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Australian tractor test report no. 41: the Massey-Ferguson 135

G H. Vasey
F. T. Baillie
THE Massey-Ferguson MF-135 is a general purpose tractor of 31 drawbar horsepower. It has 14.9 x 24 pneumatic tyres, and a three-speed gear box with a ratio change which, in the standard model, gives six forward and two reverse gears. The model tested was also fitted with the optional "Multipower" facility, which gives an "on-the-go" shift to a higher speed for each gear, thus providing 12 forward and four reverse gears.

The tractor is designed primarily for working with mounted implements directly through the three-point linkage, or with semi-mounted and trailed implements through the "Pressure Control Hitch" mounted on the three-point linkage and applying a lift to the drawbar. A fixed and swinging drawbar fitting is standard.

The tractor has a Perkins 3-cylinder 4-stroke direct injection diesel engine of 152.7 cubic inches capacity. 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.

The Test Tractor

The test tractor was chosen at random from new stock at the Massey-Ferguson assembly plant at Sunshine, Victoria. It was run-in at the Testing Station for 12 hours. Though it was agreed that the results shown in the performance summary opposite were fully representative of a typical tractor typically equipped, they could not be reconciled with the manufacturer's rating of 45.5 h.p., as quoted in the Operator Instruction Book.

Fuel pump calibration was within specified limits; governor setting was as recommended by the manufacturer, 2,410 r.p.m. high idle. Fuel used was "Shell Diesoline," weighing 8.25 lb. per gallon.

Tractor identification numbers were: Serial No. F14167; Engine No. 233 6380C.

No water was added and no repairs or adjustments were needed during the tests. Oil consumption for the 37 hours of test running was approximately 3½ pints. 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 5,660 lb. (front axle, 2,240 lb.; rear axle 3,420 lb.). This weight included 75 per cent. water ballast in the rear (14.9 x 24) tyres. Solid ballast was 600 lb. (10 x 58 lb. weights and weight carrier) attached to front of tractor. Rear wheels had heavy cast centres.

This model is more usually sold with light pressed centre rear wheels in which case its total unballasted weight would be about 3,360 lb.
The test tractor was supplied with a "Pressure Control Hitch" which is a drawbar traction aid consisting of a lever system that mounts on the three-point linkage and pulls upwards on the drawbar of trailed implements transferring weight from the implement to the tractor. The amount of weight transfer can be varied through pressure control in the hydraulic system.

It was found that full application of the pressure control hitch added about 1,000 lb. to each rear wheel. With the light pressed wheels as usually sold this would bring the total loading up to 5,360 lb., which closely approaches the recommended maximum weight as used in the tests. Drawbar test results can thus be taken as indicative of the likely performance of the light weight tractor using weight as used in the tests.

Drawbar height was 14 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 surface and other questions of interpretation of tractor test data may be obtained from the Tractor Testing Officers at the University of Melbourne.

### Performance Summary

<table>
<thead>
<tr>
<th>Gear</th>
<th>Engine Crankshaft</th>
<th>PTO</th>
<th>Belt Pulley</th>
<th>Drawbar 5th Gear</th>
<th>At Maximum Pull</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>lb.</td>
<td>m.p.h.</td>
<td>lb.</td>
<td>lb.</td>
<td>lb.</td>
</tr>
<tr>
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<td>16</td>
<td>1.320</td>
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<td>1.830</td>
<td>0.57</td>
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<td>25</td>
<td>2,290</td>
<td>0.51</td>
</tr>
<tr>
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<td>2,800</td>
<td>4.1</td>
<td>30</td>
<td>2,800</td>
<td>0.49</td>
</tr>
</tbody>
</table>

Fuel consumption—various loads, Low-3rd-low (5th) gear; from 10 Hour test.

### Inspection Report

#### Power Take-Off

The p.t.o. gives B.S. (British Standard) speed of 540 r.p.m. at 1,685 engine r.p.m., not at the rated speed of 2,250 r.p.m. This is outside the limit of not less than 80 per cent. of rated speed recommended in B.S. 1495 : 1965.

The p.t.o. is a standard 6 spline 1½ in. with guard and cover according to B.S. 1495 : 1964, located centre rear 20 in. above the ground when on 14.9 x 24 tyres. Height of p.t.o. and clearance between p.t.o. and drawbar are less than B.S. specification. Control is by the second throw of the dual clutch and by hand lever L.H. side of seat.

An alternative drive to the p.t.o. is provided from the main transmission giving approximately 19½ in. forward travel for each revolution of the p.t.o., on 14.9 x 24 tyres.
Belt Pulley

The belt pulley unit mounts on the p.t.o. It may be mounted for rotation in either direction, rearward working, at 1,315 r.p.m. at rated engine speed of 2,250 r.p.m., giving B.S. belt speed of 3,100 f.p.m.

Three-Point Linkage

The three-point linkage generally conforms to B.S. 1841, Category 1. Both “position” and “draft” control are provided. A “response” control enables the speed at which the implement drops into work to be set so that the implement under “draft” control follows more accurately changes in the profile of the ground. A “pressure” control system is provided which, with the “pressure control hitch” mounted on the three-point linkage and operating on the drawbar, enables some of the weight of trailed or semi-mounted implements to be transferred to the tractor rear wheels as a traction aid. Tappings are provided for the operation of external circuits from the built-in hydraulic pump, or a separate auxiliary hydraulic system may be fitted.

Drawbar

A fixed and swinging drawbar fitting is available as an optional extra. A linkage mounted drawbar may also be fitted.

Driver’s Accommodation

Access to the seat is from either side, forward of the rear wheels. The foot steps provided are obstructed by pedals and are too low for use as footplates—23 in. below loaded seat. Footrests are provided above and forward of the pedals, but the R.H. rest is difficult to use without resting the heel on the brake pedals. Clutch and brake pedals are 18 in. apart and 17 in.-18 in. below the loaded seat level.

The seat is a pressed metal bucket seat with detachable back rest and seat cushions; it is rigidly mounted on the tractor. Three mounting positions give 2 in. fore and aft adjustment. The seat may be tipped back for stand-up working. All controls are conveniently placed and easily operated and generally conform to B.S. 1495:1964.

Operating Features

Turning circles (minimum outside diameters on a consolidated gravel surface) with track widths front 52 in. rear 59½ in. were: No brakes, 21 ft. with brakes, 18 ft.

A safety switch prevents starting the engine unless the tractor is in neutral gear.

Ground clearance is 11½ in. under drawbar.

Centre of gravity 2 in. above 25 in. ahead of rear axle for the un-ballasted tractor.

Steering, manual, was easy and sensitive at all loads.

Standing and Optional Features

Standard equipment includes tachometer, hour meter, road speed indicator for all gears, water temperature and oil pressure gauges (band markings only), ammeter, fuel gauge. Live p.t.o., 3-pt. linkage, differential lock, lights, fixed and swinging drawbar fitting.

Optional equipment fitted on the test tractor comprised “Multi-power” facility, belt pulley unit, heavy wheel centres, front weights and weight carrier, “pressure control” hitch.

Users Service

The usual minimum kit of hand tools and a well illustrated Operator’s Manual are supplied. Service throughout Australia from Massey-Ferguson dealers and agencies.

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

W. F. BAILLIE,
Tractor Testing Officer.
University of Melbourne,
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