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1506/2 Restricted Code

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

# Case International 695 and 4210 Four-Wheel Drive Tractors





**Manufactured by:** J I Case (Europe) Limited
Wheatley Hall Road
Doncaster
DN2 4PG

**Submitted for test by:** The manufacturer

**Report No:** 765

**Date:** December 1993

R93/71784/OECD

## STATEMENT REGARDING ALL MODELS AND NEW MODELS

The Case International Model 4210 Four-Wheel Drive is identical to the Model 695 Four-Wheel Drive except with regard to the metal work of the bonnet, rear lights and the exhaust system.

The results contained in this report are those obtained during tests on the Model 695 Four-Wheel Drive.

R93/71784/OECD

## TABLE OF CONTENTS


| | | | Page No. |
|---|---|---|---|
| I. | SPECIFICATION OF TRACTOR | | 1 |
| II. | TEST CONDITIONS | | 15 |
| III. | TEST RESULTS | | 19 |
| A. | Compulsory tests | | |
| | 1 | Main power take-off performance | 19 |
| | 2 | Hydraulic power and lifting force | 21 |
| | 3 | Drawbar performance (power and fuel consumption) | 23 |
| | Repairs and adjustments | | 24 |
| | Remarks | | 24 |
| Annex 1 | | Main power take-off curves | 25 |

| | |
|---|---|
| **Tractor manufacturer's name and address:** | J I CASE Europe Ltd<br>Wheatley Hall Road<br>Doncaster DN2 4PG |
| **Location of tractor assembly:** | Doncaster |
| **Submitted for test by:** | The manufacturer |
| **Selected for test by:** | The manufacturer with the agreement of the testing station |
| **Place of running in:** | Doncaster |
| **Duration of running in:** | 20 Hrs |
| **Location of test:** | Silsoe Research Institute<br>Wrest Park, Silsoe, England |

## I. SPECIFICATION OF TRACTOR

### Tractor

| | |
|---|---|
| Make: | Case International |
| Model: | 695 |
| Type: | Four wheel drive unit construction |
| Serial No: | JJE0027384 |
| 1st Serial No: | JJE0027384 |

### Engine

| | |
|---|---|
| Make: | J I Case Company, Neuss, Germany |
| Model: | D239 |
| Type: | 4-stroke, naturally aspirated direct injection diesel |
| Serial No: | 239 DT 2D 492071 |
| Ist Serial No: | 239 DT 2D 492071 |

### Cylinders

| | |
|---|---|
| Number/disposition: | 4, vertical, in-line |
| Bore/stroke: | 98.4 mm x 128.5 mm |
| Capacity: | 3909 $cm^3$ |
| Compression ratio: | 16 : 1 |
| Arrangement of valves: | Overhead |
| Cylinder liners: | Replaceable, wet |

### Supercharging

| | |
|---|---|
| Make: | None |

Fuel system

| | |
|---|---|
| Fuel feed system: | Feed pump incorporated in injection pump |
| Make, type and model of fuel filter: | Bosch double fuel filter with replaceable elements and water traps |
| Capacity of fuel tank: | 112 l |
| Make, type and model of injection pump: | Bosch CR distributor type -<br>VE 4/12F 1200 RV-10484/4;<br>Case part 1329128 C1 |
| Serial No: | (011) 267 919039 |
| Manufacturer's production setting of injection pump: | |
| . Flow rate | 52.5 +/- 2 $mm^3$ per stroke at 1200 rpm pump speed for fuel 0.835/0.845 sg at 15° C |
| . Timing | 8° before T.D.C. |
| Make, type and model of injectors: | Bosch DLLA 150 S 815 |
| Injection pressure: | 22.5 MPa |

Governor

| | |
|---|---|
| Make: | Bosch |
| Model: | Incorporated in injection pump |
| Type: | Mechanical |
| Governed range of engine speed: | 650 to 2660 rev/min |
| Rated engine speed: | 2400 rev/min |

Air cleaner

| | |
|---|---|
| Pre-cleaner: | |
| . Make | Coopers |
| . Type | Centrifugal |
| . Model | In main cleaner body |
| . Location of air intake | |
| Main cleaner: | |
| . Make | Coopers |
| . Type | Dry paper element |
| . Model | Case part 3125199 R2 |
| . Location of air intake | Under bonnnet forward of engine |
| Maintenance indicator: | Warning light on instrument panel |

Lubrication system

| | |
|---|---|
| Type of feed pump: | Forced feed from gear pump |
| Type of filter: | Mann spin-on full flow with replaceable cartridge and metal strainer sump |
| Number: | 1 |

Cooling system

| | |
|---|---|
| Type of coolant: | Water and antifreeze solution |
| Type of pump: | Impeller |
| Specification of fan: | Belt driven puller |
| Number of fan blades: | 5 |
| Fan diameter: | 457 mm |
| Coolant capacity: | 13.7 l |
| Type of temperature control: | Thermostat |
| System pressure: | 70 kPa |

Starting system

| | |
|---|---|
| Make: | Magneti Marelli |
| Model: | M127 |
| Type: | Electrical, pre-engaged, solenoid operated |
| Starter motor power rating: | 2.8 kW |
| Cold starting aid: | Thermostart |
| Safety device: | The clutch pedal must be fully depressed to actuate the safety start switch. |

Electrical system

| | |
|---|---|
| Voltage: | 12 |
| Generator: | |
| . Make | Magneti Marelli |
| . Model | A127 |
| . Type | Belt driven |
| . Power | 45A at 6,000 rev/min |
| Batteries: | |
| . Rating | 1, Chloride type 644 90 Ah at 20-hour rating |

Exhaust system

| | |
|---|---|
| Make: | Nelson Burgess |
| Model: | Case part 84738C1 , (4210=137279A1) |
| Type: | Reflex |
| Location: | Vertical above bonnet on right-hand side |
| Height of outlet above ground: | 2768 mm |
| Measurement taken from Model 4210: | 2769 mm |

**TRANSMISSION TO WHEELS**

Clutch

| | |
|---|---|
| Make: | Rockford |
| Model: | Case part 85026 C3 |
| Type: | Dry, for transmission only |
| Number of plates: | 1 |
| Diameter of plates: | 300 mm |
| Method of operation: | Hydraulically by foot pedal |

Gear box

| | |
|---|---|
| Make: | Case IH |
| Model: | Doncaster |
| Type: | Mechanical synchromesh |
| Number of gears: | 16 forward + 8 reverse |
| Available options: | Change of gear ratios, 8 forward + 4 reverse, 8 forward + 8 reverse shuttle |

Rear axle final drives

| | |
|---|---|
| Make: | Case IH |
| Model: | Doncaster |
| Type: | Crown wheel and pinion, with differential and epicyclic reduction gear final drives |

Differential lock:

| | |
|---|---|
| . Type | Mechanical |
| . Method of engagement | Pedal operated |
| . Method of disengagement | Self-disengaging |

Front axle and final drives

| | |
|---|---|
| Make: | Carraro |
| Model: | 707 STD |
| Type: | Crown wheel and pinion, and epicyclic reduction gear final drives |

Differential lock:

| | |
|---|---|
| . Type | Self-locking |
| . Method of engagement | |
| . Method of disengagement | |

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:* 2400 rev/min km/h |
|---|---|---|---|
| Forward | | | |
| 1 | LP1 | 259.239 | 2.60 |
| 2 | LD1 | 214.931 | 3.14 |
| 3 | LP2 | 159.560 | 4.22 |
| 4 | LD2 | 132.289 | 5.09 |
| 5 | LP3 | 118.028 | 5.71 |
| 6 | LD3 | 97.855 | 6.89 |
| 7 | LP4 | 91.756 | 7.34 |
| 8 | LD4 | 76.073 | 8.86 |
| 9 | HP1 | 67.628 | 9.97 |
| 10 | HD1 | 56.069 | 12.02 |
| 11 | HP2 | 41.624 | 16.19 |
| 12 | HD2 | 34.510 | 19.53 |
| 13 | HP3 | 30.790 | 21.89 |
| 14 | HD3 | 25.527 | 26.40 |
| 15 | HP4 | 23.936 | 28.16 |
| 16 | HD4 | 19.845 | 33.97 |
| Reverse | | | |
| 1 | P1 | 216.033 | 3.12 |
| 2 | D1 | 179.109 | 3.76 |
| 3 | P2 | 132.967 | 5.07 |
| 4 | D2 | 110.241 | 6.11 |
| 5 | P3 | 98.356 | 6.85 |
| 6 | D3 | 81.545 | 8.27 |
| 7 | P4 | 76.463 | 8.82 |
| 8 | D4 | 63.394 | 10.63 |

L = Low range H = High range P = Power-shift D = Direct-drive

(*) Calculated with a tyre dynamic radius index of 745 mm (ISO 4251/1-1984)

Number of revolutions of front wheels for one revolution of rear wheels: 1.407

**POWER TAKE-OFF**

Main power take-off

| | |
|---|---|
| Type: | Independent |
| Method of engagement: | By hand lever lever |
| Number of shafts: | 2 |
| Method of changing power take-off speeds: | Manual, lever selection |

Clutch

| | |
|---|---|
| Make: | Case IH |
| Model: | Doncaster |
| Type: | Hydraulically engaging wet multi-plate clutch |
| Number of plates: | 5 |
| Diameter of plates: | 125 mm |

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: | 733 |
| Distance from the median plane of the tractor: | Central |
| Distance behind rear wheel axis: | 400 mm |
| Pto speed at rated engine speed: | 605 rev/min |
| Engine speed at standard power take-off speed: | 2140 rev/min |
| Ratio of rotation speeds: | 3.964:1 |
| Power restriction and maximum torque: | ISO recommendation, 48 kW |
| Direction of rotation (viewed from behind tractor): | Clockwise |

*1000 rev/min*

| | |
|---|---|
| Location: | At rear of tractor |
| Diameter of power take-off shaft: | 34.9 mm |
| Number of splines: | 21 to ISO 500 |
| Height above ground: | 610 mm |
| Distance from the median plane of the tractor: | Central |
| Distance behind rear-wheel axis: | 400 mm |
| PTO speed at rated engine speed: | 1096 rev/min |
| Engine speed at standard power take-off speed: | 2190 rev/min |
| Ratio of rotation speeds: | 2.190 : 1 |
| Direction of rotation (viewed from behind tractor): | Clockwise |

**POWER LIFT**

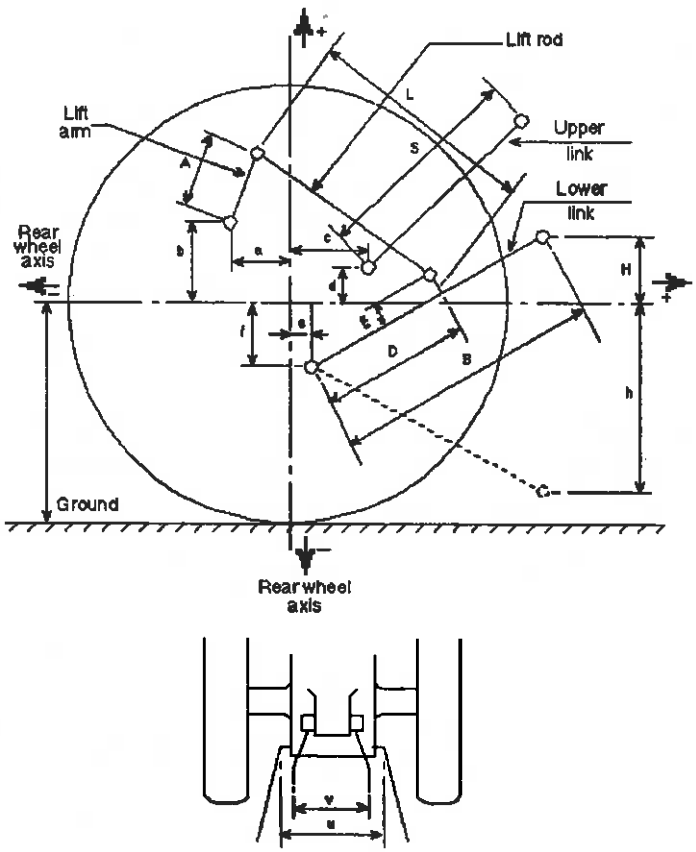
| | |
|---|---|
| Make: | Case IH |
| Model: | Doncaster |
| Type: | Hydraulic, open centre system |
| Type and number of cylinders: | One internal single acting |
| Type of linkage lock for transport: | Hydraulic |
| Relief valve pressure setting: | 17.2 MPa - 18.0 MPa |
| Opening pressure of cylinder safety valve: | 18.6 MPa |
| Lift pump type: | Plessey, fixed delivery gear |
| Transmission between pump and engine: | Forward end of pto shaft, independent of main and pto clutches |
| Type and number of filters: | 1 full flow filter to main pump and fine screen to transfer pump |
| Site of oil reservoir: | Integral with transmission housing |
| Type, number and location of tapping points: | None |
| Maximum volume of oil available to external cylinders: | 13.6 l, 40.9 l with overfill |

**AUXILIARY HYDRAULIC SYSTEM**

| | |
|---|---|
| Make: | |
| Model: | Case IH |
| Type: | Doncaster |
| Relief valve pressure setting: | 17.2 MPa - 18.0 MPa |
| Lift pump type: | Plessey, fixed delivery gear |
| Transmission between pump and engine: | Forward end of pto shaft, independent of main and pto clutches |
| Type and number of filters: | 1 full flow filter to main pump and fine screen to transfer pump |
| Site of oil reservoir: | Integral with transmission housing |
| Type and number of tapping points: | 3 on double acting auxiliary control valve |
| Maximum volume of oil available to external cylinders: | 13.6 l, 40.9 l with overfill |

**THREE-POINT LINKAGE**

| | |
|---|---|
| **Category:** | **2 to ISO Standard 730-1:1990** |
| **Category adaptor:** | **None** |
| **Controls:** | **Draught and position control, floating position, 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) | 298 mm | 298 mm |
| Length of lower links: | | (B) | 814 mm | 814 mm |
| Distance of lift arm pivot point from rear wheel centre line: | horizontally:<br>vertically: | (a)<br>(b) | 66 mm<br>288 mm | 66 mm<br>288 mm |
| Horizontal distance between the two lower link points: | | (u) | 460 mm | 460 mm |
| Horizontal distance between the two lift arm end points: | | (v) | 525 mm | 525 mm |
| Length of upper link: | | (S) | 584-774 mm | 730 mm |
| Distance of upper link pivot point from rear wheel centre line: | horizontally:<br>vertically: | (c)<br>(d) | 279 mm<br>186, 226 mm | 279 mm<br>226 mm |
| Distance of lower link pivot point from rear wheel centre line: | horizontally:<br>vertically: | (e)<br>(f) | 165 mm<br>175 mm | 165 mm<br>175 mm |
| Distance of lower link points to lift rod pivot points on lower link centre line: | horizontally:<br>vertically: | (D)<br>(E) | 571 mm<br>on central line | 571 mm<br>on central line |
| Length of lift rods: | | (L) | 680-735 mm | 720 mm |
| Height of lower hitch points (*) relative to the rear wheel centre line, situated 745 mm above the ground level: | | | | |
| - in low position | | (h) | 465-570 mm | 550 mm |
| - in high position | | (H) | 95-175 mm | 100 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 745 mm ISO 4251/1-1984

Swinging Drawbar

| | | |
|---|---|---|
| Type: | | Clevis |
| Height above ground, | maximum: | 497 mm |
| | minimum: | 387 mm |
| Type of adjustment: | | Inverting drawbar |
| Distance of hitch point from rear-wheel axis, horizontally: | | 750 mm, 800 mm |
| Distance of hitch point form power take-off shaft ends: | | |
| . Vertically: | 540 rev/min shaft: | 236 mm, 346 mm |
| | 1000 rev/min shaft: | 113 mm, 223 mm |
| . Horizontally: | | 350 mm, 400 mm |
| Lateral adjustment (centre of clevis): | | |
| . Right-hand: | | 170 mm drawbar in, 180 mm drawbar out |
| . Left-hand: | | 170 mm drawbar in, 180 mm drawbar out |
| Distance of pivot point from rear axles horizontally: | | 20 mm to rear |
| Vertical opening of clevis: | | 65 mm |
| Diameter of drawbar pin hole: | | 26 mm |
| Maximum vertical permissible load: | | 908 kg |

Trailer Hitch

Type: None fitted

Linkage Drawbar

Type: None fitted

Front Towing Hitch None fitted

Type:

Steering

| | |
|---|---|
| Make: | Case IH |
| Model: | Doncaster |
| Type: | Hydrostatic, steering wheel coupled to motor unit, power to unit from main hydraulic pump through priority valve/flow divider. |
| Method of operation: | |
| . Pump | Plessey, live |
| . Motor | Danfoss OSPC 100 OR |
| . Ram | Cararo double acting balanced |
| . Filter | As main hydraulics |
| Working pressure: | 14.5 MPa |

Brakes

Service brake

| | |
|---|---|
| Make: | Case IH |
| Model: | Doncaster |
| Type: | Oil immersed single disc, 1 per side |
| Method of operation: | Hydraulically actuated, independent or combined, pedal operated |
| Trailer braking take-off: | Optional |

Parking brake

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

Wheels

| | |
|---|---|
| Number: | 4 |
| . Front | 2 steering and driving |
| . Rear | 2 driving |
| Wheelbase: | 2235 mm |

Track width adjustment:

| | Minimum, mm | Maximum, mm | Adjustment method |
|---|---|---|---|
| Front | 1364 | 1824 | By reversing wheels and offset lug rims |
| Rear | 1425 | 1925 | By reversing wheels and offset lug rims |

**PROTECTIVE STRUCTURE**

| | |
|---|---|
| Make: | Case International |
| Model: | C85XL with revised mounts |
| Type: | Safety cab |
| Manufacturer's name and address: | Case IH, Croix, France |
| Protective device: | |
| . Rollguard | Safety cab |
| . Tiltable/Not tiltable | Non-tiltable |
| OECD approval number: | Case International 695AXL (4WD) with seat KAB (Bostrum) XH2/U1, CSS 0195/44<br><br>Case International 4210AXL (4WD) with seat KAB (Bostrum) XH2/U1, CSS 0195/104 |

**DRIVER'S SEAT**

| | |
|---|---|
| Make/Model/Type: | KAB XH2/U1 |
| Type of suspension: | Spring |
| Type of damping: | Hydraulic |
| Range of adjustment: | |
| . Longitudinal | 150 mm |
| . Vertical | 60 mm |

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 |
|---|---|---|---|
| Headlights | 1330 | 160 x 90 | 240 |
| Sidelights | 1470 | 90 x 40 | 730 |
| Rear lights | 1590 | 100 x 100 | 825 |
| Axle reflectors | 788 | 80 dia | 265 |
| Cab reflectors | 1505 | 90 x 47 | 820 |
| Rear lights* | 1540 | 100 x 20 | 692, 842 |
| Cab reflectors* | 1310 | 45 x 90 | 953 |

## II. TEST CONDITIONS

Overall dimensions

| Length mm | Width | | Height at top of | |
|---|---|---|---|---|
| | Minimum mm | Maximum mm | Protective structure mm | Exhaust pipe mm |
| 3845 mm | 1854 | 2354 | 2670 | 2768 |
| | | | 2666* | 2769* |

Ground clearance (unballasted tractor) 329 mm

Clearance-limiting part: Drawbar clevis inverted

* Measurements taken from Model 4210 with optional wide fenders. Figures from 695 apply to 4210 without wide fenders option.

Tractor mass (with safety cab)

| | Unballasted | | Ballasted | |
|---|---|---|---|---|
| | Without driver kg | With driver kg | Without driver kg | With driver kg |
| Front | 1281 | 1296 | -- | -- |
| Rear | 2038 | 2098 | -- | -- |
| Total | 3319 | 3394 | -- | -- |

Tyres and track width specification

| | Front | Rear |
|---|---|---|
| Tyres<br>. dimensions<br>. ply rating<br>. type | 12.4 x 24<br>A8<br>Radial | 16.9 x 34<br>A8<br>Radial |
| Maximum load (tyre manufacturer's), kg | 1200 | 2015 |
| Maximum load (tractor manufacturer's), kg | 1200 | 2015 |
| Inflation pressure (tyre manufacturer's), Bar | 1.7 | 1.3 |
| Dynamic radius index | 540 | 745 |
| Chosen track width (manufacturer's nominal) | 1515 | 1530 |

Oils and lubrication

Capacity and change interval

| | Capacity l | Oil change h | Filter change h |
|---|---|---|---|
| Engine | 9.8 | 200 | 200 |
| Front axle | 5.0 | 800 | None |
| Final drive (front) | 0.6 | 800 | None |
| Gearbox | 36.5 | 800 | 200 |
| Rear axle<br>Hydraulic system )<br>Final drives (rear) )<br>Steering<br>Brakes | Integral with gearbox | | |

Fuels and lubricants used in tests

Fuel

Type: Diesel oil with cetane index of 50.0 and kinematic viscosity of 3.246 cSt at 40°C within the specification limits of Class A1 British Standard 2869/1983.

Specific gravity: 0.8571 kg/l at 15°C

| Oils | Recommended | Used during test |
|---|---|---|
| Engine oil | | |
| Type: | SAE 15W/40 | 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: | SAE 85W-140EP | As recommended |
| Viscosity: | 11.0 cSt at 100°C | |
| Classification: | MIL-L-2105-C | |
| Hydraulic brakes | | |
| Type: | SAE 15W/30 | As recommended |
| Viscosity: | 54 cSt at 50°C | |
| Classification: | MIL-L-2104-C | |
| 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: | 8 | |

## III. TEST RESULTS

### A. COMPULSORY TEST RESULTS

#### 1. MAIN POWER TAKE-OFF (1000)

Date and location of tests: 6 July 1993
Silsoe Research Institute,
Wrest Park, Silsoe, Bedford

Type of dynamometer: Eddy Current, Borghi and Saveri

| 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 | | | | | | |
| 45.5 | 2399 | 1096 | 13.25 | 15.46 | 291 | 2.94 |
| 1.2 POWER AT RATED ENGINE SPEED | | | | | | |
| 45.5 | 2399 | 1096 | 13.25 | 15.46 | 291 | 2.94 |
| 1.3 STANDARD POWER TAKE-OFF SPEED (1000 ± 10 rev/min) | | | | | | |
| 43.4 | 2191 | 1000 | 12.47 | 14.54 | 288 | 2.98 |
| 1.4 PART LOADS<br>1.4.1 The torque corresponding to maximum power at rated engine speed | | | | | | |
| 45.5 | 2399 | 1096 | 13.25 | 15.46 | 291 | 2.94 |
| 1.4.2 85% of the torque defined in 1.4.1 | | | | | | |
| 39.3 | 2442 | 1115 | 11.52 | 13.44 | 293 | 2.92 |
| 1.4.3 75% of the torque defined in 1.4.2 | | | | | | |
| 30.0 | 2480 | 1132 | 9.55 | 11.14 | 319 | 2.69 |
| 1.4.4 50% of the torque defined in 1.4.2 | | | | | | |
| 20.2 | 2516 | 1149 | 7.67 | 8.95 | 380 | 2.26 |
| 1.4.5 25% of the torque defined in 1.4.2 | | | | | | |
| 10.2 | 2540 | 1160 | 5.97 | 6.96 | 584 | 1.47 |
| 1.4.6 Unloaded | | | | | | |
| 0 | 2566 | 1171 | 4.36 | 5.08 | -- | -- |

| 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 | |
| 1.5 PART LOADS AT STANDARD POWER TAKE-OFF SPEEDS (1000 ± 10 rev/min) | | | | | | |
| 1.5.1 The torque corresponding to maximum power | | | | | | |
| 43.4 | 2191 | 1000 | 12.47 | 14.54 | 288 | 2.98 |
| 1.5.2 85% of the torque obtained in 1.5.1 | | | | | | |
| 37.6 | 2243 | 1024 | 10.83 | 12.63 | 288 | 2.98 |
| 1.5.3 75% of the torque obtained in 1.5.2 | | | | | | |
| 29.0 | 2292 | 1047 | 8.85 | 10.32 | 305 | 2.81 |
| 1.5.4 50% of the torque obtained in 1.5.2 | | | | | | |
| 19.7 | 2336 | 1067 | 7.10 | 8.28 | 360 | 2.38 |
| 1.5.5 25% of the torque obtained in 1.5.2 | | | | | | |
| 10.1 | 2374 | 1084 | 5.39 | 6.29 | 535 | 1.60 |
| 1.5.6 Unloaded | | | | | | |
| 0 | 2410 | 1100 | 3.90 | 4.55 | -- | -- |

No load, maximum engine speed: 2566 rev/min

Torque (equivalent crankshaft) at maximum power: 181.0 Nm

Maximum torque (equivalent crankshaft)
(engine speed 1240 rev/min): 221.1 Nm

Mean atmospheric conditions:

- Temperature 25°C
- Pressure 1027 m bar
- Relative humidity 29%

Maximum temperatures:

- Coolant 91°C
- Engine oil 119°C
- Fuel 52°C
- Engine air intake 34°C

## 2. HYDRAULIC POWER AND LIFTING FORCE

**Date of tests:** 6 August 1993

### 2.1 Hydraulic power test

**Sustained pressure with relief valve open:** 17.4 MPa

**Pump delivery rate at minimum pressure:** 50.6 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 | 38.3 | 15.7 | 10.02 |
| Flow rate and hydraulic pressure corresponding to maximum hydraulic power | 38.2 | 15.8 | 10.06 |

**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 | 650 mm | 818 mm |
| Maximum corrected force exerted through full range | 18.8 kN | 15.4 kN |
| Corresponding pressure of hydraulic fluid | 15.7 MPa | 15.7 MPa |
| Moment about rear-wheel axis | 18.4 kNm | 24.5 kNm |
| 24.5mum tilt angle of mast from vertical | -- | 12 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 | -476 | -373 | -300 | -200 | -100 | 0 | 50 | 100 | 200 | 277 | 342 |
| 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 | -- | 18.8 | 20.3 | 21.9 | 23.1 | 23.8 | 24.0 | 24.1 | 24.3 | 23.8 | -- |
| Corresponding pressure: 15.7 MPa | | | | | | | | | | | |
| at the frame kN | 15.4 | 16.5 | 17.2 | 17.8 | 18.1 | 18.2 | 18.1 | 17.9 | 17.5 | 16.8 | 16.3 |
| Corresponding pressure: 15.7 MPa | | | | | | | | | | | |

## 3. DRAWBAR POWER AND FUEL CONSUMPTION TEST (UNBALLASTED TRACTOR, 4 WHEEL DRIVE)

Date and location of tests: 23 July 1993
Silsoe Research Institute
Wrest Park
Silsoe

Type of track: Concrete

| | Tyre inflation pressure (kPa) | |
|---|---|---|
| Height of drawbar above ground | Front | Rear |
| 370 mm | 62 | 62 |

| Gear and Rang | 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 | | | | | | | | | | | | | |
| LP1 | 24.2 | 31.5 | 2.76 | 2468 | 15.1 | 431 | 1.99 | 47 | 78 | 114 | 24 | 59 | 101.2 |
| LP2 | 32.2 | 31.4 | 3.69 | 2443 | 15.0 | 399 | 2.15 | 48 | 81 | 115 | 25 | 57 | 101.2 |
| LD2 | 35.2 | 26.3 | 4.82 | 2402 | 6.4 | 372 | 2.30 | 49 | 80 | 115 | 25 | 57 | 101.2 |
| LP3 | 36.2 | 23.9 | 5.46 | 2405 | 5.5 | 364 | 2.36 | 48 | 81 | 114 | 25 | 57 | 101.2 |
| LD3 | 37.0 | 20.0 | 6.65 | 2401 | 4.4 | 357 | 2.40 | 48 | 83 | 118 | 23 | 66 | 101.2 |
| LP4 | 36.4 | 18.4 | 7.11 | 2396 | 4.0 | 360 | 2.38 | 48 | 81 | 118 | 23 | 64 | 101.3 |
| LD4 | 35.2 | 14.6 | 8.67 | 2402 | 3.1 | 372 | 2.30 | 49 | 83 | 118 | 23 | 61 | 101.3 |
| HP1 | 35.9 | 13.2 | 9.77 | 2399 | 2.8 | 366 | 2.34 | 49 | 82 | 117 | 23 | 61 | 101.3 |
| HD1 | 34.6 | 10.5 | 11.87 | 2403 | 2.3 | 378 | 2.27 | 49 | 83 | 117 | 23 | 60 | 101.3 |
| 3.2 FUEL CONSUMPTION<br>3.2.1 In selected gear, at maximum power at rated speed | | | | | | | | | | | | | |
| LD3 | 37.0 | 20.0 | 6.65 | 2401 | 4.4 | 357 | 2.40 | 48 | 83 | 118 | 23 | 66 | 101.3 |
| 3.2.1.1 75% of pull at maximum power at rated speed | | | | | | | | | | | | | |
| LD3 | 28.8 | 15.0 | 6.90 | 2463 | 3.3 | 374 | 2.2 | 47 | 82 | 118 | 22 | 65 | 101.3 |
| 3.2.1.2 50% of pull at maximum power at rated speed | | | | | | | | | | | | | |
| LD3 | 19.5 | 9.9 | 7.08 | 2501 | 2.2 | 445 | 1.93 | 47 | 80 | 118 | 22 | 66 | 101.3 |
| 3.2.1.3 Next higher gear at reduced engine speed; same pull and travelling speed as in 3.2.1.1 | | | | | | | | | | | | | |
| LP4 | 28.6 | 14.9 | 6.90 | 2310 | 3.3 | 373 | 2.30 | 49 | 82 | 114 | 25 | 60 | 101.2 |
| 3.2.1.4 Next higher gear at reduced engine speed; same pull and travelling speed as in 3.2.1.2 | | | | | | | | | | | | | |
| LP4 | 19.5 | 9.9 | 7.09 | 2347 | 2.3 | 431 | 1.99 | 48 | 79 | 114 | 25 | 59 | 101.2 |
| 3.2.2 In selected gear nearest to 7.5 km/h, at maximum power at rated engine speed | | | | | | | | | | | | | |
| LP4 | 36.4 | 18.4 | 7.11 | 2396 | 4.0 | 360 | 2.38 | 48 | 81 | 118 | 23 | 64 | 101.3 |
| 3.2.2.1 75% of pull at maximum power at rated speed | | | | | | | | | | | | | |
| LP4 | 28.1 | 13.7 | 7.38 | 2462 | 3.0 | 379 | 2.26 | 47 | 81 | 117 | 23 | 60 | 101.3 |
| 3.2.2.2 50% of pull at maximum power at rated speed | | | | | | | | | | | | | |
| LP4 | 19.4 | 9.2 | 7.57 | 2501 | 2.1 | 440 | 1.95 | 48 | 81 | 117 | 23 | 61 | 101.3 |
| 3.2.2.3 Next higher gear at reduced engine speed; same pull and travelling speed as in 3.2.2.1 | | | | | | | | | | | | | |
| LD4 | 28.0 | 13.7 | 7.38 | 2041 | 3.1 | 361 | 2.38 | 48 | 82 | 113 | 24 | 58 | 101.2 |
| 3.2.2.4 Next higher gear at reduced engine speed; same pull and travelling speed as in 3.2.2.2 | | | | | | | | | | | | | |
| LD4 | 19.3 | 9.2 | 7.55 | 2071 | 2.3 | 406 | 2.11 | 49 | 80 | 112 | 24 | 58 | 101.2 |

* Maximum power limited by wheelslip and bounce

**Repairs and adjustments during tests:** None

**Remarks:** None

**Test carried out by:** S J Devonshire

**Officer in charge:** P C Seward

**Signed:** Head of Test Engineering Group

H M R Proctor

for the Director

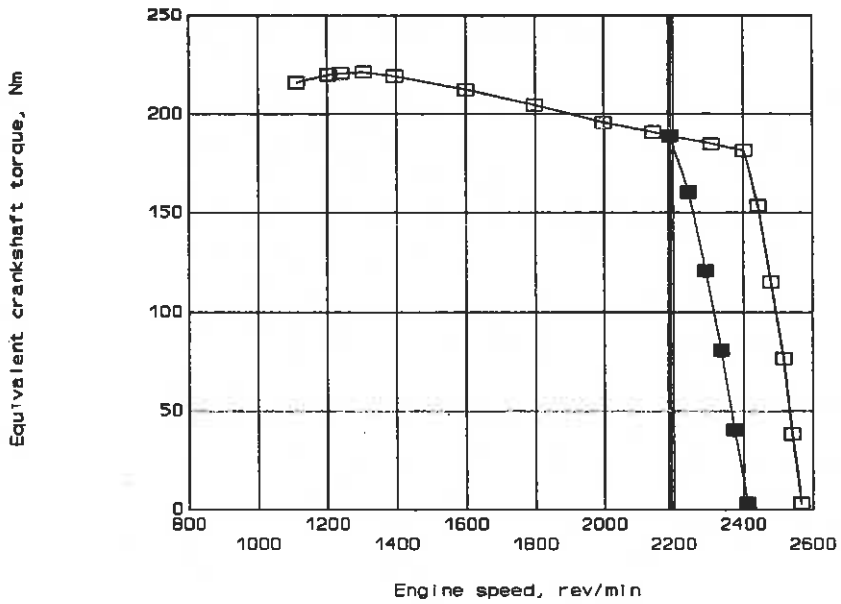
H M R Proctor

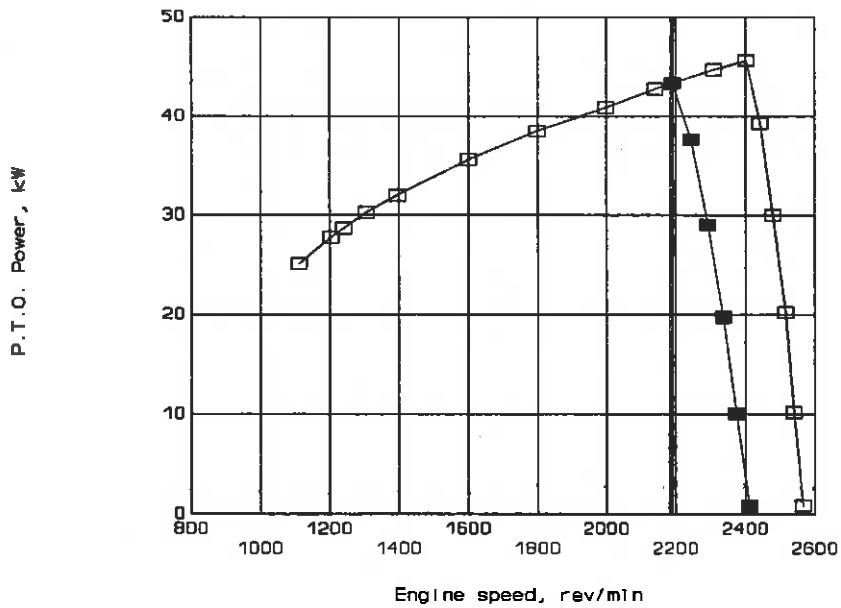
**Date:** 25/1/94

## ANNEX I MAIN POWER TAKE OFF CURVES

**P.T.O. POWER TEST - CASE INTERNATIONAL 695, 4 WHEEL DRIVE**

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

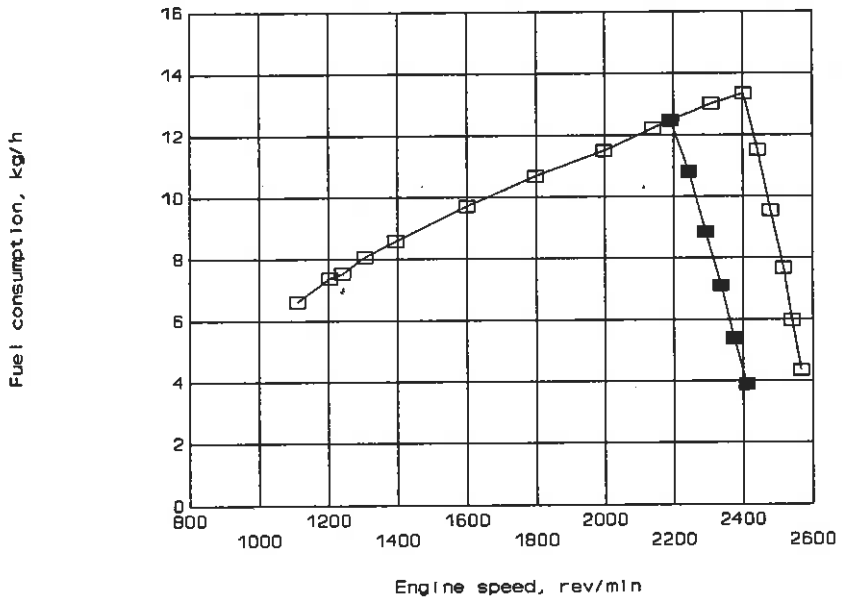


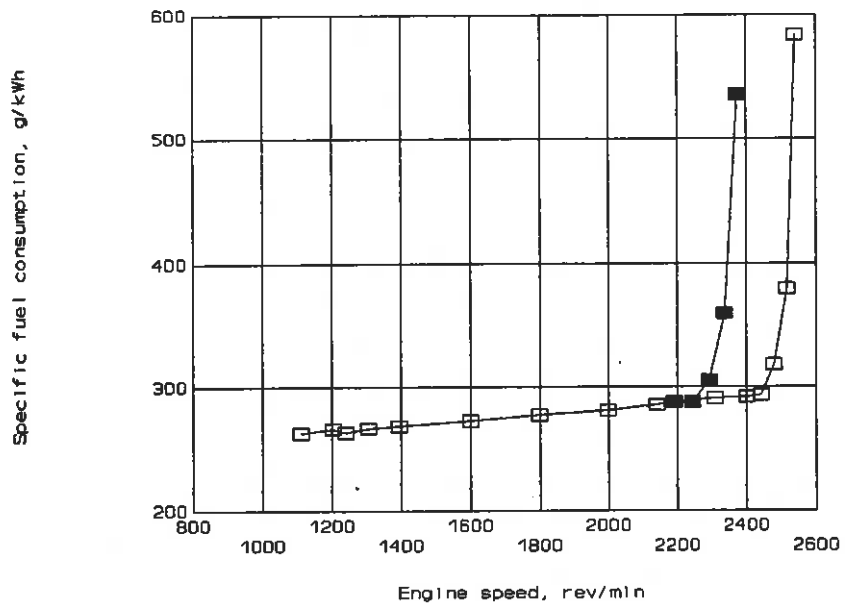



## ANNEX I MAIN POWER TAKE OFF CURVES

**P.T.O. POWER TEST - CASE INTERNATIONAL 695, 4 WHEEL DRIVE**

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



## ANNEX I MAIN POWER TAKE OFF CURVES

**P.T.O. POWER TEST - CASE INTERNATIONAL 695, 4 WHEEL DRIVE**

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

