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A most interesting report

Headquarters Machinery Development Committee

Report No. 24

on

Trailers fitted with C.A.C. rubber track units

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Origin

Trailers required to travel over soft and uneven forest rides must be designed to offer the lowest possible rolling resistance. If the resistance is high the ground is quickly cut up and tractor power is wasted. Reports Nos. 15 and 21 described the advantages to be gained in this director by increasing wheel diameters on wheeled trailers. Similar trials on trailers fitted with C.A.C. rubber track units in comparison with wheeled trailers have now been completed and the results are contained in this report.

Description

Each track unit consists of two load carrying wheels mounted on a frame which rocks on the trailer axle. Round the two wheels is wrapped a C.A.C. track which consists of a number of rubber pads reinforced with steel aircraft cord. The price of one pair of track units, complete with axle is £145 (Retail).

Illustrations of the tracked trailers used for these trials are shown at Photographs i to iii.

Trial

Three separate trials to establish rolling resistance were carried out as follows:-

- (a) A trailer on one pair of track units compared with a trailer on four large wheels (11.25 x 28 front. 11 x 36 rear) and a two wheel trailer on large wheels (9 x 36). Conditions were wet clay with no surface vegetation on an uphill gradient of 4° at Alice Holt.
- (b) The same tracked trailer in comparison with a four wheeled trailer on four large wheels (11 x 36) and a two wheel trailer on smaller (800 x 19) lorry wheels on soft unbroken peat at Kershope.
- (c) A tracked trailer on two pairs of track units (front pair articulated) in comparison with the same four wheeled trailer as at (b). This trial took place at Inverliewer on very soft peat with strong surface vegetation.

Observations

1. In trial (a) both trailers carried identical loads of 2 Tons. A number of drawbar dynamometer readings were taken, and the average recordings were:-

Tracked trailer	3,000 lbs.
Four wheel trailer	2,440 lbs.
Two wheel trailer	2,000 lbs.

These figures are averages of readings taken at the same points in each case. Speed was dead slow as hauling was by winch at about 100 feet per minute.

In trial (b) the load carried was 2½ Tons in each case and the average rolling resistance figures recorded were:-

Tracked Trailer	1,000 lbs.
Four wheel trailer (large wheels)	600 lbs.
Two wheel trailer (lorry wheels)	2,500 lbs.

Speed was 2 m.p.h. on level ground.

/Trial

Trial (c) was carried out on particularly soft peat. Both trailers carried a load of 3 Tons. The average rolling resistance figures were:-

Tracked Trailer	1,967 lbs.
Four wheel Trailer (large wheels)	1,000 lbs.

Speed was 1-2 m.p.h. on level ground.

2. During the whole series of trials it became increasingly obvious that the small size of the load carrying wheels of the track units was largely responsible for the tendency to bulldoze mud in front of the leading wheel, this "bow wave" effect is seen at Photograph 2. The two wheel trailer in trial (b) using the normal size of lorry wheel failed in the same way because sinkage was greater and the axle added to the bulldozing area and made resistance to movement even greater. The comparative ease with which large wheels continue to roll under these conditions is shown in Photographs 4, 5 and 6.
3. Whilst it has been shown that large diameter wheels are superior to the present design of C.A.C. rubber track in reducing rolling resistance it must be accepted that they increase the loading problem to some extent. Factors governing the choice between two and four wheel trailers have already been covered in Report No. 21.

Conclusions

The results of these trials under soft ground conditions show that whilst the C.A.C. rubber track units give an improvement over standard lorry sized wheels they offer a rolling resistance greater than is the case with large diameter wheels.

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1. Showing the trailer on one pair of C.A.C. rubber track units used in trials (a) and (b).



2. Showing the wave of mud forming in front of the track causing high rolling resistance. Note the better rolling conditions of large wheels under identical conditions at photographs 5 and 6. (Trial (a) Alice Holt).



3. The tracked trailer on two pairs of tracks at Inverliever. Note the broken surface under the tracks causing high rolling resistance (Trial (c)).



4. The four wheeled trailer on large wheels under the same conditions and at the same place as photograph 3. Note the comparatively little sinkage. (Trial (c)).



5. The two wheel trailer on 9 x 36 wheels rolling easily through soft wet clay. (Trial (a) Alice Holt).



6. The four wheel trailer in the same position as the trailer in photograph 5.