COMITATO PER L'OMOLOGAZIONE
DELLE MACCHINE AGRICOLE

OECD Approval No. 1069
Restricted Code

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

GOLDONI 1038 (4 W.D.)



Manufactured by: GOLDONI S.p.A. - Via Canale, 3
MIGLIARINA DI CARPI - MODENA - Italy

Date and location of tests: October-December 1986 - 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: 18th June 1987

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

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

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/cm2	or 1 kg/cm2	= 0.980665	bar
Torques:	1 mN	= 0.10196 mkg	or 1 mkg	= 9.80665	mN

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PERFORMANCE CURVES

Fig. No.

Power take-off test

Curves of power, torque, hourly and specific fuel consumption/ crankshaft speed 1

Curves of specific fuel consumption/cranksharf power p.t.o. . . . 2

Tractor manufacturer:	GOLDONI S.p.A. Via Canale, 3 MIGLIARINA DI CARPI - 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:	GOLDONI
Model:	1038
Type:	four wheel drive tractor, unit construction
Serial No.:	320511
Ist serial No.:	174966
ENGINE:	
Make:	LOMBARDINI
Model:	832
Type:	4-stroke Diesel engine, direct injection, air cooled
Serial No.:	2767287
Cylinders:	2 cylinders, vertical, in-line, 100 mm bore x 105 mm stroke, capacity 1648 cm^3, compression ratio 17,5:1, overhead in-line valves, replaceable cast-iron dry cylinder liners
Fuel system:	forced with diaphragm FISPA SUP 75 pump; one FIAAM FNA 32/01 filter with replaceable cartridge; one standard fuel tank capacity 16 l; BOSCH PFR 2K70/5 34/2 distributor injection pump; manufacturer's production setting 46-48 mm^3/stroke at rated engine speed and

full load; injection timing 27° before TDC; BOSCH multihole injectors drawing 0432.281.791; injection pressure 210÷220 bar
- Serial no of injection pump: none

Governor: LOMBARDINI centrifugal variable speed governor mechanical type, governed range of engine speed from 1000 to 3200 rev/min; rated engine speed 3000 rev/min

Air cleaner: FISPA or METAL main cleaner, oil bath air filter, drawing 2132; FISPA or METAL precleaner, drawing 2077.03
Oil capacity: 0,5 l.
Air intake under bonnet in front of engine.
Maintenance indicator: none

Lubrication system: Forced-feed lubrication with LOMBARDINI gear pump; one replaceable cartridge type FIAAM FOL 542.030 filter on pressure side pump of oil to the engine; cartridge change every 300 operating hours; oil capacity including filter 4.3 l; recommended oil ESSO TRACTOR LUBE UNIVERSAL SAE classification 20 W/40, satisfied MIL-L-2104 C specifications; oil change period every 100 operating hours.

Cooling system: Air forced feed cooled with one conveyor-distributor on the cylinder, 221 mm dia, 10 blades, flywheel axial impeller.

Starting system: Electrical BOSCH JF(R) 12 V-2.5 kW; optionally MARELLI MT 71G 12V-2.5 kW; starting motor pinion coupling solenoid operated.
Cold starting aid: thermostart.
Safety device: operable only when the clutch pedal is fully depressed.

Electrical system: 12 V, negative earth. Alternator SAPRISA type 12V-14A, 6322 model or DUCATI type 12V-14A, 43503700 model.
Battery: one lead acid type; FIAMM 6MPX75; capacity 92 Ah at 20 hours rating.

Exhaust system: GOLDONI drawing 921472, interferance type with internal perforated pipe; rectangular shape 180 x 80 mm, 270 mm length; vertical on left side of engine; maximum height above ground 460 mm.

TRANSMISSION:

Clutch: PITTERI and VIOLINI make; F215.2 type dry, single disc clutch; disc 215 mm dia; pedal operated for gear box drive and for P.T.O. drive.

Gearbox: Own make, mechanical type, sliding gear. The transmission consists of three ratios with two forward and one reverse reduction gear, with total 6 forward and 3 reverse speeds, manually selected by means of two levers.

Rear axle and final drive: Own make, mechanical type with straight teeth cylindrical gears; bevel gear type differential, hand lever operated and self-disengaging lock.

Front axle and final drive: Own make, mechanical type with straight teeth cylindrical gears; bevel gear type differential, hand lever operated having a position of engaging lock.
The front and rear axles are constantly mechanically connected.

Gear lubrication: Capacity final rear drives: 6.5 l; capacity gear box and final front drives: 9 l; change period 800 operating hours; no filter. Recommended oil ESSO GEAR OIL GX 80 W-90 or any oil conforming MIL L 2104 supplement 1.

Total ratios and speeds (tyres 7.50-18 and pressure 1.8 bar)

Gear	Group	Number of engine revolutions for one revolution of the driving wheel	Nominal travelling speed (*) from rated engine speed (3000 rev/min) km/h
I	Low	349.684	1.31
II		167.427	2.73
III		85.018	5.38
I	High	65.057	7.04
II		31.149	14.70
III		15.817	28.94
I	Reverse	266.426	1.72
II		127.564	3.59
III		64.773	7.07

(*) Calculated with the radius index of 405 mm

POWER TAKE OFF

Main:

Not indipendent, p.t.o. driven by single disc clutch; one shaft, hand lever operated.
Position: rear of tractor, in median plane; height above ground 470 mm (with tyre 7.50-18).

Proportional engine speed p.t.o.:
- 540 rev/min p.t.o.: distance behind rear axle 350 mm; diameter of p.t.o. shaft end 34.8 mm; 6 splines, according to ISO 500; no power restriction; 577 rev/min and 879 rev/min at rated engine speed; standard p.t.o. speed 540 rev/min at engine speed 1843 rev/min and 2806 rev/min; p.t.o. shaft rotates clockwisely, viewed from tractor rear.

Ratio of rotation speed: $\frac{\text{engine speed}}{\text{p.t.o. speed}} = \frac{3000}{577} = 5.199$

Proportional ground speed p.t.o.:
- 540 rev/min p.t.o.: travelling distance for one revolution of p.t.o. shaft 171 mm with tyre 7.50-18; number of p.t.o. shaft revolutions for one revolution of rear wheels 15.0 rev.; p.t.o. shaft rotates clockwisely viewed from tractor rear.

Optional:

Not indipendent, p.t.o. driven by single disc clutch; one shaft, hand lever operated.
Position: rear of tractor, in median plane, under main power take off; height above ground 390 mm (with tyre 7.50-18)
Proportional engine speed p.t.o.:
- 540 rev/min p.t.o.: distance behind rear axle 290 mm; diameter of p.t.o. shaft end 30 mm; 6 splines; not in conformity with ISO 500; no power restriction; 577 rev/min and 879 rev/min at rated engine speed; standard p.t.o. speed 540 rev/min at engine speed 1843 rev/min and 2806 rev/min; p.t.o. shaft rotates counter-clockwisely, viewed from tractor rear.

Ratio of rotation speed: $\frac{\text{engine speed}}{\text{p.t.o. speed}} = \frac{3000}{577} = 5.199$

Proportional ground speed p.t.o.:
- 540 rev/min p.t.o.: travelling distance for one revolution of p.t.o. shaft 171 mm with tyre 7.50-18; number of p.t.o. shaft revolutions for one revolution of rear wheel 15.0 rev.; p.t.o. shaft rotates counter-clockwisely, viewed from tractor rear.

POWER LIFT:

MITA make; hydraulic power lift in unit construction, draught and position control operated by means of two indipendent levers.

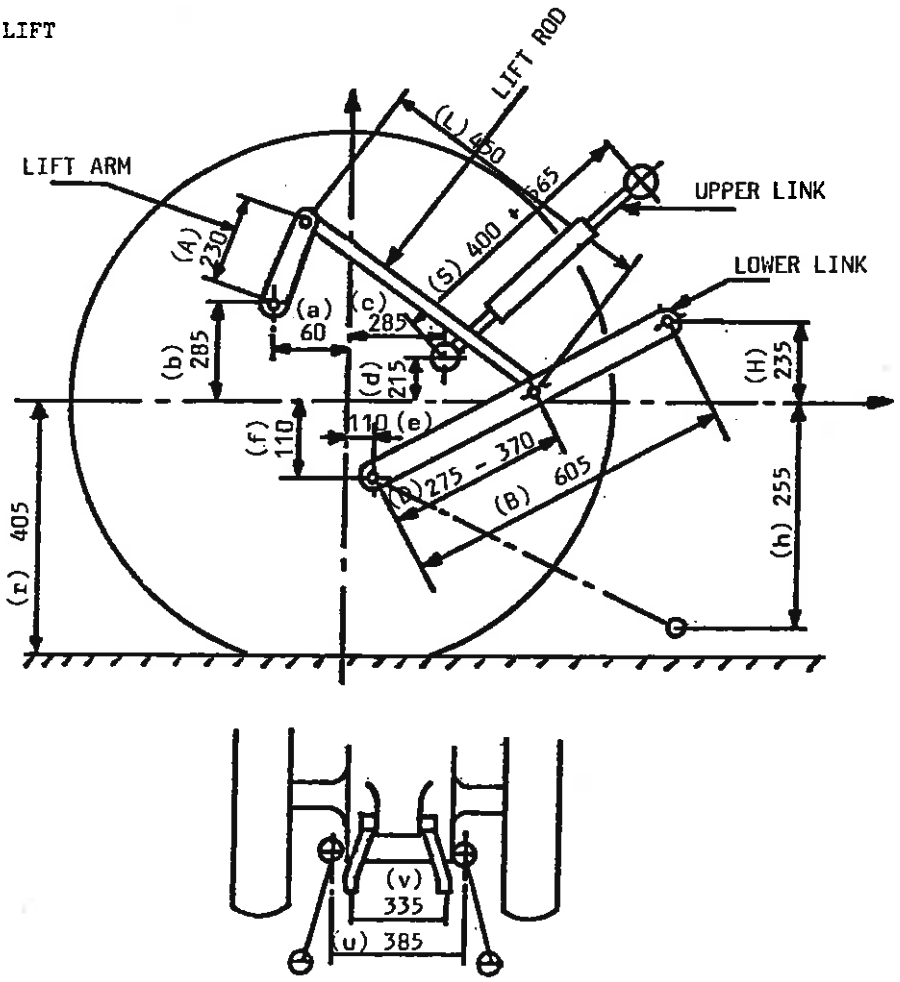
Hydraulic system:

open centre system; Hidroirma gear pump AP2/6.5S218, (optionally Salami gear pump 2PA/6.2S), directly driven by engine; delivery 18.9 l/min at rated engine speed; one hydraulic wire mesh oil filter MITA 80 micron. Filter changing period: 800-1000 operating hours.
Maximum working pressure 180 bar. One single acting cylinder with 80 mm bore and 86 mm stroke, relief valve pressure setting: 175 ÷ 185 bar, there are not cylinder safety valves. Type of linkage lock for transport: mechanical.
Oil capacity: 6.5 l.
Site of oil reservoir: inside of hydraulic system.
Optional, one tapping point for an additional external ram is available, but it is not fitted on tested tractor.
Maximum volume of oil available to external cylinders: 4 l.
Recommended oil: ESSO NUTO H 68, or ESSO LUBE HD 10W. Oil change period 800-1000 operating hours.

Implement linkage:

three point linkage, joint balls category 1N according to I.S.O. STANDARD 730/II; dimensions see on pag 8.

POWER LIFT



State setting of hydraulic power lift for test

- Rear tyres (size 7.50-18) radius index (r) : 405 mm
- Front tyres (size 7.50-18) radius index (r'): 405 mm
- Length of lift arms (A) : 230 mm
- Length of lower links (B) : 605 mm
- Distance of lift arm pivot point from rear wheel centre line:
  - horizontally (a) : 60 mm
  - vertically (b) : 285 mm
- Horizontal distance between the 2 lower link points (u) : 385 mm
- Horizontal distance between the 2 lift arm end points (v) : 335 mm
- Length of upper link (S) : from 400 to 565 mm
- Distance of upper link pivot point from rear wheel centre line:
  - horizontally (c) : 285 mm
  - vertically (d) : 215 mm
- Distance of lower link pivot point from rear wheel centre:
  - horizontally (e) : 110 mm
  - vertically (f) : 110 mm
- Distance of lower lift pivot points to lift rod pivot points on lower links (D) : 275 and 370 mm
- Length of lift rods (L) : 450 mm
- Height of lower hitch points:
  - in low position (h) : 255 mm
  - in high position relative to the rear wheel centre line, situated 405 mm above the ground level (H) : 235 mm
- Height of lower link hitch points when locked in transport position : 640 mm

PULL ATTACHMENT:

Trailer hitch:
own make, clevis type; height above ground, with tyres 7.50-18, 520 mm max and 255 mm min; distance of hitch point from rear axle 400 mm horizontally; distance of hitch point from main p.t.o. shaft end: vertically from 215 mm below to 50 mm above, horizontally 48 mm behind; distance of hitch point from optional p.t.o. shaft end: vertically from 135 mm below to 130 mm above, horizontally 108 mm behind; max vertical load 660 dN (with tyres 7.50 - 18; 6 ply) according to Italian legislation; one hitch pin hole: 28.5 mm dia.

STEERING:

Own make, hydrostatic control DANFOSS make, OSPC 50 LS; gear pump delivery 18.9 l/min, one double acting cylinder directly acting on the front wheel, trasversely mounted, bore 50 mm, stroke 112 mm, piston rod 25 mm dia; working pressure 90±5 bar; the hydrostatic system draw oil from hydraulic power lift system through a priority valve, DANFOSS make, OLS A 40 "LOAD SENSING" type; oil filter: none.
Recommended oil: see hydraulic oil.

BRAKES:

Service brakes:
Own make, dry disc brake type with drums and expanding shoes, 280 mm dia, 50 mm thickness, acting on rear and front axle by means of a double indipendent hydraulic circuit, operated by one pedal. Trailer braking take off not available.
Parking brake:
Own make, dry disc brake type with drums and expanding shoes, 280 mm dia, 50 mm thickness, with mechanical trasmission acting on rear axle, operated by hand-lever.

WHEELS:

Driving wheels:
Two at front and two at rear; diagonal type tyres PIRELLI IM110 7.50-18, 6 ply; maximum permissible load per tyre 665 kg at 1.8 bar inflation pressure and max 30 km/h speed; track width adjustment:
990 and 1050, rotating the wheels on hub.
Optional:

Tyre size	
at front	at rear
8.25 - 16	8.25 - 16
4 ply	4 ply

Wheelbase: 1155 mm

SEAT:

Driver's seat:
Own make, upholstered seat with back rest; height of unloaded seat above driver's platform 510 mm, longitudinal adjustment 20 mm.

Passenger seat: not available.

Number of grease points: 5.

OVERALL DIMENSIONS (tyres size 7.50 - 18 front and 7.50 - 18 rear)

Length	Width		Height to top of steering-wheel
	mini	maxi	
	m	m	m
2.92	1.19	1.25	1.22

Ground clearance: 260 mm below rear differential.

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

	Height above ground of centre with tyres: 7.50 - 18 front 7.50 - 18 rear	Size	Distance from outside edge of tractor to centre (°)
	mm	mm	mm
Headlights	760	ø 125	493
Side lights	655	70 x 20	340
Rear lights	880	70 x 60	210
Reflectors: 1st pair	810	40 x 50	160

(°) Track setting: 1050 mm at front
1050 mm at rear

TEST CONDITIONS

Track setting: 1050 mm at front
1050 mm at rear

Weights: Tractor (with tank fuel, without driver).

Front kg	Rear kg	Total kg
810	430	1240

Fuel and lubricants used in tests

Fuel: Esso Diesel oil; specific gravity: 0.845 kg/l at 15 °C; cetane number: not recorded; the fuel is in conformity with our National Standard.

Engine oil: ESSO TRACTOR LUBE UNIVERSAL SAE 20 W 40

Transmission oil: ESSO GEAR OIL GX 80 W-90

Hydraulic oil, steering oil: ESSO NUTO H68 or ESSO LUBE HD 10W

Grease: ESSO GP GREASE

COMPULSORY TESTS

(1) MAIN POWER TAKE-OFF PERFORMANCE

Date and location of tests: 28th October 1986 - I.M.A. - Torino (Italy)

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

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						
25.19	3000	577	8.45	7.14	283	2.98
POWER AT RATED ENGINE SPEED						
25.19	3000	577	8.45	7.14	283	2.98
STANDARD POWER TAKE OFF SPEED (540±10 rev/min)						
24.83	2806	540	8.11	6.85	276	3.06
PART LOADS						
(1) The torque corresponding to maximum power at rated engine speed						
25.19	3000	577	8.45	7.14	283	2.98
(2) 85% of the torque obtained in (1)						
22.11	3092	595	7.36	6.22	281	3.00
(3) 75% of the torque defined in (2)						
16.63	3102	597	6.15	5.20	313	2.70
(4) 50% of the torque defined in (2)						
11.13	3118	600	4.85	4.10	368	2.29
(5) 25% of the torque defined in (2)						
5.63	3144	605	3.79	3.20	568	1.49
(6) unloaded						
-	3170	610	-	-	-	-

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 AT STANDARD POWER TAKE OFF SPEED (540 rev/min)						
(1) The torque corresponding to maximum power available						
24.83	2806	540	8.11	6.85	276	3.06
(2) 85% of the torque obtained at maximum power in (1)						
21.95	2920	562	7.10	6.00	273	3.09
(3) 75% of the torque defined in (2)						
16.62	2951	568	5.33	4.50	271	3.12
(4) 50% of the torque defined in (2)						
11.23	2988	575	4.02	3.40	303	2.79
(5) 25% of the torque defined in (2)						
5.63	3003	578	3.61	3.05	542	1.56
(6) unloaded						
-	3014	580	-	-	-	-

Standard specific fuel consumption: 281/368/273/303 (g/kWh)
No load maximum engine speed: 3170 rev/min
Torque equivalent crankshaft at maximum power (2 hours): 80.2 Nm
Maximum torque equivalent crankshaft: 91.7 Nm at 2000 rev/min of the engine

Mean atmospheric conditions: temperature 17.0 °C
pressure 1000.0 mbar
relative humidity 73%

Maximum temperature: coolant 70 °C
engine oil 131 °C
fuel 19 °C
engine air intake 24 °C

DRAWBAR PERFORMANCE

Date of tests: 30th October 1986 Tyre size: - front: 7.50 - 18; 6 ply; inflation pressure: 1.8 bar
Type of track: concrete - rear: 7.50 - 18; 6 ply; inflation pressure: 1.8 bar
Height of drawbar above ground: 350 mm

Gear no. and group	Driving speed km/h	Power kW	Drawbar pull daN	Engine speed rev/min	Slip of wheel %	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 IN TESTED GEARS													
I Low	1.20	3.50	1050	3205	15.0	-	-	15.0	65	130	11.0	70	990.6
II Low	2.46	7.10	1040	3151	15.0	465	1.82	15.0	66	131	12.0	62	990.6
III Low	4.77	13.78	1040	3105	15.0	394	2.14	15.5	67	132	13.0	55	991.3
I High	6.15	17.93	1050	3065	15.0	368	2.30	15.5	67	133	14.0	49	991.3
II High	13.87	21.96	570	3000	6.3	326	2.59	15.5	68	135	14.0	45	992.0
2 - FUEL CONSUMPTION													
2.1 - SELECTED GEAR (nearest to 7.5 km/h)													
I High	6.15	17.93	1050	3065	15.0	368	2.30	15.5	67	133	14.0	49	991.3
2.1.1 - 75% OF PULL AT MAXIMUM POWER AT RATED SPEED													
I High	6.65	14.59	790	3080	8.5	439	1.93	17.0	69	132	16.5	41	992.0
2.1.2 - 50% OF PULL AT MAXIMUM POWER AT RATED SPEED													
I High	6.90	10.06	525	3110	6.1	447	1.89	17.5	69	131	16.5	42	991.3
2.2 SELECTED GEAR (maximum power)													
II High	13 .87	21.96	570	3000	6.3	326	2.59	15.5	68	135	14.0	45	992.0
2.2.1 - 75% OF PULL AT MAXIMUM POWER AT RATED SPEED													
II High	14.54	17.29	428	3065	3.7	393	2.15	18.0	69	133	16.5	43	990.6
2.2.2 - 50% OF PULL AT MAXIMUM POWER AT RATED SPEED													
II High	14.85	11.76	285	3065	2.4	536	1.58	18.0	70	132	16.5	43	990.6

It has not been possible to realize the measurements of II High and III High with reduced engine speed.

(3) POWER LIFT AND HYDRAULIC PUMP PERFORMANCE:

Date and location of tests: 9th November 1986 - I.M.A. - Torino (Italy)

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	150	490	990	162	-	-
On the frame	140	455	585	162	1173	15°

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

Lifting heights relative to horizontal links

mm	-155	-145	-100	-50	0	+ 50	+100	+200	+250	+300

Lifting forces at hitch points

mm	-	990	1010	1045	1080	1105	1130	1145	-	-

Lifting forces at test frame

mm	885	880	875	870	865	820	765	655	615	585

HYDRAULIC PUMP PERFORMANCE:

- Sustained pressure with relief valve open:	180 bar
- Pump delivery rate at minimum pressure:	19,5
- Hydraulic pressure corresponding to 90% of the minimum setting of the opening pressure of the relief valve:	162 bar
- Delivery:	18.7 l/min
- Power:	5.05 kW
- Flow rate and hydraulic pressure corresponding to maximum hydraulic power:	
- Pressure:	175 bar
- Delivery:	18.6 l/min
- Power:	5.43kW
- Temperature of hydraulic fluid:	65 °C

- Tapping point used for test: auxiliary service connection

(4) REPAIRS AND ADJUSTMENTS DURING TEST: none

(5) 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, 10th January 1987

GOLDONI 1038 (4 WD)

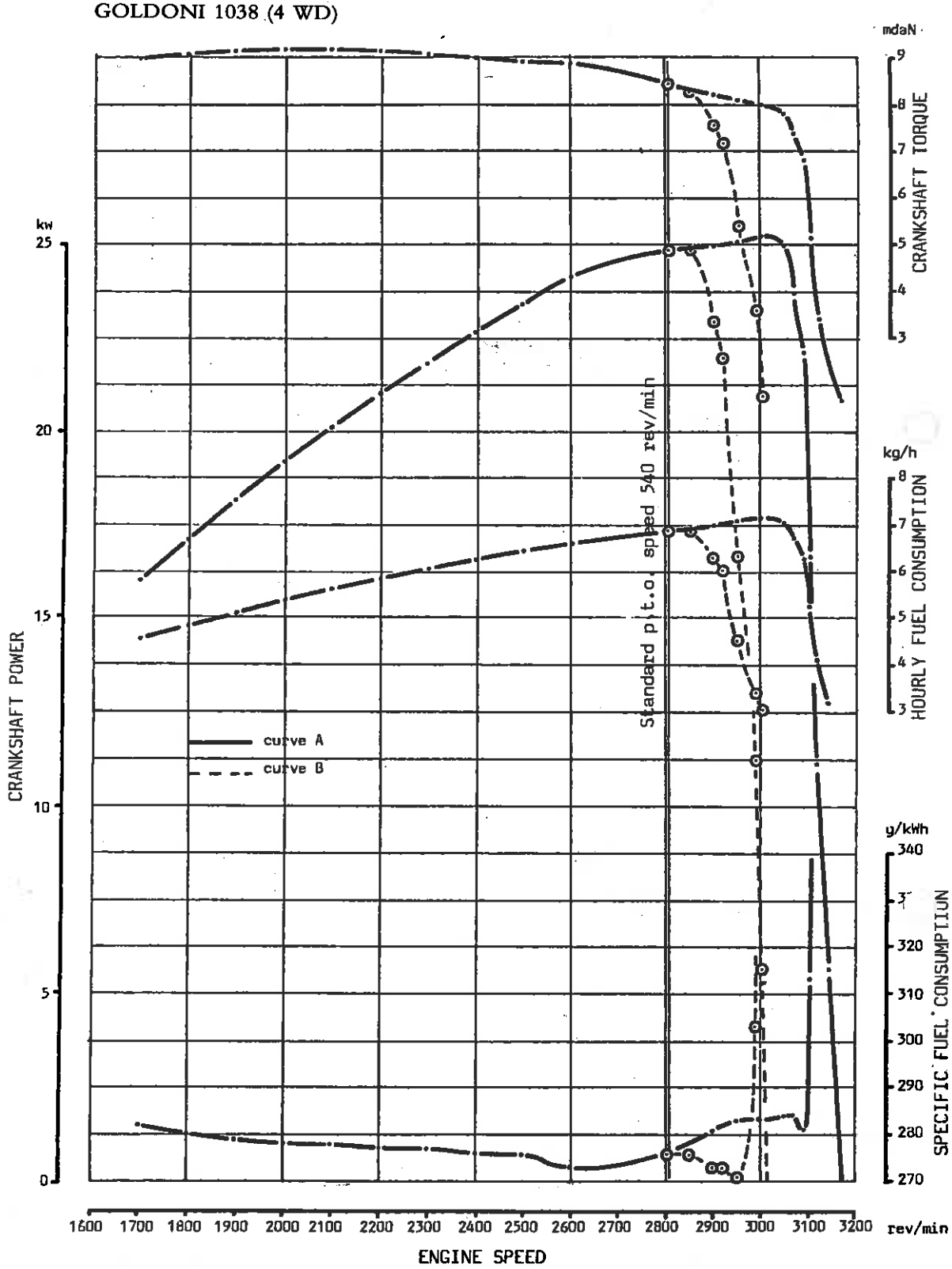


Fig. 1 - POWER TAKE-OFF TEST

GOLDONI 1038 (4 WD)

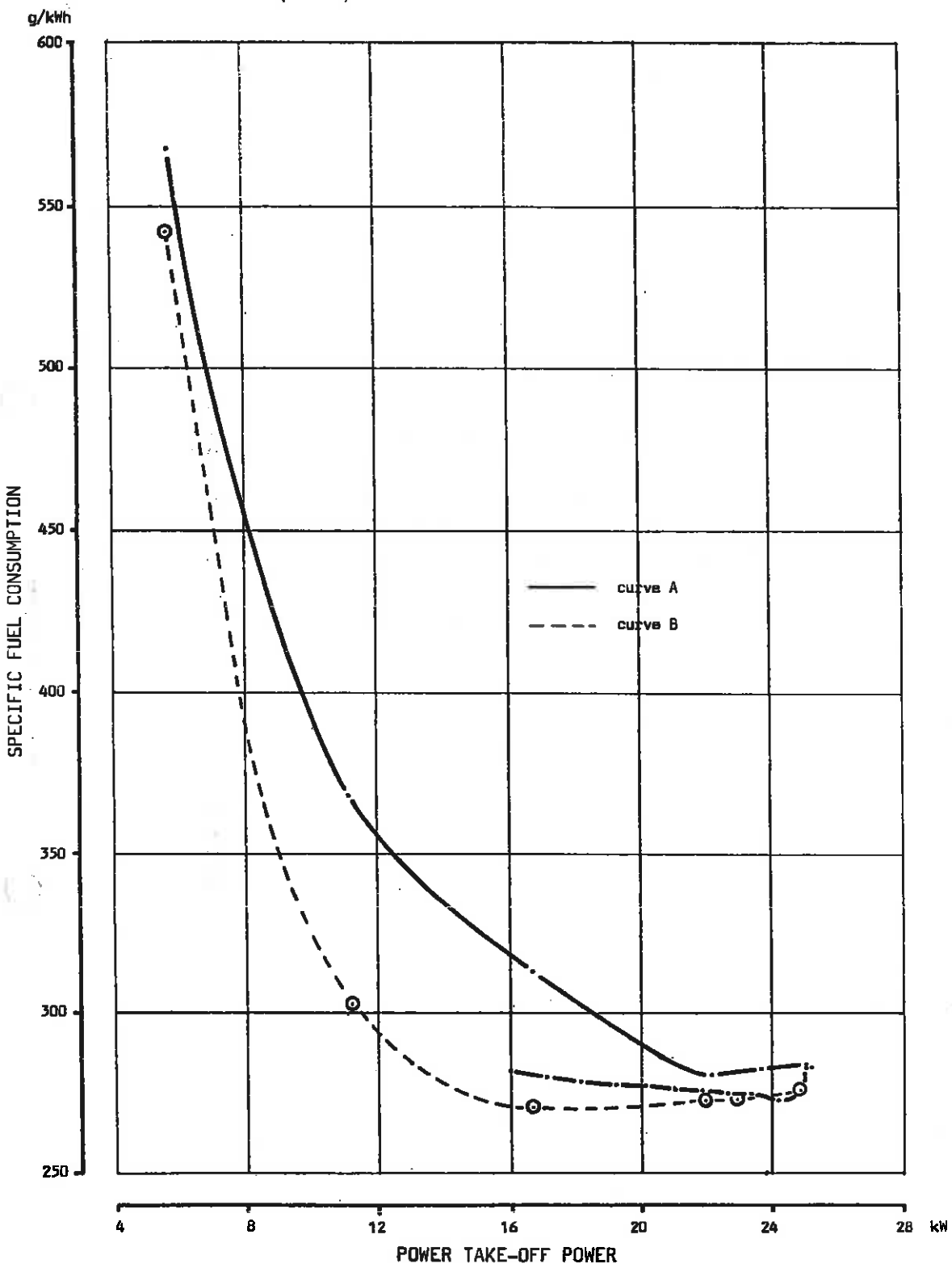


Fig. 2 - POWER TAKE-OFF TEST