



**MAINTENANCE
INFORMATION**

MI16-17H

DATE :	FEBRUARY 2016	SECTION :	06 - Electrical
SUBJECT :	BOSCH HD10 ALTERNATOR REMOVAL AND INSTALLATION		

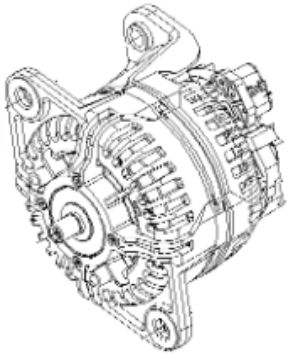

REVISION H:	THIS MAINTENANCE INFORMATION SUPERSEDES ALL PREVIOUS VERSIONS.
Released : March 2023	
Simplified version without A/C clutch removal – New A/C support arm + ColorGuard on terminal fasteners.	

DESCRIPTION




Use this procedure to remove and replace all three **Bosch HD10 (150A)** alternators.

MATERIAL NEEDED

Each vehicle will require:


Part No.	Description		Qty
564683	ALTERNATOR, BOSCH HD10PLBH 28V 150A		3
504637	NYLON CABLE TIES		10

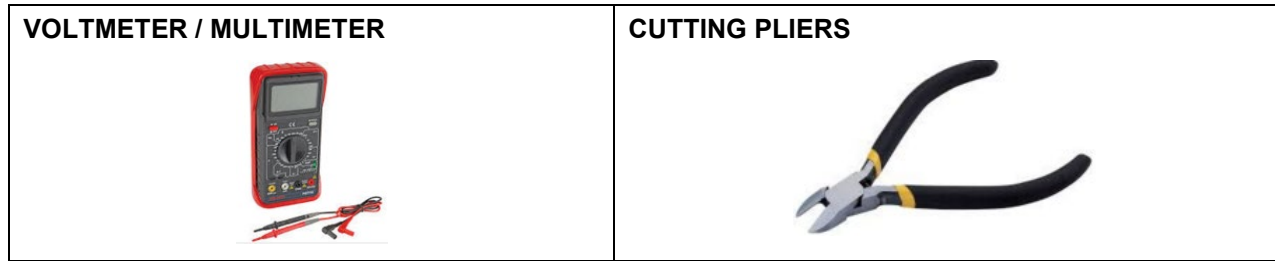
Other material required:

Part No.	Description		Qty
684013	COLOR GUARD RUBBER COATING		As req.
680335	ANTI-SEIZE COMPOUND		As req.
N97665	LOCTITE THREAD LOCKER (BLUE) MEDIUM STRENGTH # 243 OR EQUIVALENT		As req.

NOTE
 Material can be obtained through regular channels.

REQUIRED TOOLS

<p>METRIC OPEN END WRENCH SET</p> 	<p>RATCHET AND SOCKET SET – METRIC</p> 
<p>BRASS BRUSH AND / OR CLEANING PADS</p> 	<p>1/4 & 3/8 DRIVE TORQUE WRENCH</p> 
<p>BELT TENSION GAUGE</p> 	<p>1/2 SQUARE DRIVE BREAKER BAR</p> 



Also see “SPECIAL TOOLS REQUIRED TO TIGHTEN THE ALTERNATOR PULLEY MOUNTING NUT” in **PART 3**

SAFETY PRECAUTIONS

- Eye protection should always be worn when working in a shop.
- Rules for Personal Protection Equipment should always be respected. Wear your PPE including but not limited to the following:



Safety First!



PROCEDURE



DANGER

Park vehicle safely, apply parking brake, stop the engine. Prior to working on the vehicle, set the ignition switch to the OFF position and trip the main circuit breakers equipped with a trip button. On Commuter type vehicles, set the battery master switch (master cut-out) to the OFF position.

Lockout & Tag out (LOTO) must be performed during set-up, maintenance or repair activities. Refer to your local procedure for detailed information regarding the control of hazardous energy.

CONTENT

PART 1 – HOT (TURBO) SIDE SINGLE BOSCH ALTERNATOR REMOVAL AND INSTALLATION..... 4
PART 2 - COLD SIDE TWIN BOSCH ALTERNATOR REMOVAL / INSTALLATION..... 7
PART 3 – PULLEY REMOVAL / INSTALLATION16

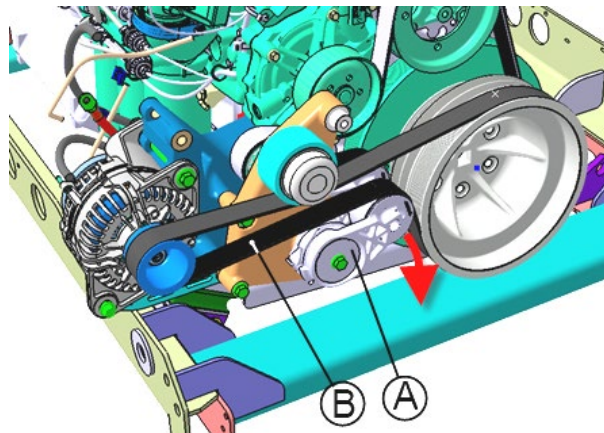
PART 1 – HOT (TURBO) SIDE SINGLE BOSCH ALTERNATOR REMOVAL AND INSTALLATION

RISK OF ELECTRICAL SHOCK

- The alternator is connected to the batteries through master relay R1. If the ignition switch is in the OFF position and the battery master switch (master cut-out) is set to the OFF position, there should not be electrical power to the alternator terminals. However, a faulty master relay R1 could eventually leave the battery power circuit closed, thus electrical power would be present at the alternator terminals.
- Using a multimeter, probe the alternator **B1+** terminal and the ground terminal. Make sure that the voltage reading is 0 volt prior disconnecting the alternator cables.

HOT SIDE SINGLE ALTERNATOR REMOVAL

1. Rotate the automatic belt tensioner **A** clockwise using a ½ square drive breaker bar and then remove the alternator drive belt **B**.

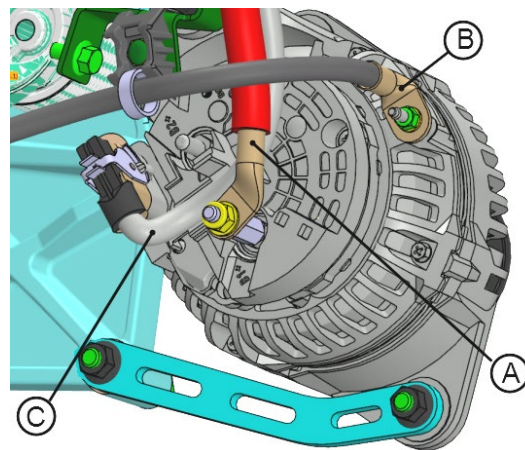


2. Cut the nylon ties securing the cables to the alternator and then disconnect the alternator cables **A**, **B** & **C**. Properly clean cable lugs as applicable using a brass wire cup brush, a Scotch-Brite pad or an emery cloth.

Keep hardware for reuse.



- A: (+) POWER CABLE**
- B: GROUND CABLE**
- C: ALTERNATOR HARNESS**



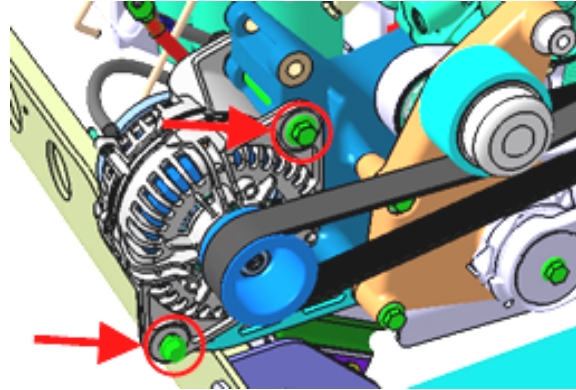
3. Remove the alternator pulley: see **PART 3** of this procedure for instruction and special tools required.

NOTE: Prevost does not recommend to remove alternator pulley using air tools (impact gun).

NOTE: The hot side pulley is different than the 2 cold side pulleys.

4. Remove the alternator. To do so, unscrew the two (2) mounting bolts identified on right.

Keep hardware for reuse.



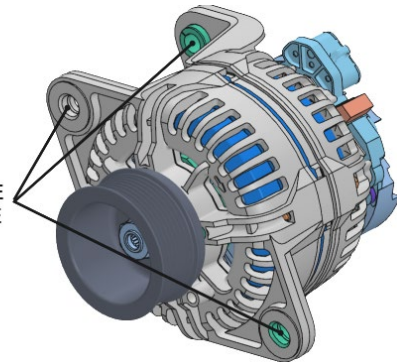
HOT SIDE ALTERNATOR INSTALLATION

5. Install the alternator pulley. See **PART3** of this procedure for instruction, tools and torque values.

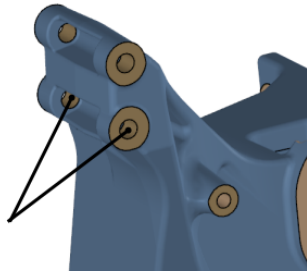
NOTE: The hot side pulley is different than the 2 cold side pulleys. Do not interchange them!

6. Apply anti-seize compound (Prevost p/n: 680335) inside the alternator mounting ears (right) and inside the support sleeves (below).

APPLY ANTI-SEIZE COMPOUND HERE



APPLY ANTI-SEIZE COMPOUND HERE

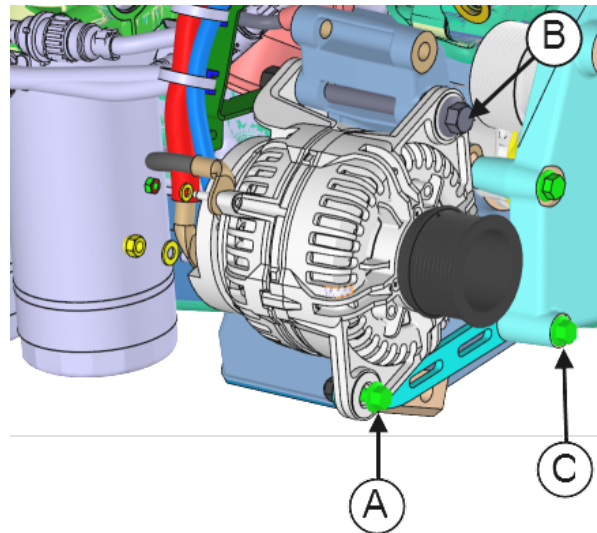


7. Reinstall the alternator using previously removed bolts **A** & **B**.

Use Loctite 243 Blue on threads

8. To ease installation, slightly loosen bolt **C** as necessary.

- A:** SCREW HEXF P/N 5001308 M10-1.25X40 G10.9,
NUT P/N 5001727 **torque: 48lb-ft**
- B:** SCREW HEXF P/N 502960 M12-1.75X160 G10.9,
NUT P/N 5001728 **torque: 82 lb-ft**
- C:** SCREW HEXF P/N 5001799 M10-1.5X70 G10.9,
NUT P/N 5001727 **torque: 48 lb-ft**



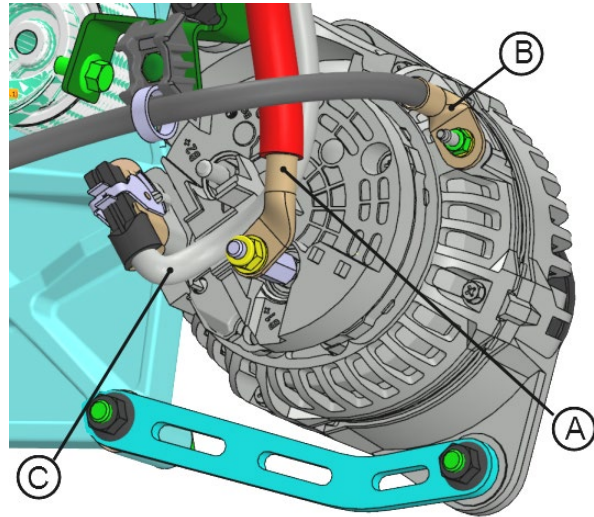
9. Connect the (+) power cable **A**, the ground cable **B** and alternator harness **C** to the alternator.
10. Fit the (+) power cable terminal onto adaptor stud at **B1+** stud terminal, place one flat washer **E** against the (+) power cable lug and screw nut **D** (see next step image).

STUD ADAPTER p/n 060297 **torque: 11 lb-ft**

A: (+) POWER CABLE

B: GROUND CABLE

C: ALTERNATOR HARNESS



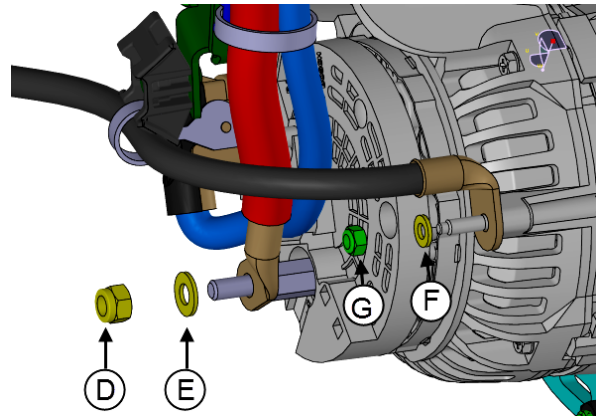
11. Connect the ground cable onto the alternator ground stud terminal as shown on image. Place one flat washer **F** against the ground cable lug terminal and screw nut **G**.

D: NUT M8 P/N 5001983 **torque: 11 lb-ft**

E: FLAT WASHER P/N 560811

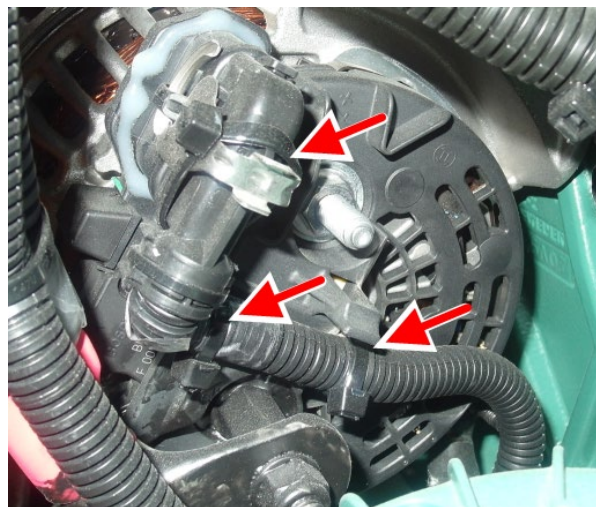
F: FLAT WASHER P/N 502573

G: NUT M6 P/N 5001182 **torque: 6 lb-ft**

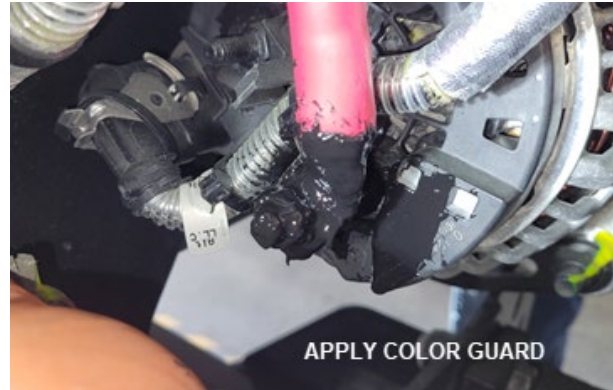


12. Secure the alternator harness using nylon cable ties P/N 504637 positioned as shown by red arrows on the image

NOTE: one nylon tie is used to block the connector locking mechanism in order to prevent unwanted unlocking.



13. Apply anti-corrosion compound or Color Guard Rubber Coating (Prevost p/n: 684013) on alternator studs, cable lugs and nuts.



PART 2 - COLD SIDE TWIN BOSCH ALTERNATOR REMOVAL / INSTALLATION

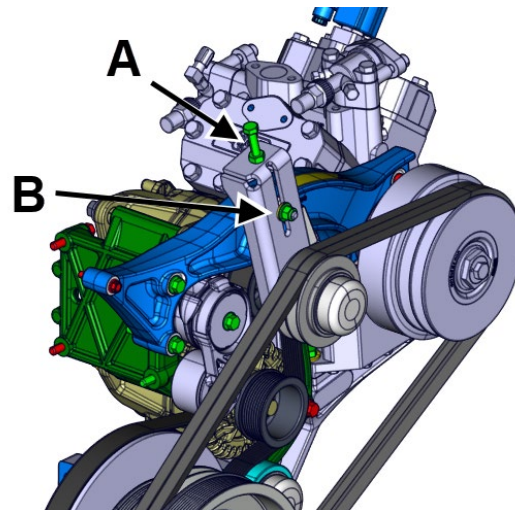
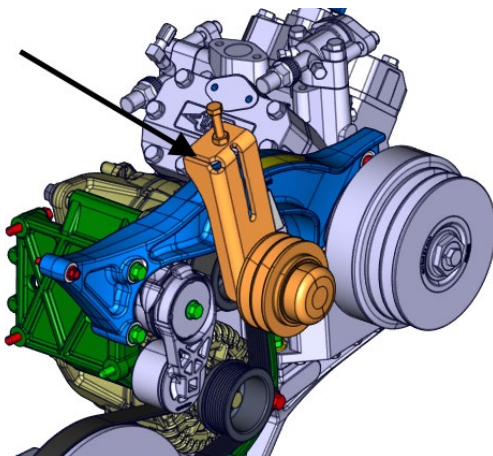
RISK OF ELECTRICAL SHOCK

- The alternator is connected to the batteries through master relay R1. If the ignition switch is in the OFF position and the battery master switch (master cut-out) is set to the OFF position, there should not be electrical power to the alternator terminals. However, a faulty master relay R1 could eventually leave the battery power circuit closed, thus electrical power would be present at the alternator terminals.
- Using a multimeter, probe the alternator **B1+** terminal and the ground terminal. Make sure that the voltage reading is 0 volt prior disconnecting the alternator cables.

GAINING ACCESS TO THE ALTERNATORS

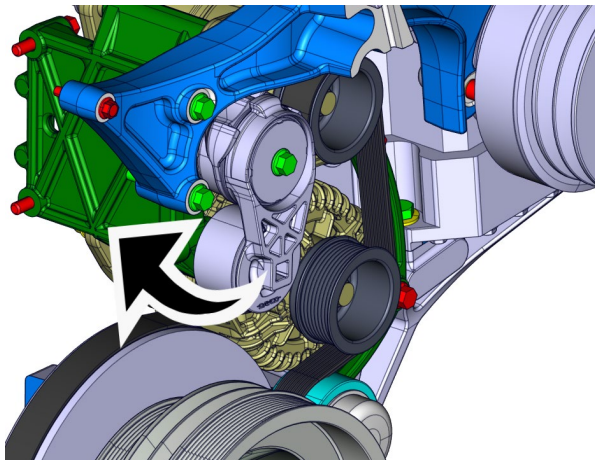
1. Loosen bolt **A**.
2. Unscrew and remove bolt **B**.
3. Remove the A/C compressor drive belts (2 side-by-side V-belts).
4. Remove the drive belt mechanical tensioner assembly as shown below.

Note: Keep hardware for reuse

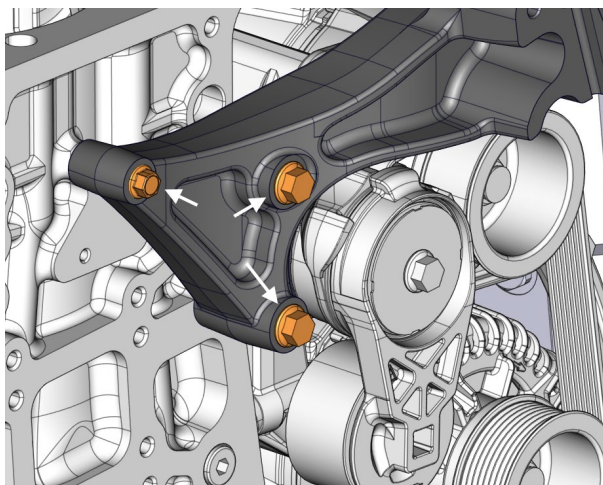


ALTERNATOR REMOVAL

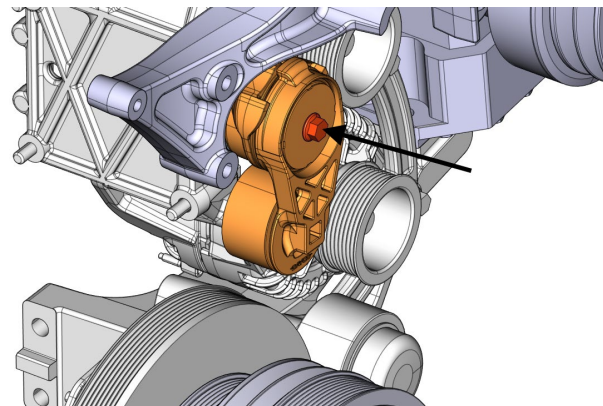
5. Using a $\frac{1}{2}$ drive ratchet or breaker bar, rotate the alternator belt tensioner clockwise to free the belt.
6. Remove the alternator belt.



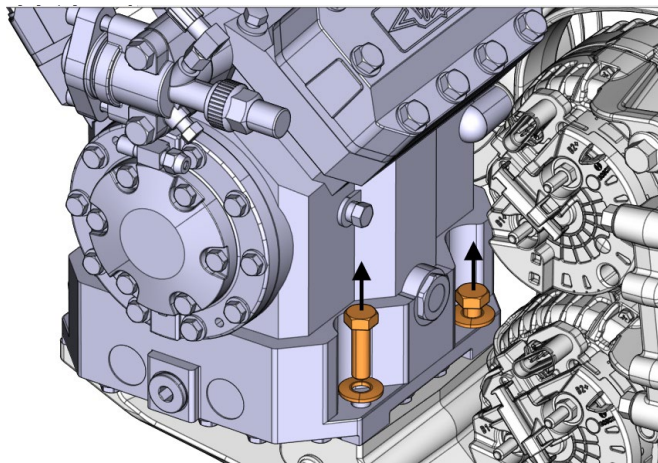
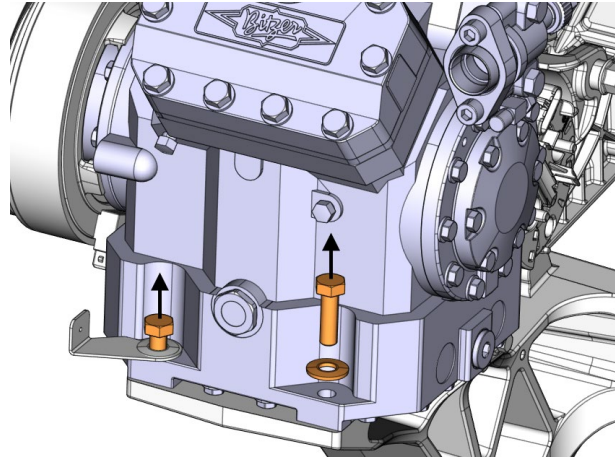
7. Remove the 3 screws securing the support arm to the engine block.



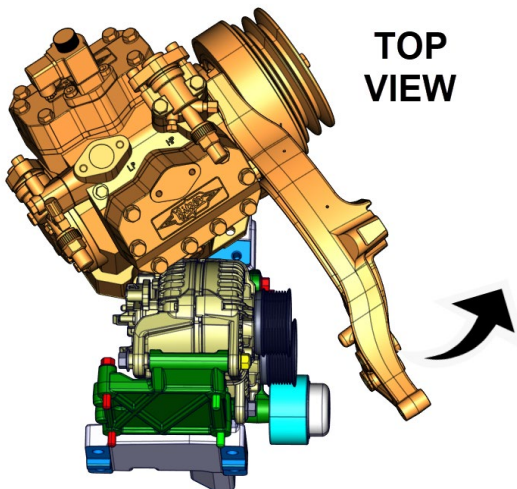
8. Optionally remove the belt tensioner.



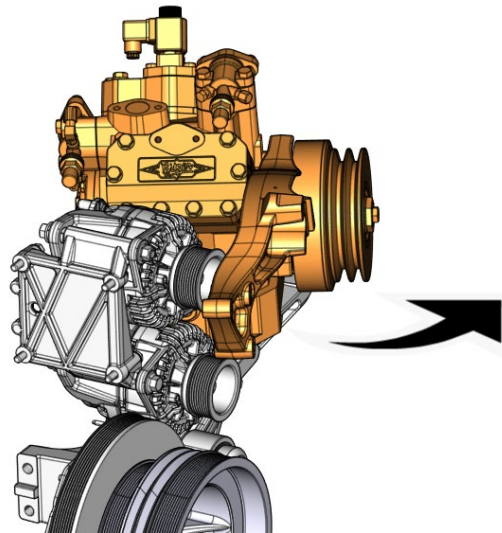
9. Unscrew the A/C compressor from the base (4 screws as seen in the right pictures).



10. Using the support arm as a lever, rotate the A/C compressor to gain access to the alternator mounting bolts behind the arm.



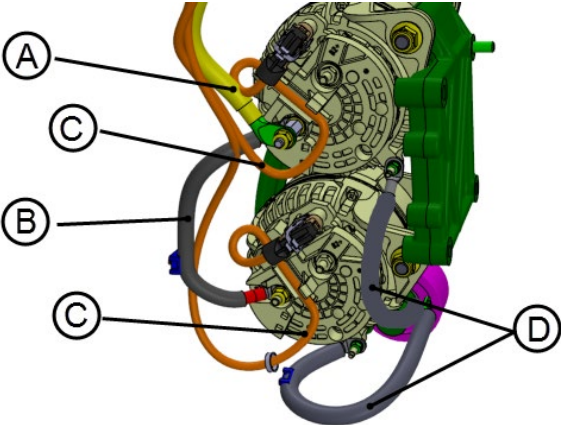
**TOP
VIEW**



11. Disconnect the alternator cables. Properly clean cable ring terminals as applicable using a brass wire cup brush, a Scotch-Brite pad or an emery cloth.

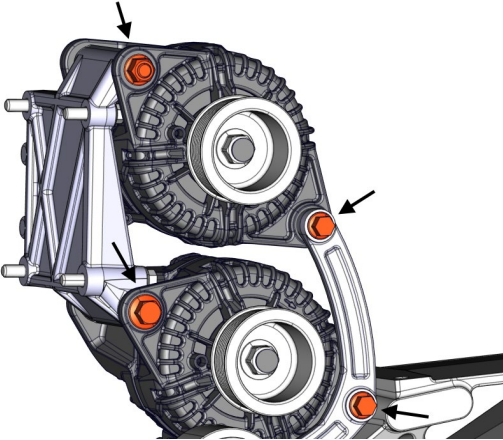
Keep hardware for reuse.

- A: (+) POWER CABLE
- B: (+) JUMPER CABLE
- C: ALTERNATOR HARNESS
- D: GROUND CABLE



12. Remove the existing alternators. To do so, unscrew the four (4) mounting bolts identified in the picture.

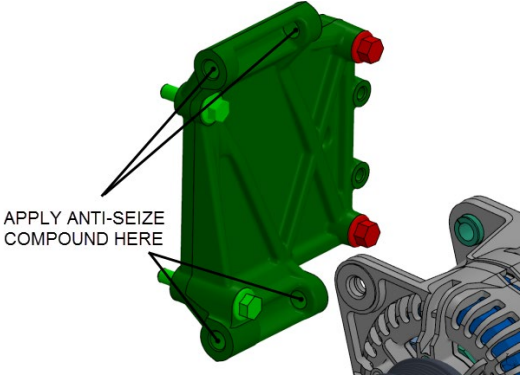
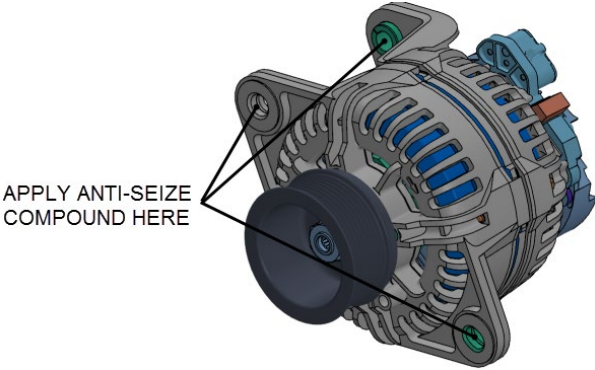
Keep hardware for reuse.



ALTERNATOR INSTALLATION

13. Install the alternator pulleys. See **PART 3** for instruction, tools and torque values.

14. Apply anti-seize compound (Prevost p/n: 680335) inside the alternator mounting ears (Right) and inside the sleeves on the alternator support (below).



15. Install the alternators. Fix lower and upper alternators loosely to alternator supports using bolts **C**. Also, mount arched support loosely onto alternators using bolts **B**.

Use Loctite 243 Blue on threads.

NOTE: Reuse existing bolts unless they are not in good condition (damaged, pitted, eroded).

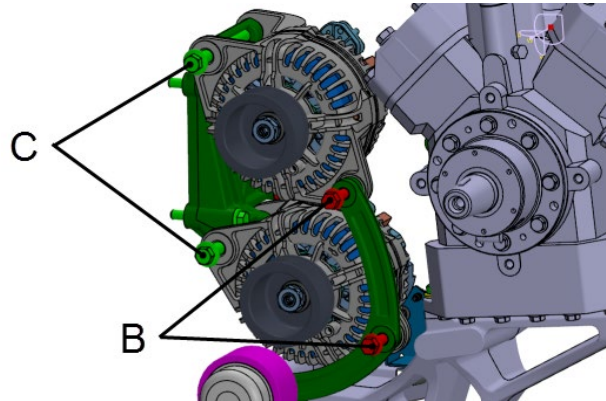
For reference:

C= NUT M12 p/n 5001761 (2X)

C= BOLT M12x160 p/n 5001853 (2X)

B= NUT M10 p/n 5001930 (2X)

B= BOLT M10x45 p/n 5001800 (2X)

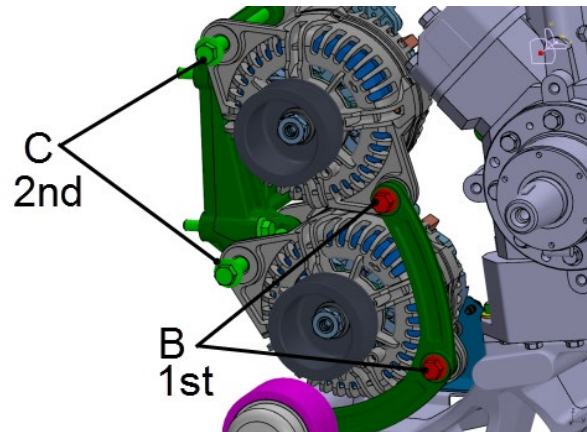


16. In order to assure proper installation, it is important to tighten the alternator mounting bolts in proper sequence.

*Tighten bolt **B** first, then finish with bolt **C***

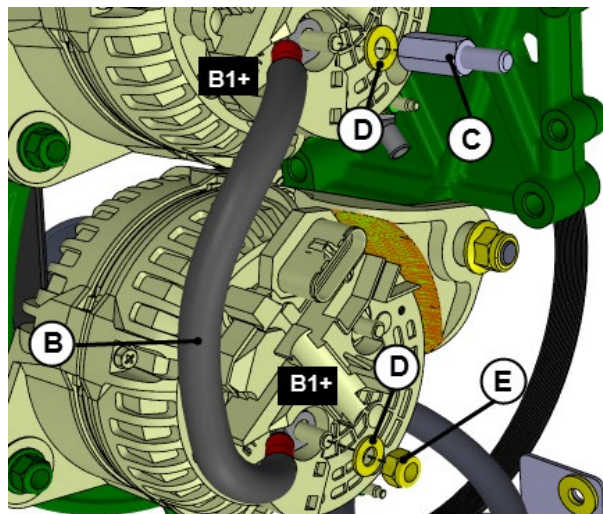
B: torque 48 lb-ft

C: torque 82 lb-ft



17. Connect jumper cable **B** to **B1+** stud terminal of the upper alternator and the lower alternator using hardware shown on the picture.

- Install jumper cable **B** onto **B1+** stud terminal on upper alternator.
- Place one flat washer **D** against the jumper cable lug.
- Screw and tighten the adapter stud **C**.
- Fit jumper cable **B** onto **B1+** stud terminal on lower alternator.
- Place one flat washer **D** against the jumper cable **B** lug and screw nut **E**.



B : JUMPER CABLE P/N 067835

C : STUD ADAPTER P/N 060297 torque: 11 lb-ft

D: FLAT WASHER P/N 560811

E: NUT M8 P/N 5001983 torque: 11 lb-ft

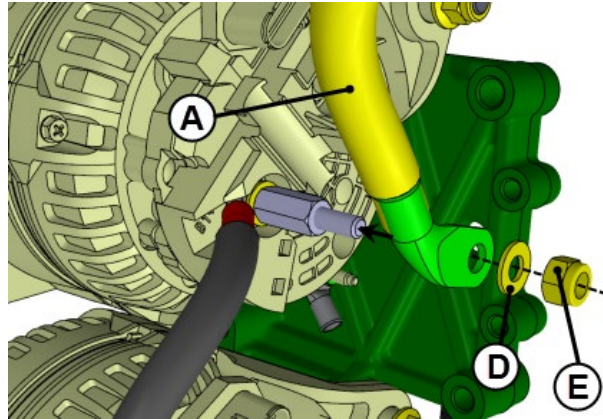
18. Reinstall the (+) power cable **A**. To do so, connect power cable **A** to the upper alternator **B1+** stud terminal.

- a) Fit the (+) power cable lug onto adaptor stud, place one flat washer **D** against the power cable terminal and screw nut **E**.

A: (+) POWER CABLE

D: FLAT WASHER P/N 560811

E: NUT M8 P/N 5001983 **torque: 11 lb-ft**

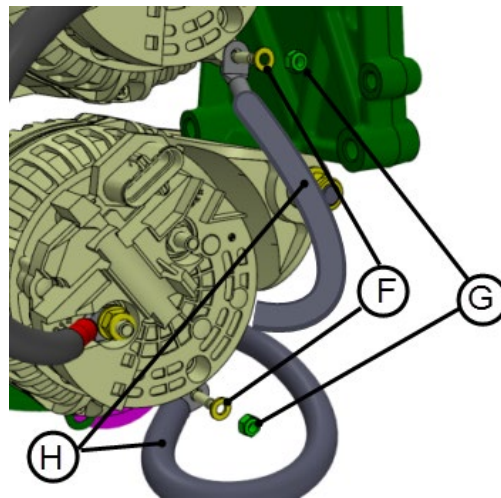


19. Fit the ground cables onto their respective alternator ground studs. For each alternator, place one flat washer **F** against the ground cable lug and screw nut **G**.

F: FLAT WASHER P/N 502573

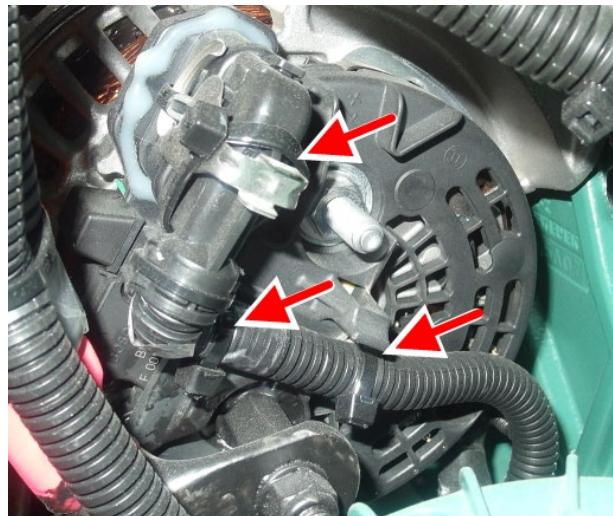
G: NUT M6 P/N 5001182 **torque: 6 lb-ft**

H: GROUND CABLES



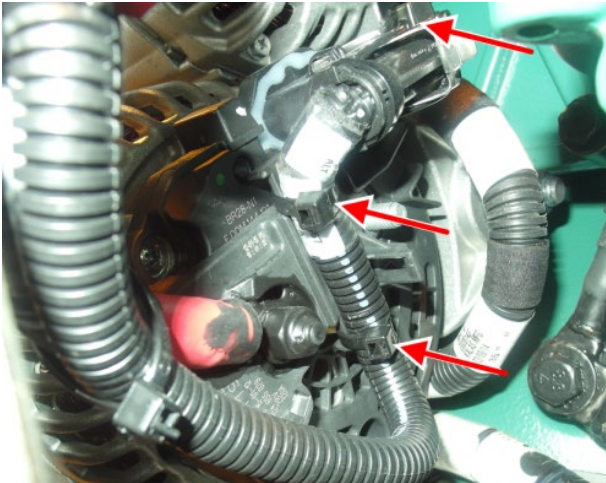
20. On the upper alternator, plug alternator harness onto alternator connector and secure using nylon cable ties P/N 504637 positioned as shown by red arrows.

NOTE: one nylon tie is used to block the connector locking mechanism in order to prevent unwanted unlocking and disconnection.

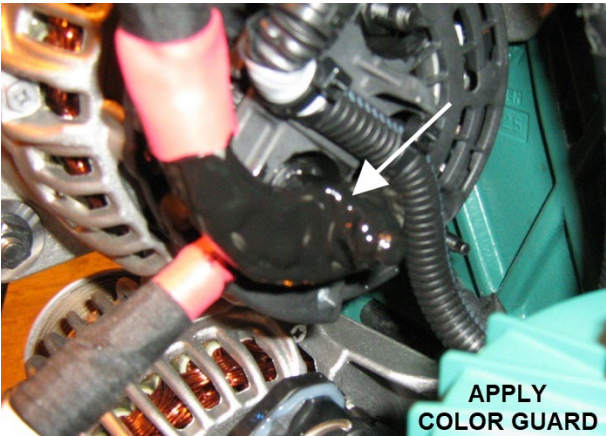


21. On the lower alternator, plug alternator harness onto alternator connector and secure using nylon cable ties P/N 504637 positioned as shown by red arrows.

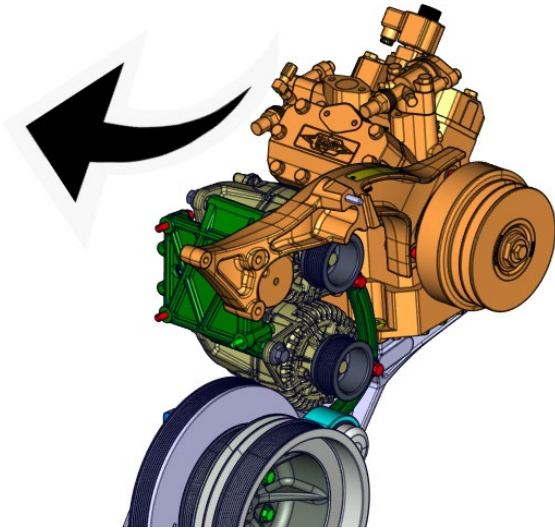
NOTE: one nylon tie is used to block the connector locking mechanism in order to prevent unwanted unlocking and disconnection



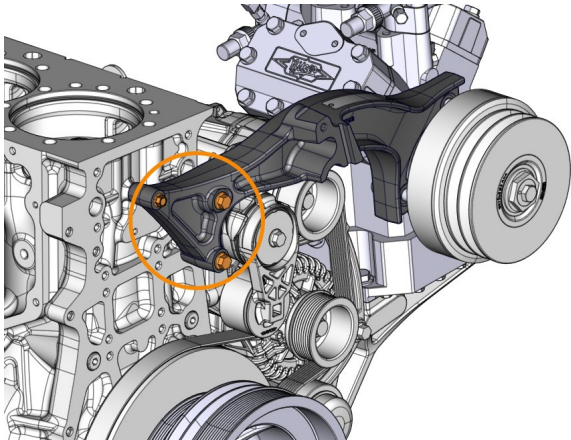
22. Apply anti-corrosion compound or **Color Guard Rubber Coating** (Prevost p/n: 684013) on alternator terminals, cable lugs and nuts.



23. Rotate the A/C compressor and support arm back to initial position.



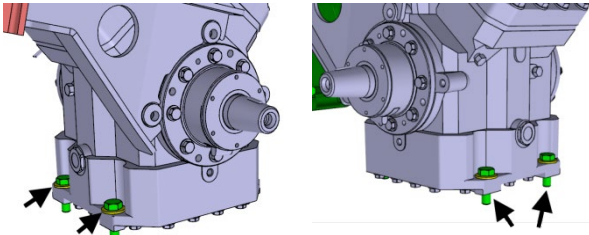
24. Loosely mount the support arm to the engine block using previously removed bolts.



25. Install the four A/C compressor mounting bolts and washers shown to secure the compressor to the base support (make sure to install the vent bracket at the front curb side position).

Tighten the compressor mounting bolts to prescribed torque of **74 lb-ft. (100 N-m)**.

Note: Use blue Loctite 243 on threads.



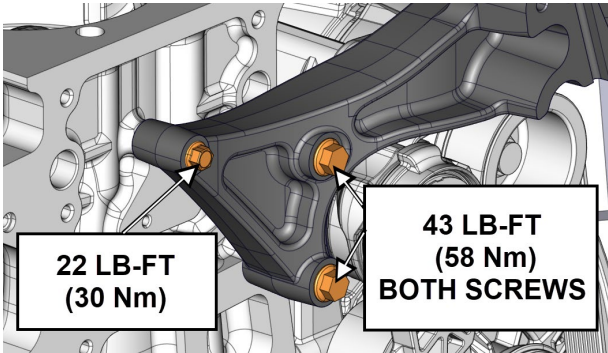
**STREET SIDE
COMPRESSOR MOUNTING
BOLTS**

**CURBSIDE COMPRESSOR
MOUNTING BOLTS**

26. Tighten the three bolts shown to the prescribed torque.

Note: Use blue Loctite 243 on threads

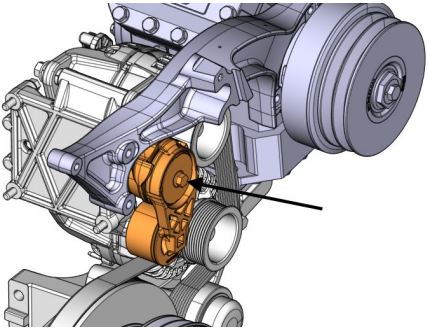
- Small: SCREW CAP HEXF M8-1.25X50 G10.9 p/n 500796 qty.1
- Large: SCREW CAP HEXF M10-1.25X55 G10.9 p/n 5001801 qty.2



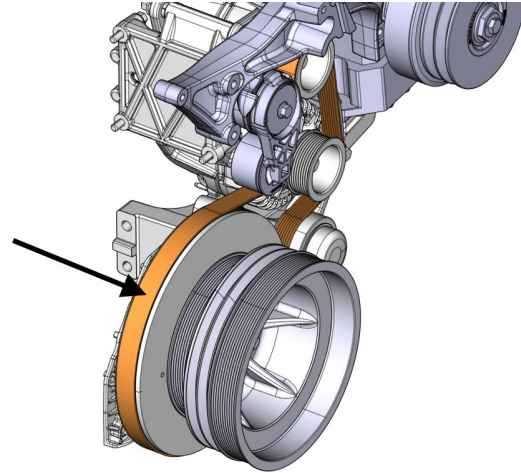
27. If it was removed, re-install the alternator belt tensioner.

Note: Use blue Loctite 243 on threads

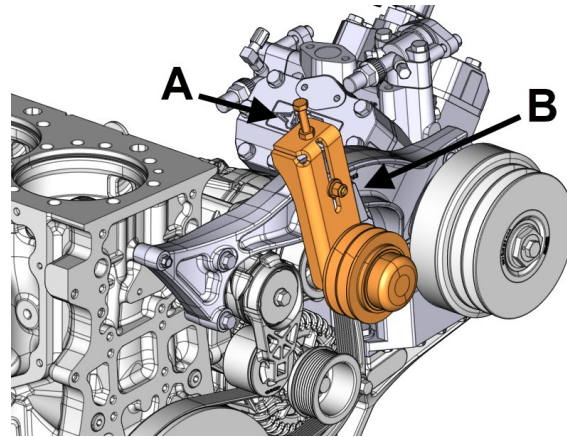
Tighten the tensioner mounting bolt to **48 lb-ft. (65 N-m)**.



28. Reinstall the alternator belt. To do so, rotate the automatic tensioner using a $\frac{1}{2}$ square drive breaker bar and install the belt as shown.



29. Reinstall tensioner, bolt and washer **B** and bolt and nut **A**. Do not tighten these bolts at this point.



30. Reinstall A/C compressor drive belts.

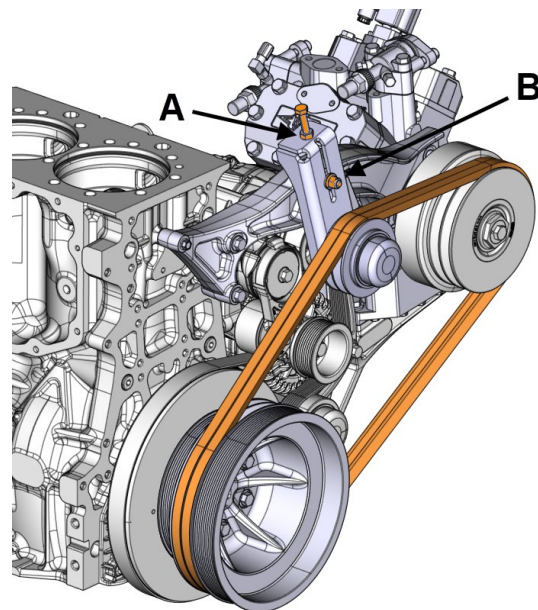
A belt strand tension gauge is needed. Belt tension should be within the following range:

- 90-100 lbs new belts (mean of 2 belt values)
- 75-85 lbs used belts (mean of 2 belt values)

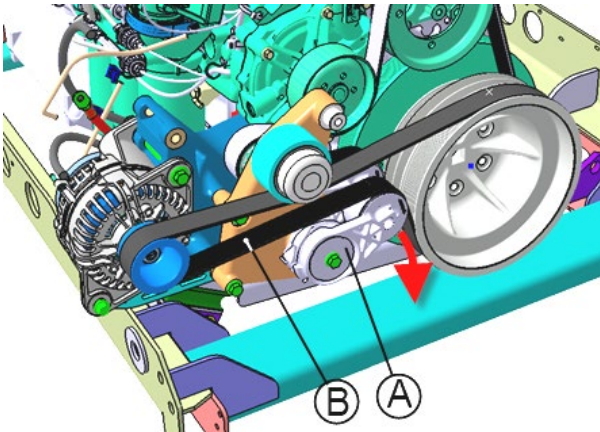
31. Apply blue Loctite 243 on bolt **B** threads and then hand-tighten bolt **B**. Adjust belt tension using bolt **A**. Use the jam nut at the base of bolt **A** to keep proper tension adjustment.

Note: Once thread locker is applied, do not wait too long before applying final torque.

When proper tension is achieved, tighten bolt **B** to **43 lb-ft. (58 N-m)**.



32. Rotate the automatic belt tensioner **A** clockwise using a 1/2 square drive breaker bar and then reinstall the cold side alternator drive belt **B**.



PART 3 – PULLEY REMOVAL / INSTALLATION

SPECIAL TOOLS REQUIRED TO TIGHTEN THE ALTERNATOR PULLEY MOUNTING NUT



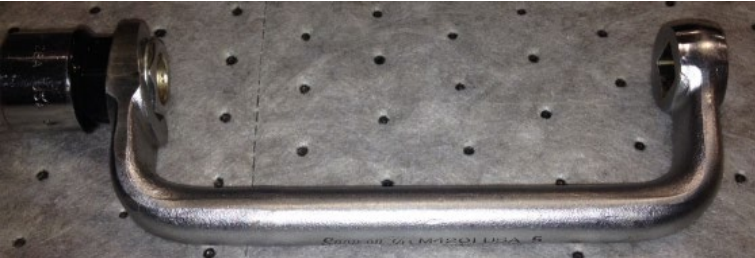
METRIC 10mm 12-POINTS SPLINE DRIVE LONG (CARLYLE SLTS3810M AVAILABLE FROM NAPA)



OFFSET 7/8 WRENCH (CYLINDER HEAD WRENCH), SNAP-ON PART NUMBER M4201

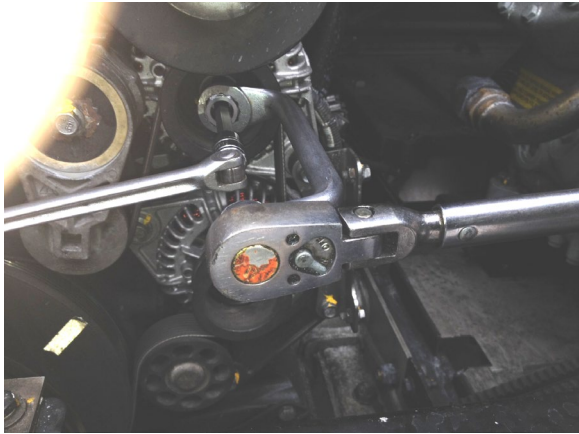
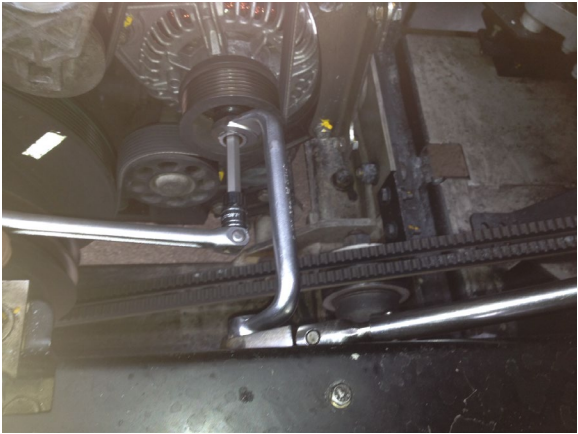


7/8 SOCKET (PART NUMBER WA28-28A)





OFFSET 7/8 WRENCH FITTED WITH 7/8 SOCKET AND 10mm 12-POINTS SPLINE DRIVE



USING THE CYLINDER HEAD WRENCH WITH A RATCHET AND A FLEX SOCKET WRENCH

PULLEY REMOVAL / INSTALLATION

IMPORTANT INFORMATION !

The Alternator may be provided with this type of nut and washer – DO NOT USE!

Reuse the original flange nut or use a new p/n **21429955** flange nut.

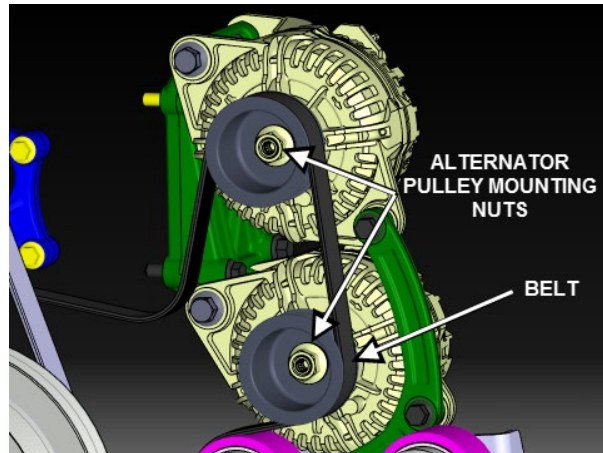


If the original alternator was equipped with a flange nut and a big flat washer, reuse both of them on the new alternator or use a new p/n **21429955** flange nut without washer.

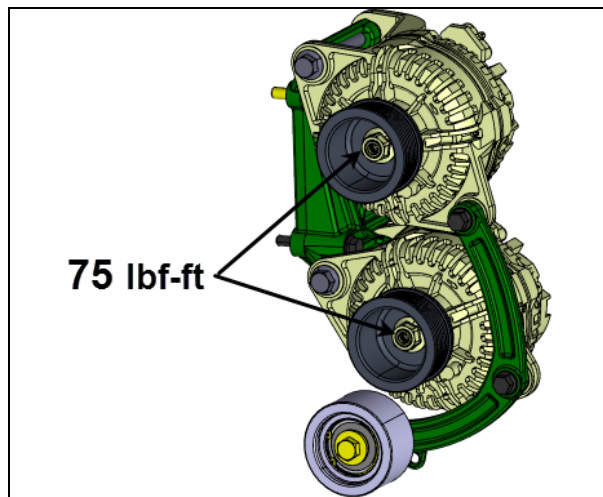


NEVER REUSE A FLANGE NUT WITH WASHER WITHOUT THE WASHER!

1. Unscrew the alternator pulley mounting nut.
2. Remove the alternator pulley (2 pulleys).




3. Mount pulley onto alternators. Use Loctite 243 blue on threads. Tighten pulley mounting nut to **75 lb-ft** using special tools and a M10 12-points spline drive mounted on a torque wrench.



FUNCTIONAL TEST

14. Reset main circuit breakers if applicable. Set the battery master switch (master cut-out) to the ON position and start the engine. Make sure that the charging system is working normally.

On the instruments cluster, the alternator telltale  illuminates if the alternators are not charging.

PARTS / WASTE DISPOSAL

Discard according to applicable environmental regulations (Municipal/State[Prov.]/ Federal)

Access all our Service Bulletins on <https://secureus5.volvo.com/technicalpublications/en/pub.asp>
Or scan the QR-Code with your smart phone.

E-mail us at technicalpublications_prev@volvo.com and type "ADD" in the subject to receive our warranty bulletins by e-mail

