

FORD RANGER ADJUSTABLE CAMBER/CASTER UPPER ARMS

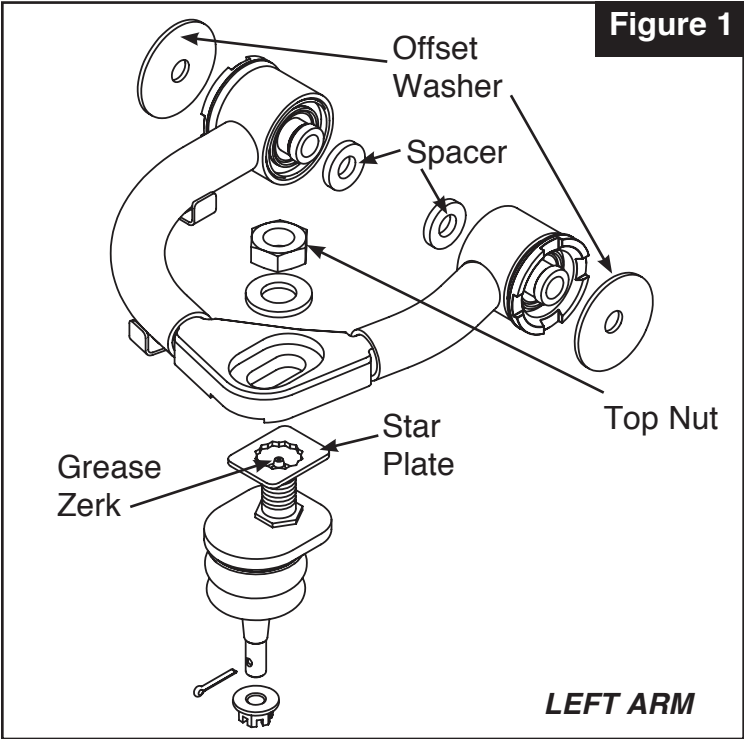
PATENT NO. US 7,513,514 B1

This part should only be installed by personnel who have the necessary skill, training and tools to do the job correctly and safely. Incorrect installation can result in personal injury, vehicle damage and / or loss of vehicle control.

Plan Ahead - Read All Instructions BEFORE installing part.

Check for loose or worn parts, proper tire pressure, and odd tire wear patterns before beginning alignment.

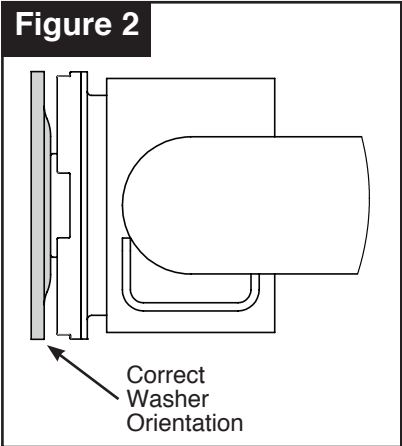
1. Raise vehicle and support by frame so suspension hangs free.
2. Remove front tire and wheel assembly.
3. Set lower cam bolts to center, neutral position and lightly tighten.
4. Loosen nut on long upper control arm-to-frame mounting bolt and remove ABS wiring harness clips from OE control arm.
5. Remove cotter pin and nut holding OE upper ball joint to knuckle. Break taper between ball joint stud and knuckle and remove ball joint from knuckle. Support knuckle to avoid strain to ABS wiring or brake lines.
6. Remove nut and OE washer from long arm-to-frame mounting bolt and remove bolt from arm.  
**NOTE: To provide clearance, additional components in engine compartment may need to be removed.**
7. Remove second washer from head of long arm-to-frame bolt and discard both OE washers. Replace with supplied offset washer. When installed, offset washer flange should face away from bushing flange. See **Figure 2**.
8. Install SPC control arm onto frame tower with supplied spacers on inner side of xAxis™ joints (2 per arm) as shown in **Figure 1**.
9. Place second supplied offset washer over protruding end of bolt. Again, be sure that offset washer flanges are installed facing away from bushing flange.
10. Torque long arm-to-frame bolt to manufacturer's specification.  
**NOTE: Unlike OE rubber bushings, xAxis™ bushings pivot freely and may be fully torqued without placing any weight on suspension.**
11. Install star plate of hex on ball joint per Figure #3 below to achieve desired caster change relative to stock arm.  
**NOTE: For most trucks with 2"-3" of lift setting "D" should return caster to OE specifications, but it may be necessary to use different positions on each side to achieve desired cross caster settings.**
12. Insert ball joint threaded post up through bottom of arm, indexing star plate on post and in machined slot, then install top washer and nut. Position ball joint approximately in middle of slot and lightly tighten nut for initial alignment readings.
13. Insert ball joint into steering knuckle, install supplied castle nut and torque to 45 lb-ft [61 Nm]. Tighten further only until supplied cotter pin can be installed.
14. Clip ABS wiring into brackets of SPC control arm.
15. Grease ball joint with **NLG# 2, Grade LB with 3%-5% Molybdenum Disulfide grease**. 5-10 pumps are sufficient at each lubrication.  
**WARNING: FAILURE TO GREASE AND MAINTAIN THIS BALL JOINT MAY RESULT IN PREMATURE FAILURE.**
16. Reinstall tire and wheel assembly and lower vehicle. Take initial alignment readings.
17. Adjust camber with SPC arm by loosening top nut slightly and sliding ball joint in control arm slot. Adjust caster with SPC arm by loosening top nut more and repositioning star plate to rotate ball joint relative to arm. (It will be necessary to raise vehicle to make camber/caster adjustments with SPC arm). Alignment can be fine-tuned with vehicle weight on suspension using lower control arm cam bolts.



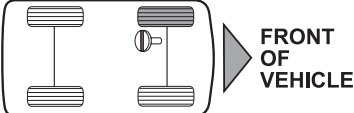
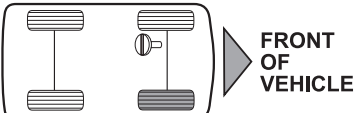
**NOTE: Camber and caster can be set with the SPC upper control arm, as well as the lower control arm cam bolts. In most cases, it is recommended that the lower cam bolts be set to their neutral position. This way they can be used to fine-tune caster.**

Alternately, more tire clearance may be obtained at the rear of the wheel opening if caster is adjusted for max positive with the lower cam bolts, and final alignment achieved with the SPC upper ball joint settings.

18. When final camber/caster settings are achieved, torque top ball joint nut to 150 lb-ft [203Nm]. Torque lower cams to manufacturer's specifications.
19. Adjust toe and road test vehicle.



**Note: With SPC logo facing away from the tire (Position D) this arm will give +1° additional caster. Using the star plate, caster change can be adjusted from -1.0° to +3.0°.**

| LEFT FRONT CASTER CHANGE                                                            |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                      |  |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| A                                                                                   | B                                                                                   | C                                                                                   | D                                                                                   | E                                                                                   | F                                                                                   | G                                                                                    |                                                                                       |
|  |  |  |  |  |  |  |                                                                                       |
| +2.0°                                                                               | +1.75°                                                                              | +1.0°                                                                               | 0°                                                                                  | -1.0°                                                                               | -1.75°                                                                              | -2.0°                                                                                | <b>Ball Joint Setting</b>                                                             |
| +3.0°                                                                               | +2.75°                                                                              | +2.0°                                                                               | +1.0°                                                                               | 0.0°                                                                                | -.75°                                                                               | -1.0°                                                                                |                                                                                       |
| RIGHT FRONT CASTER CHANGE                                                           |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                      |  |
| A                                                                                   | B                                                                                   | C                                                                                   | D                                                                                   | E                                                                                   | F                                                                                   | G                                                                                    |                                                                                       |
|  |  |  |  |  |  |  |                                                                                       |
| +2.0°                                                                               | +1.75°                                                                              | +1.0°                                                                               | 0°                                                                                  | -1.0°                                                                               | -1.75°                                                                              | -2.0°                                                                                | <b>Ball Joint Setting</b>                                                             |
| +3.0°                                                                               | +2.75°                                                                              | +2.0°                                                                               | +1.0°                                                                               | 0.0°                                                                                | -.75°                                                                               | -1.0°                                                                                |                                                                                       |
|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                      | <b>Total Arm + Ball Joint Caster Change</b>                                           |