



**SONALIKA, DI-750 III HDM S1 TRACTOR (Brand Name : DI)**



सत्यमेव जयते

भारत सरकार

कृषि एवं किसान कल्याण मंत्रालय  
(कृषि, सहकारिता एवं किसान कल्याण विभाग)

GOVERNMENT OF INDIA

MINISTRY OF AGRICULTURE AND FARMERS WELFARE

(DEPARTMENT OF AGRICULTURE, CO-OPERATION AND FARMERS WELFARE)

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](mailto:fmti-mp@nic.in)

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

Telephone : 07564 - 234729

Fax : 07564 - 234743



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Subsequent to the examination of the case in the light of Indian Standard: 12207-2014, the following tests were considered to be carried out:

- Specification checking
- Nominal speed test
- Two hours maximum PTO power performance test under Natural ambient condition
- Air cleaner oil-pull over test
- Turning ability test
- Visibility test

## 2. FUEL AND LUBRICANTS

**2.1 Fuel** : The high-speed diesel oil supplied by M/s Indian Oil Corporation Limited having density of **0.835 gm/cc** at 15°C was used.

**2.2 Lubricants:**

Particulars		As recommended by the manufacturer	As used during the test
1.	Engine oil	SAE-20-W-40	As recommended
2.	Transmission, hydraulic, differential and brake systems oil	ELF-2412	Oil originally filled in the tractor was not changed
3.	Steering system	SAE-EP- 80	-do-
4.	Grease	Multi-purpose grease	Servo grease MP

## 3. ESSENTIAL TEST

### 3.1 SPECIFICATIONS

	<u>Base Model</u>	<u>Variant Model</u>
<b>3.1.1 Tractor:</b>		
Make	: Sonalika	Sonalika
Model	: DI-750 III HDM	DI-750 III HDM S1
Type	: Four wheeled, rear-wheel drive, general purpose, agricultural tractor	
Brand name (if any)	: RX	DI
Year of manufacture	: 2015	2018
Chassis number	: EZUDU505606S3	MZZDG710986S3
Country of Origin	: India	India
<b>3.1.2 Engine:</b>		
Make	: Sonalika	Sonalika
Model	: 4100EL	4100EL
Type	: Four stroke, naturally aspirated, liquid cooled, direct injection, diesel engine.	
Serial number	: 4100EL53F497396F16	4100EL83B703595F16
<b>Engine speed (Manufacturer's recommended production setting), (rpm):</b>		
- Maximum speed at no load,	: 2150 to 2250	2150 to 2250
- Low idle speed	: 650 to 750	650 to 750
- Speed at maximum torque	: 1175 to 1225	1100 to 1300
<b>Rated speed, (rpm):</b>		
- For PTO use	: 2000	2000
- For drawbar use	: 2000	2000



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1	2	3	4	5	6
	x)	Total transmission oil capacity, (l)	53.00	54.00	Changed
	xi)	Range of nominal speed, (kmph)	3.07 to 29.92 (F) 4.18 to 14.68 (R)	3.11 to 33.24 (F) 4.12 to 14.49 (R)	Changed
	xii)	Reduction through final drive	5.090: 1 (56/11T)	4.583: 1 (55/12T)	Changed
	xiii)	Height of front towing hitch, (mm)	670	695	Changed
	xiv)	Type of steering	Hydrostatic, Open centre	Mechanical, worm & screw with single drop arm	Changed
	xv)	Capacity of steering gear box, (l)	2.20	0.75	Changed
	xvi)	Steering wheel make & size	Good Year 7.50 – 16	Apollo 6.00 – 16	Changed
	xvii)	Standard & other track widths, (mm)	1350 (Std.), 1510, 1570 & 1710	1300 (Std.), 1350, 1460, 1500, 1560 & 1670	Changed
	xviii)	Drive wheel make & size	Good Year 14.9 – 28	Apollo 14.9 – 28	Changed
	xix)	Standard & other track widths, (mm)	1420 (Std.), 1540, 1600, 1700, 1810 & 1940	1420 (Std.), 1540, 1590, 1710, 1840 & 1930	Changed
	xx)	Wheel base, (mm)	2215	2095	Changed
	xxi)	Decals (stickers)	Sonalika DI-750 III HDM	Sonalika DI-750 III HDM S1	Changed
	xxii)	Fitment of ROPS	Not provided	Provided	Changed

## 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: 2014** for acceptance of tractor for the purpose of subsidies/NABARD financing for the applicable features for this tractor model.

Sl. No.	Characteristic	Category (Evaluative / Non-Evaluative)	Requirements as per IS: 12207-2014	Values declared by the applicant/ requirement		As observed		Whether Variant model meets the requirements (Yes/No)
				Base model	Variant Model	Base model	Variant model	
1	2	3	4	5 a	5 b	6 a	6 b	7
7.1.1	<b>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 / +10% for PTO power >26 kW. -7.5/+10% for PTO power ≤ 26 kW or -5 / +10% for engine power >26 kW. -7.5/+10% for engine power ≤ 26 kW	32.0 (D)	36.0 (D)	33.4	34.4	Yes



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1	2	3	4	5		6		7
b)	Specific fuel consumption corresponding to max.power, (g/kWh)	Non-Evaluative	+ 5%	260 (D)	250 (D)	267	259	Yes
7.1.2	<b>Air cleaner pull over (%)</b>	Non-Evaluative	0.25% (Max)	Dry	0.25 Max	NA	0.15	Yes

7.1.3 Safety features :						
				Base model	Variant model	
a)	Guards against moving and hot parts	Evaluative	Belt drives, pulley, silencer, hydraulic pipes (As per IS 12239 part 2)	Conformed	Conforms	Yes
b)	Lighting arrangement	Evaluative	As per CMVR	Conformed	Conforms	Yes
c)	Seating requirement (Tractors having more than 1150 mm rear track width)	Non-Evaluative	Should meet the requirements of IS 12343 (as amended from time to time)	<b>Did not conform</b>	Conforms	Yes
d)	Technical requirements for PTO shaft	Non-Evaluative	Should meet the requirements of IS 4931 (as amended from time to time)	Conformed	Conforms	Yes
e)	Dimension of three point linkage	Non-Evaluative	Should meet the requirements of IS 4468 (part 1) (as amended from time to time)	<b>Did not conform</b>	<b>Does not conform</b>	<b>No</b>
f)	Specification of linkage and swinging drawbars	Non-Evaluative	Should meet the requirements of IS 12953 and IS 12362 (part 3) (as amended from time to time)	Conformed	Conforms	Yes

7.1.4 Labelling of tractors (Provision of labeling plate):						
1)	Make	Evaluative	Should conform to the requirements of CMVR along-with declare d value of PTO HP	SONALIKA	SONALIKA	Yes
2)	Model	Evaluative		DI-750 III HDM	DI-750 III HDM S1	Yes
3)	Year of manufacture	Evaluative		2015	GM (February 2018)	Yes
4)	Engine serial number	Evaluative		4100EL53F4973 96F16	4100EL83B7035 95F16	Yes
5)	Chassis number	Evaluative		EZUDU505606 S3	MZZDGD710986 S3	Yes
6)	Declaration of PTO power, kW	Evaluative		32.0	36.0	Yes





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**7.2 Salient Observations:**

**7.2.1 Laboratory tests:**

**7.2.1.1 PTO Performance:**

- i) The maximum PTO power in case of base and variant model was observed as **33.4 & 34.4 kW** against the declaration of **32.0 & 36.0 kW** respectively, which is within the tolerance limit as specified in IS:12207-2014.
- ii) The specific fuel consumption in case of base and variant models corresponding to maximum power was observed as **267 & 259 g/kWh** against the declaration of **260 & 250 g/kWh** respectively, which meets the requirement of **IS:12207-2014**.

**7.2.1.2 Three Point Linkage:**

- i) The lateral distance from lower hitch point to centre line of tractor does not meet the requirement of IS: 4468 (Part-1)-1997. This may be looked into for necessary corrective action.
- ii) Some of the parameters conform to Cat. I while some of them conforms to Cat. II. Keeping in view the spirit of standardization, necessary improvement may be incorporated at production level.

**7.2.1.3 Symbols of operator's controls and other displays:**

All controls are identifiable with the symbols as per IS: 6283 (Part 1&2)-1998 except the oil lubricant type & frequency and grease lubricant frequency has not been provided. This needs to be looked into for necessary corrective action.

**7.3 Maintenance / Service problems:**

No noticeable maintenance and service problems was observed during the test.

**7.4 Recommendation regarding safety on tractor:**

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

- i) The colour zones provided for engine revolution gauge should be provided as per relevant Indian Standard.
- ii) The symbols for oil, lubricant type and frequency should be provided.
- iii) The fuel shut-off knob should remain in stop position automatically.
- iv) Provision for spark arresting device in exhaust system.
- v) Provision of PTO master shield.
- vi) "Minimum cautionary notice" as per clause 11.2 of IS:12239 (part-2)-1999
- vii) Working clearance around position control lever and draft control lever as per relevant Indian Standard.

**7.5 Adequacy of Literature:**

**7.5.1** The following literatures were supplied with the test tractor for reference during the test.

- a) Operator manual
- b) Parts catalogue
- c) Service manual

**7.5.2** The printed literature supplied with the test sample is in English. The literature may be brought out as per IS: 8132-1999 (Reaffirmed in March, 2009) for the guidance of user and service personnel in national as well as other regional languages.

**The results of the tests carried out on variant model "Sonalika DI-750 III HDM S1" have been compared with those on base model "Sonalika DI-750 III HDM" and found within the limit, as specified in Indian Standard: 12207 – 2014.**



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**8. CITIZEN CHARTER**

Time frame for Testing & Evaluation as per Citizen Charter	Duration of test	Whether the report is released within the time frame given in the Citizen Charter	Remark
10 Months	2 Months (May, 2018 to July, 2018)	Yes	None

**TESTING AUTHORITY:**

  
**C.K. TIJARE**  
 AGRICULTURAL ENGINEER

  
**C.V. CHIMOTE**  
 TEST ENGINEER

  
**Y.K. RAO**  
 SENIOR AGRICULTURAL ENGINEER

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

**9. APPLICANT'S COMMENTS**

Para No.	Our Reference	Applicant's comments
9.1	7.2.1.2, 7.2.1.3 & 7.4	The point is under study in R&D design and will be incorporated soon.
9.2	7.5.2	The tractor literature is already supplying in regional languages.



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**ANNEXURE -I**

**TRACTOR RUN HOURS DURING TEST**

<b>A.</b>	<b>LABORATORY AND TRACK TESTS:</b>	<b>HOURS</b>
1.	Running-in	--
2.	PTO performance test	3.78
3.	Nominal speed test	0.75
4.	Turning ability test	0.35
5.	Air cleaner oil pull over test	3.50
<b>B.</b>	Miscellaneous test and other run hours including idle run, transportation, preparation for test and trial runs.	0.50
	<b>TOTAL:</b>	<b>8.88</b>