
MM Caster-Camber Plates 2005-14 (MM5CC-11)



- All parts are either plated or powder coated for great looks and long-lasting protection.
- Lifetime warranty for the original purchaser against spherical bearing or plate failure.

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

Continuing the Maximum Motorsports tradition of designing and manufacturing the finest double-adjustable Caster/Camber Plates, this version fits the 2005-2014 S197 Mustang. This version does not reuse any OEM Ford parts.

A must for any lowered S197 Mustang, the MM Caster/Camber Plates have separate adjustments for both camber and caster, and provide the largest continuous range of alignment settings possible. This allows correction of the excessive negative camber caused by lowering. Even a Mustang lowered as much as 2.5 inches can still be aligned to factory specifications.

Features

- 1.6-degree continuous range of camber adjustment provides alignment correction on lowered cars, and is adjustable without affecting caster.
- 0.7-degree continuous range of caster adjustment provides correction for OEM production tolerances.
- Caster and camber are easily adjusted at the top of the strut tower.
- PTFE-lined spherical bearing eliminates deflection and precisely locates the strut shaft, while still allowing the articulation required for steering and suspension movement.
- High-tech composite thrust bearing transfers the spring load into the strut tower.

Notes

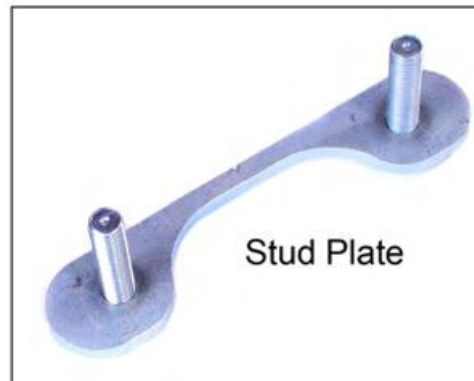
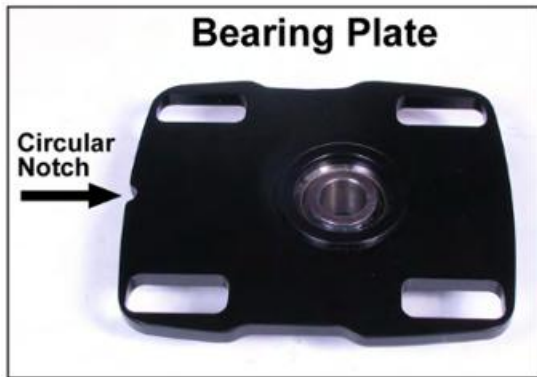
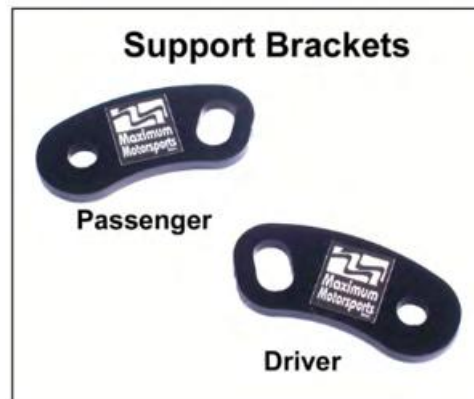
- The MM5CC-11 fits both 2005-2010 and 2011-2014 struts. The early S197 struts have a longer threaded length at the top, while the later S197 struts have a shorter threaded length. All 2007-2014 GT500 Mustangs have the early S197 strut design with a longer threaded length at the top.
- Ford says the strut-to-spindle mounting hardware is one-time use only. New OEM hardware can be purchased from your local Ford dealer or Maximum Motorsports (part# MMF-3). A total of four (4) bolts W714652 S439 and four (4) nuts W714653 S900 are required for one car. Note that this is the latest design Ford hardware; it is now fine-thread, and the tightening torque may be higher than what was originally specified for your Mustang. The torque specification for this hardware is 166 lb-ft.

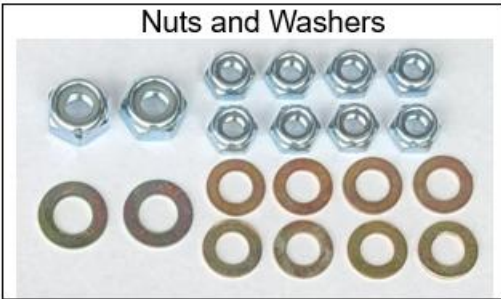
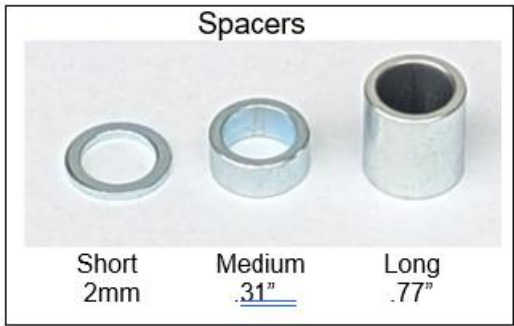
Unboxing and Prep

1. Unbox and remove the packaging material from the Maximum Motorsports Caster/Camber Plates. Match all components to the list and ID photos to confirm all are present.

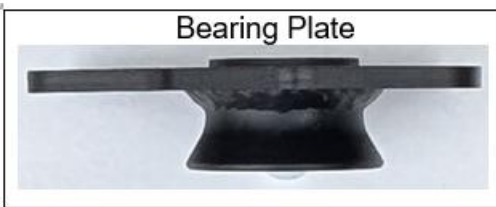
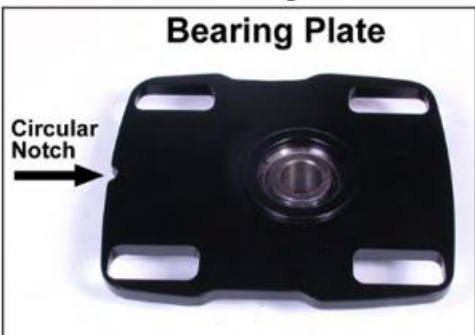
This kit includes

Description	Quantity
Bearing Plate	2
Spring Perch Assembly	2
Driver Caster Plate	1
Passenger Caster Plate	1
Spring isolator	2
Driver Support Bracket	1
Passenger Support Bracket	1
Stud Plate	4
Long spacer, .775"	2
Medium spacer, .312"	2
Short spacer, 2mm	2
Strut shaft nut	2
10mm Nylock Nut	2
Large G8 Washer	2
8mm Nylock Nut	8
Small G8 Washer	8
Rubber Band	2





NOTE: While the Bearing Plates are not side specific, they must be correctly oriented during installation in order to properly function. For correct orientation, the circular notch on the Bearing Plate must face towards the outboard side of the vehicle and the spherical bearing must be below the Bearing Plate.



Parts shown below are laid out from the viewpoint of looking under the hood while standing at the front bumper.



2. Starting with the passenger side Bearing Plate, install two of the provided Stud Plates from the bottom of the Bearing Plate, with the studs protruding up through the slots of the Bearing Plate. Position the two Stud Plates so that the large radius, located between the two studs of each Stud Plate, faces the spherical bearing.





3. Place the passenger side Caster Plate on top of the passenger side Bearing Plate, making sure that the raised lip around the spherical bearing protrudes up through the center slot of the Caster Plate. The notch on one outer edge of the Caster Plate must be aligned with the Bearing Plate notch, and both are oriented towards the outboard side of the car when installed.



4. Take one of the supplied rubber bands and wrap it around the studs as shown. The purpose of this rubber band is to hold the Stud Plates in position while installing the MM Camber Plate Assembly in the vehicle.



5. Repeat Steps 2-4 for the driver side.

Remove the Struts

6. Place the front of the car safely on jack stands, or on a lift.



7. Remove the front wheels.

8. Starting on the passenger side, disconnect the brake line bracket and the ABS sensor wire from the strut.



9. Disconnect the swaybar endlink from the strut.



10. Loosen, but do **not** remove, the strut-to-spindle mounting bolts.



11. Remove the 4 upper strut mount nuts, located on top of the strut tower.



12. Remove the lower strut-to-spindle mounting bolts, and then remove the strut/spring assembly from the vehicle.

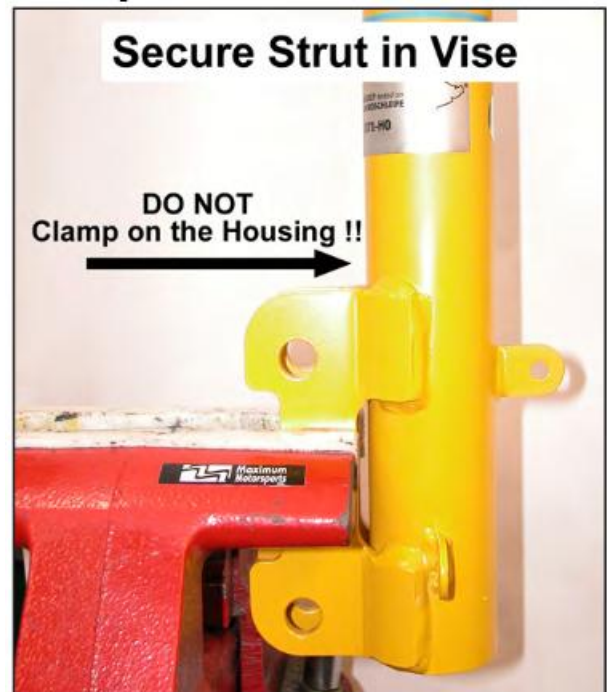
NOTE: Use a metal hanger or safety wire to prevent the spindle from placing a strain on the brake hose.



Installing the Camber Plate on the Strut

If possible, secure the strut in a vise before continuing. This will provide for an easier installation. Do not clamp down on the strut housing, as doing so may damage the internal components.

NOTE: Be careful not to clamp on the strut mounting ears too much, to avoid bending them closer together.



13. Using an external spring compressor, compress the spring to release the spring force on the upper strut mount assembly.

*NOTE: The spring is under considerable pre-load. You **MUST** secure the spring with an external spring compressor before attempting to disassemble the spring from the strut. Not following the proper disassembly procedure may cause severe personal injury and property damage.*



14. Remove the upper strut-retaining nut, and washer if present.

Note: the images are designated for the appropriate S197 model years.



15. Remove the upper strut mount assembly from the strut shaft. Note that in these photos the spring compressor was removed for clarity.



Note: spring compressor removed for clarity.



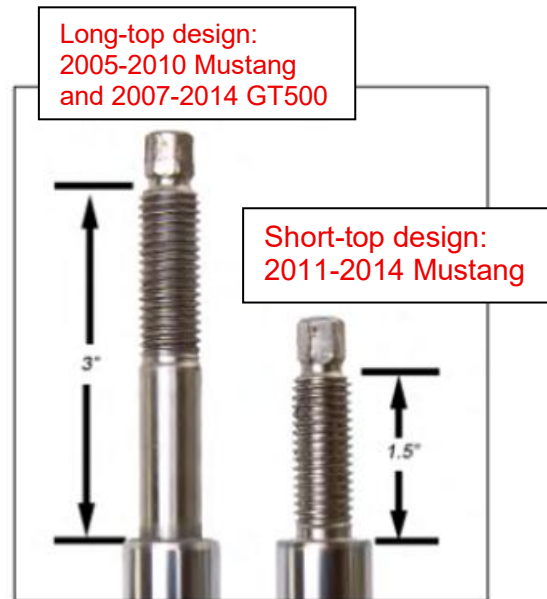
Note: spring compressor removed for clarity.

16. If retaining the currently installed spring, skip to Step 19. If changing the spring, uncompress the spring and remove the spring compressor from the spring. Then remove the spring from the strut.

NOTE: Determine if your strut is a twin-tube or a monotube design. All twin-tube struts feature an external bumpstop that is located on the strut shaft. This bumpstop must be used. Monotube struts have an internal bumpstop located inside the strut housing.



17. Check your strut shaft to determine which upper shaft length it has: the long-top or the short-top design. The upper shaft length determines how the Strut Shaft Spacers must be arranged in later steps.



Alert

If you are installing the MM5CC-11 camber plates with a small-diameter coil-over spring on a threaded body strut instead of a standard spring on a standard strut, *stop now and read the important information in Addendum 1* (page 12), then proceed to step 21



18. Install the dust boot onto the strut shaft.

19. Set the spring onto the strut. Many aftermarket springs are short enough to allow installation without a spring compressor. If necessary, compress the spring with the spring compressor enough to install the MM Camber Plate Assembly and have the strut shaft protrude through its spherical bearing. Align the end of the lower pigtail against the vertical face of the strut's lower spring perch, as shown below.



20. Set the MM Urethane Spring Isolator on top of the spring. Align the vertical face of the isolator with the end of the pigtail. Keep the bottom pigtail end in its place on the spring perch.

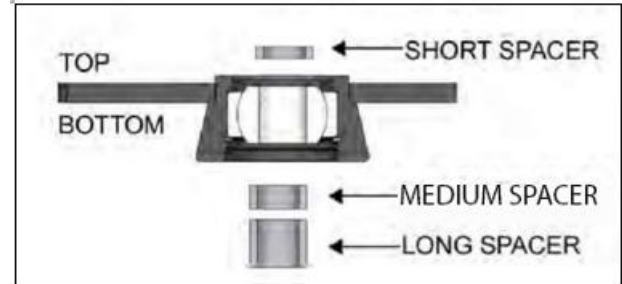


21. Place the MM Upper Spring Perch Assembly on top of the urethane isolator. The strut shaft will protrude through the center hole of the spring perch.



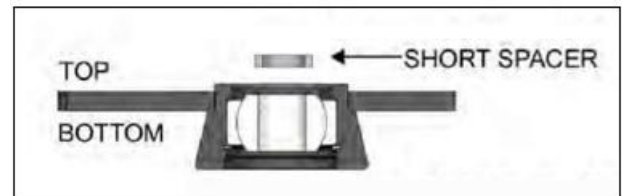
22. The following illustrations show how to arrange the Strut Shaft Spacers on the strut shaft. Use the illustration that matches your strut's upper shaft design: the long-top shaft or the short-top shaft, as shown in step 17.

Long-top strut design



Short-top strut design

Use only the 2mm spacer on top of the bearing, as shown. The shoulder of the short-top strut will rest against the bottom of the spherical bearing.



23. Place the passenger side Camber Plate Assembly onto the strut shaft by slipping the shaft through the spherical bearing. Take care to keep the spacers in place as shown in the previous illustrations.



24. Put the 2mm Short Spacer in place on the strut shaft and then install the upper strut retaining nut onto the strut.

- For a short-top strut you **must** use the nut provided in this MM kit.
- For the long-top strut you may reuse your strut's original nut or use the nut provided in this kit.

25. Torque the nut to the manufacturer's recommended value. If using OEM struts, torque to 45 lb-ft. If using aftermarket struts torque to the strut manufacturer's specification. Note that adjustable struts with a hollow shaft have a lower torque spec than does a solid strut shaft.

24. Confirm that both pigtails are still properly located in the lower spring perch and the upper urethane isolator.

25. Slowly release the spring compressor tension and then remove the compressor.

The strut & spring assembly is now ready to install in the car.



Repeat for the driver side strut.

Reinstall the Struts

26. Check the bottom of the strut tower for any raised metal flashing. You should be able to run your fingers across the surface without catching them on anything. File or sand down any roughness detected.

NOTE: The bottom of the strut tower must be smooth to allow the MM Caster-Camber Plate to slide freely during the alignment procedure.



27. Reinstall the strut assembly into the vehicle. Take care to orient the notches on the Camber Plate Assembly towards the outboard side of the vehicle. Install the two forward 8mm nuts and washers to hold the assembly in place by threading the nuts on until the tip of the stud touches the Nylock portion of the nut.

Do *not* tighten the nuts on the Stud Plates until instructed to do so.



28. Place the passenger side Support Bracket onto the protruding studs, as shown in the photo. The Support Bracket should be oriented towards the outboard side of the vehicle.



29. Place one of the large G8 washers on to the Caster Plate Stud, followed by one of the provided 10mm Nylock nuts and thread it on until the tip of the stud touches the Nylock portion of the nut.



30. Place one of the provided small G8 washers onto each of the remaining studs, followed by the provided 8mm Nylock nuts, and thread them on until the tip of the stud touches the Nylock portion of the nut.



31. Reach through the hole in the top of the strut tower and pull on the rubber band attached in Step 4 until it breaks. Completely remove the rubber band.

32. Snug, but do not yet fully torque, the five nuts securing the MM Caster/Camber Plate to the strut tower.

33. Reattach the strut to the spindle and torque the lower mounting bolts to the Ford spec for the bolts used.

2005-09 Coarse-thread	148 lb-ft
2009-14 Fine-thread	166 lb-ft

NOTE: In mid-2009 Ford switched to fine-thread fasteners because they allow a higher tightening torque and therefore provide more clamp load at the strut-to-spindle joint. This OEM hardware can also be purchased from Maximum Motorsports, Part number MMF-3.

NOTE: Ford considers the strut-to-spindle hardware to be one-time use for all S197 Mustangs.

34. Reattach the brake line bracket and the ABS sensor wire removed in Step 8.

35. Reattach the swaybar endlink to the strut and torque the mounting nut to 85 lb-ft.

36. Loosen the five nuts securing the MM Caster/Camber Plate to the strut tower *very slightly*, just enough to allow the plate to slide in its adjustment slots. Slide the entire Camber Plate Assembly forward and torque the 10mm nut to 26 lb-ft.

NOTE: This is most easily done by grasping the strut housing from underneath the fender and pulling it forward.



37. Center the strut shaft in the strut tower opening side to side. Once centered, torque the four 8mm Nylock nuts to 20 lb-ft. **Be careful!** This is a relatively low torque.

Alert! Tightening these nuts to more than 20 lb-ft. **will strip or break** the 8mm studs!

NOTE: This is most easily done by grasping the strut housing from underneath the fender to push/pull it inboard/outboard.



38. Repeat Steps 8-36 for the driver side of the vehicle.

39. Reinstall the wheels and safely lower the vehicle to the ground. Torque the lug nuts to the manufacturer's specifications.

40. The car must now have a proper front-end alignment. You can either take your Mustang to a professional alignment shop or do-it-yourself at home if you know how and have the tools. Following is important information to pass on to the alignment technician.

Important Notes for Alignment

- The Caster/Camber Plate will NOT move if the front suspension is loaded. The front end **MUST** be raised. **BOTH** front wheels must be off the ground in order to adjust the caster and camber. You cannot simply jack up one side of the vehicle to adjust the alignment because the front sway bar will transmit a load to the raised side from the other side's suspension.
- While caster and camber are adjusted separately with the MM plates, the caster should be adjusted first, locked down, and then the camber adjusted.

Alignment Recommendations

Caster

It is typical for alignment shops to set the passenger side caster to a slightly greater amount than the driver side. For street-driven cars, a difference of $1/4^\circ$ to $1/2^\circ$ will help counter the effect of road crown, preventing the car from pulling towards the right on most roads. The driver side should never have more caster than the passenger side.

Unlike camber, there are many variables that affect the caster. For example, if the car has any rake, the measured amount of caster will be less than if the car was level. Changes in ride height will affect the measured amount of caster. Different technicians using different alignment equipment will measure caster at varying amounts. Unlike camber, the number of degrees that caster is set to does not have to be exact. As long as caster is in the desired range, and the difference from one side to the other is not greater than $1/2^\circ$, it is acceptable.

Camber

On the other hand, camber should be set very carefully.

- Street-driven cars: 1° negative, $\pm 1/4^\circ$. Keep a close watch on tire wear patterns, and adjust camber to reduce poor wear, if necessary.
- Race cars: Depends greatly upon the track, driver, etc. Usually set around 2° negative as a starting point. Adjustments should be made after checking tire temperatures and wear patterns.

Toe setting

- Street-driven cars should be set at toe-in for straight-line stability. They can be set to the factory specification of 0.5° toe-in.
- Competition cars are typically set up with some amount of toe-out, for quicker turn-in response and increased front grip. A typical starting point would be 0.5° toe-out, but experimentation is required to achieve best results.

Remember that any time any change is made to the camber setting, the toe setting will be affected, and therefore toe must be readjusted. Always keep a record of the alignment settings. Inspect the tires frequently for uneven tread wear patterns. If uneven tire wear becomes evident, have the alignment adjusted. With a record of the previous alignment it will be easier to diagnose what is causing the wear pattern and then make alignment adjustments to improve tire wear.

Warranty

Maximum Motorsports Caster-Camber Plates part # Mm5CC-11 have a limited lifetime warranty against spherical bearing failure or plate failure. That's right: if you wear out the spherical bearing, or break the plates while driving, we will replace that component for free. This warranty applies to the original retail purchaser of genuine MM Caster-Camber Plates part # Mm5CC-11.

Addendum 1

Installation with Standard Coil-over Springs



The MM5CC-11 Camber Plates may be installed with aftermarket struts fitted with standard coil-over springs. Typical of these is a threaded-body strut housing and a 2.5" diameter spring, although other spring diameters are possible. *There are things to consider for this situation.*

Thrust bearing

The upper spring perch assembly must include a thrust bearing to allow rotation of the strut for steering. If there is no bearing to allow easy rotation of the strut housing there will be unpleasant and even dangerous consequences. Upper spring perch designs without a thrust bearing depend upon the spherical bearing in the camber plate having a loose fitment to allow easy strut rotation during steering. MM camber plates have a tight fitment to prevent noise when encountering bumps in the road. With a tight spherical bearing fit there is enough additional friction that steering effort is increased. It can be increased enough that the steering no longer self-centers. After steering around a corner the front tires will no longer return to center on their own. The driver must steer the car back to a straight line.

Strut Shaft Diameter

The stock S197 strut shaft diameter, where it passes through the camber plate spherical bearing, is 14mm. Some aftermarket struts have a different diameter shaft. Check the diameter of the top threads of your struts. If it is not 14mm there are options available to fit the MM5CC-11 to your struts.

The inside diameter of the MM spherical bearing is 16mm. We install a reducer to fit the standard S197 strut shaft diameter of 14mm. This reducer can be removed and replaced with a different reducer to accommodate a different shaft diameter. MM has reducers to fit 15mm and 12mm strut shafts. The standard 14mm reducer is a light press fit and can be removed without much difficulty. The proper reducer can then be easily installed.

Strut Shaft Spacers

You will need to determine the arrangement of strut shaft spacers to fit your coil-over strut assembly to the MM5CC-11 Camber Plate. It is possible you may need more strut shaft spacers than those included in the kit.

The first priority is to have enough spacers between the top of the upper spring perch assembly and the bottom of the camber plate's spherical bearing to ensure there will never be interference between the spring perch and the bottom side of the Camber Plate Assembly during any combination of suspension travel and steering angle.

Important Note

There must always be one spacer on top of the spherical bearing to ensure the retaining nut can never interfere with the side of the bearing cup as the strut angle changes with suspension movement.

Check the length of the top strut shaft. If it is longer than the long-top OEM standard length of 3.0" you will need to make another check. Confirm that the top of the strut shaft cannot hit the underside of the hood. If it does, you will need to rearrange spacers to move the shaft down, relative to the camber plate. Remember that ride height is set by adjusting the height of the lower spring perch on the strut housing.

A strut shaft smaller than 14mm diameter will require some sort of thin spacer to center the spacers on the shaft. For larger diameter strut shafts MM has 16mm spacers available.

Addendum 2

Advanced Racecar Installation (Mm5CC-11)

The standard installation instructions are intended for street-driven vehicles. Sometimes during installation additional steps can be taken to provide improved performance. These performance gains will be unnoticeable with a street-driven Mustang, although they may provide a competitive advantage for a track-driven car.

This "Advanced Racecar Installation Addendum" has additional information to help guide you towards an installation that may provide greater performance benefits. This type of advanced installation requires much greater skill on the part of the installing technician.

As this information is intended for advanced gamers only, an above-average skill level is required of participants. Do not expect this Advanced Racecar Installation Addendum to be all-inclusive; we cannot foresee the ramifications of every possible combination of parts that exists. It is part of the installer's job to look far beyond the scope of the immediate installation and to look for unintended consequences.

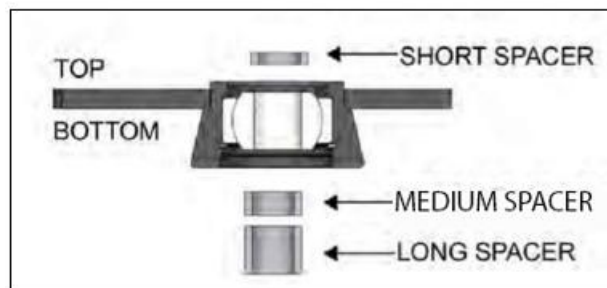
Unless your vehicle is regularly used in competitive events there is no benefit from doing the additional work of the advanced installation. You will not notice the performance gains detailed in this addendum during street driving.

Maximizing Bump Travel

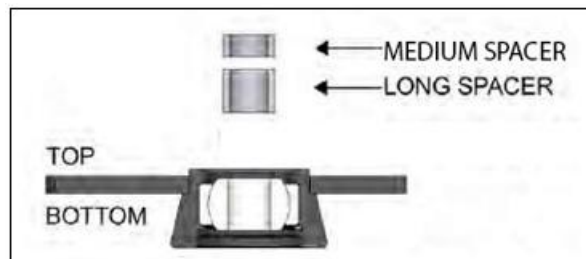
The MM Camber Plates allow the bump travel range of the strut to be changed from stock if your struts have the long-top design that was standard for 2005-10 struts. Moving the strut shaft upwards relative to the camber plate shifts the range of travel up, which can restore the bump travel lost when the car was lowered. How much it can be moved depends on the design of your specific strut.

NOTE: All twin-tube struts feature an external bumpstop that is located on the strut shaft. This bumpstop must be used.

In the base instructions was this illustration showing the spacer arrangement for the long-top strut



To move the strut shaft up for increased bump travel, change the position of the spacers.



This will pull the strut shaft up, relative to the camber plate. This will help prevent the strut shaft from bottoming internally if a shorter bumpstop is used. Internal bottoming of the shaft will damage the strut.

Please note that these recommendations only provide a starting point for the fine-tuning of an advanced installation. It is possible for interference

to occur between the top of the strut and the underside of the hood. When positioning the strut shaft with one of the arrangements shown, carefully lower the hood to check for interference.

There may be other consequences from increasing suspension travel, such as allowing the tire to travel further in upwards and hit something it would otherwise clear.

As stated previously, this addendum is for advanced gamers, who know enough to investigate related factors that could be hazardous if not addressed.

What else can Maximum Motorsports do for my Mustang?

Now that you've installed the MM5CC-11 camber plates, take a break and watch Matt Farrah's amazing /DRIVE Tuner Car Shootout video. Matt put MM's 2014 GT daily driver through a rigorous road and track comparison test against some seriously high-dollar competition!

You can duplicate the performance of MM's 2014 with your own S197 Mustang! Check out the parts list and video on the MM website.



<https://www.maximummotorsports.com/DRIVE-Video-Parts-C703.aspx>