. 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)		84	Yes
b)	Maximum noise at operator's ear level dB(A)	Evaluative	96 (as per CMVR)		94	Yes
3.1. 6	Amplitude of mechanical vibrations at (*):					
	1 Left foot rest)	Non Evaluative	100 microns (max)		200	No
	2 Right foot rest)				270	No
	3 Seat (with driver seated))				170	No
	4 Steering wheel)				90	Yes
5.1. 7	Air cleaner oil pull over test (*):					
	Maximum air cleaner pull over, (%)	Evaluative	0.25% (Max)		0.12	Yes
3.1. 8	Haulage requirements (*):					
a)	Gross mass of the trailers, (tonne):					
	Two wheel	Non	To be specified by manufacturer	5.5 (D)	5.5	Yes
	Four wheel	Evaluative		6.0 (D)	6.0	Yes
b)	Distance travelled / liter of fuel consumption, (km/l):					
	Two wheel	Non	-do-	4.5 to 6.0 (D)	6.19 to 6.36	Yes
	Four wheel	Evaluative		4.5 to 6.0 (D)	6.18 to 6.30	Yes
c)	Fuel consumption (ml/km/tonne):					
	Two wheel	Non	-do-	28 to 38	28.6 to 29.4	Yes
	Four wheel	Evaluative		28 to 38	26.4 to 27.0	Yes
3.1. 9	Wetland cultivation (Puddling Operation) (*):					
	Sealing for the following assemblies:	Evaluative	The identified assemblies should essentially meet the requirement of IS: 31362. 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 ICI of base model tested vide test report no. T-684/ 1190/2009 (August 2009)	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
3.1.10	Safety features :					
a)	Guards against moving and hot parts	Evaluative	Bolt drives, pulleys, silencer, hydraulic pipes (As per IS: 12233 (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		11.44 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 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
3.1.11	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		Sonalika International	Yes	
3)	Month & Year of manufacture	Evaluative		DI-35 DS CM Series 05 / 20	Yes	
4)	Engine number	Evaluative		3100FL04E921984F 3	Yes	
5)	Chassis number	Evaluative		FZJSH926920S3	Yes	
6)	Declaration of PTO power, (kW)	Evaluative		24.6	Yes	



1475/2002/2020

**INTERNATIONAL TRACTORS LIMITED,
SONALIKA INTERNATIONAL DI 35 DS CM SERIES TRACTOR -
Commercial - (Technical Extension)**

1	2	3	4	5	6	7
3.1.12	Discard limit for, (mm) (*):					
(a)	Cylinder bore diameter, (mm)	Evaluative	To be specified by the manufacturer and supported by the printed literature	100.15	100.03 to 100.05	Yes
(b)	Clearance between piston & cylinder liner at skirt, (mm)	Non Evaluative	the printed literature	0.450	0.143 to 0.151	Yes
(c)	Piston diameter at skirt, (mm)	Non Evaluative	-do-	99.20	99.897 to 99.906	Yes
(d)	Ring end gap (mm):					
	- Top comp. ring.	Evaluative	-do--	2.0	0.45 to 0.50	Yes
	- 2 nd comp. ring.			2.0	0.80 to 0.95	Yes
	- Oil ring.			2.0	0.70	Yes
(e)	Ring groove clearance (mm):					
	- Top comp. ring.	Evaluative	-do-	-Tapered-		Not applicable
	- 2 nd comp. ring.		-do-	0.140	0.092 to 0.113	Yes
	- Oil ring.		-do-	0.130	0.060 to 0.070	Yes
(f)	Clearance of main bearings (mm):					
	- Diametrical clearance	Evaluative	-do-	0.40	0.087 to 0.110	Yes
	- Crankshaft end float	Evaluative		0.60	0.16	Yes
(g)	Clearance of big or small end bearings, (mm):					
	- Diametrical	Evaluative	-do-	0.90	0.078 to 0.089	Yes
	- Axial	Evaluative	-do-	0.50	0.20	Yes
(h)	Clearance between king pin and bush, (mm)	Non Evaluative	-do-	1.0	0.15 to 0.16	--
(i)	Clearance between centre pin and bush, (mm)	Non Evaluative	-do-	1.0	0.13 to 0.17	Yes
3.1.13	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	Provided	Yes
(b)	Parts Catalogue	Evaluative		Provided	Provided	Yes
(c)	Workshop / Service manual	Evaluative		Provided	Provided	Yes
3.1.14	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	Not fitted		Not applicable
3.1.15	Standard Accessories	Evaluative	Trailer hitch, front tow hook, linkage drawbar should be provided with the tractor.	Provided		Yes
3.1.16	Accessories (optional)	Non Evaluative	Ballast weights, if fitted, should meet the requirement of CMVR	Provided		Yes



3.2 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 (1 major + 4) or 5 minor breakdowns.	None	Yes

Remark (*): Test results were taken from the base model "International Tractors Limited, Sonalika International DI-39 RX vide test report no.T-684/1190/2009.

3.3 Salient Observations:

3.3.1 Laboratory tests:

3.3.1.1 PTO Performance Test:

- The maximum PTO power was recorded as **24.4 kW** against the declaration of **24.6 kW**, which meets the requirement of IS: 12207-2019 with regard to tolerance limit.
- The rated PTO power was recorded as **24.2 kW** against the declaration of **24.6 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 **265 g/kWh**, which meets the requirement of IS: 12207-2019 with regard to tolerance limit.
- The maximum equivalent crankshaft torque was recorded as **155.1 N-m** against the declaration of **153.0 N-m**, which meets the requirement of IS: 12207-2019 with regard to tolerance limit.
- The backup torque is **34.4 %**, which meets the requirement of IS: 12207-2019 with regard to tolerance limit.

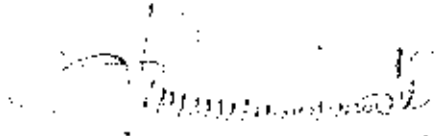
3.3.2 This tractor model meets the evaluative requirements of IS: 12207-2019

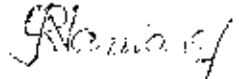
4. CITIZEN CHARTER

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 Month (June, 2020 to August, 2020)	Yes	--None--

TESTING AUTHORITY:


NITESH KUMAR VERMA
AGRICULTURAL ENGINEER


C.V. CHIMOTE
TEST ENGINEER


J.J.R. NARWARE
DIRECTOR

The report compiled by **Shri Pratyush Satya**, Senior Technical Assistant



T/21475/2002/2020

INTERNATIONAL TRACTORS LIMITED,
SONALIKA INTERNATIONAL DI 35 DS CM SERIES TRACTOR -
Commercial - (Technical Extension)

5. Applicant's comments

-----None-----

ANNEXURE - I

TRACTOR RUN HOURS DURING TEST

A.	LABORATORY AND TRACK TESTS:	HOURS
1.	Running-in	--
2.	Nominal speed test	1.25
3.	PTO performance test	6.03
B.	Miscellaneous test and other run hours, including idle run transportation, trial and preparation for test.	1.15
Total		8.43