

## MM Caster/Camber Plates - 1983-1988 T-Bird (MMCC8388)



*Read all instructions before beginning work. Following instructions in the proper sequence will ensure the best and easiest installation.*

Thank you for purchasing Maximum Motorsports' Caster/Camber Plates. Our Caster/Camber Plates are designed to maximize the performance of your T-Bird's front suspension. You will find many features that set our Caster/Camber Plates apart from the rest:

- The widest range of camber adjustment in the industry: Side-to-side reversible main plates double the camber adjustment with the underhood space limitations for camber slot length.
- Lifetime guaranteed high grade Teflon lined spherical bearings are used at the strut top mounting point. Urethane bushings do not provide positive location, and induce bending loads on the strut that reduce the strut's lifespan and may even break the strut shaft.
- The main plates are spaced well above the strut tower, to restore bump travel for lowered cars.
- High grade alloy steel allows our plates to be thin and fatigue proof. Aluminum plates must be very thick and will un-necessarily reduce bump travel and hood clearance.
- Lifetime warranty against main plate bending.

**IMPORTANT:** *The bearing used in our Caster/Camber Plates is swaged together with Teflon® in between the race and ball. This provides a very tight tolerance fit that prevents dirt from entering the bearing. The Teflon® reduces friction and minimizes wear over the lifespan of the bearing. The tight tolerances will not allow easy movement of the bearing center by hand. If the center of the bearing must be rotated, use the strut shaft as a lever to facilitate movement. DO NOT ATTEMPT TO LUBRICATE THE BEARING. Any oil or grease will attract dirt and damage the Teflon®, voiding your warranty.*

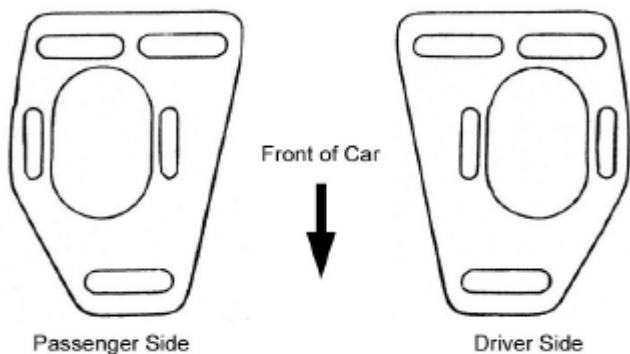
1. Before dismantling anything on your car, lay a straight edge across the fenders and measure down to the top of the strut shaft. Record this dimension, you will need it later.
2. Jack up the front of the vehicle and place firmly on jack stands.
3. Remove the front wheels.
4. On the passenger side of the car, place a floor jack under the control arm and jack up until slightly loaded.
5. If equipped with electronic ride control, unplug the wires and remove the adjusting mechanism. MM Caster/Camber Plates are not compatible with the adjusting mechanism.
6. Remove the strut top nut. Save the strut top nut, it will be used later. Note: It may be easier to initially loosen the nut with air tools.
7. Remove the three nuts/bolts that hold the factory strut mount in place. If present, drill and remove the pop rivet that retains the top mounting plate. Discard the top mounting plate.
8. Carefully lower the jack to bring the strut shaft down through the strut tower center hole, but do not completely unload the jack: the spring may become dislodged, causing injury and/or damage.
9. From the top of the strut tower, remove and discard the thrust washer, the top rubber bushing and the crush sleeves from the strut shaft.
10. Collapse the strut shaft down into the strut body far enough to remove the factory bottom plate and the dust boot. Discard the factory bottom plate. Save the dust boot.
11. Relax the strut shaft. Through the strut tower center hole, remove and discard the OEM bumpstop from the strut shaft.
12. Cut and remove the steel band clamp securing the plastic dust boot tube to the molded rubber/steel top mount. Separate the dust boot tube from the rubber/steel top mount. Discard the rubber/steel top mount, but save the dust boot tube.
13. Slip the dust boot tube back over the strut body. Lubricate the MM urethane bumpstop and slide it over the strut shaft with the conical portion facing upward. It is easiest to attach the bumpstop and the dust boot to one another later in the installation.

NOTE: The factory dust boot and MM bumpstops are

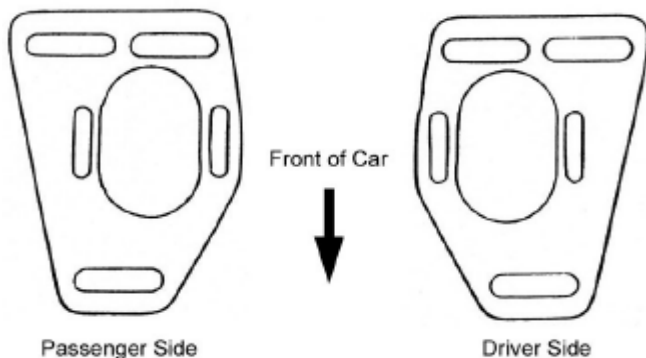
NOT used in coil-over applications. If using Bilstein struts, the MM bumpstops and the factory dust boots are not used. Bilstein struts have internal bumpstops and their own dust boots. For replacement dust boots for Bilstein struts, you can order a Service-6 kit from MM for conventional spring applications, or a Service-7 kit for coil over applications.

14. Install the MM Bottom Plate beneath the strut tower with the 12mm bolts protruding upward through the factory mounting slots and hole. Make sure the Bottom Plate slides freely in the adjusting slots of the strut tower. If not, file the slots until they do.
15. Install 1/2" washers over the 12mm bolts of the Bottom Plate. These washers will rest directly on top of the car's strut tower.
16. Install the 1/2" inside diameter spacers over the 12mm bolts of the Bottom Plate.
17. The orientation of the Main Plate can be either 'positive' or 'negative'. Use the following illustration to properly position the Main Plates in the car. Use the table as a guide to determine the orientation of the Main Plates for your alignment needs. The majority of street cars will have the Main Plates installed in the 'positive' orientation. The majority of race cars will have the Main Plates installed in the 'negative' orientation. To change the Bearing Plates between positive and negative orientation, flip the Main Plate on each side of the car. For example, a Main Plate with one side up in the positive orientation will be in the negative orientation when that side is facing down.

Main Plate in 'Positive' Orientation



Main Plates in 'Negative' Orientation



### Sample Camber Readings vs. Main Plate Orientation

MM Main Plate in positive orientation	
Stock Ride Height	7/8° Neg to 1-1/2° Pos
1" Lowered Ride Height	1-3/8° Neg to 1° Pos
MM Main Plate in negative orientation	
Stock Ride Height	2-1/8° Neg to 1/4° Neg
1" Lowered Ride Height	3/4° Neg to 2-5/8° Neg

*1987 Thunderbird Turbo Coupe used as an example. Use this table as a guide. Actual readings will vary.*

18. Install the Bearing Plates onto the Main Plates. The bearing plates have a long-straight edge and a short-beveled edge. Assemble a bearing plate onto the bottom of each Main Plate, so that the short beveled edge will be toward the rear of the car. The short-beveled edge is designed for Main Plate bolt clearance at the back of the caster adjustment slot. Failure to orient the bearing plates correctly will limit your range of caster adjustment.

### Passenger Side, Positive Orientation

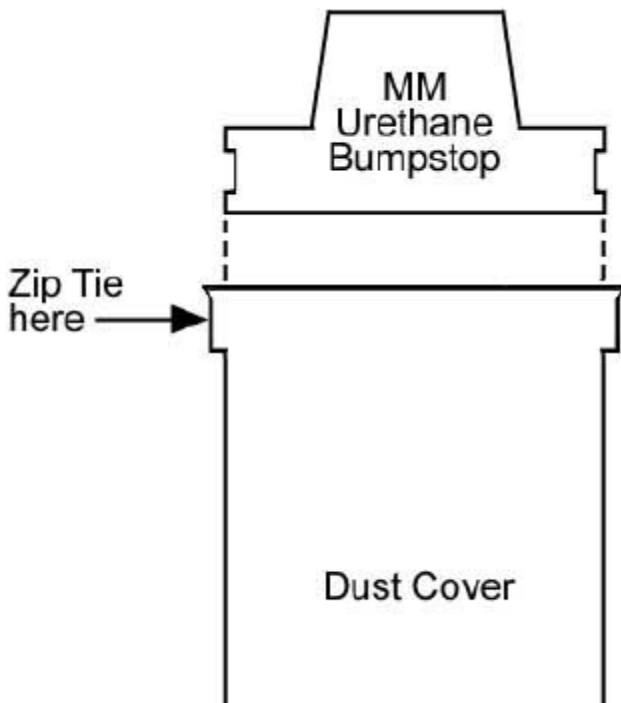


19. On each side of the car, install the appropriate Main Plate with the Bearing Plate mounted to its underside.
20. Install the 1/2" washers and 12mm nylock nuts on the bolts of the Bottom Plate.
21. Install the strut shaft through the spherical bearing with five of the 16mm (inside diameter) spacers. Use the guidelines below to determine the combination of spacers to put above and below the spherical bearing. *Use the same spacer configuration on each side of the car.*
  - If the car is at stock ride height, place one of the thinnest spacers on top of the spherical bearing. Place four remaining spacers under the spherical bearing. One spacer on top is required to allow full angularity of the spherical bearing.

- If the car is lowered from stock, position the spacers

so that the top of the strut shaft is higher than the dimension recorded in step 1 by the same amount that the car is lowered. For example: If the car is lowered 1.5" from stock, position the spacers so that the strut shaft is 1.5" higher than the dimension you recorded in step 1.

22. Reinstall the strut shaft top mounting nuts. Torque the nuts to your strut manufacturer's specification. NOTE: Various strut manufacturers have unique lengths for the top threaded portion of the strut shaft. You may need to omit a spacer to fully engage the nut on the strut shaft.
23. Temporarily tighten the Caster/Camber Plate adjusting nuts: Two 3/8" nuts for caster and three 12mm nuts for camber on each side.
24. Check hood clearance to the raised strut shaft. You can check hood clearance by carefully closing the hood with putty or Play Dough on top of the strut shaft. The thickness of the smashed putty will indicate exactly how much hood clearance there is. If hood clearance is less than 1/8", reposition the strut shaft spacers to lower the strut shaft relative to the spherical bearing.
25. Slide the MM urethane bumpstop up as far as it will go. Slip the dust boot up and onto the bumpstop. Secure it with a Zip Tie.



26. Pull the bumpstop/dustboot down the strut shaft slightly so that it will not interfere with the sliding portions of the Caster/Camber Plates while the alignment is being performed.
27. Reinstall the front wheels and carefully lower the vehicle to the ground.
28. Torque the lug nuts to the factory specification.

29. Have your car professionally aligned.

NOTE: Because camber and caster can be adjusted independently with the MM plates, you can adjust one, lock it down, and then adjust the other. Always double check all camber and caster measurements after an adjustment of even one parameter.  
*Remember: any change to ride height will cause camber to change. Any change in camber will cause the toe setting to change. You must re-adjust the toe setting after altering camber.*

30. Ford's production tolerances on the position of the large center hole of the strut tower can cause interference when the camber or caster is adjusted towards the limit of travel. If you are adjusting towards the extreme limits of camber and/or caster, check the clearance between the strut shaft and the edge of the large center hole. Check not only with the wheels pointed straight ahead, but also while turning the steering from lock to lock. You may enlarge the center hole with a file or die grinder.
31. Caster and camber settings change the strut shaft's position relative to the hood. Double check hood clearance with the car on the ground, while turning the steering from lock to lock. If necessary, reposition the strut shaft spacers to lower the strut shaft relative to the spherical bearing.
32. When the alignment is complete, torque all the caster camber plate adjusting nuts:
 

Two 3/8" caster nuts	32 ft-lb.
Three 12mm camber nuts	65 ft-lb.

#### ALIGNMENT RECOMMENDATIONS

If you wish, you can simply have your car aligned to Ford's specifications:

We recommend that caster be set to 4.5° positive for street cars. For race cars we recommend that the caster be set to 6° positive, or at the limit of adjustment on the plate - with mandatory attention to bumpsteer. The Mustang responds favorably to increased positive caster. The reason: The more positive the caster setting, the more negative camber the loaded tire will gain while cornering.

We recommend that camber be set to 0.75° negative for street cars, never positive as Ford allows. For race cars we recommend 3° negative camber. Some cars/drivers need more negative camber for optimum handling and tire wear. Keep an eye on your own tire wear and make adjustments as necessary.

We recommend setting the toe to the factory spec. of 0.10° toe-in per tire for street use. For race cars we recommend 0.20° toe-out per tire.

## BUMPSTEER:

Bumpsteer is the toe setting of a wheel changing as the suspension moves up and down over bumps, or with body roll while cornering.

There is a myth that the tie rod should be kept parallel to the ground to avoid bumpsteer. **THIS IS NOT TRUE!** What IS required, is that the tie rod be kept in the correct relationship to the lower control arm. They appear to be parallel, although they are not; they're so close to parallel that it looks parallel. Keeping the correct relationship ensures that as the suspension moves, the arc of the ball joint and the arc of the tie rod end do not cause any steering input to the spindle. If you lower your car, the tie rod end and the lower control arm move together, staying in the same (correct) relationship; visually parallel. If you install offset rack bushings on a stock geometry K-member, you will alter the geometry, making the tie rod end and the lower control arm appear NOT parallel. You will actually **CREATE** bumpsteer by installing offset rack bushings on a stock K-member.

Ford engineers have actually done a very good job at designing a low level of bumpsteer for daily driven cars. Specifically, Ford has designed the bumpsteer to toe out the front wheels under bump. This is a roll understeer condition; the outside loaded tire will turn to the outside of a corner as the body rolls. This condition is designed by Ford by positioning the tie rod end slightly low relative to the steering rack.

Increasing caster raises the spindle steering arm, and therefore the tie-rod outer end, relative to the steering rack. Increasing caster with MM Caster/Camber Plates will actually **HELP** bumpsteer and help performance by reducing roll understeer. Increasing caster will shift the bumpsteer curve toward toe IN under bump, or a roll-oversteer condition. In practice this is felt as less roll-understeer.

Competition cars using stock K-member geometry will also benefit from an adjustable tie rod end kit (MMTR-3,-4). These kits provide an assortment of spacers in .015" increments to best position a rod end at exactly the correct height; thus taking into account suspension geometry tolerances.

Offset rack bushings **DO** have a purpose and may be beneficial if you have raised your inner control arm pivots using an aftermarket K-member. In this case, raising the rack will help match the geometry of the raised inner control arm pivots. If you do use offset rack bushings, be sure to only use aluminum bushings - *polyurethane offset bushings do not work*. The urethane has too much "give", and therefore it is impossible to get the rack mounting bolts tight enough to prevent the bushings from rotating during hard cornering.

See the MM website for more details about bumpsteer. Go to the FAQs & Tech Tips section, then to the first subsection titled, "Getting Started."

### This Kit Contains the following items:

- 2 Bottom Plates
- 2 Main Plates
- 2 Bearing Assemblies
- 4 3/8 G8 Washers
- 4 3/8 Hex Nuts
- 6 1/2" ID Spacers
- 12 1/2" ID G8 Washers
- 6 12mm Nylock Nuts
- 2 Polyurethane Bumpstops
- 2 14" UV Resistant Black Zip Ties
- 2 16mm ID Strut Shaft Spacers - Short
- 2 16mm ID Strut Shaft Spacers - Medium
- 6 16mm ID Strut Shaft Spacers - Long
- 1 Instruction Set

