COMITATO PER L'OMOLOGAZIONE
DELLE MACCHINE AGRICOLE

REPORT N°. 993

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

FIAT 140-90/12 (2 WD)



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

Date of tests: Torino, April 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: 25th 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 140-90 tractor is manufactured in following variants:

1. 140-90/12 model with 12 forward and 4 reverse speeds (4x4 gear units)
2. 140-90/24 model with 24 forward and 8 reverse speeds (4x4x2 gear units)
3. 140-90/I model with 16 forward and 16 reverse speeds (4x4x2 gear units)
4. 140-90/IS model with gear units and groups similar to those of the 140-90/I model, but with different ratios.

The tests have been made on FIAT 140-90/12

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

	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
Model:	140-90/12
Type:	Wheeled tractor, unit construction, rear wheel driven.
Serial No.:	259005
Ist serial No.:	259000

Engine:

Make:	FIAT
Model:	8065.25
Type:	4-stroke Diesel engine, direct injection, water cooled, turbo supercharged.
Serial No.:	000109
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 0.84 $\pm$ 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 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 90 D in line injection pump; manufacturer's production setting 63.7 - 65.6 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 2735 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-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; 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; 470 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 1092, interferance type with internal perforated pipe; square shape 107 x 107 mm, 820 mm length; vertical on left side of engine; maximum height above ground 3170 mm.

Transmission:

Clutch:	LUK or VALEO make, dry single disc clutch, only for travel, on the primary shaft of gear box; disc 355.6 mm dia; pedal operated.
Gearbox:	Own make. On the 140-90/12 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 140-90 tractor is available in the other three variants: — 140-90/24 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; — 140-90/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; — 140-90/IS model with gear units and groups similar to those of the 140-90/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 140-90/12 model

– Total ratios and speeds (tyres 20.8 R 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	2.10
II		250.448	3.22
III		205.089	3.93
IV		136.889	5.88
I	Medium	170.371	4.73
II		111.509	7.22
III		91.302	8.82
IV		60.944	13.22
I	High	75.424	10.68
II		49.360	16.31
III		40.412	19.22
IV		26.983	29.85
I	Reverse	204.810	3.93
II		134.025	6.01
III		109.768	7.34
IV		73.263	10.99

(*) Calculated with the radius index of 855 mm

FIAT 140-90/24 model

– Total ratios and speeds (tyres 20.8 R 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	0.19
II		2711.610	0.30
III		2220.440	0.36
IV		1482.060	0.54
I	Low	382.684	2.10
II		250.448	3.22
III		205.089	3.93
IV		136.889	5.88
I	Medium (crawling speed)	1844.640	0.44
II		1207.310	0.67
III		988.624	0.81
IV		659.870	1.22
I	Medium	170.371	4.73
II		111.509	7.22
III		91.302	8.82
IV		60.944	13.22
I	High (crawling speed)	816.607	0.97
II		534.464	1.51
III		437.656	1.82
IV		292.120	2.76
I	High	75.424	10.68
II		49.360	16.31
III		40.412	19.92
IV		26.983	29.85
I	Reverse (crawling speed)	2217.300	0.36
II		1451.215	0.55
III		1188.337	0.68
IV		793.157	1.02
I	Reverse	204.810	3.93
II		134.025	6.01
III		109.768	7.34
IV		73.263	10.99

(*) Calculated with the radius index of 855 mm

FIAT 140-90/I model

– Total ratios and speeds (tyres 20.8 R 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	2.10
II		250.448	3.22
III		205.089	3.93
IV		136.889	5.88
I	Normal	189.048	4.26
II		123.711	6.51
III		101.324	7.95
IV		67.614	11.91
I	Medium	170.371	4.73
II		111.509	7.22
III		91.302	8.82
IV		60.944	13.22
I	High	75.424	10.68
II		49.360	16.31
III		40.412	19.92
IV		26.983	29.85
I	Reverse low	478.347	1.68
II		313.019	2.57
III		256.370	3.14
IV		171.119	4.71
I	Reverse normal	236.294	3.41
II		154.655	5.21
III		126.639	6.36
IV		84.534	9.53
I	Reverse medium	212.896	3.78
II		139.394	5.78
III		114.144	7.06
IV		76.172	10.57
I	Reverse high	94.263	8.54
II		61.692	13.06
III		50.532	15.94
IV		37.709	23.89

(*) Calculated with the radius index of 855 mm

FIAT 140-90/IS model

– Total ratios and speeds (tyres 20.8 R 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	3.22
II		205.028	5.93
III		169.523	4.75
IV		136.850	5.89
I	Normal	123.665	6.50
II		101.326	7.22
III		83.688	7.96
IV		67.549	8.83
I	Medium	111.444	9.62
II		91.237	10.68
III		75.424	11.93
IV		60.879	13.23
I	High	49.367	16.33
II		40.412	19.92
III		33.416	24.11
IV		26.980	29.85
I	Reverse low	313.072	2.58
II		256.272	3.14
III		211.890	3.81
IV		171.054	4.70
I	Reverse normal	154.580	5.20
II		126.542	6.36
III		104.611	7.69
IV		84.437	9.53
I	Reverse medium	139.303	5.78
II		114.047	7.06
III		94.263	8.54
IV		76.074	10.57
I	Reverse high	61.709	13.05
II		50.515	15.94
III		41.769	19.28
IV		33.709	23.89

(*) Calculated with the radius index of 855 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 median plane; height above ground 795 mm (with tyre 20.8 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: $\frac{\text{engine speed}}{\text{p.t.o. speed}} = 4.187$

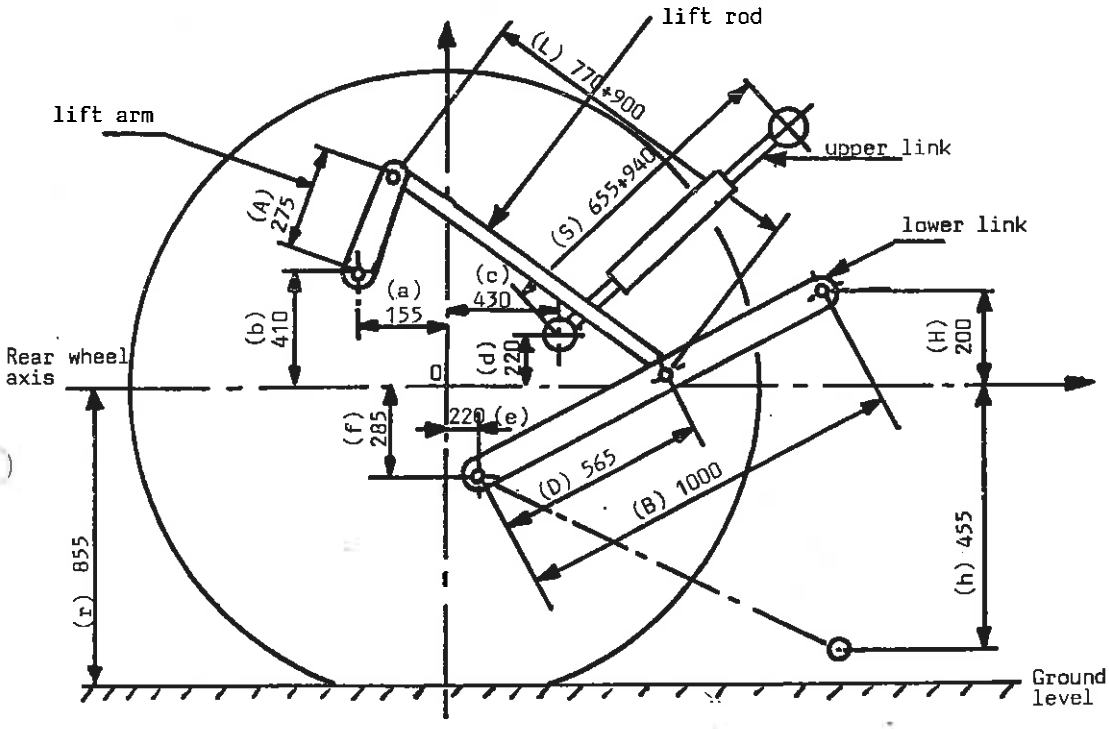
– **1000 rev/min p.t.o.:** distance behind rear axle 548 mm; diameter of p.t.o. shaft end 34.9 mm; 21 splines, according to I.S.O. STANDARD, 1017 rev/min at rated engine speed, standard p.t.o. speed 1000 rev/min at engine speed 2458 rev/min; p.t.o. shaft rotates clockwisely viewed from tractor rear.

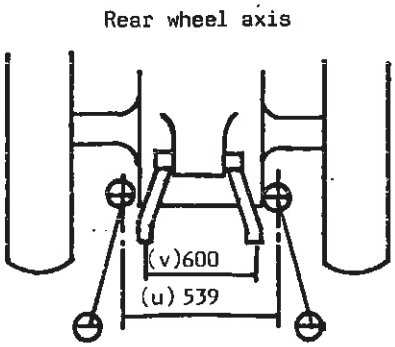
p.t.o. transmission ratio: $\frac{\text{engine speed}}{\text{p.t.o. speed}} = 2.458$

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 20.8 R 38) radius index		(r) :	855	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) :	455 mm
· in high position relative to the rear wheel centre line, situated 855 mm above the ground level		(H) :	200 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 20.8 R 38 max 575 mm, min 460 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 20.8 R 38, 1000 mm max and 555 mm min 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; 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 340 mm, max 1025 mm (with tyres 20.8 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 20.8 R 38, 10 ply; maximum permissible load per tyre 3130 kg at 1.6 bar inflation pressure and max 35 km/h speed; track width continuos adjustment from 1620 mm to 2220 mm rotating the wheels on discs (rail system).

Possible combinations of tyres:

Tyre size	
at front	at rear
9.00 - 16 8 ply	18.4 - 38 18 ply
10.00 - 16 10 ply	23.1 - 34 10 ply
11.00 - 16 8 ply	20.8 R 38 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 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 dimensions (tyres size 11.00-16 front and 20.8 R 38 rear)

	Lenght	Width		Height to top of	
		mini	maxi	exhaust silencer	cab
	m	m	m	m	m
With ballast	4.88	2.05	2.75	3.17	2.97
Without ballast	4.58	2.05	2.75	3.17	2.97

Ground clearance: 450 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 20.8 R 38 rear	Size	Distance from outside edge of tractor to centre (°)
	mm	mm	mm
Headlights	1250	180 x 120	934
Side lights	1855	35 x 110	363
Rear lights	1970	100 x 60	349
Reflectors: 1st pair	1670	90 x 55	144
2nd pair	670	90 x 55	689

(°) 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	4170	5680
With ballast	2300	5300	7600

Ballasts:

	Weights		Water (kg)
	Number	Total mass (kg)	
Front wheels Front weight	- 10 + support	- 540	- -
Rear wheels	6	390	790
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: 8th 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						
94.41	2500	1017	28.30	23.52	249	3.34
At standard p.t.o. speed						
94.37	2458	1000	27.87	23.16	245	3.39
At the speed recommended by Manufacturer for drawbar work						
94.41	2500	1017	28.30	23.52	249	3.34
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						
83.32	2596	1056	26.59	22.10	265	3.13
(ii) unloaded						
-	2736	1113	9.05	7.52	-	-
(iii) 50% of the load defined in (i)						
42.81	2667	1085	17.55	14.58	341	2.44
(iv) maximum power						
94.41	2500	1017	28.30	23.52	249	3.34
(v) 25% of the load defined in (i)						
21.68	2701	1099	13.09	10.88	502	1.66
(vi) 75% of the load defined in (i)						
63.45	2635	1072	22.17	18.42	290	2.86

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						
83.65	2564	1043	26.15	21.73	260	3.20
(ii) unloaded						
-	2711	1103	9.05	7.52	-	-
(iii) 50% of the load defined in (i)						
42.99	2635	1072	14.73	14.24	332	2.92
(iv) maximum power						
94.37	2458	1000	27.87	23.16	245	3.39
(v) 25% of the load defined in (I)						
21.79	2672	1087	12.47	10.36	476	1.75
(vi) 75% of the load defined in (i)						
63.70	2603	1059	21.61	17.96	282	2.95

Standard specific fuel consumption (g/kWh): 265/341/260/332

No load maximum engine speed: 2736 rev/min

Equivalent crankshaft torque at maximum power (2 hours): 361 Nm

Maximum equivalent crankshaft torque: 465 Nm at 1550 rev/min of the engine

Mean atmospheric conditions:
- temperature 23.0 °C
- pressure 980.6 mbar
- relative humidity 45%

Maximum temperature:
- coolant 84 °C
- engine oil 123 °C
- fuel 28 °C
- engine air intake 29 °C

(3) DRAWBAR PERFORMANCE

			with ballasts	without ballasts
Date of tests:	from 9th to 12th September 1985	Tyre size: - front: 11.00-16; 8 ply;	inflation pressure:	2.5 bar	2.5 bar
Type of track:	concrete	- rear: 20.8 R 38; 10 ply:	inflation pressure:	1.6 bar	1.6 bar

Height of trailer hitch above ground: 750 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	1.96	30.41	5590	2696	15.0	-	-	36.0	79	110	33.0	64	980
II Low	2.95	45.78	5590	2656	15.0	333	2.49	36.0	79	110	33.0	60	980
III Low	3.58	55.56	5590	2637	15.0	315	2.63	36.5	80	112	33.0	58	981
I Medium	4.27	66.30	5590	2617	15.0	302	2.74	37.0	80	114	33.0	55	982
IV Low	5.30	78.96	5364	2540	12.8	296	2.79	37.0	80	115	33.0	53	982
II Medium	6.79	83.04	4403	2510	7.8	284	2.92	38.0	81	117	32.5	50	982
III Medium	8.43	84.97	3628	2503	5.9	277	2.99	38.0	82	118	32.5	47	982
I High	10.32	85.47	2981	2500	4.8	274	3.02	38.0	82	120	32.5	48	982
IV Medium	12.92	84.81	2363	2498	3.5	277	2.99	38.5	82	120	32.0	49	982
II High	16.18	80.67	1795	2500	2.3	291	2.85	38.5	83	121	32.0	49	983
III High	19.86	76.30	1383	2497	1.6	308	2.69	38.5	85	121	31.5	48	983
2 - FIVE HOUR TEST at 75% of pull at maximum power													
II Medium	7.30	67.03	3305	2605	4.4	314	2.64	37.5	83	114	31.0	59	988
3 - FIVE HOUR TEST at pull corresponding to 15% wheelslip in test (1)													
I Medium	4.52	70.21	5590	2593	-	-	-	36.5	82	113	29.0	66	990
4 - MAXIMUM POWER (unballasted)													
I Medium	4.24	56.03	4756	2632	14.9	323	2.59	35.0	81	111	24.0	50	997
IV Low	5.23	68.68	4727	2598	14.6	318	2.63	35.0	81	112	23.5	48	997
II Medium	6.69	82.72	4452	2512	8.1	284	2.94	34.5	82	114	23.0	45	997
III Medium	8.46	85.26	3628	2503	4.4	274	3.05	34.0	83	115	22.5	42	996
I High	10.33	85.96	2996	2500	3.5	273	3.07	34.0	83	117	21.5	41	996
IV Medium	12.88	85.26	2383	2498	2.7	276	3.03	34.0	83	117	21.0	40	995
II High	16.07	80.53	1804	2[illegible]	1.8	291	2.88	34.0	84	119	21.0	40	995

(3) TURNING SPACE AND TURNING CIRCLE:

Wheel equipment: front 11.00-16 (8 ply)
rear 20.8 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	3.93	3.75	4.50	4.37
Radius of turning circle	4.17	4.00	4.75	4.52

(4) LOCATION OF CENTRE OF GRAVITY:

Height above ground	mm	1145
Distance forward from the vertical plane containing the axis of the rear wheels	mm	724
Distance from the median plane of the tractor	mm	8 right

(5) BRAKING

Date of tests: 2nd April 1985
Tractor masses during tests with driver:

	Front kg	Rear kg	Total kg
without ballast	1510	4240	5750
with ballast	2300	5370	7670

Speed before application of brakes: 29.85 km/h
Type 0 test (cold brakes)

BALLASTED TRACTOR:

Braking device control force	daN	14.7	19.6	22.6	29.4	31.4	39.2
Mean deceleration	m/s^2	1.0	1.5	2.0	2.5	2.5	2.5

UNBALLASTED TRACTOR:

Braking device control force	daN	16.7	20.6	30.4	32.4	33.3	35.3
Mean deceleration	m/s^2	1.4	1.8	2.2	2.4	2.4	2.5

Type I test (fade)

Braking device control force	daN	15.7	20.6	25.5	35.3	39.2	45.1
Mean deceleration	m/s^2	1.2	1.9	1.9	2.2	2.4	2.5

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	34.0	37.5	32.5	35.0

(6) MEASUREMENT OF EXTERNAL NOISE LEVEL

Date of tests: 12th September 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: 21.50 km/h
Sound level: 85.0 dB (A)

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

Date of tests: 12th September 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 (*)	4400	7.22	7.37	78.5
2. M (*)	light load	7.22	7.83	80.0
top gear	light load	29.85	32.37	79.0
(ii) cab with open windows and doors (optional)				
2. M (*)	4315	7.22	7.48	88.0
2. M (*)	light load	7.22	7.83	86.5
top gear	light load	29.85	32.37	92.0

(*) 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	400	655	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	−170	−160	−100	0	+100	+200	+300	+370	+485

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 two supplementary cylinders)

Lifting heights relative to horizontal links

mm	−170	−160	−100	0	+100	+200	+300	+370	+485

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	−170	−160	−100	0	+100	+200	+300	+370	+485

Lifting forces at hitch points

daN	5970	6020	6040	6140	6190	6270	6180	6140	6100

Lifting forces at test frame

daN	6310	6270	6250	6185	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

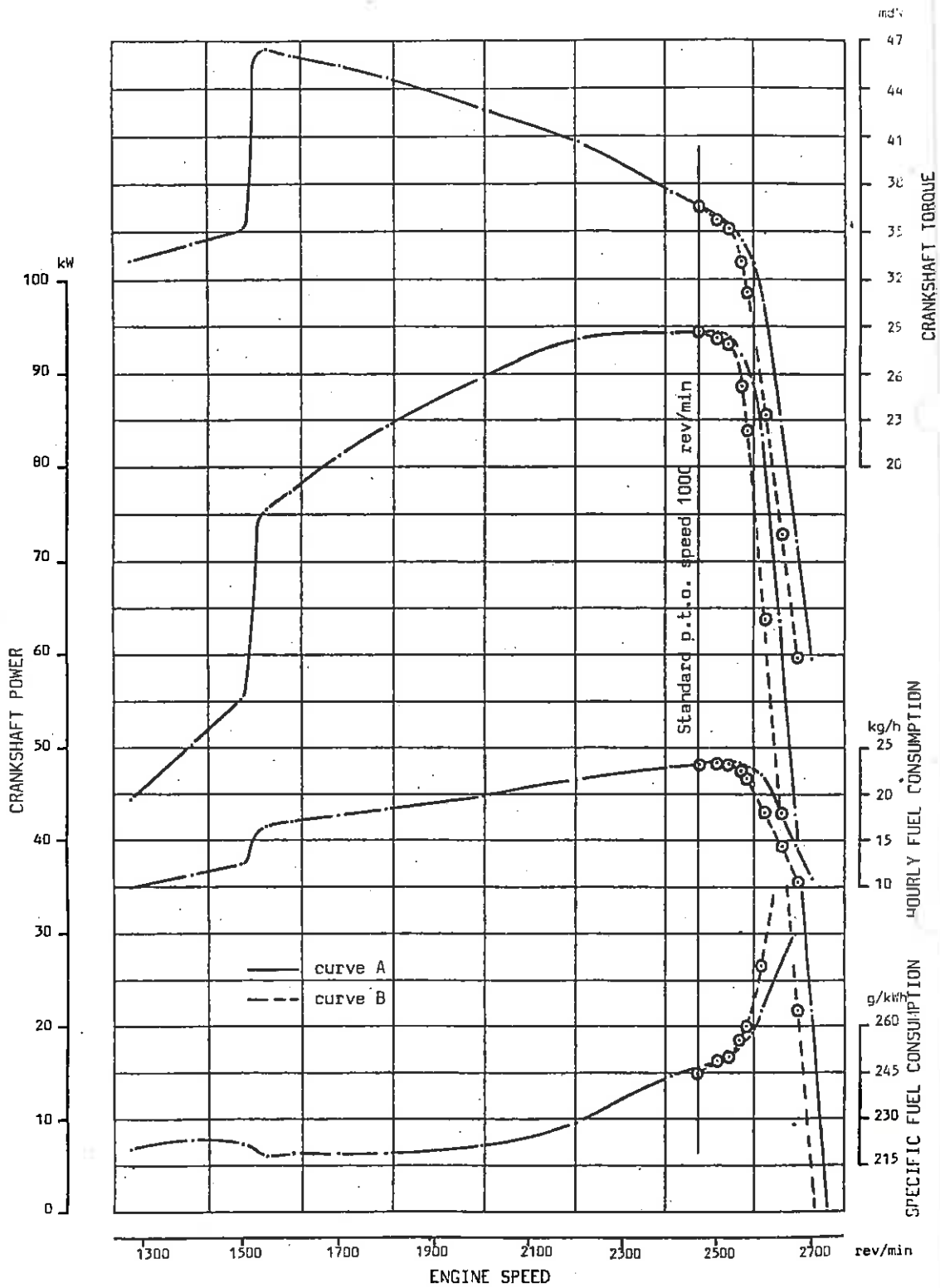


Fig. 1 - POWER TAKE- OFF TEST

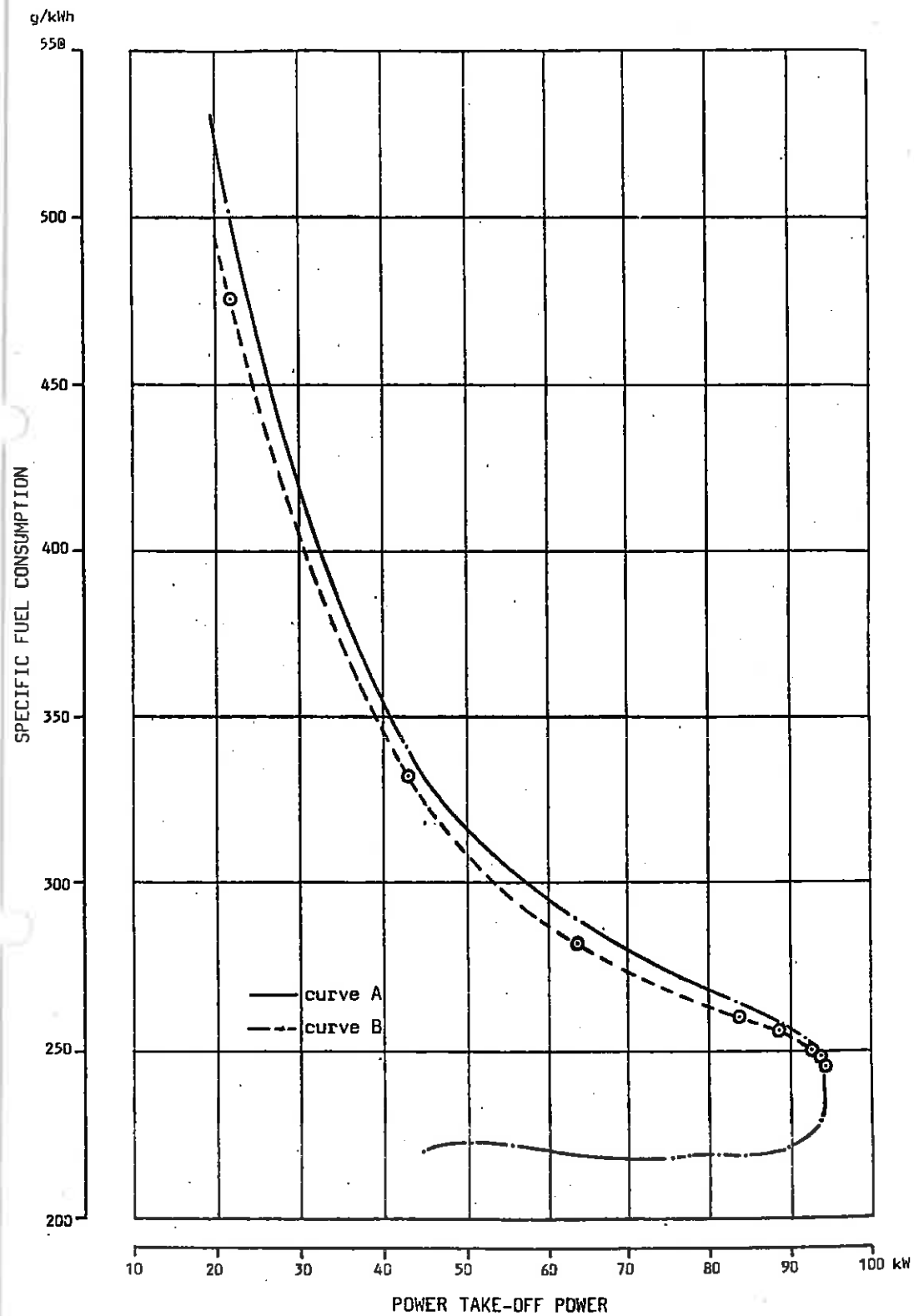
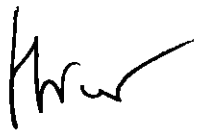


Fig. 2 - POWER TAKE-OFF TEST

HEAD OF I.M.A.
TEST DEPARTMENT



R. Gioia

DIRECTOR OF I.M.A.



L. Lisa

Turin, 27th December 1985