

## Ford 9 Inch Installation Guide

### Main areas we'll cover:

- Third Member Installation Steps
- Axle Shaft Installation Steps
- How to Measure and Cut 9-Inch Ford Axles
- Servicing Steps for 9-Inch Ford Differential

## Third Member Installation Steps

### Step 1: Clean Mounting Surfaces

Ensure the surfaces where the third-member attaches to the axle housing are clean and free of paint or powder coating for a proper seal.

### Step 2: Dry Run

Perform a dry run by positioning the pumpkin gasket and third-member over the housing to ensure all holes and studs line up properly. If the Housing 3rd Member Carrier Studs are slightly bent, straighten them so the third member fits properly.

### Step 3: Use RTV Sealant

Apply a thin bead of RTV sealant around the threaded studs securing the third member and along the gasket surface area of the housing. For best results, use a high-quality silicone gasket maker that resists oil and water-glycol, such as Part # [910491985](#) - Loctite 491985 SI 598 Black RTV Silicone Gasket Maker (80ml tube).

### Step 4: Position Gasket

Place the gasket on top of the RTV sealant on the housing. Apply another thin line of RTV sealant on the other side of the gasket and around the threaded studs once again.

### Step 5: Install Third Member

Position the third member over the mounting studs. If needed, tap it gently with a rubber mallet to seat it evenly.

**NOTE:** When installing new Carrier Studs, oil the splines, hole, and threads. Use several washers of increasing size to spread the load. Tighten the studs a little at a time and tap near the stud to help it seat. To reduce friction, use slippery washers with oil between them near the nut. Take your time to ensure a proper fit.

### Step 6: Add Washers and Nuts

Install crushable aluminum or copper washers and Nyloc nuts onto the studs. Tighten the nuts in a crisscross pattern, achieving a final torque of 30-35 ft-lbs. for each stud.



**Video:** [Ford 9-Inch Housing Identification and Axle Measurement](#)

**Article:** [How to Measure and Cut 9 Inch Ford Axles](#)

## Axle Shaft Installation Steps

### Step 1: Install Axle Seal

If your bearing type requires an axle seal, install it into the housing. For sealed bearings, an internal seal is typically necessary. Ensure that the side of the seal with the retaining spring (or open face) faces inward, toward the oil source. The spring side should always face the direction the oil flows from.

To simplify installation and avoid damaging the seal or axle housing, use a Bearing Race and Seal Driver Set. This tool allows for quick and easy installation and is available as Part # [91089625](#) - Bearing Race and Seal Driver Set.

**NOTE:** If you don't have a Bearing Race and Seal Driver Set, you can use a capped 2-inch pipe and a soft-faced hammer to carefully drive the seal into place until it is fully seated.

### Step 2: Prepare Axle

Lightly grease the axle splines and the area around the axle bearing to ensure smoother installation. At Speedway Motors, we pre-install the bearings and bearing retainers on the axle before shipping, as not all customers have access to the specialized tools required.

If you're installing a new bearing set on an existing axle, follow these steps:

- **Removal of the Old Bearings**
  - Remove the axle from the housing.
  - Use a bearing puller, slide hammer, or cutting tools to remove the old bearings and seals. Take care to avoid damaging the surfaces where the bearings or seals seat.
- **Prepare the Axle**
  - Clean the axle shaft thoroughly.
  - Inspect it for wear or damage, especially in areas where the bearings and seals seat.
- **Add the Retaining Plate**
  - Slide the retaining plate onto the axle shaft before proceeding with bearing installation.
- **Install the New Bearing**
  - Tapered Style Axle Bearing (Part # [9108015](#)):
    - If the bearing and lock ring weren't installed before you received the axle, start by placing the bearing, lock ring, and retainer plate onto the axle shaft. The tapered bearing should have the seal on the outside, with the step facing outward. Use a hydraulic press with a spacer under the lock ring and one on top of the axle for support. Press the bearing and lock ring onto the shaft until fully seated. Once done, make sure the lock ring is flush, and the retainer plate moves freely. Tightening the nuts on the housing end will secure everything in place.



### THE TOOLBOX

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- Sealed Style Axle Bearing (Part # [91080508](#)):
  - If you are using a Sealed style bearing and they weren't installed before you received the axle, place the retainer plate, bearing, and lock ring onto the axle shaft, ensuring the O-ring on the outer diameter (O.D.) of the bearing faces outboard. Position the components in a hydraulic press with a spacer under the lock ring and one on top of the axle shaft for support. Slowly press the bearing and lock ring onto the shaft until fully seated. Ensure the lock ring is flush, and the retainer plate can move freely. For sealed bearings, an internal seal is typically required, with the seam side of the seal facing inward into the housing, not over the axle first.



## Step 3: Insert Axle

Install the brake backing plate (for drum brakes) or caliper brackets/spacers (for disc brakes), sliding the pre-assembled backing plate (with the wheel cylinder at 12 o'clock) onto the four T-bolts, or mounting the caliper brackets using the supplied hardware from the disc brake kit, and include the brake kit spacer (backing plate simulator) for correct spacing. Do not secure the components yet. Next, carefully slide the greased axle into the housing, ensuring the splines align and twisting the axle slightly as needed to fit it into place while applying pressure. The brake kit spacer ensures proper alignment of the axle, bearings, and brake components, maintaining correct spacing, preventing seal leaks, and ensuring smooth brake operation. This helps avoid premature wear, protects components, and guarantees safe, reliable performance.

## Step 4: Seat the Axle

If necessary, gently tap the axle to ensure it fully seats into the housing, avoiding direct hits to the axle face.

**CAUTION:** Make sure the axle fully engages both sections of the split splines for proper seating with the side gears. Incomplete engagement can cause slippage or failure. Always check full engagement before finishing installation.



3rd Member Internal Split Spline



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**Article:** [How to Measure and Cut 9 Inch Ford Axles](#)

## Step 5: Install Retaining Plate

**For Non-Notched Style:** The retaining plate should have been installed when the bearings were placed on the axle, align it with the T-bolts. Then, add the nuts by accessing them through the access hole on the axle flange.

**For Notched Style (U-Shaped):** The retaining plate is meant to be installed after the axle is in place, slide it over the axle shaft and align it with the T-bolts. Then, add the nuts by accessing them through the access hole on the axle flange.



## Step 6: Tighten Retaining Nuts

Tighten the nuts evenly in a cross-stitch pattern, torquing them to a final torque of 30-35 ft-lbs. If the axle doesn't turn freely, check if the seal is fully seated and adjust as needed.

**NOTE:** On tapered-style bearings, the seal is positioned on the outside. When tightening the retainer plate, it's common for the seal to become compressed, which may cause the bearing retainer to have a slight bow once torqued to specification. This is normal and expected.



## THE TOOLBOX

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## How to Measure and Cut 9-Inch Ford Axles

### Measuring the Axle Length

#### Step 1: Assemble the Third Member:

Install the third member (differential) into the axle housing to account for any small variations in the housing and differential. This ensures the axle length will be correct for your setup.

#### Step 2: Insert the Axle for Measurement:

Slide the axle into the housing and note which side it belongs to. Typically, the shorter axle is installed on the driver's (left) side.

#### Step 3: Measure to the Bearing Surface:

Measure from the stop inside the differential (or axle tube) to the end of the axle bearing surface. Ensure that you are measuring accurately to account for the axle's insertion depth.

**NOTE:** Do not include the thickness of the brake backing plate in your measurement. Leave about 1/16" of space between the end of the axle and the stop inside the differential. This allows for axle expansion under load.



#### Step 4: Double-Check the Measurement:

You can also use a tape measure inserted into the axle tube to verify the length from the differential stop to the bearing surface. Double-check to ensure accuracy before proceeding to cutting.

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## Cutting the Axle (Cut-To-Fit Axles)

### Step 1: Prepare for Cutting:

Mark the measured length on the axle. Make sure the mark is square to avoid misalignment during cutting.

### Step 2: Cut the Axle:

Use a horizontal bandsaw for a clean, square cut. If a bandsaw is unavailable, any suitable cutting tool will work as long as you maintain a square cut.

**WARNING:** Cut the axles slowly to ensure accuracy and control. Fast cuts can generate too much heat, affecting the metal's temper and causing warping or brittleness. Slower cutting also helps your tools last longer and produces a smoother finish reducing the risk of accidents and tool breakage.



### Step 3: Dress the Axle End:

After cutting, use a file or grinder to remove any burrs and smooth the end of the axle. Add a slight bevel to the spline end (lead-in) to help the axle slide smoothly into the differential splines.

### Step 4: Test Fit the Axle:

Again before installing the brake backing plate or retaining plate, slide the axle into the housing. Ensure the axle engages with the splines properly and does not bottom out against the pin in the differential before the bearing seats.

### Step 5: Re-Measure if Needed:

If necessary, recheck your measurement using a tape measure to confirm the fitment before final assembly.



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## Servicing Steps for 9-Inch Ford Differential

### Filling with Gear Oil

#### Step 1: Remove Service Plug:

Remove the service plug from the left-hand side of the third member.

#### Step 2: Add Gear Oil and Limited Slip Additive

The 9-inch differential requires approximately 2-1/2 to 3 quarts of gear oil, but this may vary depending on the housing style. Fill the differential through the service plug until the gear oil reaches the bottom of the hole. Once the oil starts to trickle out, the differential is at the proper fill level. Be sure to check periodically as you add oil to avoid overfilling. For accurate readings, check the fluid level with the pinion angle parallel to the ground.

- For drag racing, use non-synthetic SAE 85W-140 gear oil.
- For street applications, use non-synthetic SAE 80W-90 gear oil.

For clutch-type limited-slip units, add 4 fl. oz. (one bottle) of limited-slip additive to reduce clutch chatter and ensure smoother operation.

**NOTE:** Some gear oils are specifically formulated for clutch-type units and may not require an additional additive.

### Break-In Procedures

#### Step 1: Break-In Procedure for New Ring and Pinion:

**NOTE:** All new ring and pinion gears require a break-in period to prevent overheating and ensure longevity.

#### Initial Driving:

- Drive at moderate speeds with light loads (no towing or hauling) for the first 20 to 30 miles.
- After this, stop and allow the rearend to cool to normal temperature before continuing.

#### Towing Restrictions:

- Do not tow for the first 500 miles. If towing is necessary before reaching 500 miles, stop every 15 miles to allow the differential to cool for the first 45 miles.

#### Step 2: Final Steps After 500 Miles:

After the initial 500-mile break-in period, we recommend changing the gear oil to remove any metal shavings or assembly chemicals that may have accumulated during the break in process.



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## For Housings Not Equipped with a Drain Plug:

If your housing doesn't incorporate a drain plug, you will need to remove the center section to drain the old fluid. For easier drain intervals and service, we offer a plug/drain kit (Part # [617602](#) - Oil Pan Inspection Plugs, Steel) that requires welding and is best installed on a new housing.

## Follow these steps below if your housing is not equipped with a drain plug:

- **Lift the Vehicle and Remove the Driveshaft:**
  - Safely lift the vehicle using a jack and secure it with jack stands, ensuring the vehicle is stable and properly supported.
  - Unbolt the driveshaft from the differential yoke using a wrench or impact tool to remove the U-joint bolts or strap bolts.
  - Remove the driveshaft and set it aside.
  - Install a transmission plug in the tailshaft to prevent transmission fluid loss.
- **Remove the Axle Shafts and Support the Third Member:**
  - You will need to remove the axle shafts to remove the third member.
  - Use a transmission jack or another suitable lifting device to support the third member while loosening it.
- **Remove the Third Member Bolts and the Third Member:**
  - Use a socket or impact wrench to remove the bolts securing the third member to the housing.
  - With the bolts removed, carefully lower the third member out of the housing. If it's stuck, gently tap it with a rubber mallet to break the seal.
- **Inspect the Housing:**
  - After removing the third member, inspect the housing for any damage or debris. Clean the mating surface before reinstalling your third member.
- **Reassembly:**
  - Follow the steps in reverse to reinstall the third member.



Use new copper sealing washers or our aluminum set Part # [9190916](#) - Third Member Mounting Hardware, Ford 8 Inch / 9 Inch Rear End.



For the gasket use Part # [9192300](#) - 9 Inch Ford Rearend Axle Housing 3rd Member Pumpkin Gasket.



We offer both in kit form under Part # [91604019](#) - Speedway Ford 9 Inch Posi Traction Third Member Install Kit.

- Ensure all bolts are torqued to the manufacturer's specifications and the seals are properly installed. Then fill as recommended.

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