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# IH: Engine Mechanical

## Engine Mounts

Page created from XLForum posts and pics, era model parts catalogs, parts catalog supplements, pics / documentation from [JW Boon.com](#) or [NOS Parts.nl](#).<sup>1)</sup>

## General Information

### Sub Documents

- [Sequence of Installing IH Motor Mounts](#) (General Assembly Procedure)
- [Shimming Motor Mounts](#)
- [Ironhead Motor Mount Torque Specs](#)
- [Discrepancies with Motor Mount Illustrations in the HD Manuals \(57-76\)](#)

### Bolt Grades

There are conflicting views on what grade bolts to use.

Some say it's best to use the original bolts which are grade 5 and that grade 8 bolts are seen as overkill. The theory is that a grade 8 bolt is more brittle and doesn't have as much elasticity as a grade 5 bolt. And that upon a collision, a grade 8 bolt would break or shear whereas a grade 5 bolt would bend or deform (but still remain "intact").

(That reasoning is debatable however. Both have been used successfully)

Others say a grade 8 bolt is always harder, and stronger in tensile and shear than a grade 5.<sup>2)</sup> (30,000 psi higher in tensile strength and 40,000-50,000 psi higher in shear strength).

If loaded to failure, grade 5 will have more % elongation than a grade 8 before it finally breaks, but will still break at a lower stress than a grade 8.

If fasteners are elongating that much in any application, there are other problems.

Lower grades are used to save cost over higher grades when cost is a factor. Lower grades offer no mechanical advantage.

The MoCo's first use of grade 8 motor mount bolts was in 1986.

## Parts Lists

Rear Motor Mounts				
Part#	Year model	Hole for kicker	Rear Mount Bushing	Notes
16201-52	52-60 K Models/XL/XLH/XLCH	✓	✗	4 hole mount.
16201-58	61-E62 XLH/XLCH	✓	✗	4 hole mount. Replaced by 16201-52 (-65)
16201-58A	L62-66 XLH/XLCH 67-69 XLCH	✓	16202-62	4 hole mount.
16203-67	67-81 XL/XLH/XLS 70-81 XLCH	✓	16202-62	2 hole mount.
16203-82	82-83 All	✗	16240-82	2 hole mount. Replaced by 16203-82A. Appearance- cast
16203-82A	84-90 All	✗	16240-82	2 hole mount. Replacement for 16203-82. Appearance- billet

Lower Front Mounts		
Sportster year model	Lower front mount (R)	Lower front mount (L)
1957-1977	16210-52A (black)	16213-52A (black)
1978	16210-52B	16213-52B
1979 L1979 adition	16210-52A (black)	16213-52A (black)
	16210-77 (chrome)	16213-77 (chrome)
	Replaced by 16210-79 (black) and 16213-79 (black)	
1980-1981	16210-79 (black)	16213-79 (black)
	16210-77 (chrome)	16213-77 (chrome)
1982-E1984	16210-81 (black)	16213-81 (black)
L1984-1990	16210-84 (black)	16212-84 (black)

1957-1976 Top Mounts			
Year Model	Description	Part#	Notes
1957-E1971 XL, XLH, XLC, XLCH	Head Straddle	16250-57	Original bracket.
L1971-1976	Head Straddle	16250-57	Relief machined on the motor side of the bracket. This version was sold for 1957-1976 models.
1957-1964 XL, XLH 1959-1964 XLCH	Cross Brace	69031-57	Original XL, XLH bracket.
1958 XLC, XLCH 1965-1976 XLH, XLCH	Cross Brace	16251-58	Has 2 holes for horn bracket on the end.

1957-1976	Straddle to Head Bolt (2)	4618W	7/16" x 20 x 7/8"
1957 XL	Straddle to Head Washer (2)	6505W	7/16" x 1" x 1/8"
1958-1976 XL, XLH, XLC, XLCH	Straddle to Head Washer (2)	6495 6495 HW	29/64" x 15/16" x 1/8"
1957-1971 XL, XLH, XLC, XLCH	Straddle to Cross Brace Bolt	4336W	3/8" x 24 x 1-1/8" Hex Head
1972-1976 XLH, XLCH	Horn Bracket	69129-72A	Has 3/8" x 24 welded (straddle to cross brace) stud.
1957-1976 XL, XLH, XLC, XLCH	Straddle to Cross Brace Nut	7775	3/8" x 24 Flexlock
1957-1971 XL, XLH, XLC, XLCH	Straddle to Cross Brace Washer (underneath straddle)	6417 6417W	3/8" x 1-1/8" x 1/4"
1957-E1972	Cross Brace to Frame Bolt	16865-52	7/16" x 20 x 7/8" (13/16" Hex Head) (w/ cotter pin hole, for XR)
L1972-1976	Cross Brace to Frame Bolt	4726	7/16" x 20 x 1-1/2", (5/8" Hex Head)
1957-1976	Cross Brace to Frame Washer	6522B 6522HB	29/64" x 1-1/8" x 5/32" (.156")
1957-1976	Cross Brace to Frame Washer	6524	29/64" x 1-1/8" x 1/64" (.016")
1957-1976	Cross Brace to Frame Washer	6521 6521W	29/64" x 1-1/8" x 3/32" (.094")
1957-1976 XL, XLH, XLC, XLCH	Cross Brace to Frame Nut	7825	7/16" x 20 Flexlock

## Rear Mounts

### Sub Documents

- [Rear Motor Mount Bolt Sizes and Lengths from Parts Catalogs](#)
- [Broken / Cracked Rear Mounts](#)
- [Removing the Rear Motor Mount and Studs from the Engine](#)
- [Rear Mount Assembly](#)
- [Aftermarket Rear Mount Option \(Pingel\)](#)

### Using studs vs bolts on rear mounts

The stud (or bolt) is threaded into an aluminum casting (the case) which is not noted for having great

strength.<sup>3)</sup>

So the wise move is to use a stud threaded into the case using red Loctite.

The reason is because this is the only time the case threads get disturbed again.

Keep in mind the question, "Just why did the factory do this"?

They did it because there is good engineering reason to use a stud over a bolt.

When you tighten a nut on the stud the nut takes all of the beating and stress as it compresses against the motor mount, not the aluminum case.

If you want to use a bolt, then you should have a Heli-Coil installed in the case first.

## 1952-1981 rear mounts

The old rear mounts and the crankcase have 4 holes.<sup>4)</sup>

When Harley changed to 2 hole mounts, all they did was knock the front 2 holes off the old mount and later eliminated the 2 front holes in the case.

But the hole spacing stayed the same.

So if you want to use a 4 hole mount on a 2 hole case;

All you have to do, if you should be so lucky to find a steel mount, is saw off the front 2 hole area of the mount.

If you want to use a 2 hole mount on a 4 hole case, you'll have to stick some short bolts in to plug the 2 unused case holes but it should fit just fine.<sup>5)</sup>

Here are the 4 kick only (4 bolt) rear motor mounts.<sup>6)</sup>

From left to right (each pic below):

1. 1952-1956 k model (iron).

Note the smaller hole for kicker shaft. The K kicker shaft used a smaller thrust collar than XL.

2. 1957-E1962 (iron).

3. The third is believed to be an XR or R model (aluminium).

It does not use and is not machined for the steel inserts for the lower bolts.

It came with a 60 XLR basket.

4. L1962-up uses the steel inserts for the lower bolts.

The first 3 use the 2-1/16" long lower bolts (when not using the passenger peg mount).

The late one uses 2-1/4" long lower bolts (when not using the passenger peg mount).



7)



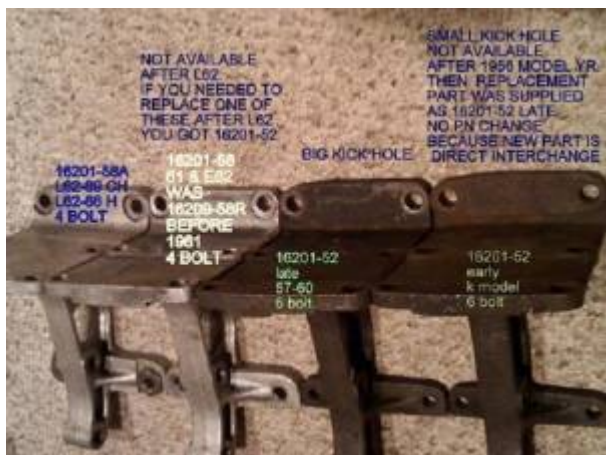
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The key to understanding the evolution of these is knowing that 60-down used a 6 bolt lower battery tray and 61-up used a 4 bolt battery tray.

In order to use the 6 bolt battery tray (up to -52b) the mount needs to be milled clear across the upper flange (iron mounts).

When the aluminum was introduced, the battery tray was modified to the 4 bolt -52c.

The two bolts at top flange were no longer incorporated into the tray, so the mounts were not milled.



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More 16201-58 pics:

This mount could be had in 1960 for \$25.70



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16203-67 pics:



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## 1982-1990 Rear Mounts

1982-1990 mounts offset the engine 13/32" to the left of the position for pre 1982 engines and don't have the hole in them for the kicker shaft to go through. <sup>20)</sup>

1984-1990 Rear Mount:

This mount is made from billet aluminum and was also sold as a replacement for the 82-83 rear motor mount.





## Lower Front Mounts

### Sub Documents

- [Lower Front Motor Mount Assembly](#)
- [Lower Front Motor Mount Bolt Sizes and Lengths from Parts Catalogs](#)

1957-1981 style lower front motor mounts. <sup>27)</sup>



1982-E1984 lower front motor mounts / filter mount. (left shown) <sup>28)</sup>

See this page in the Sportsterpedia for [building your own filter / motor mount](#) for previous year models.





## Top Mounts

### Sub Documents

- [1957-1976 Top Mount Assembly](#)
- [1977-1981 Top Mount Pics and Assembly](#)
- [1982-1985 Top Mount Pics and Assembly](#)

### 1957-1976 top mount

#### Note:

There are no instructions or mention of how to attach these mounts in the FSMs other than basic statements to the effect of "install the bolts".

Dr Dick's instructions in the sub documents in this section for details on how the washers for the straddle mount should reside UNDER the straddle mount.

And accordingly, the washers being on top under the bolt head is responsible (at least in part) for cracked heads at the threaded mounting holes for this mount.

#### Head to head straddle mount (or center mount or head steady):

There is only the one upper motor mount assembly from 57-76 consisting of a support brace between the heads and a cross mount from there to the frame.

Support brace (straddle mount) is engineered to deal with production tolerances, most owner created misalignments and is the first thing to assemble on top. <sup>30) 31)</sup>

The straddle bracket (16250-57) mounts from head to head and a cross brace bolts to the straddle and ties back to the frame.

The straddle bracket changed in L1971 and again in 1979 but the part number stayed the same.

There were two different cross braces from 1957-1976. See the [Parts List](#) above for year models used.

There are three straddle mounts from 1957-1985;



- **1957-E1971** (factory fitted with the -57 head castings).  
These were straight along the edge that faces the rocker boxes.  
You shouldn't use this mount on any other head casting with out checking for clearance.
- **L1971-1976** factory fitment.  
These were shaped like "Ben Franklin's eye glasses".  
This part can be used on all 57-76 no matter what heads you are running.
- **1977-1985**. All 3 holes are slotted.  
This should not be used on 76< frames.

<p>1957-E1971 straddle mount <sup>32)</sup></p> 	<p>L1971-1976 straddle mount <sup>33)</sup></p> 
<p>1958 XLC / XLCH, 1965-1976 XLH/XLCH Cross Brace <sup>34)</sup></p> 	<p>Measurements taken on after market mounts. <sup>35)</sup></p> 

## 1977-1985 top mounts

### Note:

There are no instructions or mention of how to attach these mounts in the FSMs other than basic statements to the effect of "install the bolts".

Reference the sub documents in this section for details on assembly.

- **1977-1985 head strap:**  
The center head strap (16250-57) between the heads is black except for 79-E81 XLS which is chrome (16276-79).  
It is not an actual motor mount but does keep structural integrity between the heads although it doesn't attach to the frame.

- **1977-1981 top frame mount locations:**

- The center motor mount and frame bracket from previous years was deleted for these models years.

The head to head strap was still used, just not attached to the frame there.

There are two motor to frame mounts on the top; an upper front mount to under the neck and an upper rear mount below the backbone.

- The top front bracket (16265-76) is an "L" shaped piece (app. 1/8" thick) <sup>36)</sup> with 3 slotted mounting holes.

It attaches to the front rocker box with 2 rocker cover mounting studs and also underneath the frame neck (by a 5/16" x 18 x 7/8" bolt that screws in upwards).

If the front of the frame is stock, you should see the threaded hole by looking up with a flashlight. It should be tapped for 5/16"-18 threads.

The upper front mount can be tedious to install. Easiest to install while installing the rocker cover while things are loose. <sup>37) 38)</sup>

- The top rear bracket (16266-76) has a hole in the top center at the frame mount and two open slots on the bottom to rocker box studs.

The same bracket is used from 1977-1981. The part that's different between 77 and 78-81 models is the fasteners used.

The 77 upper rear motor mount is attached to the rear rocker box with bolts where 78-81 models were attached with dual threaded studs.

- **1982-1985 top frame mount locations:**

The center motor mount was added back for these model years. However, the straddle mount system (between the heads) to the frame was redesigned.

There are two motor to frame mounts on the top; An upper front mount off the front rocker box to under the neck,

And a center mount bracket that sits between and attaches to both rocker boxes instead of the heads.

The head to head strap was still used, just not attached to the frame there.

- 1982-1985 top front bracket (16214-81) is a wide "L" shaped piece with 4 mounting holes. It attaches to the front rocker box with 2 rocker cover mounting studs and also underneath the frame neck (with two 5/16" x 18 bolts that screw in upwards).
- 1982-E1983 XL/XLX, E83 XLS top center bracket (16277-81) is a "T" shaped plate with 3 mounting holes.
- 1982 XLS/E1983 XL top center bracket (61021-82) is a "T" shaped plate with a welded gas tank support arm (R) and a welded horn bracket support arm (L).
- L1983-1985 XL/XLX/XLS top center bracket (16277-81A) is a "T" shaped plate with 3 mounting holes and an additional hole in the middle.

## **Top Mount Locations:**

Click on any pic to enlarge:



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## Pics of 77-85 Top Mounts

1977-1985 head strap (except 1979-E1981 XLS). <sup>41)</sup>





1977-1981 Top Front Mount (16265-76) <sup>42)</sup>1982-1985 Top Front Mount <sup>43)</sup>1977-1981 Top Rear Mount (16266-76) <sup>44)</sup>1982 XLS / E1983 XL Top Center Motor Mount <sup>45)</sup>L1983-1985 XL-XLX-XLS Top Center Motor Mount <sup>46)</sup>

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1)

HD Sportster Parts Catalogs and Supplements 99451-57, 99451-58 Supplement, 99451-59, 99451-60, 99451-61, 99451-62, 99451-63, 99451-64, 99451-65, 99451-66, 99451-67, 99451-68, 99451-69, 99451-70, 99451-71, 99451-72, 99451-73, 99451-74, 99451-75, 99451-76, 99451-76A, 99451-77A, 99451-78, 99451-78A, 99451-79, 99451-79A, 99451-80, 99451-81, 99451-82, 99451-83, 99451-84, 99451-85, 99451-86, 99451-87, 99451-88, 99451-89, 99451-90

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<https://www.xlforum.net/forum/sportster-motorcycle-forum/sportster-motorcycle-era-specific-and-model-specific/ironhead-sportster-motorcycle-talk-1957-1985/97896-motor-mount-bolts-need-specs/page2?t=829078&page=2>

3)

piniongear at HD Forums

<https://www.hdforums.com/forum/ironhead/633728-ironhead-rear-motor-mount-stud.html>

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41)

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