Consiglio Nazionale delle Ricerche

IMAMOTER

Istituto per le Macchine Agricole e Movimento Terra

Report No. 3063*2*CASE*PUMA125*0*2009

OECD Approval No. 2/2 470 on 20th May 2009

TEST IN ACCORDANCE WITH THE OECD STANDARD CODE FOR THE OFFICIAL TESTING OF AGRICULTURAL AND FORESTRY TRACTOR PERFORMANCE

Make:	**CASE IH**
Trade Name:	**PUMA 125**
Type:	**4 WD, 40 km/h, 18+6speeds, full powershift**



Manufactured by:	CNH Europe Holding S.A. 13, Rue Aldringen L-1118 Luxembourg
Date and location of the tests:	2008 TORINO (Italy)

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OREWORD

his vehicle is equipped with an electronically-controlled **Engine Power Management** (EPM) system that onitors and boosts power output in certain circumstances as engine load increases.
his is achieved by electronically changing the characteristics of the engine power-speed curve.

he **EPM** function (boosted power level) becomes active in these two following operation conditions:

) in PTO operations when
- Engine speed is above 1300 rpm
- Tractor forward speed is above 0.5 kmh^{-1}
- PTO driveline torque is above 150 Nm

ith the tractor moving and the engine speed above 1300 rpm engaging the PTO will put the EPM into andby mode. As the torque and load on the PTO reaches or exceed the above levels, the EPM will be tive and a warning light will illuminate

) in road transport application when
- 16th gear, or above, is selected
- engine speed between is 1800 and 2200 rpm

PM does not allow operate boosted mode with tractor stationary.
or test purpose an over ride system has been provide by the manufacturer of the tractor to enable PTO peration mode whilst the tractor is stationary.
or this reason the results of the test in chapter *3.1.A Optional power take-off test (with power boost)* can be chieved ONLY when PTO operation conditions are satisfied.

NOTE

The information opposite each item has been validated by the testing station as follows

C data declared and checked by the testing station

D data declared by the manufacturer

C	Tractor manufacturer's name and address:	CNH Europe Holding S.A. 13, Rue Aldringen L-1118 Luxembourg
D	Location of tractor assembly:	Basildon – United Kingdom St. Valentin - Austria
D	Submitted for test by:	the Manufacturer
C	Selected for test by:	manufacturer with the agreement of IMAMOTER
D	Place of running-in:	Modena - Italy
D	Duration of running-in:	appr. 50 hours
C	Location of test:	IMAMOTER – Torino, Italy

1 SPECIFICATIONS OF TRACTOR

1.1 Identification

1.1.1 Denomination

C	Make of the tractor:	CASE IH
C	Model (trade name):	PUMA 125
C	Type:	4WD

1.1.2 Numbers

D	1st serial N° or prototype:	not announced
C	Serial N°:	Z7BL01008

1.1.3 Other specification (if applicable)

D	Model(s) for other countries:	PUMA 125 MULTICONTROLLER
C	Transmission type or gears x ranges:	18+6 speeds, full powershift
C	Speed version:	40 km/h
D	- Manufacturer identification or technical type number :	BLLC7B

1.2 Engine

C	Make:	CNH
C	Model:	667TA/EDD
C	Type:	4 stroke Diesel engine, common rail injection, supercharged with intercooler
C	Serial N°:	481473

2.1 Cylinders

C	Number and disposition:	6, vertical, in line
D	Bore and stroke:	104x132 mm
D	Capacity:	6728 cm^3
D	Compression ratio:	17.5:1
D	Arrangement of valves:	4 overhead per cylinder
D	Cylinder liners (wet or dry):	none, monobloc construction

2.2 Supercharging

C	Make, model and type:	HOLSET, HX35, exhaust driven
D	Pressure:	0.117 MPa

2.3 Fuel system

C	Fuel feed system:	gear pump
C	Make, model and type of fuel filter(s)	plastic strainer in tank, 1 glass glow sediment and water separation pre-filter, and 2 disposable canister filters (FLEETGUARD, 2830359 and 4897897 drawings, spin on cartridge)
D	Capacity of fuel tank:	300 dm^3, placed under the tractor platform, on the left side
C	Make, model and type of injection pump:	BOSCH, Common Rail CP3, radial plunger high pressure pump
C	Serial N°:	not available
	Manufacturer's production setting of injection pump	
C	Flow rate (rated engine speed and full load):	65.03 mm^3/stroke at rated speed and full load corresponding 25.75 dm^3/h without power boost 76.36 mm^3/stroke at rated speed and full load corresponding 30.24 dm^3/h with power boost
D	Timing:	electronically controlled
D	Make, model and type of injectors:	BOSCH, CRIN2 (DSLA143PV3 388), high pressure electronically controlled
D	Injection pressure:	160 MPa
C	Make, model and type of carburettor:	not applicable

2.4 Governor

C	Make, model and type:	BOSCH, EDC16, electronic type
C	Governed range of engine speed from-to:	900--2344 rev/min
C	Rated engine speed:	2200 rev/min

2.5 Air cleaner

	Pre-cleaner	
C	Make model and type:	none
C	Location of air intake:	none
	Main cleaner	
C	Make, model and type:	CNH, 3 stage dry paper element with 2

			replaceable cartridge, inner (82028151 drawing) and outer (82028150 drawing)
	C	Location of air intake (in case of no pre-cleaner):	above the radiator under the bonnet cowling inside the pre-cleaner
	C	Maintenance indicator:	warning lamp on the dashboard
1.2.6		Lubrication system	
	D	Type of feed pump:	forced feed from concentric rotor pump
	C	Type of filter(s):	mesh strainer in sump on suction line and full flow disposable canister on pressure line
	C	Number of filters:	1
1.2.7		Cooling system	
	C	Type of coolant:	50% water and 50% antifreeze
	D	Type of pump:	centrifugal blade pump with visco-fan belt driven by engine shaft
		Specification of fan or blower	
	C	Number of fan blades:	9
	C	Fan diameter:	510 mm
	D	Coolant capacity:	25 l
	C	Type of temperature control:	thermostat with full flow bypass
	D	Over-pressure system:	100 kPa
1.2.8		Starting system	
	C	Make, model and type:	ISKRA, 11131464, positive engagement, solenoid operated, geared reduction
	D	Starter motor power rating:	4.2 kW
	C	Cold starting aid:	PHILIPS & TEMRO, electrical glow plug
	C	Safety device:	starting inoperable unless shuttle lever in neutral, clutch pedal depressed and operator seat presence switch is activated
1.2.9		Electrical system	
	C	Voltage:	12 V, negative earth
		Generator:	alternator
	C	Make model and type:	ISKRA, AAK 5592, belt driven
	D	Power:	1440 VA
		Battery of accumulators	
	C	Number:	1, lead acid type
	D	Rating:	12 V, 176 Ah at 10 hours
1.2.10		Exhaust system	
	C	Make, model and type:	ARVIN MERITOR, 1.15.1 40AA, vertical stack pipe with integrated silencer
	C	Location:	on the right hand side of engine, with the vertical exhaust pipe on right of the bonnet cowling

3 Transmission

3.1 Clutch (travel alone)

D	Make model and type:	CNH, own drawing model, multidisc wet plate clutch
D	Number of plates:	9
D	Diameter of plates:	160 mm
C	Method of operation:	electro hydraulic operated by pedal

3.2 Gear box

D	Make model and type:	CNH make, own drawing model, mechanical
	Description:	18+6 speeds (40 km/h) electronically controlled full powershift, 3 ranges (Low, Medium and High) with 6 gears for range for forward speeds and 1 range (Medium) with 6 gears for reverse speeds, with 1 switch for up/down powershifting, forward/reverse shuttle lever on steering column. Optional additional 10+6 creeper speed, switch acted, not fitted on tested tractor

		Forward	Reverse
C	Number of ranges	3	1
C	Number of group	none	none
C	Number of gears	6	6
C	Total of arrangements	18	6

D Available options:

19+6 speeds (50 km/h) electronically controlled full powershift, 3 ranges (Low, Medium and High) with 6 gears for Low and Medium range and 7 gears for High range for forward speeds and 1 range (Medium) with 6 gears for reverse speeds, with 1 switch for up/down powershifting, forward/reverse shuttle lever on steering column. Optional additional 10+6 creeper speed

19+6 speeds (40 km/h) electronically controlled full powershift, 3 ranges (Low, Medium and High) with 6 gears for Low and Medium range and 7 gears for High range for forward speeds and 1 range (Medium) with 6 gears for reverse speeds, with 1 switch for up/down powershifting, forward/reverse shuttle lever on steering column. Maximum speed in 19th speed at reduced maximum engine speed. Optional additional 10+6 creeper speed, switch acted

19+6 speeds (50 km/h) mechanical semi-powershift, 3 ranges (Low, Medium and High) with 6 gears for Low and Medium range and 7 gears for High range for forward speeds and 1 range (Medium) with 6 gears for reverse speeds, shiftable with 1 lever and with 1 switch for up/down powershifting, forward/reverse shuttle lever on steering column. Optional additional 10+6 creeper

		speed, switch acted 19+6 speeds (40 km/h) mechanical semi-powershift, 3 ranges (Low, Medium and High) with 6 gears for Low and Medium range and 7 gears for High range for forward speeds and 1 range (Medium) with 6 gears for reverse speeds, shiftable with 1 lever and with 1 switch for up/down powershifting, forward/reverse shuttle lever on steering column. Maximum speed in 19th speed, at reduced maximum engine speed. Optional additional 10+6 creeper speed, switch acted 18+6 speeds (40 km/h) mechanical semi-powershift, 3 ranges (Low, Medium and High) with 6 gears for range, shiftable with 1 lever and with 1 switch for up/down powershifting, forward/reverse shuttle lever on steering column. Optional additional 10+6 creeper speed, switch acted
1.3.3	Rear axle and final drives	
	D Make model and type:	CNH, own drawing, crown wheel and pinion with differential and inboard epicyclical reduction gear final drive
	Differential lock:	
	D Type:	multi-plate wet discs
	C Method of engagement:	electro-hydraulic actuation in response to signal from switch on right-hand control panel or auto differential lock actuation
	C Method of disengagement:	via panel switch or in response to signal from brakes on application, or auto differential lock disengagement
1.3.4	Front axle and final drives	
	D Make model and type:	CNH, own drawing, crown wheel and pinion with differential and outboard epicyclical reduction gear final drive
	Drive engagement	
	D Type:	dog clutch
	C Method of operation:	electro-hydraulic actuation in response to signal from switch on right-hand control panel or auto 4WD engagement
	Differential lock	
	D Type:	multi-plate wet discs
	C Method of engagement:	electro-hydraulic actuation in response to signal from switch on right-hand control panel or auto differential lock actuation
	C Method of disengagement:	via panel switch or in response to signal from brakes on application, or auto differential lock disengagement

3.5 Total ratios and travelling speeds

	Speed No. [1]	Gear	Range	Number of engine revolutions for one revolution of the driving wheels	Nominal travelling speed at rated engine speed of 2200 min^{-1} (rev/min)[2] km/h
	Forward				
C	1	1	Low	366.086	1.982
C	2	2	Low	304.438	2.384
C	3	3	Low	253.444	2.863
C	4	4	Low	210.764	3.443
C	5	5	Low	179.308	4.047
C	6	6	Low	149.112	4.867
C	7	1	Medium	126.108	5.755
C	8	2	Medium	104.872	6.920
C	9	3	Medium	87.306	8.312
C	10	4	Medium	72.603	9.996
C	11	5	Medium	61.767	11.749
C	12	6	Medium	51.366	14.128
C	13	1	High	43.672	16.617
C	14	2	High	36.318	19.982
C	15	3	High	30.234	24.003
C	16	4	High	25.143	28.863
C	17	5	High	21.390	33.927
C	18	6	High	17.788	40.798
	Reverse				
C	1	1	Medium	137.287	5.286
C	2	2	Medium	114.168	6.356
C	3	3	Medium	95.045	7.635
C	4	4	Medium	79.039	9.182
C	5	5	Medium	67.243	10.792
C	6	6	Medium	55.919	12.978

[1] *As displayed on dashboard*

[2] *Calculated with a tyre speed radius index of 875 mm (ETRTO Standard Manual, 2005 Ed.)*

C Number of revolution of front wheels for one revolution of rear-wheels: 1.321

1.4 Power take-off

1.4.1 Main power take-off

C	Type:	fully independent
C	Method of engagement:	engaged/disengaged by pulling/pushing a knob on the right-hand control panel, driven by electro-hydraulic operated multi-plate clutch
C	Number of shafts:	1
C	Method of changing power take-off shaft ends and speeds:	remove circlip, insert appropriate shaft replace circlip for changing shaft ends

1.4.1.1 Power take-off proportional to engine speed

Power take-off at 540 min^{-1} rev/min

C	Location:	at the rear of the tractor, in the median plane
C	Diameter of power take-off shaft end:	35 mm
C	Number of splines:	6, in conformity with ISO 500-1:2005, ISO 500-2:2004 and ISO 500-3:2004
C	Height above ground:	858.5 mm
C	Distance from the median plane of the tractor:	0 mm
C	Distance behind rear-wheel axis:	570 mm
C	PTO speed at rated engine speed:	603 rev/min
C	Engine speed at standard power take-off speed:	1969 rev/min
C	Ratio of rotation speeds (engine speed/p.t.o. speed):	3.646
D	Power restriction:	none
D	Maximum torque transmissible:	engine torque
C	Direction of rotation (viewed from behind tractor):	clockwise

Power take-off at 1000 min^{-1} rev/min

C	Location:	at the rear of the tractor, in the median plane
C	Diameter of power take-off shaft end:	35 mm
C	Number of splines:	21, in conformity with ISO 500-1:2005, ISO 500-2:2004 and ISO 500-3:2004
C	Height above ground:	858.5 mm
C	Distance from the median plane of the tractor:	0 mm
C	Distance behind rear-wheel axis:	570 mm
C	PTO speed at rated engine speed:	1038 rev/min
C	Engine speed at standard power take-off speed:	2120 rev/min
C	Ratio of rotation speeds (engine speed/p.t.o. speed):	2.120
D	Power restriction:	none
D	Maximum torque transmissible:	engine torque
C	Direction of rotation (viewed from behind tractor):	clockwise

1.4.1.2 Power take-off proportional to ground speed

Optional, not fitted on tested tractor

4.2 Optional power take-off

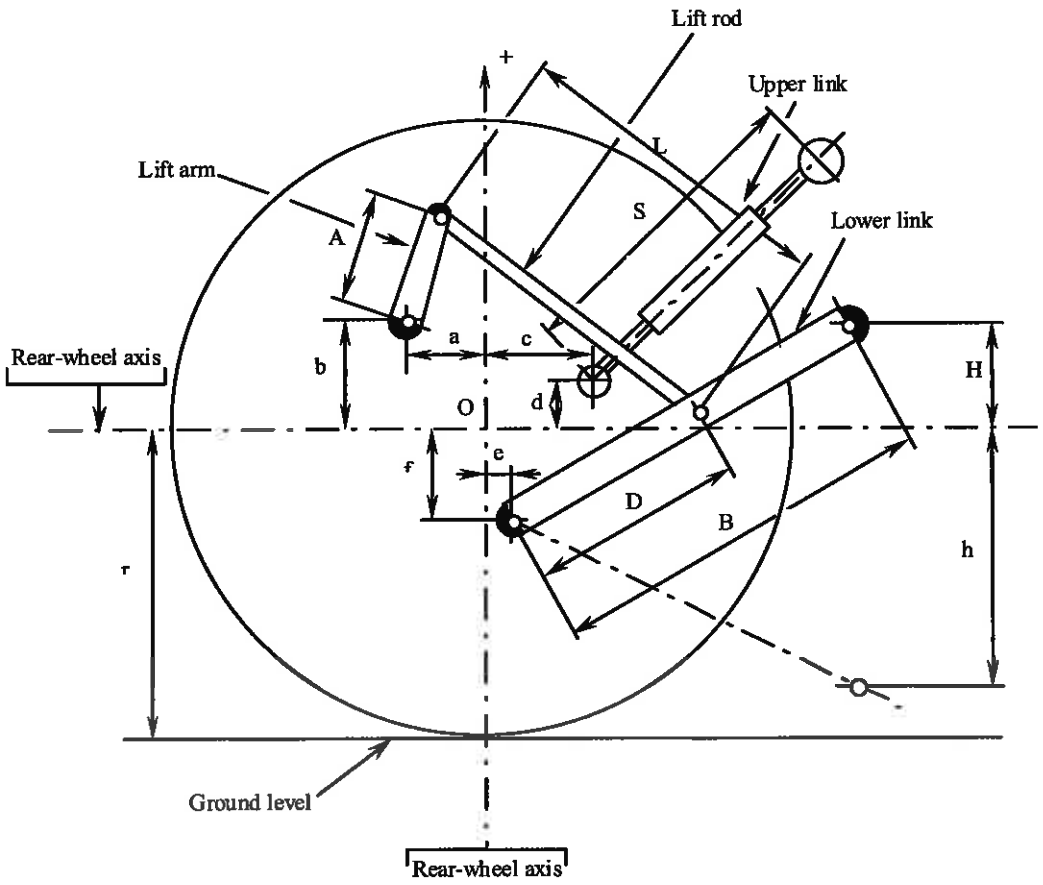
Optional, not fitted on tested tractor

5 Hydraulic power lift

C	Make, model and type:	CNH, own drawing, draft and position control and float function; electronically controlled
C	Type of hydraulic system:	closed centre system
C	Type and number of cylinders (single or double-acting):	2 single acting Ø 90 mm external
C	Type of linkage lock for transport:	hydraulic
D	Relief valve pressure setting (tolerance):	21.0±1 MPa
D	Opening pressure of cylinder safety valve (if fitted):	22±0.5 MPa
D	Lift pump type:	load sensing variable displacement pump driven by the engine shaft
D	Transmission between pump and engine:	mechanical
C	Type and number of filters:	2, replaceable canister filters
C	Site of oil reservoir:	in common with transmission and rear axle
C	Type, number and location of tapping points:	2 control valves, double acting, 2 couple of couplers at rear of tractor
D	Maximum volume of oil available to external cylinders:	38 dm^3

6 Three point linkage

C	Category:	2nd, in conformity with categories 2 ISO 730-1:1994+Cor.1:1995
C	Category adapter:	3rd



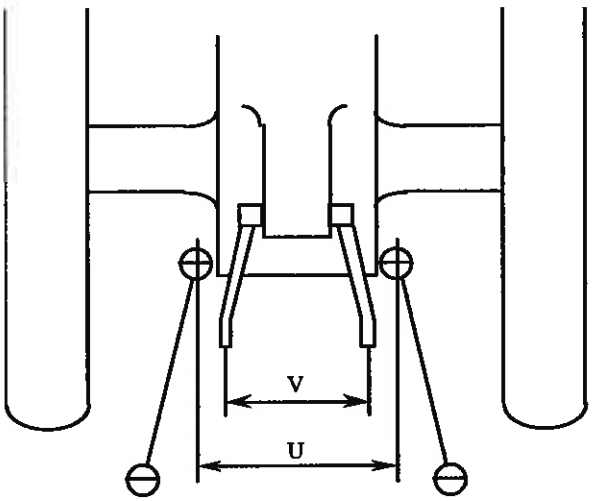


Figure 1. Lift test- Rear linkage geometry

Table 1.1. Dimension of rear linkage geometry when connected to the standard frame

		Dimension or range	Settings used in test		
			OECD[1]		SAE[2]
			Main	Additional	
		mm	mm	mm	
Length of lift arms:	(A)	310	310	310	310
Length of lower links:	(B)	974	974	974	974
Distance of lift arm pivot point from rear wheel axis:					
- horizontally (rearward)	(a)	160	160	160	160
- vertically	(b)	364	364	364	364
Horizontal distance between the 2 lower link points:	(u)	560	560	560	560
Horizontal distance between the 2 lift arm end points:	(v)	550	550	550	550
Length of upper link:	(S)	605→875	750	770	780
Distance of upper link pivot point from rear wheel axis:					
- horizontally (rearward)	(c)	427-445	445	427	427
- vertically	(d)	263-208	208	263	263
Distance of lower link pivot point from rear wheel axis:					
- horizontally	(e)	220	220	220	220
- vertically	(f)	250	250	250	250
Distance of lower link pivot points to lift rod pivot points on lower links:	(D)	440-505	440	505	505
Length of lift rods:	(L)	715→845	825	845	845/778
Height of lower hitch points (corresponding to travel of the lift without power) relative to the rear wheel axis[3]:					
- in low position	(h)	-743→-335	-675	-628	-628/-488
- in high position	(H)	35→320	107	87	86/196
Height above ground of lower hitch points when locked in transport position		Any height within lift range			

[1] *Main and additional settings are in accordance with OECD Code and manufacturer specifications*

[2] *SAE setting is in accordance with SAE Standard and manufacturer specifications*
SAE setting tests' results are not covered by OECD approval

[3] *Assuming r=875 mm tyre speed radius index of* 650/65R38 *tyres on rear axle (ETRTO Standard Manual, 2005 Ed.)*

1.7 Swinging drawbar

C	Type:	clevis
	Height above ground	
C	Maximum:	562 mm
C	Minimum:	447 mm
C	Type of adjustment:	overturning the drawbar to position the fork uppermost or underneath
C	Distance of hitch point from rear-wheel axis, horizontally:	820-920-970 mm
	Distance of hitch point from power take-off shaft end:	
C	Vertically:	296.5-411.5
C	Horizontally:	250-350-400 mm
	Lateral adjustment (centre of clevis):	
C	Right hand:	150 mm
C	Left hand:	150 mm
C	Distance of pivot point from rear-wheel axis, horizontally:	188 mm
C	Diameter drawbar pinhole:	29 mm
D	Maximum vertical permissible load:	25 kN in 250 mm PTO position

1.8 Trailer hitch

C Optional, not fitted:

1.9 Holed drawbar

Optional, not fitted

1.10 Steering

D	Make model and type:	DANFOSS make, OSPC 160 OR model, hydrostatic type with independent circuit
	Method of operation	
D	Pump(s):	BOSCH, hydraulic gear pump
D	Ram(s):	2 steering cylinders, one for each steering stub, acting directly on front axle
D	Working pressure:	17.0±0.5 MPa

1.11 Brakes

1.11.1 Service brake

D	Make model and type:	CNH make, oil bath disc, total 2 discs, 1 per side at rear axle, independently acting on the rear axle, additionally automatic 4WD engagement.
C	Method of operation:	hydraulically actuated with 2 pedals
C	Trailer braking take-off (hydraulic or air brake):	hydraulic brake system and air brake system

11.2 Parking brake

C	Type:	4 oil immersed discs acting on bevel pinion shaft
C	Method of operation:	mechanical cable linked by means of hand lever

12 Wheels

Number

C	Front:	2, driving and steering
C	Rear:	2, driving
C	Wheelbase:	2739 mm

Track width adjustment:

		Minimum mm	Maximum mm	Adjustment method
D	Front	1325	2285	Changing the position of the rims with respect to the disc
D	Rear	1430	2230	Changing the position of the rims in respect to the disc

13 Protective structure

C	Make model and type:	CNH, SLTV 15, cab
C	Manufacture's name and address:	CNH Europe Holding S.A. 13, Rue Aldringen L-1118 Luxemburg

Protective device

C	Cab, frame, rollguard or other:	4 post cab
C	Tiltable or not tiltable:	not tiltable

OECD Approval

C	Approval number:	4/0 984/3
C	Date of approval:	7th January 2008
C	Nos. of minor modification certificates, if any:	none

1.14 Seat

1.14.1 Driver's seat

C	Make model and type:	GRAMMER, MSG 95GL/741, air suspended type
C	Seat and steering wheel reversible:	no
C	Type of suspension:	parallelogram linkage
C	Type of damping:	hydraulic
	Range of adjustment:	
C	Longitudinally:	210 mm
C	Vertically:	80 mm
C	Safety belt:	yes
C	Type:	pelvic

1.14.2 Optional driver's seat(s)

Make	Model	Type of suspension	Type of damping	Range of adjustment	
				Longitudinal	Vertical
				mm	mm
GRAMMER	MSG 95G/741	Air	Hydraulic	210	80

1.14.3 Passenger seat

C	Location:	on the left side of the driver's seat
C	Capacity (number):	1

1.15 Lighting

		Height above ground of centre	Size (lxh)	Distance from outside edge of lights to median plane of tractor
		mm	mm	mm
C	Headlights	1375	80x150	110
C	Font direction light[1]	2900	190x90	830
C	Front lower working light[1]	1375	50x150	160
C	Front middle working light[2]	2180	135x85	1045
C	Front higher working light	2900	150x75	525
C	Rear lower direction lights	2140	265x55	890
C	Rear higher direction lights[1]	3000	150x90	720
C	Stop/rear position	2085	265x55	890
C	Reflectors	1925	260x45	895
C	Rear middle working light	2335	135x85	850
C	Rear higher working light	3000	150x75	530

[1] *Round shaped, front projection*

[2] *Adjustable height*

TEST CONDITIONS

.1 Overall dimensions

	Length	Width		Height at top of	
		minimum	maximum	protective structure	exhaust pipe
	mm	mm	mm	mm	mm
Unballasted	4618	2165	2900	3155	3075

.2 Ground clearance (unballasted tractor): 460 mm

Clearance-limiting part: swinging drawbar support

.3 Tractor mass

	Unballasted	
	without driver	with driver
	kg	kg
Front	2440	2450
Rear	3575	3640
Total	6015	6090

.4 Ballast

Not applicable

.5 Track specifications

Not applicable

.6 Tyres and track width specifications

	Front	Rear
Tyres:		
- dimensions (equivalent)	540/65R28	650/65R38
- ply rate	none	none
- load index	142 A8-139 D	157 A8-154 D
- type	radial	radial
- maximum load (tyre manufacturer's)	20.3 kN	31.1 kN
- maximum load (tractor manufacturer's)	20.3 kN	31.1 kN
- inflation pressure (tyre manufacturer's)	80 kPa	80 kPa
- speed radius index[1]	675 mm	875 mm
Chosen track width:	1850 mm	1920 mm

[1] *ETRTO Standard Manual, 2005 Ed.*

2.7 Fuel

Type: ESSO 50S Diesel oil, in conformity with UNI EN 590 July 2004.

Density at 15 °C: 840 kg/m^3

2.8 Oils and lubricants

2.8.1 Capacity and change interval

	Capacity	Oil change	Filter change
	dm^3	h	h
Engine	15.0	600	600
Gear box, rear axle, final drive, hydraulic system and steering	75.0	1200 or annually	1200 or annually
Front axle	9.0	1200 or annually	None
Final drive (front)	1.5	1200 or annually	None
Brakes	0.5	Max. level	None

2.8.2 Specifications (SAE, API, CCMC, ACEA, Mil.L, ISO)

	Recommended	Used during test
Engine oil - Type: - Viscosity: - Classification:	15W-40 14.6 cSt at 100 °C (ASTM D 445) API CI-4/CH-4 ACEA E7/E5	As recommended
Transmission oils - Type: - Viscosity: - Classification	SAE 10W-309.95 cSt at 100 °C (ASTM D 445) API GL 4	As recommended
Hydraulic fluid - Type: - Viscosity: - Classification	SAE 10W-30 9.95 cSt at 100 °C (ASTM D 445) API GL 4	As recommended
Steering oil - Type: - Viscosity: - Classification:	SAE 10W-30 9.95 cSt at 100 °C (ASTM D 445) API GL 4	As recommended
Grease - Type: - Viscosity: - Classification:	Lithium based Not applicable NLGI 2	As recommended
Brake fluid - Type: - Viscosity: - Classification:	No equivalent Min 6 cSt at 100 °C (ASTM D 445) ISO 7308	As recommended

2.8.3 Grease

Number of lubrication points: 16

TEST RESULTS

.1 Main power take-off (without power boost)

Date and location of tests: 30th September 2008, I.M.A.MO.TER, TORINO, ITALY
Type of dynamometer: parasitic currents, BORGHI&SAVERI FA300-30SP

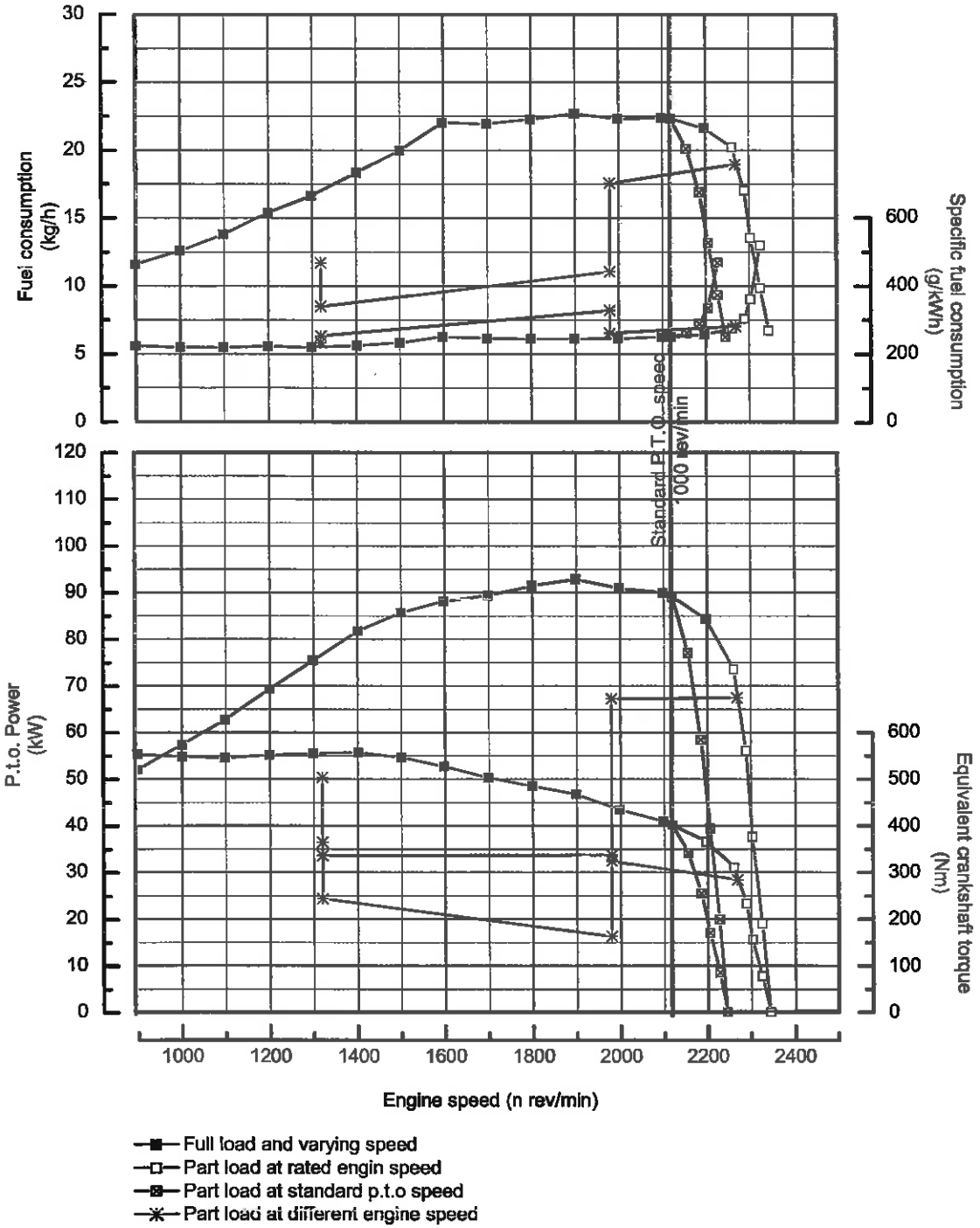
Power	Speed			Fuel consumption			Specific energy
	Engine	P.T.O.	Fan	Hourly		Specific	
kW	min^{-1} (rev/min)			kg/h	l/h	g/kWh	kWh/l
3.1.1 MAXIMUM POWER-ONE - HOUR TEST							
92.9	1899	896	1943	22.70	27.02	244	3.44
3.1.2 POWER AT RATED ENGINE SPEED							
84.3	2197	1037	1658	21.63	25.75	257	3.27
3.1.3 POWER AT STANDARD PTO SPEED [1000 ± 25 min^{-1}]							
89.1	2119	1000	1931	22.32	26.57	250	3.35
3.1.4 PART LOADS							
3.1.4.1 The torque corresponding to maximum power at rated engine speed							
84.3	2197	1037	1658	21.63	25.75	257	3.27
3.1.4.2 85% of torque obtained in 3.1.4.1							
73.5	2261	1067	1953	20.20	24.05	275	3.06
3.1.4.3 75% of torque defined in 3.1.4.2							
56.0	2289	1080	1979	17.04	20.29	304	2.76
3.1.4.4 50% of torque defined in 3.1.4.2							
37.6	2303	1087	1977	13.55	16.13	361	2.33
3.1.4.5 25% of torque defined in 3.1.4.2							
19.0	2325	1097	1866	9.85	11.73	520	1.62
3.1.4.6 Unloaded							
-	2344	1106	1690	6.71	7.99	-	-
3.1.5 PART LOADS AT STANDARD PTO SPEED [1000 ± 25 min^{-1})]							
3.1.5.1 the torque corresponding to maximum power							
89.1	2119	1000	1931	22.32	26.57	250	3.35
3.1.5.2 85% of torque obtained in 3.1.5.1							
77.0	2155	1017	2013	20.10	23.93	261	3.22
3.1.5.3 75% of torque defined in 3.1.5.2							
58.4	2185	1031	2026	16.90	20.12	289	2.90
3.1.5.4 50% of torque defined in 3.1.5.2							
39.4	2206	1041	1895	13.18	15.69	335	2.51
3.1.5.5 25% of torque defined in 3.1.5.2							
19.9	2227	1051	1737	9.34	11.12	469	1.79
3.1.5.6 Unloaded							
-	2244	1059	1654	6.22	7.40	-	-

Power	Speed			Fuel consumption			Specific energy
	Engine	P.T.O.	Fan	Hourly		Specific	
kW	min^{-1} (rev/min)			kg/h	l/h	g/kWh	kWh/l
3.1.6 PART LOADS AT DIFFERENT ENGINE SPEEDS 3.1.6.1 Maximum power at rated engine speed							
84.3	2197	1037	1658	21.63	25.75	257	3.27
3.1.6.2 80% of power obtained in 3.1.6.1 at max speed setting							
67.4	2269	1071	1980	18.95	22.56	281	2.99
3.1.6.3 80% of power obtained in 3.1.6.1 with governor control set to 90% of rated engine speed							
67.2	1979	934	1931	17.57	20.92	261	3.21
3.1.6.4 40% of power obtained in 3.1.6.1 with governor control set to 90% of rated engine speed							
33.7	1979	934	1662	11.06	13.17	328	2.56
3.1.6.5 60% of power obtained in 3.1.6.1 with governor control set to 60% of rated engine speed							
50.4	1320	623	1405	11.73	13.96	233	3.61
3.1.6.6 40% of power obtained in 3.1.6.1 with governor control set to 60% of rated engine speed							
33.6	1320	623	1306	8.49	10.11	253	3.32

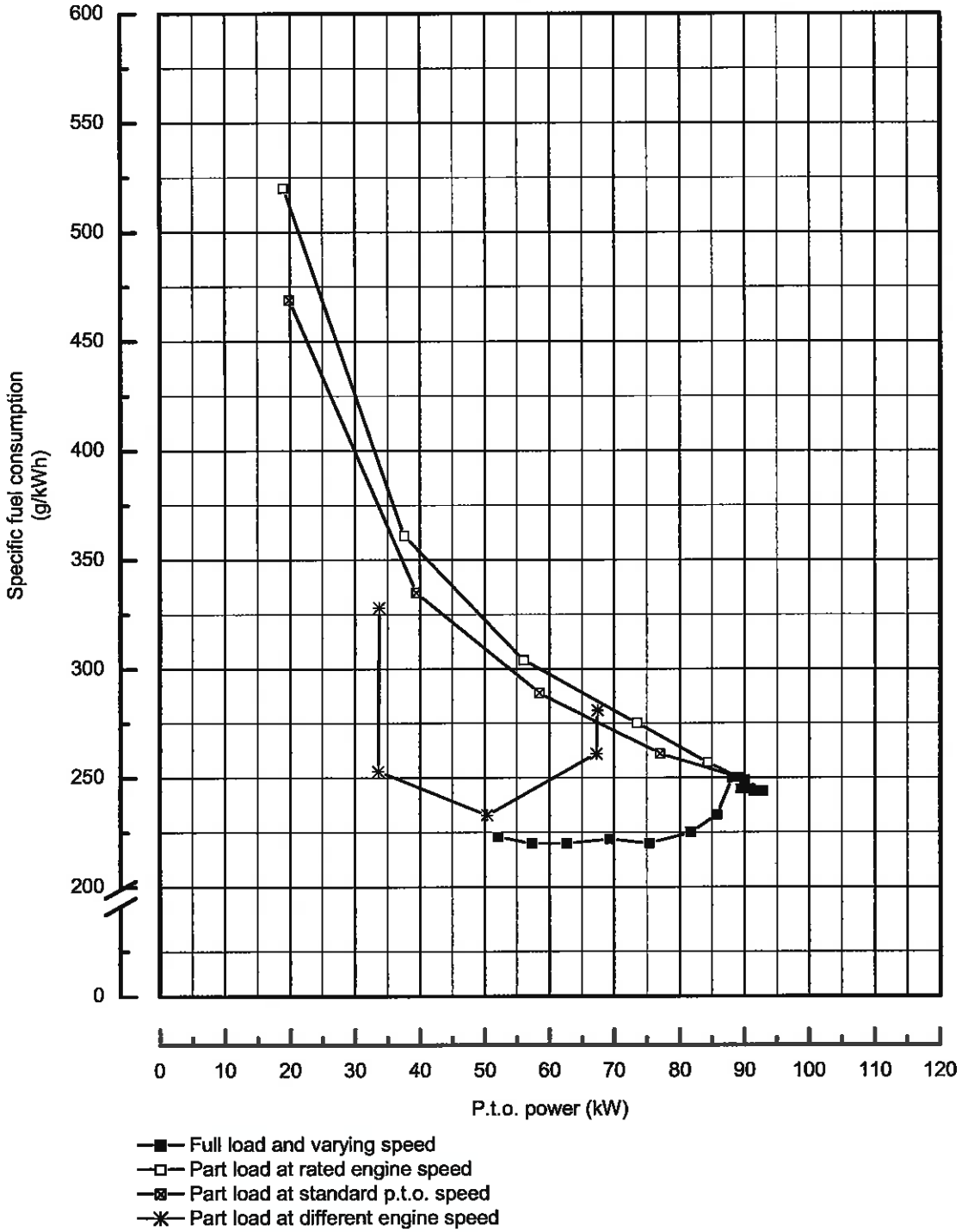
- No load maximum engine speed: 2344 min^{-1} (rev/min)
- Torque (equivalent crankshaft) at maximum power
  - At rated engine speed 366.2 Nm
  - At 1-hour test 467.2 Nm
- Maximum torque (equivalent crankshaft): 556.9 Nm at 1401 min^{-1} (rev/min)

Mean atmospheric conditions:	
Temperature	18.3 °C
Pressure	98.8 kPa
Relative humidity	57%
Maximum temperatures:	
Coolant	87.0 °C
Engine oil	107.8 °C
Fuel	46.6 °C
Engine air intake	21.9 °C

aph 1. Power take-off test (without power boost)



Graph 2. Power take-off test (without power boost)



1.A Optional power take-off test (with power boost) (see [1] next page)

Date and location of tests: 30th September 2008, I.M.A.MO.TER, TORINO, ITALY

Type of dynamometer: parasitic currents, BORGHI&SAVERI FA300-30SP

Power	Speed			Fuel consumption			Specific energy
	Engine	P.T.O.	Fan	Hourly		Specific	
kW	min^{-1} (rev/min)			kg/h	l/h	g/kWh	kWh/l
3.1.1.A.	MAXIMUM POWER-ONE - HOUR TEST						
111.2	2000	944	2235	26.72	31.81	240	3.50
3.1.2.A	POWER AT RATED ENGINE SPEED						
101.5	2197	1037	2210	25.40	30.24	250	3.36
3.1.3.A	POWER AT STANDARD PTO SPEED [1000 ± 25 min^{-1}]						
107.2	2119	1000	1906	25.79	30.70	241	3.49
3.1.4.A	PART LOADS						
3.1.4.1.A	the torque corresponding to maximum power at rated engine speed						
101.5	2197	1037	2210	25.40	30.24	250	3.36
3.1.4.2.A	85% of torque obtained in 3.1.4.1						
87.9	2240	1057	2292	22.95	27.32	261	3.22
3.1.4.3.A	75% of torque defined in 3.1.4.2						
66.8	2269	1071	2291	19.18	22.83	287	2.93
3.1.4.4.A	50% of torque defined in 3.1.4.2						
45.3	2297	1084	2146	14.83	17.65	327	2.57
3.1.4.5.A	25% of torque defined in 3.1.4.2						
22.8	2320	1095	1985	10.58	12.60	464	1.81
3.1.4.6.A	unloaded						
-	2344	1106	1865	6.77	8.06	-	-
3.1.5.A	PART LOADS AT STANDARD PTO SPEED [1000 ± 25 min^{-1})]						
3.1.5.1.A	the torque corresponding to maximum power						
107.2	2119	1000	1906	25.79	30.70	241	3.49
3.1.5.2.A	85% of torque obtained in 3.1.5.1						
94.8	2206	1041	2350	24.08	28.67	254	3.31
3.1.5.3.A	75% of torque defined in 3.1.5.2						
72.0	2227	1051	2331	19.86	23.64	276	3.04
3.1.5.4.A	50% of torque defined in 3.1.5.2						
48.5	2250	1062	2227	15.35	18.27	317	2.65
3.1.5.5.A	25% of torque defined in 3.1.5.2						
24.6	2280	1076	1972	10.54	12.55	429	1.96
3.1.5.6.A	unloaded						
-	2305	1088	1866	6.55	7.80	-	-

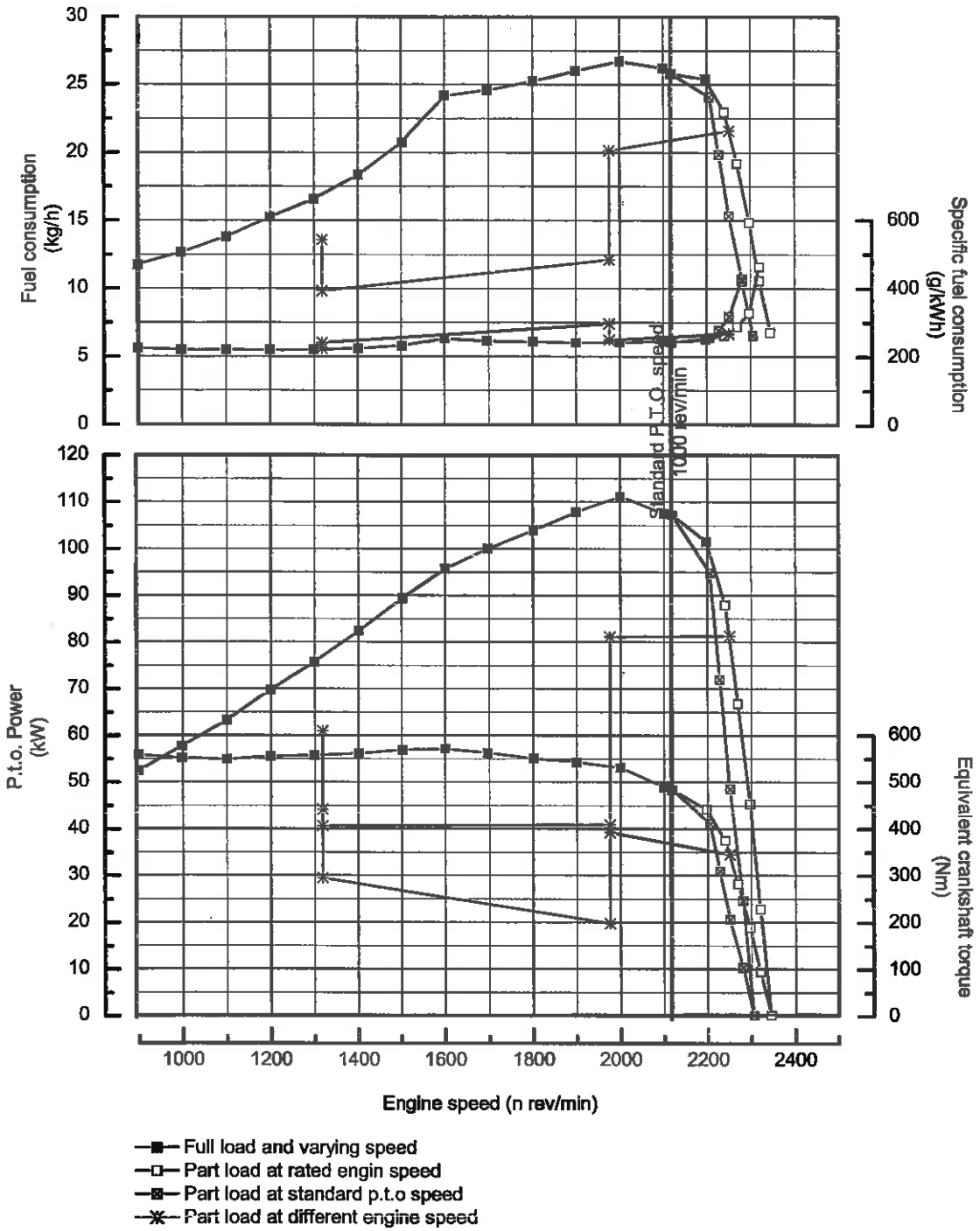
Power	Speed			Fuel consumption			Specific energy
	Engine	P.T.O.	Fan	Hourly		Specific	
kW	min^{-1} (rev/min)			kg/h	l/h	g/kWh	kWh/l
3.1.6.A	PART LOADS AT DIFFERENT ENGINE SPEEDS						
3.1.6.1.A	maximum power at rated engine speed						
101.5	2197	1037	2210	25.40	30.24	250	3.36
3.1.6.2.A	80% of power obtained in 3.1.6.1 at max speed setting						
81.3	2250	1062	2246	21.59	25.70	266	3.16
3.1.6.3.A	80% of power obtained in 3.1.6.1 with governor control set to 90% of rated engine speed						
81.1	1975	932	2196	20.13	23.96	248	3.38
3.1.6.4.A	40% of power obtained in 3.1.6.1 with governor control set to 90% of rated engine speed						
40.9	1975	932	1899	12.11	14.42	296	2.84
3.1.6.5.A	60% of power obtained in 3.1.6.1 with governor control set to 60% of rated engine speed						
60.9	1318	622	1531	13.58	16.17	223	3.77
3.1.5.6.A	40% of power obtained in 3.1.6.1 with governor control set to 60% of rated engine speed						
40.6	1318	622	1473	9.81	11.68	241	3.48

- No load maximum engine speed: 2344 min^{-1} (rev/min)
- Torque (equivalent crankshaft) at maximum power
  - At rated engine speed 441.2 Nm
  - At 1-hour test 530.9Nm
- Maximum torque (equivalent crankshaft): 571.5 Nm at 1600 min^{-1} (rev/min)

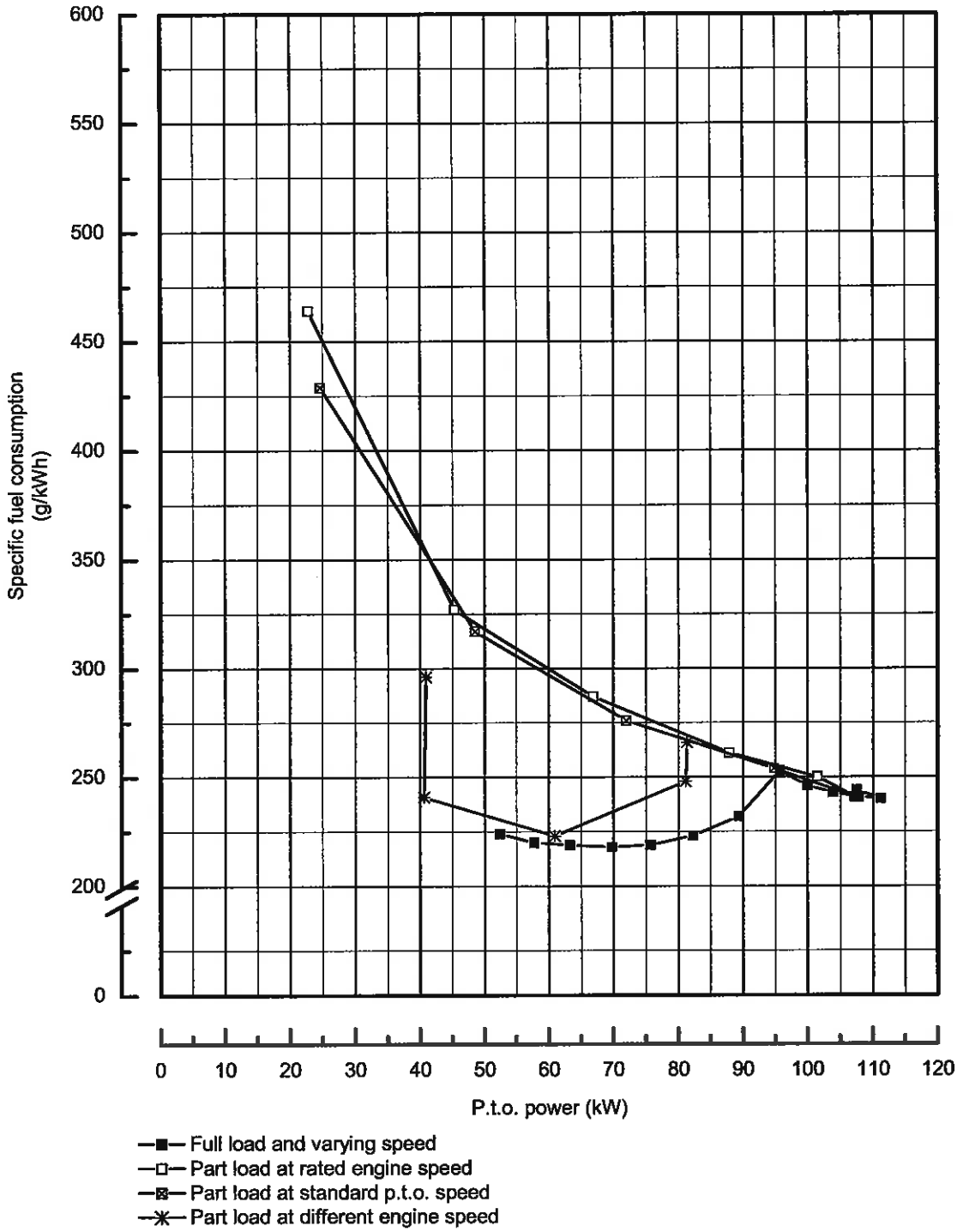
Mean atmospheric conditions:	
Temperature	21.7 °C
Pressure	98.6 kPa
Relative humidity	46%
Maximum temperatures:	
Coolant	87 °C
Engine oil	110.1 °C
Fuel	49.0°C
Engine air intake	23.9 °C

[1] In operation conditions of power take-off test the EPM system makes the engine operate in un-boosted mode.
For this test an over ride system has been provide by the manufacturer of the tractor to enable engine operate in boosted mode when tractor is stationary.
Results of this test can be achieved ONLY when EPM system makes the engine operate in PTO operation mode.
See Foreword on page 2 for more details on EPM operation modes.

raph 3. Power take-off test (with power boost)



Graph 4. Power take-off test (with power boost)



2 Hydraulic power and lifting force

Date of tests: 11th December 2008

2.1 Hydraulic Power Test

2.1.1 Hydraulic fluid data

Viscosity index (ASTM D 2270): 147
Viscosity at 65°C (ASTM D 341): 25 mm^2/s

2.1.2 Compulsory reporting

	Pressure[1]	Reservoir oil Temperature °C (65°C target)		Engine speed	Flow rate	Power
	MPa	Min.	Max.	min^{-1}	l/min	kW
Rated Engine Speed				2200		
2.1.2.1.A Pump delivery rate at minimum pressure		60	72	2340	96.3	
2.1.2.1.B Pump delivery rate at minimum pressure through two couplers		68	72	2330	104.9	
2.1.2.2 Maximum (sustained) pressure with relief valve open as measured at the coupler Pump stalled: Yes	21.0	60	72	2340		
2.1.2.3 A Flow rate corresponding to a hydraulic pressure equivalent to 90% of the actual relief valve pressure setting and corresponding hydraulic power measured at one coupler	18.9	60	72	2340	74.1	23.3
2.1.2.3 B Flow rate corresponding to a hydraulic pressure equivalent to 90% of the actual relief valve pressure setting and corresponding hydraulic power measured at two couplers	18.9	68	72	2330	84.9	26.7
2.1.2.4 Maximum available hydraulic power with flow through a single coupler pair, and corresponding flow and available coupler outlet pressure	17.5	60	72	2340	95.2	27.8
2.1.2.5 Maximum available hydraulic power with coupler pairs operating simultaneously (flow through two couplers), and corresponding flow and available coupler outlet pressure	18.0	68	72	2330	98.1	29.4

[1] *Pressure as measured at the outlet coupler (pressure near coupler where oil is exiting from tractor)*

3.2.1.3 Supplementary Reporting:

	Pressure[2]	Reservoir oil Temperature °C		Engine speed	Flow rate	Power
	MPa	min.	max.	min^{-1}	l/min	kW
3.2.1.3.1 Pump delivery rate at minimum pressure from one couple pair		65	71	2200	91.2	
3.2.1.3.2 Maximum available flow and maximum useable (*continuous*) power from one coupler	16.6	65	71	2200	87.8	24.3
3.2.1.3.3 Maximum available flow and maximum useable (*continuous*) power from two coupler pairs operating simultaneously	16.5	65	74	2200	100.3	27.6
3.2.1.3.4 Maximum differential pressure Category 1 Tractor						
3.2.1.3.5 Maximum differential pressure Category 2 or 3 Tractor	19.4	65	71	2200	50	
3.2.1.3.6 Peak Pressure						
3.2.1.3.7 Maximum sump return pressure with coupler	1.5	65	71	2200		
3.2.1.3.8 Maximum return pressure without coupler						

[2] *Differential pressure (pressure near coupler where oil is exiting from tractor – pressure near coupler where oil is re-entering the tractor)*

2.2 Compulsory Power lift test

Linkage settings for test - see Table 1.1 and Figure 1.1 and 1.2

	at the hitch point	on the frame
Height of lower hitch points above ground in down position	200 mm	200 mm
Vertical movement: - With lifting force - Without lifting force	 752 mm 782 mm	 844 mm 927 mm
Maximum corrected force exerted through full range	41.0 kN	35.3 kN
Corresponding pressure of hydraulic fluid	18.9 MPa	18.9 MPa
Moment about rear-wheel axis	48.9 kNm	63.7 kNm
Maximum tilt angle of mast from the vertical	none	10 degrees

Lifting heights relative to the horizontal plane including the lower link pivot points											
mm	-484	-440	-425	-340	-240	-140	0	160	260	327	360
Lifting forces (the values of force measured shall be corrected to correspond to a hydraulic pressure equivalent to a 90% of the actual relief valve pressure setting of the hydraulic lift system):											
at the hitch points kN	-	-	44.0	44.1	44.9	46.6	46.9	48.4	49.1	41.0	-
Corresponding pressure: 18.9 MPa											
at the frame kN	38.5	38.4	-	38.1	38.4	38.6	38.5	37.6	36.7	-	35.3
Corresponding pressure: 18.9 MPa											

3.2.3 Optional Power lift test

Tests have been performed in accordance with setting requested by manufacturer.

Linkage settings for test - see *"Additional"* column in Table 1.1 and Figure 1.1 and 1.2

	at the hitch point	on the frame
Height of lower hitch points above ground in down position	247 mm	247 mm
Vertical movement - With power travel of the lift - Without power travel of the lift	 678 mm 715 mm	 736 mm 810 mm
Maximum corrected force exerted through full range	41.2 kN	41.6 kN
Corresponding pressure of hydraulic fluid	18.9 MPa	18.9 MPa
Moment about rear-wheel axis	49.2 kNm	75.0 kNm
Maximum tilt angle of mast from the vertical	none	6.6 degrees

Lifting heights relative to the horizontal plane including the lower link pivot points									
mm	-412	-378	-275	-175	0	175	275	300	324
Lifting forces (the values of force measured shall be corrected to correspond to a hydraulic pressure equivalent to a 90% of the actual relief valve pressure setting of the hydraulic lift system):									
at the hitch points kN	-	47.6	49.1	51.3	51.5	52.0	51.5	41.2	-
Corresponding pressure: 18.9 MPa									
at the frame kN	44.1	44.3	44.8	44.9	45.1	43.8	42.4	-	41.6
Corresponding pressure: 18.9 MPa									

3 Compulsory drawbar power and fuel consumption test (unballasted tractor)

Date of tests: 17th, 19th and 20th November 2008
Type of track: asphalt

Height of drawbar above ground	Tyre inflation pressure	
	Front	Rear
495 mm	80 kPa	80 kPa

Speed No.[1]	Power	Drawbar pull	Speed	Engine speed	Fan speed	Slip of wheels	Specific fuel consumption	Specific energy	Temperature			Atmospheric conditions		
									Fuel	Coolant	Engine oil	Temperature	Relative humidity	Pressure
	kW	kN	km/h	min^{-1}	min^{-1}	%	g/kWh	kWh/l	°C	°C	°C	°C	%	kPa
3.1	MAXIMUM POWER IN TESTED GEARS/SPEED SETTINGS													
1	27.0	53.74	1.81	2302	2230	11.13	507	1.66	28	87	103	16	48	98.3
2	32.0	52.65	2.19	2295	2245	10.53	485	1.73	31	87	104	17	47	98.3
3	38.7	52.84	2.64	2288	2226	10.58	443	1.90	33	87	104	18	42	98.3
4	46.2	52.26	3.18	2269	2160	9.41	417	2.01	40	87	104	19	22	98.3
5	54.4	52.75	3.71	2247	2198	9.43	379	2.21	41	87	105	18	24	98.3
6	61.4	51.99	4.25	2125	2253	7.98	364	2.30	42	87	106	19	23	98.3
7	69.6	50.14	5.00	2089	2094	6.76	322	2.61	44	86	105	18	24	98.3
8	72.9	46.55	5.64	1932	1895	5.21	312	2.69	45	86	103	17	21	98.3
9	73.2	38.62	6.82	1905	1856	3.43	308	2.73	23	85	100	11	12	98.7
10	72.0	30.00	8.64	1981	1969	2.14	312	2.70	33	85	101	12	13	98.7
11	72.7	27.56	9.50	1853	1856	2.10	309	2.72	33	84	101	11	12	98.7
12	68.8	21.87	11.32	1822	1788	1.61	326	2.57	36	85	102	12	14	98.7

As displayed on dashboard

Speed No.[1]	Power	Drawbar pull	Speed	Engine speed	Fan speed	Slip of wheels	Specific fuel consumption	Specific energy	Temperature			Atmospheric conditions		
									Fuel	Coolant	Engine oil	Temperature	Relative humidity	Pressure
	kW	kN	km/h	min^{-1}	min^{-1}	%	g/kWh	kWh/l	°C	°C	°C	°C	%	kPa
3.3.2 FUEL CONSUMPTION														
3.3.2.1 In selected gear/speed setting nearest 7.5 km/h, at maximum power at rated engine speed														
8	65.7	35.8	6.60	2194	1990	3.11	334	2.51	34	87	104	21	31	98.5
3.3.2.1.1 75% of pull corresponding to maximum power at rated engine speed														
8	50.8	26.8	6.82	2265	1947	2.22	388	2.16	35	87	105	20	36	98.5
3.3.2.1.2 50% of pull corresponding to maximum power at rated engine speed														
8	34.5	17.9	6.92	2290	1817	1.31	451	1.86	36	87	104	19	28	98.5
3.3.2.1.3 Highest gear/speed setting at reduced engine speed able to achieve both 3.3.2.1.1 and 3.3.2.1.2; same pull and travelling speed as in 3.3.2.1.1														
9	50.8	26.8	6.82	1872	1668	2.21	339	2.48	36	85	102	19	32	98.5
3.3.2.1.4 Same gear/speed selection as 3.3.2.1.3 at reduced speed; same pull and travelling speed as in 3.3.2.1.2														
9	34.4	17.9	6.92	1895	1525	1.47	401	2.09	37	85	101	18	26	98.5
3.3.2.2 In selected gear/speed setting nearest between 7 and 10 km/h at rated engine speed														
9	64.0	28.5	8.10	2196	1985	2.26	335	2.51	12	87	100	5	65	97.9
3.3.2.2.1 75% of pull corresponding to maximum power at rated engine speed														
9	49.3	21.3	8.32	2276	1943	1.63	375	2.24	13	87	100	5	66	97.9
3.3.2.2.2 50% of pull corresponding to maximum power at rated engine speed														
9	33.5	14.1	8.53	2294	1646	1.02	473	1.78	14	85	100	6	63	97.9
3.3.2.2.3 Highest gear/speed setting at reduced engine speed able to achieve both 3.3.2.2.1 and 3.3.2.2.2; same pull and travelling speed as in 3.3.2.2.1														
10	49.3	21.4	8.32	1858	1593	1.59	345	2.43	15	85	97	4	68	97.9
3.3.2.2.4 Same gear/speed setting as 3.3.2.2.3 at reduced speed; same pull and travelling speed as in 3.3.2.2.2														
10	33.7	14.2	8.53	1900	1503	0.98	410	2.05	16	85	96	5	70	97.9
[1] *As displayed on dashboard*														

4 REPAIRS

None

5 REMARKS

Tests results of this report have been obtained from tests carried out on a prototype identical to the tractor CASE IH PUMA 125 in all practical aspects relating to the tests.
It has been checked that the series production conforms to the tested tractor.

ANNEX

Other tests results not covered by OECD approval

i Test in accordance with SAE J 283. Nov. 1999: Test procedure for measuring hydraulic lift capacity on agricultural tractors equipped with three-point hitch

1.1 Test conditions

Tests have been performed in accordance with Section 4 of SAE J283: Static lift force test. Setting of the three-point hitch is specified in *"SAE"* column the table 1.1 and more details on linkage geometry are in figure 1.1 and 1.2.

ifting heights relative to the horizontal plane including the lower link pivot points												
ift rods length 845 mm	-378	-325	-	-225	-125	0	125	225	315	-	-	-
ift rods length 778 mm	-	-	-238	-225	-125	0	125	225	-	325	425	437
ifting forces corrected to correspond to a hydraulic pressure equivalent to a 90% of the minimum relief alve setting of the hydraulic lift system												
N	63.9	60.1	-	56.0	54.6	53.3	52.0	50.2	41.1	-	-	-
N	-	-	55.8	55.6	54.0	53.8	53.5	52.8	-	51.3	48.6	41.2
orresponding pressure: 18.9 MPa												

his report has been approved by the O.E.C.D. Co-ordinating Centre (CEMAGREF. France) as being in ccordance with the O.E.C.D. Standard Code for the official testing of agricultural and forestry tractor erformance.

The Head of the Section
E. CAVALLO

The Director
G.L. ZAROTTI

orino, 29th January 2009