



**INSTALLATION INSTRUCTIONS AND
PARTS LIST FOR**

Part No. 781070, 781071, 781072

3" SUSPENSION SYSTEM

JEEP WRANGLER (TJ) 4X4

As you read these instructions, you will see NOTES, CAUTIONS, and WARNINGS. Each message has a specific purpose. NOTES are additional information to help you complete a procedure. CAUTIONS are safety messages that indicate a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. A CAUTION may also be used to alert against unsafe practice. WARNINGS are safety messages that indicate a potentially hazardous situation, which, if not avoided, could result in serious injury. CAUTIONS and

WARNINGS identify the hazard, indicate how to avoid the hazard, and advise of the probable consequence of not avoiding the hazard. PLEASE WORK SAFELY!

SAFETY PRECAUTIONS



CAUTION



Read instructions thoroughly before beginning installation.

This sheet provides guidelines to install the BLACK DIAMOND JEEP TJ WRANGLER 3" Suspension System. There are NOTES, CAUTIONS, and WARNINGS which should be followed during installation to avoid possibility of personal injury or damage to the vehicle. During installation, standard safety precautions and equipment should be used where appropriate. Because the skill and experience of the installer and the tools used can vary widely, it is impossible to anticipate all conditions under which this installation is made or to provide cautions for all possible hazards. If your installation varies from the instruction, you must be completely satisfied that your safety or the operation of the vehicle will not be compromised.

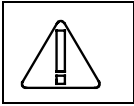


CAUTION

BLACK DIAMOND RECOMMENDS THAT THIS INSTALLATION BE COMPLETED BY A CERTIFIED MECHANIC AND THAT AN ALIGNMENT BE SCHEDULED FOR THE VEHICLE BEFORE BEGINNING THE INSTALLATION OF THIS SUSPENSION SYSTEM. THE VEHICLE MUST BE ALIGNED BY A STATE APPROVED ALIGNMENT SHOP AFTER INSTALLATION OF THE SUSPENSION SYSTEM OR THE BLACK DIAMOND WARRANTY WILL BE VOID.

YOUR VEHICLE MUST BE IN GOOD MECHANICAL CONDITION BEFORE INSTALLING THIS SUSPENSION SYSTEM. THIS INCLUDES, BUT IS NOT LIMITED TO, ALL SUSPENSION/FRAME MOUNTING POINTS, ALL ROD ENDS, THE STEERING SYSTEM, DRIVE LINE JOINTS, AND HARDWARE. IF YOU HAVE ANY DOUBT AS TO THE SOUNDNESS OF YOUR VEHICLE, HAVE IT EXAMINED BY A CERTIFIED MECHANIC BEFORE BEGINNING THE INSTALLATION.

BLACK DIAMOND DOES NOT RECOMMEND THE COMBINATION OF ANY BODY LIFT WITH ANY SUSPENSION LIFT OR MIXING PARTS BETWEEN MANUFACTURERS.



CAUTION

IF YOUR VEHICLE IS EQUIPPED WITH A LOCKING DIFFERENTIAL IN THE REAR AXLE, EXTREME CARE MUST BE TAKEN DURING VEHICLE OPERATION. THE EFFECT OF A LOCKED AXLE AND ACCELERATION OF THE THROTTLE CAN CAUSE THE VEHICLE TO RAISE THE FRONT TIRES FROM THE GROUND, LOSING CONTROL OF STEERING. !



WARNING

HEIGHT MODIFICATIONS MAY RAISE THE CENTER OF GRAVITY OF A VEHICLE. OFF ROAD OPERATION AND/OR HEIGHT MODIFICATION MAY INCREASE YOUR VEHICLE'S SUSCEPTIBILITY TO ROLL OVER. YOUR STATE MAY REGULATE HEIGHT MODIFICATIONS. PLEASE BE INFORMED OF THE LAW IN YOUR STATE. HEIGHT MODIFICATIONS MAY AFFECT REACTION, RIDE, HANDLING, AND THE WEAR RATE OF YOUR VEHICLE'S COMPONENTS. HAVE YOUR VEHICLE INSPECTED REGULARLY. HEIGHT MODIFICATIONS MAY REQUIRE OTHER ADJUSTMENTS TO YOUR VEHICLE. BLACK DIAMOND RECOMMENDS INSTALLATION BY A PROFESSIONAL MECHANIC.

USE EXTREME CAUTION WHEN ENCOUNTERING CONDITIONS WHICH MAY CREATE VEHICLE LOSS OF BALANCE OR CONTROL. AVOID SHARP TURNS AND ABRUPT MANEUVERS WHICH MAY CAUSE A VEHICLE ROLL OVER. USE SEAT BELTS AND HARNESSSES. DON'T DRINK OR USE DRUGS AND DRIVE. TREAD LIGHTLY!

THE VEHICLE MUST BE ALIGNED BY A STATE APPROVED ALIGNMENT SHOP AFTER INSTALLATION OF THE SUSPENSION SYSTEM OR THE BLACK DIAMOND WARRANTY WILL BE VOID.

TIRE SIZE NOTE:

Maximum Tire size with no tread contact is 33" x 12.5".

Maximum allowable backspacing is 3 1/2" (with a 12.5" wide tire.)

ATTENTION:

Upon completing the installation of your **Black Diamond Suspension System**, save all stock components removed. This vehicle can be readily returned to its stock configuration if these parts are retained.

When disconnecting the front anti-sway bar for OFF-ROAD driving, be sure and tie the bar to the inner fender with a zip tie or short bungi cord to prevent any damage or binding with other components.

INSTALLATION NOTES

THE JEEP TJ WRANGLER COMES FROM THE MANUFACTURER WITH A VARIETY OF ENGINE SIZES AND TOP CONFIGURATIONS. EACH OF THESE OPTIONS WILL AFFECT THE LEVEL APPEARANCE OF THE VEHICLE AFTER THE INSTALLATION OF THE SUSPENSION SYSTEM. THE TJ WRANGLER SUSPENSION IS A RELATIVELY SENSITIVE SYSTEM AND CHANGES TO THIS WILL CONSEQUENTLY AFFECT THE OVERALL LIFTED APPEARANCE / RAKE OF THE VEHICLE. OTHER AFTERMARKET OPTIONS SUCH AS GEAR RACKS, TOOL BOXES, SNOW PLOWS AND WINCHES WILL ALSO AFFECT THE RAKE OF THE VEHICLE.

THIS SUSPENSION SYSTEM IS DESIGNED TO FIT MOST TJ WRANGLERS, HOWEVER THE VEHICLES RIDE HEIGHT WILL VARY DEPENDING ON HOW YOUR VEHICLE IS OUTFITTED.

VEHICLES THAT ARE EQUIPPED WITH SHORT REAR DRIVE SHAFTS MAY INCUR VIBRATIONS. SOME OF **BLACK DIAMONDS** SUGGESTIONS ARE:

- DRIVE LINE AND PINION ANGLES MAY REQUIRE ADJUSTMENTS USING OE ADJUSTING CAMS
- SLIP YOKES MAY NEED REPLACEMENT OR REPAIR.
- DRIVE SHAFTS MAY NEED TO BE BALANCED.
- UNIVERSAL JOINTS MAY REQUIRE SERVICE OR REPLACEMENT.
- MODIFICATION OF THE TAIL SHAFT ON THE TRANSMISSION AND REPLACING THE DRIVE SHAFT.

EACH OR ALL OF THESE RECOMMENDATIONS MAY BE NECESSARY TO PREVENT EXCESSIVE OR SERIOUS DRIVE SHAFT VIBRATIONS AFTER INSTALLING A LIFT SYSTEM ON THIS TYPE OF VEHICLE.

PARTS LIST

PARTS BOX (781070)

PART NO.	QUANTITY	DESCRIPTION
781075	1	PARTS PACK T-CASE SPACER
781077	4	EXTENDED POLY BUMP STOP
711166	2	EXT. SWAY BAR DROP LINK REAR
781074	1	PARTS PACK, EXT DROP LINKS
781078	2	EXT. SWAY BAR DROP LINK FRONT
781069	1	DROP PITMAN ARM WRANGLER
781249	1	REAR TRACK ARM BRACKET
781255	1	PARTS PACK, REAR TRACK ARM
719202	2	PARTS PACK P-511

PARTS BOX (781071)

PART NO.	QUANTITY	DESCRIPTION
781073	2	COIL SPRING, FRONT

PARTS BOX (781072)

PART NO.	QUANTITY	DESCRIPTION
781081	2	COIL SPRING, REAR

PARTS PACK T-CASE SPACERS (781075)

PART NO.	QUANTITY	DESCRIPTION
781080	6	T-CASE CONE SPACERS
711165	6	T-CASE BEVELED SPACERS
12X3C8CS	6	1/2-13 X 3 HEX BOLT
12LW	6	1/2 MEDIUM LOCK WASHER

PARTS PACK SWAY BAR DROP LINKS (781074)

PART NO.	QUANTITY	DESCRIPTION
01-60418	4	POLY BUSHING 3/4" I.D.
781076	4	SLEEVE 9/16 I.D. X 3/4 O.D. X 1 1/2
01-60416	2	POLY BUSHING 5/8 I.D.
12UW	8	SPACERS 1/4 THK x 1/2 I.D.
781084	2	BAIL CLIP PIN 1/4 x 1 3/8
710206	1	COTTER PIN

TOOLS REQUIRED FOR INSTALLATION:

SAE & Metric Combination wrenches
 1/2" drive ratchet
 1/2" drive metric sockets
 Torque wrench
 Ball joint separator
 TORX® T-55, T-50

Hydraulic floor Jack
 Heavy duty jack stands
 Lithium based grease
 Large ball peen hammer
 Drill bits 1/8, 1/2, 5/16

FRONT SUSPENSION INSTALLATION:



WARNING



WEAR SAFETY GOGGLES Raised vehicles can cause falling particles.. Falling particles can cause eye injury.



Improperly supported vehicles can fall. **DO NOT USE A JACK TO SUPPORT THE VEHICLE. USE JACK STANDS IN PAIRS TO SUPPORT THE VEHICLE. USE JACKS OR JACK STANDS ONLY ON A HARD, STABLE, AND LEVEL SURFACE. DO NOT EXCEED THE RATED CAPACITY OF A JACK OR JACK STANDS.** An unstable vehicle can fall and cause a crushing injury.

A rolling vehicle can cause jack stands to tip. Before working under vehicle, **VERIFY THAT THE PARKING BRAKE IS SET, THE TRANSMISSION IS IN PARK (AUTOMATIC) OR REVERSE (MANUAL) AND THE REAR WHEELS ARE BLOCKED.** A tipping jack stand or vehicle can cause injury.

1. Raise and secure the front of the vehicle. Support the frame with jack stands and remove the front tire and wheel assemblies.
2. Support the front axle with a floor jack and disassemble the front suspension:
 - Remove the OE shocks.
 - Remove the anti sway bar end links from frame and axle.
 - Disconnect the front track bar at the axle.
 - Remove the spring retainer clips.
 - Mark alignment cams on axle end of lower suspension arms for later installation.
 - Disconnect the brake lines from the frame to prevent over stressing, and ABS sensor lines from the suspension arms.
 - Remove lower suspension arms and lower the axle.
3. Remove the OE springs and bump stops. Disconnect the drag link from the pitman arm, and remove the pitman arm.
4. Install the new polyurethane extended bumpstops. Apply a small amount of grease to the upper lip and insert using a floor jack to raise the axle and press the bump stop into the frame cup.
5. Install the new front coil springs on the axle and secure using the OE clips. Tighten the 13mm bolt.
6. Install the new longer front Black Diamond AT or XT shocks at this time.
 - Torque the lower shock mount bolts to 15 ft-lbs.
 - Tighten the upper stud until the bushings are slightly compressed.

7. Reinstall the front lower suspension arms, but do not tighten at this time. Attach the brake line brackets to the frame, and the ABS sensor lines to the suspension arms.
8. Install the new drop pitman arm and torque the steering gear nut to 185 ft·lbs.
9. Attach the drag link to the pitman arm and torque the castle nut to 55 ft·lbs. Installation of new cotter pin is required.

NOTE: ALWAYS TIGHTEN THE CASTLE NUT TO LINE UP THE COTTER PIN HOLE. NEVER LOOSEN THE NUT.

10. Relocate the new mounting hole for the front track bar on the axle bracket at this time. Scribe a horizontal line through the center of the existing hole. Using a rule, mark the location of the new track rod mounting hole $3/4$ " inboard as shown in **Figure 1**.

Center punch and drill a pilot hole through both front and back plates, keeping the drill as straight and square to the face of the axle bracket as possible.

NOTE: KEEPING THE HOLE STRAIGHT IS VERY CRITICAL. Drill the pilot hole out to $7/16$ ".

Do not attempt to attach the track rod until the vehicle is on the ground.

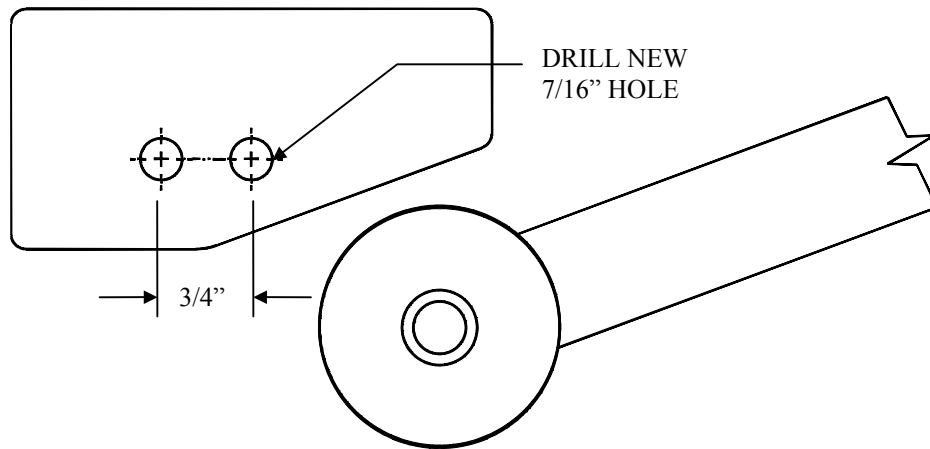


Figure 1.

11. Install the front tires and wheels at this time.
12. Lower the vehicle to the ground slowly and guide the track bar into position until the new mounting holes line up with the sleeve in the track rod. Use the original TORX® fastener and flag nut. Torque to 55 ft·lbs. Torque the wheel lug nuts.
13. Create the Black Diamond anti-sway bar quick disconnect links. The OE ball joint is utilized to maintain the OE performance and travel. Cut the OE link

just before the bend as shown **Figure 2** using a Hack Saw or similar method. File the cut end to remove any burrs. Insert the ball joint into the end of the new Black Diamond drop link and match drill a 1/4" hole using the new Black Diamond drop link as a guide. **Figure 3**.

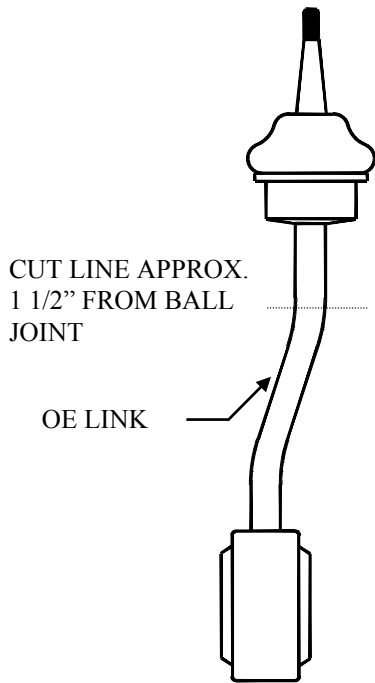


Figure 2.

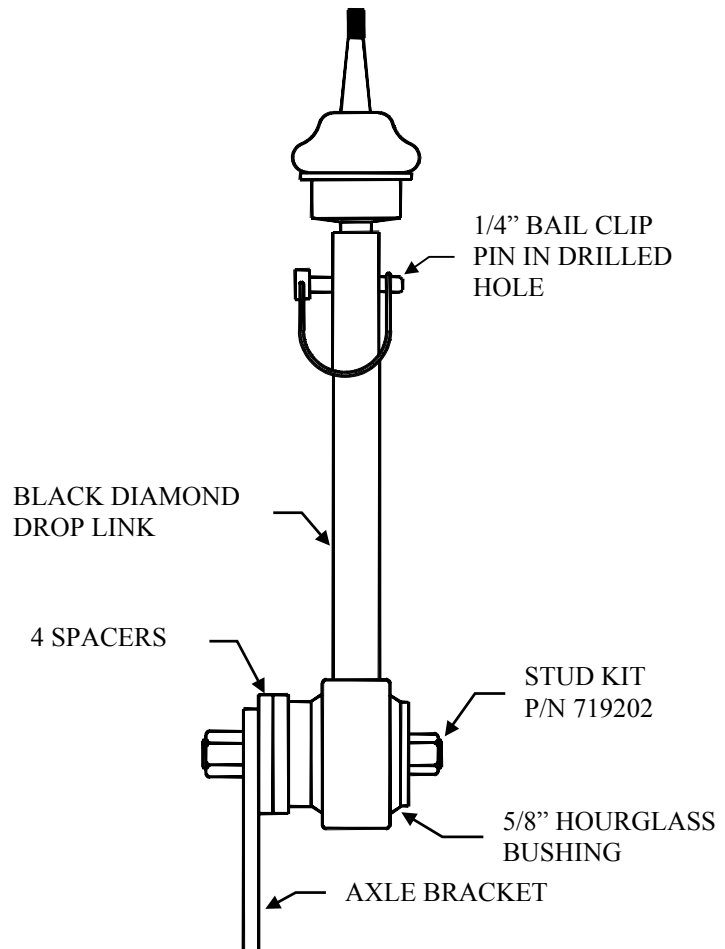


Figure 3.

14. Assemble the new Black Diamond front Anti-Sway bar links, using the 5/8" bushing, and 1/4" bail clip pin. Drill out the Anti-Sway bar axle bracket to 1/2". Install the mounting stud as shown in **Figure 3**, using the 4 spacers between the bracket and the mounting stud. Attach the drop links.

REAR SUSPENSION INSTALLATION



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A rolling vehicle can cause jack stands to tip. Before working under vehicle, **VERIFY THAT THE PARKING BRAKE IS SET, THE TRANSMISSION IS IN PARK (AUTOMATIC) OR REVERSE (MANUAL) AND THE REAR WHEELS ARE BLOCKED.** A tipping jack stand or vehicle can cause injury.

1. Raise and secure the rear of the vehicle, support the frame using jack stands and remove the tire and wheel assemblies.
2. Support the rear axle with a floor jack and disassemble the suspension:
 - Remove the rear shocks.
 - Remove the rear anti sway bar drop links.
 - Remove the track bar from the frame mount.
 - Lower the rear axle and remove the OE springs.
 - Remove the OE bump stops.
 - Remove the track rod from the axle mount at this time and mark the location of each end for reference.
3. Install the new track bar bracket . Place the bracket on the original track bar mount and install the new 1/2" x 3" bolt through the bracket , the original mounting hole, and the spacer provided. Tighten the 1/2" bolt. Using the new bracket as a guide, drill two 5/16" holes into the factory bracket. Install the 5/16" x 1" bolts through the new bracket and the factory bracket. Torque the 5/16" bolts to 17-19 ft/lbs. and the 1/2" bolt to 70 ft/lb.. **(SEE FIGURE 4)**

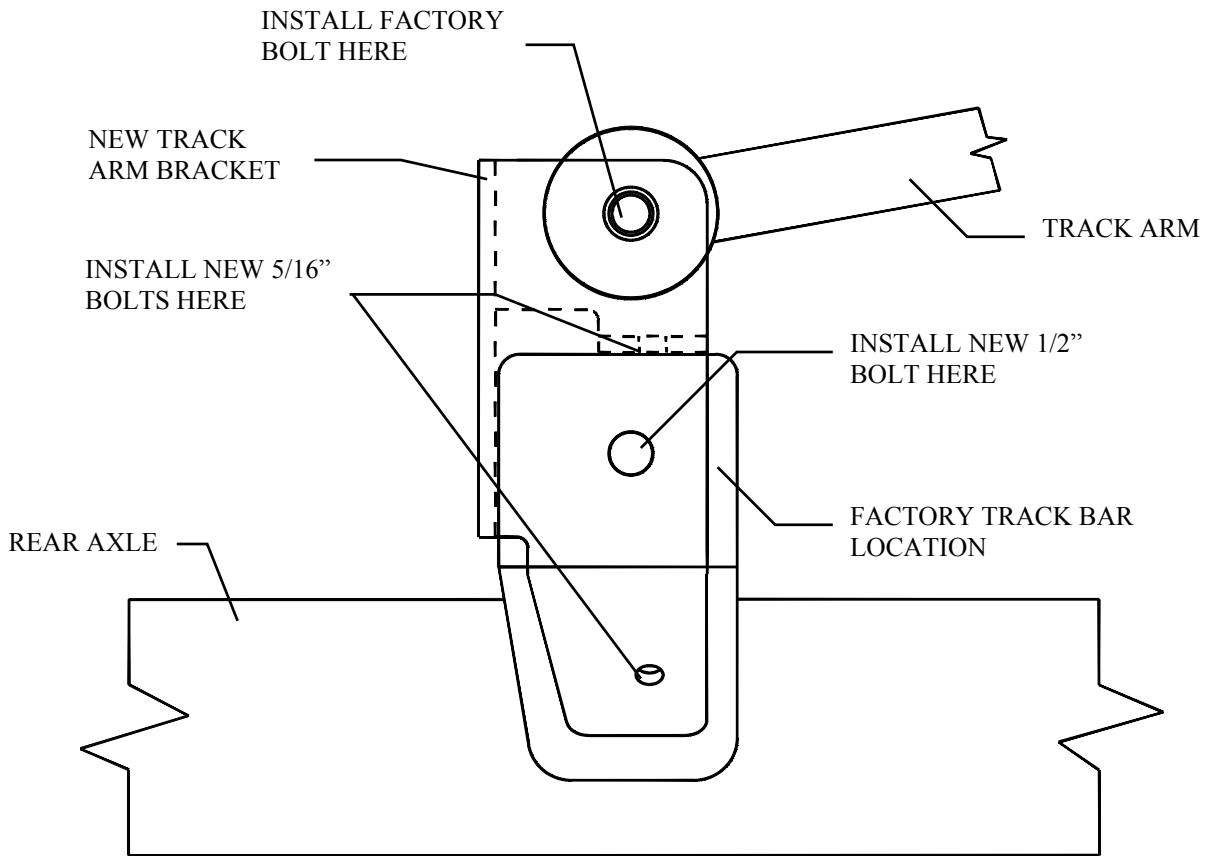


Figure 4.

4. Install the original TORX® fastener and flag nut in the new mounting hole and attach the track rod. Torque to 74 ft·lbs. Do not attempt to install frame bolt at this time.
5. Install the new polyurethane extended bumpstops. Apply a small amount of grease to the upper lip and insert using a floor jack to raise the axle and press the bump stop into the frame cup.
6. Install the new coil springs and raise the axle to position and support the springs.
7. Install the new longer rear Black Diamond AT or XT shocks at this time. Torque the upper bolts to 23 ft·lbs. Torque the lower bolt to 74 ft·lbs.
8. Assemble the rear anti-sway bar drop links with the 3/4" I.D. hourglass bushings and steel sleeves. Install the links using the original fasteners. Torque the link bolts to 40 ft·lbs.

- 9 Install the tires and wheels.
10. Lower the vehicle to the ground slowly and guide the track bar into position until the frame holes line up with the sleeve in the track rod. Install original fastener and nut. Torque to 74 ft·lbs.
11. Support the tail shaft of the transmission and remove the 4 fasteners securing the transmission / transfer case to the cross member.
12. Support the pan / cross member and remove the 6 fasteners securing it to the frame. Lower the cross member enough to insert the (6) steel concave spacers between the frame and cross member and secure with (6) 1/2-13X3" bolts, 1/2" lock washers and beveled spacers as shown in **Figure 5**. Torque to 70 ft·lbs.

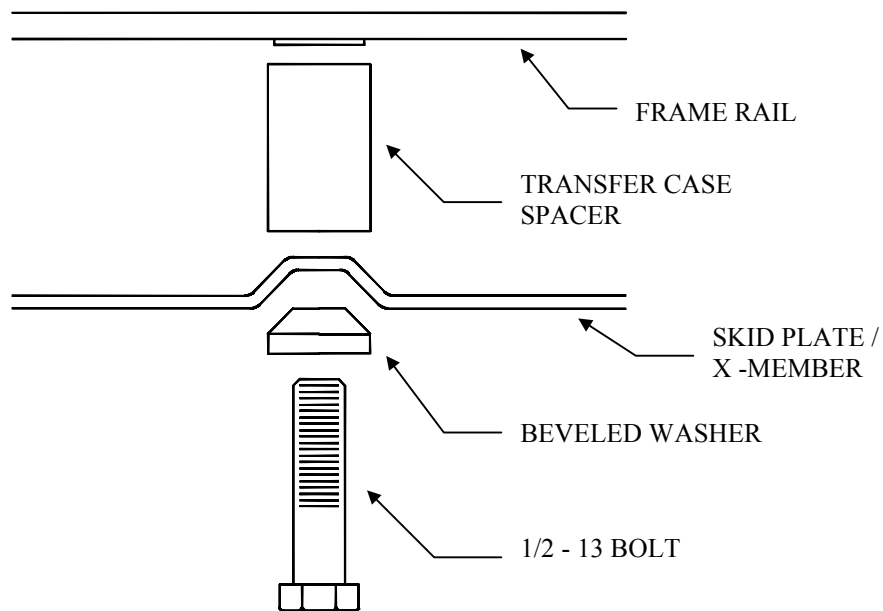


Figure 5.

13. Lower the transmission to the pan/cross member and install the 4 nuts that secure the transmission / transfer case.

FINAL INSTALLATION:

1. With the vehicle sitting on the ground, bounce the front and rear several times to settle the springs.

2. Line up match marks on alignment cams of the front lower suspension arms and torque each fastener.
Torque the axle fastener to 85 ft·lbs.
Torque the frame fastener to 130 ft·lbs.
3. Check torque on all other affected fasteners.

(ALL SPECIFICATIONS ARE DRY THREAD SPECIFICATIONS)

FRONT SUSPENSION

Fastener	Torque Specification
Drag Link to Pitman Arm	55 ft·lbs
Pitman Arm to Shaft	185 ft·lbs
Track Rod to Axle	55 ft·lbs
Anti-Sway Bar Link Upper Nut	45 ft·lbs
Anti-Sway Bar Link Lower Nut	65 ft·lbs
Lower Shock Mount	15 ft·lbs
Suspension Arm Axle Nut	130 ft·lbs
Suspension Arm Frame Nut	130 ft·lbs

REAR SUSPENSION

Fastener	Torque Specification
Upper Shock Bolts	23 ft·lbs
Lower Shock Bolt	74 ft·lbs
Track Rod Axle Bolt	74 ft·lbs
Track Rod Frame Bolt	74 ft·lbs
Anti-Sway Bar link Upper and Lower Nuts	40 ft·lbs

4. Have an assistant turn the steering wheel to full left lock and full right lock while you check for tire clearance or any excessive tension on any lines or wires.



WARNING

5. **Have your vehicle aligned to the factory specifications at a state approved alignment shop or your Black Diamond warranty will be void.**

6. After driving your vehicle for 150 miles, check torque on all affected fasteners. Check torque on all affected fasteners after any off road use during the first 300 miles of operation. It is the responsibility of the vehicle owner/operator to ensure that all fasteners have sufficient torque during the life of the vehicle.

IMPORTANT PRODUCT USE INFORMATION

As a general rule, the taller a vehicle is, the easier it will roll over. Offset, as much as possible, what is lost in roll over resistance by increasing tire track width. In other words, go “wide” as you go “tall”. Many sportsmen remove their mud tires after winter / hunting season and install ones more appropriate for street driving; always use as wide a tire and wheel combination as possible to enhance vehicle stability.

We strongly recommend, because of roll over possibility, that the vehicle be equipped with a functional roll bar and cage system. Seat belts and shoulder harnesses should be worn at all times. Avoid situations where a side rollover may occur.

Generally, braking performances and capabilities are decreased when significantly larger / heavier tires and wheels are used. Take this into consideration while driving.

Do not add, alter, or fabricate any factory or aftermarket parts to increase vehicle height over the intended height of the Black Diamond product purchased. Mixing component brands is not recommended.

Most states have some type of law limiting vehicle height. The amount of lift allowed, and how the lift may be achieved, varies greatly. Several states offer exemptions for farm or commercially registered vehicles. It is the owner’s responsibility to check state and local laws to ensure that their vehicle will be in compliance.

Black Diamond makes no claims regarding lifting devices and excludes any and all implied claims. Black Diamond will not be responsible for any altered product or any improper installation or use of our products.

We will be happy to answer any questions concerning the design, function, and correct use of our products.

IMPORTANT MAINTENANCE INFORMATION

It is the ultimate buyer’s responsibility to have all bolts / nuts checked for tightness after the first 100 miles and then every 1000 miles. The steering, suspension and driveline systems, along with wheel alignment should be inspected by a qualified professional mechanic at least every 3000 miles.

NOTICE TO DEALER AND VEHICLE OWNER

Any vehicle equipped with a Black Diamond lifting device must have the enclosed “Warning to Driver” decal installed on the inside of the windshield or on the vehicle’s dash, within driver’s view. The “Warning to Driver” decal is to act as a constant safety reminder for whoever may be operating the vehicle. The WARRANTY IS VOID unless this decal is in place. **INSTALLING DEALER...** It is your responsibility to install warning decal and forward these installation instructions to the vehicle owner for review of warnings, product use and maintenance information. Replacement warning decals are available free upon request. These instructions are to be kept with the vehicle registration papers and owners manual for the service life of the vehicle.

BLACK DIAMOND LIMITED LIFETIME WARRANTY

Suspension products bearing the Black Diamond (Woods Ready Dist.) name are warranted for as long as the original purchaser owns the vehicle that the Woods Ready product was originally installed on. This warranty is non-transferable. Warranty covers only the product, no labor, time loss, or freight incurred. Any product that has been abused, altered, incorrectly installed, or used in competition is not covered. Product finish, spring bushings, Polyurethane products, and normal wear is not covered. The Woods Ready product is subject to replacement or repair. No other warranties are expressed or implied. An authorized Black Diamond dealer must inspect the part in question and confirm that the "Warning to Driver" decal is properly displayed. A copy of the sales invoice is required for warranty consideration.

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