COMITATO PER L'OMOLOGAZIONE
DELLE MACCHINE AGRICOLE

TEST IN ACCORDANCE WITH THE OECD FULL
CODE FOR THE OFFICIAL TESTING OF AGRICULTURAL TRACTORS

O.E.C.D. Approval No. 1221/1

AGRICULTURAL TRACTOR:

Make: **LANDINI**
Model: **R 5560 L (TL 38 N/M)**
Type: **2 WD**



O.E.C.D. Approval No. 1221/2

AGRICULTURAL TRACTOR

Make: **MASSEY FERGUSON**
Model: **354 F (TL 38 N/N)**
Type: **2 WD**



Manufactured by: LANDINI S.r.l. - Works of FABBRICO (Reggio Emilia) - Italy

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

Date and location of tests: September 1988 - January 1989 - Turin (Italy)

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: 27th December 1989

The LANDINI DT 5560 L tractor and the MASSEY FERGUSON MF 354-4F tractor being mechanically similar, the tests have not been repeated and the approval number is valid for both models of tractor.

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This bulletin is based on engineering test 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 LANDINI DT 5560 L tractor and similar MASSEY FERGUSON MF 354-4F tractor are manufactured in following variants:

1. STANDARD model with 12 forward and 4 reverse speeds (4 x 4 gear units)
2. SHUTTLE + CREEPER model with 24 forward and 12 reverse speeds (3x4x3 gear units)
3. UNDERDRIVE + SHUTTLE model with 24 forward and 12 reverse speeds (3x4x3 gear units)
4. UNDERDRIVE + CREEPER model with 36 forward and 12 reverse speeds (3x4x4 gear units)

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 = 100.000 Pa	or 1 Pa	= 10^{-5} bar
Rotation speeds:	1 rad/s = 9.54930 rev/min	or 1 rev/min	= 0.10472 rad/s
Torques:	1 mN = 0.10196 mkg	or 1 mkg	= 9.80665 mN

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Tractor manufacturer's name and address:	LANDINI S.r.l. Via G. Matteotti, 7 FABBRICO - Reggio Emilia - 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 (Italy)
Duration of running-in:	Engine and tractor appr. 60 hours
Location of test:	Istituto per la Meccanizzazione Agricola - Torino (Italy)

SPECIFICATION OF TRACTOR:

Tractor:

Make:	LANDINI	MASSEY FERGUSON
Model:	DT 5560 L (TL 38 DT/M)	354-4F (TL 38 DT/N)
Type:	Wheel tractor unit construction, four wheel driven	
Serial No.:	5536 N 02003	
1st serial No.:	5536 N 02001	

Engine:

Make:	PERKINS
Model:	D 3.152
Type:	4-stroke Diesel engine, naturally aspirated, direct injection, water cooled
Serial No.:	CE 31197 U 8180205
Cylinders:	3 cylinders, vertical, in-line, 91.5 mm bore × 127 mm stroke, capacity 2505 cm^3, compression ratio 16.5 : 1, overhead in-line valves, replaceable cast-iron dry cylinder liners.
Fuel system:	Forced feed; AC DELCO mechanical diaphragm-type fuel pump; 1 CAV paper filter, type FAS 5836B 320 with replaceable cartridge element; changing interval: 500 working houres; capacity of fuel tank 62 litres; CAV model DPA ROTARY DISTRIBUTOR 3238 F 480 injection pump, PERKINS P/N 2643 B 133; manufacturer's production setting 11.16 l/h at rated engine speed and full load. Injection timing 15 ± 2 before TDC. CAV multihole injectors, model BKBL6/S 5299 AF, injector pressure 19.0 MPa; serial number: DES 5281631.
Governor:	CAV centrifugal variable speed governor, mechanical type, incorporated in fuel injection pump, governed range engine speed 750 to 2448 rev/min; rated engine speed 2250 rev/min.

Air cleaner:	DONALDSON main cleaner, model XLP 772549 dry type, with double replaceable cartridge. Air inlet under bonnet in front of engine. Maintenance indicator: warning ligth on the dashboard.
Lubrication system:	Forced feed from gear-type pump; one, PERKINS model, replaceable cartridge type filter installed on the pressure line to the engine.
Cooling system:	Water cooled with centrifugal impeller pump, overpressure relief valve set to 70 KPa, thermostat with by-pass; 394 mm dia, 4 blades, belt driven fan; cooling water capacity 11 litres. Temperature visual control with thermometer. Superpressure system: radiator cap.
Starting system:	Electrical, LUCAS or VALEO make, 12 V 2.5 kW; starting motor pinion coupling solenoid operated. Cold starting aid: ISKRA make, thermostart model with induction heater in intake manifold. Safety device: operable only when the gear box is in neutral position.

Electrical system

Voltage:	12 V, negative earth.
Generator:	Alternator, LUCAS make, A 115/45, three phase, 12 V; 500 W power.
Battery:	One, MARELLI or SCAINI make, 434470-ES (MARELLI) and BK 500.0 (SCAINI) model, lead acid type; capacity: 100 Ah at 20 hours rating for MARELLI and 95 Ah at 20 hours rating for SCAINI.
EXHAUST SILENCER:	ANSA make, DGM-SA 1269 model, rectangular shape 150 x 100 mm, expansion type; length 870 mm. Vertical position on engine left side, maximum height above ground 2210 mm. ANSA make, DGM-SA 1150 model, oval shape 155x105 mm, expansion type, 320 mm length horizontal position on engine left side; height above ground 450 mm; with pre-chamber ANSA make, DGM SA 1309 model, circular shape 82 mm dia, expansion type, 450 mm length.
TRANSMISSION TO WHEELS:	
Clutch:	LUK or OMG make, independent dry dual disc clutch; 280 mm dia plates; travelling part: pedal operated; p.t.o. part: hand lever operated, organic facing.
Gearbox:	Own make. On the tractor model tested: mechanical type syncronized constant mesh gear with total 12 forward and 4 reverse speeds; the transmission consists of two mechanical in series gear groups: the first with four speeds fully synchronized, the second with four positions to select the gear ratios (slow, normal, high and reverse); each group is operated by own lever.

The LANDINI DT 5560 L and MF 354-4F are available in other three variants:

— SHUTTLE + CREEPER model with 24 forward and 12 reverse speeds; the transmission consists of three mechanical in series gear units: the first with three groups (forward, reverse and creeper), the second with four speeds, the third with three positions to select the gear groups (slow, normal and high).
— UNDERDRIVE + SHUTTLE model with 24 forward and 12 reverse speeds; the transmission consists of three mechanical in series gear units: the first with three groups (forward, reverse and underdrive), the second with four speeds, the third with three positions to select the gear group (slow, normal and high).
— UNDERDRIVE + CREEPER model with 36 forward and 12 reverse speeds; the transmission consists of three mechanical in series gear units: the first with three groups (forward, underdrive and creeper), the second with four speeds, the third with four position to select the gear groups (slow, normal, high and reverse).

Real axle and final drive:

Own make, mechanical type; with Gleason crown wheel and pinion; differential gear with 2 planet gears; mechanical differential locking, pedal operated, and self-disengaging lock; epicyclic train final drive.

Front axle and final drive:

Own make, FRUIT type, mechanical differential gear with 2 planet gears; mechanical autolock (no SPIN), as option. Epicyclic train final drive.

Total ratios and travelling speed (tyres 13.6 R 28 and pressure 160 KPa)

Gear	Group	Number of engine revolutions for one revolution of the driving wheels	Nominal travelling speed (*) at rated engine speed (2250 rev/min) km/h
I	Slow	298.868	1.73
II		190.128	2.72
III		150.564	3.43
IV		102.039	5.07
I	Normal	125.122	4.13
II		79.601	6.50
III		63.020	8.21
IV		42.717	12.11
I	High	50.709	10.20
II		32.267	16.03
III		25.541	20.25
IV		17.322	29.86
I	Reverse	111.967	4.62
II		71.236	7.26
III		56.393	9.17
IV		38.224	13.53

(*) Calculated with a tyre dynamic radius index of 610 mm (ISO 4251/1 - 1984).

Number of revolutions of frontwheels for one revolution of rear-wheels: 1.497.

SHUTTLE + CREEPER model
Total ratios and travelling speeds (tyres 13.6 R 28 and pressure 160 KPa)

	Gear	Group	Number of engine revolutions for one revolution of the driving wheels	Nominal travelling speed (*) at rated engine speed (2250 rev/min) km/h
CREEPER	I	Slow	1.531.102	0.34
	II		964.026	0.53
	III		771.337	0.67
	IV		522.744	0.99
	I	Normal	641.001	0.81
	II		407.794	1.27
	III		322.853	1.60
	IV		218.838	2.36
	I	High	259.783	1.99
	II		165.305	3.13
	III		130.845	3.95
	IV		88.756	5.83
STANDARD	I	Slow	298.868	1.73
	II		190.128	2.72
	III		150.564	3.43
	IV		102.039	5.07
	I	Normal	125.122	4.13
	II		79.601	6.50
	III		63.020	8.21
	IV		42.717	12.11
	I	High	50.709	10.20
	II		32.267	16.03
	III		25.541	20.25
	IV		17.322	29.86
SHUTTLE	I	Slow	295.880	1.75
	II		188.227	2.75
	III		149.058	3.47
	IV		101.018	5.12
	I	Normal	123.871	4.17
	II		78.805	6.56
	III		62.390	8.29
	IV		42.290	12.23
	I	High	50.202	10.30
	II		31.944	16.19
	III		25.285	20.45
	IV		17.152	30.15

(*) Calculated with a tyre dynamic radius index of 610 mm (ISO 4251/1 - 1984).

Number of revolutions of frontwheels for one revolution of rear-wheels: 1.497.

UNDERDRIVE + SHUTTLE model
Total ratios and travelling speeds (tyres 13.6 R 28 and pressure 160 KPa)

	Gear	Group	Number of engine revolutions for one revolution of the driving wheels	Nominal travelling speed (*) at rated engine speed (2250 rev/min) km/h
UNDERDRIVE	I	Slow	360.585	1.43
	II		229.389	2.25
	III		181.655	2.85
	IV		123.110	4.20
	I	Normal	150.960	3.43
	II		96.038	5.38
	III		76.034	6.80
	IV		51.538	10.03
	I	High	61.181	8.45
	II		38.930	13.28
	III		30.815	16.78
	IV		20.903	24.74
STANDARD	I	Slow	298.868	1.73
	II		190.128	2.72
	III		150.564	3.43
	IV		102.039	5.07
	I	Normal	125.122	4.13
	II		79.601	6.50
	III		63.020	8.21
	IV		42.717	12.11
	I	High	50.709	10.20
	II		32.267	16.03
	III		25.541	20.25
	IV		17.322	29.86
SHUTTLE	I	Slow	295.880	1.75
	II		188.227	2.75
	III		149.058	3.47
	IV		101.018	5.12
	I	Normal	123.871	4.17
	II		78.805	6.56
	III		62.390	8.29
	IV		42.290	12.23
	I	High	50.202	10.30
	II		31.944	16.19
	III		25.285	20.45
	IV		17.152	30.15

(*) Calculated with a tyre dynamic radius index of 610 mm (ISO 4251/1 - 1984).

Number of revolutions of frontwheels for one revolution of rear-wheels: 1.497.

UNDERDRIVE + CREEPER model
Total ratios and travelling speeds (tyres 13.6 R 28 and pressure 160 KPa)

	Gear	Group	Number of engine revolutions for one revolution of the driving wheels	Nominal travelling speed (*) at rated engine speed (2250 rev/min) km/h
CREEPER	I	Slow	1.531.102	0.34
	II		964.026	0.53
	III		771.337	0.67
	IV		522.744	0.99
	I	Normal	641.001	0.81
	II		407.794	1.27
	III		322.853	1.60
	IV		218.838	2.36
	I	High	259.783	1.99
	II		165.305	3.13
	III		130.845	4.95
	IV		88.756	5.83
	I	Reverse	573.607	0.90
	II		364.942	1.42
	III		288.902	1.79
	IV		195.822	2.64
STANDARD	I	Slow	298.868	1.73
	II		190.128	2.72
	III		150.564	3.43
	IV		102.039	5.07
	I	Normal	125.122	4.13
	II		79.601	6.50
	III		63.020	8.21
	IV		42.717	12.11
	I	High	50.709	10.20
	II		32.267	16.03
	III		25.541	20.25
	IV		17.322	29.86
	I	Reverse	111.967	4.62
	II		71.236	7.26
	III		56.393	9.17
	IV		38.224	13.53
UNDERDRIVE	I	Slow	360.585	1.43
	II		229.389	2.25
	III		181.655	2.85
	IV		123.110	4.20
	I	Normal	150.960	3.43
	II		96.038	5.38
	III		76.034	6.80
	IV		51.538	10.03
	I	High	61.181	8.45
	II		38.930	13.28
	III		30.815	16.78
	IV		20.903	24.74
	I	Reverse	135.088	3.83
	II		85.946	6.02
	III		68.038	7.60
	IV		46.117	11.21

(*) Calculated with a tyre dynamic radius index of 610 mm (ISO 4251/1 - 1984)

Number of revolutions of frontwheels for one revolution of rear-wheels: 1.497.

POWER TAKE OFF

Main:

Type: Independent; shiftable by hand lever to independent or ground speed p.t.o.; number of shafts: one.
Method of engagement: driven by the 2nd plate of the main clutch.
Position: rear of tractor, in median plane; height above ground 580 mm (with tyre 13.6 R 28).
Changing speeds: shiftable by second hand lever.

Proportional engine speed p.t.o.:

— **540 rev/min:** distance behind rear axle 440 mm; diameter of p.t.o. shaft end 35 mm; 6 splines, in conformity with ISO 500/1979; no power restriction; 625 rev/min at rated engine speed; standard p.t.o. speed 540 rev/min at engine speed 1944 rev/min; p.t.o. shaft rotates clockwisely, viewed from tractor rear.
Ratio of rotation speed:

$$\text{Engine/p.t.o. ratio} = \frac{2250}{625} = 3.600$$

— **1000 rev/min:** distance behind rear axle 440 mm; diameter of p.t.o. shaft end 35 mm; 6 splines, not in conformity with ISO 500/1979; no power restriction; 1174 rev/min at rated engine speed; standard p.t.o. speed 1000 rev/min at engine speed 1917 rev/min; p.t.o. shaft rotates clockwisely, viewed from tractor rear.

$$\text{Engine/p.t.o. ratio} = \frac{2250}{1174} = 1.917$$

— **750 rev/min:** distance behind rear axle 440 mm; diameter of p.t.o. shaft end 35 mm; 6 splines, not in conformity with ISO 500/1979; no power restriction; 872 rev/min at rated engine speed; standard p.t.o. speed 750 rev/min at engine speed 1934 rev/min; p.t.o. shaft rotates clockwisely, viewed from tractor rear.

$$\text{Engine/p.t.o. ratio} = \frac{2250}{872} = 2.579$$

OPTIONS AVAILABILITY:
— 540 rev/min
— or 540 rev/min + 1000 rev/min
— or 540 rev/min + 750 rev/min

P.t.o. proportional to ground speed:

size of tyres: 13.6 R 28, radius index 610 mm;
travelling distance for one revolutions of p.t.o. shaft 0.452 m with 540 p.t.o., 0.324 m with 750 p.t.o. and 0.241 m with 1000 p.t.o.;

number of p.t.o. shaft revolution for one revolution of the real wheels: 8.474 with 540 p.t.o., 11.829 with 750 p.t.o. and 15.916 with 1000 p.t.o..
Direction of rotation with forward gear engaged: clockwise, viewed from tractor rear.

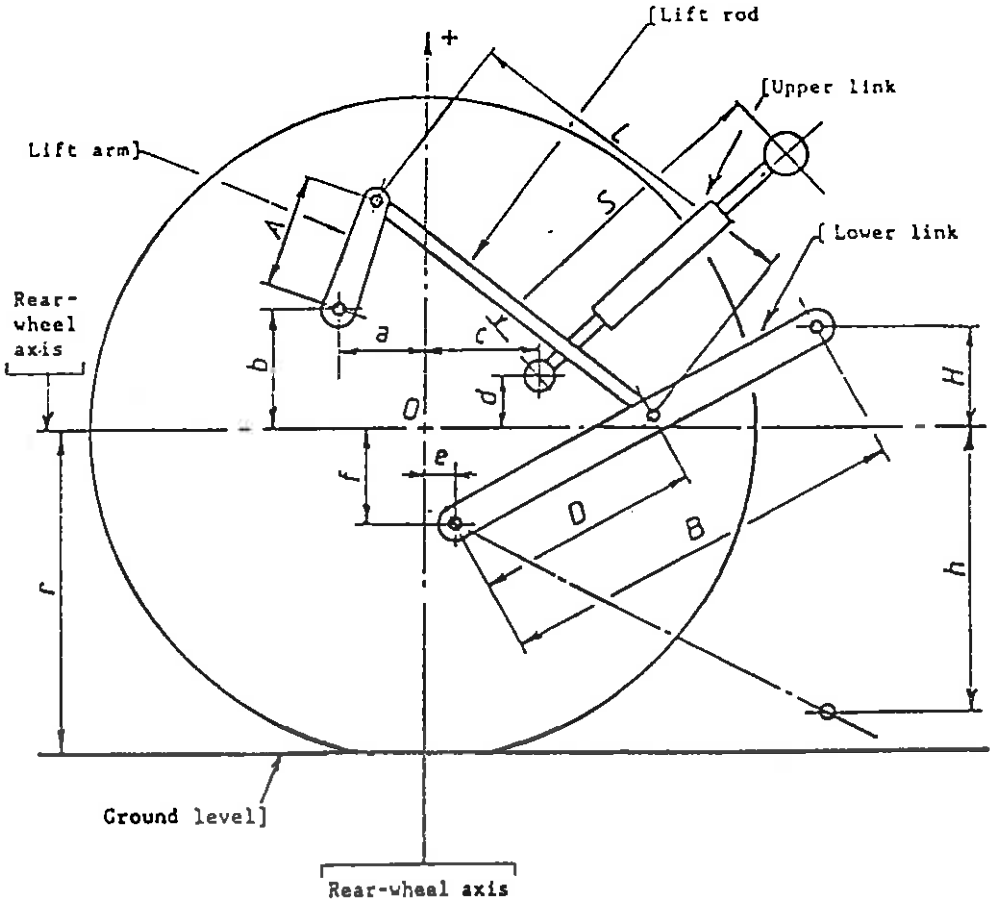
POWER LIFT:

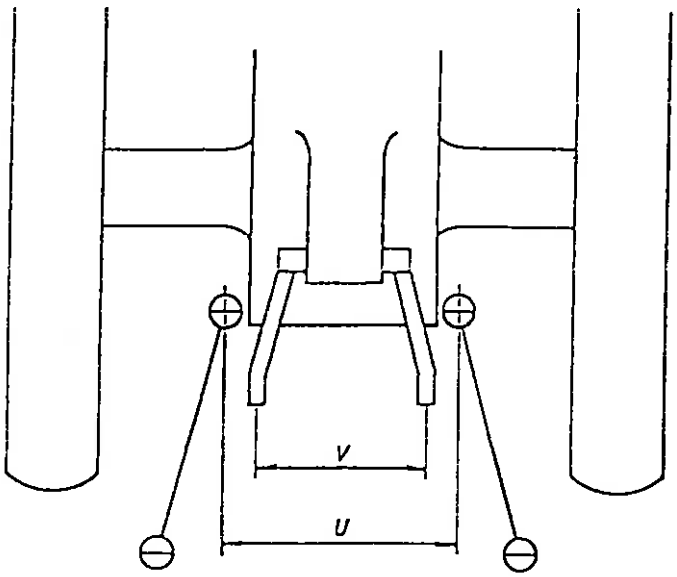
Own make; hydraulic power lift in unit construction, draught, position, intermix control and floating control.

— **Hydraulic system:** open centre system with hydraulic oil circuit in common with gear box. One single acting cylinder with 100 mm bore and 127 mm stroke.
Relief valve pressure setting: 18 MPa
Antishock valve setting: 19 MPa
TUROLLA SNP 2/11 CO or BOSCH A 510 240 229 lift gear pump, directly driven by engine.
Engine/pump ratio: 1:1.56; delivery 38.5 l/min at rated engine speed.
There are no cylinder safety valves.
Type of linkage lock for transport: hydraulic. Oil capacity 33 litres. Site of oil reservoir: gearbox cast housing. Number two tapping points on the rear part of tractor. Maximum volume of oil available to external cylinders 5 litres.

Implement linkage:
three point linkage, joint balls category 1 or 2, interchangeable according to I.S.O. 730/2 - 1979; dimensions see on pag. 14.

POWER LIFT


Lift rod
Upper link
Lift arm
Lower link
Rear-wheel axis
A
S
a
c
b
d
H
e
f
D
B
h
r
Ground level
Rear-wheel axis


v
u

Dimension of linkage geometry (when connected to the standard frame)

		Dimension or range mm	Settings used in test mm
Length of lift arms	(A)	272	272
Length of lower links	(B)	750	750
Distance of lift arm pivot: horizontally	(a)	—185	—185
point from rear-wheel axle: vertically	(b)	311	311
Horizontal distance between the 2 lower link points	(u)	390	390
Horizontal distance between the 2 lift arm end points	(v)	525	525
Length of upper link	(S)	from 450 to 630	580
Distance of upper link			
pivot point from rear: horizontally	(c)	420	420
wheel axle: vertically	(d)	from 256 to 301	256
Distance of lower link			
pivot point from rear: horizontally	(e)	250	250
wheel axle: vertically	(f)	140	140
Distance of lower link pivot points to lift rod pivot points on lower links	(D)	370	370
Length of lift rods	(L)	from 440 to 500	500
Heigth of lower hitch points relative to the rear-wheel axle:			
— in low position	(h)	from 390 to 450	450
— in high position	(H)	from 100 to 160	100
Height above ground of liver hitch points when locked in transport position (*)		from 710 to 770	710

(*) Assuming the dynamic radius index: 610 mm (ISO 4251/1 - 1984)

SWINGING DRAWBAR:

Own make; clevis type.
Vertical height with tyres 13.6 R 28, to centre of clevis: min 290 mm max 340 mm above ground; adjustments obtained changing the setting of the drawbar on the drilled guide; clevis coupling pin diameter 28 mm; distance of hitch point from rear axle horizontally: 940 mm behind.
Position relative to p.t.o. horizontally and vertically:
— 550 mm behind
— from 240 mm below to 290 mm below.
Lateral adjustments: 5 position (one in the middle and two for each side at 125 mm and 250 mm).
Pivot position relative to rear wheels horizontally 440 mm.
Maximum vertical load: not allowed by italian legislation and by manufacturer.

HITCH:

Own make; clevis type; height above ground (with tyres 13.6 R 28) 410-630-500 and 720 mm, changeable by sliding on drilled guides; hitch hole 28 mm dia; distance of hitch hole to rear axle horizontally 570 mm; position relative to p.t.o.: vertical 170 and 80 mm below; 50 and 140 mm above; 130 mm horizontal, to rear.
Maximum vertical load 1500 kg according to italian legislation (with tyres 13.6 R 28 123 A8).

HOLED DRAWBAR:

fitted on hitch points of lower links; number 9 holes; distance between holes 55 mm, 20 mm dia holes, 30 mm thickness, 70 mm width, 824 mm lenght, height above ground min 83 mm, max 768 mm (with tyres 13.6 R 28); horizontal distance to p.t.o. shaft end 550 mm.

STEERING:

Own make, hydrostatic control, with independent hydraulic circuit. Distributor DANFOSS make, Orbitrol OSPC 80; gear pump delivery 19.1 l/min at rated engine speed, one double acting cylinder directly acting on the front wheel, transversaly mounted, bore 50 mm, stroke 222 mm, piston rod 32 mm dia; working pressure 12 ± 0.2 MPa.
Oil capacity 1.5 litres. Oil filter make: MF.

BRAKES:

Service brake:

Own make, multiple wet disc brakes type, 6 plates made of resin graphite; dimensions: 177.8x139.7 mm. Total braking area: 1140 cm^2 hydraulically acting on rear wheels; operated by two independent pedals locked together for road drive.
Hydraulic trailer braking take off available as optional, only for market where it is homologated.

Parking brake:

Own make, hand lever operated; the parking brake acts on the final part of service brake by means of different linkage.

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

WHEELS:

Steering wheels:
at front, two tyres PIRELLI 250/80-18.

Driving wheels:
at front and at rear: two tyres KLEBER 13.6 R 28.

Wheelbase: 1895 mm

Track width adjustment

	Minimum mm	Maximum mm	Adjustment method
Front	1230	1530	manual through 8 positions
Rear	1140	1690	manual through 8 position, and PAVT, as option

Permissible tyre combinations:

Tyre size			
At front		At rear	
7.50-16	6 ply	12.4 R 24	119 A8
8.25-16	6 ply	13.6 R 24	121 A8
6.50-16	6 ply	11.2 R 24	114 A8
8.25-16	6 ply	11.2 R 28	116 A8
7.50-18	6 ply	12.4 R 28	121 A8
8.25-16	6 ply	11.2 R 28	116 A8
7.50-18	6 ply	12.4 R 28	121 A8
250/80-18	8 ply	13.6 R 28	123 A8

STRUCTURE:

Massey Ferguson, roll-bar, ARS5 type. NF-U 02-047 STANDARD CEMAGREF REPORT 5857 (28.01.86) approval number. It's composed by two post folding ROPS of steel welded and bolted construction in front of the operator's seat and it's tiltable.

SEAT:

Driver's seat:
GRAMMER make, DS 44/1H model, upholstered seat with back rest, double acting hydraulic damper suspension; height of unloaded seat above driver's platform adjustable from 540 mm to 585 mm in a

a continuos way, longitudinal adjustment 160 mm;

Passenger seat: none.

LIGHTING: Electrical 12 V, in accordance with Italian legislation.

	Height above ground of centre mm	Size mm	Distance from outside edge of light to median plane of tractor mm
Headlights	925	∅ 130	205
Sidelights	1435	110x35	515
Rearlights	1435	110x35	515
Reflectors 1st pair	1225	50x45	545
Reflectors 2nd pair	700	∅ 80	405

TEST CONDITIONS

OVERALL DIMENSIONS

	Length	Width		Height to top of	
		mini	maxi	exhaust silencer	structure
	m	m	m	m	m
With ballast	3.73	1.63	2.18	2.21	2.39
Without ballast	3.45	1.48	2.03	2.21	2.39

Ground clearance: 270 mm below differential box.

Tractor mass
(with roll bar):

	Without driver		With driver	
	Without ballasts kg	With ballasts kg	Without ballasts kg	With ballasts kg
Front	940	1105	960	1125
Rear	1360	1520	1410	1570
Total	2300	2625	2370	2695

Ballasts:

	Weights		Water (kg)
	Number	Total mass (kg)	
Front wheels Front weight	— 4 + support	— 145	— —
Rear wheels	4	180	—
Optional	—	—	—

Fuel:

— Type: Esso Diesel oil, in conformity with national standard.

— Density at 15 °C: 0.831 g/cm^3

Tyres and track width specifications

	Front	Rear
Tyres:	PIRELLI	KLEBER
dimensions	258/80-18	13.6 R 28
ply rating	8	123 A8
tyre	diagonal	radial
maximum load	810 kg (30 km/h)	1550 kg (30 km/h)
inflaction pressure (tyre manufacturer's)	250 KPa	160 KPa
dynamic radius index	405 mm	610 mm
Chosen track width:	1230 mm	1140 mm

Oils and lubrication

— Capacity and change interval

	Capacity dm^3	Oil change h	Filter change h
Engine	6.5	250	250
Gear box with hydraulic sistem	33	1000	250
Front axle and final reduction	4.8	1000	—
Rear axle and final reduction	3.6	1000	—
Steering system	1.5	1000	CLEANING EVERY 500 houres

— Specifications (SAE, API, MIL.L, ISO)

	Recommended	Used during test
Engine oil — Type: — Viscosity: — Classification:	 LAND-OIL SAE 15 W 40 MIL-L-2104 C	As recommended
Transmission oils — Type: — Viscosity: — Classification:	 LAND-OIL SAE 80 W 90 API CC/SE	As recommended
Hydraulic fluid — Type: — Viscosity: — Classification:	 LAND-OIL SAE 80 W 90 API CC/SE	As recommended
Steering oil — Type: — Viscosity: — Classification:	 LAND-OIL SAE W 40 MIL-46152	As recommended

— Grease: LAND-OIL
Number of lubrication points: 16

COMPULSORY TESTS RESULTS

(1) MAIN POWER-TAKE-OFF PERFORMANCE

Date and Location of tests: 05/09/1988, I.M.A., TORINO, ITALY
Type of dynamometer:
PARASITIC CURRENTS, BORGHI & SAVERI FA 300-30 SP

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 - 2 - hour test						
32.89	2250	625	11.16	9.27	282	2.95
Power at rated engine speed						
32.89	2250	625	11.16	9.27	282	2.95
Standard power-take-off speed (540 ± 10 rev/min)						
30.64	1945	540	9.99	8.30	271	3.07
PART LOADS						
(1) the torque corresponding to maximum power at rated engine speed						
32.89	2250	625	11.13	9.25	281	2.96
(2) 85% of torque obtained in (1)						
28.68	2308	641	9.69	8.05	281	2.96
(3) 75% of torque defined in (2)						
21.81	2340	650	7.98	6.63	304	2.73
(4) 50% of torque defined in (2)						
14.84	2390	664	6.20	5.15	347	2.39
(5) 25% of torque defined in (2)						
7.53	2423	673	4.87	4.05	538	1.55
(6) unloaded						
—	2448	680	3.49	2.90	—	—

PART LOADS AT STANDARD POWER-TAKE-OFF SPEED (540 ± 10 rev/min)

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
(1) the torque corresponding to maximum power						
30.93	1945	540	9.99	8.30	268	3.10
(2) 85% of torque obtained in (1)						
26.53	1991	553	8.38	6.96	262	3.17
(3) 75% of torque defined in (2)						
20.72	2045	568	7.02	5.83	281	2.95
(4) 50% of torque defined in (2)						
14.20	2099	583	5.48	4.55	320	2.59
(5) 25% of torque defined in (2)						
7.26	2146	596	4.01	3.33	459	1.81
(6) unloaded						
—	2174	604	2.53	2.10	—	—

STANDARD SPECIFIC CONSUMPTION: 281/347/262/320 (g/kWh)

No load maximum engine speed : 2448 rev/min

Torque at maximum power (2 hours) : 139.6 N/m

Maximum torque : 168.2 Nm at 1400 rev/min of the engine

Mean atmospheric conditions : Temperature 24.0 °C
Pressure 994.0 mbar
Relative Humidity 70%

Maximum Temperature : Coolant 77.0 °C
Engine oil 104.0 °C
Fuel 28.0 °C
Engine air intake 24.0 °C

2 HYDRAULIC POWER AND LIFTING FORCE

— Date of tests: 26th January 1989

2.1 HYDRAULIC POWER TEST

— Sustained pressure with relief valve open: 18 MPa
— Pump delivery rate at minimum pressure: 11 l/min

	Flow rate l/min	Pressure MPa	Power kW
Flow rate corresponding to a hydraulic pressure equivalent to 90 per cent of the actual relief valve pressure setting and corresponding hydraulic power	39.6	16.2	10.0
Flow rate and hydraulic pressure corresponding to maximum hydraulic power	39.4	16.4	10.1

— Tapping point used for test: at rear of tractor
— Temperature of hydraulic fluid: 65 °C

2.2 POWER LIFT TEST

	at the hitch point		on the frame	
Height of lower hitch points above ground in down position	160	mm	160	mm
Vertical movement	550	mm	410	mm
Maximum corrected force exerted through full range	20.3	kN	16.3	kN
Corresponding pressure of hydraulic fluid	16.2	MPa	16.2	MPa
Moment about rear-wheel axis	—	kNm	26.6	kNm
Maximum tilt angle of mast from vertical	—	degrees	5	degrees

Lifting heights relative to the horizontal plane including the lower link pivot points										
mm	—300	—250	—200	—100	—50	0	+50	+110	+200	+250
Lifting forces										
at the hitch points kN	21.30	21.10	21.05	20.90	20.80	20.60	20.60	20.55	20.50	20.30
Corresponding pressure: 16.2 MPa										
at the frame kN	22.85	21.80	21.40	20.00	19.20	18.45	17.70	16.30	—	—
Corresponding pressure: 16.2 MPa										

(3) DRAWBAR PERFORMANCE

Date of tests: 29th September till 3rd October 1988
Type of track: concrete
Tyre size front: 250/80-18 8 ply
Tyre size rear: 13.6 R 28 123 A8

		Tyre inflation pressure	
	Height of drawbar above ground	Front	Rear
Unballasted	440 mm	250 kPa	160 kPa
Ballasted	435 mm	250 kPa	160 kPa

Gear no. and group	Driving speed	Power	Drawbar pull	Engine speed	Slip of wheels	Specific fuel consumption	Specific energy	Temperatures			Atmospheric conditions		
								Fuel	Coolant	Engine oil	Temperature	Relative humidity	Pressure
	km/h	kW	daN	rev/min	%	g/kWh	kWh/l	°C	°C	°C	°C	%	mbar
3.1 - MAXIMUM POWER IN TESTED GEARS (unballasted tractor)													
1 Normal	3.69	18.90	1844	2334	14.8	354	2.34	30	75	102	21.0	58	990.4
4 Slow	4.47	23.16	1863	2305	14.7	352	2.36	30	77	103	21.0	58	990.4
2 Normal	5.80	26.24	1628	2277	12.7	353	2.36	30	78	105	21.0	58	990.4
3 Normal	7.56	26.46	1265	2260	9.3	351	2.36	30	79	106	21.0	58	990.4
1 High	9.52	26.72	1010	2251	7.6	349	2.38	30	79	107	21.0	58	990.4
4 Normal	11.44	24.78	780	2248	6.4	374	2.22	30	80	107	21.0	58	990.4
3.2 - MAXIMUM POWER IN TESTED GEARS (ballasted tractor)													
1 Slow	1.56	9.94	2295	2393	15.0	—	—	29	74	102	17.5	75	996
2 Slow	2.43	15.42	2285	2366	14.6	—	—	29	74	102	17,5	75	996
3 Slow	3.03	19.09	2265	2329	14.3	361	2.30	30	75	104	17.5	75	996
1 Normal	3.59	22.78	2285	2306	14.8	360	2.31	30	75	105	17.5	75	996
4 Slow	4.45	26.64	2157	2268	12.6	347	2.39	30	75	105	17.5	75	996
2 Normal	5.89	27.27	1667	2258	9.3	341	2.44	31	76	105	17.5	75	996
3 Normal	7.58	26.85	1275	2251	7.2	346	2.40	31	78	107	17.5	75	996
1 High	9.55	26.53	1000	2249	6.2	351	2.37	31	79	107	17.5	75	996
4 Normal	11.44	24.64	775	2251	5.1	377	2.20	31	79	108	17.5	75	996
3.3.1 - FIVE HOUR TEST at 75% of pull at maximum power													
3 Normal	7.91	21.00	956	2312	5.8	367	2.27	30	79	107	19.5	57	983.8
3.3.2 - FIVE HOUR TEST at pull corresponding to 15% wheelslip - with 280 kg as additional ballast													
1 Normal	3.89	24.70	2285	2285	6.9	370	2.24	31	80	108	19.5	68	983.8

Oil consumption during ten hours tests 3.3.1 and 3.3.2: 37 g/h
Test 3.3.2 was carried out with additional ballasts; so, the not quoted figures are irrelevant

4. TURNING AREA AND TURNING CIRCLE

Wheel equipment front: 250/80-18 8 ply
rear : 13.6 R 28 123 A8
Track width front: 1250 mm
rear : 1140 mm

	With brakes		Without brakes	
	Right-hand m	Left-hand m	Right-hand m	Left-hand m
Radius of turning area	3.83	4.38	4.06	4.61
Radius of turning circle	3.63	4.18	3.86	4.41

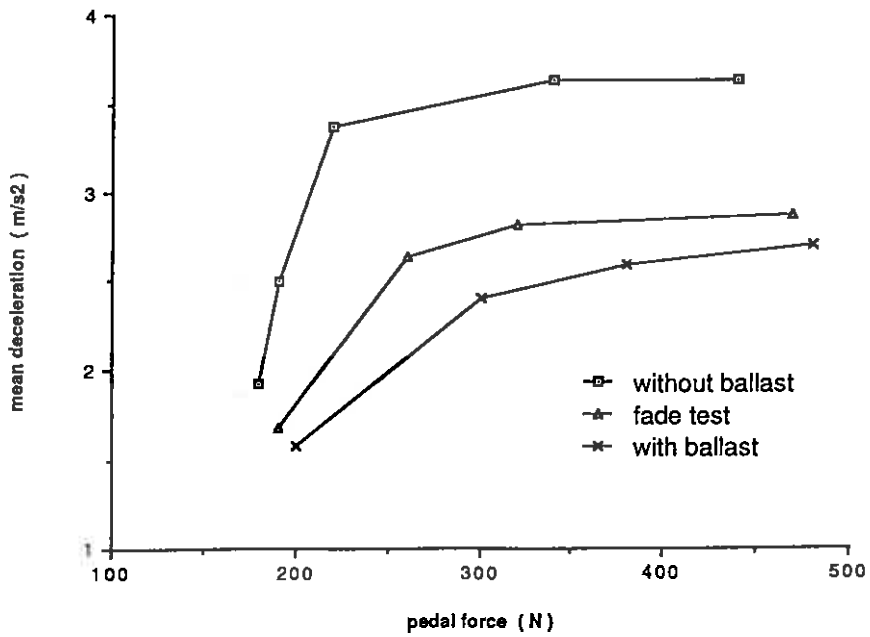
5. LOCATION OF CENTRE OF GRAVITY

Height above ground	670	mm
Distance forward from the vertical plane containing the axis of the rear wheels	774	mm
Distance from the median plane of the tractor, to the left	1	mm

6. BRAKING

— Date of tests: 7th and 8th october 1988

6.1cold service braking device test - 6.2 fade test



6.2 COLD SERVICE BRAKING DEVICE TEST

	Ballasted tractor	Unballasted tractor
Speed before application of brakes (Km/h)	30.05	30.00

FADE TEST

— Maximum deviation of the tractor from its original course: none.
— Abnormal vibration. none.
— Brake heating method: by means of towing the tractor for 1 Km at 24 Km/h with a towing force of 270 Kg.

6.3 PARKING BRAKING DEVICE TEST

	Uphill	Downhill
Braking device control force	10.2 kN	10.9 kN

7. MEASUREMENT OF EXTERNAL NOISE LEVEL

— Date of tests: 28th october 1988
— Type of sound level meter: impulse precision BRUEL & KJAER 2209 model.
— Type of track: concrete

7.1 Results of test with DGM SA 1269 model

— Gear number: 4 High
— Travelling speed before acceleration: 19.75 km/h
— Sound level: 83 dB(A)

7.2 Results of test with DGM SA 1150 model

— Gear number: 4 High
— Travelling speed before acceleration: 19.81 km/h
— Sound level: 84.0 dB(A)

OPTIONAL TEST RESULTS

8. ENGINE PERFORMANCE

Date and Location of tests: 16/11/1988 I.M.A., TORINO, ITALY
Type of dynamometer: PARASITIC CURRENTS, BORGHI & SAVERI FA 300-30 SP

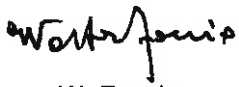
Power	Engine Speed	FUEL CONSUMPTION			Specific Energy
		Hourly		Specific	
kW	rev/min	l/h	kg/h	g/kWh	kWh/l
MAXIMUM POWER - 2 - hour test					
35.25	2250	11.28	9.38	266	3.13
POWER AT RATED ENGINE SPEED					
35.25	2250	11.28	9.38	266	3.13
STANDARD POWER-TAKE-OFF SPEED (1000 ± 25 rev/min)					
32.47	1945	10.08	8.38	258	3.22
PART LOADS					
(1) the torque corresponding to maximum power at rated engine speed					
35.25	2250	11.28	9.38	266	3.13
(2) 85% of torque obtained in (1)					
30.44	2287	9.77	8.12	267	3.12
(3) 75% of torque defined in (2)					
23.35	2340	8.07	6.71	287	2.89
(4) 50% of torque defined in (2)					
15.93	2395	6.25	5.19	326	2.55
(5) 25% of torque defined in (2)					
8.09	2428	4.93	4.10	507	1.64
(6) unloaded					
—	2445	3.55	2.95	—	—

STANDARD SPECIFIC CONSUMPTION: 267/326 (g/kWh)
No load maximum engine speed: 2445 rev/min
Torque at maximum power (2 hours): 149.6 N/m
Maximum torque: 175.5 Nm at 1400 rev/min of the engine
Mean atmospheric conditions: Temperature 17.0 C
Pressure 1000.0 mbar
Relative Humidity 69%
Maximum Temperature: Coolant 74.0 C
Engine oil 101.0 C
Fuel 28.0 C
Engine air intake 17.0 c

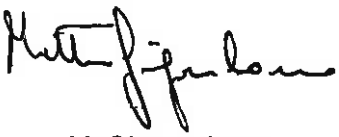
9. **REPAIRS AND ADJUSTMENT DURING TEST** = none

10. **REMARKS** = none

TEST CARRIED OUT BY:

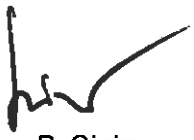


W. Faccio



M. Giangualano

HEAD OF I.M.A.
TEST DEPARTMENT



R. Gioia

DIRECTOR OF I.M.A.



L. Lisa

Turin, 9th June 1989

LANDINI DT 5560 L (TL 38 DT/M) 4 WD

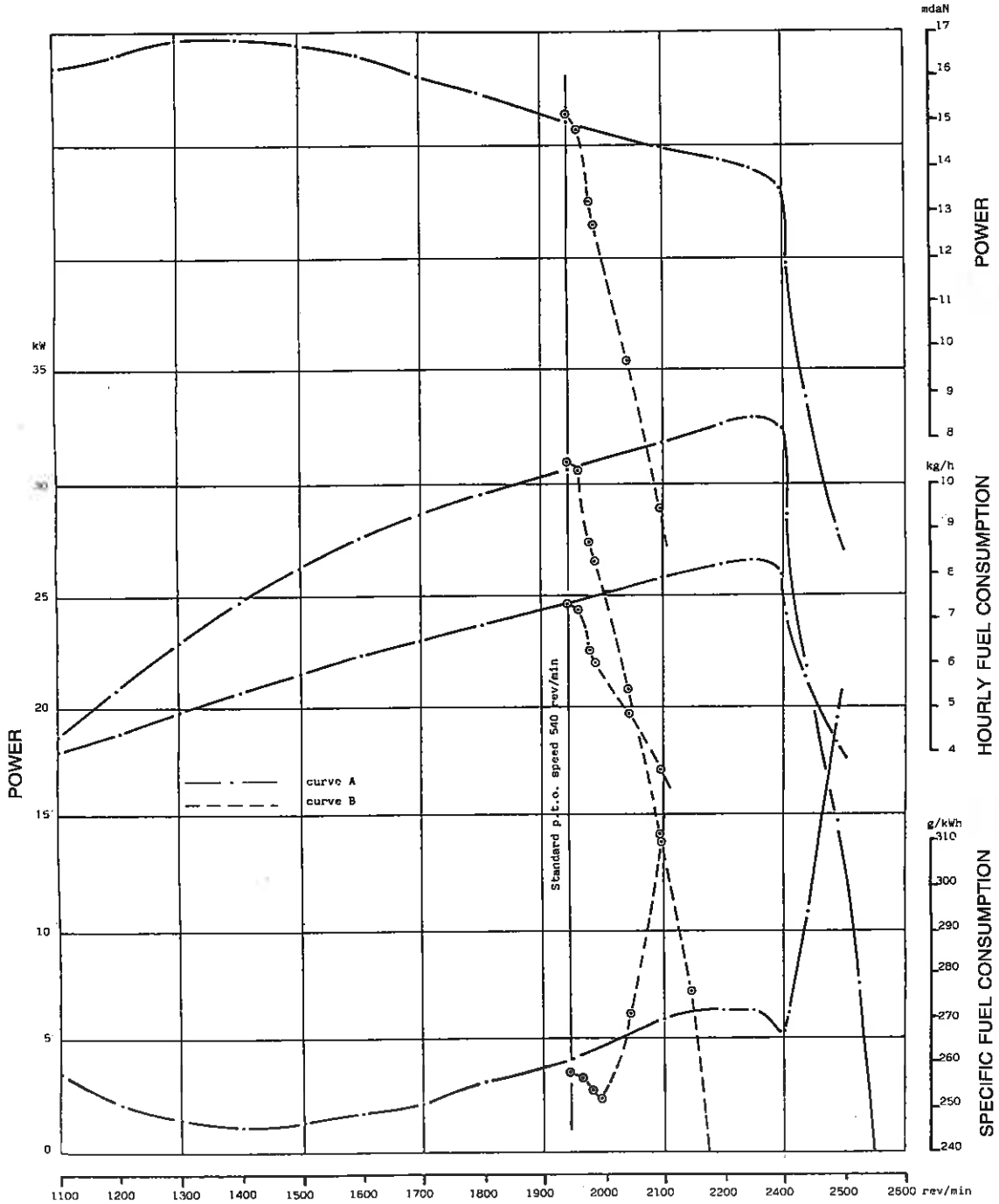


Fig. 1 - POWER TAKE-OFF TEST

LANDINI DT 5560 L (TL 38 DT/M) 4 WD

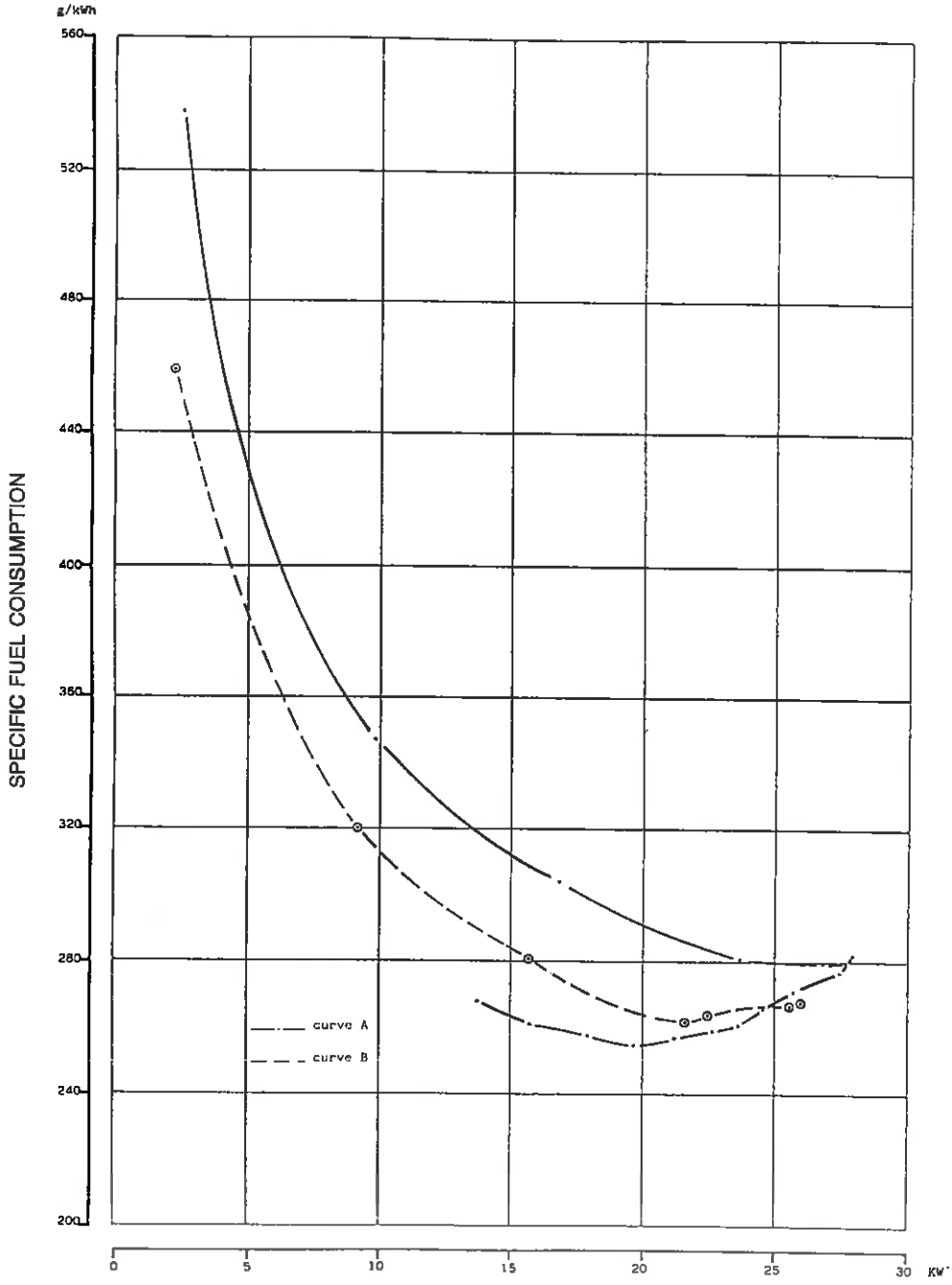


Fig. 2 - POWER TAKE-OFF TEST

LANDINI DT 5560 L (TL 38 DT/M) 4 WD

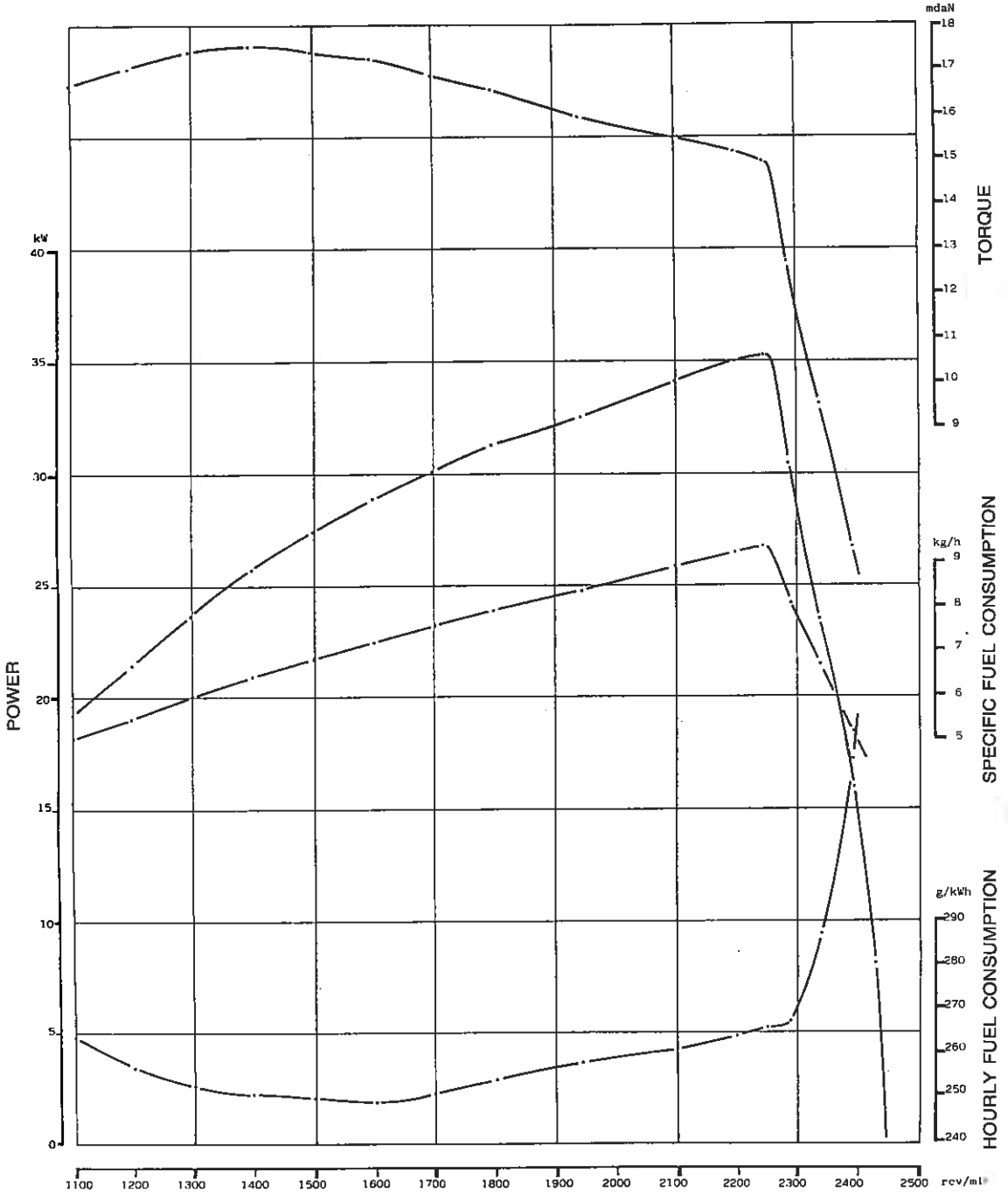


Fig. 3 - ENGINE TEST

LANDINI DT 5560 L (TL 38 DT/M) 4 WD

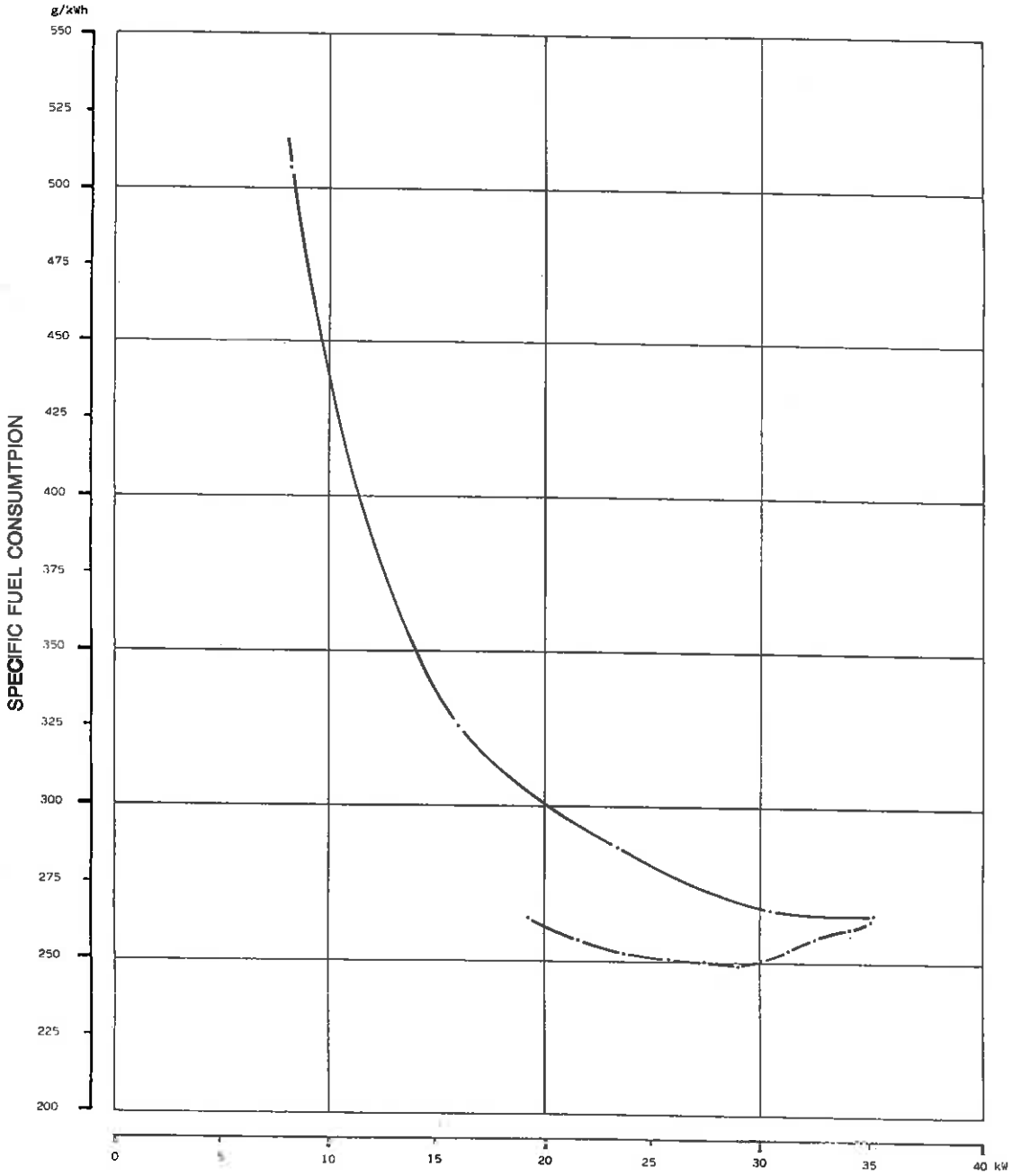


Fig. 4 - ENGINE TEST

LANDINI DT 5560 L (TL 38 DT/M) 4 WD

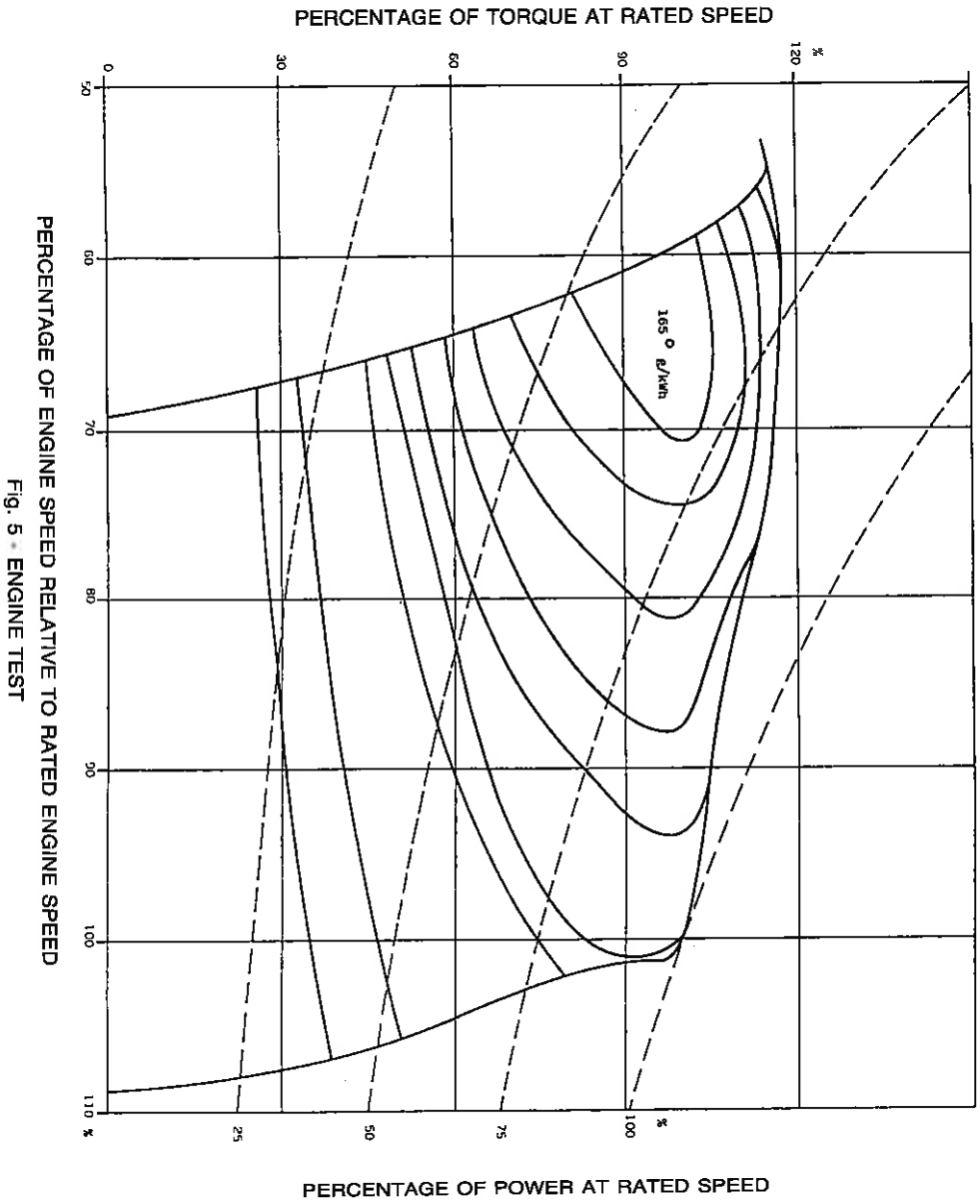


Fig. 5 - ENGINE TEST