



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

# *55-57 Thunderbird Rack and Pinion Conversion Kit*



# *Thunderbird Rack & Pinion System*

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

**Before painting or powder coating of the cradle, we recommend that you pre-fit the entire system to ensure proper fitment for your application.**

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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.

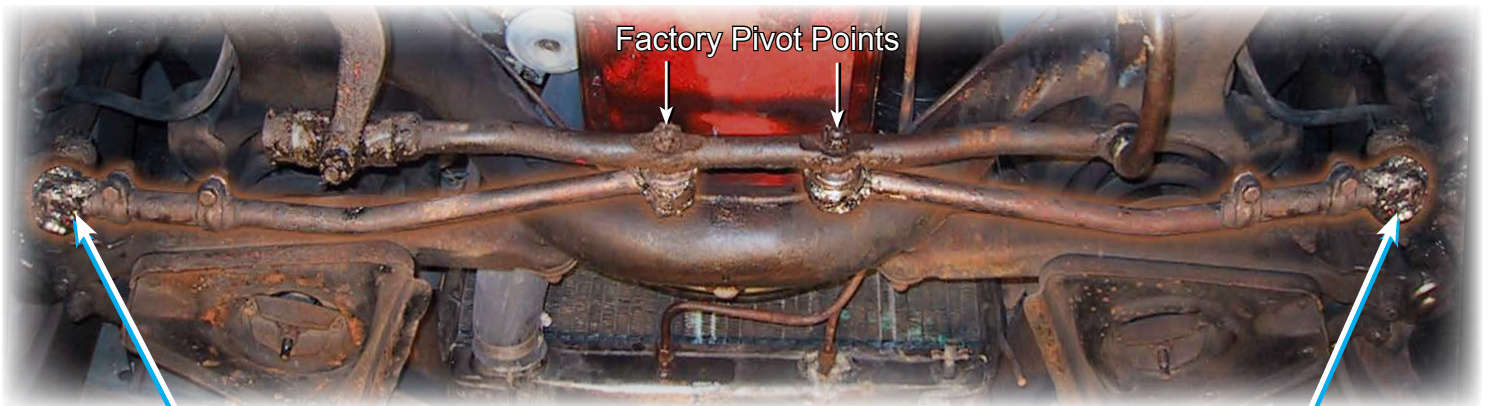
## **Color Verification To Be Completed Before Disassembly**

Before disconnecting the turn signal connector, verify the factory wiring colors and turn signal operation. The use of a wiring diagram is recommended. This will be used when connecting the new Flaming River Steering Column.

- Brake Light Switch \_\_\_\_\_
- Right Rear Turn Signal \_\_\_\_\_
- Left Rear Turn Signal \_\_\_\_\_
- Turn Signal Power \_\_\_\_\_
- Hazard Power \_\_\_\_\_
- Right Front Turn Signal \_\_\_\_\_
- Left Front Turn Signal \_\_\_\_\_
- Horn \_\_\_\_\_

## **Original System Removal**

- 1) For safety, disconnect your battery.
- 2) Before disassembly, measure from zirc to zirc on the outer tie rod ends. **Write this dimension down for future reference.** \_\_\_\_\_



**Before disassembly measure from zirc to zirc on the outer tie rod ends**

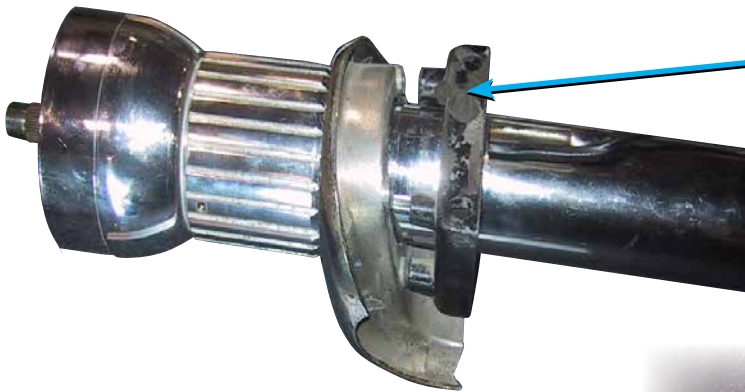
- 3) Disconnect the wiring at the bottom of the steering gear housing and at the steering column under the dash.
- 4) Remove the horn ring from the steering wheel, and then using a wheel puller remove the steering wheel from the column.





## Original System Removal

- 5) Remove the bolts retaining the column dash mounting bracket and floor mounting plate.
- 6) Slide the steering column off the steering box shaft and remove from the car.



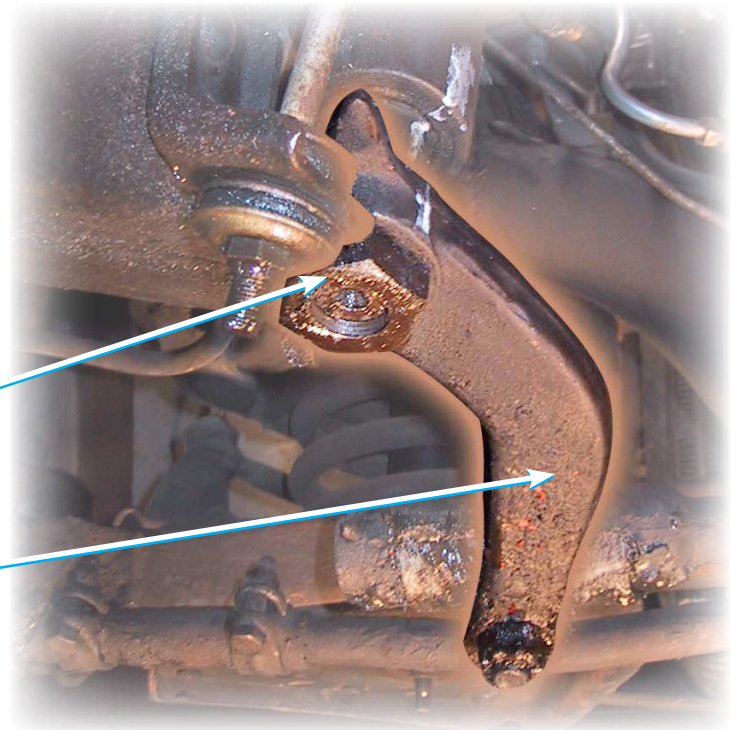
### ***Dash Mounting Bracket***

Make sure you retain OE dash mount and bezel for installation of Flaming River Column

- 7) Remove the sector shaft arm nut, then using a pitman arm puller, remove the pitman arm from the steering box.

### ***Sector Shaft Arm Nut***

### ***Pitman Arm***



- 8) Remove the bolts that hold the steering box to the frame, and then remove the box from the car.
- 9) Remove the bolts that hold the idler arm bracket to the frame, the outer tie rod ends from the spindle arms, then remove the steering linkage from the car.

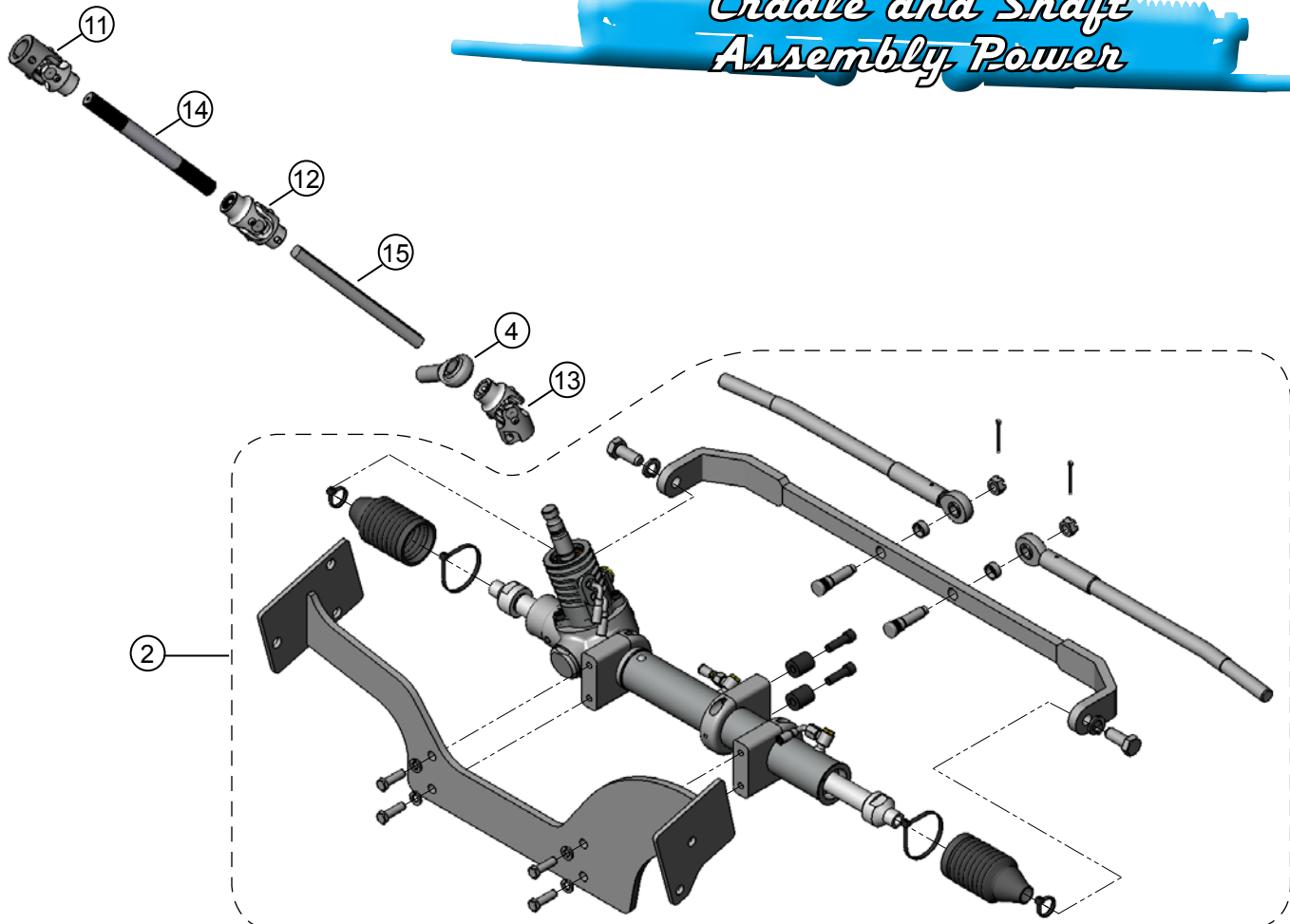
Item No.	Part No.	Description	Qty	Power/Manual Kit
1	100238	Hardware Kit	1	
2	100586	Power Rack & Cradle Assembly	1	Power Kit Only
3	BK10200	Support Bearing Bracket Bent	1	
4	FR1810	Support Bearing	1	
5	FR1612	Power Steering Pump Bracket Assembly	1	Power Kit Only
6	FR1614	Power Steering Reservoir	1	Power Kit Only
7	FRPMP5B-V	Power Steering Pump with V-Belt Pulley	1	Power Kit Only
8	FR314PB1	L-Shaped T-bird P/S Pump Bracket	1	Power Kit Only
9	FR314PB2	9" T-Bird P/S Pump Bracket	1	Power Kit Only
10	FR314PB3	Small T-Bird P/S pump Bracket	1	Power Kit Only
11	FR1714DD	3/4"-36 x 1"DD Universal Joint	1	
12	FR1715DD	3/4"-36 x 3/4"DD Universal Joint	1	
13	FR1789P	FR Power x 3/4"DD Universal Joint	1	Power Kit Only
14	FR1870-8	8" Splined Shaft	1	
15	FR1850-8	8" DD Shaft	1	
16	FR20118	Wiring Adapter	1	
17	FRHRN2	Horn Relay	1	
18	FR314-CSPC	T-Bird Column Spacer (Installed on Column)	1	

**Column Varies with Part Number Ordered**

FR20005-28TBSS      In kit FR314KT2PL  
FR20005-28SS        In kit FR314KT1PL  
FR20005-28TB        In kit FR314KT2  
FR20005-28            In kit FR314KT1



*1955 - 1957 Thunderbird  
Cradle and Shaft  
Assembly Power*



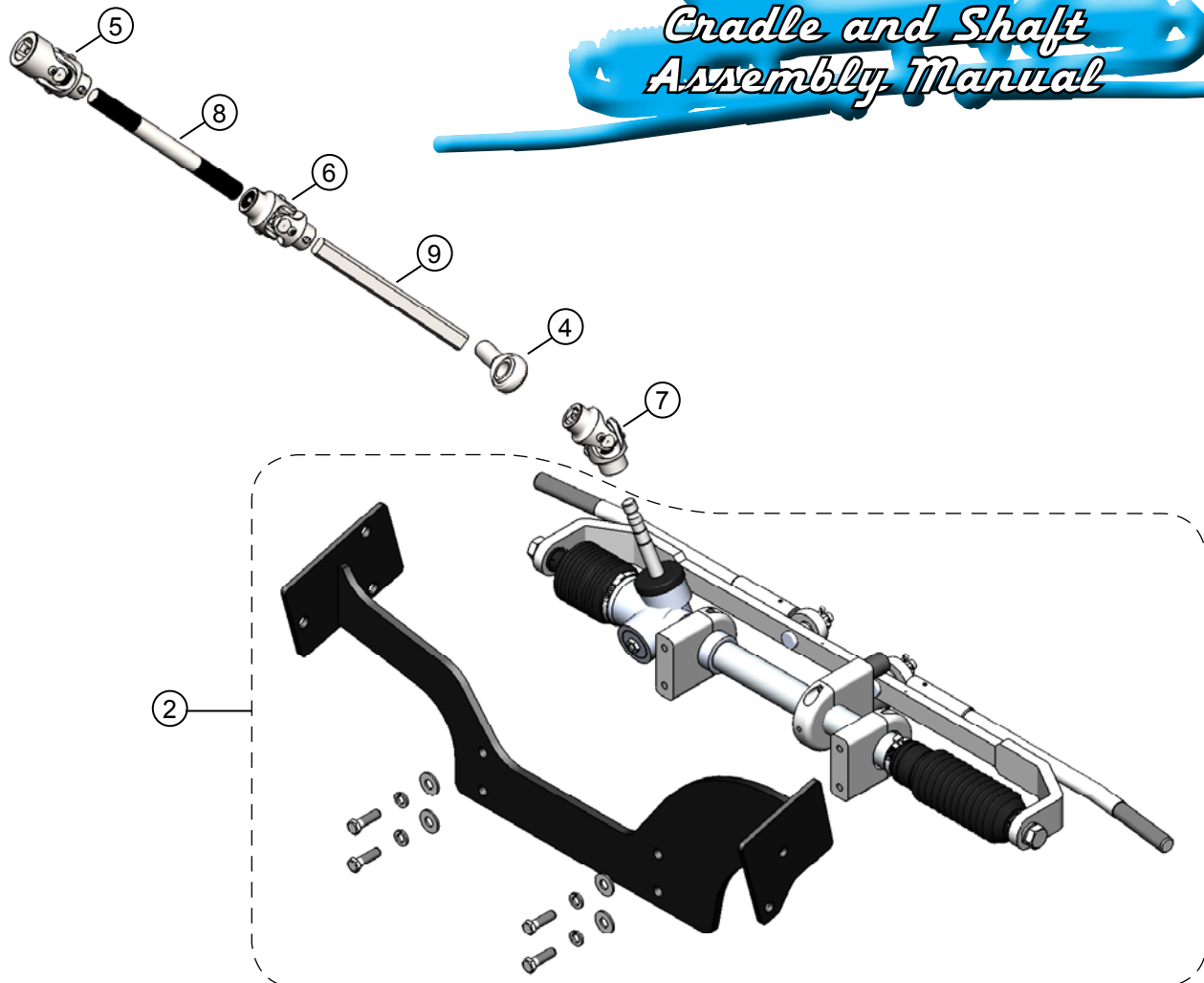
Item No.	Part No.	Description	Qty	Power/Manual Kit
1	100238	Hardware Kit	1	
2	100975	Manual Rack & Cradle Assembly	1	Manual Kit Only
3	BK10200	Support Bearing Bracket Bent	1	
4	FR1810	Support Bearing	1	
5	FR1714DD	3/4"-36 x 1"DD Universal Joint	1	
6	FR1715DD	3/4"-36 x 3/4"DD Universal Joint	1	
7	FR1709DD	9/16"-26 x 3/4"DD Universal Joint	1	Manual Kit Only
8	FR1870-8	8" Splined Shaft	1	
9	FR1850-8	8" DD Shaft	1	
10	FR20118	Wiring Adapter	1	
11	FRHRN2	Horn Relay	1	
12	FR314-CSPC	T-Bird Column Spacer (Installed on Column)	1	

**Column Varies with Part Number Ordered**

FR20005-28TBSS      In kit FR314KT2PL  
FR20005-28SS        In kit FR314KT1PL  
FR20005-28TB        In kit FR314KT2  
FR20005-28            In kit FR314KT1



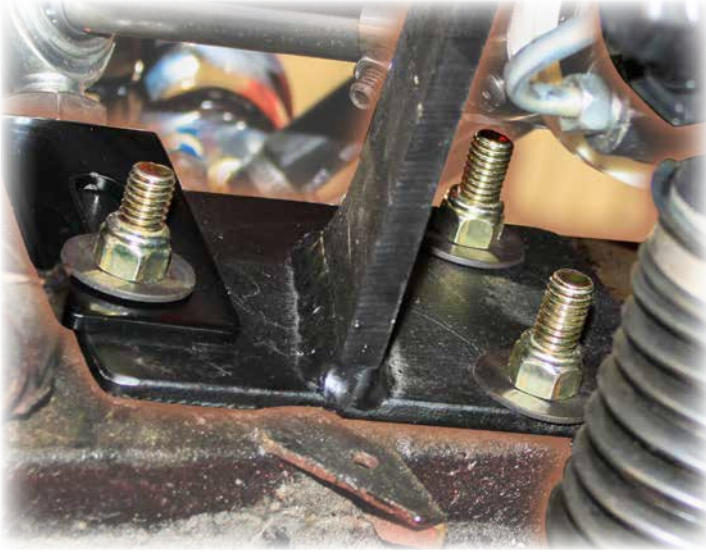
*1955 - 1957 Thunderbird  
Cradle and Shaft  
Assembly Manual*



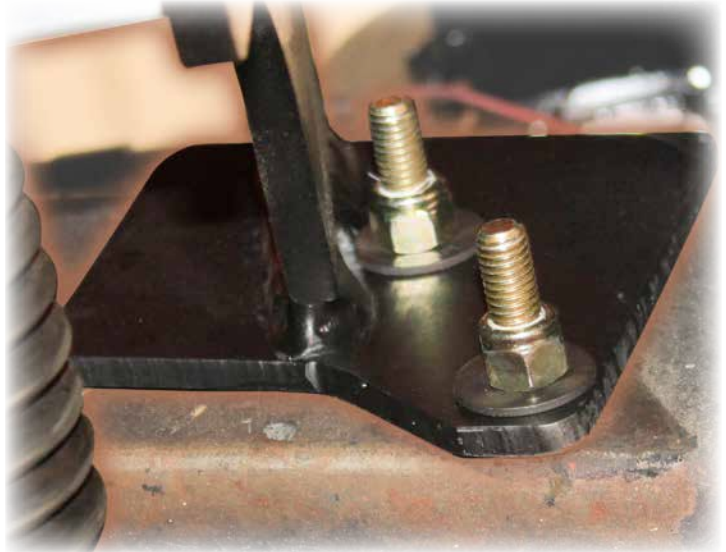


## **Flaming River Rack and Pinion Installation**

1) Install the rack and pinion mounting cradle by sliding it into place between the frame rails. Using the new hardware, install the three (3) 7/16" bolts on the drivers side using the original holes from the steering gear box. On the passenger side use the two (2) 3/8" bolts where the idler arm was mounted. Tighten the 7/16" bolts and nuts to 50-65 ft lbs. and the 3/8" bolts and nuts to 40-45 ft lbs.

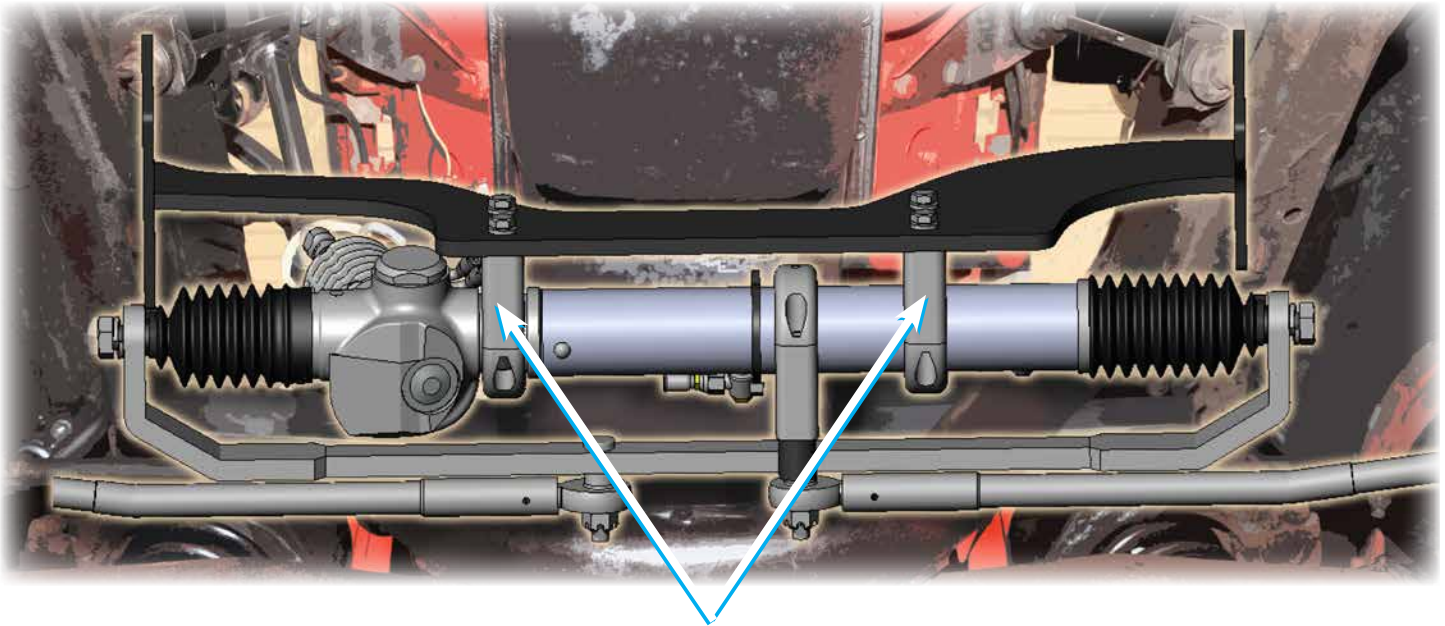


***Driver Side Mounting***



***Passenger Side Mounting***

2) To install the Flaming River rack and travel bar system, position the rack into place and install the rack to the cradle using the mounting brackets provided. (Already installed on Cradle Kit)



***Rack & Pinion  
Mounting Brackets***

## *Flaming River Rack and Pinion Installation*

- 3) Install the OEM adjuster sleeves and outer tie rod ends onto the new Flaming River inner tie rod ends.



*Flaming River  
Inner Tie Rod End*

*OEM Adjusting  
Sleeve*

*OEM Outer  
Tie Rod End*

- 4) Make sure that your wheels are centered, then install the outer tie rods into the spindle arms and tighten the castle nuts to 30-40ft lbs. Make sure to install the cotter pins through the castle nut and tie rod end and bend the tabs over.



*Castle Nut and  
Cotter Pin Shown Here*

## *Rack & Cradle Installed In Car*



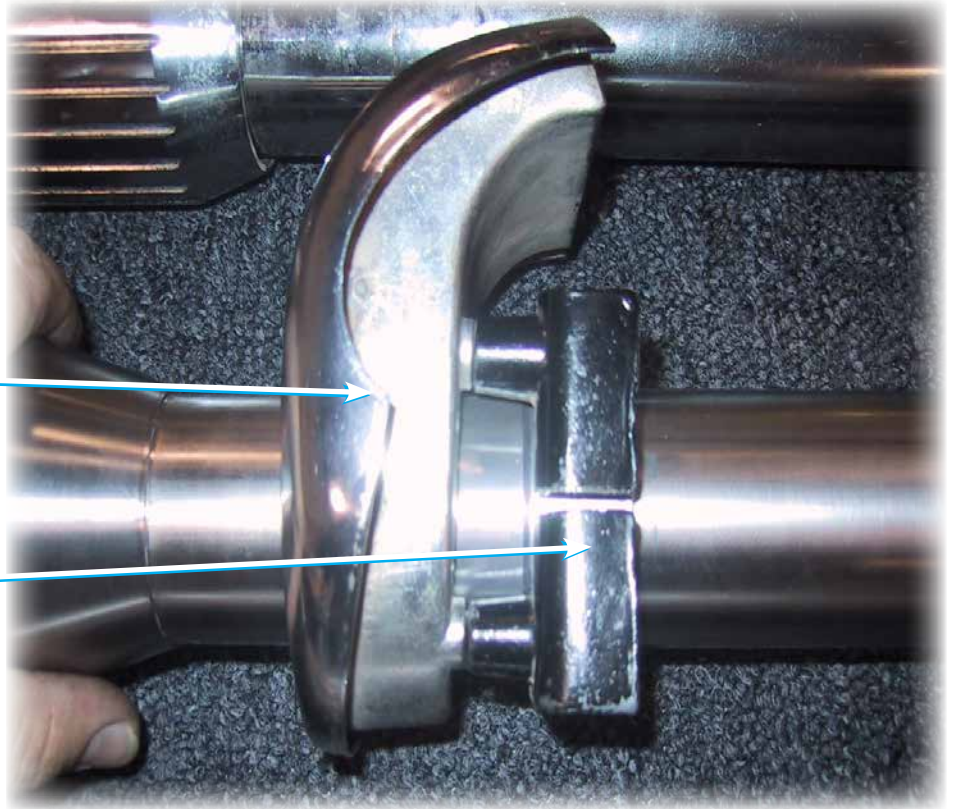


## *Flaming River Tilt Column Installation*

1) Install the original dash bezel and column mounting bracket over the new split ring spacer onto the new Flaming River Tilt Column.

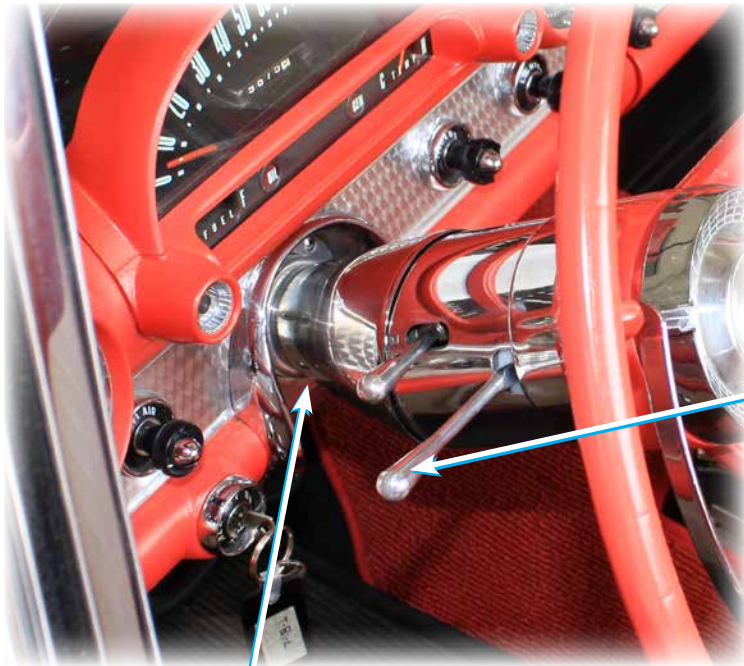
*OEM Dash Bezel*

*OEM Column Dash Mount*



2) Ensure the column is straight by rotating the turn signal arm to the 9 o'clock position.

*Column Shown installed with Turn Signal arm at the 9 o'clock Position*



*Use OEM Dash Bezel*

## Flaming River Tilt Column Installation

3) Install original floor mount onto steering column.

**Note:** A new floor mount is not provided with this kit, one will need to be fabricated or the original modified to fit the new column.

4) Place the column under the dash and tighten the mounting screws that were removed earlier.



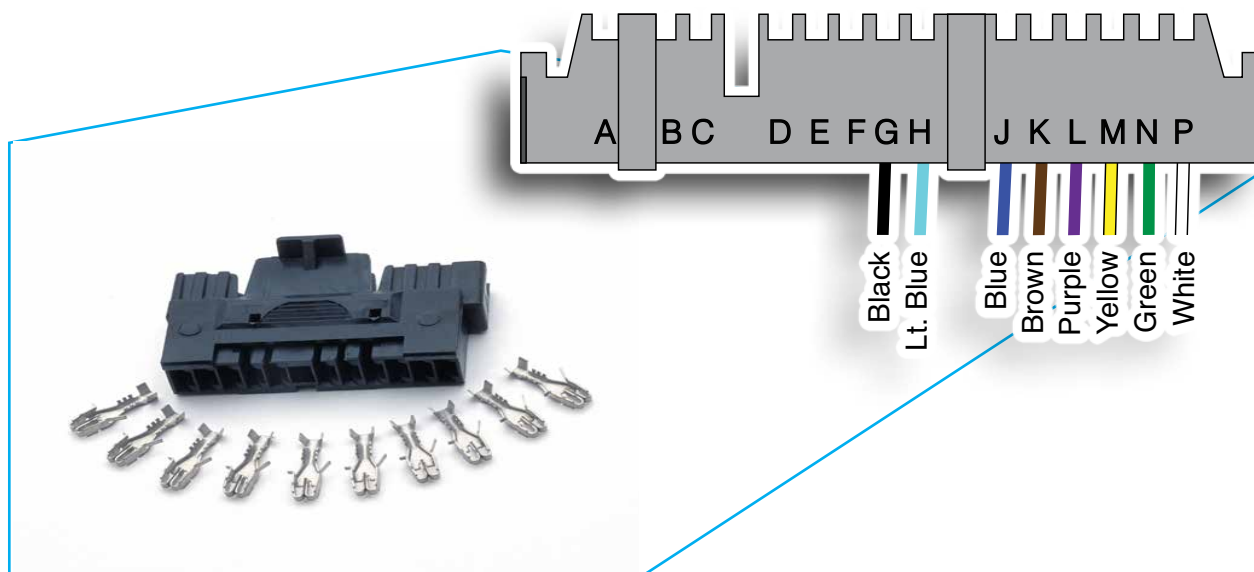
*Column shown installed with original steering wheel*



*Original Floor Mount*

### Connecting the Electric System

<u>Wiring Circuit</u>	<u>Vehicle Wiring</u>	<u>Pin Location</u>	<u>Column Wiring</u>
Brake Light Switch	Green	P	White
Right Rear Turn Signal	Orange/Blue	N	Dark Green
Left Rear Turn Signal	Green/Orange	M	Yellow
Turn Signal Power	Blue	L	Purple
Hazard Power	Not Available	K	Brown
Right Front Turn Signal	White/Blue	J	Dark Blue
Left Front Turn Signal	Green/White	H	Light Blue
Horn	Yellow/Green	G	Black





## Universal Joint Installation

- 1) Install the support bearing bracket onto the rear cradle mounting bolt.

*Note: The angle of this bracket is set for most applications. Some adjustment may be required to obtain the correct u-joint alignment.*

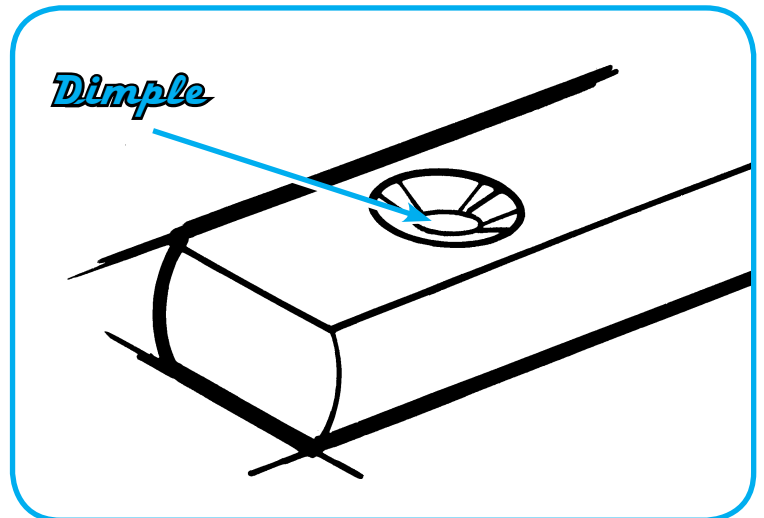
- 2) Using a 3/4" wooden dowel rod, mock up the steering shaft to obtain the correct shaft lengths and u-joint angle.

- 3) Once the correct shaft lengths are obtained, install shafts and u-joints, snugging down each set screw so that it leaves a mark in the shaft.

- 4) Remove the shafts and using a 1/4" drill bit, dimple each mark left by the set screws.

- 5) Re-install the shafts and u-joints using a red thread locker on the set screw threads. Tighten each set screw to 25 ft lbs. and then tighten all jam nuts securely.

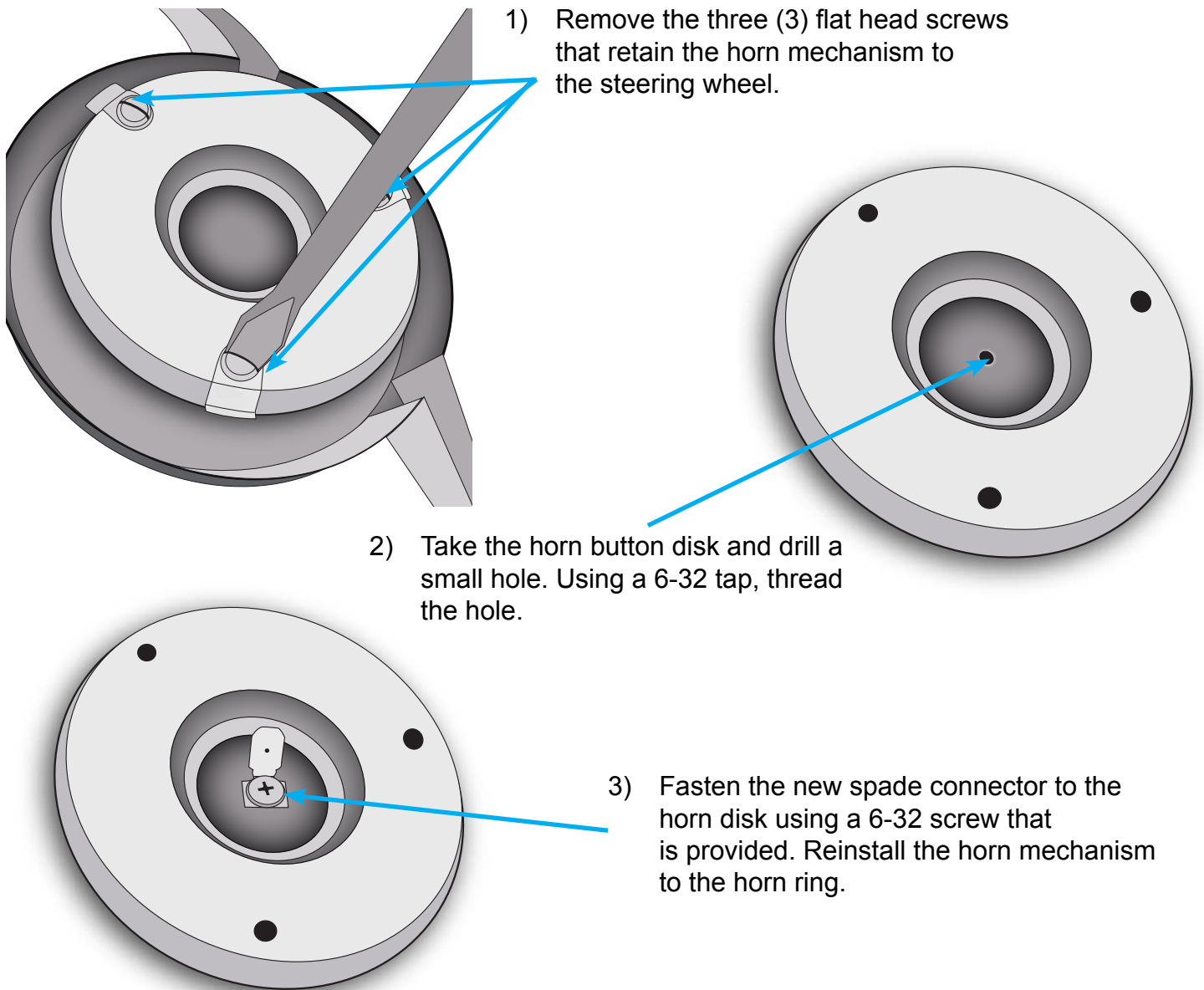
\*\* We recommend that you regularly inspect the u-joint set screws for tightness.\*\*





## Original Steering Wheel Installation

**Note: When installing the original steering wheel onto the Flaming River Tilt Column, the original wheel must be modified for the horn and the turn signal cancellation to work correctly.**



- 4) Hold the steering wheel in the straight ahead position and place the template located on page 17 onto the center of the steering wheel.
- 5) Center punch the hole shown on the template that is approximately at the 10:30 position and drill a 3/8" diameter hole.
- 6) Place the steering wheel onto the new Flaming River column making sure to run the horn contact wire through the steering wheel.
- 7) Connect the horn contact wire to the spade connector that was installed on the horn button and secure the horn button to the steering wheel.

## Original Steering Wheel Installation (Cont.)



*Horn  
Contact  
Wire*



*New Canceling  
Cam Hole*

*Original Steering Wheel Shown Installed on  
Flaming River Tilt Steering Column.*

## Aftermarket Steering Wheel Installation

- 1) Make sure that front wheels are centered and straight.
- 2) Position the canceling cam so that it is in between the 10 and 11 o'clock position. ( figure A )
- 3) Place the steering wheel adapter on the column ensuring that one wheel mounting hole is in the 12 o'clock position. (see figure B )
- 4) Tighten the 7/8" center nut until the wheel adapter has approximately 1/16 inch between the adapter and the column shroud.
- 5) Install the horn contact kit (part FR20120HN) into the canceling cam stem. (Follow instructions with kit).
- 6) Place horn button retaining ring, flange facing down, through center hole of steering wheel.
- 7) Next place horn button through retaining ring so that horn button is locked into place.
- 8) Run wire from horn contact kit to terminal on back of horn button. If horn button has two terminals on back run a wire from the second terminal to the adapter itself to complete ground. (See Fig. C)
- 9) Mount steering wheel to adapter using screws provided with adapter.
- 10) If wheel has a center pad, mount it to wheel using appropriate fasteners.
- 11) Reconnect battery

*12 O'clock Position*

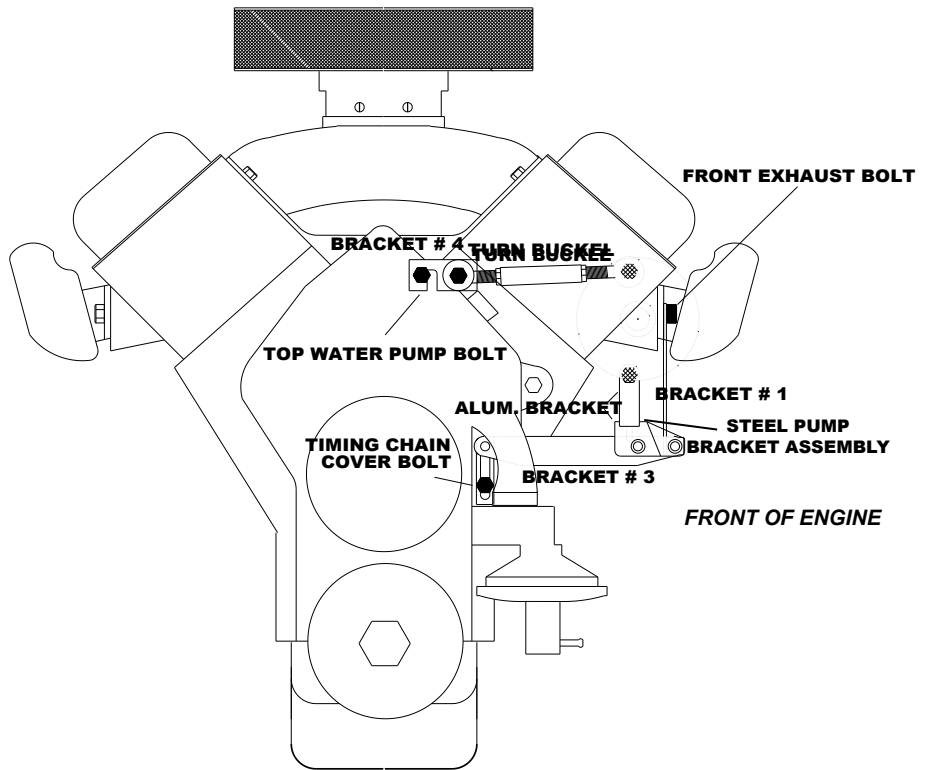


*Aftermarket Steering Wheel  
Shown Installed on Flaming  
River Tilt Steering Column.*



## **Power Steering Pump Installation**

- 1) On the driver's side exhaust manifold, remove the front mounting bolt. Using the bolt that was removed install bracket #1 and snug the bolt.
- 2) Remove the bolt from the timing chain cover and then install bracket #3 and snug the bolt.
- 3) Mount the power steering pump onto the steel pump bracket assembly and mount the assembly to bracket #1 & #3 using the bolts provided in the kit.
- 4) Mount bracket #4 to the top water pump bolt.
- 5) Install the turn buckle assembly from bracket #4 to the power steering pump.
- 6) Tighten all the mounting bolts.
- 7) Mount the power steering reservoir above the power steering pump to ensure proper feeding of power steering fluid.
- 8) Install your power steering lines according to installation instructions provided with the line kit.  
(FR1610 Stainless Braided Hose Kit not included, but recommended for installation)

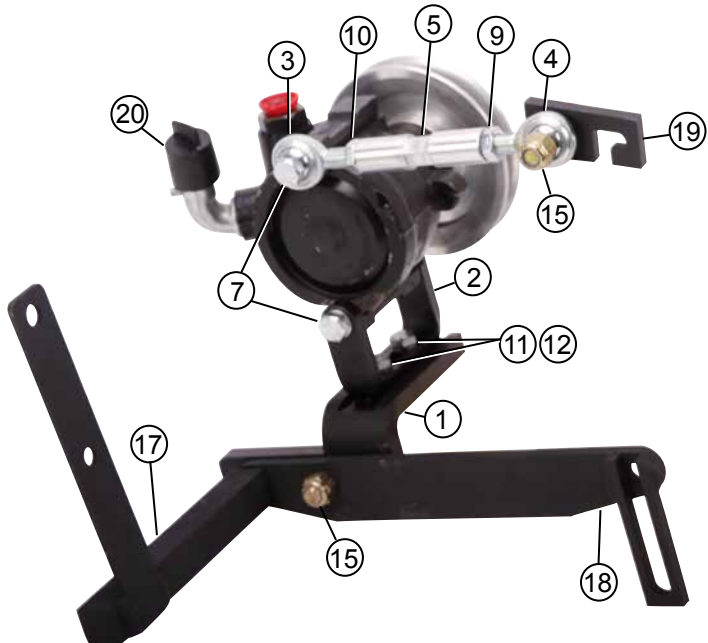
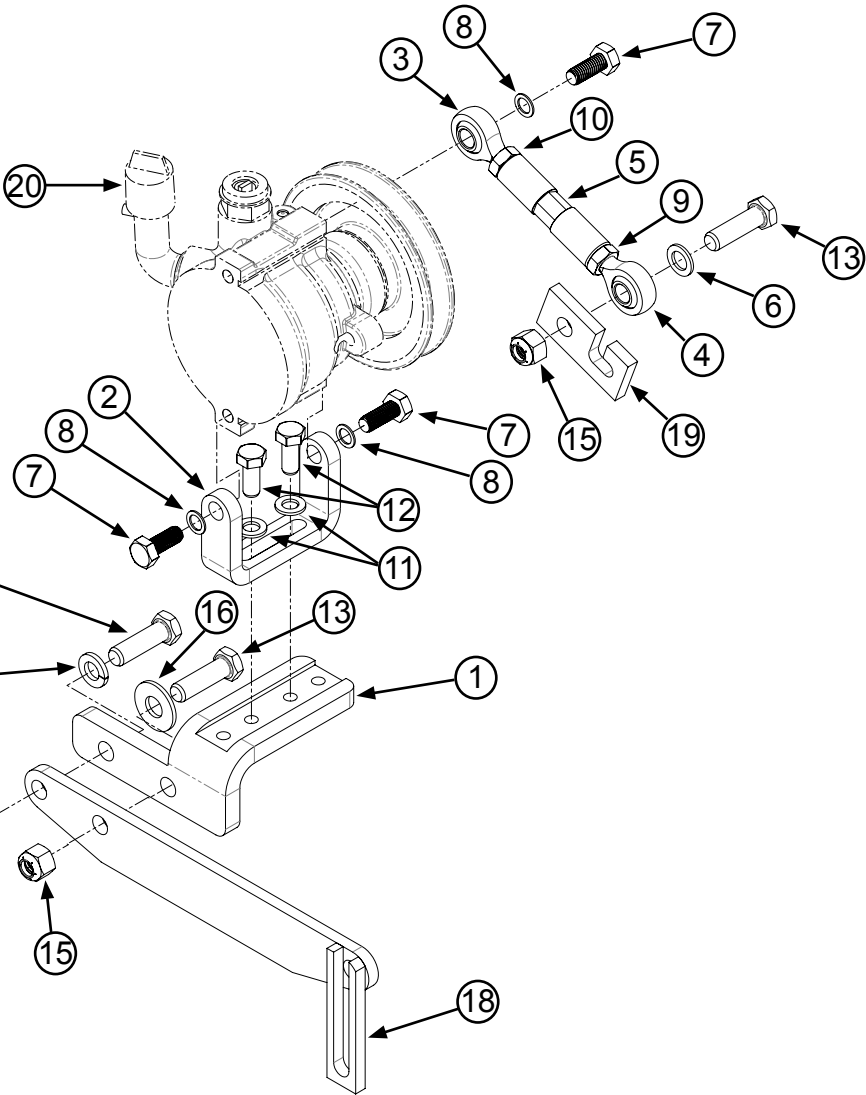
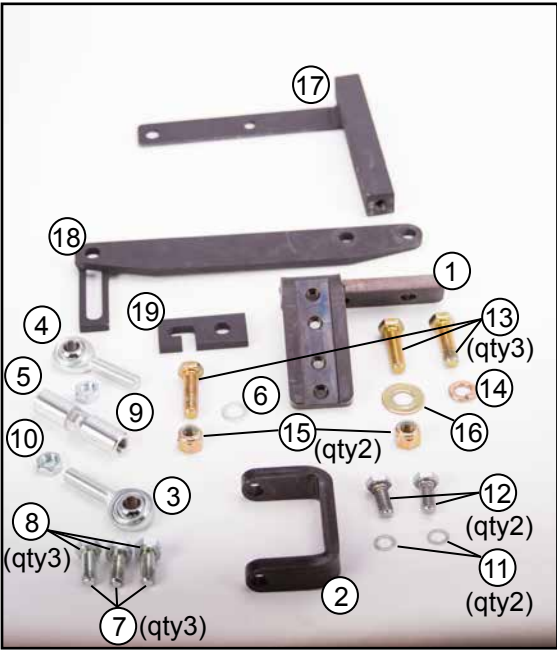


ITEM NO.	QTY.	PART NO.	DESCRIPTION
1	1	100632	BRACKET, MOUNT PUMP-MOTOR SB
2	1	100633	BRACKET, MOUNT PUMP PS
3	1	100667	HEIM JOINT, END ROD 3/8-24 RH
4	1	100668	HEIM JOINT, END ROD 3/8-24 LH
5	1	100720	SPACER, ADJ 0.62 X 2.52 W/ 3/8-24 RH-LH
6	1	100723	WASHER, FLAT 0.39 X 0.62 X .05
7	3	100724	BOLT, M8 X 1.25 X 20 HEX HD GR10.9
8	3	100725	WASHER, FLAT 0.32 X 0.47 X .04
9	1	100728	NUT, 3/8-24 JAM LH
10	1	100729	NUT, 3/8-24 JAM RH
11	2	100730	WASHER, FLAT 0.32 X 0.57 X .06
12	2	102725	SCREW, 5/16 X .75 HEX HD GR8
13	3	BOLT-3/8-16X1.25	SCREW, 3/8-16 X 1.25 HEX HD
14	1	LOCKWASH-3/8"	WASHER, LOCK SPLIT 3/8
15	2	NUT-3/8-16	NYLOCK LOCK NUT 3/8-16
16	1	WASH-3/8"	3/8 FLAT WASHER GRADE 8 EQU
17	1	FR314PB1	WLDMT, BRKT PUMP T-BIRD
18	1	FR314PB2	WLDMT, BRKT PUMP T-BIRD
19	1	FR314PB3	BRKT, PUMP T-BIRD
20	1	REFERENCE	PUMP W/ V-BELT PULLEY ON

**See Facing  
Page for  
Visual  
Reference**



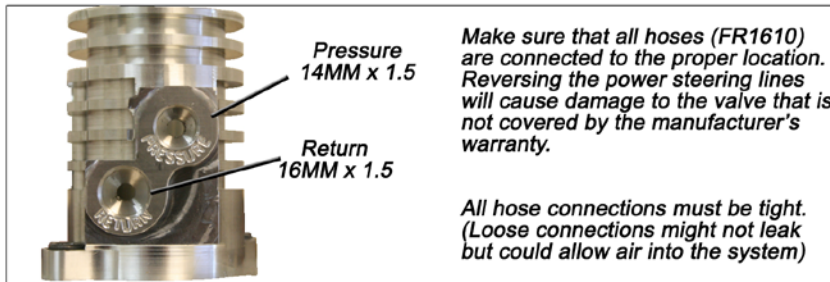
***Power Steering Pump Installation***





# Instruction Bulletin #1021

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



Make sure that all hoses (FR1610) are connected to the proper location. Reversing the power steering lines will cause damage to the valve that is not covered by the manufacturer's warranty.

All hose connections must be tight. (Loose connections might not leak but could allow air into the system)

**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.

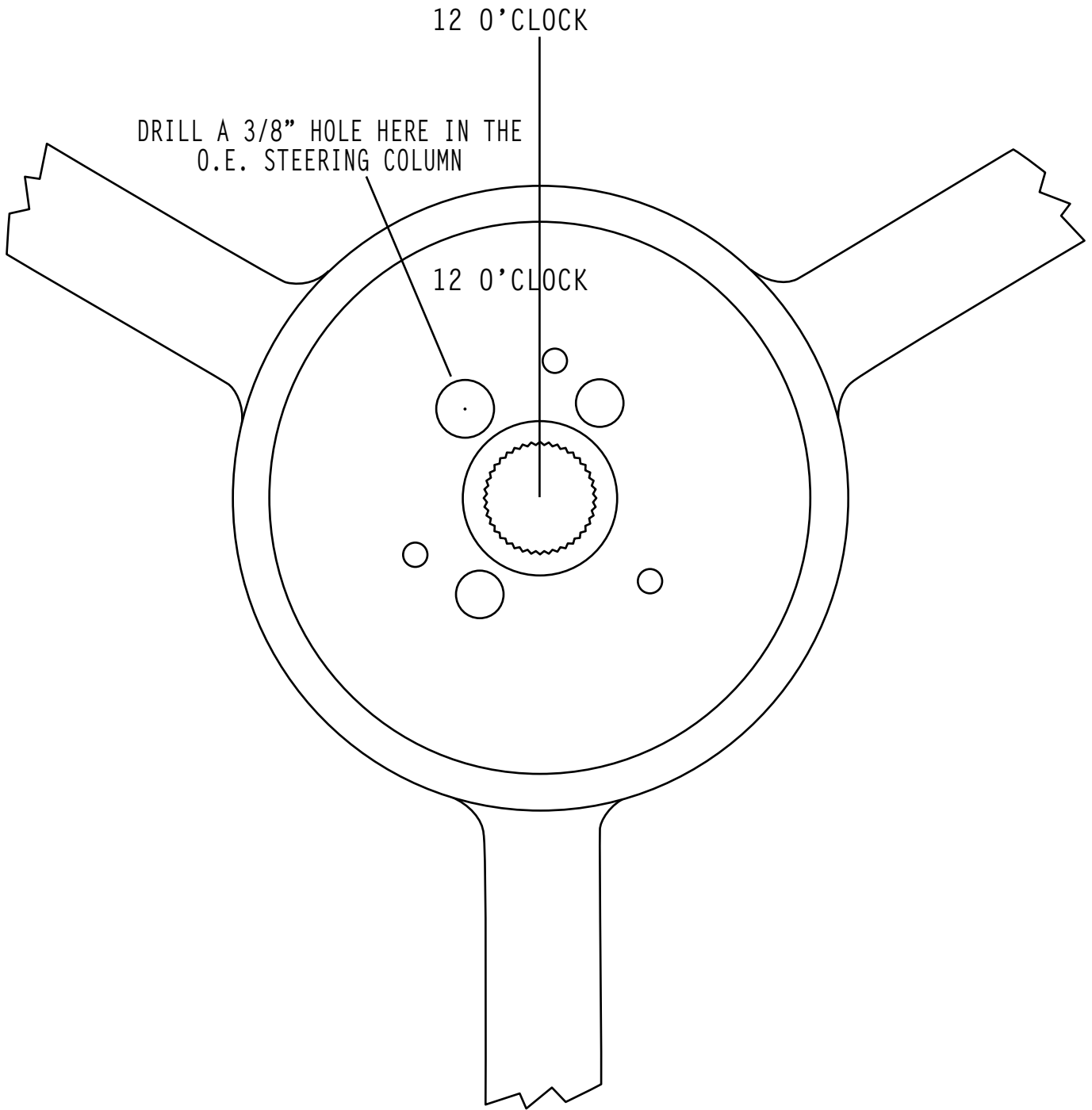
After either method of cooling, start engine and allow engine to reach normal operating temperature. If noise persists, remove and replace power steering pump. Repeat bleed procedure following pump replacement.

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**Template for Installing Original Steering Wheel**  
**(Template Actual Size)**

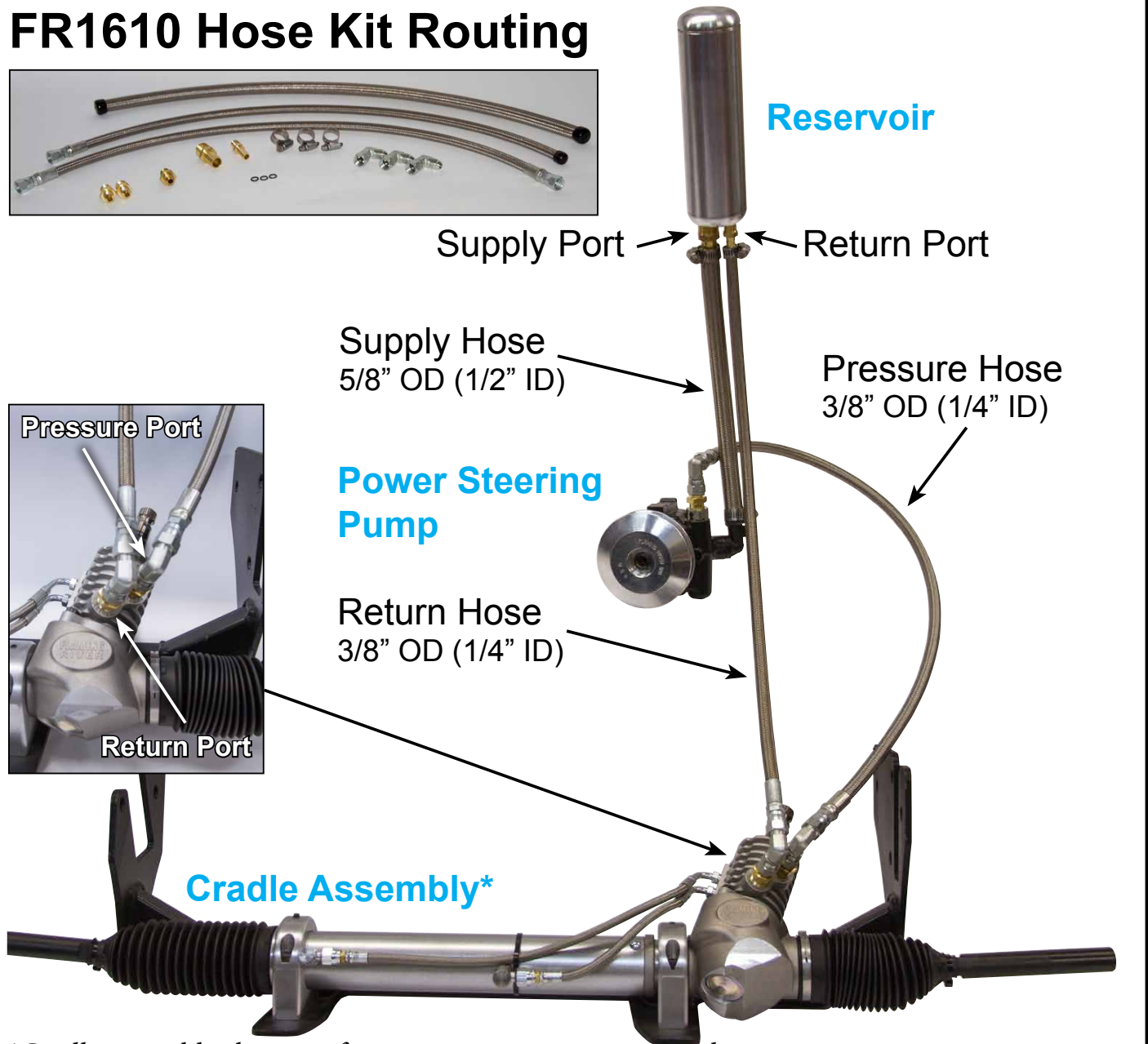
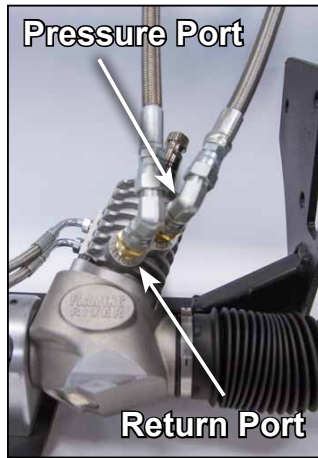
**Remove page and attach to steering wheel  
during installation**





## NOTES

# FR1610 Hose Kit Routing



Reservoir

Supply Port → ← Return Port

Supply Hose  
5/8" OD (1/2" ID)

Pressure Hose  
3/8" OD (1/4" ID)

Power Steering  
Pump

Return Hose  
3/8" OD (1/4" ID)

Cradle Assembly\*

\*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.



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