



SWARAJ 735 FE JXPDS 540 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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9.	Area of brake lining, (cm ²)	720.2 (on each wheel side)	695.1 (on each wheel side)*
10.	Rear wheel tyre size	12.4-28	13.6-28
11.	Rear wheel rim size	W 11X 28	W12X28

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

- Specification checking
- Nominal speed
- PTO performance test
- Brake Performance test

2. FUEL AND LUBRICANTS

2.1 Fuel : The High-speed diesel oil supplied by M/s Indian Oil Corporation Limited having density of 0.836 g/cc at 15°C was used.

2.2 Lubricants:

S. No.	Particulars	As recommended by the manufacturer	As used during the test
1.	Engine oil	SAE 20W40 (same as base model)	As recommended
2.	Air cleaner oil	SAE 30 (same as base model)	--do--
3.	Transmission*	EP 80 (same as base model)	Oil originally filled in the tractor was not changed
4.	Steering housing	SAE 90 (same as base model)	--do--
5.	Grease	Multipurpose Grease	MP Grease

*includes gear box, differential housing, rear axle, final drive (rear) Hydraulic system and brake housing)

3. ESSENTIAL TESTS

3.1. SPECIFICATIONS

	<u>Base Model</u>	<u>Variant Model</u>
3.1.1 Tractor:		
Make	: Swaraj	Swaraj
Model	: 735 FE	735 FE JXPDS 540
Brand name	: Swaraj	Swaraj
Type	: Four wheeled, rear wheel driven, general purpose Agricultural Tractor.	
Year of manufacture	: 2010	2013
Chassis Serial number	: WQTF 30605016088	WRTK 3062812 3299
Country of Origin	: India	India
3.1.2 Engine:		
Make	: M/s. Kirloskar oil Engines Ltd.	M/s. Kirloskar oil Engines Ltd.
Model	: RV3XM+ 3A	RV3XM+ 3A
Type	: Four stroke, water cooled, direct injection, diesel engine.	
Serial number	: 39.1350/SMD01552	39.1354/BK007094A



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 PTO Performance :								
a)	- Max. Power under 2 hrs. test, (kW) (Natural ambient condition)	Evaluative	Declared value to be achieved with a tolerance of: a)-5/+10% for PTO power >26 kW. b)-7.5/+10% for PTO power ≤ 26 kw	24.1 (D)	24.1 (D)	24.3	24.7	Yes
b)	Power at rated engine speed, (kW)	Non Evaluative	-do-	24.1 (D)	24.1 (D)	24.3	24.7	Yes
c)	Specific fuel consumption corresponding to maximum power, (g/kWh)	Non Evaluative	+5%	258 (D)	258 (D)	245	239	Yes
d)	Maximum equivalent crankshaft torque(Nm)	Non Evaluative	± 8%	150.0 (D)	150.0 (D)	158.5	158.8	Yes
e)	Back-up torque, percent	Non Evaluative	10%, min.	10%, min.	10%, min.	22.9	21.2	Yes
f) Maximum operating temperature (°C)								
1)	Engine oil	Non 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.	130 (D)	130 (D)	121	113	Yes
2)	Coolant (water)	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.	115 (D)	115 (D)	106	103	Yes



g)	Engine oil consumption g/kwh	Evaluative	Not exceeding 1% of SFC at max. power under High ambient conditions	2.50 (R)	2.43 (R)	0.32	0.53	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 meter	3.25 Per meter	0.26 Per meter	0.16 Per meter	Yes

7.1.2 Brake performance at 25 kmph:

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)	10(R)	6.60	9.65	Yes
2.	Hot Brake	Evaluative	10	10(R)	10(R)	7.75	9.65	Yes
Maximum force exerted on the brake pedal to achieve a deceleration of 2.5 m/s ² (N)		Evaluative	600	600(R)	600(R)	355 to 390	293 to 365	Yes
Whether parking brake is effective at a force of 600 N at foot pedal(s) or 400 N at hand lever		Evaluative	Yes	Yes	Yes	Yes	Yes	Yes

7.1.3 Labelling of tractors (Provision of labelling plate):

1)	Make	Evaluative	Should conform to the requirements of CMVR along-with declared value of PTO HP	SWARAJ	SWARAJ	Yes
2)	Model	Evaluative		735 FE	735 FE JXPDS 540	Yes
3)	Year of manufacture	Evaluative		WQ (2010)	WR (2013)	Yes
4)	Engine serial number	Evaluative		39-1350/SMD01552	39 1354/BK007094A	Yes
5)	Chassis serial number	Evaluative		WQTF30605016088	WQTK30628123299	Yes
6)	Declaration of PTO power, kW	Evaluative		24.1	24.1	Yes

7.1.4 Literature (Submission to test agency)

(a)	Operator manual	Evaluative	Provided/ Not Provided	As per relevant IS Code (IS 8132)	Provided	Yes
(b)	Parts Catalogue	Evaluative	Provided/Not Provided	As per relevant IS Code (IS 8132)	Provided	Yes
(c)	Workshop/Service manual	Evaluative	Provided/Not Provided	As per relevant IS Code (IS 8132)	Provided	Yes



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 models were observed as 24.3 & 24.7 kW respectively against the declaration of 24.1 kW which is within the specified limit.
- ii) The specific fuel consumption in case of base and variant models corresponding to maximum power were observed as 245 & 239 g/kWh respectively against the declaration of 258 g/kWh which is within the specified limit.

7.2.1.2 Three point linkage:

- i) Lateral distance from lower hitch point to centre line of tractor does not meet the requirements of IS 4468: 1997. It should be looked into for compliance.

7.2.1.3 Meets the requirements of IS: 12239 (Part-1) – 1996, except the following:

- a) Provision of spark arrester has not been provided.
- b) Width of foot steps

7.2.1.4 Location and movement of various controls meets the requirement of IS : 8133-1983, except the following:

- a) Differential Lock not provided.

7.2.1.5 Controls and displays are identifiable with symbols as per IS : 6283 (Part 1&2) – 1998, except the following:

- a) Hand brake

7.2.1.6 Labelling of tractor: -

Labelling plate of tractor meets the requirements.

7.3 Maintenance / Service Problems:

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

7.4 Recommendation with regard to safety on tractor:

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

- i) Safety provisions against accidental start of engine.
- ii) Provision of hand brake with identifiable symbol.
- iii) Provision of Differential lock.
- iv) The working clearance around draft control lever may be provide as per requirement of IS:12239(part-2)-1999

7.5 Adequacy of Literature supplied with machine:

It is, however, recommended literature may be brought out as per IS: 8132-1999 (reaffirmed in March, 2009) for the guidance of users & service personnel in national as well as regional language for this model of tractor.

The result of the test carried out on variant model " SWARAJ 735 FE JXPDS 540 have been compared with those on base model " SWARAJ 735 FE" & found within the limit, as specified in Indian Standard:12207-2014



8. Citizen Charter

Duration of test	Test duration under citizen charter	Whether the report release with in time frame given citizen charter	Remark, if any
15 April 2014 to 31 July 2014 (4 Month)	10 Month	Yes	None

TESTING AUTHORITY:

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