



No. 511/O.E.C.D.

REPORT ON TEST IN ACCORDANCE WITH O.E.C.D. TEST CODE FOR
AGRICULTURAL TRACTORS

COUNTY SUPER 4 MODEL 654 DIESEL TRACTOR

Manufactured by: County Commercial Cars Ltd,
Fleet, Aldershot, Hants



Date of Tests: May-June 1966
Test No.: R.66062/O.E.C.D.

*This report has been approved by the O.E.C.D.
Coordinating Centre (C.N.E.E.M.A., France) as being
in accordance with the O.E.C.D. Tractor Test Code*
Date of Approval: 28th July 1966 *Serial No.:* 123

NATIONAL INSTITUTE OF AGRICULTURAL ENGINEERING
WREST PARK SILSOE BEDFORD

This Bulletin is based on engineering tests in accordance with the O.E.C.D. Tractor Code. It does not contain an evaluation of the performance of the tractor on practical farm work

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Performance Curves

Fig. No.

POWER TAKE-OFF TEST

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DRAWBAR TEST WITH BALLAST

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DRAWBAR TEST WITHOUT BALLAST

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PART I

SPECIFICATION OF TRACTOR

Tractor

Make: County
Model: Super 4
Type: 654
Serial No.: 4F 14748

Engine

Make: Ford Motor Co. Ltd, type 5000, direct injection diesel engine, Serial No. RD-011455-B5

Cylinders: 4 cylinders, vertical, in-line, 4.2 in (106.7 mm) bore x 4.2 in (106.7 mm) stroke, capacity 232.8 in³ (3.81 l), compression ratio 16.5:1 (nominal), monobloc construction, overhead valves

Rated speeds: 2100 rev/min, governor setting - no load engine speed 2285-2335 rev/min

Fuel system: Fuel - Diesel oil
Simms type P4666 injection pump, Serial No. YM 4880; Simms type NL 413 injector nozzles. Manufacturer's production setting for injection pump: 11.8-12.4 cm³ per element for 200 injections at 700 rev/min pump speed (test bench figures). Injection pressure 185-190 atm (191-196 kp/cm²), A.C. mechanical type VP fuel feed pump, dual Simms parallel flow replaceable paper element fuel filters on pressure side of feed pump each with sediment bowl and water trap. Capacity of fuel tank 16.6 UKgal (75.5 l)

Governor: Simms mechanical, incorporated in fuel injection pump. Governed range of engine speed 600-2335 rev/min

Air cleaner: Burgess oil bath under hood forward of radiator, Donaldson centrifugal pre-cleaner with integral dust collector above hood, oil capacity 2 pt (1.14 l)

Lubricating system: Forced feed from eccentric rotor type pump with metal strainer in sump. Ford replaceable element filter. SAE 20W Supplement I oil, recommended oil change period 150 h, or SAE 20W Series III oil, recommended oil change period 300 h; oil capacity 13.4 pt (7.6 l) including filter

Cooling system: Water cooled, pressurized at 7 lb/in² (0.49 kp/cm²), impeller assisted with 16 in (406 mm) dia, belt driven 4-blade fan, thermostat for temperature control, cooling water capacity 3.2 UKgal (14.5 l)

Transmission

Clutch: Borg and Beck, 13 in (330 mm) dia, single plate dry clutch, foot-pedal operated

Gear-box: Ford Motor Co. constant mesh type, 8 forward and 2 reverse speeds

Differential:

Crown wheel and pinion and differential with epicyclic reduction gear final drives; own make constant engagement front wheel drive taken by bevel gears from each differential half shaft forward to twin telescopic and universally jointed propeller shafts, wheels driven through a separate crown wheel and pinion on each side; foot-pedal operated differential lock effective on all four wheels. Transmission oil capacities: gear-box 31.4 pt (17.8 l) SAE 80 EP oil, rear axle centre housing 4.9 pt (27.8 l) oil to Ford specification ESEN-M2C86A, outer housings 10½ pt (6.0 l) each, front axle housings 7 pt (4.0 l) each, splined shaft housings ½ pt (0.3 l) each SAE 80 EP oil

Gear	Number of engine revolutions for one revolution of driving wheel	Theoretical travelling speed for 2100 rev/min rated speed of engine, mile/h (km/h)	
Forward			
1	215.5	1.55	(2.49)
2	173.6	1.93	(3.11)
3	99.0	3.38	(5.44)
4	72.8	4.60	(7.40)
5	60.4	5.54	(8.91)
6	48.8	6.86	(11.04)
7	27.8	12.04	(19.37)
8	20.5	16.33	(26.27)
Reverse			
low	151.4	2.21	(3.56)
high	42.4	7.89	(12.70)

Steering device

Recirculating ball type with single drag link, power assisted

Brakes

Hand-lever operated transmission brake; independent or combined foot-pedal operated oil immersed disc brakes on differential half shafts

Wheels

Two at front, two at rear. All tyres 14-30, 6-ply pneumatic, steering by front wheels, all wheels driven; track 68 in (1727 mm). Maximum permissible weight on each tyre 3920 lb (1778 kg) at 16 lb/in² (1.1 kp/cm²), 3320 lb (1506 kg) at 12 lb/in² (0.8 kp/cm²)

Wheelbase:

5 ft 11 9/16 in (1818 mm)

Power take-off**Main:**

Hydraulically engaged, proportional engine speed, 6 spline, 1½ in (34.9 mm) dia at rear of tractor

Height above ground: 25 in (635 mm)

Speeds:

596 rev/min at 2100 rev/min rated engine speed
540 rev/min at 1902 rev/min engine speed
Independent of main clutch

Direction of rotation:

Clockwise viewed from tractor rear

Power lift

Ford Motor Co., hydraulic, gear pump driven from power take-off shaft, independent of main and p.t.o. clutches, supplying oil from transmission at nominal pressure of 2500 lb/in² (176 kp/cm²) to ram cylinder, one external booster ram and external tapping. Oil flow from external tapping at maximum horsepower delivered by hydraulic system, test figures: 4.05 UKgal/min (18.4 l/min) at 2000 lb/in² (141 kp/cm²) and 2100 rev/min rated engine speed, oil temperature 55°C.

Category 2 implement linkage, draught or position control with auxiliary service control and flow control device, maximum load liftable at end of lower links - test figures: through complete range - 4850 lb (2200 kg); at top of lift range - 6300 lb (2858 kg); - manufacturer's recommended figure - 4500 lb (2041 kg). Radius of motion of lower links 34 in (864 mm)

Drawbar

Swinging drawbar, radius of swing 24 $\frac{7}{8}$ in (632 mm) and 30 $\frac{7}{8}$ in (784 mm), lateral adjustment 13 $\frac{1}{4}$ in (337 mm) and 19 in (483 mm), vertical heights to centre of clevis 13 $\frac{1}{4}$ in (337 mm), 13 $\frac{3}{4}$ in (349 mm), 17 in (432 mm) and 17 $\frac{1}{2}$ in (445 mm). Distance behind rear axle 24 $\frac{7}{8}$ in (632 mm) and 30 $\frac{7}{8}$ in (784 mm). (Optional heavy duty swinging drawbar available)

Hitch

Not fitted

Electrical equipment

Voltage: 12, negative earth
 Generator: Lucas type C40A
 Battery: Ford type C5NN 10655, lead acid, 128 Ah capacity
 Starting device: Ford type C5NF 11001-A solenoid engaged starter motor, operable only when the gear selector lever is in neutral

Overall dimensions

Overall length: 12 ft 0 in (3.66 m) as tested
 Overall width: 7 ft 8 in (2.34 m) at 68 in (1727 mm) track to outside of wheel weights, 5 per wheel
 7 ft 2 $\frac{1}{2}$ in (2.20 m) at 68 in (1727 mm) track, no ballast weights
 Overall height: 7 ft 3 $\frac{1}{2}$ in (2.22 m) to top of exhaust pipe
 5 ft 8 in (1.73 m) to top of steering wheel
 Minimum ground clearance: 13 $\frac{3}{4}$ in (349 mm) to underside of drawbar frame

Weights

With full fuel tank, oil, cooling water, no driver

	Without additional weight, lb (kg)	With maximum additional weight, lb (kg) (Ref. 1) ³⁶
On front wheels	4451 (2019)	7000 (3175)
On rear wheels	3585 (1626)	5092 (2310)
Total	8036 (3645)	12 092 (5485)

Special remarks

Manually operated excess fuel device for cold starting

³⁶The reference is to the manufacturer's comment on page 11

PART II

LABORATORY TESTS

1. Compulsory tests : Power take-off test
Date and location of tests : 25th May 1966, N.I.A.E.,
Silsoe, Bedford, U.K.
Type of dynamometer : Water brake, Heenan and Froude
Fuel : Diesel oil, density 0.838 at 60°F
(15.6°C), Cetane No. 51.5
Engine oil : SAE 20W Supplement I
Transmission oil : Gear-box, SAE 80 EP
Final drive, Ford specification
ESEN-M2C86A

Horse-power (Metric hp)	Speeds, rev/min		Equiv. crank-shaft torque, lb ft (kp m)	Fuel consumption,			Temperature, °F (°C)			Atmos. conditions	
	Engine	P.t.o.		UKgal/h (l/h)	lb/hp h (g/metric hp h)	hp h/UKgal (metric hp h/l)	Cool-ant	Oil	Fuel	Temp., °F (°C)	Press., inHg (mmHg)
A. Maximum power											
57.3 (58.1)	2148	610	140.1 (19.38)	3.18 (14.46)	0.465 (208)	18.0 (4.02)	190 (88)	211 (99)	80 (27)	66 (19)	29.86 (758)
B. Power at standard p.t.o. speed (540 rev/min)											
55.1 (55.9)	1902	540	152.3 (21.06)	2.83 (12.87)	0.430 (192)	19.5 (4.35)	189 (87)	203 (95)	74 (23)	66 (19)	29.86 (758)
C. Power at maximum torque											
43.9 (44.5)	1420	403	162.4 (22.46)	2.15 (9.77)	0.410 (183)	20.5 (4.57)	189 (87)	199 (93)	80 (27)	64 (18)	29.86 (758)
D. Power at rated speed											
57.1 (57.9)	2100	596	142.8 (19.75)	3.13 (14.23)	0.459 (205)	18.3 (4.08)	190 (88)	211 (99)	80 (27)	67 (19)	29.86 (758)
No load, maximum engine speed: 2307 rev/min											

PART III

DRAWBAR TESTS ON ARTIFICIAL TRACK

Date of tests: 7th-14th June 1966

Type of track: Tarmacadam

Position of governor control lever: Fully open, giving no-load engine speed of 2285-2335 rev/min

Type of tyre: Front and rear, Goodyear Traction Sure Grip, straight bar, open centre, 14-30, 6-ply pneumatic

Fuel: Diesel oil, density 0.838 at 60°F (15.6°C), Cetane No. 51.5

Engine oil: SAE 20W Supplement I

Transmission oil: Gear-box, SAE 80 EP; final drive, Ford specification ESEN-M2C86A and SAE 80 EP

A. TESTS WITH MAXIMUM ADDITIONAL WEIGHT

Weight of tractor without driver:

Weight without ballast: Front - 4451 lb (2019 kg)
Rear - 3585 lb (1626 kg)

Ballast: Front: Weights, 5 per wheel - 1077 lb (489 kg)
Water - 1472 lb (668 kg)

Rear: Weights - nil
Water - 1507 lb (684 kg)

Weight with full ballast: Front - 7000 lb (3175 kg)
Rear - 5092 lb (2310 kg)
Total - 12 092 lb (5485 kg)

Tyre pressure: Front - 14 lb/in² (1.0 kp/cm²)
Rear - 12 lb/in² (0.8 kp/cm²)

Height of drawbar above ground: 16 in (406 mm)

(1) Maximum powers and pulls

Gear	Maximum powers						Air temp., °F (°C)	Atmos. press., inHg (mmHg)	Maximum pulls	
	Horse-power (Metric hp)	Corresponding pull, lb (kp)	Wheel-slip, %	Engine speed, rev/min	Speed, mile/h (km/h)	Engine coolant temp., °F (°C)			Pull, lb (kp)	Reason for stall
1	37.9 (38.4)	10 350 (4695)	16.7	2197	1.37 (2.20)	190 (88)	80 (27)	29.73 (755)	11 300 (5126)	Wheelspin and bouncing
2	43.3 (43.9)	9150 (4150)	11.3	2165	1.77 (2.85)	191 (88)	80 (27)	29.73 (755)	10 700 (4854)	Engine stall
3	48.2 (48.9)	5400 (2449)	4.6	2162	3.35 (5.39)	190 (88)	65 (18)	29.92 (760)	6250 (2835)	Engine stall
4	48.9 (49.6)	3975 (1803)	3.0	2151	4.61 (7.42)	188 (87)	70 (21)	29.92 (760)	4550 (2064)	Engine stall
5	50.0 (50.7)	3300 (1497)	2.3	2171	5.68 (9.14)	186 (86)	72 (22)	29.92 (760)	3850 (1746)	Engine stall
6	48.6 (49.3)	2550 (1157)	1.6	2189	7.15 (11.50)	188 (87)	80 (27)	29.92 (760)	3100 (1406)	Engine stall

(2) Fuel consumption

Gear	Optimum fuel consumption			Range of pull, lb (kp) over which specific fuel consumption does not exceed optimum consumption by more than 10%
	Specific fuel consumption, lb/drawbar hp h (g/metric drawbar hp h)	Drawbar hp h/UKgal (metric drawbar hp h/l)	Corresponding pull, lb (kp)	
1	0.626 (280)	13.4 (2.99)	8850 (4014)	5700 - 10 875 (2586) - (4933)
2	0.603 (270)	13.9 (3.10)	7500 (3402)	5000 - 10 700 M.S.P. (2268) - (4854)
3	0.540 (242)	15.5 (3.46)	6000 (2722)	4125 - 4725 (1871) - (2143) 5250 - 6250 M.S.P. (2381) - (2835)
4	0.540 (242)	15.5 (3.46)	4200 (1905)	3000 - 4550 M.S.P. (1361) - (2064)
5	0.538 (241)	15.6 (3.48)	3750 (1701)	2700 - 3850 M.S.P. (1225) - (1746)
6	0.517 (231)	16.2 (3.61)	3000 (1361)	2625 - 3100 M.S.P. (1191) - (1406)

B. TESTS WITHOUT BALLAST

Weight of tractor without driver:

Weight without ballast: Front - 4451 lb (2019 kg)
 Rear - 3585 lb (1626 kg)
 Total - 8036 lb (3645 kg)

Tyre pressure: Front - 12 lb/in² (0.8 kp/cm²)
 Rear - 12 lb/in² (0.8 kp/cm²)

Height of drawbar
 above ground: 16 in (406 mm)

(1) Maximum powers and pulls

Gear	Maximum powers						Air temp., °F (°C)	Atmos. press., inHg (mmHg)	Maximum pulls	
	Horse power (Metric hp)	Corres- ponding pull, lb (kp)	Wheel- slip, %	Engine speed, rev/min	Speed, mile/h (km/h)	Engine coolant temp., °F (°C)			Pull, lb (kp)	Reason for stall
2	35.4 (35.9)	7500 (3402)	15.3	2236	1.77 (2.85)	184 (84)	71 (22)	29.78 (756)	8400 (3810)	Wheelspin and bouncing
3	47.0 (47.7)	5400 (2449)	7.0	2141	3.26 (5.25)	193 (89)	70 (21)	29.78 (756)	6250 (2835)	Engine stall
4	49.3 (50.0)	4050 (1837)	4.6	2158	4.56 (7.34)	186 (86)	65 (18)	29.93 (760)	4650 (2109)	Engine stall
5	50.5 (51.2)	3375 (1531)	3.6	2158	5.61 (9.03)	194 (90)	70 (21)	29.85 (758)	3950 (1792)	Engine stall
6	50.0 (50.7)	2700 (1225)	2.7	2130	6.94 (11.17)	189 (87)	68 (20)	29.85 (758)	3100 (1406)	Engine stall

PART IV1. Location of centre of gravity

	Tractor unballasted
Height above ground	32.5 in (826 mm)
Distance forward from the vertical plane containing the axis of the rear wheels	38.8 in (986 mm)
Distance from the median plane parallel to the longi- tudinal axis of the tractor bisecting the track	0

2. Turning space and turning radius

Wheel equipment: As for drawbar test without ballast

Wheel track: 68 in (1727 mm)

	With brakes		Without brakes	
	Right hand	Left hand	Right hand	Left hand
Radius of turning space	10 ft 8 in (3.3 m)	10 ft 8 in (3.3 m)	20 ft 10½ in (6.4 m)	20 ft 9½ in (6.3 m)
Turning radius	9 ft 6 in (2.9 m)	9 ft 6 in (2.9 m)	19 ft 8½ in (6.0 m)	19 ft 7½ in (6.0 m)

PART V1. Repairs and adjustments during tests: None2. Remarks: None

Officer in charge: D. W. Smith

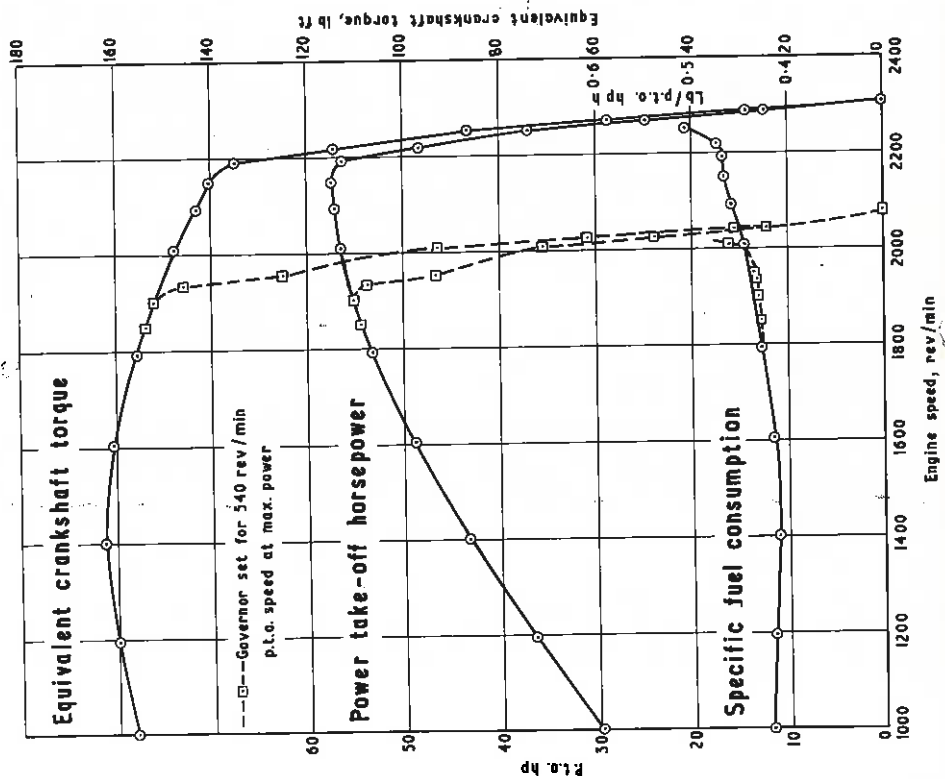
Head of Tractor and Drier Performance Department: P. H. Bailey

Date: 19th July 1966

The manufacturer states that:

- Ref. 1. The maximum additional weight used during the test corresponded with the manufacturer's recommendation for optimum performance on hard ground. Higher weights are permissible up to the limits specified by the tyre manufacturer.

County Super 4 Model 654 Diesel Tractor



County Super 4 Model 654 Diesel Tractor

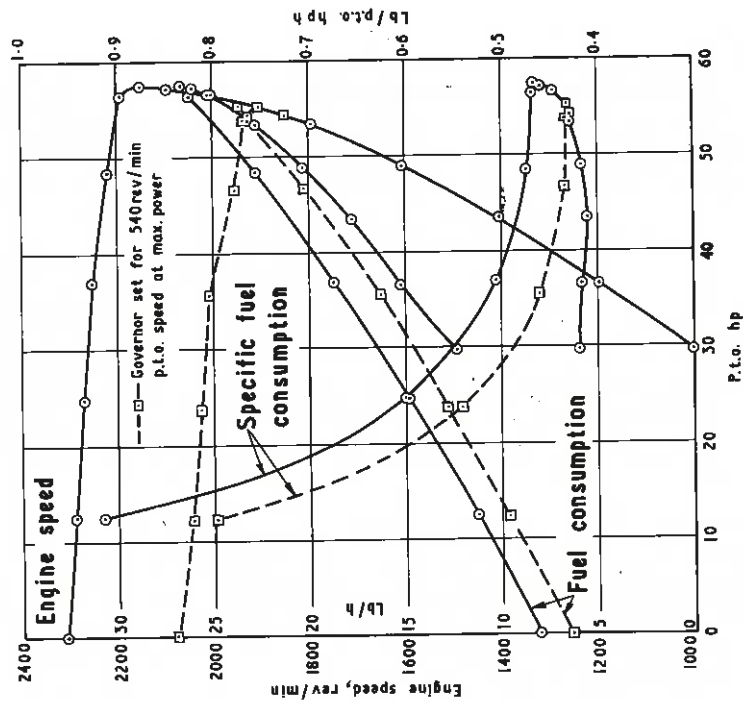


Fig. 2. Power take-off test

County Super 4 Model 654 Diesel Tractor

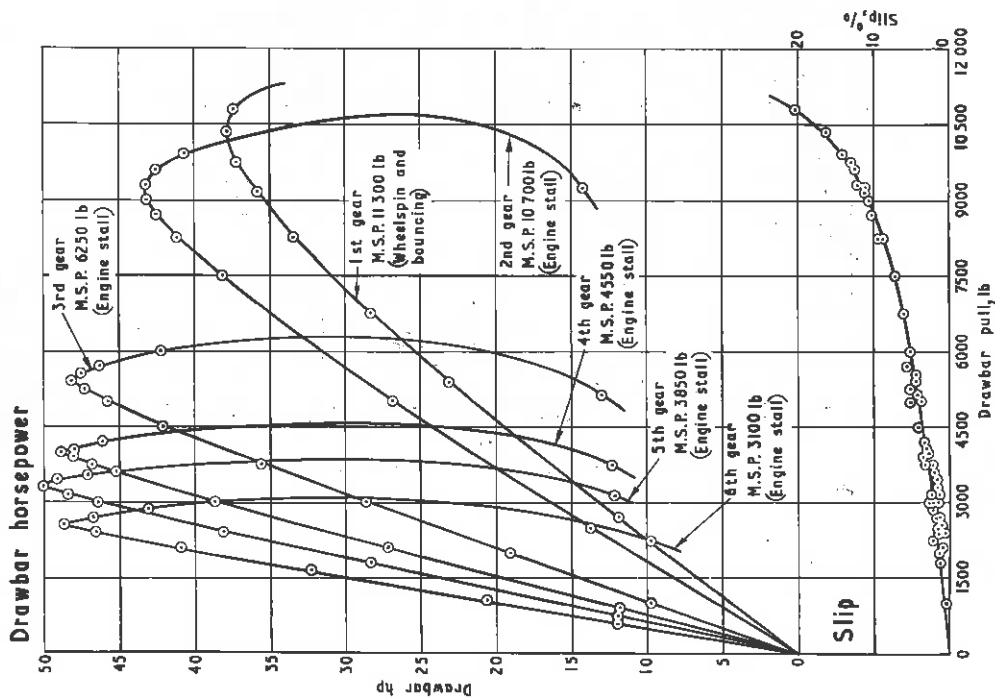


Fig. 3. Drawbar test on tarmacadam, with ballast

County Super 4 Model 654 Diesel Tractor

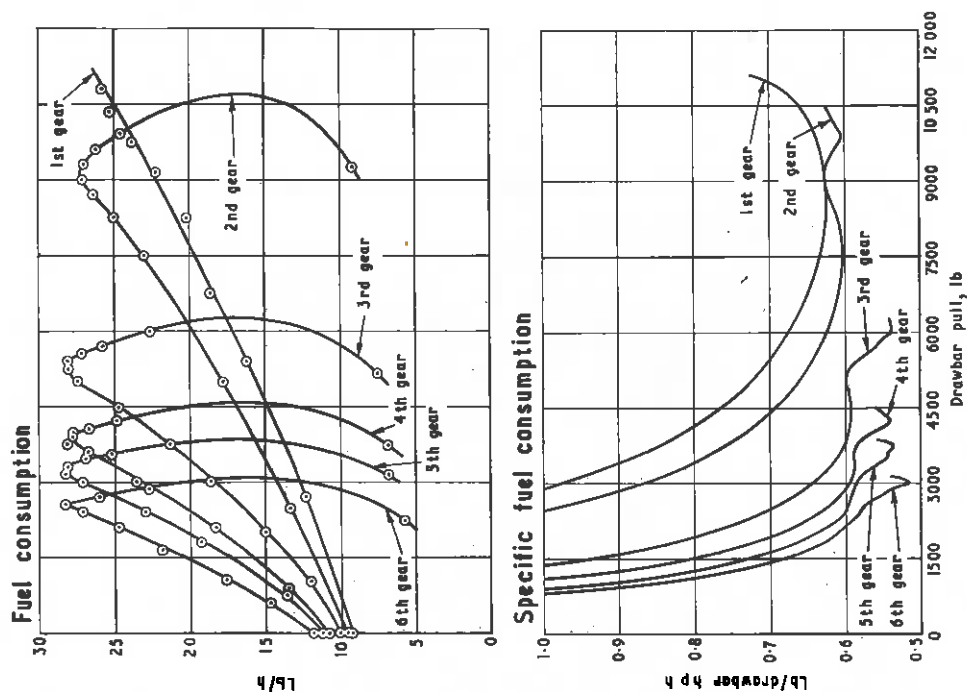


Fig. 4. Drawbar test on tarmacadam, with ballast

County Super 4 Model 654 Diesel Tractor

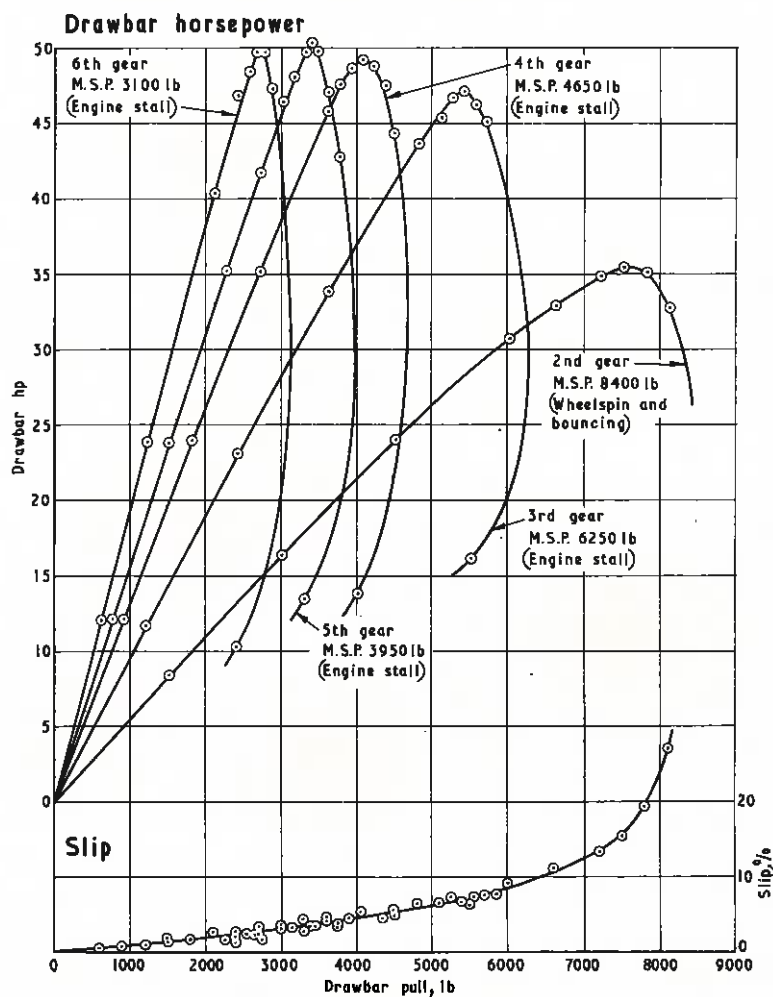
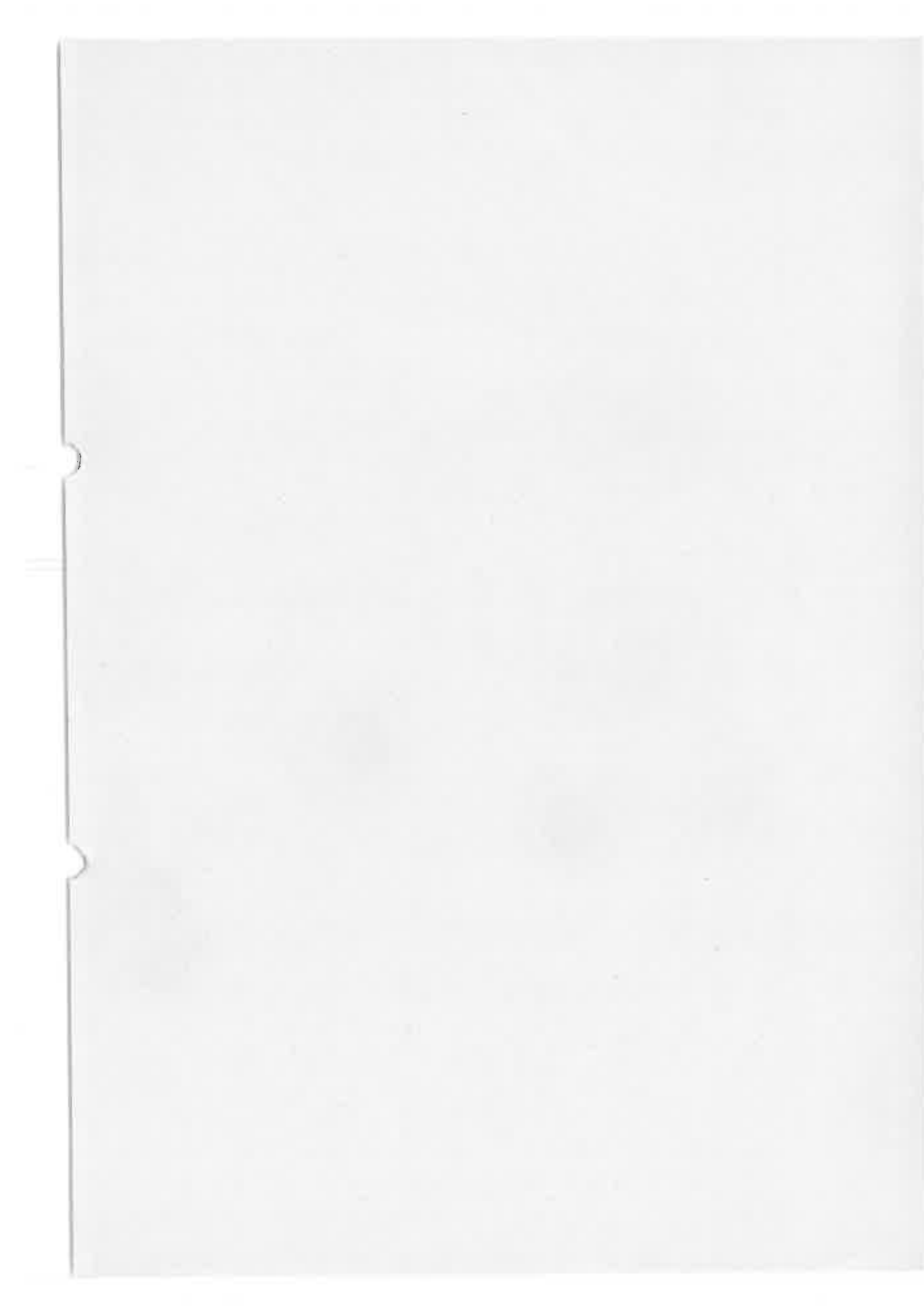


Fig.5. Drawbar test on tarmacadam, without ballast



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