

# Table of Contents

<b>IH: Engine Mechanicals</b> .....	1
<i>Sub-Documents</i> .....	1
<b>Gearcase / Cam Cover</b> .....	1
<b>Cam Cover Bushings</b> .....	3
<b>Flywheel</b> .....	5
<i>Sub-Documents</i> .....	5
<b>Commonized Flywheels</b> .....	5
<b>Roller Bearing Inspection (1957-1976)</b> .....	6
<b>Crankcase Oil Strainer</b> .....	7



[Go To Technical Menu](#)

# IH: Engine Mechanicals

See also [Crankshaft / Flywheel Tools](#) in the Reference section of the Sportsterpedia.

## Sub-Documents

- [Sprocket Cover Dowel Hole \(Case\) Repair](#)
- [Sportster Drain Plugs Explained](#)
- [Tapping or Installing a Helicoil on a Drain Plug with the Engine in the Frame](#)

## Gearcase / Cam Cover

Year Model	Cam / Gearcase Cover Part Number	Gasket
1952-1956 K Models	25200-52	25224-52 25244-52A (1977 part #)
1954-1956 KH	25200-52A (1963 part #)	
1957-1962 XL/XLH/XLCH	25200-57 25200-63A (1968 part #)	
1963-1966 XLH/XLCH 1967-1969 XLCH	25200-63 25200-63A (1968 part #)	
1967-1970 XLH	25201-67 25201-67A (1969 part #)	
1970 XLCH	25200-70	
1971-1972 XLH	25201-71	
1971-1972 XLCH	25200-71	
1973-1974 XLH	25201-73 black	
1973-1974 XLCH	25200-73 black	
1975-1976 XLH	25211-75	
1975-1976 XLCH	25205-75	
1977-1978 XL	25201-75	

1977-1978 XLCH	25200-75 25201-75 (1978 parts sup)	25244-52A
1979- XL	25201-79	
1979- XLCH	25200-79	
1980 XL	25208-80 black	
1980 XLS	25209-80 polished	
E1981 XL	25227-81 polished	
E1981 XLS	25229-81 black	
L1981-1982 XLS	25209-81 black	25263-81 '82 part# change
L1981-E1984 XL 1983-E1984 XLS/XLX	25208-81 polished	
L1984 XLX	25207-84 alum. finish	
L1984 XL/XLS	25208-84 polished	
1985 XLX	25207-84A black	
1985 XL/XLS	25208-84A polished	

1957-1967 XLs had the solid bar cam cover. <sup>1)</sup>

1968-1970 had the finned looking cam cover.

You can interchange the covers if you are not concerned about the look of a stocker for your year bike (better resale trying to stay stock). Also be aware that some covers had the round cut out for the electric starter XLH that came out in 1967.

You can slap a cover on and wing it, BUT the proper way is to have the cover line reamed when the motor is apart.

(so the cam cover and the right case half are a match in tolerances.)

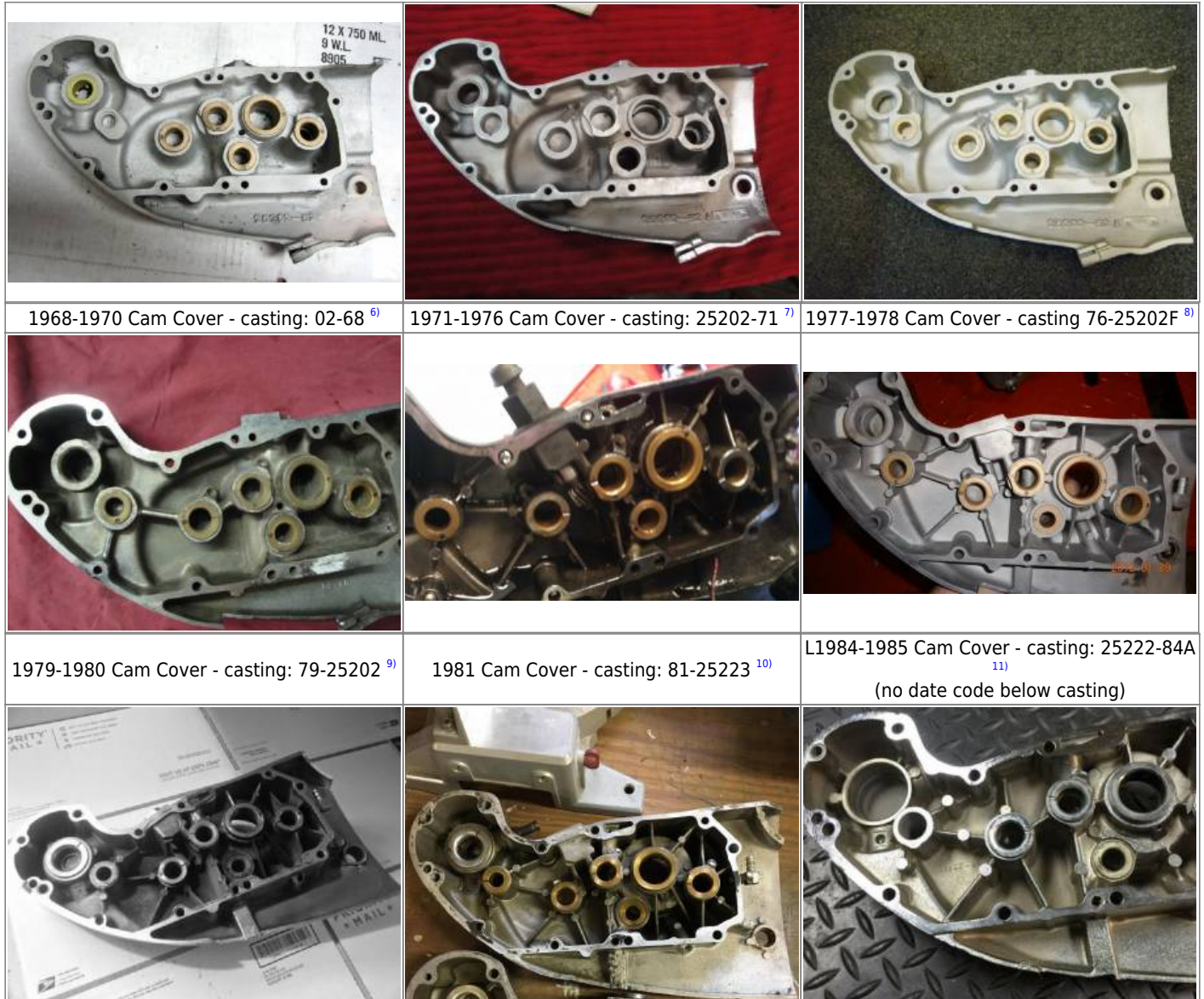
52-78 cover had only one breather port at 6:00. <sup>2)</sup>

79-85 had two. One at 6:00 and one at 10:00.

52-76 uses .625" pinion bushing bore.

77-85 uses .562" pinion bushing bore.

1952-1956 Cam Cover - casting: 25202-52 <sup>3)</sup>	1957-1962 Cam Cover - casting: 25202-52A <sup>4)</sup>	1963-1967 Cam Cover - casting: 25202-52A <sup>5)</sup>
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## Cam Cover Bushings

### Oil Deflector / Separator Bushing Assembly (57-62): (or spring loaded top hat)

Looking at the brass part, you can see how the spring catches on the inward bent tabs. There are also unbent tabs on the brass. <sup>12)</sup>

These, when bent outward just a little, fit into slots on the far side of the steel bushing pressed into cam cover.

Here's how the factory assembled this thing.

They had pre-assembled the brass to the steel before the steel was pressed into the cover.

Then dropped the spring into the cover and pressed the brass/steel assembly into the cover as a unit (and manipulated the spring to sit correctly if needed).

However, it is possible to assemble the unit without removing the steel from the cover. <sup>13)</sup>

You can bend the tangs out without having to remove the steel bush with a screwdriver and a hammer to bend the 2 locating tabs out.

**Notes:**

The tabs must be bent outward enough that the brass stays keyed to the steel at full spring compression. You don't want the brass hat to 'unkey' when the generator compresses spring. The brass needs to be able to 'plunge' in and out under the spring pressure once the tags are bent.

If you get too aggressive, you can cause deformations in the brass that allow it to hang up in it's sliding fit to the steel.

These outward bent tangs do 2 things.

- They keep the brass hat and spring captive in the cover upon generator removal.
- More importantly, they key the brass to the steel to prevent the brass from rotating with the generator gear.

The brass is unable to rotate by the tangs keying into the slots.

**Inspection:**

Check the operation of the oil separator bushing assembly.

The spring should have free action and be fully extended in the gearcase cover.







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# Flywheel

## Sub-Documents

[Catalog of OEM Flywheels](#)

## Commonized Flywheels

- In May of 1981, the MoCo issued a bulletin stating that product and quality improvements have brought about a commonized flywheel taper design.

All tapers were commonized at 6° and all keyways were standardized.

In June of 1981, an update to this bulletin was issued to include part numbers. <sup>19)</sup> <sup>20)</sup>

- A limited number of E1982 XL engines (782216009-782237017) were assembled without the commonized flywheel taper design. <sup>21)</sup>
  - Notable component changes are included in the chart below.
  - This was a running change in 1340cc and 1000cc engines but both new and old designs were used in production until the old stock parts ran out.
  - Even though the assembly and disassembly was the same for the old and new style flywheels, the torque values did change for the new style assembly. However, new and old style components must not be intermixed.

Changes for Sportster 1000 engines include:

<b>New Flywheel -</b> Sprocket Side Gear Side	23916-80 23936-80	'Lazy 8' rear cylinder timing mark and no keyway Single hole oil path.
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The old style flywheel has a keyway on the sprocket side (23916-57A) and a compound (2) hole oil path on the gear side (23936-57A).		
<b>New Crankpin</b>	23960-80	Oil hole is now 90° to the keyway
Old style crankpin (23960-54) oil hole was 110° to the keyway		
<b>New Crankpin Nuts</b>	23901-81	20/1" thread pattern at 150-185 ft/lbs.
Old style crankpin nuts (23967-54A) were 20/1" threads with 150-175 ft/lbs.		
<b>New Sprocket Shaft</b>	24000-80	No keyway
Old style sprocket shaft (24000-75) has a large keyway		
<b>New Sprocket Shaft Nut</b>	23902-81	3/4" x 20 threads at 100-120 ft/lbs.
Old style sprocket shaft nut (8011) has 11/16" x 18 threads at 100-120 ft/lbs.		
<b>New Sprocket Shaft Key</b>	Not used	
Old style sprocket shaft key (23985-12) has a large woodruff key (3/16" x 1/2")		
<b>New Gear Shaft</b>	24005-80	One piece construction
Old style gear shaft (24008-75A) is of two piece construction		
<b>New Gear Shaft Nut</b>	23902-81	3/4" x 20 threads at 100-120 ft/lbs.
Old style gear shaft nut (8011) has 11/16" x 18 threads at 100-120 ft/lbs.		
<b>New Gear Shaft Key</b>	11218	Small woodruff key (1/8" x 3/8")
Old style gear shaft key (11200) has a large woodruff key (3/16" x 1/2")		
<b>New Crank Key</b>	11218	Small woodruff key (1/8" x 3/8")
Old style crank key (23985-18) has a large woodruff key (1/8" x 1/2")		

## Roller Bearing Inspection (1957-1976)

- In a letter dated May 9, 1977, an HD interoffice memo was sent regarding an inspection of parts stock roller bearings. Some roller bearing part numbers were found to have incorrect diameters. A new micrometer was purchased to remedy this problem.
- Two of those part numbers are gear shaft (9421) and crank pin front rollers (9150A) for Sportsters.
- In light of this oversight, a listing of part numbers with their correct dims and tolerances was issued as in below:

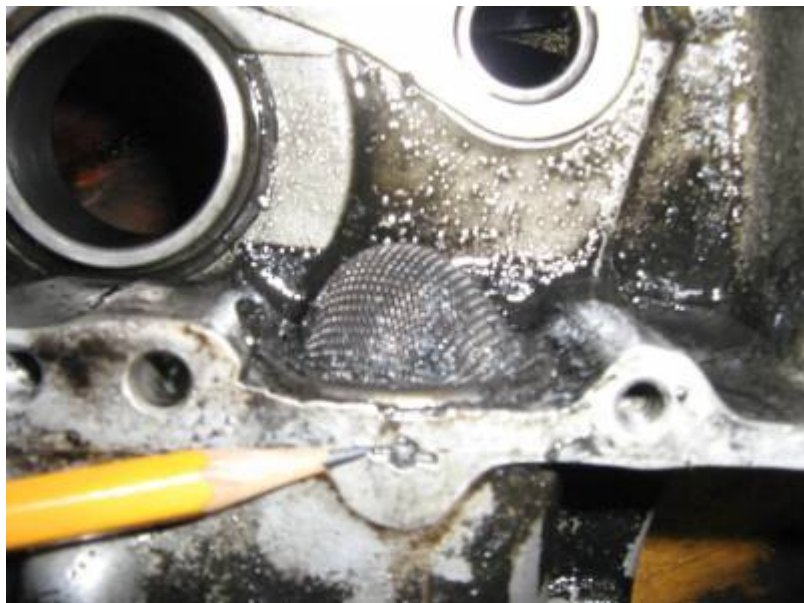
<b>Used for 57-76 Sportster gear shaft roller bearings</b>	Diameter	Size	Length
9421	.1876" - .1974"	Standard	.800" - .796"
9422	.1878" - .1876"	+ .0002"	.800" - .796"
9423	.1880" - .1878"	+ .0004"	.800" - .796"
9424	.1882" - .1880"	+ .0006"	.800" - .796"
9425	.1884" - .1882"	+ .0008"	.800" - .796"
9426	.1886" - .1884"	+ .0010"	.800" - .796"
<b>Used for 54-85 Sportster and K Model front crankpin roller bearings</b>	Diameter	Size	
9150A	.1875" - .1874"	Standard	.480"
9152A	.1877" - .1976"	+ .0002"	.480"
9154A	.1879" - .1878"	+ .0004"	.480"
9156A	.1881" - .1880"	+ .0006"	.480"



9158A	.1883" - .1882"	+ .0008"	.480"
9160A	.1885" - .1884"	+ .0010"	.480"
9161	.1873" - .1872"	- .0002"	.480"

## Crankcase Oil Strainer

- If you've split the cases and the screen is in good shape, you don't have to take it out. Hit it with some compressed air and see if it needs replacing. <sup>22)</sup>



23)



24)

The strainer is held in place by this pin. It is staked into place with the two horizontal lines radiating from the it. To remove strainer, you must first remove the pin. Tear the screen from the strainer and place pliers on the pin inside (the now destroyed strainer) and wiggle the pin out. Strainers and strainer gaskets are available for replacement. <sup>25)</sup>

[Go To Technical Menu](#)

1)

Monte03 of the XLFORUM <http://xlforum.net/forums/showthread.php?p=1284165#post1284165>

2)

Dr Dick of the XLFORUM <http://xlforum.net/forums/showthread.php?t=1845601&page=2>

3) 5) 6) 7) 9) 11)

photo by Dr Dick of the XLFORUM <http://xlforum.net/forums/showthread.php?t=1845601&page=2>

4)

photo by ironheadjunkie of the XLFORUM <http://xlforum.net/forums/showthread.php?t=1421916&page=2>

8)

photo by DirtyCory of the XLFORUM <http://xlforum.net/forums/showthread.php?t=1297584&page=9>

10)

photo by Scott of the XLFORUM <http://xlforum.net/forums/showthread.php?t=2073823>

12)

Dr Dick of the XLFORUM <http://xlforum.net/forums/showthread.php?t=1861965>

13)

62 Ironhead of the XLFORUM <http://xlforum.net/forums/showthread.php?t=1861965&page=2>

14) 15) 16) 17) 18)

photo by 62 Ironhead of the XLFORUM <http://xlforum.net/forums/showthread.php?t=1861965>

19)

HD Service Bulletin #M-829 dated May 19, 1981

20)

HD Service Bulletin #M-829A dated June 12, 1981

21)

HD Service Bulletin #M-840 dated October 2, 1981

22)

BuckIRyder of the XLFORUM

<http://xlforum.net/forums/showthread.php?t=357456&highlight=xlch+strainer>

23)

photo by Happy Bob of the XLFORUM

<http://xlforum.net/forums/showthread.php?t=357456&highlight=xlch+strainer>

24)

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25)

Hillclimb68xlch of the XLFORUM

<http://xlforum.net/forums/showthread.php?t=357456&highlight=xlch+strainer>

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