

Test n° 6074  
Date : February 1987

OECD approval n° : 1062 RESTRICTED CODE  
Date of approval : 14th may 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

OECD TEST OF AN AGRICULTURAL TRACTOR (RESTRICTED CODE)

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 : 60/4  
Trade name : 3050  
Number of driving wheels : 4  
Type : Standard

Submitted by :

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

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

# PRINCIPALES UNITÉS DU SYSTÈME INTERNATIONAL (SI) ET AUTRES UNITÉS UTILISÉES

LORS DES ESSAIS (d'après la norme ISO 1000-1981 réimprimée le 30.6.1983)

| Grandeurs                                           | Unités SI<br>Nom     | Symbole                | Multiples<br>Unités SI   | Unité hors SI figurant<br>dans la norme       |
|-----------------------------------------------------|----------------------|------------------------|--------------------------|-----------------------------------------------|
| <b>Unités SI de base</b>                            |                      |                        |                          |                                               |
| longueur                                            | mètre                | m                      | km, cm                   |                                               |
| masse                                               | kilogramme           | kg                     | g, mg                    | tonne 1 t = 10 <sup>3</sup> kg                |
| temps                                               | seconde              | s                      | ms, $\mu$ s              | heure 1 h = 60 min                            |
| intensité de courant électrique                     | ampère               | A                      | kA, mA                   | minute 1 min = 60 s                           |
| température thermodynamique                         | kelvin               | K                      |                          |                                               |
| <b>Unités SI dérivées</b>                           |                      |                        |                          |                                               |
| angle plan                                          | radian               | rad                    |                          | 1° = ( $\pi$ / 180) rad                       |
| fréquence                                           | hertz                | Hz                     | MHz, kHz                 |                                               |
| force                                               | newton               | N                      | kN, mN                   |                                               |
| pression                                            | pascal               | Pa                     | kPa                      | 1 bar = 10 <sup>5</sup> Pa                    |
| contrainte                                          |                      | Pa ou N/m <sup>2</sup> | MPa ou N/mm <sup>2</sup> |                                               |
| énergie travail                                     | joule                | J                      | kJ                       | 1 kWh = 3,6 10 <sup>6</sup> J                 |
| quantité de chaleur                                 | joule                | J                      | kJ                       |                                               |
| puissance                                           | watt                 | W                      | kW                       |                                               |
| charge électrique                                   | coulomb              | C                      | kC                       | 1 A.h = 3,6 10 <sup>3</sup> C                 |
| potentiel électrique                                | volt                 | V                      | kV, mV                   |                                               |
| capacité électrique                                 | farad                | F                      | mF                       |                                               |
| résistance électrique                               | ohm                  | $\Omega$               | k $\Omega$ , m $\Omega$  |                                               |
| conductance électrique                              | siemens              | S                      | kS, mS                   |                                               |
| température Celsius                                 | degré Celsius        | °C                     |                          | t (°C) = T (K) - 273,15                       |
| <b>Autres unités SI figurant dans la norme</b>      |                      |                        |                          |                                               |
| aire, superficie                                    | m <sup>2</sup>       |                        | cm <sup>2</sup>          | hectare 1 ha = 10 <sup>4</sup> m <sup>2</sup> |
| volume                                              | m <sup>3</sup>       |                        | cm <sup>3</sup>          | litre 1 l = 10 <sup>-3</sup> m <sup>3</sup>   |
| vitesse angulaire                                   | rad/s                |                        |                          |                                               |
| vitesse                                             | m/s                  |                        |                          | 1 km/h = (1/3,6) m/s                          |
| accélération (1)                                    | m/s <sup>2</sup>     |                        |                          |                                               |
| fréquence de rotation                               | s <sup>-1</sup>      |                        |                          | tours par minute (tr/min)                     |
| masse volumique                                     | kg/m <sup>3</sup>    |                        | g/cm <sup>3</sup>        | t/m <sup>3</sup> , kg/l, g/l                  |
| quantité de mouvement                               | kg.m/s               |                        |                          |                                               |
| moment cinétique                                    | kg.m <sup>2</sup> /s |                        |                          |                                               |
| moment d'inertie                                    | kg.m <sup>2</sup>    |                        |                          |                                               |
| moment d'une force                                  | N.m                  |                        |                          |                                               |
| viscosité (dynamique)                               | Pa.s                 |                        | mPa.s                    | 1 cP = 1 mPa.s                                |
| viscosité cinématique                               | m <sup>2</sup> /s    |                        | mm <sup>2</sup> /s       | 1 cSt = 1 mm <sup>2</sup> /s                  |
| intensité acoustique                                | W/m <sup>2</sup>     |                        |                          | décibel dB                                    |
| niveau de pression acoustique                       |                      |                        |                          |                                               |
| <b>Unités hors SI ne figurant pas dans la norme</b> |                      |                        |                          |                                               |
| débit volumique                                     | m <sup>3</sup> /s    |                        |                          | l/s, l/h, m <sup>3</sup> /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/s<sup>2</sup> (l'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/s<sup>2</sup> suivant la précision recherchée.

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(CEMAGREF)

Groupeement d'Antony - Division Machinisme Agricole, Moteurs et Tracteurs

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

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Date : February 1987

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TESTED TRACTOR

Make : MASSEY FERGUSON  
Model : B 60/4  
Grade name : 3050  
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

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

This test report includes 23 pages of text  
and 2 pages of annex

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

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- 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 60/4
- Trade name : 3050
- Number of driving wheels : 4
- Type : Standard
- Serial number : U 290 005
- 1st serial number : U 077 041

ENGINE

- Make : PERKINS
- Model : A4 - 236
- Type : 4 strokes, direct injection diesel
- Serial number : LD 31194 U 118164 N

Cylinders

- Number : 4
- Disposition : vertical in line
- Bore/stroke : 98,4/127 mm
- Capacity : 3860 cm<sup>3</sup>
- 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 : 148 l
- Make, type and model of injection pump : CAV 3241 F 490 - rotative
- Serial number : 23462 JDG
- Manufacturer's production setting of injection pump : 58,0-61,5 mm<sup>3</sup>/stroke (rated engine speed & full load)
- Injection pump timing : 23 ± 2° before T.D.C.
- Make, type and model of fuel injectors : CAV BDLL 150S6730 - 4 holes
- Injection pressure : 170 bars

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Governor

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

Rated engine speed 2200 rev/min

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

Lubrication system

- Type of feed pump : gear
- Total oil capacity including filter : 6,5 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 : 457 mm
- Coolant capacity : 16,6 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

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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 : NELSON
- Type : perforated
- Model : MF 84
- Location : under bonnet with vertical stack pipe
- Height of outlet above ground : 2592 mm

**STEERING AND DRIVING WHEELS**

- Number : 2
- Location : front axle
- Tyres : GOOD YEAR
  - . Size : 11.4 - 24
  - . Ply rating : 6
  - . Type of casing : cross ply
  - . Maximum permissible load on each tyre : 10,5 kN (with inflation pressure : 180 kPa)
- Track widths (mm) : 1398 - 1512 - 1600 - 1606 - 1714 - 1720 - 1808 - 1922
- Method of adjustment : lugs

**DRIVING WHEELS**

- Number : 2
- Location : rear axle
- Tyres : GOOD YEAR DYNATORQUE II
  - . Size : 16.9 - 30
  - . Ply rating : 6
  - . Type of casing : cross ply
  - . Maximum permissible load on each tyre : 18,60 kN (with inflation pressure : 130 kPa)
- Track widths (mm) : 1502 - 1604 - 1705 - 1807 - 1813 - 1914 - 2016 - 2117
- Method of adjustment : helicoidal ramps

**WHEELBASE** : 2375 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

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Gear box

- Make : MASSEY FERGUSON
- Type : basic gear box to be manual (4 x 4 speeds)
- Arrangement : mechanically operated gear shift - multipower as an option
- Number of speeds : 16 forward and 16 reverse doubled with Multi Power
- Available option : creeper

Rear axle and final drive

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

Front axle

- Make : own make
- Type : auto-lock

Transmission oils

- Capacity :
  - . Gear box and transmission housing )
  - . Steering ) 64 l
  - . Power lift )
  - . Front axle : 14 l
  - . Final drives : 3,3 l
- Change period : 1200 h
- Type of oil filter : removable cartridge in metallic filter elements
- Recommended oil : see "fuel and lubricants used in test"

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| Gear                                                 | Group<br>N° | Number of engine<br>revolution for 1<br>revolution of<br>driving wheels                  | Nominal travelling speed at<br>rated engine speed (km/h)                 |
|------------------------------------------------------|-------------|------------------------------------------------------------------------------------------|--------------------------------------------------------------------------|
| 1<br>2<br>3<br>4<br><br>AR 1<br>AR 2<br>AR 3<br>AR 4 | ST          | 347,825<br>291,672<br>248,497<br>210,783<br><br>326,247<br>273,578<br>233,081<br>197,707 | 1,657<br>1,976<br>2,320<br>2,735<br><br>1,767<br>2,107<br>2,473<br>2,916 |
| 1<br>2<br>3<br>4<br><br>AR 1<br>AR 2<br>AR 3<br>AR 4 | ST + MP     | 275,202<br>230,773<br>196,613<br>166,773<br><br>258,130<br>216,457<br>184,416<br>156,428 | 2,095<br>2,498<br>2,932<br>3,456<br><br>2,233<br>2,663<br>3,126<br>3,685 |
| 1<br>2<br>3<br>4<br><br>AR 1<br>AR 2<br>AR 3<br>AR 4 | FT          | 173,617<br>145,588<br>124,037<br>105,213<br><br>185,100<br>155,217<br>132,241<br>112,171 | 3,320<br>3,959<br>4,647<br>5,479<br><br>3,114<br>3,714<br>4,359<br>5,139 |
| 1<br>2<br>3<br>4<br><br>AR 1<br>AR 2<br>AR 3<br>AR 4 | FT + MP     | 137,367<br>115,191<br>98,140<br>83,245<br><br>146,453<br>122,809<br>104,630<br>88,751    | 4,196<br>5,004<br>5,873<br>6,924<br><br>3,936<br>4,694<br>5,509<br>6,495 |

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

(dynamic index radius : 695 mm)

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| Gear                                                 | Group<br>N° | Number of engine<br>revolution for 1<br>revolution of<br>driving wheels          | Nominal travelling speed at<br>rated engine speed (km/h)                         |
|------------------------------------------------------|-------------|----------------------------------------------------------------------------------|----------------------------------------------------------------------------------|
| 1<br>2<br>3<br>4<br><br>AR 1<br>AR 2<br>AR 3<br>AR 4 | SR          | 86,734<br>72,731<br>61,965<br>52,561<br><br>81,353<br>68,220<br>58,121<br>49,300 | 6,646<br>7,925<br>9,308<br>10,967<br><br>7,085<br>8,449<br>9,918<br>11,692       |
| 1<br>2<br>3<br>4<br><br>AR 1<br>AR 2<br>AR 3<br>AR 4 | SR + MP     | 68,625<br>57,546<br>49,028<br>41,587<br><br>64,367<br>53,976<br>45,986<br>39,007 | 8,400<br>10,017<br>11,757<br>13,861<br><br>8,955<br>10,679<br>12,535<br>14,777   |
| 1<br>2<br>3<br>4<br><br>AR 1<br>AR 2<br>AR 3<br>AR 4 | FR          | 43,293<br>36,304<br>30,930<br>26,236<br><br>46,157<br>38,705<br>32,976<br>27,971 | 13,314<br>15,878<br>18,636<br>21,971<br><br>12,488<br>14,893<br>17,480<br>20,608 |
| 1<br>2<br>3<br>4<br><br>AR 1<br>AR 2<br>AR 3<br>AR 4 | FR + MP     | 34,254<br>28,784<br>24,472<br>20,758<br><br>36,520<br>30,624<br>26,091<br>22,131 | 16,828<br>20,067<br>23,554<br>27,768<br><br>15,784<br>18,823<br>22,093<br>26,046 |

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

(dynamic index radius : 695 mm)

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**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 accomplished by physically replacing the 540 rpm shaft by the 1000 rpm 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 with 16.9 - 30 tyres
  - . 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 with 16.9 - 30 tyres
  - . 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 : 16.9 - 30
- Travelling distance for one revolution of power take-off : 0,55 m (540) - 0,30 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

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| Linkage dimensions (mm)                                                                                       |              |                 | Settings<br>for the test |
|---------------------------------------------------------------------------------------------------------------|--------------|-----------------|--------------------------|
| Rear tyres - dynamic index radius                                                                             | (r)          | 695             |                          |
| Front tyres - dynamic index radius                                                                            | (r')         | 516             |                          |
| Length of lift arms                                                                                           | (A)          | 266             |                          |
| Length of lower links                                                                                         | (B)          | 940             |                          |
| Distance of lift arm<br>pivot point from rear<br>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<br>pivot point from rear<br>wheel center line                                          | horizontally | (c)             | 382                      |
|                                                                                                               | vertically   | (d)             | 120   160   200          |
| Distance of lower link<br>pivot point from rear<br>wheel center line                                          | horizontally | (e)             | 100                      |
|                                                                                                               | vertically   | (f)             | 260                      |
| Distance of lower link points to lift rod pivot<br>points on lower link                                       | (D)          | 566             |                          |
| Length of lift rods                                                                                           | (L)          | from 640 to 705 | 705                      |
| Height of lower hitch points relative to the rear wheel centre line<br>situated 820 mm above the ground level |              |                 |                          |
| - in low position                                                                                             | (h)          | from 368 to 500 | 500                      |
| - in high position                                                                                            | (H)          | from 80 to 207  | 80                       |
| Height of lower hitch points when locked in transport position                                                |              | from 798 to 893 | 798                      |

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SWINGING DRAWBAR

- Height above ground : maximum : 534 mm  
minimum : 534 mm
- Type of adjustment : none
- Distance of hitch point from rear axle centre : 875 mm
- Distance of hitch point from power take-off shaft end :
  - . 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 : 893 mm  
minimum : 187 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 between holes : 80 mm

TRAILER HITCH

- Height above ground : maximum : 866 mm  
minimum : 481 mm
- Distance of hitch point from rear axle centre : 619 mm to rear
- Distance of hitch point from power take-off shaft end : 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 : 759 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-shock and anti-cavitation valves
- Working pressure : 15,7 MPa - 16,2 MPa
- Oil capacity : in common with transmission oil
- Oil change period : 1200 h
- Filter change period : 600 h
- Recommended oil : see "fuel and lubricants used in test"

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**BRAKES**

Service brake

- Make : MASSEY FERGUSON and GIRLING
- Type : oil immersed - 652 cm<sup>2</sup> 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 sensitive 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 - A
- OECD approval number : CSD 1050/3
- Description : the cab is made up from 3 major sub-assemblies, the platform, side pillars and roof  
and the front pillars. These 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

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**LIGHTING**

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

|             | Height above ground of<br>centre<br>mm | Size<br>mm | Distance from out-<br>side edge of trac-<br>tor to centre at<br>1502 mm trackwidth |
|-------------|----------------------------------------|------------|------------------------------------------------------------------------------------|
| Headlights  | 1116                                   | 167 x 107  | 1104                                                                               |
| Sidelights  | 1538                                   | 120 x 80   | 489                                                                                |
| Rear lights | 1552                                   | 300 x 62   | 474                                                                                |
| Reflectors  | 635                                    | 98 x 62    | 525                                                                                |

**CONDITIONS DURING TEST**

Overall dimensions

|             | Lenght<br>mm | Width         |               | Height at the top of   |                            |
|-------------|--------------|---------------|---------------|------------------------|----------------------------|
|             |              | minimum<br>mm | maximum<br>mm | exhaust silencer<br>mm | protective structure<br>mm |
| Unballasted | 3959         | 1851          | 2457          | 2592                   | 2592                       |

Ground clearance : 332 mm limited by drawbar bracket

Track setting . front : 1398 mm  
                          : rear : 1502 mm

Tractor mass (kg)

|             | Front | Rear | Total |
|-------------|-------|------|-------|
| Unballasted | 1225  | 2590 | 3815  |

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Fuel used in test

- Type : Diesel oil
- Viscosity : (NFT 60.100) 4,84 cSt
- Gravity at 15°C : 0,843

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 lubrication points : 15

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2. COMPULSORY TESTS RESULTS

2.1. MAIN POWER TAKE-OFF PERFORMANCE :

- Date and location of tests : 11th february 1987 - CEMAGREF
- Type of dynamometer : SCHENCK W780

| Power                                                                                | Speed   |                | Fuel consumption |          | Specific Energy |
|--------------------------------------------------------------------------------------|---------|----------------|------------------|----------|-----------------|
|                                                                                      | Engine  | Power take-off | Hourly           | Specific |                 |
| kW                                                                                   | rev/min |                | l/h              | g/kWh    | kWh/l           |
| MAXIMUM POWER - TWO HOUR TEST                                                        |         |                |                  |          |                 |
| 47,0                                                                                 | 2200    | 600            | 15,50            | 278      | 3,03            |
| MAXIMUM POWER AT RATED ENGINE SPEED                                                  |         |                |                  |          |                 |
| 47,0                                                                                 | 2200    | 600            | 15,50            | 278      | 3,03            |
| PART LOADS (governor control being set for maximum power at rated engine speed)      |         |                |                  |          |                 |
| (1) Torque corresponding to 85% of the torque at maximum power at rated engine speed |         |                |                  |          |                 |
| 40,2                                                                                 | 2230    | 608            | 13,63            | 286      | 2,95            |
| (2) 75% of the torque defined in (1)                                                 |         |                |                  |          |                 |
| 30,9                                                                                 | 2265    | 618            | 11,28            | 308      | 2,74            |
| (3) 50% of the torque defined in (1)                                                 |         |                |                  |          |                 |
| 20,9                                                                                 | 2295    | 626            | 9,18             | 371      | 2,27            |
| (4) 25% of the torque defined in (1)                                                 |         |                |                  |          |                 |
| 10,8                                                                                 | 2335    | 637            | 7,15             | 556      | 1,52            |
| (5) Unloaded                                                                         |         |                |                  |          |                 |
| -                                                                                    | 2366    | 645            | 5,25             | -        | -               |

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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 (540 rev/min)                                    |         |                |                  |          |          |
| 45,7                                                                                            | 1980    | 540            | 14,40            | 266      | 3,17     |
| PART LOADS (governor control being set for maximum power at standard power take-off speed)      |         |                |                  |          |          |
| (1) Torque corresponding to 85% of the torque at maximum power at standard power take-off speed |         |                |                  |          |          |
| 39,0                                                                                            | 1998    | 545            | 12,49            | 270      | 3,12     |
| (2) 75% of the torque defined in (1)                                                            |         |                |                  |          |          |
| 30,1                                                                                            | 2049    | 559            | 10,27            | 288      | 2,93     |
| (3) 50% of the torque defined in (1)                                                            |         |                |                  |          |          |
| 20,4                                                                                            | 2090    | 570            | 8,36             | 345      | 2,44     |
| (4) 25% of the torque defined in (1)                                                            |         |                |                  |          |          |
| 10,5                                                                                            | 2130    | 581            | 6,30             | 505      | 1,67     |
| (5) Unloaded                                                                                    |         |                |                  |          |          |
| -                                                                                               | 2163    | 590            | 4,30             | -        | -        |

Other results

- No load, maximum engine speed : 2366 rev/min
- Equivalent crankshaft torque at maximum power at rated engine speed : 204,2 N.m
- Maximum equivalent crankshaft torque : 252,6 N.m at 1262 rev/min engine speed

Mean atmospheric conditions

- Temperature : 17°C
- Pressure : 996 mbar
- Relative humidity : 53%

Maximum temperature

- Coolant : 83°C
- Engine oil : 108°C
- Fuel : 24°C
- Air intake : 20°C

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

Fuel consumption at varying load

|                                                | Governor control being set for<br>maximum power at rated engine speed |                   | Governor control being set for<br>maximum power at standard pto speed |                   |
|------------------------------------------------|-----------------------------------------------------------------------|-------------------|-----------------------------------------------------------------------|-------------------|
|                                                | at 85% (1)                                                            | at 50% of 85% (2) | at 85% (1)                                                            | at 50% of 85% (2) |
| Hourly<br>consumption<br>(l/h)                 | 13,63                                                                 | 9,18              | 12,49                                                                 | 8,36              |
| Specific<br>standard<br>consumption<br>(g/kWh) | 286                                                                   | 371               | 270                                                                   | 345               |

(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 : 26th february 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<br>above ground in down<br>position mm | 195                | 165          |
| Vertical movement mm                                               | 580                | 710          |
| Maximum force exerted<br>through full range kN                     | 28,8               | 22,7         |
| Corresponding pressure of<br>hydraulic fluid bar                   | 170                | 170          |
| Moment about rear<br>rear axle kN.m                                | 30,0               | 37,5         |
| Maximum tilt angle of<br>mast over range of lift degree            | -                  | 12°          |

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2.2.1. Power lift test (continued)

| Lifting height (1) | mm                       | -<br>270 | -<br>240 | -<br>200 | -<br>100 | 0    | +100 | +200 | +300 | +340 | +440 |
|--------------------|--------------------------|----------|----------|----------|----------|------|------|------|------|------|------|
| Lifting height (2) | at the hitch point<br>kN | -        | 28,8     | 30,1     | 32,6     | 34,9 | 35,6 | 36,1 | 36,3 | 36,3 | -    |
|                    | at frame<br>kN           | 25,3     | 25,9     | 26,2     | 27,0     | 26,7 | 26,4 | 25,2 | 24,3 | 23,7 | 22,7 |

(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 : 192 bars
- Pump delivery rate at minimum pressure : 52 l/min

|           |       | corresponding to maximum hydraulic power | corresponding to a hydraulic pressure equivalent to 90% of the actual relief valve pressure setting |
|-----------|-------|------------------------------------------|-----------------------------------------------------------------------------------------------------|
| Pressure  | bars  | 181                                      | 170                                                                                                 |
| Flow rate | l/min | 45,5                                     | 45,6                                                                                                |
| Power     | kW    | 13,7                                     | 12,9                                                                                                |

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2.3. DRAWBAR PERFORMANCE (UNBALLASTED TRACTOR)

- Date and location of test : 13th february 1987 - CEMAGREF

- Type of track : Tarmacadam

- Height of drawbar above ground : 0,42 m

| - Tyres                       | Front     | Rear      |
|-------------------------------|-----------|-----------|
| . Size :                      | 11.2 - 24 | 16.9 - 30 |
| . Inflation pressure (bars) : | 0,9       | 1,0       |

- Atmospheric conditions :

- . Temperature : 4°C
- . Pressure : 1002 mbar
- . Relative humidity : 60%

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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"

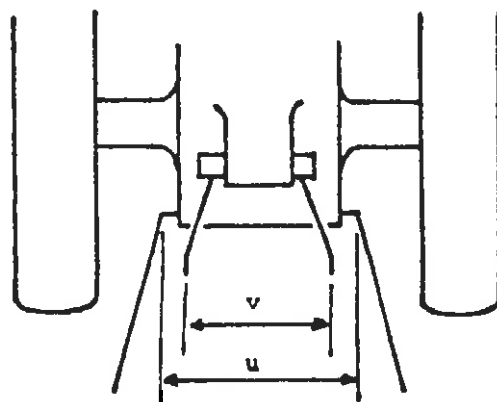
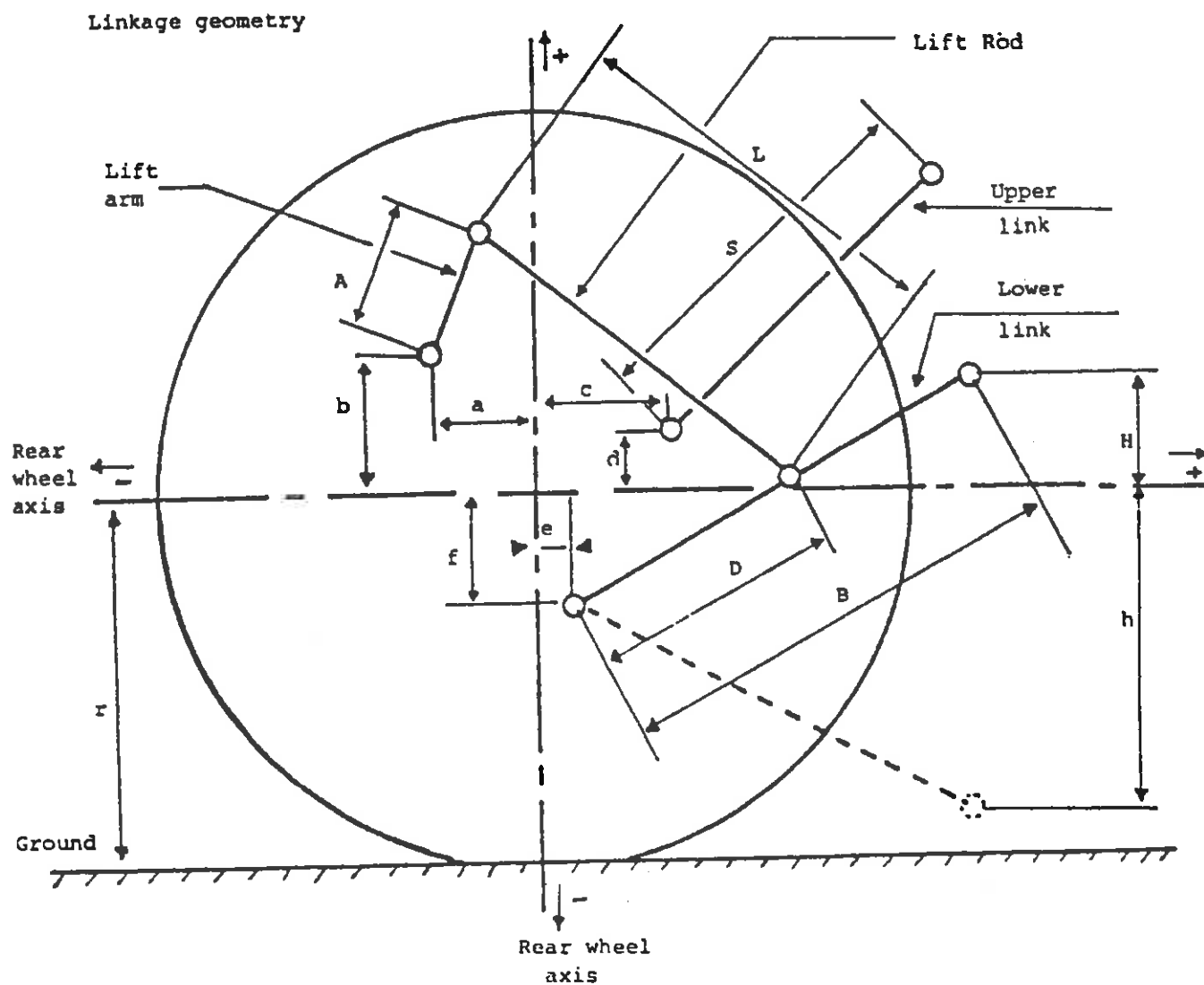
THREE- POINT LINKAGE

- 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

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## 2.3. DRAWBAR PERFORMANCE : (continued)

| Gear                                 | Speed<br>km/h | Drawbar<br>pull<br>kN | Power<br>kW | Engine<br>speed<br>rev/min | Wheelslip<br>% | Specific fuel<br>consumption<br>g/kWh | Specific<br>energy<br>kWh/l | Temperatures |               |                  |
|--------------------------------------|---------------|-----------------------|-------------|----------------------------|----------------|---------------------------------------|-----------------------------|--------------|---------------|------------------|
|                                      |               |                       |             |                            |                |                                       |                             | Fuel<br>°C   | Coolant<br>°C | Engine oil<br>°C |
| MAXIMUM DRAWBAR POWER IN TESTED GEAR |               |                       |             |                            |                |                                       |                             |              |               |                  |
| 4 ST + MP                            | 2,98          | 33,8                  | 28,0        | 2236                       | 15             | 425                                   | 1,98                        | 6            | 68            | 71               |
| 2 FT                                 | 3,37          | 33,6                  | 31,5        | 2225                       | 15             | 404                                   | 2,09                        | 6            | 72            | 75               |
| 1 FT + MP                            | 3,58          | 33,7                  | 33,6        | 2211                       | 15             | 396                                   | 2,13                        | 7            | 78            | 83               |
| 3 FT                                 | 4,13          | 31,8                  | 36,5        | 2203                       | 11             | 370                                   | 2,23                        | 7            | 82            | 90               |
| 2 FT + MP                            | 4,56          | 29,5                  | 37,4        | 2203                       | 9              | 361                                   | 2,34                        | 7            | 83            | 92               |
| 4 FT                                 | 5,09          | 27,3                  | 38,6        | 2203                       | 7              | 352                                   | 2,40                        | 7            | 83            | 95               |
| 3 FT + MP                            | 5,51          | 25,5                  | 39,0        | 2196                       | 6              | 348                                   | 2,42                        | 9            | 83            | 96               |
| 1 SR                                 | 6,30          | 22,5                  | 39,4        | 2192                       | 5              | 341                                   | 2,46                        | 9            | 82            | 98               |
| 4 FT + MP                            | 6,57          | 21,5                  | 39,2        | 2185                       | 4              | 340                                   | 2,47                        | 9            | 82            | 99               |
| 2 SR                                 | 7,54          | 19,1                  | 40,0        | 2163                       | 3              | 334                                   | 2,53                        | 10           | 83            | 100              |
| 1 SR + MP                            | 8,03          | 17,8                  | 39,8        | 2159                       | 3              | 332                                   | 2,54                        | 10           | 82            | 100              |
| 3 SR                                 | 8,85          | 16,2                  | 39,9        | 2141                       | 2              | 331                                   | 2,55                        | 9            | 80            | 99               |
| 2 SR + MP                            | 9,39          | 15,2                  | 39,7        | 2100                       | 2              | 329                                   | 2,56                        | 10           | 83            | 100              |
| 4 SR                                 | 10,32         | 14,2                  | 40,7        | 2101                       | 2              | 323                                   | 2,61                        | 10           | 82            | 99               |
| 3 SR + MP                            | 10,97         | 12,4                  | 37,9        | 2075                       | 1              | 340                                   | 2,47                        | 9            | 80            | 98               |
| 1 FR                                 | 12,45         | 11,0                  | 38,1        | 2068                       | 1              | 340                                   | 2,47                        | 9            | 83            | 98               |

## 2.3. DRAWBAR PERFORMANCE : (continued)

| Gear                                                      | Speed<br>km/h | Drawbar<br>pull<br>kN | Power<br>kW | Engine<br>speed<br>rev/min | Wheel slip<br>% | Specific fuel<br>consumption<br>g/kWh | Specific<br>energy<br>kWh/l | Temperatures |               |                  |
|-----------------------------------------------------------|---------------|-----------------------|-------------|----------------------------|-----------------|---------------------------------------|-----------------------------|--------------|---------------|------------------|
|                                                           |               |                       |             |                            |                 |                                       |                             | Fuel<br>°C   | Coolant<br>°C | Engine oil<br>°C |
| TRANSMISSION AND FUEL CONSUMPTION CHARACTERISTICS         |               |                       |             |                            |                 |                                       |                             |              |               |                  |
| (i) Maximum drawbar power in tested gear                  |               |                       |             |                            |                 |                                       |                             |              |               |                  |
| 4 SR                                                      | 10,32         | 14,2                  | 40,7        | 2101                       | 2               | 323                                   | 2,61                        | 10           | 82            | 99               |
| (ii) 75 % of pull at maximum power                        |               |                       |             |                            |                 |                                       |                             |              |               |                  |
| 4 SR                                                      | 11,07         | 10,7                  | 32,8        | 2233                       | 1               | 349                                   | 2,41                        | 9            | 80            | 97               |
| (iii) 50 % of pull at maximum power                       |               |                       |             |                            |                 |                                       |                             |              |               |                  |
| 4 SR                                                      | 11,38         | 7,2                   | 22,8        | 2273                       | 1               | 413                                   | 2,04                        | 9            | 80            | 96               |
| (iv) Higher gear same pull as in (i) reduced engine speed |               |                       |             |                            |                 |                                       |                             |              |               |                  |
| 3 SR + MP                                                 | 11,14         | 10,7                  | 33,0        | 2097                       | 1               | 350                                   | 2,40                        | 9            | 78            | 95               |
| (v) Higher gear as in (ii) reduced engine speed           |               |                       |             |                            |                 |                                       |                             |              |               |                  |
| 3 SR + MP                                                 | 11,32         | 7,3                   | 22,8        | 2112                       | 1               | 402                                   | 2,09                        | 9            | 78            | 96               |

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3. OPTIONAL TESTS RESULTS

3.1. MEASUREMENT OF EXTERNAL NOISE LEVEL

Date of test : 13th february 1987

Type of sound level meter : BRUEL & KJAER 2209

Type of track : TARMACADAM

Gear : 4 FR + MP

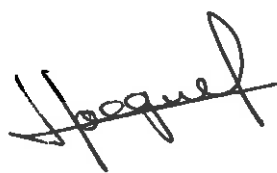
Travelling speed before acceleration : 22,4 km/h

Sound level : 83 dB(A)

REPAIR AND ADJUSTMENTS DURING TESTS : none

REMARKS : none

Le Technicien  
Chargé de l'essai



M. HOOQUEL

L'Ingénieur  
Responsable de l'essai



E. HUGO

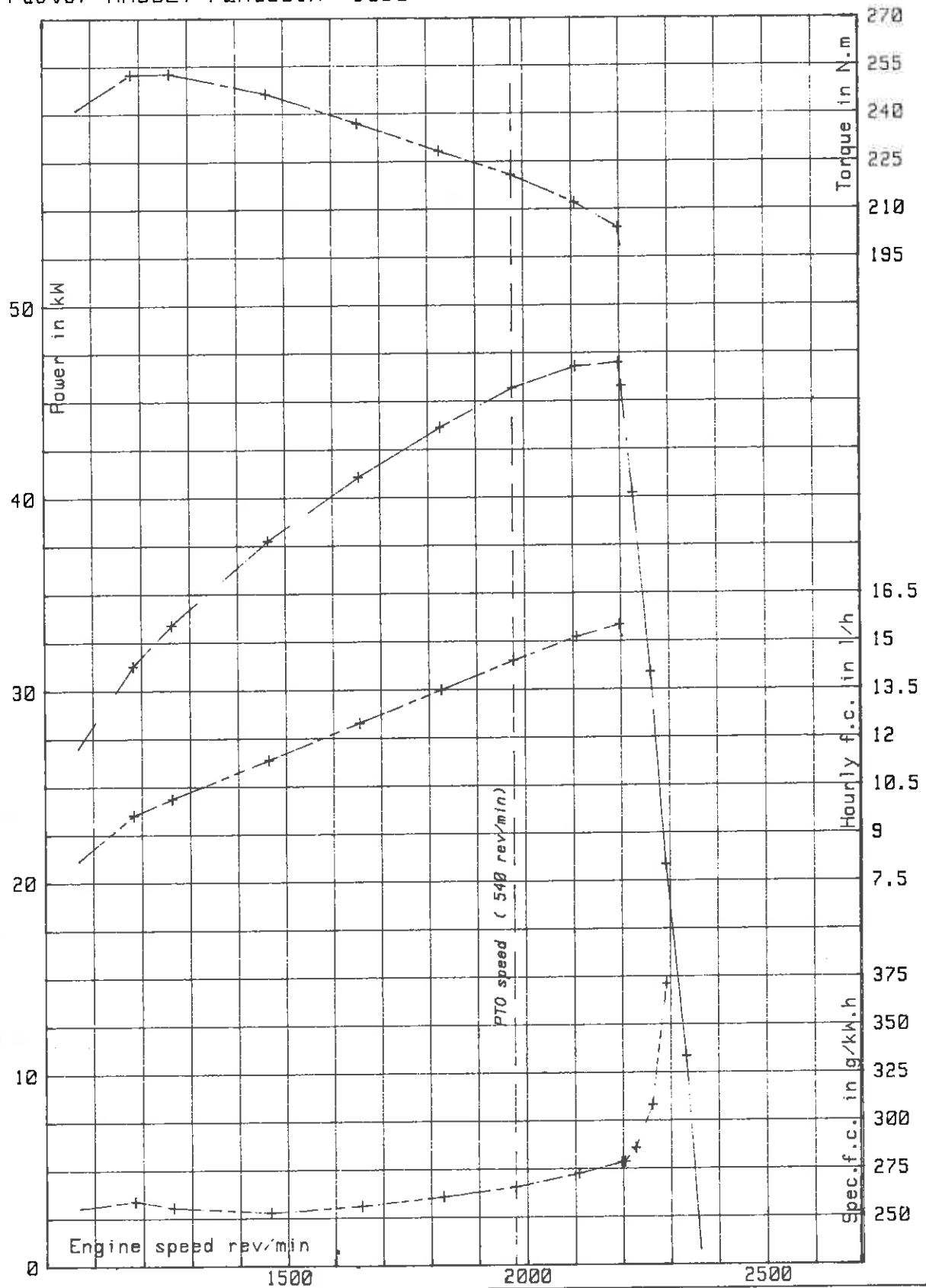
Le Chef de la Division MTAN



J.F. GOUPILLON

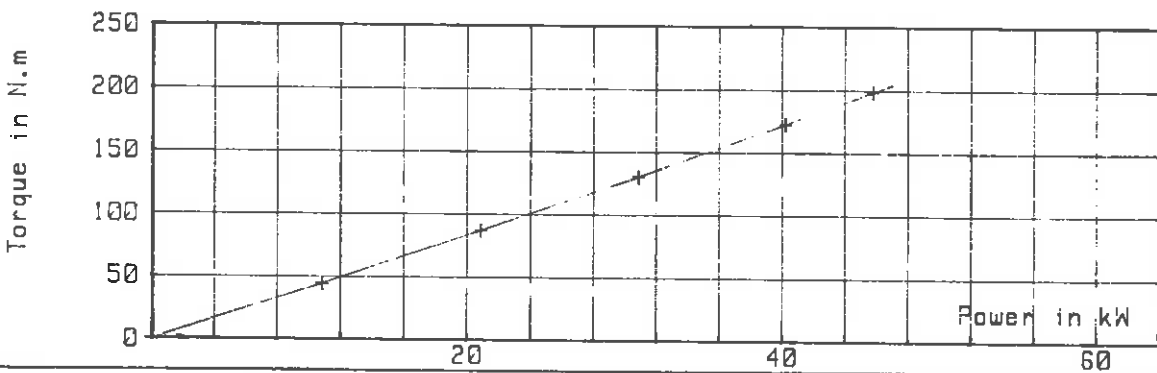
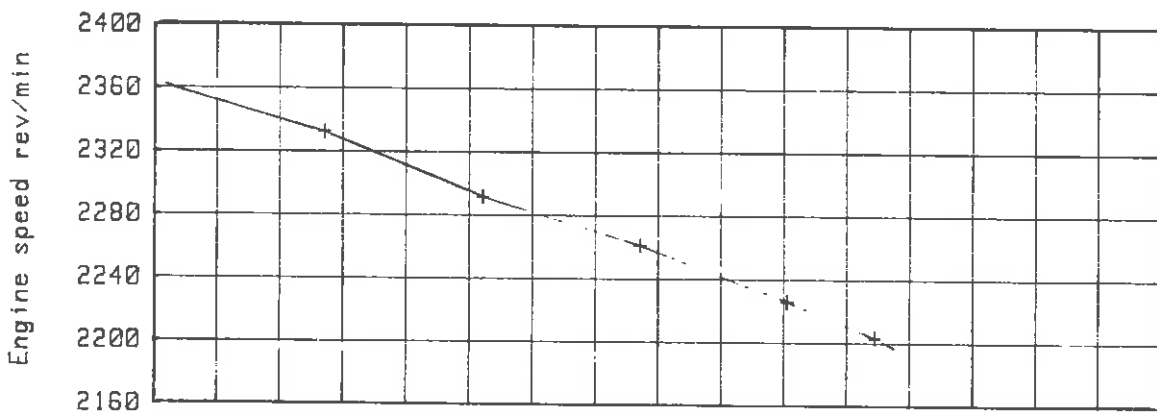
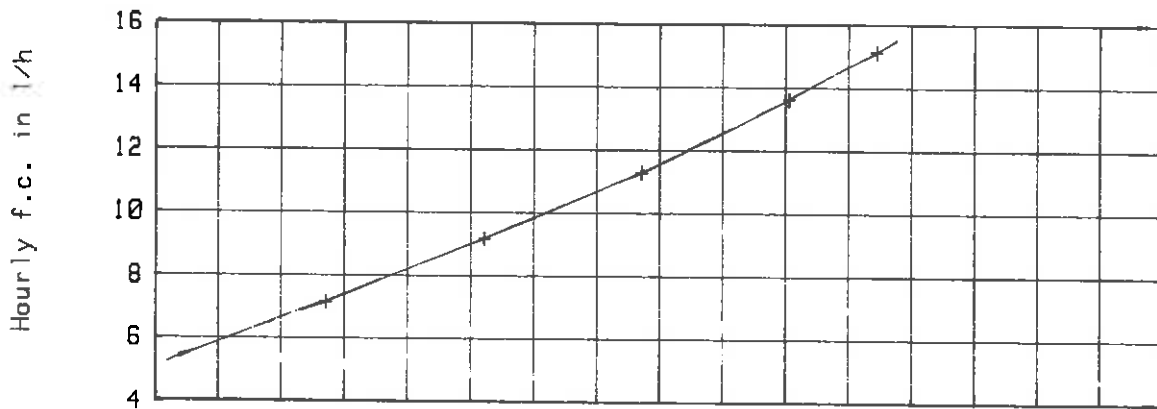
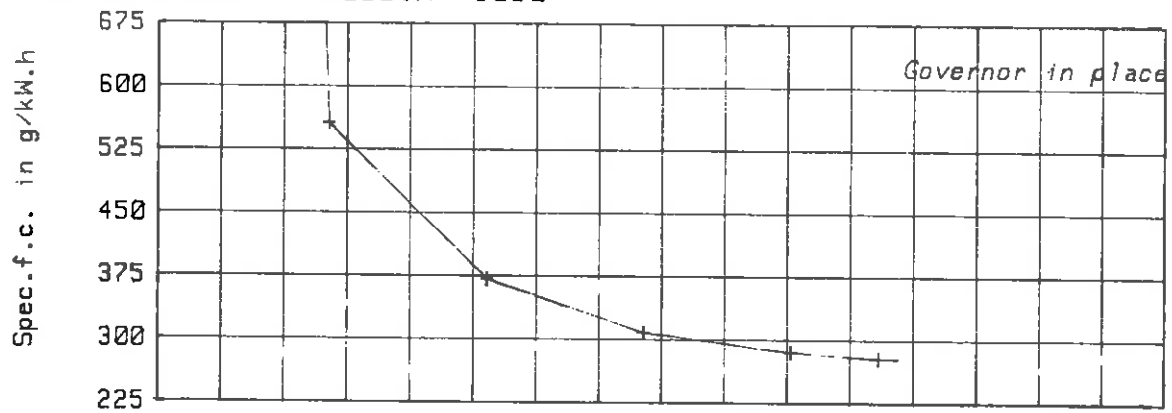
Main power take-off test  
Tractor MASSEY FERGUSON 3050

Test 6074  
of 11-02-87



Main power take-off test  
Tractor MASSEY FERGUSON 3050

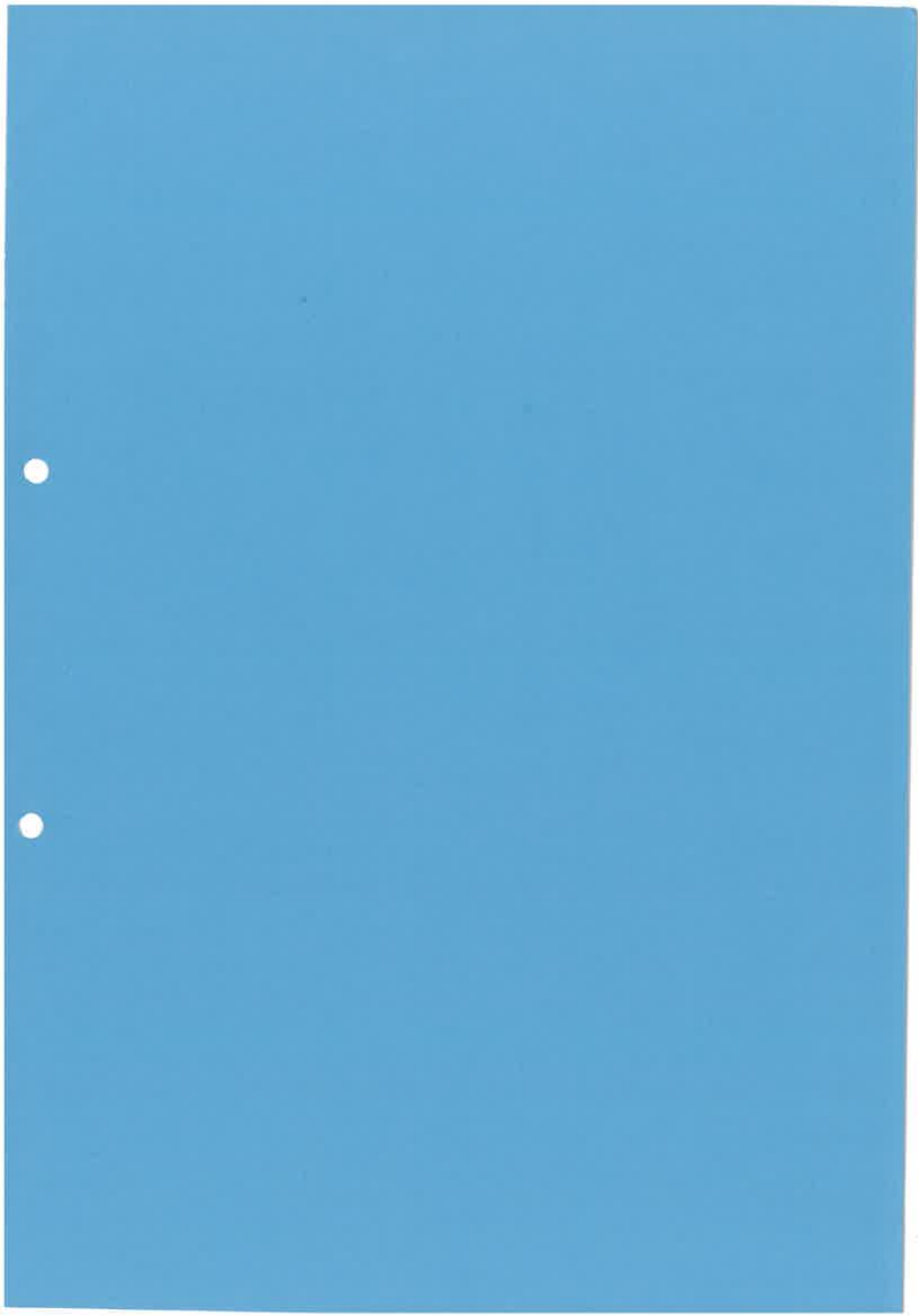
Test 6074  
of 11-02-87











# Interventions for Intimate Partner Violence: A Review of the Literature

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