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## Special Instruction

### Guidelines for Smooth Undercarriage Operation{4150}

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## Guidelines for Smooth Undercarriage Operation{4150}

SMCS - 4150-GD

**Track-Type Tractor: All****Pipelayer: All****Track-Type Loader: All**

## Introduction

This special instruction provides information pertaining to material packing (debris/soil/rock) in the link box to the extent that the sprocket tooth and idler tread cannot make full penetration into the track chain.

## Effective Track Frame Guarding

Whether a machine has a SystemOne, Heavy Duty, Sealed and Lubricated, Rotating Bushing or any other type of track, packing of the track produces excessive forces on the undercarriage. Effective guarding of the track begins with shedding of material away from the top of the track roller frame (TRF) and idlers so that it minimizes the possibility of the material from getting into the link box. Next is guarding from below the TRF to prevent material from entering the link box. Lower guarding must not be used for mud packing conditions. Lower guarding should only be used in conditions where rock and free flowing debris are entering the track roller area. The **Custom Track Service Handbook (PEKP9400-03 pages 22, 23, and 71)**, since its creation, gives guidance on packing and the use of roller guarding.

If the link boxes are packing enough, the track will be forced away from the sprocket. This may cause track jumping of the sprocket. If the link boxes are packed enough, the idler is forced into the extreme recoil position. When the chain is forced away from the sprocket and the idler is forced to the extreme recoil position, very great load forces are put on the undercarriage. These forces are strong enough that they can break idler mounting blocks, idler shafts, and in worse cases the track can separate.

Underfoot material, machine application, and operator technique all contribute to debris entry and packing into the link box.

## Underfoot Material

Wet, pliable debris/soil that have the ability to be "pushed" or "extruded" through the link openings in the track link box, have relatively low potential to pack into the link box. This might include materials such as wet sand or clay that has small enough aggregate that it will pass through the track link holes.

Damp and dry materials such as incompressible debris/soil/rock that cannot be "pushed" or "extruded" through holes in the track link box has higher potential to pack into the link box. This might include materials such as clay/rock mixtures, rock, wood chunks, or trash and metal, sod like materials, were the aggregate is too large to pass through the track link holes.

### **Machine Application**

Low Potential for Packing: Fine grading

Moderate Potential for Packing: Damp clay/sand/rock mixture such as residential construction site; "V" ditch grading; slope work

High Potential for Packing: Forestry work; aggregate stock piling; ice and rock; steep slope work; land fill

### **Operator Technique**

High Potential for Packing: Sharp turns in free flowing material which allows material to collect at the idlers above the TRF

## **Guarding Guidelines**

Effective track frame guarding must:

- Shed debris from the top of the track frame
- Guard debris from entering below

Recommendations for Oval Track Machines:

- Primary coverage - Guards at the bottom side of the idlers and the sprocket that will prevent the ingestion of material that is between 25.4 mm (1 inch) and 152.4 mm (6 inch) in size.
- Secondary coverage - Primary coverage plus full-length roller guards that prevent material from entering the link boxes between the rollers, idler and sprocket.
- Full coverage - Primary and Secondary coverage plus "tent" type guards that sit on top of the roller frame that shed material away from the idlers and rollers.

Recommendations for Elevated Track Machines:

- Primary coverage - Guards at the bottom side of the front and rear idlers that will prevent the ingestion of material that is between 25.4 mm (1 inch) and 152.4 mm (6 inch) in size.
- Secondary coverage - Primary coverage plus full-length roller guards that prevent material from entering the link boxes between the rollers and idlers.
- Full coverage - Primary and Secondary coverage plus "tent" type guards that sit on top of the

roller frame that shed material away from the idlers and rollers.

**Note:** Lower guards must **only** be used in conditions where rock and free flowing debris is entering the track roller area; not for mud packing conditions.

Roller guards use should be based on the need to keep rocks and/or other foreign debris from entering the roller areas. They should be used in conditions where there is danger of rocks and debris entering the spaces between rollers, causing roller, idler, link, bushing, or sprocket structural damage.

Roller guards should be considered when working in the following types of materials only, and when structural damage to rollers, idlers, links, bushings, and sprockets has or may be a problem:

- Rocks or gravel between 25.4 mm (1 inch) and 152.4 mm (6 inch) in size
- Tree limbs, branches, or other non-extrudable wood products, or waste materials
- Sanitary landfill and demolition materials only if large metal, wood, or other high strength objects of 25.4 mm (1 inch) to 152.4 mm (6 inch) in size, are frequently encountered.