O. E. C. D. Approval No.824

Report on test in accordance with

O.E.C.D. Test Code for Agricultural Tractors

KUBOTA B 8200 E

Manufactured by: KUBOTA,Ltd.
TSUKUBA Plant
IBARAKI, JAPAN



Test No. 81002 / O. E. C. D.
Dete of Test: November—December, 1981

This report has been approved by the O. E. C. D. Coordinating Center (C.E.M.A.G.R.E.F., France) as being in accordance with the O.E.C.D. Tractor Test Code.
Dete of Approval: 21st April, 1982

INSTITUTE OF AGRICULTURAL MACHINERY

OMIYA SAITAMA JAPAN

TABLE OF CONTENTS

Page No.

Specification of tractor 1

Test conditions 7

Compulsory tests 8

(1) Main power take-off performance 8

(2) Drawbar performance 12

(3) Turning space and turning circle 16

(4) Location of center of gravity 16

(5) Braking 17

(6) Measurement of external noise level 18

(7) Noise measurement at the driver's ear level 18

(8) Power lift and hydraulic pump performance 19

Repairs and adjustments during tests 21

Remarks 21

Manufacturer :	KUBOTA, Ltd. TSUKUBA Plant Ibaraki, Japan
Submitted for test by :	The manufacturer
Selected by :	The manufacturer with the agreement of the I.A.M.
Place of running-in :	KUBOTA, Ltd. TSUKUBA Plant
Duration of running-in :	82 hours

SPECIFICATION OF TRACTOR

Tractor

Make :	KUBOTA, Ltd.
Model :	B 8200 E
Type :	Wheeled tractor, rear wheel driven, unit construction
Serial No. :	B8200E-10430

Engine

Make :	KUBOTA, Ltd.
Model :	D950
Type :	4-stroke diesel engine with indirect injection, water cooled
Serial No. :	D950-212299
Cylinders :	3-cylinders, vertical in line, bore 75 mm stroke 70 mm, capacity 927 cm³, compression ratio 22, dry replaceable cylinder liners
Valves :	Overhead
Fuel system :	Mechanical fuel feed pump without hand primer ; DIESEL KIKI make in-line type injection pump NP-PFR3KD50/2 NP6, serial No. 1470959, manufacturer's production setting 17-20 mm³/stroke at rated engine speed and full load, injection timing 24±1° before TDC ; NIPPON DENSO make throttle type fuel injection nozzles ND-DN12SD12, injection pressure 137^{+10}_{0} bar ; TAIYO GIKEN make replaceable paper element filter with sediment bowl between fuel tank and feed pump, element changing period 400 hours; capacity of fuel tank 20 ℓ
Governor :	Own make mechanical acting variable speed type incorporated in injection pump, governed range of engine speed 700 to 2800 rev/min, rated engine speed 2600 rev/min
Air cleaner :	TOKYO ROKI make dry paper element type situated in front of radiator under bonnet ; optional, NIPPON DONALDSON make dry double paper element filter not fitted

in tests

Lubrication system :	Forced feed from gear type pump ; strainer in sump ; replaceable cartridge type paper element full flow filter, cartridge changing period 150 hours ; oil capacity 3.9 ℓ, oil changing period 75 hours, recommended oil quality API service CC or CD, SAE 10W-30, recommended oil viscosity 67.5 cSt at 40℃
Cooling system :	Water cooling with centrifugal pump ; 310 mm dia. 4-blade belt driven fan ; thermostat for temperature control ; pressurized at 0.88 bar ; water capacity 4.0 ℓ
Starting system :	Electrical ; NIPPON DENSO make solenoid engaged type starter motor, 12V, 1 kW, operable only with clutch pedal operated ; electrical glow plug for cold starting
Exhaust silencer :	Own make multi-chamber absorption-expansion type silencer, 90 mm dia. 550 mm long, overall length 1126 mm, vertical on the left side of tractor, mouth showing 45° forward from lateral direction
Electrical equipment :	12 V, negative earth ; NIPPON DENSO make three-phase alternator ACJE 73, 420 W 35 A ; 1 lead acid battery NS70, 65 Ah at 20 hours rating

Transmission

Clutch :	DAIKIN SEISAKUSHO make dry single disk, 200mm dia. ; pedal operated for gearbox and p.t.o. drive
Gearbox :	Own make mechanical type with sliding and constant mesh gear, 9 forward and 3 reverse speeds comprising 3 forward and 1 reverse speeds with 3 range possible by combination of two selector levers
Rear axle and final drives :	Own make bevel gear drive with crown wheel and pinion; bevel gear type differential with spur gear final drives ; pedal operated self disengaging differential lock
Oil capacity :	Gear box, rear axle, differential and final drives in common with hydraulic system 18 ℓ, recommended oil quality API service GL-3, SAE 75 W, recommended oil viscosity 55.7 cSt at 40℃, oil changing period 300 hours

Total ratios and speeds (tyres 8.3-24)

GEAR		Number of engine revolutions for one revolution of driving wheel	* Nominal travelling speed for rated speed of engine km/h
Sub	Main		
Forward			
L	1	450.21	1.08
L	2	253.24	1.92
L	3	168.83	2.88
M	1	102.46	4.74
H	1	66.75	7.28
M	2	57.64	8.44
M	3	38.42	12.65
H	2	37.54	12.95
H	3	25.03	19.42
Reverse			
L	R	337.66	1.44
M	R	76.85	6.33
H	R	50.06	9.71

* Calculated with a tyre rolling radius of 496 mm

Power take-off

Main p.t.o. : At rear of tractor in median plane, height above ground 485 mm, distance behind rear axle center 204.5 mm, p.t.o. shaft giving 6 spline 35 mm dia. to ISO500/SAEJ1170* ; not independent ; dependent of main clutch, driven by pedal operating single clutch ; rotation clockwise viewd from driving end, proportional engine speed

2 speeds are preselectable by hand lever

High ratio ; 767 rev/min at rated engine speed
540 rev/min (standard p.t.o. speed) at 1831 rev/min engine speed

Low ratio : 554 rev/min at rated engine speed
540 rev/min (standard p.t.o. speed) at 2534 rev/min engine speed

* Spherical clearance radius on tractor is 76.5 mm not conformed to ISO nor SAE standard

Power lift

Own make hydraulic power lift, control valve for lifting, sinking and floationg ; optional, position control not fitted in tests

Hydraulic system : Open center system ; single acting ram, bore 70 mm stroke 77 mm ; own make gear pump driven by engine, delivery 15.4 ℓ/min at rated engine speed ; oill tapping not fitted; hydraulically acting linkage lock for transport ; metal net hydraulic filter situated delivery line between gear box and gear pump, filter cleaning period 300 hours ; hydraulic oil capacity 18 ℓ in common with gear box, oil changing period 300 hours

Implement linkage : Three point linkage, category I to ISO730/SAEJ715f* liftrod length adjustable 365 and 403 mm, lifting range above ground with liftrod length of 365 mm from 300 to 760 mm

* As for mast adjustment maximum height for lowest position is not conformed ISO standard and length of lower links is short, and the following dimension is not conformed ISO nor SAE standard.
minimum height for highest position ; power range ; leveling adjustment ; side sway at hitch point each side of center position with lower links horizontal ; horizontal distance from end of p.t.o. shaft to lower hitch points with lower links horizontal ; lower hitch point tractor clearance ;

Holed drawbar : Optional, fitted on the clevis of lower links ; length between the ball joints 683 mm, thickness 25mm width 75 mm, center hole and 3 holes on either side with 80 mm distance each, all holes 29 mm dia.
distance of holes' center line with lower links in holizontal position :
from rear axle center 685 mm

from p.t.o. shaft end 480.5 mm
height above ground 412.5 mm with lower links holizontal, measured at the surface of the bar

Pull attachment

Drawbar : Optional, fitted in tests ; own make swinging drawbar, height above ground 275 mm and 360 mm, distance from rear axle 437.5 mm, position relative to p.t.o. 233 mm rearward lateral adjustment 207 mm, distance of pivot point rearward from rear axle 37.5 mm, pin hole diameter 25 mm; drawbar composed of two parts, usable as tongue type drawbar removing accessory part

Steering : NIPPON SEIKO make circulating ball steering ; single drag link on left side of tractor ; acting on front wheels

Brakes

Service brake : DAIKIN SEISAKUSHO make mechanical acting internal expanding type ; acting on 2 brake drums at the rear wheel; independent or combined pedal operated

Parking brake : In common with service brake ; operated by foot pedals with ratchet

Wheels

Steering wheels : Two pneumatics at front 4.00-12 4 ply rating, diagonal type tyre casing ; maximum permissible load on each tyre 245 kg at 3.19 bar inflation pressure ; track width 830 mm; rims 3.00D x 12DC

driving wheels : Two pneumatics at rear 8.3-24 4 ply rating, diagonal type tyre casing ; maximum permissible load on each tyre 640 kg at 1.57 bar inflation pressure ; track width 890 mm and 930 mm, changing by turning wheels ; rims W7 x 24

Weel base : 1535 mm

Seat : NANBA PRESS INDUSTRY make, upholstered seat with back rest, supported with hinge and rubber ; Range of adjustment 65 mm horizontally, not adjustable vertically

Number of grease point : 8

Dimensions

Total length : Without ballast
2680 mm with three point linkage
With ballast
2880 mm with three point linkage

Total width : Without ballast
1120 mm (end of side lights) at 890 mm rear wheels track

	width 1140 mm at 930 mm rear wheels track width With ballast 1140 mm at 930 mm rear wheels track width 1180 mm at 890 mm rear wheels track width
Total height :	Without ballast 1895 mm (to top of exhaust silencer) With ballast 1895 mm (to top of exhaust silencer)
Ground clearance :	275 mm below swinging drawbar bracket

Technical permissible total weights and axle loads

for all available wheel equipment

Tyre size		Permissible axle load		Permissible total weight
front	rear	front kg	rear kg	kg
4.00-12 4PR	8.3-24 4PR	490	1000	1300
6.50-10 4PR	12.4-16 4PR	700		
23×8.5-12 2PR	13.6-16 4PR	630		

Lighting equipment

Electrical, 12 V
as per EC directives

	Dimensions mm	Height above ground of center mm	Distance from outside edge of tractor to center mm
Head lights	120 dia.	915	440
Side lights	120 x 40	1070	60
Rear lights	120 x 40	1070	60
Flashers	120 x 70	1125	60
Reflectors	60 dia.	860	105

TEST CONDITIONS

Weights (without driver, but with tanks full)

Without ballast :	front	254 kg
	rear	388 kg
	total	642 kg
Front ballast :	3 weights 25 kg each (at front frame)	75 kg
Rear ballast :	4 weights 27.5 kg each (at rear wheel)	110 hg
	water (at rear wheel)	120 kg
with ballast :	front	353 kg
	rear	594 kg
	total	947 kg

Track setting during tests

830 mm at front
890 mm at rear

Fuel and lubricants used in tests

Fuel :	Diesel oil, specific gravity 0.8374 at 15℃, viscosity 4.071 cSt at 30℃, cetan index 58 to No.2 JIS
Engine oil :	GENERAL SEKIYU, TRACTOR OIL, API service CC, SAE 10W-30, viscosity 67.5 cSt at 40℃
Transmission oil :	MARUZEN OIL, UDT OIL, API service GL-3, SAE 75 W, viscosity 55.7 cSt at 40℃

COMPULSORY TESTS

(1) MAIN POWER TAKE-OFF PERFORMANCE

Date of test : 27th November, 1981
Type of dynamometer : DC Electrical, MEIDENSHA EB-DH 1

Power	Speed		Fuel consumption		Specific Energy
	Engine	p. t. o.	hourly	specific	
kW	rev/min	rev/min	ℓ/h	kg/kWh	kWh/ℓ
MAXIMUM POWER					
At 2hour test					
12.1	2600	554	4.12	0.285	2.94
At the speed recommended for drawbar work					
12.1	2600	554	4.12	0.285	2.94
PART LOADS, the governor hand lever in the position corresponding to the maximum power at full load					
(i) 85 per cent of the torque obtained at maximum power					
10.6	2661	567	3.65	0.290	2.89
(ii) unloaded					
0	2800	597	1.23	—	—
(iii) half the torque defined in (i)					
5.5	2741	584	2.34	0.359	2.33
(iv) the torque corresponding to maximum power					
12.1	2600	554	4.12	0.285	2.94
(v) one-quarter of the torque defined in (i)					
2.7	2764	589	1.76	0.540	1.55
(vi) three-quarters of the torque defined in (i)					
8.0	2694	574	2.96	0.308	2.72

Power	Speed		Fuel consumption		Specific Energy
kW	Engine rev/min	p. t. o. rev/min	hourly ℓ/h	specific kg/kWh	kWh/ℓ

PART LOADS, the governor hand lever in the position corresponding to the standard p.t.o. speed at full load

(i) 85 per cent of the torque obtained at maximum power					
10.3	2576	549	3.57	0.289	2.89
(ii) unloaded					
0	2731	582	1.20	—	—
(iii) half the torque defined in (i)					
5.4	2661	567	2.28	0.356	2.35
(iv) the torque corresponding to maximum power available					
11.9	2534	540	4.01	0.282	2.97
(v) one-quarter of the torque defined in (i)					
2.7	2694	574	1.70	0.525	1.59
(vi) three-quarters of the torque defined in (i)					
7.9	2619	558	2.88	0.307	2.73

STANDARD SPECIFIC FUEL CONSUMPTION: 0.290/0.359/0.289/0.356 kg/kWh

No load maximum engine speed 2800 rev/min

Equivalent crankshaft torque at maximum power 44.4 Nm

Maximum equivalent crankshaft torque: 53.0 Nm at 1800 rev/min of the engine

Mean atmospheric conditions: temperature 19 ℃

pressure 1016 mbar

relative humidity 57 %

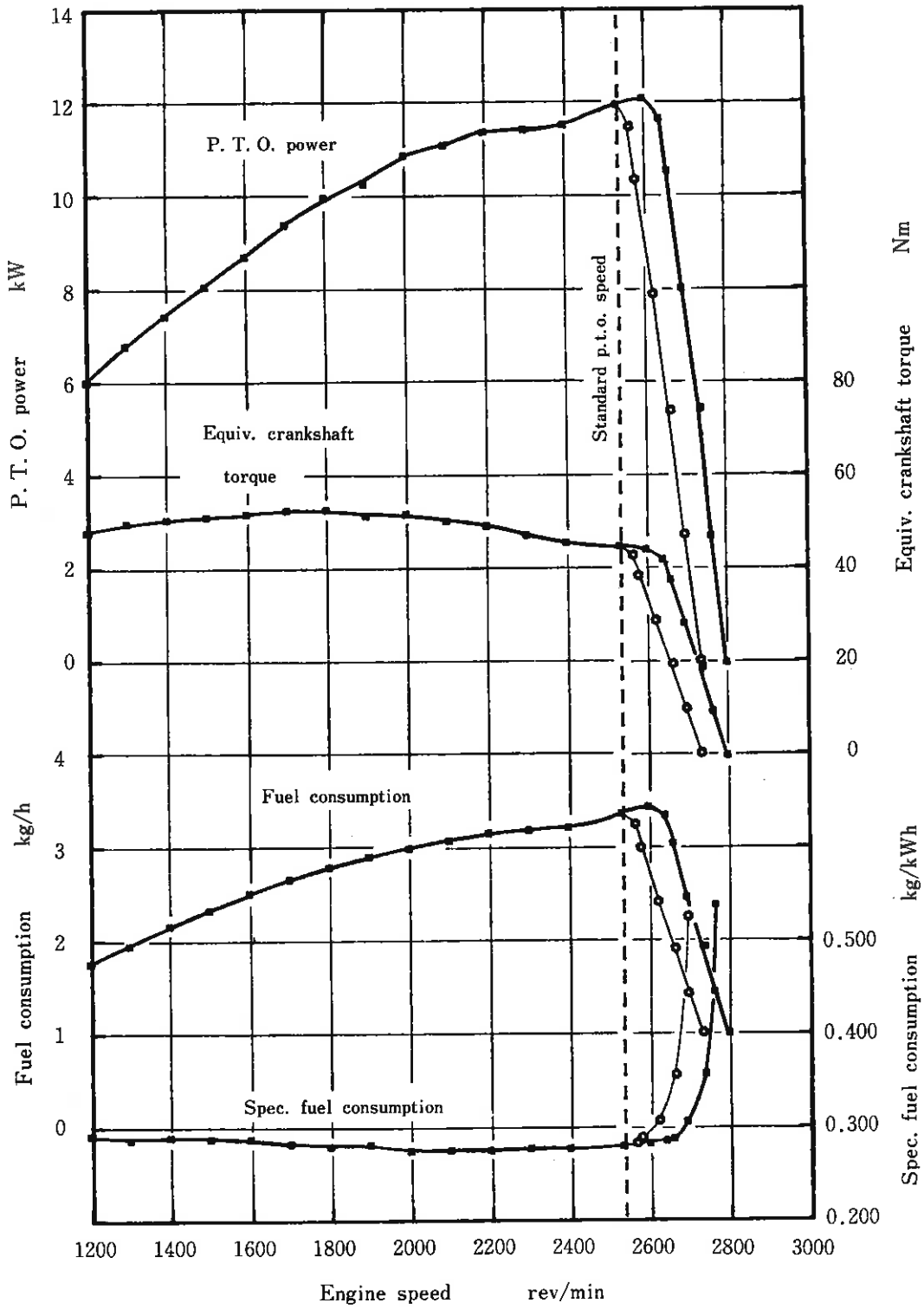
Maximum temperatures: coolant 85 ℃

engine oil 96 ℃

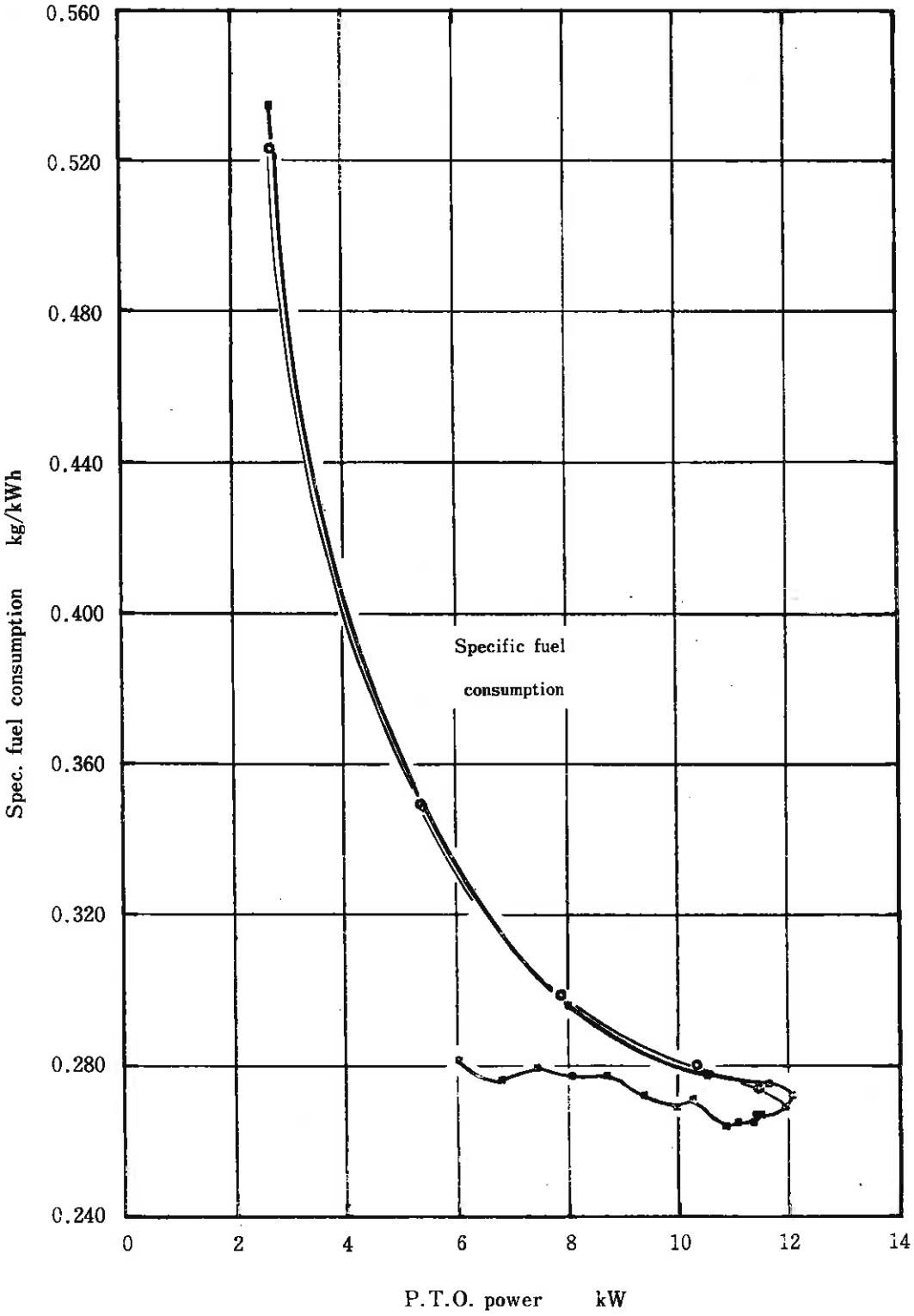
fuel 37 ℃

engine air intake 21 ℃

P. T. O. PERFORMANCE



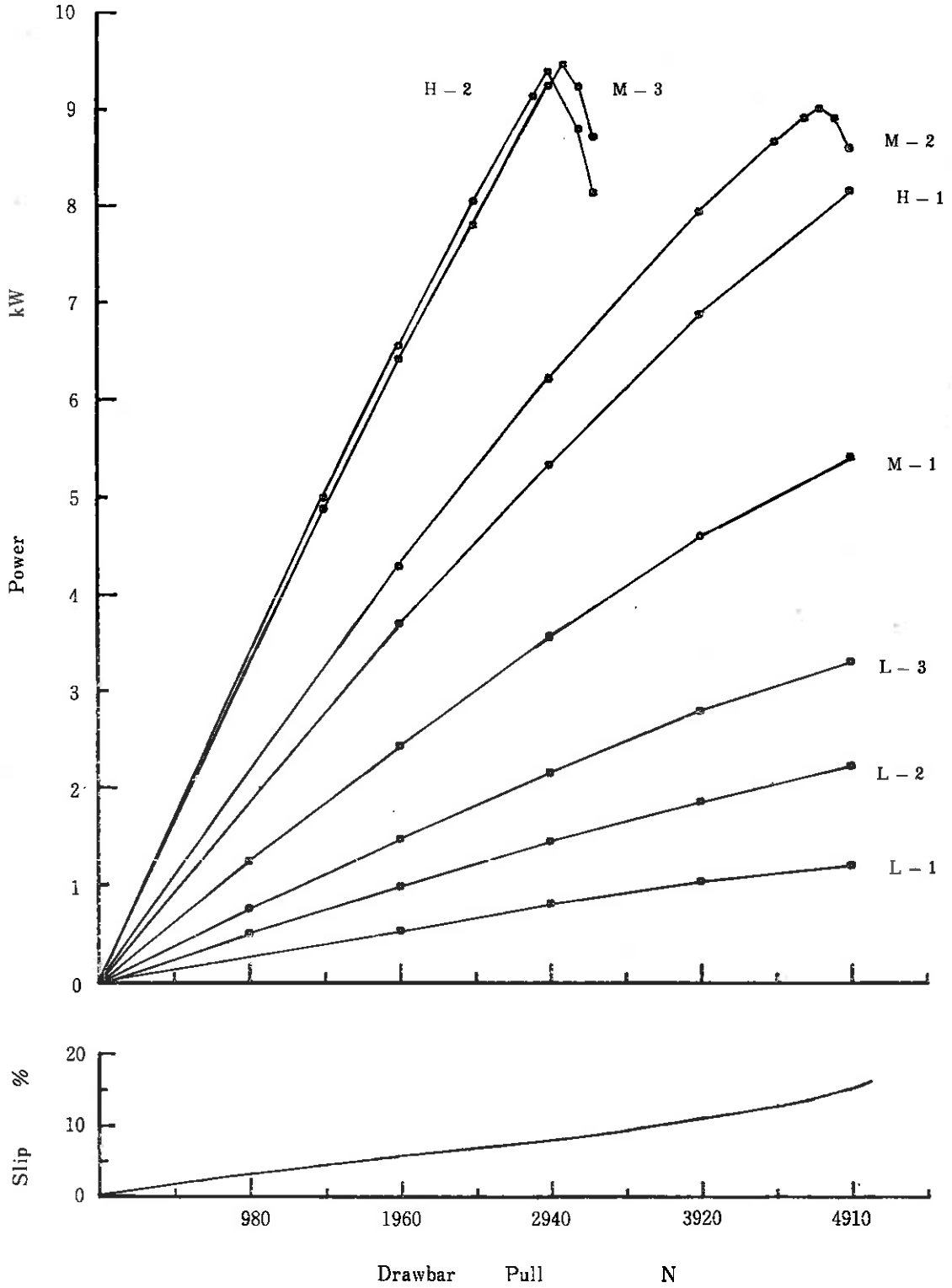
P. T. O. PERFORMANCE



(2) DRAWBAR PERFORMANCE

Date of tests : 30th November till 9th December, 1981
Tyre size : 8.3 - 24 at rear, 4.00 - 12 at front
Type of track : Concrete
Tread bar height at the beginning of drawbar tests in per cent of the value when new : 90
Height of drawbar above ground : 355 mm
Tyre inflation pressure : 1.57 bar at rear, 3.19 bar at front

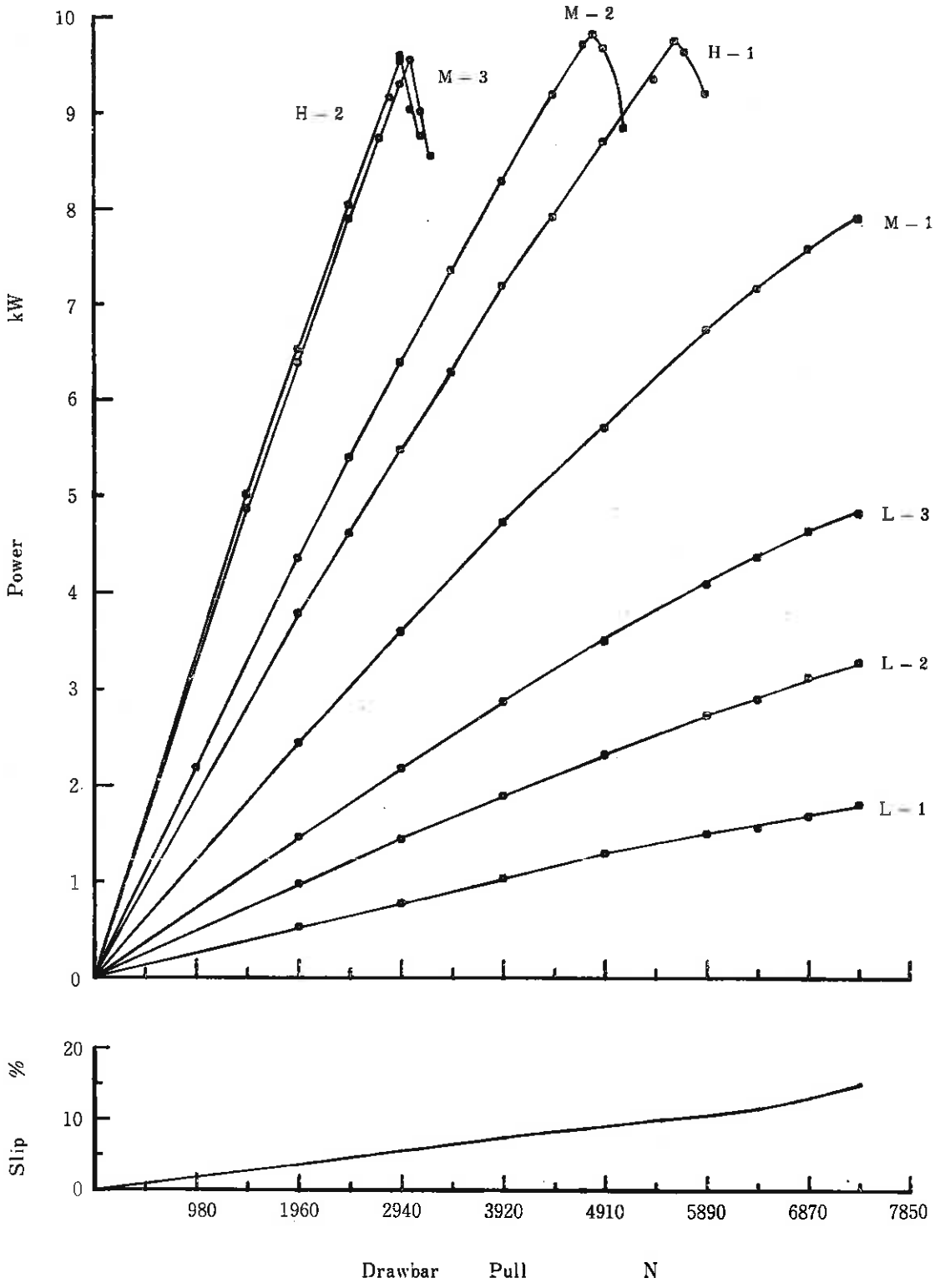
Gear No.	Speed km/h	Power kW	Drawbar pull N	Engine speed rev/min	Silp of wheels %	Specific fuel consumption kg/kWh	Specific energy kWh/ℓ	Temperature			Atmospheric conditions		
								Fuel ℃	Coolant ℃	Engine oil ℃	Temperature ℃	Relative humidity %	Pressure mbar
(I) MAXIMUM POWER (without ballast)													
L - 1	0.90	1.2	4910	2747	15.2	1.060	0.79	25	76	81	7	58	1032
L - 2	1.67	2.3	4910	2741	14.9	0.646	1.28	26	76	80	8	55	1032
L - 3	2.45	3.3	4910	2720	15.0	0.589	1.44	26	78	82	8	54	1032
M - 1	4.00	5.5	4910	2676	14.9	0.426	1.95	26	82	85	8	52	1032
H - 1	6.02	8.2	4910	2631	15.0	0.380	2.20	25	82	87	8	52	1032
M - 2	6.91	9.0	4710	2606	14.9	0.376	2.23	24	77	83	9	52	1032
M - 3	11.23	9.5	3040	2607	8.6	0.373	2.24	22	80	87	9	50	1032
H - 2	11.52	9.4	2940	2607	8.4	0.380	2.21	19	82	89	9	50	1032


10
9
8
7
6
5
4
3
2
1
0
kW
Power
H – 2
M – 3
M – 2
H – 1
M – 1
L – 3
L – 2
L – 1
20
10
0
%
Slip
980
1960
2940
3920
4910
Drawbar Pull N

Height of drawbar above ground: 345 mm
Tyre inflation pressure: 1.57 bar at rear, 3.19 bar at front

Cear No.	Speed km/h	Power kW	Drawbar pull N	Engine speed rev/min	Slip of wheels %	Specific fuel consump-tion kg/kWh	Specific energy kWh/ℓ	Temperature			Atmospheric conditions		
								Fuel ℃	Coolant ℃	Engine oil ℃	Temper-ature ℃	Relative humidity %	Pressure mbar
(Ⅱ) MAXIMUM POWER (with ballast)													
L - 1	0.90	1.8	7360	2734	15.2	0.738	1.13	21	76	80	8	40	1016
L - 2	1.62	3.3	7360	2724	15.1	0.594	1.41	22	80	84	8	40	1016
L - 3	2.38	4.9	7360	2696	15.1	0.512	1.64	22	81	85	9	40	1016
M - 1	3.89	8.0	7360	2648	14.9	0.405	2.07	19	82	85	9	40	1016
H - 1	6.30	9.8	5590	2605	9.3	0.394	2.12	17	83	88	8	45	1016
M - 2	7.38	9.9	4810	2600	7.7	0.354	2.37	21	80	86	6	88	1019
M - 3	11.34	9.6	3040	2601	5.9	0.369	2.27	17	78	86	6	85	1019
H - 2	11.70	9.6	2940	2602	5.1	0.375	2.24	19	78	85	6	85	1019
(Ⅲ) FIVE HOUR TEST at 75% of pull at maximum power													
H - 1	6.62	7.7	4193	2663	7.2	0.451	1.86	32	82	90	10	34	1019
(Ⅳ) FIVE HOUR TEST at pull corresponding to 15% wheelslip in test (Ⅱ)													
*M - 1	3.92	—	7360	—	—	—	—	24	81	90	11	34	1018

* Those figures not quoted are irrelevant due to the additional ballast.
Total oil consumption during ten hours duration of tests (Ⅲ) and (Ⅳ) 5.5 g/h


Power kW
10
9
8
7
6
5
4
3
2
1
0
H – 2
M – 3
M – 2
H – 1
M – 1
L – 3
L – 2
L – 1
Slip %
20
10
0
980
1960
2940
3920
4910
5890
6870
7850
Drawbar Pull N

(3) TURNING SPACE AND TURNING CIRCLE

Wheel equipment	front :	4.00-12 4 ply
	rear :	8.3 -24 4 ply
Track of wheels	front :	830 mm
	rear :	890 mm

	with brakes		without brakes	
	left-hand m	right-hand m	left-hand m	right-hand m
Radius of turning space	2.36	2.34	2.56	2.52
Radius of turning circle	2.25	2.23	2.45	2.41

(4) LOCATION OF CENTRE OF GRAVITY

Height above ground	612 mm
Distance forward from the vertical plane containing the axis of the rear wheels	574 mm
Distance from the mediam plane, to the left	4 mm

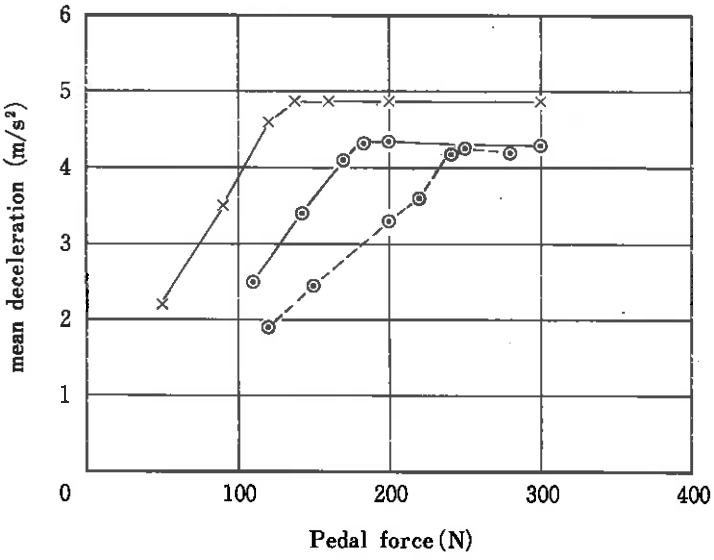
(5) Braking

Date of tests: 3rd and 10th December, 1981

Tractor masses during tests with driver:	front kg	rear kg	total kg
without ballast	266	476	742
with ballast	522	748	1270

A) Service brake

Type-0-test (without ballast) —×—, Type-I- (fade) test - -⊙- -
Type-0-test (with ballast) —⊙—



Speed before application of brakes, without ballast 19.5 km/h
with ballast 19.2 km/h

The brakes were heated by towing of the tractor for 1 km

B) Parking brake

	Ballasted tractor on 18%-slope		Unballasted tractor on 12%-slope with trailer of 742 kg	
	up	down	up	down
Braking device control force N	216	177	108	108

(6) MEASUREMENT OF EXTERNAL NOISE LEVEL

Date of test : 1st December, 1981

Type of track : Concrete

Type of sound level meter : RION NA61

Results of test :

Gear : H — 3

Travelling speed before acceleration : 14.6 km/h

Sound level : 78 dB(A)

(7) NOISE MEASUREMENT AT THE DRIVER'S EAR LEVEL

Date of tests : 1st December, 1981

Type of track : Concrete

Type of sound level meter : RION NA61

Results of tests :

Gear	Drawbar pull at which the tractor develops the max. sound level kN	Measured travelling speed km/h	Sound level dB (A)
H — 1 *)	5.4	5.69	89
M — 2	4.7	6.88	90
M — 3	3.0	10.80	90
H — 2	2.9	11.27	90
H — 3	1.8	19.10	91
H — 1 *)	Light load	6.84	89
H — 3	Light load	19.50	89

*) The H-1 gear corresponds to the nominal travelling speed nearest to 7.5 km/h

(8) POWER LIFT AND HYDRAULIC PUMP PERFORMANCE

Date of test: 1 st December, 1981

Power Lift

	Height of lower hitch point above ground in down position mm	Vertical movement mm	Maximum force exerted through full range kN	Corresponding pressure of hydraulic fluid MPa	Moment about rear axle kNm	Maximum tilt angle of mast over range of lift degrees
At hitch points	300	460	4.34	10.2	—	—
On the frame	244	675	3.09	10.2	4.00	16

Temperature of hydraulic fluid at start of test 64 ℃

Hydraulic pump performance

Opening pressure of the relief valve 10.6 MPa

Sustained pressure with relief valve open 12.3 MPa

Pump delivery rate at minimum pressure, the governor control lever being set for maximum power 16.7 ℓ/min

Hydraulic power at 90 per cent of relief valve setting 2.5 kW
Corresponding delivery rate 13.3 ℓ/min
Pressure 11.1 MPa

Temperature of hydrulic fluid 63 ℃

Tapping point used for test: inlet of hydraulic control valve from gear pump

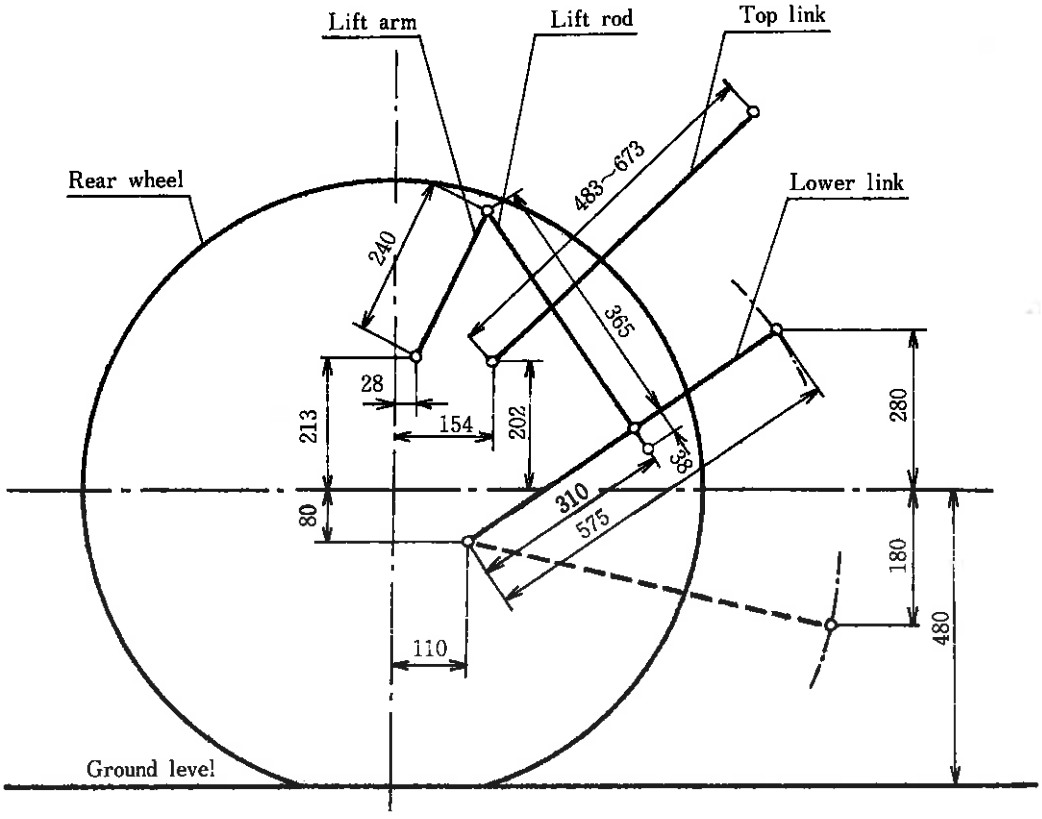
Linkage geometry when connected to the standard frame

Projected length in side view:

Lower links	575 mm
Lift arms	240 mm
Lift rods	365 mm
Top link	560 mm
Distance of lift rod connection point from pivot point of lower link	310 mm

The following dimensions are given relative to the rear wheel centre line, situated 480 mm above the ground level:

Lower link pivot point	80 mm below,	110 mm behind
Top link pivot point	202 mm above,	154 mm behind
Lift arm pivot point	213 mm above,	28 mm behind
Maximum and minimum height of lower link hitch points	280 mm above,	265 mm below
Height of lower link hitch points when locked in transport position	Any height within lift range	



REPAIRS AND ADJUSTMENTS DURING TESTS :	None
REMARKS :	None

Officer in charge :	S. YAGI
Head of testing division :	T. KANATSU
Date :	14th December, 1981