LEAF SPRING REPLACEMENT ON AN EXISTING AXLE BEAM

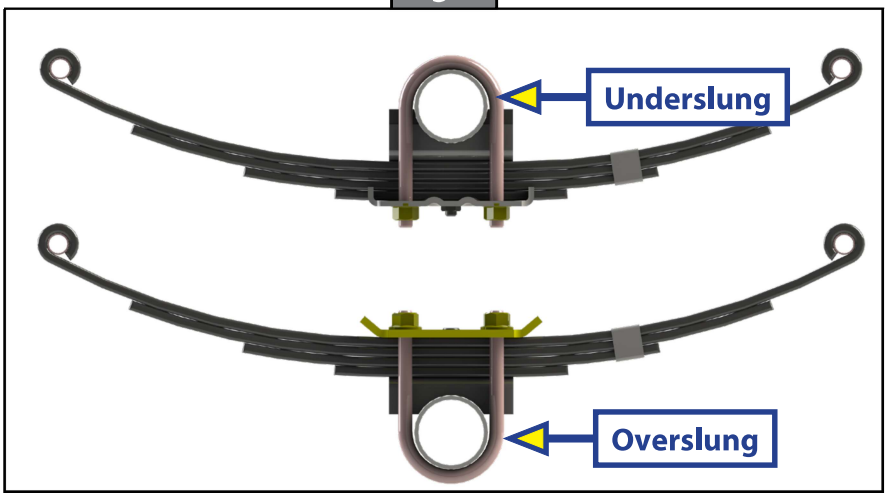
TI-345

AXLES AND SUSPENSION

Purpose

This document outlines the process for replacing the double-eye leaf spring components on an existing axle beam assembly. The following procedure is applicable for both underslung—when the leaf spring is mounted, or "slung," under the axle—and overslung—when the leaf spring is mounted, or "slung," over the axle (Fig. 1).

Fig. 1



NOTE: Images used in this document are for reference only when assembling, installing and/or operating this product. Actual appearance of provided and/or purchased parts and assemblies may differ.

Safety

Read and understand all instructions before installing or operating this product. Adhere to all safety labels.

⚠WARNING

The trailer MUST be supported per manufacturer's recommendations before working underneath. Failure to do so may result in death, serious personal injury, severe product and/or property damage.

⚠WARNING

Always lift the trailer by its frame and never by its axle or suspension. Axle and suspension components are not designed, or rated, for the dead weight, point-of-contact loads that the trailer's frame is. Do not go under the trailer unless it is supported by appropriately rated jack stands. Improperly supported trailers can collapse, causing possible serious personal injury or death.

⚠CAUTION

Moving parts can pinch, cut or crush. Keep clear and use caution.

⚠CAUTION

Wear appropriate personal protective equipment (PPE) when performing service or maintenance operations. Always wear eye protection when servicing trailer axles, brakes, hubs, springs and wheels. Not using PPE may result in personal injury.

Resources Required

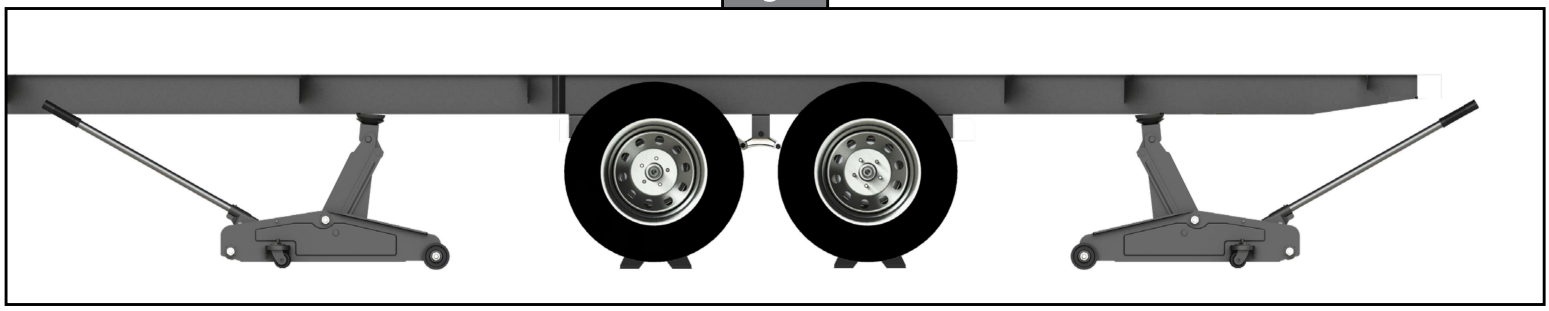
- 1 - 2 persons, depending on task
- Floor jacks
- Jack stands
- Pneumatic air or impact gun
- Assorted deep well sockets
- Hammer or mallet
- Torque wrench (ft-lb)

Replacement Procedure

1. Using floor jacks, lift the frame slightly and place properly-rated jack stands under the axles (Fig. 2) so the shackle bolts can be driven out with a hammer.
2. Place a suitable block under the axle tube near the area to be repaired.

NOTE: The block acts as a support for the weight of the axle only, allowing suspended system components to be serviced or replaced freely. Multiple axle trailers **MUST** have the weight of each axle properly supported before disassembly of any suspension system components.

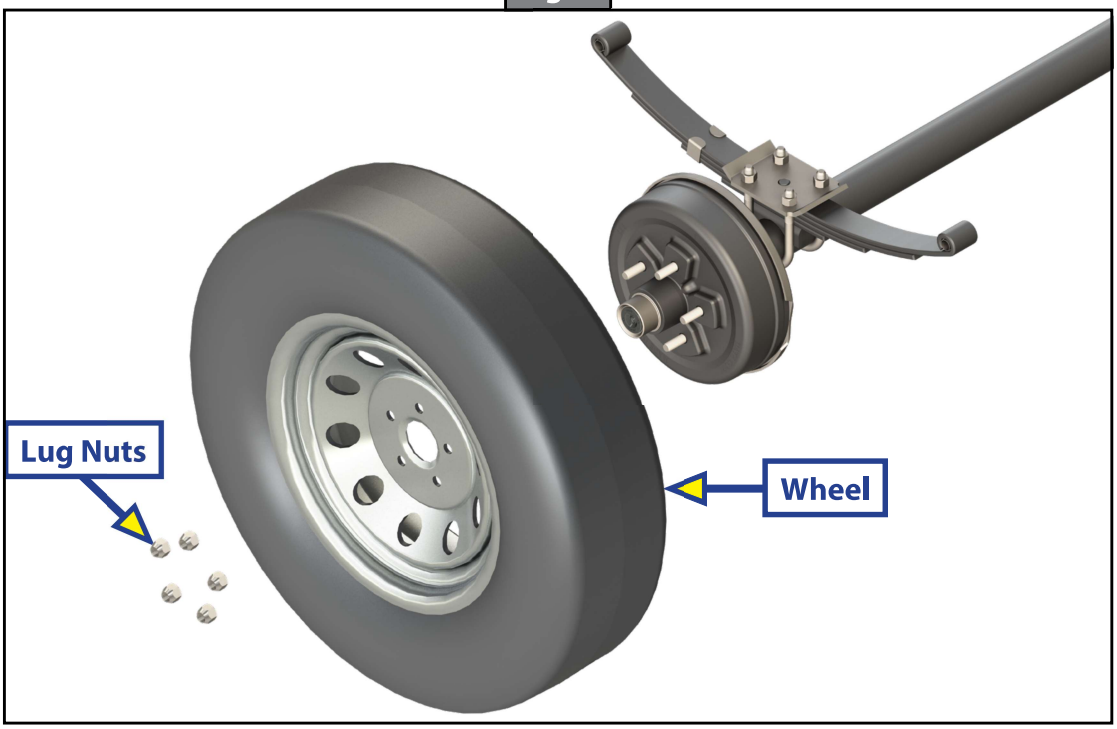
Fig. 2



3. Remove tires and wheels—curbside and roadside—from the axle (Fig. 3) with the affected leaf spring.
4. Set wheel and lug nuts (Fig. 3) aside for later installation.
5. Inspect axle/brake assembly electrical wiring and/or hydraulic hoses for length. If lines are too short to allow lowering the axle, disconnect lines before lowering.

NOTE: Make sure electrical power is off and hydraulic system has been de-energized before disconnecting lines.

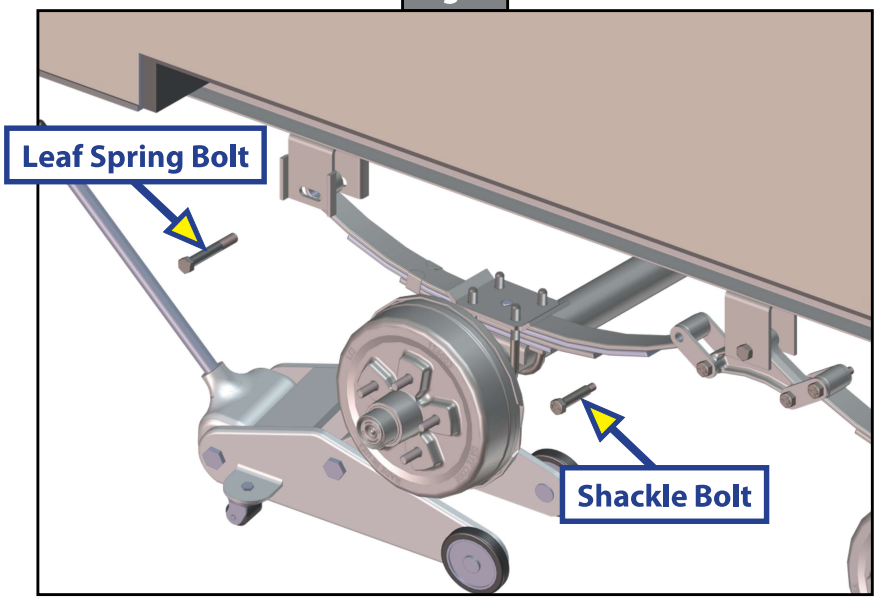
Fig. 3



6. With an impact gun or an appropriate wrench, loosen the nuts on the leaf spring bolts and the shackle bolts (Fig. 4).

NOTE: Hold the head of the bolts with a wrench.

Fig. 4



7. Remove the nuts from the leaf spring bolts and the shackle bolts.
8. Drive out the leaf spring bolts with a mallet or hammer until they unseat from their hanger.
   - **A.** Inspect the threaded end of the bolts for damage to the threads.
   - **B.** If threads are damaged, replace bolts. Otherwise, set bolts and nuts aside for later installation.
9. Drive out the shackle (wet) bolts of the shackle link assemblies with a mallet or hammer until they unseat from their leaf spring and equalizer.
   - **A.** Inspect the threaded end of the shackle (wet) bolts for damage to the threads.
   - **B.** If threads are damaged on one or both bolts, replace shackle link assembly. Otherwise, set shackle link assemblies, shackle links and nuts aside for later installation.

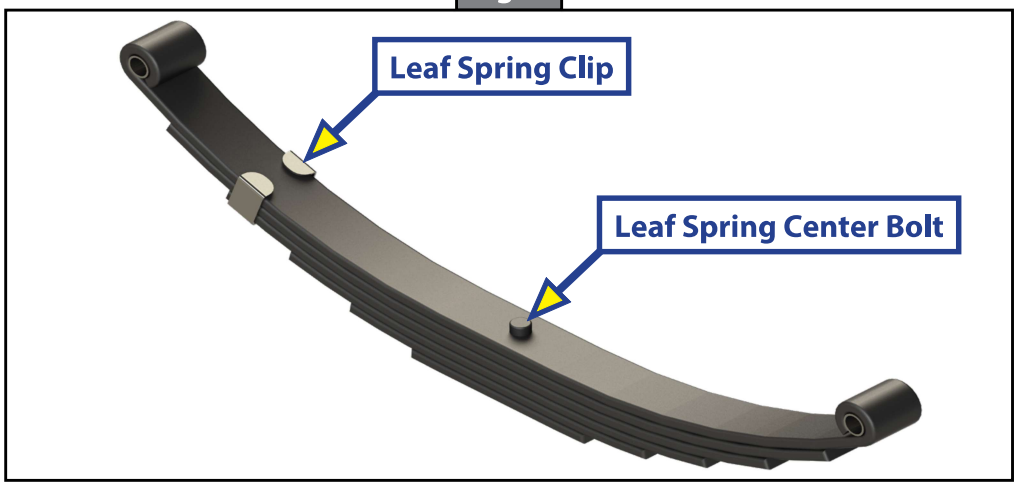
NOTE: At this point in the installation, Lippert recommends inspecting the equalizer shackle links. If the shackle links are worn, Lippert recommends replacing them.

NOTE: Shackle links **MUST** be reinstalled using the same shackle orientation used previously.

10. Adjust the floor jacks so the jack stands can be removed from under the axle.
11. Using the floor jacks, lower the axle of the leaf spring being replaced.

12. Position and orient the new leaf spring (Fig. 5) underneath the trailer to help expedite installation.

Fig. 5

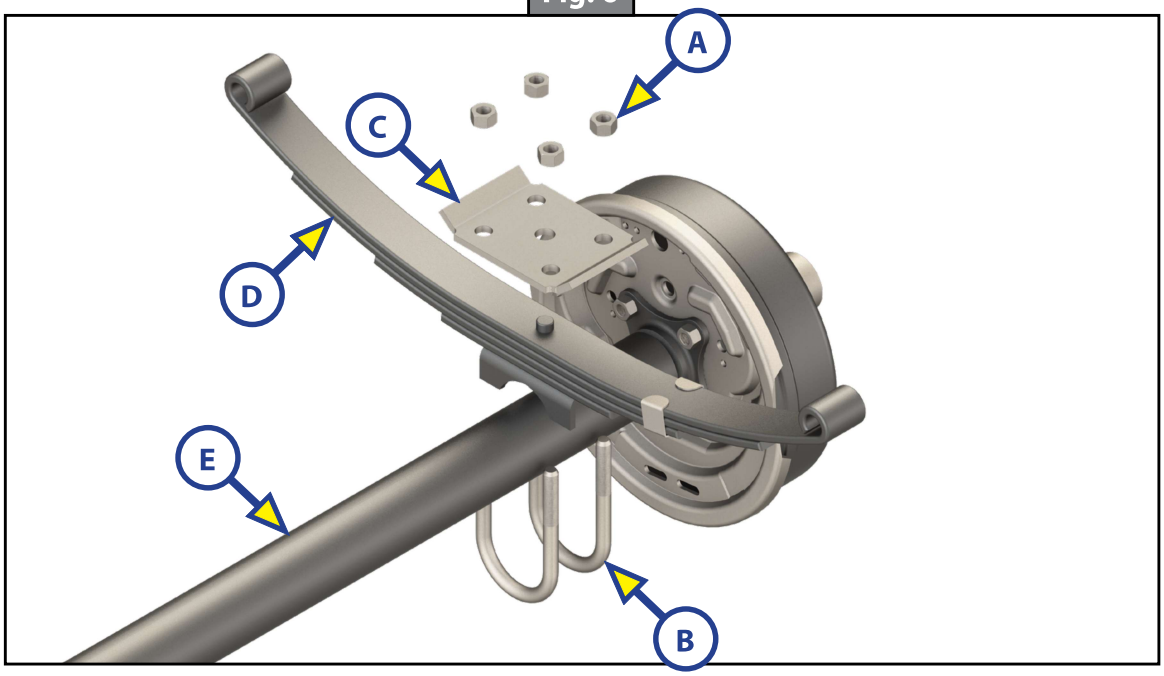


13. After the axle and leaf springs have been lowered from the chassis hangers and shackle links:

A. Remove U-bolt nuts (Fig. 6A) from the affected leaf spring.

B. Remove U-bolts (Fig. 6B) and tie (spring) plate (Fig. 6C) from the axle (Fig. 6E) holding the affected leaf spring (Fig. 6D).

Fig. 6



C. Set U-bolts, nuts and tie (spring) plate aside Do **NOT** reuse U-bolts or nuts. Tie (spring) plate may be reused if it is not damaged.

D. Set removed leaf spring aside. Do **NOT** reuse affected leaf spring.

14. Place the new leaf spring (Fig. 6) onto the axle with the leaf spring clip pointing towards the front of the trailer. Make sure spring center bolt engages the center hole of the tie (spring) plate.

15. Position new U-bolts and tie (spring) plate on the axle (Fig. 7).

A. Install new washers, if equipped, and hand-start new nuts.

B. Hand-tighten nuts until snug (Fig. 7).

C. Verify the following:

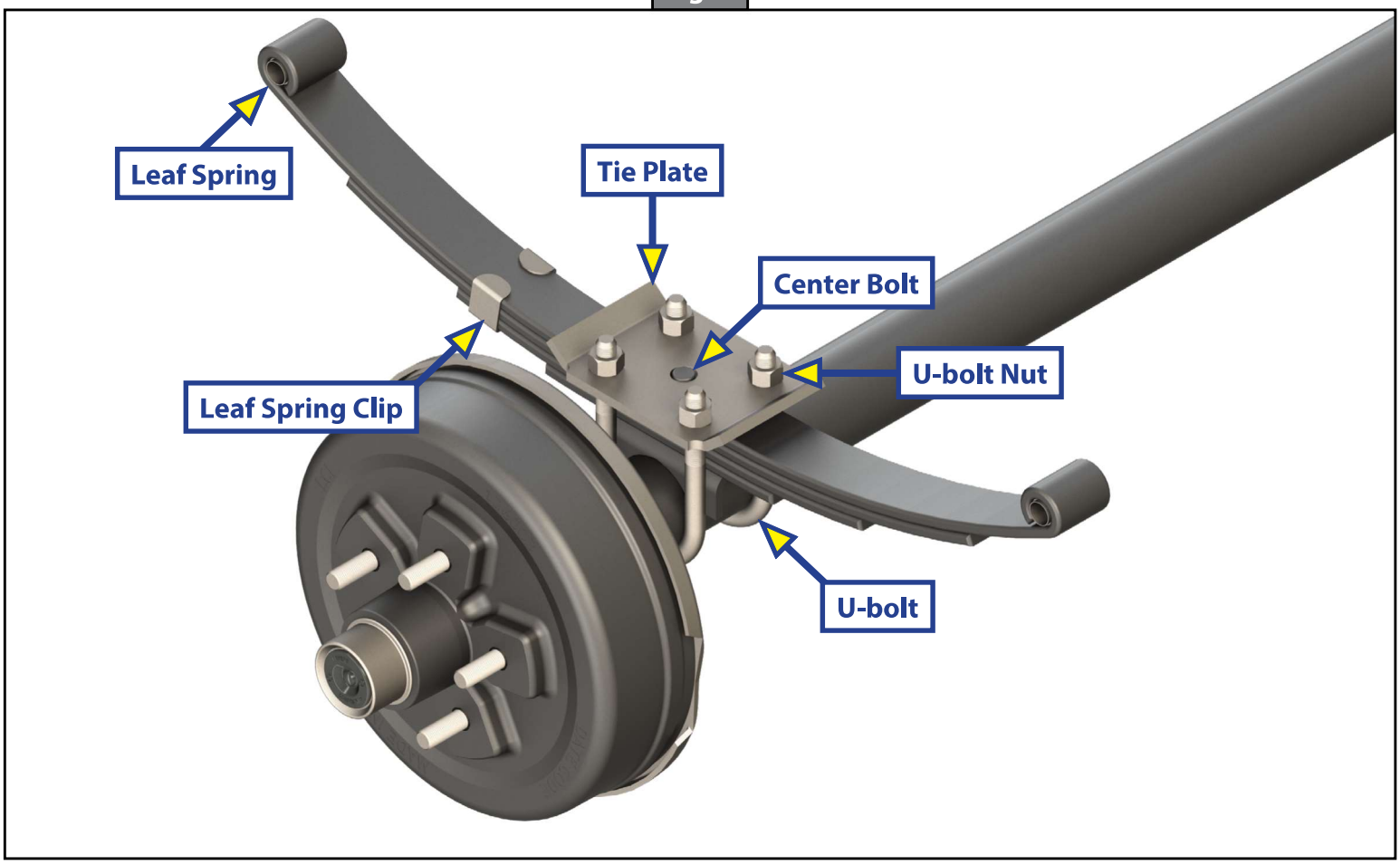
I. Center bolt is engaged in tie (spring) plate (Fig. 7).

II. Leaf spring is square to the axle (Fig. 7).

III. U-bolts are straight up and down and not splayed in or out.

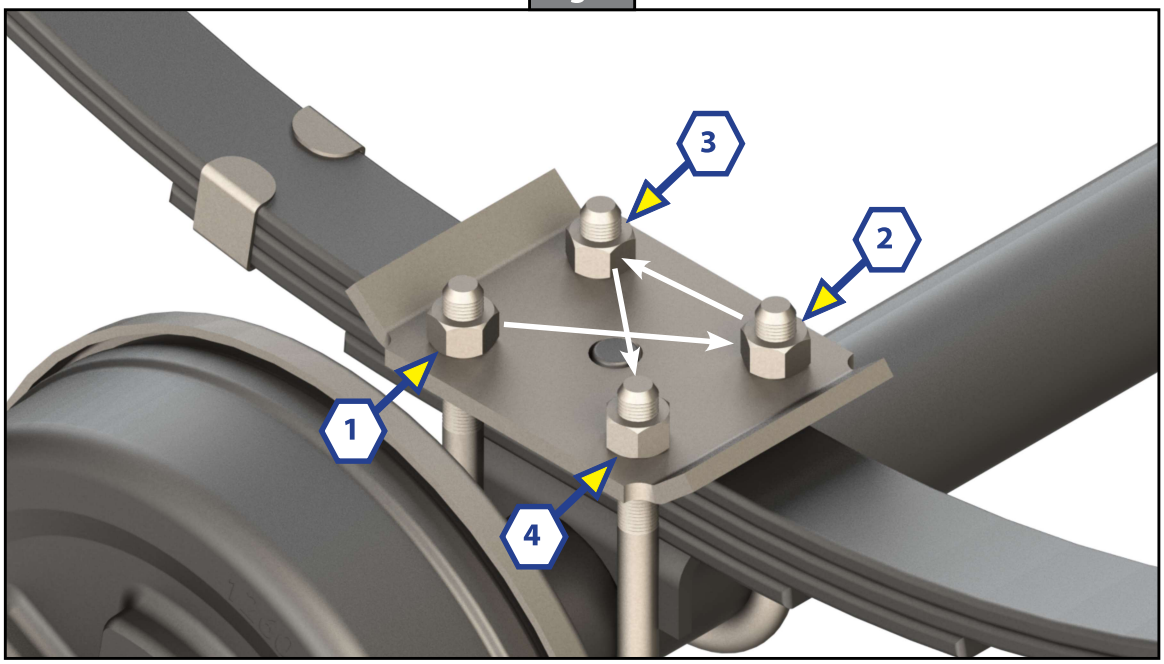
IV. U-bolts have approximately the same amount of thread sticking out of each nut.

Fig. 7



16. Progressively tighten tie (spring) plate nuts in a criss-cross pattern, in the order given (Fig. 8), until the final torque is obtained. Refer to Spring Axle Torque Specifications chart for bolt torque requirements.

Fig. 8



Spring Axle Torque Specifications		
Bolt Type	Axle Capacity	Torque
3/8" U-Bolt Nuts	2K	35 ft-lbs
1/2" U-Bolt Nuts	3.5K	50 ft-lbs
9/16" U-Bolt Nuts	5.2K	65 ft-lbs
9/16" U-Bolt Nuts	6-8K	90 ft-lbs
Overslung Orientation Silver U-Bolts	8K	145 ft-lbs
Spring Eye, Equalizer and Shackle Nuts	All Double Eye	30-50 ft-lbs

17. Verify the following:

- **A.** Leaf spring is square to the axle.
- **B.** Tie (spring) plate is flat against leaf spring.
- **C.** U-bolts are straight.
- **D.** U-bolts have approximately the same amount of thread sticking out of each nut.
- **E.** All nuts are torqued.

18. Use floor jacks and jack stands to raise axle assembly into position for reinstallation to the trailer's frame, do as follows:

- **A.** Reinstall previously removed leaf spring hanger and shackle bolts and nuts.
- **B.** When installing wet bolts, use a steel tube and hammer to drive in wet bolts to prevent damage to the grease fitting.
- **C.** Refer to Spring Axle Torque Specifications chart for bolt torque requirements.

NOTE: Hold the head of the bolts with a wrench.

D. If installing new or previously removed wet bolts, apply new grease. Use NLGI code GC-LB.

E. Reconnect any disconnected electrical lines and/or hydraulic hoses (step 5).

NOTE: If reconnecting hydraulic hoses, make sure all hydraulic lines are purged of air.

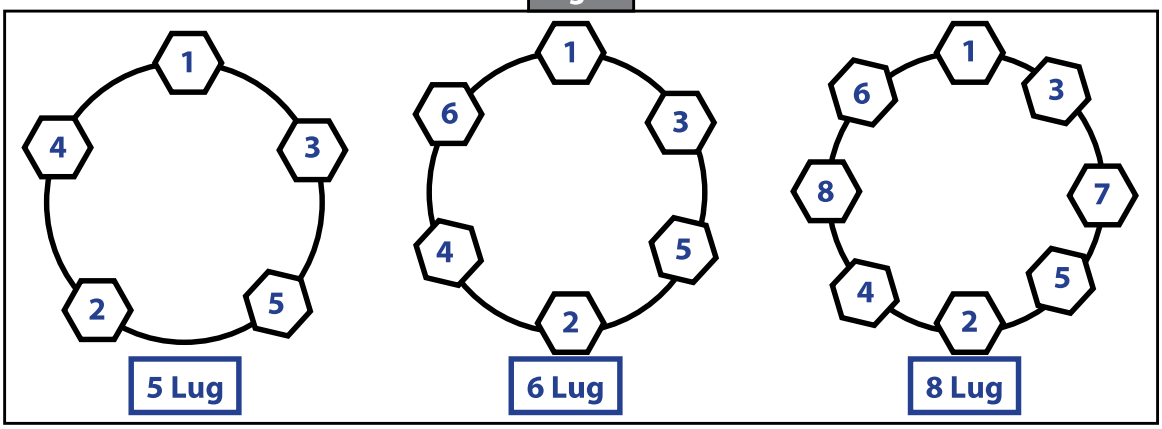
19. Reinstall previously removed tires, wheels and lug nuts (steps 3 and 4) onto the axle (Fig. 3).

A. Start all wheel lug nuts by hand to prevent cross-threading.

B. Continue to hand-tighten wheel lug nuts in the sequential pattern shown in figure 9.

C. After wheel lug nuts are fully hand-tightened, torque nuts in stages and in the sequential pattern shown in figure 9.

Fig. 9



D. Torque wheel lug nuts to the torque values listed in the Wheel Torque Requirement Chart.

Wheel Torque Requirement Chart				
Wheel Size	Stud Size	Torque Sequence		
		1st Stage	2nd Stage	3rd Stage
14″	½″	20-25 ft-lbs	50-60 ft-lbs	90-120 ft-lbs
15″	½″	20-25 ft-lbs	50-60 ft-lbs	90-120 ft-lbs
16″	½″	20-25 ft-lbs	50-60 ft-lbs	90-120 ft-lbs
16.5″ x 6.75″	½″	20-25 ft-lbs	50-60 ft-lbs	90-120 ft-lbs
16″	9/16″	20-25 ft-lbs	60-70 ft-lbs	120-140 ft-lbs
16.5″ x 6.75″	9/16″	20-25 ft-lbs	60-70 ft-lbs	120-140 ft-lbs
16″ Dual and 17.5″ Cone Nut	⅝″	50-60 ft-lbs	100-120 ft-lbs	190-210 ft-lbs
16″ Dual and 17.5″ Flange Nut	⅝″	50-60 ft-lbs	150-200 ft-lbs	275-325 ft-lbs
14.5″ Demount	½″	Tighten sequentially to 85-95 ft-lbs		

20. The leaf spring replacement procedure is now complete.