COMITATO PER L'OMOLOGAZIONE
DELLE MACCHINE AGRICOLE

REPORT N°. 992

REPORT ON TEST IN ACCORDANCE WITH O.E.C.D. TEST
CODE FOR AGRICULTURAL TRACTORS OF:

FIAT 130-90/12 (2 WD)



Manufactured by: FIAT TRATTORI S.p.A.
Via Pico della Mirandola, 72 - MODENA (Italy)

Date of tests: Torino, May 1984 - September 1985

This report has been approved by the O.E.C.D. Coordinating Center (CEMAGREF, France) as being in accordance with the O.E.C.D. Tractor Test Code.

Date of approval: 18th February 1986

CONSIGLIO NAZIONALE DELLE RICERCHE
ISTITUTO PER LA MECCANIZZAZIONE AGRICOLA
TORINO - ITALY

This bulletin is based on engineering tests in accordance with O.E.C.D. Tractor Code. It does not contain an evaluation of performance of the tractor on practical farm work.

The FIAT 130-90 tractor is manufactured in following variants:

1. 130-90/12 model with 12 forward and 4 reverse speeds (4x4 gear units)
2. 130-90/24 model with 24 forward and 8 reverse speeds (4x4x2 gear units)
3. 130-90/I model with 16 forward and 16 reverse speeds (4x4x2 gear units)
4. 130-90/IS model with gear units and groups similar to those of the 130-90/I model, but with different ratios.

The tests have been made on FIAT 130-90/12

In this report all performance characteristics are given corresponding to the International System of Units.

The reference to the former used Technical System of Units is given by the following relations:

Forces:	1 N = 0.10197 kg	or 1 kg	= 9.80665 N
Powers:	1 kW = 1.35962 metric hp	or 1 metric hp	= 0.73550 kW
Pressures:	1 bar = 1.01972 kg/cm^2	or 1 kg/cm^2	= 0.980665 bar
Torques:	1 mN = 0.10196 mkg	or 1 mkg	= 9.80665 mN

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PERFORMANCE CURVES

a) Power take-off test	Fig. No.
Curves of power, torque, hourly and specific fuel consumption/ crankshaft speed	1
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Tractor manufacturer:	FIAT TRATTORI S.p.A. Via Pico della Mirandola, 72 MODENA - Italy
Submitted for test by:	Manufacturer
Selected by:	Manufacturer with agreement by Istituto per la Meccanizzazione Agricola - Torino (Italy)
Place of running-in:	Istituto per la Meccanizzazione Agricola - Torino
Duration of running-in:	Engine and tractor appr. 70 hours

SPECIFICATION OF TRACTOR:

Tractor:

Make:	FIAT
Model:	130-90/12
Type:	Wheeled tractor, unit construction, rear wheel driven.
Serial No.:	256005
Ist serial No.:	256000

Engine:

Make:	FIAT
Model:	8065.25 R
Type:	4-stroke Diesel engine, direct injection, water cooled, turbo supercharged.
Serial No.:	000110
Cylinders:	6 cylinders, vertical, in-line, 104 mm bore x 115 mm stroke, capacity 5861 cm^3, compression ratio 16,5:1, overhead in-line valves, replaceable cast-iron dry cylinder liners.
Supercharger:	GARRET, model TO 4B/Y7/1.00E; maximum supercharge pressure 0.67 $\pm$ 0.05 bar.
Fuel system:	Fuel-supply pump, type FP/KS 22 AD6/2, fixed to injection pump; one wire-mesh filter on pump suction side and two filters make CAV type 2 FAS 3345310 with replaceable cartridge and sediment bowls on pressure side of injection pump; one standard fuel tank capacity 180 l and two optional tanks capacity 50 l each; Weber-Altecna PES 6 A 90 D in line injection pump; manufacturer's production setting 56.5 - 57.5 mm^3/stroke at rated engine speed and full load; injection timing 25° $\pm$ 1° before TDC; BOSCH multihole injectors EPPZ10F3; injection-pressure 234 $\pm$ 4 bar. – Serial No of injection pump: 774774
Governor:	BOSCH, mechanical type, RQV 300, incorporated in injection pump; governed range of engine speed from 650 to 2750 rev/min; rated engine speed 2500 rev/min.

Air cleaner:	Donaldson main cleaner, ELB 10-0060 dry paper element filter, with two replaceable cartridges under bonnet; Donaldson pre-cleaner, PBHOO-O823 centrifugal above bonnet; electrical maintenance indicator.
Lubrication system:	Forced-feed lubrification with gear pump; three filters: one wire mesh type filter on pump suction, two replaceable cartridges type on pressure side pump of oil to the engine; cartridge change every 400 operating hours; oil capacity including filters 15.2 l; recommended oil FIAT AMBRA SUPER, SAE classification 15W/40, satisfied MIL-L-2104 C specifications; oil change period every 200 operating hours.
Cooling system:	Pressurized water cooling system with centrifugal pump (0.69 bar) and thermostatic control; 450 mm dia, 6 blades, belt driven fan; coolant capacity 19 l. Temperature check with thermometer.
Starting system:	Electrical Marelli MT 68 LB (12 V - 3.5 kW) or BOSCH JF (12 V - 3 kW), starting motor pinion coupling solenoid operated: starting motor operable only with engine clutch disengaged: cold starting aid; thermostart or start-pilote.
Electrical system:	12 V, negative earth. Alternator MARELLI type AA 125-14V-65A (780 W) or BOSCH type K1-14V-65A 21 (780 W). Battery: one lead acid type; MARELLI 6A TM 25-A or SCAINI 64072 or MARELLI 6A TP 33; respective capacities 132, 140, 176 Ah at 20 hours rating.
Exhaust system:	Own make, DGM-SA 946, interferance type with internal perforated pipe; square shape 110 x 110 mm, 820 mm length; vertical on left side of engine; maximum height above ground 3140 mm.
Transmission:	
Clutch:	LUK or VALEO make, dry single disc clutch, only for travel, on the primary shaft of gear box; disc 335.6 mm dia; pedal operated.
Gearbox:	Own make. On the 130-90/12 tractor model tested: mechanical syncronized type, constant mesh gear with total 12 forward and 4 reverse speeds; the transmission consists of two mechanical in series gear units: the first with 4 speeds, the second with 4 positions to select the gear groups (low, medium, high and reverse); each unit is operated by own lever. The FIAT 130-90 tractor is available in the other three variants: – 130-90/24 model with 24 forward and 8 reverse speeds; three series gear units: the first with four speeds, the second with four positions to select the gear groups (low, medium, high, reverse), the third with two positions to select direct or crawling speeds; – 130-90/I model with 16 forward and 16 reverse speeds; three series gear units: the first with four speeds, the second with four positions to select the gear groups (low, normal, medium, high), the third with two positions to select the forward and reverse speeds; – 130-90/IS model with gear units and groups similar to those of the 130-90/I model, but with different ratios.
Rear axle and final drive:	Own make, mechanical type with Gleason crown wheel and pinion; bevel gear type differential with mechanical pedal operated and self-disengaging lock; epycicloidal final drives.

Front axle: Own make, not driven.

Gear lubrication: Gear box capacity 18.3 l; rear axle, final rear drives and power lift circuit 58.9 l; change period 1600 operating hours; two filters in full flow with by-pass valve and replaceable cartridge; filters change period 400 operating hours. Recommended oil FIAT TUTELA MULTI F, SAE classification 20W/40 or any oil conforming MIL L 2104 C or API-CD.

FIAT 130-90/12 model

– Total ratios and speeds (tyres 18.4 R 38 and pressure 1.8 bar)

Gear	Group	Number of engine revolutions for one revolution of the driving wheel	Nominal travelling speed (*) for rated engine speed (2500 rev/min) km/h
I	Low	382.684	2.02
II		250.448	3.08
III		205.089	3.77
IV		136.889	5.64
I	Medium	170.371	4.53
II		111.509	6.93
III		91.302	8.46
IV		60.944	12.67
I	High	75.424	10.24
II		49.360	15.65
III		40.412	19.11
IV		26.983	28.63
I	Reverse	204.810	3.77
II		134.025	5.76
III		109.768	7.04
IV		73.263	10.54

(*) Calculated with the radius index of 820 mm

FIAT 130-90/24 model

– Total ratios and speeds (tyres 18.4 R 38 and pressure 1.8 bar)

Gear	Group	Number of engine revolutions for one revolution of the driving wheel	Nominal travelling speed (*) for rated engine speed (2500 rev/min) km/h
I	Low (crawling speed)	4143.000	0.18
II		2711.610	0.29
III		2220.440	0.35
IV		1482.060	0.52
I	Low	382.684	2.02
II		250.448	3.08
III		205.089	3.77
IV		136.889	5.64
I	Medium (crawling speed)	1844.640	0.42
II		1207.310	0.64
III		988.624	0.78
IV		659.870	1.17
I	Medium	170.371	4.53
II		111.509	6.93
III		91.302	8.46
IV		60.944	12.67
I	High (crawling speed)	816.607	0.93
II		534.464	1.45
III		437.656	1.76
IV		292.120	2.65
I	High	75.424	10.24
II		49.360	15.65
III		40.412	19.11
IV		26.983	28.63
I	Reverse (crawling speed)	2217.300	0.35
II		1451.215	0.53
III		1188.337	0.65
IV		793.157	0.98
I	Reverse	204.810	3.77
II		134.025	5.76
III		109.768	7.04
IV		73.263	10.54

(*) Calculated with the radius index of 820 mm

FIAT 130-90/I model

– Total ratios and speeds (tyres 18.4 R 38 and pressure 1.8 bar)

Gear	Group	Number of engine revolutions for one revolution of the driving wheel	Nominal travelling speed (*) for rated engine speed (2500 rev/min) km/h
I	Low	382.684	2.02
II		250.448	3.08
III		205.089	3.77
IV		136.889	5.64
I	Normal	189.048	4.09
II		123.711	6.24
III		101.324	7.62
IV		67.614	11.42
I	Medium	170.371	4.53
II		111.509	6.93
III		91.302	8.46
IV		60.944	12.67
I	High	75.424	10.24
II		49.360	15.65
III		40.412	19.11
IV		26.983	28.63
I	Reverse low	478.347	1.61
II		313.019	2.47
III		256.370	3.01
IV		171.119	4.51
I	Reverse normal	236.294	3.27
II		154.655	4.99
III		126.639	6.10
IV		84.534	9.14
I	Reverse medium	212.896	3.63
II		139.394	5.54
III		114.144	6.77
IV		76.172	10.14
I	Reverse high	94.263	8.19
II		61.692	12.52
III		50.532	15.29
IV		37.709	20.48

(*) Calculated with the radius index of 820 mm

FIAT 130-90/IS model

– Total ratios and speeds (tyres 18.4 R 38 and pressure 1.8 bar)

Gear	Group	Number of engine revolutions for one revolution of the driving wheel	Nominal travelling speed (*) for rated engine speed (2500 rev/min) km/h
I	Low	250.458	3.08
II		205.028	3.77
III		169.523	4.56
IV		136.850	5.64
I	Normal	123.665	6.25
II		101.326	6.93
III		83.688	7.63
IV		67.549	8.47
I	Medium	111.444	9.23
II		91.237	10.24
III		75.424	11.44
IV		60.879	12.69
I	High	49.367	15.66
II		40.412	19.11
III		33.416	23.12
IV		26.980	28.63
I	Reverse low	313.072	2.47
II		256.272	3.01
III		211.890	3.65
IV		171.054	4.52
I	Reverse normal	154.580	5.00
II		126.542	6.10
III		104.611	7.38
IV		84.437	9.15
I	Reverse medium	139.303	5.38
II		114.047	6.77
III		94.263	8.19
IV		76.074	10.15
I	Reverse high	61.709	12.52
II		50.515	15.29
III		41.769	18.49
IV		33.709	22.91

(*) Calculated with the radius index of 820 mm

Power take off:

Indipendent p.t.o. driven by wet indipendent multidisc clutch, hidraulically controlled; three interchangeable shafts, automatic selection of speed changing p.t.o. shafts; hand lever operated. Position: rear of tractor, in medlan plane; helght above ground 760 mm (with tyre 18.4 R 38).

Proportional engine speed p.t.o.:
– **540 rev/min p.t.o.:** distance behind rear axle 566 mm; diameter of p.t.o. shaft end 34.9 mm or 44.4 mm; 6 splines, according to I.S.O. STANDARD; no power restriction, 597 rev/min at rated engine speed; standard p.t.o. speed 540 rev/min at engine speed 2261 rev/min; p.t.o. shaft rotates clockwisely, viewed from tractor rear.

p.t.o. transmission ratio: $\frac{\text{engine speed}}{\text{p.t.o. speed}} = 4.187$

– **1000 rev/min p.t.o.:** distance behind rear axle 548 mm; diameter of p.t.o. shaft end 34.9 mm; 21 splines, according to I.S.O. STANDARD, 1017 rev/min at rated engine speed, standard p.t.o. speed 1000 rev/min at engine speed 2458 rev/min; p.t.o. shaft rotates clockwisely viewed from tractor rear.

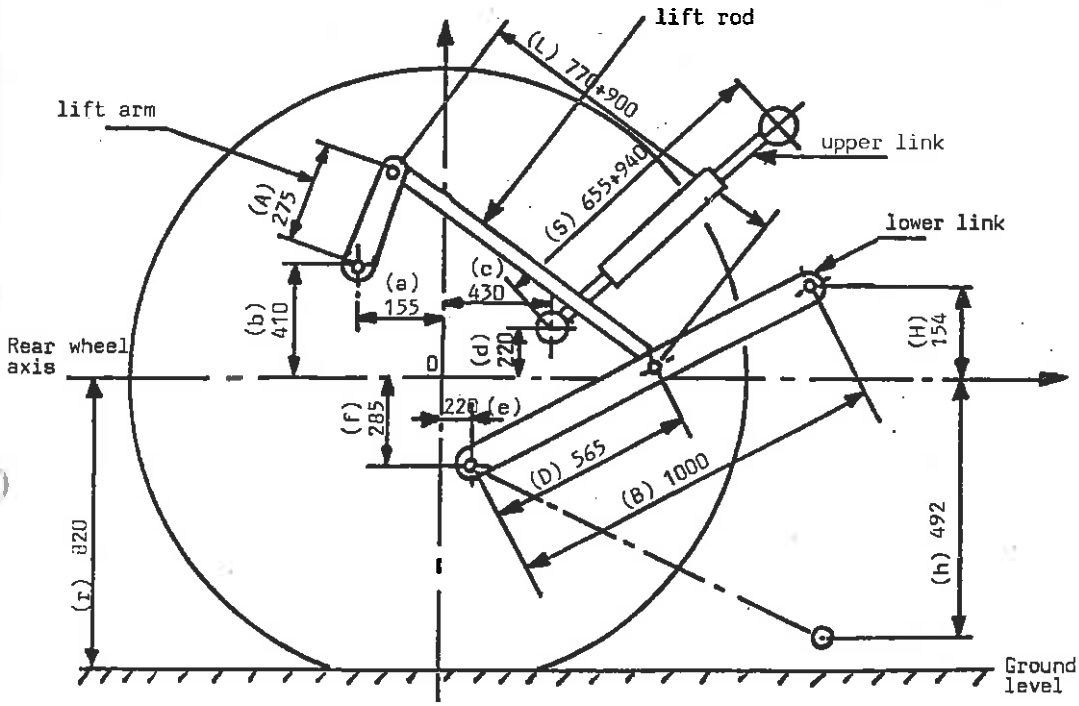
p.t.o. transmission ratio: $\frac{\text{engine speed}}{\text{p.t.o. speed}} = 2.458$

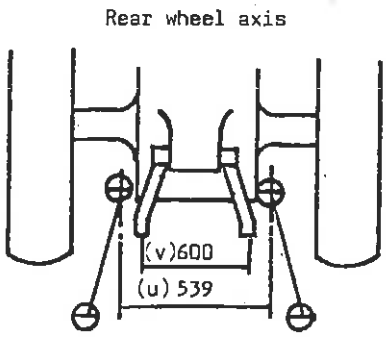
Power lift:

Own make; hydraulic power lift in unit construction. Draft and position control operated by two indipendent levers; lift-o-matic device to raise and to lower links.

Hydraulic system:
open centre system; own make gear pump A 42, directly driven by engine; delivery 55.7 l/min at rated engine speed; two hydraulic oil filters with paper cartridges; filters change period 400 operating hours.
Own make control valve; maximum working pressure 175-183 bar. Single acting cylinder with 115 mm bore and 159 mm stroke; over pressure relief valve in cylinder set to 215 bar; one or two single acting additional rams with 75 mm bore and 150 mm stroke.
Type of linkage lock for transport: hydraulic.
Maximum 3 double acting additional control valves with oil tappings at rear of tractor available; pump suction inside the rear transmission box.
Oil capacity (common at gear box and rear axle): 58.9 l.
Max oil delivery which may be taken of through oil tappings 32 l.
Recommended oil: see transmission oils. Oil change period 1600 operating hours.

Implement linkage:
three point linkage, quick couplers optional, not fitted on tested tractor; joint balls category 2 according to I.S.O. STANDARD 730. Available joint balls category 3; from category 2 to category 3 changing lower link end; dimensions see on pag 9.





State setting of hydraulic power lift for test

– Rear tyres (size 18.4 R 38) radius index		(r) :	820	mm
– Front tyres (size 11.00-16) radius index		(r') :	440	mm
– Length of lift arms		(A) :	275	mm
– Lenght of lower links		(B) :	1000	mm
– Distance of lift arm pivot point from rear wheel centre line:	horizontally	(a) :	155	mm
	vertically	(b) :	410	mm
– Horizontal distance between the 2 lower link points		(u) :	539	mm
– Horizontal distance between the 2 lift arm end points		(v) :	600	mm
– Length of upper link		(S) :	from 655 to 940	mm
– Distance of upper link pivot point from rear wheel centre line	horizontally	(c) :	430	mm
	vertically	(d) :	220	mm

– Distance of lower link pivot point from rear wheel centre	horizontally	(e) :	220 mm
	vertically	(f) :	285 mm
– Distance of lower lift pivot points to lift rod pivot points on lower links		(D) :	565 mm
– Length of lift rods		(L) :	from 770 to 900 mm
– Height of lower hitch points:			
· in low position		(h) :	492 mm
· in high position relative to the rear wheel centre line, situated 820 mm above the ground level		(H) :	154 mm
– Height of lower link hitch points when locked in transport position			Any height within lift range

Pull attachment:

Swinging drawbar and sector guide:
own make. Heights above ground with tyres 18.4 R 38 max 540 mm, min 425 mm. Two possible positions inverting (180°) the drawbar; distance of hitch points from rear axle 1005 mm behind horizontally; distance of hitch point from p.t.o. shaft end 335 mm max and 220 mm min below vertically and 457 mm behind horizontally; with 1000 p.t.o. end (439 mm behind with 540 p.t.o. end); lateral adjustments 280 mm on right and left hands; distance of pivot point from rear axle 295 mm vertically and 305 mm horizontally; one drawbar pin hole, 31 mm dia.

Trailer hitch
own make, clevis type; height above ground, with tyre 18.4 R 38, 965 mm max and 520 mm min distance of hitch point from axle 770 mm horizontally; distance of hitch point from p.t.o. shaft end: vertically from 240 mm below to 205 mm above, horizontally 227 behind with 1000 p.t.o. shaft end (209 mm with 540 p.t.o. shaft end); max vertical load 1470 daN, according to Italian legislation; one hitch pin hole 28.5 mm dia.

Holed drawbar:
fitted on hitch points of lower links; number 9 holes; distance between holes 80 mm, 33 mm dia holes, 32 mm thickness 80 mm width, height above ground min 305 mm, max 990 mm (with tyres 18.4 R 38); horizontal distance to p.t.o. shaft end 1220 mm.

Steering:

Hydrostatic control with indipendent hydraulic circuit, DANFOSS make, OSPC 160, incorporating hand control for emergency; gear pump FIAT CX 31 RP, 19 l/min delivery, 1 cylinder directly acting on front axle, transversely mounted, bore 50 mm, stroke 185 mm, piston rod 22 mm; working pressure 125 bar; oil capacity 1 l; oil filter: one paper cartridge; oil change period 1600 operating hours, filter change period 400 operating hours.
Recommended oil FIAT TUTELA MULTI F, SAE classification 20 W/40 or any oil according to MIL L 2104 C or API - CD.

Brakes:

Service brakes:
own make, wet disc brake type, one disc 370 mm dia, 10 mm thickness; hydraulically acting on rear differential half shaft; operated by 2 indipendent pedals locked together for road drive. Hydraulic trailer braking take off available as optional.

Parking brake:
indipendent, mechanic; hand lever operated acting on two discs sets on driving pinion shaft. Discs 107.5 mm dia, 7 mm thickness.

Steering brake:
divided pedal of service brake, for normal use locked together.

Wheels:

Steering wheels:
at front, 2 diagonal type tyres GOOD YEAR 11.00-16, 8 ply; maximum permissible load per tyre 1190 kg at 2.5 bar inflation pressure and max 35 km/h speed; track width adjustment continuos from 1600 mm to 2100 mm by 100 mm steps extending axle.

Driving wheels:
at rear; two radial type tyres PIRELLI 18.4 R 38, 10 ply; maximum permissible load per tyre 2850 kg at 1.8 bar inflation pressure and max 35 km/h speed; track width continuos adjustment from 1520 mm to 2220 mm rotating the wheels on discs (rail system).

Option of tyres:

Tyre size	
at front	at rear
9.00 - 16 8 ply	23.1 R 34 8 ply
10.00 - 16 10 ply	

Wheelbase: 2760 mm.

Cab:

own make, CS 5 type.
Mounted by 6 silent blocks on tractor; main frame stamped sheet-metal made.

Noise reduction materials:
- roof: 6 mm sound deadening panel, Keller make, AutoKell-MB type;
- platform: 26 mm sound deadening panel, Keller make, Auto-Kell-T type;
- fenders: 8 or 12 mm sound deadening panel, Keller make, AutoKell-MB type;
- other parts: 3 mm sound deadening panel, UNIROYAL make, ABS type.

Engine-water heat exchanger heating-system, 3-step blower for fresh and warm air.
Glasses: windscreen and rear window tempered security glasses SAINT-GOBAIN make, Security-L type, IGM 0594 VT approval.
Doors and lateral glasses: tempered security glasses DETAG make, DGM 336008 VT approval.

Option: FIAT CS 13 cab or FIAT TS 18 frame.

Seat:

Driver's seat:
GRAMMER make, DS 85 H/90 AR model, upholstered seat with back rest and arm rests, adjustable spring with shock absorber; height of unloaded seat above driver's platform adjustable from 580 mm to 640 mm in three positions, longitudinal adjustment 150 mm; seat revolving around vertical axis to the left and right each about 25°.

Passenger seat:
own make, mounted on front part of mudguard, left side; available as optional.

Number of grease points: 14.

Overall dimension (tyres size 11.00-16 front and 18.4 R 38 rear)

	Lenght	Width		Height to top of	
		mini	maxi	exhaust silencer	cab
	m	m	m	m	m
With ballast	4.88	1.99	2.69	3.14	2.86
Without ballast	4.58	1.99	2.69	3.14	2.86

Ground clearance: 410 mm below swinging drawbar frame.

Lighting equipment: Electrical 12 V, in accordance with Italian legislation.

	Height above ground of centre with tyres: 11.00 - 16 front 18.4 R 38 rear	Size	Distance from outside edge of tractor to centre (°)
	mm	mm	mm
Headlights	1260	180 x 120	905
Side lights	1825	35 x 110	332
Rear lights	1920	80 x 60	230
Reflectors: 1st pair	1590	90 x 55	115
2nd pair	660	90 x 55	660

(°) Track setting: 1600 mm at front
1720 mm at rear

TEST CONDITIONS

Track setting: 1600 mm at front
1720 mm at rear

Weights: Tractor (with FIAT CS 5 cab, standard and optional tanks fuel, without driver)

	Front kg	Rear kg	Total kg
Without ballast	1510	3580	5090
With ballast	2300	4500	6800

Ballasts:

	Weights		Water (kg)
	Number	Total mass (kg)	
Front wheels Front weight	- 10 + support	- 540	- -
Rear wheels	6	390	580
Additional	4	200	-

Fuel and lubricants used in tests

Fuel:	Esso Diesel oil; specific gravity: 0.831 Kg/l at 15 °C, which is in conformity with our National Standard;
Engine oil:	FIAT AMBRA SUPER SAE 15W/40
Transmission oil, hydraulic oil, steering oil:	FIAT TUTELA MULTI F SAE 20 W 40
Grease:	FIAT TUTELA G9

COMPULSORY TESTS

(1) MAIN POWER TAKE-OFF PERFORMANCE (1000 rev/min)

Date of tests: 11th May 1984

Location of tests: Istituto per la Meccanizzazione Agricola - Torino (Italy)

Type of dynamometer: Electrical, swinging frame

Power	Speed		Fuel consumption			Specific energy
	engine	p.t.o.	hourly		specific	
kW	rev/min	rev/min	l/h	kg/h	g/kWh	kWh/l
Maximum power At 2-hour test						
85.11	2500	1017	25.66	21.32	250	3.32
At standard p.t.o. speed						
84.62	2458	1000	24.93	20.72	245	3.39
At the speed recommended by Manufacturer for drawbar work						
85.11	2500	1017	25.66	21.32	250	3.32
Part loads, the governor hand lever in the position corresponding to the maximum power at full load (curve a) (i) 85% of the torque at maximum power at 2-hour test						
76.06	2628	1069	25.52	20.38	268	3.10
(ii) unloaded						
-	2753	1120	8.50	7.06	-	-
(iii) 50% of the load defined in (i)						
38.92	2689	1094	16.29	13.54	348	2.39
(iv) maximum power						
85.11	2500	1017	25.66	21.32	250	3.32
(v) 25% of the load defined in (i)						
19.71	2724	1108	12.61	10.48	532	1.56
(vi) 75% of the load defined in (i)						
57.79	2662	1083	20.55	17.08	296	2.81

Power	Speed		Fuel consumption			Specific energy
	engine	p.t.o.	hourly		specific	
kW	rev/min	rev/min	l/h	kg/h	g/kWh	kWh/l
Part loads, the governor hand level in the position corresponding to the standard p.t.o. speed at full load (curve b) (i) 85% of the torque at maximum power at standard p.t.o. speed						
75.16	2569	1045	23.66	19.66	261	3.18
(ii) unloaded						
-	2697	1097	8.09	6.72	-	-
(iii) 50% of the load defined in (i)						
38.48	2630	1070	15.72	13.06	340	2.45
(iv) maximum power						
84.62	2458	1000	24.93	20.72	245	3.39
(v) 25% of the load defined in (i)						
19.51	2667	1085	12.03	10.00	513	1.62
(vi) 75% of the load defined in (i)						
57.13	2603	1059	19.81	14.46	288	2.88

Standard specific fuel consumption (g/kWh): 268/348/261/340

No load maximum engine speed: 2753 rev/min

Equivalent crankshaft torque at maximum power (2 hours): 325 Nm

Maximum equivalent crankshaft torque: 393 Nm at 1500 rev/min of the engine

Mean atmospheric conditions:
- temperature 17.0 °C
- pressure 979.3 mbar
- relative humidity 42%

Maximum temperature:
- coolant 86 °C
- engine oil 115 °C
- fuel 28 °C
- engine air intake 26 °C

(3) DRAWBAR PERFORMANCE

			with ballasts	without ballasts
Date of tests:	from 25th to 27th June 1985	Tyre size: - front: 11.00-16; 8 ply;	inflation pressure:	2.5 bar	2.5 bar
Type of track:	concrete	- rear: 18.4 R 38; 10 ply:	inflation pressure:	1.2 bar	1.2 bar

Height of trailer hitch above ground: 700 mm (with and without ballasts)

Gear	Driving speed Km/h	Power KW	Drawbar pull daN	Engine speed rev/min	Slip of wheels %	Specific fuel consumption g/KWh	Specific energy KWh/l	Temperatures			Atmospheric conditions		
								Fuel °C	Coolant °C	Engine oil °C	Temperature °C	Relative humidity %	Pressure mbar
1 - MAXIMUM POWER (ballasted)													
I Low	1.88	25.08	4805	2706	15.0	-	-	30.0	82	101	17.0	35	988
II Low	2.84	37.91	4805	2680	15.0	396	2.12	30.0	82	103	17.0	35	988
III Low	3.46	46.18	4805	2669	15.0	355	2.37	30.5	82	103	17.0	36	988
I Medium	4.14	54.92	4776	2647	14.7	344	2.44	31.0	83	104	17.5	37	989
IV Low	5.04	67.00	4786	2593	14.8	314	2.67	31.0	83	105	17.5	35	989
II Medium	6.11	75.23	4433	2510	13.2	282	2.98	31.5	84	106	18.0	36	989
III Medium	7.84	77.95	3579	2504	8.6	275	3.06	31.5	84	106	18.0	38	988
I High	9.64	78.52	2932	2500	6.9	273	3.07	31.0	84	108	18.5	36	988
IV Medium	12.31	77.78	2275	2501	4.0	275	3.05	31.5	84	108	17.5	37	988
II High	15.35	74.45	1746	2499	3.0	286	2.94	31.5	84	110	17.5	36	988
2 - FIVE HOUR TEST at 75% of pull at maximum power													
II Medium	6.78	62.59	3324	2612	7.4	337	2.49	31.0	84	109	17.5	58	988
3 - FIVE HOUR TEST at pull corresponding to 15% wheelslip in test (1)													
I Medium	4.36	58.19	4805	2621	-	-	-	32.0	84	108	17.5	62	988
4 - MAXIMUM POWER (unballasted)													
I Medium	4.10	46.36	4070	2660	15.0	375	2.20	35.0	81	103	30.0	60	984
IV Low	5.05	57.10	4070	2631	15.0	334	2.48	35.0	81	103	31.0	56	984
II Medium	6.07	68.28	4050	2570	14.8	310	2.66	35.5	83	105	31.5	48	984
III Medium	7.36	77.37	3785	2509	13.3	277	2.98	36.0	83	106	32.5	44	984
I High	9.29	78.20	3030	2500	9.2	274	3.02	36.5	83	107	33.0	45	984
IV Medium	11.80	77.46	2363	2499	6.9	276	2.99	37.0	84	107	33.0	46	984
II High	15.07	75.14	1795	2501	3.8	285	2.89	37.0	85	109	33.0	44	984
III High	18.58	70.86	1373	2500	2.7	302	2.73	37.5	85	110	32.0	45	984

(3) TURNING SPACE AND TURNING CIRCLE:

Wheel equipment: front 11.00-16 (8 ply)
rear 18.4 R 38 (10 ply)

Track of wheels: front 1600 mm
rear 1720 mm

	With brakes		Without brakes	
	Right-hand	Left-hand	Right-hand	Left-hand
	m	m	m	m
Radius of turning space	3.90	3.73	4.48	4.34
Radius of turning circle	4.15	3.98	4.72	4.50

(4) LOCATION OF CENTRE OF GRAVITY:

Height above ground	mm	1150
Distance forward from the vertical plane containing the axis of the rear wheels	mm	807
Distance from the median plane of the tractor	mm	8 right

(5) BRAKING

Date of tests: 11nd March 1985
Tractor masses during tests with driver:

	Front kg	Rear kg	Total kg
without ballast	1510	3650	5160
with ballast	2300	4570	6870

Speed before application of brakes: 28.63 km/h
Type 0 test (cold brakes)

BALLASTED TRACTOR:

Braking device control force	daN	12.8	18.6	20.5	23.5	28.4	33.3
Mean deceleration	m/s^2	1.3	1.6	1.8	1.9	2.4	2.5

UNBALLASTED TRACTOR:

Braking device control force	daN	19.6	27.5	33.3	35.2	39.2	41.5
Mean deceleration	m/s^2	1.4	2.1	2.4	2.5	2.9	2.9

Type I test (fade)

Braking device control force	daN	12.7	17.7	22.6	23.5	29.4	31.4
Mean deceleration	m/s^2	1.2	1.6	1.9	1.9	2.3	2.4

Maximum deviation of tractor from its original course: none
Abnormal vibration: none
The brakes were heated by towing of the tractor for 1 km

PARKING BRAKING DEVICE TEST

	Ballasted tractor		Unballasted tractor	
	on slope of 18%		on slope of 12% with trailer of 3000 kg	
	Up	Down	Up	Down
Braking device control force: daN	30.0	33.5	29.0	31.5

(6) MEASUREMENT OF EXTERNAL NOISE LEVEL

Date of tests: 27th June 1985
Type of sound level meter: BRUEL & KJAER mod. 2209
Type of track: concrete
Position of the exhaust pipe: vertical on the left hand of the engine
Results of tests:
Gear: IV high
Travelling speed before acceleration: 21.01 km/h
Sound level: 84.5 dB (A)

(7) NOISE MEASUREMENT AT THE DRIVER'S EAR LEVEL

Date of tests: 27th June 1985
Type of sound level meter: BRUEL & KJAER mod. 2209
Type of track: concrete
Tractor with FIAT CS 5 cab

Results of tests:

Gear	Drawbar pull at which the tractor develops the maximum sound level	Measured travelling speed		Sound level
		Nominal	Effective	
	daN	km/h	km/h	dB(A)
(i) all openings closed				
2. M (*)	3920	6.93	7.01	83.0
2. M (*)	light load	6.93	7.59	83.0
top gear	light load	28.63	31.12	83.5
(ii) cab with open windows and doors (optional)				
2. M (*)	3920	6.93	7.04	88.5
2. M (*)	light load	6.93	7.59	88.5
top gear	light load	28.63	31.09	89.5

(*) The 2. M gear corresponds to the nominal travelling speed nearest to 7.5 km/h

(8) POWER LIFT AND HYDRAULIC PUMP PERFORMANCE:

Date of tests: 13th and 14th June 1984

POWER LIFT

	Height of lower hitch point above ground in down position	Vertical movement	Maximum force exerted through full range	Corresponding pressure of hydraulic fluid	Moment about rear axle	Maximum tilt angle of mast over range of lift
	mm	mm	daN	bar	daNm	degrees
At the hitch points	328	646	3300	167	-	-
On the frame	328	780	2850	167	5215	14°

Temperature of hydraulic fluid at start of test: 65 °C.

Tilting angle of mast from vertical position to uppermost position: 10°

a) Standard version

Lifting heights relative to horizontal links

mm	−207	−160	−100	0	+100	+200	+300	+370	+439

Lifting forces at hitch points

daN	3310	3345	3380	3440	3480	3480	3375	3340	3300

Lifting forces at test frame

daN	3675	3655	3620	3505	3395	3280	3075	2975	2850

b) Optional version (with one supplementary cylinders)

Lifting heights relative to horizontal links

mm	−207	−160	−100	0	+100	+200	+300	+370	+439

Lifting forces at hitch points

daN	4490	4545	4615	4660	4710	4780	4640	4620	4610

Lifting forces at test frame

daN	4790	4770	4750	4675	4580	4470	4210	4080	3910

c) Optional version (with two supplementary cylinders)

Lifting heights relative to horizontal links

mm	−207	−160	−100	0	+100	+200	+300	+370	+439

Lifting forces at hitch points

daN	5970	6020	6040	6140	6190	6270	6180	6140	6100

Lifting forces at test frame

daN	6310	6270	6250	6180	6085	5940	5670	5510	5280

HYDRAULIC PUMP PERFORMANCE:

– Sustained pressure with relief valve open:	175 bar
– Opening pressure of the pressure regulator:	167 bar
– Hydraulic pressure corresponding to 90% of the minimum setting of the opening pressure of the relief valve:	157.5 bar
– Delivery:	54 l/min
– Power:	14.2 kW
– Pressure specified by the manufacturer for an external hydraulic motor:	
– Pressure:	155 bar
– Delivery:	54 l/min
– Power:	13.9 kW
– Temperature of hydraulic fluid:	65 °C

– Tapping point used for test: at rear of tractor

(9) REPAIRS AND ADJUSTMENTS DURING TEST: none

(10) REMARKS: none

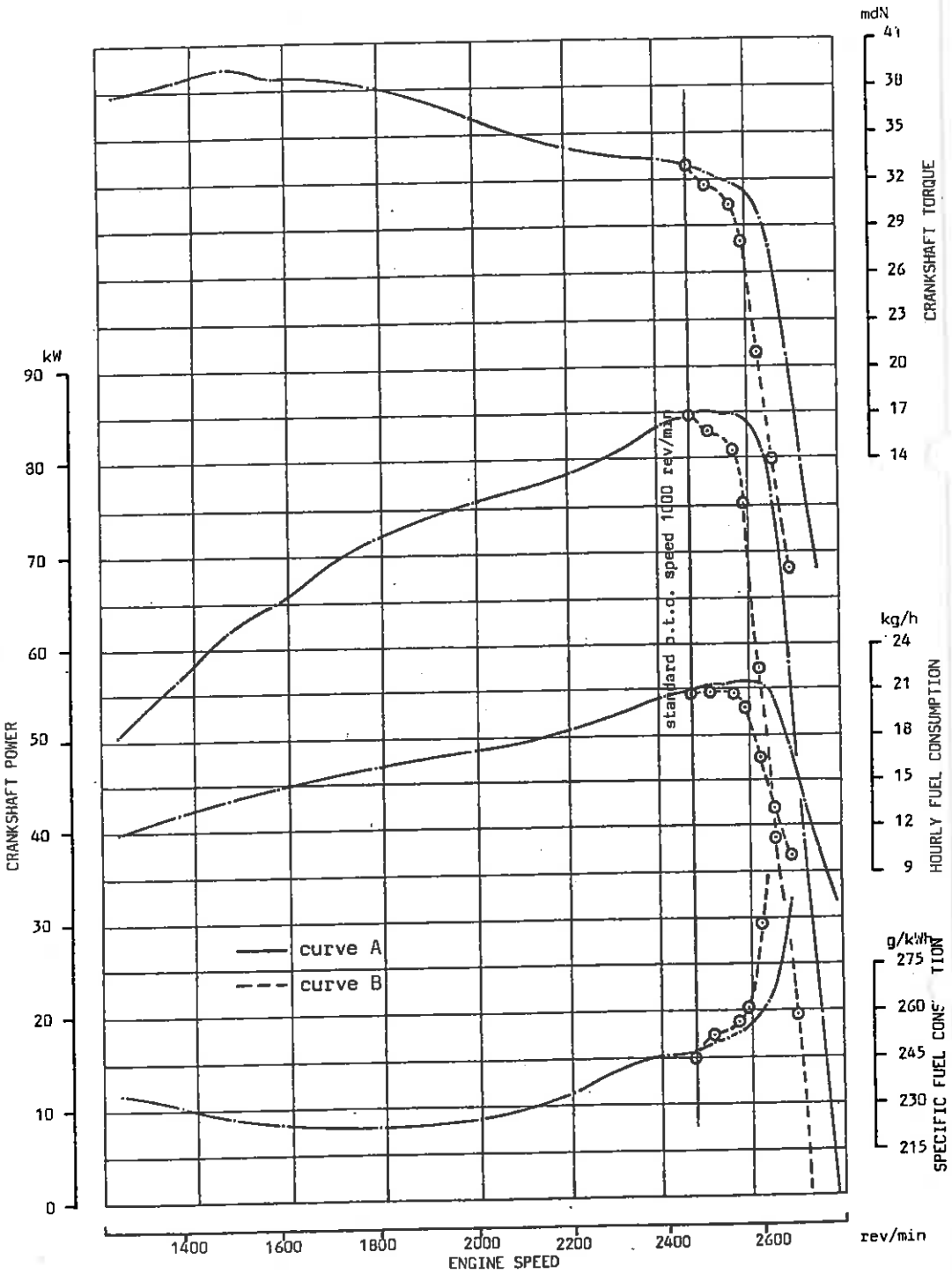


Fig. 1 - POWER TAKE- OFF TEST

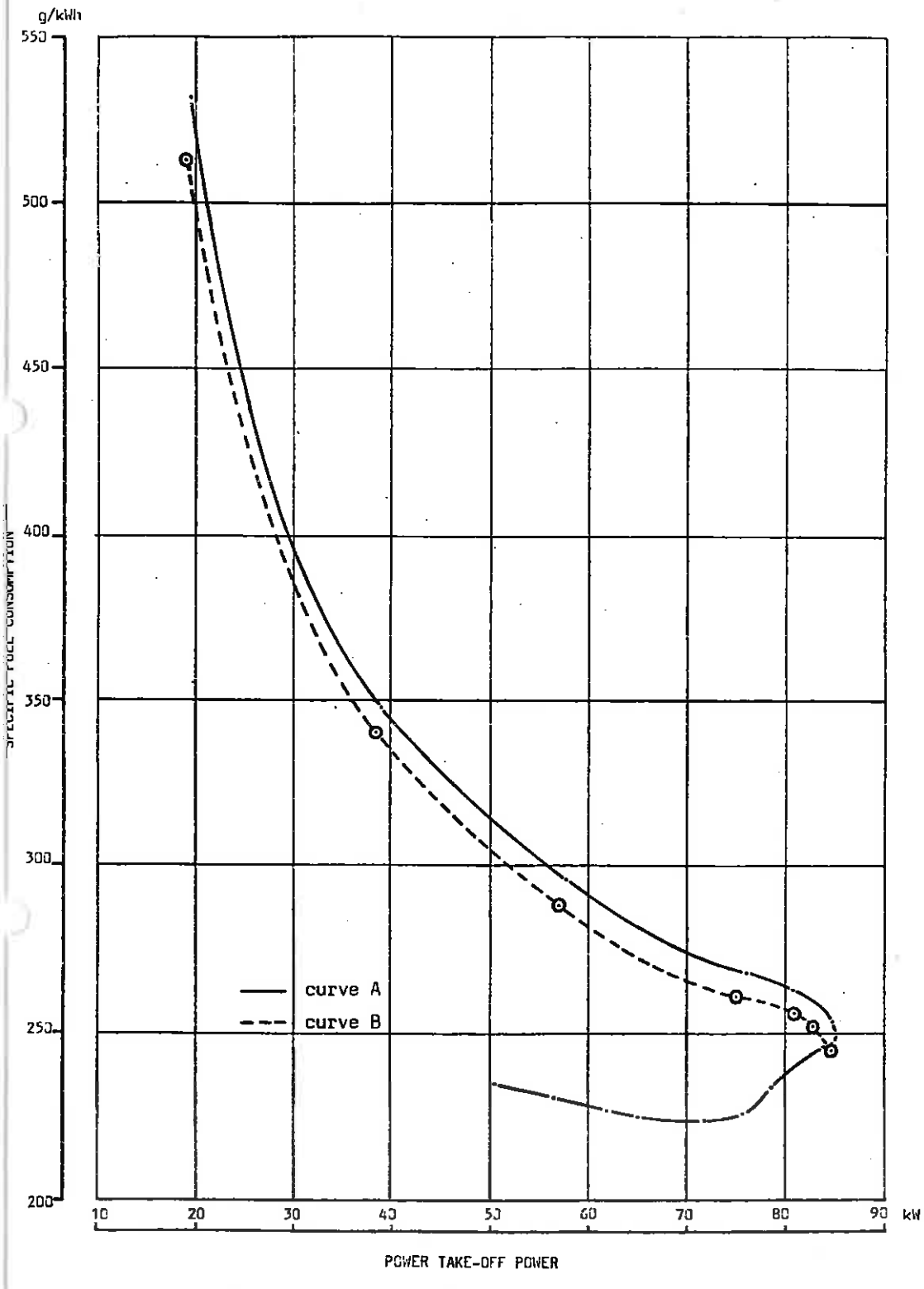
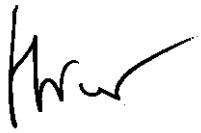


Fig. 2 - POWER TAKE-OFF TEST

HEAD OF I.M.A.
TEST DEPARTMENT



R. Gioia

DIRECTOR OF I.M.A.



L. Lisa

Turin, 30th December 1985