

The logo for PolyPerformance, featuring the word "POLYPERFORMANCE" in a stylized, italicized font with a red and black color scheme, set within a white oval border.

# PPM-8023 / PPM-8043

## JEEP JK STAGE 3

### SYNERGY SUSPENSION SYSTEM

#### GENERAL NOTES:

- These instructions are also available on our website; [www.polyperformance.com](http://www.polyperformance.com). Check the website before you begin for any updated instructions and additional photos for your reference.
- The installation of this suspension kit requires drilling a 3/8" hole on the front axle coil buckets and a 1/2" hole in the front and rear sway bars.
- Installation requires trimming of the rear track bar bracket and shock brackets with either a grinder with a cut off wheel or sawzall.
- You will need basic hand tools, a drill with 3/8" and 1/2" drill bits, a grinder with cut off wheel or sawzall, floor jack or automobile lift, and two sturdy jack stands to complete this installation.
- A list of additional components that can be added to this kit are available on our website. These components can be purchased and installed at a later date. Each component has instructions for installation.
- For Non-Rubicon models, we recommend installation of [PPM-8077](#) - JK Front Sway Bar Quick Disconnect Kit for removal of front sway bar links to increase suspension articulation while off road.
- The stock tires and wheels will not fit once the suspension system is installed due to the draglink tie rod end and rear sway bar link interference. Wheels with less offset or wheel spacers must be used.
- We recommend that you upgrade to conventional double cardon CV style drive shafts during or soon after the suspension installation. The large diameter front drive shaft will rub on the automatic transmission pan and the CV boots will tear prematurely due to the increased operating angle caused by the suspension lift, especially 2 door rear drive shafts and 2 or 4 door front drive shafts.

1. Unpack the suspension components from boxes, verify that all parts are intact and in good condition.

#### **Poly Performance Stage 3 Parts List**

PPM-8051 - Front Lower Control Arms (Pair)

PPM-8052 - Rear Lower Control Arms (Pair)

PPM-8053 - Front Upper Control Arms (Pair)

PPM-8054 - Rear Upper Control Arms (Pair)

PPM-8063-XX - Front Coil Springs (Pair)

PPM-8064-XX - Rear Coil Springs (Pair)

PPM-8059 - JK Front Sway Bar Links (Pair)

PPM-8060 - JK Rear Sway Bar Links (Pair)

PPM-80XX - Front Bump Stop Spacers (Pair)

PPM-80XX - Rear Bump Stop Spacers (Pair)

PPM-8055 - Front Track Bar Bracket

PPM-8056 - Rear Track Bar Bracket

PPM-8001 - High Steer Drag Link Kit

PPM-8066 - Front Brake Line Kit

PPM-8066 - Rear Brake Line Kit

PPM-8074 - Rear Lower Shock Mounts (Pair)

2. Read all the following steps before beginning installation. If you do not have the proper tools or ability to install the components properly do not attempt installation. Find a creditable, local shop to do the installation work.

## **FRONT SUSPENSION**

### **3. REMOVE STOCK PARTS**

- Disconnect the front track bar at the axle bracket. It is easiest to do this when the suspension is at the ride height position. If you are replacing the track bar with an adjustable one you can completely remove the front track bar.
- Remove the automatic transmission skid plate if equipped to prevent damage to the front drive shaft when the suspension is drooped out.
- Use a floor jack under the center of front axle to lift the tires off the ground. Place jack stands under each frame rail just behind the lower control arm mounts to support the weight of the Jeep. Raise or lower the floor jack under the front axle to remove and install suspension components. The jack should stay under the axle the entire time the front suspension is being installed.
- Now remove these suspension components and retain the hardware in this order
  - Front Wheel/Tires
  - Sway bar links
  - Steering stabilizer
  - Shocks
  - Drag link; remove the bent end from the steering knuckle and unthread the draglink with the adjuster sleeve from the inner tie rod, you can leave the inner tie rod attached to the pitman arm.
  - Lower the axle and remove the springs, make sure the wheel speed sensors wires are not overextended, loosen any retaining clips if needed to allow enough slack.

### **4. INSTALL BRAKE LINES.**

- Remove the stock brake lines from the frame hard line connection and brake caliper, install the new brake lines with the new banjo washers. Install the frame bracket as shown.



Figure 4-1



- The same brake line is used at all 4 corners, once the brake line is installed at the caliper you can slightly bend the 90 bent tube end of the brake line at the caliper toward the frame similar to the stock brake line.



Figure 4-2

- Wait until the rear brake lines are installed to bleed the brakes.

#### 5. INSTALL LOWER CONTROL ARMS

- Remove the stock control arms and save the mounting hardware
- Trim the top of the axle bracket as shown for clearance for the new arms.



Figure 5-1

- Preset the length of the lower control arms to 23.25" center to center of the bushing by turning the adjuster sleeve. This is just a starting measurement, final control arm length will be set during the alignment. Turn the Johnny joint so that the grease fitting is adjacent to the adjuster pinch bolt. Make sure the left and right control arms are the same length.
- Install the new control arms with the bend upward and inward, away from the tire and ground. There is a left and right so make sure they are on the correct side. The bushing goes at the axle end and the Johnny Joint goes at the frame end with the pinch bolt and grease zerk on the top.

- Hand tighten the control arm bolts, wait until the end of the installation and the jeep is sitting at ride height before you torque these bolts.



Figure 5-2

#### 6. INSTALL FRONT UPPER CONTROL ARMS

- The control arms come assembled to the shortest length. Make any length adjustments by only turning the adjuster sleeve so there is equal thread on the flex joint and adjuster sleeve. Make sure the grease zerk on the flex joint is aligned with the pinch bolt on the control arm.
- We recommend that you preset the length of the upper control arms. Start the upper control arms at the factory length of 18.75". Make sure the left and right control arms are the same length.
- Remove the existing upper control arms. The exhaust on the passenger side frame mount prevents the bolt from being removed in one piece. You will have to cut the head of the bolt off to remove the bolt. A sawzall or grinder with a cut off wheel works well. A new factory bolt is provided, reuse the factory nut.
- Install the new control arms with the flex joint at the frame end and the adjustable end at the axle. Position the arm with the pinch bolt and the grease zerk in the flex joint on the bottom of the control arm. Reuse the factory mounting bolts.
- Hand tighten the control arm bolts, wait until the end of the installation and the jeep is sitting at ride height before you torque these bolts.

#### 7. INSTALL TRACK BAR RELOCATION BRACKET

- Position the new track bar relocation bracket over the stock track bar bracket as shown in Figure 7-1. Secure the bracket to the axle using the supplied 9/16 x 3" bolt and spacer, the spacer goes where the track bar was located in the stock bracket. There are 3 cylindrical spacers included with this kit, use the shorter one for this step. Use a washer under the head of the bolt and under the toplock nut. Do not tighten this nut at this time; wait until all the other hardware is installed. See Figure 7-2.



Figure 7-1



Figure 7-2

- Install the (2) 3/8 x 1" bolts in the track bar relocation bracket on either side of the 9/16" bolt, use a flat washer under the bolt head and under the nut, then secure with a toplock nut.
- Install one of the 1.5" long spacers between the stock sway bar tab and the side of the track bar relocation bracket in the lower hole with a 1/2 x 3" bolt and top-lock nut; use a washer under the bolt head and nut. See Figure 7-3



Figure 7-3

- Install the u-bolt over the axle tube and through the track bar relocation bracket, use a flat washer and nylock nut to secure the u-bolt.
- Once all the hardware is installed in the track bar relocation bracket you can begin to torque all the hardware. Torque the 9/16 bolt to 150 ft-lbs, the 1/2" bolts to 90 ft-lbs, and the 3/8" bolts and u-bolt to 40 ft-lbs. Wait until the jeep is sitting at right height to attach the track bar.

## 8. INSTALL STEERING STABILIZER

- The track bar relocation bracket also allows you to relocate the steering stabilizer to the top of the tie rod.
- Loosen the u-bolts on the tie rod steering stabilizer bracket and rotate it to the top of the tie rod as shown in Figure 8-1. Tighten the u-bolts when finished. Attach the large end of the steering stabilizer to the tie rod bracket.
- Attach the shaft end of the steering stabilizer to the track bar relocation bracket using the factory nut and bolt and a 1/2 washer between the bushing and the track bar relocation bracket. See Figure 8-2
- Tighten both steering stabilizer mounting bolts to 60 ft-lbs.





Figure 8-1



Figure 8-2

## 9. INSTALL DRAGLINK

- You have two options for flipping the draglink to the top of the knuckle, 1) Ream the tapered hole from the top if you have the correct tie rod end reamer (1 1/2" per ft) or 2) Purchase the tie rod flip adapter (PPM-800102-01) and drill the steering arm to a 7/8" straight hole.
- Using the tapered reamer and a hand drill, ream the factory steering knuckle from the top to a diameter of .760", measured to the large end (top) of the taper.
- If using the flip adapter, drill the steering arm tie rod hole thru with a 7/8" drill bit Figure 9-1, insert the adapter into the hole from the top Figure 9-2.
- Coat the threads of the un-bent end of the new draglink liberally with anti-seize and thread onto the factory pitman arm tie rod end. Leave about 1" of thread exposed on the tie rod end. If the tie rod is difficult to install, you can wedge the pinch bolt tube open using a chisel or similar tool.
- Install the tie rod end to the steering knuckle hole from the top. Use the supplied boot and castle nut. Tighten the castle nut to 50 ft-lbs or more to align the cotter pin hole. Insert cotter pin and bend the ends over.
- Align the draglink so the bend is flat and towards the front. See Figure 9-3. Tighten the pinch bolt on the pitman arm tie rod end to 50 ft-lbs. Wait to tighten the adjuster sleeve pinch bolt until the steering wheel is centered during alignment.



Figure 9-1



Figure 9-2



Figure 9-3

#### 10. INSTALL BUMPSTOP SPACERS AND COIL SPRINGS

- Locate and center punch the center of the bumpstops strike pad on the axle coil spring mounts. Drill a 3/8" hole.



Figure 10-1

- Put the bump stop bolt through the bump stop and slide the bump stop into the bottom of the coil spring.
- Install the coil spring while holding the bump stop inside the coil. When the coil is in place, align the bump stop bolt with the hole that was drilled. Install the bump stop bolt through the hole and the 3/8" serrated nut onto the bump stop bolt. Hand tighten the nut and then use a 5/16" allen wrench through the coil spring to tighten the bump stop bolt.

#### 11. INSTALL SHOCKS

- Install the shocks using the stock lower mounting nut/bolt. Use the new stem bushings, washers and nuts.
- Tighten the lower bolts to 56 ft-lbs
- Install the thicker of the two upper stem bushing nuts and tighten until the bushing begins to bulge out. Install and tighten the jam nut.

#### 12. INSTALL SWAY BAR LINKS



- Install the driver side anti-way bar relocation bracket using a 1.5" spacer and ½" x 3" bolt and top-lock nut; use a washer under the bolt-head and nut.



Figure 12-1

- Run a 1/2" drill bit or reamer through each side of the stock sway bar holes to enlarge the holes for the new rod end studs.



Figure 12-2

- Make sure the sway bar end links are the same length by adjusting the rod ends.
- Install the sway bar link rod ends to the sway bar as shown in Figure 12-1, tighten to 60 ft-lbs.
- Install the driver side sway bar link to the sway bar relocation bracket using the stock nut/bolt as shown in Figure 12-1. Torque the lower sway bar nut/bolts to 75 ft-lbs.
- Install the passenger side sway bar links in the side of the track bar bracket using the stock nut/bolt. See Figure 12-3



Figure 12-3

### 13. INSTALL TIRES AND WHEELS AND REMOVE FROM JACKSTANDS

- Raise the front axle with the floor jack and install the tires and wheels.
- Remove the jack stands supporting the frame and lower the axle so wheels are back on the ground
- Attach the track bar to the track bar relocation bracket using the original bolt. You can have a helper turn the steering wheel to align the track bar bushing to the mounting bracket hole. Wait to torque this bolt until the end of the suspension installation.
- The installation of the front suspension is complete except for the steering wheel alignment and final torque of the control arms and track bar. You may want to wait until the rear is finished because you will be using similar tools and torque settings for both.

## REAR SUSPENSION

### 14. REMOVE STOCK PARTS

- Disconnect the rear track bar at the axle bracket. It is easiest to do this when the suspension is at the ride height position
- Use a floor jack under the center of axle to lift the tires off the ground. Place jack stands under each frame rail just in front of the lower control arm brackets to support the weight of the Jeep. Raise or lower the floor jack under the rear axle to remove and install the suspension components. The jack should stay under the axle the entire time the rear suspension is being installed.
- Now remove these suspension components and retain the hardware in this order
  - Rear Wheel/Tires
  - Sway bar links
  - Shocks
  - Lower the axle and remove the springs, make sure the wheel speed sensors wires are not overextended, loosen any retaining clips if needed to allow enough slack

### 15. INSTALL BRAKE LINES

- Remove the stock brake lines from the frame hard line connection and brake caliper, install the new brake lines with the new banjo washers. Install the frame bracket as shown.





Figure 15-1

- The same brake line is used at all 4 corners, once the brake line is installed at the caliper you can slightly bend the 90 bent tube end of the brake line at the caliper toward the frame similar to the stock brake line.



Figure 15-2

- You can now bleed the brake system.

#### 16. INSTALL LOWER CONTROL ARMS

- Remove the stock control arms and save the mounting hardware
- We recommend that you preset the length of the lower control arms. For 3-4.5" of lift, we recommend a length of 20.25" measured from the center to center of the bushings. This length works well when using the stock length upper control arms and for longer upper control arms when using a CV style rear drive line. If you need to point the pinion up to use a CV style rear driveline, try to only lengthen the upper arms and leave the lowers at 20.25". Turn the Johnny joint so that the grease fitting is adjacent to the adjuster pinch bolt.
- Install the new control arms with the bend upward. The bushing goes at the axle end and the Johnny Joint goes at the frame end with the pinch bolt and grease zerk on the top. Reuse the factory mounting bolts. See Figure 16-1



Figure 16-1

### 17. INSTALL UPPER CONTROL ARMS

- Remove the stock upper control arms and save the mounting hardware
- We recommend that you preset the length of the upper control arms. The following chart will give you a starting point for the length of the upper control arms. The final length will be determined when the jeep is sitting on the springs and tires to get the pinion at the correct angle.

UCA LENGTH WHEN USING 20.25" LCA LENGTH, & 3-4.5" LIFT		
VEHICLE TYPE	PINION ANGLE	UPPER CONTROL ARM LENGTH
4 DR WITH CV	10 DEG	18.25"
2 DR WITH CV	15 DEG	18.75"

- Install the new control arms with the bend inward toward the frame. The bend is for tire clearance. The bushing goes at the frame end and the Johnny Joint goes at the axle end with the pinch bolt and grease zerk on the bottom. Reuse the factory mounting bolts. See Figure 17-1



Figure 17-1



- Tighten and torque both upper control arm bolts to 125 ft-lbs and the pinch bolt to 50 ft-lbs when final adjustment is done.

#### 18. INSTALL BUMPSTOP SPACERS

- Install the new rear bump stop spacers. The bump stop spacers should be oriented so they angle forward. See [Figure 18-1](#). Use a washer under the head of the 3/8 bolts and use the serrated nut on the bottom. Tighten to 30 ft-lbs



Figure 18-1

#### 19. INSTALL REAR TRACK BAR RELOCATION BRACKET

- Cut part of the factory track bar off as shown in the following pictures. The pictures are shown using a 4 1/2" grinder with a cut off wheel, but a sawzall can also be used.



- Attach the new track bar relocation bracket to the factory bracket as shown with the new 9/16" bolt and lock nut; use a flat washer under the bolt head and lock nut.
- Install the u-bolts over the axle tube and through the track bar relocation bracket, use a flat washer and nylock nut to secure the u-bolt.
- Torque the 9/16 bolt to 150 ft-lbs, and the 3/8" u-bolts to 40 ft-lbs
- Wait until the vehicle is sitting at ride height to attach the track bar.

## 20. INSTALL LOWER SHOCK RELOCATION BRACKETS AND SWAY BAR LINKS

- Cut off the factory lower shock brackets using a grinder with a cut off wheel or a sawzall. Grind the weld smooth.

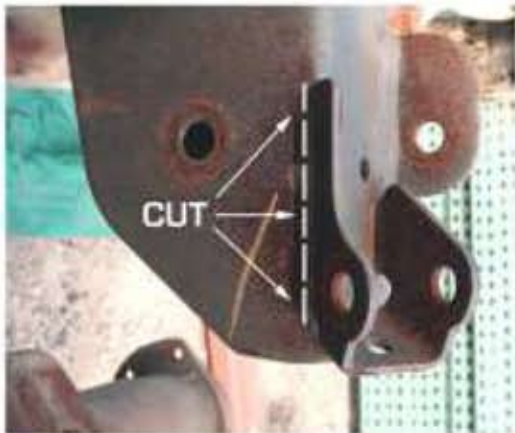


Figure 20-1

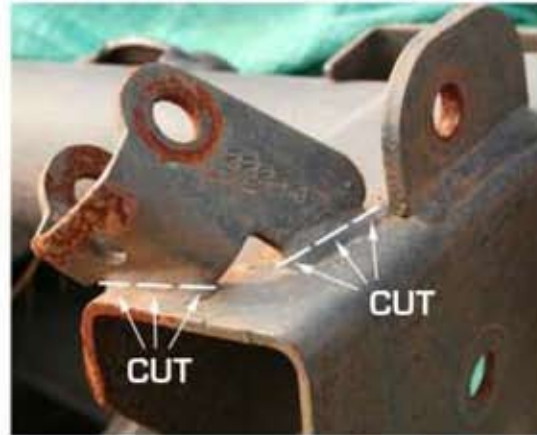


Figure 20-2

- The rear lower shock relocation bracket position can vary depending on the combination of the bump stop spacer height, shock length and control arm length. We recommend that you cycle the suspension to correctly position the new lower shock brackets to optimize your suspension travel. If you are using these shock relocation brackets with the Poly Performance Synergy Suspension System the following table will help you determine which set of holes in the shock relocation bracket to use without cycling the suspension. These hole positions are based on using the Poly Performance 8068 rear shocks, 8058 (3") or 8076 (4") rear bump stop spacers and our recommended rear upper and lower control arm lengths. If you are using anything other than this combination of parts, you should cycle the rear suspension to get the correct lower shock bracket position.

SHOCK RELOCATION BRACKET HOLE POSITION USING 20.25" LCA LENGTH AND 17.25" COLLAPSED SHOCK LENGTH, FITS 3-4.5" LIFT			
APPLICATION (PINION ANGLE)	UPPER CONTROL ARM LENGTH	3" TALL BUMP-STOP SPACER	4" TALL BUMP-STOP SPACER
STOCK UCA (5°)	17.5"	TOP HOLES	MIDDLE HOLES
4 DR CV (10°)	18.25"	TOP HOLES	MIDDLE HOLES
2 DR CV (15°)	18.75"	MIDDLE HOLES	BOTTOM HOLES

- Remove the jounce bumpers but leave any bump stop extension brackets installed. Jack the rear axle up to compress the suspension until the bump stop spacer hits



the metal cup that holds the jounce bumpers. This should be the highest the rear axle and suspension will travel. See [Figure 20-1](#).

- Install the new shock to the upper mount.
- Using the factory shock bolts, attach the shock relocation brackets to the bottom bushing of the shock.
- Compress the shock and position the bracket on the back of the lower control arm bracket to determine which set of holes to use. See [Figure 20-1](#).



[Figure 20-1](#)

- Once the shock bracket position is determined you can cut the bottom of the lower control arm bracket off flush with the bottom of the shock brackets. Remove the shock brackets and shocks. A sawzall works well for this, you can cut off the whole lower section of the bracket with one cut. Do not cut off the anti-sway bar link tabs.
- Install the lower shock relocation brackets, use the supplied 3/8 x 1" bolts to attach the shock bracket to the rear lower control arm bracket. Use flat washers under the bolt heads and use flange nuts on the inside of the lower control arm bracket. The lower nuts are easy to get to but the uppers can be difficult, the easy way is to put the flange nut in the end of a box end wrench and slide the nut up the inside of the lower control arm bracket and align it with the hole. Use the factory anti-sway bar link bolts to attach the side of the bracket to the anti-sway bar link tabs. Insert these bolts from the outside so the nut is against the shock bracket. Torque the lower sway bar bolts to 75 ft-lbs

## 21. [INSTALL COIL SPRINGS, SHOCKS AND SWAY BAR LINKS](#)

- Install the new coil springs. If you have rotated the pinion up for a CV driveline, we recommend that you cut, rotate and re-weld the lower coil spring mount on the axle to align level or purchase coil spring angled wedges.
- Jack the axle up enough to install the shocks using the original hardware, torque the upper bar pin bolts to 37 ft-lbs and the lower bolt and nut to 56 ft-lbs.
- Make sure the sway bar links are adjusted to the same length and tighten the jam nut. Install the upper end of the sway bar links to the sway bar. If the rod end stud does not fit through the sway bar you will have to enlarge the holes with a 1/2" drill. Tighten the nut to 66 ft-lbs

## 22. FINAL INSTALLATION STEPS

- Jack the rear axle up enough to install the tires and wheels.
- Remove the jack stands under the frame and lower the jeep to the ground.
- Attach the track bar to the new track bar relocation bracket using the factory nut and bolt. If the track bar does not line up with the hole you can have someone push the back of vehicle from side to side to align the track bar bushing to the hole in the bracket.
- Now that the vehicle is sitting at ride height on level ground you can do the final fastener torque
- Torque the front and rear lower control arm bolts to 125 ft-lbs and pinch bolts to 80 ft-lbs
- Torque the front upper control arm bolts to 90 ft-lbs and pinch bolts to 50 ft-lbs
- Torque the front and rear track bar bolts to 125 ft-lbs
- Torque the lug nuts to 85-125 ft-lbs.
- Bleed the brake system if you have not already done it.
- If you have rotated the pinion up we recommend that you add one additional quart of gear lube in the rear differential to supply the front pinion bearing with gear lube. You can buy an aftermarket diff cover with a higher fill plug or unscrew the breather fitting in the axle tube and add the additional gear lube through there.
- Adjust the draglink to center the steering wheel by using the adjuster sleeve on the passenger side tie rod end (steering knuckle end). This requires a 1 ¼" wrench. Tighten the pinch bolt to 50 ft-lbs.
- If the steering wheel is not centered the ESP light will come on, so make sure you adjust the draglink so the steering wheel is perfectly centered. This is can be accomplished by test driving and making the necessary adjustments. When driving in a straight line take note of which way the steering wheel needs to turn to be centered. If the steering wheel needs to turn right to be centered, shorten the draglink. If the steering wheel needs to turn left to be centered, lengthen the draglink
- We recommend you have the jeep aligned by a professional alignment shop. The front castor should be set to around 5 degrees.
- Check all hardware after 500 miles of driving.
- We also recommend checking all hardware before and after all off road trips to avoid failure due to loose fasteners.

**Thank you for choosing Poly Performance Inc. Please call you if you have any questions, we can be reached M-F 8-5 pst.**