

(Avoiding) Hammer Damage— Servicing Honda CV Joints

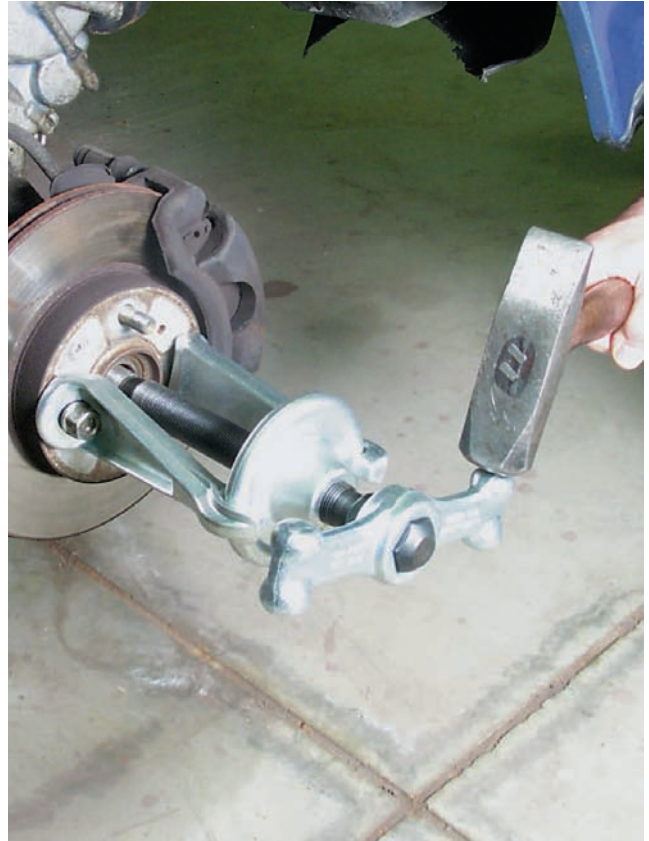
When we talk about CV joint service, it's usually just a matter of deciding when to replace a cracked boot or a noisy joint. Customers rarely spot a CV joint problem for themselves, unless they drive until a damaged joint fails completely and disables the vehicle. That's why it's important to inspect the CV joints and boots whenever a vehicle comes in for service. Even if the car didn't come to you for CV joint service, you can often spot a bad boot or hear a rattling CV joint as you do the other repair work that brought the car to your shop.

I check every CV joint boot that gets a ride on my lift, and I listen for bad CV joints on every road test. Sometimes I'll come across a noisy CV joint with a brand new boot on it. Then I have to tell the customer he needs a joint, and he'll wonder why the last guy installed a new boot on a worn-out joint.

Inspection

Some techs like to replace Honda boots if there's *any* sign of grease on the outside of the boot around the bands. The reasoning is 'If grease can get out, water and grit can get in.' While I suppose that's true, I like to give the boots a better reason to end up in the trash.

Turn the wheel full lock, and check the inner bellows folds for signs of cracks. Rotate the axle a full turn to check for deep splitting or pinholes. Small nicks that look like someone used an X-acto knife to put a tiny mark on the boot can be big trouble. They can open the whole boot at any time. Shallow surface cracks with no grease leaks alert me to inform the customer to put the CV boots on his list of things that will need to be done, usually before the weather gets cold and the boots become less flexible. They don't open as fast as the little X-acto-nick marks do, but when they let go, all the grease leaves *right now*. Deep cracks of a millimeter or more (**Photo 1**) generate an immediate phone call to the customer. These boots need replacing right away.



Removal

Getting the job done is usually straightforward. But those of us in salt-belt states have our own special set of circumstances to deal with, don't we? I don't want you guys south of the salt-belt to feel jealous, but I'm afraid you're missing some serious fun.

On a salt-belt car, the job can go right into the scrapper right after you get the axle nuts off. A 48-ounce hammer should be all you need to gently tap the axle back through the hub. I've watched guys get out their big air hammer to drive the rusty axle through the hub. If you think about it for one second, you'll realize this method bashes the wheel bearing, which may lead to premature failure.

I've had more than my share of axles frozen into the hub with rust. And I'll even confess to ruining a wheel bearing once. It wasn't fun to take it all apart to replace a wheel bearing that was quiet before I put boots on the car. That's why I invested in this most valuable of all backside savers (**Photo 2**). It's properly known as the Blue Point CJ-129.

Here's how the CJ-129 works:

- Bolt the feet to the hub with the wheel lug nuts.
- Attach the threaded portion of the tool to the axle shaft threads until it's as tight as possible.

Hammer Damage

- Use your hammer to tighten the tool up to the axle by tapping the 'dogbone' clockwise. The tool is now loaded and the hub is stressed — not the wheel bearing.
- Give the center of the driver

(where all the weld marks are on mine) a good solid blast. This is not thumbtack-driving — you may need to borrow your neighbor's five-pound mini-sledge to get the job done. Sometimes

I envision connecting with a Randy Johnson fastball and sending it over the Green Monster to get the axle moving (I'm talking serious concentration and hammer-wielding).

- Once the axle moves, retighten the dog bone and keep alternating between hammer blasts and tightening the dogbone to drive the center of the tool until the axle comes through the hub.

The reason my dogbone is welded to the tool is to keep me from using a socket and an impact wrench to tighten the driver against the axle. That's not how the tool should be used because it will destroy the threaded portion of the tool. It's a hammer driver, not an air-tool accessory.

If you are using a hammer or impact driver, keep in mind, the shaft splines are frozen to the hub. If you hammer against the hub, you hammer the bearing, thus hammering against the axle, hammers against the hub/bearing. The tool preloads the axle against the hub so the initial stress has no effect on the bearing. The initial hammer shock is absorbed by the hub/axle assembly because of the stress the tool puts between them, so the bearing is spared.

Forward Progress?

All that hammering, but the axle is still in the car? (**Photo 3**) At this point, pay particular attention to whether the car has ABS. Remove any speed sensor wiring from the steering knuckle and hub before prying the hub around to slide the joint out. It's too easy to ruin a speed sensor harness if you lose track of where you are. Those sensor wires are small and fragile, and they tear quite easily. Don't ask me how I know this.

Photo 1

A slight amount of grease seeping from a band or tiny surface cracks isn't enough to make me sell CV boots, but deep cracks of 1mm or more, pinholes or razor-cut-like nicks are a sure sign the boots are done.



Photo 2

Put the air hammer down and get one of these joint drivers if you're having trouble getting axles out of the hubs. Using an impact driver puts a tremendous shock on the wheel bearing. You'll end up brinnelling the bearing. Brinnelling leaves ball impressions in the race, which equates to a howling noise while driving down the road. This tool works well, I've done many CV joints, even using this to get axles out for a ball joint job. Resting assured you haven't ruined anything else is well worth the price for a special tool like this.



Photo 3

Getting the lower strut mount bolt out of the lower control arm can be a feat in itself. If it won't move, take the axle apart in the car. I like to disassemble the inner joint. Some techs hammer the outer end off with a vise-grip holding the axle shaft against the lower strut mount. Either way works.



Photo 4

Inspect the axle for loose paint, rust, etc. Clean off any loose paint and rust before reassembling the CV joint. Otherwise, sliding the new boot into place will allow the debris to hide in the boot. It may not be a big deal, but why do we clean parts, anyway? If the splines were rusty and you had to drive the axle out of the hub, be sure to clean them. I go through a lot of penetrating oil.



Notice the rust on the axle splines. You'll have to get this all off so the axle will slide back through the hub easily during reassembly. There are no special tools to drive it back in. Cleaning the parts should take care of that.

As you can see, I was able to remove the bolt holding the lower spring mount to the lower control arm, which proves I do reap my small share of blessings. Pull the mount over and ahead of the lower control arm to facilitate removal. If this bolt will not budge (another frequent salt-belt symptom), you'll have to take the axle apart while it's still in the car. There are two ways to go about it:

- Take the inner joint apart and slide the new outer CV boot onto the axle from that end. Taking the inner joint apart in the car is a matter of removing the large boot band (after the inner joint is out of the transmission or sub axle), slipping the axle cup off the shaft (keeping track of the cross rollers as they fall into the boot or onto the floor), then sliding the shaft with the inner boot now more collapsible through the strut bottom yoke. When you put it back together, use care to keep the cross clean as you slide the new boot (the boot goes on first) and shaft (sans joint) through the strut. Then, grease the inner cup, install the rollers on the cross and assembling the boot in the car. Or...
- Hold the axle with a locking pliers against the yoke, then hammer the outer CV joint off. Slice off the outer boot first, then lock the axle shaft against the strut bottom and hammer the 'star' portion of the axle joint. This is the less preferable approach, in my opinion. It's very cumbersome, and most locking pliers don't hold the shaft well enough. Plus, putting it all back together isn't any easier. That's why I prefer taking the inner joint apart.



Photo 5

Before driving the joint off the end of the shaft, position it in your vise as shown. When you come down with your hammer, the only thing you can hit is one of the points of the 'star' (the part actually splined to the axle). This usually pops off the joint with one well-placed, confident blow. This takes accuracy, not force.

Photo 6

All the loose paint and rust has been scraped from the shaft. Inspect the snap ring on the shaft for distortion. If you have a new clip, use it. If crusty paint extends into the boot sealing surface, clean it down to the metal, well enough for a new coat of paint. If the surface of the axle is rough, the boot will leak.



Inspection/Disassembly

The paint is flaking pretty badly on this axle shaft. Scrape as much of the loose stuff off as possible, so no rust or paint flakes get into the freshly serviced joint as you slide the new boot over it (**Photo 4**). If the boot was open when you found it and you heard clicking noises on turns, replace the outer joint. Greasing up a noisy joint won't fix the car and won't make your customer happy. If you aren't sure whether the joint is a keeper or a junker, hold the axle in a vise and try to rotate the outer joint. The joint should be tight. Any looseness is a noisemaker.

Hammer Damage



Photo 7

A good boot kit should include new boots, new bands, grease for inner and outer joints, new spring clips and a new axle nut. After torquing the axle nut, be sure to stake it with a chisel to the flat notch in the end of the axle shaft. As long as you're going to the trouble to put clean new stuff in the axle, make sure the old joints are free from all traces of old grease and cleaning solvents.



Photo 8

When installing the inner joint, slide the boot on, then assemble the rollers to the cross with a film of grease supplied for the inner joint. Make sure the sides of the inner joint are smooth and have no rough spots or depressions that can grab the shaft and cause an axle vibration. Put the remainder of the grease into the inner axle cup and slide it over the cross and rollers. This forces the grease into all parts of the roller and cross assembly. Nothing should escape unlubricated.

Separating the axle from the outer CV joint is one place where technique is much more important than strength:

- Hold the axle in a vise at a slight angle with the top facing away from you (**Photo 5**).
- Tip the axle end of the joint away from you as well so the 'star' (the part that's splined to the axle) has a point exposed higher than any other surrounding part of the joint.
- Wiggle the joint slightly to eliminate the possibility of the snap ring hanging up on either the axle or the joint.
- Strike the joint star sharply with a downward hammer blow. The outer CV joint should pop off with the first blow.

You may want to use a drift here because your hammer may not clear other joint components.

Some guys like to leave the outer joint on the car and replace the boots from the inner side. I don't favor this approach because I want to be able to completely disassemble the outer joint so all traces of old grease (as well as cleaning solvent) can be removed. I can also assure myself that the joint will be completely packed with new grease. With the outer joint removed (**Photo 6**), inspect the snap ring and replace it if deformed.

Scrape most of the rust and flaky paint off the axle before it hits the parts washer. Check the inner joint for wear marks (depressions) in the sockets where the rollers ride. I've seen wild vibrations under acceleration caused by slight depressions in the cup slides. As the rollers ride through these depressions, they actually try to grab the axle, causing it to whip around.

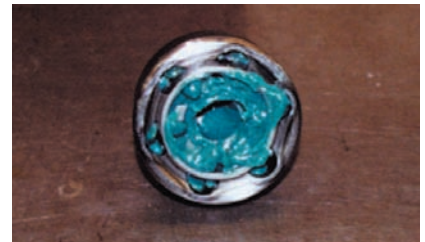


Photo 9

When packing the outer joint, fill the center of the joint with grease and push it in with your thumb until it squeezes out around the ball sockets. This ensures the outer joint is thoroughly greased. Be sure to put the boot on the shaft before you fit the joint to the axle! Leave yourself enough of a clear spot in the center of the joint that you can watch the snap ring as you slide the outer joint on. Center the snap ring with your pocket screwdriver as you reach the taper in the splined part of the 'star,' then give it a sharp rap with a hammer to start it in. Slowly tap the outer joint on the remainder of the way until you feel the snap ring lock in place. There will be a 'shadow print' from the previous contact between the joint and the axle showing you exactly how far you have to go to get the joint on to where it locks. Don't hammer it on so fast or far that you go right past the lock groove. Apply the remainder of the grease on the joint and install the boot.

Hammer Damage

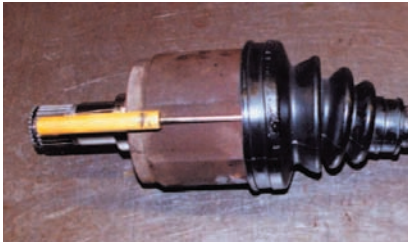


Photo 10

Once the boot is installed, slide your screwdriver between the boot and the outer cup to burp it. There should be neither positive nor negative pressure in the joint when you put the bands on.

A wild vibration on acceleration, disappearing as soon as you get off the throttle, may be caused by a small depression in one or more of the sliding surfaces of the inner joint. Run your finger up and down each side of the surface (if you can't readily identify the thrust side) and make sure each is smooth. Vehicles with this problem may not exhibit vibrations at any other time.

Cleaning/Reassembly

The new boot kit (**Photo 7**) should come with grease packs for the inner and outer joints, new boots, new bands, new retaining clips and a new axle nut. The inner joint usually gets the lighter, tan-colored grease. The blue or sometimes the black, graphite-colored grease is for the outer joint.

To clean the joints, start with a mineral spirits parts washer and get as much grease out of the joints as possible. The inner joint cleans up pretty fast, so start the final cleanup and reassembly while the outer joint soaks in the parts washer with the stream from the washer directed into the center of the inner section of the joint.

Finish by cleaning any traces of mineral spirits from the inner joint with spray brake cleaner. The joints must be clean and dry — free from all grease and from any trace of the parts-cleaning solvent. It may take more than one pass to get all the old grease out, but there is no reason why the joint shouldn't be as clean as new before it goes back together.

Prepare the inner joint by wiping the roller cross with inner joint grease before putting the rollers on. Fill the inner joint cup with the

rest of the grease next (**Photo 8**). As you slide the outer joint over the cross and rollers, the grease is forced through the cross and rollers, and everything gets slippery. Fill the center cavity of the outer joint with grease, then use your thumb to push the grease into the joint until it's forced through the ball sockets. Now we can be certain the joint is entirely packed with grease.

As the outer joint is reinstalled to the axle (**Photo 9**), the axle will force more grease through the business end of the joint. If there is any grease remaining in the packet, add it around the joint just before sliding the boot into position. Before installing the boot bands, make sure the boot is properly positioned and stretched to the proper length. The areas under the boot lips where the boot contacts the CV joint and axle should be free of any grease, to keep the boot from sliding around after the clamps are installed. Burp any trapped air from the boot with a pocket screwdriver before clamping the bands (**Photo 10**). Spray the boot with silicone so the band doesn't snag on the boot while you position it and lock it in place.

Once the axles are back in the car, don't forget to use the new axle nuts and to torque them properly before staking them in place. Various torque specs have been recommended, so check your manuals. The specification will be somewhere between 130 ft-lb. for small Hondas and 181 ft-lb. for the bigger ones. I'll repeat my caution against letting your impact chatter against the axle nut. Remember how easily wheel bearings can be ruined.

Be particular about the drive axle products you buy. I've seen replacement driveaxles that were the wrong length, but the difference wasn't big enough to make them easy to spot. An axle that is slightly longer than normal can cause a nasty idle vibration. A good parts source will eliminate this concern. Take your time, do it right, do it clean. Do it once. ■

—By Marlowe Peterson