

PURE PERFORMANCE

INSTALLATION MANUAL

FOR

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05-Pres. F250 Ford Super Duty

3.5"/4.0" SYSTEMS

FOURTH EDITION

04/25/17

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Dear customer

Thank you for purchasing the best system on the market for your FORD F250 4x4 Truck. We are sure you will be happy with this system when your installation is complete. Please take your time during the installation and be sure to do it correctly. Completely read the directions before starting your installation so you know what to expect. Remember, your personal safety depends on it.

Note: BE SURE TO CHECK ALL FASTENERS FOR PROPER TORQUE BEFORE TEST DRIVING. RECHECK AFTER 500 MILES AND BE SURE TO CHECK PERIODICALLY.

Note: DO NOT DISCARD THIS MANUAL. REBUILD PARTS & COMPONENTS SPECIFIC TO THIS KIT ARE LISTED WITH PART NUMBERS AT THE END OF THIS MANUAL.

Warning

Read and understand all instructions, warnings and safety precautions in these instructions and your owner's manual before attempting to install these components.

Caution

Proper installation of Pure Performance Products requires knowledge of recommended procedures for disassembly/assembly of OE vehicles and components. Access to OE shop manuals and special tools are required. Attempting to install this kit without knowledge of these procedures may affect the safety of your vehicle and/or the performance of these components. Pure Performance strongly recommends that a certified mechanic with off road experience install this system.

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Warning

Pure Performance does not recommend combined use of suspension lifts, body lifts or other lift devices. Combined use of lifts may result in unsafe and unexpected handling characteristics. Also, many states now have laws restricting Vehicle lifts, bumper heights and other alterations. Consult local laws to determine if your proposed alterations (including installation of this system) comply with your state laws.

Caution

Pure Performance recommends the use of loctite on all hardware, unless noted otherwise.

Warning

Properly block and secure vehicle prior to installation.

Warning

Always wear safety glasses when using power tools.

Warning

The use of limiting straps is recommended to avoid possible damage from over extending the suspension of your vehicle.

Helpful hint:

Do not tighten connections until assemblies are installed in entirety.

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Start with the rear suspension. This is easier and it will get you warmed up for the front suspension.

1. Block the front wheels in place. Jack the rear of the vehicle up a minimum of 6". Place jack stands under the frame as far back as possible. Be sure to check for ABS lines, emergency brake cables, brake lines, and breather tubes becoming tight while jacking the rear of the vehicle. Unbolt, or relocate as necessary.
2. Remove the rear wheels and tires.
3. Remove the OEM rear shocks and save the hardware for reuse.
4. Remove "U"-bolts retaining axle to the rear springs and move axle several inches away from springs.
5. Inspect the spring pads/springs and repair/replace as needed.
6. a) **For the X Factor Systems Only.** Install the supplied sheet metal lift blocks under the factory lift block. Secure the leaf springs, new blocks and the factory block to the axle with the supplied "U"-Bolts. Evenly torque the "U"-Bolts using an "X" tightening sequence to 85 ft/lbs. The bump stop pad goes to the inside of the vehicle just like the OEM cast blocks.

Please note: For 2008-2016 Super Duties, we supply a new top retaining plate for the u-bolts as well. This is so you can properly center the rear axle. Choose the pin hole you like best in the fabricated lift blocks and go from there (It is typically the forward most hole that centers the rear axle correctly in our opinion). Offset the u-bolt top plate accordingly.



Fabbed Block w/ Multiple Centering Pins



New U Bolt Top Plate

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New U Bolt Top Plate



Top Plate and U Bolts Installed

b) **For Triple Threat Systems Only.** Place C Clamps on the OEM leaf spring so the centering pin and heavy over load springs can be safely removed.



C Clamp on Stock Springs



Add A Pack Prior to Installation

Please Note: If you find out the add a pack with stock pack is too firm for you, you can remove one or two of the small leaves at the bottom of the add a pack as shown below and reinstall.

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Leaves removed from mini pack prior to installation

Install the supplied custom mini spring pack by bolting it to the bottom of the OEM spring pack using the newly supplied centering pin. Make sure the leafs are all aligned, then use the C-Clamps again to tighten the pack together. Snug up the centering pin tightening it 30 to 40 ft-lbs. Then secure the axle to the new spring pack with the supplied "U"-Bolts. Evenly torque the "U"-Bolts using an "X" tightening sequence to 85 ft/lbs. In some instances for example dually owners who want to keep the factory over load spring, this can be reinstalled underneath the mini pack as shown below. It will create a firmer than normal ride. This is only for those of you who tow a lot of weight and tow often such as dually owners! In some cases, the cross pins will need to be bolted in after the pack is fully assembled and lowered back to the ground.



Mini Pack Installed!

*****Shown with Heavy Over Load Installed under the Mini Pack for Dually Owners!***

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Please Note: For 2008-2016 Applications; prior to securing the OEM spring with mini packs, the supplied fabled blocks must be installed replacing the OEM cast blocks in order to set the ride height correctly.

c) **For Chase Series Systems Only.** Remove the factory leaf springs from the vehicle completely. Save all hardware for reuse. Install the new leaf spring packs in the same orientation as factory right over the factory blocks. Evenly torque the new supplied "U"-Bolts using an "X" tightening sequence to 85 ft/lbs

Please Note: For 05-07 Trucks, we convert you over to 08 -16 leaf springs for better ride and better performance. Please follow the below steps to complete the process.

C1) Grind an "X" in the head of the 6 factory rivets which retain the front leaf spring hanger to the frame.

C2) Using an air hammer/chisel, remove the rivet heads and push them through the frame.

C3) Remove the hanger and clean the frame rail about 8" in front and behind the front hanger mounting holes

C4) Looking at the frame, you'll have (6) holes, three on each side from removing the bracket. Insert a 1/2 - 1.5" Grade 8 bolt with a 1/2 washer into the REAR Upper and lower mounting holes of the removed hanger.

C5) Using the FRONT upper and lower mounting holes on the frame, install the bracket so the REAR of the bracket installs into the upper and lower frame holes that previously mounted the FRONT of the mount. This will index the leaf springs forward from their original mount. Only the upper and lower holes will line up, the other 4 will need to be drilled once the bracket is tightened using the upper and lower mounting holes as an index.



C6) Drill the other 4 holes with a 1/2" drill bit and secure the remaining 4 mounting points using 1/2" – 1.5" Grade 8 hardware with a washer and nyloc on each side of the assembly. You will need (4) 1/2" x 2" bolts with washers and nylocs to re-secure the spare tire crossmember as well. When you move the bracket forward, 2 of the 3 rivets that retained the rear of the factory located hanger secured the spare tire crossmember, As these holes are now un-utilized, you will need to secure the upper two open holes with the abovementioned hardware.

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C7) Torque all the newly installed hardware to 80 ft. lbs.



C8) Install passenger side leaf spring into the front hanger and attach the shackle to the rear hanger and spin the nuts on hand tight. Final torquing will be done on the ground with the weight of the truck on the leaf springs. Attach leaf springs to the axle with supplied U-Bolts torquing to 115ftlbs. In a cross pattern.

7. Install the new shocks of your choice with the OEM hardware.

Please note the following:

If you are installing Pure Performance Prodigy Shocks, we supply a custom nut for the frame connection. Be sure to apply red Loctite when torquing accordingly.



Custom Rear Upper Shock Nut Shown

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When Installing Reservoir or Bypass Shocks, the reservoir attaches to the body as shown and away from the axle tubes. Otherwise the reservoir can contact the axle tube and cause damage to the shock.



2 5/8 Bypass/Reservoir Applications Required

8. If your system included rear stainless steel brake lines install them now. Do not bleed the brake lines until the installation is complete. Be sure to bleed the brake system prior to driving the vehicle. Otherwise proceed to the next step.

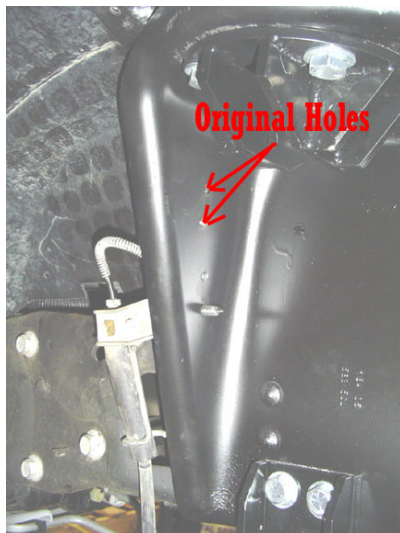
9. Reinstall the rims and tires. Remove the vehicle from the jack stands and get ready for the front end.

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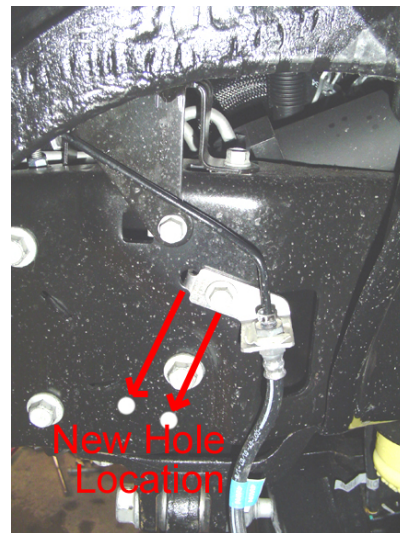
It is time to do the front suspension.

1. Block the rear wheels and make sure the parking brake is applied.
2. Jack up the front end at least 6", place jack stands under the front of the frame as far forward as possible.
3. Remove the front rims and tires.
4. Remove the following items;
 - a) Remove Sway bar end links and discard them since they will not be reused.
 - b) Remove the front shocks, front coil springs and discard them since they will not be reused.
 - c) Remove front control arms and retain the factory hardware.
 - d) Remove the front track bar and discard it for it will not be reused.
5. Now it's time to relocate or replace the front brake lines.

For the **X Factor** and **X Factor Plus Series** relocate the factory brake line holes by drilling (2) .25" diameter holes down and reinstall the front brake line. See picture below. For all other series, replace the stock line with the supplied stainless steel lines at this time. Do not bleed the brake system until the installation is complete and prior to driving the vehicle.



05-07 Super Duty



08+ Super Duty

6. Grab the newly supplied radius arm drop brackets or dropped four link mounts. Follow the instructions below based on the year of your application.

For 2005 – 2010 Models:

Slide the supplied $\frac{3}{4}$ " x 5.0" long bolt with washers through the hole not being used to mount one of the new 4 Link

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or stock radius arms. This will allow the mount to sit in place so you do not have to try to hold more than one part with only two hands. While having one 3/4" bolt in the front of the bracket in place, swing the new mount up to the frame and install 2 of the supplied 7/16" bolts, with washers, and nuts into the back slotted holes of each bracket up through the matching holes in the frame. Some models may have to unbolt an exhaust bracket and drop the hardware down from the inside of the frame rail for clearance of this bracket when it is re-bolted into place.

For 2011 – 2016 Models:

Support the transmission cross member. Do one side at a time. Remove the nuts that hold the cross member in place. While having one 3/4" bolt in the front of the bracket in place, swing the long arm mount up to the factory cross member studs and re use the factory nuts to fasten the new long arm mount to the cross member. Make sure all the hardware is loosely installed before tightening anything down.



2011+ Dropped 4 Link Mount Shown

For 2017 – Pres. Models:

Trim the pinch seam in front of the tranny cross member mounting bolts on both sides as shown below so the supplied mounts will fit in place properly.

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2017 – Pres. Pinch Weld Seam Trimming Operation

If you have the ability, weld the seam back together, if not, not a big deal. Then apply a durable finish of your choice to prevent rust. While supporting the tranny cross member, remove the tranny cross member nuts one side at a time and slide on the radius arm drop bracket (or 4 link mounts) in place. Please note: there is a specific driver side and passenger side for this so be sure to fit them in place prior to securing tightly. Once the mounts are moched into position, put one supplied $\frac{3}{4}$ " x 5" long bolt loosely through the mount and the OEM radius arm mount. Then tighten the cross member bolts first.

7. For all **X Factor** and **Triple Threat** Systems, reattach the OEM radius arm to the newly supplied radius arm drop brackets with the OEM radius arm mounting hardware at the frame. All **Plus** and **Chase** Systems – Skip this step.

8. For **All Plus** and **Chase Systems** (**X Factor** and **Triple Threat** – Skip This Step). Install the 4 Link Arms:

Set all front upper control arms to **32 5/16" from center bolt hole to center bolt hole**. The front upper control arm is the shorter of the two. Insert the Prodigy Joint into the new 4 Link Mount in the upper most hole and secure it using the supplied $\frac{3}{4}$ x 5.0 bolt, washers and nylok nuts. Attach the front upper control arm to the axle using the OEM hardware. Grab the front lower control arm and set it to the following;

2005-2016 Super Duties - 37 1/2" from center of bolt hole to center of bolt hole.

2017-Pres. Super Duties – 37 7/8" from center of bolt hole to center of bolt hole.

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Insert the front lower control arm into the bottom most hole in new four link bracket and secure it with the supplied 3/4 x 4.5" bolt, washers, and nylok nuts. Attach the front lower control arm to the axle using the OEM hardware.



4 Link Long Arm Mounts, 2005 – 2010 Model Shown



4 Link Long Arm Mounts, 2017+ Model Shown

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8. Let's install the Front Track Bar.

For 2005-2016 Models:

The starting operating dimension for the 4.0" kits Front Track Bar is **38 3/8"** from the center of the adjustable joint to the center of the tapered hole. **Do not allow for more than 1/2" of thread to show past either jam nut for final assembly.** The adjustable joint goes to the frame connection using the OEM hardware. The tapered end secures to the ball joint on the axle. Torque the OEM hardware at the frame to 200 to 249 ft-lbs and the nut at the axle to 180 to 200 ft-lbs. Be sure to tighten the jam nut with the orientation of the track bar set! By loosening both jam nuts up at the frame, you can put a wrench on the quick adjuster and easily adjust the length of the track bar without removing the track bar from the vehicle!

Do not allow more than 5/8" of threads to show past the jam nut for final adjustment. *Helpful Hit:* Be sure to crank on the jam nuts. Jam nuts not only hold the orientation of the joints, but they also preload the threads in the arm and on the joint itself. The preloading on the threaded sections will ensure a long component life and proper structure. This is critical for the overall longevity of the track bar assembly. If you do not apply a large enough preload you could also be compromising the structural integrity of the assembly which could lead to problems for your vehicle down the road. Applying red loctite to the joint where the jam nut sits after final installation and adjustment is recommended.



Track Bar Frame Connection



Track Bar Axle Connection

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For 2017 – Pres. Models:



Front Lower Track Bar Bracket Image – 1



Front Lower Track Bar Bracket Image - 2

Secure the supplied conversion bracket at the axle by putting in the supplied 7/8 x 2.5" bolt shown in Image -1, washers and nylok nut down through the bracket and the OEM hole at the axle. Then wrap the axle tube with the supplied 1/2 u bolt, 1/2" washers and nylok nuts and go through the bracket shown in Image - 2. Tighten the u bolt nuts first, then tighten the 7/8 bolt.

Set up the track bar assembly as follows;

Set the axle end heim joint to show 1/2" of threads past the jam nut. Then adjust the center to center or operating length of the track bar to 37 5/8". Secure the heim end of the track bar to the axle with the supplied 18mm x 80 mm bolt and washer (the nut is welded into the bracket). Then attach the quick adjuster end of the track bar to the OEM mount on the frame using the OEM bolt and nut. **Please note:** Any adjustments required will be done through the quick adjuster end only.

9. Install the new Pure Performance front Progressive Rate Coil springs in the factory orientation.

10. Install the supplied billet aluminum bump stop extensions between the OEM bump stop steel cup and the frame with the supplied hardware. **Please note:** you may have to flatten the tab in the steel cup so it fits flush against the billet aluminum extension.

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11. Lower the vehicle down and install the extended front sway bar links.

2005-2007 Install the top of end of the supplied sway bar link with the spherical joint at the sway bar connection point with the supplied shoulder spacer between the sway bar and the joint. Secure the connection with the supplied 14mm bolt and nylok nut. Insert the pin mount end into the bottom mounting position and tighten it up. Be sure to have a bushing and washer between each side of the axle mount! **Please Note:** A good starting position for the adjustable joint is to have it fully threaded into the link.

2008 – 2010 Install the top of the sway bar link with the supplied shoulder spacer between the sway bar and the joint and secure it with the supplied 14mm x 70mm bolt and nylok nut. For the bottom end place the shoulder spacer between the bracket and the sway bar link joint and secure with the supplied 14mm x 60mm hardware. Be sure to tighten the jam nuts with the joints oriented in their neutral position. Torque the jam nuts to 75 ft-lbs. **Note:** A good starting position for the adjustable heim is to have it fully threaded into the link.(See Pictures next page).



2008 – 2010 Sway Bar End Links

2011 – Pres. Insert the pin mount end into the bottom mounting position and tighten it up. Be sure to have a bushing and washer between each side of the axle mount. Secure the clevis bracket to the bottom side of the sway bar. Please note: the offset in the bracket is designed to go forward to improve clearance between the coil and the sway bar link itself.

12. Tighten all connections and orient all the joints using the specs below and put the front wheels and tires on.

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13. Bleed the brakes per the owners manual.

14. Remove the vehicle from the jack stands and you are DONE!!!

15. After the truck is finished and all the weight is down on the axles, it is a good idea to double check the front axle and make sure the adjustable track bar is properly set to center the axle left to right under the vehicle. Take the vehicle to a professional alignment shop and have the front end aligned.

Final Assembly Setup Instructions:

Note: *For final assembly the weight of the vehicle must be on the tires and wheels.*

1) Tighten all Suspension Connections or Pivot Bolts at this time.

The front track bar bolt at the frame should be torqued to 350-375 ft-lbs.

General Torque Values unless otherwise specified above in the instructions are as follows;

Torque for all 3/8"/10mm bolts (10.9) is 28 to 32 ft-lbs.

Torque for all 1/2"/12mm bolts (10.9) is 65 to 75 ft-lbs.

Torque for all 9/16"/14mm (10.9) is 90 to 100 ft-lbs.

Torque for all 5/8"/16mm bolts (GR 8) is 130 to 150 ft-lbs.

Torque for all 5/8" Jam Nuts is 75 to 85 ft-lbs.

Torque for all 3/4"/20mm bolts (GR 8) is 200-220 ft-lbs

Torque for all 7/8" bolts (GR 8) is 250-275 ft-lbs

All 7/8" Jam Nuts are to be torqued 200-220 ft-lbs. *Up to 5/8" of threads showing past the jam nut is safe for final adjustment. These specifications are critical for the overall longevity of the threaded section.*

All 1" Jam Nuts are to be torqued to 250-300 ft-lbs. *Up to 3/4" of threads showing past the jam nut is safe for final adjustment. These specifications are critical for the overall longevity of the threaded section.*

All 1 1/4" Jam Nuts are to be torqued to 275-325 ft-lbs. *Up to 7/8" of threads showing past the jam nut is safe for final adjustment. These specifications are critical for the overall longevity of the threaded section.*

All 1 3/8" Jam Nuts are to be torqued to 325-350 ft-lbs. *Up to 2" of threads showing past the jam nut is safe for final adjustment on the radius arms. These specifications are critical for the overall longevity of the threaded section.*

2) Typical alignment specs for the Pure Performance

Caster 3.5 to 4.5 degrees with .2 degrees caster on the passenger side than the driver's side to account for road crown. *Please note; some tire treads and steering stabilizers may cause a pull or push that needs to be accounting for.*

Tow – factory specification – zero preferred

Camber – You have no adjustment

Center the Steering wheel. This is critical for ESP/ESC equipped Ram HD's and must be done with the steering wheel position sensors at Zero as well.