Section 22: Starting Procedure

STARTING THE ENGINE

Step 1: Place *Cutter Engage* in DISENGAGED position.

Step 2: Place *Upper Feed Control Bar* in top STOP position.

Step 3: Turn ignition key clockwise to *ON* position.

Step 4: When 'Wait-to-Start' display indicator or light (Cummins has light) goes out, engine is ready to start. The Deutz petrol and PSI engines may be started immediately.

NOTICE: Never run the starter motor for more than 30 seconds at a time. Allow starter motor to cool 1 minute between attempts.

Step 5: Allow engine to warm up for 3–5 minutes before engaging the cutter.

NOTICE: Do not idle diesel engines for more than 10 minutes. The resulting low temperatures in the combustion chamber will not allow fuel to burn completely and can cause engine damage.

COLD WEATHER STARTING

Engine

Before operating in cold weather (below 32°F (0°C)), refer to the Engine Operation Manual for recommended engine oil, fuel, and starting procedures.

Hydraulic Fluid

In cold weather, take more time to warm up the hydraulic fluid. After the engine is warm, let it run for a minimum of 5 more minutes at low RPM before operating any controls.

NOTICE: Slow down engine if the hydraulic pump emits a noise due to insufficient oil.

JUMP-STARTING

Battery Explosion - Avoid

WARNING: Battery fumes are flammable and can explode. Keep all burning materials away from battery. Battery explosion can blind. Acid can blind and burn. Tools and cable clamps can make sparks.

Do not smoke. Shield eyes and face. Read instructions.

Do not jump-start or charge a battery that is frozen or low on electrolyte.

Avoid explosion hazard.

Do not allow vehicle used to jump-start to be in contact with the disabled machine. Vehicles in contact have a ground connection which allows a spark to occur at the battery when the positive jumper cable is connected or removed. If equipped with battery caps, they must be in place and tight to reduce risk of battery explosion.

NOTICE: Use only a 12-volt system for jump-starting. Do not allow vehicles to touch.

Battery Burns - Avoid

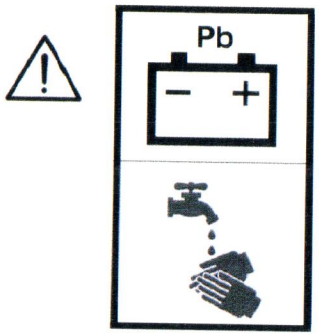
Battery contains sulfuric acid which can cause severe burns. Avoid contact with eyes, skin, and clothing.

In case of acid contact:

External: Flush with plenty of water. If eyes have been exposed, flush with water for 15 minutes and get prompt medical attention.

Internal: Drink large quantities of water or milk, follow with milk of magnesia, beaten egg, or vegetable oil. Call a physician immediately.

Jump-Starting Procedure



WARNING: Battery post, terminals, and related accessories contain lead and lead compounds.

Wash hands after handling.

NOTICE: Review battery service safety guidelines before jump-starting machine (refer to battery maintenance instructions in the *"Maintenance - 500 Service Hours"* section of the *Maintenance Manual*).

Step 1: Turn ignition switch to OFF.

Step 2: Connect jumper cables in the following order:

a. Red to discharged battery POSITIVE (+) terminal.

b. Red to booster battery POSITIVE (+) terminal.

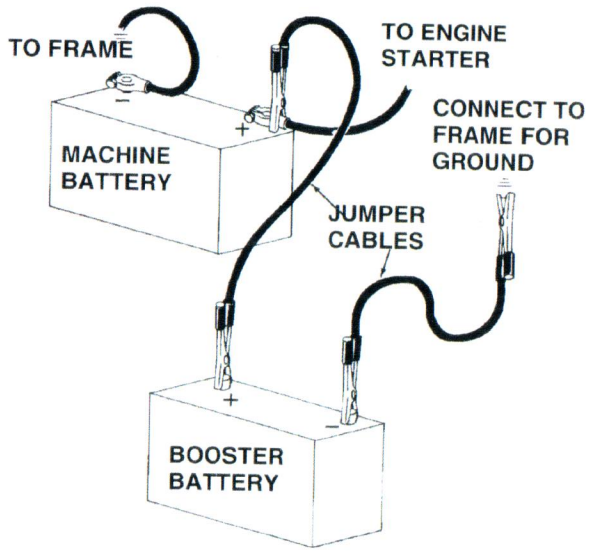
c. Black to booster battery NEGATIVE (-) terminal.

d. Black to frame of machine with the discharged battery. Make connection away from battery, hydraulic lines, and moving parts.

NOTICE: To avoid sparks near the battery, always disconnect black jumper cable from the booster battery before making any adjustment to the red jumper cable.

Step 3: Start engine.

Step 4: Remove cables in **reverse** order and install the red cover over the positive cable clamp on the battery.



Section 23: Shutdown Procedure

Stopping the Machine

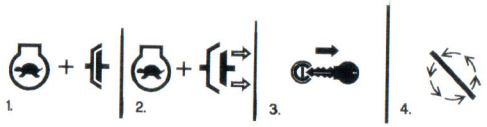
NOTICE: For your safety and the safety of others, use the shutdown procedure before working on the machine for any reason, including servicing, cleaning, unclogging, inspecting, or transporting the chipper.

A variation of this procedure may be used if so instructed within this manual, or if an emergency requires it.

Step 1: Return *Upper Feed Control Bar* to top STOP position.

Step 2: Slow the engine speed to low idle.

NOTICE: Whenever practical and safe, allow engine to idle for 1 to 5 minutes before shutting down after operating at full power. Please consult machine's engine manual for details.



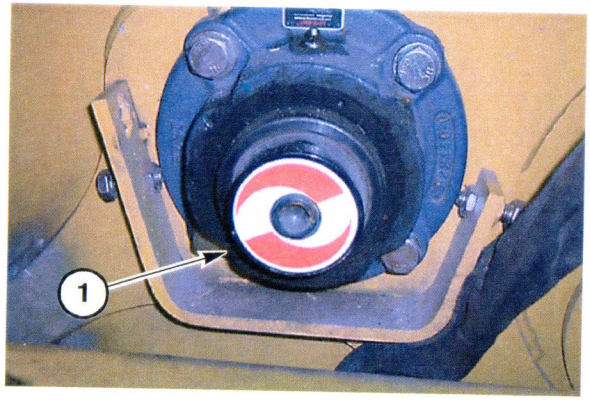
Step 3: Wait for the cutter drum to slow.

Step 4: Place *Cutter Engage Lever* in the DISENGAGED position.

Step 5: Turn ignition key to OFF position.

Step 6: Wait for the cutter drum and belt to stop.

NOTICE: Cutter drum rotation can be checked by looking at the end of the shaft **(1)** on the left side of the cutter wheel housing. The cutter drum will continue to turn for a short time after the engine has stopped.



Step 7: Remove ignition key.

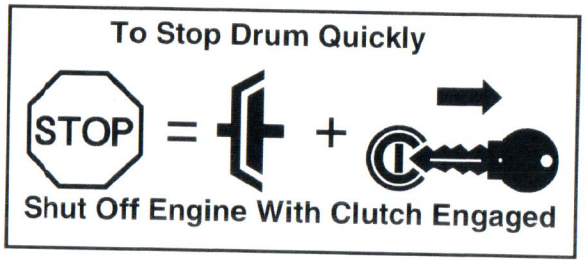
Step 8: Close and latch feed table.

Quick Stop Procedure

Step 1: Turn ignition to OFF position while cutter drum clutch is still engaged. Remove key.

Step 2: Wait for cutter drum and belt to stop.

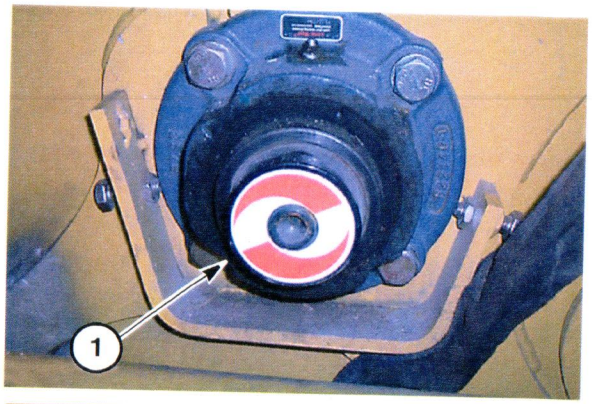
Step 3: Fully disengage cutter drum.



Section 50: Operating the Brush Chipper

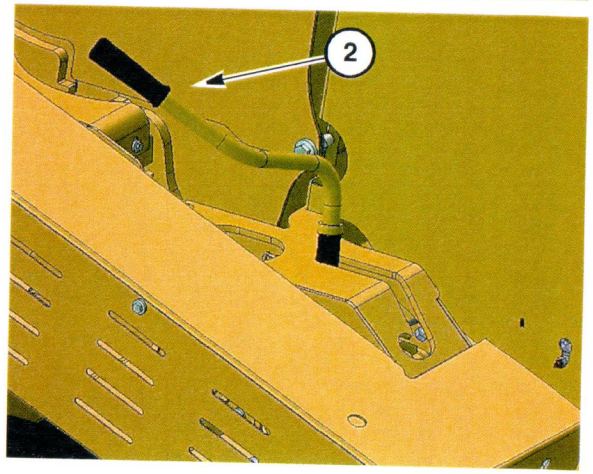
CUTTER SHAFT - CHECK

Start engine. Refer to *Starting Procedure, page 22-1.* Check cutter drum shaft end **(1)** to see that the cutter drum does not turn while the *Cutter Engage* is in the DISENGAGED position. If rotation occurs, adjustment is necessary. Refer to the *Maintenance - 50 Service Hours or Weekly* section in the *Maintenance Manual* for instructions.

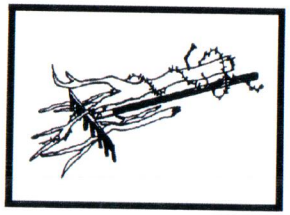


CUTTER DRUM - ENGAGE

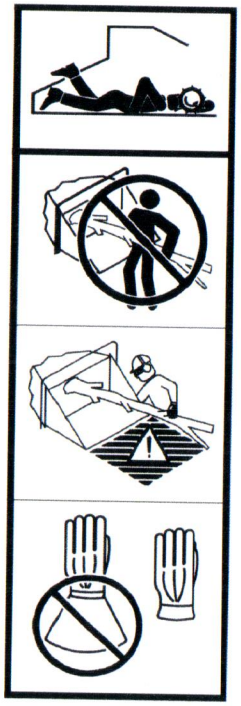
After engine has warmed up, grip *Cutter Engage Lever* **(2)** firmly and move it slowly to the ENGAGED position.



FEED ROLLER OPERATION



WARNING: Check material being chipped. Avoid stones, wire, or other objects which may damage the knives and become dangerous projectiles.

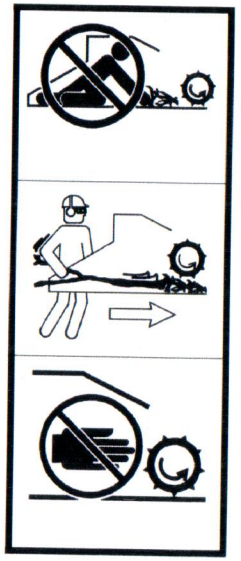


DANGER: Limbs can snag clothing. Roller or blades can grab and pull you in faster than you can let go of limb. Death or serious injury will result.

Feed material only from side of feed table.

Feed base of limb or branch first.

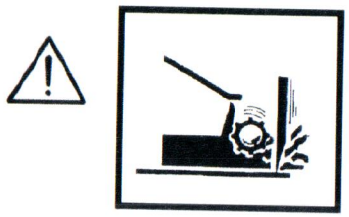
Wear gloves with narrow tight-fitting cuffs.



Never climb onto feed table.

Use wood object to push short material.

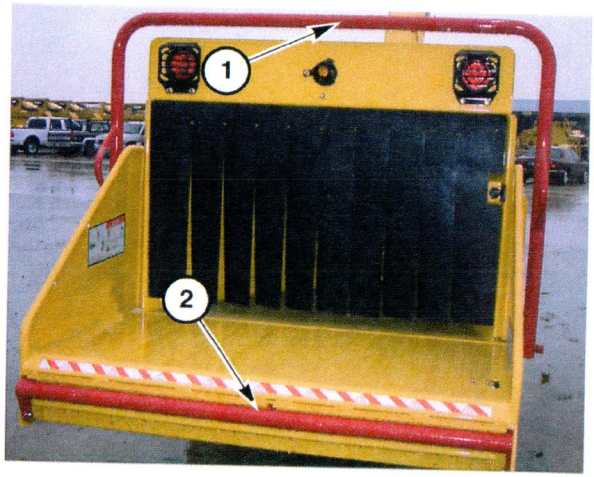
Keep away from rotating feed roller and blades.



WARNING: Feed roller may start unexpectedly with a small increase in engine speed. Place *Upper Feed Control Bar* in Center Stop and stop engine before working on or near feed roller for any reason including cleaning, servicing and unclogging feed intake area.

With SmartFeed control operation, the feed roller will stop feeding material when engine RPM drops below preset speeds, and will automatically restart when engine speed increases.

Proper operation of the *Upper Feed Control Bar* and *Lower Feed Stop Bar* should be checked every 10 hours of operation or daily. Refer to the *Maintenance Manual* for adjustment instructions.



Upper Feed Control Bar

The *Upper Feed Control Bar* **(1)** provides a means for the operator to quickly stop feed roller as well as selecting forward or reverse operation.

Lower Feed Stop Bar

The *Lower Feed Stop Bar* system **(2)** provides a means for the operator to quickly stop the feed roller if snagged by a branch and pulled toward the machine. This system is intended for your safety and must be maintained in good operating condition. Do not operate the machine if the *Lower Feed Stop Bar* is not functioning properly.

Stopping the feed roller is accomplished by bumping the *Lower Feed Stop Bar* **(2)**. The *Lower Stop Bar* is strategically located to make it possible for an operator to strike the bar and shut off the feed either intentionally or automatically in an emergency situation. If the operator does not strike the bar, the feed will not stop. It is therefore very important to follow all safety instructions for feeding material into the chipper.

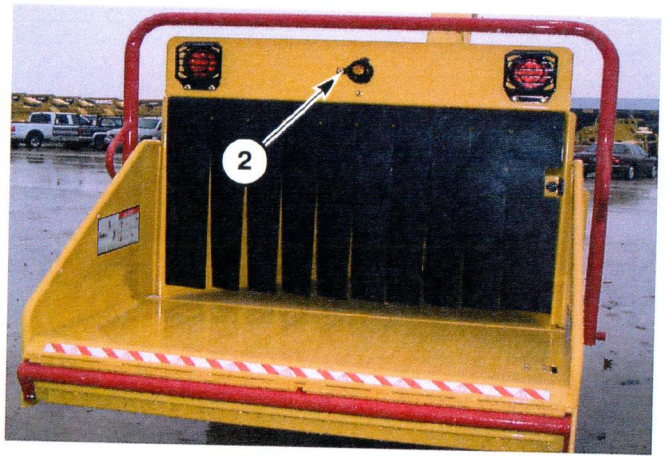
Sensitivity Levels

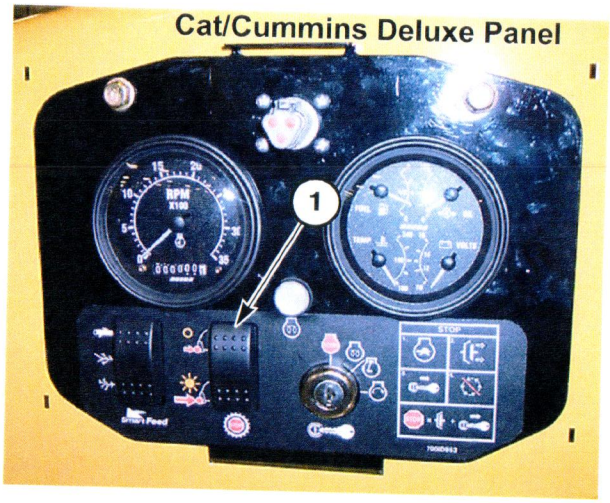
The *Lower Feed Stop Bar* has two levels of sensitivity. When the NORMAL setting is selected **(1)**, the stop bar is depressed a shorter distance before the feed roller stops. When the REDUCED setting is selected, the stop bar is depressed farther before feed roller stops.

The *Infeed Warning Light* **(2)** on the rear of the machine turns on when the REDUCED sensitivity is selected.

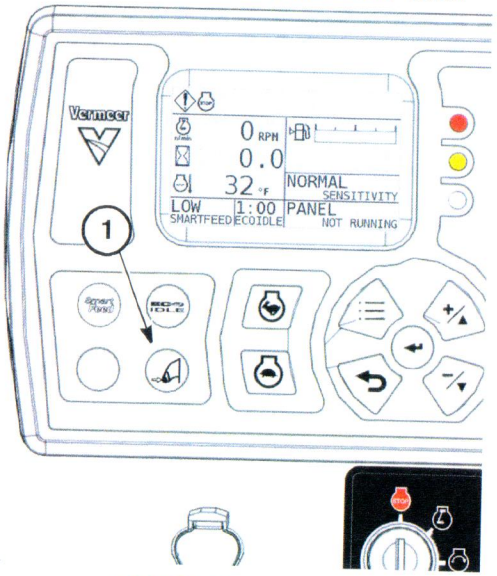
Each time the engine key is turned OFF, the lower feed stop bar system defaults to the NORMAL setting.

NOTICE: The NORMAL sensitivity setting provides the most protection for the operator since a leg is more likely to strike the bar and shut off feed in an emergency. Use NORMAL sensitivity setting whenever jobsite conditions permit. If the size and shape of limbs cause branches to strike the bar, resulting in an unacceptable frequency of feed stops, the REDUCED sensitivity setting may be temporarily selected. When these difficult conditions have passed, select the NORMAL setting to continue chipping.





Deutz/PSI Panel



BC1000XL Brush Chipper

Feed Roller - Engage

Start feed rollers:

- Pull *Upper Feed Control Bar* **(1)** to FORWARD feeding position.
- Press *Hold-to-Run / Reset Button* **(2)**.
  - Pressing it briefly causes feed roller to operate and the *Lower Feed Stop Bar* to be ignored for one second.
  - Holding it causes feed roller to operate for up to 30 seconds regardless of position of *Upper Feed Control Bar or Lower Feed Stop Bar*. After 30 seconds, feed roller stops, and can be reset by releasing the *Hold-to-Run / Reset Button* and pressing it again.

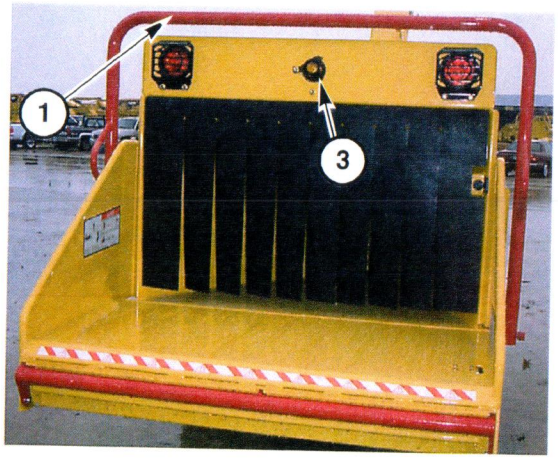
When *Hold-to-Run / Reset Button* is released:

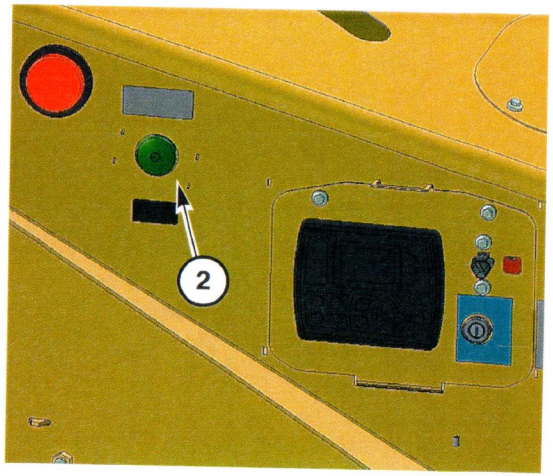
- Feed roller stops if either bar is in the STOP position.
- Feed roller runs if both bars are in the RUN position.

If material continues to strike the bar and stop the feed roller, trim or shorten material before feeding it into the chipper.

Each time the engine key is turned ON, the *Infeed Warning Light* **(3)** flashes quickly, and *Hold-to-Run / Reset Button* **(2)** must be pushed to start feed roller.

Engine throttle must be set at HIGH RPM before feed roller will roll forward.





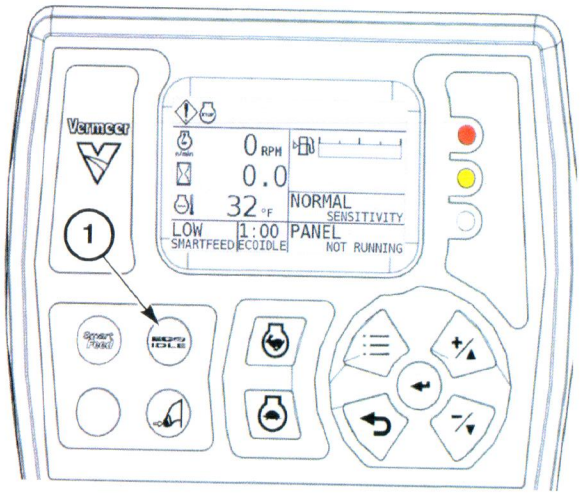
Deutz/PSI Panel Shown

EcoIdle RPM Control Option (Deutz Petrol/Deutz Diesel/PSI)

The EcoIdle system is a fuel saving technology that drops the engine speed to 1500 rpm when the control system determines there has been no material chipped for 1 or 5 minutes depending on switch setting. The system is turned on by selecting the EcoIdle button (1) on the controller. The machine must have EcoIdle selected and must be at high idle.

The system will exit EcoIdle mode whenever any of the following occur:

- Engine detects a load
- Operator adjusts engine speed
- *Hold-to-Run/Reset Button* button is selected
- EcoIdle is turned OFF



CONTROLLER OPERATION

The machine controller does the following:

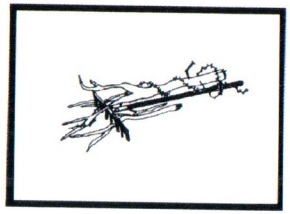
- controls the engine hourmeter (Cat and Cummins)
- controls shutdown system for low oil and high temperature (Cat and Cummins)
- provides control and reset functions for the *Lower Feed Stop Bar* and *Upper Feed Control Bar*

On Deutz petrol, Deutz diesel and PSI engines, the hourmeter, low oil, and high temperature shutdown are monitored by the engine controller.

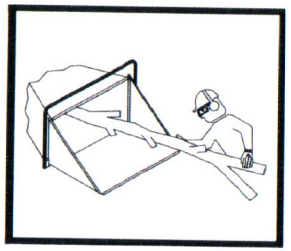
SmartFeed System

When engine speed drops below a selected RPM because of heavy chipping, SmartFeed momentarily reverses, then stops the feed rollers. Feed rollers start again once engine speed recovers. This sequence may occur several times before the material completely passes through the machine.

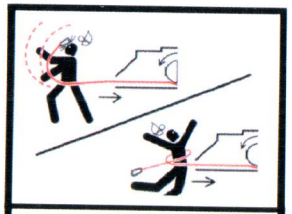
CHIP MATERIAL



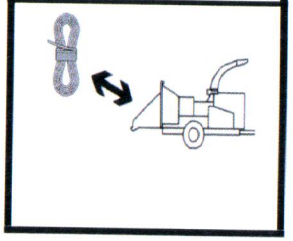
WARNING: Check material being chipped. Avoid stones, wire, or other objects which may damage the knives and become dangerous projectiles.



WARNING: Limbs may suddenly turn or move sideways and may pinch or strike you. To reduce the possibility of being injured, release the limb immediately after it begins to feeding and then turn and walk away.

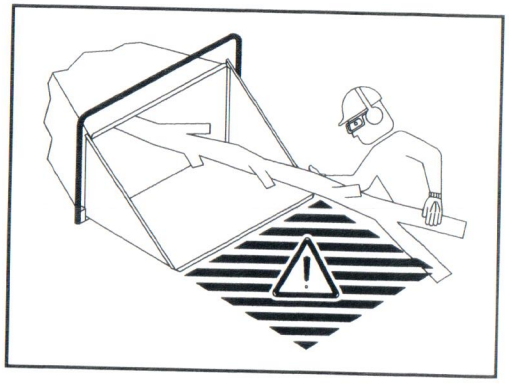


DANGER: Knives can grab and pull in rope and anything attached to it at high speed. Death or serious injury is possible if you are struck, entangled, or pulled into machine.



Keep all ropes away from the chipper and brush piles.

Feeding Tips



- Ensure that all throw lines, rigging lines and climbing ropes do not get entangled in the brush piles or the chipper during machine operation.
- If feeding material by hand, always feed from the side of the infeed chute; never directly behind it.
- Feed large end of log or branch into chipper first.
- To stay out of traffic while operating along a road, feed material from the curbside.
- If feeding brushy material that frequently catches on *Lower Feed Stop Bar* and stops the feed roller, change sensitivity setting to REDUCED SENSITIVITY.

Material Size

- The brush chipper will chip logs approximately 12" (30 cm) in diameter.
- Sometimes a log, due to its size and shape, will not go in. Trim or shorten the log to aid feeding it into the chipper.

Plugs or Stalls

- If the discharge chute, cutter drum, or feed roller becomes plugged during operation, clean it out. Refer to "Removing Plugs from the Brush Chipper," *page 51-1.*
- If the engine stalls while chipping, disengage cutter drum before restarting engine.
- Start engine and, before engaging cutter drum, reverse feed roller to remove the material that caused the stall.

Finishing

Chipped material that accumulates in the infeed chute can be pulled into the machine by feeding in a piece of brush, or by pushing it in with a long limb. **Never** push chipped material with hands, feet, rake, shovel, or any other object. Follow *Shutdown Procedure*, page *23-1.*