

# **TECHNICAL BULLETIN**

## **SHOCK ABSORBER INSPECTION**

LIT NO: 97117-208

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## **INTRODUCTION**

Low-friction suspensions, such as air, have dramatically changed the shock absorber's role and characteristics. Shock absorbers perform a critical role in dampening suspension oscillation. Properly functioning shock absorbers can help reduce the wear of more expensive suspension components, such as air springs, while assisting in the reduction of tyre wear. Shock absorbers also prevent oscillations that can damage road surfaces, which is why they are usually designed to comply with 'Road Friendly' regulations. On air spring systems, shock absorbers play a secondary role, which is to prevent air spring separation.

Shock absorbers absorb kinetic energy to prevent suspension oscillation. Shock absorbers are also used as rebound stops in Hendrickson air suspensions and limit air spring extension, which prevents the air spring from being over extended and pulled apart. Some severe service application use shock straps, or Auxiliary Rebound Limiter (ARL) straps or chains to limit axle movement during rebound. ARLs prevent air springs from overextending in service and support the suspension while a trailer is lifted. For more details regarding trailer suspension inspection and maintenance, including shock strap or ARL assessment, refer to technical bulletin [97117-161](#).

The purpose of this technical bulletin is to provide a guide to workshop personnel so that they can objectively inspect the functionality of shock absorbers.

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## GUIDE TO INSPECTING SHOCK ABSORBERS

Like most other suspension components, a program of regular scheduled inspections and preventative maintenance for shock absorbers, will avoid unscheduled downtime and reduce overall maintenance costs.

### OVERVIEW OF SHOCK MISTING AND LEAKING

Misting shock absorbers are often misdiagnosed as failures. Shock absorber rod seals rely on a thin film of oil to keep the seal lubricated and in good condition. As the shock absorber extends, some of the hot oil coating the piston rod evaporates before condensing in the cooler outside air onto the shock absorber body.

This forms an oily film on the outside of the shock absorber body. Over time, this film will collect dust and grime, which will often coat the entire body of the shock absorber. Misting is a perfectly normal and necessary function of the

shock absorber. The fluid that disperses through the seal area helps to lubricate and prolong the life of the seal.

Mechanics may find it difficult to differentiate between a misting shock absorber and leaking shock absorber that needs replacing. The images shown below can be helpful in determining shock absorber serviceability.

Heavy-duty shock absorbers have reservoirs that may contain up to a litre of oil. A typical heavy vehicle shock absorber would have to lose more than 10% of its oil volume before damping performance will be affected. Shock absorber upper seals may leak because of extreme wear, contamination, or a defect. A leaking shock absorber will show clear signs of fluid leaking in streams from the upper seal, which may drip from the shock absorber.

If you are unsure about the condition, then raise the chassis to fully extend the shock absorber. The entire shock absorber body may then be inspected without removing it from the suspension.

### SHOCK ABSORBER MISTING AND LEAKING EXAMPLES

Light Misting	Medium Misting	Heavy Misting	Leaking
<p>Light oil film on upper shock body</p>	<p>Medium oil film on upper half of the shock body</p>	<p>Heavy oil film extending to the bottom of the shock body</p>	<p>Oil leak path lines visible on the shock body.</p>
<p>Misting</p>	<p>Misting</p>	<p>Misting</p>	<p>Leaking</p>
<p><b>No action required. Do not remove shock absorber.</b></p>			<p><b>Action required. Replace shock absorber.</b></p>

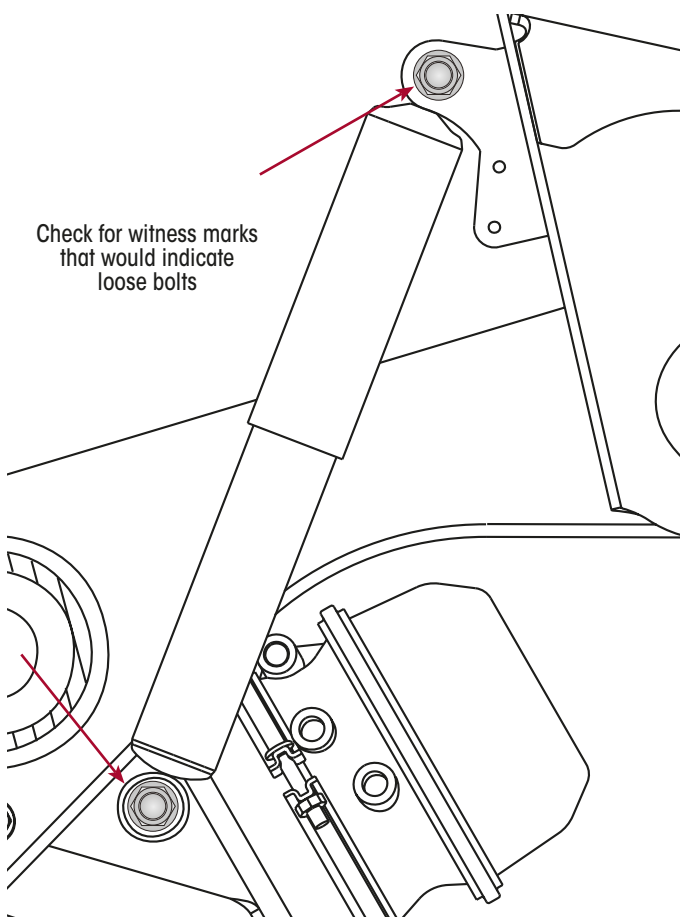
## VISUAL INSPECTION

In addition to looking for oil leaks there are other shock absorber checks that must be carried out regularly.

- Check the mount bolts for tightness and security.
- Check for broken upper or lower mounts.
- Check the mount bushes for wear or deterioration.
- Check for broken or damaged dust shield.
- Check the shock body to see if it is severely dented.

A loose mounting bolt will usually leave witness marks around the mounting bolt washer from the relative movement between the parts.

Fitting the wrong shock absorber, an incorrect ride height setting, or adverse operating conditions without jounce limiting will often cause a broken mount or even internal shock damage.



**Figure 1: Check for Movement Witness Marks**

**NOTICE:** Wipe any built up oil and dust from the shock absorber body after inspection. This will allow you to complete a clearer assessment of shock absorber condition at the next inspection.

## HEAT TESTING

Shock absorbers function at temperatures ranging from ambient to 175 degrees C. A shock absorber's role is to dampen suspension movement by transforming kinetic energy into heat and then dissipating it via the oil. As a result, the shock absorber should be at least slightly warm to touch after normal use, depending on driving conditions.

If ride deterioration is experienced and there is suspicion that a shock absorber has failed internally, which is visually undetectable, perform the following shock absorber heat test:

**⚠ WARNING:** Shock absorbers can reach temperatures sufficient to burn your skin if driven over corrugated roads. Therefore, it is best to check the shock temperature with an infrared thermometer. However, with a little care the temperature can be checked quite simply with the back of your hand. Do not touch the shock absorber if there appears to be excessive heat with your hand near it.

1. Operate the vehicle at moderate speeds for at least fifteen minutes.
2. Within a few minutes of driving the vehicle, check the temperature of the metal frame near the shock absorbers to establish a reference ambient temperature.
3. Check the temperature of each shock absorber on the body below the dust cover or tube. Temperature checks must be carried out quickly, within a few minutes of driving the vehicle.
4. All shock absorbers should be warmer than the vehicle frame. Any shock absorber that is noticeably cooler than the corresponding one on the other side of the axle may have failed. A differing temperature on any axle warrants removal and examination of the cooler shock absorber.
5. To inspect for an internal failure, remove and shake the suspected shock absorber. Listen for the sound of metal parts rattling inside. Rattling of metal parts can indicate that the shock absorber has an internal failure and requires replacement. A shock that presents no resistance when stroked will have lost all oil or have some other mechanical issue.

**⚠ CAUTION:** Do not lift the truck or trailer without the shock absorbers in place. If shock absorbers are not in place, overextension of the air springs will occur. Damage may occur to the overextended air springs.



**CHECKING SHOCK ABSORBERS BY HAND**

Removing shock absorbers to check their movement by hand is not a generally recommended procedure.

Heavy vehicle shock absorbers are difficult to check accurately by hand. If the shock has been removed from the vehicle, it is possible to extend and compress the shock to check for smoothness of movement. A shock absorber that has leaked out sufficient fluid will have erratic movement as it is extended, but by that stage, this fault will also be evident from the amount of oil around the shock body.

Different shock absorbers have differing rates of movement depending on design. It is also not possible to move a heavy vehicle shock absorber by hand with the same force that is exerted on it when fitted to the vehicle. This means that oil flow around the shock piston will be different when checked by hand to that when fitted to the vehicle.

All Hendrickson shock absorbers are dual acting. However, a truck shock absorber will usually compress easily, while the rebound is firm. On the other hand, a trailer shock absorber will usually be firm on both compressing and rebound strokes. However, this depends on the manufacturer and intended suspension application.

**Fastener Tightening**  
Shock bolts must only be tightened and torqued at the specified suspension ride height.

**NOTES**

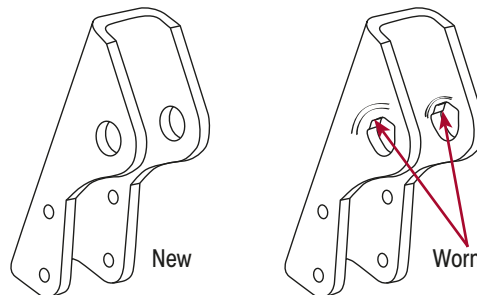


Figure 2: Inspecting Shock Bushes & Mounts

Damage to mounting holes by a loose shock absorber bolt must be replaced or repaired. Otherwise, it may cause the new shock absorber to also come loose. Refer [Figure 2](#).

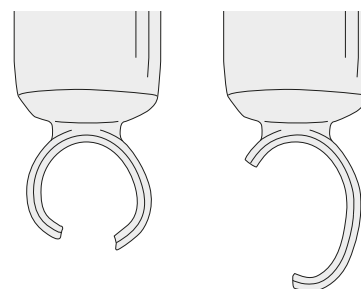


Figure 3: Checking for Damaged Mountings

Incorrect ride height, fitting the wrong shock absorber and deteriorated shocker bushes can cause damage to shock absorber mountings. Refer [Figure 3](#).

Some applications require installation of shock straps or separate Auxiliary Rebound Limiters (ARL). For details regarding inspection of trailer suspensions, shock straps or ARL refer to technical bulletin [97117-161](#).

**REVISIONS TABLE**

DATE	REV	PAGE	DESCRIPTION
Apr-2017	B	ALL	Update document format. Expand Misting, Heat Testing and Checking sections.
Jul-2022	C	All	Minor editing for clarity and consistency.

*Actual product performance may vary depending upon vehicle configuration, operation, service and other factors.  
All applications must comply with applicable Watson & Chalin specifications and must be approved by the respective vehicle manufacturer with the vehicle in its original, as-built configuration.  
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