

# The Importance of Properly Cleaning the Differential/Banjo Housing

Whenever removing or replacing a differential, an important area of responsibility is the correct cleaning of differential/banjo housing, both internally and externally. An improperly cleaned differential/banjo housing assembly can result in premature failure of the differential.

***It is the responsibility of the technician to ensure that the internal and external differential/banjo housing has been cleaned and inspected sufficiently. This includes removal of wheel ends to clean, inspect, and replace wheel seals.***

## CLEANING FLUID



Has a customer ever asked you why equipment was running low on fluid with no visible exterior leaks?

Any cleaning solution left behind will cause the new lubricant to breakdown prematurely. This causes the oil or lubricant to dissolve at an abnormally high rate. Result is disappearance of fluid causing the operator to run equipment with insufficient fluid level that causes heat damage.

## PARTS CONTAMINATION



The removal of all contamination caused by differential failures is extremely important when cleaning internal banjo housing and axle housing tubes.

It is not uncommon to find parts and fragments of metal from previous differential failures in a banjo housing after a new differential assembly has been installed. It is vitally important that all contamination be removed from banjo housing before installation of a replacement differential.



## EXTERNAL INSPECTION



This is your opportunity prior to installation of differential to replace any required plugs and check the banjo housing for any cracks by using a light focused on the interior, after a good thorough external and internal cleaning. Any light peeking through means a visible crack or hole and will need to be addressed.

***See How to Perform an Oil Crackle Test on Page 2***

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## HOW TO PERFORM AN OIL CRACKLE TEST

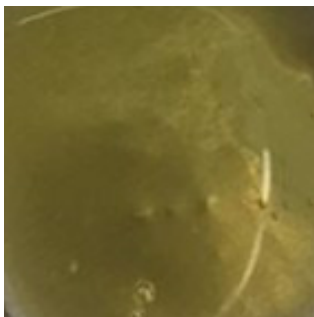
The crackle test is a cost-effective way to identify the presence of water in contaminated oil. There are many variations of what is called the **CRACKLE TEST**.

You will need a surface capable of achieving and sustaining a surface temperature of 380°F (194°C) and a clean container to gather the sample oil. Always keep in mind safety first and review all safety protocols prior to test. Always wear appropriate PPE.

1. Preheat surface to 380°F (194° C)
2. Using a clean uncontaminated container gather your sample.
3. Pour a small amount of the sample on the heated surface.
4. Observe test sample for signs of contamination.

Visible bubbles in the sample confirm water contamination. The size of bubbles will indicate the percentage of contamination. Any water in oil is always a concern. If your test concludes with large bubbles (2mm) or bigger that disappear rapidly, it is very possible that the oil exceeds water contamination limits of .2%. Further testing by an accredited facility may be necessary.

## OIL CRACKLE TEST: Refer to chart below



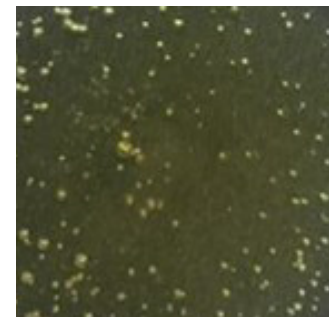
**0 ppm added water:**  
No visible or audible change.  
**Water Content by Crackle Test:**  
0%



**500 ppm added water:**  
Very small bubbles appear.  
**Water Content by Crackle Test:**  
0.05-0.1%



**1500 ppm added water:**  
Moderate bubbling.  
**Water Content by Crackle Test:**  
0.1-0.2%



**2500 ppm added water:**  
Violent bubbling and audible crackling  
**Water Content by Crackle Test:**  
>0.2%