

Installation Instructions: **GyroJoint™ LongArms – Jeep Wranglers**

Kit Part Numbers & Applications	Nth14002: Jeep TJ Wrangler (SWB = 93.4") Nth14004: Jeep TJ Unlimited (LWB = 103.4")
Box Numbers Note: some boxes may be nested inside others in your shipment.	Nth23000: Set of (4) GyroJoint™ stubs and isolators, Front Pair & Rear Pair
	Nth23010: Bolt-or-Weld-on LongArm Subframe Kit, L/R pair
	Nth20102: Front LongArms, L/R pair.
	Nth20103: Rear LongArms, L/R pair (Nth14002 kit only) or Nth20104: Rear ExtraLongArms, L/R pair (Nth14003 kit only)
Assumptions Equipment that must be present on your vehicle for this product to fit and work properly	REQUIRED PRODUCT: Nth° Tummy Tucker™ center skid plate (Nth140xx)
	REQUIRED PRODUCT: Nth° Stinger™ center-mounted rear torque arm (Nth203xx) and Nth242xx Slider™ axle skid or Universal Stinger Base, depending on your rear axle model – see website or call for application info. NOTE: Upper A-arm/"3-link" setups are not recommended and will not fit!
	REQUIRED PRODUCT: Rear Stabilizer End links (Nth2081x) must be mounted to the inboard side of the factory rear stabilizer bar to clear the rear arms - use Nth° Rear Spring Relocators (Nth23030) that have provisions for this
	Suspension ride height must be increased by at least +4.5" above stock height.
	Proper bumpstop spacing is added to the Jeep in conjunction with the increased ride height (consult various Nth° information for guidance).
	The front and rear axles are original TJ/Rubicon units. Custom axles should have factory-equivalent mounting points and may require modification for proper fit.
	Longer shocks have been installed that are appropriate for the 'lift height'.
Required Tools and Equipment (in addition to common hand tools)	Floor Jack and at least two jackstands (or vehicle lift and tall stands)
	Metal drilling, cutting, grinding/sanding, and welding equipment
	Sawzall or equivalent (for straight-cutting exhaust tubing in-place).
	1.0" diameter hole saw (if doing the bolt-on option)
	Can of black semi-gloss spray paint (for top covers and frame modifications)
	MIG Welder (required for both weld-on and bolt-on options – see Step 4)
	Vehicle chassis alignment equipment
	1" dia. countersink bit (for reworking older Tummy Tucker™ skids) – either 90° for 2003-newer models, or 82° for 2002-older models. These can be purchased at any tool supply store and many hardware stores.

Please take the time to read these instructions completely before beginning – they are long because we want you to get the installation right the first time for best performance with no unnecessary delays.

Notice: This kit is designed for use on a vehicle that has elevated ride height via taller springs and/or spacers. Any vehicle with a raised center of gravity (c.g.) has lower handling limits than it did in stock form and handling behavior will be different due to changes in suspension geometry, etc. While this product is designed to minimize some of the geometry effects of a raised c.g., the ride, handling, and performance of your specific vehicle also depends on many other factors/products that are not part of this product – especially the springs and stabilizer bars, but also including steering components, tires, wheels, shocks, and the effect on c.g. location from other items that have been changed or added to your vehicle. Consequently, Nth Degree Mobility makes no warrantee as to the safety, suitability, or reliability of a vehicle equipped with this product for any purpose or use. Also, as with any stock or modified vehicle, proper regular maintenance of these components by the owner/operator is required to assure correct and dependable suspension function for the remaining life of the vehicle.

It is the sole responsibility of the owner/driver(s) of this modified vehicle to make the time and effort to become familiar with its altered behavior after installation (under safe conditions), make changes to driving habits or other components if needed, and control and advise others that may drive the vehicle after modification with this system. Nth° also recommends taking steps to assure that your vehicle's overall combination of specific parts produces a safe and reliable dynamic behaviors that will not also endanger other people or property.

Installation Instructions: GyroJoint™ LongArms – Jeep Wranglers

Step 0: Nth° Suspension System Installations. If you are installing this product as part of a *complete* Nth° Suspension system (Nth015xx or Nth016xx), refer to the master system installation instruction for direction on the most efficient order of product installations – coordinating the install of several products will significantly reduce overall time and effort required. The master instructions will help guide you through configuring this product properly for your specific system. By using a complete Nth° system, you will have the required complimentary equipment to assure that this product performs properly and reliably.

Step 1: Survey shipment; Inventory/Check/Verify Parts. This kit comes in multiple separate boxes; Identify each box by it's external product label and match it to your shipping invoice to make sure that you appear to have all necessary boxes for the kit. Note that boxes may get separated from each other during shipping and arrive on different days. Once you've verified all of the boxes are present, unpack them to check and inventory all parts to the packing list and verify they are in good condition. Be especially sure that you have the *right* kits for your vehicle before beginning!

Step 2: Read, Understand, and Plan for all of the following instruction steps before beginning! Do not disassemble vehicle unless all parts are present and all tools and facilities required are available. Do not start or attempt this product installation if you are unsure of your abilities or do not have the resources listed above – this is not a simple 'bolt-on' installation and will take considerable time if you have never done it before and/or have limited resources. Be sure to have all welding done by a certified/qualified person, and check/set all specified torques with a torque wrench...too tight is not just right!!

Coordinated Steps: Tummy Tucker™ installation. The Nth140xx that is required for this kit needs to be 'coordinated' with installation of this kit – whether already installed or not. You will see the appropriate points at which to perform TT-related steps as indented paragraphs with the title: Coordinated Step - New TTs: If you are installing the skid for the first time along with this kit, follow these instructions as your primary guide – it will direct you to the TT instructions (for your specific TT model) at the appropriate points to make the overall installation as efficient as possible.

Older Tummy Tuckers. If your Jeep already has a TT installed that was purchased before the introduction of the Nth° LongArm suspensions (April 2005), you will need to perform modifications to the TT - these are covered in the appendix at the end of these instructions. If your existing TT was purchased in May 2005 or later, it should already have the necessary features (though some TT's for 2002-older vehicles may not, so check the appendix to confirm if you have the needed features).

All TTs not originally purchased as part of an Nth° LongArm suspension: Note that if you are using an existing TT, the transmission adapter bracket (TAB) or exhaust hanger rod will need to be modified (depending on your transmission – see chart in appendix step A6). To re-use your current TAB, requires cutting and welding (see step A6 for directions), or if you prefer, you may purchase an already-modified TAB from Nth°.

Step 3: Prep for Tummy Tucker skid and Exhaust Modification. This kit *requires* a Tummy Tucker™, but even if you already have one, it must be removed for now. Before removing your center skid, support the powertrain under the rear driveshaft yoke or CV-joint (this is the best location to keep the stand out of the way and will not hurt the yoke or joint, etc.)

NOTE: This kit fits with mild modification of the stock exhaust system – only cutting and welding are required – no new tubing or other materials are needed. If you choose to use a custom exhaust anyway, it should be installed between steps 10 and 11 and routed similarly to the modified stock exhaust shown in the pictures. The instructions and pictures provided here are for 4.0L-equipped TJs, if you have a four cylinder, your modifications will be similar but are not covered in detail. If you have a custom engine swap, you may use these steps as a general guide, but will have to "work out the details" of your specific setup on your own.

Installation Instructions: GyroJoint™ LongArms – Jeep Wranglers

To prepare the exhaust you will remove a short portion of the 'front pipe' in the area where it crosses in front of the engine oil pan 'sump', make the first cut squarely through the stock 'front pipe' in the large-diameter portion of the tube – follow the directions below depending on your model year:

1997-1999 "Federal" TJs. For all TJ's of these model years that were NOT originally sold in California, the front pipe steps up from 2.25"OD to 2.50" OD at the left-front of the oil pan. Make the first cut 1.0" to the passenger side of the weld where the smaller tube (from the header) enters the larger main tube. The second cut should be right next to the weld through the smaller tube – make sure to cut as parallel to the first cut as possible, removing a section not more than 1.0" long. **Figure 1** shows a



Federal (49-state)-emissions TJ with the second cut partially completed. After making both cuts, look into the larger (downstream) tube for any remnants of the end of the smaller tube – if there is a 'sliver' left, remove it with a pliers. When you re-weld the exhaust later, you will be able to slide the larger tube slightly over the smaller one for an overlapping fit.

1997-1999 "California" TJs If your TJ was 'native' to California, it will have a 'mini-cat' in the pipe directly in front of the oil pan – on these vehicles, make two cuts to the passenger side of the mini-cat (i.e. left side in **figure 2** - similar position to later model TJ's.), removing

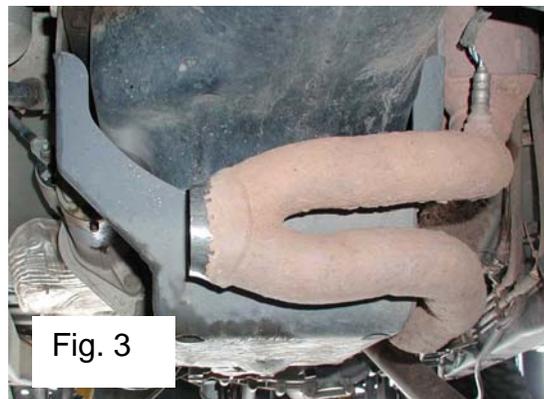
a total length of 1.25". To rejoin this exhaust, you will need to 'butt-weld' the pipe back together after later steps below.



2000-newer TJs have two separate cast-iron exhaust manifolds that feed into a 'double downpipe' that join into a single pipe in front of the oil pan. All TJs will look similar in the area where the two pipes merge into the single 2.5" diameter pipe, and most will have a mini-cat on each pipe up near the manifolds (out of the way for cutting; Early 2000MY non-CA TJ's will not have mini-cats). Cut the 2.5" diameter single tube just before it begins to turn to the rear at the passenger-front corner of the oil pan– be sure to NOT cut on the turn! Now make the second cut toward the driver's side of the first cut – make sure to cut as parallel to the first cut as possible and remove a total of

1.25". **Figure 3** shows an '03 TJ cut and with the downstream portion of the exhaust completely removed for convenience, (though this is not necessary for installation of this kit.) On this 'late-style' exhaust, you will later butt-weld the two ends together.

Now that the main portion of the exhaust is hanging free of the engine, unbolt the black transmission adapter bracket and slip it reward off of the exhaust hanger rod – be sure to support the exhaust near the front for the moment. (on 3-speed autos you will have to remove the mount first, then the TAB, on others you can leave the mount attached to the TAB).



Coordinated Install: If you are also planning to install an Nth Degree Oil Pan Skid (Nth243xx) on your 4.0L engine, you should do it now, BEFORE completing the exhaust modifications, since the OPS will not be able to be installed without dropping the exhaust after it is rewelded/modified.

Coordinated Step – older TTs: If your existing TT came with a one-piece trans adapter bracket (TAB), you will need to modify or replace the bracket you've just taken off – see Appendix 1, Step A6 for modifying your existing TAB if this is the option you choose. You may purchase a new TAB that does not require modification if you prefer – call for assistance

Installation Instructions: GyroJoint™ LongArms – Jeep Wranglers

Coordinated Step – new TTs: If you are installing a new TT at this time, follow the instructions for your specific TT model, stopping before the point of final installation. If yours is a TJ Rubicon, you should also do the floor 'dimple' (if not using a body lift) and the locker pump relocation now.

NOTE: With old-style TABs, and depending on the year of your Jeep and the transmission model you have, you may need to perform some minor modification to the trans to clear the TAB. This primarily applies to '03-newer TJs because the exhaust hanger is up high and the TAB 'tower' stands very close to the trans. On some transmissions, you may need to trim an aluminum 'boss' that was used during the machining process (it's useless now and can be removed). Remove just enough material to allow the needed clearance for the TAB - it's alright if they touch since they are bolted together anyway.

Now install the new or modified TAB bracket to the exhaust hanger rod and bolt it to the transmission (for new TT installs, you will need to raise the trans higher with the jack/stand to get the holes to line up). With the TAB installed and holding the exhaust again, it should have 'swung' the exhaust towards the driver's side and roughly closed up the 1.25"+ gap you cut out of the exhaust – don't worry about exact alignment at this moment.

If you have an older TT that did not come with the special 'flag-nut' as shown in **figure 4**, you will need to purchase one plus a socket-head bolt – call for assistance. The flag-nut design is needed instead of the normal top-down bolt so that you will be able to tighten the passenger side isolator after everything is in place for the final time. You will finish the exhaust modification and final TT installation in later steps of these instructions.



Fig. 4

Coordinated Step: If you will be installing a transfer case Slip-Yoke Eliminator (SYE) during this install, do it now. If you have a Rubicon TJ and have not yet switched to a double-Cardan rear driveshaft, you should remove the stock driveshaft, but may wait to put the new one in until later.

Subframe Attachment Choice: Bolt-on or Weld-on. You may choose to follow either step 4a or 4b depending on your preference – the choice is mainly about ease/speed of installation, since both are strong enough for even the most severe use. The bolt-on option requires more labor time/effort to drill holes and weld eight crush sleeves into the frame, while the weld-on option involves welding the GyroJoint top covers directly to the inboard side of the frame rails – eliminating the need for crush sleeves. Depending on you and your facilities, you can expect the bolt-on option to take about 1-3 hours longer to perform. Besides the labor time difference, there is another aspect to consider: The weld-on option allows for a cleaner 'invisible' appearance on the outboard side of the frame, but in order to service/change the GyroJoints later, you will have to drop each subframe completely – which requires that one front and one rear arm be detached at the same time to do so.

Step 4a: Bolt-on: Install crush sleeves in Jeep frame. To begin this step, spray paint the four GyroJoint top covers and let them dry thoroughly ahead of time. Also, detach the brake/fuel line 'bundle' from the inboard side of the driver's frame rail by gently prying the several clips out of their holes in the frame. Tie the bundle away from the frame for now with a bungee cord, etc.

The LongArm subframes require eight crush sleeves to be inserted through and welded to the frame rails – four per side. To locate the holes that need to be drilled for this, temporarily bolt each subframe to the correct frame rail with the Nth° logo on the outside of the frame and toward the front of the Jeep. In order to attach the subframes in the correct place, you must select the correct three holes on the underside of each subframe that match the hole spacing on the underside of your frame (for the three center skid holes per side) – only one set of holes will all line up at the same time ('03+ TJs use the rearmost hole on each subframe). Use the tapered/flathead bolts that were supplied with your Tummy Tucker™. Because the subframe bottom holes are slotted, make sure to keep the outer surface of the subframe flush to the side of the frame. Only tighten the bolts snug for this step – do not drive the

Installation Instructions: GyroJoint™ LongArms – Jeep Wranglers

tapered heads of the bolts hard into the slotted holes of the subframes. **Figure 5** shows a correct temporary subframe installation.

Now use a ½” transfer punch to mark a starting point at the center of each round hole on the outside of the subframe. You can do this ‘by eye’, but take the time to be accurate. Once the holes are punched, remove the subframe and drill a ¼” hole at each location through the outer frame wall only, then switch to a 1.0” hole saw (which should have a ¼” pilot bit) and enlarge each hole to 1.0”. TIP: Especially if doing this installation on a vehicle hoist, getting enough ‘push’ on the drill is difficult



Fig 5

at or above shoulder level. To make drilling much easier and faster, try this: Stand on a box (or lower the hoist if you can) so that the frame is at chest level, then hook a tie-down strap between two holes in the frame (the large round front UCA bolt access hole and oval rear shipping tie-down hole are perfect), then route the strap around your back and under both arms and adjust the length of the strap to the right length so you can lean/push against the strap while drilling.

To insert a frame sleeve into one of the new holes, first make sure to insert the end with the smallest chamfer (beveled edge) in first – the larger chamfer makes welding the slugs easier. It is important to make sure each sleeve is ‘square’ to the undrilled inboard wall of the frame before welding it. The best way to do this and have clear access to tack-weld the slug in place, use one of the supplied ½” x 3.5” bolts and a plain (non-locking) ½” coarse-thread nut. Thread the nut onto the bolt up to the end of the threads, then insert the bolt into the large-chamfered end of the sleeve; hold the head/shaft of the bolt and insert the sleeve into the frame as shown in **figure 6**. With the sleeve touching the inside wall of the frame, wiggle the bolt around until you are sure that the sleeve is resting flush against the inside wall, then tack-weld it in place and remove the bolt to finish welding around the large chamfer. Note that the rearmost sleeve may protrude from the outer wall of the frame slightly while the others are roughly flush to the frame – this is normal.

Now you can drill out the inboard side of the frame through each crush sleeve – this will be easiest with either a long ½” bit, a normal ½” bit with an extension, or using an angle-head air drill. Make sure not to nick the brake/fuel line bundle on the driver’s side! Finally, sand/grind the circular weld on each sleeve flush to the end of the sleeve and paint the sleeves/holes with semi-gloss black paint to match the original frame color.

Step 4b: Weld-on: Weld top-covers to Jeep frame. To begin, detach the brake/fuel line ‘bundle’ from the inboard side of the driver’s frame rail by gently prying the several clips out of their holes in the frame. Tie the bundle away from the frame for now with a bungee cord, etc. Next, temporarily pre-assemble the four GJ top covers to their correct locations on the L/R subframes without the stubs or isolators inside - (see figure 10 for correct orientation of the top covers) the 16 short bolts should all be installed and tightened, though just ‘snug’ will be enough (you may wish to use some non-locking nuts for this step to save the locking nuts for the final install). Hold each subframe up in place to get an idea where the top cover flanges will be against the inside of the frame, then sand the paint off the frame rails in these areas.

Now temporarily bolt each subframe to the correct frame rail with the GyroJoint boxes on the inboard side and the lower-hanging one toward the front of the Jeep. In order to attach the subframes in the correct place, you must select the correct three holes on the underside of each subframe that match the hole spacing on the underside of your frame (for the three center skid holes per side) – only one set of holes will all line up at the same time (’03+ TJs use the rearmost hole on each subframe). Use the tapered/flathead bolts that were supplied with your Tummy Tucker™. Because the subframe bottom holes are slotted, make sure to keep the outer surface of the subframe flush to the side of the frame. Only tighten the bolts snug for this step – do not drive the tapered heads of the bolts hard into the slotted holes of the subframes. Figure 5 shows a correct temporary subframe installation. Make sure each top cover is flush against the frame rail, then tack weld it in place. Once both top covers (per side) are tacked, remove the 16 bolts to allow the subframe to be removed again. Now weld each top cover fully

Installation Instructions: GyroJoint™ LongArms – Jeep Wranglers

into place by welding up the ends of the flange, stitch weld at least 65% of the length of the bottom, and if desired, 'plug weld' in the holes that were intended for the through-frame bolts (it is not necessary to weld along the top side of the flange). You can now paint the top covers in place and arrange the hard lines on the left frame rail as desired (the lowest line usually will want to be below the rear cover).

If you desire a 'clean look' on the outboard side of the frame, you can now cut off the three 'tabs' on the subframes that have the 1st, 3rd, and 4th frame holes, but you should leave the 2nd tab (the large one) else you will not know exactly how far in/out to position the subframes since all of the mounting holes left are slotted. It will be easier to touch up the edges of the subframes where you cut off the unneeded tabs before final assembly with the Tummy Tucker.

Step 5: Install zerc fittings on Subframes. Each subframe has two 'box-like' cavities that will house the GyroJoints™ in the next step. Before they are installed, locate the threaded hole on the 'back side' of each box (away from the large curved oval opening). Install a zerc fitting into each hole and tighten gently until the last opportunity to leave the fitting pointing down (away from the open top side of the 'box') – see **figure 7** for a typical fitting in the proper orientation.



Step 6: Pre-assemble GyroJoints™ to Subframes. If your TT installation prep is completed also, you are now ready to install the LongArm subframes for the final time, but first you must install the GyroJoint™ stubs and isolators into both 'boxes' on each subframe. Note that while the stubs and the half of each isolator that the stubs go through are the same for all four corners, the 'rear' half of each isolator (with eight radial grooves on the hemispherical surface and a small grease hole) are NOT the same – you should have two black pieces for the rear joints and two non-black ones for the front joints...make SURE you do not put these in the wrong locations!

Figure 8 shows installation of a front isolator/stub combination, and **figure 9** shows a rear being

installed. For each one, lightly pre-grease the spherical surfaces of both isolator halves with a quality bearing-type grease (do not use too much as it will just squeeze out any excess once installed). Also you should *very* lightly grease the outside lower edges of the isolators to help them slide into the boxes easier. Place a stub through the opening in the 'front' isolator half, add the rear half, and tip the stub down through the window in the

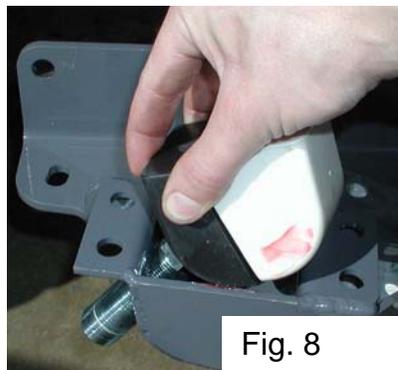


Fig. 8

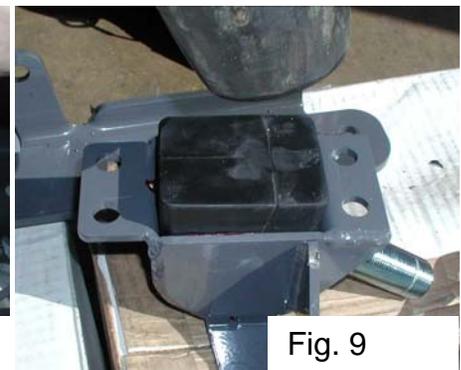


Fig. 9

appropriate subframe box. The isolator/stub assemblies fit deliberately tight into their boxes and will require tapping down with a mallet to fully install them once started. Note that the flat top surface of the isolators will be above the surrounding metal of the box when fully seated – this is intended so that the top cover can compress the isolators to hold the ball of the stub tightly.

As soon as each stub/isolator assembly is in place thread a large jam nut onto the stub – you will want to leave it near the end of the stub for now both to protect the threads of the stub and to allow access to the top cover bolts for final tightening in step 8.

Step 7: Pre-assemble Top Covers to Subframes. One top cover is used to compress and retain each GyroJoint™ in it's 'box' – so there are two covers per subframe. Identify



Fig. 10

Installation Instructions: GyroJoint™ LongArms – Jeep Wranglers

the correct top cover for each location according to the pictures in the packing list and loose-assemble them as shown in **figure 10** –the other subframe will be a mirror image of the one shown. Pay attention to the fact that the side flange on the front covers should go ‘up’, while the side flange on the rear covers should be ‘down’ as shown. Also make sure that the four ½” x 1” long bolts for each subframe are installed from the bottom (subframe side) to top (cover side), then add a washer and locking nut to each. In preparation for mounting the subframes to the Jeep’s frame, push each top cover as far away from the outboard side of the subframe as possible (the surface with the Nth° logo in it), and tighten the cover bolts only until they’re barely touching the subframes (the covers may ‘bow’ a little in the middle from the compression of the isolators - this is normal).

If you opted for the ‘Weld-on’ method, you will obviously have to put both stubs and isolators in the subframe first, then use the same 8 bolts (heads down as normal) to secure to the top covers that are already welded to the frame. In this case you can skip step 8, but the year-specific notes may still be helpful regarding routing the hard lines above/below the driver-side top covers.

Step 8: Bolt-on: Attach Subframes to Jeep Frame. It’s usually best to install the passenger side subframe first to get accustomed to how they fit before dealing with the additional ‘headache’ of fuel and brake lines on the driver’s side. Lift the subframe into place and temporarily retain it with the three countersunk TT bolts as you did before, again making sure the outer surface is pushed flush to the outside surface of the frame itself. Now insert four of the ½” x 3.5” bolts through the subframe, the crush sleeves you installed/welded in the frame, and finally into the corresponding holes in the top covers – which you can now tap flush to the inner surface of the frame as well. Note that if “things don’t line up”, it’s probably because you installed a crush sleeve in slightly out of place (usually because your drill ‘walked’ while making the frame holes) – since that can’t be changed now, you may have to file subframe/cover holes to get the bolt(s) to go through...unless the misalignment is severe (over 1/16” or so) this should not create a larger problem. Once the four bolts are through, add ½” washers and locknuts to them – if the covers are too far from the frame to get the nuts started, tap them toward the frame with a hammer until you can draw them together with the nuts and bolts – then tighten all four to at least 45 ft-lbs. Now go back to the eight cover bolts and tighten them fully to 45 ft-lbs. The passenger side subframe is now installed – repeat for the driver’s side, but first some notes about the brake and fuel lines...

On all TJs, the ‘bundle clip’ near the front end of the front top cover will not be able to remain in its original hole in the frame – this was unavoidable in the subframe’s design. You may be able to drill another hole about ½” forward, but in practice it tends to be unnecessary since the lines will be securely mounted elsewhere anyway. The easiest satisfactory solution is to simply break off the tip that was inserted into the frame and slide the clip forward on the lines to clear the bracket.

On 2002-older TJs, the ‘bundle’ of lines are few and mounted high enough that all of the hard lines should be able to ultimately remain in their original positions in the several ‘clips’ on the frame. However, the lowest line (smaller diameter – this is the rear brake line) will be close to the line of four bolts coming through the crush sleeves and may require slight bending by hand to clear them. The easiest thing to do is remove the brake line from the clips (careful not to break them), then reinstall after they are in and tightened according to the sequence above. It will also likely be better to route the brake line under the downward-pointing flange of the left-rear top cover – so plan for this when lifting the subframe into place.

On 2003-newer TJs, the ‘bundle’ has more lines than earlier TJs and they are mounted lower on the frame...this makes things much ‘messier’, but can still be dealt with fairly cleanly. If your TJ is a Rubicon model, you should have performed the preparations for relocating the locker pumps already (see TT instructions if doing along with this kit), and for now you should tie the pumps/bracket up with a bungee until the driver’s subframe is fully mounted. As with older TJs, the lowest (smaller dia.) hard line is the rear brake line; the next two above it are emissions system lines - the lower of these two (the lowest large-diameter hard line), will need to be permanently relocated higher because it is directly in line with the four subframe bolts through the crush sleeves. It is recommended that you carefully ‘re-bend’ this line so that it can run above the top-most hard line and be zip-tied to it. Note that the line is made of very hard stainless material and will be difficult to bend, so be careful not to kink it too much! The location of

Installation Instructions: GyroJoint™ LongArms – Jeep Wranglers

this line above the others is especially important on TJ Rubicons because the locker pumps will also be sharing tight space with these lines (even tighter than on a TT without the LongArm kit). As with older TJs, the brake line may fit best if routed under the flange of the rear top cover, so maneuver it under the rear flange while installing the subframe assembly.

Figure 11 shows the driver's subframe is fully tightened down per the same sequence done on the passenger side. Note that the brake line is below the top cover but not yet back in correct position - you may now finalize the location of the hard lines and add additional zip ties as desired, then remove the six flathead TT bolts from the bottom of the frame rails.

Also note that figure 11 shows a TJ Rubicon t-case. You can see a small 'L-shaped' boss that comes close to the subframe's rib. On new production subframes, this rib is reversed (i.e. at the forward edge of the bottom flange) to improve bolt access, but consequently it can come into contact with this protrusion on the Rubicon t-case. The interference can be solved by simply trimming off the boss on the t-case with a sawsall – it is only used during the machining process for the t-case and is not needed once it's built.



Fig. 11

Step 8+: Locker Pump Mounting – (TJ Rubicon models). You will notice that your already-repositioned locker pump bracket 'wants' to sit on the top of the two covers – each of which has holes in it for mounting the bracket – this will be unlike a Rubicon TJ using a TT alone where the locker pumps are mounted directly to the TT. (Note: If your Rubicon TJ had it's TT already installed, you will need to bend the rear flange of the locker pump bracket back to it's original horizontal position at this time.) In order for the locker pumps/bracket to align with the holes on the top covers, the outboard flanges on the bracket will be over the hard lines mounted to the frame (with the relocated one topmost) – that is, the hard lines will be running 'inside' the locker bracket right next to the pumps themselves (there is space enough for this). But one modification must be done to the bracket to make everything fit together so tightly: there is a 'gap' in the outboard flange of the bracket that is just about the width of the nearby clip that is holding the hard lines to the frame, but the gap and clip will not line up by about an inch. To make space for the clip, cut about one inch of the flange away just forward of the gap (this can be done in-car with a die grinder or the bracket can be removed if desired for cutting by other means). Once the clearance is made, maneuver the bracket into position and attach it to the cover plate holes with the four 5/16" bolts, washers, and nuts provided (put the washers on the underside of the cover plates since the cover holes are slotted). Your finished driver-side subframe installation should now look like **figure 12**.

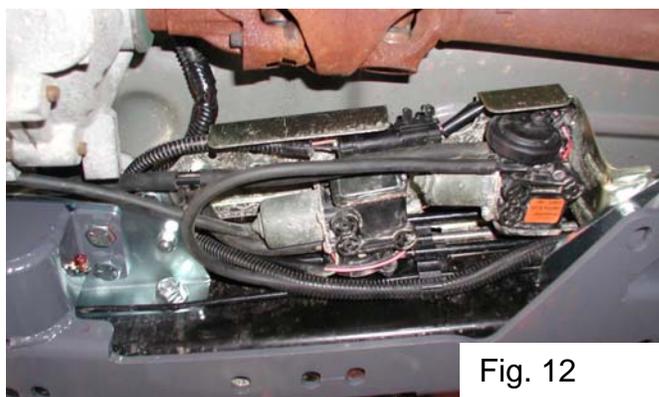


Fig. 12

Step 9: Finish Exhaust System. Now that the subframes are in, you are ready to finish the exhaust modifications. First make sure that the connection between the catalytic converter and muffler is loosened (either slip-fit with clamp or two-bolt flange style on newer TJs). As outlined in the TT instructions, the TT will partially raise the center area of the exhaust, but by loosening and realigning this connection, the rear half of the exhaust should still 'hang' from the two rear hangers. Since you will not yet be installing the TT, you will need to elevate the trans-mount area to approximately the height it will now be at when the TT is installed (if you have a TJ Rubicon without a body lift, this will be easy to do by judging the gap at the dimple, others may will have to estimate by other means). If the rear portion of the exhaust is not readily 'realigning' downward to hang from the rear hangers (usually true with older slip-fit connection), you will 'fix' this after rewelding the front together.

Installation Instructions: GyroJoint™ LongArms – Jeep Wranglers

Now you will probably need a helper to hold the exhaust to keep it properly located for welding. You should be able to bring the two cut ends together with a very small gap that will be easy to weld. Before tacking the exhaust together, make sure that the rear portion has not rotated to the point where there is contact anywhere, though clearances will be very tight in all directions – pay attention to the side of the trans (especially on automatics where you cut off material from the trans case), and to the edge of the bellhousing – in both areas you may have on a 1/16" or even less clearance, but this is okay since the exhaust moves with the powertrain. Once you have the forward portion of the exhaust (front the trans bracket forward) oriented well, tack it together and then fully weld it.



Fig. 13

If the rear portion of your exhaust is still 'high' at this time, you can now work on pulling down on it until the muffler-catalyst connection 'gives in', then re-tighten the connection. As in the TT instructions, you may need to slightly re-bend the hanger rods on the tailpipe a little to get the rubber hangers to actually 'hang'. This completes the exhaust modification, which should look similar to the views in **figure 13**. Final TT installation will come later.

Step 10: Remove Stock Frame brackets. This is the 'no turning back' part: All four of the original lower control arm (LCA) brackets must be removed from the frame, as well as the rear upper control arm (RUCA) brackets. Extra care should be taken when removing these brackets not to damage or weaken the frame by cutting into or through it – when finished the frame should look smooth and complete as if the brackets were never there. If you do gouge or damage the frame, be sure to repair it to avoid

Obviously at this time all of the original upper and lower control arms will need to be removed. If you are only performing the install of this kit, you may leave the axles in place supported by either the tires/wheels or jack stands, but be sure that they are not still supporting the weight of the vehicle (i.e. the frame should already be supported by four of its own jack stands). You may choose to remove one frame bracket at a time and then install the appropriate long arm by repeating step 11 each time for the rears, then do step 12, then repeat step 13 twice for each front corner.

If you are doing a complete Nth suspension installation, the rear axle should be completely removed for convenience, but the front may still be left in place unless it is being swapped out for a different axle, etc. – refer to your Master Installation Guide for more information.

possible failure days or even years from now.

How you choose to remove the brackets is up to you, but we have found one technique for removing the LCA brackets that has proven faster than most, with little or no risk of damaging the frame rails: Use any convenient cutting device (plasma is best) to slit each three-sided bracket down the bends along the two sides where they adjoin the sloped part that is below the frame rail - see **figure 14**. Then use a die-grinder with a cutting wheel to cut into the welds at the top of each piece, but stop short of risking cutting into the frame itself – you only need to 'weaken' the weld. Now bend each piece back and forth (with a large pliers, crescent wrench, or by hammering on it) until the weld cracks and the piece falls off. Clean up the remainder of each weld on the frame with a grinder/sander and paint with semi-gloss black to match the surrounding frame color.



Fig. 14

Installation Instructions: **GyroJoint™ LongArms – Jeep Wranglers**

Avoid damage to the fuel and brake lines when removing the left RUCA bracket by using a 'spark-less' cutting method such as a sawzall. Note that the clip that was mounted to the top of this bracket will no longer be mounted to anything, but will still help hold the lines to each other. Also, the junction of the brake hard-line to the rear brake hose will also no longer be able to be mounted to the side of this bracket. Due to the high-mounted position of the rear longarms, the hard line should be hand-bent upward to run along the other lines, then use the supplied bracket and mount it directly to the frame above the mid-point (so it will clear the rear long arm).

Step 11: Attach Rear LongArms to Subframes. Now that the hard part is over, installing the actual arms is fairly easy: The rear arms must be attached now – before the Tummy Tucker is put in place – because the rear GyroJoints will be above the TT and their downward movement is restricted once the TT is in place (though they still have plenty of movement for the normal suspension motions). Now is the time to spin the jam nuts on the stubs all the way up to the end of the threads (next to the hex on the stub). To install a rear arm, first make sure you have the *correct* arm for each side: you can tell by holding an arm roughly into position and checking the orientation of the axle-end bushing. Each arm runs roughly parallel to the frame for the portion forward of the bend, then 'dives' down-outboard to the bushing. If the arm you hold up has the bushing at a totally wrong angle – it is the arm for the other side. Once you have the correct arm, start the female threads on the arm onto the stub protruding from the subframe – if the stub wants to turn while you do this, have a helper hold it from spinning by using the supplied wrench (the open end of the larger wrench) on the hex portion of the stub. You should turn the arm on until there is about ½" of threads showing between the arm and the fully-spun-up jam nuts.

NOTE: This length setting is roughly designed to put the rear axle in the proper position for fuel tank clearance, etc. Final adjustment for 'squareness' (thrust angle) will be done later. Also, while there is about 1.5" of safe adjustment range, (shorter by the ½" of threads you left showing, or up to +1.0" longer), large deviations from the 'nominal' setting are not recommended as you may create tire clearance or other issues.

It will be far faster to turn the arm than the stub; to do this, hold the arm as low as it will swing after the threads are started onto the stub – you will need to get 'below' the rear axle (if it is still in the vehicle at this point) to rotate the bent portion of the arm – this may not be possible if you are working on the ground and you may have to resort to turning the stub. After threading both rear arms, take care to adjust them fairly close to the same length (use a tape measurement on each to be sure) – this will save time and effort later.

Step 12: Attach Rear LongArms to Rear Axle. Each rear arm is equipped with a stock-type large rubber bushing at the axle end. These arms are specifically designed to be mounted to elevated hole positions on the stock axle LCA brackets. The procedure to locate and redrill new holes for the rear LCAs is part of the Nth Degree Stinger installation – which is required for use with this kit. If not already done, consult the separate instructions for direction on use of the redrill template designed for this purpose (the redrill template is a separately packaged item – it is a flat plate with two large holes, two small ones, and two 'arrows' – the part # is NthSTGR7900 and the instructions for it are p/n Nth30127).

Once the redrilling and trimming to the rear axle is complete, attach each arm to its axle bracket using the original/stock bolts and nuts – leave them loose for now. Each arm install should look similar to **figure 15**.



Fig. 15

Step 13: Complete Tummy Tucker™ Installation. You may now bolt the TT to the frame rails using the six flathead bolts that came with the TT and have been used to temporarily hold the subframes in place earlier. Be sure you correctly follow the TT instructions regarding clearances between the transfer-case

Installation Instructions: GyroJoint™ LongArms – Jeep Wranglers

and TT/floor, check fan shroud clearance, etc. You may find that you need to use some of the 'shim washers' that were supplied with the TT even if your specific application does not call for them in the table found in the TT instructions (take the TT down now and correct clearances with shims now if needed).

Once the TT is properly installed, there are four additional flathead bolts that must be installed to connect the subframes to the TT. This kit was supplied with sets of both English/SAE standard bolts and metric bolts to match the TT frame bolts that came with your TT – which depend on the model year of your Jeep. If your Jeep is a 2002 or older, use the ½" bolts (no number on heads); conversely the M12 metric bolts are used for 2003-newer TJs (bolts read "10.9" or "12.9" on heads). Use the shorter two of the correct set of bolts on the driver's side with washers and nuts on the top. To use the longer bolts on the passenger side with a 1.25" drop TT, insert the supplied spacers above the countersunk holes in the TT then install the bolts with washers and nuts on top (you may have to slightly pry the subframe up to slip the spacers into place). If you have a completely flat Tummy Tucker, the passenger-side subframe will be sitting directly on the TT like the driver's side; you can do one of two things: use the spacers on top of the subframes (to 'use up' the unthreaded length of the longer bolts supplied), or obtain two more

Note that with this TT+LongArm installation, taking the TT down in the future for service, etc. will (as before) require removal of the four small flathead bolts at the trans mount in the middle plus now 10 of the large-size flathead bolts (M12 or ½") - instead of just the six at the frame rails. Also, if your Jeep is a TJ Rubicon, you will no longer have to unbolt the locker pumps as is necessary with TT-only installations.

of the shorter bolts as used on the driver's side and omit the spacers.

Coordinated Step: Install your Nth° Stinger™ at this time if it was not previously installed.

Step 14: Install front LongArms (Nth20102). Install the two main front arms in a manner similar to the rear arms, holding the stub from rotating if necessary. Again with the jamb nut threaded up as far as it will go (to the hex), leave a gap of about ½" of exposed threaded between the end of the arm and the nut as a 'starting length'. After each arm is threaded onto its stub, attach the lower control arm bushing to the stock, unmodified LCA bracket on the front axle using the original hardware.

Once both long arms are attached to the front axle, you can assemble and connect the short 'upper control arms' from the stock UCA bushings to the reinforced hole at the top corner of the bracket on the front arms. Begin each arm by threading one of the ¾"RH jamb nuts onto the threads of the UCA 'clevis' – all the way up as far as it will go - then thread the ¾" end of a longarm FUCA tube (looks like a 'spark plug socket; the ¾" threaded end is opposite the hex-shaped end) on until there is about ¼" of threads showing. Next place each pre-assembled FUCA to the axle using the original bolts. If your Jeep came with 'flag bolts' with a folded end on the flag, your FUCA clevis may have a notch that will engage the flag and make tightening the bolt a one-tool operation – but leave them loose for now (**figure 16**). To complete each FUCA connection, support the axle (without springs installed) to keep it from 'flopping forward' and set the caster angle in approximately the correct range somewhere around 5 degrees (see Appendix B on alignments for more info). The hole in each longarm should be roughly an inch behind the end of



Fig. 16



Fig. 17

Installation Instructions: GyroJoint™ LongArms – Jeep Wranglers

each FUCA tube when held up to approximate alignment. Now take one of the supplied 5/8" bolts and add a 'cup washer' and one of the two shiny black bushings (these are harder urethane material – the dull black ones are softer and made of rubber). Make sure the 'step' on the bushing is facing away from the cup washer as in **figure 17**. Now place the bolt through the reinforced hole in the longarm and through one of the dull black rubber bushing with its step facing the hole, and finally add one of the 5/8" hardened washers (gold color) and lastly add a 5/8" jam nut – run the jam nut up until you just start to compress the bushings for now. Finally, get the tip of the bolt started into the 5/8"

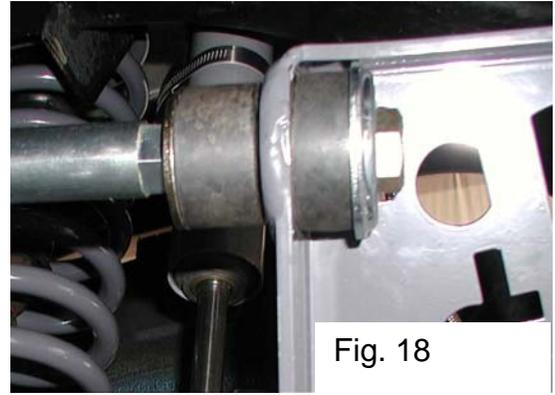


Fig. 18

Note that while clearance is tight, the FUCA clevis on the driver's side (above the differential) will just clear a Rubicon TJ Dana 44 front axle when the caster is set. If it doesn't appear to want to align at this point, roll the axle further back until you can get the bolt started. Stock Jeep high pinion front axles will also clear. Aftermarket axles are an 'unknown' that will have to be dealt with by the installer.

threads on the FUCA tube – you will need to push the tube into the alignment with the bolt – this is normal and alignment will automatically improve when the Jeep is fully assembled again. Once the bolt is started into the FUCA tube, turn the bolt until there are no gaps on either side of either bushing – watch that you don't also overtighten the 5/8" nut at the same time - you will adjust caster and bushing preload later (**Figure 18** shows how it will look later when the weight of the Jeep is pulling on the bolt, causing the rear bushings to bulge more than the forward one). Repeat the process for the other side.

Step 15: Finish up related/simultaneous product installations. At this point your LongArm installation is complete except for adjustments and final tightening. Because this kit must be installed with other Nth° products (a Tummy Tucker™ and Stinger™ at minimum), make sure you have completed those installations according to their instructions, as well as any and all other parts/products being installed at the same time as this kit such as front and rear track bar products like Nth20400 and Nth23040.

Suspension modification is not merely a matter of bolting on parts and calling it 'done' – there is a lot of 'optimization' that is the responsibility of the owner/installer to perform before you can realize the full performance, reliability, and refinement of your newly-modified suspension. No matter how well engineered the parts you're using are, there are variations in the construction of your specific vehicle (and any damage you may have already done to it!), plus variations in the dimensions of the aftermarket parts, plus the added adjustability of many parts which dictates that you find the 'right' setting for your vehicle (that's why they're adjustable after all), and the combination of parts/modifications on your vehicle can require adjustments or even further modification in order to get the most out of it...or prevent it from self destructing. Nth° strongly recommends that you spend the time to set up your vehicle properly including chassis alignment and cycling the suspension to confirm that all parts clear, etc. Some things (such as checking bumpstop-vs.-shock bottoming) can be performed before your suspension is fully assembled to save time. Be prepared for the possibility that you will discover issues with your unique combination of parts that will require additional time, effort - and possibly even parts – to fully optimize your Jeep.

Step 16: Adjustments & Final Torques. To complete your initial installation of the suspension, you will need to do a comprehensive chassis alignment using the additional adjustability of the suspension to compensate for variations in your specific vehicle. Listed below are the adjustments available in this kit and how to perform them as needed.

Installation Instructions: **GyroJoint™ LongArms – Jeep Wranglers**

Adjustment	How to adjust it	Direction/Range	Notes
Front or Rear Axle Thrust Angle	Change length of front/rear LongArms by turning frame-end GyroJoints in/out of the arm	GyroJoint stubs are 1"-14 right-hand threaded, so turning them into the arms will shorten the arm, and vice-versa. Each full turn will	To change thrust angle without changing wheelbase, adjust both rear arms by equal amounts in opposite directions.
Front or Rear Axle fore-aft position	Change length of both front/rear LongArms by turning their frame-end GyroJoints in/out of the arm	change length by just over 1/16". The safe adjustment range is about 1.5"; from the 'starting position' there should be approx. -0.5" to +1.0" of length adjustment available.	To change position without changing thrust angle, make sure both front/rear arms are changed the same amount in the same direction (longer or shorter).
Front Caster Angle / Front Pinion Angle (these are linked by axle's construction; generally prioritize caster angle and pinion/joint angle will be acceptable for stock Jeep axles).	Change length of Front Upper Control Arms (FUCA) at axle-end by turning tube on/off of 3/4" stud of clevis	Clevis/tube thread is 3/4"-16 right-hand, so each full turn changes caster angle by about 0.42 degrees. Remember the correct range for larger tires is LESS than stock caster spec.	To adjust, turn the FUCA tube by the 7/8" hex at the back end, making sure that the rear 5/8" bolt turns with it, otherwise the stud bushing preload will change as well as the caster angle.
Rear Pinion/Joint Angle	Nth Stinger™ rod-end and/or bushing shims.	See Stinger installation instructions	Adjusted via Stinger; not adjusted by this kit

After all pre-test-drive adjustments are complete, you can tighten the various suspension connection points to prepare for the first test drive. NOTE: Bolts at all suspension bushings MUST be tightened with the vehicle sitting on its tires (not even stands under the axles) in order to assure that you will not induce residual wind-up/bind into the suspension – which can cause poor ride quality, premature bushing failure, and in some cases even handling problems. Here is a list of the bolts that should need to be torqued at this time (but also make sure that *everything* is tight before you drive!)

Connection	# of locations	Torque Value	Tools Required
GyroJoint™ jam nuts	4	Max w/ tool*	Large end of large Nth Wrench (1-1/2")
FUCA jam nuts	2	Max w/ tool*	Large end of small Nth Wrench (1-1/8")
Lower Control Arm bushings at Axles	4	See service manual	Two 21mm wrenches and/or sockets (can also use both Nth Wrenches)
Front Upper Control Arm bushings at axle	2	See service manual	15mm socket or wrench (if using stock flag-bolts engaged in notch on FUCA clevis)

* Tighten as much as can be achieved using the provided laser-cut wrenches without extensions, etc.

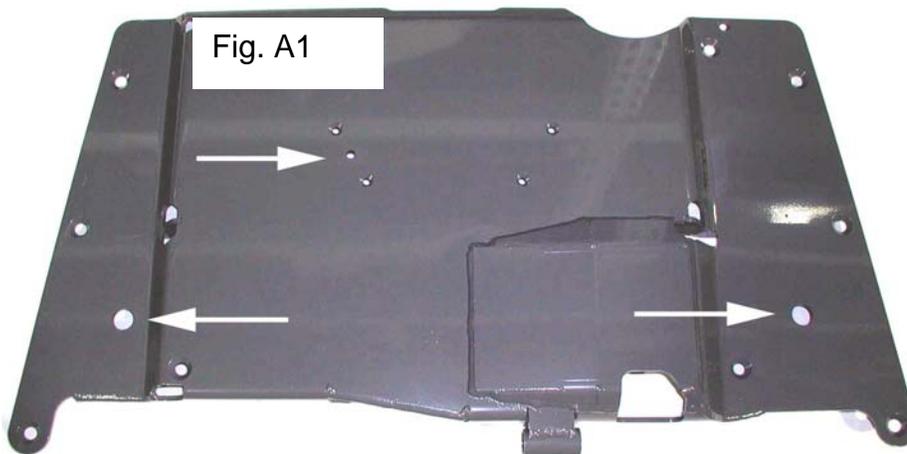
Installation Instructions: GyroJoint™ LongArms – Jeep Wranglers

Appendix 1: Pre-modifications for very early Tummy Tucker skid plates for use with Nth° LongArms.

All existing TTs will work with this kit, but older TTs purchased before May 2005 must be modified to fit. The steps below must be done with the TT is removed from the Jeep and laying on the floor.

Tools and supplies	Notes
Drill motor	air or electric powered
Drill bits	Need sizes up to 3/8"
Countersink Bit (1.0" diameter, single or multiple flute)	If 2002- Jeep, need 82° bit for SAE bolts, If 2003+ Jeep, need 90° bit for Metric bolts
Hole saw – 1.0"	Can be slightly larger or smaller as available.
Grinder or Sander with stones/discs	Various types will work; will need to grind down edge of ¼" material by 1/8".
Rustoleum "Painter's Touch" gloss dark grey paint	Matches the original powdercoat color well

Step A1: Drill Access hole for TT trans isolator. With this LongArm kit, you used a socket-head bolt and 'flag-nut' to mount the passenger-side isolator to the TT's TAB near the end of step 3. To be able to tighten that bolt after the TT is installed, you need a small hole in the TT to fit a 5/16" allen key/socket through. This should be a 3/8" or larger hole that is located exactly midway between the two countersunk holes for the passenger isolator. Those two holes are exactly 3.0" apart, so using a ruler, mark the midpoint, center punch it, then drill a small pilot hole, and finally enlarge it to 3/8". Consult the bottom-view drawing of a typical TT for dimensions and see **figure A1** (a current production TT) for guidance.



Step A2: Drill Access holes for rear GyroJoint™ grease zeracs. Since the rear joints will be located above the Tummy Tucker, accessing the grease fitting for regular maintenance is easy through holes located directly below the zeracs. Consult the same drawing and picture for clarification of the hole locations. A hole saw or 1" 'step-bit' on a drill motor is the easiest and cleanest way, but a plasma cutter or other method will also

work. Note that these two holes should be straight across from each other, but the trailing edge of the skid is NOT straight across, so make sure to measure correctly!



Fig. A2

Step A3: Drill and Countersink subframe holes. Four additional holes are needed to accept the extra bolts that will tie the subframes and the TT together – one near each GyroJoint™. To locate the holes, place the TT right-side-up on the floor (set it on two pieces of wood at the frame-rail edges to keep it flat and solidly supported for drilling). Set each subframe on it's correct side of the skid and line up the correct frame bolt holes – you may even bolt them together with the TT bolts and some nuts if you desire. Now locate and mark the two slotted holes from the subframe onto the TT as shown in **figure A2** (forward hole) and **figure A3** (rear hole)

Installation Instructions: **GyroJoint™ LongArms – Jeep Wranglers**

using a transfer punch. Ideally you will use a ½" transfer punch near the middle of each slot, but 'eyeballing it' will work fine too – and is necessary on the passenger side of drop-type TTs anyway since the subframe slots will be 1.25" above the TT at their locations anyway.



Fig. A3

Once marked, remove the subframes and drill the holes up to 9/16" diameter using several intermediate drill sizes to avoid 'walking' the holes out of position. After all four are drilled, flip the TT over and countersink them to match the frame holes at the edges of the TT – make sure to use the correct countersink bit angle depending on your skid as indicated in the table above.

Step A4: Grind down rear TT rib for rear GyroJoint clearance.

On pre-May2005 built TTs, the rib across the back of the TT is slightly too tall to clear under the GJ's when they go down to their lowest possible angle during suspension travel. The ends of the rib where they will pass below/behind the rear GJs is already reduced in height, but not quite enough – they need to be ½" tall or less directly below the GJ stubs when installed. To minimize the amount of grinding required, you may use the subframes again to locate the area directly behind the oval window in the subframe's rear GJ 'box', then grind just a 'low spot' in line with the window that is no more than ½" tall at its bottom/lowest point – in other words grind a shallow 'dip' in the top edge that is about 1/8" deep directly under the stub – **figure A4** shows a modified TT installed for clarity. Repeat for each side of the TT.



Fig. A4

Step A5: Remove right-front longitudinal TT rib for catalytic converter clearance. On pre-May2005 TTs, the rib that runs from front-to-back on the TT just to the right (passenger) side of the center will usually need to be removed. This is because when the exhaust modified for the LongArms, this moves the converter inboard as well – often just enough to touch the rib and rattle. Removing this rib is not easy, but can be done either with a plasma cutter or torch (messy, but fast), or with a die grinder/cutting wheel and a hammer (slower, but will leave more of the powdercoating intact). Testing has verified that the longitudinal ribs on all TTs are not essential to the strength of the skid – they have been deleted from current production TTs. Note that only the portion of this rib that is in front of the main cross-rib needs to be removed. Once removed, grind down the remaining weld material.

Once all modifications to the TT skid are completed, you may wish to repaint the affected areas. The paint listed above is nearly identical in color to the original Nth° powdercoat color.



Fig. A5

Step A6: Modify Transmission Adapter Bracket (TAB). If you chose not to purchase a new LongArm-ready TAB, you can modify your current bracket, or if you have a 2002-older TT, you can modify the exhaust hanger rod instead. Follow the steps for your model year below:

2003-newer TJs. The tall 'tower' with the exhaust hanger tube must be moved inboard (towards the transmission) by 0.75". To do this, cut the tower 'strategically' so that you will be able to simply weld it back on again. Note that the tower will now stand directly over the slotted hole for the passenger-side isolator bolt, so you must leave at least 5/8" of clearance above the slot for the flag nut and the tip of the bolt that will be used on this side – in other words it will be rewelded only at the back and in front of the slot. Take care to

Installation Instructions: GyroJoint™ LongArms – Jeep Wranglers

move the tube/tower straight inboard without lowering or raising its height above the slotted hole or you will have exhaust clearance problems later. **Figure A5** shows unmodified and modified towers on manual TABs, while **figure A6** shows the same modification done to a TAB for the 42RLE 4-speed automatic.

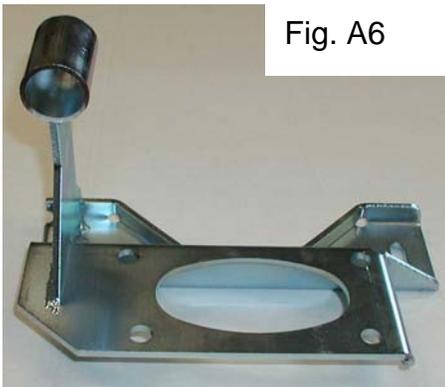


Fig. A6

2002-older TJs with 4.0L+manual trans. For older Jeeps the exhaust hanger mount tube is down low and towards the front of the TAB. On these you have two options: If you want to modify the TAB, move the tube inward all the way until it is flush to the vertical wall of the bracket – this should move the tube nearly 1.0". Note that the tube runs parallel to the bottom surface of the REAR part of the TAB, so use this to your advantage to keep the tube level and



Fig. A7

at the correct height – see **figure A7** for before and after modification close-ups.

If you want to leave the TAB alone, you can follow the instructions in the next paragraph.

2002-older TJs with 3speed Auto (32RE) or 2.5L+5speed manual (AX-5). On these transmissions, the TAB that was originally supplied with your TT cannot be easily modified to accommodate an unmodified exhaust hanger, so you will need to cut a section out of the hanger rod instead. Cut about 1-1/8" of rod out of the angled area of the rod about halfway between the exhaust tube itself and the portion that goes into the hanger bushing. Re-mount the TAB to the trans as it was, then when you complete the exhaust modifications while following the main instructions, reweld the hanger rod together in-place. You can even wait until after the TT is installed if you prefer since you will still be able to access the hanger rod, but you will not be able to weld it from the back as well as the front side, so in this case you should add a small gusset on the top of the rod as shown in **figure A8**.



Fig. A8