प्रारंभिक व्यावसायिक परीक्षण रिपोर्ट संख्या/No. : T-1715/2246/2023

INITIAL COMMERCIAL TEST REPORT माह/Month : March, 2023

Application Reference No. 28/2022-23/45

(यह परीक्षण रिपोर्ट 31/03/2028 तक वैध है / THIS TEST REPORT IS VALID UPTO 31/03/2028)



Make of Agricultural Tractor: INTERNATIONAL TRACTORS LIMITED

Model : SOLIS 4515 4WD TRACTOR

Manufactured by : M/s. International Tractors Limited,

Vill. Chak Gujran, P.O. Piplanwala, Jalandhar Road, District: Hoshiarpur

146 022 (Pb). India



#### भारत सरकार

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

# GOVERNMENT OF INDIA MINISTRY OF AGRICULTURE AND FARMERS WELFARE (DEPARTMENT OF AGRICULTURE & FARMERS WELFARE)

केन्द्रीय कृषि मशीनरी प्रशिक्षण एवं परीक्षण संस्थान ट्रैक्टर नगर, बुदनी (म.प्र.) 466 445

**CENTRAL FARM MACHINERY TRAINING & TESTING INSTITUTE** 

TRACTOR NAGAR, BUDNI (M.P.) 466 445 (An ISO 9001:2015 Certified Institute)

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TRACTOR - INITIAL COMMERCIAL TEST

THIS TEST REPORT IS VALID UPTO: 31/03/2028

#### IMPORTANT INFORMATION

The Government of India, Ministry of Agriculture and Farmers' Welfare has directed, vide a OM No. 13-17/2021-M&T(I&P) dated 28.07.2022, that since 15<sup>th</sup> August, 2022, only mandatory tests will be carried out on a tractor unless applicant has expressly requested for optional tests as well, mentioned in the above captioned OM.

In the instant case, there is no request from the applicant to carry out the optional tests hence only Mandatory Tests, as given below, have been conducted and reported in this report:-

- 1. PTO performance
- 2. Hydraulic performance
- 3. Drawbar performance
- 4. Brake performance

Month: March Test Report No.: T-1715/2246/2023 Year: 2023



## GOVERNMENT OF INDIA CENTRAL FARM MACHINERY TRAINING & TESTING INSTITUTE TRACTOR NAGAR, BUDNI (MADHYA PRADESH) 466445, INDIA

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### INTERNATIONAL TRACTORS LIMITED, SOLIS 4515 4WD TRACTOR - INITIAL COMMERCIAL TEST

THIS TEST REPORT IS VALID UPTO: 31/03/2028

This report is released as per IS: 12207-2022 as per the request of applicant vide letter No. Nil dated 23.11.2022.

[C] Tractor manufacturer's name and : International Tractors Limited,

address

Vill. Chak Gujran, P.O. Piplanwala, Jalandhar Road, District: Hoshiarpur -

146 022 (Punjab), India

[D] Location of tractor assembly : International Tractors Limited,

Vill. Chak Gujran, P.O. Piplanwala, Jalandhar Road, District: Hoshiarpur –

146 022 (Punjab), India

[C] Submitted for test by (Applicant) : The Manufacturer

[C] Selected for test by : The Ministry vide OM No. 13-17/2021 - M&T

(I&P) dated 28.07.2022, has allowed the applicant to submit the test sample directly to the Institute without requiring any random selection for Initial Commercial Testing. Thus, the applicant directly submitted the test

sample to the Institute for test.

[D] Place of running-in : At manufacturer's works

[D] Duration of running-in, (h):

-Engine : 20 -Transmission : 20

[C] Location of test : Government of India,

Central Farm Machinery Training and Testing

Institute, P.O. - Tractor Nagar, BUDNI – 466445 (M.P.), INDIA

#### 1. SPECIFICATIONS OF TRACTOR

1.1 Identification:

1.1.1 Denomination

[C] Make of tractor : INTERNATIONAL TRACTORS LIMITED

[C] Model (trade name) : SOLIS 4515 4WD

[C] Type : Four Wheel Driven, Standard Agricultural

Tractor.

[C] Month & year of manufacture : 08/22 [D] Country of origin : India

1.1.2 Numbers:

[D] 1<sup>st</sup> Serial No. of prototype : HXSDJ1181841S3 [C] Serial No. : JXSDJ1208541S3

1.2 Engine:

[D] Manufacturer's address : M/s. International Tractors Limited,

Vill. Chak Gujran, P.O. Piplanwala,

Jalandhar Road, District: Hoshiarpur -

146 022 (Punjab), India

[C] Make : INTERNATIONAL TRACTORS LIMITED

[C] Model : 3105 ELU

[C] Type : Four stroke, naturally aspirated, liquid cooled,

direct injection, diesel engine.

[C] Serial No. : 3105ELU24H1199583F20

### INTERNATIONAL TRACTORS LIMITED, SOLIS 4515 4WD TRACTOR - INITIAL COMMERCIAL TEST

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#### 6. SUMMARY OF OBSERVATIONS, COMMENTS & RECOMMENDATIONS

On the basis of test conducted the performance results have been summarized as evaluative (mandatory) / Non-evaluative (Non-mandatory) parameters applicable for Qualifying Minimum Performance criteria as per Clause-4 (Table-1) of IS: 12207-2022 for acceptance of the tractor for the purpose of subsidies/NABARD financing are summarized as under:

SI. No.	Cha	aracteristic	Category (Evaluative / Non Evaluative)	Requirements as per IS: 12207-2022	Values declared by the applicant/ (D) Requirement (R)	As observed	Whether meets the require-m ents (Yes/No)
1		2	3	4	5	6	7
	MAN	DATORY TES I 28 <sup>th</sup> of July,	Ministry's Office Memorandun	n No. 13-17	/2021-M8	kT (I&P)	
6.1.1		Performance:					
a)		num power	Evaluative	Declared value to be achieved with	33.1	33.8	Yes
	unde	r 2 h test, (Natural ent		a tolerance of: ±5 per cent for PTO Power & or engine power > 26 kW ±10 per cent for PTO Power & or engine ≤ 26 kW.	(D)		
b)		r at rated e speed,	Non Evaluative	-do-	33.1 (D)	33.8	Yes
c)	consu	ific fuel umption sponding to num power, /h)	Evaluative	Should not be more than 10% of declared value	250 (D)	252	Yes
d)	Maximum equivalent crankshaft torque, (Nm)		Non Evaluative	± 8%	205 (D)	204.1	Yes
e)	Back- perce	up torque, ent	Evaluative	Should be Min 12 %	12 (D) 12 (R)	20.3	Yes
f)		num operating	temperature,	(°C):	( /	I	ı
	1)	Engine oil	Evaluative	The declared value should not exceed the max. value specified by the oil company and the observed value under natural ambient/high ambient condition should not exceed the declaration.	132(D)	115	Yes
	2)	Coolant	Evaluative	The observed value should not exceed the declared value or boiling point of coolant at radiator cap pressure whichever is lower. The boiling point of the coolant at radiator pressure shall be provided by the applicant.	118(D)	104	Yes
g)	Engine oil consumption, (g/kWh)		Evaluative	Not exceeding 1% of SFC at max. Power under natural ambient conditions.	2.52 Maximum (R)	0.30	Yes
h)	Smo	ke level, m <sup>-1</sup>	Evaluative	Maximum light absorption coefficient of 3.25 per meter or equivalent BOSCH No. 5.2 or 75 Hatridge value ( <b>As per CMVR</b> ).	3.25 per meter Maximum (R)	0.11	Yes

### INTERNATIONAL TRACTORS LIMITED, SOLIS 4515 4WD TRACTOR - INITIAL COMMERCIAL TEST

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1		2	3	4	5	6	7
6.1.2	Dra	wbar performance		· · ·	•	<u> </u>	· · ·
a)	Max balla to 1	ast corresponding before the services of the s	Non Evaluative	Minimum 70% of static mass with ballast	19.50 (D) 19.10 (R) Minimum	25.10	Yes
b)	stan corr	drawbar pull with dard ballast esponding to 15 cent wheel slip,	Evaluative	In case of tractors having total static mass ≥ 1500 kg, Min <b>70%</b> of static mass of tractor without ballast or with standard ballast, as the case may be.  In case of light weight tractors having ≤ 1500 kg total static mass of tractor, Min. <b>65%</b> of static mass of tractor without ballast or with stand, as the case may be.	16.00 (D) 15.48 (R) Minimum	19.87	Yes
c)	pow balla	timum drawbar er with standard ast, (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.	26.9 (D) 27.0 (R) Minimum	29.0	Yes
d)	tran	imum smission oil perature, (°C)	Evaluative	The declared value should not exceed the recommendation by the oil manufacturer. The observed value should not exceed the declared value throughout the drawbar test.	130 (D)	89	Yes
6.1.3	Pow	ver lift and hydraul	ic pump per				
a)	Maximum lifting capacity throughout the range of lift, (kN):						
	1)	At hitch points	Evaluative	Should not be less than 90% of declared value.	19.60 (D) 17.64 (R) Minimum	20.44	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.	14.00 (D) 7.96 (R) Minimum	16.92	Yes
b)	heig appli after inter dura (mm		Non Evaluative	The observed value should not exceed 50 mm	50 (D) Maximum	30	Yes
6.1.4		ke performance at					
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	10 (R)	7.61	Yes
b)	is ef 600 400	Hot brake ther parking brake fective at a force of N at foot pedal (s) or N at hand lever	Evaluative Evaluative	Yes / No	10 (R) Yes	7.92 Yes	Yes Yes
	*Applicant has not recommended ballast during the brake test. Hence, the brake test was conducted in standard ballasted condition.						e (est

### INTERNATIONAL TRACTORS LIMITED, SOLIS 4515 4WD TRACTOR - INITIAL COMMERCIAL TEST

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1		2	3	4	5	6	7
6.1.5	OPTIONAL TESTS: As the applicant has not applied for any optional tests, therefore no optional tests was conducted.						s was
6.1.6		ety features :			1		
a)	Gua mov	ards against ving and hot parts	Evaluative	Belt drives, pulleys, silencer, hydraulic pipes [As per IS 12239 (Part2)]	Meets the requirement		Yes
b)	Ligh	nting arrangement	Evaluative	As per CMVR		ts the ement	Yes
c)	(Tra	ating requirements actors having more n 1150 mm rear k 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		Non Evaluative	Should meet the requirements of IS: 4931 (As amended from time to time)	requir	ts the ement	Yes
e)	Dimensions of three point linkage		Non Evaluative	Should meet the requirements of IS: 4468 (Part-I) (As amended from time to time)	mee requii	s not et the rement	No
f)	linka	ecifications of age drawbar	Non Evaluative	Should meet the requirements of IS: 12953 (As amended from time to time)	requir	ts the rement	Yes
g)	Swinging drawbar (wherever fitted)		Non Evaluative	Should meet the requirement of IS: 12362 (Part 3) (As amended from time to time)	Not pr	ovided	Not appli- cable
h)	sign	lible warning nal on tractor	Evaluative	If tractor travel speed in reverse gear exceeds 20 kmph, an audible warning signal on tractor shall get activated.  A sticker to the effect that "operating the tractor beyond 20 kmph speed in reverse gear is not safe" should be prominently displayed.	(Max. spe reverse	fitted travel ed in gear is kmph)	Not appli- cable
6.1.7	Lab	elling of tractors (	Provision of				
	1)	Make	Evaluative	Should conform to the requirements of CMVR along with maximum PTO Power in		NATION CTORS D	Yes
	2)	Model	Evaluative	kW and year of manufacture in numerical form.	SOLIS 4WD	4515	Yes
	3)	Month & Year of manufacture	Evaluative	MM YY	08 & 20		Yes
	4)	Engine number	Evaluative	Digit 01 – 12 in box No.1for MM will represent the months and next two digits in box No.2 for	3105EL 199583	F20	Yes
	5)	Chassis number	Evaluative	YY will represent the year of Manufacturing.	S3	1208541	Yes
	6)	Maximum PTO power, (kW)	Evaluative		33.1		Yes
	7)	Specific fuel consumption, g/kWh	Evaluative		250		Yes

### INTERNATIONAL TRACTORS LIMITED, SOLIS 4515 4WD TRACTOR - INITIAL COMMERCIAL TEST

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1	2	3	4	5	6	7
6.1.8	Literature (Submis	ssion to test a	igency):			
(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
6.1.9	Fitment of Roll Over Protective Structures (ROPS):					
	For tractor having Evaluative more than 1150 if fitted requirement of IS:11821 or OECD code or equivalent International Standard		21 or	ot fitted	Not applicable	
6.1.10	Standard Evaluative Trailer hitch, front tow hook, linkage drawbar should be provided with tractor		,	rovided	Yes	
6.1.11	Accessories (optional)	Non Evaluative	Ballast weight, if f should meet requirement of CMVR	itted, N the	ot fitted	Not applicable

6.2	CATEGORY O	F BREAKDOW	/NS / DEFECTS ( As per clause 5	.0 of IS:12207-	·2022):
S. No.	Category of breakdowns	Category (Evaluative / Non Evaluative)	Requirements as per IS: 12207-2022	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 of repetitive in nature	None	Yes
3.	Minor	Evaluative	Not more than five and neither of them should be of repetitive in nature	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

#### 6.3 Conformity with following IS:

Guidelines for declaration of power and specific fuel consumption and : Conforms labeling of agricultural tractors (First revision) [IS:10273 -1987 (Reaffirmed Year 2019)]

ii) Agricultural tractors - Rear mounted power take-off - Types 1, 2 and 3 : Conforms (third revision) [IS:4931-1995 (Reaffirmed Year 2019)]

Agricultural wheeled tractors – Rear mounted three-point linkage: Part 1 : Categories 1, 2, 3 & 4 (fourth revision) [IS:4468(Part-I) – 1997 (Reaffirmed in 2022)]

iv) Drawbar for agricultural tractors – Link type [IS 12953:1990 (Reaffirmed : Conforms Year 2022)]

v) Agricultural tractors- Operator's seat technical requirement [IS12343 - : Does not conform

vi) Guide for safety & comfort of operator of agricultural tractors:Part 1 : Does not General requirements (first revision):[IS 12239 (Part 1) - 2018] conform

vii) Tractors and machinery for agriculture and forestry – Technical means for : Does not ensuring safety Part 2: Tractors (first revision) (IS 12239 (Part 2) 1999) conform (Reaffirmed Year 2019)]

viii) Guide lines for location and operation of operator controls onagricultural : Does not tractors and machinery [IS: 8133 - 2021] conform

### INTERNATIONAL TRACTORS LIMITED, SOLIS 4515 4WD TRACTOR - INITIAL COMMERCIAL TEST

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Tractors and machinery for agriculture and forestry, powered lawn and : Conforms garden equipment - Symbols for operator controls and other displays Part2 Symbols for agricultural tractors and machinery [IS: 6283(Part-1) - 2006 (Reaffirmed Year 2019) and IS: 6283 (Part-2) - 2007 (Reaffirmed Year 2019)]

x) Agricultural Tractors and Machinery-Lighting device for travel on public : Conforms roads (IS:14683-1999) (Reaffirmed Year 2019)]

#### 6.4 Salient Observations:

#### 6.4.1 Laboratory tests:

T-1715/2246/2023

#### 6.4.1.1 Hydraulic performance test:

The moment about rear axle was computed as 24.96 kN-m, whereas moment about front axle was calculated as 19.33 kN-m under standard ballasted condition and 24.41 kN-m under ballasted condition respectively. The moment about rear axle is on higher side as compared to the moment about front axle even under ballasted condition. It is, therefore, recommended that the lifting capacity of the hydraulic system may be reduced suitably or ballast recommendation may be reviewed to avoid the front lifting of the tractor.

#### 6.4.1.2 Operator's seat:

The following parameters does not meet the requirement of IS: 12343 - 2021

- i) Provision for adjustment of driver's mass has been specified as 50 to 120 kg against the requirement of 40 to 100 kg.
- ii) The longitudinal distance from SIP to centre of steering control wheel has been measured as 420 mm against the requirement of 425 to 525 mm. This should be looked into for necessary corrective action.

#### 6.4.1.3 Operator's work place:

The following parameters does not meet the requirement of IS: 12239 (Part-I) 2018.

- i) Vertical retainers on inner side of clutch pedal are not provided.
- ii) Spark arresting device has not been provided in the exhaust system.

This should be looked into for necessary corrective action.

#### 6.4.1.4 Three point linkage:

The dimensions viz. diameter of hitch pin hole of upper hitch points, diameter of hitch pin hole & width of ball of lower hitch points, lateral distance from lower hitch point to centre line of tractor and power range (without force) does not meet the requirements of IS:4468 (Part-I) – 1997. This should be looked into for necessary corrective action.

#### 6.4.1.5 Constructional requirement with regard to safety:

Meets the requirements of IS: 12239 (Part-II)-1996 (Re-affirmed in January, 2019), except the following:

- i) PTO master shield has not been provided.
- ii) Working clearance in between draft control lever and RHS mudguard has been measured as 20 mm against the minimum requirement of 70 mm.
- iii) Differential lock has not been provided.

This should be looked into for necessary corrective action.

#### 6.5 Specification of Tractor:

Discrepancies in the specification between the Specification sheet and Operator's manual are as under:

S.	Description	As per Specification	As per Operator's manual
No.		Sheet	
a)	Total lube oil capacity, I	7.5	8.5 (Page No. 69)
b)	Front standard track width, mm	1370	1380 (Page No. 69)
c)	Ground clearance, mm	360	390(Page No. 69)

#### 6.6 Maintenance / Service Problems:

No noticeable maintenance or service problem was observed during the test.

### INTERNATIONAL TRACTORS LIMITED, SOLIS 4515 4WD TRACTOR - INITIAL COMMERCIAL TEST

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- 6.7 Recommendation with regard to safety on tractor:
  - The engine stop control does not remain in stop position as per the requirement of IS: 8133-2021.
  - ii) Identification of hand controls by colour code has not been provided for engine stop control & engine speed control as per the requirement as laid down in Table – 5 of IS: 8133-2021.
  - iii) Engine stop control is located 300 mm from engine start control as against the requirement of within 150 mm as per IS: 8133-2021.
  - iv) The hand accelerator lever, when moved away from the operator (i.e. forward) decreases the engine speed, which does not meet the requirement as laid down in Table 1 of IS: 8133-2021.
  - V) Working clearance in between draft control lever and RHS mudguard should has been measured as 20 mm against the requirement of 70 mm minimum as per IS: 12239 (Part-2) – 2019, for easy operating the lever.
  - vi) There should be provision of differential lock.
  - vii) Master shield on PTO shaft should be provided.

Above parameters should be looked into for necessary corrective action.

- 6.8 Adequacy of Literature supplied with machine:
- 6.8.1 The following literatures were supplied with the test tractor for reference during the test: -
  - a) Operator manual for "SOLIS 4515 4WD" tractor model.
  - b) Parts catalogue for "SOLIS 4515 4WD" tractor model.
  - c) Service manual for "SOLIS 4515 4WD" tractor model.
- 6.8.2 The operator manual may be brought out for the guidance of users and service personnel as per IS: 8132-1999 incorporating, inter alia, the following:
  - Safe hitch height of the trailer.
  - ii) Recommended ballast masses for different operations

### TEST CARRIED OUT AT C.F.M.T. & T.I., BUDNI (M.P.), INDIA

#### **TESTING AUTHORITY**

C. V. CHIMOTE TEST ENGINEER	Thumanawit
P.K. PANDEY DIRECTOR	43n-7m8h

Draft Test Report compiled by: C. K. Tijare, Agricultural Engineer.

#### 7. APPLICANT'S COMMENTS

Para no.	Our reference	Comments
7.1		Our comments for your observations are Nil.

T-1715/2246/2023 INTERNATIONAL TRACTORS LIMITED, SOLIS 4515 4WD
TRACTOR - INITIAL COMMERCIAL TEST
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#### **ANNEXURE-I**

#### TRACTOR RUN HOURS DURING TEST

A.	LABORATORY AND TRACK TESTS:	HOURS
1.	Running-in	Applicant has declared it to be conducted on their work place.
2.	PTO performance test	11.6
3.	Power lift and hydraulic pump performance test	2.9
4.	Drawbar performance test	16.5
5.	Brake performance test	1.3
6.	Nominal speed test	2.1
B.	Miscellaneous test and other run hours including idle run, transportation, trials and preparation for test	4.9
	TOTAL:	39.3