



No. 516/O.E.C.D.

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

**DAVID BROWN MODEL 990 SELECTAMATIC LIVEDRIVE  
DIESEL TRACTOR**

*Manufactured by:* David Brown Tractors Ltd,  
Meltham, Huddersfield, Yorkshire



*Date of Tests:* March-April 1966  
*Test No.:* R.66047/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.: 118*

**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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PART I

SPECIFICATION OF TRACTOR

Tractor

Make: David Brown  
Model: 990 Selectamatic Livedrive  
Serial No.: 990A 482488

Engine

Make: David Brown direct injection diesel, type AD4/47A, Serial No. AD4/47A 60786

Cylinders: 4 cylinders, vertical, in-line, 3.625 in (92.1 mm) bore x 4.50 in (114.3 mm) stroke, capacity 185.8 in<sup>3</sup> (3.045 l), compression ratio 17:1, replaceable cast iron wet cylinder liners, overhead valves

Rated speeds: 2200 rev/min, governor setting - maximum no-load engine speed 2350 rev/min

Fuel system: Fuel - Diesel oil  
C.A.V. type DPA 3248260 injection pump, Serial No. R32265XG, C.A.V. type BDLL 140S 6417 injector nozzles. Manufacturer's production setting for injection pump: 15.54 pt/h (8.83 l/h) - 16.22 pt/h (9.22 l/h) at 1600 rev/min engine speed. Injection pressure 175 atm (181 kp/cm<sup>2</sup>), AC type E/FP 63154-A fuel feed pump, two C.A.V. paper cartridge fuel filters on pressure side of feed pump, sediment bowl on feed pump. Capacity of fuel tank 13½ UKgal (61.4 l)

Governor: C.A.V. mechanical, incorporated in fuel injection pump. Governed range of engine speed 700-2350 rev/min

Air cleaner: A.C. oil bath with centrifugal pre-cleaner above hood. Oil capacity 1¼ pt (0.71 l)

Lubricating system: Forced feed from gear-type pump with metal strainer in sump. Purolator replaceable paper element full flow filter. Multi-purpose 20W/30 oil. Recommended oil change period 125 h. Oil capacity 13 pt (7.39 l)

Cooling system: Water cooled, pressurized at 4 lb/in<sup>2</sup> (0.28 kp/cm<sup>2</sup>), impeller assisted with 16 in (406 mm) dia, belt driven, 2-blade fan, thermostat for temperature control. Cooling water capacity 3 UKgal (13.6 l)

Transmission

Clutch: Borg and Beck dual dry clutch, two plates 10 in (254 mm) dia and 11 in (279 mm) dia, for p.t.o. shaft and gear-box drives respectively, two stage foot-pedal operated

Gear-box: Own make, sliding gear type, 6 forward and 2 reverse speeds

**Differential:**

Crown wheel and pinion and differential with spur gear final drives, foot-pedal operated differential lock. Oil capacities, transmission 40 pt (22.7 l) multi-purpose 20W/30 oil, final drives 4 pt (2.27 l) each of gear oil type EP 140

Gear	Number of engine revolutions for one revolution of driving wheel	Theoretical travelling speed for 2200 rev/min rated speed of engine, mile/h (km/h)	
Forward			
1	168.83	2.08	(3.35)
2	101.77	3.45	(5.55)
3	75.49	4.65	(7.48)
4	55.70	6.30	(10.14)
5	45.49	7.71	(12.41)
6	24.88	14.10	(22.69)
Reverse			
low	102.52	3.42	(5.50)
high	45.83	7.65	(12.31)

**Steering device**

Recirculating ball type with single drag link

**Brakes**

Internal expanding on differential half shafts, independent or combined foot-pedal operated. Hand lever with ratchet operating both brakes for parking

**Wheels****Steering wheels:**

Two at front. Tyres 6.00-19, 6-ply, pneumatic. Track 52 in (1321 mm) by 4 in (102 mm) steps to 72 in (1829 mm) changed by extending front axle. Track of 50 in (1270 mm) obtainable by further movement inwards of the right-hand axle. Maximum permissible weight on each tyre: 1500 lb (680 kg) at 48 lb/in<sup>2</sup> (3.4 kp/cm<sup>2</sup>), 1185 lb (538 kg) at 32 lb/in<sup>2</sup> (2.2 kp/cm<sup>2</sup>)

**Driving wheels:**

Two at rear. Tyres 11-36, 6-ply, pneumatic. Track 52 in (1321 mm) by 4 in (102 mm) to 76 in (1930 mm) changed by reversing wheel centres and offset lug type rims. Maximum permissible weight on each tyre: 3020 lb (1370 kg) at 22 lb/in<sup>2</sup> (1.5 kp/cm<sup>2</sup>)

**Wheel base:**

6 ft 6 $\frac{3}{4}$  in (2000 mm)

**Belt pulley****Location:**

Attachable to rear of tractor in two alternative horizontal positions, main p.t.o. driven

**Diameter x width:**

8 $\frac{1}{2}$  in (216 mm) x 5 11/16 in (144 mm)

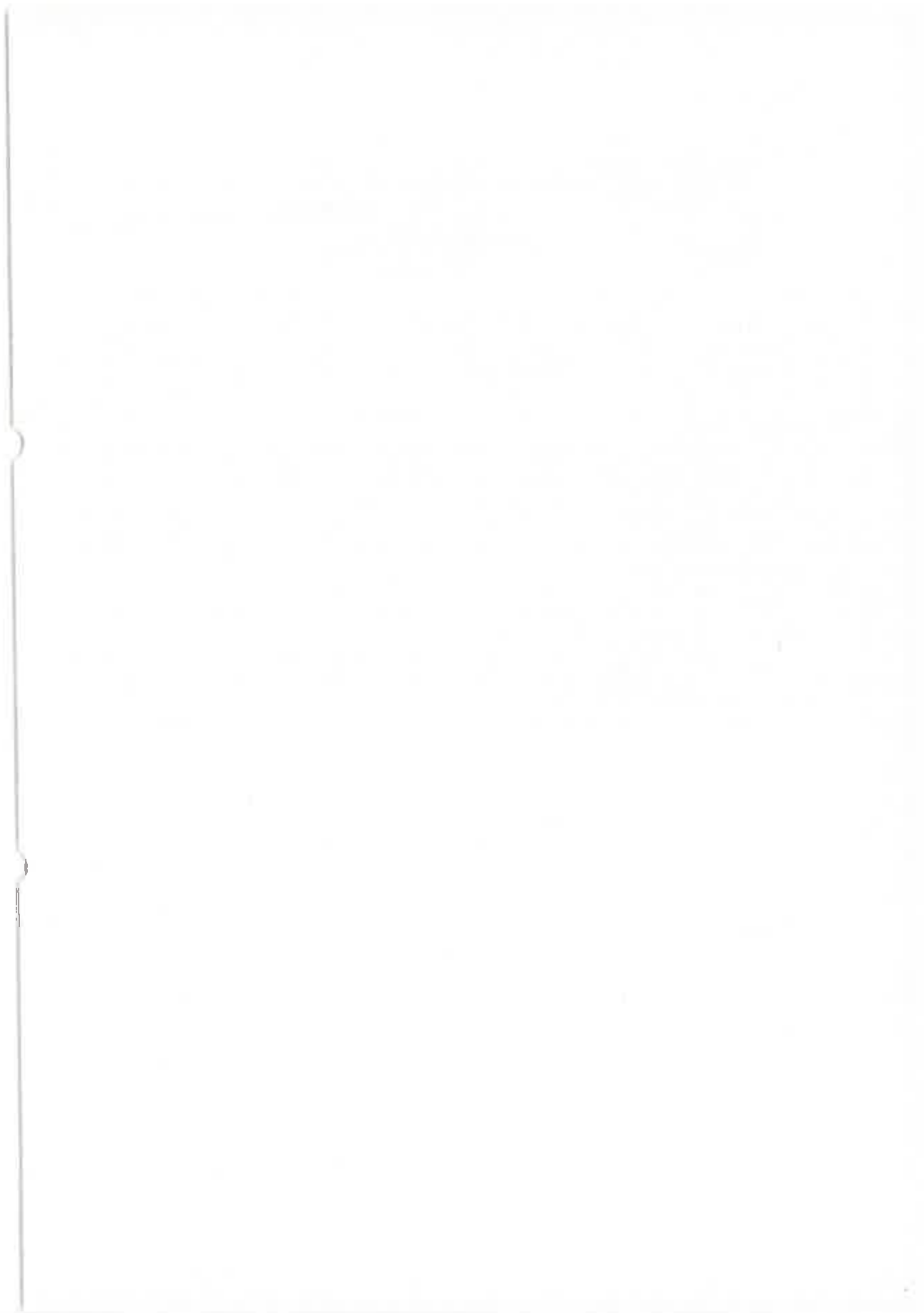
**Speeds:**

1553 rev/min giving 3455 ft/min (17.55 m/s) linear speed at 2200 rev/min rated engine speed. 1393 rev/min giving 3100 ft/min (15.75 m/s) linear speed at 1974 rev/min engine speed, p.t.o. in high ratio

**Direction of rotation:**

Optional, related to position of unit





2. Supplementary tests : Belt test (high ratio)  
 Date and location of tests : 18th March 1966, N.I.A.E., Silsoe, Bedford, U.K.  
 Type of dynamometer : Electrical swinging frame  
 Fuel : Diesel oil, density 0.838 at 60°F (15.6°C),  
 Cetane No. 51.5  
 Engine oil : Multi-purpose 20W/30  
 Transmission oil : Multi-purpose 20W/30

Horse-power (Metric hp)	Speeds		Equiv. crank- shaft torque, lb ft (kp m)	Fuel consumption,			Temperature, °F (°C)			Atmos. conditions	
	Engine, rev/min	Belt, ft/min (m/s)		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)
<b>A. Maximum power</b>											
51.3 (52.0)	2239	3516 (17.86)	120.3 (16.64)	2.62 (11.91)	0.427 (191)	19.6 (4.37)	181 (83)	200 (93)	115 (46)	69 (21)	30.46 (774)
<b>B. Power at standard belt speed of 3100 ft/min (15.75 m/s)</b>											
47.6 (48.3)	1974	3100 (15.75)	126.6 (17.51)	2.34 (10.64)	0.413 (185)	20.3 (4.53)	180 (82)	198 (92)	115 (46)	70 (21)	30.46 (774)
<b>C. Power at maximum torque</b>											
29.5 (29.9)	1180	1853 (9.41)	131.3 (18.16)	1.41 (6.41)	0.401 (179)	20.9 (4.66)	189 (87)	178 (81)	116 (47)	68 (20)	30.46 (774)
<b>D. Power at rated speed</b>											
50.9 (51.6)	2200	3455 (17.55)	121.4 (16.79)	2.56 (11.64)	0.422 (189)	19.9 (4.44)	180 (82)	200 (93)	116 (47)	69 (21)	30.46 (774)
No load, maximum engine speed: 2344 rev/min											

## PART III

DRAWBAR TESTS ON ARTIFICIAL TRACK

- Date of tests : 4th-29th April 1966  
 Type of track : Tarmacadam  
 Position of  
 governor  
 control lever : Fully open, giving maximum no load engine speed of 2350 rev/min  
 Type of tyre : Rear - Dunlop Fieldmaster open centre, 11-36, 6-ply, pneumatic  
 Front - Dunlop Tractor, 6.00-19, 6-ply, pneumatic  
 Fuel : Diesel oil, density 0.837 at 60°F (15.6°C), Cetane No. 54  
 Engine oil : Multi-purpose 20W/30  
 Transmission oil : Multi-purpose 20W/30



## A. TESTS WITH MAXIMUM ADDITIONAL WEIGHT

Weight of tractor without driver:

Weight without ballast: Front - 1730 lb (785 kg)  
 Rear - 2942 lb (1334 kg)

Ballast : Front: Weights - Nil  
 Water - Nil  
 Rear: Weights, 10 per wheel - 2006 lb (910 kg)  
 Water - 886 lb (402 kg)

Additional: 6 front frame weights and frame - 450 lb (204 kg)

Weight with full ballast : Front - 2278 lb (1033 kg)  
 Rear - 5736 lb (2602 kg)  
 Total - 8014 lb (3635 kg)

Tyre pressure : Front - 32 lb/in<sup>2</sup> (2.2 kp/cm<sup>2</sup>)  
 Rear - 22 lb/in<sup>2</sup> (1.5 kp/cm<sup>2</sup>)

Height of drawbar above ground : 18 in (457 mm)

(1) Maximum powers and pulls

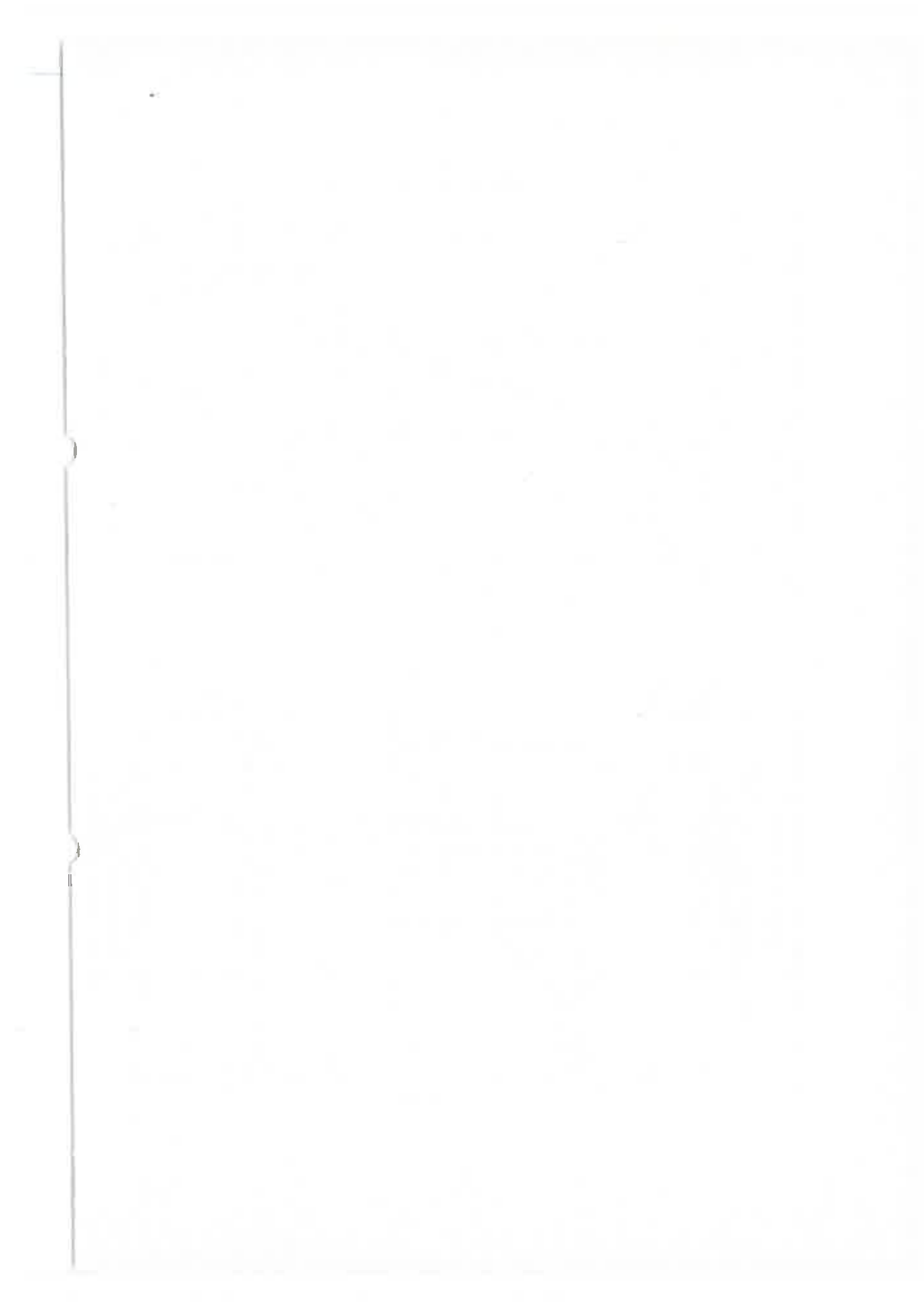
Gear	Maximum powers							Air temp., °F (°C)	Atmos. press., inHg (mmHg)	Maximum pulls	
	Horse-power (Metric hp)	Corresponding pull, lb (kp)	Wheel-slip, %	Engine speed, rev/min	Speed, mile/h (km/h)	Engine coolant temp., °F (°C)	Pull, lb (kp)			Reason for stall	
1	31.8 (32.2)	6750 (3062)	17.7	2244	1.77 (2.85)	180 (82)	60 (16)	29.46 (748)	7150 (3243)	Wheelspin and bouncing	
2	44.4 (45.0)	5200 (2359)	8.2	2202	3.20 (5.15)	178 (81)	45 (7)	29.57 (751)	5650 (2563)	Engine stall	
3	46.3 (46.9)	3850 (1746)	4.8	2220	4.51 (7.26)	188 (87)	44 (7)	29.87 (759)	4100 (1860)	Engine stall	
4	47.3 (48.0)	2850 (1293)	3.1	2223	6.22 (10.01)	188 (87)	45 (7)	29.87 (759)	3050 (1383)	Engine stall	
5	46.8 (47.5)	2300 (1043)	2.3	2225	7.63 (12.28)	186 (86)	45 (7)	29.87 (759)	2430 (1102)	Engine stall	

(2) Fuel consumption

Gear	Optimum fuel consumption <sup>a</sup>			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	0.523 (234)	16.0 (3.57)	5500 (2495)	3580 - 6870 (1624) - (3116)
2	0.490 (219)	17.1 (3.82)	4000 (1814)	2650 - 5650 (1202) - (2563) M.S.P.
3	0.491 (220)	17.1 (3.82)	4050 (1837)	2060 - 4100 (934) - (1860) M.S.P.
4	0.489 (219)	17.1 (3.82)	2850 (1293)	1510 - 3050 (685) - (1383) M.S.P.
5	0.495 (221)	16.9 (3.77)	2300 (1043)	1330 - 2430 (603) - (1102) M.S.P.

<sup>a</sup>The drawbar specific fuel consumption curves in Gears 4 and 5 had no clearly marked minima, the values shown are those corresponding to maximum drawbar horsepower





David Brown Model 990 Selectomatic Livedrive Diesel Tractor

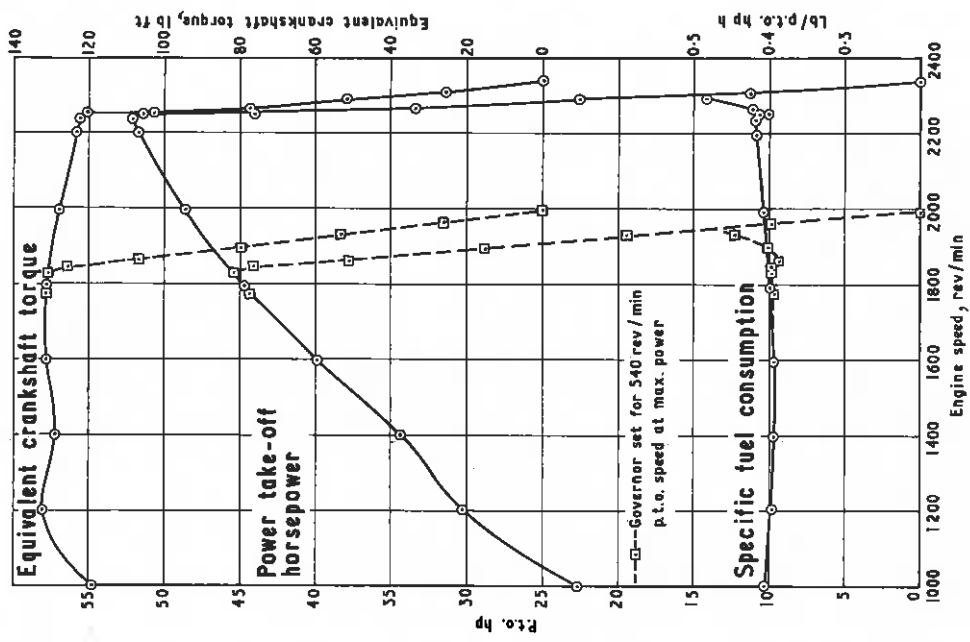


Fig. 1. Power take-off test (low rating)

David Brown Model 990 Selectomatic Livedrive Diesel Tractor

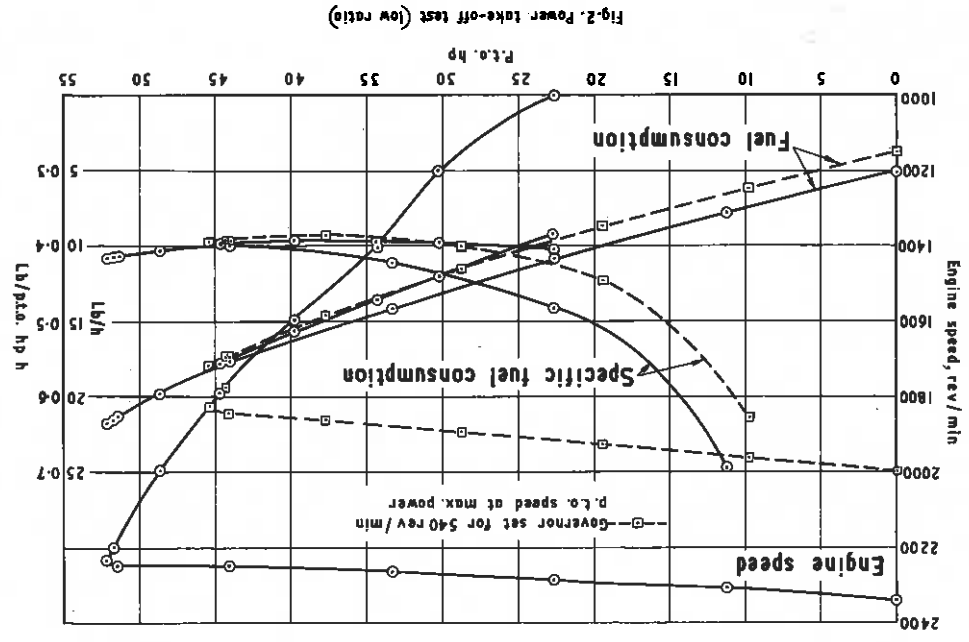


Fig. 2. Power take-off test (low rating)

David Brown Model 990 Selectomatic LiveDrive Diesel Tractor

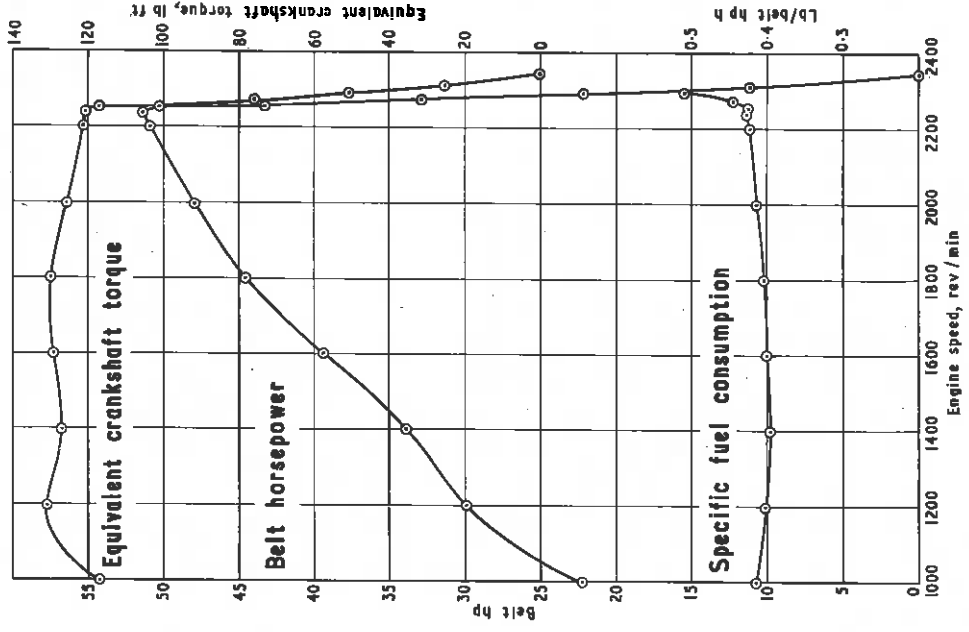


Fig. 3. Belt test

David Brown Model 990 Selectomatic LiveDrive Diesel Tractor

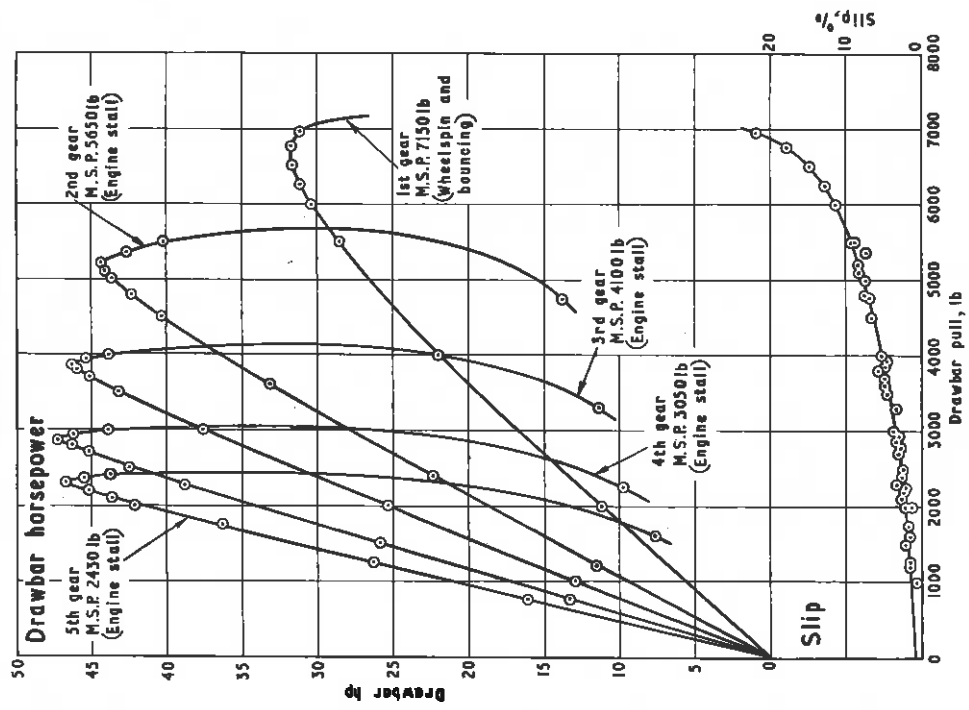


Fig. 4. Drawbar test on tarroadam, with ballast

David Brown Model 990 Selectomatic LiveDrive Diesel Tractor

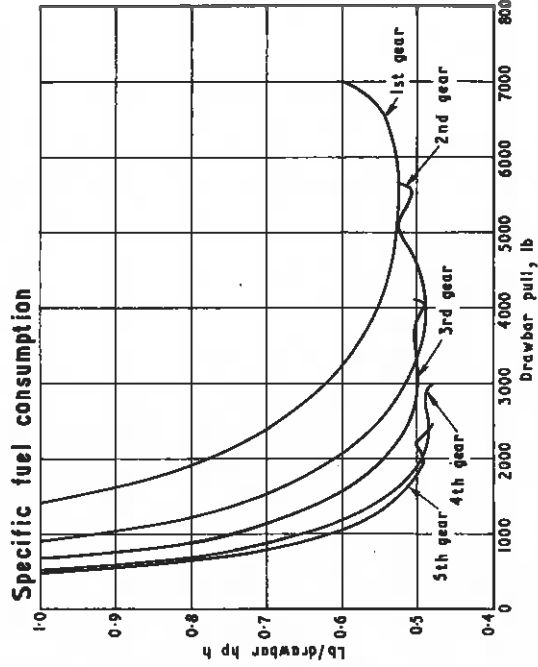
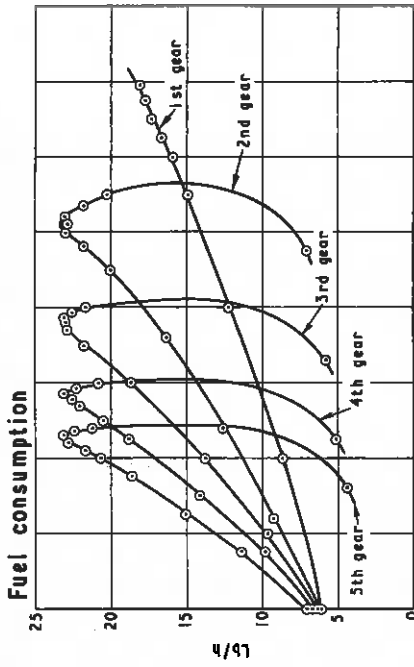


Fig.5. Drawbar test on tarmacadam, with ballast

David Brown Model 990 Selectomatic LiveDrive Diesel Tractor

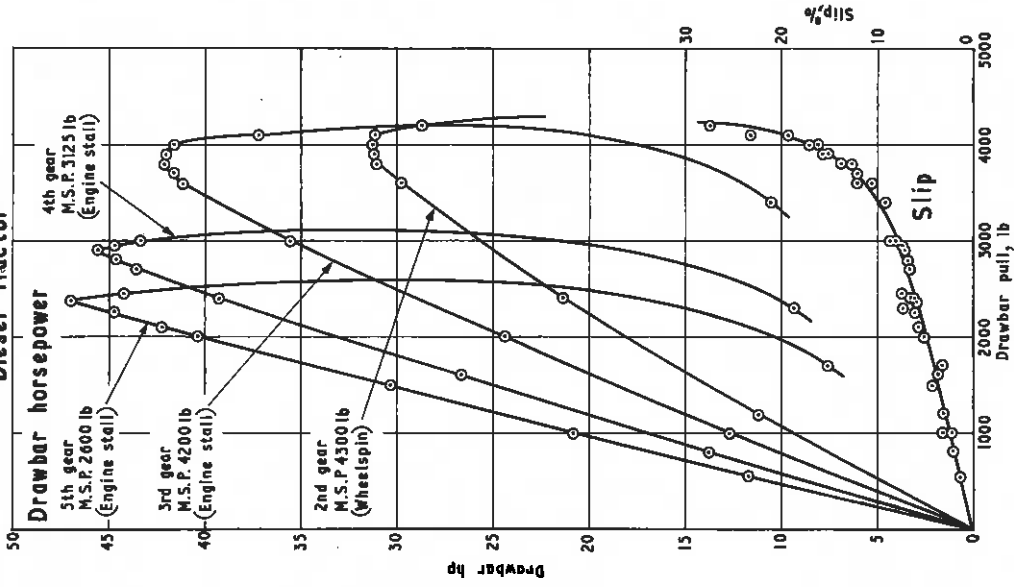
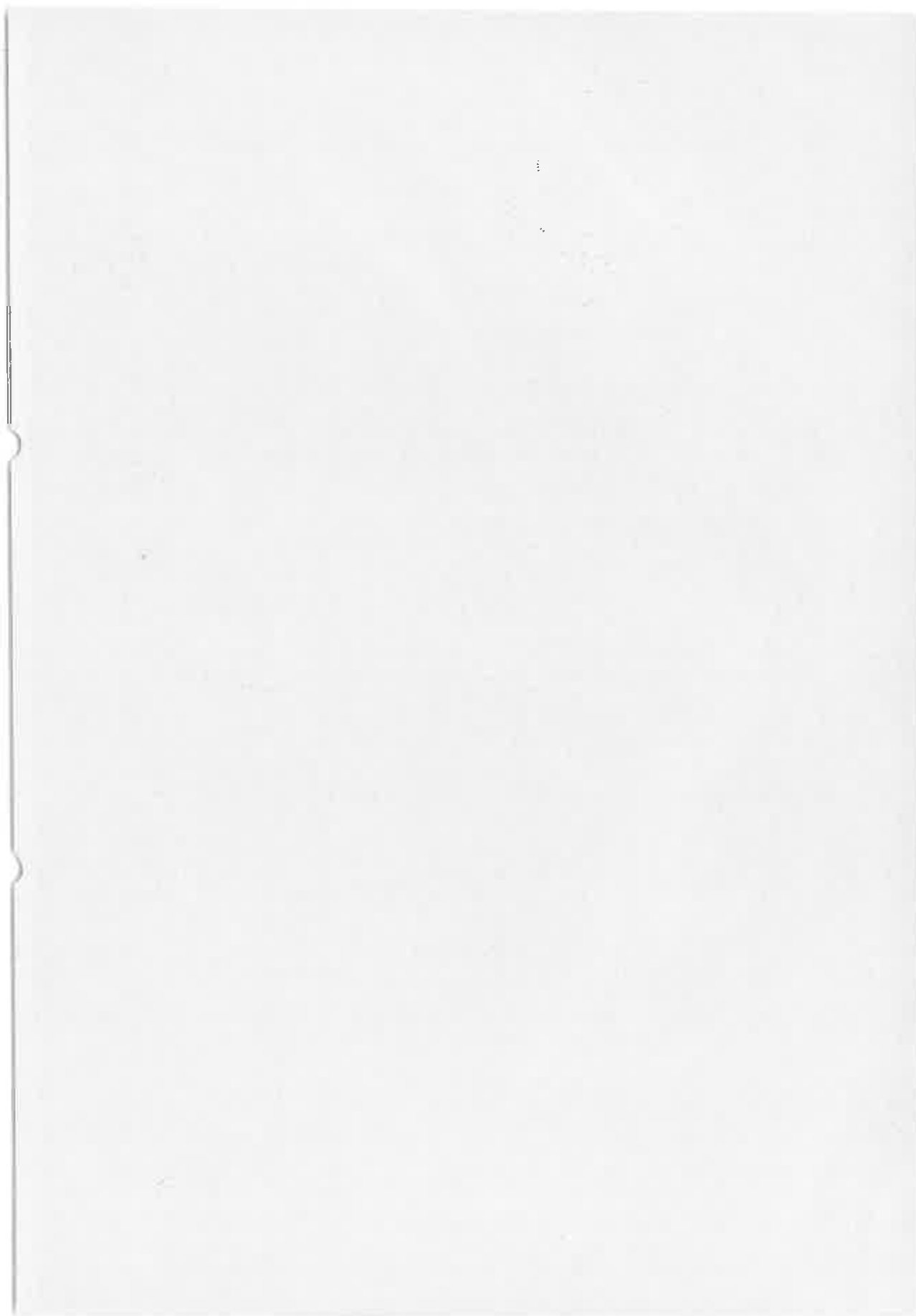


Fig.6. Drawbar test on tarmacadam, without ballast



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