

CHAPTER 5

BODY / STEERING / SUSPENSION

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BODY / STEERING / SUSPENSION

TORQUE SPECIFICATIONS

ITEM	TORQUE VALUE ft. lbs. (Nm)
Front Frame to Rear Frame Support Fasteners (CREW)	38-40 ft. lbs. (52-54 Nm)
Main Frame to Rear Frame Fasteners (6x6)	34-36 ft. lbs. (46-49 Nm)
Front Upper / Lower A-Arm Bolts	30 ft. lbs. (41 Nm)
Mid Upper / Lower A-Arm Bolts	30 ft. lbs. (41 Nm)
Rear Upper / Lower A-Arm Bolts	30 ft. lbs. (41 Nm)
Front Ball Joint Pinch Bolts	23 ft. lbs. (31 Nm)
Mid / Rear Lower Bearing Carrier	30 ft. lbs. (41 Nm)
Mid / Rear Upper Bearing Carrier	30 ft. lbs. (41 Nm)
Upper / Lower Shock Bolts	30 ft. lbs. (41 Nm)
Stabilizer Bar to Frame	17 ft. lbs. (23 Nm)
Stabilizer Bar Linkage Bushings	17 ft. lbs. (23 Nm)
Front Wheel Hub Castle Nut	80 ft. lbs. (108 Nm)
Mid / Rear Wheel Hub Castle Nut	110 ft. lbs. (150 Nm)
Wheel Nuts (Cast Rims) Wheel Nuts (Steel Rims)	30 ft. lbs. + 90° (1/4 turn) 35 ft. lbs. (47 Nm)
Outer Tie Rod to Bearing Carrier	40 ft. lbs. (54 Nm)
Tie Rod End Jam Nut	12-14 ft. lbs. (17-19 Nm)
Seat Belt to Cab Frame	35-40 ft. lbs. (47-54 Nm)
Seat Belt to Seat Base	36-44 ft. lbs. (49-60 Nm)
Steering Wheel to Shaft	25-31 ft. lbs. (34-42 Nm)
Upper Steering Shaft to U-Joint Shaft	15-19 ft. lbs. (20-26 Nm)
Lower Steering Shaft to Steering Box	30 ft. lbs. (41 Nm)
Steering Box	17 ft. lbs. (23 Nm)

NOTE: Refer to exploded views throughout this chapter for more torque specifications, component identification, and location of components.

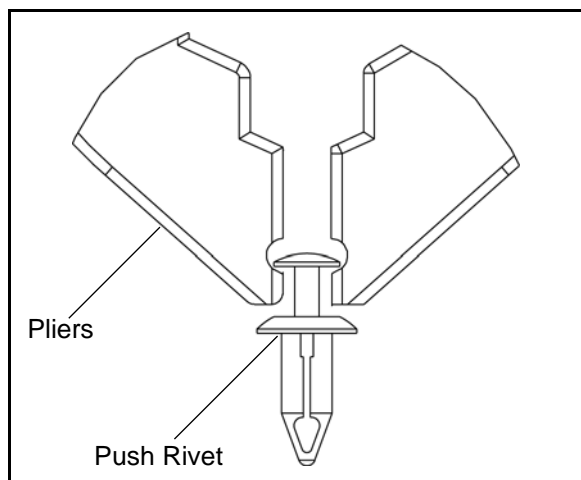
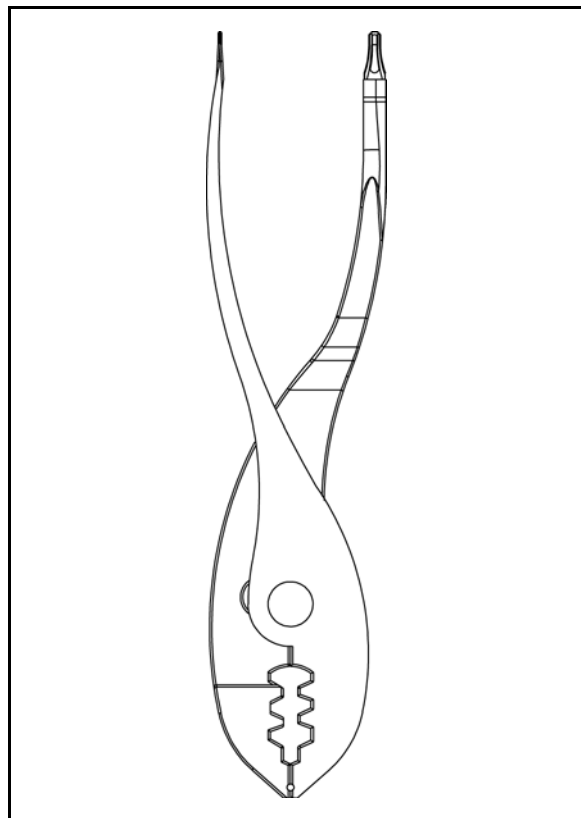
SPECIAL TOOLS

TOOL DESCRIPTION	PART NUMBER
Shock Spanner Wrench	2871095
Shock Spanner Wrench (W.E.)	2870803
Shock Spring Compressor Tool	2870623
Multi-Function Pliers	2876389

SPX Corp: 1-800-328-6657 or <http://polaris.spx.com/>

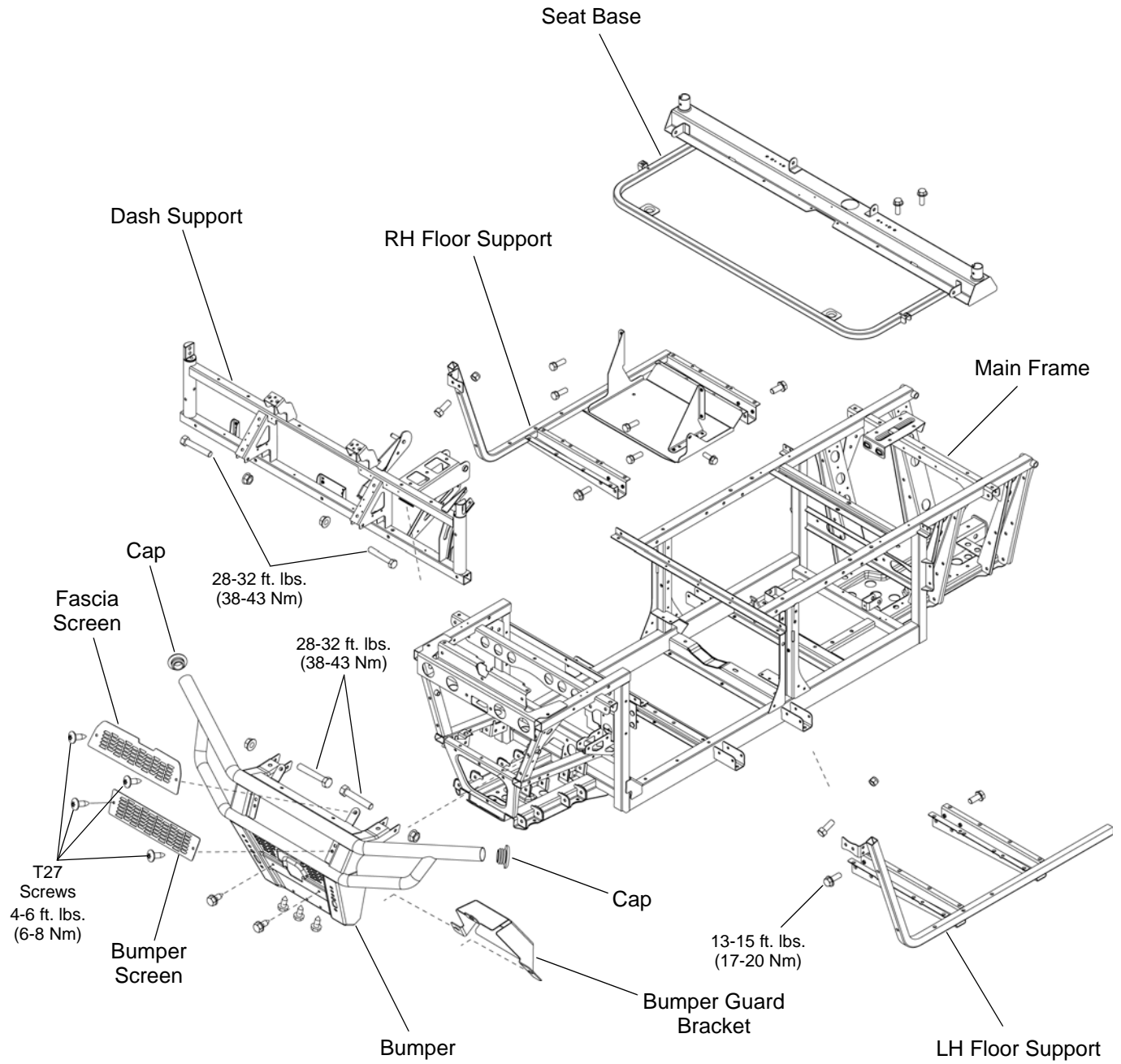
Multi-Function Pliers

Included in the tool kit, this multi-function pliers is designed to remove plastic push rivets and install body components.



CHASSIS / MAIN FRAME

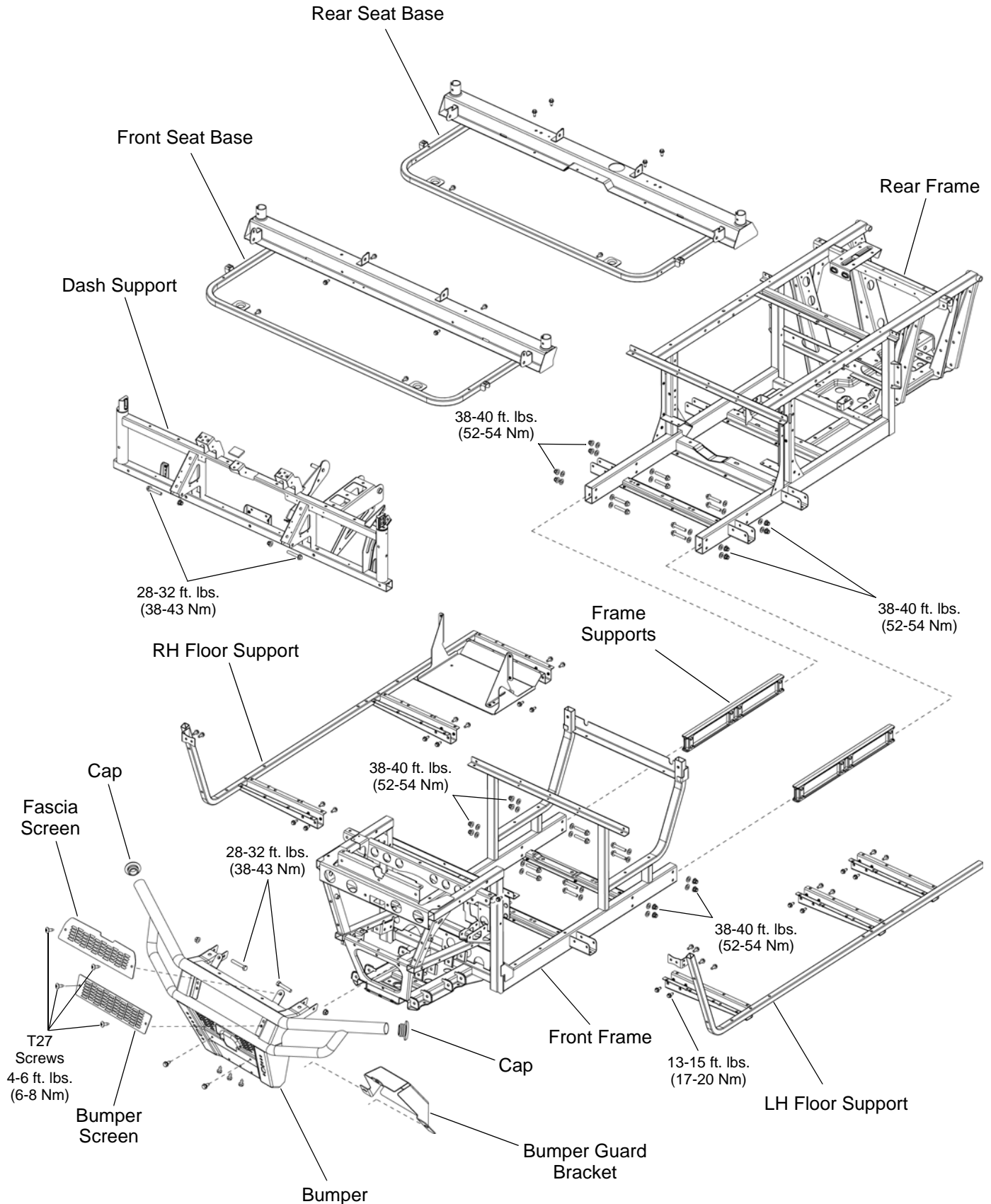
Exploded View (XP / HD)



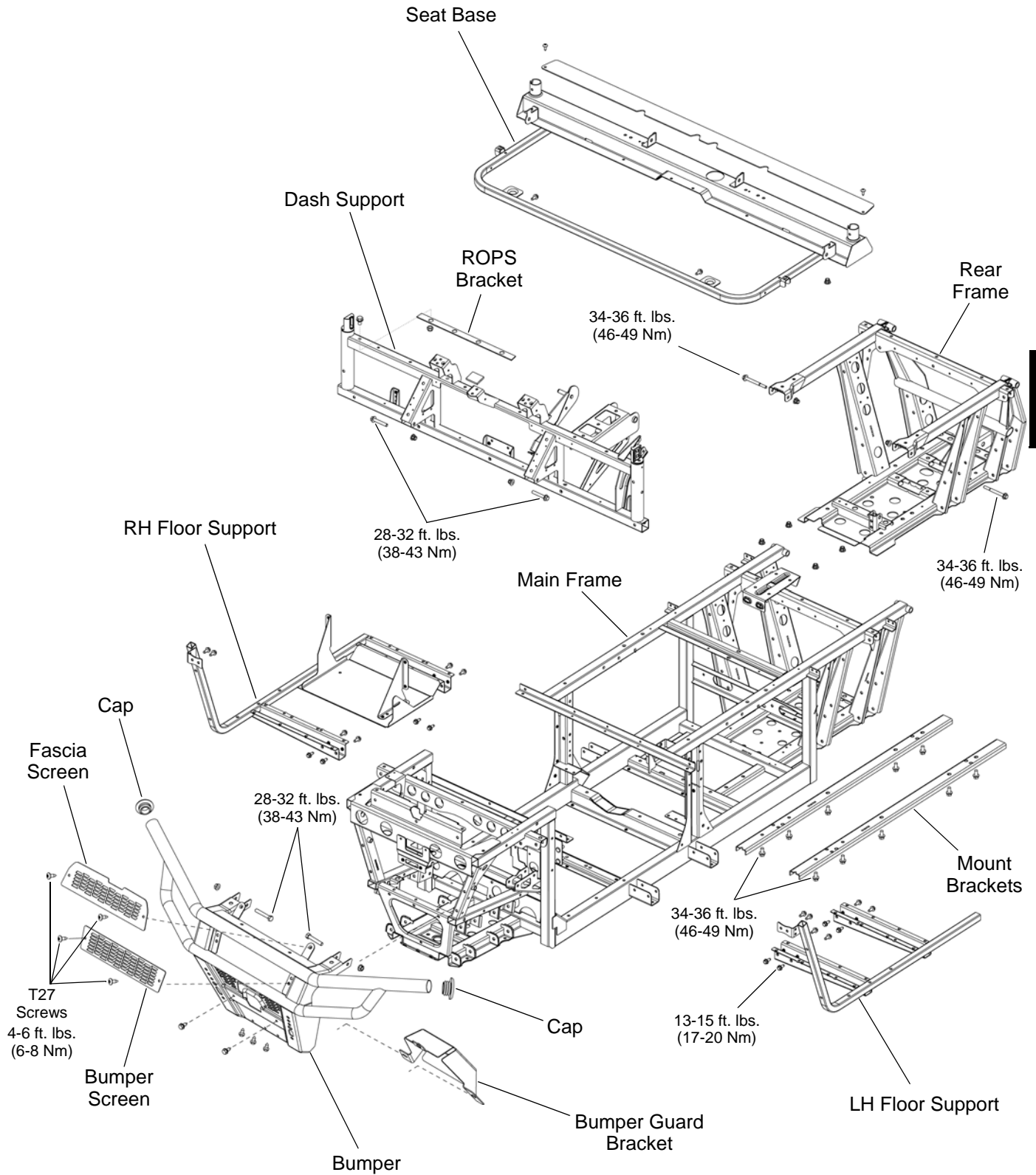
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BODY / STEERING / SUSPENSION

Exploded View (CREW)



Exploded View (6x6)

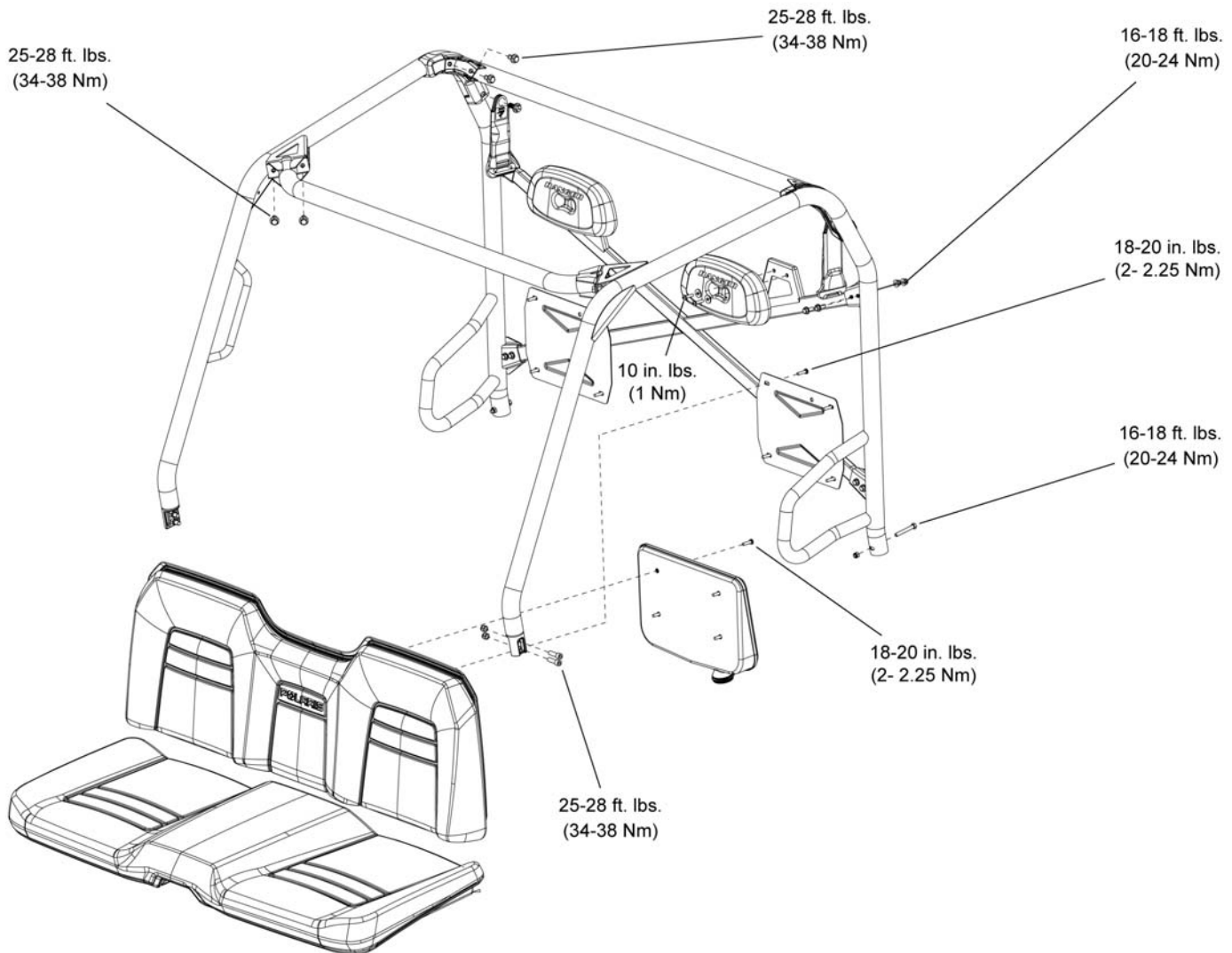


BODY / STEERING / SUSPENSION

CAB FRAME / SEAT BACK / HEADREST / PVT AIR INTAKE BAFFLE BOX

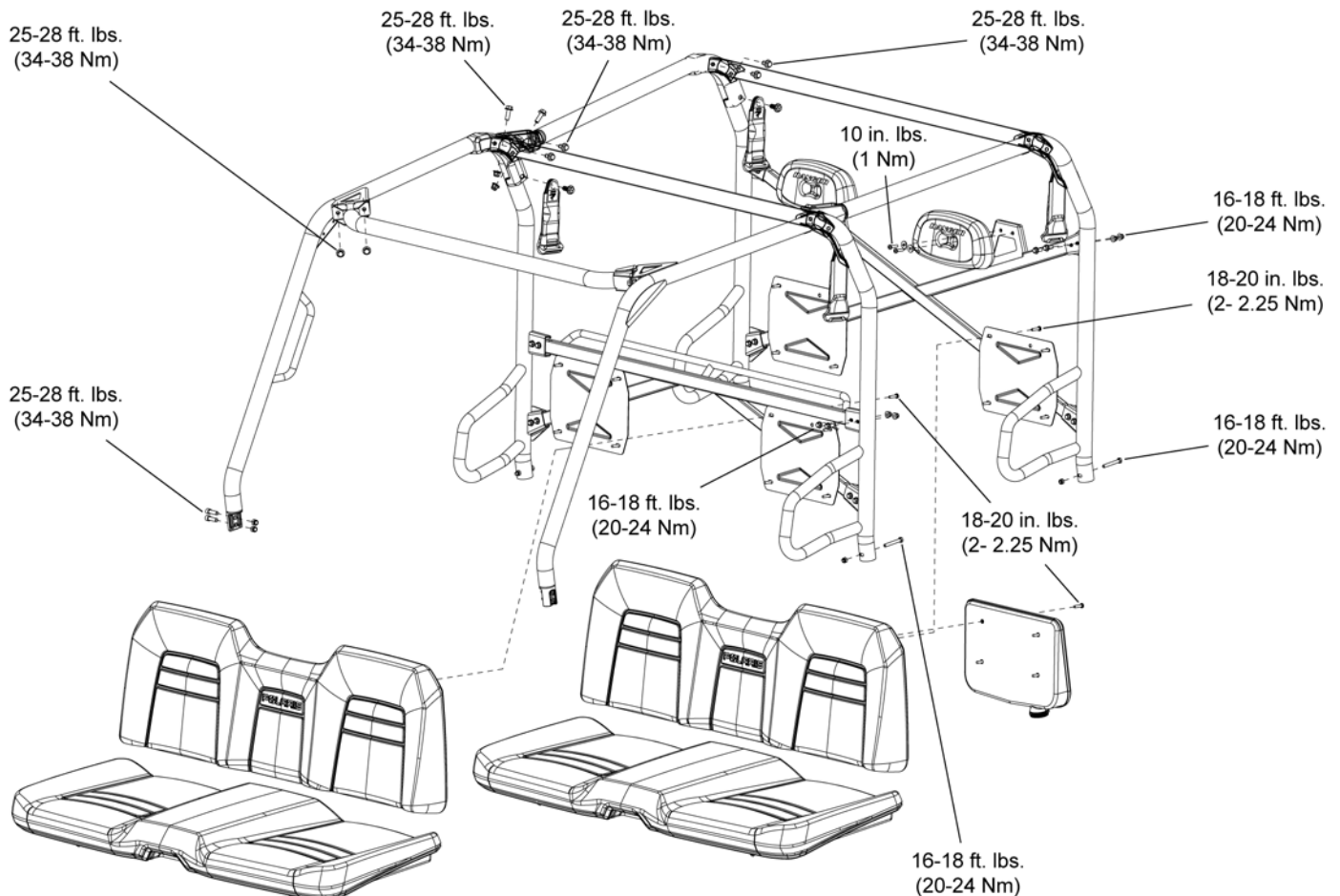
Exploded View / Assembly (XP / HD / 6x6)

1. Assemble RH / LH cab frame side hoops by sliding tube over the rear coupler. Secure using (2) 5/16" bolts and nuts. Line up front side hoop couplers with front frame couplers and secure using (4) 3/8" screws and nuts. Leave all fasteners finger tight.
2. Attach the front cab frame cross tube to the side hoops using (4) M10 bolts. Attach the rear cab frame cross tube to the side hoops using (4) M10 bolts. Leave all fasteners finger tight.
3. Loosely install the rear cab frame X brace to the side hoops using (8) M8 bolts and nuts. Leave all fasteners finger tight.
4. Tighten (8) front and rear cab frame cross tube fasteners installed during Step 2 to 25-28 ft. lbs. (34-38 Nm).
5. Tighten (2) 5/16" fasteners installed during Step 1 to 16-18 ft. lbs. (20-24 Nm) and (4) 3/8" fasteners to 25-28 ft. lbs. (34-38 Nm).
6. Tighten (8) M8 X brace fasteners installed during Step 3 to 16-18 ft. lbs. (20-24 Nm).
7. Fasten the seat back to the X brace using (8) #14 self-tapping screws. Tighten fasteners to 18-20 in. lbs. (2-2.25 Nm).
8. Slide the clutch air intake box over the clutch intake hose. Attach the clutch air intake box to the seat back using (4) #14 self-tapping screws. Tighten fasteners to 18-20 in. lbs. (2-2.25 Nm).
9. Attach each headrest to the rear cab frame using four 1/4" self-tapping fasteners. Place washers between the fastener head and headrest as shown below. Torque fasteners to 10 in. lbs. (1 Nm).



Exploded View / Assembly (CREW)

1. Assemble RH / LH front cab frame side hoops by sliding tube over the rear coupler. Secure using (2) 5/16" bolts and nuts. Line up front side hoop couplers with front frame couplers and secure using (4) 3/8" screws and nuts. Leave all fasteners finger tight.
2. Attach the front cab frame cross tube to the side hoops using (4) M10 screws. Install the rear cab frame cross tube to the side hoops using (4) M10 screws. Leave all fasteners finger tight.
3. Loosely install the rear cab frame K brace to the side hoops using (8) M8 screws and nuts. Leave all fasteners finger tight.
4. Tighten (8) front and rear cab frame cross tube fasteners installed during Step 2 to 25-28 ft. lbs. (34-38 Nm).
5. Tighten (2) 5/16" fasteners installed during Step 1 to 16-18 ft. lbs. (20-24 Nm) and (4) 3/8" fasteners 25-28 ft. lbs. (34-38 Nm).
6. Tighten the (8) M8 K brace fasteners installed during Step 3 to 16-18 ft. lbs. (20-24 Nm).
7. Assemble the RH and LH rear cab frame side hoops by sliding the tube over the rear coupler. Secure using (2) 5/16" bolts and nuts. Line up the front upper rear hoop couplers with the rear cab frame cross tube holes and secure using (2) M10 screws and nuts. Leave all fasteners finger tight.
8. Install the rear cab frame cross tube to the rear side hoops using (4) M10 screws. Leave all fasteners finger tight.
9. Loosely install the rear cab frame X brace to the rear side hoops using (8) M8 screws and nuts. Leave all fasteners finger tight.
10. Tighten (2) 5/16" fasteners installed during Step 7 to 16-18 ft. lbs. (20-24 Nm) and (4) M10 fasteners to 25-28 ft. lbs. (34-38 Nm).
11. Tighten the (4) rear cab frame cross tube fasteners installed during Step 8 to 25-28 ft. lbs. (34-38 Nm).
12. Tighten the (8) M8 X brace fasteners installed during Step 9 to 16-18 ft. lbs. (20-24 Nm).
13. Fasten the seat back to the rear cab frame X brace using (8) #14 self-tapping screws. Tighten fasteners to 18-20 in. lbs. (2-2.25 Nm). Repeat this step to attach the front seat back to the mid cab frame K brace.
14. Slide the clutch air intake box over the clutch intake hose. Attach the clutch air intake box to the seat back using (4) #14 self-tapping screws. Tighten fasteners to 18-20 in. lbs. (2-2.25 Nm).
15. Attach the headrest to the rear cab frame using (4) 1/4" self-tapping fasteners. Place washers between the fastener head and headrest as shown below. Torque fasteners to 10 in. lbs.

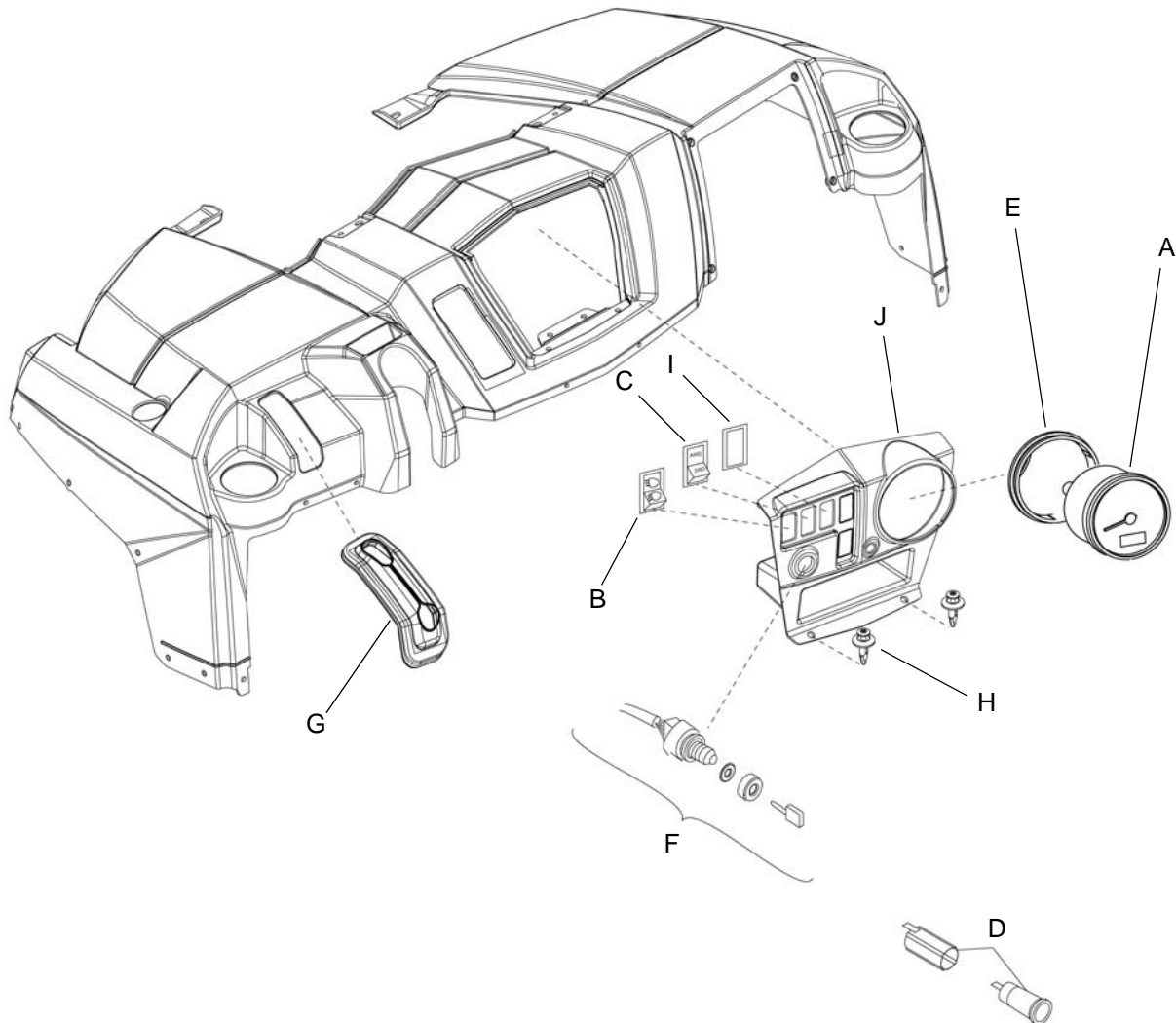


BODY / STEERING / SUSPENSION

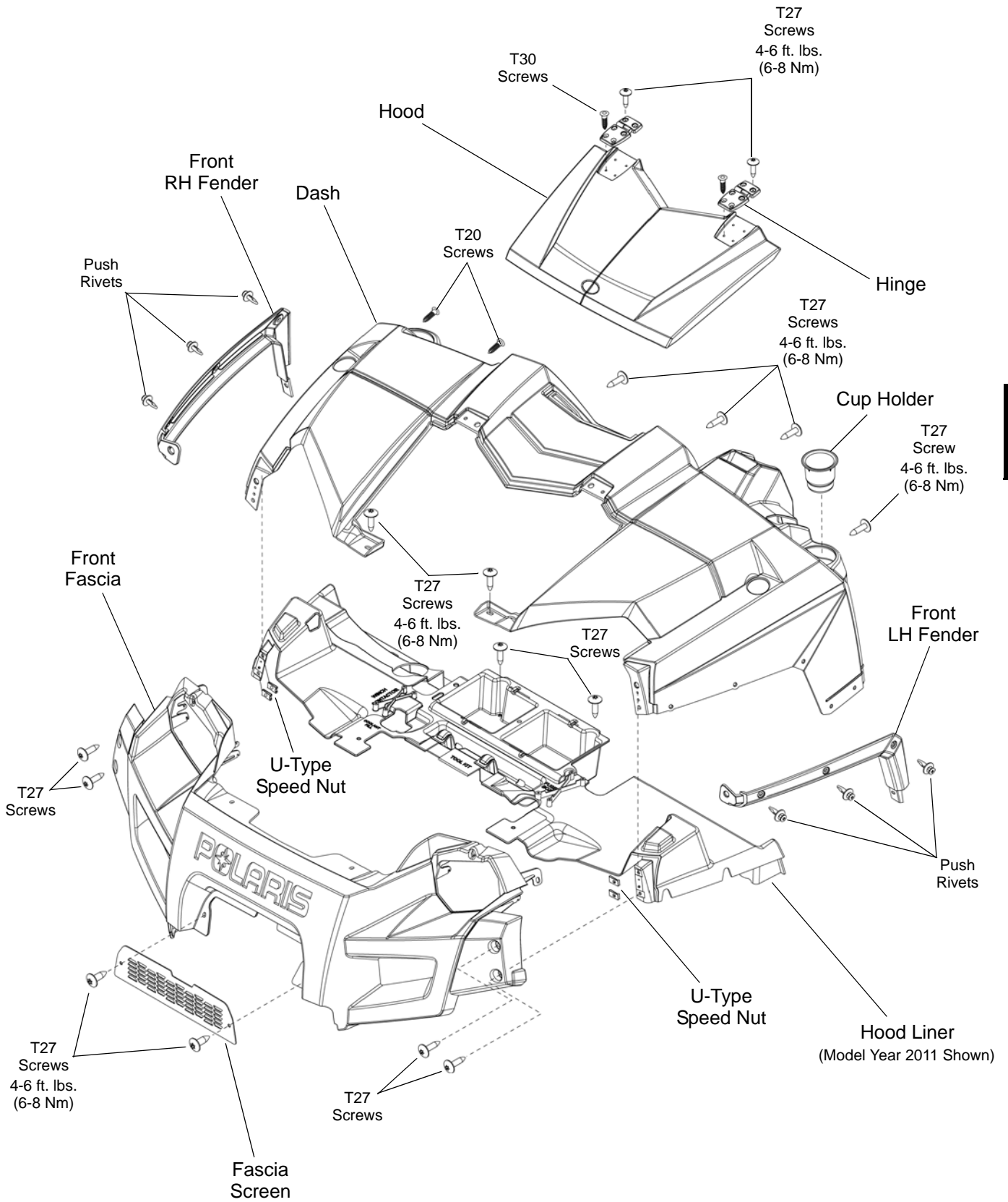
BODY EXPLODED VIEWS

Dash Instruments / Controls

- A. Instrument Cluster (Speedo)
- B. Headlight Switch
- C. AWD / 2WD / TURF Switch
- D. 12 Volt Accessory Receptacle (2)
- E. Rubber Mount
- F. Key Switch
- G. Grommet
- H. Push Rivet
- I. Dash Plug
- J. Dash Panel



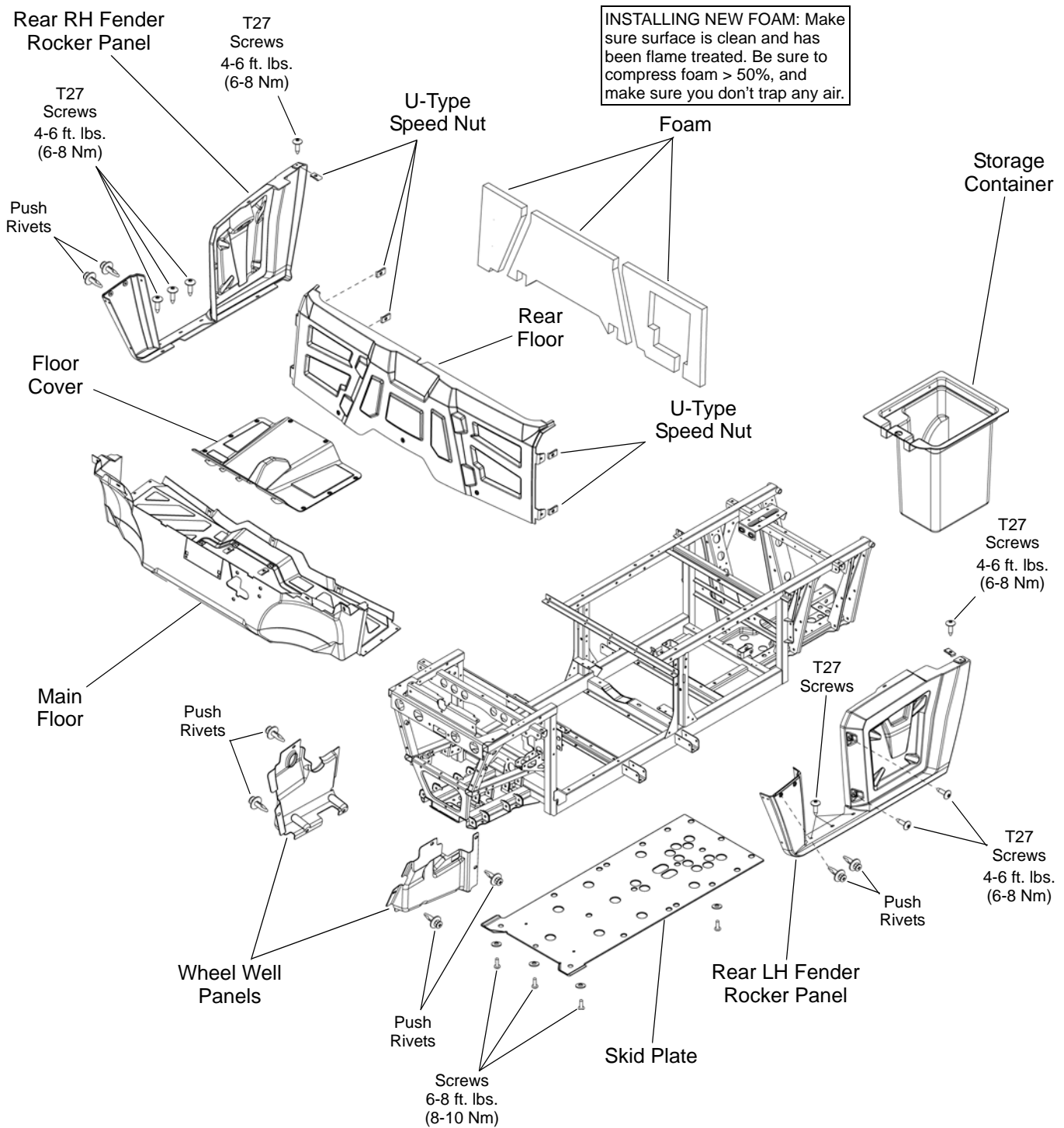
Hood / Dash / Front Fenders / Front Fascia



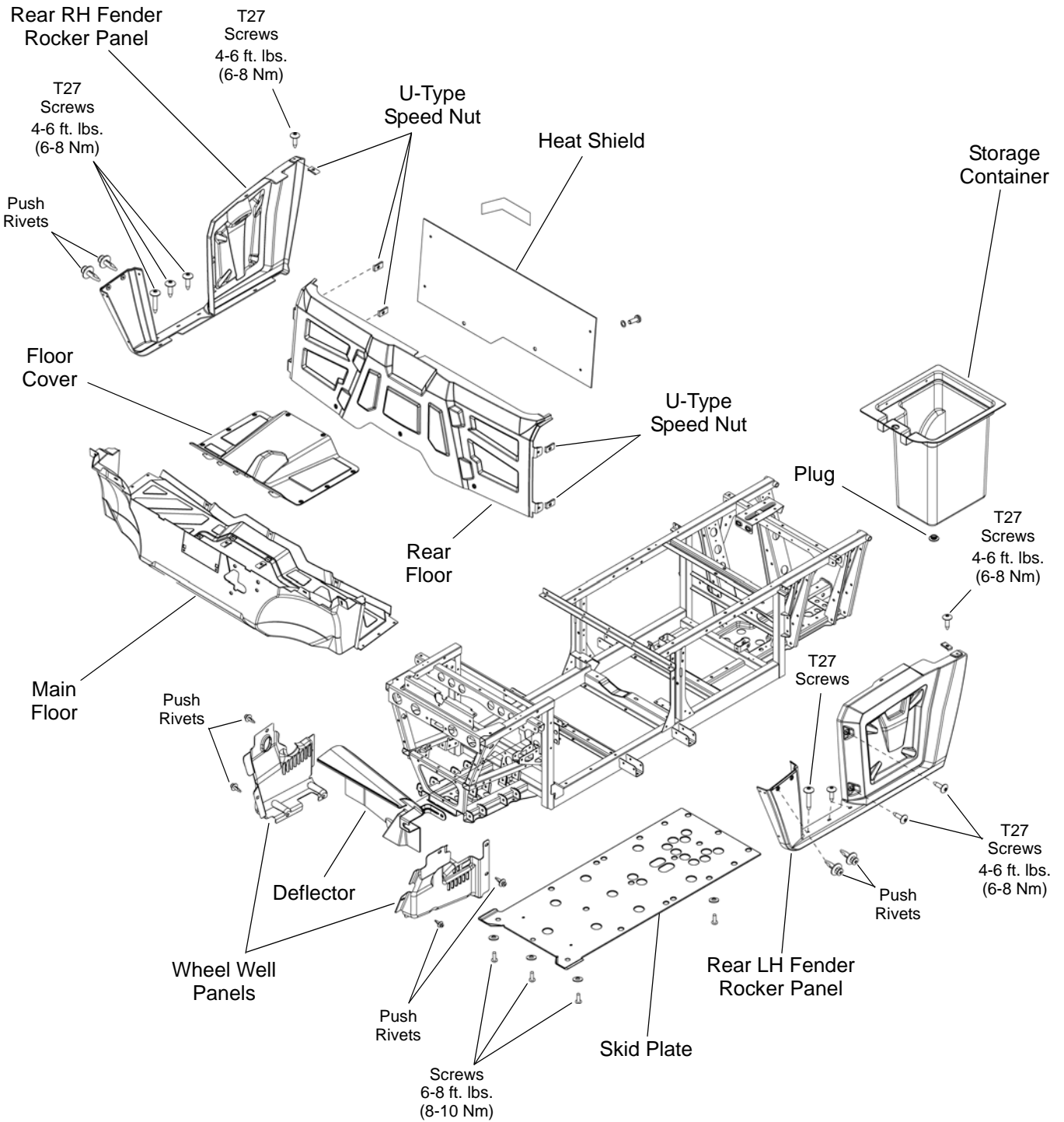
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BODY / STEERING / SUSPENSION

2011 Floor / Rear Fenders (XP / HD / 6x6)



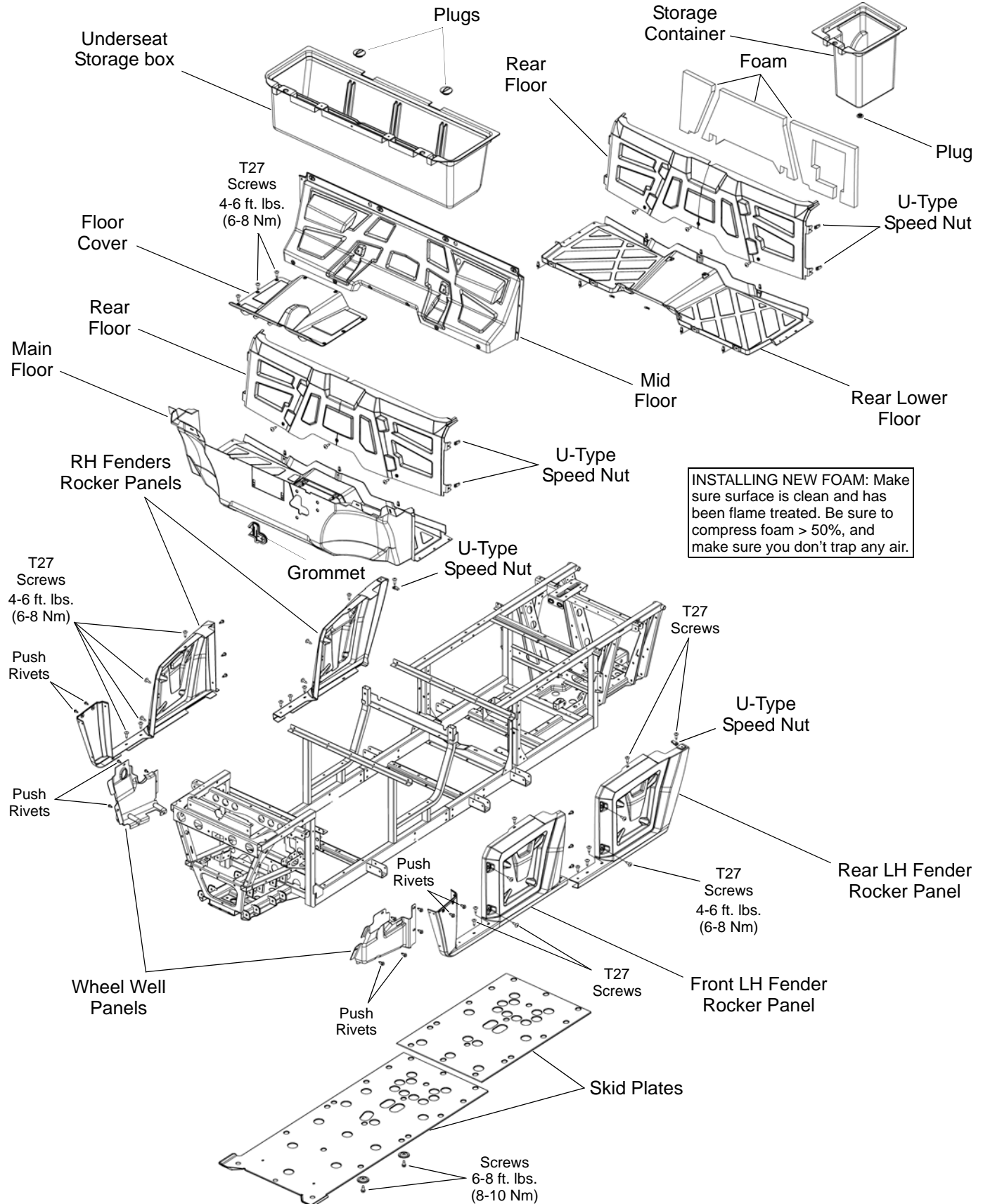
2012 Floor / Rear Fenders (XP / HD / 6x6)



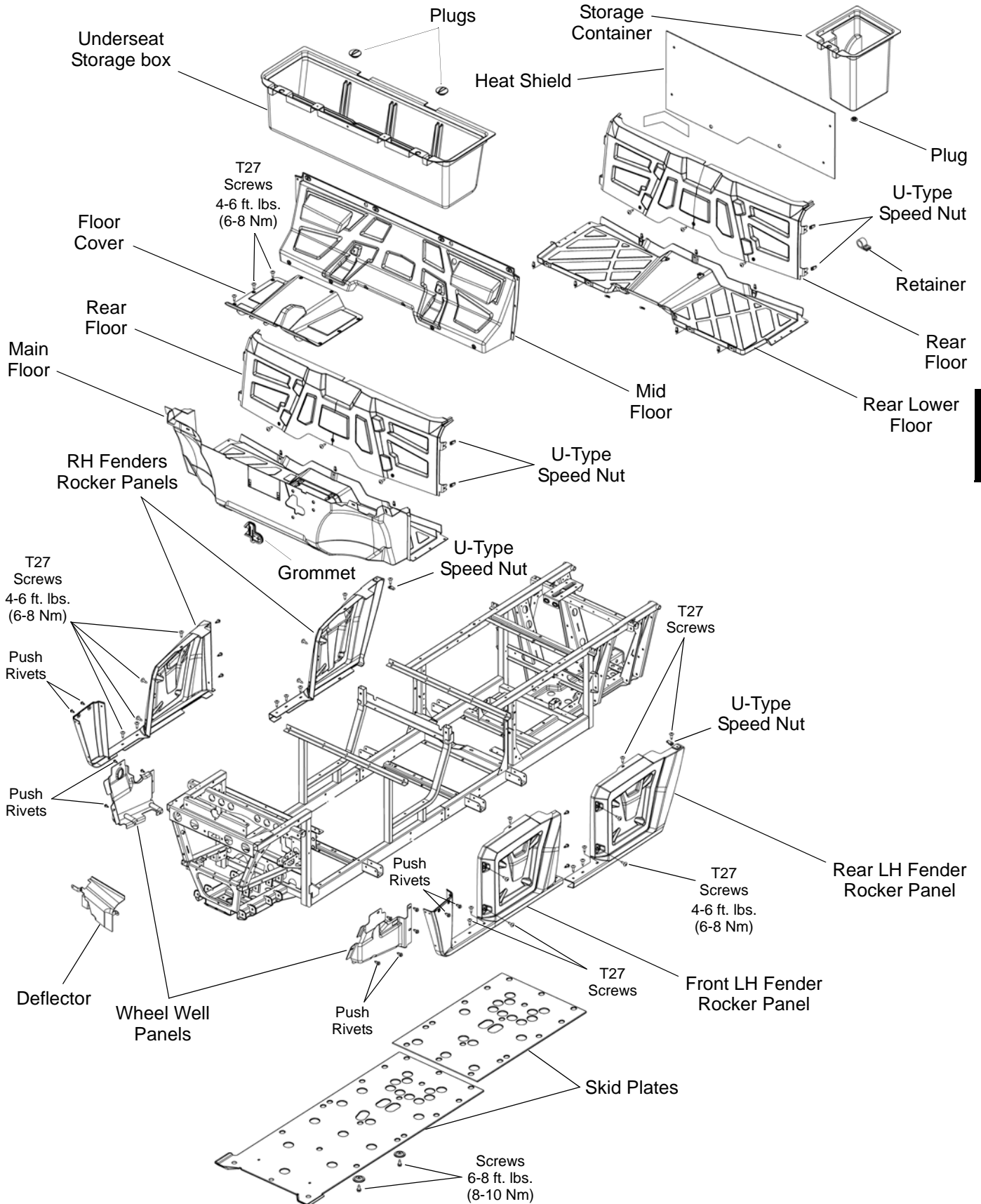
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BODY / STEERING / SUSPENSION

2011 Floor / Rear Fenders (CREW)



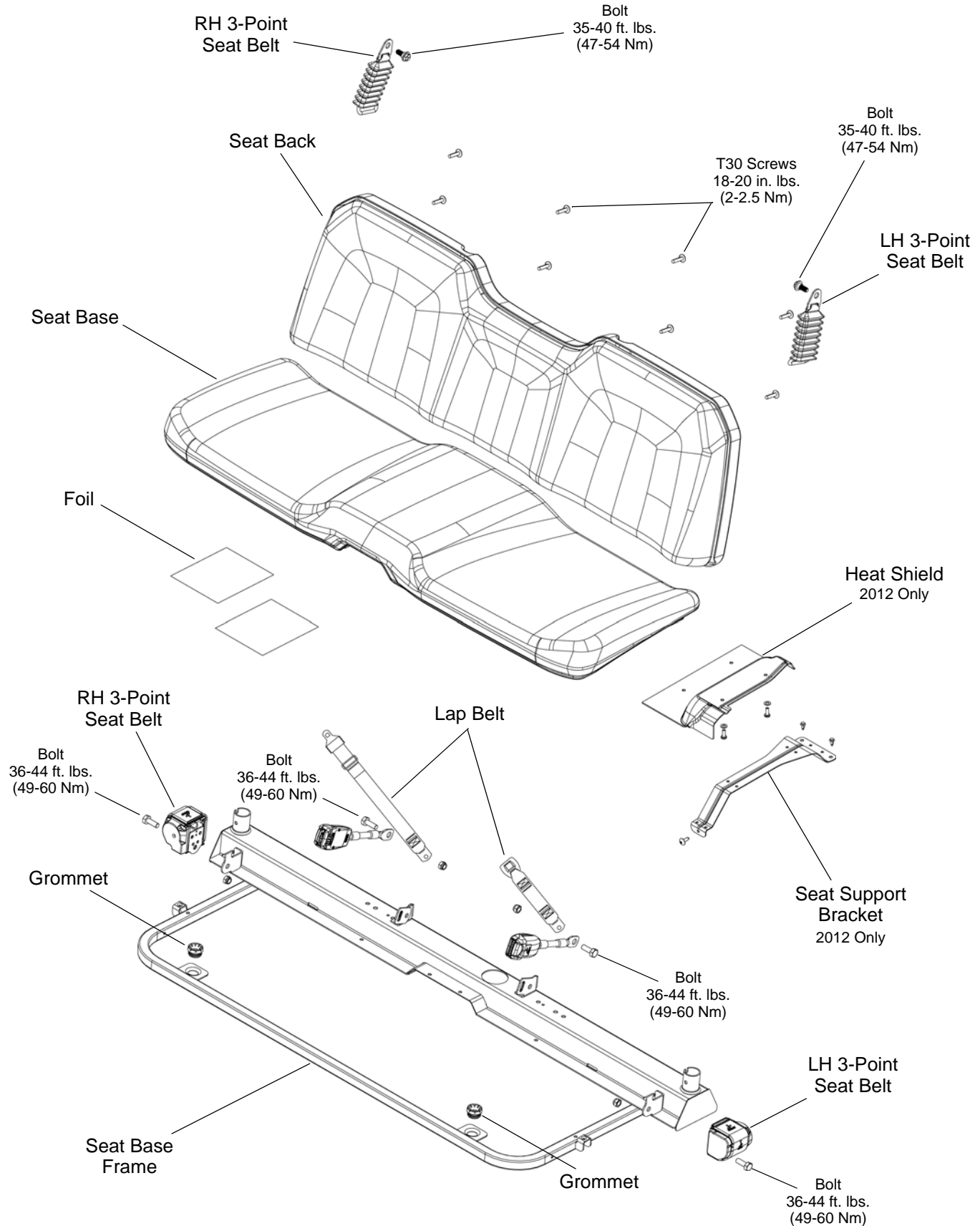
2012 Floor / Rear Fenders (CREW)



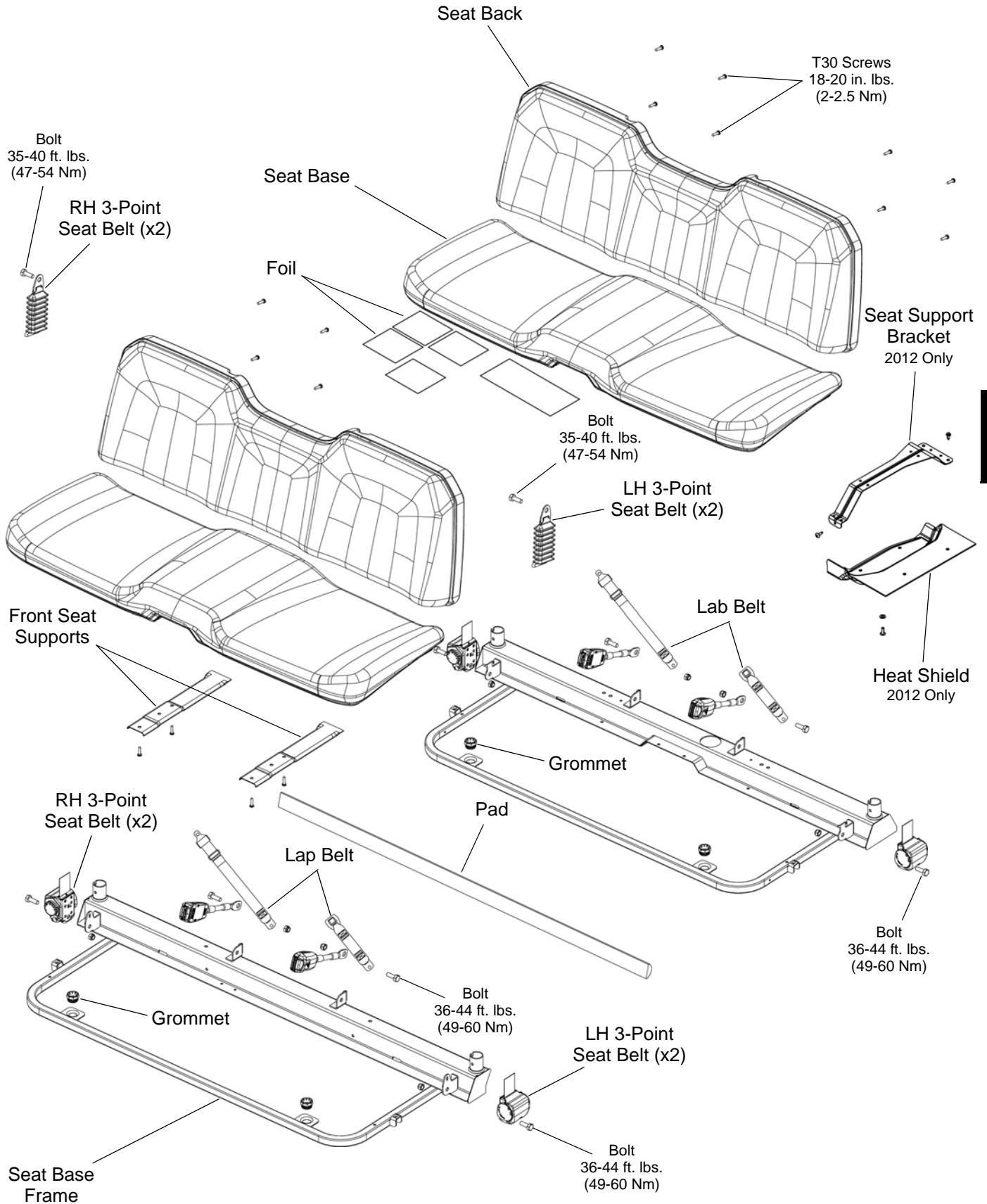
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BODY / STEERING / SUSPENSION

Seat Mounting / Seat Belts (XP / HD / 6x6)



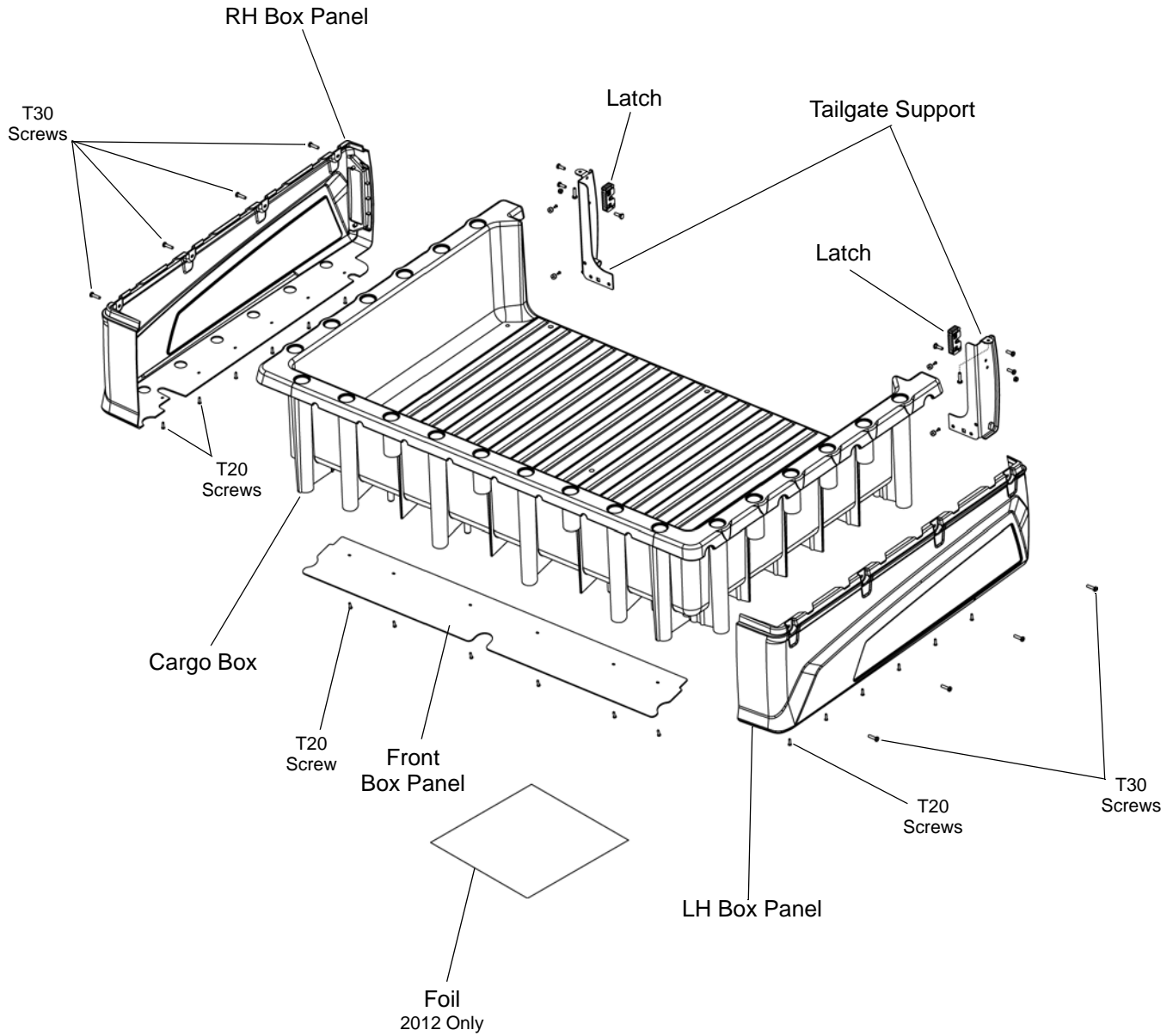
Seat Mounting / Seat Belts (CREW)



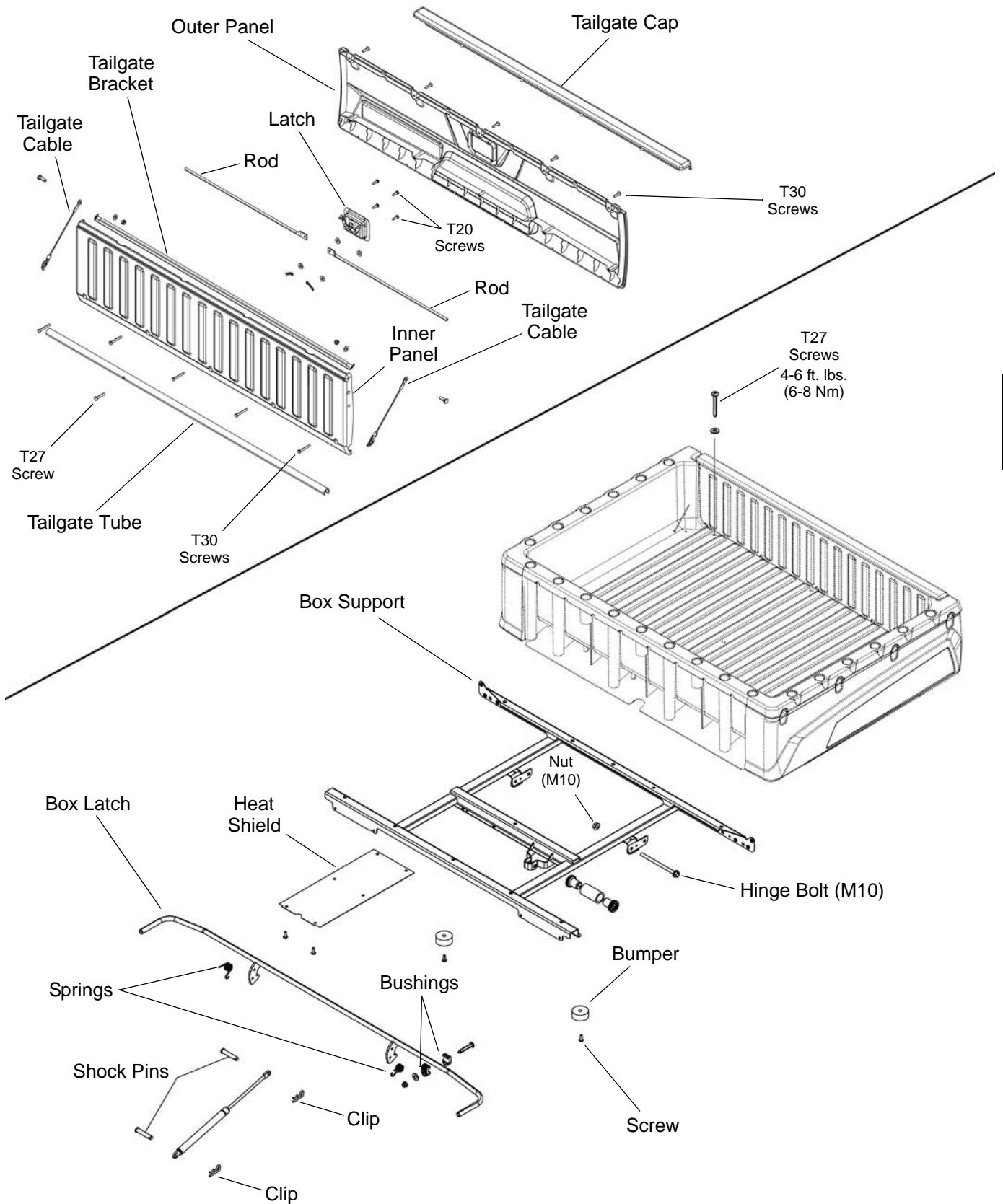
BODY / STEERING / SUSPENSION

REAR CARGO BOX

Cargo Box - Panels



Cargo Box - Tailgate / Box Support

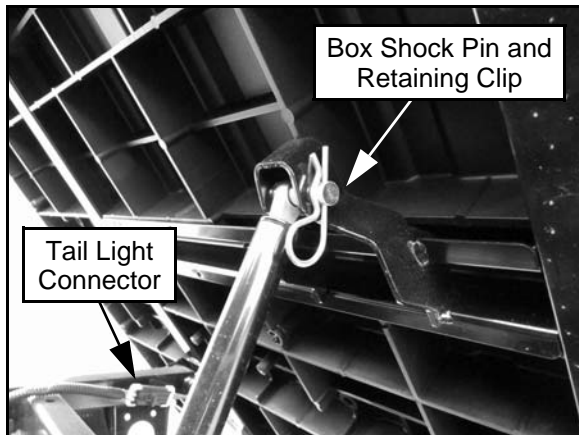


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BODY / STEERING / SUSPENSION

Box Removal

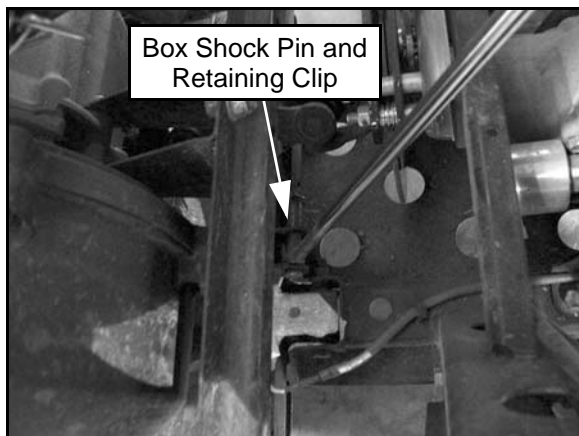
1. Lift the cargo box into the dump position.
2. Disconnect the rear wire harness attached to the tail lights.
3. Remove the upper clip and pin attaching the shock to the cargo box.



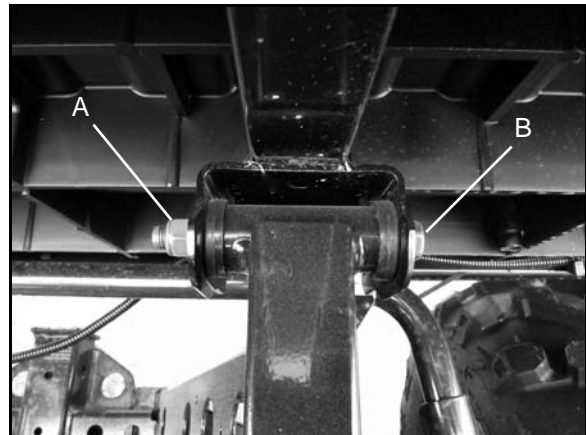
CAUTION

Safely support the box during the remainder of the removal process. The box is not as stable with the shock removed.

4. Remove the lower clip and pin attaching the shock to the vehicle frame if replacing the box shock.

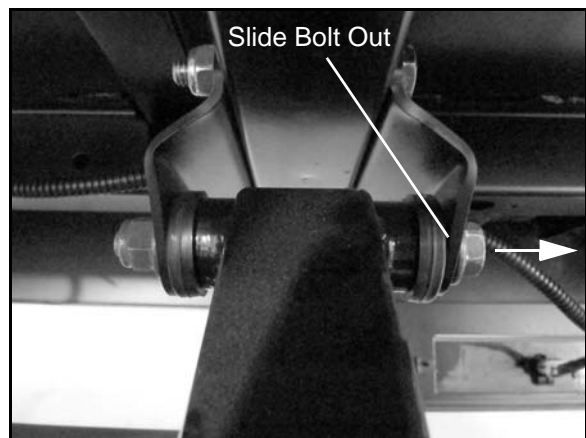


5. Remove nut (A) and bolt (B) that secure the box frame on both pivot points.



CAUTION

Safely support the box during the remainder of the removal process. The box is not as stable with the hinge pins removed.



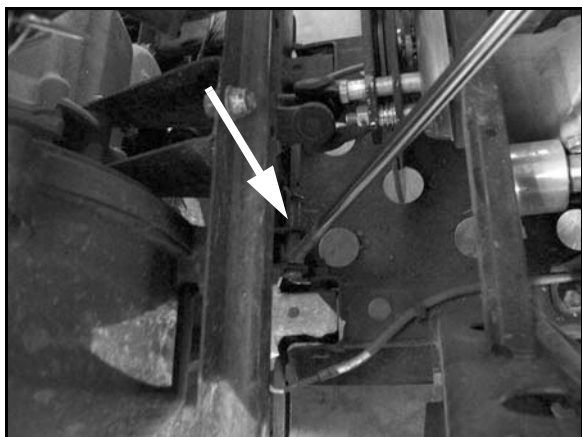
6. With both hinge bolts removed, lift the box from the frame. Two people or an appropriate hoist may be needed to remove the box from the frame.

CAUTION

Use caution when removing the box. It is recommended to have two people carefully remove the box from the frame.

Box Installation

1. If the shock was removed, install the lower portion of the shock to the frame and secure it with the pin and clip.

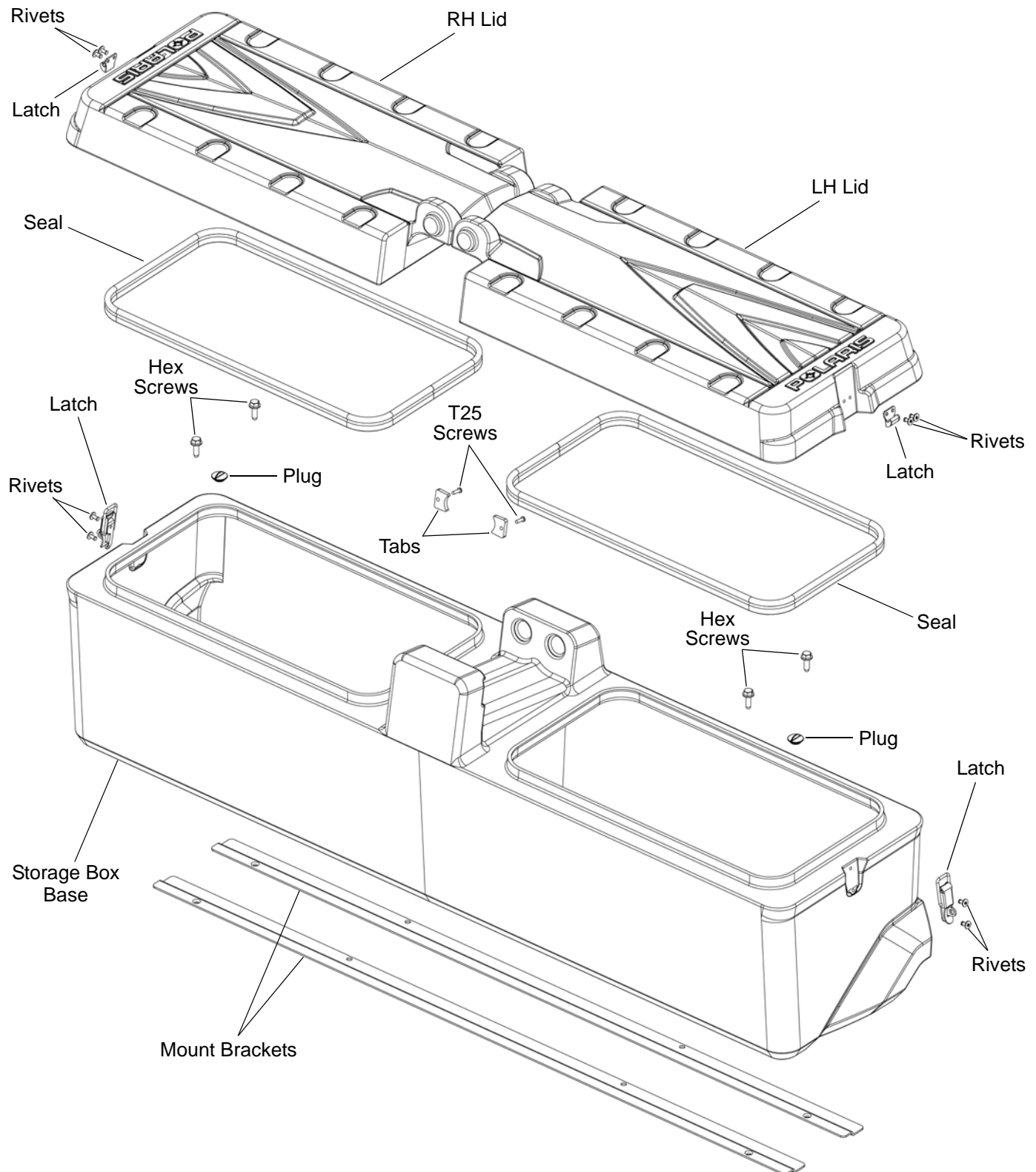


2. Place the cargo box onto the frame. Align the hinges of the box with the bracket on the frame.
3. Install the box hinge bolts on both sides.
4. Install the hinge bolt nuts on both sides and torque the nut to **30 ft. lbs. (41 Nm)**.
5. With the hinge bolts installed, attach the shock to the cargo box by inserting the pin and clip.
6. Connect tail light harness connector.
7. Lower the box and secure the latch.

BODY / STEERING / SUSPENSION

REAR STORAGE BOX (6X6)

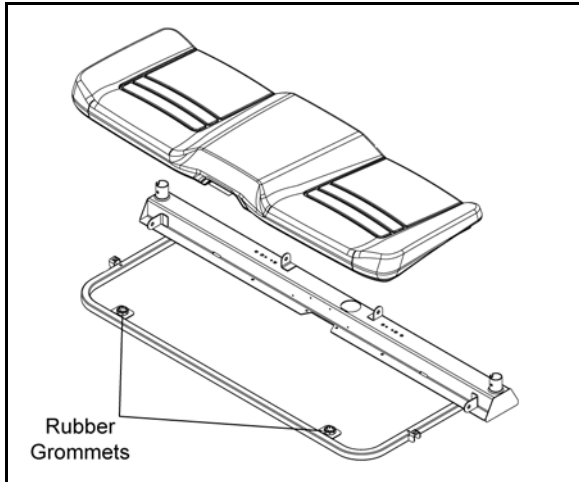
Exploded View



BODY COMPONENT REMOVAL

Lower Seat Base

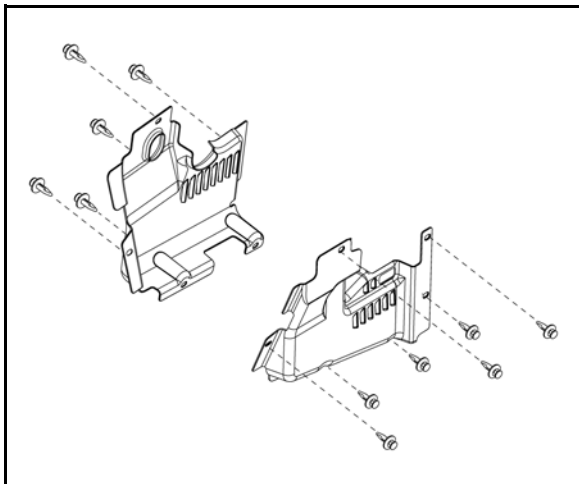
1. Lift up on the front of the seat base to disengage the seat from the rubber grommets.



2. Pull the seat base forward to disengage the rear tabs and remove the seat base from the vehicle.

Wheel Well Panels

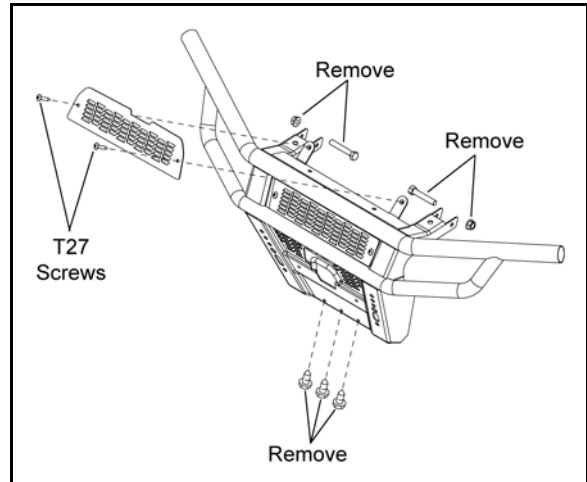
1. Using the multi-function pliers, remove the (6) push rivets from the LH panel and the (5) push rivets from the RH panel.



2. Pull both panels out from the wheel wells.

Front Bumper

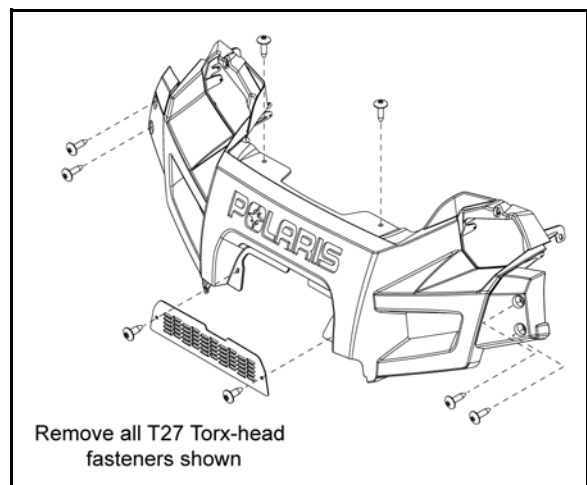
1. Remove the (2) T27 Torx-head screws retaining the fascia screen and remove the screen.



2. Remove the (3) bolts from lower portion of bumper.
3. Remove the fasteners from each side of the upper portion of the bumper.
4. Carefully remove the bumper from the vehicle.

Front Fascia

1. Remove the (2) T27 Torx-head screws retaining the fascia screen and remove the screen.

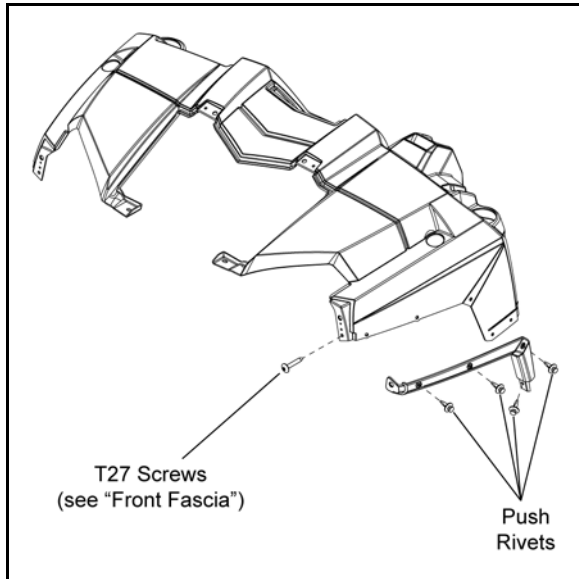


2. Remove the remaining T27 Torx-head screws retaining the front fascia.
3. Turn the headlight bulbs counter-clockwise 90° and remove the bulbs from the head lamps.
4. Carefully remove the fascia from the vehicle.

BODY / STEERING / SUSPENSION

Front Fenders

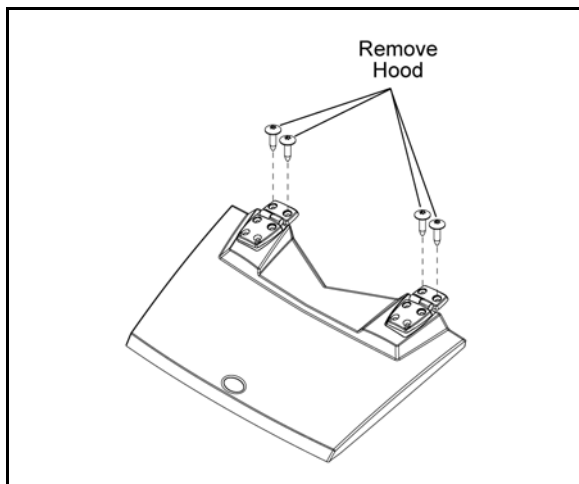
1. Remove the lower T27 Torx-head screws retaining the front fascia (see "Front Fascia").



2. Remove the (4) push rivets retaining the front fender and remove the fender from the vehicle.
3. Repeat this procedure to remove other front fender.

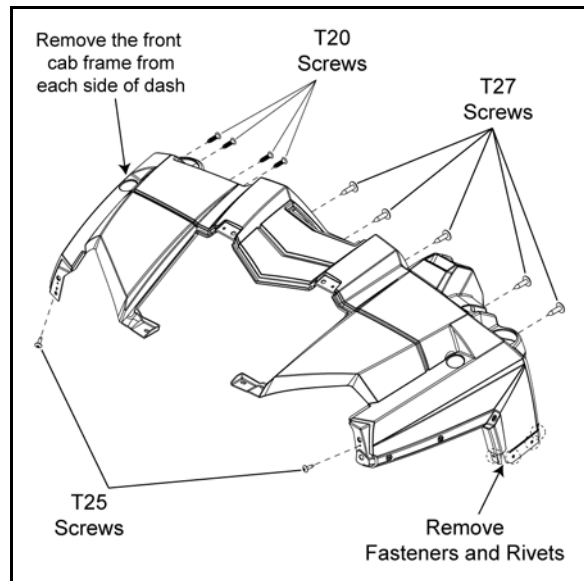
Hood / Dash

1. Remove front fascia (see "Front Fascia" removal).
2. Unlatch the hood and remove the (2) T27 Torx-head screws to remove the hood assembly.



3. Remove the front portion of the cab frame on each side to allow dash removal (see "Cab Frame - Exploded View").
4. Remove the (2) T25 Torx-head screws retaining the front of the dash to the hood liner.

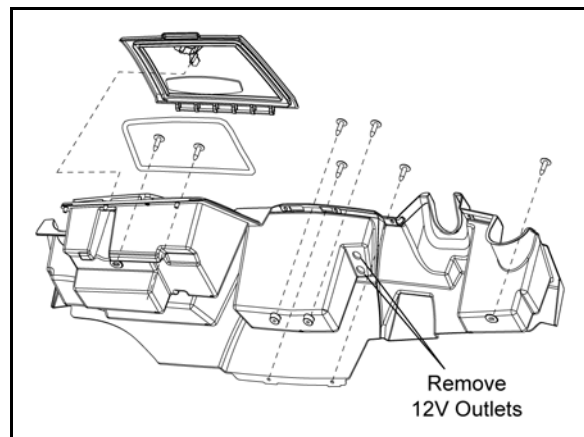
5. Open the glove box and remove the (4) T20 Torx-head screws from the dash.



6. Remove the (5) T25 Torx-head screws retaining the rear portion of the dash.
7. Remove the (8) fasteners from each side of the dash where it attaches to the front and rear fenders.
8. Remove the rubber boots from around the parking brake and shift lever.
9. Remove the (2) push rivets from dash panel (see "Dash Instruments/Controls"). Unhook all electrical components to allow panel to be completely removed.
10. Carefully remove the dash assembly from the vehicle.

Glove Box / Storage Panel

1. Remove the hood / dash (see "Hood / Dash").



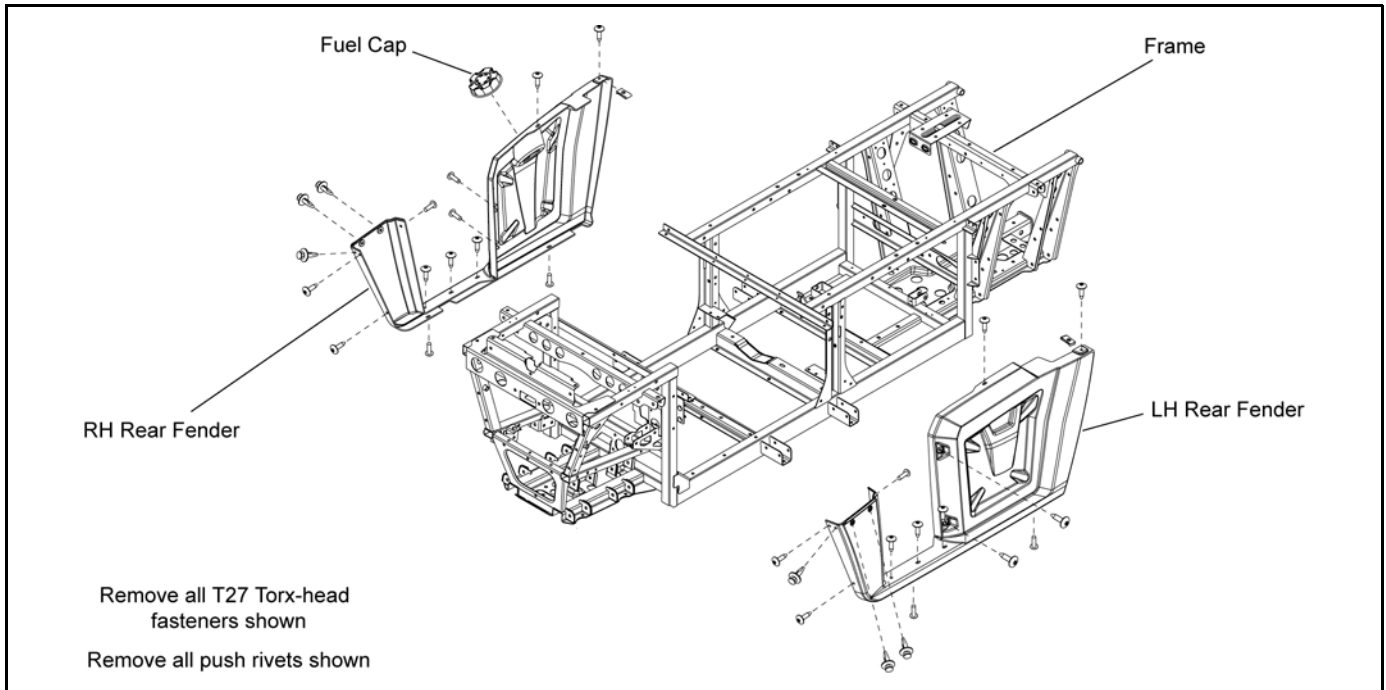
2. Remove the (7) T27 Torx-head screws retaining the glove box storage panel.
3. Disconnect 12V power outlets and remove assembly.

Rear Fenders (XP / HD / 6x6)

1. Remove (11) T27 Torx-head screws and (3) push rivets retaining the rear fender.

NOTE: If removing the RH side, remove the fuel cap as well. Reinstall fuel cap after fender removal.

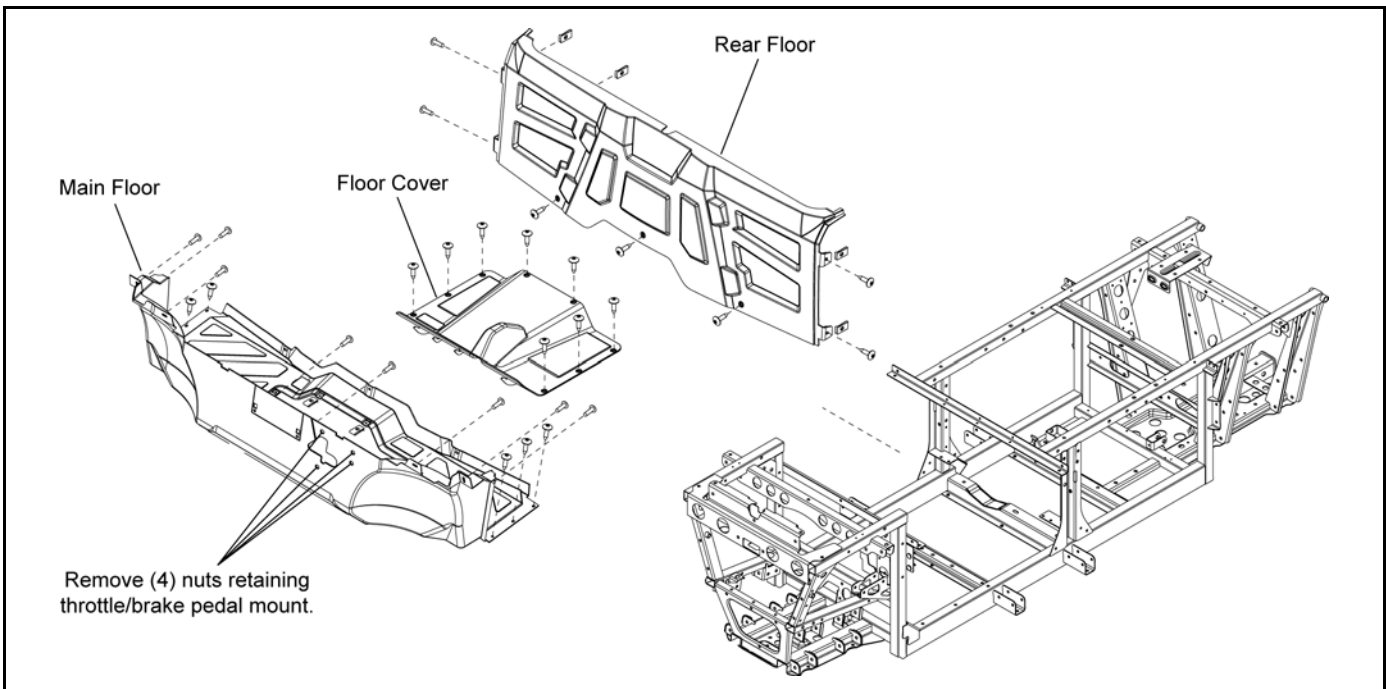
2. Repeat this procedure to remove other rear fender.



Floor (XP / HD / 6x6)

1. Remove (7) T27 Torx-head screws retaining the rear floor. Disconnect ECU harness and remove the rear floor.
2. Remove (8) T27 Torx-head screws retaining the floor cover and remove the floor cover from the vehicle.

3. Loosen the glove box/storage panel fasteners to access the screws retaining the upper portion of the main floor (see "Glove Box / Storage Panel").
4. Remove (14) T27 Torx-head screws retaining the main floor. Remove (4) nuts retaining the brake/throttle pedal mount and remove the main floor from the vehicle.



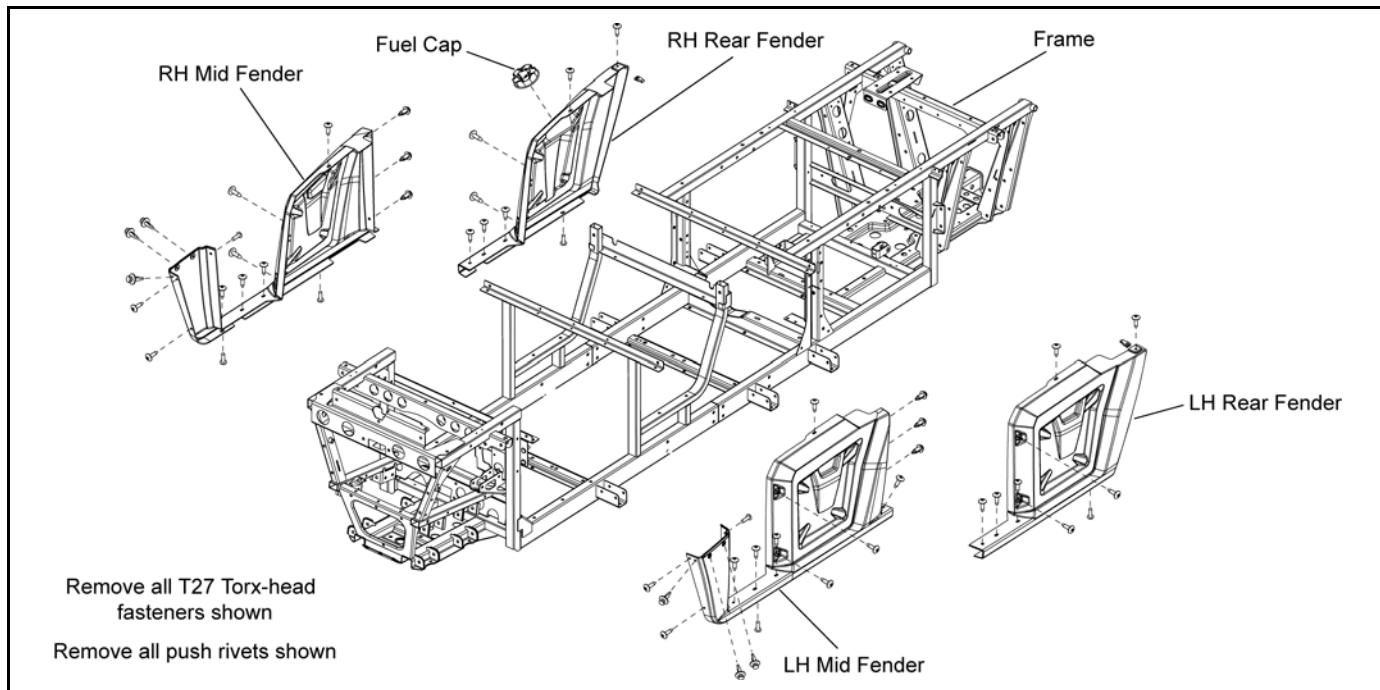
BODY / STEERING / SUSPENSION

Mid / Rear Fenders (CREW)

1. Remove (19) T27 Torx-head screws and (6) push rivets retaining the fenders.

NOTE: If removing the rear RH side, remove the fuel cap as well. Reinstall fuel cap after fender removal.

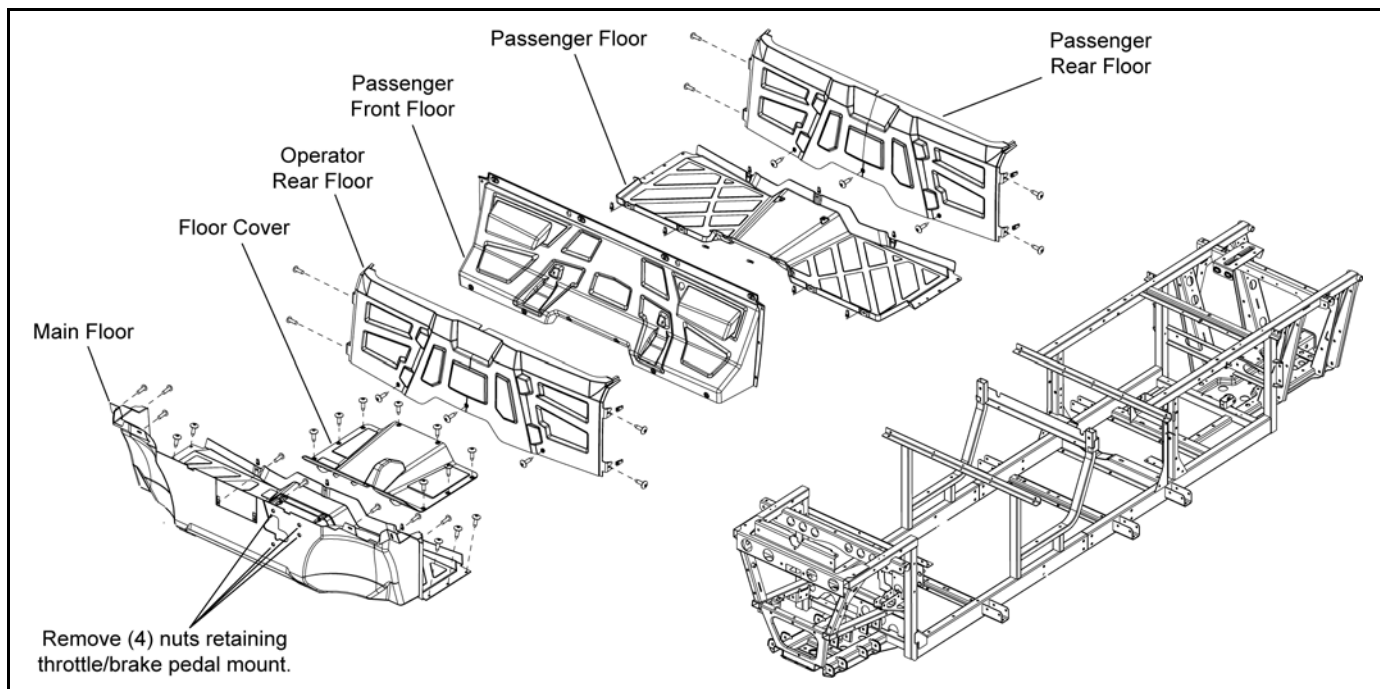
2. Repeat this procedure to remove the other fenders.



Floor (CREW)

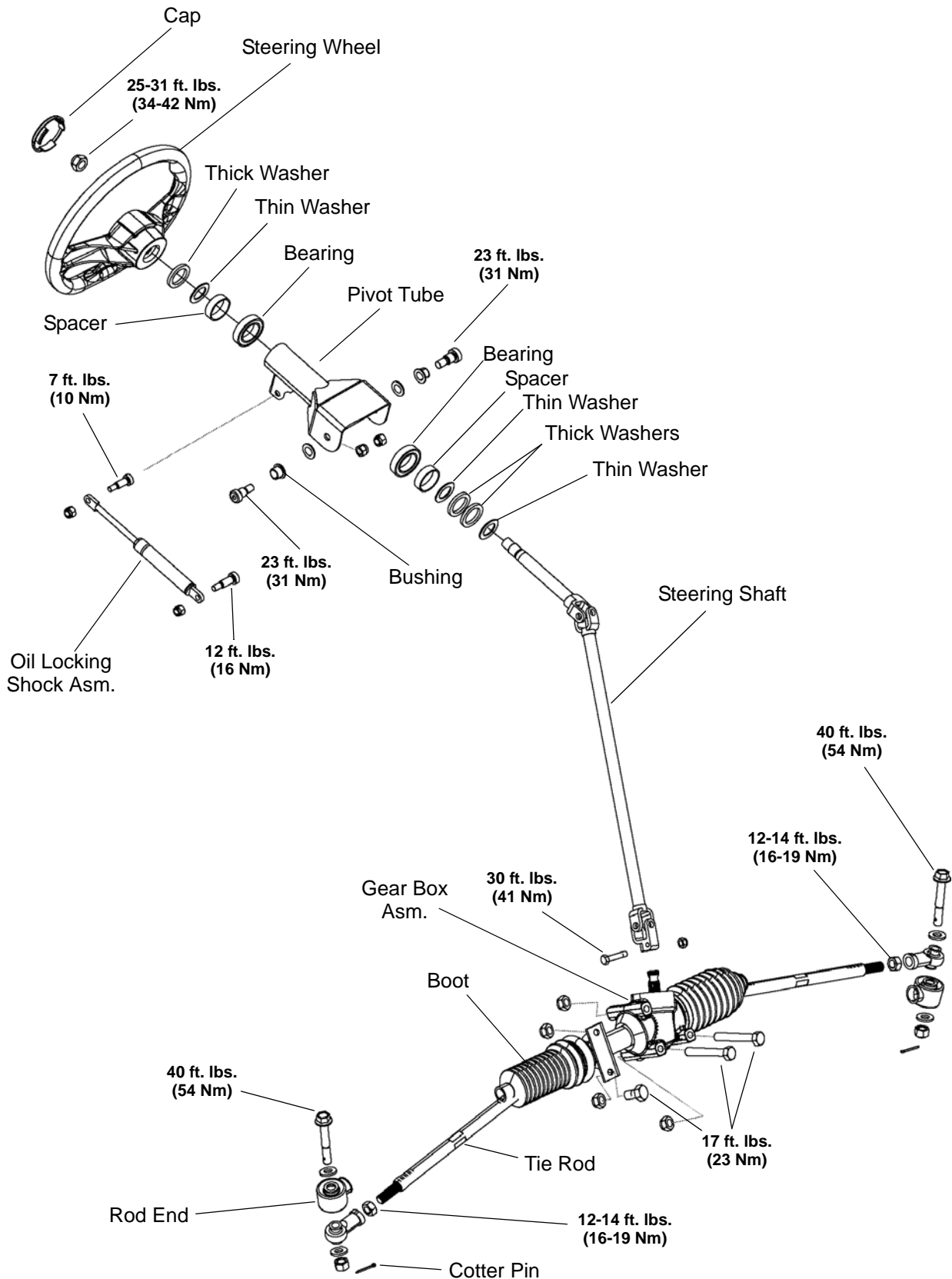
1. Remove (7) T27 Torx-head screws retaining either rear floor. Disconnect ECU harness if removing the passenger rear floor.
2. Remove (8) T27 Torx-head screws retaining the floor cover and remove the floor cover from the vehicle.

3. Loosen the glove box/storage panel fasteners to access the screws retaining the upper portion of the main floor (see "Glove Box / Storage Panel").
4. Remove (14) T27 Torx-head screws retaining the main floor and remove (4) nuts retaining the brake/throttle pedal mount. Remove main floor from vehicle.
5. See illustration if further disassembly is required.



STEERING ASSEMBLY

Exploded View



BODY / STEERING / SUSPENSION

Steering Wheel Removal (Non-EPS Models)

CAUTION

This procedure should NOT be used on EPS models. Using this procedure on an EPS model can permanently damage the EPS unit and cause a Power Steering Fault.

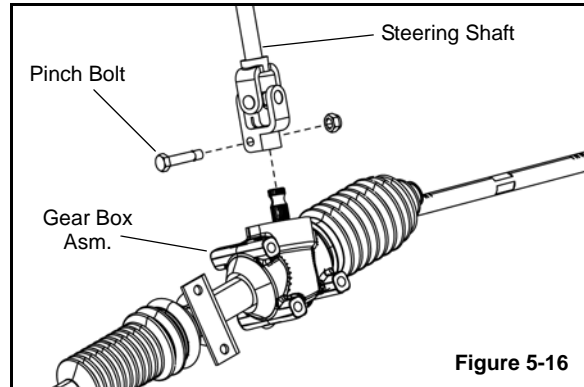
1. Remove the steering wheel cap.
2. Loosen the nut and back it half way off the steering shaft.
3. With a glove on your hand, place it under the steering wheel. Lift upward on the inner portion of the steering wheel while using a hammer to strike the steering shaft nut.

IMPORTANT: If the steering wheel will not pop loose, proceed to "Steering Shaft Removal".

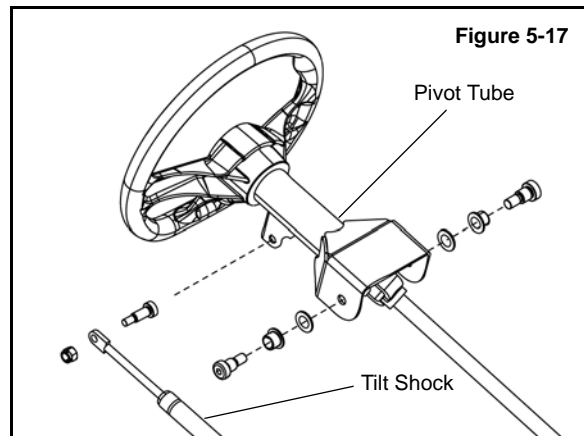
4. Once the steering wheel pops loose, completely remove the nut and lift the steering wheel off the shaft.

Steering Shaft Removal (Non-EPS Models)

1. Remove the pinch bolt retaining the lower portion of the steering shaft to the steering gear box assembly.



2. Remove the fastener retaining the upper portion of the steering wheel tilt shock to the pivot tube.



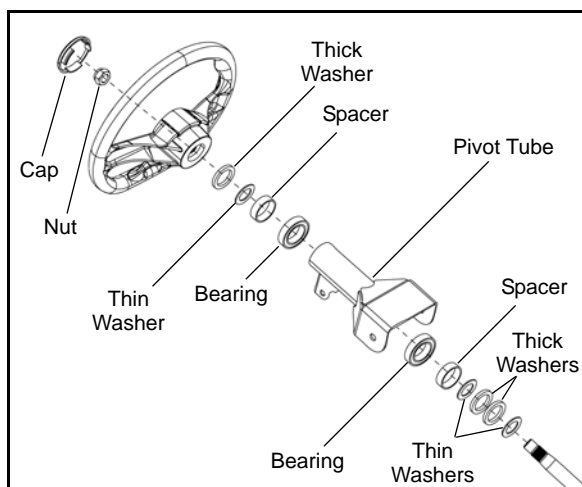
3. Remove the (2) fasteners that retain the pivot tube.
4. Remove the steering shaft, pivot tube and steering wheel from the vehicle as an assembly.
5. Refer to steps 11-13 of the "Steering Shaft Bearing Replacement" procedure for installation.

Steering Shaft Bearing Replacement

IMPORTANT: Replacement pivot tube assembly comes with new upper and lower bearings installed. Use this procedure if replacing just the bearings only.

1. Perform the "Steering Shaft Removal" procedure.
2. Remove the steering wheel cap and retaining nut.
3. Press steering shaft out of the steering wheel and pivot tube.
4. Note the order and location of the washers and spacers between the steering wheel and pivot tube.
5. Drive the bearings out of the pivot tube using a drift punch.
6. Inspect the pivot tube bearing surfaces for signs of excessive wear or damage.
7. Apply Loctite® 271™ (Red) to the outer circumference of the new lower bearing race. Slide the new lower bearing onto the steering shaft and install the steering shaft through the pivot tube.

NOTE: Use care not to allow any of the Loctite® to get in the bearing.



NOTE: Be sure the lower washers and spacers are still on the steering shaft.

8. Apply Loctite® 271™ (Red) to the outer circumference of the new upper bearing race. Slide the new upper bearing onto the steering shaft and press it into the pivot tube by hand.

NOTE: Use care not to allow any of the Loctite® to get in the bearing.

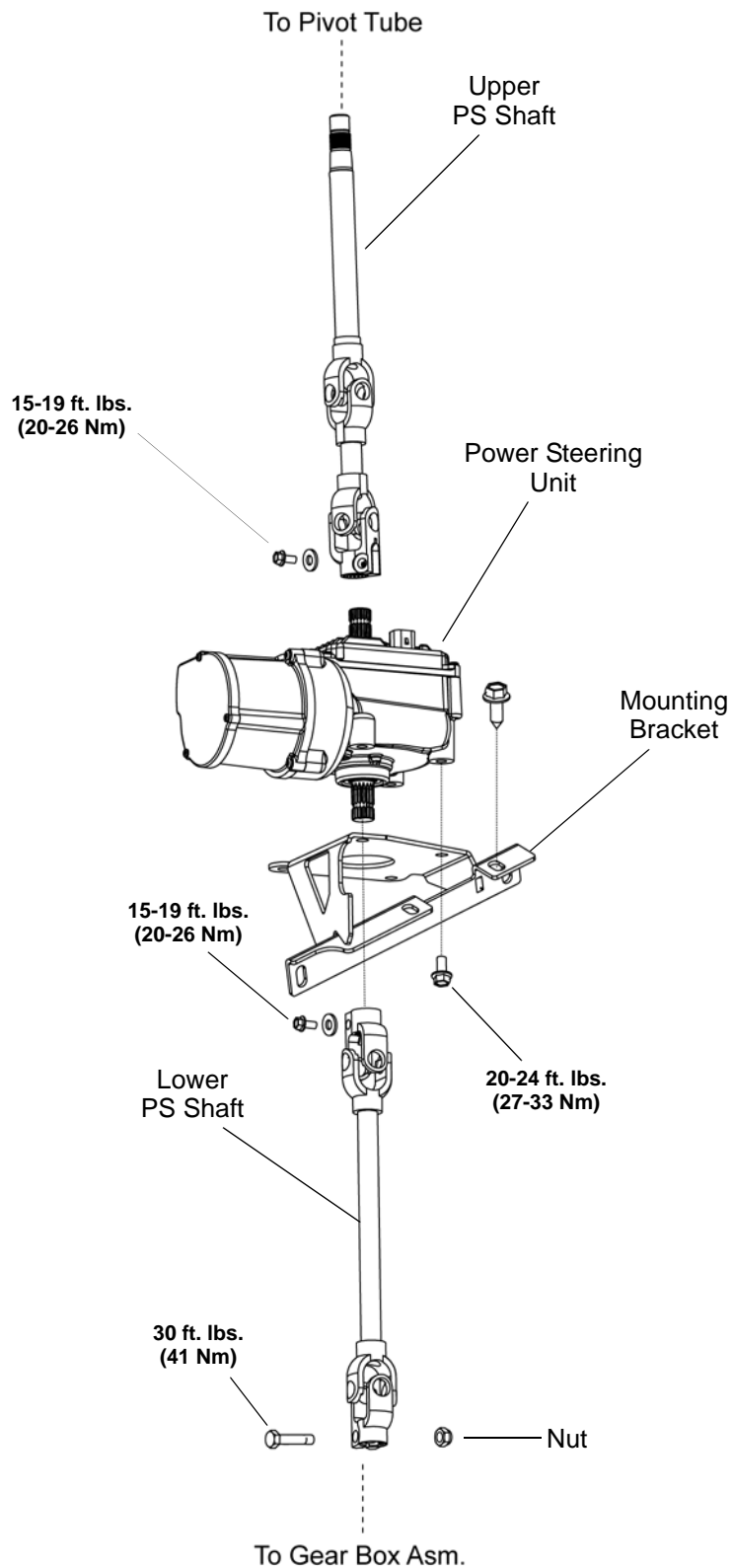
NOTE: Bearings will be seated in the pivot housing upon tightening the steering wheel nut in step 14.

9. Reinstall the upper washers and spacers in the order in which they were removed.
10. Install the steering wheel and hand tighten the nut.
11. Reinstall the steering shaft assembly in the vehicle. Install the lower portion of the steering shaft onto the steering gear box assembly (see Figure 5-16). Torque the lower pinch bolt to **30 ft. lbs. (41 Nm)**.
12. Install the (2) fasteners that retain the pivot tube (see Figure 5-17). Torque fasteners to **23 ft. lbs. (31 Nm)**.
13. Install the fastener retaining the upper portion of the steering wheel tilt shock to the pivot tube (see Figure 5-17). Torque fastener to **7 ft. lbs. (10 Nm)**.
14. Be sure the front wheels are facing straight forward. Remove the steering wheel and align as needed. Torque the steering wheel nut to **28 ft. lbs. (38 Nm)**.
15. Wipe the pivot tube clean of any excess Loctite®.
16. Install steering wheel cap and field test steering operation.

BODY / STEERING / SUSPENSION

POWER STEERING ASSEMBLY (EPS)

Exploded View



Steering Wheel Removal (EPS Models)

1. Remove the upper steering shaft, pivot tube and steering wheel as an assembly *before* attempting to remove the steering wheel. Refer to "Power Steering Unit Removal (EPS Models)".

CAUTION

Striking the steering wheel or steering shaft while installed in the vehicle can permanently damage the EPS unit and cause a Power Steering Fault.

2. Remove the steering wheel cap.

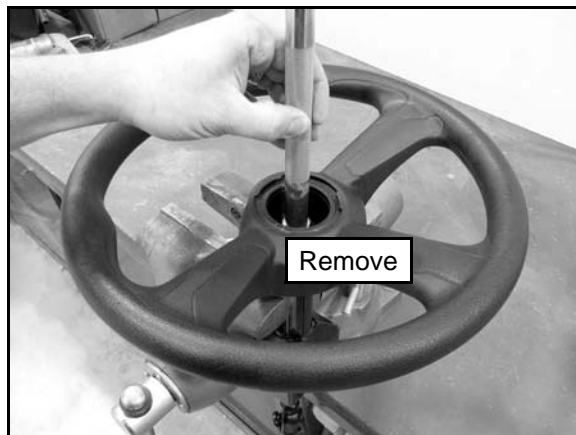


3. Loosen the nut and back it half way off the steering shaft.



4. Place the assembly in a vise.

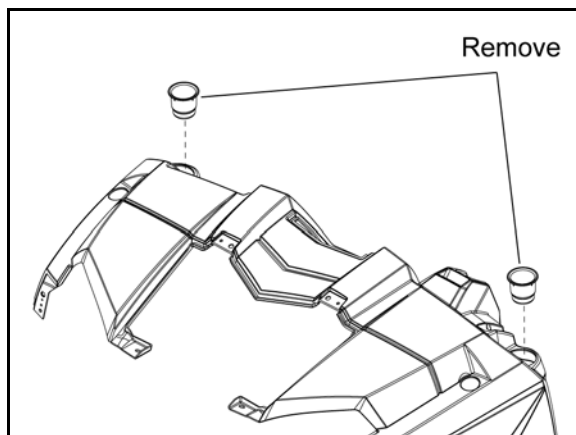
5. Using a large bronze drift and hammer, strike steering shaft nut to pop the steering wheel off the shaft taper.



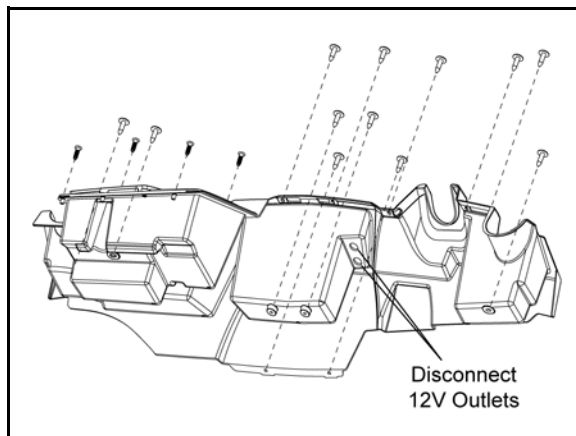
6. Once the steering wheel pops loose, completely remove the nut and lift the steering wheel off the shaft.

Power Steering Unit Removal

1. Remove the cup holders from the upper dash panel.

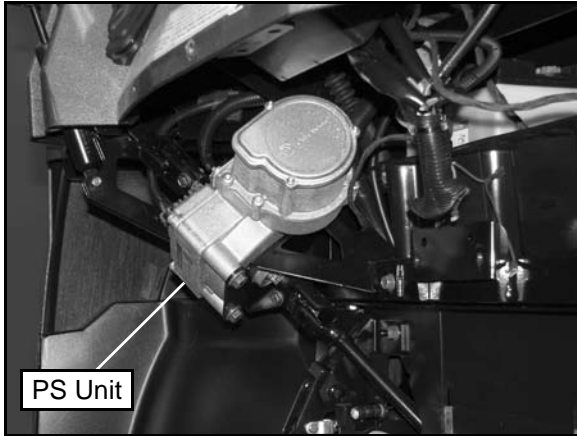


2. Remove the fasteners retaining the lower dash panel and glove box.

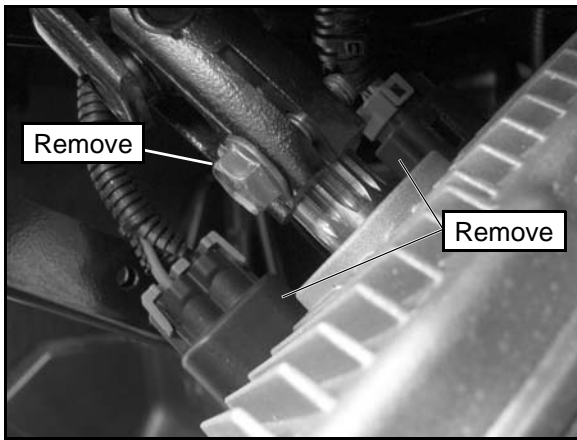


BODY / STEERING / SUSPENSION

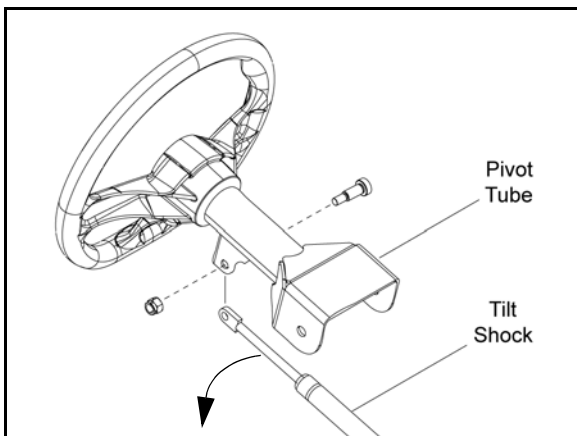
- Carefully remove the lower dash panel assembly from the vehicle. Disconnect the 12V outlets upon removal.
- Locate power steering unit under the steering column.



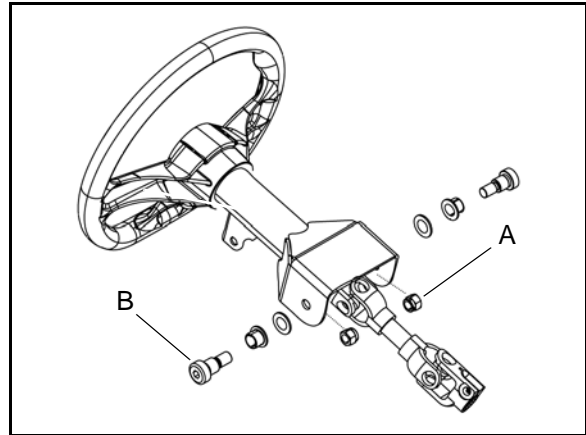
- Disconnect the (2) electrical harnesses and remove the pinch bolt retaining the upper power steering shaft to the power steering unit.



- Remove the upper fastener retaining the steering tilt shock to the pivot tube and swing the shock down out of the way.



- Secure the steering wheel in the upward position to gain access to nuts (A) through the dash slot. Reach up under dash to gain access to shoulder bolts (B). Remove both nuts and pivot tube shoulder bolts (A and B). DO NOT REMOVE STEERING WHEEL.

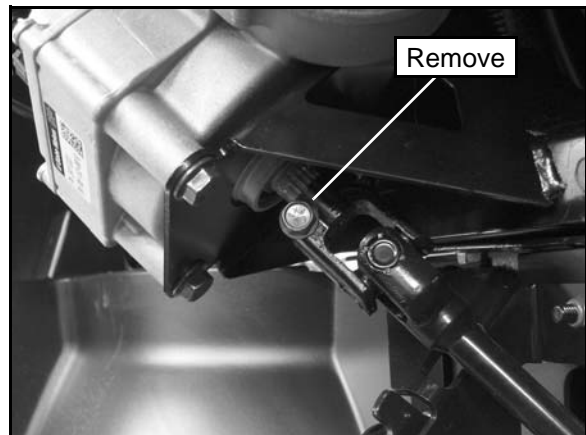


- Pull plastic dash up slightly and lift up on the steering wheel / pivot tube / upper steering shaft assembly. Remove assembly from vehicle and set in a suitable location.

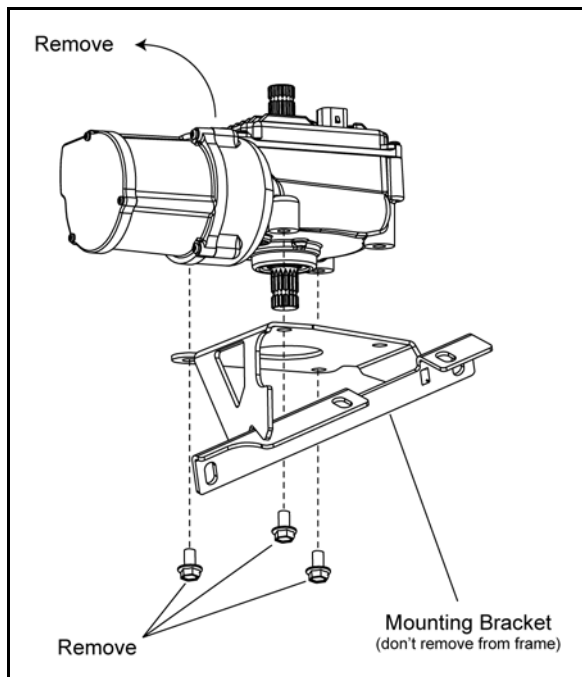
CAUTION

Striking the steering wheel or steering shaft can permanently damage the EPS unit and cause a Power Steering Fault.

- Remove the pinch bolt retaining the lower power steering shaft to the power steering unit.



- Remove the (3) bolts retaining the power steering unit to the mounting bracket and remove the power steering unit from the vehicle.



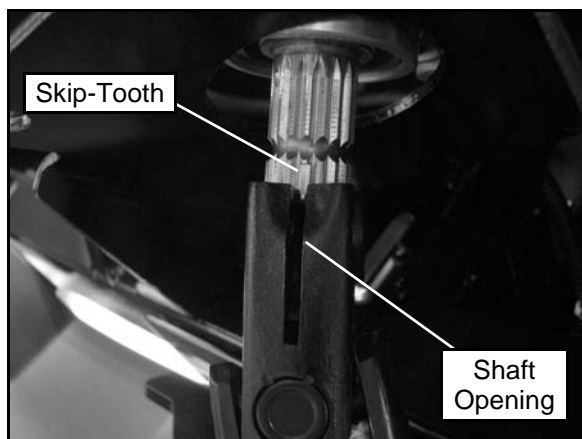
⚠ WARNING

Electronic Power Steering (EPS) units are not interchangeable between ATV and *RANGER* product lines.

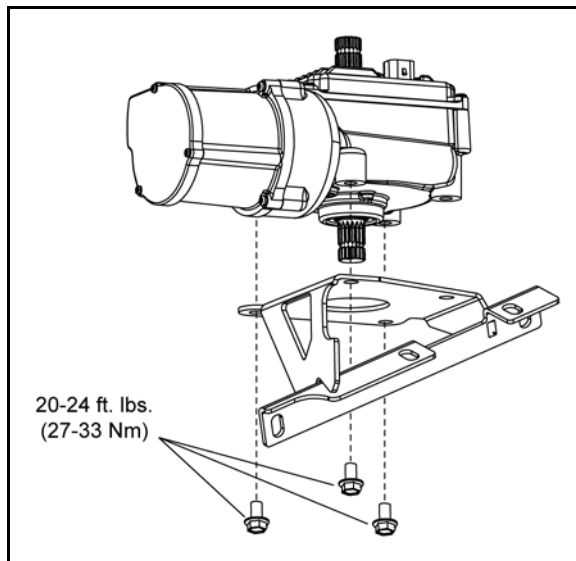
Power Steering Unit Installation

Refer to the "Power Steering Unit Removal" procedure for detailed photos and illustrations during installation.

- Install power steering unit onto mount bracket and align skip-tooth spline on power steering stub shaft with the opening in the lower power steering shaft.



- Torque the mounting bolts to specification.



⚙ = T

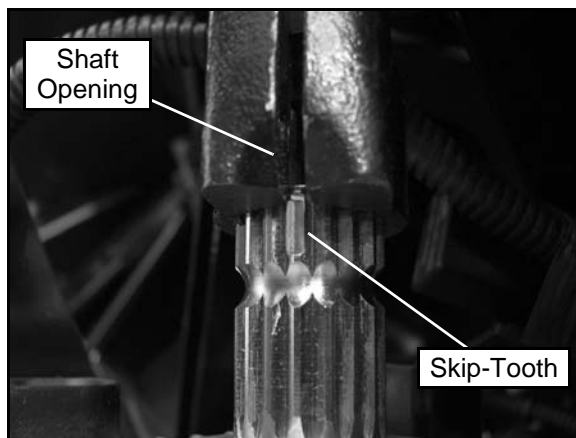
Power Steering Unit Mounting Bolts:
20-24 ft. lbs. (27-33 Nm)

- Install pinch bolt retaining the lower power steering shaft to power steering unit. Torque to specification.

⚙ = T

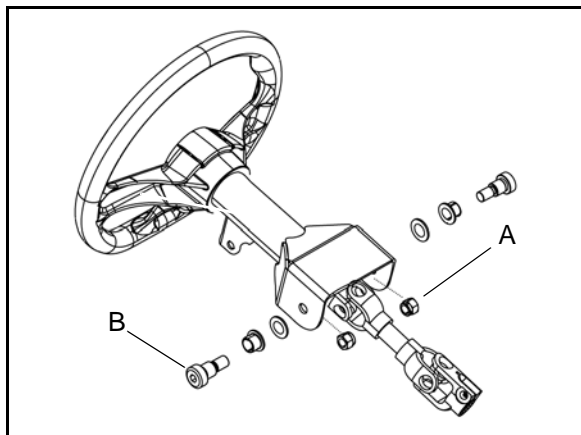
Lower Power Steering Shaft Pinch Bolt:
15-19 ft. lbs. (20-26 Nm)

- Position steering wheel / pivot tube / upper steering shaft assembly into the proper mounting location. Be sure front wheels are pointing straight ahead and that the steering wheel is straight when installing the upper steering shaft onto the upper power steering stub.
- Align skip-tooth spline on power steering stub shaft with the opening in the upper power steering shaft.



BODY / STEERING / SUSPENSION

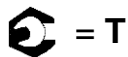
6. Loosely install pivot tube shoulder bolts (B) and nuts (A).



CAUTION

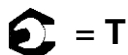
Striking the steering wheel or steering shaft can permanently damage the EPS unit and cause a Power Steering Fault.

7. Install upper shaft pinch bolt and torque to specification.



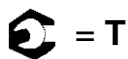
Upper Power Steering Shaft Pinch Bolt:
15-19 ft. lbs. (20-26 Nm)

8. Verify that the pivot tube bushings are properly seated into the pivot tube. Torque the pivot tube shoulder bolts and nuts to specification.



Pivot Tube Shoulder Bolt:
23 ft. lbs. (31 Nm)

9. Install tilt shock and torque fastener to specification.



Tilt Shock Fastener: **12 ft. lbs. (16 Nm)**

10. Reconnect both electrical harnesses onto the power steering unit. Be sure the connectors snap into place and the wires are routed correctly.

11. Reinstall the lower dash panel and glove box. Be sure to reconnect the 12V outlets upon assembly.

12. Turn the key switch on and test EPS operation.

FRONT A-ARMS

Removal / Replacement

The following procedure details upper and lower A-arm removal and replacement on one side of the vehicle.

1. Elevate and safely support the front of the vehicle and remove the front wheel.
2. Remove the lower shock fastener (A) from the upper A-arm.
3. Remove the brake line clamp from the A-arm.
4. Remove the upper ball joint pinch bolt (B) from the front bearing carrier.
5. Using a soft face hammer, tap on bearing carrier to loosen the upper A-arm ball joint end while lifting upward on the upper A-arm. Completely remove the ball joint end from the bearing carrier.
6. Loosen and remove the upper A-arm through-bolt fasteners (C) and remove the upper A-arm from the vehicle.
7. Examine A-arm bushings and pivot tubes (see "Exploded View"). Replace if worn. Discard hardware.

! WARNING

The locking agent on the existing bolts was destroyed during removal. DO NOT reuse old hardware. Serious injury or death could result if fasteners come loose during operation.

8. If not replacing the A-arm, thoroughly clean the A-arm and pivot tubes.
9. Install new ball joint into A-arm. Refer to "Ball Joint Replacement" section.
10. Insert new A-arm bushings and pivot tubes into new A-arm.
11. Install new upper A-arm assembly onto vehicle frame. Torque new bolts to **30 ft. lbs. (41 Nm)**.
12. Insert upper A-arm ball joint end into the bearing carrier. Install the upper ball joint pinch bolt (B) into the bearing carrier and torque bolt to **23 ft. lbs. (31 Nm)**.
13. Attach shock to A-arm with fastener (A). Torque lower shock bolt to **30 ft. lbs. (41 Nm)**.
14. Remove the lower ball joint pinch bolt (D) from the front bearing carrier.

5.32

15. Using a soft face hammer, tap on bearing carrier to loosen the lower A-arm ball joint end while pushing downward on the lower A-arm. Completely remove the ball joint end from the bearing carrier.
16. Loosen and remove the lower A-arm through-bolt fasteners (E) and remove the lower A-arm from the vehicle.
17. Examine A-arm bushings and pivot tubes (see "Exploded View"). Replace if worn. Discard hardware.
18. If not replacing the A-arm, thoroughly clean the A-arm and pivot tubes.
19. Install new ball joint into A-arm. Refer to "Ball Joint Replacement" section.
20. Insert new A-arm bushings and pivot tubes into new A-arm.
21. Install new lower A-arm assembly onto vehicle frame. Torque new bolts to **30 ft. lbs. (41 Nm)**.
22. Insert lower A-arm ball joint end into the bearing carrier. Install the lower ball joint pinch bolt (D) into the bearing carrier and torque bolt to **23 ft. lbs. (31 Nm)**.

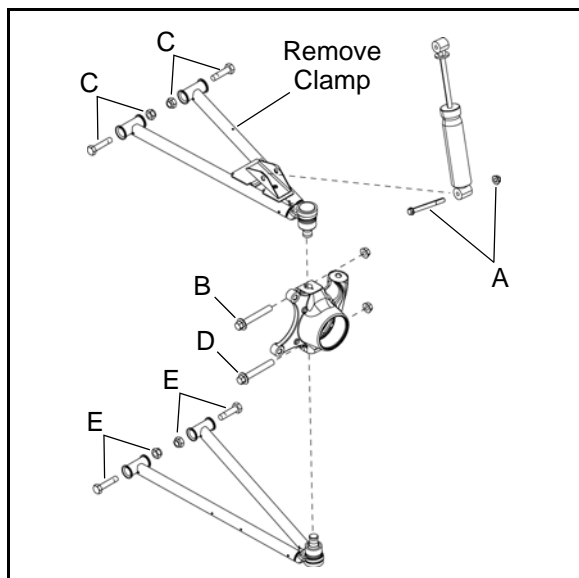


WARNING

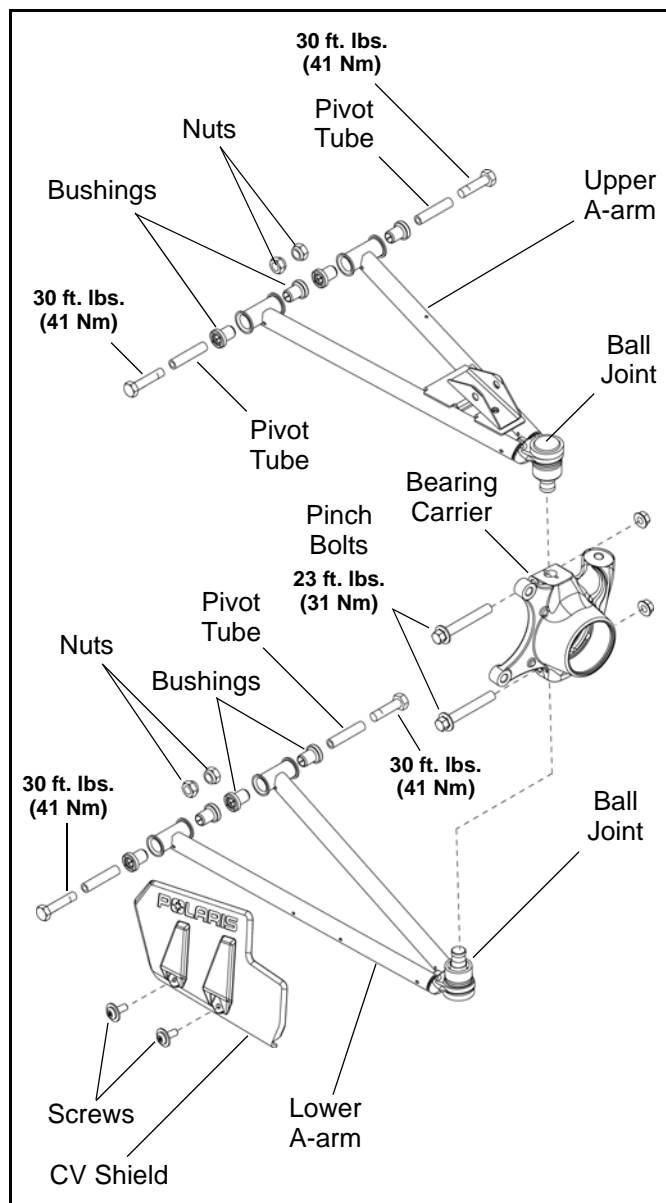
Upon A-arm installation completion, test vehicle at low speeds before putting into service.

**Upper / Lower A-arm Bolt Torque:
30 ft. lbs. (41 Nm)**

**Ball Joint Pinch Bolt Torque:
23 ft. lbs. (31 Nm)**



Exploded View

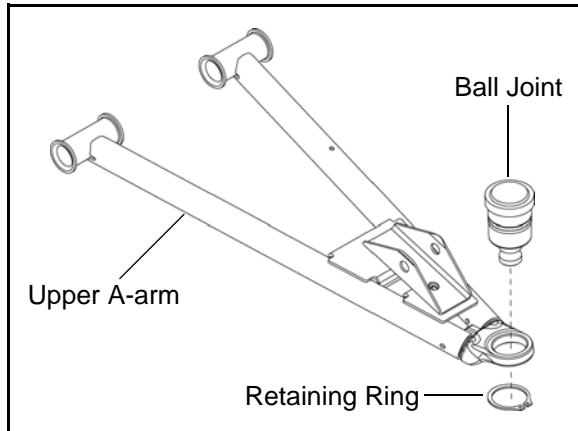


BALL JOINT SERVICE

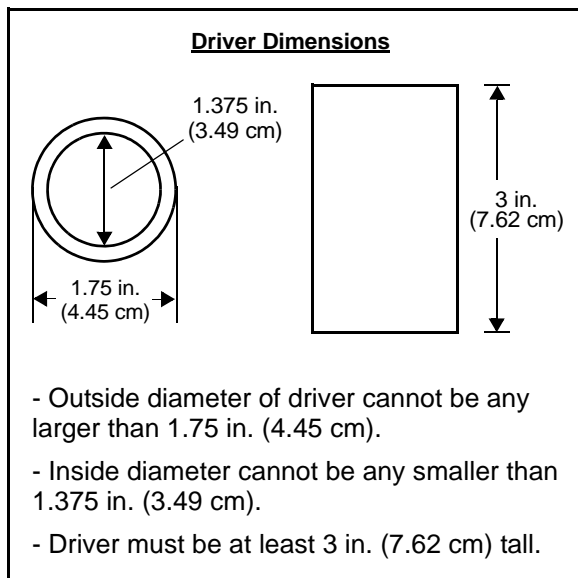
Removal

IMPORTANT: Do not reuse a ball joint if it has been removed for any reason. If removed, it must be replaced. Use this removal procedure only when replacing the ball joint.

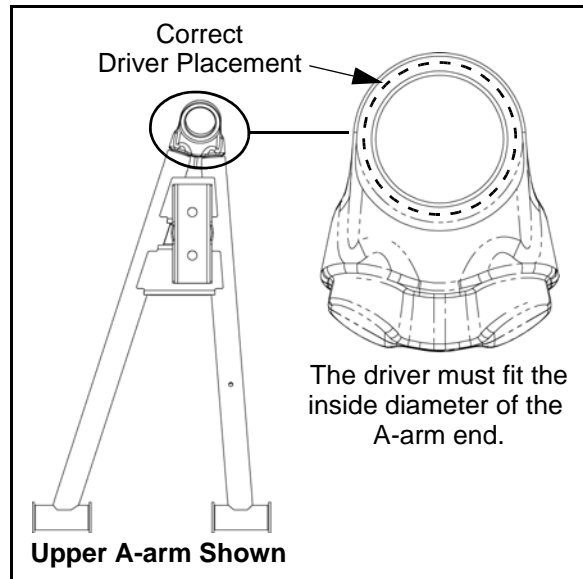
1. The A-arm must be removed to perform this procedure (see "FRONT A-ARMS - Removal / Replacement").



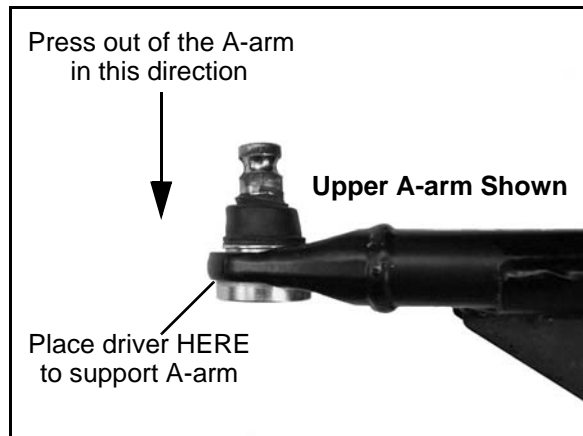
2. Remove the retaining ring from the ball joint.
3. A driver must be used for the removal of the ball joint. Use the dimensions below to fabricate or locate the correct size driver to use in the following process.



4. Use a press and correct size driver to remove the ball joint from the A-arm.

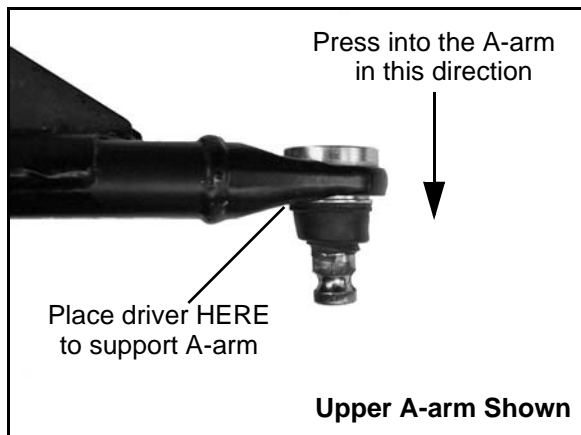


NOTE: The driver must fit the ball joint housing in the A-arm. This will allow the ball joint to be properly pressed out of the A-arm without damaging the A-arm.

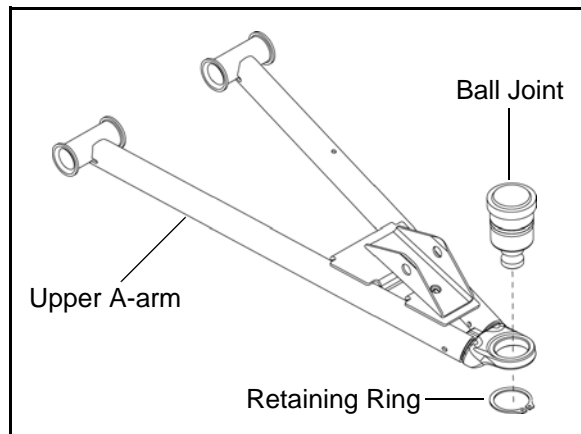


Installation

1. Place the A-arm in the correct position for ball joint installation. Face the A-arm end flat on top of the driver. Carefully drive the ball joint into place until the ball joint is properly seated.



2. After the new ball joint is installed into the A-arm, install a NEW retaining ring.



3. Reinstall the A-arm (see "FRONT A-ARMS - Removal / Replacement").
4. Repeat the ball joint service procedure for any additional A-arm ball joint replacements.

BODY / STEERING / SUSPENSION

MID / REAR A-ARMS

Removal / Replacement

The following procedure details upper and lower A-arm removal and replacement on one side of the vehicle. Repeat the following steps to remove the A-arm(s) from the opposite side.

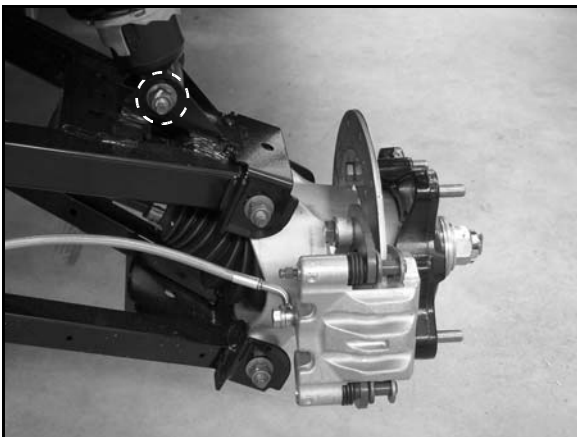
NOTE: Use the exploded view in this section as a reference during the procedure.

1. Elevate and safely support the rear of vehicle off the ground and remove the mid or rear wheel.

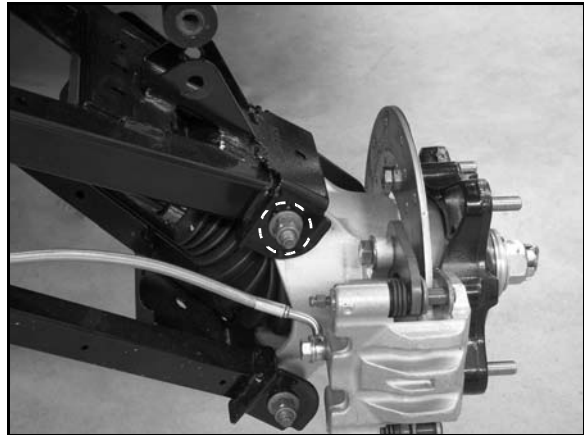


Upper A-arm Removal

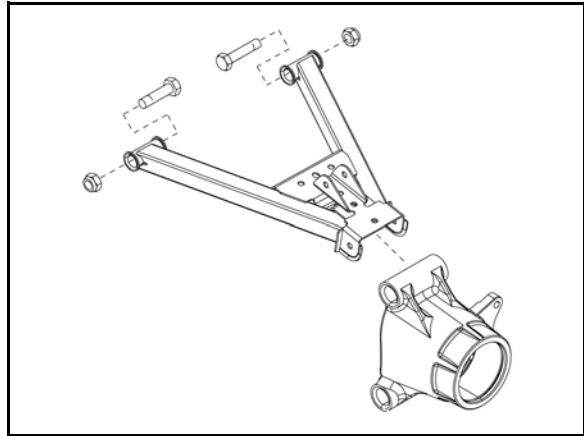
2. Remove the fastener retaining the lower portion of the shock and stabilizer linkage to the upper A-arm.



3. Remove the fastener attaching the upper A-arm to the bearing carrier.



4. Remove the fasteners attaching the upper A-arm to the frame and remove the upper A-arm from the vehicle.



5. Examine A-arm and bearing carrier bushings and pivot tubes (see "Exploded View"). Replace if worn. Discard hardware.

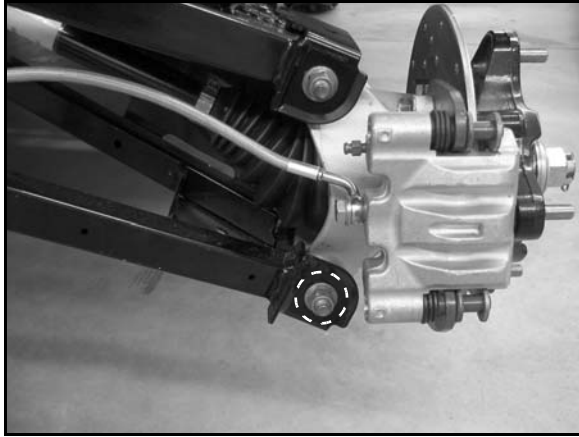
WARNING

The locking agent on the existing bolts was destroyed during removal. DO NOT reuse old hardware. Serious injury or death could result if fasteners come loose during operation.

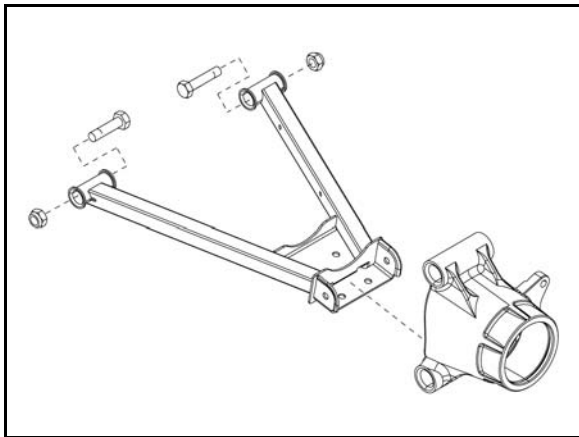
6. If not replacing the A-arm, thoroughly clean the a-arm and pivot tubes.
7. Insert new A-arm bushings and pivot tubes into the new A-arm.

Lower A-arm Removal

8. Remove the fastener attaching the lower A-arm to the bearing carrier.



9. Remove the fasteners attaching the lower A-arm to the frame and remove the lower A-arm from the vehicle.



10. Examine A-arm and bearing carrier bushings and pivot tubes (see "Exploded View"). Replace if worn. Discard hardware.

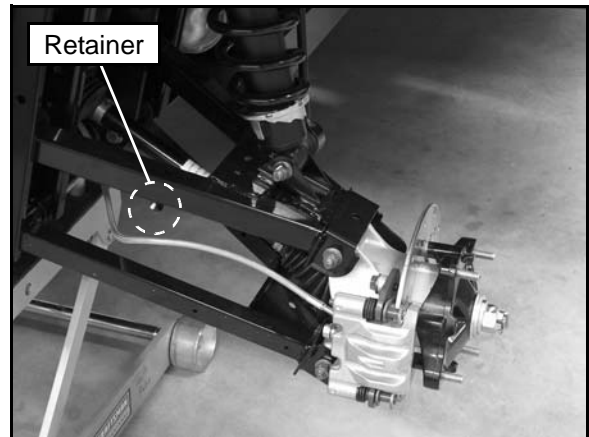
WARNING

The locking agent on the existing bolts was destroyed during removal. DO NOT reuse old hardware. Serious injury or death could result if fasteners come loose during operation.

11. If not replacing the A-arm, thoroughly clean the a-arm and pivot tubes.
12. Insert new A-arm bushings and pivot tubes into the new A-arm.

Installation

1. Install lower A-arm assembly onto vehicle frame. Torque new fasteners to **30 ft. lbs. (41 Nm)**.
2. Attach lower A-arm to bearing carrier. Torque new fastener to **30 ft. lbs. (41 Nm)**.
3. Route the brake line over the top of the lower A-arm and secure it in the retainer.



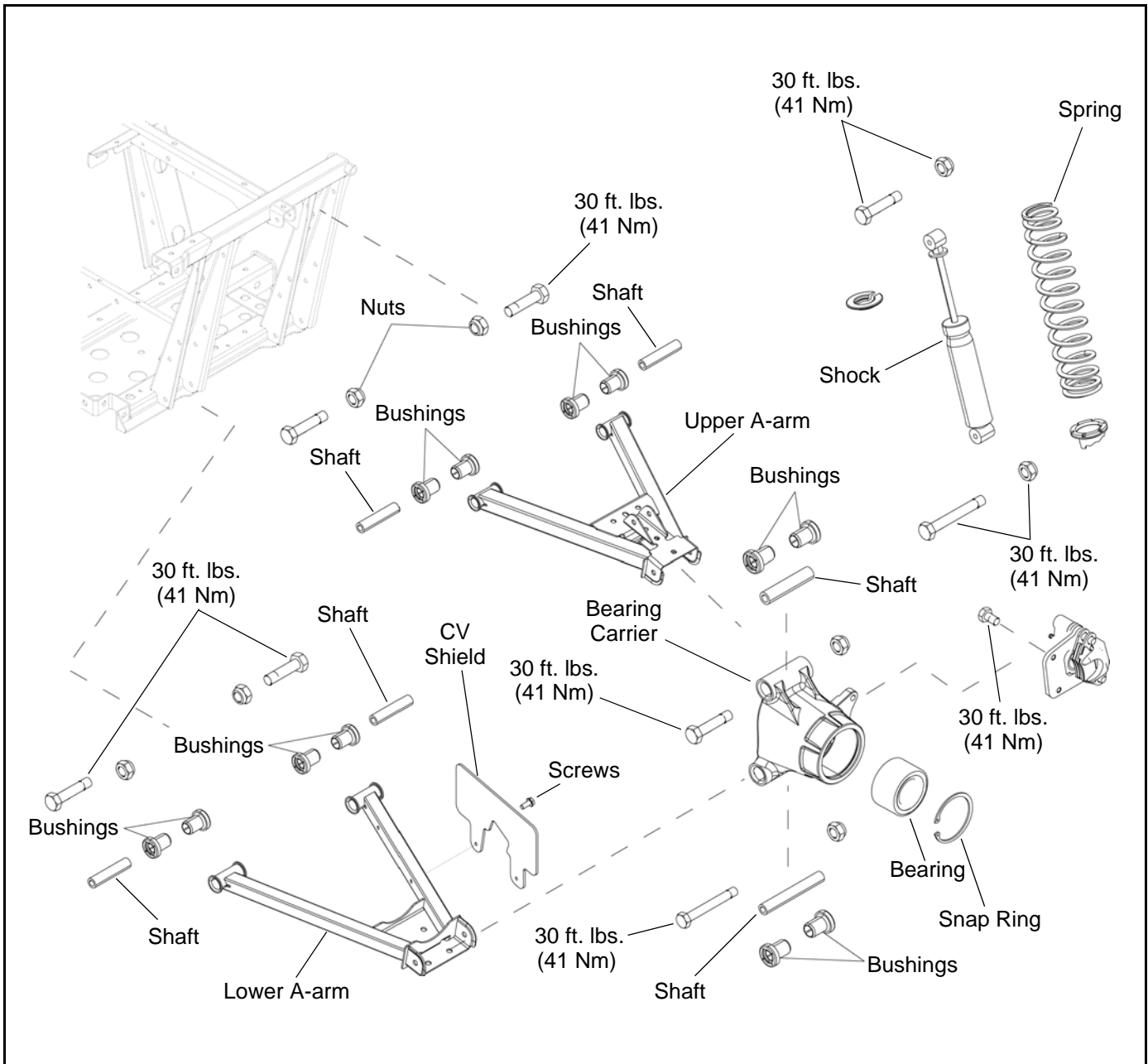
4. Install upper A-arm assembly onto vehicle frame. Torque new fasteners to **30 ft. lbs. (41 Nm)**.
5. Attach upper A-arm to bearing carrier. Torque new fastener to **30 ft. lbs. (41 Nm)**.
6. Reinstall the lower portion of the shock and stabilizer linkage to the upper A-arm. Torque shock / linkage fastener to **30 ft. lbs. (41 Nm)**.
7. Install wheel and torque wheel nuts to specification (see Chapter 2).

WARNING

Upon A-arm installation completion, test vehicle at low speeds before putting into service.

BODY / STEERING / SUSPENSION

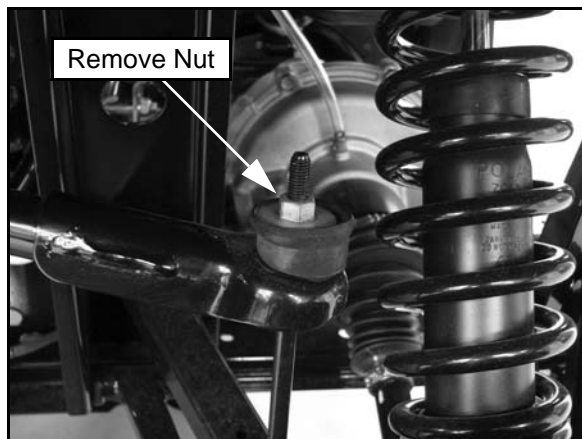
Exploded View



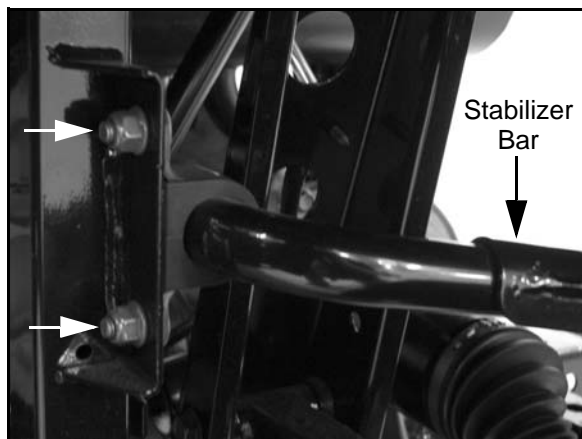
REAR STABILIZER BAR / LINKAGE

Removal / Installation

1. Elevate and safely support vehicle with weight removed from the rear wheel(s).
2. Remove the retaining nut from the upper portion of the stabilizer bar linkage bushing on each side of the vehicle.





3. Remove the two fasteners that secure the stabilizer bar to the main frame on each side.




4. Remove the stabilizer bar from the frame and inspect the stabilizer bar for straightness.
5. Inspect the stabilizer bar bushings and replace if needed.
6. Inspect the rubber bushings on the stabilizer linkage rod and replace if needed. If replacing the stabilizer linkage, remove the lower shock bolt from the upper A-arm.
7. Reverse this procedure for installation.

8. Torque the stabilizer bar retaining bolts and upper rubber linkage bushing nuts to specification.

 = T
Stabilizer Bar Retaining Bolts: 17 ft. lbs. (23 Nm)

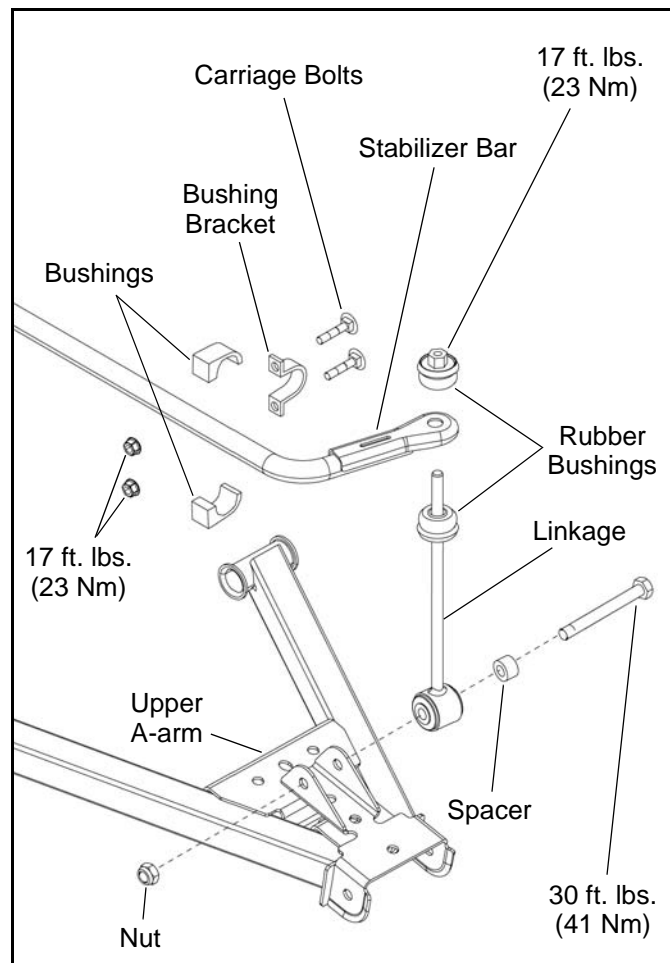
 = T
Upper Linkage Bushing: 17 ft. lbs. (23 Nm)

9. If the stabilizer linkage was removed, torque the lower shock retaining bolt to specification.

 = T
Shock Mounting Bolts: 30 ft. lbs. (41 Nm)

5

Exploded View



DECAL REPLACEMENT

 WARNING

The following procedure involves the use of an open flame. Perform this procedure in a well ventilated area, away from gasoline or other flammable materials. Be sure the area to be flame treated is clean and free of gasoline or flammable residue.

 WARNING

Do not flame treat components that are installed on the vehicle. Remove the component from the vehicle before flame treating.

The side panels, front and rear fender cabs are plastic polyethylene material. Therefore, they must be “flame treated” prior to installing a decal to ensure good adhesion. A bonus of the flame treating procedure is it can be used to reduce or eliminate the whitish stress marks that are sometimes left after a fender or cab is bent, flexed, or damaged.

CAUTION

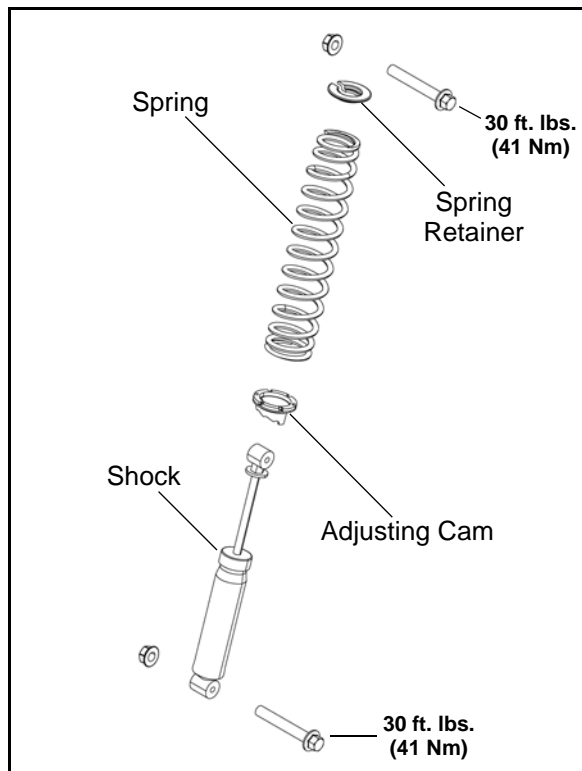
Do not flame treat painted plastic components. Painted plastic surfaces should only be wiped clean prior to decal adhesion.

To flame treat the decal area:

1. Pass the flame of a propane torch back and forth quickly over the area where the decal is to be applied until the surface appears slightly glossy. This should occur after just a few seconds of flame treating. Do not hold the torch too close to the surface (2-3 inches from the flame tip is recommended). Keep the torch moving to prevent damage.
2. Apply the decal on one edge first. Slowly lay down remainder of the decal while rubbing lightly over the decal surface to eliminate any air bubbles during the application.

SHOCKS / SPRINGS

Exploded View (Standard)



Shock Removal / Installation

1. Elevate the vehicle far enough off the ground to relieve the suspension load and support the A-arm.
2. Remove the upper and lower fasteners retaining the shock and remove the shock from the vehicle. Discard nuts and replace with new upon installation.
3. Reverse the procedure to reinstall the shock. Torque new fasteners to specification.



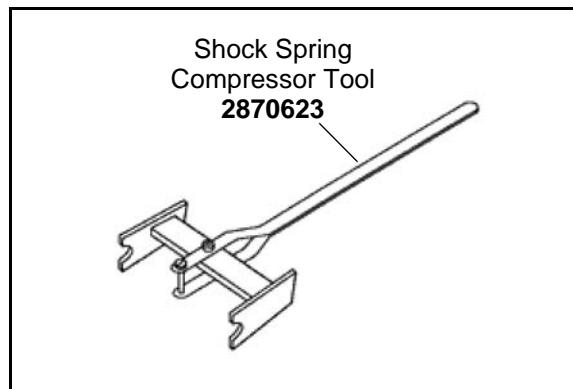
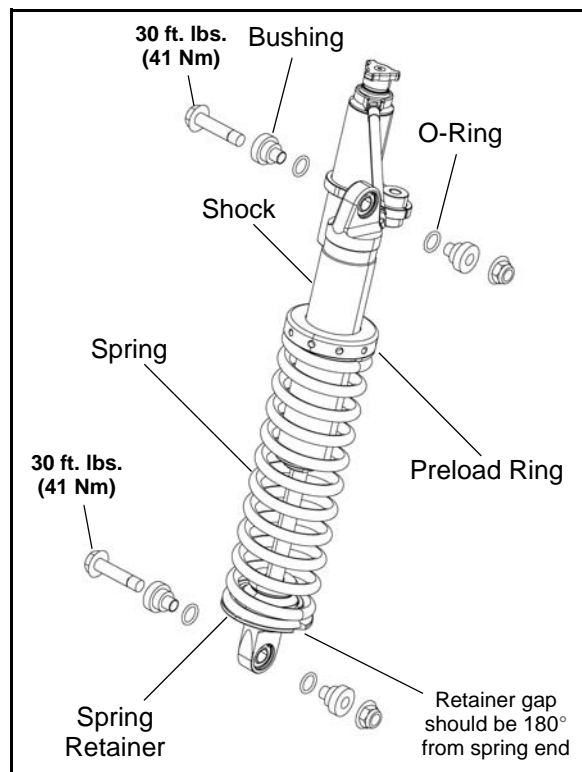
Shock Mounting Bolts:
30 ft. lbs. (41 Nm)

Shock Replacement

1. Remove shock and note the spring preload distance or setting (see Chapter 2 for factory settings).
2. Remove spring tension in order to remove retainer:
 - **Standard:** Using a spring compressor, compress shock spring far enough to remove spring retainer.
 - **Walker Evans™:** Loosen the preload adjustment ring until the spring is loose. If needed, use a spring compressor to compress the spring far enough to remove the spring retainer.

5

Exploded View (Walker Evans™)



3. Remove spring and other components from existing shock and install components onto the new shock.
4. Install the spring and spring retainer. If needed, use the spring compressor to compress the spring far enough to install the spring retainer.

IMPORTANT: The spring retainer gap should be 180° from the end of the spring upon installation.

5. Tighten spring preload adjustment ring (Walker Evans) or turn adjustment cam (Standard) to set preload distance noted in Step 1 (see Chapter 2 for factory settings).
6. Reinstall shock onto vehicle and torque new fasteners to specification.

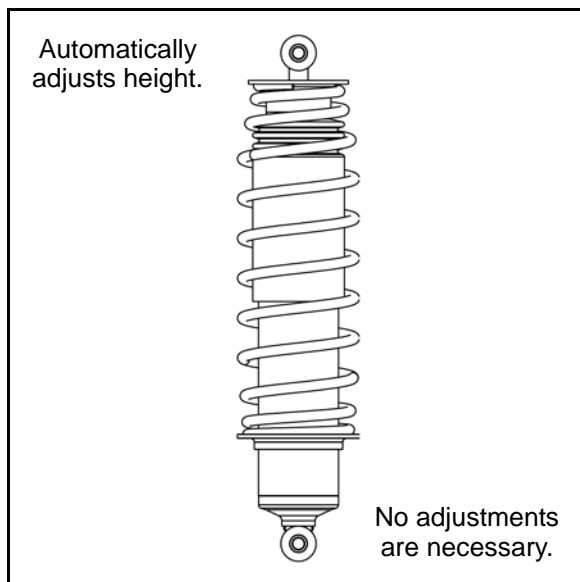
BODY / STEERING / SUSPENSION

SELF-LEVELING SUSPENSION (HD)

Nivomat® Shock Operation

The self-leveling Nivomat® shocks eliminate rear-end squat when carrying heavy loads.

When the *RANGER* HD starts moving, the Nivomat® shocks start working, automatically adjusting the box to near its unloaded height.



Nivomat® Shock Disposal / Replacement

CAUTION

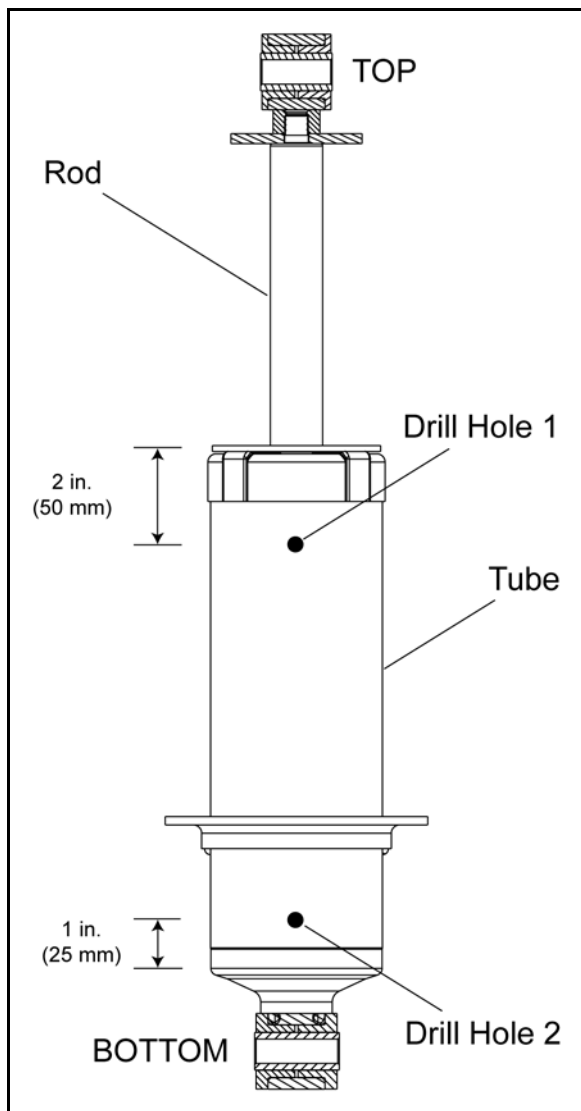
Gas charged shock absorbers contain high pressure gas. Do not attempt to cut the shock open before all gas pressure is released.

CAUTION

To prevent personal injury, wear safety glasses when center punching the shock absorber. Use care not to puncture the shock absorber tube with the center punch.

1. Make an indentation 2 in. (50 mm) from the top of the tube using a center punch.
2. Clamp the shock absorber in a vise horizontally with the shock absorber completely extended.

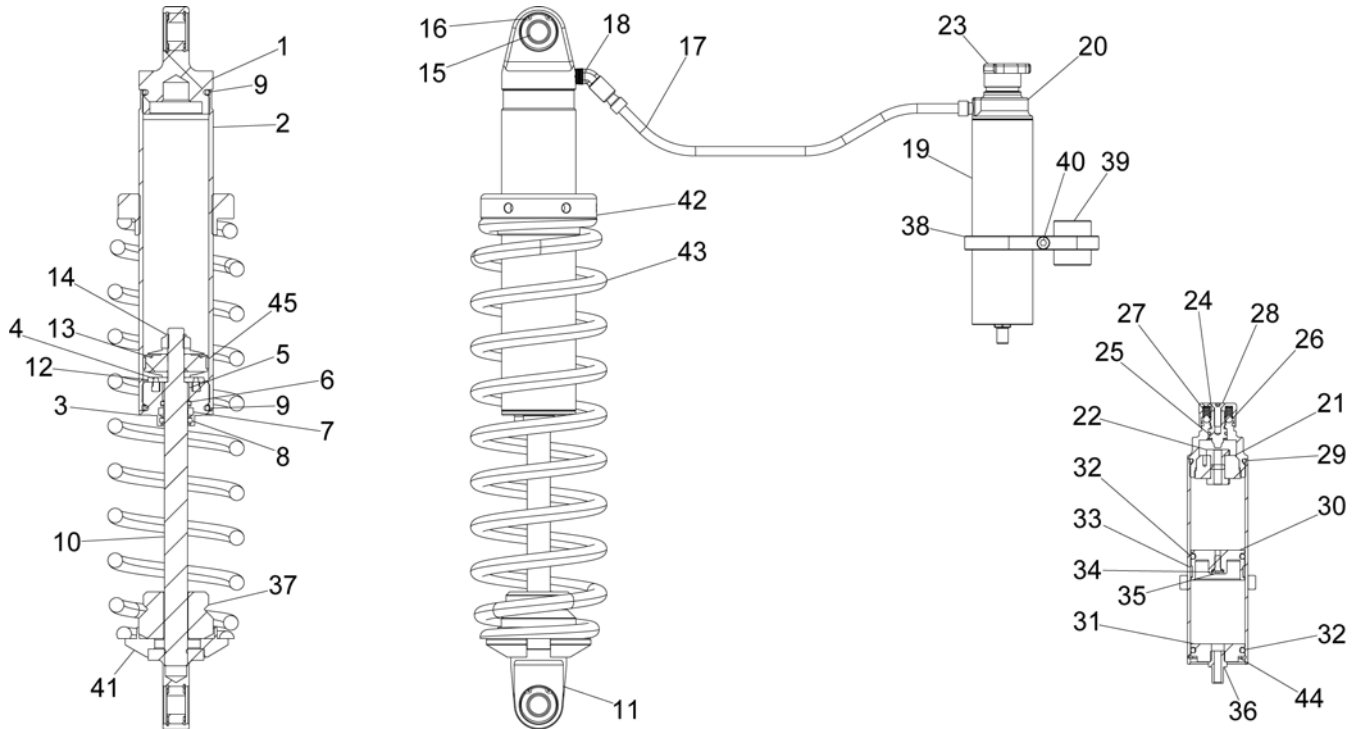
3. Drill a hole in the shock absorber at the center punch using a 3/16" (5 mm) drill bit. Gas or a gas/oil mixture will exhaust when the drill bit penetrates the shock absorber. Use an oil pan and shop towels in order to contain the escaping oil.



4. Make another indentation 1 in. (25 mm) from the bottom of the tube with a center punch.
5. Drill a second hole in the shock absorber at the indentation using a 3/16" (5 mm) drill bit. Oil will exhaust when the drill bit penetrates the shock absorber. Use an oil pan and shop towels in order to contain the escaping oil.
6. Remove shock absorber from the vise. Hold the shock absorber horizontally with the holes down to drain the oil from the tube. Move the shock rod in and out of the tube to completely drain the oil from the shock.
7. Properly dispose the oil and discard the shock.

WALKER EVANS™ SHOCK EXPLODED VIEW

Walker Evans™ Compression Adjust Remote Reservoir Shock (RANGER L.E.)



5

Ref.	Qty	Description	Ref.	Qty	Description
1.	1	Body Loop	24.	1	Stud, Clicker
2.	1	Body, Shock	25.	1	O-Ring
3.	1	Seal, Head	26.	5	Detent Ball
4.	1	Internal Bump Stop	27.	2	Detent Spring
5.	1	Bushing, Shaft	28.	1	Screw, #10-32
6.	1	O-Ring	29.	1	O-Ring
7.	1	Seal	30.	1	Piston, Reservoir
8.	1	Wiper, D-Type	31.	1	End Cap, Reservoir
9.	2	O-Ring	32.	2	O-Ring
10.	1	Shaft	33.	1	Piston Wear Band, Reservoir
11.	1	Loop, Shaft	34.	1	O-Ring
12.	1	Washer	35.	1	Screw
13.	1	Piston	36.	1	Valve, Schrader
14.	1	Nut, Crimp	37.	1	Bump Stop
15.	2	Bearing, Spherical	38.	2	Clamp, Reservoir
16.	4	Snap Ring	39.	1	Spacer, Reservoir
17.	1	Line	40.	1	Screw, #10-32 x 1.0
18.	1	Hose Fitting, 45°	41.	1	Spring Retainer
19.	1	Body, Reservoir	42.	1	Preload Adjustment Ring
20.	1	Housing, Clicker	43.	1	Spring
21.	1	Piston, Clicker	44.	1	Snap Ring, Reservoir
22.	2	Bolt, Clicker	45.	1	Piston Wear Band, Shock
23.	1	Knob, Clicker			

BODY / STEERING / SUSPENSION

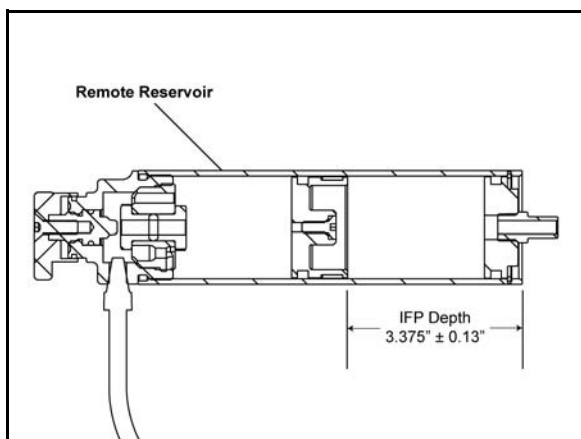
WALKER EVANS™ SHOCK SERVICE

Recommended Service Intervals

Walker Evans™ Racing Shocks will perform the best if serviced at regular intervals:

- Every ride - Wash and dry the vehicle and suspension
- Every 100 hours - Visually inspect shock seals
- Every 500 hours or Annually - Change shock oil and replace seals

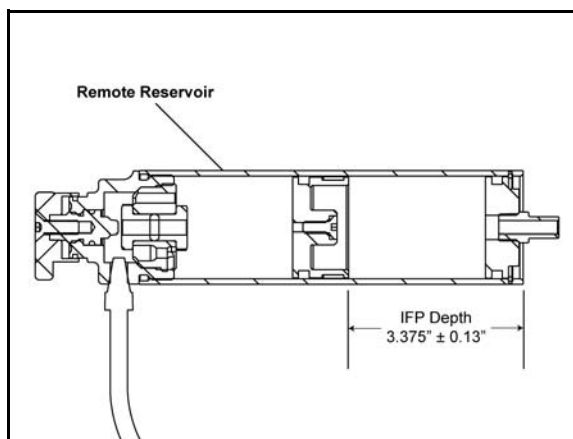
Front Shock Service Information



SHOCK DESIGN DETAILS	
Travel (Stroke)	5.985"
Extended Length	18.035"
IFP Location	3.375" (85.725 mm)
Nitrogen Pressure	200 ± 10 psi
Gas Shock Oil	2874522 (qt.) WE 5 wt.

SHOCK VALVING		
COMPRESSION	REBOUND	CLICKER
1.50 x .008	1.50 x .008	1.10 x .025
1.45 x .008	1.45 x .008	1.10 x .012
1.30 x .008	1.30 x .008	1.00 x .025
1.20 x .008	1.20 x .008	.625 x .065
1.10 x .008	1.10 x .008	
1.00 x .008	1.00 x .008	
.900 x .008	.900 x .008	
.800 x .008	.800 x .008	
.700 x .008	.700 x .008	
.750 x .065	.750 x .065	
1.50 x .100	NOTE: Valve shim stacks listed as they would appear on the shaft when shock rod is locked in a vise (eyelet down, threaded end up).	
Piston Bleed Orifice: .073		

Rear Shock Service Information



SHOCK DESIGN DETAILS	
Travel (Stroke)	5.985"
Extended Length	16.385"
IFP Location	3.375" (85.725 mm)
Nitrogen Pressure	200 ± 10 psi
Gas Shock Oil	2874522 (qt.) WE 5 wt.

SHOCK VALVING		
COMPRESSION	REBOUND	CLICKER
1.55 x .008	1.50 x .012	1.10 x .025
1.50 x .008	1.45 x .012	1.10 x .012
1.45 x .008	1.30 x .010	1.00 x .025
1.30 x .008	1.20 x .010	.625 x .065
1.20 x .008	1.10 x .010	
1.10 x .008	1.00 x .010	
1.00 x .008	.900 x .010	
.900 x .008	.800 x .010	
.800 x .008	1.00 x .090	
.700 x .008	NOTE: Valve shim stacks listed as they would appear on the shaft when shock rod is locked in a vise (eyelet down, threaded end up).	
.750 x .065		
1.50 x .100		
Piston Bleed Orifice: .073		

Walker Evans™ Shock Rebuild Information

When performing maintenance on Walker Evans™ shocks, use the Gas Shock Recharging Kit (PN 2200421), as it contains the necessary valves, pressure gauge, and fittings to deflate and pressurize shocks.

WARNING

Walker Evans™ shocks contain high pressure nitrogen gas. Extreme caution must be used while handling and working with Walker Evans™ shocks and related high pressure service equipment. The pressure must be released from the shock before disassembly. It is strongly recommended you wear safety glasses and ear protection during these procedures.

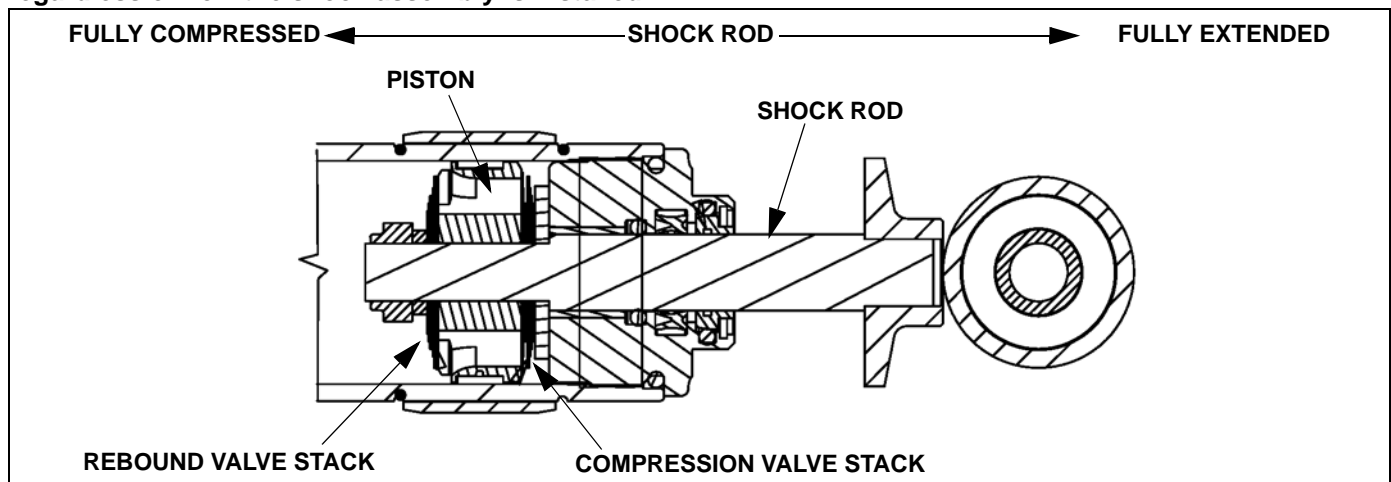
Special Tools

PART NUMBER	DESCRIPTION
2200421	Gas Shock Recharging Kit
2201640	Shock Shaft Seal Protector .625" Diameter
2870803	Shock Spring Pre-Load Adjustment Tool
PS-45908	IFP Tool

Valve Shim Arrangement

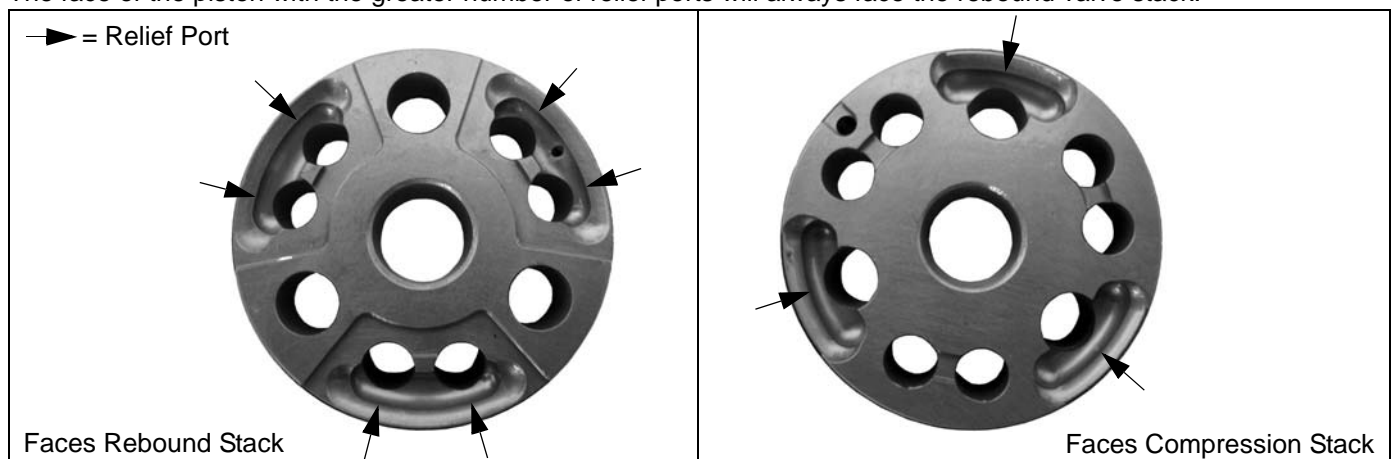
Shown below is an example of how valving stacks are arranged.

NOTE: The rebound and compression valve stacks will always be positioned as shown in the illustration, regardless of how the shock assembly is installed.



Piston Orientation

The face of the piston with the greater number of relief ports will always face the rebound valve stack.



BODY / STEERING / SUSPENSION

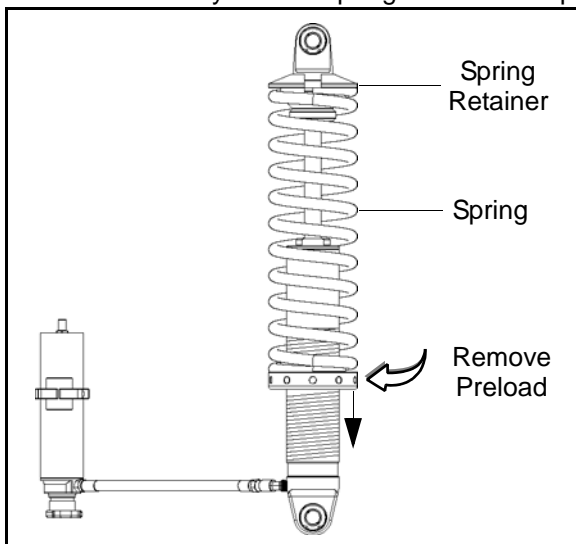
Walker Evans™ Shock Disassembly

IMPORTANT: To prevent damage or marks to the shock, the use of soft jaws on a vise is recommended.

WARNING

Walker Evans™ shocks contain high pressure nitrogen gas. Extreme caution must be used while handling and working with Walker Evans™ shocks and related high pressure service equipment. The pressure must be released from the shock before disassembly. It is strongly recommended you wear safety glasses and ear protection during these procedures.

1. Clean and carefully remove shock from the vehicle.
2. Secure shock in a vise using soft jaws to prevent cosmetic damage. Back preload adjuster all the way down and carefully remove spring retainer and spring.



3. Remove the valve cap from the end of the reservoir.
4. Carefully depressurize the shock.



5. Using a snap ring pliers, remove the retaining ring from the reservoir.



6. Carefully remove the cap from the reservoir body.



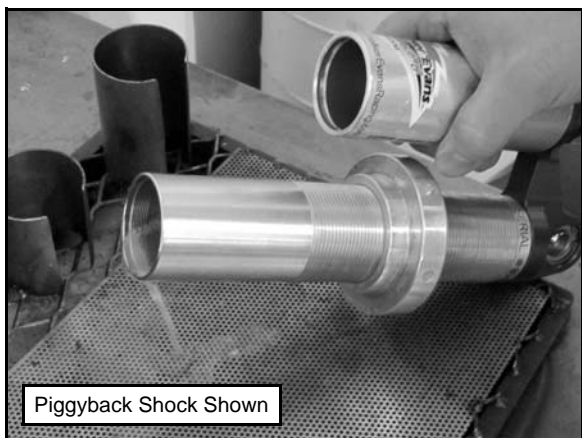
7. Using a 1" open-end wrench, loosen and remove the bearing cap from the shock body.



8. Slowly lift up and remove the shock rod assembly from the shock body.

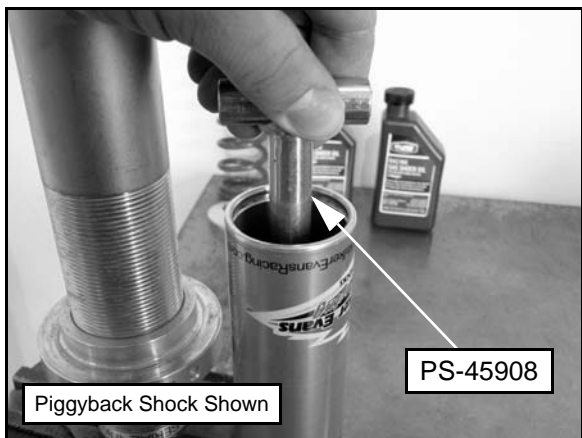


9. Remove the used oil from the shock body.



NOTE: Insert the IFP Tool (PS-45908) and cycle the Internal Floating Piston (IFP) a few times to purge the shock oil from the line and reservoir.

10. Remove the floating piston from the shock reservoir using the IFP Tool (PS-45908).



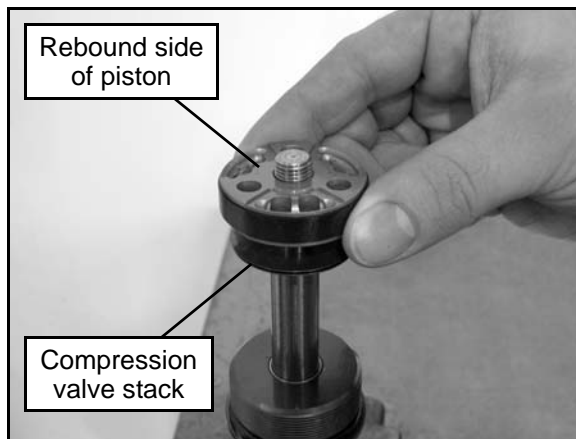
11. Clean and inspect ALL parts and replace as needed.

IMPORTANT: Seal kits are available and should be installed at this time if seals or O-rings are damaged or worn.

12. Place the shock rod in a vise so the threaded part is facing up. Using an 11/16" socket, remove the nut retaining the valve stack and piston.



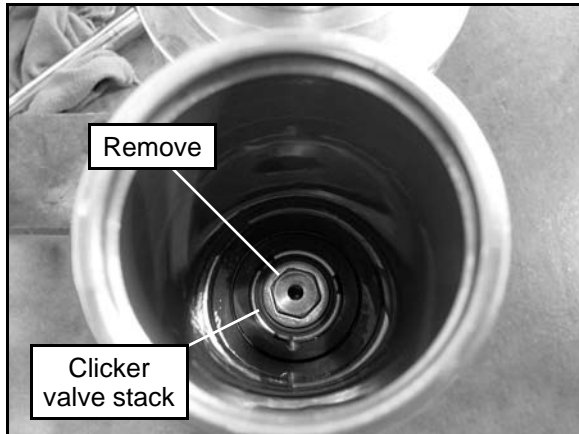
IMPORTANT: Keep the rebound and compression valve stacks in the order they were removed. If unsure of order, refer to "Shock Valving" under the "Shock Service Information" provided earlier in this section.



13. Place the valve stack on a clean shop towel in order of removal.
14. Inspect the valves for kinks, waves, pits or foreign material.
15. Inspect the piston wear band and replace if damaged or worn.

BODY / STEERING / SUSPENSION

- Using a 9/16" socket w/extension, remove the fastener retaining the clicker valve stack. Place the valve stack on a clean shop towel in order of removal.

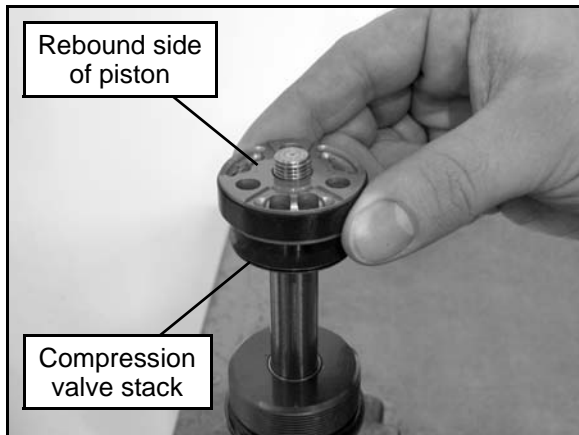


IMPORTANT: Keep the valve stack in the order it was removed. If unsure of order, refer to "Shock Valving" under the "Shock Service Information" provided earlier in this section.

- Inspect the valves for kinks, waves, pits or foreign material
- Thoroughly clean all shock components and shock body prior to assembly.

Walker Evans™ Shock Assembly

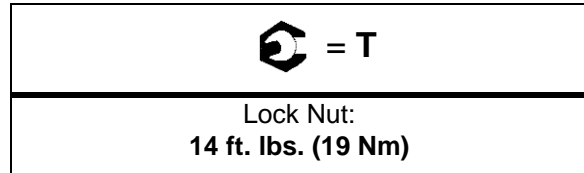
- Secure the shock rod in a vise with the threads of the rod facing up.
- Place the compression valve stack on the rod in the reverse order of disassembly.
- Place the valve piston on top of the compression stack.



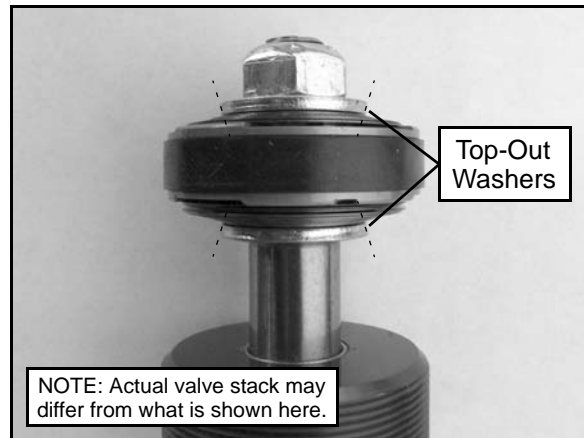
IMPORTANT: If unsure of the valve stack order, refer to "Shock Valving" under the "Shock Service Information" provided earlier in this section.

- Place a new lock nut onto the shock rod. Torque the new lock nut to specification.

IMPORTANT: Do not over torque the nut or damage to the valve stack can occur.



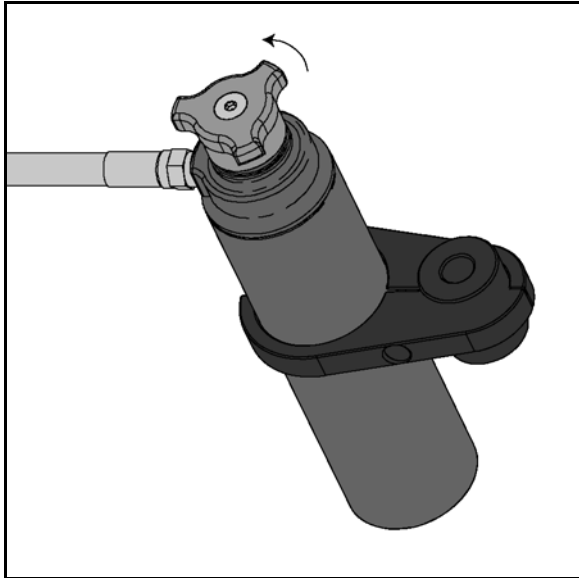
NOTE: Make sure "Top-Out" washers are orientated as shown.



- Assemble the clicker valve stack on top of the fastener and install the assembly into the reservoir body. Tighten the valve stack fastener securely.



- Turn the compression adjuster knob counter-clockwise (soft) until it stops, so damping is in the full open position.



- Secure the shock body in a vise by its lower mount.
- Fill the shock body and remote reservoir 1/2 full of the recommended gas shock oil.



Recommended Shock Oil:
 Racing Gas Shock Oil (PN 2874522) (Quart)
 5 Weight for Walker Evans Shocks

- Using a 3/32" Allen wrench, remove the IFP bleed screw.

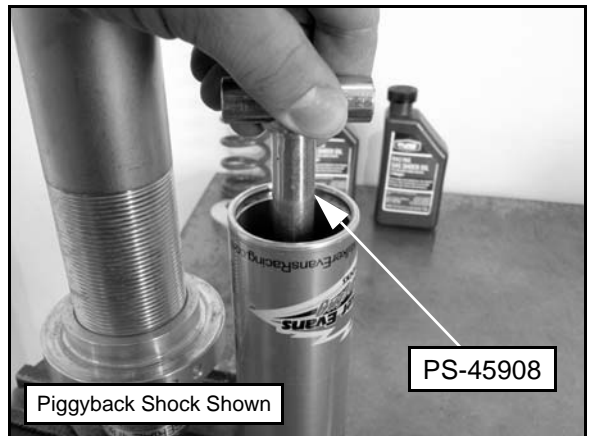


- Apply a thin film of oil to the IFP O-ring and wear band. Insert the IFP into the reservoir until it is completely submerged. Allow air to escape as you install the piston.

5

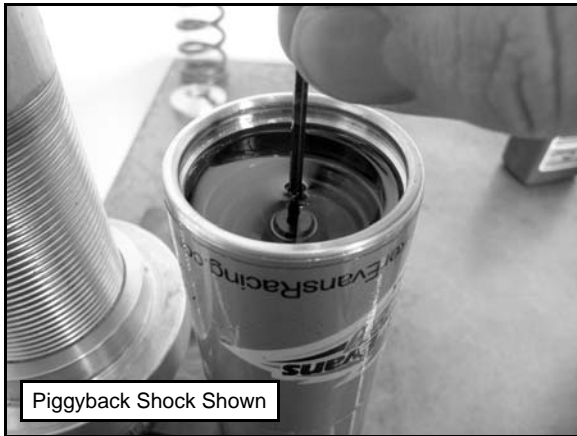


- Screw the IFP Tool (PS-45908) onto the floating piston.



BODY / STEERING / SUSPENSION

12. Slowly cycle the IFP up and down.
 - Be sure to bottom out the piston in the reservoir body.
 - Allow time for the bubbles to dissipate.
 - Repeat the process until all the air has been removed.
13. Pull the IFP up until its top is approximately 1" (2.54 cm) from the top of the reservoir and remove the IFP Tool. Using a 3/32" Allen wrench, install the IFP bleed screw.



IMPORTANT: When the IFP Tool is removed, the IFP must remain submerged in shock oil to prevent air from getting under the floating piston.

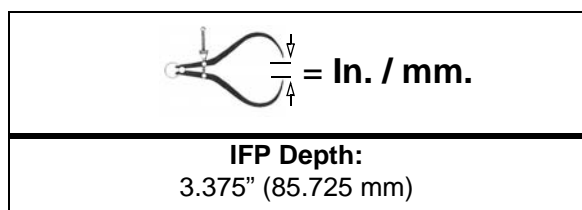
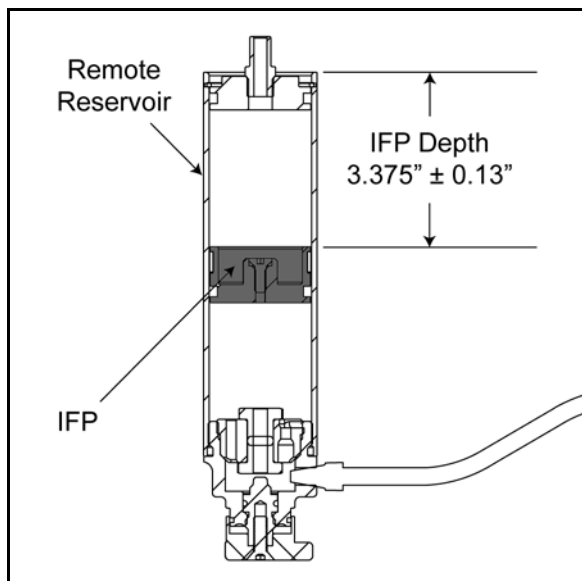
14. Fill the shock body with oil approximately 1/4" below the threads.
15. Apply a thin film of oil to the wear band on the damping piston. Slowly insert the shock rod assembly into the body until the damping piston assembly is approximately 1" below the oil surface.
 - Move the rod up and down slowly over a range of about 1" until no air bubbles rise from the damping piston. Be careful to keep the damping piston at least 1/4" below the surface of the oil during this process.
 - While holding the shock rod, apply 2 - 3 sharp blows to the rod eyelet with a rubber mallet driving the piston down into the shock body. This opens the valves on the damping piston. You will see the released air bubbles come to the surface of the oil.
16. Add oil to the body tube until the surface of the oil is at the top of the shock body threads.



NOTE: During installation, some shock oil will overflow. Wrap a shop cloth around the shock body to catch any oil overflow.

17. Pull the damping piston up until it is just below the surface of the oil.
18. Hold the rod eyelet with one hand. With other hand, slide the bearing cap down the shaft until contact with the body is made. Oil will overflow from around the bearing cap.
19. Screw the bearing cap assembly into the shock body by hand, holding the rod up so that the bearing cap is in contact with the bottom of the damping piston assembly. Be careful not to cross-thread the bearing assembly.
20. Using a 1" open-end wrench, tighten the bearing cap.
21. Using a 3/32" Allen wrench, remove the IFP bleed screw.

22. Set the IFP depth to the specified length from the top of the reservoir.

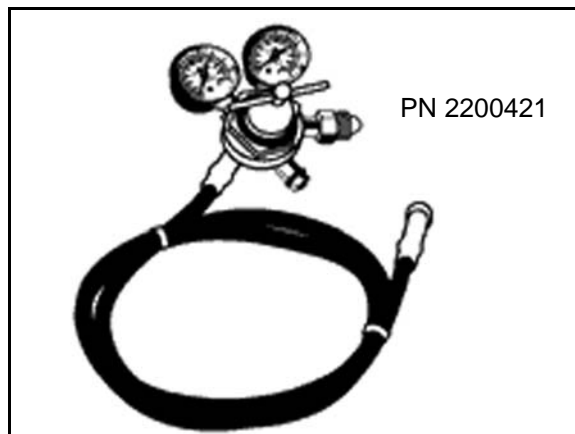


23. Using a long 3/32" Allen wrench, install the IFP bleed screw.

NOTE: Apply grease to the end of the Allen wrench so the bleed screw sticks to it during installation.

24. Pour the residual shock oil out of the reservoir into a proper disposal container.
25. Install the reservoir cap. Push down on the reservoir cap using even pressure until the retaining ring groove is exposed.
26. Install the retaining ring and check to make sure retaining ring is seated properly.
27. Push the shock rod assembly completely into the shock body. It should go all the way down smoothly without interference. If it does not, disassemble and reassemble per this procedure.
28. Secure the shock body in a vise by its lower mount.

29. Pressurize the shock reservoir through the Schrader® valve using the Gas Shock Recharging Kit (PN 2200421).



30. Continue filling until the shaft has fully extended and the reservoir pressure is at 200 psi.



Nitrogen Pressure: 200 psi (1379 kPa)

⚠ WARNING

CHARGE THE SHOCK USING NITROGEN GAS ONLY. DO NOT FILL WITH ANY OTHER GASES. Doing so compromises the performance of the shock and may be EXTREMELY DANGEROUS!

31. Reinstall the Schrader® valve cap.
32. Clean all oil residue from the shock and reservoir with solvent, and dry with low pressure compressed air in a well ventilated area.
33. Check shock for any leaks.

BODY / STEERING / SUSPENSION

34. Reinstall the compression spring and the spring retainer.
35. Thread the spring preload adjuster down against the spring and set the preload to the specified measurement (see Chapter 2).
36. Set the compression adjuster knob to the recommended setting or the original setting upon removal (see Chapter 2).
37. Remove the shock from the vise.
38. Reinstall spherical bearing O-rings and polyurethane bushings.

NOTE: After installation, be sure to RIDE SLOWLY initially to ensure the shock and the vehicle's suspension is performing correctly.