



**Installation Instructions for AS Racing Mach 7 R Billet 4-Way Adjustable
Cartridge Fork Leg System (For 49MM Harley Davidsons)**



**Mach 7 R Fork Leg System
Assembly/ Installation Instruction Manual**



1. Introduction

The Mach 7R Fork Leg System by American Suspension is a high-performance fork assembly designed to enhance handling, ride quality, and braking stability. This manual outlines the mechanical steps required for safe and correct installation onto your motorcycle.

Important: Installation should be performed by a trained, professional motorcycle technician. Improper setup or installation can lead to serious injury or death.

2. Safety & Important Warnings

1. **Professional Installation**
 - Due to the complexity and critical nature of suspension components, only an experienced technician with the proper tools and training should install this system.
2. **Inspect Components and Verify All Parts for Assembly**
 - Before beginning, ensure that you have the correct Mach 7R parts for your specific make/model.
 - Confirm all hardware (axle spacers, brake bracket spacers, fork legs, etc.) and instructions are present and undamaged.
 - If any item is missing or appears damaged, contact American Suspension or your supplier.
3. **Torque Specifications & Threadlocker**
 - Always use a calibrated torque wrench and follow the motorcycle manufacturer's recommended torque values for triple tree pinch bolts, axle nuts, caliper bolts, etc.
 - Apply a medium-strength threadlocker (e.g., Loctite 243) to all critical fasteners.
 - Improper tightening (over-torquing or under-torquing) can lead to unsafe riding conditions.
4. **Special Tools**
 - While basic hand tools and Harley service tools are required, some specialty tools may be necessary for certain steps. See Section 3 (Tools & Materials Needed) for more details.
5. **Post-Installation Testing**
 - Conduct a thorough, low-speed test ride in a safe area. Always begin testing suspension components slowly and carefully until you have fully acclimated to the new handling characteristics.
 - For suspension tuning setup and baseline recommendations, see the last page of this document or consult official American Suspension guidelines.
6. **Disclaimer**
 - This document provides general guidelines. Always cross-reference your specific motorcycle's service manual for model-specific details.

Disclaimer

This manual provides general guidelines for assembling and installing the Mach 7R Fork Leg System. Exact procedures may vary depending on your motorcycle's make, model, and any updates from American Suspension. Always follow the most current documentation and professional advice for safe, effective results.

Baseline Suspension Setup

For additional baseline tuning chart and informational for Mach 7R setup/tuning, please refer to official American Suspension resources or consult a professional suspension tuner. Begin with conservative settings and only fully explore performance potential after confirming safe operation.



3. Tools/ Materials Needed

1. Torque Wrench (Calibrated)

- Purpose: Ensures all fasteners (pinch bolts, axle nut, caliper bolts, etc.) are tightened to the manufacturer's recommended values.
- Range: Choose a wrench capable of both lower- and higher-torque settings.
- Why It's Critical: Over-torquing can strip threads or damage components; under-torquing can cause bolts to loosen, potentially leading to unsafe riding conditions.

2. Socket / Allen (Hex) Wrench Set

- Purpose: Used to remove and install axle nuts, pinch bolts, caliper bolts, fork caps, and other hardware specific to your Harley or custom application.
- Sizes Vary: Check your motorcycle's service manual or measure existing hardware to ensure you have the correct metric/SAE sizes on hand.

3. Thread Locker (Medium Strength, e.g., Loctite 243)

- Purpose: Prevents critical fasteners (like pinch bolts and caliper bolts) from vibrating loose.
- Application: Always apply a small amount to threads, as recommended by the service manual and American Suspension guidelines.

4. Fork Oil & Measuring Tools

- Recommended Oil: 20W fork oil, with an approximate fill of 400 cc per fork (exact volume may vary by model—consult American Suspension or your tuner's specs).
- Measuring Method: Use a graduated cylinder, fork oil level tool, or tape measure to verify the oil is 1" above the damper rod head with the upper fork tube fully extended.
- Importance: Proper oil level and viscosity are crucial for correct damping performance and to prevent internal damage.

5. American Suspension 49mm Premium Fork Seal/Bushing Kit (Recommended)

- Contents: High-quality double-lip fork seals, in-house machined fork seal spacers, and specially coated anti-stiction 49mm fork seal bushings.
- Benefit: Ensures a leak-free seal, smoother fork action, and extended service life in high-performance applications

6. 49mm Fork Seal Driver (Specialty Tool)

- Purpose: Used to properly seat the 49mm fork seals into the upper fork tubes without damage.
- Importance: Ensures a snug, leak-free seal and prevents seal distortion or premature wear.

7. Front Stand or Lift

- Purpose: Safely raises the front end of the motorcycle for wheel, caliper, and fork installation/removal.
- Stability: A sturdy stand or lift is essential to keep the motorcycle from tipping while you work.

8. Clean Rags & Solvent

- Purpose: Maintains cleanliness of parts and work area—dirt or debris can damage fork seals or threads.
- Practice: Use lint-free rags and mild solvents (e.g., brake cleaner) to remove grease, oil, or old threadlocker before reassembly.

9. Fork Seal Grease or Vaseline

- Purpose: Lightly coat the inner and outer lips of the fork seals to facilitate smooth installation and prevent seal damage.
- Importance: Reduces friction on initial assembly, ensuring the seals seat properly and reducing the chance of leakage.



4. Pre-Assembly Check

Inventory & Inspection

- Verify that all Mach 7R components are present (both fork legs, any included hardware like spacers or brackets).
- If the Mach 7R forks were ordered fully assembled, inspect them for any signs of leakage or shipping damage.
 - If no issues are found, skip directly to Section 5.1 (Installation of Assembled Mach 7R Forks).

1. Motorcycle Preparation

- Review your bike's service manual.
- Ensure the motorcycle is clean and properly supported on a stable stand or lift.

5. Mach 7R Fork Assembly

If you have unassembled Mach 7R forks (or are reusing OEM tubes), follow these steps to complete the fork assembly before installation on the motorcycle.

5.1. Mach 7R Fork Leg Lower & Upper Tube Assembly

1. Prepare Work Area

- Lay out all parts: lower fork leg, upper fork tube, seals, bushings, spacers, springs (if applicable), dampner rods, top-out springs, etc.
- Clean each component with solvent and a lint-free rag.

2. Important Note on Reusing OEM Fork Tubes

- If you are reusing OEM fork tubes and not using American Suspension Black Mamba DLC-coated fork tubes (with the patent-pending lower fork tube reduction cup), refer to your motorcycle's factory service manual for the correct procedure to remove and disassemble the original fork leg assemblies.
- Once disassembled according to factory specs, proceed with installing any required parts/seals/bushings into those OEM tubes (as outlined below).

3. Install Fork Tube Bushing Kit

- Lower Bushing: Slide the lower bushing into the upper fork tube seat until it is fully seated.
- Larger OD Bushing & Spacer: From the top of the upper tube, slide the larger OD bushing down, followed by one seal spacer.
- Orientation: Refer to reference images for proper placement.
- Lubrication: Lightly coat the bushings with the same fork oil you'll use in final assembly.

4. Assemble Valved Dampner Rods

- Unscrew Dampner Rod Seats: Unscrew the dampner rod seats so the top-out spring can slide over the dampner rod.
- Top-Out Springs: Install either OEM or American Suspension top-out springs (from FK Series kits) onto the rods.
- Insert Dampner Rods: Carefully slide the rods, with top-out springs, into the upper fork tubes.
- Threaded End: Once the threaded end protrudes from the bottom of the upper fork tube, apply Loctite and torque the dampner rod seats to 15 ft-lbs.
- Mock Installation: To keep rods from moving when installing the fork drain/connecting bolt, you can temporarily drop in springs/spacers and lightly thread the top caps.



5. Attach Upper Fork Tube

1. Pre-Lubricate Mach 7R Fork Lower

- Pour a small amount of fork oil into the Mach 7R fork lowers.
- Roll the Mach 7R fork leg gently to coat the internal bore with oil.

2. Slide Upper Tube into Mach 7R Lower

- Carefully slide the upper tube into the Mach 7R lower, ensuring the lower fork tube bushing stays in place and the dampner rod seats properly.

3. Install Fork Drain Bolts

- Locate the drain bolts and copper crush washers.
- Apply Loctite to the bolt threads and torque to 18 ft-lbs.

4. Stand Fork Upright & Remove Mock Assembly

- If you used springs/caps to stabilize the dampner rod, remove them now (top caps, springs, etc.).

5. Drive Upper Fork Seal Bushing & Spacer

- Use a 49 mm fork seal driver to firmly drive the upper fork seal bushing (with the spacer on top) down until fully seated.

6. Install Fork Seal

- Lubricate the fork seal with fork oil or grease.
- Work it over the top of the fork tube (cupped side down).
- Drive it down with the 49 mm seal driver until fully seated and the retaining clip groove is visible.

7. Install Retaining Clip (if using a spring-style clip)

- Expand the clip 2–3× its size and carefully insert it into the groove. Listen for a click.

8. Install Dust Seal

- Drive the dust seal down with the seal driver until it seats against the retaining clip.

5.2. Preload Cap Setup / Fork Oil Fill, Bleeding & Final Oil Level

If you're using OEM components and have not purchased the FK Series Preload Kit, follow your factory service manual for the orientation of springs, spacers, top caps, etc.. The only difference for OEM setups will be the fork oil level, which aligns with the same steps below for filling, bleeding, and final oil measurement.

If you are using the American Suspension FK Series Preload Kit (with performance spring), follow these instructions for assembling/installing your preload adjusters, springs, and spacers:

FK Series Preload Kit Components

1. Preload Caps (2) – available in 1"–3" extended lengths
2. Preload "Clip Rod" (2)
3. Retaining Clips (2)
4. Spring Spacers (2)
5. Performance Fork Springs (2)
6. Performance Top-Out Springs (2)

See reference images for orientation of these components.

Assembly:

- Cap Assembly: Apply a small amount of threadlocker to the male threads of the preload adjuster cap adjustment screw. The clip rod has female threaded ends; thread the rod onto the cap screw and torque as required.
- Install provided preload cap O-rings. Lightly coat with vaseline or lubricant.
- Apply a light coat of neverseize to the threads of the preload cap body to ease thread engagement of preload cap into the upper fork leg
- Set Aside: Keep the assembled preload caps/clip rods aside until after you fill and bleed the forks.



1. Fork Oil Filling & Bleeding

1. Verify Fork Tube Is Completely Empty

- Ensure the upper fork tube is completely empty and that any spring/preload components are removed.
- The valved head of the dampner rod should be visible inside the fork.

2. Begin Adding Fork Oil

- Slowly pour the fork oil (e.g., 20W, ~400 cc) into the fork leg assembly.
- Pump the Upper Fork Tube gently up/down, allowing oil to flow into the Mach 7R cartridge passageways and expel air bubbles.

3. Eliminate Air

- Continue adding oil and pumping until no more bubbles appear and the fork stops drawing in fluid.
- Tip/Angle Method: Lightly tap the fork assembly or tilt it at various angles while pumping to free any trapped air pockets.

4. Check Fork Oil Level

- With the upper fork tube fully extended, the minimum oil level is 1" above the dampner rod head.
- Adjustable Oil Level: Expert tuners may vary oil level from 1"-3" above the dampner rod head to alter the air pocket's size and fork progression. Recommended only for professional tuners.

2. Final Assembly with Springs & Preload Components

1. Insert Fork Spring

- Once the fork is fully bled and at the correct oil level, slide the fork spring down into the Mach 7R fork leg assembly.

2. Add Spring Spacer

- Place the spring spacer on top of the spring, with the male-lipped side engaging the spring and the counterbored side facing upward.

3. Install Retaining Clip on "Clip Rod"

- Pick a groove on the "clip rod" and install the provided retaining clip.
- Confirm the preload cap adjuster screw is backed all the way out.

4. Insert Assembled Preload Cap & "Clip Rod"

- Carefully slide the preload cap & clip rod into the fork tube, where the retaining clip on the rod will engage the spring spacer.
- Select a groove such that the preload adjuster cap threads sit about 1/2" above the fork tube threads.
- Apply Hand Pressure: Push the preload adjuster cap down and thread it fully until seated in the fork tube.

5. Preload Adjustment

- You can set preload by screwing preload adjuster cap screw in or out. You can further fine tune preload by selecting which groove the retaining clip occupies and adjusting the preload cap as needed. Fine-tune preload once the forks are on the motorcycle.



6. Installation Steps

Once your Mach 7R forks are fully assembled—or if they arrived pre-assembled—follow the OEM service manual for removal of your existing front-end components and installation of the new fork legs.

6.1. Removal of Existing Forks

1. Refer to OEM Service Manual

- Use your motorcycle's factory service manual for the proper procedures and torque specifications to remove the OEM front wheel, calipers, axle, and fork legs.
- This ensures correct disassembly steps and preserves the integrity of original components (if reusing any parts).
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6.2. Installing Mach 7R Forks onto the Motorcycle

1. Install Mach 7R Fork Legs Using OEM Procedures

- Position the Mach 7R fork legs in the triple trees as if installing OEM forks, following the factory service manual for:
 - Pinch bolt torque on upper/lower triple trees
 - Proper alignment and ride height
 - General front-end reassembly checks

2. Caliper Adapter Brackets (If Applicable)

- If using American Suspension OEM Caliper Adapter Brackets or American Suspension Radial Caliper Adapter Brackets, install these before mounting calipers.
- Torque the adapter bracket hardware to 18 ft-lbs and apply a small amount of Loctite.

3. Flush Mount Axle System

- The new flush mount axle uses (2) 5/8" Allen sockets for the axle nuts.
- Loctite each axle nut's threads, and apply a light coat of anti-seize to the axle shaft itself.
- Thread one axle nut completely on one side, then slide the axle through the fork/wheel/spacer assembly.
- Torque the axle nuts to 60 ft-lbs.
- Axle Pinch Bolts: On the Mach 7R fork legs, torque all 4 pinch bolts to 15 ft-lbs and use a small amount of Loctite here as well.

4. OEM Calipers

- Reinstall the OEM calipers using OEM hardware.
- Torque to OEM specifications as per your factory service manual.

5. American Suspension Fender Brackets

- If using the American Suspension fender brackets, these mount to the Mach 7R fork legs and allow adjustable fender height via the external grooves.
- Adjust the fender for proper clearance and fitment, then torque the bracket hardware to 14 ft-lbs with a small amount of Loctite.

6. Final Checks

- Follow the OEM service manual for final pinch bolt torque on the upper fork tubes.
- Verify the wheel spins freely, there is no contact between components, and the front end turns fully from right to left without interference.

Once you have completed the above steps, move on to the Post-Installation Checks to ensure everything is secure and functioning correctly.

7. Post-Installation Checks

1. Free Movement & Clearance

- Compress the forks to confirm smooth travel without interference from fender, brake lines, etc.

2. Brake Function

- Pump the front brake lever to reset caliper pistons.
- Check brake fluid level and look for any leaks.

3. Torque Verification

- Re-check all pinch bolts, axle nuts, caliper bolts, and top cap torque (if removed).

4. Test Ride

- Conduct a cautious, low-speed test ride in a safe area to ensure stable, quiet operation.

8. Maintenance & Inspection

1. Periodic Bolt Checks

- Re-check torque (axle, pinch bolts, caliper bolts) after the first few rides.

2. Fork Oil & Seal Service

- Inspect fork seals regularly for leaks; replace oil/seals according to American Suspension or tuner recommendations.
- Replacement fork seals and bushings or inner fork tubes can be purchased and supplied from American Suspension. Contact to re-order.

3. Visual Inspections

- Look for nicks or scratches on fork tubes that could compromise seals.

9. Final Safety Statement

WARNING: Suspension components are critical for safe motorcycle operation. Assembly and installation should be performed by a skilled and trained technician. Improper assembly or incorrect installation can cause loss of control, leading to serious injury or death. Verify all torque settings, ensure proper clearance, and test ride at low speeds before normal use.

Contact & Support

American Suspension Customer Service

Email: sales@americansuspensionracing.com

Phone: (714) 906-4843

Website: WWW.AS-RACING.COM

For model-specific details, always consult your motorcycle's official service manual or an authorized dealer. If you have questions about compatibility, assembly nuances, or installation, contact American Suspension or a certified motorcycle technician.

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ASSEMBLY REFERENCE PICTURES



FK49-80 PRELOAD KIT



**AMERICAN SUSPENSION
VALVED DAMPNER RODS**



**PROPER
ASSEMBLY
ORIENTATION
OF
FK SERIES
PRELOAD
KIT**



**“CLIP ROD
AND RETAINING
RING SEATED
IN SPRING SPACER**



REFERENCE PICTURES CONTINUED:



**DAMPNER
ROD
WITH
TOPOUT
SPRING
GOING
INTO
UPPER
FORK
TUBE**



**DAMPNER
RODS
INSTALLED
WITH
FORK TUBE
BUSHINGS IN
PROPER
ORIENTATIO
N
AND
DAMPNER
ROD SEAT
INSTALLED**



**FORK
DRAIN
BOLT AND
COPPER
CRUSH
WASHER
INSTALL**



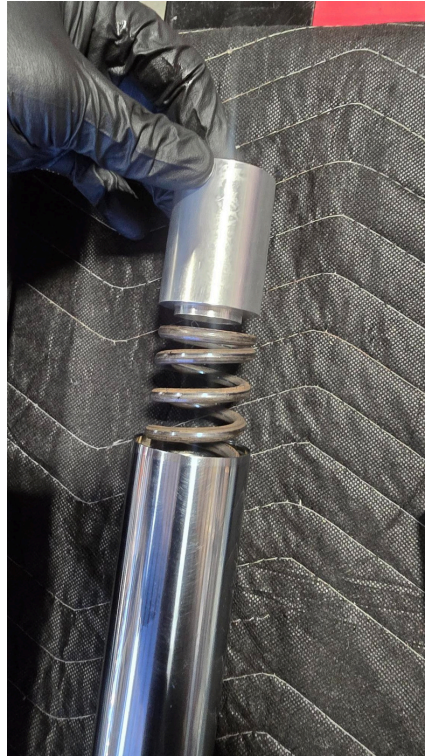
**FORK
DRAIN
BOLT
TORQUE
TO 18 FT.
LB**



REFERENCE PICTURES CONTINUED:



**FORK
SEAL
PROPER
ORIENTA
TION**



**SPRING AND
SPRING SPACER
DROPPING IN**



**HOW
SPRING
SPACER
SHOULD
LOOK ONCE
INSTALLED**



**CLIP ROD
SPACER
(UPDATED
FK KITS
ARE
THREADED
ONTO THE
CAP)
DEPICTED
SITTING 1/2
" ABOVE
THE
FORK TUBE
THREADS**