

## Electric Power Steering Diagnosis

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Topic number	LI46.35-N-076604
Version	1
Function group	46.35 - Electrical steering
Date	7/11/23
Validity	Model 447 Model 907 except code ZG1 (Engageable all-wheel drive) and except code ZG3 (Engageable all-wheel drive with transmission ratio)
Reason for change	

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### Complaint

Various concerns in relation to electric power steering including Rattling/humming noise from electric power steering when steering fully turned (see video recordings 01 and 02).

Attachments	
File	Description
<a href="#">01.mp4</a>	Noise on underbody from electric power steering when steering fully turned.
<a href="#">02.mp4</a>	Noise in vehicle from electric power steering when steering fully turned.

### Cause

1. Check vehicle history for repairs in relation to front of vehicle or wheel damages
  2. Inspect wheels, suspension and steering gear for damages as shown in example pictures below.
  3. If no physical damages are found during inspection, pull the boots back to inspection for signs of corrosion/water or damages.
- If the presence of water is found inside the boots or rack, in combination with no physical outer damage, this is a sign of the vehicle being used in high water situations and will not be warrantable.

#### NOTE:

- Please review AH46.20-P-9409-01A for vehicles that have been in an accident
- Please review AP46.00-D-4650TS Check condition of steering mechanism
- Please review attached Steering Gear Diagnosis presentation from 2021 NDTD

Ball screw drive (KGT) of electric power steering damaged by:

- External force due to:
1. Hitting a curb or post with the front wheels.

# XENTRY TIPS

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2. Driving over obstacles (e.g. pothole/ threshold/ speed bump/ gully) at an inappropriate speed.

• Corrosion / water ingress due to damaged boot:

1. Cracks (see picture 03).



2. High pressure cleaner (see picture 04).



3. Animal bite (see picture 05).



4. Defective retaining clamp (see picture 06).



Attachments	
File	Description
<a href="#">03.jpg</a>	Corrosion / water ingress due to damaged boot (cracks).

# XENTRY TIPS

<p><a href="#">04.jpg</a></p>	<p>Corrosion / water ingress due to damaged boot (high pressure cleaner).</p>
<p><a href="#">05.jpg</a></p>	<p>Corrosion / water ingress due to damaged boot (animal bite).</p>
<p><a href="#">06.jpg</a></p>	<p>Corrosion / water ingress due to damaged boot (defective retaining clamp).</p>
<p><a href="#">Steering Gear Diagnosis NDTD2021.pdf</a></p>	<p>Steering Gear Diagnosis- NDTD2021</p>

WIS-References		
Document number	Title	Note
AH46.20-P-9409-01A	Evaluating steering gear when repairing accident vehicles	all models
AP46.00-D-4650TS	Check condition of steering mechanism	all models

## Remedy

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# XENTRY TIPS

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**Note:** The replacement of component parts (I.E. replacement of electric power steering) or the invoicing of material costs or wage costs through warranty or goodwill in combination with any improper use of the vehicle or any external damage is not permitted.

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1. Replace electric power steering.

**Information:** See AR46.20-S-0500E for model 447 with engine 274

See AR46.20-D-0500TS for model 907 except code ZG1 (Engageable all-wheel drive) and except code ZG3 (Engageable all-wheel drive with transmission ratio)

WIS-References		
Document number	Title	Note
AR46.20-D-0500TS	Remove/install steering gear	Model 907 except code ZG1 (Engageable all-wheel drive) and except code ZG3 (Engageable all-wheel drive with transmission ratio)
AR46.20-S-0500E	Remove/install steering gear	Model 447 with engine 651, 654.9 except code ZG2 (Permanent all-wheel drive) Model 447, 448 with engine 274

Symptoms
Chassis/suspension > Noises > Humming/droning/throbbing
Chassis/suspension > Noises > Vibrates
Chassis/suspension > Noises > Grunting
Chassis/suspension > Steering system > Noises > Chattering/knocking
Chassis/suspension > Steering system > Noises > Humming/vibrations

Parts						
Part number	ES1	ES2	Designation	Quantity	Note	EPC
-			Additional necessary replacement part scopes, small parts, workshop equipment or consumable materials must be replaced according to the information in the repair documents referred to in this document. These are to be determined according to the vehicle identification number (VIN) through the XENTRY Portal Parts Information system.	1		X
-			Additional necessary replacement part scopes, small parts, workshop equipment or con-	-		X

# XENTRY TIPS

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		sumable materials must be replaced according to the information in the repair documents referred to in this document. These are to be determined according to the vehicle identification number (VIN) through the XENTRY Portal Parts Information system.		
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## Operation numbers/damage codes

Op. no.	Operation text	Time	Damage code	Note
			4648638	Rack-and-pinion steering sealing boot – loose Note: Only for the case that the customer complaint does not involve any improper use of the vehicle or external damage. The listed damage code is not to be considered as an acceptance of costs. The general guidelines in the Warranty Manual apply.
463013	Replace electric power steering	---		Information: Model 907
463406	Replace electric power steering	---		Information: Model 447