Difs general

Knowledge is priceless. That's true generally, and it's especially true when you want to upgrade your 4x4's axles. Because of the investment and the work involved in this type of upgrade, it's important to select the right axle the first time, instead of enduring expensive and time-consuming trial and error. Clearly, there are criteria that should be factored into the selection process of an axle, including the weight and type of vehicle in which it's to be installed, the weight of the axle itself, the type of suspension being used, the location of the transfer case, what size tire will be fitted and what type of work the vehicle is being designed to do.

There are axles that you should consider because of their excellence, and some you should avoid because of weak design. To find out which is which, we asked a group of professional axle builders for their favorites. The following list, compiled from the answers those experts gave us, contains everything you need to know about 10 axles that the experts routinely build and install.

Now, before you dispute the findings in this guide--things like maximum recommended tire size, for instance--keep in mind that recommendations like these are meant only as a guide to reflect the performance and durability of said tire mounted to a bone-stock axle. We know that some of you will argue that you've had 44-inch tires on stock Dana 44 or GM 10-bolt axles under your fullsize truck for years without breakage--but bear in mind that we've factored in the axle's ability to endure slightly above-average abuse in its stock form while fitted with the listed maximum tire size. Conversely, those who wish to fit aggressive, large tires driven by high-horsepower engines and plan to use their vehicles as rockcrawlers or mud boggers may require a much stouter axle because of the inherent stresses caused by this type of terrain.

We've also included some facts, figures and building tricks for stock axles, and in order to make your hunt at the junkyard a little easier, we've asked the pros which vehicles sport the most desirable axles. After all, many of these axles have been manufactured for years and many have a significant number of variations depending on their original application. Some have gotten better with age, and some have not. For those of you who don't want to wander junkyards, we've also included a brief list of aftermarket companies that offer complete, ready-to-bolt-in axles (or third-members, in the case of the Ford 9-inch).

Semi-floating or full-floating?

From the factory, stock axle assemblies came in either semi-floating or full-floating designs. On a semi-floating axle, the wheel attaches directly to its outer end, and the weight of the vehicle, as well as its engine power, are channeled through a single bearing set at the end of the axle. **The full-floater, the stronger of the two designs**, attaches the axle to a separate hub, and two larger bearing sets support the weight of the vehicle. This means that the axle is only used to drive engine power through the axle. The upside to the semi-floating axle design is that the aftermarket has responded with a full-floater conversion for almost every type of semi-floating axle.

Ford 9-inch

This axle has been in production since the late '50s and is available in a variety of widths and housing types. Over the years, a number of different wheel-bearing designs and types of brakes have been used. Ford 9-inch guru Randy Thomas at Performance Unlimited in Hartford, Wisconsin, warns to be careful when hunting for a 9-inch in junkyards because they are cosmetically similar to the weak (and expensive) Ford 8-inch axle. Also beware of the 9 3/8-inch axles in Lincoln cars because they also look similar but take a different axle length on one side due to their slightly offset housing.

Application: Rear.
Type: Semi-floating.
Spline count: 28 or 31.
Factory ratios: 2.50:1 through 4.56:1.
Maximum tire size for stock axle: 37-inch.
Strong point: Removable third member allows for easy upgradeability, can upgrade to larger-diameter pinion.
Weak point: Difficult to remove third member if an axleshaft breaks, stock pinion-shaft diameter is smallish.
Junkyard jewel: They're hard to find, but some Ford ½-ton 4x4 pickups were equipped with an optional nodular-iron 9-inch, which was stronger and offered less chance of bearing-cap failure.
Building secrets: Replace the crush sleeve in the pinion bearing with solid spacers and shim kit. This eliminates the movement of the pinion shaft under hard load.
Aftermarket alternatives: Currie Enterprises, Custom Differentials, DTS Custom Service, National Drivetrain Inc., Randy's Ring & Pinion.

Ford 8.8-inch

An Explorer 8.8-inch is a popular swap for TJ Wranglers because it's almost exactly the same width as the stock Wrangler axles and thus requires no width modifications. Further, Alan at Mountain Off Road Enterprises says that the Explorers used the same wheel bolt pattern as a TJ. Other vehicles that used the 8.8-inch axle included Ford ½-ton trucks from '80 to present, and Mustang GTs.

Application: Rear.
Type: Semi-floating.
Spline count: 28, 31.
Factory ratios: 2.47:1 through 4.10:1.
Maximum tire size for stock axle: 37-inch.
Strong point: Approximately the same pinion diameter as a Dana 60, mass availability.
Weak point: C-clips.

Junkyard jewel: Look for fullsize Ford trucks made after late '86 with ABS because these axles had a larger 7/8-inch-diameter cross pin. Also look for late-model Explorers equipped with these axles because they have disc brakes.
Building secrets: The stock diff cover is very thin, so replace it with a quality aftermarket cover. Also, apply silicone to the pinion splines because some builders have found that they're prone to leaking.
Aftermarket alternatives: Currie Industries, Custom Differentials, DTS Custom Service, Mountain Off Road Enterprises.

Dana 60

The venerable '60 has been available in either high- or low-pinion designs and was never used in an IFS application. Custom Differentials warns to steer clear of the rare but virtually identical Dana 61 because most of the parts are not interchangeable.

Applications: Front and rear.
Type: Semi- and full-floating.
Spline count: 16, 23, 30, 32 and 35.
Factory ratios: 3.54:1 through 7.17:1.
Maximum tire size for stock axle: 38.5-inch.
Strong point: Available in a variety of widths, most of which were full-floaters.
Weak point: The driver-side carrier bearing was known to spin on the carrier and this often spun the race, which can damage the housing.
Junkyard jewel: A heavy-duty front '60 can be found on '78 and '79 ¾-ton Ford pickups equipped with the snowplow package. Some late '70s and early '80s Dodge trucks had 35-spline '60 rear axles. Rear '60s are easy to find.
Building secrets: The spider-gear roll pin is small and hollow, and is prone to breakage. Builders often double up the roll pin for extra strength (slide one inside of another). Also, replace the pinion yoke with a 1350-series yoke for extra strength. Finally, be careful about the spline count. Look for the 32- and 35-spline axles, avoid the 16s and 23s.
Aftermarket alternatives: Currie Enterprises, DTS Custom Service, Dynatrac, Custom Differentials.

Dana 44

The '44 has been offered in scores of applications since its introduction in 1951, so it's easy to find in junkyards. They came in both low-pinion and high-pinion models, and the centersection was even used in '80-and-up Ford Twin-Traction-Beam applications. They were offered in 5-, 6-, or 8-lug bolt patterns.

Applications: Front and rear.
Type: Mainly semi-floating, although there were some very rare full-floating units.
Spline count: 30 (after '72; prior to '72, some were 19-spline).
Factory ratios: 2.76:1 through 5.89:1.
Maximum tire size for stock axle: 35-inch.
Strong point: Wide availability and significant aftermarket support in parts and upgrades.
Weak point: Carrier and spider gears, U-joints, ring-and-pinion.
Junkyard jewel: Find a front axle out of an early '80s Dodge 3/4-ton because they were

equipped with locking hubs. Also, a front axle out of a '76-or-earlier ½- or ¾-ton Chevy has steering knuckles that are cast flat and easily adaptable to crossover steering.
Building secrets: Upgrade the stock carrier and spider gears because they're notoriously weak. Also, if you've indexed the axle to improve pinion angle, use a diff cover from a '78 or '79 Ford ¾-ton high-pinion '44 because it allows for a larger quantity of lube and a higher fill point.
Aftermarket alternatives: Currie Enterprises, Custom Differentials, DTS Custom Service, Dynatrac.