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# REF: Oiling & Lubrication

## 77-Present Sportster Oil Pump Comparisons

Links to more oil pump pics and dims in the Sportsterpedia;  
[77-85 Oil Pump](#) in the IH section of the Sportsterpedia.  
[86-Present Oil Pump](#) in the Evo section of the Sportsterpedia.

## Return to Feed Ratios

1977-1985 feed gerotors have the smallest volume and smallest of the gerotor pumps used on Sportsters.

1986-2006 feed gerotors have the same volume.

1977-1997 return gerotors have the same volume.

1998-2006 return gerotors have the same volume.

1977-2006 gerotors all have the same teeth profile (bodies changed OD but volume per height stayed the same).

2007-present are the tallest and also have a different teeth profile.

- **77-85 return to feed ratio app 2.78:1**
  - Return Height: .500", Feed Height: .180"
- **86-90 return to feed ratio app 1.89:1**
  - Return Height: .500", Feed Height: .265"
- **91-97 return to feed ratio app 1.89:1**
  - Return Height: .500", Feed Height: .265"
- **98-06 return to feed ratio app 2.64:1**
  - Return Height: .700", Feed Height: .265"
- **07-up return to feed ratio app 4.25:1**
  - Return Height: .850", Feed Height: .200"

## Return hole in the "duck bill"

The size of the crankcase oil inlet hole inside the duck bill changed a couple times.

1977-1990 return inlet hole ID = 0.250"

1991-1997 return inlet hole ID = 0.280"

1998-Present return inlet hole ID = 0.350"



## Comparing 77-85, 98-06 and 07 and up Pumps

With a 98 style gasket on the 79 pump, the gasket fits nice and snug as it should be. There were 3 different fitting changes to the 77-81 pump but the body stayed the same. A 1-1/2" hole was cut into an aluminum plate with 4 holes tapped to mount the pump. <sup>1)</sup>



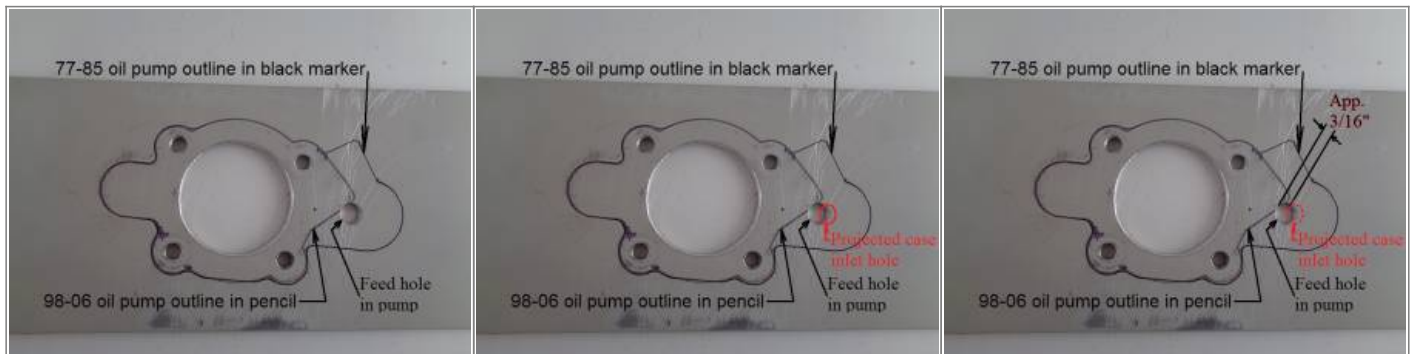
The 79, 98 and 07 pumps were bolted to and outlined on the aluminum sheet. <sup>2)</sup>



The mounting surfaces are compared below.

The red circle indicates the projected oil entry hole in 77-90 engine cases.

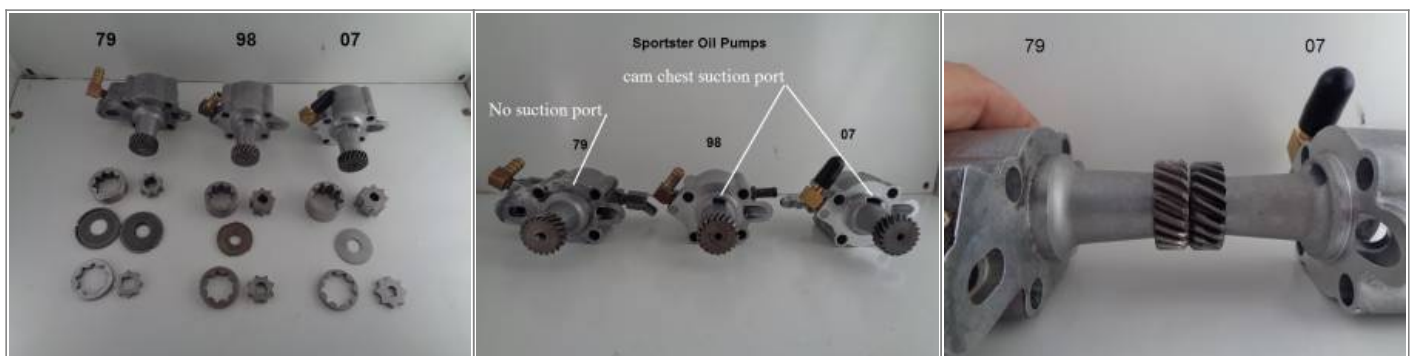
The last pic is a projected lineal of 3/16" from the outside upper edge of the 98 style pump to the center of the entry hole in the case. <sup>3)</sup>



You can see the change in gerotors and plates between the different year pumps.

98 and up oil pumps have a cam chest suction port built into the neck of the pump.

The drive gear on the shaft is the same from 77 to present. <sup>4)</sup>



The gearshaft is longer on 77-90 oil pumps but the gearshaft to mounting surface heights are the same.

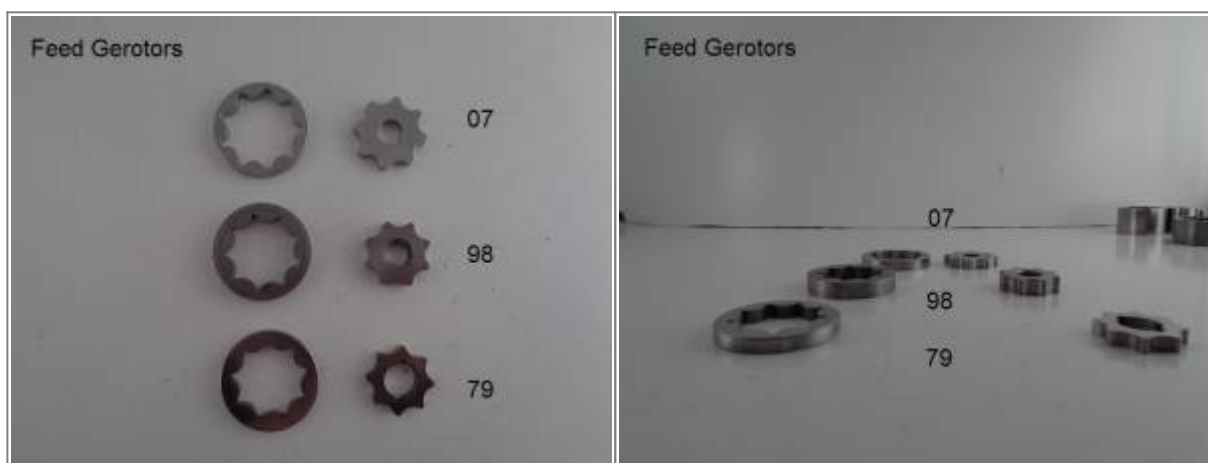
The body housings are longer on 77-90 pumps due to the clearances needed for the gearshaft, spring washer and separator plates (2). <sup>5)</sup>



Scavenger gerotors got bigger through the progressive years. <sup>6)</sup>



Feed gerotors got bigger also. The 07 feed gears were made thinner than the 06 gears but wider. <sup>7)</sup>



## 77-85 and 86-90 Oil Pump Comparison

The 79-85 pump was bolted to and outlined on the aluminum sheet.

The 86-80 pump was then bolted to the sheet clearly within the mark of the 79-85 pump.





## Feed Gerotors

### 77-85:

77-85 feed gerotors are the same size with the exception of the L83 removal of the chamfer on the outside of the set.

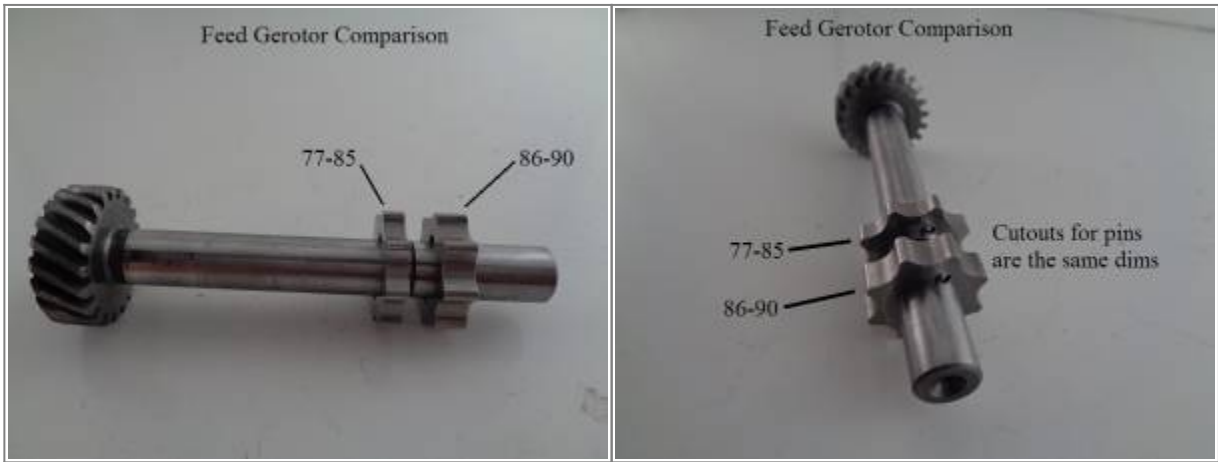
E83 chamfered feed gerotors will work in in 77-85 oil pumps.

However, L83 straight cut gerotors will only work in L83-85 oil pumps (they will bind up in 77-E83 pumps due to the chamfered surfaces in the early pumps).

The O.D of both the outside and inside gerotors stayed the same from 1977-1990.

86-90 feed gerotors were made taller than the 77-85 gerotor set and will only work in 86-90 oil pumps.





**1977-Up:**

In fact, the O.D of both the outside and inside gerotors stayed the same from 1977-2006. But 86-90 gerotors were made taller than there predecessors and that dim stayed the same through 2006.

The difference between 86-90 and 91-06 gerotors is that the later ones were held to the gearshaft by flats cut into the I.D. instead of pins.

(plus being taller)

Consequently, only 91-06 gerotors will interchange between oil pumps.

The 07-up feed gerotors were made shorter (almost as short as the 77-85 set) but they were also made with a larger inside cavities within the gerotor teeth.

The outside feed gerotors are all the same O.D. from 77-up.

**Oil Flow:**

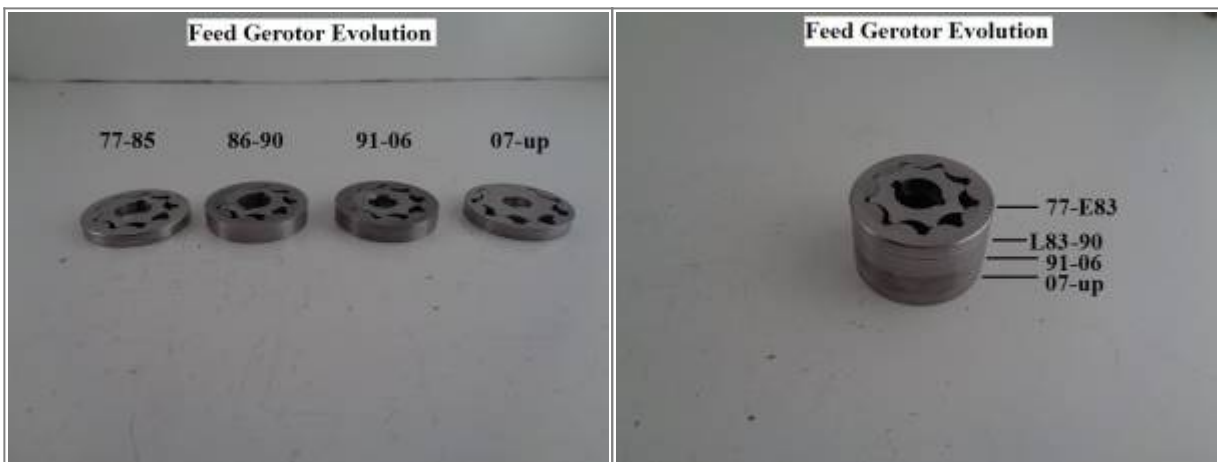
Sportster feed gerotors pumped the same volume of oil from 86-06.

(less from 77-85)

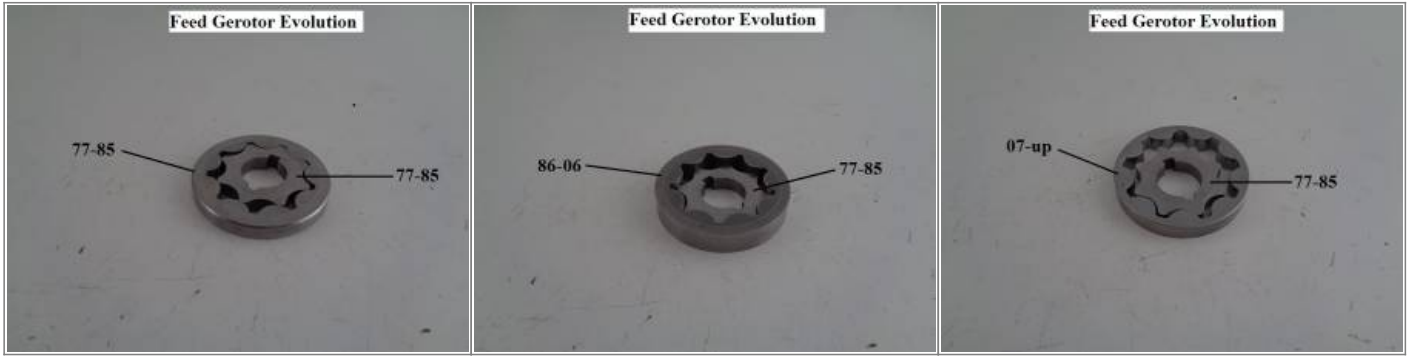
Although the 07 feed gerotors have larger inside cavities with the same O.D. as previous years, the set is thinner than 86-06 sets,

So it's possible that the 07 feed gerotors also flow the same volume of oil as 86-06 pumps.

(a minimum of the same volume at least)







## Return (scavenge) Gerotors

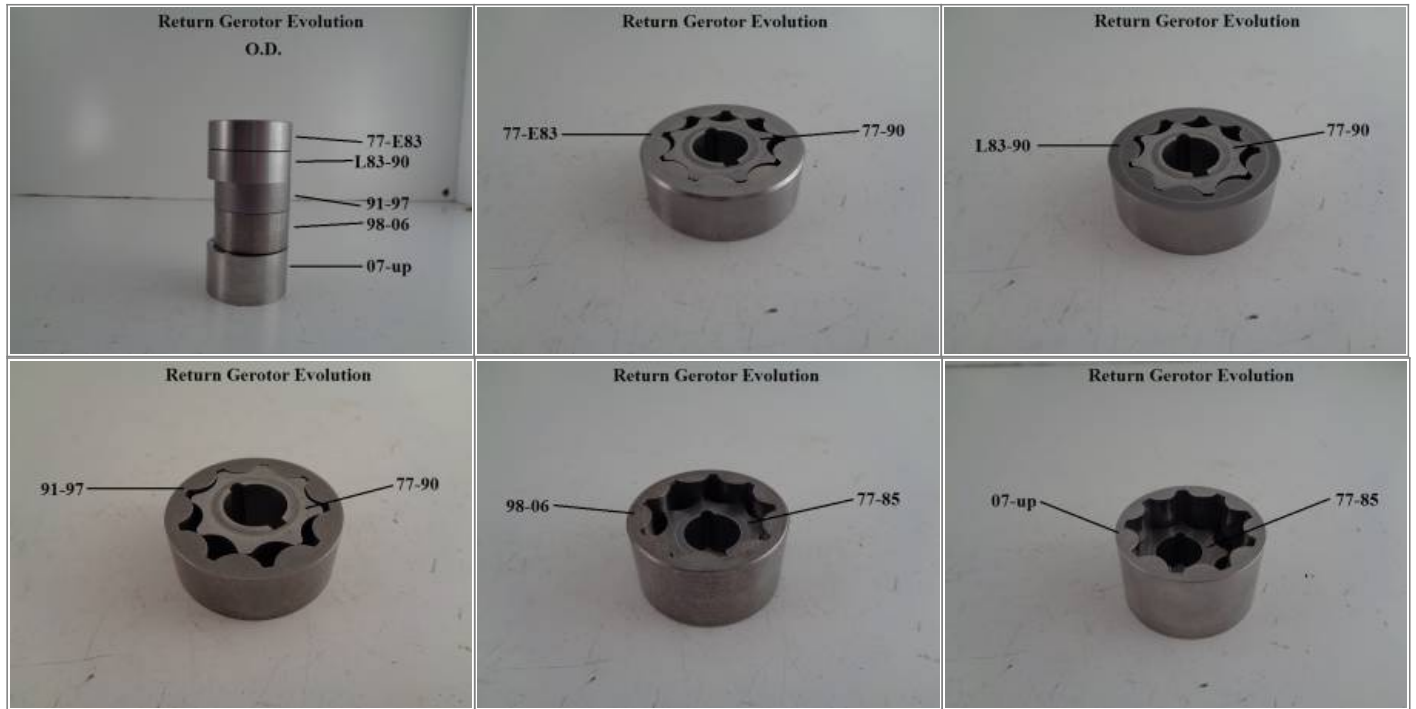
### 77-90:

77-85 return gerotors are the same size with the exception of the L83 removal of the chamfer on the outside of the set.



### 1977-Up:





## Oil Pump Covers

### 86-90 cover on 77-85 pump body:

Installing an 86 cover on the 77-85 oil pump creates problems.

77-90 oil pump covers look identical from the outside.

The only visual difference on the outside is that the 77-85 pump has an oil pressure switch on the front and the 86-90 pump has a hose fitting there.

Take the fittings off the ends and it looks as if they would be interchangeable.

The factory oil fittings are different which can give clues to the year model used on.

But these fittings do get changed from time to time from different owners.

Looking on the inside, there is a feed hole in the arm of the 77-85 pumps that doesn't exist in the later pump covers.

This is the oil feed hole to the engine on 77-85 engines.

86-90 oil pumps route the feed out to an external oil filter and back into a separate cavity in the pump body to feed the engine.

(so the feed hole in the arm is not needed in the cover on 86-90 pumps)

86-90 engines are fed oil from a passage in the pump body instead of the cover.

L83 pump body and 86-90 cover. <sup>8)</sup>	77-85 covers w/ feed hole in arm. <sup>9)</sup>	86-90 covers without the feed hole in the arm. <sup>10)</sup>
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**Feed gerotor surface depth change:**

Modding the 86-90 cover by drilling the hole out in the arm won't be an adequate fix to adapt it for use on a 77-85 pump body.

The scavenge gerotors are the same size in 77-90 pumps.

However, the feed gerotors got bigger in 86.

The depth of the cover got bigger to accommodate this change.

If you have the 77-85 body and drill the hole in the 86 cover, it won't work properly and it'll wet sump from the jump.

That'll leave the clearances too loose inside using the 85 pump body.

This is how the feed gerotors should sit in the the proper cover. Spec: .001"-.011" above the lip. <sup>11)</sup>

This is how the 77-85 feed gerotors fit in an 86-90 cover. <sup>12)</sup>



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1) 3) 4) 5) 6) 7)

photos by Hippysmack

2)

photos by Hippysmack of the XLFORUM

<https://www.xlforum.net/forum/sportster-motorcycle-forum/sportster-motorcycle-era-specific-and-model-specific/ironhead-sportster-motorcycle-talk-1957-1985/194881-let-s-study-the-77-85-oil-pump-parts-and-changes-and-when/page6?t=2071153&page=6>

8)

photo by jlv of the XLFORUM

<https://www.xlforum.net/forum/sportster-motorcycle-forum/sportster-motorcycle-motor-engine/sportster->

[motorcycle-bottom-end/196850-oil-pump-iron-1000-1979-bizarre#post4301658](http://sportsterpedia.com/motorcycle-bottom-end/196850-oil-pump-iron-1000-1979-bizarre#post4301658)

9) , 10) , 11) , 12)

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