OPERATOR'S MANUAL

Road Graders RG140 - RG170 - RG200 - RG170 AWD - RG200 AWD

NEW HOLLAND
CONSTRUCTION

MAIN SYMBOLS USED IN THIS MANUAL


WARNING
(Warning signal)


FUELING


AIR CLEANER RESTRICTION


PARKING BRAKE


HYDRAULIC OIL FILTER RESTRICTION


TRANSMISSION OIL FILTER RESTRICTION


BATTERY


BRAKE OIL - LOW PRESSURE


ENGINE WATER TEMPERATURE


ELECTRICAL SYSTEM


HYDRAULIC OIL TEMPERATURE


TRANSMISSION OIL TEMPERATURE


HAZARD WARNING LIGHTS


SUPPLEMENTAL STEERING


LIGHTS


LOW TRANSMISSION HYDRAULIC OIL PRESSURE


LOW ENGINE OIL PRESSURE


DIFFERENTIAL LOCK


HOURMETER


OPERATOR'S SEAT ADJUSTMENT


LOCKED


UNLOCKED


BLADE FLOAT
(Right cylinder)


BLADE FLOAT
(Left cylinder)

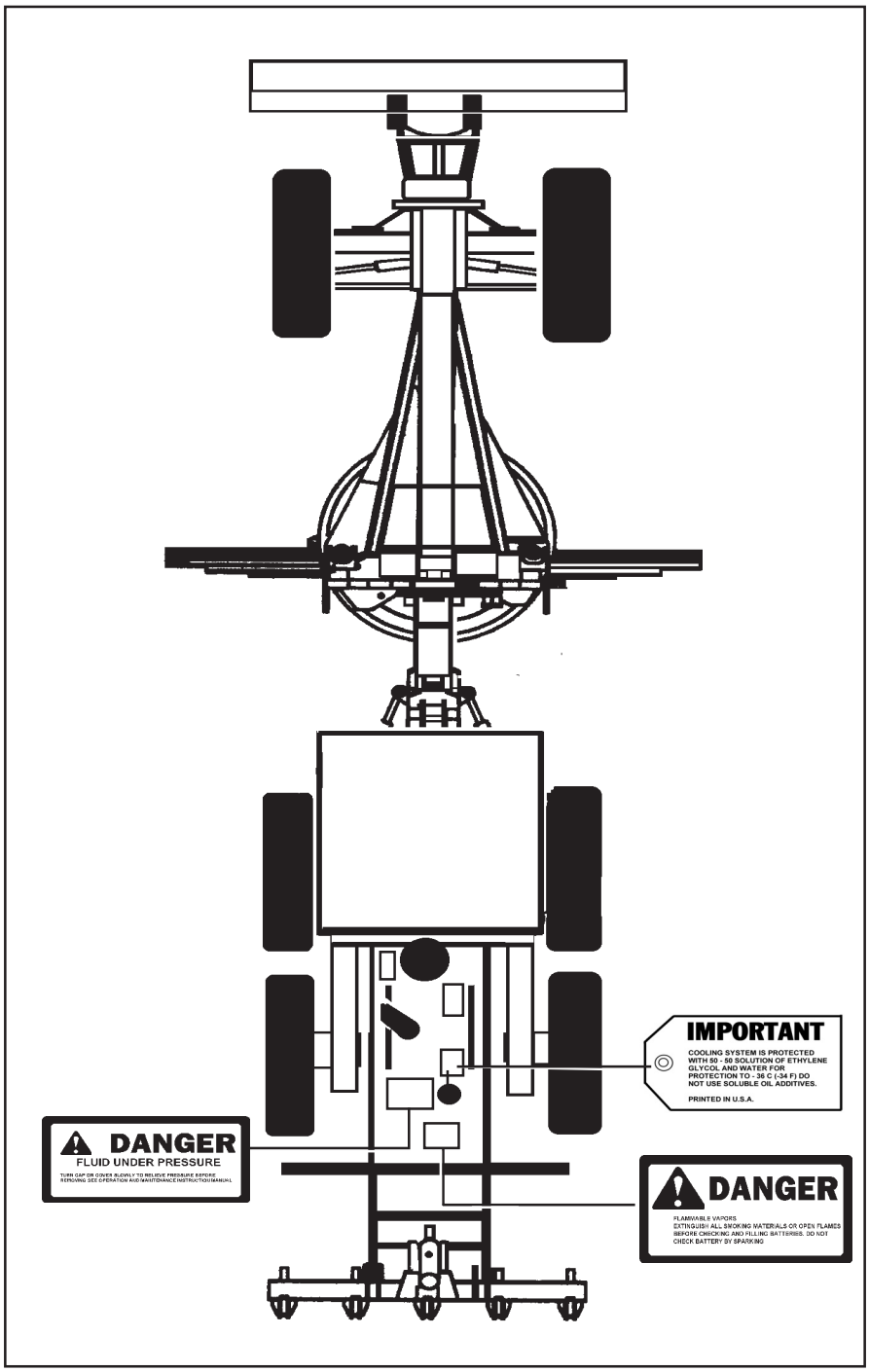

FRONT BLADE FLOAT


RIPPER


SCARIFIER


SADDLE LOCK


HORN


IMPORTANT
COOLING SYSTEM IS PROTECTED WITH 50 - 50 SOLUTION OF ETHYLENE GLYCOL AND WATER FOR PROTECTION TO - 36 C (-34 F) DO NOT USE SOLUBLE OIL ADDITIVES.
PRINTED IN U.S.A.
DANGER
FLUID UNDER PRESSURE
DANGER
FLAMMABLE VAPORS
EXTINGUISH ALL SMOKING MATERIALS OR OPEN FLAMES BEFORE CHECKING AND FILLING BATTERIES. DO NOT CHECK BATTERY BY SPARKING

TANDEM

19 mm (3/4 in) and 16 mm (5/8 in) thickness steel plate rectangular section welded box assembly.
Interchangeable shafts and gears supported by opposed tapered roller bearings.
Roller chain pitch ..... 50.8 mm (2.0 in)
Tandem oscillation angle (for each side) ..... 20^0

FRONT AXLE

High strength steel welded assembly, with 19^0 oscillation angle, to each side.
18^0 front wheel lean (right and left) hydraulically operated.
Ground clearance ..... 640 mm (25.19 in)

FRONT AXLE - AWD (OPT)

High strength steel welded assembly, with 15^0 oscillation angle, to each side.
17^0 front wheel lean (right and left) hydraulically operated.
Ground clearance ..... 600 mm (23.62 in)

REAR AXLE *(STD)*

Heavy duty cast iron case, heat treated steel shafts supported by tapered roller bearings.
Ground clearance (STD) ..... 370 mm (14.57 in)
Limited slip (Super Max Trac) differential with inboard planetary and inboard brakes.

REAR AXLE (*OPT*)

Heavy duty cast iron case, heat treated steel shafts supported by tapered roller bearings.
Ground clearance ..... 398 mm (15.67 in)
With planetary reductions at he four drive wheels, outboard brakes and differential electro-hydraulic lock.

OPERATION WEIGHTS

Coolant, hydraulic oil, full fuel tank, fluid supplied, including operator's weight.

Weight distribution:
Front axle ..... 3990 Kg (8778 lbs)
Front axle (AWD-OPT) ..... 4210 Kg (9273 lbs)
Rear axle ..... 9780 Kg (21516 lbs)
Total operating weight ..... 13770 Kg (30294 lbs)
Total operating weight (AWD-OPT) ..... 16420 Kg (36167 lbs)

Same as the above machine, equipped with cab ROPS type, moldboard side shift, blade pitch, rear drawbar and scarifier.

Weight distribution:
Front axle ..... 4698 Kg (10335 lbs)
Front axle (AWD-OPT) ..... 4920 Kg (10832 lbs)
Rear axle ..... 11502 Kg (25304 lbs)
Total operating weight ..... 16200 Kg (35639 lbs)
Total operating weight (AWD-OPT) ..... 16420 Kg (36167 lbs)

DRAWBAR

A-frame welded box made with circle shift hydraulic motor in the central place installed.
Shim adjusted ball and socket joint.

CIRCLE

- Steel welded assembly, cross section in "T" 177 x 168 x 38 mm (7.0 x 66 x 1.5 in).
- External diameter ..... 1753 mm (69.0 in)
- Turning angle ..... 360^0 continued
- Supported by 4 (four) phenolic resin guides.
- Total wear plate area ..... 2.846 cm^2 (441 in^2)
- Circle turn gears enclosed and running in oil.

MOLDBOARD

- "Roll Away", involute curve with replaceable cutting edges and end bits.
- Moldboard side shift and pitch hydraulically operated.
- Available sizes:

3.658 x 622 x 22 mm (144 x 24.5 x 88 in) ..... standard
3.960 x 671 x 22 mm (156 x 26.4 x 88 in) ..... optional
4.267 x 671 x 22 mm (168 x 26.4 x 88 in) ..... standard

- Lift above ground ..... 435 mm (16.97 in)
- Bank cutting angle max ..... 90^0
- Blade pitch angle:
  40^0 Forward
  5^0 Backward

MOLDBOARD REACH (OUTSIDE REAR TIRES FRAME GRADER) - NON ARTICULATED

With circle shift only:
Right ..... 931 mm - 36.65 in (*)
Left ..... 954 mm - 37.55 in (*)

With blade shift only:
Right ..... 1406 mm - 55.35 in (*)
Left ..... 1261 mm - 49.64 in (*)

With circle shift and blade shift:
Right ..... 1613 mm - 63.50 in (*)
Left ..... 1533 mm - 60.35 in (*)

With circle shift, blade shift and saddle rotated one hole:
Right ..... 1873 mm - 73.74 in (*)
Left ..... 1763 mm - 69.41 in (*)

RUN IN

1- Operate the machine with a light load for the first 50 hours. Efficient engine operation is obtained with the engine coolant temperature held in the GREEN area of the gauge. Operating engine with coolant temperature below this range will result in incomplete combustion of fuel, higher fuel consumption with less power and will cause harmful gummy deposits within the engine.

WARNING

Never lubricate, service or adjust the machine with the engine running, except as called for in the Operation and Maintenance Instruction Manual to prevent accidents or being caught in moving parts or by a moving machine.

2- Inspect entire unit after the first 10 hours of operation. Tighten all loose bolts and check all brake and control adjustments. Check also the hydraulic and electrical systems.
After the first 50 hours of operation on a new unit or after major repairs perform the following services:

a) Change transmission oil filter element.

WARNING

Fluid under pressure. Turn cap or cover slowly to relieve pressure before removing it.

b) Change hydraulic oil filter element.

c) Check ROPS mounting capscrews.

WARNING

The protection offered by the ROPS structure may be impaired if it has been subjected to any modification or damage.

d) Check tandem wheel nut.

e) Check wheel lock nuts.

WELDING OPERATIONS

Never perform welding operations unless you are qualified to do so.

Observe the accident pevention regulations.

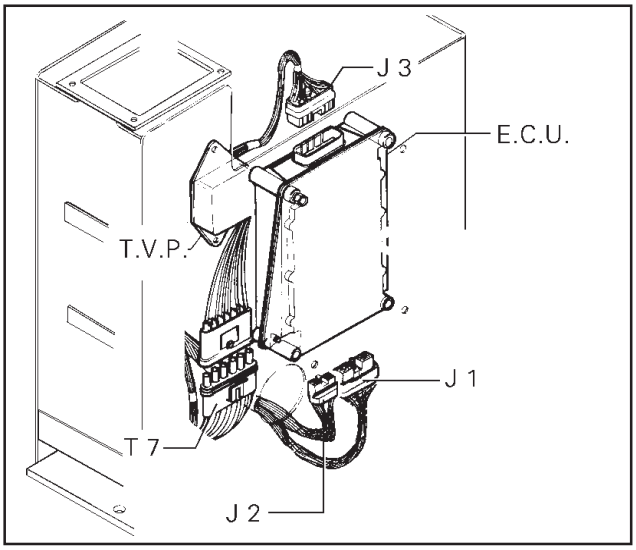
Welding work may be performed only under expert supervision and by experienced authorized personnel may work on receptacles which contain or have contained substances:
- that are flammable or encourage combustion,
- that are susceptible to explosion,
- that can develope gas, steam, mist or dust harmful to health during welding operations.

Before welding operations may be performed on the machine:
- disconnect the battery, first at the negative pole, and then at the positive pole,
- disconnect the positive pole at the alternator,
- (on AWD units) remove the plug for the "Black Box" of the electronically controlled front-wheel drive,
- protect the dosconnected terminals and plugs from short circuits and contamination, by covering them with foil or adhesive strips.
- (transmission) disconnect the master switch and connectors J1, J2 and J3 from the ECU and connector T7 from the TVP.

Attach the welding terminals as near as possible to the welding point.

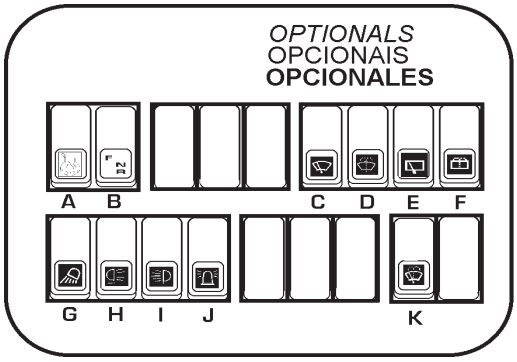
The welding current must not flow throught the slewing ring, pin couplings or link joints of the hydraulic cylinders.

Restore all electrical connections after welding:
- when connecting the battery, connect the positive poles disconnected before the welding operation, before connecting the negative pole connections.

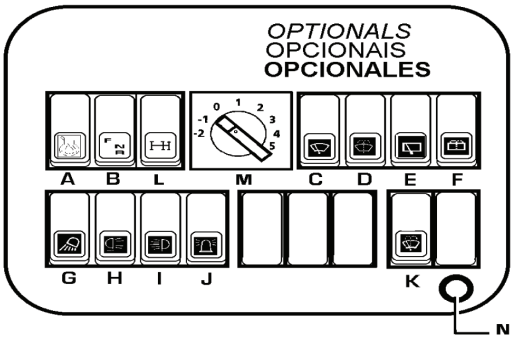


F- MOLDBOARD ANTI-SHOCK FUNCTION SWITCH
This switch activates and deactivates the moldboard cylinders anti-shock function. It is an ON/OFF type switch.
To activate the anti-shock function, place the switch in the ON position.
To deactivate it, place the switch in the OFF position.

4 - SWITCH PANEL (B)



4 - SWITCH PANEL (B) (AWD - OPT)



A- NOT USED

B- COME-HOME
This switch is located in the lower part of the right console and is used to move the machine in the event of a transmission electronic control unit problem. The switch has three positions: F - forward, N - neutral and R - reverse.
The switch must be in the Neutral (N) position with park brake "on" to start the machine.

See "PERIODIC SERVICES" in Maintenance Section.

C- FRONT WINDSHIELD WIPER SWITCH
This switch is used to activate the front windshield wiper.

D- FRONT WINDSHIELD WASHER SWITCH
This switch is used to activate the front windshield washer.

E- REAR WINDOW WIPER SWITCH
This switch activates the rear windshield wiper function.

F- REAR WINDSHIELD WASHER SWITCH
This switch activates the rear windshield washer function.

G- FLOODLIGHTS SWITCH
This switch is used to activate the floodlights.

H- TAIL LIGHT SWITCH
This switch is used to activate the tail light.

I- CAB DOME LIGHT SWITCH
This switch activates the cab dome light.

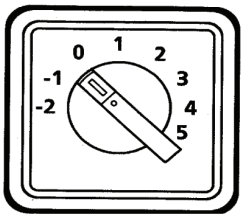
J- CAB BEACON LIGHT SWITCH
This switch activates the cab beacon light.

K- REAR WINDOW WASHER/WIPER SWITCH
This switch activates the rear window washer/ wiper function.

L- FRONT WHEEL DRIVE SWITCH (OPT)
This switch activates the optional front wheel drive function.

M- FRONT WHEEL DRIVE SPEED LEVELS
This switch adapts the optional front wheel drive to the working and driving conditions independent of rear wheel slip, the speed of the front wheels can be adjusted to eight levels independent of the speed of the rear wheels.
The speed levels are selected by means of a rotary switch.
Front wheel drive will not operate in eighth gear.

Position 0: Front and rear wheels run at the same speed.
Position 1 to 5: Front wheels turning at a higher speed (lead). Each position increases in two percent increments.
Position -1 to -2: Front wheels turning at a lower speed (lag). Each position increased in two percent increments. The tractive force of the front axle is reduced.



N- PLUG TO THE EDS TESTER

This machine and its attachments should be operated only by a qualified operator stationed at the operator's controls either seated or standing as conditions require.

The use of seat belts is required on ROPS equipped machines.

Before starting the machine, check, adjust and lock the operator's seat assembly for maximum comfort and control of the machine.

This machine is equipped with power steering which is effective only when the engine is running. If the engine fails, stop the machine immediately.

For emergency stops, apply foot brakes as required or pull parking/emergency brake lever.

Check wheel fasteners and/or rim lugs at the start of each shift. Tighten according to procedure and specifications.

Always travel with the scarifier, ripper and/or dozer blade in the full raised position and lowered to the ground when parked.

Use extra care when using down pressure on the blade when working on hills, banks and slopes.

WARNING

When the Grader wheels have been turned to the maximum (in either direction), do not continue to turn the steering wheel in the same direction (it causes unnecessary wear on pump and valve components).

Avoid excessive spinning of all wheels.

To place the machine in motion, raise moldboard, release handbrake, shift into the desired range and direction and move the throttle lever to meet the starting requirments.

Subsequent range changes will be governed by the speed attained or desired.

Select a transmission range which will maintain engine speed appropriate for the load required. Low engine speed can be corrected by down-shifting or lightening the load. Over speeding of the engine should be avoided. Slow the machine by applying the brakes (only drag the cutting edge of moldboard as a last resort).

Improper shifting can result in injury to the operator as well as damage to the engine and the transmission.

Observe the following instructions:
1- Down shift only when the ground speed for the selected range has been achieved.

2- Down shift only one range at a time.

3- AWD (OPT RG170, RG200) will not engage or disengage at speeds above two mph.

ALL WHEEL DRIVE (OPT RG170, RG200)
Operation of the AWD system in forward is accomplished by communication between the Forward Control Box and the TCU. Engine speed, transmission rotation proportional to ground speed, directional selection, AWD control setting and eighth gear selection are all sensed and evaluated. A current is sent to proportional solenoids in the AWD variable displacement pump. A cylinder integral with the pump then moves a plate to provide flow volume commensurate with ground speed. In reverse the AWD system acts like a differential.

WARNING

Do not coast the machine at any time with the transmission in neutral.

Do not attempt to decelerate on grades by shifting. Decelerate the engine and apply the foot brakes.

Anticipate grades before starting down. Select the proper gear range to maintain the control.

Engage transmission to start up only when the engine is at low idle.

Down or up shift only one range at a time and only when the speed of the machine approximates the speed of the next range.

Always turn AWD (OPT RG170, RG200) off while "Roading" the motor grader.

TOWING

WARNING

Do not start suddenly at full throttle against a tow chain or cable. Take up slack carefully. Only designated towing or pulling attachments points should be used for towing or pulling operations.

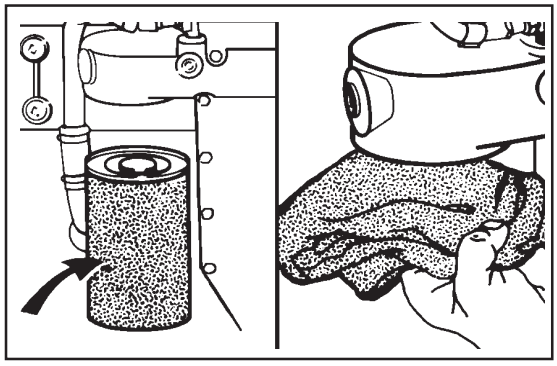
Do not tow the grader when the engine is not operating.

Use care in making attachment.

REAR AXLE OPT/With planetary reductions at the four drive wheels, outboard and differential electro-hydraulic lock

HOURS	SERVICE POINTS	*	NO OF POINTS	LUBRICANT	APPROX. CAPACITY
10 hours or daily	Engine crankcase oil level (including filters)	V	1	EO	5 gals
	Radiator (coolant level)	V	1		10.6 gals
	Transmission oil level	V	1	HO	6.6 gals
50 hours or weekly	Hydraulic tank (includes entire system)	V	1	HO	25.1 gals
	Fuel filters (drain water)	V	2		
100 hours or	Moldboard lift cylinder mounting balls	L	2	PGL	6 to 10 shots
every 15 days	Side shift cylinder mounting balls	L	2	PGL	6 to 10 shots
	Drawbar ball and socket	L	1	PGL	6 to 14 shots
	Front axle pivot pin	L	2	PGL	4 to 6 shots
	Articulation joint pins	L	2	PGL	6 to 14 shots
	Articulation cylinders ends	L	2	PGL	6 to 10 shots
	Rear ripper (Optional)	L	11	PGL	As needed
	Front scarifier or dozer blade (Optional)	L	1	PGL	As needed
	Fan drive bearings	L	1	PGL	As needed
250 hours or monthly	Engine crankcase (including filters)	T	1	EO	5 gals
	Universal joint	L	2	PGL	1 to 2 shots
	Rear axle housing center compartment	V	1	EPGL	9.6 gals
	Batteries (2)	V	1 2		
	Brake master cylinder	V	1	HBF	1.0 qt
	Circle turn gear housing	V	1	EPGL	0.75 gal
	Alternator and fan belts	V	2		
	Moldboard adjusting link ends	L	2	PGL	4 to 6 shots
	Moldboard pitch cylinder	L	2	PGL	As needed
	Front axle knockle pivot	L	2	PGL	4 to 6 shots
	Front axle drag link	L	4	PGL	4 to 6 shots
	Front axle spindle pivot	L	2	PGL	4 to 6 shots
	Front wheel lean cylinder	L	2	PGL	4 to 6 shots
	Fuel sediment bowl (wash filter sediment)	Lp	1		
500 hours or	Fuel filters	T	2		
every three months	Rear axle housing end compartments	V	2	EPGL	3.2 gals
	Tandem drive cases	V	1 each side	PGL	7.6 gals (each side)
	Tandem wheel shaft bearings	L	4 each side	PGL	14 to 20 shots
	Transmission oil filter	T	1		
	Rear axle cooling system filter	T	1		
	Engine cooling system filter	T	1		
	Fuel tank drain plug (drain sediment)	Lp	1		
1000 hours or	Transmission	T	1	HO	6.6 gals
every six months	Transmission screen	Lp			
	Fuel injectors	A	6		
	Engine valves	A	12		
2000 hours or	Hydraulic tank and filter	T	1	HO	25.1 gals
every year	Rear axle housing center compartment	T	1	EPGL	7.6 gals
	Front wheel bearing (repack)	T	2	WBG	2 lbs (each side)
	Rear axle housing end compartments	T	2	EPGL	5.0 gals
	Tandem drive cases	T	1 each side	PGL	7.6 gals (each side)

Service description: V = Verify; T = Change; L = Lubricate; A = Adjust; Lp = Clean

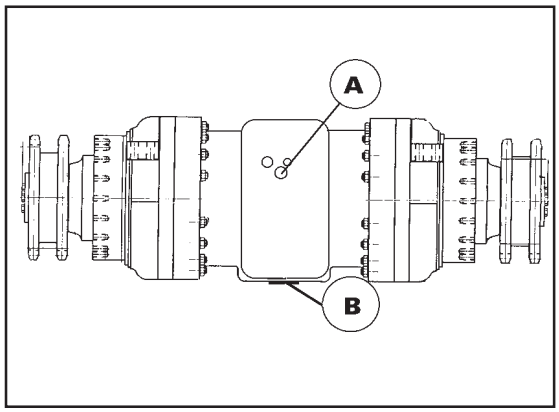


Engine oil filter

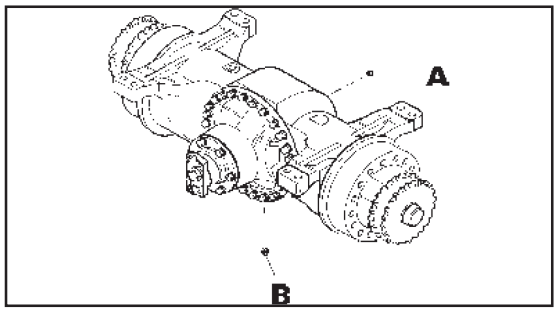
Add specified oil, through the filler neck. Start the engine and keep it running for 15 minutes to fill the filters and lubricate the engine. Check the oil level and top off as necessary. Check if there is any leakage from the filters.

10- Rear axle housing center compartment
Check oil level

Remove level/filler plug(A). Add oil as necessary to bring oil level to bottom of plug hole.
Install plug and be sure it is properly tightened.



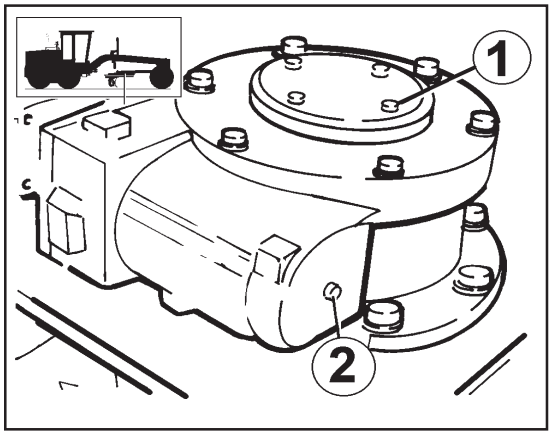
Rear axle housing center compartment (Graziano)



Rear axle housing center compartment (Clark-Hurth)

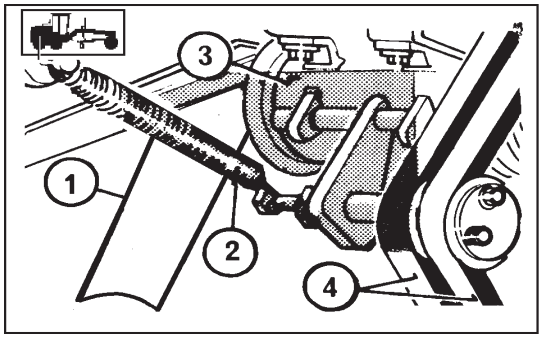
11- Circle turn gear box
Check oil level

Remove oil level plug (2). If the oil does not drain from the hole, remove the plug (1) and add oil until it comes out of the level plug hole (2). Then install level plug and filler plug.



12- Cooling fan belts
Check

This is the cooling fan driven off the transmission PTO. The alternator and optional A/C compressor are mounted on the front of then engine behind the cab.

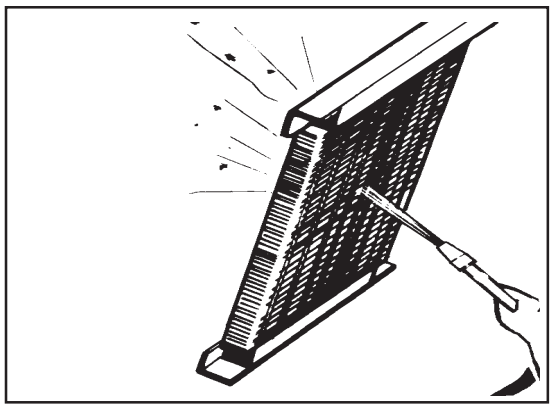


1- Fan
2- Spring
3- Remote drive system
4- Belts

The fan and belts are found on the rear part of the engine. They are both assembled in a remote drive system that is driven by the transmission PTO. The belt tension is maintained by the action of a spiral tensioning spring.

NOTE: Check that the belts are not cracked or damaged. Replace if it is necessary.

NOTE: It may be necessary to spray the exterior of radiator core with water and detergent to remove caked dirt.

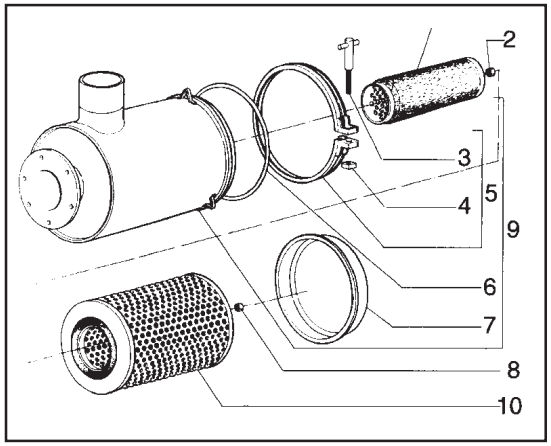


37- Air filter
Clean

The outer element of the air cleaner should be disassembled only when the air restriction indicator is in the red area.
For correct maintenance of the air filter proceed as following:

a) Clean dirt and oil from air cleaner assembly.
b) Loosen clamp (2) attaching cup to air cleaner body. Remove cup (7) and deflector (6).
c) Remove outer element by loosening wing nut and gasket.

NOTE: Visually check inner element each time outer element is cleaned or replaced.



1- Inner element; 2- Nut; 3- Capscrew; 4- Nut; 5- Clamp; 6- -'ring; 7- Cup; 8- Nut; 9- Filter housing
10- Outer element

d) The filter may be cleaned with compressed air.

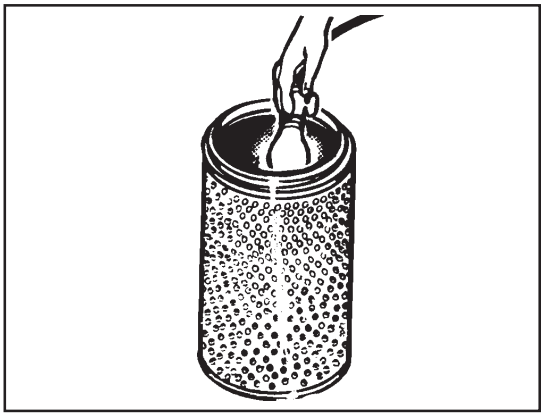
WARNING

Wear safety glasses with side shield or goggles when using compressed air for cleaning. This reduces the danger of accidents caused by flying particles. Limit the pressure to 30 PSI (2 kg/cm²) according to local or national requirements.

If required clean fins inside air cleaner with a stiff fiber brush.

e) To clean element with compressed air, direct dry clean air up and down plates on clean air side of element until all dust is removed.

ATTENTION: The inner element of the air cleaner is extremely important and should never be disregarded. We suggest that it be changed after 3 outer elements have been changed.



f) After the filter has been cleaned and dried, it must be inspected for ruptures or holes. Place a bright light inside the element and inspect it from the outside. The light will shine through any holes or tears. If any holes are evident, install a new element.

g) Inspect inner element retaining wing nut (4). Change wing nut if it is damaged.

h) Clean inside of the air cleaner body and cup (7) before re-installing element (5). Insert element in air cleaner body and tighten wing nut.

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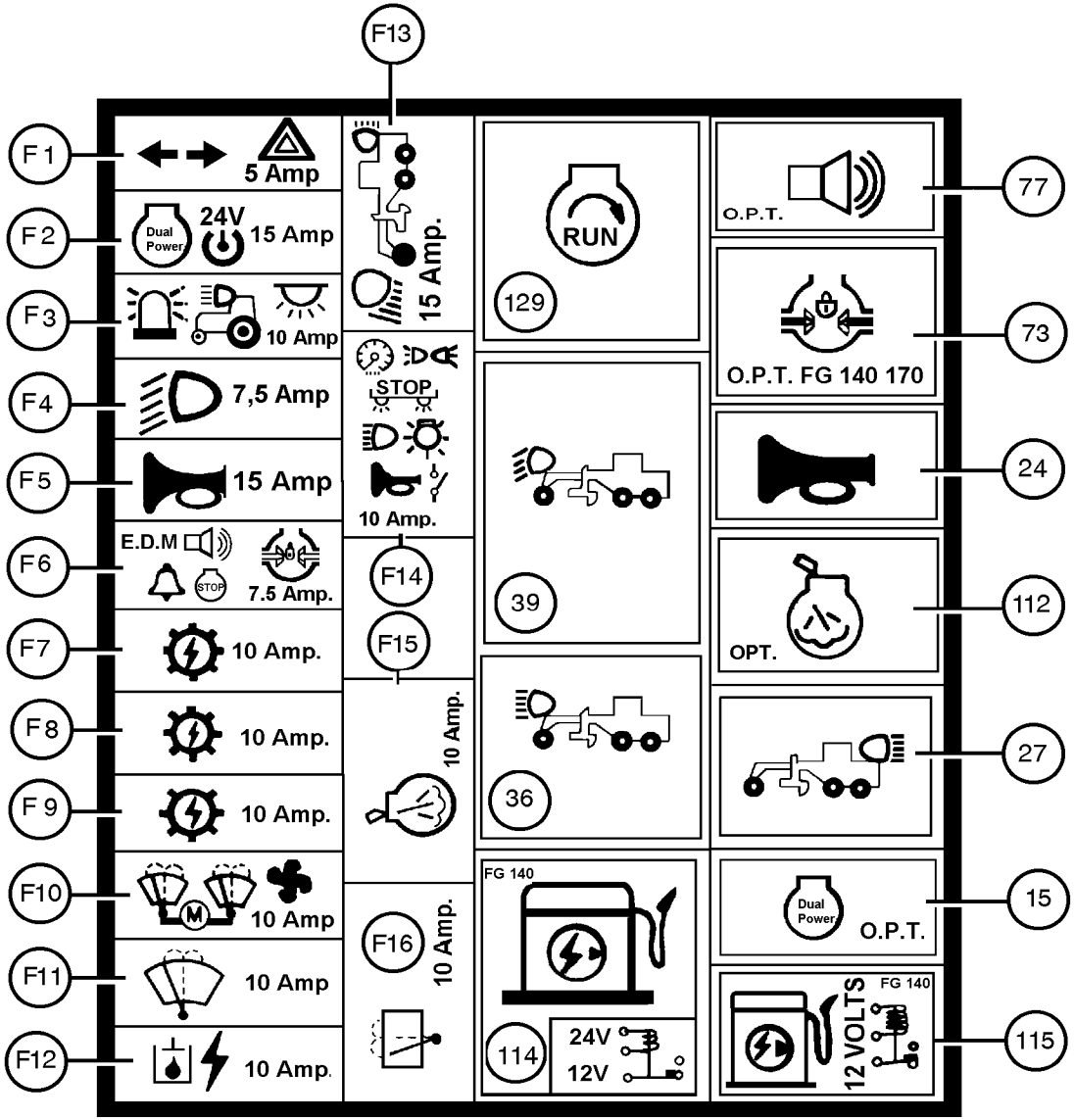
F13
F1
5 Amp
F2
Dual Power
24V
15 Amp
F3
10 Amp
F4
7,5 Amp
F5
15 Amp
F6
E.D.M
STOP
7.5 Amp.
F7
10 Amp.
F8
10 Amp.
F 9
10 Amp.
F10
10 Amp
F11
10 Amp
F12
10 Amp.
15 Amp.
STOP
10 Amp.
F14
F15
10 Amp.
F16
10 Amp.
RUN
129
39
36
FG 140
114
24V
12V
O.P.T.
77
O.P.T. FG 140 170
73
24
OPT.
112
27
Dual Power
O.P.T.
15
12 VOLTS
FG 140
115

FUSE BOX