

# AI 7-416-2003K001

## ASSEMBLY INSTRUCTIONS



October, 2020

### ATTENTION:

Service Managers / Parts Managers.

### SUBJECT:

Replacement of the aluminum crossmember and the installation of the underslung crossmember on certain Autocar ACX chassis configurations.

### CONTINUOUS PRODUCT IMPROVEMENT:

Autocar, LLC is engaged in continuous efforts to evaluate and improve how trucks are performing in the field. While being committed to continuous product improvement, Autocar is not liable for updating existing chassis after they have been accepted into service.

If you have any questions regarding this Assembly Instruction Bulletin, please contact Autocar Technical Support at 888-218-3611.

### TO OBTAIN PARTS:

DO NOT submit a Solutions ticket. Ensure that you have authorization from the customer to perform this work and send an e-mail to: [warranty@autocartruck.com](mailto:warranty@autocartruck.com).

### Include:

1. VIN(s) (or) (last 6 digits of the VIN(s))
2. Attention To Name
3. Ship To Address

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## **REQUIRED PARTS:**

- (1) S4162003K001 Service kit
  - (1) 30103-3605 Support bearing bracket
  - (2) A3010042-001 Center bearing offset spacer
  - (1) A4090050-001 Aluminum crossmember
  - (2) A4090101-001 Crossmember tie plate
  - (2) A4090101-002 Crossmember tie plate
  - (1) A7471051-001 ABS bracket
  - (3) GZ010002-001 Tape (per foot)
  - (1) S2840020-001 TCU bracket
  - (1) S3730002-002 Right shock/crossmember bracket
  - (1) S3730004-001 Left shock/crossmember bracket
  - (2) S4030064-001 Spring hanger frame plate
  - (1) S4160002-001 Underslung crossmember
  - (1) S4160006-001 Spacer plate
  - (1) S4161003K002 Hardware kit
    - (48) 3082750 Spacer washer
    - (2) FE286243BW01 7/16" Locknut
    - (6) FE286250BW01 1/2" Locknut
    - (24) FE286250DW01 1/2" Locknut
    - (30) FE286262BW01 5/8" Locknut
    - (2) FE286275DW01 3/4" Locknut
    - (2) FE410143AW16 7/16" X 1-1/2" Bolt
    - (6) FE410150AW16 1/2"-13 X 1-1/2" Bolt
    - (8) FE410150CW20 1/2"- 20 X 2" Bolt
    - (16) FE410150CW22 1/2"- 20 X 2-1/4" Bolt
    - (3) FE410162AW20 5/8"- 11 X 2" Bolt
    - (12) FE410162AW22 5/8"- 11 X 2-1/4" Bolt
    - (13) FE410162AW24 5/8"- 11 X 2-1/2" Bolt
    - (1) FE410162AW26 5/8"- 11 X 2-3/4" Bolt
    - (1) FE410162AW29 5/8"- 11 X 3-1/4" Bolt
    - (2) FE410162AW32 5/8"-11 X 4" Bolt
    - (2) FE410175CW44 3/4"- 16 X 7" Bolt
    - (4) GE410150AO20 1/2"- 13 X 2" Bolt
    - (3) GE410419CB07 #10 X 1/2" Bolt
    - (3) GE811619NS01 #10 Flat washer
    - (4) GE811662WY01 5/8" Wide washer
    - (3) GZ030007-006 #10-32 X 1-1/2" Phillips screw

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## SAFETY NOTICES:



### WARNING

Allow the vehicle's engine and cooling system to cool to ambient temperature before performing the repair procedure. A hot engine or cooling assembly may cause burns or other personal injury.



### WARNING

Never rely on the hydraulic pressure to hold the cab in an open position. Always use the safety pin in the cab tilt lock tube to prevent serious personal injury or death.



### WARNING

To prevent eye injury, always wear eye protection when performing vehicle maintenance, service or inspection.



### WARNING

Before working on a vehicle, set the parking brake, place the transmission in neutral and block the wheels. Failure to do so can result in unexpected vehicle movement and can cause serious personal injury or death.

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## Working on CNG/LNG Trucks

### SAFETY INSTRUCTIONS

If you store or dispense Compressed Natural Gas (CNG) or Liquefied Natural Gas (LNG), or if you work on CNG or LNG trucks, your location must be fully compliant with applicable codes, regulations and standards, including National Fire Protection Association (NFPA) codes, Society of Automotive Engineers (SAE) standards, American National Standards Institute (ANSI) Natural Gas Vehicle (NGV) standards, the United States Code of Federal Regulations (CFR) and your state and local fire and other applicable codes (including, for example, the California Code of Regulations and the Texas Administrative Code).

Contact your local fire department for guidance and additional compliance information.

Technicians working on Autocar trucks with CNG or LNG engines must be trained in the proper repair of CNG and LNG trucks and engines and the safe storage and dispensing of CNG and LNG.

## Working on CNG Fuel Systems



### WARNING

CNG fuel systems include a high pressure (3600 psi) system for fuel storage and a low pressure system (125 psi) for consumption by the engine. Understanding the characteristics of CNG and how the fuel system works will prevent injury and damage to persons and property.

Attempting to operate or maintain any CNG fuel system without proper training is dangerous. Complete training and consult instructional bulletins from the CNG system suppliers, such as Agility Fuel Systems' Field Service Bulletin, *Safely Working on CNG Fuel Systems*.

## Welding and Hot Work Near CNG and LNG Trucks



### WARNING

Welding, grinding, and other "hot work" can be safely performed on or near a CNG or LNG vehicle, but certain precautions must be followed. Understand and perform the necessary precautions provided by the CNG system suppliers, such as Agility Fuel Systems' Field Service Bulletin, *Welding and Hot Work Precautions Near CNG and LNG Vehicles*.

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### CNG Cylinders



#### WARNING

CNG fuel containers must meet Federal Motor Vehicle Safety Standard (FMVSS) 304 (Compressed Natural Gas Fuel Container Integrity) and/or ANSI/CSA NGV2 (Basic Requirements for Compressed Natural Gas Vehicle Fuel Containers). Both standards specify a detailed visual examination every three years.

Truck owners are required to complete all necessary inspections, in accordance with the applicable standards and other resources, such as the Clean Vehicle Education Foundation and NGV America's Compressed Natural Gas (CNG) Container Visual Inspection Advisory.

FMVSS 304 also requires that cylinders not be used after the end of life (EOL) date provided on the tank label. The EOL date is also displayed in the engine compartment and at the fueling connection of each truck. If there are any question as to proper decommissioning of a cylinder, contact the manufacturer, whose name and address is also required to be on the label.

### CNG Fuel Container Pressure Relief Devices (PRDs)



#### WARNING

PRDs must be properly maintained and positioned for safe operation of a CNG fuel system. Missing vent caps can allow moisture into PRDs and vent lines, which can freeze and damage these safety components. Debris which clogs the PRDs and/or vent lines can prevent proper function.

PRDs must be positioned to vent upward, not outward, from a vehicle.

Ensure that every truck owner completes periodic inspections of the PRDs and vent lines and systems, in accordance with guidance provided by the system component suppliers.

### Alert First Responders to CNG and LNG



#### DANGER

In the event of a fire or other emergency, alert first responders to the presence and location of CNG fuel systems, tanks and dispensers. Ensure that emergency personnel are aware of proper precautions, such as those provided in Agility's *First Responder Guide: CNG and LNG Vehicle Fuel Systems*.

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## LOCKOUT/TAGOUT PROCEDURES:



## CAUTION

Before entering the vehicle or vehicle body, read and follow OSHA regulations concerning entry and working in “CONFINED SPACE” OSHA 1910.146 and “LOCKOUT/TAGOUT” OSHA 1910.147. Follow OSHA regulations while performing any work on the vehicle. The vehicle must be disabled by the following steps before performing any work on the vehicle:

1. Place the transmission in NEUTRAL.
2. Set the parking brake.
3. Shut the engine OFF.
4. Lock cab doors, keep the key in your pocket. Block the wheels before entering the body or performing any work on the vehicle.
5. Turn the battery disconnect switch OFF, if equipped.
6. Completely drain the air from the primary/A system and secondary/B system by opening the drain valves on the air tanks themselves or by using the drain manifold if supplied. When draining the air tanks, do not look into the area where air is draining. Dirt or sludge particles may be expelled in the air stream and can cause eye injury.
7. Place magnetic “DANGER” signs on both cab doors before entering the body or performing any work on the vehicle.
8. Take proper precautions before working under the vehicle. Use ramps approved for the weight of your vehicle, or use floor jacks and stands. Never work under a vehicle supported by jacks alone. Always use jack stands to support the vehicle.

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## S4162003K001 UNDERSLUNG CROSSMEMBER INSTALLATION INSTRUCTIONS:

**Note:** The Assembly Instructions are laid out in three separate sections as follows:

Section A provides instructions for the installation of an underslung crossmember.

Section B provides instructions for the installation of the spring hanger frame plates.

Section C provides instructions for the replacement of the frame crossmember.

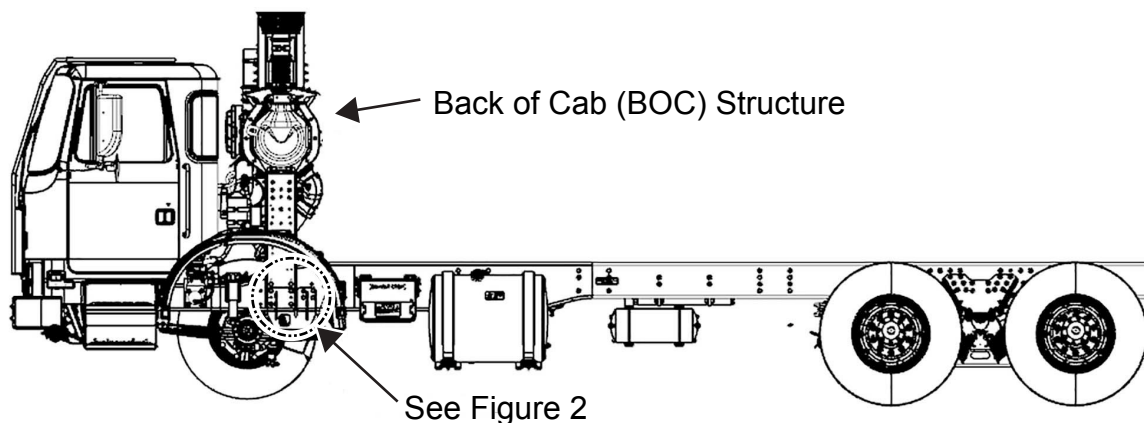
### Section A: Installation of the underslung crossmember.

1. Complete the Lockout/Tagout procedure.
2. Disconnect all battery terminals beginning with the negative connections, then the positive connections.
3. Using an overhead crane or similar lifting apparatus, support the Back of Cab (BOC) Structure, to facilitate fastener removal.



## WARNING

Safely support the BOC Structure before loosening or removing any of the mounting bolts. Do not rely on the lifting apparatus alone to secure the load.



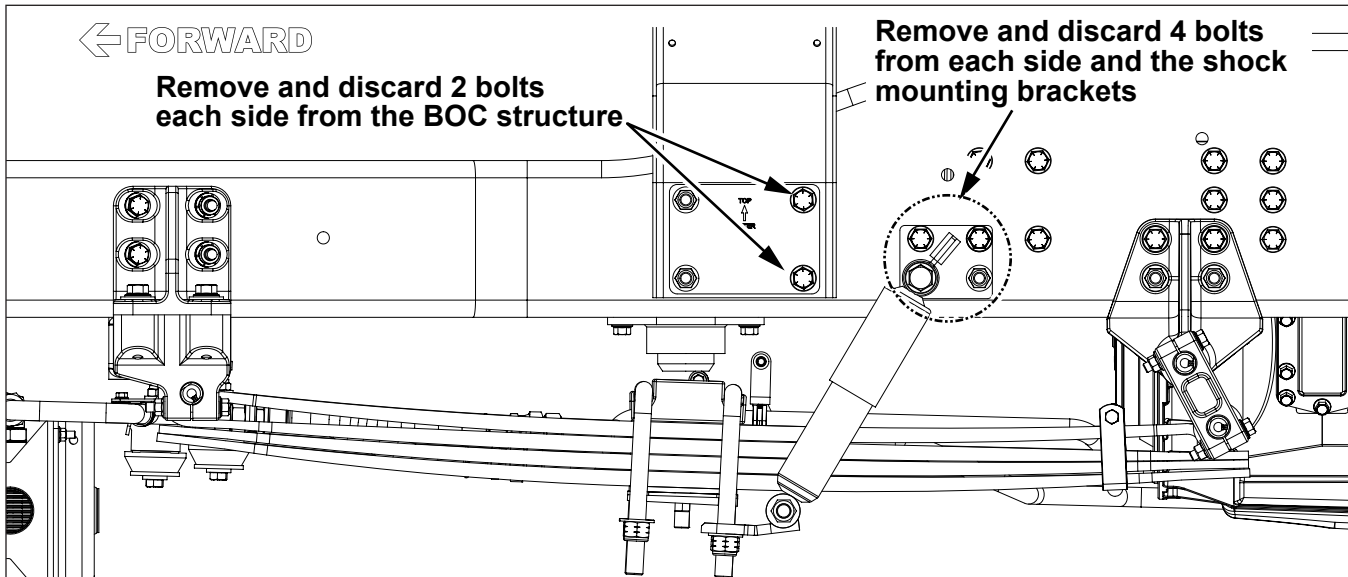
**Figure 1, Crossmember Location**

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4. Remove and discard 6 bolts from each side of the frame (total of 12), the shock mounting brackets and the square hollow spacer (SHS) as indicated (see Figures 2, 3 and 4).



**Figure 2, Outboard Frame View**

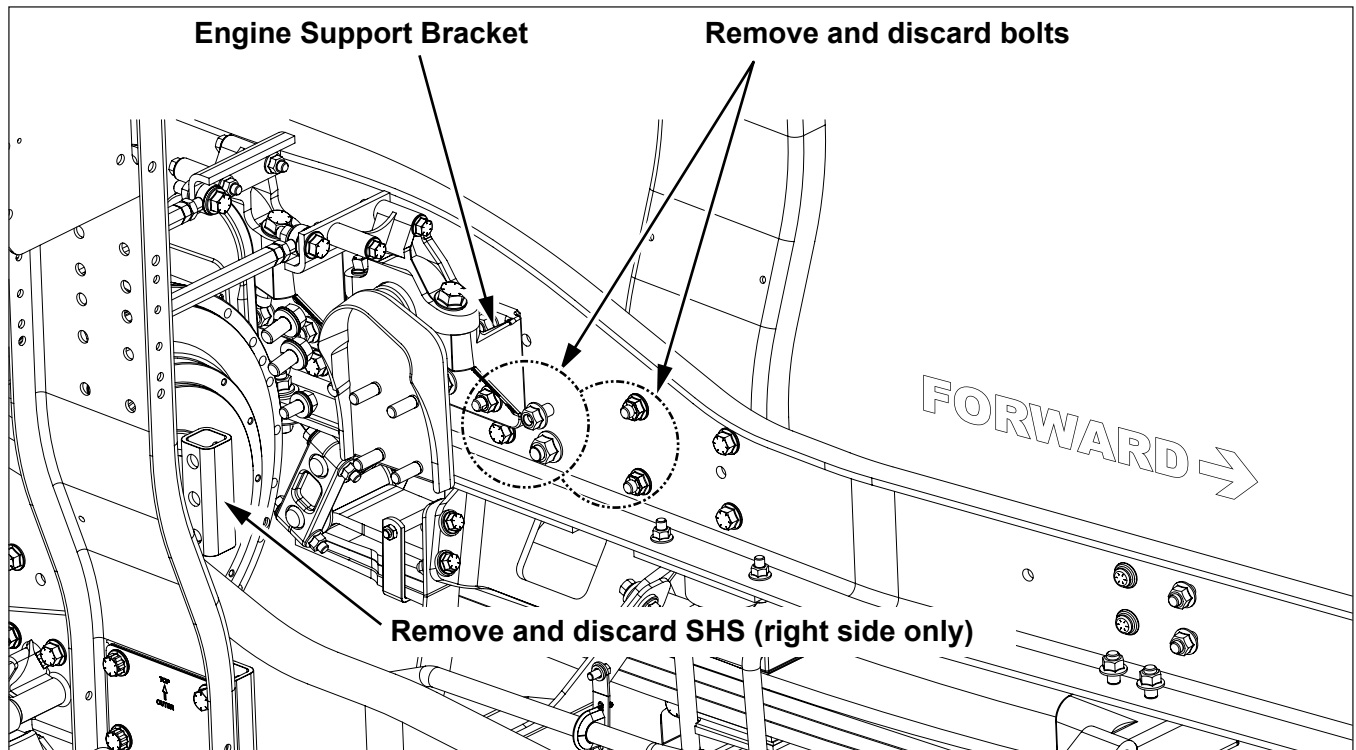


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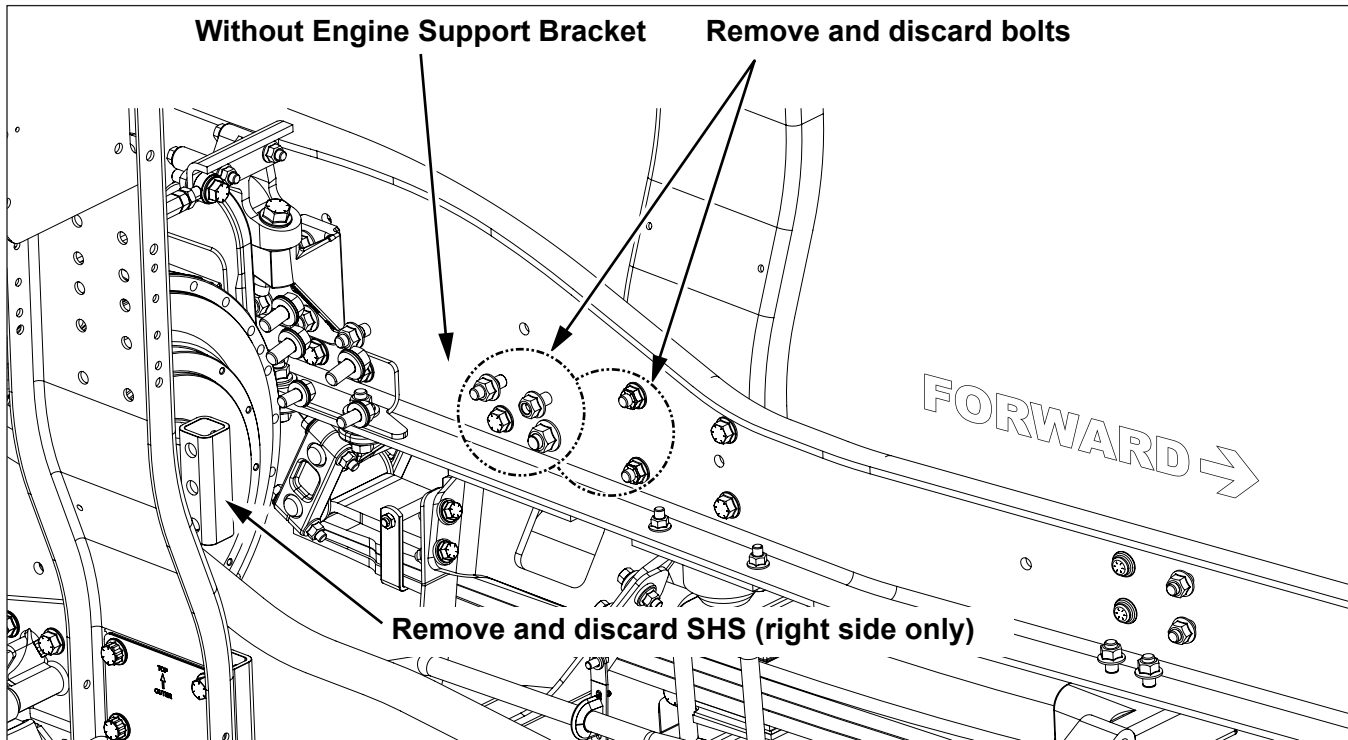


**Figure 3, With Engine Support Bracket - Inside View - Engine Hidden for Clarity**

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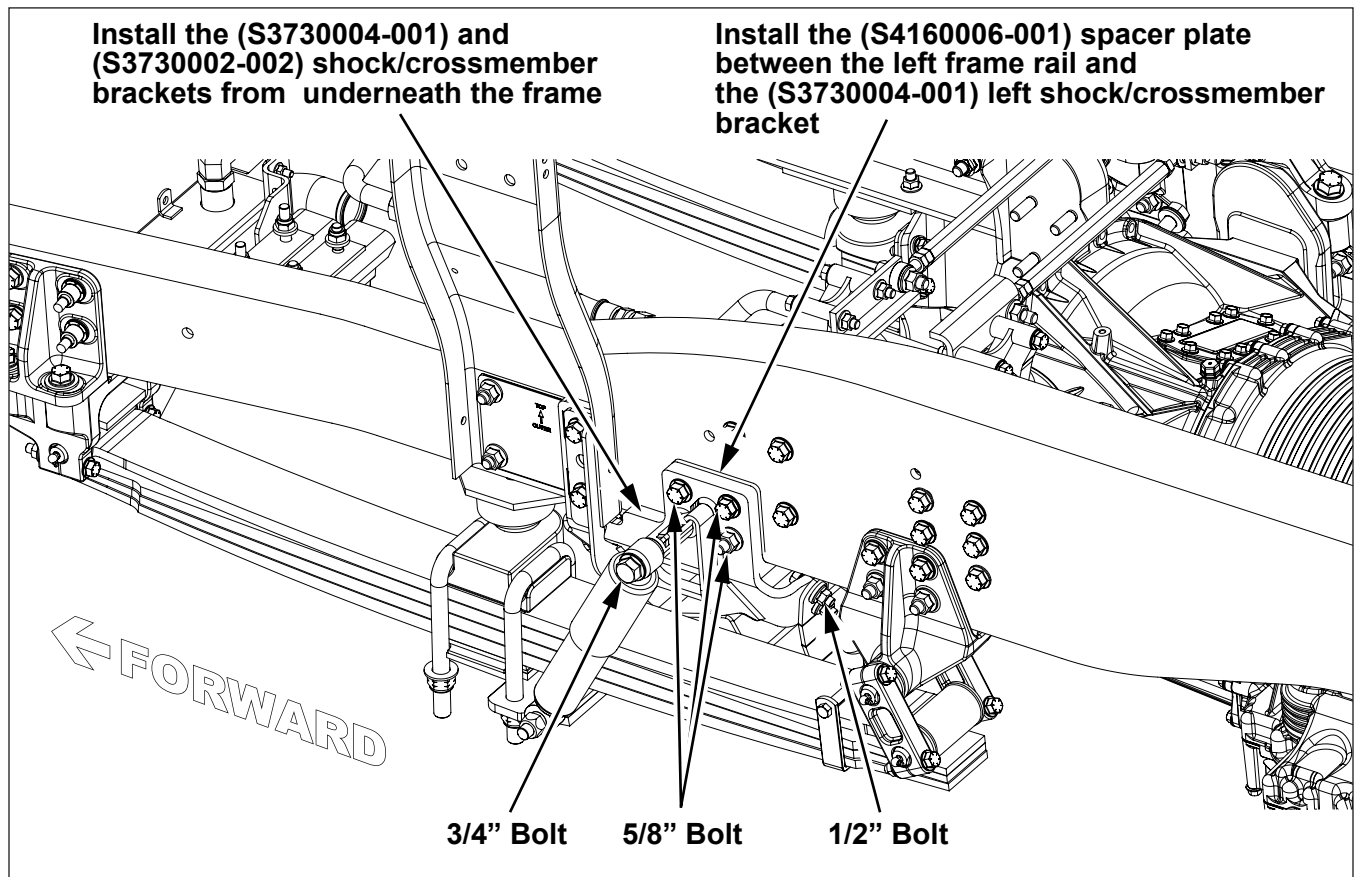
**Figure 4, Without Engine Support Bracket - Inside View - Engine Hidden for Clarity**

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5. Install the (S3730004-001) Left shock/crossmember bracket with the (S4160006-001) spacer plate and the (S3730002-002) right shock/crossmember bracket. Install the (S4160002-001) underslung crossmember from underneath the frame using the hardware designated in the following figures. Install all fasteners loosely to position the crossmember and then tighten the 3/4" bolts to 300 lb. ft. of torque, the 5/8" bolts to 200 lb. ft. of torque and the 1/2" bolts to 90 lb. ft. of torque (see Figures 5, 6, 7, 8 and 9).

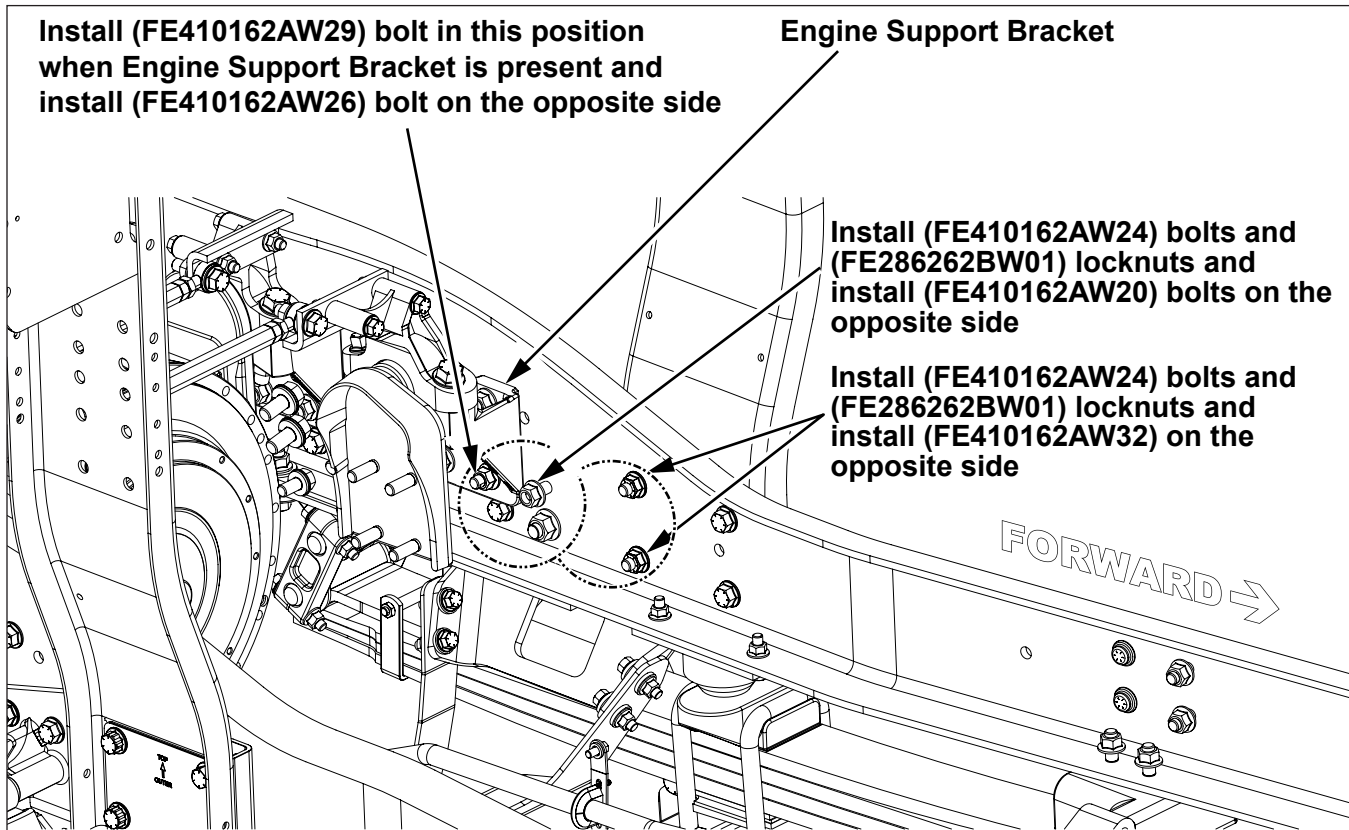


**Figure 5, Outboard Frame View**

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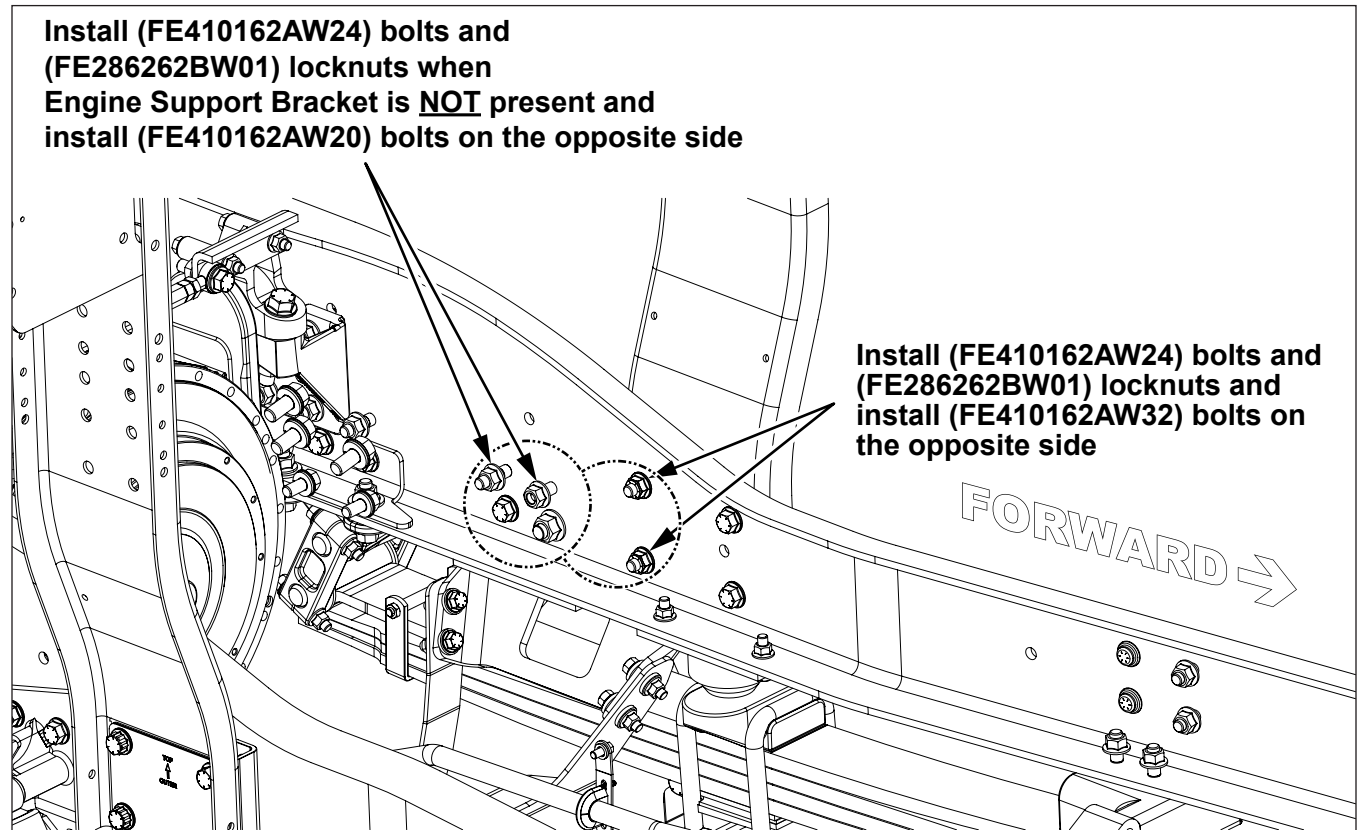
**Figure 6, With Engine Support Bracket - Inside View - Engine Hidden for Clarity**

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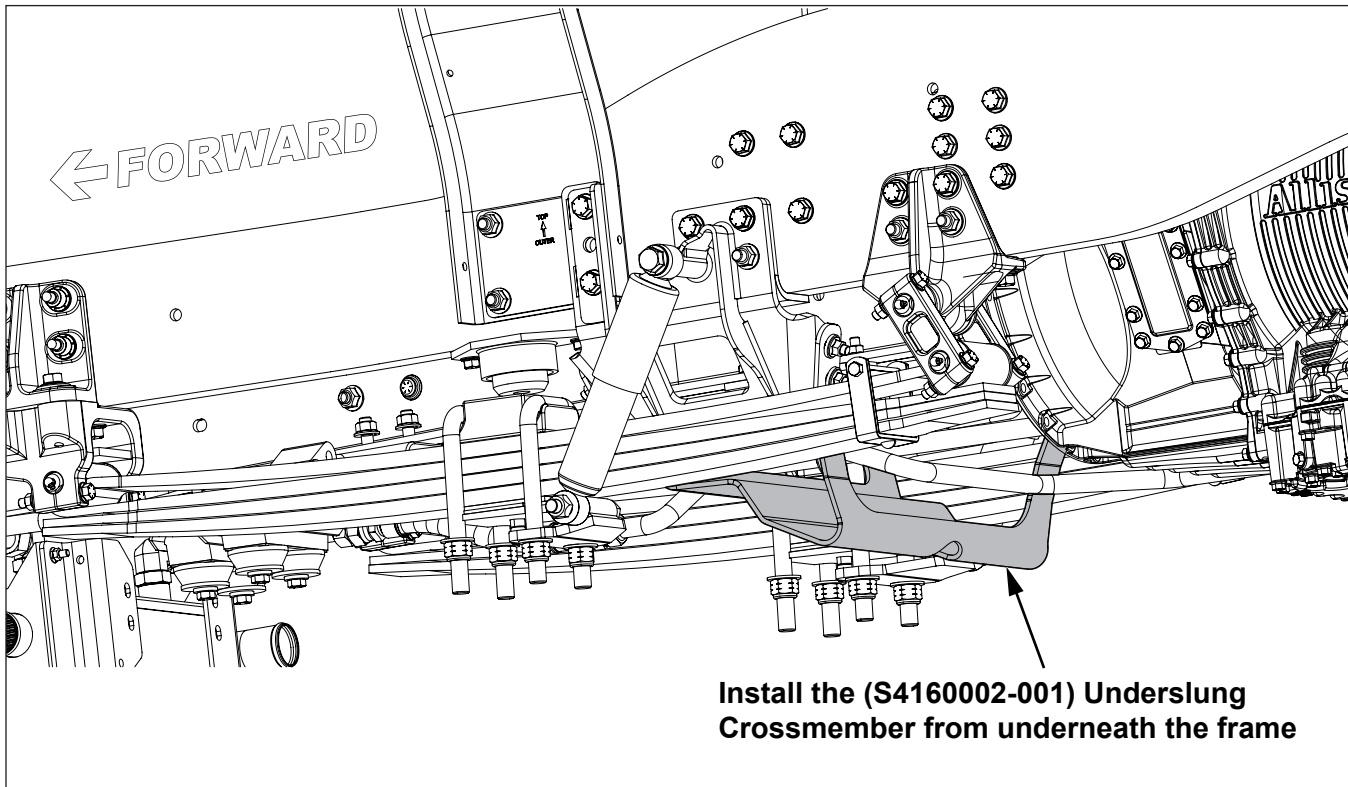


**Figure 7, Without Engine Support Bracket - Inside View - Engine Hidden for Clarity**

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**Figure 8, Underslung Crossmember Positioning**

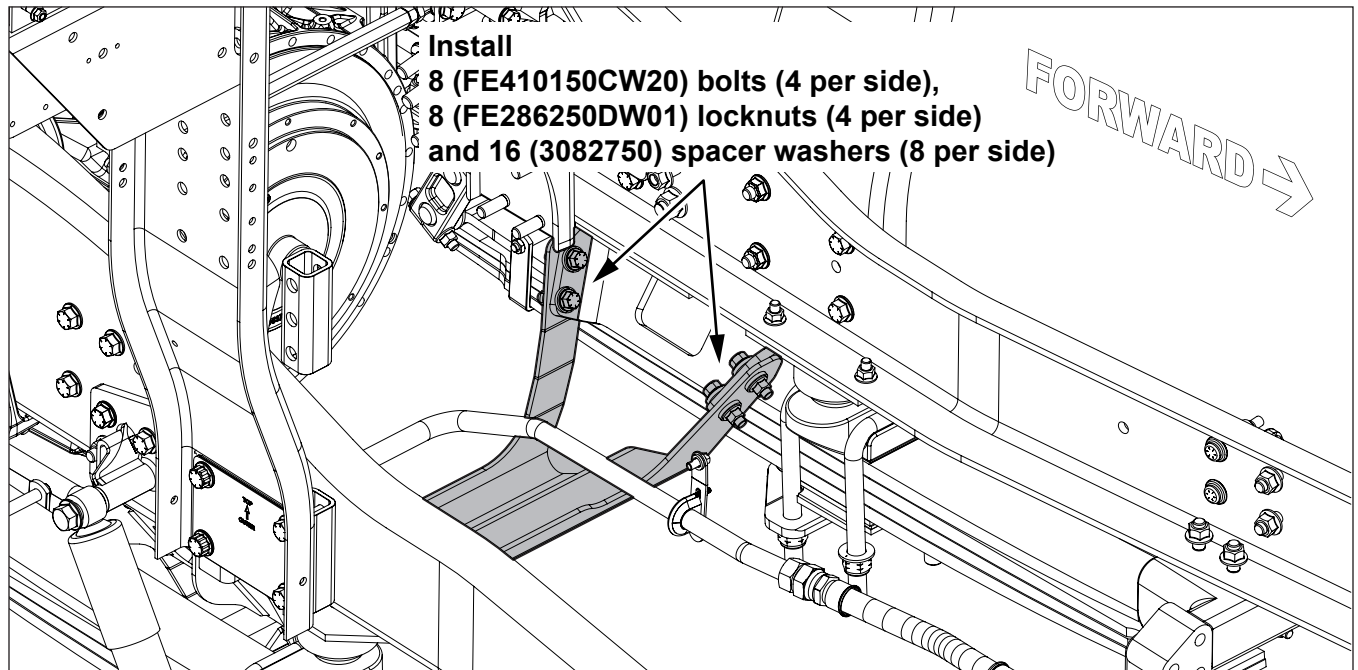


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**Figure 9, Underslung Crossmember Hardware Orientation**

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## Section B: Installation of spring hanger frame plates

6. Remove 4 spring hanger bolts from frame rail bottom flange and discard. Remove 4 bottom bolts from frame rail web section and discard (both sides) (see Figure 10).

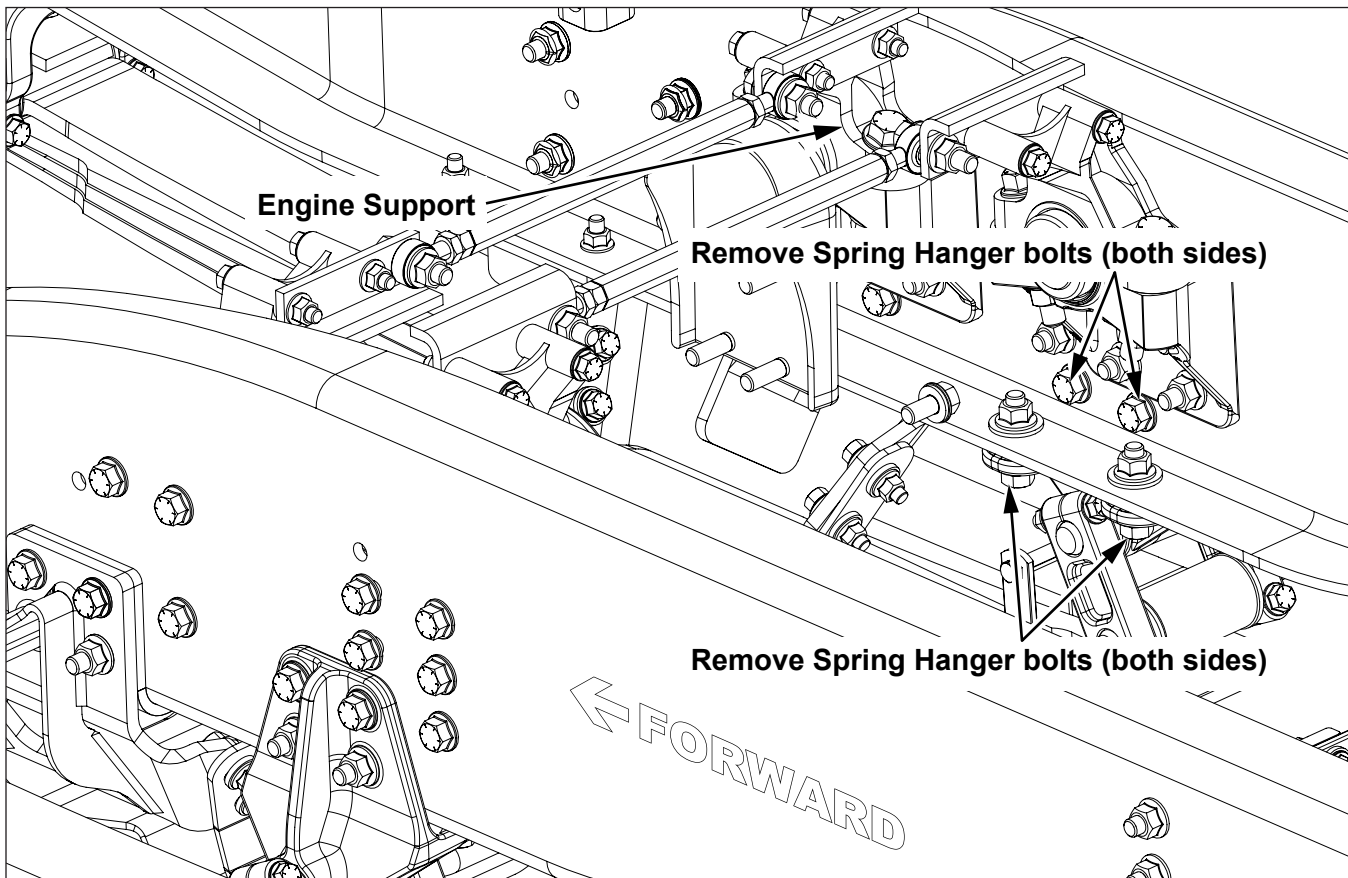


Figure 10

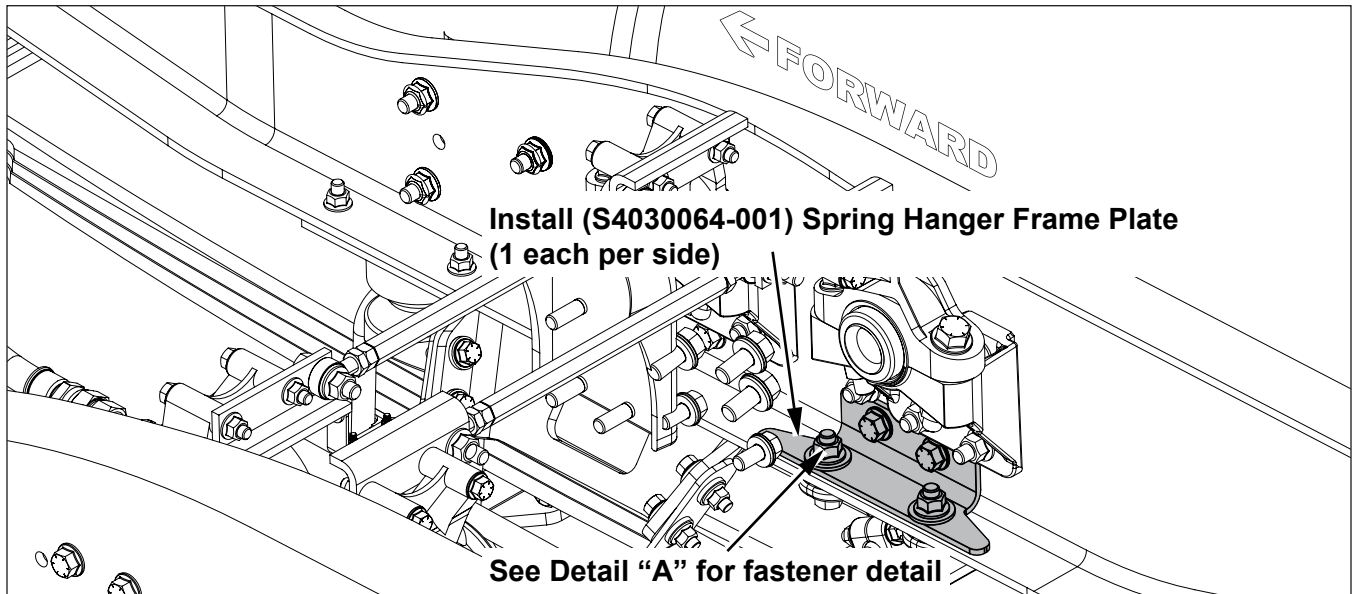


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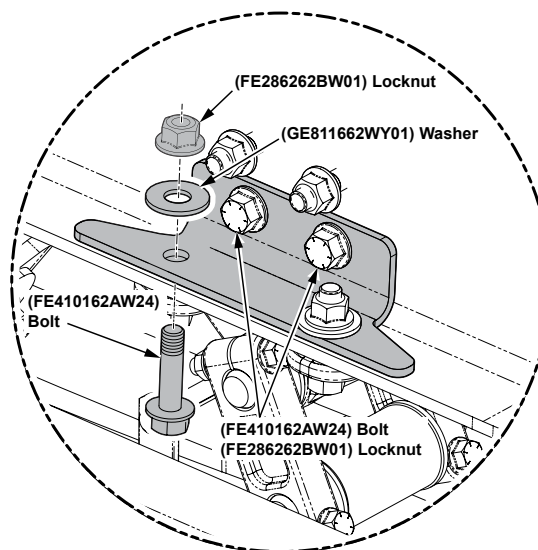


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7. Install 2 (S4030064-001) Spring hanger frame plates using 8 (FE410162AW24) bolts, 8 (FE286262BW01) locknuts, and 4 (GE811662WY01) wide washers and tighten to 200 lb. ft. of torque (see Figure 11).



**Figure 11**



**Detail "A"**

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## Section C: Instructions for the replacement of the frame crossmember

8. Support the driveshaft (not pictured) with a suitable jack stand, remove and discard the 2 bolts and 2 nuts securing the center bearing to the support bracket. Lower the driveshaft (see Figure 12).

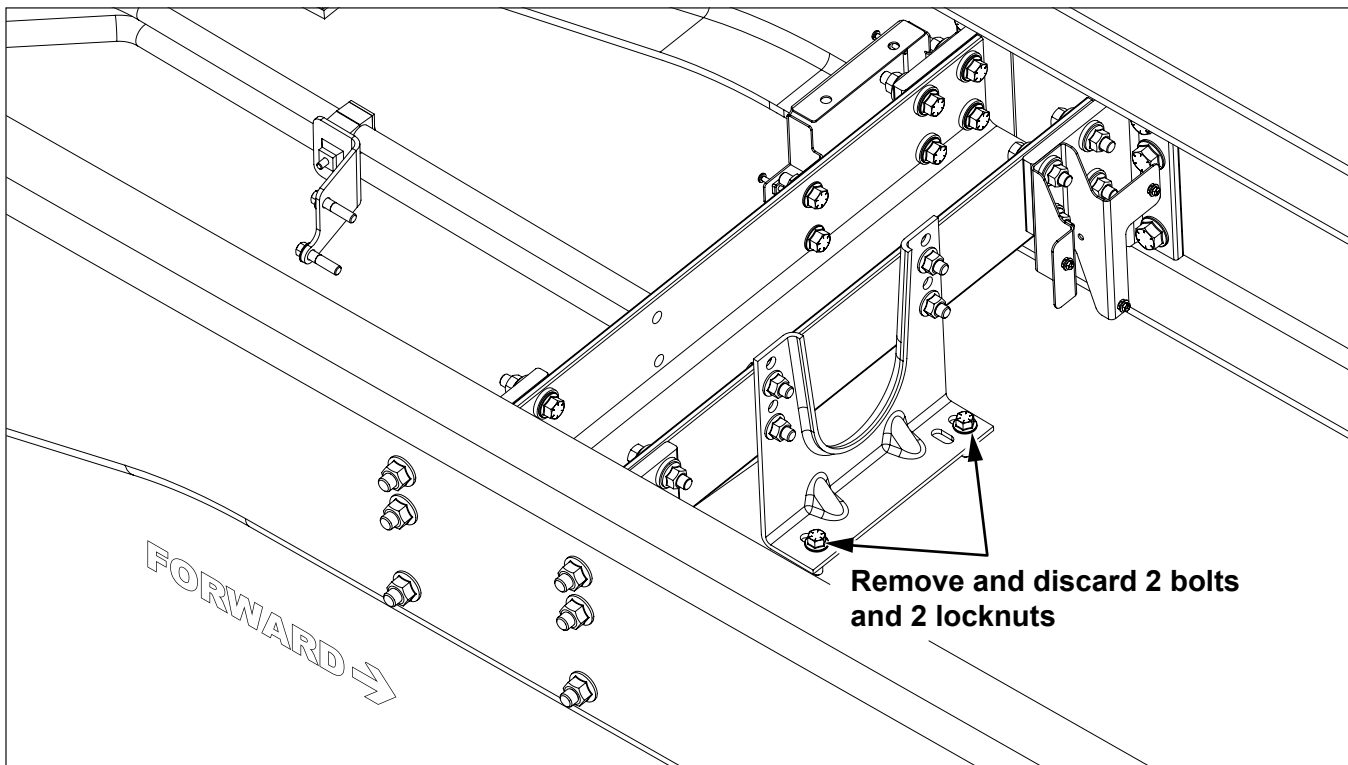


Figure 12

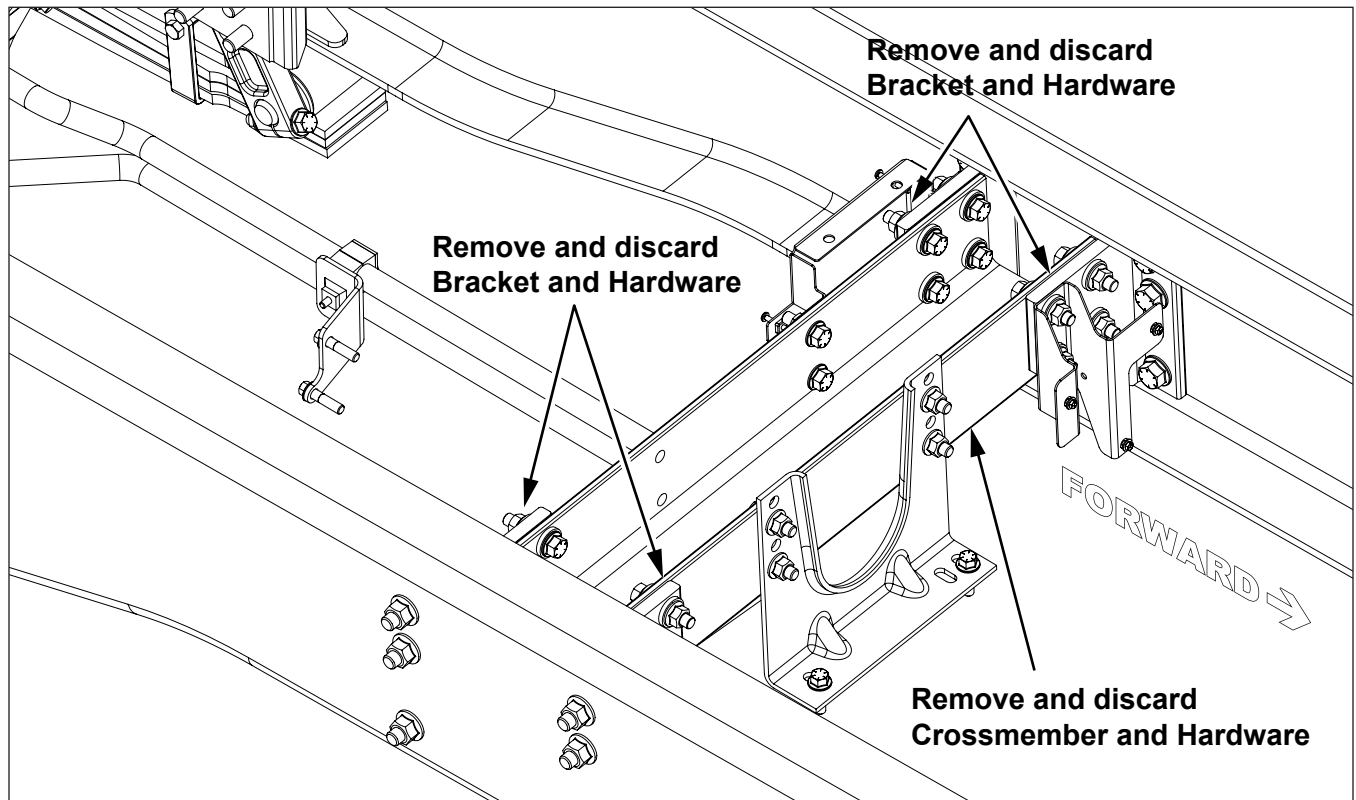
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9. Locate the first forward crossmember from the transmission. If equipped with a transmission retarder accumulator: Place a suitable drain pan under the accumulator, loosen the fittings at each end of the accumulator to allow it to be rotated. Support the accumulator, remove the four mounting bolts from the accumulator bracket and set aside for reinstallation and reposition the accumulator to allow access to the crossmember. Remove the accumulator bracket from the crossmember and set aside for reinstallation. Remove and discard the center bearing support bracket and hardware. Remove and discard the crossmember including the brackets and the hardware. Remove the gateway module and hardware, transmission control unit (TCU) and anti lock braking system (ABS) module and set aside for reinstallation. Remove and discard the TCU and ABS mounting brackets and hardware (see Figures 13, 14 and 15).

**Note:** The current crossmember orientation used in your vehicle may vary from the illustration. The ABS/TCU mounting brackets may require reuse for certain configurations (see Figure 13)

**Figure 13**

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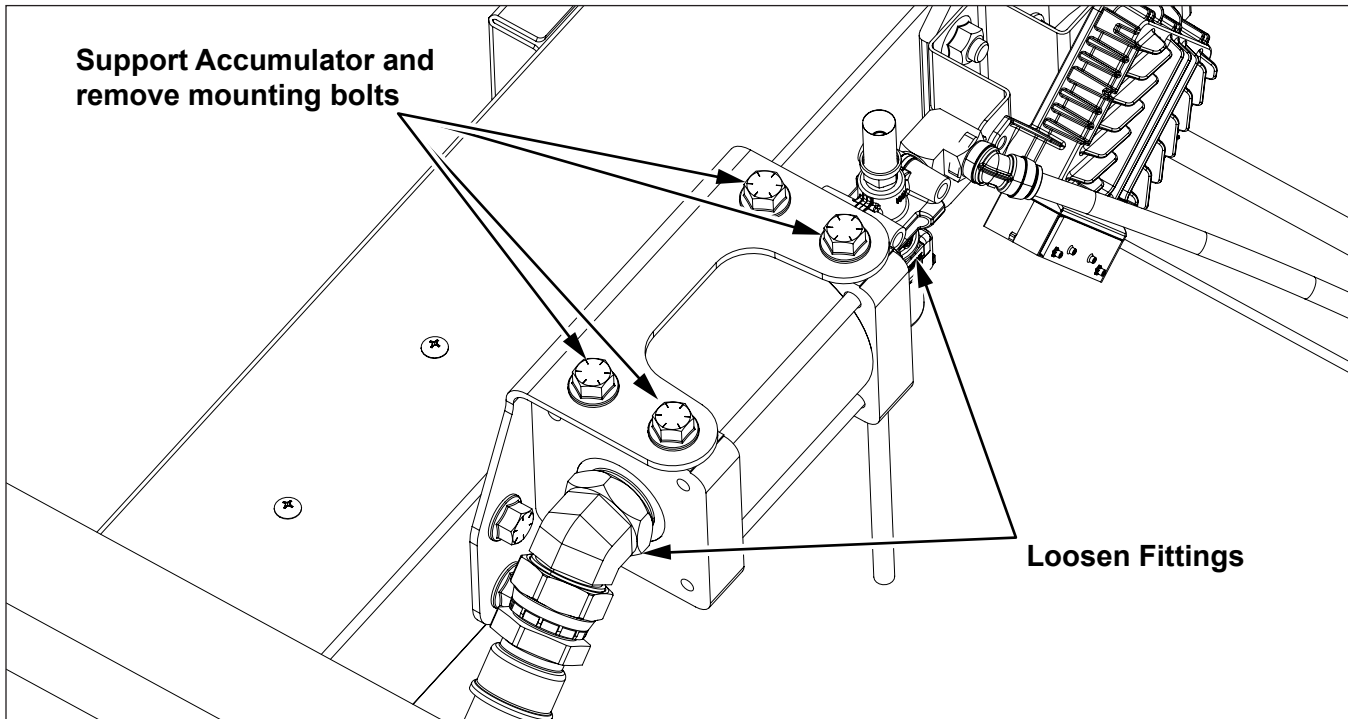


Figure 14

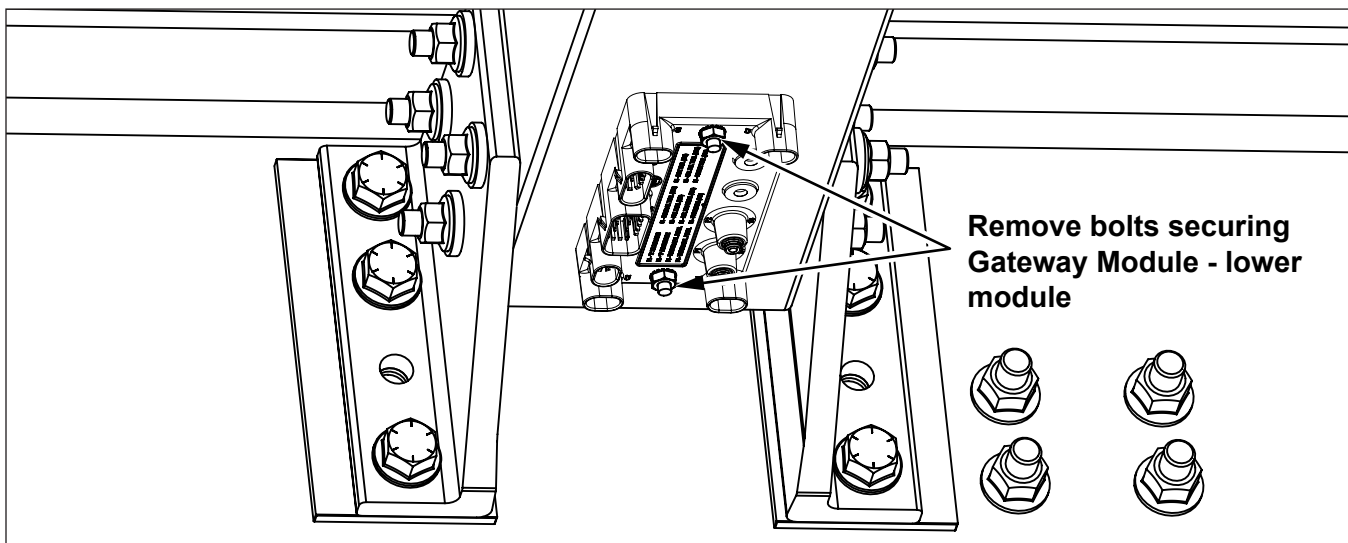


Figure 15

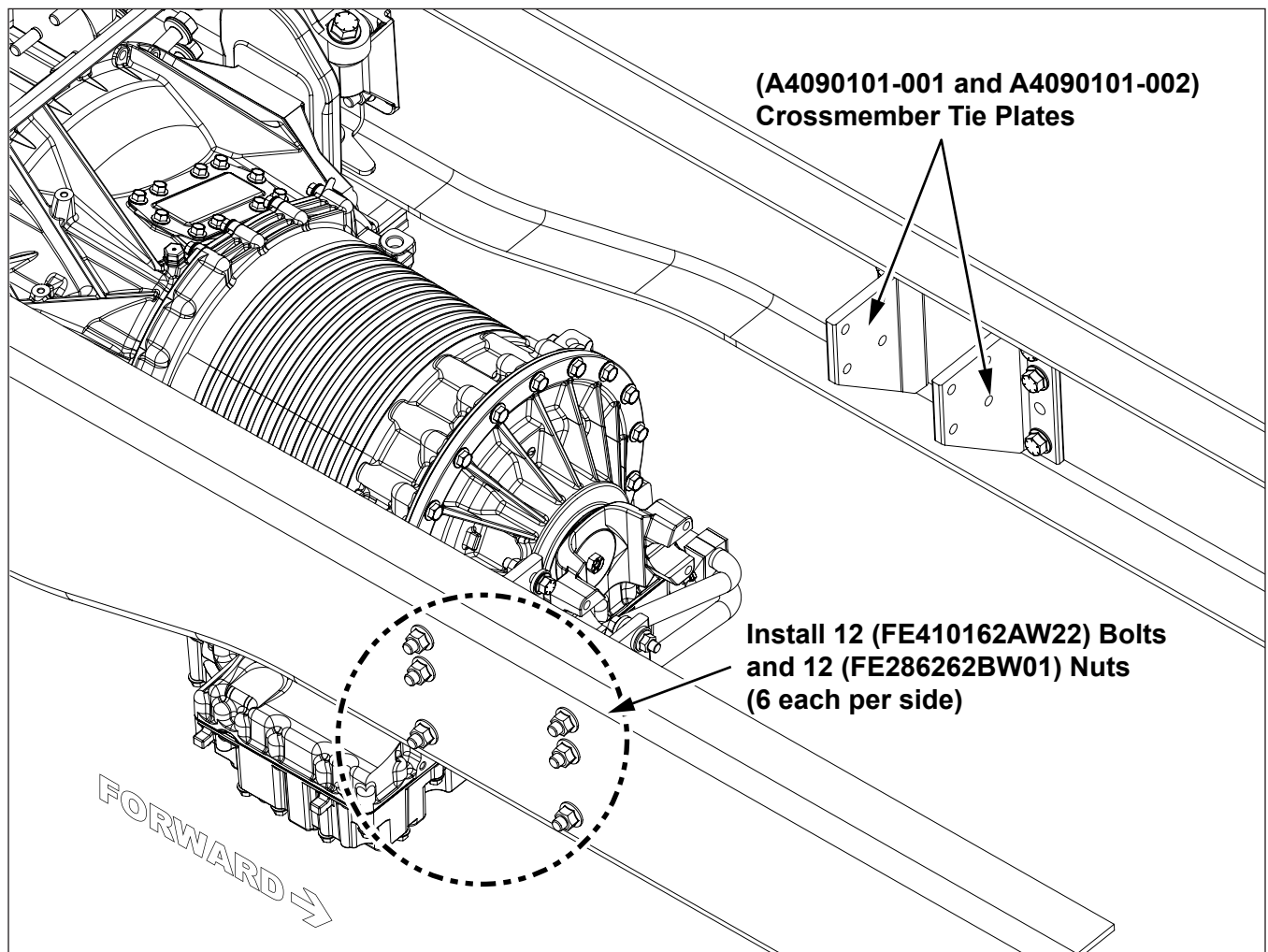
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10. Apply (GZ010002-001) tape to form an insulating barrier between the aluminum crossmember tie plates and the frame rail and install 2 (A4090101-001) and 2 (A4090101-002) crossmember tie plates using 12 (FE410162AW22) bolts and 12 (FE286262BW01) locknuts, install all fasteners loosely to position the tie plates (see Figure 16).

**Note:** If the unit is equipped with external frame plates (not pictured), remove and discard the external frame plates. If you have questions or concerns regarding the external frame plates, please contact Autocar Technical Support at 888-218-3611.



**Figure 16, Proper Orientation of Crossmember Tie Plates**

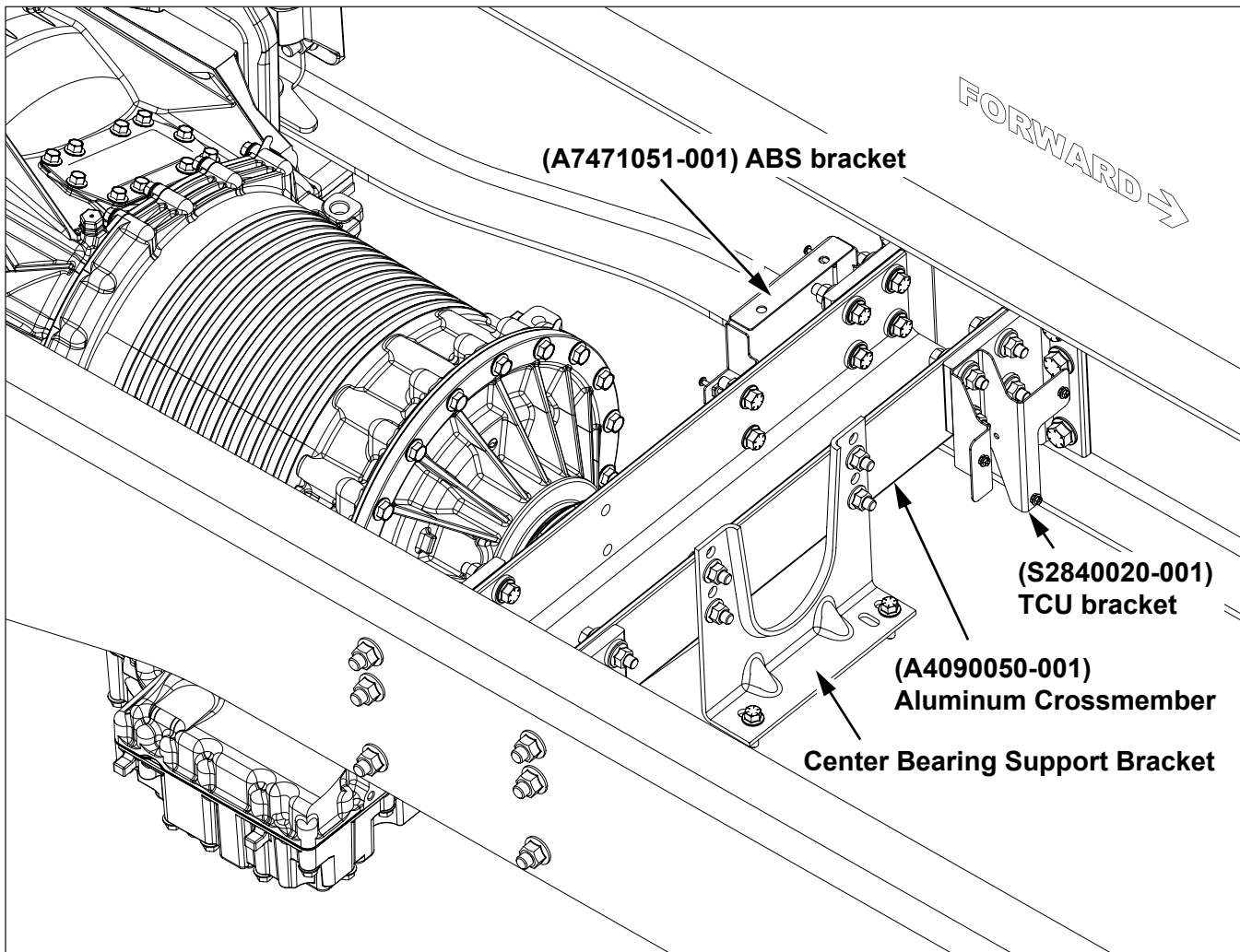


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11. Install the (A4090050-001) Aluminum crossmember, the (A7471051-001) ABS bracket and the (S2840020-001) TCU bracket using 16 (FE410150CW22) bolts, 32 (3082750) spacer washers, 16 (FE286250DW01) locknuts, 2 (FE410150AW16) bolts and 2 (FE286250BW01) locknuts. Install all fasteners loosely to position the crossmember and tighten all fasteners in sequence. First, tighten the 12 (FE410162AW22) bolts to 200 lb. ft. of torque (see Figure 16). Second, tighten the 16 (FE410150CW22) bolts to 90 lb. ft. of torque (see Figure 17).

**Figure 17**

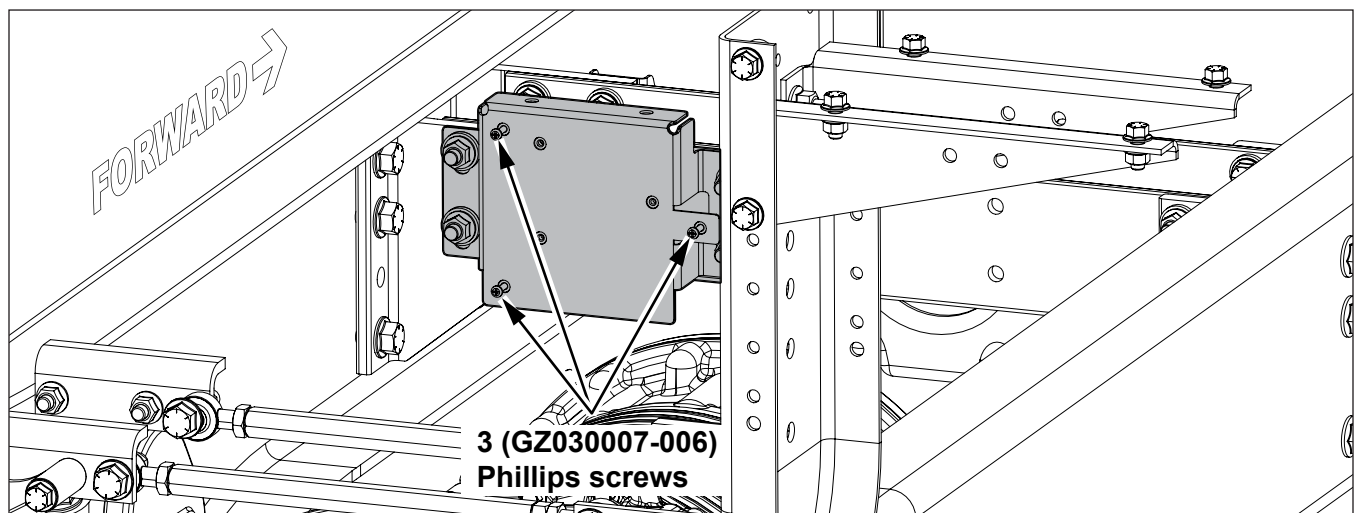
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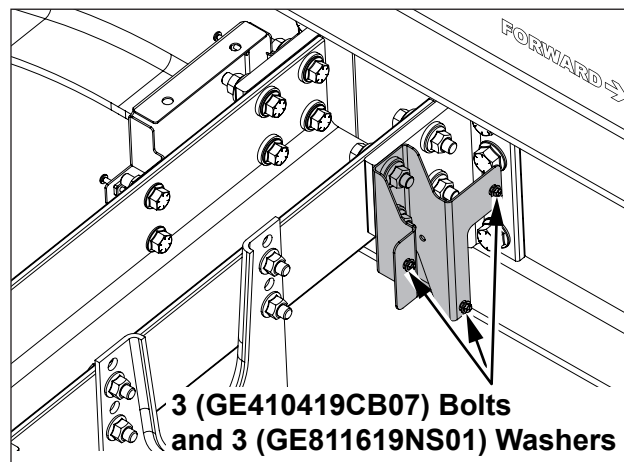
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12. Reinstall the ABS module using 3 (GZ030007-006) Phillips screws, reinstall the TCU using 3 (GE410419CB07) bolts and 3 (GE811619NS01) washers and reinstall the gateway module using the hardware set aside in Step 9 (see Figures 18, 19 and 20).

**Note:** Due to TCU/ABS mounting variations, it may be necessary to reuse the original mounting brackets. If the gateway mounting hardware is compromised, obtain fasteners locally as required.



**Figure 18**

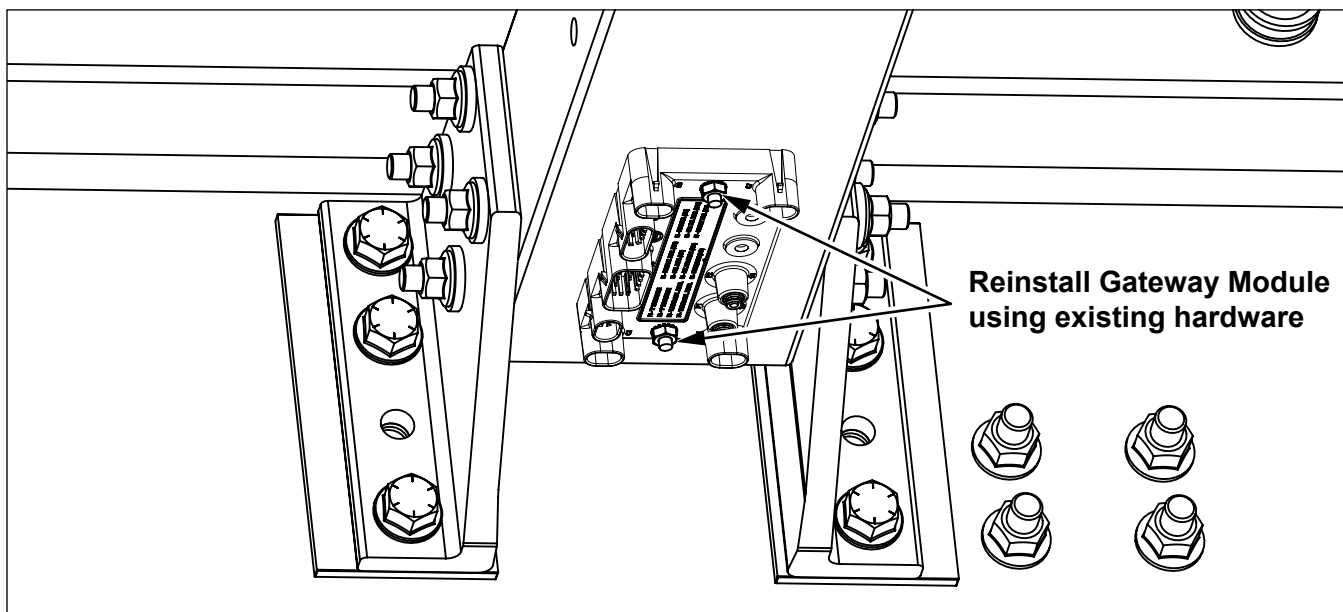


**Figure 19**

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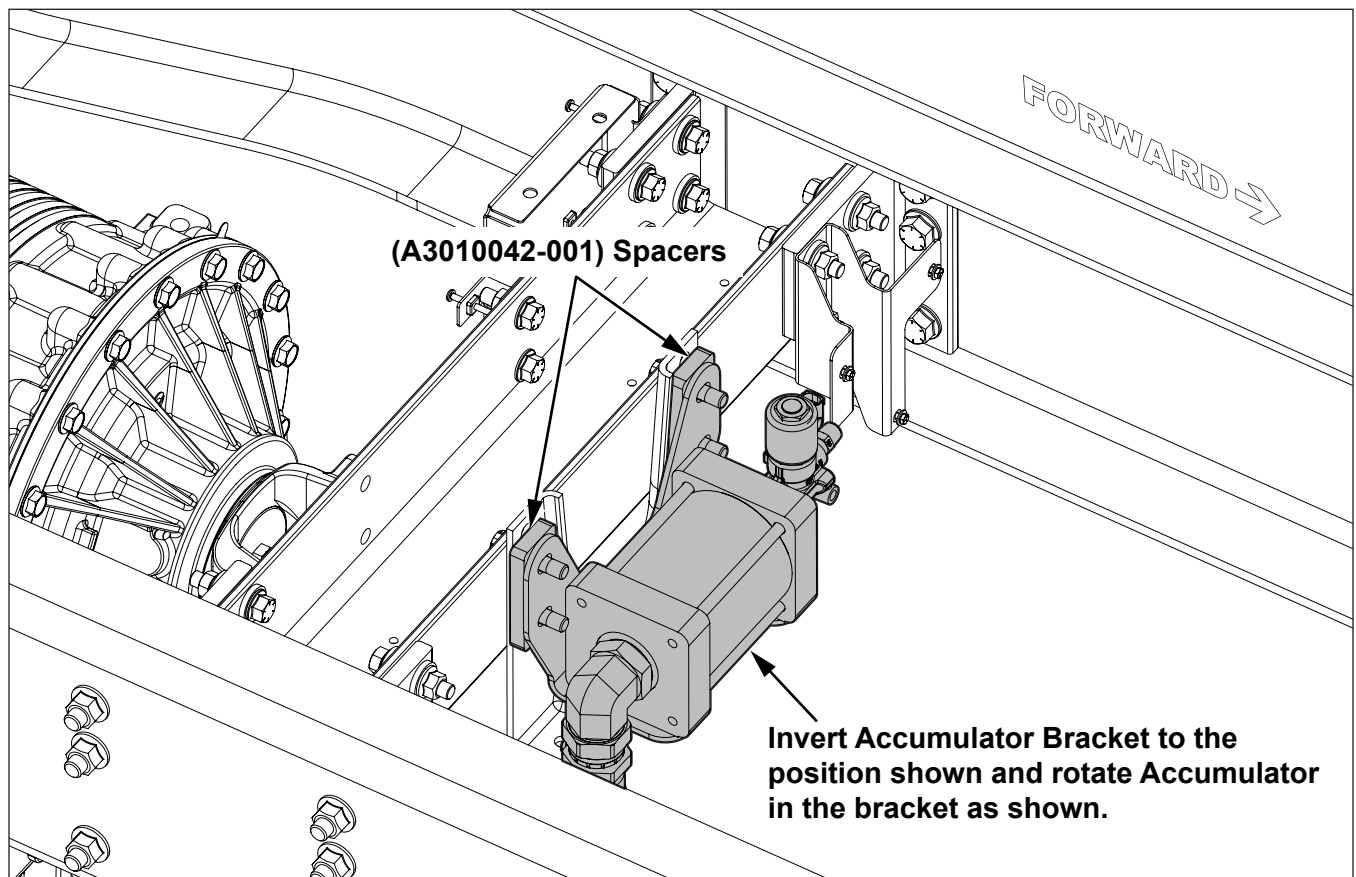
**Figure 20**



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13. Apply (GZ010002-001) tape to form an insulating barrier between the aluminum crossmember and the support bearing bracket and install the (30103-3605) support bearing bracket to the aluminum crossmember using 4 (FE410150AW16) bolts and 4 (FE286250BW01) locknuts and tighten to 90 lb. ft. of torque. If equipped with a transmission retarder accumulator: Install the (A3010042-001) center bearing offset spacers between the (30103-3605) support bearing bracket and the accumulator bracket. Invert the accumulator bracket to the position shown and install using 4 (GE410150AO20) bolts and 4 (FE286250BW01) locknuts and tighten to 90 lb. ft. of torque. Re-position fluid and air connections as required to rotate the accumulator 180° to the position shown. Apply thread lock medium blue (obtain locally) and reinstall the accumulator mounting bolts that were set aside in Step 7 and tighten to 55 lb. ft. of torque. Tighten all fluid and air connections (see *Figure 21*).



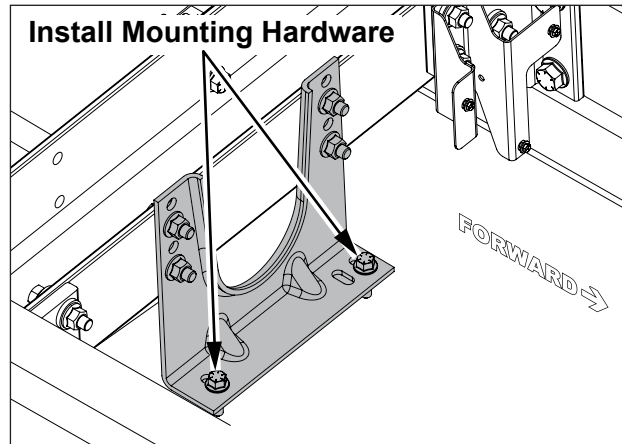
**Figure 21, Transmission Retarder Accumulator**

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14. Reinstall the drive shaft (lowered in Step 8) using 2 (FE410143AW16) bolts and 2 (FE286243BW01) locknuts and tighten to 65 lb. ft. of torque (see *Figure 22*).

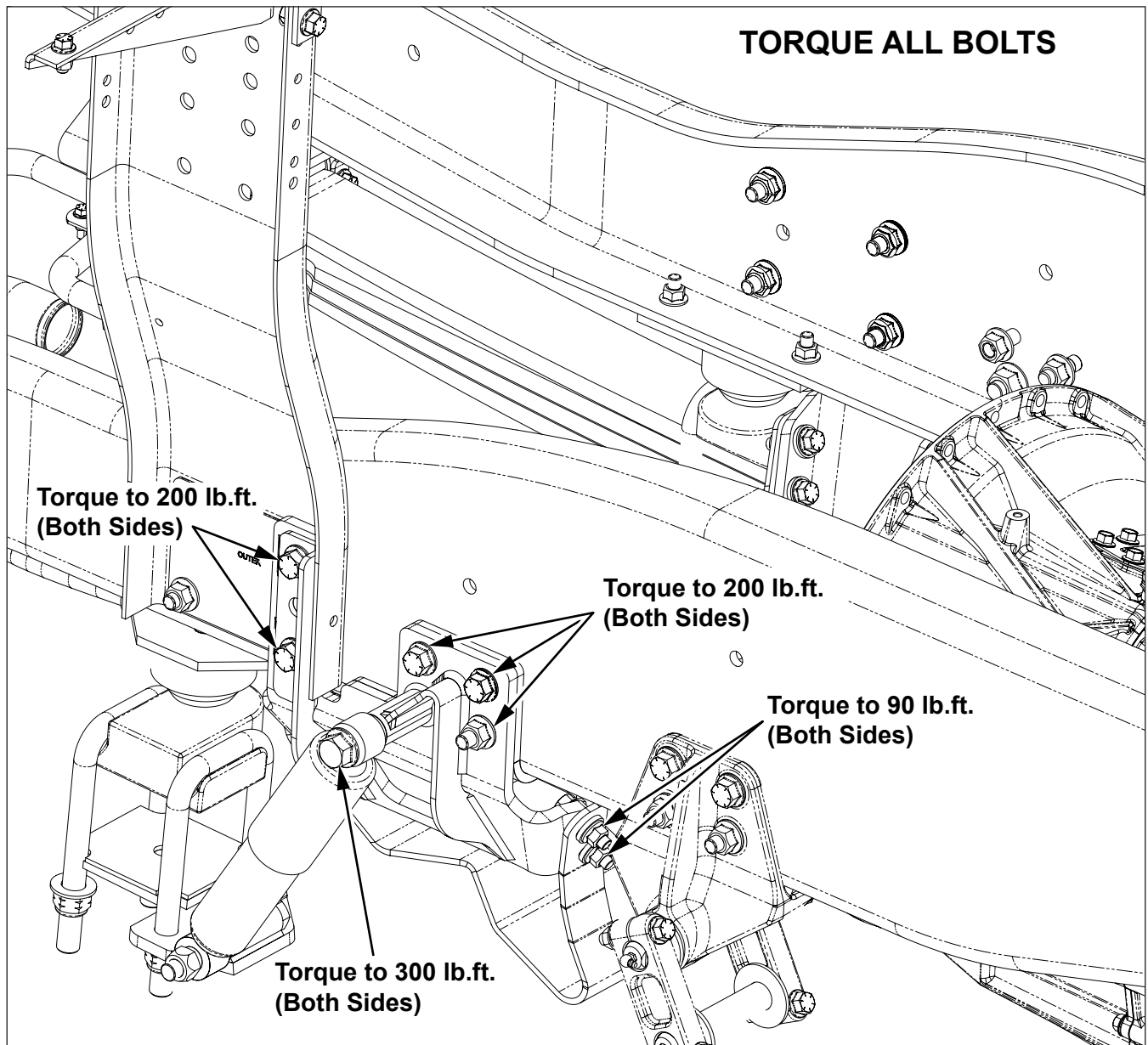


***Figure 22, Support Bearing Bracket***

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**Torque References** (see Figures 23, 24, and 25).



**Figure 23**

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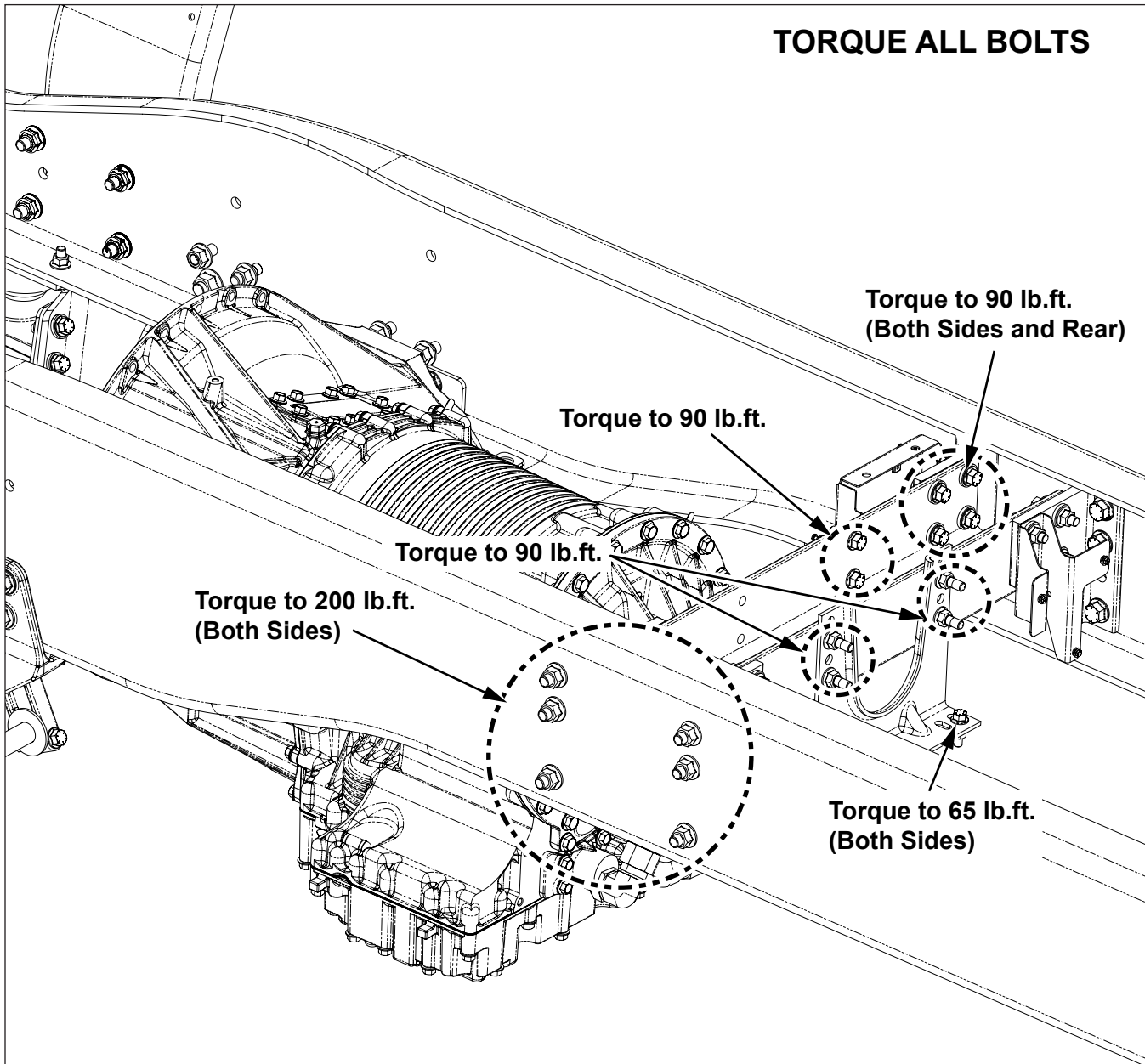


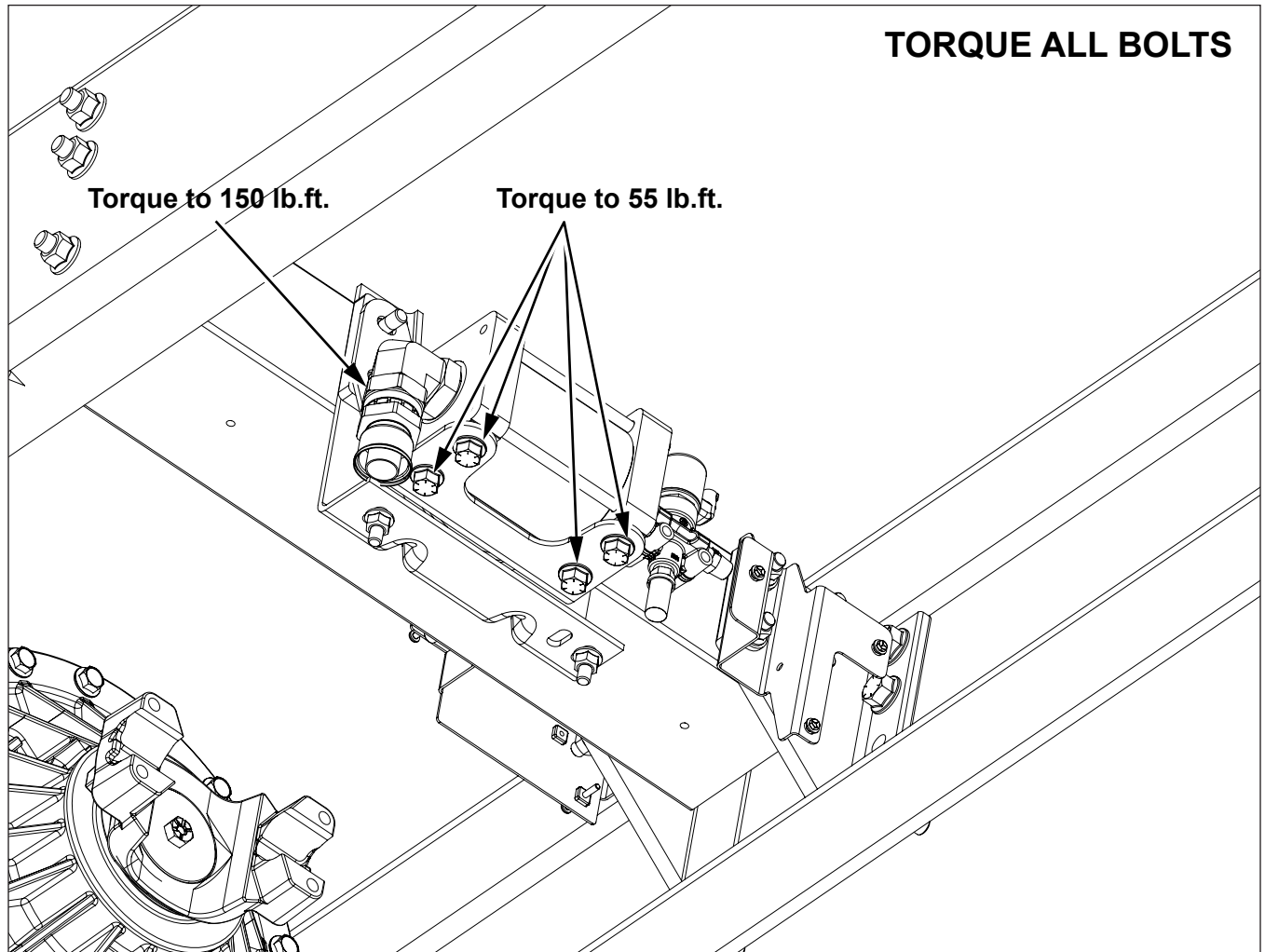
Figure 24

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**Figure 25**

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15. Secure any harnesses that were displaced during the repair process and confirm that no chafing or rubbing can occur. Re-connect any air lines or other plumbing that was disconnected. Re-connect all battery terminals. Remove all support fixtures and stands that were used to support components during this procedure.
16. If the unit is equipped with a transmission retarder and the accumulator was relocated, refill the transmission as required using the specified fluid (obtain locally) following the appropriate procedures.
17. Start the engine and build air pressure to governor cut out, shut the engine off and confirm there are no fluid or air leaks.
18. Assembly instructions for the installation of underslung crossmember is complete.

***Note: If you have questions or concerns regarding this Assembly Instruction, please contact Autocar Technical Support at 888-218-3611.***