QENR2011-01
October 2008

Testing and Adjusting

PM102 Cold Planer

Z1X1-Up (Machine)
Z2X1-Up (Machine)

Important Safety Information

Most accidents that involve product operation, maintenance and repair are caused by failure to observe basic safety rules or precautions. An accident can often be avoided by recognizing potentially hazardous situations before an accident occurs. A person must be alert to potential hazards. This person should also have the necessary training, skills and tools to perform these functions properly.

Improper operation, lubrication, maintenance or repair of this product can be dangerous and could result in injury or death.

Do not operate or perform any lubrication, maintenance or repair on this product, until you have read and understood the operation, lubrication, maintenance and repair information.

Safety precautions and warnings are provided in this manual and on the product. If these hazard warnings are not heeded, bodily injury or death could occur to you or to other persons.

The hazards are identified by the “Safety Alert Symbol” and followed by a “Signal Word” such as “DANGER”, “WARNING” or “CAUTION”. The Safety Alert “WARNING” label is shown below.

⚠ WARNING

The meaning of this safety alert symbol is as follows:

Attention! Become Alert! Your Safety is Involved.

The message that appears under the warning explains the hazard and can be either written or pictorially presented.

Operations that may cause product damage are identified by “NOTICE” labels on the product and in this publication.

Caterpillar cannot anticipate every possible circumstance that might involve a potential hazard. The warnings in this publication and on the product are, therefore, not all inclusive. If a tool, procedure, work method or operating technique that is not specifically recommended by Caterpillar is used, you must satisfy yourself that it is safe for you and for others. You should also ensure that the product will not be damaged or be made unsafe by the operation, lubrication, maintenance or repair procedures that you choose.

The information, specifications, and illustrations in this publication are on the basis of information that was available at the time that the publication was written. The specifications, torques, pressures, measurements, adjustments, illustrations, and other items can change at any time. These changes can affect the service that is given to the product. Obtain the complete and most current information before you start any job. Caterpillar dealers have the most current information available.

⚠ WARNING

When replacement parts are required for this product Caterpillar recommends using Caterpillar replacement parts or parts with equivalent specifications including, but not limited to, physical dimensions, type, strength and material.

Failure to heed this warning can lead to premature failures, product damage, personal injury or death.

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Testing and Adjusting Section

Testing and Adjusting

Machine Preparation for Testing and Adjusting

⚠ WARNING

Do not operate or work on this machine unless you have read and understand the instructions and warnings in the Operation and Maintenance Manual. Failure to follow the instructions or heed the warnings could result in injury or death. Contact any Caterpillar dealer for replacement manuals. Proper care is your responsibility.

1. Move the machine to a smooth, horizontal location that is away from operating machines and away from personnel.

NOTE: Permit only one operator on the machine at a time. Keep all other personnel away from the machine or in the operator's sight.

2. Raise the machine and support the machine with suitable blocks.

3. Engage the parking brake. Place blocks around the tracks (or wheels).

4. Stop the engine.

5. Make sure that all of the hydraulic pressure is released before any hydraulic components are altered.

Correct oil flow and pressure are necessary for correct operation. The output of the pump (oil flow) increases with an increase in engine speed (rpm). The output of the pump decreases when engine speed (rpm) is decreased. Oil pressure is caused by resistance to the flow of oil.

Visually inspect the complete hydraulic system for oil leaks and damaged parts before you test the machine. For some of the tests, a magnet and a measuring rule are usable tools.

The hydraulic oil must be at the normal temperature for operation before any tests are performed.

Troubleshooting can be complex.Some of the possible problems and corrections are listed on the following pages.

This list will only provide an indication of the location of a problem and the repairs that are required. Remember that a problem is not necessarily caused by one part, but by the relation of one part with other parts. This list can not provide all possible problems and corrections. Service personnel must find the problem and the source of the problem. Then, complete the necessary repairs.

Perform a visual inspection first. If the visual checks are completed but the problem has not been identified, perform operational checks. If the problem is not understood, perform instrument tests. This procedure will help to identify problems in the machine systems.

Visual Inspection

⚠ WARNING

Do not operate or work on this machine unless you have read and understand the instructions and warnings in the Operation and Maintenance Manual. Failure to follow the instructions or heed the warnings could result in injury or death. Contact any Caterpillar dealer for replacement manuals. Proper care is your responsibility.

⚠ WARNING

Diesel engine exhaust contains products of combustion which may cause personal injury.

Always start and operate the engine in a well-ventilated area, and, if in an enclosed area, vent the exhaust to the outside.

⚠ WARNING

Personal injury can result from hydraulic oil pressure and hot oil.

Hydraulic oil pressure can remain in the hydraulic system after the engine has been stopped. Serious injury can be caused if this pressure is not released before any service is done on the hydraulic system.

Make sure all of the attachments have been lowered, and that the oil is cool before removing any components or lines. Remove the oil filler cap only when the engine is stopped, and the filler cap is cool enough to touch with your bare hand.

⚠ WARNING

Personal injury or death can result from improperly checking for a leak.

Always us a board or cardboard when checking for a leak. Escaping air or fluid under pressure. even a pin-hole side leak, can penetrate body tissue causing serious injury, and possible death.

If fluid is injected into your skin, it must be treated immediately by a doctor familiar with this type of injury.

NOTICE

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the machine. Be prepared to collect the fluid in suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, "Caterpillar Tools and Shop Products Guide," for tools and supplies suitable to collect and contain fluids from Caterpillar machines.

Dispose of all fluids according to local regulations.

A visual inspection of the hydraulic system and its components is the first step when a diagnosis of a problem is made. Stop the engine, and make the following inspections.

1. Measure the oil level in the hydraulic oil tank.

2. Use a clear container to obtain an oil sample from the hydraulic tank immediately after the engine is stopped. Examine the sample for air bubbles.

3. Check all oil lines and check all connections for damage. Look for oil on the ground under the machine.

4. Remove the hydraulic oil filter and examine the filter element for debris.

   a. Shiny steel particles indicate a pump failure or pump deterioration. Shiny steel particles can also indicate a motor failure or motor deterioration.

   b. Rubber particles indicate seal failures or hose failures.

   c. Bronze-colored particles indicate pump port plate failure.

   d. Aluminum particles indicate a pump group failure.

NOTE: When foreign particles are found, all hydraulic systems on the machine must be thoroughly flushed. Each hydraulic system must be filtered independently. Do not reuse damaged parts.

5. Inspect the control linkages for damaged components.

6. Inspect the tracks (or wheels) for wear. Inspect the tracks (or wheels) for damage. The tracks may show the following signs of wear or damage:

   - loose tracks
   - broken parts
   - worn rollers and wheels
   - damaged tracks.

   Repair the tracks (or wheels) if the tracks (or wheels) are worn or damaged.

7. Check the machine for loose wiring. Check the machine for frayed wiring.

8. Inspect the lights for broken bulbs. Inspect the lights for broken lenses. Replace the bulbs or the lenses if the bulbs or the lenses are broken.

9. Inspect the following for damage or wear: the steps, the walkways, and the handholds. Repair any damaged or worn components. Inspect these areas for cleanliness. Clean the components.

Checks During Operation

Operation checks can be used in order to find a valve or a pump that is not working. The speed of rod movement or the torque on a motor can be used to check the condition of the cylinders, motors, and pumps.

1. Monitor the extension and monitor the retraction of the cylinders. The movement of the cylinders should be smooth.

2. Listen for irregular noise that may come from the pumps.

3. Listen to the relief valves. Low pressure in the relief valves may cause an increase in oil temperature. Also, cycle time of the cylinders may increase.

NOTE: High pressure in the hydraulic system may decrease the service life of hydraulic system components.

4. Observe the drift rates of the cylinders. Excessive drift rates can be caused by the following:

   - cylinder leakage
   - damaged o-ring seals on the control valves
   - improper adjustment of the relief valves.

Hydraulic Oil Contamination—Test

⚠ WARNING

Escaping fluid under pressure, even a pinhole size leak, can penetrate body tissue, causing serious injury, and possible death. If fluid is injected into your skin, it must be treated immediately by a doctor familiar with this type of injury.

Always use a board or cardboard when checking for a leak.

⚠ WARNING

Personal injury can result from hydraulic oil pressure and hot oil.

Hydraulic oil pressure can remain in the hydraulic system after the engine has been stopped. Serious injury can be caused if this pressure is not released before any service is done on the hydraulic system.

Make sure all of the attachments have been lowered, and that the oil is cool before removing any components or lines. Remove the oil filler cap only when the engine is stopped, and the filler cap is cool enough to touch with your bare hand.

NOTICE

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the machine. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, “Caterpillar Tools and Shop Products Guide,” for tools and supplies suitable to collect and contain fluids in Caterpillar machines.

Dispose of all fluids according to local regulations and mandates.

Table 1

Required Tools			
Tool	**Part Number**	**Description**	**Qty**
A	169-8373	Bottle Group—Fluid	1

If the oil becomes contaminated, premature component failure could result. Contaminated oil can also contribute to overheating.

Use the following procedure to determine the contamination of the oil in the hydraulic system.

1. Drive the machine to a smooth, horizontal surface.

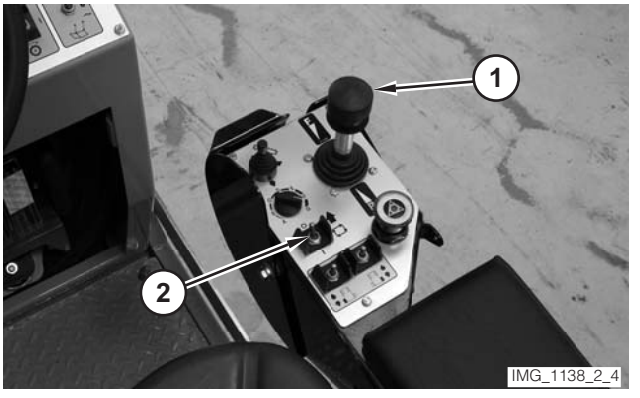

Illustration 1

2. Move propulsion lever (1) to the NEUTRAL position.

3. Move drive selector switch (2) to the OFF position.

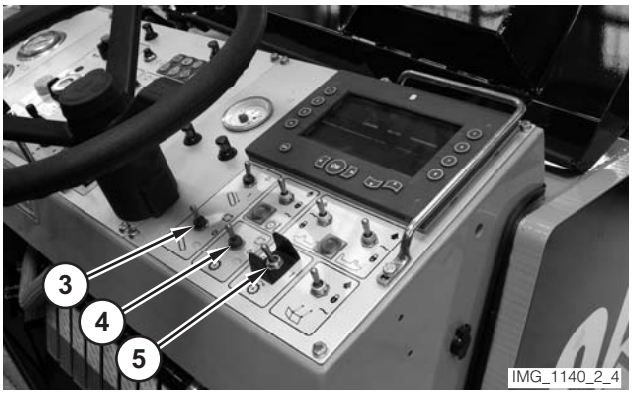

Illustration 2

4. Move the conveyor switch (3) to the OFF position.

5. Move the water spray switch (4) to the OFF position.

6. Move the rotor switch (5) to the OFF position.

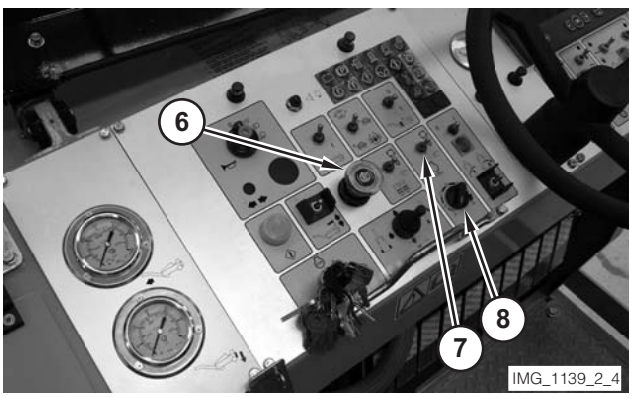

Illustration 3

7. Move parking brake switch (6) to the ON position.

8. Move engine control switch (7) to the OFF (“O”) position.

9. Rotate engine speed dial (8) to the LOW-IDLE position.

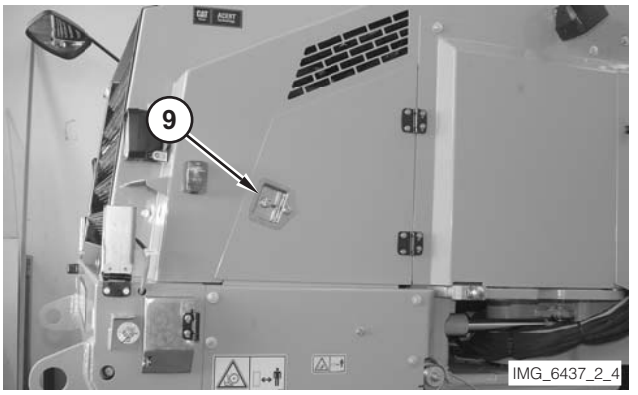

Illustration 4

10. Open right rear access door (9).

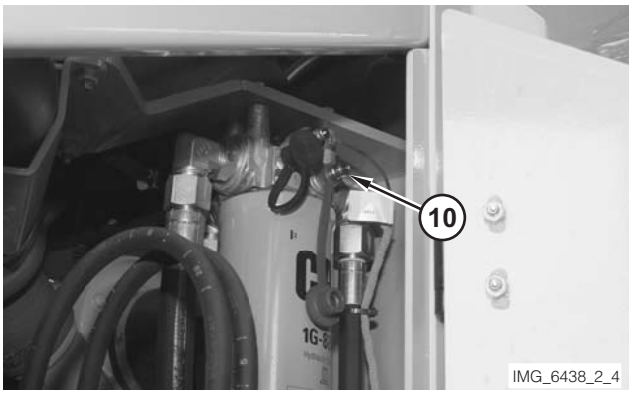

Illustration 5

11. Remove cap from S•O•S tap (10).

12. Use Tool (A) to obtain an oil sample from S•O•S tap (10).

13. Close right rear access door (9).

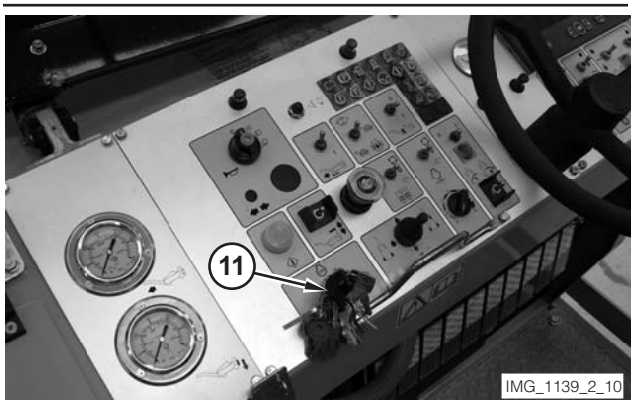

Illustration 6

14. Move engine start switch (11) to the OFF position.

15. Inspect the hydraulic oil filter for foreign particles. Refer to the “Operation and Maintenance Manual” for the procedure to change the hydraulic oil filter.

Plus-1 Software—Connect

Table 2

Required Tools			
Tool	**Part Number**	**Description**	**Qty**
A		Laptop Computer with Plus-1 Software Installed	1
B	300-7925	Cable Assembly	1
C	300-7924	Cable	1

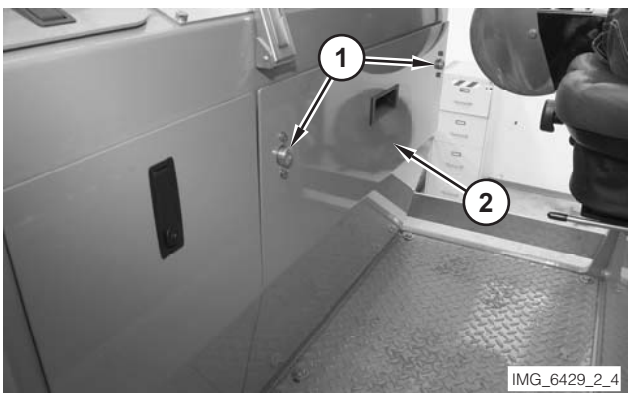

Illustration 7

1. Unlock two latches (1), and remove cover (2).

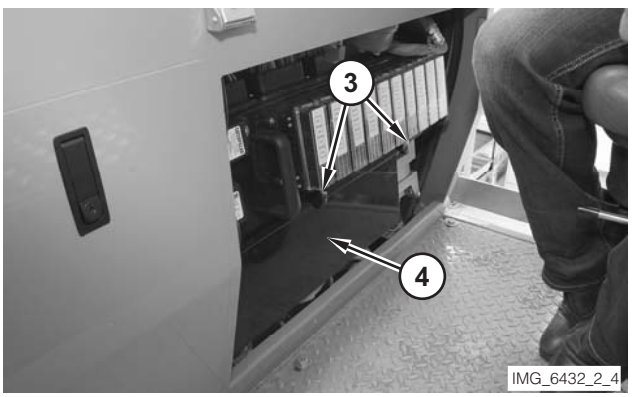

Illustration 8

2. Remove two bolts (3) and remove cover (4).

Illustration 9

3. Locate diagnostic connector (5) and remove the protective plug from the connector.

4. Connect Tool (B) to Tool (C). Connect Tool (B) to diagnostic connector (5). Connect Tool (C) to a USB port on Tool (A).

NOTE: First-time users need to perform the tasks in the “Communication Settings and Connections” wizard. This wizard allows the Windows operating system to recognize the USB device. Follow the on-screen instructions.

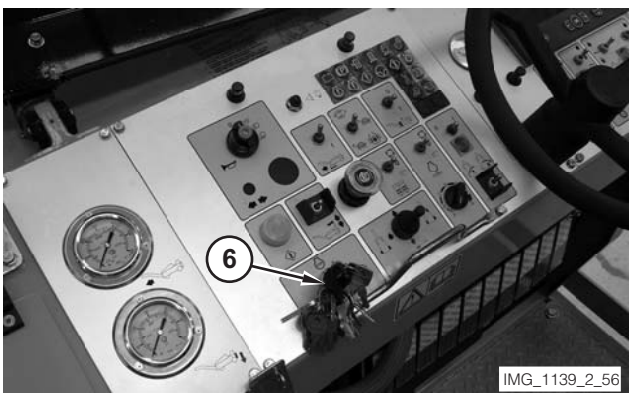

Illustration 10

5. Move engine start switch (6) to the ON position. Do not start the engine.

6. Start the Plus-1 software on Tool (A).

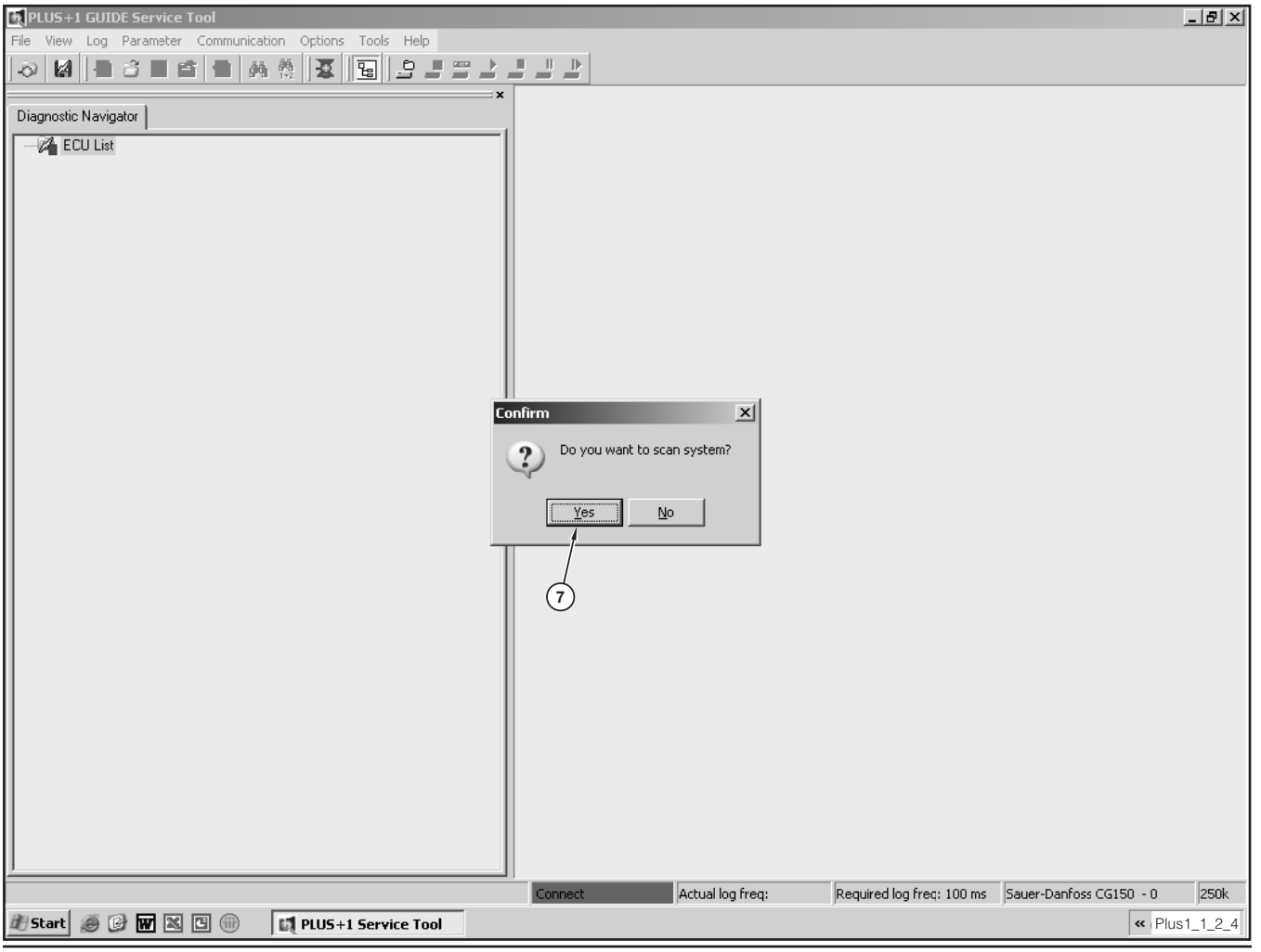

Illustration 11

7. Choose “Yes” (7) in the “Confirm” dialog box.

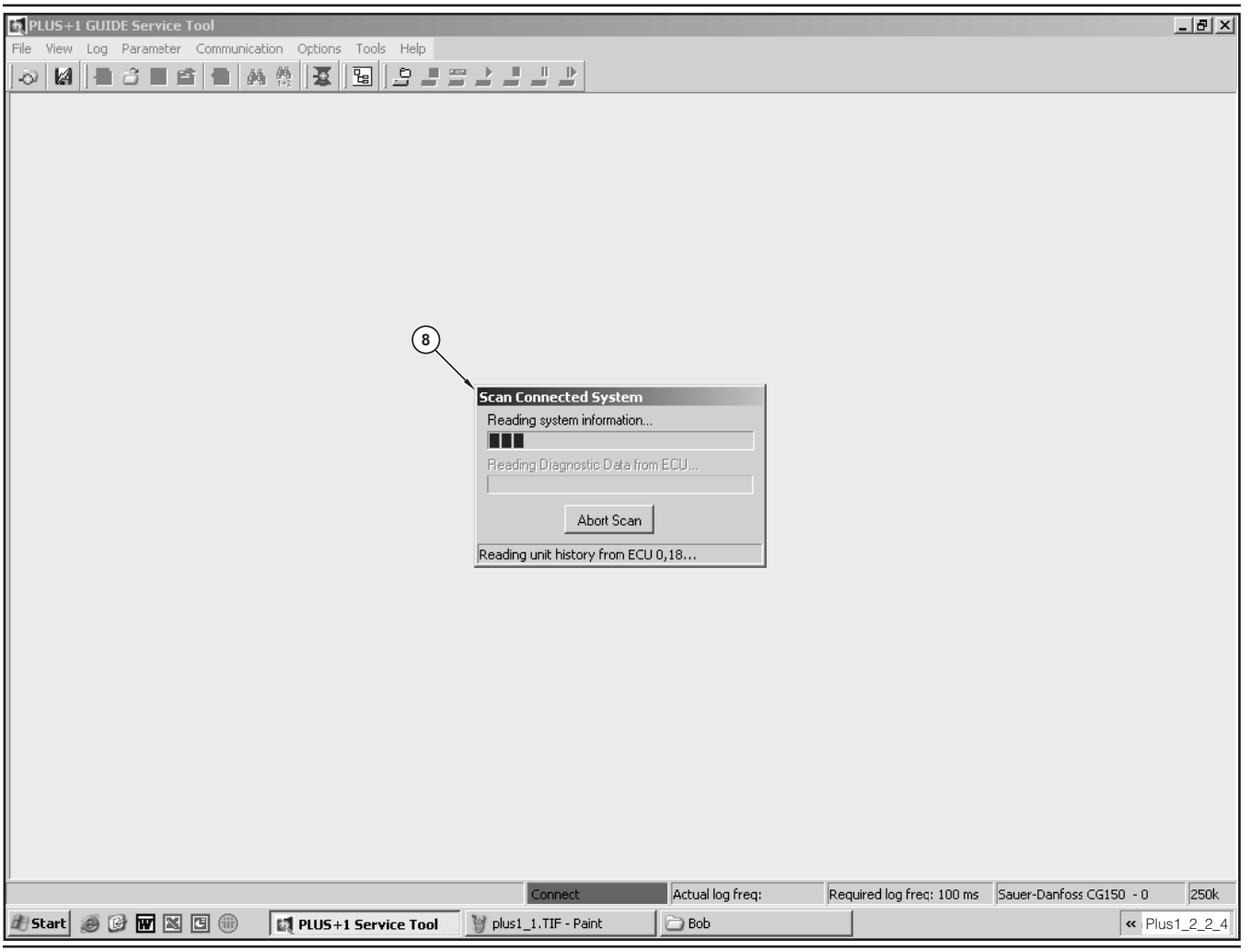

Illustration 12

8. Wait for the software to scan the system. “Scan Connected System” dialog box (8) shows the progress of the scan.

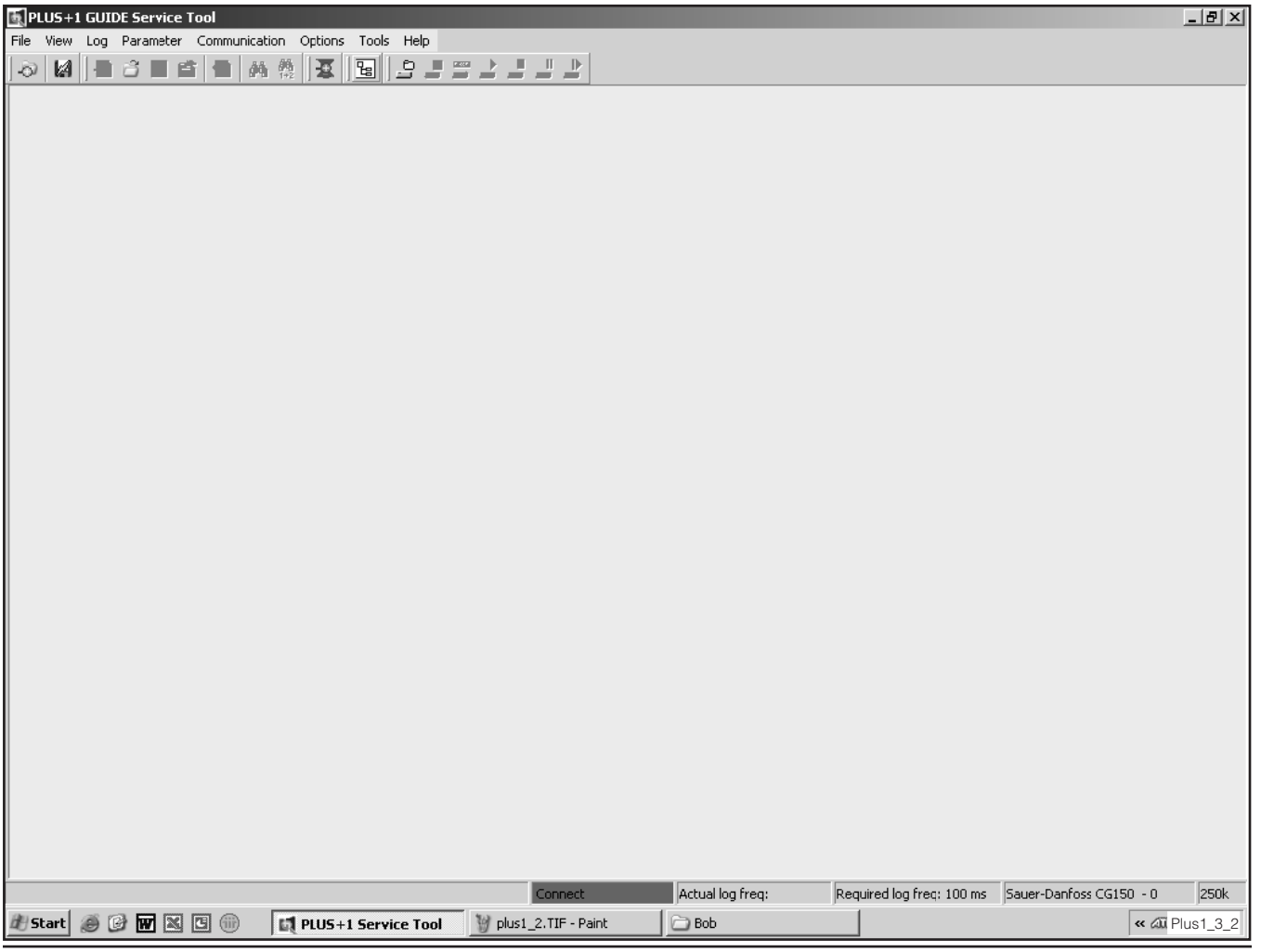

Illustration 13

9. The software is connected to the machine when the screen appears like the illustration in Illustration 13.

Plus-1 Software Version—Check

1. Perform the steps in “Plus-1 Software—Connect.”

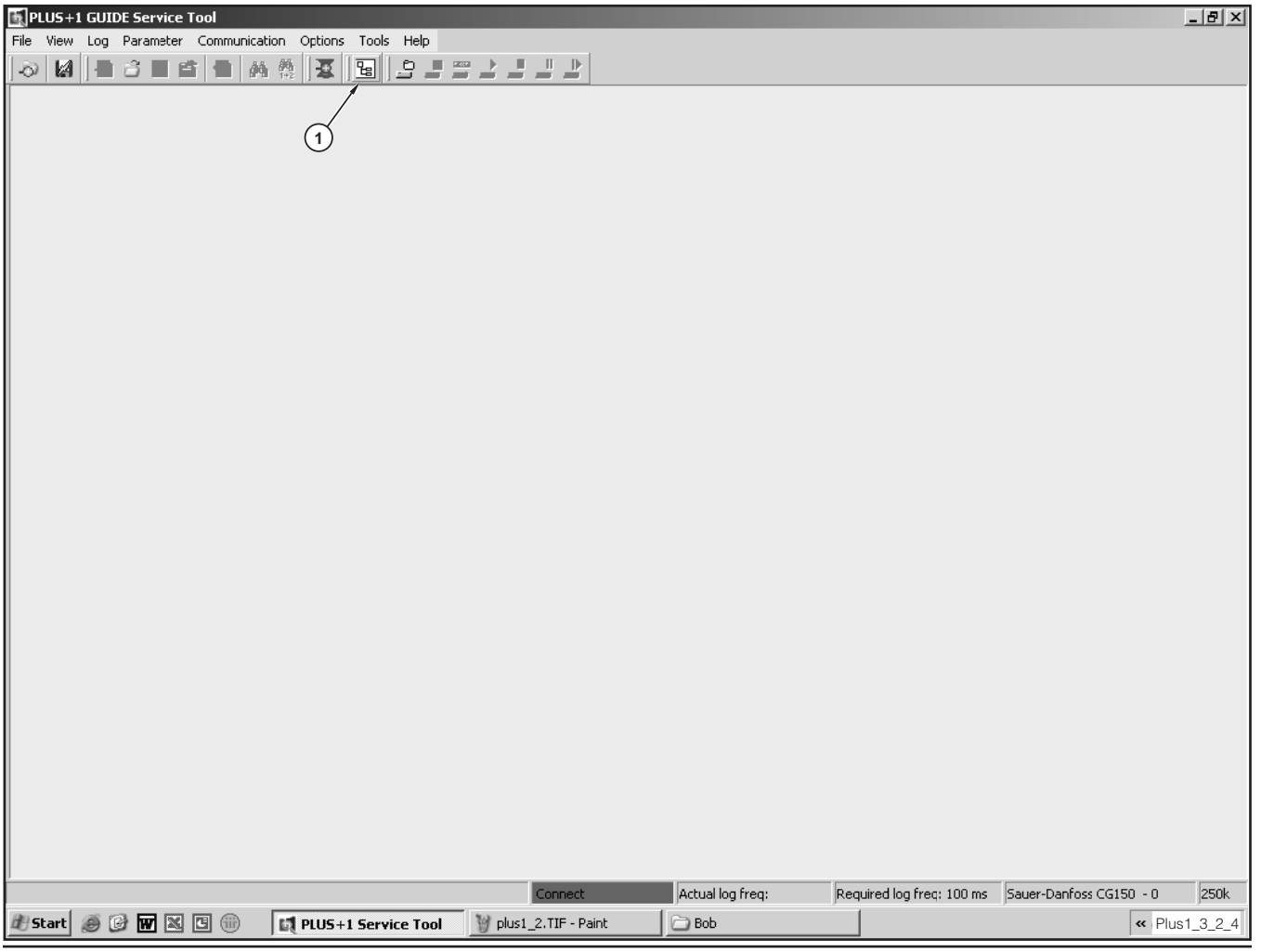

Illustration 14

2. Choose “Diagnostic Navigator” (1).

NOTE: The software sets a preference that will open the diagnostic navigator each time the program is restarted. In order to prevent this behavior, close the diagnostic navigator before you close the Plus-1 software.

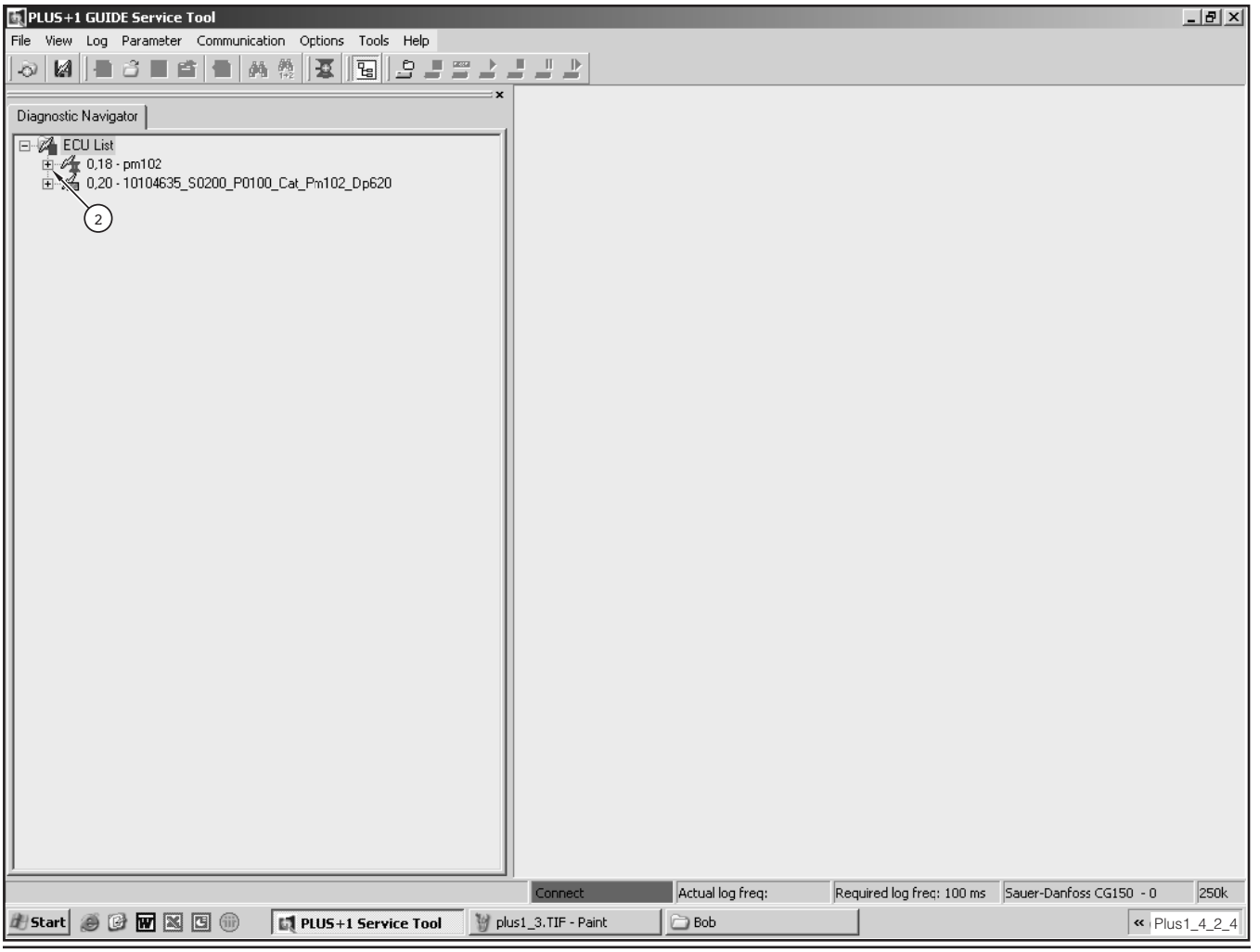

Illustration 15

3. Expand first child element (2) of the “ECU List.” This element contains information about the machine ECM.

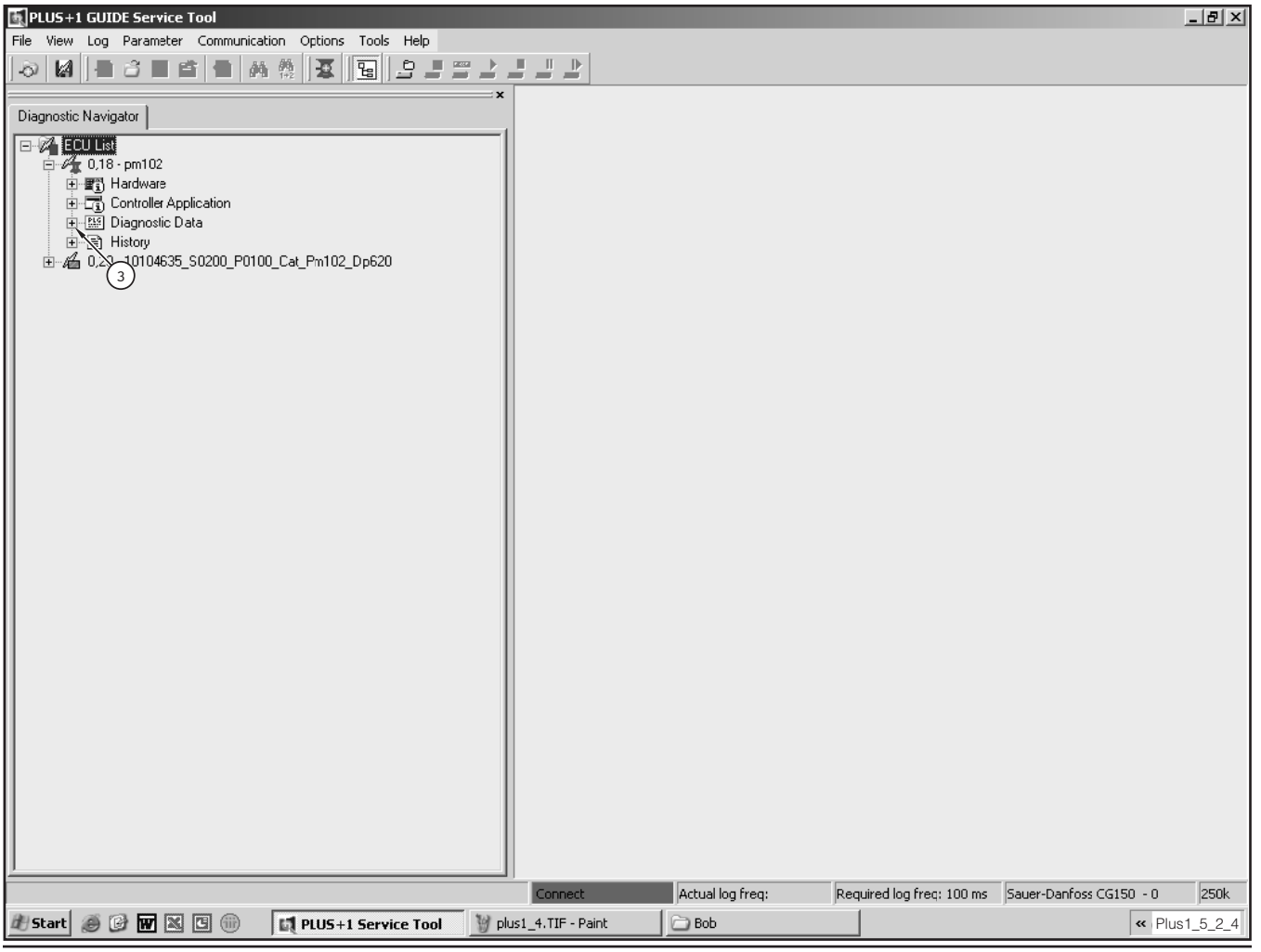

Illustration 16

4. Expand “Diagnostic Data” (3). This element lists the currently installed software.

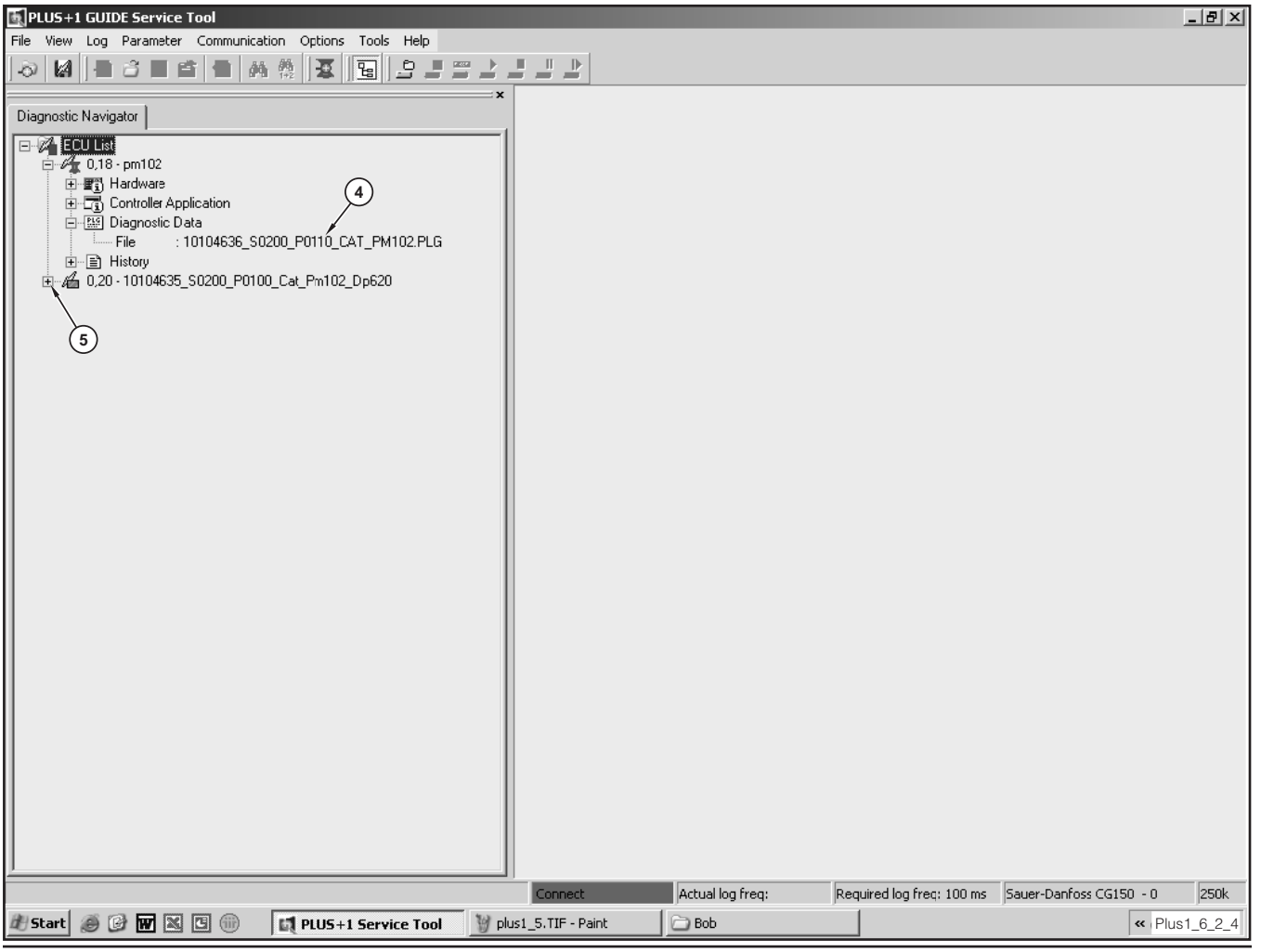

Illustration 17

5. Copy file name (4) for future use.

6. Expand second child element (5) of the “ECU List.” This element contains information about the display unit on the machine.

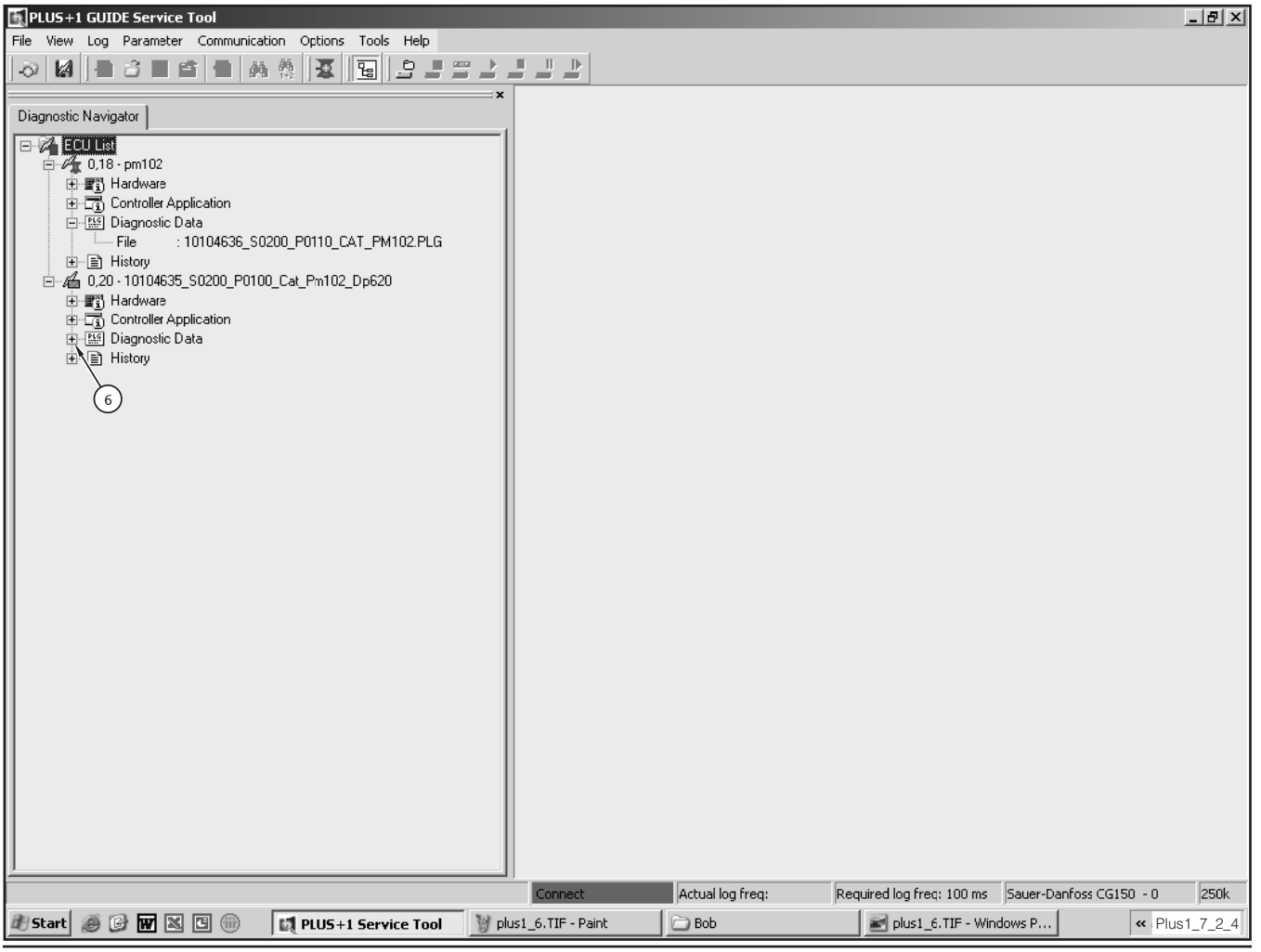

Illustration 18

7. Expand “Diagnostic Data” (6). This element lists the currently installed software.

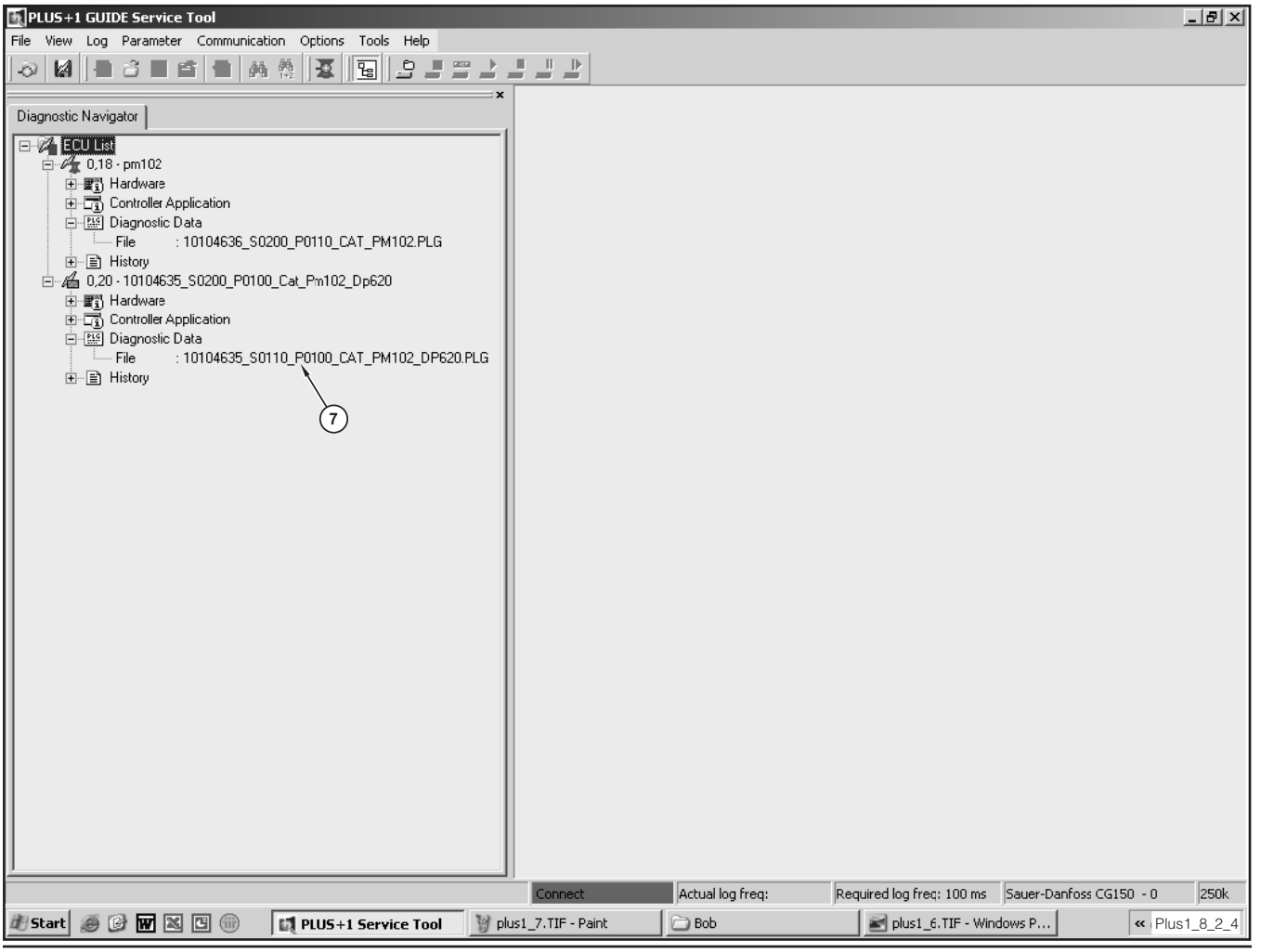

Illustration 19

8. Copy file name (7) for future use.

NOTE: The application file for the display is specific to the type of display. If the machine is equipped with a color display, the file name should contain “DP620.” If the machine is equipped with a monochrome display, the file name should include “DP600.”

9. Compare the file names recorded in Step 5 and in Step 8 to the current files for this machine in SIS. Refer to “Diagnostic and Flash Files—Download” in order to find the current file in SIS. If the file names do not match, complete the steps in “Diagnostic and Flash Files—Download.”

NOTE: The application file is serial-number specific. Make sure to use the correct serial number prefix when comparing the file names.

Diagnostic and Flash Files—Download

A flash file is required to update the operating software for the ECM, and a flash file is required to update the operating software for the display unit. The flash files are named in the following way: “part_number.1hx.”

A diagnostic file is required to perform service operations on the ECM. This file is designed to access and organize information retrieved from the ECM. The diagnostic file is named in the following way: “part_number.P1D.”

New flash files and new diagnostic files are announced in service publications.

Table 3

Required Tools			
Tool	**Part Number**	**Description**	**Qty**
A		Laptop Computer with Access to SIS	1

1. Open SIS.

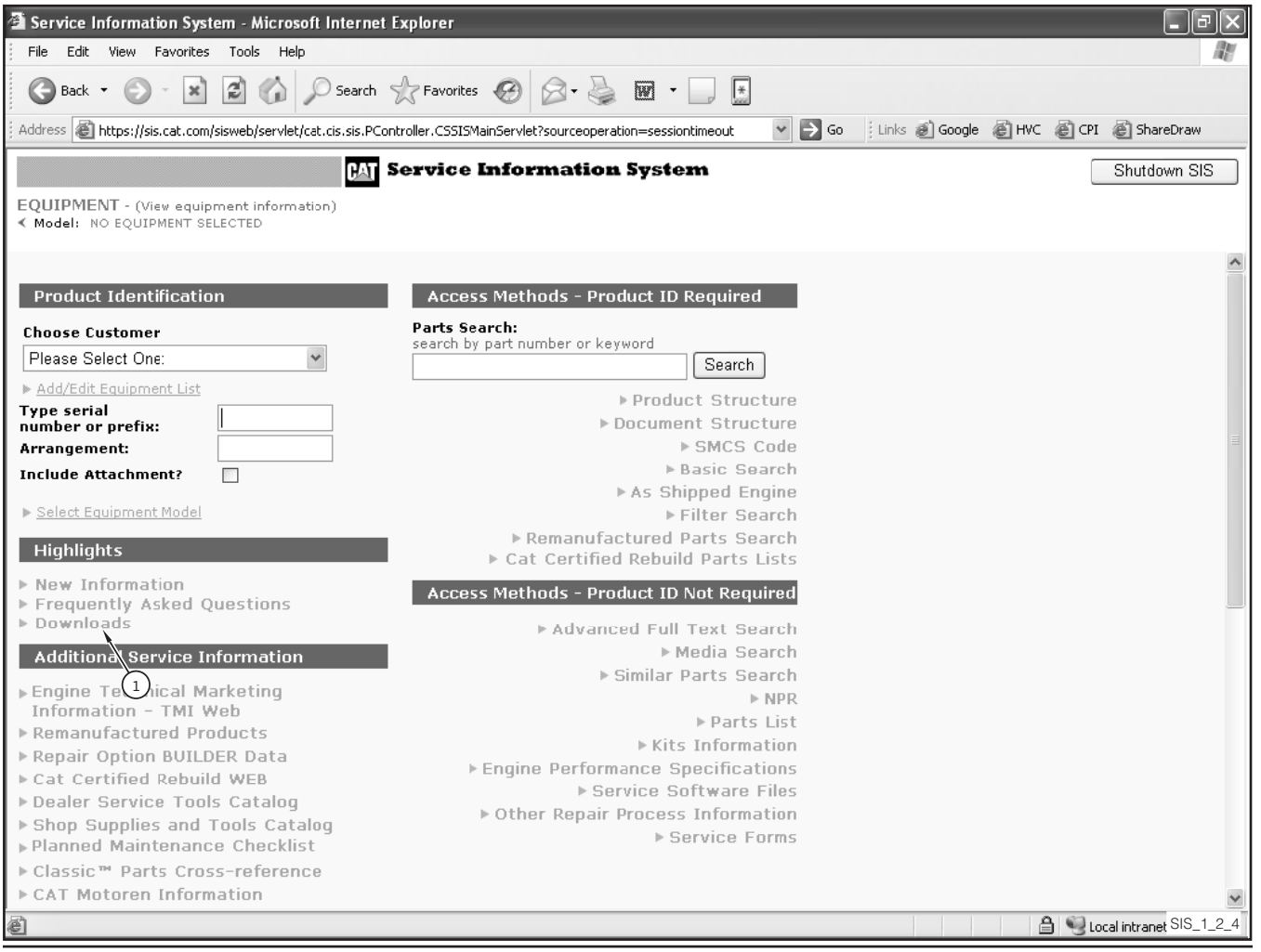

Illustration 20

2. Choose “Downloads” (1).

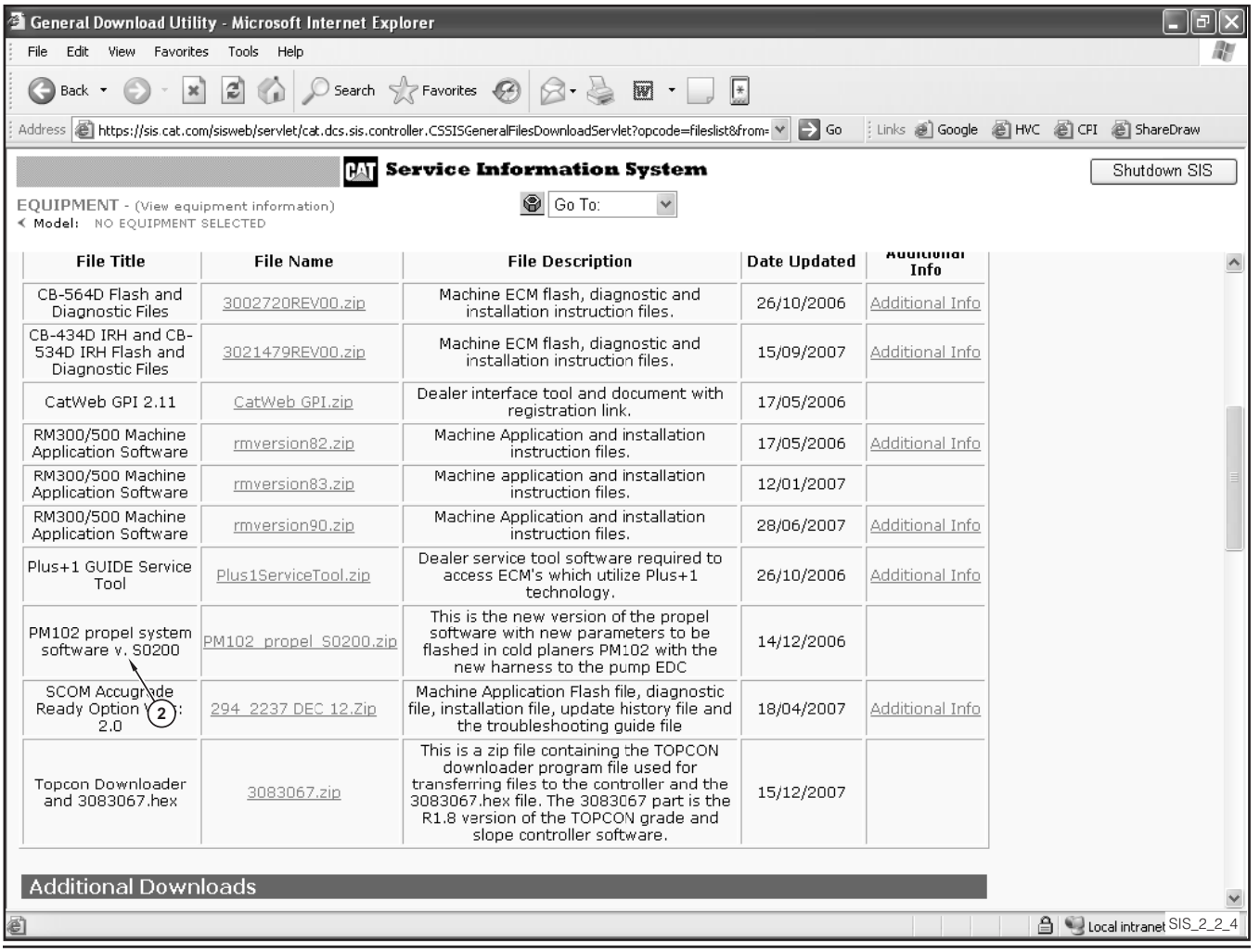

Illustration 21

3. Navigate to PM102 downloads (2).

4. Download the PM102 files. Save the files into a known location on the computer.

Install Flash Files on ECM

1. Perform the steps in “Plus-1 Software—Connect.”

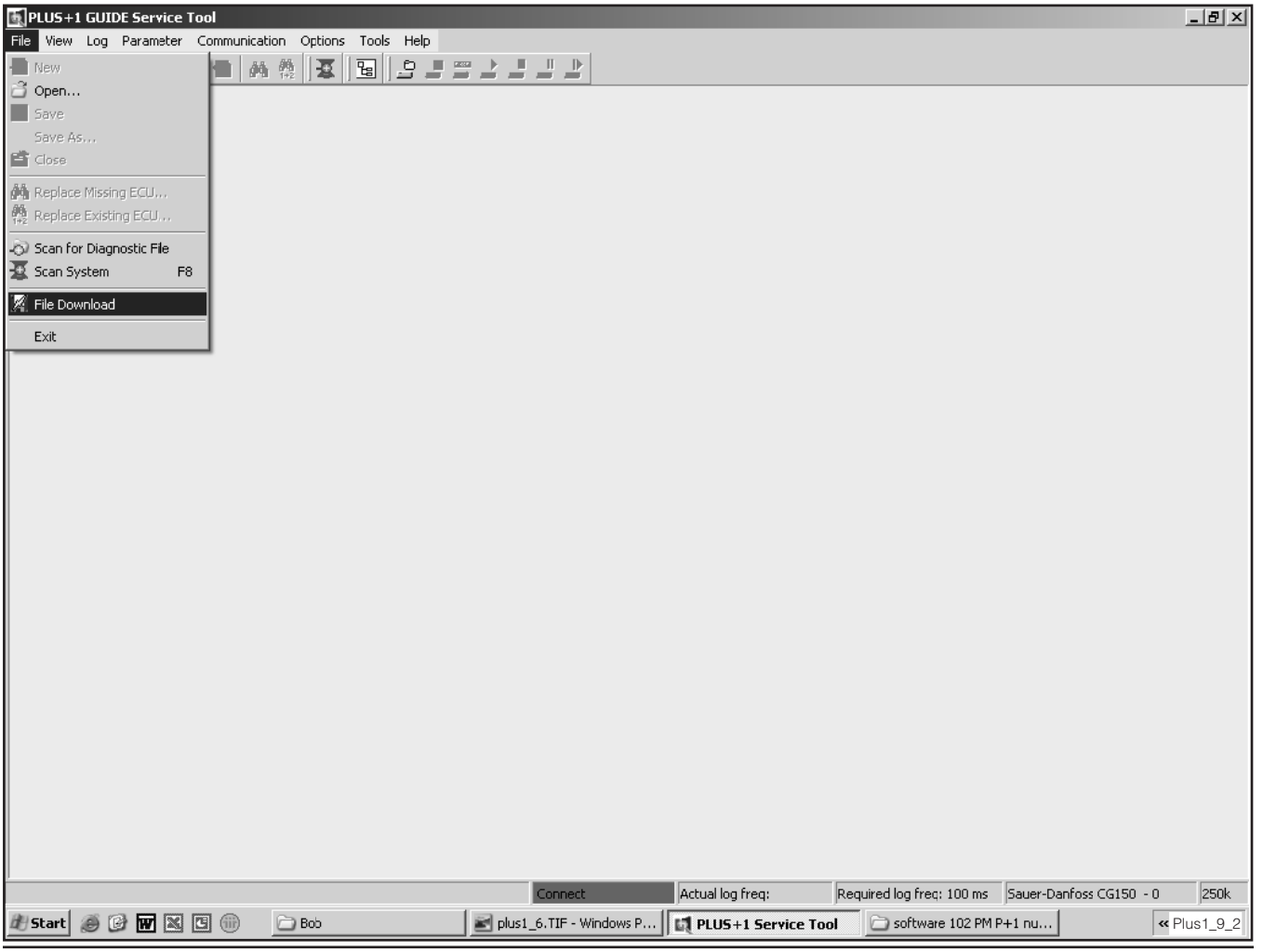

Illustration 22

2. Choose “File/File Download.”

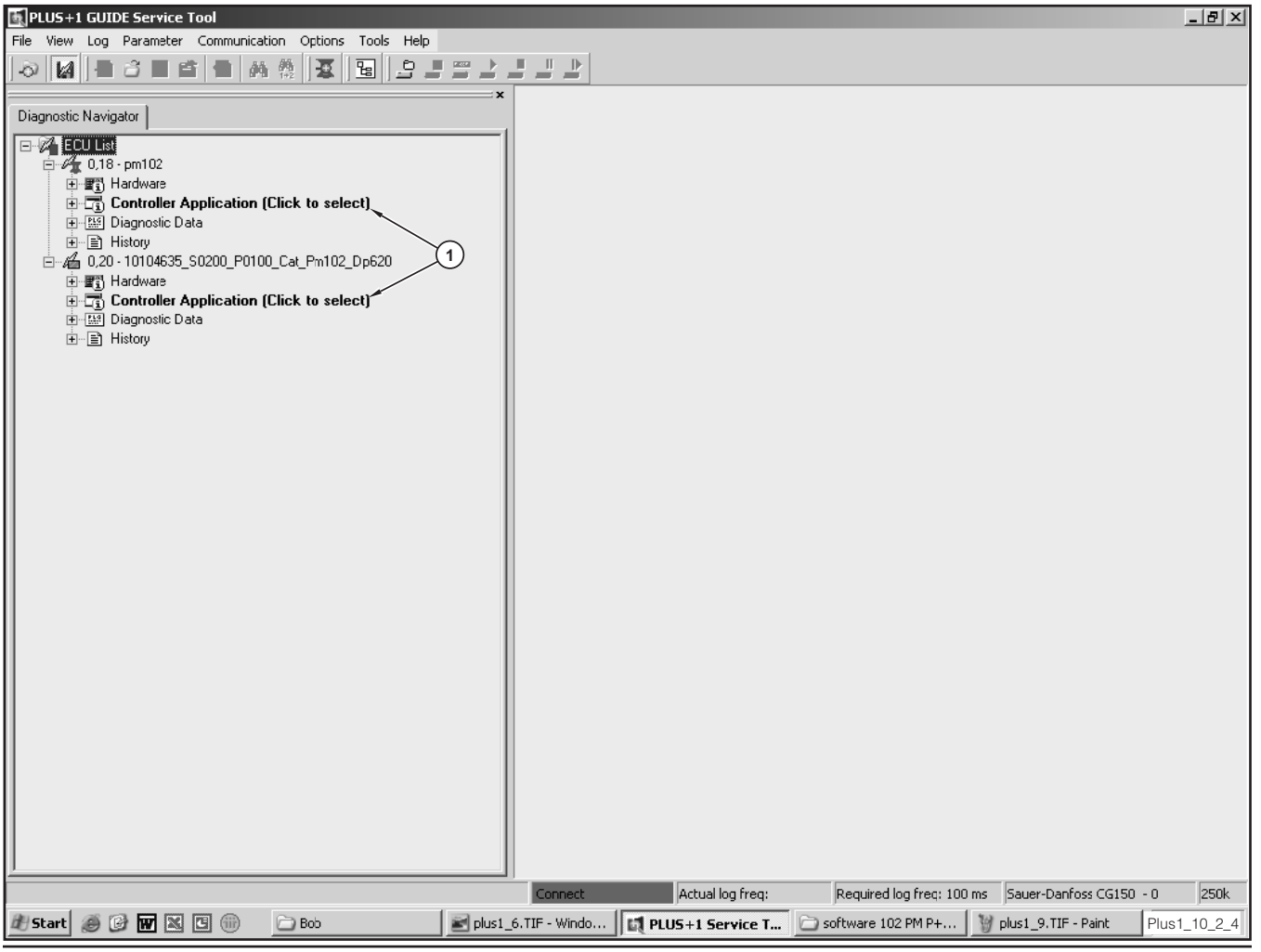

Illustration 23

3. In the “Diagnostic Navigator” tree, highlight “Controller Application” (1) for either the machine ECM or the display, depending on which application is to be updated.

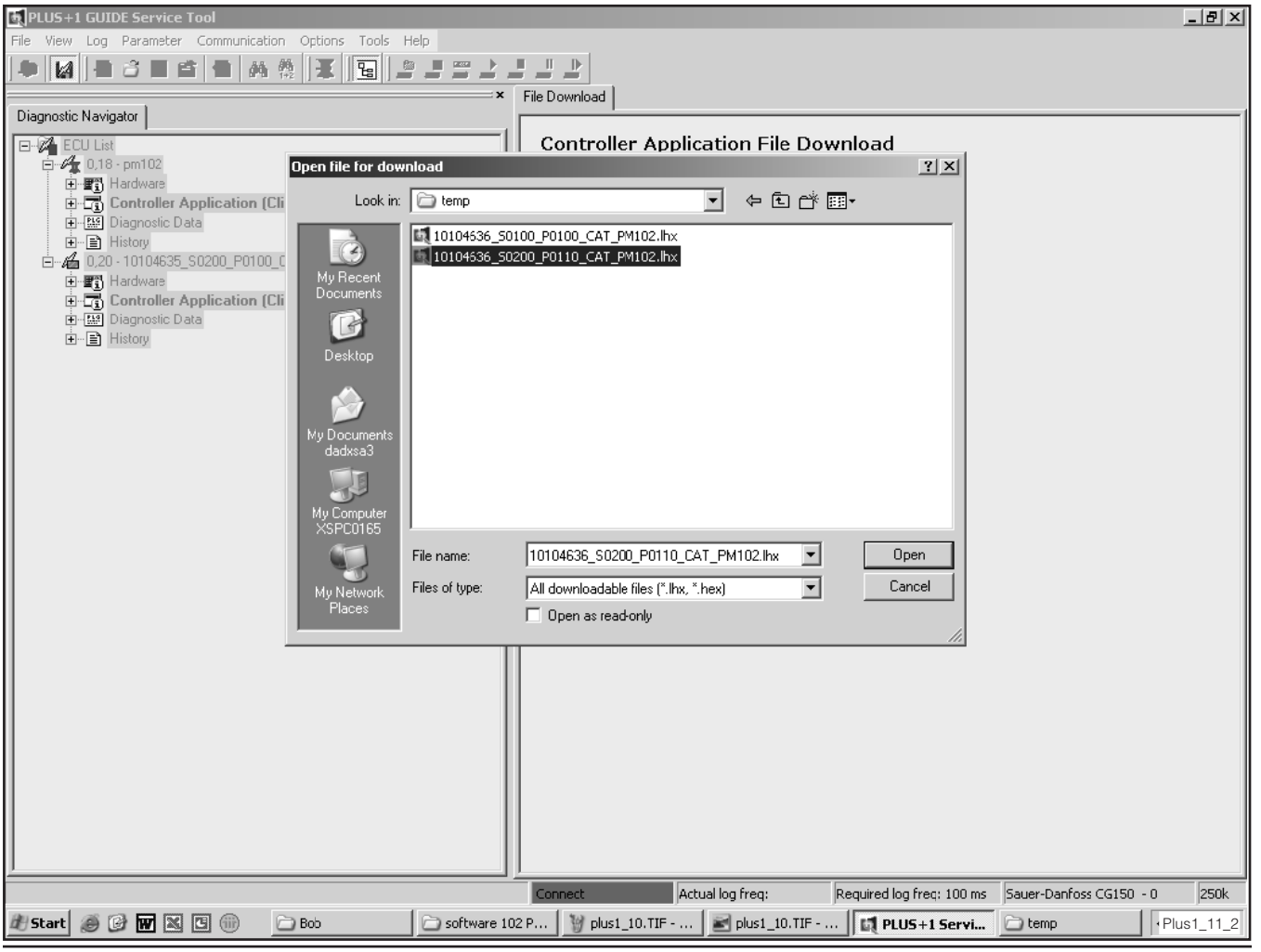

Illustration 24

4. Navigate the computer's file structure to the location of the flash file.

5. Highlight the desired file for download. Choose "Open."

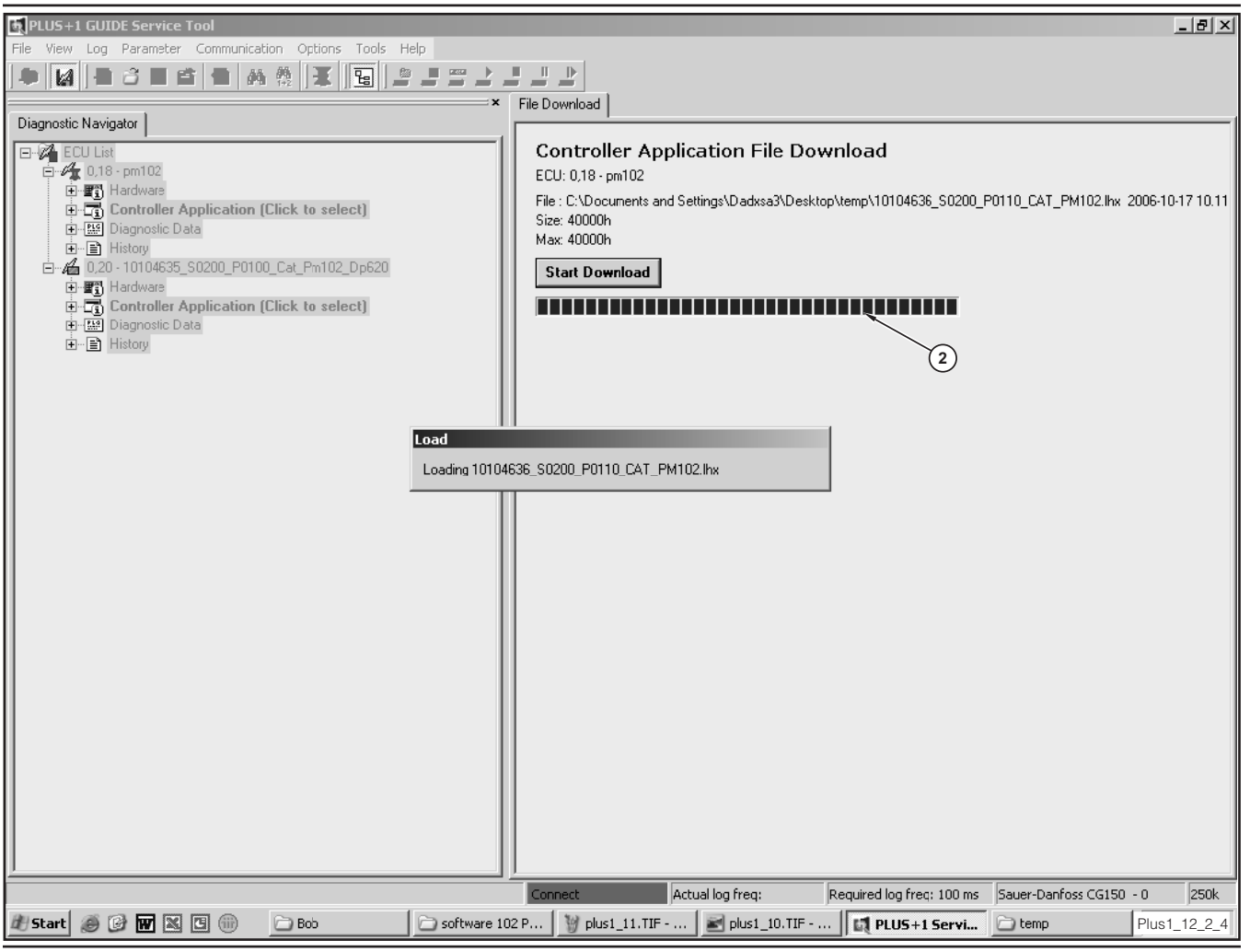

Illustration 25

6. Wait for the file to load. Status bar (2) shows the status of loading.

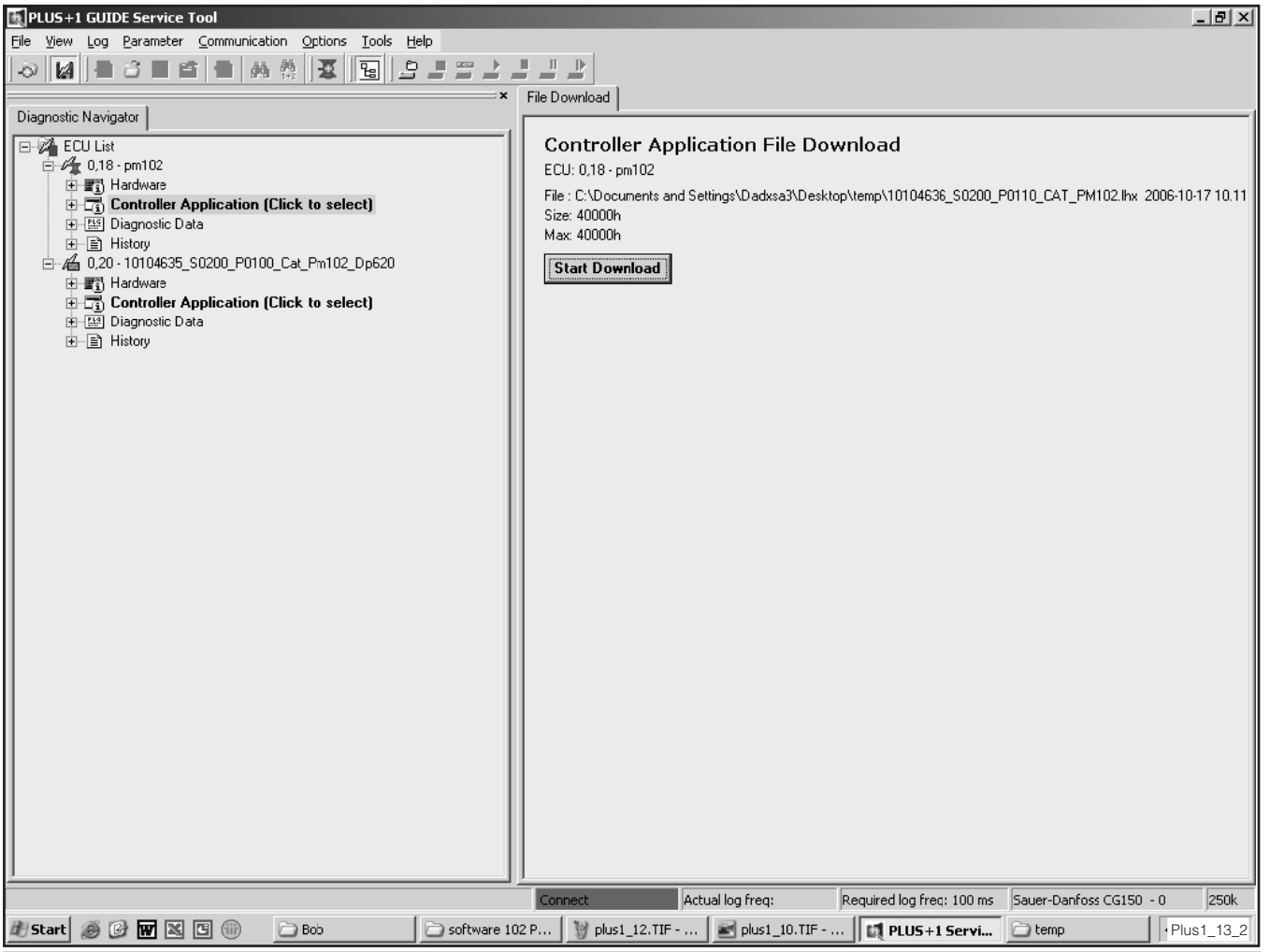

Illustration 26

7. Choose “Start Download.”

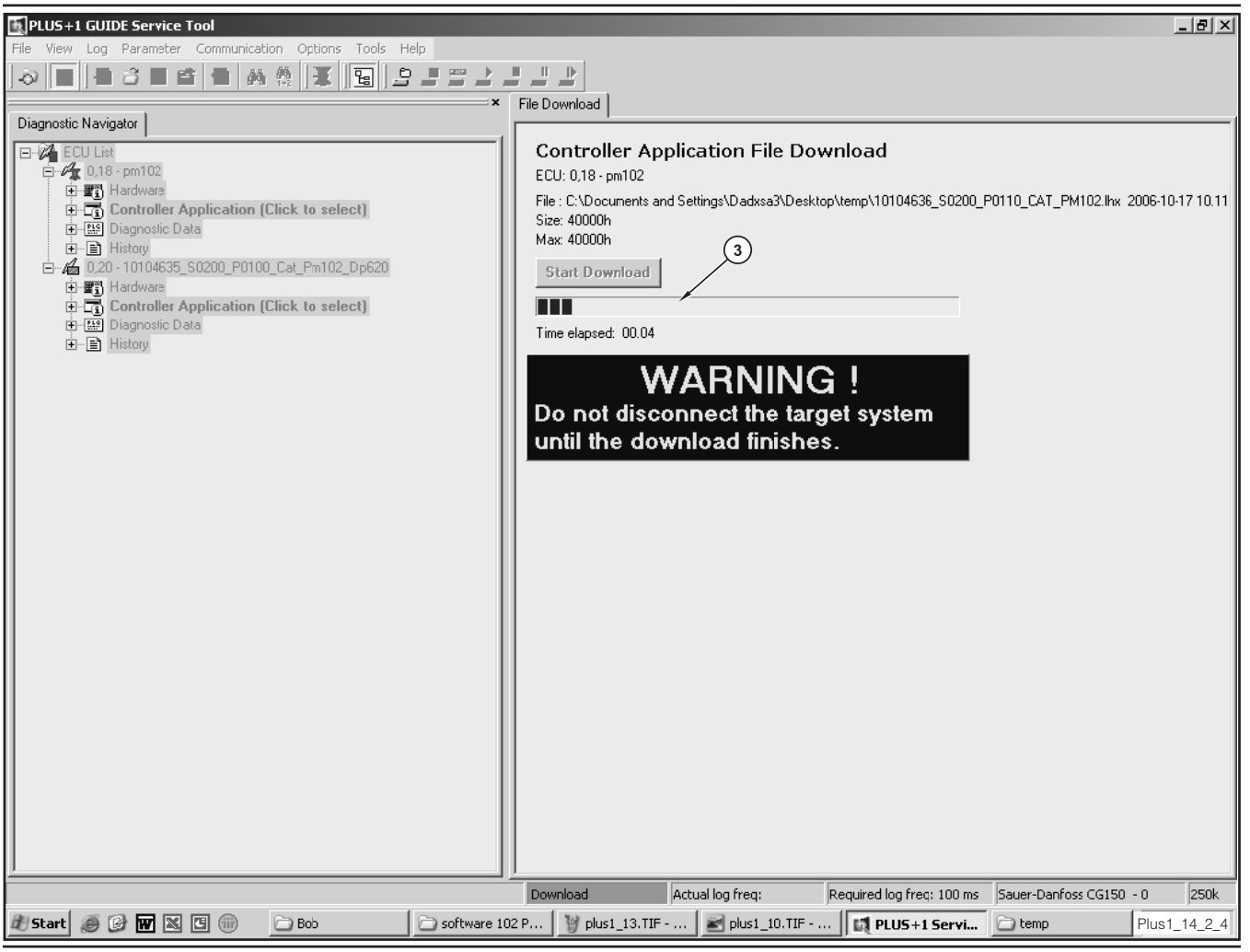

Illustration 27

8. Wait for the file to download. Status bar (3) shows the status of the download.

9. After the download is complete, the system is available for other operations.

Propulsion System

Relief Valve (Charge)–Test

⚠ WARNING

Sudden movement of the machine or release of oil under pressure can cause serious injury to persons on or near the machine.

To prevent injury or death, make sure that the area around the machine is clear of personnel and obstructions before operating the machine.

⚠ WARNING

Injury to personnel can result if they are not in the operator's view. Allow only essential personnel near the machine, and make sure the personnel are in the operator's view when testing, to prevent injury. Make sure checks are done in an open area.

⚠ WARNING

Personal injury can result from rotating and moving parts.

Moving fan blades and moving parts will throw or cut any object or tool that falls or is pushed into them.

Make sure no one is working on, underneath or close to an engine that is running. Make sure the area is free of personnel.

NOTICE

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the machine. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, "Caterpillar Tools and Shop Products Guide," for tools and supplies suitable to collect and contain fluids in Caterpillar machines.

Dispose of all fluids according to local regulations and mandates.

Table 4

Required Tools			
Tool	**Part Number**	**Description**	**Qty**
A	8T-0855	Pressure Gauge 0–4000 kPa (0–580 psi)	1
	6v-4144	Coupler	1
B	272-0775	Hose Assembly 1000 mm (39 in)	1
	280-9168	Nipple Fitting	1
	6V-0405	Dowty Seal	1
	8T-7910	Adapter–Union	1
	3J-1907	O-Ring Seal	1
	164-5567	Nipple Fitting	1

Table 5

Optional Tools(1)			
Tool	**Part Number**	**Description**	**Qty**
C(2)	198-4234	Digital Pressure Indicator	1
D(2)	198-4236	Extension Cable	1
E(2)	198-4237	Pressure Sensor 0–3500 kPa (0–500 psi)	1

(1) The optional tools can be used in place of the analog pressure measurement Tool A, which is specified in the required tool list.
(2) Tool C, Tool D, and Tool E are part of the 198-4240 Digital Pressure Indicator Group.

1. Drive the machine to a smooth, horizontal surface.

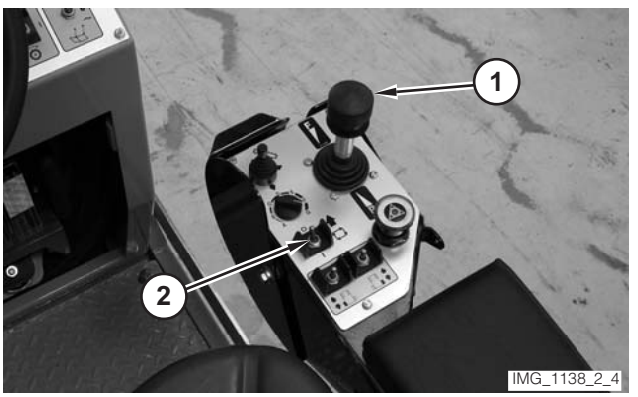

Illustration 28

2. Move propulsion lever (1) to the NEUTRAL position.

3. Move drive selector switch (2) to the OFF position.

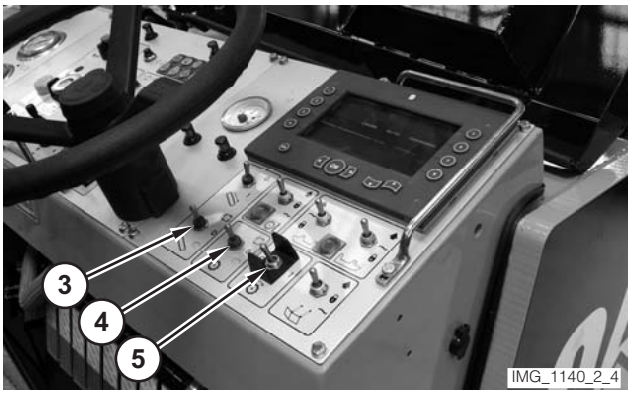

Illustration 29

4. Make sure conveyor switch (3) is in the OFF position.

5. Make sure water spray switch (4) is in the OFF position.

6. Make sure rotor switch (5) is in the OFF position.

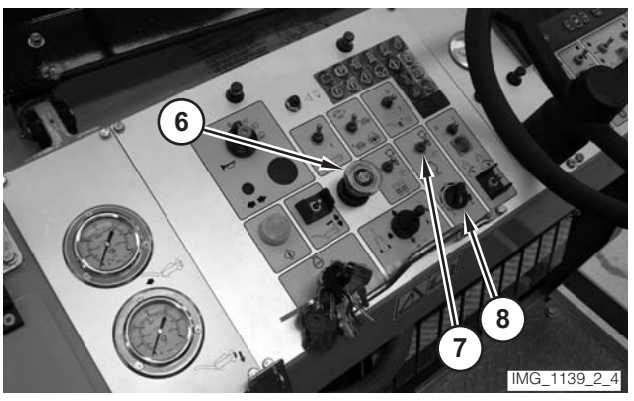

Illustration 30

7. Move parking brake switch (6) to the ON position.

8. If necessary, move engine control switch (7) to the “O” position.

9. Rotate engine speed dial (8) to the LOW-IDLE position.

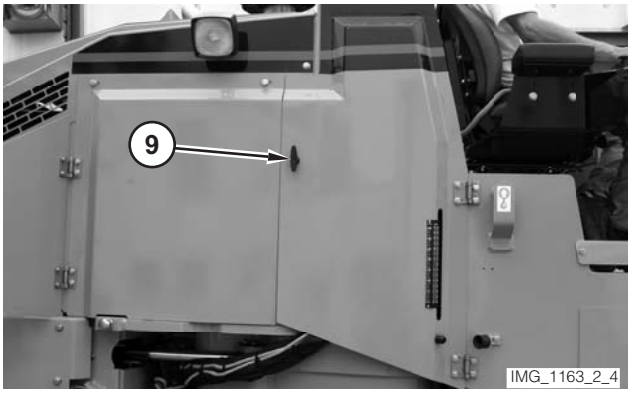

Illustration 31

10. Open right leg compartment (9).

11. If the right rear column is inside the compartment, go to Step 12. If the right rear column is outside the compartment, go to Step 25.

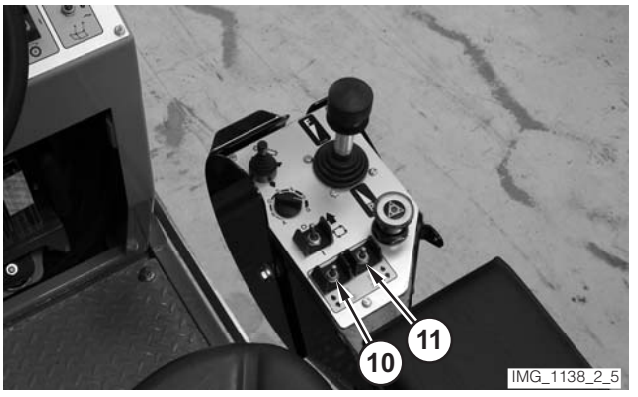

Illustration 32

12. Use left rear leg switch (10) and right rear leg switch (11) to lower the rear of the machine. Release the switches when the drum rests on the ground.

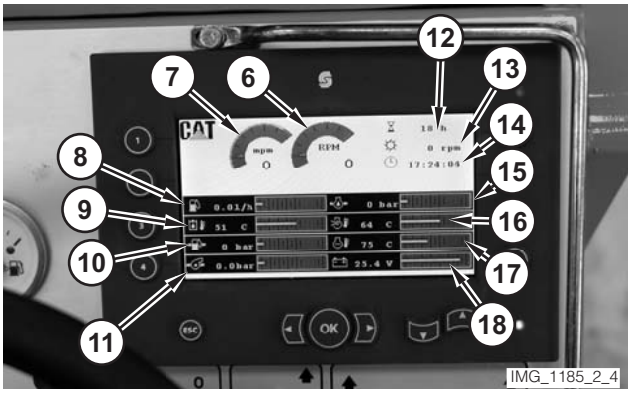

Illustration 33

13. Press “4” switch (13), on the digital display, twice.

14. Press “1” switch (12), on the digital display, once.

15. Move right rear leg switch (11) to the LOWER position.

Illustration 34

16. Watch “Column high position sensor” box (14) on the digital display. When the box changes from red to green, release right rear leg switch (11).

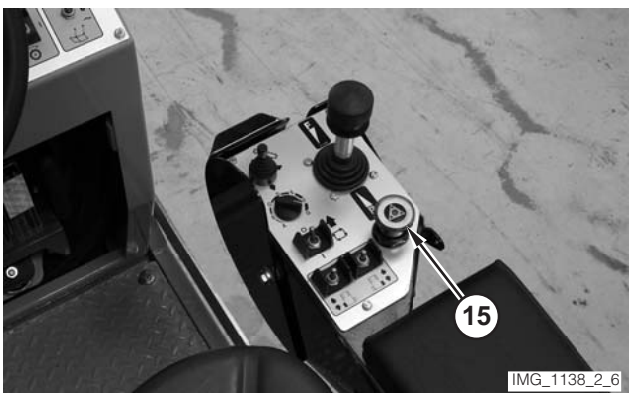

Illustration 35

17. Move electrical controls disable switch (15) to the DISABLE position.

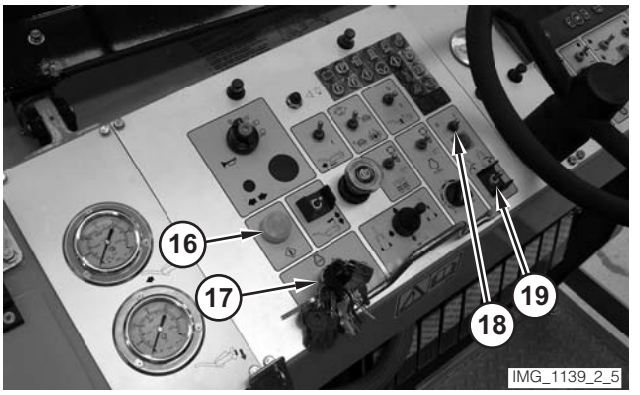

Illustration 36

18. Move column enable switch (18) to the ON position.

19. Move column switch (19) to the OPEN position. Release the switch when the column is completely open.

20. Move column enable switch (18) to the OFF position.

21. Move electrical controls disable switch (15) to the NORMAL position.

22. Press electrical controls master switch (16).

23. Move right rear leg switch (11) to the RAISE position.

24. When the right track (or wheel) touches the ground, move left rear leg switch (10) to the RAISE position. Hold right rear leg switch (11) and the left rear leg switch until the rotor no longer touches the ground.

25. Move key switch (17) to the OFF position.

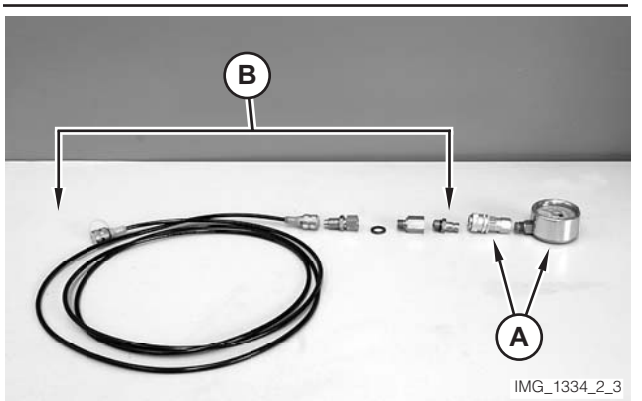

Illustration 37

26. Assemble Tool A. Assemble Tool B. Connect Tool A to Tool B.

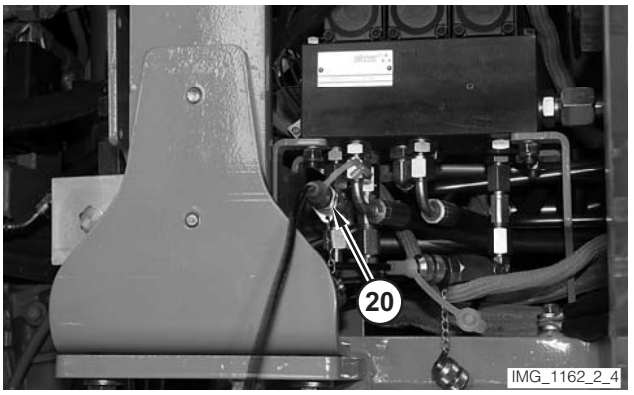

Illustration 38

27. Remove the cap from charge pressure tap (20). Connect Tool B to the charge pressure tap.

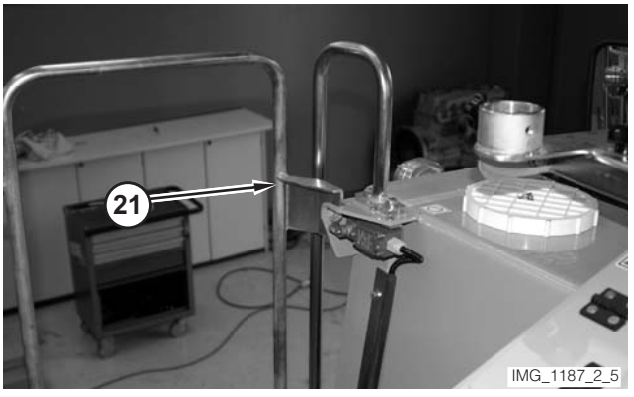

Illustration 39

28. Ensure that gate (21) is closed.

29. Move key switch (17) to the START position. Release the key switch when the engine starts.

30. Operate the engine at low idle for a few minutes.

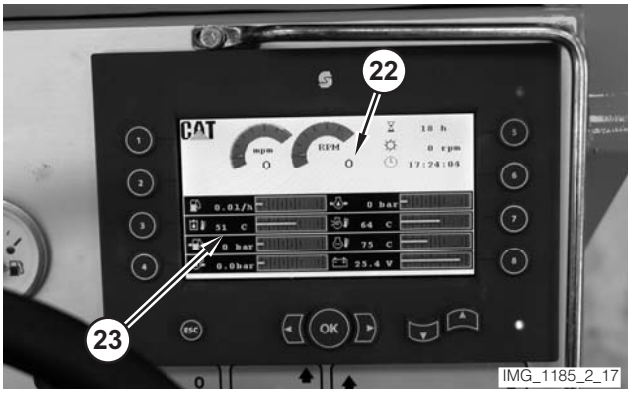

Illustration 40

31. Monitor engine speed value (22) on the digital display. Rotate engine speed dial (8) until the engine speed reaches 1500 rpm.

32. Monitor hydraulic oil temperature (23) on the digital display. Operate the machine until the oil temperature reaches 45 ± 5 °C (110 ± 10 °F).

33. With propulsion lever (1) in the NEUTRAL position and the engine at 1500 rpm, record the pressure at charge pressure tap (20). The pressure should be 2150 ±150 kPa (312 ± 22 psi).

34. If the pressure is outside the specified range, go to Step 35. If the pressure is inside the specified range, go to Step 39.

35. Rotate engine speed dial (8) to the LOW-IDLE position. Move key switch (17) to the OFF position.

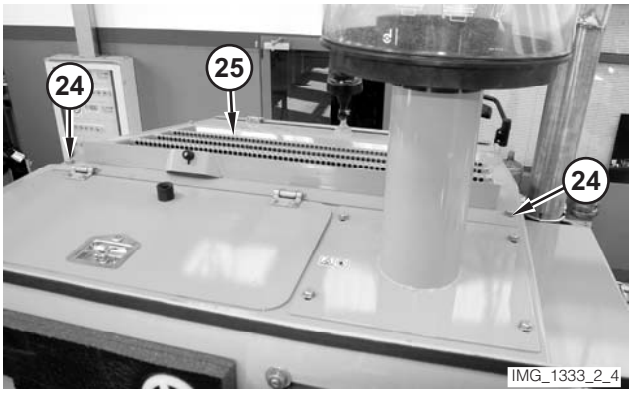

Illustration 41

36. Remove four bolts and washers (24). Open grill (25). Use a suitable device to prevent the grill from falling.

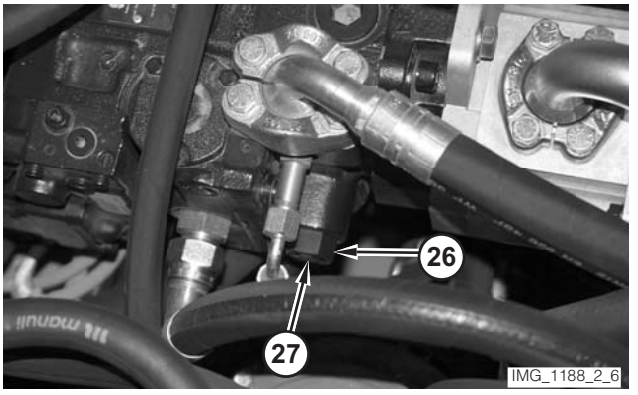

Illustration 42

37. Loosen locknut (26) on the charge relief valve. In order to increase pressure, rotate adjustment screw (27) clockwise. In order to decrease pressure, rotate the adjustment screw counterclockwise.

38. Hold adjustment screw (27) in place, and tighten locknut (26). Go to Step 28.

⚠ WARNING

The machine will move during the next steps. In order to prevent injury or death, make sure that the area around the machine is clear of personnel and clear of obstructions before operating the machine.

39. Rotate engine speed dial (8) until the engine reaches high idle.

40. Depress electrical controls master switch (16).

41. Move parking brake switch (6) to the OFF position.

42. Move drive selector switch (2) to the ON position.

43. Move propulsion lever (1) slightly out of the NEUTRAL position and into the FORWARD range. Slowly move the propulsion lever forward until the pressure at charge pressure tap (20) stabilizes.

44. Read the pressure at charge pressure tap (20). The pressure should be 200 ± 100 kPa (29 ± 15 psi) less than the pressure recorded in Step 33.

45. Move propulsion lever (1) to the NEUTRAL position.

46. If the pressure recorded in Step 44 is outside the specified range, components in the propulsion system may have excessive case drain leakage.

47. Rotate engine speed dial (8) to the LOW-IDLE position.

48. Move drive selector switch (2) to the OFF position. Move parking brake switch (6) to the ON position.

49. Move key switch (17) to the OFF position.

50. Remove the tooling.

51. Close right leg compartment (9). Close grill (25). Install bolts and washers (24).

Pressure Limiter Valve (Propel Pump)—Test and Adjust

⚠ WARNING

Sudden movement of the machine or release of oil under pressure can cause serious injury to persons on or near the machine.

To prevent injury or death, make sure that the area around the machine is clear of personnel and obstructions before operating the machine.

⚠ WARNING

Injury to personnel can result if they are not in the operator's view. Allow only essential personnel near the machine, and make sure the personnel are in the operator's view when testing, to prevent injury. Make sure checks are done in an open area.

⚠ WARNING

Personal injury can result from rotating and moving parts.

Moving fan blades and moving parts will throw or cut any object or tool that falls or is pushed into them.

Make sure no one is working on, underneath or close to an engine that is running. Make sure the area is free of personnel.

NOTICE

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the machine. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, "Caterpillar Tools and Shop Products Guide," for tools and supplies suitable to collect and contain fluids in Caterpillar machines.

Dispose of all fluids according to local regulations and mandates.

1. Drive the machine to a smooth, horizontal surface.

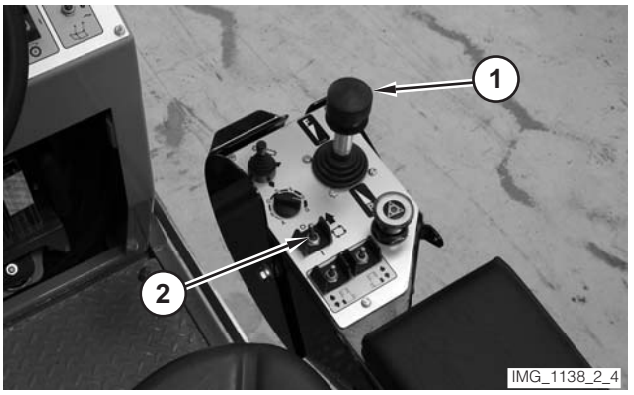

Illustration 43

2. Move propulsion lever (1) to the NEUTRAL position.

3. Move drive selector switch (2) to the OFF position.

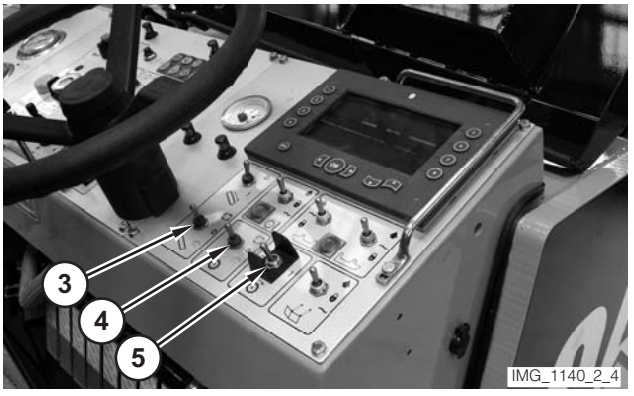

Illustration 44

4. Make sure conveyor switch (3) is in the OFF position.

5. Make sure water spray switch (4) is in the OFF position.

6. Make sure rotor switch (5) is in the OFF position.

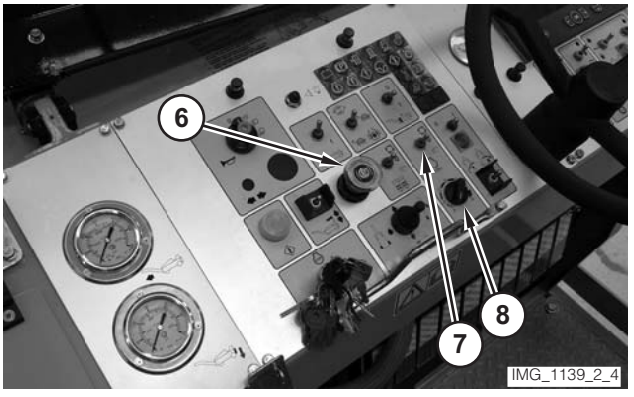

Illustration 45

7. Move parking brake switch (6) to the ON position.

8. If necessary, move engine control switch (7) to the “O” position.

9. Rotate engine speed dial (8) to the LOW-IDLE position.

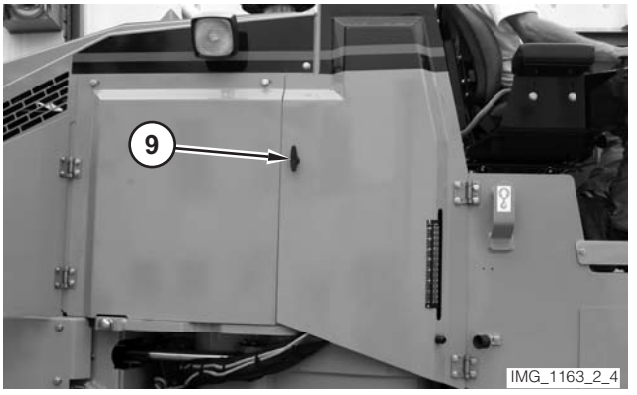

Illustration 46

10. Open right leg compartment (9).

11. If the right rear column is inside the compartment, go to Step 12. If the right rear column is outside the compartment, go to Step 25.

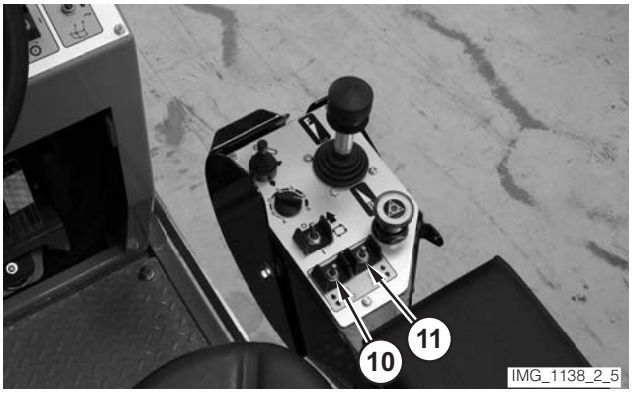

Illustration 47

12. Use left rear leg switch (10) and right rear leg switch (11) to lower the rear of the machine. Release the switches when the drum rests on the ground.

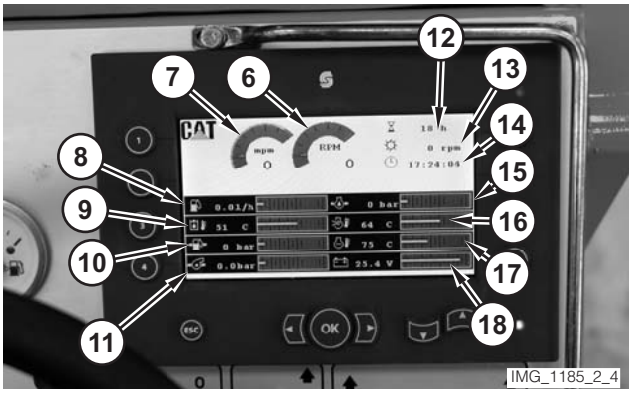

Illustration 48

13. Press “4” switch (13), on the digital display, twice.

14. Press “1” switch (12), on the digital display, once.

15. Move right rear leg switch (11) to the LOWER position.

Illustration 49

16. Watch “Column high position sensor” box (14) on the digital display. When the box changes from red to green, release right rear leg switch (11).

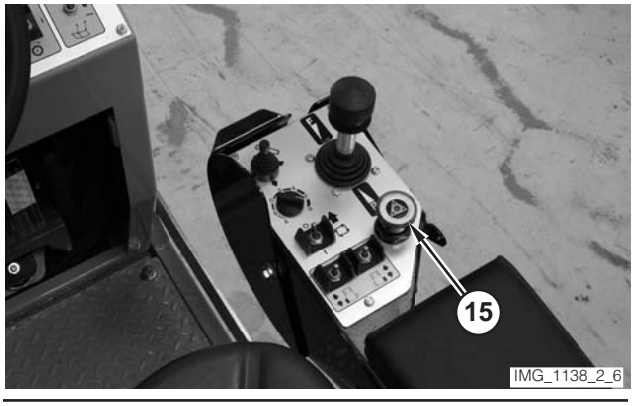

Illustration 50

17. Move electrical controls disable switch (15) to the DISABLE position.

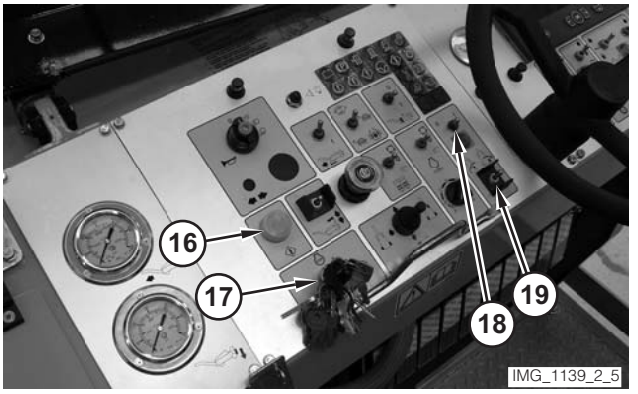

Illustration 51

18. Move column enable switch (18) to the ON position.

19. Move column switch (19) to the OPEN position. Release the switch when the column is completely open.

20. Move column enable switch (18) to the OFF position.

21. Move electrical controls disable switch (15) to the NORMAL position.

22. Press electrical controls master switch (16).

23. Move right rear leg switch (11) to the RAISE position.

24. When the right track (or wheel) touches the ground, move left rear leg switch (10) to the RAISE position. Hold right rear leg switch (11) and the left rear leg switch until the rotor no longer touches the ground.

25. Move key switch (17) to the OFF position.

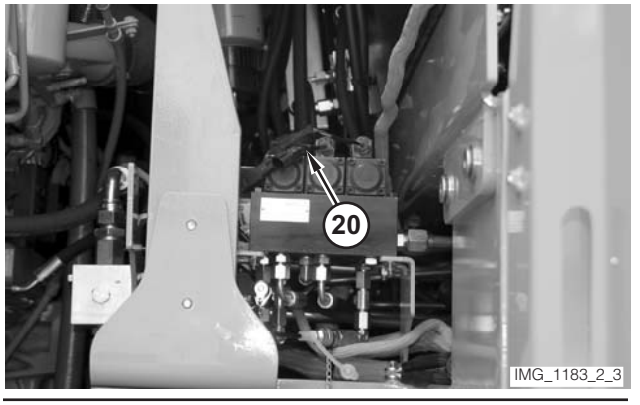

Illustration 52

26. Disconnect parking brake solenoid (20).

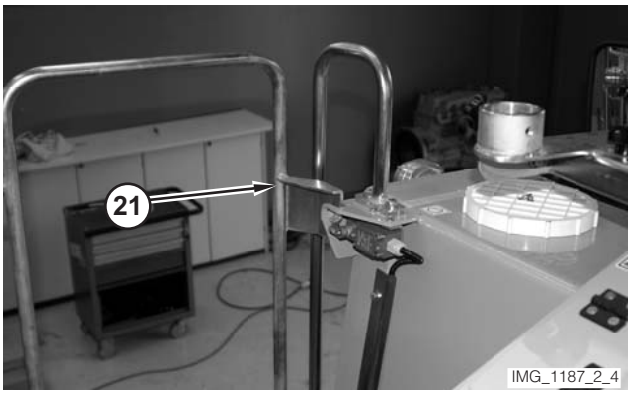

Illustration 53

27. Ensure that gate (21) is closed.

28. Move key switch (17) to the START position. Release the key switch when the engine starts.

29. Operate the engine at low idle for a few minutes.

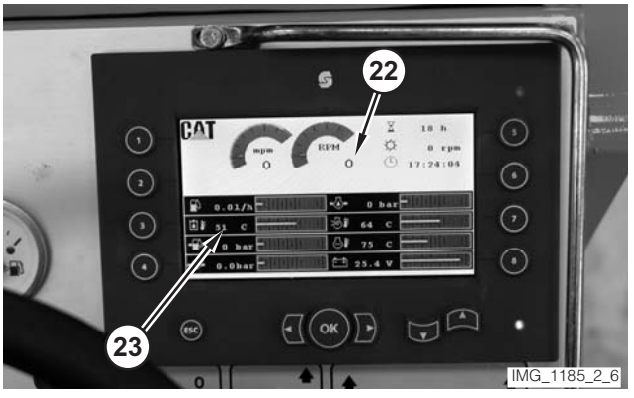

Illustration 54

30. Monitor engine speed value (22) on the digital display. Rotate engine speed dial (8) until the engine speed reaches 1500 rpm.

31. Monitor hydraulic oil temperature (23) on the digital display. Operate the machine until the oil temperature reaches 45 ± 5 °C (110 ± 10 °F).

32. Depress electrical controls master switch (16).

WARNING

The travel mode switch must be in the TRAVEL position during this test. If the travel mode switch is in the WORK position or in the DIFFERENTIAL LOCK position, the machine may drive through the parking brake.

If the machine moves at any time during this test, immediately move the propulsion lever to NEUTRAL. Stop the machine and repair the parking brakes before this test is continued and/or before the machine is placed back in service.

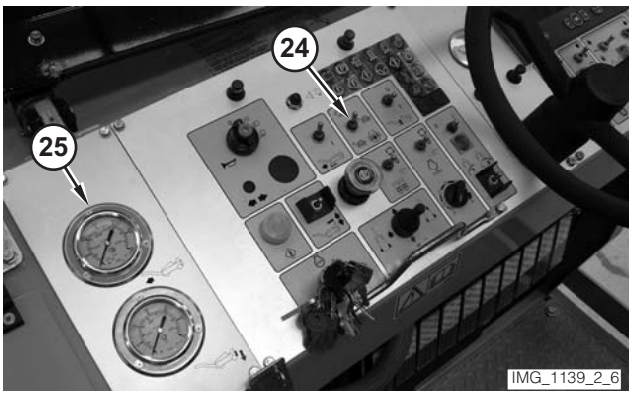

Illustration 55

33. Move travel mode switch (24) to the TRAVEL position.

34. Move drive selector switch (2) to the ON position.

35. Move parking brake switch (6) to the OFF position.

36. Move propulsion lever (1) slightly out of the NEUTRAL position and into the FORWARD range. Slowly move the propulsion lever forward until the pressure on gauge (25) stabilizes. Record the pressure as “forward pressure.” The forward pressure should be 29 000 kPa (4200 psi).

37. Move propulsion lever (1) to the NEUTRAL position.

38. Move propulsion lever (1) slightly out of the NEUTRAL position and into the REVERSE range. Slowly move the propulsion lever rearward until the pressure on gauge (25) stabilizes. Record the pressure as “reverse pressure.” The reverse pressure should be 29 000 kPa (4200 psi).

39. Move propulsion lever (1) to the NEUTRAL position.

40. Move drive selector switch (2) to the OFF position.

41. Move parking brake switch (6) to the ON position.

42. Rotate engine speed dial (8) to the LOW-IDLE position.

43. Move key switch (17) to the OFF position.

44. If the forward pressure or the reverse pressure is outside the specified range, go to Step 45. If the forward pressure and the reverse pressure are inside the specified range, go to Step 53.

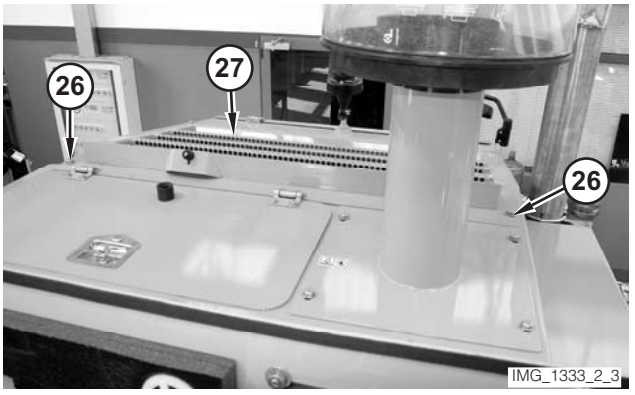

Illustration 56

45. Remove four bolts and washers (26). Open grill (27). Use a suitable device to prevent the grill from falling.

46. If the forward pressure is outside the specified range, go to Step 47. If the forward pressure is inside the specified range, go to Step 49.

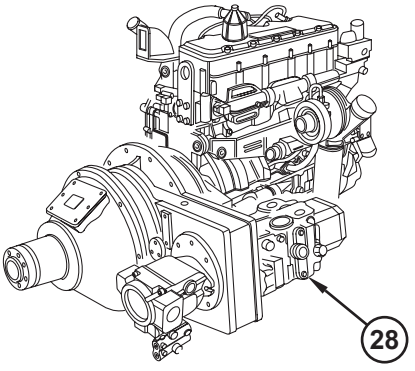

Illustration 57

Location of Pump.

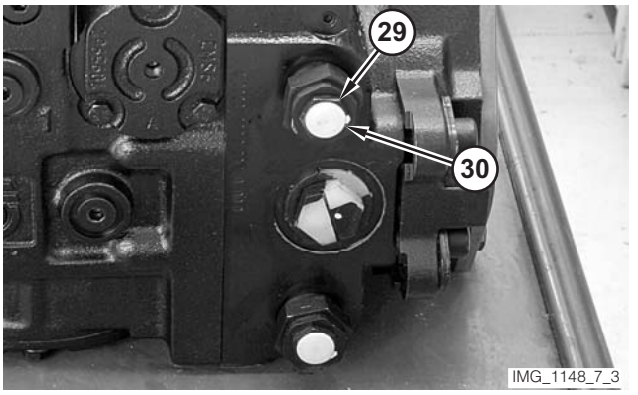

Illustration 58

Pump Removed From Machine.

47. Remove cap (30) in order to access the adjustment screw on propulsion pump (28). Loosen locknut (29) on the forward multifunction valve. In order to increase pressure, rotate the adjustment screw clockwise. In order to decrease pressure, rotate the adjustment screw counterclockwise.

NOTE: One revolution of the adjustment screw changes the pressure by approximately 9300 kPa (1350 psi).

48. Hold the adjustment screw and tighten locknut (29). Install cap (30).

49. If the reverse pressure is outside the specified range, go to Step 50. If the reverse pressure is inside the specified range, go to Step 52.

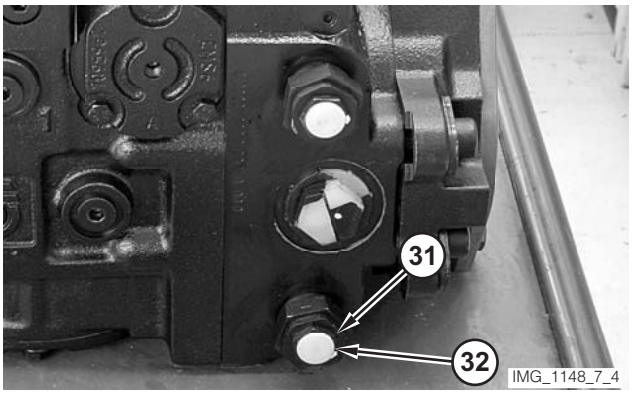

Illustration 59

Pump Removed From Machine.

50. Remove cap (32) in order to access the adjustment screw. Loosen locknut (31) on the reverse multifunction valve. In order to increase pressure, rotate the adjustment screw clockwise. In order to decrease pressure, rotate the adjustment screw counterclockwise.

NOTE: One revolution of the adjustment screw changes the pressure by approximately 9300 kPa (1350 psi).

51. Hold the adjustment screw and tighten locknut (31). Install cap (32).

52. If an adjustment was made in Step 47 or in Step 50, go to Step 27.

53. Reconnect parking brake solenoid (20).

54. Close grill (27). Install bolts and washers (26).

55. If necessary, close compartment (9).

Differential Lock Engagement—Test

NOTE: Perform the procedure entitled "Pressure Limiter Valve (Propulsion Pump)—Test and Adjust," before the following test is performed.

⚠ WARNING

Sudden movement of the machine or release of oil under pressure can cause serious injury to persons on or near the machine.

To prevent injury or death, make sure that the area around the machine is clear of personnel and obstructions before operating the machine.

⚠ WARNING

Injury to personnel can result if they are not in the operator's view. Allow only essential personnel near the machine, and make sure the personnel are in the operator's view when testing, to prevent injury. Make sure checks are done in an open area.

⚠ WARNING

Personal injury can result from rotating and moving parts.

Moving fan blades and moving parts will throw or cut any object or tool that falls or is pushed into them.

Make sure no one is working on, underneath or close to an engine that is running. Make sure the area is free of personnel.

1. Drive the machine to a smooth, horizontal surface.

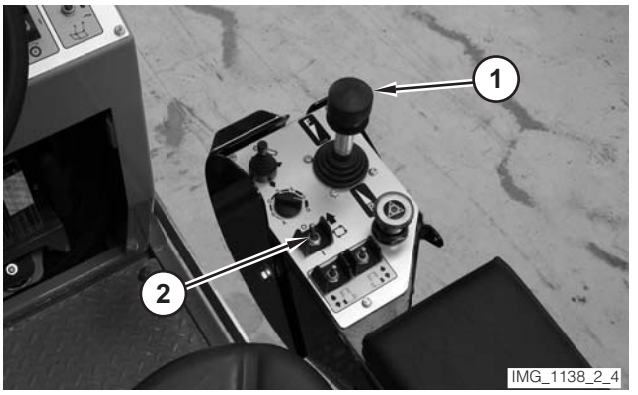

Illustration 60

2. Move propulsion lever (1) to the NEUTRAL position.

3. Move drive selector switch (2) to the OFF position.

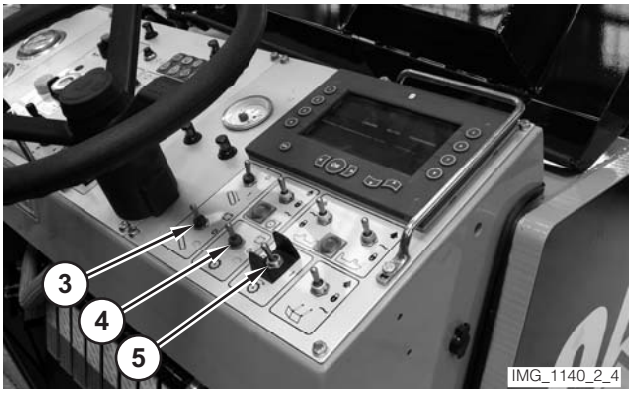

Illustration 61

4. Make sure conveyor switch (3) is in the OFF position.

5. Make sure water spray switch (4) is in the OFF position.

6. Make sure rotor switch (5) is in the OFF position.

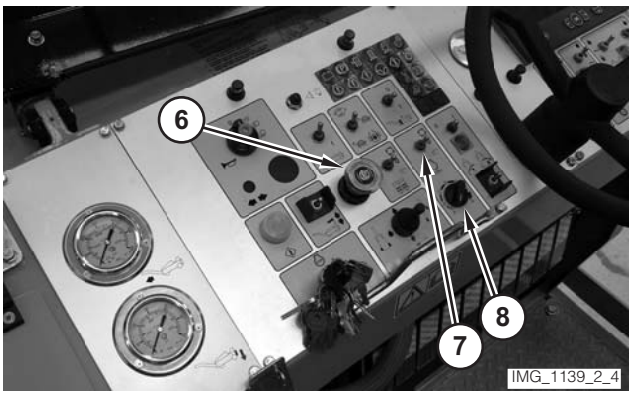

Illustration 62

7. Move parking brake switch (6) to the ON position.

8. If necessary, move engine control switch (7) to the “O” position.

9. Rotate engine speed dial (8) to the LOW-IDLE position.

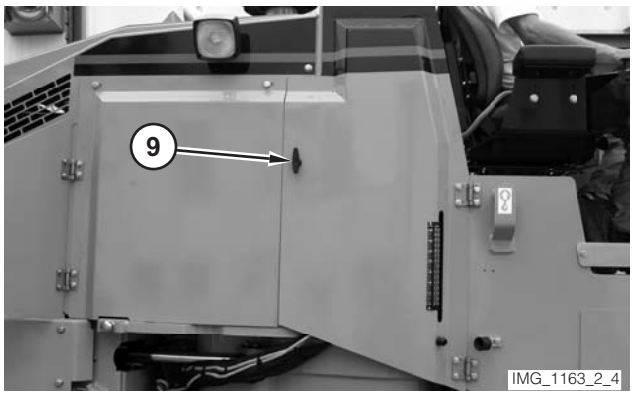

Illustration 63

10. Open right leg compartment (9).

11. If the right rear column is inside the compartment, go to Step 12. If the right rear column is outside the compartment, go to Step 25.

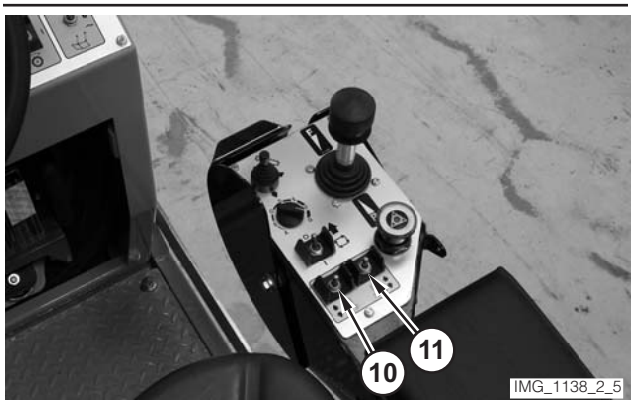

Illustration 64

12. Use left rear leg switch (10) and right rear leg switch (11) to lower the rear of the machine. Release the switches when the drum rests on the ground.

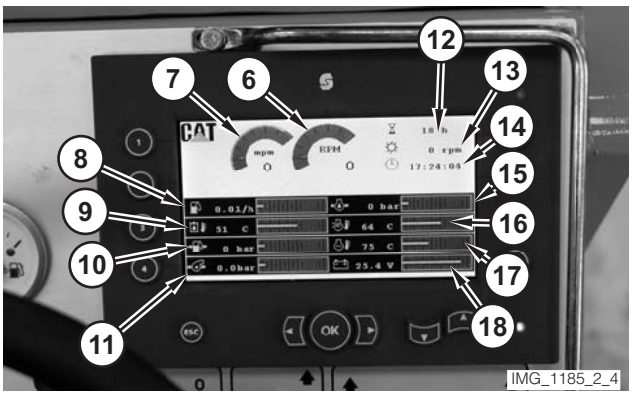

Illustration 65

13. Press “4” switch (13), on the digital display, twice.

14. Press “1” switch (12), on the digital display, once.

15. Move right rear leg switch (11) to the LOWER position.

Illustration 66

16. Watch “Column high position sensor” box (14) on the digital display. When the box changes from red to green, release right rear leg switch (11).

Illustration 67

17. Move electrical controls disable switch (15) to the DISABLE position.

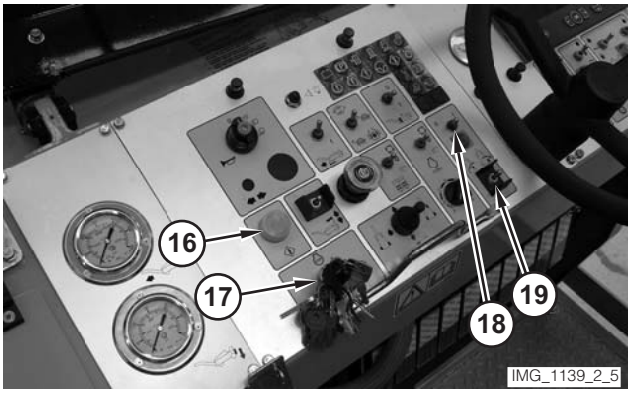

Illustration 68

18. Move column enable switch (18) to the ON position.

19. Move column switch (19) to the OPEN position. Release the switch when the column is completely open.

20. Move column enable switch (18) to the OFF position.

21. Move electrical controls disable switch (15) to the NORMAL position.

22. Press electrical controls master switch (16).

23. Move right rear leg switch (11) to the RAISE position.

24. When the right track (or wheel) touches the ground, move left rear leg switch (10) to the RAISE position. Hold right rear leg switch (11) and the left rear leg switch until the rotor no longer touches the ground.

25. Move key switch (17) to the OFF position.

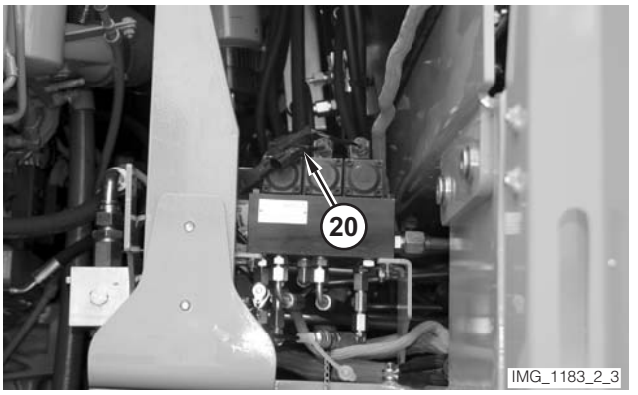

Illustration 69

26. Disconnect parking brake solenoid (20).

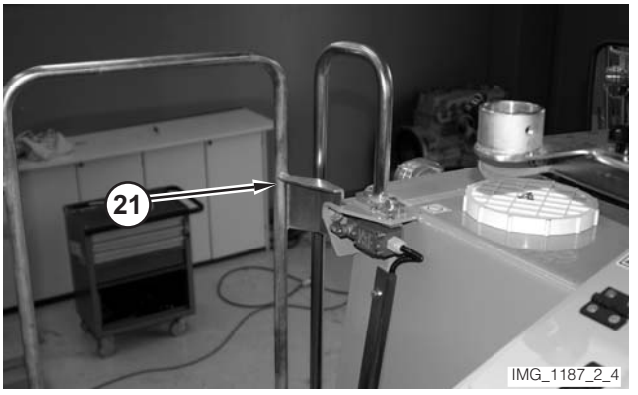

Illustration 70

27. Ensure that gate (21) is closed.

28. Move key switch (17) to the START position. Release the key switch when the engine starts.

29. Operate the engine at low idle for a few minutes.

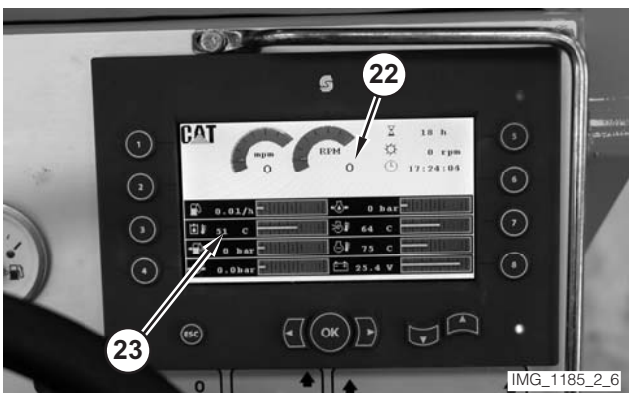

Illustration 71

30. Monitor engine speed value (22) on the digital display. Rotate engine speed dial (8) until the engine speed reaches 1500 rpm.

31. Monitor hydraulic oil temperature (23) on the digital display. Operate the machine until the oil temperature reaches 45 ± 5 °C (110 ± 10 °F).

32. Depress electrical controls master switch (16).

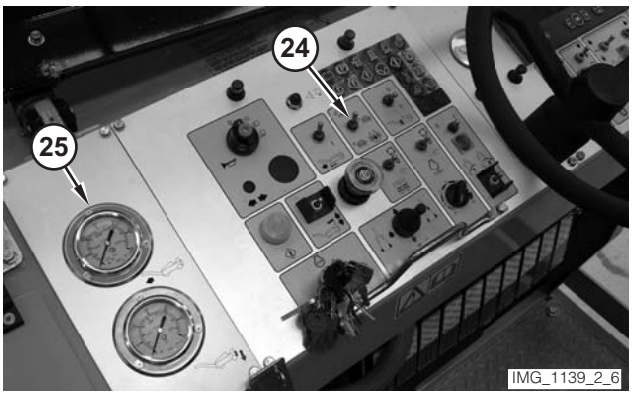

Illustration 72

33. Move travel mode switch (24) to the DIFFERENTIAL LOCK position.

34. Move parking brake switch (6) to the OFF position.

35. Move drive selector switch (2) to the ON position.

⚠ WARNING

If the parking brake is not functioning properly, the machine may move during this test.

If the machine moves at any time during this test, immediately move the propulsion lever to NEUTRAL. Stop the machine and repair the parking brakes before this test is continued and/or before the machine is placed back in service.

36. Move propulsion lever (1) slightly out of the NEUTRAL position and into the FORWARD range.

37. Read the pressure on gauge (25). The pressure should be low (case drain pressure).

38. Move travel mode switch (24) to the TRAVEL position. Read the pressure on gauge (25). The pressure should be 320 ± 20 Bar (4640 ± 290 psi).

39. Move propulsion lever (1) to the NEUTRAL position.

40. Rotate engine speed dial (8) to the LOW-IDLE position.

41. Move drive selector switch (2) to the OFF position.

42. Move parking brake switch (6) to the ON position.

43. Move key switch (17) to the OFF position.

44. If the pressure is outside the specified range, go to Step 45. If the pressure is inside the specified range, go to Step 46.

45. Inspect the differential lock solenoid and the shuttle valve on the brake and shift manifold. Make the necessary repairs, and go to Step 27.

46. Connect parking brake solenoid (20).

47. If necessary, close compartment (9).

Manual Brake Release System—Test

⚠ WARNING

Sudden movement of the machine or release of oil under pressure can cause serious injury to persons on or near the machine.

To prevent injury or death, make sure that the area around the machine is clear of personnel and obstructions before operating the machine.

⚠ WARNING

Injury to personnel can result if they are not in the operator's view. Allow only essential personnel near the machine, and make sure the personnel are in the operator's view when testing, to prevent injury. Make sure checks are done in an open area.

⚠ WARNING

Personal injury can result from rotating and moving parts.

Moving fan blades and moving parts will throw or cut any object or tool that falls or is pushed into them.

Make sure no one is working on, underneath or close to an engine that is running. Make sure the area is free of personnel.

1. Drive the machine to a smooth, horizontal surface.

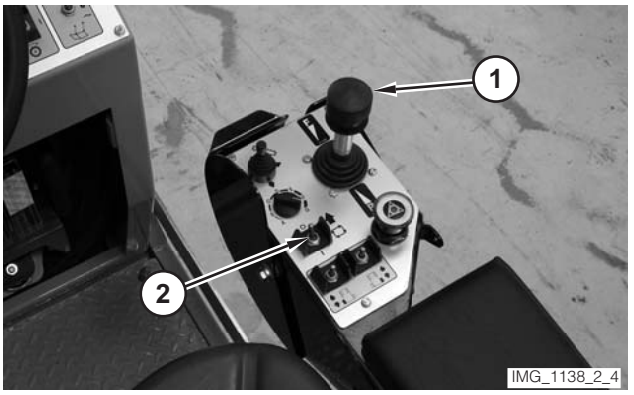

Illustration 73

2. Move propulsion lever (1) to the NEUTRAL position.

3. Move drive selector switch (2) to the OFF position.

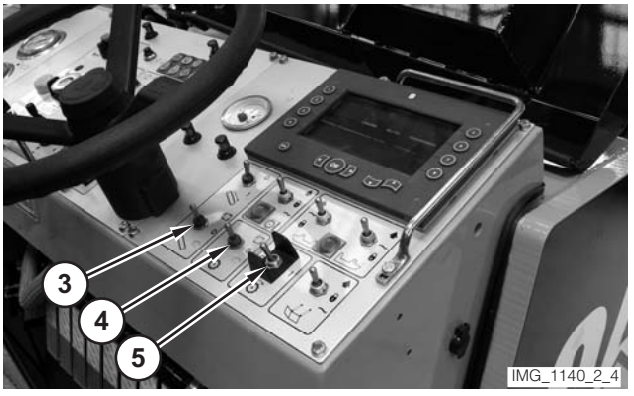

Illustration 74

4. Make sure conveyor switch (3) is in the OFF position.

5. Make sure water spray switch (4) is in the OFF position.

6. Make sure rotor switch (5) is in the OFF position.

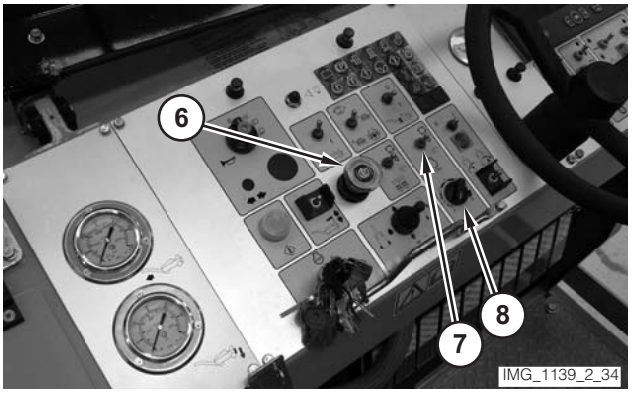

Illustration 75

7. Move parking brake switch (6) to the ON position.

8. If necessary, move engine control switch (7) to the “O” position.

9. Rotate engine speed dial (8) to the LOW-IDLE position.

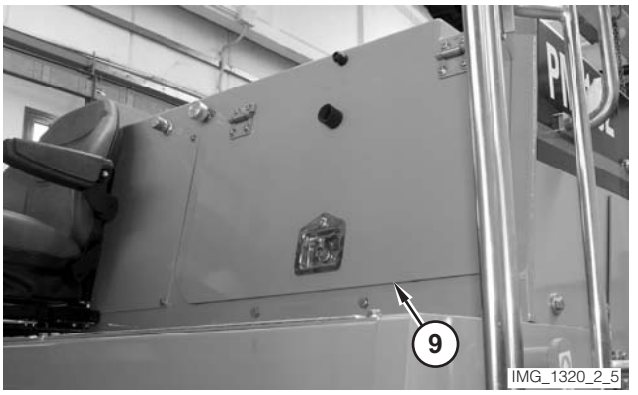

Illustration 76

10. Open compartment (9).

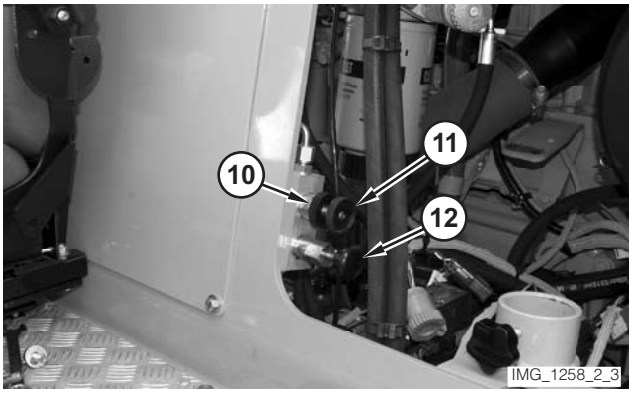

Illustration 77

11. Loosen locking ring (10). Rotate gate valve (11) clockwise.

12. Operate hand pump (12).

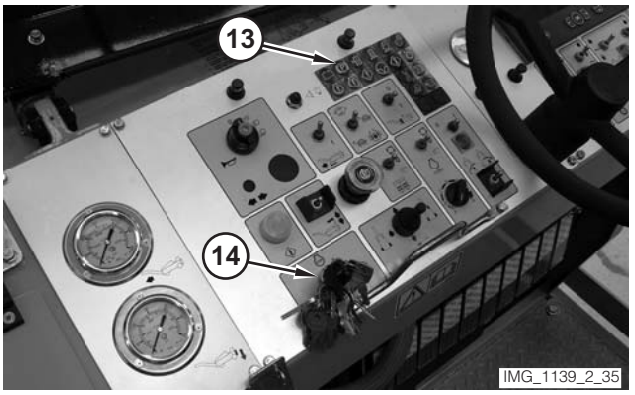

Illustration 78

13. Monitor parking brake indicator (13). The indicator should go out within 10 strokes of the pump. The indicator should remain out for a minimum of five minutes.

14. Rotate gate valve (11) fully counterclockwise. Tighten locking ring (10).

15. Close compartment (9).

16. Move key switch (14) to the OFF position.

Piston Pump Neutral—Test and Adjust

⚠ WARNING

Sudden movement of the machine or release of oil under pressure can cause serious injury to persons on or near the machine.

To prevent injury or death, make sure that the area around the machine is clear of personnel and obstructions before operating the machine.

⚠ WARNING

Injury to personnel can result if they are not in the operator's view. Allow only essential personnel near the machine, and make sure the personnel are in the operator's view when testing, to prevent injury. Make sure checks are done in an open area.

⚠ WARNING

Personal injury can result from rotating and moving parts.

Moving fan blades and moving parts will throw or cut any object or tool that falls or is pushed into them.

Make sure no one is working on, underneath or close to an engine that is running. Make sure the area is free of personnel.

NOTICE

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the machine. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, "Caterpillar Tools and Shop Products Guide," for tools and supplies suitable to collect and contain fluids in Caterpillar machines.

Dispose of all fluids according to local regulations and mandates.

Table 6

Required Tools			
Tool	**Part Number**	**Description**	**Qty**
A	8T-0862	Pressure Gauge 0–500 kPa (0–70 psi)	2
	6V-4144	Coupler	2
B	6V-3965	Nipple	2
	3J-1907	O-Ring Seal	2

Table 7

Optional Tools(1)			
Tool	**Part Number**	**Description**	**Qty**
C(2)	198-4234	Digital Pressure Indicator	1
D(2)	198-4236	Extension Cable	2
E(2)	198-4237	Pressure Sensor 0–3500 kPa (0–500 psi)	2

(1) The optional tools can be used in place of the analog pressure measurement Tool A, which is specified in the required tool list.

(2) Tool C, Tool D, and one Tool E are part of the 198-4240 Digital Pressure Indicator Group.

1. Drive the machine to a smooth, horizontal surface.

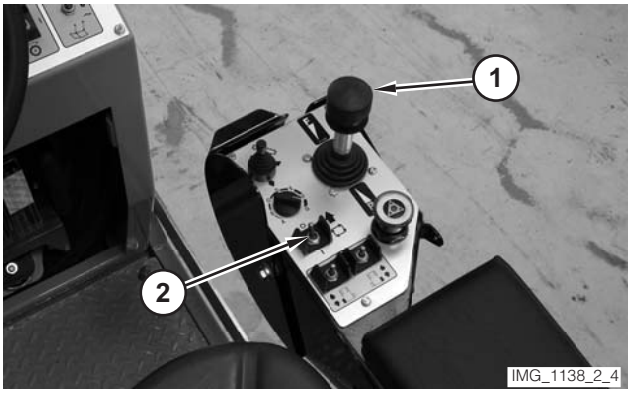

Illustration 79

2. Move propulsion lever (1) to the NEUTRAL position.

3. Move drive selector switch (2) to the OFF position.

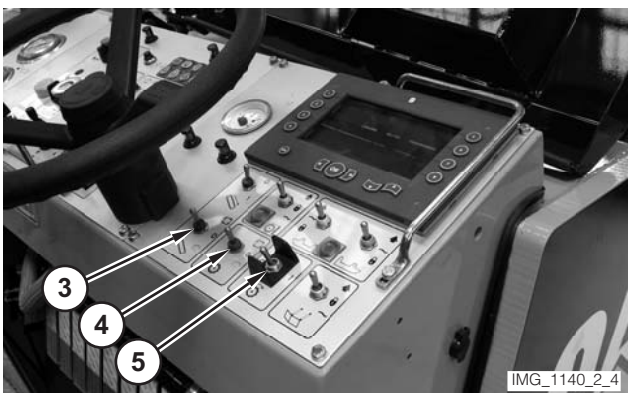

Illustration 80

4. Make sure conveyor switch (3) is in the OFF position.

5. Make sure water spray switch (4) is in the OFF position.

6. Make sure rotor switch (5) is in the OFF position.

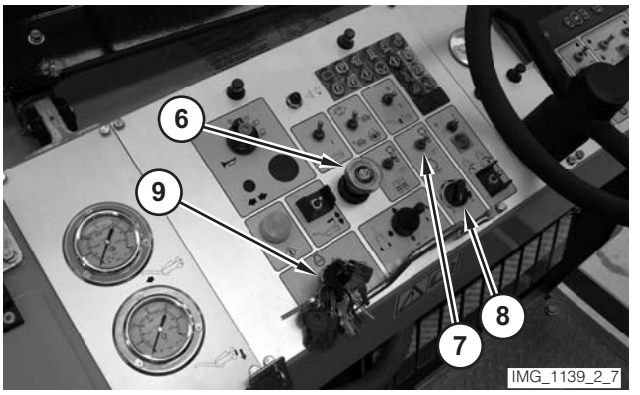

Illustration 81

7. Move parking brake switch (6) to the ON position.

8. If necessary, move engine control switch (7) to the “O” position.

9. Rotate engine speed dial (8) to the LOW-IDLE position.

10. Move key switch (9) to the OFF position.

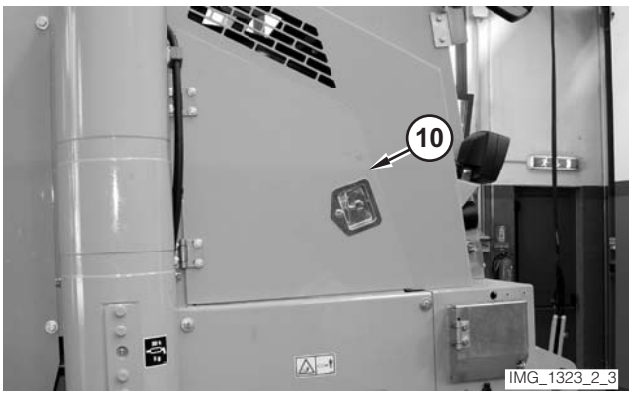

Illustration 82

11. Open compartment (10).

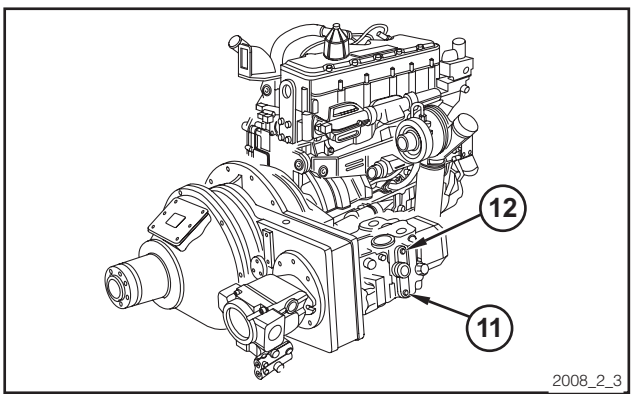

Illustration 83

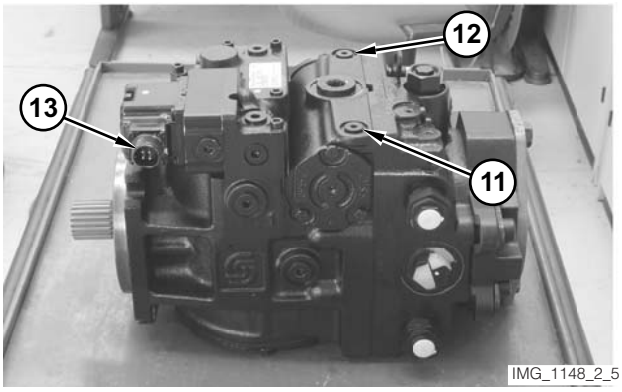

Illustration 84

Pump Removed From Machine.

12. Remove the plug from M4-port (11). Remove the plug from M5-port (12).

13. Install Tool B in M4-port (11). Install a second Tool B in M5-port (12).

14. Connect Tool A to M4-port (11). Connect a second Tool A to M5-port (12).

15. Disconnect the connector for propulsion pump EDC (13).

16. Move key switch (9) to the START position. Release the key switch when the engine starts.

17. Operate the engine at low idle for a few minutes.

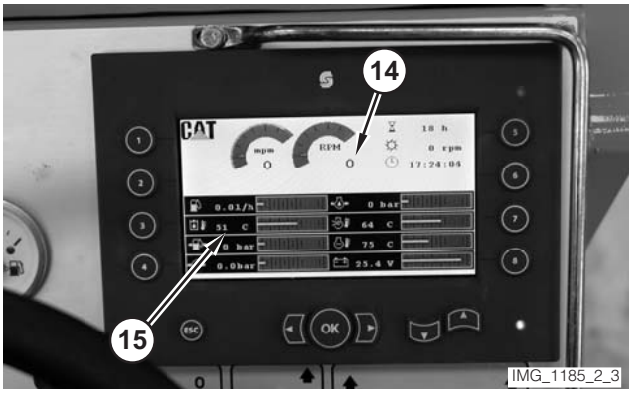

Illustration 85

18. Monitor engine speed value (14) on the digital display. Rotate engine speed dial (8) until the engine speed reaches 1500 rpm.

19. Monitor hydraulic oil temperature (15) on the digital display. Operate the machine until the oil temperature reaches 45 ± 5 °C (110 ± 10 °F).

20. Read the pressure at M4-port (11) on Tool A. Read the pressure at M5-port (12) on Tool A. The pressure at the M4-port and the pressure at the M5-port should be equal. If the pressure is equal, go to Step 24. If the pressure is not equal, go to Step 21.

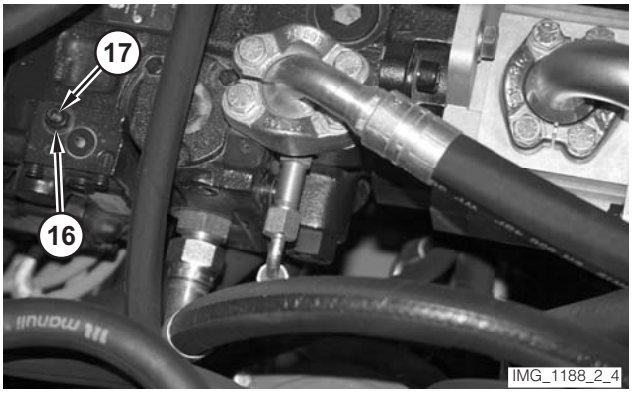

Illustration 86

NOTE: Do not adjust the pressure beyond the rating of the gauges during the next two steps.

21. Loosen locknut (16) on the pump adjustment mechanism. Turn adjustment screw (17) until the pressure at M4-port (11) starts to increase over the pressure at M5-port (12). Record the pressure at the M4-port. Note the angular position of the wrench.

22. Rotate adjustment screw (17) the opposite direction until the pressure at M5-port (12) is equal to the pressure which was recorded during Step 21. Note the angular position of the wrench.

23. Rotate adjustment screw (17) to the center of the two positions which were noted in Step 21 and Step 22. Hold the adjustment screw in place, and tighten locknut (16). Go to Step 20.

24. Rotate engine speed dial (8) to the LOW-IDLE position.

25. Move key switch (9) to the OFF position.

26. Allow the oil to cool. Remove the tooling, and replace the plugs in M4-port (11) and M5-port (12).

27. Reconnect the connector for propulsion pump EDC (13).

28. Close compartment (10).

Hydraulic Services System

Relief Valve (Main)—Test and Adjust

⚠ WARNING

Sudden movement of the machine or release of oil under pressure can cause serious injury to persons on or near the machine.

To prevent injury or death, make sure that the area around the machine is clear of personnel and obstructions before operating the machine.

⚠ WARNING

Injury to personnel can result if they are not in the operator's view. Allow only essential personnel near the machine, and make sure the personnel are in the operator's view when testing, to prevent injury. Make sure checks are done in an open area.

⚠ WARNING

Personal injury can result from rotating and moving parts.

Moving fan blades and moving parts will throw or cut any object or tool that falls or is pushed into them.

Make sure no one is working on, underneath or close to an engine that is running. Make sure the area is free of personnel.

NOTICE

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the machine. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, "Caterpillar Tools and Shop Products Guide," for tools and supplies suitable to collect and contain fluids in Caterpillar machines.

Dispose of all fluids according to local regulations and mandates.

Table 8

Required Tools			
Tool	**Part Number**	**Description**	**Qty**
A	8T-0860	Pressure Gauge 0–40 000 kPa (0–5800 psi)	1
	6V-4144	Coupler	1
B	272-0775	Hose Assembly 1000 mm (39 in)	1
	280-9168	Nipple Fitting	1
	6V-0405	Dowty Seal	1
	8T-7910	Adapter–Union	1
	3J-1907	O-Ring Seal	1
	164-5567	Nipple Fitting	1

Table 9

Optional Tools(1)			
Tool	**Part Number**	**Description**	**Qty**
C(2)	198-4234	Digital Pressure Indicator	1
D(2)	198-4236	Extension Cable	1
E	198-4238	Pressure Sensor 0–35 000 kPa (0–5000 psi)	1

(1) The optional tools can be used in place of the analog pressure measurement Tool A, which is specified in the required tool list.
(2) Tool C and Tool D are part of the 198-4240 Digital Pressure Indicator Group.

1. Drive the machine to a smooth, horizontal surface.

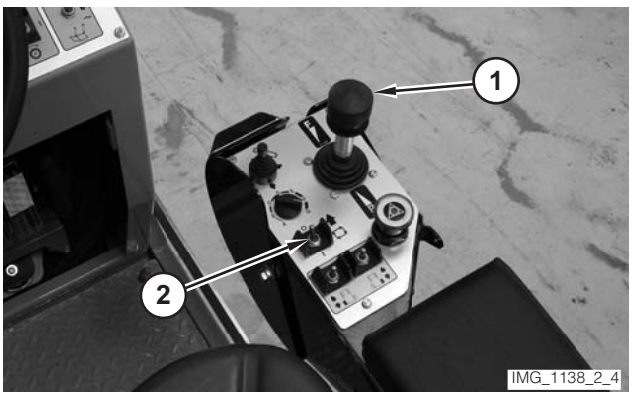

Illustration 87

2. Move propulsion lever (1) to the NEUTRAL position.

3. Move drive selector switch (2) to the OFF position.

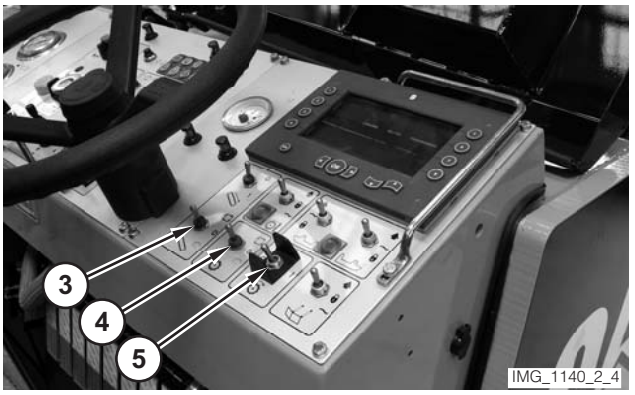

Illustration 88

4. Make sure conveyor switch (3) is in the OFF position.

5. Make sure water spray switch (4) is in the OFF position.

6. Make sure rotor switch (5) is in the OFF position.

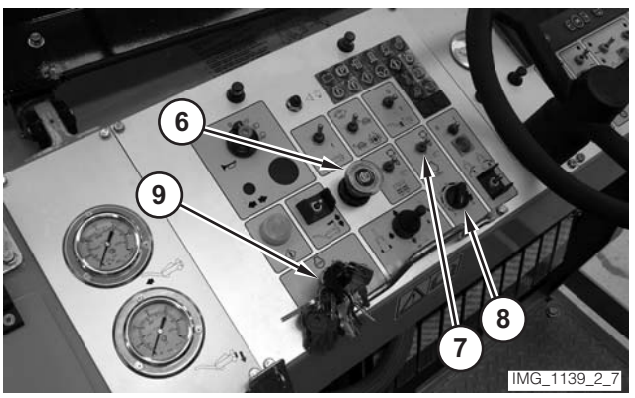

Illustration 89

7. Move parking brake switch (6) to the ON position.

8. If necessary, move engine control switch (7) to the "O" position.

9. Rotate engine speed dial (8) to the LOW-IDLE position.

10. Move key switch (9) to the OFF position.

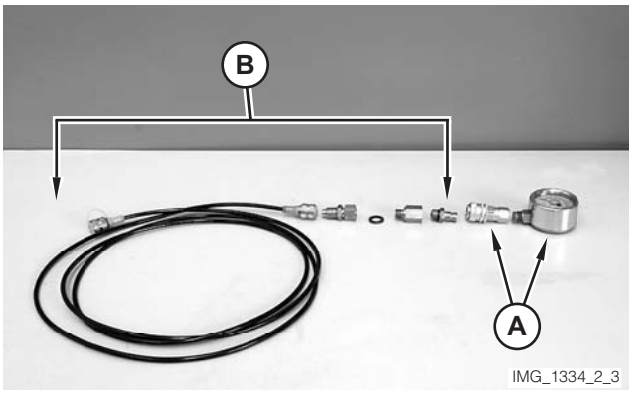

Illustration 90

11. Assemble Tool A. Assemble Tool B. Connect Tool A to Tool B.

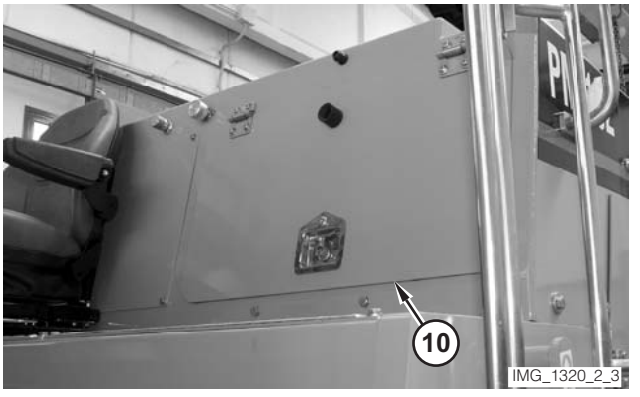

Illustration 91

12. Open compartment (10).

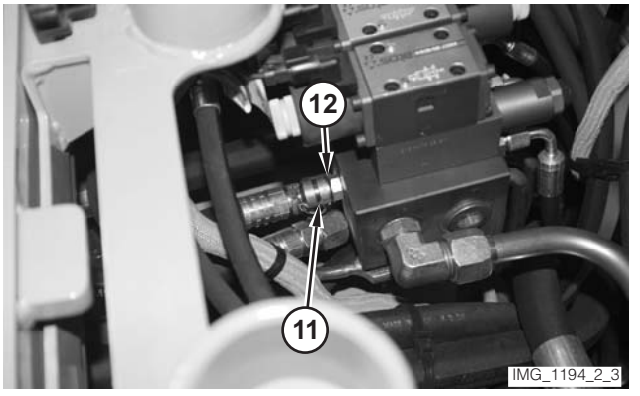

Illustration 92

13. Remove cap (11). Connect Tool B to port (12).

14. Move key switch (9) to the START position. Release the key switch when the engine starts.

15. Operate the engine at low idle for a few minutes.

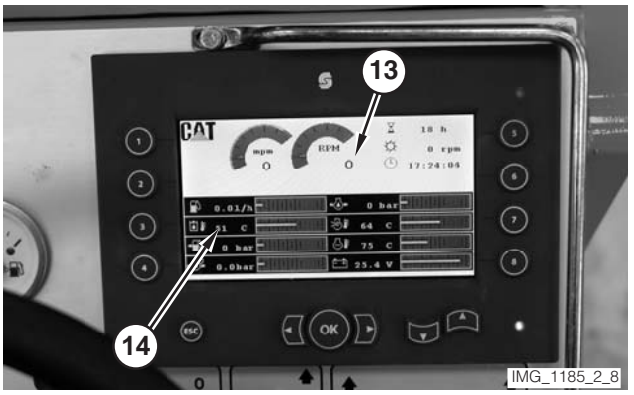

Illustration 93

16. Monitor engine speed value (13) on the digital display. Rotate engine speed dial (8) until the engine speed reaches 1500 rpm.

17. Monitor hydraulic oil temperature value (14) on the digital display. Operate the machine until the oil temperature reaches 45 ± 5 °C (110 ± 10 °F).

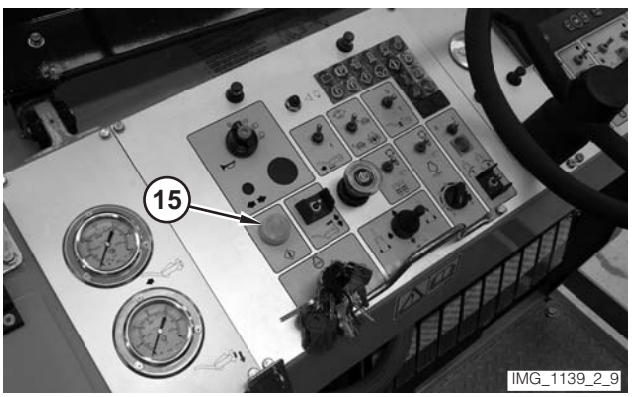

Illustration 94

18. Depress electrical controls master switch (15).

19. Read the pressure on Tool A. The pressure should be 45 cc per revolution (2.8 in3 per revolution).

20. Rotate engine speed dial (8) to the LOW-IDLE position.

21. Move key switch (9) to the OFF position.

22. If the pressure is inside the specified range, go to Step 26. If the pressure is outside the specified range, go to Step 23.

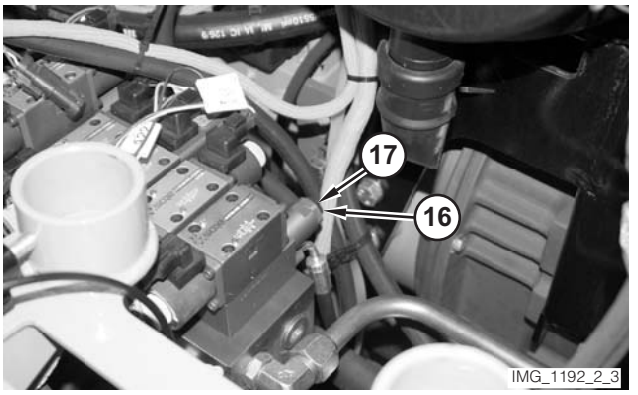

Illustration 95

23. Loosen locknut (16) on the relief valve. In order to increase pressure, rotate adjustment screw (17) counterclockwise. In order to decrease the pressure, rotate the adjustment screw clockwise.

24. Hold adjustment screw (17), and tighten locknut (16).

25. Go to Step 14.

26. Remove the tooling. Replace cap (11). Close compartment (10).

Steering Relief Pressure—Test

⚠ WARNING

Sudden movement of the machine or release of oil under pressure can cause serious injury to persons on or near the machine.

To prevent injury or death, make sure that the area around the machine is clear of personnel and obstructions before operating the machine.

⚠ WARNING

Injury to personnel can result if they are not in the operator's view. Allow only essential personnel near the machine, and make sure the personnel are in the operator's view when testing, to prevent injury. Make sure checks are done in an open area.

⚠ WARNING

Personal injury can result from rotating and moving parts.

Moving fan blades and moving parts will throw or cut any object or tool that falls or is pushed into them.

Make sure no one is working on, underneath or close to an engine that is running. Make sure the area is free of personnel.

NOTICE

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the machine. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, “Caterpillar Tools and Shop Products Guide,” for tools and supplies suitable to collect and contain fluids in Caterpillar machines.

Dispose of all fluids according to local regulations and mandates.

Table 10

Required Tools			
Tool	**Part Number**	**Description**	**Qty**
A	8T-0860	Pressure Gauge 0–40 000 kPa (0–5800 psi)	1
	6V-4144	Coupler	1
B	272-0775	Hose Assembly 1000 mm (39 in)	1
	280-9168	Nipple Fitting	1
	6V-0405	Dowty Seal	1
	8T-7910	Adapter–Union	1
	3J-1907	O-Ring Seal	1
	164-5567	Nipple Fitting	1

Table 11

Optional Tools(1)			
Tool	**Part Number**	**Description**	**Qty**
C(2)	198-4234	Digital Pressure Indicator	1
D(2)	198-4236	Extension Cable	1
E	198-4238	Pressure Sensor 0–35 000 kPa (0–5000 psi)	1

(1) The optional tools can be used in place of the analog pressure measurement Tool A, which is specified in the required tool list.
(2) Tool C and Tool D are part of the 198-4240 Digital Pressure Indicator Group.

1. Drive the machine to a smooth, horizontal surface.

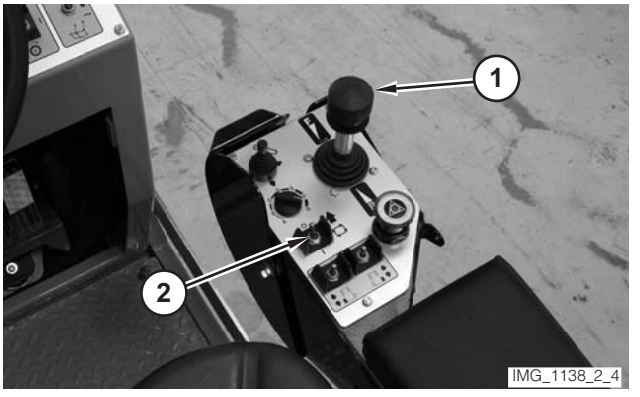

Illustration 96

2. Move propulsion lever (1) to the NEUTRAL position.
3. Move drive selector switch (2) to the OFF position.

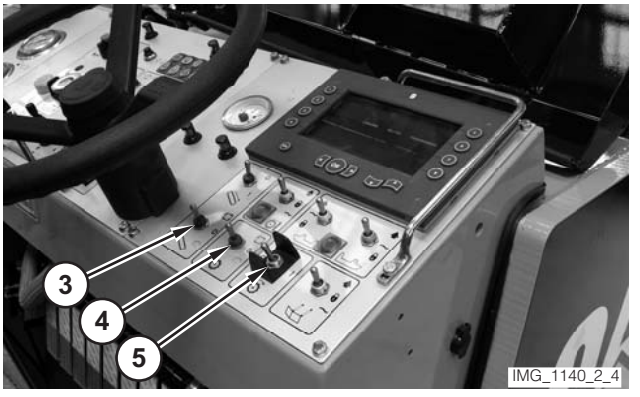

Illustration 97

4. Make sure conveyor switch (3) is in the OFF position.

5. Make sure water spray switch (4) is in the OFF position.

6. Make sure rotor switch (5) is in the OFF position.

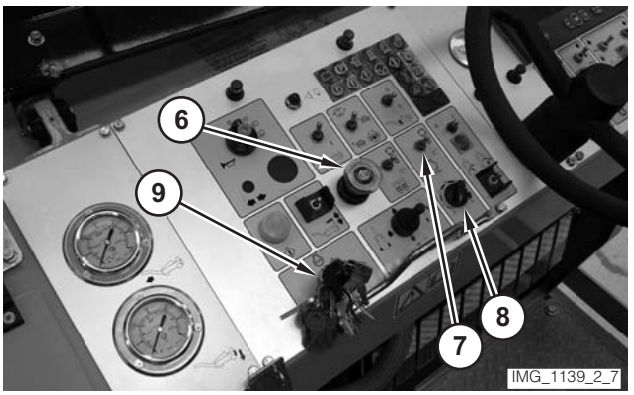

Illustration 98

7. Move parking brake switch (6) to the ON position.

8. If necessary, move engine control switch (7) to the “O” position.

9. Rotate engine speed dial (8) to the LOW-IDLE position.

10. Move key switch (9) to the OFF position.

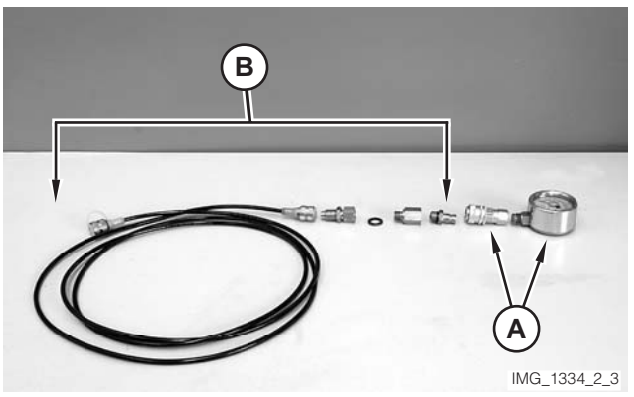

Illustration 99

11. Assemble Tool A. Assemble Tool B. Connect Tool A to Tool B.

Illustration 100

12. Remove panel (10) from under the steering wheel.

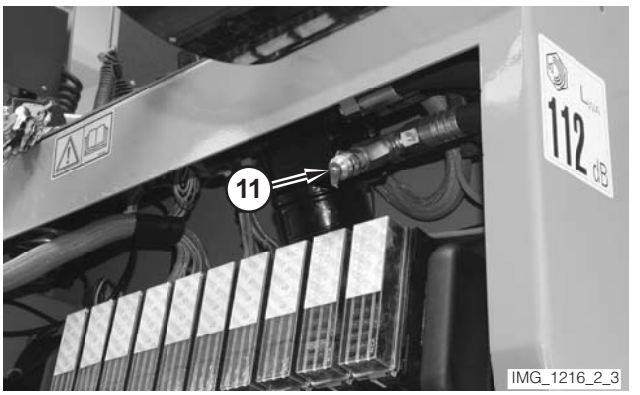

Illustration 101

13. Remove cap (11) from the steering pressure port.

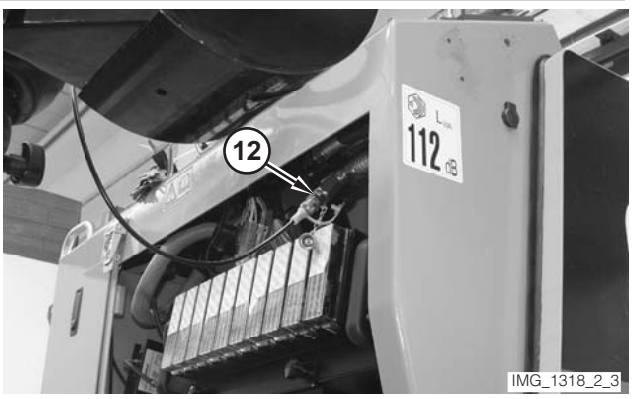

Illustration 102

14. Connect Tool B to steering pressure port (12).

15. Move key switch (9) to the START position. Release the switch when the engine starts.

16. Operate the engine at low idle for a few minutes.

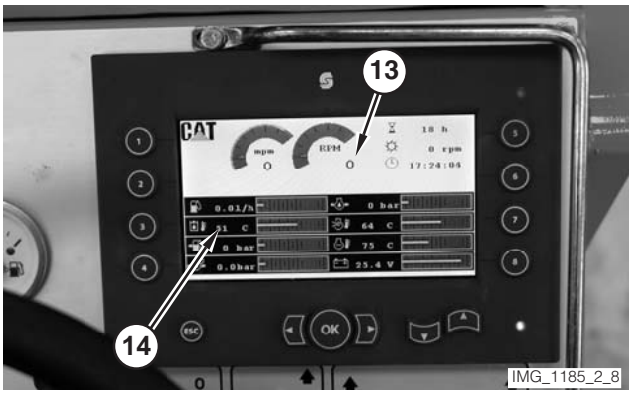

Illustration 103

17. Monitor engine speed value (13) on the digital display. Rotate engine speed dial (8) until the engine speed reaches 1500 rpm.

18. Monitor hydraulic oil temperature (14) on the digital display. Operate the machine until the oil temperature reaches 45 ± 5 °C (110 ± 10 °F).

19. Rotate the steering wheel to the FULL LEFT position. Hold the steering wheel in this position in order to completely retract the steering cylinder.

20. Read the pressure on Tool A. The pressure should be 18 000 ± 1000 kPa (2600 ± 150 psi). Release the steering wheel.

21. Remove the tooling. Attach cap (11). Install panel (10).

Steering Control Unit (Wheel Machine)—Test

1. Drive the machine to a smooth, horizontal surface.

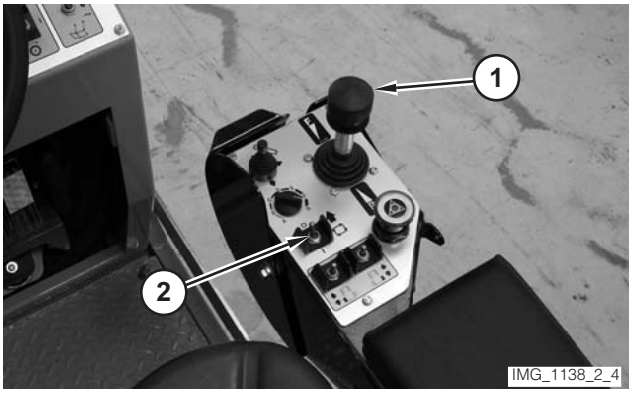

Illustration 104

2. Move propulsion lever (1) to the NEUTRAL position.

3. Move drive selector switch (2) to the OFF position.

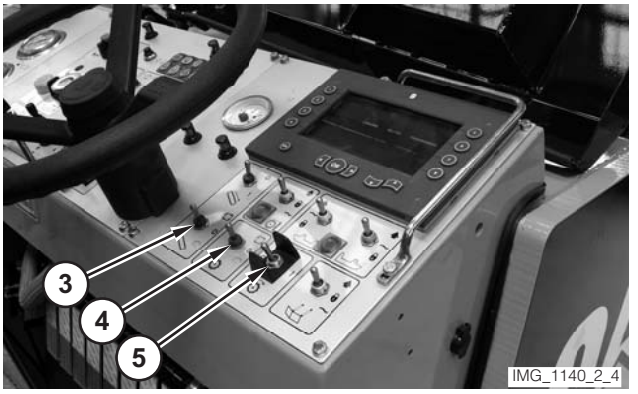

Illustration 105

4. Make sure conveyor switch (3) is in the OFF position.

5. Make sure water spray switch (4) is in the OFF position.

6. Make sure rotor switch (5) is in the OFF position.

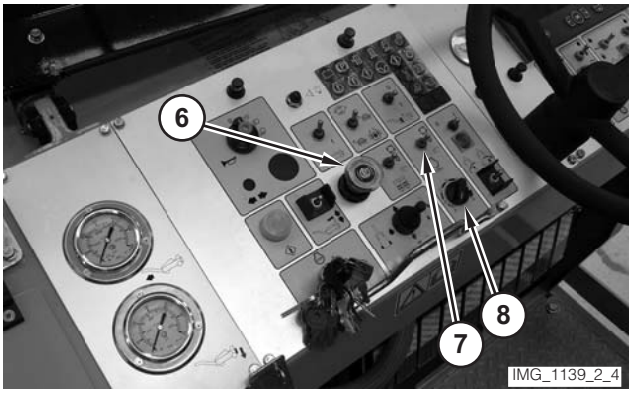

Illustration 106

7. Move parking brake switch (6) to the ON position.

8. If necessary, move engine control switch (7) to the “O” position.

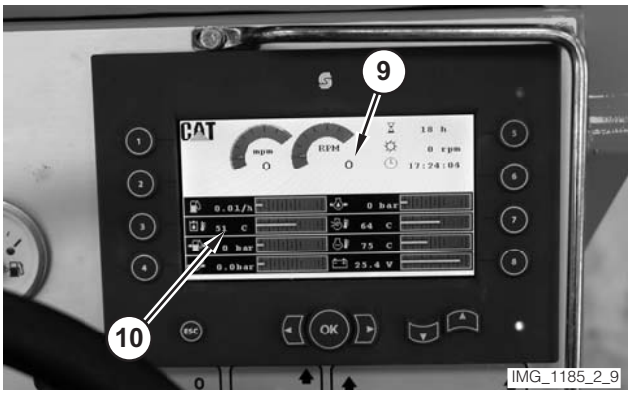

Illustration 107

9. Monitor engine speed value (9) on the digital display. Rotate engine speed dial (8) until the engine speed reaches 1500 rpm.

10. Monitor hydraulic oil temperature (10) on the digital display. Operate the machine until the oil temperature reaches 45 ± 5 °C (110 ± 10 °F).

11. Rotate the steering wheel to the FULL-LEFT position. Record the number of revolutions necessary to rotate the steering wheel to the FULL-RIGHT position. The machine should require 11 ± 1 revolutions.

12. Record the number of revolutions necessary to rotate the steering wheel to the FULL-LEFT position. The machine should require 8 ± 1 revolutions.

13. Rotate engine speed dial (8) to the LOW-IDLE position.

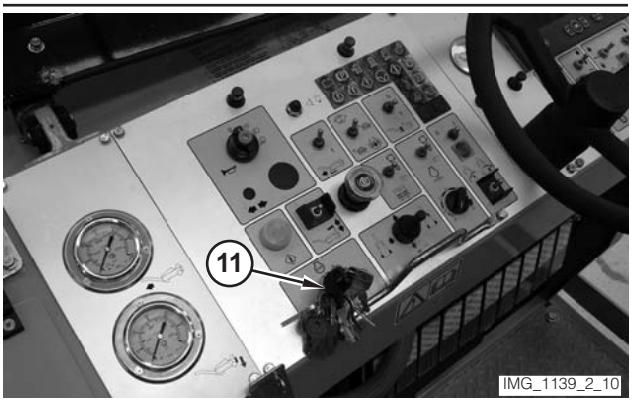

Illustration 108

14. Move key switch (11) to the OFF position.

Steering Control Unit (Track Machine)—Test

1. Drive the machine to a smooth, horizontal surface.

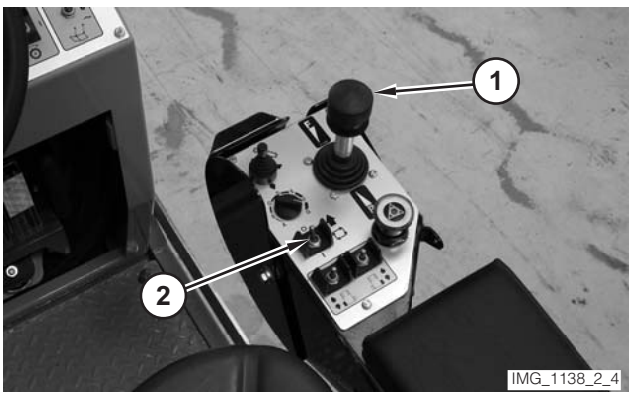

Illustration 109

2. Move propulsion lever (1) to the NEUTRAL position.

3. Move drive selector switch (2) to the OFF position.

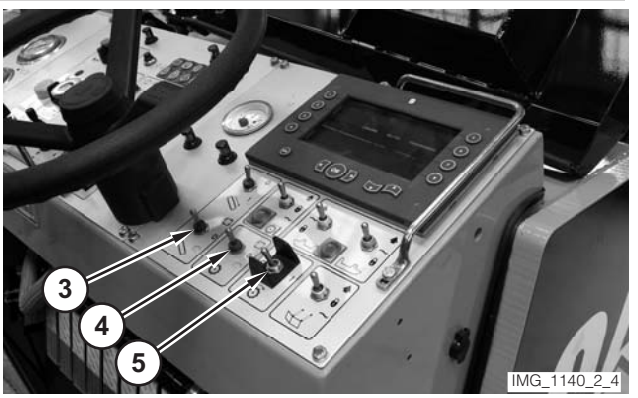

Illustration 110

4. Make sure conveyor switch (3) is in the OFF position.

5. Make sure water spray switch (4) is in the OFF position.

6. Make sure rotor switch (5) is in the OFF position.

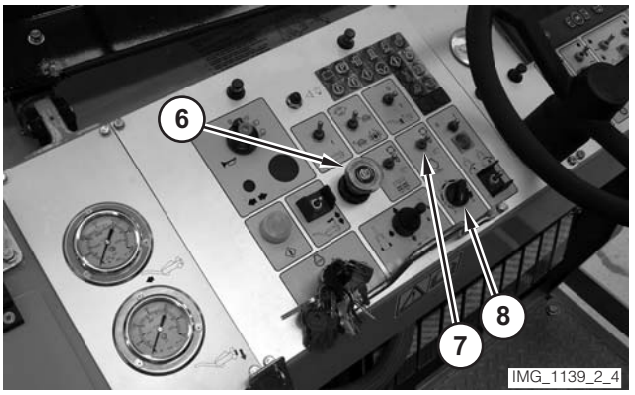

Illustration 111

7. Move parking brake switch (6) to the ON position.

8. If necessary, move engine control switch (7) to the “O” position.

9. If necessary, move engine control switch (3) to the “O” position.

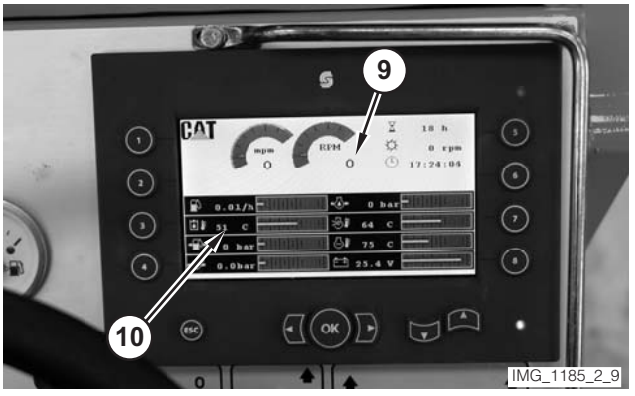

Illustration 112

10. Monitor engine speed value (9) on the digital display. Rotate engine speed dial (8) until the engine speed reaches 1500 rpm.

11. Monitor hydraulic oil temperature (10) on the digital display. Operate the machine until the oil temperature reaches 45 ± 5 °C (110 ± 10 °F).

12. Rotate the steering wheel to the FULL-LEFT position. Record the number of revolutions necessary to rotate the steering wheel to the FULL-RIGHT position. The machine should require 9 ± 1 revolutions.

13. Record the number of revolutions necessary to rotate the steering wheel to the FULL-LEFT position. The machine should require 6.5 ± 1 revolutions.

14. Rotate engine speed dial (8) to the LOW-IDLE position.

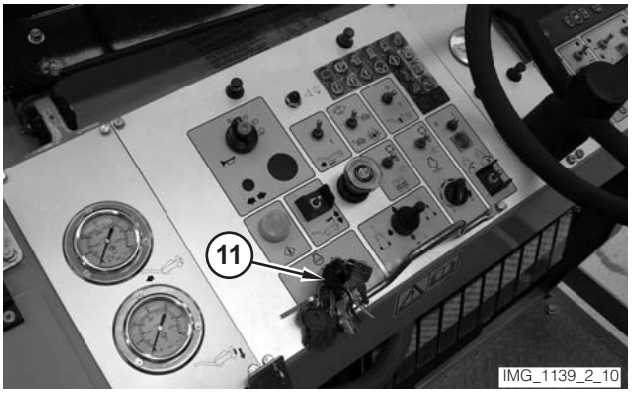

Illustration 113

15. Move key switch (11) to the OFF position.

Legs Cycle Time—Test

Table 12

Required Tools			
Tool	**Part Number**	**Description**	**Qty**
A	9U-7839	Stop Watch	1

1. Drive the machine to a smooth, horizontal surface.

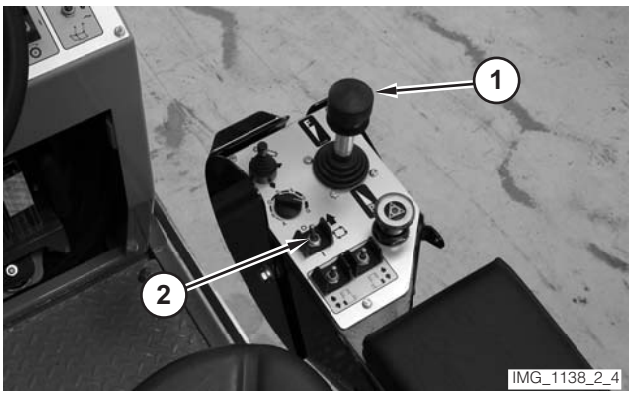

Illustration 114

2. Move propulsion lever (1) to the NEUTRAL position.

3. Move drive selector switch (2) to the OFF position.

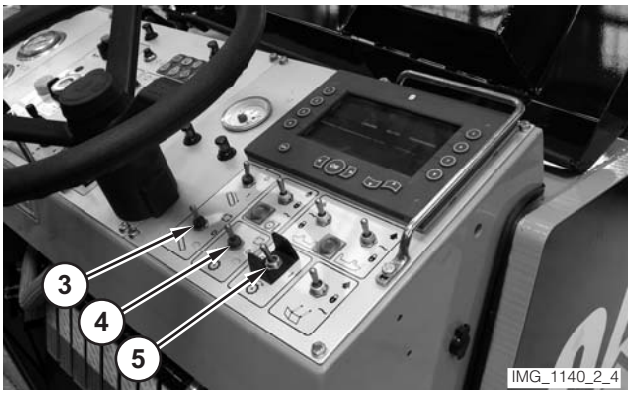

Illustration 115

4. Make sure conveyor switch (3) is in the OFF position.

5. Make sure water spray switch (4) is in the OFF position.

6. Make sure rotor switch (5) is in the OFF position.

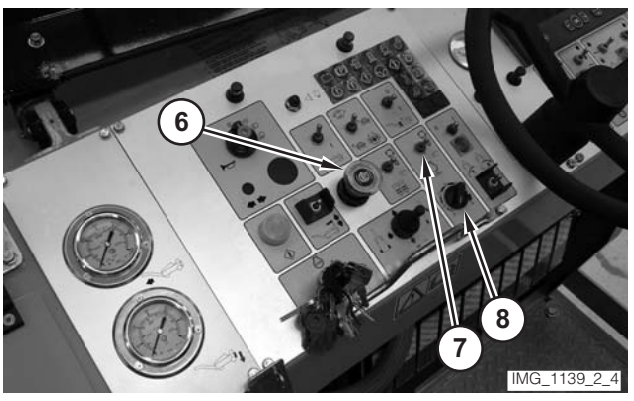

Illustration 116

7. Move parking brake switch (6) to the ON position.

8. If necessary, move engine control switch (7) to the “O” position.

9. Rotate engine speed dial (8) to the HIGH-IDLE position.

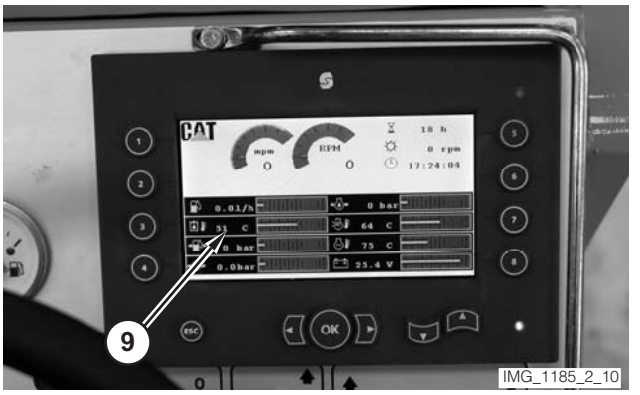

Illustration 117

10. Monitor hydraulic oil temperature (9) on the digital display. Operate the machine until the oil temperature reaches 45 ± 5 °C (110 ± 10 °F).

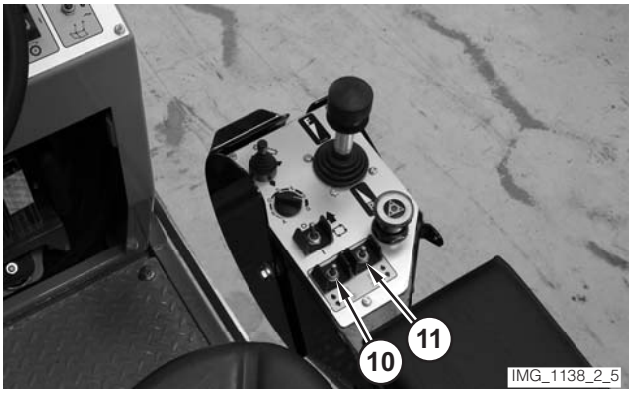

Illustration 118

11. Use left rear leg switch (10) and right rear leg switch (11) in order to level the rear of the machine. Use these switches in order to position the rear of the machine so that the rotor is approximately 250 mm (10 in) above the ground. Release the rear legs switches.

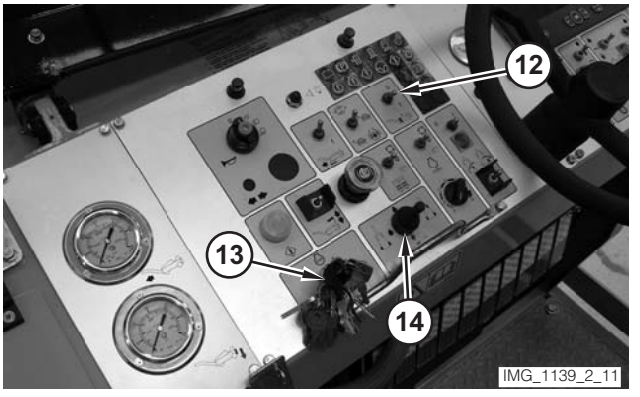

Illustration 119

12. Move auto-stop override switch (12) to the OVERRIDE position. Move all-legs joystick (14) to the FRONT-LOWER position. Release the joystick when the front of the machine is completely lowered.

13. Simultaneously start Tool A and move all-legs joystick (14) to the FRONT-RAISE position. Record the amount of time required to completely raise the front of the machine. Release the joystick. The time should be 16 ± 3 seconds.

14. Simultaneously start Tool A and move all-legs joystick (14) to the FRONT-LOWER position. Record the amount of time required to completely lower the front of the machine. Release the joystick. The time should be 16 ± 3 seconds.

15. Move all-legs joystick (14) to the FRONT-RAISE position. Release the joystick when the front of the machine has lifted approximately 300 mm (12 in).

16. Simultaneously move left rear leg switch (10) and right rear leg switch (11) to the LOWER position. Release the switches when the rotor tips just touch the ground.

17. Simultaneously start Tool A and move all-legs joystick (14) to the REAR-RAISE position. Record the amount of time required to completely lift the rear of the machine. Release the joystick. The time should be 16 ± 3 seconds.

18. Simultaneously start Tool A and move left rear leg switch (10) and right rear leg switch (11) to the LOWER position. Record the amount of time required to lower the machine until the rotor tips just touch the ground. Release the joystick. The time should be 16 ± 3 seconds.

19. Move all-legs joystick (14) to the REAR-RAISE position. Release the joystick when the machine is level.

20. Rotate engine speed dial (8) to the LOW-IDLE position.

21. Move key switch (13) to the OFF position.

Conveyor Swing Time—Test

Table 13

Required Tools			
Tool	**Part Number**	**Description**	**Qty**
A	9U-7839	Stop Watch	1

1. Drive the machine to a smooth, horizontal surface.

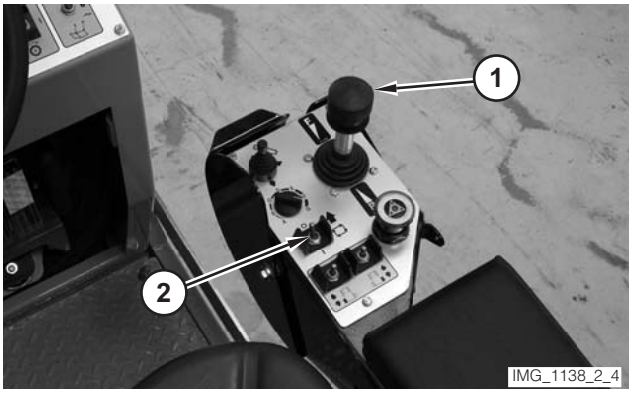

Illustration 120

2. Move propulsion lever (1) to the NEUTRAL position.

3. Move drive selector switch (2) to the OFF position.

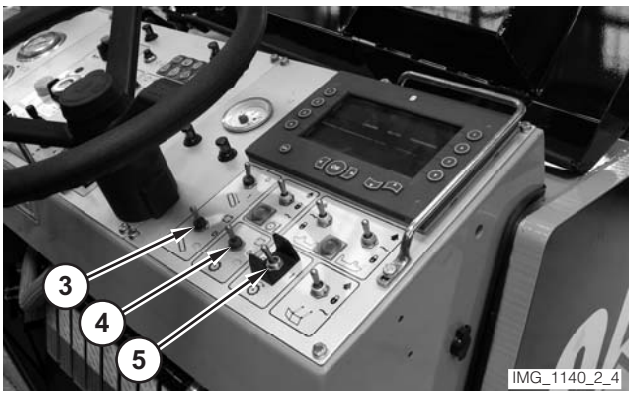

Illustration 121

4. Make sure conveyor switch (3) is in the OFF position.

5. Make sure water spray switch (4) is in the OFF position.

6. Make sure rotor switch (5) is in the OFF position.

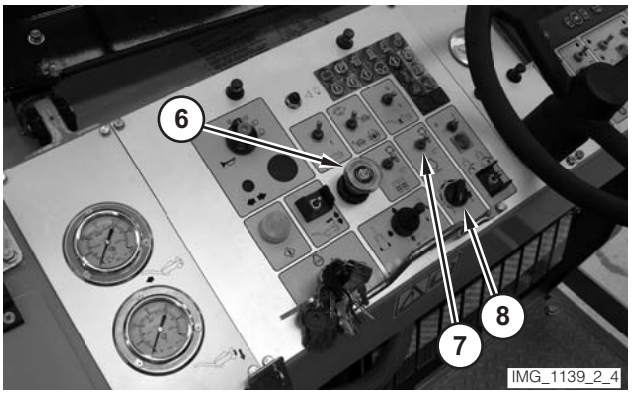

Illustration 122

7. Move parking brake switch (6) to the ON position.

8. If necessary, move engine control switch (7) to the “O” position.

9. Rotate engine speed dial (8) to the HIGH-IDLE position.

Illustration 123

10. Monitor hydraulic oil temperature (9) on the digital display. Operate the machine until the oil temperature reaches 45 ± 5 °C (110 ± 10 °F).

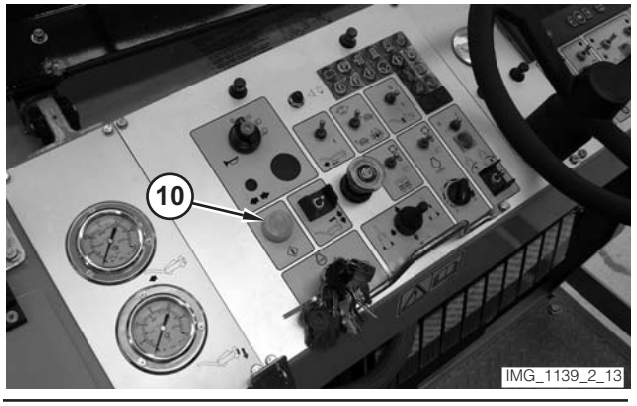

Illustration 124

11. Depress electrical controls master switch (10).

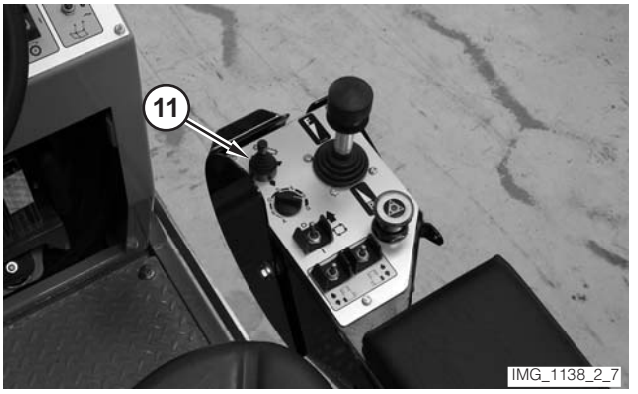

Illustration 125

⚠ WARNING

Ensure that the conveyor will not contact any obstacles when the conveyor is moved.

12. Move conveyor joystick (11) to the FULL-RIGHT position. Release the joystick when the conveyor is in the full-right position.

13. Simultaneously start Tool A and move conveyor joystick (11) to the FULL-LEFT position. Record the amount of time required for the conveyor to reach the full-left position. Release the joystick. The time should be 16 ± 2 seconds.

14. Simultaneously start Tool A and move conveyor control joystick (11) to the FULL-RIGHT position. Record the amount of time required for the conveyor to reach the full-right position. Release the joystick. The time should be 15 ± 2 seconds.

15. Rotate engine speed dial (8) to the LOW-IDLE position.

16. Move key switch (7) to the OFF position.

Clutch Engagement Pressure—Test and Adjust

NOTE: Perform the procedure entitled “Relief Valve (Main)—Test and Adjust” before the following test is performed.

⚠ WARNING

Sudden movement of the machine or release of oil under pressure can cause serious injury to persons on or near the machine.

To prevent injury or death, make sure that the area around the machine is clear of personnel and obstructions before operating the machine.

⚠ WARNING

Injury to personnel can result if they are not in the operator’s view. Allow only essential personnel near the machine, and make sure the personnel are in the operator’s view when testing, to prevent injury. Make sure checks are done in an open area.

⚠ WARNING

Personal injury can result from rotating and moving parts.

Moving fan blades and moving parts will throw or cut any object or tool that falls or is pushed into them.

Make sure no one is working on, underneath or close to an engine that is running. Make sure the area is free of personnel.

NOTICE

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the machine. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, “Caterpillar Tools and Shop Products Guide,” for tools and supplies suitable to collect and contain fluids in Caterpillar machines.

Dispose of all fluids according to local regulations and mandates.

Table 14

Required Tools			
Tool	**Part Number**	**Description**	**Qty**
A	8T-0855	Pressure Gauge 0–4000 kPa (0–580 psi)	1
	6V-4144	Coupler	1
B	272-0775	Hose Assembly 1000 mm (39 in)	1
	280-9168	Nipple Fitting	1
	6V-0405	Dowty Seal	1
	8T-7910	Adapter–Union	1
	3J-1907	O-Ring Seal	1
	164-5567	Nipple Fitting	1

Table 15

Optional Tools(1)			
Tool	**Part Number**	**Description**	**Qty**
C(2)	198-4234	Digital Pressure Indicator	1
D(2)	198-4236	Extension Cable	2
E(2)	198-4237	Pressure Sensor 0–3500 kPa (0–500 psi)	2

(1) The optional tools can be used in place of the analog pressure measurement Tool A, which is specified in the required tool list.
(2) Tool C, Tool D, and one Tool E are part of the 198-4240 Digital Pressure Indicator Group.

1. Drive the machine to a smooth, horizontal surface.

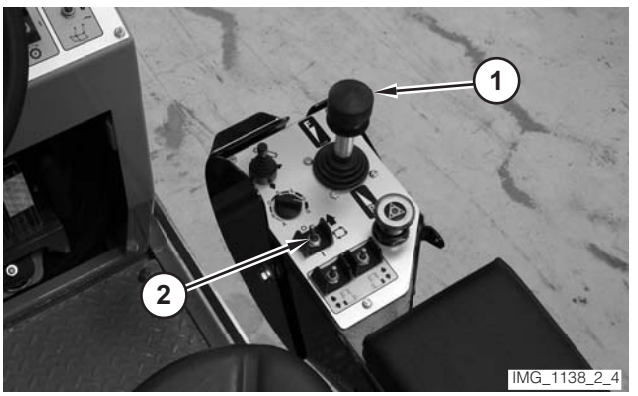

Illustration 126

2. Move propulsion lever (1) to the NEUTRAL position.

3. Move drive selector switch (2) to the OFF position.

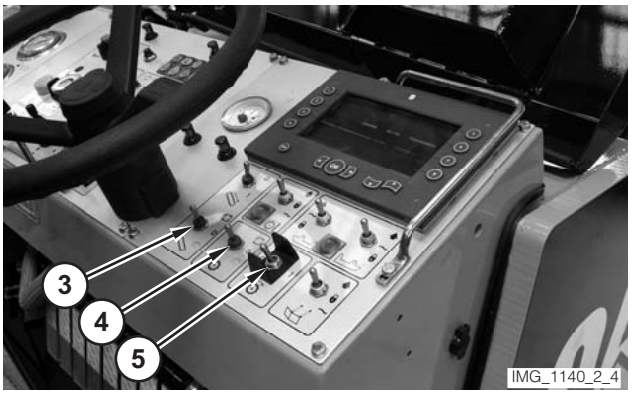

Illustration 127

4. Make sure conveyor switch (3) is in the OFF position.

5. Make sure water spray switch (4) is in the OFF position.

6. Make sure rotor switch (5) is in the OFF position.

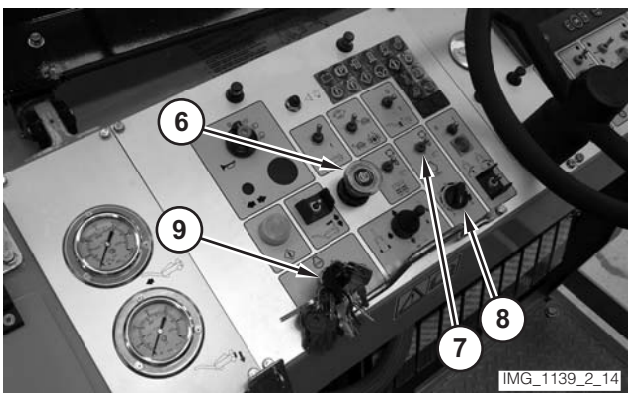

Illustration 128

7. Move parking brake switch (6) to the ON position.

8. If necessary, move engine control switch (7) to the “O” position.

9. Rotate engine speed dial (8) to the LOW-IDLE position.

10. Move key switch (9) to the OFF position.

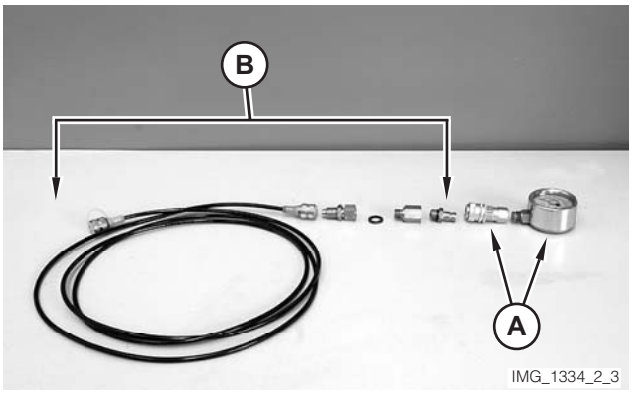

Illustration 129

11. Assemble Tool A. Assemble Tool B. Connect Tool A to Tool B.

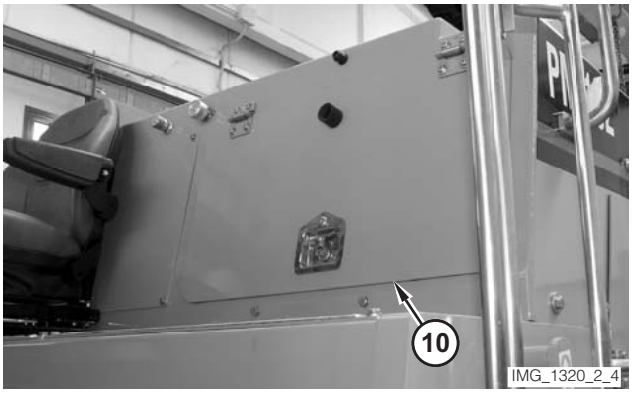

Illustration 130

12. Open compartment (10).

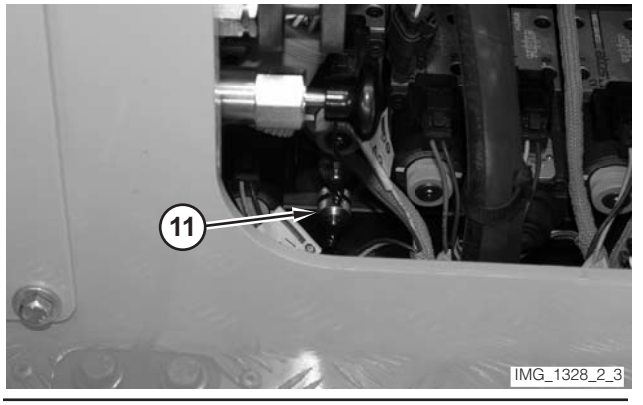

Illustration 131

13. Remove the cap from rotor clutch pressure tap (11).

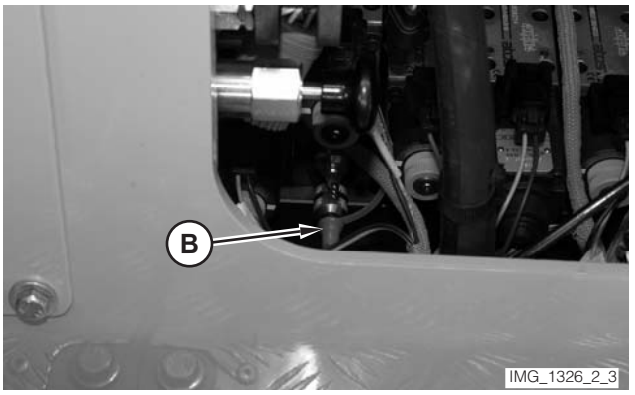

Illustration 132

14. Connect Tool B to rotor clutch pressure tap (11).

15. Move key switch (9) to the START position. Release the key switch when the engine starts.

16. Operate the engine at low idle for a few minutes.

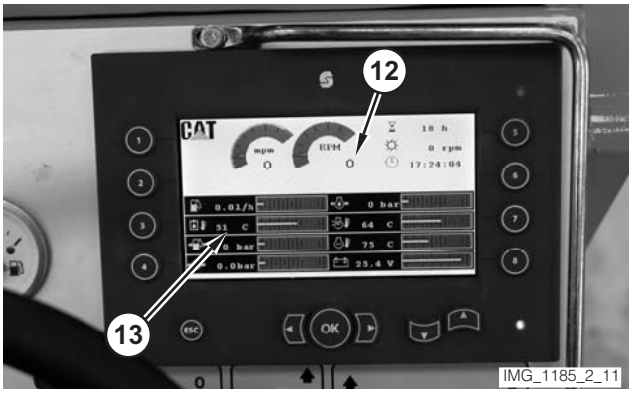

Illustration 133

17. Monitor engine speed value (12) on the digital display. Rotate engine speed dial (8) until the engine speed reaches 1500 rpm.

18. Monitor hydraulic oil temperature (13) on the digital display. Operate the machine until the oil temperature reaches 45 ± 5 °C (110 ± 10 °F).

19. Rotate engine speed dial (8) to the LOW-IDLE position.

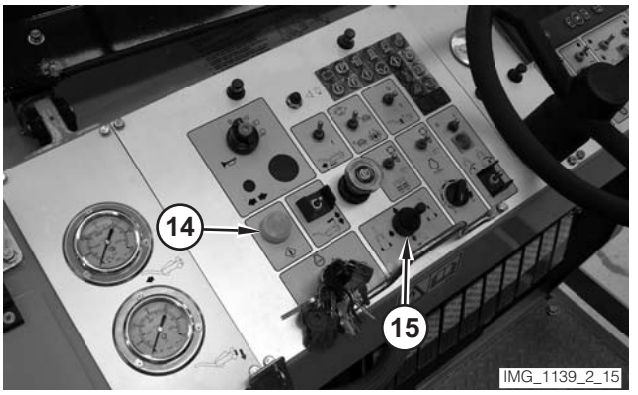

Illustration 134

20. Depress electrical controls master switch (14).

21. If necessary, use all-legs joystick (15) to lift the machine. Release the joystick when the machine is at the maximum height.

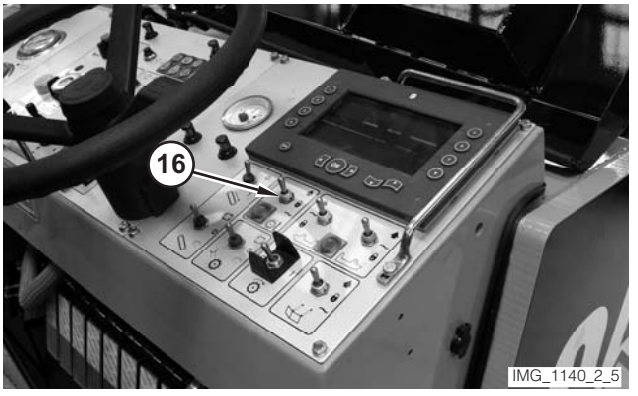

Illustration 135

22. Move moldboard switch (16) to the FLOAT position.

23. Move rotor switch (5) to the ON position.

24. Read the pressure on Tool A. The pressure should be 2790 ± 100 kPa (405 ± 15 psi).

25. Move rotor switch (5) to the OFF position.

26. Rotate engine speed dial (8) to the LOW-IDLE position.

27. Move key switch (9) to the OFF position.

28. If the pressure is outside the specified range, go to Step 29. If the pressure is inside the specified range, go to Step 32.

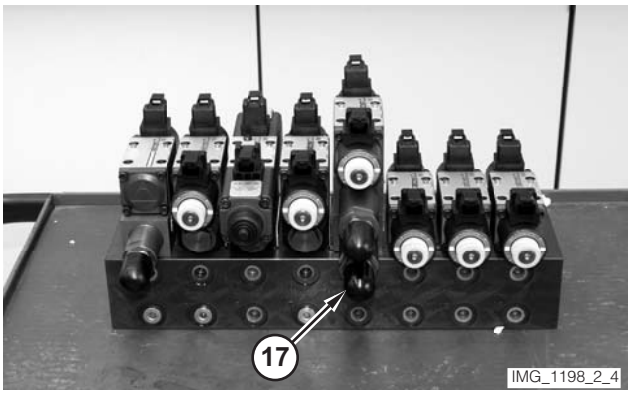

Illustration 136

Valve Removed From Machine.

29. Remove cap (17).

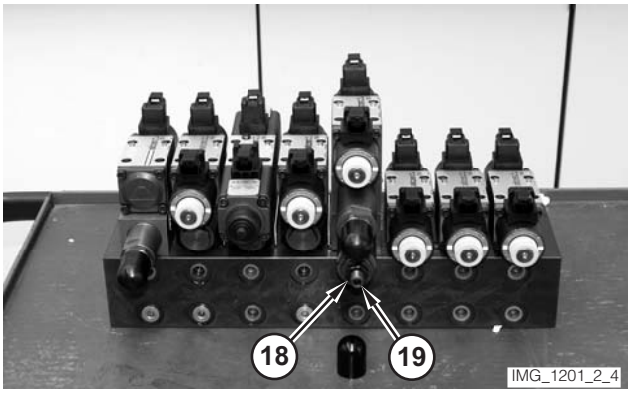

Illustration 137

Valve Removed From Machine.

30. Loosen locknut (18) on the relief valve. In order to increase the pressure, rotate adjustment screw (19) clockwise. In order to decrease the pressure, rotate the adjustment screw counterclockwise.

31. Hold adjustment screw (19), and tighten locknut (18). Go to Step 15.

32. Remove the tooling. Close compartment (10).

Relief Valve (Belt Tensioner)—Test and Adjust

NOTE: Perform the procedure entitled “Clutch Engagement Pressure—Test and Adjust” before the following test is performed.

⚠ WARNING

Sudden movement of the machine or release of oil under pressure can cause serious injury to persons on or near the machine.

To prevent injury or death, make sure that the area around the machine is clear of personnel and obstructions before operating the machine.

⚠ WARNING

Injury to personnel can result if they are not in the operator’s view. Allow only essential personnel near the machine, and make sure the personnel are in the operator’s view when testing, to prevent injury. Make sure checks are done in an open area.

⚠ WARNING

Personal injury can result from rotating and moving parts.

Moving fan blades and moving parts will throw or cut any object or tool that falls or is pushed into them.

Make sure no one is working on, underneath or close to an engine that is running. Make sure the area is free of personnel.

NOTICE

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the machine. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, “Caterpillar Tools and Shop Products Guide,” for tools and supplies suitable to collect and contain fluids in Caterpillar machines.

Dispose of all fluids according to local regulations and mandates.

Table 16

Required Tools			
Tool	**Part Number**	**Description**	**Qty**
A	8T-0855	Pressure Gauge 0–4000 kPa (0–580 psi)	1
	6V-4144	Coupler	1
B	272-0775	Hose Assembly 1000 mm (39 in)	1
	280-9168	Nipple Fitting	1
	6V-0405	Dowty Seal	1
	8T-7910	Adapter–Union	1
	3J-1907	O-Ring Seal	1
	164-5567	Nipple Fitting	1

Table 17

Optional Tools(1)			
Tool	**Part Number**	**Description**	**Qty**
C(2)	198-4234	Digital Pressure Indicator	1
D(2)	198-4236	Extension Cable	1
E(2)	198-4237	Pressure Sensor 0–3500 kPa (0–500 psi)	1

(1) The optional tools can be used in place of the analog pressure measurement Tool A, which is specified in the required tool list.
(2) Tool C, Tool D, and Tool E are part of the 198-4240 Digital Pressure Indicator Group.

1. Drive the machine to a smooth, horizontal surface.

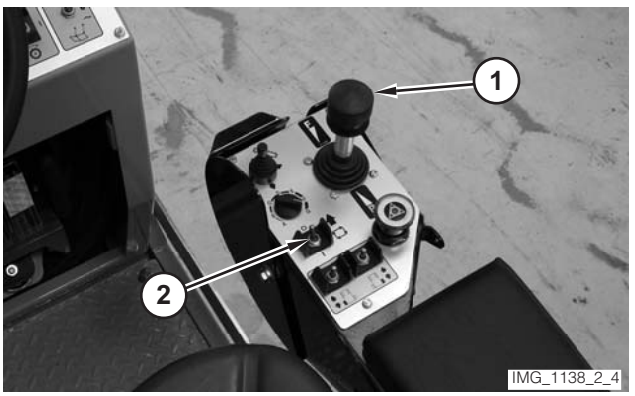

Illustration 138

2. Move propulsion lever (1) to the NEUTRAL position.

3. Move drive selector switch (2) to the OFF position.

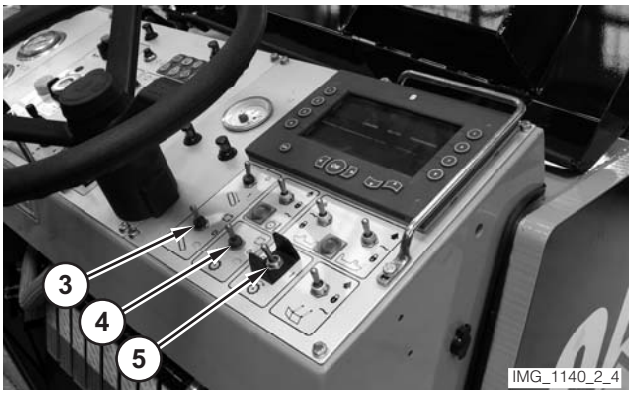

Illustration 139

4. Make sure conveyor switch (3) is in the OFF position.

5. Make sure water spray switch (4) is in the OFF position.

6. Make sure rotor switch (5) is in the OFF position.

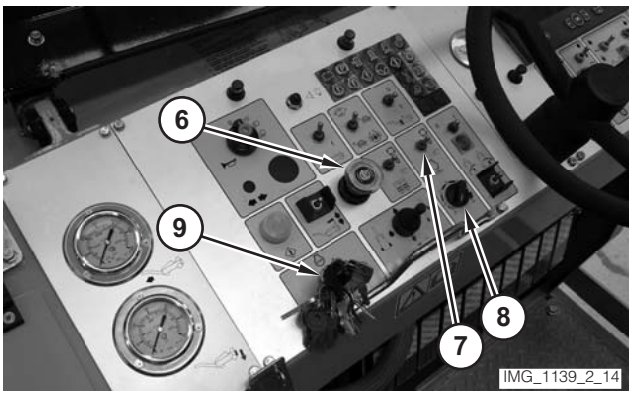

Illustration 140

7. Move parking brake switch (6) to the ON position.

8. If necessary, move engine control switch (7) to the “O” position.

9. Rotate engine speed dial (8) to the LOW-IDLE position.

10. Move key switch (9) to the OFF position.

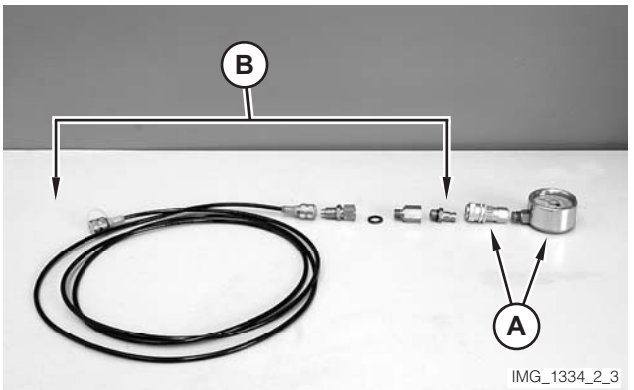

Illustration 141

11. Assemble Tool A. Assemble Tool B. Connect Tool A to Tool B.

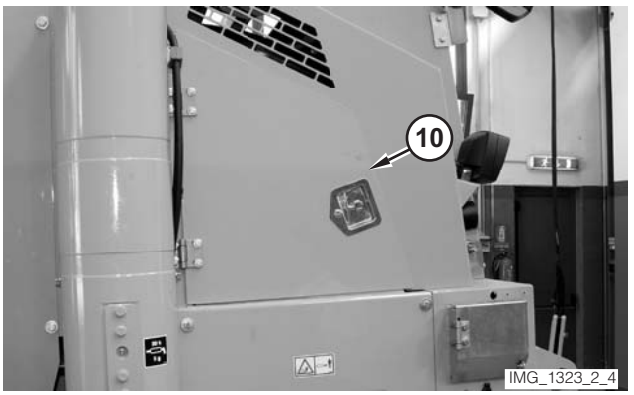

Illustration 142

12. Open rear left compartment (10).

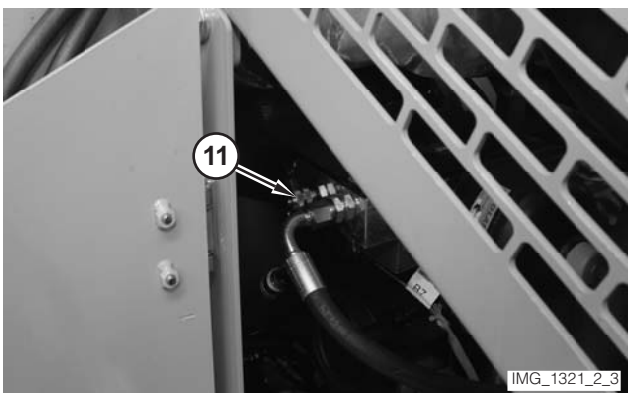

Illustration 143

13. Remove cap (11) from the belt tensioner pressure tap.

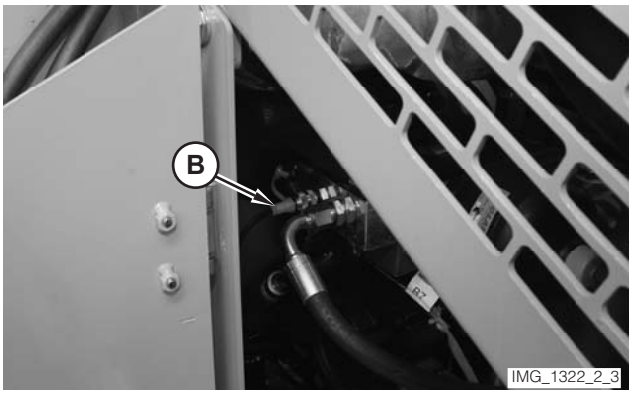

Illustration 144

14. Connect Tool B to the belt tensioner pressure tap.

15. Move key switch (9) to the START position. Release the key switch when the engine starts.

16. Operate the engine at low idle for a few minutes.

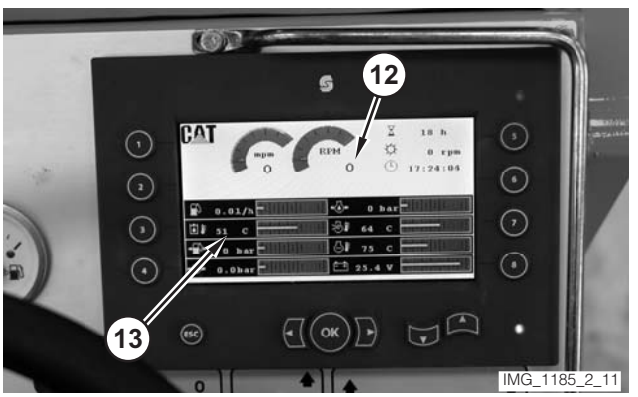

Illustration 145

17. Monitor engine speed value (12) on the digital display. Rotate engine speed dial (8) until the engine speed reaches 1500 rpm.

18. Monitor hydraulic oil temperature (13) on the digital display. Operate the machine until the oil temperature reaches 45 ± 5 °C (110 ± 10 °F).

19. Rotate engine speed dial (8) to the LOW-IDLE position.

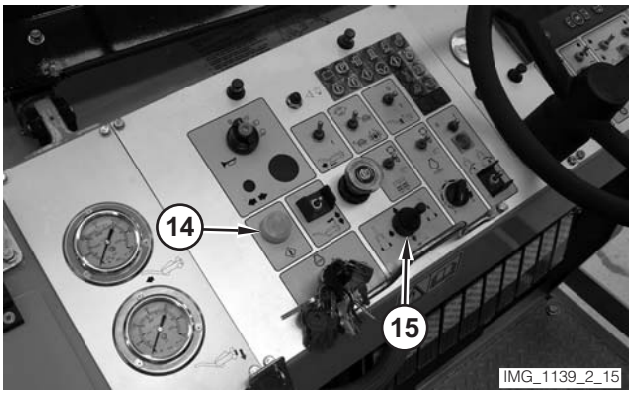

Illustration 146

20. Depress electrical controls master switch (14).

21. If necessary, use all-legs joystick (15) to lift the machine. Release the joystick when the machine is at the maximum height.

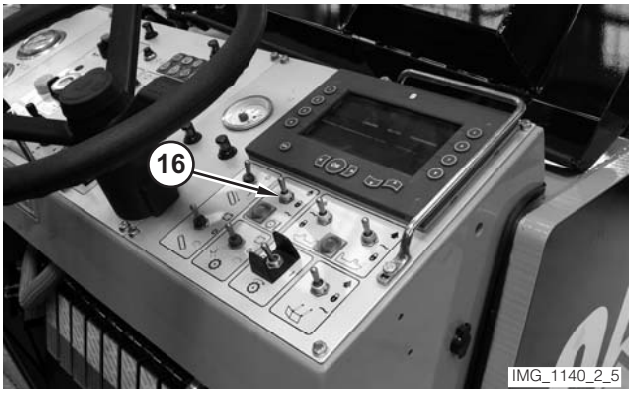

Illustration 147

22. Move moldboard switch (16) to the FLOAT position.

23. Move rotor switch (5) to the ON position.

24. Read the pressure on Tool A. The pressure should be 2000 ± 100 kPa (290 ± 15 psi).

25. Move rotor switch (5) to the OFF position.

26. Rotate engine speed dial (8) to the LOW-IDLE position.

27. Move key switch (9) to the OFF position.

28. If the pressure is outside the specified range, go to Step 29. If the pressure is inside the specified range, go to Step 31.

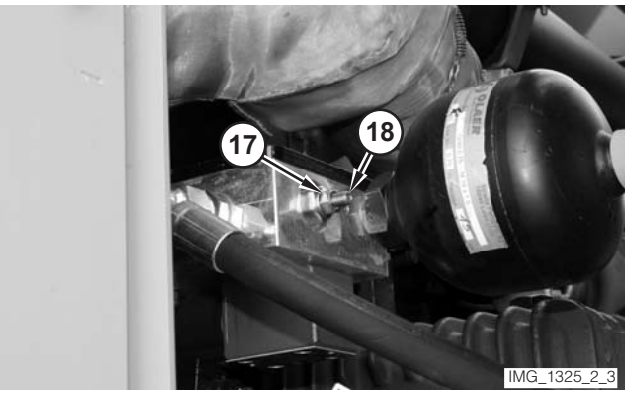

Illustration 148

29. Loosen locknut (17) on the differential pressure valve. In order to increase the pressure, rotate adjustment screw (18) clockwise. In order to decrease the pressure, rotate the adjustment screw counterclockwise.

30. Hold adjustment screw (18), and tighten locknut (17). Go to Step 15.

31. Remove the tooling. Close compartment (10).

Relief Valve (Right Rear Column)—Test and Adjust

⚠ WARNING

Sudden movement of the machine or release of oil under pressure can cause serious injury to persons on or near the machine.

To prevent injury or death, make sure that the area around the machine is clear of personnel and obstructions before operating the machine.

⚠ WARNING

Injury to personnel can result if they are not in the operator's view. Allow only essential personnel near the machine, and make sure the personnel are in the operator's view when testing, to prevent injury. Make sure checks are done in an open area.

⚠ WARNING

Personal injury can result from rotating and moving parts.

Moving fan blades and moving parts will throw or cut any object or tool that falls or is pushed into them.

Make sure no one is working on, underneath or close to an engine that is running. Make sure the area is free of personnel.

NOTICE

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the machine. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, “Caterpillar Tools and Shop Products Guide,” for tools and supplies suitable to collect and contain fluids in Caterpillar machines.

Dispose of all fluids according to local regulations and mandates.

Table 18

Required Tools			
Tool	**Part Number**	**Description**	**Qty**
A	8T-0858	Pressure Gauge 0–16 000 kPa (0–2300 psi)	1
	6V-4144	Coupler	1
B	272-0775	Hose Assembly 1000 mm (39 in)	1
	280-9168	Nipple Fitting	1
	6V-0405	Dowty Seal	1
	8T-7910	Adapter–Union	1
	3J-1907	O-Ring Seal	1
	164-5567	Nipple Fitting	1

Table 19

Optional Tools(1)			
Tool	**Part Number**	**Description**	**Qty**
C(2)	198-4234	Digital Pressure Indicator	1
D(2)	198-4236	Extension Cable	1
E	198-4238	Pressure Sensor 0–35 000 kPa (0–5000 psi)	1

(1) The optional tools can be used in place of the analog pressure measurement Tool A, which is specified in the required tool list.
(2) Tool C and Tool D are part of the 198-4240 Digital Pressure Indicator Group.

1. Drive the machine to a smooth, horizontal surface.

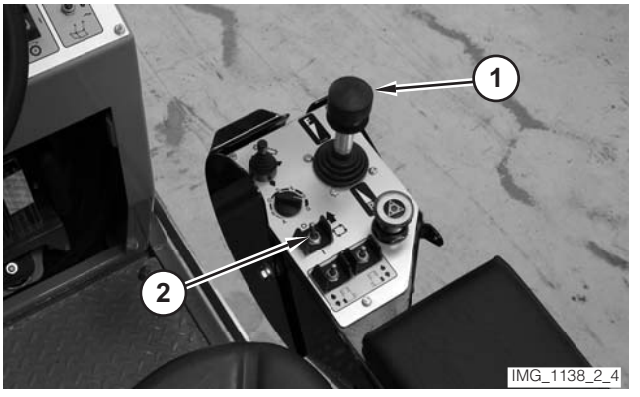

Illustration 149

2. Move propulsion lever (1) to the NEUTRAL position.
3. Move drive selector switch (2) to the OFF position.

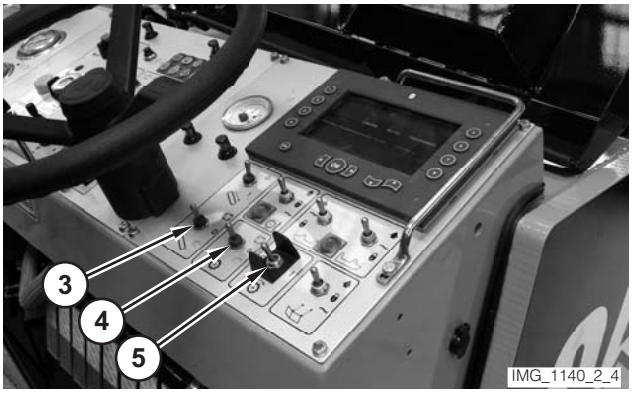

Illustration 150

4. Make sure conveyor switch (3) is in the OFF position.

5. Make sure water spray switch (4) is in the OFF position.

6. Make sure rotor switch (5) is in the OFF position.

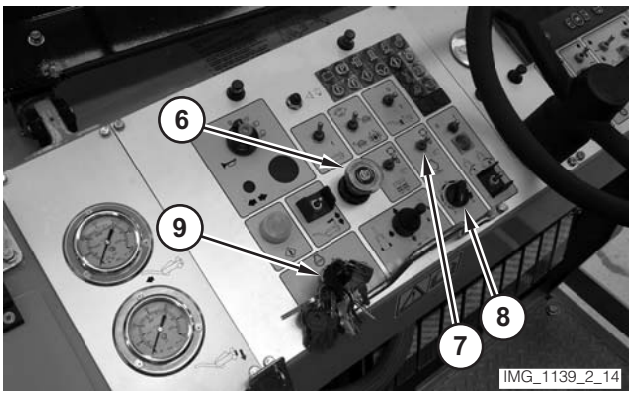

Illustration 151

7. Move parking brake switch (6) to the ON position.

8. If necessary, move engine control switch (7) to the “O” position.

9. Rotate engine speed dial (8) to the LOW-IDLE position.

10. Move key switch (9) to the OFF position.

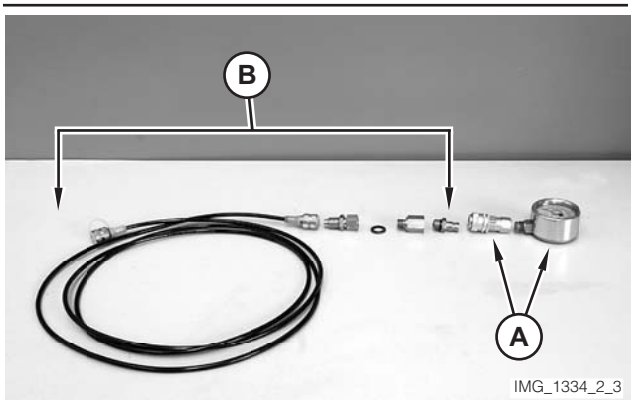

Illustration 152

11. Assemble Tool A. Assemble Tool B. Connect Tool A to Tool B.

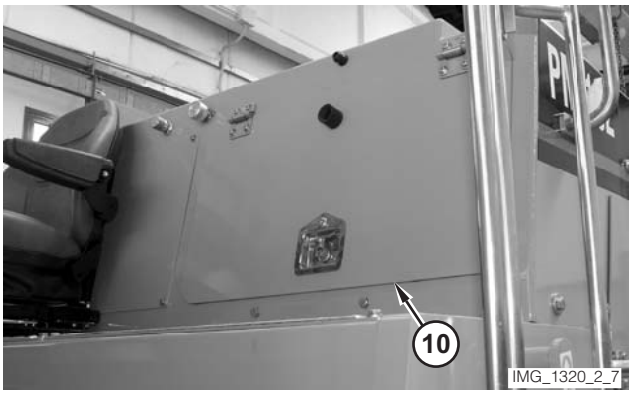

Illustration 153

12. Open compartment (10).

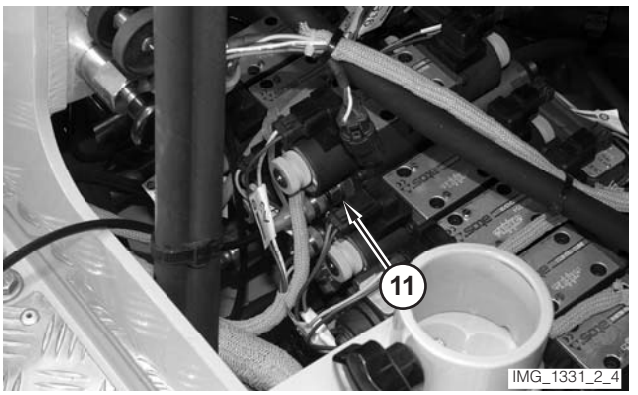

Illustration 154

13. Remove the cap from pressure tap (11).

14. Connect Tool B to pressure tap (11).

15. Move key switch (9) to the START position. Release the key switch when the engine starts.

16. Operate the engine at low idle for a few minutes.

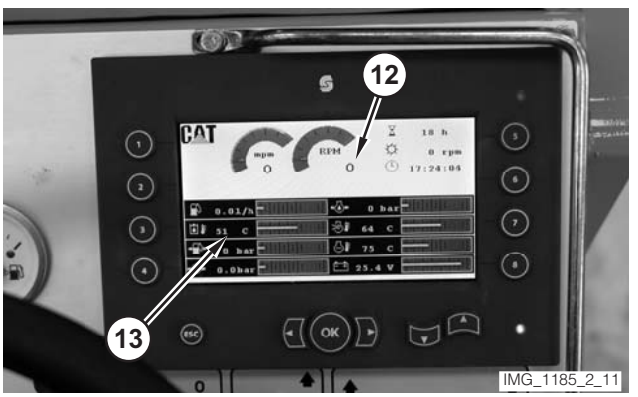

Illustration 155

17. Monitor engine speed value (12) on the digital display. Rotate engine speed dial (8) until the engine speed reaches 1500 rpm.

18. Monitor hydraulic oil temperature (13) on the digital display. Operate the machine until the oil temperature reaches 45 ± 5 °C (110 ± 10 °F).

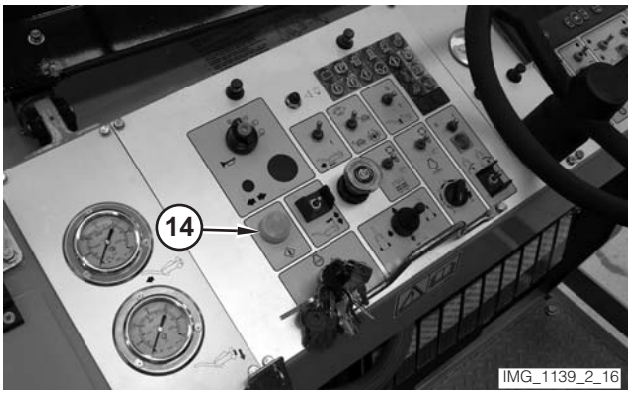

Illustration 156

19. Depress electrical controls master switch (14).

20. Read the pressure on Tool A. The pressure should be 8000 ± 500 kPa (1160 ± 70 psi).

21. Rotate engine speed dial (8) to the LOW-IDLE position.

22. Move key switch (9) to the OFF position.

23. If the pressure is outside the specified range, go to Step 24. If the pressure is inside the specified range, go to Step 27.

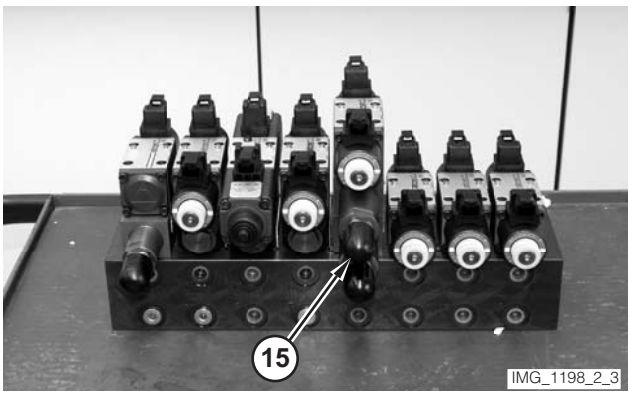

Illustration 157

Valve Removed From Machine.

24. Remove cap (15).

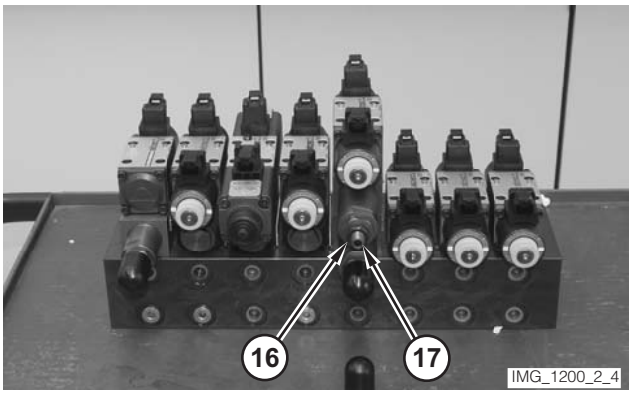

Illustration 158

Valve Removed From Machine.

25. Loosen locknut (16) on the relief valve. In order to increase the pressure, rotate adjustment screw (17) clockwise. In order to decrease the pressure, rotate the adjustment screw counterclockwise.

26. Hold adjustment screw (17), and tighten locknut (16). Go to Step 15.

27. Remove the tooling. Close the compartment (10).

Standard Water Pump RPM—Test

⚠ WARNING

Sudden movement of the machine or release of oil under pressure can cause serious injury to persons on or near the machine.

To prevent injury or death, make sure that the area around the machine is clear of personnel and obstructions before operating the machine.

⚠ WARNING

Injury to personnel can result if they are not in the operator's view. Allow only essential personnel near the machine, and make sure the personnel are in the operator's view when testing, to prevent injury. Make sure checks are done in an open area.

⚠ WARNING

Personal injury can result from rotating and moving parts.

Moving fan blades and moving parts will throw or cut any object or tool that falls or is pushed into them.

Make sure no one is working on, underneath or close to an engine that is running. Make sure the area is free of personnel.

Table 20

Required Tools			
Tool	**Part Number**	**Description**	**Qty**
A(1)	1U-7771	Tachometer	1
B(1)	1U-6605	Reflective Tape	1

(1) Tool (A) and Tool (B) are part of the 1U-6602 Photo-Tach Group.

1. Drive the machine to a smooth, horizontal surface.

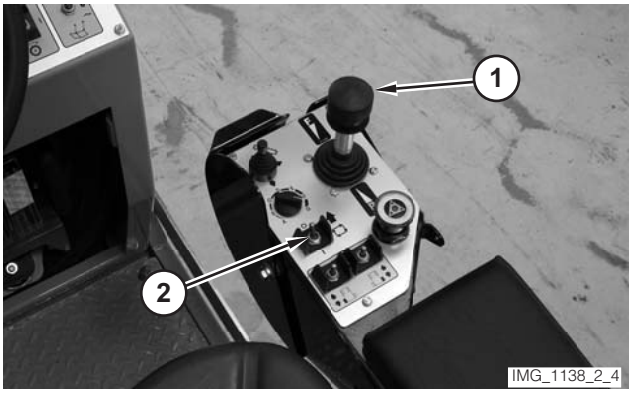

Illustration 159

2. Move propulsion lever (1) to the NEUTRAL position.

3. Move drive selector switch (2) to the OFF position.

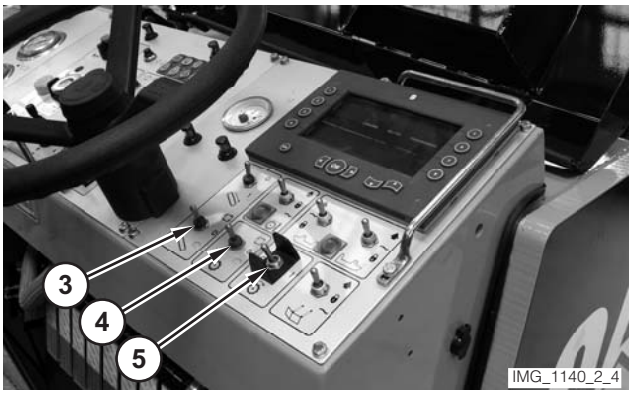

Illustration 160

4. Move conveyor switch (3) is in the OFF position.

5. Move water spray switch (4) is in the OFF position.

6. Move rotor switch (5) is in the OFF position.

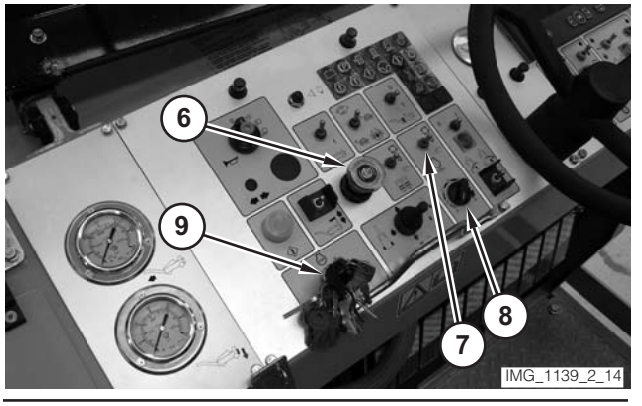

Illustration 161

7. Move parking brake switch (6) to the ON position.

8. If necessary, move engine control switch (7) to the OFF (“O”) position.

9. Rotate engine speed dial (8) to the LOW-IDLE position.

10. Move key switch (9) to the OFF position.

Illustration 162

NOTICE
In order to prevent possible pump damage, make sure that the water tank contains water.

11. Use water sight gauge (10) in order to check the water level in the water tank. Add water to the tank if necessary.

Illustration 163

12. Open compartment (11).

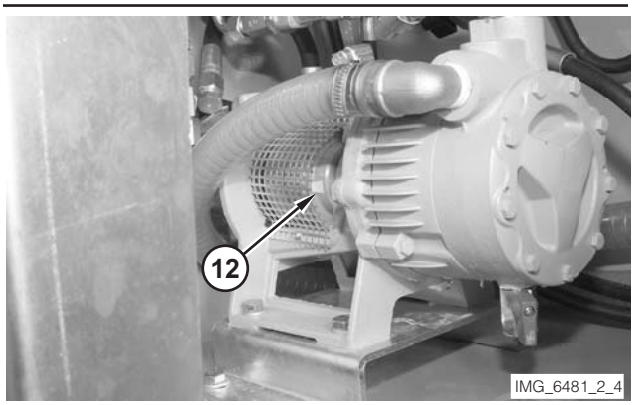

Illustration 164

13. Place reflective tape on the motor output shaft (12).

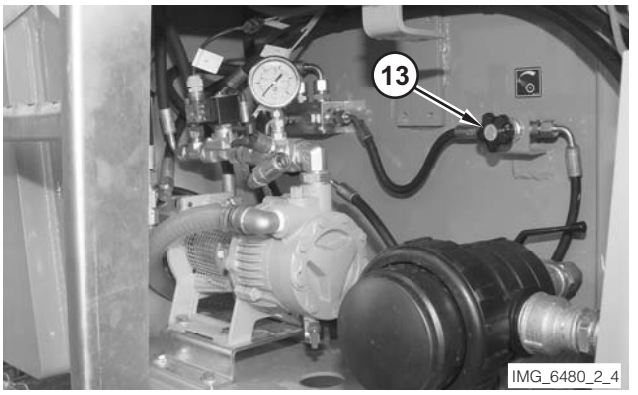

Illustration 165

14. Turn flow control valve (13) fully clockwise.

15. Move key switch (9) to the START position. Release the key switch when the engine starts.

16. Operate the engine at low idle for a few minutes.

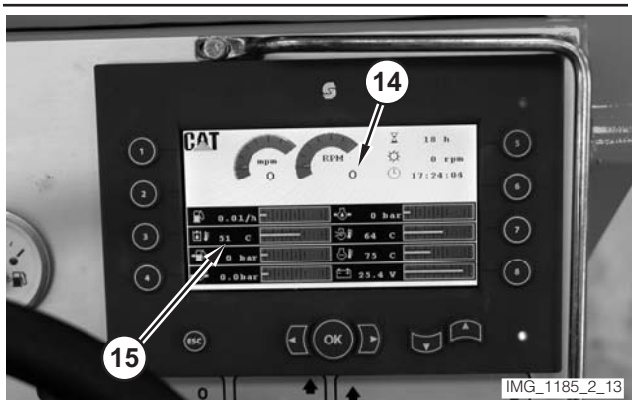

Illustration 166

17. Monitor engine speed value (14) on the digital display. Rotate engine speed dial (8) until the engine speed reaches 1500 rpm.

18. Monitor hydraulic oil temperature (15) on the digital display. Operate the machine until the oil temperature reaches 45 ± 5 °C (110 ± 10 °F).

19. Rotate engine speed dial (8) to the HIGH-IDLE position.

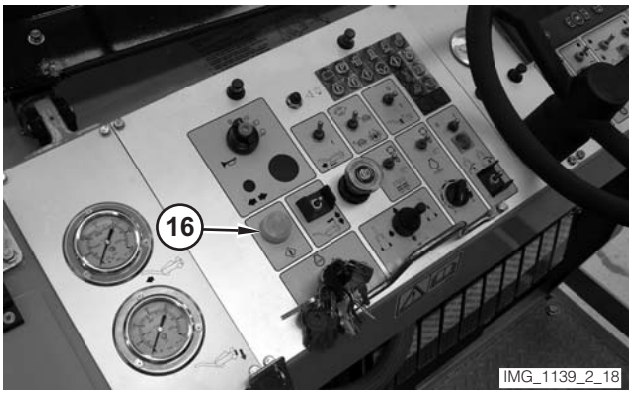

Illustration 167

20. Depress electrical controls master switch (16).

21. Move water spray switch (4) to the MANUAL position.

22. Use Tool (A) to record the speed of motor output shaft (12). The speed of the shaft should be 4850 ±150 RPM.

23. Move water spray switch (4) to the OFF position.

24. Move engine speed dial (8) to the LOW-IDLE position.

25. Move key switch (9) to the OFF position.

26. If the speed is outside of the specified range, go to Step 27. If the speed is inside the specified range, go to Step 31.

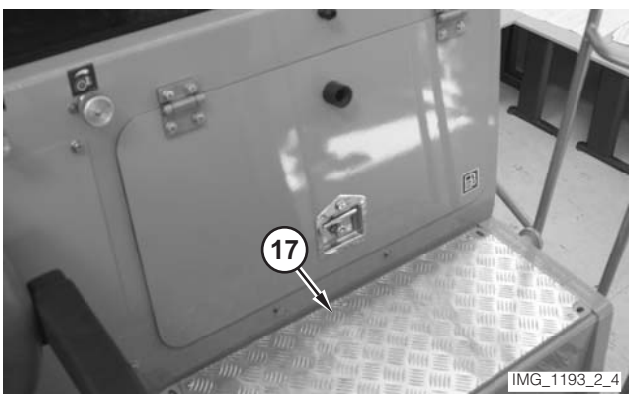

Illustration 168

27. Remove four bolts and remove plate (17).

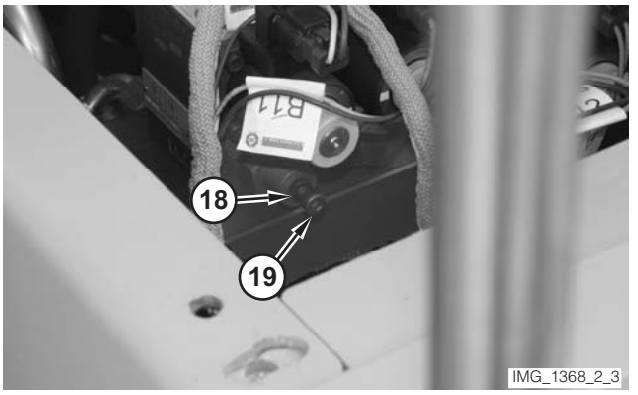

Illustration 169

28. Loosen locknut (18) on the flow control valve. In order to decrease the speed, rotate adjustment screw (19) clockwise. In order to increase the speed, rotate the adjustment screw counterclockwise.

29. Hold adjustment screw (19), and tighten locknut (18).

30. Go to Step 15.

31. If necessary, install plate (17). Close compartment (11).

Optional Water Loading Pump RPM—Test and Adjust

⚠ WARNING

Sudden movement of the machine or release of oil under pressure can cause serious injury to persons on or near the machine.

To prevent injury or death, make sure that the area around the machine is clear of personnel and obstructions before operating the machine.

⚠ WARNING

Injury to personnel can result if they are not in the operator's view. Allow only essential personnel near the machine, and make sure the personnel are in the operator's view when testing, to prevent injury. Make sure checks are done in an open area.

⚠ WARNING

Personal injury can result from rotating and moving parts.

Moving fan blades and moving parts will throw or cut any object or tool that falls or is pushed into them.

Make sure no one is working on, underneath or close to an engine that is running. Make sure the area is free of personnel.

Table 21

Required Tools			
Tool	**Part Number**	**Description**	**Qty**
A(1)	1U-7771	Tachometer	1
B(1)	1U-6605	Reflective Tape	1

(1) Tool A and Tool B are part of the 1U-6602 Photo-Tach Group.

1. Drive the machine to a smooth, horizontal surface.

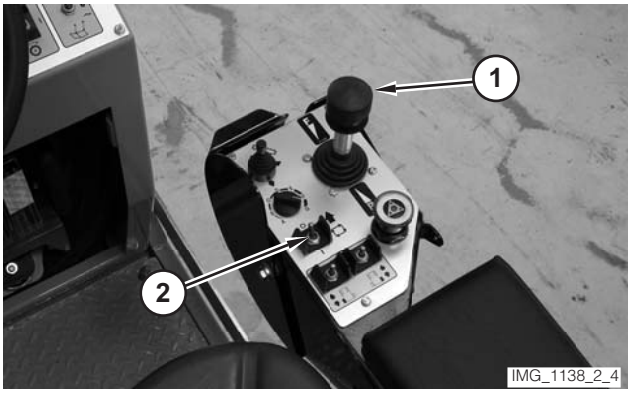

Illustration 170

2. Move propulsion lever (1) to the NEUTRAL position.

3. Move drive selector switch (2) to the OFF position.

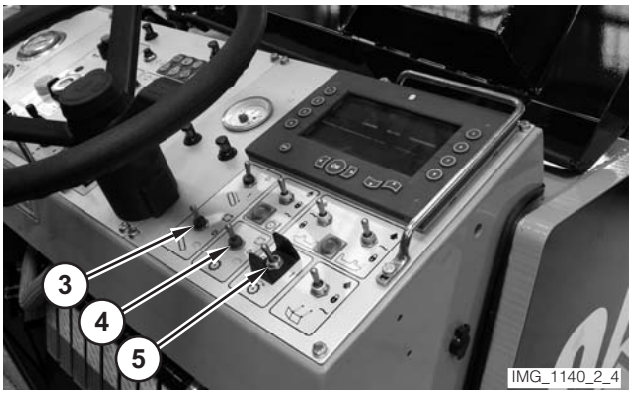

Illustration 171

4. Make sure conveyor switch (3) is in the OFF position.

5. Make sure water spray switch (4) is in the OFF position.

6. Make sure rotor switch (5) is in the OFF position.

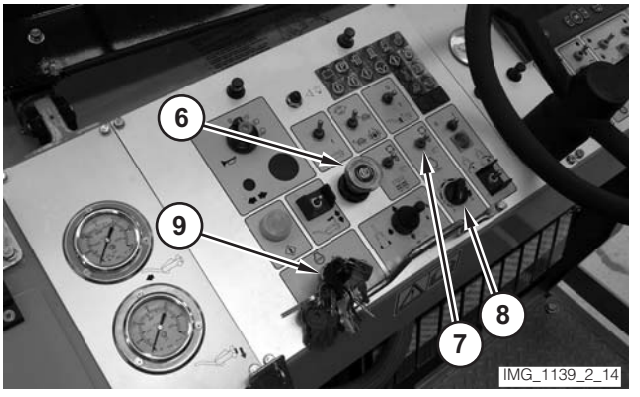

Illustration 172

7. Move parking brake switch (6) to the ON position.

8. If necessary, move engine control switch (7) to the “O” position.

9. Rotate engine speed dial (8) to the LOW-IDLE position.

10. Move key switch (9) to the OFF position.

Illustration 173

NOTICE
In order to prevent possible pump damage, make sure that the water tank is not full.

11. Use water sight gauge (10) in order to check the water level in the water tank. Remove water from the tank, if necessary.

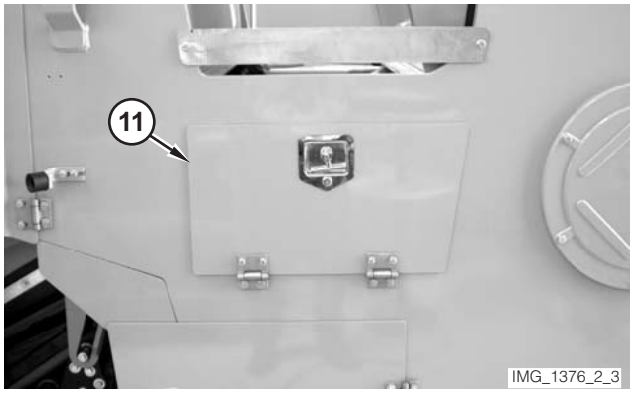

Illustration 174

12. Open compartment (11).

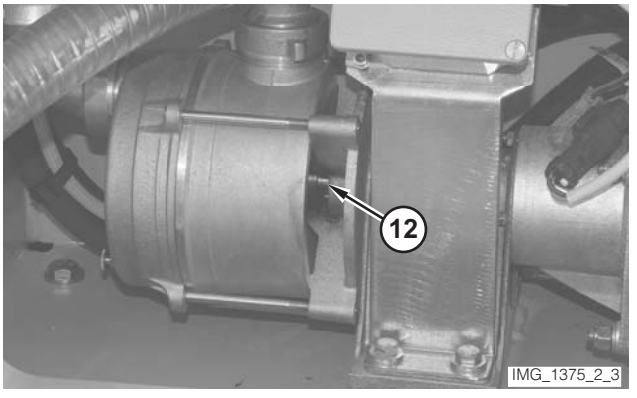

Illustration 175

13. Install a piece of Tool B on motor output shaft (12).

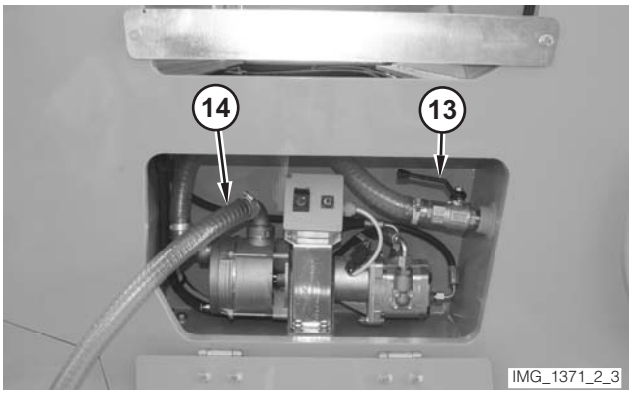

Illustration 176

14. Open water valve (13).

15. Install hose (14). Place the other end of the hose in a clean water source.

16. Move key switch (9) to the START position. Release the key switch when the engine starts.

17. Operate the engine at low idle for a few minutes.

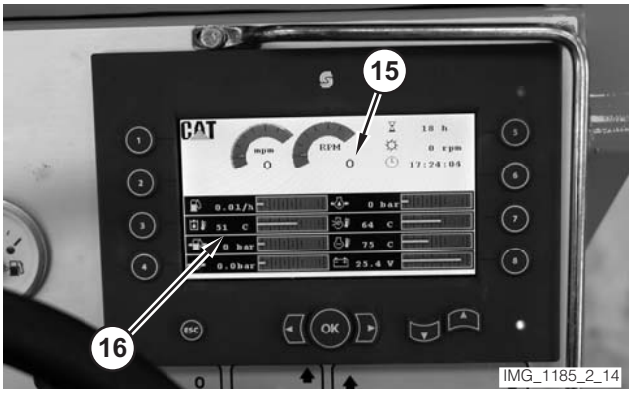

Illustration 177

18. Monitor engine speed value (15) on the digital display. Rotate engine speed dial (8) until the engine speed reaches 1500 rpm.

19. Monitor hydraulic oil temperature (16) on the digital display. Operate the machine until the oil temperature reaches 45 ± 5 °C (110 ± 10 °F).

20. Rotate engine speed dial (8) to the HIGH-IDLE position.

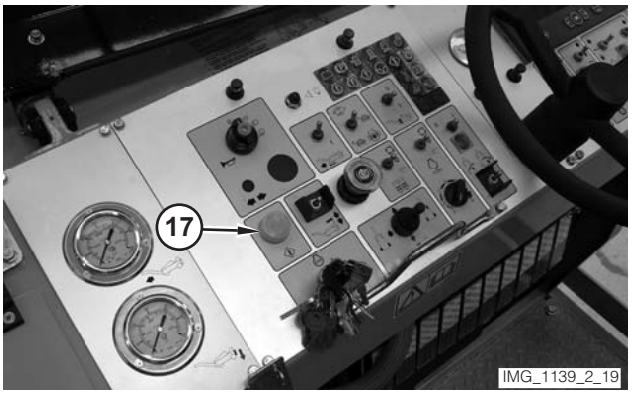

Illustration 178

21. Depress electrical controls master switch (17).

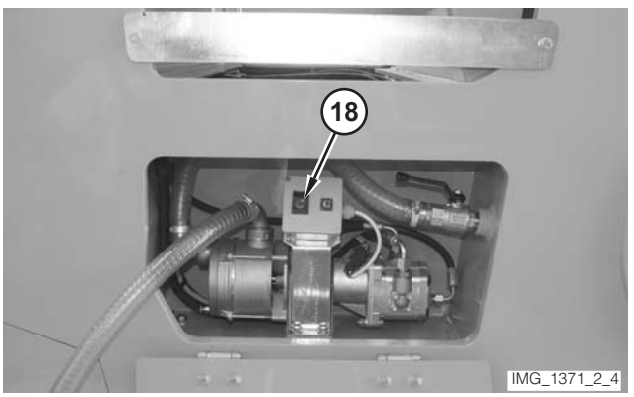

Illustration 179

22. Move water spray switch (18) to the ON position.

23. Use Tool A to record the speed of motor output shaft (12). The speed of the shaft should be 2250 ±50 rpm.

24. Move water spray switch (18) to the OFF position.

25. Move engine speed dial (8) to the LOW-IDLE position.

26. Move key switch (9) to the OFF position.

27. If the speed is outside of the specified range, go to Step 28. If the speed is inside the specified range, go to Step 32.

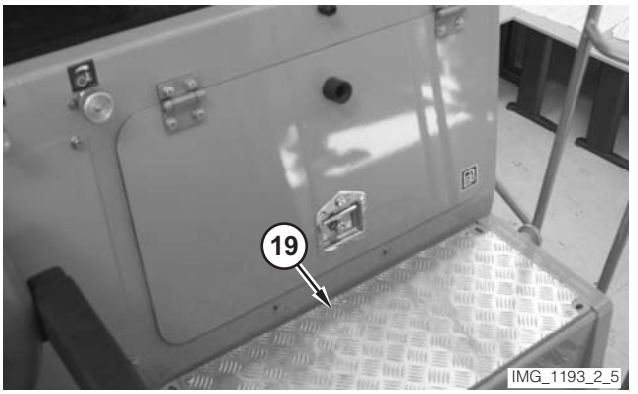

Illustration 180

28. Remove four bolts and remove plate (19).

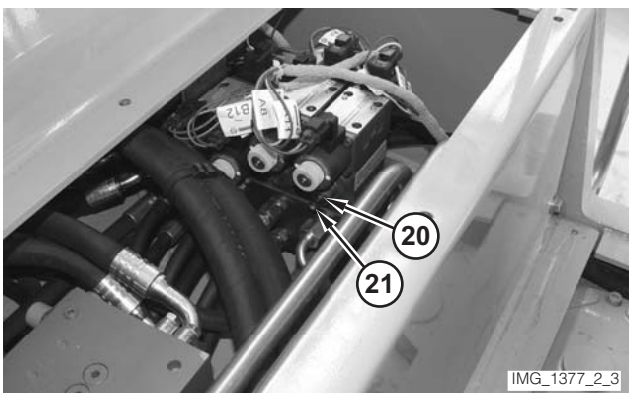

Illustration 181

29. Loosen locknut (20) on the flow control valve. In order to decrease the speed, rotate adjustment screw (21) clockwise. In order to increase the speed, rotate the adjustment screw counterclockwise.

30. Hold adjustment screw (21), and tighten locknut (20).

31. Go to Step 16.

32. If necessary, install plate (19).

33. Close water valve (13). Remove hose (14). Close compartment (11).

Propel Control Handle Potentiometer—Calibrate

⚠ WARNING

Sudden movement of the machine or release of oil under pressure can cause serious injury to persons on or near the machine.

To prevent injury or death, make sure that the area around the machine is clear of personnel and obstructions before operating the machine.

⚠ WARNING

Injury to personnel can result if they are not in the operator's view. Allow only essential personnel near the machine, and make sure the personnel are in the operator's view when testing, to prevent injury. Make sure checks are done in an open area.

⚠ WARNING

Personal injury can result from rotating and moving parts.

Moving fan blades and moving parts will throw or cut any object or tool that falls or is pushed into them.

Make sure no one is working on, underneath or close to an engine that is running. Make sure the area is free of personnel.

1. Drive the machine to a smooth, horizontal surface.

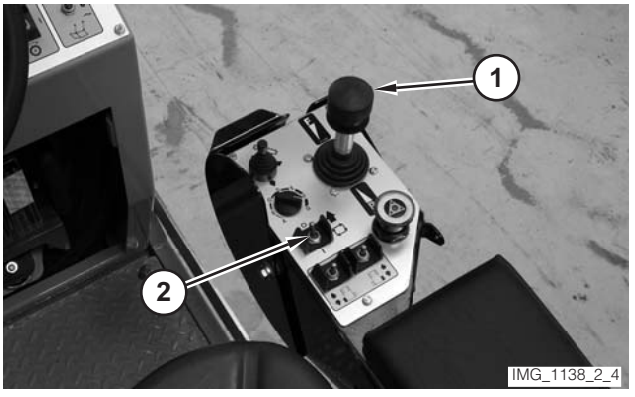

Illustration 182

2. Move propulsion lever (1) to the NEUTRAL position.

3. Move drive selector switch (2) to the OFF position.

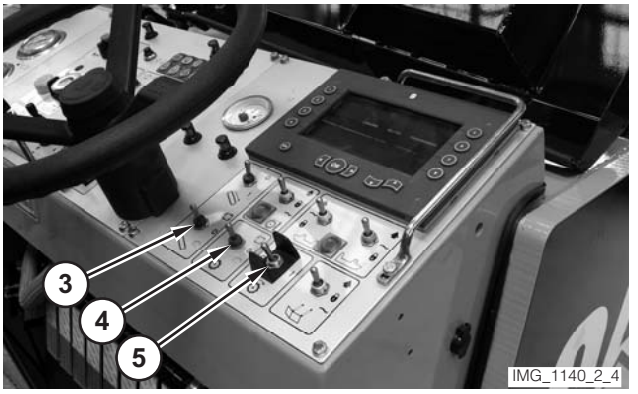

Illustration 183

4. Make sure conveyor switch (3) is in the OFF position.

5. Make sure water spray switch (4) is in the OFF position.

6. Make sure rotor switch (5) is in the OFF position.

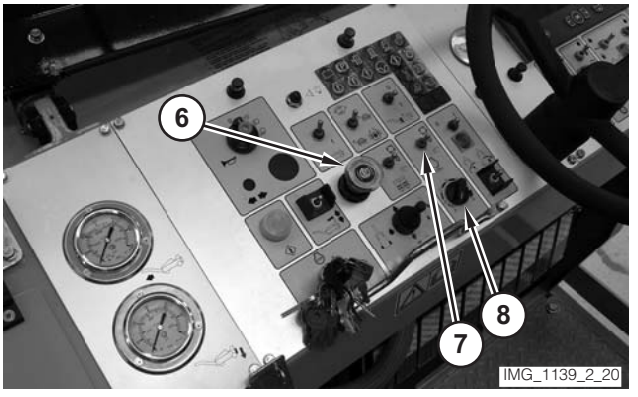

Illustration 184

7. Move parking brake switch (6) to the ON position.

8. If necessary, move engine control switch (7) to the "O" position.

9. Rotate engine speed dial (8) to the LOW-IDLE position.

Illustration 185

10. Push “8” button (9), on the digital display, twice.

Illustration 186

11. Press “1” button (10), on the digital display.

12. Press “5” button (11), on the digital display.

13. Press “2” button (12), on the digital display.

14. Press “6” button (13), on the digital display.

15. If the machine is equipped with wheels, go to Step 16. If the machine is equipped with tracks, go to Step 17.

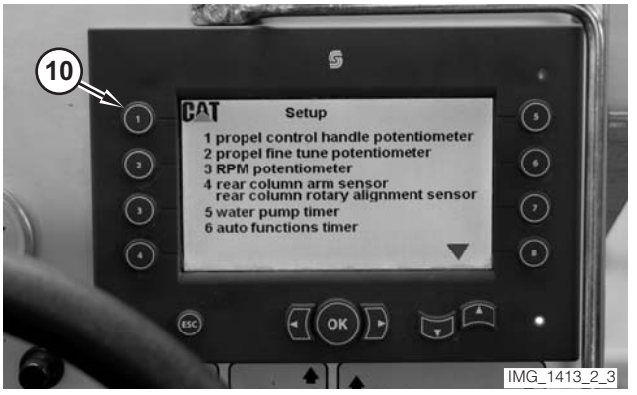

Illustration 187

Photo From Wheel Machine

16. Press “1” button (10) on the digital display. Go to Step 18.

Illustration 188

Photo From Track Machine

17. Press “1” button (10) on the digital display. Go to Step 18.

Illustration 189

18. Monitor the values in “mV” column (14) during the following steps. The values should change smoothly. If the values do not change smoothly, the sensor should be checked with a multimeter.

19. Move propulsion lever (1) to the FULL REVERSE position.

NOTE: A red value in the “mV” indicates that the value is out of range. If a value is out of range after the calibration, check the sensor with a multimeter. If the values on the multimeter match the values on the display, replace the sensor. If the values do not match, check the wiring of the circuit.

20. Move propulsion lever (1) to the FULL FORWARD position.

21. Move propulsion lever (1) to the NEUTRAL position.

Illustration 190

22. Press “OK” button (15) to save the values or press “ESC” button (16) to go back one screen without saving the currently displayed values.

23. Once the value has been saved, press “ESC” button (16) to return to the “Setup” screen.

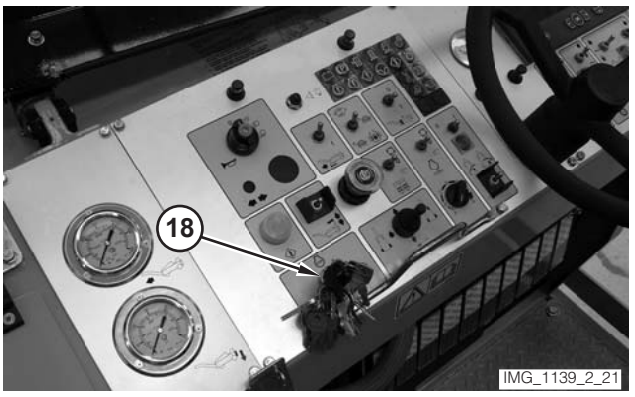

Illustration 191

24. Move key switch (17) to the OFF position.

Propel Fine Tune Potentiometer—Calibrate

⚠ WARNING

Sudden movement of the machine or release of oil under pressure can cause serious injury to persons on or near the machine.

To prevent injury or death, make sure that the area around the machine is clear of personnel and obstructions before operating the machine.

⚠ WARNING

Injury to personnel can result if they are not in the operator’s view. Allow only essential personnel near the machine, and make sure the personnel are in the operator’s view when testing, to prevent injury. Make sure checks are done in an open area.

⚠ WARNING

Personal injury can result from rotating and moving parts.

Moving fan blades and moving parts will throw or cut any object or tool that falls or is pushed into them.

Make sure no one is working on, underneath or close to an engine that is running. Make sure the area is free of personnel.

1. Drive the machine to a smooth, horizontal surface.

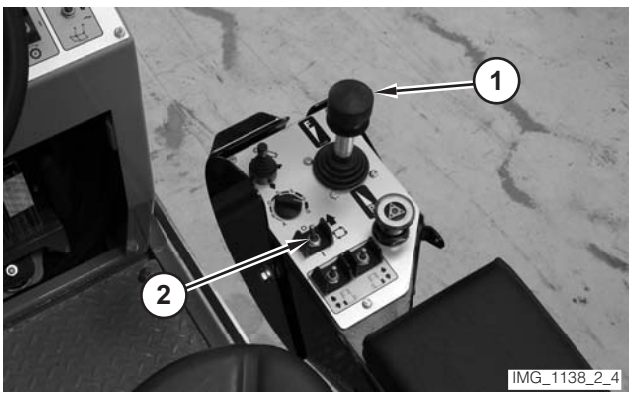

Illustration 192

2. Move propulsion lever (1) to the NEUTRAL position.

3. Move drive selector switch (2) to the OFF position.

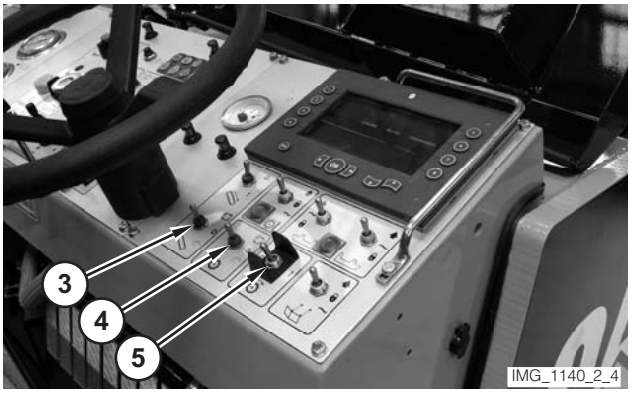

Illustration 193

4. Make sure conveyor switch (3) is in the OFF position.

5. Make sure water spray switch (4) is in the OFF position.

6. Make sure rotor switch (5) is in the OFF position.

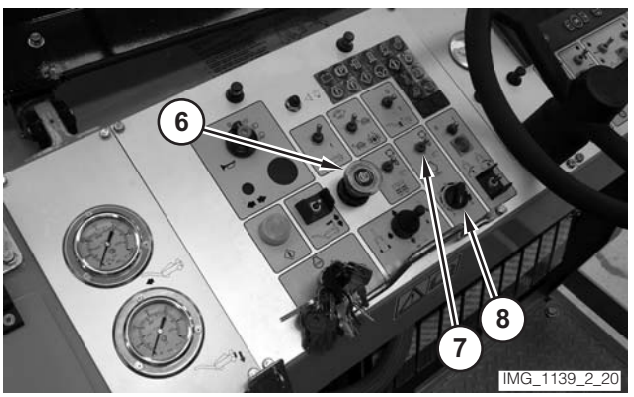

Illustration 194

7. Move parking brake switch (6) to the ON position.

8. If necessary, move engine control switch (7) to the “O” position.

9. Rotate engine speed dial (8) to the LOW-IDLE position.

Illustration 195

10. Push “8” button (9), on the digital display, twice.

Illustration 196

11. Press “1” button (10) on the digital display.

12. Press “5” button (11) on the digital display.

13. Press “2” button (12) on the digital display.

14. Press “6” button (13) on the digital display.

15. If the machine is equipped with wheels, go to Step 16. If the machine is equipped with tracks, go to Step 17.

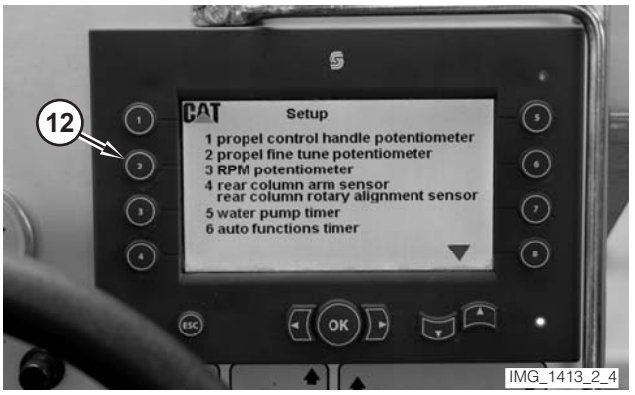

Illustration 197

Photo From Wheel Machine

16. Press “2” button (12) on the digital display. Go to Step 18.

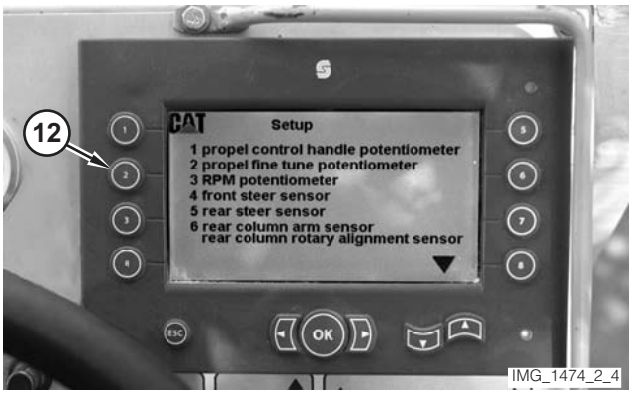

Illustration 198

Photo From Track Machine

17. Press “2” button (12) on the digital display. Go to Step 18.

Illustration 199

18. Monitor the values in “mV” column (14) during the following steps. The values should change smoothly. If the values do not change smoothly, the sensor should be checked with a multimeter.

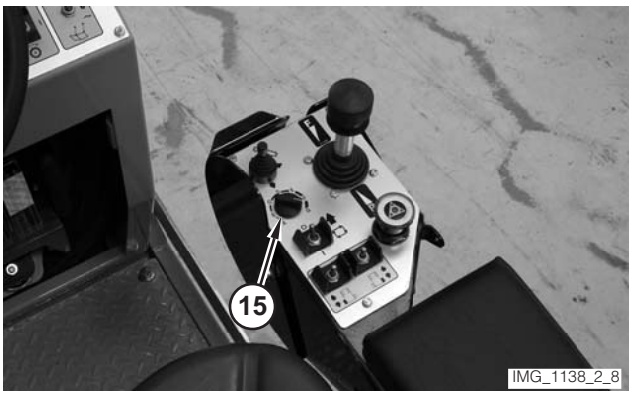

Illustration 200

19. Rotate speed dial (15) to the LOW-IDLE position.

20. Rotate speed dial (15) to the HIGH-IDLE position.

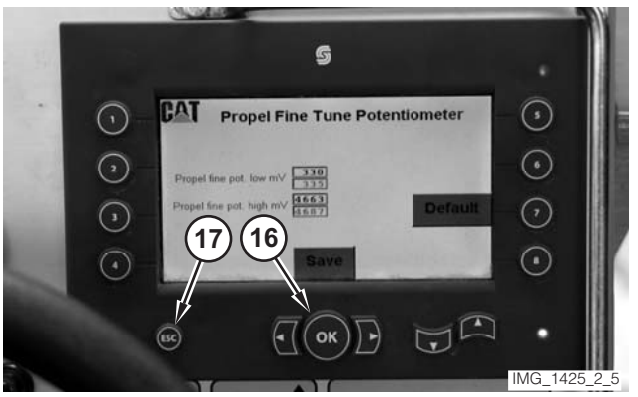

Illustration 201

21. Press “OK” button (16) to save the values or press “ESC” button (17) to go back one screen without saving the currently displayed values.

NOTE: A red value in the “mV” indicates that the value is out of range. If a value is out of range after the calibration, check the potentiometer with a multimeter. If the values on the multimeter match the values on the display, replace the potentiometer. If the values do not match, check the wiring of the circuit.

22. Once the value has been saved, press “ESC” button (17) to return to the “Setup” screen.

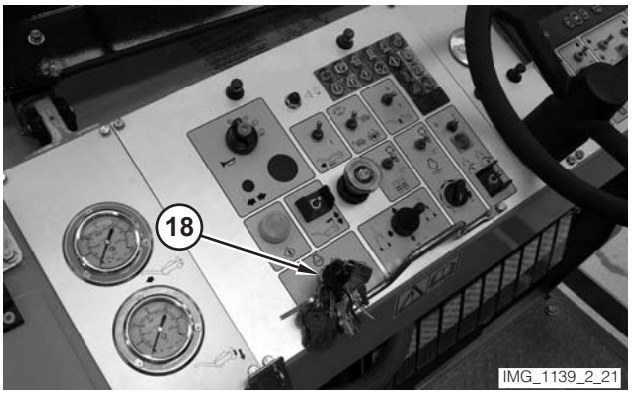

Illustration 202

23. Move key switch (18) to the OFF position.

RPM Potentiometer (Engine)—Calibrate

⚠ WARNING

Sudden movement of the machine or release of oil under pressure can cause serious injury to persons on or near the machine.

To prevent injury or death, make sure that the area around the machine is clear of personnel and obstructions before operating the machine.

⚠ WARNING

Injury to personnel can result if they are not in the operator's view. Allow only essential personnel near the machine, and make sure the personnel are in the operator's view when testing, to prevent injury. Make sure checks are done in an open area.

⚠ WARNING

Personal injury can result from rotating and moving parts.

Moving fan blades and moving parts will throw or cut any object or tool that falls or is pushed into them.

Make sure no one is working on, underneath or close to an engine that is running. Make sure the area is free of personnel.

1. Drive the machine to a smooth, horizontal surface.

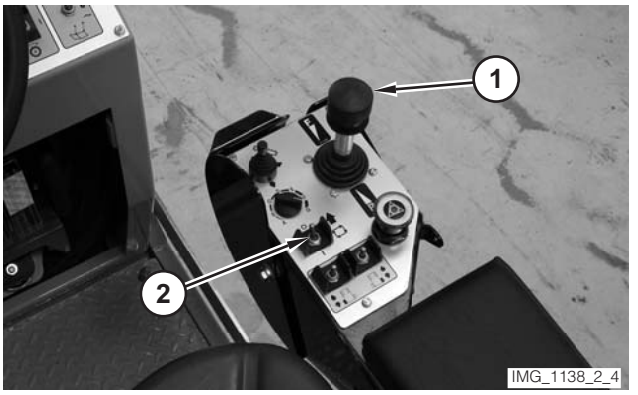

Illustration 203

2. Move propulsion lever (1) to the NEUTRAL position.

3. Move drive selector switch (2) to the OFF position.

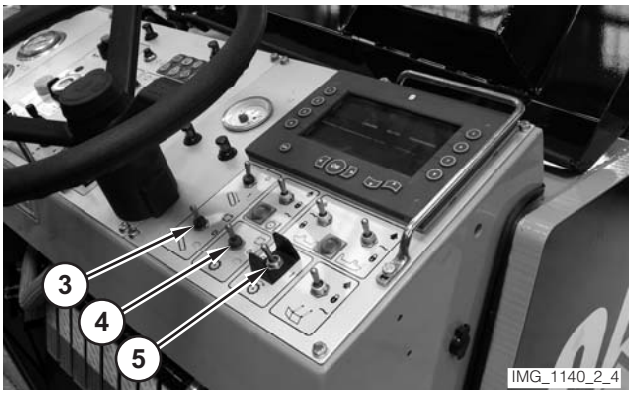

Illustration 204

4. Make sure conveyor switch (3) is in the OFF position.

5. Make sure water spray switch (4) is in the OFF position.

6. Make sure rotor switch (5) is in the OFF position.

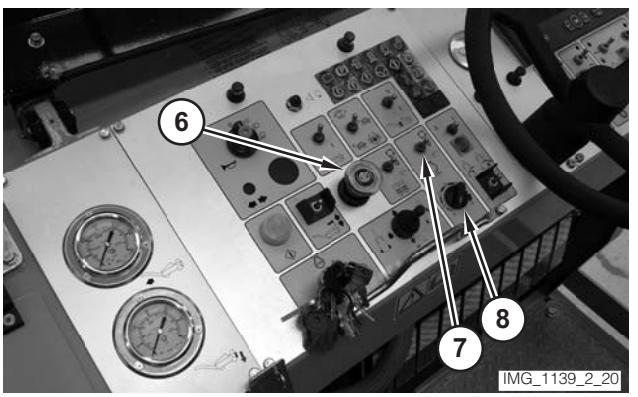

Illustration 205

7. Move parking brake switch (6) to the ON position.

8. If necessary, move engine control switch (7) to the"O" position.

9. Rotate engine speed dial (8) to the LOW-IDLE position.

Illustration 206

10. Push “8” button (9), on the digital display, twice.

Illustration 207

11. Press “1” button (10) on the digital display.

12. Press “5” button (11) on the digital display.

13. Press “2” button (12) on the digital display.

14. Press “6” button (13) on the digital display.

15. If the machine is equipped with wheels, go to Step 16. If the machine is equipped with tracks, go to Step 17.

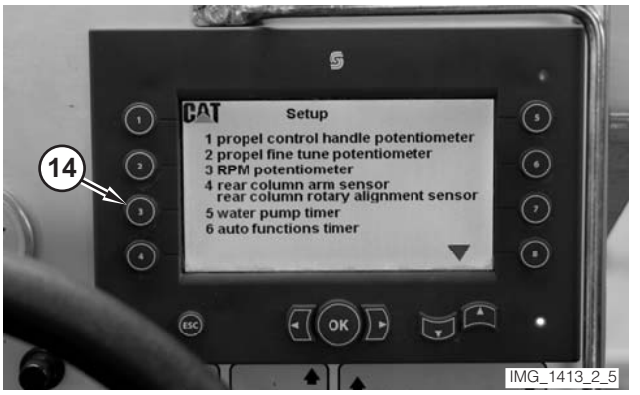

Illustration 208

Photo From Wheeled Machine

16. Press “3” button (14) on the digital display. Go to Step 18.

Illustration 209

Photo From Tracked Machine

17. Press “3” button (14) on the digital display. Go to Step 18.

Illustration 210

18. Monitor the values in “mV” column (15) during the following steps. The values should change smoothly. If the values do not change smoothly, the sensor should be checked with a multimeter.

19. Rotate engine speed dial (8) to the LOW-IDLE position.

20. Rotate engine speed dial (8) to the HIGH-IDLE position.

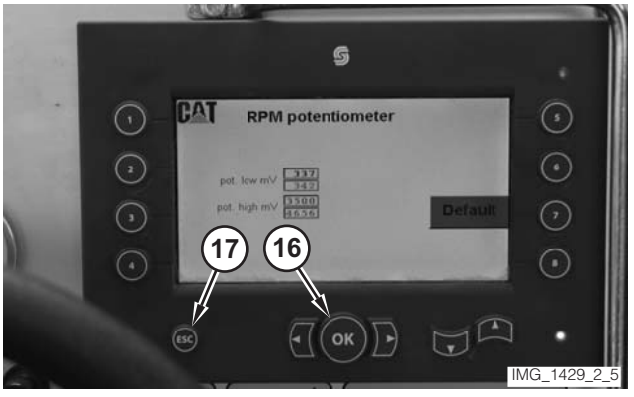

Illustration 211

21. Press “OK” button (16) to save the values or press “ESC” button (17) to go back one screen without saving the currently displayed values.

NOTE: A red value in the “mV” indicates that the value is out of range. If a value is out of range after the calibration, check the potentiometer with a multimeter. If the values on the multimeter match the values on the display, replace the potentiometer. If the values do not match, check the wiring of the circuit.

22. Once the value has been saved, press “ESC” button (17) to return to the “Setup” screen.

23. Rotate engine speed dial (8) to the LOW-IDLE position.

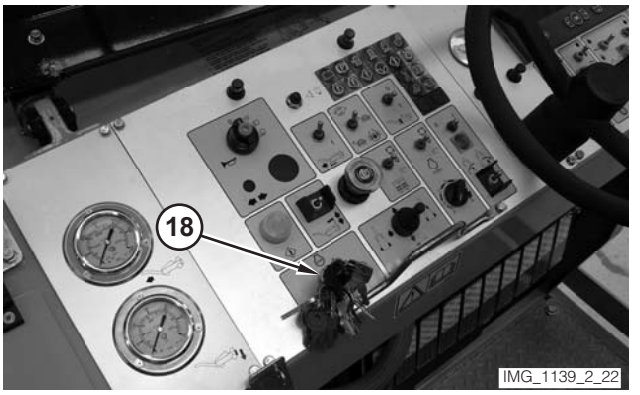

Illustration 212

24. Move key switch (18) to the OFF position.

Proximity Switch (Horizontal Pin)—Calibrate

⚠ WARNING

Sudden movement of the machine or release of oil under pressure can cause serious injury to persons on or near the machine.

To prevent injury or death, make sure that the area around the machine is clear of personnel and obstructions before operating the machine.

⚠ WARNING

Injury to personnel can result if they are not in the operator’s view. Allow only essential personnel near the machine, and make sure the personnel are in the operator’s view when testing, to prevent injury. Make sure checks are done in an open area.

⚠ WARNING

Personal injury can result from rotating and moving parts.

Moving fan blades and moving parts will throw or cut any object or tool that falls or is pushed into them.

Make sure no one is working on, underneath or close to an engine that is running. Make sure the area is free of personnel.

1. Drive the machine to a smooth, horizontal surface.

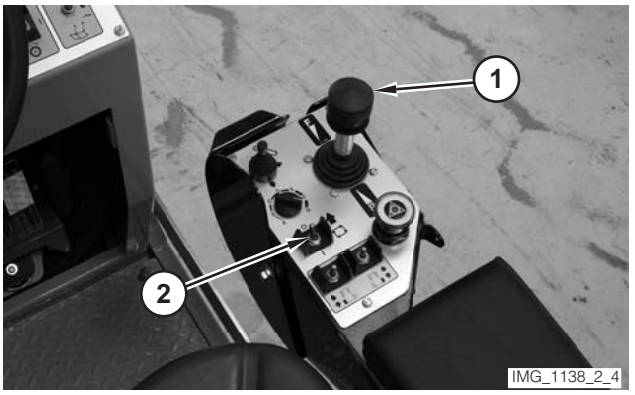

Illustration 213

2. Move propulsion lever (1) to the NEUTRAL position.

3. Move drive selector switch (2) to the OFF position.

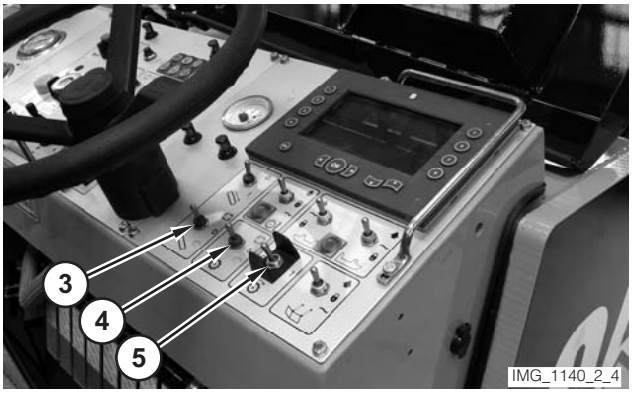

Illustration 214

4. Make sure conveyor switch (3) is in the OFF position.

5. Make sure water spray switch (4) is in the OFF position.

6. Make sure rotor switch (5) is in the OFF position.

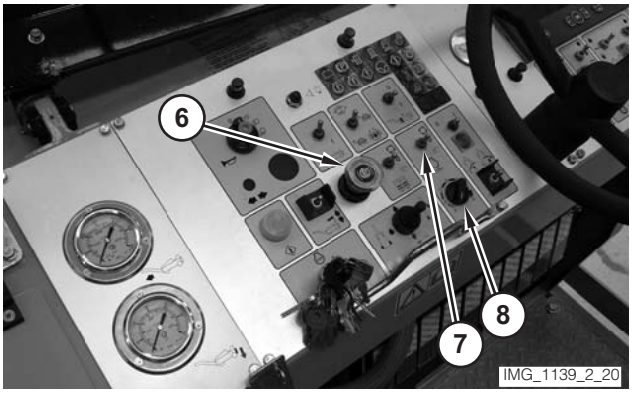

Illustration 215

7. Move parking brake switch (6) to the ON position.

8. If necessary, move engine control switch (7) to the"O" position.

9. Rotate engine speed dial (8) to the LOW-IDLE position.

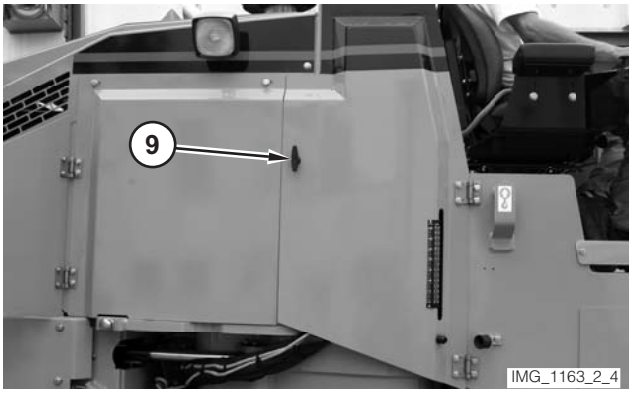

Illustration 216

10. Open right leg compartment (9).

11. If the right rear column is inside the compartment, go to Step 12. If the right rear column is outside the compartment, go to Step 23.

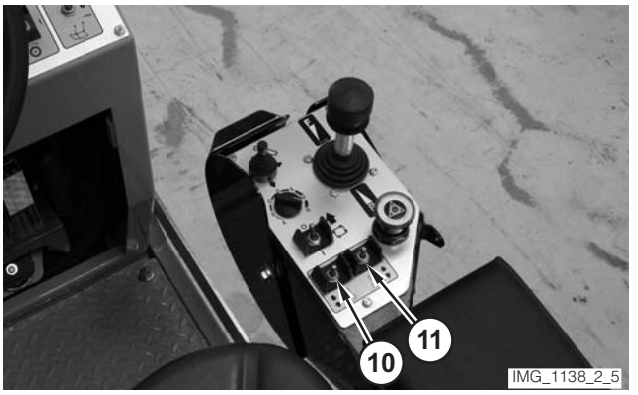

Illustration 217

12. Use left rear leg switch (10) and right rear leg switch (11) to lower the rear of the machine. Release the switches when the drum rests on the ground.

Illustration 218

13. Press “4” switch (12), on the digital display, twice.

14. Press “1” switch (13), on the digital display, once.

15. Move right rear leg switch (11) to the LOWER position.

Illustration 219

16. Watch “Column high position sensor” box (14) on the digital display. When the box changes from red to green, release right rear leg switch (11).

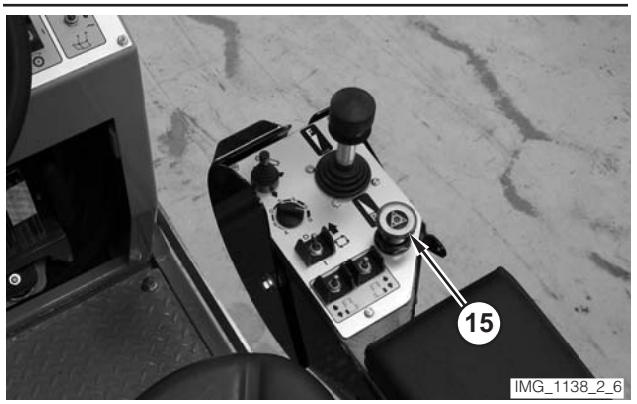

Illustration 220

17. Move electrical controls disable switch (15) to the DISABLE position.

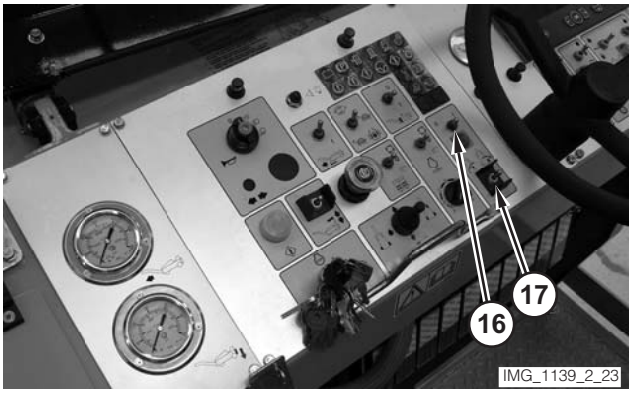

Illustration 221

18. Move column enable switch (16) to the ON position.

19. Move column switch (17) to the OPEN position. Release the switch when the column is completely open.

20. Move column enable switch (16) to the OFF position.

21. Move electrical controls disable switch (15) to the NORMAL position.

22. Go to Step 28.

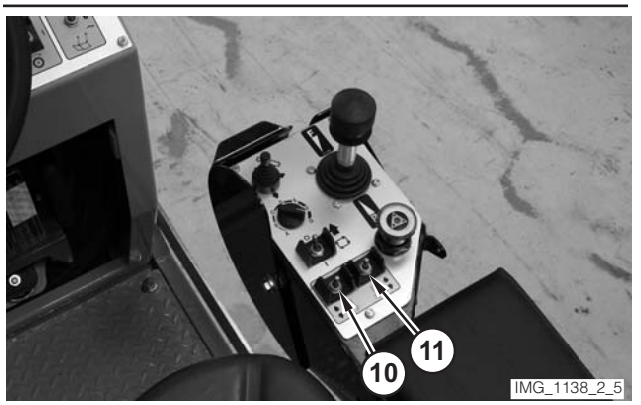

Illustration 222

23. Use left rear leg switch (10) and right rear leg switch (11) to lower the machine rear of the machine. Release the switches when the drum rests on the ground. Release the rear leg switches.

Illustration 223

24. Press “4” switch (12), on the digital display, twice.

25. Press “1” switch (13), on the digital display, once.

26. Move right rear leg switch (11) to the LOWER position.

Illustration 224

27. Watch “Column high position sensor” box (14) on the digital display. When the box changes from red to green, release right rear leg switch (11).

Illustration 225

28. Press “8” button (18), on the digital display, twice.

29. Press “1” button (13) on the digital display.

30. Press “5” button (19) on the digital display.

31. Press “2” button (20) on the digital display.

32. Press “6” button (21) on the digital display.

33. If the machine is equipped with wheels, go to Step 34. If the machine is equipped with tracks, go to Step 35.

Illustration 226

Photo From Wheel Machine.

34. Press “4” button (12) on the digital display. Go to Step 36.

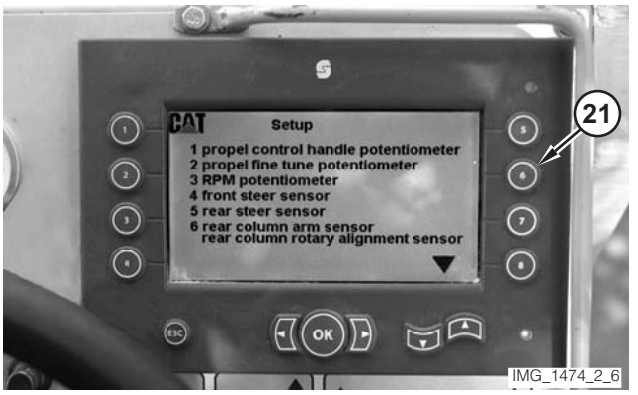

Illustration 227

Photo From Track Machine.

35. Press “6” button (21) on the digital display. Go to Step 36.

Illustration 228

36. Press “IN” button (22) on the digital display. Hold the key for approximately 1 second.

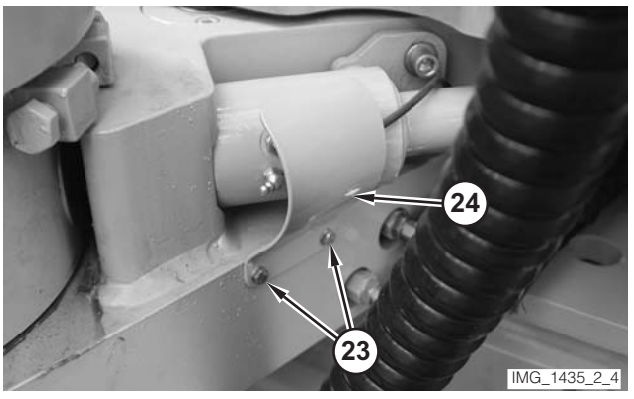

Illustration 229

37. Remove bolts (23). Remove cover (24).

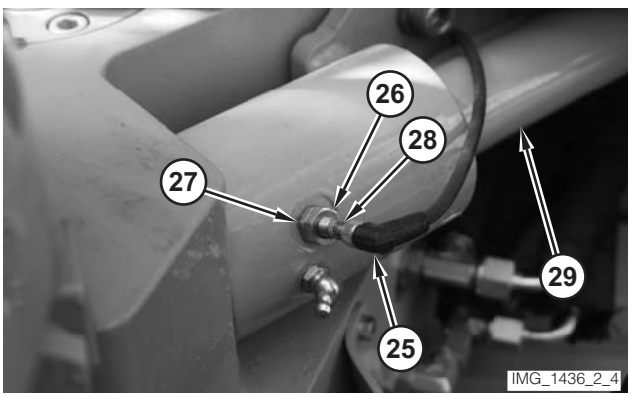

Illustration 230

38. Disconnect connector (25).

39. Loosen jam nut (26) and locknut (27). Rotate sensor (28) clockwise until the sensor touches pin (29).

40. Rotate sensor (28) one-and-one-half turns counterclockwise. Hold the sensor and tighten locknut (27).

41. Tighten jam nut (26). Connect connector (25).

Illustration 231

42. Press “OUT” button (30) on the digital display. Release the button when the leg stops moving.

43. Move right rear leg switch (11) to the RAISE position. Release the switch when the leg is on the ground.

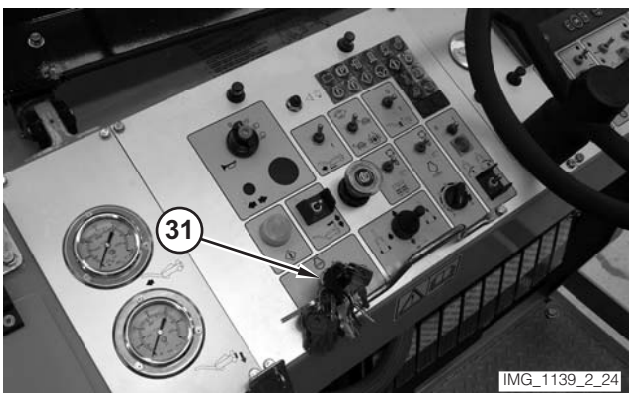

Illustration 232

44. Move key switch (31) to the OFF position.

45. Install cover (24). Install bolts (23). Close right leg compartment (9).

Proximity Switch (Leg Height)—Calibrate

⚠ WARNING

Sudden movement of the machine or release of oil under pressure can cause serious injury to persons on or near the machine.

To prevent injury or death, make sure that the area around the machine is clear of personnel and obstructions before operating the machine.

⚠ WARNING

Injury to personnel can result if they are not in the operator's view. Allow only essential personnel near the machine, and make sure the personnel are in the operator's view when testing, to prevent injury. Make sure checks are done in an open area.

⚠ WARNING

Personal injury can result from rotating and moving parts.

Moving fan blades and moving parts will throw or cut any object or tool that falls or is pushed into them.

Make sure no one is working on, underneath or close to an engine that is running. Make sure the area is free of personnel.

1. Drive the machine to a smooth, horizontal surface.

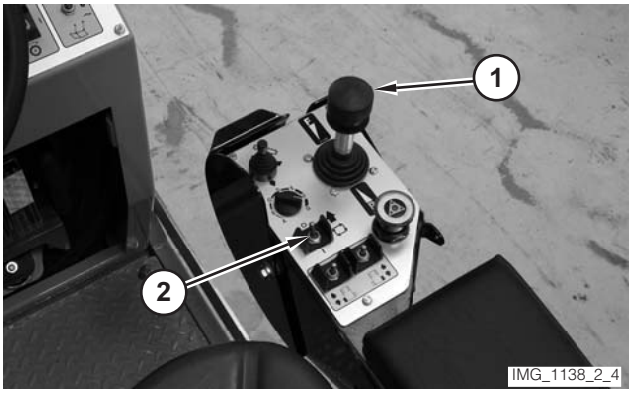

Illustration 233

2. Move propulsion lever (1) to the NEUTRAL position.

3. Move drive selector switch (2) to the OFF position.

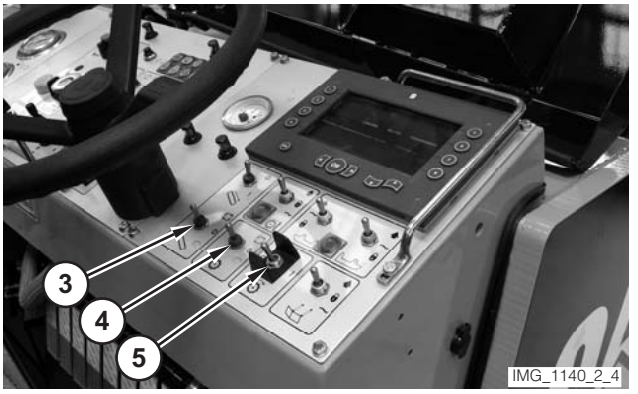

Illustration 234

4. Make sure conveyor switch (3) is in the OFF position.

5. Make sure water spray switch (4) is in the OFF position.

6. Make sure rotor switch (5) is in the OFF position.

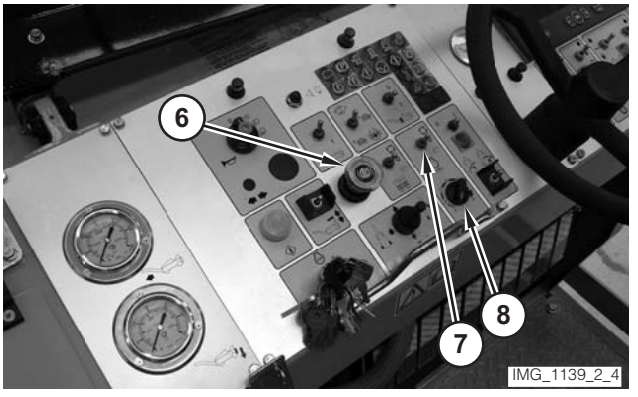

Illustration 235

7. Move parking brake switch (6) to the ON position.

8. If necessary, move engine control switch (7) to the "O" position.

9. Rotate engine speed dial (8) to the LOW-IDLE position.

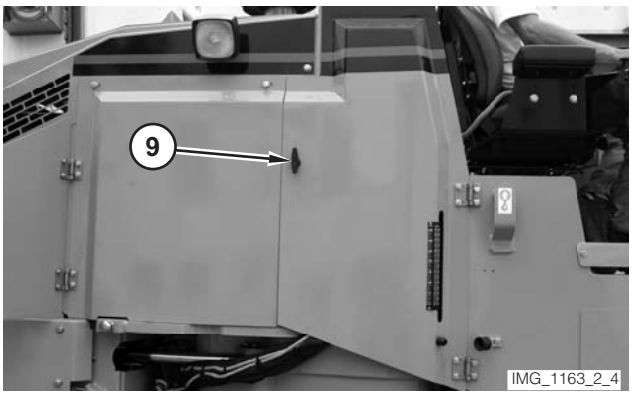

Illustration 236

10. Open right leg compartment (9).

11. If the right rear column is inside the compartment, go to Step 12. If the right rear column is outside the compartment, go to Step 21.

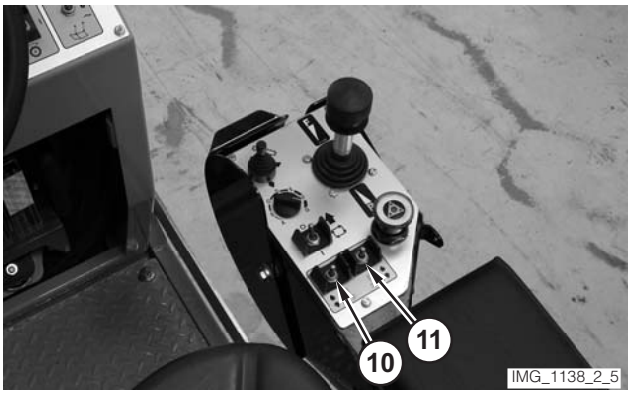

Illustration 237

12. Use left rear leg switch (10) and right rear leg switch (11) to lower the machine rear of the machine. Release the switches when the drum rests on the ground.

13. Move right rear leg switch (11) to the LOWER position. Release the switch when the leg is completely raised.

Illustration 238

14. Move electrical controls disable switch (12) to the DISABLE position.

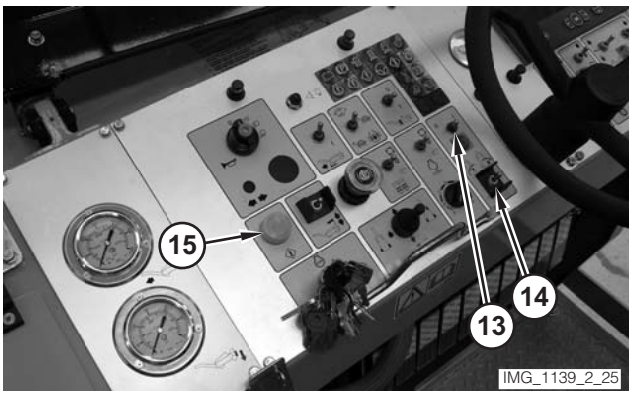

Illustration 239

15. Move column enable switch (13) to the ON position.

16. Move column switch (14) to the OPEN position. Release the switch when the column is completely open.

17. Move column enable switch (13) to the OFF position.

18. Move electrical controls disable switch (12) to the NORMAL position.

19. Depress electrical controls master switch (15).

20. Go to Step 23.

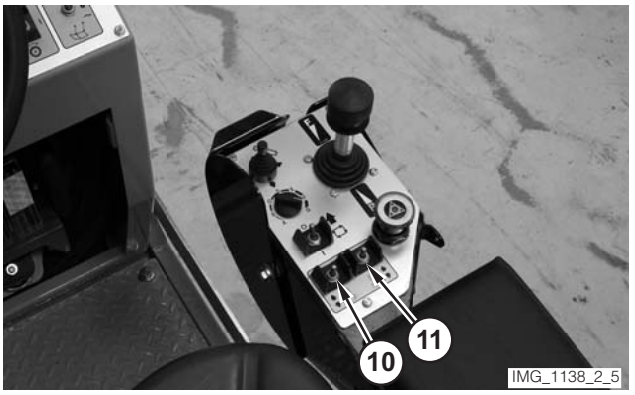

Illustration 240

21. Use left rear leg switch (10) and right rear leg switch (11) to lower the machine rear of the machine. Release the switches when the drum rests on the ground.

22. Move right rear leg switch (11) to the LOWER position. Release the switch when the leg is completely raised.

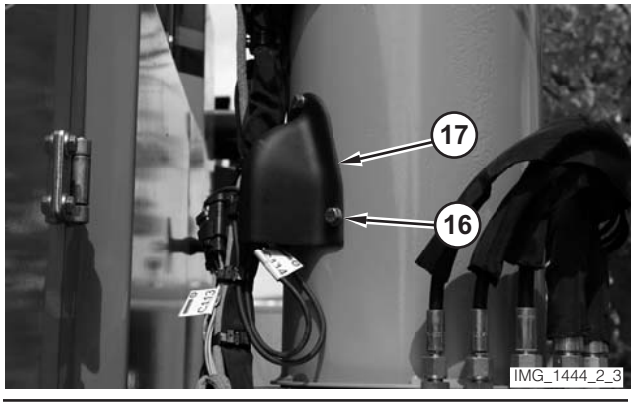

Illustration 241

23. Remove two bolts (16). Remove cover (17).

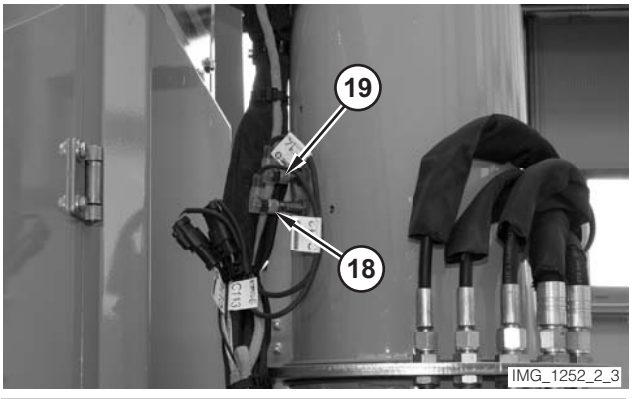

Illustration 242

24. Disconnect connector (18). Disconnect connector (19).

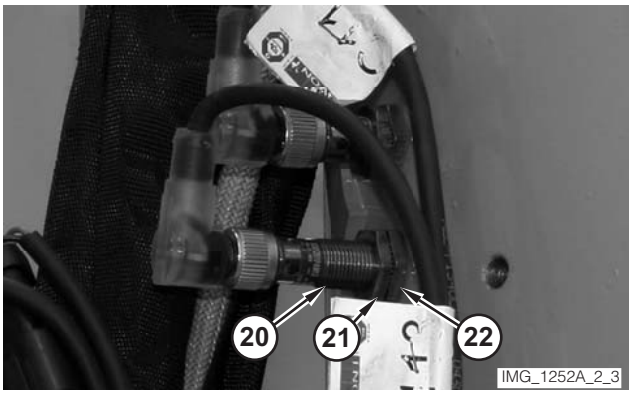

Illustration 243

25. Loosen jam nut (21) and locknut (22). Rotate sensor (20) clockwise until the sensor touches the pin.

26. Rotate sensor (20) one-and-one-half turn counterclockwise. Hold the sensor and tighten locknut (22).

27. Tighten jam nut (21). Connect connector (18). Verify that the light in the sensor illuminates.

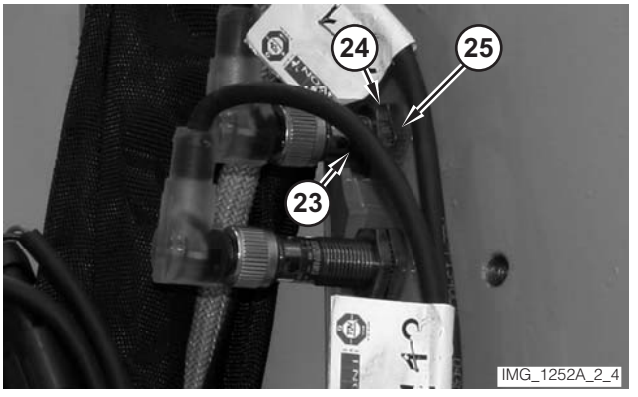

Illustration 244

28. Loosen jam nut (24) and locknut (25). Rotate sensor (23) clockwise until the sensor touches the pin.

29. Rotate sensor (23) one-and-one-half turn counterclockwise. Hold the sensor and tighten locknut (25).

30. Tighten jam nut (24). Connect connector (19). Verify that the light in the sensor illuminates.

31. Move right rear leg switch (11) to the RAISE position. Release the switch when the leg is on the ground.

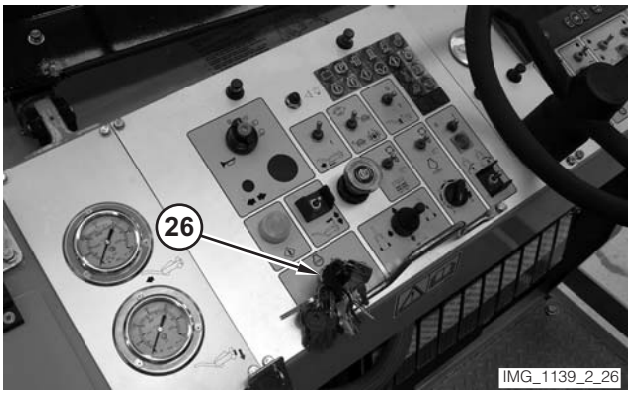

Illustration 245

32. Move key switch (26) to the OFF position.

33. Install cover (17). Install bolts (16). Close right leg compartment (9).

Rear Column Mechanical Stops—Adjust

NOTE: An assistant and an operator are required in order to perform the following test.

⚠ WARNING

Sudden movement of the machine or release of oil under pressure can cause serious injury to persons on or near the machine.

To prevent injury or death, make sure that the area around the machine is clear of personnel and obstructions before operating the machine.

⚠ WARNING

Injury to personnel can result if they are not in the operator's view. Allow only essential personnel near the machine, and make sure the personnel are in the operator's view when testing, to prevent injury. Make sure checks are done in an open area.

⚠ WARNING

Personal injury can result from rotating and moving parts.

Moving fan blades and moving parts will throw or cut any object or tool that falls or is pushed into them.

Make sure no one is working on, underneath or close to an engine that is running. Make sure the area is free of personnel.

1. Drive the machine to a smooth, horizontal surface. Make sure the tracks (or wheels) are in the straight travel position.

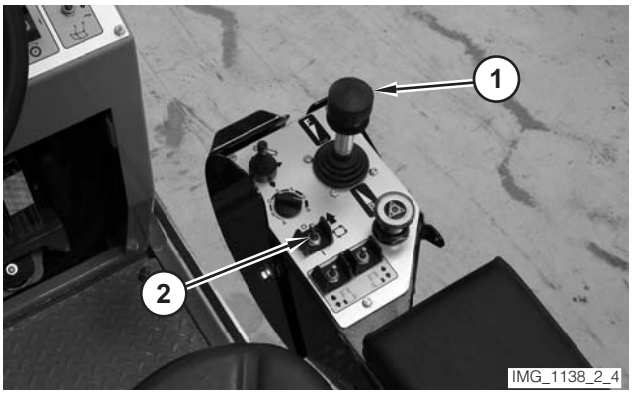

Illustration 246

2. Move propulsion lever (1) to the NEUTRAL position.

3. Move drive selector switch (2) to the OFF position.

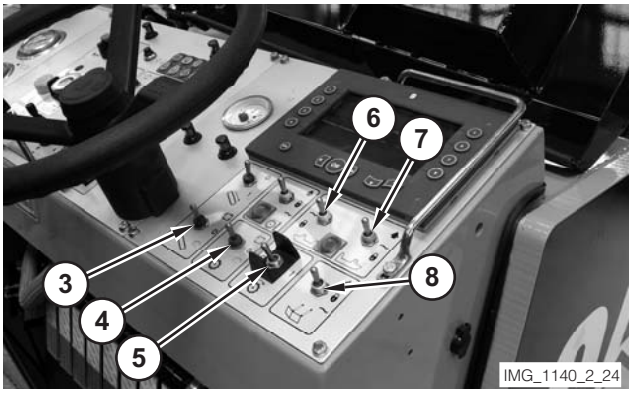

Illustration 247

4. Move conveyor switch (3) to the OFF position.

5. Move water spray switch (4) to the OFF position.

6. Move rotor switch (5) to the OFF position.

7. Briefly move left side plate switch (6) to the LIFT position. Release the left side plate switch. The switch will return to the FLOAT position.

8. Briefly move right side plate switch (7) to the LIFT position. Release the right side plate switch. The switch will return to the FLOAT position.

9. Move antislab switch (8) into the FLOAT position.

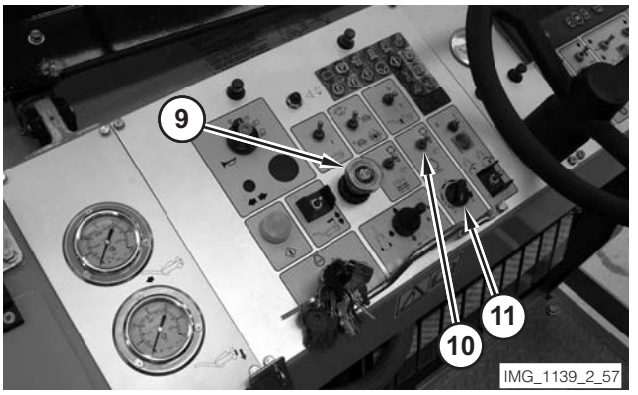

Illustration 248

10. Move parking brake switch (9) to the ON position.

11. Move engine control switch (10) to the OFF (“O”) position.

12. Rotate engine speed dial (11) to the LOW-IDLE position.

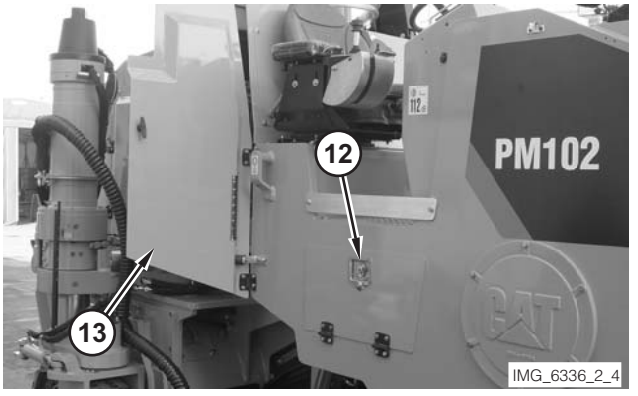

Illustration 249

13. Make sure water pump compartment door (12) is closed.

14. Open right leg compartment door (13).

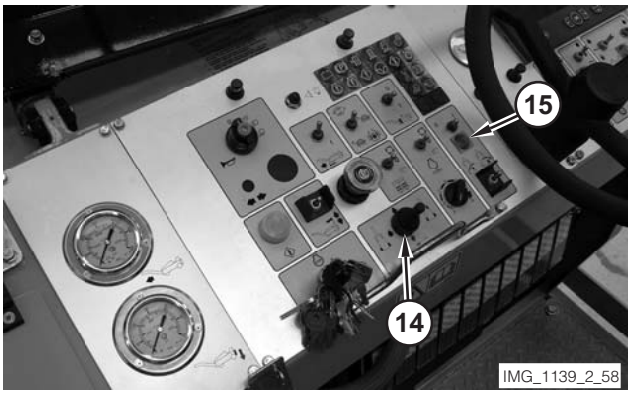

Illustration 250

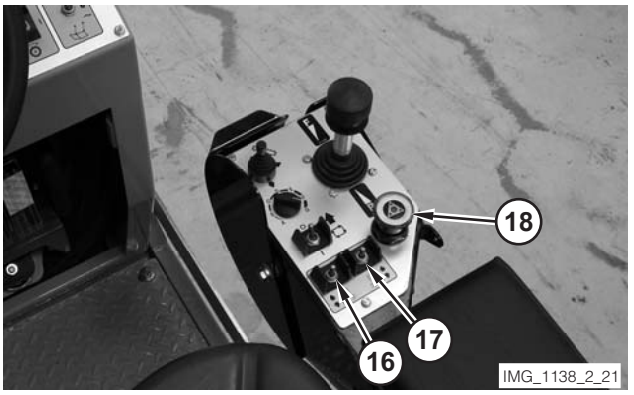

Illustration 251

NOTICE

If the machine is on hard ground, place a sheet of plywood under the drum in order to prevent breakage of the cutting bits.

15. Use all-legs joystick (14), left rear leg switch (16), and right rear leg switch (17) in order to lower the machine. Lower the machine so the machine is level when the drum touches the ground.

16. Use right rear leg switch (17) in order to lift the right rear column. Release the switch when light (15) illuminates.

17. Move electrical controls disable switch (18) to the DISABLE position.

Illustration 252

18. Move column enable switch (19) to the ON position.

Illustration 253

19. Press “8” button (25), on the digital display, twice.

20. Press “1” button (20) on the digital display.

21. Press “5” button (21) on the digital display.

22. Press “2” button (22) on the digital display.

23. Press “6” button (23) on the digital display.

24. Press “OK” button (24) on the digital display.

25. If the machine is equipped with wheels, go to Step 26. If the machine is equipped with tracks, go to Step 27.

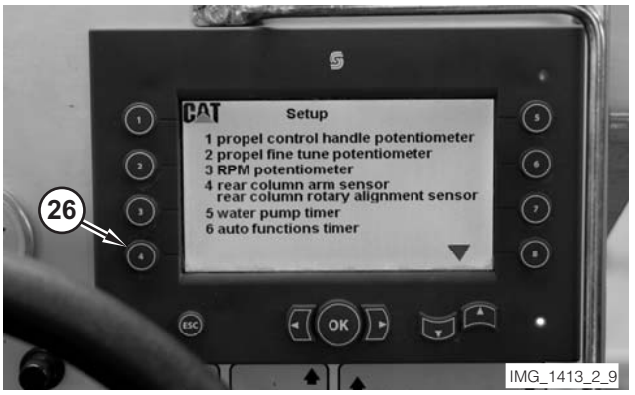

Illustration 254

Photo From Wheel Machine

26. Press “4” button (26) on the digital display. Go to Step 28.

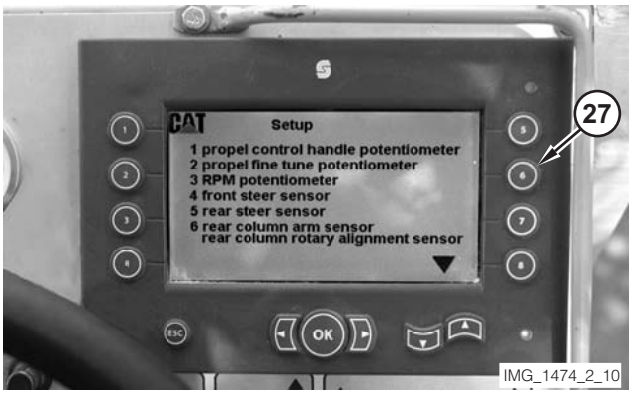

Illustration 255

Photo From Track Machine.

27. Press “6” button (27) on the digital display. Go to Step 28.

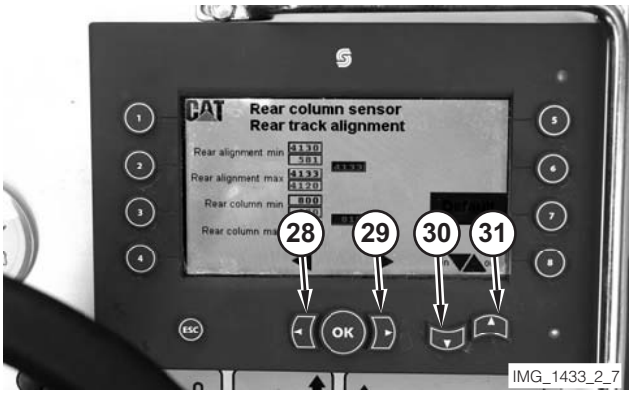

Illustration 256

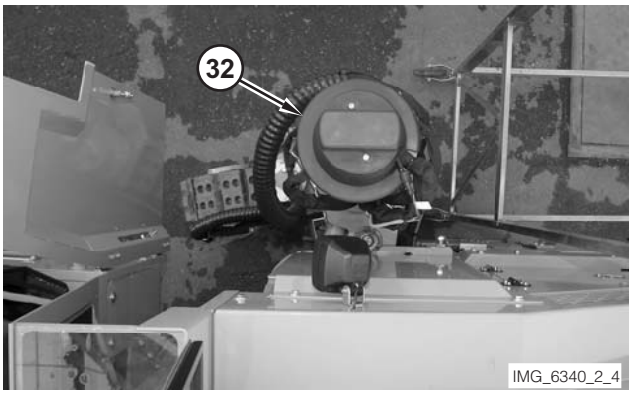

Illustration 257

28. Use button (28), button (29), button (30), and button (31) on the digital display to move column (32) into the position shown in the above illustration, which is about half way retracted. During the movement, have the assistant help the operator ensure that the wheel or track does not contact the machine.

NOTE: To move the column it is necessary to push button (30) first (if the column is out) or button (31) (if the column is in), in order to disengage the horizontal and vertical locking pins.

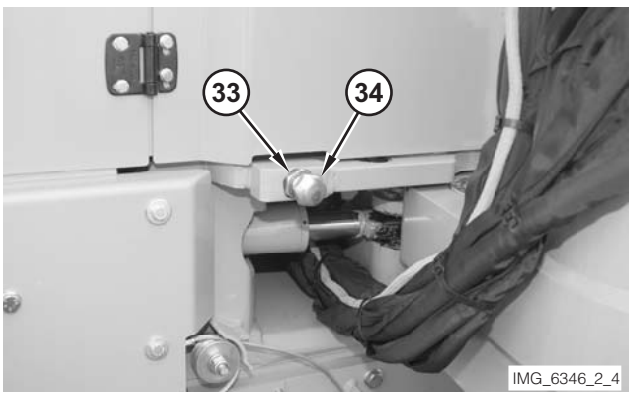

Illustration 258

29. Loosen locknut (33), and turn adjustment bolt (34) all the way in.

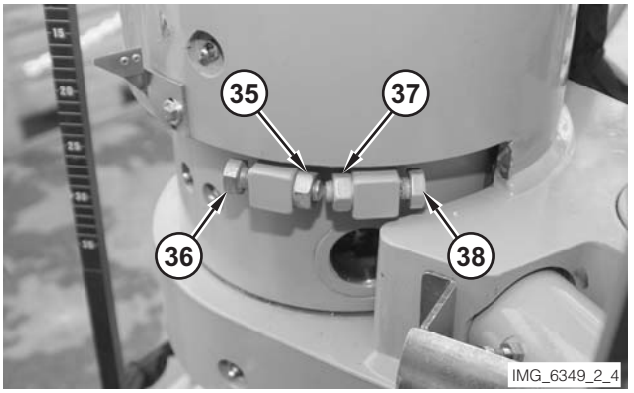

Illustration 259

30. Loosen locknut (35), and turn adjustment bolt (36) all the way in.

31. Loosen locknut (37), and turn adjustment bolt (38) all the way in.

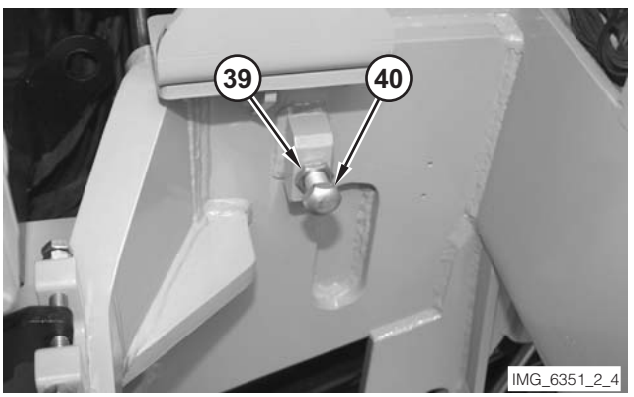

Illustration 260

32. Loosen locknut (39) and turn adjustment bolt (40) all the way in.

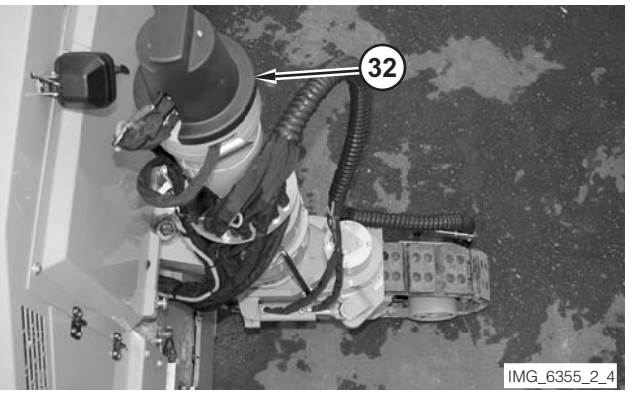

Illustration 261

33. Use button (28), button (29), button (30), and button (31) on the digital display to move column (32) into the position shown in the above illustration. During the movement, have the assistant help the operator ensure that the wheel or track does not contact the machine.

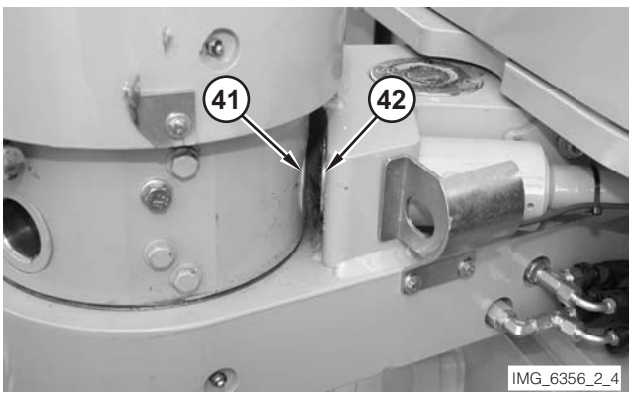

Illustration 262

34. Make sure horizontal pin (42) aligns with hole (41) in the leg column.

35. Move electrical controls disable switch (18) to the NORMAL position.

36. Move column enable switch (19) to the OFF position.

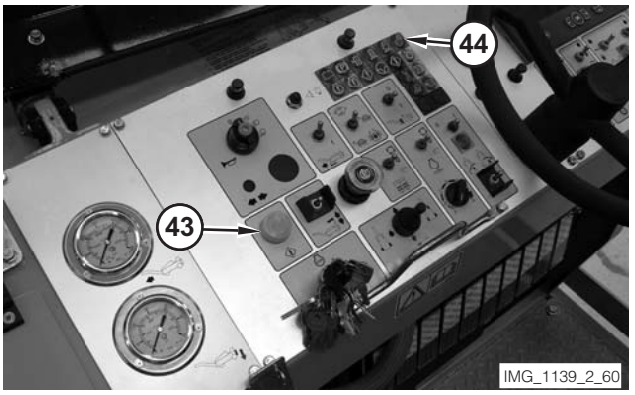

Illustration 263

37. Depress electrical controls master switch (43).

38. Watch column unlock indicator (44). If the horizontal pin is aligned, the indicator will illuminate momentarily. If the indicator remains illuminated, the horizontal pin is not aligned.

39. If horizontal pin (42) is aligned and in hole (41), go to Step 51. If the pin is not aligned, go to Step 40.

40. Move electrical controls disable switch (18) to the DISABLE position.

41. Move column enable switch (19) to the ON position.

42. Press “8” button (25), on the digital display, twice.

43. Press “1” button (20) on the digital display.

44. Press “5” button (21) on the digital display.

45. Press “2” button (22) on the digital display.

46. Press “6” button (23) on the digital display.

47. Press “OK” button (24) on the digital display.

48. If the machine is equipped with wheels, go to Step 49. If the machine is equipped with tracks, go to Step 50.

49. Press “4” button (26) on the digital display. Go to Step 33.

50. Press “6” button (27) on the digital display. Go to Step 33.

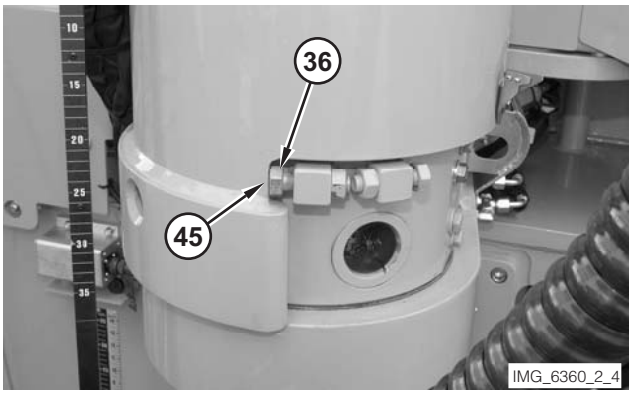

Illustration 264

51. Adjust bolt (36) so that the bolt touches relief (45).

52. Move electrical controls disable switch (18) to the DISABLE position.

53. Move column enable switch (19) to the ON position.

54. Press “8” button (25), on the digital display, twice.

55. Press “1” button (20) on the digital display.

56. Press “5” button (21) on the digital display.

57. Press “2” button (22) on the digital display.

58. Press “6” button (23) on the digital display.

59. Press “OK” button (24) on the digital display.

60. If the machine is equipped with wheels, go to Step 61. If the machine is equipped with tracks, go to Step 62.

61. Press “4” button (26) on the digital display. Go to Step 63.

62. Press “6” button (27) on the digital display. Go to Step 63.

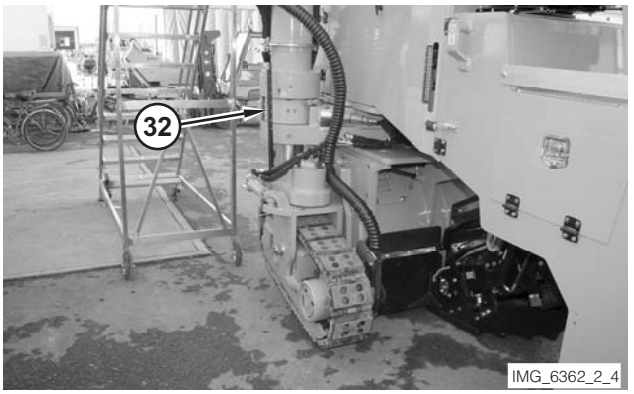

Illustration 265

63. Use button (28), button (29), button (30), and button (31) on the digital display in order to move column (32) into the position shown in the above illustration. During the movement, have the assistant help the operator ensure that the wheel or track does not contact the machine.

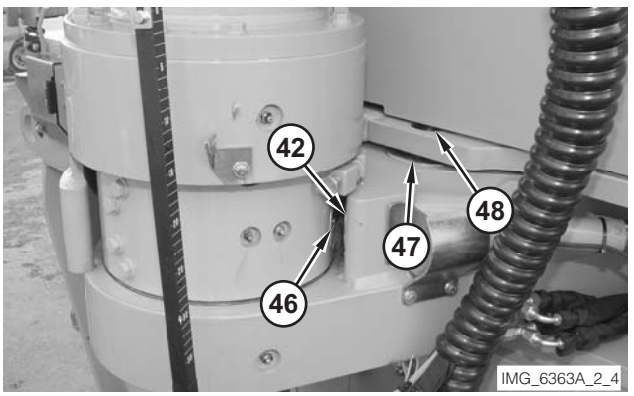

Illustration 266

64. Make sure horizontal pin (42) aligns with the hole in column (46). Make sure the vertical pin (47) aligns with hole (48) in the frame.

65. Move electrical controls disable switch (18) to the NORMAL position.

66. Move column enable switch (19) to the OFF position.

67. Depress electrical controls master switch (43).

68. If horizontal pin (42) is aligned and in hole (46) and if vertical pin (47) is aligned and in hole (48), go to Step 80. If either pin is not aligned, go to Step 69

69. Move electrical controls disable switch (18) to the DISABLE position.

70. Move column enable switch (19) to the ON position.

71. Press “8” button (25), on the digital display, twice.

72. Press “1” button (20) on the digital display.

73. Press “5” button (21) on the digital display.

74. Press “2” button (22) on the digital display.

75. Press “6” button (23) on the digital display.

76. Press “OK” button (24) on the digital display.

77. If the machine is equipped with wheels, go to Step 78. If the machine is equipped with tracks, go to Step 79.

78. Press “4” button (26) on the digital display. Go to Step 63.

79. Press “6” button (27) on the digital display. Go to Step 63.

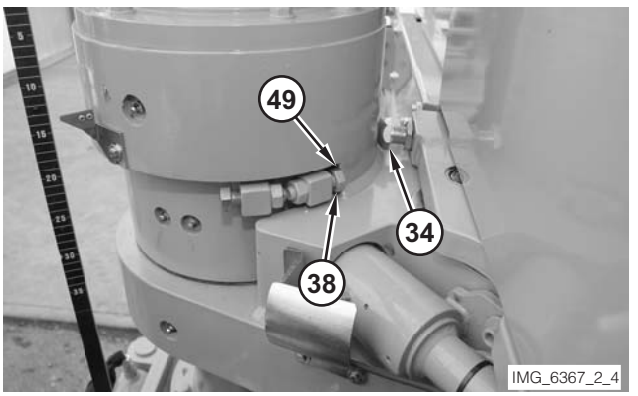

Illustration 267

80. Adjust bolt (38) so that the bolt touches relief (49).

81. Adjust bolt (34) so that the bolt touches the leg column.

82. Move electrical controls disable switch (18) to the DISABLE position.

83. Move column enable switch (19) to the ON position.

84. Press “8” button (25), on the digital display, twice.

85. Press “1” button (20) on the digital display.

86. Press “5” button (21) on the digital display.

87. Press “2” button (22) on the digital display.

88. Press “6” button (23) on the digital display.

89. Press “OK” button (24) on the digital display.

90. If the machine is equipped with wheels, go to Step 91. If the machine is equipped with tracks, go to Step 92.

91. Press “4” button (26) on the digital display. Go to Step 93.

92. Press “6” button (27) on the digital display. Go to Step 93.

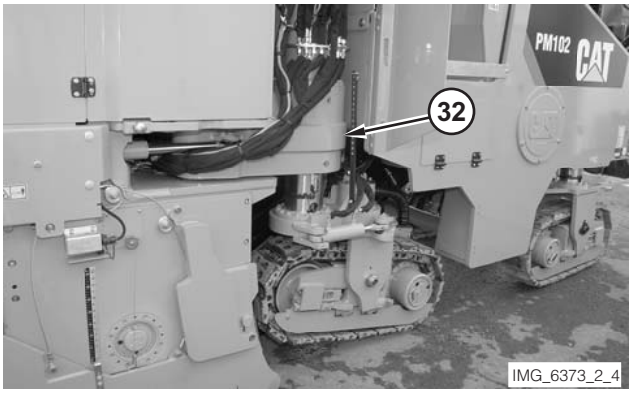

Illustration 268

93. Use button (28), button (29), button (30), and button (31) on the digital display in order to move column (32) into the position shown in the above illustration. During the movement, have the assistant help the operator ensure that the wheel or track does not contact the machine.

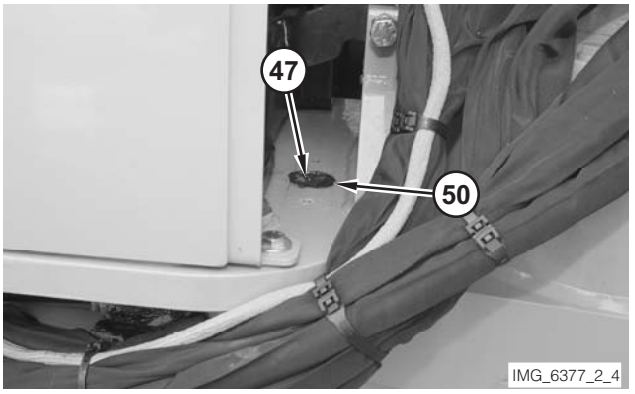

Illustration 269

94. Make sure vertical pin (47) aligns with hole (50) in the machine frame.

NOTE: A cover plate is removed in the above illustration.

95. Move electrical controls disable switch (18) to the NORMAL position.

96. Move column enable switch (19) to the OFF position.

97. Depress electrical controls master switch (43).

98. If vertical pin (47) is aligned and in hole (50), go to Step 110. If vertical pin is not aligned, go to Step 99.

99. Move electrical controls disable switch (18) to the DISABLE position.

100. Move column enable switch (19) to the ON position.

101. Press “8” button (25), on the digital display, twice.

102. Press “1” button (20) on the digital display.

103. Press “5” button (21) on the digital display.

104. Press “2” button (22) on the digital display.

105. Press “6” button (23) on the digital display.

106. Press “OK” button (24) on the digital display.

107. If the machine is equipped with wheels, go to Step 108. If the machine is equipped with tracks, go to Step 109.

108. Press “4” button (26) on the digital display. Go to Step 93.

109. Press “6” button (27) on the digital display. Go to Step 93.

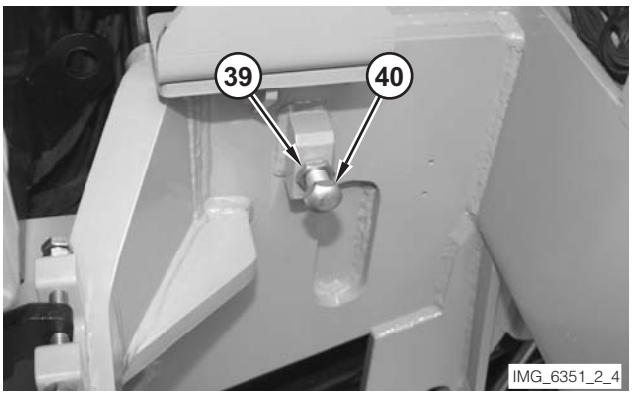

Illustration 270

110. Adjust bolt (40) so that the bolt touches column. Tighten locknut (39).

111. Move right rear leg switch (17) to the RAISE position. Release the switch when the leg is on the ground.

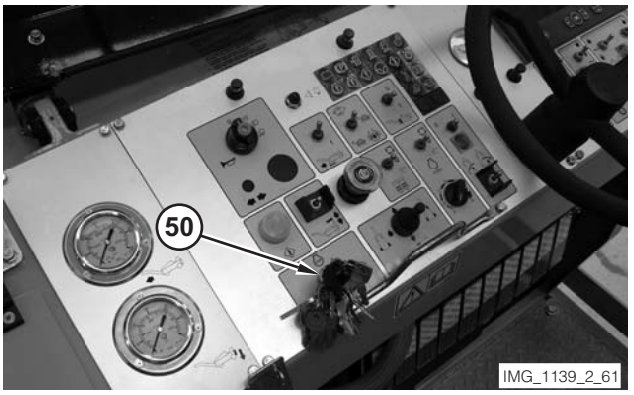

Illustration 271

112. Move key switch (50) to the OFF position.

113. Calibrate the rear column sensors. Refer to "Rear Column Sensors—Calibrate".

Rear Column Sensors—Calibrate

NOTE: An assistant and an operator are required in order to perform the following test.

⚠ WARNING

Sudden movement of the machine or release of oil under pressure can cause serious injury to persons on or near the machine.

To prevent injury or death, make sure that the area around the machine is clear of personnel and obstructions before operating the machine.

⚠ WARNING

Injury to personnel can result if they are not in the operator's view. Allow only essential personnel near the machine, and make sure the personnel are in the operator's view when testing, to prevent injury. Make sure checks are done in an open area.

⚠ WARNING

Personal injury can result from rotating and moving parts.

Moving fan blades and moving parts will throw or cut any object or tool that falls or is pushed into them.

Make sure no one is working on, underneath or close to an engine that is running. Make sure the area is free of personnel.

1. Drive the machine to a smooth, horizontal surface. Make sure the tracks (or wheels) are in the straight travel position.

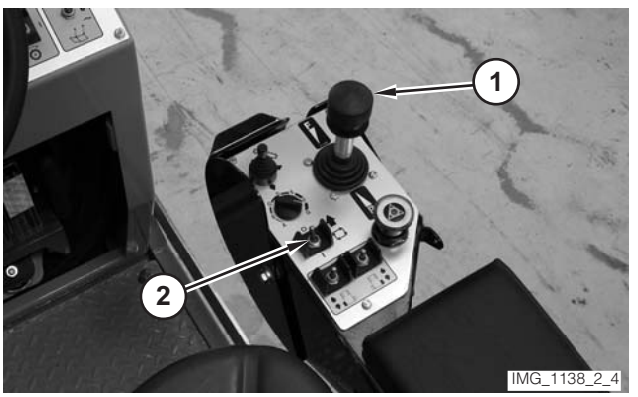

Illustration 272

2. Move propulsion lever (1) to the NEUTRAL position.

3. Move drive selector switch (2) to the OFF position.

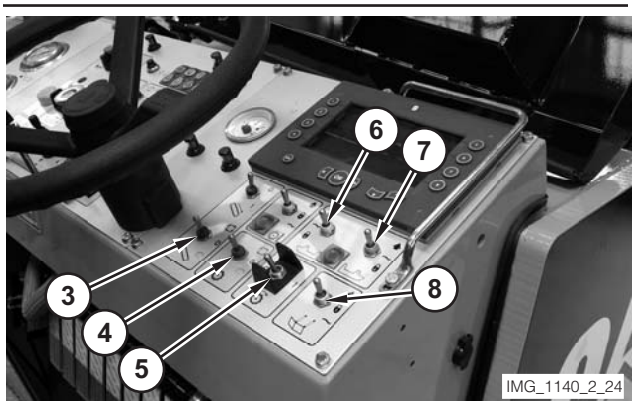

Illustration 273

4. Move conveyor switch (3) to the OFF position.

5. Move water spray switch (4) to the OFF position.

6. Move rotor switch (5) to the OFF position.

7. Briefly move left side plate switch (6) to the LIFT position. Release the left side plate switch. The switch will return to the FLOAT position.

8. Briefly move right side plate switch (7) to the LIFT position. Release the right side plate switch. The switch will return to the FLOAT position.

9. Move antislab switch (8) into the FLOAT position.

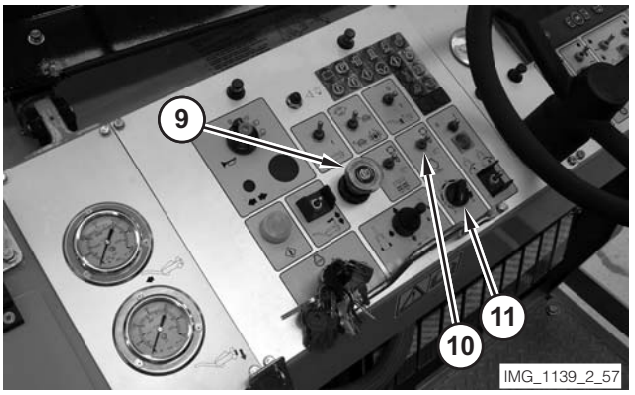

Illustration 274

10. Move parking brake switch (9) to the ON position.

11. Move engine control switch (10) to the OFF (“O”) position.

12. Rotate engine speed dial (11) to the LOW-IDLE position.

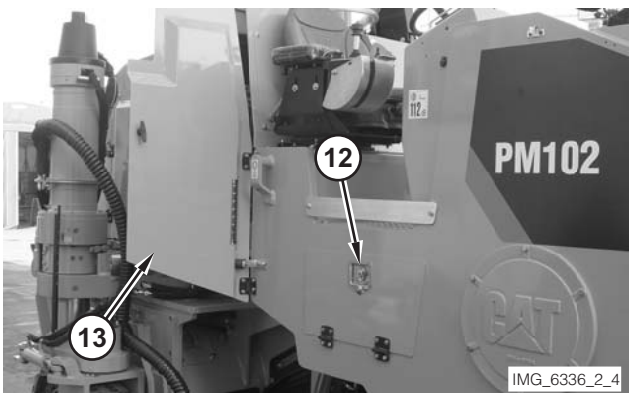

Illustration 275

13. Make sure water pump compartment door (12) is closed.

14. Open right leg compartment door (13).

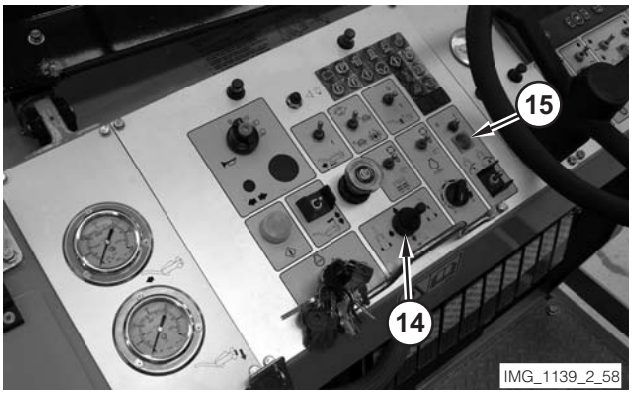

Illustration 276

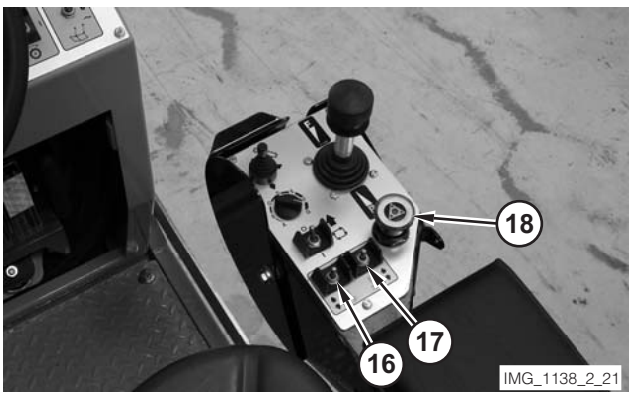

Illustration 277

NOTICE

If the machine is on hard ground, place a sheet of plywood under the drum in order to prevent breakage of the cutting bits.

15. Use all-legs joystick (14), left rear leg switch (16), and right rear leg switch (17) in order to lower the machine. Lower the machine so the machine is level when the drum touches the ground.

16. Use right rear leg switch (17) in order to lift the right rear column. Release the switch when light (15) illuminates.

17. Move electrical controls disable switch (18) to the DISABLE position.

Illustration 278

18. Move column enable switch (19) to the ON position.

Illustration 279

19. Press “8” button (25), on the digital display, twice.

20. Press “1” button (20) on the digital display.

21. Press “5” button (21) on the digital display.

22. Press “2” button (22) on the digital display.

23. Press “6” button (23) on the digital display.

24. Press “OK” button (24) on the digital display.

25. If the machine is equipped with wheels, go to Step 26. If the machine is equipped with tracks, go to Step 27.

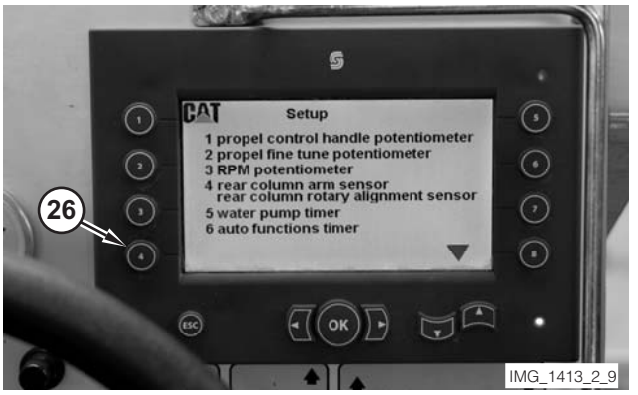

Illustration 280

Photo From Wheel Machine

26. Press “4” button (26) on the digital display. Go to Step 28.

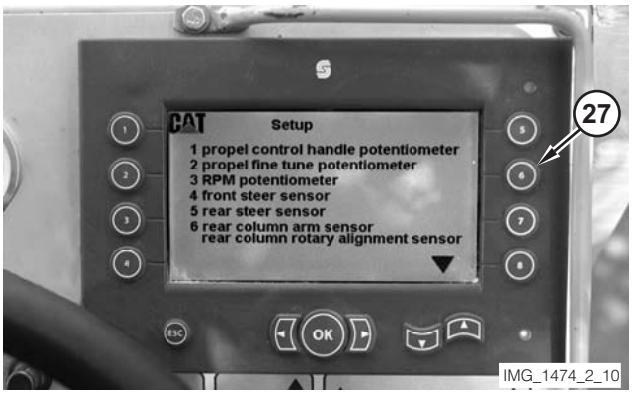

Illustration 281

Photo From Track Machine.

27. Press “6” button (27) on the digital display. Go to Step 28.

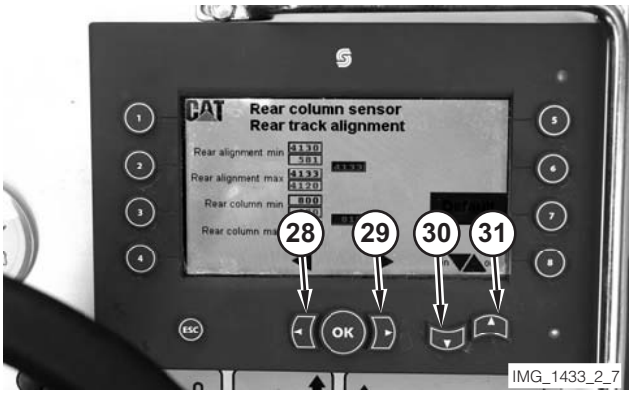

Illustration 282

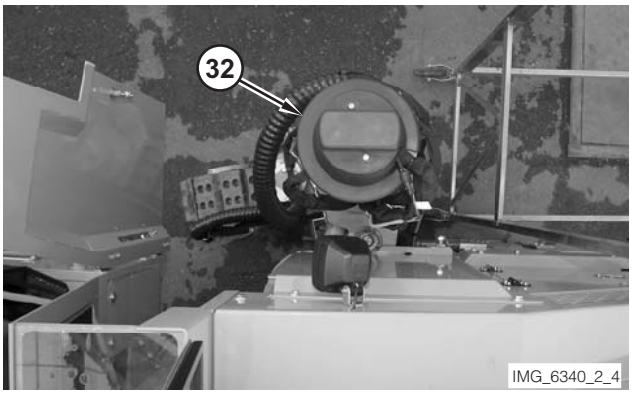

Illustration 283

28. Use button (28), button (29), button (30), and button (31) on the digital display to move column (32) into the position shown in the above illustration, which is about half way retracted. During the movement, have the assistant help the operator ensure that the wheel or track does not contact the machine.

NOTE: To move the column it is necessary to push button (30) first (if the column is out) or button (31) (if the column is in), in order to disengage the horizontal and vertical locking pins.

Illustration 284

29. Press “7” button (33) in order to reset the default values for the rotary actuator sensor and the default values for the column position sensor.

NOTE: Each sensor parameter has a set of two values—the top value is the minimum or maximum value detected, and the bottom value is the currently saved value. When the default values are reset, the currently saved value is changed to the default value.

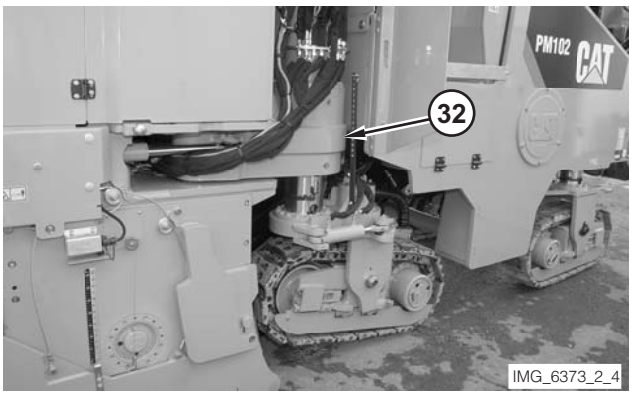

Illustration 285

30. Use button (28), button (29), button (30), and button (31) on the digital display to move column (32) into the inside position, as shown in the above illustration. During the movement, have the assistant help the operator ensure that the wheel or track does not contact the machine.

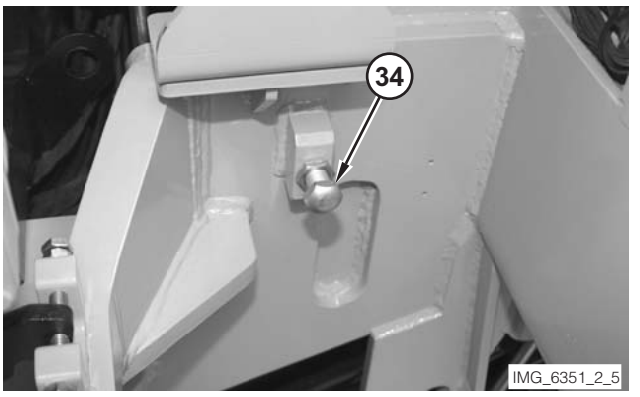

Illustration 286

31. Make sure column contacts mechanical stop (34) on the machine frame.

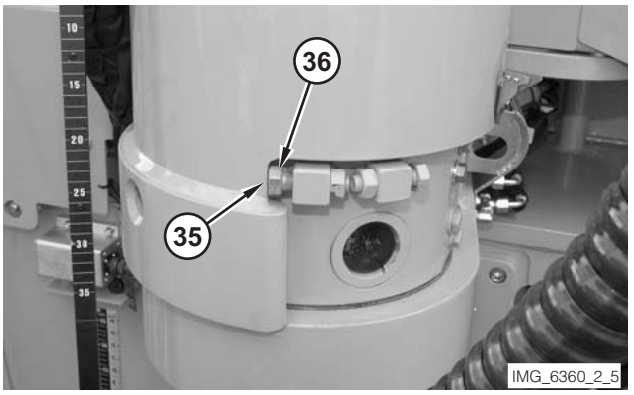

Illustration 287

NOTE: Photo shows rotary actuator in outboard position for clarity

32. Make sure the rotary actuator (35) contacts mechanical stop (36) for the inside position.

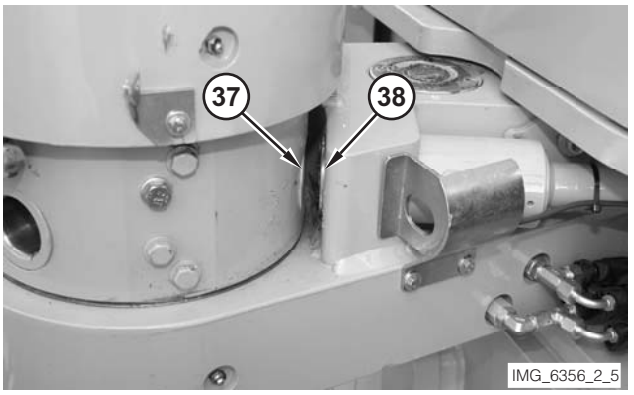

Illustration 288

NOTE: Photo shows rotary actuator in outboard position for clarity

33. Make sure horizontal pin (38) aligns with hole (37) in the leg column.

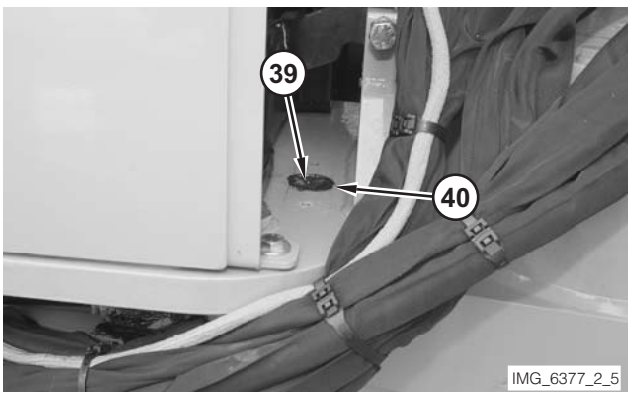

Illustration 289

34. Remove cover plate over hole (40) in the machine frame.

35. Make sure vertical pin (39) aligns with hole (40) in the machine frame.

36. Move electrical controls disable switch (18) to the NORMAL position.

37. Move column enable switch (19) to the OFF position.

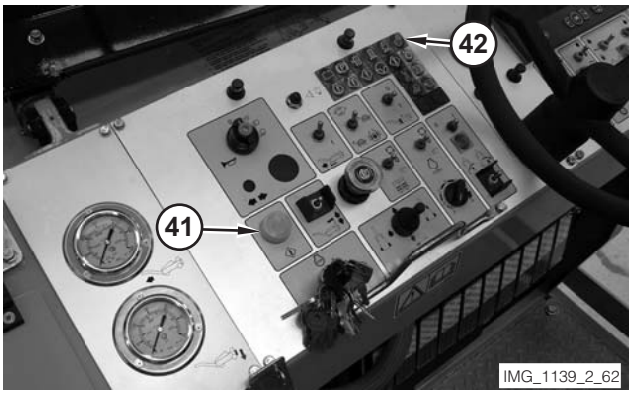

Illustration 290

38. Depress electrical controls master switch (41).

39. Watch column unlock indicator (42). If the horizontal pin is aligned, the indicator will illuminate momentarily.

NOTE: If column unlock indicator (42) remains illuminated, the horizontal pin is not aligned, and the mechanical stops must be adjusted. Refer to “Rear Column Mechanical Stops—Adjust” in this publication.

40. Move electrical controls disable switch (18) to the DISABLE position.

41. Move column enable switch (19) to the ON position.

42. Press “6” button (27) on the digital display. Go to Step 43.

Illustration 291

43. Use button (28), button (29), button (30), and button (31) on the digital display in order to move column (32) into the position shown in the above illustration, which is fully retracted. During the movement, have the assistant help the operator ensure that the wheel or track does not contact the machine.

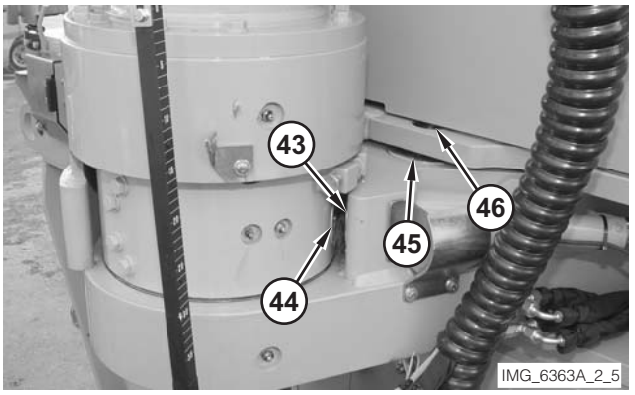

Illustration 292

44. Make sure horizontal pin (43) aligns with the hole in column (44). Make sure the vertical pin (45) aligns with hole (46) in the frame.

45. Move electrical controls disable switch (18) to the NORMAL position.

46. Move column enable switch (19) to the OFF position.

47. Depress electrical controls master switch (41).

48. Watch column unlock indicator (42). If the horizontal pin is aligned, the indicator will illuminate momentarily.

NOTE: If column unlock indicator (42) remains illuminated, the horizontal pin is not aligned, and the mechanical stops must be adjusted. Refer to “Rear Column Mechanical Stops—Adjust” in this publication.

49. Move electrical controls disable switch (18) to the DISABLE position.

50. Move column enable switch (19) to the ON position.

51. Press “OK” button (24) in order to save the calibrated minimum and maximum values. At this point, the value in the top field of each parameter is copied into the bottom field, and the newly calibrated values are saved in the software.

52. Move electrical controls disable switch (18) to the NORMAL position.

53. Move column enable switch (19) to the OFF position.

54. Depress electrical controls master switch (41).

55. Move right rear leg switch (17) to the RAISE position. Release the switch when the leg is on the ground.

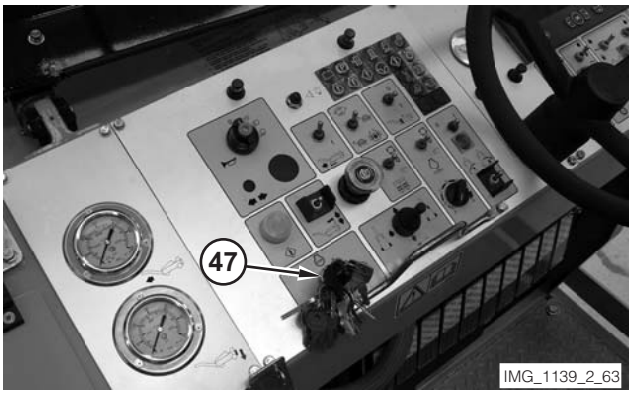

Illustration 293

56. Move key switch (43) to the OFF position.

Front Steering Sensor (Track Machine)—Calibrate

⚠ WARNING

Sudden movement of the machine or release of oil under pressure can cause serious injury to persons on or near the machine.

To prevent injury or death, make sure that the area around the machine is clear of personnel and obstructions before operating the machine.

⚠ WARNING

Injury to personnel can result if they are not in the operator’s view. Allow only essential personnel near the machine, and make sure the personnel are in the operator’s view when testing, to prevent injury. Make sure checks are done in an open area.

⚠ WARNING

Personal injury can result from rotating and moving parts.

Moving fan blades and moving parts will throw or cut any object or tool that falls or is pushed into them.

Make sure no one is working on, underneath or close to an engine that is running. Make sure the area is free of personnel.

1. Drive the machine to a smooth, horizontal surface.

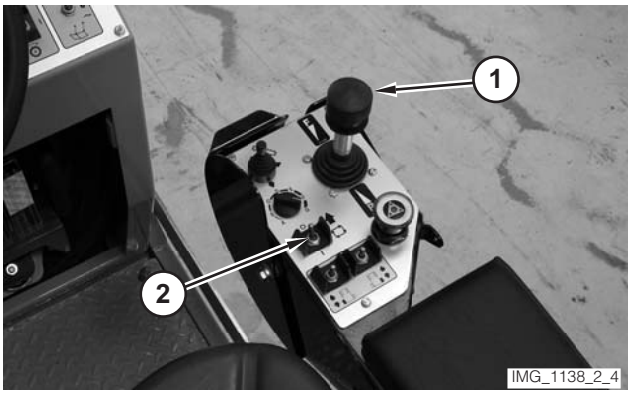

Illustration 294

2. Move propulsion lever (1) to the NEUTRAL position.

3. Move drive selector switch (2) to the OFF position.

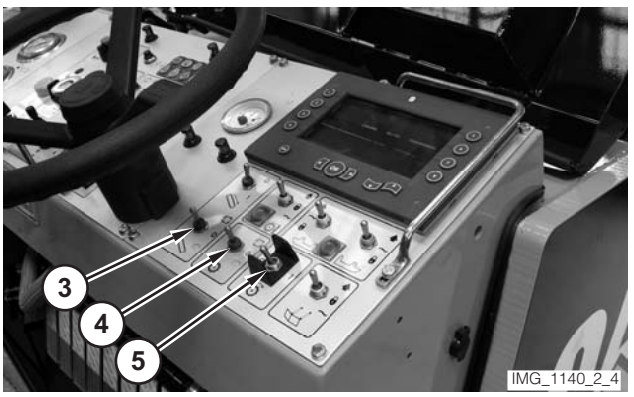

Illustration 295

4. Make sure conveyor switch (3) is in the OFF position.

5. Make sure water spray switch (4) is in the OFF position.

6. Make sure rotor switch (5) is in the OFF position.

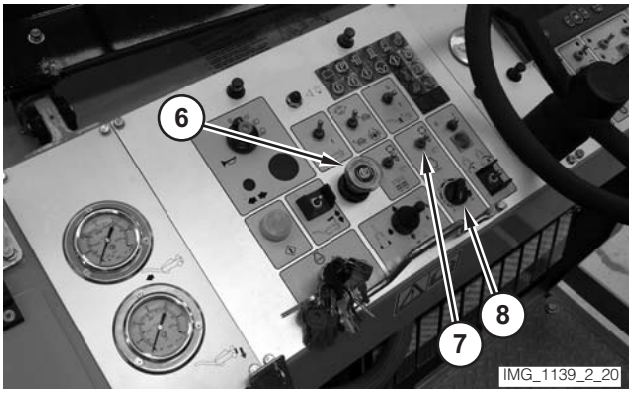

Illustration 296

7. Move parking brake switch (6) to the ON position.

8. If necessary, move engine control switch (7) to the “O” position.

9. Rotate engine speed dial (8) to the LOW-IDLE position.

Illustration 297

10. Push “8” button (9), on the digital display, twice.

Illustration 298

11. Press “1” button (10) on the digital display.

12. Press “5” button (11) on the digital display.

13. Press “2” button (12) on the digital display.

14. Press “6” button (13) on the digital display.

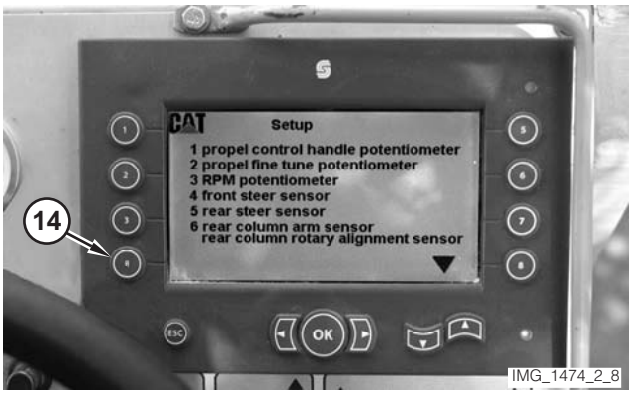

Illustration 299

15. Press “4” button (14) on the digital display.

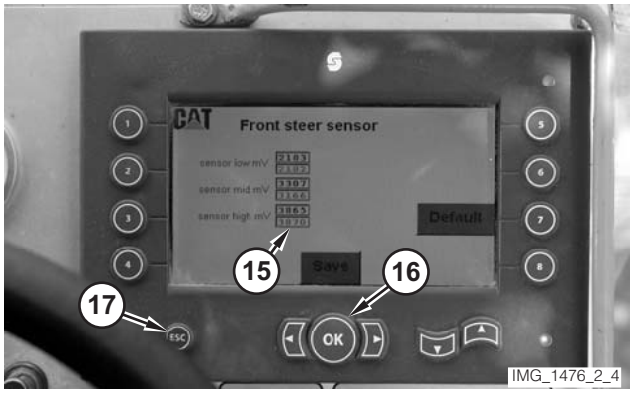

Illustration 300

16. Monitor the values in “mV” column (15) during the following steps. The values should change smoothly. If the values do not change smoothly, the sensor should be checked with a multimeter.

17. Rotate the steering wheel to the FULL RIGHT position. Rotate the steering wheel to the FULL LEFT position.

18. Press “OK” button (16) to save the values or press “ESC” button (17) to go back one screen without saving the currently displayed values.

19. Once the value has been saved, press “ESC” button (17) to return to the “Setup” screen.

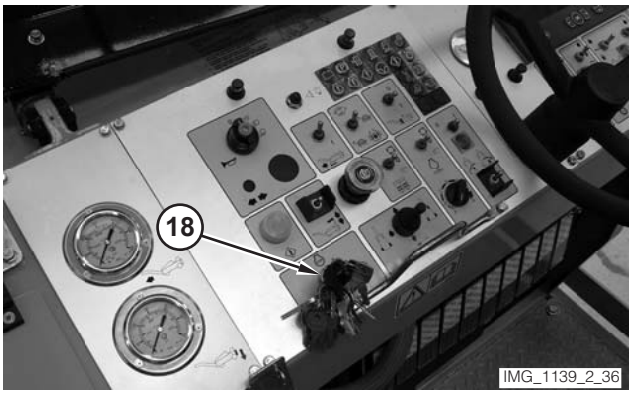

Illustration 301

20. Move key switch (18) to the OFF position.

Rear Steering Sensor (Track Machine)—Calibrate

WARNING

Sudden movement of the machine or release of oil under pressure can cause serious injury to persons on or near the machine.

To prevent injury or death, make sure that the area around the machine is clear of personnel and obstructions before operating the machine.

WARNING

Injury to personnel can result if they are not in the operator’s view. Allow only essential personnel near the machine, and make sure the personnel are in the operator’s view when testing, to prevent injury. Make sure checks are done in an open area.

WARNING

Personal injury can result from rotating and moving parts.

Moving fan blades and moving parts will throw or cut any object or tool that falls or is pushed into them.

Make sure no one is working on, underneath or close to an engine that is running. Make sure the area is free of personnel.

Table 22

Required Tools			
Tool	**Part Number**	**Description**	**Qty**
A(1)	N/A	Straight Edge 5 m (15 ft) Minimum	1
B(1)	N/A	Clamp	2

(1) Obtain locally.

1. Drive the machine to a smooth, horizontal surface.

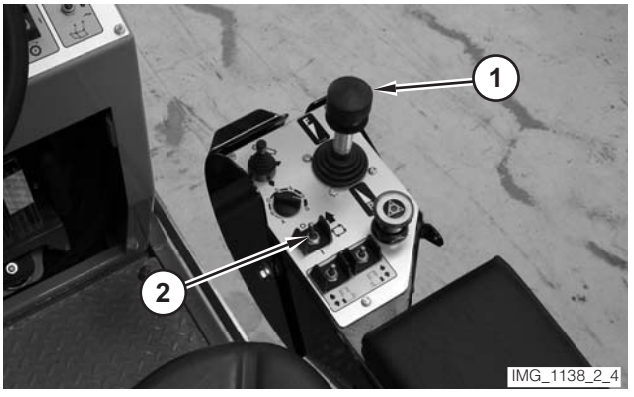

Illustration 302

2. Move propulsion lever (1) to the NEUTRAL position.

3. Move drive selector switch (2) to the OFF position.

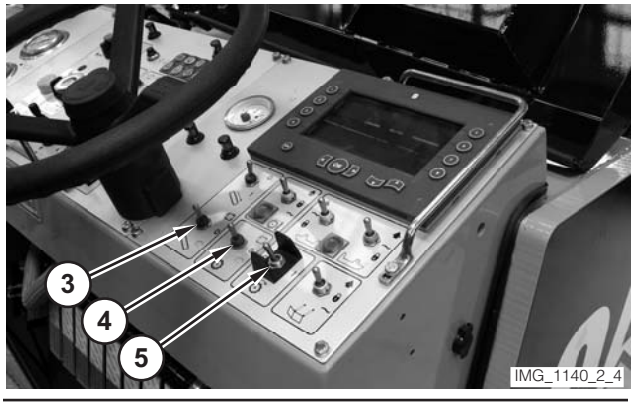

Illustration 303

4. Make sure conveyor switch (3) is in the OFF position.

5. Make sure water spray switch (4) is in the OFF position.

6. Make sure rotor switch (5) is in the OFF position.

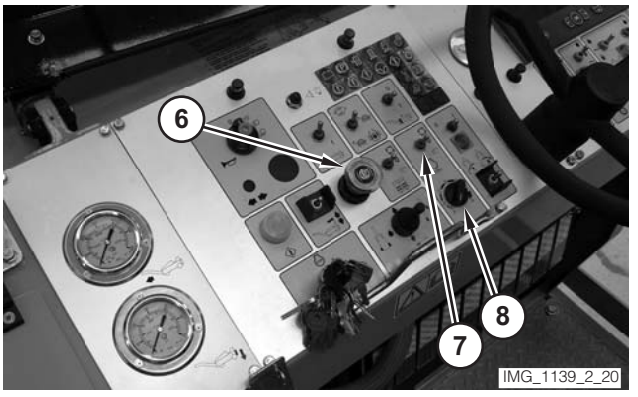

Illustration 304

7. Move parking brake switch (6) to the ON position.

8. If necessary, move engine control switch (7) to the “O” position.

9. Rotate engine speed dial (8) to the LOW-IDLE position.

Illustration 305

10. Push “8” button (9), on the digital display, twice.

Illustration 306

11. Press “1” button (10) on the digital display.

12. Press “5” button (11) on the digital display.

13. Press “2” button (12) on the digital display.

14. Press “6” button (13) on the digital display.

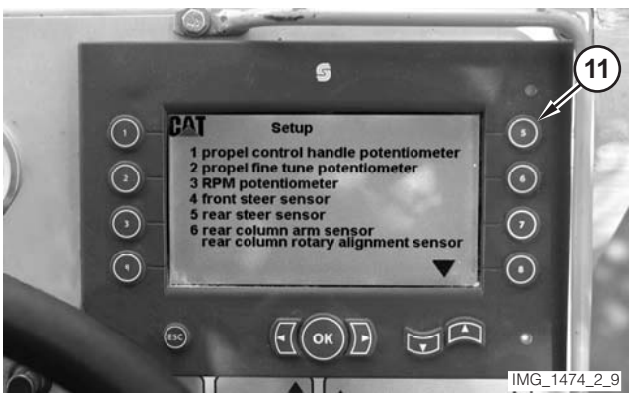

Illustration 307

15. Press “5” button (11) on the digital display.

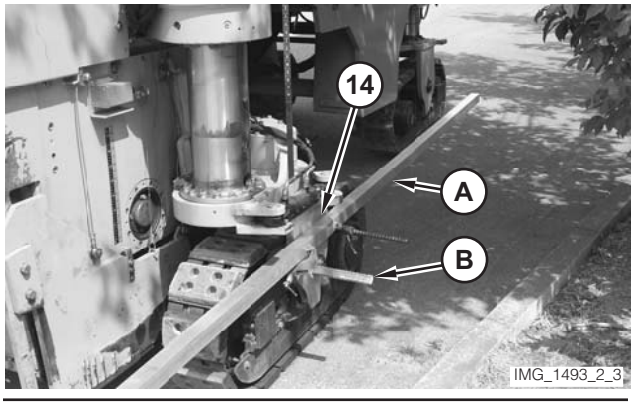

Illustration 308

16. Use Tool B to attach Tool A to track frame (14).

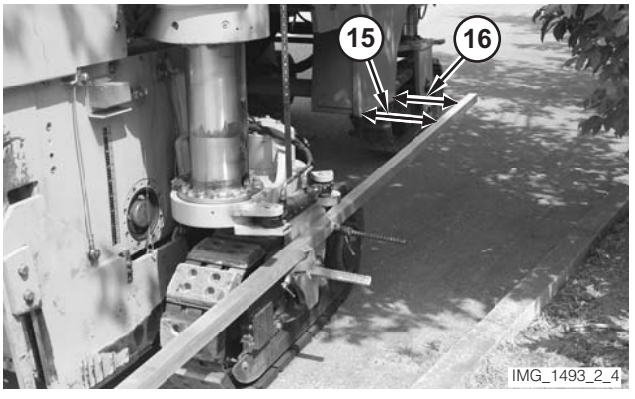

Illustration 309

17. Measure the distance from Tool A to the machine frame at location (15). Measure the distance from the Tool A to the machine frame at location (16).

18. If the distance measured at location (15) is the same as the distance measured at location (16), go to Step 22. If the distance is not equal, go to Step 19.

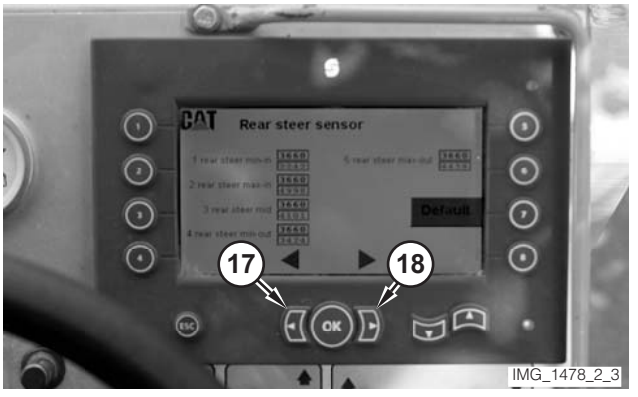

Illustration 310

19. Use button (17) and button (18) in order to move the track into the straight position. Go to Step 17.

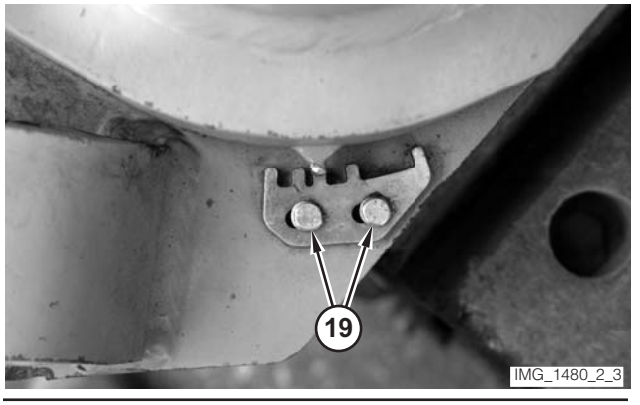

Illustration 311

20. Loosen two bolts (19).

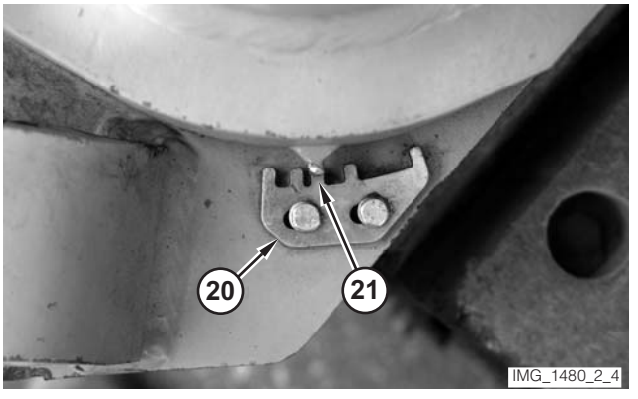

Illustration 312

21. Move scale (20) to center tab (21). Hold the scale and tighten bolts (19).

22. Remove Tool A.

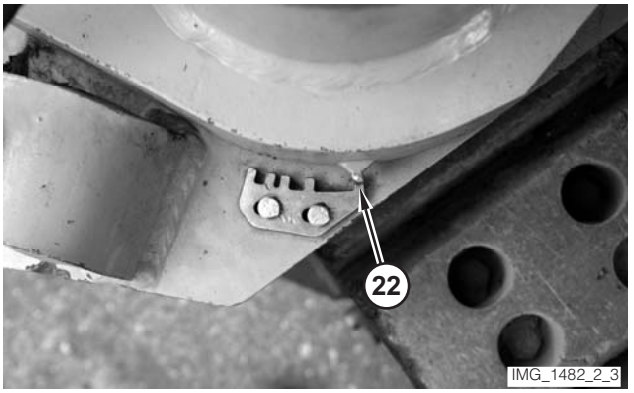

Illustration 313

23. Monitor minimum inside position tab (22). Use button (17) and button (18) in order to move the track to the minimum inside position.

24. Press “1” button (10) on the digital display.

Illustration 314

25. Monitor maximum inside position tab (23). Use button (17) and button (18) in order to move the track to the maximum inside position.

26. Push “2” button (12) on the digital display.

27. Monitor center position tab (21). Use button (17) and button (18) in order to move the track to the center position.

Illustration 315

28. Press “3” button (24) on the digital display.

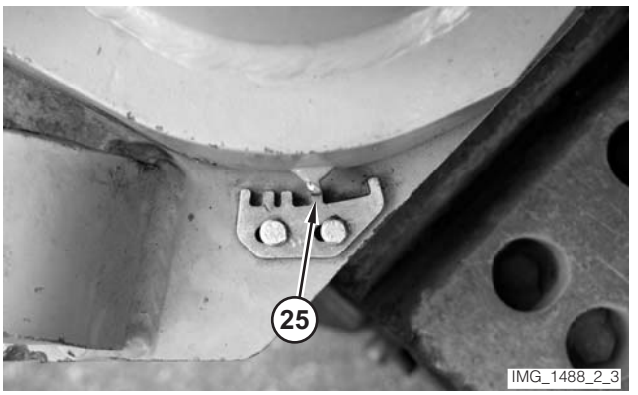

Illustration 316

29. Monitor minimum out position tab (25). Use button (17) and button (18) in order to move the track to the minimum outside position.

Illustration 317

30. Press “4” button (26) on the digital display.

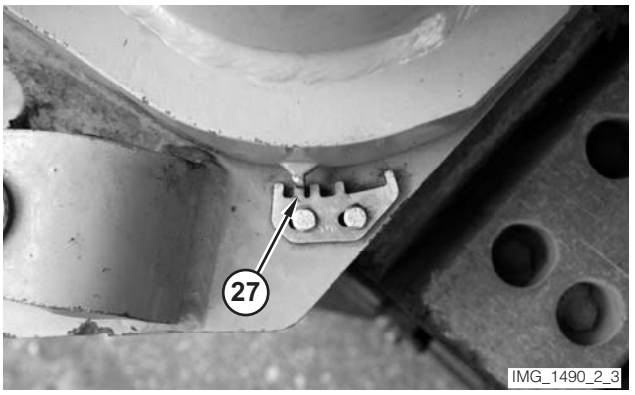

Illustration 318

31. Monitor maximum outside position tab (27). Use button (17) and button (18) in order to move the track to the maximum outside position.

32. Press “5” button (11) on the digital display.

Illustration 319

33. Press “OK” button (28) on the digital display.

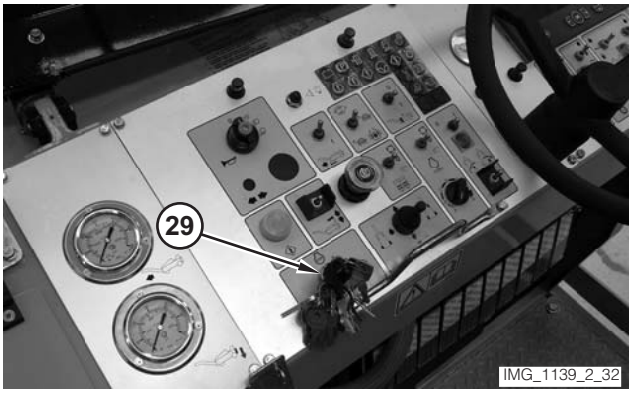

Illustration 320

34. Move key switch (29) to the OFF position.

Conveyor Control System

Relief Valve (Conveyor)—Test and Adjust

WARNING

Sudden movement of the machine or release of oil under pressure can cause serious injury to persons on or near the machine.

To prevent injury or death, make sure that the area around the machine is clear of personnel and obstructions before operating the machine.

WARNING

Injury to personnel can result if they are not in the operator’s view. Allow only essential personnel near the machine, and make sure the personnel are in the operator’s view when testing, to prevent injury. Make sure checks are done in an open area.

WARNING

Personal injury can result from rotating and moving parts.

Moving fan blades and moving parts will throw or cut any object or tool that falls or is pushed into them.

Make sure no one is working on, underneath or close to an engine that is running. Make sure the area is free of personnel.

NOTICE

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the machine. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, “Caterpillar Tools and Shop Products Guide,” for tools and supplies suitable to collect and contain fluids in Caterpillar machines.

Dispose of all fluids according to local regulations and mandates.

Table 23

Required Tools			
Tool	**Part Number**	**Description**	**Qty**
A	8T-0860	Pressure Gauge 0–40 000 kPa (0–5800 psi)	1
	6V-4144	Coupler	1
B	272-0775	Hose Assembly 1000 mm (39 in)	1
	280-9168	Nipple Fitting	1
	6V-0405	Dowty Seal	1
	8T-7910	Adapter–Union	1
	3J-1907	O-Ring Seal	1
	164-5567	Nipple Fitting	1

Table 24

Optional Tools(1)			
Tool	**Part Number**	**Description**	**Qty**
C(2)	198-4234	Digital Pressure Indicator	1
D(2)	198-4236	Extension Cable	1
E(2)	198-4238	Pressure Sensor 0–35 000 kPa (0–5000 psi)	1

(1) The optional tools can be used in place of the analog pressure measurement Tool A, which is specified in the required tool list.
(2) Tool C and Tool D are part of the 198-4240 Digital Pressure Indicator Group.

1. Drive the machine to a smooth, horizontal surface.

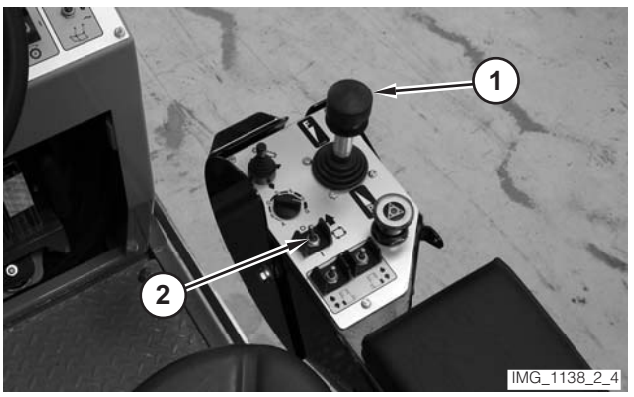

Illustration 321

2. Move propulsion lever (1) to the NEUTRAL position.

3. Move drive selector switch (2) to the OFF position.

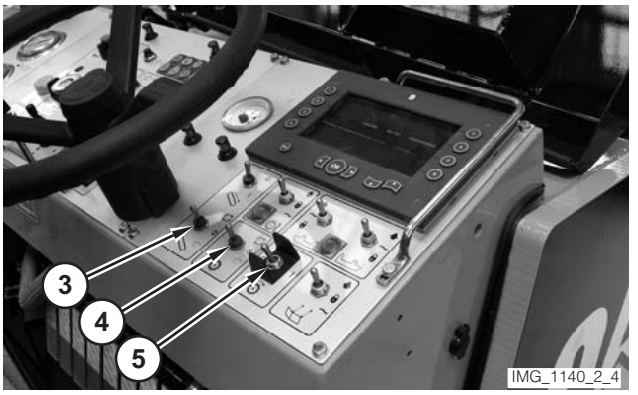

Illustration 322

4. Make sure conveyor switch (3) is in the OFF position.

5. Make sure water spray switch (4) is in the OFF position.

6. Make sure rotor switch (5) is in the OFF position.

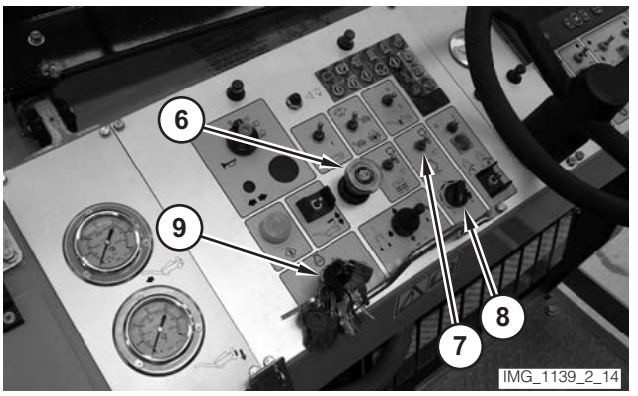

Illustration 323

7. Move parking brake switch (6) to the ON position.

8. If necessary, move engine control switch (7) to the “O” position.

9. Rotate engine speed dial (8) to the LOW-IDLE position.

10. Move key switch (9) to the OFF position.

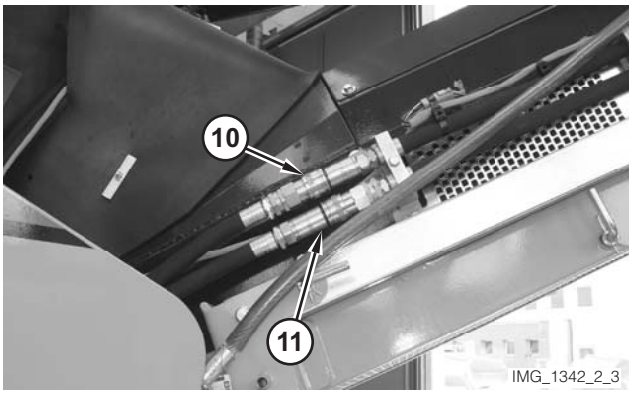

Illustration 324

11. Disconnect hose (10). Disconnect hose (11).

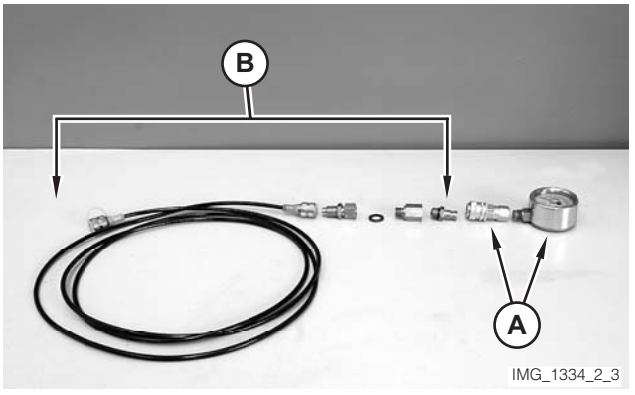

Illustration 325

12. Assemble Tool A. Assemble Tool B. Connect Tool A to Tool B.

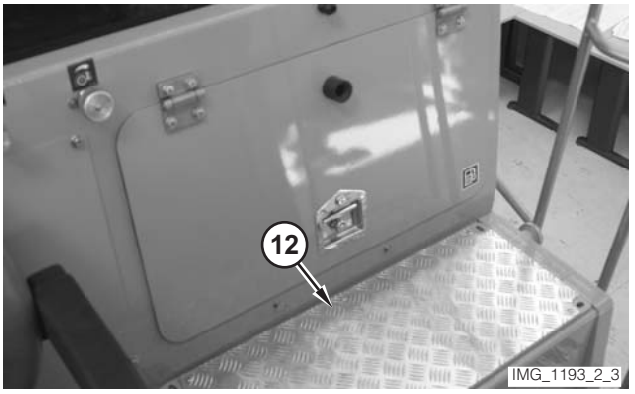

Illustration 326

13. Remove four bolts and remove plate (12).

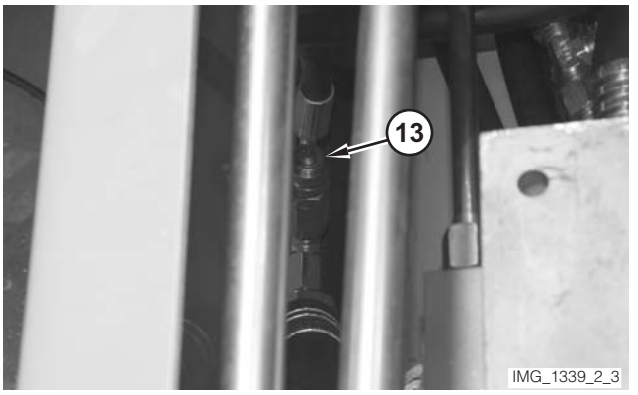

Illustration 327

14. Remove cap (13) from the conveyor pressure tap.

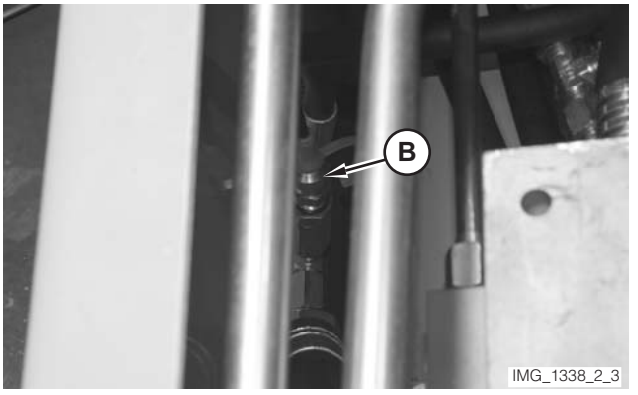

Illustration 328

15. Connect Tool (B) to the conveyor pressure tap.

16. Move key switch (9) to the START position. Release the key switch when the engine starts.

17. Operate the engine at low idle for a few minutes.

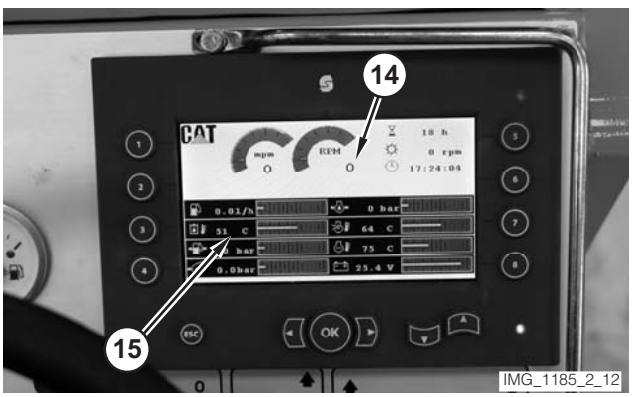

Illustration 329

18. Monitor engine speed value (14) on the digital display. Rotate engine speed dial (8) until the engine speed reaches 1500 rpm.

19. Monitor hydraulic oil temperature (15) on the digital display. Operate the machine until the oil temperature reaches 45 ± 5 °C (110 ± 10 °F).

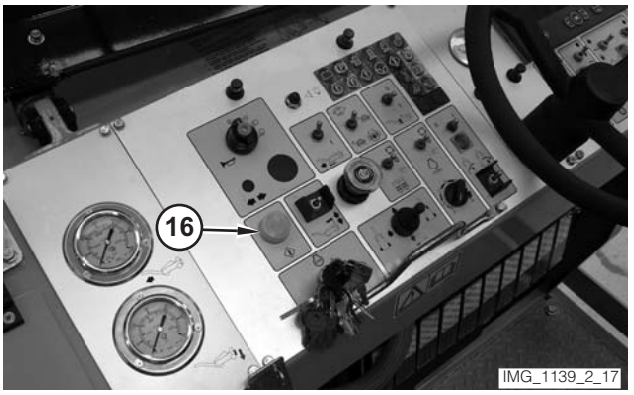

Illustration 330

20. Depress electrical controls master switch (16).

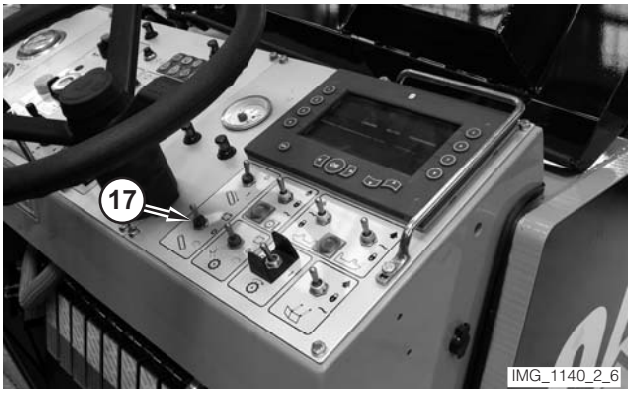

Illustration 331

21. Move conveyor switch (17) to the MANUAL position.

22. Read the pressure on Tool A. The pressure should be 24 000 kPa (3480 psi).

23. Move conveyor switch (17) to the OFF position.

24. Rotate engine speed dial (8) to the LOW-IDLE position.

25. Move key switch (9) to the OFF position.

26. If the pressure is inside the specified range go to Step 30. If the pressure is outside the specified range go to next Step 27.

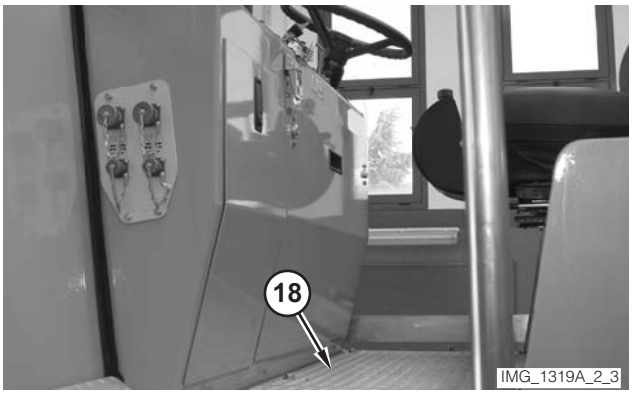

Illustration 332

27. Remove floor plate (18).

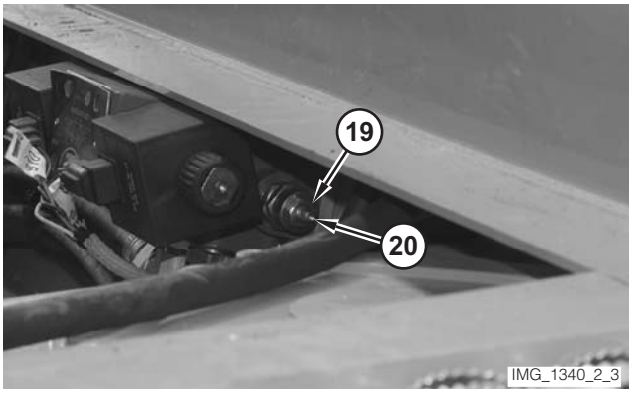

Illustration 333

28. Loosen locknut (19) on the relief valve. In order to increase the pressure, rotate adjustment screw (20) counterclockwise. In order to decrease the pressure, rotate the adjustment screw clockwise.

29. Hold adjustment screw (20), and tighten locknut (19). Go to Step 16.

30. Remove the tooling. Attach cap (13). Install plate (18). Install plate (12). Connect hose (11). Connect hose (10).

Conveyor Speed—Test

⚠ WARNING

Sudden movement of the machine or release of oil under pressure can cause serious injury to persons on or near the machine.

To prevent injury or death, make sure that the area around the machine is clear of personnel and obstructions before operating the machine.

⚠ WARNING

Injury to personnel can result if they are not in the operator's view. Allow only essential personnel near the machine, and make sure the personnel are in the operator's view when testing, to prevent injury. Make sure checks are done in an open area.

⚠ WARNING

Personal injury can result from rotating and moving parts.

Moving fan blades and moving parts will throw or cut any object or tool that falls or is pushed into them.

Make sure no one is working on, underneath or close to an engine that is running. Make sure the area is free of personnel.

Table 25

Required Tools			
Tool	**Part Number**	**Description**	**Qty**
A(1)	1U-7771	Tachometer	1
B(1)	1U-6605	Reflective Tape	1

(1) Tool A and Tool B are part of the 1U-6602 Photo-Tach Group.

1. Drive the machine to a smooth, horizontal surface.

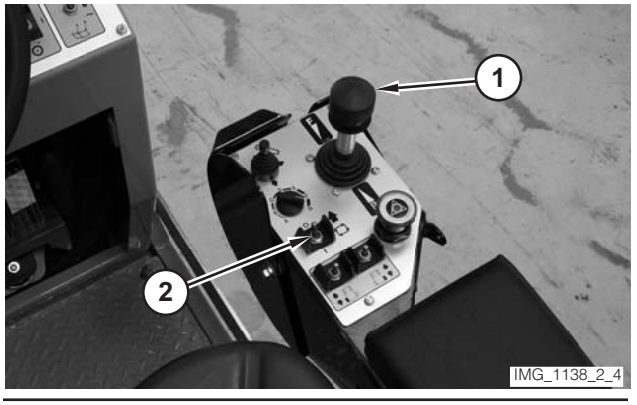

Illustration 334

2. Move propulsion lever (1) to the NEUTRAL position.

3. Move drive selector switch (2) to the OFF position.

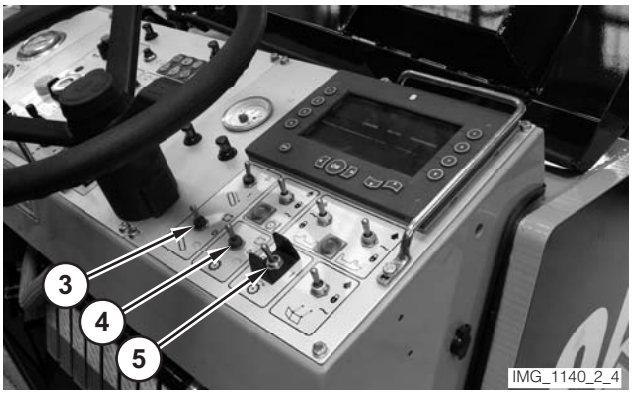

Illustration 335

4. Make sure conveyor switch (3) is in the OFF position.

5. Make sure water spray switch (4) is in the OFF position.

6. Make sure rotor switch (5) is in the OFF position.

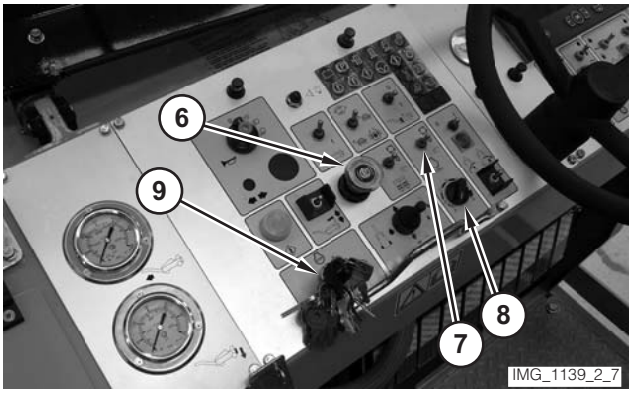

Illustration 336

7. Move parking brake switch (6) to the ON position.

8. If necessary, move engine control switch (7) to the "O" position.

9. Rotate engine speed dial (8) to the LOW-IDLE position.

10. Move key switch (9) to the OFF position.

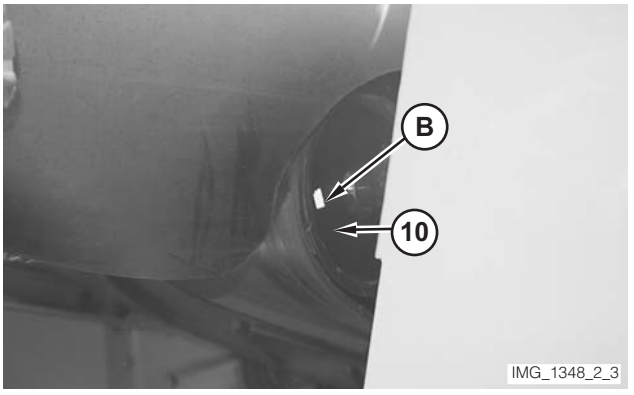

Illustration 337

11. Install a piece of Tool B on idler (10) at the top of the first-stage conveyor.

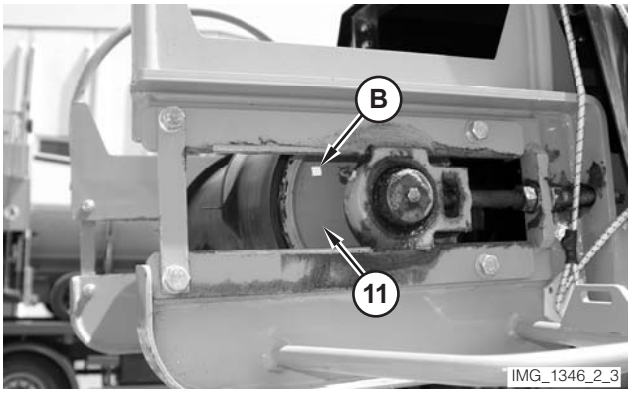

Illustration 338

12. Install a piece of Tool B on idler (11) at the top of the second-stage conveyor.

13. Move key switch (9) to the START position. Release the key switch when the engine starts.

14. Operate the engine at low idle for a few minutes.

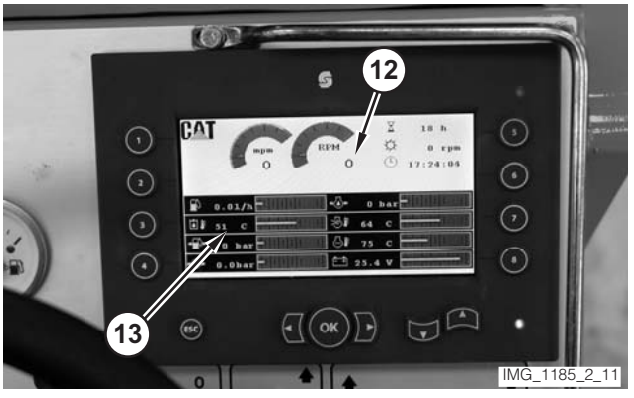

Illustration 339

15. Monitor engine speed value (12) on the digital display. Rotate engine speed dial (8) until the engine speed reaches 1500 rpm.

16. Monitor hydraulic oil temperature (13) on the digital display. Operate the machine until the oil temperature reaches 45 ± 5 °C (110 ± 10 °F).

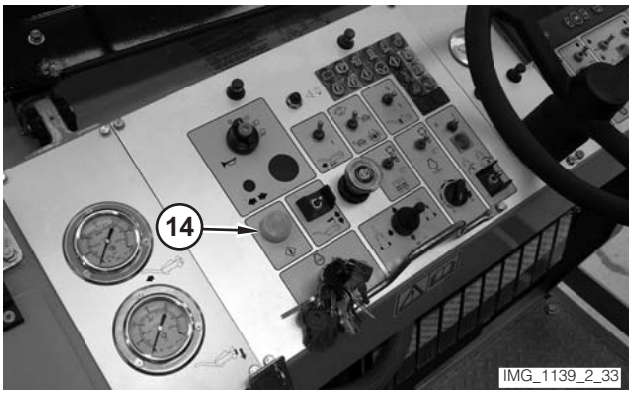

Illustration 340

17. Depress electrical controls master switch (14).

18. Rotate engine speed dial (8) to the HIGH-IDLE position.

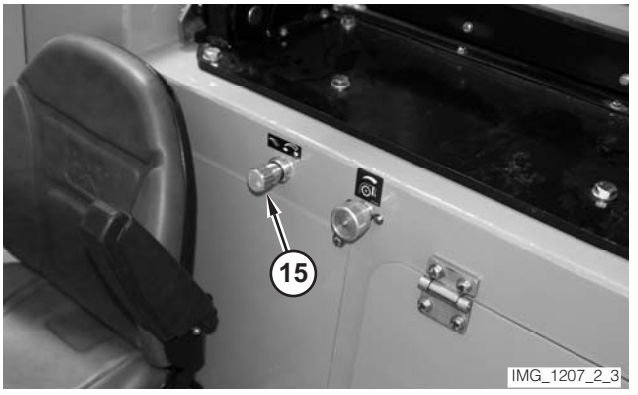

Illustration 341

19. Rotate conveyor speed valve (15) completely counterclockwise.

⚠ WARNING

The conveyor will move during the next steps. In order to prevent injury or death, make sure that the area around the machine is clear of personnel and clear of obstructions before operating the conveyor.

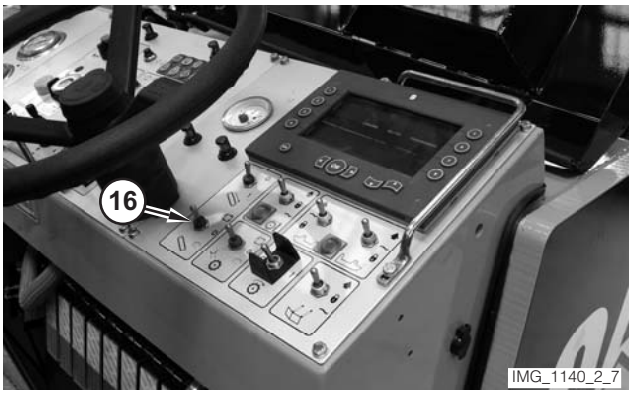

Illustration 342

20. Move conveyor switch (16) to the MANUAL position.

21. Use Tool A to determine the speed of idler (10). The speed of the idler should be 410 ± 10 rpm.

22. Use Tool A to determine the speed of idler (11). The speed of the idler should be 410 ± 10 rpm.

23. Move conveyor switch (16) to the OFF position. Wait for the conveyor to stop operating.

24. Move engine speed dial (8) to the LOW-IDLE position.

25. Move key switch (9) to the OFF position.

Fan Control System

Relief Valve (Fan)—Test and Adjust

⚠ WARNING

Sudden movement of the machine or release of oil under pressure can cause serious injury to persons on or near the machine.

To prevent injury or death, make sure that the area around the machine is clear of personnel and obstructions before operating the machine.

⚠ WARNING

Injury to personnel can result if they are not in the operator's view. Allow only essential personnel near the machine, and make sure the personnel are in the operator's view when testing, to prevent injury. Make sure checks are done in an open area.

⚠ WARNING

Personal injury can result from rotating and moving parts.

Moving fan blades and moving parts will throw or cut any object or tool that falls or is pushed into them.

Make sure no one is working on, underneath or close to an engine that is running. Make sure the area is free of personnel.

NOTICE

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the machine. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, "Caterpillar Tools and Shop Products Guide," for tools and supplies suitable to collect and contain fluids in Caterpillar machines.

Dispose of all fluids according to local regulations and mandates.

Table 26

Required Tools			
Tool	**Part Number**	**Description**	**Qty**
A	8T-0856	Pressure Gauge 0–6000 kPa (0–870 psi)	1
	6V-4144	Coupler	1
B	272-0775	Hose Assembly 1000 mm (39 in)	1
	280-9168	Nipple Fitting	1
	6V-0405	Dowty Seal	1
	8T-7910	Adapter–Union	1
	3J-1907	O-Ring Seal	1
	164-5567	Nipple Fitting	1
C	438 297(1)	T-Fitting	1
	438 631(1)	Nipple Fitting	1
	685 212(1)	Nipple Fitting	1
D	438 819(1)	Plug	1
E	438 810(1)	Cap	1

(1) Bitelli part number.

Table 27

Optional Tools[1]			
Tool	**Part Number**	**Description**	**Qty**
F[2]	198-4234	Digital Pressure Indicator	1
G[2]	198-4236	Extension Cable	1
H[2]	198-4237	Pressure Sensor 0–3500 kPa (0–500 psi)	1

(1) The optional tools can be used in place of the analog pressure measurement Tool A, which is specified in the required tool list.
(2) Tool F, Tool G, and Tool H are part of the 198-4240 Digital Pressure Indicator Group.

1. Drive the machine to a smooth, horizontal surface.

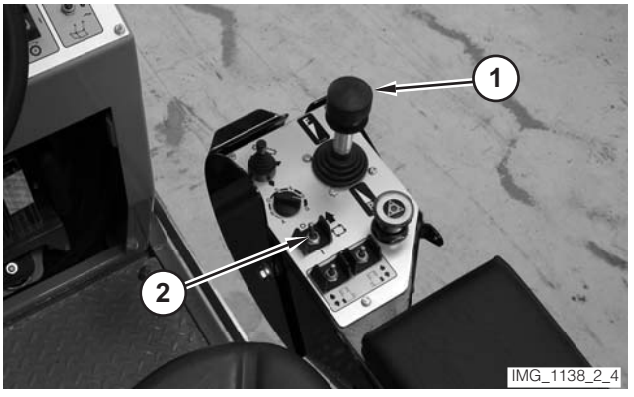

Illustration 343

2. Move propulsion lever (1) to the NEUTRAL position.

3. Move drive selector switch (2) to the OFF position.

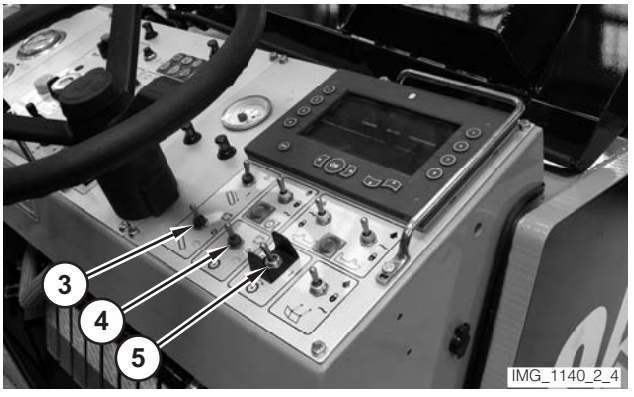

Illustration 344

4. Make sure conveyor switch (3) is in the OFF position.

5. Make sure water spray switch (4) is in the OFF position.

6. Make sure rotor switch (5) is in the OFF position.

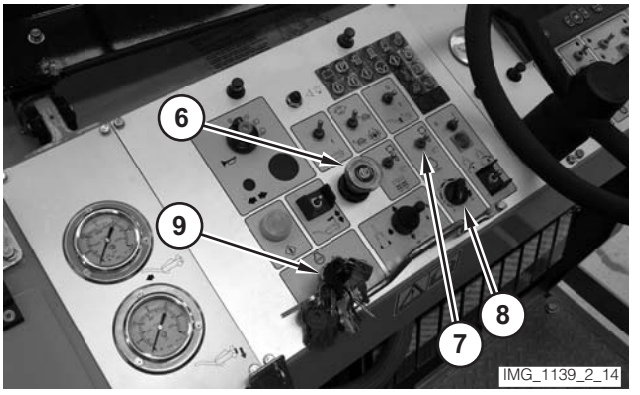

Illustration 345

7. Move parking brake switch (6) to the ON position.

8. If necessary, move engine control switch (7) to the “O” position.

9. Rotate engine speed dial (8) to the LOW-IDLE position.

10. Move key switch (9) to the OFF position.

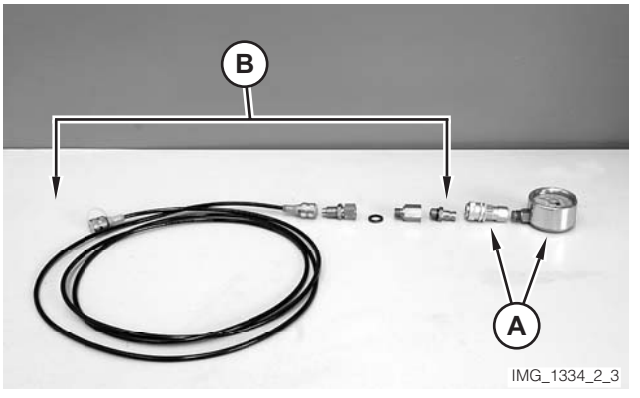

Illustration 346

11. Assemble Tool A. Assemble Tool B. Connect Tool A to Tool B.

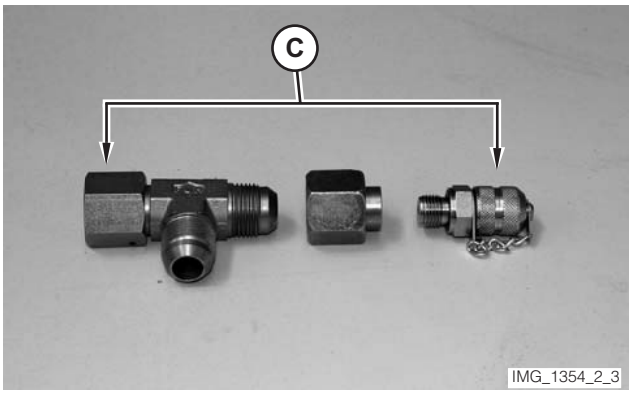

Illustration 347

12. Assemble Tool C.

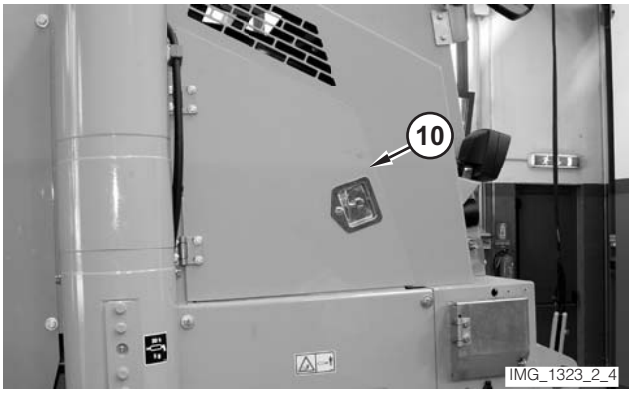

Illustration 348

13. Open compartment (10).

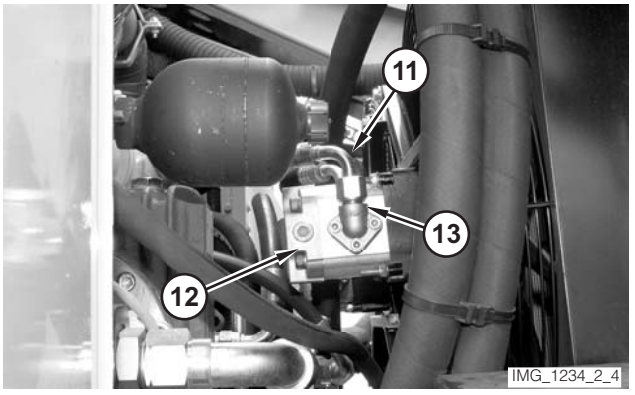

Illustration 349

14. Disconnect hose (11) from motor (12).

15. Connect Tool C to motor port (13).

16. Connect hose (11) to Tool C.

17. Connect Tool A to Tool C.

18. Move key switch (9) to the START position. Release the key switch when the engine starts.

19. Operate the engine at low idle for a few minutes.

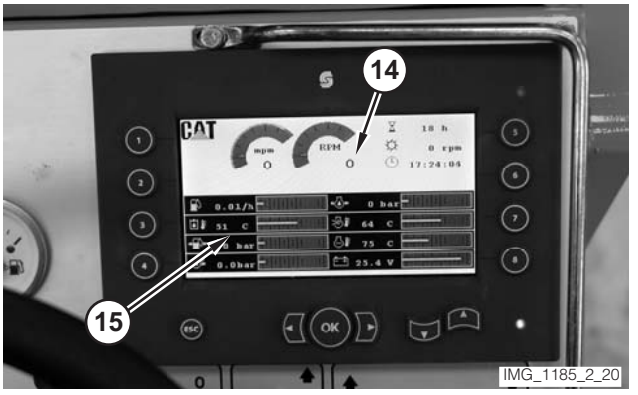

Illustration 350

20. Monitor engine speed value (14) on the digital display. Rotate engine speed dial (8) until the engine speed reaches 1500 rpm.

21. Monitor the hydraulic oil temperature (15) on the digital display. Operate the machine until the oil temperature reaches 45 ± 5 °C (110 ± 10 °F).

22. Record the pressure on Tool A as “working pressure.” The pressure should be 1910 ± 10 kPa (277 ± 1 psi).

23. Rotate engine speed dial (8) to the LOW-IDLE position.

24. Move key switch (9) to the OFF position.

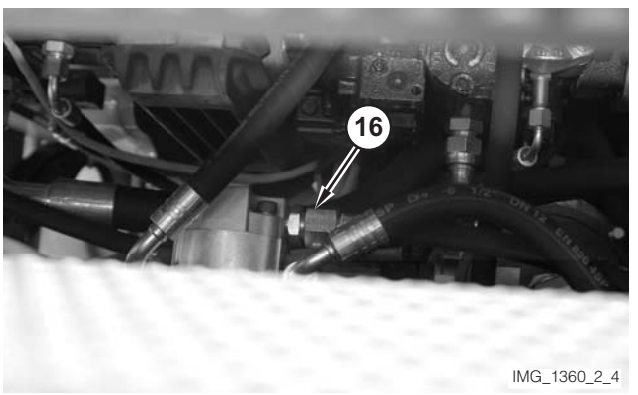

Illustration 351

25. Disconnect hose (16) from the other fan motor. Cap the port using Tool E. Plug the hose with Tool D.

26. Move key switch (9) to the ON position. Leave engine speed dial in the LOW-IDLE position.

NOTICE
Monitor hydraulic oil temperature during this test to prevent overheating.

27. Record the pressure on Tool A as “relief pressure.” The pressure should be 18 000 kPa (2610 psi). Fan pressure is not adjustable.

28. Remove the tooling. Reconnect the hoses. Close compartment (10).

Fan Speed (Hydraulic Oil Cooler and Radiator)—Test

⚠ WARNING

Sudden movement of the machine or release of oil under pressure can cause serious injury to persons on or near the machine.

To prevent injury or death, make sure that the area around the machine is clear of personnel and obstructions before operating the machine.

⚠ WARNING

Injury to personnel can result if they are not in the operator’s view. Allow only essential personnel near the machine, and make sure the personnel are in the operator’s view when testing, to prevent injury. Make sure checks are done in an open area.

⚠ WARNING

Personal injury can result from rotating and moving parts.

Moving fan blades and moving parts will throw or cut any object or tool that falls or is pushed into them.

Make sure no one is working on, underneath or close to an engine that is running. Make sure the area is free of personnel.

Table 28

Required Tools			
Tool	**Part Number**	**Description**	**Qty**
A(1)	1U-7771	Tachometer	1
B(1)	1U-6605	Reflective Tape	1

(1) Tool A and Tool B are part of the 1U-6602 Photo-Tach Group.

1. Drive the machine to a smooth, horizontal surface.

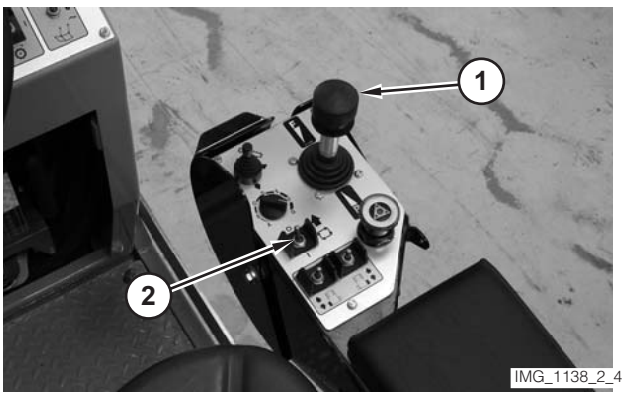

Illustration 352

2. Move propulsion lever (1) to the NEUTRAL position.

3. Move drive selector switch (2) to the OFF position.

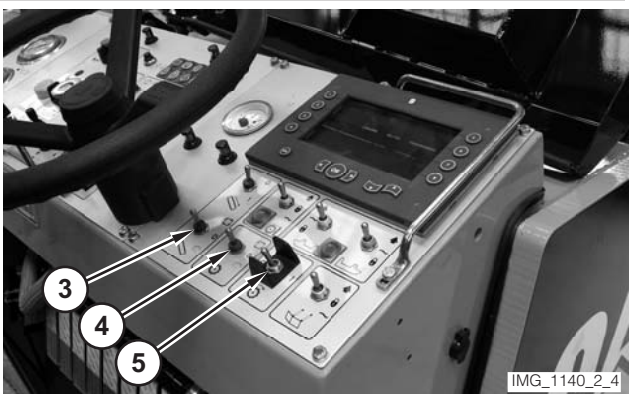

Illustration 353

4. Make sure conveyor switch (3) is in the OFF position.

5. Make sure water spray switch (4) is in the OFF position.

6. Make sure rotor switch (5) is in the OFF position.

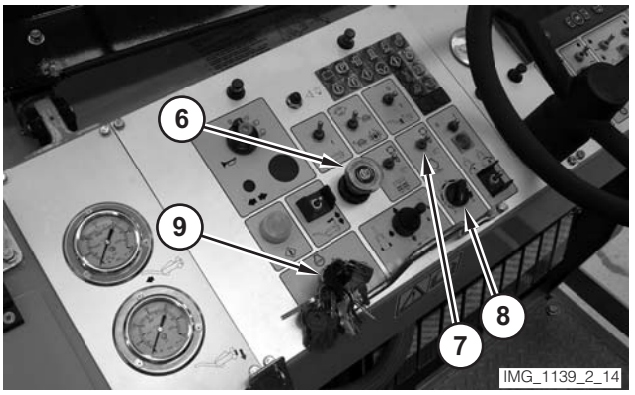

Illustration 354

7. Move parking brake switch (6) to the ON position.

8. If necessary, move engine control switch (7) to the “O” position.

9. Rotate speed dial (8) to the MINIMUM position.

10. Move key switch (9) to the OFF position.

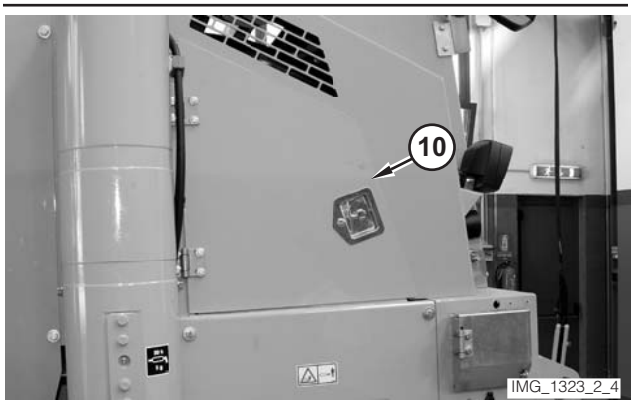

Illustration 355

11. Open left rear compartment (10).

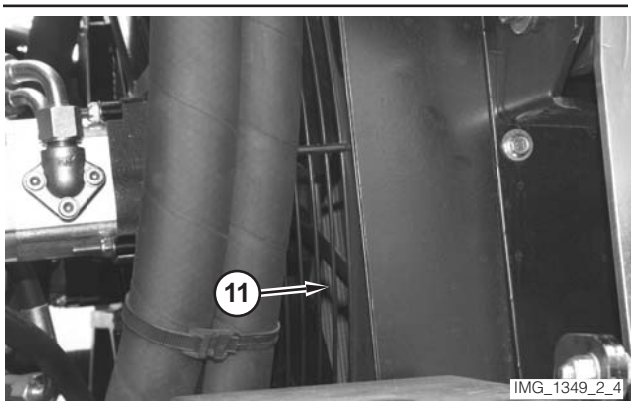

Illustration 356

12. Install a piece of Tool B on a blade of oil cooler fan (11).

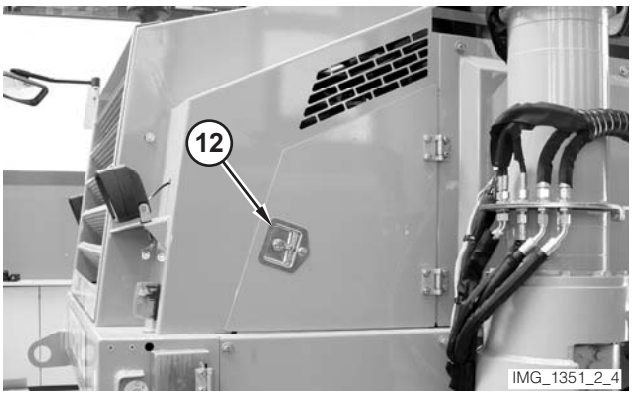

Illustration 357

13. Open right rear compartment (12).

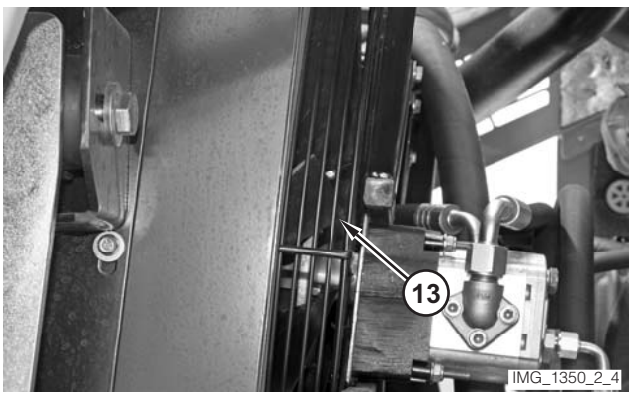

Illustration 358

14. Install a piece of Tool B on a blade of radiator fan (13).

15. Move key switch (9) to the START position. Release the key switch when the engine starts.

16. Operate the engine at low idle for a few minutes.

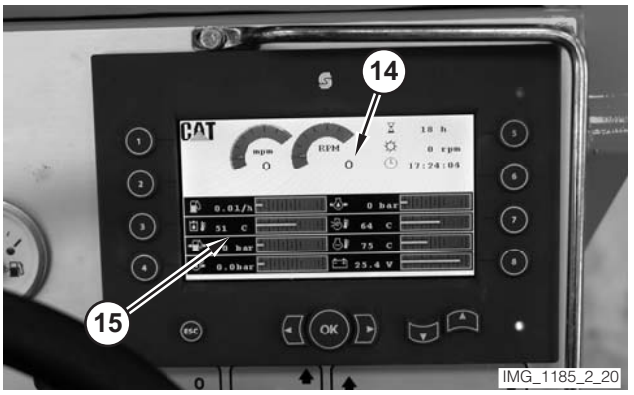

Illustration 359

17. Monitor engine speed value (14) on the digital display. Rotate engine speed dial (8) until the engine speed reaches 1500 rpm.

18. Monitor the hydraulic oil temperature (15) on the digital display. Operate the machine until the oil temperature reaches 45 ± 5 °C (110 ± 10 °F).

19. Rotate engine speed dial (8) to the HIGH-IDLE position.

20. Use Tool A to measure the oil cooler fan speed. The speed of the fan should be 2170 ± 60 rpm.

21. Use Tool A to measure the radiator fan speed. The speed of the fan should be 2520 ± 60 rpm.

22. Move engine speed dial (8) to the LOW-IDLE position.

23. Move key switch (9) to the OFF position.

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