

The Arning/Shelby Control Arm Drop

By David Suesz, with thanks to Jeff Burgy

Historical Background

In the early 1960's, Ford Motor Company developed the Mustang, to fill a spectrum of automotive markets, from inexpensive economy cars to hard-charging performance cars. With the introduction of the independent rear suspension in the 1963 Corvette, Ford tasked Klaus Arning, who designed the suspension in the GT40, to design an IRS option for the new Mustang.

The front suspension on the standard Mustang was developed from the Falcon/Fairlane design, and was not compatible with the IRS, but this was remedied by relocating the attaching point of the pivot shafts of upper control arms 1" lower. The IRS-equipped prototypes handled well, but cost-accounting determined the option would be too expensive for the market, and the IRS was cancelled.

However, it was also discovered that a big part of the handling improvement was due not to the IRS, but to the 1" alteration of the front suspension.

Shelby American was aware of this modification, and incorporated it into the early production GT350.



How it Works

A common misconception is the “drop” improves handling by lowering the car. While it is true that the car is about 5/8” lower after this modification, the real improvement comes from the change in the geometry of the suspension. The “roll center” of the suspension is raised, which causes the front suspension to resist “body roll”, which makes the suspension feel, and act, as though a larger sway bar were installed. It also serves to keep the wheels more square in contact with the road surface, compared with the original design.

This is also important, since the original suspension was designed to work with narrow, bias-ply, non-belted tires. Almost universally, people today use wider, belted radial tires. This modification has the effect of “radial-tuning” the suspension for modern tires.

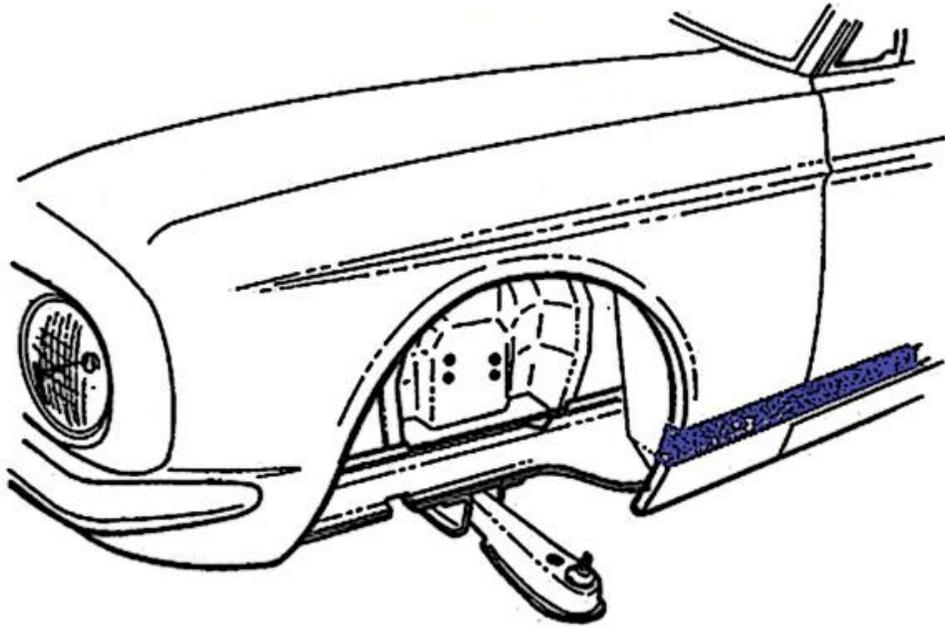
How it's Done

You'll need to remove the shock absorbers, and coil springs. The upper control arms will need to be disconnected from the shock tower, and carefully swung out of the way, and supported to prevent damage to the tie rod ends or brake hoses. Collect and carefully store the spacers used on 64-66 Mustangs, so they can be placed back where they were.

The holes should be marked and center punched one inch lower, and on 64-66 Mustangs, 1/8” toward the rear of the car. This rearward offset cannot be used on the 67-70 Mustang, due to the very tight confines of the shock tower. If the engine and exhaust system are installed, you should slide a sheet of plywood in between the engine and tower to prevent the drill from causing damage. Carefully mark the hole location, or use a template. Start by drilling a 1/8” pilot hole. When you are certain the holes are correctly located, drill them out to 1/2”. Any slight misalignment of the holes can be fixed with a round file, checking the fit with the upper control arm shafts.

Reassembly is the same as disassembly, but on 64-66 Mustangs, you must remove 1/8” of spacers to approximately compensate for the change in the upper arm angle. Similar compensation of the cam bolt on the inner end of the lower control arms of 67-70 Mustangs is recommended, but if you cannot accurately adjust this, let a professional do it.

Wheel alignment will be required immediately after performing this modification.



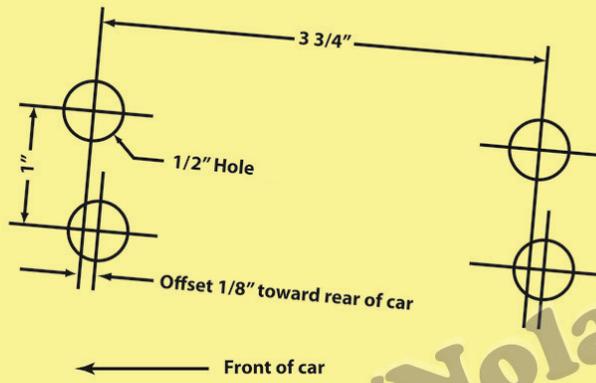
Other Recommendations

While we recommend this modification for any 64-70 Mustang that will actually be driven, there are other simple changes that work very well with this modification. Addition of a 1" front sway bar will further reduce body roll. Of course, the improved road-handling ability of the suspension will now exert greater forces on the chassis. To tighten the "feel" of the chassis, you need to reinforce the chassis with, at minimum, an Export Brace, to stabilize the shock towers and cowl.

You may also want to use a Monte Carlo bar, to connect the shock towers, further stabilizing the chassis. The Monte Carlo bar is not compatible with most stock air cleaners, so you must decide whether this is critical for the type of driving you plan.

ALIGNMENT SPECIFICATIONS				
'65-'66 Mustang I6	Minimum	Maximum	Maximum Variation	Optimum Setting
Caster	0°	+2°	1/2°	+1°
Camber	-1/4°	+1 1/4°	1/2°	+1/2°
Toe-In	1/8"	3/8"	-	1/4"
'65-'66 Mustang V8	Minimum	Maximum	Maximum Variation	Optimum Setting
Caster	-1°	+1°	1/2°	0°
Camber	-1/4°	+1 1/4°	1/2°	+1/2°
Toe-In	1/8"	3/8"	-	1/4"
'67-'70 Mustang	Minimum	Maximum	Maximum Variation	Optimum Setting
Caster	-3/4°	+1 1/4°	1/2°	+1/4°
Camber	+1/4°	+1 3/4°	1/2°	+1°
Toe-In	1/16"	5/16"	-	3/16"
'65-'70 Shelby	Minimum	Maximum	Maximum Variation	Optimum Setting
Caster	-	-	-	+2°
Camber	-	-	-	0°
Toe-In	-	-	-	1/8"
'65 Shelby R Model	Minimum	Maximum	Maximum Variation	Optimum Setting
Caster	-	-	-	-2 1/2°-3°
Camber	-	-	-	-1°
Toe-In	-	-	-	1/8"

1965 - 1966 Mustang



1967 - 1970 Mustang

