



NEW DRIVE AXLE TIPS

BEFORE YOU START

NEVER diagnose a vehicle on a lift unless it is supported by the suspension. And **never turn the wheels** side to side while the vehicle is supported in this manner.

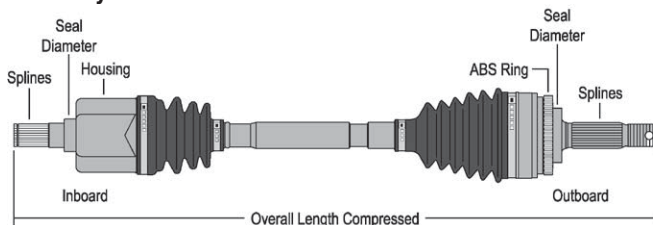
NOTE

To reduce the inventory required to cover a maximum number of applications, EMPI supplies most axles which have a with or without ABS option **WITH the ABS tone ring installed!!** In most cases this ring will not effect the installation of the axle on non-ABS vehicles. If there are any clearance issues with the ring, it may be carefully removed from the axle with a suitable tool prior to installation.

Many new C.V. Joints such as found on Mazda, Mitsubishi, Nissan, Subaru, Toyota etc., utilize 8 Balls instead of 6. EMPI C.V. Joints are all 6 Ball design which can replace 8 Ball design. Carefull consideration has been taken to ensure that EMPI Axles will fit the first time, everytime.

When replacing an O.E. drive axle, the unit coming off of the vehicle may not look exactly the same as the new EMPI replacement axle supplied. This section is a guide to explain some of the differences and how to verify that the new EMPI replacement axle is correct.

The important areas in Constant Velocity Drive Axle interchangeability are Overall Length, Spline Count, Seal Boss Diameters, Stub Length, and Number of mounting holes. When all of these match, the Axle will interchange correctly in most cases.



1.) The Number of Splines

Count the number of Splines on the Inboard & Outboard Joints of the new axle and compare the count with the unit coming off the vehicle. The Spline Counts must be the same for the replacement part to properly fit and function.

2.) Seal Surface Diameters

Measure both inboard and outboard seal surfaces. These measurements should be the same for the replacement part to properly fit. **Note.** If the old axle seal bosses have grooves worn into the surface, be sure to measure where the surface has not been damaged or worn.

3.) ABS Rings

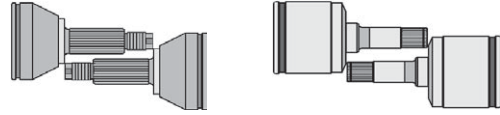
If the old axle coming off the vehicle has an ABS ring installed, verify that the new axle has the correct one installed. Count the number of teeth or windows on the old axle and compare to the new axle. The design and tooth count must be the same for the ABS to function properly.

4.) Inboard Mounting

Examine the Inboard Joint method of mounting into the transmission. The Inboard Joint should have the same Clips, Bolt Holes and / or Splines.

5.) Male Stub Lengths

The Axle Joints with a Male Stub should be checked by placing the corresponding new and the old Inboard Joints against each other end to end and comparing their lengths. The Stub Lengths should be the same in most cases. Exceptions are when the new axle's nut size changes. Then the length of the threaded portion may be different.



6.) Over All Axle Length

Overall Length of the EMPI New Axle compared to the old axle will be within 1/4 of an inch longer or shorter and still function correctly. Worn and/or broken components within the old axle can contribute to this difference. In most cases over all axle length is the compressed length. To measure the compressed length, start by placing the old axle with the Inboard Joint down on a flat surface with the Outboard Joint in the air. While holding the Outboard Joint, push down to compress the axle to it's shortest length. Be sure to keep the assembly straight. Repeat with the new axle. Some axles have a spring loaded Inboard Joint, the length of these axles is determined by the over all extended length. On axles that have hard plastic inboard boots it may become necessary to remove the large clamp and release all of the trapped air in the inboard end to acheive the correct collapsed length.

7.) New Spindle Nut Size and Thread

EMPI New axles are supplied with a new Spindle Nut or Bolt where required. The Nut or Bolt Thread Size may be different than the original, but this is acceptable.

BE PREPARED

A.) Certain vehicles, Ford and Subaru especially, require specialized tools to remove the Outer Joint from the hub.

B.) If you encounter difficulty removing the Inner Joint from the transaxle, try removing the opposite side axle, then carefully using a long drift punch, tap out the other axle.

NOTE: On many vehicles extreme caution must be exercised when removing both axles at the same time. Do Not jolt the transmission or move the transmission gear selector while both axles are removed. Failure to do so may cause the side gears to move and prevent re-installation of the new axles.

C.) After removing any axle with a cir-clip on the inner spline, check carefully that all of the clip and any other metal debris has been cleaned from the transaxle.

D.) **AVOID EXCESSIVE FORCE** which may damage the transaxle.

E.) Inspection of related Engine, Suspension, Steering and Transmission mounts/bushings should be performed prior to installation of new Drive Axles. **Worn or broken mounts/bushings can be the cause of noise or vibration.** This may lead to incorrect diagnosis of Axle performance.

F.) Always check the condition of the transaxle fluid. If discolored, has particle contamination, or smells burnt, it should be replaced.

G.) Before installing the new axle, check the transaxle seal for damage or excessive wear.

H.) After putting the vehicle back on the ground, but **BEFORE** test driving, **ALWAYS** check the transaxle fluid level, that the axle nuts & bolts have been properly torqued, staked or the cotter pins have been installed, and the lug nuts are tightened correctly.

I.) Test drive the vehicle to verify proper function of the new axles.

NEW DRIVE AXLE TIPS



INTERCHANGEABILITY

On EMPI's new replacement axles, the C.V. Joints may be larger or smaller in diameter, slightly different in shape ("Round" verses "Y" shaped) and still work properly on the vehicle. The Axle Bar may be slightly thinner or thicker, and will not have a damper and still work properly.

The following section will show a variety of illustrations of various units which are interchangeable with EMPI replacement axles.

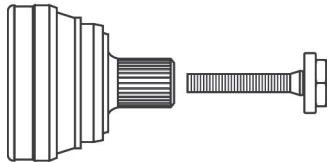
Also be aware that there are footnotes in many places within the catalog. These footnotes will reference an illustration or additional text which can be critical in the determination and selection of the correct axles. Footnotes will be designated as superscript numbers preceded by the # sign within the application text. Text information will be located at the bottom of the page and information with illustrations will be located at the end of the vehicle's make section (I.E. Dodge)

Audi / Volkswagen



Axles interchange when the lengths are the same.

Late Model Audi and Volkswagen



Bolt may be 14mm or 16mm

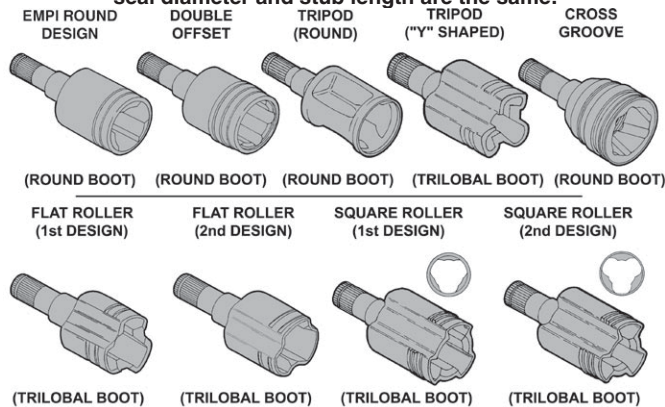
Joints interchange when splines are the same

WARNING

Inspection of related Engine, Suspension, Steering and Transmission mounts/bushings should be performed prior to installation of new Drive Axles. **Worn or broken mounts/bushings can be the cause of noise or vibration.** This may lead to incorrect diagnosis of Axle performance.

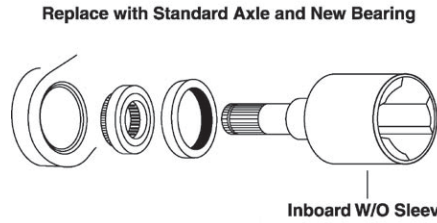
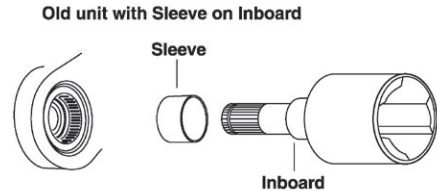
Buick, Cadillac, Chevrolet, Geo, GMC, Pontiac, Oldsmobile

These O.E.M. Inboard Joints will interchange when splines, seal diameter and stub length are the same.

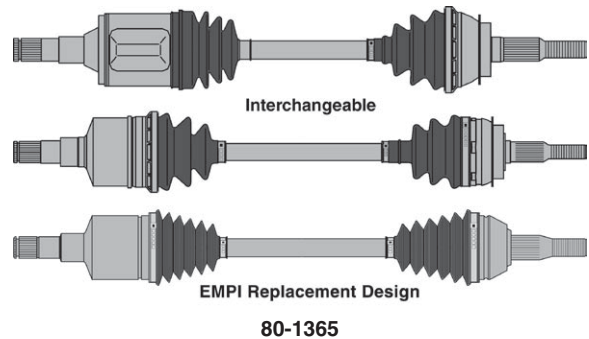


Buick, Cadillac, Chevrolet, Geo, GMC, Pontiac, Oldsmobile (Cont'd)

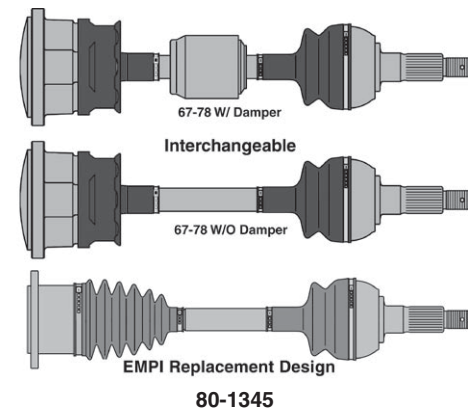
General Motors Vehicles equipped with the TH-125C 3 Spd. Automatic Transmission 1979 to April of 1986. If the Inboard Joint seal boss has a sleeve on it, it will be necessary to replace the oversized transmission seal and carrier bearing assembly with a standard sized one from the dealer. This is to assure a proper axle to transmission seal and avoid leakage of fluid.



Broad Coverage



Cadillac Eldorado, Oldsmobile Toronado

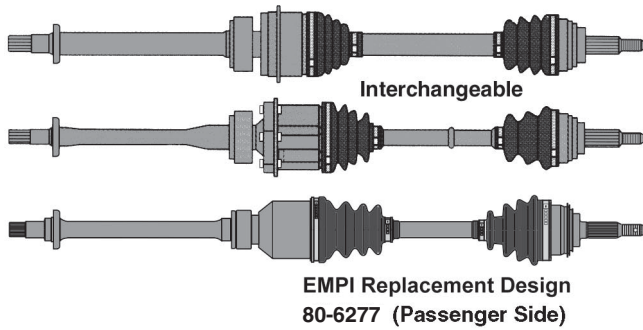
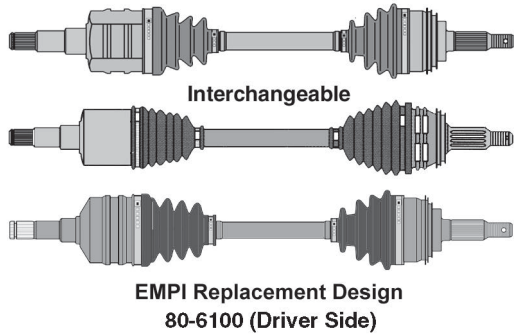




NEW DRIVE AXLE TIPS

Buick, Cadillac, Chevrolet, Geo, GMC, Pontiac, Oldsmobile (Cont'd)

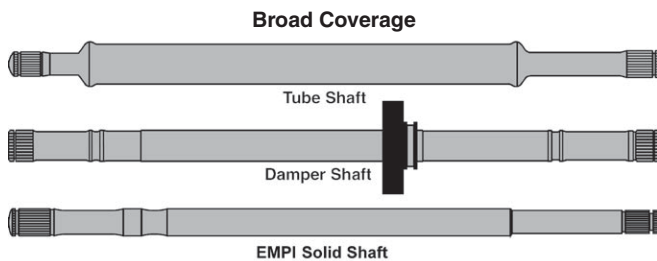
85-88 Chevrolet Nova, 89-92 Chevrolet / Geo Prizm



Chrysler/Dodge/Plymouth

CAUTION!!

In the case which the original inner axle joint has pulled apart, a very careful inspection must be performed to identify if the engine has shifted, if there are broken mounts, or if there has been frame damage. A worn axle will not pull apart, but the above vehicle driveline and frame conditions may cause this. New EMPI axles returned with torn boots and / or separated inner joints will be ineligible for warranty consideration.



Axles interchange when the lengths are the same.

Chrysler/Dodge/Plymouth (Cont'd)

EMPI axles will replace multiple designs of Chrysler axles, as long as the stub splines and the collapsed/extended lengths are the same.

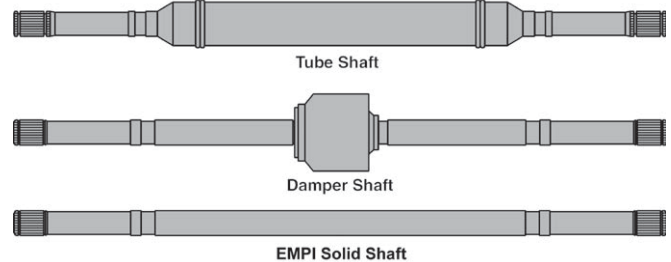
2002-2005 Dodge Ram 1500 Axles (EMPI 80-2105)

When replacing Axles on this Vehicle the Transmission Output shaft splines **MUST** be inspected for rust or corrosion. If this condition exists the output shafts must be replaced. These items can be purchased from your Dodge Dealer. Also inspect the condition of the O-Rings and replace if necessary.

Axles returned for Inboard Spline damage or corrosion will not be eligible for warranty consideration

Ford/Mercury/Lincoln

Ford Escort/Mercury Lynx



Axles interchange when the lengths are the same.

Honda/Acura

Acura Integra ABS Rings

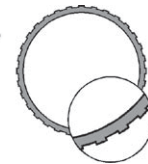
1990 - 1993

1994 - 2000

Round Teeth



Square Teeth



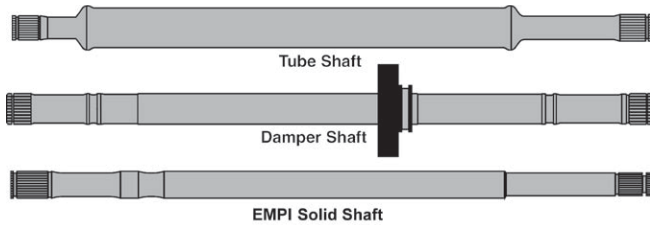
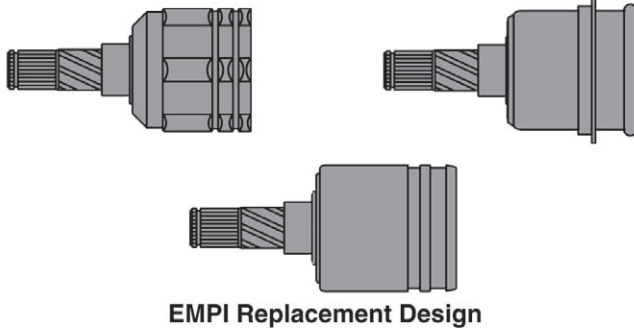
These Axles Do Not interchange.

NEW DRIVE AXLE TIPS



Nissan/Infiniti

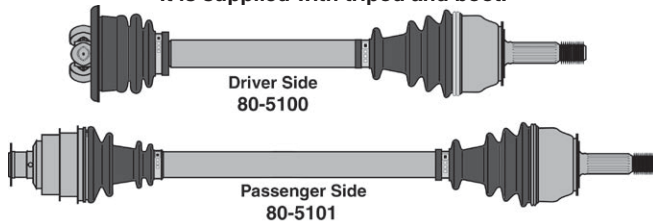
These O.E.M. inboard joints interchange when stub splines are the same.



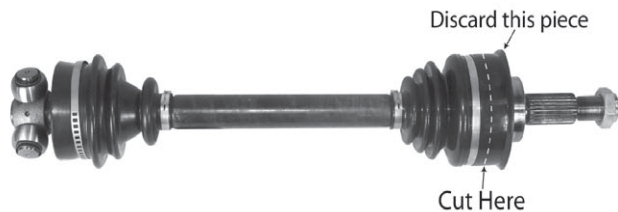
Axles interchange when the lengths are the same.

Renault

Alliance/Encore
Driver side does not have inboard joint.
It is supplied with tripod and boot.



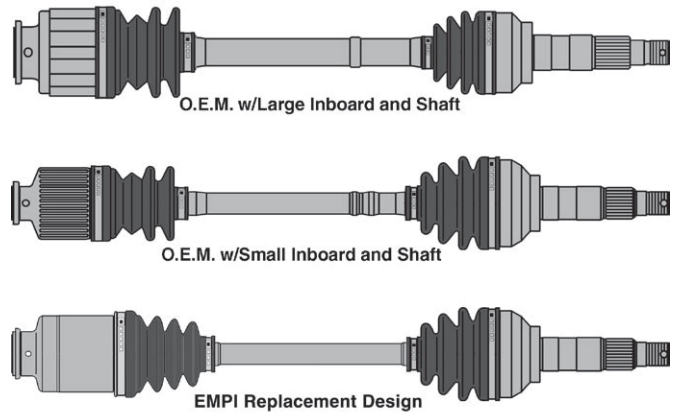
Saab



On 88-89 Saab 900 models it may become necessary to trim outboard C.V. Boot for spindle hub clearance. Carefully cut C.V. Boot with a razor blade or utility knife approximately 1/2" in front of large clamp. (See Illustration)

On 81-87 Saab 900 models no modification to Boot is necessary prior to installation

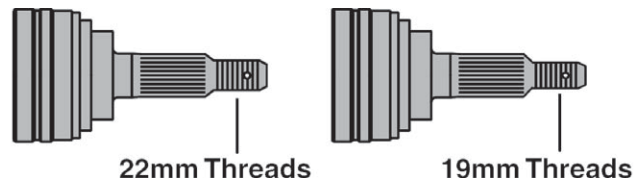
Subaru



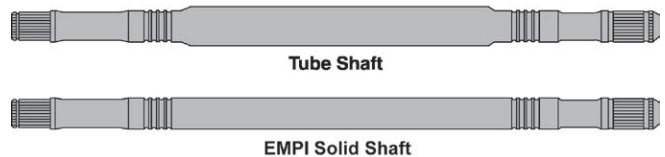
Interchangeable if spline, seal diameters and overall length are the same.

Toyota

Toyota Outboard Joints with different Spline Threads will interchange when new Spindle Nut is used. New EMPI axles are supplied with a new Spindle Nut where required. The Nut & Thread Size may be different than the original, but this is acceptable.



Volkswagen / Audi



Axles interchange when the lengths are the same.

WARNING

Inspection of related Engine, Suspension, Steering and Transmission mounts/bushings should be performed prior to installation of new Drive Axles. **Worn or broken mounts/bushings can be the cause of noise or vibration.** This may lead to incorrect diagnosis of Axle performance.



NOTES

Handling of Flat Cross-Groove Design C.V. Joints (Non-German)

Care must be exercised when handling this design C.V. Joint. Axles are shipped **WITHOUT Grease in the C.V. Joint**; therefore it must be greased prior to installation. **(Note: Newer production Axles already have Grease applied to these Joints so all of the instructions listed below may or may not apply).** Once the Plastic Tie (Placed on at the factory to secure C.V. Joint in transit) has been cut, carefully move the C.V. Boot back to expose the Front side the CV Joint (See Figure #1). Care must be taken so that the outer housing does not roll at an angle, try and keep the housing at the 90° angle to the center shaft. Carefully squeeze grease (1/2 the contents of the Grease Pack) between the cage and race, and between the Balls and Tracks (see Figure #2). Once this is completed, move the CV Boot back into position being careful to line up the holes in the Boot Flange with the corresponding holes in the C.V. Joint Housing. Squeeze the remaining grease from the packet between the Cage, Race and Balls on the Rear side of the CV Joint (See Figure #3)

If during the above procedure or during installation in the car a Ball drops out or the entire C.V. Joint becomes disassembled (All the Balls fall out, see figure #4) do not become alarmed, with a little patience the Joint can be reassembled.

The easiest way to reassemble is to first mark the Inner Race so that when reassembling it will go back on the same way (which end of the inner race faces the end of the shaft, and which way faces the center of the shaft). The same applies for the Outer Housing. In Most cases the Housing end facing the end of the shaft will have a recessed area for the Gasket. First Place the Inner Race inside of the Cage and begin placing the Balls inside the Cage Windows. Once this task is completed move the Inner Race upward so that the very edge of the race is in line with the Balls (Figures #5 and #6). Next gently lift the assembled Cage/Race/Ball combination and place it on the Housing (Figure # 7). The next step is critical; make sure the Race to Housing orientation is correct before proceeding. The Narrow Shoulder between the Ball Tracks on the Housing must line up with the Wide Shoulder between the Ball Tracks on the Inner Race (Figure #8) **Failure to orientate the Race to the housing will not allow the CV Joint to “Plunge” once assembled.** Next gently tap on the Cage assembly with a small hammer (Figures #9 and #10) the assembly will now begin to move towards the center of the CV Joint. When the Cage/Ball/Race assembly reaches the center of the housing the joint is now ready for installation back on the Center Shaft.

During installation in the Vehicle do not let the axle “hang” once the Inboard Joint has been secured to the companion flange. Use Wire or Rope to secure the shaft while working with the installation of the Outer End into the Spindle Hub on Front applications or Companion flange on Rear applications.



Figure 1



Figure 2

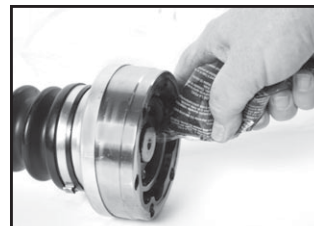


Figure 3



Figure 4



Figure 5



Figure 6

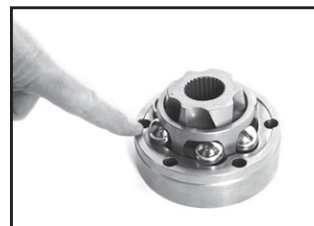


Figure 7

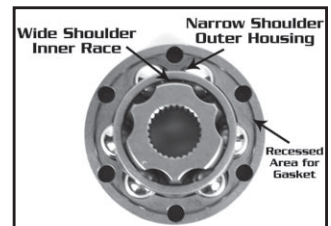


Figure 8



Figure 9



Figure 10

NOTES



Handling Cross-Groove Design C.V. Joints (German Design)

Care must be exercised when handling this design C.V. Joint. Axles are shipped **WITHOUT Grease in the C.V. Joint**; therefore it must be greased prior to installation. **(Note: Newer production Axles already have Grease applied to these Joints so all of the instructions listed below may or may not apply).** Once the Plastic Tie (Placed on at the factory to secure C.V. Joint in transit) has been cut, carefully move the C.V. Boot back to expose the Front side the CV Joint (See Figure #1). Care must be taken so that the outer housing does not roll at an angle, try and keep the housing at the 90° angle to the center shaft. Carefully squeeze grease (1/2 the contents of the Grease Pack) between the cage and race, and between the Balls and Tracks (see Figure #2). Once this is completed, move the CV Boot back into position being careful to line up the holes in the Boot Flange with the corresponding holes in the C.V. Joint Housing. Squeeze the remaining grease from the packet between the Cage, Race and Balls on the Rear side of the CV Joint (See Figure #3)

If during the above procedure or during installation in the car a Ball drops out or the entire C.V. Joint becomes disassembled (All the Balls fall out, see figure #4) do not become alarmed, with a little patience the Joint can be reassembled.

The 1st step to reassembly will be sure to make the orientation of the Outer Housing to the Inner Race is correct. When viewing Joint from the end make sure that the Narrow Shoulder between the Ball Tracks on the Housing aligns with the Wide Shoulder between the Ball Tracks on the Inner Race. (See Figure #5)

The easiest way to reassemble is to first remove the Snap Ring securing the Inner Race to the Center Bar (See Figure #6). Then Tap the Inner Race free from the Center Bar (See Figure #7). Next tip the outer housing to such a angle that it will expose Cage Window and Ball Tracks on Both Sides of the CV Joint at 180° (See Figure #8). Insert 1st ball on the front side, then the second ball on the back side (180° from the first Ball). Once the 2 balls are inserted, rotate the housing back parallel to the Inner Race. Carefully plunge the outer housing back and forth (Being careful to maintain the Outer Housing and Race parallel. See Figure #9). Repeat the process for the next 2 balls (Rotate housing to expose Window & Tracks, Top & Bottom) insert 1st Ball from the top, next ball from the bottom at 180° (see Figure #10). Repeat this step one last time to insert 5th and 6th balls. With a little practice you will find that this is really easier than it looks. Once Joint is reassembled slide the Race on the Bar & Reinstall the Snap Ring.

During installation in the Vehicle do not let the axle "Hang" once the Inboard Joint has been secured to the companion flange. Use Wire or Rope to secure the shaft while working with the installation of the Outer End into the Spindle Hub on Front applications or Companion flange on Rear applications.



Figure 1



Figure 2

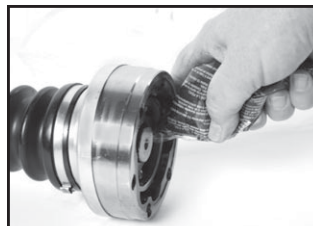


Figure 3



Figure 4

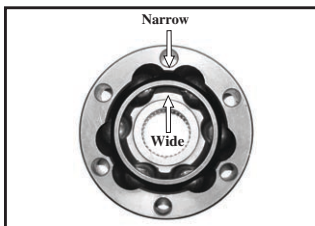


Figure 5

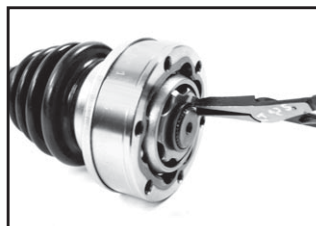


Figure 6



Figure 7

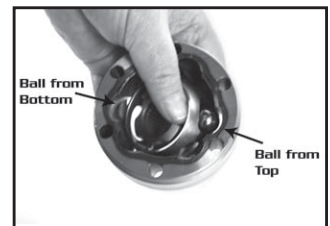


Figure 8

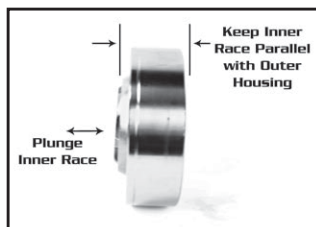


Figure 9

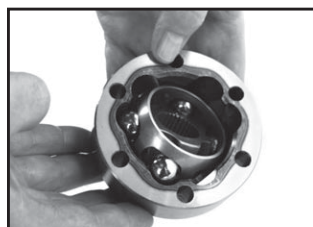


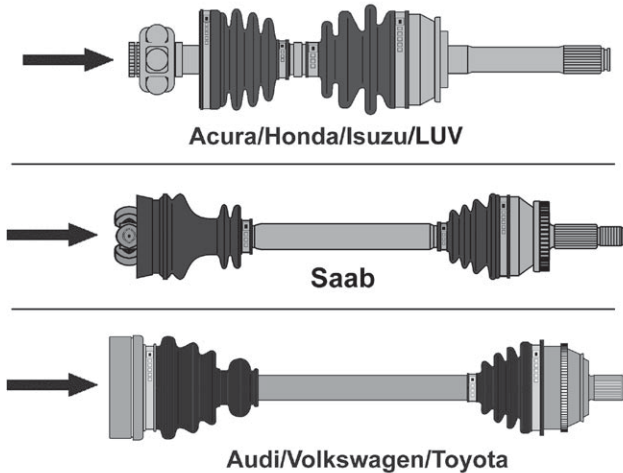
Figure 10



NOTES / FOOTNOTES

Additional Notes

Axles supplied by **EMPI**, which have joints that are not sealed (Flat cross-groove style) or do not include the inner joint housing as is the case on some Acura's, Honda's, Isuzu's, and Saab's, are not packed with grease from **EMPI**. However, all of these **EMPI** axles are supplied with packets of the same high quality moly grease to be used to pack the joint prior to installation.



Care should be taken when removing new **EMPI** axles from their box and while handling the axle. Some joints do not have retaining clips to hold the joint together while it is out of the vehicle. Do not pick up the axle by the inboard or outboard joint allowing a joint to hang. If this is done, it may cause the inboard tripod joint to over extend. In some cases this will result in the tripod no longer being aligned with the roller tracks of the housing. This is not a defect! In most cases the tripod can be realigned, and the joint put back together without dis-assembling the joint, being careful not to damage the boot. If this is not successful, the large clamp can be removed and the boot carefully pulled back from the joint so the tripod can be re-aligned with the tracks then reassembled. Being sure that the boot and sealing surface on the joint is clean and free of any grease, a new clamp can be installed to re-attach the large end of the boot. (See the Tools and Components section in the rear of this catalog for additional clamps and clamp crimping tools.)

As above, Flat cross-grove style joints, common to Audi's, Volkswagen's and some Toyota's are secured from the factory with plastic ties to prevent the joint from coming apart during shipping. However, occasionally a joint may come apart. This is not a defect. With some care and patience, these too can be re-assembled.

Footnotes

- #1 Axle is same length on driver and passenger side without Inboard Joint. Many installers replace this unit leaving the Inboard Joint housing inside the transmission. (**EMPI** supplies these axles with cage, race, boot, grease, clamps and ball bearings.) (**Illustration**).
- #2 Taiwan Built - Vin #'s start with "L". Japan Built - Vin #'s start with "J". USA Built - Vin #'s start with "1" or "2".
- #3 See GM brake and suspension I.D. in front of catalog. Page 9
- #4 G.M. Outboard Joints H.D. Brakes vs. L.D. Brakes. (**Illustration**).
- #5 If Inboard Joint seal boss on original axle has a sleeve on it, See "Axle Tips" section for proper replacement procedure.
- #6 Tempo, Topaz Drive Axles, Joint I.D. (**Illustration**).
- #7 All Saab axles come without the Inboard Joint, due to the time required to remove the joint from the transmission. Installers replace these units leaving the Inboard Joint inside the transmission. (**EMPI** supplies these axles with the inner tripod, boot, clamp, and grease.) (**Illustration**).
- #8 I.B. Joint Stub Axles, Passenger side Inboard Joint is female, if axle removed has male stub, it must be reattached to new **EMPI** female Inboard Joint. It is also recommended that the seal (**EMPI** Part# 87-6719-0) be replaced. (**Illustration**).
- #9 General Motors Manual Transmission Drive Axles w/ Intermediate Shaft System. (**Illustration**).
- #10 Chrysler Intermediate Shaft System. (**Illustration**).
- #11 Trans. Code located on door tag, or on transmission.
- #12 AX4N Transmissions have 19 Oil Pan Bolts.
- #13 AX4S and AXOD Transmissions have 17 Oil Pan Bolts.
- #14 Ring Gear I.D. is located on differential housing.
- #15 Honda Accord Outboard Joint Seal Dia. (**Illustration**).
- #17 LSD's (Limited Slip Differentials) have a driver side Inboard Joint with two sets of splines going into the transmission. If there is the question of whether a vehicle has a LSD, Put the car into neutral with the front wheels raised off the ground, if you rotate one tire, and the opposite side tire rotates in the same direction it has a LSD. If the opposite side tire rotates in the opposite direction, it does not. (**Illustration**).
- #18 4 Spd. A/T has on/off switch on Shift handle.
- #19 To determine whether a vehicle is a Coupe or Hatchback, refer to the VIN #. The fifth digit is "G" for Coupes and "F" for Hatchbacks.
- #20 Bolt on Toyota Drive Axle 80-6106. (**Illustration**).
- #21 Splined GKN Drive Axle 80-6108. (**Illustration**).
- #22 Japan Built (Toyota Design) Vin # begins with "J", USA Built GKN Design) Vin # begins with "1" or "4".
- #23 Volkswagen Inboard C.V. Joint O.D. (**Illustration**).
- #24 All **EMPI** New Replacement Axles are supplied without dampers and with solid shafts.
- #26 With manual locking hubs, for auto locking hubs see service manual for correct procedure.
- #27 Axles do not require an Inboard Joint. (**Illustration**).
- #28 Interchangeable 86-89 Celica GTS Axles. (**Illustration**).
- #29 Interchangeable Axles, 88-92 Corolla, 87-88 Corolla FX Axles. (**Illustration**).
- #30 Volvo **EMPI** Replacement Axle. (**Illustration**).
- #31 Focus **EMPI** Replacement Axle. (**Illustration**).
- #32 C.V. Joint to Wheel Flange.
- #33 Saab C.V. Boot spindle hub clearance. (**Illustration**).