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व्यावसायिक परीक्षण रिपोर्ट (प्रथम बैच परीक्षण)
COMMERCIAL TEST REPORT (1st Batch Test)

संख्या / No. : T-1462/1989/2020
माह / Month : July, 2020

(यह परीक्षण रिपोर्ट 31/07/2025 तक वैध है। / THIS TEST REPORT IS VALID UP TO : 31/07/2025)



ACE, DI 854 NG 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

CENTRAL FARM MACHINERY TRAINING & TESTING INSTITUTE
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The "ACE, DI 854 NG" tractor had undergone "Initial Commercial Test" at this Institute and a test report No. T- 996/1485/2015 released on March, 2015. Now the applicant has submitted application vide letter no.854 NG/00 for Batch testing of "ACE, DI 854 NG" tractor.

All necessary tests as per Table-1 of clause 6.0 of IS: 5994 - 1998 (Reaffirmed in 2014) were carried out and test report released as under.

The applicant has informed vide letter no. 854 NG/00 dated: 28.11.2019 last cut off tractor chassis number and engine serial number of tractor model ""ACE,DI 854 NG" tractor generated on production line as under:-

S. No.	Parameters Modified	Chassis Number	Engine Number
1.	Re-declaration of hydraulic lifting capacity at hitch point, kN	UAJ850036339	TUAJ0010059
2.	Specification of PTO shaft		
3.	Labelling plate		

Manufacturer : M/s. Action Construction Equipment Ltd.,Plant-II, Dudhola Link Road, Dudhola Palwal, Haryana - 121 102

Test requested by (Applicant) : M/s. Action Construction Equipment Ltd.,Jajru Road, 25th Mile Stone, Mathura Road, Ballabgarh, Faridabad, Haryana - 121 004

Selected for test by : The testing authority
Place of running-in : At manufacturer's works

Duration of said running-in, (h):

- Engine : 25
- Transmission : 25

Method of Selection : The test sample was selected randomly out of Five tractors from the production line by the representative of testing authority.

Tractors chassis serial number made available for random selection:

- i) UAJ850036338
- ii) UAJ850036339
- iii) UAJ850036340
- iv) UAJ850036342
- v) UAJ850036341

1. SPECIFICATIONS

1.1 Tractor:
 Make : ACE
 Model : DI 854 NG
 Brand name : None
 Type : Four wheeled, rear-wheel driven, unit construction, general purpose, Agricultural Tractor
 Year of manufacture : 09 19
 Chassis number : UAJ850036339
 Country of origin : India



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14. SUMMARY OF OBSERVATIONS, COMMENTS & RECOMMENDATIONS

14. 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: 12207-2019 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 meets the requirements (Yes/No)
1	2	3	4	5	6	7
14.1.1	PTO Performance :					
a)	Maximum power under 2 hours 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.	22.0 (D)	23.0	Yes
b)	Power at rated engine speed, (Kw)	Non Evaluative	-do-	22.0 (D)	23.0	Yes
c)	Specific fuel consumption corresponding to maximum power, (g/kWh)	Evaluative	+ 10% max.	265 (D)	267	Yes
d)	Maximum equivalent crankshaft torque, (Nm)	Non Evaluative	$\pm 8\%$	175 (D)	163.5	Yes
e)	Back-up torque, percent	Evaluative	12 percent, min	12 (R)	34.2	Yes
f)	Maximum operating temperature ($^{\circ}\text{C}$)					
	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.	135 (D)	95	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.	110 (D)	84	Yes
g)	Engine oil consumption, (g/kWh)	Evaluative	Not exceeding 1% of SFC at max. power under High ambient conditions	2.67 (R)	0.40	Yes
h)	Smoke level	Evaluative	Maximum light absorption coefficient of 3.25 per metre or equivalent BOSCH No. 5.2 or 75 Hatridge value (As per CMVR)	3.25 per metre (R)	0.17 per meter	Yes

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1	2	3	4	5	6	7	
14.1.2	Drawbar performance :						
a)	Maximum drawbar pull with ballast corresponding to 15 percent wheel slip, (kN)	Non Evaluative	Minimum 70% of static mass with ballast	16.00 (D) 16.92 (R)	18.86	Yes	
b)	Maximum drawbar pull without ballast corresponding to 15 percent wheel slip, (kN)	Evaluative	Minimum 70% of static mass of tractor without ballast or with standard ballast, as the case may be	13.30 (D) 12.84 (R)	13.71	Yes	
c)	Maximum drawbar power without ballast, (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.	17.6 (D) 18.4 (R)	19.9	Yes	
d)	Maximum transmission oil temperature (°C)	Evaluative	The declared value should not exceed the maximum value specified by oil company	135 (D)	81	Yes	
14.1.3	Power lift and hydraulic pump performance :						
a)	Maximum lifting capacity throughout the range of lift, (kN):						
	1) At hitch points	Evaluative	Tolerance of $\pm 10\%$	10.80 (D)	11.53	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	7.50 (D) 5.41 (R)	10.11	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 minute, (mm)	Non Evaluative	The observed value should not exceed 50 mm	50 (D)	210	No	
14.1.4	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, (m):						
	1) Cold brake	Evaluative	10	10 (R)	8.60	Yes	
	2) Hot brake	Evaluative	10	10 (R)	9.09	Yes	
b)	Maximum force exerted on the brake pedal to achieve a deceleration of 2.5 m/s^2 (N)	Evaluative	600	600 (R) Maximum	431 to 452	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	446 to 513	Yes	



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1	2	3	4	5	6	7
14.1.5	Noise measurement :					
a)	Maximum ambient noise emitted by the tractor dB(A)	Evaluative	As per CMVR	88 (R)	82	Yes
b)	Maximum noise at operator's ear level dB(A)	Evaluative	As per CMVR	96 (R)	91	Yes
c)	Amplitude of mechanical vibrations at:					
	1) Left foot rest	Non Evaluative	100 microns (max)	100(R)	125	No
	2) Right foot rest				113	No
	3) Seat (with driver seated)				63	Yes
	4) Steering wheel				434	No
14.1.6	Air cleaner:					
	Maximum air cleaner oil pull over, (%)	Evaluative	0.25 % (maximum)	Not applicable	Dry type air cleaner fitted	Not applicable
14.1.7	Haulage requirements :					
a)	Gross mass of the trailers, (tones):					
	1) Two wheel	Non Evaluative	--	5.0 (D)	5.0	Yes
	2) Four wheel	Evaluative	--	6.0 (D)	6.0	Yes
b)	Distance travelled / liter of fuel consumption, (km/l):					
	1) Two wheel	Non Evaluative	--	3.50 to 5.50 (D)	5.70 to 5.87	Yes
	2) Four wheel		--	4.0 to 6.0 (D)	5.63 to 5.91	Yes
c)	Fuel consumption (ml/km/tonne):					
	1) Two wheel	Non Evaluative	--	30.0 to 50.0(D)	34.09 to 35.06	Yes
	2) Four wheel		--	35 to 55 (D)	28.21 to 29.62	Yes
14.1.8	Wetland cultivation :					
	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 were not observed during ICT test vide test report No.T-966/ 1485/ 2015 (March, 2015). So, as per clause 7.2 of IS:12207-2019 , test was not conducted .	Yes
	1) Clutch assembly	-do-				
	2) Brake housings	-do-				
	3) Front axle hubs	-do-				
	4) Engine Oil	-do-				
	5) Transmissi on Oil	-do-				
14.1.9	Safety features :					
a)	Guards against moving and hot parts	Evaluative	Belt drives, pulley, silencer, hydraulic pipes (As per IS 12239 (part 2)	--	Meets the requirement	Yes
b)	Lighting arrangement (Tractor having more than 1150 mm rear track width)	Evaluative	As per CMVR	--	Meets the requirement	Yes



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1	2	3	4	5	6	7
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)	--	Meets the requirement	Yes
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)	Dimension of three point linkage	Non-Evaluative	Should meet the requirements of IS 4468 (part 1) (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	--	Meet the requirements	Yes
(g)	Swinging drawbar (wherever fitted)	Evaluative	Should meet the requirements of IS 12362 (Part 3) (As amended from time to time)	--	Not fitted	Not applicable
(h)	1) Maximum traveling speed at rated engine speed in reverse gear, kmph	Evaluative	Should not exceed 20 kmph	--	10.43 kmph Meet the requirements	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 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

14.1.10 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	ACE		Yes
2)	Model	Evaluative		DI 854 NG		Yes
3)	Year of manufacture	Evaluative		09	19	Yes
4)	Engine number	Evaluative		TUAJ0010059		Yes
5)	Chassis number	Evaluative		UAJ850036339		Yes
6)	Declaration of PTO power, (kW)	Evaluative		22		Yes
7)	Specific fuel consumption,(g/ kWh)	Evaluative		265		Yes

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1	2	3	4	5	6	7
14.1.11	Discard limit for:					
(a)	Cylinder bore diameter, (mm)	Evaluative	To be specified by Manufacturer	105.30	105.024 to 105.047	Yes
(b)	Clearance between piston & cylinder liner at skirt, (mm)	Non Evaluative		0.45 (D)	0.118 to 0.124	Yes
(c)	Piston diameter	Non Evaluative		104.929 (D)	104.914 to 104.926	Yes
(d)	Ring end gap (mm):					
	- Top comp. ring.	Evaluative	-do-	2.0 (D)	0.50	Yes
	- 2 nd comp. ring.		-do-	2.0 (D)	0.85 to 0.90	Yes
	- Oil ring.		-do-	2.0 (D)	0.55 to 0.65	Yes
(e)	Ring groove clearance (mm):					
	- Top comp. ring.	Evaluative	-do-	--Tapered-		Yes
	- 2 nd comp. ring.		-do-	0.20 (D)	0.072 to 0.078	Yes
	- Oil ring.		-do-	0.20 (D)	0.025 to 0.030	Yes
(f)	Clearance of main bearings (mm):					
	Diametrical clearance	Evaluative	-do-	0.40 (D)	0.085 to 0.105	Yes
	Crankshaft end float	Evaluative	-do-	0.60 (D)	0.20	Yes
(g)	Clearance of big end bearings, (mm):					
	- Diametrical	Evaluative	-do-	0.60 (D)	0.098 to 0.116	Yes
	- Axial	Evaluative	-do-	1.00 (D)	0.25 to 0.30	Yes
(h)	Clearance between king pin and bush, (mm)	Non Evaluative	-do-	1.00 (D)	0.102 to 0.142	Yes
(i)	Clearance between centre pin and bush, (mm)	Non Evaluative	-do-	1.00 (D)	0.083 to 0.107	Yes
14.1.12	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
14.1.13	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
14.1.14	Standard Accessories	Evaluative	Trailer hitch, front tow hook, linkage drawbar should be provided with the tractor.	--	Provided	Yes
14.1.15	Accessories (optional)	Non Evaluative	Ballast weights, if fitted, should meet the requirement of CMVR	--	Provided	Yes



14.1.16 CATEGORY OF BREAKDOWNS / DEFECTS :					
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	There is no 'critical breakdown' during the course of testing	None	Yes
2.	Major	Evaluative	There are not more than 1 major breakdowns	None	Yes
3.	Minor	Evaluative	There are not more than 3 minor defects during the test and the frequency of each is not be more than two	None	Yes
4.	Total breakdowns	Evaluative	In no case, the total number of breakdowns should exceed four that is, (1 major + 3 minor) or 4 minor breakdowns	None	Yes

14.3 Salient Observations:

14.3.1 Laboratory tests:

14.3.1.1 PTO Performance Test:

- i) The maximum PTO power in case of previous & present sample were observed as **22.5 & 23.0 kW** respectively against the declaration of **22.0 kW** & which meets the requirement of IS: 12207-2019 with regard to tolerance limit.
- ii) The specific fuel consumption corresponding to maximum power in case of previous & present sample was recorded as **264 & 267 g/kWh** respectively against the declaration of **265 g/kWh** & which meets the requirement of IS: 12207-2019 with regard to tolerance limit.
- iii) The maximum equivalent crankshaft torque was recorded as **163.5 Nm** against the declaration of **175.0 Nm** which meets the requirement of IS: 12207-2019 with regard to tolerance limit.
- iv) The backup torque is **34.2 %** & which meets the requirement of IS: 12207-2019 with regard to tolerance limit.

14.3.1.2 Drawbar performance test:

- i) Maximum drawbar pull in case of previous & present sample with unballast condition corresponding to 15 percent wheel slip was recorded as **14.12 kN & 13.71 kN** respectively against the minimum requirement of **12.84 kN**, which meets the requirement of IS: 12207-2019 with regard to tolerance limit.
- ii) Maximum drawbar power with unballast condition in case of previous & present sample was recorded as **20.0 kW & 19.9 kW** respectively against the minimum requirement of **18.4 kW**, which meets the minimum requirement of IS: 12207-2019 with regard to tolerance limit.
- iii) During the 10 hour drawbar test at the 15 % wheel slip, the RHS rear tyre got puncture due to excessive creeping of tyre over the rim. So, the RHS rear wheel tube was replaced with new one. This should be looked into for necessary corrective action.
- iv) During ten hours drawbar performance test, creeping of LHS & RHS rear tyre over the rims was observed as **140 & 130 mm** respectively. This should be looked into for necessary corrective action.

**14.3.1.3 Hydraulic performance test:**

- i) Maximum lifting capacity throughout the range of lift at hitch point and standard frame was recorded as **11.53 kN & 10.11 kN** respectively against the declaration of **10.8 kN & 7.50 kN** respectively & which meets the requirement of IS: 12207-2019 with regard to tolerance limit.
- ii) Maximum drop in the height of lower links during maintenance of lift load test was recorded as **210 mm** against the maximum permissible limit of **50 mm** & which does not meet the non -evaluative requirement of IS: 12207-2019. This should be looked into necessary corrective action.

14.3.1.4 Mechanical Vibration:

The amplitude of mechanical vibration on various assemblies marked as (*) in **Chapter – 8** of this test report is on higher side. This calls for dampening down of vibrations especially on LHS & RHS of foot rest and steering control wheel to improve the operational comfort and service life of components.

14.3.1.5 Specifications of three point linkage:

- i) The parameter Lateral distance from lower hitch point to centre line of tractor does not meet the requirement of IS: 4468 (Part-1) -1979 (Reaffirmed 2014). This should be looked into for necessary corrective action.

14.4 Maintenance / Service Problems:

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

14.5 Recommendation with regard to safety on tractor:

The following requirements, inter alia, may be considered for incorporation on the tractor:

- i) There should be vertical retainness at both side in clutch pedal
- ii) There should be provision for spark arresting device in exhaust system.
- iii) There should be provision of differential lock.
- iv) Working clearance between auxiliary hydraulic lever , PC and DC engaging lever should be as per relevant standard.
- v) There should be provision of safety against accidental start of engine.

14.6 Adequacy of Literature supplied with machine:

14.6.1 Literature was supplied with the tractor for reference during the test.

- a) Operator's manual (for ACEDI 305 NG, DI 854, DI 350 NG, DI 450 NG & DI 550 NG & DI 6565 tractor models)
- b) Parts catalogue of (ACEDI 305 NG, DI 854, DI 350 NG, DI 450 NG & DI 550 NG & DI 6565 tractor models)
- c) Service Manual of (for ACEDI 305 NG, DI 854, DI 350 NG, DI 450 NG & DI 550 NG & DI 6565 tractor models.

14.6.2 The supplied literature was found adequate

14.6.3 However, these literatures should be brought out in other vernacular languages of India for guidance of users

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15. Citizen charter

Test duration under citizen charter	Duration of Test	Whether the report released within time frame given in the citizen charter	Remark
10 Months	06 Months (January, 2020 to June, 2020)	Yes	--None--

TESTING AUTHORITY:

C.S. RAGHUWANSHI
AGRICULTURAL ENGINEER

C.V. CHIMOTE
TEST ENGINEER

J.J.R. NARWARE
DIRECTOR

Test Report compiled by **Shri Shivkumar Sharma**, Senior Technical Assistant.

16. APPLICANT'S COMMENTS

Para no.	Our reference	Applicant comments
16.1	14.3.1.2 (iii), 14.3.1.3(ii), 14.3.1.4, 14.3.1.5 & 14.5	Your valuable comments & suggestion, for improvements are well taken & these aspects are further looked into & will try to eliminate these deviation soon wherever necessary.

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THIS TEST REPORT IS VALID UPTO:31/07/2025**ANNEXURE - I****TRACTOR RUN HOURS DURING TEST**

A.	LABORATORY AND TRACK TESTS	HOURS
1.	Running-in(Engine & Transmission)	50.0
2.	PTO Performance Test	10.0
3.	Power lift and hydraulic pump performance test	1.2
4.	Drawbar performance test	17.6
5.	Brake test	1.2
6.	Noise measurement	1.3
7.	Mechanical vibration test	1.0
8.	Nominal speed test	1.1
B.	HAULAGE TEST	6.2
C.	Miscellaneous test and other run hours including idle run, transportation, trials and preparation for test	4.5
TOTAL:		94.1