

PARTS & SERVICE NEWS

REF NO.	AA00038A
DATE	May 5, 2000

(C)

This PARTS & SERVICE NEWS supercedes AA00038 dated March 8, 2000 and should be discarded.

SUBJECT: TORQUE CONVERTER BOLT AND ELECTRONIC CONTROL UNIT (ECU) FOR THE TRANSMISSION.

PURPOSE: Change the washer thickness to prevent the impeller to impeller hub bolted joint from loosening and insure that the bolt threads have had thread locker applied. Enhance the ECU program to give an early warning if the transmission sump temperature exceeds 230° F (110 °C).

APPLICATION: GD750A-1 Grader Serial Number 07001 thru 07103 and 07105

FAILURE CODE: 132504

DESCRIPTION:

INTRODUCTION

The bolted joint between the torque converter impeller and the impeller hub has been found with loose bolts, too small of a washer and no Loctite on the mounting bolt threads. This field campaign will replace the torque converter with one that has been properly assembled and pre-tested for leakage.

In addition, we are taking this field campaign opportunity to enhance the transmission controller (ECU). The ECU will be exchanged for an updated program that will add a audible alarm and transmission error code "150" if transmission sump temperature exceeds 230° F (110° C). The temperature sensor and alarm module are already present on the grader but were not previously used for this function. This programming enhancement will provide the operator an early warning if too much oil begins to bypass the torque converter cooler and the temperature climbs to an elevated level in the transmission sump.

Table 1: Replacement Parts

Part Number	Qty	Description
8100 611 H91	1	Torque converter kit, GD750
Torque Converter Kit consists of:		
1440 083 H92		Torque converter assembly
1437 669 H91		drive plate
1244 194 H1		ring
1437 733 H1		capscrew 10 x 18
1440 144 H1		sleeve - pilot
1437 653 H1		Seal oil
1440 102 H1		transmission control unit

Note:

This field campaign is being conducted replacing the torque converter as a tested swing component between graders. Upon removing the transmission, please closely examine the transmission housing for any signs of interference or wear between the torque converter and the transmissions front cover. If there has been any signs of interference call Frank Quail (Service engineer) immediately for repair directions. Phone (847) 970-5714.

Once the converter has been removed return both ECU and the converter to CMO freight collect, with the "Returned Parts Request Form" provided. Contact Dennis Rogers with any questions. Phone (423) 755-9628.

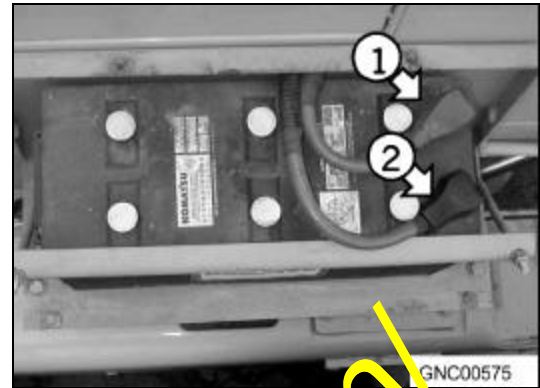
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DISCONNECT THE BATTERIES

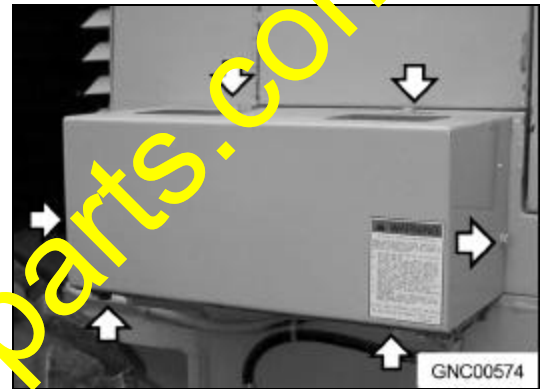


WARNING! The battery to machine ground is on the **LEFT** battery. Therefore, if the **RIGHT** battery is disconnected before the **LEFT**, you will have the possibility to have a 12V short-circuit to the machine.

1. Disconnect the battery by first removing **negative** cable (2). Then remove positive cable (1).
2. Remove the left battery, then the right battery.
3. Remove the six mounting bolts (M10 x 20 mm) and lift off the step cover.

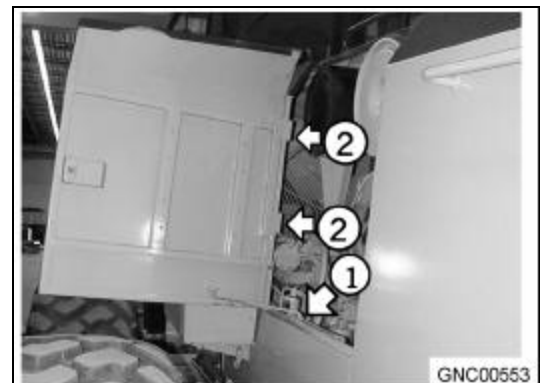


WARNING! Key switch must be in the **OFF** position. Care must be taken! If you do not ensure that the (-) terminal is removed first and that the (+) terminal is held away from the frame an arc can occur when the key switch is in the **ON** position.

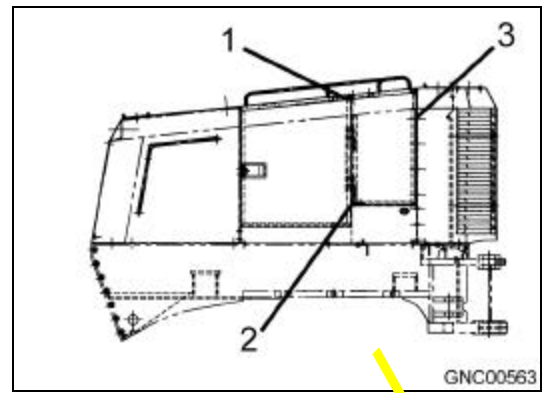


REMOVE THE ENGINE COWLING AND DOORS

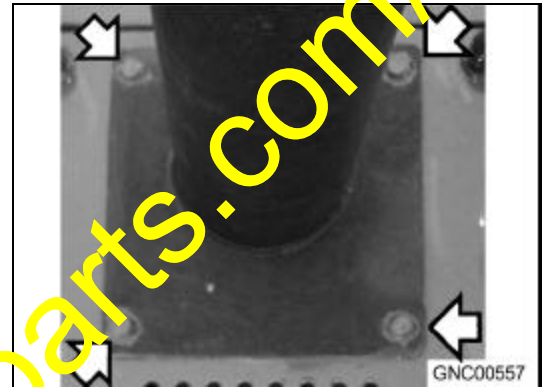
1. Using the latch, open engine left and right side doors.
2. Using a web strap, loop it around each door at about the midpoint. Remove LH and RH side doors. Disengage door stop (1), then lift up on the door. Each door is hung on two pins (2).



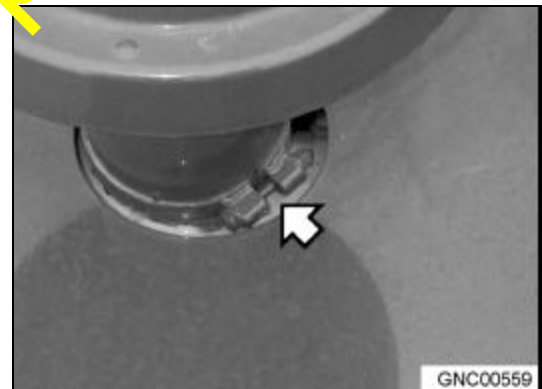
3. Remove the small side access doors by removing mount bolt (1) (M8 x 25 mm) at the top, then remove mount bolt (2) (M8 x 25 mm) at the bottom. H The door will swing open. You can leave the doors attached or take out the four mount bolts (3) (M8 x 25 mm) in the hinge.



4. Remove the four mounting bolts (M10 x 20 mm) and lift the exhaust stack off and place it out of the way.



5. Remove the air intake cap and tube.
 - a. Remove the bolt (M10 x 80 mm) in the clamp at the base of the cap & tube of the air intake.



- b. Lift cap & tube off and place it out of the way.



6. Secure top cowling with web straps and a lifting device.



- a. Remove the four forward and five rear mount bolts (M10 x 20 mm).



- b. Lift off and place out of the way.



INSTALL THE ENGINE COWLING AND DOORS

1. Carry out installation in the reverse order of removal.
 - a. Install with bolts and washers that were removed.

Hi Torque values:

M8 = 23.2 ± 2.1 lbf ft. (31.38 ± 2.94 Nm)

M10 = 48.5 ± 5.0 lbf ft. (65.70 ± 6.86 Nm)

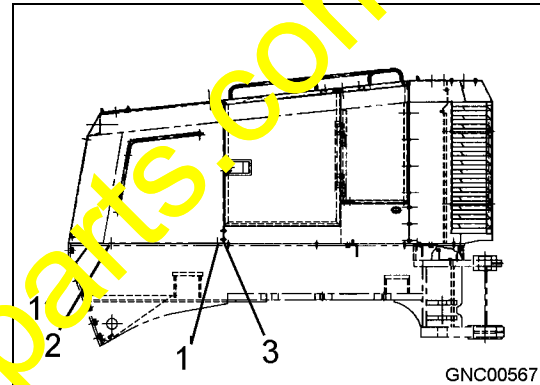
REMOVE THE FUEL/HYDRAULIC TANK HOOD

1. Remove the hood grille. Remove the four mount bolts (M10 x 20 mm) (as indicated by the four arrows at the right), then pull the hood grille out and set out of the way.
2. Reach in and disconnect the combination tail light wiring harness from the main harness.
H This connection is located on the lower left side of the machine.



3. Remove five mount bolts from each side as indicated by (1, 2, 3) at the right.

- (1) = M10 x 25 mm ----- 2 EA.
- (2) = M10 x 50 mm ----- 1 EA.
- (3) = M10 x 25 mm ----- 2 EA.



4. Using three lifting straps or chains and lifting crane lift the hood straight up. Then move it to the side out of the way.
H While lifting, watch for "pinched joints" on the wiring, etc.



INSTALL THE FUEL/HYDRAULIC TANK HOOD

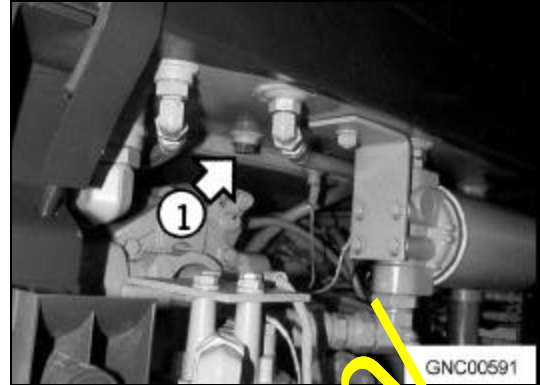
1. Carry out installation in the reverse order of removal.
H Install with bolts and washers that were removed.

H Torque values:

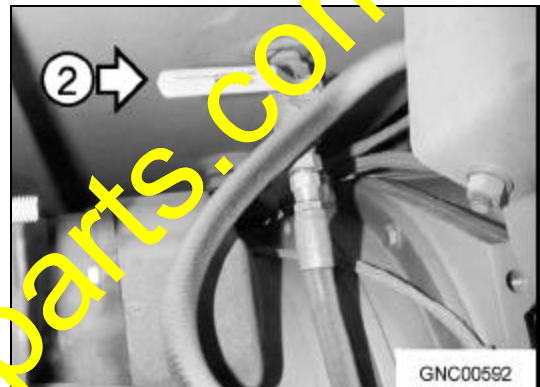
M10 = 48.5 ± 5.0 lbf ft. (65.70 ± 2.9 Nm)

REMOVE THE FUEL / HYDRAULIC TANK

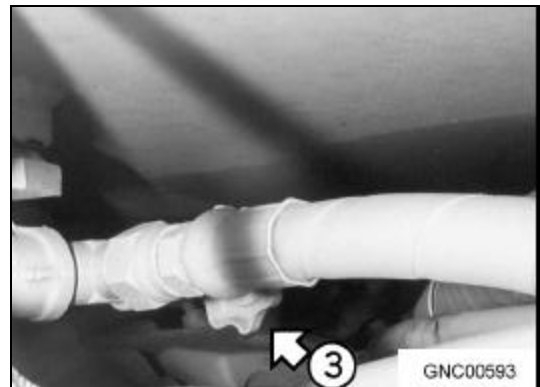
1. Remove drain plug (1) and drain oil from the hydraulic tank.
H Hydraulic tank: 60 L (16 gal)
H Watch out for splash from drain fluid.



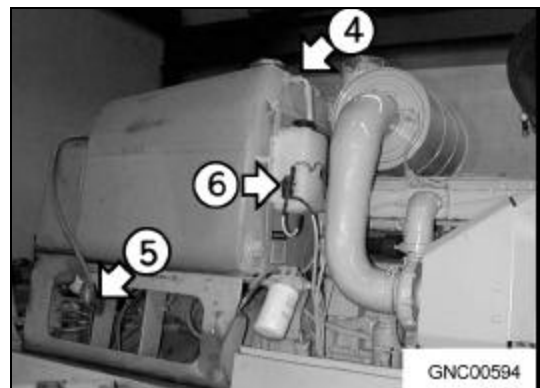
2. Reach under right forward side of the fuel tank and turn lever valve (2) down to drain fuel from the tank.
H Make sure drain hose is in a suitable container.
H Fuel tank: 378.5 L (100 gal)



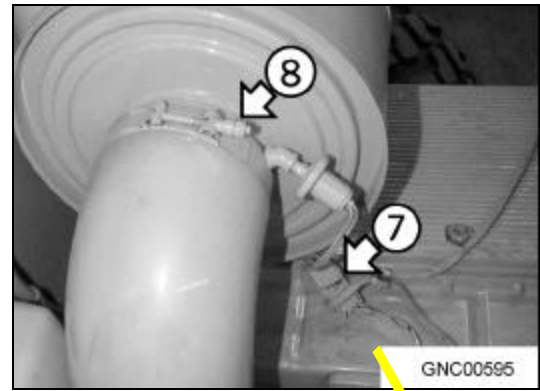
3. Turn the "faucet" type valve (3) off (clockwise), then disconnect and plug hose leading to the fuel filter at the fuel tank end.
H The valve is located dead center, forward edge of the fuel tank. It can be more easily reached from the left forward side of the fuel tank.



4. Disconnect, plug and cap the fuel return line (4).
5. Remove clamp (5) on the axle to hydraulic tank air pressure relief line.
6. Disconnect, plug and cap axle to hydraulic tank air pressure relief line. The end located by the hydraulic service port.
7. Disconnect electrical wiring and tubing (6) for the windshield washer storage tank.



8. Tape over the opening to the air cleaner. Disconnect the electrical connector to the electrical vacuum switch hook up (7). Loosen clamp (8) and remove the air intake hose from the air cleaner.



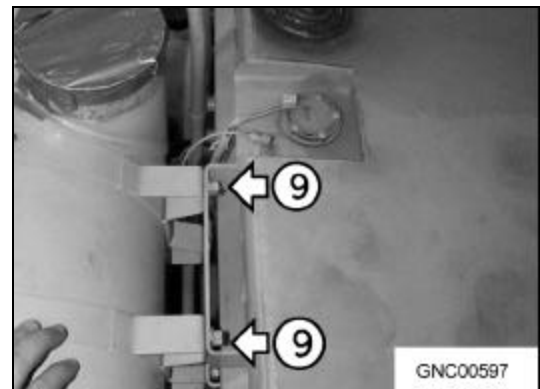
9. Remove the lower two mount bolts (9) (M10 x 25 mm) on the air cleaner.



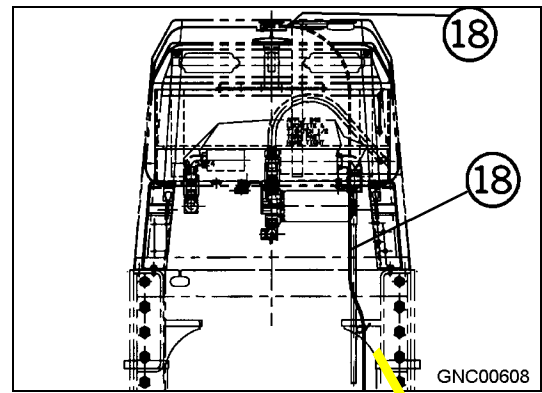
10. Loop a web strap (11) around the air cleaner and to the lifting device.



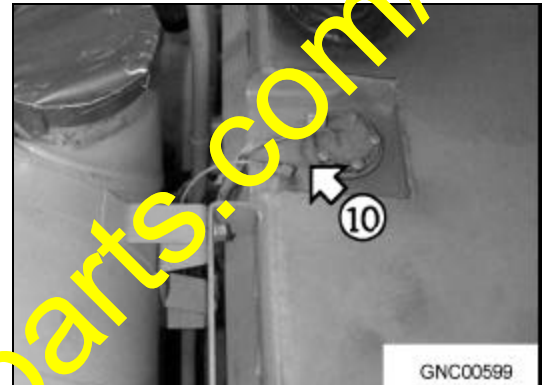
11. Remove the top two mount bolts (9) (M10 x 25 mm) of the air cleaner, then lift and set the air cleaner out of the way.



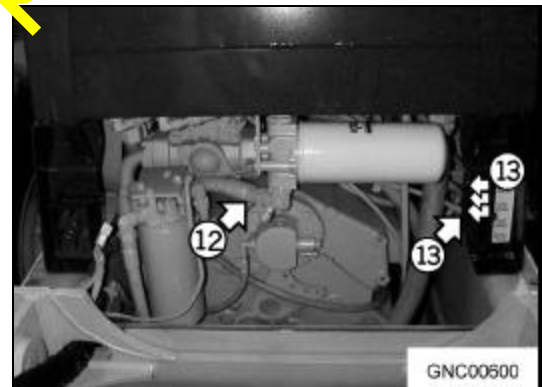
12. Disconnect and remove the fuel overflow tubing (18).



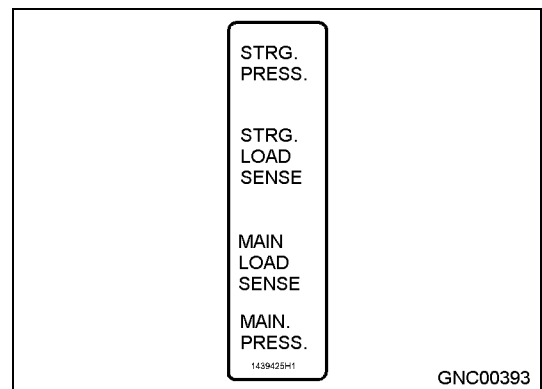
13. Disconnect the electrical wiring to the fuel sensor (10).



14. Disconnect and cap the hydraulic line below the hydraulic filter (12). Also, disconnect and cap the hydraulic lines on the bottom left of the tank.



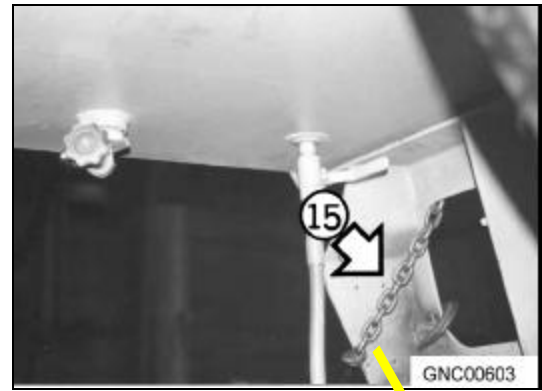
15. Disconnect, plug and cap the lines (13) right behind the mounts for remote test ports located on the right rear tank support behind the decal pictured at right.



16. Install chains at the four corners of the tank support brackets as shown (15). Use a compatible lifting device for the weight.

H Hydraulic tank (dry): 74 kg (163.1 lb.)

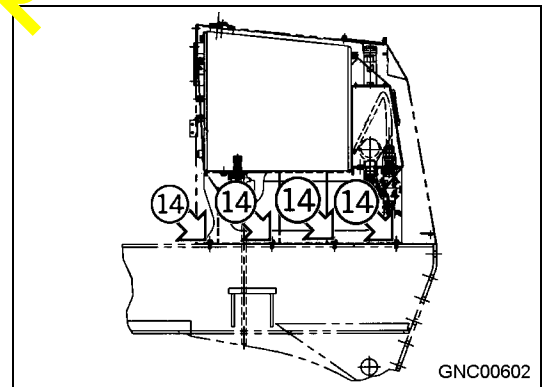
H Fuel tank (dry): 119.2 kg (263 lb.)



17. Remove four mount bolts (14) (M12) on the left side and on the right side.



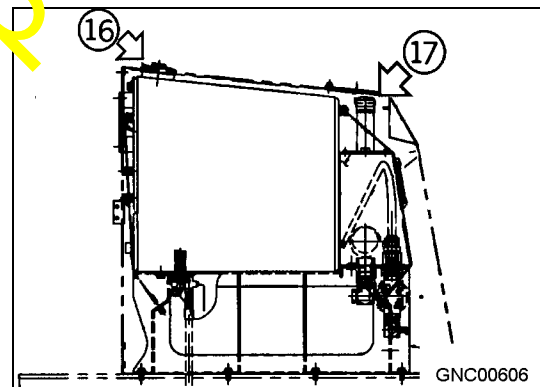
18. Lift the fuel / hydraulic tank off the machine and set it aside on a wood pallet.



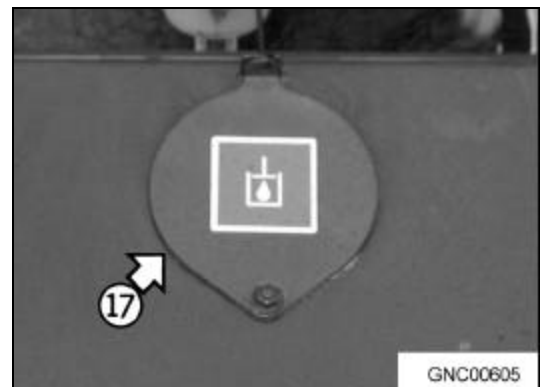
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INSTALL THE FUEL / HYDRAULIC TANK

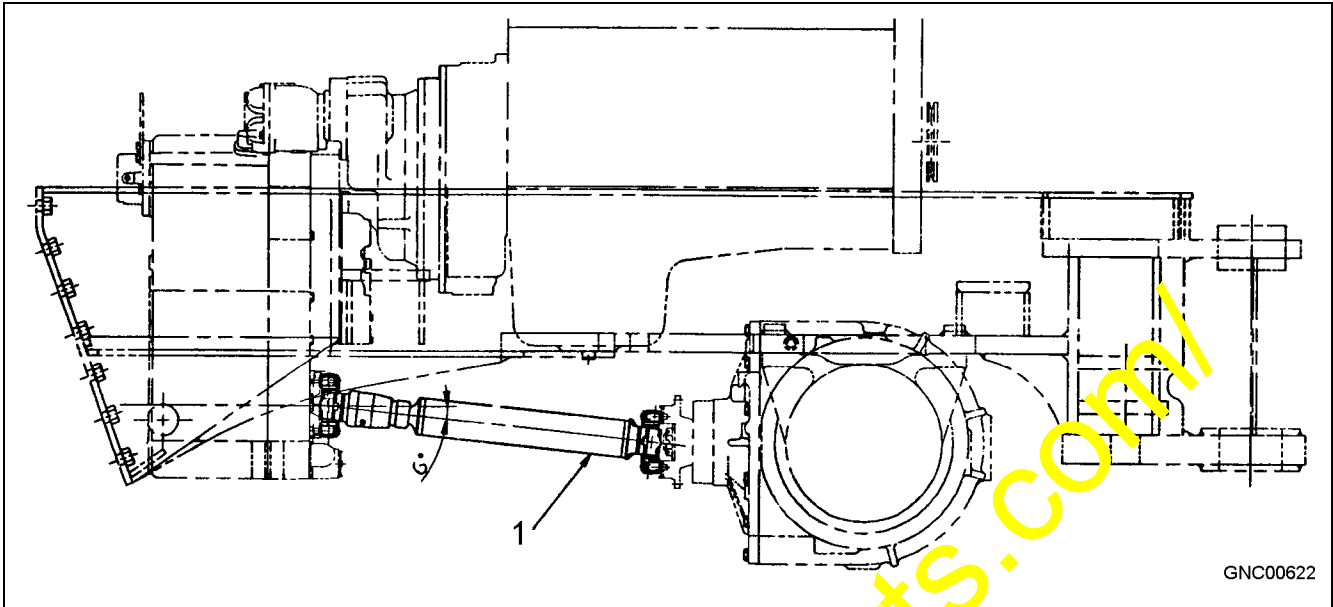
1. Carry out installation in the reverse order of removal.
 - H Install the bolts and washers and nuts for clamps that were removed.
 - H Put hydraulic oil on all O-ring seals before installation.
 - H Remove all tape, caps and plugs.
 - H Torque values:
 - M10 = 48.5 ± 5.0 lbf ft. (48.5 ± 5.0 Nm)
 - M12 = 82.6 ± 7.2 lbf ft. (112.77 ± 9.80 Nm)
2. Fill the fuel tank through the service port (16).
 - H Fuel tank: 378.5 L (100.0 gal.)



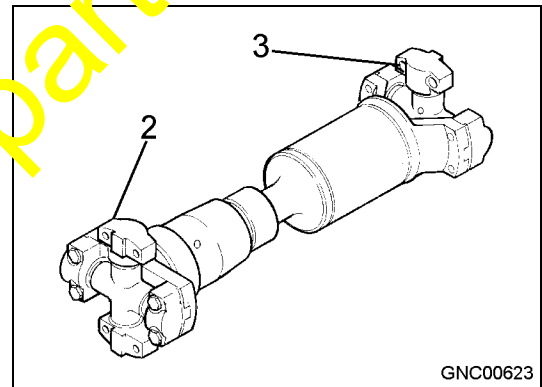
3. Fill the hydraulic tank through the service port (17).
 - H Hydraulic tank: 60 L (16 gal.)



REMOVE THE DRIVE SHAFT



1. Remove the four bolts (2) (12 PT. Flange head 1/2 x 20 UNF-2A x 2 1/4 LG) on the transmission side of the drive shaft.
H Support the drive shaft so it will not fall and damage the Cross and Bearings.
2. Remove the four bolts (3) (12 PT. Flange head 1/2 x 20 UNF-2A x 2 1/4 LG) on the differential side of the drive shaft.
3. Place the drive shaft in a secure area so it will not be damaged.

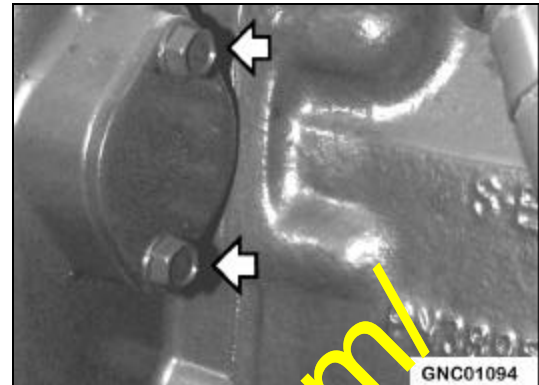


INSTALL THE DRIVE SHAFT

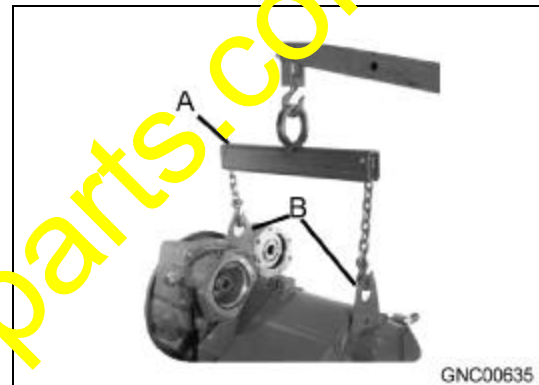
1. Carry out installation in the reverse order of removal.
H **Torque values:**
12 PT. Flange head 1/2 x 20 UNF-2A x 2 1/4 LG = 15.2 - 16.5 KgF (110-120 lb-ft) [149 - 163 Nm]

REMOVE THE TRANSMISSION

2. Remove flywheel housing access cover and remove 12 bolts (3/8-24 NF Grade 8) from the torque converter to engine flywheel. (Rotate crankshaft by hand to gain access to each bolt by using wrench on crank shaft dampener mounting bolts)

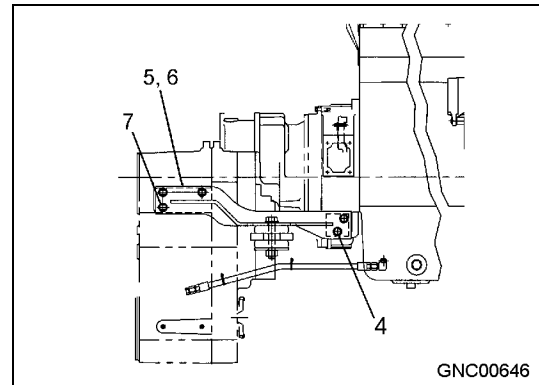


3. Connect appropriate chains (B) and hoist (A) to transmission at the lifting points.
H Support the rear part of engine with large blocks. (Rear portion of the engine is not supported when transmission is removed.)

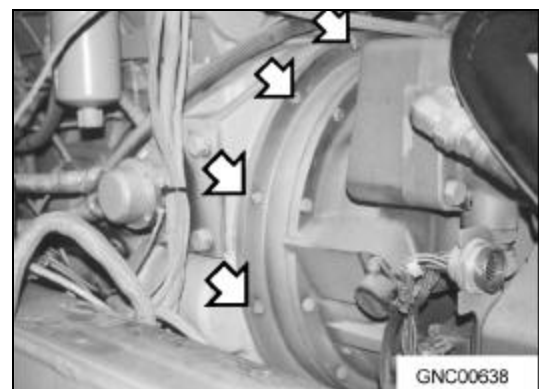


4. Make sure all hydraulic lines and electrical connectors are disconnected from the transmission.

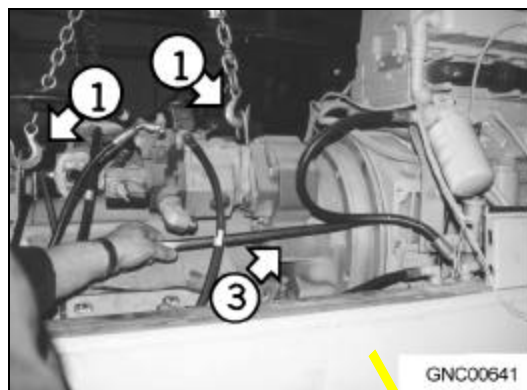
5. Disconnect the six bolts (7) (M16 x 45 mm) and the four bolts (4) (M16 x 80 mm) on the LH & RH transmission support brackets.



6. Remove 12 bolts (3/8 NF grade 8) from the torque converter to engine.



7. Working with the transmission, hoist (1) and crow-bar (3), move the transmission toward the back.



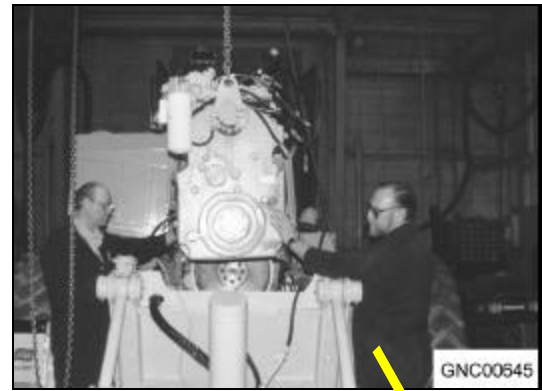
8. Using two men, work the transmission back and up



- a. Raise the transmission up.



- b. Swing the transmission out.



- c. Place it on stand (A).



9. Wrap lifting strap around converter OD and pull converter assembly away from the transmission.
H Converter weight: 74.8 kg (165 lbs.).
10. Closely examine the transmission housing for any signs of interference or wear between the torque converter and the transmission's front cover. If there has been any signs of interference call Frank Quail (Service engineer) immediately for repair directions. Phone (847) 970-5714.
11. Replace input seal in transmission front cover provided in torque converter kit P/N 8100 611 H91.
H If outside diameter of oil seal is not already coated with a sealer apply Loctite #620
H Clean up converter provided in kit and carefully install on input shaft.

INSTALL THE TRANSMISSION

1. Check the engine crankshaft end play. It should comply with the engine manufacturer's tolerance. (See the Cummins Engine Shop Manual)
2. Clean, prepare and apply Loctite 680 to the surface between the flywheel pilot bore and the pilot sleeve mating surface and install the pilot sleeve.
3. Place a light coat (0.06 to 0.12 thick) of grease grade 251H EPM on the inside diameter of pilot sleeve. Pilot cavity should be less than 25% filled.
4. Thread a 3/8 - 24 stud (with a screwdriver slot in the end) into one of the threaded inserts on the drive plate from the engine side.

5. Rotate the engine flywheel until one of the drilled holes is aligned with the flywheel housing access hole.
6. Support the transmission assembly so that it can be positioned directly in line with the engine crankshaft, align the converter cover pilot with the pilot sleeve bore, and align the stud (protruding from drive plate face) with one of the thru holes in the flywheel.



WARNING! Pilot sleeve must be in the engine FLYWHEEL and on the transmission DRIVE PLATE or severe damage will occur to the engine and transmission.

7. Push the transmission up to the engine.



WARNING! If the transmission does not close up to the flywheel, do not proceed. Forcing the transmission up to the engine with the assembly bolts could preload the engine crankshaft and cause engine and / or transmission problems later. Remove the transmission and check previous assembly steps as listed to determine where the problem is and take corrective action before proceeding.

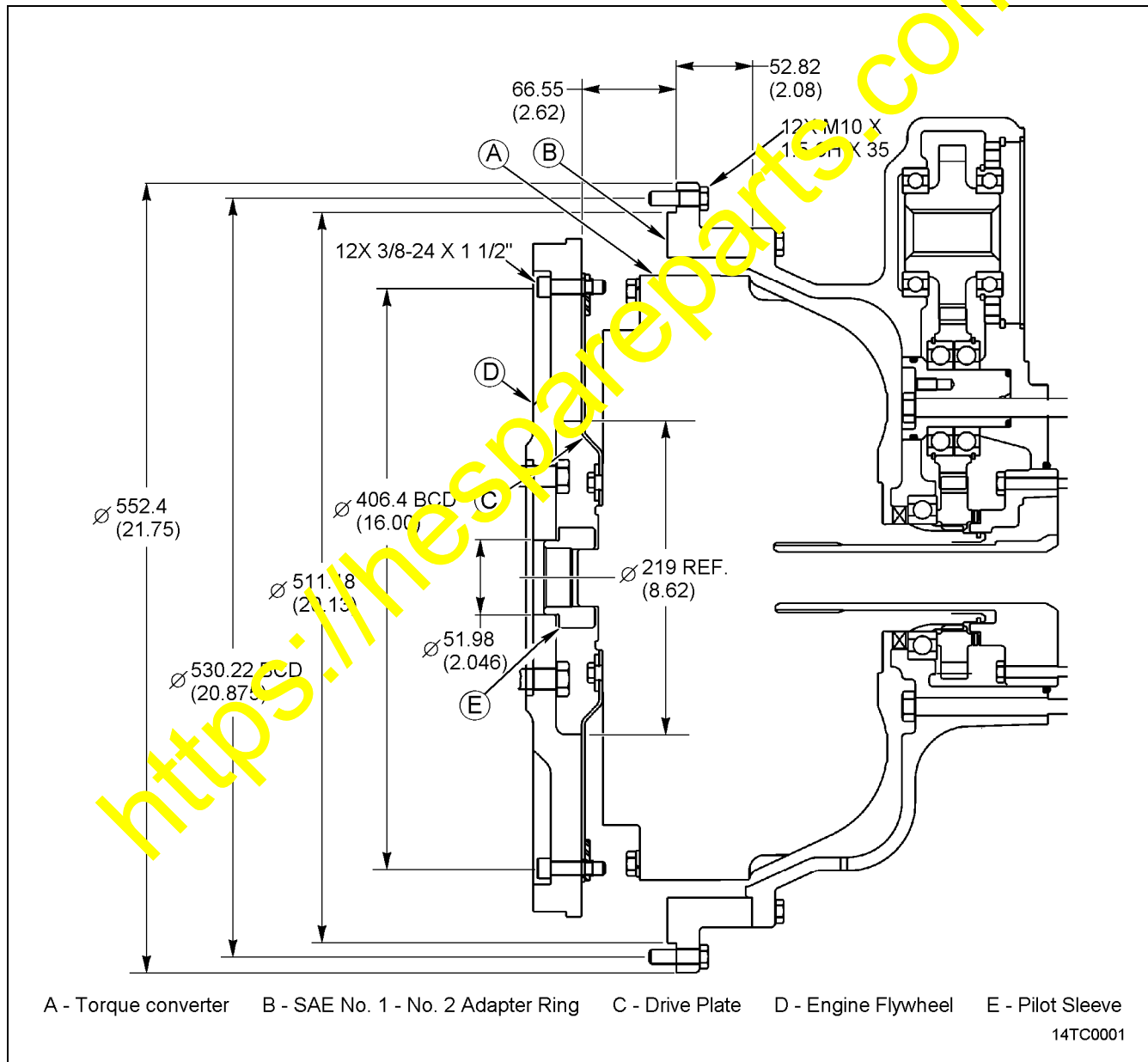
8. Bolt up the transmission to the engine flywheel housing
9. Attach the drive plate to the flywheel, using 3/8 - 24 UNF grade 8 bolts. One by one, install the bolts and hand tighten thru the engine flywheel housing access hole, removing the alignment stud when it is encountered. After the bolts have been installed, tighten the bolts.
H **Torque value:** 38 lbf ft. (50.99 Nm), (W/T).
10. Recheck the crankshaft end play and compare it with the end play from assembly step number 1. No end play could mean that the crankshaft has been preloaded at assembly with the transmission. The engine and transmission should not be run until a reason for the preload is determined and corrected.
11. Reinstall the access hole cover.
12. Install the LH & RH transmission brackets.
H **Torque values:**
M16 x 45 mm = 206 lbf ft. (278.50 Nm)
M16 x 60 mm = 206 lbf ft. (278.50 Nm)
13. Carry out the rest of the installation in reverse order of removal beginning at step 7 and working back to step 1.

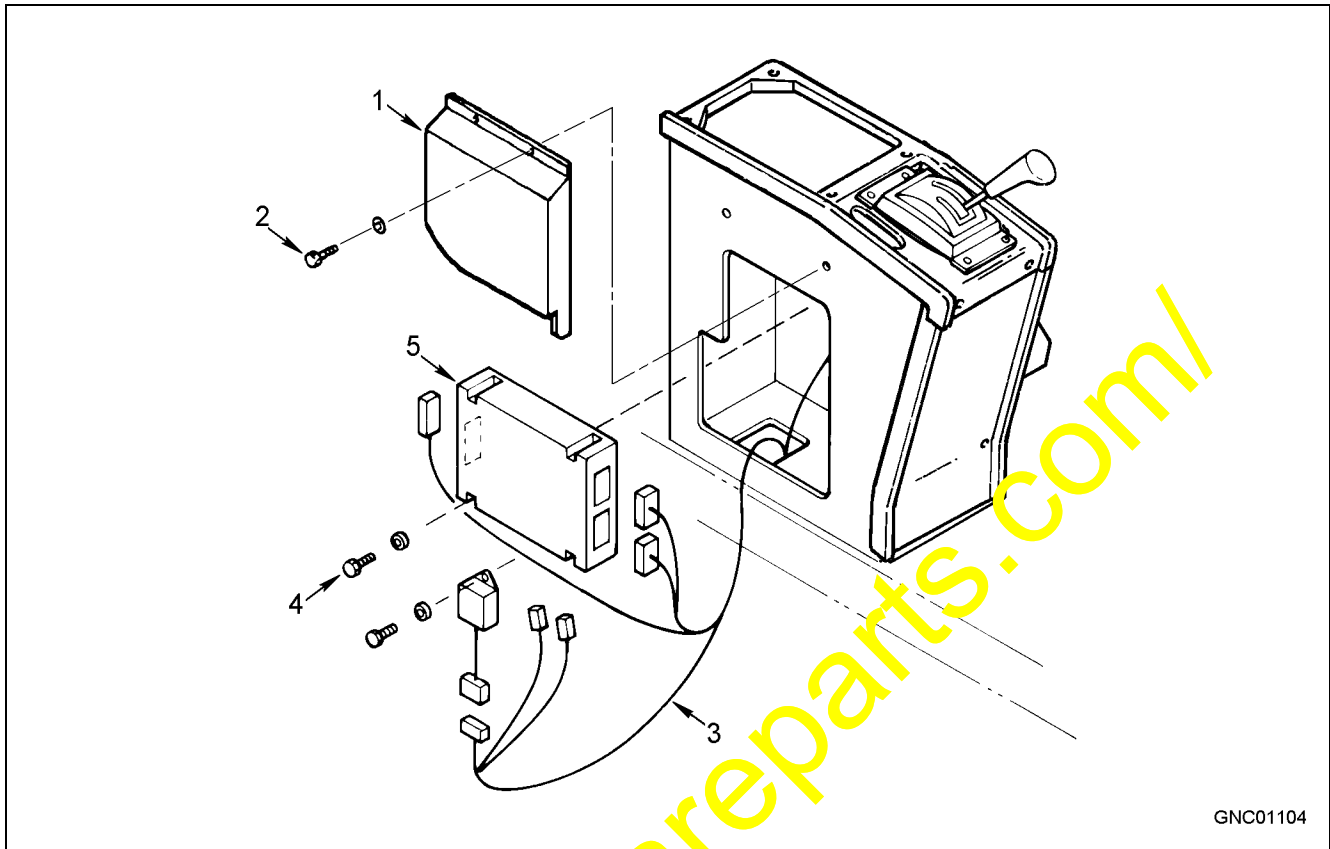
TORQUE CONVERTER TO ENGINE FLYWHEEL DIMENSIONS

Check the torque converter to engine dimensions any time:

- H The engine has been changed.
- H The engine flywheel has been changed.
- H The engine flywheel housing has been changed.
- H The torque converter has been replaced with a different part number.
- H The drive plate has been replaced with a different part number.

NOTE: Check the engine crankshaft end play before and after installing torque converter and transmission. The results must be within the engine manufacturer's specifications. Damage to the engine, torque converter or transmission could result.



REPLACING THE ELECTRONIC CONTROL UNIT

GNC01104

1. Remove Electronic Control Unit cover (1) mounted on side of shifter tower with two screws (2) and two washers.
2. Disconnect transmission harness (3).
H With a hex key wrench, loosen the mounting bolts of the three electrical connectors.
3. Remove four M6 x 70 bolts (4) and four M6 washers securing the Electronic Control Unit (5).
4. Install the replacement Electronic Control Unit (ECU) following instructions in the reverse order to mount.
H Torque value for ECU mounting bolts (4): 10 lbf ft. (13.5 Nm)
5. Once the grader is completely assembled, calibrate the new ECU to the transmission.
H Refer to the shop manual section 20, "**TO READ DIAGNOSTIC FOR TRANSMISSION**".
H Refer to the shop manual section 20, "**CLUTCH CALIBRATION**".
H Refer to the shop manual section 20, "**SUCTION LEAK TEST**".