

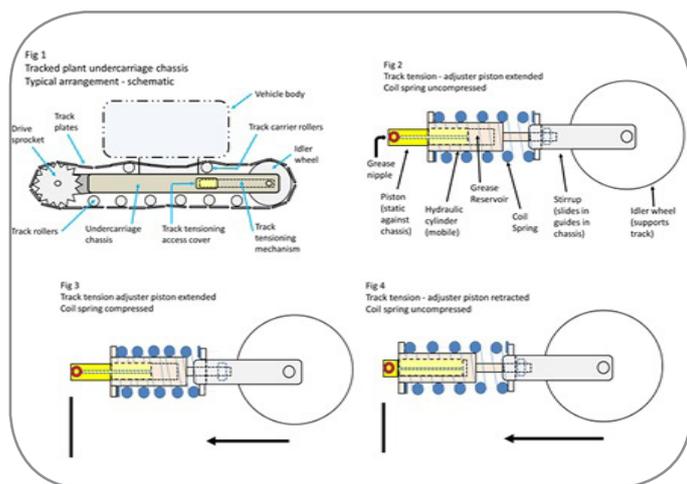
HSE Safety Alert Issued on Hydraulic Injection Fatality

Do not refit/reuse hydraulic components that have detached from the hydraulic system under pressure. An operative died from hydraulic injection injury sustained whilst tensioning the track of an item of construction plant. The grease nipple became detached from the track adjustment mechanism permitting the release of grease under high pressure.

Introduction

The purpose of this alert is to raise awareness of the risks from reuse of hydraulic components that have become detached while under pressure. The detachment event may occur without anyone present or within range and components may not appear visibly damaged. Where this occurs with personnel close to the point of detachment there is a risk of penetration injuries from both the released component and/or the high pressure fluid which can result in hydraulic injection injury.

The tracks on tracked vehicles (Fig 1) are tensioned by adjusting the position of the idler wheel. On the majority of these machines a coil spring compresses or extends to take up normal small changes in track tension during operation (Fig 3). However initial set up and wear adjustment is achieved by a short stroke hydraulic cylinder filled with grease (Figs 2 & 4). The piston of this is extended using a hand held grease gun. This compresses the coil spring which in turn drives the idler wheel to the desired position and holds it there under retained grease pressure. While this operation was being carried out on the track of a piling rig, the nipple connecting the grease gun to the track mechanism detached, permitting the grease (under significant stored energy) to release, injecting the fitter and causing fatal injuries.



Background Information

A previous HSE safety bulletin (FOD 4-2014) was issued at an early stage of the investigation into the track adjustment fatal incident. It addressed the risk of hydraulic injection injury in general terms and reminded readers that hydraulic injection injury can occur at pressures as low as 7bar. Tests on simple hand-pumped grease guns have achieved pressures of over 600bar.

Action Required

Track tension on tracked plant must be kept within the limits set by the manufacturer. Track that loses tension repeatedly must not be over-tensioned to compensate. The cause of repeat loss of tension must be investigated by a competent person (eg experienced plant fitter) to identify and rectify the root cause. If necessary assistance should be sought from the manufacturer or their local representative.

While tracked machinery is being operated, the hatch covers which provide access to the track tensioning grease nipple must be in place and secured in line with the manufacturer's instructions.

The tracks, including the chain, should be cleaned on a daily basis, and the tracks, rollers, idler wheel and sprocket on each side of the vehicle should be visually checked, as far as possible, and any trapped debris removed. The tracks must not be parked up standing in wet concrete.

Tensioning of tracks on tracked plant should only be carried out by a person who has received training in how to correctly do this. The training should include how to identify faults and who to report them to. Each time track tensioning is carried out an entry should be made in the operators' inspection and maintenance log kept with the machine. The reason for any need for excessive adjustment should be assessed by a person competent to do so.

When tensioning the tracks on vehicles where the grease nipple is perpendicular to the tensioner cylinder (ie where the axis of the nipple and/or any other parts of the tensioner assembly is pointing toward the grease gun operator), as a precaution the operator must ensure they are not positioned in front of or in-line with the nipple. This is so as to avoid injury should it break free of the tensioner assembly. On vulnerable machines, if the manufacturer provides a retrofit cover that allows the grease nipple to be permanently shielded this should be installed.

If a hydraulic component is ejected, the component must not be re-used, since it is likely to have sustained damage during such an event. Where a threaded component has detached, both the male and female thread involved must be scrapped and not reused. Partially stripped threads may not appear visibly damaged but will be unable to sustain their design load/pressure. The integrity of the union between any replacement components and the assembly must be verified by a competent person. If there is any doubt, seek advice/guidance from the original equipment manufacturer or supplier. Scrapped components should be destroyed to prevent inadvertent reuse.

SOURCE: HSE STU 2-2017

If you require any further information or advice please contact 4see on 01327 811166, enquiry@4see.co.uk, www.4see.co.uk