

# **Comparing Eight Oil Filters for the Fiat Sport Spider 1967-1985**

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## **Foreword**

I'm not an engineer of any sort, let alone an engine lubrication expert, but several oil filter comparison tests posted on the Internet for muscle and other cars prompted me to do a comparison of the oil filters used on the 1967-1985 Fiat Sport Spider.

There are two general sizes of filter used on this car; the "large" fits all Spiders except those with air conditioning, the "small" fits not only air-conditioned Spiders, but many other cars, including nearly all Alfa Romeos. It seems to me that one should use the largest filter that will fit, because:

- the larger can should house more filtering media
- bigger can means more engine oil capacity
- external spin-on filter also acts as oil cooler

So I'm disappointed that several Fiat-specific vendors offer only the smaller filter for our cars. As you will see, the larger can does not necessarily equate to more filtering media, but the filters I've subjectively judged the best are all the larger size.

You will also note that there is no mention in this comparison of the filtering ability of the various manufacturers' media. I don't have the ability to test this.

## Measurements

Eight oil filters were purchased anonymously for this comparison. All have paper elements and an anti-drainback flap. The anti-drainback feature is important in applications where the filter is mounted horizontally or upside-down, to prevent the filter contents from draining back into the crankcase when the engine is switched off. Without this feature, each cold start is a dry start, as the filter must first fill before oil can circulate thru the engine. The anti-drainback feature is not required in the Spider application, since the filter is mounted with the base plate Up.

**Part Number** is of the filter recommended by the selling vendor or his filter catalog, and is the one examined.

**Overall weight in grams** is the weight of a new, unused filter, including gasket.

**Element size** is diameter x length in millimeters of the filtering medium housing. Some elements nearly consume the entire space within the can; others leave a lot of room for the oil. Remember that the oil enters through the small holes around the circumference of the end plate, is forced through the media, and exits to the engine through the 3/4" threaded hole. I would imagine that the greater volume of prefiltered oil would better equalize the pressure on the media, providing more uniform filtration and a longer-lasting filter.

**Pleat size** is given as height x depth in mm. It would seem that, all other things being equal, for a given total pleat surface area, the shallower pleat would be preferable to a deeper one, providing less resistance and more uniform dirt loading.

**Pleat pitch** is the distance, in millimeters center-to-center, of the individual pleats. It would seem that the greater the pitch, *i.e.* the more distance between pleats, the better.

**Filter square inches** I believe is the most important spec in the table. I would imagine that the more surface area available for filtering is better, all other things being equal.

**Media weight** is the weight in grams of 10 in<sup>2</sup> of new media. I have no idea if this is relevant, but here's the data.

**Number of inlet holes, their diameter and total inlet area in mm<sup>2</sup>** are the next two entries. I guess that the filter designer must calculate a certain inlet area vs. filter media area to ensure the correct velocity through the media.

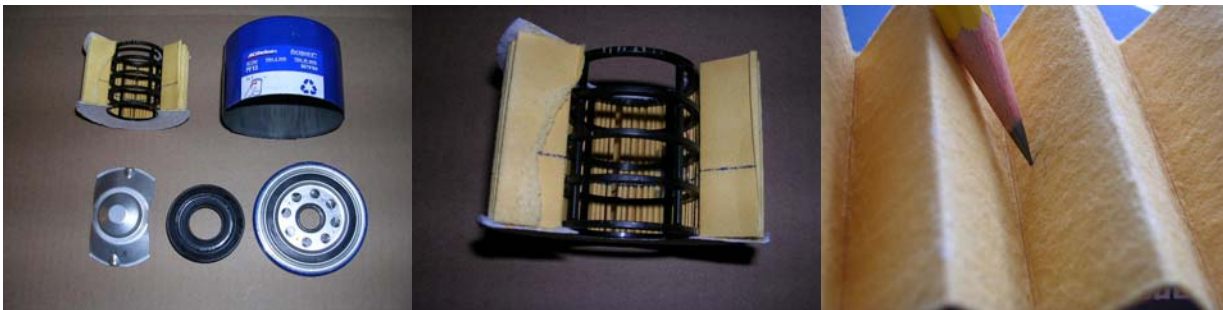
**Bypass pressure**, in Bar, is the psi required to open a spring-loaded valve or move the entire filtering element. When the oil is thick and cold, or when the filtering media has reached capacity, the filter must have a mechanism to allow the oil to circulate around the media. Remember that in a "full flow" system such as ours, 100% of the oil pump output first goes directly to the filter. Without a bypass, in the conditions described above, the engine would starve of oil or the can would burst, etc. I don't know what the Fiat spec was for this engine, but it would be interesting to know. If the bypass opens too soon, then unfiltered oil is circulating unnecessarily. If the filter bypass psi is too high, then oil volume is compromised, as the oil pump cannot overcome the bypass setting. The two Italian filters here are 1.0 and 1.2 Bar, so I'm inclined to target this range when looking at aftermarket filters. Two domestic filters also have an identical spec of 0.55 bar; I'm wondering if their filter was originally designed for a different vehicle, or for use in hydraulic lines, etc.

A **button** bypass is my term for a round, spring-loaded valve in the bottom of the filter element. It seems to me that this is the better way to perform the bypass function than moving the entire filter element against a large spring. The round button acts as an overflow to relieve excess pressure, rather than the "all or nothing" action of moving the element. The four filters with this feature are visible in the last photo.

	AC/Delco	Clean	Fram	Mann	“OEM”	Purolator	UFI	Wix
origin	USA	Italy	USA	Germany	China	USA	Italy	USA
p/n	PF13	DO 224	PH7	W920/21	OF1002	L20020	2312700	51189
dia. x ht.	92 x 98	<b>107 x 113</b>	108 x 106	93 x 95	93 x 95	108 x 101	96 x 96.5	108 x 99
overall weight	298	582	520	456	416	618	494	<b>676</b>
element size	86 x 55	<b>87 x 81</b>	76 x 101	84 x 69	86 x 84	101 x 72	67 x 90	62 x 103
# pleats	59	75	54	69	55	78	68	<b>88</b>
Pleat H x W	55 x 38	<b>80 x 40</b>	52 x 72	60 x 40	55 x 40	42 x 63	60 x 38	50 x 50
pleat pitch	5	3	<b>5</b>	4	2-6	2.5	4	3
filter in <sup>2</sup>	191	<b>372</b>	202	257	188	320	240	341
media 10 in <sup>2</sup>	1.315	0.820	1.248	0.778	0.883	0.985	0.833	0.888
inlet #/diameter	8/8.0	8/5.8	8/6	4/7±	8/5.9	8/7	8/6.3	6/7.8
total inlet area	40.2	21.1	22.6	15.4	21.9	30.8	25	28.6
bypass pressure	n/a	1.0	0.83	0.8	n/a	0.55	1.2	0.55 - .76
button bypass		✓		✓	✓		✓	

## Results

**AC/Delco PF13** is a small, inexpensive filter. Second-smallest in filter area, it also suffers from a plastic media support which can be deformed by finger pressure. The pleats are lightly glued to plastic end caps, and are easily stripped free. Additionally, the media itself is unique among those tested in having the reverse side smooth and hard. All other filters tested had the same surface front and rear. You can probably get one virtually anywhere in the USA, but I certainly wouldn't go shopping for one.



**Clean Filters** are designed and manufactured by Delgrosso in Turin, Italy. This family-owned business has been manufacturing automotive filters since 1960, and is still privately-held. The DO 224 is the filter that I will be using in my Spider from now on. The inner element is the longest of any filter tested, the pleats are shallow, there is a great amount of reserve capacity of pre-filtered oil, the filter is equipped with a button-type bypass, the gasket is very thick, and all components are steel. Available from IAP and elsewhere.



The **Fram** PF7 has the smallest filter area of the four “large” filters measured, smaller even than several “small” filters. The element has cardboard end caps. Only it and the AC/Delco do not use steel element housing. The filter does have a unique base plate design that diffuses oil upon entering the can, perhaps to relieve the stress on the cardboard element.



**Mann** filters are made in Germany and sold here by Beck-Arnley, among others. Very sturdy appearance, pleats well-secured against element, nice even pleat pitch. Button bypass, textured media, and the best-fitting gasket of the bunch. Good specs for its small size. At the time of this comparison, the most-expensive filter of the group.



“OEM”, a clever sophism, as the name of this Chinese company is “Original Engine Management”. OEM’s website boasts that their 34 SKUs cover 94% of popular cars and trucks, and that they are “competitively priced”. Not what I want to hear when choosing an oil filter for my restored car. Textured media and button bypass, but very tiny element exit holes, loosely-held gasket, and the smallest filtering area of all filters tested.



**Purolator** invented the oil filter in 1923. The L20020 has a well-made appearance, although the gasket is easily dislodged. Third place in terms of filter area, but not off by much. Like the Wix, a bypass pressure half that of the Italians, so you may need to change it more frequently. Probably the best value of the lot, as they are available everywhere, though the store may have to order it for you.



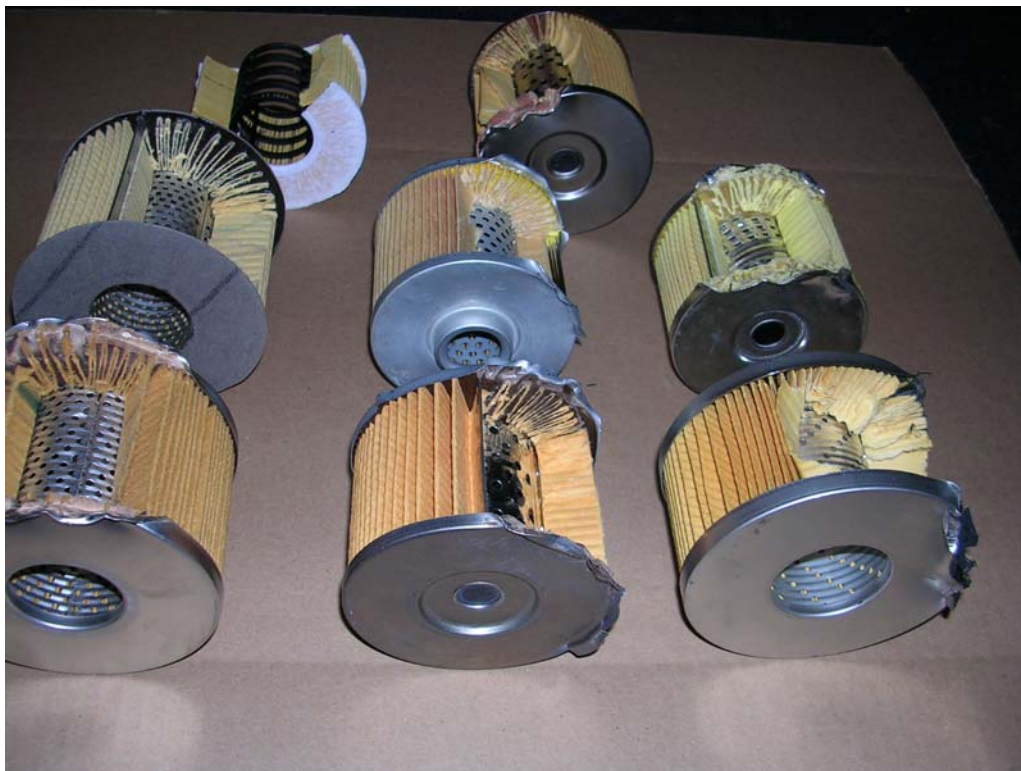
**UFI** filters are designed and manufactured in Verona, Italy. In business since 1972, their filters are a familiar sight on many exotic Italian autos. They claim to be Europe’s #1 aftermarket oil filter manufacturer and OE supplier to over 50 marques. The 23.127.00 tested here is sold by F.U.N. Imports and Vick Autosports. Interestingly, UFI’s website calls out their p/n 23.124.00 for the Spider, and it would be the UFI model I’d use, as it is a larger filter (the size of the Clean). Nonetheless, the filter tested had respectable filter area (best in its can size) with all-steel components, a button bypass, and substantial shell.



**Wix** filters made in Gastonia, North Carolina are the “Official Filters of NASCAR”, and one look inside tells you why. This is the oil filter you want to take to a bar fight. I damn near fainted trying to cut this can open. 410 psi burst strength. Wix filters are also sold by NAPA under their “NAPA Gold” line. This filter has the second-highest square inches of filter media of those measured. The 51189 (Wix) and 1189 (NAPA) is the filter I have been using in my Spider. Available at 6,000 NAPA stores and many speed shops nationwide.



Here’s a group photo of the elements, in alphabetical order beginning from upper-left



**Afterword**

Some of these filters poorly contain the gasket, so inspect the filter mounting plate after removal, to insure you haven’t left the old gasket behind. Always fill the new filter with new oil before installing. This takes time, as you are pouring into the filter exit, but performing this step insures that dry running the engine is minimized.

Your comments are welcome. Send them to [bernie@pennstar.com](mailto:bernie@pennstar.com) If you have a filter to include in a later revision of this document, contact me for shipping instructions.