

# PROBLEM *Solver*<sup>™</sup> BULLETIN

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## Inner Tie Rod Failure

General Motors Full Size Pickup Trucks and SUVs, including Hummer H2

### PROBLEM:

#### Inner tie rod failure

- Application: General Motors full size pickup trucks and SUVs with relay rod and R&P style inner tie rod assemblies.
- Inner tie rod end Belleville preload spring shatters under load. Loss of socket assembly preload causes excessive deflection (sideways "play" or movement), resulting in loose steering, misalignment and poor handling.



A disassembled failed OE part reveals a shattered spring

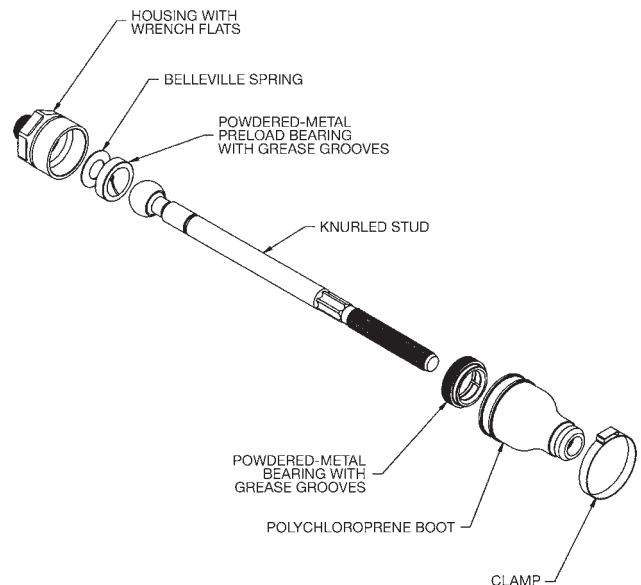
Description	Year	Make/Model	Replacement Part Number
Inner Tie Rod	1999-2000	Silverado 2500/Sierra 2500 2WD	ES3489
	2000	Suburban 2500/Yukon XL 2500 2WD	
Inner Tie Rod	2002-2006	Chevrolet Avalanche 1500 2WD/4WD	ES3488
	2002-2003	Chevrolet Avalanche 2500 2WD	
	2002-2006	Chevrolet Avalanche 2500 4WD	
	2002-2006	Cadillac Escalade 2WD/4WD	
	2002-2006	Cadillac Escalade Ext. 4WD	
	2003-2006	Hummer H2	
	2000-2006	Chevrolet Suburban, Tahoe 1500/2500 2WD/4WD; GMC Yukon & Yukon XL, Denali 1500/2500 2WD/4WD	
	2001-2006	Chevrolet Silverado 2500HD/3500HD 2WD/4WD; GMC Sierra 2500HD/3500HD 2WD/4WD	
	2001-2007	Chevrolet Silverado 2500/3500 2WD; GMC Sierra 2500/3500 2WD	
	1999-2007	Chevrolet Silverado 1500 4WD GMC Sierra 1500 4WD	
	2001-2003	Chevrolet Silverado 1500 Crew Cab 2WD; GMC Sierra 1500 Crew Cab 2WD	
	2005-2007	Chevrolet Silverado 1500 Crew Cab w/153" Wheel Base 2WD	

### SOLUTION:

#### MOOG® ES3489 and ES3488 Inner Tie Rod



- Through FEA (Finite Element Analysis) modeling, MOOG® engineers were able to identify housing and spring design issues causing the OE failures. MOOG-specified housing and Belleville washer design eliminates spring bind and shattering during shock load.
- Hardened powdered-metal bearings provide a smooth, durable surface for extended service life.
- Grease grooves in front and rear bearings ensure proper flow of lubrication to bearing surfaces.



THE PROBLEM SOLVER™

