

**FLAMING
RIVER**



67-69 Camaro

Power Rack & Pinion Steering Conversion Kit

Installation Instruction #HB2003



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Index

NOTE: Before beginning you must first measure the width of your front end from LEFT outer tie rod end zerk to the RIGHT outer tie rod end zerk to determine the overall width of your front end. Write dimension here for further reference _____

NOTE: Hoses (FR1625) and Pump Mounting Brackets (FR1611) are sold separately and are not included in this kit.

NOTE: Part number **ES381RL** 68-69 Camaro Outer Tie Rod Ends must be used with this rack and pinion kit.

NOTE: 1969 Camaro straight column may require a 1" smooth u-joint.

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Note: For safety disconnect battery cables and ensure that vehicle is properly supported by jack stands.

We recommend a professional alignment to set the proper alignment settings after system installation.

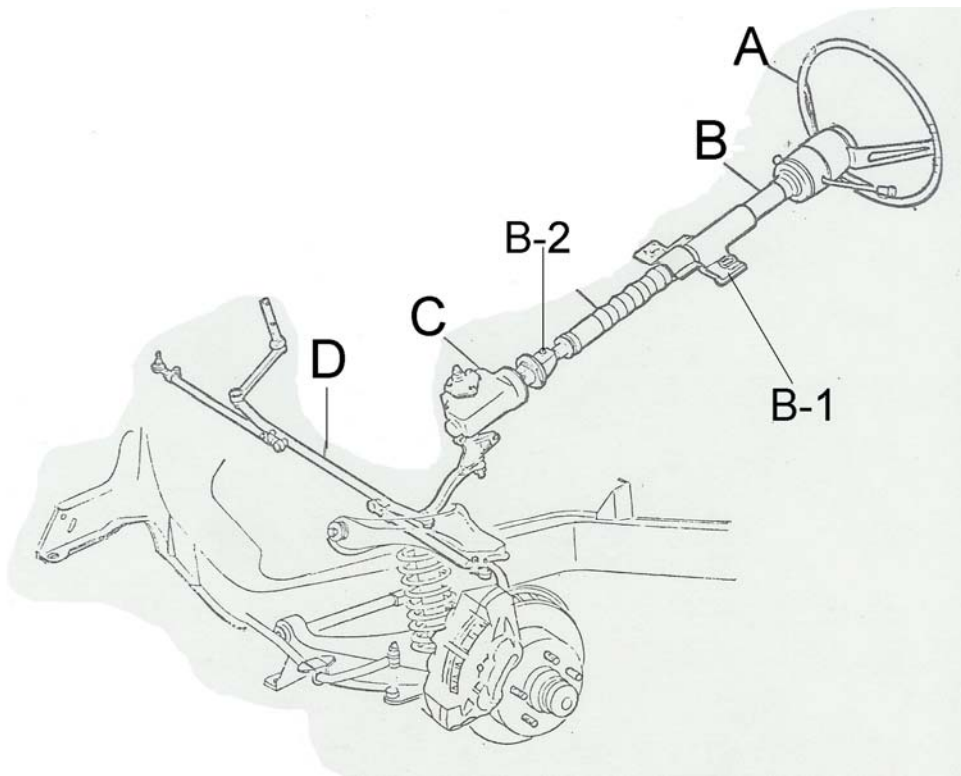
We recommend that you always install new outer tie rod ends when installing this kit.

Original Column Removal

- 1) Remove the pinch bolt that retains the rag joint (B-2) to the steering box.
- 2) Remove the bolts that hold the column floor mount to the firewall.
- 3) Support the column (B) and remove the bolts that retain the under dash mounting clamp (B-1).
- 4) Disconnect the column wiring and remove the steering column (B) from the car.

Steering Box and Linkage Removal

- 1) Remove the pitman arm from the steering box (C) using a pitman arm puller.
- 2) Remove the two bolts that retain the idler arm to the frame rail.
- 3) Remove the cotter pins and castle nuts and separate the outer tie rod ends from the spindles.
- 4) Next remove the steering linkage (D) from the car.
- 5) If you have power steering remove the lines from your power box, pump and pump brackets. A shorter belt may need to be installed.
- 6) Remove the three bolts that retain the box to the frame rail and remove the box from the car.



Installation of Flaming River Column

- 1) Install the upper portion of the new Flaming River under dash mount into the stock location. (see photo B)
- 2) Install rubber isolator into the original floor mount and then slide it over the column tube. Slightly snug clamp. (see photo A)
- 3) Place the column under the dash and snug the two mounting screws for the under dash mount. (see photo B)
- 4) Install the floor mounting screws and tighten to 15 ft lbs.
- 5) Ensure that the column straight by having the turn signal arm points to the 9 o'clock position. Tighten the two mounting screws on the new Flaming River clamp. (see photo B)
- 6) Tighten the floor mounting clamp around the tube. (see photo A)
- 7) Install the wiring jumper harness.



Photo A

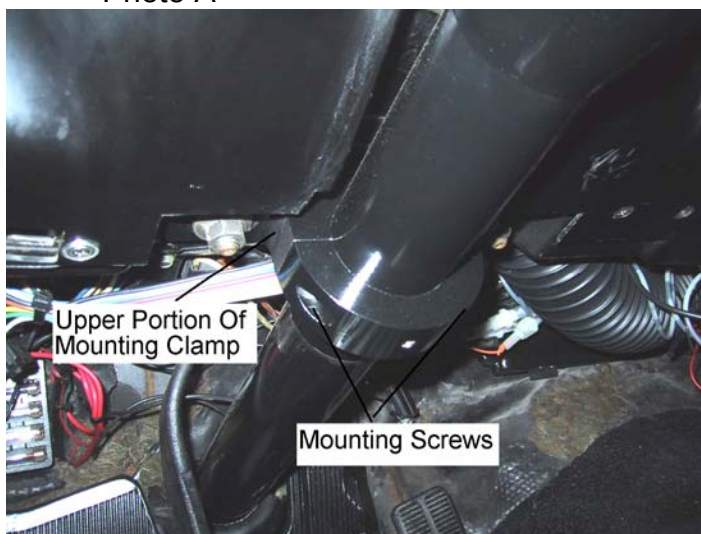


Photo B

Electrical System Notes

Caution: Before disconnecting your original steering column wiring harness please verify each wire color and function on the worksheet below. Some wire colors may vary from year to year.

FLAMING RIVER COLUMN WIRING

P-WHITE-BRAKELIGHT SWITCH
N-DK GREEN-RR TURN SIGNAL
M-YELLOW-LR TURN SIGNAL
L-PURPLE-TURN SIGNAL POWER
K-BROWN-HAZARD POWER
J-DK BLUE-RF TURN SIGNAL
H-LT BLUE-LF TURN SIGNAL
G-BLACK-HORN

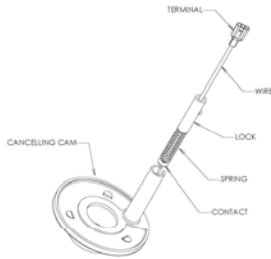
HAZARD NOTE: SOME VEHICLES DID NOT HAVE HAZARDS FROM THE FACTORY, SO NO HAZARD POWER WIRE IS PRESENT BUT CAN BE ADDED BY PURCHASING PART # FR20118-1

Color Verification to be completed before disassembly

- Brake Light Switch : _____
- RR Turn Signal : _____
- LR Turn Signal : _____
- Turn Signal Power : _____
- Hazard Power : _____
- RF Turn Signal : _____
- LF Turn Signal : _____
- Horn : _____

Steering Wheel Installation

- 1) Install horn contact kit into canceling cam tube and turn to lock.



- 2) Align steering wheel adapter so that the canceling cam hole is at approx the 11 o'clock position and that one of the steering wheel mounting holes is at the 12 o'clock position.

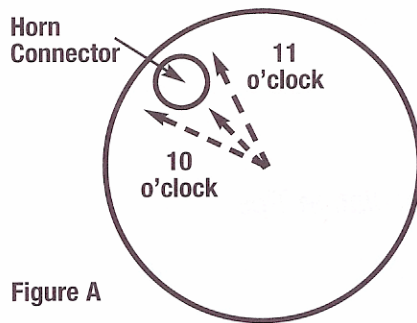
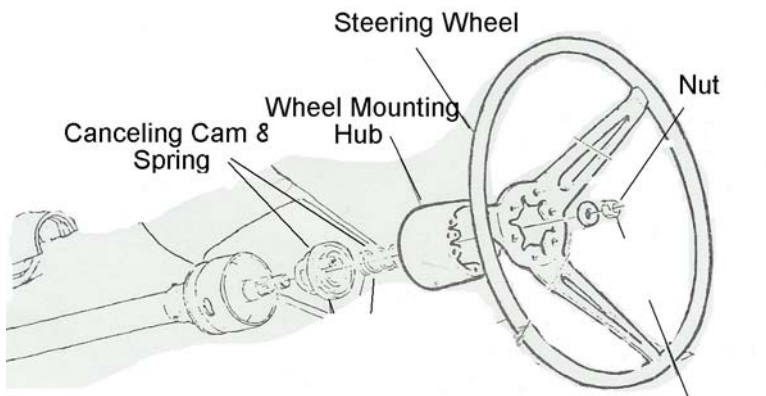


Figure A

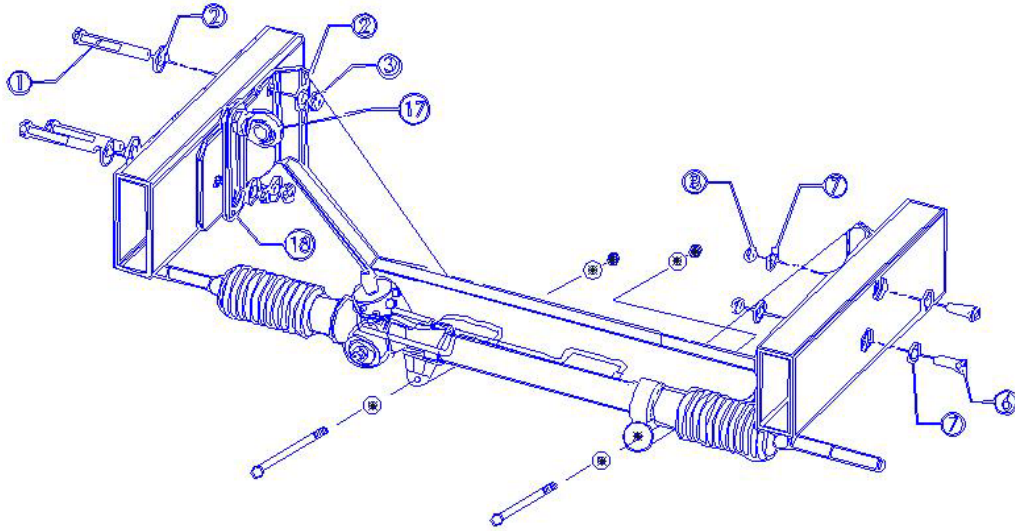


- 3) To install the wheel adapter run the horn contact wire through the hole for the canceling cam and place the adapter on to the splined column shaft.
- 4) Tighten the adapter-retaining nut until the adapter is approximately 1/16" away from the column shroud.



Installation of the Flaming River Rack and Cradle

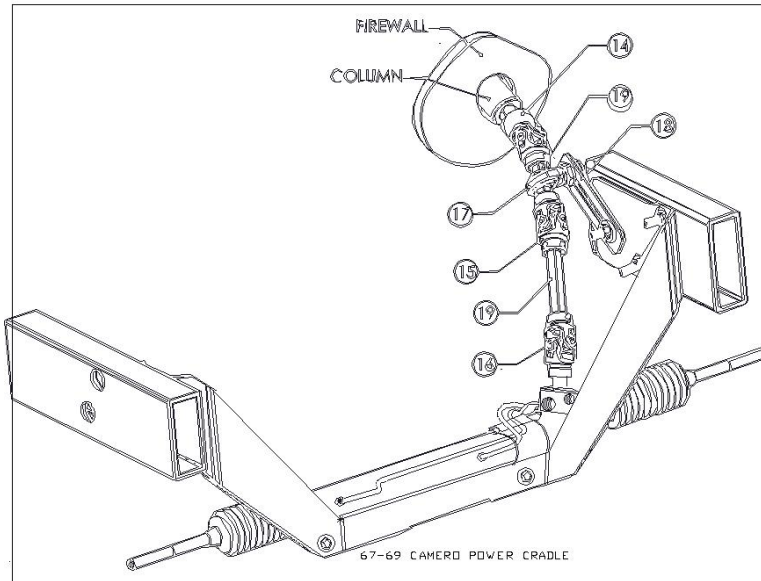
- 1) Install the rack and pinion cross member by sliding it into place, installing the new hardware using three 7/16" bolts where the gear box was mounted and two 3/8" bolts where the idler arm was located. Tighten the 7/16" nuts and bolts to 50-65 ft lbs and the 3/8" nuts and bolts to 40 -45 ft lbs.



- 2) Install the passenger side rack mount onto the mounting bushing on the cradle using the 7/16" x 14 x 5" bolt washer and nut.
- 3) Mount the driver's side of the rack using the 7/16" x 14 x 4.5" bolt washer and nut.
- 4) Tighten both rack mounting bolts to 50-65 foot pounds.
- 5) Install tie rod ends onto the rack and pinion assembly.
- 6) To install the outer tie rod ends you must load the front suspension. (Securely placing jack stands under the lower control arms and lowering the car onto the jack stands accomplishes this.) Install the outer tie rod ends into the spindle and tighten the castle nuts to 30-40 ft lbs. Make sure to install cotter pins into the castle nut and tie rod end and bend the tabs over for security.

Header Universal Joint System.

- 1) Install support-bearing mount onto the rear cradle bolt. (Diagram below). Note: The angle of this mount is set for most applications. Some adjustment may be necessary for the correct angle and u-joint alignment.



- 2) We recommend the use of $\frac{3}{4}$ " dowel rod to mock up the steering shaft to obtain the correct length of the shafts.
- 3) Install your shaft kit and snug each set screw so that it will leave a mark in the shafts.
- 4) Remove shaft and dimple each setscrew mark using a $\frac{1}{4}$ " drill bit. (As shown below.)



- 5) Re-install the shafts using **red loc-tite thread locker** on the set screw threads. Tighten each setscrew to 25 ft. lbs. Tighten all lock nuts securely. We recommend that you inspect setscrews periodically for tightness.

Power Steering Pump Installation

(If using FR1611 please see diagram with Mounting Bracket)

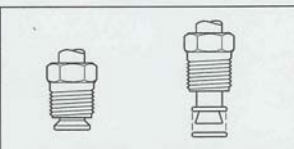
Note: Factory original pump may be used however performance of the rack may vary.

- 1) Using two of the 8.8MM x 1" long bolt and washers fasten the pump mounting bracket to the Flaming River power steering pump on the two lower mounting flanges.
- 2) Next mount the pump and bracket to the lower driver's of the engine using the two 3/8" x 1 1/2" bolts in to existing holes in the engine block.
- 3) Align the power steering pump pulley groove with the correct groove in the crankshaft pulley then tighten the two 5/16" x 1" bolts that are on the slider bracket.
- 4) Attach the adjusting bar to the top flange of the power steering pump using one 8.8MM x 1" long bolt. Then attach the end of the adjusting bar to the engine.
- 5) Install your belt (not included in kit) and adjust the tension by turning the adjuster bar.

Power Steering Bleeding Procedure

Thread Size	English	Metric
7/16 - 14 UNC Thd.	59 - 74 ft. lb.	80 - 100 N•m
1/2 - 13 UNC Thd.	89 - 110 ft. lb.	120 - 150 N•m
9/16 - 12 UNC Thd.	89 - 110 ft. lb.	120 - 150 N•m
14mm x 2 - 6H Thd.	89 - 110 ft. lb.	120 - 150 N•m

Figure 2 Table of Torques for Attaching Gears to Frame



FLARED CONNECTOR FITTING STYLE
TIGHTEN 40 - 54 N•m (30 - 40 ft. lb.)

O-RING FITTING STYLE
TIGHTEN 20 - 35 N•m (15 - 26 pl. lb.) AFTER THE NUTS AND BEADS HAVE BEEN FIRMLY SEATED

- 1) Fill the reservoir with high-quality power steering fluid and allow to sit for 2 minutes
- 2) Raise the front end of the vehicle so the wheels are just off the ground. Rotate wheels back and forth at least 20 times. Have an assistant check and maintain fluid level while performing this operation.
- 3) Start the engine and recheck fluid level. Add fluid if necessary.
- 4) With the engine running, rotate the steering wheel back and forth from lock-to-lock. Repeat several times. Check fluid level and add fluid if necessary.
- 5) Lower the vehicle on the ground and with the engine running, repeat step 5. Check fluid level and add if necessary

Torque Specs

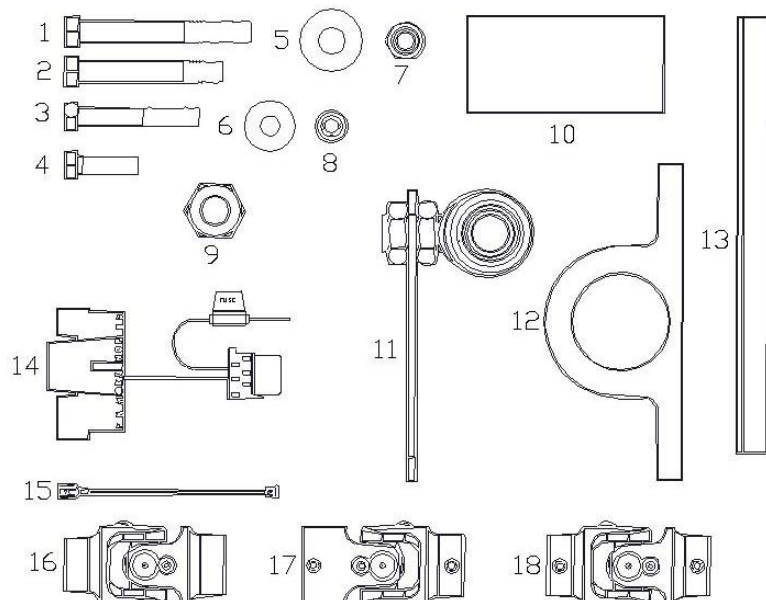
Cradle to Frame Mounting Bolts

7/16" Mounting Bolts	50-65 ft lbs
3/8" Mounting Bolts	40-45 ft lbs

Outer Tie Rod Ends to Spindle 30-40 ft lbs

Universal Joint Set Screws 25 ft-lbs

Installation Kit Hardware Package



Camaro Cradle Installation Parts

ITEM #	QTY	SIZE	DESCRIPTION
1	1	7/16-14 x 5	Driver's Side Rack Mounting Bolt
2	1	7/16-14 x 4 1/2	Passenger Side Rack Mounting Bolt
3	3	7/16-14 X 3 1/2	Driver's Side Cradle Mounting Bolts
4	2	3/8-16 x 1 1/2"	Passenger Side Cradle Mounting Bolts
5	10	7/16 Washers	Washers for 7/16 Mounting Bolts
6	4	3/8 Washers	Washers for all 3/8 bolts
7	5	7/16-14 Stover Lock Nuts	Locking Nuts for 7/16 Mounting Bolts
8	2	3/8-16 Stover Lock Nuts	Locking Nuts for Passenger Side Cradle Mounting Screws
9	2	5/8-18 Jam Nuts	Outer Tie Rod End Jam Nuts
10	1	FRBSH2	Floor Mount Bushing
11	1	FR1810	Support Bearing
12	1	BK10200-1	Support Bearing Bracket
13	1	FR20114	Under Dash Mounting Clamp
14	1	FR1850	18" DD Shaft
15	1	FR20118-1	Column Wiring Jumper Harness
16	1	FR20120HN	Horn Contact Kit
17	1	FR1932	17MM DD X 3/4"DD Chromemolly U-joint
18	1	FR1934	1"DD x 3/4"DD Chromemolly U-joint
19	1	FR1920	3/4"DD x 3/4"DD Chromemolly U-joint

Warranty Disclaimer

Because of their intended usage, the manufacturer makes no warranties whatsoever express or implied, oral or written, to purchasers of their products regarding performance, safety, fit merchantability, or length of service. Purchasers are responsible for selection of proper goods and must rely on there own skill or judgment that such goods are suitable for purchasers application.