COGNITO SM Series Ball Joint Upper Control Arm Kit for 2020 GM 2500HD/3500HD 2WD/4WD

INSTALL INSTRUCTIONS:

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SKU: 110-90910

COMPONENTS INCLUDED:

QUANTITY	PART #	DESCRIPTION
1	80000	COGNITO 2020 GM 2500HD/3500HD SM UCA DRVR
1	80001	COGNITO 2020 GM 2500HD/3500HD SM UCA PASS

HARDWARE INCLUDED:

QUANTITY	PART #	DESCRIPTION
1	8689	COGNITO 2020+ GM 8-Lug SM UCA, Driver
1	8690	COGNITO 2020+ GM 8-Lug SM UCA, Passenger
2	91253	COGNITO Alpha Pro Ball Joint
2	7057	CMS 40mm ALPHA PRO BILLET CAP
4	6879	PIVOT BUSHING (MAINTENANCE FREE)
2	2100	COGNITO BADGE LOGO 4.75” OAL
2	HARDWARE-SPIROLOX-2.375	SPIROLOX 2.375” INTERNAL RETAINING RING
4	HARDWARE-RIVET-1/8	1/8” DIA X 3/16”-1/4” GRIP RANGE SS RIVET

TECH NOTES:

- Read instructions carefully and study the pictures (if included) before attempting installation.
- If this product was purchased as part of a bundle/package, familiarize yourself with each set of instructions included with the bundle/package before beginning.
- Check the parts and hardware packages against the parts list to assure that your kit is complete before starting.
- Ball joints come pre-greased from the factory



WARNING

Please read this entire instruction sheet before beginning installation. Proper installation of these components requires a qualified mechanic. Always wear safety glasses when using power tools, and take appropriate precautions when working under a vehicle. If these instructions are not properly followed you may jeopardize your, and your passenger’s safety, and severe frame, suspension or tire damage may also result from improper installation.
Modification of vehicle suspension can interfere with ride-height sensors, active suspension, lane departure features, semi-autonomous, and autonomous driving features. It is the responsibility of the installer to determine feature compatibility prior to installation. Recalibration of sensors may be required in the event of any modification.

BALL JOINT WARNING:

The upper control arm is not designed to be the droop limiter, ball joint failure will occur if the upper arm is used as the droop limiter. A shock or limit strap is required to be the limiter. It is required that the proper length shock from Cognito or a limit strap kit from Cognito be installed to prevent failure which could cause an accident and serious injury. If you have questions, please contact the Cognito Sales Team to have you questions or concerns addressed.

IMTRODUCTION

The Cognito Ball Joint SM Series Upper Control Arm Kit is a direct replacement for the factory upper control arms (UCAs). The Cognito UCA kit will add performance due to a modified ball joint angle that extends travel limitations of the ball joint in leveled or lifted applications. The allowable droop travel is also improved with the design of these arms. Designed and made in the USA

REQUIREMENTS

- **The upper control arm is not designed to be the droop limiter, ball joint failure will occur if the upper arm is used as the droop limiter. A shock or limit strap is required to be the limiter. It is required that the proper length shock from Cognito or a limit strap kit from Cognito be installed to prevent failure which could cause an accident and serious injury. When installing the upper control arms, it is critical that the lower control arm be properly supported to limit the movement of the suspension. Removal of droop limiting parts while the torsion bar is loaded can result is sudden and rapid movement of the suspension, potentially resulting in damage to components, serious injury or death.**
- Proper shocks and shock lengths must be used or damage to the control arms, ball joints, and vehicle will occur.
- Trimming of inner fender well and bottom rear of steel fender may be required.
- Installation requires a qualified mechanic.
- Follow the OE specifications when replacing or re-installing OE fasteners, retainers, and hardware specified in the OEM service manual.
- Always wear safety glasses when using power tools.
- When a lift is required to perform the installation of these products ensure the vehicle is properly supported before attempting installation or serious injury may occur.

INSTALLATION

1. Place the truck on a flat surface with the parking brake engaged, chock the rear tires.
2. Use a suitable floor jack in the manufacturer designated spot on the frame to lift the front of the truck, then place a suitable jack stand under the frame and set the truck down securely on the jack stand. NEVER WORK UNDER AN UNSUPPORTED VEHICLE. Remove the front wheels and tires.

3. **It is critical that the correct length shock is used**, using a shock that is too long will cause the upper ball joint to bind and break. **For this kit, when used in a stock-height or leveling application, the maximum shock length that can be used is 19.7" from the center of the lower eyelet to the mounting face at the top of the strut hat. Any spacers added to the shock must be included in this measurement** (see **[FIGURE 1]**). If this UCA kit is used with any other parts then specified, warranty will be void on this arm kit, and damage may occur to arms, ball joints, tie rods, cv axles and possibly more. Do not remove or unbolt the shock while the torsion bars are loaded.

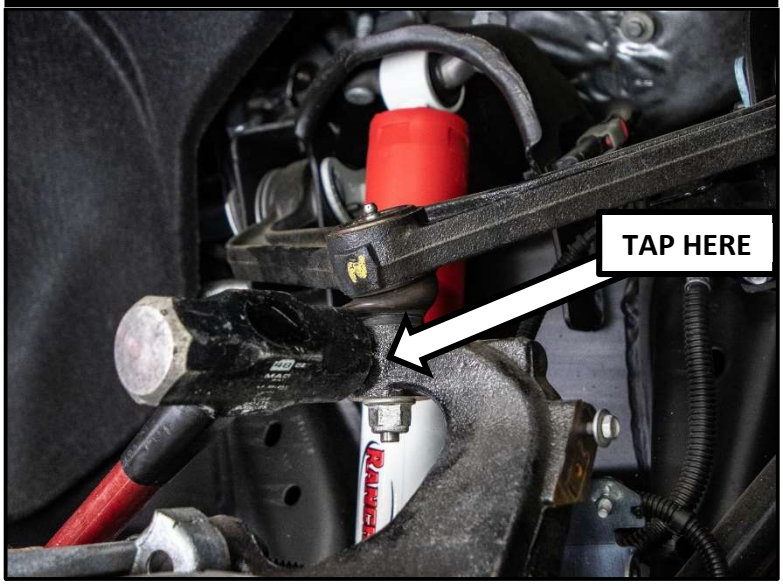
Figure 1: Shock Length Check



4. Support the lower control arms with a floor jack or stand prior to removing the upper control arms (UCA's).
   - **NOTE:**
     These vehicles are equipped with torsion bar springs that will require the jack to remain in place until the upper control arm is reinstalled.
     Failure to support the lower control arm prior to removing the UCAs can result in rapid unloading of the torsion springs causing the lower control arm and spindle to forcibly snap downwards, possibly damaging components or causing bodily harm to the user.
     If unable to support the lower control arms for this install, then the torsion bars must be unloaded to safely perform this install. Reference a repair manual for how to properly unload and load the torsion bars for the specific vehicle being worked on.

5. Remove the factory upper control arms. Loosen the ball joint nut of the upper control arm enough until the nut can be spun by hand, but do not remove totally. Use a pickle fork to separate the ball joint from the spindle or tap on the side of the spindle next to the ball joint stud. When the tapered seat of the ball joint breaks loose, remove the ball joint nut, and separate the factory upper control arm from the spindle. **[FIGURE 2]**

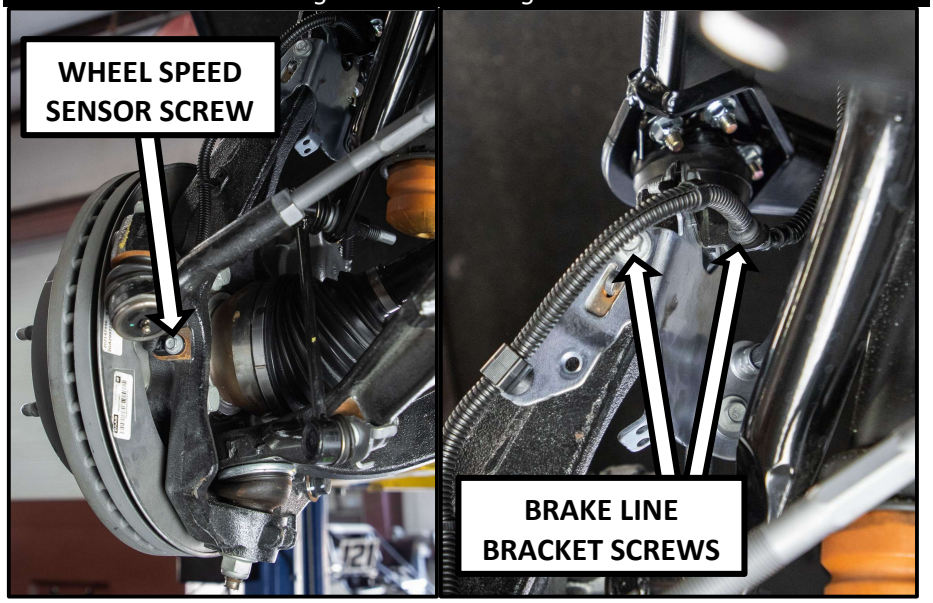
Figure 2: UCA and Spindle Disassembly



6. Remove the factory bolts and eccentric washers that connect the control arm to the frame and retain them for future use. Place them aside and note the order in which the components were removed, that way they may be re-installed in the same manner they came off.

7. Remove the wheel speed sensor and brake line bracket that are attached to the spindle. **[FIGURE 3]**

Figure 3: Shock Length Check



8. Due to the added droop travel when using the COGNITO upper control arms, the service perch under the upper control arm which is welded to the frame, must be partially cut off to facilitate full trave l. Start by removing the screw for the brake line bracket attached to the service perch. **[FIGURE 4]**

Figure 4: UCA and Spindle Disassembly

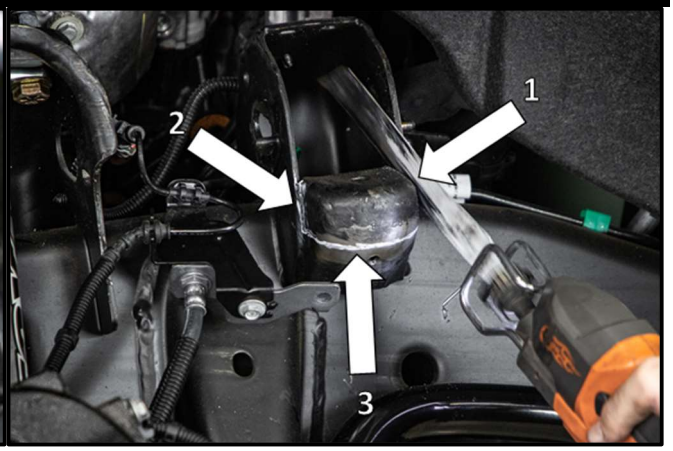


9. Mark the service perch in the 3 locations shown in **[FIGURE 5]** with the lower horizontal line 1/2 inch above the brake line bracket mounting hole. Tie up any hoses and wires so they are clear of the cutting area and cut the service perch along the marked lines.

- **NOTE:**
  Take great care to keep the lines and wires safe during the cut and make sure to shield them from sparks if any kind of grinder is used.
  - Wear safety glasses.
  - Exposed raw metal should be coated or painted to prevent corrosion.

Figure 5: Mark and Cut Service Perch





10. Reinstall the removed brake line bracket to the service perch [Torque the bolt to **22 ft-lbs**].
11. Reinstall the lower brake line bracket to the service perch [Torque the bolt to **22 ft-lbs**].
12. Reinstall the wheel speed sensor [Torque the bolt to **72 in-lbs**].
13. Locate the driver side UCA (assembly P/N 80000), mount the COGNITO UCA to the frame using the factory bolts, nuts and eccentric washers as previously removed. [Torque the hardware to **90 ft-lbs**].

- **NOTE:**

The control arms are not identical and are stamped with identifying numbers. **8689** is the driver side, and **8690** is the passenger side UCA. The Cognito logo will be closest to the front of the vehicle when properly mounted.

Ensure that the cam bolts are the middle of the adjustment swing. It is not recommended to drive long-term on this alignment, Professional front-end alignment is required once the install is completed. **[FIGURE 6]**

Figure 6: COGNITO UCA Installation



14. Mount the ball joint to the spindle with supplied hardware. Use the flat washers supplied if the castle nut needs to be spaced down for the cotter pin to engage with its castellations [Torque the nut to **50 ft-lbs**]. Install the cotter pin and bend to lock into place.

- If the castellations in the castle nut and the hole in the ball joint pin do not align once torqued to **50 Ft.-lbs** continue tightening the nut until the two are aligned and the cotter pin can be installed. ***NEVER LOOSEN THE NUT TO GET THE CORRECT ALIGNMENT!***

15. Repeat the steps above for the passenger side using the UCA assembly P/N 80001.

16. Ensure that all bolts are properly torqued. Ensure there are no rubbing or loose cables anywhere after the Cognito UCA installation. Use cable ties to restrain any cables from interfering with any other parts. Check that all lines are free of stress or interference while the vehicle is in full droop, full bump, and throughout the complete steering cycle.

17. Reinstall the wheels and tires, remove the vehicle from the jackstands and lower it back to the ground. [Torque lugs to factory specs]

18. Before lowering the vehicle, measure from the top of the wheel well directly above the center line of the wheel to the top of the tire, **[FIGURE 7]**. Record this measurement as (A) in Table 1. Subtract 3 inches from A and record this number.

- **NOTE:**
  It can be helpful to place a piece of painter's tape at the top of the wheel well directly above the centerline of the wheel and measure from there.

19. Set the truck on the ground and drive forward and backward a few times to settle the suspension. Measure again from the top of the tire to the top of the wheel well as in the step above and record this measurement as (C) in Table 1.

- **NOTE:**
  If (C) is larger than (B), the ride height is too tall. This can be caused by shocks or shock spacers that are too long, stacked shock spacers, spring preload devices, or any combination of the above.

Failure to use compatible shocks to limit the vehicles front suspension may cause over-extension, which as a result can cause damage to ball joints, uni-balls, tie rods, and/or CV axles, along with other related safety issues.

Warranty on Cognito products will be void if the vehicles front suspension is not properly limited to the above max ride height calculation.

Suspension Travel	Record	Measurement (Inches)
Full Droop	**A**	
Max Ride Height	**B** = A – 3 in	
Ride Height	**C**	

Table 1: Suspension Travel Measurements

Figure 7: Measuring and Setting Ride Height



20. Check wheel and tire clearance one last time through the steering cycle. Make adjustments as needed.

21. Adjust the headlights per your owner's manual.

22. Get vehicle professionally aligned after the install.

- **NOTE:**

  Some COGNITO upper control arms have added caster built into them to increase drivability performance, therefore it's important to be sure the correct control arm is installed on the correct side of the vehicle. It's also important to make your alignment shop aware that if caster is higher than normal for OEM, that is the intention by design.

  Cross caster is important in making your vehicle track straight down the road. Most roads have crown to them, high in the middle for water runoff. This crown will make your vehicle want to pull to the right.

Vehicles with stock tires on them have a narrow contact patch on the ground and are not as affected as a vehicle having larger wider tires. With larger wider tires it's important to have cross caster proper in order for the vehicle to track straight on these roads. Trucks with dual rear wheels have more tire on the ground and require more cross caster. The length of the wheelbase will also affect cross caster needed.

Generally, crew cab short and long bed trucks like .8 degrees of cross caster. For example, the driver side would have 2° while the passenger side would have 2.8° of caster. Dual rear wheel trucks like .9-1.0 degrees of cross caster. Your area might have roads that are crowned more or less than average therefore these numbers may need to change, and your alignment shop should understand this. If your alignment tech is stating they can't align the truck, that typically means they can't get the alignment to OEM spec, and that's fine because your vehicle is no longer OEM. A good tech will understand this and the numbers and let caster run slightly out of OEM spec (Caster should always be above 2 degrees positive) while maintaining cross caster needed for the vehicle and roads so you enjoy your vehicle with aftermarket Cognito parts and your driving experience. Camber should always be from -.1° to +.1° and toe should always be .125" to .250" toe in for best tire wear.

VERIFY ALL FASTENERS ARE PROPERLY TORQUED BEFORE DRIVING VEHICLE.
RETORQUE ALL NUTS, BOLTS AND LUGS AFTER 100 MILES AND PERIODICALLY THEREAFTER.

This completes the installation steps, enjoy your new Cognito SM Series Ball Joint Upper Control Arm Kit!

WARRANTY / RETURN POLICY / SAFETY

Cognito Limited Lifetime Warranty

Cognito Motorsports, Inc. hereinafter "Cognito," warrants to the original retail purchaser, that its suspension products are free from workmanship and material defects for as long as the purchaser owns the vehicle on which the product(s) were originally installed. This warranty will be void if any modifications are made to the components, including alterations to the surface finish, i.e.; painting, powder coating, plating, and/or welding, or if they are improperly installed. Cognito truck suspension products are not designed nor intended to be installed on "competition" vehicles used in race applications, stunt or for exhibition purposes that are outside of the intended operating conditions specified by the manufacturer. Racing and competition are defined as any contests between two or more vehicles; or vehicles competing individually on off road circuits in timed events (whether or not such contests are for an award or prize).

This warranty does not include coverage for police, taxi, government or commercial vehicles, and the warranty does not cover Cognito products sold outside of the USA. Cognito's obligations under this warranty are specified and applied at its sole discretion, and warranty coverage is limited to repair or replacement of the defective product(s). Any and all costs of removal, installation or reinstallation; freight charges, incidental or consequential damages associated with the covered products are expressly excluded from this warranty.

The following items are exempt from Cognito limited warranty coverage: bushings, bump stops, tie-rod ends (Heim joints) and limiting straps. These parts are "consumables" and designed to wear as a normal part of their duty cycle, therefore they are not considered defective when worn. The aforementioned products are warrantied separately against defects in workmanship, for 60 days from the date of purchase. As a condition of warranty validation, respective Cognito suspension components must be installed as a complete system (not combined with non-Cognito hardware or ancillary parts). Any substitutions or omission of required components will void the warranty. Some minor cosmetic wear and imperfections may occur to parts during shipping, which is not covered under this warranty. This limited warranty does not apply to any components that have been subjected to collision damage, negligence, alteration, abuse, or misuse, and coverage does not extend to products manufactured by third-party companies. Cognito reserves the right to supersede, discontinue, or change the design, finish, part number and/or application of its parts when deemed necessary, without notice.

Return Policy

Product returns will not be accepted without prior written approval from an authorized Cognito representative. All products being returned must be shipped via trackable, prepaid freight. Returned products are subject to a 25% percent restocking fee. The eligible return period for products purchased directly from Cognito is 30 days from the verified date when the product(s) were originally received by the purchaser.

Product Safety Advisory

The installation of Cognito steering and suspension components will modify your vehicle's original factory equipment and geometry, which may cause it to handle differently than a stock (unaltered) vehicle. Installation of these components is not intended to strengthen nor reinforce the vehicle's frame, nor are they designed to increase rollover protection. It is necessary to periodically inspect all suspension and drive train components for proper attachment, torque specifications, operation, and for any potential unusual wear or damage. Installation of these parts will modify the height of the vehicle and may raise the center of gravity. Modifying vehicle height combined with off road operation may increase your vehicle's susceptibility to rollover conditions, which may cause serious injury or death. Many states regulate allowable vehicle height modifications, and it is your responsibility to know and comply with the legal requirements specified by the laws where you reside. Modifications to your vehicle's ride height may also affect the ride quality, driver input response, trackability and handling, and wear to your vehicle's suspension components and tires.

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