

Upgrading the Front Brakes and Suspension on a 1992-1999 H-Body.

Version 1.1



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*****Disclaimer – I will not be held responsible for any damage or personal injury that comes from performing the following modifications to your car. Understand that you are modifying your car at your own risk.*****

Overview

The goal of this modification is to allow you to upgrade the front brakes and struts on a 1992-1999 H-Body. The 1997-1999 Grand Prix is at the root of this upgrade, and this is basically adapting our cars to accept its aftermarket parts. As we all know, the H-Body brake and suspension aftermarket is no where near what the W-Body's is. And while this is only an upgrade for the front, it's a step in the right direction.

This upgrade is done by using:

- 2000-2005 H-Body suspension knuckles and wheel bearing assemblies
- 1998-2002 F-Body 12" Brakes, 1997-2003 W-Body struts and springs
- 1992-1999 H-Body stock top strut mount

All of these parts won't just bolt on and work properly, but they can be made to do so safely and effectively. The specifics will be outlined throughout this write-up.

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Section I.

Parts Needed:

Parts from McMaster-Carr: (www.mcmaster.com)

F-Body Brake Parts:

- Caliper bracket bolts, p/n 91310A718. They come in a pack of 10. (\$8.27)
- Shims, p/n 6679K16. You'll need 4. (\$2.88/ea)
- High Strength Steel Washers, p/n 98023A033. They come in a pack of 25. (\$5.23)

The washers will also be used for the strut.

Strut Parts:

- Dome shaped washer, p/n 91944A303. You'll need 2. (\$4.92/ea)
- Stainless steel bushing p/n 8504A162. You'll need 2. (\$22.04/ea)

Parts from anywhere:

Right and left front 2000-2005 Bonneville suspension knuckle and wheel bearing assemblies

Any 1997-2003 GM W-Body front struts, springs, bottom spring rubbers, and 2 knuckle bolts.

2 Camber bolts for a 1997-2003 W-body.

Any 1992-1999 GM H-Body front top strut mount assembly, top spring rubber, and dust boot.

1998-2002 F-Body calipers, brackets, and banjo bolts.

Any 12" rotor from a 19981-1999 Oldsmobile Intrigue (JA9 Heavy Duty brake option), 1998-2002 F-Body, 00-05 Monte Carlo/Impala/ Lucerne, and more than likely others.

2 Camber bolts for a 1997-2003 W-body.

Tools:

For the most part you will only need basic hand tools. Other than that you'll need a 34mm axle nut socket, strut-style spring compressors, a rotary tool, and a torque wrench. An impact will help when disassembling your old struts. And a pickle fork will help break loose the ball joints.

Section II.

F-Body Brake Fitment Issue

First, here is why F-body brakes will not work on the 92-99 H-Body knuckle.

The bolt hole spacing difference is apparent in this picture:



On the top is the F-body caliper bracket. Below is the 1992-1999 Bonneville knuckle.



The bolt hole spacing is one of many issues. The knuckle is threaded, as is the F-body bracket. The two ears on the knuckle (with the threaded caliper mounting holes) are located where the F-body caliper bracket should be in the direction parallel to the axle.

Section III.

Why a 2000-2005 H-Body Knuckle?

I compared the 1997-2003 W-Body, 2000-2005 H-Body, and 1992-1999 H-Body knuckles. All have similar features but no two are a like.

All three can be seen in the two pictures below:

Going clockwise from the top, 1997-2003 W-Body, 2000-2005 H-Body, and 1992-1999 H-Body.



How the 1992-1999 H-Body and the 2000-2005 H-Body knuckles compare:

- Relative to the axle, they have the same ball joint and tie rod end locations.
- The strut mounting patterns are different, with the 2000-2005 being 0.65” further apart.
- The brake mounting locations are different. (See F-Body Brake Fitment Issue)
- The 2000-2005 knuckle is aluminum while the 1992-1992 is cast iron.

How the 2000-2005 H-Body and the 1997-2003 knuckles compare:

- Relative to the axle, they have the same ball joint and strut mounting locations.
- The strut bolt locations are the same size and in the same locations.
- The tie rod location on the 2000-2005 is 1.12” away from the 1997-2003 knuckle’s location.
- Both are aluminum.

So, the 2000-2005 H-Body knuckle works since the ball joint and tie rod locations have the correct placement.

Since the 1997-2003 W-Body and 2000-2005 H-Body share the same strut pattern, this allows you to adapt the W-Body’s strut to our car. This means all of the aftermarket struts (KYB AGX’s, GMPP Koni Adjustable, etc.) from the W-Body can now work for the 1992-1999 H-Body.

Section IV.

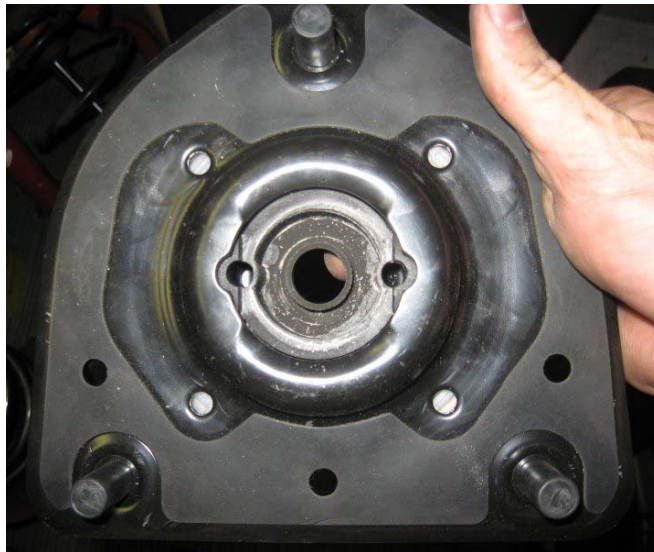
Top Mount Interchangeability Issue

Here is why you cannot bolt up W-Body top mount to an H-Body:

W-Body top mount:



H-Body top mount:



The mounting studs are in different locations and they are different sizes.

The W-body plate more than likely could be modified to work. But adapting the stock mounting plate makes for a more solid mounting point.

Section V.

Adapting F-Body Brakes to a 2000-2005 Bonneville Knuckle

The caliper bolt holes are in the correct location on the 2000-2005 Bonneville knuckle, same as the 1997-2003 W-Body. The only issue is the brake caliper holes in the knuckle are a larger diameter than the F-Body's caliper bracket bolts.

There are 2 current solutions to this.

The first, and the one I chose to do, is to insert shims into the knuckle and use the stock sized F-body bolts.

For this option, you will need 4 shims (p/n 6679K16), 4 stock sized, hardened, F-Body bolts (p/n 91310A718), and 8 high strength steel washers (p/n 98023A033).

The second is to drill and tap the F-body brackets with a 14.0 x 2 thread tap. This is the stock 2000-2005 bolt size.

Torque specs for the F-Body brakes are as follows:

Bleeder Valve 12 N•m 106 lb in

Brake Caliper Mounting Bracket Bolt 100 N•m 74 lb ft

Brake Hose Bolt 40 N•m 30 lb ft

Caliper Guide Pin Bolt 31 N•m 23 lb ft

Section VI.

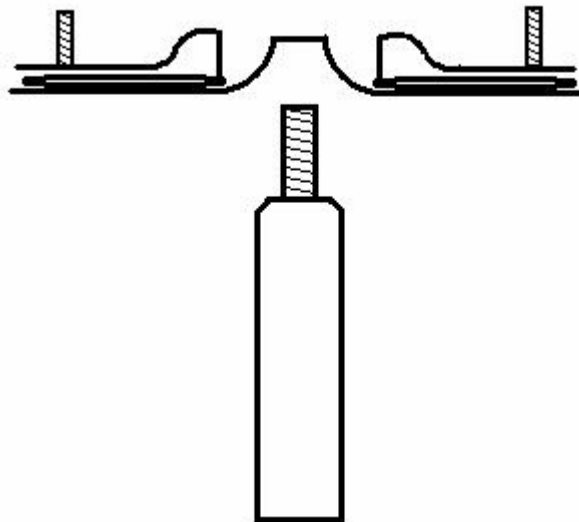
Adapting the W-Body Strut to the H-body Top Mount and Assembly

The issue here is the piston rod and perch on the W-Body strut is a smaller diameter than the H-Body's. The H-Body top mount will bolt up but the smaller diameter W-Body piston rod could work its way through the mount over time.

This piston rod to mount is, in effect, a joint. The spring mount and rubber pivots the strut and spring down on an angle away from the car. The piston rod perch has an angled edge similar to the W-Body's:



The H-Body top mount has a radius on the bottom of the hole that the piston rod goes through. A crude side view paint illustration of the top mount and piston rod:



So if you were just to put a washer there, it wouldn't allow the mount to pivot.

My solution to this is to:

1. Take 8 of the “high strength steel” washers (p/n 98023A033) I was already using for the F-body brakes and bore them out using a rotary tool to fit on the threaded portion of the W-Body strut.
2. Take the two stainless dome-shaped (p/n 91944A303) washers and bore them out the same.
3. Place 2 of the 8 steel washers on each of the W-body strut piston perch.
4. Place a dome-shaped stainless steel washer, radius side up on top of the two steel washers.
5. Slit a stainless steel bushing (p/n 8504A162) with a rotary tool to fit over the threaded portion of the strut shaft.

Now, when you go to assemble the strut, it will be able to pivot since there are two radii contacting. And it will be centered in the top mount due to the bushing.

The other issue with the smaller piston rod is centering it in the H-Body top mount hole. By some stoke of luck I had ‘Anti-Pogo Washers’ laying around that will center the rod perfectly.

Here is a picture of the bushing and the gap it fills within the H-Body top mount:



And a shot of it centering the piston rod:



For assembling the struts, follow steps 1 through 4 in this section, then:

6. Place lower W-Body Spring rubbers on the spring perch.
7. Seat the spring, compress height if necessary.
8. Place H-Body top spring seats and dust covers on the spring tops
 - a. Make sure the position the top spring rubber with the thinnest part facing the suspension mounting flange.
9. Place the H-Body mount on the W-Body piston rod.
 - a. Make sure to position the top mount so the smaller side is pointing toward the suspension mounting flange.
10. Add a washer on top.
11. Tighten top strut nut to suggested manufacturer's torque.
12. Repeat Steps 3 thru 11 for the second strut.

To adjust how high you would like the top of the piston rod to come through the mount, add washers to Step 3 as necessary. If you are lowering the car, you want the piston rod to be as high as possible. This puts the strut's plunger closer to where it would be stock.

Section VII.

Strut/Spring Install Height Differences

This section will outline what I know about the difference in assembled height and compressed height of the stock and W-Body/H-Body combination. I'll start with some visual aid then get into details.

Pictured is a stock 1992-1999 H-Body strut and knuckle assembly on top and a 2000-2005 H-Body knuckle, 1997-2003 W-Body strut/spring/spring rubber, and a 1992-1999 H-body top spring rubber and top mount assembly below.



The same assemblies, just upside down:



Uncompressed, the stock 1992-1999 assembly has a height of approximately 26" from the strut top mount to the axle centerline.



Uncompressed, the H-Body/W-Body combo has a height of approximately 25 1/4" from the strut top to the axle centerline.



This does not mean that the compressed height of the two assemblies will differ by 3/4". Only the spring rate and loaded weight will determine that.

I went with Eibach front lowering springs. They lowered the front of my car (1995 SLE) approximately 3" in the front. That is coming from 210k mile old FE1 springs and 110k mile old struts. My car did seem to ride higher in the front to begin with than your typical 1992-1999 FE1 equipped car. Ultimately, I have approximately a 1/2" of wheel well gap up top. On the W-body these same springs will lower the front end as much as 2".

If you're trying to keep as much stock height as possible, the best option I know of would be to find 1997-2003 W-Body FE3 springs or Police Package Impala springs.

Section VIII.

Procedure

I won't go into the specifics of removing the stock components. It's pretty straight forward and if you need help there are great resources out there. Consult a repair manual for proper torque specs.

1. Break front lugs loose, jack up front end, and place on jack stands
2. Remove wheels
3. Remove stock rotors, calipers, and disconnect the brake lines.
4. Remove stock strut assemblies.
5. Remove stock suspension knuckle and wheel bearing assembly.
 - Remove 34mm axle nut.
 - Remove ball joint and tie rod end castle nuts.
 - A pickle fork may be needed.
6. Disassemble stock struts if you are using your used dust boots, spring rubbers, and top mount assemblies. I would advise to at least get replacement top mounts.
7. Assemble struts by the procedure outlined in Section VI.
8. Install 2000-2005 H-Body suspension knuckles and wheel bearing assemblies.
9. Install assembled struts.
10. Install 12" rotors and F-Body brakes using one of the methods outlined in Section V and connect stock lines.
11. Bleed brakes.
12. Install front wheels
13. Check alignment and install camber bolts as necessary.

An example of everything assembled:



Section IX.

Summary

This modification allows you to use many new stock and aftermarket parts on the front end of your 1992-1999 H-Body!

With the F-Body brake upgrade you get:

- 12" rotors that have more leverage, more thermal mass, and are less likely to warp.
- A dual piston aluminum caliper that is more powerful and transfers heat faster.

With the W-Body strut and spring upgrade you get:

- The option to use any quality aftermarket W-Body strut.
(KYB AGX's, Koni Inserts, etc.)
- The option to use any of the front W-Body aftermarket springs.
(Eibach, GMPP, etc.)

And with the 2000-2005 knuckle and H/W-Body combo strut assembly you shave a 10 full pounds off sprung weight per side. This will improve suspension response dramatically.

Add this all together and you can have a nice ride with great stopping power.

Section X.

Q&A

Can the 1992-1999 H-Body rear suspension be modified to accept the 1997-2003 W-Body rear suspension?

The short answer is no.

The H-Body has a simple control arm, shock, and spring. The W-Body has a MacPherson strut with trailing arms. The two issues with it are: 1. The trailing arms and knuckles aren't interchangeable and 2. There isn't enough room in the H-Body shock tower for a MacPherson strut.

This also cancels out using the W-Body's rear disc setup.

Did pedal travel change with the F-Body brake upgrade?

Yes. There is more pedal travel before the brakes really start to slow the car down. But once it begins to brake, the power is significantly greater than anything I saw with quality slotted rotors, quality ceramic pads, and properly adjusted rear drums.

What about a rear disc conversion?

I've searched the salvage yards for a disc equipped rear knuckle that will work on our cars but could not find anything similar. The H-Body's knuckle is unique in that its strut mounting location is offset from the vertical centerline of the wheel bearing.

There are some ideas that I would like to confirm but I'm not sure when I'll be able to materialize them.

Why can't 1992-1999 H-Body springs be used with 1997-2003 W-Body Struts?

The spring perch on the W-Body strut is smaller and much different from the H-Body's. This causes the bottom H-Body spring coil to be too large for the W-Body's perch. The top coils are the same diameter though.

Credits

I would like to give credit to the four major resources that helped make this upgrade possible:

The old Bonneville Club (www.bonnevilleclub.com)

Bonneville PRO (www.nebonnevilleclub.com)

Pontiac Bonneville Club (www.pontiacbonnevilleclub.com)

Club GP (www.clubgp.com)