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° 9531 **DATE : 8th february 1993**

OECD TEST OF AN AGRICULTURAL TRACTOR (RESTRICTED CODE) 50.3

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



OECD Approval
N° 1426 Restricted Code
Date : 1st february 1993

Tested equipment	
Nature	: TRACTOR
Make	: MASSEY FERGUSON
Model	: B 115/4
Trade name	: 3115-4 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 **Fax** : 44.89.34.18

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 : 3rd november 1992

2. SPECIFICATIONS

2.1 Tested tractor

ake : MASSEY FERGUSON
Model : B 115/4
Trade name : 3115-4 PS/4
Number of driving wheels : 4
Type : standard
Serial number : A 170006
1st serial number : A 170006

2.2 Engine

2.2.1 Identification

Make : PERKINS
Model : 1006-6 LR
Type : 4 strokes - Direct injection diesel - Naturally aspirated
Serial number : U 541 407 W

2.2.2 Cylinders

Number : 6
Disposition : vertical, in line
Bore/stroke : 100/127 mm
Capacity : 5985 cm^3
Compression ratio : 16,5/1
Arrangement of valves : overhead
Cylinders liners : dry

2.2.3 Supercharging : none

2.2.4 Fuel system

Fuel feed system : Diaphragm fuel feed pump
Make, type and model of fuel filter : CAV 2 FAS 58488130, dual element with water trap
Capacity of fuel tank : 190 l
Make, type and model of injection pump : CAV, DPA 939, rotative
Serial number : 07981 EFG
Manufacturer's setting of injection pump : 63 ± 2 mm^3/stroke (at rated engine speed and full load)
Injection pump timing : 22° before TDC
Make, type and model of injectors : CAV, LRB 680 1058 EDG
Injection pressure : 220 bars

2.2.5 Governor

Make : CAV
Type : DPA
Model : mechanical, incorporated into fuel injection pump
Governed range of engine speed : 850 - 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 of air intake : in front of engine and under bonnet

Main : . Make : DONALDSON
. Type and model : dry ELB 08-0024
. Location : in front of engine and 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 : 1 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 : Electrical switch under 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 :
. Make : VALEO
. Type and model : alternator 70 AMS
. Power : 980 W
Batteries
. Number : 2
. Cold starting capacity : 420 A for 60 s at -18°C each

2.2.12 Exhaust system

Make : LUCHAIRE
Type : perforated
Model : 86
Location : under bonnet with vertical stack pipe
Height of outlet above ground : 2774 mm

2.3 Transmission

2.3.1 Clutch (travel)

Make : VALEO
Type : dry, single plate, pushed type
Number of plates : 1
Diameter of plates : 330 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 : creeper

2.3.3 Rear axle and final drives

Make : MASSEY FERGUSON
Type and model : crown wheel and pinion and outboard epicyclic gear 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 drives

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	Number of engine revolutions for one revolution of the driving wheels	Nominal travelling speed (*) at rated engine speed of 2200 rev/min km/h
T forward	1 A	332,516	2,045
	1 B	284,101	2,394
	1 C	240,686	2,826
	1 D	205,635	3,307
	2 A	195,701	3,475
	2 B	167,207	4,067
	2 C	141,655	4,801
	2 D	121,026	5,619
	3 A	148,686	4,574
	3 B	127,037	5,353
	3 C	107,624	6,319
	3 D	91,951	7,396
	4 A	109,879	6,189
	4 B	93,881	7,244
	4 C	79,534	8,551
	4 D	67,952	10,008
T reverse	1 A	365,075	1,863
	1 B	311,919	2,180
	1 C	264,253	2,574
	1 D	225,770	3,012
	2 A	214,864	3,165
	2 B	183,579	3,704
	2 C	155,526	4,373
	2 D	132,876	5,118
	3 A	163,245	4,166
	3 B	139,476	4,876
	3 C	118,162	5,755
	3 D	100,954	6,736

T : Turtle, A B C D : quadrupler positions
(*) Calculted for dynamic index radius of 18.4 R 38 : 820 mm (ISO 4251/1-1984)

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2.3.6 Total ratios and travelling speeds (continued)

Range	Gear	Number of engine revolutions for one revolution of the driving wheels	Nominal travelling speed (*) at rated engine speed of 2200 rev/min km/h
T	4 A	120,638	5,637
	4 B	103,073	6,598
reverse	4 C	87,322	7,788
	4 D	74,605	9,116
	1 A	88,715	7,666
	1 B	75,798	8,972
	1 C	64,215	10,590
	1 D	54,863	12,396
	2 A	52,213	13,025
	2 B	44,610	15,245
L	2 C	37,793	17,994
	2 D	32,289	21,062
forward	3 A	39,669	17,143
	3 B	33,893	20,065
	3 C	28,714	23,684
	3 D	24,532	27,722
	4 A	29,316	23,198
	4 B	25,047	27,152
	4 C	21,220	32,048
	4 D	18,129	37,512
	1 A	97,401	6,982
	1 B	83,219	8,172
	1 C	70,502	9,646
	1 D	60,235	11,290
	2 A	57,325	11,863
	2 B	48,979	13,885
L	2 C	41,494	16,183
	2 D	35,451	19,183
reverse	3 A	43,553	15,615
	3 B	37,212	18,275
	3 C	31,525	21,249
	3 D	26,934	26,327
	4 A	32,186	21,129
	4 B	27,500	24,730
	4 C	23,297	29,191
	4 D	19,905	34,165

T : Turtle, L : rabbit, A B C D : quadrupler positions
(*) Calculted for dynamic index radius of 18.4 R 38 : 820 mm (ISO 4251/1-1984)

Number of revolutions of front wheels for one revolution of rear wheels : 1,308

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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 : 777 mm with tyres 18.4 R 38
Distance from the median plane of the tractor : 0 mm
Distance behind rear axle : 475 mm

Power take-off speed : 601 rev/min
for rated engine speed : 2200 rev/min

Engine speed : 1976 rev/min
for standard power take-off speed : 540 rev/min

Engine to power take-off ratio : 3,66
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 : 777 mm with tyres 18.4 R 38
Distance from the median plane of the tractor : 0 mm
Distance behind rear axle : 475 mm

Power take-off speed : 1100 rev/min
for rated engine speed : 2200 rev/min

Engine speed : 2000 rev/min
for standard power take-off speed : 1000 rev/min

Engine to power take-off ratio : 2,00
Power restriction : none
Direction of rotation (viewed facing driving end) : clockwise

2.4.3 Power take-off proportional to ground speed :

Speed of shaft : both 540 and 1000 rev/min
Size of : 18.4 R 38
Travelling distance for one revolution of power take-off shaft : 0,626 (540); 0,342 (1000)
Number of power take-off shaft revolutions for one revolution rear wheels : 8,23 (540); 15,08 (1000)
Direction of rotation with forward gear engaged : clockwise

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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 73 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 : 64 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 : 25 l
Recommended oil : see "fuel and lubricants used in test"

2.6 Three-point linkage

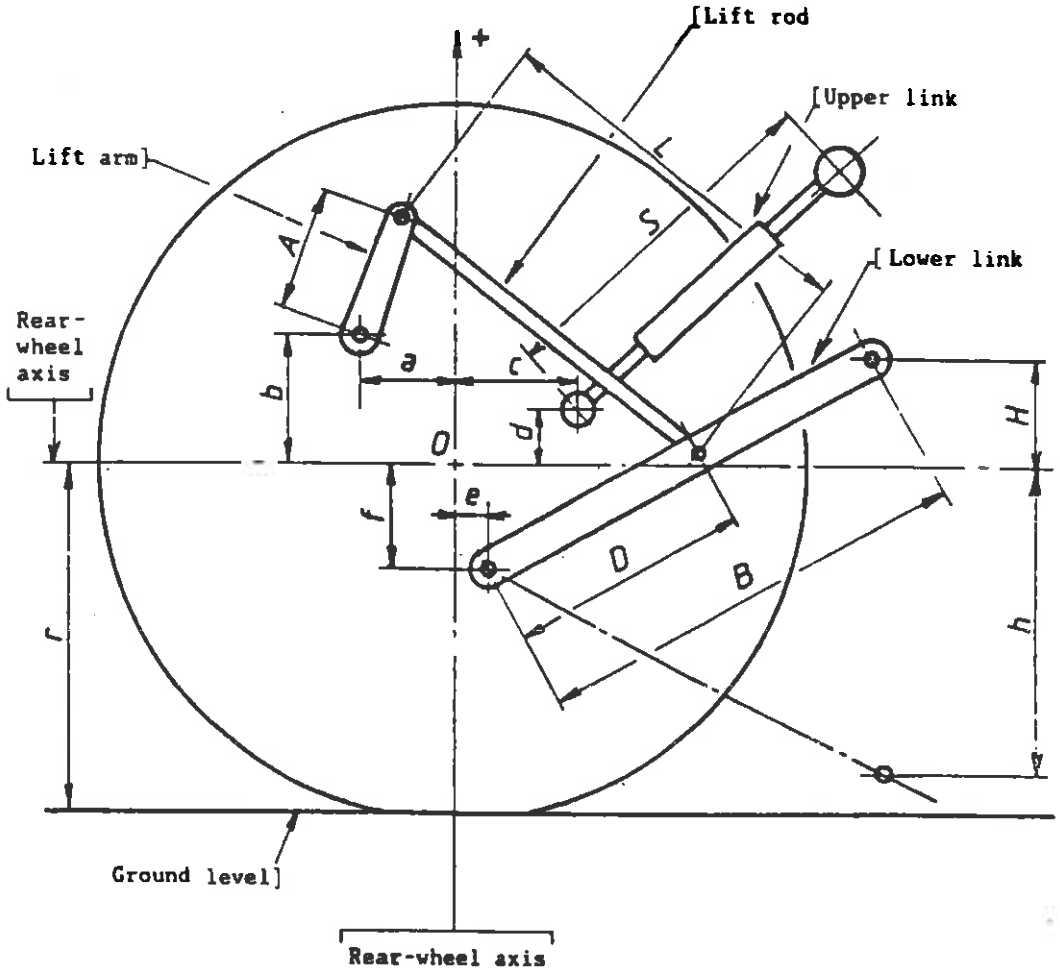
Category : II - III (in accordance with ISO 730/1-1977 art.II)
Category adapter : by changing the rockshafts
Controls : . position control by linear sensor measuring the rockshaft position
. draft control by pin sensors at each lower link

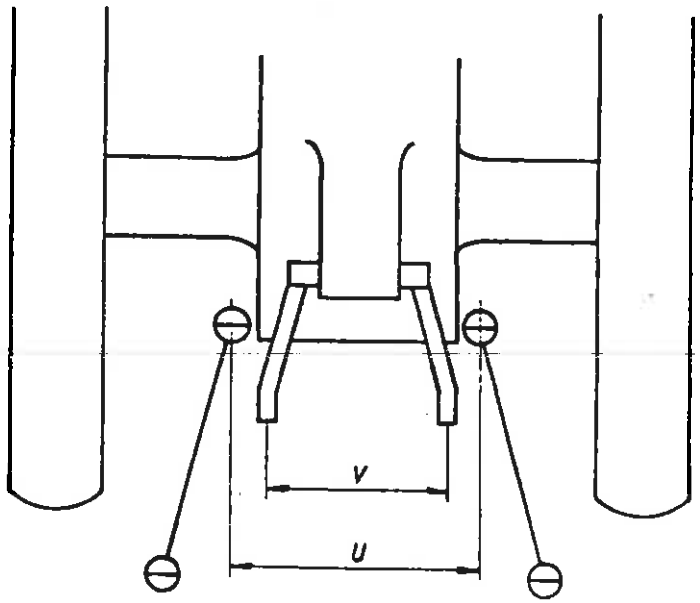
Linkage dimensions (mm)				Settings used for test
Rear tyres : dynamic index radius	18.4 R 38	(r)	820	
Front tyres : dynamic index radius	14.9 R 28	(r')	640	
Length of lift arms		(A)	295	
Length of lower links		(B)	940	
Distance of lift arm pivot point from rear wheels centre line	horizontally	(a)	+128	
	vertically	(b)	+330	
Horizontal distance between the two lower link points		(u)	610	
Horizontal distance between the two lift arm end points		(v)	626	
Length of upper link		(S)	from 669 to 827	732
Distance of upper link pivot point from rear wheels centre	horizontally	(c)	+382	
	vertically	(d)	+120/160/200	200
Distance of lower link pivot point from rear wheels centre	horizontally	(e)	161	
	vertically	(f)	-280	
Distance of lower link points to lift rod pivot points on lower link		(D)	550/650	550
Length of lift rods		(L)	from 595 to 827	755
Height of lower hitch points relative to the rear wheels centre				
- in low position		(h)	from 174 to 158	570
- in high position		(H)	from - 7 to 341	45
Height of lower hitch points when locked in transport position (*)			from 813 to 1161	

(*) Assuming the dynamic index radius = 820 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 : 543 mm
. minimum : 543 mm
Type of adjustment : none
Distance of hitch point from rear axle centre, horizontally : 875 mm
Distance of hitch point from power take-off shaft end : . vertically : 234 mm
. horizontally : 400 mm
Lateral adjustment : 283 mm right and left hands
Distance of pivot point from rear axle horizontally : 106 mm to rear
Diameter drawbar pin hole : 30 mm
Maximum permissible load : .vertically 17 kN

2.9 Trailer hitch

Height above ground : . maximum : 1000 mm
. minimum : 614 mm
Distance of hitch point from rear axle centre, horizontally : 619 mm ou 634
Distance of hitch point from power take-off shaft end :
. vertically above maximum : 223 mm
minimum : 162 mm
. horizontally : 144/162 mm
Diameter of pin hole : 33 mm
Maximum vertical permissible load : 17 kN

2.10 Linkage drawbar

Height above ground : . maximum : 1161 mm
. minimum : 62 mm
Horizontal distance to power take-off shaft end : 627,5 mm
Number of holes : 9
Distance between holes : 80 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 : 851 mm
Width of clevis : 365 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 : 64 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 : 2699 mm

2.14.3 Track width adjustment

	Minimum mm	Maximum mm	Adjustment method
Front	1548	2072	Lugs
Rear	1530	1950	Lugs

2.17 Protective structure specifications

2.17.1 Specifications

Manufacturer's name : MASSEY FERGUSON S.A.
Trade name : 3000 B
Type of structure : . cab
. tiltable : no
CEMAGREF test : 8691
OECD approval number : CSS 0181/6

Description : see test report

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 1950 mm track width (mm)
Headlights	1208	167 x 107	1057
Sidelights	1720	120 x 80	460
Rearlights	1734	300 x 62	444
Reflectors	769	98 x 62	723

3. CONDITIONS DURING TEST

3.1 Overall dimensions

LENGTH m	WIDTH		HEIGHT	
	min m	max m	exhaust silencer m	at top of protective structure
4,323	1,899	2,399	2,774	2,774

3.2 Ground clearance : 455 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	1795	1810
Rear	3095	3155
Total	4890	4965

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3.4 Tyres and track width specifications

	Front	Rear	
Tyres :	GOOD YEAR	GOOD YEAR	
. dimensions	14.9 R 28	18.4 R 38	
. ply rating	8	8	
. type of casing	radial	radial	
. maximum load (tyre manufacturer's)	18,4	27	kN
. maximum load (tractor manufacturer's)	18,4	27	kN
. inflation pressure (tyre manufacturer's)	1,4	1,3	bar
. dynamic radius index	640	820	mm
Chosen track width :	1864	1530	mm

3.5 Oils and lubrication recommended and used during tests

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

- Grease : BP TERRAC CHARGE

. Number of lubrication points : 10

3.6 Fuel

. Type : Diesel Oil (in accordance to AFNOR standard NFM 15 - 008)
. 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, 12th november 1992
Type of dynamometer : SCHENCK W780

Power	Speed		Fuel consumption			Specific
	Engine	Power take-off	Hourly		Specific	energy
kW	rev/min		kg/h	l/h	g/kWh	kWh/l
MAXIMUM POWER - TWO HOURS TEST						
78,2	2215	1108	20,07	23,58	257	3,31
MAXIMUM POWER AT RATED ENGINE SPEED						
78,2	2215	1108	20,07	23,58	257	3,31
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 .						
68,2	2258	1129	17,30	20,33	253	3,36
(2) 75% of the torque defined in (1) .						
51,1	2269	1134	13,69	16,09	268	3,17
(3) 50% of the torque defined in (1) .						
33,9	2273	1136	10,30	12,10	304	2,80
(4) 25% of the torque defined in (1) .						
17,0	2280	1140	7,45	8,75	437	1,95
(5) Unloaded						
-	2293	1147	4,96	5,83	-	-
MAXIMUM POWER AT STANDARD POWER TAKE-OFF SPEED (1000 +/- 25 rev/min)						
75,3	2005	1002	18,82	22,12	250	3,40
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						
65,1	2035	1017	15,69	18,44	243	3,51
(7) 75% of the torque defined in (6) .						
49,3	2052	1026	12,22	14,37	248	3,43
(8) 50% of the torque defined in (6) .						
33,1	2066	1033	9,34	10,98	283	3,01
(9) 25% of the torque defined in (6) .						
16,6	2080	1040	6,63	7,79	400	2,13
(10) Unloaded						
-	2096	1048	4,17	4,90	-	-

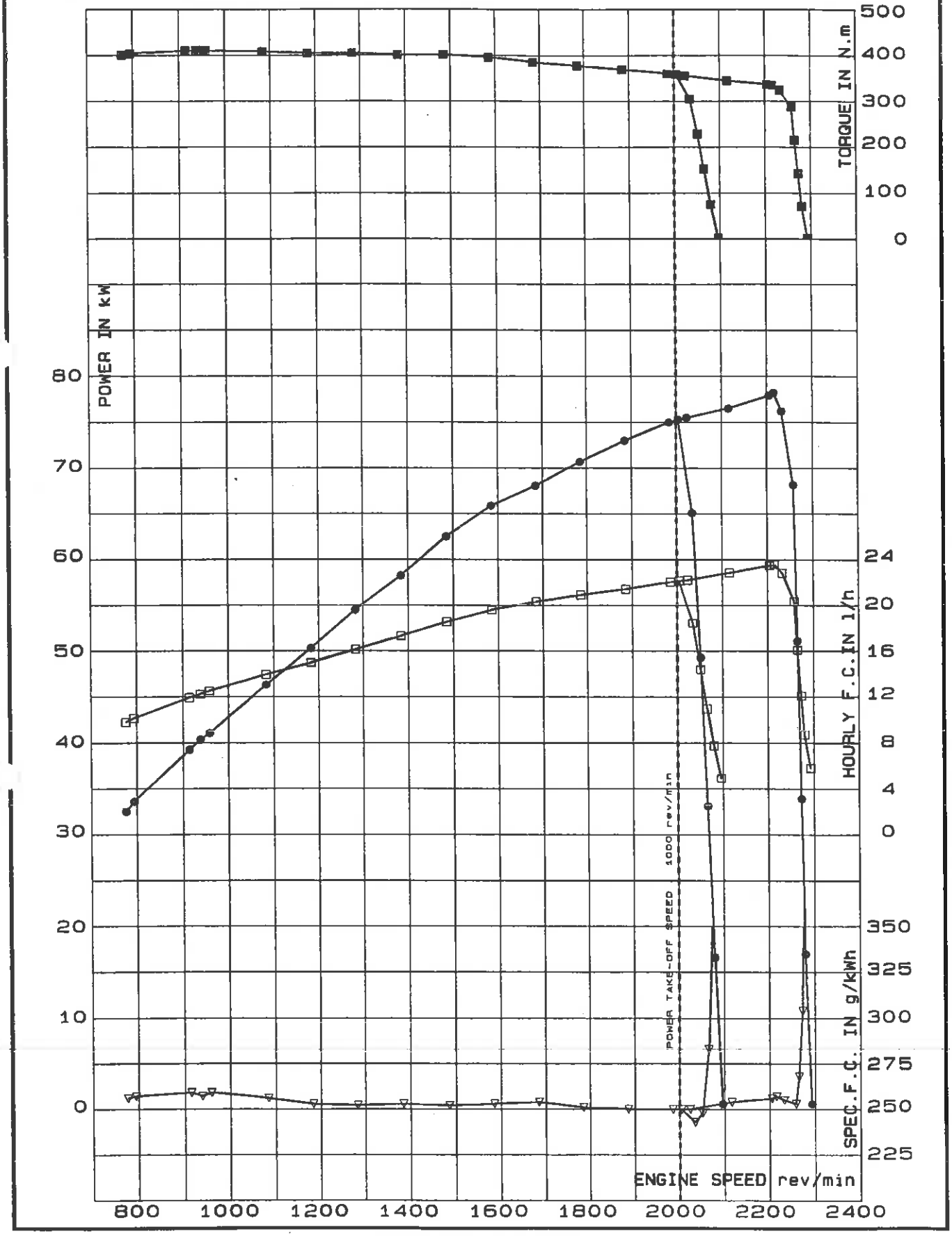
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MAIN POWER TAKE-OFF TEST

TEST : 9531

TRACTOR : MASSE FERGUSON 3115-4 (PS/4) 4WD

OF 12th november 1992



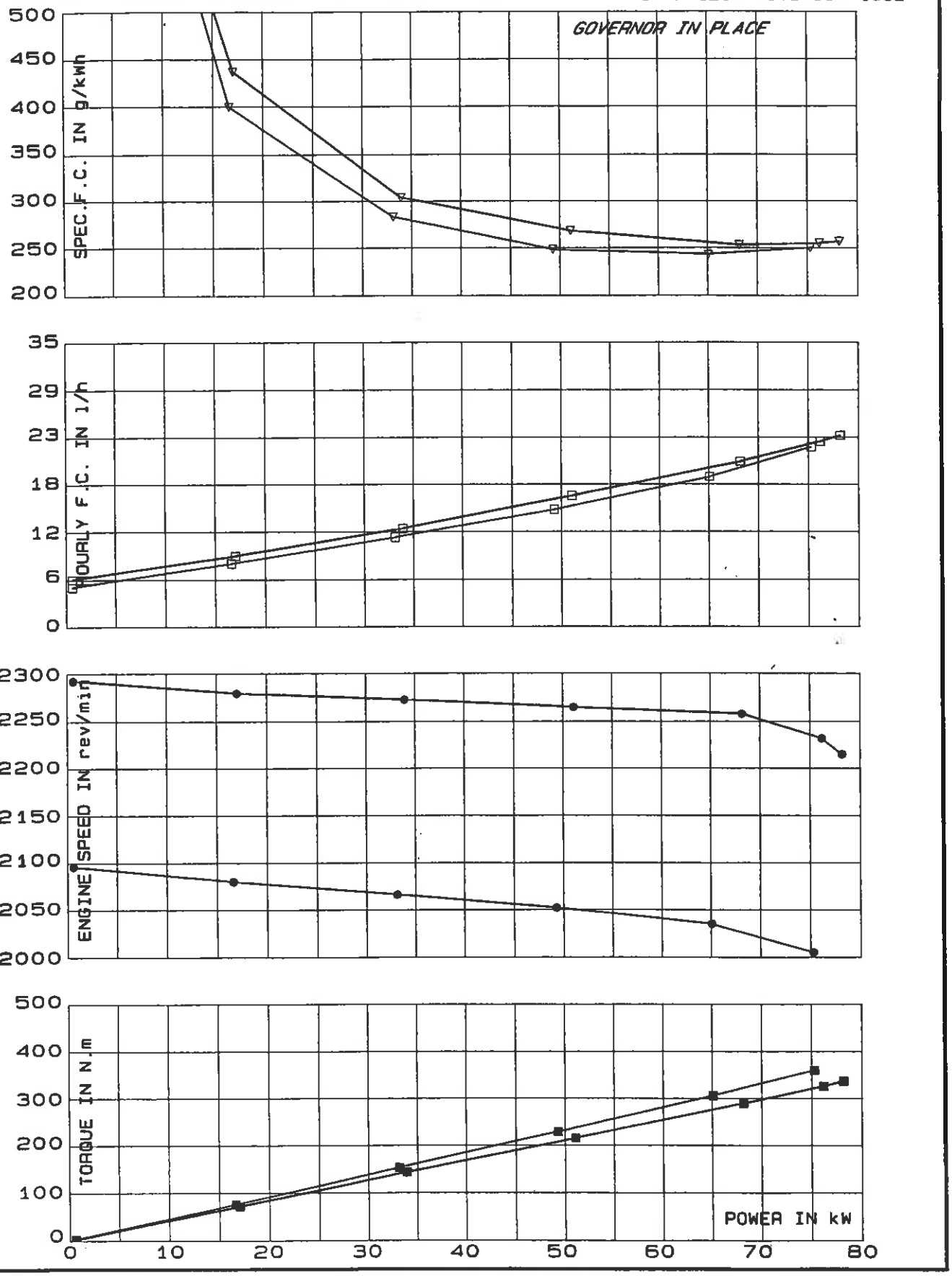
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MAIN POWER TAKE-OFF TEST

TEST : 9531

TRACTOR : MASSEY FERGUSON 3115-4 (PS/4) 4WD

OF : 12th november 1992



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4.1 Main power take-off performance (continued)

Other results

No load, maximum engine speed : 2293 rev/min

Equivalent crankshaft torque at maximum power : 336,1 N.m

Maximum equivalent crankshaft torque : 412,1 N.m at 938 rev/min

Mean atmospheric conditions

Temperature : 23 °C

Pressure : 1007 mbar

Relative humidity : 39 %

Maximum temperatures

Coolant : 90 °C

Engine oil : 105 °C

Fuel : 27 °C

Air intake : 26 °C

Fuel consumption at varying 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)	20,33	12,10	18,44	10,98
Standard specific consumption (g/kWh)	253	304	243	283

(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 : 16th december 1992

4.2.1 Hydraulic power test

- Hydraulic pump
- Tapping point used for test : auxiliary service connection
- Sustained pressure with relief valve open : 187 bars
- Pump delivery rate at minimum pressure : 48,7 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	45,2	168	12,7
Flow rate and hydraulic pressure corresponding to maximum hydraulic power	47,1	165	13,0

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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	250	229
Vertical movement mm	615	735
Maximum force exerted through full range kN	44,2	35,9
Corresponding pressure of hydraulic fluid bar	168	168
Moment about rear axle kN.m	48,7	61,4
Maximum tilt angle of mast over range of lift degree	/	11 °

4.2.2 Power lift test

Lifting height (1)	mm	-311	-290	-200	-100	0	+100	+200	+250	+325	+376	+424
Lifting force (2)	at the hitch point kN	-	44,2	45,6	47,5	48,9	49,6	49,9	50,0	47,2	-	-
	at the frame kN	40,6	41,2	41,6	41,9	41,5	40,9	39,4	38,6	38,0	37,1	35,9

Corresponding pressure : 168 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

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4.3 Drawbar performance (unballasted tractor)

Date and location of test : 17th november 1992, Antony

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

Tyres	Front	Rear
. Size :	14.9 R 28	18.4 R 38
. Inflation pressure (bar) :	1,1	1,0

Atmospheric conditions :
- . Temperature : 10 °C
- . Pressure : 1018 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	1,84	48,6	24,9	2286	15	404	2,10	19	81	94
1 T B	2,15	48,4	29,0	2279	15	368	2,31	19	81	94
1 T C	2,54	48,6	34,3	2274	15	345	2,47	19	82	92
1 T D	2,93	48,6	39,6	2267	15	317	2,68	20	81	96
2 T A	3,12	48,4	41,9	2268	15	313	2 72	19	81	95
2 T B	3,69	47,4	48,6	2258	12	296	2,88	20	85	98
3 T A	4,26	46,9	55,5	2252	11	290	2,93	19	80	97
2 T C	4,50	46,0	57,5	2252	10	290	2,94	19	80	100
3 T B	5,00	45,7	63,5	2245	10	291	2,93	20	82	100
2 T D	5,28	45,6	66,9	2256	10	286	2,97	21	86	102
4 T A	5,89	43,0	70,3	2232	8	289	2,95	20	84	100
3 T C	6,01	41,6	69,3	2218	7	289	2,94	20	84	105
4 T B	6,97	36,4	70,5	2213	6	288	2,95	20	84	106
3 T D	7,12	35,7	70,6	2203	6	292	2,92	20	84	102
1 L A	7,40	34,7	71,2	2203	5	292	2,91	19	80	98
4 T C	8,29	30,6	70,5	2198	5	294	2,90	20	80	100
1 L B	8,74	29,2	70,9	2215	5	291	2,92	20	82	100
4 T D	9,77	25,8	69,9	2208	4	292	2,91	19	82	99
1 L C	10,39	24,4	70,5	2209	5	289	2,94	20	82	100
1 L D	12,22	20,7	70,4	2207	4	288	2,96	19	82	102
2 L A	12,89	19,7	70,5	2207	3	286	2,97	20	82	101
2 L B	14,90	16,7	68,9	2200	3	297	2,87	18	82	103

A speed sesor releases the front axle above 15 km/h

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

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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 A	7,40	37,7	71,2	2203	5	292	2,91	19	80	98
(2) 75% of pull at maximum power at rated engine speed										
1 L A	7,69	25,7	55,6	2256	4	287	2,97	19	82	92
(3) 50% of pull at maximum power at rated engine speed										
1 L A	7,84	17,1	37,3	2271	3	311	2,74	19	82	90
(4) next higher gear at reduced engine speed, same pull and travelling speed as in (2)										
4 T C	7,66	26,1	55,5	2022	4	284	3,00	19	80	84
(5) next higher gear at reduced engine speed, same pull and travelling speed as in (3)										
4 T C	7,87	17,1	37,3	2041	3	301	2,83	19	81	82
(6) Maximum drawbar power in selected gear nearest to 7,5 km/h										
4 T B	6,97	36,4	70,5	2213	6	288	2,95	20	84	106
(7) 75% of pull at maximum power										
4 T B	7,23	27,2	54,6	2253	4	288	2,95	19	81	100
(8) 50% of pull at maximum power										
4 T B	7,38	18,3	37,5	2267	3	307	2,77	20	80	101
(9) Higher gear at reduced engine speed; same pull and travelling speed as in (7)										
3 T D	7,20	27,2	54,5	2191	4	282	3,02	20	80	101
(10) Higher gear at reduced engine speed; same pull and travelling speed as in (8)										
3 T D	7,34	18,5	37,6	2209	3	305	2,79	19	81	101

(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 : 23rd november 1992
Type of sound level meter : BRUEL & KJAER 2209
Type of track : Tarmacadam
Gear : 4 L D
Travelling speed before acceleration : 29,7 km/h
Sound level : 89 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
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