

Toyota Motorhomes Rear Axle FAQs **All You Ever Wanted To Know and Then Some!**

Disclaimer: This document is a digest of posts to the Toyota RV special interest group (groups.yahoo.com/group/toyota-campers) regarding issues with the rear axles of these vintage motorhomes. The digest was compiled to help educate owners and prospective owners about the rear axle problem with these vehicles. This information is presumed to be accurate, but it is the owner who is ultimately responsible for ascertaining that the vehicle purchased is safe for use on the road.

Q: What is the big deal about the rear axle on Toyota motorhomes?

A: Beginning in 1977, Toyota sold pickup truck chassis's (without the bed) to RV manufacturers (coachbuilders) to make motorhomes. Progressively, these coachbuilders started weighing down the stock Toyota chassis with larger and larger coaches, and the excess weight caused catastrophic failure of the rear axle in some cases. This was in spite of the fact that coachbuilders usually retrofitted a second set of wheels to the rear axle (a.k.a. "duals" or "tandem wheels") to carry the extra load. The problem was severe enough to warrant the National Highway Traffic Safety Administration (NHTSA) to issue a recall of certain motorhomes built on the Toyota chassis.

Q: How and why does the rear axle fail?

A: The retrofitted axle (with after-market dual wheels) was not suitable for heavier loads. The addition of two more tires helped bear the load "where the rubber meets the road", but the axle itself was overloaded. The original rear axle had only one bearing, mounted on the backside of the inner wheel. As the weight of the coach bore down, the axle bent, creating load stresses on the bearing. Also, the additional wheels attached at the extreme end of the axle created even more stress due to the effect of leverage (picture a cartoon of a muscle bound weightlifter lifting a sagging, overloaded barbell. It's like that, only in reverse). These stresses caused the bearing to overheat and ultimately disintegrate in some cases. There are also posts to the forum stating that the aftermarket dual wheels themselves came apart, and at least one post stating that the lug nuts literally sheared off.

Q: What happens when the axle fails?

A: Bad things can happen. Until Toyota upgraded the rear axles, the original axles were designed in such a way that the entire assembly; wheels, brakes and all, could disengage from the axle itself and leave the vehicle. As one forum member put it rather directly, ". . . *By the time owners would load their own stuff in them too, it was putting too much weight for the Toyota chassis to handle. Then the rear axles would break and then the wheels would fly off, killing some occupants and other travelers on the road . . .*"

Q: At what point is the failure likely to occur?

A: To quote one post: "*Some rigs failed on their maiden voyage, others at differing mileage and still others have yet to fail. This to me indicates even perfectly maintained bearings may only be a feel-good approach.*"

Q: When was the problem corrected?

A: As a general rule of thumb for motorhomes over 18' in overall length, the 1984 and older vehicles came with an axle subject to breaking. 1987 and newer vehicles came with an upgraded rear axle from Toyota that could bear more weight and natively supported dual rear wheels. The improved axle is physically larger in size, has reinforcement in critical areas, larger brakes, and natively supports dual rear wheels. 1985 and 1986 model years were TRANSITION years and may or may not have the upgraded axle. See the next question for specifics.

Note: It is not clear whether motorhomes with overall lengths less than 18' feet were recalled, but conventional wisdom has it that any Toyota motorhome with the aftermarket dual wheels should have the rear axle replaced. See below for how to identify which axle a particular vehicle has.

Q: How do I determine if the Toyota motorhome I own/am thinking of purchasing has the faulty axle?

A: There are several methods. One thing you can do is check the VIN (Vehicle Identification Number) of the vehicle with the NHTSA to see if it has been recalled (see Contact Information below). This will tell you about both the axle and any other NHTSA safety recalls for the specific vehicle in question. (This will NOT tell you however, if the rear axle has been replaced with the stronger version. Read on.)

Some people think that if you contact Toyota that they can give you information on the axle recall, but that is not so. Toyota never shipped "defective" axles that required recall. Rather, the motorhome companies that put the excess weight on the chassis caused the problem, and therefore there will not be an entry in the Toyota recall database. (You CAN however check with Toyota regarding other recalls that may apply to the Toyota chassis in question).

The second thing you can and should do is eyeball the axle itself. First, check to see if there are wheel covers (hubcaps) on the rear wheels and if so, pull one of the wheel covers off. If the axle has **6 lug nuts** it is probably the upgraded axle. Additionally, an upgraded axle will have an obvious center hub with another set of smaller bolts encircling the hub, and it will protrude well into the outer wheel area. (If the vehicle is 1985 or older and has this type of 6-lug wheel with protruding hub, it means a previous owner probably had the upgrade performed).

*Warning: A forum member posted a story of a sharp individual who spotted a vehicle with a supposed 6-lug rear axle, only to find that it was a 5-lug rear axle with an **adapter** to accommodate a 6-lug wheel (caveat emptor!). That is why you must also check that there is a stout center hub that protrudes into the area of the outermost wheel!*

Conversely, if the axle has **5 lug nuts** it is probably the inferior axle with the aftermarket duals and should be replaced for safety's sake. There is one exception: In 1985 (and maybe 1986) Toyota shipped a beefed-up version of the 5-lug axle that was NOT subject to recall, nor have any failures been recorded. Some 1985 (and maybe 1986) vehicles MAY have this improved 5-lug axle. This axle is identified by a center hub with another set of smaller bolts encircling the hub, just like the 6-lug axle. But unlike the 6-lug axle, the hub is flush with the outermost wheel. It does not protrude into the wheel (see photos below). The inferior 5-lug axle that requires replacement does **not** have the center hub with bolts in it. If there is any doubt, check the NHTSA recall database (see Contact Information below).



Original, non-floating, 5-lug axle with aftermarket dual wheels.
Needs replacement. Note the absence of bolts around the center hub.



Full floating, 6-lug axle.
Note the additional bolts around the protruding center hub.



Close-up of center hub showing end-cap bolts on 6-lug axle.

Unfortunately, as of this writing there is no photo of the improved 5-lug axle shipped in the 1985-86 time frame that was not subject to recall (sorry). However, it should have the inner hub bolts as shown above. Fortunately these are rare and not often encountered – not something most Toyota motorhome owners/buyers need be too concerned with.

Q: How did the recalled axles get upgraded and can they still be upgraded today?

A: Originally, the responsibility of changing out the recalled rear axles fell on the motorhome companies (coachbuilders) that put the coach on the Toyota chassis. The coachbuilder was required to perform the upgrade at no cost to the consumer. As a result, most of them went out of business due to the liability and/or the cost of the recall. One company still in business and still providing an upgrade for the models it sold however is National RV, makers of the Dolphin models (see Contact Information below).

Also, as a gesture of goodwill, Toyota supplied a number of the improved 6-lug axles to customers at no charge. But unlike when the coachbuilder performed the work, the customer had to pay to have the Toyota-supplied axles installed (which was not a bad deal if your coachbuilder had gone out of business). Toyota has since discontinued the program.

Q: I currently own or plan to own a Toyota motorhome that requires an axle upgrade. What are my options?

A: You have four options:

- 1) The coachbuilder is still in business and will perform the upgrade for free (it is unlikely at the time of this writing that anyone besides National RV provides this service).
- 2) Buy a new axle from your friendly neighborhood Toyota dealer and have them install it. (Bad idea. This option costs thousands of dollars.)
- 3) Buy a used 6-lug axle from a junkyard, and arrange for installation.
- 4) Buy a new axle at a great discount from a guy named Chuck in Indiana who happened along a warehouse full of the 6-lug rear axles! (See Contact Information below.) As of this writing (8/03) he had about 30 units left.

Q: I have seen references to 1/2-ton vs. 1-ton rear axles. 1/2-ton axles are supposedly “bad” and 1-ton axles are supposedly “good.”

A: This is basically true except that Toyota apparently shipped slightly beefed up versions of its 5-lug, 1/2-ton axle and designated them 1-ton. But those axles did not support dual wheels natively and thus were subject to failure and were recalled. For this reason we have stayed away from the “ton” designations in this digest. However, people in the Toyota camper forum will often refer to “1-ton” or “true 1-ton axles. They are usually referring to the improved 6-lug rear axle that natively supports dual wheels. *Also, note that tonnage is specified in “metric tons”. A 1 metric ton axle equates to 3/4 std. or American ton.*

Q: I have also heard about “floating” or “full floating” axles as being the preferred axle.

A: True. The original axle subject to recall was **not** a so-called “floating” design. The 6-lug axle is a “full floating” axle. It has a set of bearings on both the inside and outside of the inside wheel (the original axle only had bearings on the inside of the wheel, which is a key component of why it failed). With bearings on both sides of the wheel, the wheel “floats” between them, thus the designation. Another characteristic of the full floating axle is that if it fails, the wheels do not disengage from the axle and fly off (another “good” thing).

Note that the above-mentioned improved 5-lug axle with a center hub, and not subject to recall is only a floating type, not full floating. It is unclear at the time of this writing which of the two aforementioned characteristics of the full floating axle is missing from this design.

SUMMARY

1.

If the Toyota motorhome in question has a 6-lug rear axle it is probably the beefed-up, a.k.a. “true 1-ton axle.” Warning: If the 6-lug rear axle vehicle is a 1986 or earlier model, be sure you are looking at the hub and not a wheel cover. Also be advised that 5 to 6-lug adapters have been spotted. Adapters don’t fix the problem! It would be wise to check with a mechanic if there is any doubt, and/or check the recall database.

2. Most motorhomes with 5-lug rear axles on chassis over 18' in length have likely been recalled and require an upgraded axle. Any 5-lug rear axle with the aftermarket duals (identified by the lack of a center hub with additional bolts) on any motorhome is suspect and should be replaced.
3. The one style of 5-lug axle that was not recalled is the improved, floating 5-lug rear axle shipped on some Toyota chassis in the 85-86 time frame (additional bolts on center hub). Check with the NHTSA to confirm.

CONTACT INFORMATION:

- 1) National RV: 909-943-6007 (Dolphin).
- 2) The guy with the inexpensive replacement axles: chuck.nan@gte.net He has a limited supply.
- 3) National Highway Traffic Safety Administration (NHTSA) <http://nhtsa.org>. Recall search: <http://www-odi.nhtsa.dot.gov/cars/problems/recalls/recallsearch.cfm>

For those with additional interest, here are some more rear axle fun facts:

- 1) There appear to be several incarnations of the axles supplied on the Toyota chassis used for RV coaches:
 - a) The original 5-lug, 1/2-ton rear axle shipped with two rear wheels, (to which the two additional bolt-on wheels would be subsequently added).
 - b) Same 5-lug, axle with more leaf springs and 6 ply tires. This was the first time the axle was given a "1-ton" rating.
 - c) 5-lug, 1-ton "floating" rear axle with a center hub flush with outer wheel (this is the one that was not recalled).
 - d) 6-lug, 1-ton "full floating" rear axle with center hub, but still with a 5-lug front axle (sometimes referred to as "true 1-ton")
 - e) 6-lug, 1-ton "full floating" rear axle with center hub, 6-lug front axle (also sometimes referred to as "true 1-ton")
- 2) The 6-lug rear AND 6-lug front axle may be the optimum combination because not only does it embody the strongest capacity that Toyota engineered for that chassis, you only need to carry one spare. Also, the 6-lug front axle has bigger brakes.
- 3) Some manufacturers added a "tag" axle, a.k.a tandem axle (not tandem *wheels*), which was a second rear axle to hold additional weight. Tag axles are rare and seem to have their own set of issues (see post #12779 in the Yahoo toyota-campers group).

Note: Simply removing the aftermarket dual wheels on the 5-lug axle to make them "singles" does NOT solve the problem. You need the extra support (4 rear wheels) to distribute the load, as well as a proper rear axle (unless you have a lighter, under 18' RV).

FINAL WORD:

The overloading issue was never really put to bed, because Toyota finally quit selling the chassis to RV manufacturers throughout most of the world in 1993 due to liability concerns regarding overweight issues. The sage advice mentioned throughout the forum archives is to PAY ATTENTION. Don't overload your RV, use the proper tires, periodically check for excess heating in brakes and tires, watch your tires and tire pressures, employ safe driving habits, and of course make sure you have a proper rear axle.

With these caveats, many people seem to be enjoying many miles of safe and happy times in their Toyota RVs. (Occasionally these folks can be seen mouthing the words "Na na na na na" to humongous, gas guzzling RVs passing them on the highway.)

Excerpt from an NHTSA recall notice on Dolphin models:

CAMPAIGN ID Number: 91V060000
Component: POWER TRAIN: AXLE ASSEMBLY
Manufacturer: NATIONAL R.V. INC.
Year: 1984
Make: NATIONAL RV
Model: DOLPHIN
Potential Number of Units Affected: 8000

Year of Recall: '91

Vehicle Summary: REAR AXLE BEARINGS MAY FAIL DUE TO A BENDING MOVMENT CREATED BY THE AFTERMARKET DUAL REAR WHEELS FROM A VARIETY OF FACTORS AND ESPECIALLY WHEN OVERLOADED. FAILURE OF THE BEARINGS CREATE STRESSES ON THE REAR AXLE, RESULTING IN THE BREAKAGE OF THE AXLE. A BROKEN AXLE WILL CAUSE SEPARATION OF THE DUAL REAR WHEEL ASSEMBLY FROM THE MOTORHOME, CAUSING LOSS OF CONTROL, WHICH COULD RESULT IN AN ACCIDENT.

Replace rear axle assemblies with full-floating rear axle assemblies.

System: rear axle; single axle with dual rear wheels.

Vehicle description: micro-mini motorhomes built on Toyota camper cab-chassis equipped with aftermarket dual rear wheels on a rear axle designed for single wheels.

Note: repairs will be done at no cost to owners of vehicles when the first purchase date is within eight years of the date of notification.

Vehicles first purchased beyond this period will be repaired at reduced price.