

DIRECTORATE GENERAL BORDER ROADS
GENERAL REPAIR INSTRUCTION NO 52
ON
TECHNIQUE OF MACHINING AND SKIMMING
OF BRAKE DRUMS

Introduction

1. Brakes form vital system in a vehicle. It assumed greater importance when a vehicle is used in hilly terrain. Due to constant heavy usage, Brake Drums are often found to be scored and hence need machining / skimming within the limits permitted by manufacturers. Occasions on which skimming is found necessary are many. In the absence of Brake Drum skimming machine, or when the same is out of order, and no other workshop resources are immediately available, a simple 'field method' may be effectively improvised using the power of the repairable vehicle to skim Brake Drums as per details in the succeeding paragraphs.

Aim

2. (a) To explain the technique to be followed when machining Brake Drums.
- (b) To lay down an improvised 'FIELD method' of skimming Brake Drums, when brake drum machine is not available.

Action by

3. (a) Base Workshop (GREF): To machine Brake Drums as per details given in paras 4 to 6.
- (b) Field Workshops (GREF) : If brake drum skimming machine is held, to machine / skim as per details in Paras 4 to 6. In the same is not held to rig up a simple method in field for skimming Brake Drums with the power of the vehicle under repairs. The method has been found very effective.

DETAILS

Machining of Brake Drum under Static Conditions

4. The modern brake drums vary so much in material that it is difficult to definitely state whether it is preferable to machine them with or without coolant. From actual experience, it is found that most of the steel drums are best machined dry, whereas drums particularly of cast iron types are best machined wet. Although this may appear to be contrary to engineering practice, these have given the best results. When drums are turned wet, less grinding is required to finish off as distortion is reduced. But on extremely hard steel work-hardened drums, it has been found that when machined wet it has a tendency to ride over work-hardened patches, whereas when machined dry this does not occur. When machining dry, it is important to disconnect the coolant pipe to avoid the possibility coolant dripping, on the hot carbide tool which invariably causes failure through cracking.

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5. Do not attempt to machine a drum by turning from inside to outside but always from outside to inside, keeping the tool reasonably sharp and always working with the minimum possible coolant. No chatter will be experienced.

6. **Precautions** : The following Don'ts should be observed :-

- (a) DO NOT take too deep a cut when turning.
- (b) DO NOT let coolant drip on hot Tungsten Carbide tool or quench it when hot. It will affect tool's hardness.
- (c) DO NOT start turning the drum from the back.
- (d) DO NOT try to grind with untrue wheel.

Skimming of Brake Drums – Field Method

7. Using the power of a vehicle under repairs, the following simple method can be effectively improvised in the absence of Brake-drum skimming, machine and adopted for the purpose even in field :-

- (a) Park the vehicle on horizontal hard ground.
- (b) Jack up one wheel of the rear axle firmly.
- (c) Lock the other wheel of the rear axle on ground with suitable wooden planks / support, thus fully utilizing the differential action of the rear axle to drive the free wheel.
- (d) Remove the wheel on the jacked up side and mount the repairable brake drum on the studs of the exposed drum using its own nuts.
- (e) Keep swage block of blacksmith suitable in front of the jacked up wheel and mount a tool post of a lathe on top with suitable nuts & bolts.
- (f) The swage block should be raised in height from the ground conveniently so that a cutting tool, when mounted on the tool post, will be level with the geometrical centre of the drum circle.
- (g) Put the gear in 4x2, start the engine, and engage 1st or reverse gear according to the direction required for cutting. Adjust engine speed to obtain the correct cutting speed of the tool for skimming.
- (h) Centre the tool by slight sideward movement of swage block so that the movement of the tool is parallel to the internal surface of the drum.

- (j) When the tool is centred, skim the drum in convenient outs.
- (k) If a sufficiently hard cutting tool is not available, a portable grinding wheel could be suitable mounted in place of the cutting tool.

Precautions

- (a) The base of the tool post must be heavy and firm.
- (b) The wheel bearings of the drum, on which the drum under skimming is mounted, must be serviceable condition. This will prevent vibrations of the rotating drum and also eliminate eccentricity of the drum.

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