



## INSTALLATION INSTRUCTIONS

1075 North Ave. Sanger, CA 93657-3539 local: 559-875-0222 fax: 559-876-2259 toll free: 800-445-3767

**6612/6616 & 6614/6618  
REAR AXLE FLIP-KIT  
1999-UP CHEVROLET SILVERADO/GMC SIERRA 1500**

**Congratulations! You were selective enough to choose a BELLTECH PRODUCT. We have spent many hours developing our line of products so that you will receive maximum performance with minimum difficulty during installation.**

**Note:** Confirm that all of the hardware listed in the parts list is in the kit (Page 8). **Do not** begin installation if any part is missing. Read the instructions thoroughly before beginning this installation.

**Warning:** **DO NOT** work under a vehicle supported by only a jack. Place support stands securely under the vehicle in the manufacturer's specified locations unless otherwise instructed.

**Warning:** **DO NOT** drive vehicle until all work has been completed and checked. Torque all hardware to values specified.

**Reminder:** Proper use of safety equipment and eye/face/hand protection is absolutely necessary when using these tools to perform procedures!

**Note:** It is very helpful to have an assistant available during installation.

### RECOMMENDED TOOLS:

Properly rated floor jack and six (6) support stands  
Wheel chocks  
Die grinder equipped with abrasive cut-off wheel  
Drill motor with 1/4" & 1/2" twist drill bits  
Standard socket wrench set  
Air powered 1/2" drive impact wrench  
Flat bladed screw driver  
C-Clamps  
Safety glasses

Felt-tipped pen  
Steel construction square  
1/2" drive torque wrench  
Medium weight ball peen hammer  
Metal file  
Grinder with abrasive disc  
Cleaning solvent and rag  
Masking tape

! It is very helpful to have an assistant available while performing this installation.

**SAFETY REMINDER:** **PROPER USE OF SAFETY EQUIPMENT AND EYE/FACE/HAND PROTECTION IS ABSOLUTELY NECESSARY WHEN USING THESE TOOLS TO PERFORM THE FOLLOWING PROCEDURES!**

### KIT INSTALLATION

As this is a relatively involved installation, **we recommend** that a qualified mechanic at a properly equipped facility perform it. We also recommend that the installation be performed on a firm, flat and level surface, such as seasoned asphalt or concrete. The use of safe and properly maintained equipment is very important! In order to document any possible irregularities in the factory ride height of your vehicle, please take a few moments to fill out the **Belltech Vehicle Inspection Record** included with these instructions. **We also recommend measuring and recording all stock driveline angles prior to installing this kit.** This information may be helpful if vibration problems arise after installation.

## 1. FRAME IDENTIFICATION

Be aware that General Motors has produced several different style rear frame modules for GMT800 ½ Ton trucks. **It is very important, prior to beginning installation, that you confirm that you have the correct parts for your vehicle's frame style.** Refer to **Diagram A** below and **Table A** to confirm that you have obtained the correct kit.

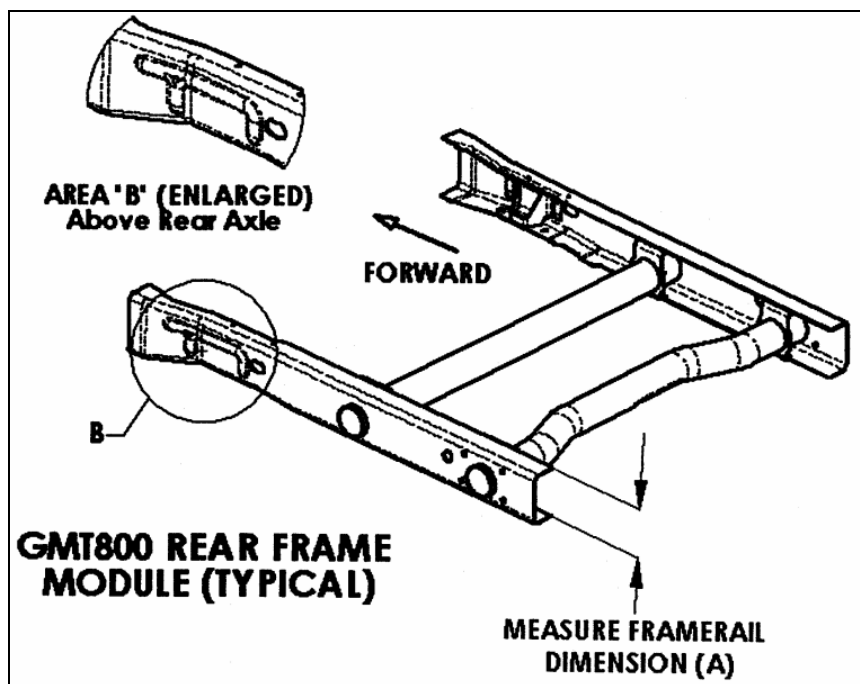


Figure A

Table A: Frame style and Flip Kit identification information

Vehicle Year	Dimension "A"	Area B	Belltech Flip Kit P/N
1999	5.0"	Flat without dimple	6612/6614*
Late '99-2000	5.0"	Dimpled (as shown)	6612/6614*
Late 2000-01	5.25"	Flat without dimple	6616/6618*


\* Indicates Extended Cab Model Kit P/N's only

### 1. JACKING, SUPPORTING, AND PREPARING THE VEHICLE

- Block the front wheels of the vehicle with appropriate wheel chocks. Make sure the vehicle's transmission is in "Park" (automatic) or 1<sup>st</sup> gear (manual). Activate the parking brake.
- Loosen, but **DO NOT REMOVE**, the rear wheel lug nuts.
- Using a properly rated floor jack, lift the rear of the vehicle off the ground. Lift the vehicle so that the rear tires are approximately 6-8 inches off the ground surface.
- Support the vehicle using four (4) support stands, rated for the vehicle's weight. The stands should be positioned, two on each of the frame rails, just forward of the front leaf spring hangers and just below the rear leaf spring shackle hangers. Prior to lowering the vehicle onto stands, make sure the supports will securely contact the straight, flat portions of the frame rails.

! It is very important that the vehicle is properly supported during this installation to prevent frame damage and personal injury! Make sure that the support stands are properly placed prior to performing the following procedures.

- e) Slowly lower the vehicle onto the stands and, before placing the vehicle's weight on them, again check that they properly and securely contact the frame rails as described above. Check for possible interference with any lines, wires, or cables.
- f) Remove the rear wheels from the vehicle.

 **SAFETY REMINDER:** Check for safe vehicle stability before proceeding under the vehicle to begin the following procedures. Never work under a vehicle supported by only a jack. Always use properly rated support stands to support the vehicle.

- g) On Step side models, remove the rear inner-fender liners from the vehicle.
- h) Using the floor jack located directly below the differential, lift the axle housing just enough to remove a significant portion of the axle load from the leaf springs. This step is required to minimize the load applied to frame rails during notching operations. **BE CAREFUL NOT TO LIFT THE VEHICLE OFF OF THE SUPPORT STANDS.**
- i) Support the axle housing with two (2) additional support stands at this height. Make sure the support stands securely contact the axle housing tubes so that the axle housing cannot fall when detached from leaf springs.
- j) Remove the rear shock absorbers from the vehicle (Photo 1). Keep the factory hardware for use during re-assembly.

## **2. FRAME NOTCH SUPPORT (C-SECTION) INSTALLATION LEFT-HAND**

Due to the design of the included Frame Notch Supports (heretofore referred to as "C-sections"), pickup box removal is not required with this kit. However, some installers may prefer to remove the box to facilitate access to the frame. If it is decided to remove the vehicle's bed assembly, please refer to the appropriate *General Motors Service Manual* for recommendations regarding *Pickup Box Removal Procedures*.

 **Safety Reminder: Proper use of safety equipment and eye/face/hand protection is absolutely necessary when performing the following procedures!**

- a) Working from the LH rear wheel opening, remove the small plastic clip (Photo 2), which secures the rear brake line and wiring harness to the top of the frame rail. This is accomplished by removing the small rivet from its' mounting hole. The clip is located on the top of the LH frame rail just rearward of the fuel tank. This clip will not be reused.

**!** To avoid chassis damage, **perform the following procedures to only ONE frame rail at a time.**

- b) Remove the rear brake line bracket from the top of the driver's side (LH) frame rail (Photo 3) by removing two hex-head sheet metal screws using a 13mm wrench. The bracket is located above and just behind the rear axle. To avoid damage, temporarily secure the rear brake line, bracket and brake hose, away from the frame rail, using zip ties or elastic straps secured to the rear axle housing or frame cross-member.
- c) Remove factory jounce stop by loosening and removing the attachment nut, located within the frame rail internal support, using a 15mm wrench.
- d) Clean frame rail area (Photo 4) with solvent to remove the factory coating. **CAUTION: Do not use flammable solvents around sparks or open flames.**
- e) Using the supplied steel template, align slot in template with the slot located on the LH frame rail above and just behind rear axle housing (Photo 5). Also, align the top and bottom edges of the template parallel with the frame rail edges. Be sure that the arrow is pointing forward (towards front of truck). If necessary, fasten template to frame rail using clamps.

**!** It is **very important** that the template be positioned exactly as shown/described, so that the C-Section Assembly fits over the frame rail properly. **Check for proper alignment PRIOR to cutting frame!** Also, be aware that this template properly aligns the C-Section notch with the axle **ONLY WHEN** using the stock leaf springs, hangers, shackles, and other stock components.

- f) Using a felt tipped pen, mark the exact shape of the C-Notch opening onto the outside face of the LH frame rail (Photo 6).

- g) Using a center punch, mark the center location of the 1/4" hole, provided on the template, as shown (Photo 7). This hole is made so that there will be a round corner at the intersection of the cuts. This will eliminate the possibility of cracks forming at the intersections of the cuts. The rear corner of the C-notch cut intersects within the slot; therefore ***NO hole is required there.***
- h) Remove the template. Extend marked lines in places covered by template (Photo 8).
- i) Using a steel square, transfer and mark the lower corners of the C-notch opening, perpendicular to outer face of frame rail, back to underside portion of frame rail (Photo 9). Be sure the lines are perpendicular (90 degrees) to outer face of frame rail.
- j) **IMPORTANT NOTE:** Gasoline fumes are extremely explosive. Check to make sure the fuel tank cap is properly installed and secured, and that the fuel tank is fully sealed.

**!** Check the backside of the frame rail to be sure that all lines, electrical wiring, control cables and other components are cleared from this area to avoid damaging them in the following steps. Be sure to wear proper safety protection when using power tools! **DO NOT** create sparks near flammable or explosive materials.

- k) Using the drill motor equipped with a 1/4" drill bit, drill a hole through frame centered on the mark made above in Step 3g (Photo 10).
- l) With the frame properly supported as described above, use the die-grinder equipped with a cut-off wheel to cut the C-Notch opening along the scribed lines (Photos 11 & 12). Use the forward 1/4" hole, drilled in Step 3k above, to form the front C-Notch corner. If required, a reciprocating saw may be used to cut through the internal OEM jounce-stop re-enforcement.

**!** Be careful when cutting the frame rail. **DO NOT** remove any material from the frame rail that is not shown/described here. Be careful not to damage any lines or other components located behind the frame rail. Avoid creating any sharp corners or other defects that may cause unnecessary stress-concentrated areas in the frame rail. Avoid overheating frame rail.

**👉 Safety Recommendation:** Due to the close proximity of fuel tank to this area, **we DO NOT recommend using a flame-cutting torch or plasma cutter when performing these operations.** Also, excess heat can easily damage the frame rail and other adjoining components.

**!** Some care should be taken when cutting through the center portion of the C-Notch, as the factory jounce stop reinforcement bracket is located within the frame rail in this area. Secondary cutting may be required from the inside of the frame rail to remove any portion of this bracket that might interfere with subsequent C-Section installation.

- m) This Step is required only for vehicles using the 6616/6618 kits as described in Table A. An additional notch is required in the lower frame rail flange just behind the C-notch cut out in Step 3l.
  - Working from the inside of the frame area, use solvent soaked rag to clean coating from the inside upper surface of the lower frame flange (Photo 13).
  - Using felt tip pen (or scribe) and tape measure, mark out a line, parallel to rear C-Notch cut made in Step 3l above, 3 1/2" back towards rear of vehicle (Photo 14).
  - Mark out a line, parallel to inner edge of frame rail flange, 1 1/4" towards inner area of frame rail (Photo 15). Photo 16 shows the proper notch layout.
  - Again using the die-grinder equipped with cut-off wheel cut the notch as shown. Photo 17 shows the completed RH cut.
- n) Deburr all freshly cut edges using hand file or grinder.
- o) Paint all bare metal surfaces and edges to prevent rust.
- p) Install the outer C-section shell over the frame rail, aligning C-notch Support portion with the C-notch cut made in frame rail. Make sure the C-section fits properly over the frame rail and that all profiles align correctly (Photo 18). Check that the support is properly aligned such that the

square notch, located in the top surface of the C-section, is evenly aligned with central bed cross-member (Photo 19).

**!** It may be necessary to use a soft-faced hammer to position the C-Section shell over frame rail. Make sure the C-section is properly installed prior to proceeding with following hole-drilling procedures.

- q) With the C-section installed tightly against the outside face of frame rail, use the drill motor, equipped with a 1/2" drill bit, to transfer the nine (9) 1/2" holes to the frame rail. Use the C-section holes to locate the drill bit (Photo 20). Use cutting lubricant or light oil to facilitate the drilling and to extend drill bit life. To prevent movement while drilling, use C-clamps to fix the C-section shell to the frame rail. ***Be careful not to damage any lines or other components located behind the frame rail.***

**!** Be cautious when drilling these holes, as the fuel tank is located directly behind this area (LH only). While drilling, **we highly recommend** placing a protective metal plate in the fuel tank area to prevent puncture and/or other damage.

- r) Working from the outside of the frame rail, insert four (4) 1/2-20 x 1 1/4" (shorter) hex head bolts with washers into the two most forward and two most rearward holes (Photo 21). Secure these bolts with washers and locknuts. These four (4) nuts/washers should directly contact the inner surface of frame rail. Tighten and torque these bolts to 110 lb ft.

**!** It is important that these shorter, outermost bolts be installed and tightened **PRIOR** to internal stiffener installation procedures (below), as the forward holes cannot be accessed after stiffener is in position. **Follow these instructions exactly as the bolt installation sequence is VERY IMPORTANT!**

- s) Install the kit-supplied urethane jounce stop to the C-notch portion of the C-section shell with supplied locknut (Photo 22). It may be necessary to bend the rearward ear of the internal factory jounce stop reinforcement bracket (cut in Step 3l above) forward to clear the replacement jounce stop stud and nut.

**!** **The jounce stop must be installed PRIOR** to stiffener plate installation below.

- t) Insert five (5) 1/2-20 x 3 1/2" (longer) hex head bolts with washers, from outside and through the remaining holes drilled in Step 3q (Photo 23).
- u) From the inside of the frame rail, install five (5) tubular spacers over the threaded-ends of these bolts. Position the brake line and electrical wiring harness so that they route outside of frame rail and Internal Stiffener. Zip-tie wiring harness to brake line as shown (Photo 24). Be sure that none of these components are pinched or damaged by the hardware.
- v) Locate the LH C-section Internal Stiffener inside the C-section shell so that the five (5) bolts pass through the appropriate holes and the tubular spacers are located between the frame rail and internal Stiffener (Photo 25). The tabs on the Stiffener should point towards the inside of the vehicle, so that they align with the tabs on the C-section shell.

**!** Make sure the five (5) bolt spacers are sandwiched between the **inside** portion of frame rail and the C-section stiffener.

- w) Loosely secure the five (5) bolts, installed in Step 3t, with washers and locknuts but **DO NOT TIGHTEN** until instructed to below.
- x) Adjust the C-section stiffener position until the remaining five (5) holes and tabs align with the corresponding holes in the C-section shell. It may be necessary to bend some of the stiffener plate tabs slightly to align with the corresponding tabs of C-section shell. In some cases it may be necessary to enlarge one or more holes slightly using the die-grinder or round file to achieve proper alignment.

- y) Install two (2) 3/8-24 x 1 H.H.C.S. (bolts) with washers through the top two forward holes of the C-section shell and then through the tabs of the Internal Stiffener.
- z) Install one (1) 3/8-24 x 1 H.H.C.S. first through the factory rear brake line bracket (removed in Step 3b), then through the rearward most top bolt hole of the C-section and finally through the rear Stiffener tab (Photo 26). NOTE: The hole in the OEM bracket might need to be enlarged slightly using a round file.
- aa) Secure the three (3) bolts with washers and locknuts but **DO NOT TIGHTEN** until instructed to below.
- bb) Install two (2) 3/8-24 x 1 H.H.C.S. through the lower two holes of the C-section shell and then through the tabs of the Internal Stiffener (Photo 27) from the bottom. Secure with washers and locknuts but **DO NOT TIGHTEN** until instructed to below.
- cc) Tighten and torque the five (5) ½" bolts and locknuts installed in Step 3t & 3w to 110 lb ft.
- dd) Tighten and torque the five (5) 3/8" bolts and locknuts installed in Step 3y, 3z, 3bb, & 3cc to 45 lb ft.

### 3. **FRAME NOTCH SUPPORT (C-SECTION) INSTALLATION RIGHT-HAND**

- a) Repeat Steps 3a through 3dd for passenger's side (RH) of vehicle. Note: the brake line and fuel tank Steps are not applicable for the RH side. Be sure to have the LH side fully installed prior to beginning RH side C-section installation. The completed installation should appear as shown (Photo 28).

### 4. **LEAF SPRING REMOVAL AND RE-INSTALLATION**

- a) With rear axle assembly properly supported, loosen and remove the U-bolt nuts from both sides of axle. Remove the U-bolts, U-bolt locator plates, and axle clamps from the axle tubes (Photo 29). These parts will not be reused.

**NOTE:** Leaf springs may be under tension. Springs under tension store a great amount of energy. **USE CAUTION** during the following steps to avoid personal injury and/or damage to the vehicle. Be careful not to damage the brake hoses and/or driveline while re-locating rear axle assembly.

- b) Using the floor jack, adjust the height of the rear axle housing to remove weight from the leaf springs to allow for easy removal of the spring and shackle bolts.
- c) Loosen and remove the mounting bolts from the front spring hangers and the bottom of the rear shackles (Photo 30). Loosen, but **do not remove**, the shackles from the springs.
- d) Mark the leaf springs "Left" and "Right". ***Also mark each forward spring end with a forward pointing arrow so that the springs can be properly re-installed into their original locations.***
- e) Carefully remove the leaf springs from their mounting locations.
- f) Using the floor jack, lift the rear axle assembly so that the leaf springs will fit under it.
- g) Place the leaf springs **under the axle** in the location and orientation removed (Photo 31).
- h) Attach the front spring eye into its location in the front spring hanger using the original hardware. Lift the rear of the leaf springs up so that shackles fit into rear spring hangers. Attach using original hardware. **DO NOT** tighten and torque to final specification until instructed to below.
- i) Locate the *Belltech* axle Adapter Saddles supplied in the kit. Place the Adapter Saddles on top of the springs with the hole over the head of the spring center bolt. To properly position the axle, the offset holes **MUST** be oriented toward the front of the vehicle (Photo 32). Slowly lower the rear axle assembly down onto the saddles. The ears should fit into the stock spring perches on the axle tubes (Photo 33). Make sure both ears on each saddle locate completely into the perches.
- j) Install the four (4) new U-bolts, 2 per spring, over the axle tubes on each side of the leaf spring packs with threaded ends pointing down. Install the new U-bolts plates below the leaf springs; offset holes forward, so that the U-bolts pass through the appropriate slots (Photo 34). Attach the U-bolt plates using washers and locknuts. Tighten and torque locknuts to 90 lb ft.

! The axle adapter saddles have been design to properly position the rear axle pinion shaft relative to the driveline so that vibrations are eliminated. If driveline vibrations are experienced, take vehicle to driveline service shop immediately for driveline angle inspection and necessary adjustments. **DO NOT** drive vehicles exhibiting driveline vibrations, as U-joint wear could occur prematurely. Be sure to lubricate the U-joints if deemed necessary.

- k) Torque spring front hanger nut to 92 lb ft. Torque shackle to frame bracket and shackle to spring nuts to 70 lb ft.

## 5. **SHOCK ABSORBER AND EXTENSION INSTALLATION**

- a) Install Shock Absorber Extensions (P/N 6654) as described in the 6654-888 instructions (these instructions are included separately).
- b) Install the appropriate *Belltech* Nitro-Drop® or Nitro-Active® rear shock absorbers using the original hardware. See the current *Belltech Application Guide* or contact you nearest *Belltech Dealer* for the appropriate part numbers for your application. Tighten and torque hardware to 70 lb ft.

## 6. **BED CROSS-MEMBER C-NOTCH INSTALLATION**

- a) Install the Bed Cross-member C-notch (P/N 6655) as described in the 6655-888 instructions (these instructions are included separately).

! The Bed Cross-member C-notch Assembly helps to prevent the center-section of the rear axle housing from coming in contact with the underside of the bed. It also strengthens the central area of the bed so that loads can be carried while reducing the possibility of damage occurring to the bed floor.

## 7. **CENTER-CARRIER BEARING RE-LOCATOR INSTALLATION(EXTENDED CAB MODELS ONLY)**

! The Center Carrier Bearing Adjuster assembly allows adjustments to be made to both the horizontal and vertical positions of the center-carrier bearing on Extended Cab models. These adjustments help to eliminate driveline vibrations.

- a) Install and adjust the Center-Carrier Bearing Adjustment Assembly (P/N 4995) as described in the 4995-888 instructions (these instructions are included separately).

! Due to installation variables and factory manufacturing variances beyond our control, we **HIGHLY RECOMMEND** that the driveline angles present in the vehicle after modification be checked and compared to the driveline angles present before modification and, if necessary, be brought back within factory specifications. Installation of shims and/or center-carrier bearing adjustments may be required.

## 8. **FINALIZING THE INSTALLATION**

- a) On Step side models, replace the rear inner-fender liners.
- b) Re-install wheels and torque to the Manufacturer's specifications.
- c) Check that all components and fasteners have been properly installed, tightened and torqued.
- d) Lift vehicle and remove support stands. Carefully lower vehicle to ground.
- e) Check brake hoses, cables and other components for any possible interference.
- f) If necessary, ***check driveline angles as described above.***
- g) Check for wheel/tire to chassis/body interference.
- h) Immediately test-drive the vehicle in a remote location so that you can become accustomed to the revised driving characteristics and handling. Be aware that the vehicle will handle substantially different now that it has been lowered.
- i) Take the vehicle to a qualified shop for 4-wheel alignment.

- j) Check all of the hardware and re-torque at intervals for the first 10, 100, and 1000 miles.

**!** The front of the vehicle **MUST** be lowered accordingly for proper handling and performance and also to maintain warranty. See the current *Belltech Application Guide* or contact your nearest *Belltech Dealer* for the appropriate part numbers for your application.

### Parts List: 6612/6614 & 6616/6618

#### GMT800 Rear Axle Flip Kit

Part #	Description	Quantity
6612-050	LH C-Section Frame Support (6612/6614 Only)	1
6612-060	RH C-Section Frame Support (6612/6614 Only)	1
6612-055	LH C-Section Stiffener (6612/6614 Only)	1
6612-065	RH C-Section Stiffener (6612/6614 Only)	1
6612-014	C-section Bolt Spacer	10
6612-005	Axle Adapter Saddle	2
6612-015	U-Bolt 5/8-18	4
110505	5/8-18 Locknut	8
110502	5/8" Washer A325	8
6600-010	U-Bolt Plate	2
110424	1/2-20 x 3 3/4 H.H.C.S. Grade. 8	10
110408	1/2-20 x 1 1/4 H.H.C.S. Grade. 8	8
110403	1/2-20 Locknut	18
110660	1/2" AN Washer	36
110251	3/8-24 x 1 H.H.C.S. Grade. 8	10
110254	3/8-24 Locknut	10
110625	3/8" AN Washer	20
4915-001	Bump Stop	2
9999-975	7" Zip-Tie	2
6654	Shock Extension Assy.	1
4995	C.C.B. Adjuster Assy. (6614 Ext. Cab only)	1
6612-889-1	Installation Template C-section	1
6616-030	C-Section LH (6616/6618 Only)	1
6616-040	C-Section RH (6616/6618 Only)	1
6616-033	C-Section Frame Stiffener LH (6616/6618 Only)	1
6616-043	C-Section Frame Stiffener RH (6616/6618 Only)	1



