

Headquarters Mechanical Development Committee  
Report No. 75

The Manuel Roadless 4 Wheel Drive  
Conversion for the Fordson Tractor

*B. 19.8*

Origin

The scope of the wheeled agricultural tractor in forestry is limited by the low drawbar pull that it is capable of giving on soft ground. Tractors with full tracks have therefore had to play a large part in spite of the damage that they do to roads and rides.

The Manuel Roadless 4 wheel drive conversion for the Fordson Major was therefore an interesting development and one of these machines was obtained for trial by the Forestry Commission in July 1956. The object of the trial was to find out to what extent this converted Fordson could take on the work previously handled by the smaller tracked and half tracked tractors.

Description

The conversion is effected by inserting a transfer gearbox between the main gearbox and the transmission case. The drive is then taken through a train of gears and a torque clutch to a Hardy Spicer Shaft which takes the drive to the front axle. A dog clutch in the transfer gearbox enables 2 or 4 wheel drive to be used at will.

A photograph showing the machine hauling timber on a trailer over a wet ride is attached to this report.

The basic retail price of the 4 wheel drive machine is £997.15.0 compared with £535 for the standard Fordson.

The manufacturer of the conversion is Roadless Traction Ltd., Hounslow, Middlesex.

Conditions

The tractor has been used on a wide variety of forest operations including ploughing, extraction and in conjunction with towed trailers, scrub cutters etc.

Observations

1. The total number of hours worked to date is 1,835.
2. No defects have occurred in any part of the 4 wheel drive conversion equipment.
3. The performance of the tractor on every operation where a high drawbar pull is required has proved to be far superior to that of the standard tractor.
4. Dynamometer tests were carried out to determine the maximum sustained

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3. The performance of the tractor on every operation where a high drawbar pull is required has proved to be far superior to that of the standard tractor.
4. Dynamometer tests were carried out to determine the maximum sustained drawbar pull available on a wet and deeply rutted clay ride in

comparison with a standard Fordson and a Fordson with Roadless half tracks. In a test of this nature dynamometer readings fluctuate very widely but the following figures are the averages of a number of readings and they represent a fair comparison:-

- |                                           |           |
|-------------------------------------------|-----------|
| (a) Roadless Manual 4 wheel drive -       | 2790 lbs. |
| (14 x 30 rear tyres 9 x 24 front tyres)   |           |
| (b) Standard Fordson - 2 wheel drive -    | 1550 lbs. |
| (11 x 36 rear tyres 600 x 19 front tyres) |           |
| (c) Fordson Roadless half track -         | 4480 lbs. |
| (10 x 28 front tyres)                     |           |
| (d) 4 wheel drive as in (a) above -       | 2580 lbs. |
| but with 11 x 36 rear tyres.              |           |

Wheelspin was the limiting factor in each case.

No wheel weights or water ballasting were used. The lowest gear was used throughout.

5. The 14 x 30 rear tyres on the 4 wheel drive machine not only gave a higher drawbar performance than the 11 x 36 tyres but also did less damage when running on soft rides.
6. The driven (larger than standard) front wheels gave the tractor a far greater ability to climb out of ruts than is the case with the 2 wheel drive machine.
7. Fuel consumption through out the trial has averaged 0.625 gallons per hour.
8. It is interesting to note that in a trial under more favourable ground conditions on damp grass by the National Institute of Agricultural Engineering the 4 wheel drive machine gave a pull of 5,600 lbs. compared with 4,500 lbs. by the standard 2 wheel tractor. There is, therefore, evidence that the advantage of the 4 wheel drive increases as the ground conditions deteriorate.

#### Conclusions

The Manual Roadless 4 wheel drive conversion has given the Fordson tractor a vastly improved performance in bad ground conditions. This improvement is sufficient to enable 4 wheel drive to take on a considerable proportion of the work for which half tracked and fully

tracked tractors of the same size have previously been considered necessary. Tracks, however, remain supreme if absolute maximum draw bar pull is required.

In choosing between 4 wheel drive and tracks great weight must be given to the fact that wheels possess the advantage of being able to travel on roads and rides without causing damage.

Further Action

Three more Roadless Manual 4 wheel drive Fordsons have been purchased since the start of this trial and they have now run 918, 382 and 344 hours respectively with no defects in the conversion equipment.

R. G. SHAW

Machinery Research Officer

August, 1958



THE MANUAL ROADLESS 4 WHEEL DRIVE CONVERSION ON A  
FORDSON HAULING TIMBER ON A TRAILER OVER A WET CLAY RIDE  
AT ALICE HOLT