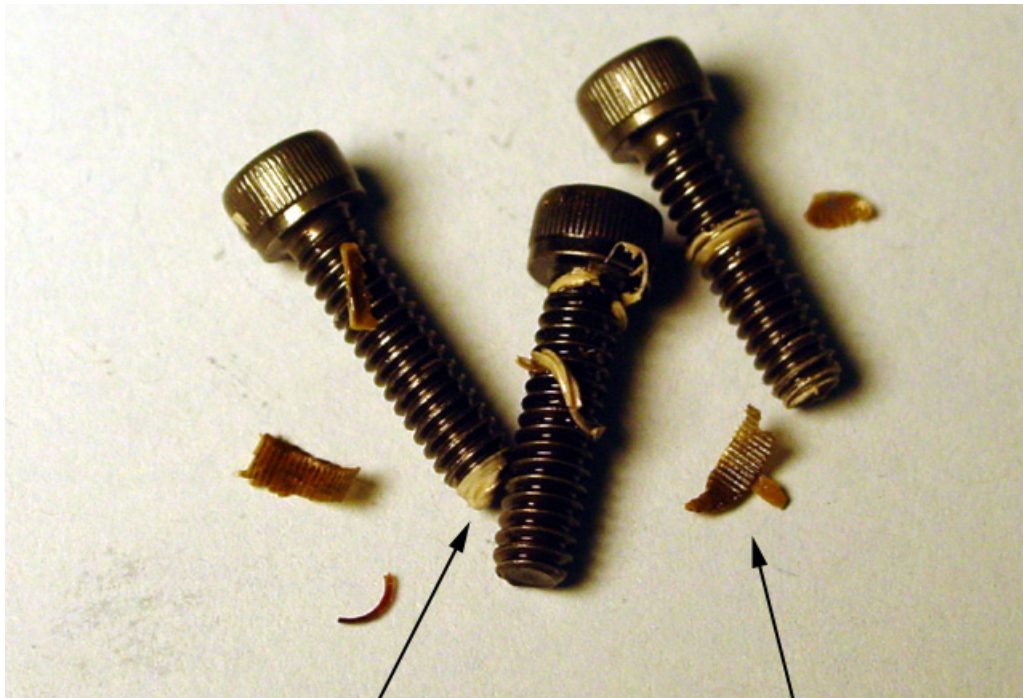


Woodward **Type MR and MRC** Power Steering Rack



Mistakes to avoid

Excessive use of sealants and threadlocking adhesives can cause damage far out of proportion to their benefits. Be especially careful not to get sealant into a blind hole as it will interfere with the screw just as if the hole were too shallow.



Silicone on end of screw

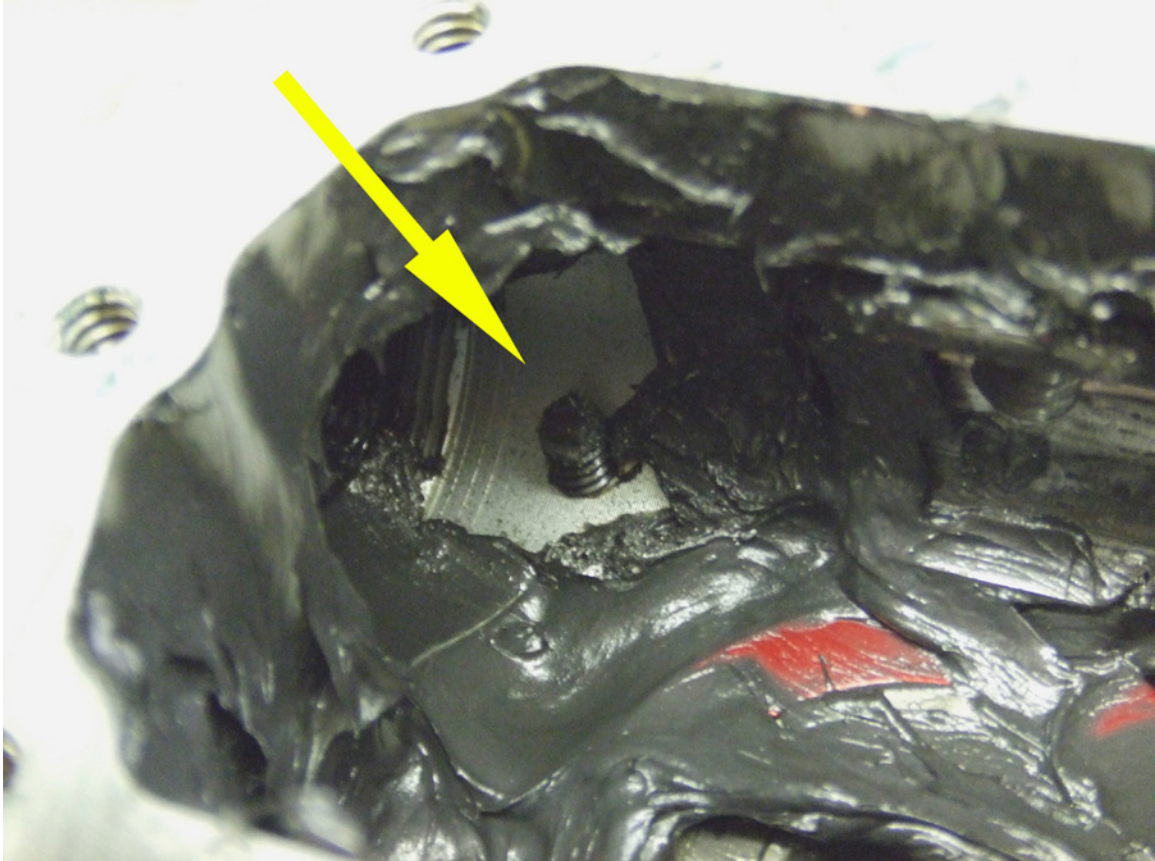
Threadlocking compound

Sealant and threadlocking adhesive on one of the screws in a servo housing filled the bottom of the hole. When the screw was tightened it created hydraulic pressure at the bottom of the hole and cracked the housing.

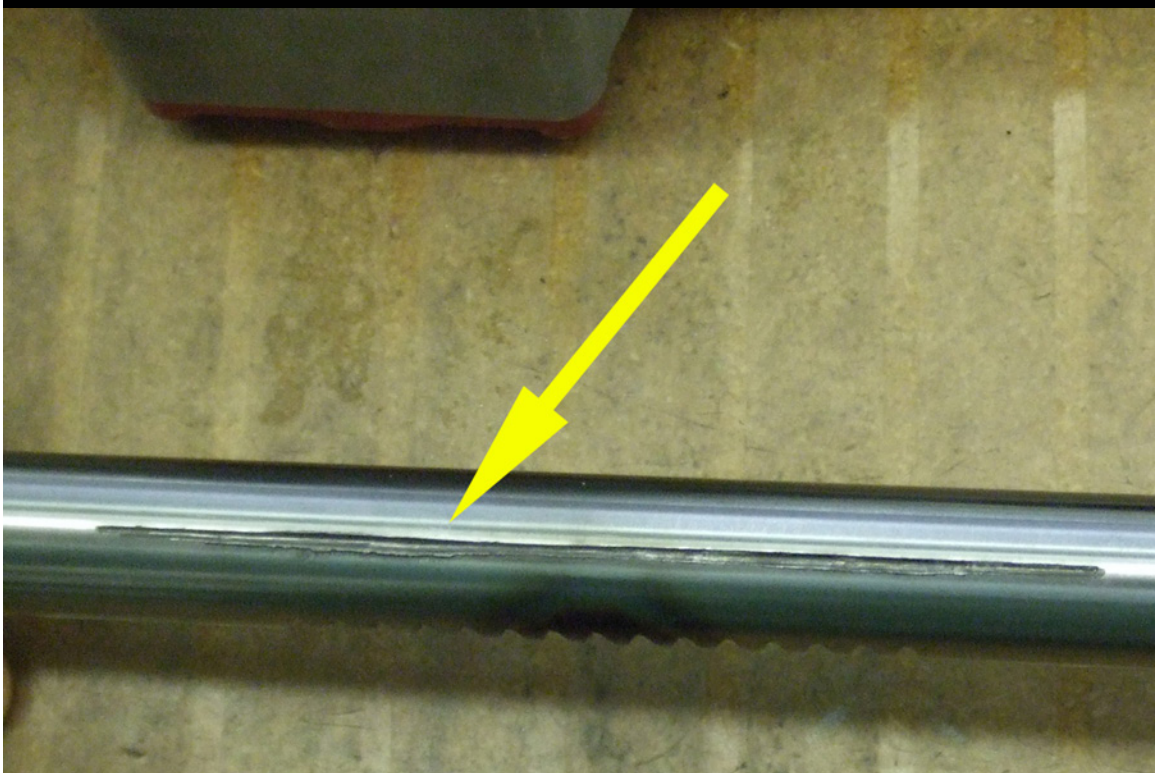


Found inside hydraulic circuit

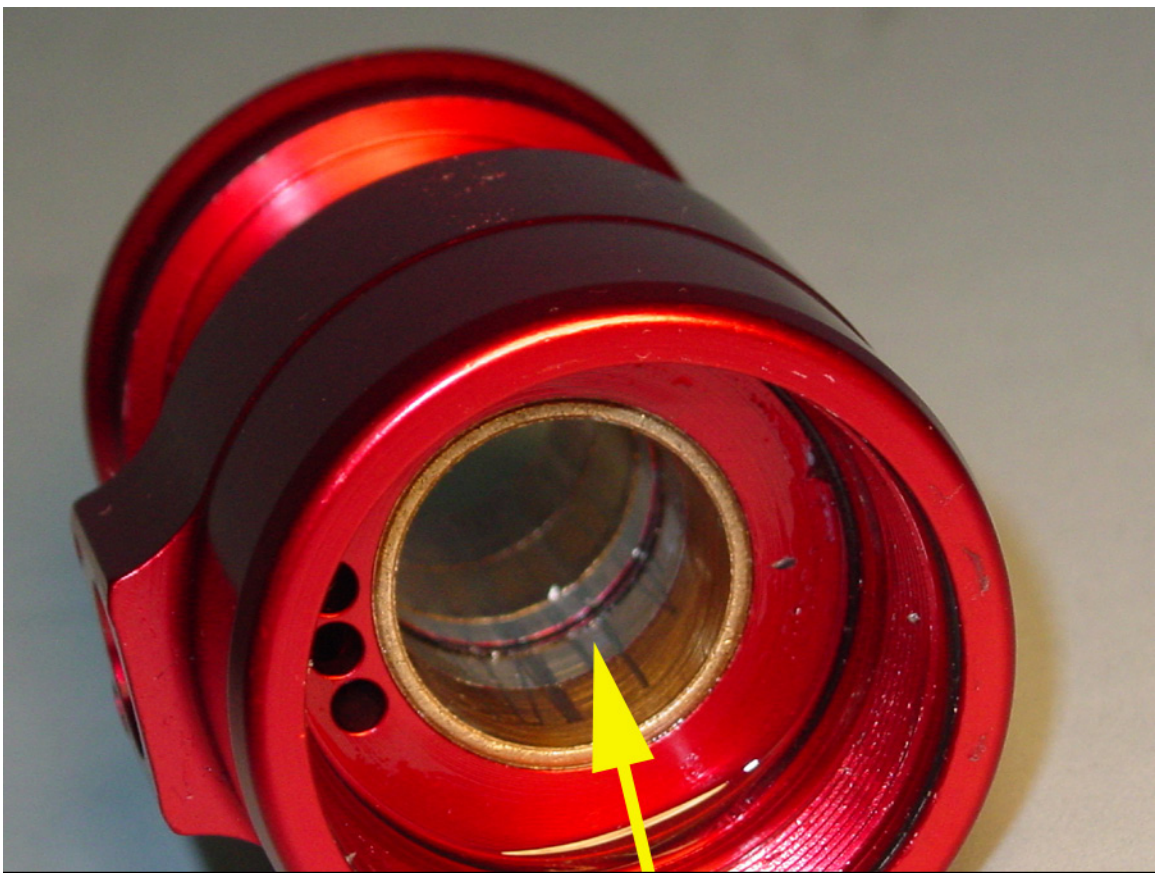
Leak-stop compounds are useless in high-pressure hydraulic systems. As a general rule, leakage must be corrected; it cannot be patched. Materials introduced into hydraulic fluid may react in unpredictable ways, forming a gel or precipitating out as a solid. Neither condition is helpful to precision metering orifices.



Customer substituted screws which were too long and extended into the housing far enough to contact the rackshaft. Note the steel particles, magnetized by the tremendous friction, radiating from the end of the screw.



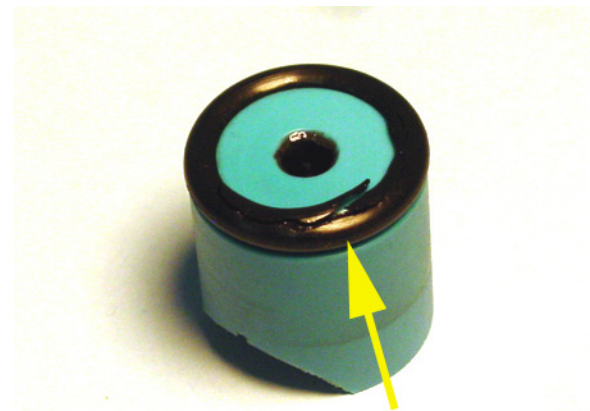
Groove machined into a hard chrome rackshaft from a protruding screw. The power steering overcame the added resistance, but over a six-hour period the driver complained that the steering lacked sensitivity. Note that the groove stops just short of the cylinder seal, otherwise the defect would have become immediately and spectacularly obvious...



Careless handling of a rackshaft, attempting to install a cylinder end over burrs left by a wrench. The seal groove is damaged and the part is scrap.

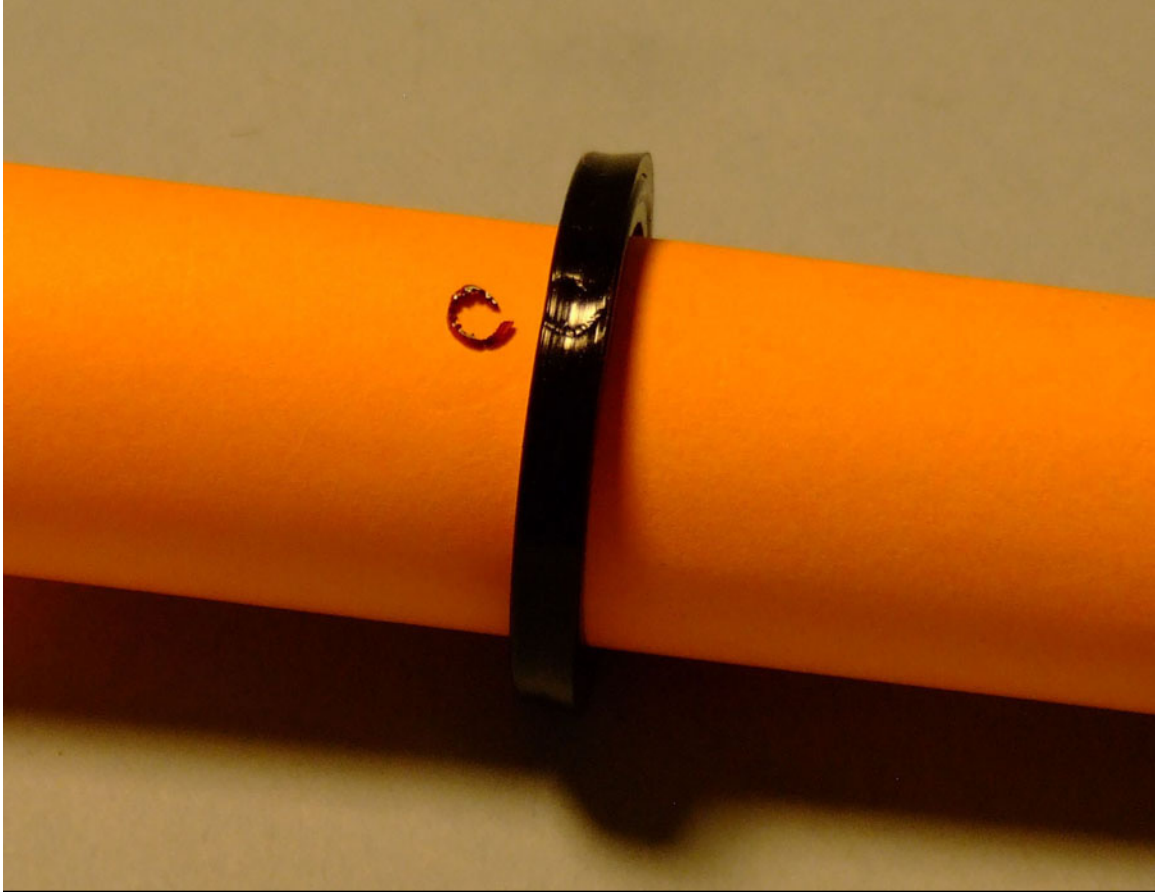
MC and MRC steering racks should not be treated as “auto parts.” Although in operation they are capable of high force, on the bench the parts are revealed as generally smaller and lighter than automobile parts and they should be handled with appropriate care. The design intent of this type of steering is to provide a direct and unfiltered connection between the driver and the tire patch, and in order to do this its mechanical parts must move freely.

Before arbitrarily tightening a nut or screw or otherwise applying force during assembly or adjustment, read the instructions.



Crushed from overtightening

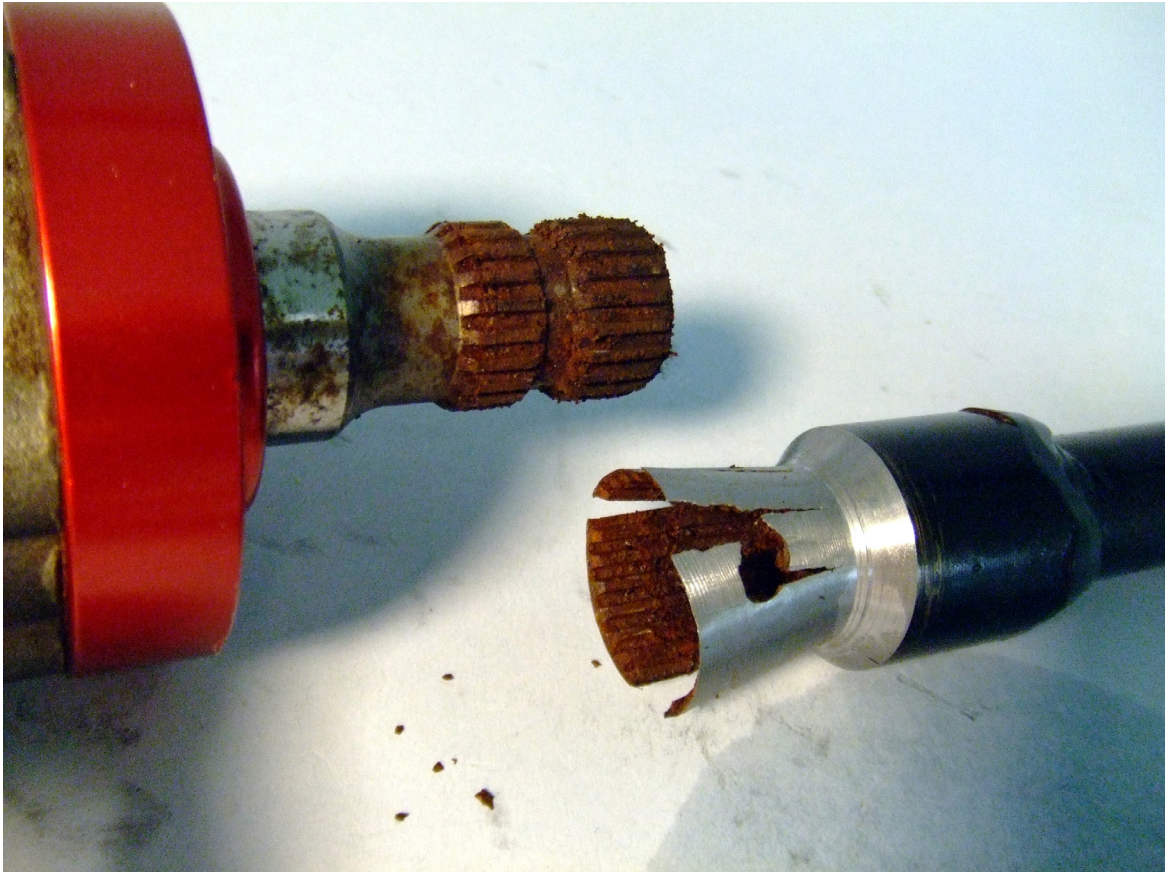
The snubber in an MR or MC rack is a backstop to counteract the separating force of the gear teeth. It is not intended to create preload or adjust backlash.



Debris in seal groove. Note the piece did not quite extend across the lip of the seal, which allowed it to function problem-free for an entire season. The seal material is 90 durometer Hallite urethane.



Soft, unreinforced, non-vacuum-rated hose used on the intake side of a power steering pump. Pump suction stripped the inner layer and forced it through the system. This did not significantly reduce flow through the servo but jammed it mechanically.



Components under mechanical stress without lubrication, even in static, non-moving connections, are subject to greatly accelerated rust. To prevent fretting or stress corrosion, always apply anti-seize compound or grease to splined joints. To remove a seized joint with stripped screws it may be necessary to machine away one of the components as shown here. If carefully done, the more expensive part can be rescued.

