ISTITUTO SPERIMENTALE PER
LA MECCANIZZAZIONE AGRICOLA
SEZIONE DI TREVIGLIO

REPORT ON TEST IN ACCORDANCE WITH OECD STANDARD CODE FOR THE OFFICIAL TESTING OF AGRICULTURAL AND FORESTRY TRACTOR PERFORMANCE (CODE 2)





GOLDONI 3070 STAR V
type denomination **TUA1**

JOHN DEERE 2070 V
type denomination **FH2070**

16+8 forward and 8+8 reverse speeds
30 km/h
four-wheel drive agricultural tractor

Manufactured by: GOLDONI S.p.A.
Via Canale, 3
41012 Migliarina di Carpi MO
Italy

OECD approval No.: **2/1879**
Date of approval: 21 January 2000
Period of test: September 1999

ISMA Via Milano 43 24047 Treviglio BG Italy
Tel/Fax: 0363 49603

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The Goldoni 3070 STAR V TUA1 (4WD) and John Deere 2070 V FH2070 (4WD) tractors are technically identical in all main respects except with regard to model designation, and colour.

All tests were carried out the Goldoni 3070 STAR V TUA1

All stated dimensions and tests refer to tyre size 7.00 - 12 at front and 12.4 R20 at rear, as well as to track widths 908 mm at front and 864 mm at rear.

- Tractor manufacturer's name and address: GOLDONI S.p.A.; Via Canale, 3 41012 Migliarina di Carpi MO, Italy;
- Location of tractor assembly: Migliarina di Carpi MO, Italy;
- Submitted for test by: the manufacturer;
- Selected by: the manufacturer with the agreement of ISMA;
- Place of running in: Treviglio BG, Italy;
- Duration of running in: 50 hours;
- Location of test: ISMA, Via Milano 43, Treviglio BG, Italy.

1. SPECIFICATION OF TRACTOR

1.1 Identification

- Make: GOLDONI respectively JOHN DEERE;
- Model: 3070 STAR V respectively 2070 V with 16 forward and 8 reverse / 8 forward and 8 reverse speeds 30km/h version;
- Type denomination: TUA1 respectively FH2070;
- Type: four-wheel drive, unit construction;
- Number of driving wheels: 4;
- Serial number: A494219;
- First serial number: A494000

1.2 Engine

- Make: VM MOTORI;
- Model: 29B/8;
- Type: water cooled 4-stroke diesel, direct injection turbo charged
- Serial number: 03781.

1.2.1 *Cylinders*

- Number and disposition: 3 vertical in line;
- Bore x stroke: 94 x 100 mm;
- Capacity: 2082 cm^3;
- Compression ratio: 17:1;
- Arrangement of valves: overhead;
- Cylinder liners: wet liners.

1.2.2 *Supercharging*

- Make: SCHWITZER;
- Model: S1AG;
- Type: exhaust driven supercharger;
- Pressure: 83 kPa.

1.2.3 *Fuel system*

- Fuel feed system:	AC corone fuel feed pump;
- Make, model and type of fuel filter:	STANADYNE final fuel filter (FFF);
- Total capacity of fuel tanks:	38 dm^3 ;
- Make, model and type of injection pump:	BOSCH PFR 1 K-90A 547, immersed, one per cylinder in line;
- Serial number:	0414191011;
- Manufacturer's production setting of injection pump:	
. Flow rate:	58 ± 2 mm^3/stroke at rated speed and full load corresponding 13.58 dm^3/h;
. Timing:	11°30' before TDC;
- Make, model and type of injectors:	STANADYNE 31242;
- Injection pressure:	25 ± 0.8 MPa.

1.2.4 *Governor*

- Make:	VM MOTORI;
- Model:	none;
- Type:	centrifugal automatic;
- Governed range of engine speed:	from 500 to 2875 rev/min;
- Rated engine speed:	2600 rev/min.

1.2.5 *Air cleaner*

- Pre-cleaner:	none;
- Main filter	
. Make:	VIRGIS;
. Model:	FC 06 21183;
. Type:	dry paper element filter with replaceable cartridge;
. Location of air intake :	front of engine, above bonnet;
- Maintenance indicator	warning lamp on the dashboard.

1.2.6 *Lubrication system*

- Type of feed pump:	forced feed from gear pump;
- Type of filter:	FIAMM FT 5144 VM;
- Number of filters:	1.

1.2.7 *Cooling system*

- Type of coolant:	water cooling with impeller pump;
- Specification of fan:	propeller fan driven by engine shaft;
- Number of fan blades:	8;
- Fan diameter:	400 mm;
- Coolant capacity:	10 dm^3;
- Type of temperature control:	thermostat;
- Superpressure system:	98 kPa.

1.2.8 *Starting system*

- Make:	BOSCH;
- Model:	EV 12 V;
- Type:	electromagnetic engagement;
- Starter motor power rating:	2.7 kW;
- Cold starting aid:	none;
- Safety device:	electrical lockout on clutch.

1.2.9 *Electrical equipment*

- Voltage:	12 V;
- Generator	
. Make:	DENSO;
. Model:	AAK 5115 14 V 50 A;
. Type:	alternator;
. Power:	55 A;
- Battery:	1 lead acid;
. capacity:	80 Ah at 20 hours rating.

1.2.10 *Exhaust system*

- Make:	GOLDONI;
- Model:	22284;
- Type:	one reflection absorption chamber;
- Location:	on the left hand side of engine, horizontal position under side bonnet;
- Height of outlet above ground:	300 mm.

1.3 Transmission

1.3.1 *Clutch (utilized only for travelling of tractor)*

- Make:	LUK;
- Model:	11";
- Type:	double disk dry clutch;
- Number of plates:	1;
- Plates diameter:	250 mm;
- Control system:	mechanical operated by pedal.

1.3.2 *Gear box*

- Make: GOLDONI;
- Model: STAR V;
- Type: mechanical synchromesh speed change gear; hand lever selects two speed/range combinations;

4 speeds combined with 2 forward (Normal/Fast) and 1 reverse group and with 1 reduction gear (High/Low); total of 16 forward and 8 reverse,

	Forward	Reverse
Number of gears	4	4
Number of ranges	2	2
Number of reduction gears	2	-
Total of arrangements	16	8

or 4 speeds combined with 2 forward (Normal/Fast) and 1 reverse group; total of 8 forward and 8 reverse.

	Forward	Reverse
Number of gears	4	4
Number of ranges	2	2
Number of reduction gears	-	-
Total of arrangements	8	8

- Available option: 4 speeds combined with 2 forward (Super creep/ Fast) and 1 reverse group and 1 reduction gear (High/Low); total of 16 forward and 8 reverse.

	Forward	Reverse
Number of gears	4	4
Number of ranges	2	2
Number of reduction gears	2	-
Total of arrangements	16	8

1.3.2 *Gear box* (continued)

or 4 speeds combined with 2 forward (Normal/Fast) and 1 reverse group; total of 8 forward and 8 reverse.

	Forward	Reverse
Number of gears	4	4
Number of ranges	2	2
Number of reduction gears	-	-
Total of arrangements	8	8

1.3.3 *Rear axle and final drives*

- Make: GOLDONI;
- Model: STAR V;
- Type: bevel gear differential and epicyclic final drive.
- Differential lock
  - Make: GOLDONI;
  - Model: STAR V;
  - Type: mechanical;
  - Control system: engaged or disengaged by button.

1.3.4 *Front axle and final drives*

- Make: GOLDONI;
- Model: STAR V;
- Type: system with central shaft bevel gear drive, differential and epicyclic final drives.
- Differential lock none;

1.3.5 *Total ratios and travelling speeds*

16 forward and 8 reverse (combination selected during the test)

Gear	Group	Number of engine revolutions for one revolution of the driving wheels		Nominal travelling speed at rated engine speed of 2600 rev/min (*) km/h	
		Low	High	Low	High
FORWARD					
1	Normal	486.18	384.95	0.99	1.25
2	Normal	295.32	233.83	1.63	2.05
3	Normal	171.09	135.47	2.81	3.54
4	Normal	118.26	93.64	4.06	5.13
1	Fast	85.19	67.45	5.63	7.12
2	Fast	51.75	40.97	9.28	11.72
3	Fast	29.98	23.74	16.01	20.22
4	Fast	20.72	16.41	23.17	29.26
REVERSE					
1	Reverse	203.52	161.14	2.36	2.98
2	Reverse	123.62	97.88	3.88	4.90
3	Reverse	71.62	56.71	6.70	8.47
4	Reverse	49.50	39.20	9.70	12.25

(*) *Calculated with a tyre dynamic radius index of 490 mm. (ISO 4251/1-1992)*

- Number of revolutions of front wheels for one revolution of rear wheels: 1.53.

1.3.5 *Total ratios and travelling speeds* (continued)
8 forward and 8 reverse

Gear	Group	Number of engine revolutions for one revolution of the driving wheels	Nominal travelling speed at rated engine speed of 2600 rev/min (*) km/h
FORWARD			
1	Normal	384.95	1.25
2	Normal	233.83	2.05
3	Normal	135.47	3.54
4	Normal	93.64	5.13
1	Fast	67.45	7.12
2	Fast	40.97	11.72
3	Fast	23.74	20.22
4	Fast	16.41	29.26
REVERSE			
1	Normal	487.47	0.98
2	Normal	296.11	1.62
3	Normal	171.54	2.80
4	Normal	118.57	4.05
1	Fast	85.42	5.62
2	Fast	51.89	9.25
3	Fast	30.06	15.97
4	Fast	20.78	23.88

(*) *Calculated with a tyre dynamic radius index of 490 mm. (ISO 4251/1-1992)*

- Number of revolutions of front wheels for one revolution of rear wheels: 1.53.

1.4 Power take-off

1.4.1 *Main power take-off*

- Type: independent, at rear of tractor;
- Method of engagement: engaged or disengaged by hand lever, driven by single dry clutch independent of travel clutch;
- Number of shafts: 1;
- Method of changing of power take-off shaft ends: not changeable;
- Method of changing speeds: by external hand lever;

1.4.1.1 Power take-off proportional to engine speed (continued)

Power take-off at 540 (rev/min)

- Location: at rear of tractor;
- Diameter of power take-off shaft ends: 35 mm;
- Number of splines: 6, in conformity with ISO 500:1991, type 1;
- Height above ground: 419 mm;
- Distance from the median plane of the tractor: 0 mm;
- Distance behind rear axle: 313 mm;
- PTO speed at rated engine speed: 578 rev/min;
- Engine speed at standard power take-off speed: 2430 rev/min;
- Ratio of rotation speeds (engine speed/p.t.o. speed): 4.5;
- Power restriction: none;
- Maximum torque transmissible: none;
- Direction of rotation (viewed from behind tractor): clockwise.

Power take-off at 750 (rev/min)
(optional not fitted on tested tractor)

- Location: at rear of tractor;
- Diameter of power take-off shaft ends: 35 mm;
- Number of splines: 6, in conformity with ISO 500:1991, type 1;
- Height above ground: 419 mm;
- Distance from the median plane of the tractor: 0 mm;
- Distance behind rear axle: 313 mm;
- PTO speed at rated engine speed: 749 rev/min;
- Engine speed at standard power take-off speed: 2602 rev/min;
- Ratio of rotation speeds (engine speed/p.t.o. speed): 3.47;
- Power restriction: none;
- Maximum torque transmissible: none;
- Direction of rotation (viewed from behind tractor): clockwise.

Power take-off at 1000 (rev/min) (continued)
(optional not fitted on tested tractor)

- Location:	at rear of tractor;
- Diameter of power take-off shaft ends:	35 mm;
- Number of splines:	6, in conformity with ISO 500:1991, type 1;
- Height above ground:	419 mm;
- Distance from the median plane of the tractor:	0 mm;
- Distance behind rear axle:	313 mm;
- PTO speed at rated engine speed:	1257 rev/min;
- Engine speed at standard power take-off speed:	2069 rev/min;
- Ratio of rotation speeds (engine speed/p.t.o. speed):	2.07;
- Power restriction:	none;
- Maximum torque transmissible:	none;
- Direction of rotation (viewed from behind tractor):	clockwise.

1.4.1.2 *Power take-off proportional to ground speed*
(optional, not fitted on tested tractor)

- Type:	independent, not adjustable to 540-1000 rev/min location at rear of tractor, in tractor's median plane, engaged or disengaged by hand lever at the left hand side of the seat;
- Number and type of shafts:	1, ISO 500:1991, type 1 (35 mm dia, 6 splines);
- Method of changing power take-off shaft ends:	none;
- Travelling distance for one revolution of power take-off shaft:	0.64 m;
- Number of power take-off shaft revolutions for one revolution of rear driving wheels:	4.82;
- Direction of rotation with forward gear engaged (viewed from behind tractor):	clockwise.

1.5 Hydraulic power lift

1.5.1 *Rear power lift*

- Make:	GOLDONI;
- Model:	STAR V;
- Type:	load sensing;
- Type of hydraulic system:	open centre system;
- Number and type of cylinders:	1 internal single-acting;
- Type of lock for transport:	by lever;
- Relief valves pressure setting:	19.0 ± 0.5 Mpa;
- Opening pressure of anti-shock valve:	21.0 ± 0.5 MPa;
- Lift pump	
. Make:	HIDROIRMA;
. Type:	hydraulic rotary pump, driven by engine shaft;
- Transmission between pump and engine:	mechanical;
- Number and type of filters:	1, metal cleaner cartridge;
- Oil capacity:	32 dm^3;
- Site of oil reservoir:	gear box;
- Number, type and location of tapping points:	3, double acting, at rear of tractor;
- Maximum volume of oil available to external cylinders:	7 dm^3.

1.5.2 *Front power lift* (optional, not fitted on tested tractor)

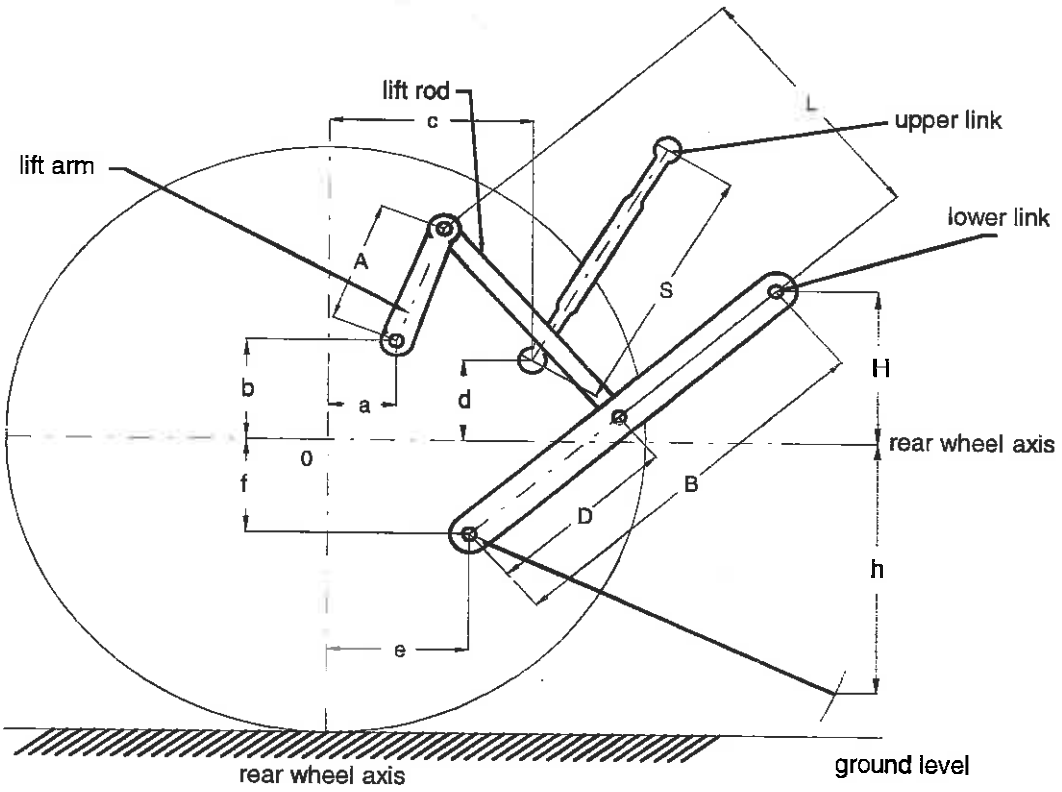
- Make:	GOLDONI;
- Model:	STAR V;
- Type of hydraulic system:	open centre system;
- Type and number of cilinders:	2 at single acting;
- Type of lock for transport:	none;
- Relief valve pressure setting:	19.0 ± 0.5 Mpa;
- Opening pressure of anti-shock valve:	21.0 Mpa;
- Lift pump type:	hydraulic rotary pump, driven by engine shaft;
- Trasmission between pump and engine:	mechanical;
- Number and type of filters:	1, metal cleaner cartridge;
- Oil capacity:	32 dm^3;
- Site of oil reservoir:	gear box;
- Number, type and location of tapping points:	none;
- Maximum volume of oil available to external cylinders:	none.

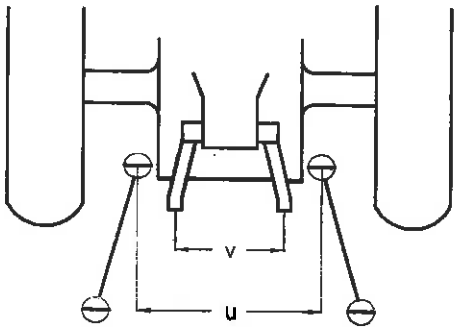
1.6 Three-point linkage

1.6.1 *Rear three point linkage*

- Category: 1, in conformity with category 1 of ISO 730-1:1994 + technical corrigendum;
- Category adapter: none.

Rear linkage geometry





Dimensions of rear linkage geometry when connected to the standard frame

			Dimension or range mm	Settings used in test mm
Length of lift arms		(A)	310	310
Length of lower links		(B)	800	800
Distance of lift arm pivot point from rear wheel axis (behind)				
- horizontally		(a)	17	17
- vertically		(b)	225	225
Horizontal distance between the 2 lower link points		(u)	368	368
Horizontal distance between the 2 lift arm end points		(v)	315	315
Length of upper link		(S)	from 590 to 720	611
Distance of upper link pivot point from rear wheel axis				
- horizontally		(c)	212-224-232-240	232
- vertically		(d)	171-197-223-261	223
Distance of lower link pivot point from rear wheel axis				
- horizontally		(e)	33	33
- vertically		(f)	183	183
Distance of lower link pivot points to lift rod pivot points on lower links		(D)	380	380
Length of lift rods		(L)	from 385 to 431	390
Height of lower hitch points relative to the rear wheel axis:				
Length of lift rods	(L)	385	431	390
Linkage distance of lift rods	(D)	380	380	380
Lowest position	(h)	378	486	390
Highest position	(H)	176	85	166
Height above ground of lower hitch points when locked in transport position (*)				656

(*) *Assuming the dynamic radius index = 490 mm (ISO 4251-1:1992)*

1.7 Swinging drawbar (not available)

1.8 Trailer hitch

- Type:	DGM-GA 1761C YY;
- Hole diameter:	29 mm;
- Height above ground	
. Min.:	278 mm;
. Max.:	581 mm;
- Distance of hitch point from rear wheel axis	
. Horizontally:	424 mm;
- Distance of hitch point from power take-off shaft end	
. Vertically:	144 mm below, 159 mm above;
. Horizontally:	111 mm;
- Maximum vertical permissible load:	15 kN.

1.9 Holed drawbar (optional, not fitted on tested tractor)

- Number of holes:	7;
- Distance between holes:	50 mm;
- Hole diameter:	20 mm;
- Thickness x width of the drawbar:	25 x 60 mm;
- Height above ground,	
. Min.:	100 mm;
. Max.:	656 mm;
- Horizontal distance behind power take-off shaft end:	400 mm;
- Diameter of the pinhole:	19.5 mm.

1.10 Steering

- Specification:	hydrostatic steering with HIDROIRMA hydraulic gear pump;
- Make:	OGNIBENE;
- Model:	DEKF 48/32.150;
- Type:	hydrostatic;
- Working pressure:	18 MPa.

1.11 Brakes

1.11.1 *Service brake*

- Make: GOLDONI;
- Model: STAR V;
- Type: oil bath disc, total 8 discs, 4 at rear per wheel, all mounted before the final drive;
  . Front disc diameter: none;
  . Rear disc diameter: 165 mm;
  . Material: HDT 303;
- Method of operation: mechanical actuated with 2 pedals;
- Trailer braking take-off: none.

1.11.2 *Parking brake*

- Type: mechanical, in common with service brake;
- Method of operation: mechanical by hand lever.

1.11.3 *Steering brake*

- Method of operation: divided pedal of service brake, for normal use locked together.

1.12 Wheels

- Number
  . Front: 2, steering and driving;
  . Rear: 2, driving;
- Wheelbase: 1690 mm.

-Track width adjustment:

	Minimum mm	Maximum mm	Adjustment method
Front	908	1184	changing the position of the rims with respect to the disc
Rear	820	1180	

1.13 Protective structure

- Make: GOLDONI;
- Model: k37;
- Type: roll-bar, tiltable;
- Manufacturer's name and address: GOLDONI S.p.A.,via canale 3, Migliarina di Carpi MO, Italy.
- OECD approval number: 6/S/0 103/1;
- Date of approval of the : extension: 14 January 2000;
- Modification certificate: none.

1.14 Seat

1.14.1 *Driver's seat*

- Make: GOLDONI;
- Model: Y01 EEC om e2 034;
- Type: upholstered seat with back rest;
- Seat and steering wheel reversible: no;
- Type of suspension: mechanical;
- Type of damping: shock absorber;
- Range of adjustment: 76 mm longitudinally and 76 mm vertically;
- Safety belt: no.

1.14.2 *Optional driver's seats* none;

1.14.3 *Passenger's seat* none.

1.15 Lighting

Lighting system in accordance with EEC 78/933

	Height above ground of centre mm	Size mm	Distance from out side edge of lights to median plane of tractor mm
Headlights	870	145 x 85	190
Front parking lights	800	70 x 20	510
Front direction indicator	820	70 x 50	510
Rear parking lights	1060	70 x 60	360
Rear direction indicator	1060	90 x 60	450
Brake lights	1060	70 x 60	360
Reflectors	990	90 x 53	400

2. TEST CONDITIONS

2.1 Overall dimensions

	Length	Width		Height at top of	
		minimum	maximum	protective structure	exhaust pipe
	mm	mm	mm	mm	mm
Unballasted	3070	1180	1420	2065	300

2.2 Ground clearance: 150 mm below front axle (unballasted tractor).

2.3 Tractor mass (with full fuel tanks, and roll bar)

	Without driver kg	With driver kg
Front	770	795
Rear	950	1000
Total	1720	1795

2.5 Tyres and track width specifications

	Front	Rear
Tyres		
make	PIRELLI	PIRELLI
model	IM 110	TM 200
dimensions	7.00 - 12	12.4 R20
ply rating	6 PR	-
load index/speed index	-	116 A8
type	diagonal	radial
maximum load (tyre manufacturer's)	440 daN	1285 daN
inflation pressure (tyre manufact.'s)	250 kPa	160 kPa
dynamic radius index	305 mm	490 mm
Chosen track width	908 mm	864 mm
Technically permissible axle load	750 daN	1650 daN
Other tyres available	6.5/80-15 11.0/65-12 10.0/80-12 26x12.00-12 26x12.00-12 garden	9.5-24 12.4-20 320/70 R20 360/70 R20 38x14.00-20 garden

2.6 Fuel

- Type: AGIP DIESEL DIN 51061;
  (in accordance with the national standard)
- Density at 15 °C: 0.838 g/m^3.

2.7 Oils and lubricants

2.7.1 *Capacity and change interval*

	Capacity dm^3	Oil change h	Filter change h
Engine	6	200	200
Gear box with rear axle and final drives, hydraulic system, steering	32	800	200
Front PTO transmission	1.5	-	-
Front axle/final drives	4	-	-
Brakes	-	-	-

2.7.2 *Specifications*

	Recommended	Using during test
Engine oil		
Type	AGIP SUPER TRACTOR UNIVERSAL 15W/40	AGIP SUPER TRACTOR UNIVERSAL 15W/40
Viscosity	13.6 cSt	13.6 cSt
Classification	API GL4	API GL4
Transmission oil used in Gear box, front PTO transmission, front / rear axle and final drives		
Type	AGIP SUPER TRACTOR UNIVERSAL 15W/40	AGIP SUPER TRACTOR UNIVERSAL 15W/40
Viscosity	13.6 cSt	13.6 cSt
Classification	API GL4	API GL4
Steering oil		
Type	AGIP SUPER TRACTOR UNIVERSAL 15W/40	AGIP SUPER TRACTOR UNIVERSAL 15W/40
Viscosity	13.6 cSt	13.6 cSt
Classification	API GL4	API GL4

2.7.3 *Grease*

- Type: ESSO GP GREASE;
- Number of lubrication points: 8.

3. COMPULSORY TESTS RESULTS

3.1 Main power take-off

- Date and location of test: 23 September 1999, ISMA, Treviglio BG, Italy;
- Type of dynamometer: eddy-current, ZÖLLNER B500.

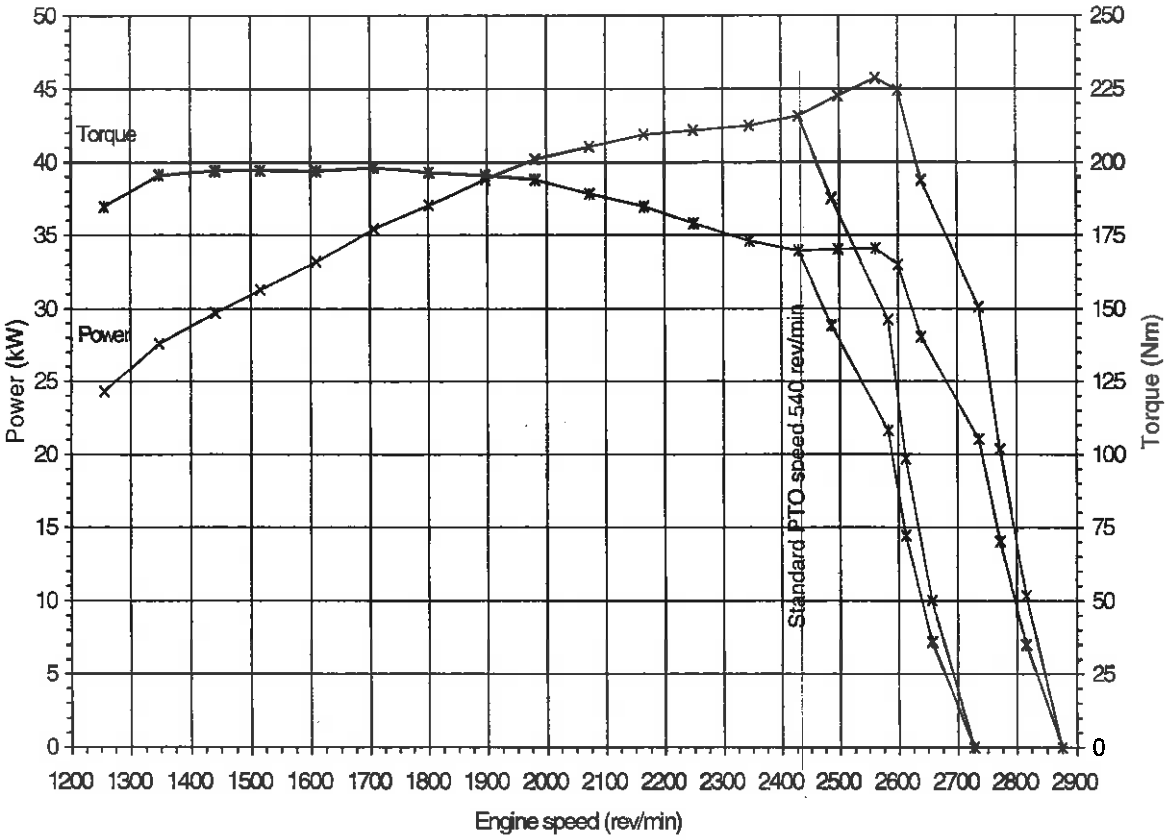
Power	Speed		Fuel consumption			Specific energy
	Engine	PTO	Hourly		Specific	
kW	rev/min	rev/min	l/h	kg/h	g/kWh	kWh/l
3.1.1 MAXIMUM POWER - TWO-HOUR TEST						
45.75	2562	569	13.90	11.65	255	3.29
3.1.2 POWER AT RATED ENGINE SPEED						
44.92	2600	578	13.58	11.38	253	3.31
3.1.3 STANDARD POWER TAKE-OFF SPEED (540 ± 10 rev/min)						
43.15	2429	540	13.04	10.93	253	3.31
3.1.4 PART LOADS 3.1.4.1 The torque corresponding to maximum power at rated engine speed						
44.92	2600	578	13.58	11.38	253	3.31
3.1.4.2 85% of torque obtained in 3.1.4.1						
38.77	2640	587	11.86	9.94	256	3.27
3.1.4.3 75% of torque defined in 3.1.4.2						
30.14	2736	608	9.82	8.23	273	3.07
3.1.4.4 50% of torque defined in 3.1.4.2						
20.35	2772	616	8.02	6.72	330	2.54
3.1.4.5 25% of torque defined in 3.1.4.2						
10.34	2816	626	5.80	4.86	470	1.78
3.1.4.6 unloaded						
0	2875	639	3.63	3.04	-	-

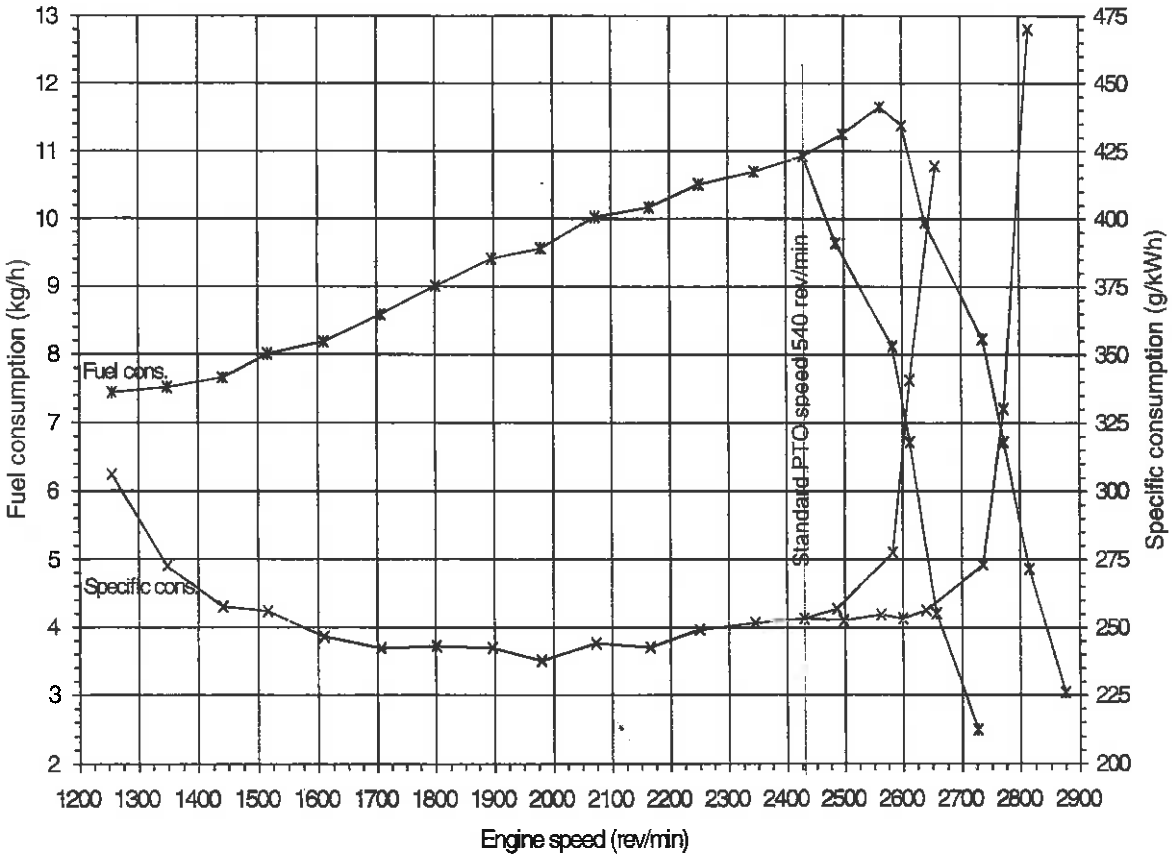
Power	Speed		Fuel consumption			Specific energy
	Engine	PTO	Hourly		Specific	
kW	rev/min	rev/min	l/h	kg/h	g/kWh	kWh/l
3.1.5 PART LOADS AT STANDARD POWER TAKE-OFF SPEED (540 ± 10 rev/min) 3.1.5.1 The torque corresponding to maximum power available						
43.15	2429	540	13.04	10.93	253	3.31
3.1.5.2 85% of torque obtained in 3.1.5.1						
37.54	2486	552	11.50	9.64	257	3.26
3.1.5.3 75% of torque defined in 3.1.5.2						
29.25	2583	574	9.69	8.12	278	3.02
3.1.5.4 50% of torque defined in 3.1.5.2						
19.73	2613	581	8.02	6.72	341	2.46
3.1.5.5 25% of torque defined in 3.1.5.2						
10.03	2657	590	5.02	4.21	420	2.00
3.1.5.6 unloaded						
0	2727	606	2.98	2.5	-	-

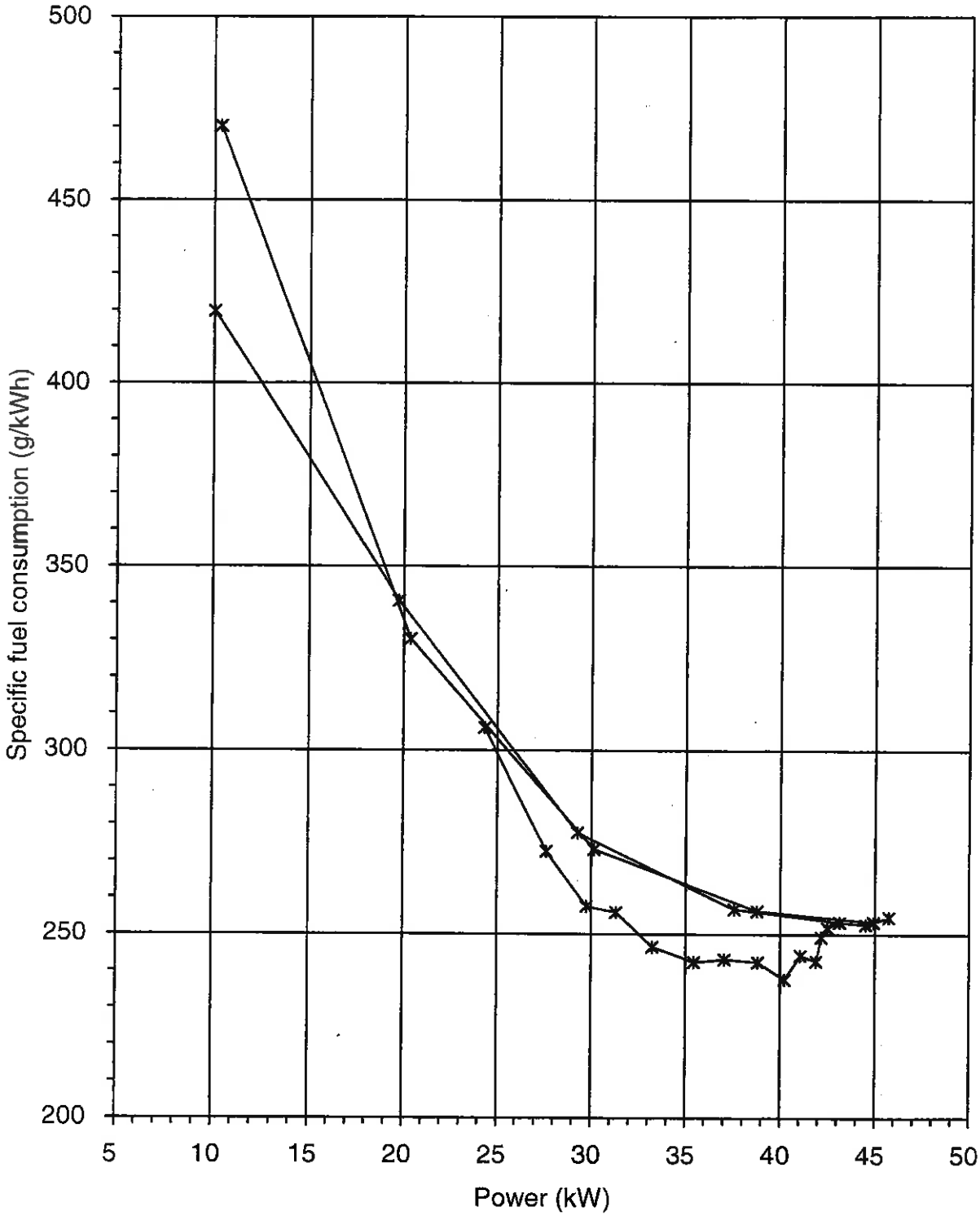
- No load maximum engine speed: 2875 rev/min;
- Equivalent flywheel torque at rated engine speed: 165.06 Nm;
- Equivalent flywheel torque at 2-hour test: 170.58 Nm;
- Maximum equivalent flywheel torque: 198.35 Nm at 1707 rev/min of the engine.

- Mean atmospheric conditions
  . Temperature: 25°C
  . Pressure: 99.4 kPa
  . Relative humidity: 60 %

- Maximum temperatures
  . Coolant: 84°C
  . Engine oil: 120°C
  . Fuel: 23°C
  . Engine air intake: 34°C


Torque
Power
Power (kW)
Torque (Nm)
Standard PTO speed 540 rev/min
Engine speed (rev/min)


Fuel cons.
Specific cons.
Fuel consumption (kg/h)
Specific consumption (g/kWh)
Standard PTO speed 540 rev/min
Engine speed (rev/min)


Specific fuel consumption (g/kWh)
500
450
400
350
300
250
200
5
10
15
20
25
30
35
40
45
50
Power (kW)

3.2 Hydraulic power and lifting force

- Date of tests: 29 September 1999.

3.2.1 *Hydraulic power test*

- Sustained pressure with relief valve open: 19.0 MPa;
- Pump delivery rate at minimum pressure: 28.7 l/min;

	Flow rate l/min	Pressure MPa	Power kW
At 90% of the actual relief valve setting	27.7	17.1	7.89
Maximum	27.5	18.0	8.25

- Tapping point used for test: at rear of tractor;
- Temperature of hydraulic fluid if different from 65 ± 5°C: - ;
- Opening pressure of the unloading valve: - (*);
- Closing pressure of the unloading valve: - (*).

(*) Opening and closing pressures of the unloading valve could not be measured

3.2.2 *Rear power lift test*

Linkage settings for test - see paragraph 1.6

		At hitch point	On the frame
Height of lower hitch point above ground in down position	mm	100	100
Vertical movement			
without lifting forces	mm	557	652
with lifting forces	mm	506	581
Maximum corrected force exerted through full range	kN	10.75	7.50
Corresponding pressure of hydraulic fluid	MPa	17.1	17.1
Moment about rear-wheel axis	kNm	8.95	10.82
Maximum tilt angle of mast from vertical	degrees	-	8

Lifting heights relative to the horizontal plane including the lower link pivot points. (mm)											
	-218	-207	-200	-100	0	+100	+200	+299	+300	+363	
Lifting forces at hitch points (kN), corrected to 17.1 MPa											
	-	12.24	12.25	12.24	12.07	12.01	11.43	10.75	-	-	
Lifting forces at test frame (kN), corrected to 17.1 MPa											
	10.40	-	-	10.42	9.98	9.52	8.78	-	8.11	7.50	

3.3 Drawbar performance

- Date of tests: 30 September 1999;
- Type of track: concrete.

	Height of drawbar above ground mm	Tyre inflation pressure	
		Front kPa	Rear kPa
Unballasted	264	250	160

Gear and range	Power kW	Drawbar pull kN	Speed km/h	Engine speed rev/min	Slip of wheels %	Specific fuel consumption g/kWh	Specific energy kWh/l	Temperatures Fuel °C	Coolant °C	Engine oil °C	Atmospheric conditions Temperature °C	Relative humidity %	Pressure kPa
3.3.1 MAXIMUM POWER IN TESTED GEARS (unballasted tractor)													
1NL	3.43	13.59	0.91	2835	15.0	1254	0.67	23	84	118	20	73	102.1
1NH	4.43	13.88	1.15	2831	15.0	993	0.84	23	84	122	20	73	102.1
2NL	6.19	14.87	1.50	2822	14.8	751	1.12	23	85	123	21	73	102.2
2NH	7.69	14.73	1.88	2813	15.0	650	1.29	23	85	123	21	73	102.2
3NL	9.72	13.72	2.55	2795	15.1	588	1.42	23	84	125	21	74	102.2
3NH	13.14	14.83	3.19	2781	15.0	479	1.75	24	85	127	22	73	102.2
4NL	15.31	15.10	3.65	2772	15.0	438	1.91	23	86	127	22	73	102.2
4NH	18.57	14.53	4.60	2750	14.9	409	2.05	23	86	128	23	73	102.2
1FL	20.73	14.81	5.04	2745	15.1	377	2.22	22	86	129	22	73	102.2
1FH	25.42	14.55	6.29	2718	15.2	334	2.51	22	85	129	23	73	102.2
2FL	32.33	14.55	8.00	2640	15.0	307	2.73	22	85	133	22	73	102.2
2FH	38.62	13.44	10.35	2597	11.3	294	2.85	22	86	135	22	73	102.2
3FL	38.77	9.26	15.08	2597	5.5	294	2.85	23	85	135	22	73	102.2
3FH	38.50	7.14	19.42	2601	3.9	294	2.85	23	85	135	22	73	102

Gear and range	Power kW	Drawbar pull kN	Speed km/h	Engine speed rev/min	Slip of wheels %	Specific fuel consumption g/kWh	Specific energy kWh/l	Temperatures Fuel °C	Coolant °C	Engine oil °C	Atmospheric conditions Temperature °C	Relative humidity %	Pressure kPa
3.3.2 FUEL CONSUMPTION													
3.3.2.1 in selected gear, at maximum power at rated speed													
3FL	38.77	9.26	15.08	2597	5.5	294	2.85	23	85	135	22	73	102.2
3.3.2.1.1 75% of pull at maximum power at rated speed													
3FL	30.71	6.86	16.11	2709	3.3	283	2.96	23	83	131	22	72	102.2
3.3.2.1.2 50% of pull at maximum power at rated speed													
3FL	21.78	4.71	16.66	2754	1.6	342	2.45	23	83	131	22	72	102.2
3.3.2.1.3.next higher gear at reduced engine speed; same pull and travelling speed as in 3.3.2.1.1													
3FH	30.49	6.81	16.13	2120	2.0	243	3.44	23	82	132	21	72	102.1
3.3.2.1.4 next higher gear at reduced engine speed; same pull and travelling speed as in 3.3.2.1.2													
3FH	22.77	4.90	16.72	2162	0.5	277	3.03	22	83	132	21	71	102.2
3.3.2.2 in selected gear nearest to 7.5 km/h at rated speed													
2FL	32.33	14.55	8.00	2640	15.0	307	2.73	22	85	133	22	73	102.2
3.3.2.2.1 75% of pull at maximum power at rated speed													
2FL	27.71	10.90	9.15	2730	5.8	300	2.80	23	83	131	22	71	102.2
3.3.2.2.2 50% of pull at maximum power at rated speed													
2FL	19.45	7.26	9.65	2772	2.3	344	2.43	23	84	131	22	71	102.2
3.3.2.2.3 next higher gear at reduced engine speed; same pull and travelling speed as in 3.3.2.2.1													
2FH	28.03	10.98	9.19	2165	5.5	265	3.16	23	84	132	22	71	102.2
3.3.2.2.4 next higher gear at reduced engine speed; same pull and travelling speed as in 3.3.2.2.2													
2FH	19.64	7.31	9.68	2205	2.3	260	3.23	22	84	132	22	71	102.2

4. OPTIONAL TEST RESULTS: none.

5. REPAIRS: none.

6. REMARKS: none.

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