

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

**Massey-Ferguson 375 Two-Wheel Drive Tractor with 12-speed
Multi-power Transmission**



Manufactured by	Massey-Ferguson Manufacturing Ltd., Banner Lane, Coventry, Warwickshire. CV4 9GF.
Test No.	R87/70577/OECD
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Dry

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Fuel System

Fuel feed system:	AC Delco mechanical feed pump.
Make, type and model of fuel filter(s):	C.A.V. paper element filter with transparent sediment bowl
Capacity of fuel tank:	108 l
Make, type and model of injection pump:	C.A.V., distributor, DPA3241F490
Serial No:	27228 FDG
Manufacturer's production setting of injection pump:	13.1-14.8 l/h at 2000 rev/min engine speed at full load and 40°C pump inlet temperature
Injection pump timing:	Delivery starts 23° before T.D.C., static
Make, type and model of injectors:	C.A.V. 4-hole, BDLL 150S6705
Injection pressure:	17.1 MPa

Governor

Make:	C.A.V.
Type:	Mechanical incorporated in injection pump
Governed range of engine speed:	750 to 2420 rev/min
Rated engine speed:	2200 rev/min

Air cleaner**Pre-cleaner**

Make and type:	Nelson-Burgess, Visibowl, centrifugal
Location:	Above engine cover

Main

Make and type:	Donaldson, ELD08 2-stage dry paper element
Location	Under engine cover
Maintenance indicator:	Warning light on instrument panel

Lubrication system

Type of feed pump:	Forced feed from eccentric rotor pump
Total oil capacity including filter(s):	7.5 l
Oil change period:	250 hours
Type of filter:	Full flow replaceable element canister
Number:	1
Filter change period:	250 hours
Recommended oil:	See "Fuels and lubricants used in tests"

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Cooling system

Type of coolant: Water or water and anti-freeze solution

Specification of pump

Type: Centrifugal

Description of fan: Belt driven, puller

Number of fan blades: 4

Fan diameter: 457 mm

Coolant capacity: 15.1 l

Type of temperature control: Thermostat

Superpressure system: 69 kPa

Starting system

Safety device: Operable only when high/low gear and pto selectors are in neutral position

Starter motor

Make: Lucas

Type: Electrical, pre-engaged, solenoid operated

Model and power rating: M127, 12V, 2.8 kW

Cold starting aid: Lucas C.A.V. Thermostart

Electrical system

Voltage: 12

Generator: Alternator

Make: Lucas

Model: A127

Type: Belt driven

Power: 0.54 kW

Batteries 2, M.F. Powerpart, lead-acid

Rating: 420 A CCA rating each or equivalent
75 Ah at 20-hour rating

Exhaust system

Make: Nelson-Burgess

Type: Spark arrester silencer

Model: 17AE10

Location: Under engine cover with vertical stack pipe

Height of outlet above ground: 2410 mm

TRANSMISSION**Clutch**

Make: Laycock
Type: Dry, for transmission only
Number of plates: 1
Diameter of plates: 305 mm
Method of operation: Mechanically by pedal

Gear box

Make: Massey-Ferguson
Type: Mechanical, manual operation
Arrangement: 3 forward and 1 reverse speeds with a manually operated high/low range epicyclic unit and an electro/hydraulically operated dual range constant mesh unit
Number of speeds: 12 forward, 4 reverse
Available options: 12 speed synchromesh

Rear axle and final drives

Make: Massey-Ferguson
Type: Crown wheel and pinion, with outboard epicyclic reduction gears

Differential lock

Type: Mechanical
Method of engagement: Pedal operated
Method of disengagement: Pedal operated

Transmission oils

Gear box, transmission, final drives and power lift housing:

Capacity 49.8 l
Change period: 1000 hours
Filter change period: 250 hours
Recommended oil: See "Fuels and lubricants used in tests"

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Gear	Group No.	Number of engine revolutions for one revolution of the driving wheels	Nominal travelling speed at rated engine speed: 2200 rev/min km/h
Forward			
1	LM	294.83	1.96
1	L	232.81	2.48
2	LM	196.56	2.93
2	L	155.21	3.71
3	LM	107.21	5.38
3	L	84.66	6.81
1	HM	72.07	8.00
1	H	56.91	10.13
2	HM	48.05	12.00
2	H	37.94	15.19
3	HM	26.21	21.99
3	H	20.69	27.85
Reverse			
R	LM	196.56	2.93
R	L	155.21	3.71
R	HM	48.05	12.00
R	H	37.94	15.19

M = Multipower engaged L = Low range H = High range

Rear tyre size: 16.9-30

Tyre loaded radius 695 mm

FRONT AXLE

Make: Massey-Ferguson

Type: Non-driven, extendable

POWER TAKE-OFFMain power take-off

Type:	Independent of main clutch
Method of engagement:	Lever and hydraulically operated multiplate clutch
Number of shafts:	1
Method of changing power take-off speeds	Manually by exchanging shafts

Power take-off proportional to engine speed

Tyre sizes, Front, Rear:	7.50-16, 16.9-30
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(i) 540 rev/min

Location:	At rear of tractor
Diameter of power take-off shaft:	34.9 mm
Number of splines:	6 to ISO standard 500
Height above ground:	577 mm
Distance from the median plane of the tractor:	Central
Distance behind rear axle:	296 mm
Pto speed at rated engine speed:	627 rev/min
Engine speed at standard power take-off speed:	1893 rev/min
Engine to pto ratio:	3.5064:1
Power restriction:	I.S.O. recommendation, 48 kW
Direction of rotation (viewed facing driving end):	Clockwise

(ii) 1000 rev/min (not fitted for test)

Location:	At rear of tractor
Diameter of power take-off shaft:	34.9 mm
Number of splines:	21 to ISO standard 500
Height above ground:	577 mm
Distance from the median plane of the tractor:	Central
Distance behind rear axle:	296 mm
Pto speed at rated engine speed:	1158 rev/min
Engine speed at standard power take-off speed:	1900 rev/min
Engine to pto ratio:	1.900:1
Direction of rotation (viewed facing driving end):	Clockwise

POWER LIFT

Make:	Massey-Ferguson
Type:	Hydraulic
Number and type of cylinders:	One, single acting,
Type of linkage lock for transport:	Hydraulic
Relief valve pressure setting:	20.5 - 24.0 MPa
Opening pressure of cylinder safety valve:	None fitted
Main lift pump type:	4-cylinder piston
Transmission between pump and engine:	Driven from pto shaft, independent of main clutch
Make and number of filters:	Own make metal mesh strainer
Time between oil changes:	1000 hours
Time between filter changes:	Clean mesh every 1000 hours
Oil capacity:	47.4 l
Site of oil reservoir:	Main transmission housing
Type and number of tapping points:	One on centre housing top cover, a valve allows flow to spool valves and quick release couplings when selected
Maximum volume of oil available to external cylinders:	18 l
Recommended oil	See "Fuels and lubricants used in tests"

AUXILIARY HYDRAULIC SYSTEM

Make:	Bosch
Relief valve pressure setting:	17.0 - 20.6 MPa
Pump type:	Gear
Transmission between pump and engine:	Driven in tandem with steering pump from engine timing gears
Make and number of filters:	Parker Hannifin replacement canister and mesh strainer
Time between oil changes:	1000 hours
Time between filter changes:	250 hours, clean strainer 1000 hours
Oil capacity:	47.4 l
Site of oil reservoir:	Main transmission housing
Type and number of tapping points:	2 quick release couplings via 2 spool valves with separate returns to ISO standard. A valve allows combination of main and auxiliary systems up to auxiliary system relief valve pressure
Maximum volume of oil available to external cylinders:	18 l
Recommended oil	See "Fuels and lubricants used in tests"

THREE POINT LINKAGE

Category:	2, to ISO standard 730/1
Category adaptor:	None
Controls	Draught or position control, top link sensing

Linkage dimensions for the lifting test

		Compulsory test	Supplementary test
Rear tyres: (size 16.9-30) radius index:	(r)	695 mm	695 mm
Front tyres: (size 7.50-16) loaded radius:	(r')	360 mm	360 mm
Length of lift arms:	(A)	267 mm	267 mm
Length of lower links:	(B)	965 mm	965 mm
Distance of lift arm pivot point from rear wheel centre line:	horizontally: vertically:	(a) (b)	196 mm 233 mm
Horizontal distance between the two lower link points:	(u)	492 mm	492 mm
Horizontal distance between the two lift arm end points:	(v)	534 mm	534 mm
Length of upper link:	(S)	753 mm	753 mm
Distance of upper link pivot point from rear wheel centre line:	horizontally: vertically:	(c) (d)	186 mm 205 mm
Distance of lower link pivot point from rear wheel centre:	horizontally: vertically:	(e) (f)	32 mm forward 212 mm
Distance of lower link points to lift rod pivot points on lower link centre line:	horizontal: vertical:	(D) (E)	504 mm 21 mm
Length of lift rods:	(L)	680 mm	668 mm
Height of lower hitch points relative to the rear wheel centre line, situated 695 mm above the ground level			
- in low position:	(h)	495 mm	468 mm
- in high position:	(H)	191 mm	200 mm
Height of lower hitch points when locked in transport position:		Any height within lift range	

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SWINGING DRAWBAR

Tyre sizes	Front:	7.50-16
	Rear:	16.9-30
Height above ground, maximum:		498 mm
	minimum:	352 mm
Type of adjustment:		Inverting drawbar and clevis
Distance of hitch point from rear axle centre:		650 mm and 700 mm
Distance of hitch point from power take-off shaft ends:		
vertically:		78 mm to 224 mm
horizontally:		356 mm and 406 mm
Lateral adjustment:		510 mm and 542 mm
Distance of pivot point from rear axles horizontally:		130 mm forward
Diameter drawbar pin hole:		25.4 mm

FRONT TOWING HITCH

Vertical height to centre of clevis:	605 mm
Width of clevis:	63 mm
Diameter of pin hole:	33 mm

STEERING

Method of operation:	Hydrostatic system with hand operated steering motor powered from engine mounted gear pump operating a ram integral with track rod
Pump:	Bosch gear type, in tandem with auxiliary hydraulic system pump
Motor:	Danfoss OSPC-ON
Oil cooler:	Mounted to front of radiator
Ram	Massey-Ferguson double acting, integral with track rod
Working pressure:	17 MPa
Oil capacity:	47.4 l
Oil change period:	1000 hours
Make and model of filter:	Parker Hannifin replaceable canister and metal strainer
Filter(s) change period:	250 hours
Recommended oil:	See "Fuels and lubricants used in tests"

BRAKES**Service brake**

Make:	Girling
Type:	Oil immersed multi-plate discs, 4 per side
Method of operation:	Independent or combined pedal, hydraulic actuation
Trailer braking take-off:	None fitted

Parking brake

Type:	Mechanical by cable connected to both service brakes
Method of operation:	Hand lever with ratchet

STEERING WHEELS

Number:	2
Location:	At front
Tyres:	Goodyear Super Rib Tractor
Size:	7.50-16
Ply rating:	6
Type of casing:	Cross-ply
Maximum permissible load on each tyre:	745 kg
Corresponding inflation pressure:	280 kPa
Track widths:	1247 mm by 102 mm steps to 1857 mm
Method of adjustment:	Extending axle

DRIVING WHEELS

Number:	2
Location:	At rear
Tyres:	Goodyear Dyna Torque
Size:	16.9-30
Ply rating:	6
Type of casing:	Crossply
Maximum permissible load on each tyre:	1900 kg
Corresponding inflation pressure:	130 kPa
Track widths:	1500 mm by 102 mm steps to 2112 mm
Method of adjustment:	Power assisted variable track

WHEELBASE

2136 mm

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PROTECTIVE STRUCTURE SPECIFICATION

OECD approval number: CSS 052/6

Trade name and model: Massey Ferguson 300H

Manufacturer: Massey-Ferguson Manufacturing Ltd

Description: A two-post folding ROPS of steel welded and bolted construction to the rear of the operator's seat, bolted to the rear axle casings.

DRIVER'S SEAT

Make: Grammer DS44

Type of suspension: Spring

Type of damping: Hydraulic

Range of adjustment, longitudinal: 150 mm

vertical: 60 mm

LIGHTING

Unrestricted beam angle of head light in plan view 110°

Tyres: front 7.50-16: rear 16.9-30

	Height above ground of centre, mm	Size, mm	Distance from out- side edge of tractor to centre, at 1500 mm track width, mm
Headlights,	1098	100 x 160	825
Front work lights	1590	100 x 160	256
Rear lights,	1545	73 x 50	438
Mudguard reflectors,	1545	46 x 46	381
Rear axle reflectors	658	80 dia	518

CONDITIONS DURING TESTOverall dimensions

(front: 7.50-16 rear: 16.9-30 tyres fitted)

Length, m	Width,		Height at top of, Protective structure, m	Height at top of, steering wheel, m
	min. m	max. m		
3.64	1.94	2.55	2.48	1.71

Ground clearance

Clearance: 311 mm limited by drawbar clevis in lowest position

Track setting

Front: 1350 mm
Rear: 1500 mm

Tractor mass

(without driver but with tanks full, ROPS fitted)

Front, kg	Rear, kg	Total, kg
1124	1863	2987

Fuel and lubricants used in testsFuel

Type: Diesel oil to Class D British Standard 2869:1970 specific gravity 0.8345 at 15°C, Cetane index 53.5

<u>Oils</u>	<u>Recommended</u>	<u>Used during test</u>
Engine		
Type:	SAE 15W/30	
Viscosity:	54cSt at 50°C	As recommended
Classification:	MIL-L-2104-C	
Transmission, final drives, steering and hydraulics		
Type:	SAE 15W/30	
Viscosity:	54 cSt at 50°C	As recommended
Classification:	MIL-L-2104-C	
Hydraulic brakes		
Type:	Mineral	
Viscosity:	7.2 cSt at 50°C	As recommended
Classification::	M-F CMS 1151A	
Recommended grease:	Consistency 2 lithium	As recommended
Number of lubrication points:	13	

II. TEST RESULTSA. COMPULSORY TESTS1. MAIN POWER TAKE-OFF PERFORMANCE

Date of tests: 29th April 1987,

Type of dynamometer: Water brake, Heenan & Froude

Power, kW	Speed, rev/min		Fuel consumption,			Specific energy, kWh/1
	Engine	P.t.o.	Hourly, 1/h	kg/h	Specific, kg/kWh	
MAXIMUM POWER - 2 HOUR TEST						
43.3	2200	627	14.39	12.01	0.277	3.01
POWER AT RATED ENGINE SPEED						
43.3	2200	627	14.39	12.01	0.277	3.01
POWER AT STANDARD POWER TAKE-OFF SPEED						
40.9	1893	540	12.81	10.69	0.261	3.20
PART LOADS						
(1) The torque corresponding to maximum power at rated engine speed						
43.3	2200	627	14.39	12.01	0.277	3.01
(2) 85% of the torque obtained in (1)						
37.8	2273	648	13.09	10.92	0.289	2.89
(3) 75% of the torque defined in (2)						
29.0	2302	657	11.13	9.29	0.320	2.61
(4) 50% of the torque defined in (2)						
19.6	2335	666	9.28	7.74	0.395	2.11
(5) 25% of the torque defined in (2)						
9.8	2354	671	7.35	6.13	0.626	1.33
(6) Unloaded						
0	2405	686	5.60	4.67	-	-

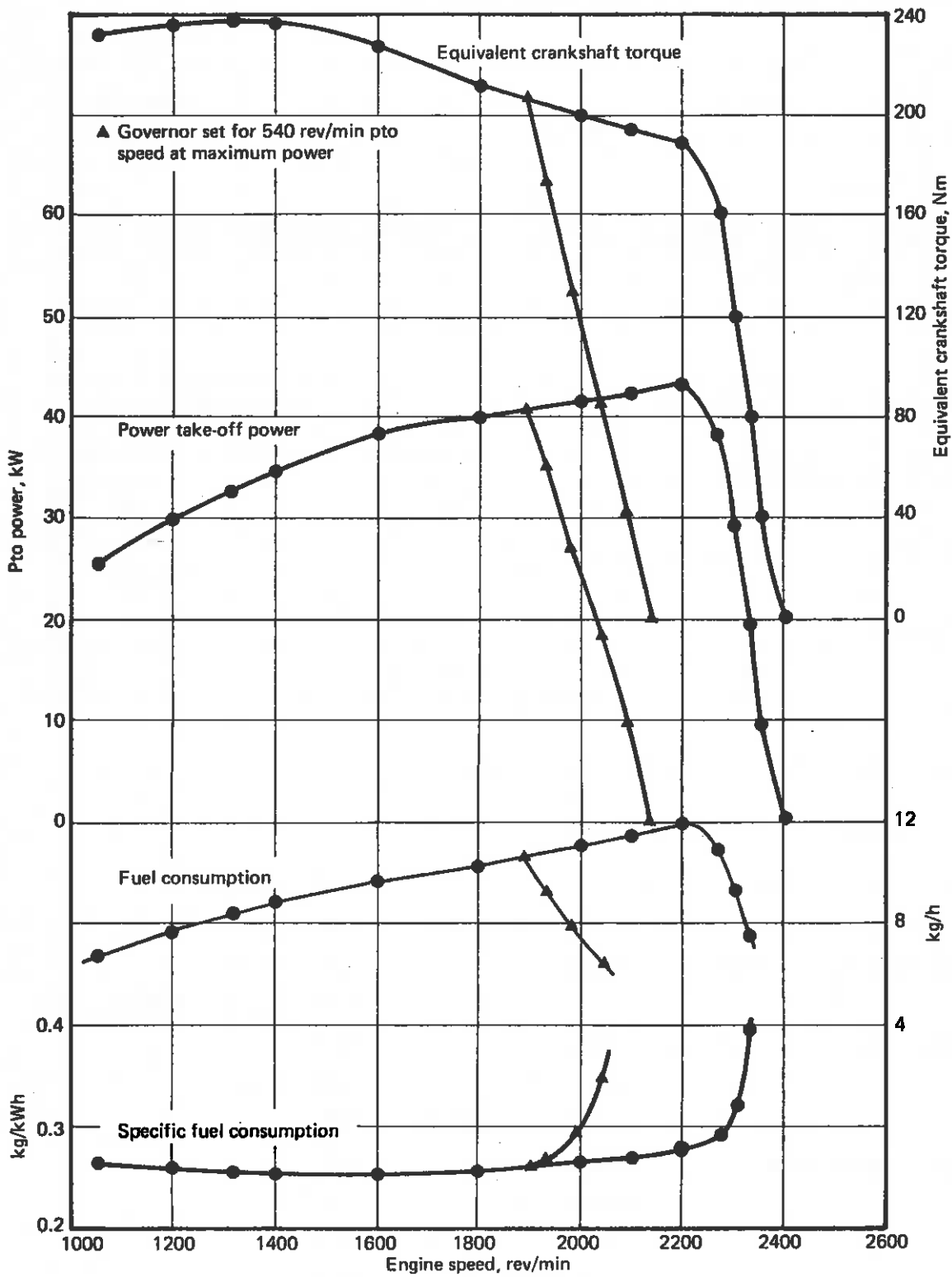
Part loads, the governor hand lever in the position corresponding to the standard p.t.o. speed at full load (540 rev/min).

Power, kW	Speed, rev/min		Fuel consumption,			Specific energy, kWh/l
	Engine	P.t.o.	Hourly, l/h	kg/h	Specific, kg/kWh	
(1) The torque corresponding to maximum power at standard pto speed						
40.9	1893	540	12.81	10.69	0.261	3.20
(2) 85% of the torque obtained at maximum power						
35.0	1935	552	11.23	9.37	0.268	3.11
(3) 75% of the torque defined in (2)						
26.9	1987	567	9.38	7.83	0.291	2.87
(4) 50% of the torque defined in (2)						
18.4	2044	583	7.70	6.43	0.349	2.39
(5) 25% of the torque defined in (2)						
9.5	2095	597	6.00	5.01	0.527	1.58
(6) Unloaded						
0	2139	610	4.37	3.65	-	-

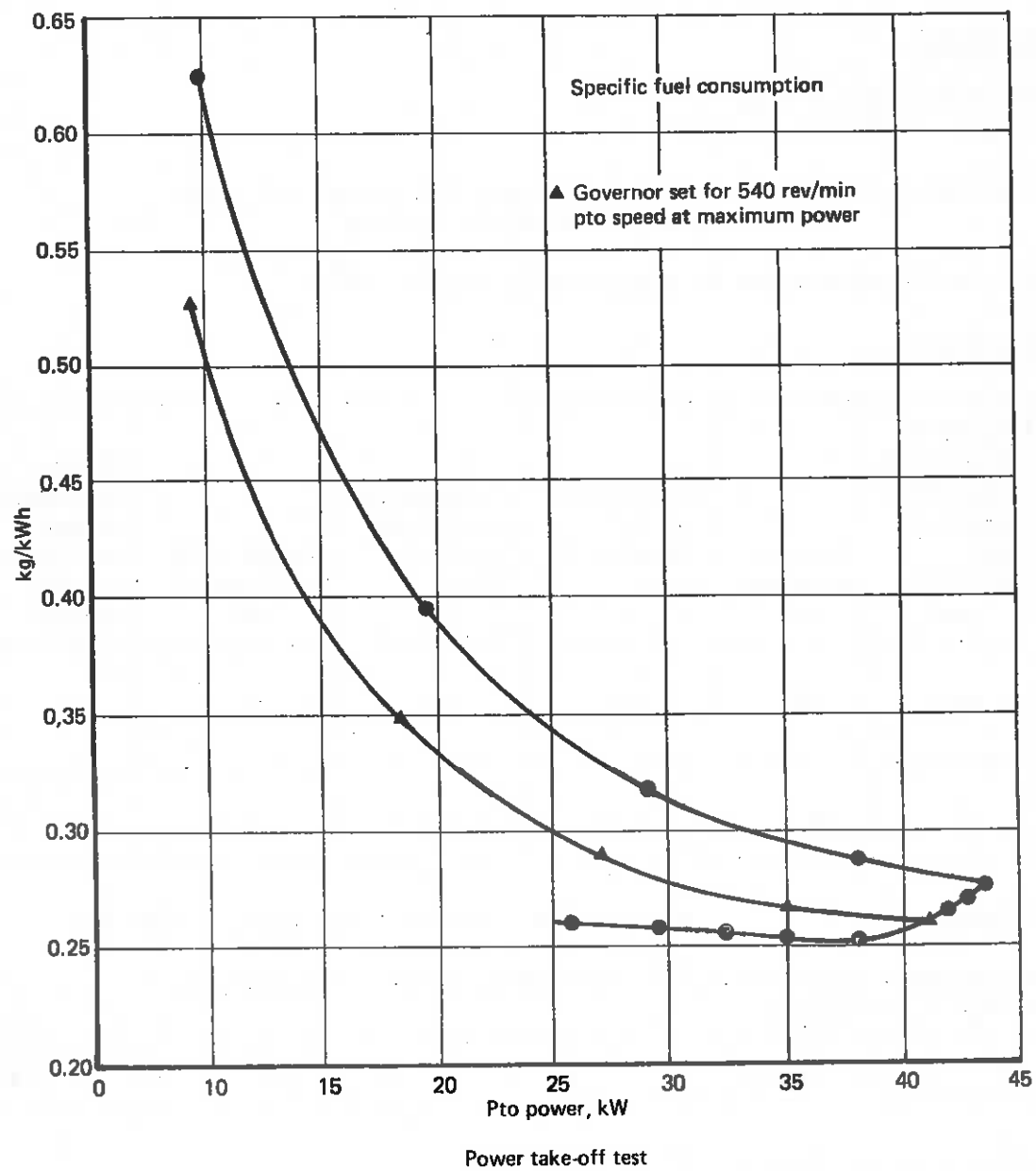
Standard specific fuel consumption, kg/kWh

(a) 0.289 (c) 0.268
(b) 0.395 (d) 0.349

No load, maximum engine speed	2405 rev/min
Equivalent crankshaft torque at maximum power	188.0 Nm
Maximum equivalent crankshaft torque	237.0 Nm at
	1320 rev/min engine speed
Mean atmospheric conditions	temperature 26°C
	pressure 1016 m bar
	relative humidity 59%
Maximum temperature	coolant 83°C
	engine oil 112°C
	fuel 51°C
	air intake 27°C



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2. LIFTING FORCE AND HYDRAULIC POWER (without auxiliary system in operation)

Date of tests: 27th April 1987

Hydraulic fluid

Make and type: SAE 15W/30

Viscosity: 54 cSt at 50°C

Type of hydraulic system: Piston type pump delivering oil from
main transmission housing

Hydraulic fluid temperature at beginning of test: 60°C

Power lift test

	Height of lower hitch point above ground in down position, mm	Vertical movement, mm	Maximum force exerted through full range, kN	Corresponding pressure of hydraulic fluid, MPa	Moment about rear axle, kNm	Maximum tilt angle of mast over range of lift, degrees
At the hitch point	200	686	19.5	20.5	18.2	-
On the frame	200	791	18.9	20.5	29.2	11

Main linkage dimensions - see drawings and table on pages 9 and 10

Lifting heights relative to the horizontal plane including the
lower link pivot points

mm	-287	-283	-150	-50	0	100	250	361	435
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Lifting forces at hitch points
(corresponding pressure 20.5 MPa)

kN	-	19.5	21.3	22.4	23.1	23.9	25.0	25.9	-
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Lifting forces at test frame
(corresponding pressure 20.5 MPa)

kN	18.9	18.9	20.1	20.5	20.6	20.5	20.5	20.0	19.4
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Hydraulic power test

Sustained pressure with relief valve open 23.8 MPa

Pump delivery rate at minimum pressure 33.1 l/min

Flow rate corresponding to a hydraulic pressure equivalent to 90 per cent of the actual relief valve pressure setting and corresponding hydraulic power

Flow rate 28.0 l/min

Pressure 21.4 MPa

Power 10.0 kW

Flow rate and hydraulic pressure corresponding to maximum hydraulic power

Flow rate 30.2 l/min

Pressure 20.5 MPa

Power 10.3 kW

Tapping point used for test: Auxiliary service connection fitted for test only

Temperature of hydraulic fluid, if different from $65^{\circ} \pm 5^{\circ}\text{C}$ Not applicable

Opening pressure of the unloading valve Not applicable

Closing pressure of the unloading valve Not applicable

3. MAXIMUM DRAMBAR POWER, TRANSMISSION AND FUEL CONSUMPTION CHARACTERISTICS

Date of tests: 19th May 1987
 Type of track: Concrete
 Height of drambar above ground: 480 mm
 Tyre size and pressure:
 Front: 7.50-16 179 kPa
 Rear: 16.9-30 83 kPa

Gear	Speed, km/h	Power, kW	Drawbar pull, kN	Engine speed, rev/min	Wheel-slip, %	Specific fuel consumption,		Temperature, °C		Atmospheric conditions			
						kg/kWh	kWh/l	Fuel	Coolant	Engine oil	Temperature, °C	Relative humidity, %	Pressure, m bar
(1) MAXIMUM DRAWBAR POWER IN GEARS													
2L	3.29	20.4	22.3	2300	15.0	0.452	1.85	39	82	106	14	65	1010
3LM	4.71	29.2	22.3	2274	15.0	0.392	2.13	41	83	106	15	61	1010
3L	5.98	33.9	20.4	2206	12.4	0.364	2.29	44	86	103	14	65	1010
11M	7.20	35.6	17.8	2201	9.9	0.351	2.38	44	85	106	12	82	1010
11H	9.39	36.0	13.8	2206	7.2	0.347	2.40	38	84	102	12	73	1010
21M	11.31	35.8	11.4	2206	5.7	0.344	2.43	44	77	106	12	84	1010
(2a) TRANSMISSION AND FUEL CONSUMPTION CHARACTERISTICS													
(1) SELECTED GEAR (Speed closest to 7.5 km/h)													
11M	7.20	35.6	17.8	2201	9.9	0.351	2.38	44	85	106	12	82	1010
(11) 75% OF PULL AT MAXIMUM POWER													
11M	7.79	29.0	13.4	2291	7.0	0.367	2.27	41	82	103	11	98	1010
(111) 50% OF PULL AT MAXIMUM POWER													
11M	8.01	19.8	8.9	2304	4.4	0.438	1.91	38	82	101	9	95	1010
HIGHEST GEAR SAME PULL AS IN (11) REDUCED ENGINE SPEED													
21M	7.82	29.1	13.4	1526	7.0	0.296	2.82	40	84	93	13	91	1010
HIGHEST GEAR SAME PULL AS IN (111) REDUCED ENGINE SPEED													
21M	8.01	19.8	8.9	1533	4.4	0.319	2.62	41	82	93	13	96	1010
(2b) TRANSMISSION AND FUEL CONSUMPTION CHARACTERISTICS													
(1) SELECTED GEAR (Maximum power)													
11H	9.39	36.0	13.8	2206	7.2	0.347	2.40	38	84	102	12	73	1010
(11) 75% OF PULL AT MAXIMUM POWER													
11H	10.00	28.9	10.4	2291	5.2	0.367	2.27	39	82	98	11	91	1010
(111) 50% OF PULL AT MAXIMUM POWER													
11H	10.38	19.9	6.9	2301	3.4	0.456	1.83	37	82	97	11	96	1010
HIGHEST GEAR SAME PULL AS IN (11) REDUCED ENGINE SPEED													
21H	10.00	28.6	10.3	1525	5.2	0.298	2.80	40	83	97	13	93	1010
HIGHEST GEAR SAME PULL AS IN (111) REDUCED ENGINE SPEED													
21H	10.18	19.8	7.0	1530	3.4	0.321	2.60	40	86	95	13	94	1010

B. OPTIONAL TESTS**1. LOCATION OF CENTRE OF GRAVITY**

Height above ground, mm	751
Distance forward from the vertical plane containing the axis of the rear wheels, mm	785
Distance from the median plane of the tractor, mm	0

2. NOISE MEASUREMENT AT THE DRIVER'S EAR

Date of tests: 19th May 1987
 Type of sound level meter: Bruel and Kjaer 2209
 Type of track: Concrete
 Cab fitted: Roll bar

Results of tests:

Gear	Drawbar pull at which the tractor develops maximum sound level, kN	Measured travelling speed, km/h	Sound level, dBA
*1HM	8	8.0	96
1HM	Light load	8.5	96
2HM	10	12.0	98
3H	Light load	29.5	96

* The 1HM gear corresponds to the nominal travelling speed nearest to 7.5 km/h

3. MEASUREMENT OF EXTERNAL NOISE LEVEL

Date of tests: 20th May 1987
 Type of sound level meter: Bruel and Kjaer 2209
 Type of track: Concrete

Results of tests

Gear: 3H
 Travelling speed before acceleration: 22.1 km/h
 Sound level: 89 dBA

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B. SUPPLEMENTARY TESTS**Lifting force** (Without auxiliary system in operation)

Linkage set in accordance with the manufacturers recommendations for general use.

Date of tests: 29th May 1987

Hydraulic fluid

Make and type: SAE 15w/30

Viscosity: 54 cSt at 50°C

Type of hydraulic system: Piston type pump delivering oil from main transmission housing

Hydraulic fluid temperature at beginning of test: 60°C

Power lift test

	Height of lower hitch point above ground in down position, mm	Vertical movement, mm	Maximum force exerted through full range, kN	Corresponding pressure of hydraulic fluid, MPa	Moment about rear axle, kNm	Maximum tilt angle of mast over range of lift, degrees
At the hitch point	227	668	20.7	20.5	19.3	-
On the frame	227	779	19.4	20.5	29.9	12

Main linkage dimensions - see drawings and table on pages 9 and 10

Lifting heights relative to the horizontal plane including the lower link pivot points

mm	-256	-200	-150	-50	0	100	250	365	470
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Lifting forces at hitch points
(corresponding pressure 20.5 MPa)

kN	20.7	21.6	22.2	23.2	23.6	24.5	25.6	27.1	-
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Lifting forces at test frame
(corresponding pressure 20.5 MPa)

kN	19.8	20.1	20.2	20.6	20.7	20.8	20.5	20.0	19.4
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REPAIRS AND ADJUSTMENTS DURING TESTS: None

REMARKS: None

Test carried out at AFRC Engineering by: M. Osborne, P.C. Seward

Officer in charge: P.C. Seward

Signed:

P.C. Seward

Head of Testing Group

R.M. Stanger

for the Director

Date:

5th August 1987.

