



Flaming River Ind.  
800 Poertner Dr  
Berea, OH 44017  
800-648-8022

*68-72 Chevelle/El Camino  
Rack and Pinion  
Conversion Kit*



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

**NOTE: Hoses (FR1610) Pump Mounting Brackets (FR1612–Small Block or FR1613–Big Block) sold separately and not included in this kit.**

**Chevelle Outer Tie Rod Ends ES333RL and adjuster sleeves ES2032S must be used with this rack and pinion kit. (Must purchase separately from local or online auto parts supplier)**

**NOTE: Flaming River Recommends that you use synthetic or high grade power steering fluid. Before paint or powder coating of the rack and pinion cradle system we recommend that you prefit the system to ensure proper fit.**

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**WARRANTY DISCLAIMER: Flaming River's® Limited Warranty**

Flaming River® warrants its products to be free from defects in material and workmanship for a period of one (1) year after the date of purchase, except that: All steering columns are warranted for a period of three (3) years from the date of purchase. The Big Switch (part number FR1005) is warranted for a period of three (3) years from the date of purchase, provided that it is not mounted with a steel bracket and provided further that it is adequately protected from environmental conditions. All electrical products other than the Big Switch are warranted for a period of ninety (90) days from the date of purchase. Flaming River's® warranty liability is limited to the replacement of defective products. Flaming River® is not liable for any labor costs associated with any warranty claim, or for any incidental or consequential damages. Improper installation, abuse, racing, and/or modification of the products voids this warranty. No warranty of merchantability or fitness for a particular purpose is made by Flaming River® with respect to any of its products. Warnings and Recommendations It is the customer's responsibility to determine the suitability of a given Flaming River® product for the customer's uses. Likewise, it is the customer's responsibility to install a Flaming River® product. Contact the vehicle manufacturer whenever installing a switch to confirm the appropriateness of using such a switch and the recommended placement of the switch on the vehicle. Use qualified chassis specialists for the installation of all steering related components. Be aware that the installation of certain Flaming River® products may adversely impact a manufacturer's warranty with respect to certain vehicles and other manufactured goods. Flaming River will repair or replace any product found to be defective in material or workmanship. Improper installation, abuse, racing and/or modification VOID WARRANTY. Flaming River® is not responsible for any labor costs associated with any warranty.

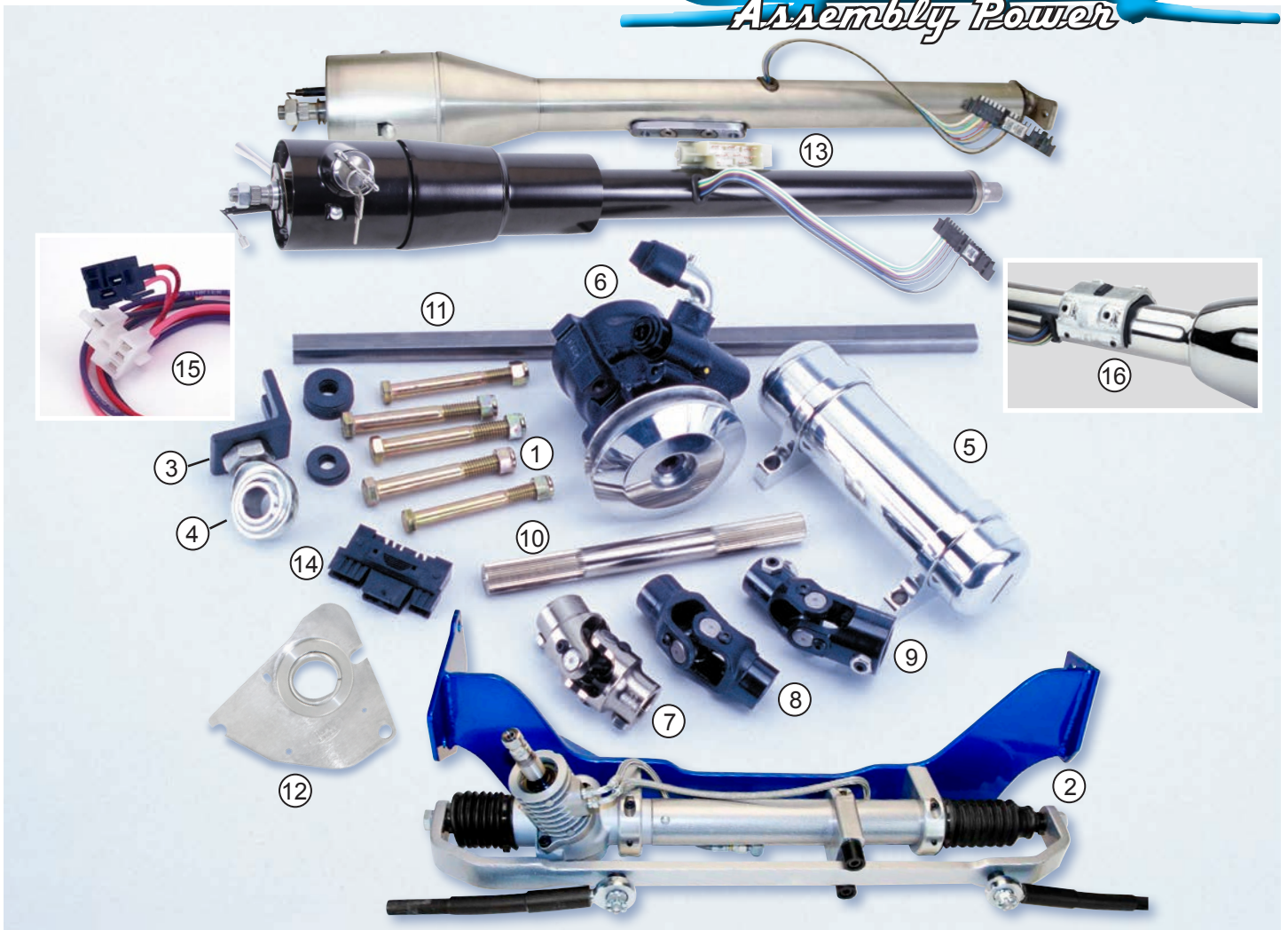
Item No.	Part No.	Description	Qty	Key or Non-Key
1	100237	Hardware Kit	1	Both
2	FR313-AS	Power Rack & Cradle Assembly	1	Both
3	100435	Support Bearing Bracket	1	Both
4	FR1810	Zinc 3/4" Support Bearing	1	Both
5	FR1614	Power Steering Reservoir	1	Both
6	FRPMP5B-V	Power Steering Pump with V-Belt Pulley	1	Both
7	FR1934	1"DD x 3/4"DD NB Universal Joint	1	Both
8	FR2643	3/4"-36 x 3/4"DD Forged Universal Joint	1	Both
9	FR1789P-2	FR Power x 3/4"-36 Universal Joint	1	Both
10	FR1870-6	3/4-36 x 3/4-36 x 6" Splined Shaft	1	Both
11	FR1850-22	3/4"DD x 22" Shaft	1	Both
12	FR20101AB	68-72 GM A-Body Swivel Floor Mount	1	Both
13	See Below	Tilt Steering Column (See Below)	1	Both
14	FR20118	Female Connector Kit	1	Both
15	FR20118-5	Ignition Plug Set	1	Key Only
16	FR20300	Stramp Clamp	1	Key Only
17	FRB5H-2	Column Mount Bushing	1	Both
18	FRDMDCL	FR Domed Decal	1	Both

**Column Varies with Part Number Ordered**

1968 (1"48): FR21019 (Non-Key)  
 1968 (1"DD): FR21020 (Non-Key)  
 1969-72 (1"48): FR30009 (Key)

In kit FR313KT  
 In kit FR313KT  
 In kit FR313KTK

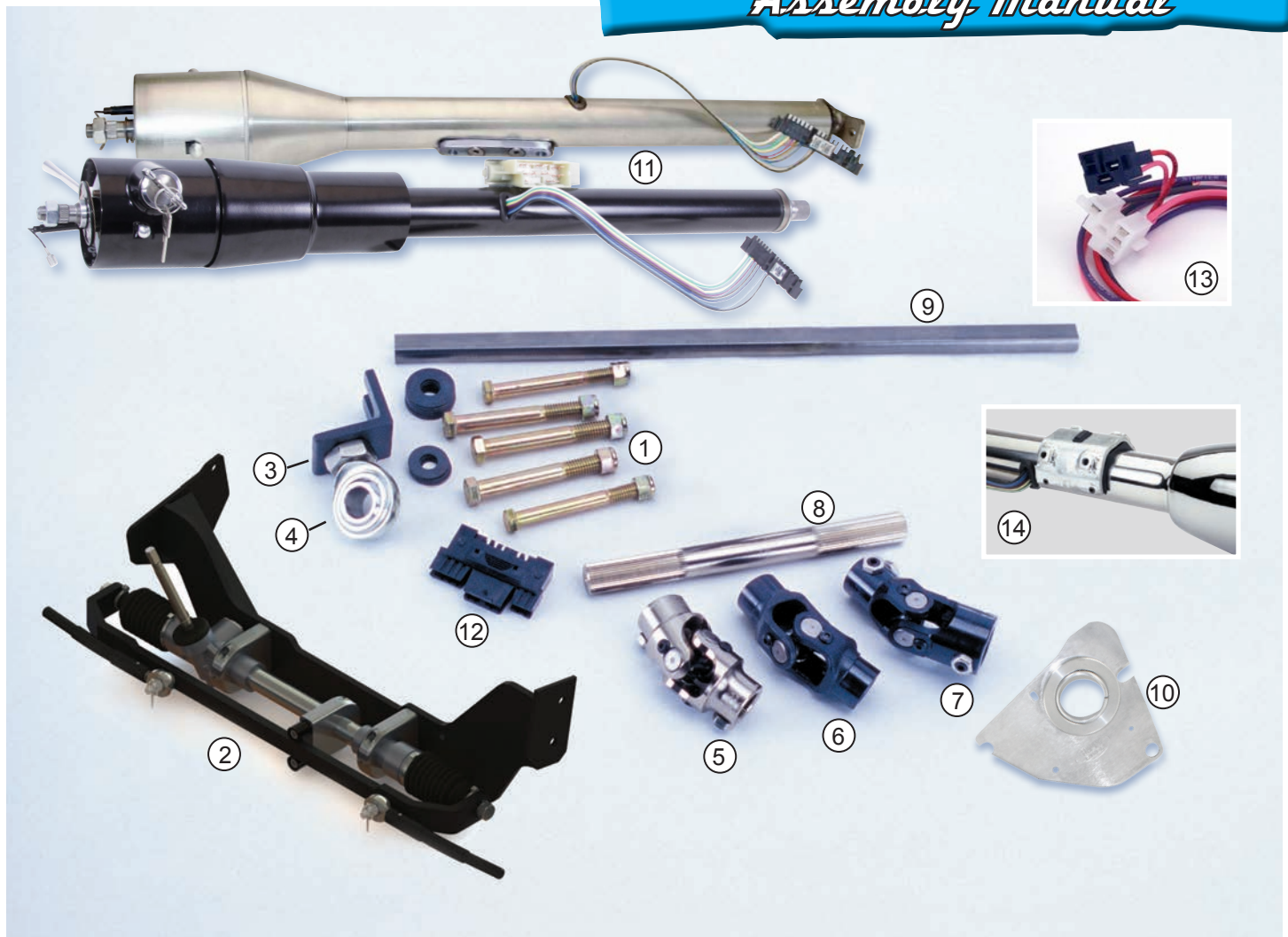
*1968-72 Chevelle  
 Cradle and Shaft  
 Assembly Power*



Item No.	Part No.	Description	Qty	Key or Non-Key
1	100237	Hardware Kit	1	Both
2	FR315-AS	Manual Rack & Cradle Assembly	1	Both
3	100435	Support Bearing Bracket	1	Both
4	FR1810	Zinc 3/4" Support Bearing	1	Both
5	FR1934	1"DD x 3/4"DD NB Universal Joint	1	Both
6	FR2643	3/4"-36 x 3/4"DD Forged Universal Joint	1	Both
7	FR1923	9/16"-26 x 3/4"-36 Universal Joint	1	Both
8	FR1870-6	3/4-36 x 3/4-36 x 6" Splined Shaft	1	Both
9	FR1850-22	3/4"DD x 22" Shaft	1	Both
10	FR20101AB	68-72 GM A-Body Swivel Floor Mount	1	Both
11	See Below	Tilt Steering Column (See Below)	1	Both
12	FR20118	Female Connector Kit	1	Both
13	FR20118-5	Ignition Plug Set	1	Key Only
14	FR20300	Stramp Clamp	1	Key Only
15	FRBSH-2	Column Mount Bushing	1	Both
16	FRDMDCL	FR Domed Decal	1	Both

**Column Varies with Part Number Ordered**

1968 (1"48): FR21019 (Non-Key)      In kit FR313KT  
 1968 (1"DD): FR21020 (Non-Key)      In kit FR313KT  
 1969-72 (1"48): FR30009 (Key)        In kit FR313KTK



**Additional Installation Products**



Small Block Ultra-Angle  
Exhaust Headers  
FR50001C



Pump Mounting Brackets  
FR1612, Small Block or  
FR1613, Big Block  
**(Required for Install –  
Sold Separately)**



Power Steering Hose Kit  
FR1610  
**(Recommended for Install –  
Sold Separately)**



FR20160  
Cascade Black

FR20150LG  
Waterfall Light Grey

Waterfall  
Wheel Adapter  
FR20150HGAD

Cascade  
Wheel Adapter  
FR20160AD



FR20130LT  
D Wheel Light Tan

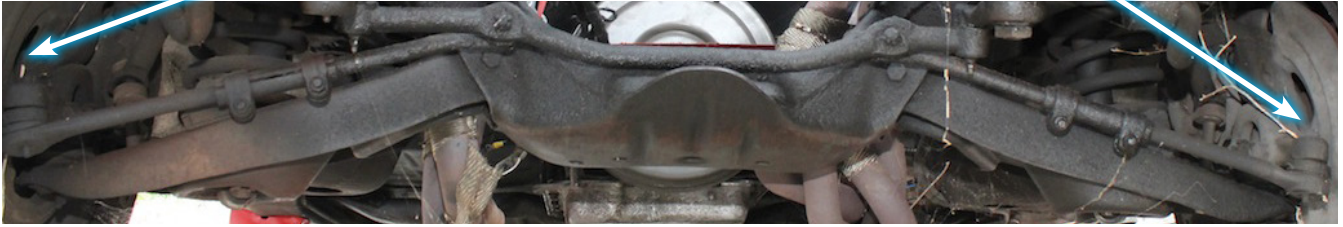
5/6 Bolt  
Wheel Adapter  
FR20119TA

Chevelle Outer Tie Rod Ends ES333RL  
and adjuster sleeves ES2032S  
**(Purchase from local auto or online parts supplier)**



## Original Steering Shaft Removal

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 \_\_\_\_\_



1) Remove the pinch bolt that retains the steering coupler to the steering column and the bolt that retains the rag joint to the steering box. Collapse shaft and remove it from the car.



*Coupler  
Mounting Bolt*

*Steering  
Coupler*



*Rag Joint*

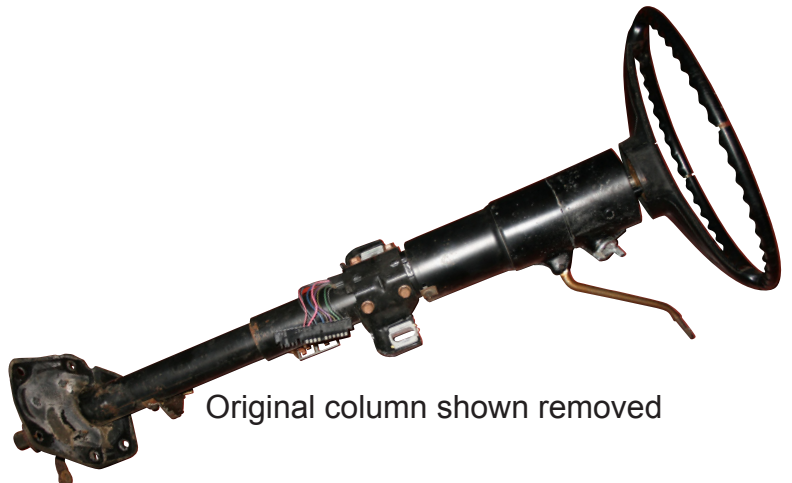


*Original Steering Shaft*

## Original Column Removal



Original column shown installed



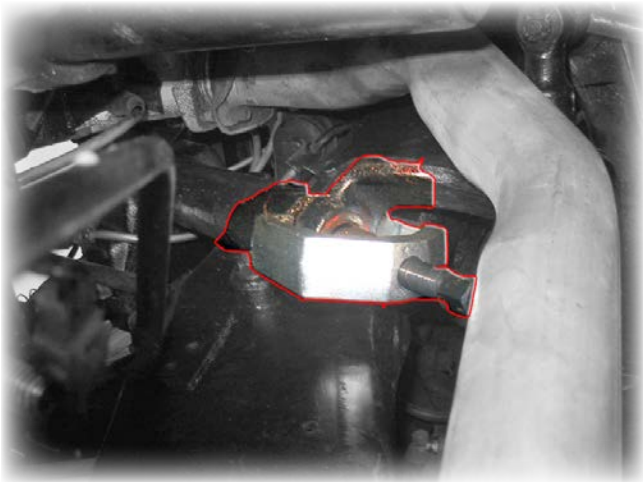
Original column shown removed

Only perform these steps if using a new Flaming River Steering Column

- 1) Disconnect the column wiring connectors.
- 2) Remove the bolts that hold the column floor mount to the firewall.
- 3) Support the column and remove the bolts that retain the under dash mounting clamp.
- 4) Remove the factory steering column from the vehicle.

For additional disassembly instructions, we recommend that you refer to your OEM Service or Chilton's Manual

## Steering Box and Linkage Removal



1) Remove the pitman arm from the steering box using a pitman arm puller.

*Idler Arm  
Mounting Bolts*



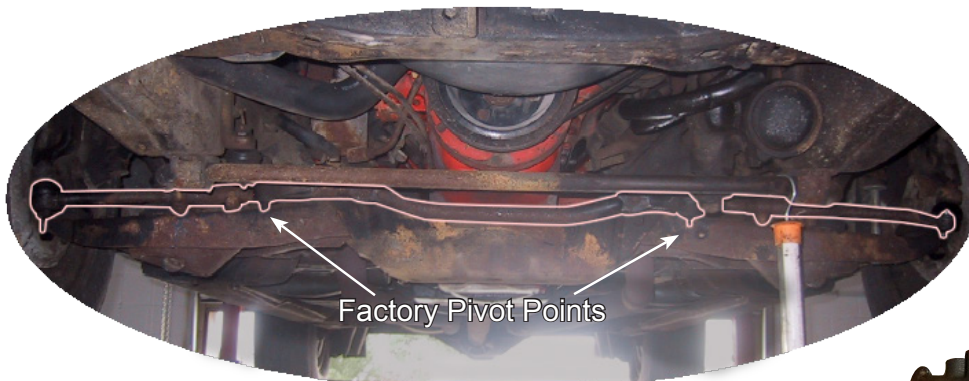
2) Remove the two bolts that retain the idler arm to the frame rail.



3) Remove the cotter pins and castle nuts and separate the outer tie rod ends from the spindles.

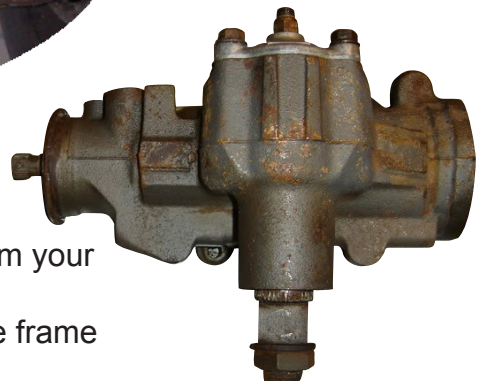


4) Next, remove the steering linkage from the car.



5) If you have power steering, remove the lines from your power box, pump and pump brackets.

6) Remove the three bolts that retain the box to the frame rail and remove the box from the car



## Flaming River Rack and Pinion Cradle Installation

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



*Photo A*



*Photo B*

*Photo C*

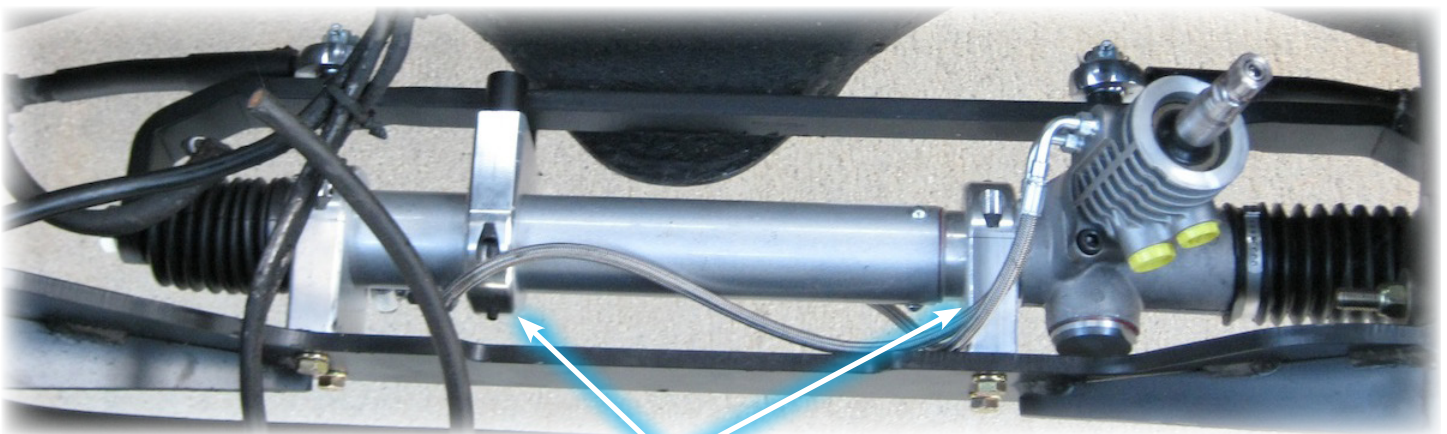


*Tighten to 50-65 ft lbs*



*Tighten to 40-45 ft lbs*

2) To install the Flaming River rack and travel bar system, rotate the travel bar over the lip of the cross member, next position the rack into place and install the rack to the cradle using the mounting brackets provided.



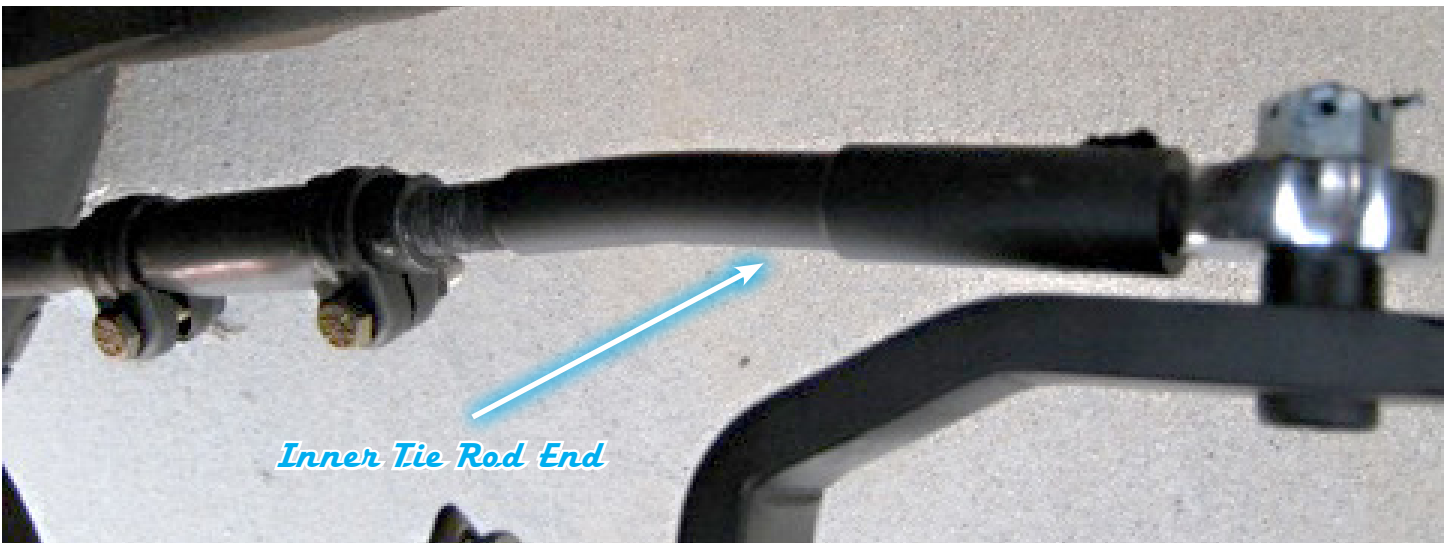
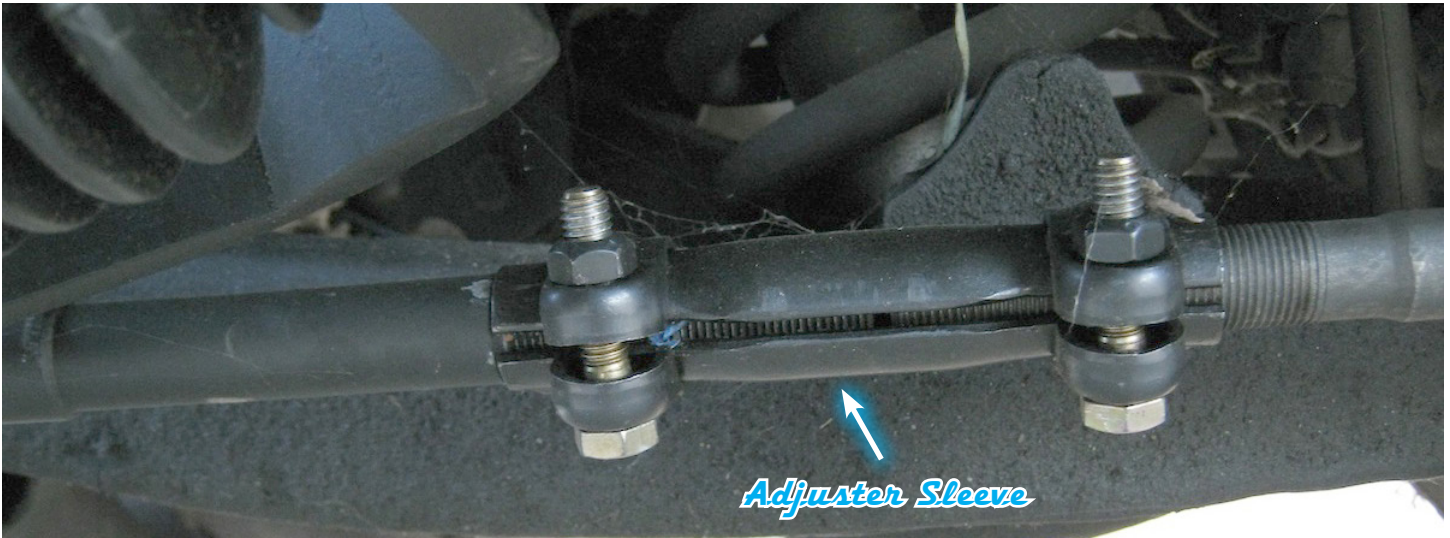
*Mounting Brackets*



### *Flaming River Rack and Pinion Cradle Installation*

3) Install the OEM adjuster sleeves onto the new Flaming River inner tie rod ends. Next install the outer tie rod ends into the adjuster sleeves and adjust tie rods until the original zerker to zerker measurement taken before disassembly is obtained. Measurement from page 3: \_\_\_\_\_

**NOTE:** Make sure rack is centered and adjust tie rods evenly

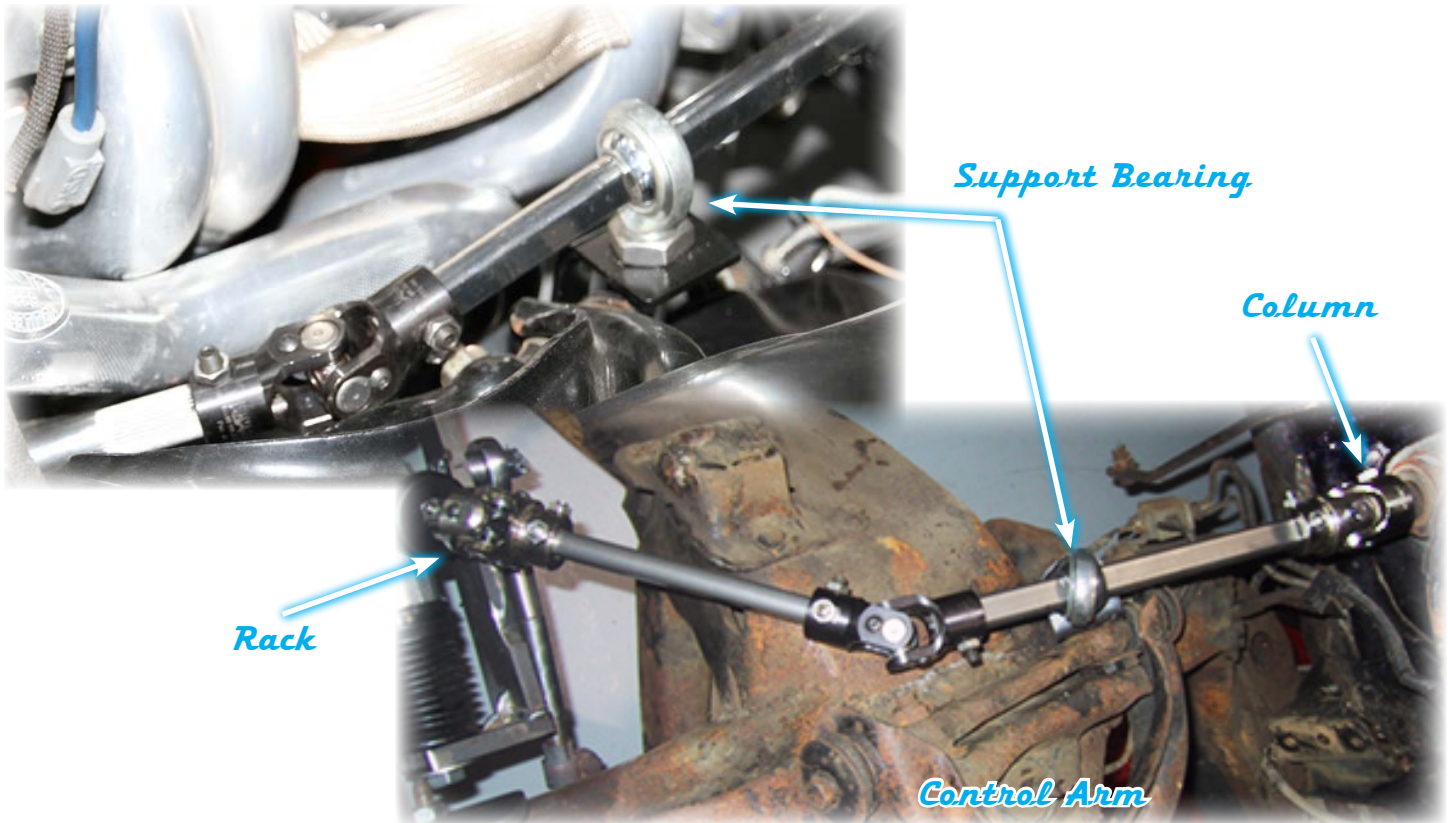


4) Install the outer tie rod ends into the spindle and tighten the castle nuts to 30-40 ft lbs. Make sure to install cotter pins into the castle nut and tie rod end and bend the tabs over for security.



## Universal Joint System

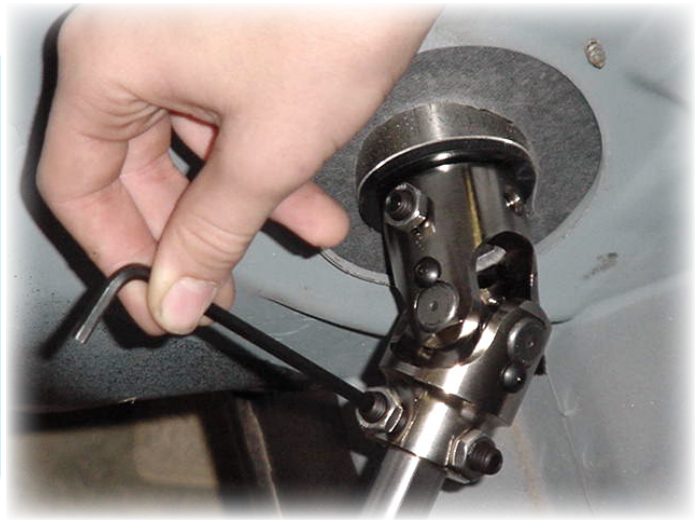
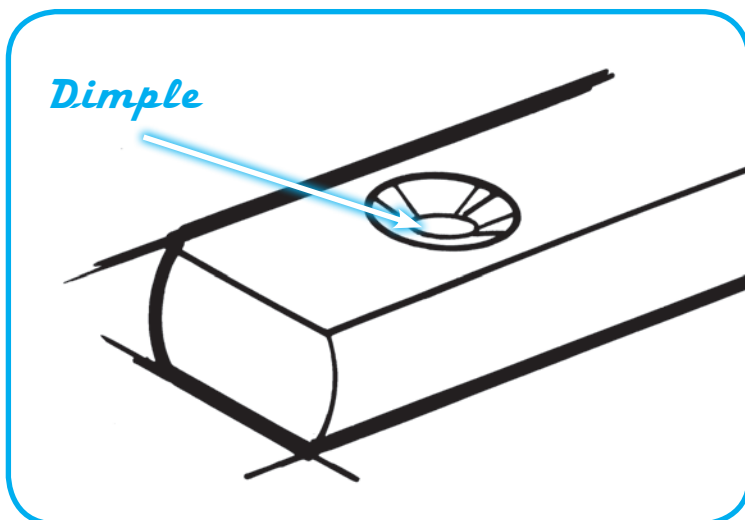
1) Install support-bearing mount onto the rear control arm bolt. (Picture below). Note: The angle of this mount is set for most applications. Some adjustment may be necessary for the correct angle and u-joint alignment.



2) We recommend the use of  $\frac{3}{4}$ " wood 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.

**Now That the Cradle System is Installed,  
Install Your New Flaming River Column**



**1968**

1"48: FR21019 or  
1"DD: FR21020  
Included with kit FR313KT (Power)  
or FR315KT (Manual)



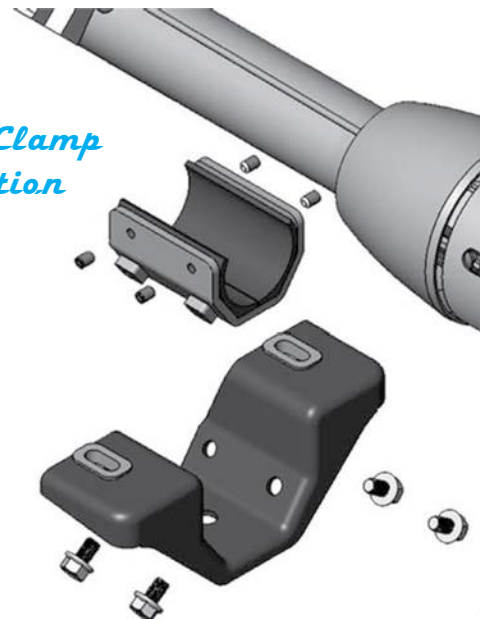
**1969-72**

1"48: FR30009  
Included with kit FR313KTK (Power)  
or FR315KTK (Manual)

- 1) Position the included floor mount to the bottom of the steering column. Do not fully tighten the mount until the column is in its final position.
- 2) Install the column in the vehicle and install the stramp clamp (Key Column) or original dash mount (Non-Key Column) in order to hold the column in place. Next, re-adjust floor mount to fit snug to the floor and make any final adjustments before tightening all the clamps.
- 3) Connect the wiring adapter to your vehicle wiring harness.



***Stramp Clamp  
Installation***



## Connecting the Electric System

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

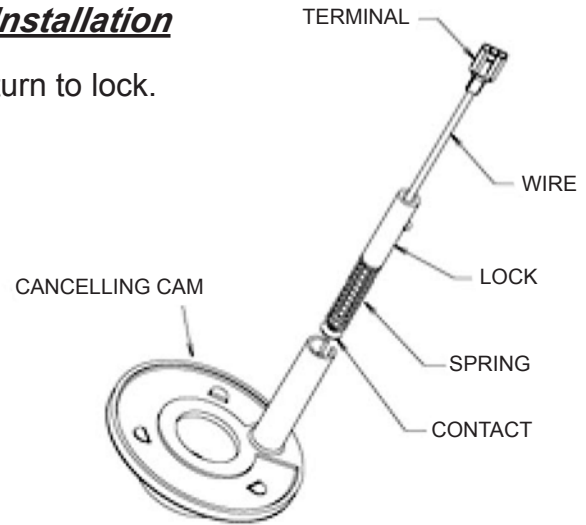
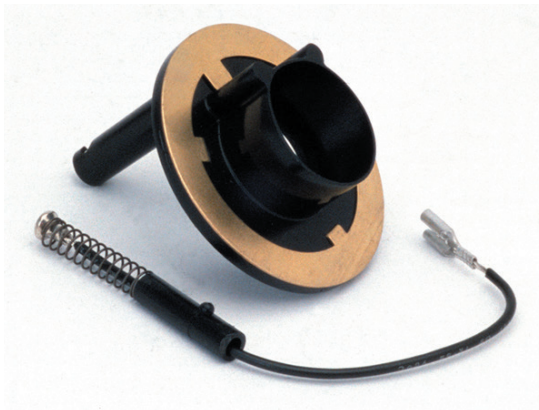
P-White-Brakelight Switch  
 N-Dk Green-Rr Turn Signal  
 M-Yellow-Lr Turn Signal  
 L-Purple-Turn Signal Power  
 K-Brown-Hazard Power  
 J-Dk Blue-Rf Turn Signal  
 H-Lt Blue-Lf Turn Signal  
 G-Black-Horn

### Color Verification to be completed before disassembly

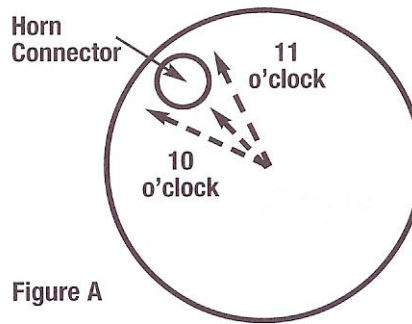
• Brake Light Switch : \_\_\_\_\_  
 • RR Turn Signal : \_\_\_\_\_  
 • LR Turn Signal : \_\_\_\_\_  
 • Turn Signal Power : \_\_\_\_\_  
 • Hazard Power : \_\_\_\_\_  
 • RF Turn Signal : \_\_\_\_\_  
 • LF Turn Signal : \_\_\_\_\_  
 • Horn : \_\_\_\_\_

## Steering Wheel Installation

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

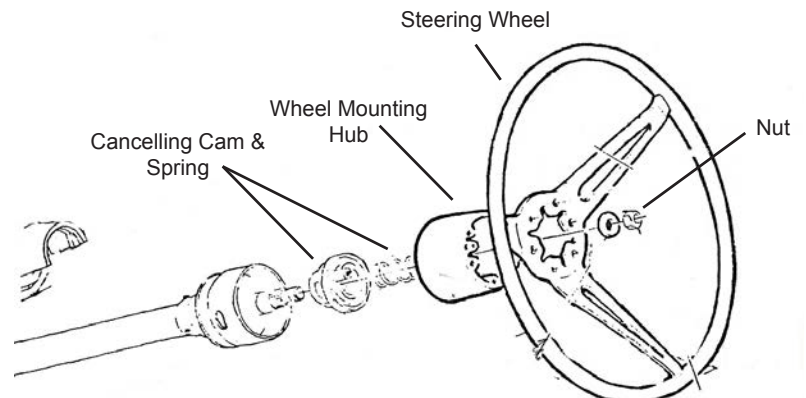


2) Be sure Rack and Pinion is in the center position before starting install of steering wheel. Align steering wheel adapter so that the canceling cam hole is at approx the 11 o'clock position and that one of the steering wheel mounting holes is at the 12 o'clock position. (After 1st test drive, it may be necessary to re-center wheel)

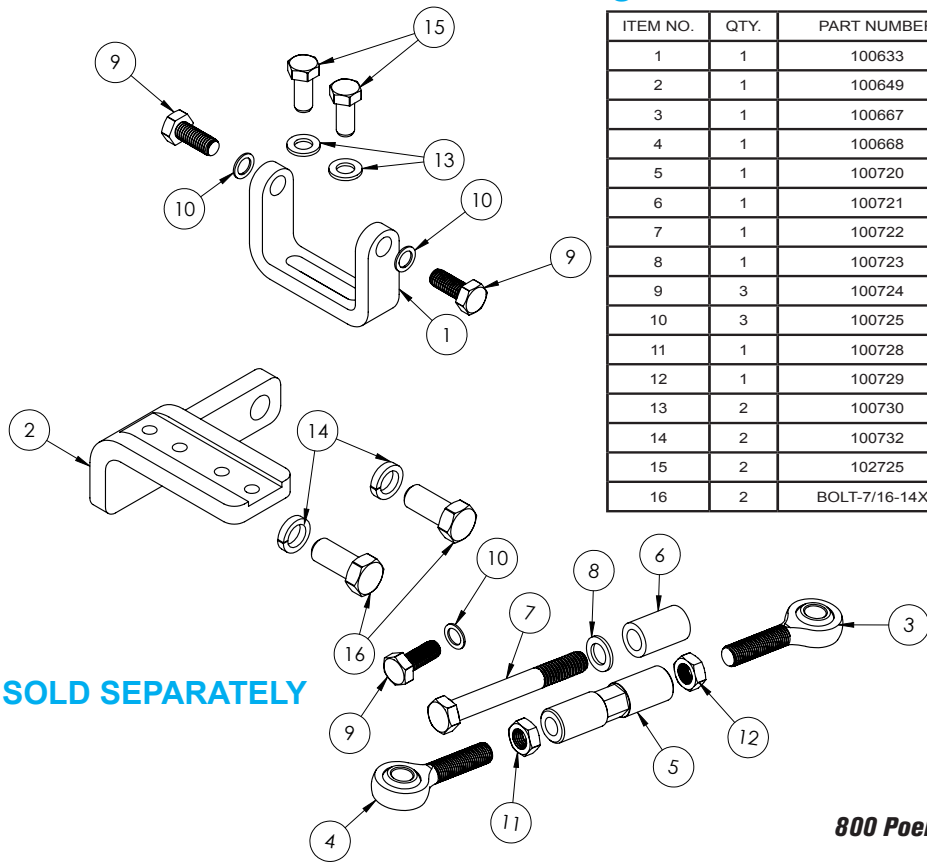


3) To install the wheel adapter run the horn contact wire through the hole for the canceling cam and place the adapter on to the splined column shaft.

4) Tighten the adapter-retaining nut securely until the adapter is approximately 1/16" away from the column shroud. (Overtightening can cause wheel to rub)



# FR1613 Big Block Chevy Power Steering Pump Bracket



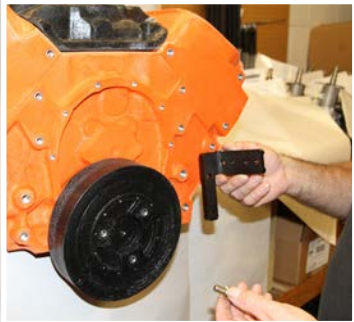
**SOLD SEPARATELY**

ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
1	1	100633	BRACKET, MOUNT PUMP PS
2	1	100649	BRACKET, MOUNT PUMP-MOTOR SB
3	1	100667	HEIM JOINT, END ROD 3/8-24 RH
4	1	100668	HEIM JOINT, END ROD 3/8-24 LH
5	1	100720	SPACER, ADJ 0.62 X 2.52 W/ 3/8-24 RH-LH
6	1	100721	SPACER, 0.392 X 0.62 X 1.00 ALUM
7	1	100722	BOLT, 3/8-16 X 3.00 HEX HD GR8
8	1	100723	WASHER, FLAT 0.39 X 0.62 X .05
9	3	100724	BOLT, M8 X 1.25 X 20 HEX HD GR10.9
10	3	100725	WASHER, FLAT 0.32 X 0.47 X .04
11	1	100728	NUT, 3/8-24 JAM LH
12	1	100729	NUT, 3/8-24 JAM RH
13	2	100730	WASHER, FLAT 0.32 X 0.57 X .06
14	2	100732	WASHER, LOCK SPLIT 7/16 HIGH COLLAR
15	2	102725	SCREW, 5/16-18 X .75 HEX HD GR8
16	2	BOLT-7/16-14X1	BOLT, 7/16-14 X 1.00 HEX GR8



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## Power Steering Pump Installation/Big Block Chevy



Install L-shaped bracket (2) on engine with bolts (16) and lockwashers (14) supplied



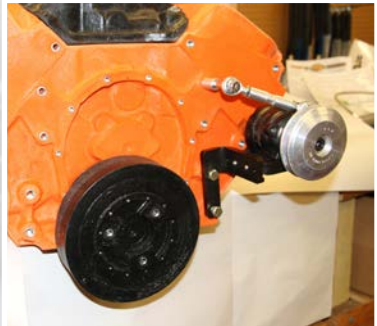
Install pump bracket (1) to L-shaped bracket (2) with bolts (15) and washers (13) supplied



Install pump to bracket (1) using bolts (9) and washers (10) supplied

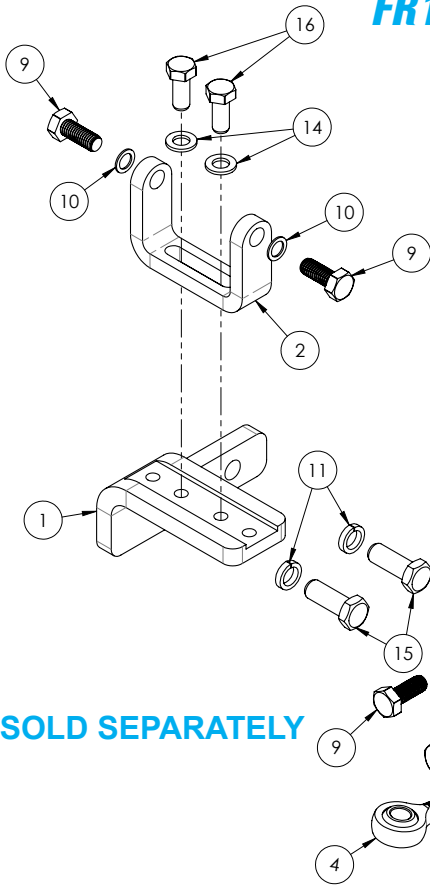


Install adjuster to pump using bolt (9) and washer (10) supplied



Remove upper water pump bolt. Install spacer (6) and adjuster with bolt (7) and washer (8) supplied

# FR1612 Small Block Chevy Power Steering Pump Bracket



ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
1	1	100632	BRACKET, MOUNT PUMP-MOTOR SB
2	1	100633	BRACKET, MOUNT PUMP PS
3	1	100667	HEIM JOINT, END ROD 3/8-24 RH
4	1	100668	HEIM JOINT, END ROD 3/8-24 LH
5	1	100720	SPACER, ADJ 0.62 X 2.52 W/ 3/8-24 RH-LH
6	1	100721	SPACER, 0.392 X 0.62 X 1.00 ALUM
7	1	100722	BOLT, 3/8-16 X 3.00 HEX HD GR8
8	1	100723	WASHER, FLAT 0.39 X 0.62 X .05
9	3	100724	BOLT, M8 X 1.25 X 20 HEX HD GR10.9
10	3	100725	WASHER, FLAT 0.32 X 0.47 X .04
11	2	100726	WASHER, LOCK SPLIT 3/8 HIGH COLLAR
12	1	100728	NUT, 3/8-24 JAM LH
13	1	100729	NUT, 3/8-24 JAM RH
14	2	100730	WASHER, FLAT 0.32 X 0.57 X .06
15	2	100779	SCREW, 3/8-16 X 1.00 HEX HD GR8
16	2	102725	SCREW, 5/16-18 X .75 HEX HD GR8

**SOLD SEPARATELY**



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## Power Steering Pump Installation/Small Block Chevy



Install L-shaped bracket (1) on engine with bolts (15) and lockwashers (11) supplied



Install pump bracket (2) to L-shaped bracket (1) with bolts (16) and washers (14) supplied



Install pump to bracket (2) using bolts (9) and washers (10) supplied



Install adjuster to pump using bolt (9) and washer (10) supplied

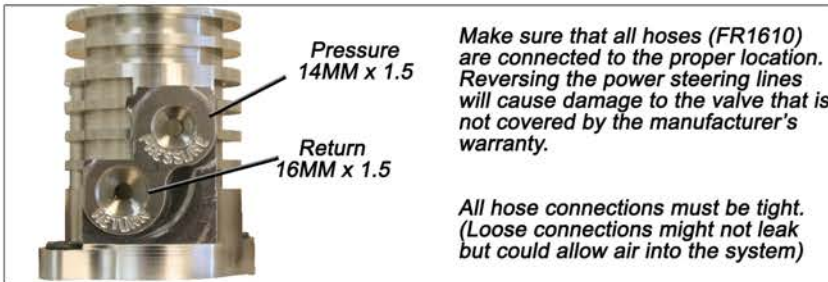


Remove upper water pump bolt. Install spacer (6) and adjuster with bolt (7) and washer (8) supplied



# Instruction Bulletin #1021

## Correct Bleeding Procedure for Flaming River Power Rack & Pinion Systems.



**Important**

**\*\*\* Power Steering Fluid\*\*\***  
**Use clean, new power steering fluid only.**

- 1) Turn Ignition Off
  - 2) Raise front wheels off the ground.
  - 3) Turn the steering wheel full left.
  - 4) Fill fluid level to "Full Cold" level or if using remote reservoir 1" over inner tube.
  - 5) With assistant checking fluid level and condition, turn steering wheel lock to lock at least 20 times.
  - 6) While turning wheels check fluid level constantly.
  - 7) Start engine. With engine idling, maintain fluid level. Reinstall cap.
  - 8) Return wheels to center. Lower front wheels to the ground.
  - 9) Keep engine running for two (2) minutes.
  - 10) Turn steering wheel in both directions.
  - 11) If all proper conditions apply, bleeding is complete.
  - 12) If any problem remains see "Special Conditions".
- Verify:  
 Smooth power assist  
 Noiseless operation  
 Proper fluid level  
 No system leaks  
 Proper fluid condition  
 No bubbles, no foam, no discoloration.

**Note:** On systems with long return lines or fluid coolers, turn steering wheel lock to lock at least 40 times.

Trapped air may cause fluid to overflow. Thoroughly clean spilled fluid to allow for leak check.

**Note:** No bubbles are allowed.

For any sign of bubbles, recheck connections then repeat step 5.

### Special Conditions:



- Foam or bubbles in fluid
- Fluid must be completely free of bubbles. In step 5, be alert to periodic bubbles that could indicate a loose connection or leaky O-Ring seal in either the return hose or pressure hose.
- Discolored fluid (milky, opaque, or light tan color)

Switch ignition off. Wait two (2) minutes. Recheck hose connections. Repeat steps 7-10. If condition still exists, replace and check a possible cause:

- Return hose clamps
- Return hose o-ring
- Pressure hose o-ring
- Gear cylinder line o-rings

Fill system and repeat bleed procedure for each possible cause. Repeat steps 7-10 to verify whether noise has been eliminated.



- Pump whine or groan
- With engine running, recheck hoses for possible contact with frame body or engine. If no contact is found, follow either method below to cool down fluid and re-pressurize system.

**Method 1:**  
 Normal Cool Down

Switch engine off.  
 Wait for system to cool.  
 Install reservoir cap.

**Method 2:**  
 Partial Fluid Replacement

Switch engine off. Use a Suction device to remove fluid from the reservoir. Refill with cool, clean fluid. Install Reservoir cap.

After either method of cooling, start engine and allow engine to reach normal operating temperature. If noise persists, remove and replace power steering pump. Repeat bleed procedure following pump replacement.

### WARRANTY DISCLAIMER:

Flaming River® warrants its products to be free from defects in material and workmanship for a period of one (1) year after the date of purchase. It is the customer's responsibility to determine the suitability of a given Flaming River® product for the customer's uses. Use qualified chassis specialists for the installation of all steering related components. Be aware that the installation of certain Flaming River® products may adversely impact a manufacturer's warranty with respect to certain vehicles and other manufactured goods. Flaming River will repair or replace any product found to be defective in material or workmanship. Improper installation, abuse, racing and/or modification VOID WARRANTY. Flaming River® is not responsible for any labor costs associated with any warranty.

**Additional Installation Accessories (Sold Separately)**

**SHOCK KITS**

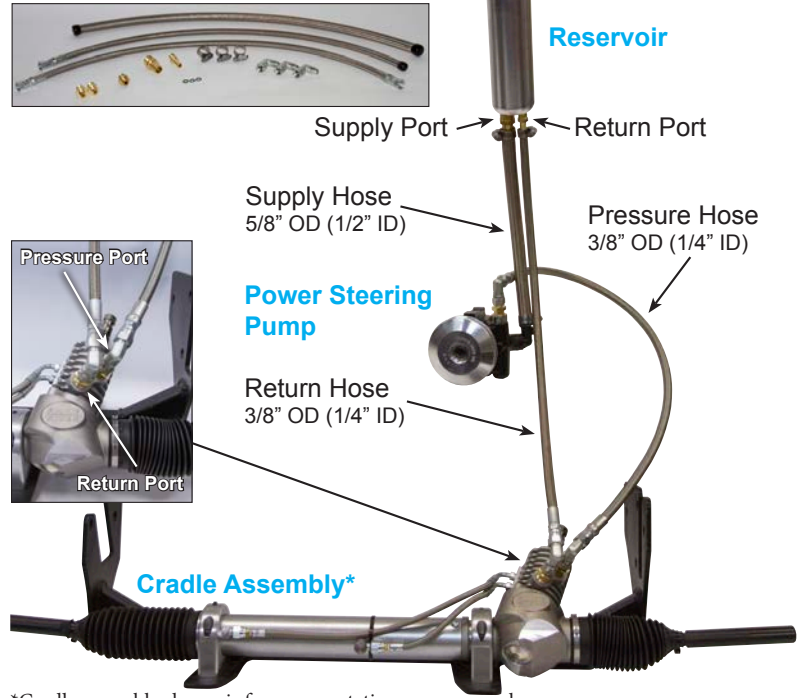


Front Coil-Over FR70022



Power Steering Hose Kit FR1610

**FR1610 Hose Kit Routing**



\*Cradle assembly shown is for representation purposes only



If not using our hose kit, we recommend purchasing the FR1632 Pressure and Return fittings kit. If you have any questions regarding connecting alternate hose kit to Flaming River Cradle Assembly, please call 1-800-648-8022.

In order to ensure the best customer experience possible, we've created a Customer Satisfaction Survey to gather important feedback about different facets of our business. We would appreciate it if you could please take a couple of minutes to fill out this survey about your experience.

The results of the survey will be used to improve and gather feedback about customer service, technical and sales support, order processing and fulfillment, manufacturing, and new product development.

Upon completing the survey, you will be issued a discount coupon code to be used on your next online purchase at [www.flamingriver.com/survey](http://www.flamingriver.com/survey).



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