

Preparation

**Part Number: PTR13-35100/Front
PTR13-35101/Rear**

Kit Contents:

Item #	Quantity Req'd.	Description
1	1	Front or Rear TRD Off-Road Shock Assy (w/ Dust Cover)
2	1	Cotter Pin – Front Shock Only
3	1	Lock Nut M12 x 1.25 - Rear Shock Only
4		(washer deleted)

Hardware Bag Contents

Item #	Quantity Req'd.	Description
1		
2		
3		

Additional Items Required For Installation

Item #	Quantity Req'd.	Description
1		
2		
3		

Conflicts

NONE

Recommended Tools

Personal & Vehicle Protection	Notes
Eye Protection	Safety Glasses
Hand Protection	Mechanic Gloves
Special Tools	Notes
Tie Rod Removal Tool	SST: 09611-12010/20015-01 or equivalent
Spring Compressor	SST: BRNM-ST7200
Vehicle Lift	Frame Lift (2 Post)
Installation Tools	Notes
Socket / Ratchet	12mm ,14 mm, 17 mm, 19mm, 21mm
Extension	6" Extension
Wrenches - Ratcheting	14 mm, 17 mm, 21mm
Pneumatic Wrench	For fastener removal only
Impact Gun	For fastener removal only
Screwdriver	Flat head
Punch / Drift	1.4" Dia. / 6" Punch
Pliers	Needle Nose
Crescent Wrench	
Rubber Mallet	
Paint Marker	
Scissors	
Torque Wrench	0 - 150 lbf-ft (0 - 204 N·m) w/ crows foot or torque adaptor

Adjustable Pole Jack	
Special Chemicals	Notes
Cleaner	Approved TLS cleaner

General Applicability

2010MY FJ Cruiser – All Grades (2x4 & 4x4)
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Recommended Sequence of Application


Item #	Accessory
1	Off-Road Shocks
2	Off-Road Wheel/Tire Assembly


* Mandatory


Vehicle Service Parts (may be required for reassembly)


Item #	Quantity Req'd.	Description
1		
2		
3		


Legend


 **STOP:** Damage to the vehicle may occur. Do not proceed until process has been complied with.

 **OPERATOR SAFETY:** Use caution to avoid risk of injury.

 **CAUTION:** A process that must be carefully observed in order to reduce the risk of damage to the accessory/vehicle and to ensure a quality installation.

 **TOOLS & EQUIPMENT:** Used in Figures calls out the specific tools and equipment recommended for this process.

 **REVISION MARK:** This mark highlights a change in installation with respect to previous issue.

 **SAFETY TORQUE:** This mark indicates that torque is related to safety.

Care must be taken when installing this accessory to ensure damage does not occur to the vehicle. The installation of this accessory should follow approved guidelines to ensure a quality installation

These guidelines can be found in the "Accessory Installation Practices" document.

This document covers such items as:

- Vehicle Protection (use of covers and blankets, cleaning chemicals, etc.).
- Safety (eye protection, rechecking torque procedure, etc.).
- Vehicle Disassembly/Reassembly (panel removal, part storage, etc.).
- Electrical Component Disassembly/Reassembly (battery disconnection, connector removal, etc.).

1. Check the Kit Content.



- (a) Make sure that the kit contains all the parts listed in the Kit Contents.

2. Place Vehicle on Frame Lift

- (a) Securely place vehicle onto frame lift & raise

3. Remove Wheel/Tire Assemblies

- (a) Using the 21mm socket and impact gun, remove all 4 wheel/tire assemblies.
 - (1) Ensure that the wheel surfaces are protected when temporarily removed.
 - (2) Keep all original lug nuts for re-installation (6 per wheel).

4. Disconnect Front Stabilizer Bar Ends

- (a) Using a 17mm socket, remove and save the two lower nuts securing the stabilizer links to the steering knuckle. (Fig. 4-1)

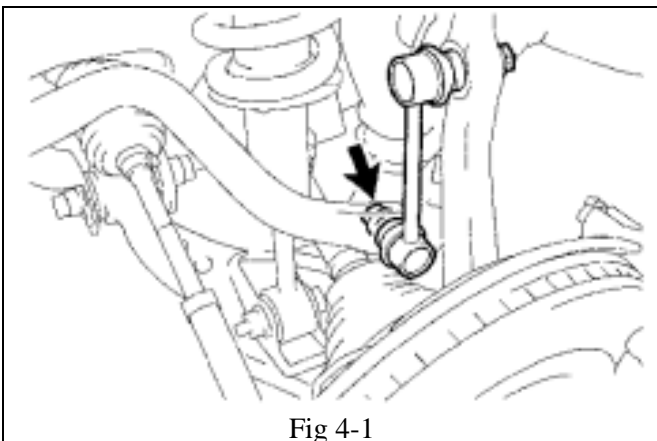
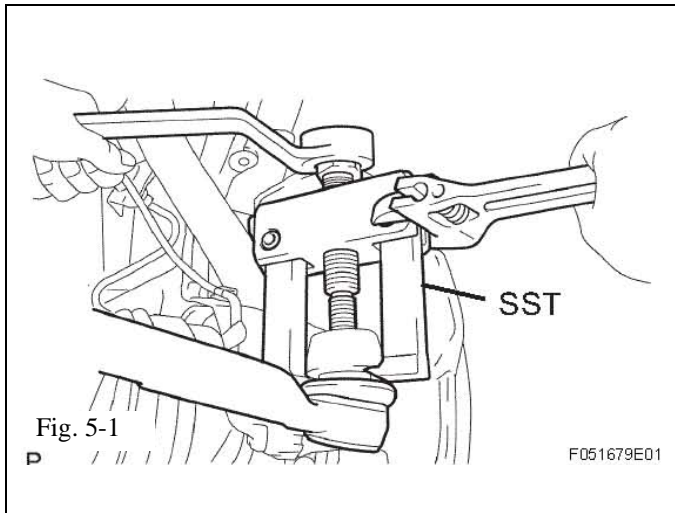


Fig 4-1

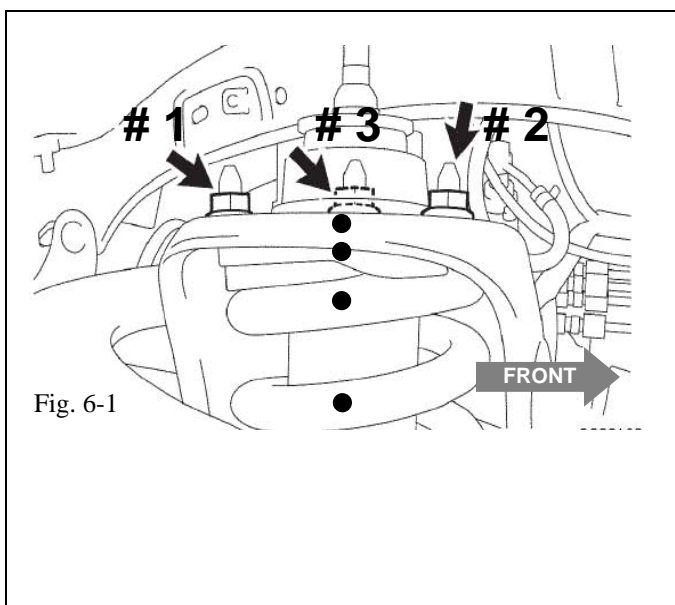


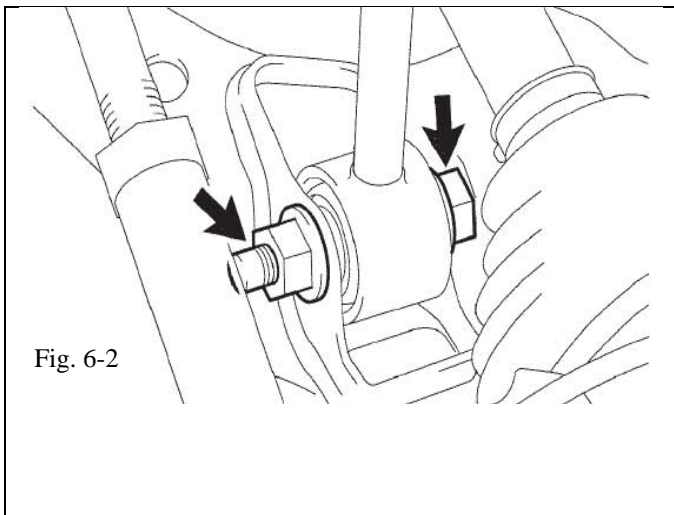
5. Remove Tie Rod from Steering Knuckle

- (a) Using a flat head screwdriver and needle nose pliers, remove and discard the OE cotter pin from the tie rod nut.
- (b) Using a 19mm socket, remove and save the tie rod nut.
- (c) Using SST (09611-12010/20015-01), carefully place the bottom portion of the SST above the grease filled bushing and align the bottom of the SST's bolt head, with the top of the tie rod's bolt head. (Fig. 5-1)
 - (1) It is very important that the SST does not cut into the grease filled bushing.
- (d) Using a 17mm socket, tighten down on the SST until the tie rod pops out of the knuckle.
 - (1) Holding the SST will prevent it from falling
 - (2) Turn wheel outward to better access shock.
- (e) Repeat steps 6 (a) – 6 (d) on the opposite side.

6. Remove OE Front Shock/Spring Assembly

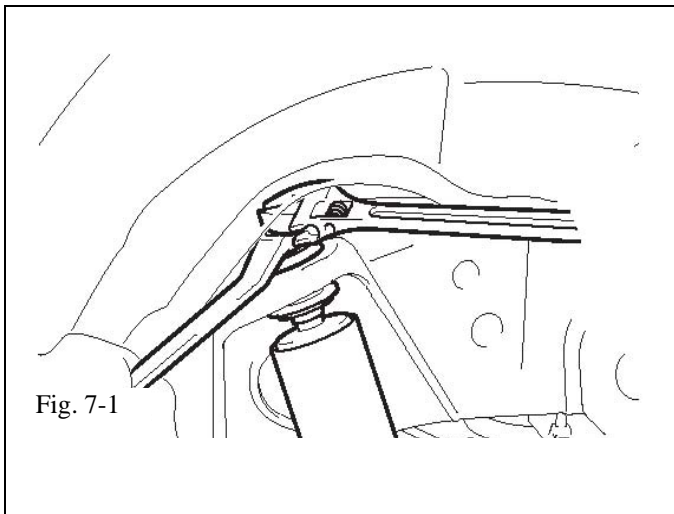
- (a) Identify right (or left) assembly, if removing both front assemblies at the same time.
- (b) Prior to removing the OE shock/spring assembly, it is highly recommended to use a paint marker (or equivalent) to mark the relative location of the shock, shock tower, and spring, to one another. This process will ensure the assembly is reinstalled properly in its aligned state. (Fig. 6-1)
- (c) Using a 14mm ratcheting wrench, remove and save the 3 nuts on the top shock tower. (Fig. 6-1)





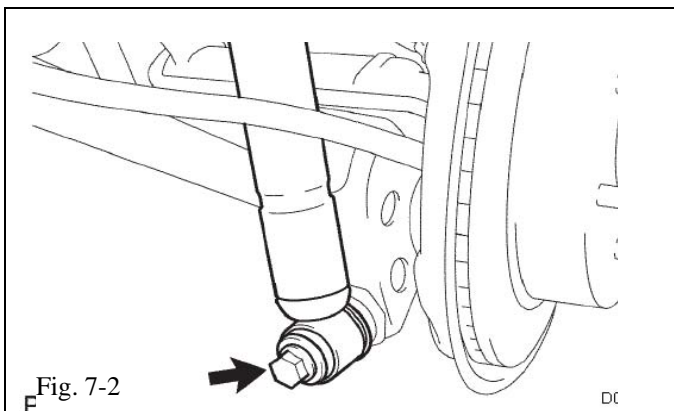
- (d) Using a 19mm socket, remove and save the bottom shock nut and washer. (Fig. 6-2)
 - (e) Using a punch (or drift) and rubber mallet, remove and save the bottom shock bolt.
 - (f) Remove the front OE shock/spring assembly.
 - (1) Raise sway bar ends to provide clearance.
- NOTE:** Take care to not hit the wheel speed sensor wire.
- (g) Repeat steps 7 (b) – 7 (f) on the opposite side.

7. Remove OE Rear Shocks

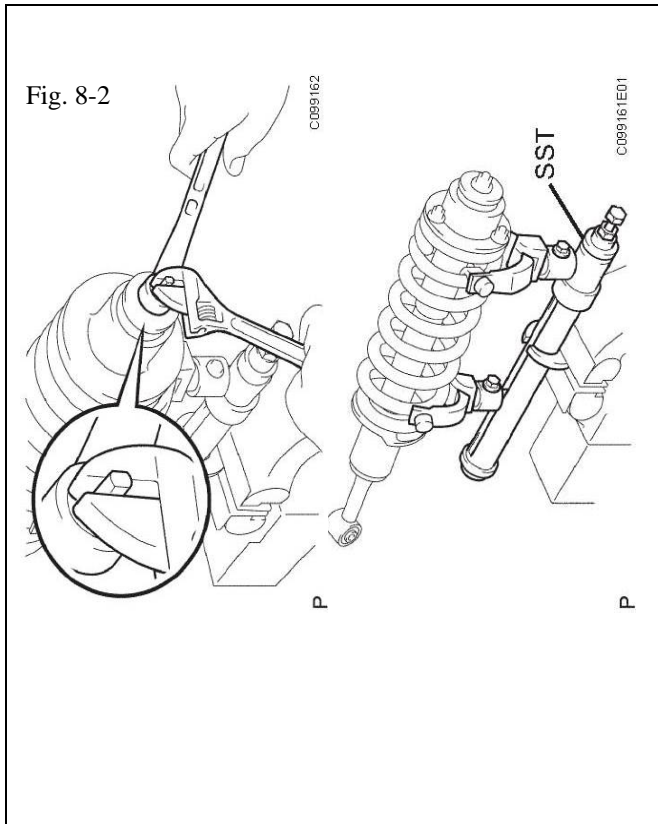


- (a) Grey Shock: Use a 17mm ratcheting wrench & a crescent wrench on the wrench flat to remove & discard the top shock nut.(Fig. 7-1)
 - (1) If used, ensure the crescent wrench is properly placed onto wrench flat to prevent stripping/rounding.
- (b) Black Shock: Use a 17mm ratcheting wrench & a 19mm wrench on the hex flats under the bushings to remove & discard the top shock nut.

NOTE: Carefully note proper configuration and placement of the OE bushing assemblies (upper & lower), prior to removal - for reinstallation.



- (c) Using a 17mm socket, remove and save the bottom shock bolt. (Fig. 7-2)
- (d) Remove the rear shock.
- (e) Repeat steps 8 (a) – 8 (d) on the opposite side.



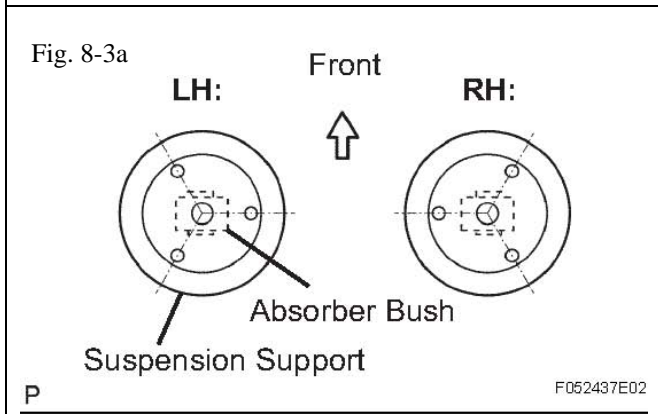
8. Replace OE Front Shock with TRD Shock

- (a) With the OE front shock/spring assembly properly marked (Step 6 (a & b)), place the OE assembly into the spring compressor (SST: BRNM-ST7200), and set up accordingly. (Fig. 8-1)
- (b) Place slight compression onto the spring, and place the 17mm ratcheting wrench onto the nut, and use the crescent wrench on the wrench flat (to keep the stud from spinning) & remove the top nut. (Fig. 8-1)
- (c) Once the nut is removed, remove the OE shock from the OE spring.

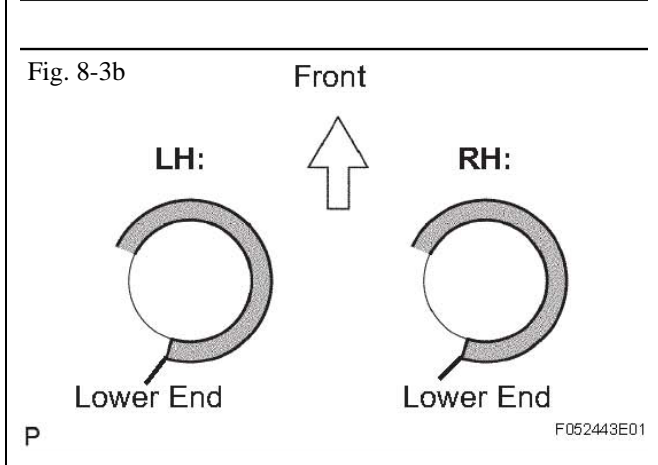


NOTE: Carefully note the configuration of the OE bushing assemblies (upper & lower) for reinstallation.

- (d) Gently place TRD shock into OE spring, and place all OE bushings in the same order and configuration as the original OE set up.
- (e) Secure and lightly tighten the original 17mm nut onto the TRD shock.



- (1) Align all the alignment marks made in Step 6 (b).
- (2) Align the shock eye to match the OE configuration. (Fig. 8-3a)
- (3) Align the spring seat to mate up to the end of the pig tail portion of the spring. (Fig. 8-3b)



- (f) Once all items are aligned, release the compression from the spring, until the entire shock/spring assembly is in tension. Be sure to ensure proper alignment of shock, spring seat, and upper shock tower.

- (g) Tighten and torque the top 17mm nut to **18 lbf-ft (25 N-m) [$\pm 15\%$ (2.7 lbf-ft) (3.75 N-m)]**.
- (h) Repeat Steps 8 (a) – 8 (g) for the other front shock/spring assembly.

9. Installing TRD Shock/Spring Assembly

NOTE: Air tools are NOT allowed for re-installation of any suspension components.

- (a) Carefully place the TRD shock/spring assembly into vehicle, by aligning the 3 top studs on the shock/spring assembly with the 3 openings in the top shock tower. (Fig.9-1)

NOTE: Make sure the orientation of the TRD spring/shock assembly is identical to the OE orientation (i.e. facing forward, etc)

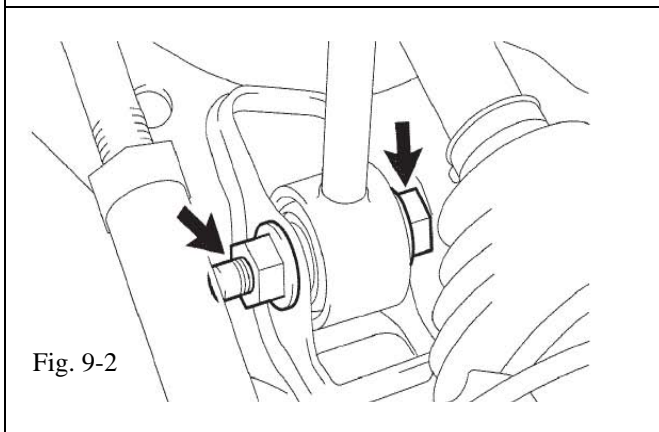
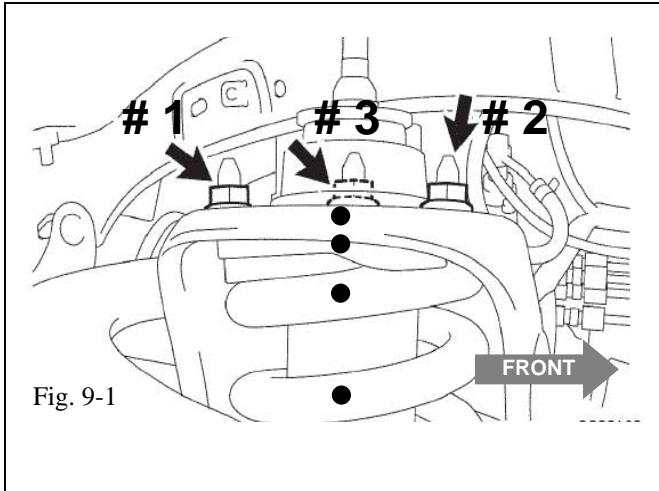
- (b) Insert the lower portion of the front TRD shock into the suspension arm, by pressing down on the lower arm and placing the shock in its cradle.

- (c) Hand tighten the 3 top 14mm nuts. (Fig.9-1)

- (d) Align the lower shock eye with holes in the cradle. Push the lower shock bolt through the cradle and shock. Secure the bolt with the OE washer and nut. Hand tighten for now. (Fig.9-2)

- (e) Torque the 2 top front 14mm nuts (#1 & #2) to **47 lbf-ft (63 N-m) [$\pm 15\%$ (7 lbf-ft) (9.5 N-m)]** and fully tighten nut #3. (Fig.9-1)

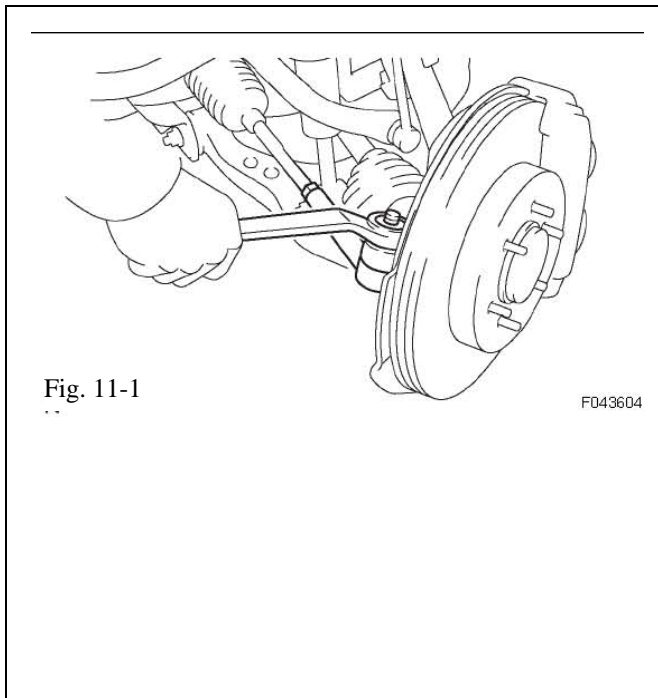
- (f) Repeat Steps 10 (a) – 10 (g) for the other TRD front shock/spring assembly.



10. Reassemble Tie Rods onto Steering Knuckles

NOTE: Air tools are NOT allowed for re-installation of any suspension components.

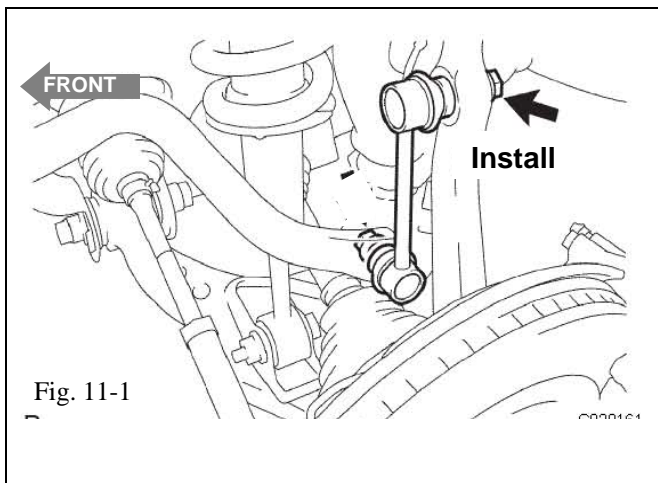
- (a) Install the tie rod stud through the steering knuckle and secure it with the nut. (Fig.11-1)
- (b) Tighten and torque the nut to **67 lbf-ft (91N-m) – PROCESS AUDIT ONLY.**
- (c) Install new cotter pin in the same orientation as the OE pin (i.e. with pin wrapped on top of the stud).
 - (1) If the holes in the cotter pin are not aligned, tighten the nut until the pin can be inserted.
- (d) Repeat Steps 11 (a) – 11 (c) on the opposite side.

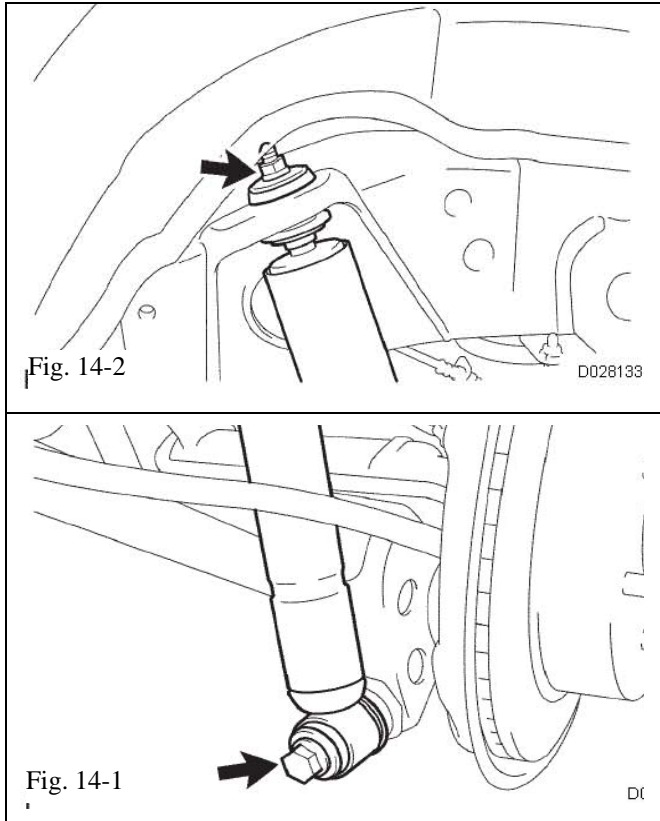


11. Fasten Front Stabilizer Bar Ends

NOTE: Air tools are NOT allowed for re-installation of any suspension components.

- (a) Starting on either side, secure the stabilizer link onto steering knuckle with its corresponding nut. (Fig.11-1)
- (b) Tighten and torque the nut to **52 lbf-ft (70N-m) [+/- 15% (7.8 lbf-ft) (10.5 N-m)].**
- (c) Repeat Step 12 (b) – 12 (c) on the opposite side.





12. Install Rear TRD Shocks

NOTE: Air tools are NOT allowed for re-installation of any suspension components.

- (a) Install the No. 1 cushion, the No. 2 cushion and the shock absorber with the new nut provided.
- (b) Tighten and torque the top nut to **18 lbf-ft (25 N-m) [+/- 15% (2.7 lbf-ft) (3.75 N-m)]**.
- (c) Use a pole jack to carefully raise the rear axle, and mount the lower shock eye back onto the axle. (Fig.14-2)
 - (1) You may use a rubber mallet to fully seat the lower bushing onto the axle mount.

13. Reinstall Wheel/Tire Assemblies

- (a) Install front and rear wheel/tire assemblies.
- (b) Torque the lug nuts to **82 lbf-ft (111 N-m) [+/- 15% (12.3 lbf-ft) (16.6 N-m)]**

14. Lower Vehicle from Lift



15. Tighten Lower Shock Mounts

Rear Shock:

Torque the bottom bolt to **72 lbf-ft (98 N-m) [+/- 15% (10.8 lbf-ft) (14.7 N-m)]**

Front Shock:

Torque the bottom 19mm bolt to **100 lbf-ft (136 N-m) [+/- 10% (10 lbf-ft) (13.6 N-m)]**.

16. Disposition of OE Shocks

- (a) Dispose of shocks per the Processes & Procedures of your individual facility.

Stop!

Torque lower shock bolts. >

Checklist. These points MUST be checked to ensure a quality installation.

CHECK FOR:

Accessory Function Checks

- Correct part has been installed.

LOOK FOR:

All fasteners have been securely fastened.
All suspension components are properly aligned

Vehicle Function Checks

- Inspection torque – Front shock bottom bolts (Qty 2)
- Inspection torque – Front shock top nut (Qty 2)
- Inspection torque – Front shock top bolts (# 1 & # 2 Bolts Only) (Qty 4)
- Inspection torque – Tie rod bolt (Qty 2)
- Inspection torque – Steering Stabilizer Link Nuts (Qty 2)
- Inspection torque – Steering Stabilizer Link Lower Bolts (Qty 4)
- Inspection torque – Engine Under Cover Assembly Bolts (Qty 4)
- Inspection torque – Rear shock lower bolts (Qty 2)
- Inspection torque – Rear shock upper nuts (Qty 2)
- Inspection torque – Wheel lug nuts (Qty 24)

- 100+/- 10 lbf-ft (136 +/- 136 N-m).
- || 18 +/- 2.7 lbf-ft (25 +/- 3.75 N-m)
- 47+/- 7 lbf-ft (63 +/- 9.5 N-m).
- 67lbf-ft (91 N-m) – Process Audit Only
- 52+/- 7.8 lbf-ft (70 +/- 10.5 N-m).
- 30+/- 4.5 lbf-ft (40 +/- 6 N-m).
- 21+/- 3.2 lbf-ft (29 +/- 4.4 N-m).
- 72+/- 10.8 lbf-ft (98/- 14.7 N-m).
- || 18 +/- 2.7 lbf-ft (25 +/- 3.75 N-m)
- 82+/- 12.3 lbf-ft (111/- 16.6 N-m).

Verify part number on package.

Verify fasteners are properly torqued.

Verify components are in the same OE orientation