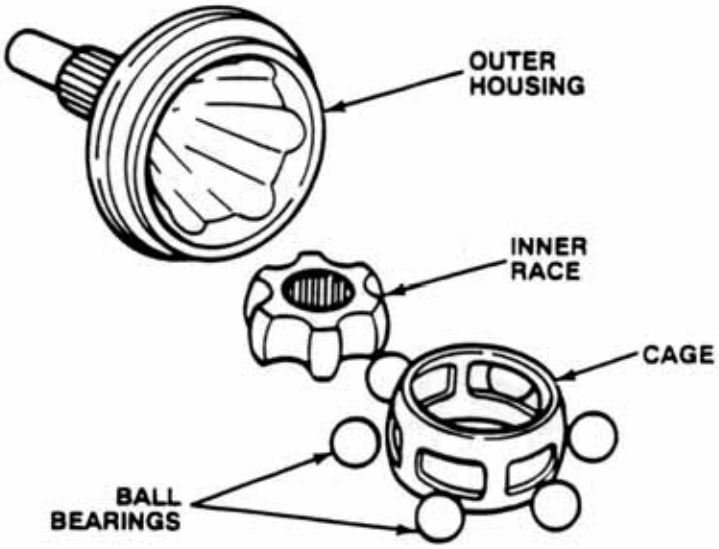
History

The Rzeppa CV joint was patented by Alfred H. Rzeppa in 1928. These early designs had six tracks in the housing and race, and a cage with six balls just like the modern version. These early designs worked well but they lacked lubrication. The grease in these early joints did not hold up and the boots were made of leather and did not seal properly. This type of joint did not work practically until the advent of the neoprene boot.

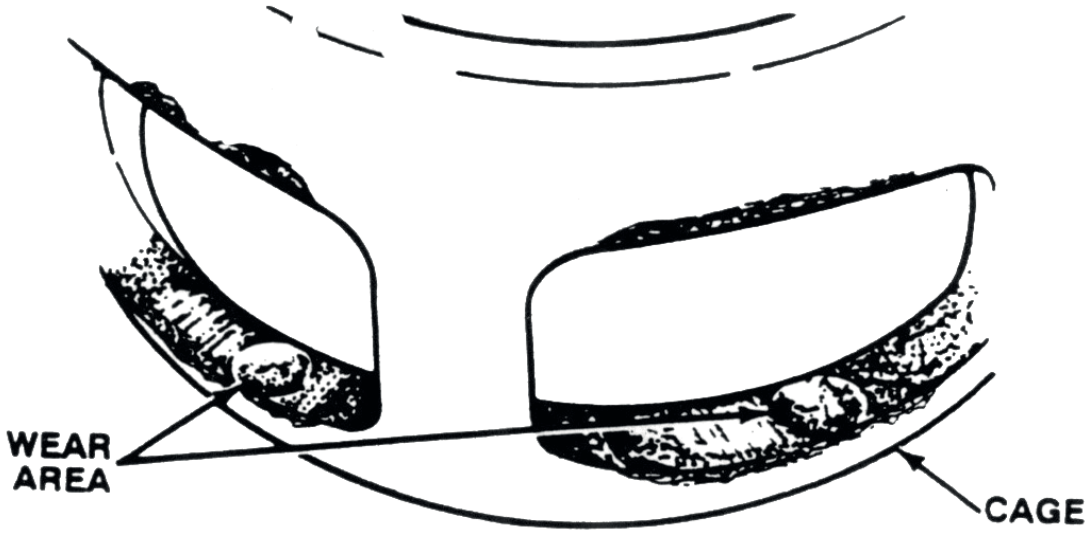


Inspection & Diagnosis

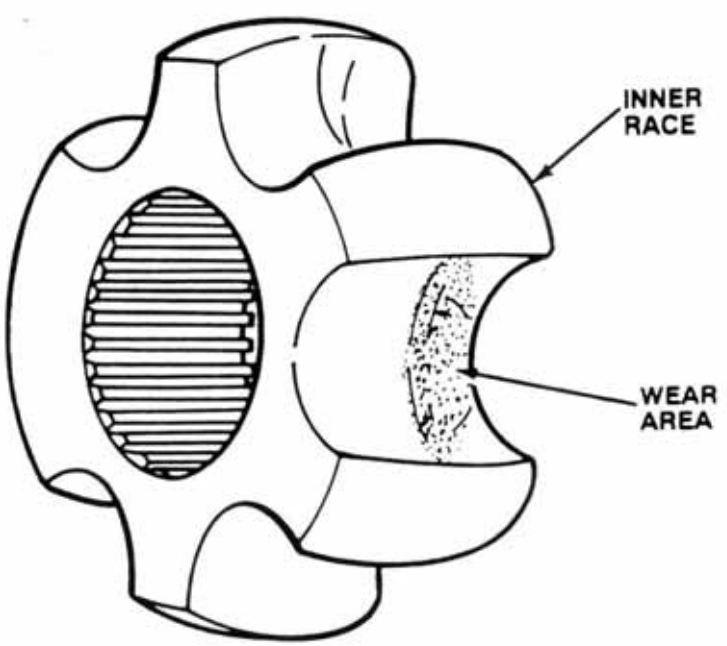
Communication with your customer is very important. Ask specific questions and listen very carefully to the answers. If necessary take your customer with you on a test drive. Vibrations or wobbles are usually caused by indention or looseness in the inner joint. The clicking noise commonly associated with a bad CV joint is usually caused by indention or wear in the outer joint. To diagnose which side of the vehicle the clicking noise is coming from turn the steering wheel all the way to one lock. Drive the car in reverse. If the clicking noise is louder while turning to the right then the left axle is the cause of the problem. If the clicking noise is louder while turning to the left then the right axle is the cause of the problem. Look for torn or dry rotted boots during a visual inspection.

Clicking Noise

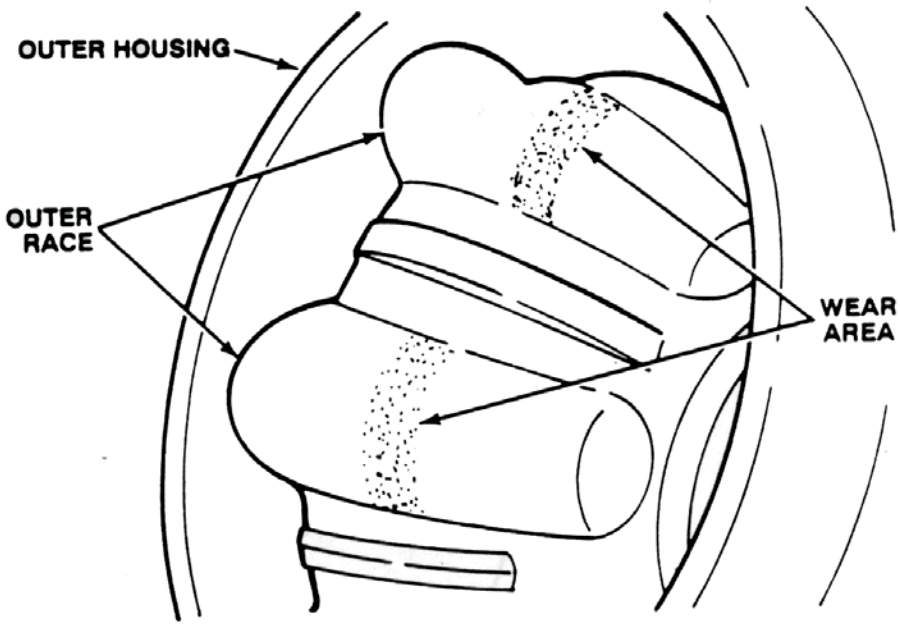
The clicking noise that a worn CV joint makes is caused by indention and wear in the components. The first component to wear is usually the cage. Small dimples form in the windows of the cage. The clicking noise is created when the balls travel in and out of these dimples.



The next component to wear is the race. Indention, pitting, or spalling can all occur in the tracks of the race. The indention or wear creates looseness and causes the joint to wear faster.



The final component to wear is the housing.



The only way to properly repair a joint with this type of indention is to replace the worn components or machine them to accept an over-sized ball.

CV Boot vs. Axle

When inspecting the CV shafts be sure to check the condition of the boots. To determine if your customer needs a couple of boots or a complete axle, answer these questions. Are the joints clicking or making noise? Is the boot completely torn open or does it have a small hole? Has all of the grease been completely thrown out of the joint or is it still in good condition? What is the vehicle mileage? How long has the boot been torn open? Many times the cost of replacing both boots vs. replacing the complete axle is not much different. The warranty your customer gets with a complete axle is usually much better than with a boot replacement. With a complete axle your customer not only gets new boots but they get a remanufactured inner and outer joint and the shaft too.

CV Boot Installation

1. Remove the CV axle from the vehicle, the joint from the center shaft, and the old boot from the center shaft. Using a rag clean as much of the old grease from the joint as possible.

2. Apply a small amount of grease to the inside lip on both the small end and the large end of the boot. This will help the boot slide onto the center shaft and over the outer joint. Install the small end of the new boot on the center shaft. Be careful not to damage the boot on the splines of the center shaft.

3. Cut a corner off the grease package and squeeze as much of the grease into the hole in the center of the race. Squeeze the remaining grease into the boot.

4. Install the center shaft into the race of the outer joint. The pressure will force the grease out through the balls. The grease that squeezes out through the balls should be cleaned off with a rag.

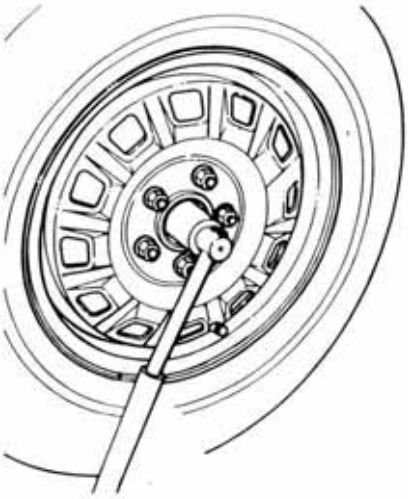
5. Install the large end of the boot onto the CV Joint.

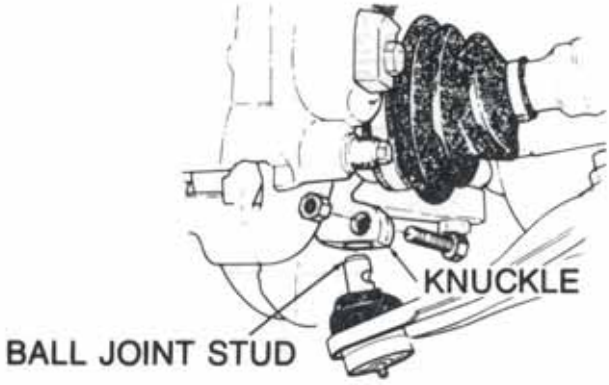
6. Before installing the clamps, you must vent any excess air that is trapped in the boot. Excess air will cause the boot to distort and shorten the life of the boot. To purge air from the boot, insert a small screwdriver between the small end of the boot and the center shaft. Any trapped air will escape and the boot will stabilize.

7. The clamps supplied with this kit are universal-type. Wrap the clamp around the boot and insert the end of the clamp into the clamp tool. Ratchet the clamp tool till the clamp is tight. Be careful not to over tighten the clamp so it cuts the boot. Cut the band with the clamp tool and fold the end back between the tabs. Fold the tabs over to lock the end in place.

Removal of Old Axle

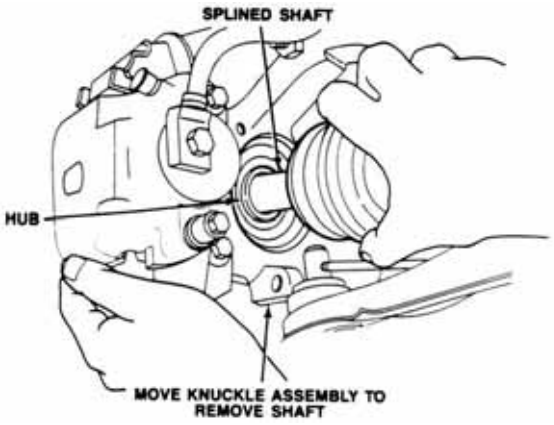
1. Remove the spindle nut.





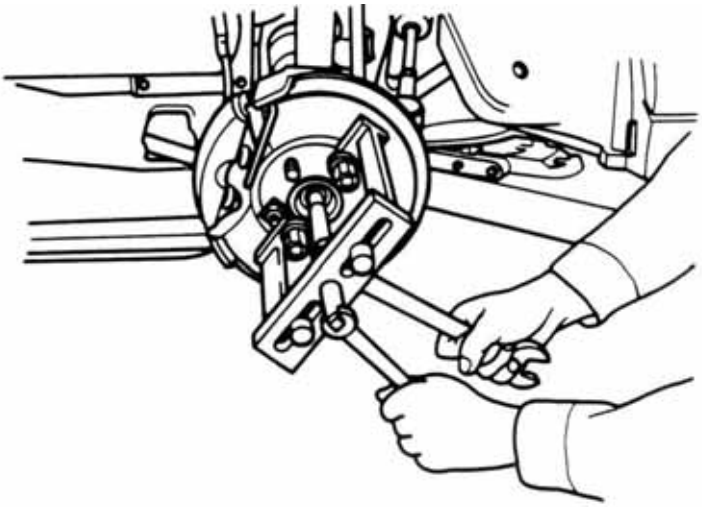
2. Separate ball joint.

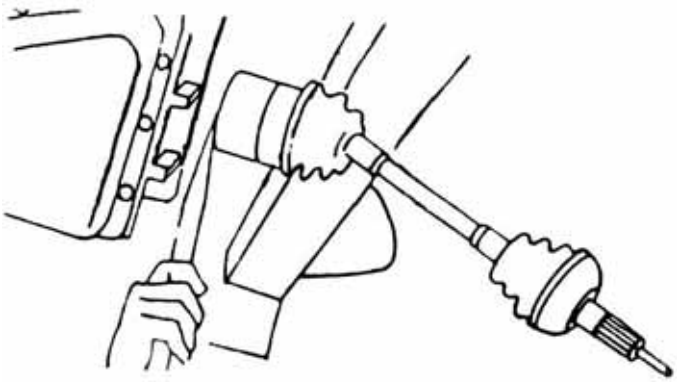
3. Remove outer joint from hub.



4. Do not use a hammer to drive the C.V. Joint out of the hub. This will damage the joint and the core will have no value.

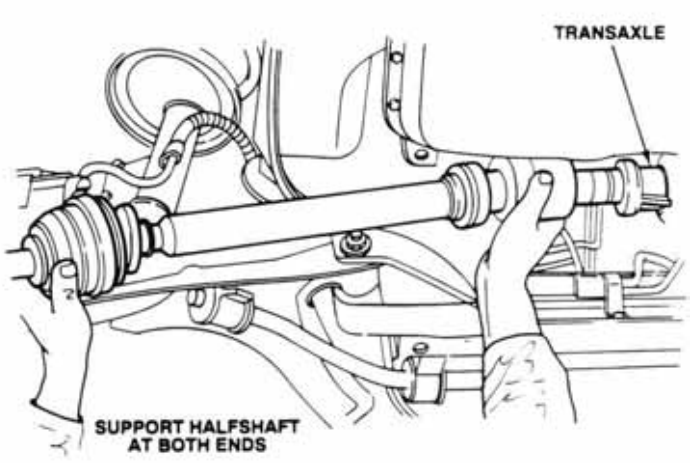
5. On most Subaru's and some Ford models the outer joint has to be removed with a hub puller. OTC Part #7394





6. Remove the inner joint from the transmission. The inner joint will normally pop out by prying between the joint housing and transmission. Do not pry too hard on the transmission case or damage may occur.

7. Remove the axle from the vehicle. Be sure to inspect the transmission seal for wear and replace if necessary.



Matching Axles

1. Before installing the new axle match it to the old unit. Check the over all compressed length by bottoming both inboard joints on something hard like a cement floor.

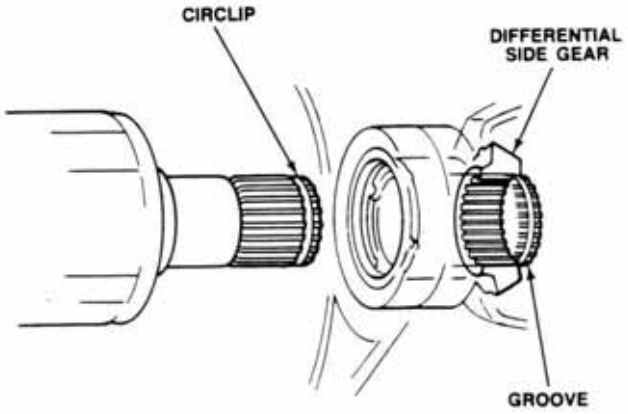
2. Measure and compare the inner and outer seal surfaces.

3. Compare the outer stub lengths.

4. Compare the inner stub lengths.

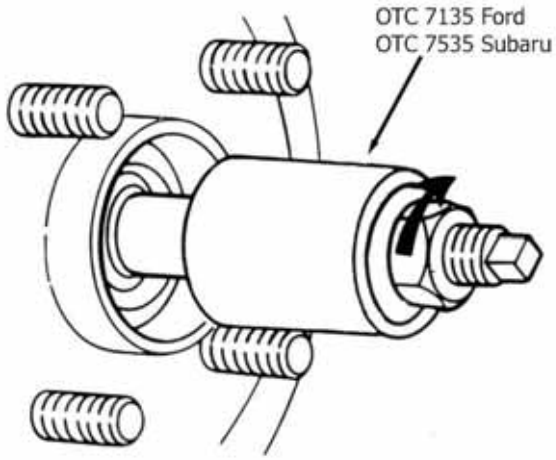
Installing New Axle

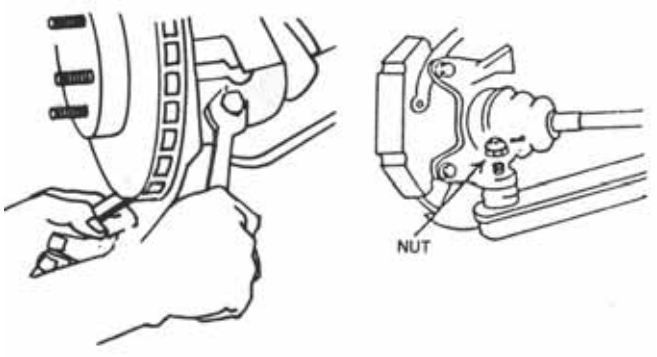
To install the new axle, reverse the removal instructions. Follow these tips to aid you when installing your new axle.



1. When installing the new axle be sure the cir-clip on the inner joint stub locks into the transmission.

2. If installing a Subaru or a Ford axle it may be necessary to use this tool to pull the outer joint through the hub.

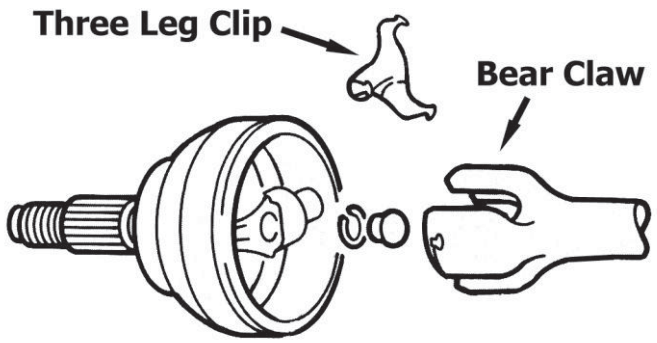




3. After pushing the outer joint through the hub, install the ball joint and nut or bolt.

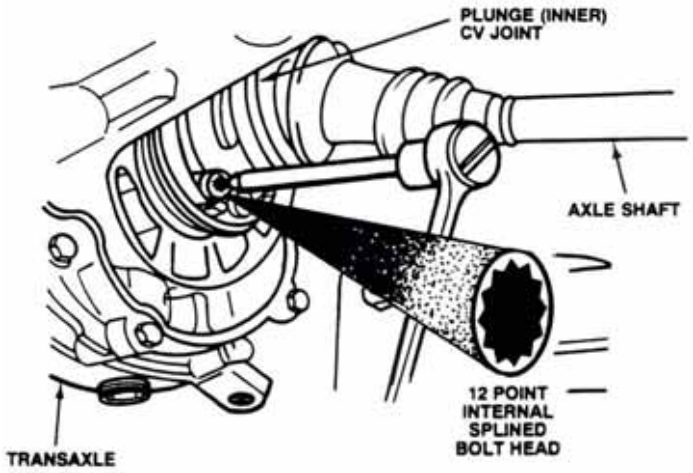
4. Always torque the spindle nut to the properly specification.

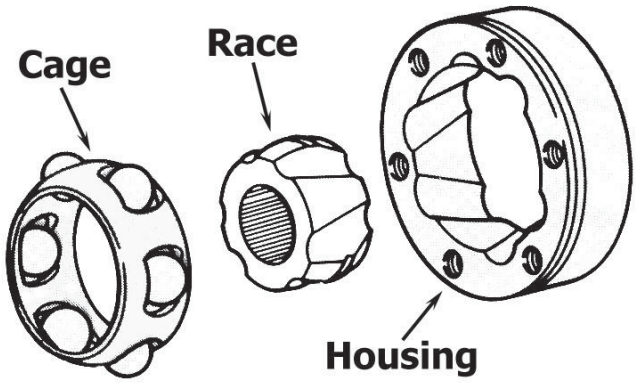
Special Conditions



1. Toyota Tercel, Nissan Stanza, and various Renault models use a Bear Claw design outer joint. If doing a boot job, **do not** disassemble the outer joint. Disassemble the inner joint and slide the boot on from the inner end.

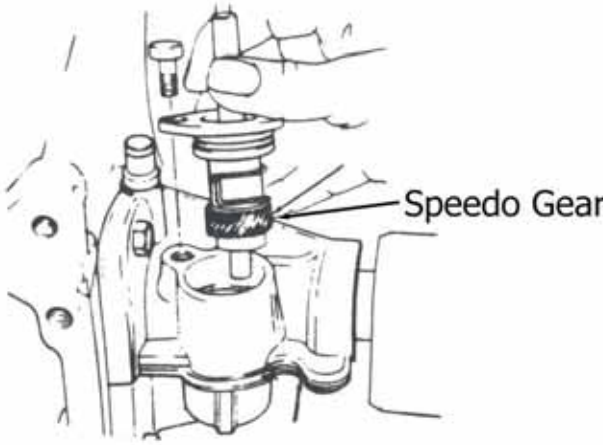
2. Volkswagen and Audi use a bolt that requires a serrated bit to remove. The bolt heads strip out very easy. Use brake or parts cleaner on the head of the bolt before attempting to remove it.

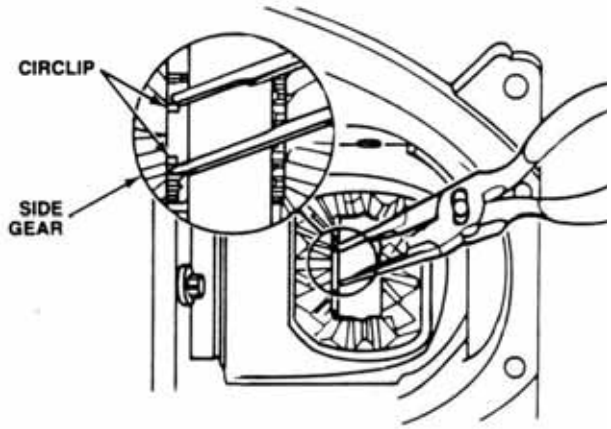




3. The cross groove style joint can be assembled two different ways. The correct way is to align the grooves in the race to cross the grooves in the housing so they make an X pattern. If the joint is not assembled properly it will not plunge and move freely.

4. Most Chrysler vehicles have a Nylon speedometer gear that drives off of the passenger side axle stub. You should remove this gear before removing the axle. If the teeth of the drive on the axle stub do not mesh with the teeth of the gear, the teeth on the gear will strip.



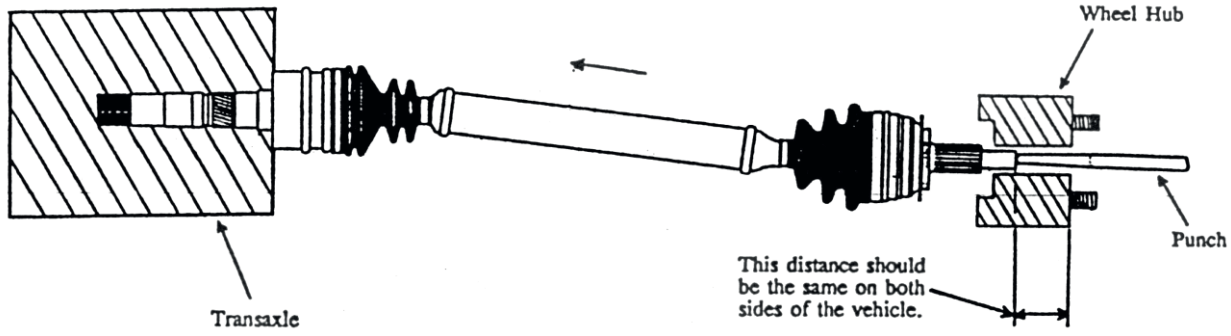


5. The Chrysler vehicles listed below use a cir-clip to retain the axles into the transmission. This clip must be compressed before the axles can be removed from the transmission. Remove the differential inspection cover, compress the tangs of the clip with needle nose pliers, and remove the axle from the transmission.

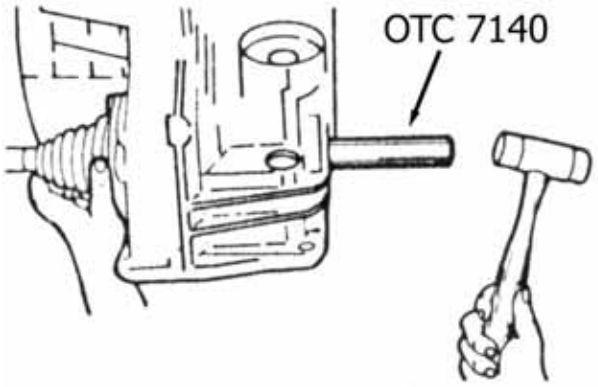
1978-80	Omni, Horizon A/T
1981-82	Omni, Horizon 2.2 L
1981-83	Aries, Reliant
1982-83	Fifth Ave., LeBaron, New Yorker
1982	Scamp 2.2 L

6. General Motors vehicles from 1982-91 with the TH125 transmission may have a carrier support bearing on the passenger side of the vehicle. This bearing and sleeve is an aftermarket fix for a worn side bushing. If the vehicle has this carrier bearing assembly on it you will need to order the axle that includes the sleeve.

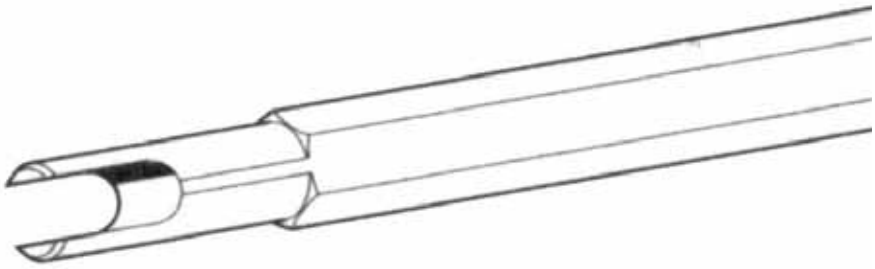
7. Most Chrysler vehicles have adjustable motor mounts. If the motor and transmission are not centered in the vehicle the inner joint will pull apart. A simple measurement and adjustment will fix this problem.



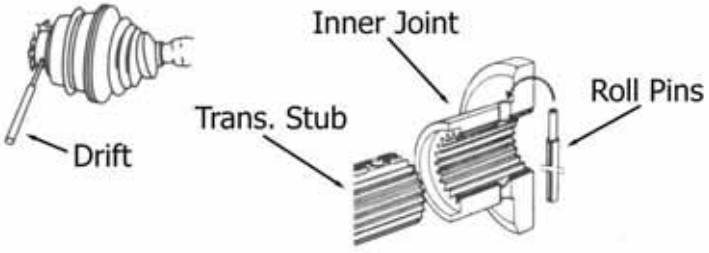
8. G.M. Trucks with I.F.S. have a problem that is similar to the Chrysler pull apart. The inner joint housing can break or crack due to an axle being stretched longer than it is designed for. This is usually caused by increasing the operating angle of the axle.

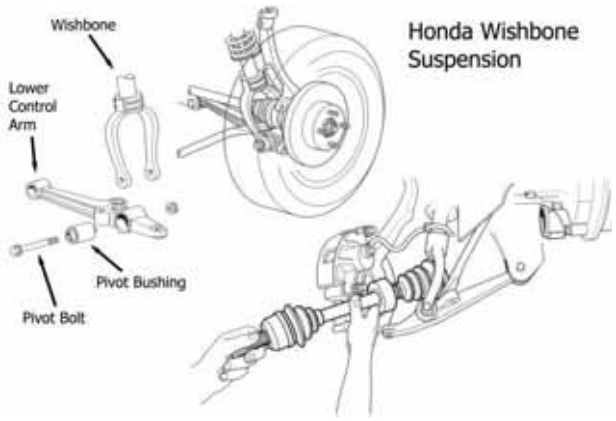


9. On some Escort & Lynx models you will need to remove the right hand CV shaft before removing the left hand shaft. The Ford differential rotator tool can be used to remove the left hand shaft. If both shafts are removed leave the rotator tool in the differential so the side gears will stay aligned.



10. Various Renault models use two roll pins to hold the inner joint on to the transmission stub. One roll pin is inside of the other. Be sure to remove both of the roll pins before attempting to remove the axle.





11. On Honda's, with wishbone suspension, the pivot bolt has a tendency to seize to the inner sleeve of the pivot bushing. Instead of removing the pivot bolt and risk damaging the bushing. Disassemble the inner joint and remove the axle in two separate pieces.

12. The front stub axle on a Mazda MPV 4X4 requires a small amount of grease on the splines. Without lubrication the splines on the stub axle and the inner joint housing will wear and create a vibration.