COMITATO PER L'OMOLOGAZIONE
DELLE MACCHINE AGRICOLE

REPORT No. 937

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

FIAT 115-90 DT/12 (4 WD)



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

Date of tests: Torino - March 1984 - February 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 June 1985

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 115-90 DT tractor is manufactured in following variants:

1. 115-90 DT/12 model with 12 forward and 4 reverse speeds (4 × 4 gear units)

2. 115-90 DT/24 model with 24 forward and 8 reverse speeds (4 × 4 × 2 gear units).

3. 115-90 DT/I model with 16 forward and 16 reverse speeds (4 × 4 × 2 gear units).

4. 115-90 DT/IS model with gear units and groups similar to those of the 115-90 DT/I model, but with different ratios.

The tests have been made on FIAT 115-90 DT/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

TABLE OF CONTENTS

	Page
Specification of tractor	2
Fuel and lubricants used in test	16
Compulsory tests	
1 - Power take-off performance	17
2 - Drawbar performance on a concrete track	19
3 - Turning space and turning circle	20
4 - Location of centre of gravity	20
5 - Braking performance	20
6 - Measurement of ambient noise emitted by the tractor	21
7 - Noise measurement at the driver's ear level	22
8 - Power lift and hydraulic pump performance	22
9 - Repairs and adjustments during tests	24
10 - Remarks	24

PERFORMANCE CURVES

	Fig. No.
a) Power take-off test	
Curves of power, torque, hourly and specific fuel consumption/crankshaft speed	1
Curves of specific fuel consumption/crankshaft power p.t.o.	2

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 TRATTORI S.p.A.
Model:	115-90 DT/12
Type:	Four-wheel-drive tractor, unit construction
Serial No.:	253008
1st Serial No.:	253000

Engine:

Make:	FIAT
Model:	8065.05
Type:	4-stroke Diesel engine, direct injection, water cooled
Seriale No.:	000106
Cylinders:	6 cylinders, vertical, in-line, 104 mm bore × 115 mm. stroke, capacity 5861 cm^3, compression ratio 17:1, overhead in-line valves, replaceable cast-iron dry cylinder liners.
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 5845310 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 80 D in line injection pump; manufacturer's production setting 53.5 ÷ 54.6 mm^3 /stroke at rated engine speed; injection timing 25° ± 1° before TDC; BOSCH multihole injectors EPPZ210F3; injection pressure 234 ± 4 bar. Serial n° of injection pump: 774768

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, PBH00-0823 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; cartridges 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, 4 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 star-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 833, interferance type with internal perforated pipe; rectangular shape 105 x 102 mm, 700 mm lenght; vertical on left side of engine; maximum height above ground 2930 mm.

Transmission:

Clutch:	LUK or VALEO make, dry dual disc clutch, one for P.T.O. and the other for gear box, but indipendently operated; disc 305 mm dia; pedal operated for gearbox drive and hand lever operated for P.T.O. drive.

Gearbox:	Own make. On the 115-90 DT/12 tractor model tested: mechanical syncronized type, constant mesh gear with total 12 forward and 4 reverse speeds; the trasmission 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 115-90 DT tractor is available in the other three variants: — 115-90 DT/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, hight, reverse), the third with two positions to select direct or crawling speeds; — 115-90 DT/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, hight), the third with two positions to select the forward and reverse speeds; — 115-90 DT/IS model with gear units and groups similar to those of the 115-90 DT/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 and final drive:	Own make, mechanical type with crown wheel and pinion; NO-SPIN type automatic lock, epycicloidal final drives.
Gear lubrication:	Gear box capacity 18.3 l; rear axle, final rear drives and power lift circuit 58.9 l; front axle and final front drives 12.9 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 115-90 DT/12 model

— Total ratios and speeds (tyres 18.4-38 and pressure 1.6 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	382.864	2.02
II		250.448	3.08
III		205.089	3.77
IV		136.889	5.64
I	Mediudm	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 115-90 DT/24 model

— Total ratios and speeds (tyres 18.4-38 and pressure 1.6 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 115-90 DT/I model

— Total ratios and speeds (tyres 18.4-38 and pressure 1.6 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 115-90 DT/IS model

— Total ratios and speeds (tyres 18.4-38 and pressure 1.6 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 2nd plate of dual disc clutch; three interchangeable shafts, automatic selection of speed changing p.t.o. shafts, hand lever operated. Position: rear of tractor, in median plane; height above ground 760 mm (with tyre 18.4-38).

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

Proportional ground speed p.t.o.:

— **1000 rev/min p.t.o.:** travelling distance for one revolution of p.t.o. shaft 377 mm with tyre 18.4-38; number of p.t.o. shaft revolutions for one revolution of rear wheels 13.65 rev; p.t.o. shaft rotates clockwisely viewed from tractor rear.

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 low lower links.

Hydraulic sistem:

open centre sistem; 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 catridges; 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 single acting additional ram with 75 mm bore and 150 mm stroke. Maximum 3 double acting additional control valves with oil tappings at rear of tractor available; pump suction inside the rear transmission box.

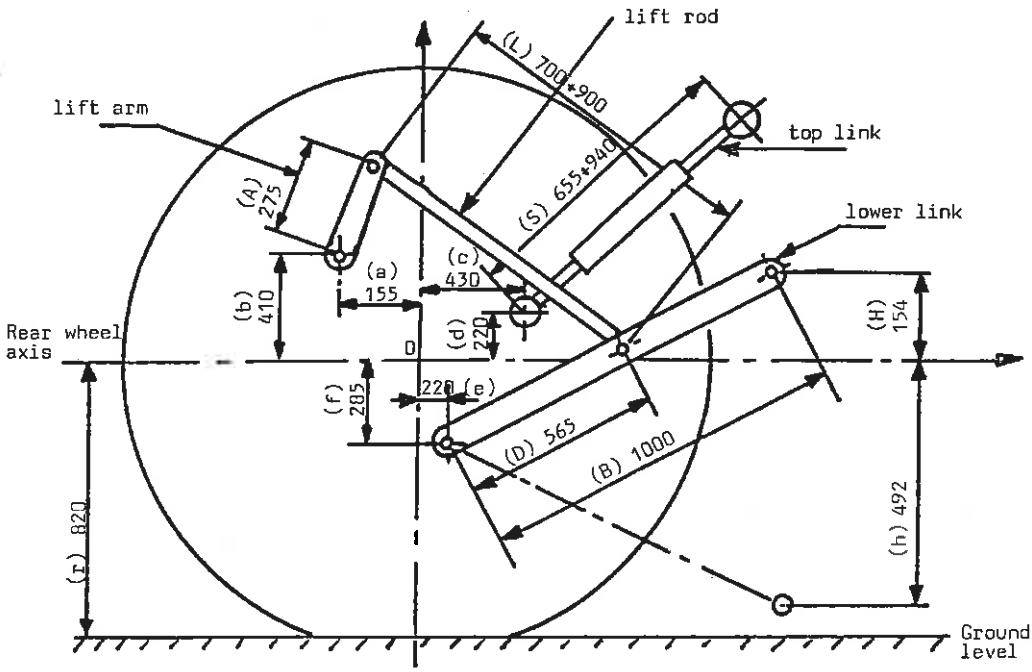
Max oil capacity (common at gear box and rear axles): 58.9 l; oil delivery which may be taken be taken of through oil tapping 32 l.

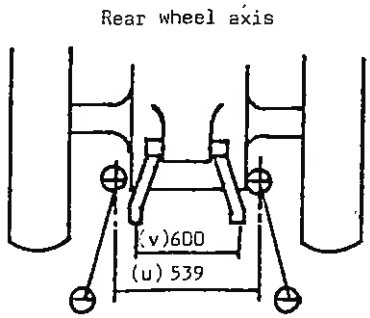
Recommended oil: (see transmission oils). Oil change period 1600 operating hours.

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. 11.

POWER LIFT

Dimensions of linkage geometry for the table on page 11.





State setting of hydraulic power lift for test

— Rear tyres (size 18.4-38) radius index		(r) :	820 mm
— Front tyres (size 14.9-28) radius index		(r') :	640 mm
— Length of lift arms		(A) :	275 mm
— Length 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 700 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 855 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 18.4-38 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 965 mm max and 520 mm min (with tyres 18.4-38); distance of hitch point from rear 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.

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 18.4-38); 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, 2 cylinders 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 20W/40 or any oil conforming 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 radial type tyres PIRELLI 14.9-28, 8 ply; maximum permissible load per tyre 1690 kg at 1,8 bar inflation pressure and max 35 km/h speed; track width adjustment continuos from 1800 mm to 2230 mm rotating the wheels on discs (rail system).

Driving wheels:
at front and at rear; rear wheels: two radial type tyres PIRELLI 18.4-38, 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).
Possible combinations of tyres:

Tyre size	
at front	at rear
13.6 - 28 8 ply	16.9 - 38 8 ply
14.9 - 28 8 ply	18.4 - 38 8 ply 23.1 - 34 8 ply

Wheelbase: 2670 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, AutoKell-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.
Assembly and mounting bolts: see Report CSD N° 0410/19-a (C) ÷ 78-a(C).
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: 24.

Overall dimensions (tyres size: 14.9-28 front and 18.4-38 rear)

	Lenght	Width		Height to top of	
		mini	maxi	exhaust silencer	safety cab or frame
	m	m	m	m	m
With ballast	4.88	2.18	2.69	2.93	2.86
Without ballast	4.63	2.18	2.69	2.93	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: 14.9 - 28 front 18.4 - 38 rear	Size	Distance from outside edge of tractor to centre (°)
	mm	mm	mm
Headlights	1250	180 x 120	905
Side lights	1835	35 x 110	332
Rear lights	1930	80 x 60	240
Reflectors: 1st pair	1630	90 x 55	115
2nd pair	640	90 x 55	660

(°) Track setting: 1800 mm at front
1720 mm at rear

TEST CONDITIONS

Track setting: 1900 mm at front, 1720 mm at rear
Weights: Tractor (with safety cab, standard and optional tanks fuel, without driver)

	Front kg	Rear kg	Total kg
Without ballast	2130	3200	5330
With ballast	2930	4070	7000

Ballasts:

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

Fuel and lubricants used in tests

Fuel: Esso Diesel oil; specific gravity: 0.831 kg/l at 15°C; cetane number: not recorded

Engine oil: FIAT AMBRA SUPER SAE 15W/40

Transmission oil, hydraulic oil, steering oil: FIAT TUTELA MULTI F SAE 20 W 40

COMPULSORY TESTS

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

Date of tests: 23rd March 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						
76.66	2500	1017	24.19	20.10	262	3.17
At standard p.t.o. speed						
76.30	2458	1000	23.71	19.70	258	3.22
At the speed recommended by Manufacturer for drawbar work						
76.66	2500	1017	24.19	20.10	262	3.17
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						
68.37	2623	1067	21.08	17.52	256	3.24
(ii) unloaded						
—	2771	1127	8.05	6.69	—	—
(iii) 50% of the load defined in (i)						
35.15	2697	1097	14.08	11.70	333	2.50
(iv) maximum power						
76.66	2500	1017	24.19	20.10	262	3.17
(v) 25% of the load defined in (i)						
17.81	2734	1112	10.90	9.06	508	1.63
(vi) 75% of the load defined in (i)						
51.99	2660	1082	17.51	14.55	280	2.97

Power	Speed		Fuel consumption			Specific
	engine	p.t.o.	hourly		specific	energy
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						
68.04	2579	1049	21.73	18.06	265	3.13
(ii) unloaded						
—	2750	1118	7.64	6.35	—	—
(iii) 50% of the load defined in (i)						
35.16	2665	1084	14.32	11.90	338	2.46
(iv) maximum power						
76.30	2458	1000	23.71	19.70	258	3.22
(v) 25% of the load defined in (i)						
17.84	2704	1100	10.97	9.12	511	1.63
(vi) 75% of the load defined in (i)						
52.07	2630	1070	17.93	14.90	286	2.90

Standard specific fuel consumption (g/kWh): 256/333/265/338

No load maximum engine speed: 2771 rev/min

Equivalent crankshaft torque at maximum power (2 hours): 293 Nm

Maximum equivalent crankshaft toruqe: 353 Nm at 1500 rev/min of the engine

Mean atmospheric conditions:
- temperature 17 °C
- pressure 1000 mbar
- relative humidity 47%

Maximum temperature:
- coolant 80 °C
- engine oil 106 °C
- fuel 25 °C
- engine air intake 20 °C

(2) DRAWBAR PERFORMANCE

			with ballasts	without ballasts
Date of tests:	6th and 7th September 1984	Tyre size: - front: 14.9-28; 8 play;	Inflation pressure:	1.5 bar	1.5 bar
Type of track:	concrete	- rear: 18.4-38; 10 play:	inflation pressure:	1.0 bar	1.0 bar

Height of drawbar above ground: 540 mm. with ballasts and 520 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	1.92	30.94	5786	2705	15.0	307	2.71	27	80	100	17	65	985
II Low	2.91	46.59	5766	2678	14.8	248	3.35	27	80	102	17	66	985
III Low	3.50	56.18	5786	2642	15.0	264	3.15	28	80	102	17	65	985
I Medium	4.07	65.44	5786	2560	15.0	305	2.73	29	80	105	19	68	985
IV Low	5.24	66.83	4590	2507	10.2	300	2.77	31	81	107	19	60	985
II Medium	6.61	67.51	3677	2503	7.6	298	2.79	31	81	107	19	64	986
III Medium	8.21	68.22	2991	2500	6.0	296	2.81	32	83	109	20	59	986
I Hight	10.04	67.55	2422	2498	4.9	298	2.79	32	83	109	20	55	986
IV Medium	12.63	63.99	1824	2501	3.5	317	2.62	32	83	109	20	54	986
2 - FIVE HOUR TEST at 75% of pull at maximum power													
II Medium	7.22	55.08	2746	2640	4.5	294	2.83	25	80	101	18	78	988
3 - FIVE HOUR TEST at pull corresponding to 15% wheelslip in test (1)													
III Low	3.70	59.48	5786	2630	-	-	-	25	81	102	20	55	987
4 - MAXIMUM POWER (unballasted)													
II Low	3.48	45.52	4707	2675	15.0	308	2.70	24	80	101	19	80	989
I Medium	4.15	54.27	4707	2650	15.0	288	2.89	25	80	103	19	80	989
IV Low	5.12	63.89	4490	2530	11.8	313	2.65	26	80	107	19	78	989
I Medium	6.41	67.59	3795	2505	9.0	301	2.77	26	82	107	18	78	989
III Medium	7.93	68.73	3120	2500	7.7	294	2.83	27	82	110	18	76	989
I Hight	9.74	67.92	2510	2503	6.5	298	2.79	28	82	110	19	75	989
IV Medium	12.16	64.59	1912	2496	5.4	312	2.67	31	82	112	19	77	989
II Hight	15.20	60.47	1432	2500	4.5	335	2.48	31	84	112	18	78	989

Oil consumption during ten hours duration of test (2) and (3): 83 g/h

(3) TURNING SPACE AND TURNING CIRCLE:

Wheel equipment: front 14.9-28 (8 ply)
rear 18.4-38 (10 ply)

Track of wheels: front 1900 mm
rear 1720 mm

Front wheel drive disengaged

	With brakes		Without brakes	
	Right-hand	Left-hand	Right-hand	Left-hand
	m	m	m	m
Radius of turning space	5.35	5.22	6.17	6.12
Radius of turning circle	5.13	5.00	5.95	5.90

(4) LOCATION OF CENTRE OF GRAVITY:

Height above ground	mm	1095
Distance forward from the vertical plane containing the axis of the rear wheels	mm	1052
Distance from the median plane of the tractor	mm	8 right

(5) BRAKING (front wheel drive disengaged)

Date of tests: 29th January 1985
Tractor masses during tests with driver:

	Front kg	Rear kg	Total kg
without ballast	2130	3270	5400
with ballast	2930	4140	7070

Speed before application of brakes: 28.63 km/h

Type 0 test (cold brakes)

BALLASTED TRACTOR:

Braking device control force	daN	12.3	15.7	17.6	18.1	19.6	31.4
Mean deceleration	m/s^2	1.9	2.2	2.6	2.6	2.7	2.8

UNBALLASTED TRACTOR:

Braking device control force	daN	13.7	15.7	19.6	23.5	28.0	31.5
Mean deceleration	m/s^2	1.6	1.9	2.6	2.6	2.7	2.7

Type I test (fade)

Braking device control force	daN	15.7	17.2	19.6	27.5	28.4	31.0
Mean deceleration	m/s^2	2.0	2.2	2.6	2.7	2.7	2.7

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	34	27	30

(6) MEASUREMENT OF EXTERNAL NOISE LEVEL

Date of tests: 7th September 1984

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: 20.95 km/h

Sound level: 84.0 dB (A)

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

Date of tests: 7th September 1984

Type of sound level meter: BRUEL & KJAER mod. 2209

Type of track: concrete

Tractor with FIAT CS 5 safety 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 (*)	3520	6.93	6.70	80.0
2. M (*)	light load	6.93	7.25	77.5
top gear	light load	28.63	31.31	80.0
(ii) cab with open windows and doors (optional)				
2. M (*)	3490	6.93	6.80	89.5
2. M (*)	light load	6.93	7.20	87.5
top gear	light load	28.63	31.10	90.0

(*) 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 lower 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 cylinder)

Lifting heights relative to horizontal lower 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 cylinder)

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	6290	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 TESTS: none

(10) REMARKS: none

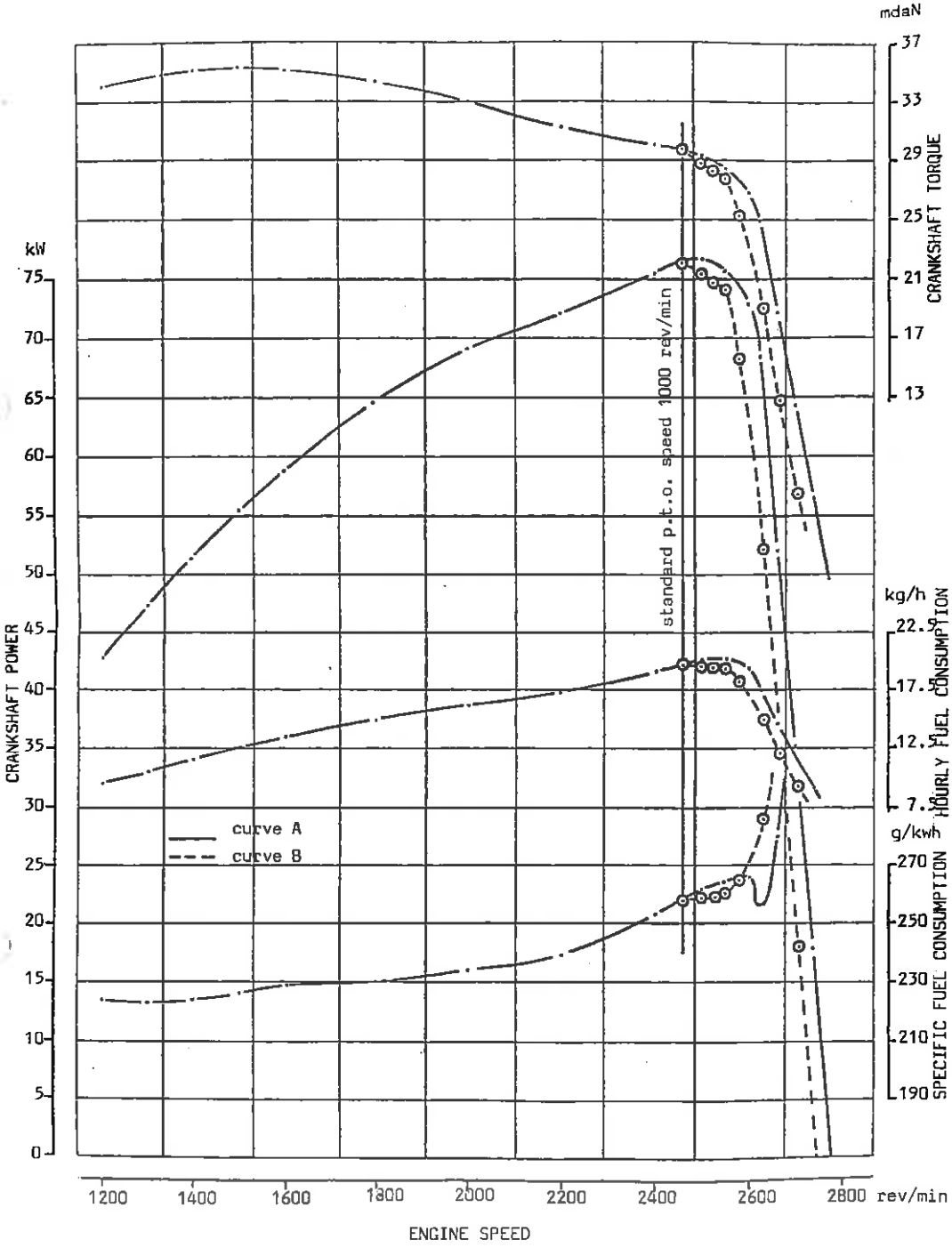


Fig. 1 - POWER TAKE-OFF TEST

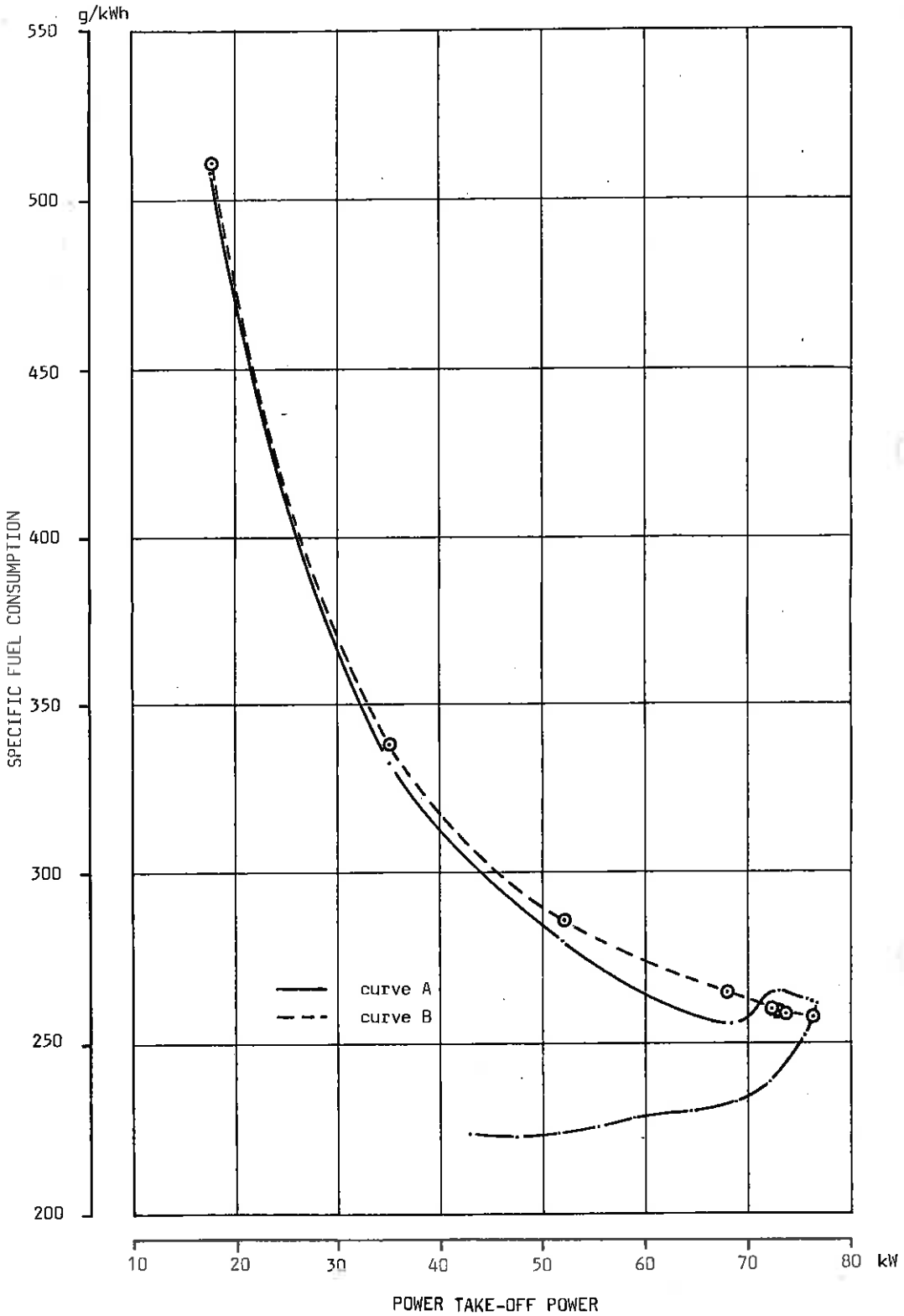


Fig. 2 - POWER TAKE-OFF TEST

HEAD OF I.M.A.
TEST DEPARTMENT

R. Gioia

DIRECTOR OF I.M.A.

L. Lisa

Turin, 3rd April 1985