

MF 50 B

**TRACTOR/BACKHOE/
LOADER**

SPECIFICATIONS

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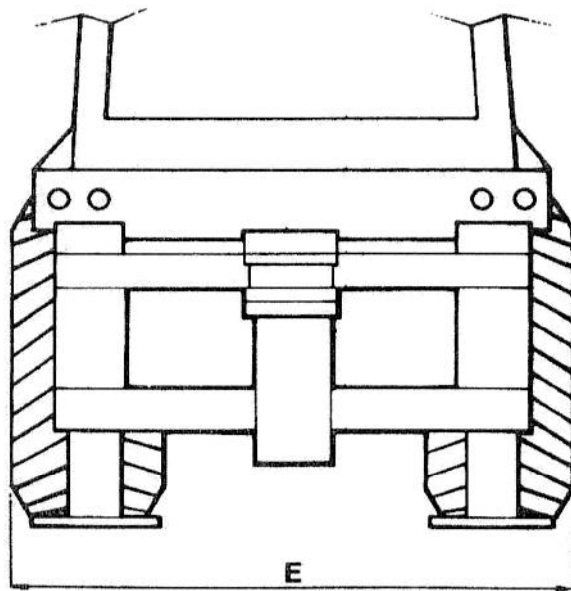
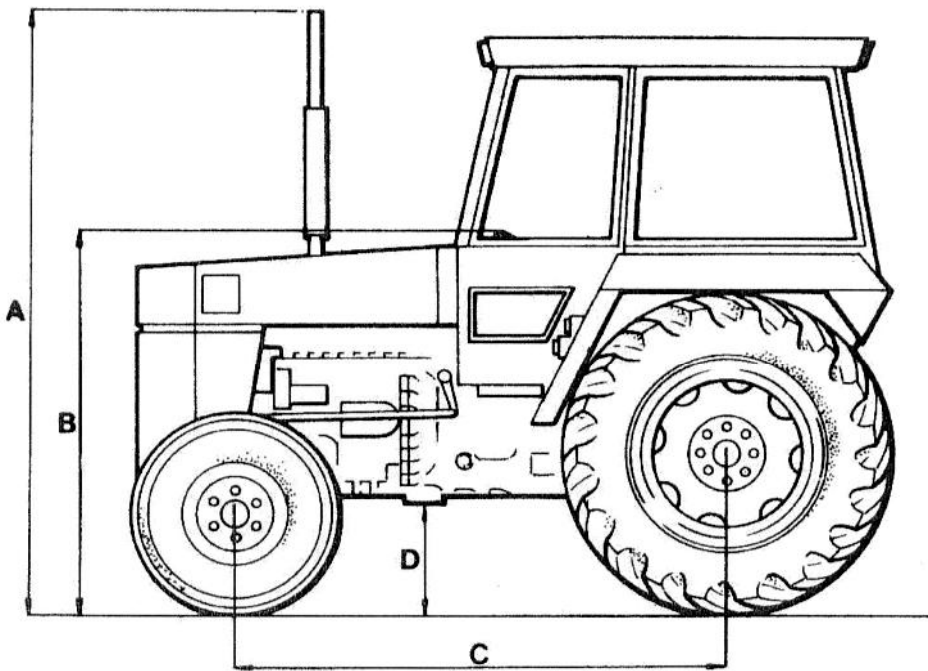
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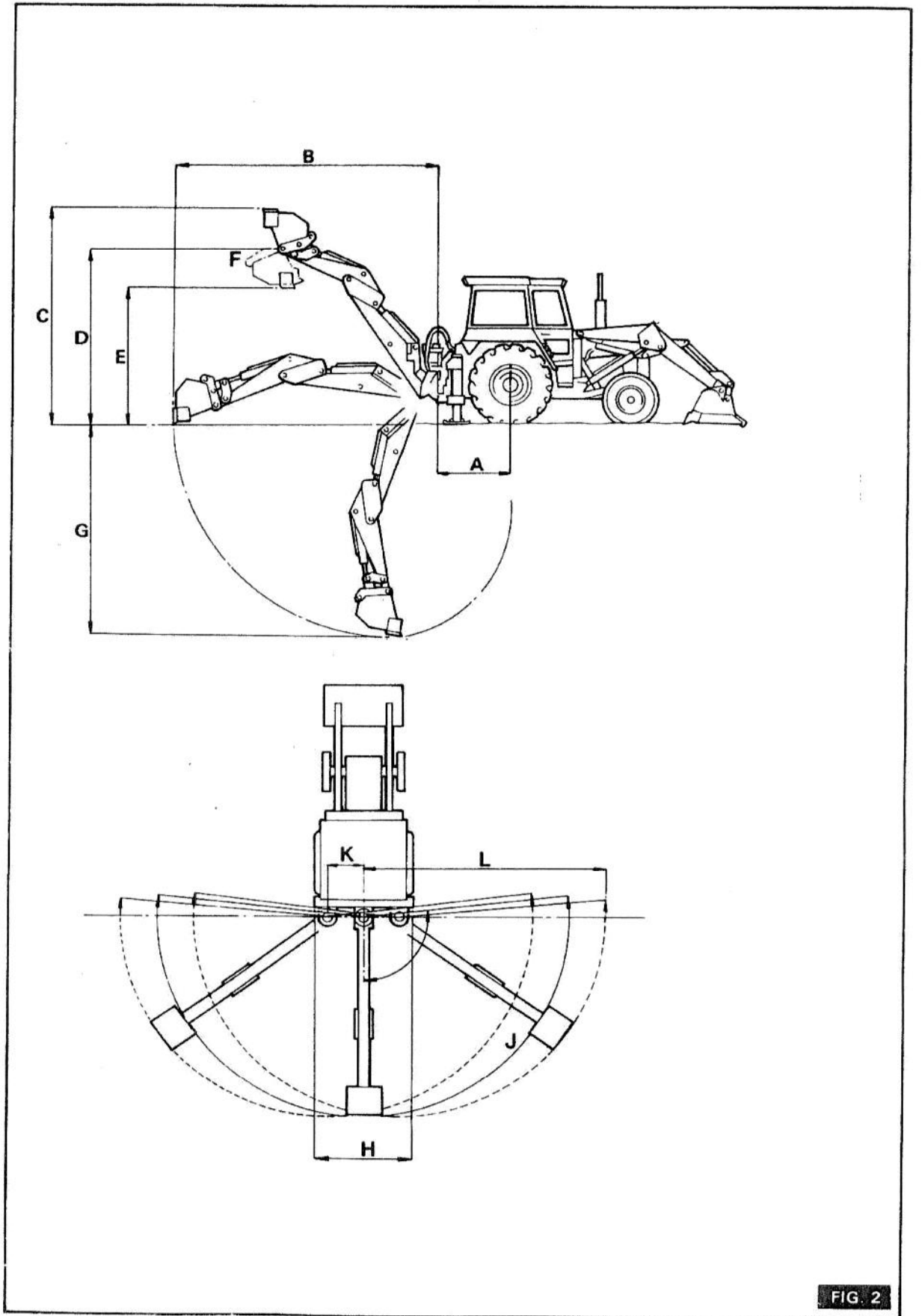


FIG. 2

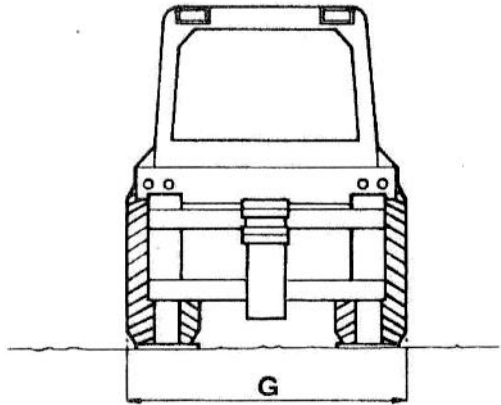
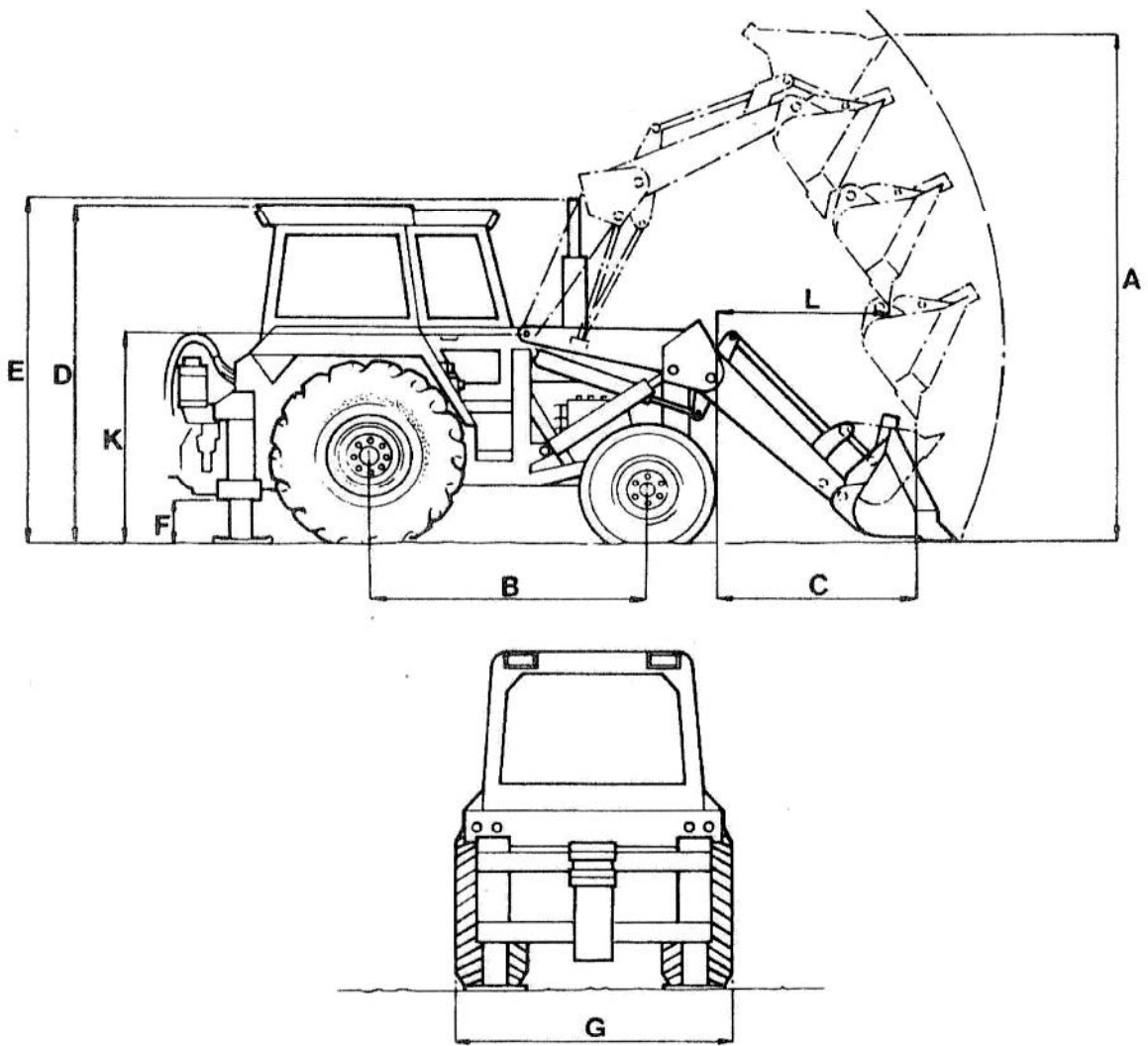


FIG. 3

SPECIFICATIONS

General

This section deals with the specification of the MF 50B Tractor. The tractor is available in two models, one with standard transmission and the other with reversomatic transmission. The reversomatic transmission incorporates a torque converter in place of the usual clutch. The torque converter is operated by two pedals and produces either forward or reverse motion without rear reselection. This method allows rapid backward and forward shuttling between lorry and work pile. Standard equipment includes full power steering, five plate wet brakes, full lighting, heater and hazard warning lights.

Key to Fig 1

A	Overall height to exhaust	104" (2640 mm.)
B	Overall height over steering wheel	73" (1855 mm.)
C	Wheel base	81½" (2100 mm.)
D	Ground clearance	16" (406.4 mm.)
E	Overall width	82" (2085 mm.)

GENERAL

Total weight, with fuel, oil, water loader, digger and cab, less operator	13,300 lb. (6050 kg.)
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ENGINE

Maker	Perkins – to M.F. Specifications
Type and Model	Diesel A4.212 – Direct Injection
Number of Cylinders	4
Bore	3.875 (98.43 mm.)
Stroke	4.5 in. (114.3 mm.)
Capacity	212 cu. ins. (3.47 litres)
Compression Ratio	15.5:1
Firing Order	1, 3, 4, 2.
B.H.P. Governed Speed	62 at 2,000 rpm
Maximum Torque	173 lb/ft (23.7 kg/m) at 1250 rpm.
Lubrication	System Pressure 50 - 65 p.s.i. (3.515 - 4.75 kg/cm ²). Replacement cartridge type, oil filter, full flow external. Overhead type
Valves	
Working Valve Tip Clearance	
Inlet	0.012 in. (0.30 mm.) cold
Exhaust	0.010 in. (0.25 mm.) hot
Fuel Lift Pump	A.C. Delco
Fuel Filters	Two with replaceable elements. Primary incorporates transparent sediment bowl.
Injection Pump	C.A.V. Distributor type fitted with mechanical governor.
Fuel Injectors	C.A.V. type nozzles and nozzle holders. Injection timing 22° B.T.D.C. Working Pressure, 170 A.T.S. Initial Setting (New Injector) 175 A.T.S.
Easy Starting Aid	C.A.V. Thermostart Mark IIIC.
Air Cleaner	Dry element, removable for cleaning.

GENERAL . . . Cont'd**COOLING SYSTEM**

System Pressure	10 p.s.i. (0.703 kg/cm ²). Circulation assisted by centrifugal pump driving a cooling fan.
Normal Temperature	170° - 180°F (76.7° - 82.2°C)
Fan Belt Deflection	¼ in (19 mm) midway between fan pulley and crankshaft pulley.

ELECTRICAL SYSTEM

Voltage	12 volt - NEGATIVE EARTH.
Battery	12 volt Heavy Duty 96 amp hour in 20 hours (Standard Transmission). 12 volt Heavy Duty 125 amp hour, (Reversomatic Transmission). Lucas M50 Solenoid engaged pinion. Lucas 18 A.C.R. Front and Rear worklamps fitted as integral part of cab. Headlights Panel Lights Interior Lights Side Lights Indicator Lights Tail Lights Number Plate Lights Front windscreen wiper Rear wiper optional
Starter Motor	
Alternator	
Lights	
Cab	
Heater	

TRANSMISSION

Standard Range	Single clutch Laycock Spicer (composite) 12 in. drive disc, coil spring operated.
Dual Range	Constant mesh spur primary reduction gears with three speed forward and one reverse sliding spur gear compounded by a planetary reduction gear set on the output end of the mainshaft to provide 6 speeds forward and 2 reverse. 3.14:1 Bevel drive with epicyclic final hub reduction gives a ratio of 10.86:1
Planetary Reduction Final Drive	Automatic shuttle transmission with hydraulically operated clutches for forward and reverse travel. Shuttle transmission comprises two speed sliding spur gear and 4:1 planetary reduction gear giving 4 speeds forward, 4 reverse. Two multi-plate clutch packs combine with a gear train so that engagement of forward clutch locks the input shaft to the output shaft and reverse clutch 'drive' and 'driven' plates are forced to counter rotate. Engagement of the reverse clutch locks the reverse gear to the output shaft creating drive from the input shaft, through the reverse idler and layshaft causing forward clutch 'drive' and 'driven' plates to counter rotate.
Instant Reverse Transmission	Bevel drive with epicyclic final hub reduction giving a ratio of 10.9:1.
Final Drive	

GENERAL . . . Cont'd

ROAD SPEEDS

STANDARD TRANSMISSION

16.9/14 - 28 (10 Ply) Tyres
No allowance made for Tyre Slip.

SELECTED GEAR		m.p.h.	2000 r.p.m.	k.p.h.
LOW	1st	1.4		2.3
	2nd	2.1		3.4
	3rd	3.8		6.0
	Rev.	1.9		3.0
HIGH	1st	5.5		8.9
	2nd	8.3		13.3
	3rd	15.2		24.4
	Rev.	7.5		12.0

REVERSOMATIC TRANSMISSION

16.9/14 - 28 (10 Ply) Tyres
No allowance made for Tyre Slip.

SELECTED GEAR		m.p.h.	2000 r.p.m.	k.p.h.
FORWARD	1st	1.7		2.7
	2nd	4.6		7.4
	3rd	6.6		10.7
	4th	18.5		29.7
REVERSE	1st	1.7		2.7
	2nd	4.6		7.4
	3rd	6.6		10.7
	4th	18.5		29.7

STEERING

Type	Power Steering worm and peg with single Pitman arm.
Pump	Plessey
Relief Valve	1450 - 1600 p.s.i. (101.50 - 112.48 kg/cm ²).
Turning Circle Between Kerbs	27 ft. 5 in. (8360 mm).
Tyre Size	Front 9.00 x 16 (10 Ply) tubeless. Rear 16.9 x 14.28 (10 Ply) tubeless.
Tyre Pressure	Front 50 p.s.i. (3.52 kg/cm ²). Rear 26 p.s.i. (1.41 kg/cm ²).

GENERAL . . . Cont'd

BRAKES

Service Brake	Mechanically operated five plate disc brakes, fully enclosed, oil immersed.
Parking Brake (Duel Brakes)	Mechanical Linkage to 14 in. x 2 in. (35.5 cm x 5.08 cm) wheel drum brakes on each driven wheel.

CAPACITIES

Fuel Tank	17 Imp Gallons (20.4 U.S. Gallons; 77.3 litres).
Engine Sump (inc. Filters)	Dipstick low :— 10½ pints (1.575 U.S. Gallons; 5.96 litres).
	full : — 16 pints (2.4 U.S. Gallons; 9.09 litres)
Transmission and Axle Standard	7.2 Imp. galls. (8.64 U.S. Gallons; 32.2 litres)
Instant Reverse	6.7 Imp. galls. (8.04 U.S. Gallons; 30.5 litres)
Torque Converter	2.1 Imp. galls. (2.52 U.S. Gallons; 9.55 litres). Reverso-matic Transmission.
Epicyclic Hubs	2 pints (0.3 U.S. Gallons; 1.14 litres)
Steering Gearbox	2 pints (0.3 U.S. Gallons; 1.14 litres)
Cooling System	3 Imp. galls. (3.6 U.S. Gallons; 13.64 litres)
Power Steering Reservoir	1½ pints (0.85 litres)

SPECIFICATIONS - DIGGER

General

The MF 50B Digger is designed for use with the 50B Tractor and 50B Loader.

The digger is operated by means of a seven spool valve. A reversible seat is incorporated on the 50B tractor and when swivelled round this seat becomes the digger control position. A platform around the tractor seat enables the operator to transfer to the digger control position quickly and safely.

KEY TO FIG. 2

A	Length from pivot post to centre rear axle	50"
B	Maximum digging reach from pivot	209"
C	Maximum height fully raised	130"
D	Transport height	122"
E	Clearance height maximum	123"
F	Bucket angular movement	190"
G	Maximum digging depth	169"
H	Width	81½"
J	Total slewing arc	186"
K	Maximum offset position	24½"
L	Maximum side reach, boom fully offset	230½"

WEIGHT

Basic weight digger unit plus spool valve and covers	3480 lb. (1579 kg).
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GENERAL**WEIGHT . . . Cont'd**

Weight of attaching sills, links and pins	258 lb. (117 kg).
Weight of foot well	110 lb. (50 kg).
Total weight of digger plus attachment parts, foot well and 24 in. (60 cm.) trench bucket	4209 lb. (1909 kg).

HYDRAULIC SYSTEM

Pump (Supplied with loader)	Dowty gear type, driven from front of engine crankshaft.
Pump Output	23.8 Imp. Gallons (28.5 U.S. Gallons; 108 litres) per minute at 2000 r.p.m.
System Pressure	2500 - 2650 p.s.i. (175 - 185 kg/sq.cm.).
System Capacity (including loader)	12 Imp. Gallons (14.4 U.S. Gallons; 5.4 litres).
System Capacity (excluding loader)	5½ Imp. Gallons (6 U.S. Gallons; 23.9 litres).

ATTACHMENTS

French Buckets						
Size (ins. and cms.)	12 (30)	18 (45)	24 (60)	30 (76)	36 (91)	42 (106)
Number of teeth	3	3	4	5	6	7
Weight (lbs.)	190	234	345	387	432	398
(kgs.)	86	106	156	175	195	180
S.A.E. rated heaped capacity (cu. ft.)	(2.3)	(3.4)	(6.8)	(8.2)	(10.2)	(7.9)
Ditch Digging Bucket						
Size	Top 48" (121.9 cm.) Bottom 15" (38.1 cm)					
Number of teeth	3					
Weight	357 lbs. (162 kgs).					
S.A.E. rated heaped capacity (cu. ft.)	7 cu. ft. (0.198 cu.m.)					
Ditch Cleaning Bucket						
Size	48" (121.9 cm.)					
Extensions (2)	12 (30).					
Weight	342 lbs. (155 kgs.) with extensions					
Capacity	4 cu. ft. (0.113 cu. m.) without extensions.					

SPECIFICATIONS - LOADER**General**

The MF 50B Loader is designed for use with the 50B Tractor and 50B Digger. The loader is operated by means of a two spool valve. The loader is fitted with a general purpose 1 cu. yd. (765 litres) capacity bucket. As an alternative a 4 in. 7/8 cu. yd. (669 litres) capacity bucket may be fitted.

The design of the bucket ram and linkage is such that the bucket can be completely filled during each cycle and as the bucket can be rolled back through 45° from the horizontal, it will remain full whilst the machine is moved to the unloading point.

Key to Fig 3

A	Overall height, beam raised bucket crowded	165½" (420.4 mm)
B	Wheel base	81½" (207 mm)
C	Maximum reach when bucket dumped at 45°	64" (162.6 mm)
D	Overall height, to top of cab	101½" (254.8 mm)
E	Overall height, without cab	104½" (265.4 mm)
F	Grand Clearance Minimum	10½" (26.7 mm)
G	Overall width, less bucket	84" (213.3 mm)

GENERAL

Lift capacity at full height with bucket	4670 lb. (2120 kg)
Breakout force	7650 lb. (3445 kg)
Maximum lift capacity (SAE to full height, with bucket)	4670 lb. (2120 kg)
Breakout force (SAE)	7650 lb. (3445 kg)
Cycle times:	
Raise to full height	4.3 secs.
Lower time (power)	3.0 secs.
Bucket dump time	1.2 secs.
Bucket crowd time	1.5 secs.

HYDRAULIC SYSTEM

Pump	Dowty gear type, driven from front of engine crankshaft.
Pump Output	23.8 Imp. Gallons (28.5 U.S. Gallons; 108 litres) per minute at 2000 r.p.m.
System Pressure	2500 - 2650 p.s.i. (175 - 185 kg/sq.cm.)
System Capacity (including digger)	12 Imp. Gallons (14.4 U.S. Gallons; 5.4 litres)
System Capacity (excluding digger)	6½ Imp. Gallons (8.1 U.S. Gallons; 30.7 litres)
Filter Type	Full flow with renewable paper element.

ATTACHMENTS

Drott 4 in. 1 Bucket width	80" (203 cm.)
S.A.E. Heaped Capacity	7/8 cu.yd. (1.145 cu.m.)
Number of teeth	7
Weight	1000 lb. (454 kg)
General Purpose Bucket	
Width	83 ¾" (213 cm)
S.A.E. Heaped Capacity	27 cu. ft. (3.924 cu. m.)
Number of teeth	8
Weight	689 lb. (312.4 kg)

**ENGINE REMOVAL
AND INSTALLATION**

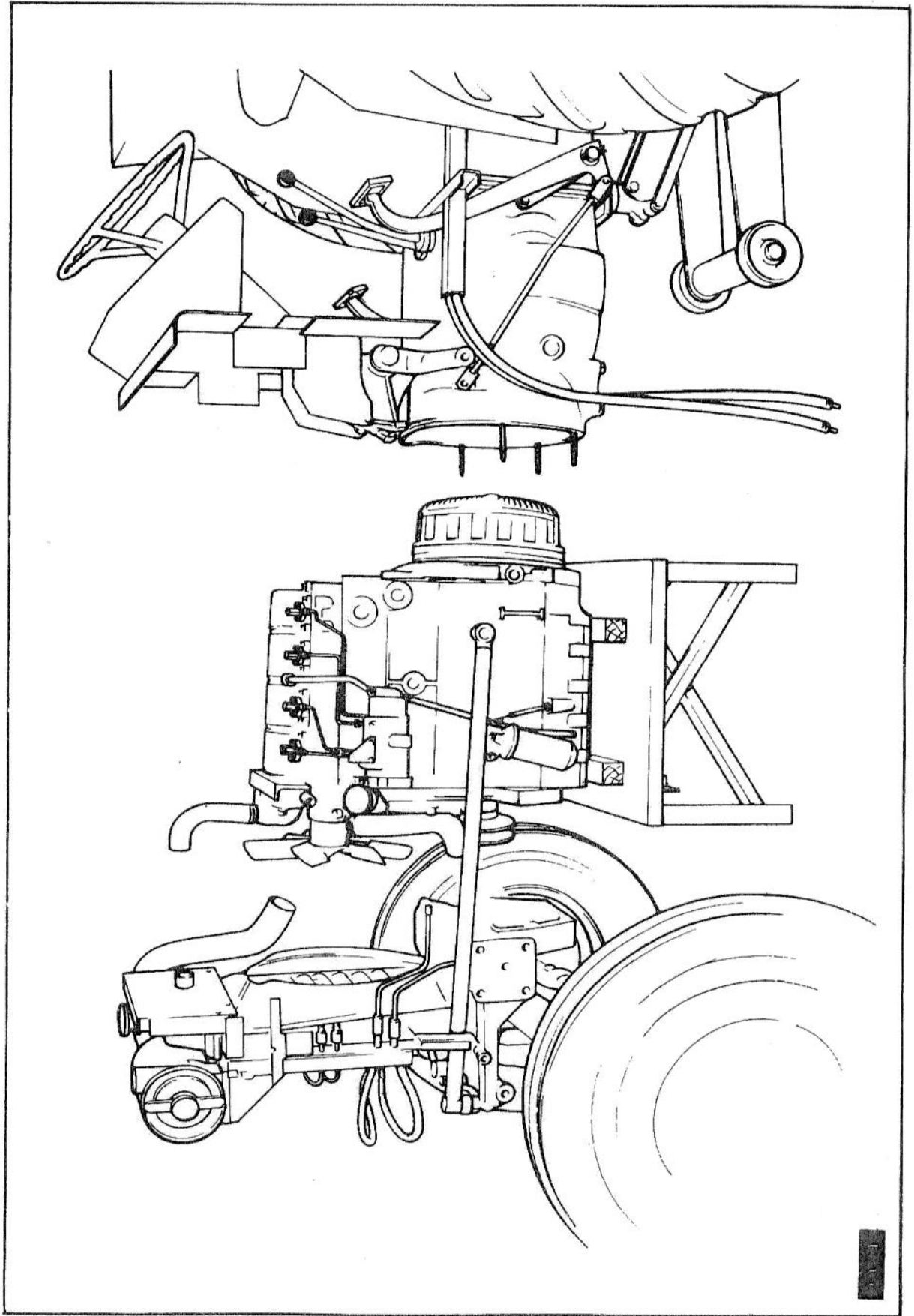
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Fig 1 ENGINE, Removal 4



A4-212 DIESEL ENGINE**Removal****(2A/1)**

1. The operations in this section assume that the cab, digger and loader have been removed from the machine.
2. Remove the hood assembly.
3. Insert wooden wedges between the upper side of the axle and the axle support casting.
4. Remove the drag link from the steering box drop arm.
5. Remove the sump drain plug and drain the engine oil. Refit the drain plug.
6. Remove the oil filter centre securing bolt and remove the filter container and filter.
7. Drain the water from the cylinder block, heater and radiator.
8. Release the fuel tank rear mountings.
9. Position the rails of dismantling stand MF 27X and support the engine sump and transmission housing on rail trolleys.
10. Disconnect the battery leads.
11. Disconnect the wiring from the thermostart, starter motor, alternator, horn, lights and neutral safety switch.
12. Disconnect heater hoses at the water pump.
13. Disconnect the water temperature gauge wire, oil pressure gauge pipe, tachometer cable, tube from the air, filter restriction indicator, fuel sender unit wire.
14. Disconnect the fuel cut-off cable.
15. Release all harness securing clips.
16. Switch off the fuel and disconnect the fuel pipes at the injection pump.
17. Disconnect the fuel pipe between the primary and secondary fuel filters.
18. Disconnect the throttle control rod from the injection pump.
19. Remove the starter motor.
20. Remove the filler and drain plugs and drain the torque converter and instant reverse transmission. Replace the filler and drain plugs in the transmission case.
21. Remove the hydraulic pipes from the transmission case to the oil filter and oil cooler, and the pipes from the oil cooler to the transmission.
22. Remove two bolts securing the torque converter oil filter to the transmission case.
23. Disconnect the torque converter oil thermo unit on the transmission case.
24. Disconnect the torque converter oil pressure gauge pipe.
25. Remove two bolts and spring washers securing the steering box to the engine.
26. Remove the bolts securing the engine to the transmission housing.
27. Push the rear part of the machine out of engagement with the engine.
28. (Fig. 1) Fit support stand MF 27G to the front of the transmission housing and secure with two bolts each side.
29. Support the engine on a table and separate the front axle from the engine as described in operation.

Refitting**(2A/2)**

1. Refit the front axle assembly to the engine as described in operation.
2. Support the transmission on a rail trolley.
3. Remove support stand MF 27G from the front of the transmission housing.
4. Wedge the rear part of the fuel tank in a slightly raised position.
5. Align the transmission with the engine then using guide studs join the two halves together.
6. Bolt the engine to the transmission housing and refit the starter motor.
7. Replace the two bolts and washers securing the steering box to the engine.
8. On instant reverse transmission machines connect the torque converter oil pressure gauge pipe.
9. Connect the torque converter oil thermo unit on the transmission case.
10. Refit the torque converter oil filter to the transmission case.
11. Replace the hydraulic pipes from the transmission case to the filter and oil cooler and from the oil cooler to the transmission case.
12. Remove the wedge from under the fuel tank and bolt the fuel tank to the tank support bracket.
13. Reconnect the fuel pipe between the primary and secondary fuel filters and the fuel pipes at the injection pump.

A4-212 DIESEL ENGINE

Refitting . . . Cont'd

14. Reconnect the throttle rod at the injection pump, fuel cut-off cable, tachometer cable, oil pressure pipe, water temperature gauge wire and blockage indicator tube.
15. Reconnect the wiring to the thermostat, alternator, starter motor, horn, lights, fuel sender unit and neutral safety switch. Connect battery leads.
16. Secure wiring harness with clips.
17. Reconnect the heater hoses at the water pump.
18. Clean the oil filter container, fit a new element, and sealing rings and refit the container to the engine.
19. Refill the torque converter and instant reverse transmission with oil of the correct grade up to the full level.
20. Refill the engine with oil up to the full mark on the dipstick.
21. Fit the drag link back onto the drop arm.
22. Remove the wooden wedges from between the axle and the axle support casting. Then remove the rail trolley.
23. Replace the hood assembly.
24. Open the fuel shut-off tap and bleed the fuel system.
25. Refill the engine cooling system with fresh water containing the correct amount of anti-freeze solution as required.