व्यावसायिक परीक्षण रिपोर्ट COMMERCIAL TEST REPORT (Initial Test)

संख्या / No. : T-1137/1663/2018

माह / Month: March, 2018



CIMMCO LIMITED, TITAGARH SUPER DI - 45 TRACTOR



भारत सरकार

कृषि एवं किसान कल्याण मंत्रालय (कृषि, सहकारिता एवं किसान 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.) ४६६ ४४५

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

Website: http://www.fmttibudni.gov.in

Telephone: 07564 - 234729 Fax: 07564 - 234743

CIMMCO LIMITED, TITAGARH SUPER DI - 45 TRACTOR

-Commercial (Initial)

Manufacturer

M/s. Cimmco limited, Mal Godown Road, Bharatpur - 321 001 (Rajasthan) India

Registered Office-

M/s. Cimmco limited,756 Anandpur, E M Bypass, KolKata -700107(India) CIN: 128910WB1943PLC168801

Test requested by

The manufacturer

Selected for test by

Applicant

Place of running-in

At applicant's works

Duration of said running-in, (h):

- Engine

20 (apa)

- Transmission

20 (apa)

Method of Selection

The tractor was submitted directly by the applicant for test. Hence method of

selection is not known.

1. SPECIFICATIONS

1.1 Tractor:

Cimmco limited Make

Model

Titagarh Super DI - 45

Brand name

None

Variants. If any

None

Type

Four wheeled, rear wheel driven, general

purpose, Agricultural tractor

Year of manufacture

November, 2016

Chassis number

TNKE 45000459

Country of origin

India

1.2 Engine:

Make

Kirloskar Oil Engines Limited

Model

3R1040 NA1

Type

Four Stroke, Water cooled, Direct Injection, Naturally aspirated, Diesel

Engine

Serial number

3H.2125/1520558

India Country of origin

Engine speed (rpm), (Manufacturer's recommended production setting),: 1.2.1

- Maximum speed at no load

: 2100 to 2200

- Low idle speed

650 to 750 :

- Speed at maximum torque

1200 to 1400

Rated speed, (rpm):

2000

- For PTO use

2000

- For drawbar use

1.3 Cylinder & Cylinder Head:

Number

Disposition

Vertical, inline

105/120

Bore/stroke, (mm)

Capacity as specified by the applicant,

3120(apa)

(cc)

18±0.5:1

Compression ratio Type of cylinder head

Monoblock

CENTRAL FARM MACHINERY TRAINING & TESTING INSTITUTE - BUDNI

Page 5 of 44

CIMMCO LIMITED, TITAGARH SUPER DI - 45 TRACTOR

-Commercial (Initial)

Steering system: 14.6

Visual condition of the components of : Normal

complete steering assembly

Starter motor & Alternator: 14.7

Presence of soil/oil in housing None Condition of bearings and other : Normal

components

15. ADJUSTMENTS, DEFECTS, BREAKDOWNS AND REPAIRS

	15. ADJUSTMENTS, DEFECTS, BREAKDOWNO AND NEW YORK	Tractor
	Adjustments/Defects/Breakdowns and Repairs	run hours
1.	During maximum power 2 hours test, the power was continuously dropping and temperature of air intake was recorded as 57 °C. To rectify the problem persist in the tractor following checking /adjustment were carried out. i) The Tappet valve clearance was checked & recorded as 0.40 mm & 0.20 mm of intake valve of first & second cylinder of the engine one of the engine of the specified limit of 0.25 mm. The valve clearance was adjusted to 0.25 mm. ii) Injector pressure was checked & found correct as 260 kgf/cm². iii) Fuel filter elements were found choked & replace with new ones.	4.5
2.	iii) Fuel filter elements were also cleaned. iv) Air cleaner filters were also cleaned. physical property and the property conditions, the maximum engine oil	12.8
3.	2014 with regard to tolerance. 2014 with regard to tolerance. During the dry land operation rotavation test, the RHS lower link pivot & During the dry land operation rotavation test, the RHS lower link pivot & During the dry land operation rotavation test, the RHS lower link pivot & During the dry land operation rotavation test, the RHS lower link pivot & During the dry land operation rotavation test, the RHS lower link pivot & During the dry land operation rotavation test, the RHS lower link pivot & During the dry land operation rotavation test, the RHS lower link pivot & During the dry land operation rotavation test, the RHS lower link pivot & During the dry land operation rotavation test, the RHS lower link pivot & During the dry land operation rotavation test, the RHS lower link pivot & During the dry land operation rotavation test, the RHS lower link pivot & During the dry land operation rotavation test, the RHS lower link pivot & During the dry land operation rotavation test, the RHS lower link pivot & During the dry land operation rotavation test, the RHS lower link pivot & During the dry land operation rotavation test, the RHS lower link pivot & During the dry land operation rotavation test, the RHS lower link pivot & During the dry land operation rotavation test, the RHS lower link pivot & During the dry land operation rotavation test.	74.7
	point (Part no.35303005A47 little point (Part no.353005A47 little point (Part no.353005A47 little point (Part no.353005A47 little point (Part no.353005A47 little point (Part no	

16. SUMMARY OF OBSERVATIONS, COMMENTS & RECOMMENDATIONS Evaluative (mandatory) / Non-evaluation (Non-mandatory) parameter applicable for evaluative (mandatory) / Non-evaluation (Non-mandatory) parameter applicable for qualifying Minimum Performance criteria as per Clause-4 (Table-1) of IS: 12207-2014 qualifying Minimum Performance criteria as per Glause-4 (Table-1) of IS: 12207-2014 for acceptance of the tractor for the purpose of subsidies/NABARD financing are 16.1

	qualifying Millim for acceptance of summarized as und			Values declared by the	As observed	meets the require-
SI. No.	Characteristic	Category (Evaluative / Non Evaluative)	Requirements as per IS: 12207-2014	applicant/ (D) Requirement (R)		ments (Yes/No)
		Evalue		5	6	7
			4			
1 16.1.1 a)	PTO Performanc Maximum power under 2 h test, (kW) (Natural ambient		Declared value to be achieved with a tolerance of: -5 / +10% for PTO power >26 kW7.5/+10% for PTO power \$ 26 kW orfor PTO power 5 / +10% for Engine power \$ 26 kW7.5/+10% for power \$ 26 kW2.5/+10% for power \$ 26 kW.	31.5 (D)	31.8	Yes
	condition)		>26 kW7.57 Engine power ≤ 26 kW	31.5 (D)	31.8	Yes
b)	Power at rated engine speed, (kW)	Non Evaluative	-00-	ITE - BUDN	ıı Page	36 of 44

	,,,,,,	3/2018		–Commercial (I	5	6	一文
		2	3	4			00,
)	corre maxii	ific fuel umption sponding to mum power,	Non Evaluative	+ 5%	265 (D)	240	Yes
)		mum valent	Non Evaluative	± 8%	166 (D)	181.9	No
)	(Nm) Back	-up torque,	Non	10 percent, min.	18 (D) 10 (R)	19.8	Yes
	perce	ent	Evaluative	ture, (°C)			
)	Max 1)	ent imum operati 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	125 (D)	126	No
	2)	Coolant (water)	Evaluative	the declaration. The declared value should not exceed the boiling temperature of coolant under the pressurized or otherwise and the observed value under high ambient witten should not exceed.	110 (D)	112	Yes
				Not exceeding 1% of SFC	2.50 (D) 2.40(R)	0.25	Yes
1)	cons (g/k\	ine oil sumption, Wh) oke level	Evaluative Evaluative	at max. powel, ambient conditions Maximum light absorption coefficient of 3.25 per meter or equivalent BOSCH No. 5.2 or 75 Hatridge value (As 5.2 WVR)	3.25 per meter (R)	0.10	Yes
1.2	Max pull	wbar perform imum drawbar with ballast	Non	Minimum 65% of static mass with ballast	17.72 (K)	19.68	Yes
0)	15 slip.	esponding to percent wheel (kN) drawbar pull	a II	Minimum 65% of static mass of tractor with		15.20	Yes
	with balla corr	standard ast esponding to percent wheel		Minimum 80 % of PTO power as Minimum 80 % of PTO power as referred in SI. No. i) a) of PTO referred in SI. No. ii) a of tractors referred in the mass > 1500	(Minimum) 25.2 (D)		
c)	wog	kimum drawbar ver with ndard ballast, /).	Evaluative	having total static market having total static market having total static market having market having for performance in case performance in case performance in tractors having tractor weight tractors having for the engine total static market having 75 % of the language of the having 75 % of the having 12 having 13 having 15 having 16	25.4 (R) (Minimum)	28.6	Yes
				of tractors which declared value pto shaft. declared the	105 (D)	81	Yes
d)		ximum nsmission oi	Non Evaluative	maximad by oil com		II Page	e 37 of 44
	tem	iperature (0)		specified by	UTE - BUDI		
				VC & TESTING			

CIMMCO LIMITED, TITAGARH SUPER DI - 45 TRACTOR -Commercial (Initial)

a) <u>r</u>	2) With the standard	frame in the point of the force minutes a total	pump perfor throughout the Non Evaluative Evaluative Non Evaluative	[Tolerance of minus 10%] 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	Not declared 8.5 (D) 7.48 (R) (Minimum)	Siec	Yes
6.1.3 F a) N	Maximum lifting 1) At hitch p 2) With the standard Maximum dropheight of the application of after each 5 integral for	frame in the point of the force minutes a total	throughout the Non Evaluative Evaluative	[Tolerance of minus 10%] 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	8.5 (D) 7.48 (R)	Ciec	
a) <u>r</u>	Maximum lifting 1) At hitch p 2) With the standard Maximum dropheight of the application of after each 5 interval for	frame in the point of the force minutes a total	Non Evaluative Evaluative	[Tolerance of minus 10%] 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	8.5 (D) 7.48 (R)	Ciec	
b)	2) With the standard Maximum dropheight of the application of after each 5 interval for	frame in the point of the force minutes a total	Evaluative Evaluative Non	minus 10% 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 Observed value	8.5 (D) 7.48 (R)	Ciec	
b)	Maximum dropheight of the application of after each 5	frame in the point of the force minutes a total	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	7.48 (R)	8.66	Yes
b)	Maximum dropheight of the application of after each 5	in the point of the force minutes a total	Non	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	7.48 (R)	8.66	Yes
	height of the application of after each 5	point of the force minutes a total	Non Evaluative	Observed value			
	after each 5	a total		should not exceed 50 mm.	50 (D)	97	No
16.1.4 a)	duration of 30 (mm)	Minutes.	-				
16.1.4	(mm) Brake perform	Milliate					dol
16.1.4	Brake perform		25 kmph:	to or less	s than 600 N	on brake	pedai
a)	Brane per	nance at	ance at a force	e, equal to or	12 (D)	7.72	Yes
~,	Maximum stor	oblug giago	ATT6-2	10	10 (R) 10 (R)	8.66	Yes
	William Dad Dane		Lyaluan	10	10 (K)	285	7717
	 Cold bra Hot brak 		Evaluative		600 (R)	to	Yes
b)	2) Hot brak Maximum force	exerted	Luctive	600	000 (* /	312	
		43110	Evaluative				
	achieve a dece	leration of			, (D)	Yes	Yes
	') E m /o" (NI)			Yes / No	Yes (R)	1.00	
c)	Whether parkin effective at a fo	rce of 600	Evaluative	100			
	N at foot pedal	(s) or 400					
	N at hand level			1.17	85	82	Yes
16.1.5	Noise measu	rement.	Evaluative	As per CMVR	00		
a)	M · amh	ישוו ווחסי				02	Yes
	emitted by tr	ie liaor	tive	As per CMVR	96	93	163
h	dB(A)	oise at	Evaluative	As per o			
b)	Maximum	level				180	No
	operator's e		Luibrations	at:	100 (R)	180	No
16.1.6	operator's e dB(A) Amplitude of	mechani	cal VIDIC	100 microns	(Maximum)	100	Yes
0	Left foot I	rest		(max)	(,,,,,		No
	2) Right foo	t rest	Non Evaluative			150	140
	3) Seat (v	vith drive	Evalua				
	acatod)				5.0 (D)	5.0	Yes
16.1.7	4) Steering	roments	;			6.5	Yes
a)	Haulage requirements	of the trails	ers, (tories)	-	6.5 (D)		
a)	Gross mass (ool	Evaluative	mption, (km/l):	5.7 to 6.7	5.83 to	Yes
139	Two Wil	-01	Evaluationsul	mption, (Kiii)	(D)	5.50	Vac
hi	2) Four wr	eel / litre	of fuel corre		5.3 to 6.5	5.74 to	Yes
b)	Distance trav	elleu	Non		0.0	5.91	
	1) Two wh	neel	Evaluative				
	2) Four wh	neel		TESTING INSTIT	== BLIDNI	Page 3	8 of 44
			-	TING INSTIT	UTE-BODY		
			JING &	TESTING "			
CE		TUNERY	TRAINING				
CENTR	RAL FARM MA	CHINCIA					

T-1137	7/166	63/2018	CIM	MCO LIMITED, TITAGARH SUPER DI - 45 TRACTOR C						
					4	5		6		70
1		2		3	4					
c)	Fue	l consumpti	on (ml/k	m/tonne):		32	to	33.6		Yes
	1)	Two whee	l	22 02		40(34.		NI.
	,			Non		35		26.0	1.00	No
	2)	Four whee	el	Evaluative		42(D)	26.	78	
10.10		. 1 14:	etion:		The identified					
16.1.8		land cultiv	the	Evaluative	should	Tł manu				
	Sea	Sealing for the ollowing assemblies:			essentially meet the	rer				
far I	1)	Clutch ass	embly	-do-	requirement of IS: 11082. No water	recon				
	2)	Brake hous	sings	-do-	ingress in the		that		ot	
	3)	Front axle	hubs	-do-	identified assembly	A	actor	recomr	nended	
	-,				If tractor does	suit	able			
					meet of wetland	for w	etland			
					ments it may be	cultiv	ation dling		4	
					recommended for dry land operation only.	oper	ation)			
					land operation					
					Belt drives, pulley,					\/
16.1.9		ety feature	s:	Evaluative				Pro	vided	Yes
a)	Guards against				-ince (AS per					
	mo۱	ing and hot	parto		10020 (Dall 4)			Provided		Yes
				Evaluative	or (IVIVIV	_	Moots		Meets the	
b)	Ligh	nting arrange	ement	Non-	Should meet and			Mee	rement	Yes
c)	Soating requirement		irement	Evaluative	requirements of 12343 (as amended			requi	Temone	
(Tractors havin		a more	Evalue	fime to time						
	than 1150 mm		n rear		- ant life			-	do-	Yes
-11	track width)		Non-		requirements					
d)	Tec	chnical uirements fo	or PTO	Evaluative	4931 (as to time)			-	A. V. D. S.	
	req	uirements i	51 ,					Do	es not	NI.
	shaft		Non-		requirements of			Me	eet the	No
e)		Dimension of three Evaluat		Evaluative	requirements 1S 4468 (part 1)	1		requ	irement	
	point linkage				(as amended			_	7.5	
					(as afficient from time to time) Should meet the	9				
				Non-	Should most of requirements of requirements of the second	f		Col	nforms	Yes
f)	f) Specification of linkage and swinging drawbars		OI = aluative		requirements IS 12953 and IS			OG:		
			winging	L	12362 (pande)	d				
			drawbars		(as from time to time					
					from time to plate	e):		1MCO LI	MITED	Yes
				icion	of labelling plas		CIN	GARH	SUPER	Ye
16.1.10) 1 -	halling of	tractors	(Provision	of labelling plate Should conform to the		1117	DI 45	5	
	1)	Make		Evaluation	to the			2016	6	Ye
	2)	Model		Evaluative	requirements of	1 -		.2125/15		Ye
	1			Evaluative		f	3H	.2125/13 VKE 450	00459	Ye
	3)	Year	of	Evaluation	PTO HP		11			Ye
		manufac	ture	Evaluative	1 10.			31.5)	
	4)	Engine r	number	Evaluative						
	5)	Chassis	ion of	Evaluative			-05		to 105 00	Ye
	6)	Declarat PTO pov				105.	185	104.97	to 105.00	-
16.4	-			Livo.	To be specified by	(D	1		6.444	Ye
16.1.1		iscard limi	t for:	Evaluative	specified by	0.2	20	0.130	to 0.144	16
a)	C	/linder	Doio		manufacturer	(E				
-	-11	1 (mm	l)	Non	mailuis				Page 3	9 of 4
p)	CI	earance	between	Non Evaluative		TITLI	TE-I	BUDNI	1 490 0	49 - 10 - 10
	pi	ston & cylin	idei iiiis.		G & TESTING INS	21110				
	at	skirt, (mm)		TRAINING	G & 120					
		Linguist Control		VIKA						

1	3	3/2018	(CIMMCO LIM	–Com	merc	cial (Initia		*:(
C Ring end gap (mm): - Top comp. ring. Evaluative -do- 2.0 0.35 - Q nd comp. ring. Evaluative -do- 2.0 0.40 - Oil ring. Evaluative -do- 2.0 0.35 - Oil ring. Taper Ring - Z nd comp. ring. - do- 0.20 0.058 to 0.072 - Oil ring. Evaluative -do- 0.20 0.046 to 0.054 - Oil ring. Evaluative To be specified by the manufacturer - Clearance of main bearings (mm): - Diametrical Evaluative Evaluative manufacturer - Clearance of big end bearings, (mm): - Diametrical Evaluative -do- 0.30 0.072 to 0.097 - Diametrical Evaluative -do- 0.80 0.55 - Axial Evaluative -do- 0.90 0.083 to 0.151 - Output	_			3	4		5	6	03
- Top comp. ring Oil ring. d) Ring groove clearance (mm): - Top comp. ring Top comp. ring Top comp. ring Oil ring. Evaluative - Top comp. ring Oil ring. Evaluative - Oil ring. Evaluative - Oil ring. Evaluative - Oil ring. Evaluative - Oil ring. Final Evaluative - Oil ring. Clearance of main bearings (mm): - Diametrical clearance - Crankshaft end float Final Evaluative - Diametrical - Diametrical - Clearance of big end bearings, (mm): - Diametrical - Diamet			,					0.05	Yes
Clearance of big end bearings, (mm): Clearance of big end bearings, (mm): Clearance of big end bearings, (mm): Clearance of big end bearings (mm): Clearance of big end bearings (mm): Clearance of between king pin and bush (mm) Evaluative Cod-	g	end gap	(mn	n):	-do-				Yes
Clearance of big end bearings, (mm): Clearance of big end bearings, (mm): Clearance of big end bearings (mm): Clearance of big end bearin					-do-		2.0		
Color Colo	no	id comp. rii	ng.	Evaluative	-do-		2.0	0.35	Yes
- Top comp. ring 2 nd comp. ring Oil ring. - Oil ring. - Diametrical clearance - Crankshaft end float f) Clearance of big end bearings, (mm): Clearance of big end bearings, (mm): - Diametrical clearance - Crankshaft end float - Diametrical Evaluative - Diametrical Evaluative - Diametrical Evaluative - Oil ring. To be specified by the manufacturer - Crankshaft end float - Clearance of big end bearings, (mm): Clearance of big end bearings, (mm): - Diametrical Evaluative - do- O.20 0.046 to 0.054 0.80 0.20 0.80 0.20 0.80 0.55 - Oil ring. - O	Οi	il ring.							
- Top comp. ring 2 nd comp. ring Oil ring. - Oil ring. - Diametrical clearance - Crankshaft end float f) Clearance of big end bearings, (mm): Clearance of big end bearings, (mm): - Diametrical clearance - Crankshaft end float - Diametrical Evaluative - Diametrical Evaluative - Diametrical Evaluative - Oil ring. To be specified by the manufacturer - Crankshaft end float - Clearance of big end bearings, (mm): Clearance of big end bearings, (mm): - Diametrical Evaluative - do- O.20 0.046 to 0.054 0.80 0.20 0.80 0.20 0.80 0.55 - Oil ring. - O	Ping groove clear			rance (mm):			Taper	Ring	
- 2 nd comp. ring Oil ring. - Oil ring. - Oil ring. - Clearance of main bearings (mm): - Diametrical clearance - Crankshaft end float - Crankshaft end float - Diametrical clearance of big end bearings, (mm): - Clearance of big end bearings, (mm): - Diametrical Evaluative manufacturer end float - Diametrical Evaluative -do- 0.80 0.72 to 0.097 - Diametrical Evaluative -do- 0.80 0.55 - Axial Evaluative -do- 0.90 0.083 to 0.151 g) Clearance between king pin and hush (mm) - Clearance between king pin and hush (mm)	LU B	on comp. I	ing.		do-			0.058 to 0.072	Yes
Clearance of main bearings (mm): Clearance of main bearings (mm): Diametrical clearance Evaluative clearance Evaluative manufacturer 0.80 0.20 Clearance of big end bearings, (mm): Clearance of big end bearings, (mm): Diametrical Evaluative -do- 0.80 0.55 Axial Evaluative -do- 0.80 0.55 Clearance Evaluative -do- 0.90 0.083 to 0.151 Clearance between king pin and bush (mm) Evaluative -do- 0.90 0.278 to 0.289				Evaluative			0.20	0.046 to 0.054	Yes
e) Clearance of main bearings (mm): - Diametrical clearance - Crankshaft end float f) Clearance of big end bearings, (mm): - Diametrical end bearings, (mm): - Diametrical Evaluative - Diametrical Evaluative - Axial Evaluative - Clearance between king pin end bearings (mm): - Clearance between king pin end bearings (mm): - O.30 O.072 to 0.097 - O.30 O.072 to 0.097 - O.30 O.072 to 0.097 - O.90 O.083 to 0.151	_:								
- Diametrical clearance - Crankshaft end float - Clearance of big end bearings, (mm): - Diametrical end bearings, (mm): - Diametrical Evaluative - Diametrical Evaluative - Axial Evaluative - Axial Evaluative - do- 0.80 0.072 to 0.097 - O.80 0.278 to 0.289	- Oll fillig.		hearings (m	m):	ho	- 200	0.058 to 0.107	Yes	
f) Clearance of big end bearings, (mm): Clearance of big end bearings, (mm): Diametrical Evaluative manufacturer - Diametrical Evaluative -do Axial Evaluative -do Axial Evaluative -do- between king pin end bearings and bush (mm) Clearance between king pin end bearings, (mm): Clearance of big end bear	aı	rance of	man	I Dours	To		0.30	0.030 to 0.101	
f) Clearance of big end bearings, (mm): Clearance of big end bearings, (mm): - Diametrical Evaluative -do Axial Evaluative -do Axial Evaluative -do- between king pin end bush (mm) Clearance between king pin end bush (mm) Clearance between king pin end bush (mm) Clearance between king pin evaluative -do- Diametrical Evaluative				Evaluative		Dy	0.00	0.20	Yes
end float end bearings, (mm):	٠.			1 1:10	the	er	0.80	0.20	
g) Clearance between king pin and hush (mm) - Diametrical Evaluative00 O.90 0.083 to 0.151	Cı	ranksnait		Evaluative	mariulacidi	0.		2 207	Yes
g) Clearance between king pin and bush (mm) - Diametrical Evaluative -do- 0.90 0.083 to 0.151	er	nd float	hia	end bearings.	(mm):		0.30		_
g) Clearance between king pin and bush (mm) - Diametrical Evaluative -do- 0.90 0.083 to 0.151	a	rance of	big	Evaluative	-00-			0.55	Yes
g) Clearance between king pin evaluative Solution (mm) Sol	D	Diametrical		_,	-do-				\ \v
between king pin Evaluative 0.90 0.278 to 0.289	A	xial			40		0.90	0.083 to 0.151	Yes
between king pin Evaluative 0.90 0.278 to 0.289	between king pin		• • •	Non	-do-			'	
			Evaluative				0.278 to 0.289	Yes	
d0-			m)		-do-		0.90	0.278 10 0.200	
h) Clearance between centre pin Evaluative	ar	rance	- nin	Non	-40				

	and bush, (mm)	Evaluativ	DEFECTS:		Whether
16.1.12	CATEGORY C	Category	OWNS / DEFECTS : Requirements 42207-2014	As observed	meets the requirement s (Yes/No.)
S. No.	Category of breakdowns	(Evaluative /	as per IS: 12207-2014	None	Yes
1.	Critical	Evaluative) Evaluative	No critical breakdown Not more than two and neither of them should be repetitive in	Mj-22	Yes
2.	Major	Evaluative	of them should nature Not more than five and frequency of each should not be frequency two.		Yes
3.	Minor	Evaluative	more than the total number of	One	Yes
4.	Total breakdowns	Evaluative	breakdown + 3 minor) or a	, ,	

16.2	breakdowns	rements as per Clause-4 (Table-2) of Requirements	As observed	Whether meets the requirements (Yes/No.)
10.2	Optional requir	Requiremon 2014	bobi	-
S. No.	Characteristic	ac ner io.	1401	
	Ona.	rovision for little meet the	Not provided	Applicable
1.	Fitment of	With a provision for fitment of Kor With a provision for fitment of Kor If ROPS fitted it should meet the requirement of IS: 11821-1992 requirement of IS: 100 hook, linkage	Provided	Yes
		and the town		
2.	Accessories	Trailer hitch, front total drawbar may be provided.	el : Conform	S

16.3

Guidelines for declaration of power and specific fuel : Conforms

Consumption of labeling of agricultural tractors (First Suidelines for declaration of power and specific fuel consumption and labeling of agricultural tractors (First consumption and labeling of agricultural march, 2009)] revision) [IS 10273:1987 (Reaffirmed in March, 2009)] i)

Page 40 of 44

CIMMCO LIMITED, TITAGARH SUPER DI - 45 TRACTOR -Commercial (Initial)

- Agricultural tractors Rear mounted power take-off -: Conforms Types 1, 2 and 3(third revision)[IS: 4931-1995 ii)
- (Reaffirmed in March, 2009)] Does not conform Agricultural wheeled tractors - Rear mounted threepoint linkage: Part 1 Categories 1, 2, 3 & 4 (fourth iii) revision) [IS 4468 (Part-I):1997 (Reaffirmed in March, 2007)/ISO 730-1:1994] Conforms [IS
- Drawbar for agricultural tractors Link type iv) Conforms
- 12953:1990 (Reaffirmed in March, 2007)] - Operator's seat technical revision) Agricultural tractors -1998 (First V) 12343 [IS requirement
- Does not conform (Reaffirmed in March, 2009)] Guide for safety & comfort of operator of agricultural: tractors: Part 1 General requirements (first revision): vi) (PT-1)-1996 12239 [IS
- Does not conform Tractors and machinery for agriculture and forestry -Technical means for ensuring safety Part 2: Tractors (first revision) IS 12239 (PT-2)-1999 (Reaffirmed in vii) Does not conform
- Tractors and machinery for agriculture and forestry, powered lawn and garden equipment - Symbols for operator controls and other displays [IS: 6283 (Partviii) 1 & Part-2) -2006 & 2007(Reaffirmed in March, 2009)/ Does not conform
- Guide lines for location and operation of operator controls on agricultural tractors and machinery (first revision) (IS: 8133 – 1983) (Reaffirmed in March, ix) Does not conform
- Agricultural Tractor & Machinery Lighting device for travel on public roads (IS: 14683-1999) (Reaffirmed in X) March, 2009)]

Salient Observations: 16.4

Laboratory tests: 16.4.1

16.4.1.1

Performance:

During maximum power 2 hours test, the power was continuously dropping and During maximum power 2 hours test, the power was continuously dropping and temperature of air intake was recorded as 57°C. To rectify the problem persist temperature of air intake was recorded as 57°C. PTO Performance: i)

in the tractor following checking /adjustment were carried out. e tractor following checking raujustifiers, were carried out.

The Tappet valve clearance was checked & recorded as 0.40 mm & 0.20

- The Tappet valve clearance was second cylinder of the engine respectively, mm of intake valve of first & second cylinder of the engine respectively, mm of intake valve of the specified limit of 0.25 mm. The valve clearance was adjusted against the specified limit of 0.25 mm.
 - Injector pressure was checked & found correct as 260 kgf/cm². Injector pressure was checked a replace with new ones.
 Fuel filter elements were found choked & replace with new ones.

- The maximum PTO power was recorded as 31.8 kW against the declaration of the maximum PTO power was recorded as 31.8 kW against the declaration of the maximum PTO power was recorded as 31.8 kW against the declaration of the maximum PTO power was recorded as 31.8 kW against the declaration of the maximum PTO power was recorded as 31.8 kW against the declaration of the maximum PTO power was recorded as 31.8 kW against the declaration of the maximum PTO power was recorded as 31.8 kW against the declaration of the maximum PTO power was recorded as 31.8 kW against the declaration of the maximum PTO power was recorded as 31.8 kW against the declaration of the maximum PTO power was recorded as 31.8 kW against the declaration of the maximum PTO power was recorded as 31.8 kW against the declaration of the maximum PTO power was recorded as 31.8 kW against the declaration of the maximum PTO power was recorded as 31.8 kW against the declaration of the maximum PTO power was recorded as 31.8 kW against the declaration of the maximum PTO power was recorded as 31.8 kW against the declaration of the maximum PTO power was recorded as 31.8 kW against the declaration of the maximum PTO power was recorded as 31.8 kW against the declaration of the maximum PTO power was recorded as 31.8 kW against the declaration of the maximum PTO power was recorded as 31.8 kW against the declaration of the maximum properties and the power was recorded as 31.8 kW against the declaration of the maximum properties and the power was recorded as 31.8 kW against the declaration of the maximum properties and the power was recorded as 31.8 kW against the declaration of the maximum properties and the power was recorded as 31.8 kW against the declaration of the maximum properties and the power was recorded as 31.8 kW against the declaration of the maximum properties and the power was recorded as 31.8 kW against the declaration of the power was recorded as 31.8 kW against the power was recorded as 31.8 kW against the power was recorded as 31.8 kW against the p The maximum PTO power was recorded as 31.0 keV against the declaration of 31.5 kW, which meets the requirement of IS: 12207-2014 with regard to ii)
- The backup torque is 19.8%.

 The maximum equivalent crankshaft torque was observed as 181.9 Nm.

 The maximum equivalent of 166 Nm and which does not meet the requirement. The maximum equivalent cranksnant torque was observed as 181.9 Nm and which does not meet the requirements against the declaration of 166 Nm and which does not meet the requirements of 10. 40007 2014 with regard to tolerance. against the declaration of 166 Nm and which does not meet the requirements. This should be looked into for of IS: 12207-2014 with regard to tolerance. necessary corrective action.

 The maximum engine oil temperature was recorded as 126°C against the declaration of 18: 12207-2044.

 The maximum engine oil temperature was recorded as 126°C against the declaration of 125°C which does not meet the requirement of 18: 12207-2044. iii) iv)
- The maximum engine oil temperature was recorded as 120 C against the declaration of 125°C. which does not meet the requirement of IS: 12207-2014.

CIMMCO LIMITED, TITAGARH SUPER DI - 45 TRACTOR -Commercial (Initial)

Hydraulic performance test: 16.4.1.2

Total drop in height of lift during lift load maintenance test was recorded as 97 mm against the preferably maximum requirement of 50 mm and calls for necessary corrective action.

16.4.1.3

The amplitude of mechanical vibration on various assemblies marked as (*) in Chapter-9 of this test report is on higher side, especially at LHS & RHS foot rest & steering control wheel. This calls for dampening down of vibrations to improve the operational comfort and service life of the components.

16.4.1.4

The lateral distance from lower hitch point to center line of tractor does not meet the requirements of IS: 4468(Part I)-1997. This should be looked into for necessary corrective action.

16.4.2

16.4.2.1

During the rotavation test, the RHS lower link pivot point (Part no.35303005AA -Plate assembly, lower link) got broken & replace with new ones. This breakdown breakage of three point linkage has been categorized as major breakdown (Mj-22) as per IS: 12207-2014 and calls for introduction of stringent quality control measures at production level.

16.4.2.2

The manufacturer has recommended that the tractor is not suitable for wetland cultivation (puddling operation). Hence the, wetland cultivation was not conducted. Therefore, the declaration of the fact that the tractor is not suitable for wetland cultivation (Puddling operation) should be mentioned clearly and boldly in all the literature relevant to this tractor.

16.5

No noticeable maintenance or service problems was observed the test.

16.6

Recommendation with regard to safety on tractor: The following requirements, inter alia, may be considered for incorporation on the Provision for spark arresting device in exhaust system.

tractor:

- Provision of safety against according to one of lever & draft control lever. The working clearance around the position control lever. The working clearance around the requirement of IS: 12239 (part-2), 1000 i)
- shall be provided as per the requirement of IS: 12239 (part-2)-1999. ii)
- The fuel shut-off lever does not remain in stop position iii)
- Width of subsequent step of foot pedal is less than 200 mm.. iv)
- Operator's manual for DI (DS) TITAGARH SUPER DI 45 (Options) Adequacy of Literature supplied with machine: 16.7
 - Operator's manual for TITAGARH SUPER DI 30, TITAGARH NGT 45 DI, TITAGARH NGT 50 DI (PS), TITAGARH NGT 39 DI tractoro TITAGARH NGT 50 DI CUIDER DI 39 & TITAGARH NGT 39 DI tractoro Steering), TITAGARH 45 & 50 HP tractors Spare parts catalogue for TITAGARH 45 & 50 HP tractors. i)

 - Workshop manual for TITAGARH 45 & 50 HP tractors.
- It is, however, recommended that following literature may be brought out as per IS: It is, however, recommended that rollowing literature may be brought out as per IS: 8132-1999 (reaffirmed in March, 2009) for the guidance of users & service personal language for this model of tractor personnel in national as well as regional language for this model of tractor. personnel in national as well as regional language mentioning this model name on its cover.

 The parts catalogue should be developed mentioning this model name on its cover 16.7.1
- 16.7.2 page.

CIMMCO LIMITED, TITAGARH SUPER DI - 45 TRACTOR —Commercial (Initial)

- The specification details as maximum power, specific fuel consumption, drawbar pull and power, hydraulic power, haulage requirement and its performance recommendation of ballasting for various operation, preparation and maintenance of tractor for field operation should be update in owner's manual in secured binding form.
- The declaration of the fact that the tractor is not suitable for wetland cultivation (puddling operation) should be mentioned clearly and boldly in all the literature relevant to this tractor model

17.0 Citizen charter

	Whether the report	
Test duration under Duration of Test	released within time frame given in the citizen charter	Remark
citizen charter (09 Months) March, 2017 to December, 2017	No	

TESTING AUTHORITY:

C.S RAGHUWANSHI AGRICULTURAL ENGINEER C. V. CHIMOTE TEST ENGINEER Y.K.RAO SENIOR AGRICULTURAL ENGINEER

J.J.R.NARWARE DIRECTOR

18. APPLICANT'S COMMENTS

		Applicant's comments
		Applicant's comments
Para No.	Our Reference	Special care will be taken during engine testing Special care will be taken during engine testing We will ensure proper sealing in hydraulic system & will ensure We will ensure product testing after roll out in regular production. during product testing after roll out in reduce the vibration level during assembly.
18.1	16.1.1 (d & f)	We will end testing after follow by reduce the vibration level
18.2	16.1.3(b)	during production to during assembly.
18.3	16.1.6	below recommend will be made in assembly 18:4468(part-1)
18.4	16.1.9 (e)	below recommendation and the assertion in assertion in regular production to avoid distance with in required range as per IS:4468(part-1) Adjustment will be made in assertion IS:4468(part-1) distance with in required range as per IS:4468(part-1) We will take strict quality action in regular production to avoid when we will take strict quality action in regular production to avoid when the strict quality action in regular production to avoid when the strict quality action in regular production to avoid when the strict quality action in regular production to avoid when the strict quality action in regular production to avoid when the strict quality action in regular production to avoid when the strict quality action in regular production to avoid when the strict quality action in regular production to avoid when the strict quality action in regular production to avoid when the strict quality action in regular production to avoid when the strict quality action in regular production to avoid when the strict quality action in regular production to avoid when the strict quality action in regular production to avoid when the strict quality action in regular production to avoid the strict quality action in regular production to avoid when the strict quality action in regular production in regular production to avoid the strict quality action in regular production to avoid action to avoid the strict quality action in regular production to avoid action
18.5	16.1.12(4)	such premace