CEMAGREF

CENTRE NATIONAL
DU MACHINISME AGRICOLE
DU GÉNIE RURAL
DES EAUX ET DES FORÊTS

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Division Tracteurs et Machines Agricoles

TEST REPORT N° 8992

DATE : 2nd september 1992

OECD TEST OF AN AGRICULTURAL TRACTOR (RESTRICTED CODE) 50.3

Reference text : O.E.C.D code II



OECD Approval

N° 1383 Restricted Code

Date 28th august 1992

Tested equipment	
Nature	: TRACTOR
Make	: MASSEY FERGUSON
Model	: B 415/4
Trade name	: 3645-4 PS/4
Number of driving wheels	: 4
Type	: standard

Submitted for tests by

Name : MASSEY FERGUSON S.A.

Address : avenue Blaise Pascal
BP 307
60026 BEAUVAIS CEDEX

Phone : 44.89.33.33 Telex : 140396 F

This test report may only be duplicated as a whole

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1. GENERALITIES

Tractor manufacturer's name and address : MASSEY FERGUSON S.A, BP 307 avenue Blaise Pascal 60026 BEAUVAIS

Submitted for tests by : MASSEY FERGUSON S.A.

Selected for tests by the manufacturer with the agreement of CEMAGREF

Place of running in : BEAUVAIS

Duration of running in : 20 h

Date of arrival of the equipment in CEMAGREF : 29th october 1991

2. SPECIFICATIONS

2.1 Tested tractor

Make : MASSEY FERGUSON
Model : B 415/4
Trade name : 3645-4 PS/4
Number of driving wheels : 4
Type : standard
Serial number : S 175 107
1st serial number : S 175 107

2.2 Engine

2.2.1 Identification

Make : PERKINS
Model : 1006-6 T5
Type : 4 strokes - Direct injection diesel turbocharged
Serial number : U 530 035 V

2.2.2 Cylinders

Number : 6
Disposition : vertical, in line
Bore/stroke : 100/127 mm
Capacity : 5985 cm^3
Compression ratio : 16/1
Arrangement of valves : overhead
Cylinders liners : dry

2.2.3 Supercharging

Make : AIRESEARCH (GARRET)
Model : turbo charger
Type : TB 4135
Supercharging pressure : 0,74 bar

2.2.4 Fuel system

Fuel feed system : piston fuel feed pump
Make, type and model of fuel filter : CAV 2 FAS 58488130, dual element with water trap
Capacity of fuel tank : 260 l (320 l with auxiliary fuel tank)
Make, type and model of injection pump : CAV, DPS 940, rotative
Serial number : 23 709 KHG
Manufacturer's setting of injection pump : 72 ± 2 mm^3/stroke (at rated engine speed and full load)
Injection pump timing : 18° before TDC
Make, type and model of injectors : CAV, LRB 670 3201 LF
Injection pressure : 250 bars

2.2.5 Governor

Make : CAV
Type : DPA
Model : mechanical, incorporated into fuel injection pump
Governed range of engine speed : 1000 - 2310 rev/min

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2.2.6 Rated engine speed : 2200 rev/min

2.2.7 Air cleaner

Pre-cleaner : . Make : DONALDSON
. Type and model : cyclone incorporated into main
. Location : under bonnet

Main : . Make : DONALDSON
. Type and model : dry, FLB10-0070
. Location : under bonnet

Maintenance indicator : lamp on desk board

2.2.8 Lubrication system

Type of feed pump : gear
Total oil capacity including filter : 19 l
Oil change period : 400 h
Type and number of filter : 2 cartridge
Filter change period : 400 h
Recommended oil : see "fuel and lubricants used in test"

2.2.9 Cooling system

Type of coolant : water or water anti-freeze mixture
Type of pump : centrifugal
Description of fan
. Puller
. Number of fan blades : 7
. Fan diameter : 504 mm
Coolant capacity : 25 l
Type of temperature control : thermostatic
Surpressure system : 0,5 bar

2.2.10 Starting system

Safety device : switch operated by main clutch pedal
Make : LUCAS
Type and model : pre-engaged M 127
Power : 2,8 kW
Cold starting aid : thermostart

2.2.11 Electrical system

Voltage : 12 V negative earth
Generator : alternator
. Make : VALEO
. Type and model : alternator 70 A
. Power : 980 W
Batteries
. Number : 2
. Rating : 80 Ah at 20 hours
. Cold starting capacity : 420 A for 60 s at -18°C

2.2.12 Exhaust system

Make : LUCHAIRE
Type : perforated
Model : 107
Location : under bonnet with vertical stack pipe
Height of outlet above ground : 2905 mm

2.3 Transmission

2.3.1 Clutch (travel)

Mak : VALEO
Type : dry, single plate clutch, pushed type
Number of plates : 1
Diameter of plates : 350 mm
Method of operation (for travel) : foot pedal

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2.3 Transmission (continued)

2.3.2 Gear box

Make : MASSEY FERGUSON
Type and model : mechanically operated gear shift, speedshift
Arrangement : 4 gears with four positions speed shift,
2 ranges and one reverse groupe
Number of speeds : 32 forward gears and 32 reverse gears
Available option : none

2.3.3 Rear axle and final drives

Make : MASSEY FERGUSON
Type and model : crown wheel and pinion and inboard epicyclic reduction
Differential lock :
. Type and model : mechanical hydraulically actuated
. Method of engagement : electrical switch
. Method of disengagement : when brake pedal is depressed

2.3.4 Front axle and final drive

Make : GKN
Type and model : crown wheel and pinion and outboard epicyclic gear reduction
Differential lock : automatic
Driven : from main shaft

2.3.6 Total ratios and travelling speeds

Range	Gear	Overall gear ratios	Rated forward speed km/h (*)
T forward	1 A	278,592	2,545
	1 B	238,028	2,979
	1 C	201,654	3,517
	1 D	172,287	4,116
	2 A	183,568	3,863
	2 B	156,840	4,521
	2 C	132,873	5,337
	2 D	113,522	6,247
	3 A	128,498	5,519
	3 B	109,788	6,459
	3 C	93,011	7,624
	3 D	79,466	8,924
	4 A	94,406	7,511
	4 B	80,661	8,791
	4 C	69,335	10,377
	4 D	58,383	12,146
T reverse	1 A	302,608	2,343
	1 B	258,548	2,743
	1 C	219,038	3,237
	1 D	187,139	3,789
	2 A	199,393	3,556
	2 B	170,361	4,162
	2 C	144,327	4,913
	2 D	123,309	5,751
	3 A	139,575	5,081
	3 B	119,253	5,946
	3 C	101,029	7,019
	3 D	86,316	8,215
	4 A	102,545	6,915
	4 B	87,614	8,094
	4 C	74,225	9,554
	4 D	63,416	11,182

T : Turtle, A B C D : quadrupler positions
(*) Calculated for the rated engine speed 2200 rpm and dynamic index ratio of 20.8 - 38 tyres : 855 mm (ISO 4251/1-1984)

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2.3.6 Total ratios and travelling speeds

Range	Gear	Overall gear ratios	Rated forward speed km/h (*)
L avant forward	1 A	84,572	8,385
	1 B	72,259	9,814
	1 C	61,216	11,584
	1 D	52,301	13,558
	2 A	55,726	12,725
	2 B	47,612	14,894
	2 C	40,336	17,580
	2 D	34,462	20,577
	3 A	39,008	18,179
	3 B	33,329	21,277
	3 C	28,235	25,115
	3 D	24,124	29,395
	4 A	28,659	24,743
	4 B	24,486	28,960
	4 C	20,744	/
	4 D	17,723	/
L reverse	1 A	91,863	7,719
	1 B	78,488	9,035
	1 C	66,494	10,664
	1 D	56,810	12,482
	2 A	60,530	11,715
	2 B	51,717	13,712
	2 C	43,814	16,185
	2 D	37,433	18,944
	3 A	42,371	16,736
	3 B	36,202	19,588
	3 C	30,670	23,121
	3 D	26,203	27,062
	4 A	31,130	22,780
	4 B	26,597	26,662
	4 C	22,533	/
	4 D	19,531	/

L : rabbit, A B C D : quadrupler positions
Number of revolutions of front wheels for one revolution of rear wheels : 1,322

(*) Calculated for the rated engine speed 2200 rpm and dynamic index ratio of 20.8 - 38 tyres : 855 mm (ISO 4251/1-1984)

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2.4 Main power take-off

2.4.1 General specifications

Type : rear independant power take-off (wet, hydraulic, multiplate clutch)

Engagement by lever with electrical switch located at the middle of the upper right hand side console

Number of shafts : 1

Method of changing power take-off speed : speed and spline change achieved by physically replacing the 540 rev/min shaft by the 1000 rev/min and vice-versa

2.4.2 Power take-off proportional to engine speed

540 rev/min

Location : at the rear of the tractor on vertical center plane
Diameter of power take-off shaft : 34,9 mm
Number of splines : 6 (in accordance with ISO R 500-1979)
Height above ground : 779 mm with types 20.8-38
Distance from the median plane of the tractor : 0 mm
Distance behind rear axle : 550 mm

Power take-off speed : 596 rev/min
for rated engine speed : 2200 rev/min

Engine speed : 1993 rev/min
for standard power take-off speed : 540 rev/min

Engine to power take-off ratio : 3,69
Power restriction : none
Direction of rotation (viewed facing driving end) : clockwise

1000 rev/min

Location : at the rear of the tractor on vertical center plane
Diameter of power take-off shaft : 34,9 mm
Number of splines : 21 (in accordance with ISO R 500-1979)
Height above ground : 779 mm with types 20.8-38
Distance from the median plane of the tractor : 0 mm
Distance behind rear axle : 498 mm

Power take-off speed : 1053 rev/min
for rated engine speed : 2200 rev/min

Engine speed : 2090 rev/min
for standard power take-off speed : 1000 rev/min

Engine to power take-off ratio : 2,09
Power restriction : none
Direction of rotation (viewed facing driving end) : clockwise

2.4.3 Power take-off proportional to ground speed :

None

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2.5 Power lift

Make : MASSEY FERGUSON
Type : top link, electronic position, draft or mixed control, open centre system
Type and number of cylinders : 2, single acting, diameter 89 mm
Type of linkage lock for transport : hydraulic lock
Relief valve pressure setting : 188 bars
Opening pressure of cylinder safety valve : 200 bars
Lift pump type : gear
Transmission between pump and engine : mechanical
Make and number of filters : 1 - PUROLATOR
Time between oil changes : 1200 h
Time between filter changes : 600 h
Oil capacity : 88 l
Site of oil tank : transmission housing
Type and number of tapping points : 2 - on lift cover
Maximum volume of oil available to external cylinders : 34 l
Recommended oil : see "fuel and lubricants used in test"

2.6 Three-point linkage

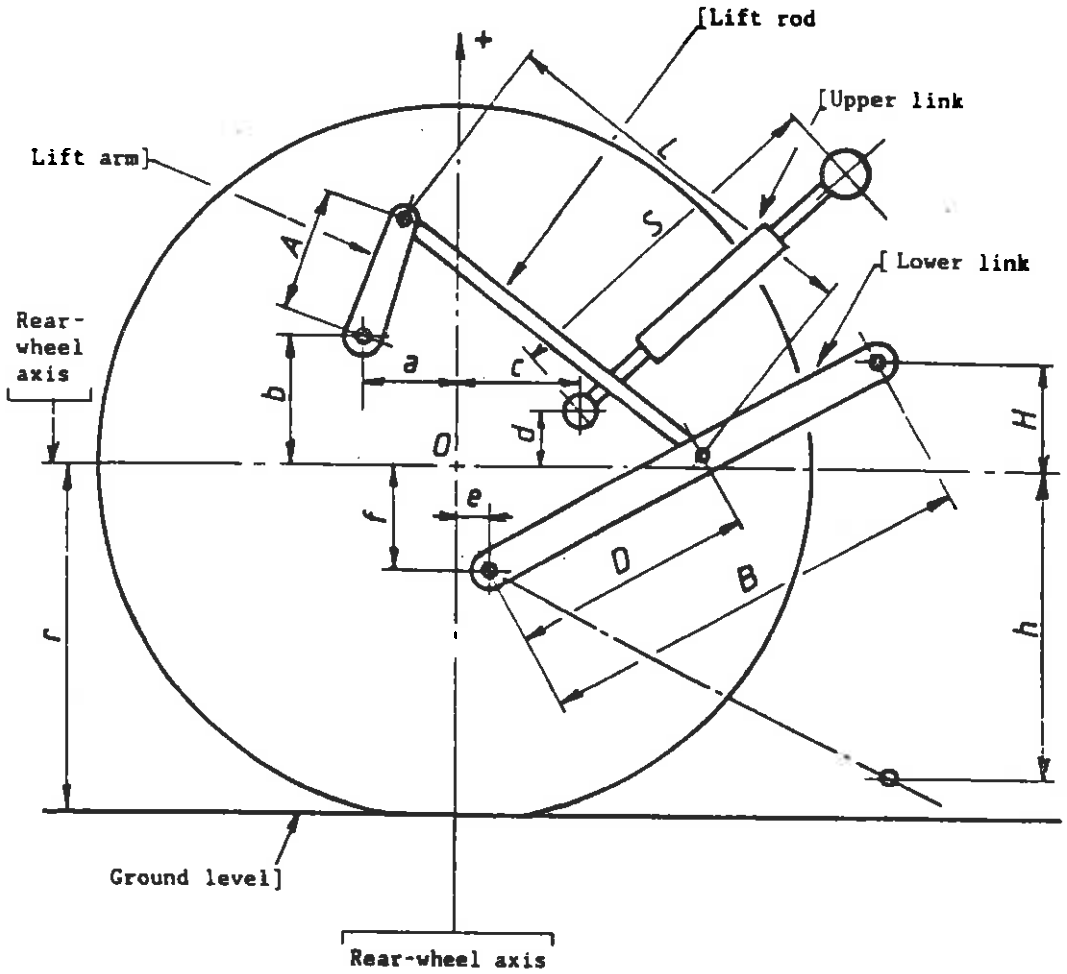
Category : II - III (in accordance with ISO 730/1-1977 art.II)
Category adapter : by changing the rockshafts
Controls : . position control by linear sensor measuring the rockshaft position
. draft control by pin sensors at each lower link

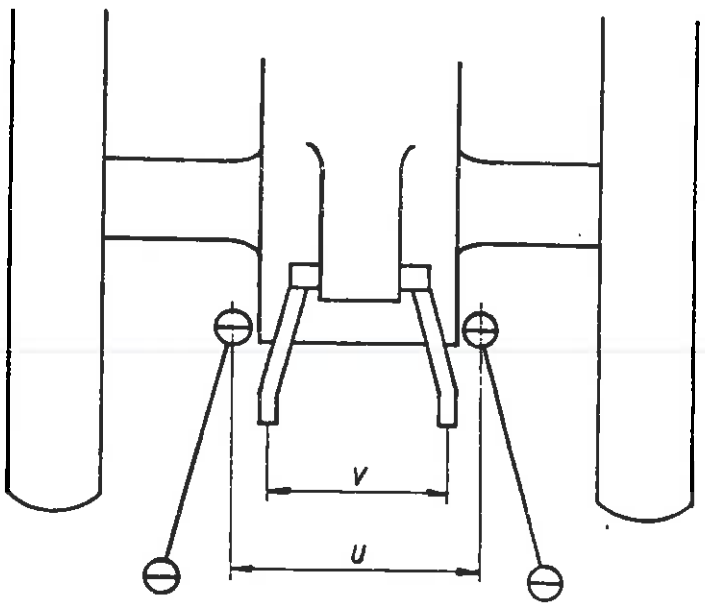
Linkage dimensions (mm)				Settings used for test
Rear tyres : dynamic index radius	20.8 - 38	(r)	855	
Front tyres : dynamic index radius	16.9 - 28	(r')	670	
Length of lift arms		(A)	362	
Length of lower links		(B)	975	
Distance of lift arm pivot point from rear wheels centre line	horizontally	(a)	185,8	
	vertically	(b)	431,8	
Horizontal distance between the two lower link points		(u)	511	
Horizontal distance between the two lift arm end points		(v)	610	
Length of upper link		(S)	from 666 to 786	765
Distance of upper link pivot point from rear wheels centre	horizontally	(c)	428	
	vertically	(d)	179|237	179
Distance of lower link pivot point from rear wheels centre	horizontally	(e)	225	
	vertically	(f)	-300	
Distance of lower link points to lift rod pivot points on lower link		(D)	525	
Length of lift rods		(L)	from 675 to 860	797
Height of lower hitch points relative to the rear wheels centre - in low position		(h)	from 324 to 722	531
- in high position		(H)	from 0 to 328	75
Height of lower hitch points when locked in transport position (*)			from 855 to1183	

(*) Assuming the dynamic index radius = 855 mm (ISO 4251/1-1984)

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2.7 Linkage geometry





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2.8 Swinging drawbar

Height above ground : . maximum : 462 mm
. minimum : 462 mm
Type of adjustment : none
Distance of hitch point from rear axle centre, horizontally : 898 mm
Distance of hitch point from power take-off shaft end : . vertically : 234 mm
. horizontally : 355 mm (540 RPM) - 400 mm (1000 RPM)
Lateral adjustment : 250 mm right and left hands
Distance of pivot point from rear axle horizontally : 128 mm
Diameter drawbar pin hole : 32 mm
Maximum permissible load : .vertically 20 kN
.horizontally 100 kN

2.9 Trailer hitch

Height above ground : . maximum : 1000 mm
. minimum : 760 mm
Distance of hitch point from rear axle centre, horizontally : 749 mm
Distance of hitch point from power take-off shaft end :
. vertically above maximum : 240 mm
minimum : 1 mm
. horizontally : 201 mm (540 RPM) - 251 mm (1000 RPM)
Diameter of pin hole : 30 mm
Maximum vertical permissible load : 30 kN

2.10 Linkage drawbar

Height above ground : . maximum : 1183 mm
. minimum : 261 mm
Horizontal distance to power take-off shaft end : 650 mm (540 RPM) - 700 mm (1000 RPM)
Number of holes : 9
Distance between holes : 84 mm
Hole diameter : 24 mm
Thickness and width of drawbar : 30 X 80 mm

2.11 Front towing hitch

Vertical height at centre of clevis : 863 mm
Width of clevis : 340 mm
Diameter of pin hole : 32 mm

2.12 Steering

Method of operation : hydrostatic steering system, gear box housing mounted on gear pump
Make : DANFOSS steering unit
Model : OSPC - ON
Type : open center type with integral system relief valves, anti-shock end and anti-cavitation valves
Working pressure : 15,7 to 16,2 MPa
Oil capacity : 88 l
Oil change period : 1200 h
Filter change period : 600 h
Recommended oil : see "fuels and lubricants used in test"

2.13 Brakes

2.13.1 Service brake

Make : MASSEY FERGUSON and GIRLING
Model : oil-immersed, 652 cm² friction area on each brake
Type : single disk brake, hydraulic actuated Girling hydraulic master cylinder
MF hydraulic slave annular piston.
Method of operation : independant or dependant operation of twin pedals (which can be latched)

2.13.2 Parking brake

Make and type : SIRMAC - HUSCO - 4 disks
Method of operation : hand lever - cable and rod

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2.13.3 Trailer brake

Make : BOSCH
Type : hydraulically actuated valve to regulate oil flow and pressure to the trailer brakes
proportional and progressive trailer/tractor braking effort is achieved by linking their services together via a sensive valve
Method of operation : automatic, as the right hand side tractor brake pedal is depressed
Maximum braking pressure : 130-150 bars
Maximum flow : 30 l/min

2.14 WHEELS

2.14.1 Number and location

. Front : 2 steering and driving
. Rear : 2 driving

2.14.2 Wheelbase : 2763 mm

2.14.3 Track width adjustment

	Minimum mm	Maximum mm	Adjustment method
Front	1686	2171	Reversing wheels and off-set lug rims
Rear	1588	2180	Reversing wheels and off-set lug rims

2.17 Protective structure specifications

2.17.1 Specifications

Manufacturer's name : MASSEY FERGUSON S.A.
Trade name : 3000 C
Type of structure : . cab
. tiltable : no
CEMAGREF test : 7727
OECD approval number : CSS 057/15

Description : the cab is made up from 3 major sub-assemblies, the plateform, side pillars and roof and the front pillars. These sub-assemblies are bolted together to form the complete cab structure

2.17.2 Driver's seat

Make : GRAMMER DS 85H/90 AR
Type of suspension : parallelogram
Type of damping : gas cylinder
Range of adjustment . longitudinal : 150 mm
. vertical : 60 mm

2.17.3 Miscellaneous

Passenger's seat : either factory fitted or as an accessory
Location : left of the operator
Number of places : 1

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2.18 Lighting

Unrestricted beam angle of head light in plan view in accordance with French regulation

	Height above ground of centre (mm)	Size (mm)	Distance from outside edge of tractor to centre at 2180 mm track width (mm)
Headlights	1237	167 x 107	991
Sidelights	1775	120 x 80	410
Rearlights	1844	300 x 62	289
Reflectors	754	98 x 62	557

3. CONDITIONS DURING TEST

3.1 Overall dimensions

LENGTH m	WIDTH		HEIGHT	
	min m	max m	exhaust silencer m	at top of protective structure
4,649	2,088	2,488	2,905	2,905

3.2 Ground clearance : 428 mm limited by drawbar bracket

3.3 Tractor mass (kg)

(with or without driver but with tanks full and cab)

	Without driver kg	With driver kg
Front	2155	2170
Rear	3755	3810
Total	5910	5980

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3.4 Tyres and track width specifications

	Front	Rear	
Tyres :	GOOD YEAR	GOOD YEAR	
. dimensions	16.9 - 28	20.8 - 38	
. ply rating	8	8	
. type of casing	cross ply	cross ply	
. maximum load (tyre manufacturer's)	18,8	30	kN
. maximum load (tractor manufacturer's)	18,8	30	kN
. inflation pressure (tyre manufacturer's)	1,7	1,3	bar
. dynamic radius index	670	855	mm
Chosen track width :	1968	1850	mm

3.5 Oils and lubrication recommended and used during tests

Engine oil . Type . Viscosity . Classification	B.P TERRAC MANAGER 10 W 30 MIL L 2104 D
Transmission oils . Type . Viscosity . Classification	B.P TERRAC MANAGER 10 W 30 MIL L 2104 D
Final drives oils . Type . Viscosity . Classification	B.P TERRAC MANAGER 10 W 30 MIL L 2104 D
Front differential and final drives . Type . Viscosity . Classification	B.P TERRAC MANAGER 10 W 30 MIL L 2104 D
Hydraulic fluid . Type . Viscosity . Classification	B.P TERRAC MANAGER 10 W 30 API GL 4
Steering oil . Type . Viscosity . Classification	B.P TERRAC MANAGER 10 W 30 API GL 4

- Grease : B.P TERRAC CHARGE

. Number of lubrication points : 10

3.6 Fuel

. Type : Diesel Oil
. Gravity at 15°C : 0,851
. Viscosity : (NFT 60.100) : 4,84 cSt

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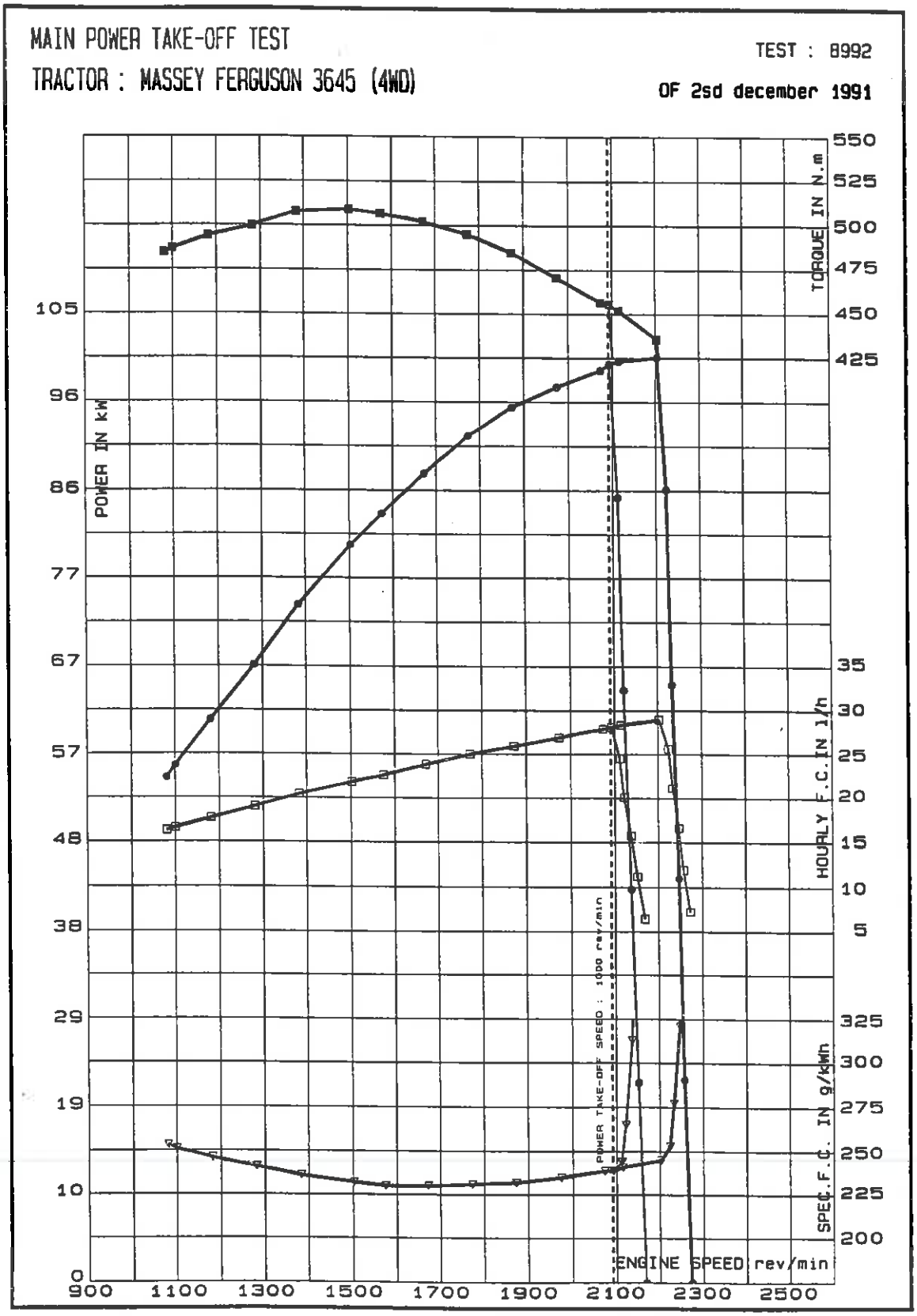
4. COMPULSORY TESTS RESULTS .

4.1 Main power take-off performance

Location and date of tests : Antony , of 2nd december 1991
Type of dynamometer : SCHENCK W400

Power	Speed		Fuel consumption			Specific energy
	Engine	Power take-off	Hourly		Specific	
kW	rev/min		kg/h	l/h	g/kWh	kWh/l
MAXIMUM POWER - TWO HOURS TEST						
100,5	2203	1054	24,64	28,96	245	3,47
MAXIMUM POWER AT RATED ENGINE SPEED						
100,5	2203	1054	24,64	28,96	245	3,47
PART LOADS (governor control being set for maximum power at rated engine speed) (1) Torque corresponding to 85% of the torque at maximum power at rated engine speed .						
86,2	2223	1063	21,81	25,63	253	3,36
(2) 75% of the torque defined in (1) .						
65,0	2232	1068	18,01	21,16	277	3,07
(3) 50% of the torque defined in (1) .						
44,0	2246	1074	14,14	16,62	321	2,65
(4) 25% of the torque defined in (1) .						
22,1	2257	1079	10,15	11,93	459	1,85
(5) Unloaded						
-	2272	1087	6,18	7,26	-	-
MAXIMUM POWER AT STANDARD POWER TAKE-OFF SPEED (1000 +/- 25 rev/min)						
99,8	2093	1001	23,92	28,11	239	3,55
PART LOADS (governor control being set for maximum power at standard power take-off speed) (6) Torque corresponding to 85% of the torque at maximum power at standard power take-off speed						
85,3	2112	1010	20,86	24,51	244	3,48
(7) 75% of the torque defined in (6) .						
64,4	2122	1015	17,11	20,10	265	3,20
(8) 50% of the torque defined in (6) .						
42,8	2137	1022	13,43	15,78	313	2,71
(9) 25% of the torque defined in (6) .						
21,8	2151	1030	9,51	11,17	435	1,95
(10) Unloaded						
-	2168	1037	5,51	6,47	-	-

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MAIN POWER TAKE-OFF TEST
TRACTOR : MASSEY FERGUSON 3645 (4WD)
TEST : 8992
OF 2sd december 1991
POWER IN kW
TORQUE IN N.m
HOURLY F.C. IN l/h
SPEC.F.C. IN g/kWh
ENGINE SPEED rev/min
POWER TAKE-OFF SPEED : 1000 rev/min
0
10
19
29
38
48
57
67
77
86
96
105
425
450
475
500
525
550
5
10
15
20
25
30
35
200
225
250
275
300
325
900
1100
1300
1500
1700
1900
2100
2300
2500

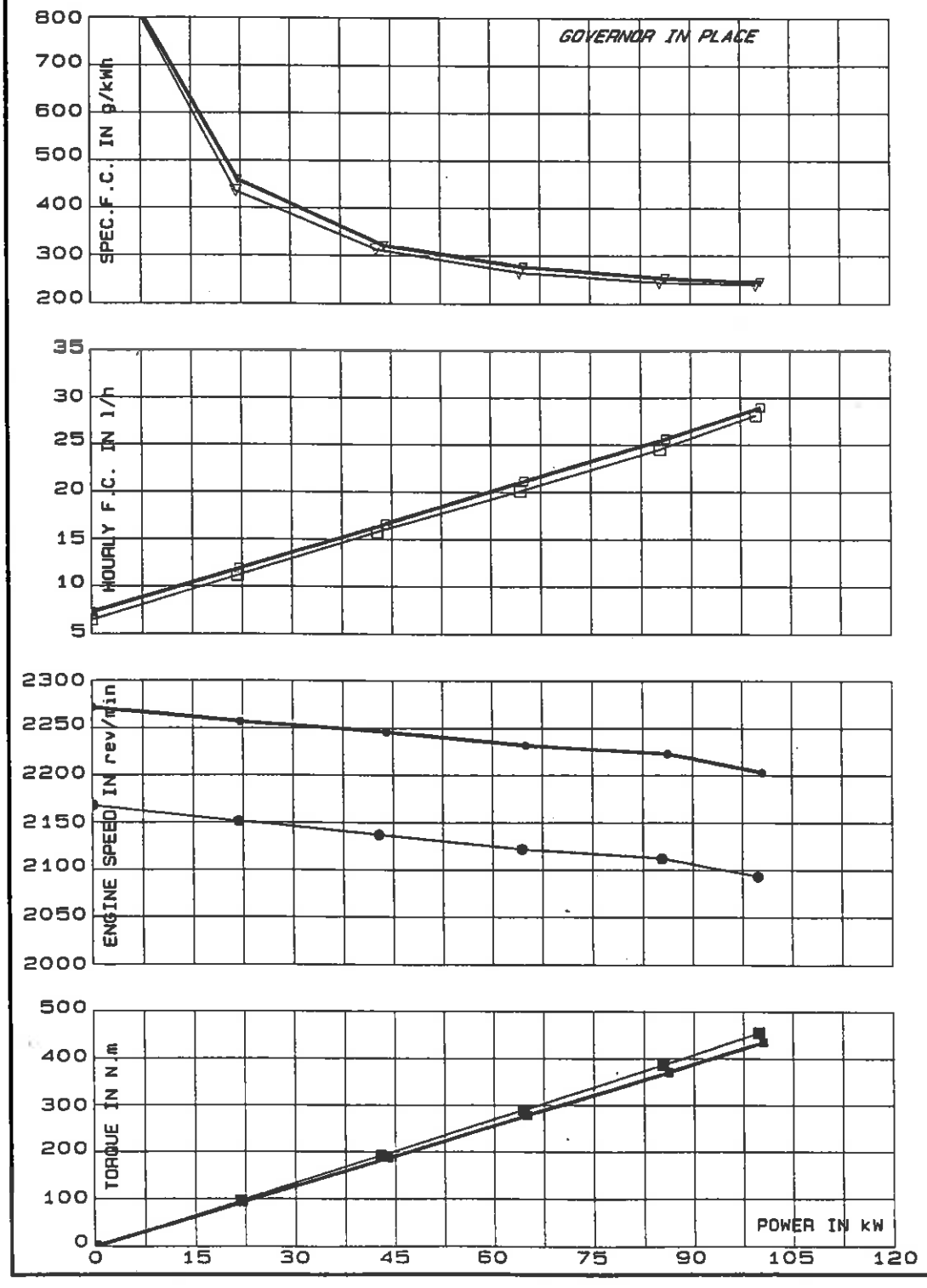
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MAIN POWER TAKE-OFF TEST

TRACTOR : MASSEY FERGUSON 3645 (4WD)

TEST : 8992

OF : 2sd december 1991



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4.1 Main power take-off performance (continued)

Other results

No load, maximum engine speed : 2272 rev/min

Equivalent crankshaft torque at maximum power : 435,6 N.m

Maximum equivalent crankshaft torque : 509,2 N.m at 1502 rev/min

Mean atmospheric conditions

Temperature : 24 °C

Pressure : 1030 mbar

Relative humidity : 34 %

Maximum temperatures

Coolant : 89 °C

Engine oil : 102 °C

Fuel : 33 °C

Air intake : 29 °C

Fuel consumption at variyng load

Charge	Governor control being set for maximum power at rated engine speed		Governor control being set for maximum power at standard pto speed	
	at 85% (1)	at 50% of 85% (2)	at 85% (1)	at 50% of 85% (2)
Hourly consumption (l/h)	25,63	16,62	24,51	15,78
Standard specific consumption (g/kWh)	253	321	244	313

(1) 85% of the torque corresponding to maximum power for the position of the governor hand lever

(2) 50% of the torque defined in (1)

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4.2 Lifting force and hydraulic power

Date : 30th january 1992

4.2.1 Hydraulic power test

4.2.1.1 Hydraulic pump (lift and auxiliary service connections number 1 and 2)

- Tapping point used for test : auxiliary service connection
- Sustained pressure with relief valve open : 188 bars
- Pump delivery rate at minimum pressure : 50,1 l/min

	Flow rate l/min	Pressure bars	Power kW
Flow rate corresponding to a hydraulic pressure equivalent to 90 percent of the actual relief valve pressure setting and corresponding hydraulic power	44,6	169	12,6
Flow rate and hydraulic pressure corresponding to maximum hydraulic power	44,6	169	12,6

4.2.1.2 Hydraulic pump (auxiliary service connections number 3 and 4)

- Tapping point used for test : auxiliary service connection
- Sustained pressure with relief valve open : 188 bars
- Pump delivery rate at minimum pressure : 52,2 l/min

	Flow rate l/min	Pressure bars	Power kW
Flow rate corresponding to a hydraulic pressure equivalent to 90 percent of the actual relief valve pressure setting and corresponding hydraulic power	37,8	168	10,6
Flow rate and hydraulic pressure corresponding to maximum hydraulic power	42,0	165	11,5

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4.2 Lifting force and hydraulic power

4.2.2 Power lift test

Hydraulic fluid : see "fuel and lubricants used in tests"

	at the hitch point	on the frame
Height of lower hitch point above ground in low position mm	324	341
Vertical movement mm	606	655
Maximum force exerted through full range kN	56,0	51,5
Corresponding pressure of hydraulic fluid bar	169	169
Moment about rear axle kN.m	67,2	93,5
Maximum tilt angle of mast over range of lift degree	/	5 °

4.2.2 Power lift test

Lifting height (1)	mm	-231	-214	-150	-100	0	+100	+200	+350	+375	+441
Lifting force (2)	at the hitch point kN	56,0	56,2	57,9	59,1	60,5	61,8	63,2	64,9	65,5	-
	at the frame kN	-	56,8	57,2	57,0	56,5	56,1	55,1	53,4	52,8	51,5

Corresponding pressure : 169 bars

(1) Lifting height relative to the horizontal plane including the lower link pivot points
(2) The values of force measured are corrected to correspond to a hydraulic pressure equivalent to 90% of the actual relief valve pressure setting or to maximum power delivered by the hydraulic system, whichever is lower.

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4.3 Drawbar performance (unballasted tractor)

Date and location of test : 13th december 1991, Antony

Type of track : Tarmacadam
Height of drawbar above ground : 0,54 m

Tyres	Front	Rear
. Size :	16.9 - 28	20.8 - 38
. Inflation pressure (bar) :	1,3	1,1

Atmospheric conditions :
- . Temperature : 06°C
- . Pressure : 1030 mbar
- . Relative humidity : 60 %

Gear ratio	Travelling speed km/h	Drawbar pull kN	Power kW	Engine speed rev/min	Wheelslip %	Specific consumption g/kWh	Specific energy kW/l	Temperatures (1) °C	(2) °C	(3) °C
MAXIMUM POWER IN TESTED GEAR										
1 T A	2,27	56,3	35,4	2244	15	415	2,06	8	84	86
1 T B	2,64	55,4	40,6	2238	15	395	2,16	19	83	90
1 T C	3,10	55,4	47,7	2232	15	365	2,34	20	82	91
2 T A	3,37	55,1	51,6	2231	15	351	2,43	25	83	92
1 T D	3,63	55,1	55,6	2219	15	345	2,48	25	83	92
2 T B	3,95	55,8	60,1	2207	15	335	2,55	26	83	91
2 T C	4,65	54,9	71,0	2207	15	320	2,66	25	83	90
3 T A	5,05	52,4	73,5	2228	12	314	2,71	27	83	91
2 T D	5,63	53,1	83,1	2198	12	307	2,78	25	84	93
3 T B	5,98	51,2	85,1	2213	10	298	2,85	26	84	90
4 T A	7,15	43,8	87,1	2204	7	295	2,88	24	82	95
3 T C	7,18	43,7	87,1	2191	7	290	2,94	26	83	98
1 L A	7,94	40,2	88,7	2186	7	284	3,00	25	83	100
4 T B	8,37	37,7	87,5	2174	6	286	2,98	26	82	98
3 T D	8,44	37,1	87,9	2184	6	285	2,99	24	86	97
1 L B	9,30	34,4	88,9	2155	6	280	3,04	25	83	96
4 T C	9,93	31,5	87,0	2163	5	286	2,97	24	85	97
1 L C	11,16	28,2	87,3	2160	4	284	3,00	25	85	96
4 T D	11,58	26,7	85,8	2136	4	288	2,95	25	85	95
2 L A	12,20	26,0	88,1	2141	4	281	3,03	25	85	96
1 L D	13,01	24,0	86,8	2138	4	284	3,00	25	84	96
2 L B	14,35	21,8	87,1	2138	4	282	3,02	22	84	98

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4.3 Drawbar performance (unballasted tractor) (continued)

Gear ratio	Travelling speed km/h	Drawbar pull kN	Power kW	Engine speed rev/min	Wheelslip %	Specific consumption g/kWh	Specific energy kW/l	Temperatures (1) °C	(2) °C	(3) °C
TRANSMISSION AND FUEL CONSUMPTION CHARACTERISTICS (1) Maximum drawbar power in tested gear										
1 L B	9,30	34,4	88,9	2155	6	280	3,04	25	83	96
(2) 75% of pull at maximum power at rated engine speed										
1 L B	9,68	25,7	69,2	2205	4	304	2,80	25	83	95
(3) 50% of pull at maximum power at rated engine speed										
1 L B	9,85	17,1	46,9	2215	3	356	2,39	25	83	94
(4) next higher gear at reduced engine speed, same pull and travelling speed as in (2)										
1 L C	9,68	25,8	69,5	1870	4	283	3,01	23	84	90
(5) next higher gear at reduced engine speed, same pull and travelling speed as in (3)										
1 L C	9,87	17,2	47,1	1886	3	315	2,71	22	82	88
(6) Maximum drawbar power in selected gear nearest to 7,5 km/h										
4 T A	7,15	43,8	87,1	2204	7	295	2,88	24	82	95
(7) 75% of pull at maximum power										
4 T A	7,50	33,5	69,7	2218	3	271	3,14	18	82	88
(8) 50% of pull at maximum power										
4 T A	7,64	22,2	47,0	2224	2	307	2,78	26	82	89
(9) Higher gear at reduced engine speed; same pull and travelling speed as in (7)										
1 L A	7,37	33,0	67,5	1991	3	286	2,97	25	83	95
(10) Higher gear at reduced engine speed; same pull and travelling speed as in (8)										
1 L A	7,54	21,4	44,8	2001	2	328	2,60	25	82	90

(1) Fuel temperature - (2) Coolant temperature - (3) Engine oil temperature

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5. OPTIONAL TESTS RESULTS

5.2 Measurement of external noise level

Date of test : 9th december 1991
Type of sound level meter : BRUEL & KJAER 2209
Type of track : Tarmacadam
Gear : 4 L B
Travelling speed before acceleration : 22,5 km/h
Sound level : 85 dB(A)

6. REPAIRS AND ADJUSTMENTS DURING TESTS

none

Le Technicien chargé des essais	L'Ingénieur responsable des essais	Le Chef de la Division Tracteurs et Machines Agricoles
M.HOCQUEL	E.HUGO	J.F.GOUPILLON

- This test report was approved for publication by the requester of the test -

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