DAVID BROWN
990, 995 & 996
Tractors

Operator's Manual

CASE

9-5101

Reprinted

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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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March, 1995 (Revised October, 1997)

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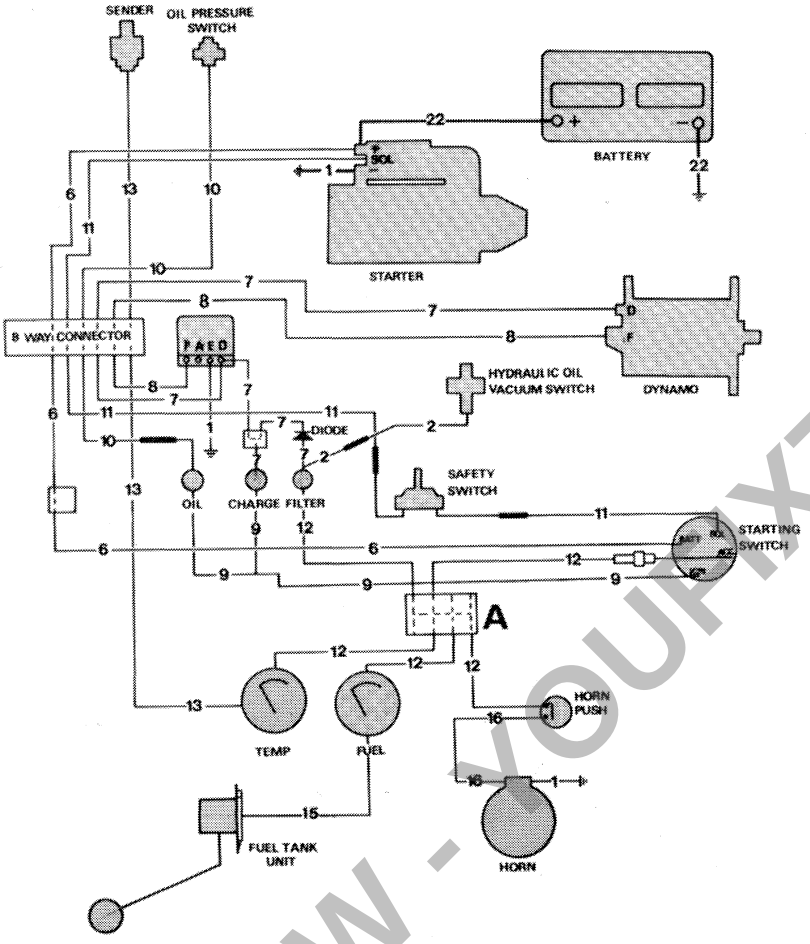


FIGURE 5/33. BASIC WIRING DIAGRAM WITH DYNAMO

A. Auxiliary connector

1. Black
2. Black/Light Green
3. Red
4. Blue/Red
5. Blue/White
6. Brown
7. Brown/Yellow
8. Brown/Green
9. White
10. White/Brown
11. White/Red
12. Green
13. Green/Blue
14. Blue
15. Green/Black
16. Purple/Black
17. Green/White
18. Green/Purple
19. Green/Red
20. Light Green/Brown
21. Light Green/Purple
22. Heavy Duty Cable

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Lubrication of the Gearbox and PTO

This is supplied by overflow oil from the hydraulic pump and is illustrated in Fig. 2/6. When using external equipment which uses a large continuous flow of oil (e.g. hydraulic mower), lubrication to the gearbox and PTO will be severely reduced unless the return oil is fed back into the lubrication pipes at point E or F, Fig. 2/6. These points are illustrated in Figs. 2/7 and 2/8.

Return points — Use point A, Fig. 2/7 or point A, Fig. 2/8 whichever is the more convenient. Both are tapped 7/8 UNF.

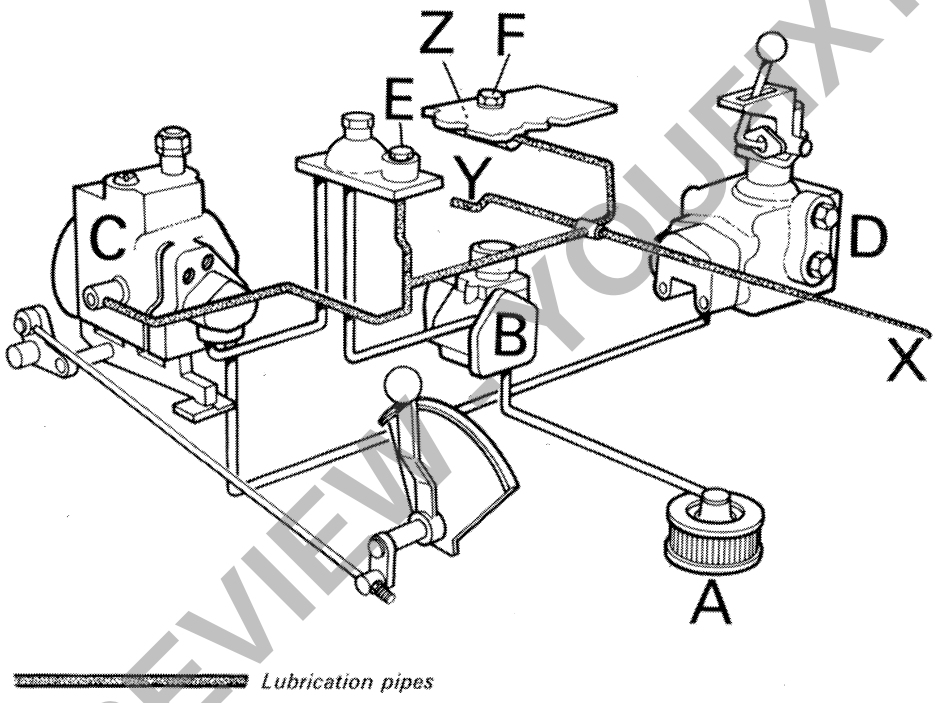


FIGURE 2/6. DIAGRAM OF HYDRAULIC SYSTEM

A. Inlet and full flow filter
B. Hydraulic pump
C. Hydraulic control valve
D. 3-way valve
E. Hydraulic return point
F. Alternative return point
X. Gearbox lubrication
Y. P.T.O. lubrication
Z. Ram cylinder lubrication

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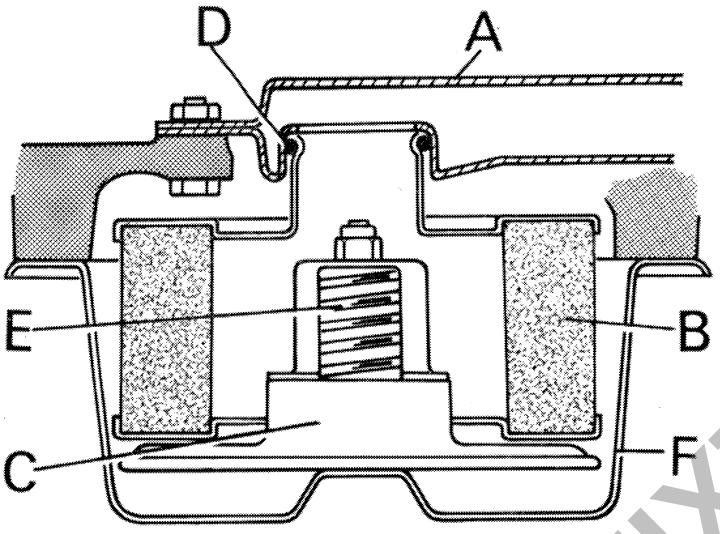


FIGURE 5/22. HYDRAULIC FILTER DIAGRAM

A. Suction pipe
B. Filter element
C. By-pass valve and screen
D. 'O' Ring
E. Magnet
F. Housing

Figure 5/22 shows a section through the hydraulic filter and suction pipe. Care should be taken, when re-installing the filter complete with the by-pass valve and wire mesh screen, to ensure that it is retained in the suction pipe A by the 'O' ring D. Failure to do this indicates that the 'O' ring is not sealing in the suction pipe and unfiltered oil will get by. Fit a new 'O' ring and make sure the filter is pushed fully home into the pipe. Although housing F retains the filter in position it should not compress the filter element.

NOTE: When transmission oil is drained off, air will enter the system. After changing the oil run the engine at minimum idling speed for thirty seconds with the hydraulic control lever in the lower position. The system will then automatically bleed itself.

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CYLINDER HEAD TIGHTENING

The sequence of tightening the cylinder head is shown in Fig. 5/16. Use a torque wrench set at 90 lb ft (12,5kg m) to tighten the bolts. The valve clearances should be checked after tightening the head.

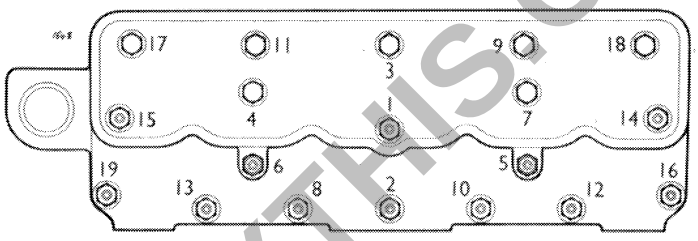


FIGURE 5/16. CYLINDER HEAD TIGHTENING SEQUENCE

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STARTING AND STOPPING THE ENGINE

Starting

1. With fuel in the tank, pull the stop control knob to the running position and drop into the retaining slot.
2. Pull the throttle lever towards the driver, approximately one quarter of the way (when cold — pull to full throttle position).
3. The gear lever must be in neutral.* In any other position an isolating switch prevents the starter motor from being energised.
4. Turn the starter key one click to the right and check that the three warning lights glow. If not, check for a faulty or defective bulb.

4a. Ensure that the PTO range lever is in neutral and on 996 tractors the PTO hand lever is in the engaged position.

5. Turn the starter key further to the right against the spring to operate the starter. Release as soon as the engine runs.
6. Close the throttle to give about 1000 rev/min to warm up.
7. Check that the warning lights have gone out.

Starting in cold weather — Screw in the wing nut underneath the injection pump before starting the engine. To prevent black exhaust smoke, unscrew the wing nut immediately the engine starts.

NOTE:

A. If the engine does not start within 25 seconds, release the starter switch and wait 20 seconds before trying again, otherwise the battery will be overheated and damaged.

B. If the engine oil warning light (green) stays on or comes on while the engine is running, stop the engine and investigate for loss of oil pressure, insufficient oil in the sump, or a fault in the oil switch.

C. If the charge warning light (red) stays on above 800 rev/min, investigate for an electrical fault.

D. If the transmission filter warning light (yellow) stays on while the oil is cold, reduce engine speed until it goes out.

**Tractors manufactured before April 1973 have the isolating switch on the range lever which must be placed mid-way between H and L before the starter can be energised.*

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TABLE OF ROUTINE SERVICE TASKS

NOTE: Recommended frequencies are for moderate operating conditions. Under more arduous conditions, such as dry dust or wet mud, the daily greasing and inspection of the air cleaner should be carried out twice a day or even more often as dictated be experience. The other tasks should also be carried out at correspondingly shorter intervals.

In addition to the Daily Inspection and Greasing, carry out the tasks marked X at the times shown.

Hour Meter Reading	Task A	Task B	Task C	Task D	Task E
60	X				
125	X	X			
185	X				
250	X	X	X		
315	X				
375	X	X			
440	X				
500	X	X	X	X	
560	X				
625	X	X			
685	X				
750	X	X	X		
815	X				
875	X	X			
940	X				
1000	X	X	X	X	X

Repeat the above service tasks at similar intervals throughout subsequent 1000 hour periods.

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CHASSIS

BRAKES

990	—8½in (22cm) dia. × 1¾in (4,45cm) wide, 52in² (341cm²) area.
995/996	—8½in (22cm) dia. × 2½in (6cm) wide, 72in² (464cm²) area.
*Heavy Duty	—8½in (22cm) dia. × 3½in (8,9cm) wide, 105·1in² (678cm²) area.

*Only with heavy duty rear axle and reductions.

CAPACITIES (Approximate initial fill)

	Imperial Measure	US Measure	Metric Measure
Cooling system	3 gal	3,6 gal	13,6 litre
Air cleaner oil bath	1¼ pt	¾ qt	0,71 litre
Engine lubricating oil	13 pt	8 qt	7,4 litre
Transmission oil	5 gal	6 gal	22,7 litre
Final drive oil (each)	4 pt	2½ qt	2,3 litre
Belt pulley	1¼ pt	1½ pt	0,7 litre
Power steering reservoir	2,2 pt	1,3 qt	1,25 litre
Manual steering box	2 pt	1,2 qt	1,1 litre
Fuel tank	13½ gal	16¼ gal	61,4 litre

990 DIMENSIONS — on 6·00–19 front, 12·4/11–36 rear tyres.

Overall length	126in (320cm)
Height over exhaust pipe	88in (224cm)
Height over steering wheel	64in (162cm)
Height over Weatherframe or cab	101in (256cm)
Overall width — minimum	67in (170cm)
Wheelbase	79in (200cm)
Ground clearance under front axle	21in (53cm)
Ground clearance under drawbar frame	15in (38cm)

Weight — with oil, fuel etc. —

	Livedrive	Non-Livedrive
—total	4670 lb (2120kg)	4630 lb (2100kg)
—rear axle	2970 lb (1350kg)	2950 lb (1338kg)
—front axle	1700 lb (770kg)	1680 lb (762kg)

Turning radius on 52in (132cm) track:

—without brakes	138in (350cm)
—with brakes	126in (320cm)

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SECTION 6.
INFORMATION AND DATA

DIESEL ENGINE

990 — 449001 and 449002

995 — 455051

996 — 455071

The 4-cylinder direct injection engine is a robust power unit applying the cross flow head technique for economy coupled with high performance. The crankshaft, flywheel, pistons and conrods are balanced and matched in weight to ensure rugged dependability and smooth running.

Displacement—4 cylinders	
990	195in³ (3195cm³)
995, 996	219in³ (3594cm³)
Bore	3 15/16in (100,01mm)
Stroke	
990	4in (101,6mm)
995, 996	4½in (114,3mm)
Rated speed	1800 rev/min
Maximum full load speed	2200 rev/min
Maximum no load speed ..	2350 rev/min
Power	See graphs pp. 115 to 118
Compression Ratio ..	17:1
Firing order	1, 2, 4, 3

Valve clearances — SET COLD
inlet and exhaust 0·010in (0,25mm)

Cooling system — The thermostat is set to commence opening at 82°C (180°F) and to be fully open at 94°C (200°F). It controls the flow of coolant through the cylinder head from the water pump. Circulation through the block is by thermo-syphon. A 7-blade fan is fitted to the water pump drive pulley. The radiator coolant is pressurised by means of a relief valve fitted in the radiator cap.

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SECTION 1. DESCRIPTION AND OPERATION — GENERAL

INSTRUMENT PANEL

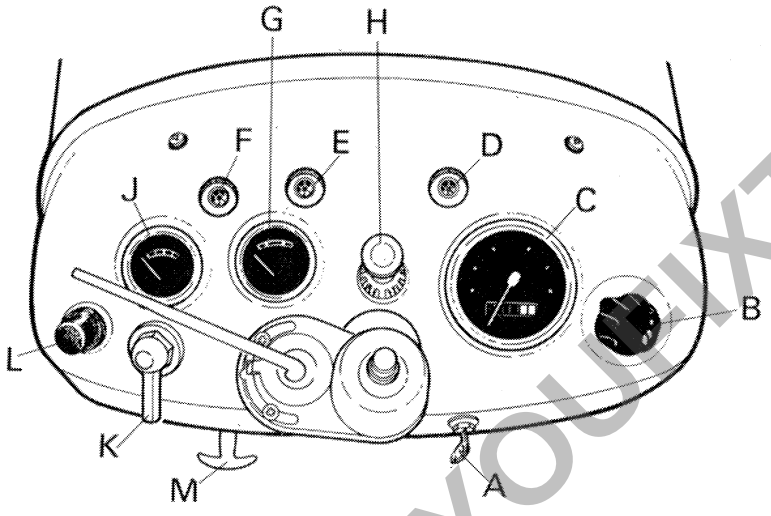


FIGURE 1/1. INSTRUMENT PANEL

A. Ignition — starter switch
B. Lighting switch
C. Engine speed indicator (or speedometer)
D. Charge warning light (red)
E. Engine oil warning light (green)
F. Transmission filter warning light (yellow)
G. Water temperature
H. Hazard warning switch
J. Fuel gauge
K. Direction indicator switch
L. Horn push button
M. Engine stop control/choke

Engine stop control

This cuts off the fuel supply to the injectors. Never stop the engine by letting the tank run dry. This allows air to enter the system and is very difficult to get rid of.

Before starting the engine pull out the stop control and lower into the retaining slot. To stop ; lift the knob and allow it to move forward.

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