OECD Approval No. : 2 / 2 388
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Report on test in accordance with
OECD STANDARD CODE 2
for the Official Testing of Agricultural and Forestry Tractors



Agricultural Tractor

MAHINDRA 6500 4 WD TRACTOR

A6 – 40 km/h

Manufactured by	:	**Mahindra & Mahindra Limited,** **(Farm Equipment Sector)** **Akurli Road, Kandivli (East)** **Mumbai-400 101 (M.P.), India**
Submitted for test by	:	**The manufacturer**
Report No.	:	**T-639/1145/16/OECD/2008**
Month & Year	:	**September, 2008**

GOVERNMENT OF INDIA
Ministry of Agriculture, (Deptt. of Agriculture and Co-opn.)
CENTRAL FARM MACHINERY TRAINING & TESTING INSTITUTE
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Statement

1. The information opposite each item in the specification portion of this report has been validated by the Testing Station. An item marked [C] indicates to the test report user that the information declared by the manufacturer has been checked whereas an item marked [D] indicates that the manufacturer's declaration has been endorsed.

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[C]	Tractor manufacturer's name and address	:	Mahindra & Mahindra Limited, (Farm Equipment Sector) Akurli Road, Kandivli (East) Mumbai- 400 101 (M.S.), India
[D]	Location of tractor assembly	:	Kandivli (East), Mumbai (M.S.), India
[D]	Submitted for test by	:	The manufacturer
[C]	Selected for test by	:	The manufacturer with agreement of the Testing Station.
[D]	Place of running-in	:	Kandivli (East), Mumbai (M.S.), India
[D]	Duration of running-in	:	60 h
[C]	Location of test	:	Government of India, Central Farm Machinery Training and Testing Institute, P.O.- Tractor Nagar, BUDNI – 466 445 (M.P.), INDIA

1. SPECIFICATIONS OF TRACTOR

1.1 Identification:

1.1.1

[C]	Make of tractor	:	Mahindra
[C]	Model (trade name)	:	6500 4WD
[C]	Type	:	4WD, Agricultural tractor

1.1.2 Numbers:

[D]	1st Serial No. or prototype	:	PS 1001
[C]	Serial No.	:	PS 2377

1.1.3 Other specification (if applicable):

[D]	Model(s) for other countries	:	6500 4WD
[C]	Transmission type or gears x ranges	:	8-speed, mechanical, synchromesh
[C]	Speed version	:	40 km/h
[D]	Manufacturer identification or Technical type no.	:	A6

1.2	**Engine:**		
[D]	Make	:	Mahindra
[D]	Model	:	NE 462
[C]	Type	:	Four stroke, water cooled, direct injection, diesel engine.
[C]	Serial No.	:	PS 2377
1.2.1	**Cylinders:**		
[C]	Number and disposition	:	Four, in-line, vertical
[D]	Bore/Stroke	:	96 mm / 122 mm
[D]	Capacity	:	3532 cm^3
[D]	Compression ratio	:	19.5 : 1
[D]	Arrangement of valves	:	Overhead
[D]	Cylinder liners	:	Wet
1.2.2	**Supercharging:**	:	**Not provided**
1.2.3	**Fuel system:**		
[D]	Fuel feed system	:	Vane pump built-in fuel injection pump
	Filter(s):		
[C]	Make	:	MICO LIC BOSCH
[C]	Model	:	9 450 030 116
[C]	Type	:	Paper elements on both primary and secondary filter.
[C]	Number	:	Two
[D]	Capacity of fuel tank	:	64.5 dm^3
	Injection pump:		
[C]	Make	:	MICO LIC BOSCH
[C]	Model	:	0 460 424 335 VE4/12F 1100 R 1025
[C]	Type	:	Rotary distributor type
[C]	Serial Number	:	68218868
	Manufacturer's production setting of injection pump:		
[D]	Flow rate (rated engine speed & full load)	:	12.67 dm^3/h
[D]	Timing	:	1.05±0.05 mm plunger lift @TDC

Injectors:

[C]	Make	:	BOSCH
[C]	Model	:	F002 C70 552
[D]	Type	:	Multihole
[D]	Injection pressure	:	25.0 MPa to 25.8 MPa

1.2.4 Governor:

[D]	Make	:	Mico (Bosch)
[D]	Model	:	Not declared
[D]	Type	:	Mechanical, variable speed
[D]	Governed range of engine speed	:	825 ± 50 to 2500 ± 50 rev/min
[C]	Rated engine speed	:	2200 rev/min.

1.2.5 Air cleaner:

Pre-cleaner:

[C]	Make	:	Donaldson
[C]	Model	:	Not declared
[C]	Type	:	Cyclone type, integrated with main air cleaner
[C]	Location of air intake	:	Forward of radiator, under the bonnet

Main cleaner:

[C]	Make	:	Donaldson
[C]	Model	:	Not declared
[C]	Type	:	Dry, paper element with additional safety cartridge.
[C]	Maintenance indicator	:	Warning light on dash board

1.2.6 Lubricating System:

[D]	Type of feed pump	:	Gear pump
[C]	Type of filter(s)	:	Spin-on type with paper element
[C]	Number of filter(s)	:	One

1.2.7	**Cooling System:**		
[C]	Type of coolant	:	Water (with coolant)
[D]	Type of pump	:	Centrifugal, belt driven
	Specification of fan:		
[C]	Number of fan blades	:	7
[C]	Fan diameter	:	450 mm
[D]	Total coolant capacity	:	10 dm^3
[C]	Type of temperature control	:	Thermostat
[D]	Super pressure system	:	88 kPa
1.2.8	**Starting system:**		
[C]	Make	:	Lucas TVS
[C]	Model	:	M-14
[C]	Type	:	Pre-engaging, solenoid operated
[D]	Starter motor power rating	:	2.2 kW
[C]	Cold starting aid	:	None
[C]	Safety device	:	Starter will not operate unless the "Forward – Reverse gear lever" is in neutral position and the 'PTO engaging /disengaging lever' is in disengaged position.
1.2.9	**Electrical System:**		
[C]	Voltage	:	12V
	Generator:		
[C]	Make	:	Lucas TVS
[C]	Model	:	A115-36
[C]	Type	:	Alternator
[D]	Power	:	2.2 kW
	Battery:		
[C]	Number	:	One
[D]	Rating	:	12V, 75 Ah at 20 hours discharge rate

1.2.10 Exhaust System:

[D]	Make	:	Walker Exhaust
[C]	Model	:	None
[C]	Type	:	Vertical, elliptical
[C]	Location	:	On right hand side of engine

1.3 Transmission:

1.3.1 Clutch (Travel and power take-off):

[D]	Make	:	Carraro
[D]	Model	:	OMG
[D]	Type	:	Dry
[D]	Number of plate(s)	:	Two
[D]	Diameter of plate(s)	:	280 mm
[C]	Method of operation:		
	- Travel	:	By depressing a pedal, on LHS
	- PTO	:	By a hand lever on LHS of driver's seat.

1.3.2 Gear Box:

[D]	Make	:	Carraro
[D]	Model	:	Mod. Skid 506
[D]	Type	:	Mechanical, synchromesh.

	Description:	Forward	Reverse
[C]	Number of gears	4	4
[C]	Number of ranges	2 (' L ' & ' H ')	2 (' L ' & ' H ')
[C]	Total of arrangements	8	8

' L ' = Low, ' H ' = High

[D]	Available options	:	None

1.3.3 Rear axle and final drives:

[D]	Make	:	Carraro
[D]	Model	:	None
[D]	Type	:	Crown wheel and pinion with differential and outboard epicyclic reduction gear final drives.

Differential lock:

[D]	Type	:	Mechanical, Dog clutch
[C]	Method of engagement	:	By depressing a pedal on RHS
[C]	Method of disengagement	:	By releasing the above pedal

1.3.4 Front axle and final drives:

[D] Make : Carraro

[D] Model : None

[D] Type : Bevel gear type differential and bevel gear type final drives.

- Differential lock : Not available

1.3.5 Total ratios and traveling speeds:

	Movement	GEAR	RANGE	Number of engine revolutions for one revolution of the driving wheels	Nominal traveling speed (*) at rated engine speed of **2200** rev/min, (km/h)
	1	2	3	4	5
[C]	Forward	1	L	233.4	2.47
[C]		2	L	157.6	3.66
[C]		3	L	107.8	5.35
[C]		4	L	76.7	7.51
[C]		1	H	53.9	10.70
[C]		2	H	36.3	15.87
[C]		3	H	24.8	23.21
[C]		4	H	17.7	32.55
[C]	Reverse	1	L	278.2	2.07
[C]		2	L	187.1	3.08
[C]		3	L	128.3	4.49
[C]		4	L	91.4	6.31
[C]		1	H	64.2	8.98
[C]		2	H	43.4	13.29
[C]		3	H	29.6	19.45
[C]		4	H	21.1	27.35

* Calculated with a tyre dynamic radius index of 695 mm (ISO 4251-1:2005)

'L' = Low, 'H '= High

[C] Number of revolutions of front wheels for one revolution of rear wheels : 1.386

1.4	**Power take-off:**		
1.4.1	**Main Power Take-Off:**		
[C]	Type	:	Independent
[C]	Method of engagement	:	Mechanically, by a hand lever on LHS of driver's seat.
[C]	Number of shafts	:	One
[C]	Method of changing power take-off shaft ends and speeds.	:	Speed can be changed by a lever provided behind the driver's seat.
1.4.1.1	**Power take-off proportional to engine speed:**		
	Power take-off at 540 (rev/min):		
[C]	- Location	:	At the rear of the tractor
[C]	- Diameter of power take-off shaft end	:	34.79 mm
[C]	- Number of splines	:	6 (in conformity with ISO 500 – 1: 2004)
[C]	- Height above ground	:	700 mm
[C]	- Distance from the median plane of the tractor	:	0 mm
[C]	- Distance behind rear wheel axis	:	400 mm
[C]	- PTO speed at rated engine speed	:	560 rev/min
[C]	- Engine speed at standard power take-off speed	:	2121 rev/min
[C]	- Ratio of rotation speeds (Engine speed/ PTO speed)	:	3.928 : 1
[D]	- Power restriction	:	None
[D]	Maximum torque transmissible	:	931.4 Nm
[C]	Direction of rotation (viewed from rear of tractor)	:	Clockwise

1.4.1.2	**Power take-off proportional to ground speed**	:	**None**
1.4.2	**Optional power take-off**	:	**None**
1.5	**Hydraulic power-lift:**		
[D]	Make	:	Mahindra
[C]	Model	:	Not specified
[C]	Type of hydraulic system	:	Open centre
[C]	Type and number of cylinders	:	Single acting, one
[C]	Type of linkage lock for transport	:	Hydraulic
[D]	Relief valve pressure setting (tolerance)	:	17.16 Mpa ± 0.98 MPa
[D]	Opening pressure of cylinder safety valve	:	20.15 Mpa ± 1.25 MPa
[D]	Lift pump type	:	Gear type
[D]	Transmission between pump and engine	:	Gear drive
[D]	Number and Type of filter(s)	:	Total three (one suction strainer, one orifice assembly strainer and one return line strainer)
[C]	Site of oil reservoir	:	Above differential housing
	Type, number and location of tapping points:		
[C]	- Type	:	One internal tapping type and remaining two are of quick release coupling type.
[C]	- Number	:	Three
[C]	- Location	:	One point on front side of VTU control valve and two points on LHS of VTU control valve, at auxiliary valve.
[D]	- Maximum volume of oil available to external cylinders	:	8 dm^3

1.6 Three point linkage:

[C] Category : 2 In conformity with ISO 730 – 1: 1994 + Corr.1: 1995 except for the following:
- Width of ball of lower hitch points
- Lateral distance from lower hitch point to centre line of tractor
- The vertical movement without lifting force at the hitch point
- The distance from end of power take-off to centre of lower hitch point with the lower link horizontal

[C] Category adapter : None

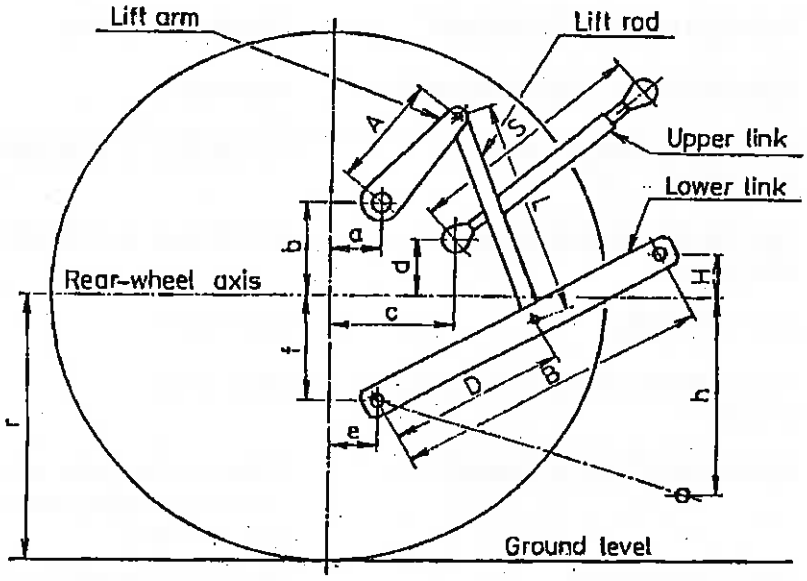


Fig. 1 .1

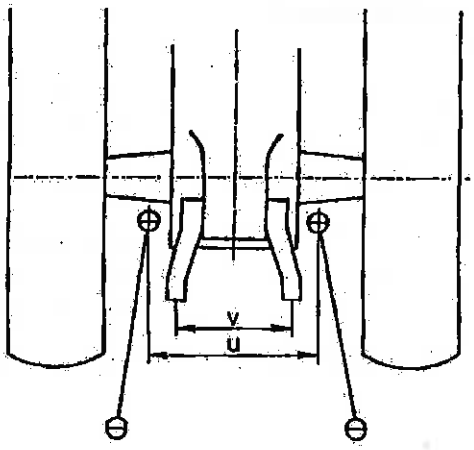


Fig. 1.2

Table: Linkage Geometry dimensions (Ref. fig. 1.1 & 1.2):

			Dimension or range, (mm)	Settings used during test, (mm)
[C]	Length of lift arms:	(A)	275	275
[C]	Length of lower links:	(B)	825	825
	Distance of lift arm pivot point from rear-wheel axis:			
[C]	- Horizontally	(a)	35	35
[C]	- Vertically	(b)	405	405
[C]	Horizontal distance between the 2 lower link points:	(u)	420	420
[C]	Horizontal distance between the 2 lift arm end points:	(v)	525	525
[C]	Length of upper link:	(S)	from 580 to 850	640
	Distance of upper link pivot point from rear wheel axis:			
[C]	- Horizontally	(c)	240, 260 & 290	240
[C]	- Vertically	(d)	245, 300 & 340	340
	Distance of lower link pivot point from rear wheel axis:			
[C]	- Horizontally	(e)	105	105
[C]	- Vertically	(f)	175	175
[C]	Distance of lower link pivot points to lift rod pivot points on lower links:	(D)	390	390
[C]	Length of lift rods:	(L)	from 570 to 715	660
	Height of lower hitch points relative to the rear-wheel axis:			
[C]	- in low position	(h)	from – 635 to – 230	– 495
[C]	- in high position	(H)	from 115 to 305	145
[C]	Height above ground of lower hitch points when locked in transport position (*)	--	Any height within lift range	

(*) Assuming r=695 mm, tyre dynamic radius index of ISO 4251-1:2005

1.7 Swinging drawbar:

[C]	- Type	:	Clevis
[C]	- Height above ground	:	
[C]	- Maximum	:	525 mm
[C]	- Minimum	:	430 mm
[C]	- Type of adjustment	:	By changing the position of drawbar on hitch points.
[C]	- Distance of hitch point from rear-wheel axis, horizontally	:	790 and 840 mm

	Distance of hitch point from power take-off shaft end:		
[C]	- Vertically	:	175 and 270 mm
[C]	- Horizontally	:	390 and 440 mm
	Lateral adjustment (centre of clevis) :		
[C]	- Right hand	:	250 mm
[C]	- Left hand	:	250 mm
[C]	- Distance of pivot from rear wheel axis, horizontally	:	270 mm
[C]	- Diameter of drawbar pinhole	:	31 mm
[D]	- Maximum vertical permissible load	:	6.15 kN
1.8	**Trailer hitch**	:	Not provided
1.9	**Holed drawbar:**		
[C]	Number of holes	:	9
[C]	Distance between holes	:	81 mm
[C]	Hole diameter	:	25 mm
[C]	Thickness / Width of the drawbar	:	32 mm/ 76 mm
[C]	Height above ground:		
[C]	Minimum	:	60 mm
[C]	Maximum	:	385 mm
[C]	Horizontal distance to power take-off shaft end (rear)	:	530 mm
1.10	**Steering:**		
[D]	Make	:	Eaton
[D]	Model	:	None
[D]	Type	:	Hydrostatic
[D]	Method of operation	:	Manual, through steering control wheel
[D]	Pump(s)	:	Gear
[D]	Ram(s)	:	Single acting
[D]	Working pressure	:	14.0 MPa

1.11 Brakes:

1.11.1 Service brake:

[D]	Make	:	Carraro
[D]	Model	:	None
[D]	Type	:	Wet disc
[C]	Method of operation	:	Mechanical, independent or coupled pedal operation
[C]	Trailer braking take-off	:	None

1.11.2 Parking brake:

[C]	Type	:	Common with service brake
[C]	Method of operation	:	By a hand lever on RHS of driver's seat.

1.12 Wheels:

Number

[C]	Front	:	2, driving and steering
[C]	Rear	:	2, driving
[C]	Wheel base	:	2110 mm

Track width adjustment:

		Minimum [mm]	Maximum [mm]	Adjustment method
[C]	Front	1550	1900	Reversing wheels and offsetting wheel disc on rim lugs
[C]	Rear	1505	1895	Reversing wheels and offsetting wheel disc on rim lugs

1.13 Protective structure:

[C]	Make	:	FEMCO, Inc.
[C]	Model	:	3399
[C]	Type	:	Roll guard
[D]	Manufacturer's Name & Address	:	FEMCO Inc. 500, North Highway, 81 Bypass, Mc Pherson, Kansas – 67460 (USA)

Protective device:

[D]	- Cab/frame/roll guard/other	:	Roll guard
[D]	- Tiltable/not Tiltable	:	Tiltable

	OECD approval:		
[D]	- Approval Number	:	Not applicable
[D]	- Date of approval	:	Not applicable
[D]	Nos. of minor modification certificates, if any	:	Not applicable
1.14	**Seat:**		
1.14.1	**Driver's seat:**		
[C]	Make	:	Mahindra
[C]	Model	:	Not declared
[C]	Type	:	Cushioned
[C]	Seat and steering wheel reversible	:	No
[C]	Type of suspension	:	Mechanical
[C]	Type of damping	:	Shock absorber
	Range of adjustment:		
[C]	Longitudinally	:	± 75 mm
[C]	Vertically	:	Nil
[C]	Safety belt	:	Provided
1.14.2	Optional driver's seat(s)	:	Not provided
1.14.3	Passenger seat	:	Not provided

1.15 Lighting:

		Height of centre above ground	Size	Distance from outside edge of lights to median plane of tractor
		[mm]	[mm]	[mm]
[C]	Head lights	1145	160 x 100	218
[C]	Side lights	1510	123 x 81	637
[C]	Rear lights	1395	85 x 75	707
[C]	Reflectors	1395	55 x 55	625

2. TEST CONDITIONS

2.1 Overall dimensions (unballasted tractor)

Length [mm]	Width		Height at top of	
	Minimum [mm]	Maximum [mm]	Protective structure [mm]	Exhaust pipe [mm]
3630	1960	2360	2490	2160

2.2 Ground clearance (unballasted tractor) : 395 mm

Clearance – limiting part : Front axle drive housing

2.3 Tractor Mass:

	Unballasted	
	Without driver	With driver
	[kg]	[kg]
Front	1080	1090
Rear	1690	1755
Total	2770	2845

2.4 Tyres and track width specifications:

Tyres		Front	Rear
- Dimensions		11.2 – 24	16.9 – 30
- Ply rating		8 PR	10 PR
- Type		Pneumatic, Diagonal	Pneumatic, Diagonal
- Maximum load (tyre manufacturer's)	kN	10.25	18.50
- Maximum load (tractor manufacturer's)	kN	10.25	18.50
- Inflation pressure (tyre manufacturer's)	kPa	196	137
- Dynamic radius index	mm	515	695
- Chosen track width	mm	1550	1505

2.5 Fuel:

Type : High speed diesel (commercial fuel) conforming to IS: 1460-2000

Density at 15 °C : 0.840 g/cm^3

2.6 Oils and lubrication:

2.6.1 Capacity and change interval:

	Capacity, [dm^3]	Oil change, [h]	Filter change, [h]
Air cleaner	Not applicable	Not applicable	Primary element after 750 hours of operation. Whereas safety cartridge after 2250 hours of operation.
Engine oil sump	8.9	250	250
Gear box (in-common with service brake, rear axle and rear final drive)	34	1000	Not applicable
Hydraulic	14	1000	Return line strainer after 1000 hours of operation.
Steering	1.5	1000	Not applicable
Front axle (in-common with front final drive)	6	1000	Not applicable

2.6.2 Specifications:

	Recommended	Used during test
Engine:		
Type	SAE 15 W 40	As recommended
Viscosity	13.5 to 14.5 cSt at 100°C	
Classification	API – CF4	
Transmission, service brake and rear axle oil:		
Type	TRACTELF MUSA	As recommended
Viscosity	9.0 to 10.5 cSt at 100°C	
Classification	API GL4	
Hydraulic fluid :		
Type	VG 68	As recommended
Viscosity	24 to 28 cSt at 65°C	
Classification	IS 10522	
Steering oil :		
Type	VG 46	As recommended
Viscosity	42 to 50 cSt at 40°C	
Classification	ISO VG 46	

Front axle oil:

Type	SAE 80 W 90	As recommended
Viscosity	14.5 cSt at 100°C	
Classification	API GL-5	

2.6.3 Grease:

Number of lubricating points:
Grease nipples : 23
Grease cups : 02

3. COMPULSORY TESTS RESULTS

3.1 Main power take-off:

Date and location of tests : 01.03.2007 at CFMT&TI, BUDNI (M.P.), India.
Type of dynamometer bench : Schenck D1100e

Power,	Speed			Fuel consumption			Specific
	Engine	PTO	Fan	Hourly		Specific	Energy,
[kW]	[rev/min]			[kg / h]	[l / h]	[g/kWh]	[kWh/l]
1	2	3	4	5	6	7	8
3.1.1 Maximum Power – One-Hour Test:							
42.9	2251	573	2933	10.79	12.85	252	3.34
3.1.2 Power at Rated Engine Speed (2200 rev/min) :							
42.6	2200	560	2866	10.65	12.68	250	3.36
3.1.3 Standard Power Take-Off Speed [540 ± 10 (rev/min)] :							
42.3	2121	540	2764	10.46	12.45	247	3.40
3.1.4 Part Loads:							
3.1.4.1 The torque corresponding to maximum power at rated engine speed :							
42.6	2200	560	2866	10.65	12.68	250	3.36
3.1.4.2 85 % of torque obtained in 3.1.4.1 :							
39.5	2400	611	3127	10.24	12.19	259	3.24
3.1.4.3 75 % of torque defined in 3.1.4.2 :							
30.1	2431	619	3168	8.20	9.76	272	3.08
3.1.4.4 50 % of torque defined in 3.1.4.2 :							
20.1	2439	621	3178	6.16	7.33	306	2.74
3.1.4.5 25 % of torque defined in 3.1.4.2 :							
10.3	2486	633	3240	4.69	5.58	455	1.85
3.1.4.6 Unloaded :							
0.7	2526	643	3291	3.25	3.87	4643	0.18

1	2	3	4	5	6	7	8
3.1.5	**Part Loads at Standard Power Take-Off Speed [540± 10 (rev/min)] :**						
3.1.5.1	**The torque corresponding to maximum power :**						
42.3	2121	540	2764	10.46	12.45	247	3.40
3.1.5.2	**85 % of torque obtained in 3.1.5.1 :**						
38.4	2263	576	2948	9.78	11.64	255	3.30
3.1.5.3	**75 % of torque defined in 3.1.5.2 :**						
29.0	2282	581	2974	7.62	9.07	263	3.20
3.1.5.4	**50 % of torque defined in 3.1.5.2 :**						
19.5	2302	586	2999	5.69	6.77	292	2.88
3.1.5.5	**25 % of torque defined in 3.1.5.2 :**						
10.0	2357	600	3071	4.49	5.35	449	1.87
3.1.5.6	**Unloaded :**						
0.8	2400	611	3127	2.95	3.51	3688	0.23
3.1.6	**PART LOADS AT DIFFERENT ENGINE SPEEDS**						
3.1.6.1	**maximum power at rated engine speed:**						
42.6	2200	560	2866	10.65	12.68	250	3.36
3.1.6.2	**80% of power obtained in 3.1.6.1 at max. speed setting :**						
34.1	2420	616	3153	9.08	10.81	266	3.15
3.1.6.3	**80% of power obtained in 3.1.6.1 with governor control set to 90% of rated engine speed :**						
34.1	1980	504	2579	8.07	9.61	237	3.55
3.1.6.4	**40% of power obtained in 3.1.6.1 with governor control set to 90% of rated engine speed :**						
17.1	1980	504	2579	5.08	6.05	297	2.83
3.1.6.5	**60% of power obtained in 3.1.6.1 with governor control set to 60% of rated engine speed :**						
25.6	1320	336	1720	5.82	6.93	227	3.69
3.1.6.6	**40% of power obtained in 3.1.6.1 with governor control set to 60% of rated engine speed :**						
17.1	1320	336	1720	4.17	4.96	244	3.45

No load maximum engine speed	:	2526 rev/min
Torque (equivalent crankshaft) at maximum power:		
- At rated engine speed	:	185.1 Nm
- At one – hour test	:	182.0 Nm
Maximum torque (equivalent crankshaft) (Engine speed: 1398 (rev/min))	:	217.4 Nm

Mean atmospheric conditions:

- Temperature	:	26°C
- Pressure	:	98.6 kPa
- Relative humidity	:	44 %

Maximum temperatures:

- Coolant	:	91°C
- Engine oil	:	101°C
- Fuel	:	45°C
- Engine air intake	:	28°C

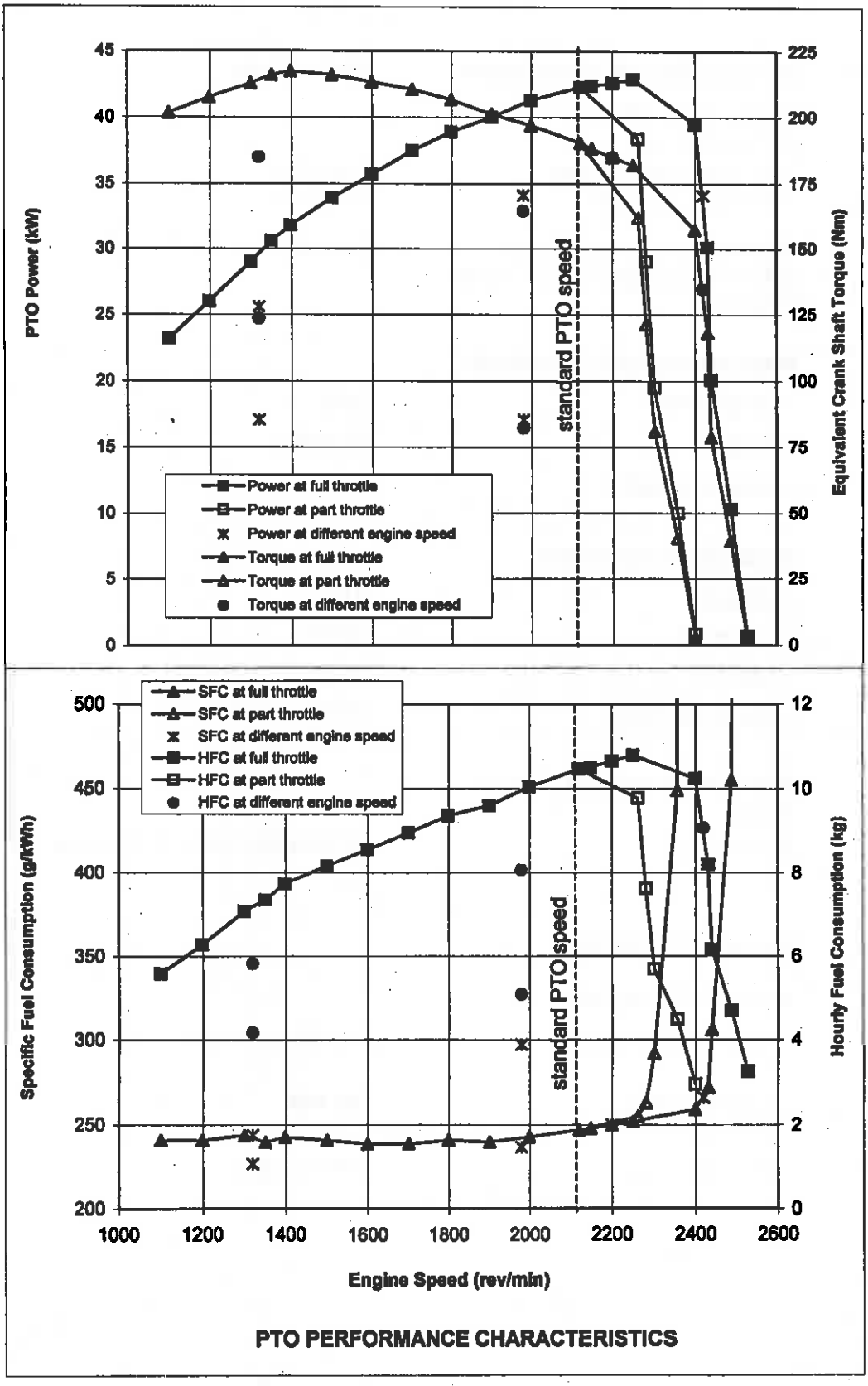
3.2 Hydraulic power and lifting force:

Date of tests : 02.04.2007, 03.04.2007 and 04.04.2007

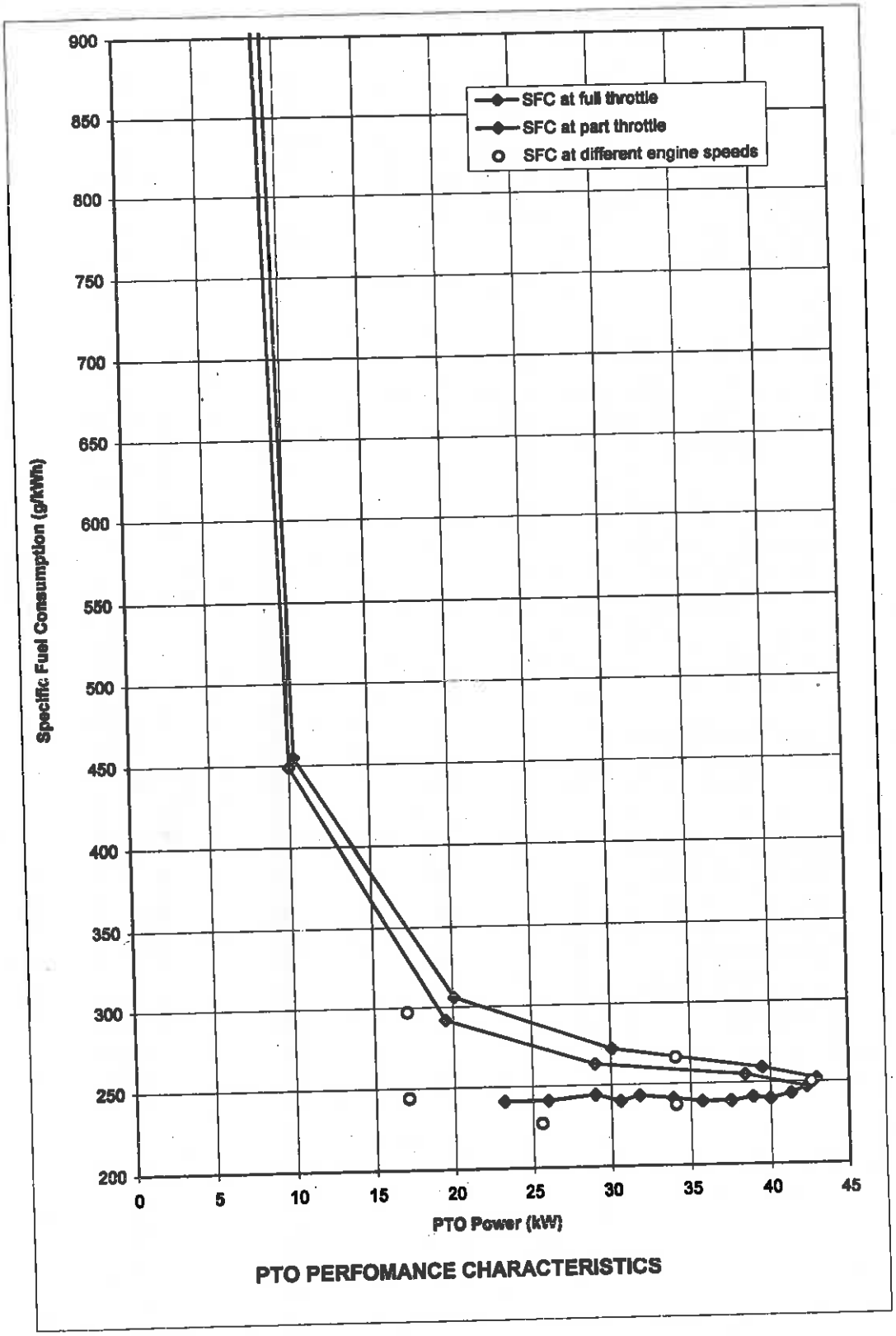
3.2.1 Hydraulic Power Test:

3.2.1.1 Hydraulic Fluid Data:

- Hydraulic fluid type	;	VG 68
- Viscosity index (ISO 3448 + Corr1: 1993)	:	90, min
- Viscosity at 65 °C	:	24 to 28 cSt



PTO PERFORMANCE CHARACTERISTICS



PTO PERFOMANCE CHARACTERISTICS

3.2.1.2 Compulsory Reporting (Test Results):

		Press-ure, [MPa]	Reservoir oil Temp. °C		Engine speed, [rev/min]	Flow rate, [l/min]	Power, [kW]
			Min	Max.			
1	2	3	4	5	6	7	8
1.	Rated Engine speed (Manufacturer's specification)	--	--	--	2200	--	--
2.	Maximum (sustained) pressure with relief valve open as measured at the coupler. Pump stalled- No	18.0	60	68	2518	--	--
3.	Flow rate corres-ponding to a hydraulic pressure equivalent to 90% of the actual relief valve pressure setting and corresponding hydraulic power.	16.2	67		2518	18.00	4.9
4.	Maximum available flow and maximum power from one coupler pair	14.0	66		2518	21.98	5.1
5.	Maximum available flow and maximum power from coupler pairs operating simultaneously (flow through two or in over coupler pair if required)	**Not applicable**	**Not applicable**		**Not applicable**	**Not applicable**	**Not applicable**

3.2.2 Power Lift Test:

-Linkage settings for test - See **Table at Page 11, and Fig. 1.1 & 1.2**

	At hitch point	On the frame
Height of lower hitch points above ground in down position	200 mm	200 mm
Vertical movement: - Without lifting force - With lifting force	 640 mm 605 mm	 640 mm 610 mm
Maximum corrected force exerted through full range	13.6 kN	9.0 kN
Corresponding pressure of hydraulic fluid	16.2 MPa	16.2 MPa
Moment about rear wheel axle	12.6 kN-m	13.9 kN-m
Maximum tilt angle of mast from vertical	--	13 degree

Lifting height relative to the horizontal plane including the lower link pivot points:								
mm	-305	-200	-100	0	+100	+200	+300	305
Lifting forces (the values of the force measured have been corrected to correspond to a hydraulic pressure equivalent to 90% of actual relief valve pressure setting of the hydraulic lift system.)								
At the hitch point in (kN)	13.6	14.8	15.5	15.7	15.7	15.3	15.0	–
Corresponding pressure 16.2 MPa:								
At the frame in (kN)	13.7	14.1	14.3	13.9	13.1	11.6	10.0	9.0
Corresponding pressure 16.2 MPa.								

3.3 Drawbar power test (unballasted tractor):

Date(s) of tests : 22.03.2007 and 23.03.2007

Type of track : Concrete

Rolling radius of rear tyres : 519.8 mm

Height of drawbar above ground, (mm)	Tyre inflation pressure	
	Front	Rear
	[kPa]	[kPa]
325	167	118

DRAWBAR TEST RESULTS

Gear Number & Range	Draw-bar power	Draw-bar pull	Speed	Engine speed	Fan speed	Slip of wheels	Specific fuel cons-ump-tion	Specific Energy	Temperature			Atmospheric conditions		
									Fuel	Cool-ant	Eng-ine oil	Temp	R.H.	Pres-sure
	[kW]	[kN]	[Km/h]	[rev/ min]	[rev/ min]	[%]	[g/kWh]	[kWh/l]	[°C]	[°C]	[°C]	[°C]	[%]	[kPa]
3.3.1	**Maximum Power in tested Gears (Unballasted tractor):**													
1 L	17.2	25.78	2.40	2437	3175	15.3	392	2.14	40	75	90	32	27	99.4
2 L	25.1	25.74	3.52	2410	3140	15.2	347	2.42	41	79	94	33	25	99.4
3 L	33.4	23.30	5.16	2307	3006	11.4	308	2.73	41	81	95	32	24	99.7
4 L	34.4	16.91	7.33	2208	2876	6.5	293	2.87	41	82	97	32	25	99.7
1 H	34.8	11.75	10.67	2203	2870	3.8	290	2.90	40	82	96	31	25	99.8
3.3.2	**Fuel Consumption:**													
3.3.2.1	In Selected gear setting nearest 7.5 km/h, at maximum power at rated engine speed:													
4 L	34.3	16.89	7.32	2203	2870	6.5	297	2.83	36	80	91	29	23	99.9
3.3.2.1.1	75% of pull corresponding to maximum power at rated engine speed:													
4 L	28.7	12.68	8.15	2398	3124	4.3	324	2.59	36	78	93	31	25	99.8
3.3.2.1.2	50% of pull corresponding to maximum power at rated engine speed:													
4 L	19.6	8.44	8.36	2414	3145	2.6	368	2.28	36	75	91	30	25	99.8
3.3.2.1.3	Next higher gear at reduced engine speed: Same pull and traveling speed as in 3.3.2.1.1:													
1 H	28.6	12.68	8.13	1679	2188	3.8	261	3.22	36	80	91	30	23	99.8
3.3.2.1.4	Next higher gear at reduced engine speed: Same pull and traveling speed as in 3.3.2.1.2:													
1 H	19.7	8.45	8.40	1707	2225	2.6	289	2.91	38	76	84	30	23	99.8
3.3.2.2	In selected gear/speed nearest between 7 km/h and 10 km/h at rated engine speed:													
4 L	34.3	16.89	7.32	2203	2870	6.5	297	2.83	36	80	91	29	23	99.9
3.3.2.2.1	75% of pull corresponding to maximum power at rated engine speed:													
4 L	28.7	12.68	8.15	2398	3124	4.3	324	2.59	36	78	93	31	25	99.8
3.3.2.2.2	50% of pull corresponding to maximum power at rated engine speed:													
4 L	19.6	8.44	8.36	2414	3145	2.6	368	2.28	36	75	91	30	25	99.8
3.3.2.2.3	Next higher gear at reduced engine speed: Same pull and traveling speed as in 3.3.2.2.1:													
1 H	28.6	12.68	8.13	1679	2188	3.8	261	3.22	36	80	91	30	23	99.8
3.3.2.2.4	Next higher gear at reduced engine speed: Same pull and traveling speed as in 3.3.2.2.2:													
1 H	19.7	8.45	8.40	1707	2225	2.6	289	2.91	38	76	84	30	23	99.8

Remarks: Maximum power in the gear '2H' was not measured because forward speed in this gear exceeded the safety limit of testing equipment.

4. REPAIR AND ADJUSTMENTS PRIOR TO TESTS

-- None --

5. REMARKS

1. The maximum torque (equivalent crankshaft) was observed as 217.4 Nm against the declaration of 238 Nm.
2. Following dimensions of three point linkage are not in conformity with the requirements of ISO 730 – 1: 1994 + Corr.1: 1995:
   (a) Width of ball of lower hitch points.
   (b) Lateral distance from lower hitch point to centre line of tractor.
   (c) Distance from end of power take-off to centre of lower hitch point with lower links in horizontal position.
   (d) The vertical movement without lifting force at the hitch point.

TEST CARRIED OUT AT CFMT & TI, BUDNI (M.P.), INDIA

TESTING AUTHORITY

P. K. PANDEY
SENIOR TEST ENGINEER

V.N. KALE
DIRECTOR

Draft Test report compiled by: **Shri. Chakradhar V. Chimote**, Senior Technical Assistant