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PART #	DESCRIPTION
95220	2010-2014 FORD RAPTOR MULTI RATE LEAF SPRING KIT

COMPONENTS INCLUDED	
(2) 10+ RAPTOR LEAF PACK W/ADD IN (2) ADD-A-LEAF	(1) 95220H HARDWARE KIT
HARDWARE INCLUDED	
95220H HARDWARE KIT	
(2) 190007 10+ RAPTOR LEAF PACK CLAMP PLATE (4) 195010 9 X 3.125 SQUARE U-BOLT 5/8-18 THREAD W/NUTS & WASHERS	(2) 197019 RAPTOR REAR BUMP STOP SPACER (2) 605826 M8-1.25 X 80MM HHCS GR10.9 (2) 605831 M18 X 139.3 OAL OEM FORD BOLT
TOOLS REQUIRED	
FLOOR JACK JACK STANDS TORQUE WRENCH 15MM SOCKET / WRENCH 18MM SOCKET / WRENCH 21MM SOCKET / WRENCH 24MM SOCKET / WRENCH	27MM SOCKET / WRENCH 9/16" SOCKET / WRENCH 3/4" SOCKET / WRENCH 15/16" SOCKET / WRENCH CUT-OFF WHEEL OR RECIPROCATING SAW VICE GRIP (3) C-CLAMPS
TECH NOTES	
1. REVIEW RATE CHANGE NOTES ON PAGE 3 PRIOR TO INSTALLATION!	
2. REAR SPRING SHIPPED WITHOUT A CROSS BOLT INTENTIONALLY FOR SPRING ORIENTATION PURPOSES, SEE STEP 15 OF INSTALLATION INSTRUCTIONS FOR MORE INFORMATION.	



WARNING!
** READ ALL INSTRUCTIONS THOROUGHLY FROM START TO FINISH BEFORE BEGINNING INSTALLATION! IF THESE INSTRUCTIONS ARE NOT PROPERLY FOLLOWED SEVERE FRAME, SUSPENSION AND TIRE DAMAGE MAY RESULT TO THE VEHICLE!
** ICON VEHICLE DYNAMICS RECOMMENDS THAT YOU EXERCISE EXTREME CAUTION WHEN WORKING UNDER A VEHICLE THAT IS SUPPORTED WITH JACK STANDS.

## INSTALLATION

1. ENSURE TRUCK IS IN GEAR OR IN PARK, SET PARKING BRAKE, TURN OFF ENGINE AND CHOCK REAR TIRES!
2. Jack up the rear of the truck and support with jack stands under the frame rail. Remove tires and wheels.
3. With a floor jack under the rear end, slightly raise the rear axle housing from full droop to remove tension from the shock, loosen and remove the shocks. Make sure the axle is well supported. Keep all of the hardware, it will be reused.
4. Remove the vent line from the axle and remove the vent fitting which also holds the brake line bracket to the axle tube. This will allow for additional flex in the lines so the axle may be drooped further.
5. Slowly lower the axle to unload the tension in the leaf spring. When the axle reaches full droop on the leaf springs jack the rear end back up about 1" to relieve any negative pressure in the spring and to insure that the axle weight is being supported by the jack.
6. Replace one side at a time so that the other side helps maintain pinion angle and prevents the drive shaft from pulling out. However loosening the u-bolts slightly on both sides during the installation process reduces bind and aids in the installation.
7. Starting on the driver's side, remove the u-bolts and lower u-bolt plate. Lower the axle slightly to disengage the center pins from the block and axle pad. Remove the factory block
8. Loosen the upper shackle bolt and remove the nut from the lower shackle bolt.
9. The front spring bolt cannot be removed because of interference with the gas tank and exhaust so it must be cut out. New bolts are supplied in the kit. Remove the nut from the front spring bolt, it will be reused (27mm nut, 24mm head). Push the bolt back through the hole so that there is adequate shank exposed under the head of the bolt to cut the head off. This can be done with either an abrasive cutting disc or reciprocating saw. Clamping a vise grip on the nut end of the bolt helps hold the bolt while cutting. Cut the head off the bolt. (FIGURE 1)

FIG.1



**10.** The spring is now only being held in by the shank of the front bolt and the lower rear shackle bolt. This is a heavy assembly so use caution when removing the bolts, use a helper if possible. Remove the bolts and remove the spring from the vehicle.

**11.** Remove the shackle from the stock spring noting the orientation of the shackle and the direction of the bolt, the open part of the formed metal shackle should be toward the spring. If the shackle is put on backward it can bind against the leaf pack under compression of the suspension. Install the shackle on the new spring, start the nut but **DO NOT TIGHTEN**. (FIGURE 2)



**FIG.2**

**12.** Install the spring in the vehicle, again, it's heavy so use a helper. Install the new front bolt in the opposite direction from factory, from the outside inward and start the nut but **DO NOT TIGHTEN**. Install the lower shackle bolt, start the nut but **DO NOT TIGHTEN**.

**13.** Trim the center pins: Cut off the excess thread 2-3 threads above the nut on the center pins (FIGURE 3). The center pins are left long for ease of assembly if changing to an alternative spring rate. **NOTE: FAILURE TO TRIM CENTER PINS WILL CAUSE COLLISION WITH AIR BUMP KIT.**



**FIG.3**



**FIG.4**

**14.** Raise the axle up to the spring and align the center pins in the spring pad. Place the supplied clamp plate (Part #190007) on top of the leaf pack. Install the new u-bolts using the openings in the spring plate to locate them correctly. Install the factory lower spring plate, washers and nuts. Take up the slack in the u-bolts but **DO NOT TIGHTEN**. (FIGURE 4)

**15.** The supplied spring clip sleeve and bolt in the hardware kit should be installed with the exposed threads facing away from the frame. Installing it backwards will cause contact. This cross bolt and sleeve is not required, but has been included for those who feel it necessary.

**16.** Repeat steps 7-13 on passenger side.

**17.** Raise the axle enough to reinstall the shocks. Tighten the u-bolts to approximately 40 ft-lbs. Final torquing will be done on the ground.

**18.** Reattach the lower brake line bracket and vent line.

**19.** Reinstall the tires and lower the vehicle to the ground. Bounce the back of the truck a couple of times to let the bushings center at ride height.

**20.** Torque the front spring eye and shackle bolts [Torque front bolt to 181 ft-lbs, Shackle bolts to 89 ft-lbs].

**21.** Tighten the u-bolts. [Torque to 145 ft-lbs]

### **RATE CHANGE INSTRUCTIONS:**

**1.** ENSURE TRUCK IS IN GEAR OR IN PARK, SET PARKING BRAKE, TURN OFF ENGINE AND CHOCK REAR TIRES!

**2.** Jack up the rear of the truck and support with jack stands under the frame rail. Remove tires and wheels.

3. With a floor jack under the rear end, slightly raise the rear axle housing from full droop to remove tension from the shock, loosen and remove the shocks. Make sure the axle is well supported. Keep all of the hardware, it will be reused.
4. Remove the vent line from the axle and remove the vent fitting which also holds the brake line bracket to the axle tube. This will allow for additional flex in the lines so the axle may be drooped further.
5. Slowly lower the axle to unload the tension in the leaf spring. When the axle reaches full droop on the leaf springs jack the rear end back up about 1" to relieve any negative pressure in the spring and to insure that the axle weight is being supported by the jack.
6. Replace one side at a time so that the other side helps maintain pinion angle and prevents the drive shaft from pulling out. However loosening the u-bolts slightly on both sides during the installation process reduces bind and aids in the installation.
7. Lower the axle so there is a couple of inches clearance between the leaf pack and the spring pad.
8. Use a C-clamp to clamp the first 3 leaves at the front eyelet and the first 2 leaves at the rear eyelet together to help hold them in the vehicle and maintain their alignment. (FIGURE 5, FIGURE 6)



FIG.5



FIG.6

9. Remove the cross bolts and sleeves from the spring retainers. Carefully loosen the center pins, it may be necessary to hold the head of the pins with a vise-grip. There may be some residual force left in the spring before the nuts are fully off the center pin so it helps to use a C-clamp near the middle of the pack also to slowly release the pressure.
10. Remove the bottom 5 leaves of the pack.

**RATE CHANGE OPTIONS:**

Counting from the bottom the longest of the leaves that were removed would be the #5 leaf. You can either replace #5 with the add-a-leaf or leave #5 and make the add-a-leaf #6.

Add-a-leaf replaces #5 = .5" higher ride height and 10 % higher spring rate  
 Add-a-leaf becomes #6 = 1.0" higher ride height and 20 % higher spring rate

11. Add or replace the additional leaf and additional separator plate to the pack. Line up all the holes and put the new center pins through the pack. The center pins are fine thread, use care not to damage the threads during assembly. (FIGURE 7)



FIG.7

12. Put the bottom half of the pack back in the vehicle guiding the center pins up through the upper 3 leaves. A long drift punch helps to align the holes. It may be helpful to loosen the 2 c-clamps slightly on the front and rear to help shift all leaves into position. Use a large c-clamp near the middle to pull everything together until you can get the nuts started on the center pin.

**13.** Tighten the center pins [Torque to 54 ft-lbs]. Reinstall the cross bolts and sleeves in the retainer clips. Make sure the bolt go from the inside out with the head toward the frame for clearance. Trim the center pins: Cut off the excess thread 2-3 threads above the nut on the center pins

**14.** Raise the axle up to the spring and align the center pins in the spring pad. Place the clamp plate on top of the leaf pack. Install the u-bolts using the openings in the spring plate to locate them correctly. Install the factory lower spring plate, washers and nuts. Take up the slack in the u-bolts but **DO NOT TIGHTEN**.

**15.** Repeat process on other side.

**16.** Raise the axle enough to reinstall the shocks. Tighten the u-bolts to approximately 40 ft-lbs. Final torquing will be done on the ground. Reattach the lower brake line bracket and vent line

**17.** Reinstall the tires and lower the vehicle to the ground. [Torque u-bolts to 145 ft-lbs]

**VERIFY ALL FASTENERS ARE PROPERLY TORQUED BEFORE DRIVING VEHICLE.**

**RETORQUE ALL NUTS, BOLTS AND LUGS AFTER 100 MILES AND PERIODICALLY THEREAFTER.**

#### **ICON VEHICLE DYNAMICS LIMITED LIFETIME WARRANTY**

Icon Vehicle Dynamics warrants to the original retail purchaser who owns the vehicle on which the product was originally installed. Icon Vehicle Dynamics does not warrant the product for finish, alterations, modifications and/or installation contrary to Icon Vehicle Dynamics instructions. Icon Vehicle Dynamics products are not designed, nor are they intended to be installed on vehicles used in race applications, for racing purposes or for similar activities. (A "race" is defined as any contest between two or more vehicles, or a contest of one or more vehicles against the clock, whether or not such contest is for a prize). This warranty does not include coverage for police or taxi vehicles, race vehicles, or vehicles used for government or commercial purposes. Also excluded from this warranty are sales outside of the United States of America and Canada.

Icon Vehicle Dynamics' obligation under this warranty is limited to the repair or replacement, at Icon Vehicle Dynamics' discretion, of the defective product. Any and all costs of removal, installation or re-installation, freight charges and incidental or consequential damages are expressly excluded from this warranty. Items that are subject to wear are not considered defective when worn and are not covered.

Icon Vehicle Dynamics components must be installed as a complete kit as shown in our current application guide. Any substitutions or exemptions of required components will immediately void the warranty. Some finish damage may happen to parts during shipping and is not covered under warranty.

This warranty is expressly in lieu of all other warranties expressed or implied. This warranty shall not apply to any product that has been improperly installed, modified or customized subject to accident, negligence, abuse or misuse.

**FOR TECHNICAL ASSISTANCE OR SUGGESTIONS ON HOW TO MAKE OUR PRODUCT BETTER CALL (951) 689-ICON MONDAY-FRIDAY BETWEEN THE HOURS OF 8AM-5PM PACIFIC-STANDARD TIME, CERTAIN HOLIDAYS EXCLUDED.**

## **ICON VEHICLE DYNAMICS**

PERFORMANCE SUSPENSION SYSTEMS AND SHOCK ABSORBERS

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