



MAHINDRA, 215+ (Brand Name : Yuvraj 215) TRACTOR



भारत सरकार

GOVERNMENT OF INDIA

कृषि मंत्रालय (कृषि एवं सहकारिता विभाग, मशीनीकरण एवं प्रोद्योगिकी प्रभाग)
Ministry of Agriculture (Deptt. of Agri. & Co-op, Mechanization & Technology Division)

केन्द्रीय कृषि मशीनरी प्रशिक्षण एवं परीक्षण संस्थान

CENTRAL FARM MACHINERY TRAINING & TESTING INSTITUTE

(An ISO : 9001-2008 Certified Institute)

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T-861/1372/2013

MAHINDRA, 215+ (Brand Name: Yuvraj 215) TRACTOR
Commercial (Variant)

Manufacturer : M/s. Mahindra & Mahindra Limited
(Farm Equipment Sector)
Akurli Road, Kandivli (E)
MUMBAI – 400 101

Location of other manufacturing plants (apa) : Deepak Diesel Pvt. Ltd.
Survey no. 287/1, Shapar Village ,
Main Road ,Shapar (Veraval),
Dist. Rajkot-360024

Test requested by (applicant) : M/s. Mahindra & Mahindra Limited
(Farm Equipment Sector)
Akurli Road, Kandivli (E)
MUMBAI – 400 101

Selected for test by : Applicant
Place of running-in : At applicant's works

Duration of said running-in (h):
- Engine : 15
- Transmission : 30

Method of Selection : The tractor was submitted directly by the applicant for test. Hence method of selection is not known.

1. SCOPE OF TEST

The "Mahindra 215 (Brand Name: Yuvraj 215)" had undergone "Confidential test" at this institute having test report no. T- 721/1228/2010 released in May, 2010. Later, on the request of the applicant via letter no. Nil dated 30.7.2010 test report converted from confidential to the Initial Commercial Test" at this Institute and the test report No. T- 721/1228/2010 released in May, 2010 was treated as Initial Commercial Test report. Now the applicant has submitted an application vide letter No. Nil dated 27.11. 2012 for testing of "Mahindra 215+ (Brand Name: Yuvraj 215) Tractor" as a Variant of "Mahindra 215 (Brand Name: Yuvraj 215) Tractor".

The applicant having enclosed a list of following differences in the technical specifications between "Mahindra 215 (Brand Name: Yuvraj 215)" and "Mahindra 215+ (Brand Name: Yuvraj 215) Tractor" and requested to test the "Mahindra 215+ (Brand Name: Yuvraj 215) Tractor " as a variant of "Mahindra 215 (Brand Name: Yuvraj 215) Tractor.

The major features of Base model and Variant model are listed below:

S. No.	Parameters	Base Model		Variant Model
1.	Type of Silencer	Updraft Cylindrical		Downdraft/Horizontal cylindrical
3.	Difference in Nominal Speed	Forward	2.05 to 25.63	2.02 to 25.34
		Reverse	1.95 to 5.51	1.92 to 5.45

Subsequent to the examination of the case in light of Indian Standard IS 12207-2008, the following tests were considered to be carried out:

- Specification checking
- Two hour maximum PTO power performance test, under normal ambient condition
- Nominal speed test
- Visibility Test



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MAHINDRA, 215+ (Brand Name: Yuvraj 215) TRACTOR
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2.1 Fuel : The High-speed diesel oil supplied by M/s Indian Oil Corporation Limited having density of 0.836 g/cc at 15°C was used.

2.2 Lubricants:

S. No.	Particulars	As recommended by the manufacturer		As used during the test in case of variant model
		Base	Variant	
1.	Engine & air cleaner oil	20W40	20W40	As recommended
2.	Transmission & Hydraulic system	EP 90	EP 90	Oil originally filled in the tractor was not changed
3.	Steering housing	SAE140	SAE140	--do--
4.	Grease	Servo Grease MP		Servo Grease MP

3. ESSENTIAL TESTS**3.1. SPECIFICATIONS**

	Base Model	Variant Model
3.1.1 Tractor:		
Make	Mahindra	Mahindra
Model	215	215+
Brand name	Yuvraj 215	Yuvraj 215
Type	Four wheel, Rear-wheel drive, Agricultural Tractor	General Purpose,
Year of manufacture	2008	2012
Chassis serial number	AGR 1005	AGR 23436
Country of Origin	INDIA	INDIA
3.1.2 Engine:		
Make	Mahindra	Mahindra
Model	FMW100	FMW100
Type	Four stroke, naturally aspirated, water cooled, direct injection, diesel engine.	
Serial number	BL42	AE 23559
Engine speed (Manufacturer's recommended production setting) (rpm) :		
- Maximum speed at no load	2500 to 2600	2500 to 2600
- Low idle speed	950 to 1150	950 to 1150
- Speed at maximum torque	1200 to 1600	1300 to 1500 (apa)
Rated speed, (rpm):		
- For PTO use	2300	2300
- For drawbar use	2300	2300
3.1.3 Cylinder & Cylinder Head:		
Number	One	One
Disposition	Vertical inline	Vertical inline



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MAHINDRA, 215+ (Brand Name: Yuvraj 215) TRACTOR
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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: 2008 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: 12207-2008	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	PTO Performance :							
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 >35hp. -7.5/+10% for PTO power ≤ 35 hp	9.04	9.04	8.9	8.8	Yes
b)	Specific fuel consumption corresponding to maximum power, (g/kWh)	Non Evaluative	± 5%	285	285	280	277	Yes

7.1.2 Labelling of tractors (Provision of labelling plate):						
1)	Make	Evaluative	Should conform to the requirements of CMVR along-with declared value of PTO HP	Mahindra	Mahindra	Yes
2)	Model	Evaluative		215	215+	Yes
3)	Year of manufacture	Evaluative		2008	2012	Yes
4)	Engine serial number	Evaluative		BL 47	AE 23559	Yes
5)	Chassis serial number	Evaluative		AGR 1005	AGR 23436	Yes
6)	Declaration of PTO power, kW	Evaluative		9.04	9.04	Yes

7.2 Salient Observations:**7.2.1 Laboratory tests:****7.2.1.1 PTO Performance:**

- The specific fuel consumption in case of base and variant models corresponding to maximum power were observed as 280 & 277 g/kWh respectively against the declaration of 280 g/kWh, which is within the tolerance limit.
- The maximum PTO power in case of base and variant models were observed as 8.9 & 8.8 kW respectively against the declaration of 9.04 kW which is within the specified limit.



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MAHINDRA, 215+ (Brand Name: Yuvraj 215) TRACTOR
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Dimension "A ϕ " of PTO shaft does not meet to requirement of IS 4931:1995. This should be looked into for compliance.

7.2.1.3 Operator's seat (Conformity with IS: 12343-1998):

The operator's seat provided on the tractor does not meet the following requirements and calls necessary improvement.

- Length & Width of seat
- Longitudinal distance from seat index point to the centre of steering control wheel.
- Provision for adjustment of the driver's mass

7.2.1.4 Operator's work place: IS :12239 (Part-I& II)

The operator's work place provided on the tractor does not meet the following requirements and calls necessary improvement.

- Silencer is not fully protected.
- Hydraulic pipe lines are not insulated properly.
- Width of foot Step is lees .
- Provision of PTO master shield is not provided.
- Spark arrester not provided at the exhaust location.
- Vertical retainers have not been provided on both sides of clutch & brake pedals

7.2.1.5 Location and operation of operator's control:

Operations of some of the operator's control do not meet the requirements of IS: 8133-1983 like the **safety starting switch**. This may be looked into for necessary corrective action.

7.2.1.6 Labelling of tractor: - Meets the requirements**7.3 Maintenance / Service Problems:**

No noticeable maintenance or service problem was observed during the test. However, suitable provision for draining the water may be provided at the fuel tank.

7.4 Recommendation with regard to safety on tractor:

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

- Safety provision against accidental start of engine.
- Proper insulation at hydraulic pipes may be provided
- Silencer is should be fully guarded to protect the operator from injury.
- Width of foot step should be enough to safe step up on the tractor.
- The working clearance around Draft control lever may be provided as per the requirements of Indian Standard: 12239 (Part-2) – 1999.



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MAHINDRA, 215+ (Brand Name: Yuvraj 215) TRACTOR
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7.5.1 Operator's manual, service manual and parts catalogue of Mahindra, 215+ (Brand Name: Yuvraj 215) literatures were supplied by the manufacturer for reference.

The results of the tests carried out on variant model "MAHINDRA 215+ (Brand Name: Yuvraj 215) TRACTOR" have been compared with those on base model "MAHINDRA, 215 (Brand Name : Yuvraj 215) TRACTOR" and found within the limit, as specified in Indian Standard:12207-2008.

8.0 Citizen Charter

Duration of Test	Test duration under citizen charter	Whether the report released within time frame given in citizen charter	Remark
December 2012 to January 2013 – 2 Months	10 Months	Yes	--

TESTING AUTHORITY:

PK VERMA
SENIOR AGRICULTURAL ENGINEER

C.R. LOHI
DIRECTOR

Test report compiled by Nitesh Kumar Verma, Senior Technical Assistant



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MAHINDRA, 215+ (Brand Name: Yuvraj 215) TRACTOR
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Para No.	Our Reference	Applicant's comments
9.1	7.2.1.2, 7.2.1.3 (i,ii,iii,iv & v), 7.2.1.4 (i,ii,iii,iv & v), 7.2.1.5, 7.4 (i & v)	Observation will be studied and necessary action will be incorporated.

TRACTOR RUN HOURS DURING TEST

A.	LABORATORY AND TRACK TESTS	HOURS
1.	Running -in	--
2.	PTO Performance Test	3.33
3.	Nominal speed test	0.65
4.	PTO /TPL & Operator's field of vision tests	0.2
B.	Miscellaneous test and other run hours, including idle run transportation, trial and preparation for test.	0.70
Total		4.88