AFRC Institute of ENGINEERING RESEARCH

OECD Approval No. 1258 Restricted Code

Approval Date 2 May 1990

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

Massey-Ferguson 362 Four-Wheel Drive Tractor with 8-speed Transmission



Manufacturered by	Massey-Ferguson Manufacturing Limited Banner Lane Coventry Warwickshire CV4 9GF
Test No.	R89/71045/OECD
Report No.	739
Date	January 1990

THE BRITISH SOCIETY FOR RESEARCH IN AGRICULTURAL ENGINEERING

AFRC Institute of Engineering Research
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- Tractor manufacturer's name and address:	Massey-Ferguson Manufacturing Ltd., Banner Lane, Coventry, Warwicks. CV4 9GF
- Location of tractor assembly:	Coventry
- Submitted for test by:	The manufacturer
- Selected for test by:	The manufacturer with the agreement of the testing station
- Place of running in:	Coventry
- Duration of running in:	44 hours
- Location of test:	AFRC Engineering, Silsoe

I. SPECIFICATION OF TRACTOR

TRACTOR

- Make:	Massey-Ferguson
- Model:	M-F362 with 8-speed transmission
- Type:	Four-wheel drive, unit construction
- Serial No:	5727 N 36194
- 1st Serial No:	5727 N 38118

ENGINE

- Make:	Perkins
- Model:	A4.236
- Type:	4-stroke, direct injection diesel
- Serial No:	LD31190 U301623T

Cylinders

- Number/disposition:	4, vertical, in-line
- Bore/stroke:	98.5 mm/127.0 mm
- Capacity:	3870 cm^3
- Compression ratio:	16:1
- Arrangement of valves:	Overhead
- Cylinder liners:	Dry

Supercharging

- Make:	)
- Model:	)
- Type:	) None
- Pressure:	)

Fuel system	
- Fuel feed system:	ISMA mechanical feed pump
- Make, type and model of fuel filter:	C.A.V. paper element filter with transparent sediment bowl
- Capacity of fuel tank:	77 l
- Make, type and model of injection pump:	C.A.V, DPAV 3340F000, Distributor
-Serial Number:	B95001
- Manufacturer's production setting of injection pump:	
. Flow rate:	12.0-12.9 l/h at 2000 rev/min engine speed at full load on 40°C pump inlet temperature
. Timing:	Delivery starts 23° before T.D.C., static
- Make, type and model of injectors:	C.A.V. 4-HOLE, BDLL150S6705
- Injection pressure:	17.1 MPa
Governor	
- Make:	C.A.V.
- Model:	Not applicable
- Type:	Mechanical incorporated in injection pump
- Governed range of engine speed:	750 to 2310 rev/min
- Rated engine speed:	2200 rev/min
Air cleaner	
- Pre-cleaner:	
. Make:	None
. Type:	Not Applicable
. Model:	Visibowl
. Location of air intake:	Not Applicable
- Main cleaner:	
. Make:	Donaldson
. Type:	2 stage, dry paper element
. Model:	FL6-06
. Location of air intake:	Under bonnet in front of radiator
- Maintenance indicator:	Warning light on instrument panel

Lubrication system	
- Type of feed pump:	Forced feed from gear pump
- Type of filter:	Full flow replacement element
- Number:	1
Cooling system	
- Type of coolant:	Water or water and antifreeze solution
- Type of pump:	Centrifugal
- Specification of fan:	Belt driven puller
- Number of fan blades:	6
- Fan diameter:	394 mm
- Coolant capacity:	10.0 l
- Type of temperature control:	Thermostat
- Superpressure system:	69 kPa
Starting system	
- Make:	Lucas
- Model:	M127
- Type:	Electrical, pre-engaged, solenoid operated
- Starter motor power rating:	12V, 2.8 kW
- Cold starting aid:	Lucas, C.A.V. Thermostart
- Safety device:	Operable only when high/low range and pto selectors are in neutral position
Electrical system	
- Voltage:	12
- Generator:	Alternator
. Make:	Valeo
. Model:	E0439C
. Type:	Belt driven
. Power:	0.54 kW
- Batteries:	1 M-F Powerpart, lead acid maintenance free
. Rating:	570 CCA rating each or equivalent 105 Ah at 20-hour rating
Exhaust system	
- Make:	Nelson Burgess
- Model:	MF70
- Type:	Spark round baffle silencer
- Location:	Vertical stack pipe on right hand side
- Height of outlet above ground:	2475 mm

TRANSMISSION TO WHEELS

Clutch

- Make:	Laycock
- Model:	None
- Type:	Dry for transmission only
- Number of plates:	1
- Diameter of plates:	305 mm
- Method of operation:	Mechanically by pedal

Gear box

- Make:	M-F
- Model:	None
- Type:	Mechanical manual operation, 4 forward combinations and 1 reverse with manually operated high/low range
- Number of gears:	8 forward, 2 reverse
- Available options:	None

Rear axle and final drives

- Make:	Own make
- Model:	None
- Type:	Crown wheel and pinion with outboard epicyclic reduction gear final drives
- Differential lock:	
. Type:	Mechanical dog clutch on differential gears
. Method of engagement:	Pedal operated
. Method of disengagement:	Pedal operated

Front axle and final drives

- Make:	M-F
- Model:	None
- Type:	Crown wheel and pinion with differential and outboard epicyclic reduction gear final drives
- Differential lock:	
. Type:	Mechanical dog clutch on differential gears
. Method of engagement:	Hydraulically actuated in unison with rear differential in response to electrical signal from diff-lock pedal
. Method of disengagement:	Reverse of above

Total ratios and travelling speeds

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	L	235.97	2.25
2	L	160.89	3.30
3	L	87.76	6.05
4	L	71.51	7.42
1	H	58.99	9.00
2	H	40.22	13.20
3	H	21.94	24.19
4	H	17.88	29.69
Reverse			
1R	L	173.28	3.06
2R	H	43.32	12.25

L = Low range H = High range

(*) Calculated with a tyre dynamic radius index of 640 mm (ISO 4251/1-1984)

Number of revolutions of front wheels for one revolution of rear wheels: 1.374:1

POWER TAKE-OFF

Main power take-off

- Type: Independent
- Method of engagement: By hand lever hydraulically engaging multi-plate clutch
- Number of shafts: 1
- Method of changing power take-off speeds: Not Applicable

Clutch

- Make: Own make
- Model: None
- Type: Hydraulically actuated wet multiplate
- Number of plates: 7
- Diameter of plates: 136mm

Power take-off proportional to engine speed

540 rev/min

- Location:	At rear of tractor
- Diameter of power take off shaft:	34.9 mm
- Number of splines:	6 to ISO 500
- Height above ground:	505 mm
- Distance from the median plane of the tractor:	Central
- Distance behind rear-wheel axis:	296 mm
- PTO speed at rated engine speed:	679 rev/min
- Engine speed at standard power take-off speed:	1789 rev/min
- Ratio of rotation speeds:	3.3125:1
- Power restriction and maximum torque:	48 kW (ISO recommendation)
- Direction of rotation (viewed from behind tractor):	Clockwise

1000 rev/min (not fitted for test)

- Location:	N/A
- Diameter of power take-off shaft:	N/A
- Number of splines:	N/A
- Height above ground:	N/A
- Distance from the median plane of the tractor:	N/A
- Distance behind rear-wheel axis:	N/A
- PTO speed at rated engine speed:	N/A
- Engine speed at standard power take-off speed:	N/A
- Ratio of rotation speeds:	N/A
- Direction of rotation (viewed from behind tractor):	N/A

POWER LIFT

- Make:	Massey-Ferguson
- Model:	None
- Type:	Hydraulic, open centre with inlet suction control
- Type and number of cylinders:	1, single acting, internal
- Type of linkage lock for transport:	Hydraulic
- Relief valve pressure setting:	20.0-23.5 MPa
- Opening pressure of cylinder safety valve:	None fitted
- Lift pump type:	4 cylinder, piston
- Transmission between pump and engine:	Driven from PTO shaft independent of main clutch
- Type and number of filters:	Full flow with metal mesh strainer, 1
- Site of oil reservoir:	Transmission housing
- Type, number and location of tapping points:	One on centre housing, top cover, a valve allows flow to spool valves and quick release couplings
- Maximum volume of oil available to external cylinders:	18.0 l

AUXILIARY HYDRAULIC SYSTEM

- Make:	Bosch
- Model:	None
- Type:	Gear
- Relief valve pressure setting:	17.0-20.6 MPa
- Lift pump type:	Gear
- Transmission between pump and engine:	Engine mounted in tandem with steering pump
- Type and number of filters:	Metal mesh strainer and Parker Hannifin replaceable canister in shared circuit with steering system
- Site of oil reservoir:	Main transmission housing
- Type and number of tapping points:	2 quick release couplings to each of 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:	18.0 l

Three-point linkage

- Category:	1 or 2 to ISO standard 730/1-1977
- Category adaptor:	Replaceable ball ends
- Controls:	Draught or position control, top link sensing

LIFT TEST

Linkage geometry

Figure 2.1

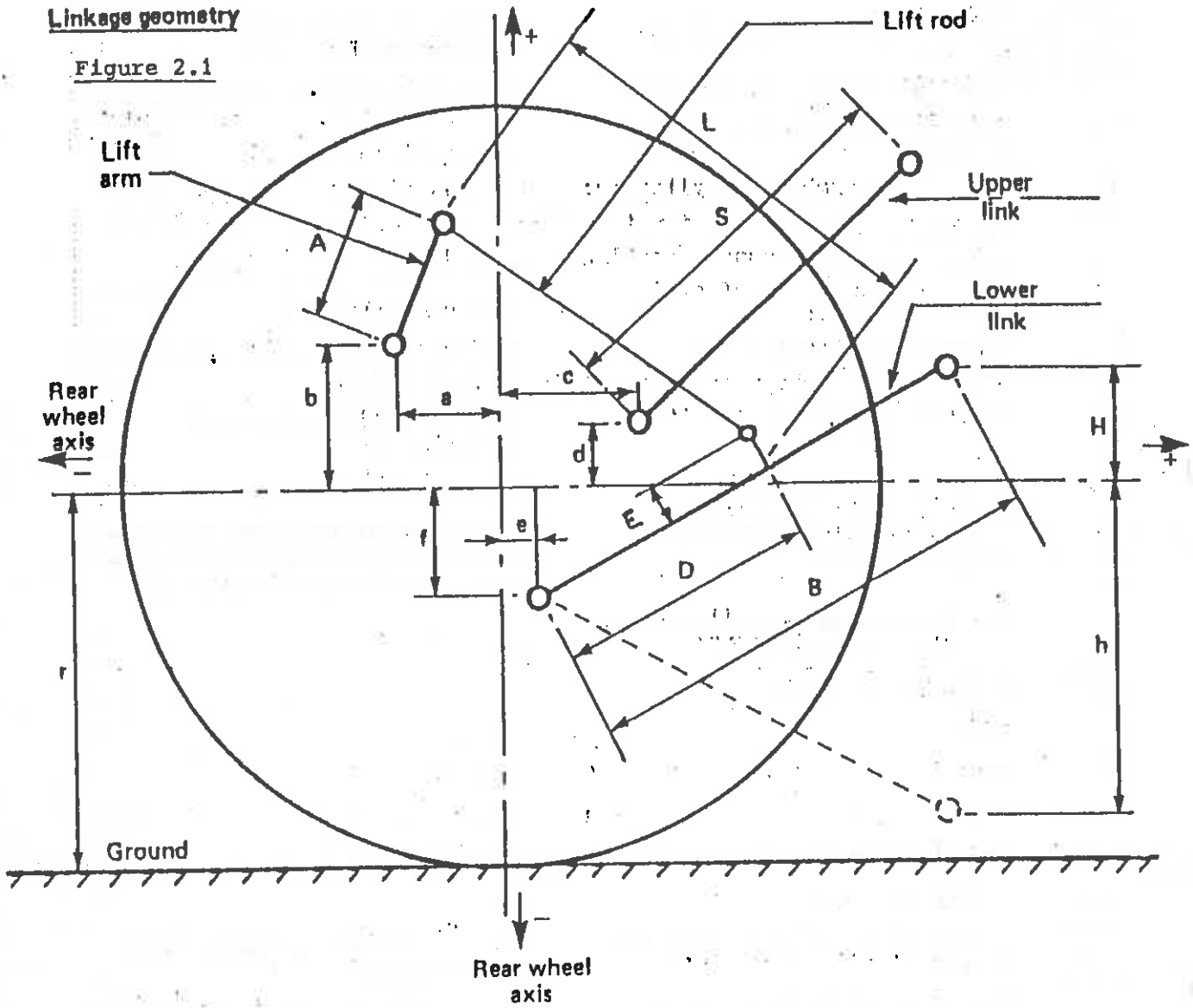


Figure 2.2

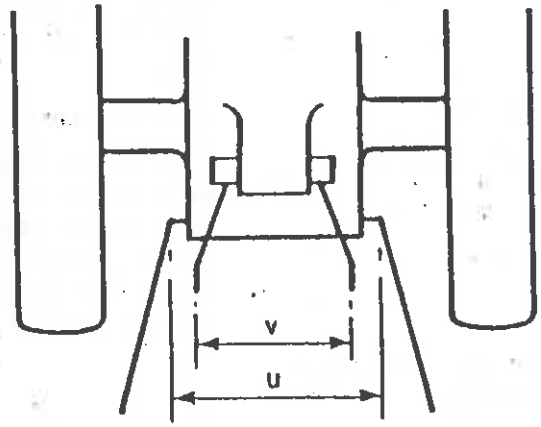


Table 2.1

Dimensions of linkage when attached to the standard frame (ISO 730/3-1982 CAT 2)

			Dimensions or range	Setting used in test
Length of lift arms:		(A)	267 mm	267 mm
Length of lower links:		(B)	885 mm	885 mm
Distance of lift arm pivot point from rear wheel centre line:	horizontally:	(a)	196 mm	196 mm
	vertically:	(b)	233 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)	609 to 762 mm	673 mm
Distance of upper link pivot point from rear wheel centre line	horizontally:	(c)	186,200,216 mm	186 mm
	vertical:	(d)	205,171,132 mm	205 mm
Distance of lower link pivot point from rear wheel centre	horizontally:	(e)	32 mm forward	32 mm
	vertically:	(f)	212 mm	212 mm
Distance of lower link points to lift rod pivot points on lower link centre line:	horizontal:	(D)	428 mm	428 mm
	vertically:	(E)	0 mm	0 mm
Length of lift rods:		(L)	574 to 623 mm	605 mm
Height of lower hitch points relative to the rear wheel centre line, situated 695 mm above the ground level:				
- in low position:		(h)	515 to 363 mm	??? mm
- in high position:		(H)	195 to 285 mm	??? mm
Height of lower hitch points when locked in transport position:			Any height within lift range	

*Assuming r = tyre dynamic radius index of 640 mm to ISO 4251/1-1984

SWINGING DRAWBAR

- Type:		Clevis
- Height above ground,	maximum:	448 mm
	minimum:	243 mm
- Type of adjustment:		Inverting cranked drawbar and clevis
- Distance of hitch point from rear-wheel axis, horizontally:		652 mm and 702 mm
- Distance of hitch point from power take-off shaft ends:		
. Vertically:		57 mm and 256 mm
. Horizontally:		356 mm and 406 mm
- Lateral adjustment centre of clevis:		
. Right-hand:		259 mm drawbar in 266 mm out
. Left-hand:		259 mm drawbar in 266 mm out
- Distance of pivot point from rear axles horizontally:		132 mm forward
- Width of clevis:		65 mm
- Diameter of drawbar pin hole:		25 mm
- Maximum vertical permissible load:		11.56 kN

TRAILER HITCH

- Type:	Not fitted
- Hole diameter:	N/A
- Height above ground:	N/A
- Distance of hitch points from rear wheel axis, horizontally:	N/A
- Distance of hitch point from power take-off shaft end:	
. Vertically:	N/A
. Horizontally:	N/A
- Maximum vertical permissible load:	N/A

LINKAGE DRAWBAR

- Type:	Not fitted
- Height above ground:	
. Minimum:	N/A
. Maximum:	N/A
- Horizontal distance to power take-off shaft end:	N/A
- Number of holes:	N/A
- Distance between holes:	N/A
- Hole diameter:	N/A
- Thickness and width of drawbar:	N/A

FRONT TOWING HITCH

- Type:	Clevis in front weight frame
- Vertical height to centre of clevis:	619 mm
- Width of clevis:	63 mm
- Diameter of pin hole:	33 mm

STEERING

- Make:	Own make
- Model:	None
- Type:	Hydrostatic
- Method of operation:	
. Pump:	Bosch gear type mounted on engine in tandem with auxiliary hydraulic system pump
. Motor:	Danfoss OSPC-ON
. Ram:	1 double acting on steering arm
. Filter:	1 replaceable canister in shared circuit with auxiliary hydraulics
- Working pressure:	14.0 MPa

BRAKES

Service brake

. Make:	Girling
. Model:	None
. Type:	Oil immersed multi-plate discs, 3 per side
- Method of operation:	Independent or combined pedal, hydraulic actuation
- Trailer braking take-off:	None fitted

Parking brake

- Type:	Mechanical via cable
- Method of operation:	Hand lever with ratchet

WHEELS

- Number:	4
. Front:	2 Steering and driving
. Rear:	2 Driving
- Wheelbase:	2209 mm

- Track width adjustment:

	Minimum, mm	Maximum, mm	Adjustment method
Front	1502	1502	None
Rear	1398	1908	Power assisted variable track

PROTECTIVE STRUCTURE

- Make: Massey-Ferguson
- Model: 300 H
- Type: ROPS
- Manufacturer's name and address: Massey-Ferguson Ltd. Banner Lane, Coventry
- Protective device:
  - . Rollguard: Two post folding ROPS
  - . Tiltable/Not tiltable: Tiltable
- OECD approval number: CSS 052/22

DRIVER'S SEAT

- Make/Model/Type: Grammer DS44/1H
- 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°

	Height above ground of centre, mm	Size mm	Distance from outside edge of lights to median plane of tractor mm
Headlights	1140	100 x 160	213
Front Worklights	1590	130 x 70	771
Rear lights	1480	65 x 50	575
Rear reflectors	1480	45 x 50	629
R.axle reflectors	602	80 dia.	490

II. TEST CONDITIONS

Overall dimensions

Length	Width		Height at top of	
	minimum	maximum	protective structure	exhaust silencer
mm	mm	mm	mm	mm
3.53	1.81	2.30	2.39	2.48

Ground clearance (unballasted tractor) 191 mm

- Clearance-limiting part: Drawbar clevis in lowest position

Tractor mass (with roll bar)

	Unballasted		Ballasted	
	Without driver kg	With driver kg	Without driver kg	With driver kg
Front	1155	1172	N/A	N/A
Rear	1647	1705	N/A	N/A
Total	2802	2877	N/A	N/A

Ballast

	Number of weights	Mass (total) kg	Water kg
Front	N/A	N/A	N/A
Rear	N/A	N/A	N/A
Additional front frame and weights	N/A	N/A	N/A

Dimensions of tracks

Tyres and track width specification

	Front	Rear
Tyres:		
. dimensions	11.2-20	14.9-28
. ply rating	8	6
. type	Cross ply	Radial
. maximum load (tyre manufacturer's), kg	1125	1610
. maximum load (tractor manufacturer's), kg	1125	1610
. inflation pressure (tyre manufacturer's)	220 kPa	140 kPa
. dynamic radius index	460 mm	640 mm
. Chosen track width	1502	1494

Oils and lubrication

Capacity and change interval

	Capacity	Oil change	Filter change
	l	h	h
Engine	7.5	250	250
Front axle	5.8	1000	N/A
Final drive (front)	2.8	1000	N/A
Gearbox	47.4	1000	250
Rear axle Final drives (rear) Hydraulic system Steering	Integral with gearbox		
Brakes	N/A	Top-up	N/A

Fuels and lubricants used in tests

Fuel

Type:	Diesel oil with Cetane index of 54.5 and kinematic viscosity of 2.9 cSt at 40°C within the specification limits of Class A2 British Standard 2869/1983	
Specific gravity:	0.8380 at 15°C	
Oils	Recommended	Used during test
Engine oil:		
Type:	SAE 15W/30	As recommended
Viscosity:	54 cSt at 50°C	
Classification	MIL-L-2104-C	
Transmission oils		
Type:	SAE 15W/30	As recommended
Viscosity:	54cSt at 50°C	
Classification:	MIL-L-2104-C	
Rear final drives:		
Type:	SAE 15W/30	As recommended
Viscosity:	54cSt at 50°C	
Classification:	MIL-L-2104-C	
Front differential and final drives:		
Type:	SAE 15w/30	As recommended
Viscosity:	54 cSt at 50°C	
Classification:	MIL-L-2104-C	
Hydraulic brakes:		
Type:	Mineral	As recommended
Viscosity:	7.2 cSt at 50°C	
Classification:	M-F CMS 1151A	
Hydraulic fluid:		
Type:	SAE 15W/30	As recommended
Viscosity:	54 cSt at 50°C	
Classification:	MIL-L-2104-C	
Steering oil:		
Type:	SAE 15W/30	As recommended
Viscosity:	54 cSt at 50°C	
Classification:	MIL-L-2104-C	
Recommended grease:	Consistency 2 lithium	As recommended
Number of lubrication points:	13	

III. TEST RESULTS

COMPULSORY TEST RESULTS

1. MAIN POWER TAKE-OFF

- Date and location of tests: 6th December 1989
AFRC Engineering, Wrest Park,
Silsoe, Bedford

- Type of dynamometer: Water brake, Heenan & Froude

Power	Speed		Fuel consumption		Specific energy
	Engine	P.T.O.	Hourly	Specific	
kW	rev/min		kg/h l/h	g/kWh	kWh/l
1.1 MAXIMUM POWER - TWO HOUR TEST					
41.1	2196	663	10.98 13.10	267	3.14
1.2 POWER AT RATED ENGINE SPEED					
41.1	2196	663	10.98 13.10	267	3.14
1.3 STANDARD POWER TAKE-OFF SPEED (540 ± 10 rev/min)					
38.6	1784	539	9.44 11.26	245	3.43
1.4 PART LOADS 1.4.1 the torque corresponding to maximum power at rated engine speed					
41.1	2196	663	10.98 13.10	267	3.14
1.4.2 85% of the torque defined in 1.4.1					
35.5	2233	674	9.81 11.70	276	3.03
1.4.3 75% of the torque defined in 1.4.2					
26.6	2241	676	8.16 9.74	306	2.73
1.4.4 50% of the torque defined in 1.4.2					
18.0	2243	677	6.59 7.86	366	2.29
1.4.5 25% of the torque defined in 1.4.2					
9.0	2255	681	5.16 6.16	574	1.46
1.4.6 Unloaded					
0	2282	689	3.83 4.57	-	-

Power	Speed		Fuel consumption			Specific energy
	Engine	P.T.O.	Hourly		Specific	
kW	rev/min		kg/h	l/h	g/kWh	kWh/l
1.5 PART LOADS AT STANDARD POWER TAKE-OFF SPEED (± 10 rev/min) 1.5.1 the torque corresponding to maximum power						
38.6	1784	539	9.44	11.26	244	3.43
1.5.2 85% of the torque obtained in 1.5.1						
33.4	1819	549	8.32	9.93	249	3.36
1.5.3 75% of the torque obtained in 1.5.2						
25.4	1840	556	6.84	8.16	269	3.11
1.5.4 50% of the torque obtained in 1.5.2						
17.0	1854	560	5.35	6.38	314	2.66
1.5.5 25% of the torque obtained in 1.5.2						
8.6	1876	566	3.97	4.74	462	1.81
1.5.6 unloaded						
0	1915	578	2.72	3.25	-	-

- No load, maximum engine speed: 2282 rev/min
- Torque (equivalent crankshaft) at maximum power: 179.0 Nm
- Maximum torque (equivalent crankshaft): 234.1 Nm
  (engine speed 1173 rev/min)
- Mean atmospheric conditions:
  - . Temperature: 18°C
  - . Pressure: 1031 m bar
  - . Relative humidity: 44%
- Maximum temperatures:
  - . Coolant: 86°C
  - . Engine oil: 112°C
  - . Fuel: 41°C
  - . Engine air intake: 21°C

2. HYDRAULIC POWER AND LIFTING FORCE

- Date of tests: 15th December 1989

2.1 HYDRAULIC POWER TEST

- Sustained pressure with relief valve open: 23.3 MPa
- Pump delivery rate at minimum pressure: 18.6 l/min

	Flow rate l/min	Pressure MPa	Power kW
Flow rate corresponding to a hydraulic pressure equivalent to 90% of the actual relief valve pressure setting and corresponding hydraulic power	17.4	21.0	6.1
Flow rate and hydraulic pressure corresponding to maximum hydraulic power	17.4	21.0	6.1

- Tapping point used for test: Auxilliary service connection
- Temperature of hydraulic fluid if different from 65 ± 5°C NA °C
- Opening pressure of the unloading valve NA MPa
- Closing pressure of the unloading valve NA MPa

2.2 POWER LIFT TEST

	at the hitch point	on the frame
Height of lower hitch points above ground in down position	200 mm	200 mm
Vertical movement	668 mm	818 mm
Maximum corrected force exerted through full range	19.1 kN	17.2 kN
Corresponding pressure of hydraulic fluid	21.0 MPa	21.0 MPa
Moment about rear-wheel axis	16.3 kNm	25.2 kNm
Maximum tilt angle of mast from vertical	NA degrees	17 degrees

- Linkage settings for test - see Table 2.1 and Figures 2.1 and 2.2

Lifting heights relative to the horizontal plane including the lower link pivot points											
mm	-258	-228	-150	-100	0	+100	+200	+300	+400	+440	+560
Lifting forces (the values measured are corrected to correspond to a hydraulic pressure equivalent to 90% of the actual relief valve pressure setting or to maximum power delivered by the hydraulic system, whichever is lower)											
at the hitch points kN	_	19.1	20.5	21.5	23.3	24.6	25.8	27.1	27.8	28.0	-
Corresponding pressure: 21.0 MPa											
at the frame Kn	18.1	18.2	18.8	19.2	19.6	19.7	19.5	18.9	18.2	18.0	17.2
Corresponding pressure: 21.0 MPa											

3. DRAWBAR POWER AND FUEL CONSUMPTION (UNBALLASTED TRACTOR)

Date of tests: 4th January 1990
Type of track: Concrete

Height of drawbar above ground	Tyre inflation pressure	
	Front	Rear
230 mm	110 kPa	100 kPa

Gear and Range	Power	Drawbar pull	Speed	Engine speed	Slip of wheels or tracks	Specific fuel consumption	Specific energy	Temperature		Atmospheric conditions			
								Fuel	Coolant	Engine Oil	Temperature	Relative humidity	Pressure
	kW	kN	km/h	rev/min	%	g/kWh	kWh/l	°C	°C	°C	°C	%	Bar
3.1 MAXIMUM POWER IN TESTED GEARS													
1L	13.1	24.7	1.91	2247	15.0	534	1.57	31	71	101	8	62	1018
2L	19.2	24.7	2.80	2238	15.0	435	1.93	33	71	102	8	60	1018
3L	31.5	21.8	5.20	2200	12.1	365	2.29	33	73	101	7	63	1018
4L	31.7	17.1	6.68	2203	8.6	364	2.30	32	74	94	7	64	1018
1H	32.9	14.3	8.27	2204	6.6	352	2.38	34	74	102	8	58	1018
2H	32.3	9.3	12.46	2204	3.6	359	2.34	34	73	103	8	61	1018
3.2 FUEL CONSUMPTION													
3.2.1 In selected gear, at maximum power													
1H	32.9	14.3	8.27	2204	6.6	352	2.38	34	74	102	8	58	1018
3.2.1.1 75% of pull at maximum power at rated speed													
1H	25.6	10.8	8.56	2233	4.5	379	2.21	32	70	102	7	62	1018
3.2.1.2 50% of pull at maximum power at rated speed													
1H	17.4	7.2	8.74	2244	2.4	444	1.89	32	71	102	7	62	1018
3.2.1.3 next higher gear at reduced engine speed; same pull and travelling speed as in 3.2.1.1.													
2H	25.4	10.7	8.55	1523	4.5	324	2.59	32	70	96	7	65	1018
3.2.1.4 next higher gear at reduced engine speed; same pull and travelling speed as in 3.2.1.2.													
2H	17.5	7.2	8.74	1532	2.4	357	2.35	32	69	94	6	67	1018
3.2.2 in selected gear nearest to 7.5 km/h													
4L	31.7	17.1	6.68	2203	8.6	364	2.30	32	74	94	7	64	1018
3.2.2.1 75% of pull at maximum power at rated speed													
4L	24.7	12.7	6.98	2242	5.6	386	2.15	34	73	101	8	57	1018
3.2.2.2 50% of pull at maximum power at rated speed													
4L	17.0	8.6	7.17	2253	3.3	457	1.84	33	70	101	8	57	1018
3.2.2.3 next higher gear at reduced engine speed; same pull and travelling speed as in 3.2.2.1.													
1H	24.8	12.7	7.00	1850	5.6	335	2.50	32	71	98	7	62	1018
3.2.2.4 next higher gear at reduced engine speed; same pull and travelling speed as in 3.2.2.2													
1H	16.9	8.5	7.18	1856	3.3	387	2.16	32	69	97	7	63	1018

4. OPTIONAL TEST

DRAWBAR POWER AND FUEL CONSUMPTION (UNBALLASTED TRACTOR, 2-WHEEL DRIVE ONLY)

Date of tests: 11th January 1990
Type of track: Concrete

Height of drawbar above ground	Tyre inflation pressure	
	Front	Rear
400 mm	110 kPa	100 kPa

Gear and Range	Power	Drawbar pull	Speed	Engine speed	Slip of wheels or tracks	Specific fuel consumption	Specific energy	Temperature		Atmospheric conditions			
								Fuel	Coolant	Engine Oil	Temperature	Relative humidity	Pressure
	kW	kN	km/h	rev/min	%	g/kWh	kWh/l	°C	°C	°C	°C	%	Bar
3.1 MAXIMUM POWER IN TESTED GEARS													
2L	13.4	17.3	2.80	2246	15.0	530	1.58	34	71	98	11	56	1023
3L	24.0	17.3	5.00	2233	15.0	416	2.01	36	72	100	11	57	1023
4L	29.1	17.2	6.10	2200	14.9	390	2.15	36	74	99	11	57	1023
1H	30.9	14.3	7.80	2200	10.0	363	2.31	37	75	91	11	57	1022
2H	30.6	9.2	12.01	2200	5.2	371	2.26	37	75	98	11	58	1022
3.2 FUEL CONSUMPTION 3.2.1 in selected gear, at maximum power													
4L	29.1	17.2	6.10	2200	14.9	390	2.15	36	74	99	11	57	1023
3.2.1.1 75% of pull at maximum power at rated speed													
4L	23.5	12.9	6.56	2231	8.5	402	2.08	36	72	99	12	56	1023
3.2.1.2 50% of pull at maximum power at rated speed													
4L	16.4	8.6	6.84	2242	4.5	476	1.76	36	71	99	12	53	1023
3.2.1.3 next higher gear at reduced engine speed; same pull and travelling speed as in 3.2.1.1.													
1H	23.5	13.0	6.54	1837	8.5	348	2.41	37	73	97	12	55	1023
3.2.1.4 next higher gear at reduced engine speed; same pull and travelling speed as in 3.2.1.2.													
1H	16.4	8.6	6.84	1845	4.5	385	2.18	36	71	95	12	55	1023
3.2.2 in selected gear nearest to 7.5 km/h													
1H	30.9	14.3	7.80	2200	10.0	363	2.31	37	75	91	11	57	1022
3.2.2.1 75% of pull at maximum power at rated speed													
1H	24.4	10.7	8.21	2242	6.5	396	2.12	36	74	93	11	59	1022
3.2.2.2 50% of pull at maximum power at rated speed													
1H	17.1	7.2	8.50	2254	3.5	459	1.83	36	73	94	11	57	1022
3.2.2.3 next higher gear at reduced engine speed; same pull and travelling speed as in 3.2.2.1.													
2H	24.5	10.7	8.22	1524	6.5	330	2.54	35	73	90	10	60	1022
3.2.2.4 next higher gear at reduced engine speed; same pull and travelling speed as in 3.2.2.2													
2H	17.0	7.2	8.50	1536	3.5	360	2.33	35	71	91	10	60	1022

5. MEASUREMENT OF EXTERNAL NOISE LEVEL

- Date of tests:	29th March 1990
- Type of sound level meter:	Bruel and Kjaer 2209
- Type of track:	Concrete
- Gear:	4
- Group:	H
- Travelling speed before acceleration:	23:1 km/h
- Sound level:	87 dBA

6. REPAIRS

7. REMARKS

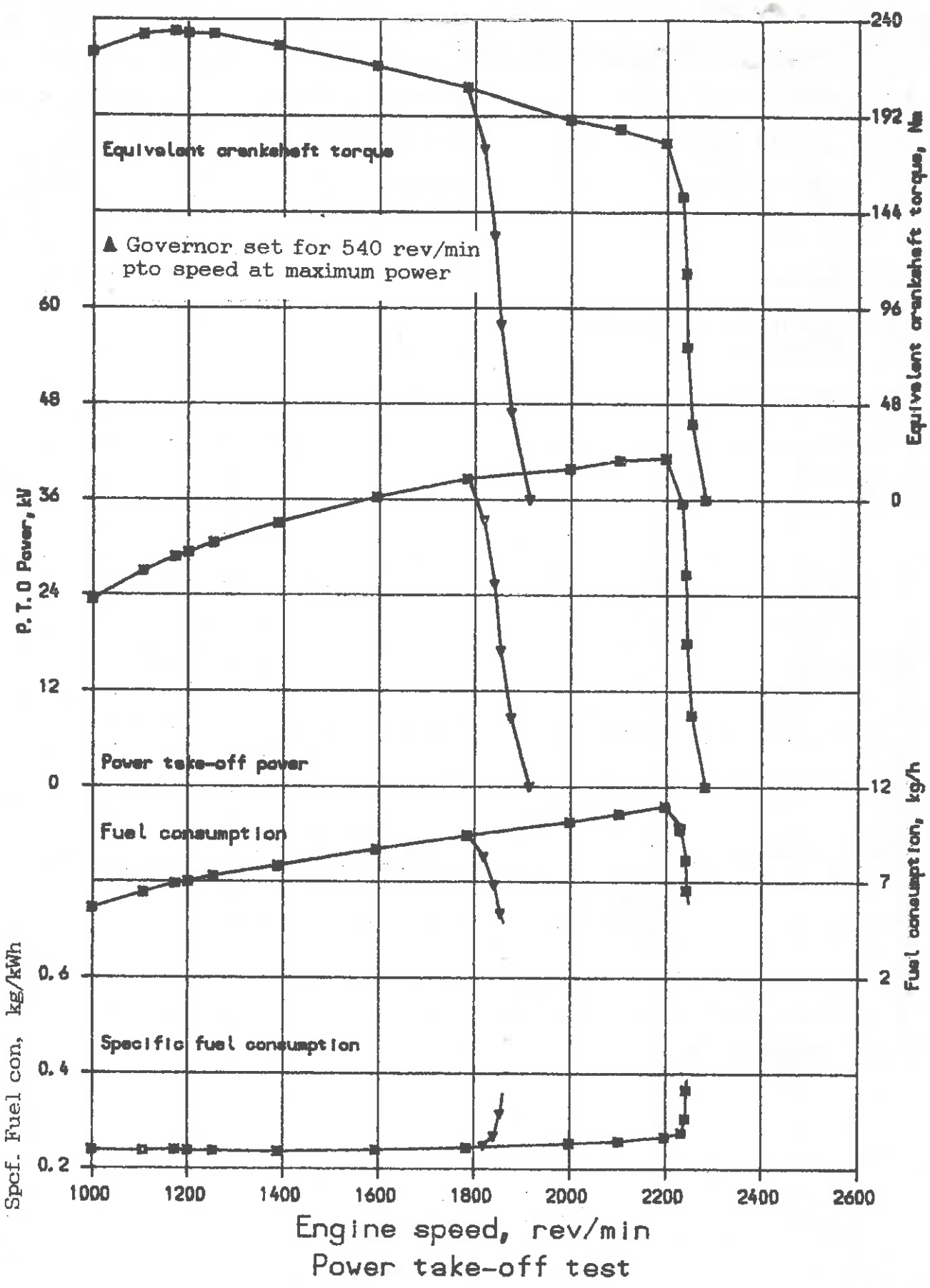
Test carried out by: P.C. Seward

Officer in charge: P.C. Seward

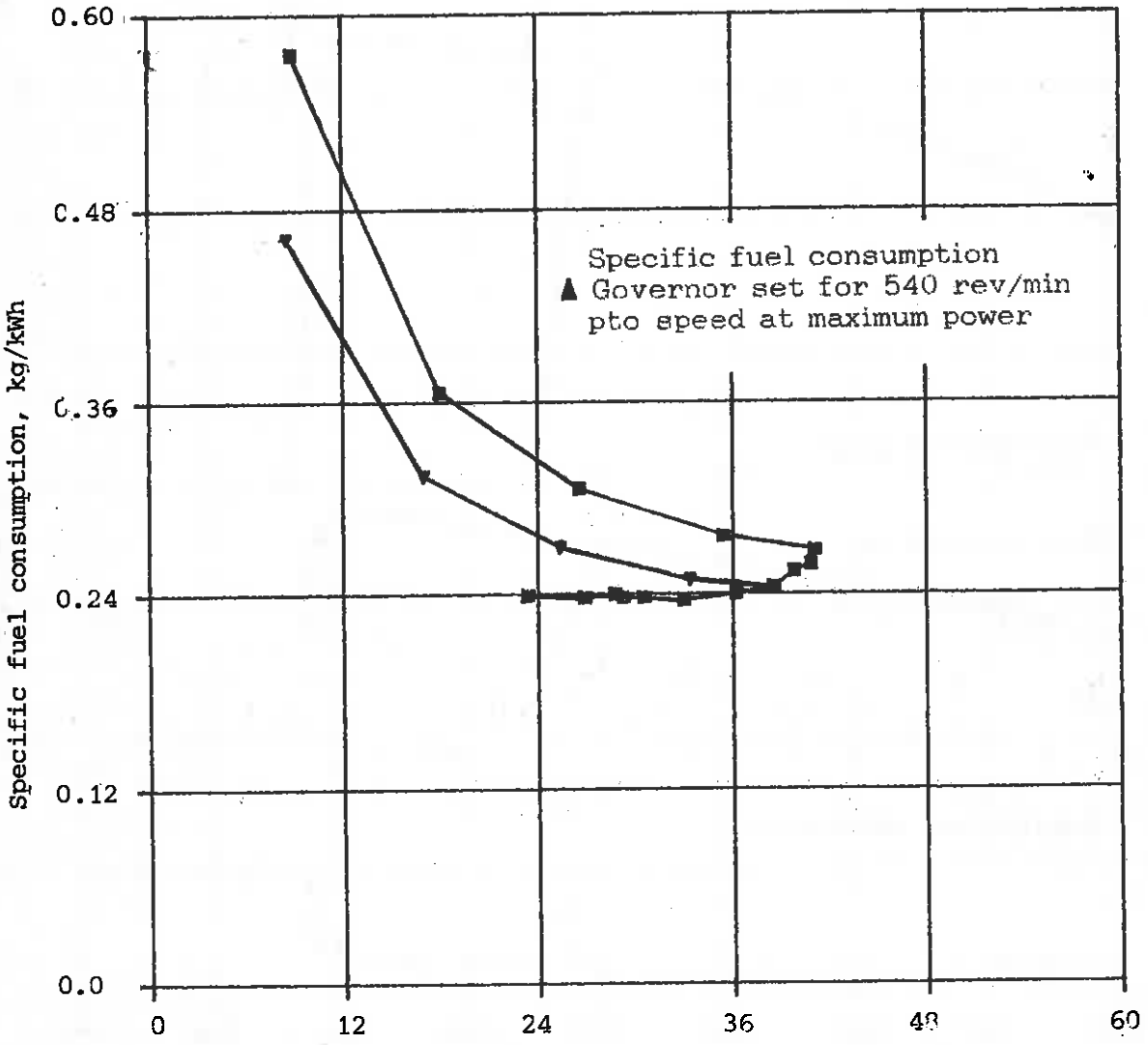
Signed: Head of Testing Group

for the Director

Date: 9/3/90



Power take-off test



Power take-off test