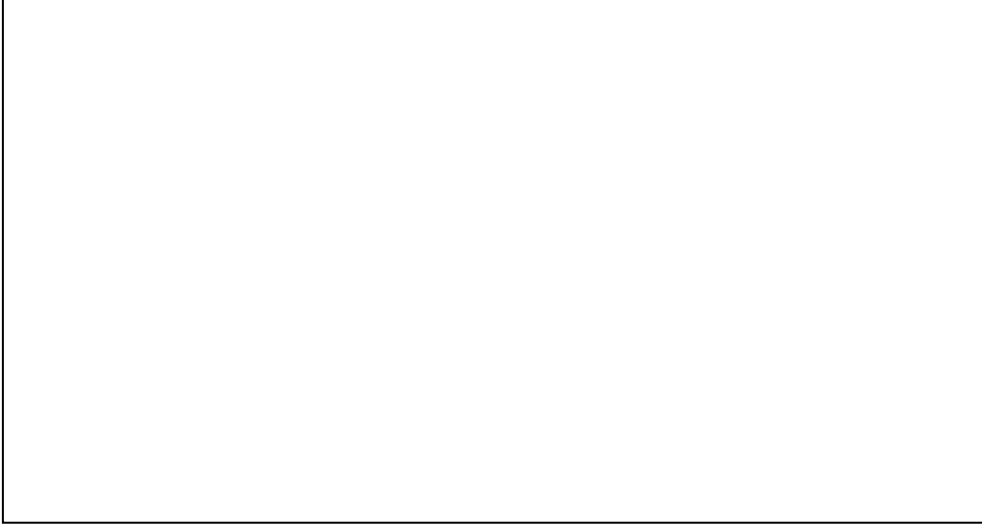


व्यावसायिक वैरिएंट परीक्षण रिपोर्ट (प्रथम
बैच)

संख्या/No. : T-1564/2092/2021

COMMERCIAL VARIANT TEST REPORT (1st Batch) माह/Month : July, 2021

(यह परीक्षण रिपोर्ट 31/07/2026 तक वैध है | THIS TEST REPORT IS VALID UPTO: 31/07/2026)



EICHER 242 USJ TRACTOR



भारत सरकार

कृषि एवं किरान कल्याण मंत्रालय
(कृषि, सहकारिता एवं किरान 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.)-466 445

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, Web site: fnttibudni.gov.in Telephone: 07564-234729, 234743

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2. FUEL AND LUBRICANTS

2.1 Fuel : The High-speed diesel oil supplied by M/s Indian Oil Corporation Limited having density of 0.829 g/cc at 15°C was used.

2.2 Lubricants:

S. No.	Particulars	As recommended by the manufacturer	As used during the test
	Air cleaner	15W40	As recommended
1.	Engine oil	15W40	--do--
2.	Gearbox, differential, rear axle, rear final drive and hydraulic system oil	EP 80	Oil originally filled in the tractor systems were not changed
	Steering system oil	EP 80	--do--
4.	Grease	Multi purpose	MP Grease

3. ESSENTIAL TESTS

3.1 SPECIFICATIONS

3.1.1 Tractor:

Make : Eicher
 Model : Eicher 242 USJ
 Brand name : None
 Type : Four wheel, Rear wheel driven, Unit construction, General purpose, Agricultural Tractor
 Month & Year of manufacture : 07 / 20
 Chassis number : 929510299337
 Country of origin : India

3.1.2 Engine:

Make : Eicher
 Model : 115 NCE
 Type : Four stroke, air cooled, Naturally aspirated, Direct injection, Diesel engine.
 Serial number : 529529175453
 Country of origin : India

3.1.2.1 Engine speed (rpm), (Manufacturer's recommended production settings):

- Maximum speed at no load : 1730 to 1830
 - Low idle speed : 480 to 520
 - Speed at maximum torque : 900 to 1100

Rated speed, (rpm):

- For PTO use : 1650
 - For drawbar use : 1650

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6.1.4 Service Brake:		<u>Previous sample</u>	<u>Present sample</u>
Make	:	TVS - Girling	
Type	:	Mechanical, dry friction discs	
No. of friction disc	:	Two (on each wheel side)	
Area of liners, (cm ²)	:	636.4(on each wheel side)	610.7 (on each wheel side)
6.1.5 Wheel equipment:			
Make & Size of tyres			
- Front	:	CEAT & 6.00 – 16	MRF & 6.00 – 16
- Rear	:	CEAT & 12.4-28	MRF & 12.4-28
Standard Track width, (mm):			
- Front	:	1310	1310
- Rear	:	1340	1420
6.1.5.1 Wheel base, (mm)	:	1920	1920
6.1.6 Overall dimensions, (mm):			
- Length	:	3220	3220
- Width	:	1690	1770
- Height (with exhaust pipe)	:	2050	2040
- Ground clearance, (mm)	:	400	390
(Below the drain plug of transmission housing)			
6.1.7 Operational mass of unballasted tractor(kg):			
- Front	:	610	615
- Rear	:	1090	1125
- Total	:	1700	1740
6.1.8 Conformity with following IS:		<u>Previous sample</u>	<u>Present sample</u>
i)	Guide lines for declaration of power and specific fuel consumption and labelling of agricultural tractors (First revision) [IS10273: 1987 (Reaffirmed in January, 2019)]	Confirmed	Confirms
ii)	Agricultural tractors – Rear mounted power take-off - Types 1, 2 and 3 (third revision) [IS:4931-1995 (Reaffirmed in January, 2019)]	Confirmed	Confirms
iii)	Agricultural wheeled tractors - Rear mounted three-point linkage: Part 1 Categories 1, 2, 3 & 4 (fourth revision) [IS 4468 (Part-I):1997 (Reaffirmed in 2017)]	Did not Confirm	Doesn't Confirm
iv)	Drawbar for agricultural tractors – Link type [IS 12953:1990 (Reaffirmed in 2017)]	Confirmed	Confirms
v)	Agricultural tractors - Operator's seat technical requirement [IS 12343 –1998 (First revision) (Reaffirmed in January, 2019)]	Did not Confirm	Confirms
vi)	Guide for safety & comfort of operator of agricultural tractors: Part 1 General requirements (first revision): [IS 12239 (PT-1) 1996/ISO 4254-1:2018]	Did not Confirm	Doesn't Confirm

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	<u>Previous sample</u>	<u>Present sample</u>
vii) Tractors and machinery for agriculture and forestry – Technical means for ensuring safety Part 2: Tractors (first revision) (IS 12239 (PT-2) 1999) (Reaffirmed in January, 2019)]	: Did not Confirm	Doesn't Confirm
viii) Guide lines for location and operation of operator controls on agricultural tractors and machinery (first revision) IS: 8133-1983 (Reaffirmed in January, 2019)]	: Did not Confirm	Doesn't Confirm
ix) Tractors and machinery for agriculture and forestry, powered lawn and garden equipment – Symbols for operator controls and other displays Part 2 Symbols for agricultural tractors and machinery [IS:6283 (Part-1)- 2006 and IS: 6283 (Part-2)-2007 (Reaffirmed in January, 2019)]	: Confirmed	Confirms
x) Agricultural Tractors and Machinery – Lighting device for travel on public roads (IS: 14683-1999) (Reaffirmed in January, 2019)]	: Confirmed	Confirms

6.2 Performance Characteristics:

6.2.1 PTO Performance:

Maximum Power, (kW)	:	14.2		14.3
Specific fuel consumption corresponding to maximum power, (g/kWh)	:	265		269

6.2.2 Brake performance test at max attainable speed (max.):

Parameter	Cold	Hot	Cold	Hot
Maximum Stopping distance, (m)	8.48	8.65	9.19	9.32
Maximum force exerted on the brake Pedal effort required to achieve deceleration of 2.5 m/sq sec, (N)	: 470 to 474		479 to 554	
Weather parking brake is effective at a force of 600N at foot pedal (s) or 400 N at hand lever	: Effective		Effective	

6.3 Laboratory test:

<u>Previous Sample</u>	<u>Present Sample</u>
6.3.1 PTO Performance:	
i) The maximum PTO power in case of base and variant models were observed as 13.9 & 14.2 kW respectively against the declaration of 14.7 kW which is within the specified limit.	i) The maximum PTO power is recorded as 14.3 kW against the declaration of 14.7 kW & which meets the requirement of IS: 12207-2019 with regard to tolerance limit.
ii) The specific fuel consumption in case of base and variant models corresponding to maximum power were observed as 263 & 265 g/kWh respectively against the declaration of 265 g/kWh. This is within the tolerance limit.	ii) The specific fuel consumption corresponding to maximum power was recorded as 269 g/kWh against the declaration of 265 g/kWh & which meets the requirement of IS: 12207-2019 with regard to tolerance limit.

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6.4 Adequacy of literature:

Following literatures of Eicher, 242 USJ tractor models were supplied with the test sample for reference during the test.

- | | |
|----------------------|----------------------|
| a) Service Manual | a) Service Manual |
| b) Parts Catalogue | b) Parts Catalogue |
| c) Operator's manual | c) Operator's manual |

7. SUMMARY OF OBSERVATIONS, COMMENTS & RECOMMENDATIONS

7.1 On the basis of tests conducted the performance results have been summarized as evaluative (mandatory) and non-evaluation (not-mandatory) parameter 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:-

S. 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	
7.1.1	PTO Performance :						
a)	Max. power under 2 h test, (kW) (Natural ambient condition)	Evaluative	Declared value to be achieved with a tolerance of: ± 5% for PTO power or engine power >26 kW, ± 10% for PTO power or Engine power ≤ 26 kW.	14.7 (D)	14.3	Yes	
b)	Specific fuel consumption corresponding to maximum power, (g/kWh)	Evaluative	+ 10% Max.	265 (D)	269	Yes	
7.1.2	Brake performance at 25 kmph:						
a)	Maximum stopping distance at a force, equal to or less than 600 N on brake pedal with ballast, (m):						
	1)	Cold brake	Evaluative	10	10 (R)	9.19	Yes
	2)	Hot brake	Evaluative	10	10 (R)	9.32	Yes
b)	Maximum force exerted on the brake pedal to achieve a deceleration of 2.5 m/s ² (N)	Evaluative	600	600 (R)	479 to 554	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 (R)	570	Yes	

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1	2	3	4	5	6	7		
7.1.3	Safety features :							
a)	Guards against moving and hot parts	Evaluative	Belt drives, pullies, silencer, hydraulics pipes(as per IS-12239 Part 2)		Meet the requirements	Yes		
b)	Lighting arrangement	Evaluative	As per CMVR		Meet the requirements	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)		Meet the requirements	Yes		
d)	Technical requirements for PTO shaft	Evaluative	Should meet the requirements of IS: 4931 (As amended from time to time)		Meet the requirements	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 requirements	No		
f)	Specifications of linkage drawbar	Evaluative	Should meet the requirements of IS 12953 (As amended from time to time)		Meet the requirements	Yes		
g)	Specifications of 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 travelling speed at rated engine speed in reverse gears, kmph	Evaluative	Should not exceed 20 kmph		11.49 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 warning signal on tractor shall be activated.		Not fitted	Not applicable		
7.1.4	Labelling of tractors (Provision of labelling plate):							
	1) Make	Evaluative	Should conform to the requirements of CMVR along with maximum declared value of PTO power in kW and for month & year of manufacture in numerical <table border="1" style="display: inline-table; vertical-align: middle;"><tr><td>MM</td><td>YY</td></tr></table> Digit 01-12 in box No.1 for MM will represent the month and next two digit in the box No.2 for YY will represent the year of manufacturing	MM	YY		EICHER	Yes
MM	YY							
	2) Model	Evaluative				EICHER 242 USJ	Yes	
	3) Month & Year of manufacture	Evaluative				07 / 20	Yes	
	4) Engine number	Evaluative				529529175453	Yes	
	5) Chassis number	Evaluative				929510299337	Yes	
	6) Declaration of PTO power, kW	Evaluative			14.7	Yes		

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1	2	3	4	5	6	7
7.1.5	Literature (Submission to test agency)					
(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
7.1.6	Fitment of Roll Over Protective Structure (ROPS): for tractors having more than 1150 mm rear track width	Evaluative	ROPS should meet the requirement of IS:11821 or OECD code or equivalent International Standard	Provided	Not Fitted	Not Appli- cable
7.1.7	Standard accessories	Evaluative	Trailer hitch, front tow hook, linkage drawbar should be provided with tractor	Provided	Provided	Yes
7.1.8	Accessories (Optional)	Non Evaluative	Ballast weights if fitted should meet the requirement of CMVR.	Provided	Provided	Yes

7.2 CATEGORY OF BREAKDOWNS / DEFECTS (As per clause 5.0 of IS:12207-2019) :					
S. No.	Category of Breakdown	Category (Evaluative / Non Evaluative)	Requirements as per IS: 12207-2019	As observed	Whether meets the requirement (Yes/No.)
1.	Critical breakdown	Evaluative	There is no 'critical breakdown' during the course of testing	None	Yes
2.	Major breakdowns	Evaluative	There are not more than 1 major breakdowns and neither of them is of repetitive nature	None	Yes
3.	Minor breakdowns	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

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7.3 Salient Observations:

7.3.1 Laboratory tests:

7.3.1.1 PTO Performance:

- i) The maximum PTO power is recorded as **14.3 kW** against the declaration of **14.7 kW** & which meets the requirement of IS: 12207-2019 with regard to tolerance limit.
- ii) The specific fuel consumption corresponding to maximum power was recorded as **269 g/kWh** against the declaration of **265 g/kWh** & which meets the requirement of IS: 12207-2019 with regard to tolerance limit.

7.3.1.2 Brake test:

During brake test, braking system was not working properly, thereafter brake system of tractor was dismantled and all brake discs liners were cleaned with the help of emery paper. This should be looked into for necessary corrective action.

7.3.1.3 Three point linkage:

Lateral distance from lower hitch point to centre of tractor does not meet the requirement of IS:4468-1997(Part-I) (Reaffirmed in January, 2017). This should be looked into for necessary corrective action.

7.4 Maintenance / Service Problems:

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

7.5 Recommendation with regard to safety on tractor:

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

- i) Width of foot should be provided as per IS:12239 (Part-1)-2018
- ii) Spark arrester should be provided in the exhaust system as per the requirement of IS:12239 (Part-2)-1999 (Re-affirmed in January, 2019).
- iii) Fuel shut-off knob should remain in "STOP" position as requirement of IS:8133-1983 (Re-affirmed in 2019).
- iv) Master shield around the PTO shaft has not been provided as per the requirement of IS:4931-1995 (Re-affirmed in January, 2019).
- v) The working clearance between position and draft control lever of hydraulic system shall be provided as per IS:12239 (Part-2)-1999 (Re-affirmed in January, 2019).
- vi) There shall be provision of differential lock pedal.

7.6 Adequacy of Literature:


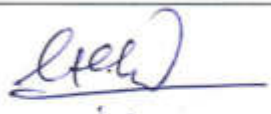

7.6.1 Following literature of following tractor models were supplied with the test sample for reference during the test.

- a) Service Manual of Eicher, 242 USJ tractor model
- b) Parts Catalogue of Eicher, 242 USJ tractor model
- c) Operator's manual of Eicher, 242 USJ tractor model

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- 7.6.2** Literatures submitted by applicant are found sufficient, **except the following:**
- i) Service schedule and routine maintenance chart is not provided in Operator's manual and Service manual. This should be looked into for necessary corrective action.
- 7.6.3** The literature should be brought out in national as well as other regional languages of India for guidance of users.

TESTING AUTHORITY:

C.V. CHIMOTE TEST ENGINEER	
Y. K. RAO SENIOR AGRICULTURAL ENGINEER	
P. K. PANDEY DIRECTOR	

Draft Test Report is compiled by: **Rajneesh Patel**, Agricultural Engineer.

8. APPLICANT'S COMMENTS

Para No.	Our Reference	Applicant's comments
8.1	6.1.8 (vi), 7.3.1.2, 7.3.1.3 & 7.6.2	These are being looked into w.r.t. corrective action.
8.2	7.5	Recommendations are being looked into w.r.t. Design, Development & Implementation.

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ANNEXURE – I

TRACTOR RUN HOURS DURING TEST

A.	LABORATORY AND TRACK TESTS	HOURS
1.	Running-in (at manufacturer's work place)	53.00
2.	PTO performance test	3.00
3.	Nominal speed test	0.97
4.	Brake test	2.50
B.	Miscellaneous test and other run hours including idle run, transportation, trials and preparation for test	1.70
TOTAL		61.17