W24C
Articulated Loader
Operators Manual 9-6121

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 OR IS LOANED OR RENTED, MAKE ABSOLUTELY CERTAIN THAT THE OPERATOR(S), PRIOR TO OPERATING:

1. IS INSTRUCTED IN SAFE AND PROPER USE.
2. REVIEWS AND UNDERSTANDS THE MANUAL(S) PERTAINING TO THE MACHINE.

751253

WARNING

BEFORE STARTING ENGINE

STUDY OPERATOR'S MANUAL SAFETY MESSAGES
READ ALL SAFETY SIGNS ON MACHINE
CLEAR THE AREA OF OTHER PERSONS

LEARN & PRACTICE SAFE USE OF CONTROLS BEFORE OPERATING

IT IS YOUR RESPONSIBILITY TO UNDERSTAND AND FOLLOW MANUFACTURER'S INSTRUCTIONS ON MACHINE OPERATION, SERVICE, AND TO OBSERVE PERTINENT LAWS AND REGULATIONS. OPERATOR AND SERVICE MANUALS MAY BE OBTAINED FROM YOUR EQUIPMENT DEALER.

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Price of this manual $2.40

November 1977

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"Right-Hand" and "Left-Hand", when used in this manual, represent the right and left sides of the machine as seen by the operator when sitting in the seat.

TO THE OWNER

This manual is your guide to safe, efficient operation. Read it carefully. This is the best way to learn about the machine. This will also decrease damage caused by wrong maintenance.

When you are not using the manual, put it into the box for storage. The box for storage is behind the seat for the operator.

DELIVERY OF NEW MACHINE

When your Case dealer shows you your new machine, he will tell you about correct operation and maintenance as shown in the Owner Warranty Registration and Delivery Report. When your dealer has given these instructions, you must write your name on the report. Then he will give you a copy for your records.

AFTER DELIVERY CHECK

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

NOTE: Your only cost for this inspection will be for filters, oil, or other accessories. If the check is not done in the dealer's shop, there can also be a cost for the time and distance from the dealer's shop.

If you need more information, see us.

Your Authorized Case Dealer

The J I Case Company can make changes in design or specifications of the machine at any time with no obligation in relation to these changes.

SAFETY

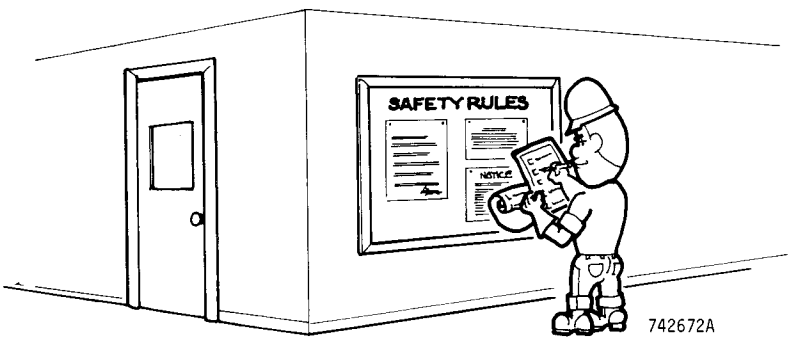
RULES FOR SAFETY

Your safety and the safety of the personnel in your area are the result of your safe operation of this equipment. Know the positions and functions of all the controls before you operate. BE SURE TO CHECK ALL CONTROLS IN A SAFE, CLEAR AREA BEFORE YOU OPERATE.

READ THIS MANUAL COMPLETELY and make sure you understand it. The abilities of any equipment are limited. Be sure you understand, for example, the characteristics of speed, stability, load, braking system, and steering system for this machine before you operate.

The information for safety given in this manual does not replace any other rules or laws for safety which are used in your area. Know the rules or laws for safety that are used in your area and be sure that your machine has the ability to run according to these rules.

It is a good procedure to make copies of the rules for safety which follow and to put them in the work area.



Before You Start the Engine

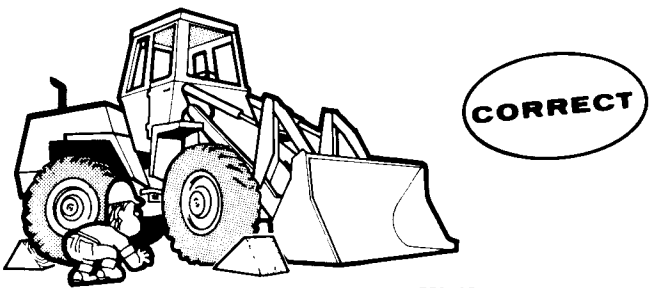
WARNING: *Before starting engine, study operator's manual safety messages. Read all safety signs on machine. Clear the area of other persons. Learn and practice safe use of controls before operating.*

It is your responsibility to understand and follow manufacturer's instructions on machine operation, service, and to observe pertinent laws and regulations. Operator and service manuals may be obtained from your equipment dealer. D-34-2-A

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

IMPORTANT: *Always install new decals whenever the old decals are destroyed, lost, painted over or illegible. When individual parts are replaced that have decals attached, be sure to install a new decal with the new part. Decals are available from your Case dealer.* 46-48

CAUTION: *Visually check out the machine for leaks and broken, missing or malfunctioning parts. Be sure all caps, dip sticks, battery covers, etc. are secure before starting. A part failure during operation could cause injury.* 25-10



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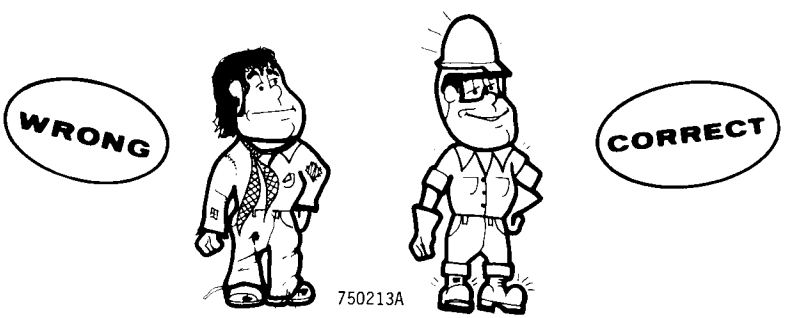
CAUTION: *Wear the proper safety equipment - - avoid loose clothing. Obtain additional safety equipment when your safety may be in doubt. Hard hat, safety shoes, ear protectors, reflective clothing, safety goggles and heavy gloves may be required.* 1-3



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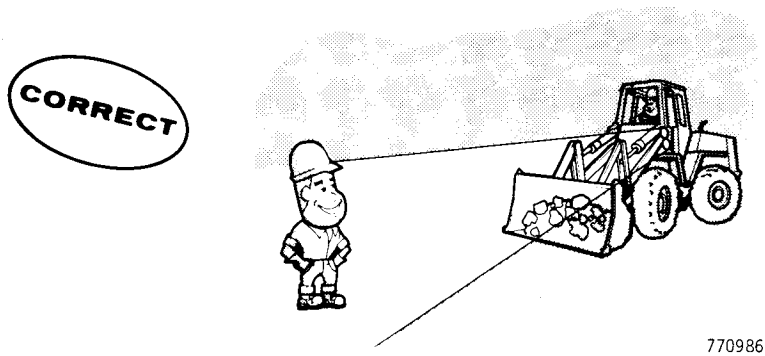
WARNING: *Do not smoke when using starting fluid or spray fluid near an open fire. Do not puncture or throw starting fluid can into an incinerator. Use this starting aid sparingly and do not store in a hot area.* 1-10

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

CAUTION: *Check that all lights (if so equipped) are functioning properly before operating at night.* *25-7*



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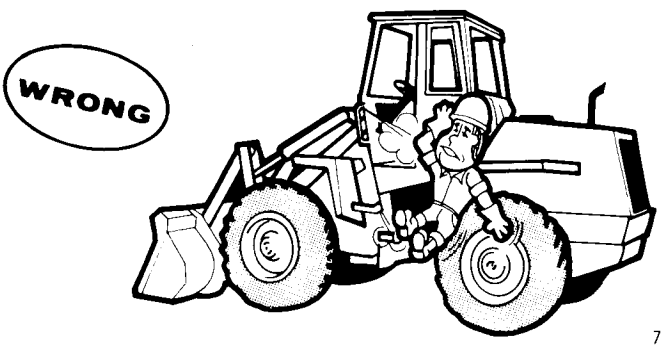
WARNING: *Be sure the operator's area, steps and grab handles are free of oil, loose objects or ice. Remove or secure all maintenance or personal items. Failure to keep these areas clean could cause a serious accident.* *25-8*



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CAUTION: *Carry and maintain a fire extinguisher and first aid kit at all times. Know how to use them both.* *25-9*

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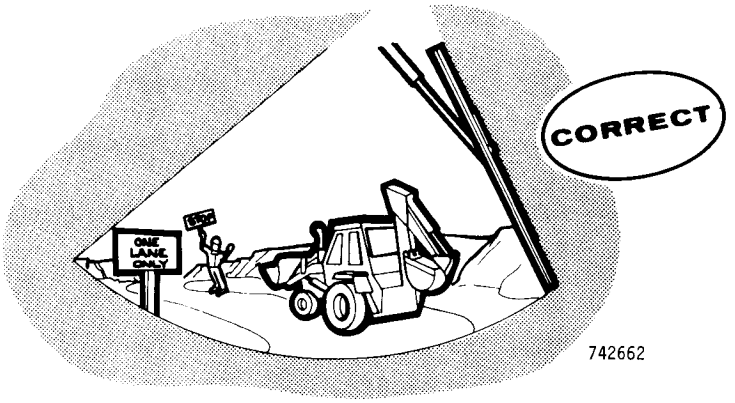
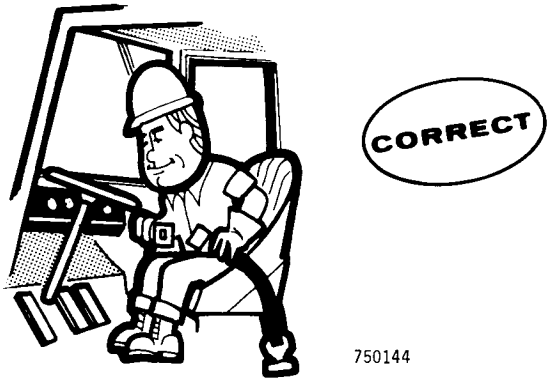
CAUTION: *Know and understand the traffic flow patterns of your job. Understand and obey the flagman, road signs or signals. Failure to do so could cause an accident.* *29-3*

CAUTION: *Clean the windshield and windows to provide good visibility. Be sure the windshield wipers are in good condition. Dirty windows contribute to accidents.* *24-1*



CAUTION: *Fasten seat belt securely before operating.* *D-46-68*



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

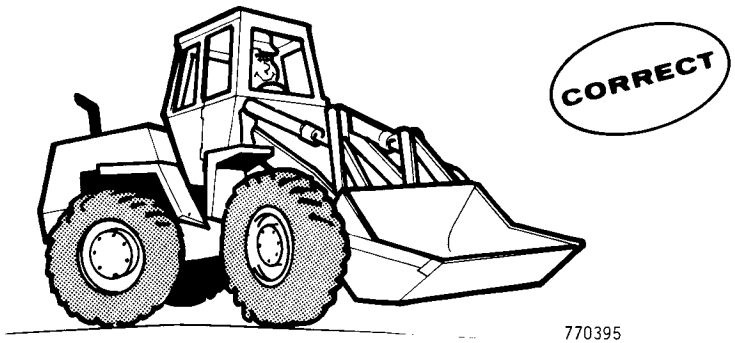
CAUTION: *Keep all personnel clear of loader arms, attachments and articulated joint area.* *D-46-71*

When You Operate the Machine

CAUTION: *Keep alert. Clear the operating area of all unauthorized persons. Know the location of fellow workers in your area.* 2-3

WARNING: *If the brake system air pressure drops below normal, the warning buzzer will sound. If the air pressure drops further, the park brake will engage automatically. Be prepared for a sudden stop.* 46-73

CAUTION: *Before each operating period, test the machine for proper steering, braking, operation of the hydraulic controls and safety devices. A properly operating machine can prevent accidents. If required, repair or adjust machine before operating.* 26-4-A



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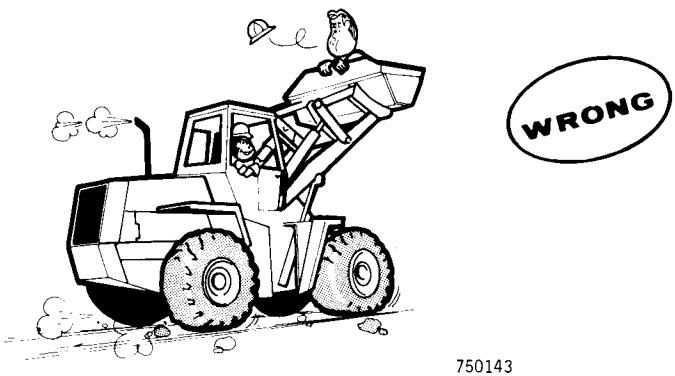
CAUTION: *Do not permit riders on machine. This is a one man machine.* D-28-9



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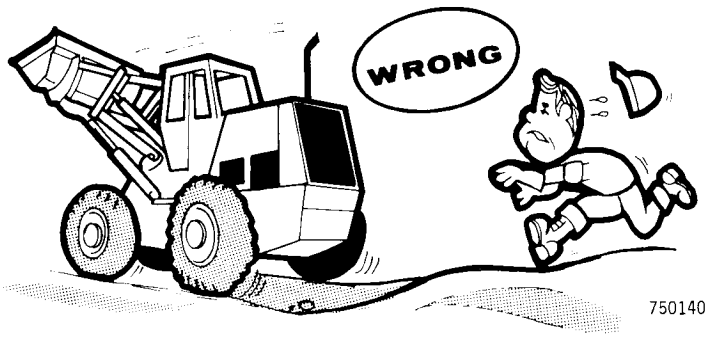
CAUTION: *Do not use the steering wheel or control levers as a hand-hold for getting on or off the machine.* 12-9

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

WARNING: *Always operate the controls from the operator's seat only.*
2-5

CAUTION: *Never leave the machine unattended with the engine running. Set the parking brake, lower the attachments to the ground and shut off the engine. Park the machine on level ground or parallel to a slope.*
24-2



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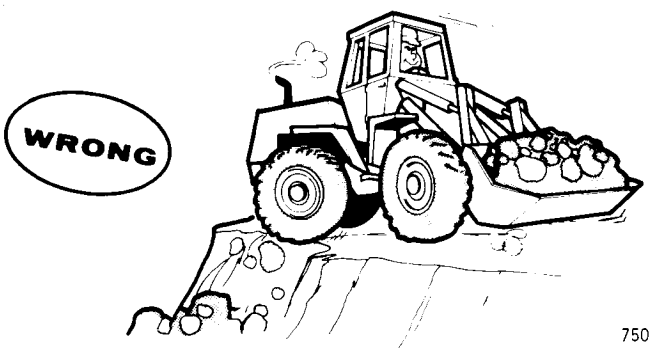
CAUTION: *Do not jump from the machine, serious injury could result.*
27-2

WARNING: *Always drive the machine slowly when on hillsides, ramps or rough terrain. 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.* *26-10*



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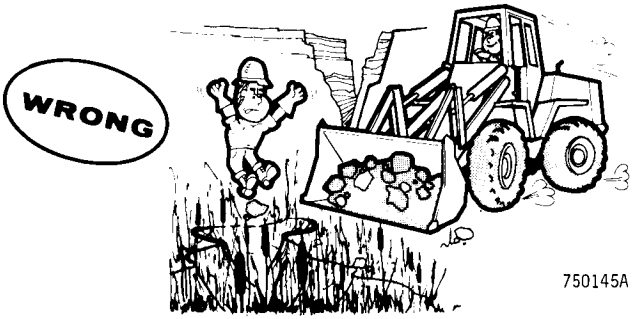
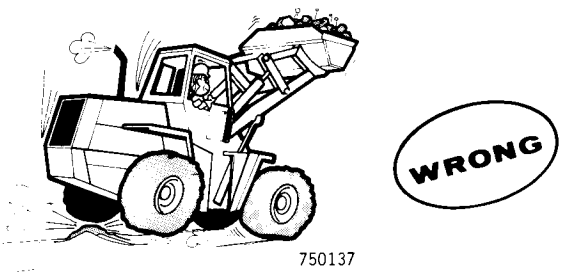
CAUTION: *Understand the machine's limitations. Keep it under control at all times. DO NOT TRY TO DO TOO MUCH TOO FAST.* *3-7*

WARNING: *Before operating in an unfamiliar area, walk around and check for hidden holes, drop-offs or obstacles that could cause an accident.* 26-5



WARNING: *Never transport a loaded bucket at full height. Keep the bucket as low as possible for better machine balance and visibility. When transporting a loaded bucket over rough, uneven ground, keep travel speed within safe operating limits.* 18-6



WARNING: *Know the location of underground cables, water mains, gas lines, etc. A ruptured gas line or cut electrical line could result in personal injury.* 26-8

WARNING: *Keep the transmission in low gear when going down steep 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

DANGER: *Keep all machine parts away from electrical lines. If work must be done close to high voltage lines, have the utility company disconnect them. It is not necessary to actually contact a power line for the electricity to ground through the machine. If power does ground through the machine, remain on the machine and DO NOT TOUCH THE MACHINE STRUCTURE. Refer to the following chart.* 4-4-A

Conductor Voltage	Minimum Working Clearance from Conductor	Minimum Transit Clearance from Conductor
50,000 volts or less	10' (3 m)	4' (1.2 m)
Over 50,000 volts	10' (3 m) plus 0.4" (10.2 mm) for each 1,000 volts over 50,000	10' (3 m)
345,000-750,000 volts		16' (4.8 m)

NOTE: IF ABOVE REQUIREMENTS ARE LESS STRINGENT THAN STATE REQUIREMENTS, THE STATE REQUIREMENTS SHALL APPLY. 750997

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DANGER: *If the steering system fails for any reason, bring the machine to a stop as quickly as possible. Do not attempt to drive a machine without a properly functioning power steering system.* 32-1

WARNING: *Before operating machine on the roads or highways, check the local governmental regulations on the proper use of lights, flags, SMV (Slow Moving Vehicle) emblem, rotating beacon, etc.* 29-9

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

CAUTION: *Report and correct any defects in machine noted during operation.* 37-8

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

WARNING: *If the brake system air pressure drops below normal, the warning buzzer will sound. If the air pressure drops further, the park brake will engage automatically. Be prepared for a sudden stop.* 46-73

When You Do Service on the Machine

CAUTION: *Do not attempt repairs you do not understand. There is no disgrace in asking for help.* 6-1

CAUTION: *Never grease, oil or perform any maintenance with the engine running unless so instructed in the operator's manual or service manual. If the attachment must be raised in order to perform the operation, block up the attachment securely.* 18-8

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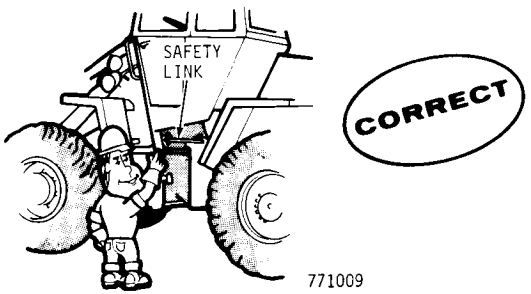
DANGER: *Keep clear of this area when engine is running. Machine could pivot unless the transport/service link is in its locked position. After servicing is completed, unlock the transport/service link and secure in the operating position on the rear frame.* 47-14



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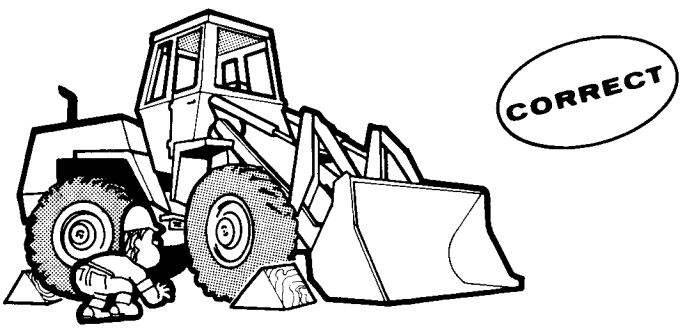
CAUTION: *Transport/Service Link: Engage link for locking machine in straight ahead position only. Link will prevent machine from pivoting.* D-39-15

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

CAUTION: *Wear eye or face protection when servicing the machine, especially when pounding or grinding.*

Use a soft-faced hammer, such as plastic, wood, brass or rawhide when striking hardened tools or hardened metal surfaces. Possible injury from flying chips could result. 46-14

WARNING: *Locate the machine on level ground and block the wheels securely before working under the machine. Failure to follow the above procedure could result in personal injury.* 41-6



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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: *Before loading the machine, remove all ice, snow or grease from the loading dock or ramp.* 46-76

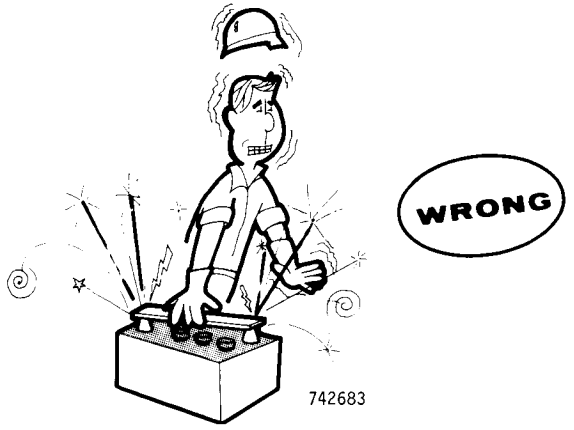
CAUTION: *Never wear rings or metal watch bands as you may ground a live circuit when working on electrical system.* 46-55

CAUTION: *Think out the circuit before making or breaking a connection. A wrong connection can be painful and expensive.* 5-4

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

CAUTION: *Storage areas for batteries must be well ventilated to prevent accumulation of hydrogen gas from newly recharged batteries.* 7-2

WARNING: *Never check battery charge by placing a metal object across the posts - the sparks could cause an explosion. Use a voltmeter or hydrometer.* 5-7



POISON: *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

CAUTION: *When removing a battery, always disconnect the (-) negative ground cable first. When installing the battery, always connect the (-) negative ground cable last.* 7-3

WARNING: *To jump start this machine, connect positive jumper cable to battery terminal on starter solenoid and connect negative jumper cable to good engine ground. Start engine only when seated in operator's seat with seat belt fastened. Stop engine before leaving machine. Disconnect jumper cables. Any other method could result in uncontrolled machine movement.* 18-7

CAUTION: *Always block elevated components before servicing equipment.* D-17-7

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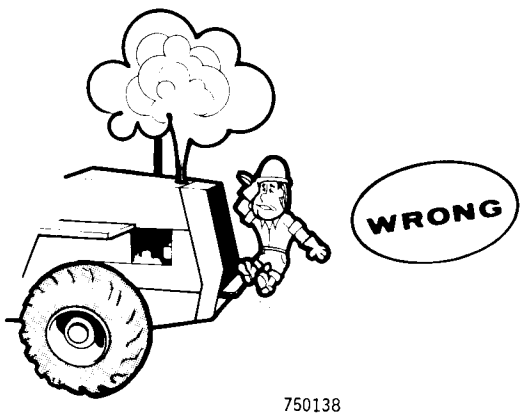
CAUTION: *Pressure cooling system. Remove cap slowly and only when engine is cool or painful burns could result.* D-28-2



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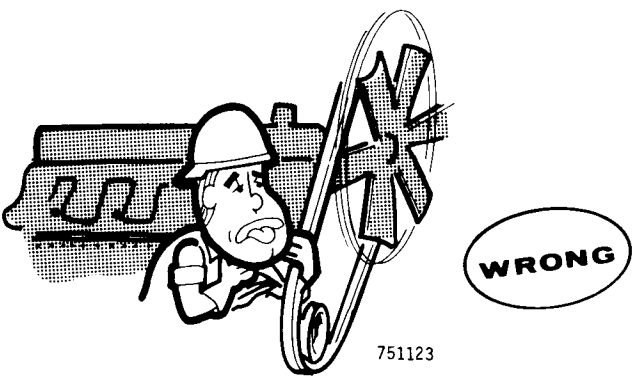
CAUTION: *Never attempt to service the air conditioning system unless you are completely familiar with air conditioning and the safety precautions which must be followed when handling liquid refrigerant, which can cause severe and painful frostbite. Contact your Authorized Case Dealer, who is experienced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

DANGER: *Exhaust fumes can kill. If necessary to start an engine in an enclosed area, be sure to provide adequate ventilation.* 27-4

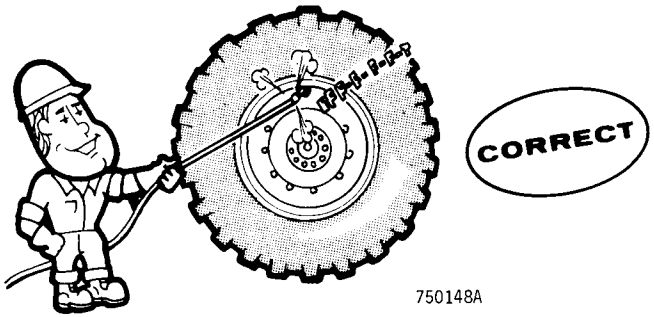
CAUTION: *When cleaning interior soft trim do not use volatile cleaning colvents such as acetone, lacquer thinner, carbon tetracholoride, enamel reducers, nail polish removers; or such cleaning materials as laundry soaps, bleaches or reducing agents. Never use gasoline or naptha for any cleaning purpose.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

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



WARNING: *Do not fuel the machine when smoking, when near an open fire or with the engine running.* 6-6

WARNING: *Stand to the side of the lock ring when airing tires.* 6-4



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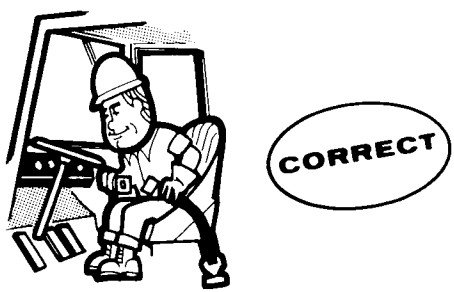
CAUTION: *Hydraulic systems are highly pressurized. Escaping hydraulic oil, even an invisible pinhole leak, can penetrate body tissues causing serious injury. Use a piece of wood or cardboard when looking for leaks - never use the hands or other parts of the body.*

Relieve hydraulic pressure before disconnecting circuits. When reassembling, make absolutely certain that all connections are tight.

If injured by hydraulic oil escaping under pressure, see a doctor immediately. Serious complications may arise if medical attention is not given at once. 43-7

CAUTION: *After adjusting seat, make sure that it is locked in position. Seat movement during operation could cause a serious injury.* 37-5



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WARNING: *Do not allow personnel in or on the machine when it is being towed with the engine stopped.* 46-75

WARNING: *Before loading the machine, remove all ice, snow or grease from the loading dock or ramp.* 46-76

CAUTION: *The seat belts can help insure the safety of the operator if they are used and maintained as described.* 36-5

CAUTION: *Never wear a seat belt loosely or with slack in the belt system. Never wear the belt in a twisted condition or pinched between the seat structural members.* 36-6

Engine Coolant Additive Case Part No. 331-508

WARNING: *Alkaline solution. Keep out of reach of children. Do not get in eyes, on skin or on clothing. Use this product only as directed on the container. For first aid (1) in case of contact, immediately flush eyes or skin with water for at least 15 minutes (2) if swallowed, induce vomiting, following by large quantities of water. Call a doctor immediately. If clothing is contaminated, remove and wash. Flush skin as stated above.* 47-20

Hydraulic Reservoir

CAUTION: *Shut off air valve then unscrew filler dipstick slowly for daily check. Any other method could result in an injury.* D-39-14

SPARK ARRESTING SYSTEM

Laws of some states or provinces may require that this machine be equipped with a spark arrestor or spark arresting muffler. Check with the authorities in your area to see it this machine must be so equipped. Proper maintenance of the spark arresting muffler is required to keep it in proper working order. Refer to page 84 in this manual.

ROLL-OVER PROTECTIVE STRUCTURE

Your machine may already be equipped with a roll-over protective structure (hereafter referred to as ROPS). If not, ROPS is available from your Authorized Case Dealer for field installation.

ROPS data is determined from the ROPS label. Refer to page 24 for label location.

In addition to the serial number of the ROPS, this label shows the industry standard to which it conforms, the maximum weight of the vehicle on which the ROPS is approved for use, the state or provincial approval numbers (if used), and the model/models for which it is intended.

As owner or operator of a ROPS equipped machine, several points are extremely important if you are to gain all the benefits of ROPS.

Seat Belts with ROPS

Seat belts are an integral part of your protective system and must be worn at all times.

Accidental Upset with ROPS

ROPS is an energy absorbing safety device. Once it has been subjected to an upset or some other form of impact (such as striking an overhead abutment during travel), it must be replaced so that you will have the same degree of protection originally provided.

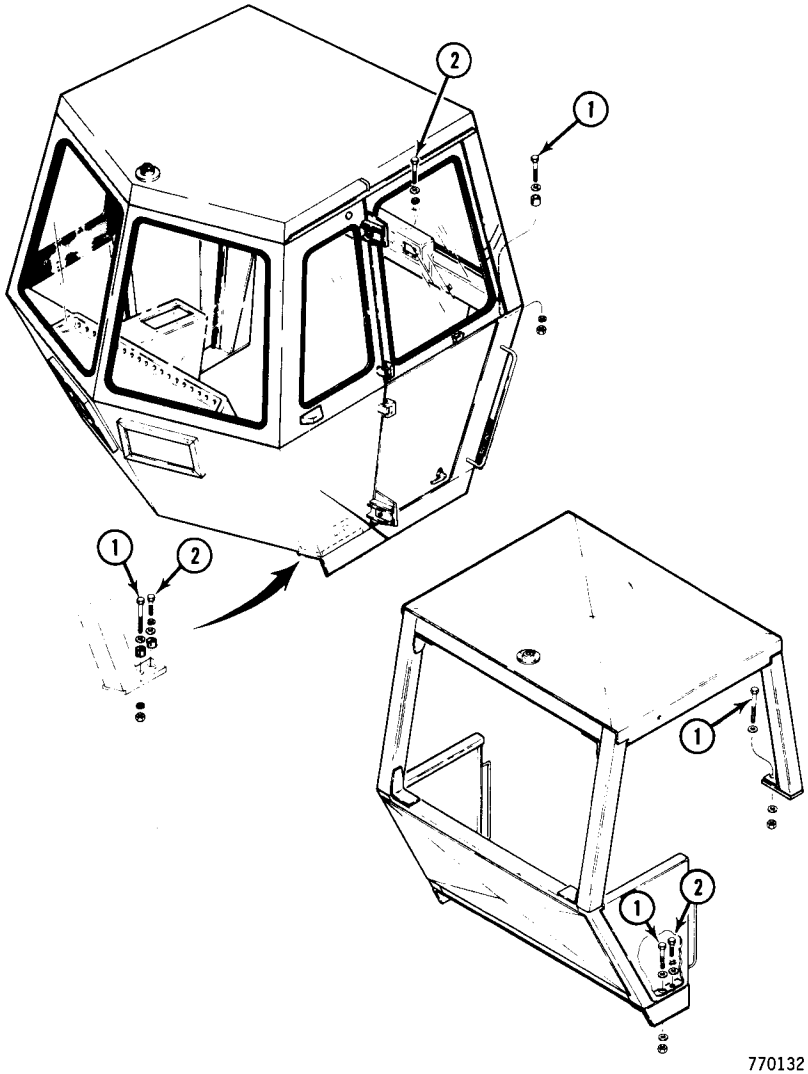
ROPS, the operator's seat, the seat belts and their respective mountings, any any accessories, wiring, etc., within the operator protective system, must be very carefully inspected after an upset. All broken or damaged parts must be replaced immediately. DO NOT ATTEMPT TO STRAIGHTEN OR WELD ROPS.

ROPS Maintenance and Inspection

After the first 20 hours of operation and after every 500 hours (twice yearly), perform the following:

1. Check torque on ROPS mounting bolts and retorque to specifications if required.

2. Inspect the operator's seat and seat belt mountings. Tighten bolts to specifications. Replace damaged or worn parts.



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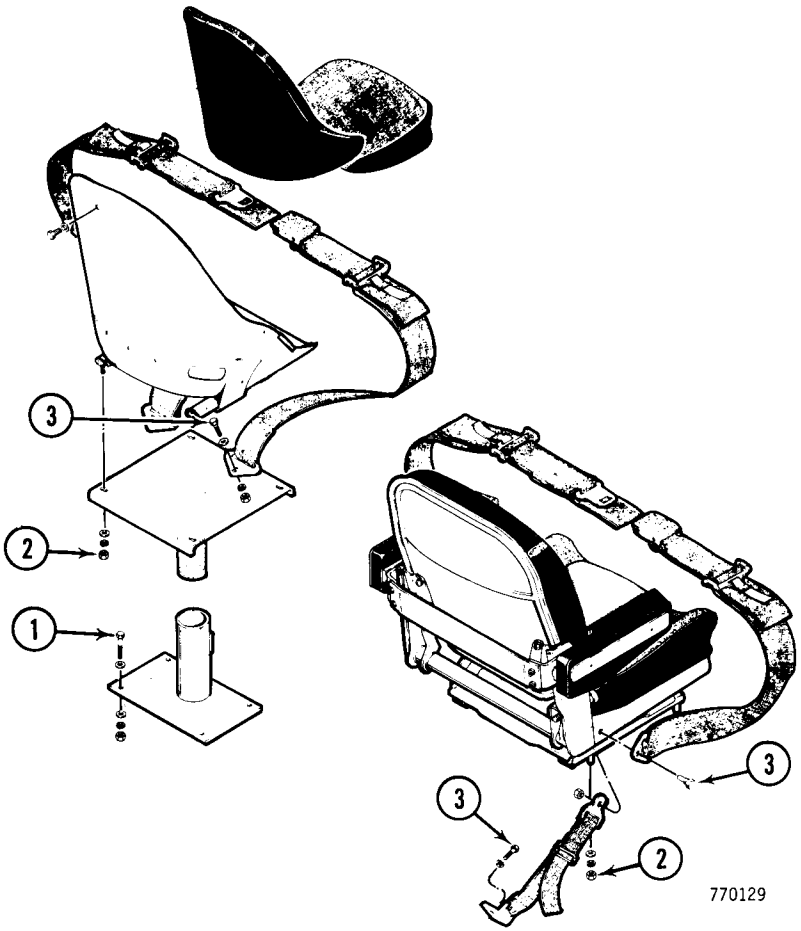
1. Tighten 240 to 280 foot-pounds (325-380 N m) torque.
2. Tighten 40 to 50 foot-pounds (54-68 N m) torque.
3. Tighten 340 to 420 foot-pounds (461-569 N m) torque.

WARNING: *Always fasten seat belt securely before starting engine.* 8-5

WARNING: *Special hardware is often used for mounting and anchoring ROPS. Replacement parts must be those listed in the Case Parts Catalog.* 4-9



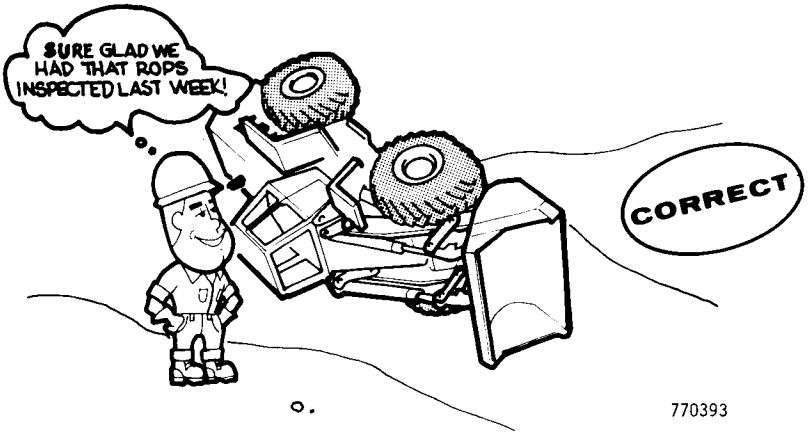
1. Tighten 25 to 35 foot-pounds (34-47 N m) torque.
2. Tighten 15 to 20 foot-pounds (20-27 N m) torque.
3. Tighten 65 to 85 foot-pounds (88-115 N m) torque.

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

ROPS Safety Precautions

WARNING: *Keep the ROPS and mounting parts in the original factory built condition. Do not modify the ROPS by welding, grinding, adding attachments or drilling holes. These will weaken the structure and reduce your protection.* 18-3

WARNING: *Do not remove the roll-over protective structure except for servicing. Properly reinstall before using machine.* 3-10



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WARNING: *Do not install attachments that will cause the total gross weight of the machine to exceed the weight shown in the "for maximum gross vehicle weight" space on the ROPS label.* 18-4

SIMS ALL WEATHER ROPS CABS	SIMS CABS, SIMS INC. 230 NORTH MAPLE ST. PAYNE, OHIO 45880 MANUFACTURED IN U.S.A.
TRACTOR MODEL	ROPS PART NO.
MAX GROSS VEHICLE WT	CAB SERIAL NO.
CONFORMS TO	APPROVAL NUMBER
PERFORMANCE STDS MEASURED IN ACCORDANCE WITH	

770165

J I Case Racine, Wisconsin 53404 U.S.A.	FOR APPLICATION ON	TYPE-CERTIFICATION FOR ROLLOVER PROTECTIVE STRUCTURES
ROPS SERIAL NUMBER	FOR MAX. GROSS VEHICLE WEIGHT	PROTECTION AFFORDED BY THIS ROPS WILL BE REDUCED IF THE ROPS IS ALTERED, HAS STRUCTURAL DAMAGE, OR HAS BEEN SUBJECT TO UPSET. SEE OPERATOR'S MANUAL FOR COMPLETE INSTRUCTIONS AND INSPECTION REQUIREMENTS.
CONFORMS TO OSHA REGULATION	APPROVAL NUMBER	
PERFORMANCE STANDARDS MEASURED IN ACCORDANCE WITH		

761188

SERIAL NUMBER LOCATION

When ordering parts or requesting information from your Authorized Case Dealer, always specify the model and serial number of the machine and the equipment or component in question. The serial numbers are located as follows:

Basic machine - located on the right hand instrument panel.

Engine - located on the left hand side above the starter.

Transmission - located on the front, lower right side.

Axle - one located on the center bowl, one located next to the mounting flange.

ROPS Cab - located on upper rear crossmember.

ROPS Canopy - located on upper rear crossmember.

Use the space below to record the model, serial or part numbers.

	Model or Part Number	Serial Number
Basic machine	W24C	
Engine		
ROPS		
Transmission		
Axle, front		
Axle, rear		
Starter motor		
Air compressor		
Loader control valve		

SPECIFICATIONS

Specifications taken with 17.5 x 25 tires, 2-1/2 cu yd (1.9 m^3) bucket and no ballast in the tires or no counterweights.

ENGINE

Model ..... Case 504 BD
Type ..... Diesel, 6 cylinder, 4 cycle
Maximum rated horsepower
SAE Gross ..... 158 @2200 rpm (118 kw @2200 r/min)
SAE Net ..... 132 @2200 rpm (98 kw @2200 r/min)
Engine Speeds
Full throttle, no load ..... 2300 to 2375 rpm
Full throttle, full load ..... 2200 rpm
Idle speed ..... 750 to 825 rpm
Type of fuel ..... See page 68
Number of cylinders 6
Bore and stroke ..... 4-5/8 in x 5 in (117 x 127 mm)
Displacement ..... 504 cu in (8259 cm^3)
Firing order 1-5-3-6-2-4

ELECTRICAL SYSTEM

Type ..... 24 volt, negative ground
Batteries ..... (2) 12 volt, connected in series
Alternator ..... 24 volt, 40 amps
Replacement bulbs (industry standard numbers)
Left-hand instrument cluster, (warning lights and gauge illumination) 12 volt ..... No. 194
Right-hand instrument panel, (panel illumination) 12 volt ..... 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

Reservoir - Air pressurized with one suction line filter in reservoir.
Equipment control valve
main relief setting ..... 2300 ± 50 psi @2200 rpm (15 858 ± 345 kPa @2200 r/mn)

Hydraulic reservoir air pressure . . . . . 10 ± 5 psi @725 rpm (69 ± 34 kPa @725 r/mn)

TIRE AIR PRESSURE

SIZE	PLY RATING	*SHIPPING PRESSURES	OPERATING PRESSURES
17.5 x 25	12	55 psi (380 kPa)	50 psi (345 kPa)
20.5 x 25	12	50 psi (345 kPa)	40 psi (275 kPa)
20.5 x 25	16	65 psi (450 kPa)	50 psi (345 kPa)

*Shipping pressures must be used when transporting the machine. Before operating the machine, reduce the pressure of the tires. See the right hand column "Operating Pressure". Also refer to pages 58 thru 61.

TRAVEL SPEEDS

	1st		2nd	
	mph	(km/h)	mph	(km/h)
Forward	6.5	(10.5)	22.2	(35.7)
Reverse	8.7	(14)	---	---

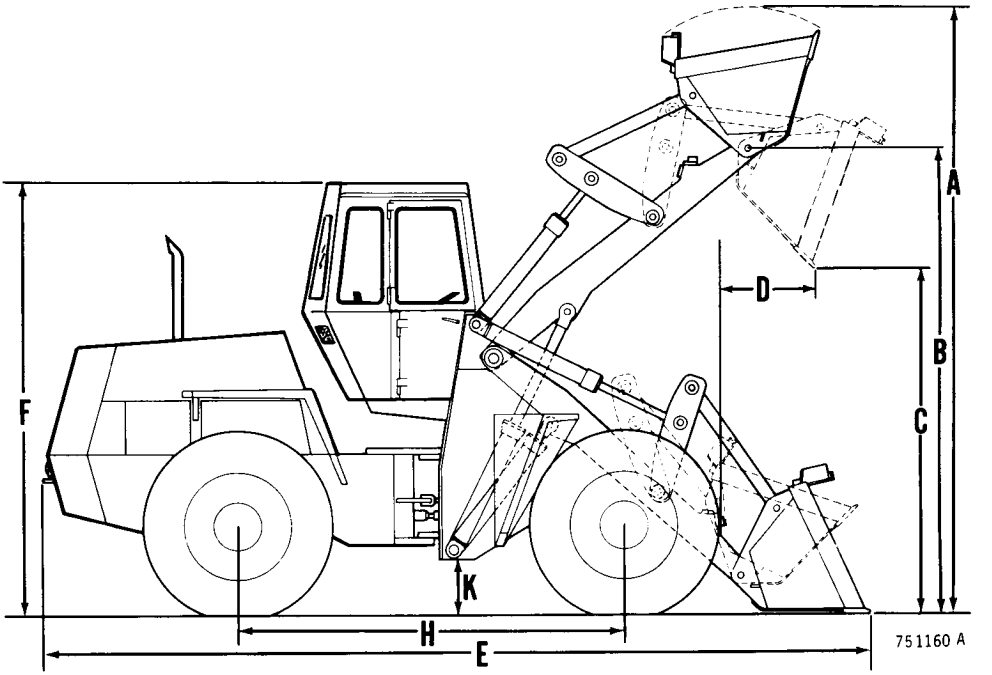
STEERING SYSTEM

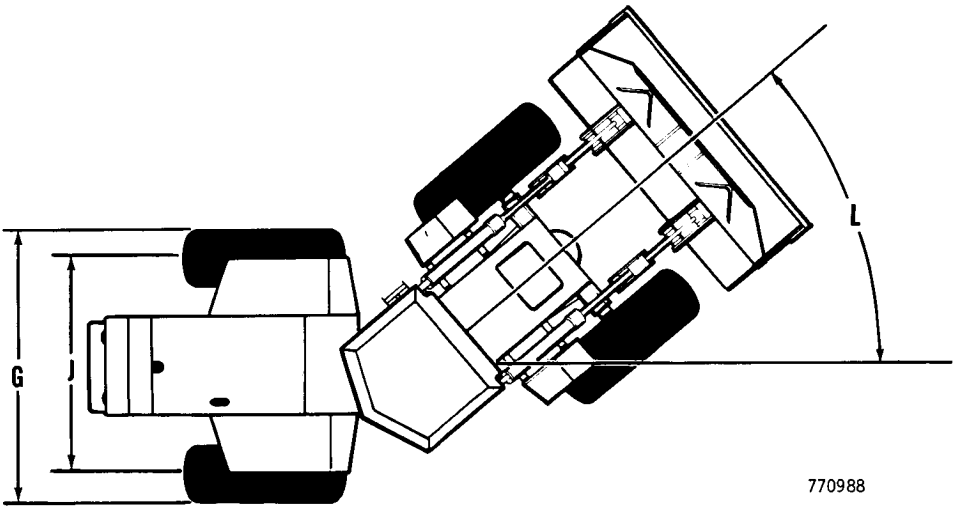
Type . . . . . Full hydraulic power articulation
Steering control valve relief setting . . . . . 2500 ± 100 psi @2200 rpm (17 237 kPa @2200 r/mn)

COOLING SYSTEM

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

OPERATING DATA AND DIMENSIONS





A	Overall height, bucket fully raised	16 ft (4877 mm)
B	Height to bucket hinge pin	12 ft 4 in (3760 mm)
	Dump angle at full height	54°
C	Dump height, 45° dump, bucket at full height	8 ft 11 in (2718 mm)
D	Dump reach, 45° dump, bucket at full height	40 in (1016 mm)
E	Overall length, bucket on the ground without bucket teeth	22 ft 1-1/2 in (6.7 m)
F	Overall height, top of ROPS	10 ft 10 in (3302 mm)
G	Overall width, less bucket	8 ft (2438 mm)
	Overall width, with bucket	8 ft (2438 mm)
H	Wheelbase	10 ft 1-1/2 in (3086 mm)
J	Tread	6 ft 5 in (1956 mm)
K	Ground clearance	15-1/2 in (394 mm)
	Turning clearance circle diameter (outside of tires)	36 ft 6 in (11 m)
	Loader clearance circle diameter (at bucket)	39 ft 2 in (11.9 m)
L	Turning angle (total)	80°

NOTE: Add 2" (51 mm) to the vertical dimensions if the machine is equipped with 20.5 x 25 tires.

BUCKETS

CAPACITY		WIDTH	WEIGHT
SAE Heaped	Struck		
2.5 cu yd (1.91 m^3)	2.0 cu yd (1.53 m^3)	96" (2438 mm)	2140 lbs (971 kg)
2.5 cu yd (1.9 m^3)	2.0 cu yd (1.53 m^3)	104" (2642 mm)	2153 lbs (977 kg)
3.0 cu yd (2.29 m^3)	2.6 cu yd (1.99 m^3)	104" (2642 mm)	2263 lbs (1020 kg)
4-In-1 2.5 cu yd (1.91 m^3)	2.0 cu yd (1.53 m^3)	101" (2565 mm)	2450 lbs (1111 kg)

SPECIAL NUT AND BOLT TIGHTENING SPECIFICATIONS

	Foot-Pounds	(N m)
Hydraulic tank cover bolt	15 to 20	(20 to 27)
ROPS cab 3/4 inch bolts	240 to 280	(325 to 380)
ROPS cab 1/2 inch bolts	45 to 55	(61 to 75)
ROPS canopy 3/4 inch bolts	340 to 420	(461 to 569)
Air conditioner compressor bolts	20 to 22	(27 to 30)
Wheel nuts	340 to 420	(461 to 569)
Steering wheel nut	20 to 25	(27 to 34)
Alternator pulley nut	40 to 60	(54 to 81)
Engine mounting bracket to engine	235 to 285	(319 to 386)
Transmission mounting bracket to transmission	135 to 165	(184 to 224)
Engine and transmission shock mounts	135 to 165	(184 to 224)
Front and rear axle mounting bolts	520 to 640	(705 to 868)
Universal joints	63 to 83	(85 to 113)
Front drive shaft yoke nut	300 to 400	(407 to 542)

NOTE: The above specifications are for nuts and bolts with dry threads. Refer to the service manual for this machine for tightening specifications not listed above.

CAPACITIES

Fuel tank	58 U.S. gallons (219 litres)
Engine oil	
Without filter change	12 quarts (11.4 litres)
With filter change	13 quarts (12.3 litres)
Cooling system	11-1/4 U.S. gallons (42.6 litres)

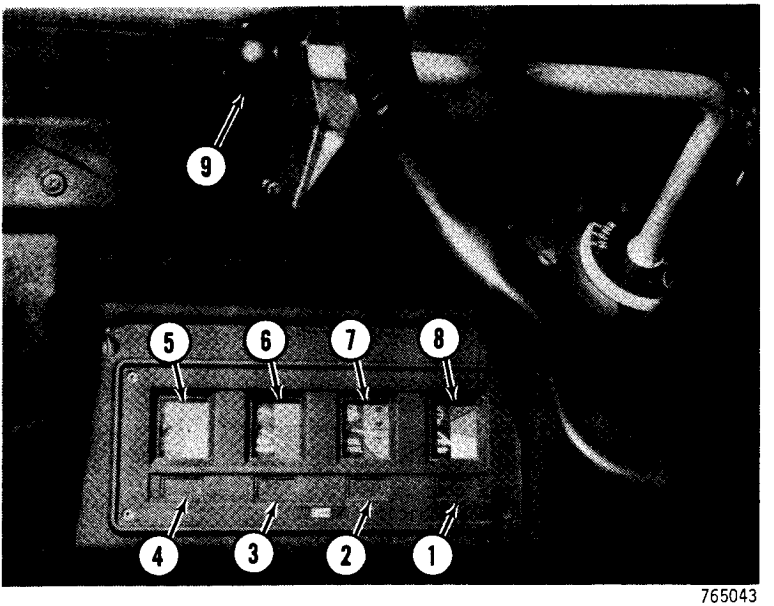
NOTE: Mix the following quantities of ethylene glycol anti-freeze with water in the cooling system to protect from freezing.

Protection down to 0° F (-18° C)	add 3.4 U.S. gallons (13 litres)
Protection down to -20° F (-29° C)	add 4.6 U.S. gallons (17 litres)
Protection down to -40° F (-40° C)	add 5.6 U.S. gallons (21 litres)
Hydraulic system	
Reservoir refill capacity	17 U.S. gallons (64 litres)
Total system	29 U.S. gallons (110 litres)
Transmission	
Refill capacity	7.5 U.S. gallons (28.4 litres)
Total system	9 U.S. gallons (34 litres)
Axles	
Center bowl (each)	13 quarts (12.3 litres)
Wheel ends (each)	4 quarts (3.8 litres)
Alcohol evaporator	1 pint (0.5 litres)
Auxiliary brake reservoir (each)	11.5 fl oz (340 ml)

OPERATING INSTRUCTIONS

INSTRUMENTS AND CONTROLS

Left-Hand Instrument Cluster



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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 left brake pedal is pushed. See Note below.

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. See Note below.

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

NOTE: These three warning lights will illuminate when the key switch is in the On position and the engine is not operating. Replace any light bulb that does not illuminate.

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

5.  CONVERTER OIL TEMPERATURE GAUGE: Normal operating temperatures are 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:** *If the brake system air pressure drops below normal, the warning buzzer will sound. If the air pressure drops further, the park brake will engage automatically. Be prepared for a sudden stop.* 46-73

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

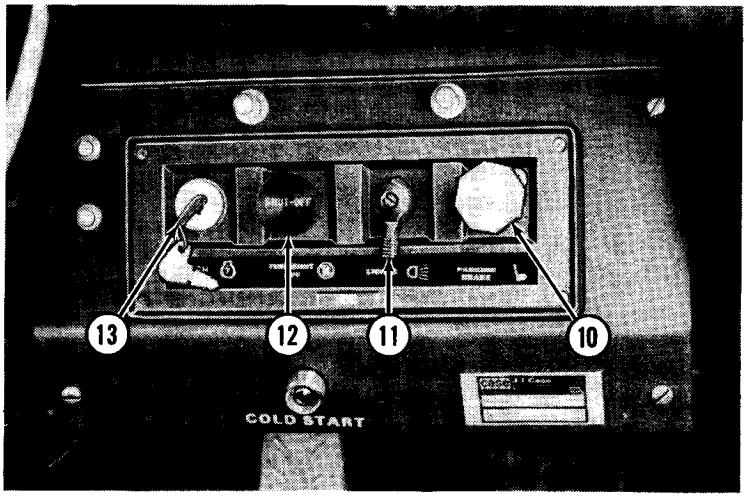
8.  WATER TEMPERATURE GAUGE: This gauge indicates the engine coolant temperature. The green zone indicates normal operating temperature. If the gauge needle remains in the yellow zone or moves into the red zone, stop the engine and check the cause.

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 6.5 mph (10.5 kg/h). Also refer to Clutch Cutout, page 67.

 **WARNING:** *Keep the transmission in low gear when going down steep 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

Right-Hand Instrument Panel



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10. PARKING BRAKE CONTROL: When the control is pulled out, the parking brake is applied and the brake warning light (item 4) comes on in the left-hand instrument panel. To release the brake, push in the control.

NOTE: A serious loss of system air pressure will cause the parking brake to set automatically. Refer to item 6 on page 32.

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

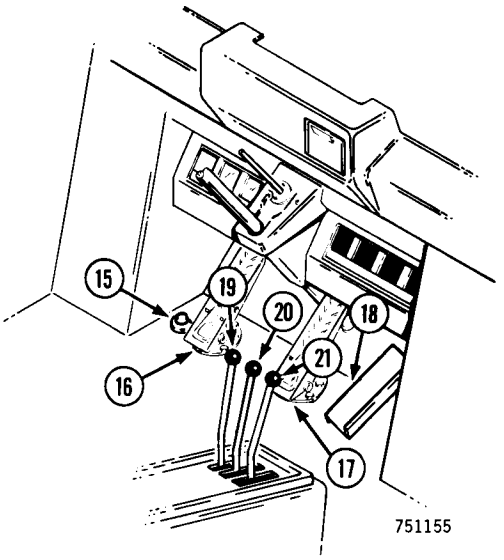
12. FUEL SHUTOFF KNOB: Pull the knob out to stop the engine. After the engine has stopped, push the knob in and turn the key switch to the OFF position.

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:

	ACC.	OFF	RUN	START
Accessories	ON	OFF	ON	OFF
Gauges and Warning Lights	OFF	OFF	ON	ON
Fuel Pump	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: *If the brake system air pressure drops below normal, the warning buzzer will sound. If the air pressure drops further, the park brake will engage automatically. Be prepared for a sudden stop.* 46-73



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 67.

WARNING: *Keep the transmission in low gear when going down steep 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

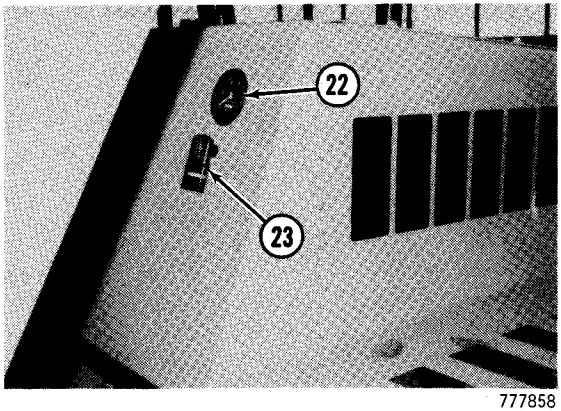
17. RIGHT BRAKE PEDAL: When the right brake pedal is depressed, the brakes are applied and the stoplight is turned on. The transmission remains engaged.

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 44.

20. BUCKET CONTROL LEVER: The bucket lever controls bucket rollback and dump actions. See page 43.

21. LIFT CONTROL LEVER: The lift lever controls the raising and lowering of the loader lift arms. See page 43.



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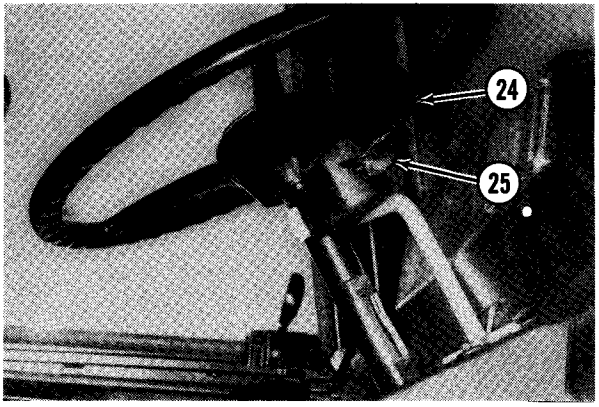
22. TACHOMETER-HOURMETER - The engine tachometer is located on the front panel above the restriction indicator (see illustration above). The gauge indicates engine speed in hundreds of rpm's. An engine hourmeter is located in the lower half of the gauge which indicates hours and tenths of hours the engine has operated.

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.



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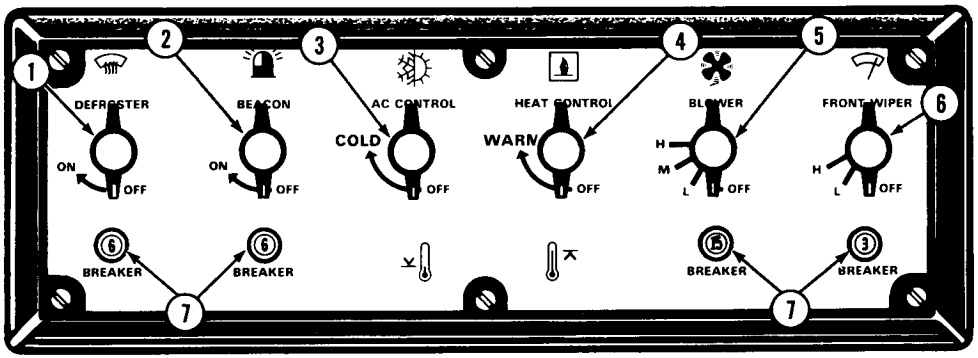
24. TURN SIGNALS: Move lever up for a left turn and down for a right turn. To cancel the signal, move the lever to the center position.

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



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Control Console

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.

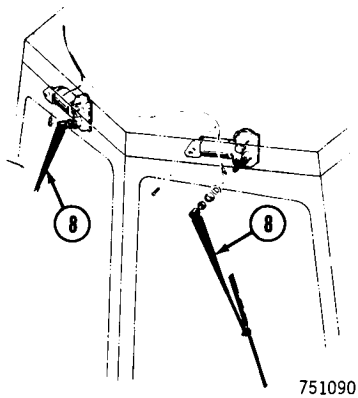
4. HEATER TEMPERATURE CONTROL: Turn the switch clockwise to attain the desired temperature. Turn the blower switch (item 5) to Medium, High, or Low speed. Open the air louvers.

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 Authorized Case Dealer.



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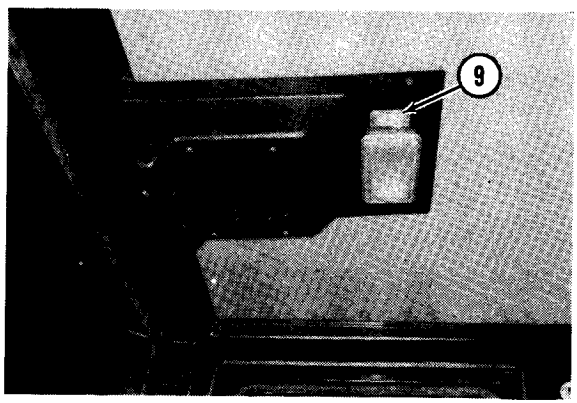
8. REAR WINDSHIELD WIPERS: Two optional wiper blades can be installed at the rear cab window. The on-off switch is located on each wiper motor.



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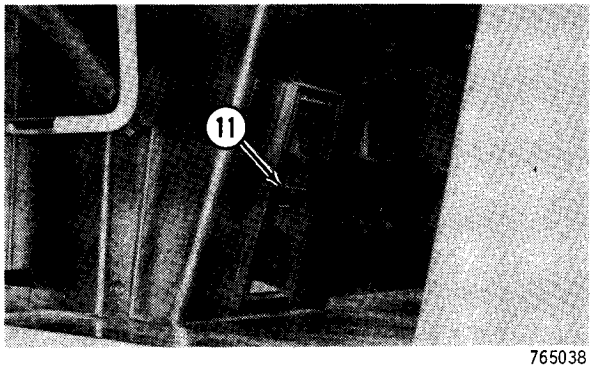
9. DOME LIGHT SWITCH: The on-off switch controls the cab dome light.

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.



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

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 is too cold, ALWAYS adjust the temperature control to a warmer setting before reducing the blower speed.

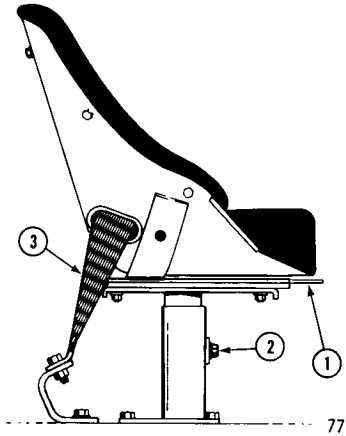
Under normal operating conditions, with the cab sealed properly and the windows and doors closed, temperatures of 10° F to 25° F (6° C to 14° C) (depending upon relative humidity) lower than the outside temperature can be expected. Humidity is also greatly reduced when operating the air conditioning system, making the cab even more comfortable to the operator.

NOTE: If you notice that the air conditioner stops working, refer to page 122.

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

"Junior Road King" Seat

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



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

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

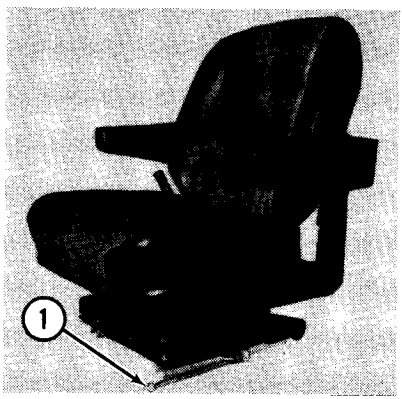
3. SEAT BELT: Adjust seat belt length so it fits snugly without being tight. If the seat belt is damaged in any way, it must be replaced immediately.

Suspension Seat

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

1. FORWARD AND REARWARD SEAT ADJUSTMENT: Seat assembly moved forward or back 4 inches (102 mm) along ball bearing slides to suit operator.

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



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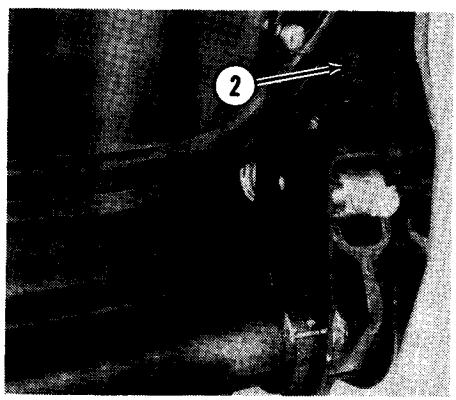

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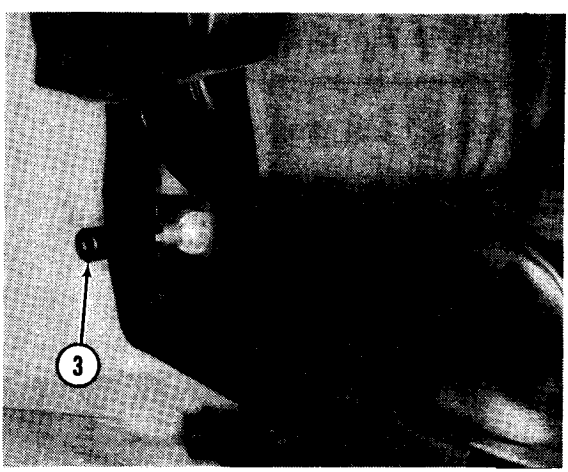
3. WEIGHT ADJUSTMENT LEVER: This hand-operated lever controls a ratchet mechanism which adjusts the torsion bar to the operator's weight - from 130 to 275 pounds (59 to 125 kg). Adjust with the operator in the seat. Proper adjustment will position the seat and operator midway in the suspension, thus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



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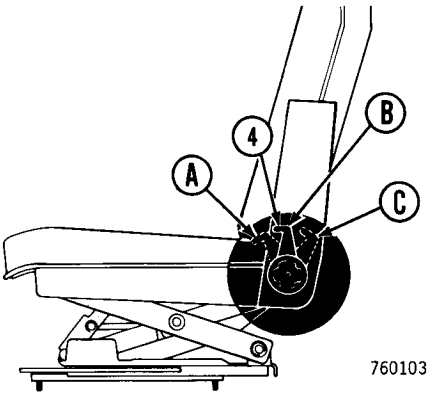
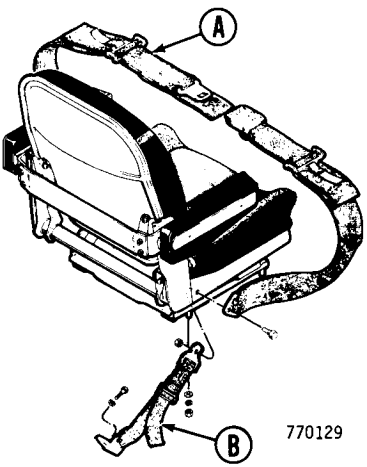
4. RIDE LEVEL INDICATOR: This indicator is located inside the left frame upright. When properly adjusted, the tip of the indicator is flush with the frame (see illustration) when the operator is in the seat.



A. Too Much Preload
B. Correct Adjustment
C. Not Enough Preload

5. SEAT HEIGHT ADJUSTMENT: Loosen bolt and adjust seat to desired height. See illustration on page 40. Item number 2.

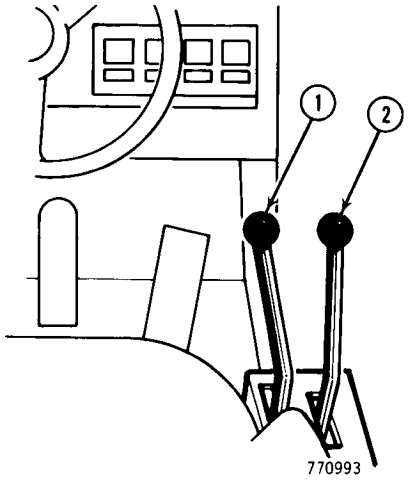
6. SEAT BELT: Adjust as follows: Adjust seat to desired height. With seat empty, take slack out of tether belt on each side. Sit in seat and adjust lap belt to fit snugly without being tight.



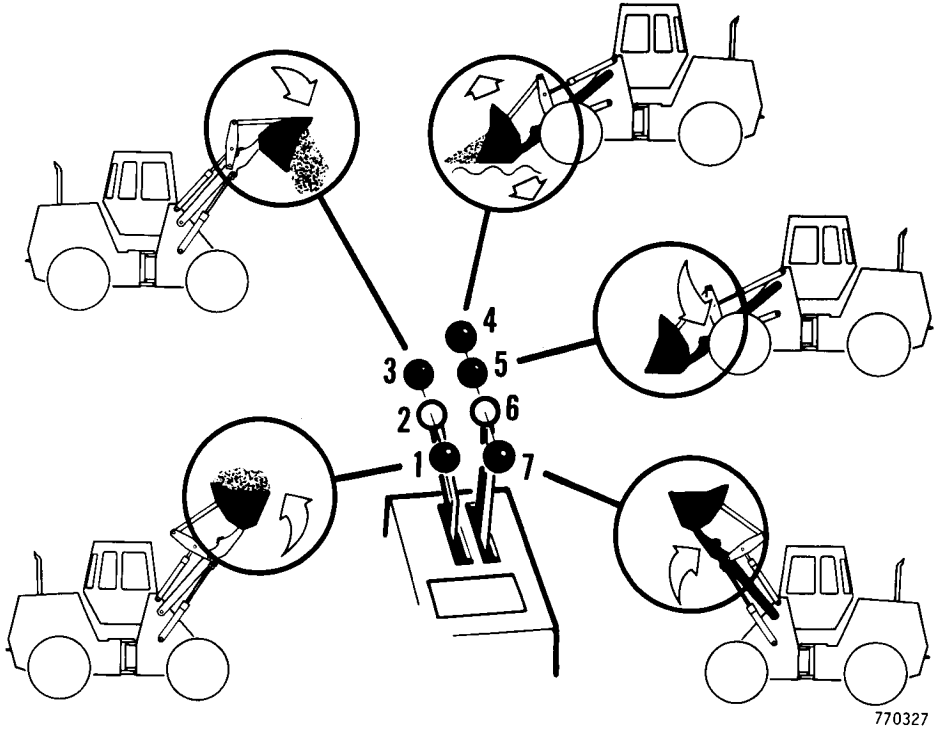
A. Lap Belt
B. Tether Belt

CAUTION: *Fasten seat belt securely before operating.* D-46-68

LOADER CONTROLS



1. Bucket Control
2. Lift Arm Control



BUCKET CONTROL

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

LIFT ARM CONTROL

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

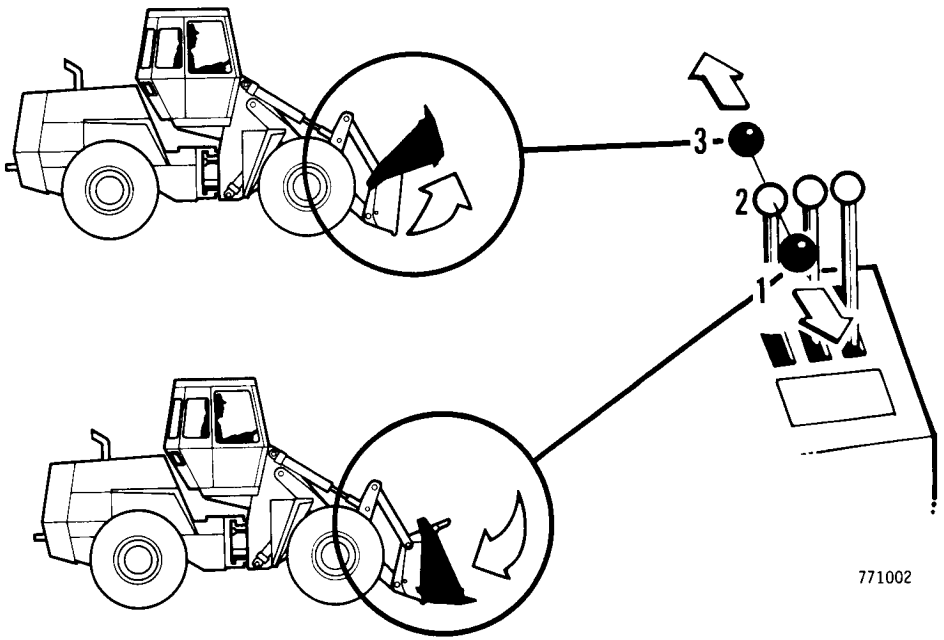
The levers are held by electromagnets in the Raise and Rollback (Crowd) positions and must be returned to Hold manually.

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 Control

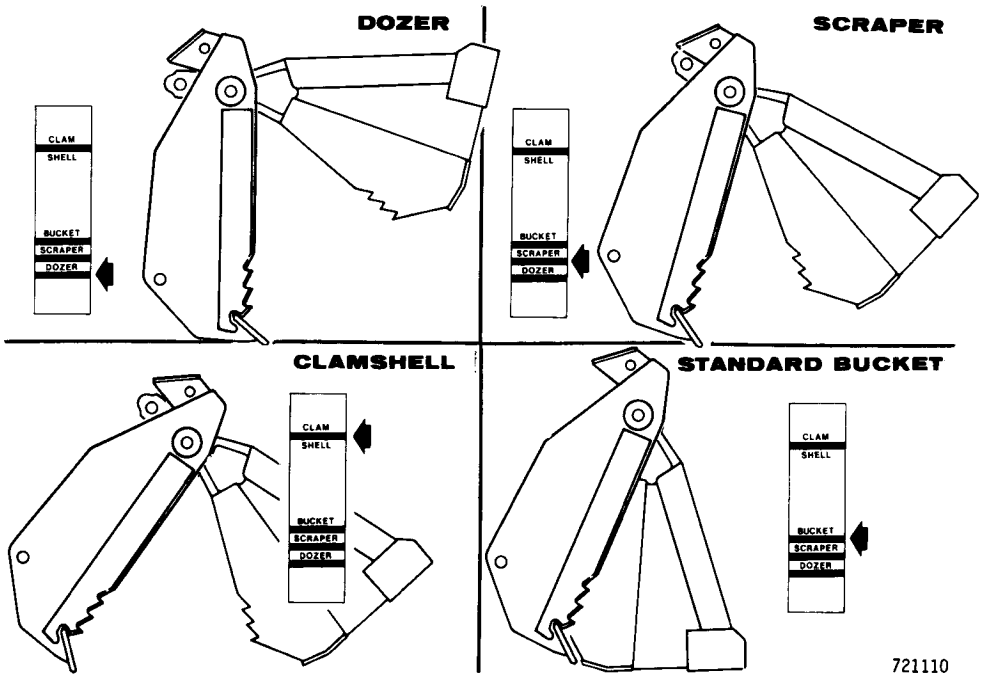
Clam Control Lever



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

Selector Gauge

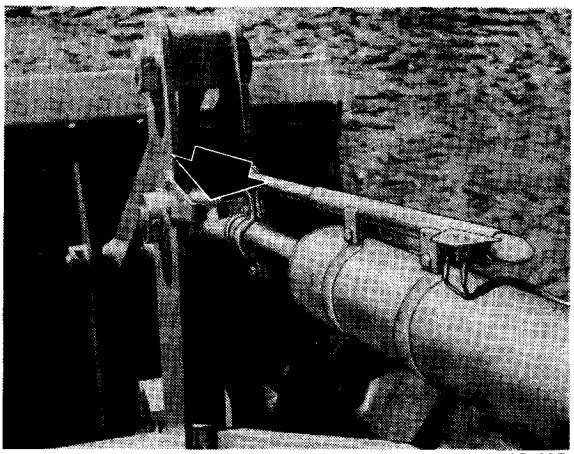
The 4-In-1 Bucket can be quickly converted from a standard bucket to a blade, scraper, or clamshell by adjusting the bucket tilt and clam opening as shown below. Have bucket on or near the ground when making adjustments. The gauge indicates the type of usage.



Bucket Level Indicator

The bucket level indicator consists of two metal pointers on the right-hand tilt cylinder.

When the two pointers are in alignment, the bottom of the loader bucket is level or parallel to the ground.



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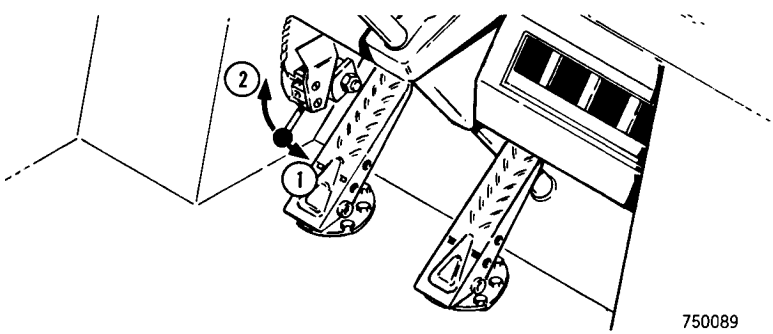
Bucket Height Control



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1. To Increase Dump Height
2. To Decrease Dump Height

The operator can adjust the bucket dump height using the bucket height control. To obtain maximum height, pull the bucket height control to the rear against the stop. Push the bucket height control forward to decrease the bucket dump height.

To adjust,

1. Position the loader bucket at the desired dump height.
2. Stop the engine.

3. Turn the key switch to the Off position.

4. Pull the bucket height control back to its stop.

5. Turn the key switch to the Run position (do not start engine).

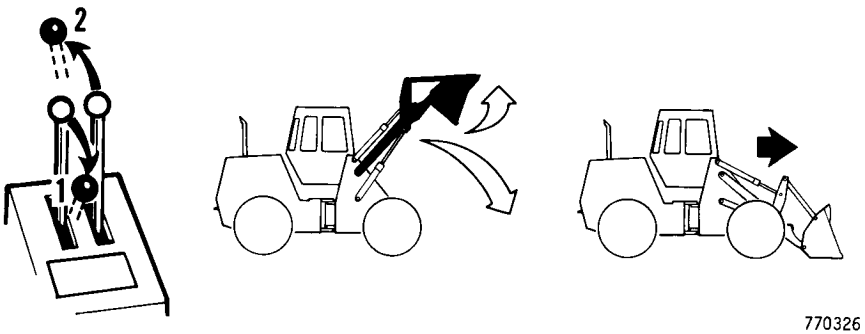
6. Put the lift arm control in the Raise position.

7. Push the bucket height control slowly forward. Stop moving the bucket height control when the lift arm control returns to the Hold position.

8. Start the engine and lower the bucket to the ground.

9. Raise the loader and check the adjustment.

Return-To-Dig



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1. Bucket Control in Roll Back 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. See page 120 for Return-To-Dig adjustment.

Alcohol Evaporator

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

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 must be installed on machine which operates in freezing temperatures to prevent the possibility of brake failure.

ENGINE OPERATION

Run-In

The engine requires careful and close attention during the run-in period. Piston rings and cylinder sleeves can be damaged in a new engine if run-in instructions are not followed:

1. LOAD: For the first 8 hours, maintain a normal load. Do not baby the engine but avoid prolonged converter or hydraulic stall (do not exceed 10 seconds of stall).

2. ENGINE SPEED: During the run-in period always operate the engine at full governed rpm (throttle wide open). Avoid idling at reduced speed.

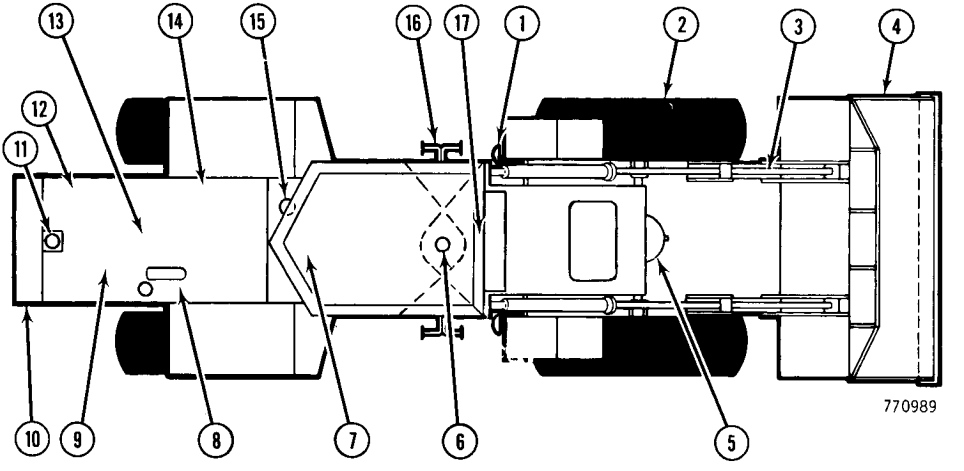
3. OPERATING TEMPERATURE: Maintain temperature at recomended levels. Low operating temperature contributes to the formation of destructive acids and harmful deposits in the engine.

4. CRANKCASE OIL: Drain run-in oil and remove the crankcase filter after the first 20 hours of operation. Install a new filter cartridge and refill crankcase with the recommended grade of oil.

5. COOLING: If the machine has been working under load, idle the engine for several minutes before shutting it off so that engine parts can cool evenly.

Walk-Around Checks Before Starting

Walk around and check the machine before you start the engine in the moring or before each shift change. See the following illustration and do the checks that are listed below.



SAFETY DECALS: Clean or replace all safety or instruction decals that can not be read. See page 127.

1. FRONT LIGHTS: Check for damage.
2. TIRES: Check air pressure and check for damage.
3. BUCKET LINKAGE: Lubricate the loader pivot points and check for damage.
4. BUCKET: Check for damage.
5. FRONT AXLE: Check for leaks of oil.
6. PIVOT AREA: Check for dirt, foreign material and for leaks or oil.
7. TRANSMISSION: Check for leaks of oil.
8. AIR RESERVOIR: Drain water from the reservoir.
9. ENGINE COMPARTMENT: Check for leaks of oil or fuel. Check for water in the sediment bowl. See if the side covers are missing or damaged.
10. REAR LIGHTS: Check for damage.
11. COOLING SYSTEM: Check for leaks and dirt or foreign material on the radiator. Check the level of the coolant.
12. REAR AXLE TRUNNION PIVOTS: Grease two fittings.
13. REAR AXLE: Check for leaks of oil.
14. ENGINE OIL: Check the level of the oil.
15. INDICATOR FOR THE AIR CLEANER: Look at the center of the indicator. If the red band can be seen, service the air cleaner.
16. OPERATOR'S AREA: Clean.
17. INSTRUMENT PANEL: Check for damage.

NOTE: The above checks include all items in the 10 hour (daily) area of the Scheduled Maintenance Chart on page 71. See the maintenance section starting on page 73 for more information.

CAUTION: *Fasten seat belt securely before operating.* D-46-68

Standard Engine

1. Be sure the bucket and lift arm levers are in Neutral.
2. Engage parking brake.
3. Put range selector lever in Neutral.
4. Push the fuel shutoff lever all the way in.
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 the 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 reengaging 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 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 page 53.

Turbocharged Engine

The following applies to machines that have turbocharged engines.

1. Be 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 the fuel shutoff lever all the way in.

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 and crank the engine.

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

9. If engine fires and stops, wait for the starter motor to stop turning over before engaging the starter again.

10. 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.

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

CAUTION: *Never leave the machine unattended with the engine running. Set the parking brake, lower the attachments to the ground and stop the engine. Park the machine on level ground or sideways on a slope.* 24-2-A

Standard Engine

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

Turbocharged Engine

The following applies to machines that have a turbocharged engine.

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.

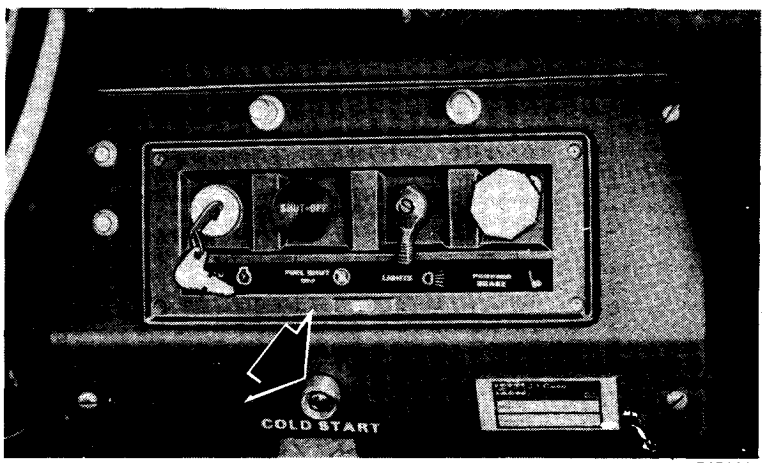
If the machine is kept outdoors overnight, cover the exhaust stack to keep moisture out of the turbocharger. The stack must also be covered when transporting the machine to prevent air from spinning the turbine.

Starting Aids

Cold Start

STANDARD ENGINE: Refer to "Starting the Standard Engine" on page 50 and do steps 1 thru 4. Then, proceed as follows.

TURBOCHARGED ENGINE: Refer to "Starting the Turbocharged Engine" on page 51 and do steps 1 thru 5. Then, proceed as follows.



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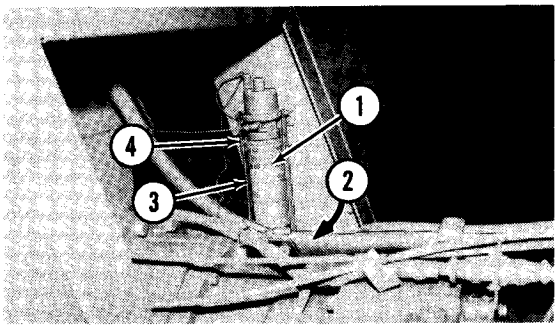
1. Push down the foot throttle until it is 1/3 open.

2. Turn the key of the ignition switch to the Start position.

3. 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 start, stop injecting ether and check the supply of ether in the Cold Start can.



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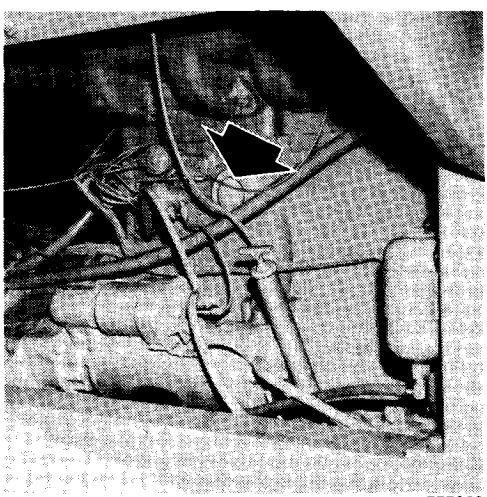
1. Starting Fluid Can
2. Locknut
3. Bail
4. Bail Extension

Replacing Cold Start Fluid Container

WARNING: *Do not smoke when using starting fluid or spray fluid near an open fire. Do not puncture or throw starting fluid can into an incinerator. Use this starting aid sparingly and do not store in a hot area.* 1-10

To install a 15 oz. container of Case Starting Fluid, B17072, turn locknut counterclockwise to loosen and position top holes of bail onto tabs of cold start body. Remove safety cap and plastic spray nozzle from fluid can. Position fluid container in bail and install the two bail extensions. Tighten locknut.

Coolant Heater



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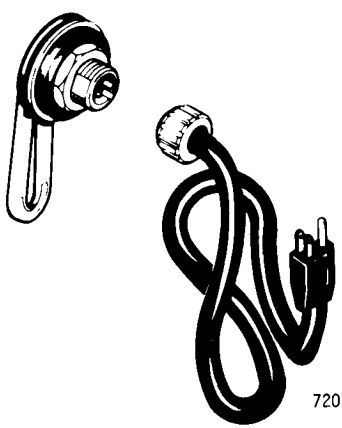

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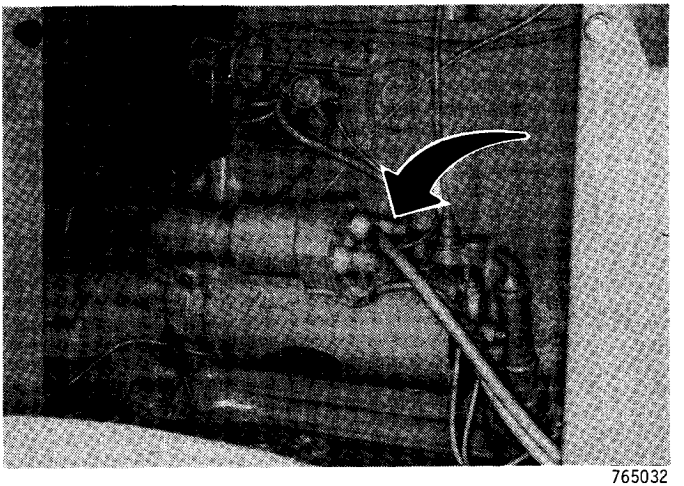
The engine cylinder block is provided with a passage for installing a coolant heater plug. The passage is located on the left-hand side of the engine slightly above and to the right of the engine serial number plate. The coolant heater kit can be purchased from your authorized Case Dealer.

Jumper Batteries (24 Volts)

WARNING: *To jump start this machine, connect positive jumper cable to battery terminal on starter solenoid and connect negative jumper cable to good engine ground. Start engine only when seated in operator's seat with seat belt fastened. Stop engine before leaving machine. Disconnect jumper cables. Any other method could result in uncontrolled machine movement.* D-18-7



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MACHINE OPERATION

CAUTION: *Wear the proper safety equipment - - avoid loose clothing. Obtain additional safety equipment when your safety may be in doubt. Hard hat, safety shoes, ear protectors, reflective clothing, safety goggles and heavy gloves may be required.* 1-3

CAUTION: *Fasten seat belt securely before operating.* D-46-68

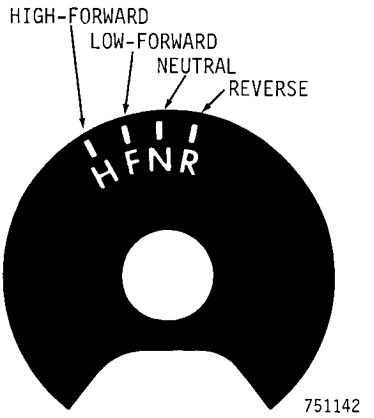
After the engine has warmed up, and the needle of the air pressure gauge is in the green zone, release the parking brake. Shift range selector lever into forward or reverse. Increase engine speed as required.

Shifting to High and Low Ranges

When a shift is made from Neutral to any driving range, the engine must be at low idle speed. Shifting from Low to High in the same direction can be made at full throttle under load. Downshifting from High to Low can be done at full throttle under load, providing the vehicle is not exceeding the maximum speed attainable in the Low range. See page 26.

Shifting to Forward and Reverse

Directional shifts can be made under full power and/or full speed conditions in the working ranges (Low to Reverse and Reverse to Low). Shifts from Reverse must be made to Low-Forward not to High-Forward. Direct shifts from Reverse to High-Forward will adversely affect clutch service life.



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 condition (engine wide open and transmission engaged but wheels not turning).

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

If the temperature gauge pointer enters the red zone, stop loader immediately, place transmission in neutral and run engine at full throttle until the pointer goes back into the green zone. Check the transmission oil level and check for leaks.

If the converter continues to overheat, consult your Authorized Case Dealer.

Steering

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.

DANGER: *If the steering system fails for any reason, bring the machine to a stop as quickly as possible. Do not attempt to drive a machine without a properly functioning power steering system.* 32-1

Auxiliary Steering

An electrically driven auxiliary steering system is 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 stalling out, the auxiliary system is automatically actuated.

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 shut off the engine (if still running). Prolonged use of auxiliary steering will cause a severe drain on the battery and heat up the auxiliary electric motor.

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.

CAUTION: *Never leave the machine unattended with the engine running. Set the parking brake, lower the attachments to the ground and stop the engine. Park the machine on level ground or sideways on a slope.* 24-2-A

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 67).

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 (0.8 km) with driveshafts connected.

IMPORTANT: If the loader is to be towed in excess of 1/2 mile (0.8 km), the front and rear axle driveshafts 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.

Transporting the Machine

WARNING: *Before loading the machine, remove all ice, snow or grease from the loading dock or ramp.* 46-76

Before transporting the machine, know the regulations and laws that apply to your area and the transport route. Be sure that your machine and truck are properly equipped to meet such laws and regulations. Refer to the following procedure for proper loading.

1. Refer to the following tire pressure chart and increase the air pressure in the tires. Use the column for "Shipping Pressure".

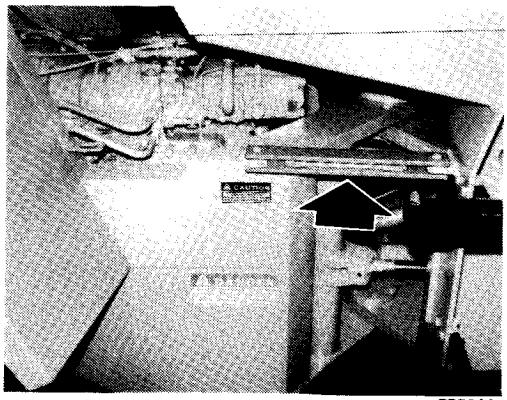
SIZE	PLY RATING	*SHIPPING PRESSURES	OPERATING PRESSURES
17.5 x 25	12	55 psi (380 kPa)	50 psi (345 kPa)
20.5 x 25	12	50 psi (345 kPa)	40 psi (275 kPa)
20.5 x 25	16	65 psi (450 kPa)	50 psi (345 kPa)

2. Remove all ice, snow or grease from the loading dock or ramp.

3. Block the trailer's wheels.

4. Drive the machine carefully onto the trailer.

5. Position the transport/service link in the Lock position.



Lock Position

6. Stop the engine and remove the key.

7. Set the park brake.

8. Block the tires and secure the machine on the trailer with chains.

9. Cover exhaust to prevent rain from going into the engine.

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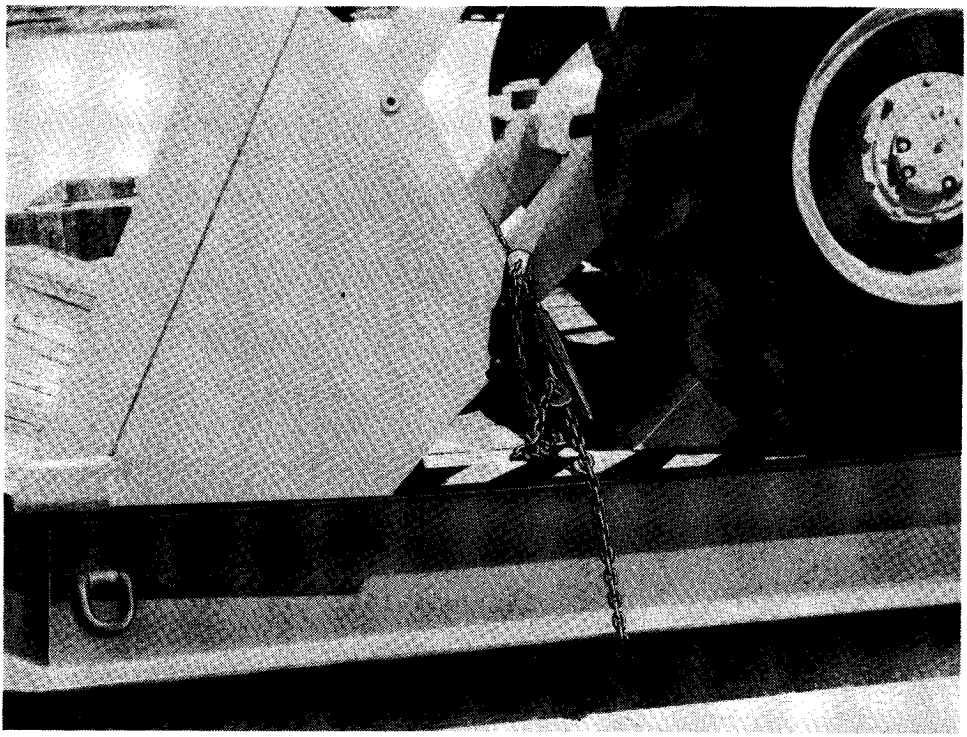

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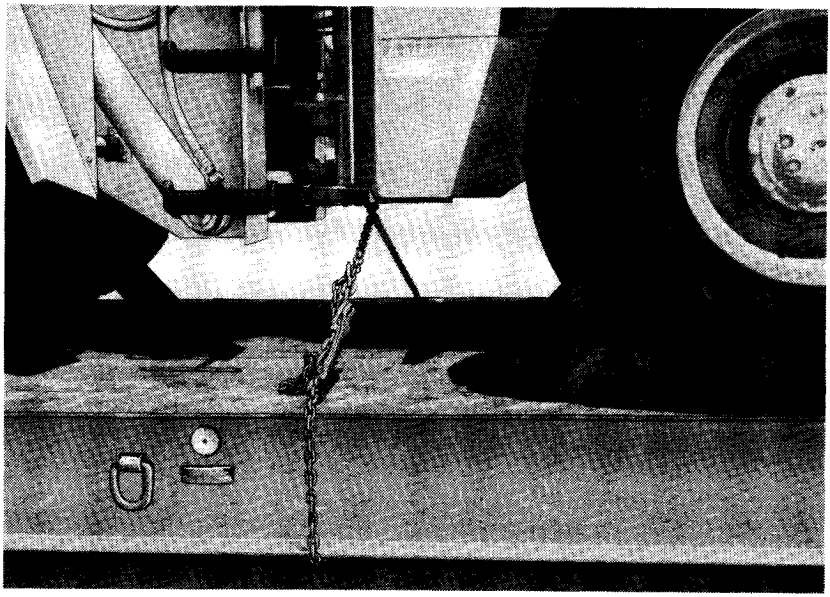
Front Tie-Down



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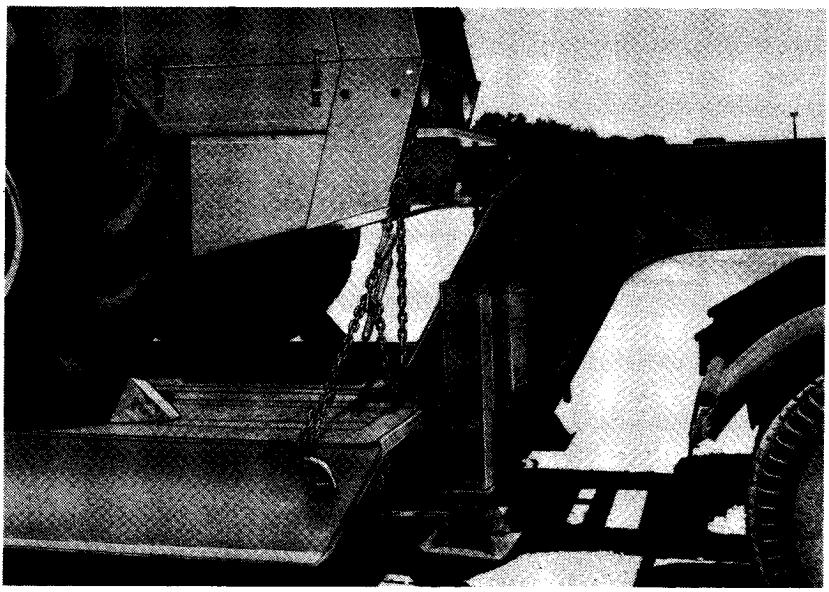
Middle Tie-Down



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Rear Tie-Down

NOTE: Before operating the machine, reduce the pressure of the tires. Refer to the tire pressure chart on page 59. Use the column for "Operating Pressure".

Cold Weather Operation

Precautions must be taken during cold weather to prevent damage and to assure easy starting.

1. Keep the batteries at full charge.

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

3. Protect the cooling system from freezing with a solution of ethylene glycol antigreeze and water. Refer to page 30.

4. When not operating, park the machine out of the mud or water.

5. Cover the exhaust stack at the end of the day's work.

6. Fill the fuel tank at the end of each shift. Be sure the engine is stopped before filling.

7. If liquid is to be added to the tires, be sure the solution is properly mixed to prevent freezing.

8. See your Authorized Case Dealer for further cold weather aids. They include dipstick heaters, battery heater, alcohol evaporator or percolator type coolant heaters.

9. Prime the engine turbocharger (if so equipped) with oil before starting the engine. Refer to page 51.

10. Operate the engine at speeds high enough to maintain proper operating temperatures. Idling the engine will lower the coolant temperature.

Hot Weather Operation

During periods of hot weather, extra precautions should be taken on the following items.

1. Keep coolant up to correct level. Keep cooling system pressurized. Replace the radiator cap immediately if it cannot maintain 7 psi (48 kPa) pressure.

2. Keep radiator free of bugs, dirt and trash.

3. Check fan belt tension frequently.

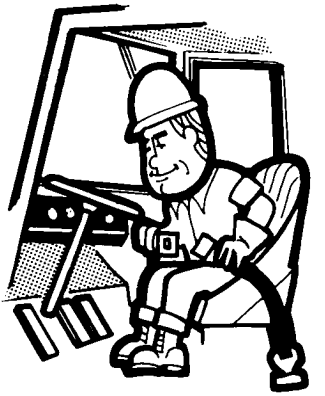
4. Use lubricants of correct viscosity for high temperature operation.

OPERATING TIPS

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

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.

CAUTION: *Fasten seat belt securely before operating.* D-46-68



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CAUTION: *Before each operating period, test the machine for proper steering, braking, operation of the hydraulic controls and safety devices. A properly operating machine can prevent accidents. If required, repair or adjust machine before operating.* 26-4-A

ENGINE SPEED AND TRANSMISSION RANGE

Place the transmission range control lever in a lower gear during loading operations and when transporting a load.

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

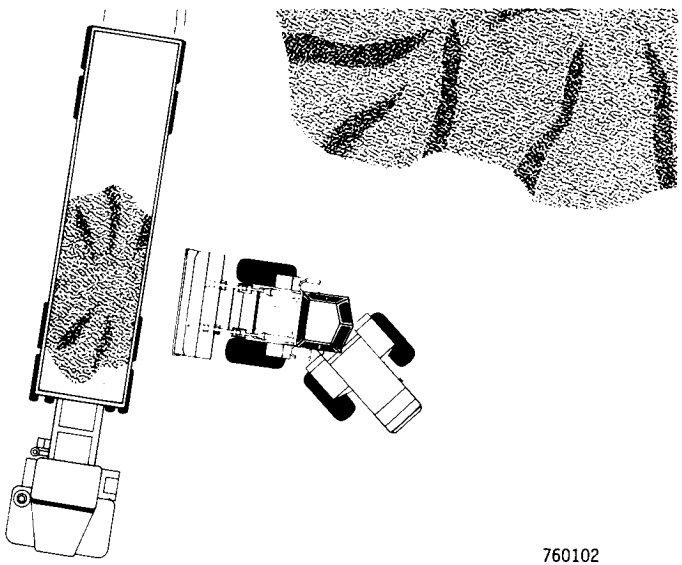
NOTE: Long periods of operation at or near stall speed (wheels and/or bucket moving slowly or not at all under load) may cause converter overheating. Watch the converter temperature gauge - if the needle enters the red zone, select a lower gear or reduce load.

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 tracks will speed up the job.

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



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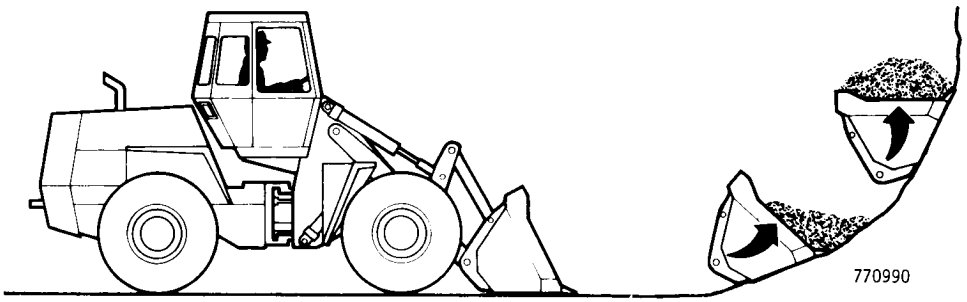
FILLING THE BUCKET

The operator should judge the type of penetration needed for loading. Penetrate the pile smoothly and firmly. Do not use the loader like a ramrod; it is hard on both man and machine.

Arc Penetration

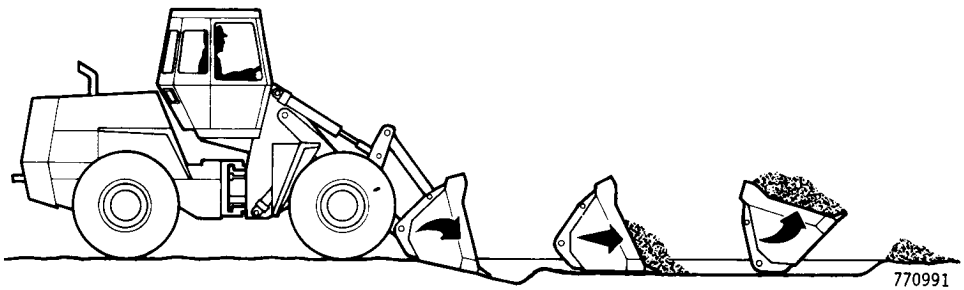
Approach bank or stockpile slowly with bucket horizontal at ground level. With engine running at full throttle, keep machine in forward motion until bucket is full. Penetrate bucket straight into pile. Then coordinate loader arm lift motion and bucket rollback motion so that the rear of the bucket is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



Excavating on the Flat

Position the bottom of the bucket a slight downward angle to aid penetration. Bucket teeth are extremely helpful in this type of digging. Select low range and full throttle. Lower the bucket into the ground. As the desired depth is reached, level off and continue forward.

Roll back the bucket when the pass is completed or when the bucket is full. Pushing material ahead of the bucket wastes time.



Transporting a Load

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

WARNING: *Never transport a loaded bucket at full height. Keep the bucket as low as possible for better machine balance and visibility. When transporting a loaded bucket over rough, uneven ground, keep travel speed within safe operating limits.* 18-6

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 chance 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 46 and 67.

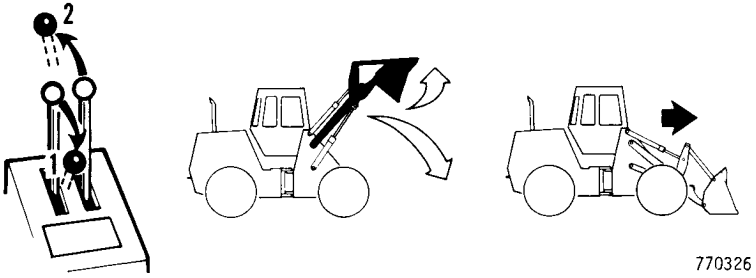
If one side of the truck is lower than the other, try to spot the truck so you dump over the low side. This improves reach and distribution of the load in the truck.

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 Rollback 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 Roll Back 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 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 46.

Clutch Cutout

A clutch cutout system is built into the brake system. This system 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 transmission is re-engaged. The right-hand brake pedal has no effect on clutch cutout.

WARNING: *Keep the transmission in low gear when going down steep 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

FUELS AND LUBRICANTS

DIESEL FUEL

Case diesel engines are designed to operate most efficiently with No. 2 diesel fuel in temperatures above 32° F (0° C) See Note. However, when operating in temperatures below 32° F (0° C), use No. 1 diesel fuel.

NOTE: When No. 2 diesel fuel reaches its cloud point, wax crystals will collect on the screen and filters. This will cause the engine to loose power and will eventually stop the engine. Refer to your fuel distributor for further information.

Fuel Specifications

There can be considerable variation in diesel fuels marked as No. 2. The American Society for Testing Materials (ASTM) has established a well known specification, ASTM Designation D975 which is used in the United States, Canada, and many other areas of the world. Any fuel purchased for use in a Case engine should meet this ASTM specification.

Cloud point, maximum (No. 2 diesel fuel)	-10° F. (-23° C)
Pour point, maximum	10° F (6° C) 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 fuel the machine when smoking, when near an open fire or with the engine running.* 6-6

Fuel Storage

Storing fuel for a long period of time causes accumulation of sediment, dirt scale, water and other foreign material in the fuel. Many engine difficulties can be traced to dirty fuel and long storage periods.

Store fuel in a convenient outside location. Use a shelter to keep the fuel as cool as possible. Condensed water must be regularly syphoned or drained from the storage tank. If stored in a barrel, position the barrel horizontally with the outlet end raised a few inches higher than the base. This allows collection of sediment and water at the base.

Fuel, Fluids and Lubricants

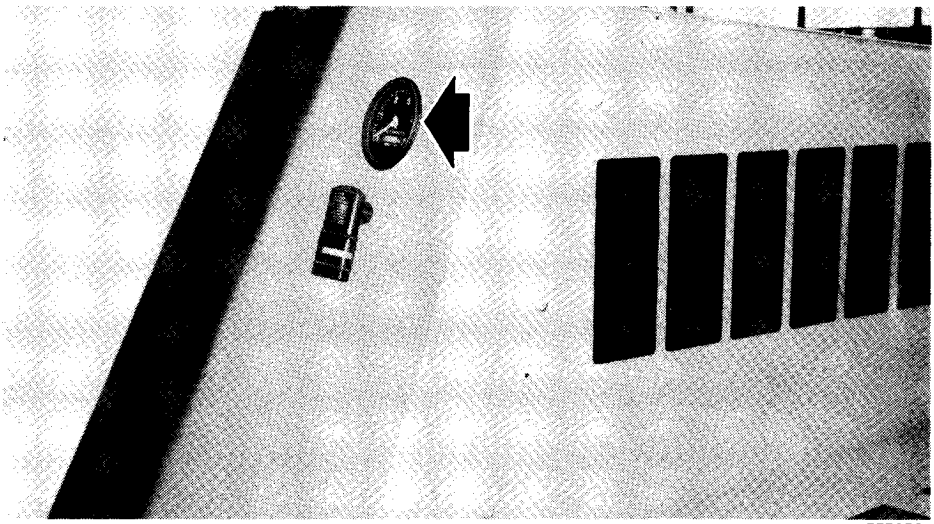
COMPONENT	CAPACITY U.S.	CAPACITY Metric	SPECIFICATIONS
Fuel tank	58 gals.	219 litres	Diesel fuel (see page 68).
Engine coolant	11-1/4 gals.	42.6 litres	Ethylene glycol and water should be mixed for prevailing temperatures. Follow antifreeze manufacturer's specifications. See page 30.
Engine crankcase: Without Filter change With filter change	 12 qts. 13 qts.	 11.4 litres 12.3 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 20W Below 40° F (4° C) . . . . SAE 10W
Auxiliary brake reservoirs (each)	11-1/2 fl. oz.	340 mL	SAE J1703c brake fluid (DOT 3)
Transmission Refill Total system	 7-1/2 gals. 9 gals.	 28.4 litres 34 litres	Case TCH Fluid. Alternate oils: Type C-2 transmission hydraulic fluid such as Tenneco Hytrans Fluid.
Axles Each center bowl Each wheel end	 13 qts. 4 qts.	 12.3 litres 3.8 litres	0° to 100° F (-18° C to 38°C). .SAE 90 API-GL-5 Gear Lubricant -10° F to 0° F (-23° C to -18° C) SAE 80 SAE 80W API-GL-5 Gear Lubricant Below -10° F (-23° C). .MIL-L-1034A
Hydraulic system: Reservoir (refill) System total	 17 gals. 29 gals.	 64 litres 110 litres	Case TCH Fluid Alternate oils Engine oil - SD-Service class D or CA-Commercial class A Above 32° F (0° C) . SAE 10W Below 32° F (0° C) . . SAE 5W Type C-2 Transmission and hydraulic fluid such as Tenneco Hytrans Fluid.
Pressure fittings	As required		No. 2 moly-disulfide grease.
Alcohol evaporator	1 pt.	0.5 litres	Clean wood alcohol.
Batteries	As required		Drinking water or distilled water.

MAINTENANCE/LUBRICATION

INTRODUCTION

Scheduled maintenance and lubrication are the normal operations required to provide safe and efficient operation. Following the maintenance charts is the easiest and most economical means of assuring the least amount of down 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 when the engine is running, indicates the accumulated hours of operation.



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RUN-IN PERIOD

The items listed in the run-in section are performed during the run-in period only.

SCHEDULED MAINTENANCE

The items listed in this section 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 interval.

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

RUN-IN MAINTENANCE CHART

INTERVAL	SERVICE	INSTRUCTIONS
Run-In After First 20 Hours of Operation	Have your Authorized Case Dealer perform the checks and adjustments listed in the After Delivery Checkup.	See page 133.
	Check the tightness of the wheel nuts.	See page 117.

NOTE: The following scheduled Maintenance Chart is based on maximum intervals. If the machine operates in severe conditions, service more often.

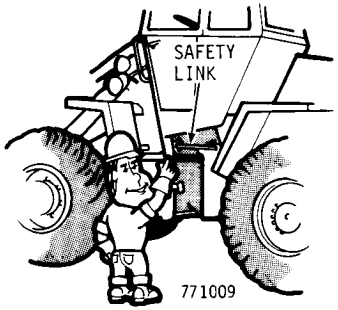
NOTE: See page 69 for a list of fluids and lubricants.

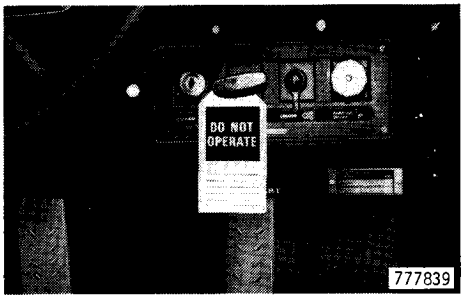
SCHEDULED MAINTENANCE CHART

INTERVAL	SERVICE	INSTRUCTIONS
Every 10 Hours of Operation or Daily Whichever Comes First	Do all steps in the "Walk Around Checks Before Starting".	See page 49.
Every 50 Hours	Check the sediment bowl of the transfer pump. If you see water or sediment, clean the fuel system.	See page 96.
	Check the level of oil in the transmission.	See page 113.
	Check the level of oil in the hydraulic reservoir.	See page 107.
	Check the level of fluid in the batteries.	See page 105.
	Check the level of fluid in the auxiliary brake reservoirs.	See page 110.
	Check the filters of the ROPS cab.	See page 122.
	Put grease into the pivots of the steering cylinders.	See page 76.
	Put grease into the pivots of the frame hinge pins.	See page 76.
	Put grease into the support bearing of the front drive shaft.	See page 76.
	Put grease into the universals and slip spline of the drive shafts.	See page 76.
	Clean all safety decals on the machine. Replace all safety decals that can not be read.	See page 127.
Every 100 Hours of Operation	Clean the spark arresting muffler (if so equipped).	See page 84.
	Change the oil of the engine. (Turbocharged engines only).	See page 77.
Every 150 Hours of Operation	Change the oil of the engine. (Engines without turbocharger)	See page 77.
Every 200 Hours of Operation	Change the filter of the engine oil. (Turbocharged engines only).	See page 78.

INTERVAL	SERVICE	INSTRUCTIONS
Every 250 Hours of Operation	Put grease into the pivots of the equipment control levers.	See page 75.
	Put grease into the pivots and on to the sliding rails of the suspension seat.	See page 76.
	Clean the screen of the alcohol evaporator.	See page 111.
	Check the level of oil in the axles.	See page 116.
Every 300 Hours of Operation	Change the filter of the engine oil. (Engines without turbocharger).	See page 78.
Every 500 Hours of Operation	Check the tension of the drive belts.	See page 89.
	Change the two filters of the fuel system.	See page 97.
	Remove sediment and water from the fuel tank.	See page 95.
	Clean the filters of the fuel pump and transfer pump.	See pages 95 and 96
	Put grease into the lower pivot of the shift lever.	See page 77.
Every 1000 Hours of Operation	Change the oil of the hydraulic reservoir.	See page 108.
	Change the filter of the oil in the hydraulic reservoir.	See page 108.
	Change the oil of the transmission.	See page 114.
	Change the filter of the transmission.	See page 114.
	Clean the oil strainer of the transmission.	See page 114.
	Clean the breather of the transmission.	See page 114.
	Change the oil of both axles.	See page 116.
	Clean the cylinder head of the air compressor (by dealer only).	
Every 2000 Hours of Operation	Change the coolant of the cooling system. Clean the cooling system.	See page 85.
	Remove and clean the alcohol evaporator (by dealer only).	
As Required	Clean or replace the air cleaner element/s when the restriction indicator shows the red band.	See page 82.
	Check the refrigerant charge when loss of coolant is indicated.	See page 128.
	When a wheel is removed and installed again, check the tightness of the wheel nuts every 10 hours until they do not loosen.	See page 117.
	Replace the fire extinguisher shell if it has been used or does not have pressure (if so equipped).	
	Fill the alcohol evaporator with clean wood alcohol (if so equipped).	See page 112.

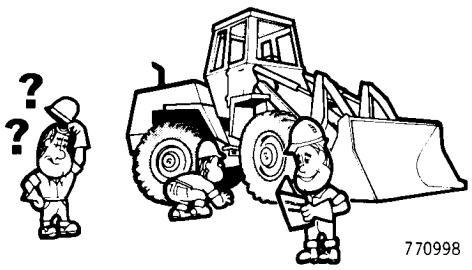
SAFETY BEFORE YOU DO SERVICE





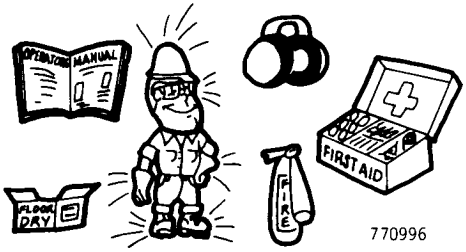
Lower the bucket to the ground or hold up with a stand or hoist. Put the Transport/Service link in the Locked position. See page 74.

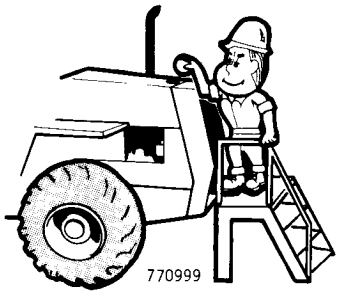
Put the parking brake control in the Engaged position. Put a Do Not Operate tag on the instrument panel.



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

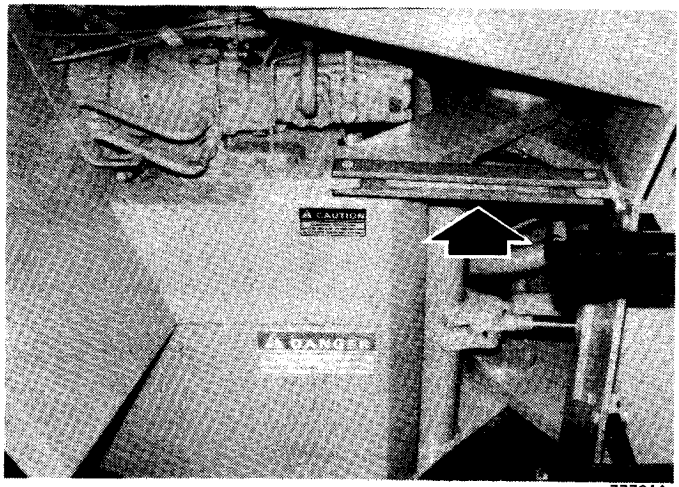




Use the correct safety clothing and safety equipment. Understand how to use the fire extinguisher and first aid kit.

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

TRANSPORT/SERVICE LINK



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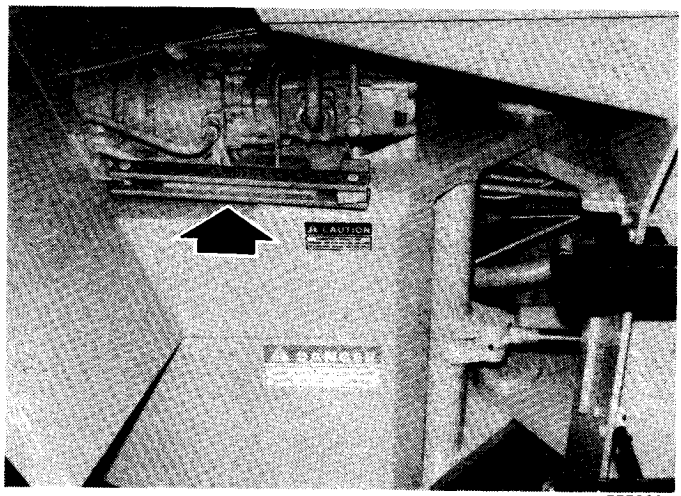
Locked Position



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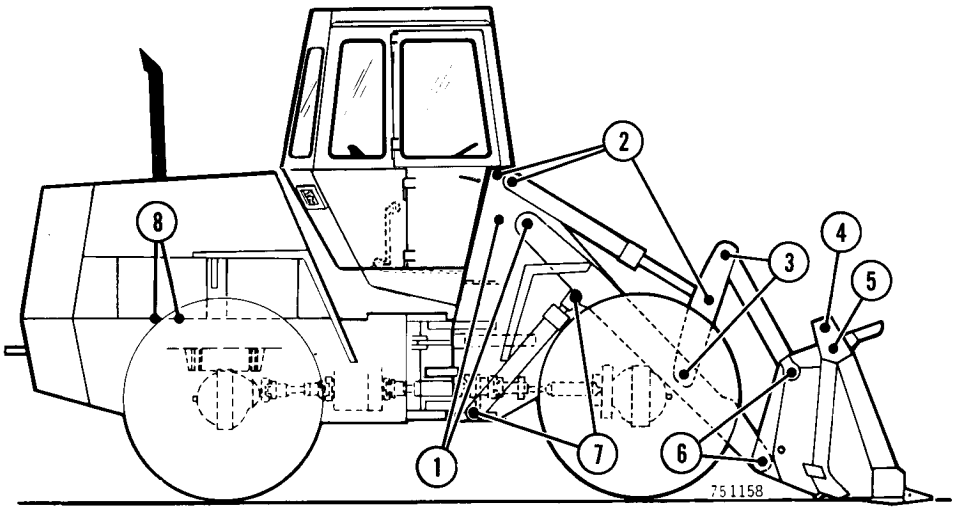
Operating Position

LUBRICATION POINTS

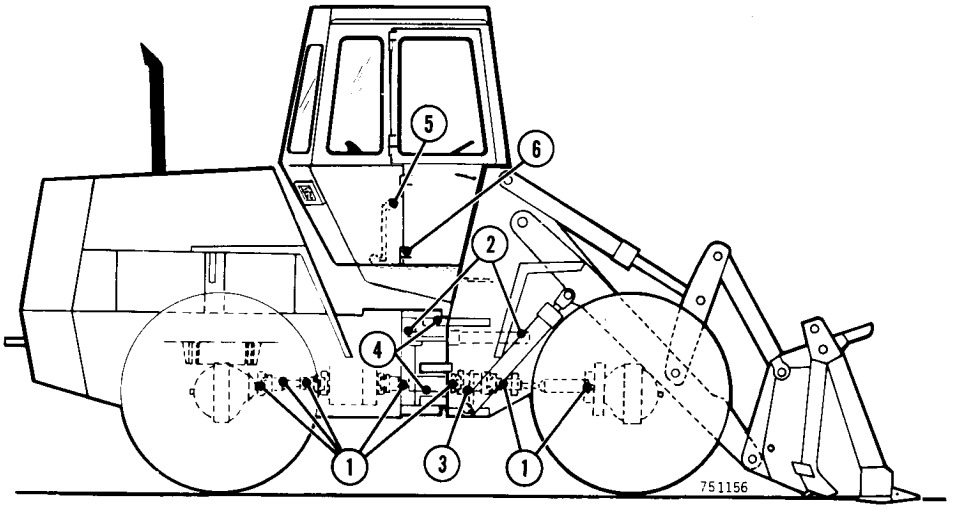
If the machine is operated in severe conditions such as water, mud or dust, lubricate points more often. Wipe all pressure points clean before greasing.

Every 10 Hours



1. Lift arm pivots . . . . . (4) two each side
2. Tilt cylinders . . . . . (6) three each side
3. Tilt linkage . . . . . (4) two each side
4. 4-In-1 clam cylinder (rod end) . . . . . (2) one each side
5. 4-In-1 clam pivot . . . . . (2) one each side
6. Bucket pivot points . . . . . (4) two each side
7. Lift cylinder . . . . . (4) two each side
8. Rear axle trunnion pivots . . . . . (2) on left side

(Two lube hose fittings located on left-hand side of chassis)

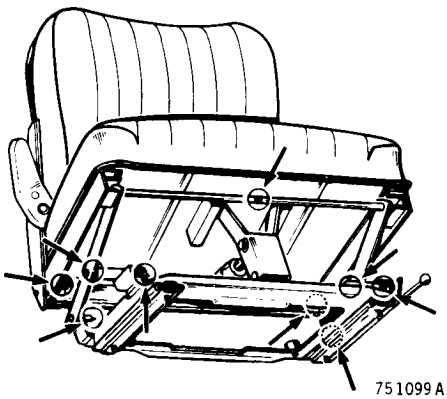


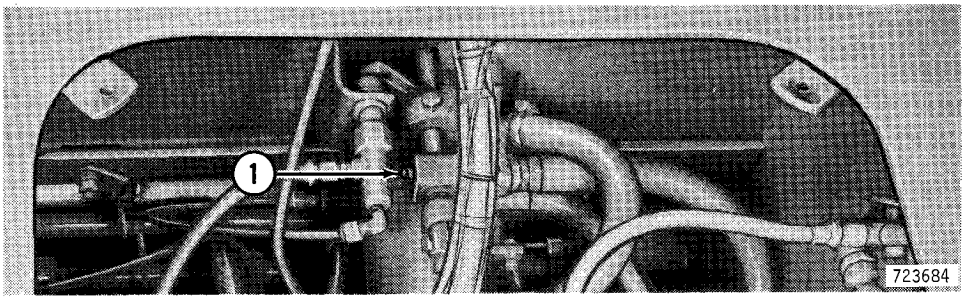
Every 50 Hours

1. Driveshaft universals and slip spline 8
2. Steering cylinder pivots (2 each side) 4
3. Front shaft support bearing 1
4. Upper and lower frame hinge pins 2

Every 250 Hours

5. Control lever pivots (2 each lever) 2-3
6. ROPS cab door hinges (Use powdered graphite) 4
7. Suspension seat 9
   (See illustration. Lubricate slide rails with Lubriplate)





1. Shifting lever lower pivot . . . . . (1) one fitting

ENGINE LUBRICATION SYSTEM

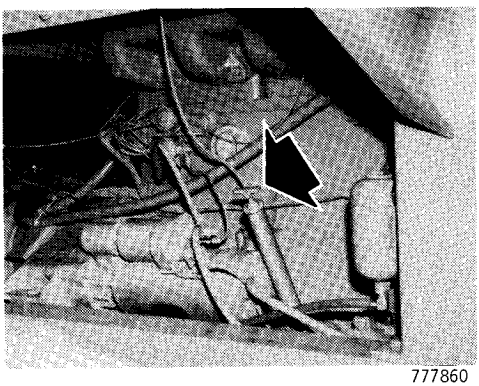
Oil Level

Check engine oil level in the morning or before each shift change. If checked during operation, stop engine and allow oil to settle 5-10 minutes before checking. The dipstick is located on the left-hand side of engine. To remove, turn T-handle counterclockwise and lift up. Oil level should be between Full and Low marks on dipstick.

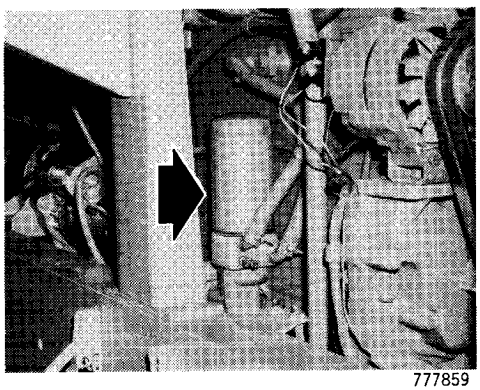
Oil Change

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 high altitude compensating kit (turbocharger), change the oil every 100 hours of operation.



Dipstick



Filter

If your operating conditions are unusually severe, increase the frequency of oil changes.

Draining the Oil

If possible, drain the oil while the engine is hot. Allow time for the oil to drain completely - small amounts will continue to drain for a long time.

Measured Refill

A crankcase refill will require either of the following:

1. If the engine oil filter has not been changed, refill with 12 measured U.S. quarts (11.4 litres) or oil. Do not use the dipstick for a guide.

2. If the filter has been changed, refill with 13 measured U.S. quarts (12.3 litres) of oil.

   a. If your machine is equipped with a high altitude compensating kit (turbocharger), pull out the fuel shutoff control and crank the engine for 20 to 30 seconds before starting.

   b. All machines: Start engine and operate a few minutes at low idle. Check for filter leaks. 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 than every 300 hours.

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

The filter change must be made with every other oil change.

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 contaminated filter by turning out counterclockwise with a strap wrench or special wrench A64761 (available through your Authorized Case Dealer).

2. Wipe 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 from 18 to 20 pounds-feet (24-28 N m) torque.

6. Refill the crankcase with 13 measured quarts (12.3 liters) 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 air for both the engine and the air compressor. Working conditions will determine the intervals at which the air cleaner should be serviced. See page 80. Restriction Indicator.

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.

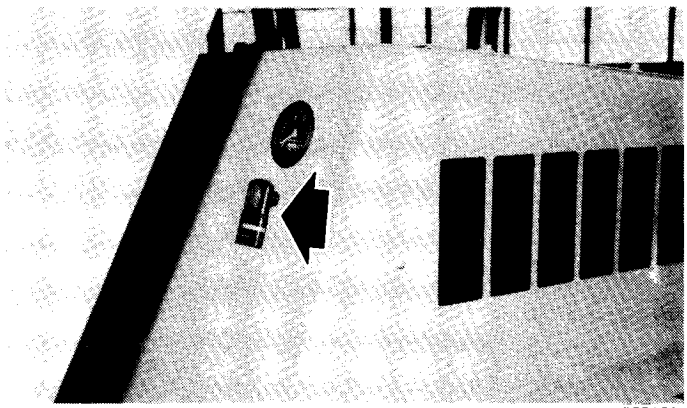
When accumulated dust on the elements causes excessive air flow restriction, the red band will rise and remain in view in the window; this means the air cleaner must be serviced immediately.

Restriction Indicator

The air cleaner must be serviced whenever the restriction indicator red signal band comes up into view.

Resetting Indicator

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



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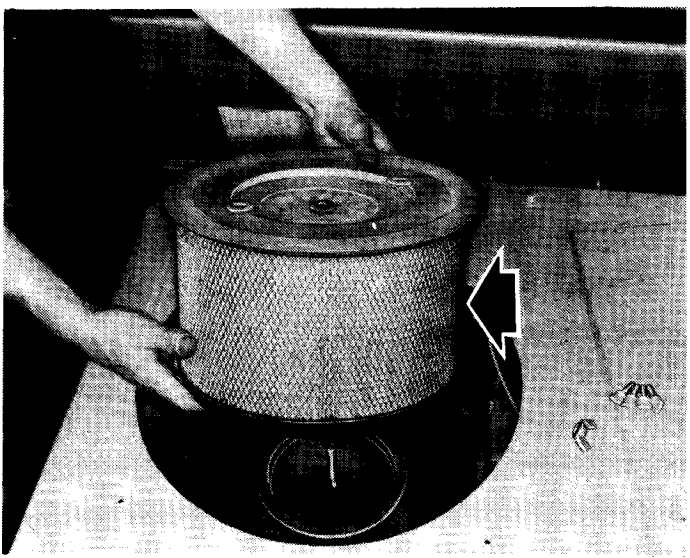

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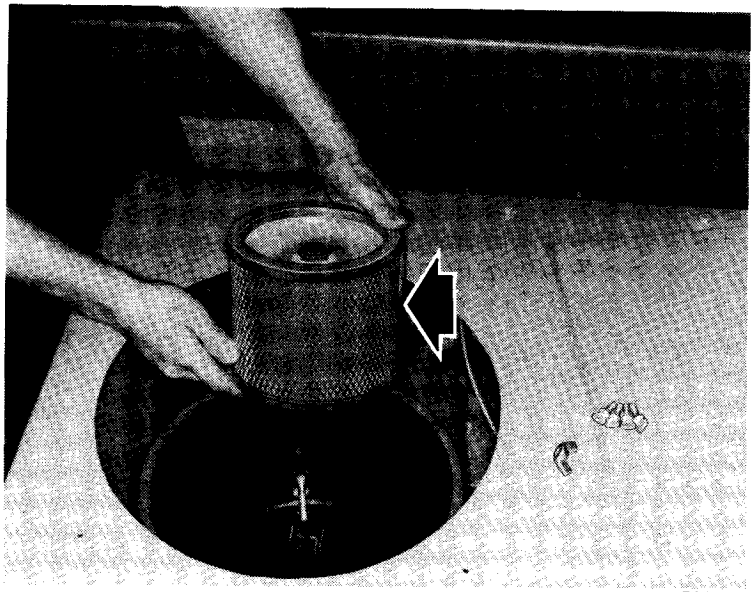
Primary Element



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Secondary Element

Air Cleaner Servicing

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

1. Replace or clean the air cleaner outer element.

2. After replacing/cleaning the outer element, install the element 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 clean the inner element.

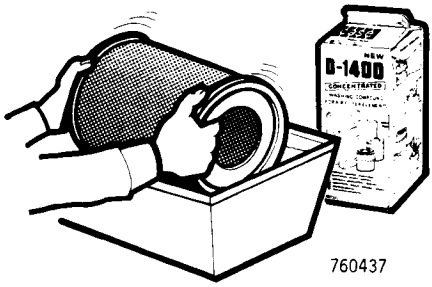
Servicing the Elements

Washing the Outer Element

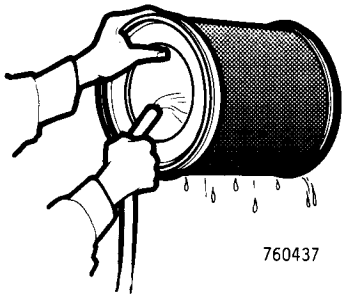
Washing is the preferred method of cleaning the element. Have two or three spare elements on hand to reduce down time when servicing.

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 element.

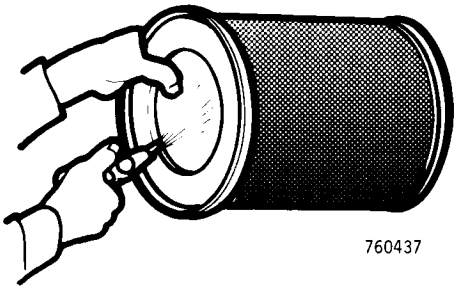


Washing The Element



Rinsing The Element

Cleaning the Outer Element With Compressed Air



Cleaning With Compressed Air

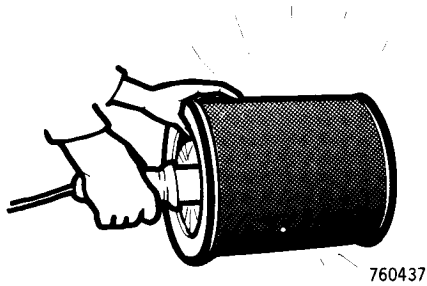
The element can also be cleaned with compressed air, using a maximum of 30 psi (207 kPa) at the nozzle. Keep the air nozzle a reasonable distance from the filter element. Use of compressed

air is not always recommended because it will not remove carbon and soot like washing.

NOTE: Never attempt to clean the element by rapping it. 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.



Inspecting The Element

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, 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.

Checking the Secondary Element

The secondary element should be checked for restriction whenever the primary element is serviced. After the primary 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 starts to enter the indicator window, the secondary element must be replaced.

Secondary Element Service

Cleaning the secondary 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.

SPARK ARRESTING MUFFLER

Clean the spark arresting muffler every 100 hours of operation. To clean, remove the band covering the slot in the side of the muffler. With transmission in Neutral and parking brake on, increase engine speed to full throttle several times to force loose carbon out the slot. Reinstall band over slot.

ENGINE COOLING SYSTEM

Radiator Cap

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

Replace the radiator pressure cap if a test indicates it does not maintain correct pressure.

The radiator cap (1) pressurizes the cooling system which raises the coolant boiling point and reduces loss of coolant by evaporation, surging and boiling, and (2) serves as a relief valve to maintain system pressure at 7 psi (48 kPa).

Coolant

Coolant Level

Check the coolant level daily while the engine is cold. The coolant should be approximately 2 inches (51 mm) below the level of the radiator cap opening. Add coolant if necessary, but do not overfill.

NOTE: Never pour coolant into a hot engine. The engine block or cylinder heads could crack because of sudden contraction caused by temperature differences between the metal and the coolant.

Never remove the radiator cap when the engine temperature gauge shows the engine is overheated. Coolant may boil away allowing engine parts to cool too fast and causing the block or heads to crack.

Antifreeze

The recommended coolant for year round use in the cooling system is a good brand of ethylene glycol base (permanent) antifreeze.

The loader is shipped from the factory with permanent type antifreeze in the cooling system for protection down to —20° F (-29° C). The antifreeze should never be used more than one winter due to natural breakdown of rust inhibitors.

For cooling system capacity see page 30. When putting new antifreeze in cooling system, follow manufacturer's recommendations to determine proportion of antifreeze required for lowest expected temperature. Then fill the cooling system with enough water so that the coolant level is approximately 2 inches (51 mm) below the level of the radiator cap opening.

IMPORTANT: Mix the antifreeze and water thoroughly by running the engine at operating temperature for about 5 minutes. This must be done before the loader is parked outside in temperatures below 32° F (0° C).

Water Coolant

If water alone is used in the cooling system during the summer months, add a rust inhibitor (Case part number 331-508).

WARNING: *Alkaline solution. Keep out of reach of children. Do not get in eyes, on skin or on clothing. Use this product only as directed on the container. For first aid (1) in case of contact, immediately flush eyes or skin with water for at least 15 minutes (2) if swallowed, induce vomiting, following by large quantities of water. Call a doctor immediately. If clothing is contaminated, remove and wash. Flush skin as stated above.* 47-20

If possible, use soft water. If only hard water is available, check the system at frequent intervals for signs of scale formation.

Cleaning the System

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

1. While the coolant is still hot, open the radiator drain valve, oil cooler drain valve and the engine block drain valve. See photos on pages 86 and 87. Drain all coolant and close the valves.

2. Add a radiator cleaner to the system and refill with clean water. Any commercial brand cleaner marketed by a reputable manufacturer can be used. Follow the directions provided with the cleaner.

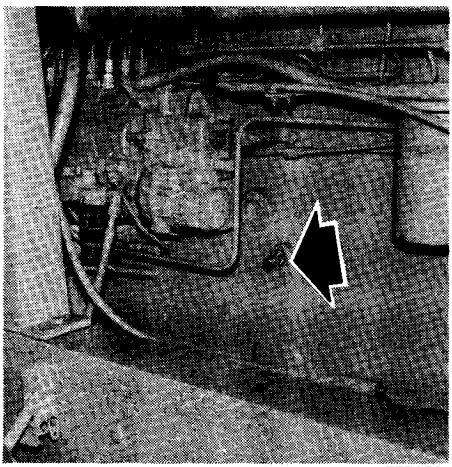
3. After draining the cleaner solution, flush the system with clean water before refilling the radiator.

4. Check the hoses, elbows, pump and water manifold for leakage.

5. Make sure the outside of the engine is clean and that the radiator fins are free of accumulations. Blow dirt and trash out of the radiator with compressed air.

6. Refill the cooling system to within 2 inches (51 mm) of the top of the radiator neck.

7. Run the engine approximately 5 minutes with cap loosened to bleed the air out of the system. Recheck the coolant level and add coolant, if necessary.



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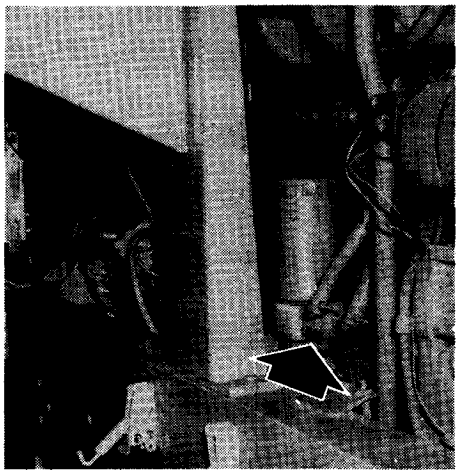
Engine Block Drain Valve



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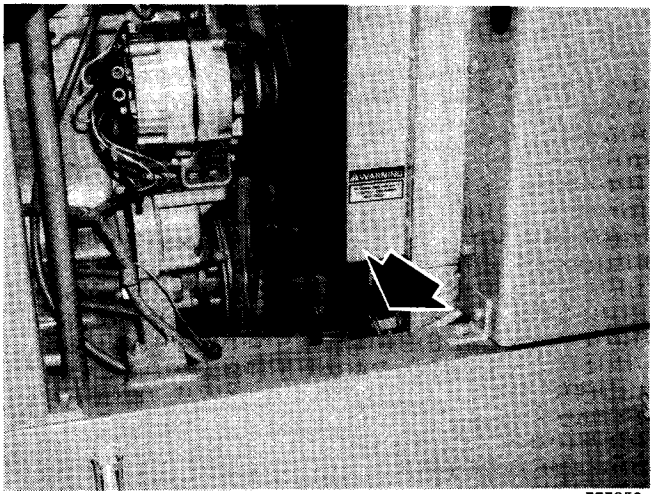
Oil Cooler Drain Valve



Radiator Drain Valve

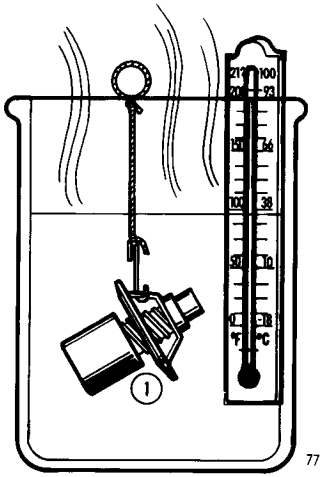
Thermostats

Temperature Range

The cooling system is equipped with 2 thermostats that start to open at 175°-182° F (80°-83° C), are fully open at 202° F (94° C), and remain open above 202° F (94° C). Coolant temperature will vary according to the workload. If the radiator is equipped with a properly functioning 7 psi (48 kPa) pressure cap, the loader can operate with engine coolant temperatures up to 230° F (110° C) without damage to the engine or loss of coolant.

Checking Thermostats

During loading operations check the engine temperature gauge frequently. Should the engine warm up very slowly under load, or if the engine temperature gauge needle does not reach the recommended operating range, remove and check the thermostats. This can be done by suspending each thermostat in a pan of water that is being heated and checking the opening temperature with a thermometer.



1. Thermostat Open

If a thermostat is inoperative, discard it and install a Genuine Case thermostat having the same temperature range as the original. The thermostat must start to open at 175°-182° F (80°-83° C) and be fully open at 202° F (94° C).

Replacing Thermostats

To replace the thermostats:

1. Drain the radiator to a level below the thermostats.

2. Remove the upper radiator hose and clamp from thermostat housing. Remove the 3 thermostat housing bolts and remove housing from water manifold.

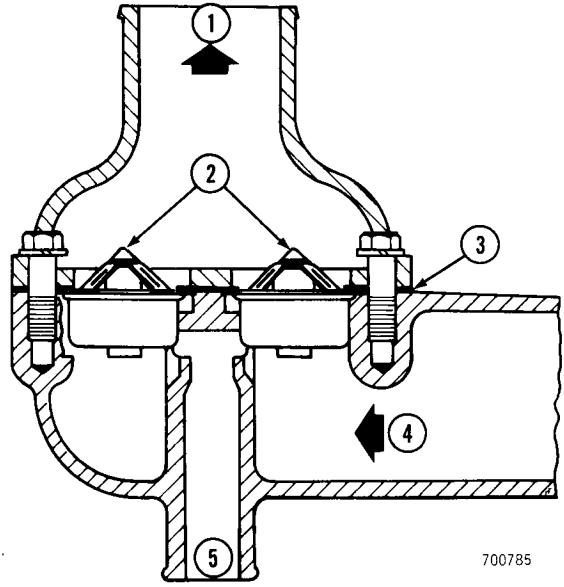
3. Remove thermostats from water manifold.

4. Remove gasket from thermostat housing or water manifold, and discard.

5. Install new thermostats with pointed ends upward.

6. Place a thin film of sealing compound on both sides of new gasket. Place gasket on water manifold and reinstall thermostat housing, tightening the 3 bolts evenly. Reinstall upper hose on thermostat housing and tighten hose clamp.

7. Refill radiator and operate engine about 5 minutes and check for leaks. Check coolant level and add as required.



1. Upper Hose
2. Thermostats
3. Gasket
4. Water Manifold
5. Bypass Hose

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 and permit engine everheating and battery failure.

Belt Tension

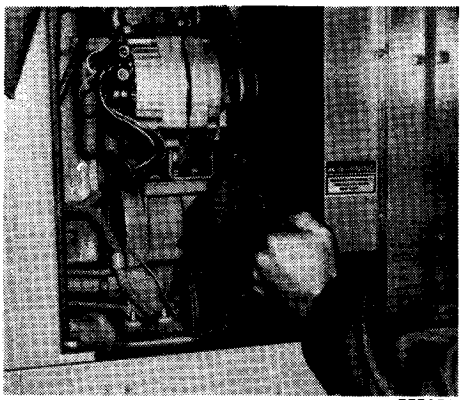
Properly adjusted fan belts can be depressed 1/2 inch (12 mm) using firm thumb pressure midway between the fan pulley and the

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.

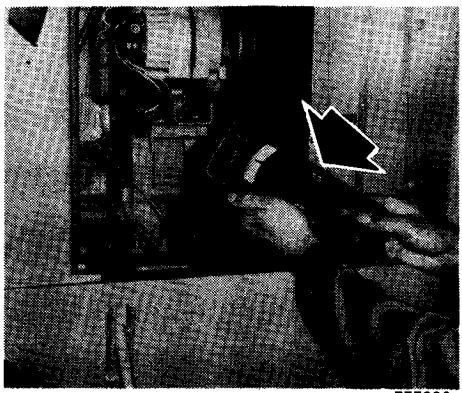
Installing New Belts

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.

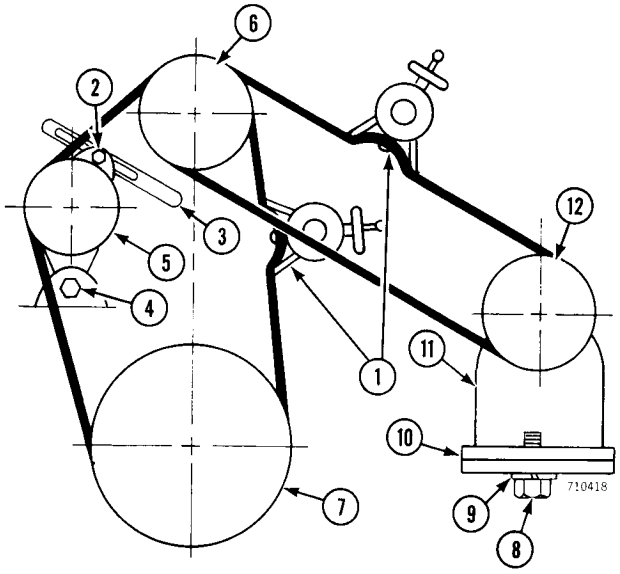
NOTE: The fan belts are a matched set. Do not replace the fan belts individually. Use genuine Case replacement belts, available from your Authorized Case Dealer.



Put the Belt Tension Gauge on One Belt



Reading the Belt Tension Gauge



1. 1/2 Inch (12 mm) Deflection with Firm Thumb Pressure, or Using Belt Tension Gauge:
   New Belt - 110 Lbs (50 kg)
   Used Belt - 90 Lbs (41 kg)
2. Adjusting Bolt
3. Strap
4. Pivot Bolt
5. Alternator Pulley
6. Fan Pulley
7. Crankshaft Pulley
8. Adjusting Bolt
9. Lockwasher
10. Sliding Bracket
11. Compressor
12. Compressor Pulley

Brake System Compressor Belt

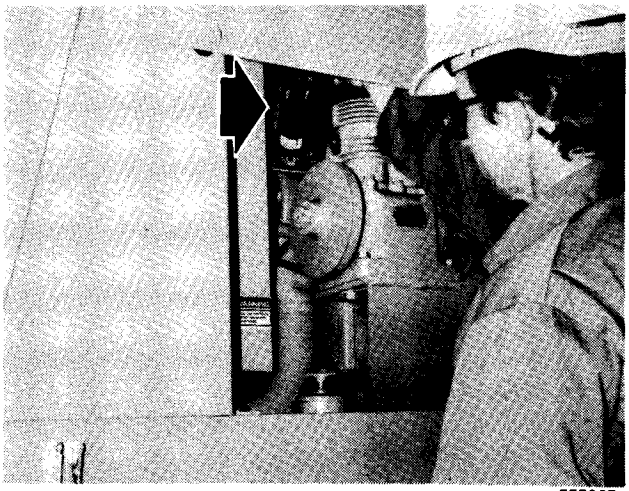
Check the air compressor belt every 500 hours of operation. If too tight, the belt can cause rapid wear of water pump and compressor bearings. If too loose, the compressor may not maintain full pressure in the brake system air reservoir.

Tension Check

A properly adjusted compressor belt can be depressed 1/2 inch (12 mm) using firm thumb pressure 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.



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1. Belt Tension Gauge
2. Adjusting Belt

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

NOTE: Check pulley grooves for alignment. If grooves are misaligned, rapid belt wear will result.

Air Conditioner Compressor Belt

A properly adjusted compressor belt can be depressed 1/2 inch (12 mm) using firm thumb pressure 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.

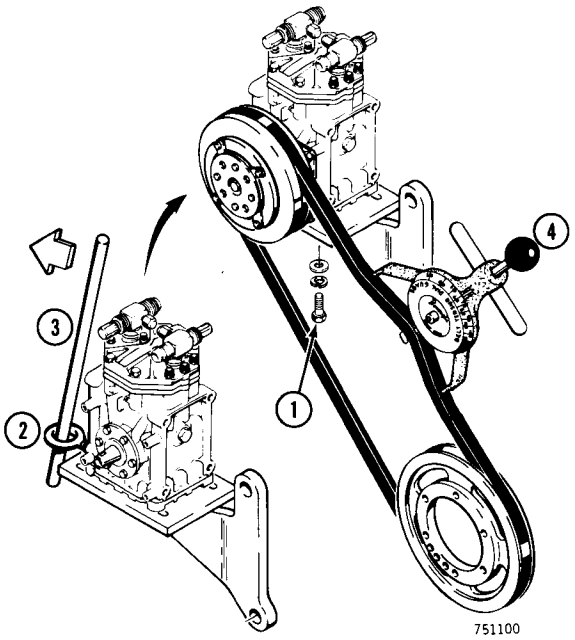
Belt tension is measured with a tension gauge. A properly tightened belt will give a reading of 110 pounds (50 kg) on a new belt and 90 pounds (41 kg) on a belt that has been run-in.

Belt Adjustment

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

2. Install an eye bolt in tapped hole as shown. Insert a pry bar 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 eye bolt. Recheck pulley grooves for alignment. If grooves are misaligned, rapid belt wear will result.



1. Mounting Bolt (4)
2. Eyebolt
3. Pry Bar
4. Tension Gauge

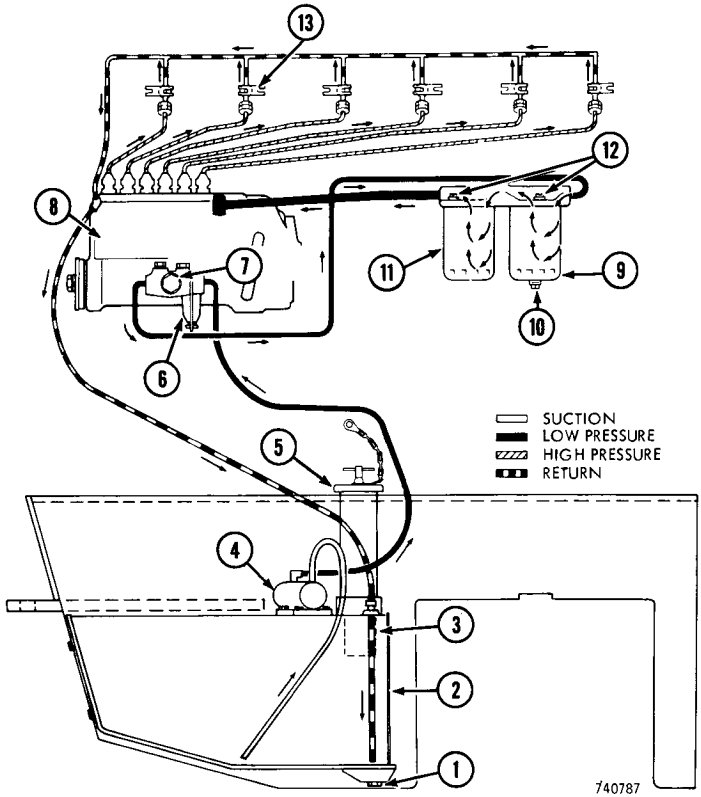
Air Conditioner Belt Adjustment

FUEL SYSTEM

The fuel system includes a tank, filters, pumps, and injection equipment. Refer to illustration below for location of major components in the fuel system when cleaning or changing filters, draining the water trap, cleaning the filter bowl, and bleeding air from fuel lines.

Clean fuel and regular servicing of water draining and fuel filtering components 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.



1. Drain Plug
2. Fuel Tank
3. Screen
4. Electric Fuel Pump
5. Filler Cap
6. Transfer Pump Filter Bowl
7. Transfer Pump
8. Injection Pump
9. 1st Stage Filter
10. Drain Plug
11. 2nd Stage Filter
12. Bleed Valves
13. Injector

Service of the Fuel System

Water and sediment that collect in the fuel system must be removed regularly. Check the transfer pump filter bowl every 50 hours or weekly. If water or deposits are found, drain the fuel tank water trap, clean the transfer pump filter bowl and filter, and drain the first stage filter.

Do the following every 500 hours or whenever loss of power is suspected:

1. Drain the fuel tank water trap.

2. Clean or change the electric fuel pump filter.

3. Clean or change the transfer pump filter.

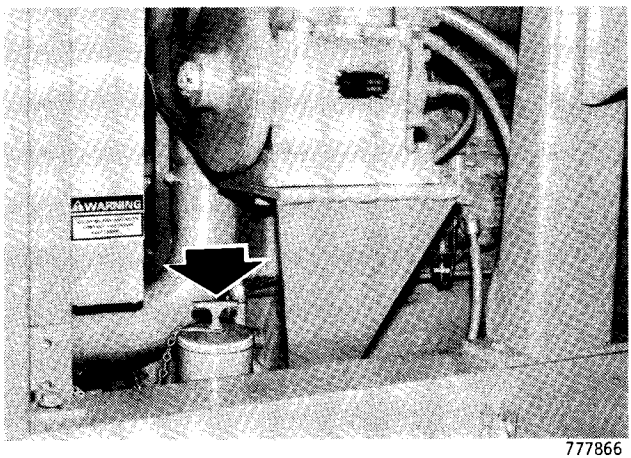
4. Change the first and second stage filters.

Fuel Tank

The fuel tank should be filled at the end of each daily operation. A full tank will prevent water condensation.

WARNING: *Do not fuel the machine when smoking, when near an open fire or with the engine running.* 6-6

Occasionally check the condition of the fuel tank filler pipe screen when the tank is about half empty. Remove the filler cap by turning the T-handle counterclockwise and lift up. Use a light to check screen at bottom of pipe. If it is necessary to clean screen, remove the filler pipe from the tank and take out the screen. Be sure to reinstall the screen in the tank opening before installing the filler pipe.



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Fuel Tank Filler Cap

The fuel tank is equipped with a water trap. Drain water and deposits from the tank whenever water is found in the transfer pump filter bowl or every 500 hours of operation. Loosen the drain plug and let fuel drain slowly until clear of water.

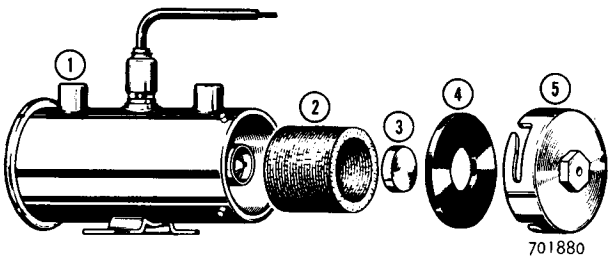
Electric Fuel Pump Filter

1. Clean the filter every 500 hours or whenever loss of power is suspected. Use a wrench to release the bottom cover from the bayonet fittings. Twist cover by hand to remove from pump body.

2. Remove filter, magnet, and cover gasket. Wash filter in cleaning solvent. Use air pressure to blow out dirt and cleaning solvent. Use a new filter if the old one is damaged or cannot be cleaned satisfactorily. Check cover gasket. If gasket is damaged, use a new one. Clean bottom cover.

3. Install parts in reverse order of disassembly. Twist bottom cover by hand to hold in position on pump housing. Use a wrench to tighten the bottom cover.

4. Remove air from the fuel system as instructed on page 98.

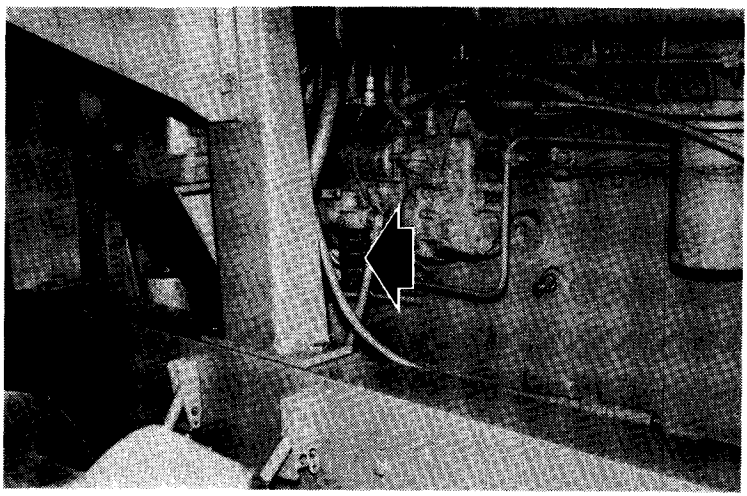


701880

1. Pump Body
2. Filter
3. Magnet
4. Gasket
5. Bottom Cover

Transfer Pump Filter Bowl and Filter

Remove and clean the bowl and filter whenever water or deposits are found or after every 500 hours of operation.


777852

1. Clean area around fuel transfer pump filter bowl.

2. Loosen the bail locknut. Swing bail to the side, and remove bowl with filter, spring, and gasket.

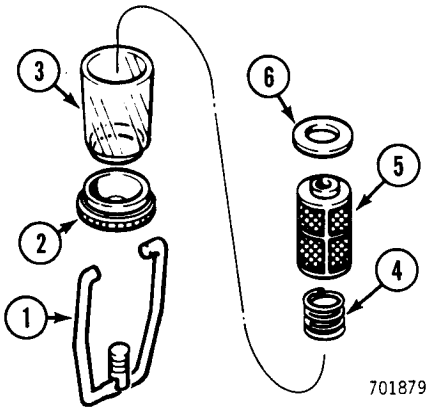
3. Clean the filter with diesel fuel. Use a new filter if the old one is damaged or cannot be cleaned satisfactorily.

4. Clean bowl in diesel fuel. Wipe dry with a clean cloth.

5. Check gasket for damage or deterioration. Use a new gasket if the old one is not satisfactory.

6. Assemble the parts and put bowl into the bail. Tighten the bail locknut so that the bowl is held in place but is still loose.

7. Turn the key switch to the Run position to activate the electric fuel pump. Do not turn the key switch to the Start position. Allow fuel to run until it overflows bowl slightly so that no air remains in bowl. Turn key switch to the Off position. Tighten bail locknut.



1. Bail
2. Locknut
3. Bowl
4. Spring
5. Element
6. Gasket

To Drain the First Stage Filter

1. Loosen but do not remove the drain plug on the bottom of the first stage filter. Allow fuel to drain until clear of water. Tighten the drain plug.

2. Turn the key switch to the Run position to activate the electric fuel pump. Do not turn the key switch to the Start position. Open the bleed screw on top of the first stage filter to allow air to escape. Close the bleed screw when clear fuel appears. Turn the key switch to the Off position.

To Change the First and Second Stage Filters

Change the first and second stage filters every 500 hours or whenever loss of power is suspected.

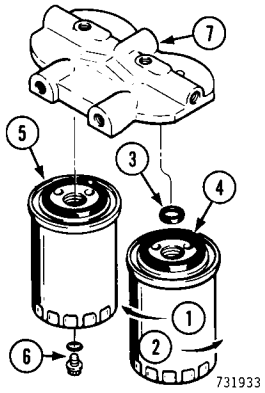
1. Clean the filter bodies and surrounding area. Remove both filters by turning counterclockwise with a strap wrench or special filter wrench A64761. The special wrench is available through your Authorized Case Dealer.

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

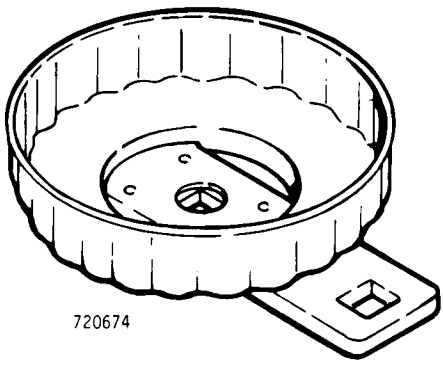
3. Apply a coat of clean oil to the gasket of the new filters. Install each filter by turning in a clockwise direction until gasket contact is made. Hand tighten 1/2 turn.

4. Loosen each 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. Remove air from the fuel system as instructed below.



1. Remove
2. Install
3. Stud Gasket
4. Second Stage Filter
5. First Stage Filter
6. Drain Plug
7. Filter Head



A64761 Wrench

To Remove Air from the Fuel System

You must remove air from the fuel system (1) if the engine runs out of fuel, (2) if maintenance procedures leave air trapped in the system, or (3) if the engine is taken out of storage.

1. Make sure there is fuel in the tank. Turn the key switch to the Run position to activate the electric fuel pump. Do not turn the key switch to the Start position.

2. Open the bleed screw on the top of the first stage filter and allow air to escape. Close the bleed screw when clear fuel appears.

3. Remove air from the second stage filter in the same manner as the first stage filter.

4. Start the engine. If roughness or missing is detected, remove air from each injector line by loosening the tube nut at the injector. Tighten the nut when clear fuel appears.

ELECTRICAL SYSTEM

Lights

Sealed beam and bulb part numbers are given on page 25.

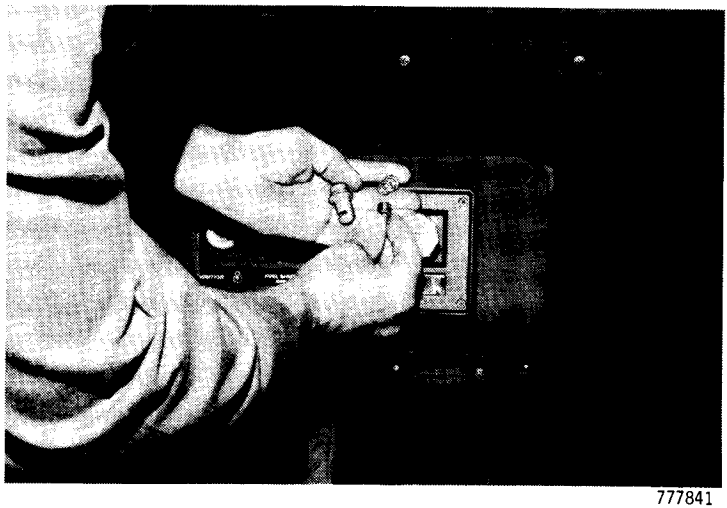
Instrument Cluster Warning and Gauge Lights

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. See picture on top of page 100.



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Instrument Panel Light

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.

CAUTION: *Check that all lights (if so equipped) are functioning properly before operating at night.* 25-7

777871

Headlight or Floodlight

Stop/Taillight

To replace a stop/taillight bulb, turn the complete lens head counterclockwise to remove it from the mounting stud. Remove the old bulb, and install a new bulb. Install the lens head.

Turn Signal/Safety Flasher Lights

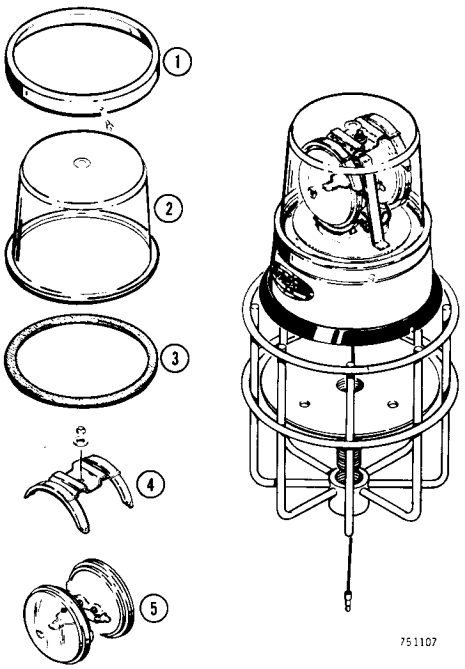
To replace a turn signal/safety flasher light bulb, remove the three screws which hold one lens, and remove that lens. Remove the old bulb. Install a new bulb. Install the lens and the three screws.

Cab Dome Light

To remove 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.



1. Dome Retaining Ring
2. Dome
3. Gasket
4. Sealed Beam Retaining Bracket
5. Sealed Beams (2)

Do's and Do Not's For An Alternator Charging System

Do

1. Do disconnect the battery ground (-) cable when performing work on the electrical system or charging batteries.

2. Do disconnect the regulator plug and wires at alternator terminals whenever using an arc welder on the machine.

3. Do maintain the drive belts at proper tension and in good condition.

Do Not

1. Do not reverse the battery connections. This will damage the diodes. This machine has a negative (-) ground.

2. Do not ground the alternator output terminal.

3. Do not ground the field circuit between the alternator and regulator.

4. Do not operate the machine with the batteries disconnected.

5. Do not attempt to polarize the alternator.

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

CAUTION: *When removing a battery, always disconnect the (-) negative ground cable first. When installing the battery, always connect the (-) negative ground cable last.* 7-3

CAUTION: *Never wear rings or metal watch bands as you may ground a live circuit when working on electrical system.* 46-55

CAUTION: *Think out the circuit before making or breaking a connection. A wrong connection can be painful and expensive.* 5-4

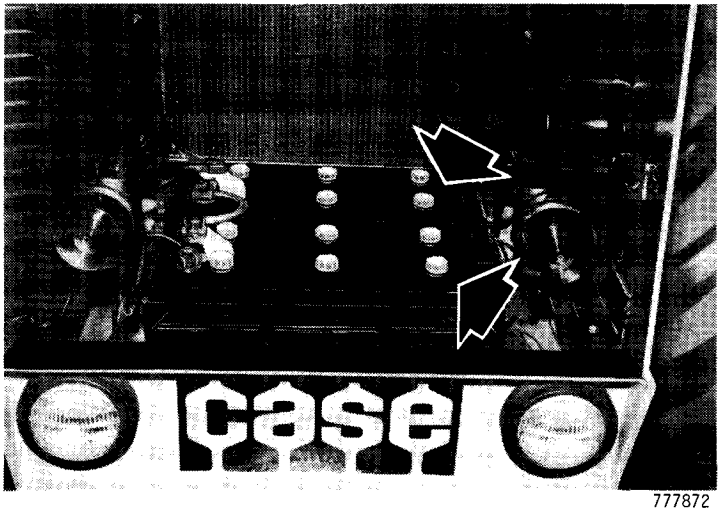
Battery Care and Maintenance

A battery can be considered a perishable item. Proper care and maintenance will aid in obtaining maximum service life.

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

The batteries are located at the rear of the machine behind the grille.



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Cleaning

The battery should be inspected periodically for dirt, corrosion and damage. Dirt, combined with electrolyte or moisture on the top of the battery, can result in a continuous battery discharge.

The battery and cable terminals can be cleaned using one of the methods shown on page 104.

a. Use Case Battery Saver, part number M20376, according to instructions on container. This is a spray and wipe cleaner that requires no water. It also prevents further corrosion.

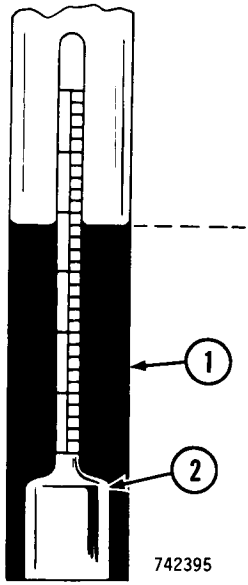
b. Use soda or ammonia and flush battery with clear water. If Case Battery Saver is not available, install corrosion retarding washers on the battery terminals. These washers are available locally.

750182

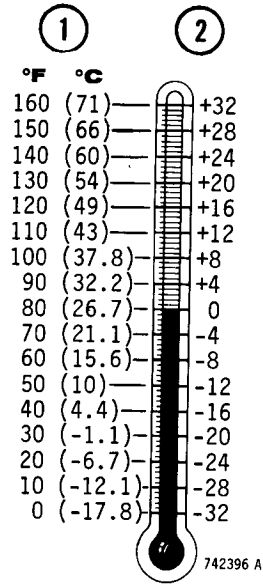
It is recommended that the battery be removed and the battery area cleaned at the same time.

Specific Gravity Check

A hydrometer is used to check the specific gravity (weight) of the battery electrolyte. The specific gravity of the electrolyte indicates the approximate state of charge of the battery. Hydrometers are calibrated to give the true reading when the electrolyte temperature is 80° F (26.7° C). Therefore, to obtain a correct specific gravity reading, the temperature of the electrolyte must be known. Some hydrometers contain a thermometer while others do not. A separate thermometer is required to check electrolyte temperature if the hydrometer is not so equipped.



1. Hydrometer
2. Float



1. Temperature
2. Gravity Points

Electrolyte Level

The electrolyte level should be checked every 50 hours. Extensive use in hot weather will require more frequent checks because of a more rapid water loss. If the electrolyte level is low, add colorless, odorless drinking water or distilled water to each cell until the fluid level rises to the split ring at the bottom of the cell opening. Overfilling serves no useful purpose and will result in poor performance, short life and excessive corrosion around the battery.

NOTE: Add water only, not electrolyte, when servicing the battery.

Maintain the electrolyte level above the plates at all times to prevent permanent damage which will result in reduced performance and service life.

Water Usage

Excessive water usage indicates high battery temperature and/or high voltage regulator setting.

No appreciable water use over a period of time indicates an undercharged battery. Poor cable connections or a too low voltage regulator setting can be the cause.

NOTE: If water must be added to check specific gravity, fast charge battery for 30 minutes or false readings will be obtained.

1. Remove electrolyte from one cell with the hydrometer. Observe and record the hydrometer reading. Be sure to hold hydrometer vertical, check that the float is free and take reading at eye level.

2. Note the electrolyte temperature. Refer to previous illustration and add or substract four (.004) specific gravity points for each 10° F (5° C approx.) above or below 80° F (26.7° C). The corrected reading will be a true indication of cell condition.

3. Repeat steps 1 and 2 for remaining cells.

Interpretation of Hydrometer Readings

1. The approximate state of charge can be determined by comparing readings to the specific gravity table below:

State of Charge	Specific gravity at 80° F. (26.7° C)	Electrolyte Freezes approx.
100%	1.260	-75° F. (-59° C)
75%	1.230	-38° F. (-39° C)
50%	1.200	-17° F. (-26° C)
25%	1.170	1° F. (-17° C)
Discharged	1.110	19° F. (-7.2°C)

742393

2. If all cells read between 1.200 and 1.260, and the variation between the high and low cell is less than 30 gravity points, the battery is good. It may be necessary to charge the battery before using.

3. If all cells read between 1.200 and 1.260 and the variation between the high and low cell is 30 gravity points or more, fully charge battery and recheck specific gravity. If the variation is still 30 gravity points or more after charging, the battery is defective and must be replaced.

EQUIPMENT AND STEERING

HYDRAULIC SYSTEM

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

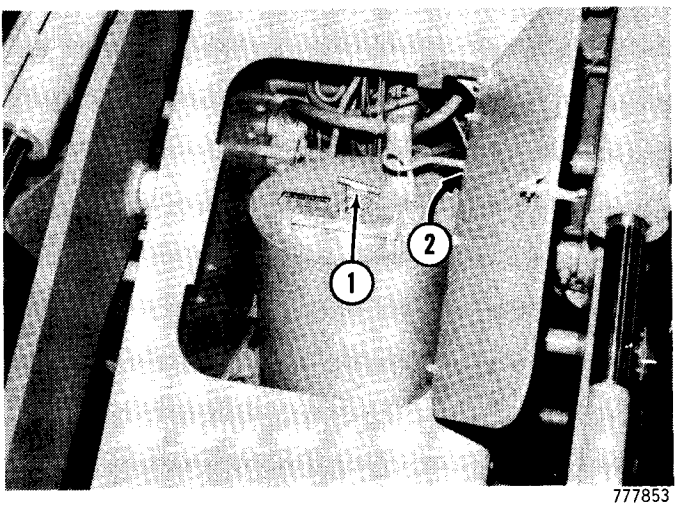
The equipment and steering hydraulic system is air pressurized. Before servicing the system reservoir, the air supply must be shut off and the tank depressurized as instructed below.

Oil Level

Check the reservoir oil level after every 50 hours of operation or weekly; if possible, have oil at operating temperature, 120° F. (49° C) or higher.

Lower bucket to ground. Shut off engine. 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 from the system.



777853

1. Oil Level Dipstick
2. Air Shutoff Valve

Oil and Filter Change

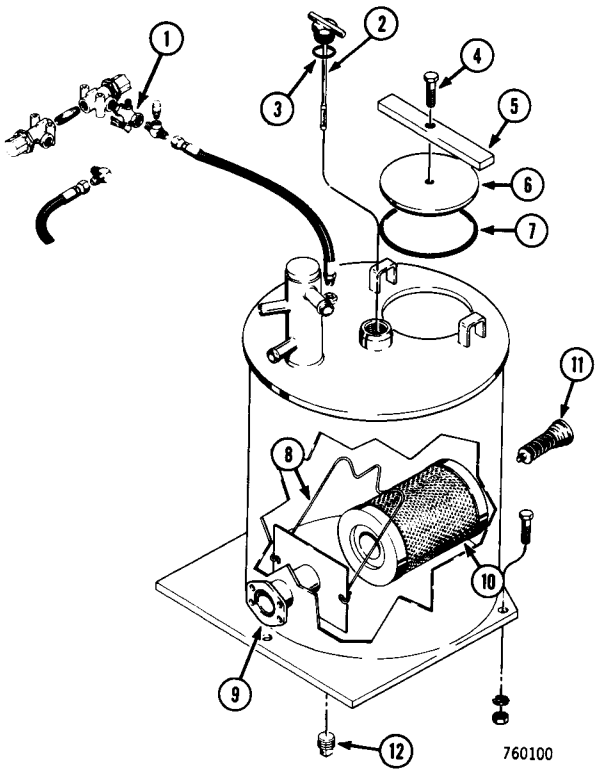
After every 1000 hours of operation, change the reservoir oil and replace the filter in the reservoir.

1. Shut off engine. Close air shutoff valve above tank. Loosen dipstick 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 or draw out with a suction pump. Flush and wipe reservoir clean.

3. Lift the retainer at bottom of reservoir. Remove the filter and relief valve. Remove valve from filter and discard the filter.

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



1. Shut Off Valve
2. Oil Level Dipstick
3. O-Ring
4. Screw
5. Bar
6. Cover
7. O-Ring
8. Retainer
9. Outlet Tube
10. Filter
11. Relief Valve
12. Magnetic Drain Plug

5. Refill reservoir with 17 U.S. gallons (64.3 litres) of Case TCH Fluid and pressurize reservoir. Start the engine and cycle the steering and loader. Check for air or oil leaks. Check oil level and add if required.

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

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 filter.

Drive Belt

Tension on the compressor drive belt should be checked every 500 hours of operation; see page 91.

Cleaning and Replacement

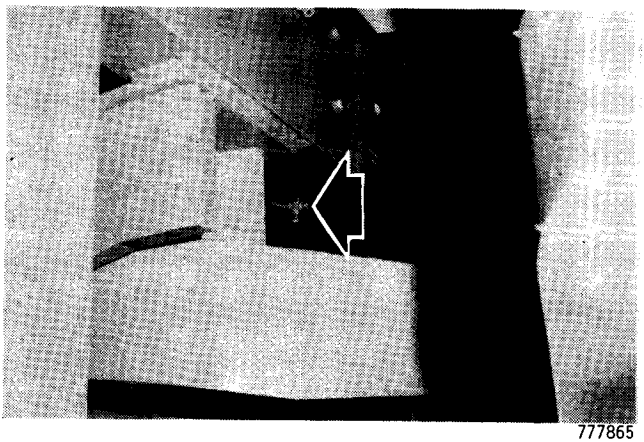
Every 1000 hours the air compressor cylinder head should be removed and cleaned by your Authorized Case Dealer.

Every 3000 hours the air compressor should be either rebuilt or replaced by your Authorized Case Dealer.

Air Reservoir

The air reservoir should be drained of water every 10 hours or daily.

The reservoir draincock is located underneath the tank just above the right-hand side of the rear axle housing.



Air Reservoir Draincock

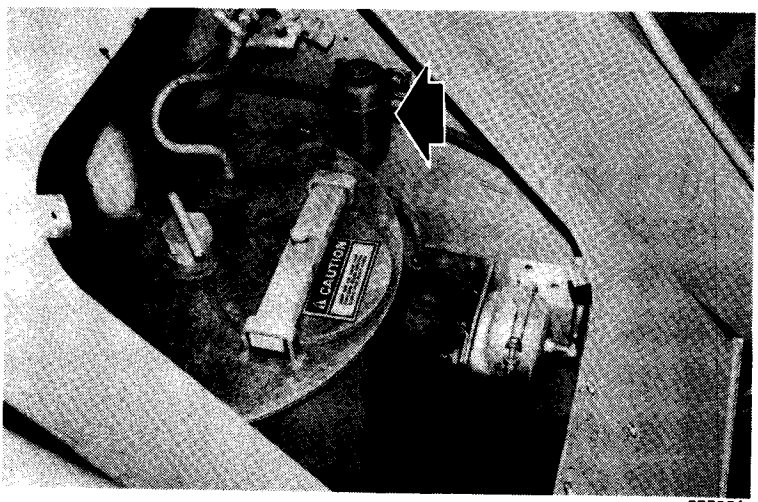
Master Cylinders

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

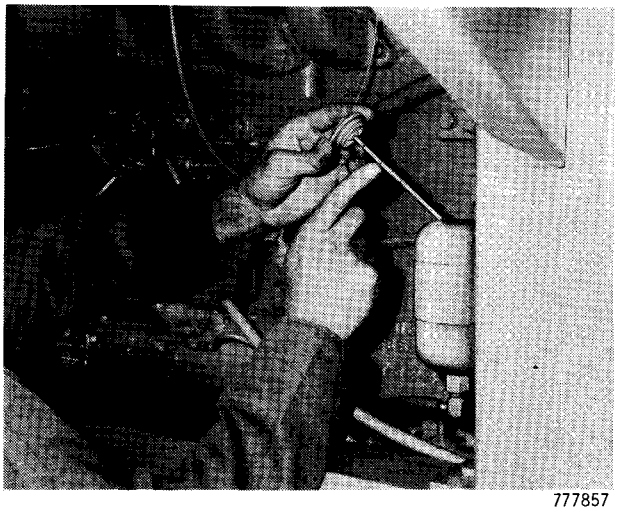
Remove the dipstick of each remote reservoir and add fluid if necessary. The fluid level should be up to the full mark on the dipstick. See picture on page 111.

The master cylinder remote reservoir for the front wheel brakes is located on the left side plate.

The master cylinder for the rear wheel brakes is mounted on the inside of the left-hand hood mounting center post.



Front Brakes Remote Reservoir



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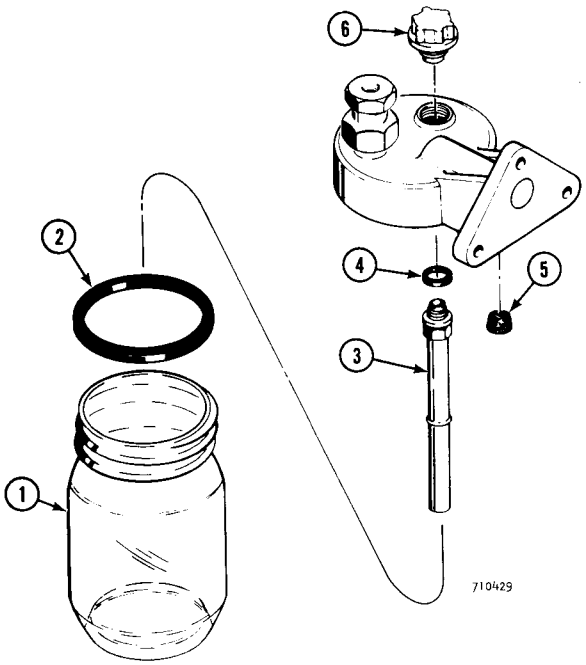
Rear Brakes Remote Reservoir

Alcohol Evaporator

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

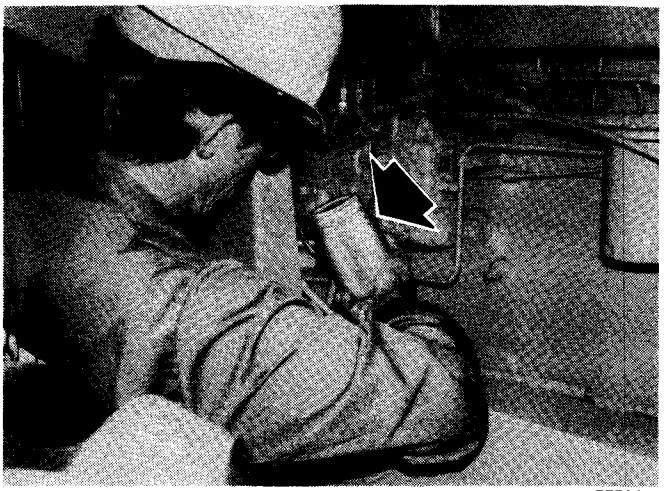
WARNING: *Do not use the tire inflation hose to inflate tires or use it as an auxiliary source of air for any reason unless the air system in the machine has been purged of alcohol vapor. Use of air containing alcohol vapor could result in exploding tires and personal injury.* 31-5



1. Jar
2. Jar Gasket (If Used)
3. Tube
4. Tube Gasket (If Used)
5. Screen
6. Filler Cap

Checking

Replace the plastic jar with a glass jar full of alcohol. 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 jar and pass through the alcohol. If no bubbles are present during compression, check all connections and the condition of gaskets. After checking, install the plastic jar again.



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Alcohol Evaporator Jar

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 screen. Clean in solvent and back blow air through the evaporator intake screen.

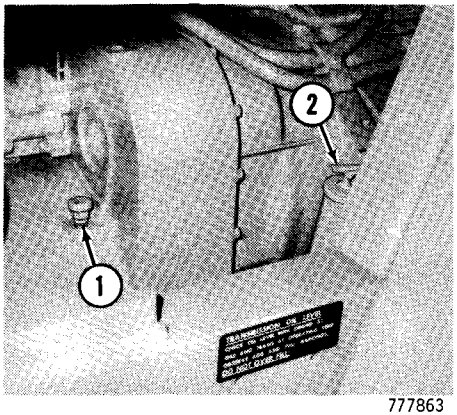
Every 2000 hours or yearly have your Authorized Case Dealer disassemble and clean the evaporator and replace all gaskets.

TRANSMISSION

HYDRAULIC SYSTEM

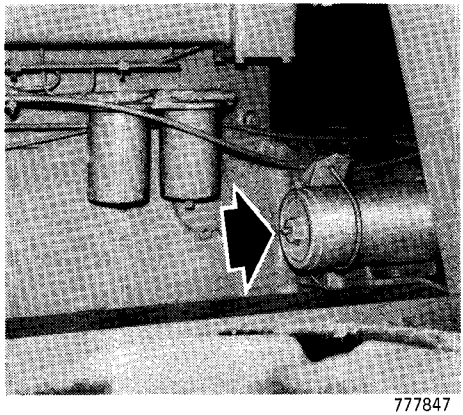
Oil Level

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



777863

1. Breather
2. Oil Level Dipstick



777847

Filter

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

D-39-15

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 the FULL mark, no further checks are necessary.

2. Proceed to step 4 if oil is above ADD mark.

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

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

Warm Oil Check

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

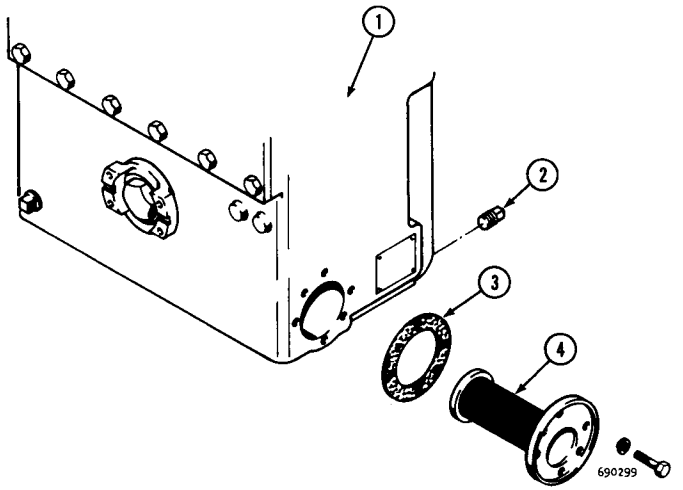
2. If oil is below the ADD mark, add oil as required to establish oil level at the FULL mark.

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 thoroughly.



1. Right Side of Transmission
2. Drain Plug
3. Gasket
4. Suction Line Oil Strainer

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. Reinstall.

4. Change transmission filter element.

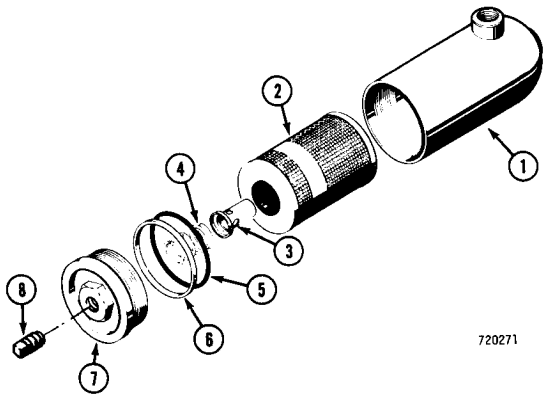
a. The filter is located at the right-hand side of the engine near the flywheel housing.

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 disconnected 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).



1. Body
2. Filter Element
3. Relief Valve
4. Retaining Spring
5. O-Ring Seal
6. Backup Ring
7. Cover: Torque 20-35 Foot-Pounds (27-47 N m)
8. Plug

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 114. Check for oil leaks.

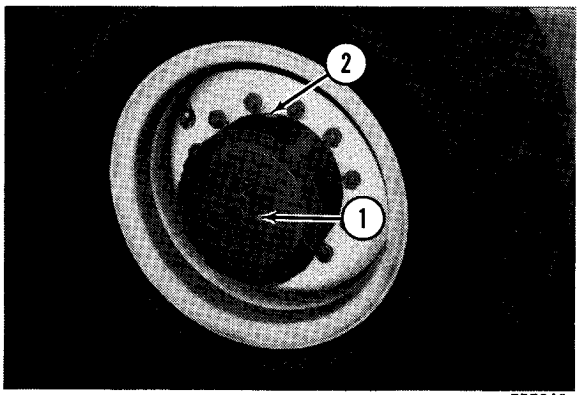
The differential and planetary ends of each axle share a common oil level. Circulation of lubricant between planetary ends and the center bowl is partially restricted by gears, bearings, washers, and other components. Lubricant must be correctly installed, especially if the loader is to be used immediately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

Oil Level

The oil level at each planetary of each axle should be checked every 250 hours of operation.

1. Park the loader on a level surface.

2. Check oil level at both planetary ends. Markings on the thrust cap indicate how to position the wheel. The lubricant should be level with the bottom of the plug opening.



777848

1. Level Plug 2. Drain Plug

3. If the oil level is low at either side, check level at the center bowl. Add oil if required.

Oil Change

Drain and refill the front and rear axle oil every 1000 hours of operation. Each axle has a common oil level. The circulation of lubricant between the two planetary ends and the center bowl is partially restricted by gears, bearings, washers, etc. Therefore, it is important that lubricant is properly installed, particularly if the unit is to be put into service soon after filling.

1. Position the machine on a level surface.

2. Drain the center bowls and planetary ends while the oil is still warm from operation.

3. Position each planetary housing so that the oil level plug is at the correct position, as indicated by the markings on the thrust cap. Jack up the axle and rotate the wheel(s) by hand if necessary.

4. Pour 13 quarts (12.3 litres) of lubricant in each center bowl. Oil should be level with the bottom of the filler hole. Reinstall the fill plugs.

5. Pour 4 quarts (3.8 litres) of lubricant in each planetary end and reinstall the fill and level plugs.

WHEELS AND TIRES

Wheel Nut Torque

During the new machine run-in period, check and retighten the wheel nuts 340 to 460 foot-pounds (461 to 568 N m) torque. Check the wheel nut tightness after the first 10 hours of operation and every 10 hours thereafter until the torque is stabilized.

Each time the wheel/s have been removed for servicing, check the nut torque every 10 hours until the torque has stabilized.

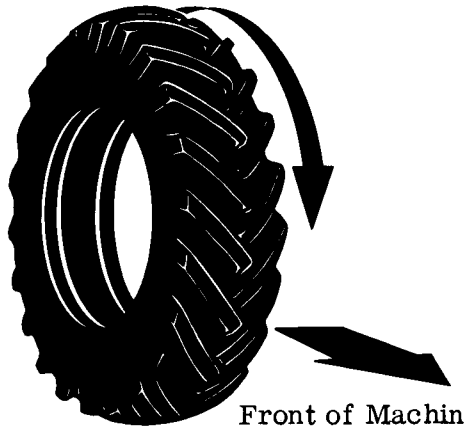
Tire Pressure Chart

SIZE	PLY RATING	*SHIPPING PRESSURES	OPERATING PRESSURES
17.5 x 25	12	55 psi (380 kPa)	50 psi (345 kPa)
20.5 x 25	12	50 psi (345 kPa)	40 psi (275 kPa)
20.5 x 25	16	65 psi (450 kPa)	50 psi (345 kPa)

*Shipping pressures must be used when transporting the machine. Before operating the machine, reduce the pressure of the tires. See the right hand column "Operating Pressure".

Installing Tires

To obtain proper traction and self cleaning action of the tire lugs, install the front and rear tires as shown in the following illustration.



TIRE INFLATION KIT

WARNING: *Stand to the side of the lock ring when airing tires.* 6-4

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

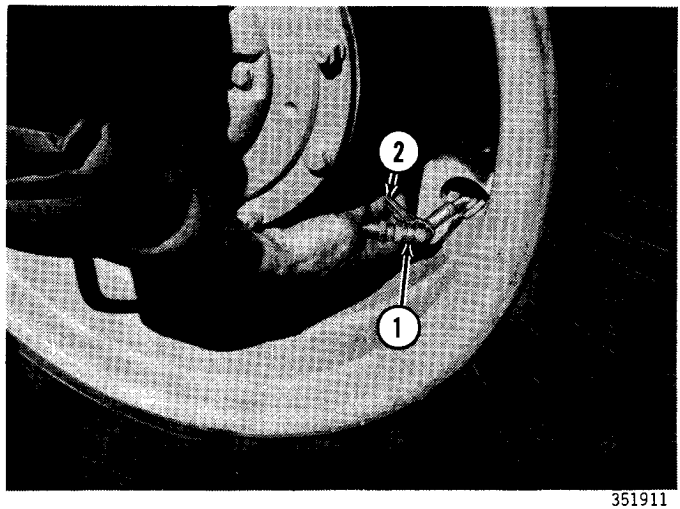
To operate the tire inflation kit, proceed as follows:

1. Stop the engine.

2. Push the end of the tire inflation hose into the quick disconnect coupling. This coupling is located on top of the auxiliary air reservoir.

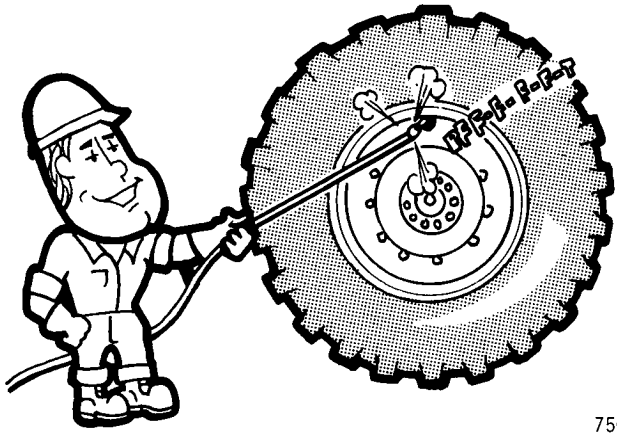
3. Have a second operator start the engine. Be sure the transmission is in Neutral and the park brake is set.

4. Squeeze the lock lever on the air chuck and push the air chuck onto the tire valve stem. See pictures on page 119. Release the lock lever and the air chuck will be locked onto the tire valve stem. Stand to the side of the tire when inflating. Refer to page 117 for correct tire air pressures.



351911

1. Air Chuck 2. Lock Lever



750148

Stand Behind Tire Tread
when Inflating Tires

LOADER SERVICE

Return-To-Dig

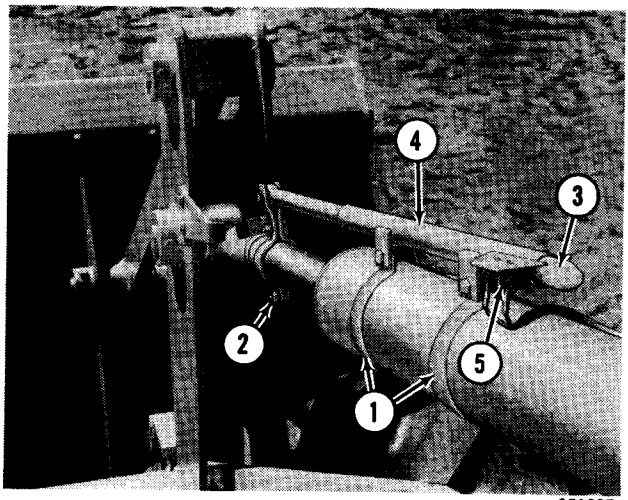
The Return-To-Dig mechanism, on the right-hand tilt cylinder, may occasionally need adjustment on its limit switch to maintain a desired bucket digging position after the bucket is automatically returned to ground level. In most circumstances, the desired position is with the bucket bottom parallel to the ground.

Before making any adjustment, lower the bucket to the ground at the desired digging angle. Shut off the engine. Turn key switch to the off position.

Loosen mounting bracket clamps. Position the tube assembly so that the switch arm is at the end of the rod. When you hear the switch "click", stop moving the tube assembly. Retighten brackets.

Loosen mounting bracket clamp. Position the switch so that the tab on the indicator just trips the switch. Retighten bracket.

Start the engine. Check switch adjustment by running loader arm and bucket through a complete Return-To-Dig operating cycle as described on page 66. Check bucket angle after it is automatically returned to ground level.



351907

1. Mounting Bracket Clamp
2. Do not Adjust Here
3. Rod
4. Tube Assembly
5. Switch

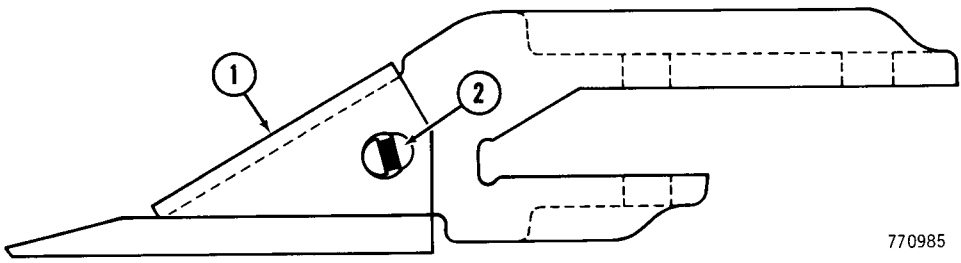
REPLACING BUCKET TEETH

CAUTION: *Wear eye or face protection when servicing the machine, especially when pounding or grinding.*

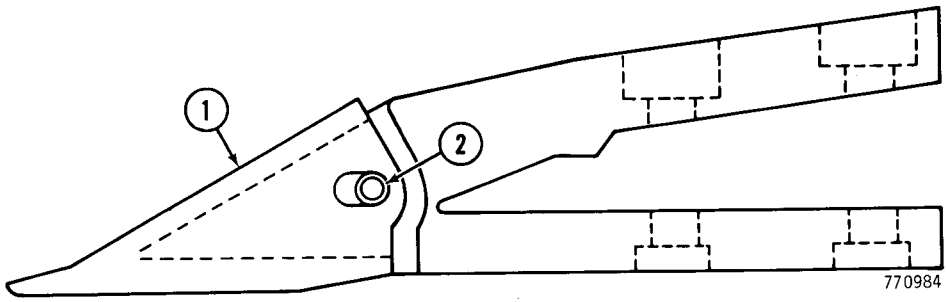
Use a soft-faced hammer, such as plastic, wood, brass or rawhide when striking hardened tools or hardened metal surfaces. Possible injury from flying chips could result if a hard faced hammer is used. 46-14A

When replacing tooth tips retained with flex pins, drive out the flex pin with an oval shaped punch. Tap out carefully to prevent the flex pin from flying out or splitting. Use a round punch when removing roll pins.

Install the new tooth tip on the shank and drive the pin into place.



1. Tooth Tip 2. Flex Pin



1. Tooth Tip 2. Roll Pin

ROPS CAB AND AIR CONDITIONER

General Maintenance

COMPRESSOR BELT - Check for proper tension after the first 20 hours of operation and every 500 hours thereafter, see page 92.

CAB AIR FILTERS: Check the filters for contamination at least every 50 hours of operation or weekly, whichever comes first. In very dusty conditions, it may be necessary to check and clean filters more often. See page 123 for cleaning instructions.

NOTE: If during the day's operation you notice restricted cab air flow when operating in extremely dust conditions, slam the cab door several times. The back pressures will force the dust out of the cab filter and help open the air flow.

REFRIGERANT: The refrigerant should be checked at the beginning of the summer cooling season and whenever you notice the air conditioning is not working. See page 128.

HEADLINER - The foam headliner in your cab is a noise reducing material. To help it 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 imbalance in the blowers. Such imbalance could cause rapid motor wear.

IMPORTANT: The motor is lubricated and sealed for life. No further oiling is necessary.

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

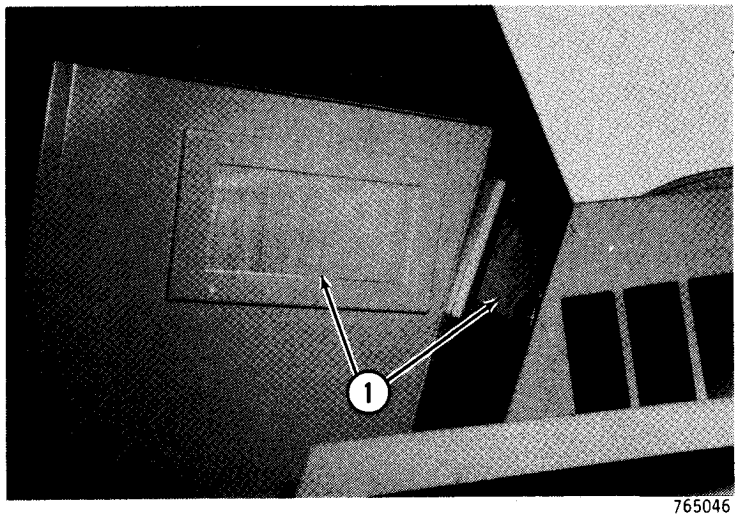
HOSES AND WIRING - Occasionally check all hoses and wiring for field damage, such as kinks, abrasions, breaks, or loss of refrigerant. If such should happen, contact your Case Dealer for replacement of damaged parts or refrigerant.

Cab Air Filters

Removal/Installation

Two air filters are located at the read 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.

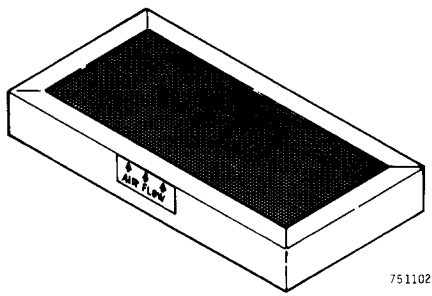


1. Cab Air Filters

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 can be cleaned by three methods, tapping, compressed air or water washing.



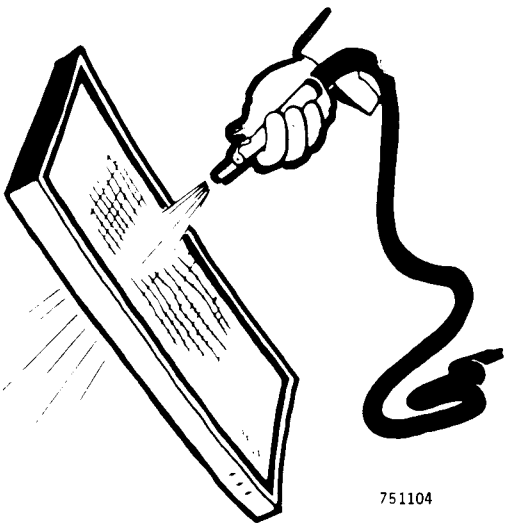
Tapping

The tapping method is used when the dirt is chiefly dust and the filter is 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

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 liters) of water at 70° to 100° F (21° to 38° C). Soak element for 15 minutes. Rinse throughly with hose. Do not use water pressure over 30 psi (207 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

CAUTION: *Fasten seat belt securely before operating.* D-46-68

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 questionable parts replaced.
4. Replace belts if cut, weakened, frayed, or subjected to collision loads.
5. Check that anchor mounting bolts are tight.
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 can be equipped with an optional seat which is trimmed with soft fabric for maximum operator comfort. The care and maintenance of this seat 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 dirt spots or stains 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 carefless 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 (perferably 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 grime from fabric and for cleaning where a minor cleaning ring may be left from spot cleaning.

Vacuum area to remove loose dirt. Always clean at least a full trim panel or section of trim. Mask adjacent trim along stich. 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 absorbend 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.

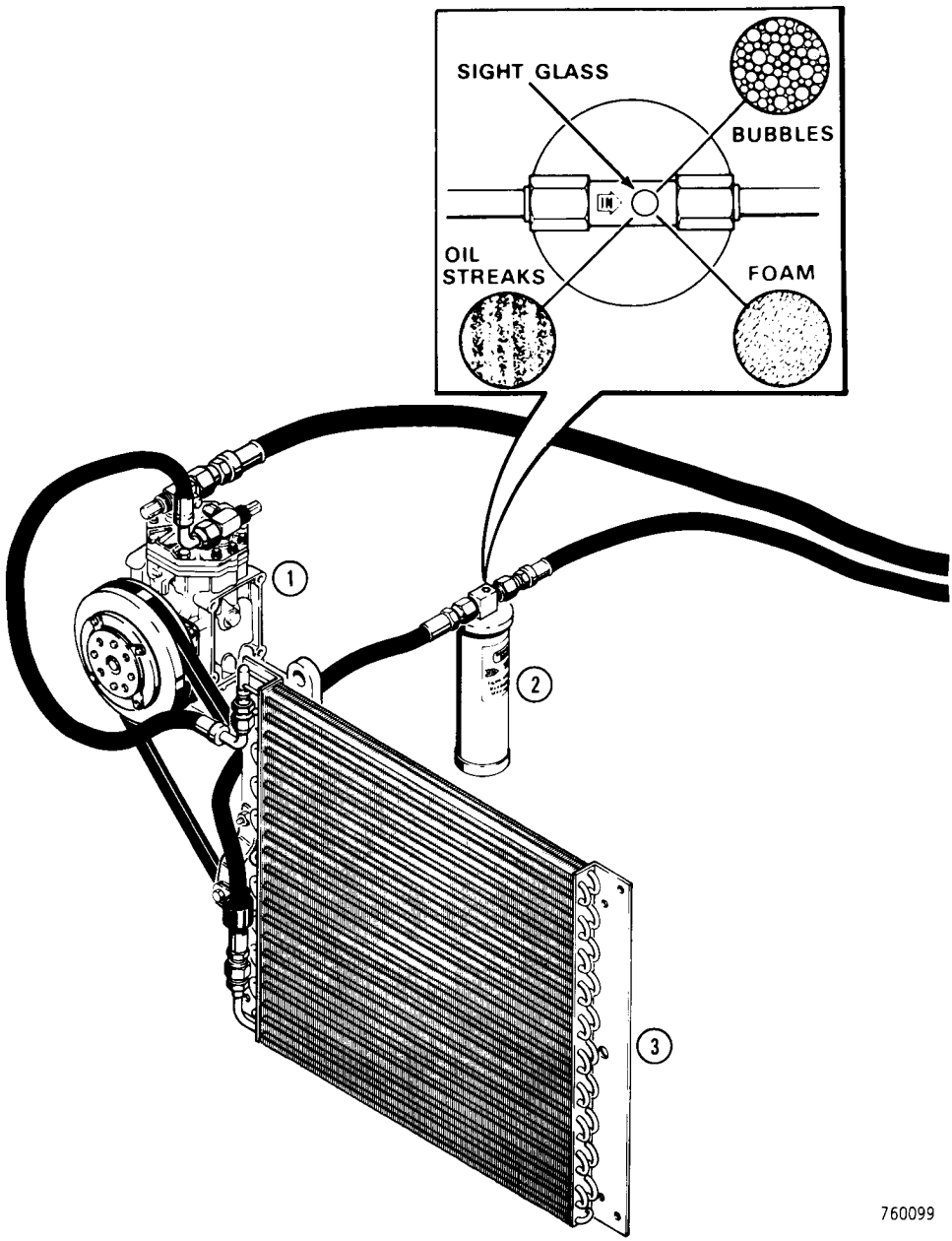
SAFETY DECALS

Clean all safety decals and machine information decals (a) every 10 hours of operation or (b) any time they become dirty and can not be read.

Clean the decals with a damp cloth. Do not use solvents or fuel. If the decals are destroyed, lost, painted over or can not be read, always install a new decal. When individual parts are replaced that have decals attached, be sure to install a new decal with the new part. Decals are available from you Case dealer.

Procedure to Check Air Conditioning Refrigerant

The refrigerant level 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.



1. Compressor 3. Condenser
2. Receiver-Dryer

"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 steam 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 indicate a full charge, an 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. If there is refrigerant in the system, bubbles will appear when the control is off and disappear when the control is on. If no bubbles appear during the on-off cycle, there is no refrigerant in the system.

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, the air conditioning stops working, first check that the compressor clutch is operating and then check 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. Turn off the air conditioner, and allow the evaporator to dry. When the evaporator is dry, use compressed air to clean the condenser. If the air conditioner still does not function properly, see your Authorized 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

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 clean engine oil.

2. Install new crankcase 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 stopping. Drain the remainder of the flushing oil from the fuel tank. Put a heaping 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 must 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 for several minutes to thoroughly mix water with antifreeze.

CAUTION: *Storage areas for batteries must be well ventilated to prevent accumulation of hydrogen gas from newly recharged batteries.* 7-2

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 cylinder rods with M20637 grease to prevent corrosion.

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 will 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 the following items 1-8 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 crankcase 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 diesel fuel.

5. Check tires for correct air pressure.

6. Close the draincock on the bottom of the air reservoir.

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. Be sure they do not stick.

9. Change the fuel filters and remove air from the fuel system.

10. Start the engine and run at idle 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.

NOTE: If machine is equipped with a turbocharger, refer to page 51 for procedure to start the engine.

AFTER DELIVERY CHECK-UP
(20 HOURS)

Check-up date _____ Hourmeter reading: _____ hours

MACHINE: Model No. _____ Serial No. _____

OWNER: Name _____

Address _____

DEALERSHIP: Name _____

Address _____

COOLING SYSTEM

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

FUEL SYSTEM

- ☐ Check for leaks.

ELECTRICAL SYSTEM

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

LUBRICATION

- ☐ Grease all pivot points.
- ☐ Drain engine oil and refill.
- ☐ Change engine oil filter.
- ☐ Check differential and planetary oil level.
- ☐ Check transmission oil level.

ENGINE

- ☐ Torque cylinder head bolts.
- ☐ Check valve tappet clearance.
- ☐ Check full throttle-no load and idle engine speeds.

HYDRAULIC SYSTEM

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

GENERAL

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

SAFETY

- ☐ Check safety decals and replace as required.
- ☐ Check safety components (seat belt, back alarm, etc.)
- ☐ Check ROPS mounting bolt torque.

DEALER: Question purchaser carefully about his experience with the loader and answer any questions on operation or maintenance that are not clear to him.

Check-up performed by _____

Dealer's signature _____

C. E. Service copy

Owner's signature _____

AFTER DELIVERY CHECK-UP (20 HOURS)

Check-up date_____ Hourmeter reading:_____ hours

MACHINE: Model No._____ Serial No._____

OWNER: Name_____

Address_____

DEALERSHIP: Name_____

Address_____

COOLING SYSTEM

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

FUEL SYSTEM

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Check-up performed by_____

Dealer's signature_____

Dealer's copy

Owner's signature_____

AFTER DELIVERY CHECK-UP (20 HOURS)

Check-up date _____ Hourmeter reading: _____ hours

MACHINE: Model No. _____ Serial No. _____

OWNER: Name _____

Address _____

DEALERSHIP: Name _____

Address _____

COOLING SYSTEM

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

FUEL SYSTEM

- ☐ Check for leaks.

ELECTRICAL SYSTEM

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Dealer's signature _____

Owner's copy

Owner's signature _____