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**Australian tractor test report no. 58 : Massey-Ferguson 165**

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THE Massey-Ferguson 165 is a general purpose farm tractor. The test tractor gave 50 drawbar h.p. with 59 h.p. at the P.T.O. at rated engine speed it comes within Class 5 of the Australian Standard Classification of Wheeled Tractors for Agricultural Purposes, AS D10-1967. It is equipped with 18.4 x 28 in. pneumatic tyres. It has a threespeed gear box with a ratio change giving 6 forward and reverse speeds.

The tractor is designed for linkage work (category 1 or 2 three-point linkage is supplied as standard equipment), or for drawbar work using the pressure control system.

The tractor has a Perkins 4-cylinder, 4-stroke, direct injection diesel engine of 212 cubic inches capacity, rated speed 2,000 r.p.m. The recommended fuel is distillate.

Further details, including an abstract of the manufacturer's specifications, are contained in the full Technical Report from which this abridgement has been made.

Test tractor

The test tractor was chosen at random from cased stock at the Sunshine, Victoria assembly plant of Massey-Ferguson (Australia) Ltd., the Australian distributors of the model. It was run-in at the Testing Station for 25 hours. Full power was measured in a 2-hour test after a further 7 hours of running on other tests; a check test on the P.T.O. at the end of the test program showed no significant change in output during 44 hours of test running.

As delivered the fuel pump calibration was below the specified service setting; it was reset within specified limits. Governor setting was within the range 2,130-2,200 r.p.m. specified by the manufacturer. Fuel used was "Shell Diesoline" weighing 8.29 lb. per gallon.

At the time of the tests it was not the policy of the Company to declare, in Australia, a power rating for this model, either in advertising or in the handbook. For the purpose of the test however, the company nominated a bare engine rating of 55 h.p. at 2,000 r.p.m.; this is based on the minimum value for an engine ex-production. The test tractor more than met this rating; the performance shown may be taken as not untypical for a fully run-in and equipped engine set to the Australian service specification for fuel delivery.

Tractor identification numbers were: Serial No. 165-573485H; Engine No. 212 UA 44540.

No water was added during the tests. Oil consumption for the 44 hours of test running was approximately 1 pint. During the run-in period an oil leak from the rocker cover and a severe rattle in the drawbar were corrected. The engine and the transmission were partly dismantled after the test, and found to be in satisfactory condition.

Drawbar tests were done with the tractor ballasted to the maximum recommended by the Company for normal agricultural drawbar work. Total weight, including the driver was 9,030 lb. (front axle, 2,325 lb.; rear axle 6,705 lb.). This weight included 75 per cent. water ballast in the rear (18.4 x 28 in.) tyres, and additional solid ballast of 560 lb. on each rear wheel.

Drawbar height was 18 in. The tests were done on a level tarmac road. Further information on the effect on performance of varying drawbar height, weight, wheel equipment, road surfaces and other questions of the interpretation of tractor test data may be obtained from the Tractor Testing Officers at the University of Melbourne.

Inspection report

Power take off

The P.T.O. gives 540 r.p.m. at 1,685 r.p.m. engine speed not at the engine rated speed of 2,000 r.p.m.; this is within the limit of 80 per cent. of rated speed specified in BS 1495: 1964.
The P.T.O. is a standard 6 spline 1\(\frac{3}{4}\) in. dia. live drive, with guard and cover according to BS 1495 : 1964; located centre, rear, 22\(\frac{1}{4}\) in. above the ground on 18.4 x 28 in. tyres. Control is by second throw of double clutch; selector lever left of seat.

Clearance around P.T.O. generally accords with BS 1495 but clearance to drawbar at maximum height setting is 3\(\frac{1}{4}\) in. (8 in. is minimum recommended.)

Ground drive P.T.O. gives 19 in. forward travel per revolution of the P.T.O.

**Belt pulley**

The belt pulley mounts on the P.T.O. for rearward working, in either direction of rotation at 1,165 r.p.m. at 1,940 r.p.m. engine speed. At this speed the linear speed of the belt is 3,100 r.p.m. in accordance with BS 1495. Pulley dia. 10\(\frac{1}{2}\) in.; face width 6\(\frac{1}{4}\) in.

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**Performance Summary**

<table>
<thead>
<tr>
<th>Manufacturer's rating</th>
<th>Engine crankshaft r.p.m.</th>
<th>P.T.O. at 540 r.p.m.</th>
<th>Belt pulley</th>
<th>Drawbar (3rd gear)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full power—h.p.</td>
<td>2.61</td>
<td>1.53</td>
<td>0.75</td>
<td>0.50</td>
</tr>
<tr>
<td>At Engine speed—r.p.m.</td>
<td>2,000</td>
<td>1,685</td>
<td>1,940</td>
<td>2,000</td>
</tr>
<tr>
<td>Fuel Economy—lb./h.p.-hr.</td>
<td>0.4</td>
<td>0.41</td>
<td>0.34</td>
<td>0.59</td>
</tr>
<tr>
<td>Fuel Consumption—lb./gal./hr.</td>
<td>24.63</td>
<td>21.8</td>
<td>24.3</td>
<td>24.4</td>
</tr>
</tbody>
</table>

Full crankshaft torque—at rated speed, 160 ft. lb. at 1,300 r.p.m., 178 ft. lb. (max.), Best economy—0.375 lb./shaft h.p.-hr. at 70 per cent. load, at about 1,300 r.p.m.

High idle speed—2,180 r.p.m.

**Drawbar Performance**

<table>
<thead>
<tr>
<th>Gear</th>
<th>At Maximum Power</th>
<th>Pull (lb.)</th>
<th>Speed (m.p.h.)</th>
<th>Slip (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (L 1)</td>
<td>22</td>
<td>2,100</td>
<td>6,500</td>
<td>1.3</td>
</tr>
<tr>
<td>2 (L 2)</td>
<td>33</td>
<td>2,080</td>
<td>6,500</td>
<td>1.9</td>
</tr>
<tr>
<td>3 (L 3)</td>
<td>50*</td>
<td>2,000</td>
<td>5,200</td>
<td>3.6</td>
</tr>
<tr>
<td>4 (H 1)</td>
<td>51*</td>
<td>2,000</td>
<td>3,500</td>
<td>5.5</td>
</tr>
<tr>
<td>5 (H 2)</td>
<td>50*</td>
<td>2,000</td>
<td>2,250</td>
<td>8.4</td>
</tr>
<tr>
<td>6 (H 3)</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

* These correspond with engine at full power rated speed.

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**Drawbar**

A fixed and swinging drawbar fitting is standard equipment. The drawbar dimensions generally conform to BS 1495 : 1964.

**Driver's accommodation**

Access to the seat is from either side forward of the rear wheels with a footstep on left side. Flat perforated footplates are provided either side of transmission housing.

The seat is a pressed metal bucket seat with removable seat and back-rest cushions. It is mounted on a parallel motion linkage with springs and damper, which may be adjusted to suit the driver's weight. Fore-and-aft adjustment is 5\(\frac{1}{2}\) in.

All controls are conveniently placed and easily operated, and conform generally to BS 1495 : 1964.

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**Operating features**

Turning circles (minimum outside diameters on a consolidated gravel surface) with track widths front 58\(\frac{1}{2}\) in. and rear 60 in. were: no brakes, 26 ft. with brakes 22 ft. Ground clearance is 11 in. under the drawbar, or 14\(\frac{1}{2}\) in. without the drawbar fitted.

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**Fuel Consumption**

<table>
<thead>
<tr>
<th>Pull (lb.)</th>
<th>Speed (m.p.h.)</th>
<th>Slip (%)</th>
<th>Fuel Consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td>4,900</td>
<td>—</td>
<td>2.8</td>
<td>0.48</td>
</tr>
<tr>
<td>6,000</td>
<td>—</td>
<td>4.0</td>
<td>0.56</td>
</tr>
<tr>
<td>7,000</td>
<td>—</td>
<td>5.6</td>
<td>0.6</td>
</tr>
<tr>
<td>8,000</td>
<td>—</td>
<td>7.0</td>
<td>0.7</td>
</tr>
<tr>
<td>9,000</td>
<td>—</td>
<td>8.4</td>
<td>0.8</td>
</tr>
<tr>
<td>10,000</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

Hydraulics, three-point linkage

A four-cylinder pump driven from the P.T.O. shaft supplies power for external hydraulic circuits and the three-point linkage, and delivers 3.1 g.p.m. at up to 3,100 p.s.i. at 2,000 engine r.p.m.

The three-point linkage conforms with BS 1841 : 1951 for Category 2 implements except that the levelling-box lever is turned anti-clockwise to shorten the lift-rod. “Position,” “draft” and “pressure” control are provided. The “pressure control” feature is a means of achieving weight transfer from trailed or semi-mounted implements.

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Centre of gravity is $3\frac{1}{2}$ in. above and 22 in. ahead of the rear axle for the tractor as tested in the maximum weight condition.

**Standard and optional features**

Standard equipment includes tachometer incorporating an hour meter; water temperature and oil pressure gauges (band marking only); fuel gauge; ammeter. Lighting equipment. Fixed and swinging drawbar; three-point linkage; live P.T.O. differential lock; foot throttle.

Optional features include power steering belt pulley, wheel weights, front weights and weight carrier. Pressure control hitch. “Multipower” ratio change facility, including auxiliary hydraulic pump. Remote hydraulics.

**Users’ service**

A minimum set of tools and a well illustrated Operator’s Manual are supplied. Service is available throughout Australia from Massey-Ferguson dealers and agencies.

G. H. VASEY,
Officer-in-Charge, Tractor Testing.

W. T. BROWN,
Testing Officer.

University of Melbourne
September, 1969.

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**DEPARTMENT APPOINTS DAIRYING CHIEF**

Mr. T. A. Morris has been appointed Chief of the Department of Agriculture’s Dairying Division.

Mr. Morris, who came from Brisbane in January this year to the position of Assistant Chief of the Division, has been acting Chief since the retirement of Mr. H. G. Elliott in July.

For 19 years Mr. Morris was with the Queensland Department of Primary Industries and his last position before coming to W.A. was Chief Dairy Technologist in the Field Services Branch of the Division of Dairying.

His experience includes administering dairy technology research, product development programmes and quality control inauguration as well as general industry advice and assistance.

In 1967 Mr. Morris, who holds a New Zealand B.Sc.(Agric.) degree gained a post-graduate diploma of Agricultural Extension at Queensland University and in 1965 he was awarded the Australian Society of Dairy Technology Silver Medal for a research publication.

He has had a lot to do with the technology of cheese-making and has studied the mechanisation of cheese-making in Victoria and the manufacture of non-cheddar cheese in England and Europe.