No. 593/O.E.C.D.

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

MASSEY-FERGUSON MODEL 165 TRACTOR

(with Perkins type A4.212 diesel engine)

Manufactured by: Massey-Ferguson Manufacturing Ltd,
Banner Lane, Coventry



Test No.: R.68/5505/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
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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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SPECIFICATION OF TRACTOR

Manufacturer:	Massey-Ferguson Manufacturing Ltd, Banner Lane, Coventry
Submitted for test by:	The manufacturer
Selected by:	The manufacturer with the agreement of the testing station
Place of running-in:	Coventry and district
Duration of running-in:	100 hours

Tractor

Make:	Massey-Ferguson Manufacturing Ltd, Banner Lane, Coventry
Model:	MF 165 with Perkins A4.212 diesel engine
Type:	Four wheel, rear wheel driven, unit construction
Serial No.:	548044

Engine

Make:	F. Perkins Ltd, Peterborough	Model: A4.212
Type:	4-stroke, direct injection diesel	Serial No.: 212 UA 1186
Cylinders:	4 cylinders, vertical, in-line, 3·875 in (98·4 mm) bore × 4·5 in (114·3 mm) stroke, capacity 212·3 in³ (3·479 l), compression ratio 15·5:1, overhead in-line valves, replaceable cast-iron dry cylinder liners	
Fuel system:	A.C. model V.P. mechanical type fuel feed pump with hand primer; two pressurized C.A.V. filters in series, with water coalescent paper replaceable elements; primary filter with transparent sediment bowl and drain tap; gauze strainers in fuel tank, lift pump and fuel injection pump; capacity of fuel tank 15 UKgal (68·2 l); C.A.V. type DPA 324 1100Y injection pump, Serial No. R 27387 NJ; manufacturer's production setting: 21·9 lb/h (9·93 kg/h) to 23·0 lb/h (10·43 kg/h) at 2000 rev/min rated engine speed and 145°F (63°C) pump temperature, using fuel of 0·837 specific gravity at 60°F (15·6°C); C.A.V. type BDLL 150S 6507 injector nozzles, injector setting 170–175 atm (176–181 kg/cm²)	
Governor:	C.A.V. mechanical, incorporated in fuel injection pump, governed range of engine speed 500 to 2200 rev/min, rated engine speed 2000 rev/min	
Air cleaner:	A.C. oil bath, under hood forward of radiator (centrifugal pre-cleaner available, not fitted), oil capacity 1½ pt (0·85 l)	
Lubrication system:	Forced feed from eccentric rotor type pump with metal strainer in sump; A.C. full flow replaceable element filter, total oil capacity 16 pt (9·1 l), recommended oil change period 300 h	
Cooling system:	Water cooled, pressurized at 10 lb/in² (0·7 kg/cm²), impeller assisted with 16¼ in (413 mm) dia, belt driven 2 blade fan, 180°F (82°C) thermostat for temperature control, cooling water capacity 3 UKgal (13·6 l)	
Starting system:	Electrical, 12 V Lucas type M 45 G solenoid engaged starter motor, operable only when high-low range gear selector lever is in neutral, C.A.V. Mark IIIC inlet manifold flame type cold starting aid	

Electrical system

Voltage:	12, negative earth
Generator:	Lucas type C 40 A
Battery:	Exide type 6TXAZ15L, lead acid, capacity 96 Ah at 10 hour rating

Transmission

Clutch: Auburn Laycock dual dry clutch, two plates, 9 in (229 mm) dia for p.t.o. shaft drive and 11 in (279 mm) dia for gearbox drive, pedal operated

Gearbox: Own make, sliding gear type, 6 forward speeds and 2 reverse, comprising constant mesh input gears, 3 forward and 1 reverse speed gearbox and dual range epicyclic reduction gear at output end

Rear axle and final drive: Own make, crown wheel and pinion with bevel gear type differential and epicyclic reduction gear final drives, pedal operated differential lock

Oil capacities: Transmission 48 pt (27·3 l), final drives 2 pt (1·1 l) each
Recommended oil change period 600 h

Gear	*Number of engine revolutions for one revolution of driving wheel*	*Nominal travelling speed for 2000 rev/min rated speed of engine, mile/h*	*(km/h)*
Forward 1	224·55	1·38	(2·22)
2	149·70	2·07	(3·33)
3	81·65	3·79	(6·10)
4	56·14	5·51	(8·85)
5	37·42	8·27	(13·31)
6	20·41	15·16	(24·39)
Reverse			
Low	164·88	1·88	(3·02)
High	41·22	7·51	(12·08)

Power take-off

Main: Manually engaged, proportional engine speed or proportional ground speed, 6-spline, $1\frac{3}{8}$ in (34·9 mm) dia, at rear of tractor in vertical centre plane, height above ground $22\frac{1}{2}$ in (572 mm); proportional engine speed: 641 rev/min at 2000 rev/min rated engine speed, 540 rev/min (standard p.t.o. speed) at 1684 rev/min engine speed, independent of main clutch, direction of rotation clockwise viewed from tractor rear; proportional ground speed: 1 revolution of p.t.o. for approximately 20 in (508 mm) of travel, direction of rotation clockwise viewed from tractor rear in forward gear

Belt pulley Attachable to rear of tractor in two alternative horizontal positions, main p.t.o. driven, manually engaged, $10\frac{1}{4}$ in (260 mm) dia × $6\frac{1}{2}$ in (165 mm) face width, 1191 rev/min giving 3197 ft/min (974 m/min) linear speed at 2000 rev/min rated engine speed; 1155 rev/min giving 3100 ft/min (945 m/min) linear speed at 1940 rev/min engine speed; direction of rotation related to position of unit: clockwise with pulley on right side and anti-clockwise with pulley on left side, viewed from tractor right side

Power lift

Own make, live hydraulic, 4-cylinder piston type pump with Ferguson suction side control, oil from transmission supplied to single-acting ram cylinder and 4 external tappings

Controls: Two way draught control with top link sensing, controls for position and selective response on drop; external oil supply operated by tractor hydraulic controls or external spool valves; pressure control for selective weight transfer from semi-mounted implements by direct action from lower links (or through the pressure control coupler when fitted, in the case of towed implements and trailers) and control of pressure for external supply; three point linkage, adjustable lift rods, lower links with interchangeable Category 1 and Category 2 hinged ends, vertical lift movement above ground: 7 in (178 mm) to $35\frac{1}{2}$ in (902 mm) or $19\frac{1}{2}$ in (495 mm) to $41\frac{1}{4}$ in (1048 mm) depending on lift rod position

Auxiliary hydraulics:	Available (not fitted), own make, live, oil from transmission supplied to external spool valves

Drawbar

Linkage drawbar:	Drawbar fixed on lower links with central hole and 4 holes $2\frac{1}{8}$ in (54 mm) apart either side of centre line, vertical adjustment from $9\frac{3}{4}$ in (248 mm) to $21\frac{5}{8}$ in (549 mm) changed by adjustable stay links, drawbar holes to take $\frac{3}{4}$ in (19 mm) dia pin, distance from rear axle $36\frac{1}{2}$ in (927 mm) as tested
Swinging drawbar:	Radius of swing $24\frac{7}{8}$ in (632 mm) and $29\frac{1}{2}$ in (749 mm), lateral adjustment $17\frac{3}{4}$ in (451 mm) and $21\frac{1}{4}$ in (540 mm), vertical heights to centre of clevis, 6 positions from $14\frac{1}{4}$ in (362 mm) to $15\frac{3}{4}$ in (400 mm), drawbar hole to take 1 in (25 mm) dia pin, distance behind rear axle $17\frac{3}{8}$ in (441 mm), $19\frac{7}{8}$ in (505 mm) and $24\frac{1}{2}$ in (622 mm), position relative to p.t.o. $7\frac{1}{8}$ in (181 mm), $9\frac{5}{8}$ in (244 mm) and $14\frac{1}{4}$ in (362 mm) to rear

Hitch

Rear:	Automatic hitch (optional, not fitted), hook type, height above ground $16\frac{3}{8}$ in (416 mm), distance from rear axle $7\frac{7}{8}$ in (200 mm) to rear
Front:	Towing hitch combined with front weight carrier, height above ground to centre of clevis $26\frac{3}{4}$ in (679 mm)

Steering — Worm and peg type with single drag link (power assistance optional, not fitted)

Brakes — Girling double disc dry type on rear axle high speed shafts; independent or combined pedal operated, hand lever with ratchet operating both brakes for parking

Wheels

Steering wheels:	Two at front, Goodyear Super Rib 6·00–19 tyres, 6 ply rating, maximum permissible weight on each tyre, 1500 lb (680 kg) at 48 lb/in² (3·4 kg/cm²), track width 48 in (1219 mm) by 4 in (102 mm) steps to 72 in (1829 mm) changed by extending front axle
Driving wheels:	Two at rear, Goodyear Traction Sure Grip 14–30 tyres, 6 ply rating on DW 14 rims, maximum permissible weight on each tyre 3920 lb (1778 kg) at 16 lb/in² (1·1 kg/cm²), track width 56 in (1422 mm) by 4 in (102 mm) steps to 88 in (2235 mm) changed by reversing inner and outer wheel centres and offset lug type rims
Wheelbase:	6 ft 10 in (2083 mm)

Tractor and ballast weights
(without driver but with tanks full)

Weight without ballast

Front:	1770 lb (803 kg)
Rear:	2861 lb (1298 kg)
Total:	4631 lb (2101 kg)

Ballast

Front:	Weights—2 per wheel, total 538 lb (244 kg) Liquid—nil
Rear:	Weights—15 per wheel, total 3492 lb (1584 kg) Liquid—1459 lb (662 kg)
Additional:	8 front frame weights and frame, total 549 lb (249 kg)

Weight with full ballast

Front:	2982 lb (1353 kg)
Rear:	7687 lb (3487 kg)
Total:	10 669 lb (4839 kg)

Seat Kneodler type made by Sankey of Wellington, upholstered cushion and back rest, parallelogram linkage with spring and hydraulic damper adjustable for driver's weight; range of adjustment 2½ in (63·5 mm) fore and aft in median plane of tractor

Number of grease points

Whole tractor: 13

Overall dimensions

Overall length:	Without front weights 11 ft 3½ in (3·44 m) With front weights 12 ft 1¼ in (3·69 m)
Overall width:	Without ballast weights 6 ft 2 in (1·88 m) at 56 in (1422 mm) track With ballast weights 9 ft 2 in (2·79 m) at 56 in (1422 mm) track
Overall height:	To top of steering wheel 65½ in (1664 mm) To top of exhaust pipe 84 in (2134 mm)
Minimum ground clearance:	To underside of gearbox casing 17¾ in (451 mm) To underside of swinging drawbar 10¾ in (273 mm)

Lighting

	Height above ground of centre,		*Size,*		*Distance from outside edge of tractor, at 56 in (1422 mm) wheel track, to centre,*	
	in	*(cm)*	*in*	*(cm)*	*in*	*(cm)*
Headlights	41	(104)	4	(10·2) dia	27¾	(70·5)
Side lights	59	(150)	2	(5·1) dia	6⅝	(16·8)
Rear lights	57¾	(147)	4½ × 2	(11·4) × (5·1)	8⅝	(21·9)
Reflectors	55	(140)	2¾ × 1½	(7·0) × (3·8)	8⅝	(21·9)

Unrestricted beam angle of headlight in plan view 100°

FUELS AND LUBRICANTS USED IN TESTS

Fuel:	Diesel oil, density 0·845 at 60°F (15·6°C), Cetane No. 53, to Class A B.S.2869:1957
Engine oil:	Shell Multi-Purpose 20W/30
Transmission oil:	Shell Multi-Purpose 20W/30
Final drives:	Shell Spirax 90 EP

COMPULSORY TESTS

1. Main power take-off performance

Date and location of tests: 29th January 1968; N.I.A.E., Silsoe, Bedford, U.K.
Type of dynamometer: Water brake, Heenan and Froude

Horsepower (Metric hp)	*Speeds, rev/min*		*Fuel consumption,*		
	Engine	*P.t.o.*	*UKgal/h (l/h)*	*lb/hp h (g/metric hp h)*	*hp h/UKgal (metric hp h/l)*
Maximum power—2 hour test					
61·8 (62·7)	2098	673	2·87 (13·05)	0·393 (176)	21·5 (4·80)
Standard p.t.o. speed (540 rev/min)					
53·0 (53·7)	1684	540	2·39 (10·86)	0·380 (170)	22·2 (4·95)
Standard belt speed of 3100 ft/min (945 m/min)					
58·2 (59·0)	1940	622	2·66 (12·09)	0·387 (173)	21·9 (4·89)
*Speed recommended by the manufacturer for drawbar work					
59·6 (60·4)	2000	641	2·74 (12·46)	0·389 (174)	21·7 (4·84)
Fuel consumption at part loads					
53·8 (54·6)	2147	689	2·55 (11·59)	0·400 (179)	21·1 (4·71)
0	2198	705	0·75 (3·41)	—	—
27·2 (27·6)	2176	698	1·54 (7·00)	0·479 (214)	17·7 (3·95)
61·8 (62·7)	2098	673	2·87 (13·05)	0·393 (176)	21·5 (4·80)
13·7 (13·9)	2184	700	1·12 (5·09)	0·691 (309)	12·2 (2·72)
40·7 (41·3)	2165	694	2·04 (9·27)	0·424 (190)	20·0 (4·46)

* The manufacturer made no specific recommendation for speed for drawbar work and the results given are at the rated engine speed

No load, maximum engine speed: 2198 rev/min
Equivalent crankshaft torque at maximum power: 154·7 lb ft (21·4 kg m)
Maximum equivalent crankshaft torque: 169·0 lb ft (23·4 kg m) at 1420 rev/min engine speed

Mean atmospheric conditions:	temperature	67°F	(19°C)
	pressure	30·10 in Hg	(765 mm Hg)
	relative humidity		33%
Maximum temperature:	coolant	188°F	(87°C)
	engine oil	232°F	(111°C)
	fuel	70°F	(21°C)

2. Drawbar performance

Date of tests: March 1968
Type of track: Tarmacadam
Height of drawbar above ground: 20 in (508 mm)
See table on page 9

Gear	Horse-power (Metric hp)	Drawbar pull, lb (kg)	Speed, mile/h, (km/h)	Engine speed, rev/min	Wheel-slip, %	Specific fuel consumption, lb/drawbar hp h (g/metric drawbar hp h)	Specific fuel consumption, drawbar hp h/UKgal (metric drawbar hp h/l)	Temperature, °F (°C)			Atmospheric conditions		
								Coolant	Fuel	Engine oil	Temperature, °F (°C)	Relative humidity, %	Pressure, inHg (mmHg)
(i) Maximum power (ballasted)													
1	†30·0 (30·4)	9000 (4082)	1·25 (2·01)	2112	15·0	0·541 (242)	15·6 (3·48)	125 (52)	63 (17)	155 (68)	59 (15)	47	29·35 (745)
2	†44·7 (45·3)	9000 (4082)	1·86 (2·99)	2084	15·0	0·507 (227)	16·7 (3·73)	124 (51)	70 (21)	155 (68)	59 (15)	47	29·35 (745)
3	54·5 (55·3)	5400 (2449)	3·78 (6·08)	2106	7·3	0·459 (205)	18·4 (4·11)	130 (54)	67 (19)	160 (71)	53 (12)	47	29·47 (749)
4	55·1 (55·9)	3650 (1665)	5·66 (9·11)	2105	4·2	0·450 (201)	18·8 (4·19)	136 (58)	63 (17)	150 (66)	50 (10)	61	29·22 (742)
5	54·3 (55·1)	2350 (1066)	8·66 (13·93)	2111	2·6	0·458 (205)	18·5 (4·13)	130 (54)	59 (15)	138 (59)	54 (12)	42	29·22 (742)
(ii) Five-hour test at 75% of pull at maximum power													
4	42·4 (43·0)	2740 (1243)	5·80 (9·33)	2133	3·3	0·461 (206)	18·3 (4·08)	150 (66)	82 (28)	190 (88)	66 (19)	36	29·33 (745)
(iii) *Five-hour test at pull corresponding to 15% wheelslip in Test (i)													
2	—	9000 (4082)	1·92 (3·09)	—	—	—	—	178 (81)	100 (38)	219 (104)	71 (22)	33	29·31 (744)
(iv) Maximum power (unballasted)													
2	24·5 (24·8)	4800 (2177)	1·92 (3·09)	2118	14·2	—	—	114 (46)	—	167 (75)	47 (8)	66	30·40 (772)
3	45·6 (46·2)	4800 (2177)	3·56 (5·73)	2115	14·2	—	—	130 (54)	—	180 (82)	50 (10)	55	30·40 (772)
4	56·3 (57·1)	3850 (1746)	5·48 (8·82)	2114	8·6	—	—	147 (64)	—	173 (78)	47 (8)	72	30·40 (772)
5	57·1 (57·9)	2500 (1134)	8·56 (13·77)	2091	4·7	—	—	130 (54)	—	171 (77)	47 (8)	72	30·40 (772)

Total oil consumption during ten hours duration of tests (ii) and (iii): 0·006 lb/h (2·8 g/h)

† Maximum power available at 15% wheelslip

* Test (iii) was carried out with additional ballast and the results for power, slip and fuel consumption have no practical significance

3 and 4. Turning space and turning circle

Details of wheel equipment: As in specification, without ballast

Track of wheels: Front—48 in (1219 mm)

Rear—56 in (1422 mm)

	With brakes		*Without brakes*	
	Right-hand	*Left-hand*	*Right-hand*	*Left-hand*
Radius of turning space	10 ft 8 in (3·25 m)	10 ft 7 in (3·22 m)	11 ft 4 in (3·45 m)	11 ft 4 in (3·45 m)
Radius of turning circle	10 ft 3 in (3·12 m)	10 ft 2 in (3·10 m)	10 ft 11 in (3·33 m)	10 ft 11 in (3·33 m)

5. Location of centre of gravity

Height above ground	30·8 in (782 mm)
Distance forward from the vertical plane containing the axis of the rear wheels	30·6 in (777 mm)
Distance from the median plane of the tractor	0

6. Braking

Date of test: 29th March and 22nd April 1968

Type of track: Tarmacadam

Cold brakes

	Tractor without ballast		*Tractor ballasted*	
Travelling speed of tractor, mile/h (km/h)	15·5	(25·0)	15·5	(25·0)
Maximum deceleration, ft/s² (m/s²)	14·5	(4·4)	15·8	(4·8)
Stopping distance, ft (m)	15·4	(4·7)	19·2	(5·9)
Force on brake pedal, lb (kg)	100	(45)	160	(73)

Brake fade characteristics (hot tests)

Maximum deceleration hot/maximum deceleration cold × 100: 89%

Stopping distance cold/stopping distance hot × 100: 79%

Force on pedal cold/force on pedal hot × 100: 111%

Efficiency of hand brake: Satisfactory

Pull on hand brake: 75 lb (34 kg)

7. Measurement of ambient noise emitted by the tractor

Date of tests:	3rd April 1968	
Type of sound level meter:	Brüel and Kjoer Type 2203	
Type of track:	Tarmacadam	
Results of tests:	gear	6th
	travelling speed before acceleration	12·5 mile/h (20·1 km/h)
	sound level	87 dBA

8. Noise measurements at the driver's ear level

Date of tests:	3rd April 1968
Type of sound level meter and octave filter:	Brüel and Kjoer Type 2203 with octave filter set Type 1612
Type of track:	Tarmacadam

Results of Tests

Gear	*Travelling speed, mile/h*	*(km/h)*	*Loudness, sones*
3	3·9	(6·28)	137
6	16·7	(26·87)	117

9. Power lift and hydraulic pump performance

Date and location of tests:	23rd and 27th February 1968; N.I.A.E., Silsoe, Bedford, U.K.
Hydraulic fluid:	
Make and type:	Shell Tractor Oil Universal
Viscosity:	20W/30
Viscosity index:	105

	Vertical movement,		*Maximum force exerted through full range,*		*Pressure, lb/in²*		*Linkage load at which unballasted front end of tractor lifts off the ground,*	
	in	*(mm)*	*lb*	*(kg)*	*lb/in²*	*(kg/cm²)*	*lb*	*(kg)*
Linkage giving maximum mechanical advantage								
At lower hitch points (height above ground in down position 19⅝ in (498 mm))	21¼	(552)	5100	(2313)	3100	(218)	4800	(2177)
On the frame 24 in (610 mm) to rear of lower hitch points	26	(660)	3600	(1633)	3100	(218)	2750	(1247)
Linkage giving minimum mechanical advantage								
At lower hitch points (height above ground in down position 9¾ in (248 mm))	28½	(724)	3150	(1429)	3100	(218)	—	—
On the frame 24 in (610 mm) to rear of lower hitch points	32¾	(832)	3000	(1361)	3100	(218)	2500	(1134)

Type of linkage lock for transport:	Hydraulic
Opening pressure of the cylinder over pressure relief valve (manufacturer's figures):	Not applicable

Pump characteristics

(i)	Opening pressure of relief valve:	2700 lb/in² (190 kg/cm²)
	Sustained pressure of the open relief valve:	3060 lb/in² (215 kg/cm²)
	Pump delivery rate at external tapping	
(ii)	at minimum pressure (rated engine speed):	3·28 gal/min (14·9 l/min)
(iii)	at maximum hydraulic power:	3·16 gal/min (14·4 l/min)
	delivery pressure:	2700 lb/in² (190 kg/cm²)
	power:	5·97 hp (6·05 metric hp)

OPTIONAL TESTS

10. Performance at the engine crankshaft

Date and location of tests: 24th January 1968; N.I.A.E., Silsoe, Bedford, U.K.

Type of dynamometer: Water brake, Heenan and Froude

Horsepower (Metric hp)	*Engine speed, rev/min*	*UKgal/h (l/h)*	*Fuel consumption, lb/hp h (g/metric hp h)*	*hp h/UKgal (metric hp h/l)*
Maximum power—2 hour test				
63·6 (64·5)	2100	2·88 (13·09)	0·382 (171)	22·1 (4·93)
Standard p.t.o. speed (540 rev/min)				
54·4 (55·2)	1684	2·38 (10·82)	0·370 (166)	22·9 (5·11)
Standard belt speed of 3100 ft/min (945 m/min)				
60·0 (60·8)	1940	2·68 (12·18)	0·377 (169)	22·4 (5·00)
*Speed recommended by the manufacturer for drawbar work				
61·3 (62·2)	2000	2·74 (12·46)	0·378 (169)	22·3 (4·98)
Fuel consumption at part loads				
55·1 (55·9)	2139	2·51 (11·41)	0·385 (172)	22·0 (4·91)
1·7 (1·7)	2195	0·81 (3·68)	—	—
27·8 (28·2)	2158	1·52 (6·91)	0·463 (207)	18·3 (4·08)
63·6 (64·5)	2100	2·88 (13·09)	0·382 (171)	22·1 (4·93)
14·0 (14·2)	2170	1·07 (4·86)	0·644 (288)	13·1 (2·92)
41·5 (42·1)	2150	1·97 (8·96)	0·400 (179)	21·1 (4·71)

*The manufacturer made no specific recommendation for speed for drawbar work and the results given are at the rated engine speed

No load, maximum engine speed: 2195 rev/min

Crankshaft torque at maximum power: 159·1 lb ft (22·0 kg m)

Maximum crankshaft torque: 173·3 lb ft (24·0 kg m) at 1420 rev/min engine speed

Mean atmospheric conditions:

temperature	64°F	(18°C)
pressure	30·15 in Hg	(766 mm Hg)
relative humidity		34%

Maximum temperature:

coolant	189°F	(87°C)
engine oil	229°F	(109°C)
fuel	82°F	(28°C)

Optimum fuel consumption recorded: 0·362 lb/hp h (162 g/metric hp h) at 38·2 hp and 1390 rev/min

11. Performance at the belt pulley

Date and location of tests: 1st February 1968; N.I.A.E., Silsoe, Bedford, U.K.

Type of dynamometer: Electrical swinging frame

Horsepower (*metric hp*)	*Speeds, rev/min*		*Fuel consumption,*		
	Engine	*Belt pulley*	*UKgal/h* (*l/h*)	*lb/hp h* (*g/metric hp h*)	*hp h/UKgal* (*metric hp h/l*)
Maximum power—2 hour test					
58·9 (59·7)	2099	1250	2·86 (13·00)	0·411 (184)	20·6 (4·60)
Standard belt speed of 3100 ft/min (945 m/min)					
56·1 (56·9)	1940	1155	2·66 (12·09)	0·401 (179)	21·1 (4·71)
*Speed recommended by the manufacturer for drawbar work					
57·2 (58·0)	2000	1191	2·73 (12·41)	0·404 (181)	20·9 (4·66)
Fuel consumption at part loads					
51·2 (51·9)	2148	1279	2·56 (11·64)	0·422 (189)	20·0 (4·46)
0	2199	1310	0·76 (3·45)	—	—
25·8 (26·2)	2166	1290	1·54 (7·00)	0·506 (226)	16·7 (3·73)
58·9 (59·7)	2099	1250	2·86 (13·00)	0·411 (184)	20·6 (4·60)
13·0 (13·2)	2174	1295	1·12 (5·09)	0·728 (326)	11·6 (2·59)
38·6 (39·1)	2158	1285	2·01 (9·14)	0·439 (196)	19·2 (4·28)

* The manufacturer made no specific recommendation for speed for drawbar work and the results given are at the rated engine speed

No load, maximum engine speed: 2199 rev/min

Equivalent crankshaft torque at maximum power: 147·3 lb ft (20·4 kg m)

Maximum equivalent crankshaft torque: 162·4 lb ft (22·5 kg m) at 1420 rev/min engine speed

Mean atmospheric conditions:

temperature	63°F	(17°C)
pressure	29·89 in Hg	(759 mm Hg)
relative humidity		37%

Maximum temperature:

coolant	194°F	(90°C)
engine oil	232°F	(111°C)
fuel	78°F	(26°C)

15. Repairs and adjustments during test: A new hydraulic pump was fitted during preliminary tests

Remarks: None

Officer in charge: D. W. Smith

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

Date: 26th June 1968

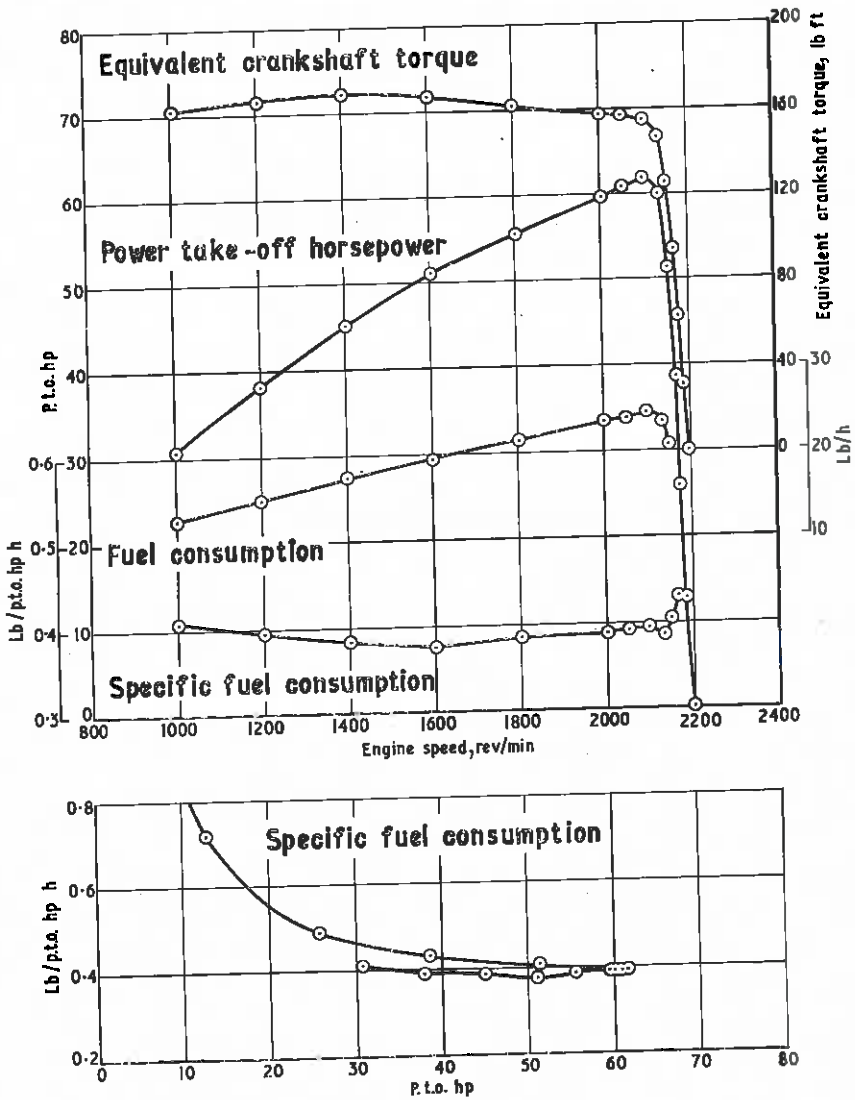


FIG. 1. Power take-off test

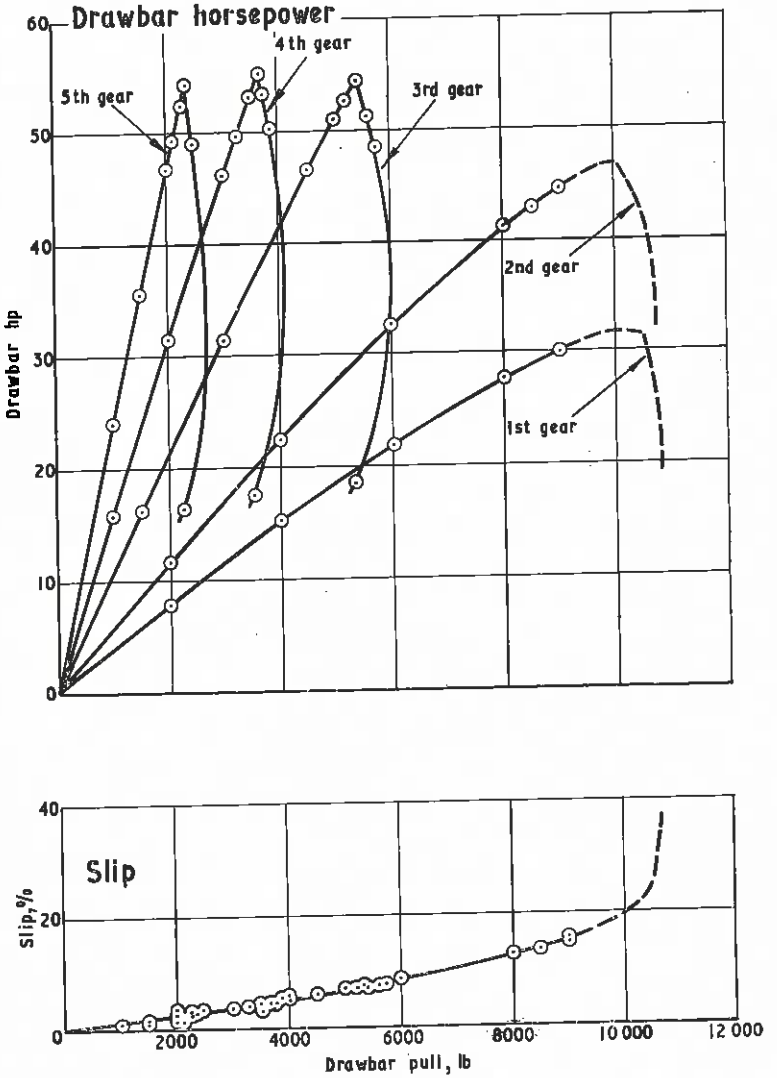


FIG. 2. Drawbar test on tarmacadam with ballast

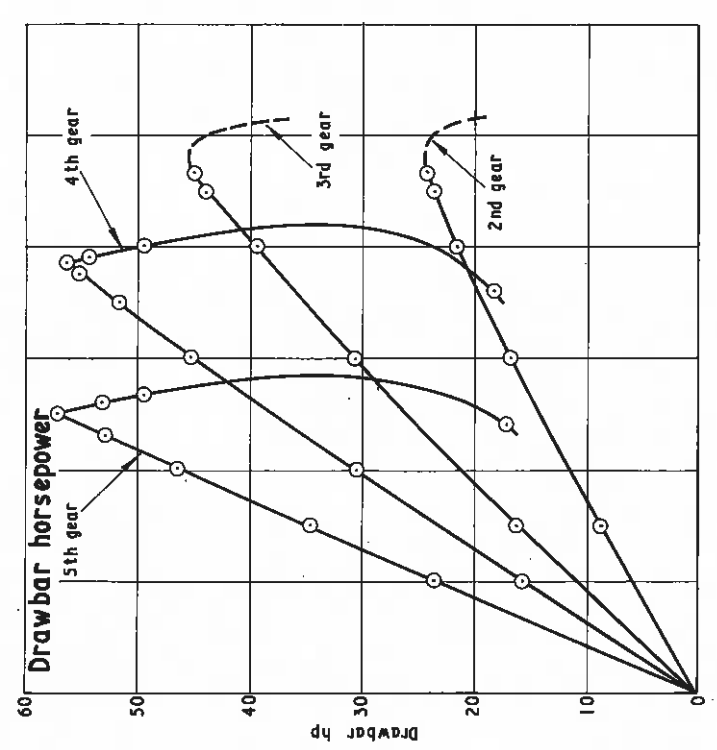


FIG. 4. Drawbar test on tarmacadam, without ballast

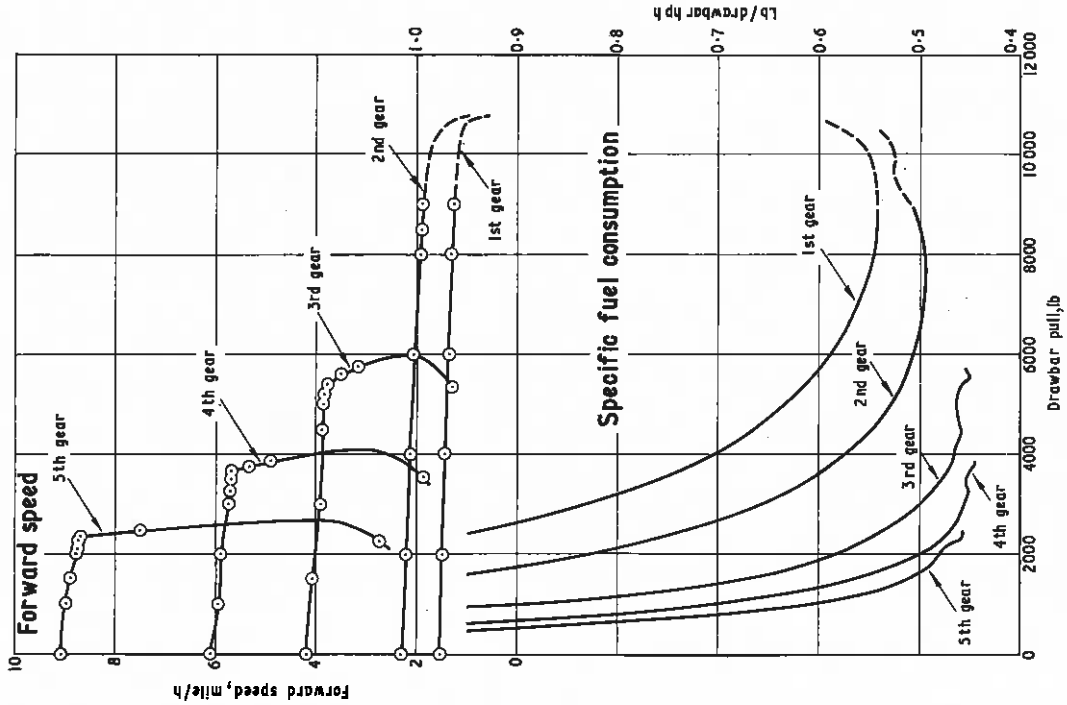


FIG. 3. Drawbar test on tarmacadam, with ballast

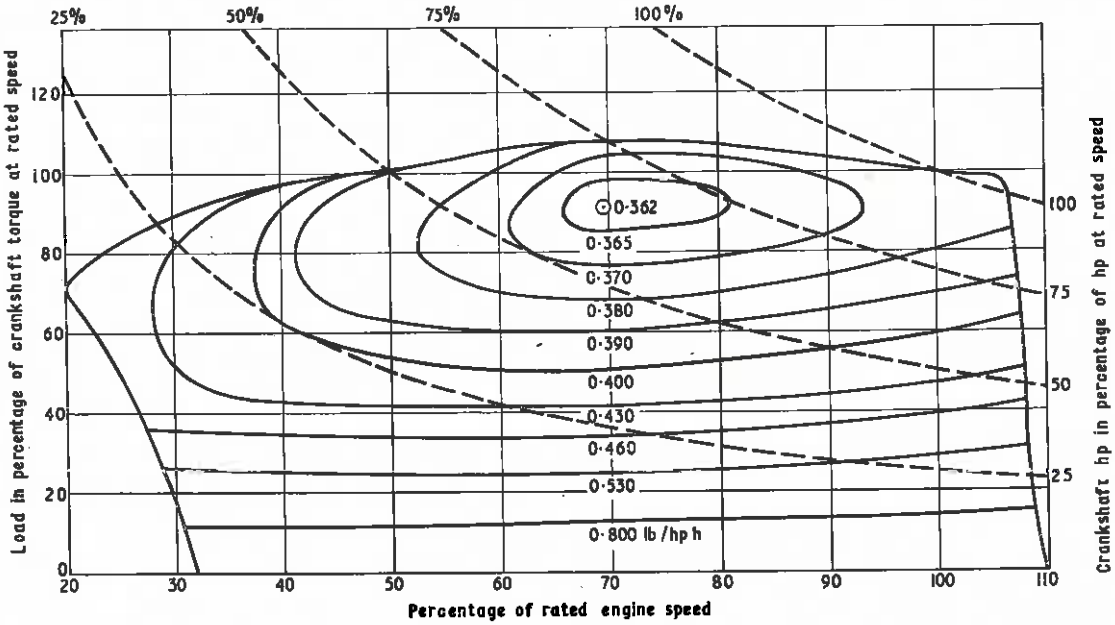


FIG. 6. Engine test

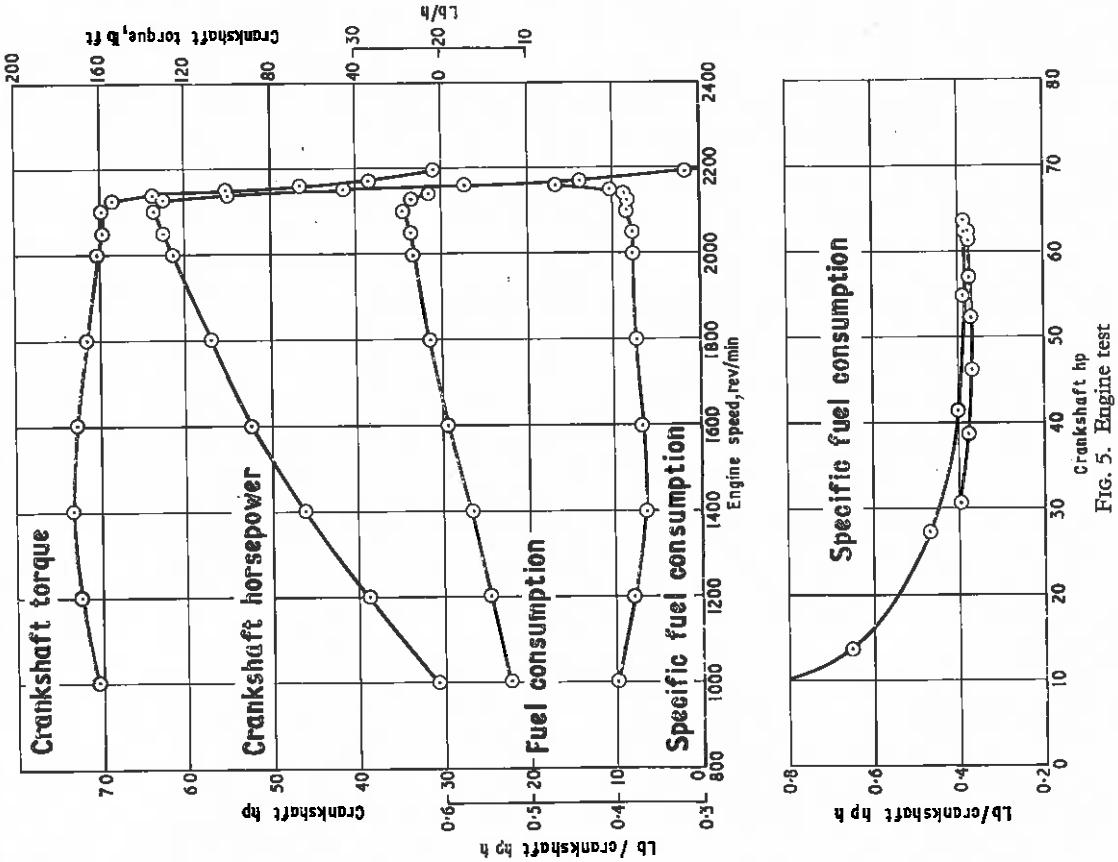


FIG. 5. Engine test

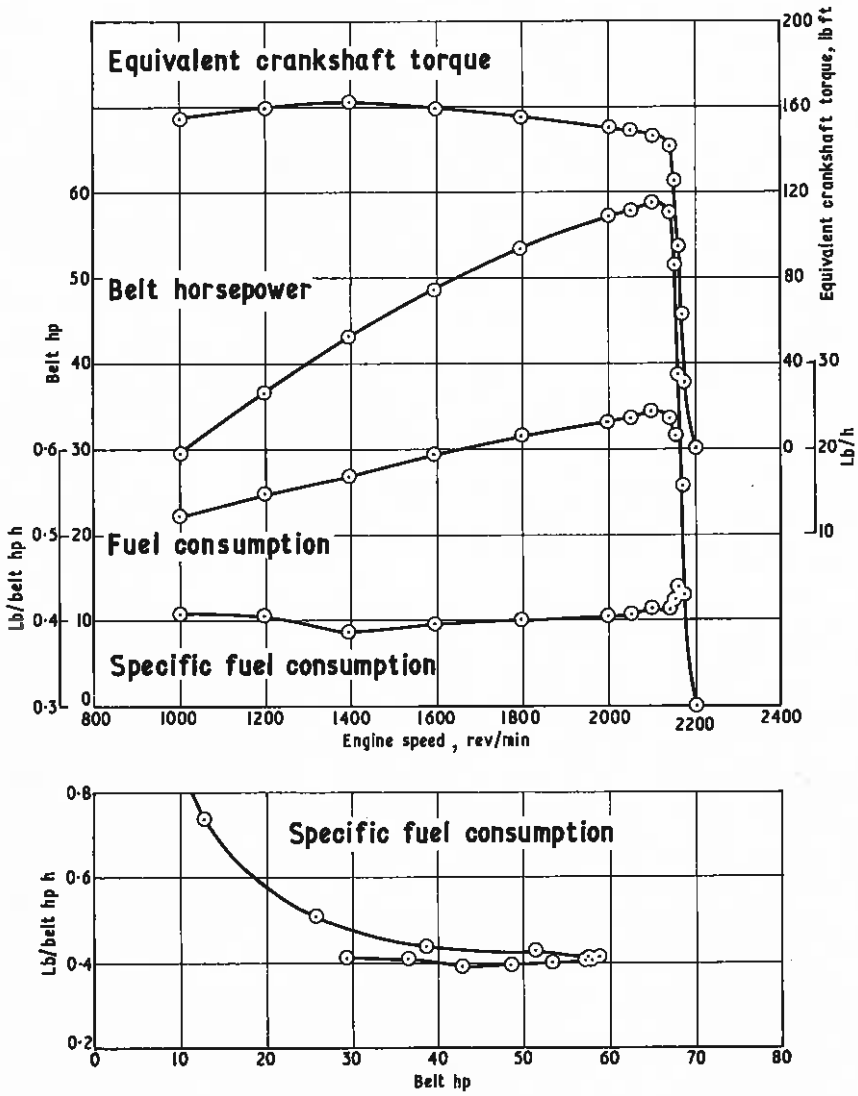


FIG. 7. Belt test

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