ENVIRONMENT CONTROL Heating, ventilation and air-conditioning E.40.D

SAFETY SECURITY ACCESSORIES Safety E.50.B

TOOL POSITIONING G

LIFTING G.10.A

TILTING G.20.A

SWINGING G.40.A

WORKING ARM H

SINGLE ARM TOOL ATTACHMENT Lift H.50.B

TOOLS AND COUPLERS J

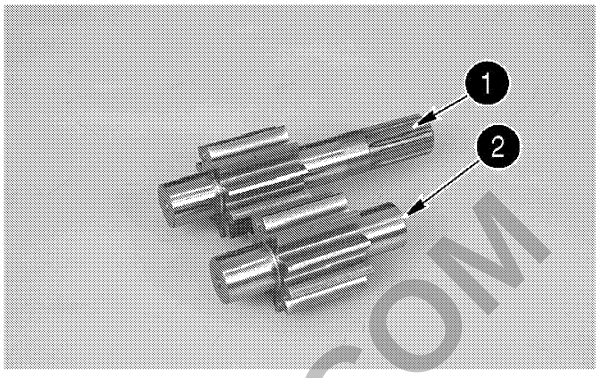
DIGGING Non-articulated digging tools J.20.B

LANDSCAPING Dozer blade J.40.F

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7. Inspect the ends, bearing shaft area and teeth of each gear for scoring. If the scoring is excessive use a new pump.
   (1) Drive gear
   (2) Driven gear



BD02E094 4

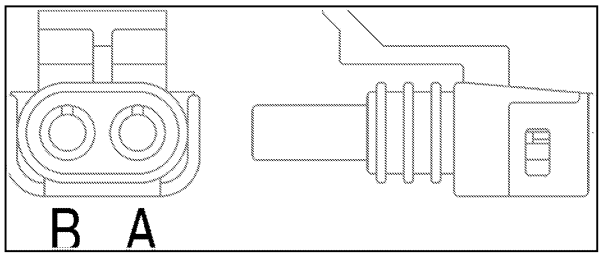
Next operation:
Hydraulic pump - Assemble (A.10.A)

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Cavity	Circuit ID
3	0
4	953

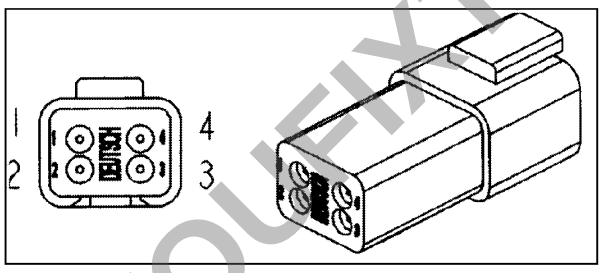
Connector C23A



C23A 9

Cavity	Circuit ID
A	818A
B	818B

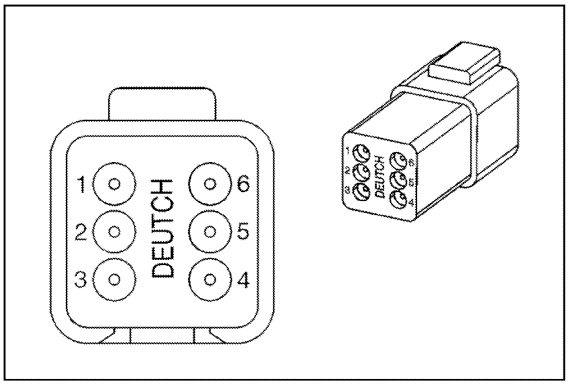
Connector C24



225326C1 10

Cavity	Circuit ID
1	911
2	800
3	801
4	802

Connector C25



225350C1 11

Cavity	Circuit ID	Cavity	Circuit ID
1	921	4	V3ACC
2	818A	5	NOT USED
3	501	6	NOT USED

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Battery - Visual inspection

⚠ WARNING ⚠

Never try to charge the battery if the electrolyte in the battery is frozen. 47-83A

⚠ WARNING ⚠

Never cause sparks to occur or smoke near batteries that are charging or have been recently charged. 13-8A

⚠ WARNING ⚠

Disconnect the ground cable first when the battery cables are disconnected from the battery. Connect the ground cable last when the battery cables are connected to the battery. 47-55A

⚠ WARNING ⚠

Some batteries have a ventilation tube. If there is battery acid in the ventilation tube, this battery acid can be released when the battery is turned upside down. If you turn the battery upside down, make sure that the end of the ventilation tube is away from you and away from any other people in the area. Battery acid can cause severe burns. 48-57B

⚠ WARNING ⚠

BATTERY ACID CAUSES SEVERE BURNS. Batteries contain sulfuric acid. Avoid contact with skin, eyes or clothing. Antidote: EXTERNAL - flush with water. INTERNAL - Drink large quantities of water or milk. DO NOT induce vomiting. Seek medical attention immediately. EYES - Flush with water for 15 minutes and seek medical attention immediately. BATTERIES PRODUCE EXPLOSIVE GASES. Keep sparks, flame, cigars and cigarettes away. Ventilate when charging or using in enclosed area. Always wear eye protection when working near batteries. Wash hands after handling. KEEP OUT OF REACH OF CHILDREN. M144B

1. If the battery is a maintenance free battery, check the level of the electrolyte every 1000 hours of operation or six months, whichever occurs first. For all other batteries, check the level of the electrolyte every 250 hours of operation.

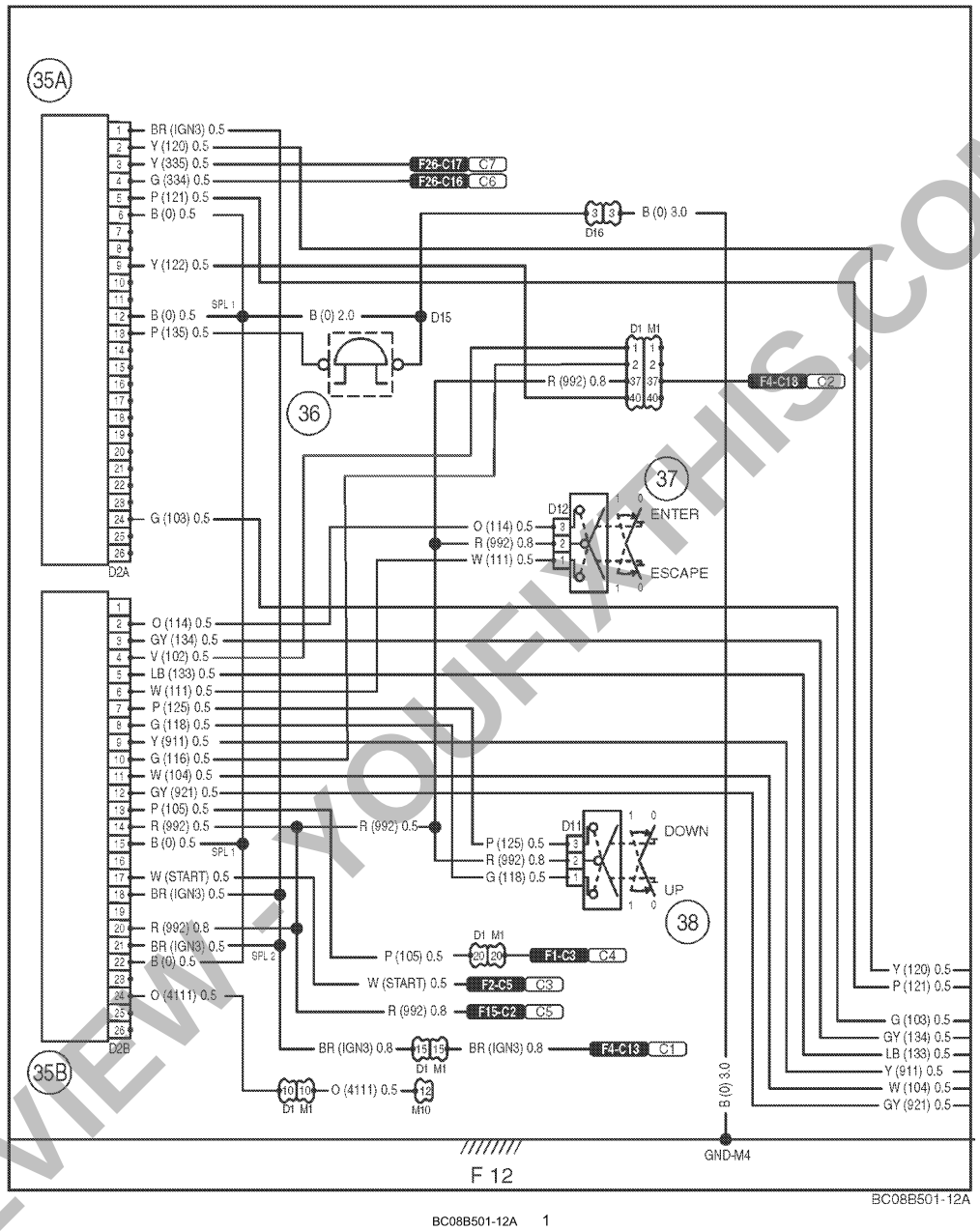
NOTE: *A maintenance free battery will have the words Maintenance Free on the decal on the top of the battery. If the center part of the decal has been removed for access to the battery caps, it is possible that the words Maintenance Free have been removed from the decal.*

2. Check the level of the electrolyte more often during hot weather. The use of a large amount of water by the battery can be caused by high battery temperature or a voltage regulator setting that is too high. Keep the electrolyte level above the top of the plates in the battery at all times to prevent damage to the battery.

NOTE: *On maintenance free batteries it is necessary to remove the center part of the decal for access to the battery caps. Do not discard the center part of the decal. Install the center part of the decal after the battery caps have been installed.*

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Wiring harness - Electrical schematic frame 12 Menu Switches and Instrument Cluster



BC08B501-12A 1

(35A) Instrument Cluster A
(35B) Instrument Cluster B
(36) Warning Buzzer
(37) Enter - Escape Switch
(38) Up - Down Switch

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(3) Clean female pins by installing and removing.

(4) Check circuit between pin 48 of **Connector C4**, and pin 80 of the **Connector C2**.

(5) Check circuit between pin 45 of **Connector C4**, and pin 62 of **Connector C2**.

(6) Check circuit between pin 2 of **Connector C4**, and pin 19 of **Connector C1**.

A. NOT OK – Determine the break between connectors and repair. Return to Step **1** to confirm elimination of fault.

B. OK – Go to Step **5**.

5. Adjust the Decelerator Potentiometer using the Electronic Service Tool (EST).

   The Fully Up Decelerator Position and High Throttle Lever Position will be **2.75 - 4.45 V** (nominal readings), and the Fully Depressed Position or Low Throttle Lever Position will be **0.5 - 2.25 V** (nominal readings).

   A. NOT OK – Voltage is found to be out of acceptable limits, replace and adjust Decelerator Potentiometer. Return to Step **1** to confirm elimination of fault.

   B. OK – Go to Step **6**.

6. Replace the Drivetrain Control Module.

   Prior to changing the drivetrain control module contact Technical Services Group for further assistance.

   (1) Remove and replace drivetrain control module.

   (2) Write symptom on failed drivetrain control module.

   (3) Install program with Electronic Service Tool (EST) and calibrate system.

   A. Return to Step **1** to confirm elimination of fault. If fault is recorded again contact Technical Services Group for assistance.

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(1)	Connector engine temperature sender
(2)	Upper radiator hose

(1) Disconnect connector from engine temperature sending unit.

(2) Inspect pins on temperature sending unit and connector. Clean connections.

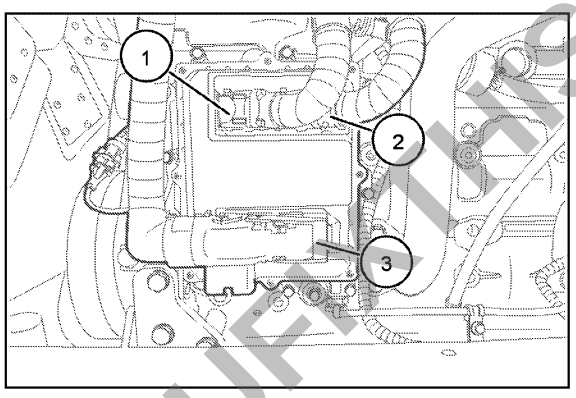
(3) Clean female pins by installing and removing.

(4) Take Ohm reading on sending unit, **2500 Ω** at **20 °C** (**68.0 °F**).

A. NOT OK – Replace sending unit. Return to Step **1** to confirm elimination of fault.

B. OK – Go to Step **4**.

4. Check circuit.



BD07F080-01 2

(1)	Connector C
(2)	Connector A
(3)	Connector E2

(1) Check from pin 2 of engine temperature sender to pin 26 of **Connector C**.

(2) Check from pin 1 of engine temperature sender to pin 15 of **Connector C**.

A. NOT OK – Determine the break between connectors and repair. Return to Step **1** to confirm elimination of fault.

B. OK – Go to Step **5**.

5. Replace the engine control module.

Prior to changing the engine control module contact Technical Services Group for further assistance.

(1) Remove and replace engine control module.

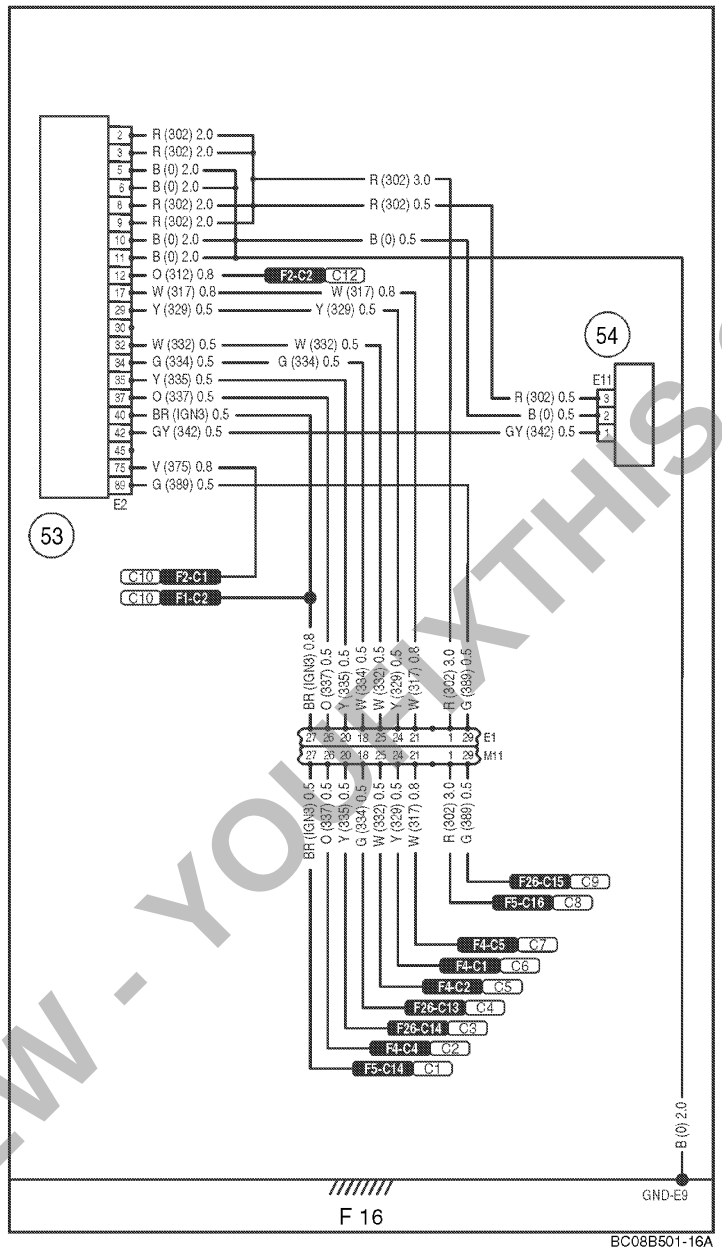
(2) Write symptom on failed engine control module.

A. Return to Step **1** to confirm elimination of fault. If fault is recorded again contact Technical Services Group for assistance.

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Wiring harness - Electrical schematic frame 16 Engine Control Unit



BC08B501-16A 1

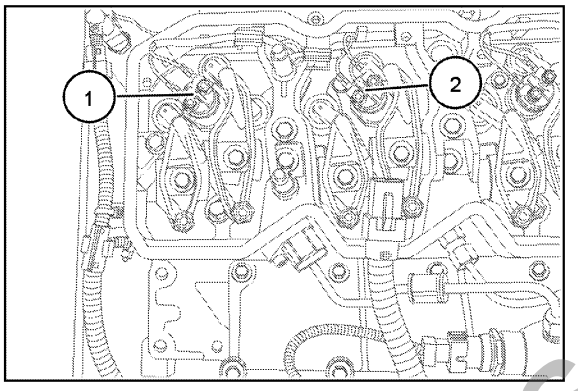
(53) Engine Controller
(54) Water in Fuel Sensor

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B. OK – Go to Step **4**.

4. Check injector.



BD07E034-01 4

(1)	Injector cylinder 1
(2)	Injector cylinder 2

(1) Disconnect leads from number 2 injector.

(2) Take an Ohm reading between terminals on number 2 injector, a reading of **0.5 - 1.0 Ω** at **20 °C** (**68 °F**) should be obtained.

A. NOT OK – Replace injector. Return to Step **1** to confirm elimination of fault.

B. OK – Go to Step **5**.

5. Replace the engine control module.

Prior to changing the engine control module contact Technical Services Group for further assistance.

(1) Remove and replace engine control module.

(2) Write symptom on failed engine control module.

A. Return to Step **1** to confirm elimination of fault. If fault is recorded again contact Technical Services Group for assistance.

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3119-ECM 12V sensor supply voltage low

Control Module : EDC

IMPORTANT: *When available use special tool 380040185 harness diagnostic/repair kit and 380040188 electro injector test fixture.*

IMPORTANT: *Check alternator output voltage, if below 12 volts refer to section on troubleshooting charging system before proceeding.*

NOTE: *See engine repair manual for electrical schematic information.*

NOTE: *Besides the 3 independent 5 volt voltage supplies the ECM also provides a 12 volt supply for the sensors. This 12 volt supply is monitored to ensure it remains within a certain range. This is done by using an analogue input of the ECM. The lower and upper thresholds depend on the battery voltage.*

Cause:

1. Failed sensor, voltage to low coming into ECM.
2. Faulty reading from component.
3. Connectors not mated fully, pins not pushed into connector fully, bent pin or broken wire at rear of connector.
4. Wiring or circuits open.
5. Wiring or circuits shorted.

Solution:

1. Find out if the fault code is still active, refer to
   0000 - Retrieving fault codes, Crawlers

   Prior to clearing fault codes write down all fault codes, number of occurrences, and engine hours at last occurrence.

   (1) Turn ignition switch to RUN position to power instrument cluster.

   (2) Clear all fault codes from the cluster.

   (3) To check for fault code: Start and operate machine.

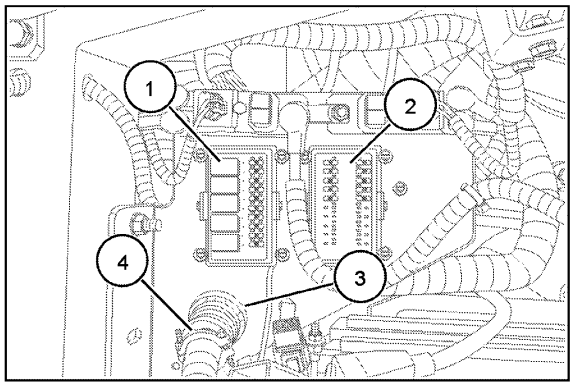
   A. NOT OK – Fault code 3118 is recorded again. Go to Step **2**.

   B. OK – Fault is not recorded again. OK for return to service.
2. Check input power circuit.

   (1) Turn master disconnect switch and ignition switch ON.

   (2) Check voltage on pins 2, 3, 8, 9, and 40 of **Connector E2** to ground, a reading of **12 V** should be obtained.

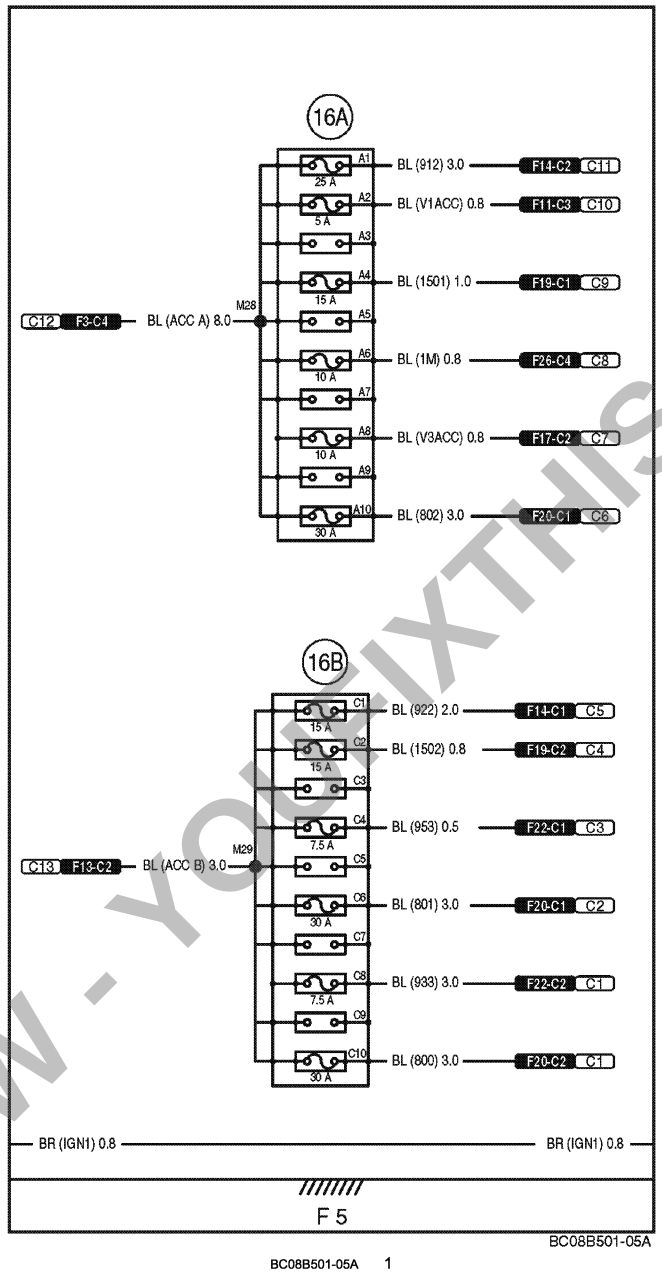
   (3) If no voltage is present, check fuses F6 and F8 in fuse and relay panel **Connector M2**. Replace as needed.



BD07N475-01 1

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Wiring harness - Electrical schematic frame 05 Fuse Block

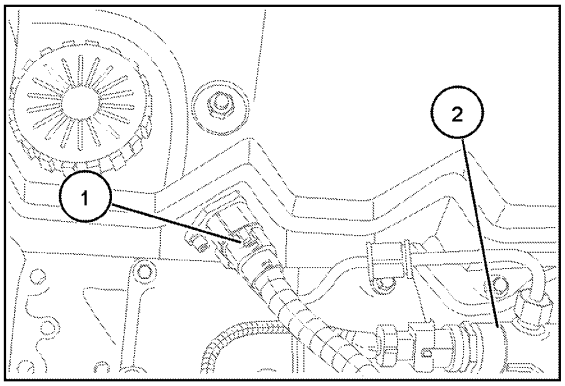


BC08B501-05A 1

(16A) Fuses F11 to F20
(16B) Fuses F1 to F10

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BD07E030-01 2

(1)	Connector cylinders 1 and 2
(2)	High pressure common rail

(4). Disconnect Connector for cylinders 1 and 2.

(5). Inspect pins 1, 2, 3, and 4 in Connector for cylinders 1 and 2. Clean connections.

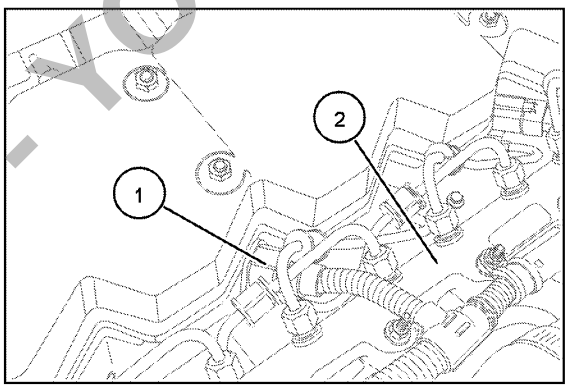
(6). Clean female pins by installing and removing.

(7). Take an Ohm reading from pin 11 **Connector A** to pin 1 Connector cylinders 1 and 2.

(8). Take an Ohm reading from pin 6 **Connector A** to pin 2 Connector cylinders 1 and 2.

(9). Take and Ohm reading from pin 13 **Connector A** to pin 3 Connector cylinders 1 and 2.

(10). Take an Ohm reading from pin 4 **Connector A** to pin 4 Connector cylinders 1 and 2 .



BD07E029-01 3

(1)	Connector cylinders 3 and 4
(2)	High pressure common rail

(11). Disconnect Connector cylinders 3 and 4.

(12). Inspect pins 1, 2, 3 and 4 in Connector cylinders 3 and 4. Clean connections.

(13). Clean female pins by installing and removing.

(14). Take an Ohm reading from pin 14 **Connector A** to pin 1 Connector cylinders 3 and 4.

(15). Take an Ohm reading from pin 3 **Connector A** to pin 2 Connector cylinders 3 and 4.

(16). Take an Ohm reading from pin 12 **Connector A** to pin 3 Connector cylinders 3 and 4.

(17). Take an Ohm reading from pin 5 **Connector A** to pin 4 Connector cylinders 3 and 4.

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3265-Energizing time exceeds limit of over run monitoring, injection time too long

Control Module : EDC

IMPORTANT: *When available use special tool 380040185 harness diagnostic/repair kit and 380040188 electro injector test fixture.*

NOTE: *See engine repair manual for electrical schematic information.*

Cause:

1. The sum of all torque-forming energizing times of an individual cylinder (OvRMon_tiTDCAvrg_mp) exceeds the limit OvRMon_tiLimET_mp (calculated from the map OvRMon_tiLmET_MAP depending on the engine speed and the time since the overrun monitoring is active) for more than 100 test events (test frequency every 10 ms).
2. Faulty reading from component.
3. Connectors not mated fully, pins not pushed into connector fully, bent pin or broken wire at rear of connector.
4. Wiring or circuits open.
5. Wiring or circuits shorted.

Solution:

1. Find out if the fault code is still active, refer to
   0000 - Retrieving fault codes, Crawlers

   Prior to clearing fault codes write down all fault codes, number of occurrences, and engine hours at last occurrence.

   (1) Turn ignition switch to RUN position to power instrument cluster.

   (2) Clear all fault codes from the cluster.

   (3) To check for fault code: Start and operate machine.

   A. NOT OK – Fault code 3265 is recorded again. Go to Step **2**.

   B. OK – Fault is not recorded again. OK for return to service.
2. Reset ECM (electronic control module) by turning the key to the OFF position and turning back ON.

   A. OK— Return to Step **1**to confirm elimination of fault.

   B. NOT OK— Go to Step **3**.
3. Replace ECM (engine control module).

   Prior to changing the engine control module contact Technical Services Group for further assistance.

   (1). Remove and replace engine control module.

   (2). Write symptom on failed engine control module.

   A. Return to Step **1** to confirm elimination of fault. If fault is recorded again contact Technical Services Group for assistance.

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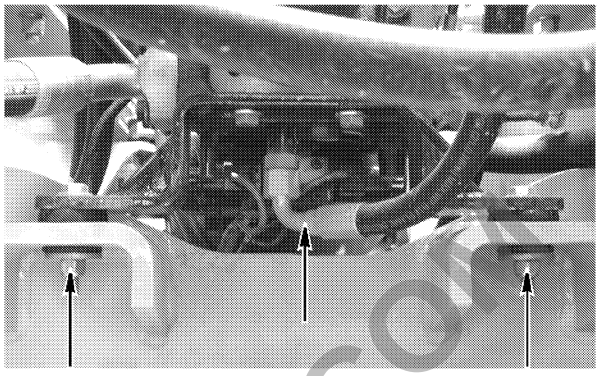
Engine starter - Torque

Mounting bolts	**68 - 77 Nm (50 - 57 lb ft)**
Battery terminal nut	**17.7 - 24.5 Nm (13 - 18 lb ft)**
Solenoid + screw	**2.6 - 4.5 Nm (23 - 40 lb in)**

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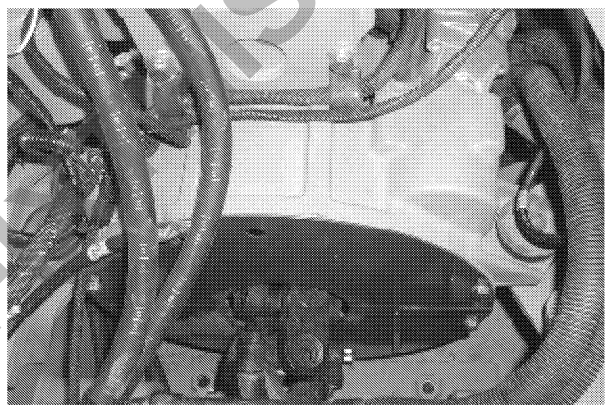
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3. Torque the rear mount bolts to 68 to 81 Nm (50 to 60 lb-ft). Connect the hose to the filter element.



BD02H059 2

4. Torque the two front mounting bolts (2) to 68 to 81 Nm (50 to 60 lb-ft).
5. If removed, Install the drive shaft and torque flange to flywheel mounting bolts to 285 to 305 Nm (210 to 225 lb-ft). Install the bell housing covers and grounding cable.



BD02H069 3

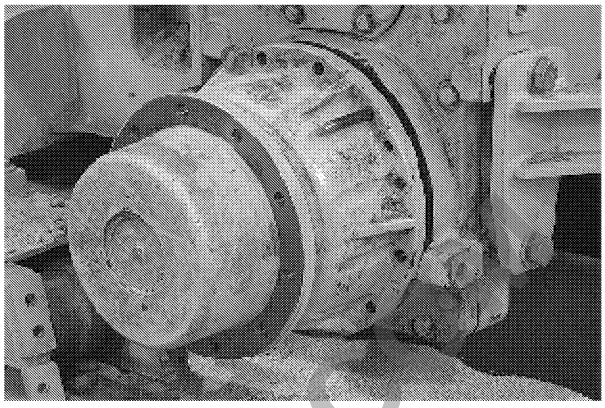
6. Connect lift cylinder crossover lines (4). Install the two bolts and clamps to the front mounting bracket.
7. Connect the right motor pressure lines (5). Snug the split flange clamps down evenly and then torque to 90 to 100 Nm (66 to 74 lb-ft).
8. Connect the left motor pressure lines (12). Snug the split flange clamps down evenly and then torque to 90 to 100 Nm (66 to 74 lb-ft).
9. Connect the brake solenoid pressure line to the front charge pump (10).
10. Connect the five lines to the diagnostic center (13). Three lines are located on the right side of the pump.
11. Connect the solenoid and pressure switch wiring harness to both solenoids and pressure switch (17).
12. Connect the thermal valve to filter line (18).
13. Connect the equipment valve return line (11).
14. Connect hydraulic pump outlet line (7).
15. Connect the filter output line (14).
16. Connect the case drain to reservoir line (6).
17. Connect the rear charge pump inlet line (8). Orientate the threads downward and torque to 6.5 to 7.6 Nm (58 to 65 lb-in).

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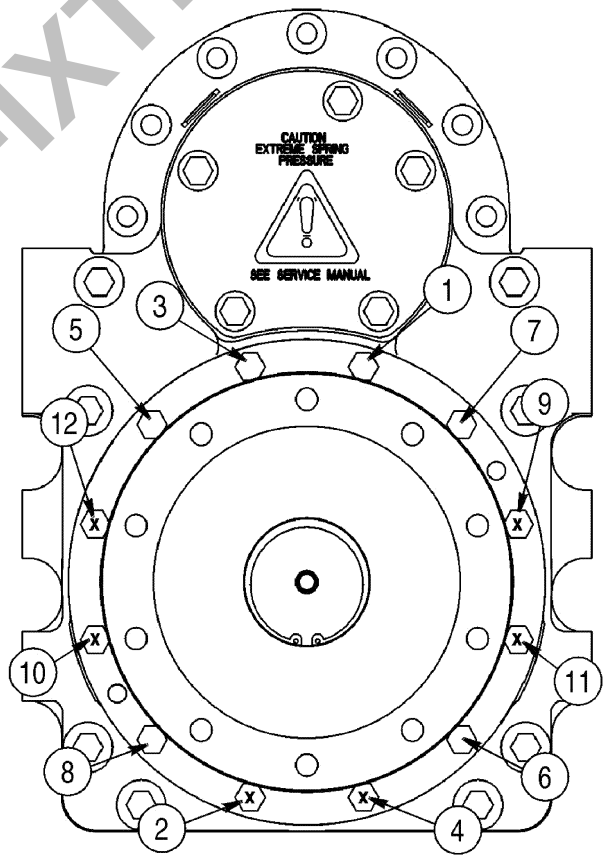
19. Push the wheel hub housing **(42)** onto the sandwich housing **(24)**.

NOTE: *The wheel hub **(44)** may have to be turned to align the teeth on the plnetary gears **(31)** and the sun gear **(15)**.*



BD02M115 14

20. Secure the wheel hub housing **(42)** to the sandwich housing **(24)** with nine of the twelve mounting bolts **(51)** and **(52)**.
21. Remove the dowel bolts and install the last three mounting bolts **(51)** and **(52)**.
22. Using the torque pattern, torque the bolts to **195 - 250 Nm (144 - 184 lb ft)**.



Bc02m145_2 15

23. Install the inner track rail cove and sprocket scraper.
24. Remount any attachments removed from the rear of the machine, torque mounting bolts into the final drives to **1160 - 1300 Nm (856 - 959 lb ft)**.

Next operation:
Steel track - Install (D.50.B)

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TRAVELLING - D

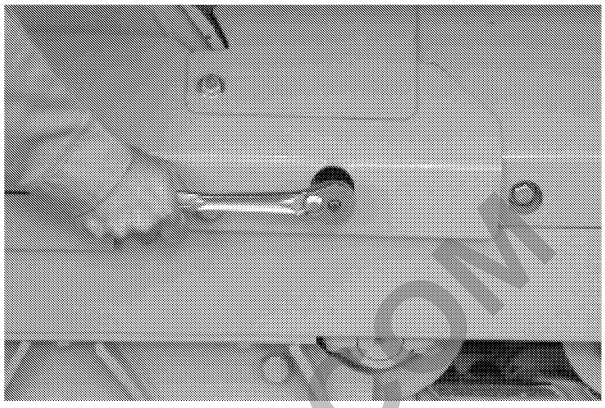
SERVICE BRAKE Hydraulic - 30.C

750L
850L

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5. To loosen the track, loosen the valve in the track adjuster two turns only with a socket to allow grease to flow from the track adjuster.



bd02h016 4

6. When the deflection is correct, tighten the valve to **61 - 74 Nm (45 - 55 lb ft).**.

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A22094 2

OEM1415 REFRIGERANT RECOVERY, RECYCLING AND CHARGING STATION



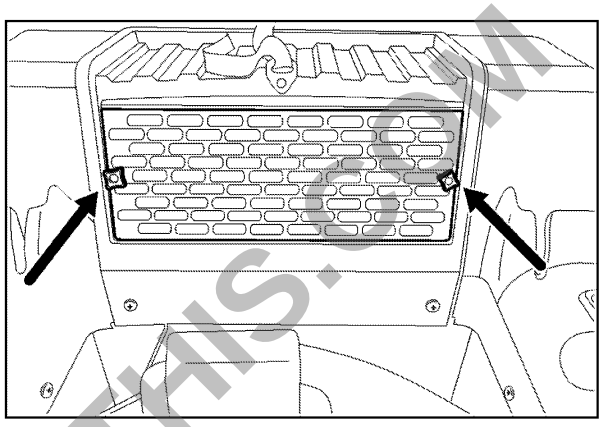
A22090 3

OEM1437 ELECTRONIC LEAK DETECTOR

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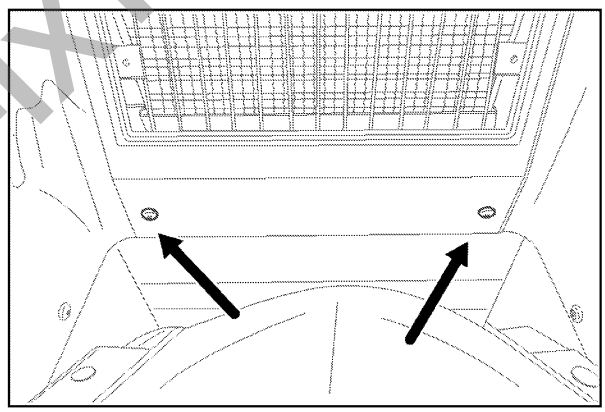
Heater - Replace

1. Park the machine on a level surface and lower the blade to the floor. Apply the parking brake. Stop the engine and turn the master disconnect switch OFF.
2. Drain **4 l** (**1 US gal**) from the engine cooling system.
3. Remove the inside air filter by removing the two thumb screws.



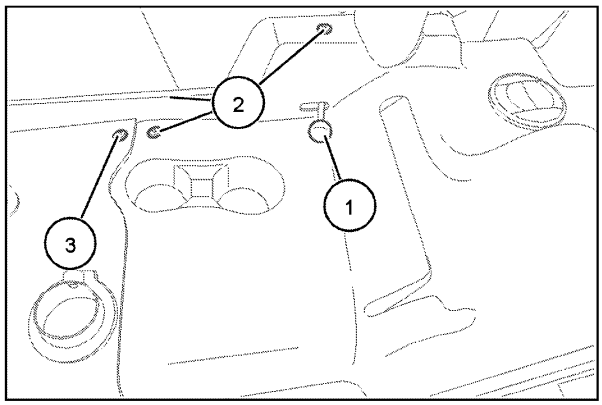
BD06K003-01 1

4. Remove five mounting screws from the center rear console, two from the font and three are located at the back glass in the rear.



BD06K004-01 2

5. Remove the rear console from the cab.
6. Remove the right arm rest from the cab.
7. Remove two screws (2) mounting the right console, remove the door catch release knob (1), loosen console mounting screw (3).



BD06K018-01 3

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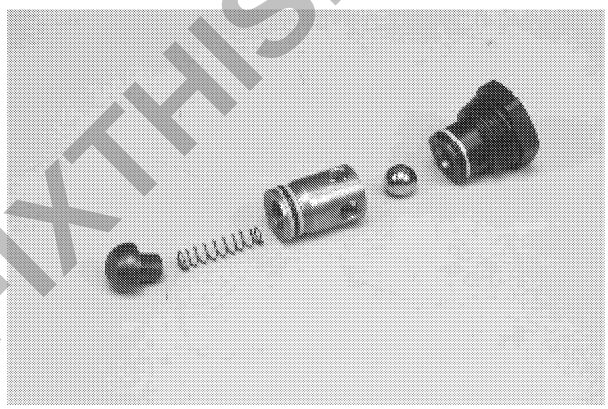
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4. Install the seal retainer, the backup ring, and the O-ring on the spool. Be careful so that you do not cut the O-ring on the edges of the spool.



BP99J136 4

5. Install new O-rings and backup rings on anti-cavitation bodies.



BD02F001 5

6. Install new O-rings and backup rings on load check bodies.



B411433M 6

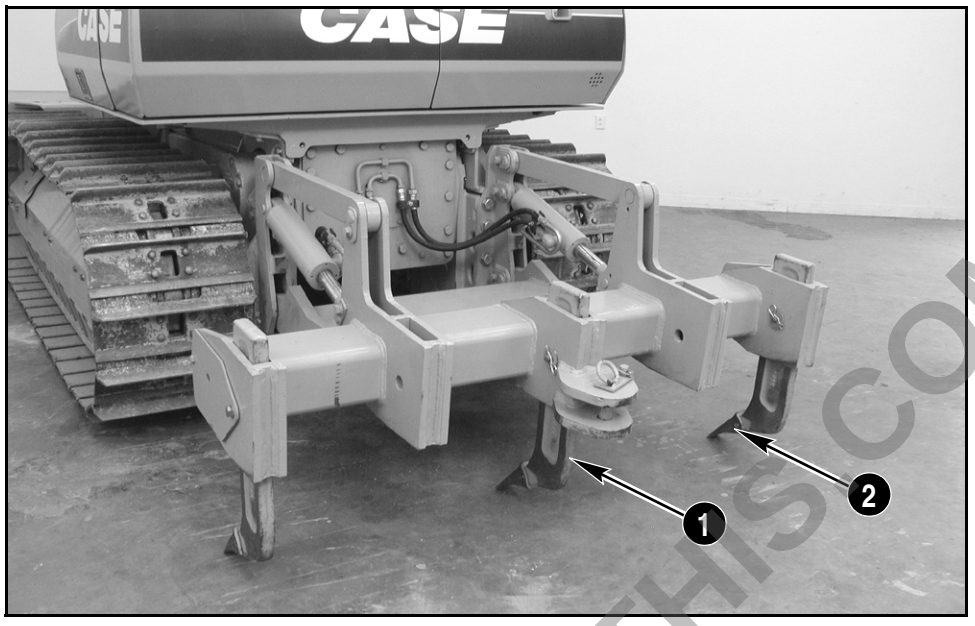
7. Install new O-rings and backup rings on circuit relief bodies.



B411734M 7

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BD02J032

Figure 9

RIPPER

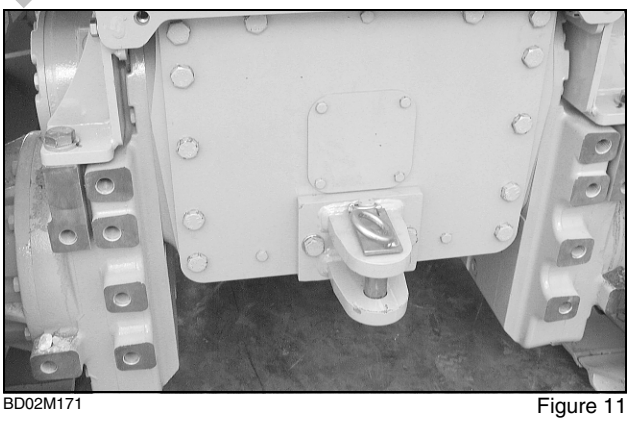
1. RIPPER SHANK 2. TOOTH



BD02M132

Figure 10

DRAWBAR



BD02M171

Figure 11

HITCH

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DOZER OPERATION

WARNING: *Always know the location of all workers in your area. Warn them before you start working the machine. Always keep all other persons away from your area. Serious injury or death can result if you do not follow these instructions.*

SA015

WARNING: *You are protected by the ROPS (Roll-Over Protective Structure) system on this machine. The seat belt is an important part of that ROPS system. Before you operate this machine, always fasten the seat belt. If the machine rolls over and you DO NOT have the seat belt fastened, you can be crushed by the ROPS or the machine.*

SA080

WARNING: *DO NOT operate the machine while under the influence of alcohol or drugs.*

CM112

WARNING: *Raised equipment on the machine without an operator can cause injury or death. Before you leave the operator's compartment, always support or lower the equipment (backhoe, blade, boom, bucket, etc.) to the ground and stop the engine.*

SA044

WARNING: *Jumping on or off the machine can cause an injury. Always face the machine, use the hand rails and steps, and get on or off the machine slowly.*

SA038

WARNING: *Hillside operations can be dangerous. Rain, snow, ice, loose gravel, soft ground, etc., change the ground conditions. You must make a judgment if your machine can be safely operated on any hillside or ramp.*

SB013

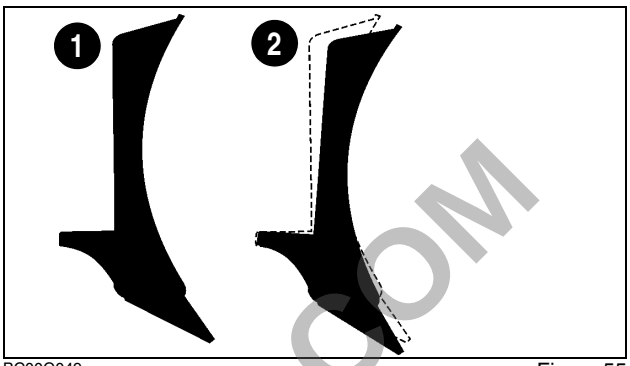
The operating tips given in this section do not include all possible conditions. This is basic information that can help you move more material in less time.

If you are a new operator, always operate the machine in an open area at decreased speed until you know the function of each control.

ENGINE SPEED

Run the engine at full throttle when safe. The ground condition and type of job will control the track speed and range position that you use.

DOZER BLADE PITCH



BC00G049 Figure 55

1. REARWARD POSITION (52 DEGREE PITCH)
2. FORWARD PITCH (60 DEGREE PITCH)

Rearward Position Advantages

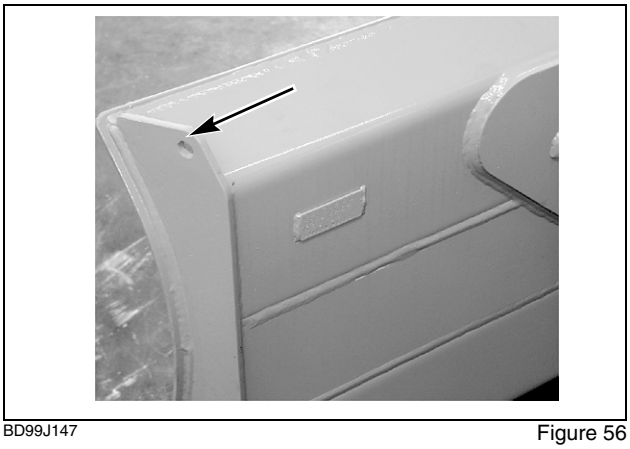
1. Blade is able to push larger load.
2. Blade will stay on top in soft ground.
3. Blade will not dig into ground.
4. Blade best used for fine grading.

Forward Position Advantages

1. Load slides off the blade as the crawler travels in reverse.
2. Blade will dig into hard ground.
3. Less load spillage over top of blade.

NOTE: *See Blade Pitch Adjustment in this manual for adjustment procedure.*

BLADE LIFT EYE



BD99J147 Figure 56

Do not pull, tow, or lift the machine using the blade lift eye.

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