W14
Articulated Loader
S/N 9119672 And After
Operators Manual 9-3324

J I Case
A Tenneco Company

This Symbol Shows Important Information About Safety In This Manual. When You See This Symbol, Carefully Read The Information That Follows and Understand The Possible Causes Of Injury Or Death. 1-1-A

IF THIS MACHINE IS USED BY AN EMPLOYEE, IS LOANED, OR RENTED, MAKE SURE THAT THE OPERATOR UNDERSTANDS THE TWO INSTRUCTIONS BELOW.

BEFORE THE OPERATOR STARTS THE ENGINE:

1. GIVE INSTRUCTION TO THE OPERATOR ON SAFE AND CORRECT USE OF THE MACHINE.

2. MAKE SURE THE OPERATOR READS AND UNDERSTANDS THE OPERATORS MANUAL FOR THIS MACHINE.

781112

Printed December, 1981

TABLE OF CONTENTS

Introduction 2
To the Owner 2
Delivery of New Machine 3
Safety 4
Safety Rules 4
Spark Arrester 19
Roll-Over Protective Structure 20
Location of Product Identification Number 24
Location of Serial Numbers 25
Specifications 26
Operating Instructions 30
Instruments and Controls 30
Left Instrument Cluster 30
Right Instrument Panel 32
Operators Compartment 34
ROPS Cab Controls 36
Air Conditioning Operating Tips 39
Operators Seat 40
Seat Belts 42
Loader Controls 45
4-In-1 Bucket Controls 46
Bucket Level Indicator 48
Bucket Height Control 48
Return-To-Dig 49
Engine Operation 50
First Period of Operation with a New Engine 50
Service and Checks Before You Start 51
Starting the Engine 52
Stopping the Engine 54
Starting Aids 55
Operating the Machine 58
Operating in Cold Temperatures 61
Operating in Hot Temperatures .62
Loader Operations 63
Fuels and Lubricants 68
Diesel Fuel 68
Fuel Storage 68
Fuel, Fluids and Lubricants Chart 69
Maintenance and Lubrication ... 70
Introduction 70
Run-In Maintenance Chart 71
Scheduled Maintenance Chart 71
Safety Before You do Service 74
Grease Fittings 77
Engine Lubrication System ... 79
Engine Air Cleaning System .. 82
Engine Cooling System 87
Drive Belts 89
Fuel System 93
Electrical System 98
Battery Service 102
Hydraulic System (Before P.I.N. 9141518) 104
Hydraulic System (P.I.N. 9141518 and After) 106
Brake System 111
Transmission Hydraulic System 114
Front and Rear Axles 118
Cold Starting Aid 120
ROPS Cab and Air Conditioner 123
Cab Air Filters 124
Seat Belts 126
Wheels and Tires 131
Loader Service 133
Return-To-Dig Adjustment .133
Bucket Height Control 134
Bucket Teeth 135
Machine Storage 136
Removal from Storage 138
Spark Arrester Muffler 139
After Delivery Check 141

INTRODUCTION

TO THE OWNER

This manual is your guide to safe, efficient operation. Before you operate this machine, read this manual.

If you need more information, call us.

Your Authorized Case Dealer

The JI Case Company can make changes in design or specifications of the machine at any time with no obligation for these changes.

DELIVERY OF THE NEW MACHINE

When you get your new machine from your Case dealer, you will be instructed about correct operation and maintenance as shown in the Owner Warranty Registration form. When your Case dealer has given you these instructions, write your name on the report. Then he will give you a copy for your records.

AFTER DELIVERY CHECK

Three copies of the After Delivery Check are in the back of this manual. One copy is for you, one copy is for the dealer and one copy is for the Construction Equipment Service Department. Make sure that your Case dealer does the After Delivery Check after the first 20 hours of machine operation.

NOTE: Your cost for this inspection will be for filters, oil or other accessories. If the dealer travels to your machine, there can also be a cost for the time and distance that he must travel.

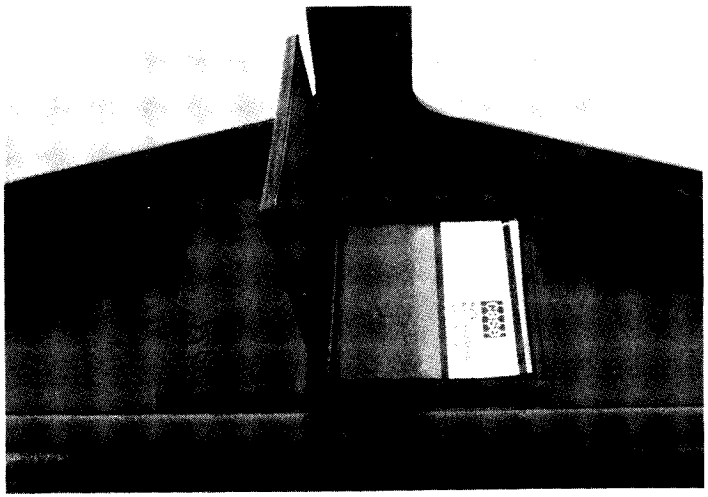
RIGHT AND LEFT SIDES OF THE MACHINE

"Right Hand" and "Left Hand", when used in this manual, represent the right and left sides of the machine as seen from the operators seat.

SAFETY

SAFETY RULES

Your safety and the safety of other persons in the work area are the result of your correct operation of this machine. Know the location, positions and functions of all the controls. MAKE SURE YOU CHECK ALL CONTROLS IN A SAFE, CLEAR AREA BEFORE YOU OPERATE THE MACHINE.



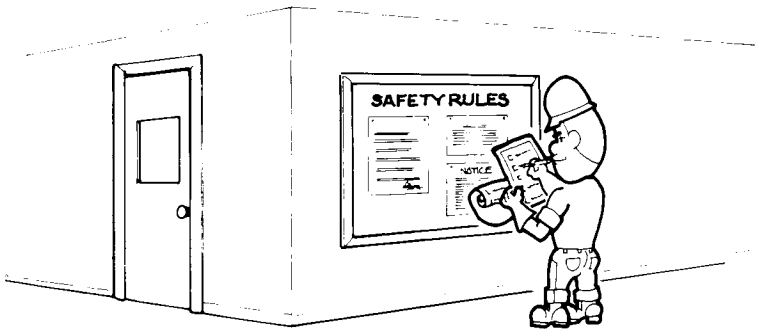
Manual Storage Box

READ THIS MANUAL COMPLETELY and make sure you understand the contents. Make sure you understand, for example, the characteristics of speed, ability, brakes and steering, of this machine. If you have any questions, call your Case dealer.

The safety information in this manual does not replace any other rules or laws for safety that are used in your area. Learn the rules or laws for safety that are used in your area. Make sure that your machine has the correct equipment according to these rules or laws.

It is recommended that you make copies of the safety rules in this manual and put the copies in the work area.

Pre-Starting



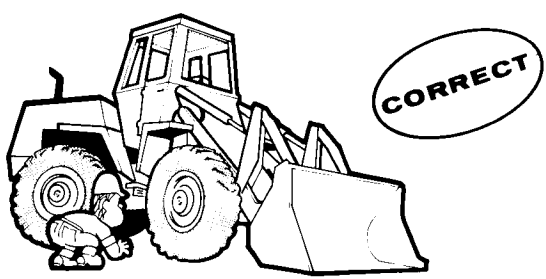
WARNING: *Before starting engine, study operator's manual safety messages. Read all safety signs on machines. Clear the area of other persons. Learn and practice safe use of controls before operating.*

It is your responsibility to understand and follow manufacturer's instructions on machine operation, service, and observe pertinent laws and regulations. Operators' and service manuals can be obtained from your J I Case dealer. *D-46-59*

IMPORTANT: Always install new decals if the old decals cannot be read. When parts that have decals are replaced, make sure to install new decals with the new part. You can get new decals from your Case dealer. 46-48-A

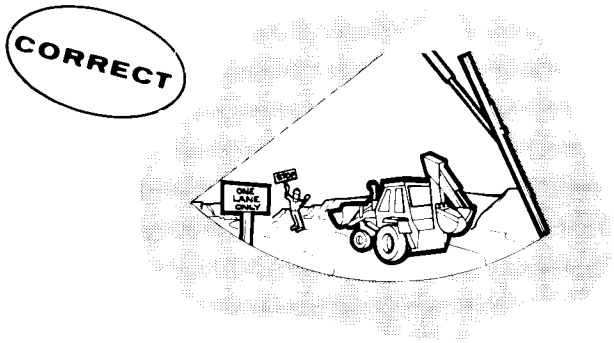
WARNING: *Before each period of operation, check the machine for correct function of the steering controls, brake controls, hydraulic controls, instruments, and safety equipment. Check the Neutral position of the transmission control levers. A machine that runs correctly can prevent accidents. Make all necessary repairs or adjustments before you operate the machine.* *26-4-C*

WARNING: *You can have an accident if a part or a system on the machine does not operate correctly. Before you operate the machine, make sure that you check all oil and fluid levels according to the maintenance chart in this manual. Tighten all caps, dipsticks and plugs. Check for oil or fluid leaks. Replace or adjust all parts that do not operate correctly.* *25-10-B*



CAUTION: *Before you operate at night, check that all lights (if the machine is so equipped) are working correctly.* 25-7-A

WARNING: *Make sure the windows of your cab are clean. Make sure the windshield wipers are operating correctly. Dirty windows can cause an accident.* 24-1-A



CAUTION: *Warn all personnel who may be servicing or in path of machine before starting.* D-28-10-A

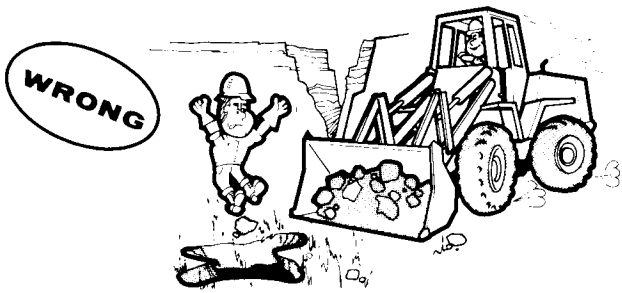
WARNING: *You can operate this machine only after the warning buzzer for the air pressure has stopped making noise.* 12-10-A

WARNING: ***Do not drive the machine unless the air pressure gauge needle can be maintained in the green zone.*** 5-1

WARNING: *Know the location of all underground electrical cables, water pipes, gas pipes, etc. A broken gas pipe or cut electrical cable can cause injury.* 26-8-A

CAUTION: *Review operators manual before operating this machine.* D-19-5

WARNING: *Before you start to work in a new area, walk around and look for holes or obstructions. Failure to find hidden holes or obstructions can cause an accident and injury.* 26-5-A



WARNING: *Keep a good fire extinguisher and a first aid kit with you at all times. Know how to use both of these items.* 25-9-A

WARNING: *If you wear clothing that is too loose or do not use the correct safety equipment for your job, you can be injured. Always wear clothing that will not catch on objects. Extra safety equipment that can be required includes hard hat, safety shoes, ear protection, eye or face protection, heavy gloves and reflector clothing.* 1-3-B

WARNING: *Before you operate this machine on a road, check the local laws. Know the correct safety equipment that must be used. Lights, flashing lights, backup alarm, rotating beacon, Slow Moving Vehicle emblem (SMV), etc., are available from your Case dealer.* 29-9-A

WARNING: *Make sure the entry area and operator's area are clear of oil, foreign material or ice. Remove or fasten all maintenance or personal items. Failure to keep these areas clean can cause a bad accident.* 48-24

CAUTION: *Know and understand the arrangements for movement of trucks, machines, persons, etc., on your job. Understand and follow the instructions of the flagman, road signs, or signals. Failure to follow these instructions can cause an accident.* 29-3-A

Machine Operation

WARNING: ***Before starting the engine, fasten seat belt securely, set the parking brake, shift transmission to neutral and close both doors. Failure to perform one of these steps could cause an accident.*** 29-6

WARNING: *BE VERY CAREFUL IF THIS IS NOT THE MACHINE YOU NORMALLY OPERATE.* 2-2-B

WARNING: *If you connect jumper cables wrong to the starter motor solenoid, the engine can be started with the transmission in gear. To prevent personal injury or damage to the machine, use the following procedure:*

1. *Two persons are required for jump starting.*
2. *Connect the positive jumper cable to the battery terminal of the starter motor solenoid.*
3. *Connect the negative jumper cable to a good engine ground. See the Operator's Manual for this machine. Sit in the operator's seat and then start the engine.*
4. *Have the other person disconnect the jumper cables.*

If you do not use the above procedure, the machine can move out of control and you or other persons can be seriously injured. D-48-21

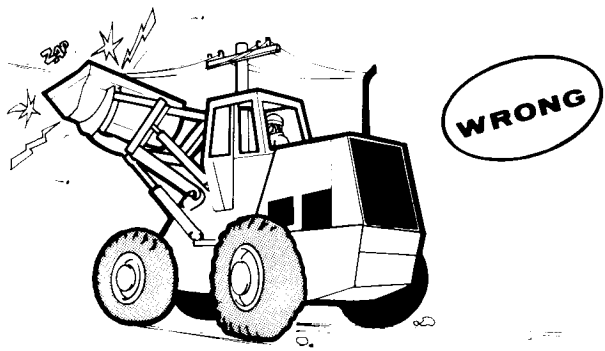
WARNING: *If the engine stops or the power steering system does not operate, stop the machine as quickly as possible to avoid an accident. The steering ability of this machine is greatly reduced if the engine stops or if the power steering system does not operate.* 34-8-A

CAUTION: *Always use the hand rails and steps when you get on or off the machine. Do not use the steering wheel or the controls as a hand rail. Any other method can cause an injury.* 12-9-B

DANGER: *Do not permit any part of the machine to come in contact with electric cables. If work must be done near electric cables, first make sure the Utility Company disconnects the power. It is not necessary for the machine to be in contact with the electric cable for the electricity to go through the machine. If the machine does come in contact with a power line, stay in the seat. Do not try to get off the machine. KEEP AWAY FROM THE METAL PARTS OF THE MACHINE.See the chart that follows.* 4-4-B

Voltage of Electric Cables	Minimum Amount of Clearance from the Electric Cables When the Machine is Working	Minimum Amount of Clearance from the Electric Cables When You Drive the Machine Between Jobs
50,000 volts or less	10 feet (3 m)	4 feet (1.2 m)
Over 50,000 volts	10 feet (3 m) plus 1/2 inch (10 mm) for every 1,000 volts over 50,000 volts	10 feet (3 m)
345,000 - 750,000 volts		16 feet (5 m)

NOTE: If the clearances in the specifications above are less than the clearances given in the rules and laws of your area, you must follow the rules and laws of that area.

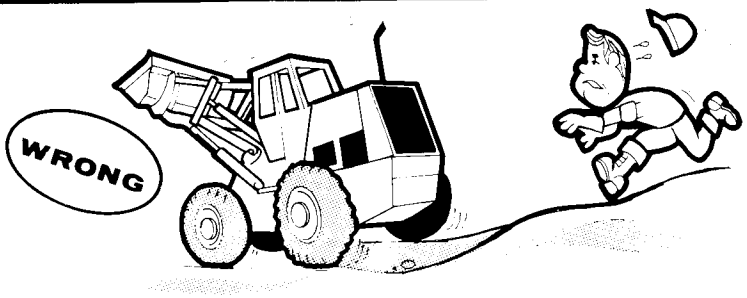


WARNING: *Keep the transmission in low gear when going down hills. Only use the right brake pedal to slow or stop the machine. The left brake pedal allows the machine to freewheel before the brake is applied. Do not allow the machine to freewheel down the hill.* 22-2-A

WARNING: *Understand the limits of the machine. Keep the machine under control at all times. DO NOT TRY TO DO TOO MUCH TOO FAST.* 3-7-B

WARNING: *Be careful when you operate the machine in dust, smoke or fog. If you can not see clearly, you can have an accident.* 34-7-A

CAUTION: *Never leave machine while engine is running.* D-46-72A



WARNING: *An explosion can result if sparks or flame contact the ether in the starting fluid container, or if you keep the container in an area with the temperatures above 120° F (49° C). Read the following.*

1. *Know the correct method for starting your engine with ether.*
2. *If you weld, grind, or use a cutting torch on the machine, always remove the starting fluid container from the machine. Use compressed air to remove any ether fumes from the area.*
3. *Do not breathe the ether vapor or let the ether touch your skin.*
4. *Keep the starting fluid container above the reach of children.*
5. *Never make a hole in the starting fluid container.*
6. *Do not put the starting fluid container in a fire.*
7. *When the temperature is above 35° to 40° F (0° to 5° C) remove the starting fluid container from the machine.*

Failure to follow the above procedure can cause a severe injury. 48-12-C

WARNING: *A warning buzzer in the machine will make a noise if the air pressure in the brake system is decreased below normal. If the air pressure continues to decrease, the parking brake will automatically engage. Make sure you are prepared for a sudden stop.*

46-73-B

CAUTION: *Never allow riders.* *D-17-9*

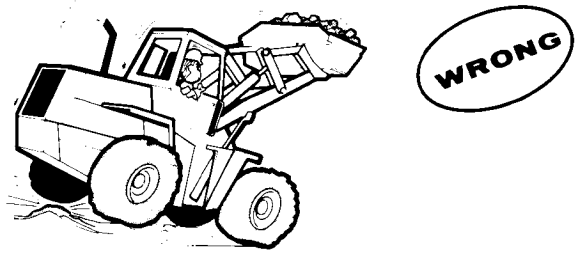
CAUTION: *Keep all personnel clear of loader arms, attachments and articulated joint area.* *D-46-71*

WARNING: *Operate the controls only from the operator's seat. Personal injury can be caused if you operate the controls from any other location.* *2-5-A*

CAUTION: *Keep hands on proper controls at all times while operating.* *D-46-69*

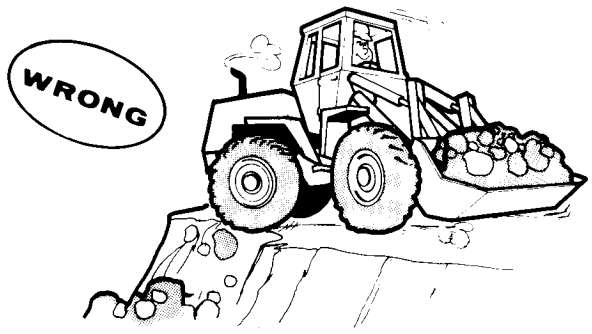
CAUTION: *Be careful when you leave the machine. Use the hand rails and steps on the machine. Any other method can cause injury.* *27-2-B*

CAUTION: *Always carry load low.* *D-9-10*



CAUTION: *Use low range for hillside or ramp operation. Never coast downhill with transmission in neutral. The machine could go out of control and tip over.* D-45-12

CAUTION: *Always operate slowly on hillsides, rough ground or ramps. Be extremely careful when working around trenches or banks. Failure to follow the above recommendations could cause the machine to roll over. Personal injury could result.* D-26-10-A

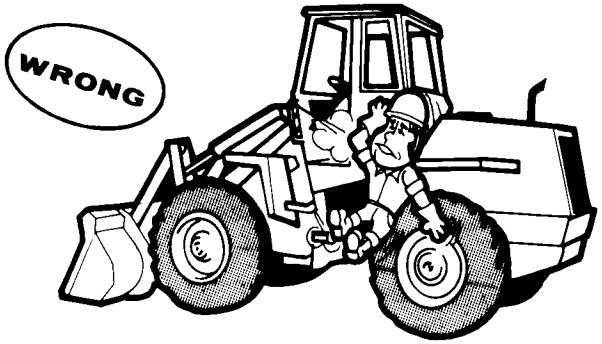


DANGER: *Sparks can come from the exhaust pipe or sparks can come from the electrical system. Do not operate in closed areas where there are flammable materials, dust or vapor that can cause an explosion or fire. Severe injury or death can be the result if you do not follow these instructions.* 47-99-B

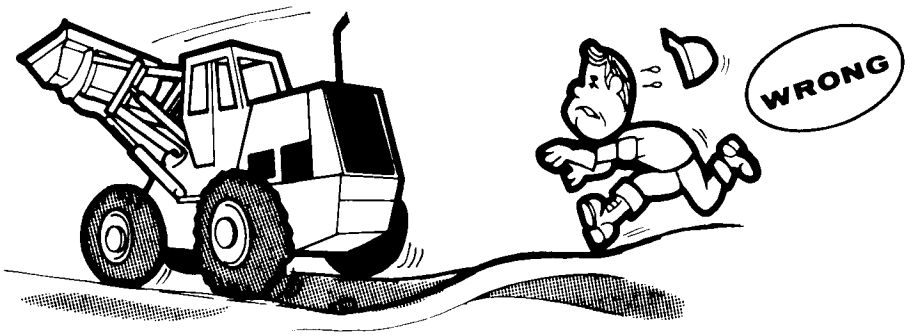
DANGER: *Engine exhaust fumes can cause death. If you operate this machine in a closed area, make sure there is good ventilation to remove all the exhaust fumes. You must replace the exhaust fumes with fresh air.* 48-1

Stopping the Machine

CAUTION: *Be careful when you leave the machine. Use the hand rails and steps on the machine. Any other method can cause injury.* 27-2-B



WARNING: *Make sure you are on level ground before you stop the engine and leave the machine. If you must stop on the side of a hill, put the side of the machine toward the bottom of the hill. Engage the parking brake and lower the loader bucket or attachment to the ground. Stop the engine and remove the key. Failure to follow these instructions can cause an accident.* 47-49



Service

CAUTION: *Do not try to do repairs that you do not understand. Get a service manual or call your Case dealer.* 6-1-A

WARNING: *When you adjust or service the machine, always follow the instructions in the operator's or service manual. If the engine must be running, always have an extra person help you. Do not leave the operator's seat while the engine is running. Failure to follow these instructions can cause injury.* 47-51-A

DANGER: *Batteries produce explosive gases. Keep sparks, flame and cigarettes away. Ventilate when charging or using in enclosed space. Always shield eyes when working near batteries.* D-38-14

POISON/DANGER: *Batteries contain sulfuric acid which can cause severe burns. Avoid contact with skin, eyes or clothing. Antidote: EXTERNAL flush with water; INTERNAL, drink large quantities of water or milk. Follow with milk of magnesia, beaten egg or vegetable oil. Call physician immediately; EYES, flush with water for 15 minutes and get prompt medical attention. Keep out of reach of children.* D-19-2-A

CAUTION: *Never wear metal rings or metal watch bands. You can make a ground for the electrical circuit and get a burn on your hand or arm.* 46-55-A

CAUTION: *Know the electrical circuit before you connect or disconnect an electrical component. A wrong connection can cause injury or damage.* 5-4-A

CAUTION: *When you remove a battery, always disconnect the (-) negative ground cable first. When you install a battery, always connect the (-) negative ground cable last. This procedure can prevent an explosion that is caused by a spark.* 47-38

WARNING: *When the battery electrolyte is frozen, the battery can explode if, (1) you try to charge the battery, or (2) you try to jump start and run the engine. To prevent the battery electrolyte from freezing, try to keep the battery at full charge. If you do not follow these instructions, you or others in the area can be injured.* 48-35

CAUTION: ***Do not service the air conditioning system unless you are completely familiar with air conditioning and the safety precautions which must be followed when handling liquid refrigerant. Liquid refrigerant can cause a severe and painful frostbite. See your Case dealer.*** ***32-3-A***

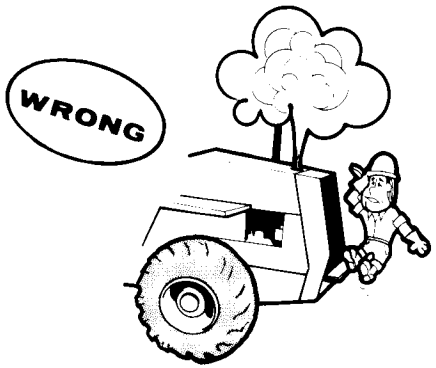
DANGER: *Engine exhaust fumes can cause death. If it is necessary to start an engine in a closed place, remove the exhaust fumes from the area with an exhaust pipe extension. If you do not have an exhaust pipe extension, make sure you open the doors and get outside air into the area.* 27-4-A

WARNING: ***Do not use the tire inflation hose to inflate tires or use it as an auxiliary source of air for any reason unless the air system in the machine has been purged of alcohol vapor. Use of air containing alcohol vapor could result in exploding tires and personal injury.*** ***31-5***

WARNING: *The split rim type wheel on this machine can be dangerous. When you add air to the tire, always (1) stand behind the tread of the tire or (2) put the tire in a tire cage. The retaining ring and rim of the wheel can come off with an explosive force. You or a person in the area can receive a serious injury.* 47-43-B

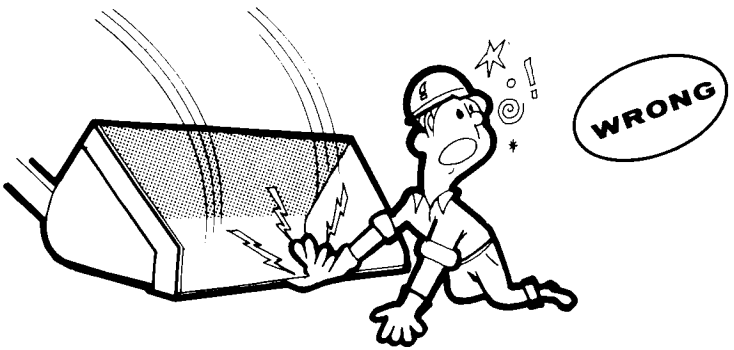
CAUTION: *When cleaning interior soft trim do not use volatile cleaning solvents such as acetone, lacquer thinner, carbon tetracholoride, enamel reducers, nail polish removers; or such cleaning materials as laundry soaps, bleaches or reducing agents. Never use gasoline or naptha for any cleaning purpose. These materials may be toxic or flammable, or may cause damage to interior trim.* 32-2-A

CAUTION: *Pressure cooling system. Remove cap slowly and only when engine is cool or painful burns could result.* D-28-2



CAUTION: *Wear eye or face protection when you service the machine. Use a hammer with a soft face, such as plastic, wood, brass or leather, when you hit hardened tools or hardened metal surfaces. Any other procedure can cause injury from flying chips.* 46-14-C

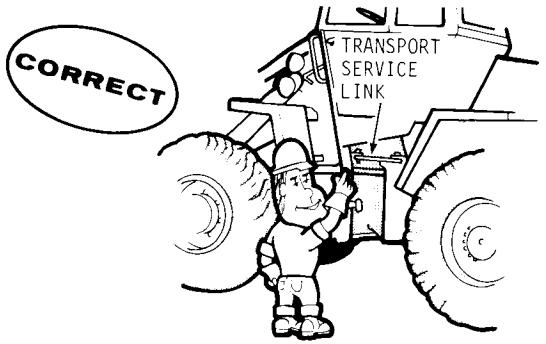
CAUTION: *Lower or block hydraulically or mechanically elevated components before servicing or when leaving vehicle.* D-46-70



CAUTION: *Do not try to do repairs that you do not understand. Get a service manual or call your Case dealer.* 6-1-A

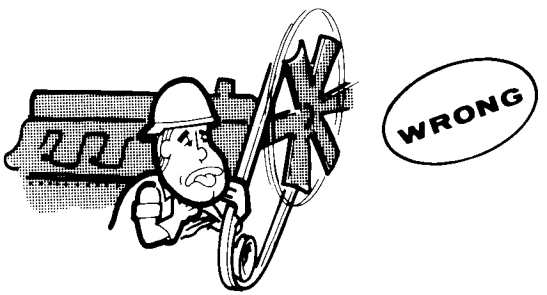
DANGER: *Keep clear of this area when engine is running. Machine could pivot unless the frame pivot safety link is in its lock position. After servicing is completed, unlock the safety link and secure in place on the rear frame pivot.*
D-32-4

CAUTION: *Transport/Service Link: Engage link for locking machine in straight ahead position only. Link will prevent machine from pivoting.*
D-39-15



WARNING: *Before you do service under the machine, put the machine on a level surface, engage the parking brake and stop the engine. Put blocks at the front and rear of the tires. Failure to follow these instructions can cause injury.* *46-77-A*

WARNING: *Rotating fan and belts: Contact can injure. Keep clear.*
D-39-13



WARNING: *Do not put fuel into the machine if (1) the engine is running, (2) you are near an open flame or (3) you have a burning cigarette, cigar, etc. You can cause a fire and a serious injury.*
6-6-A

WARNING: *Use extreme caution when disconnecting air pressure or hydraulic lines. High pressure in a system could cause injury when fittings are disconnected. Relieve all pressure in system before working on system.*
31-6

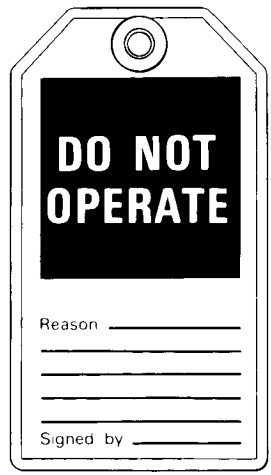
WARNING: *The hydraulic system operates at a very high pressure. The hydraulic oil, even from a very small leak, can go through your skin and cause serious injury. When you check for leaks, do not use your hands. Use a piece of wood or paper. Before you disconnect any hydraulic lines or components, make sure there is no pressure in the circuit. When you connect the hydraulic lines or components, make sure the connections are tight. If the hydraulic oil goes through your skin, get a doctor immediately.* 43-7-A

SPARK ARRESTER

Rules or laws of some areas can make it necessary for this machine to have a spark arrester or spark arrester muffler. Check the rules or laws in your area. Make sure that you do the correct maintenance to the spark arrester. See page 139 in the manual.

DO NOT OPERATE TAG

When you service, put a Do Not Operate tag on the instrument panel. A Do Not Operate tag, Case Part Number 321-4614, is included with each new machine. You can get extra tags from your Case dealer.



ROLL-OVER PROTECTIVE STRUCTURE

Your machine has a roll-over protective structure (ROPS). A ROPS label is fastened to the structure. The ROPS label has important information about ROPS. See page 25 for the location of the ROPS label.

The ROPS label shows the serial number of the ROPS, gross weight, approval and regulation numbers and model number of the machine.

Before you operate this machine, always make sure that the ROPS, and operator's seat belts are correctly installed.

Read the following important information.

SEAT BELT FOR THE ROPS

The seat belt is an important part of your ROPS. You must wear the seat belt at all times when you operate the machine.

POSSIBLE DAMAGE TO THE ROPS

If the machine has rolled over or the ROPS has been in some other type of accident (such as hitting an overhead object during transport) you must replace the ROPS to get as much protection as you had originally.

After an accident, check for damage to (1) the ROPS, (2) the operator's seat, (3) the seat belt and the seat belt mountings, and (4) all accessories, wiring, etc., in the ROPS. Before you operate the machine, replace parts which have damage.

DO NOT TRY TO WELD THE ROPS OR TO MAKE THE ROPS STRAIGHT.

MAINTENANCE AND INSPECTION OF THE ROPS

After the first 20 hours of operation and after every 500 hours of operation or six months, whichever comes first, do the following:

1. Check the torque of the ROPS mounting bolts. If necessary, tighten the bolts to the correct torque.

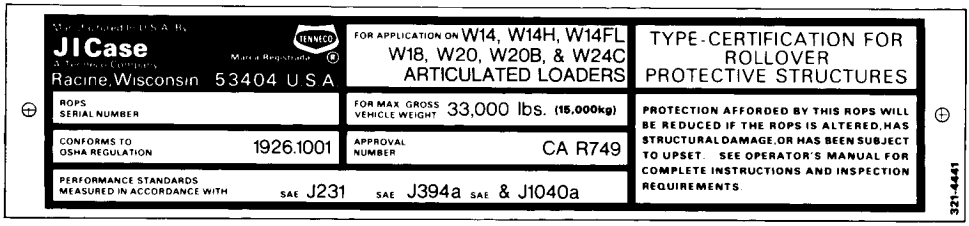
2. Check the operator's seat and the mounting parts for the seat belt. Tighten the bolts to the correct torque. Replace parts that have wear or damage.

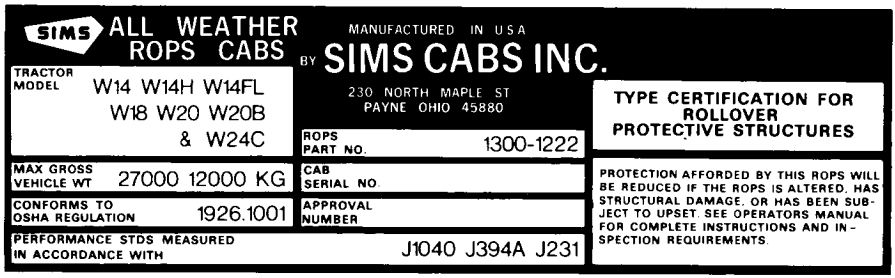
ROPS Safety Precautions

WARNING: *Do not remove the ROPS except for service. Install the ROPS correctly before you operate the machine again.* 3-10-A

WARNING: *Do not modify ROPS in any manner. Unauthorized modifications such as welding, drilling, cutting or adding attachments could weaken the structure and reduce your protection. Replace ROPS if subjected to rollover or damage. Do not attempt to repair. See operator's manual for complete instructions and inspection requirements.* D-46-91

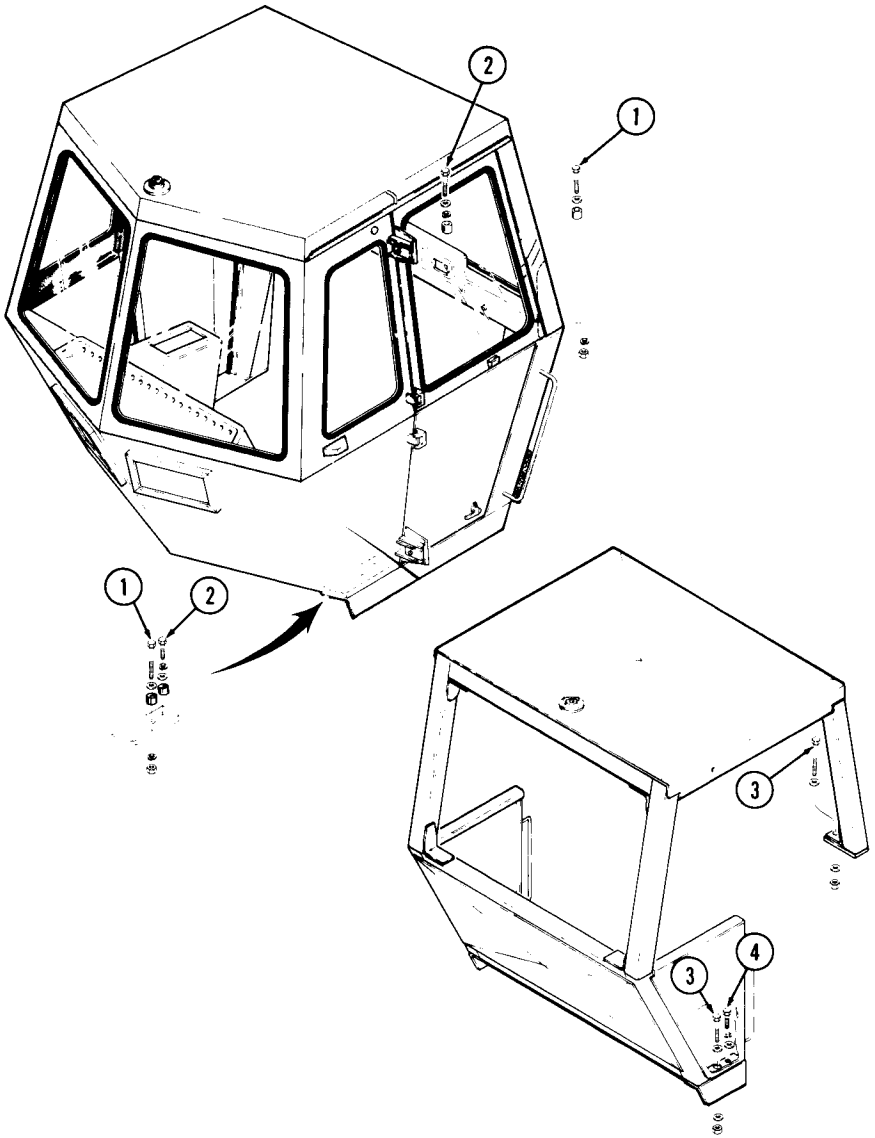
WARNING: *Do not install attachments that will cause the total gross vehicle weight of the machine to exceed the weight shown in the "FOR MAXIMUM GROSS VEHICLE WEIGHT" space on the ROPS label.* D-46-56-A



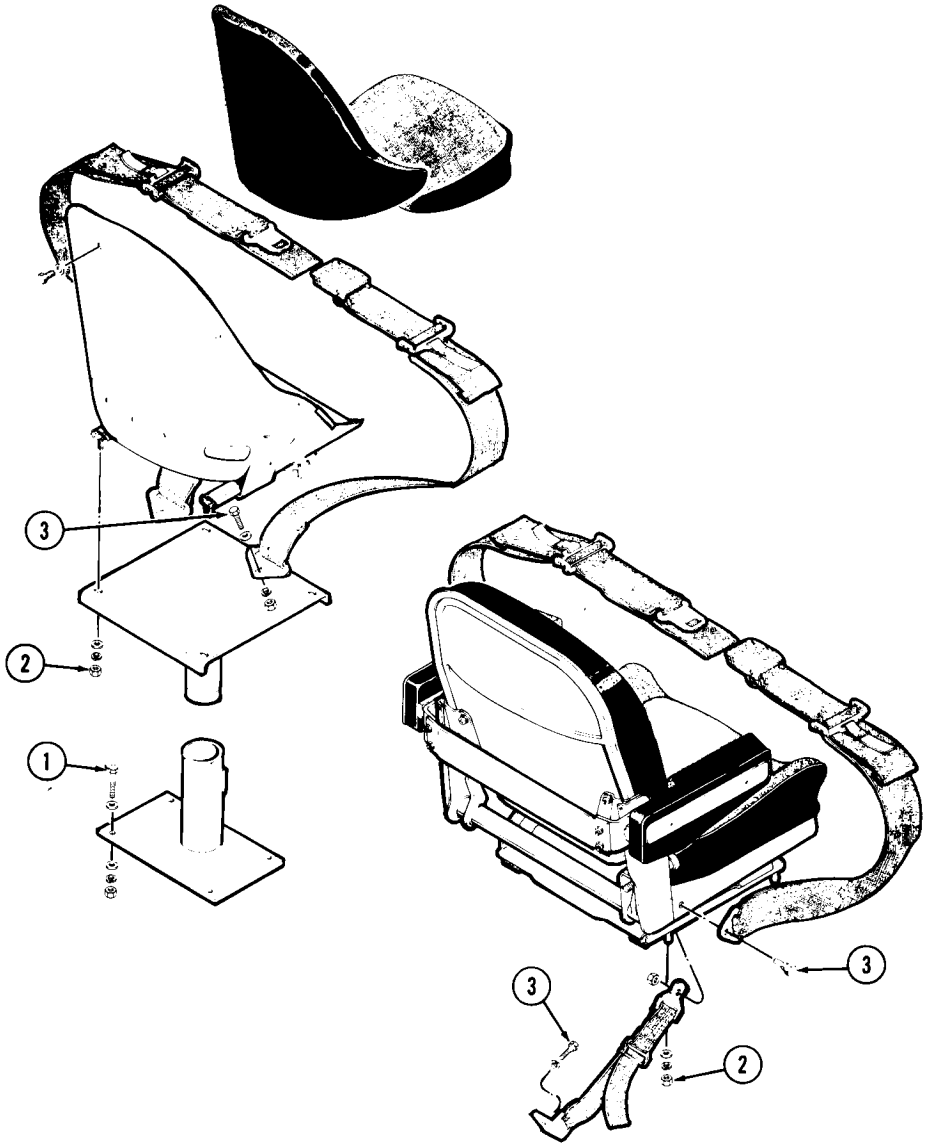


WARNING: *Special hardware is used to fasten the ROPS to the machine. You must use only the replacement parts shown in the Case parts catalog for this machine.* 4-9-A

WARNING: *Always fasten the seat belt before you start the engine. Make sure the buckle for the seat belt is fastened correctly.* 8-5-A



1. 3/4 Inch NC (Grade 8) 240-280 Foot-Pounds (325-380 N m)
2. 1/2 Inch NC (Grade 5) 45-55 Foot-Pounds (61-75 N m)
3. 3/4 Inch NC (Grade 8) 340-420 Foot-Pounds (461-569 N m)
4. 1/2 Inch NC (Grade 8) 100-120 Foot-Pounds (136-163 N m)



1. Tighten 25 to 35 Foot-Pounds (34-47 N m) Torque
2. Tighten 15 to 20 Foot-Pounds (20-27 N m) Torque
3. Tighten 65 to 85 Foot-Pounds (88-115 N m) Torque

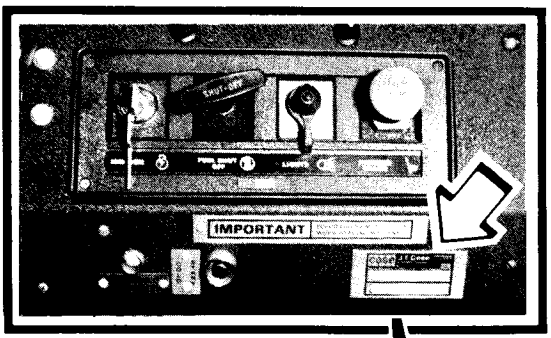
NOTE: Clean oil from threads on bolts and nuts that are reinstalled and tightened.

LOCATION OF PRODUCT IDENTIFICATION NUMBER (PIN) AND SERIAL NUMBERS

When you get parts or need information from your Case dealer, you must give the model number and the Product Identification Number (PIN). Also give the serial number of major components such as the engine, transmission, etc.

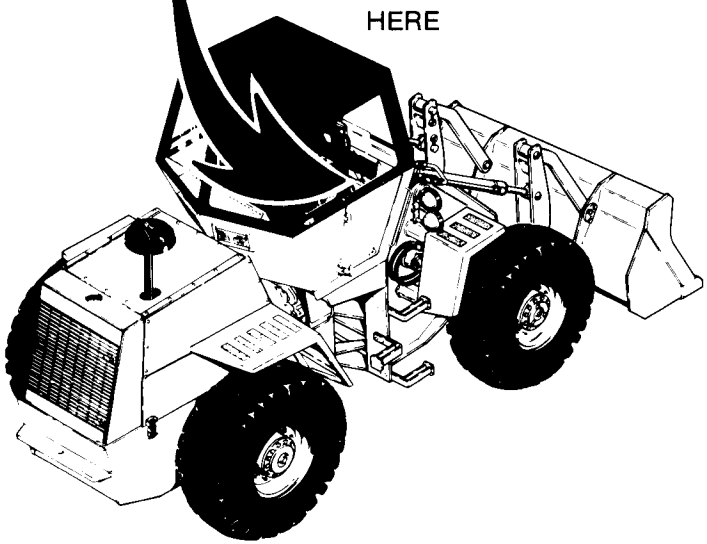
Production Identification Number

BASIC MACHINE - The Product Identification Number (PIN) is located on the right instrument panel.



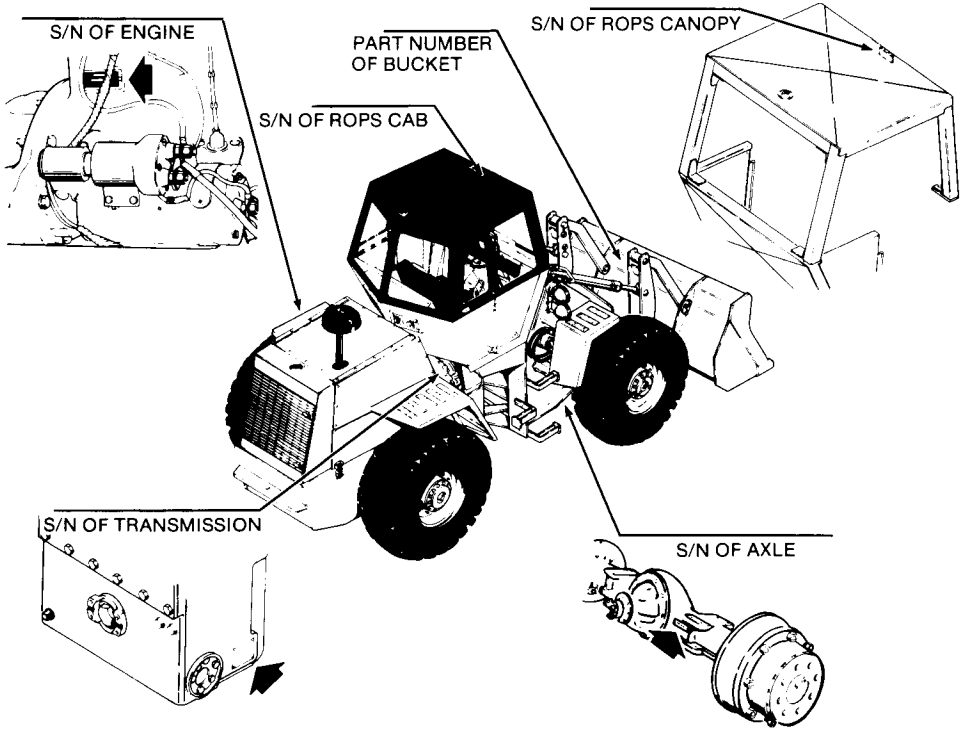
WRITE THE PRODUCT IDENTIFICATION NUMBER HERE

WRITE THE MODEL NUMBER HERE



Make a record of the above PIN and model number. Also make a record of the serial numbers shown on the next page. Keep these records and the Manufacturer's Statement of Origin in a safe place. If this machine is stolen, report the PIN, model number and serial numbers to your local law enforcement agency.

Serial Numbers and Part Numbers



SPECIFICATIONS

ENGINE

NOTE: All specifications are given according to ICED or SAE standards or Recommended Practices where the specification applies.

Model	Case 336BD
Type	4-cylinder diesel, 4 stroke, valve in head
Firing order	1-3-4-2
Bore and stroke	4-5/8" x 5" (117 x 127 mm)
Piston displacement	336 cu. in. (5506 cm^3)
Compression ratio	16.5 to 1
Horsepower	
Gross	93 @ 2200 rpm (69.4 kw @ 2200 r/mn)
SAE net	83 @ 2200 rpm (61.9 kw @ 2200 r/mn)
Engine speed	
Full throttle, no load	2330 to 2370 rpm
Rated, full load	2200 rpm
Idle	700-750 rpm
Fuel	See page 68.

COOLING SYSTEM

Radiator pressure cap	7 psi (48 kPa)
Thermostat range	175° to 202° F (80° to 94° C)

ELECTRICAL SYSTEM

Electrical system voltage	24 volts
Replacement bulbs (industry standard numbers)	
Left-hand instrument cluster, warning lights and gauge illumination) 12 v	No. 194
Right-hand instrument panel, panel illumination) 12V	No. 363
Taillights	No. 1683
Turn signals	No. 307
Dome light	No. 93
Replacement sealed beam units	
Headlights	No. 4880
Floodlights	No. 4578
Rotating beacon	No. 4505

HYDRAULIC SYSTEM

Loader pressure setting	2200 - 50 psi (15 168 - 345 kPa)

CAPACITIES

Cooling system	28 U.S. quarts (27 litres)
With cab heater	31 U.S. quarts (29 litres)
Fuel tank	38 U.S. gallons (144 litres)
Engine oil	
With filter change	11 U.S. quarts (10 litres)
Without filter change	10 U.S. quarts (9.5 litres)
Transmission - converter	
Total system	9 U.S. gallons (34 litres)
Refill	7-1/2 U.S. gallons (28 litres)
Axles, front and rear	
Center bowl	9-1/2 U.S. quarts (9 litres)
Each wheel end	3 U.S. pints (1.4 litres)
Hydraulic system, total	21 U.S. gallons (80 litres
Hydraulic reservoir refill	16 U.S. gallons (61 litres)
Alcohol evaporator	1 U.S. pint (.5 litres)

TRAVEL SPEEDS

Low forward (F)	7.0 mph (11.3 km/h)
High forward (H)	22.4 mph (36 km/h)
Reverse (R)	9.2 mph (14.8 km/h)

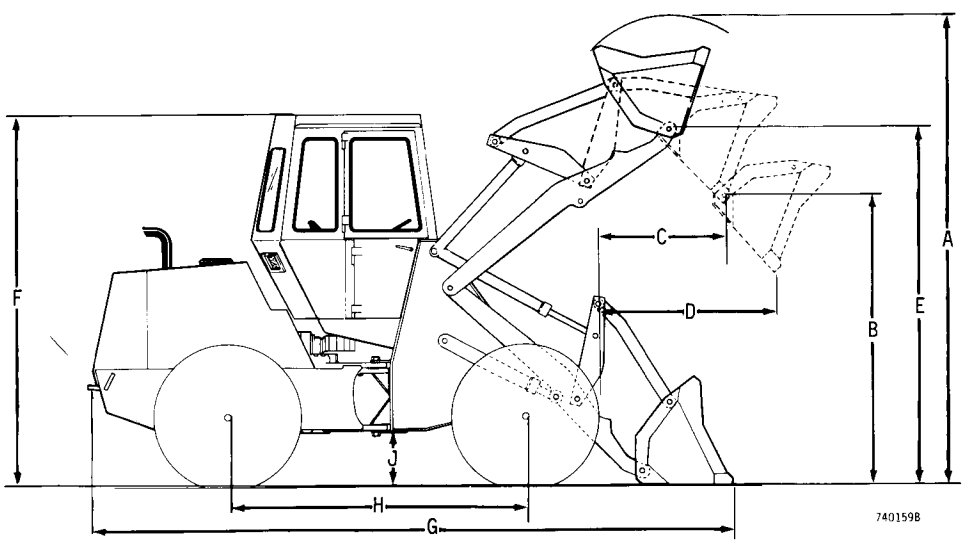
TIRES

Size	Ply Rating	Tread	Tire Pressure
13.00 x 24	8 PR	G2	45 psi (310 kPa)
13.00 x 24	12 PR	G2	70 psi (480 kPa)
14.00 x 24	8 PR	G2	40 psi (275 kPa)
14.00 x 24	10 PR	G2	50 psi (345 kPa)
14.00 x 24	12 PR	G2	65 psi (450 kPa)
15.5 x 25	8 PR	L2	40 psi (275 kPa)
15.5 x 25	10 PR	L2	45 psi (310 kPa)
15.5 x 25	12 PR	L2	55 psi (380 kPa)
16.9 x 24	10 PR	R4	32 psi (220 kPa)
18.4 x 26	10 PR	LS 2	25 psi (170 kPa)
15.5 x 25	16 PR	XRAT 1	Front 40 psi (275 kPa) Rear 30 psi (207 kPa)

LOADER OPERATING DATA AND DIMENSIONS

Specifications taken with 15.5 x 25 8 PR, L2 tires, 1-1/4 cu. yd. (0.96 m^3) bucket and no ballast.

	Rated bucket load, 1-1/4 cu.yd. at 3000 lb./cu. yd. (0.96 m^3 at 1361 kg/m^3	3,783 lbs. (1716 kg)
A	Overall operating height	14' 3" (4343 mm)
	Maximum dump angle, full height	50°
B	Dump clearance, at maximum height, 45° dump	9' 1" (2769 mm)
	Dump reach:	
C	At maximum height, 45° dump	2' 5-1/2" (749 mm)
D	At 7' (2134 mm) dump height, 45° dump	4' 1" (1245 mm)
E	Height to bucket hinge pin	11' 2" (3404 mm)
	Turning angle, left or right	40°
	Turning radius:	
	To outside bucket corner	16' 3" (9.91 m)
F	Height to top of cab	10' (3.05 m)
G	Overall length, bucket on ground	18' 1" (5.51 m)
H	Wheel base	100" (2540 mm)
	Tread, standard tires	68" (1727 mm)
J	Ground clearance	16" (406 mm)



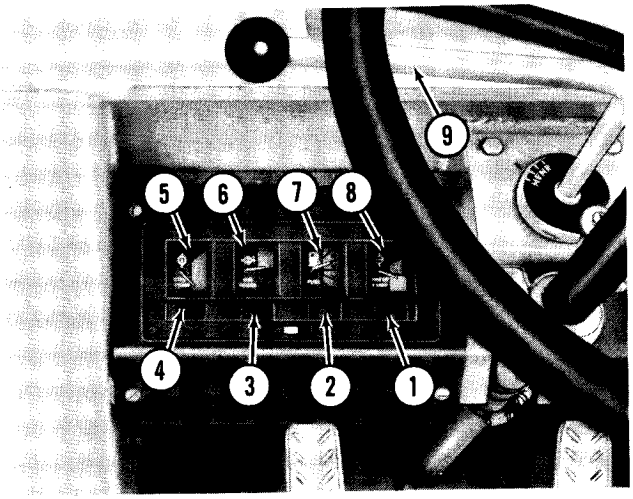
Loader Buckets

TYPE	CAPACITY	
	Heaped:	Struck:
General purpose	1-1/4 cu yd (0,96 m^3)	1.02 cu yd 0,78 m^3)
General purpose	1-1/2 cu yd (1,15 m^3)	1.29 cu yd (0,99 m^3)
Light material	1-3/4 cu yd (1,34 m^3)	1.45 cu yd (1,11 m^3)
4-In-1	1-1/4 cu yd (0,96 m^3	0.97 cu yd (0,74 m^3)

OPERATING INSTRUCTIONS

INSTRUMENTS AND CONTROLS

Left-Hand Instrument Cluster



1. CLUTCH PRESSURE WARNING LIGHT: The clutch pressure warning light indicates low or no oil pressure in the transmission clutches with the key switch turned on. The light also comes on when the clutch cutout (page 66) is engaged.

2. ENGINE OIL PRESSURE WARNING LIGHT: This light comes on (1) when the key switch is turned on and the engine is not running and (2) when engine oil pressure is low with the engine running.

3. ALTERNATOR WARNING LIGHT: This warning light will come on when there is a discharge condition in the electrical system.

4. BRAKE WARNING LIGHT: The brake warning light comes on when the parking brake is set.

5. CONVERTER OIL TEMPERATURE GAUGE: Normal operating temperature is within the green zone. If the gauge needle nears the red zone, stop and shift to neutral. Operate the engine at full throttle and allow oil to cool. However, if the needle continues moving into the red zone, stop the engine and check the radiator for obstructions or other cause.

6. AIR PRESSURE GAUGE: The air pressure gauge indicates air pressure in the brake system. Normal operating pressure is within the green zone. If the gauge needle moves into the red zone, a warning buzzer will sound. A further drop of air pressure will cause the parking brake to set automatically.

WARNING: *Do not drive the machine unless the air pressure gauge needle can be maintained in the green zone.* 5-1

7. FUEL GAUGE: The fuel gauge indicates the amount of fuel remaining in the tank.

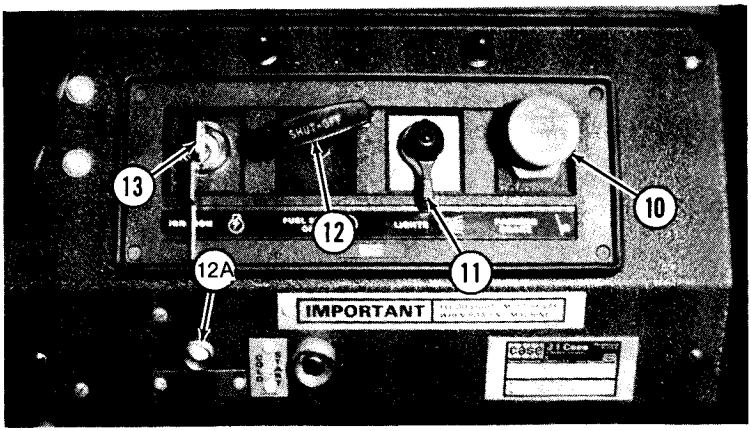
8. WATER TEMPERATURE GAUGE: This gauge indicates the engine coolant temperature. The green zone indicates normal operating temperature. If the gauge needle remains in the yellow zone or moves into the red zone, stop the engine and check the cause.

9. RANGE SELECTOR LEVER: This lever controls the direction of travel and selects high or low range. Push the lever forward to "F" position. The transmission is simultaneously shifted to forward travel and low speed range. Pull the lever back to "R" position for reverse travel. Lift the lever up and push it forward to the "H" position for high speed range. The "N" position is neutral. The range selector lever must be in neutral position before the engine will start.

   The transmission can be upshifted from low to high range while the machine is moving at any speed. When downshifting from high to low range, reduce machine speed so that it does not exceed maximum low range speed of 7 mph (11.3 km/h). Also refer to Clutch Cutout, page 66.

WARNING: *Keep the transmission in low gear when going down hills. Only use the right brake pedal to slow or stop the machine. The left brake pedal allows the machine to freewheel before the brake is applied. Do not allow the machine to freewheel down the hill.* 22-2-A

Right-Hand Instrument Panel



10. PARKING BRAKE CONTROL: Pull this control out to engage the parking brake. Push the control in to release. The parking brake will engage automatically if the air pressure is decreased below normal (pointer in red area of the air pressure gauge).

WARNING: *When you operate the backhoe or when you do service, use the hand throttle to control the engine speed. You can have an accident if you use the hand throttle for any other operation.*
46-23-A

11. LIGHT SWITCH: The light switch has four positions which turn on the following lights:

	1.	2.	3.	4.
Instrument Panel Lights	OFF	ON	ON	ON
Headlights	OFF	OFF	ON	ON
Front Floodlights	OFF	ON	ON	OFF
Rear Floodlights	OFF	ON	ON	OFF
Taillights	OFF	ON	ON	ON

12. FUEL SHUTOFF KNOB: Pull the lever out to stop the engine. After the engine has stopped, push the lever in and turn the key switch to the OFF position.

12A. WARNING LAMP FOR HYDRAULIC FILTER RESTRICTION: This warning lamp will illuminate when, (1) the engine is stopped and the key switch is On or, (2) the hydraulic oil filer requires service. See page 107.

13. KEY SWITCH: The key switch has four positions: (1) Accessory, (2) Off, (3) Run and (4) Start. The engine will not start without the key. The switch positions electrically activate the systems and components described in the following chart:

Machines Before *P.I.N. 9125771

	ACC.	OFF	RUN	START
Accessories	ON	OFF	ON	OFF
Gauges and Warning Lights	OFF	OFF	ON	ON
Fuel Pump (Optional)	OFF	OFF	ON	ON
Starter	OFF	OFF	OFF	ON
Cold Start Button	OFF	OFF	ON	OFF

Machines With *P.I.N. 9125771 and After

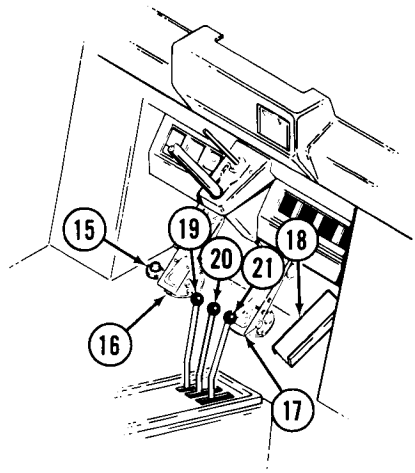
	ACC.	OFF	RUN	START
Accessories	ON	OFF	ON	OFF
Gauges and Warning Lights	OFF	OFF	ON	ON
Fuel Pump (Optional)	OFF	OFF	ON	ON
Starter	OFF	OFF	OFF	ON
Cold Start Button	OFF	OFF	OFF	ON

14. AIR PRESSURE WARNING BUZZER (not shown): When the key switch is turned on, the buzzer sounds if the air pressure gauge (item 6) registers in the red zone. Run the engine to allow air pressure to build up. If pressure remains low, stop operation and check the cause.

WARNING: *You can operate this machine only after the warning buzzer for the air pressure has stopped making noise.* *12-10-A*

*Product Identification Number (see page 24).

Operator's Compartment



15. AIR HORN BUTTON: Depress button to sound horn.

16. LEFT BRAKE PEDAL: When the left brake pedal is depressed, (1) the brakes are applied and the stoplight is turned on, (2) the transmission is disengaged, and (3) the clutch pressure warning light in the left-hand instrument cluster comes on. See Clutch Cutout, page 66.

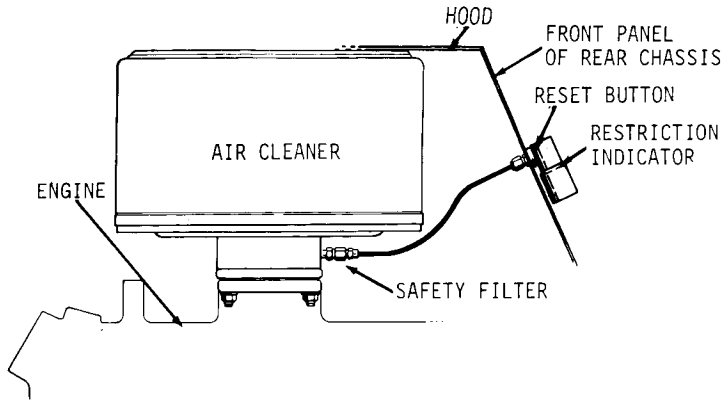
17. RIGHT BRAKE PEDAL: When the right brake pedal is depressed, the brakes are applied and the stoplight is turned on. The transmission remains engaged.

18. FOOT THROTTLE: Depress pedal to increase engine speed.

19. CLAM CONTROL LEVER: This lever controls the operation of the clam on machines equipped with a 4-In-1 Bucket. See page 46.

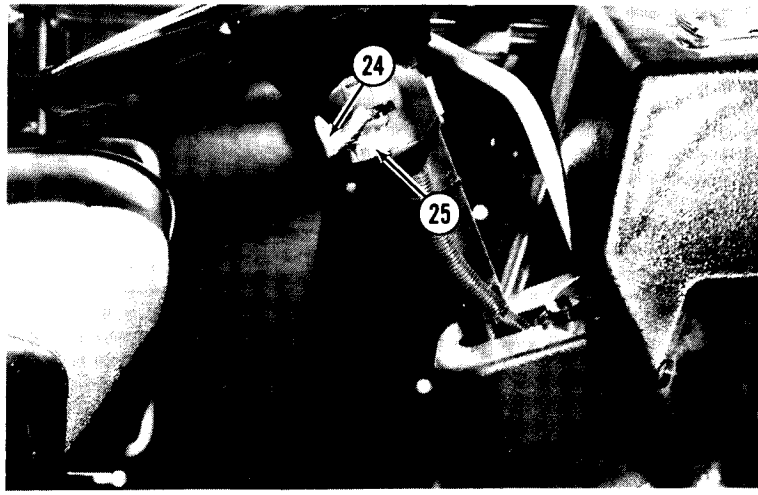
20. BUCKET CONTROL LEVER: The bucket lever controls bucket rollback and dump actions. See page 45.

21. LIFT CONTROL LEVER: The lift lever controls the raising and lowering of the loader lift arms. See page 45.



22. TACHOMETER (not shown): The engine tachometer is located on the front panel above the restriction indicator (see illustration above). The gauge indicates engine speed in hundreds of rpm's. An engine hourmeter is located in the lower half of the gauge which indicates hours and tenths of hours the engine has run.

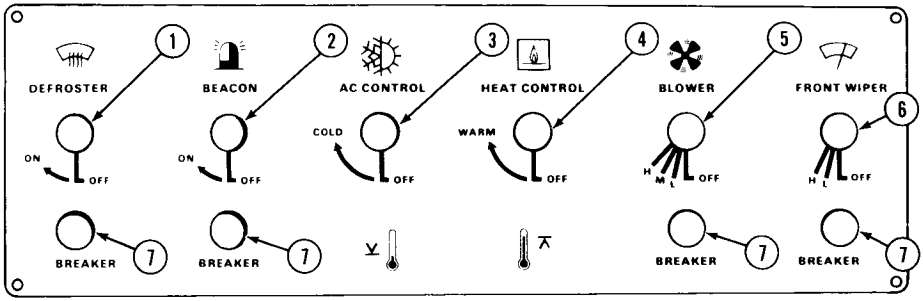
23. AIR CLEANER RESTRICTION INDICATOR: This gauge indicates the amount of dirt and dust in the air cleaner. When the red band shows full in the window, stop the engine and service the air cleaner elements. After the air cleaner has been serviced, push in the reset button.



24. TURN SIGNALS: Move lever up for a left turn and down for a right turn. To cancel the signal, move the lever to the center position.

25. SAFETY FLASHER LEVER: To use both turn signals together as safety flashers, pull out the flasher lever. To turn off the flashers, push in the lever.

ROPS Cab Controls



A control console, located within easy reach of the operator's left hand, contains the main cab operating and environmental controls.

1. DEFROSTER: Turn the defroster switch to On. The blower is located in the housing above the front window.

2. BEACON LIGHT: This switch controls an optional rotating beacon located at the top rear of the cab.

3. AIR CONDITIONER TEMPERATURE CONTROL: Turn the switch clockwise for desired air temperature. Turn the blower (item 5) switch to Medium or High position and open the air louvers on both sides of the operator. See Air Conditioning Operating Tips, page 39.

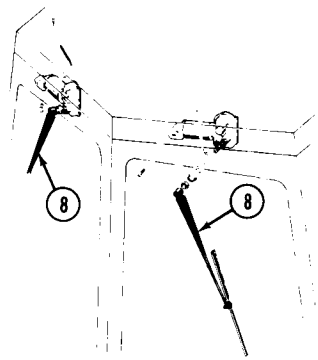
4. HEATER TEMPERATURE CONTROL: Turn the switch clockwise to attain the desired temperature. Turn the blower switch (item 5) to Medium, High, or Low speed. Open the air louvers.

5. CAB BLOWER FAN SWITCH: Three speed switch. Turn the knob clockwise to obtain the desired blower speed --- Low, Medium, or High. The blower fan pressurizes the cab when the windows are closed. This keeps air in the cab clean and dust-free. Run the blower continuously with the door and windows closed whenever weather conditions permit.

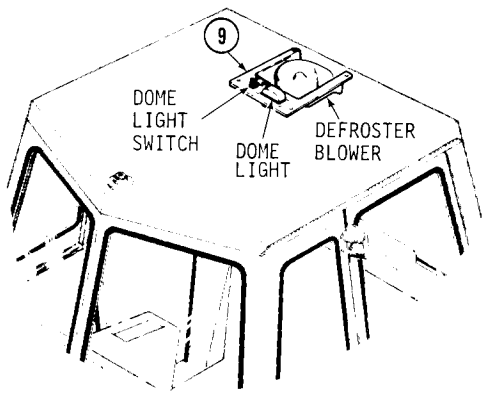
   NOTE: For best air conditioning results, operate blower fan in the Medium or High speed position.

6. FRONT WINDSHIELD WIPER: This is a two-position switch --- turn to Low or High speed as desired. To operate the rear wipers (if so equipped) see item 8 below.

7. CIRCUIT BREAKERS: Electrical circuits in the console are protected by circuit breakers. If a circuit fails, reset the circuit breaker below the switch by pushing in with your finger. If this does not restore the failed circuit, see your Case Dealer.

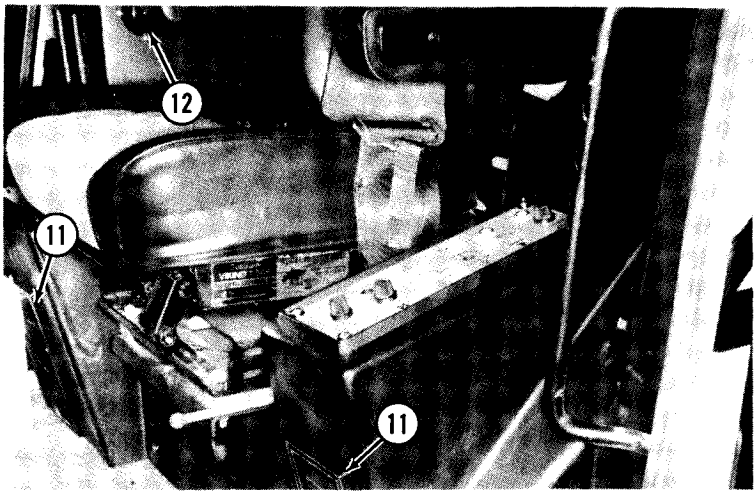


8. REAR WINDSHIELD WIPERS: Two optional wiper blades can be installed at the rear cab window. The on-off switch is located on each wiper motor.



9. DEFROSTER BLOWER AND DOME LIGHT SWITCH: This unit is located above the front window. The on-off switch at the rear of the unit controls the cab dome light.

10. WINDOW LATCHES: (Not shown) The door windows can be swung open if desired. Unlatch and swing the windows completely to the rear and secure them with the latch on each side. DO NOT drive the machine unless the windows are secured.



11. AIR LOUVERS: These louvers are adjustable to control the amount of cooled or heated air entering the cab.

12. BALL LOUVERS: An adjustable ball louver is located on each side of the operator. Turn the louvers as desired to direct air flow.

Air Conditioning Operating Tips

IMPORTANT: For the most efficient operation of the air conditioning system, operate the blower fan at either medium or high speed and then vary the temperature control to arrive at a comfortable setting.

NEVER operate the blower fan in the medium speed position when the Air Conditioning temperature control is in the coldest position. Failure to operate the blower fan at a high enough speed when the air conditioner is operating can result in evaporator icing (freeze) up and no cooling.

The blower speed and temperature control will have to be adjusted together for the most efficient cooling depending upon outside temperature. Remember: high cooling - high fan speed. If the cab air is too cold ALWAYS adjust the temperature control to a warmer setting before reducing the blower speed.

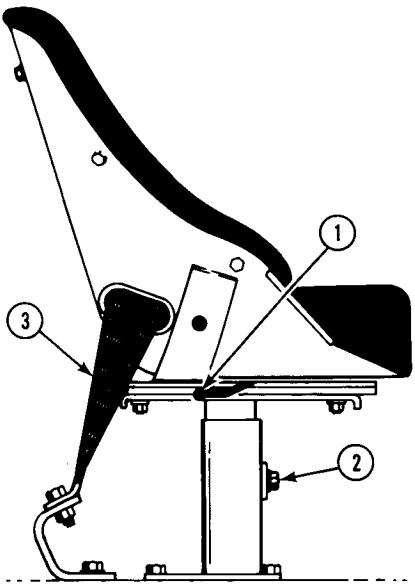
Under normal operating conditions, with the cab sealed properly and the windows and doors closed, temperatures of 10 to 25 fahrenheit degrees (5.5 to 13.8 celsius degrees) depending upon relative humidity) lower than the outside temperature can be expected. Humidity is also greatly reduced when operating the air conditioning system, making the cab even more comfortable to the operator.

NOTE: If you notice that the air conditioner stops working, refer to page 123.

Operator's Seats

"Junior Road King" Seat

The seat illustrated below is provided with all units unless an optional suspension seat is ordered. See page 41.



1. SEAT HORIZONTAL ADJUSTMENT LEVER: Pull lever forward and move seat forward or backward to desired position. Release lever. The seat can be adjusted 2-1/2" (64 mm) forward or backward from the center position.

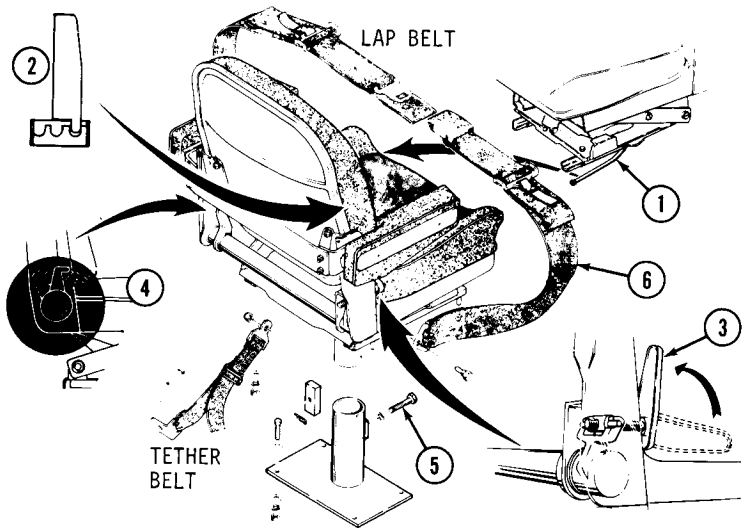
   NOTE: If your seat has an adjusting lever in the front, move the lever to the left to release the seat lock. Release the adjusting lever after you have adjusted the seat.

2. SEAT HEIGHT ADJUSTMENT: Loosen bolt and adjust seat to desired height.

3. SEAT BELT: Adjust seat belt length so it fits snugly without being tight. If the seat belt is damaged in any way, it must be replaced immediately.

Suspension Seat

The seat illustrated below is provided as optional equipment on all units.



1. FORE AND AFT SEAT ADJUSTMENT: The assembly moves forward or back 4" (102 mm) along ball bearing slides.

2. BACK ANGLE ADJUSTMENT: Backrest can be lifted out and placed in any of three positions to suit operator's preference.

3. WEIGHT ADJUSTMENT LEVER: This hand-operated lever controls a ratchet mechanism which adjusts the torsion bar to the operator's weight - from 130 to 275 pounds (59 to 125 kg). Adjust with the operator in the seat. Proper adjustment will position the seat and operator midway in the suspension, thus limiting topping and bottoming in rough terrain. Proper adjustment is indicated by item 4 below.

4. RIDE LEVEL INDICATOR: This indicator is located inside the left frame upright. When properly adjusted, the tip of the indicator is flush with the frame (see illustration).

5. SEAT HEIGHT ADJUSTMENT: Loosen bolt and adjust seat to desired height.

6. SEAT BELT: Adjust as follows: Adjust seat to desired height. With seat empty, take slack out of tether belt on each side. Sit in seat and adjust lap belt to fit snugly without being tight.

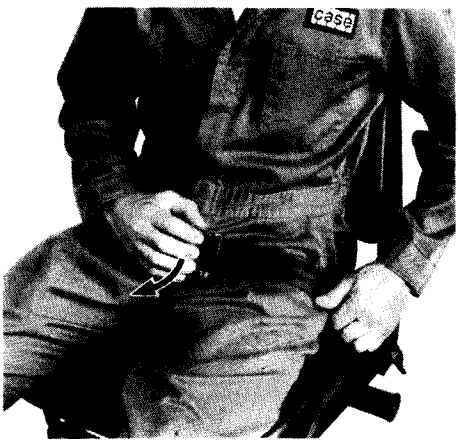
OPERATOR'S SEAT BELT

(Use Seat Belt Only if Machine Has a ROPS Cab or ROPS Canopy)

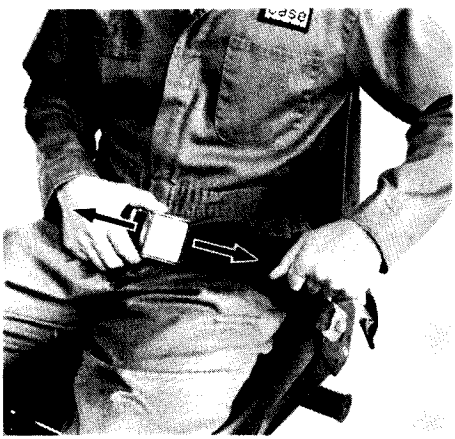
NOTE: The illustrations that follow show the correct procedure to fasten, release, tighten and loosen the belt. Refer to page 126 for correct inspection and care of seat belt.

CAUTION: *Always fasten seat belt securely before starting engine.*
D-17-6

Fasten



Release

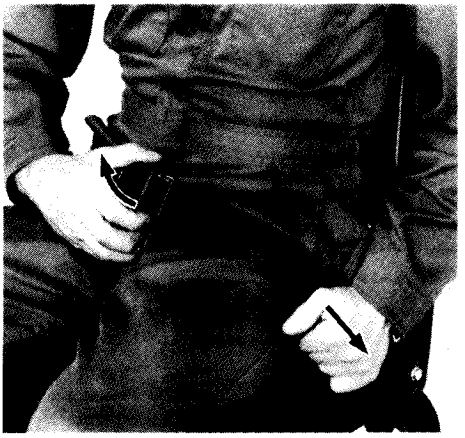


Tighten

Loosen

Two Inch (50 mm) Seat Belt

Fasten



Release

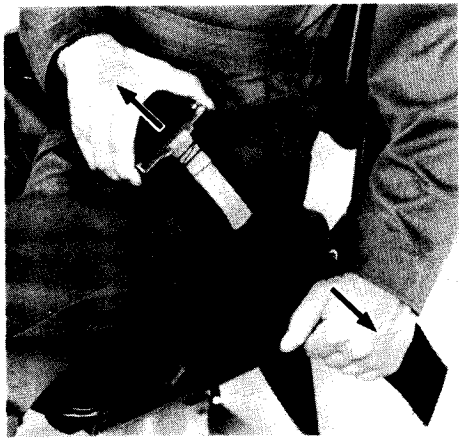
Tighten

Loosen

Three Inch (76 mm) Seat Belt

Fasten

Release

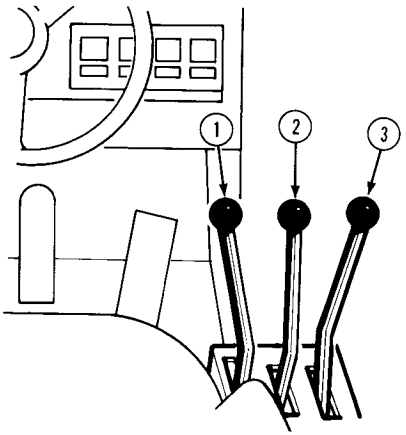


Tighten

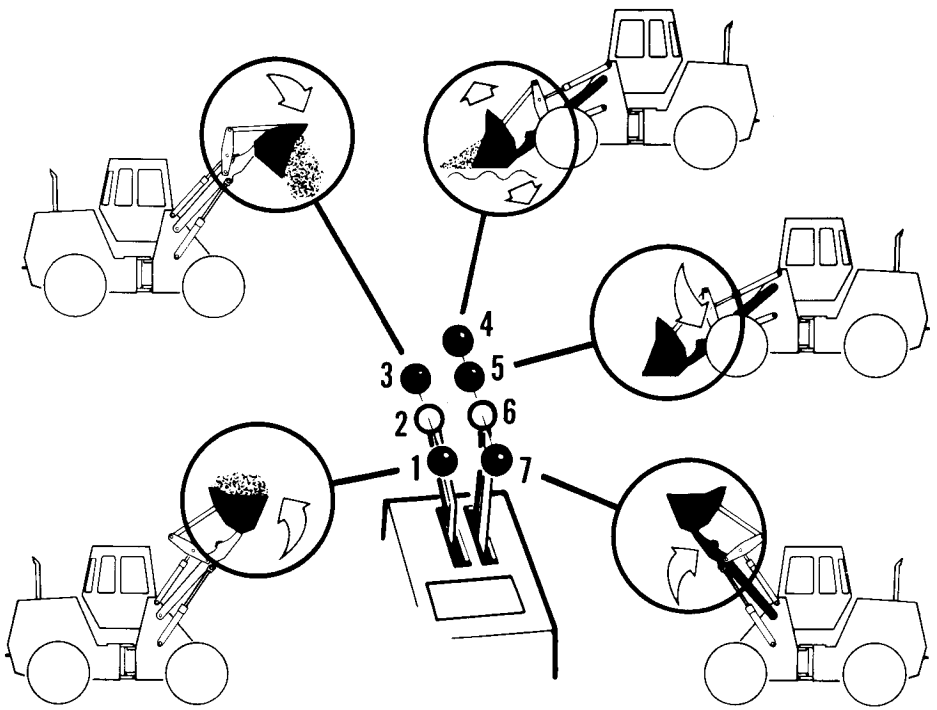
Loosen

Three Inch (76 mm) Seat Belt

LOADER CONTROLS



1. Clam Control
2. Bucket Control
3. Lift Arm Control



Bucket Control

1. Rollback
2. Hold (Neutral)
3. Dump

Lift Arm Control

4. Float
5. Lower
6. Hold (Neutral)
7. Raise

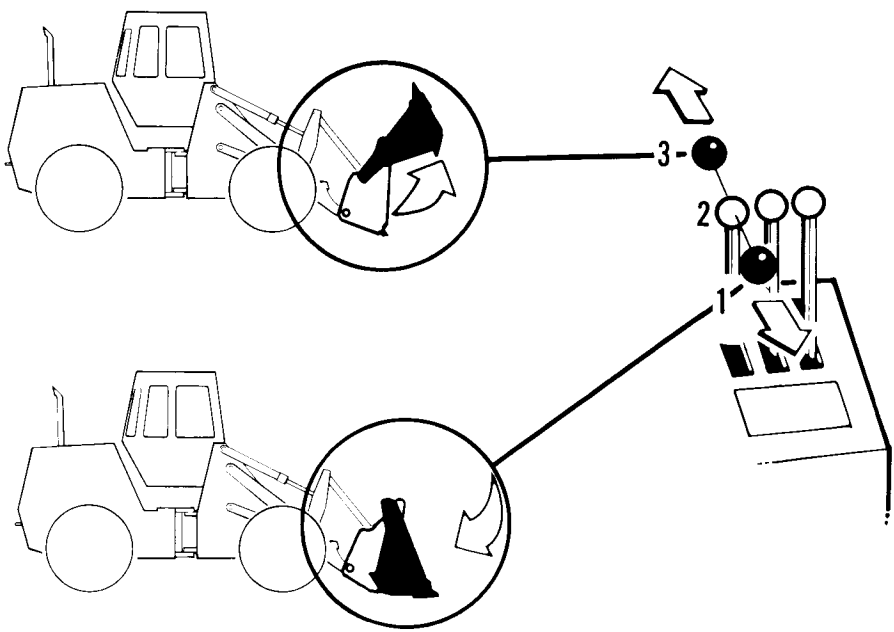
The levers are held by electromagnets in the Raise and Rollback (Crowd) positions and must be returned to Hold manually.

NOTE: When loading the bucket (Tilt lever in Rollback position) on units equipped with Return-To-Dig, hold the lever in position manually. It is possible for the lever to return to Hold before you get the desired amount of rollback.

When the control lever is placed in the Float position, the bucket is free to follow the contour of the ground.

4-In-1 Bucket Controls

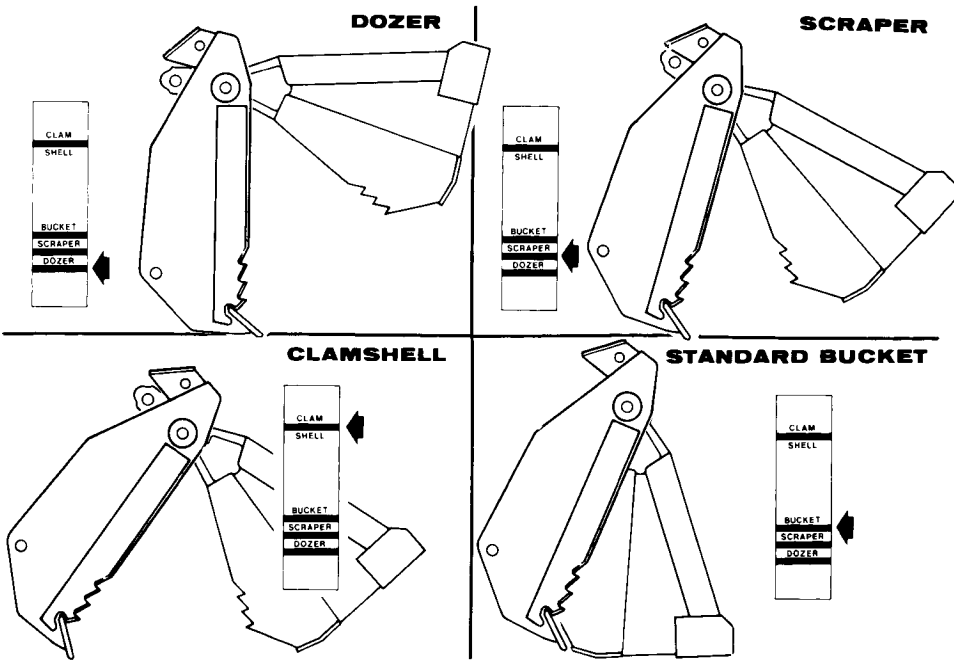
Clam Control Lever



1. Close
2. Hold (Neutral)
3. Open

Selector Gauge

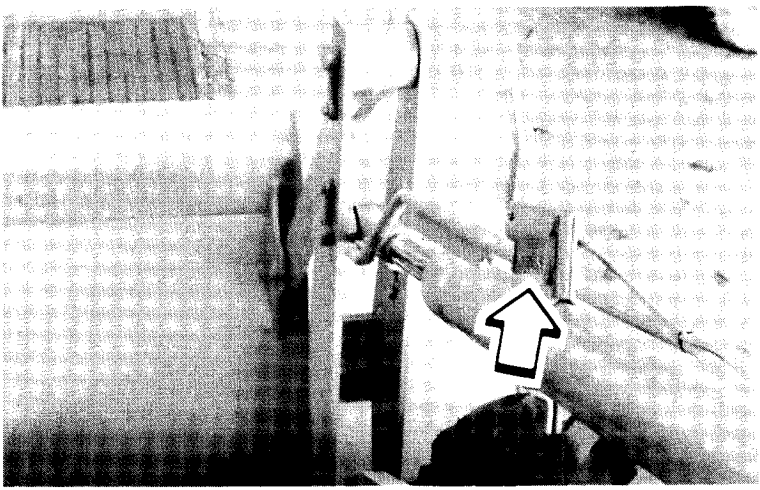
The 4-In-1 Bucket can be quickly converted from a standard bucket to a blade, scraper, or clamshell by adjusting the bucket tilt and clam opening as shown below. Have bucket on or near the ground when making adjustments. The gauge indicates the type of usage.



Bucket Level Indicator

The bucket level indicator consists of a rod and a metal plate mounted with brackets on the right-hand tilt cylinder.

When the ends of the rod and plate are in alignment, the bottom of the loader bucket is level or parallel to the ground.

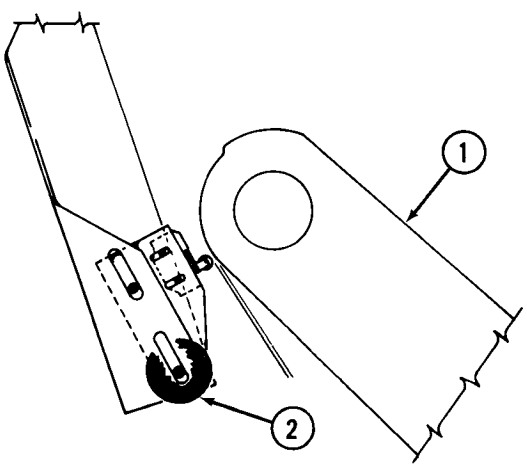


Bucket Height Control

The bucket height control automatically stops the lift arms and bucket from rising beyond a present height.

The height control is mounted behind the right-hand lift arm pivot. To preset the height:

1. Raise bucket to desired height.



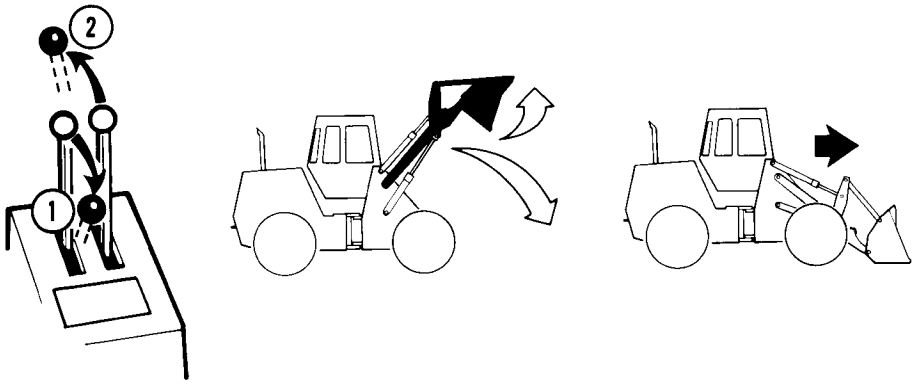
1. Lift Arm Pivot
2. Knob

2. Loosen the height control knob mounted on the right-hand loader upright.

3. Use the knob to move the limit switch bracket up or down as required until the limit switch is just closed by the actuator on the lift arm. Tighten knob.

NOTE: The limit switch may occasionally need adjustment. See page 134.

Return-To-Dig



1. Bucket Control in Rollback Position
2. Lift Arm Control in Float Position

Return-to-dig is used to automatically position the bucket for the next loading pass after you have dumped it. This permits you to concentrate on maneuvering the machine.

After the bucket has been dumped, pull the bucket lever back into Rollback position, and push the lift arm lever forward into Float position. See illustration above. The bucket will lower and automatically return to digging position.

At the end of the cycle, the bucket lever will automatically release from the Rollback Detent position and return to Hold position. The lift arm lever will remain in Float Detent position and must be manually returned to the Hold position.

For Return-To-Dig adjustments, see page 133.

ENGINE OPERATION

First Period of Operation with a New Engine

During the first period of operation of a new engine you must do the following:

1. LOAD - For the first 8 hours, operate with a normal load. Do not permit a transmission or hydraulic stall longer than 10 seconds.

2. ENGINE SPEED - During the first period of operation, operate the engine at maximum speed when safe.

3. OPERATING TEMPERATURE - Keep the operating temperature of the engine at the normal level. Low operating temperature can cause acids and deposits in the engine.

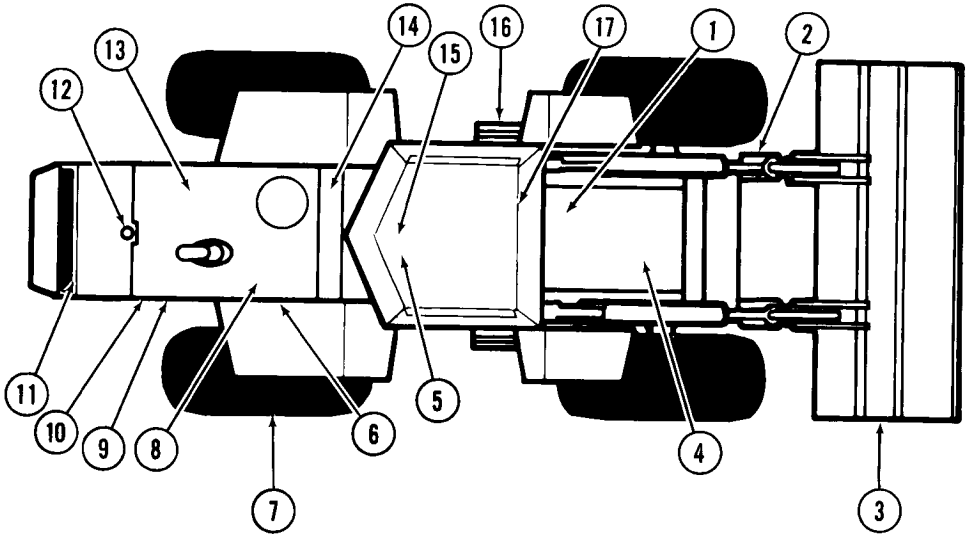
4. ENGINE OIL - Change the engine oil and oil filter after the first 20 hours of engine operation.

5. COOLING SYSTEM - If the machine has been operating with a load, run the engine at idle speed for several minutes before you stop the engine. This permits the engine parts to become cool evenly.

Before starting the engine for the first time and before each operating period, carefully follow the information in this manual.

Service and Checks Before You Start

Check the machine before starting the day's work or before each shift change. See the following illustration and do the recommended checks before starting the engine.



SAFETY DECALS: You must clean or replace all safety or instruction decals that you cannot read. See page 76.

1. FRONT LIGHTS: Check for damage.
2. BUCKET LINKAGE: Check for damage and grease all loader pivot points.
3. BUCKET: Check for damage.
4. FRONT AXLE: Check for leaks.
5. PIVOT AREA: Check for trash and leaks.
6. AIR RESERVOIR: Drain water.
7. TIRES: Check air pressure. Check for cuts and gouges.
8. REAR AXLE: Check for leaks and grease rear axle trunnions.
9. ENGINE COMPARTMENT: Check for oil and fuel leaks.
10. COVERS AND GUARDS: Check for damaged or missing parts.
11. REAR LIGHTS: Check for damage.
12. COOLING SYSTEM: Check for leaks and trash on radiator. Check for correct coolant level.
13. ENGINE OIL: Check oil level.
14. AIR CLEANER SERVICE INDICATOR: Check condition of air cleaner elements.
15. TRANSMISSION: Check for leaks.
16. OPERATOR'S AREA: Clean.
17. INSTRUMENT PANEL: Check for damage.

NOTE: The checks above include all items in the 10 Hour Interval of the Maintenance Chart. See page 72. For more information, see the Maintenance and Lubrication section of this manual.

Starting the Engine

CAUTION: *Always fasten seat belt securely before starting engine.*
D-17-6

Standard Engine

1. Make sure the bucket and lift arm levers are in Neutral.
2. Engage parking brake.
3. Put range selector lever in Neutral.
4. Push in the fuel shutoff control.
5. Depress foot throttle about one-third to one-half.
6. Turn key switch to Start position (extreme right) and hold it there to engage the starter and crank the engine.
7. When engine starts, release the key switch. It will return to Run position.

   NOTE: When the key switch is turned on, the clutch pressure, engine oil pressure, and alternator warning lights will come on. when the engine starts, all three lights will go out. If one or more stays on, shut off the engine immediately and determine the cause.

8. If engine fires and stops, wait for the starter motor to stop turning over before re-engaging it.
9. Do not operate the starter motor more than 30 seconds at one time. Wait at least 3 minutes between each cranking so batteries can recuperate and the starter motor can cool.
10. While the engine is being cranked with the starter, white or black exhaust smoke will be observed at the top of the exhaust pipe. If no smoke is observed and the engine will not start, it indicates that no fuel is getting into the cylinders.
11. Do not accelerate the engine above low idle immediately after starting the engine. This will allow the engine oil pressure to build up first.
12. The machine cannot be moved until the air pressure warning buzzer stops sounding, the air pressure gauge needle is in the green zone and the parking brake released.
13. For starting aids, see pages 55 to 57.

Turbocharged Engine

The following applies to machines in which a high altitude compensating kit has been installed.

1. Make sure the bucket and lift arm levers are in Neutral.

2. Engage parking brake.

3. Put range selector lever in Neutral.

4. In cold weather, after several weeks standing, or with an oil filter change, pull out the fuel shutoff control and crank the engine for 20 to 30 seconds to prime the turbocharger.

5. Push in the fuel shutoff control.

6. Depress foot throttle about one-third to one-half.

7. Turn key switch to Start position (extreme right) and hold it there to engage the starter motor.

8. When engine starts, release the key switch. It will return to Run position.

   NOTE: When the key switch is turned on, the clutch pressure, engine oil pressure, and alternator warning lights will come on. When the engine starts, all three lights will go out. If one or more stays on, shutoff the engine immediately and determine the cause.

9. If engine starts and stops, wait for the starter motor to stop turning before re-engaging it.

10. Do not operate the motor more than 30 seconds at one time. Wait at least 3 minutes between each cranking so batteries can recuperate and the starter motor can cool.

11. While the engine is being cranked with the starter, white or black exhaust smoke will be observed at the top of the exhaust pipe. If no smoke is observed and the engine will not start, it indicates that no fuel is getting into the cylinders.

12. When the engine starts, run at 1000 rpm for two minutes to circulate oil to all parts of the turbocharger.

13. The machine cannot be moved until the air pressure warning buzzer stops sounding, the air pressure gauge needle is in the green zone and the parking brake released.

Idling

Avoid idling the engine at low idle speed for long periods. This will not maintain the engine operating temperature.

Prolonged idling, and resultant low engine temperature, can cause destructive acid formation, heavy valve deposits and possible serious damage to the engine. Proper operating temperature keeps an engine efficient and clean.

The engine must never be idled for long periods during the run-in period and during extremely cold weather.

Stopping the Engine

WARNING: *Make sure you are on level ground before you stop the engine and leave the machine. If you must stop on the side of a hill, put the side of the machine toward the bottom of the hill. Engage the parking brake and lower the loader bucket or attachment to the ground. Stop the engine and remove the key. Failure to follow these instructions can cause an accident.* 47-49

Standard Engine

To stop the engine, reduce engine speed to low idle, lower attachments to the ground, set the parking brake and pull out the fuel shutoff control. When the engine has stopped, turn the key switch to the Off position, remove the key and push in the fuel shutoff control.

Turbocharged Engine

The following applies to machines in which a high altitude compensating kit has been installed.

Before stopping the engine, reduce speed to low idle, lower attachments to the ground, set the parking brake and allow the engine to idle for two minutes. Pull out the fuel shutoff knob. Turn the key to Off position. Remove key and push in the fuel shutoff knob.

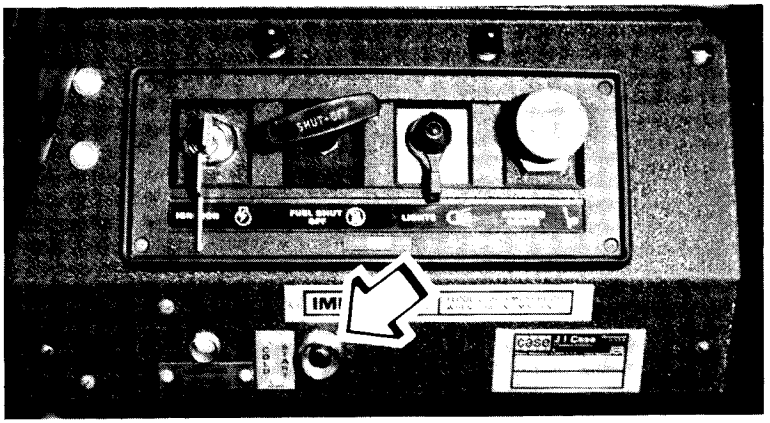
If the machine is kept outdoors overnight, cover the exhaust stack to keep moisture out of the turbocharger.

Starting Aids

Cold Start (Before Machine S/N 9125771)

The cold start system electrically injects ether into the air intake system. To operate, turn key switch to Run position and depress cold start button for one second. Wait two seconds and crank engine.

WARNING: *Do not have a burning cigarette, cigar, etc., when you use starting fluid. Never make a hole in the starting fluid container. Do not use starting fluid near an open flame or put the starting fluid container into a fire. Use only small amounts of starting fluid. Never put starting fluid in storage in a hot area.* *1-10-A*



Cold Start (With Machine S/N 9125771 and After)

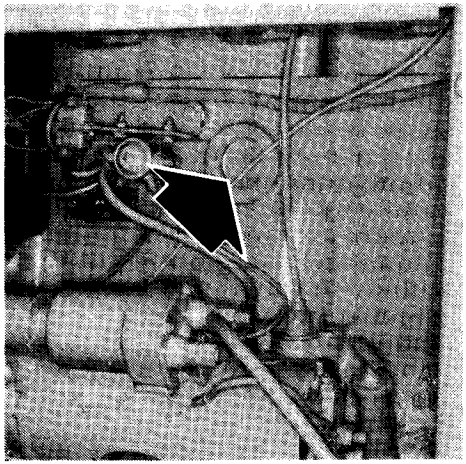
The cold start system electrically injects ether into the air intake system. It is used to aid engine starting in cold weather. The system injects a measured amount of ether each time the button is pushed in. It will operate only when the key switch is in the Start position. To operate, proceed as follows:

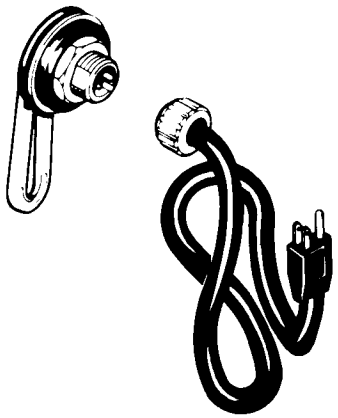
1. Refer to "Starting the Engine" on pages 52 or 53.
2. Push down the foot throttle until it is 1/3 open.
3. Turn the key of the ignition switch to the Start position.
4. After the starter motor is engaged, push and release the Cold Start button two times. When the engine starts, release the key.

   NOTE: If the engine runs for a short time and then stops, engage the starter again, push and release the Cold Start button one time. If the engine does not fire, stop injecting ether and check the supply of ether in the Cold Start can.

   NOTE: When installing new ether cans, refer to pages 120 and 121.

Coolant Heater





The engine cylinder block is provided with a passage for installing a coolant heater plug. The passage is located on the left-hand side of the engine slightly above and to the right of the engine serial number plate. The coolant heater kit can be purchased from your Case dealer.

Booster Battery

WARNING: *If you connect jumper cables wrong to the starter motor solenoid, the engine can be started with the transmission in gear. To prevent personal injury or damage to the machine, use the following procedure:*

1. *Two persons are required for jump starting.*
2. *Connect the positive jumper cable to the battery terminal of the starter motor solenoid.*
3. *Connect the negative jumper cable to a good engine ground. See the Operator's Manual for this machine. Sit in the operator's seat and then start the engine.*
4. *Have the other person disconnect the jumper cables.*

If you do not use the above procedure, the machine can move out of control and you or other persons can be seriously injured.

D-48-21

The following instructions give the correct method of connecting the booster battery to the starter motor solenoid of the machine. Two persons are required for this procedure.

1. The booster battery must have a total of 24 volts.

2. When you are seated in the operator's seat with the seat belt fastened, have the other person connect the jumper cables. See the following photograph.

3. Connect the positive (+) jumper cable of the booster battery to the Battery terminal of the starter motor solenoid.

4. Connect the negative (-) jumper cable of the booster battery to a good engine ground. This ground must be free of paint or dirt.

5. Sit in the operator's seat and then start the engine. See "Procedure to Start the Engine" on pages 52 or 53.

6. Have the other person disconnect the jumper cables.

When the engine is warm, decrease the engine speed to idle and do the following:

1. Check the instruments.

2. Raise the loader bucket about two feet (600 mm) above the ground.

3. Test the parking brake:

   a. Put the transmission control in High Range position.

   b. Engage the parking brake.

   c. Increase the engine speed to full throttle. The machine must not move.

   IMPORTANT: If the machine moves, see your Case dealer or refer to the service manual for this machine and service the brakes.

4. Release the parking brake after the air pressure gauge pointer is in the green area.

Shifting

Upshifting from low to high speed range can be done while the machine is moving at any speed. Do not downshift if machine speed exceeds its maximum low range speed of 7 mph (11.3 k/mh).

Converter Overheating

To avoid converter overheating and possible transmission damage, especially in severe, hot working conditions, avoid operating the machine continuously at or near a stall speed condition (engine wide open but wheels not turning).

If the machine has been operating in high range and the converter temperature gauge needle nears the red zone, downshift from high to low range to avoid overheating.

If the temperature gauge needle enters the red zone, stop machine immediately, place transmission in neutral and run engine at full speed until the needle goes back into the green zone.

If the converter continues to overheat, see your Case dealer.

Steering

The machine is equipped with full power steering that requires only light operator effort. When maneuvering the machine in close quarters, the operator must remember that articulated front and rear halves turn an equal amount and maneuvering space must be checked for each half.

WARNING: *If the engine stops or the power steering system does not operate, stop the machine as quickly as possible to avoid an accident. The steering ability of this machine is greatly reduced if the engine stops or if the power steering system does not operate.*

34-8-A

Auxiliary Steering

Two Auxiliary steering systems (electrically driven) are available to satisfy mandated requirements of certain areas, such as British Columbia. If the regular steering system fails for any reason, such as the engine stops, one type of system will actuate automatically. The second type system must be manually engaged. Push the switch up to engage the auxiliary steering. Push the switch down to disengage.

Machines equipped with auxiliary steering can be identified by a decal on the left-hand instrument cluster which reads "Auxiliary Steering".

When the auxiliary steering system is actuated, a red warning light on the instrument panel comes on and a warning buzzer sounds.

NOTE: The auxiliary steering system is designed for brief, temporary use only. If the system is actuated, bring the machine to a stop as soon as possible and shutoff the engine (if still running). Prolonged use of auxiliary steering will cause a severe drain on the battery and will make the electric motor of the auxiliary steering hot.

Engine Braking

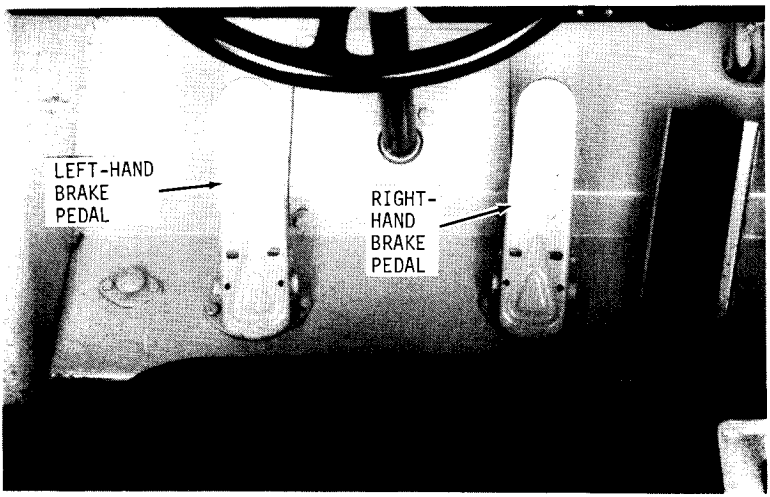
When engine braking is needed during loading operations:

1. Shift Transmission into low range.
2. Use the right brake pedal so that the clutch remains engaged and power is not cut to the engine.

Stopping

To stop the machine, depress either the right-hand or left-hand brake pedal. If the left-hand brake pedal is depressed, transmission power also is cut off (see Clutch Cut-Out, page 66).

If the machine is to be parked, shift the range selector lever to Neutral and engage the parking brake.



Towing

The loader can be towed at slow speed for a distance not greater than 1/2 mile (.8 km).

IMPORTANT: If the loader is to be towed in excess of 1/2 mile (.8 km), the front and rear axle driveshifts MUST be disconnected.

The reason for disconnecting the transmission from the drive lines is to prevent damage to upper bearings and shafts that do not receive lubrication when the engine, converter and charging pumps are inoperative.

Disconnect front pins from steering cylinders and tie together for better tracking when towing.

NOTE: USE A RIGID TYPE COUPLER WHEN TOWING.

Do not try to start the loader by towing.

Operating in Cold Temperatures

To prevent damage to the machine and for easy starting in cold temperatures, do the following:

1. Keep the battery at full charge.

2. Use the correct viscosity oil in the engine and transmission.

3. Use the correct mixture of ethylene glycol coolant and water to prevent the coolant from freezing.

4. When not operating, put the machine in a building or cover the machine with a tarpaulin.

5. Fill the fuel tank at the end of each operating period.

6. See your Case dealer for the following options; dipstick heaters, ether injector, battery heaters, alcohol evaporator, etc.

7. Run the engine at 1/2 or full throttle to keep the temperature of the engine at the correct level.

Operating in Hot Temperatures

To prevent damage to the machine, do the following:

1. Keep the coolant at the correct level.
2. Keep the correct pressure in the cooling system. If the radiator cap is damaged, replace the cap.
3. Clean all dirt and debris from the radiator.
4. Check the tension of the drive belts each day.
5. Use lubricants of the correct viscosity.
6. Use the correct solution of ethylene glycol coolant and water in the cooling system.
7. Clean the dust cup of the air cleaner more frequently during extreme dust conditions.

Alcohol Evaporator

The alcohol evaporator, if installed on the machine, prevents freezing of moisture which has condensed in the brake air system during cold weather operation. An alcohol evaporator should be installed on machine which operates in freezing temperatures to prevent the possibility of brake failure.

WARNING: *Do not use the tire inflation hose to inflate tires or use it as an auxiliary source of air for any reason unless the air system in the machine has been purged of alcohol vapor. Use of air containing alcohol vapor could result in exploding tires and personal injury.* 31-5

LOADER OPERATION

Review the following tips on operating techniques. They will help you move more yardage safely and with less effort for you and wear on the machine.

Safety Rules

A careful operator is the best insurance against an accident. Practice safety before starting out and during the working day. Your life can depend on it.

WARNING: *Before starting the engine, fasten seat belt securely, set the parking brake, shift transmission to neutral and close both doors. Failure to perform one of these steps could cause an accident.* 29-6

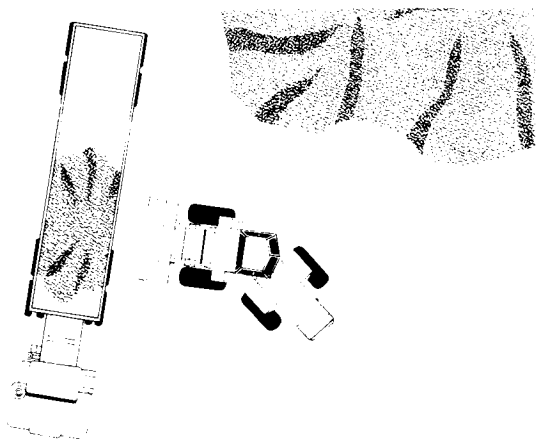
WARNING: *You can have an accident if a part or a system on the machine does not operate correctly. Before you operate the machine, make sure that you check all oil and fluid levels according to the maintenance chart in this manual. Tighten all caps, dipsticks and plugs. Check for oil or fluid leaks. Replace or adjust all parts that do not operate correctly.* 25-10-B

Job Layout

Set up the work cycle as short as possible. Proper spotting of the truck is very important for efficient operation.

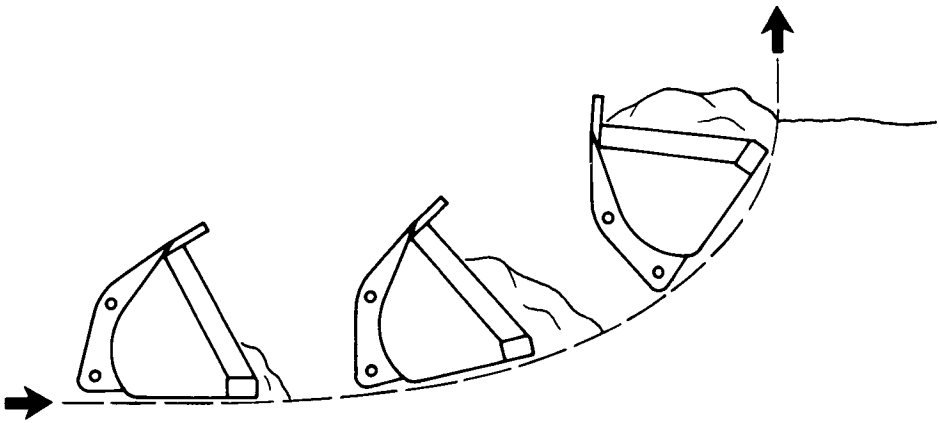
Spend a few minutes leveling off the work area, if necessary. Smooth runways for the machine and a level parking area for trucks will speed up the job.

Keep transport distances as short as possible; less transport makes a shorter work cycle.



Filling the Bucket

Approach bank or stockpile slowly with bucket horizontal at ground level. With engine running at full throttle, keep machine in forward motion until bucket is full. Penetrate bucket straight into pile about 6 to 8 inches (152 or 203 mm). Then coordinate loader arm lift motion and bucket rollback motion so that the rear of the bucket is filled as the machine moves forward. Too much rollback will underfill the bucket; too little rollback will overload the bucket.



Engine Speed and Transmission Range

Place the transmission range selector lever in low range during loading operations and when transporting a load.

Keep the engine operating at high rpm while dumping the bucket or digging with bucket.

NOTE: Long periods of operation at or near stall speed (wheels and/or bucket moving slowly at maximum engine speed) may cause converter oil overheating. Watch the converter temperature gauge - if the needle enters the red zone, select a lower gear or reduce load.

Transporting a Load

When backing out and transporting a load, carry the bucket just high enough to clear obstacles in the loader's path. Raising the bucket higher than necessary reduces traction and stability.

CAUTION: *Always carry load low.* D 9 10

Dumping the Bucket

When dumping a load into a truck or hopper, gradually spill the load out of the bucket to ease the strain of added weight on the truck or receptacle. Dumping a load quickly in one big mass puts a sudden load shock on the truck or receptacle.

If part of the load remains in the bucket after dumping, knock the bucket against its stops to loosen any remaining material.

Truck Loading

Keep the wind to your back when dumping into a truck. This eliminates a change of dust and loose material blowing into your face and impairing visibility. This also reduces engine air cleaner maintenance.

Start raising the bucket so it will just reach dumping height at the time you arrive at the dump area. See Bucket Height Control, pages 66 and 134.

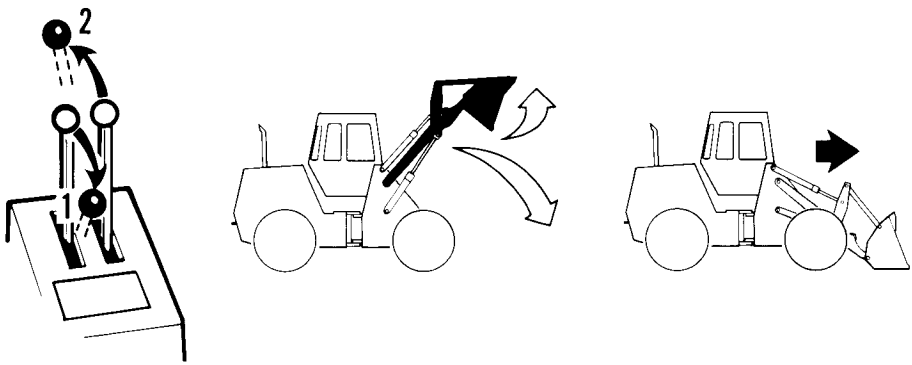
If one side of the truck is lower than the other, try to spot the truck so you dump over the low side. This improves reach and distribution of the load in the truck.

Reach over and dump into the far side of the truck first. Fill the truck gradually from the far side to the near side in order to distribute the load in the truck properly.

Return-To-Dig Operation

The loader bucket can be returned automatically to the digging position after a load has been dumped. This permits faster cycle time by letting the operator concentrate on maneuvering the machine.

After the bucket has been dumped, pull the bucket lever back into Roll-back position, and push the lift arm lever forward into Float position. The bucket will lower and automatically return to digging position. Engine speed must be high enough so that the bucket bottom returns to a horizontal position before it reaches ground level.



1. Bucket Control in Rollback Position
2. Lift Arm Control in Float Position

At the end of the cycle, the bucket lever will automatically release from the Rollback position and return to Hold position. The lift arm lever will remain in the Float position and must be manually returned to the Hold position.

Bucket Height Control

This control enables the operator to preset the dump height of the bucket when loading hoppers, trucks, etc. Move the lift arm lever to the Raise position. In this position the lever is detented and will return automatically to the Hold position at the end of the cycle. The bucket will be raised and stopped automatically when the desired height is reached. For height adjustment, see page 134.

Clutch Cutout

A clutch cutout system is built into the brake system. The clutch cutout provides a convenient means of temporarily disengaging the transmission to make full engine power available to operate the loader.

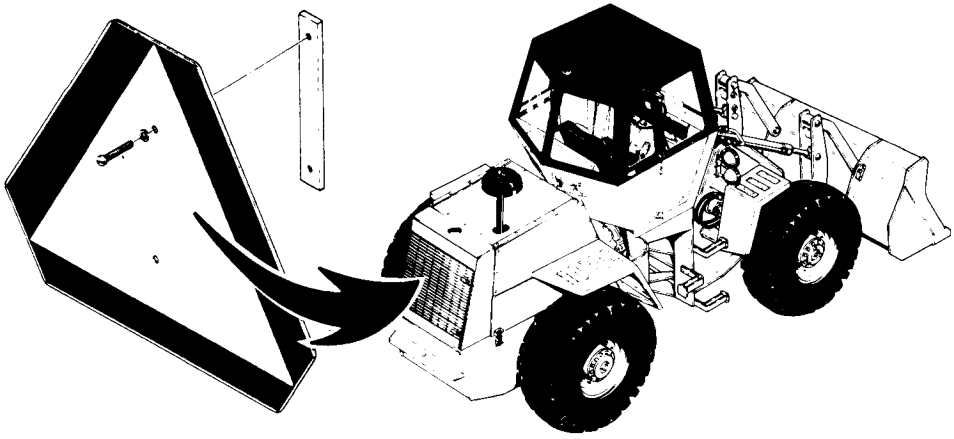
To engage the clutch cutout, depress the left-hand brake pedal. When you let up on the pedal, the transmision is re-engaged. The right-hand brake pedal has no effect on clutch cutout.

WARNING: *Keep the transmission in low gear when going down hills. Only use the right brake pedal to slow or stop the machine. The left brake pedal allows the machine to freewheel before the brake is applied. Do not allow the machine to freewheel down the hill.*

22-2-A

SLOW MOVING VEHICLE EMBLEM (SMV)

(If So Equipped)



FUELS AND LUBRICANTS

DIESEL ENGINE

In temperatures above 32° F (0° C), use number 2 diesel fuel in your Case diesel engine. See NOTE. When you operate in temperatures below 32° F (0° C), use number 1 diesel fuel.

NOTE: If the temperature lowers to the "Cloud Point" of the diesel fuel, wax particles will be in the fuel. These wax particles will cause a restriction of the fuel filters. Then, the engine power will decrease. See your fuel dealer for more information.

Diesel Fuel Specifications

Different manufacturers can have diesel fuels of different specifications. All diesel fuel used in Case diesel engines must be the same quality as specification D975 of the American Society for Testing Materials. See the following chart.

Diesel Fuel Specification Chart

Cloud point, maximum (No. 2 diesel fuel)	-10° F (-23° C)
Pour point, maximum	10 Fahrenheit degrees (6 Celsius degrees) below lowest atmospheric temperature at which engine must start and operate.
Cetane number, minimum	40 (45-55 for winter or high altitudes)
Sulphur, by weight, maximum	.50 of 1%
Water and sediment, by volume, maximum	.05 of 1%
Ash, by weight, maximum	.01 of 1 %
Carbon residue on 10%, maximum	.20 of 1%
Distillation, 90% point	540°-625° F (282°- 329° C)
End point	675° F (357° C)
Flash point, minimum	125° F (51° C) or legal
Viscosity, centistokes at 100° F (38° C)	2.0-4.3
Saybolt Universal Seconds at 100° F (38° C)	32-40
Corrosion, copper strip, 3 hours at 212° F (100° C)	No. 3 ASTM
API gravity, minimum	30

WARNING: *Do not put fuel into the machine if (1) the engine is running, (2) you are near an open flame or (3) you have a burning cigarette, cigar, etc. You can cause a fire and a serious injury.*

6-6-A

Fuel Storage

If you keep fuel in storage for a period of time, you can get foreign material or water in the fuel storage tank. Many engine problems are caused by water in the fuel.

Keep the fuel storage tank outside and keep the fuel as cool as possible. Remove water from the storage container at regular periods of time.

FUEL, FLUIDS AND LUBRICANTS

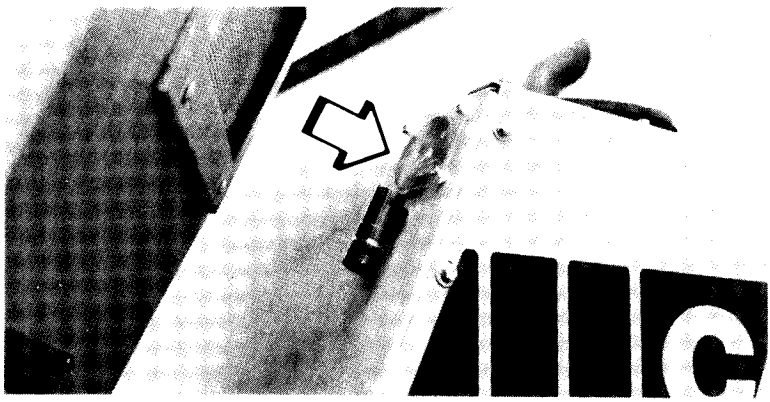
COMPONENT	CAPACITY U.S.	CAPACITY Metric	SPECIFICATIONS
Fuel tank	38 gals.	144 litres	See page 68.
Cooling system	28 qts.	27 litres	A mixture of 50% ethylene glycol and 50% water must be used for temperatures above -34° F (-37° C). If it is possible that the temperature will be lower, adjust the mixture.
Engine crankcase: Without filter change With filter change	 10 qts. 11 qts.	 9.4 litres 10.4 litres	Engine oil: Case HDM Oil CD - Commercial class D Above 32° F (0° C) - SAE 30 10° to 50° F (-12° to 10° C) - SAE 20W20 Below 32° F (0° C) - SAE 10W
Brake master cylinders	As required		SAE J1703c (DOT 3) brake fluid
Hydraulic system: System total Reservoir refill	 21 gals. 16 gals.	 80 litres 61 litres	Case TCH Fluid Alternate oil: Automatic transmission fluid (ATF) such as Dexron II.
Axles: Each center bowl Each wheel end	 9-1/2 qts. 3 pts.	 9 litres 1.4 litres	Case FDL Fluid (SAE 85W - 140 API-GL-5 Gear Lube)
Grease fittings	As required		No. 2 moly-disulfide grease.
Alcohol evaporator	1 pt.	0.5 litres	Clean wood alcohol.
Transmission-converter: System total Transmission refill	 9 gals. 7-1/2 gals.	 34 litres 28 litres	Case TCH Fluid. Alternate oils: Type C-2 transmission hydraulic fluid such as Tenneco Hytrans Fluid.

MAINTENANCE AND LUBRICATION

INTRODUCTION

Scheduled maintenance and lubrication are the normal operations required to provide safe and efficient operation. Follow the maintenance chart carefully to insure that all points have been serviced properly and on time.

Hourly intervals have been established for servicing your machine. They are based on the number of hours the engine has run. The hourmeter, which operates whenever the engine is running, indicates the accumulated hours of operation.



A service manual is available for this machine at a nominal fee. Contact your Case dealer for further information.

FIRST PERIOD OF OPERATION

The items listed in the first period of operation section are performed during the first period of operation only.

SCHEDULED MAINTENANCE

The items listed under Maintenance Chart for Regular Intervals are separated into maximum hourly intervals. These intervals are based on "average" operating conditions. When operating under "severe" conditions, such as excessive heat, cold, dust, mud or water, shorten the intervals.

The chart on the following two pages lists all components to be serviced, the interval of servicing and the page on which each is found.

NOTE: The following charts are based on maximum intervals. If the machine operates in severe conditions, service more often.

NOTE: See page 69 for a listing of fluids and lubricants.

RUN-IN MAINTENANCE CHART

INTERVAL	SERVICE	INSTRUCTIONS
Run-In: Every Two Hours Until Stabilized	Torque wheel nuts 380 - 420 ft-lbs (515 - 569 N m), dry threads.	-----
	Torque axle mounting bolts 380 - 460 ft-lbs (515 - 624 N m), dry threads.	-----
Run-In: After First 20 Hours	Have your Case dealer perform the checks and services listed in the After Delivery Check.	See page 141
	Torque bucket pin bolts 75 ft-lbs (102 N m), dry threads.	-----

SCHEDULED MAINTENANCE CHART

INTERVAL	SERVICE	INSTRUCTIONS
Every 10 Hours or Daily	Grease center pivot points.	See page 77
	Grease loader pivot points.	See page 77
	Grease rear axle trunnion pivot points.	See page 77
	Check engine oil level.	See page 79
	Check radiator coolant level.	See page 87
	Drain air reservoir.	See page 111
	Check hydraulic oil level (Machines with *P.I.N. 9141518 and after).	See page 106
	Visually inspect transfer pump sediment bowl for water. If found, drain water from bowl, fuel filters and fuel tank.	See page 94
	Check machine and ground under machine for signs of leaks.	-----
	Clean or replace all safety and instruction decals that cannot be read.	See page 76

*Product Identification Number (see page 24).

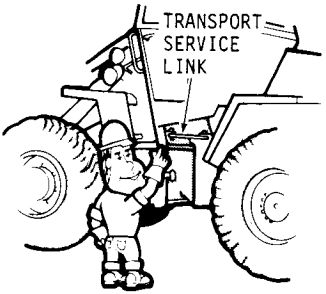
INTERVAL	SERVICE	INSTRUCTIONS
Every 50 Hours or Weekly, Whichever Comes First	Check brake master cylinders.	See page 112
	Check transmission oil level.	See page 114
	Drain fuel sediment bowl.	See page 93
	Check hydraulic reservoir oil level. (Machines before *P.I.N. 9141518).	See page 104
	Check cab air filters.	See page 124
	Grease front driveshaft support bearing.	See page 78
	Grease steering cylinder pivots.	See page 78
	Grease drive shaft universals and slip spline.	See page 78
	Check battery fluid level.	See page 102
Every 100 Hours	Clean spark arresting muffler (if equipped).	See page 139
	Change engine oil (machines with turbocharger).	See page 79
Every 150 Hours	Change engine oil (machines without turbocharger.)	See page 79
Every 200 Hours	Change engine oil filter (machines with turbocharger).	See page 81
Every 250 Hours	Grease equipment control levers.	See page 78
	Grease suspension seat.	See page 78
	Check front and rear axle oil level.	See page 118
	Clean alcohol evaporator intake filter.	See page 112
Every 300 Hours	Change engine oil filter (machines without turbocharger).	See page 81

*Product Identification Number (see page 24).

INTERVAL	SERVICE	INSTRUCTIONS
Every 500 Hours	Change first and second stage fuel filters and fuel transfer pump filter.	See page 95
	Check tension of drive belts.	See pages 89
	Inspect ROPS system.	See page 20
	Clean electric fuel pump filter.	See page 95
	Change hydraulic oil filter. (Machines with *P.I.N. 9141518 and after).	See page 107
	Change transmission filter.	See page 115
Every 1000 Hours or 6 Months Whichever Comes First	Change hydraulic oil filter (Machines before *P.I.N. 9141518).	See page 104
	Change hydraulic oil.	See page 104 or 109
	Clean hydraulic reservoir suction screen.	See page 105 or 109
	Change transmission oil.	See page 115
	Clean transmission oil strainer.	See page 115
	Clean transmission breather.	See page 116
	Change front and rear axle oil.	See page 118
	Clean air compressor cylinder head (by dealer only).	-----
Every 2000 Hours or Yearly, Whichever Comes First	Clean and refill cooling system.	See page 87
	Check refrigerant.	See page 129
	Disassemble and clean alcohol evaporator and replace all gaskets (by dealer only).	-----
Every 3000 Hours	Rebuild/replace air compressor (by dealer only.)	-----
As Required	Service air cleaner when restriction indicator shows red signal band.	See page 84
	After wheel has been removed for servicing and reinstalled, check wheel nut torque every two hours until stabilized.	See page 131
	Each time bucket is removed and reinstalled, torque bucket pin bolts.	-----
	Check refrigerant (cab machines) when loss of cooling is noticed.	See page 129

*Product Identification Number (see page 24).

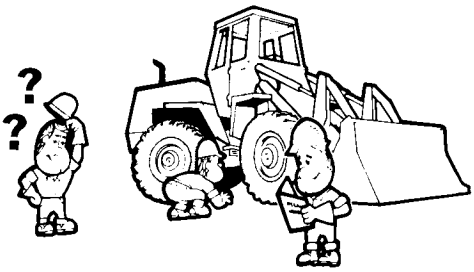
SAFETY BEFORE YOU DO SERVICE



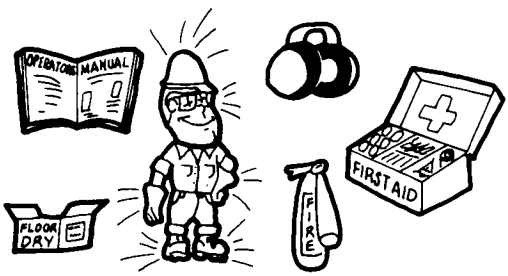
Lower the bucket to the ground or hold up with a stand or hoist. Put the Transport/Service link in the Locked position. See page 75.

Put the parking brake control in the Engaged position. Put a Do Not Operate tag on the instrument panel.

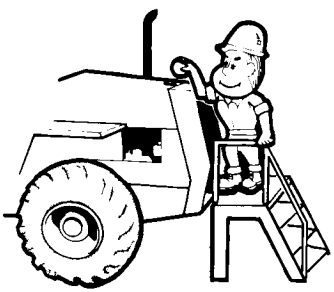
Read the safety decals and information decals on the machine. Read the operator's manual. Understand the operation of the machine before you work on it.



Do only repairs you understand. Find assistance if you do not understand what you are doing.



Use the correct safety clothing and safety equipment. Understand how to use the fire extinguisher and first aid kit.

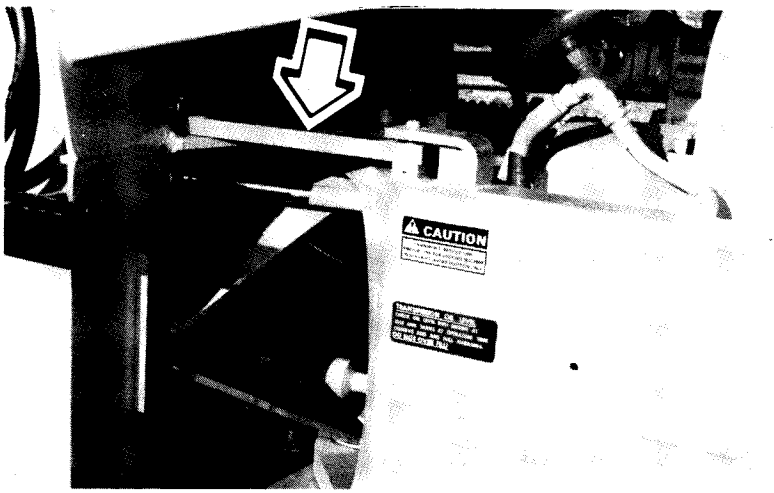


Be careful when you remove the cap for the hydraulic reservoir or radiator.

TRANSPORT/SERVICE LINK

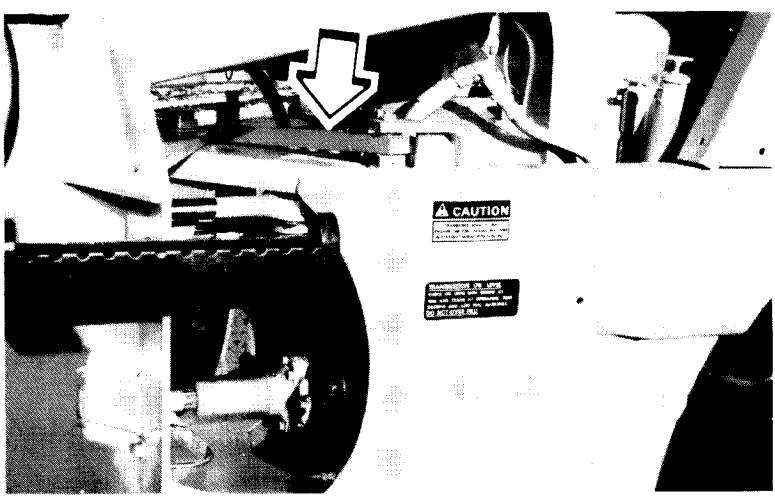
Before starting any servicing or maintenance. ALWAYS lock the transport/service link on the machine.

DANGER: *Keep clear of this area when engine is running. Machine could pivot unless the frame pivot safety link is in its lock position. After servicing is completed, unlock the safety link and secure in place on the rear frame pivot.* *D-32-4*



Lock Position

After servicing is completed, unlock the safety link and secure in place on the rear frame pivot.



Operating Position

Safety Decals on the Machine

Make sure that you can read all safety decals and all instruction decals. Check these decals every 10 hours of operation. Clean these decals if you cannot read the words.

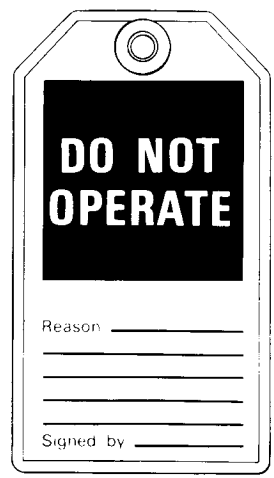
When you clean the decals, use only a cloth, water and soap. Do not use solvent, gasoline, etc.

You must replace a decal if (1) the decal is damaged, (2) the decal is missing or (3) the decal cannot be read.

If a decal is on a part that is replaced, make sure you install a new decal on the new part. See your Case dealer for new decals.

Do Not Operate Tag

When you service, put a Do Not Operate tag on the instrument panel. A Do Not Operate tag, Case Part Number 321-4614, is included with each new machine. You can get extra tags from your Case dealer.

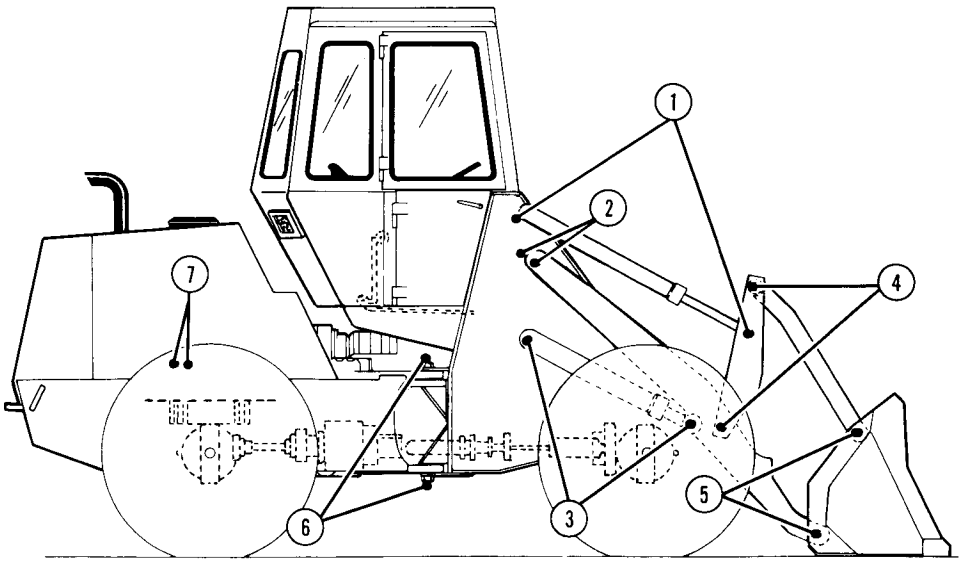


GREASE FITTINGS

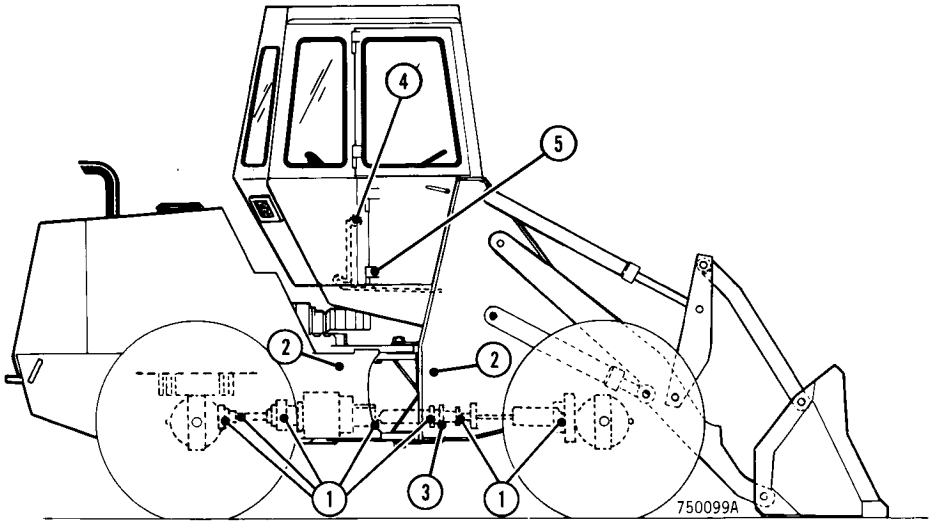
WARNING: *When you adjust or service the machine, always follow the instructions in the operator's or service manual. If the engine must be running, always have an extra person help you. Do not leave the operator's seat while the engine is running. Failure to follow these instructions can cause injury.* *47-51-A*

Lubricate the machine according to the intervals given in the maintenance chart unless you operate the machine in severe conditions. If you operate the machine in severe conditions, lubricate the machine more frequently. Remove all dirt from the grease fittings before you lubricate.

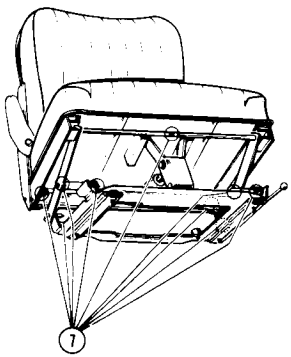
Loader



1. Tilt cylinder pivots (2 each side) 4
2. Lift arm pivots (2 each side) 4
3. Lift cylinder pivots (2 each side) 4
4. Tilt bellcrank pivots (2 each side) 4
5. Bucket pivots (2 each side) 4
6. Center pivots 2
   4-In-1 bucket clam pivots (not shown) (1 each side) 2
   Clam cylinder pivots (not shown) (2 each side) 4
7. Rear axle trunnion pivots (2 left side) 2



1. Driveshaft universals and slip spline 7
2. Steering cylinder pivots (2 each side) 4
3. Front shaft support bearing 1
4. Control lever pivots (1 each lever) 2-3
5. Cab door hinges 4
   (use powdered graphite)
6. Suspension seat 9
   (See illustration, lubricate slide rails with Lubriplate)



ENGINE LUBRICATION SYSTEM

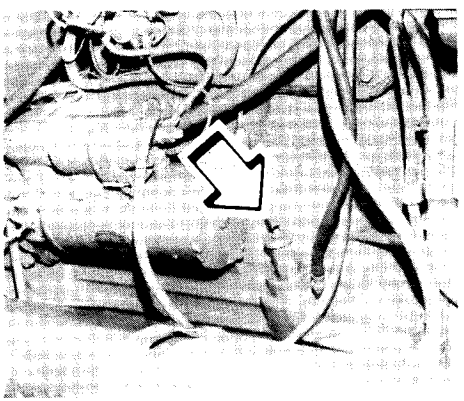
Oil Level

Check engine oil level daily or after every 10 hours, preferably before engine is started for daily operation. If checked during operation, stop engine and allow oil to settle 5-10 minutes before checking. The dipstick is located on the center of the left-hand side of engine. To remove, turn T-handle counter-clockwise and lift up. Oil level should be between Full and Low marks on dipstick.

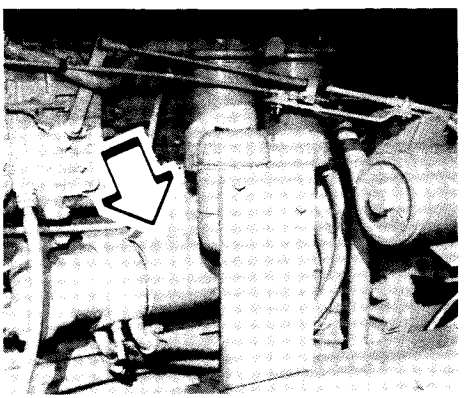
Oil Change

Change Interval

When the machine is new, change the engine oil after the first 20 hours of operation. Thereafter, change the oil every 150 hours of operation. If your machine is equipped with a turbocharger, change the oil every 100 hours of operation.



DIPSTICK



FILTER

If your operating conditions are unusually severe, change the engine oil more often.

Draining the Oil

If possible, drain the old oil while the engine is warm. Allow time for the oil to drain completely.

Measured Refill

A crankcase refill will require either of the following:

1. If the engine oil filter has not been changed, refill with 10 measured U.S. quarts (9.4 litres) of oil.

2. If the filter has been changed, refill with 11 measured U.S. quarts (10.4 litres) of oil.

   a. If your machine is equipped with a turbocharger, pull out the fuel shutoff control and operate the starter motor for 20 to 30 seconds before starting the engine.

   b. All machines: Start engine and operate a few minutes at idle. Check for leaks of oil. Stop engine, let oil settle for 5 minutes and check oil level with the dipstick.

NOTE: Do not overfill or underfill the crankcase. Either situation is harmful to the engine.

Engine Oil Filter

Change the engine oil filter after the first 20 hours of operation, and every 300 hours thereafter. If the engine service is severe, the filter must be changed more often.

NOTE: The change interval is 200 hours on machines with turbocharger.

A spin-on type filter is located on the left-hand side of the engine. To change the filter:

1. After the crankcase has been drained, remove the old filter by turning out counterclockwise with a strap wrench or special wrench A64761 (available through your Case dealer).

2. Clean the area on the filter mounting bracket where gasket contact is made.

3. Apply a coat of clean oil to the gasket of the new filter. Install the filter by turning in a clockwise direction until gasket contact is made. Hand tighten 1/2 turn.

4. Loosen the filter approximately one full turn. Retighten by turning clockwise until gasket contact is made. Hand tighten 1/2 to 3/4 turn to obtain the proper seal.

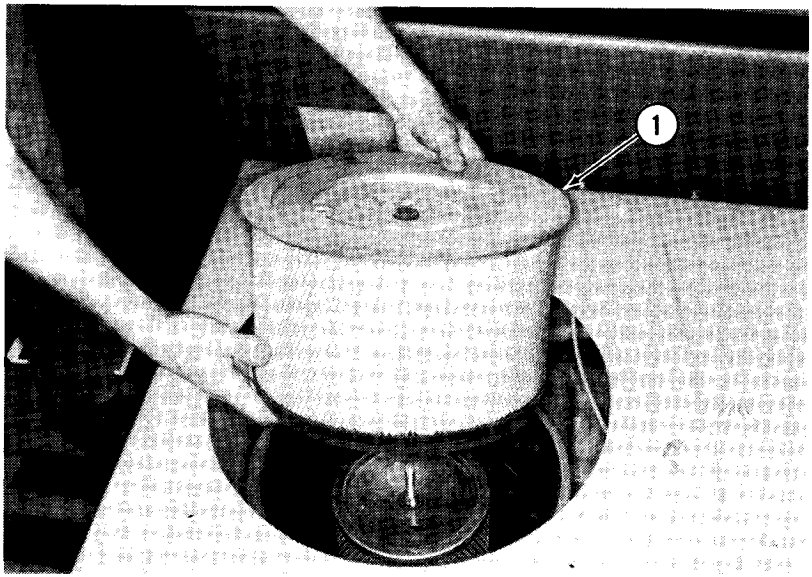
5. Install the oil pan drain plug with nylon gasket. Tighten to a torque of 18 to 20 pound-feet (24 to 28 N m).

6. Refill the crankcase with 11 measured quarts (10.4 litres) of oil. Start the engine and operate a few minutes at low idle. Check for leaks. Stop the engine and allow to stand for 5 to 10 minutes. Check the oil level with the dipstick.

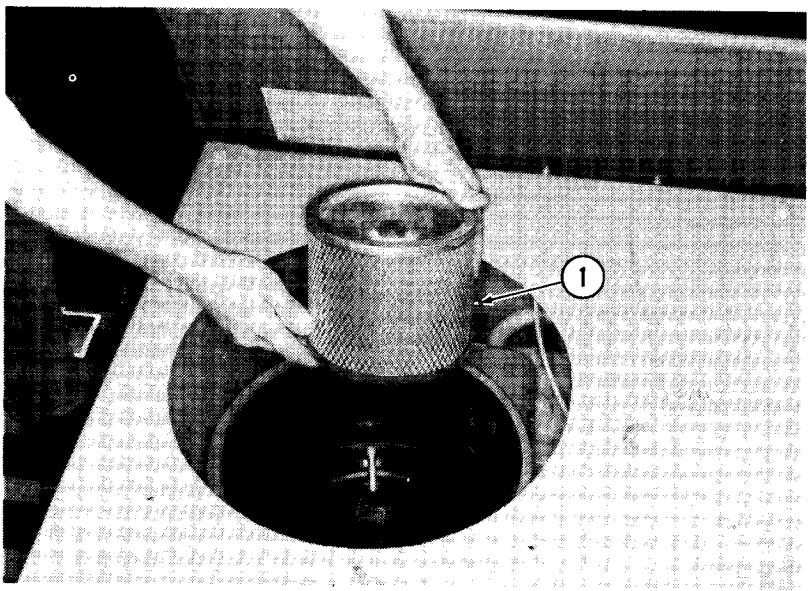
   NOTE: If engine has a turbocharger, pull out fuel shutoff control and crank engine 20 to 30 seconds before starting.

ENGINE AIR CLEANING SYSTEM

The air cleaner filters are for both the engine and the air compressor. Working conditions will determine the intervals at which the air cleaner should be serviced. See page 83, Restriction Indicator.



1. Outer Element



1. Inner Element

Restriction Indicator

The air cleaner must be serviced whenever the restriction indicator red signal band remains in view.

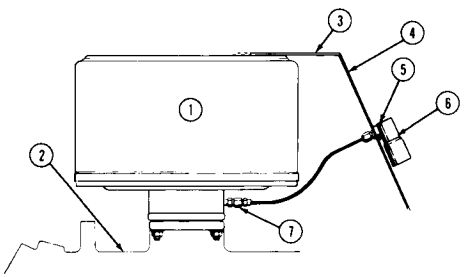
Restricted Elements

When the air cleaner elements are dust free and the intake air flow is unrestricted, the red band in the indicator will stay out of sight.

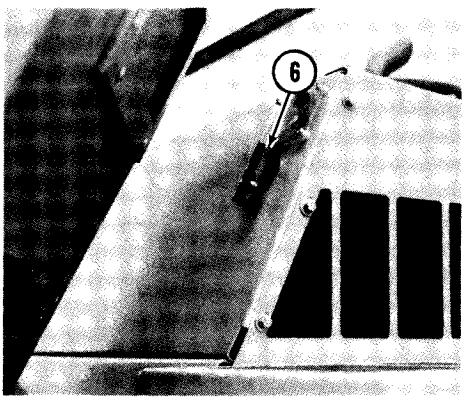
When accumulated dust on the elements causes excessive air flow restriction, the red band will rise and remain in view in the window; this means the air cleaner must be serviced immediately. See page 84 for Air Cleaner Servicing.

Resetting Indicator

After air cleaner servicing, the restriction indicator must be reset. Press the reset button on the indicator. When the button is released, the red band should drop out of sight.



1. Air Cleaner
2. Engine
3. Hood
4. Front Panel of Rear Chassis



5. Reset Button
6. Restriction Indicator
7. Safety Filter

Safety Filter

A safety filter is built into the connector which joins the tube from the restriction indicator to the engine air intake manifold. This filter prevents unfiltered air from entering the engine if the tube to the indicator or the indicator itself becomes damaged.

The restriction indicator will fail to operate if the indicator or the tube between the indicator and manifold are damaged to the extent that air can enter either part. The restriction indicator will also fail to operate if the safety filter is plugged.

Checking for Plugged Safety Filter

Remove the body cover and the outer element of the air cleaner. Start the engine. Wrap a piece of paper around the inner element so that air flow is sealed off. If the red signal band fails to appear in the restriction indicator, the safety filter is plugged. The connector and safety filter must be immediately replaced as a unit.

Air Cleaner Servicing

When the restriction indicator shows the red band, service the elements as follows:

1. Replace the air cleaner outer element, or clean it by washing or back-blowing with compressed air.

2. After replacing/cleaning the outer element, install it in the air cleaner. Start the engine and check restriction indicator.

3. If indicator still shows the red band, replace the air cleaner inner element immediately. Do not attempt to clean the inner element.

Washing the Outer Element

Washing is the preferred method of cleaning the element. Have two or three spare elements on hand to reduce down time when servicing.

The element should be replaced after 6 washings or one year, whichever comes first. Do not use elements which are over three years old. The month and year of manufacture are stamped on the metal end cap of the element.

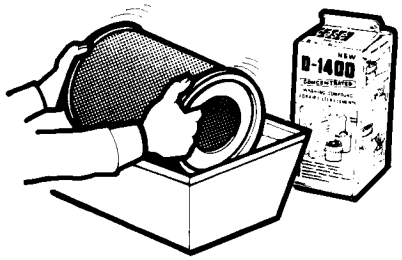
Wash the filter in Case Filter Element Cleaner (available from your Case dealer) according to instructions on the container. Rinse thoroughly in clear water; do not use a hard stream from a hose. Set filter aside to dry; do not use compressed air to dry the element.

Inner Element

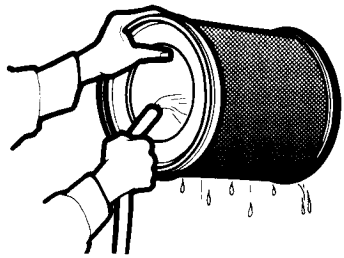
The inner element should be checked for restriction whenever the outer element is serviced. After the outer element has been cleaned or a new element installed, start the engine and run at full throttle and observe the restriction indicator. If the red band moves into the indicator window, replace the inner element.

Element Service

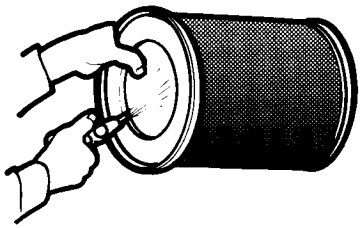
Cleaning the inner element is not recommended except in an emergency. If the element is cleaned, it must be replaced as soon as possible. Maximum engine protection is achieved by replacing the restricted element with a new element.



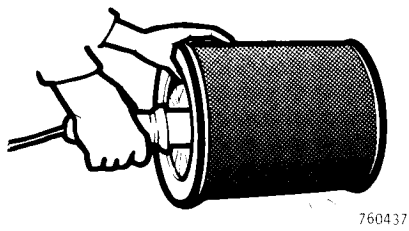
Washing the Element



Rinsing the Element



Cleaning with Compressed Air



Inspecting the Element

Cleaning the Outer Element with Compressed Air

The element can also be cleaned with compressed air, using a maximum of 30 psi (207 kPa) at the nozzle. Keep the air nozzle a reasonable distance from the filter element. Use of compressed air is not always recommended because it will not remove carbon and soot like washing.

NOTE: Never attempt to clean the element by rapping. Rapping the element will dent the metal covering. The inner paper element will in turn rub this dent, causing the element to puncture.

Inspecting the Outer Element

To inspect the element after it is clean and dry, use a light bulb. By rotating the filter element against the light, the element can be checked for damage or pinholes. Visually check the rubber gasket for damage. If any holes appear in the element or the gasket is damaged, the element must be replaced.

The filter elements must also be checked for dents in the metal covering. Any dent in the covering is a potential puncture because it lets the paper element rub the dent. If any fuzz is noted around a dent or any place in the element, the element is punctured. Replace it immediately or serious damage will result. Do not accept a new filter or install a new or used filter if the metal covering is dented.

ENGINE COOLING SYSTEM

Coolant Level

CAUTION: *Pressure cooling system. Remove cap slowly and only when engine is cool or painful burns could result.* D-28-2

Check the coolant level every 10 hours of operation or each day. When the coolant is cold, the coolant must be two inches (50 mm) below the level of the radiator opening. Add coolant if necessary. Do not add coolant above the correct level.

Ethylene Glycol Coolant

A mixture o 50% ethylene glycol and 50% water must be used in this machine. This mixture is used if the lowest ambient temperature is above -34° F (-37° C). If the ambient temperature is lower, adjust the mixture. It is recommended that ethylene glycol and water be used in your machine all year.

IMPORTANT: Mix the ethylene glycol and water completely by running the engine at operating temperature for approximately five minutes. This procedure must be done before the machine is put outside in temperatures below 32° F (0° C).

Cleaning the System

Clean the cooling system every 2000 hours or at least once a year. Clean more often in areas where hard water, containing scale forming minerals is all that is available.

1. While the coolant is still hot, open the radiator drain valve and the engine block drain valve. See photos, following page. Remove radiator cap to aid draining. Drain coolant thoroughly and close drain valves.

2. Add a radiator cleaner to the system and refill with clean water. Use a cleaner marketed by a reputable manufacturer. Follow directions provided with the cleaner.

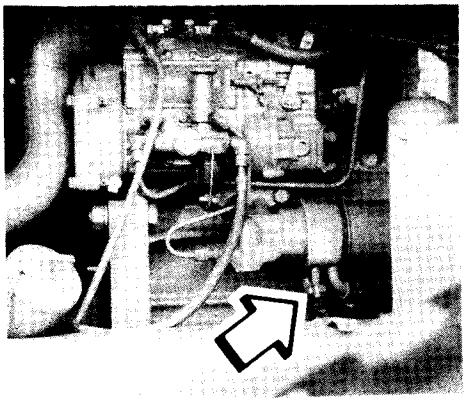
3. Check hoses, elbows, pump and water manifold for leakage.

4. Drain the cleaning solution and water. Flush the system with clean water.

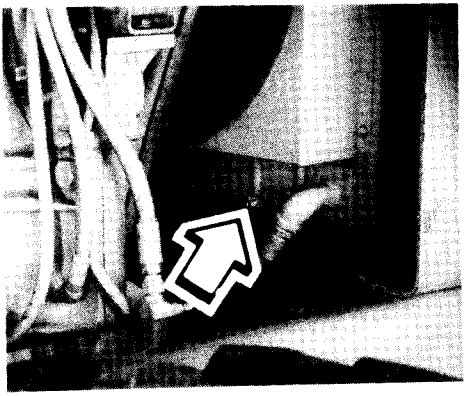
5. Clean dirt off exterior of radiator. Blow out dirt between fins with compressed air.

6. Refill cooling system with the recommended coolant.

7. Run the engine about 5 minutes to bleed air from the system. Check coolant level and add coolant as required.



Engine Block
Drain Valve



Radiator Drain Valve

DRIVE BELTS

WARNING: *Rotating fan and belts: Contact can injure. Keep clear.*
D-39-13

Your machine is equipped with the following belts:

1. Matched set of fan and alternator belts.
2. Brake system compressor belt.
3. Air conditioner compressor belt (if machine is equipped with air conditioning).

Fan Belts

Check the matched set of engine fan belts after every 500 hours of operation. If too tight, the belts can cause rapid wear of alternator and water pump bearings. If too loose, the belts may slip, wear fast, and permit engine overheating and battery run-down.

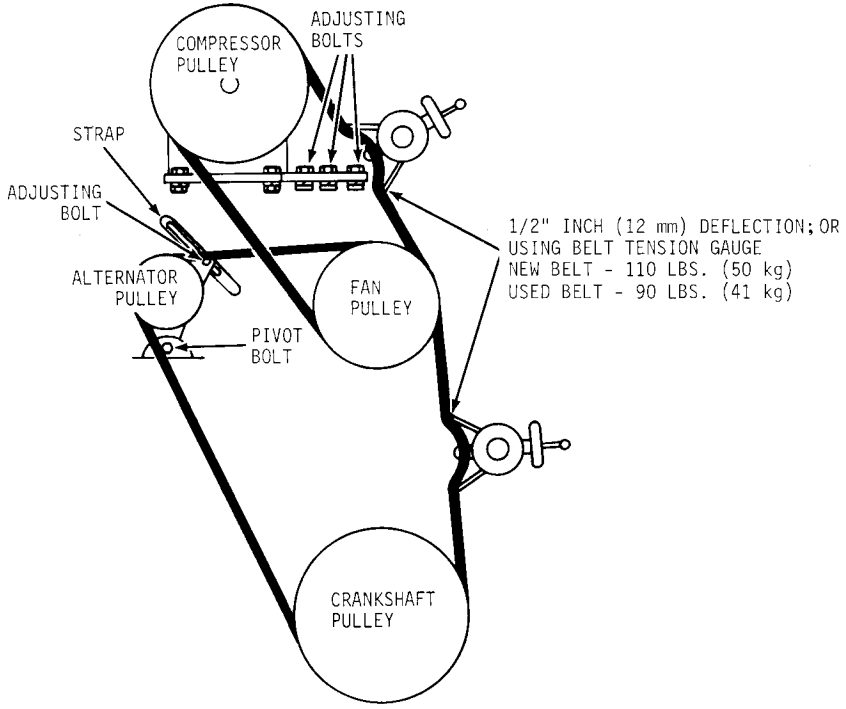
Belt Tension

Properly adjusted fan belts can be depressed 1/2 inch (12 mm) midway between the fan pulley and the crankshaft pulley. A belt tension gauge, used between the two pulleys, should give a tension reading of 110 pounds (50 kg) on a new belt, and 90 pounds (41 kg) on a belt that has been run-in. To tighten belts, loosen the adjusting bolt at the strap on top of the alternator, and swing the alternator away from the engine. When adjusting belts, pry against pulley housing only.

Installing New Belts

To install a new set of matched fan belts, remove the compressor belt, then loosen the alternator adjusting bolt and swing the alternator inward. Slip the new belts over the fan, crankshaft and alternator pulleys. Adjust new belts for 1/2 inch (12 mm) deflection or 110 pounds (50 kg) with a tension gauge. Reinstall compressor belt.

NOTE: The fan belts are a matched set. Do not replace the fan belts individually. Use genuine Case replacement belts, available from your Case Dealer.



Brake System Compressor Belt

Check the air compressor belt every 500 hours of operation. If too tight, the belt can cause rapid wear of water pump and compressor bearings. If too loose, the compressor may not maintain full pressure in the braking system air reservoir.

Tension Check

A properly adjusted compressor belt can be depressed 1/2 inch (12 mm) midway between the fan pulley and compressor pulley. A belt tension gauge should give a reading of 110 pounds (50 kg) on a new belt, and 90 pounds (41 kg) on a belt that has been run-in.

Adjustment and Installation

When adjusting belt tension, or installing a new belt, loosen the three bolts underneath the compressor sliding bracket. Then slide the compressor inward or outward as required and retighten the bolts.

WARNING: *Rotating fan and belts: Contact can injure. Keep clear.*

D-39-13

Air Conditioner Compressor Belt

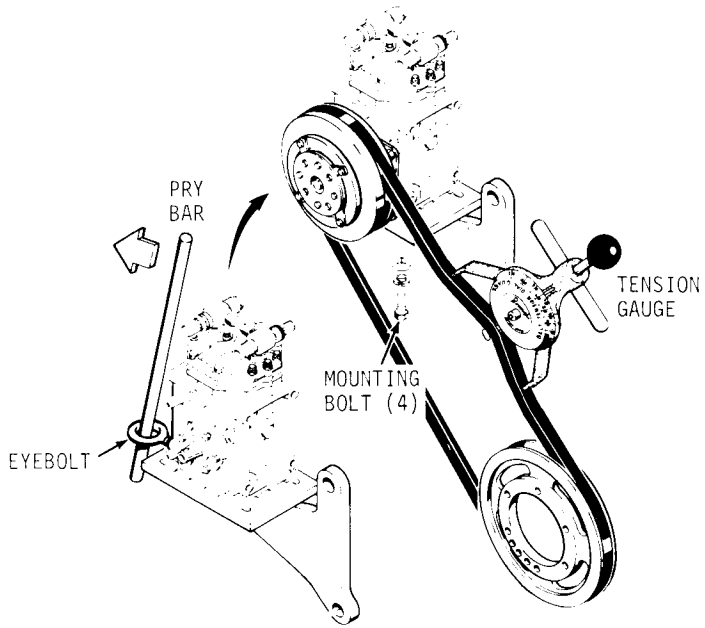
Belt tension is measured with a tension gauge. A properly tightened belt will give a reading of 100 pounds (50 kg) on a new belt and 90 pounds (41 kg) on a belt that has been run-in.

Belt Adjustment

1. Loosen mounting bolts shown in illustration. Make sure pulley grooves are aligned.

2. Install an eyebolt in tapped hole as shown. Insert a prybar through eye and adjust by prying in direction of arrow until specified tension is achieved.

3. Tighten mounting bolts to 25 - 35 foot-pounds (34 - 47 N m), then remove the eyebolt. Recheck pulley grooves for alignment. If grooves are misaligned, rapid belt wear will result.



Air Conditioner Belt Adjustment

FUEL SYSTEM

The fuel system includes a tank, filters and injection equipment. Cleanliness of diesel fuel will determine the service life of the fuel injection equipment. Water and abrasives, allowed to reach the precision injection mechanism, will cause rapid wear and poor performance.

Clean fuel, regular servicing of fuel filtering components and water draining are requirements for long service life.

NOTE: Servicing of the injection pump and nozzles requires specialized equipment, gauges and tools. Work of this type must always be done by your Authorized Case Dealer.

Fuel Conditioner

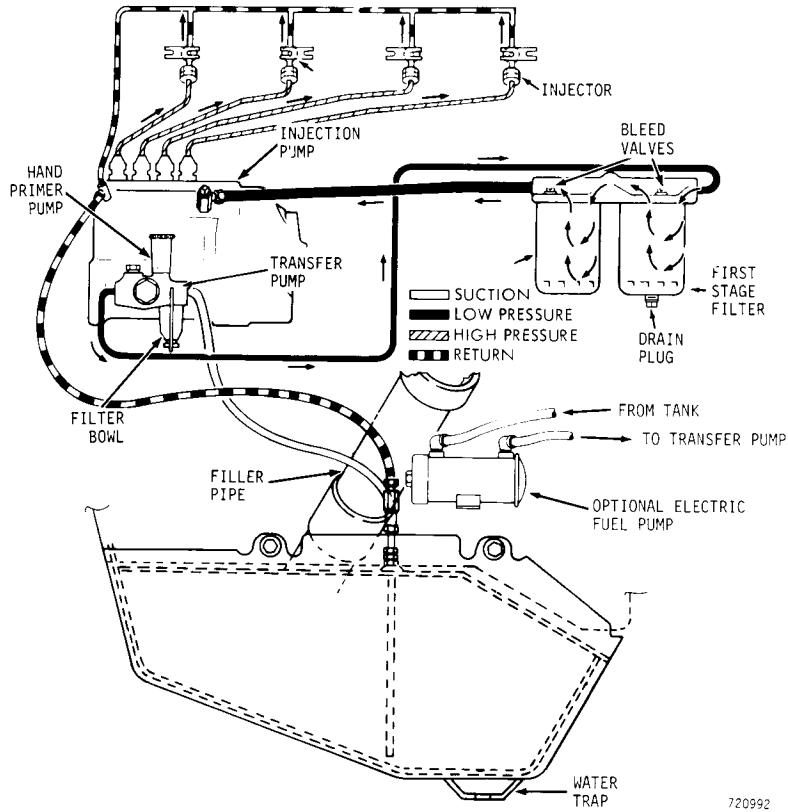
Case diesel fuel conditioner is available at your Authorized Case Dealer.

When used as directed the fuel conditioner will aid in preventing gummy deposits in the fuel system and fouling of injector nozzles, valves and manifolds. It also provides upper cylinder lubrication and maintains a higher degree of fuel combustion which results in improved engine performance. The fuel conditioner also helps keep condensation suspended in the fuel, allowing it to be burned with the fuel.

In areas troubled with gum or varnish in diesel fuel, it is recommended that conditioner be added to fuel in the storage tank, or a small amount be added daily to the fuel tank.

Draining Water from System

Every 10 hours or daily, check for water in the fuel transfer pump bowl. If water is present, it must be drained from (1) the transfer pump bowl, (2) the first stage fuel filter and (3) the fuel tank water trap.



Transfer Pump Bowl

Clean area around the bowl. Loosen ball lock nut and remove bowl from bail. Remove water and any sediment from bowl. Wipe bowl clean and reinstall in bail. Tighten lock nut.

First Stage Fuel Filter

Loosen drain plug on filter bottom. Do not remove the plug. Allow fuel to drain until clear of water. Tighten drain plug.

NOTE: After draining the transfer pump bowl and the first stage fuel filter it may be necessary to bleed the fuel system. If the engine appears to lack power or stalls, refer to Bleeding the System, page 95.

Fuel Tank Water Trap

Loosen, but do not remove, the drain plug in the fuel tank water trap. Let fuel drain until clear of water. Tighten plug.

Bleeding the System

Air must be bled from the fuel system if (1) the engine runs out of fuel, (2) the fuel system is serviced, or (3) the engine is taken out of storage.

1. Fill the fuel tank. Do not start the engine.

   a. If fuel system is not equipped with the optional electric fuel pump, loosen hand primer pump knob by turning counterclockwise and operate primer pump.

   b. If equipped with an optional fuel pump, turn key switch to Run position to activate the pump. Do not turn switch to Start position.

2. Open bleed screw on top of first stage filter and allow air to escape. Close bleed screw when clear fuel appears. Bleed second stage filter in the same manner. Secure hand primer pump by pushing knob down and turning clockwise until secured.

3. Start the engine. If roughness or missing is detected, bleed each injector line by "cracking" open the tube nut at the injector.

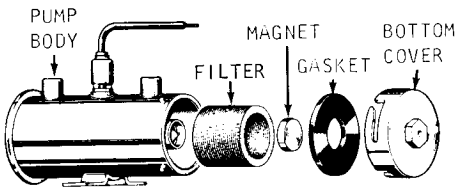
Servicing Fuel Filters

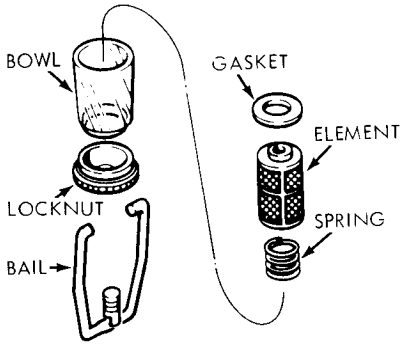
Service fuel filters every 500 hours or sooner if loss of power is indicated. Service in following order: (1) Electric fuel pump filter, (2) fuel transfer pump filter, and (3) first and second stage fuel filters. If filter servicing does not solve problem, see your Case Dealer.

Electric Fuel Pump Filter

1. Use a wrench to turn bottom cover from bayonet pins. Twist cover off.

2. Remove filter, magnet and cover gasket. Replace filter (preferred) or clean in solvent and blow dry. Replace gasket, reinstall parts and tighten cover. Bleed system.





Transfer Pump Filter

1. Clean area around transfer pump bowl. Loosen ball lock nut. Remove bowl with filter, spring and gasket.

2. Replacing the filter is preferred, but it can be cleaned with diesel fuel unless damaged or coated with deposits. Clean the bowl in diesel fuel and wipe dry. Replace the gasket.

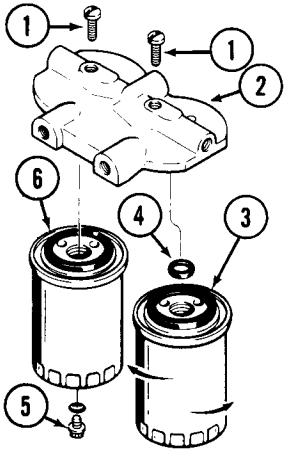
3. Install spring, filter and gasket, and replace bowl in bail. Tighten bail so that bowl is retained but still loose. Operate hand primer pump. Let bowl fill with fuel and slightly overflow so that no air remains in bowl. When no air remains in bowl, tighten bail securely onto bowl.

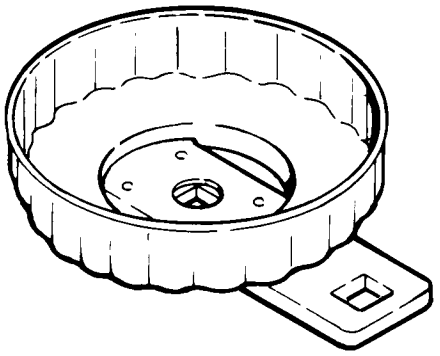
First and Second Stage Fuel Filters

1. Clean filter bodies and surrounding area. Remove both filters by turning with a strap wrench. Discard the contaminated filters.

2. Remove the stud gasket from the second stage fuel filter and install a new stud gasket.

3. Apply a thin film of grease to the gaskets on the new filters. Install both filters by turning until gasket contact is made. Hand tighten 1/2 to 3/4 turn. Bleed the fuel system.





A64761 Wrench

1. Screws for Removing Air
2. Filter Body
3. Second Stage Filter
4. Seal
5. Screw for Water Removal
6. First Stage Filter

ELECTRICAL SYSTEM

Sealed beam and bulb specifications are given on page 26.

Instrument Cluster Warning and Gauge Lights

The left-hand instrument cluster contains seven lights. The clutch pressure, engine oil pressure and alternator warning lights should light when the key switch is turned on. The brake warning light should light when the parking brake is applied. The gauges should be illuminated whenever the light switch is on.

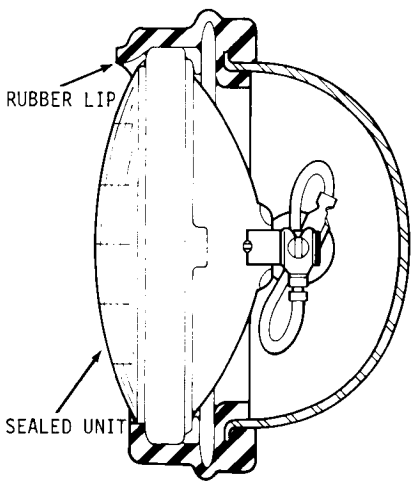
To replace a bulb, turn the plastic holder counterclockwise and both the holder and the bulb will drop out the back of the panel. Replace bulb and screw in the holder.

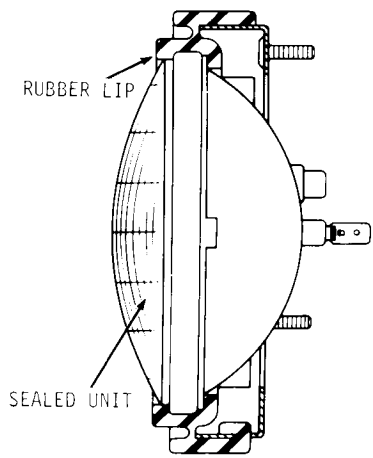
Instrument Panel Lights

To replace an instrument panel light bulb grasp the light hood firmly and pull out from the panel. If the hood is difficult to remove, insert a screwdriver under the hood base and pry up carefully so that the hood snap bushing is not damaged. Remove the bulb and replace. Reinstall light hood.

Headlights and Flood Lights

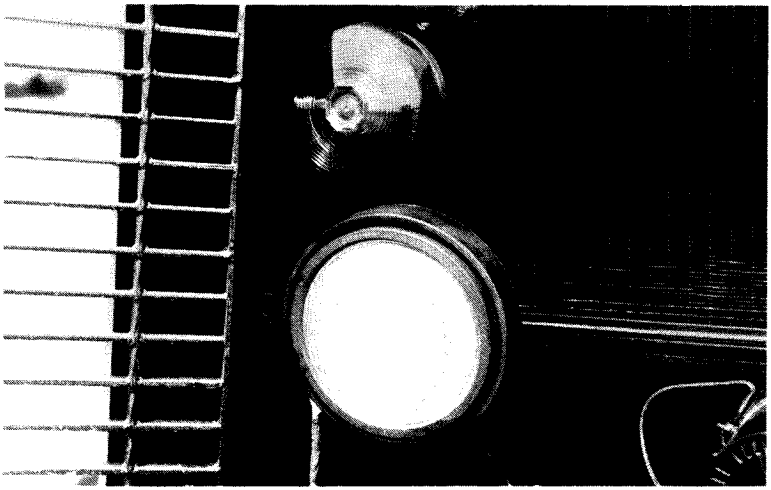
To install a new sealed light unit, roll back the lip of the rubber retainer from the edge of the unit. Remove the old light unit and disconnect the wires. Be sure wire connections are made tight on the new unit. Then roll the rubber retainer lip over the edge of the unit.





Stop/Taillight

To replace a stop/taillight bulb, unscrew the lens and remove the bulb. Install a new bulb. Reinstall the lens.



Turn Signal/Safety Flasher Lights

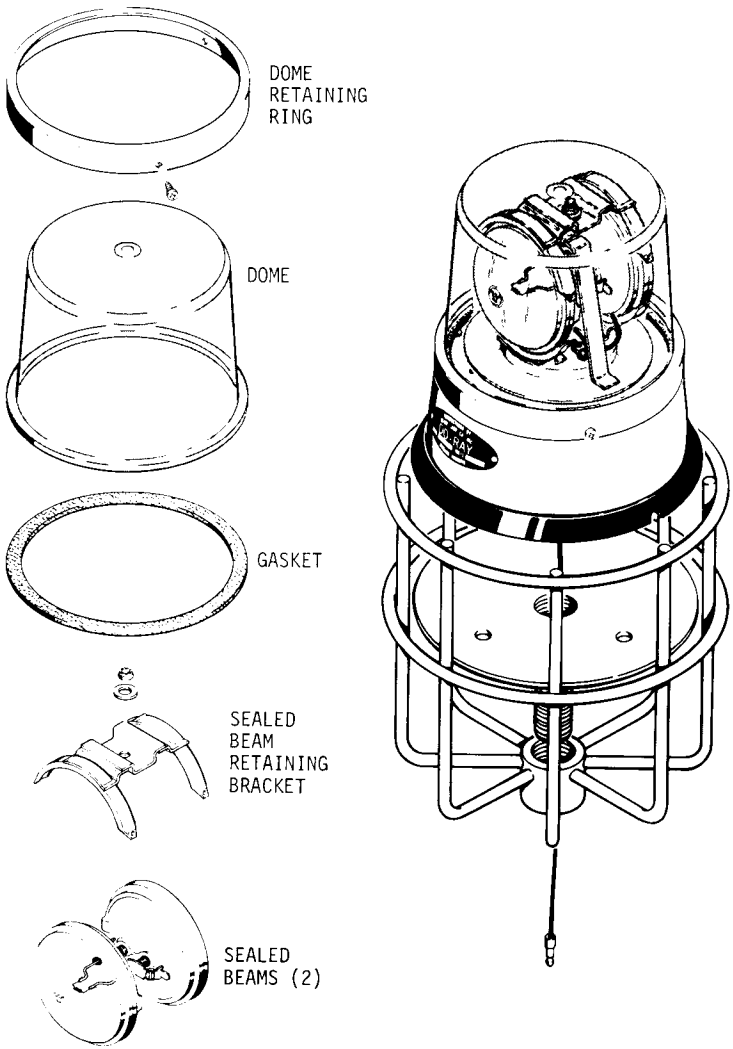
To replace a turn signal/safety flasher light bulb, unscrew the lens and remove the bulb. Install a new bulb and reinstall lens.

Cab Dome Light

To replace the bulb, remove the lens retaining screws and remove lens. Install new bulb and reinstall lens.

Rotating Beacon

To replace the sealed beams, remove the dome retaining ring. Lift off the dome and remove the sealed beam retaining bracket. Disconnect wires from the sealed beam(s) and replace with new units. Reinstall bracket, dome, and retaining ring.



Alternator Charging System

CAUTION: *When you remove a battery, always disconnect the (-) negative ground cable first. When you install a battery, always connect the (-) negative ground cable last. This procedure can prevent an explosion that is caused by a spark.* 47-38

CAUTION: *Never wear metal rings or metal watch bands. You can make a ground for the electrical circuit and get a burn on your hand or arm.* 46-55-A

CAUTION: *Know the electrical circuit before you connect or disconnect an electrical component. A wrong connection can cause injury or damage.* 5-4-A

Rules for Service

1. Before you service components of the electrical system or before you charge a battery, disconnect the battery cables.

2. Before you use an electric welder on this machine, disconnect the alternator wires.

3. Keep the correct tension on the drive belt. Replace the drive belt if not in good condition.

4. Do not connect the negative battery cable to the positive battery terminal.

5. Do not connect the positive battery cable to the negative battery terminal. This machine has a negative ground.

6. Do not make a wrong connection with the wires of the alternator. See the service manual for this machine.

7. Do not operate the engine if the battery cables are disconnected.

8. Do not use a steam cleaner or a cleaning solvent to clean the alternator.

9. This machine has a 24 volt, electrical system.

Battery Maintenance

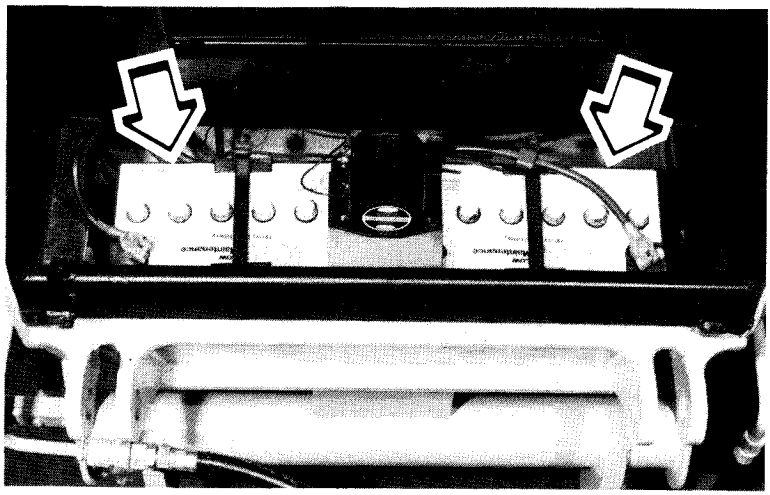
To get long life from your battery, give the battery correct maintenance.

DANGER: *Batteries produce explosive gases. Keep sparks, flame and cigarettes away. Ventilate when charging or using in enclosed space. Always shield eyes when working near batteries.* D-38-14

POISON/DANGER: *Batteries contain sulfuric acid which can cause severe burns. Avoid contact with skin, eyes or clothing. Antidote: EXTERNAL flush with water; INTERNAL, drink large quantities of water or milk. Follow with milk of magnesia, beaten egg or vegetable oil. Call physician immediately; EYES, flush with water for 15 minutes and get prompt medical attention. Keep out of reach of children.* D-19-2-A

Battery Fluid Level

Check the battery fluid level every 1000 hours of operation or once every six months, whichever comes first.



NOTE: Add water only. Do not add electrolyte.

A battery that uses a large amount of water over a period of time indicates a high battery temperature and/or a high setting for the voltage regulator.

To Clean the Battery

Check each battery regularly for dirt, corrosion and damage. Dirt, mixed with electrolyte or moisture on the top of the battery, can cause a discharged condition in the battery. Use one of the following methods to clean the battery.

1. Use Case Battery Saver, part number M20376. Follow the instructions on the container. This cleaner does not need water.

2. Use baking soda or ammonia and flush the battery with clear water. If you do not have Case Battery Saver, use other special cleaners to prevent corrosion on the battery terminals.

WARNING: *When the battery electrolyte is frozen, the battery can explode if, (1) you try to charge the battery, or (2) you try to jump start and run the engine. To prevent the battery electrolyte from freezing, try to keep the battery at full charge. If you do not follow these instructions, you or others in the area can be injured.* 48-35

HYDRAULIC SYSTEM

(Machines Before P.I.N. 9141518)

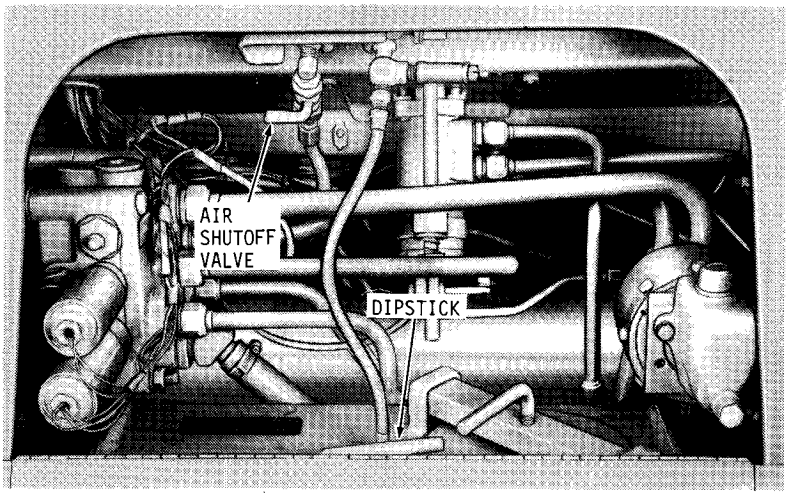
The equipment and steering hydraulic system is air pressurized. Before servicing the system reservoir, the air supply must be shut off and the tank depressurized.

Oil Level

Check the reservoir oil level after every 50 hours or weekly. If possible, have oil at operating temperature, 120° F (44° C) or higher.

Shut off engine. Lower bucket to ground. Close air shutoff valve above tank. Let pressurized air escape by very slowly removing the dipstick-filler cap. Add oil as required.

If the oil level is to be checked after servicing parts in the system, run the loader arm, bucket and steering wheel through several complete cycles to remove air in system lines.



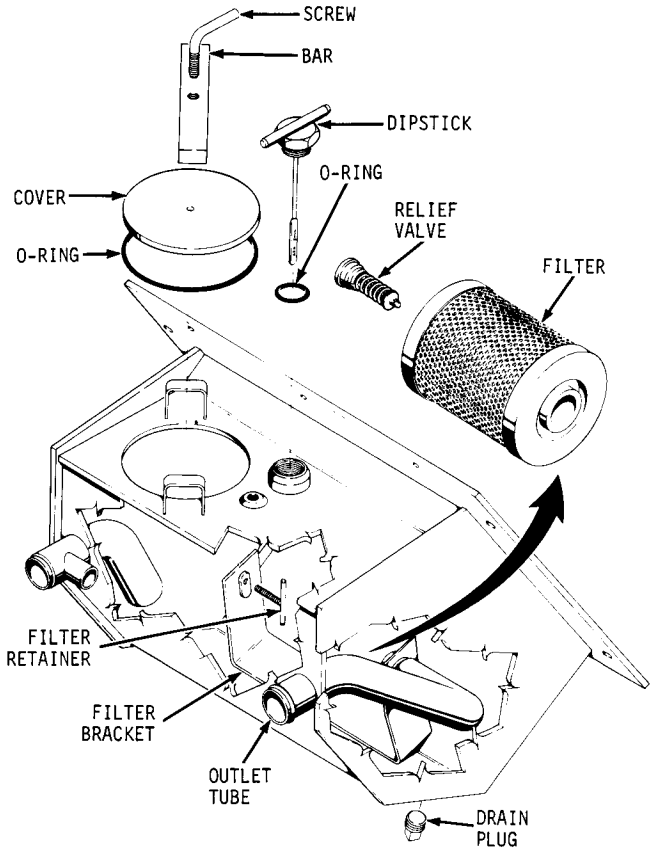
Oil and Filter Change

Every 1000 hours or yearly change the reservoir oil and replace the reservoir outlet filter.

1. Shut off engine. Close air shutoff valve above reservoir. Loosen reservoir cover slowly and carefully. Let pressurized air escape. Remove cover and O-ring. Discard O-ring if damaged or worn.

2. Remove drain plug on bottom of reservoir and drain the oil.

3. Loosen filter retainer at bottom of reservoir. Remove the filter and the bypass valve. Remove valve from filter and discard the filter.



4. Install bypass valve in either end of a new filter. Install the open end of the filter on the outlet tube. Tighten the retainer. Reinstall drain plug.

   NOTE: Do not install the filter end containing the bypass valve directly onto the outlet tube. The end with the valve MUST be installed away from the tube.

5. Refill reservoir with 16 U.S. gallons (61 litres) of Case TCH Fluid. Check oil level with dipstick. Add oil if necessary.

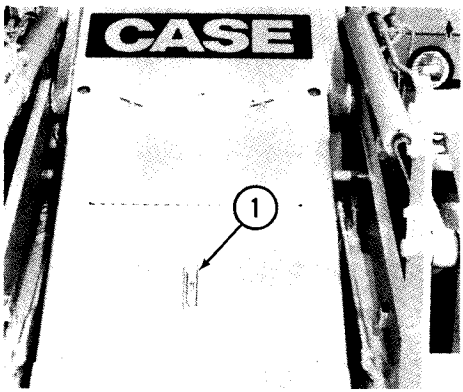
6. Tighten dipstick. Reinstall cover and O-ring. Open air shutoff valve above reservoir. Check for air leaks at cover and dipstick.

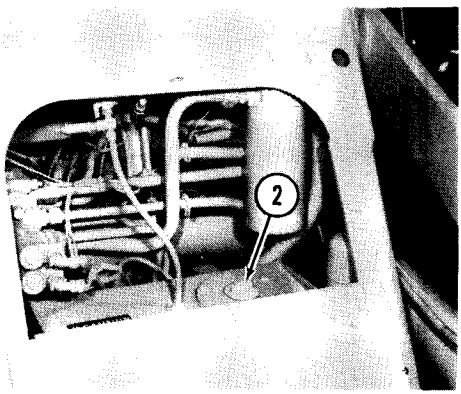
HYDRAULIC SYSTEM

(Machines with P.I.N. 9141518 and After)

Oil Level

Check the oil level of the hydraulic reservoir every 10 hours of operation or each day, whichever comes first.





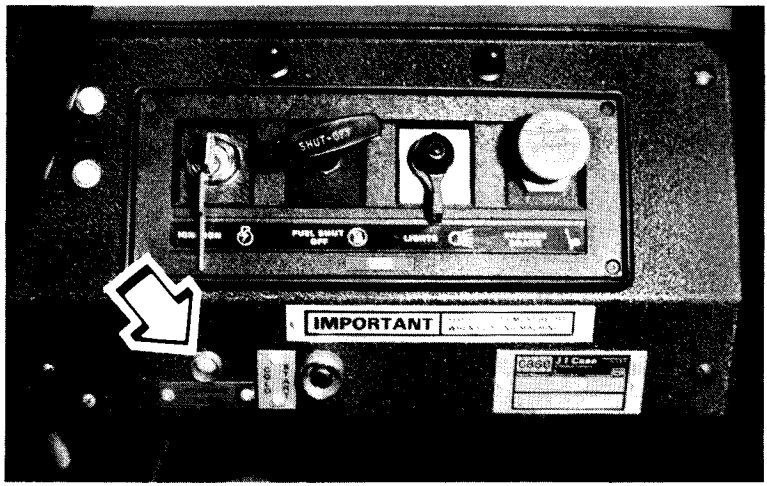
1. Sight Gauge
2. Filler Cap for Hydraulic Oil

To check the oil level:

1. Park the machine on a level surface.
2. Make sure the loader bucket is flat on the ground.
3. Make sure the oil is cold when you check the oil level (oil temperature the same as the outside air temperature).
4. Check the level of the oil in the sight gauge on the left side of the hydraulic reservoir. The level of the oil must be between the High and Low marks on the sight gauge. If the oil level is at the Low mark, add Case TCH Fluid to raise the oil level up to the High mark.

Hydraulic Oil Filter

The hydraulic filter is installed on the right side of the machine. If the machine is new, replace the filter after the first 20 hours of operation. Then, replace the filter after every 500 hours of operation or if the warning lamp for the hydraulic filter is illuminated.



Procedure to Check the Condition of the Hydraulic Oil Filter

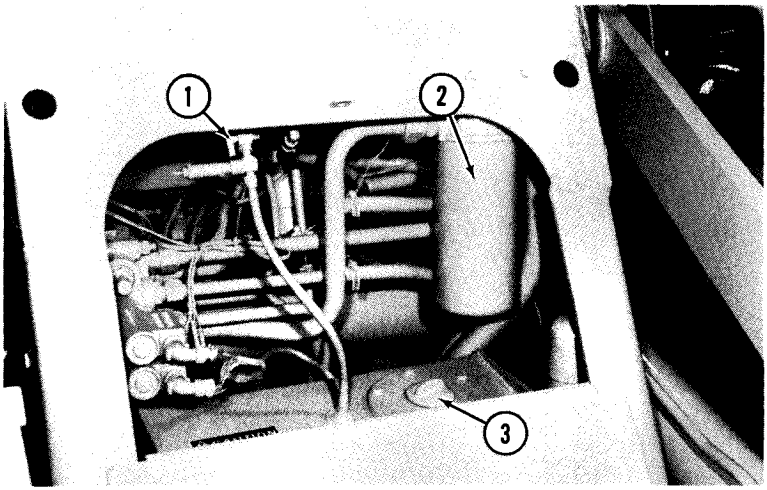
1. Start the engine and raise the temperature of the hydraulic oil to operating temperature (side of the hydraulic oil reservoir feels very warm). To increase the temperature of the oil, do the following:

   a. Roll back the loader bucket and hold the control lever in this position for 15 seconds.

   b. After 15 seconds, move the control lever to the Neutral position.

   c. Do this procedure until the side of the hydraulic reservoir feels very warm.

2. Increase the engine speed to full throttle. If the warning lamp for the hydraulic oil filter is illuminated, replace the filter.



1. Air Pressure Valve
2. Filter
3. Fill Cap

Procedure to Replace the Hydraulic Oil Filter

1. Stop the engine, turn the air pressure valve to the Off position, and slowly remove the fill cap of the hydraulic reservoir. This will remove the air pressure in the reservoir.

2. Use a strap wrench and remove the old filter. Turn the filter counter-clockwise to remove.

3. Lubricate the gasket on the new filter with clean Case TCH Fluid and install the new filter.

4. Turn the filter clockwise with your hand until the gasket contacts the head of the filter assembly. Continue to tighten the filter for 1/2 to 3/4 turn.

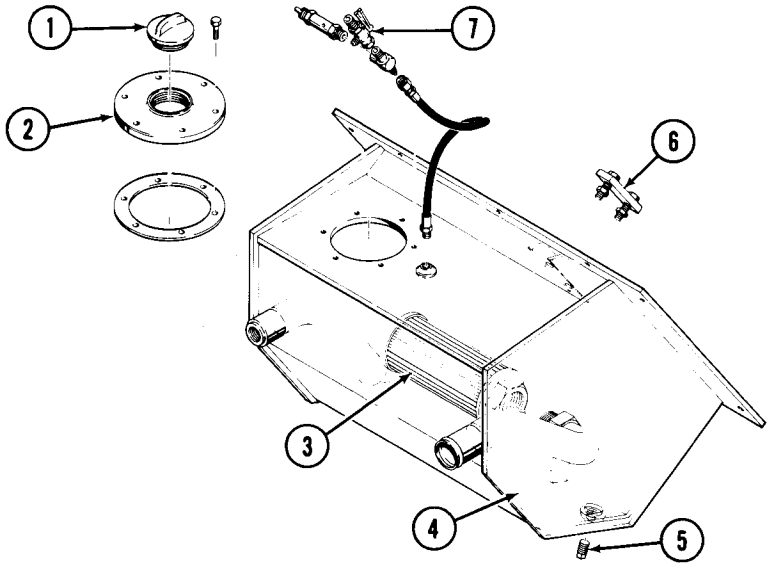
   IMPORTANT: Do not use a filter wrench to install the oil filter. An oil leak can occur if the filter is dented by the filter wrench.

5. Turn the air pressure valve to the On position (handle of valve pointing down).

6. Start the engine and check for oil leaks around the filter.

Hydraulic Oil Change

Every 1000 hours of operation or every six months, whichever comes first (1) change the hydraulic reservoir oil, (2) change the hydraulic filter and (3) clean the suction screen.



1. Fill Cap With O-ring
2. Access Cover With O-ring
3. Suction Screen
4. Hydraulic Reservoir
5. Drain Plug
6. Sight Gauge for Oil Level
7. Air Pressure Valve

1. Make sure the oil is at operating temperature.

2. Lower the loader bucket to the ground and put the backhoe in the Transport position.

3. Stop the engine and put a Do Not Operate tag on the key switch.

4. Open the access door to the hydraulic reservoir.

5. Put a container under the drain plug that will hold 16 U.S. gallons (61 litres).

6. Turn the air pressure valve 90° to the Off position.

7. Remove the air pressure from the reservoir by slowly loosening the fill cap of the reservoir. Remove the drain plug from the reservoir.

8. Remove the access cover. Flush the reservoir with clean TCH fluid. Dry the reservoir with a clean cloth.

9. Remove the suction screen. Clean the suction screen in solvent. Dry the suction screen with compressed air. Install the suction screen.

10. Replace the hydraulic oil filter. See page 108.

11. Install the access cover with a new O-ring. Tighten the access cover bolt.

12. Clean and install the magnetic drain plug.

13. Put 16 U.S. gallons (61 litres) of new Case TCH Fluid into the reservoir.

14. Install the fill cap with a new O-ring. Turn the air pressure valve to the On position.

15. Start the engine and operate the loader controls for three or four minutes. Stop the engine and check for leaks. Check the oil level.

BRAKING SYSTEM

Air Compressor

The compressor supplies air to the air reservoir. It is lubricated by the engine oil system and is provided filtered air by the engine air cleaning system.

Drive Belt

Check the tension on the compressor drive belt every 250 hours: see page 91. Check the fan belts tension at the same time to be sure the compressor belt is receiving full drive capacity from the fan belts.

Cleaning and Replacement

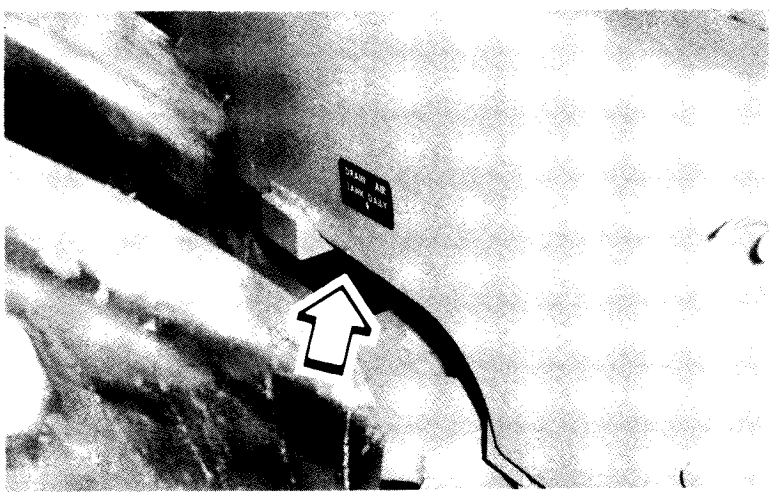
Every 1000 hours have the air compressor cylinder head removed and cleaned by your Case Dealer.

Every 3000 hours have the air compressor either rebuilt or replaced by your Case Dealer.

Air Reservoir

Drain accumulated water from the air reservoir every 10 hours or daily.

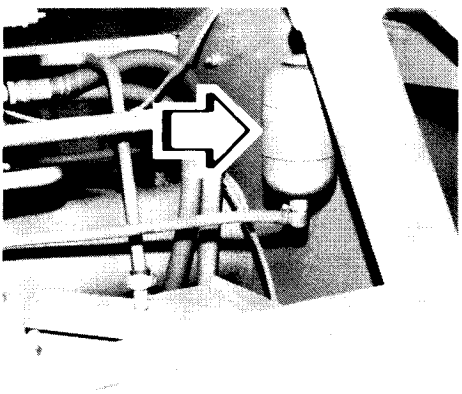
The reservoir draincock is located at the rear axle housing as shown below.



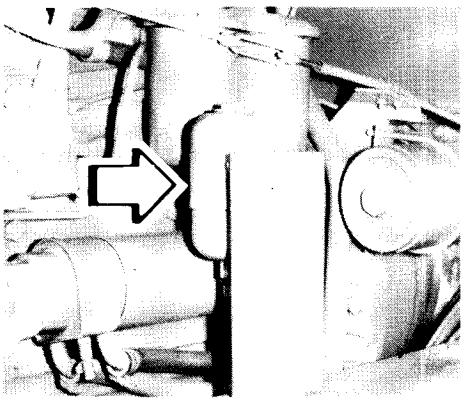
Master Cylinders

The fluid level of the foot brake master cylinders should be checked every 50 hours of operation.

Remove the plug of each remote reservoir and add fluid if necessary. The fluid level should be approximately 1/2 inches (12 mm) from the plug opening.



Remote Reservoir for Front Wheel Brakes

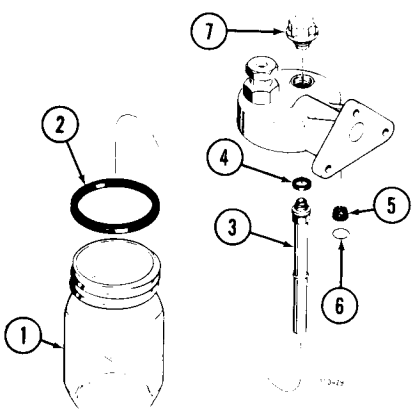


Remote Reservoir for Rear Wheel Brakes

Alcohol Evaporator

The alcohol evaporator prevents freezing of moisture which has condensed in the brake air system during cold weather operation.

WARNING: *Do not use the tire inflation hose to inflate tires or use it as an auxiliary source of air for any reason unless the air system in the machine has been purged of alcohol vapor. Use of air containing alcohol vapor could result in exploding tires and personal injury.* 31-5



1. Jar
2. Jar Gasket
3. Tube
4. Tube Gasket
5. Filter
6. Retaining Ring
7. Filler Cap

Checking

When the air compressor governor starts the compression process at required intervals, air bubbles will come out of the evaporator intake tube at the bottom of the plastic jar and pass through the alcohol. If no bubbles are present during compression, check all connections and the condition of gaskets.

Capacity of the evaporator jar is approximately one pint. Check alcohol level daily during initial use of evaporator and determine amount used in any particular time period. Thereafter, check alcohol level at intervals required by operating conditions.

Refill the evaporator jar at the refill plug with only commercially pure methyl (wood) alcohol. The alcohol should be free of any inhibitor.

Servicing

Every 250 hours clean the evaporator air intake filter. Remove the filter retaining ring and pull out the filter. Clean in solvent.

Every 2000 hours or yearly have your Case Dealer disassemble and clean the evaporator and replace all gaskets.

Checking Brake Linings

Machines with disc brakes: Replace linings when the lining material is worn to 1/8 inch (3 mm) thickness.

Machines with drum and shoe brakes: Replace linings before the lining material is worn to the level of the rivet heads.

Brake Adjustment

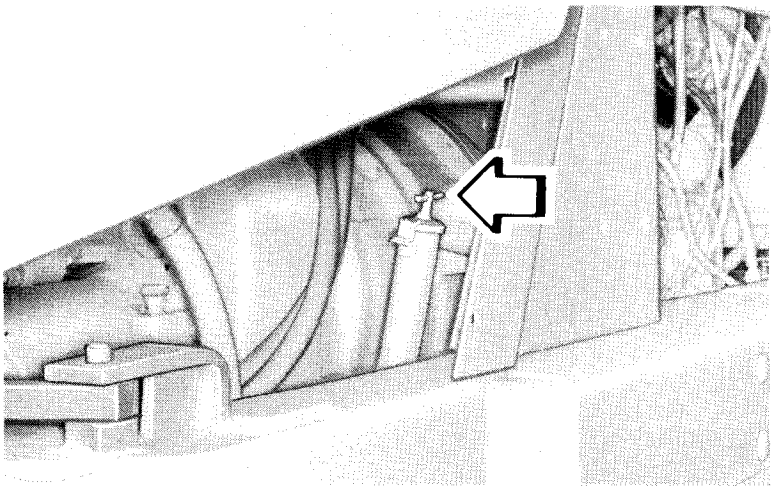
Machines with drum and shoe brakes: An indicator rod for brake adjustment is located on the front and rear brake actuators.

Have an assistant apply the brakes. Measure the travel of the indicator rod. Brake adjustment is required when the indicator rod extends 2-1/2 inches (64 mm) or more with the brakes applies.

TRANSMISSION-CONVERTER HYDRAULIC SYSTEM

Oil Level

Every 50 hours of operation or each week, check the transmission oil level. The dipstick cap is at the left-hand side of the transmission.



DANGER: *Keep clear of this area when engine is running. Machine could pivot unless the frame pivot safety link is in its lock position. After servicing is completed, unlock the safety link and secure in place on the rear frame pivot.* *D-32-4*

NOTE: One quart of oil will raise the oil level approximately 1/2 inch (12 mm). To remove the dipstick, turn the T-handle counterclockwise and lift up. To install, push all the way in and turn T-handle clockwise until tight.

Cold Oil Check

1. Before starting engine, remove dipstick and check oil level. If oil is at or near FULL mark no further checks are necessary. Proceed to step 3 if oil is above ADD mark.

2. If oil level is below the ADD mark, add oil to raise oil level to or slightly above the ADD mark.

3. Start engine and run at low idle with transmission in neutral for approximately two minutes. Recheck oil level and add oil as required to establish oil level at or slightly above the ADD mark.

Hot Oil Check

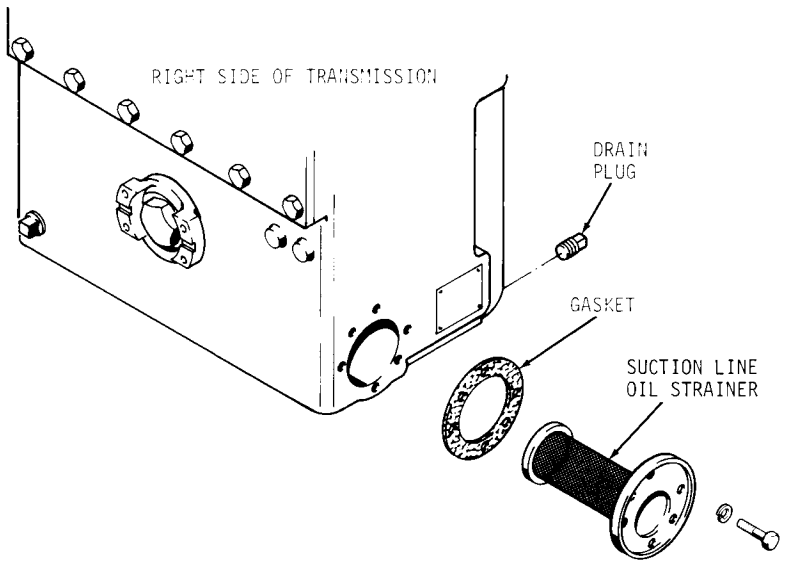
1. With transmission at operating temperature (needle in green zone on gauge), place transmission in neutral and run engine at low idle. Remove dipstick and check oil level. The oil level should be between the ADD and FULL marks.

2. If oil is below the ADD mark, add oil as required to raise the oil level to the FULL mark.

Oil Change and Filter Service

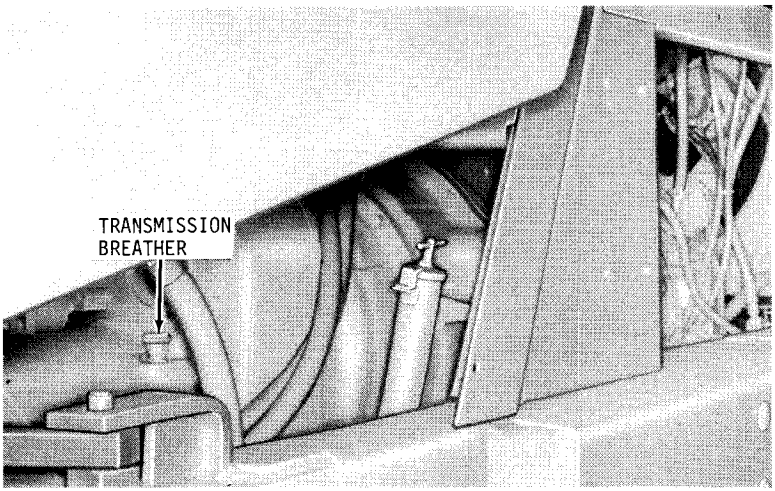
Every 1000 hours (1) change transmission oil, (2) change transmission filter element, (3) clean the oil strainer and (4) clean the breather.

1. Have oil at operating temperature. Remove drain plug. Allow oil to drain thoroughly.



2. Remove oil strainer and gasket. Discard gasket. Clean strainer in solvent. Dry with compressed air.

   NOTE: Do not reinstall drain plug or oil strainer until the transmission filter element has been changed.



3. Remove breather. Clean in solvent, or replace if damaged. Dry the breather with compressed air and install the breather.

4. Change transmission filter element.

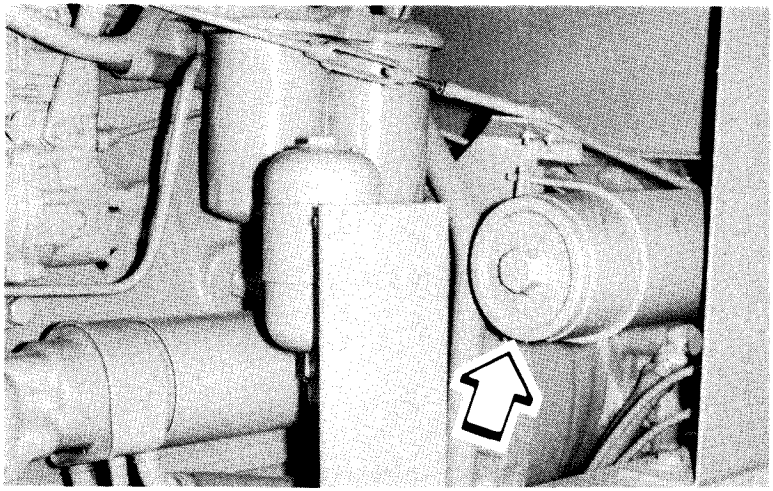
   a. The filter is located at the right-hand side of the engine near the flywheel housing.

   b. Remove filter cover, backup ring, O-ring seal, retaining spring and relief valve. Check O-ring and backup ring for damage and deterioration and replace as required.

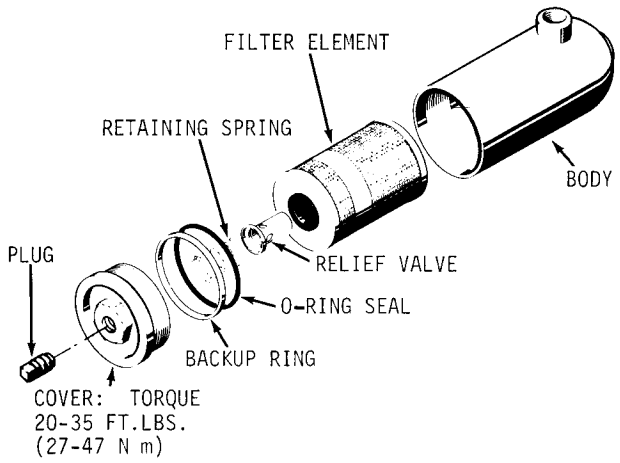
   c. Remove and discard filter element. Clean filter body with a clean dry cloth. Do not use cleaning solvent unless lines are disconncted from filter body.

   d. Install new filter element. Reinstall valve, spring, seal and backup ring.

   e. Reinstall cover using care not to cut O-ring. Torque cover 20 to 35 foot-pounds (27 - 47 N m).



Transmission Filter



5. Reinstall oil strainer with a new gasket.

6. Reinstall transmission drain plug.

7. Fill transmission with 7-1/2 U.S. gallons (28 litres) of Case TCH Fluid. Start engine. Run at low idle several minutes to fully charge transmission and converter with oil. Check oil level when oil is hot, see page 115. Check for oil leaks.

FRONT AND REAR AXLES

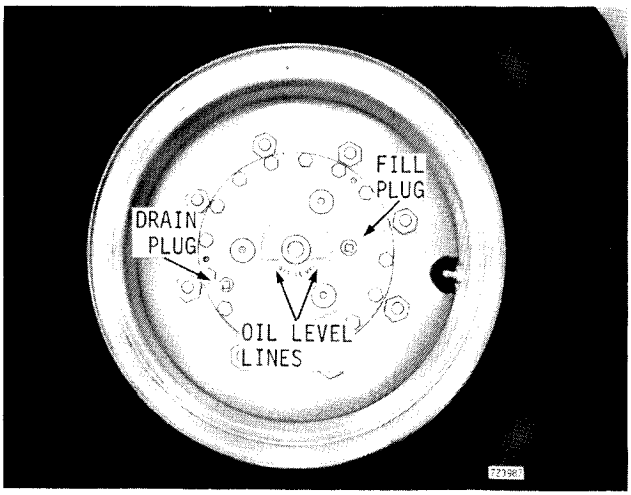
The differential and planetary ends of each axle share a common oil level. Circulation of lubricant between wheel ends and the center bowl is partially restricted by gears, bearings, washers and other components. The lubricant MUST be checked as specified; and the lubricant MUST be installed correctly, especially if the machine is to be used immediately after an axle oil refill.

Oil Level

Every 250 hours check the oil level in each axle.

The oil level can be checked at either wheel end of an axle. Park the machine on a LEVEL surface, so that the oil level lines on one wheel end are parallel to the ground. Remove the oil fill plug. The oil level should be even with the bottom of the plug opening.

NOTE: If one planetary is lower than the other, check oil level at center bowl fill plug.



Oil Change

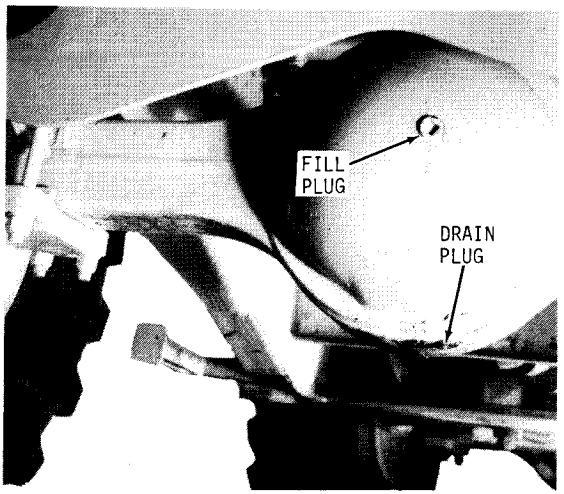
Change the axle oil every 1000 hours of operation or each year.

Draining

1. Park the machine on a level surface with the drain plug on each wheel end in the bottom position. If necessary, jack up the axle and move the wheels into position by hand.

2. Remove the drain plug from each wheel end. Remove the center bowl drain plug. Drain oil thoroughly from the three openings in the axle.

NOTE: Do not drain the center bowl alone. The oil MUST be drained from all three openings.



Refill

3. See page 69 for the type and amount of lubricant required for each axle.

4. Move each wheel end until the oil level lines are parallel to the ground. If necessary, jack up the axle and move the wheels by hand. Reinstall wheel end drain plugs. Remove wheel end fill plugs.

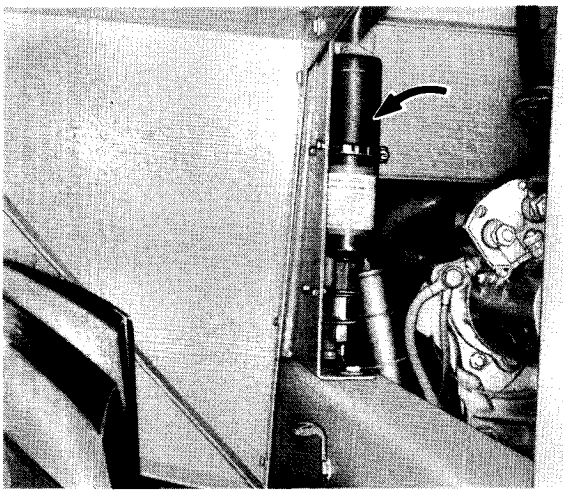
5. Reinstall center bowl drain plug. Remove center bowl fill plug. Pour lubricant into the bowl fill opening until it starts to run out. Reinstall fill plug.

6. Take the remainder of the lubricant and pour one-half of it into each wheel end fill opening. Reinstall wheel end fill plugs.

IMPORTANT: Both wheel ends MUST receive lubricant.

COLD START AID

Replacing Ether Cylinder (Early Production Models)



1. Unclamp the cylinder.
2. Unscrew cylinder from base of unit. Inspect O-ring and replace if required.
3. Install new ether cylinder and tighten securely.
4. Install cylinder clamp.

Replacing Ether Starting Fluid Can (Late Production Models)

IMPORTANT: Before replacing a container of Case Starting fluid, read the information and warnings on the can.

WARNING: *An explosion can result if sparks or flame contact the ether in the starting fluid container, or if you keep the container in an area with the temperatures above 120° F (49° C). Read the following.*

1. *Know the correct method for starting your engine with ether.*
2. *If you weld, grind, or use a cutting torch on the machine, always remove the starting fluid container from the machine. Use compressed air to remove any ether fumes from the area.*
3. *Do not breathe the ether vapor or let the ether touch your skin.*
4. *Keep the starting fluid container above the reach of children.*
5. *Never make a hole in the starting fluid container.*
6. *Do not put the starting fluid container in a fire.*
7. *When the temperature is above 35° to 40° F (0° to 5° C) remove the starting fluid container from the machine.*

Failure to follow the above procedure can cause a severe injury.

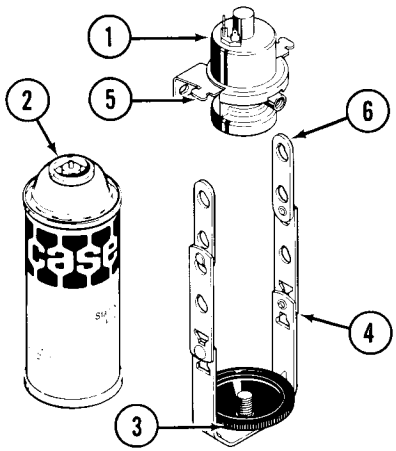
48-12-C

To install a 15 oz. (.44 litre) container of Case Starting fluid, proceed as follows:

1. Loosen the lock nut and put the top holes of the bail extensions on the tabs of the cold start body.

2. Remove the safety cap and plastic spray nozzle from the fluid can.

3. Position the fluid can on the locknut and tighten the lock nut.



1. Cold Start Body
2. Starting Fluid Can
3. Lock Nut
4. Bail
5. Tab
6. bail Extension

When the temperature is warm and the engine does not require assistance to start, do the following.

1. Remove the can of Case Starting Aid from the machine.

2. Install the can holder on the cold start body.

3. Tighten the lock nut so the bottom of the cold start body is sealed.

ROPS CAB AND AIR CONDITIONER

General Maintenance

COMPRESSOR BELT - Check for proper tension after the first 20 hours of operation and every 250 hours thereafter.

CAB AIR FILTERS - Check the filters at least every 50 hours of operation or weekly, whichever comes first, for contamination. In very dusty conditions, it may be necessary to check and clean filters more often.

NOTE: If during the days operation you notice restricted cab air flow when operating in extremely dusty condition - slam the cab door several times - the back pressures will force the dust out of the cab filter and help unrestrict the air flow.

REFRIGERANT LEVEL - The refrigerant level should be checked at the beginning of the summer cooling season and whenever you notice the air conditioning is not working.

HEADLINER - The foam headliner in your cab is a noise reducing material. To function properly, periodically remove dust accumulation from the headliner with a vacuum cleaner.

BLOWER - Clean dust accumulation off the motor and blowers. This will permit the motor to run cooler and eliminate any unbalance in the blowers which could cause rapid motor wear.

IMPORTANT: Do not oil the motor bearings, the motor is lubricated and sealed for life. Oiling will cause dust to accumulate and can result in rapid bearing wear.

IMPORTANT: If the machine is equipped with a heater as well as an air conditioner, the cooling system must be protected with a permanent type anti-freeze during the summer to 15° F (-9° C) or lower to prevent the heater core from freezing.

DOOR HINGES - Use powdered graphite for lubricating hinges, since oil will tend to collect dust.

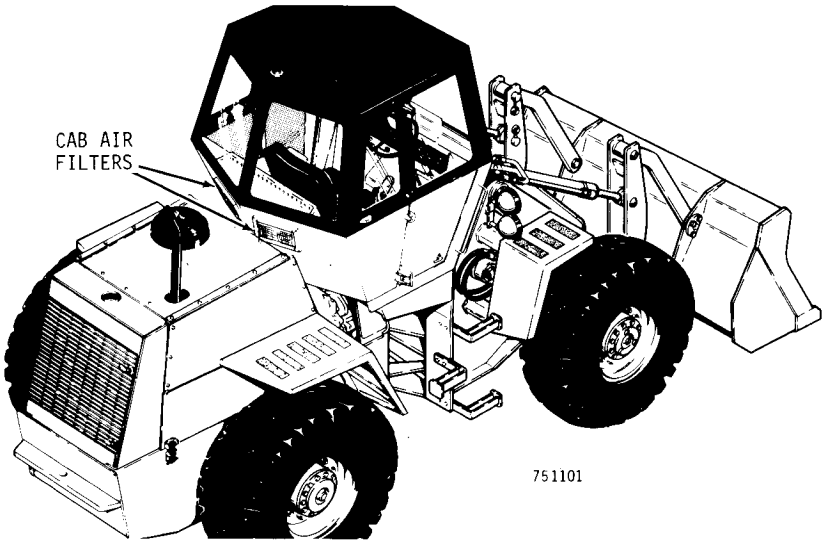
HOSES AND WIRING - Occasionally check all hoses and wiring for field damage, such as kinks, abrasions, breaks, or loss of refrigerant. If such should happen, contact your Case Dealer for replacement of damaged parts or refrigerant.

Cab Air Filters

Removal/Installation

Two air filters are located at the rear of the ROPS Cab. To remove the filter elements, remove four screws, then remove the filter.

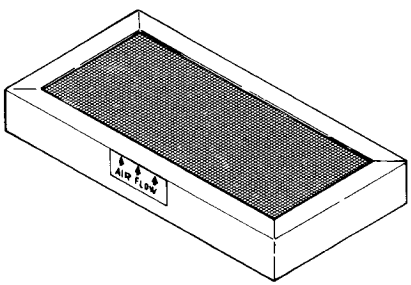
When installing the filters, make sure the arrows on the filter point toward the cab.



Filter Service

The air filter element must be checked and cleaned regularly for efficient operation. Replace the filter element if damaged in any way or when element cannot be cleaned for efficient operation.

The filter element may be cleaned by three methods, tapping, compressed air or water washing.



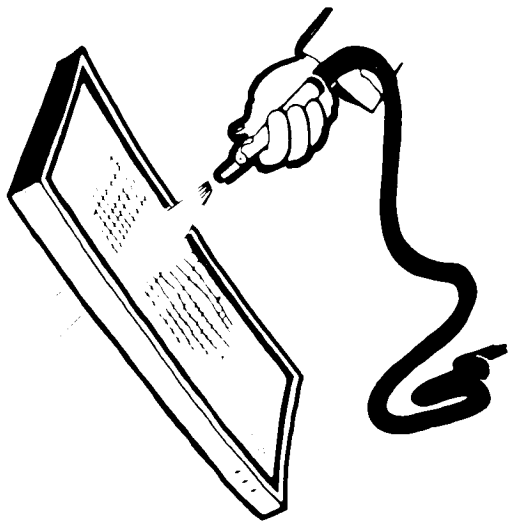
Tapping

The tapping method is used when the dirt is chiefly dust and not heavily contaminated. Tap gently on flat surface; contaminated side down. DO NOT tap in a manner that may dent or rupture the filter elements.

Compressed Air

The air method is used if the dirt is chiefly dust. Direct compressed air up and down the pleats opposite to the air flow arrows shown on element. (Blow air against the clean side of the filter element).

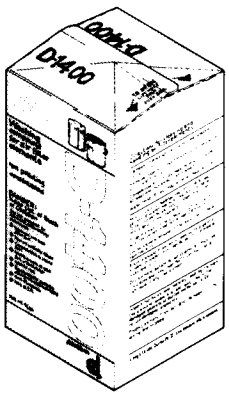
IMPORTANT: The maximum air pressure at nozzle must not exceed 30 psi (207 kPa). Excessive air pressure will rupture the filter elements.



Washing

The washing method is used if element is heavily contaminated and sooty. Wash the element in water using Case Filter Element Cleaner Part No. A40910. Mix 2 ounces (60 grams) of cleaner to 1 gallon (3.8 litres) of water at 70° to 100‡F (21° to 38° C). Soak element for 15 minutes. Rinse thoroughly with hose. Do not use water pressure over 40 psi (276 kPa) at the nozzle. Let air dry completely before installing. This usually requires 24 to 72 hours.

IMPORTANT: Do not use air pressure to dry filter element. It would be a good practice to have a second filter element to use while the recently washed element is drying.



Seat Belts

1. Keep sharp edges and damaging objects away from belts.
2. Periodically inspect belts, buckles and anchors for damage that could lessen the effectiveness of the restraint system.
3. Have questioned parts replaced.
4. Replace belts if cut, weakened, frayed, or subjected to collision loads.
5. Check that anchor mounting bolts are tightened to the seat mounting bracket.
6. Keep seat belts clean and dry.
7. Clean only with a mild soap solution and lukewarm water.
8. Do not bleach or dye belts since this may severely weaken belts.

Operator's Seat and Trim

Your Case Cab is equipped with an optional soft fabric trimmed seat and panels of soft foam material for maximum operator comfort. The care and maintenance of these parts will ensure many satisfactory hours of comfort.

CARE AND CLEANING - Dust and loose dirt that accumulates on seat fabric should be removed frequently with a vacuum cleaner, wisk broom or soft brush. Normal cleanable soilage, spots or stain can be cleaned with the proper use of fabric cleaners.

Before attempting to remove spots or stains from upholstery, determine as accurately as possible the nature and age of the spot or stain. Some spots or stains can be removed satisfactorily with water or mild soap solution.

For best results, spots or stains should be removed as soon as possible. Some types of stains or soilage such as oil and certain types of grease are extremely difficult and, in some cases, impossible to completely remove. When cleaning this type of stain or soilage, care must be taken not to enlarge the soiled area. It is sometimes more desirable to have a small stain than an enlarged stain as a result of careless cleaning.

CAUTION: *When cleaning interior soft trim do not use volatile cleaning solvents such as acetone, lacquer thinner, carbon tetracholoride, enamel reducers, nail polish removers; or such cleaning materials as laundry soaps, bleaches or reducing agents. Never use gasoline or naptha for any cleaning purpose. These materials may be toxic or flammable, or may cause damage to interior trim.* 32-2-A

CLEANING WITH CLEANING FLUID - This type of cleaner should be used for cleaning stains containing grease, oil or fats. Excess stain should be gently scraped off trim with a clean dull knife or scraper. Use very little cleaner, light pressure, and clean cloths (preferably cheese cloth). Cleaning action with cloth should be from outside of stain towards center and constantly changing to a clean section of cloth.

When stain is cleaned from fabric, immediately wipe area briskly with a clean absorbent towel or cheese cloth to help dry area and prevent a cleaning ring. If ring forms, immediately clean entire area.

NOTE: Sometimes a difficult spot may require a second application of cleaning fluid followed immediately by a soft brush to completely remove the spot.

CLEANING WITH DETERGENT FOAM CLEANERS - This type of cleaner is excellent for cleaning general soilage from fabric and for cleaning where a minor cleaning ring may be left from spot cleaning.

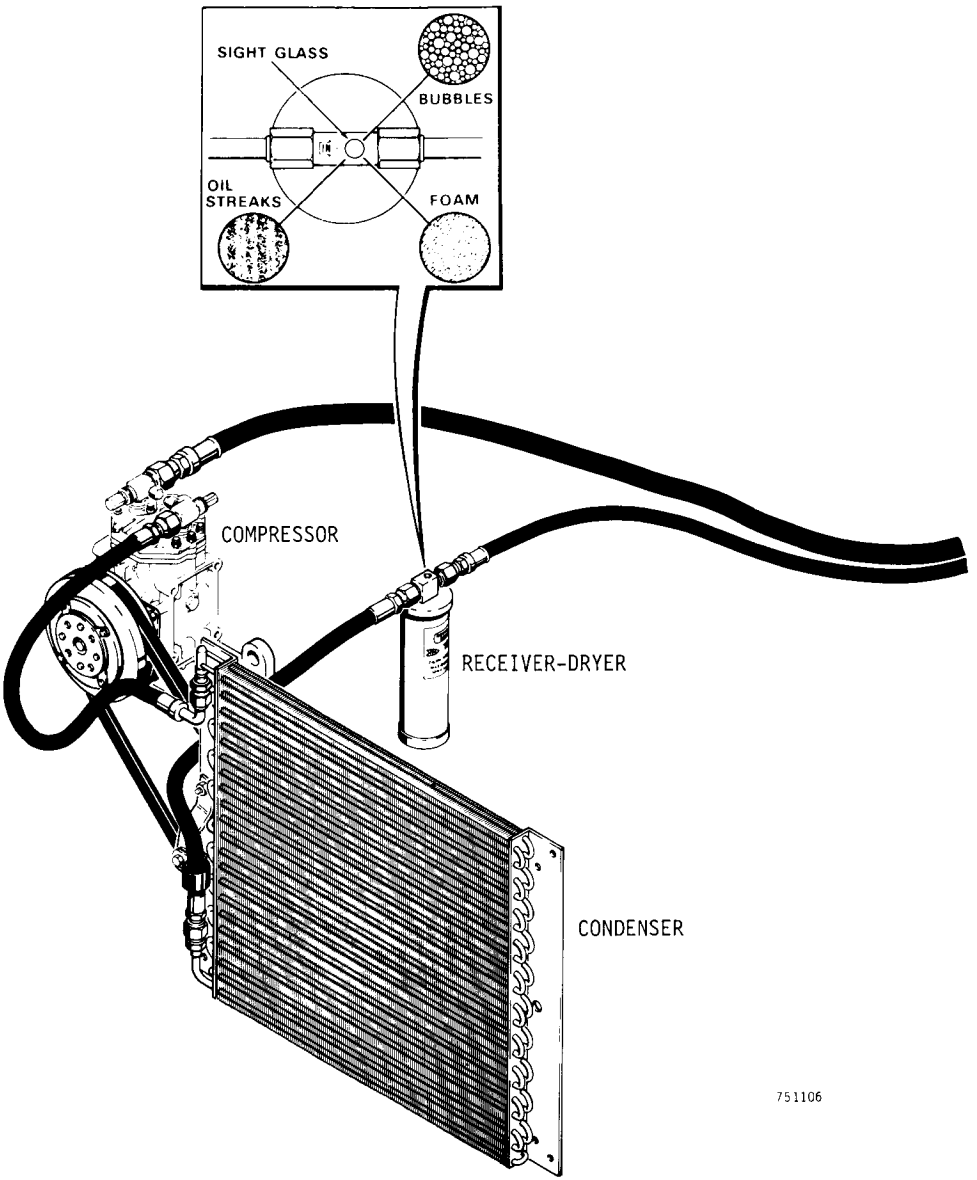
Vacuum area to remove excess loose dirt, Always clean at least a full trim panel or section of trim. Mask adjacent trim along stitch. Mix detergent type foam cleaners in strict accordance with directions on label of container. Use foam only on a clean sponge or soft bristle brush.

NOTE: Do not wet fabric excessively or rub harshly with brush. Wipe clean with a slightly damp absorbent towel or cloth. Immediately after cleaning fabric, dry fabric with a dry towel.

Rewipe fabric with dry absorbent towel or cloth to restore the luster of the trim and to eliminate any dried residue.

Checking Refrigerant

The refrigerant sight glass, which is located in the top of the receiver - drier, should be checked before the start of the summer season and whenever a noticeable loss of cooling is experienced.



"Reading" the sight glass at ambient temperatures above 70° F (21° C) when the system is operating, will help to determine whether the refrigerant charge is sufficient. After about 5 to 10 minutes of compressor operation, the appearance of slow moving bubbles (vapor) indicates a slight shortage of refrigerant. Foam or a heavy stream of bubbles indicates the system is very low on refrigerant. Oil streaks on the sight glass indicate a complete lack of refrigerant.

No bubbles in the sight glass may also indicate a full, over charge or a complete loss of refrigerant. Start the engine and run at about 1500 rpm. While looking at the sight glass, have someone turn the air conditioning control on and off. When the control is off, bubbles will appear if refrigerant is in the system and will disappear when the control is on. If no bubbles appear during the on-off cycle, it indicates there is no refrigerant in the system.

However, if the sight glass is generally clean and the cooling performance of the system is satisfactory, occasional bubbles do not indicate a refrigerant shortage.

NOTE: Under conditions of extremely high temperatures, occasional foam or bubbles may appear in the sight glass.

NOTE: If during the course of operation, you notice the air conditioning stops working, the first thing to check is the refrigerant as described. If the refrigerant is okay, and the system is still not working, check the evaporator, it could be frozen up due to a dirt plugged condenser. In this case it will be necessary to defrost the evaporator by turning off the air conditioner and when it is dry - clean the condenser with compressed air. If the air conditioner still does not function properly, see your Case Dealer.

CAUTION: *Never attempt to service the air conditioning system unless you are completely familiar with air conditioning and the safety precautions which must be followed when handling liquid refrigerant, which can cause severe and painful frostbite. Contact your Authorized Case Dealer, who is experienced in serivicing and handling of refrigerants.* 32-3

WHEELS AND TIRES

Wheel Nut Torque

Check the wheel nut torque according to the intervals that follow.

Check the torque of a new machine after the first hour, first five hours, first ten hours, first 20 hours, first 50 hours, and every 50 hours thereafter until the torque remains the same. If a wheel is removed for service, check the wheel nut torque every 50 hours of operation until the torque remains the same.

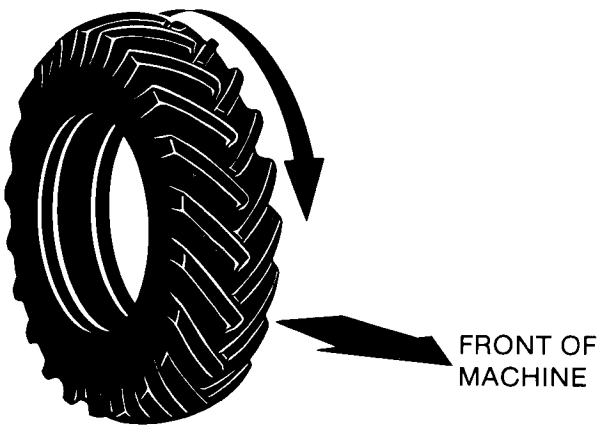
The following are torque specifications for clean, dry threads:

Wheel nuts	380 - 420 ft-lbs (515 - 569 N m)
Axle bolts	380 - 460 ft-lbs (515 - 624 N m)

NOTE: See page 27 for tire pressures.

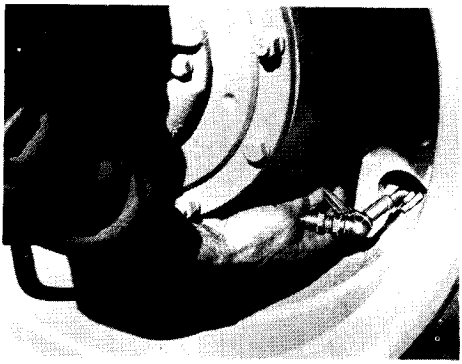
Procedure to Install the Tires

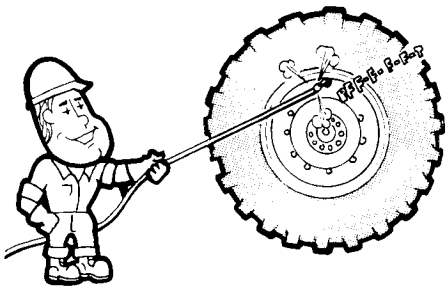
When you install the tire on the wheel, make sure you put the tire tread in the direction shown in the following photograph.



Procedure to Add Air to the Tires

WARNING: *The split rim type wheel on this machine can be dangerous. When you add air to the tire, always (1) stand behind the tread of the tire or (2) put the tire in a tire cage. The retaining ring and rim of the wheel can come off with an explosive force. You or a person in the area can receive a serious injury.* 47-43-B





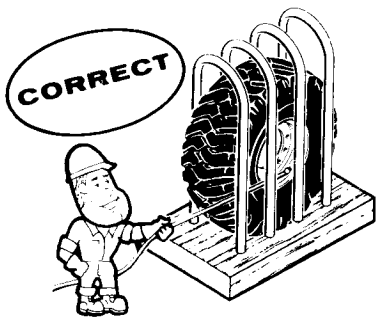
This procedure is only for adding air to the tire. When you must disassemble the wheel, refer to the following topic.

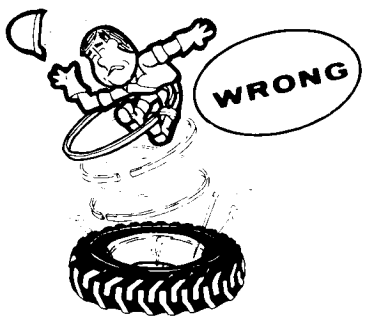
When you add air to the tires, use a hose that has a self-locking nozzle. Attach the self-locking nozzle to the tire stem and start the flow of air. Always stand behind the tread of the tire when you add air. See the photographs above.

Stop the flow of air to the tire and disconnect the air hose nozzle from the tire. Check the tire air pressure.

Procedure to Service the Tires (Tires With Split Rim Wheels)

Always have a qualified tire mechanic service the split rim type wheels on your machine. A tire inflation cage and other correct tire repair equipment is required. Using the wrong service procedure with this type of wheel can be dangerous.



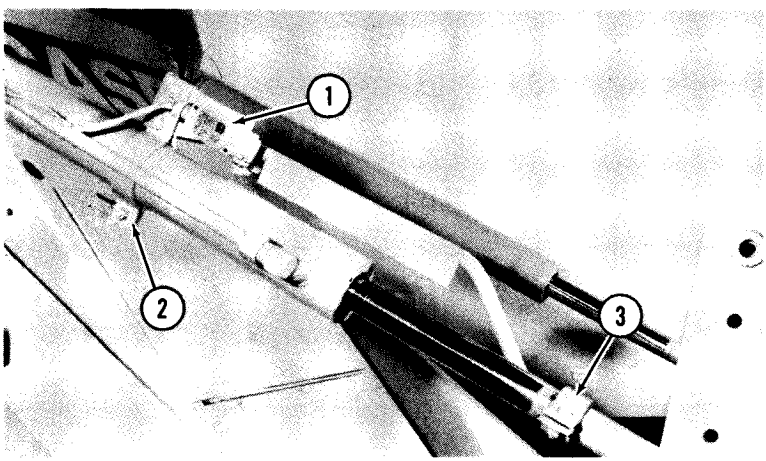


LOADER SERVICE

Return-To-Dig Adjustment

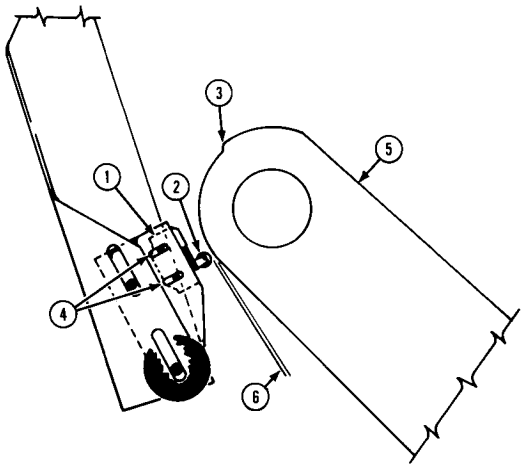
This adjustment controls the digging angle of the bucket when the return-to-dig is used. To change the digging angle of the bucket, proceed as follows:

1. Stop the machine on a level surface.
2. Lower the loader bucket to the ground. Make sure the bottom of the bucket is parallel with the ground or at the necessary digging angle.
3. Engage the parking brake and stop the engine.
4. Loosen the bolt for the switch mounting bracket and move the switch assembly away from the loader bucket.
5. Turn the key switch to the On position. Do not start the engine.
6. Pull the bucket control lever back to the Rollback position. The bucket control lever will remain in this position.
7. Slowly move the switch assembly toward the loader bucket until the bucket control lever releases and returns to the Neutral position. Stop moving the switch assembly.
8. Tighten the bolt for the switch mounting bracket.
9. Start the engine and check the operation of the return-to-dig.



1. Switch
2. Switch Mounting Bracket
3. Do Not Loosen

Bucket Height Control
(Limit Switch Adjustment)



The height control limit switch may occasionally need adjustment to maintain a minimum gap between the switch roller and the surface of the lift arm pivot end. To adjust the switch:

1. Lower bucket to ground.

2. Loosen the 2 switch mounting bolts and position switch to obtain clearance specified above.

3. Adjust switch until a gap of .070" (1.8 mm) is obtained. Tighten bolts.

4. Raise the bucket and observe movement of lift arm pivot end. The gap between the switch roller and the arm end surface should be maintained until the arm actuator contacts the switch roller. Reposition switch if necessary.

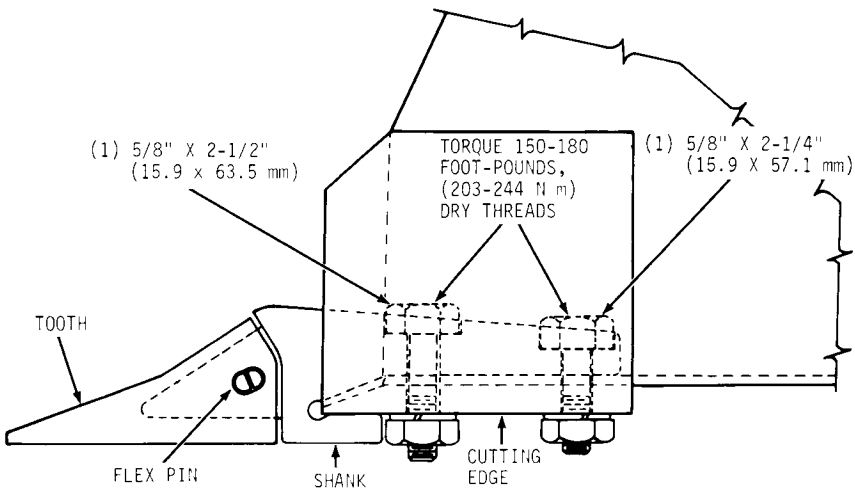
Bucket Teeth

CAUTION: *Wear eye or face protection when you service the machine. Use a hammer with a soft face, such as plastic, wood, brass or leather, when you hit hardened tools or hardened metal surfaces. Any other procedure can cause injury from flying chips.*

46-14-C

To replace a bucket tooth, drive out the flex pin and remove the old tooth from the shank. Install new tooth on shank and drive flex pin into place.

To replace a tooth shank, remove the 2 mounting bolts from the bucket cutting edge. Install new shank, and torque the bolts, if clean and dry, to 150 - 180 foot-pounds (203 - 244 N m).



MACHINE STORAGE

If the machine is stored for 30 days or more, it should be moved to a dry, protected place and, if possible, put inside a heated building. Certain precautions must be taken to prevent rust, corrosion and deterioration of parts:

Engine Lubrication System

For protection of valves and cylinder sleeve walls:

1. While the engine is still hot, drain crankcase oil and refill crankcase with new engine oil.

2. Install a new engine oil filter.

3. Clean the air cleaner.

Fuel System

For protection of fuel lines and injectors:

1. Drain the diesel fuel tank and pour 1 to 2 U.S. gallons (4 to 8 litres) of diesel flushing oil into the tank. Use a good quality diesel flushing oil.

2. Start and operate the engine until blue-white smoke appears at the exhaust. This indicates the regular fuel in the filters has been used up and flushing oil is being burned. Operate the engine for an additional 10 minutes before storing. Drain the remainder of the flushing oil from the fuel tank. Put a tablespoon of VPI 260 crystals in the fuel tank. These crystals eliminate rust formation. VPI 260 crystals are manufactured by the Shell Oil Company.

Cooling System

If water alone has been used in the cooling system, then either of the following methods should be used to protect the system, especially in winter storage:

1. While the engine is still hot, drain the coolant from the cooling system. Leave the engine and radiator drains open and loosen the radiator cap to relieve pressure on the cap gasket. Place a warning tag on the radiator cap and in the operator's compartment stating that the cooling system has been drained.

2. While the engine is still hot, drain the coolant from the cooling system. When engine has cooled, put in clean, soft water and permanent type antifreeze in the proportions recommended by the antifreeze manufacturer for the lowest expected temperature. Start engine, get it up to operating temperature, and run it for several minutes to thoroughly mix water with antifreeze.

Batteries

DANGER: *Batteries produce explosive gases. Keep sparks, flame and cigarettes away. Ventilate when charging or using in enclosed space. Always shield eyes when working near batteries.* D-38-14

After charging batteries to near full charge, remove them from machine and store in a dry, moderately cool place. Place batteries on a wood pallet or similar insulating material and, if possible, store them in a building where temperatures remain above freezing (32° F, 0° C). Periodically check batteries for proper electrolyte level and test electrolyte with a hydrometer. When hydrometer readings near 1.200, the battery is close to complete discharge. When necessary, recharge batteries to keep readings well above 1.200 so that the electrolyte will not freeze.

Equipment Hydraulic System

1. Place wood planking on the ground and lower the loader bucket on it.

2. After engine has stopped, move bucket control levers through several cycles to relieve pressure in hydraulic system.

3. Coat the hydraulic cylinder rods with special Case rust and corrision preventative.

4. Open the drain-cock on the bottom of the air reservoir to drain out water and sediment and relieve the air pressure in the tank. When reservoir is completely depressurized, the air pressure gauge reading should be zero.

5. Loosen the dipstick SLOWLY at the top of the hydraulic reservoir and relieve air pressure in the tank.

REMOVAL FROM STORAGE

A loader taken out of storage must have the following done before being placed in operation.

NOTE: Do not start the engine until items 1-8 below have been done.

1. If cooling system has been drained for storage, refill with clean, soft water and with permanent type antifreeze.

2. Make sure the engine oil is at the required level.

3. Reinstall the batteries, fully charged.

4. A fuel tank protected from rust by VPI 260 crystals has only to be refilled with clean, water-free No. 2 diesel fuel.

5. Check tires for correct air pressure.

6. Close the draincock on the bottom of both air reservoirs.

7. Tighten the dipstick/filler cap on top of the hydraulic reservoir. Be sure the air shutoff valve, above the reservoir, is turned on so that the tank is pressurized.

8. Check all controls for freedom of movement making sure they do not stick.

9. Change the fuel filters and bleed the fuel system.

   NOTE: If machine is equipped with a turbocharger, refer to page 53 for procedure to start the engine.

10. Start the engine and run at idling speed, 700-750 rpm. It is advisable to remove the valve cover to make sure valves are not sticking and the rocker arm assembly is being lubricated. The flushing oil in the fuel system will cause a blue-white exhaust smoke for a short time; this will not damage the engine.

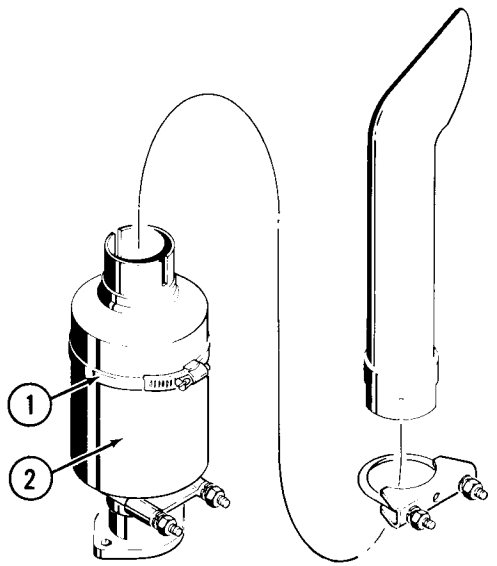
SPARK ARRESTER MUFFLER

The spark arrester muffler is available as optional equipment.

Clean the spark arrester muffler after every 100 hours of operation.

Do the following:

1. Remove the clamp (1) from the muffler (2).



1. Clamp 2. Spark Arrester Muffler

2. Hold a piece of wood over the outlet of the exhaust pipe to stop the exhaust flow.

3. Pull the fuel shutoff control all the way out. This will prevent the engine from starting.

4. Make sure the parking brake is in the Engaged position.

5. Operate the starter motor for 30 seconds. This procedure will remove loose soot from the muffler.

6. Turn the key switch to the Off position.

7. Install the clamp of the muffler. Make sure the clamp is put over the slot in the muffler. Tighten the clamp.

AFTER DELIVERY CHECK

(After First 20 Hours of Operation of New Machine)

Date of Check _____ Hourmeter reading: _____ hours

MACHINE: Model W14 Product Identification Number _____

OWNER: Name _____

Address _____

DEALER: Name _____

Address _____

COOLING SYSTEM

- ☐ Check radiator coolant level.
- ☐ Check for leaks.

FUEL SYSTEM

- ☐ Check for leaks.

ELECTRICAL SYSTEM

- ☐ Check battery fluid level and specific gravity.
- ☐ Check operation of starter, alternator, instruments.

LUBRICATION

- ☐ Grease all pressure fittings.
- ☐ Change engine oil.
- ☐ Change engine oil filter.
- ☐ Check differential and planetary oil level.
- ☐ Check transmission oil level.

ENGINE

- ☐ Tighten cylinder head bolts.
- ☐ Check valves tappet clearance.
- ☐ Check no load full goverened speed and idle speed.
- ☐ Check engine timing.

HYDRAULIC SYSTEM

- ☐ Check reservoir oil level and air pressure.
- ☐ Check main relief valve pressure on loader.
- ☐ Check steering operation.
- ☐ Change the hydraulic oil filter.

GENERAL

- ☐ Check foot and parking brake adjustment.
- ☐ Service the air cleaner.
- ☐ Inspect for oil leaks.
- ☐ Tighten all accessible bolts.
- ☐ Clean all breathers.
- ☐ Check ROPS Cab environmental controls for proper operation.
- ☐ Check the tension of all drive belts.

SAFETY

- ☐ Inspect the ROPS.
- ☐ Check the safety decals and replace if necessary.
- ☐ Check safety components (seat belt, lights, etc.)
- ☐ Make sure the machine has the W14 Operator's Manual in the Manual Storage Box.

DEALER: Learn whether the owner or operator has any problems with the machine. Make sure the owner or operator understands all the information in this manual. Give the owner or operator information he needs.

After Delivery Check done by _____

Name of Dealer (signature) _____

Name of Owner (signature) _____

Dealer Copy

AFTER DELIVERY CHECK

(After First 20 Hours of Operation of New Machine)

Date of Check _____ Hourmeter reading: _____ hours

MACHINE: Model W14 Product Identification Number _____

OWNER: Name _____

Address _____

DEALER: Name _____

Address _____

COOLING SYSTEM

- ☐ Check radiator coolant level.
- ☐ Check for leaks.

FUEL SYSTEM

- ☐ Check for leaks.

ELECTRICAL SYSTEM

- ☐ Check battery fluid level and specific gravity.
- ☐ Check operation of starter, alternator, instruments.

LUBRICATION

- ☐ Grease all pressure fittings.
- ☐ Change engine oil.
- ☐ Change engine oil filter.
- ☐ Check differential and planetary oil level.
- ☐ Check transmission oil level.

ENGINE

- ☐ Tighten cylinder head bolts.
- ☐ Check valves tappet clearance.
- ☐ Check no load full goverened speed and idle speed.
- ☐ Check engine timing.

HYDRAULIC SYSTEM

- ☐ Check reservoir oil level and air pressure.
- ☐ Check main relief valve pressure on loader.
- ☐ Check steering operation.
- ☐ Change the hydraulic oil filter.

GENERAL

- ☐ Check foot and parking brake adjustment.
- ☐ Service the air cleaner.
- ☐ Inspect for oil leaks.
- ☐ Tighten all accessible bolts.
- ☐ Clean all breathers.
- ☐ Check ROPS Cab environmental controls for proper operation.
- ☐ Check the tension of all drive belts.

SAFETY

- ☐ Inspect the ROPS.
- ☐ Check the safety decals and replace if necessary.
- ☐ Check safety components (seat belt, lights, etc.)
- ☐ Make sure the machine has the W14 Operator's Manual in the Manual Storage Box.

DEALER: Learn whether the owner or operator has any problems with the machine. Make sure the owner or operator understands all the information in this manual. Give the owner or operator information he needs.

After Delivery Check done by _____

Name of Dealer (signature) _____

Name of Owner (signature) _____

Owner Copy