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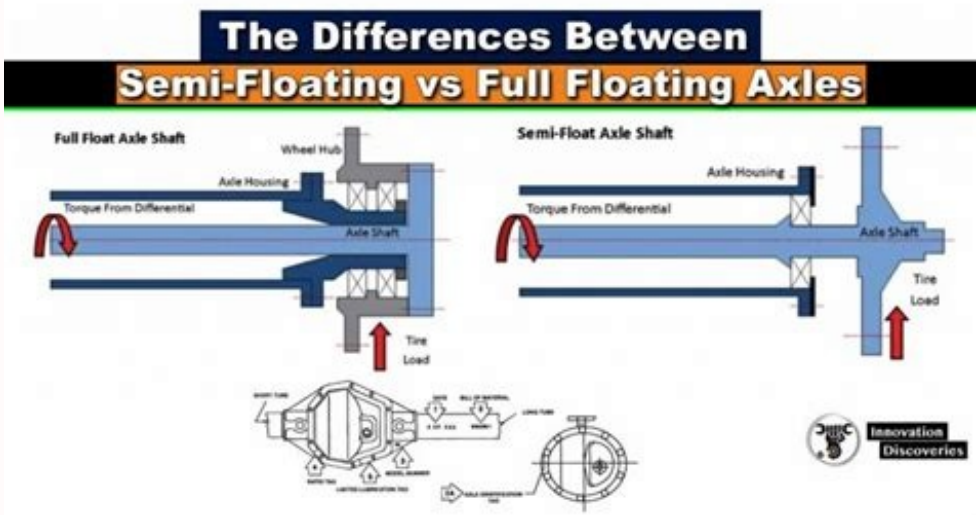
Semi floating axle pdf

Rear axle semi floating. Semi-floating axle.

See all 11 photos11 photosDec 1, 2010There are several basic axle varieties used in 4WDs, and each has some specific design pros and cons. There are front steering axles and rear fixed axles. Axle designs can vary in load handling, bearing and flange type, and gear set configuration. In this article, we'll take a look at the various axles and discuss the benefits of the designs.Semi-Floating vs. Full-Floating There are two types of rear axles found on light-duty 4WDs: Semi-floating and full-floating. Each has its advantages and disadvantages.A semi-floating axle is very common on the rear of most 4WDs. It consists of an axle shaft on each side that is splined on the inner end where it mates to the differential and has a wheel flange where the wheel studs mount at the other end. This assembly typically mates to the end of the axle housing using some type of bolted flange arrangement. The axle shaft also rides on a large roller or ball bearing out at the end of the axle housing.For a full-floating system, the axle shaft only serves to transmit the rotational torque from the differential out to the wheel.

It does not carry the weight of the vehicle as a semi-floater does. On a full floater, a spindle is attached to the outer end of the axle housing.

The wheel hub is mounted on this spindle and rides on tapered roller bearings. It is this assembly that carries the vehicle weight. As such, a full-floating axle system is considerably stronger than an equivalently sized semi-floating system.For those of you who carry heavy loads, this means your axle load capacity is greatly increased with a full-floater. Load ratings for similar vehicles with the two different axles are usually significantly different. If you do hardcore wheeling on big tires, a full-floater means that your axle shafts can also handle much more loading than a similar semi-floater because it now must only handle torque loading.Further advantages of a full-floater include being able to remove a broken axle shaft while keeping a functional rolling tire on that corner of the vehicle. This can be done since the wheel actually bolts to the wheel hub that rides on the spindle attached to the axle housing. If the axle has been fitted with manual locking hubs, it may be possible to unlock the rear hubs for towing a disabled vehicle on the trail or for flat towing over the road.It is also possible to convert some semi-floating rear axles to full-floating configuration using aftermarket kits. These kits allow an owner to easily upgrade the axle shaft strength of his axle. However, such a kit does not upgrade the differential assembly so axles having this portion as a weak link to begin with would not benefit much from such a conversion.See all 11 photos11 photosCast Center Housing Vs. Third Member There are two types of differential assemblies used in axle housings.The first is the type where the center portion of the axle housing is a cast unit and holds the bearing caps for the differential carrier. This is common on many domestic axles. With this type, a cover is removed to reveal the differential assembly in the housing. All gear setup must be performed at the axle housing, which means it is typically performed under the vehicle.A second method of mounting the differential carrier is in what is called a drop-out center section, or third member. This type of axle is common on many imports and on the venerable Ford 9-Inch housing (shown here).



In this case, the carrier is mounted in a cast steel housing that bolts up to a flanged hole in the axle housing. One disadvantage to a third member axle is that there is typically no cover that can be easily removed to inspect the gear set as in the axle type discussed above. The entire third member must be removed to view or setup the gears, and this requires removal of the axle shaft ends from the differential. However, once removed the third member can be carried over to a workbench where all gear work can be performed. Gear setup is often more convenient with this method. One other advantage of a third member setup is that it is possible to trail swap them if necessary because there is no precision work involved in swapping third members as there is in setting up a carrier in the assembly. High Pinion Vs. Low Pinion When we look at differentials, there is another design factor to consider. There are the most common low-pinion axles, or third members, and there are the less common high-pinion versions. This simply refers to the fact of whether the pinion gear mates with the ring gear below (low) or above (high) the centerline of the ring gear and axle housing.See all 11 photos11 photosC-Clip vs. Pressed Bearing When it comes to holding the axle shafts in a semi-floating axle housing, there are two methods used by designers. One uses a C-clip inside the differential assembly, and the other uses a pressed bearing out at the wheel end of the axle shaft. We'll look at each in a little more detail here.There are advantages and disadvantage to disassembly of each type of axle. The C-clip variety requires access to the differential area, but the press bearing variety requires brake line work and brake bleeding. Another difference is that when an axle shaft on a C-clip assembly breaks, there is nothing left holding the axle shaft in the housing so the tire and wheel assembly will readily separate from the vehicle. On a pressed bearing-type axle, the wheel and tire will usually remain intact with the bearing pressed to the axle shaft holding the assembly together. For light side loads, such a vehicle may be able to limp along for a ways without the axle shaft separating from the housing.For some axles that are factory equipped with C-clips, there are kits designed to eliminate the C-clips and convert the setup to a captive bearing setup. These eliminator kits solve the problems associated with standard C-clips. The stock roller bearings are removed and replaced with ball bearings. A pressed collar and shaft flange are added to the axle shaft and the assembly is bolted to the housing flange through the newly added shaft flange and the holes on the brake backing plate.See all 11 photos11 photosNewsReviewsBuyer's GuideWatchMotorTrend+The FutureShare on FacebookShare on Twitter