



MAHINDRA, YUVO 265 DI TRACTOR



सत्यमेव जयते

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

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T-1097/1623/2017

MAHINDRA, YUVO 265 DI TRACTOR
- Commercial (Supplementary)

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

Month: July

Test Report No. T-1097/1623/2017

Year : 2017

GOVERNMENT OF INDIA
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T-1097/1623/2017

MAHINDRA, YUVO 265 DI TRACTOR
- Commercial (Supplementary)

Type of Test : **COMMERCIAL (Variant)**
 Test code/Procedure : IS: 5994-1998 (Reaffirmed in March 2009),
and IS: 12207-2014
 Period of Test : May,2017 to June,2017
 Test Report No. : 1097/1623 /2017
 Month/Year : July,2017

- i) The results reported in this report are observed values and no corrections have been applied for atmospheric and site conditions.
- ii) The data given in this report pertain to the particular machine submitted by the applicant for test.
- iii) The results presented in this report do not in any way attribute to the durability of the machine.
- iv) This report should not be reproduced in part or full without prior permission of the Director, Central Farm Machinery Training and Testing Institute, Budni (M.P.).
- v) This is a supplementary test report and, should be read in conjunction with the Test Report of base model i.e. "Mahindra, Yuvo 265 DI Tractor" bearing No. T-1017/1541/2016, was released in March, 2016.

Sl. No	Units	Conversion Factor
1.	Force:	
	1 kgf	9.80665 N
		2.20462 lbf
2.	Power:	
	1 hp	1.01387metric hp (Ps)
		745.7 W
	1 Ps	735.5 W
	1 kW	1.35962 Ps
3.	Pressure:	
	1 psi	6.895 kPa
	1 kgf/cm ²	98.067 kPa = 735.56 mm of Hg
	1 bar	100 kPa = 10 N/cm ²
	1 mm of Hg	1.3332 m-bar

ABBREVIATIONS	
Apa	As per applicant
TDC	Top Dead Centre
IS	Indian Standard
LHS/RHS	Left Hand Side/ Right Hand Side
Hg	Mercury
Temp.	Temperature
N.R.	Not recorded
Rpm	Revolutions per minute
O.D/I.D	Outer diameter/ Inner diameter
N.A.	Not available/ Not applicable
PTO	Power take-off
R.H.	Relative Humidity

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T-1057/1523/2017

MAHINDRA, YUVO 265 DI TRACTOR
- Commercial (Supplementary)

Manufacturer	: M/s. Mahindra & Mahindra Limited (Farm Equipment Sector) Akurli Road, Kandivli (E) MUMBAI – 400 101
Location of other manufacturing plants (apa)	: Mahindra Research Valley-AS, Mahindra World City, Plot No. 41/1, Anjur P.O.: Chengalpattu- 603004 Kanchipuram- district (Tamil Nadu) : M/s. Mahindra & Mahindra Limited (Farm Equipment Sector) Hingna Road, Hingna MIDC, NAGPUR- 440 016, (Maharashtra). : M/s. Mahindra & Mahindra Limited (Farm Equipment Sector) Agri Business Development Centre, Khatima Panipat Highway, Udham Singh Nagar, Vil-Lalpur, Tehsil-Kichha, RUDRAPUR-263153 (Uttanchal) : M/s. Mahindra & Mahindra Limited (Farm Equipment Sector) Agri Development Centre, Vil-Mehla Tehsil-Dudu Jaipur- Ajmer Road, JAIPUR-303 007 (Rajasthan) : M/s. Mahindra & Mahindra Limited (Farm Equipment Sector) Near Bidar 'T' Junction , Mahindra Nagar, Zaheerabad- 502 220 Medak District (Telangana)
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	: 30 hours & 2 min.
- Transmission	: 39 hours
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, YUVO 265 DI" tractor had undergone "Initial Commercial Test" at this Institute vide test report No.T-1017/1541/2016, was released in March, 2016. During the Initial commercial test the sustained pressure of the open relief valve was recorded as 20.5MPa against the declaration of 19.0 to 19.7 MPa resultant in the lifting capacity of hydraulic system at hitch point was recorded 22.45% higher side. Now, the firm has made following permanent changes in the technical specifications of tractor and requested vide letter no. Nil, dated 26.05.2016 for supplementary test of model i.e. "Mahindra, YUVO 265 DI Tractor".



The major features of Previous sample and Supplementary Present sample are listed below:

S. No.	Parameters	Previous Sample (Test Report No. T-1017/1541/March,2016)	Present sample
1.	Hydraulic system :-		
	Make of hydraulic pump	Dynamics	Dynamics
	Type	Gear pump	Tandem gear pump
	Sustained pressure of Relief valve (MPa)	19 to 19.7 (Declared) 20.5 (Observed)	19.2 to 19.7 (Declared) 18.5 (Observed)
	Lifting capacity at Hitch point	14.70 kN (Declared), 18.00 kN (Observed)	14.70 kN (Declared), 15.18 kN (Observed)
2.	Steering system :-		
	Make	RANE	Danfoss
	Type	Mechanical	Hydrostatic

The applicant has modified the previous sample in the Institutes premises by replacing / adding and resetting the following parts and submitted for testing.

- Added power steering system as a optional fitment.
- The relief valve (Hydraulic system) Part no. 007207575V91 pressure has reset at specified limit to achieve optimum hydraulic lifting capacity at Hitch & Standard frame of the tractor.

Subsequent to the examination of the case in light of clause (iv) to Table- 4 of Indian Standard IS: 12207-2014, the following tests were considered to be carried out:-

- Specification checking
- Hydraulic performance test
- Turning ability 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	15W40	SAE 15W40
2.	Transmission*	Tract ELF MM/IOCL	Oil originally filled in the tractor was not changed
	Common with differential, rear axle, final drive, hydraulic, brake and steering system		
3.	Grease	MP3 Lithium base	MP Grease

3. ESSENTIAL TESTS

3.1. SPECIFICATIONS

	Previous sample	Present sample
3.1.1 Tractor:		
Make	: Mahindra	Mahindra
Model	: Yuvo 265 DI	Yuvo 265 DI
Brand name	: None	None
Type	: Four wheel, Rear-wheel drive, General Purpose, Agricultural Tractor	
Year of manufacture	: FE (i.e. September, 2014)	
Chassis number	: ZGDA 00016	
Country of Origin	: INDIA	INDIA



		<u>Previous sample</u>	<u>Present sample</u>
3.1.2	Engine:		
	Make	:	Mahindra
	Model	:	MDI17853AD
	Serial number	:	ZGDA 00016
	Engine speed (Manufacturer's recommended production setting)(rpm) :		
	- Maximum speed at no load	:	2175 to 2375
	- Low idle speed	:	750 to 850
	- Speed at maximum torque	:	1300 to 1500
	Rated speed, (rpm):		
	- For PTO use	:	2000
	- For drawbar use	:	2000
3.1.3	Cylinder & Cylinder Head:		
	Number	:	Three
	Disposition	:	Vertical, Inline
	Bore/stroke, (mm)	:	88.9/110
	Capacity as specified by the applicant, (cc)	:	2048
	Compression ratio, (apa)	:	19.8±1 : 1
	Type of cylinder head	:	Monoblock
	Type of cylinder liners	:	Wet, replaceable
	Type of combustion chamber	:	Re-entrant bowl cavity on piston top
	Arrangement of valves	:	Overhead, inline
	Valve clearance (cold/hot):		
	- Inlet valve, (mm)	:	0.40/0.30
	- Exhaust valve, (mm)	:	0.50/0.40
3.1.4	Fuel System:		
	Type of fuel feed system	:	Gravity and force feed
3.1.4.1	Fuel tank:		
	Capacity, (l)	:	62.0
	Location	:	Above clutch housing
	Provision for draining of sediments/ water	:	Yes provided
	Material of fuel tank	:	Plastic
3.1.4.2	Water separator	:	Not provided
3.1.4.3	Fuel feed pump:		
	Make	:	Bosch, India
	Type	:	Mechanical
	Model/Group combination No.	:	FP/KS22AD62, 9440030029
	Location	:	On Fuel Injection pump.
	Method of drive	:	Through camshaft Fuel Injection pump
3.1.4.4	Fuel filters:		
	Make	:	Bosch, India
	Model/Group combination No.	:	F 002 H20 170
	Number	:	Two
	Type of element	:	Paper
	Capacity (l)		
	- Primary	:	0.5
	- Secondary	:	0.5
3.1.4.5	Fuel Injection pump:		
	Make	:	Bosch, India
	Model/Group combination No.	:	E040 278 700, PES4A 85 D 320 RS35
	Type	:	Inline plunger
	Serial number	:	45558355
	Method of drive	:	Through timing gears



		<u>Previous sample</u>	<u>Present sample</u>
3.1.4.6	Fuel injectors:		
	Make :	Bosch, India	
	Holder Number :	F 002 C70007	
	Nozzle Number :	DSLA 144P 1754	
	Type :	Multihole (Five holes)	
	Manufacturer's production pressure setting, (Mpa) :	25+0.8	
	Injection timing :	5.5 Degree BTDC	
	Firing order :	1 - 3 - 2	
3.1.4.7	Governor:		
	Make :	Bosch, India	
	Model/Group combination No. :	EC42213300	
	Type :	Mechanical, centrifugal, variable speed	
	Governed range of engine speed, (rpm) :	700 to 2375	
	Rated engine speed, (rpm) :	2000	
3.1.5	Air intake system:		
3.1.5.1	Pre-cleaner:		
	Make :	Popular (apa)	
	Type :	Plastic transparent bowl, cyclonic action type	
	Location :	In front of radiator	
3.1.5.2	Air cleaner:		
	Make :	Donaldson	
	Type :	Dry type	
	Location :	In between radiator and engine, under the bonnet	
	Range of suction pressure at maximum power, (kPa) :	3.1 to 3.5	
	Details of elements:	<u>Primary element</u>	<u>Secondary element</u>
	- Size (OD/ID), (mm) :	126/84	82/64
	- Length, (mm) :	305	300
	- Type :	Polyester felt	Cellulose fiber
	- No. of elements :	Two	
	Air flow restriction indicator :	Provided on dash board	
	Dust unloading valve :	Provided	
	Maintenance schedule :	Primary- First replacement after 900hrs, subsequent every 800 hrs. Secondary- First replacement after 2500 hrs, subsequent every 2400 hrs.	
3.1.6	Exhaust System:		
	Type of silencer :	Updraft, (Cylindrical)	
	Position of silencer outlet with respect to SIP, (mm):-		
	- Vertical :	800	
	- Longitudinal :	1425	
	- Lateral :	485 (on RHS)	
	Range of exhaust gas pressure at maximum power, (kPa) :	0.5 to 4.9	
	Provision of spark arresting device :	None	
	Provision against entry of rain water :	A bend is provided at the top of silencer	
3.1.6.1	Turbocharger:	Not Available	
3.1.6.2	Exhaust Gas Recirculation system :	NA	



		<u>Previous sample</u>	<u>Present sample</u>
3.1.7	Lubricating system:		
	Type	:	Forced feed-cum-splash
	Oil sump capacity, (l)	:	6.0
	Total lub oil capacity, (l)	:	6.8
	Oil change period	:	First change after 100 hours and subsequently after every 400 hours of operation.
3.1.7.1	Filters:		
	Make	:	Mahale/Purolator (apa)
	Type	:	Full flow, spin-on paper element.
	Number	:	One
	Capacity, (l)	:	0.45
3.1.7.2	Pump:		
	Make	:	Precision Autowares Pvt. Ltd. (apa)
	Type	:	Lobe
	Method of drive	:	Through timing gears
	Pressure release setting, (kPa)	:	221 to 255
3.1.8	Cooling system:		
	Type	:	Forced circulation of coolant
	Coolant as recommended	:	BIL MT-92 (apa), having coolant and water in ratio 0.08:1
3.1.8.1	Details of Pump	:	Centrifugal, semi open impeller having seven vanes of 99.0 mm diameter and driven through crankshaft pulley by a cogged "V" belt.
3.1.8.2	Details of fan	:	Suction type, having six plastic blades of 400 mm diameter and mounted on water pump.
	Means of temperature control	:	Thermostat
	Bare radiator capacity, (l)	:	2.0
	Capacity of expansion flask, (l)	:	1.6
	Total coolant capacity, (l)	:	8.5
	Radiator cap pressure, (kPa)	:	88
3.1.9	Starting System:		
	Type	:	12V, DC, electrical
	Aid for cold starting	:	None
	Any other device provided for easy starting	:	None
3.1.10	Electrical System:		
3.1.10.1	Battery:		
	Make and model	:	Exide MHD 880
	Number	:	One
	Type	:	Lead Acid
	Capacity and rating	:	12V, 88 Ah at 20 hour discharge rating
	Location	:	RHS of clutch housing in a separate metallic box.
	Ground polarity	:	Negative
3.1.10.2	Starter:		
	Make	:	Autolek
	Model	:	1105 A
	Type	:	Pre-engaging solenoid operated
	Power rating	:	12V, 2.0 kW
	Serial number	:	NA

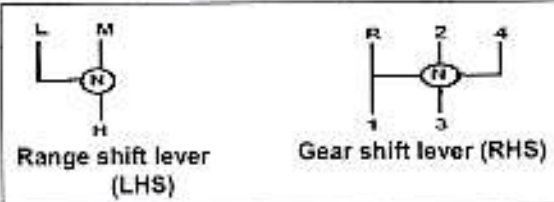


		<u>Previous sample</u>	<u>Present sample</u>
1.1.10.3	Generator:		
	Make	:	PMP
	Model	:	7988-3
	Type	:	Alternator
	Serial number	:	015C0416U
	Output rating	:	12V, 35 Amp
	Method of drive	:	Through water pump pulley by a cogged "V".
1.1.10.4	Voltage regulator	:	In-built in alternator
1.1.10.5	Details of lights:		

Description	No. & capacity of bulb	Height of the centre of beam above ground level, (mm)	Size, (mm)	Distance between centre of the beam and outside edge of tractor at standard rear track setting, (mm)
Front Lights:				
- Head light	2, 12V, 55/60W	1220	180 x 95	785
- Parking light (Near Head light)	2, 12V, 5W	1245	70 x 15	235
- Turn-cum-hazard indicator light	2, 12V, 21W	1245	75 x 55	135
Rear lights:				
- Parking light	2, 12V, 5W	1235	60 x 50	235
- Stop light	2, 12V, 21W	1235	65 x 55	235
- Turn-cum-hazard indicator light	2, 12V, 21W	1235	65 x 50	135
- Plough light (on RHS mudguard)	1, 12V, 55 W	1340	110 Φ	410
- Reflectors (Red)	2	1300	60 x 50	190
- Registration plate light	Part of the rear light	1125	70 x 65	230

1.1.10.6	Main switch	Key turn type having three positions viz. : OFF, Circuit ON & START										
1.1.10.7	Light switch	: Rotary type having three positions viz. i) OFF ii) Parking lights iii) Head light ON										
1.1.10.8	Combination switch	: i) Horn push button ii) Upper/dipper Light switch iii) L-R turn switch										
1.1.10.9	Horn:											
	Make	: Minda										
	Type	: 12V, 2B, Electromagnetically vibrated diaphragm										
	Location	: In front of radiator, under the bonnet										
1.1.10.10	Fuse box	: Contains 13 number of fuses having following capacities										
		<table border="1"> <thead> <tr> <th>Capacity</th> <th>5A</th> <th>7.5A</th> <th>10A</th> <th>15A</th> </tr> </thead> <tbody> <tr> <td>Number</td> <td>3</td> <td>1</td> <td>4</td> <td>5</td> </tr> </tbody> </table>	Capacity	5A	7.5A	10A	15A	Number	3	1	4	5
Capacity	5A	7.5A	10A	15A								
Number	3	1	4	5								
1.1.10.10.1	Details of other electrical accessories:											
1.1.10.10.2	Flasher Unit:											
	Make	: Interface										
	Capacity:											
	- Turn signal	: 12V, 21W x 2 + 2W x 1										
	- Hazard signal	: 12V, 21W x 4 + 2W x 2										
	-Flashes/min.	: 85										

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		<u>Previous sample</u>	<u>Present sample</u>
21.11.1.3	Slow moving triangle	: Provided	
21.11.1.4	Safety device	: Starter will not operate until the main gear shifting lever is in neutral position.	
21.11.1.5	Seven pin trailer socket	: Provided	
21.11	Instrument panel details:		
i)	Engine speed meter Analog type (0 to 30 x 100 rpm) hour meter		Cum Digital cumulative run
ii)	Coolant temperature gauge (with colour zones).		
iii)	Fuel level gauge (with colour zones).		
iv)	Lub.oil pressure indicator light		
v)	Main switch (key-turn type)		
vi)	Combination Light switch (Rotary type)		
vii)	Plough Light switch		
viii)	Side/Hazard warning light switch		
ix)	Turn indicator lights (Tell-tale)		
x)	Battery charging indicator light		
xi)	Head lamp (high beam) 'ON' indicator light		
xii)	Parking brake indicator light		
xiii)	Air cleaner clogging warning indicator light		
xiv)	Horn push button		
xv)	Hand accelerator lever		
xvi)	Steering control wheel		
xvii)	Rear view mirror.		
xviii)	Engine stop knob.		
21.12	Transmission System:	<u>Previous sample</u>	<u>Present sample</u>
21.12.1	Clutch:		
Make	: Luk India		
Type	: Single, Dry friction plate, diaphragm type.		
No. of friction plate(s)	: One		
Size, OD/ID, (mm)	: 280/166 Φ		
Method of operation	: By pressing clutch pedal fully provided on LHS of operator's seat.		
21.12.2	Gear box:		
Make	: Mahindra		
Type	: Mechanical, Constant mesh gears		
Gear shifting pattern	: 		
Location of gear shifting levers	: Gear shift lever provided on RHS & Range shift (low-medium-high) lever are in LHS operator's seat		
No. of speeds: - Forward	: 12		
- Reverse	: 03		
Oil capacity (l)	: 32.0 (Common with differential, rear axle, final drive, hydraulic & brake system)	36.0 (Common with differential, rear axle, final drive, hydraulic brake & steering system)	
Oil changing period	: After every 1300 hours of operation.		



Previous sample | Present sample

2.1.12.3 Nominal Speed:-

Gearment	Gear No.	No. of engine revolutions for one revolution of driving wheel	Nominal speed at rated engine speed when fitted with 12.4 -28 size tyres of 590 mm radius index, (kmph)	Nominal speed at rated engine speed when fitted with 13.6 -28 size tyres of 610 mm radius index, (kmph) (Optional)	
Forward	L1	317.68	317.44	1.40	1.45
	L2	198.46	198.37	2.24	2.32
	L3	126.41	126.42	3.53	3.64
	L4	82.23	82.25	5.41	5.59
	M1	116.61	116.67	3.81	3.94
	M2	72.90	72.98	6.09	6.3
	M3	46.32	46.39	9.61	9.92
	M4	30.19	30.21	14.73	15.23
	H1	58.11	58.12	7.66	7.91
	H2	36.17	36.28	12.30	12.68
	H3	23.10	23.11	19.26	19.90
	H4	15.04	15.02	29.59	30.61
Reverse	LR	224.16	224.85	1.99	2.05
	MR	82.37	82.62	5.40	5.57
	HR	41.09	41.08	10.83	11.20

2.1.12.4 Differential:

Type : Previous sample Crown wheel & pinion with differential unit accommodated inside the differential housing. Present sample

Reduction through crown wheel & bevel pinion : 4.1 : 1 (41/10 T)

Differential lock :

Type : Pin type

Location : On RHS of operator's seat

Method of operation : By pressing a pedal provided at RHS of operator's seat

2.1.12.5 Rear axle & final drive:

Make : Mahindra (apa)

Type : Planetary reduction unit

Reduction through final drive : 6.21 : 1 (Ring:73, Sun:14 & planets: 29)

Oil capacity of final drive, (l) : 32.0 (Common with gear box & differential hydraulic & brake system). 36.0 (Common with gear box & differential hydraulic, brake & steering system).

Oil changing period : After every 1300 hours of operation.

2.1.13 Power lift (Hydraulic System):

- Make : Mahindra

- Type : Open centre, live & ADDC

- No. and type of cylinder : One, single acting

- Type of linkage lock for transport : Hydraulic, isolating valve in fully closed position act as transport lock.

2.1.13.1 Hydraulic pump:

- Make : Dynamics

- Type : Gear

- Location : On RHS of engine

- Drive : Through timing gears



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	<u>Previous sample</u>	<u>Present sample</u>
No. & Type of hydraulic filter(s)	: Three i) One strainer at suction ii) Full flow spin on paper element type iii) Orifice filter on distributor	
Hydraulic oil capacity, (l)	: 32.0 (common to transmission, brake & system)	: 36.0 (common to transmission, brake & steering system)
Oil change period	: After every 1300 hours of operation.	
Provision for external tapping	: Provided	
Details of control levers	: i) Position control lever (Black) ii) Draft control lever (Red) iii) Isolating valve knob on distributor (White)	
Method of draft sensing	: Through top link	

2.1.12.2 Three point linkage:

Sl. No.	Observations	As per IS: 4468- (Part-1)-1997, (Cat.I / Cat.II), (mm)	As measured (mm)		Remarks in case of present sample
			Previous sample	Present sample	
1	2	3	4		5
ii. Upper hitch points:					
a)	Dia of hitch pin hole	19.30 to 19.50 / 25.70 to 25.90	25.82		Conforms to Cat.II
b)	Width of ball	44.0 (max.) / 51.0 (max.)	51.0		Conforms to Cat.II
iii. Lower hitch points:					
a)	Dia of hitch pin hole	22.40 to 22.65 / 28.70 to 29.00	28.94		Conforms to Cat.II
b)	Width of ball	34.8 to 35.0 / 44.8 to 45.0	45.0		Conforms to Cat.II
ii.	Lateral distance from lower hitch point to centre line of tractor.	359 / 435	435		Conforms to Cat.II
iii.	Lateral movement of lower hitch points	100 (min) / 125 (min)	125		Conforms to Cat.I&II
iv.	Distance from end of power take-off to centre of lower hitch point (lower links in horizontal position)	450 to 575 / 550 to 625	495		Conforms to Cat.I&II
v.	Transport height	820 (min) / 950 (min)	910		Conforms to Cat.I&II
vi.	Power range (without force)	560(min) / 650 (min)	680		Conforms to Cat.I
vii.	Leveling adjustment	100 (min) / 100 (min)	300		Conforms to Cat.I&II
viii.	Lower hitch point clearance	100 (min) / 100 (min)	130		Conforms to Cat.I&II
ix.	Lower hitch point height	200 (max) / 200 (max)	200		Conforms to Cat.I&II

TABLE 1 Linkage geometry dimensions [Refer Fig.-1(A)]:

The following are dimensions observed, corresponding to 590 mm as tyre dynamic radius index:

S. No.	Parameter	Notation	Dimension or range, (mm)	Setting used during test, (mm)
(1)	(2)	(3)	(4)	(5)
1	Length of lower link	A	700	700
2	Length of lift arm	B	265	265
3	Length of lift rods	C	475 to 550	495
4	Length of top link	D	515 to 795	630
5	Distance of lift rod connection point from pivot point of lower link.	E	345	345
6	Distance of lower link pivot point from rear wheel axis:			
	-Horizontally	F	180, behind	180, behind
	-Vertically	G	150, below	150, below
7	Distance of upper link pivot point from rear wheel axis:			
	-Horizontally	H	280,290 behind	280, behind
	-Vertically	J	220,255, above	220, above
8	Distance of lift arm pivot point from rear wheel axis:			
	-Horizontally	K	75, behind	75, behind
	-Vertically	L	310, above	310, above
9	Height of lower hitch points relative to the rear wheel axis:			
	- In high position	M	180 to 320 above	290 above
	- In low position	N	-645 to -335 below	390 below
10	Height of lower link hitch points when locked in transport position		290	

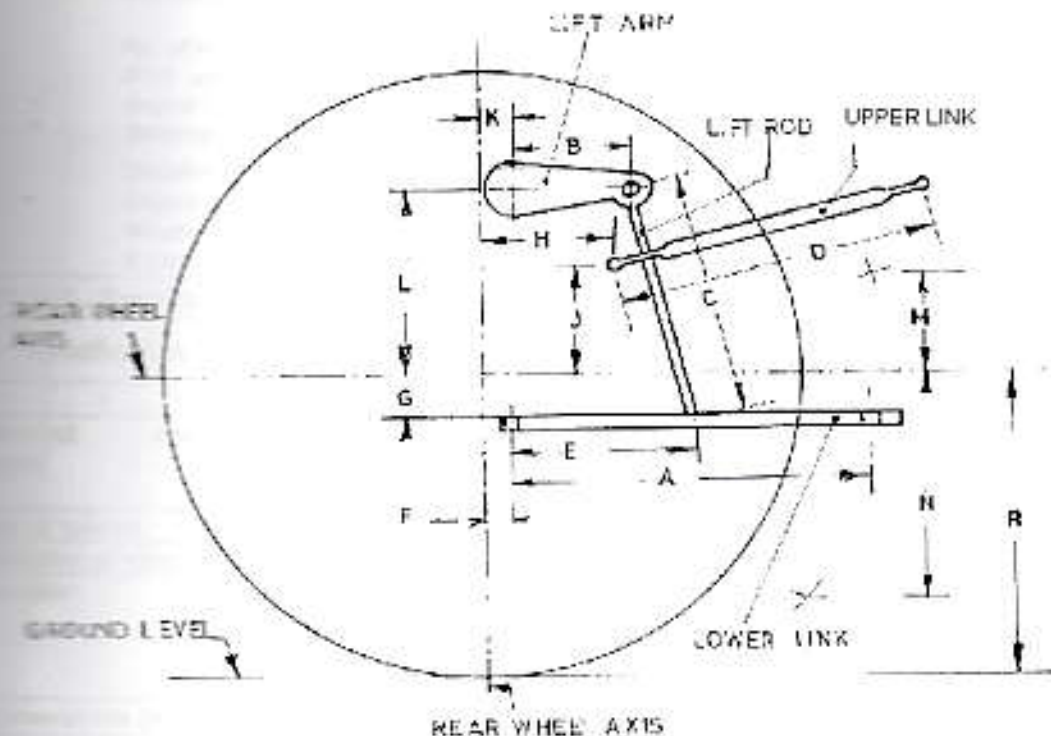


Fig. 1(A): DIMENSIONAL NOTATIONS FOR TABLE OF LINKAGE GEOMETRY

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2.1.13.4.1 Drawbar: Previous sample & Present sample
2.1.13.4.2 Linkage Drawbar (Refer Fig. 1(B)):

Notation	As per IS: 12953-1995 (Cat. II) (mm)	As measured, (mm)	Remarks
A	825 ± 1.5	826	Conforms
B	75 (min)	75.45	Conforms
C	30 (min)	32.31	Conforms
D ₁	27.79 to 28.00	27.92	Conforms
E	49.0 (min)	49.3	Conforms
F ₁	12.0 (min)	12.1	Conforms
G	15.0 (min)	18.0	Conforms
H ₁	25 ± 1	24.0	Conforms
J	80 ± 1.5	80.6	Conforms
No. of holes	9	9	Conforms

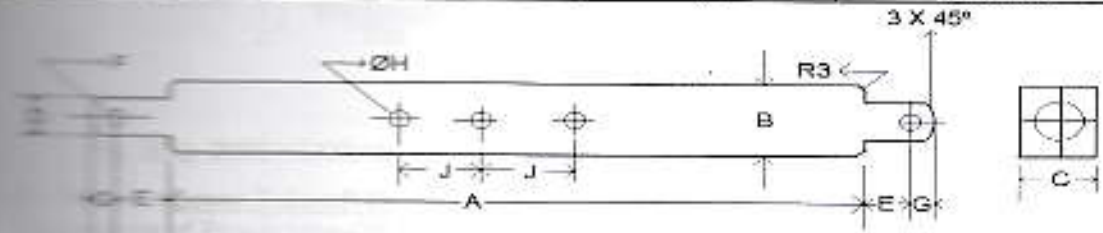


Fig. 1(B): DIMENSIONAL NOTATIONS FOR LINKAGE DRAWBAR

- 2.1.13.4.2 Swinging drawbar : Not provided
- 2.1.14 Power take-off shaft: Previous sample | Present sample
- Type : Type-I, Not independent
 - Method of engaging : By a hand lever provided on LHS of operator's seat
 - No. of shaft(s) : One
 - PTO speed corresponding to rated engine speed (rpm) : 595
 - Other speeds, if any : None
 - Distance behind rear axle, (mm) : 385
 - Engine to PTO speed ratio : 3.36 : 1
 - Whether the PTO shaft is capable of transmitting the full power of engine : Yes

2.1.14.1 Specifications of Power Take-Off Shaft:

Specification	As per IS:4931-1995 (Type-I)	As observed	Remarks
1	2	3	4
Nominal speed (rpm)	540 ± 10	540 rpm of PTO corresponds to 1814 rpm of engine.	Conforms
No. of splines	6	6	Conforms
Direction of rotation	Clockwise	Clockwise	Conforms
Location	The position of the centre of the end of PTO shaft shall be within 50 mm to right or left of the centre line of the tractor	Centrally located	Conforms

Dimensions (mm) [See Fig. 2(A)]:

D _Ø	34.79 ± 0.06	34.83	Conforms
d _Ø	28.91 ± 0.05	28.90	Conforms

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	2	3	4
30	29.4 ± 0.1	29.47	Conforms
40 (Optional)	8.3 ± 0.1	8.3	Conforms
5	8.69 - 0.09 - 0.16	8.6	Conforms
6	7	7	Conforms
10 (Optional)	25 ± 0.5	25.5	Conforms
11	38	38	Conforms
12	30°	30°	Conforms
13	76 (min)	78	Conforms
14	450 to 675	565	Conforms

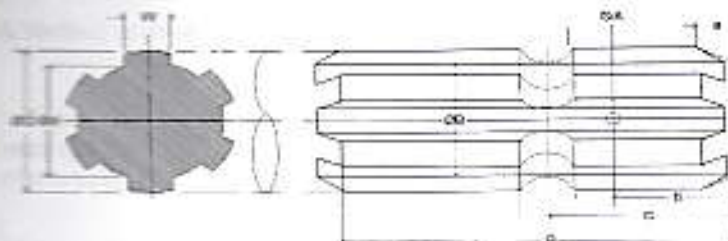


Fig. 2(A): DIMENSIONAL NOTATIONS FOR TYPE-I POWER TAKE-OFF SHAFT

2014.2 Power Take-off Master Shield (Type I&II):

Dimensions of Power take-Off Shaft, [See Fig. 2(B)]:

Specification	As per IS 4931-1995 (mm)	As Observed	Remark
K	70(Min.)	75	Conforms
W	125 ± 5	120	Conforms
N	85 ± 5	115	Conforms
P	285 ± 5	285	Conforms
R	76 (Max.)	0	Conforms

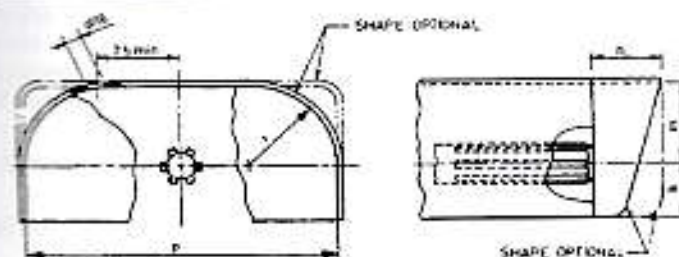


Fig. 2(B): DIMENSIONAL NOTATIONS FOR PTO SHAFT MASTER SHIELD

2015	Towing hitch:	<u>Previous sample</u>	<u>Present sample</u>
2015.1	Front	:	Not Provided
2015.2	Rear:		
	Type	:	Clevis
	Location	:	At rear of transmission housing
	Height above ground level, (mm):		
	- Maximum	:	655
	- Minimum	:	375
	No. of position	:	10
	- Type of adjustment	:	By changing the position of hitch and reversing hitch on its mounting bracket.
	Distance of hitch point, (mm):		
	- From rear axle centre	:	490
	- From power take-off shaft end	:	105
	Dia of pin hole, (mm)	:	29.5
	Width of clevis, (mm)	:	74.25

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	<u>Previous sample</u>	<u>Present sample</u>
Steering:		
Make :	Rane	Danfoss
Type :	Mechanical, Re-circulating ball & nut type, having single drop arm	Open centre, Hydrostatic
Location :	Above the clutch housing	
Method of operation :	Manual, by steering control wheel	
Diameter of steering control wheel, (mm) :	420	420
Make & Type of pump :	Not applicable	Dynamics & tandem Gear pump
Location & Method of drive :	Not applicable	On RHS of engine & driven through timing gears
Number, Type & Location of hydraulic ram cylinder :	Not applicable	One, double acting & in front of front axle.
Steering oil capacity, (l) :	0.80	36.0 (common with transmission, hydraulic & brake.
Lubricant change period :	After every 500 hours	First change after 1300 hours of operation. Subsequent change after every 1200 hours of operation.
Brakes:		
Service Brake:		
Make :	Brakes India Ltd. (apa)	
Type :	Mechanical, oil immersed disc brakes	
Location :	On rear axle shaft, outside of differential housing,	
No. of disc (s) :	Three (on each wheel side)	
Area of liners, (cm ²) :	759.4 (on each wheel side)	
Material of liners :	Organic paper based (apa)	
Method of operation :	Individual or combined pedal operation by right foot of operator	
Parking Brake:		
Type :	Toggle link locking mechanism	
Method of operation :	Service brake act as parking brake when locked in position by a hand lever provided on RHS of the operator's seat.	
Wheel Equipment:		
Steered Wheel(s):		
Make :	Ceat	
Number :	Two	
Type of tyre :	Pneumatic, ribbed	
Size :	6.00 -16	
Ply rating :	8	
Maximum permissible loading capacity of each tyre at 196 kPa pressure, (kgf) :	535 (apa)	
Recommended inflation pressure, (kPa) :		
- for field work :	167	
- for transport :	196	
Track width, (mm) :	1225(Std.),1315,1435,1495,1500 & 1600	
Method of changing track width :	By extending telescopic axle and reversing wheel disc	
Make & size of rim :	SSWL, 4.50E x 16	



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201202	Driving wheel (Standard fitment)	Previous sample	Present sample
	Make :		Apollo
	Number :		Two
	Type of tyre :		Pneumatic, traction
	Size :		12.4 -28
	Plating :		12
	Maximum permissible loading capacity of each tyre at 230 kPa pressure, kgf :		1125
	Recommended inflation pressure, (kPa):		
	- for field work :	118	
	- for transport :	137	
	Track width, (mm) :	1320(Std.),1420,1480,1540,1590,1700 & 1800	
	Method of changing track width :	By reversing the wheel disc & changing the position of wheel disc on off-set rim lugs.	
	Make & size of rim :	Wheels India Ltd., W11 x 28	
201203	Wheel base (mm) :	1840	
	Method of changing wheel base, if any :	None	
201204	Operator's seat:		
	Make :	Polar Auto (apa)	
	Type :	Cushioned	
	Type of suspension :	Helical coil springs	
	Type of dampening :	Hydraulic shock absorber	
	Range of adjustment,(mm):		
	- Vertical :	Nil	
	- Lateral :	Nil	
	- Longitudinal :	± 65	
201205	Provision for safety and comfort of operator in case previous & present sample		
201205.1	Conformity with IS:12343-1998: Operator's seat meets the requirements of IS: 12343-1998, (Re-affirmed in March, 2009).		
201205.2	Conformity with IS: 6283 (Part-1 & 2)-2006 & 2007(Re-affirmed in March, 2009): Controls are identifiable with symbols as per IS: 6283 (Part-1 & 2)-2006 & 2007.		
201205.3	Conformity with IS:8133-1983 (Re-affirmed in March, 2009): Location and movement of various controls meets the requirement of IS: 8133-1983.		
201205.4	Conformity with IS: 12239 (Part-1)-1996 (Re-affirmed in March, 2007): Meets the requirements of IS:12239(Part-1)-1996, except the following: <ul style="list-style-type: none"> ⓐ Provision of spark arresting device in the exhaust system. 		
201205.5	Conformity with IS:12239 (Part-2)-1999 (Re-affirmed in March, 2009): Meets the requirements of IS: 12239 (Part-2)-1999,except the working clearance around the draft control lever .		
201205.6	Conformity with IS: 14683 – 1999 (Re-affirmed in March, 2009) : Lighting requirements conform to IS: 14683-1999.		
201205.7	Rear view mirror: Rear view mirror has been provided		
201205.8	Labelling of tractor as per IS: 10273-1987 (Reaffirmed in March, 2009): The Labelling plate riveted on LHS of mudguard, provides the following information:		

Name of Manufacturer	M/s. Mahindra & Mahindra Ltd. Farm Equipment Sector
Make	Mahindra
Model	YUVO 265 DI
Year of manufacture	FE
Engine serial number	ZGDA 00016
Chassis serial number	ZGDA00016
Maximum P.T.O Power, (kW)	20.37
Specific fuel consumption, g/kWh(g/hph)	243



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10.10.1 Weight:

	Front	Rear	Total
10.10.1.1 With standard ballast	770	1200	1980

10.10.2 Overall dimensions:

Dimension	Length (mm)	Width (mm)	Height (mm)		Ground Clearance, (mm)
			With exhaust Pipe	Without exhaust pipe	
With standard ballast	3300	1860	2140	1720	310 (Below front std. weight)

10.10.3 Number of external lubricating points:

- Oiling : Nil
- Grease nipples : 19
- Grease cups : Nil

10.10.4 Colour of tractor:

- Chassis & engine : Smoke grey
- Bonnet : Red
- Wingguard : Red
- Wheel discs & rims : Red

10.10.5 Optional features :

10.10.6 Driving wheel :

- Make : Good Year
- Number : 02
- Type of tyre : Pneumatic, traction
- Size : 13.6-28
- ply rating : 12
- Maximum permissible loading capacity of each tyre at 230 kPa pressure, (kgf) : 1800

Recommended inflation pressure, (kPa) :

- for field work : 118
- for transport : 137
- Make & size of rim : Wheels India Ltd., W12 x 28

10.10.7 Steering:

- Make : Danfoss
- Type : Open centre, Hydrostatic
- Location : Above the clutch housing
- Method of operation : Manual, by steering control wheel
- Diameter of steering control wheel, (mm) : 420
- Make & Type of pump : Dynamics & tandem Gear pump
- Location & Method of drive : On RHS of engine & driven through timing gears
- Number, Type & Location of hydraulic ram cylinder : One, double acting & In front of front axle.
- Steering oil capacity, (l) : 36.0 (common with transmission, hydraulic & brake.
- Lubricant change period : First change after 1300 hours of operation. Subsequent change after every 1200 hours of operation.



3.2. POWER LIFT AND HYDRAULIC PUMP PERFORMANCE TEST

Dates of test : 05.06.2017 & 06.06.2017

Tractor run at the institute prior to start of : 0.40

Hydraulic test, (h)

Pump speed at rated engine speed, (rpm) : 2100

3.2.1 Hydraulic power test:

Pump delivery rate at minimum pressure : 31.5

and rated engine speed (l/min)

Maximum hydraulic power, (kW) : 5.3

Pump delivery rate at maximum hydraulic : 24.5

power, (l/min)

Pressure at maximum hydraulic power, : 13.0

(MPa)

Sustained pressure of the open relief : 18.5

value, (MPa)

Tapping point:

(a) Relief valve test : External circuit

(b) Pump performance test : Pump outlet

Temperature of hydraulic fluid, (°C) : 60

3.2.2 Lifting capacity test:

Test	Height of lower hitch point above ground in down position, (mm)	Vertical Movement with lifting force, (mm)	Maximum corrected force exerted through full range, (kN)	Corresponding pressure (MPa)	Moment about rear axle, (kN-m)	Maximum tilt angle of mast from vertical (degrees)
1st lift	200	625	15.18	16.65	13.43	--
2nd lift	200	625	9.46	16.65	14.14	20

3.2.3 Maintenance of lift load:

Force applied at the frame, (kN) : 8.5

Temperature of hydraulic fluid at the start : 60

of test, (°C)

Test data:

Elapsed Time, (minute)	5	10	15	20	25	30
Cumulative drop in height of lift, (mm)	0	0	0	0	0	0

4.0 OTHER APPLICABLE TESTS

4.1 TURNING ABILITY

Test sample	Characteristics	Minimum turning diameter, (m)		Minimum clearance diameter, (m)	
		LHS	RHS	LHS	RHS
Previous model	Brake applied	5.61	5.52	5.81	5.72
	Brakes released	6.57	6.54	6.85	6.82
Present model	Brake applied	5.57	5.57	5.81	5.81
	Brakes released	6.51	6.53	6.79	6.81

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15. SUMMARY OF OBSERVATIONS, COMMENTS & RECOMMENDATIONS

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 IS: 12207-2014 for acceptance of tractor for the purpose of subsidies/NABARD financing for the applicable features for this tractor model.

15.1 Evaluative & Non-Evaluative Parameters:

Sl. No.	Characteristic	Category (Evaluative / Non-Evaluative)	Requirements as per IS: 12207-2014	Values declared by the applicant/ requirement		As observed		Whether Variants meet the requirement (Yes/No)
				Previous model	Present Model	Previous model	Present Model	
1	2	3	4	5 a	5 b	6 a	6 b	7
15.1.1 Power, lift and hydraulic pump performance :								
15.1.1.1 Maximum lifting capacity throughout the range of lift, (kN):								
1	At hitch points	Non Evaluative	[Tolerance of minus 10%]	14.70 (D)		18.0	15.18	Yes
2	With the standard frame	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	11.77 (D)		12.50	9.46	Yes
				4.82 (R)				
3	Maximum drop in the height of the point of application of the force after each 5 minutes interval for a total duration of 30 minutes, (mm)	Non Evaluative	Observed value should not exceed 50 mm.	50 (D)		05	00	Yes
15.1.2 Safety features:								
a	Guards against moving and hot parts	Evaluative	Belt drives, pulleys, silencer, hydraulic pipes (As per IS 12239 Part 2)	--		Meets the requirement		Yes
b	Lighting arrangement	Evaluative	As per CMVR	--		Meets the requirements		Yes
c	Sealing requirements (Tractors having more than 1150 mm track width)	Non Evaluative	Should meet the requirements of IS 12343 (as amended from time to time)	--		Meets the requirements		Yes
d	Technical requirements for PTO shaft	Non Evaluative	Should meet the requirements of IS 4931 (as amended from time to time)	--		Meets the requirements		Yes
e	Dimensions of three point linkage	Non Evaluative	Should meet the requirements of IS 4468 (Part 1) (as amended from time to time)	--		Meets the requirements		Yes

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1	2	3	4	5 a	5 b	6 a	6 b	7
171	Specifications of Heavy tractor	Non Evaluative	Should meet the requirements of IS 12953 (as amended from time to time)	--		Meets the requirements		Yes
172	Specifications of Lighter tractor	Non Evaluative	Should meet the requirements of IS 12362 (Part 3) (as amended from time to time)	--		Not provided		NA
173) Labelling of tractors (Provision of labelling plate):								
173.1	Make	Evaluative	Should conform to the requirements of CMVR along-with declared value of PTO HP	--		Mahindra		Yes
173.2	Model	Evaluative		--		Yuvo 265 DI		Yes
173.3	Year of manufacture	Evaluative		--		FE		Yes
173.4	Engine number	Evaluative		--		ZGDA 00016		Yes
173.5	Chassis number	Evaluative		--		ZGDA 00016		Yes
173.6	Declaration of PTO power kW	Evaluative		--		20.37		Yes
174) Literature (Submission to test agency)								
174.1	Operator manual	Evaluative	Provided/Not Provided	Provided		Provided		Yes
174.2	Part Catalogue	Evaluative	Provided/Not Provided	Provided		Provided		Yes
174.3	Maintenance/Service manual	Evaluative	Provided/Not Provided	Provided		Provided		Yes

175) Salient Observations:

175.1) Laboratory tests:

175.1.1) Hydraulic performance :

- i) The lifting capacity at hitch point in case of previous and present sample were recorded as 18.0 kN & 15.18 kN against the declaration of 14.70 kN respectively, which is within the tolerance limit.

175.1.2) Maintenance / Service Problems:

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

175.1.3) Recommendation with regard to safety on tractor:

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

- i) The spark arrester has not been provided in the exhaust system.

175.1.4) Adequacy of Literature supplied with machine:

The following literature has been supplied with the tractor

- a) Service Manual for Mahindra, Yuvo 265 DI tractor.
- b) Parts Catalogue for Mahindra, Yuvo 265 DI tractor.
- c) Operator's manual Mahindra, Yuvo 265 DI tractor.

It is therefore, recommended that following literature may be brought out as per IS: 8132-1999 (Reaffirmed in March, 2009) for the guidance of users and service personnel in national as well as regional languages for this model of tractor.

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6. CITIZEN CHARTER

Time frame for Testing & Evaluation as per Citizen Charter	Duration of Test	Whether the Test Report is released within the time frame given in Citizen Charter	Remarks
10 Months	2 Month (May to June, 2017)	Yes	None

TESTING AUTHORITY:

C.S. RAGHUWANSHI
AGRICULTURAL ENGINEER

C.V. CHIMOTE
TEST ENGINEER

Y.K. RAO
SENIOR AGRICULTURAL
ENGINEER

J.J.R. NARWARE
DIRECTOR

7. APPLICANT'S COMMENTS

--None--

**ANNEXURE-I****TRACTOR RUN HOURS DURING TEST**

A.	LABORATORY AND TRACK TESTS	HOURS
1.	Running -in	--
2.	Hydraulic Performance Test	2.4
3.	Turning ability	0.2
4.	Location of centre of gravity	0.2
B.	Miscellaneous test and other run hours, including idle run transportation, trial and preparation for test.	0.5
	Total	3.3