



INDO FARM, 3040 DI TRACTOR



भारत सरकार
कृषि मंत्रालय
(कृषि एवं सहकारिता विभाग)

GOVERNMENT OF INDIA
MINISTRY OF AGRICULTURE
(DEPARTMENT OF AGRICULTURE & CO-OPERATION)

केन्द्रीय कृषि मशीनरी प्रशिक्षण एवं परीक्षण संस्थान
ट्रैक्टर नगर, बुदनी (म.प्र.) ४६६ ४४५

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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 0.836 g/cc at 15°C was used during test.

2.2 Lubricants:

S. No.	Particulars	As recommended by the manufacturer	As used during the test
1.	Engine & air cleaner oil	20W40	As recommended
2.	Transmission and Hydraulic system	EP 80	Oil originally filled in the tractor was not changed
3.	Steering housing	EP 80	-do-
4.	Grease	Multipurpose	Servo grease MP

3. ESSENTIAL TESTS

3.1. SPECIFICATIONS

3.1.1 Tractor:		<u>Base Model</u>	<u>Variant Model</u>
Make	: INDO FARM		INDO FARM
Model	: 3035 DI		3040 DI
Brand name	: INDO FARM		INDO FARM
Type	: Four wheel, Rear-wheel driven, General purpose agricultural tractor.		
Year of manufacture	: CNM (March, 2010)		FNM (June, 2010)
Chassis serial number	: CNM 3035 00 1888		FNM 3040 001684
Country of origin	: India		India
3.1.2 Engine:			
Make	: INDO FARM		INDO FARM
Model	: 3035 DI		3040 DI
Type	: Four stroke, water cooled, naturally aspirated, direct injection, diesel engine.		
Engine serial number	: C324301836 NM		C324401665 NM
Country of origin	: India		India
Engine speed (Manufacturer's recommended production setting)(rpm):			
- Maximum speed at no load	: 2300 to 2360		2300 to 2360
- Low idle speed	: 500 to 600		500 to 600
- Speed at maximum torque	: 1200 to 1400		1200 to 1400
Rated speed, (rpm):			
- For PTO use	: 2100		2100
- For drawbar use	: 2100		2100
3.1.3 Cylinder & Cylinder Head:			
Number	: Three		Three
Disposition	: Vertical, inline		Vertical, inline
Bore/stroke, (mm)	: 97/110		97/110
Capacity as specified by the applicant, (cc)	: 2439		2439
Compression ratio	: 17.4 : 1		17.4 : 1
Type of cylinder head	: Monoblock		Monoblock



1	2	3	4	5	6
20.	xx)	Change related to ergonomics, safety comfort, statutory / regulatory requirements:			
	a)	IS: 10273	Conformed	Conforms	No change
	b)	IS: 4931	Conformed	Conforms	No change
	c)	IS: 4468	Conformed	Conforms	No change
	d)	IS: 12953	Conformed	Conforms	No change
	e)	IS:12343	Conformed	Does not conform	Changed
	f)	IS:12239 (Pt-I)	Did not conform	Does not conform	No change
	g)	IS:12239 (Pt-II)	Did not conform	Does not conform	No change
	h)	IS:8133	Conformed	Conforms	No change
	i)	IS: 6283	Conformed	Does not conform	Changed
	j)	IS:14683	Conformed	Conforms	No Change
21.	xxi)	Final Reduction:	Same configuration in base & variant models (refer para 3.1.12.5).		No change
22.	xxii)	Type of fuel Injection pump:	Same configuration in base & variant models (refer para 3.1.4.5).		No change
23.	Change related to statutory/ regulatory requirements (As per Table 4):				
	a)	Engine operating principle (spark/ compression ignition, two/four stroke)	Compression ignition, 4 stroke	Compression ignition, 4 stroke	No change
	b)	Number & arrangement of cylinders	Three vertical inline	Three vertical inline	No change
	c)	PTO power (kW)	22.5	25.5	Changed
	d)	Engine displacement (cc)	2439	2439	No change
	e)	Rated engine speed (rpm)	2100	2100	No change
24.	Other changes:				
		Engine model	3035 DI	3040 DI	Changed

6. SUMMARY OF OBSERVATIONS, COMMENTS & RECOMMENDATIONS

6.1 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
6.1.1	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	22.5	25.5	23.2	27.1	Yes



1	2	3	4	5 a	5 b	6 a	6 b	7
b)	Power at rated engine speed, (kW)	Non Evaluative	-do-	22.5	25.5	23.2	27.1	Yes
c)	Specific fuel consumption corresponding to maximum power, (g/kWh)	Non Evaluative	± 5%	255	255	273	253	Yes
6.1.2	Labelling of tractors (Provision of labelling plate):							
1)	Make	Evaluative	Should conform to the requirements of CMVR along-with declared value of PTO HP	--		Indo Farm		Yes
2)	Model	Evaluative		--		3040 DI		Yes
3)	Year of manufacture	Evaluative		--		FNM (June,2010)		Yes
4)	Engine serial number	Evaluative		--		C324401665 NM		Yes
5)	Chassis number	Evaluative		--		FNM3040 001684		Yes
6)	Declaration of PTO power, kW	Evaluative		--		25.5		Yes

6.2 Salient Observations:

6.2.1 Laboratory tests:

6.2.1.1 PTO Performance:

- i) The specific fuel consumption in case of base and variant models corresponding to maximum power were observed as 273 & 253 g/kWh respectively against the declaration of 255 & 255 g/kWh respectively, which is within the specified limit in case of variant model.
- ii) The maximum PTO power in case of base and variant models was observed 23.2 kW & 27.1 against the declaration of 22.5 & 25.5 kW respectively, which is within the specified limit.

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

Vertical distance from seat index point to centre of clutch pedal does not meet the requirement of IS: 12343-1998. This should be looked into for necessary corrective action.

6.2.1.4 Symbols of operator's control and other displays [Conformity with IS: 6283 (Part 1 & 2)-1998]:

Colour zones in the engine revolution gauge has not been provided as per the requirements of Indian Standard and calls necessary improvement.

6.2.1.5 Location and operation of operator's control:

Provision of safety switch to avoid accidental start of the tractor is not provided, besides fuel shut-off lever does not remain in "STOP" position and hence does not meet the requirement of IS: 8133-1983. This may be looked into for corrective action.

6.3 Maintenance / Service Problems:

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

6.4 Recommendation with regard to safety on tractor:

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

- i) Provision of safety against accidental start of engine.
- ii) Provision for spark arresting device in exhaust system.



T-828/1337/2012

INDO FARM, 3040 DI TRACTOR - Commercial (Variant)

T-828

- iii) Provision of master shield has not been provided.
- iv) The fuel shut-off lever does not remain in "STOP" position
- v) Differential lock

6.5 Adequacy of Literature supplied with machine:

6.5.1 The following literatures were supplied with the test sample for reference during test:

- i) Operator's & service manual for 3035 DI, 3055 DI, 3055 NV VX, 3052 DI, 3050 DI, 3048 DI, 3040 DI & 3035 DI tractor models.
- ii) Spare parts catalogue for 3035 DI, 3055 DI, 3055 NV VX, 3052 DI, 3050 DI, 3048 DI, 3040 DI & 3035 DI tractor models.
- iii) Workshop manual for 3035 DI, 3055 DI, 3055 NV VX, 3052 DI, 3050 DI, 3048 DI, 3040 DI & 3035 DI tractor models.

6.5.2 The supplied literature was found adequate, however These literatures may also be brought out in national as well as other regional languages may also be brought out in national & other regional languages for the guidance of the user's.

The results of the tests carried out on variant model "Indo Farm 3040 DI" have been compared with those on base model "Indo Farm 3035 DI" and found within the limit, as specified in Indian Standard:12207-2008.

TESTING AUTHORITY:

**J.J.R. NARWARE
SENIOR AGRICULTURAL ENGINEER**

**V.N. KALE
DIRECTOR**

Test report compiled by: **Chanchlesh Singh Raghuwanshi** ,Senior Tech.Asst.

7. APPLICANT'S COMMENTS

Para No.	Our Reference	Applicant's comments
7.1	6.2.1.3, 6.2.1.4, 6.2.1.5	We are looking into these for improvement.
7.2	6.5.2	Already available in national language.

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Annexure-I

COMPARATIVE MAJOR MODIFICATION IN THE SPECIFICATIONS OF THE TRACTOR

S. No.	Particulars	Previous sample Tested vides test report No. T- 582/1081 April, 2007)	Present sample
1.	Provision of water separator	Not provided	Provided
2.	Model /group combination number of fuel filters	9 450 030 118	9 450 030 119
3.	Opening pressure of fuel injectors (Mpa)	25.0	25.0 to 25.8
4.	Lubricating oil pump discharge at rated engine speed (l)	25.5	35.8
5.	Oil sump capacity (l)	9.00	7.00
6.	Total lub oil capacity (l)	11.00	7.70
7.	Brand name of coolant	Not provided	Golden coolex (MGC)
8.	Bare radiator capacity (l)	4.3	2.30
10.	Capacity of expansion flask (l)	Not provided	0.80
11.	Total coolant capacity, (l)	9.2	6.90
12.	Change in gear ratio:		
	Bull gear	Z-59	Z-54
	Bull pinion shaft	Z-12	Z-11
	PTO drive shaft	Z-21	Z-15
	Constant mesh dual gear	Z-43	Z-49
13.	Change in nominal speed (Kmph):		
	- Forwards		
	L1	2.40	2.43
	L2	3.36	3.38
	L3	5.78	5.79
	L4	7.72	7.73
	H1	9.45	9.45
	H2	13.25	13.29
	H3	22.73	22.77
	H4	30.40	30.45
	- Reverse		
	LR	3.36	3.36
	HR	13.19	13.20
14.	Speed reduction through final drive	4.917 : 1 (59/12T)	4.909 : 1 (54/11T)
15.	Location of hydraulic pump	On LHS of timing case	On RHS of timing case
16.	Speed of hydraulic pump corresponding to rated engine speed, (rpm)	1050	2100
17.	Discharge of pump at rated engine speed and minimum pressure, (l/min)	14.9	23.6
18.	Maximum hydraulic power, kW	2.8	5.5
19.	Pump delivery at maximum power, (l/min)	10.59	20.16
20.	Type of PTO shaft	Type-II	Type-I
21.	PTO speed corresponding to rated engine speed (rpm)	1025	643
22.	Engine to PTO speed ratio	2.048 : 1	3.267 : 1
23.	Area of brake lining on each wheel side (cm ²)	608.9	730.2
24.	Colour of chassis and engine	Grey	black
25.	Lifting capacity at hitch points, kN	11.43	13.7
26.	Lifting capacity at standard frame, kN	9.35	10.0



T-828/1337/2012

INDO FARM, 3040 DI TRACTOR - Commercial (Variant)

Annexure- IITRACTOR RUN HOURS DURING TEST

A.	LABORATORY AND TRACK TESTS:	HOURS
1.	Running-in	--
2.	PTO performance test	7.9
3.	Theoretical speed test	1.0
B.	Miscellaneous test and other run hours including idle run, transportation, trials and preparation for test	Nil
	TOTAL:	8.9