



Chassis: Technical Bulletin CTB 013, 13 November 2009

Title: Chassis Wheel End Inspections – When?

Component: Wheels, Brakes, Bearings, Axles and Associated Components

CAUTION:

Wheels, brakes, bearings and axles are critical to safe chassis operation. Inspectors and/or mechanics involved in judging if need to be removed and if further work is needed must have training and experience which qualifies^(NOTE 1) them to correctly diagnose, make decisions, and undertake repairs to these components as necessary.

Typically wheel-end work will be accomplished as part of a proper brake job; this is the ideal interval since container chassis are by their operating nature relatively low mileage vehicles.

In addition to brake jobs, there are other conditions under which wheels may need to be pulled.

The IICL presents the following visual inspection guidelines to be referenced during the chassis wheel end inspection.

Presence of one or more of the following conditions suggests the need to pull (removed) the wheel(s.)

However, these criteria are not necessarily comprehensive – Refer to the current IICL Chassis Inspection & Maintenance Manual for further details. As in all IICL guidelines, there are no substitutes for training, experience, good judgment, knowledge of federal and local laws, and common sense.



DO NOT PULL WHEELS For oil filled hubcaps that exhibit VERY light “weeping” or wetness of lubricant ONLY at or slightly beyond hubcap gasket (within no more than ½” of the hubcap gasket), and with chassis on level ground:

- *For oil filled hubcap (See Figure 1)*
 1. *First, insure that oil level is no lower than the **Minimum** mark, and that remaining oil is clean*
 2. *Remove bolts, gasket and hubcap*
 3. *Reinstall hubcap using a NEW gasket, torque bolts to spec, and add oil to “full” mark*



Figure 1



*DO NOT PULL WHEELS For **grease** filled hubcaps that exhibit VERY light “weeping” or wetness of lubricant ONLY at or slightly beyond hubcap gasket (within no more than 1/2” of the hubcap gasket):*

- For grease filled hubcap (See Figure 2)
 1. Remove bolts, gasket & hubcap
 2. Insure that remaining grease is clean
 3. Add new grease to hubcap as required by axle manufacturer
 4. Reinstall hubcap using a NEW gasket, and torque bolts to spec



Figure 2



For leaking oil filled hubcaps, as defined by lubricant on wheel spokes (See Figure 3) and/or on hubcap flanges (See Figure 4), or by oil leaking thru hubcap window (See Figure 5) and/or oil level below “low” level line on hubcap with chassis on level ground:

Check both outboard (hubcap, spokes) and inboard (inside hub and drum) for MORE THAN “Weeping /slight dampness”**

****NOTE:** To further check for problems resulting from incorrect bearing end play **PRIOR** to wheel removal, secure and brace chassis, jack chassis up, place rigid supports under chassis, cage emergency brake, and spin wheel. If wheel is not free spinning [is sluggish or stops], proceed to remove hubcap and check bearing end play. Acceptable end play for chassis axles is .001” to .005”

End play may be measured two ways:

- For oil filled hubcaps
 1. Check hubcap bolt torque to specs; Remove hubcap
 2. Check oil to see if clean
 3. Check wheel end play
 4. If end play is .001-.005, and oil is clean, hubcap bolt torque was low, and original leakage was thru gasket area, reinstall hubcap using NEW gasket, torque bolts to spec, add oil to “full” mark
 5. If end play is .001-.005, and oil is clean, and original leakage was thru WINDOW of hubcap, install NEW hubcap using NEW gasket, torque bolts to spec, add oil to “full” mark
 6. If end play is **NOT** .001-.005, **pull wheel**, clean parts as needed, and check ALL wheel end parts for damage, scoring, burn indication, excessive wear, etc. Reinstall all parts to axle manufacturer’s specs, replacing those that are damaged and/or worn beyond allowable limits.
 7. If oil is dirty, **pull wheel**, clean parts as needed, and check ALL wheel end parts for damage, scoring, burn indication, excessive wear, etc. Reinstall all parts to axle manufacturer’s specs, replacing those that are damaged and/or worn beyond allowable limits.

- Saturation with oil (See Figure 3, 11, 12)



Figure 3 – Oil Leak



Figure 4 – Oil Leak

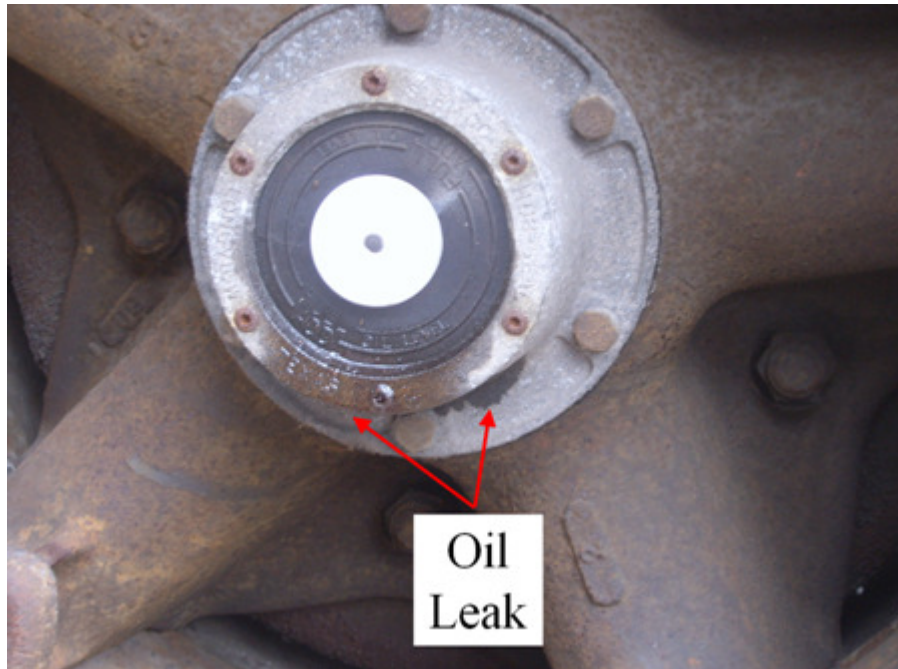


Figure 5 – Oil Leak



For leaking **grease** filled hubcaps, as defined by lubricant on wheel spokes (See Figure 6) and/or on hubcap flanges:

Check both outboard (hubcap, spokes) and inboard (inside hub and drum) for MORE THAN “Weeping /slight dampness”**

***NOTE: To further check for problems resulting from incorrect bearing end play **PRIOR** to wheel removal, secure and brace chassis, jack chassis up, place rigid supports under chassis, cage emergency brake, and spin wheel. If wheel is not free spinning [is sluggish or stops], proceed to remove hubcap and check bearing end play. Acceptable end play for chassis axles is .001” to .005”*

End play may be measured two ways:

- *For grease filled hubcaps*
 1. *Check hubcap torque to specs. Remove hubcap*
 2. *Check grease to see if clean.*
 3. *Check wheel end play*
 4. *If end play is .001-.005, and grease is clean, hubcap bolt torque was low, and original leakage was thru gasket area, add grease to hubcap per manufacturer spec & reinstall hubcap using NEW gasket, torque bolts to spec,.*
 5. *If end play is **NOT** .001-.005, **pull wheel**, clean parts as needed, and check ALL wheel end parts for damage, scoring, burn indication, excessive wear, etc. Reinstall all parts & grease to axle manufacturer’s specs, replacing those that are damaged and/or worn beyond allowable limits.*
 6. *If grease is dirty, **pull wheel**, clean parts as needed, and check ALL wheel end parts for damage, scoring, burn indication, excessive wear, etc. Reinstall all parts & grease to axle manufacturer’s specs, replacing those that are damaged and/or worn beyond allowable limits.*

Saturation with grease (See Figure 6)

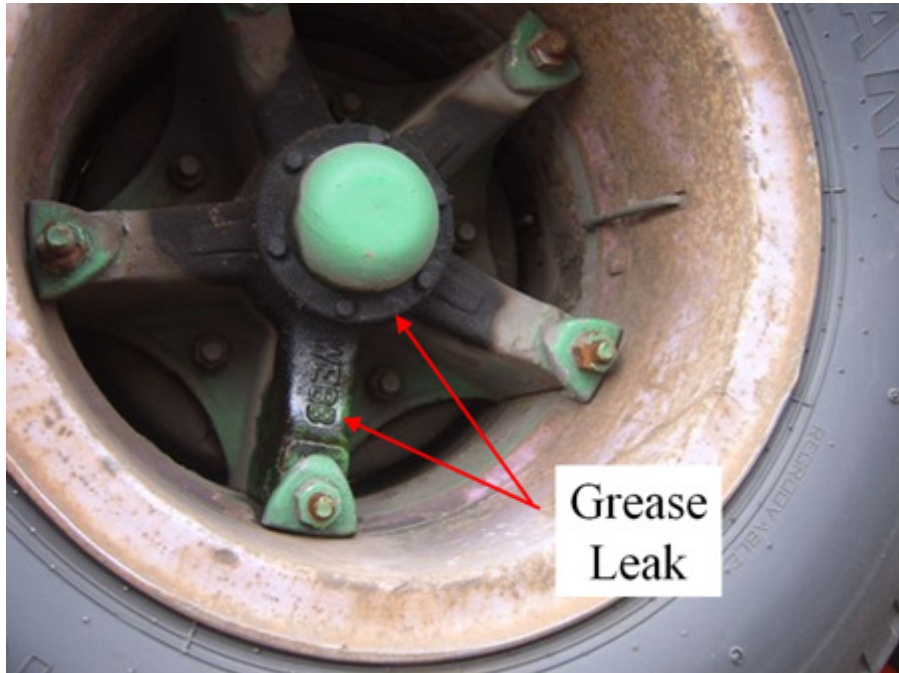


Figure 6 – Grease Leak

Visual inspection of other wheel end items which reveal:

- Brake drums with cracks through wall*, deep score marks, and/or broken out pieces (See Figure 7)

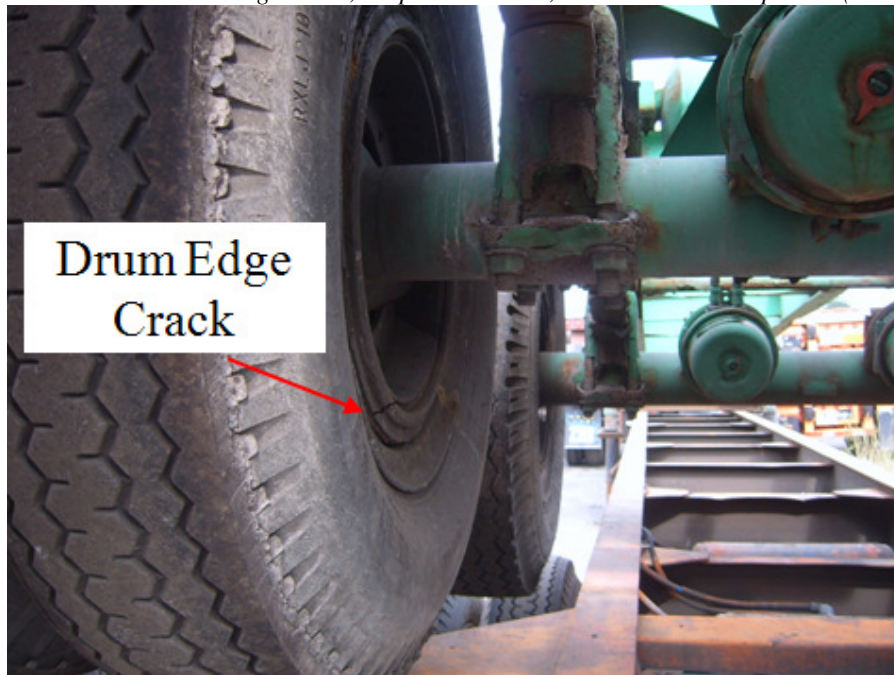


Figure 7

*NOTE: Heat checks [fine cracks on braking surface] are normal and not to be confused w/ through cracks (See Figure 8

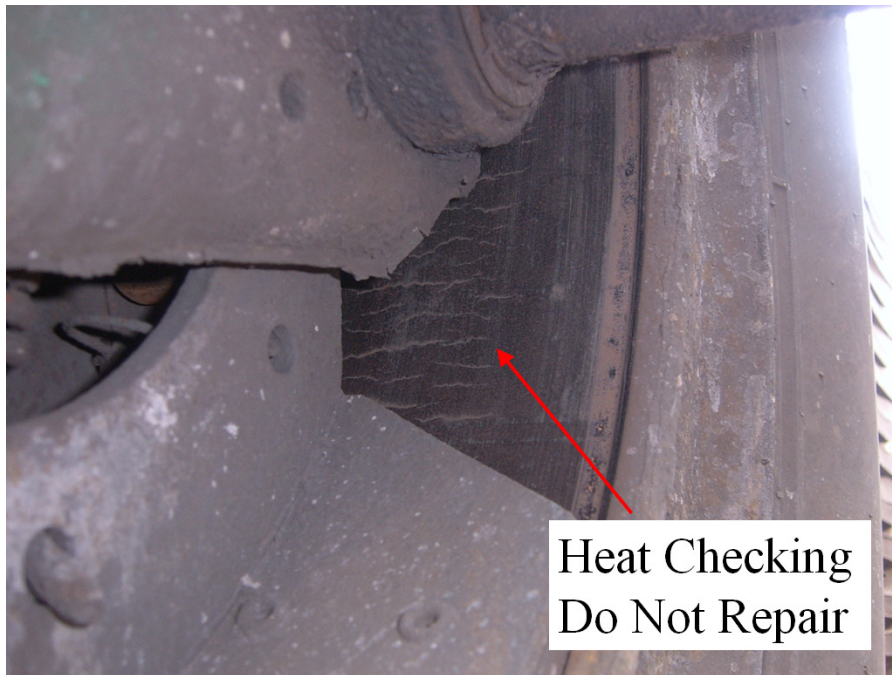


Figure 8

- *Hubcap sight glass which is burnt (on oil bearing seals) (See Figure 9)*



Figure 9



Operational occurrences which including the following

- *Smoking or very hot to the touch hubcaps*
- *Visible wheel wobble/looseness*
- *Wheel noise – grinding, etc*
- *Wheel lock-up*
- *Owner- authorized end-play checks resulting in too much or insufficient wheel end play (outside the .001” to .005” range.)*