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# ST450 / ST470

## Operators Manual

37-062R1

Reprinted

CASE

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*THIS SAFETY ALERT SYMBOL INDICATES IMPORTANT SAFETY MESSAGES IN THIS MANUAL. WHEN YOU SEE THIS SYMBOL, CAREFULLY READ THE MESSAGE THAT FOLLOWS AND BE ALERT TO THE POSSIBILITY OF PERSONAL INJURY OR DEATH.*

M171B

If Safety Decals on this machine use the words **Danger, Warning or Caution,** which are defined as follows:

- **DANGER:** Indicates an immediate hazardous situation which if not avoided, will result in death or serious injury. The color associated with Danger is RED.
- **WARNING:** Indicates an potentially hazardous situation which if not avoided, will result in serious injury. The color associated with Warning is ORANGE.
- **CAUTION:** Indicates an potentially hazardous situation which if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices. The color associated with Caution is YELLOW.

If Safety Decals on this machine are ISO two panel Pictorial, decals are defined as follows:

- The first panel indicates the nature of the hazard.
- The second panel indicates the appropriate avoidance of the hazard.
- Background color is YELLOW.
- Prohibition symbols such as  and  if used, are RED.



# WARNING

IMPROPER OPERATION OF THIS MACHINE CAN CAUSE INJURY OR DEATH. BEFORE USING THIS MACHINE, MAKE CERTAIN THAT EVERY OPERATOR:

- Is instructed in safe and proper use of the machine.
- Reads and understands the Manual(s) pertaining to the machine.
- Reads and understands ALL Safety Decals on the machine.
- Clears the area of other persons.
- Learns and practices safe use of machine controls in a safe, clear area before operating this machine on a job site.

It is your responsibility to observe pertinent laws and regulations and follow Case Corporation instructions on machine operation and maintenance.

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# Foreword

In order to obtain the maximum performance and efficiency from the machine, read this manual thoroughly before operating or servicing. Become familiar with the controls and their individual responses before working the tractor.

This operator's manual has been designed into seven major sections: Foreword, Safety, Specifications, Operating Instructions, Service & Maintenance, Trouble Shooting and Index.

A general contents page is located at the beginning of the manual for a quick reference to the major sections.

For a specific item, there is an alphabetical index placed in the rear of the manual.

It is important the owner/operator know the tractor serial number. Write the serial number in the space provided, on inside back cover, and use it in all correspondence when referring to the tractor. For your convenience there is a maintenance service chart printed on this page also.

Throughout the manual references are made to left side and right side. These terms are used as viewed from the operator's seat facing the front of the tractor.

Because of design changes that may occur in the product since this manual was published it is possible that some pictures and/or illustrations found within this manual may be different from those found on the product; however, the technical information found within the manual was correct at the time this manual was approved for publication.

The signal words CAUTION or BE CAREFUL, WARNING, DANGER are used to indicate degree of hazards and to warn against unsafe practices that may cause personal injury and are used with appropriate safety instructions.



CAUTION or BE CAREFUL denotes a general reminder of good safety practices or directs attention to unsafe practices.



WARNING denotes a hazard intermediate between DANGER and CAUTION or BE CAREFUL.



DANGER denotes the most serious hazard.

The word **NOTE,** is used to convey information that is out of context with the manual text. Special information such as specifications, techniques, reference information and other information of a supplementary nature.

The word **IMPORTANT,** is used in the text when immediate damage will occur to the machine due to improper technique or operation. **IMPORTANT** will apply to the same information as specified by **NOTE,** only of an immediate and urgent nature.

Steiger Tractor, Inc. does not endorse specific brands of lubricants. We consider it the obligation of the supplier to assure that all lube oils meet the applicable specifications.

It is the responsibility of the user to read the operator's manual and comply with the safe and correct operating procedure as pertains to the operation of the product; and to lubricate and maintain the product according to the maintenance schedule in the Operator's Manual.



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## Cooling System
## Corrosion Resistor Information:

**Cummins and Caterpillar 3408**

The initial life of a corrosion resistor element on a new or rebuilt engine, or after complete change of coolant supply, is 100 hours. Maintenance periods thereafter should be done every 300 hours.

When a cooling system is first filled with new coolant or water, an element with more than normal amount of inhibitor (precharge) is used. At the first change interval, the precharge element is removed and an element with a normal amount of inhibitor (maintenance) is then installed to keep the corrosion protection at an acceptable level. After the first change period, only maintenance elements are installed to give protection to the cooling system.

The precharge elements will give the correct charge of 1.5 to 3 ounces per gallon in the cooling system when it is filled. The maintenance elements, and the correct change periods, will keep the corrosion inhibitor in the cooling system between a maximum charge of 3.4 ounces per gallon and a minimum charge of .8 ounce per gallon for a 2,000 hour maintenance period.

The cooling system should be drained, chemically flushed and properly pre-charged after 2,000 operating hours or every two years, whichever happens first. The system may be precharged with a precharge element or a service element and DCA chemical. This will prevent salt deposits in the cooling system caused by the evaporation and addition of water to the system.

**Flushing Cooling System**

To clean the cooling system any good commercial radiator cleaning solution can be used. Follow the instructions included with the cleaner. Remove thermostats when flushing system.

**NOTE:** *Whenever coolant supply is changed (spring or fall), the system must be drained and flushed.*

To ensure adequate corrosion protection, the coolant should be tested at each third element change, annually or more often. The level of the chemical can be adjusted by adding DCA as required. Your Steiger Dealer has access to a DCA Test Kit. Have him test your cooling system at regular intervals.

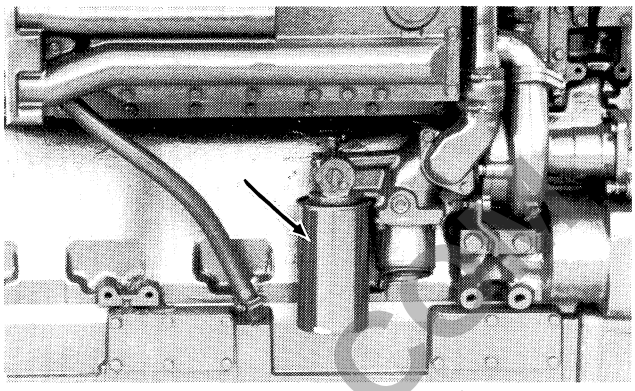


*Figure 143: Corrosion resistor (Cummins)*

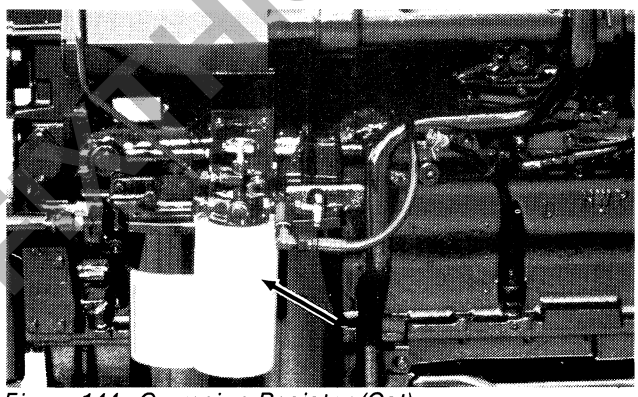


*Figure 144: Corrosion Resistor (Cat)*

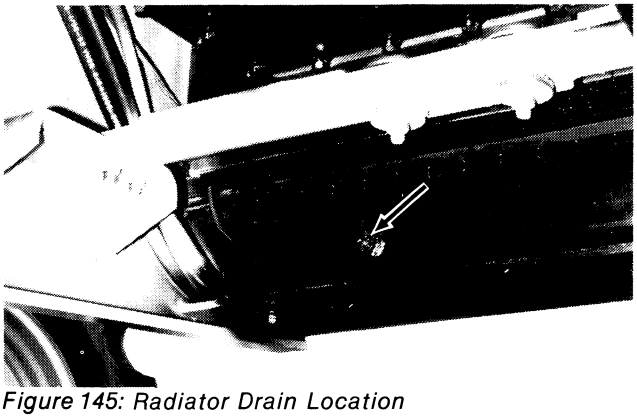


*Figure 145: Radiator Drain Location*

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# IMPORTANT SUPPLEMENT TO

## ST 450 & ST 470 Tiger III Operation & Maintenance Manual

A new model K594 20/30 axle is installed as a running production change effective with the following serial numbers:

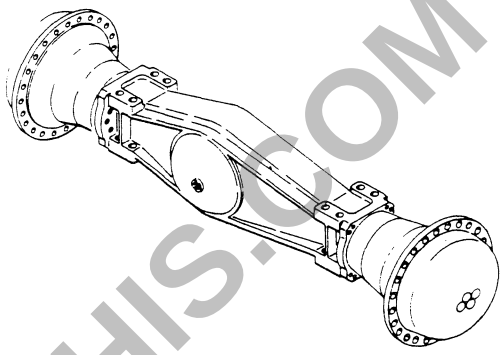
ST 450 Tiger III - 129-01502 & up
ST 470 Tiger III - 130-01517 & up

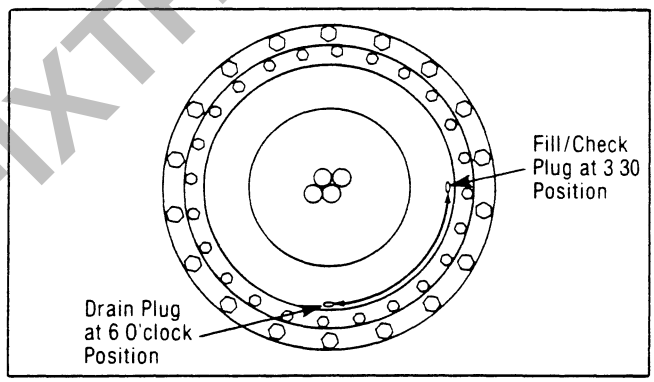
The new K594 20/30 axle has a compound reduction 3 x 5 planet gear arrangement at the wheel end. The power flow is as follows:

A. The outer planetary (3 gears) is the intermediate drive and receives the power flow from the axle shaft sun gear.

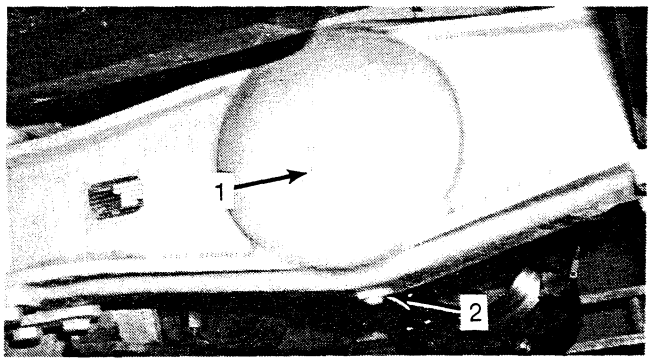
B. The power flow is then transferred to the inner wheel end planetary (5 gears) which is the final drive that transmits the torque directly to the wheel hub.

C. The outboard planetary design teams with a new differential carrier to provide a 31.702:1 total axle ratio. This ratio will **not** change the current tractor speeds shown within this manual any significant amount.



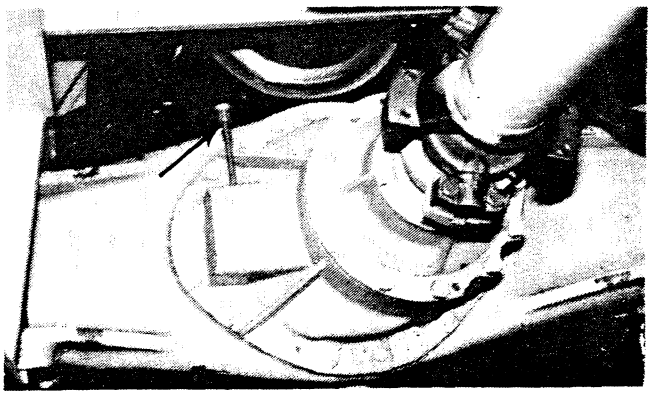



*Planetary Check/Fill & Drain Plug Positions*




*Differential*

1-Check/Fill Port 2-Drain Plug



*Differential Breather Plug*

### Axle:

**General Specifications**

**Model:** K594 20/30
**Overall Ratio:** 31.702:1
**Type:** Dual planetary outboard hubs. Spiral bevel ring and pinion
**Oil Type:** SAE 80W-90 Gear Lube only. Axle lubricant must meet MIL-L-2105B and/or API GL-5 specifications
**Oil Capacity:** Center Differential - 38 US qts (35.9L) wheel hubs - 10 US qts (9.4L) each
**Total Capcity:** 58 US qts (54.8L)

**NOTE:** *Axle assemblies are flow-through design; oil is allowed to flow between compartments. Always park the tractor on a level surface when checking fluid levels.*

**IMPORTANT:** *Change axle lube oil after the first 100 hours of operation. Change oil after operation while the oil is warm.*

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# Specifications

**TRACTOR SERVICE GUIDE**

The hour meter is the most reliable method of determining service intervals. The following figures are based on a ten hour day. If operations differ from these figures, base service intervals on actual running time. Keep an accurate record of operating time.

10 hours . . . . . One Day
50 hours . . . . . One Week
100 hours . . . . . Two Weeks
200 hours . . . . . One Month

| | | |
|---|---|---|
| Crankcase Oil Pressure | Check oil pressure gauge | During Operations |
| Water Temperature | Check water temperature gauge | |
| Battery Voltage | Check voltmeter reading | |
| Dash Gauges and Lights | Check and Monitor during start and operation | |
| U-Joints and Hanger Bearing | Lubricate | Every 10 Hours |
| Main Hinge & Pivot Link | Lubricate | |
| Hydraulic Oil Tank | Check oil level | |
| All Drive Belts | Check adjustment | |
| Cab Air Filter | Check and clean | |
| Crankcase Lube Oil | Check oil level | |
| Cooling System | Check coolant level | |
| Wheel Lug Nuts (first 50 hrs.) | Torque per manual | |
| Air Cleaner Indicator | Check | |
| Transmission Oil Level | Check | |
| Tire Pressure | Check pressure | Every 100 Hours |
| Brakes | Check fluid level-master cylinder (under hood) | |
| Transmission Vent | Clean and inspect | |
| Axle & Planetary Drive Assembly | Check oil level | |
| Slip Yokes | Lubricate | |
| Fuel Tank Sump | Drain water | |
| Fuel Filter | Replace (or as often as necessary) | |
| Air Breather Vents (Axles) | Inspect and clean as necessary | |
| Crankcase Lube Oil & Filters | Drain & refill & replace filter(s) (first 30 hrs. new machine) | 250 Hours (OR 6 MO.) |
| Water Filter (Every 300 Hrs.) | (check engine Water Conditioner) | |
| Engine Air Cleaner Element | Check, clean and replace as needed | 500 Hours (OR 6 MO.) |
| Axle & Planetary Drive Assembly* | Drain and refill (first 100 hrs. new machine) | |
| Hydraulic Oil Filter | Replace (100 hrs. new machine) | |
| Hinge Bolts | Check tightness | |
| Transmission Filter | Change (100 hrs. new machine) | |
| Hydraulic Oil Suction Screen | Clean or replace | Every 1000 Hours (OR 12 MO.) |
| Hydraulic Oil | Change oil and filter | |
| Hydraulic Vent Filter Cartridge | Replace | |
| Transmission Oil | Change (C-3 type oil) | |
| Batteries | Rotate "A" and "B" set | |
| Engine Valves and/or Injectors | Adjust (see your Steiger dealer) | 2000 Hours |

***NOTE:** *Axle and planetary drive assemblies should be changed at 300 hour intervals when ambient temperatures are consistently above 90°F (32°C).*

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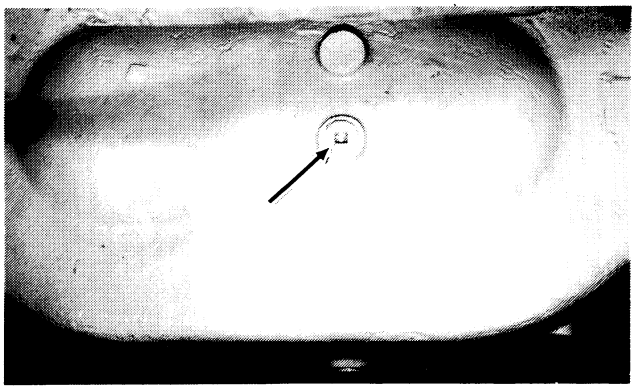


*Figure 165: Differential Check/Fill Plug*

## Differential Oil Check/Fill or Drain

To check the center differential oil level, remove the check plug shown. The oil level should be within 1/4 to 1/2 inch (6.4-12.7 mm) of the lower level of the plug opening.

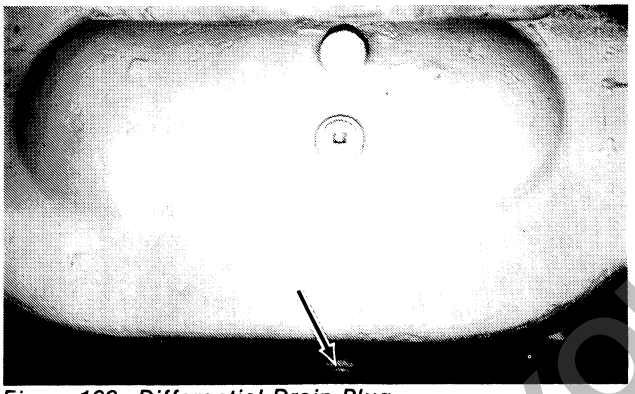


*Figure 166: Differential Drain Plug*

To drain the center differential remove the drain plug from the location shown.

**NOTE:** *When refilling an axle assembly after a complete drain, fill the wheel hubs to the proper level first, and fill the center differential housing last.*



*Figure 167: Vent Location*

## Axle Breather Vent

Remove the breather vent assembly at least every 100 hours and wash out in petroleum solvent and blow dry with compressed air. Reinstall the vent assembly.

**NOTE:** *If axle hub seals or pinion seals should suddenly show signs of leakage, suspect that the axle housing may be pressurized due to a plugged vent.*

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# Operating Information

## Upper Console

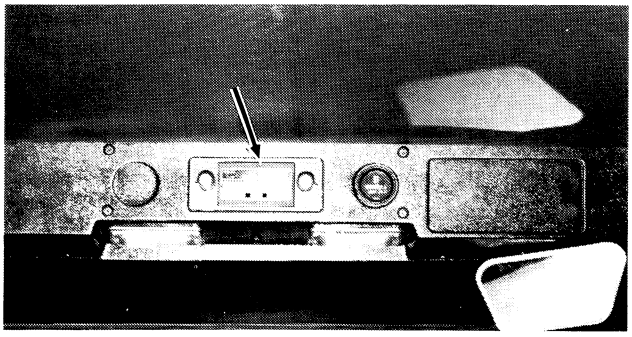


*Figure 72: Radio—AM-FM Stereo/Cassette & Clock*

**Radio—AM-FM Stereo/Cassette and Clock (Fig. 72).**

Refer to radio manufacturer's Operational information furnished with the tractor.

**NOTE:** *This style and model radio used on later production tractors only.*

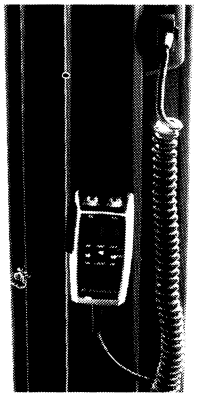


*Figure 73: CB Radio*

**CB Radio (Fig. 73).**

Refer to manufacturer's Operator Manual and FCC (Federal Communications Commission) rules for proper usage.

**The CB Radio is located in the upper console.**

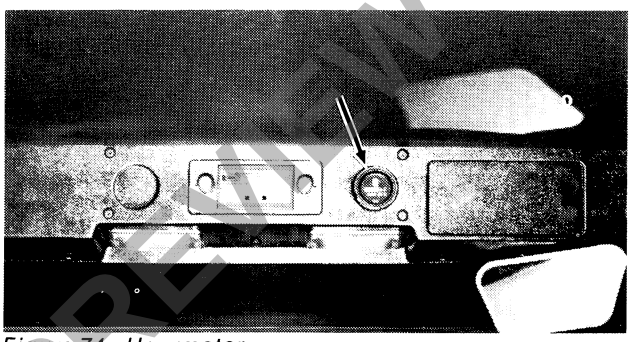


*Figure 74: Hourmeter*

**Hourmeter (Fig. 74).**

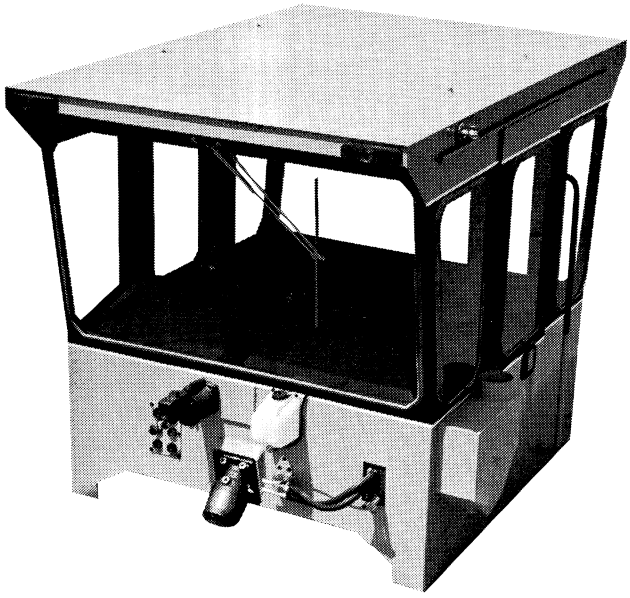
The hourmeter indicates the actual hours that the engine has run. It is the most reliable method of determining service intervals.

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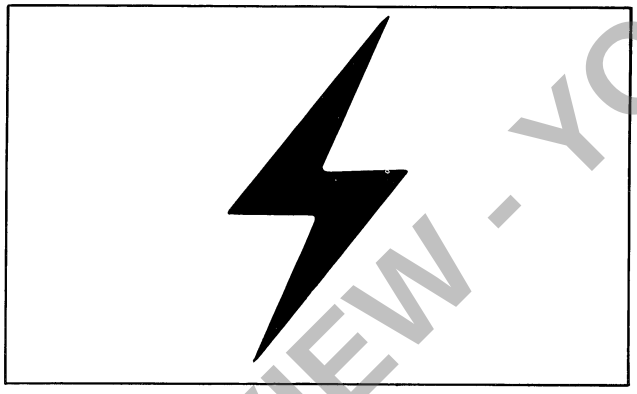
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# Specifications



## Cab

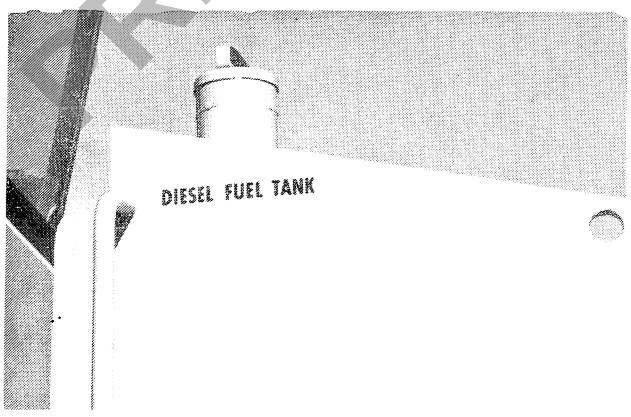
**Rubber Mounted**
**Air Conditioning and Heater**
**Tinted glass:** All
**Sound level:** (per official test @ maximum available power) 76.5 db(A) @2100 rpm - 75.5 db(A) @1700 rpm
**Windshield wipers:** Electric front and rear
**Door:** Right and left sides
**Seat:** Deluxe fully weight adjustable, fore/aft position
**Instruments:** Speedometer, tachometer, voltmeter, fuel gauge, oil pressure gauge, water temperature gauge, hour-meter, warning lights
**CB radio:** 40 channel
**Radio:** AM/FM stereo with cassette tape deck-and quartz clock
**Steering wheel:** Tilt/telescoping type
**Turn signals, warning flashers**
**Engine decelerator:** Foot pedal control
**Control console:** Right-hand side. Tilt-up type for exit, entry
**ROPS tested per OSHA:** 29 CFR 1928 Subpart C to a maximum of 50,000 lbs. (22,680 Kgs.)



## Electrical System

### General Specifications

**Negative ground, 24-volt start. All other functions 12-volt**
**Alternator:** 30 S.I. transformer rectifier,90 amps @12 volts and 24 amps @ 24 volts
**Batteries:** Four 12-volt 625 CCA - 1110 series, maintenance free
**Lights:** Front field - four 60 watt, two with spotlight-type lenses.
Front headlights - four 5-3/4 inch headlights - grill mounted, high/low beam, 150 watts on high beam
Rear field-six 60-watt, two with spotlight-type lenses
Tail and brake - two
Interior lights - all instruments illuminated
Two dome lights
**Circuit breakers:** Automatic reset type
**Electrical connectors:** Bulkhead-mounted




## Fuel System

### General Specifications

**Type of Fuel:** No. 2 Diesel Fuel or No. 1 Diesel Fuel. See Fuel chart (Fig. 155, page 75).

**Capacity:** 385 gallons (1457.22 liters).

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# Operating Information

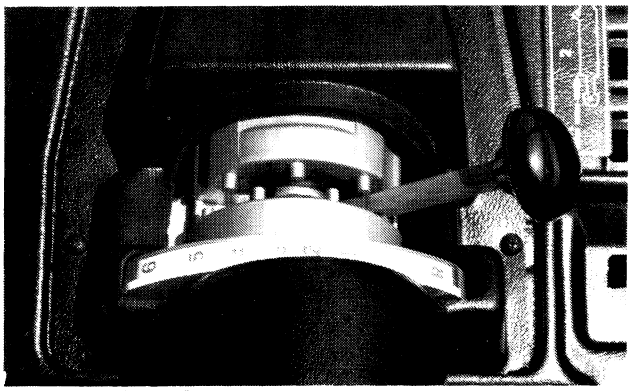


*Figure 1: Shift Selector Neutral*

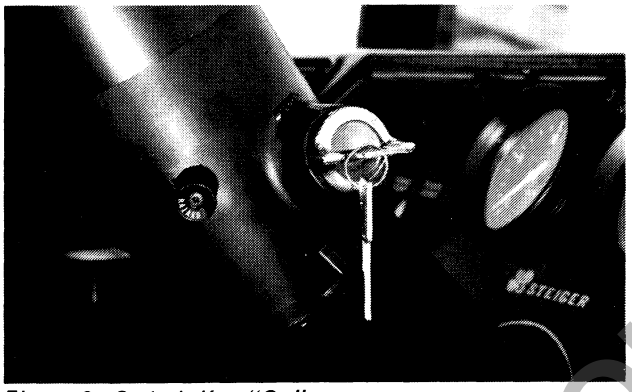


*Figure 2: Switch Key "On"*




*Figure 3: Start-Aid Switch*

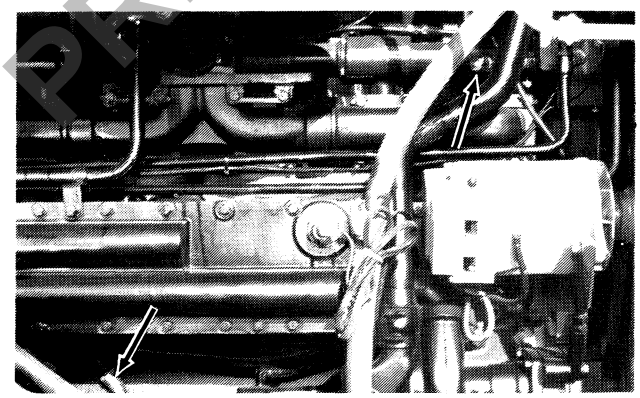


*Figure 3 A: Coolant couplers*

## Starting Procedure

1. Place the transmission shift selector in the neutral position to activate the neutral start switch. Place the throttle control lever one-fourth (1/4) open.

**CAUTION: If the starting motor will not operate in neutral, or will operate in any range other than neutral, service is required. Starter engagement in any position out of neutral is potentially dangerous to the operator and others.**

2. Turn and hold the master key switch fully clockwise to crank the engine.

**IMPORTANT:** *Do not use the starting motor longer than 30 seconds without interruption. Allow the starter motor to cool 2 minutes before reattempting to start.*

3. Depress and release the start-aid switch while the engine is cranking (Fig. 3).

When the engine starts, check all gauges. DO NOT exceed 1000 rpm until the oil pressure has stabilized in the normal idle operating range to provide protection to the turbocharger.

## Cold Weather Starting

If the tractor is to be operated in cold weather, use the proper grade and viscosity engine oil. The electric engine water heater may be plugged into a power source. This will decrease wear on the engine and electrical systems. This tractor is equipped with an Ether Start Aid.

The tractor is shipped from the factory with coolant couplers installed on the engine. The purpose of these couplers is to aid cold weather starting by allowing warm coolant to be transferred and circulated through the engine from a slave unit, such as another tractor or service truck that is already running and warmed up.

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## Hydraulic System Maintenance

### Inlet Screen Cleaning Procedure

The hydraulic tank should be drained while the oil is still warm to help flush out any contamination that may be in the tank. Be sure the tractor is parked on a level surface to avoid pockets of oil that may not drain out.

To aid in the draining procedure it is suggested to use a short piece of rain gutter from the drain plug to the oil catch container. After the oil is drained out, remove the inlet pipe from the bottom cover at the hose connection. Remove the bolts from the cover and remove the cover. After removal of the cover, the floor of the tank should be inspected for contamination and wiped clean. Loosen the screen locking nut and disconnect the screen from the cover inlet line with a chain wrench or large pliers.

**NOTE:** *The immediate installation of a new or previously cleaned screen is suggested to prevent contamination from entering the system.*

Soak screen in cleaning solvent to soften contaminant.

Scrub lightly with soft-bristled brush or other suitable soft-bristled brush to remove contaminant. DO NOT USE WIRE BRUSH.

Remove embedded contaminant with clean dry compressed air. Direct air flow against side of screen with perforated support. Additional dirt may be removed by directing air along pleated wire cloth.

Rewash in solvent and blow off with compressed air.

Inspect screen for damage to wire mesh. Holes in the wire mesh will permit dirt to leak into pump and other vital hydraulic components. If element is damaged, replace with new or previously cleaned screen.

When the suction screen has been thoroughly cleaned, reinstall it into the inlet line and tighten the lock nut securely or place the screen in a clean storage area for next installation.

**CAUTION: Be sure oil is not too hot before you attempt to drain oil or work on the system.**



*Figure 173: Hydraulic suction screen*

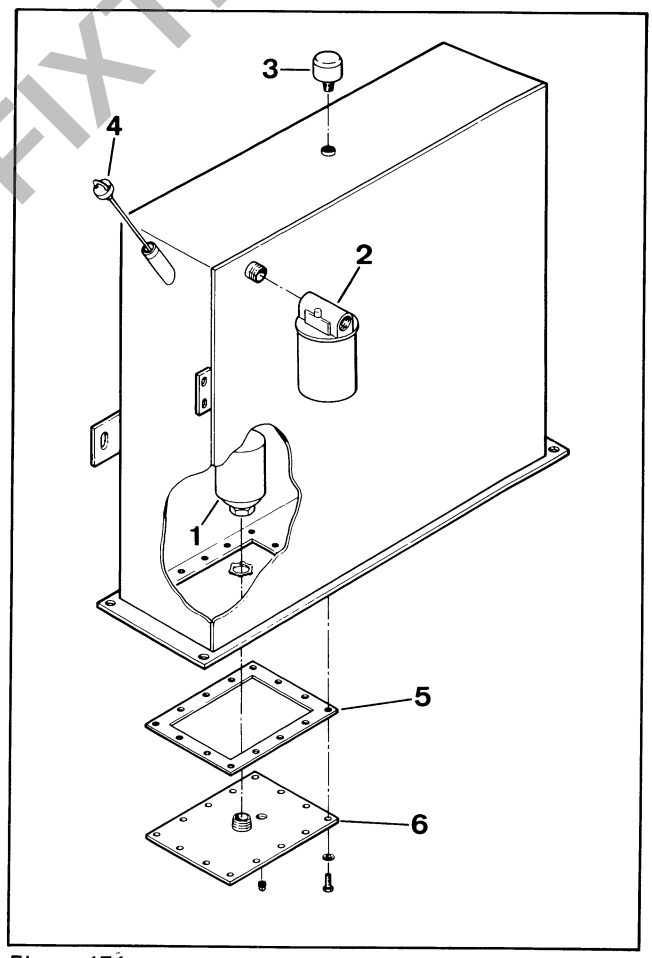



*Figure 174:*

1—Tank Screen
2—Filter
3—Vent Filter
4—Oil Level Dipstick
5—Gasket (Cover)
6—Cover

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