SILSOE RESEARCH INSTITUTE
Wrest Park, Silsoe,
Bedford MK45 4HS

Report No: R92/71383/OECD
OECD Approval No: 1374 Restricted Code
Approval Date: 4 August 1992

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

JCB Fastrac 145 Turbo Four-Wheel Drive Tractor



Manufactured by: JCB Landpower Ltd
Cecilly Mills
Oakamoor Road
Cheadle
Staffs ST10 4QT

Submitted for test by: The Manufacturer

Report No: 748

Date: March 1992

R92/71383/OECD

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Tractor manufacturer's name and address:	JCB Landpower Ltd Cecilly Mills, Oakamoor Road, Cheadle, Staffs, ST10 4QT
Location of tractor assembly:	As above
Submitted for test by:	Manufacturer
Selected for test by:	Manufacturer with agreement of Testing Station
Place of running in:	On manufacturer's premises
Duration of running in:	Engine approx 100 hrs, tractor approx 200 hrs
Location of test:	Silsoe Research Institute Wrest Park, Silsoe, Bedford, England

I. SPECIFICATION OF TRACTOR

Tractor

Make:	JCB
Model:	Fastrac 145 Turbo
Type:	High speed four wheel drive tractor, chassis construction with front and rear suspension
Serial No:	W1314 (pre production)
1st Serial No:	SLPHMV14500635000

Engine

Make:	Perkins
Model:	1006-6T
Type:	Direct injection, turbocharged diesel
Serial No:	YB50375U531731V

Cylinders

Number/disposition:	6 vertical in line
Bore/stroke:	100.0 mm/127.0 mm
Capacity:	5985 cm^3
Compression ratio:	16.0:1
Arrangement of valves:	Overhead
Cylinder liners:	Dry

Supercharging

Make:	Garrett
Model:	TB4131
Type:	Exhaust driven turbocharger
Pressure:	85 to 100 kPa

Fuel system

Fuel feed system:	Mechanical Lift Pump
Make, type and model of fuel filter:	Agglomerator near tank and CAV dual paper element filter with transparent sediment bowls on side of engine
Capacity of fuel tank:	280 ℓ
Make, type and model of injection pump:	Lucas CAV Rotary DPS Type DSA 922
Serial No:	16733DJG
Manufacturer's production setting of injection pump:	
. Flow rate:	74 mm^3 ± 3% per stroke at 1150 rev/min pump speed
. Timing:	21° before T D C
Make, type and model of injectors:	CAV LRB6703201 JF
Injection pressure:	25.3 MPa

Governor

Make:	CAV
Model:	--
Type:	Mechanical incorporated in injection pump
Governed range of engine speed:	750 rev/min to 2830 rev/min ± 50 rev/min
Rated engine speed:	2600 rev/min

Air cleaner

Pre-cleaner:	None
. Make:	--
. Type:	--
. Model:	--
. Location of air intake:	--
Main cleaner:	
. Make:	Coopers
. Type:	Two stage dry paper element
. Model:	CD2513
. Location of air intake:	Duct from front grille above radiator
Maintenance indicator:	Warning light on instrument panel

Lubrication system

Type of feed pump:	Twin gear
Type of filter:	Dual, full flow replacement element
Number:	1

Cooling system

Type of coolant:	Water/antifreeze solution
Type of pump:	Centrifugal
Specification of fan:	Belt driven puller fan with viscous coupling
Number of fan blades:	10
Fan diameter:	558.8 mm
Coolant capacity:	25 ℓ
Type of temperature control:	Thermostat and viscous fan drive
System pressure:	48.26 kPa

Starting system

Make:	Magnetti Marelli
Model:	M127
Type:	Electrical, pre engagement, solenoid operated
Starter motor power rating:	2.8 kW
Cold starting aid:	Electrical - Fuel induction heater
Safety device:	Operable only with 6 speed gearbox in neutral and both front and rear power take-off controls in (braked) stop position

Electrical system

Voltage:	12 V
Generator:	Alternator
. Make:	Magnetti Marelli
. Model:	A 133-80
. Type:	Belt driven alternator
. Power:	80 amps at 6000 rev/min
Batteries:	Two JCB heavy duty maintenance free lead acid type 663
. Rating:	Cold cranking amps (SAE) = 815 A. 30 s @ -18°C to 1.2 V per cell 115 Ah at 20 hours rating (each)

Exhaust system

Make:	Tubrex
Model:	0400
Type:	Vertical silencer
Location:	To right of engine
Height of outlet above ground: height	2780 mm at normal suspension running

Transmission to wheels

Rear

Clutch

Make:	Borg and Beck
Model:	DS350
Type: only	Dry, single disc diaphragm for transmission
Number of plates:	1
Diameter of plates:	355.6 mm
Method of operation:	Hydraulically actuated with pneumatic assist via pedal

Gear box

Make:	JCB/Eaton
Type:	Mechanical manual operation 6 speed synchromesh box followed in series by synchromesh box with 3 forward ranges and one reverse
Number of gears:	18 forward, 6 reverse
Available options:	None

Drive to rear axle

Driven from:	Rear of range box via cardan shaft

Rear axle and final drives

Make:	JCB
Model:	PD70
Type:	Crown wheel and pinion differential and epicyclic reduction hub

Differential lock:

. Type:	Mechanical dog clutch
. Method of engagement:	Hydraulically operated in response to panel mounted electrical switch
. Method of disengagement:	Reverse of above

Front

Front axle and final drives

Make:	JCB
Model:	SD55
Type:	Crown wheel and pinion differential and epicyclic reduction hub
Differential lock:	
. Type:	Mechanical NOSPIN
. Method of engagement:	Automatic
. Method of disengagement:	Automatic

Drive to front axle

Driven from:	Front of range box via cardan shaft

Clutch

Make:	JCB (Front axle disconnect)
Type:	Oil immersed multi-plate clutch in range gearbox
No of plates:	11
Diameter of plates:	102 mm
Method of engagement:	Spring keeps clutch engaged in default mode (4WD)
Method of disengagement:	Hydraulically in response to panel mounted electrical switch

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:* 2600 rev/min km/h
Forward			
1	L	358.56	1.69
2	L	208.52	2.91
3	L	133.16	4.56
4	L	88.77	6.85
5	L	61.74	9.84
6	L	47.53	12.79
1	M	125.12	4.86
2	M	72.76	8.35
3	M	46.47	13.08
4	M	30.98	19.62
5	M	21.54	28.21
6	M	16.59	36.63
1	H	59.47	10.22
2	H	34.59	17.57
3	H	22.09	27.51
4	H	14.72	41.28
5	H	10.24	59.35
6	H	7.88	77.12
Reverse			
1	R	207.64	2.93
2	R	120.75	5.03
3	R	77.11	7.88
4	R	51.41	11.82
5	R	35.75	17.00
6	R	27.53	22.07

L = Low range M = Medium H = High range

(*) Calculated with a tyre manufacturers stated dynamic radius index of 620 mm. Not available in ISO 4251/1-1984 or ETRTO 1991

Number of revolutions of front wheels for one revolution of rear wheels: 1.02

Power take-off

Main power take-off

Type:	Independent
Method of engagement:	Hydraulically actuated wet multi-plate clutch in response to electrical signal from panel mounted switch, (can be used at the same time as the front pto)
Number of shafts:	1, reversible 21 or 6 spline
Method of changing power take-off speeds:	Hand lever in cab changes gear to give Neutral, 1000 or 540 rev/min only when engine is stopped
Safety device:	Solenoid operated, hydraulically actuated brake prevents rotation of shaft when in the stop (braked) position

Clutch

Make:	JCB
Model:	None
Type:	Wet multiplate, independent of both main transmission and front pto clutches
Number of plates:	12
Diameter of plates:	133.4 mm

Power take-off proportional to engine speed (rear)

540 rev/min

Location:	Rear of tractor above axle
Diameter of power take-off shaft:	34.9 mm
Number of splines:	6 to ISO 500
Height above ground:	840 mm
Distance from the median plane of the tractor:	Central
Distance behind rear wheel axis:	308 mm
Pto speed at rated engine speed:	741 rev/min
Engine speed at standard power take-off speed:	1894 rev/min
Ratio of rotation speeds:	3.51:1
Power restriction and maximum torque:	68 kW
Direction of rotation (viewed from behind tractor):	Clockwise

1000 rev/min

Location:	At rear of tractor above axle
Diameter of power take-off shaft:	34.9 mm
Number of splines:	21 to ISO 500
Height above ground:	840 mm
Distance from the median plane of the tractor:	Central
Distance behind rear-wheel axis:	308 mm
PTO speed at rated engine speed:	1071 rev/min
Engine speed at standard power take-off speed:	2428 rev/min
Ratio of rotation speeds:	2.428:1
Direction of rotation (viewed from behind tractor):	Clockwise

Optional Front Power take-off

Driven from:	Opposite end of shaft driving rear power take-off via separate clutch and cardan shaft
Type:	Independent
Method of engagement:	Hydraulically actuated wet multiplate clutch responding to electrical signal from switch in cab, (can be used at the same time as the rear pto)
Number of shafts:	Two, one anticlockwise, one clockwise with choice of 21 or 6 spline stub shafts with flange fitting
Method of changing power take-off speeds:	Hand lever in cab changes gear and selects neutral 1000 or 540 rev/min only when engine is stopped
Safety device:	Solenoid operated, hydraulically actuated brake prevents rotation of shaft when in the stop (brake) position

Clutch

Make:	JCB
Model:	None
Type:	Wet multiplate, independent of both main transmission and rear pto clutches
Number of plates:	10
Diameter of plates:	133.4 mm

Front Power take-off proportional to engine speed

540 rev/min

Location:	At front of tractor
Diameter of power take-off shaft:	34.9 mm
Number of splines:	6
Height above ground:	845 mm at normal suspension running height
Distance from the median plane of the tractor:	Right hand shaft - 61 mm Left hand shaft - 67 mm
Distance forward of front wheel axis:	988 mm
Pto speed at rated engine speed:	741 rev/min
Engine speed at standard power take-off speed:	1894 rev/min
Ratio of rotation speeds:	3.51:1
Power restriction and maximum torque:	61 kW
Direction of rotation (viewed from front of tractor):	Right hand shaft - anticlockwise Left hand shaft - clockwise

1000 rev/min

Location:	At front of tractor
Diameter of power take-off shaft:	34.9 mm
Number of splines:	21
Height above ground:	845 mm at normal suspension running height
Distance from the median plane of the tractor:	Right hand shaft - 61 mm Left hand shaft - 67 mm
Distance forward of front-wheel axis:	970 mm
PTO speed at rated engine speed:	1071 rev/min
Engine speed at standard power take-off speed:	2428 rev/min
Ratio of rotation speeds:	2.428:1
Power restriction and maximum torque:	86 kW for left hand and 61 kW for right hand shaft
Direction of rotation (viewed from front of tractor):	Right hand shaft - anticlockwise Left hand shaft - clockwise

Power lift

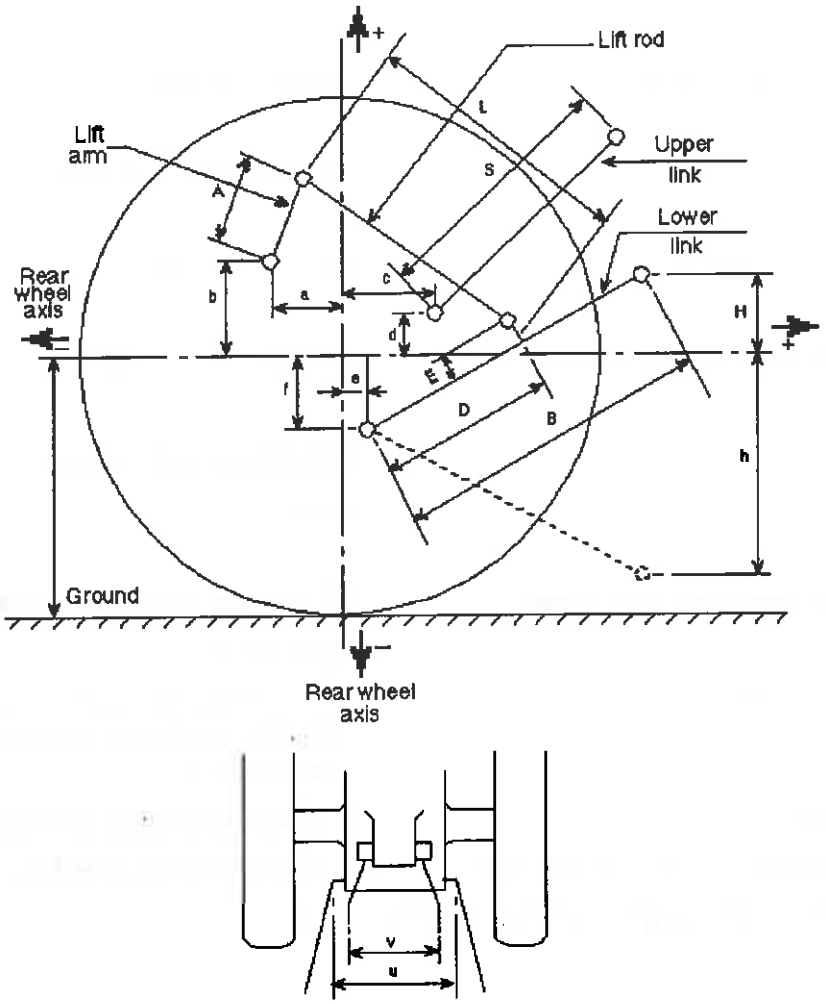
Make:	JCB
Model:	None
Type:	Rear - hydraulic with electronic position and bottom link draught control systems
	Optional front - hydraulic
Type and number of cylinders:	Rear - 2 external, single acting
	Optional front - 2 external, double acting
Type of linkage lock for transport:	Rear - hydraulic
	Optional Front - hydraulic
Relief valve pressure setting:	20.65 - 21.35 MPa
Opening pressure of cylinder safety valve:	Rear = 20 - 21.9 MPa
	Optional Front = None
Lift pump type:	Gear
Transmission between pump and engine:	Gear driven from pto layshaft independent of clutches
Type and number of filters:	125 μ metal mesh suction strainer in tank and 10 μ single element return line filter with magnetic core
Site of oil reservoir:	Separate tank under left hand cab steps
*Type, number and location of tapping points:	Auxillary service connectors, at rear of tractor
Maximum volume of oil available to external cylinders:	35 ℓ

* Single used for test. Other auxillary service connections are provided to ISO for use with various implements.

THREE-POINT LINKAGE

(Rear)

Category:	3 to ISO standard 730/1-1990
Category adaptor:	None
Controls:	Draught or position control with bottom 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 3)

			Dimensions or range (mm)	Settings used in tests (mm)	
				(Main)	(B1)
Length of lift arms:		(A)	430	430	
Length of lower links:		(B)	942	942	
Distance of lift arm pivot point from rear wheel centre line:	horizontally: vertically:	(a) (b)	40 600	40 600	
Horizontal distance between the two lower link points:		(u)	646	646	
Horizontal distance between the two lift arm end points:		(v)	720	720	
Length of upper link:		(S)	690 - 990	840	855
Distance of upper link pivot point from rear wheel centre line:	horizontally: vertically:	(c) (d)	150 375, 415, 455	150 415	375
Distance of lower link pivot point from rear wheel centre line:	horizontally: vertically:	(e) (f)	84 132	84 132	
Distance of lower link points to lift rod pivot points on lower link centre line:	horizontally: vertically:	(D) (E)	476 on centre line	476 on centre line	
Length of lift rods:		(L)	555 - 785	640	670
Height of lower hitch points (*) relative to the rear wheel centre line.					
- in low position		(h)	327 - 530	387	462
- in high position		(H)	209 - 629	303	223
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 620 mm to ISO 4251/1-1984.

"Main test" with 620 mm tyre radius and supplementary test "B1" with 695 mm radius.

DRAWBAR	Drawbar	Pickup hook
Type:	Clevis	Hook
Height above ground:	413 mm	485 mm
Type of adjustment:	None	None
Distance of hitch point from rear-wheel axis, horizontally:	707 mm	263 mm
Distance of hitch point from power take-off shaft ends:		
. Vertically:	427 mm	355 mm
. Horizontally:	399 mm	-45 mm
Lateral adjustment centre of clevis:		
. Right-hand:	None	None
. Left-hand:	None	None
Width of clevis:	66 mm	--
Diameter of drawbar pin hole:	33 mm	--
Maximum vertical permissible load:	13.7 kN	29.4 kN

TRAILER HITCH	
Type:	Ladder hitch Optional, not fitted for test

LINKAGE DRAWBAR	
Type:	Not available
Height above ground:	
Minimum:	--
Maximum:	--
Horizontal distance to power take-off shaft end:	--
Number of holes:	--
Distance between holes:	--
Hole diameter	--
Thickness and width of drawbar	--

FRONT TOWING HITCH	
Type:	Incorporated in front weight frame when fitted. Not available with front three point linkage option
Vertical height to centre of clevis:	850 mm
Width of clevis:	58 mm
Diameter of pin hole:	26 mm

STEERING	(To EEC Dir 70-311) Approval No: E11-177-01 EXTN 1
- Make:	Own make
- Model:	None
- Type:	Power assisted recirculating ball
- Method of operation:	
. Pump	Sauer Sundstrand, engine driven gear type
. Motor	None, Sheppard M100 steering box controls flow
. Ram	N/A
. Filter	Suction line plus partial return line filtration
- Working pressure:	14.0 MPa
BRAKES	(To EEC Dir 71-320 AB 88-194 and ECE Reg 13.05) Approval No: E11-2096 ETN 4 Approval No: 13R-052096 ETN 4
Service brake	
- Make:	Various makes of component
- Model:	None
- Type:	Disc and caliper, all wheel air over hydraulic with independent air and hydraulic circuits for front and rear brakes
- Method of operation:	Foot pedal in cab
- Trailer braking take-off:	1. Air, two line brake system (high speed) 2. Single line hydraulic (max speed 30 kph)
Parking brake	
- Type:	Single disc and caliper transmission brake. Failsafe requiring air pressure to release. 4WD automatically engaged when brake applied.
- Method of operation:	Hand lever in cab

WHEELS

- Number: 4
  - . Front: 2 steering and driving
  - . Rear: 2 driving
- Wheelbase: 3006 mm
- Track width adjustment: None

	Minimum, mm	Maximum, mm	Adjustment method
Front	1875	1875	None
Rear	1875	1875	None

PROTECTIVE STRUCTURE

- Make: JCB
- Model: None
- Type: Two door full width low noise safety cab
- Manufacturer's name and address: GKN Sankey, Hadley Castle Works, P O Box 20, Telford, Shropshire
- Protective device:
  - . Rollguard: Safety cab
  - . Tiltable/Not tiltable: Not tiltable
- OECD approval number: CSS 0177/6

DRIVER'S SEAT

- Make/Model/Type: Kab Bostrom, T6
- Type of suspension: None
- Type of damping: None
- Range of adjustment:
  - . Longitudinal: 150 mm
  - . Vertical: 60 mm

LIGHTING

- Unrestricted beam angle of headlight in plan view: 110°

MISCELLANEOUS

- Additional seat:
  - • Location: Left of driver seat
  - • Number of places: 1

All dimensions at normal suspension running height

	Height above ground to centre, mm	Size, mm	Distance from outside edge to median plane of tractor, mm
Headlights	1100	185 x 125	753
Sidelights	1100	185 x 125	753
Rear lights	1450	55 x 120	950
Axle reflectors	--	--	--
Rear cluster reflectors	1450	120 x 120	1022

II. TEST CONDITIONS

Overall dimensions (overall width at 1875 measured front track)

Length mm	Width		Height at top of	
	Minimum mm	Maximum mm	Protective structure mm	Exhaust pipe mm
5118	2360	2360	2883+	2780+

+ at normal suspension running height

Ground clearance (unballasted tractor) 340 mm

Clearance-limiting part: Bottom of drawbar

Tractor mass (with safety cab)

	Unballasted		Ballasted	
	Without driver kg	With driver kg	Without driver kg	With driver kg
Front	3472	3501	--	--
Rear	2845	2891	--	--
Total	6317	6392	--	--

Tyres and track width specification

	Front and Rear		
Tyres . dimensions . rating . type	495/70 R24 155 'G' Radial, tubeless High speed		
Speed maximum, km/h	30	40	70
Maximum load (tyre manufacturer's), kg	4845	4455	4145
Corresponding inflation pressure, Bar	4.1	4.1	4.1
Maximum load (tractor manufacturer's), front, kg	2550	2550	2550
Corresponding inflation pressure, front, Bar	1.8	2.0	2.3
Maximum load (tractor manufacturer's), rear, kg	2950	2950	2950
Corresponding inflation pressure, rear, Bar	2.2	2.4	2.8
Dynamic radius index	620 mm		
. Tested track width	1875 mm		
Optional . high traction tyre . high speed tyre	16.9R30 480/70R30 445/70R24		

Oils and lubrication

Capacity and change interval

	Capacity litres	Oil change h	Filter change h
Engine (oil)	12.5	250	250
Front axle	15.0	1000	--
Front axle hubs (x 2)	1.5	1000	--
Rear axle	22.0	1000	--
Range gearbox and PTO gearbox combined	20.0	1000	500
Six speed gearbox	10.0	1000	--
Hydraulic system	60.0	2000	500
Front PTO transfer box	1.2	1000	--
Brake system - Front - Rear	0.75 0.75	2000 2000	-- --
Clutch system	0.5	2000	--

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 and used during test
Engine oil	
Type:	JCB 15W/40 Multigrade
Viscosity:	92 cSt @ 40°C
Classification:	MIL-L-2104D
Range & Pto Gearbox Combined	
Type:	JCB Super Universal Agricultural Oil
Viscosity:	77 cST @ 40°C
Classification:	MIL-L-2104C
6 speed gearbox	
Type:	JCB HD90 Gear Oil
Viscosity:	216 cSt @ 40°C
Classification:	MIL-L-2105
Rear axle	
Type:	JCB HD90 Gear Oil
Viscosity:	216 cSt @ 40°C
Classification:	MIL-L-2105
Front axle and hubs	
Type:	JCB HD90 Gear Oil
Viscosity:	216 cSt @ 40°C
Classification:	MIL-L-2105
Brake fluid	
Type:	JCB Universal Brake Fluid
Viscosity:	8 cSt @ 40°C
Classification:	SAE J1703
Hydraulic fluid	
Type:	JCB Special Hydraulic Fluid
Viscosity:	30 cSt @ 40°C
Classification:	ISO VG32
Steering oil	
Type:	JCB Special Hydraulic Fluid
Viscosity:	30 cSt @ 40°C
Classification:	ISO VG32
Recommended grease:	JCB MPL Grease - Lithium based, No 2 consistency
Number of lubrication points:	37

III. TEST RESULTS

A. COMPULSORY TEST RESULTS

1. MAIN POWER TAKE-OFF

- Date and location of tests: 3 December 1991
  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		Specific g/kWh	
			kg/h	l/h		
1.1 MAXIMUM POWER - TWO HOUR TEST						
98.7	2450	1009	25.37	30.27	257	3.26
1.2 POWER AT RATED ENGINE SPEED						
98.2	2600	1070	26.56	31.70	270	3.10
1.3 STANDARD POWER TAKE-OFF SPEED (1000 ± 10 rev/min)						
98.6	2428	1000	25.03	29.86	254	3.30
1.4 PART LOADS 1.4.1 The torque corresponding to maximum power at rated engine speed						
98.2	2600	1070	26.56	31.70	270	3.10
1.4.2 85% of the torque defined in 1.4.1						
85.6	2665	1097	25.15	30.01	294	2.85
1.4.3 75% of the torque defined in 1.4.2						
65.4	2715	1118	21.27	25.38	325	2.58
1.4.4 50% of the torque defined in 1.4.2						
44.3	2757	1135	17.76	21.19	401	2.09
1.4.5 25% of the torque defined in 1.4.2						
22.7	2798	1152	14.01	16.72	617	1.36
1.4.6 Unloaded						
0.0	2850	1173	10.27	12.26	--	--

Power kW	Speed		Fuel consumption			Specific energy kWh/1
	Engine rev/min	P.T.O. rev/min	Hourly		Specific g/kWh	
			kg/h	l/h		
1.5 PART LOADS AT STANDARD POWER TAKE-OFF SPEEDS (1000 rev/min)						
1.5.1 The torque corresponding to maximum power						
98.6	2428	1000	25.03	29.86	254	3.30
1.5.2 85% of the torque obtained in 1.5.1						
86.2	2508	1032	23.99	28.63	278	3.01
1.5.3 75% of the torque obtained in 1.5.2						
66.2	2559	1053	20.33	24.26	307	2.73
1.5.4 50% of the torque obtained in 1.5.2						
44.7	2603	1072	16.62	19.83	372	2.25
1.5.5 25% of the torque obtained in 1.5.2						
22.7	2651	1091	12.87	15.36	567	1.48
1.5.6 Unloaded						
0.0	2719	1119	8.91	10.63	--	--

No load, maximum engine speed: 2850 rev/min

Torque (equivalent crankshaft) at maximum power: 384.7 Nm

Torque (equivalent crankshaft) at rated speed: 360.7 Nm

Maximum torque (equivalent crankshaft) (engine speed 1700 rev/min): 482.6 Nm

Mean atmospheric conditions:

- Temperature: 19°C
- Pressure: 1030 m bar
- Relative humidity: 49%

Maximum temperatures:

- Coolant: 87°C
- Engine oil: 109°C
- Fuel (at pump): 53°C
- Engine air intake: 26°C

2. HYDRAULIC POWER AND LIFTING FORCE

Date of tests: 30 March 1992

2.1 HYDRAULIC POWER TEST

Sustained pressure with relief valve open: 21.3 MPa

Pump delivery rate at minimum pressure: 70.3 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	63.0	19.2	20.2
Flow rate and hydraulic pressure corresponding to maximum hydraulic power	64.0	19.0	20.3

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 WITH TYRE RADIUS OF 620 MM) REAR LINKAGE

	At the hitch point	On the frame
Height of lower hitch points above ground in down position	230 mm	230 mm
Vertical movement	690 mm	780 mm
Maximum corrected force exerted through full range	65.4 kN	51.0 kN
Corresponding pressure of hydraulic fluid	19.2 MPa	19.2 MPa
Moment about rear-wheel axis	67.1 kNm	83.4 kNm
Maximum tilt angle of mast from vertical	–	12 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	-275	-255	-200	-100	-50	0	100	200	300	435	505
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	–	66.5	67.1	67.7	67.7	67.8	67.9	67.6	66.4	65.4	–
Corresponding pressure: 19.2 MPa											
at the frame kN	59.5	59.6	59.9	60.0	60.0	59.7	58.8	57.5	55.8	52.8	51.0
Corresponding pressure: 19.2 MPa											

3. DRAWBAR POWER AND FUEL CONSUMPTION TEST (UNBALLASTED TRACTOR)

Date of tests: 6 February 1992
Type of track: Concrete

Height of drawbar above ground	Tyre inflation pressure	
	Front	Rear
390 mm	194 kPa	194 kPa

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	Pres
	kW	kN	km/h	rev/min	%	g/kWh	kWh/l	°C	°C	°C	°C	%	kPa
3.1	MAXIMUM POWER IN TESTED GEARS												
2L*	48.3	65.6	2.65	2736	15.2	434	1.93	50	81	88	10	66	1019
3L*	74.8	66.7	4.04	2655	15.1	357	2.34	49	82	87	10	64	1019
1M*	77.7	65.3	4.27	2625	14.8	351	2.39	49	85	88	11	62	1018
4L	87.7	51.1	6.18	2450	6.1	299	2.80	48	84	87	11	62	1019
2M	88.2	41.5	7.65	2450	4.7	296	2.83	49	86	87	10	64	1018
5L	89.0	35.2	9.12	2454	3.9	294	2.85	48	85	86	11	63	1019
1H	88.1	33.4	9.48	2457	3.8	296	2.83	50	85	91	11	60	1019
6L	90.2	27.2	11.92	2450	3.1	289	2.90	49	85	90	11	62	1019
3M	90.0	26.5	12.24	2458	3.1	291	2.88	48	85	88	11	63	1019
3.2	FUEL CONSUMPTION												
3.2.1	In selected gear, at maximum power at rated speed												
6L	88.8	25.2	12.68	2600	2.9	307	2.73	48	85	89	11	62	1019
3.2.1.1	75% of pull at maximum power at rated speed												
6L	69.5	18.9	13.22	2695	2.4	347	2.42	49	85	90	11	61	1019
3.2.1.2	50% of pull at maximum power at rated speed												
6L	47.1	12.5	13.54	2744	1.7	427	1.96	49	84	90	11	61	1019
3.2.1.3	Next higher gear at reduced engine speed; same pull and travelling speed as in 3.2.1.1 †												
2H†	69.1	18.8	13.21	1961	2.4	269	3.12	48	84	86	10	67	1019
3.2.1.4	Next higher gear at reduced engine speed; same pull and travelling speed as in 3.2.1.2 †												
2H†	47.5	12.6	13.55	2000	1.8	307	2.73	49	82	86	10	66	1019
3.2.2	In selected gear nearest to 7.5 km/h, at maximum power at rated speed												
4L	87.3	47.6	6.60	2601	5.6	312	2.68	49	85	91	11	62	1019
3.2.2.1	75% of pull at maximum power at rated speed												
4L	69.5	35.9	6.97	2699	4.0	348	2.41	49	86	91	11	63	1019
3.2.2.2	50% of pull at maximum power at rated speed												
4L	47.2	23.6	7.19	2749	2.6	420	1.99	51	83	91	11	62	1019
3.2.2.3	Next higher gear at reduced engine speed; same pull and travelling speed as in 3.2.2.1												
2M	69.2	35.7	6.97	2213	3.9	288	2.91	48	82	84	10	64	1019
3.2.2.4	Next higher gear at reduced engine speed; same pull and travelling speed as in 3.2.2.2												
2M	47.0	23.5	7.19	2253	2.6	332	2.52	49	81	88	10	65	1019

* Maximum power limited by wheelslip

† Next higher gear showing a significantly lower fuel consumption

B SUPPLEMENTARY POWER LIFT TEST

1 POWER LIFT TEST (To ISO 730-1:1990 with tyre radius of 695 mm) REAR LINKAGE

	At the hitch point	On the frame
Height of lower hitch points above ground in down position	230 mm	230 mm
Vertical movement	685 mm	830 mm
Maximum corrected force exerted through full range	65.4 kN	51.2 kN
Corresponding pressure of hydraulic fluid	19.2 MPa	19.2 MPa
Moment about rear-wheel axis	67.1 kNm	83.7 kNm
Maximum tilt angle of mast from vertical	–	11 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	-375	-330	-200	-100	-50	0	50	100	200	355	455
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	–	65.4	66.0	67.0	67.3	67.5	67.5	67.6	67.6	68.0	–
Corresponding pressure: 19.2 MPa											
at the frame kN	56.1	57.0	57.7	57.4	57.3	57.2	57.1	56.5	55.6	53.2	51.2
Corresponding pressure: 19.2 MPa											

B SUPPLEMENTARY POWER LIFT TESTS

2 POWER LIFT TEST (To ISO 730-1:1990) ON FRONT LINKAGE

	At the hitch point	On the frame (a)	On the frame (b)
Height of lower hitch points above ground in down position	180 mm	180 mm	180 mm
Vertical movement	860 mm	930 mm	930 mm
Maximum corrected force exerted through full range	27.5 kN	21.5 kN	21.1 kN
Corresponding pressure of hydraulic fluid	19.2 MPa	19.2 MPa	19.2 MPa
Moment about front-wheel axis	43.5 kNm	47.1 kNm	46.3 KNm
Maximum tilt angle of mast from vertical	--	9 degrees	12 degress

Linkage settings for test - see Table 2.2 and Figures 2.2

(a) Top link in top hole
(b) Top link in bottom hole

Lifting heights relative to the horizontal plane including the lower link pivot points											
mm	350	-345	200	100	50	0	150	250	400	515	580
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	--	27.5	27.5	27.8	28.1	28.2	28.8	29.2	29.3	29.1	--
Corresponding pressure: 19.2 MPa (a) Top link in top hole											
at the frame kN	28.7	28.6	27.0	26.7	26.6	26.5	26.2	25.7	24.5	23.2	21.5
Corresponding pressure: 19.2 MPa (b) Top link in bottom hole											
at the frame kN	26.5	26.5	25.6	25.4	25.4	25.2	24.8	24.5	23.4	22.2	21.1

THREE-POINT LINKAGE

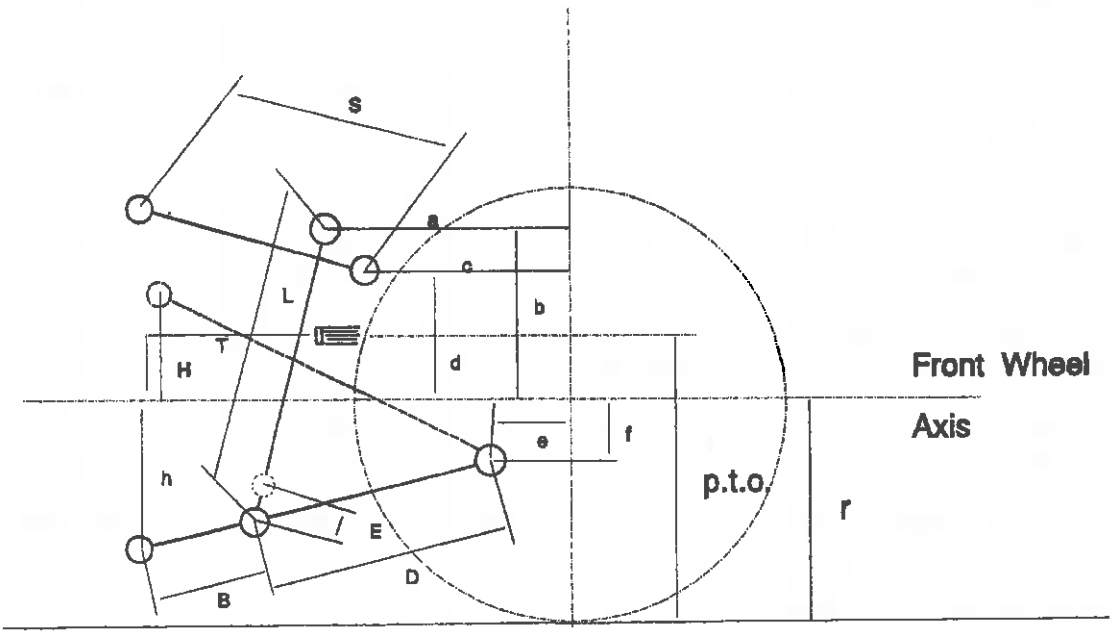
(Front)

Category: 2 to ISO 8759/2-1985

Category adaptor: None

Controls: Hand lever operating spool valve

Fig 2.2 FRONT LINKAGE DIMENSIONS



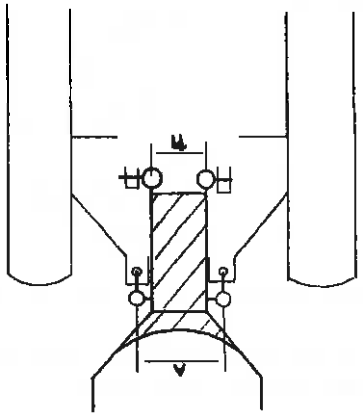


Table 2.2 FRONT LINKAGE DIMENSIONS

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

			Dimensions or range (mm)	Settings used in tests (mm)	
† Conventional lift arms and rods replaced by lift rams				Main (a)	(b)
Length of lift arms: (None)†		(A)	0	0	
Length of lower links:		(B)	1000	1000	
Distance of lift ram attachment point from front wheel centre line:	horizontally: vertically:	(a) (b)	886 565 and 611	886 611	
Horizontal distance between the two lower link points:		(u)	455	455	
Horizontal distance between the two lift cylinder attachment points:		(v)	570	570	
Length of upper link:		(S)	580 - 850	790	
Distance of upper link pivot point from front wheel centre line:	horizontally: vertically:	(c) (d)	785 415 - 455	785 455	415
Distance of lower link pivot point from front wheel centre line:	horizontally: vertically:	(e) (f)	584 95	584 95	
Distance of lower link points to lift rod pivot points on lower link centre line:	horizontally: vertically:	(D) (E)	368 -24	368 -24	
Length of lift rods (integral rams):†		(L)	525 - 855	525 - 855	
Height of lower hitch points (*) relative to the front wheel centre line, situated 620 mm above the ground level:					
- in low position		(h)	439	439	
- in high position		(H)	420	420	
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 620 mm ISO 4251/1-1984 and lower pivot point at a nominal 525 mm above ground. Height will vary according to suspension level.

C OPTIONAL TESTS

1 FRONT POWER TAKE-OFF (LEFT HAND SHAFT NOMINAL 1000 REV/MIN)

(Special cases of tractors with a power take-off unable to transmit the full power from the engine).

2 hour test

Overload every 5 minutes during 2 hours up to maximum power (not exceeding 1 minutes duration)

2 hour test power: 85.8 kW

2 hour engine speed: 2678 rev/min

Overload power: 99.4 kW

Overload engine speed: 2467 rev/min

2 LOCATION OF CENTRE OF GRAVITY

Height above ground, mm	962
Distance forward from the vertical plane containing the axis of the rear wheels, mm	1651
Distance from the median plane of the tractor, mm (to left viewed from rear)	18

REPAIRS AND ADJUSTMENTS DURING TESTS: None

REMARKS: None

Test carried out by: E Nigro, S Devonshire

Officer in charge: P C Seward

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

H M R Proctor — for the Director

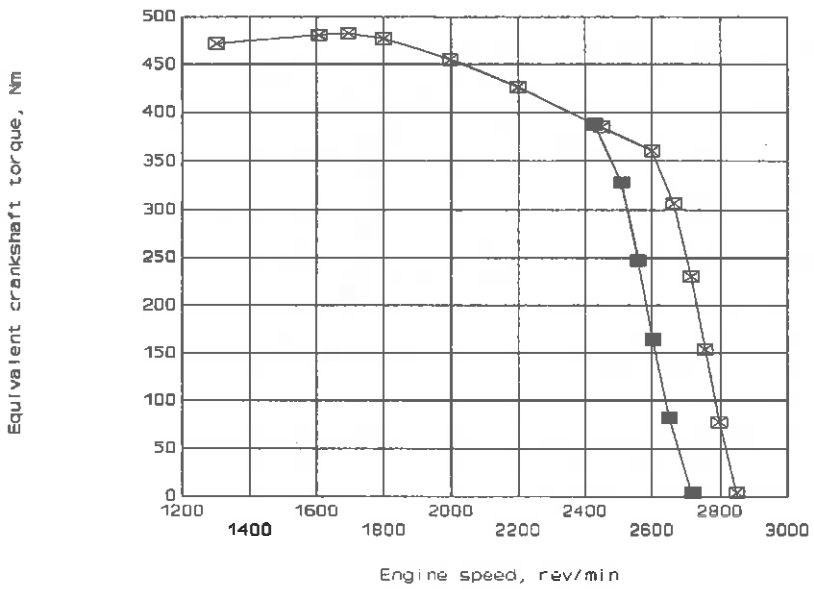
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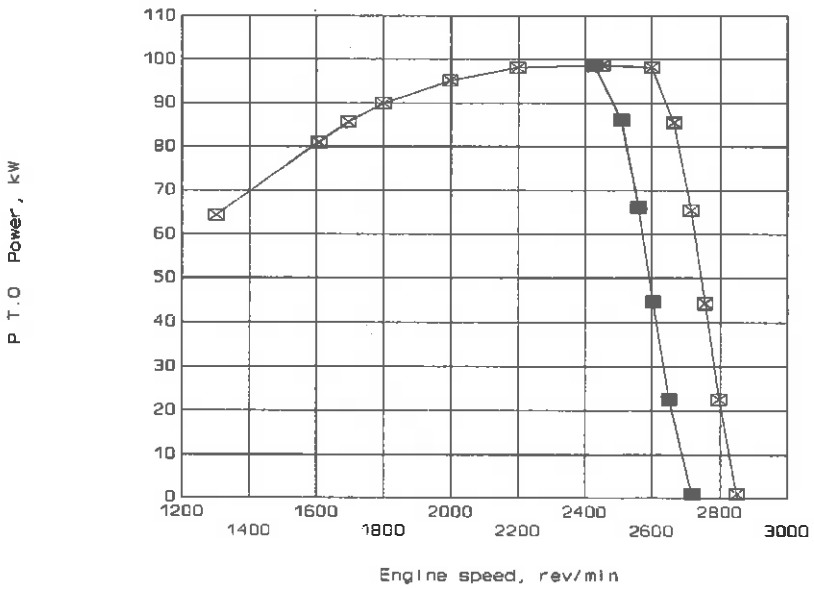
ANNEX **MAIN POWER TAKE-OFF CURVES**

P.T.O. POWER TEST - JCB FASTRAC 145 TURBO (4 WD)

Governor set for max power at rated engine speed ⊠

Governor set for max power at pto speed, 1000 rev/min ■

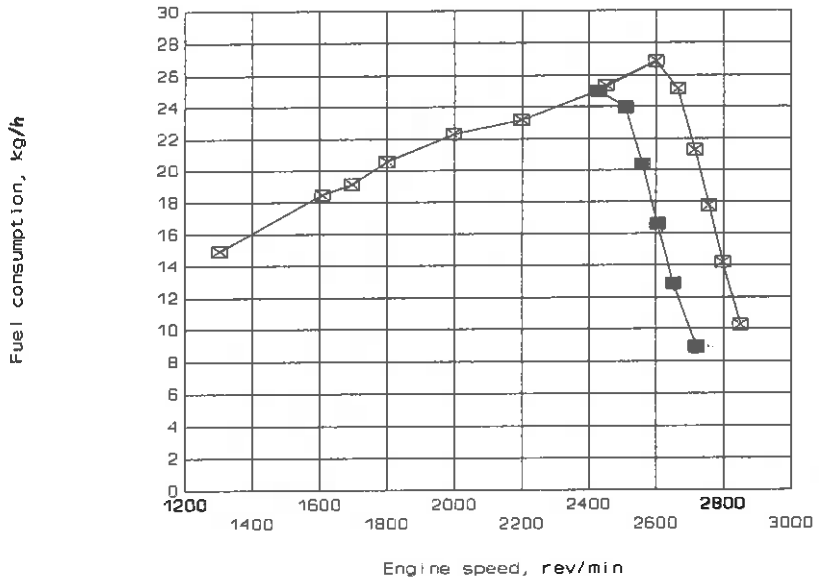


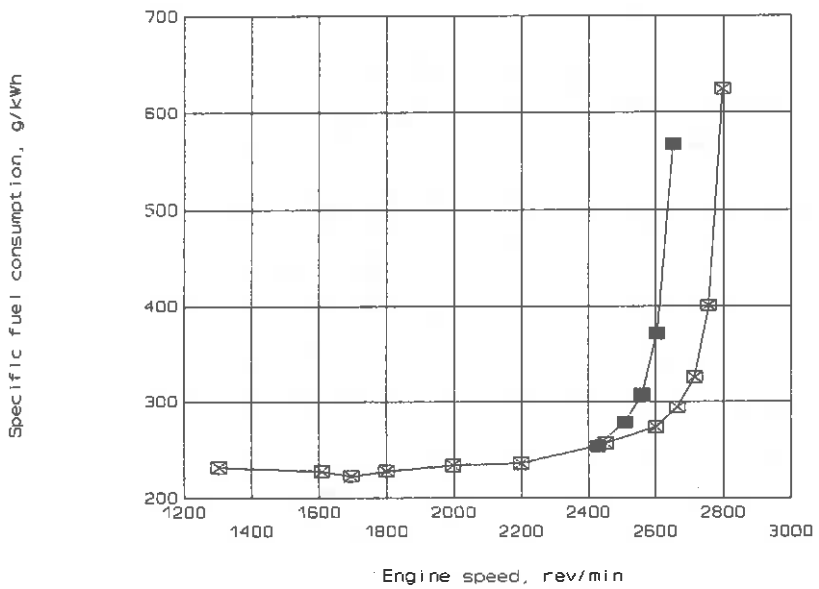


P.T.O. POWER TEST - JCB FASTRAC 145 TURBO (4 WD)

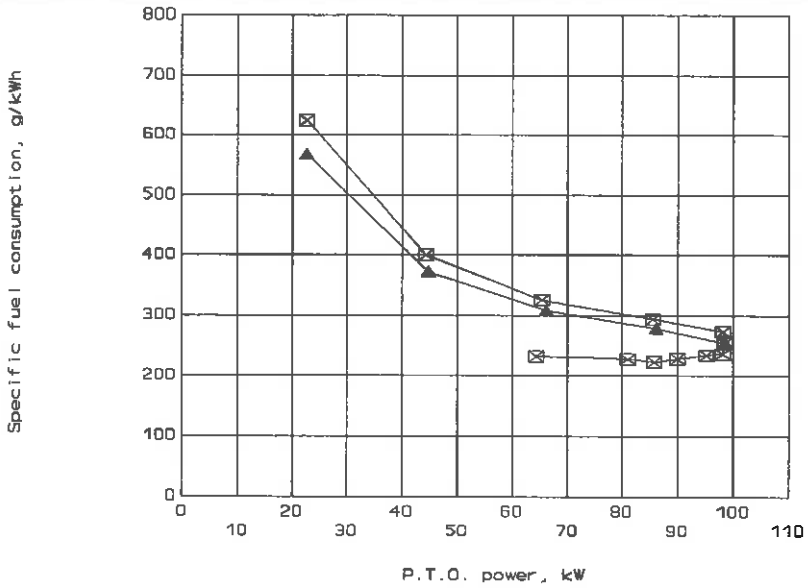
Governor set for max power at rated engine speed ⊠

Governor set for max power at pto speed, 1000 rev/min ■





P.T.O. POWER TEST - JCB FASTRAC 145 TURBO (4 WD)



Governor set for max power at rated engine speed ⊠

Governor set for max power at pto speed, 1000 rev/min ▲