850 Crawler

Operators Manual

9-2724

CASE

Reprinted

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.

Bur 0-00000
March, 1995 (Revised October, 1997)

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SAFETY

SAFETY RULES

Your safety and the safety of those around you is highly dependent upon the care and good judgment you exercise in the use of this equipment. Know the positions and functions of all controls before attempting to operate. BE SURE TO CHECK ALL CONTROLS IN A SAFE OPEN AREA BEFORE STARTING YOUR WORK.

READ THIS MANUAL THOROUGHLY and make sure you understand its contents. All equipment has limitations. Be sure you understand, for example, the speed, braking, steering, stability and load characteristics of this machine before starting to operate.

The safety information presented in this manual is not intended to replace safety codes, insurance requirements, federal, state and local laws, rules and regulations. Know the regulations and laws that apply to your area and be sure that your machine is properly equipped to meet such laws and regulations.

It is recommended that the following safety rules be posted on the job site.

NOTE: Items followed by an asterisk (*) can be purchased from your Authorized Case Dealer.

Pre-Starting

Clean or replace all decals* if they can't be read.

Wear the proper safety equipment - - avoid loose clothing. Request additional safety equipment when you feel your safety is in doubt. A hard hat, safety glasses, ear plugs, etc., may be required.

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.

Be sure the operator's area is free of oil, loose objects or ice. During operation take time to clean the operator's area as required.

Be throughly familiar with location of underground gas lines, water mains, cables, etc.

Safety Continued on Next Page

Check clearance of overhead power and telephone lines. Never touch wires with any part of the machine.

Clear the area of all unauthorized people. Do not allow anyone to ride in the loader bucket or on the machine. This is a one man machine.

Carry a fire extinguisher and first aid kit at all times.

Check that the parking brake is set and the transmission controls are in neutral before starting the engine.

Operation

The seat belt* must be worn at all times if the crawler is equipped with ROPS*.

This is a one man machine - - no riders.

Be sure the machine is serviced before operating.

Understand the limitations of your machine. Do not try to do too much too fast. Be particularly careful if this is not the machine you would normally operate. If you are not familiar with the operation of this machine, operate in an open area with the engine speed reduced. Study this operator's manual carefully.

Check that all lights* are functioning properly before operating at night.

Observe all gauges to insure proper machine operation.

Know and understand the traffic flow patterns of your job. Understand and obey the flagman, road signs or signals.

Before using a coolant heater, manifold heater, or ether to aid in starting the engine in cold weather, read the instructions starting on page 27.

After the engine is started, check the instruments for proper operation.

SAFETY (CONT'D)

Never operate any of the controls unless seated in the operator's seat.

Test the brakes and check the crawler and attachments for proper operation.

Be extremely careful when working on banks or hillsides. Stay away from trenches or steep banks. Again, know your limitations.

When operating on steep inclines, use low range and engine speed for slowing the crawler and the foot brakes for stopping. Do not allow the crawler to coast down hill in neutral. See page 23 for Clutch Cutout operation.

Care should be taken when driving over raised objects. Slowly drive onto the obstacle at a slight angle if possible. When the crawler is balanced, ease down gently to the other side.

Operate at a safe speed at all times. If the terrain gets rough, slow down.

Before dismounting, lower the attachments to the ground, shift all controls to neutral, set the parking brake and stop the engine. Lock the transmission controls in neutral and turn off the master disconnect switch. Remove the key. Lock up your machine if equipped with lock up kit.*

Service

Always lower all attachments to the ground or block them securely before performing any service or adjustment.

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

Never operate the controls unless you are properly seated in the operator's seat.

Check the foot brakes and parking brake frequently to make sure they are operating properly.

Safety Continued on Next Page

SAFETY (CONT'D)

Never operate the machine in a closed building without proper venting.

Wear safety glasses when working on the machine.

Do not attempt repairs you do not understand. There is no disgrace in asking for help.

Winch

Be sure the machine is equipped with ROPS* and that the rear screen is properly installed before operating the winch.

Check the cable and fittings for damage before starting. Replace or cut back the cable if damaged.

Do not stand near a cable under tenstion. Do not allow anyone near the machine or cable when winching.

Do not leave the crawler with tension on the winch cable.

Always set the parking brake before winching when the machine is stopped.

Use leather gloves and caution when installing, reversing or removing the cable.

Never stand in the loop of a cable.

When skidding trees, always take the safest route. Keep away from steep banks and hillsides. Be alert at all times for unstable soil conditions.

Shift the winch control to Brake Off position before leaving the machine.

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.

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

Seat Belts

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 mounting, and 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

Every 500 hours or twice yearly, whichever comes first, 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.

ROPS Safety Precautions

1. Do not make any field modifications to this ROPS structure, such as welding accessories to, or drilling holes in it.

2. 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" column on the ROPS label.

Safety Continued on Next Page

SAFETY (CONT'D)

3. Special hardware is often used for mounting and anchoring operator protective devices. Replacement parts must be those listed in the Case Parts Catalog.

4. Batteries, fuel tanks, oil reservoirs, coolant system, etc. if located near the operator's compartment, should be equipped with non-spill caps.

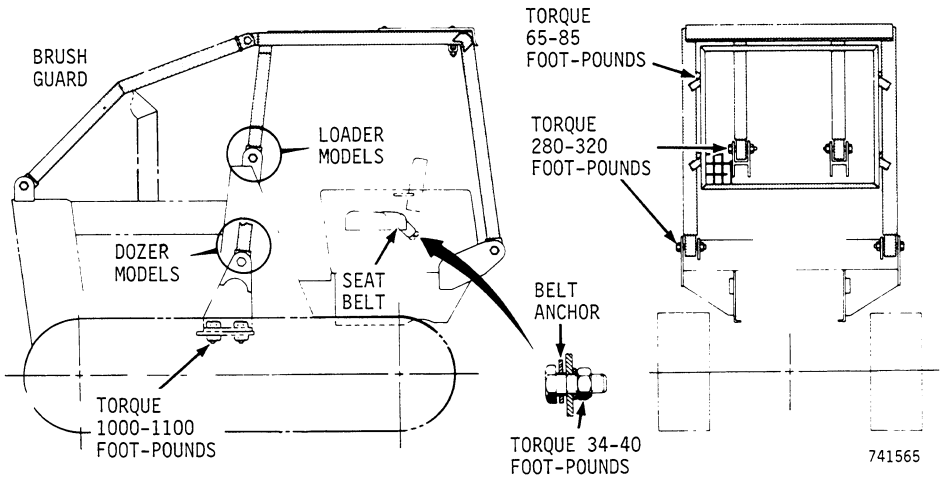

Figure 1

DANGER: DO NOT remove the roll-over protective structure except for servicing. Properly reinstall before using machine.

SPARK ARRESTING MUFFLER

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 if 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 100 in this manual.

INTRODUCTION

TO THE OWNER

This manual is your guide to safe, productive operations. Read it carefully. It will help to reduce trial and error learning. It should also minimize damage and downtime caused by improper maintenance.

If you require additional information, contact us.

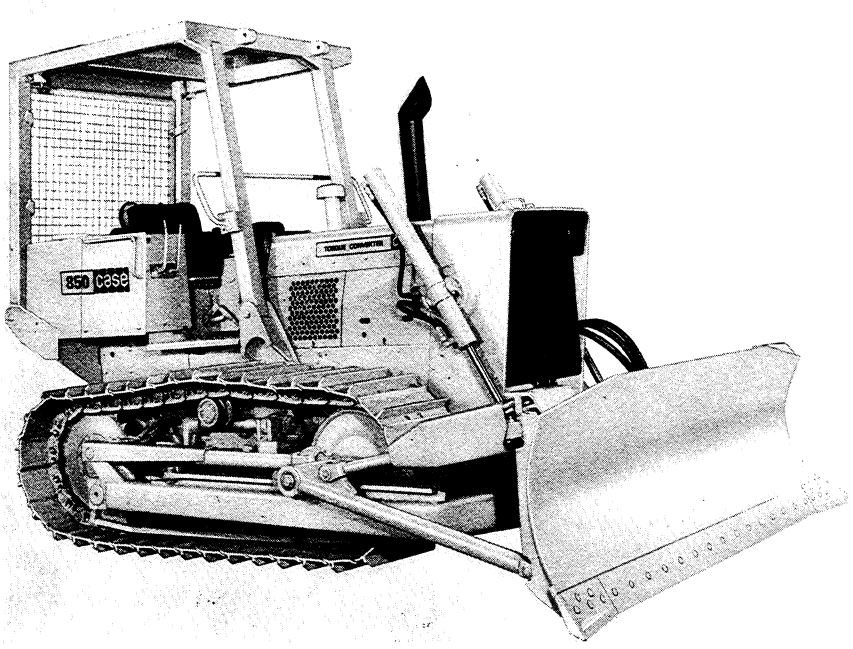

Figure 3

Your Authorized Case Dealer

CASE CORPORATION reserves the right to make improvements in design or changes in specifications at any time, without incurring any obligation relating to such changes.

Oct. 1975

SERIAL NUMBER LOCATION

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

Basic crawler - located on the left arm rest in front.

Engine - located on the right hand side toward the rear. See note.

Transmission - located on the top right side of the transmission.

Loader - located on the loader cross tube on the right side.

Dozer - located on the left side of the blade.

Ripper - located on the lower left connecting arm.

Winch - located on the left side of the Carco winch and on top of the Gearmatic winch.

ROPS - located in the left corner of the ROPS structure.

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

	Model or Part Number	Serial Number
Basic crawler	850	
Engine	A301BD	
Transmission		
Loader		
Dozer		
Ripper		
Winch		
ROPS		

NOTE: "Right Hand" and "Left Hand", when used in this manual, indicate the right and left sides of the machine as viewed from the operator's seat.

general specifications

NOTE: Use the engine assembly number - located on the engine serial number plate - to aid identification of your machine in the following specifications.

Specifications taken in accordance with IEMC or SAE where applicable and apply only to production machines at time of printing.

A301BD DIESEL ENGINE

Make and type . . . . . CASE - 4 cylinder, 4 stroke cycle, valve-in-head

Maximum rated horsepower:

Gross . . . . . Dozer-drawbar (A59899 engine) 74 @ 1950 rpm
All models (A60715 engine) - 81 @ 2000 rpm
SAE net. . . Dozer-drawbar (A 59899 engine) - 66 @ 1950 rpm
All models (A60715 engine) - 72 @ 2000 rpm

Gross horsepower: Manufacturer's rating of maximum engine horsepower at flywheel when equipped with oil and water pumps. Fuel set at maximum quantity for this application. Corrected to sea level - 29.92" (760 mm) Hg. and 60° F. (16° C.) dry air.

SAE net horsepower: Flywheel horsepower of engine as applied to this vehicle when equipped with operating accessories including oil and water pumps, alternator, air cleaner, fan and muffler. Corrected to 500' (152,4 m) altitude with .38" (10 mm) Hg. vapor pressure 29.38" (746 mm) Hg. observed barometer and 85° F. (29° C.) air (per SAE J816b).

Firing order 1-3-4-2
Cylinder bore and stroke . . . . 4-3/8" (111 mm) x 5" (127 mm)
Piston displacement . . . . . 301 cubic inches (4933 cm^3)
Compression ratio . . . . . 16.5 to 1
Cylinder sleeves . . . . . Replaceable wet type

Valve tappet clearance -
Hot settings are made after engine has operated at thermostat controlled temperature at least 15 minutes:

Exhaust	
Hot	.020"
Cold	.025"
Intake, hot and cold	.015"

Engine Speeds

High idle, no load	
Dozer, drawbar (A59899 engine)	2110 to 2140 rpm
All models (A60715 engine)	2100 to 2150 rpm
Rated, full load	
Dozer, drawbar (A59899 engine)	1950 rpm
All models (A60715 engine)	2000 rpm
Low idle	
All models	725 to 775 rpm

Lubrication System

Type pump	Gear
Oil filter	Replaceable, spin-on
Oil pressure relief valve	45-55 psi (3,2-3,9 kg/cm^2)

Fuel System

Injection pump	Robert Bosch; type PES multiple plunger
Pump mounting	Left-hand engine side
Pump timing	30° BTDC
Fuel injectors	Pencil type
Opening pressure	2800 psi (197 kg/cm^2)
Fuel transfer pump	Plunger type, integral part of injection pump
Governor	Variable speed; flyweight centrifugal type; integral part of injection pump

Fuel tank water trap	Base of fuel tank
First stage fuel filter	Replaceable spin-on
Second stage fuel filter	Replaceable spin-on

COOLING SYSTEM

Type of system	Pressurized; thermostat controlled continuous bypass; forced circulation (pump)
Type pump	Impeller vane
Type radiator	Heavy duty fin and tube
Radiator cap	7 psi (0,5 kg/cm²)
Thermostats (2)	175° to 202° F. bypass (80° to 94° C)

ELECTRICAL SYSTEM

Type of system	24 volt, negative ground
Batteries (2)	12 volt, wired in series,
Alternator	24 volt, 35 amps
Voltage regulator	24 volt, transistorized
Starting motor	24 volt, solenoid
Headlights	24 volt dual front, shock mounted and protected
Rear light	24 volt, swivel and shock mounted
Circuit breakers	
Crawler electrical system	40 amps
Lighting system	10 amps

CRAWLER

Basic Measurements

Gauge, standard	54" (1372 mm)
Width, overall, with 14" (356 mm) plates	68" (1727 mm)
Height, overall:	
To top of exhaust stack	88" (2235 mm)
To top of ROPS	101-1/2" (2578 mm)
Length, overall:	
With drawbar	126-1/2" (3213 mm)
Without drawbar	121-1/2" (3086 mm)
Ground clearance, with drawbar	11.5 (292 mm)

Approximate Shipping Weights

TRACTOR WEIGHTS	POUNDS (kg)
Drawbar	13,370 (6064)
Power angle-tilt-pitch dozer	16,685 (7523)
Power angle-tilt dozer	16,385 (7432)
Power tilt dozer	15,085 (6842)
Loader without C/W or bucket	15,720 (7130)

EQUIPMENT WEIGHTS	
Backhoe	4,903 (2224)
3 - tooth ripper	1,516 (688)
Counterweight, loader	1,900 (862)
Counterweight, loader	2,600 (1179)
Counterweight, front	1,020 (463)
Counterweight, ripper	1,750 (794)
Drawbar	140 (64)
ROPS , loader	537 (244)
Front gaurd, ROPS	155 (70)
ROPS , dozer	593 (269)
Model E30-SG winch	1,200 (544)
Model 19 winch	1,111 (504)
Bucket - 1-3/8 cu. yd. (1,0 m^3)	1,220 (553)
Bucket - 1-1/2 cu yd. (1,1 m^3)	1,160 (526)
4-in-1 bucket - 1-3/8 cu. yd. (1,0 m^3)	1,800 (816)
Bucket teeth	136 (62)

Brake System

Type of system	Hydraulic actuated disc brakes which neutralize power drive
Parking brake	Mechanical, hand operated

Track System

Track gauge ..... 54" (1372 mm)

Track shoe types (heat treated):

- Grouser, open center - 12" (305 mm), 13" (330 mm), 14" (356 mm), 15" (381 mm), 16" (406 mm), 17" (432 mm) and 18" (457 mm)
- Grouser, closed - 12" (305 mm), 13" (330 mm), 14" (356 mm), 15" (381 mm), 16" (406 mm), 17" (432 mm), 18" (457 mm) and 20" (508 mm)
- Grouser, ice and snow - 14" (356 mm), 15" (381 mm), 16" (406 mm) and 17" (432 mm)
- Semi-grouser, open center - 12" (305 mm), 13" (330 mm), 15" (381 mm) and 16" (406 mm)
- Semi-grouser, closed - 12" (305 mm), 13" (330 mm), 15" (381 mm) and 16" (406 mm)
- Semi-grouser, open center, offset - 14" (356 mm)
- Semi-grouser, closed, offset - 14" (356 mm)
- Semi-grouser, mining special - 10" (254 mm)
- Rubber pads for grousers - 14" (356 mm) and 15" (381 mm)

Shoes per track:
- Dozer and drawbar models 36
- Loader models 39

Lower rollers per track:
- Dozer and drawbar models 5
- Loader models 6

Carrier rollers per track:
- Dozer and drawbar models 1
- Loader models 1

Length of track on ground:
- Dozer and drawbar ..... 72" (1829 mm)
- Loader models ..... 81-1/2" (2070 mm)

Ground contact, with 13" (330 mm) shoes .. 2119 sq.in. (13 672 cm^2)

Shoe bolt torque ..... 190 to 230 ft. lbs. (26,4 to 31,8 m-kg)

Track adjustment ..... Hydraulic

Track frame ..... Torsion bar suspension

Track sag:
- Crawlers with one carrier roller on each side ..... 1" to 1-1/2" (25 to 38 mm)
- Crawlers with two carrier rollers on each side ..... 3/4" to 1-1/4" (19 to 32 mm)

Approximate Capacities

U. S. MEASURE

Crankcase	10 qts. (9,5 liters)
With filter change	11 qts. (10,4 liters)
Fuel tank	36 gals. (136 liters)
Hydraulic reservoir (refill)	8.5 gals. (32 liters)
Transmission-torque converter	32 qts. (30 liters)
Cooling system	11 gals. (42 liters)
Final drives (each side)	4 qts. (4 liters)

Approximate Speeds

Speed	Dual Range Lever	Track Speed Levers	Miles Per Hour (km/h) Forward	Reverse
DOZER-DRAWBAR:				
1st	Low	Low	0 - 2.45 (3,9)	0 - 2.68 (4,3)
2nd	High	Low	0 - 3.50 (5,6)	0 - 3.84 (6,2)
3rd	Low	High	0 - 4.72 (7,6)	0 - 5.16 (8,3)
4th	High	High	0 - 6.70 (10,8)	0 - 7.50 (11,88)
LOADER:				
1st	Low	Low	0 - 2.32 (3,71)	0 - 2.55 (4.08)
2nd	High	Low	0 - 3.32 (5,31)	0 - 3.65 (5,84)
3rd	Low	High	0 - 4.55 (7,3)	0 - 5.01 (8,1)
4th	High	High	0 - 6.50 (10,50)	0 - 7.15 (11,5)

Transmission

Make	Case
Model	A601TA
Type	Power shift, full power shuttle, constant mesh
Number of speeds:	
Forward	4
Reverse	4
Oil filters:	
Suction line	100 wire mesh, reuseable
Pressure line	10 micron replaceable element

Torque Converter

Make	Twin Disc
Type	Single stage, hydrokinetic

operating instructions

PRE-STARTING CHECK LIST

Before starting the new Case crawler for the first time, be familiar with the location and operation of the instruments and controls.

Instruments

The following instruments are grouped on the panel (Figure 8) in front of the operator:

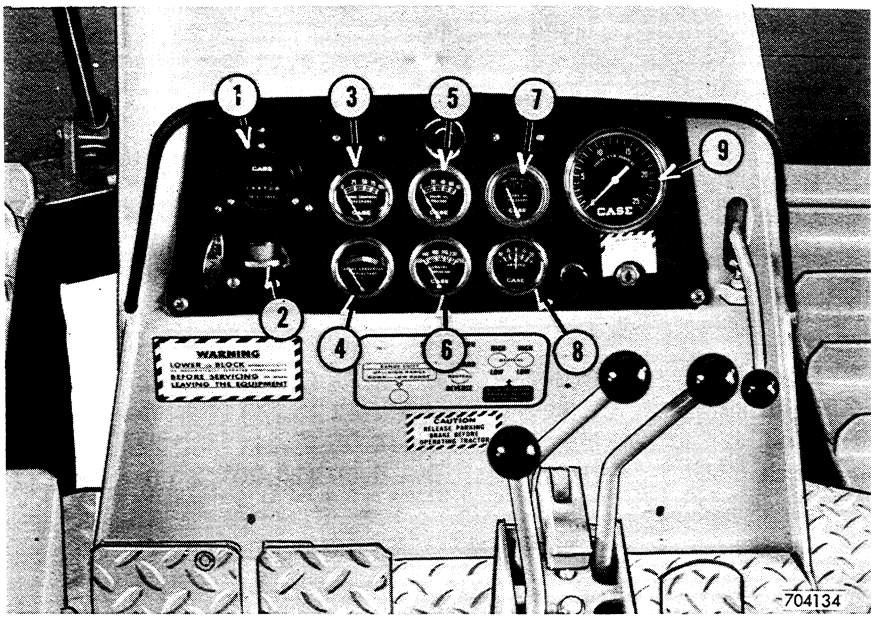

Figure 8 - Instrument Panel

1. Hourmeter
2. Air cleaner condition indicator
3. Torque converter oil pressure gauge
4. Torque converter oil temperature gauge
5. Engine oil pressure gauge
6. Engine temperature gauge
7. Transmission oil pressure gauge
8. Ammeter
9. Tachometer

HOURMETER: Indicates hours and tenths of hours the engine has operated. Shows operating time intervals when the crawler is to be serviced. Operates electrically and is turned on and off by an oil pressure switch.

AIR CLEANER CONDITION INDICATOR: Indicates condition of air cleaner filter. During normal operation, the indicator shows a yellow band. When the filter reaches maximum restriction from dust and dirt, a red band will completely cover the yellow band indicating the need for filter servicing. After starting the engine, the red band may rise enough to cover a portion of the yellow band; this should not be mistaken as an indication for servicing.

TORQUE CONVERTER OIL PRESSURE GAUGE: At the start of a crawler warm-up, the converter oil pressure may register over 100 psi on the gauge. After operating temperature is reached, the gauge should register 50 to 70 psi during normal working conditions. When the converter reaches stall speed, under full throttle and heavy load, the oil pressure will tend to drop and register from 20 to 60 psi during the few seconds of converter stall. But if converter stall occurs too frequently and too long, the converter will tend to overheat as indicated by the torque converter oil temperature gauge.

TORQUE CONVERTER OIL TEMPERATURE GAUGE - Indicates three temperature zones:

(1) Green or "Normal": From 140° to 240° F. After the crawler is warmed up, the gauge should register in this zone during normal or average operating conditions.

(2) Yellow: From 240° to 270° F. If gauge registers in this zone, it indicates the converter is being overworked and extreme caution must be used during continued operation.

(3) Red: From 270° to 300° F. Never allow the temperature to reach 270° F. At 270° F., the transmission should be put in Neutral and the engine operated at half speed until converter oil temperature is lowered. If this method fails, or the gauge registers in the red zone during average operating conditions, have transmission checked by an Authorized Case Dealer.

The converter should not be operated at stall speed too long or too frequently. "Stall speed" means the point at which, under full throttle and heavy load, the tracks stop turning while the engine continues running. Excessive converter stall causes overheating and possible serious damage to the torque converter-transmission hydraulic system. Overheating is caused by the

engine transferring full horsepower to the converter which cannot deliver the power to the tracks. The undelivered power is transformed into excess converter heat.

ENGINE OIL PRESSURE GAUGE: After crawler is warmed up, the gauge should register 40 to 45 psi during normal operating conditions when the engine is running at about 1900 rpm.

ENGINE TEMPERATURE GAUGE: Indicates engine coolant temperature which is regulated by a thermostat that starts to open at 175° to 182° F., is fully open at 202° F., and remains open above 202° F. Coolant temperature will vary according to the crawler workload. If the radiator is equipped with a properly functioning 7 psi pressure cap, the crawler can operate safely with engine coolant temperatures up to 230° F. without damage to the engine or loss of coolant.

TRANSMISSION OIL PRESSURE GAUGE: After the crawler is warmed up the gauge should register 260 to 290 psi during normal operating conditions.

AMMETER: Indicates amount by which the batteries are being charged or discharged. With the batteries in a normal charge state and the engine running, the ammeter should show a slight charging (+) rate. An exception is just after starting, when the charging rate will be higher. A continuous high-charging rate or discharge (-) indicates electrical system trouble which should be checked by an Authorized Case Dealer.

TACHOMETER: Indicates engine speed in revolutions-per-minute (rpm), and is calibrated in hundreds.

FUEL PRESSURE GAUGE: (Early production only) Located on the left-hand side of the engine at the top of the fuel injection pump, the gauge indicates the amount of restriction in the first and second stage fuel filters. The gauge has two pressure zones:

(1) Green: With the engine running under normal operating conditions, the gauge needle will register in the green zone. This indicates the filters are removing sediment without blocking the fuel line.

(2) Red: As sediment gradually plugs a filter element, there will be a pressure drop and the gauge needle will slowly move towards the red zone. When the needle enters the red zone, the filters are clogged with sediment and should be replaced immediately.