OECD Approval No. 875

**Test in accordance with the OECD standard code for the official testing of agricultural tractors**

Report on test of John Deere 4450 Tractor with Mechanical Front Wheel Drive



| | |
|---|---|
| **Manufactured by** | John Deere,<br>Tractor Works,<br>P.O. Box 3500, Waterloo,<br>IA 50704, USA. |
| **Test No.** | R83/70119/OECD |
| **Report No.** | 694 |
| **Date** | February 1983 |

THE BRITISH SOCIETY FOR RESEARCH IN AGRICULTURAL ENGINEERING

**National Institute of Agricultural Engineering**
Wrest Park Silsoe Bedford MK45 4HS

BSRAE Copyright

TABLE OF CONTENTS


| | | Page No. |
|---|---|---|
| SPECIFICATION OF TRACTOR | | 1 |
| CONDITIONS DURING TEST | | 8 |
| FUEL AND LUBRICANTS USED IN TESTS | | 8 |
| COMPULSORY TESTS | | |
| 1 | Main power take-off performance | 9 |
| 2 | Drawbar performance | 13 |
| 3 | Turning space and turning circle | 14 |
| 4 | Location of centre of gravity | 14 |
| 5 | Braking | 14 |
| 6 | Measurement of external noise level | 15 |
| 7 | Noise measurement at the driver's ear | 16 |
| 8 | Power lift and hydraulic pump performance | 16 |
| OPTIONAL TESTS | | |
| 9 | Performance at engine crankshaft | 19 |
| REPAIRS AND ADJUSTMENTS DURING TESTS | | 23 |
| REMARKS | | 23 |

| | |
|---|---|
| Manufacturer's name and address: | John Deere Tractor Works,<br>P.O. Box 3500,<br>Waterloo,<br>IA 50704, U.S.A. |
| Submitted for test by: | The manufacturer |
| Selected for test by: | The manufacturer with the agreement of the testing station |
| Place of running-in: | John Deere Product Engineering Centre |
| Duration of running-in: | 100 hours |

Tractor:

| | |
|---|---|
| Make: | John Deere |
| Model: | 4450 |
| Type: | 4-wheel drive, unit construction |
| Serial No: | RW 4450P001558 |

Engine:

| | |
|---|---|
| Make: | John Deere |
| Model: | 6466TR17 |
| Type: | Diesel, turbocharged |
| Serial No: | RG6466T230956 |
| Cylinders: | |
| Number and disposition: | 6 in-line, vertical |
| Bore: | 115.9 mm (4.563 in) |
| Stroke: | 120.6 mm (4.748 in) |
| Capacity: | 7634 $cm^3$ (466 $in^3$) |
| Compression ratio: | 15.8 : 1 nominal |
| Arrangement of valves: | Overhead |
| Liners: | Replaceable, wet |
| Fuel system: | |
| Feed system: | BOSCH fuel feed pump is incorporated in injection pump |
| Make, type and model of filter(s) | Stanadyne, dual replaceable element, model 22072 |
| Tank capacity | 246 l (54 UK gal) |
| Make, type and model of injection pump | Robert Bosch, in line, US-PES6A 100 D410 RS 3040 |
| Injection pump Serial No: | 24613994 |
| Manufacturer's production setting of injection pump: | 98-104 $mm^3$ per stroke at 1100 rev/min pump speed, bench test figures, using fuel of 0.824 specific gravity at 15.6°C (60°F) and pump inlet temperature of 40°C (104°F) |

| | |
|---|---|
| Fuel system (Cont'd) | |
| Make, type and model of injectors: | Robert Bosch, KDEL 65 S1/13, 4 hole |
| Injection pressure: | 26.2-27.0 MPa (258-266 atm) |
| Injection pump delivery starts: | 31° before T.D.C. |
| Governor: | |
| Make and type: | Robert Bosch, US-RSV400-1100 A2B 2160L, mechanical |
| Governed range of engine speed: | 800 rev/min to 2400 rev/min |
| Rated engine speed: | 2200 rev/min |
| Air cleaner: | |
| Make and type: | Donaldson air maze, dry type with safety element |
| Model: | CDS1118500, 3 stage |
| Oil capacity: | None |
| Position: | Under the hood, on right-hand side of engine |
| Pre-cleaner: | |
| Make and type: | Donaldson with plastic mesh chaff screen |
| Position: | Top of air cleaner |
| Turbo-charger: | |
| Make and type: | Air Research, T04B-87 LC0899 exhaust driven |
| Lubrication system: | |
| Type of feed and pump: | Full pressure positive displacement |
| Type of filter(s) | Bypass and full flow primary |
| Total oil capacity including filter(s): | 17.0 l (29.9 UK pt) |
| Recommended oil: | S.A.E. 15W40, viscosity 65 cSt at 50°C (122°F) |
| M.I.L. standard: | L2104C |
| Oil change period: | 200 hours |
| Filter change period: | 200 hours |
| Cooling system: | |
| Coolant: | Water and anti-freeze, 50% solution |
| Type of pump: | Centrifugal |
| Fan diameter: | 635 mm (25.0 in) |
| Number of fan blades: | 8 |
| Type of temperature control: | 2 thermostats and variable speed fan drive |
| Coolant capacity: | 25.6 l (45.1 UK pt) |
| System pressure: | 48 kPa (7 lb/in$^2$) |
| Starting system: | |
| Make, type and model: | Nippondenso electric motor, 5B 2068 |
| Starter motor power rating: | 4.0 kW (5.4 hp) |
| Safety features: | Electrical lockout on gearshift |
| Cold starting aid: | Ether spray in intake manifold |

## Exhaust system

| | |
|---|---|
| Make and construction: | Donaldson MOM06-0221 |
| Dimensions of expansion chamber: | 117 mm (4.6 in) x 213 mm (8.4 in) x 838 mm (33.0 in) long |
| Position: | Left-side over engine, outlet 3.28 m above ground |

## Electrical system

| | |
|---|---|
| Voltage: | 12 |
| Earth polarity: | Negative |
| Make and type of alternator: | Nippondenso, 100211-0290 |
| Output: | 90 A at 2200 rev/min |
| Make and type of battery: | John Deere, lead-acid, dual 6-volt |
| Rating: | 178 Ah at 100 hour rating |

## Transmission

Clutch:

| | |
|---|---|
| Make and type: | John Deere, multi-plate, oil cooled |
| Diameter of plates: | 278 mm (10.9 in) |
| Method of operation: | Hydraulic, by foot pedal |

Gearbox:

| | |
|---|---|
| Make and type: | John Deere, power shift transmission |
| Number of speeds: | 15 forward and 4 reverse |
| Arrangement: | 2 speed hydraulic shifted planetary in front of compound planetary with multiple wet disc clutches and brakes, shifting on the move, under load. |

Rear axle and final drive(s):

| | |
|---|---|
| Make and type: | John Deere, crown wheel and pinion, differential and planetary reduction |
| Type of differential lock and method of engagement: | Hydraulic, self disengaging |

Front axle and final drive(s)

| | |
|---|---|
| Make and type: | ZF, crown wheel and pinion differential and planetary reduction |
| Driven from: | Rear of gearbox |
| Type of differential lock and method of engagement: | Limited slip, self locking. |

Transmission oils

| | Gearbox and transmission housing | Front axle | Front wheel hubs |
|---|---|---|---|
| Recommended oil: John Deere | JDM J20A | JDM J11E | JDM J11E |
| Capacity: | 87.0 l (153.1 UK pt) | 8.5 l (15.0 UK pt) | 1.9 l each (3.3 UK pt) |
| Viscosity at 50°C (122°F) | 38 cSt | 250 cSt | 250 cSt |
| M.I.L. standard | - | L-2105C | L-2105C |
| Oil change period | 1200 hours | 1200 hours | 1200 hours |
| Filter change period | 600 hours | NA | NA |

| Gear | Number of engine revolutions for one revolution of driving wheel | Nominal travelling speed for 2200 rev/min rated engine speed,* km/h | (mile/h) |
|---|---|---|---|
| Forward | | | |
| 1 | 316.5 | 2.24 | ( 1.39) |
| 2 | 221.1 | 3.21 | ( 1.99) |
| 3 | 182.9 | 3.88 | ( 2.41) |
| 4 | 145.6 | 4.87 | ( 3.03) |
| 5 | 126.4 | 5.61 | ( 3.49) |
| 6 | 111.3 | 6.37 | ( 3.96) |
| 7 | 96.7 | 7.34 | ( 4.56) |
| 8 | 84.1 | 8.43 | ( 5.24) |
| 9 | 73.0 | 9.71 | ( 6.03) |
| 10 | 64.3 | 11.02 | ( 6.85) |
| 11 | 55.8 | 12.71 | ( 7.90) |
| 12 | 49.9 | 14.21 | ( 8.83) |
| 13 | 40.3 | 17.58 | (10.92) |
| 14 | 28.8 | 24.59 | (15.28) |
| 15 | 23.3 | 30.42 | (18.90) |
| Reverse | | | |
| 1 | 228.4 | 3.10 | ( 1.93) |
| 2 | 159.6 | 4.44 | ( 2.76) |
| 3 | 105.2 | 6.74 | ( 4.19) |
| 4 | 69.8 | 10.16 | ( 6.31) |

*Calculated with a tyre radius index of 855 mm (33.7 in)

Power take-off

| | | |
|---|---|---|
| Type: | | Two speed with interchangeable shafts |
| Position: | | At rear of tractor in vertical centre plane |
| Height above ground: | | 698 mm (27.5 in) |
| Distance behind rear axle: | | |
| | 540 rev/min | 521 mm (20.5 in) |
| | 1000 rev/min | 498 mm (19.6 in) |
| Diameter: | 540 rev/min | 34.9 mm (1.375 in) |
| | 1000 rev/min | 34.9 mm (1.375 in) |
| Number of splines: | 540 rev/min | 6 to I.S.O. 500 |
| | 1000 rev/min | 21 to I.S.O. 500 |
| Proportional engine speed p.t.o. | | |
| Method of engagement: | | Hydraulically actuated multi-plate clutch selected by hand lever independent of main clutch |
| Diameter of clutch plates: | | 196 mm (7.7 in) |
| Speed at rated engine speed: | | 540 rev/min p.t.o.: 540 rev/min<br>1000 rev/min p.t.o.: 1002 rev/min |
| Engine speed at standard p.t.o. speed: | | 540 rev/min p.t.o.: 2200 rev/min<br>1000 rev/min p.t.o.: 2195 rev/min |
| Direction of rotation viewed facing driving end: | | Clockwise |

Power lift

| | |
|---|---|
| Make and type of pump: | John Deere, radial piston, variable delivery, constant pressure. |
| Nominal working pressure: | 13.8 MPa (2000 lb/in$^2$) |
| Pump drive: | From front of engine crankshaft |
| Oil supplied from: | Transmission housing via charge pump |
| Oil capacity: | 87.0 l (153.1 UK pt), common with transmission |
| Oil capacity available for external use: | 5.0 l (8.8 UK pt) |
| Permissible additional fill for external use: | 5.0 l (8.8 UK pt) |
| Number of rams: | One internal, two external |
| Type, number and position of external tapping(s): | Two at rear of tractor, controls in cab with seperate levers . |
| Linkage category: | 2 and 3 narrow, to I.S.O 730/1 and ASAE S3 |
| Controls: | Draught or position control with intermediate steps, lower link sensing, adjustable speed on drop. |

Drawbar

| | |
|---|---|
| Type: | Swinging |
| Vertical height to centre of clevis: | max. 612 mm (24.1 in), min. 490 mm (19.3 i |
| Changed by: | Inverting drawbar and repositioning clevis |
| Distance behind rear axle centre: | 727 mm (28.6 in) and 902 mm (35.5 in) |
| Distance behind pto (1000 rev/min): | 229 mm (9.0 in) and 404 mm (15.9 in) |
| Lateral adjustment: | Outer position only 400 mm (15.7 in) |
| Pivot position relative to rear axle: | 185 mm (7.3 in) forward |
| Drawbar pin hole diameter: | 33 mm (1.3 in) |

Hitch

| | |
|---|---|
| Make and type: | None |

Steering

| | |
|---|---|
| Make and type: | John Deere, hydraulic, incorporating manual control for emergency. |
| Make and type of pump: | John Deere, main hydraulic pump |
| Oil supplied from: | Transmission |

Brakes

| | |
|---|---|
| Make and type: | John Deere, oil immersed disc |
| Position: | On rear axle differential shafts |
| Method of operation: | Hydraulically actuated from main system, operated by two pedals, idependently or combined. |
| Type of parking brake: | Transmission lock |
| Method of operation: | Gear selection lever. |
| Emergency brake: | Oil supplied from accumulator through hand lever actuated valve to multi plate transmission brake |

Wheels

Steering wheels:

| | |
|---|---|
| Make and size of tyres: | BF Goodrich Power Grip 16.9-26 |
| Type: | Radial-ply 10-ply rating |
| Maximum mass on each tyre and pressure: | 2305 kg (5082 lb) at 200 kPa (29 lb/in$^2$) |
| Track width: | 1537 mm (60.5 in) by 8 steps to 2098 mm (82.6 in) |
| Changed by: | Reversing wheels and off-set lug rims |

Driving wheels:

| | |
|---|---|
| Make and size of tyres: | BF Goodrich Power Saver 20.8-38 |
| Type: | Radial-ply 8-ply rating |
| Maximum mass on each tyre and pressure: | 3090 kg (6812 lb) at 130 kPa (19 lb/in$^2$) |
| Track width: | 1600 mm (63.0 in) by infinite steps to 2464 mm (97.0 in) |
| Changed by: | Rack and pinion axle, reversing wheels and off-set lug rims. |

Wheelbase: 2675 mm (105.3 in)

Cab

Description: John Deere Sound-Gard Cab has an integral four-post protective structure attached to the tractor through four anti-vibration mounts. Fitted with a door and mounting steps on the left side, air conditioning system and noise reduction padding on the inside.

Lighting

Unrestricted beam angle of headlight in plan view 120°

| | Height above ground of centre, mm | (in) | Size, mm | (in) | Distance from outside edge of tractor at 1600 mm (63.0 in) wheel track, to centre, mm | (in) |
|---|---|---|---|---|---|---|
| Headlights | 1090 | (42.9) | 130 | (5.1)dia | 1015 | (40.0) |
| Side lights | 1475 | (58.1) | 70 (2.8)X 20 (0.8) | | 360 | (14.2) |
| Rear lights | 1751 | (68.9) | 70 (2.8)X 30 (1.2) | | 272 | (10.7) |
| Reflectors | | | | | | |
| Upper | 1742 | (68.6) | 76 (3.0)dia | | 105 | ( 4.1) |
| Lower | 824 | (32.4) | 76 (3.0)dia | | 750 | (29.5) |

Number of grease points

Whole tractor: 26

Overall dimensions

| | Length, m | (in) | Width, max. m | (in) | Width, min. m | (in) | Maximum height to top of exhaust, m | (in) |
|---|---|---|---|---|---|---|---|---|
| Without ballast | 4.58 | (180) | 2.98 | (117) | 2.46 | (97) | 3.28 | (129) |
| With ballast | 4.87 | (192) | 2.98 | (117) | 2.46 | (97) | 3.26 | (128) |

Minimum ground clearance 440 mm ( 17.3in) to underside of drawbar frame

Seat

Make and type: John Deere Hydra Cushioned

Suspension and damping: By gas charged accumulators as spring. Power from main hydraulic system.

Range of adjustment: Longitudinal 150 mm (5.9 in)

Vertical 64 mm (2.5 in)

## CONDITIONS DURING TEST

### Masses

Tractor (without driver but with tanks full)

| | Front, kg (lb) | Rear, kg (lb) | Total, kg (lb) |
|---|---|---|---|
| Without ballast | 2336 (5150) | 4309 (9500) | 6645 (14650) |
| With ballast | 2858 (6301) | 4468 (9850) | 7326 (16151) |

Ballast

| | Number of weights | Total mass, kg (lb) | Water, kg (lb) |
|---|---|---|---|
| Front wheels | nil | nil | nil |
| Rear wheels | 4 | 254 (560) | nil |
| Additional | Front frame plus 7 weights | 427 (941) | - |

### Track setting during tests

Front - 1830 mm ( 72.0 in)

Rear - 1815 mm ( 71.5 in)

## FUEL AND LUBRICANTS USED IN TESTS

### Fuel

| | | |
|---|---|---|
| Laboratory tests: | Pto: | Diesel oil to S.A.E. J313 Grade 2-d, specific gravity 0.8285 at 15°C (59°F), viscosity 2.25 cSt at 40°C (104°F), Cetane No. 50 |
| | Engine: | Diesel oil to S.A.E. J313 Grade 2-d, specific gravity 0.8275 at 15°C (59°F), viscosity 2.26 cSt at 40°C (104°F), Cetane No. 50 |
| Drawbar tests: | | Diesel oil to S.A.E. J313 Grade 2-d, specific gravity 0.829 at 15°C (59°F), viscosity 2.25 cSt at 40°C (104°F), Cetane No. 50 |

### Oil

| | |
|---|---|
| Engine: | John Deere, Torq-Gard Supreme, S.A.E. 15W40, viscosity 65 cSt at 50°C (122°F) |
| Transmission and power lift: | John Deere, Hy-Gard, viscosity 38 cSt at 50°C (122°F) |
| Front axle and front hubs: | John Deere J11E, S.A.E. 85W/140 multi purpose, viscosity 250 cSt at 50°C (122°F) |

## COMPULSORY TESTS

1. MAIN POWER TAKE-OFF PERFORMANCE

Date and location of tests: 19th October, 1982, John Deere Works, USA

Type of dynamometer: Eaton, Dynamatic

| Power, kW (hp) | Speed, rev/min | | Fuel consumption, Hourly, | | Specific, | Spec. energy, |
|---|---|---|---|---|---|---|
| | Engine | P.t.o. | l/h (UKgal/h) | kg/h (lb/h) | kg/kWh (lb/hph) | kWh/l (hph/UKgal) |
| Maximum power - 2 hour test | | | | | | |
| 106.2 (142.4) | 2019 | 920 | 32.06 (7.05) | 26.56 (58.55) | 0.250 (0.411) | 3.31 (20.2) |
| The speed recommended by the manufacturer for drawbar work | | | | | | |
| 104.7 (140.4) | 2200 | 1002 | 33.18 (7.30) | 27.49 (60.60) | 0.263 (0.432) | 3.16 (19.3) |
| Part loads | | | | | | |
| (1) 85% of the torque obtained at rated speed. | | | | | | |
| 90.6 (121.5) | 2239 | 1020 | 30.08 (6.62) | 24.92 (54.94) | 0.275 (0.452) | 3.01 (18.3) |
| (2) Unloaded | | | | | | |
| 0 | 2331 | 1062 | 9.79 (2.15) | 8.11 (17.88) | - | - |
| (3) 50% of the torque defined in (1) | | | | | | |
| 46.2 (62.0) | 2285 | 1041 | 19.99 (4.40) | 16.56 (36.51) | 0.358 (0.589) | 2.31 (14.1) |
| (4) Maximum power at rated speed | | | | | | |
| 104.7 (140.4) | 2200 | 1002 | 33.18 (7.30) | 27.49 (60.60) | 0.263 (0.432) | 3.16 (19.3) |
| (5) 25% of the torque defined in (1) | | | | | | |
| 23.3 (31.2) | 2307 | 1051 | 14.87 (3.27) | 12.32 (27.16) | 0.529 (0.870) | 1.57 (9.6) |
| (6) 75% of the torque defined in (1) | | | | | | |
| 68.7 (92.1) | 2265 | 1032 | 24.91 (5,48) | 20.64 (45.50) | 0.300 (0.493) | 2.76 (16.8) |

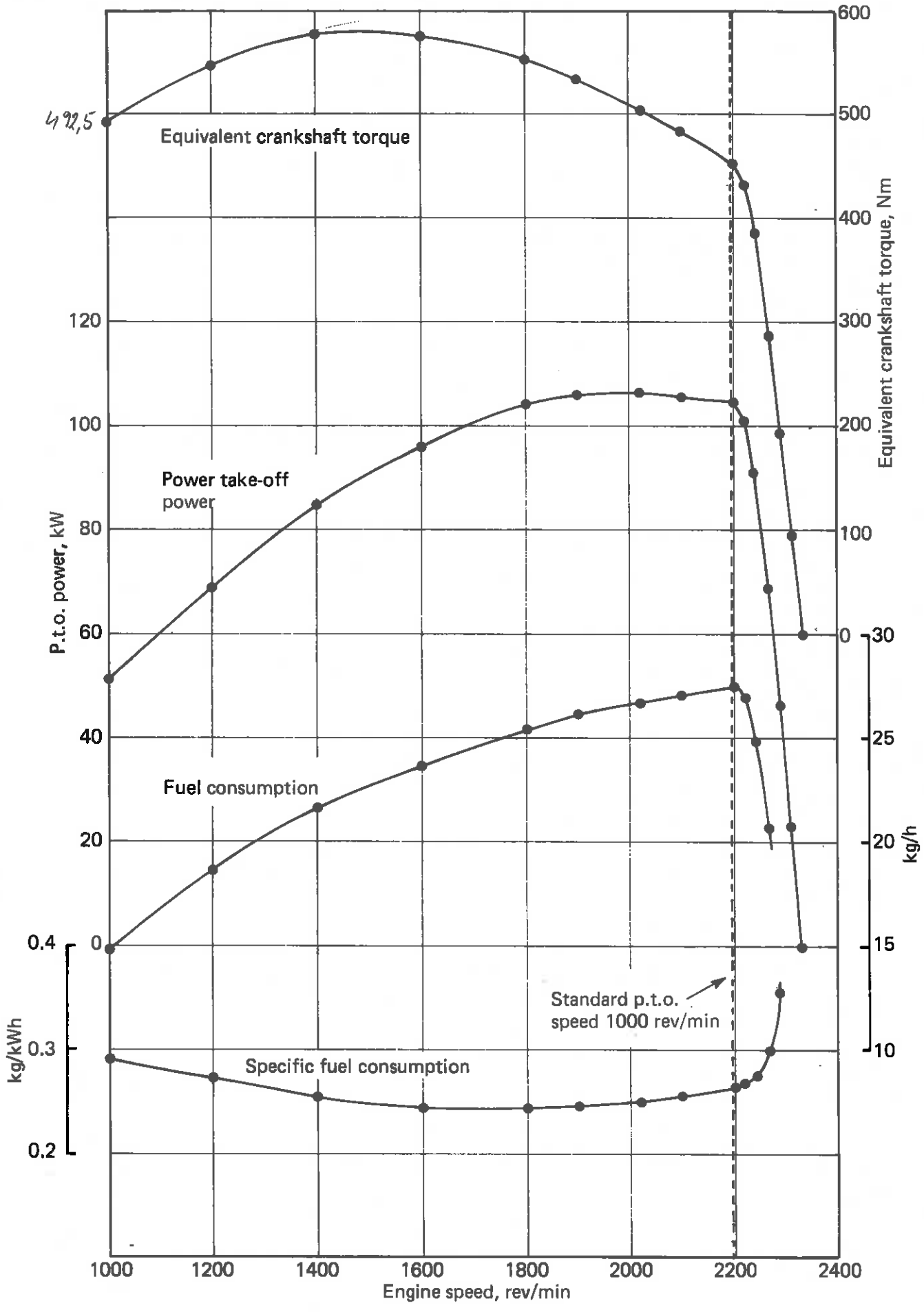
ø 22,1 ø 330

| Power, kW (hp) | Speed, rev/min | | Fuel consumption, Hourly, l/h (UKgal/h) | Hourly, kg/h (lb/h) | Specific, kg/kWh (lb/hph) | Spec. energy, kWh/l (hph/UKgal) |
|---|---|---|---|---|---|---|
| | Engine | P.t.o. | | | | |
| Part loads, the governor hand lever in the position corresponding to the standard p.t.o. speed at full load (1000 rev/min). | | | | | | |
| (1) 85% of the torque obtained at maximum power | | | | | | |
| 90.6 (121.5) | 2239 | 1020 | 30.08 (6.62) | 24.92 (54.94) | 0.275 (0.452) | 3.01 (18.3) |
| (2) Unloaded | | | | | | |
| 0 | 2331 | 1062 | 9.79 (2.15) | 8.11 (17.88) | - | - |
| (3) 50% of the torque defined in (1) | | | | | | |
| 46.2 (62.0) | 2285 | 1041 | 19.99 (4.40) | 16.56 (36.51) | 0.358 (0.589) | 2.31 (14.1) |
| (4) Maximum power | | | | | | |
| 104.7 (140.4) | 2200 | 1002 | 33.18 (7.30) | 27.49 (60.60) | 0.263 (0.432) | 3.16 (19.3) |
| (5) 25% of the torque defined in (1) | | | | | | |
| 23.3 (31.2) | 2307 | 1051 | 14.87 (3.27) | 12.32 (27.16) | 0.529 (0.870) | 1.57 (9.6) |
| (6) 75% of the torque defined in (1) | | | | | | |
| 68.7 (92.1) | 2265 | 1032 | 24.91 (5.48) | 20.64 (45.50) | 0.300 (0.493) | 2.76 (16.8) |

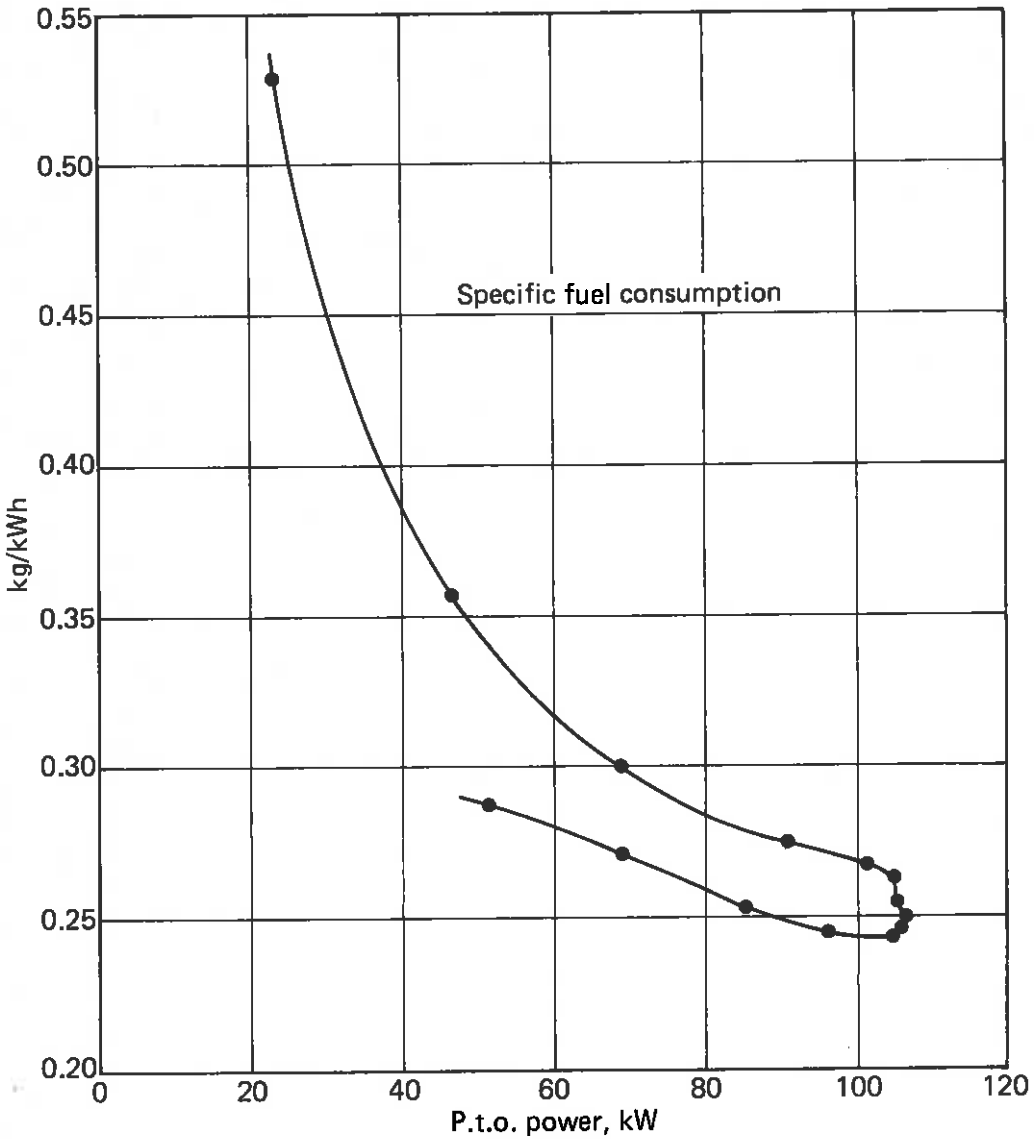
Standard specific fuel consumption, kg/kWh (lb/hph)

(a) 0.275 (0.452) (b) 0.358 (0.589) (c) 0.275 (0.452) (d) 0.358 (0.589)

| | | |
|---|---|---|
| No load, maximum engine speed | | 2331 rev/min |
| Equivalent crankshaft torque at maximum power | | 502.1 Nm ( 370.3 lb ft) |
| Maximum equivalent crankshaft torque | | 578.8 Nm ( 426.9 lb ft) at 1460 rev/min engine speed |
| Mean atmospheric conditions | temperature | 17 °C ( 63 °F) |
| | pressure | 977 m bar ( 28.86 in Hg) |
| | relative humidity | 81 % |
| Maximum temperature | coolant | 94 °C ( 201 °F) |
| | engine oil | 107 °C ( 225 °F) |
| | fuel | 46 °C ( 115 °F) |
| | air intake | 29 °C ( 84 °F) |




Power take-off test




Power take-off test

2 DRAWBAR PERFORMANCE

Date of tests: October 1982
Type of track: Concrete

Height of drawbar above ground: Unballasted: 480 mm ( 18.9 in)
Ballasted: 450 mm ( 17.7 in)

| Gear | Speed, km/h (mile/h) | Power, kW (hp) | Drawbar pull, kN (lb) | Engine speed, rev/min | Wheel-slip, % | Specific fuel consumption, kg/kWh (lb/hph) | Specific fuel consumption, kWh/l (hph/UKgal) | Temperature, °C (°F) Fuel | Coolant | Engine oil | Atmospheric conditions: Temperature, °C (°F) | Relative humidity, % | Pressure, m bar (in Hg) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (i) MAXIMUM POWER (unballasted) Tyre inflation pressure: front 80 kPa (12lb/in$^2$), rear 110 kPa (16 lb/in$^2$) | | | | | | | | | | | | | |
| 3 | 3.67 (2.28) | 64.3 (86.2) | 63.0 (14160) | 2252 | 9.9 | - | - | 43 (109) | 86 (187) | 94 (201) | 6 (43) | 71 | 986 (29.12) |
| 4 | 4.60 (2.86) | 80.5 (108.0) | 63.0 (14160) | 2244 | 9.9 | - | - | 44 (111) | 86 (187) | 97 (207) | 6 (43) | 59 | 986 (29.12) |
| 5 | 5.21 (3.24) | 88.0 (118.0) | 60.8 (13670) | 2182 | 8.2 | - | - | 44 (111) | 88 (190) | 96 (205) | 6 (43) | 59 | 986 (29.12) |
| 6 | 5.65 (3.51) | 92.4 (123.9) | 58.9 (13240) | 2035 | 7.3 | - | - | 44 (111) | 88 (190) | 94 (201) | 8 (46) | 50 | 986 (29.12) |
| 7 | 6.59 (4.10) | 92.6 (124.2) | 50.6 (11380) | 2023 | 5.1 | - | - | 44 (111) | 86 (187) | 95 (203) | 7 (45) | 60 | 986 (29.12) |
| 8 | 7.65 (4.75) | 91.8 (123.1) | 43.2 (9710) | 2015 | 3.9 | - | - | 44 (111) | 88 (190) | 94 (201) | 8 (46) | 50 | 986 (29.12) |
| (ii) MAXIMUM POWER (ballasted). Tyre inflation pressure: front 100 kPa (15 lb/in$^2$), rear 110 kPa (16 lb/in$^2$) | | | | | | | | | | | | | |
| 1 | 2.12 (1.32) | 41.8 (56.1) | 71.0 (15960) | 2289 | 10.6 | 0.421 (0.693) | 1.97 (12.0) | 45 (113) | 85 (185) | 94 (201) | 6 (43) | 71 | 1000 (29.53) |
| 2 | 3.02 (1.88) | 59.7 (80.1) | 71.3 (16030) | 2264 | 10.9 | 0.362 (0.595) | 2.29 (14.0) | 43 (109) | 87 (189) | 95 (203) | 6 (43) | 71 | 1000 (29.53) |
| 3 | 3.66 (2.27) | 72.4 (97.1) | 71.2 (16010) | 2267 | 10.9 | 0.347 (0.571) | 2.39 (14.6) | 43 (109) | 86 (187) | 96 (205) | 6 (43) | 71 | 1000 (29.53) |
| 4 | 4.43 (2.75) | 87.4 (117.2) | 71.0 (15960) | 2196 | 10.6 | 0.325 (0.535) | 2.55 (15.6) | 44 (111) | 87 (189) | 92 (198) | 7 (45) | 73 | 1000 (29.53) |
| 5 | 4.84 (3.01) | 90.0 (120.7) | 67.0 (15060) | 2023 | 8.3 | 0.307 (0.505) | 2.70 (16.5) | 41 (106) | 90 (194) | 96 (205) | 7 (45) | 73 | 1000 (29.53) |
| 6 | 5.60 (3.48) | 94.4 (126.6) | 60.7 (13650) | 2017 | 6.6 | 0.293 (0.482) | 2.83 (17.3) | 42 (108) | 90 (194) | 96 (205) | 8 (46) | 74 | 1000 (29.53) |
| 7 | 6.55 (4.07) | 93.8 (125.8) | 51.5 (11580) | 2014 | 4.8 | 0.295 (0.485) | 2.81 (17.1) | 42 (108) | 90 (194) | 95 (203) | 8 (46) | 74 | 1000 (29.53) |
| (iii) FIVE HOUR TEST AT 75% OF PULL AT MAXIMUM POWER | | | | | | | | | | | | | |
| 7 | 7.43 (4.62) | 79.7 (106.9) | 38.6 (8680) | 2235 | 3.1 | 0.326 (0.536) | 2.54 (15.5) | 45 (113) | 88 (190) | 99 (210) | 10 (50) | 54 | 996 (29.41) |
| + (iv) FIVE HOUR TEST AT PULL CORRESPONDING TO 15% WHEELSLIP IN TEST (ii) | | | | | | | | | | | | | |
| 3 | 3.71 (2.31) | - | 73.0 (16410) | 2229 | - | - | - | 43 (109) | 91 (196) | 101 (214) | 14 (57) | 41 | 996 (29.41) |

Total oil consumption during ten hours duration of tests (iii) and (iv) 29.0 g/h ( 0.0638lb/h)

*Maximum power available at 15% wheelslip

+Test (iv) was carried out with additional ballast and the results for power, slip and fuel consumption have no practical significance.

3. TURNING SPACE AND TURNING CIRCLE (Front wheel drive engaged)

Details of wheel equipment: As in specification, without ballast

Track of wheels: front - 1830 mm ( 72.0 in)
rear - 1815 mm ( 71.5 in)

| | With brakes | | Without brakes | |
|---|---|---|---|---|
| | Left-hand | Right-hand | Left-hand | Right-hand |
| Radius of turning space, m (in) | 4.56 (180) | 4.58 (180) | 5.79 (228) | 5.77 (227) |
| Radius of turning circle, m (in) | 4.30 (169) | 4.32 (170) | 5.53 (218) | 5.51 (217) |

4. LOCATION OF CENTRE OF GRAVITY

| | |
|---|---|
| Height above ground, mm (in) | 1029 (40.5) |
| Distance forward from the vertical plane containing the axis of the rear wheels, mm (in) | 931 (36.7) |
| Distance from the median plane of the tractor, mm (in) | 0 |

5. BRAKING (Front wheel drive disengaged)

Date of tests: 29th and 30th October, 1982

Type of track: Concrete

Masses during brake tests

| | Front, kg (lb) | Rear, kg (lb) | Total, kg (lb) |
|---|---|---|---|
| Ballasted | 3461 (7630) | 4772 (10520) | 8233 (18150) |
| Unballasted | 2336 (5150) | 4309 ( 9500) | 6645 (14650) |

Tyres:

Front: 16.9 - 26, 10 ply rating.

Rear: 20.8 - 38, 8 ply rating.

Type 0 Service brakes (cold)

Travelling speed before application of brakes, 32.7 km/h (20.3 mile/h)

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Ballasted | Force on brake pedal | N (lb) | 150 (34) | 200 (45) | 250 (56) | 300 (67) | 350 (79) | 380 (85) | |
| | Mean deceleration | $m/s^2$ ($ft/s^2$) | 0.9 (3.0) | 1.4 (4.6) | 2.0 (6.6) | 2.5 (8.2) | 3.1 (10.2) | 3.5 (11.5) | |
| Unballasted | Force on brake pedal | N (lb) | 120 (27) | 150 (34) | 200 (45) | 250 (56) | 300 (67) | 350 (79) | 400 (90) |
| | Mean deceleration | $m/s^2$ ($ft/s^2$) | 0.6 (2.0) | 0.9 (3.0) | 1.4 (4.6) | 2.0 (6.6) | 2.5 (8.2) | 3.1 (10.2) | 3.7 (12.1) |

Type 1 Service brakes (hot)

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Ballasted | Force on brake pedal | N (lb) | 150 (34) | 200 (45) | 250 (56) | 300 (67) | 350 (79) | 380 (85) | |
| | Mean deceleration | $m/s^2$ ($ft/s^2$) | 0.9 (3.0) | 1.4 (4.6) | 2.0 (6.6) | 2.5 (8.2) | 3.1 (10.2) | 3.5 (11.5) | |

Brakes were heated by: Towing

Comments on deviation and vibration: None

Parking brake: Transmission lock, engaged by gear selector lever

## 6. MEASUREMENT OF EXTERNAL NOISE LEVEL

Date of tests: 4th November, 1982
Type of sound level meter: Bruel and Kjaer 2204
Type of track: Concrete
Results of tests:
Gear: 15th
Travelling speed before acceleration: 24.5 km/h (15.2 mile/h
Sound level: 90 dBA

## 7. NOISE MEASUREMENT AT THE DRIVER'S EAR

Date of tests: 28th October, 1982
Type of sound level meter: Bruel and Kjaer 2209
Type of track: Concrete
Cab fitted: Yes

Results of tests

| Gear | Drawbar pull at which the tractor develops maximum sound level, kN (lb) | Measured travelling speed, km/h (mile/h) | Sound level, dBA |
|---|---|---|---|
| All openings closed with cab fitted | | | |
| * 7 | 45.0 (10120) | 7.0 (4.3) | 76 |
| * 7 | Light load | 8.1 (5.0) | 76 |
| 1 | 55.0 (12360) | 2.3 (1.4) | 77 |
| 8 | 35.0 ( 7870) | 8.6 (5.3) | 77 |
| 9 | 35.0 ( 7870) | 9.5 (5.9) | 77 |
| 11 | 30.0 ( 6740) | 11.1 (6.9) | 77 |
| | | | |
| 15 | Light load | 32.7 (20.3) | 77 |

*The 7th gear corresponds to the nominal travelling speed nearest to 7.5 km/h (4.7 mile/h).

## 8. POWER LIFT AND HYDRAULIC PUMP PERFORMANCE

Date of tests: 1st November, 1982
Hydraulic fluid:
Make and type: John Deere Hy-Gard
Viscosity: 38 cSt at 50°C (122°F)

Type of linkage lock for transport: Hydraulic

Power lift

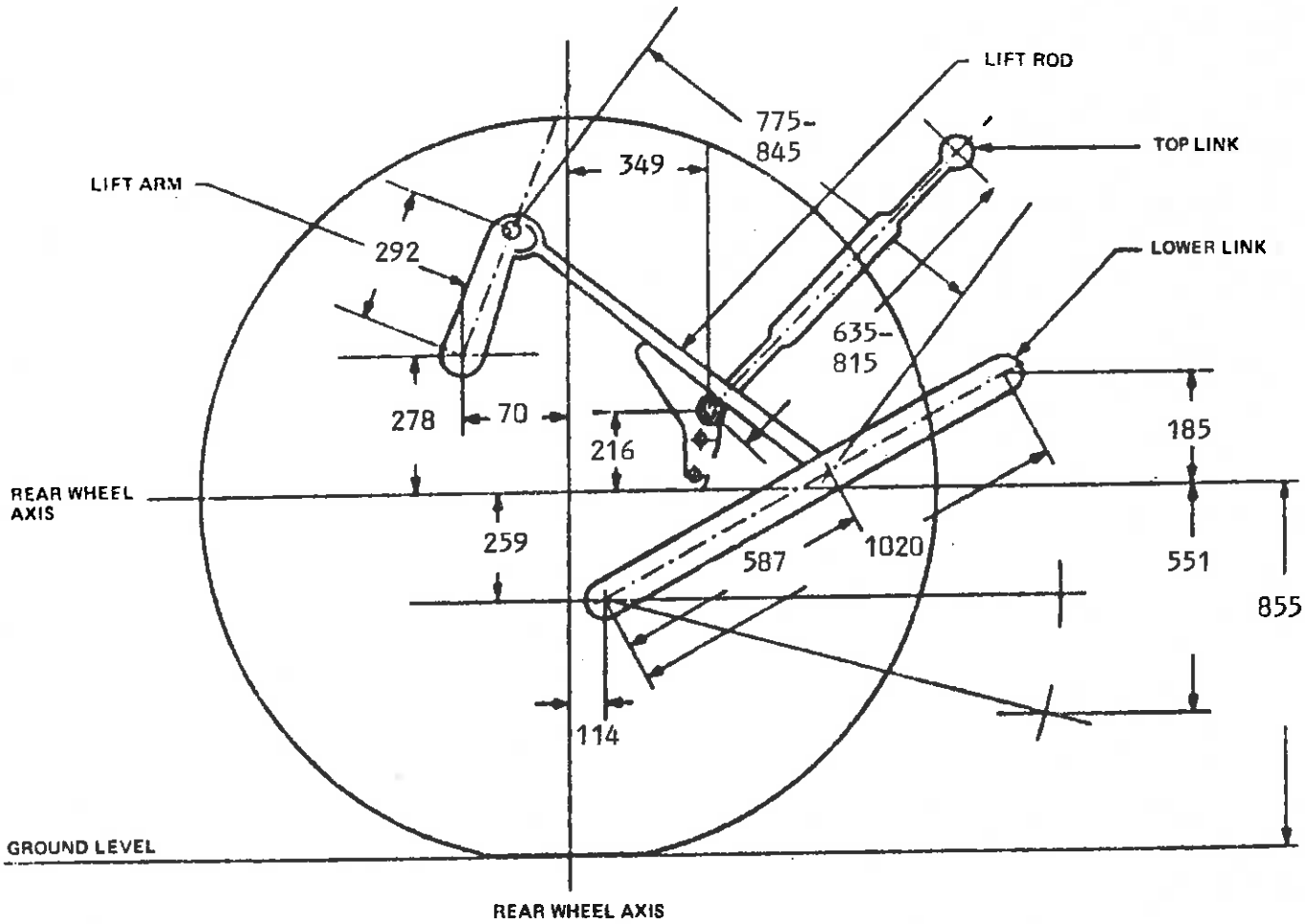
| | Height of lower hitch point above ground in down position, mm (in) | Vertical movement, mm (in) | Maximum force exerted through full range, kN (lb) | Corresponding pressure of hydraulic fluid, MPa (lb/in$^2$) | Moment about rear axle, kNm (lb ft) | Maximum tilt angle of mast over range of lift, degrees |
|---|---|---|---|---|---|---|
| At the hitch points | 304 (12.0) | 736(29.0) | 34.7 (7800) | 14.1 (2040) | 39.3 (28986) | - |
| On the frame | 304 (12.0) | 836(32.9) | 31.4 (7060) | 14.1 (2040) | 54.8 (40418) | 11 |

## Hydraulic pump performance

| | |
|---|---|
| Opening pressure of the relief valve: | 12.0 MPa (1740 lb/in$^2$) |
| Sustained pressure with relief valve open: | 15.7 MPa (2280 lb/in$^2$) |
| Opening pressure of the unloading valve: | Not applicable |
| Closing pressure of the unloading valve: | Not applicable |
| Pump delivery rate at minimum pressure, the governor control lever set for maximum power: | 111.6 l/min (24.6 gal/min) |
| Pressure specified by the manufacturer for an external hydraulic motor: | 12.0 MPa (1740 lb/in$^2$) |
| Hydraulic power at 12.0 MPa (1740 lb/in$^2$): | 22.0 kW (29.5 hp) |
| Pump delivery rate at stated power: | 109.8 l/min (24.2 gal/min) |
| Tapping point: | 2 at rear of tractor |
| Temperature of hydraulic fluid: | 69°C (156°F) |

## Power lift

Dimensions of linkage geometry, mm (lift rod length 810 mm)



Linkage geometry when connected to the standard frame, mm (in)

| | | |
|---|---|---|
| **Projected length in side view** | | |
| Lower links | 1020 | (40.2) |
| Lift arms | 292 | (11.5) |
| Lift rods | 808 | (31.8) |
| Top link | 783 | (30.8) |
| **Distance of lift rod connection point from pivot point of lower link** | 587 | (23.1) |
| **The following dimensions are given relative to the rear wheel centre line, situated 855 mm ( 33.7in) above the ground level** | | |
| Lower link pivot point | 114 (4.5) behind, | 259(10.2) below |
| Top link pivot point | 349(13.7) behind, | 216 (8.5) above |
| Lift arm pivot point | 70 (2.8) forward | 278(10.9) above |
| Maximum and minimum height of lower link hitch points | 185 (7.3) above, | 551(21.7) below |
| Height of lower link hitch points when locked in transport position | Any height within lift range | |

## OPTIONAL TESTS

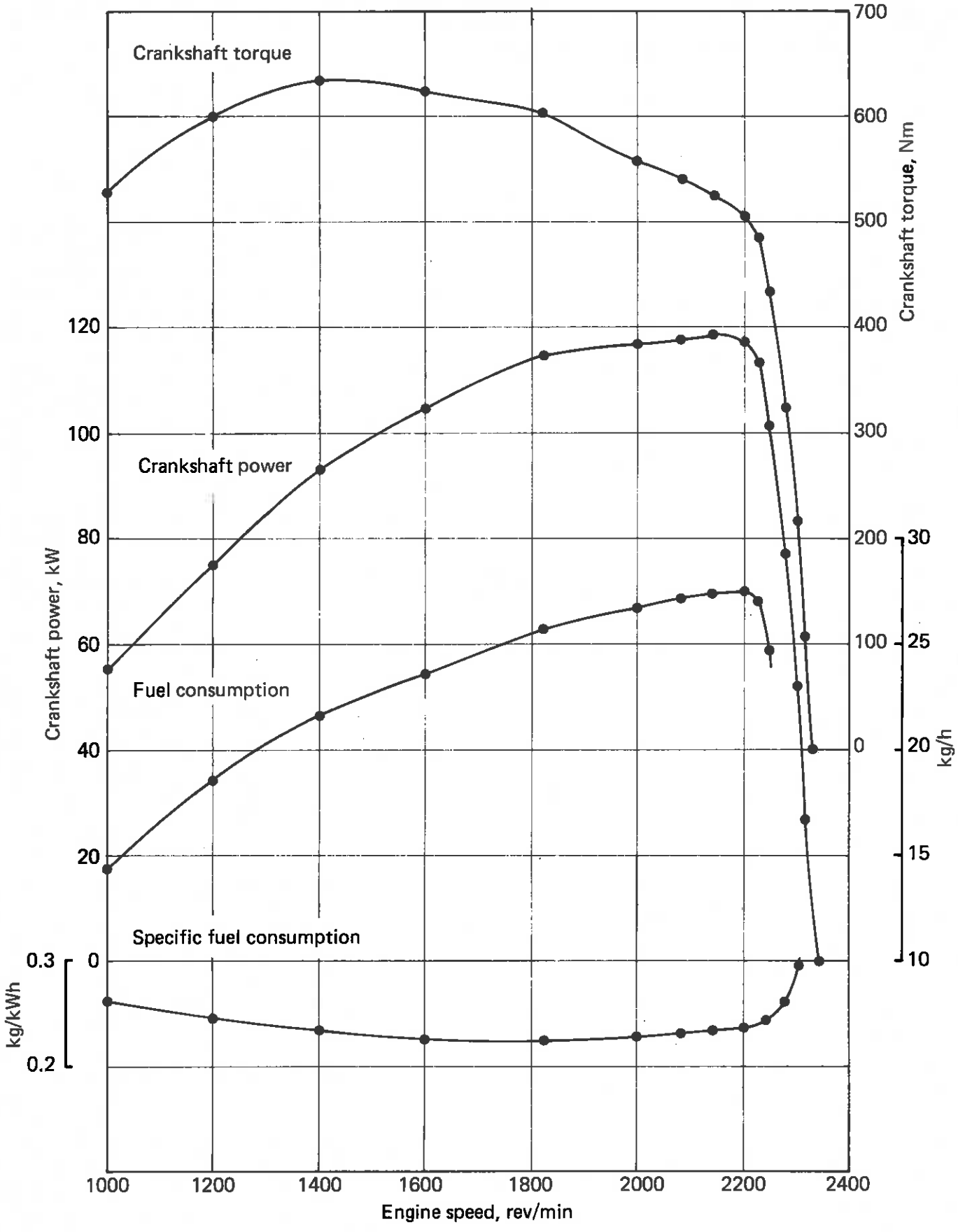
### 9. PERFORMANCE AT ENGINE CRANKSHAFT

Date and location of tests: 9th November, 1982, John Deere Works, USA.

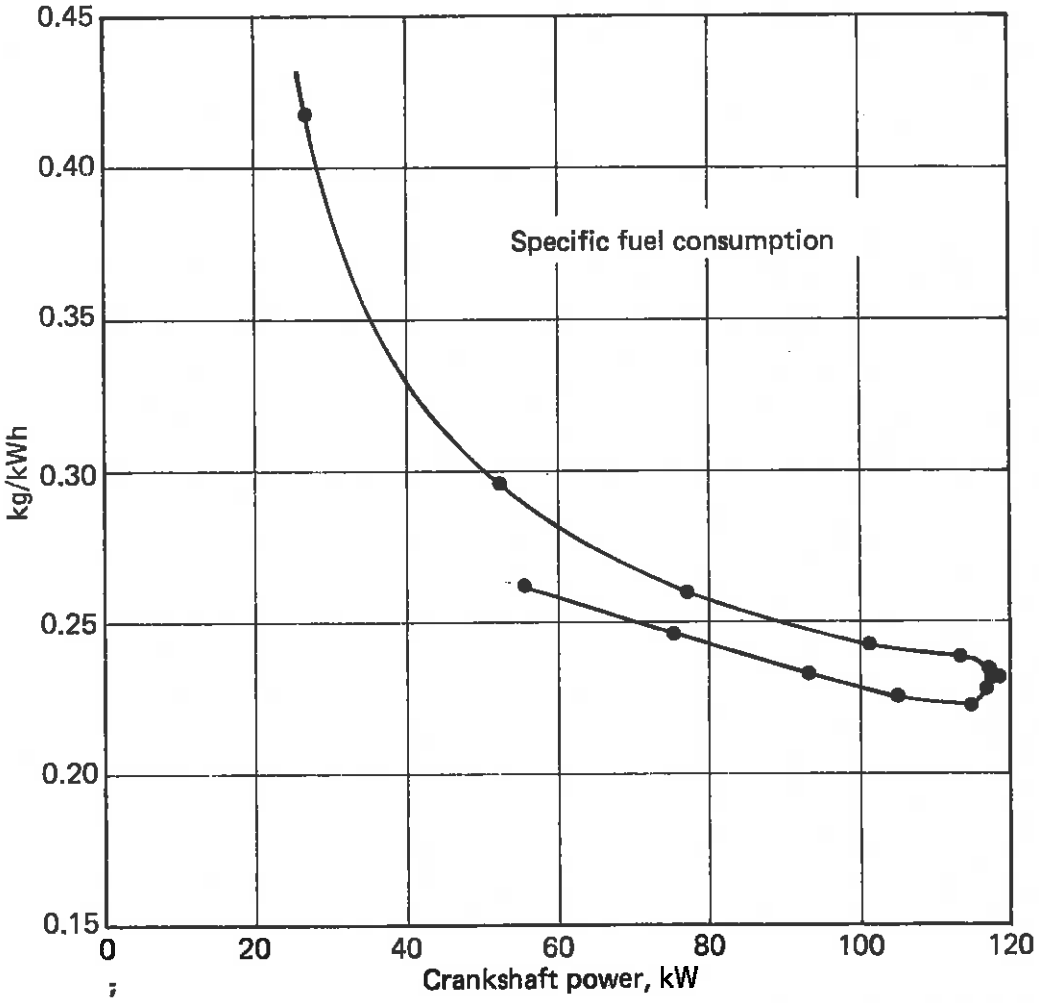
Type of dynamometer: Eaton Dynamatic

| Power, kW (hp) | Speed, rev/min | Fuel consumption, Hourly, l/h (UKgal/h) | Hourly, kg/h (lb/h) | Specific, kg/kWh (lb/hph) | Spec. energy, kWh/l (hph/UKgal) |
|---|---|---|---|---|---|
| Maximum power - 2 hour test | | | | | |
| 118.3 (158.6) | 2140 | 33.11 (7.28) | 27.40 (60.41) | 0.232 (0.382) | 3.57 (21.8) |
| The speed recommended by the manufacturer for drawbar work | | | | | |
| 117.0 (156.9) | 2200 | 33.22 (7.31) | 27.49 (60.60) | 0.235 (0.387) | 3.52 (21.5) |
| Part loads | | | | | |
| (1) 85% of the torque obtained at maximum power | | | | | |
| 101.4 (136.0) | 2242 | 29.81 (6.56) | 24.67 (54.39) | 0.243 (0.400) | 3.40 (20.7) |
| (2) Unloaded | | | | | |
| - | 2340 | 7.99 (1.76) | 6.61 (14.57) | - | - |
| (3) 50% of the torque defined in (1) | | | | | |
| 52.0 (69.7) | 2300 | 18.63 (4.10) | 15.42 (33.99) | 0.296 (0.487) | 2.79 (17.0) |
| (4) Maximum power at rated speed | | | | | |
| 117.0 (156.9) | 2200 | 33.22 (7.31) | 27.49 (60.60) | 0.235 (0.387) | 3.52 (21.5) |
| (5) 25% of the torque defined in (1) | | | | | |
| 26.2 (35.1) | 2316 | 13.22 (2.91) | 10.94 (24.12) | 0.418 0.688 | 1.98 (12.1) |
| (6) 75% of the torque defined in (1) | | | | | |
| 77.2 (103.5) | 2276 | 24.30 (5.35) | 20.11 (44.33) | 0.260 (0.428) | 3.18 (19.4) |

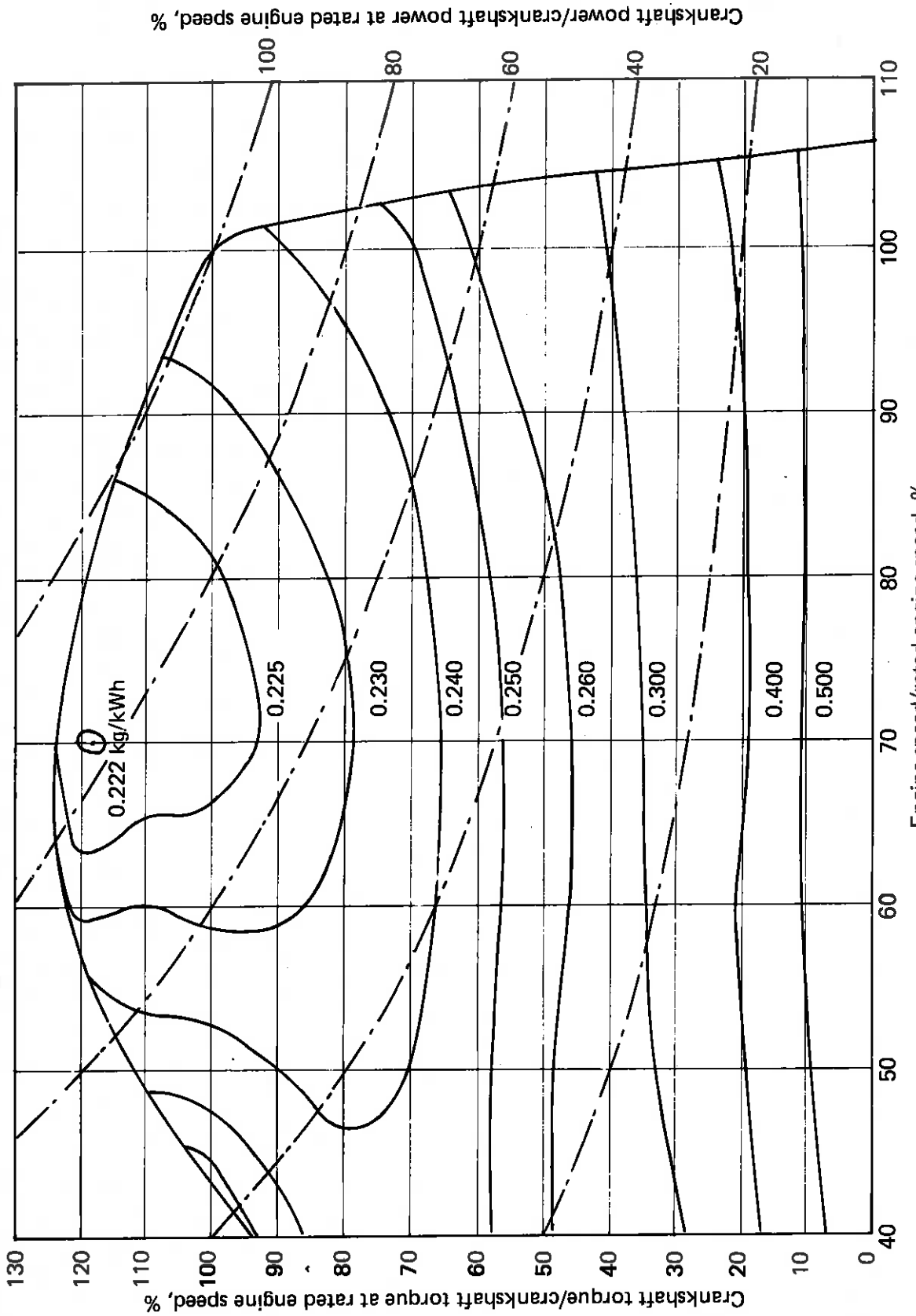
| | | |
|---|---|---|
| No load, maximum engine speed | | 2340 rev/min |
| Crankshaft torque at maximum power | | 528.0Nm ( 389.4 lb ft) |
| Maximum crankshaft torque | | 635.0Nm ( 468.4 lb ft) at 1440 rev/min engine speed |
| Mean atmospheric conditions | temperature | 16 °C ( 61°F) |
| | pressure | 992 m bar ( 29.29in Hg) |
| | relative humidity | 53 % |
| Maximum temperature | coolant | 89 °C ( 192°F) |
| | engine oil | 102 °C ( 216°F) |
| | fuel | 46 °C ( 115°F) |
| | air intake | 30 °C ( 86°F) |


Crankshaft torque
Crankshaft power
Fuel consumption
Specific fuel consumption
Crankshaft power, kW
Crankshaft torque, Nm
kg/h
kg/kWh
120
100
80
60
40
20
0
700
600
500
400
300
200
100
0
30
25
20
15
10
0.3
0.2
1000
1200
1400
1600
1800
2000
2200
2400
Engine speed, rev/min

Engine test


0.45
0.40
0.35
0.30
0.25
0.20
0.15
kg/kWh
Specific fuel consumption
0
20
40
60
80
100
120
Crankshaft power, kW

Engine test




Engine test, specific fuel consumption

REPAIRS AND ADJUSTMENTS DURING TESTS: None

REMARKS: None

Test carried out by: F. Thistlewaite, J.P. Evans.

Signed: D.W. Smith Tractor Test Section

for the Director

Date: 10th February 1983