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Weld-In Front Frame Clip and Suspension for 1964-1970 Mustang and 1967-70 Cougar



The Most Complete Subframe System

Total Control Products front subframe clip is a directfit, high-performance suspension solution designed for 1964-1970 Mustangs and Cougars, featuring a factory-welded subframe with g-Machine double A-arm, rack-and-pinion crossmember. The system deletes the original shock towers opening up the engine bay to accept bolt-in installation of all popular early- or late-model engines including Ford Coyote and Chevy LS-Series. With the broadest selection of supporting suspension, steering, and brake components, the TCP frame clip system is the most highly configurable system available. Customtailored performance and prices levels that fit the needs of your project. Visit the TCP website and E-store for realtime price quotes.



Precision-Fit Quality Through Advanced Technology

One of the key pieces of advanced technical equipment used in development of our vehicle-retrofit component systems is the FaroArm portable coordinate-measuring machine. The FaroArm is an articulating, multi-segmented arm that enables



precise three-dimensional digitization of vehicle surfaces and mounting points, accurate to within .003". To begin, multiple identical vehicles are extensively measured to find the OEM tolerance range we must accommodate in our final design. From these scans, an exact model of the vehicle chassis is created in our Pro/ENGINEER software. Engineers can then accurately and efficiently design systems, simulate movement or conditions.

and conduct finite element analysis (FEA) testing to optimize performance and durability before physically making any parts. Manufacturing fixtures and tooling are also based on the original vehicle scans, avoiding loose tolerances of transferred prototype dimensions and ensuring the quality and ease of fit of the final product.



Firewall-Length Subframe Clip



Chassisworks-assembled frame clip inserts and welds into factory frame-rail bulkhead. Select this option if OEM subframe rails are in good condition and vehicle is primarily used for street and mild performance applications.

TCP KCFT	Firewall-length subframe clip welded assembly for tubular anti-roll bar
ТСР КСҒА	Firewall-length subframe clip welded assembly for splined-end anti-roll bar





Full-Length Subframe Clip



Fully boxed rails with heavier wall thickness provide a more rigid structure. Recommended for highperformance, high-horsepower builds. Combine with TCP g-Connector subframe system to create a tubular structure that extends to the rear suspension.

ТСР КСЅТ	Full-length subframe clip welded assembly for tubular anti-roll bar
ТСР КСЅА	Full-length subframe clip welded assembly for splined-end anti-roll bar





Shock Tower Deletes

A common obstacle when working on or swapping to a more desirable powertrain combination are the factory shock towers. Each frame clip includes a pair of recessed-pocket steel delete panels with rubber splash flaps. Panel edges are predrilled for rosette welding to factory inner fenders and securing splash flaps with included hardware.

TCP JA1	1964-66 Mustang tower delete panels
TCP JA2	1967-70 Mustang / Cougar delete panels
TCP JC1	1964-70 Mustang / Cougar inner fender splash flaps







Oil Pan Fitment and Notes

Ford 289/302	Use Ford Performance oil pan kit #M-6675-A50. 5.0L oil pan kit. Includes rear sump oil pan, dipstick, dipstick tube, pickup and main cap stud. Ideal for engine swaps. NOTE: Does not have provision for low oil sender. Fasteners not included.
	Directly fits 1983-2001 production blocks only. Blocks prior to 1982 require modification to incorporate dipstick receiver (Canton 20-850 or 20-854).
Ford 351W	Use Ford Performance oil pan kit #M-6675-A58. 351W/5.8L oil pan kit. Includes rear sump oil pan, dipstick, dipstick tube, pickup and main cap stud. Ideal for engine swaps. Fits 1969-1997 production blocks. Fasteners not included.
Ford 351C	Requires custom oil pan.
Ford 390/428	Requires use of custom pan with external oil pump or drysump. Visit www.aviaid.com for product options.
Ford MOD/ Coyote	Most Mustang OEM oil pans clear front crossmember. Must use front-mounted (splined) anti-roll bar. Modular Motor & 5.0L & 5.2L Mustang Coyote 2011-2016.
GM LS-Series	Requires custom oil pan.

Engine Mounts

The significant increase in engine bay space make room for most engine choices. Straightforward, simple bolt-in installations are accommodated by our poly-bushed steel mounts for popular early- and late-model Ford and GM engines.

TCP MM-C1S	Ford	260, 289, 302	Steel
TCP MM-C2S	Ford	390, 427, 428 - FE	Steel
TCP MM-C3S	Ford	Coyote, V8 Modular	Steel
TCP MM-C4S	Ford	260, 289, 302 - (adjustable)	Steel
TCP MM-C5S	Ford	351W, 351C - (adjustable)	Steel
TCP MM-C6A	Chevy	LS-series	Aluminum
TCP MM-C7A	Chevy	V8 side mount	Aluminum
TCP MM-C8S	Chevy	LS-series	Steel
TCP MM-C9S	Chevy	V8 side mount	Steel

FORD - Adjustable Position, Steel



Small Block Short (TCP MM-C4S) Fits: 260, 289, 302





Small Block Short (TCP MM-C1S) Fits: 260, 289, 302

CHEVY - Fixed Position, Steel



LS Series (TCP MM-C8S) Fits: All LS style engines



Small Block Tall (TCP MM-C5S) Fits: 351W, 351C



FE Big Block (TCP MM-C2S) Fits: 390, 427, 428



Modular-Coyote (TCP MM-C3S) Fits: Modular, Coyote 2011-2016





Chevy V8 (TCP MM-C9S) Fits: All big- and small-block engines

CHEVY - Fixed Position, Aluminum



LS Series (TCP MM-C6A) Fits: All LS style engines



LS Series (TCP MM-C7A) Fits: All LS style engines



Single-Piece 4 x 2" Crossmember

Bent-tube, billet-component crossmembers are a completely closed, rigid structure with greater strength and resistance to bending and twisting than other designs. Formed from a single piece of 4 x 2 x .120" steel tubing, large-radius mandrel bends are placed at each end to distribute loads throughout the crossmember, eliminating fatigue points at critical areas. Slots for the billet-mount tabs are machined in a horizontal machining center with dedicated fixturing to guarantee correct component geometry that ensures the suspension moves as designed.



Locating features are machined into each crossmember to enable selfpositioning of billet components.

Interlocking-Slot-Tab Technology

Self-fixturing female slots used with machined male tabs provide an interlocking assembly method that enables A-arm, rack and pinion, and shock mounts to be accurately positioned in all axes. This guarantees the suspension will perform as designed. Non-interlocking designs are not nearly as accurate after welding. Our superior spray-arc welding process produces the best weld penetration with excellent appearance.



Billet rack-and-pinion mount bases insert into the machined crossmember slot.

Steering Components

Manual Rack and Pinion

(Left Hand Drive - USA, Europe) Billet-aluminum construction with satin anodized finish.



Power Rack and Pinion (Left Hand Drive - USA, Europe)

(Right Hand Drive - Australia, New Zeland, U.K., Japan)

Specific-configuration steel-body rack with rotatable banjo fitting; black finish.





Billet Rack Mounts and Clamps

Billet steel rack mounts using dual slot-tab technology form an interlocking bridge between the 4 x 2" crossmember and billet aluminum rack brackets. The angled mount fixture welds to a 4 x 2" crossmember, attaching to the rack body at the widest points. This allows positioning of the rack above the bottom of the crossmember, safe from road hazards. Billet aluminum rack clamps attach into interlocking grooves in the rack gearbox, preventing flex in hard cornering unlike rubber-mounted designs. This also allows rotation of the input shaft to aid steering-shaft installation around engine obstacles and the exhaust system





Slot-Tab Technology, Interlocking Joint



Pinion Rotated **Up**



Pinion Rotated **Down**

Billet Manual Rack and Pinion

Rack-and-Pinion Body

The rack-and-pinion main body is made up of three components threaded together at O-ring–sealed joints to create a rigid, lightweight structure. A sturdy, polished, stainless-steel center tube connects the gear box to the outer body and features a

smaller diameter for additional harmonic-balancer clearance. The gear box and opposite-end rack body are CNC-machined from aluminum to increase wall thickness for added strength directly under the rack mounting clamps without excessive weight.



Unique Sculpted Gear Box

A sculpted-surface gear box shape was developed through the use of finite element analysis (FEA) software to eliminate fatigue points, minimize gear box deflection, and provide an attractive modernized appearance. Due to the complexity in engineering and machining this component, most manufacturers are limited to inferior cast or simple geometric designs. To attach the protective rubber boots at each end of the rack assembly, external grooves are present for slip-proof installation and easy replacement if ever necessary.

Internal Components



The helical-cut pinion gear and rack shaft are supported by a combination of low-friction, polymer bushings and roller

bearings for smooth gear engagement and extended service life. A spring-loaded gear-lash mechanism enables precise and predictable "zero-play" steering with no need for future adjustment. Tie-rods are screwed directly into the rack gear and locked using crush tabs to prevent loosening. During final assembly all internal components are thoroughly lubricated and the rack completely sealed to prevent contaminants from entering.

When used with Chassisworks sculpted or fabricated spindles, the complete system provides a comfortable balance of responsiveness and steering effort. The rack features four turns lock to lock with 5.25" of travel. To reduce wear, internal stops prevent unnecessarily loading the tie-rod pivots. Connecting the rack and pinion requires a 3/4" 36-spline universal joint and 9/16"-18 female-thread tie-rods or bumpsteer adjusting sleeves. For a high-quality appearance, center tubes are polished stainless steel with billet aluminum rack-body components available in anodized-satin or polished finishes.

g-Machine Power Rack and Pinion

The g-Machine front-steer power rack and pinion provides responsive steering with excellent driver feedback as a direct bolt-on for Total Control Product Mustang front clip. To increase durability, performance, and reduce deflection, the rack body, control servo, and hard lines are constructed from steel. Hard lines are routed tightly against the rack body and low-profile, rotatable banjo fittings are used exclusively at the control servo to better package the rack for installation.



Internal Components

For smooth gear engagement and extended service life, helical-cut rack-and-pinion gears are guided by a combination of low-friction, polymer bushings and roller bearings. A gear-lash mechanism enables precise and predictable "zero-play" steering with no need for future adjustment. Tie-rods are screwed directly into the rack gear and locked using crush tabs to prevent loosening. During final assembly all internal components are thoroughly lubricated and durable rubber boots attached to completely seal the rack and prevent contaminants from entering. Connecting the rack and pinion requires a 16.8-mm DD universal joint, 9/16"-18 female-thread tie-rods or bumpsteer adjusting sleeves, and -6 AN highpressure hose ends. Racks are black-powder-coatfinished with anodized-satin-finished mounts.

Feature	Specification/Dimension	
	3 turns lock to lock, 1.8" per turn, 5.375" total travel	
Thread	9/16-18 RH Male	
Length ¹	10.135″	
nbly Length ²	13.283″	
	16.8-mm DD	
ngs	-6 AN (pressure and return)	
d Pump Flow Rate	1.0 - 1.5 gpm (3.8 - 5.7 lpm)	
Measured from tie-rod pivot center to end of threaded shaft.		
Measured from center of inner- and outer-tie-rod pivots.		
	Feature Thread Length ¹ nbly Length ² ngs d Pump Flow Rate Measured from tie-rod pivot cer Measured from center of inner-	

Common Specifications

Aftermarket Tilt Columns

Aftermarket, five-position, tilt steering columns are optional with the rack and pinion package. Column lengths are specific to our rack and pinion installation and provide improved universal joint alignment compared to competitors aftermarket columns. All columns have the stock Ford steering wheel spline, 11/16-36. The

spline at the steering column shaft is 3/4-36. Columns are available in three finfishes, paintable, black powder coated or chrome plated. Electrical connectors and floor mounts are also included. Columns can also be purchased separately for use with the rack and pinion call for part numbers.



Steering Shaft Components

A selection of hardware component kits are available to complete installation with OEM or aftermarket steering columns. Kits include replacement OEM shaft, floor mount with rubber gasket, column roller bearing, intermediate steering shaft, and universal joints.

Components for Factory Columns

Vehicle specific installation kits are available for use of factory or aftermarket steering columns.

Non-collapsible steering columns were in use from 1960 through early 1967. Most vehicle's column tube and steering shaft were supported directly by the steering box. Rack installation requires the column tube be shortened, steering shaft replaced and the addition of a firewall mount. The remaining early 1967 vehicles featured a shortened column tube, factory firewall mount and rag-joint but remained non-collapsible. These applications are supplied a correct length steering shaft with roller bearing assembly (Photo 1) and pivoting firewall mount with factory seal (Photo 2). Non-collapsible tilt or swing-away columns must upgrade to factory collapsible or aftermarket columns. Late 1967 through 1970 steering columns feature a slip-fit collapsible steering shaft and can be identified by measuring the 1" diameter shaft above the rag-joint. A replacement lower slip shaft, roller bearing assembly and firewall seal (Photo 3) is provided.

All installations also receive an intermediate steering shaft kit with needle bearing universal joints. Various u-joint sets are available to accommodate major aftermarket column manufacturers and high-misalignment applications (Photo 4).



Wheel and Tire Clearance

The inner fender panel and outside fender are in the exact same position as stock. Any tire and wheel width combination that fits the stock car will fit with our clip. Contact your wheel manufacturer or supplier to verify what wheel and tire sizes fit your car. The TCP front clip hub-to-hub width differs depending upon suspension and brake choice, so wheel offset must be adjusted accordingly.

1965-1966 Mustang

Brake Kit	Clip	Hub Width	Change (per side)
Stock Drums	Stock	56-3/4"	0"
TCP DB122-BK, TCP DB122-RD	TCP	57-3/4"	+1/2"
TCP DB111-BK, TCP DB143-BK, TCP DB175-BK	TCP	59"	+1-1/8"
TCP DB275-BK, TCP DB295-BK (wide-track arms)	TCP	60"	+1-5/8"

Benefits of Increasing Hub Width

- Decreased scrub radius; tire pivots about its center
- Reduced steering effort
- Less weight jacking effect
- Improved suspension geometry (Wide Track Arms)

1967-1970 Mustang / Cougar

Brake Kit	Clip	Hub Width	Change (per side)
Stock Drums	Stock	58-3/4"	0"
TCP DB122-BK, TCP DB122-RD	TCP	57-3/4"	-1/2"
TCP DB111-BK, TCP DB143-BK, TCP DB175-BK	TCP	59"	+1/8"
TCP DB275-BK, TCP DB295-BK (wide-track arms)	TCP	60"	+5/8"

Brake Kits



Street Machine Scuplted Spindle

Our most popular and versatile spindle; suitable for use in all performance applications.



TCP DB122-BK 11-3/4" x .81" vented

1-piece rotor with 4-piston caliper; optional red caliper not shown



TCP DB175-BK 14"x 1.25" vented rotor billet-aluminum hat and hub, with 6-piston radial-mount caliper



TCP DB143-BK

13" x 1" vented rotor billetaluminum hat and hub, with 4-piston radial-mount caliper



gStreet Pro-Touring Billet-Aluminum Upright The gStreet unit-bearing

The gStreet unit-bearing upright for the ultimate accuracy and control.



Drag Race Fabricated Spindle High-strength 4130 upright and spindle for reliability and reduced weight.



TCP DB275-BK 14" x 1.25" vented rotor with billetaluminum hat and 6-piston radialmount caliper



TCP DB111-BK

11-3/4" x .35" slotted rotor billet-aluminum hat and hub, with 4-piston (Drag race only)



TCP DB295-BK 15" x 1.25" vented rotor with billetaluminum hat and 6-piston radialmount caliper



TCP DB122-BK 11-3/4" x .81" vented 1-piece rotor with 4-piston caliper; optional red caliper not shown

Control Arms

Street-Machine Arms

- Street and drag race performance applications
- Adjustable upper control arm
- Low-friction, deflection free polymer pivots
- Heavy-duty screw-in ball joints
- Mandrel-bent 7/8" and 1" mild-steel tubing

6171	Street-Machine Upper Arms, bare steel
6181	Street-Machine Upper Arms, gloss black
6172	Street-Machine Lower A-Arms, bare steel
6182	Street-Machine Lower A-Arms, gloss black

g-Machine Arms

- Stree and performance-handling applications
- Rigid triangulated arm brace design
- Upper arm couplers for on-car adjustment
- Low-friction, deflection free polymer pivots
- Heavy-duty screw-in ball joints
- Mandrel-bent 1" and 1-1/4" mild-steel tubing

6152 g-Machine Upper Arms, matte black6153 g-Machine Lower A-Arms, matte black

gStreet Arms

- Ultimate pro-touring and race applications
- Wide track suspension geometry
- Requires gStreet billet-aluminum upright
- High load capacity pivot ball mechanisms
- Rigid triangulated arm brace design
- Mandrel-bent 1" and 1-1/4" mild-steel tubing

6156 gStreet Upper Arms, matte black6157 gStreet Lower A-Arms, matte black





Suspension Systems

Five-different base suspension and steering systems are offered with a variety of options from which to choose. Detailed option selectors are viewable online by adding to your shopping part.

TCP KS4	Ultimate Pro-Touring - gStreet wide-track suspension with billet-aluminum large-unit- bearing hub, remote-reservoir 4-way coil-over option. multiple brake options
TCP KS3	g-Machine System - g-Machine suspension with sculpted spindle, multiple brake options
TCP KS2	Restomod System - Street Machine stainless or black arms with sculpted spindle, multiple brake options
TCP KS1	Value System - Street Machine arms with sculpted spindle, multiple brake options
TCP KS5	Drag Race System - Street Machine arms with fabricated spindle, multiple brake options

g-Machine System















Restomod System (TCP KS2)

Suspension Components



CONTROL ARMS:

- Street Machine style
- Black or bare arms





SPINDLES:

- Sculpted style
- Black or bare



ANTI-ROLL BARS:

- 3/4", poly-poly
- 1", bearing-poly
- 1-1/4", bearing-poly

TOOLS:

• Ball-joint wrench



COIL-OVER SHOCKS:

- Preset, single or double adjustable
- 500 to 750 lb/in



• Single or double

adjustable



SHOCK HARDWARE:

- Grade 8 hex head
- Stainless spuds



TOOLS: • Shock simulators

Steering



MANUAL RACK: • Satin anodized



POWER RACK:

- Left-hand drive (USA)
- Right-hand drive (AUS)



TIE RODS:

- OEM style
- Bump steer kit



Brakes

11-3/4 x .81":

- 1-piece vented rotor and hub
- 4-piston caliper Black or red



- 13 x 1.00": • Vented iron rotor
- Billet-aluminum
 - hat and hub
- 4-piston caliper

14 x 1.25":

- Vented iron rotor
- Billet-aluminum
- hat and hub
- 6-piston caliper



Ultimate Pro-Touring System (TCP KS4)

Suspension Components





CONTROL ARMS:

- gStreet style
- Wide-track geometry

Shock Absorbers



COIL-OVERS:

- Single or double adjustable
- 500 to 750 lb/in

SPINDLES:

- Billet aluminum
- Unit-bearing hub • Centerlock option



ANTI-ROLL BARS:

- 1-1/4" splined bar
- Adjustable rate



TOOLS: • Shock simulators



AIR-SPRING SHOCKS: • Single or double



SHOCK HARDWARE:

- Grade 8 hex head
- Stainless spuds



POWER RACK:

- Left-hand drive (USA)
- Right-hand drive (AUS)

hat and hub

nickel caliper

Brakes





TIE RODS: • Bump steer kit



15 x 1.25":

- Vented iron rotor
- Billet-aluminum
- hat and hub
- 6-piston caliper
- Black, red, or nickel caliper



- QR4 COIL-OVERS:
 - 4-way adjustable
 - Remote reservoir
- Reservoir mounts







Related Products

Late Ford Transmission Adapter

Adapter allows use of late model Ford transmission with horizontal plane transmission crossmember; urethane mount included.

Weld-In Transmission Crossmember

One and one-quarter inch bent crossmember allows drop and fore/aft position to be adjusted for best fit with non-standard engine and transmission swaps.

TCP PKG-SFC-01

TCP MTC-A1

TCP MTC-U4

Subframe g-Connector System

Fits 1964-70 Mustang and 1967-70 Cougar (Hardtop) - Includes weld-in subframe g-Connectors, bolt-in center support, and driveshaft safety loop. Fits completely under floor with mounts for optional center support and driveshaft loop.

All prices subject to change. Current pricing available at www.totalcontrolproducts.com.



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