

When Clean is Too Clean

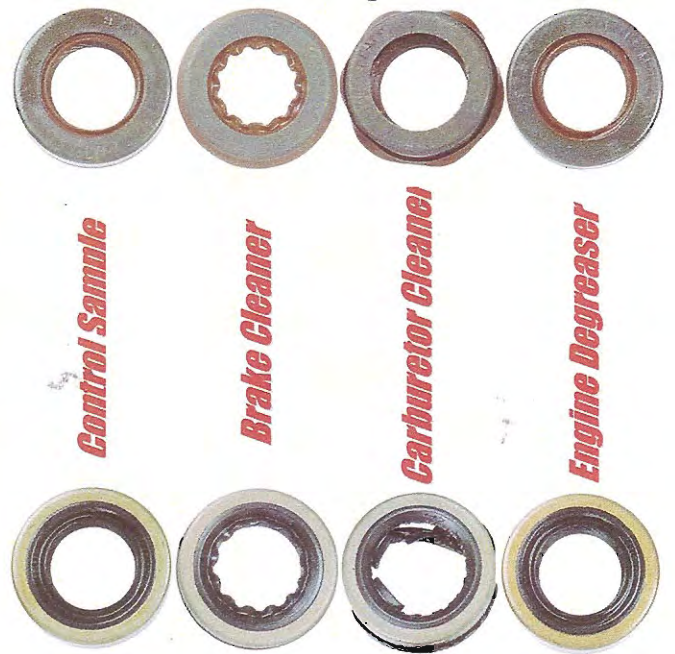
A Customer Concern

Recently, a service dealer called his CARDONE sales representative, concerned that his steering warranties were around 20-25%. The issue was escalated and the customer was contacted in order to learn more and possibly eliminate the root causes of the problems. It was found that the technician uses a reliable, national brand of power steering fluid that meets CARDONE criteria (see article "Not all power steering fluids are created equal"), while also flushing with new fluid and bleeding the system every time. However, the technician also mentioned that he uses brake cleaner to wash out all the debris and build-up from the inside of the power steering lines/hoses. This off-the-cuff statement led to further investigation into common automotive cleaning chemicals and the potential effects they could have on the steering system.

Brake Cleaner, Carburetor Cleaner & Engine Degreaser

Brake cleaner was specifically mentioned above, but carburetor cleaner and engine degreaser were additionally explored, as all three are common cleaning chemicals that are found in all parts stores or on a shop shelf.

Rubber components in a steering system are either Viton or BUNA material; therefore seals of both compositions were spray tested at 100% concentration. Both the brake cleaner and carburetor cleaner began to swell 15 minutes after exposure; however the engine degreaser had no visual change. The seals were then soak tested for 24 hours in 100% concentration, and further degradation occurred (see pictures at right). The results of the brake cleaner and carburetor cleaner are both undeniable, but the engine degreaser did not cause damage, as significant, to the rubber.



Testing continued with the presumption that the chemicals will not remain at full strength when power steering fluid is added to the system, as in the case where the hoses are sprayed out. Therefore new seals were soak tested for 72 hours in a 10% chemical to 90% power steering fluid mixture. Results were not as dramatic as shown in the swelling and tearing above, but the hardness of the rubber did degrade. In a power steering system, where dynamic function is key to retain the fluid during all ranges of heat, flow and pressure, even small changes in the rubber integrity will cause leaking and premature failure.

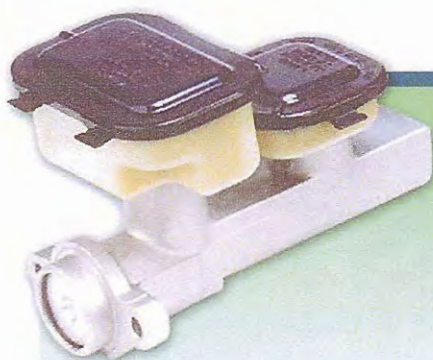
The Aftermath

The seals seemed to react well against the engine degreaser, but visual appearance is not a viable analysis method, so additional testing will be performed to analyze if any long-term effects occur.

It is understandable that technicians would use brake cleaner and/or carburetor cleaner as a method to clean the system, as both are sold in every parts store across the country, and are known to remove grease and grime better than anything else. However in an attempt to

"do some good" the end result is the exact opposite. Therefore, the best advice is avoid all chemicals completely and simply use the old-fashioned power steering flushing method to remove contaminants from the system, as it will avoid introducing foreign elements into the system.

SLASH BLEEDING TIME with **CARDONE's** new **Bench Bleeder Tool!**



CARDONE's new **Master Cylinder Bench Bleeder**

The next time you purchase our new or reman master cylinders, try CARDONE's new Master Cylinder Bench Bleeder. This new tool cuts bench bleeding time in half and is a more effective way to purge the system of unwanted air. Our new bleeder tool allows you to move more cars through your shop with fewer comebacks.

The **CARDONE Service Plus Bench Bleeder** tool is easy to use:

1. Extract brake fluid from the reservoir.



2. Insert the tip of the bleeder into the port of the master cylinder.



3. Push the brake fluid into the port with the tool.



Repeat the above process to ensure all air has been completely bled from the master cylinder.

Part # 10-5000MCB



Not All Power Steering Fluids Are Created Equal

Having trouble with power steering pumps failing prematurely? Not sure why? We might have a simple answer for you – power steering fluid. Read on, you might be surprised.

The Elusive Problem

Recently, a service dealer called CARDONE's Technical Hotline regarding a premature failure issue with power steering pumps. Because CARDONE's foundation is built on delivering quality products, they were determined to get to the bottom of the issue and sent two engineers to the shop to find out what was going wrong and why. After three days of replacing multiple pumps, hoses, a rack and pinion, and basically rebuilding the customer's entire steering system, the replacement pump was still running noisily and operating at close to 320° (normal operating temperature is around 180°). Through process of elimination, they eventually replaced the power steering fluid with another brand, and the pump ran beautifully. This led to an in-depth investigation on why fluid brand makes such a difference in pump performance.

The Testing Process

During extensive lab and on-car testing, CARDONE engineers learned that there are many substandard power steering fluid brands on the market that lack the additives necessary for proper lubrication of the pump. More specifically, additives such as viscosity improvers, friction modifiers and anti-foaming agents are not present. Use of a substandard fluid eventually causes the steering system to overheat and the pump bushing to break down. At this point, the pump no longer holds pressure, which results in a total loss of assist. In fact, during the testing process, pump failure due to substandard fluid was recorded in as little as 20-30 minutes after installation!

The Solution

So what power steering fluid should you use? For complete system replacement and top offs, refer to the vehicle manual or an OEM vehicle information system



(Mitchell's, Alldata, etc.) to find the recommended fluid for your application. A fluid that meets OEM standard typically has specific application information printed on the label. A general statement claiming the fluid meets OEM requirements DOES NOT guarantee good fluid quality. Currently, there are no API (American Petroleum Institute) standards established for power steering fluid, which is why there are so many questionable brands out there. The only standards you can trust today come from the OEM.

The Results

Service Dealers who switched to a recommended power steering fluid greatly improved their customer satisfaction and reduced their number of comebacks. If you are uncertain of your power steering fluid quality, refer to CARDONE's list of recommended fluids and part numbers at cardone.com under the A1 CARDONE Steering section. The fluids listed there have undergone independent lab testing to determine their lubricating qualities and additive packages. Not all fluids have been tested yet, so check back often to review any updates as additional fluids are tested and found to meet the minimum standards.

CARDONE

CARDONE Industries
5501 Whitaker Ave.
Philadelphia, PA 19124-1799
cardone.com

Product Description:	Part Number:
Advance Power Steering Fluid	A260
Autoguard Power Steering Fluid	701127
Autozone Power Steering Fluid	AZPSF-32
Berkebile 2+2 Power Steering Fluid	B-1502
BG Power Clean Power Steering Fluid	332
CARQUEST Power Steering Fluid	57000, 57032, 57690
Castrol GT Power Steering Fluid	492
Champion Power Steering Fluid	4900K
CRC Power Steering Fluid	5341
Ever-wear	NA
Gunk Power Steering Fluid	M2732
Granitize Power Steering Fluid	AD-77
Havoline Power Steering Fluid	221806
Johnsen's Power Steering Fluid	4610
McKay Power Steering Fluid	50503, 50504, 50506
MOC	01231
NAPA Power Steering Fluid	9832
O'Reilly Power Steering Fluid	72813
Parts Master Power Steering Fluid	70-953
Parts Plus Power Steering Fluid	3390
Penray HD	3912
Penray Premium Power Steering Fluid	3964
Prestone Power Steering Fluid	AS-261
Pyroil Power Steering Fluid	PSF-32
Sta-Lube Power Steering Fluid	SL2631, SL2633, SL2641
STP Power Steering Fluid	NA
SuperTech Power Steering Fluid	NA
Super X Power Steering Fluid	404
Valucraft Power Steering Fluid	VCPSF32
Valvoline Max-Life Power Steering Fluid	VV335
Wynn's Power Steering Fluid	61904BT

CARDONE established fluid standards using OE fluid specifications and on-car test results. All power steering fluids have not yet been tested. The current list will be updated as additional fluids are found to meet the minimal standards. If your fluid does not appear in the recommended list, please call (215) 912-3587 for further details.