



**MAINTENANCE
INFORMATION**









MI16-16

DATE :	FEBRUARY 2016	SECTION :	01 - Engine
SUBJECT :	VOLVO D13 ENGINE – STARTER REMOVAL AND INSTALLATION		

DESCRIPTION

This procedure applies to current Melco 105P70 starter part number #21212425.

REQUIRED TOOLS

<p>RATCHET EXTENSION BAR</p> 	<p>RATCHET AND SOCKET SET – METRIC</p> 
<p>CORDLESS DRILL</p> 	<p>BRASS WIRE CUP BRUSH</p> 
<p>TORQUE WRENCH</p> 	<p>CUTTING PLIERS</p> 
<p>VOLTMETER / MULTIMETER</p> 	<p>METRIC OPEN END WRENCH SET</p> 

PROCEDURE – STARTER REMOVAL AND INSTALLATION



DANGER

Park vehicle safely, apply parking brake, stop engine. Prior to working on the vehicle, **set the ignition switch to the OFF position**, the battery master switch to the OFF position and trip the main circuit breakers equipped with a trip button.

RISK OF ELECTRICAL SHOCK

1. The starter 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 starter **B** (batt) terminal. However, a faulty master relay R1 could eventually leave the battery power circuit closed, thus electrical power would be present at the starter **B** terminal.
2. Using a voltmeter or multimeter, probe the starter **B** terminal and the **ground** terminal. Make sure that the voltage reading is 0 volt prior disconnecting the starter cables (FIGURE 2).

STARTER REMOVAL

3. While proceeding from under the vehicle, gain access to the starter (item 29 on FIGURE 1) on the turbocharger side (street side).

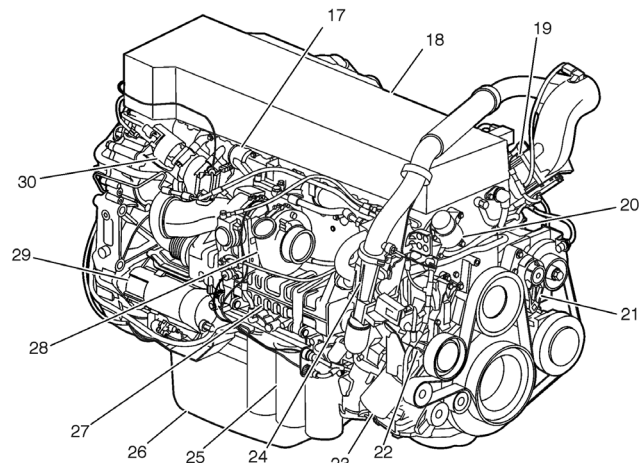


FIGURE 1: D13H ENGINE OVERVIEW, TURBO SIDE

4. On the starter, disconnect circuits **0C**, **101** and **101B** (see FIGURE 2). Properly clean cable lugs as applicable using a brass wire cup brush, a Scotch-Brite pad or an emery cloth. Remove old Color Guard Rubber Coating as much as possible.

IMPORTANT: keep hardware for later use

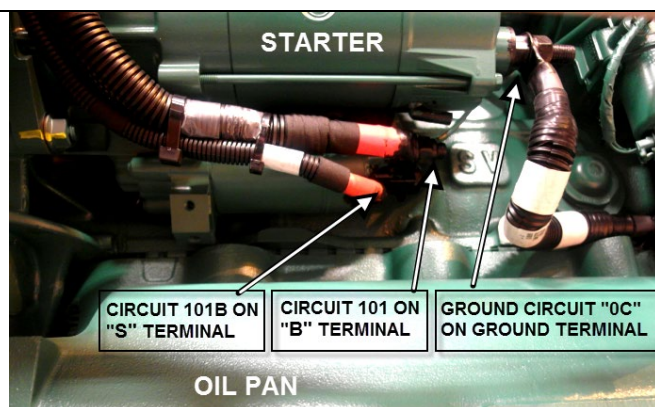


FIGURE 2

5. Using a 18mm socket, unscrew three bolts fastening the starter to the flywheel housing (FIGURE 3).
6. Detach the starter from the flywheel housing.

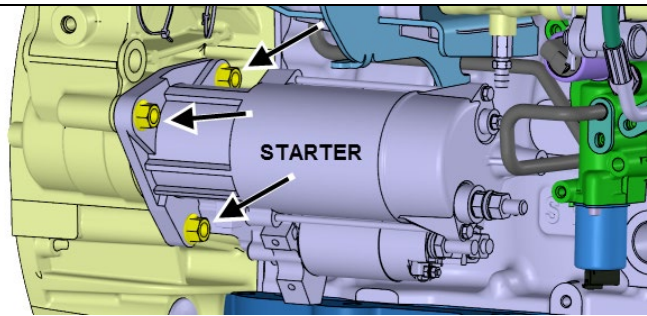


FIGURE 3

STARTER INSTALLATION

1. If the starter is replaced with a brand new starter, prepare the new starter as follows (refer to FIGURE 5).
 - a) Remove the second nut on the ground terminal (FIGURE 5). Keep for later use.
 - b) Remove the jumper cable connected to the ground terminal (FIGURE 5).
 - c) Make sure that the three nuts identified on FIGURE 5 are tightened to a torque of **22 lbf-ft**.
 - d) Reinstall the jumper cable to the ground terminal.
 - e) Install a nylon tie mount p/n 504013 on the starter. Refer to FIGURE 6 for proper location. Secure the nylon tie mount with one screw p/n 502817 (FIGURE 7).

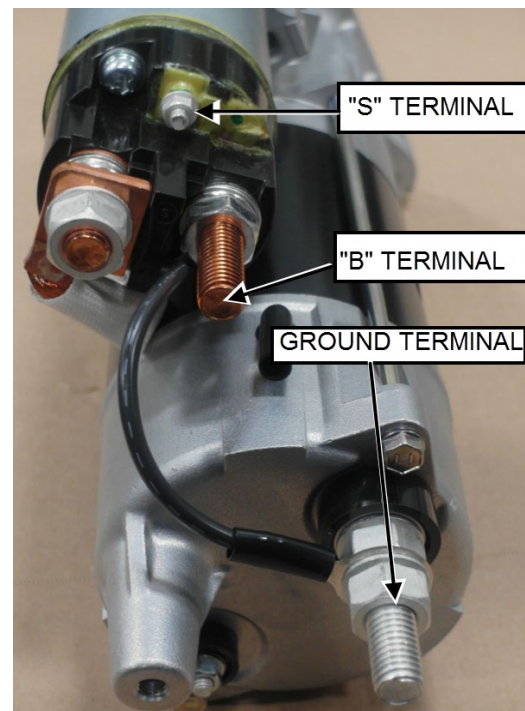


FIGURE 4 : TERMINAL IDENTIFICATION

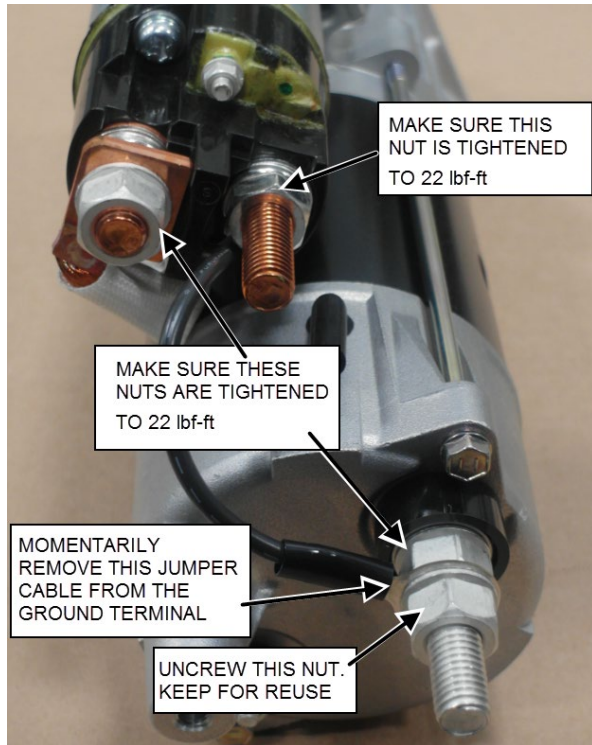


FIGURE 5

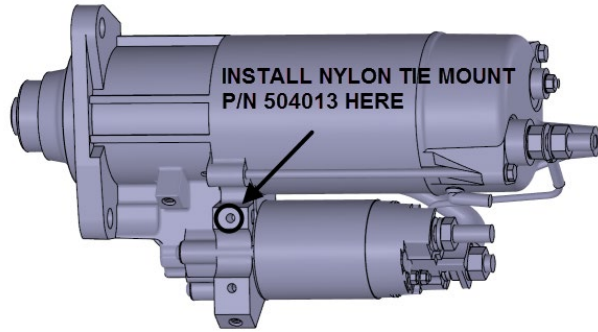


FIGURE 6

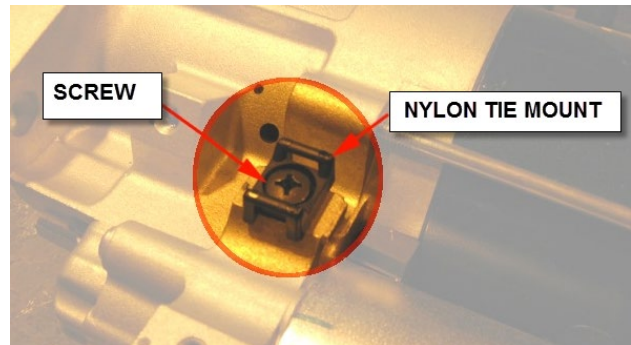


FIGURE 7

2. Install the replacement starter with the solenoid located on the underside of the starter motor as shown on **FIGURE 8**.
3. Hand tighten the three mounting nut.
Flange nut M12 p/n 990942 qty: 3
4. Once the starter is properly seated on the flywheel housing, torque the three mounting nuts to a torque of **44 lbf-ft**.

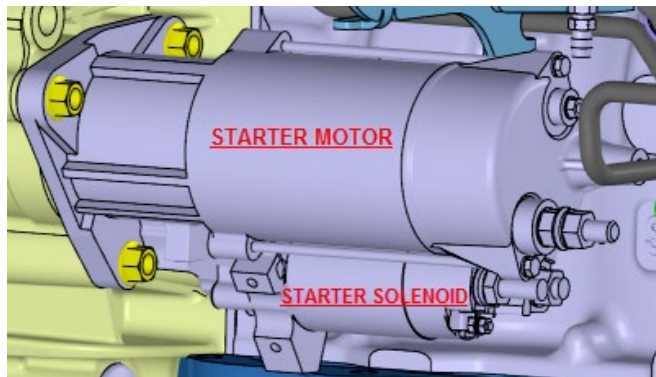


FIGURE 8

INSTALLATION OF CIRCUIT 0C

5. Connect the ground cable (circuit 0C) to the ground terminal first. Make sure the ground cable extends vertically downward from the terminal as shown on **FIGURE 9**.
6. Secure the ground cable lug with the nut previously removed at step 1-a. Tighten to a torque of **22 lbf-ft**.

M12 hex nut p/n 983717

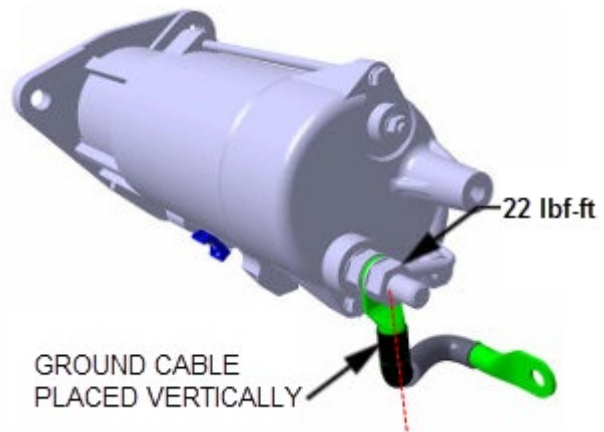


FIGURE 9

INSTALLATION OF CIRCUIT 101

7. Connect circuit **101** to **B** terminal (FIGURE 4 & FIGURE 5). Position circuit **101** cable to be in line with the nylon tie mount on the starter.
8. Place the washer against circuit **101** cable lug and secure cable lug and washer with the nut. Tighten the nut to a torque of **22 lbf-ft.**

washer p/n 500958 qty:1

nut p/n 5001761 qty:1

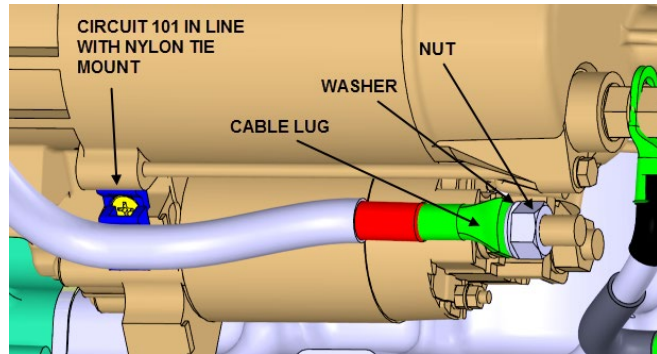


FIGURE 10

INSTALLATION OF CIRCUIT 101B

9. If not already done, remove the nut and washer provided with the brand new starter on **S** terminal (FIGURE 4).
10. Connect circuit **101B** to **S** terminal. Position circuit **101B** cable to be in line with the nylon tie mount on the starter.
11. Place the provided washer against circuit **101** cable lug and then secure cable lug and washer with the nut provided. Tighten the nut to **35 lbf-in.**

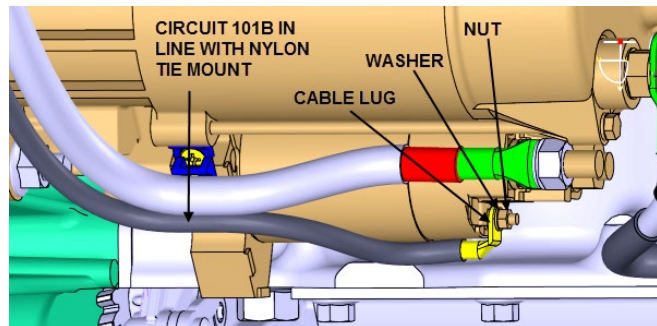


FIGURE 11

12. Secure circuit **101** and **101B** to the tie mount using one nylon tie *p/n 504016*.
13. Tie circuit **101** and **101B** together using one nylon tie *p/n 504637* as shown on FIGURE 12.

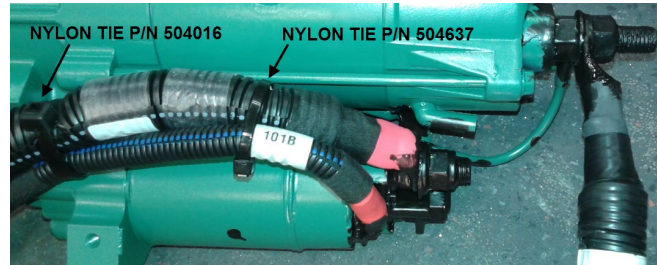


FIGURE 12

14. Apply anti-corrosion compound or **Color Guard Rubber Coating** (Prevost *p/n 684013*) on starter terminals, cable lugs and nuts (see FIGURE 13 to FIGURE 15).



FIGURE 13

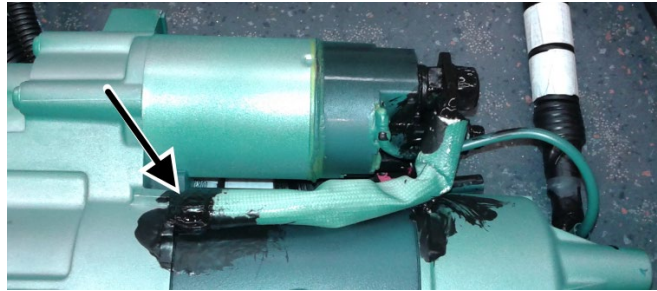


FIGURE 14



FIGURE 15

FUNCTIONAL TEST

1. Reset main circuit breakers if applicable. Set the battery master switch (master cut-out) to the ON position and start the engine.

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.