SILSOE RESEARCH INSTITUTE
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Report No: R92/71565/OECD
OECD Approval No: 1420 Restricted Code
Approval Date: 19 January 1993

Test in accordance with the OECD Restricted Standard Code for the Official Testing of Agricultural Tractors

Massey-Ferguson 253 Two-Wheel Drive Tractor with 8-speed Transmission

(with engine power uprated from previous 253 model, OECD Approval No 1199)



Manufactured by: Massey-Ferguson Tractors Limited
Banner Lane
Coventry
Warwicks CV4 9GF
England

Submitted for test by: The manufacturer

Report No: 754

Date: November 1992

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R92/71565/OECD

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Note: The MF 253 was previously tested and given OECD Approval No 1199 In May 1989. Accordingly to test codes OECD [c (84) 163 (Final)], page 21 Rules and Directives.

It has been retested because its power and fuel consumption have been significantly uprated.

Tractor manufacturer's name and address:	Massey-Ferguson Tractors Limited Banner Lane, Coventry, Warwicks, CV4 9GF
Location of tractor assembly:	Coventry, England
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:	55 hours
Location of test:	Silsoe Research Institute Wrest Park, Silsoe, England

I. SPECIFICATION OF TRACTOR

TRACTOR

Make:	Massey-Ferguson
Model:	MF 253 with 8-speed transmission
Type:	Four wheel, rear wheel driven, unit construction
Serial No:	5485 A35072
1st Serial No:	5485 A23051

ENGINE

Make:	Perkins
Model:	AT3 152.4
Type:	4 stroke, direct injection, diesel, turbocharged
Serial No:	CN31255U901870W
Ist Serial No:	CN31255U897867W

Cylinders

Number/disposition:	3 vertical In-line
Bore/stroke:	91.5 mm/127 mm
Capacity:	2505 cm^3
Compression ratio:	15:2
Arrangement of valves:	Overhead
Cylinder liners:	Dry

Supercharging

Make:	Schwitzer
Model:	52A
Type:	Exhaust driven
Pressure:	0.07 MPa

Fuel system

Fuel feed system:	Superpar mechanical feed pump
Make, type and model of fuel filter:	CAV paper, dual element filter with transparent sediment bowl
Capacity of fuel tank:	48 litres
Make, type and model of injection pump:	CAV distributor, DPA3238F471, Perkins 2643B141DW/5/2470
Serial No:	32708FKS
Manufacturer's production setting of injection pump:	11.1 to 11.75 l/hr
. Flow rate	55-58 mm^3/stroke at 2250 rev/min engine speed at full load on 50°C pump inlet temperature
. Timing	Delivery starts 16° before T.D.C. static
Make, type and model of injectors:	CAV 4-hole, LRB 6701503
Injection pressure:	21.3 MPa

Governor

Make:	CAV
Model:	Not applicable
Type:	Mechanical incorporated in injection pump
Governed range of engine speed:	750 to 2470 rev/min
Rated engine speed:	2250 rev/min

Air cleaner

Pre-cleaner:	None
Main cleaner:	
. Make	Donaldson
. Type	2 stage, dry paper element
. Model	FLG06-5368
. Location of air intake	Behind radiator grill
Maintenance indicator:	Warning light on instrument panel

Lubrication system

Type of feed pump:	Forced feed from gear pump
Type of filter:	Full flow replaceable 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:	4
Fan diameter:	394 mm
Coolant capacity:	10.2 litres
Type of temperature control:	Thermostat
System pressure:	75 kPa

Starting system

Make:	Magneti Marelli
Model:	M127
Type:	Electrical, pre-engaged, solenoid operated
Starter motor power rating:	2.8 kW
Cold starting aid:	ISKRA induction heater 12V
Safety device:	Operable only when high/low gear and pto selectors are in neutral position

Electrical system

Voltage:	12
Generator:	Alternator
. Make	Massey-Ferguson Powerpart
. Model	A 127-45
. Type	Belt driven
. Power	0.54 kW
Batteries:	1 M-F Powerpart, type 372 lead acid maintenance free
. Rating	420 CCA rating each or equivalent 70 Ah at 20 hour rating (590 amp SAE)

Exhaust system

Make:	Nelson Burgess
Model:	MF86
Type:	Oval baffle silencer
Location:	Vertical on left hand side
Height of outlet above ground:	2366 mm

TRANSMISSION TO WHEELS

Clutch

Make:	LUK
Model:	None
Type:	Dry, dual plate (main and pto)
Number of plates:	2
Diameter of plates:	305 mm main - 254 mm pto
Method of operation:	Mechanical by pedal

Gear box

Make:	Massey-Ferguson
Model:	None
Type:	Mechanical manual operation, 4 forward and 1 reverse speeds with high and low range selector.
Number of gears:	8 forward, 2 reverse
Available options:	Manual shuttle, 6 forward, 6 reverse

Rear axle 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	Automatic

Front axle and final drives

Make:	Massey-Ferguson
Model:	None
Type:	--
Differential lock:	None fitted

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:* 2250 rev/min km/h
Forward			
1	L	205.761	2.51
2	L	140.308	3.69
3	L	76.538	6.76
4	L	62.367	8.30
1	H	51.440	10.06
2	H	35.077	14.75
3	H	19.134	27.04
4	H	15.592	33.18
Reverse			
1	L	151.101	3.42
1	H	37.775	13.70

L = Low range H = High range

(*) Calculated with a tyre dynamic radius index of 610 mm (ISO 4251/1-1984)

Number of revolutions of front wheels for one revolution of rear wheels: Not applicable

POWER TAKE-OFF

Main power take-off

Type:	Independent
Method of engagement:	By hand lever mechanically engaged
Number of shafts:	1
Method of changing power take-off speeds:	Not applicable

Clutch

Make:	See main clutch
Model:	
Type:	
Number of plates:	
Diameter of plates:	

Power take-off proportional to engine speed

540 rev/min

Location:	Rear of tractor
Diameter of power take-off shaft:	34.9 mm
Number of splines:	6 to ISO 500
Height above ground:	490 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:	ISO recommendation 48 kW
Direction of rotation (viewed from behind tractor):	Clockwise

POWER LIFT

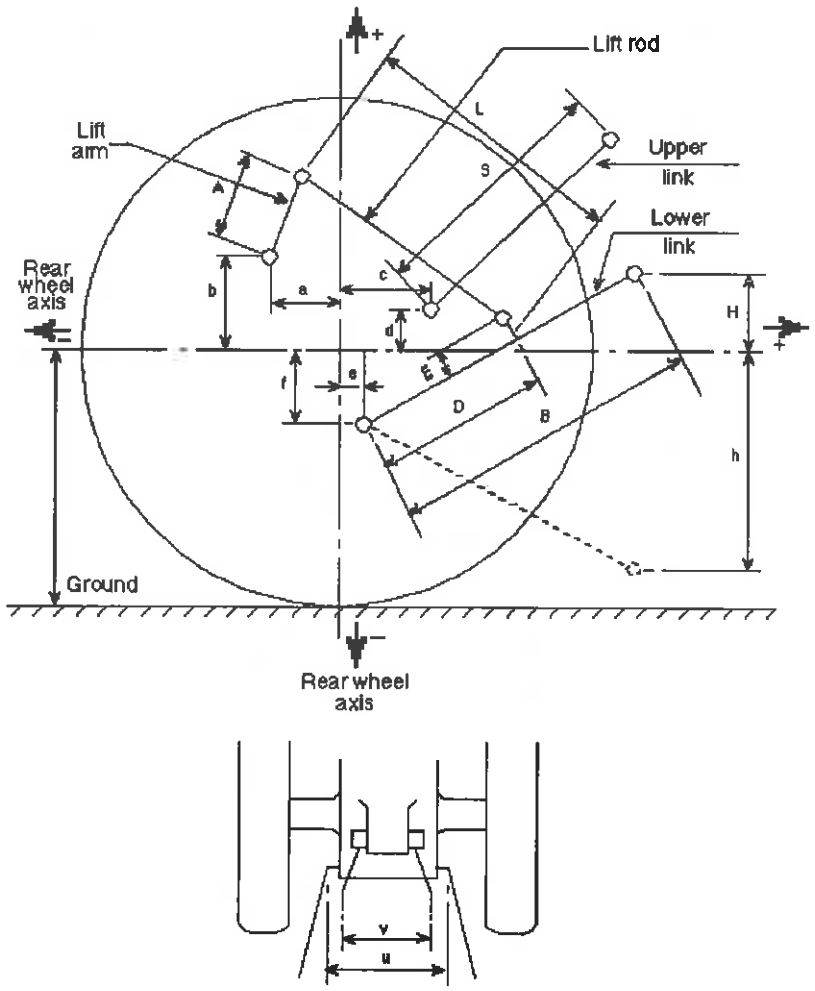
Make:	Massey-Ferguson
Model:	None
Type:	Hydraulic, with inlet suction control closed system
Type and number of cylinders:	1 single acting, internal
Type of linkage lock for transport:	Hydraulic
Relief valve pressure setting:	20.0 - 23.4 MPa
Opening pressure of cylinder safety valve:	None fitted
Lift pump type:	4 cylinder, piston
Transmission between pump and engine:	Driven from lift pump (pto) shaft via pto 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 (Trailer tipping pipe fitted for hydraulic test only)
Maximum volume of oil available to external cylinders:	20.0 litres

AUXILIARY HYDRAULIC SYSTEM

Make:	Hydrauquip
Model:	None
Type:	Gear pump
Relief valve pressure setting:	17.0 - 20.6 MPa
Lift pump type:	Gear
Transmission between pump and engine:	Driven by gears from the lift pump shaft (pto shaft) via the pto clutch
Type and number of filters:	Full flow, metal mesh strainer
Site of oil reservoir:	Main transmission housing
Type and number of tapping points:	2 quick release couplings 1 spool valve with separate return 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:	20.0 litres

THREE-POINT LINKAGE

Category:	1 or 2 to ISO standard 730-1:1990
Category adaptor:	Interchangeable balls
Controls:	Draught or position control with top link sensing



LIFT TEST
Linkage geometry

Fig 2.1

Table 2.1

Dimensions of linkage when attached to the standard frame (ISO 730-1:1990 CAT 2)

			Dimensions or range	Setting used in Test
Length of lift arms:		(A)	267 mm	267 mm
Length of lower links:		(B)	903 mm	903 mm
Distance of lift arm pivot point from rear wheel centre line:	horizontally: vertically:	(a) (b)	196 mm 233 mm	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)	609 - 762 mm	712 mm
Distance of upper link pivot point from rear wheel centre line:	horizontally: vertically:	(c) (d)	186, 200, 216 mm 205, 171, 132 mm	186 mm 205 mm
Distance of lower link pivot point from rear wheel centre line:	horizontally: vertically:	(e) (f)	32 mm forward 212 mm	32 mm 212 mm
Distance of lower link points to lift rod pivot points on lower link centre line:	horizontally: vertically:	(D) (E)	428 mm on centre line	428 mm 0 mm
Length of lift rods:		(L)	574 - 623 mm	605 mm
Height of lower hitch points (*) relative to the rear wheel centre line, situated 610 mm above the ground level:				
- in low position		(h)	470 mm 335 mm	410 mm
- in high position		(H)	305 mm 208 mm	230 mm
Height of lower hitch points when locked in transport position (*):			Any height within lift range (Hydraulic Transport Lock)	

* Assuming r = tyre dynamic radius index of 610 mm ISO 4251/1-1984

SWINGING DRAWBAR

Type:	Clevis
Height above ground, maximum:	460 mm
minimum:	260 mm
Type of adjustment:	Inverting drawbar and clevis
Distance of hitch point from rear-wheel axis, horizontally:	537 mm - 651 mm - 702 mm
Distance of hitch point form power take-off shaft ends:	
. Vertically:	30 - 230 mm
. Horizontally:	241 mm - 355 mm - 406 mm
Lateral adjustment (centre of clevis):	
. Right-hand:	200 mm drawbar in, 234 mm, 248 mm drawbar out
. Left-hand:	200 mm drawbar in, 234 mm, 248 mm drawbar out
Distance of pivot point from rear axles horizontally:	130 mm forward
Width of clevis:	65 mm
Diameter of drawbar pin hole:	27 mm
Maximum vertical permissible load:	7.6 kN

TRAILER HITCH

Type:	None fitted

LINKAGE DRAWBAR

Type:	None fitted

FRONT TOWING HITCH

Type:	Clevis in front weight frame
Vertical height to centre of clevis:	448 mm
Width of clevis:	70 mm
Diameter of pin hole:	33 mm

STEERING

Make:	Own make
Model:	None
Type:	Hydrostatic
Method of operation:	
. Pump	Sundstrand hydatec gear pump type, mounted on engine
. Motor	Danfoss OSPC-100-ON
. Ram	2, double acting, one on each steering link
. Filter	
Working pressure:	14.0 MPa

BRAKES

Service brake

Make:	Girling
Model:	None
Type:	Oil-immersed multiplate discs, 3 per side
Method of operation:	Independent or combined pedal, mechanical
Trailer braking take-off:	None fitted

Parking brake

Type:	Mechanical
Method of operation:	Hand lever with ratchet

WHEELS

Number:	4
. Front	2 steering only
. Rear	2 driving
Wheelbase:	1930 mm

Track width adjustment:

	Minimum, mm	Maximum, mm	Adjustment method
Front	1226	1836	Extending axle
Rear	1400	2100	Power assisted variable track and reversing wheels

PROTECTIVE STRUCTURE

Make:	Massey-Ferguson
Model:	ROPS
Type:	400
Manufacturer's name and address:	Massey-Ferguson Tractors Limited, Banner Lane, Coventry, Warwickshire, CV4 9GF
Protective device:	
. Rollguard	Two-post
. Tiltable/Not tiltable	Non tiltable
OECD approval number:	CSS 0114/1

DRIVER'S SEAT

Make/Model/Type:	Grammer DS44/1HB
Type of suspension:	Spring
Type of damping:	Hydraulic
Range of adjustment:	
. Longitudinal	140 mm
. Vertical	None

LIGHTING

Unrestricted beam angle of headlight in plan view: 110°

	Height above ground to centre, mm	Size, mm	Distance from outside edge to median plane of tractor, mm
Headlight	985	118 dia	160
Sidelights	--	--	--
Rear lights*	1040	110 x 70	352
Axle reflectors	570	80 dia	490
Cab reflectors	--	--	--

* One only on left hand side

II. TEST CONDITIONS

Overall dimensions (overall width at 1335 measured front track)

Length mm	Width		Height at top of	
	Minimum mm	Maximum mm	Protective structure mm	Exhaust pipe mm
3190	1838	2438	2212	2366

Ground clearance (unballasted tractor) 203 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	725	737	--	--
Rear	1446	1509	--	--
Total	2171	2246	--	--

Tyres and track width specification

	Front	Rear
Tyres . dimensions . ply rating . type	6.00 x 16 6 cross ply	13.6 x 28 6 cross ply
Maximum load (tyre manufacturer's), kg	560	1430
Maximum load (tractor manufacturer's), kg	560	1430
Inflation pressure (tyre manufacturer's), Bar	3.3	1.6
Dynamic radius index, mm	340	610
Chosen track width (manufacturer's nominal), mm	1335	1500

Oils and lubrication

Capacity and change interval

	Capacity l	Oil change h	Filter change h
Engine	6.8	250	250
Front axle	--	--	--
Final drive (front)	--	--	--
Gearbox	47.4	1000	1000
Rear axle Hydraulic system) Final drives (rear))	Common with gearbox		
Steering	0.7	None	None
Brakes	--	Top-up	None

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 kg/l 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:	54 cSt at 50°C	
Classification:	MIL-L-2104-C	
Rear final drives		
Type:	SAE 15W/30	As recommended
Viscosity:	54 cSt at 50°C	
Classification:	MIL-L-2104-C	
Front differential and final drives		
Type:	Not applicable	Not applicable
Viscosity:		
Classification:		
Hydraulic brakes		
Type:	Not applicable	Not applicable
Viscosity:		
Classification:		
Hydraulic fluid		
Type:	Common with transmission	
Viscosity:		
Classification:		
Steering oil		
Type:	SAE 10W	As recommended
Viscosity:	18.5 cSt at 50°C	
Classification:	MF CMS1110, or SAE 10W engine oil with C3 approval	
Recommended grease:	Consistency 2 lithium	As recommended
Number of lubrication points:	13	

III. TEST RESULTS

A. COMPULSORY TEST RESULTS

1. MAIN POWER TAKE-OFF (540)

Date and location of tests: 5 October 1992
Silsoe Research Institute,
Wrest Park, Silsoe, Bedford

Type of dynamometer: Water brake, Heenan & Froude

Power kW	Speed		Fuel consumption			Specific energy kWh/l
	Engine rev/min	P.T.O. rev/min	Hourly kg/h	Hourly l/h	Specific g/kWh	
1.1 MAXIMUM POWER - TWO HOUR TEST						
37.5	2250	679	9.42	11.24	251	3.34
1.2 POWER AT RATED ENGINE SPEED						
37.5	2250	679	9.42	11.24	251	3.34
1.3 STANDARD POWER TAKE-OFF SPEED (540 ± 10 rev/min)						
33.8	1789	540	7.88	9.40	233	3.60
1.4 PART LOADS 1.4.1 The torque corresponding to maximum power at rated engine speed						
37.5	2250	679	9.42	11.24	251	3.34
1.4.2 85% of the torque defined in 1.4.1						
32.5	2297	693	8.61	10.28	265	3.16
1.4.3 75% of the torque defined in 1.4.2						
24.6	2303	695	7.13	8.51	290	2.89
1.4.4 50% of the torque defined in 1.4.2						
16.5	2331	703	5.74	6.85	348	2.41
1.4.5 25% of the torque defined in 1.4.2						
8.3	2357	711	4.19	5.00	505	1.66
1.4.6 Unloaded						
0	2388	720	2.93	3.50	--	--

Power kW	Speed		Fuel consumption			Specific energy kWh/l
	Engine rev/min	P.T.O. rev/min	Hourly kg/h	l/h	Specific g/kWh	
1.5 PART LOADS AT STANDARD POWER TAKE-OFF SPEEDS (540 ± 10 rev/min)						
1.5.1 The torque corresponding to maximum power						
33.8	1789	540	7.88	9.40	233	3.60
1.5.2 85% of the torque obtained in 1.5.1						
29.5	1817	548	6.95	8.29	236	3.56
1.5.3 75% of the torque obtained in 1.5.2						
22.5	1866	563	5.75	6.86	255	3.28
1.5.4 50% of the torque obtained in 1.5.2						
15.0	1902	574	4.37	5.22	292	2.87
1.5.5 25% of the torque obtained in 1.5.2						
7.7	1933	583	3.13	3.73	406	2.06
1.5.6 Unloaded						
0	1990	600	1.96	2.34	--	--

No load, maximum engine speed: 2388 rev/min

Torque (equivalent crankshaft) at maximum power: 159.3 Nm

Maximum torque (equivalent crankshaft)
(engine speed 1452 rev/min): 191.9 Nm

Mean atmospheric conditions:

- Temperature 19°C
- Pressure 1015 m bar
- Relative humidity 44%

Maximum temperatures:

- Coolant 81°C
- Engine oil 114°C
- Fuel 58°C
- Engine air intake 24°C

2. HYDRAULIC POWER AND LIFTING FORCE

Date of tests: 23 October 1992

2.1 Hydraulic power test

Sustained pressure with relief valve open: 23.2 MPa

Pump delivery rate at minimum pressure: 20.0 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	13.3	20.9	4.61
Flow rate and hydraulic pressure corresponding to maximum hydraulic power	17.3	19.2	5.55

Tapping point used for test: Auxiliary service connection

Temperature of hydraulic fluid if different from 65 ± 5°C -- °C

Opening pressure of the unloading valve: -- MPa

Closing pressure of the unloading valve: -- MPa

2.2 Power lift test - (To ISO 730-1:1990)

	At the hitch point	On the frame
Height of lower hitch points above ground in down position	200 mm	200 mm
Vertical movement	640 mm	903 mm
Maximum corrected force exerted through full range	13.2 kN	10.9 kN
Corresponding pressure of hydraulic fluid	20.9 MPa	20.9 MPa
Moment about rear-wheel axis	11.5 kNm	16.1 kNm
Maximum tilt angle of mast from vertical	--	22 degrees

- Linkage settings for test - see Table 2.1 and Figure 2.1

Lifting heights relative to the horizontal plane including the lower link pivot points											
mm	-251	-198	-150	-80	0	80	150	250	350	442	652
Lifting forces (the values measured are corrected to correspond to a hydraulic pressure equivalent to 90% of the actual relief valve pressure delivered by the hydraulic system)											
at the hitch points kN	--	13.2	14.1	15.2	16.1	16.8	17.4	17.9	18.5	18.9	--
Corresponding pressure: 20.9 MPa											
at the frame kN	10.9	11.4	11.7	12.1	12.4	12.5	12.6	12.6	12.3	11.9	11.1
Corresponding pressure: 20.9 MPa											

3. DRAWBAR POWER AND FUEL CONSUMPTION TEST (UNBALLASTED TRACTOR, 2 WHEEL DRIVE)

Date and location of tests: 13 October 1992
Silsoe Research Institute
Wrest Park
Silsoe

Type of track: Concrete

Height of drawbar above ground	Tyre inflation pressure (kPa)	
	Front	Rear
420 mm	172	83

Gear and Range	Power	Drawbar Pull	Speed	Engine Speed	Slip of wheels or track	Spec fuel cons	Spec energy	Temperature			Atmospheric conditions		
								Fuel	Coolant	Eng oil	Temp	Rel Humidity	Pressure
	kW	kN	km/h	rev/min	%	g/kwh	kWh/l	Deg.C	Deg.C	Deg.C	Deg.C	%	kPa
3.1 MAXIMUM POWER IN TESTED GEARS													
2L*	15.2	17.1	3.22	2334	15.4	418	2.00	43	79	98	15	42	101.9
3L*	27.5	17.2	5.76	2277	15.3	331	2.53	44	79	97	15	38	101.9
4L	29.8	15.0	7.16	2255	13.4	323	2.59	49	79	104	14	48	102.0
1H	31.2	12.6	8.92	2250	10.7	308	2.72	49	79	105	14	48	102.0
2H†	31.9	8.4	13.63	2250	7.0	305	2.74	46	79	99	14	46	102.0
3.2 FUEL CONSUMPTION 3.2.1 In selected gear, at maximum power at rated speed													
1H	31.2	12.6	8.92	2250	10.7	308	2.72	49	79	105	14	48	102.0
3.2.1.1 75% of pull at maximum power at rated speed													
1H	24.5	9.3	9.45	2302	7.6	323	2.60	50	79	106	15	45	101.9
3.2.1.2 50% of pull at maximum power at rated speed													
1H	17.2	6.3	9.83	2331	5.1	377	2.22	49	79	106	15	41	101.9
3.2.1.3 Next higher gear at reduced engine speed; same pull and travelling speed as in 3.2.1.1													
2H	24.7	9.3	9.52	1574	7.3	273	3.07	51	79	97	15	41	101.9
3.2.1.4 Next higher gear at reduced engine speed; same pull and travelling speed as in 3.2.1.2													
2H	17.1	6.3	9.83	1585	4.8	290	2.88	49	79	93	15	40	101.9
3.2.2 In selected gear nearest to 7.5 km/h, at maximum power at rated engine speed													
4L	29.8	15.0	7.16	2255	13.4	323	2.59	49	79	104	14	48	102.0
3.2.2.1 75% of pull at maximum power at rated speed													
4L	24.5	11.4	7.75	2317	8.7	330	2.54	46	79	95	15	41	101.9
3.2.2.2 50% of pull at maximum power at rated speed													
4L	16.7	7.5	8.05	2329	5.8	389	2.15	46	79	97	15	39	101.9
3.2.2.3 Next higher gear at reduced engine speed; same pull and travelling speed as in 3.2.2.1													
1H	24.6	11.4	7.76	1916	8.8	287	2.92	47	79	98	15	42	101.8
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	7.6	8.03	1919	5.8	318	2.63	47	79	98	15	38	101.8

Maximum power limited by wheelslip and bounce

† Highest gear measurable within speed limits of testing equipment

B. OPTIONAL TESTS

1. MEASUREMENT OF EXTERNAL NOISE LEVEL

Date of tests:	5 November 1992
Type of sound level meter:	Bruel and Kjaer
Type of track:	Concrete
Gear:	4
Group:	H
Travelling speed before acceleration:	26.53 km/h
Sound level:	85 dBA

REPAIRS AND ADJUSTMENTS DURING TESTS: None

REMARKS: None

Test carried out by: S J Devonshire

Officer in charge: P C Seward

Signed: H M R Proctor — Head of Test Engineering Group

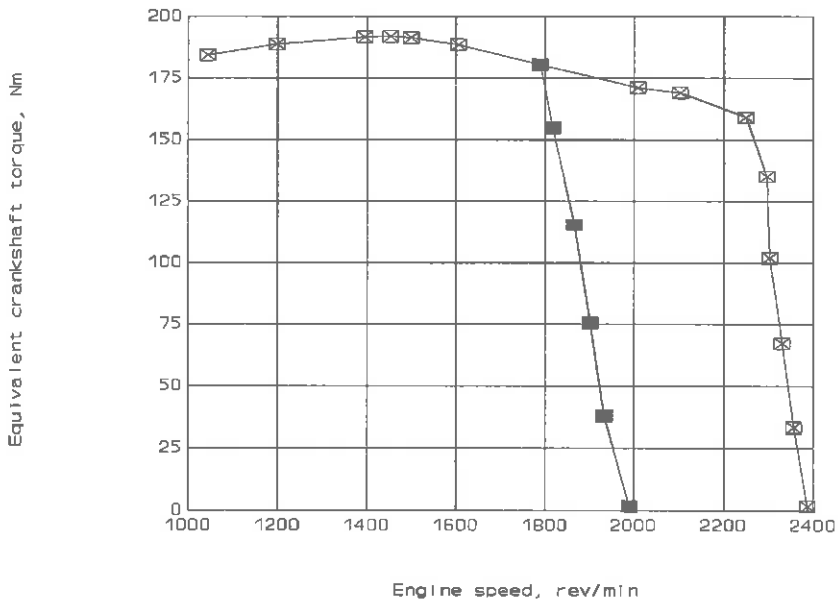
H M R Proctor — for the Director

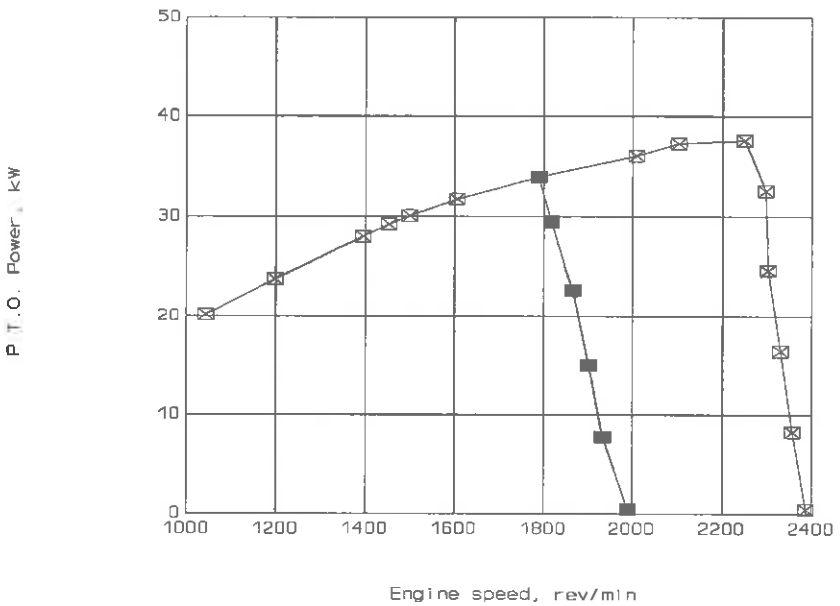
Date: 13/11/92

ANNEX I POWER TAKE OFF CURVES

P.T.O. POWER TEST - MASSEY FERGUSON 253, 2 WHEEL DRIVE

Governor set for maximum power at rated speed ⊠
Governor set for maximum power at pto speed ■



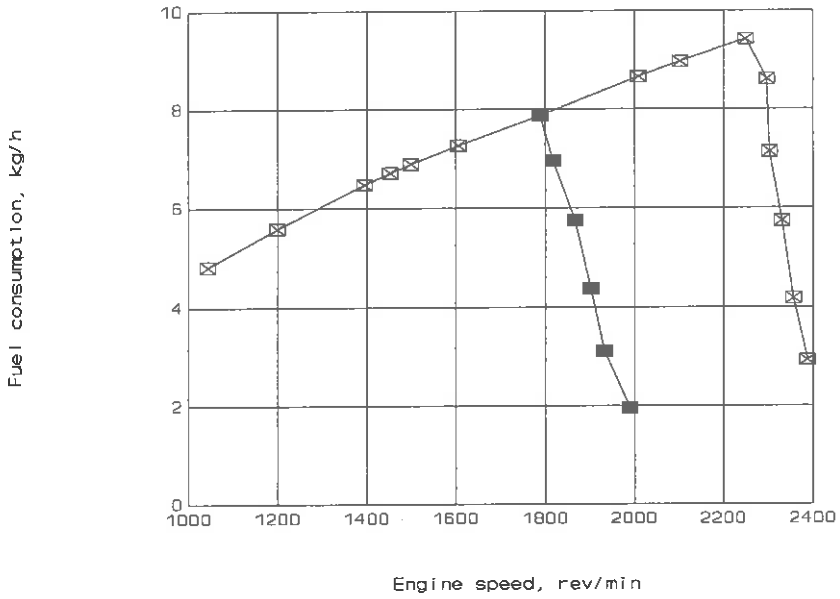


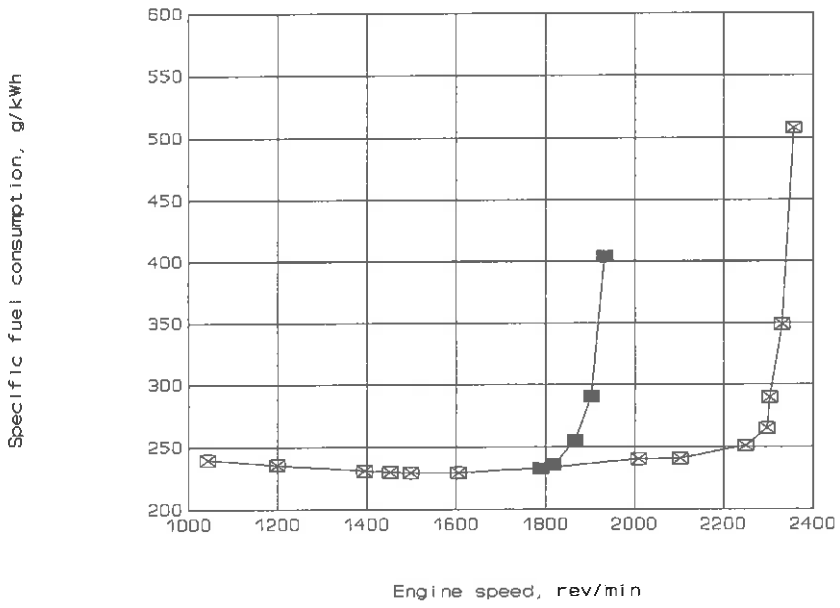
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