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Australian tractor test report no. 54 : Fiat 615

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No. 54 – FIAT 615

THE Fiat 615 is a general purpose farm tractor of 56 drawbar horsepower. With 65 h.p. at the P.T.O. at rated engine speed it comes within Class 6 of the Australian Standard Classification of Wheeled Tractors for Agricultural Purposes, A.S. D-10: 1967. It is equipped with 10.4 x 28 pneumatic tyres. It has a three speed gear box with a high and low ratio change giving 6 forward and 2 reverse speeds in the field work range. A seventh speed, road gear, may be selected in either high or low ratio.

The tractor is designed for working either with mounted implements directly through the three-point linkage or through the drawbar.

The tractor has a Fiat 4-cylinder 4-stroke direct injection diesel engine of 268.3 cubic inches capacity, rated speed 1,900 r.p.m. The recommended fuel is distillate.

The manufacturer's advertised value for power output of 66 shaft h.p. at rated speed refers to a bare engine.

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 stock at Fiat's Victorian assembly plant. It was run-in at the Testing Station for 12 hours. Full power was measured in a 2-hour test after a further 18 hours of running on other tests; a check test on the P.T.O. at the end of the test programme showed no significant change in output during 38 hours of test running. As will be seen from the performance summary the test value of full power output exceeded the manufacturer's expectations.

Fuel pump calibration was set within specified limits; governor setting, 2,050 r.p.m. was as specified by the manufacturer. Fuel used was "Shell Diesoline" weighing 8.34 lb. per gallon.

Tractor identification numbers were: Serial No. 152085, Engine No. 907877.

No water was added during the tests. Oil consumption for the 38 hours of test running was approximately 4 pints. During the engine tests a split fuel line, and

the top cover of the fuel filter, which showed a fault in the casting, were replaced. 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 9,220 lb. (front axle, 2,530 lb.; rear axle 6,690 lb.). This weight included no ballast on the front (7.50 x 18) wheels but 75 per cent. water ballast in the rear (18.4 x 28) tyres. Solid ballast was 600 lb., comprising 2 x 150 lb. weights per 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 1,450 r.p.m. engine speed not at the engine rated speed of 1,900 r.p.m.; this is outside the limit of 80 per cent, of rated speed specified in B.S. 1495 : 1964. The measured value above does not correspond with the recommended speed given in the operator's manual.

The P.T.O. is a standard 6 spline $1\frac{1}{8}$ in. dia. "live" drive, with guard and cover according to B.S. 1495 : 1964, located centre, rear, 25 in. above the ground on 18.4 x 28 tyres. Control is by the second

throw of the two-stage clutch and hand lever at left rear of seat.

Clearance around P.T.O. generally accords with B.S. 1495, but clearance to drawbar in the higher settings is less than 8 in. minimum recommended.

Belt Pulley

The belt pulley unit mounts on the P.T.O. for rearward working, in either direction of rotation at 1,057 r.p.m. at 1,900 r.p.m. engine rated speed. At this speed, speed of belt is 3,200 r.p.m. in accordance with B.S. 1495 : 1964. Pulley 7 in. dia. 11½ in. face width. No tests were taken of belt power output. In practice, the power delivered through the belt would be limited to the capacity of the 7 in. belt employed to about 60 h.p.

A feature of the belt pulley unit is that the P.T.O. drive is brought through so that the standard P.T.O. remains available with the belt pulley unit fitted. The outer rim of the pulley may be removed from the boss, enabling other sizes and types of pulley, or other drive arrangements to be fitted.

Hydraulics, Three-Point Linkage

A gear pump mounted externally on the engine gives 4.4 g.p.m. at 2,134 p.s.i. at 2,160 r.p.m. (1,900 engine r.p.m.) and supplies power for external hydraulic circuits, and the three-point linkage.

The three-point linkage conforms with B.S. 1841 : 1951 for both Category 1 and 2 implements.

Drawbar

A fixed drawbar mounting plate 18¾ in. above ground is provided with 7-1½ in. clearance holes at 2 in. centres. The standard swinging drawbar has 7 positions, offsetting the drawbar pin 3½ in., 7 in., 10½ in. either side of centre. Height is adjustable 13 in., 15½ in., 18¾ in., 22½ in. to centre line of drawbar. Drawbar and clevis dimensions conform with B.S. 1495.

A heavy-duty roller-mounted drawbar is optionally available.

Driver's Accommodation

There is clear access to the seat from either side forward of the rear wheels with a footstep on either side. Flat footplates are provided either side of transmission housings.

The seat is a pressed metal bucket seat with detachable sponge-rubber cushion and back rest. It is mounted on a parallel motion linkage with a spring adjustable to the driver's weight. Fore-and-aft adjustment is 1 in.

All controls are conveniently placed and easily operated, with the exception of the engine "stop" control which is operated by

Performance summary

	Engine Crankshaft	PTO	Belt Pulley	Drawbar (3L Gear)
Manufacturer's rating*	66
Full power—h.p.	67	54	(not taken)	56
At engine speed—r.p.m.	1900	1450	(not taken)	1900
Fuel economy—lb./h.p.-hr.	0.40	0.39	(not taken)	0.47
Fuel consumption—lb./hr.	26.6	21.0	(not taken)	26.5
gal./hr.	3.2	2.5		3.2

* From current advertising; refers to a bare engine.

Full crankshaft torque—at rated speed, 186 ft. lb.

—at 1,200 r.p.m., 208 ft. lb. (max).

Best economy—0.385 lb./shaft h.p.-hr. at 85 per cent. load, at about 1,200 r.p.m.

High idle speed—as specified, 2,050 r.p.m.

Drawbar performance

Gear	At Maximum Power				
	dbhp	Engine (rpm)	Pull (lbs)	Speed (m.p.h.)	Slip (%)
1 (L.1)	35	1950	7000	1.9	16
2 (L.2)	52*	1900	7000	2.8	16
3 (L.3)	56*	1900	5600	3.7	9
4 (H.1)	56*	1900	4450	4.8	7
5 (H.2)	56*	1900	3550	5.9	5
6 (H.3)	53*	1900	2100	9.3	3
7 (H. or L.)					

Road gear, not tested

*These correspond with engine at full power rated speed.

Gear	At Maximum Pull		
	Pull (lbs)	Engine (rpm)	Limited by
1	7500	Wheelslip
2	7500	Wheelslip and Engine torque
3	6250	1300	Engine torque
4	5000	1300	Engine torque
5	4100	1300	Engine torque
6	2550	1300	Engine torque
7			

Road gear, not tested

Fuel consumption

Pull (lb.)	Speed (m.p.h.)	d.b.h.p.	slip (%)	Fuel Consumption	
				gal./hr.	lb./d.b.h.p.-hr
2500	3.8	27	4	1.9	0.57
3300	3.9	35	5	2.2	0.51
4200	4.0	44	6	2.5	0.48
5000	4.1	51	8	2.9	0.47

an upward movement of the "foot-throttle" pedal. This unusual arrangement is not very convenient and is non-standard in terms of B.S. 1495 : 1964. Other control arrangements not in conformity with the Standard are: Handbrake on right hand not left hand side; P.T.O. lever positions not marked; engine may be started with tractor in gear.

Operating Features

Turning circles (minimum outside diameters on a consolidated gravel surface) with track widths front 59 in. and rear 68½ in. were: no brakes, 28 ft., with brakes, 22 ft. Ground clearance is 18 in. under the front axle.

Centre of gravity is 3 in. above and 24 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 and P.T.O.

speed indications, though these are not correct; water temperature and oil pressure indicators (band markings only); "live" P.T.O.; lighting equipment; fixed and swinging drawbar, three-point linkage.

Optional features fitted on the test tractor included the belt pulley unit and wheelweights.

User's Service

The usual minimum kit of hand tools is supplied and were delivered with the test tractor; a well illustrated Operator's Manual in English is supplied. Service is available through Australia from Fiat dealers and agencies.

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

W. F. BAILLIE, Testing Officer.
University of Melbourne,
June, 1968.