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## Overhauling Electric Ry. Rolling Stock.

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In presenting these remarks concerning the periodical overhauling of rolling stock, it is my intention to endeavor to convince those interested in the maintenance of electric railway rolling stock that periodical overhauling is absolutely necessary to obtain the maximum of efficiency and also that when this work is completed, the term, general overhaul will be amply justified.

Prior to three years ago very few of the cars on the Toronto system were overhauled with any degree of regularity. This neglect was responsible for some of the following results: Average daily cripple cars amounted to about 17% of all motor-operated rolling stock, failures in service were very common, line blockades interrupted schedules, cars out of service when required to fill schedules, inconvenience to passengers, lost mileage and revenue. This condition of affairs necessitated the introduction of a method of repairs whereby the average daily number of cripples would be reduced to a minimum. Instructions were issued by the management that all cars were to be put in first-class condition at once. This was done, but not without a very large expenditure of money; the results obtained, however, were such as to prove without the shadow of a doubt the wisdom of permitting the above-mentioned expenditure. To-day in Toronto there are comparatively speaking no motor breakdowns in service, and as a comparison I may say, that instead of 17% of the cars being crippled as before stated every 24 hours, the daily average is now 3.7%; and it must be borne in mind that every car that is repaired, whether large or small repairs, is classed in the totals from which this percentage is struck. Those not included are those cars repaired by the night and day inspectors and repair men, after the cars are housed and have completed their day's run; or, in other words, cars which have not caused any interruption to service or schedules. This is a considerable reduction you will admit, but we are endeavoring to lower this record, and those in charge of the rolling stock are of opinion that this can be done. The vastly superior service which we are now enabled to give has secured to the company a very valuable asset in the citizens' good-will.

It is very necessary that the good work of overhauling rolling stock should be done in a most thorough and systematic way. The work should be laid out so that there will be no confusion of material, men or ideas. All the work should be done in a pre-determined manner. Gauges, measurements and tools should be supplied for the proper carrying out of the same. When a system

of overhaul is finally decided upon as being the best suited to local conditions, it should become a law in the shop, and any employe departing from the standard of practice should be dealt with accordingly. The introduction of new methods or stunts or experiments should not be permitted until they are carefully considered by the proper officials. I strongly recommend that employes be encouraged to promote new ideas, and if on the presentation of them to the

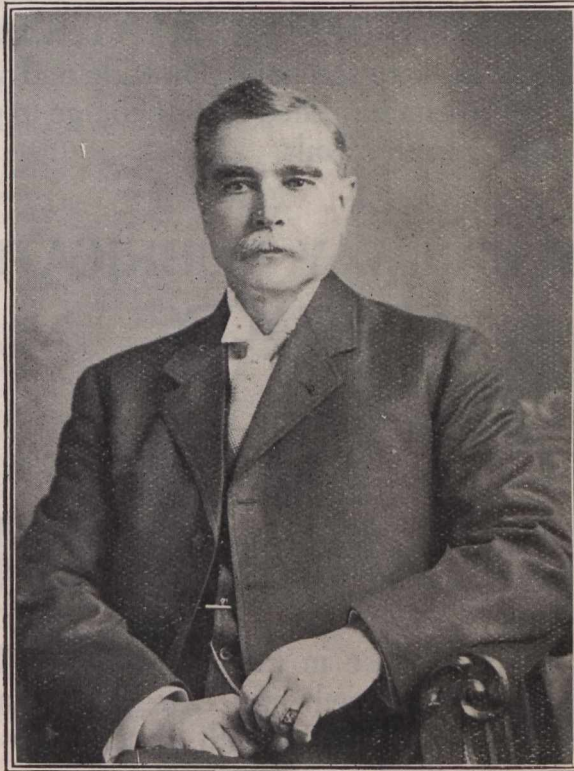
methods in use in the Toronto Ry. Co.'s central shops. This system no doubt would be more readily understood by a visit to our works, which we will at all times welcome. The cars are overhauled on a mileage basis; 50,000 to 55,000 miles being the limit of distance a car travels before being brought to the shops and thoroughly overhauled. Owing to the fact that our roadbed is now in a very much better condition than it formerly was, and the cars standing up so much better, the matter of permitting cars to run 70,000 to 75,000 miles before over-hauling is now under serious consideration.

I will now trace the course of overhauling a car. Owing to the fact that overhauling was first started by rotation of car numbers, it is quite easy for us in the shops to know just about the car or cars due to come in, and as accurate mileage is kept on all cars, a glance at the mileage statements is sufficient to procure the proper car for overhauling. This done, the central car dispatcher is instructed to have that car delivered to the shops ready for the following morning. The car is then placed in a section set aside for the purpose, brake and cable connections unfastened, car body raised and placed on trestles, trucks are then pulled out from under the body and shunted to truck overhaul section; here the motors are removed and sent to motor overhauling section.

The truck is completely stripped down, except side and end frame, wheel centres marked, and trammel points used to test for truck frame being true. Journal boxes are stripped of braced wedges and waste, and thoroughly cleansed. Wheels and journals are now replaced if necessary. The stripped material has been placed on one side of the truck, the floor on the other side is swept clean, the truck inspector inspects the old material and o.k.'s that which is to be used again. This o.k. material is now moved to the clean space on the other side of the truck, the balance is taken to the shop storekeeper, who gives in return a new

or repair part for every one sent in; this is then delivered to the truck fitters, and is placed with the balance of the o.k. material. The trucks are now built up, the journals being packed with clean, oil-soaked waste; the trucks having been thoroughly scraped and blown off with compressed air, are now given a coat of mineral quick drying black paint, and ready for the motors.

The motors are first stripped of armatures and field coils; these with the brushholders are sent to the armature and machine departments respectively. The motor frame is next scraped inside and out, grease boxes cleaned out, bottom oiled, wells cleaned and washed with kerosene. The inside of motor frames are next painted with black insulating compound, oiled canvas liners are placed around permanent pole pieces, frames are



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proper officials, they are found to possess even some small merit, every encouragement should be given the originator to perfect the same, and on the adoption of his proposal in practice he should, so far as the shop is concerned, receive all the credit due him.

In preparing the repair material in the Toronto Ry. shops, carefully kept gigs, patterns and gauges are always used in production. By this means absolute accuracy is assured, and the parts are interchangeable. The fact that the pit men or fitters have no work other than to bolt together and put to place, is a strong argument in favor of the repair material being properly produced in the company's shops or by outside manufacturers.

I will endeavor to explain some of the