Test n° 6055
Date : january 1987

OECD approval n° : 1042 RESTRICTED CODE
Date of approval : 13rd february 1987

MINISTERE DE L'AGRICULTURE

**CENTRE NATIONAL DU MACHINISME AGRICOLE, DU GENIE RURAL, DES EAUX ET DES FORETS**
Groupement d'Antony, Division Machinisme Agricole, Moteurs et Tracteurs

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**OECD TEST OF AN AGRICULTURAL TRACTOR (RESTRICTED CODE)**

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Report on test in accordance with the OECD standard code for the official testing of agricultural tractors C(84) 163 (Final) appendix IV



**Tested tractor**

Make : MASSEY FERGUSON
Model : 8 100/4
Trade name : 3090
Number of driving wheels : 4
Type : Standard


Submitted by :

Name : MASSEY FERGUSON S.A.
Address : avenue Blaise Pascal
60026 BEAUVAIS (FRANCE)
Phone : 44.89.33.33 Telex : 140396 F

CEMAGREF Division MTAN
BP 121 - 92164 ANTONY CEDEX
Phone : (1) 46.66.21.09 Telex : 204565 F

# PRINCIPALES UNITÉS DU SYSTEME INTERNATIONAL (SI) ET AUTRES UNITÉS UTILISÉES LORS DES ESSAIS (d'après la norme ISO 1000-1981 réimprimée le 30.6.1983)

| *Grandeurs* | *Unités SI* | | *Multiples Unités SI* | *Unité hors SI figurant dans la norme* |
|---|---|---|---|---|
| | *Nom* | *Symbole* | | |
| **Unités SI de base** | | | | |
| longueur | mètre | m | km, cm | |
| masse | kilogramme | kg | g, mg | tonne 1 t = $10^3$ kg |
| temps | seconde | s | ms, µs | heure 1 h = 60 min |
| intensité de courant électrique | ampère | A | kA, mA | minute 1 min = 60 s |
| température thermodynamique | kelvin | K | | |
| **Unités SI dérivées** | | | | |
| angle plan | radian | rad | | 1° = (π / 180) rad |
| fréquence | hertz | Hz | MHz, kHz | |
| force | newton | N | kN, mN | |
| pression | pascal | Pa | kPa | 1 bar = $10^5$ Pa |
| contrainte | | Pa ou N/m² | MPa ou N/mm² | |
| énergie travail | joule | J | kJ | 1 kW.h = 3,6 $10^6$ J |
| quantité de chaleur | joule | J | kJ | |
| puissance | watt | W | kW | |
| charge électrique | coulomb | C | kC | 1 A.h = 3,6 $10^3$ C |
| potentiel électrique | volt | V | kV, mV | |
| capacité électrique | farad | F | mF | |
| résistance électrique | ohm | Ω | kΩ, mΩ | |
| conductance électrique | siemens | S | kS, mS | |
| température Celsius | degré Celsius | °C | | t (°C) = T (K) – 273,15 |
| **Autres unités SI figurant dans la norme** | | | | |
| aire, superficie | | m² | cm² | hectare 1 ha = $10^4$ m² |
| volume | | m³ | cm³ | litre 1 l = $10^{-3}$ m³ |
| vitesse angulaire | | rad/s | | |
| vitesse | | m/s | | 1 km/h = (1/3,6) m/s |
| accélération (1) | | m/s² | | |
| fréquence de rotation | | s⁻¹ | | tours par minute (tr/min) |
| masse volumique | | kg/m³ | g/cm³ | t/m³, kg/l, g/l |
| quantité de mouvement | | kg.m/s | | |
| moment cinétique | | kg.m²/s | | |
| moment d'inertie | | kg.m² | | |
| moment d'une force | | N.m | | |
| viscosité (dynamique) | | Pa.s | mPa.s | 1 cP = 1 mPa.s |
| viscosité cinématique | | m²/s | mm²/s | 1 cSt = 1 mm²/s |
| intensité acoustique | | W/m² | | |
| niveau de pression acoustique | | | | décibel dB |
| **Unités hors SI ne figurant pas dans la norme** | | | | |
| débit volumique | | m³/s | | l/s, l/h, m³/h |
| débit massique | | kg/s | | t/h |
| consommation spécifique de carburant | | kg/J | | g/(kW.h) |

(1) La valeur adoptée en 1901 comme «accélération normale de la pesanteur» est de 9,80665 m/s² (accélération de la pesanteur à 45° de latitude au niveau de la mer). Dans les applications courantes on prend généralement g = 9,8 ou 10 m/s² suivant la précision recherchée.

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# OECD TEST OF AN AGRICULTURAL TRACTOR (RESTRICTED CODE)

Report on test in accordance with OECD standard code for the official testing of agricultural tractors C(84) 163 (Final) appendix IV

est n° 6055
ate : January 1987



ESTED TRACTOR

ake : MASSEY FERGUSON
odel : B 100/4
rade name : 3090
umber of driving wheels : 4
ype : Standard

SUBMITTED BY

Name : MASSEY FERGUSON S.A.
Address : Avenue Blaise Pascal
60026 BEAUVAIS (FRANCE)
Phone : 44.89.33.33 - Telex : 140396 F

## SUMMARY

1. Specification of tested tractor
2. Compulsory tests results
   2.1. Main power take-off performance
   2.2. Lifting force and hydraulic power
   2.3. Drawbar performance (unballasted tractor)
3. Optional tests results
   3.1. Measurement of external noise level

Annex : Main power take-off performance curves

his test report includes 23 pages of text
nd 2 pages of annex

CEMAGREF Division MTAN
BP 121 - 92164 ANTONY CEDEX
Phone : (1) 46.66.21.09 Telex : 204565 F

- Tractor manufacturer's name and address : MASSEY FERGUSON S.A.
avenue Blaise Pascal 60026 BEAUVAIS (FRANCE)

- Submitted for test by : The manufacturer

- Selected for test by the manufacturer with the agreement of CEMAGREF

- Place of running in : BEAUVAIS

- Duration of running in : 20 hours

## 1. SPECIFICATION OF TRACTOR

### TRACTOR

- Make : MASSEY FERGUSON
- Model : B 100/4
- Trade name : 3090
- Number of driving wheels : 4
- Type : Standard
- Serial number : U 290 029
- 1st serial number : U 076 201

### ENGINE

- Make : PERKINS
- Model : A6 - 354 - 4
- Type : 4 strokes, direct injection diesel
- Serial number : TW 31156 U 766620 N

#### Cylinders

- Number : 6
- Disposition : vertical in line
- Bore/stroke : 98,4/127 mm
- Capacity : 5800 cm³
- Compression ratio : 16/1
- Arrangement of valves : overhead in line
- Cylinders liners : dry

#### Supercharging

None

#### Fuel system

- Fuel feed system : diaphragm fuel feed pump
- Make, type and model of fuel filter : CAV V 7005 - 3064 - dual element with water trap
- Capacity of fuel tank : 190 l
- Make, type and model of injection pump : CAV 3269 F 952 - rotative
- Serial number : 07707 FDG
- Manufacturer's production setting of injection pump : 57,4-59,8 mm³/stroke (rated engine speed & full load)
- Injection pump timing : 28 ± 2° before T.D.C.
- Make, type and model of fuel injectors : CAV BDLL 150S6730 - 4 holes
- Injection pressure : 200 bars

Governor

- Make : CAV
- Type : Mechanical incorporated in fuel injection pump
- Governed range of engine speed : 900 - 2420 RPM

Rated engine speed 2200 RPM

Air cleaner

Pre-cleaner
. Make : DONALDSON
. Type : cyclone
. Model : vertical
. Location : over bonnet

- Main
. Make : DONALDSON
. Type : dry
. Model : ELB 08 - 0024
. Warning light on panel
. Location : under bonnet - horizontal

Lubrification system

- Type of feed pump : gear
- Total oil capacity including filter : 19 l
- Oil change period : 250 h
- Type of filter : cartridge
- Number : 1
- Filter change period : 250 h

Recommended oil : see "fuel and lubricants used in test"

Cooling system

- Type of coolant : water or water anti-freeze mixture
- Type of pump : centrifugal
- Description of fan
. Type : puller
. Number of fan blades : 6
. Fan diameter : 508 mm
- Coolant capacity : 24,1 l
- Type of temperature control : thermostatic
- Surpressure system : 0,5 bar

Starting system

- Safety device : switch operated by main clutch pedal
- Make : LUCAS
- Type : pre-engaged
- Model and starter motor power rating : LUCAS M 127 - 2,8 kW
- Cold starting aid : CAV - Thermostart

Electrical system

- Voltage : 12 V - negative hearth
- Generator : alternator
  - . Make : MOTOROLA
  - . Model : 55 AMS
  - . Power : 660 W
- Batteries :
  - . Make : CHLORYDE 372
  - . Number : 2
  - . Rating : 420 A for 60 s at -18°C

Exhaust system

- Make : LUCHAIRE
- Type : perforated
- Model : 86
- Location : under bonnet with vertical stack pipe
- Height of outlet above ground : 2774 mm

**STEERING AND DRIVING WHEELS**

- Number : 2
- Location : front axle
- Tyres : GOOD YEAR
  - . Size : 13.6 - 28
  - . Ply rating : 8
  - . Type of casing : cross ply
  - . Maximum permissible load on each tyre : 16,4 kN (with inflation pressure : 200 kPa)
- Track widths (mm) : 1548 - 1662 - 1750 - 1756 - 1864 - 1870 - 1958 - 2072

- Method of adjustment : lugs

**DRIVING WHEELS**

- Number : 2
- Location : rear axle
- Tyres : GOOD YEAR DYNATORQUE II
  - . Size : 18.4 - 38
  - . Ply rating : 8
  - . Type of casing : cross ply
  - . Maximum permissible load on each tyre : 27,00 kN (with inflation pressure : 138 kPa)
- Track widths (mm) : 1530 - 1650 - 1750 - 1850 - 1950
- Method of adjustment : lugs

**WHEELBASE** : 2699 mm

**TRANSMISSION**

Clutch

- Make : VALEO
- Type : dry, single plate clutch
- Number of plates : 1
- Diameter of plate : 330 mm
- Method of operation (for gearbox) : foot pedal

Gear box

- Make : MASSEY FERGUSON
- Type : basic gear box to be manual (4 x 4 speeds)
- Arrangement : mechanicaly operated gear shift - multipower as an option
- Number of speeds : 16 - (16 x 2 with multipower)
- Available option : creeper

ear axle and final drive

- Make : own make
- Type : crown wheel and pinion and outboard epicyclic gear reduction
- Differential lock :
  - . Type : mechanical hydraulicaly actuated
  - . Method of engagement : electrical switch
  - . Method of disengagement : when brake pedal is depressed

Front axle

- Make : own make
- Type : crown wheel and pinion and outboard epicyclic gear reduction
- Driven from main shaft

Transmission oils

- Capacity :
  - . Gear box and transmission housing ) ) 64 l
  - . Power lift )
  - . Front axle assembly : 6,5 l
  - . Front axle final reduction : 1,8 l (each)
- Change period : 1200 h
- Type of oil filter : removable cartridge in metallic filter elements
- Recommended oil : see "fuel and lubricants used in test"

| Gear | Group N° | Number of engine revolution for 1 revolution of driving wheels | Nominal travelling speed at rated engine speed (km/h) |
|---|---|---|---|
| 1 | ST | 374,581 | 1,816 |
| 2 | | 314,108 | 2,165 |
| 3 | | 267,612 | 2,541 |
| 4 | | 226,997 | 2,996 |
| AR 1 | | 351,343 | 1,936 |
| AR 2 | | 294,623 | 2,308 |
| AR 3 | | 251,011 | 2,709 |
| AR 4 | | 212,915 | 3,194 |
| 1 | ST + MP | 286,371 | 2,295 |
| 2 | | 248,525 | 2,737 |
| 3 | | 211,737 | 3,212 |
| 4 | | 179,602 | 3,787 |
| AR 1 | | 277,986 | 2,446 |
| AR 2 | | 233,108 | 2,917 |
| AR 3 | | 198,602 | 3,424 |
| AR 4 | | 168,461 | 4,037 |
| 1 | FT | 186,972 | 3,637 |
| 2 | | 156,787 | 4,338 |
| 3 | | 133,579 | 5,091 |
| 4 | | 113,306 | 6,002 |
| AR 1 | | 199,338 | 3,412 |
| AR 2 | | 167,157 | 4,069 |
| AR 3 | | 142,413 | 4,775 |
| AR 4 | | 120,800 | 5,630 |
| 1 | FT + MP | 147,934 | 4,597 |
| 2 | | 124,052 | 5,482 |
| 3 | | 105,689 | 6,435 |
| 4 | | 89,649 | 7,586 |
| AR 1 | | 157,718 | 4,312 |
| AR 2 | | 132,256 | 5,142 |
| AR 3 | | 112,679 | 6,036 |
| AR 4 | | 95,578 | 7,116 |

ST : Slow Turtle - FT : Fast Turtle - MP : MultiPower

(dynamic index radius : 820 mm)

| Gear | Group N° | Number of engine revolution for 1 revolution of driving wheels | Nominal travelling speed at rated engine speed (km/h) |
|---|---|---|---|
| 1 | SR | 93,406 | 7,281 |
| 2 | | 78,326 | 8,683 |
| 3 | | 66,732 | 10,191 |
| 4 | | 56,604 | 12,015 |
| AR 1 | | 87,611 | 7,763 |
| AR 2 | | 73,467 | 9,257 |
| AR 3 | | 62,592 | 10,865 |
| AR 4 | | 53,093 | 12,810 |
| 1 | SR + MP | 73,903 | 9,202 |
| 2 | | 61,972 | 10,974 |
| 3 | | 52,799 | 12,881 |
| 4 | | 44,786 | 15,185 |
| AR 1 | | 69,319 | 9,811 |
| AR 2 | | 58,1?? | 11,700 |
| AR 3 | | 49,523 | 13,733 |
| AR 4 | | 42,007 | 16,190 |
| 1 | FR | 48,624 | 14,587 |
| 2 | | 39,097 | 17,395 |
| 3 | | 33,309 | 20,417 |
| 4 | | 28,254 | 24,071 |
| AR 1 | | 49,707 | 13,682 |
| AR 2 | | 41,682 | 16,316 |
| AR 3 | | 35,512 | 19,151 |
| AR 4 | | 30,123 | 22,577 |
| 1 | FR + MP | 36,889 | 18,436 |
| 2 | | 30,934 | 21,986 |
| 3 | | 26,355 | 25,805 |
| 4 | | 22,355 | 30,423 |
| AR 1 | | 39,329 | 17,293 |
| AR 2 | | 32,979 | 20,622 |
| AR 3 | | 28,098 | 24,205 |
| AR 4 | | 23,833 | 28,535 |

SR : Slow Rabbit - FR : Fast Rabbit - MP : MultiPower

(dynamic index radius : 820 mm)

## POWER TAKE-OFF

Main power take-off

- Type : rear independant PTO (hydraulic mutiplate clutch)
- Method of engagement : lever located at the middle of the upper right hand side console
- Method of changing power take-off speeds : speed and spline change accomplised by physically replacing the 540 rev/min shaft by the 1000 rev/min shaft and vice-versa

Power take-off proportional to engine speed

- 540 rev/min
  - . Location : at the rear of the tractor on vertical center plane
  - . Diameter of power take-off shaft : 34,9 mm
  - . Number of splines : 6 (in accordance with ISO R500)
  - . Height above ground : 777 mm
  - . Distance from the median plane of the tractor : 0
  - . Distance behind rear axle : 450 mm
  - . Power take-off speed at rated engine speed : 600 rev/min
  - . Engine speed at standard power take-off speed : 1980 rev/min
  - . Engine to power take-off ratio : 3,66
  - . Power restriction : none
  - . Direction of rotation (viewed facing driving end) : clockwise

- 1000 rev/min
  - . Location : at the rear of the tractor on vertical center plane
  - . Diameter of power take-off shaft : 34,9 mm
  - . Number of splines : 21 (in accordance with ISO R500)
  - . Height above ground : 777 mm
  - . Distance from the median plane of the tractor : 0
  - . Distance behind rear axle : 450 mm
  - . Power take-off speed at rated engine speed : 1100 rev/min
  - . Engine speed at standard power take-off speed : 2000 rev/min
  - . Engine to power take-off ratio : 2
  - . Power restriction : none
  - . Direction of rotation (viewed facing driving end) : clockwise

Power take-off proportional to ground speed

- Speed of shaft : both 540 and 1000 rev/min
- Size of tyre : 18.4 - 38
- Travelling distance for one revolution of power take-off : 0,843 m (540) - 0,460 m (1000)
- Number of power take-off shaft revolutions for one revolution of the rear wheels : 5,6 (540) - 10,3 (1000)
- Direction of rotation with forward gear engaged : clockwise

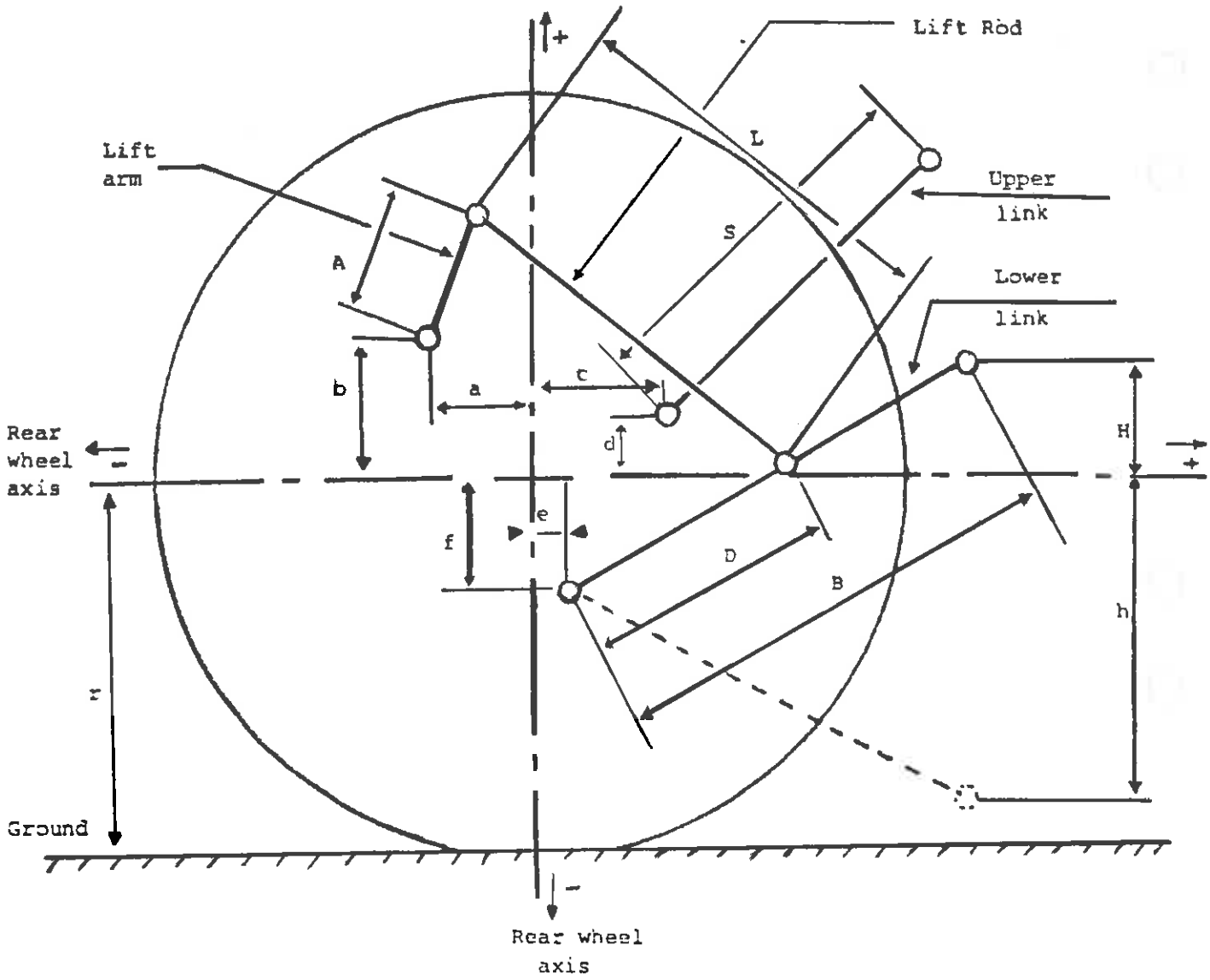
## POWER LIFT

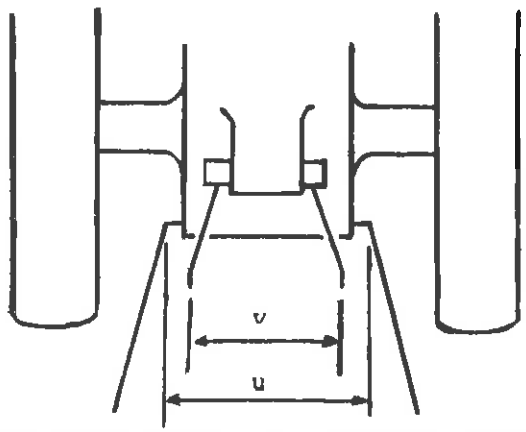
- Make : MASSEY FERGUSON
- Type : top link, electronic position, draft or mixed control
- Type and number of cylinders : 2 - single acting
- Type of linkage lock for transport : hydraulic lock
- Relief valve pressure setting : 188 bars
- Opening pressure of cylinder safety valve : 200 bars
- Lift pump type : gear
- Transmission between pump and engine : mechanical
- Make and number of filters : PUROLATOR - 1
- Time between oil changes : 1200 h
- Time between filter changes : 600 h
- Oil capacity : 64 l
- Site of oil reservoir : transmission housing
- Type and number of tapping points : 2 - on lift cover
- Maximum volume of oil available to external cylinders : 25 l/min
- Recommended oil : see "fuel and lubricants used in test"

## THREE- POINT LINKAGE

- Category : II (in accordance with ISO 730/I art. II)
- Category adapter : none
- Controls : position control by linear sensor measuring the rockshaft position
  draft control by pin sensors at each lower link

Linkage geometry



| Linkage dimensions (mm) | | | | Settings for the test |
|---|---|---|---|---|
| Rear tyres - dynamic index radius | | (r) | 820 | |
| Front tyres - dynamic index radius | | (r') | 610 | |
| Length of lift arms | | (A) | 266 | |
| Length of lower links | | (B) | 940 | |
| Distance of lift arm pivot point from rear wheel center line | horizontally | (a) | 128 | |
| | vertically | (b) | 330 | |
| Horizontal distance between the 2 lower link points | | (u) | 580 | |
| Horizontal distance between the 2 lift arm end points | | (v) | 604 | |
| Length of upper link | | (S) | from 590 to 750 | 650 |
| Distance of upper link pivot point from rear wheel center line | horizontally | (c) | 382 | |
| | vertically | (d) | 120 \| 160 \| 200 | 120 |
| Distance of lower link pivot point from rear wheel center line | horizontally | (e) | 100 | |
| | vertically | (f) | 260 | |
| Distance of lower link points to lift rod pivot points on lower link | | (D) | 568 | |
| Length of lift rods | | (L) | from 680 to 745 | 745 |
| Height of lower hitch points relative to the rear wheel centre line situated 820 mm above the ground level | | | | |
| - in low position | | (h) | from 447 to 578 | 578 |
| - in high position | | (H) | from 15 to 149 | 15 |
| Height of lower hitch points when locked in transport position | | | from 863 to 964 | 863 |

**SWINGING DRAWBAR**

- Height above ground : maximum : 538 mm
  minimum : 538 mm
- Type of adjustment : none
- Distance of hitch point from rear axle centre : 875 mm
- Distance of hitch point from power take-off shaft ends :
  . horizontally : 400 mm to rear
  . vertically : 234 mm
- Lateral adjustment : 293 mm left hand
  293 mm right hand
- Distance of pivot point from rear axles horizontally : 106 mm to rear
- Diameter drawbar pin hole : 30 mm

**LINKAGE DRAWBAR**

- Height above ground : maximum : 964 mm
  minimum : 237 mm
- Horizontal distance to power take-off shaft end : 565 mm
- Number of holes : 9
- Hole diameter : 24 mm
- Thickness and width of drawbar : 30/80 mm
- Distance beetween holes : 80 mm

**TRAILER HITCH**

- Height above ground : maximum : 945 mm
  minimum : 560 mm
- Distance of hitch point from rear axle centre : 619 mm to rear
- Distance of hitch point : vertically above maximum : 223 mm
  minimum : 162 mm
  horizontally : 144 mm
- Diameter hitch pin hole : 33 mm
- Maximum vertical permissible load : 17 kN

**FRONT TOWING HITCH**

- Vertical height at center of clevis : 851 mm
- Width of clevis : 365 mm
- Diameter of pin hole : 32 mm

**STEERING**

- Method of operation : hydrostatic steering system, gearbox housing mounted gear pump
- Make : DANFOSS steering unit
- Model : OSPC-ON
- Type : open center type with integral system relief valves,anti-schock and anti-cavitation valves
- Working pressure : 15,7 MPa - 16,2 MPa
- Oil capacity : 64 l
- Oil change period : 1200 h
- Filter change period : 600 h
- Recommended oil : see "fuel and lubricants used in test"

## BRAKES

### Service brake

- Make : MASSEY FERGUSON and GIRLING
- Type : oil immersed - 652 cm² friction area on each brake - single disk brake - hydraulic actuated
  GIRLING hydraulic master cylinder - MASSEY FERGUSON hydraulic slave annular piston
- Method of operation : independant or dependant operation of twin pedals
  (which can be latched)

### Parking brake

- Make : SIRMAC
- Model : HUSCO
- Method of operation : hand lever - cable and rod

### Trailer brakes

- Make : BOSCH
- Type : hydraulically actuated valve to regulate oil flow and pressure to the trailer brakes
  proportional and progressive trailer/tractor braking effort is achieved by linking their services
  together via a sensive line.
- Method of operation : automatic as the right hand tractor brake pedal is depressed
- Maximum braking pressure : 130-150 bars
- Maximum flow : 15 l/min

## PROTECTIVE STRUCTURE SPECIFICATIONS

- Manufacturer's name and address : MASSEY FERGUSON S.A.
  avenue Blaise Pascal 60026 BEAUVAIS (FRANCE)
- Trade name : 3000 - B
- OECD approval number : CSD 1043/1
- Description : the cab is made up from 3 major sub-assemblies, the platform, side pillars and roof
  and the front pillars. Thesse sub-assemblies are bolted together to form the complete
  cab structure.

## DRIVER'S SEAT

- Make : GRAMMER
- Model : DS 85 H/90 AR
- Type of suspension : parallelogram
- Type of damping : gas cylinder
- Range of adjustment : longitudinal : 150 mm
  vertical : 60 mm

## MISCELLANEOUS

- Passenger's seat : either factory fitted or as an accessory
  . Location : left of the operator
  . Number of places : 1

LIGHTING

Unrestricted beam angle of head light in plane view : in accordance with national regulation

| | Height above ground of centre mm | Size mm | Distance from outside edge of tractor to centre at 1950 mm trackwidth |
|---|---|---|---|
| Headlights | 1208 | 167 x 107 | 1057 |
| Sidelights | 1720 | 120 x 80 | 460 |
| Rear lights | 1734 | 300 x 62 | 444 |
| Reflectors | 769 | 98 x 62 | 723 |

CONDITIONS DURING TEST

Overall dimensions

| | Lenght mm | Width | | Height at the top of | |
|---|---|---|---|---|---|
| | | minimum mm | maximum mm | exhaust silencer mm | protective stru re m |
| Unballasted | 4323 | 1899 | 2399 | 2774 | 2774 |

Ground clearance : 457 mm limited by drawbar bracket

Track setting . front : 1864 mm
. rear : 1530 mm

Tractor mass (kg)

| | Front | Rear | Total |
|---|---|---|---|
| Unballasted | 1805 | 2885 | 4690 |

Fuel used in test

- Type : Diesel oil
- Viscosity : (NFT 60.100) 4,84 cSt
- Gravity at 15°C : 0,844

Lubricants used in test

- Engine oil :
  . Type : BP TOU
  . Viscosity : 10 W 30
  . Classification : MIL-L-2104 C

- Transmission, hydraulic and steering oils :
  . Type : BP AGROTRANS
  . Viscosity : 9,3 cSt at 100°C
  60,6 cSt at 40°C

- Recommended grease : BP AGRICHARGE

Number of lubrification points : 12

## 2. COMPULSORY TESTS RESULTS

### 2.1. MAIN POWER TAKE-OFF PERFORMANCE :

- Date and location of tests : 12th january 1987 - CEMAGREF
- Type of dynamometer : SCHENCK W780

| Power | Speed | | Fuel consumption | | Specific |
|---|---|---|---|---|---|
| | Engine | Power take-off | Hourly | Specific | Energy |
| kW | rev/min | | l/h | g/kWh | kWh/l |
| MAXIMUM POWER - TWO HOUR TEST | | | | | |
| 75,1 | 2196 | 1098 | 23,28 | 262 | 3,22 |
| MAXIMUM POWER AT RATED ENGINE SPEED | | | | | |
| 75,1 | 2196 | 1098 | 23,28 | 262 | 3,22 |
| PART LOADS (governor control being set for maximum power at rated engine speed)<br>(1) Torque corresponding to 85% of the torque at maximum power at rated engine speed | | | | | |
| 64,9 | 2236 | 1118 | 20,03 | 261 | 3,24 |
| (2) 75% of the torque defined in (1) | | | | | |
| 49,3 | 2269 | 1135 | 16,06 | 275 | 3,07 |
| (3) 50% of the torque defined in (1) | | | | | |
| 33,2 | 2301 | 1151 | 12,55 | 319 | 2,65 |
| (4) 25% of the torque defined in (1) | | | | | |
| 17,2 | 2332 | 1166 | 9,35 | 458 | 1,84 |
| (5) Unloaded | | | | | |
| - | 2355 | 1178 | 6,35 | - | - |

2.1. MAIN POWER TAKE-OFF PERFORMANCE : (continued)

| Power | Speed | | Fuel consumption | | Specific |
|---|---|---|---|---|---|
| | Engine | Power take-off | Hourly | Specific | Energy |
| kW | rev/min | | l/h | g/kWh | kWh/l |
| MAXIMUM POWER AT STANDARD POWER TAKE-OFF SPEED (1000 rev/min) | | | | | |
| 71,8 | 2000 | 1000 | 21,94 | 258 | 3,27 |
| PART LOADS (governor control being set for maximum power at standard power take-off speed)<br>(1) Torque corresponding to 85% of the torque at maximum power at standard power take-off speed | | | | | |
| 61,9 | 2017 | 1008 | 18,38 | 251 | 3,37 |
| (2) 75% of the torque defined in (1) | | | | | |
| 47,4 | 2069 | 1035 | 14,76 | 263 | 3,21 |
| (3) 50% of the torque defined in (1) | | | | | |
| 32,0 | 2111 | 1055 | 11,37 | 300 | 2,82 |
| (4) 25% of the torque defined in (1) | | | | | |
| 16,0 | 2151 | 1076 | 8,17 | 431 | 1,96 |
| (5) Unloaded | | | | | |
| - | 2176 | 1088 | 5,44 | - | - |

Other results

- No load, maximum engine speed : 2355 rev/min
- Equivalent crankshaft torque at maximum power at rated engine speed : 326,4 N.m
- Maximum equivalent crankshaft torque : 392,3 N.m at 1277 rev/min engine speed

Mean atmospheric conditions

- Temperature : 16°C
- Pressure : 1020 mbar
- Relative humidity : 30%

Maximum temperature

- Coolant : 86°C
- Engine oil : 98°C
- Fuel : 18°C
- Air intake : 18°C

2.1. MAIN POWER TAKE-OFF PERFORMANCE : (continued)

Fuel consumption at varying load

| | Governor control being set for maximum power at rated engine speed | | Governor control being set for maximum power at standard pto speed | |
|---|---|---|---|---|
| | at 85% (1) | at 50% of 85% (2) | at 85% (1) | at 50% of 85% (2) |
| Hourly consumption (l/h) | 20,03 | 12,55 | 18,38 | 11,37 |
| Specific standard consumption (g/kWh) | 261 | 319 | 251 | 300 |

**(1)** 85% of the torque corresponding to maximum power for the position of the governor hand lever
**(2)** 50% of the torque obtained in (1)

2.2 LIFTING FORCE AND HYDRAULIC POWER
- Date : 15th january 1987

2.2.1. Power lift test :

- Hydraulic fluid : see "Fuel and lubricants used in test"

| | | at the hitch point | on the frame |
|---|---|---|---|
| Height of lower hitch point above ground in down position | mm | 242 | 225 |
| Vertical movement | mm | 593 | 710 |
| Maximum force exerted through full range | kN | 36,9 | 30,6 |
| Corresponding pressure of hydraulic fluid | bar | 170 | 170 |
| Moment about rear rear axle | kN.m | 38,4 | 50,5 |
| Maximum tilt angle of mast over range of lift | degree | - | 11° |

2.2.1. Power lift test (continued)

| Lifting height (1) | mm | - 335 | - 318 | - 250 | - 150 | - 50 | 0 | + 50 | + 150 | + 275 | + 375 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lifting force (2) | at the hitch point kN | - | 36,9 | 39,4 | 41,9 | 43,4 | 44,1 | 44,6 | 45,0 | 45,3 | - |
| | at frame kN | 34,4 | 34,9 | 35,3 | 35,1 | 34,5 | 34,2 | 34,0 | 32,7 | 31,3 | 30,6 |

(1) Lifting height relative to the horizontal plane including the lower link pivot points

(2) The values of force 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.

2.2.2 Hydraulic power test :

- Tapping point used for test :auxiliary service connection (spool valve)
- Sustained pressure with relief valve open : 189 bars
- Pump delivery rate at minimum pressure : 51,2 l/min

| | | corresponding to maximum hydraulic power | corresponding to a hydraulic pressure equivalent to 90% of the actual relief valve pressure setting |
|---|---|---|---|
| Pressure | bars | 175 | 170 |
| Flow rate | l/min | 43,5 | 44,4 |
| Power | kW | 12,68 | 12,58 |

## 2.3. DRAWBAR PERFORMANCE (UNBALLASTED TRACTOR)

- Date and location of test : 28th january 1987 - CEMAGREF

- Type of track : Tarmacadam

- Height of drawbar above ground : 0,60 m

| - Tyres | Front | Rear |
|---|---|---|
| . Size : | 13.6 - 28 | 18.4 - 38 |
| . Inflation pressure (bars) : | 0,9 | 1,1 |

- Atmospheric conditions :

. Temperature : 1°C
. Pressure : 1006 mbar
. Relative humidity : 32%

2.3. DRAWBAR PERFORMANCE : (continued)

| Gear | Speed | Drawbar pull | Power | Engine speed | Wheelslip | Specific fuel consumption | Specific energy | Temperatures | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | km/h | kN | kW | rev/min | % | g/kWh | kWh/l | Fuel °C | Coolant °C | Engine oil °C |
| MAXIMUM DRAWBAR POWER IN TESTED GEAR | | | | | | | | | | |
| 3 ST + MP | 2,90 | 37,5 | 30,2 | 2264 | 15 | 410 | 2,06 | 7 | 81 | 80 |
| 4 ST + MP | 3,32 | 37,1 | 34,2 | 2252 | 14 | 409 | 2,07 | 7 | 81 | 82 |
| 2 FT | 3,91 | 37,2 | 40,4 | 2240 | 14 | 367 | 2,30 | 7 | 81 | 82 |
| 1 FT + MP | 4,10 | 37,2 | 42,3 | 2234 | 15 | 364 | 2,32 | 8 | 81 | 81 |
| 3 FT | 4,54 | 37,4 | 47,1 | 2228 | 15 | 361 | 2,34 | 7 | 76 | 81 |
| 2 FT + MP | 4,99 | 37,0 | 51,2 | 2216 | 14 | 349 | 2,41 | 7 | 78 | 81 |
| 4 FT | 5,47 | 37,0 | 56,3 | 2200 | 13 | 348 | 2,42 | 7 | 78 | 81 |
| 3 FT + MP | 5,77 | 37,1 | 59,4 | 2182 | 13 | 351 | 2,40 | 8 | 82 | 83 |
| 1 SR | 6,80 | 32,9 | 62,2 | 2180 | 9 | 335 | 2,52 | 9 | 81 | 83 |
| 4 FT + MP | 7,13 | 31,7 | 62,7 | 2178 | 9 | 334 | 2,52 | 10 | 81 | 85 |
| 2 SR | 8,29 | 27,7 | 63,9 | 2178 | 7 | 328 | 2,57 | 10 | 81 | 86 |
| 1 SR + MP | 8,88 | 25,7 | 63,4 | 2178 | 6 | 332 | 2,54 | 8 | 82 | 82 |
| 3 SR | 9,90 | 23,3 | 64,0 | 2172 | 5 | 328 | 2,58 | 9 | 82 | 84 |
| 2 SR + MP | 10,74 | 21,5 | 64,1 | 2158 | 4 | 325 | 2,60 | 7 | 81 | 82 |
| 4 SR | 11,63 | 20,0 | 64,6 | 2144 | 4 | 319 | 2,65 | 9 | 82 | 82 |
| 3 SR + MP | 12,46 | 18,4 | 63,7 | 2134 | 3 | 321 | 2,63 | 9 | 82 | 85 |
| 1 FR | 14,19 | 16,1 | 63,5 | 2132 | 3 | 322 | 2,62 | 10 | 82 | 85 |

2.3. DRAWBAR PERFORMANCE : (continued)

| Gear | Speed km/h | Drawbar pull kN | Power kW | Engine speed rev/min | Wheelslip % | Specific fuel consumption g/kWh | Specific energy kWh/l | Temperatures | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Fuel °C | Coolant °C | Engine oil °C |
| TRANSMISSION AND FUEL CONSUMPTION CHARACTERISTICS (i) Maximum drawbar power in tested gear | | | | | | | | | | |
| 4 SR | 11,63 | 20,0 | 64,6 | 2144 | 4 | 319 | 2,65 | 9 | 82 | 82 |
| (ii) 75 % of pull at maximum power | | | | | | | | | | |
| 4 SR | 12,22 | 15,2 | 51,6 | 2228 | 3 | 316 | 2,67 | 9 | 82 | 82 |
| (iii) 50 % of pull at maximum power | | | | | | | | | | |
| 4 SR | 12,56 | 10,1 | 35,2 | 2262 | 2 | 364 | 2,32 | 9 | 87 | 82 |
| (iv) Higher gear same pull as in (i) reduced engine speed | | | | | | | | | | |
| 3 SR + MP | 12,20 | 15,2 | 51,5 | 2072 | 3 | 316 | 2,67 | 9 | 82 | 82 |
| (v) Higher gear as in (ii) reduced engine speed | | | | | | | | | | |
| 3 SR + MP | 12,61 | 10,1 | 35,4 | 2116 | 2 | 355 | 2,38 | 9 | 82 | 80 |

## 3. OPTIONAL TESTS RESULTS

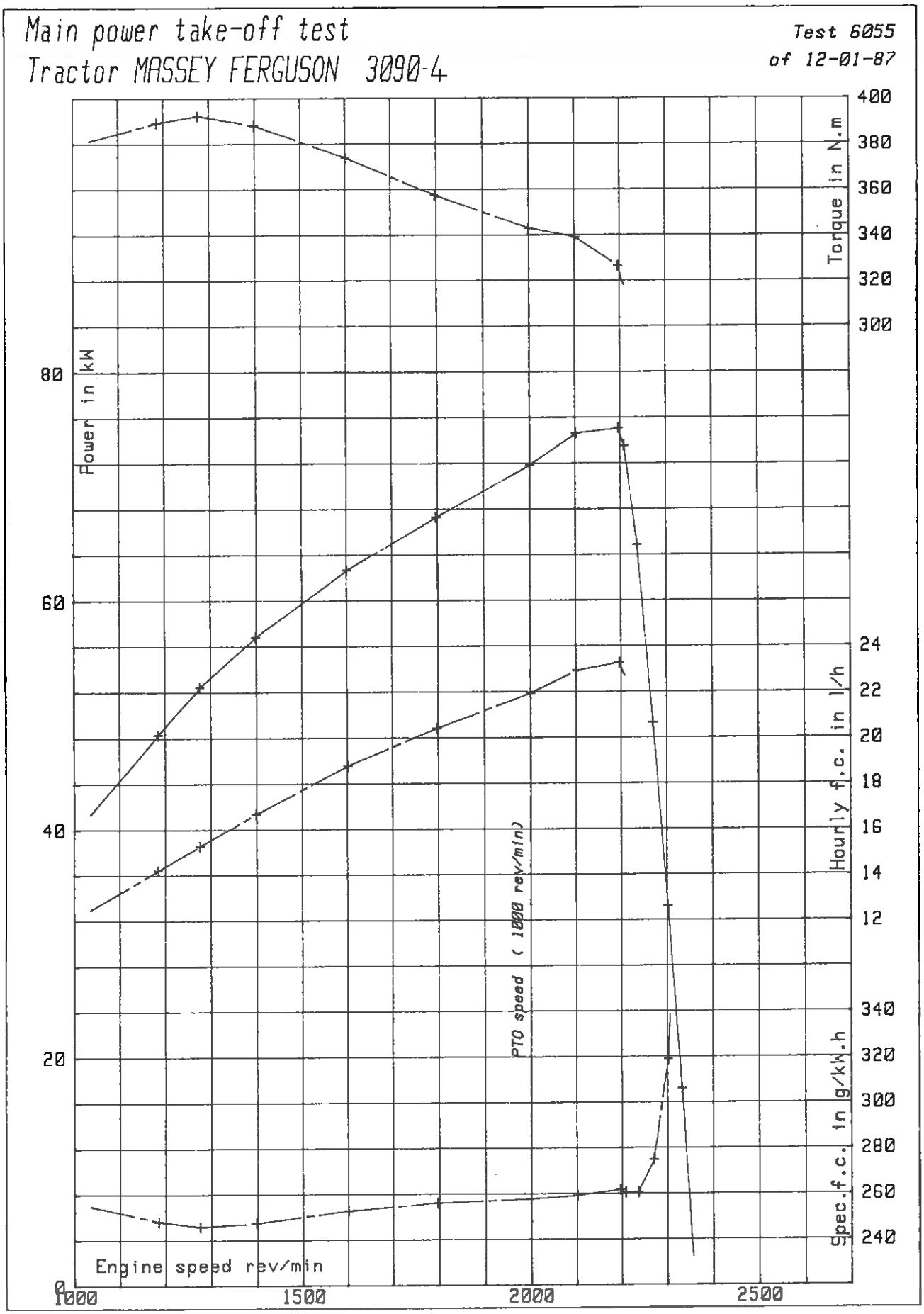
### 3.1. MEASUREMENT OF EXTERNAL NOISE LEVEL

Date of test : 28th january 1987
Type of sound level meter : BRUEL & KJAER 2209
Type of track : TARMACADAM
Gear : 4 FR + MP
Travelling speed before acceleration : 22,8 km/h
Sound level : 87 dB(A)

REPAIR AND ADJUSTMENTS DURING TESTS : none

REMARKS : none

| Le Technicien<br>Chargé de l'essai | L'Ingénieur<br>Responsable de l'essai | Le Chef de la Division MTAN |
|---|---|---|
| M.HOCQUEL | E.HUGO | J.F.GOUPILLON |


Main power take-off test
Tractor MASSEY FERGUSON 3090-4
Test 6055
of 12-01-87
Power in kW
Torque in N.m
Hourly f.c. in l/h
Spec.f.c. in g/kW.h
PTO speed ( 1000 rev/min)
Engine speed rev/min
0
20
40
60
80
240
260
280
300
320
340
12
14
16
18
20
22
24
300
320
340
360
380
400
1000
1500
2000
2500

Main power take-off test

Tractor MASSEY FERGUSON 3090-4

Test 6055
of 12-01-87

