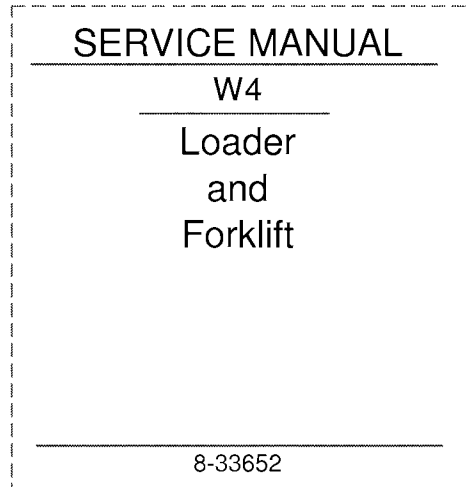


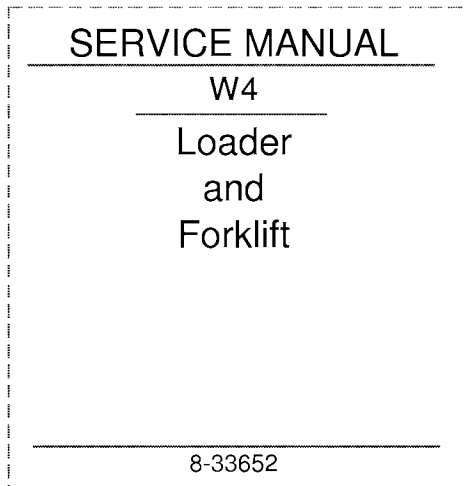
1. Trim along dashed line.
2. Slide into pocket on Binder Spine.

TYPE 1-4



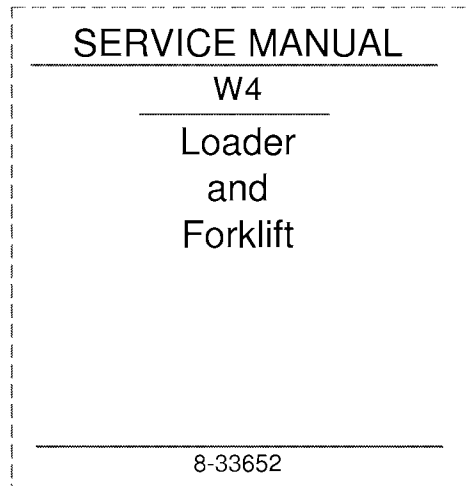
1. Trim along dashed line.
2. Slide into pocket on Binder Spine.

TYPE 1-4



1. Trim along dashed line.
2. Slide into pocket on Binder Spine.

TYPE 1-4



1. Trim along dashed line.
2. Slide into pocket on Binder Spine.

TYPE 1-4

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Mitsubishi Diesel Engine 4DQ50 (2.1 litres)		99609-10111
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Reprinted

NOTES

Section 1001

SAFETY RULES SERVICE MANUAL INTRODUCTION AND TORQUE SPECIFICATIONS

Written in *Clear
And
Simple
English*

**Thanks very much for your reading,
Want to get more information,
Please click here, Then get the complete
manual**

JustClickHere 

NOTE:

**If there is no response to click on the link above,
please download the PDF document first, and then
click on it.**


**Have any questions please write to me:
admin@servicemanualperfect.com**


SAFETY RULES


 This Symbol Shows Important Information About Safety In This Manual. When You See This Symbol, Carefully Read The Information That Follows and Understand The Possible Causes of Injury Or Death. 1-1-A


IMPORTANT: To prevent injury on job, follow the Warning, Caution, and Danger notes in this section and other sections throughout this manual. Follow the instructions carefully.


The procedures recommended and shown in this manual are good, effective service methods. However, all possible procedures and service hazards may not be covered. Therefore, if you use a tool or procedure not recommended, you must make sure that the method you select is a safe method.

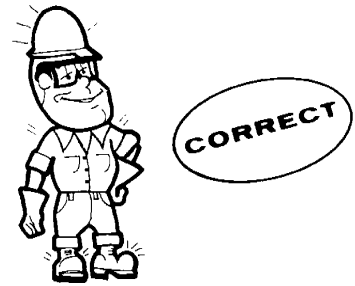
 **DANGER:** Engine exhaust fumes can cause death. If it is necessary to start the engine in a closed place, remove the exhaust fumes from the area with an exhaust pipe extension. If you do not have an exhaust pipe extension, open the doors and get outside air into the area. 48-56


 **WARNING:** Read operator's manual to familiarize yourself with control lever functions. 46-27


 **WARNING:** Operate tractor and equipment controls from the seat position only. Any other method could result in serious injury. 48-55


 **WARNING:** This is a one man machine, no riders allowed. 35-8

 **WARNING:** If you wear clothing that is too loose or do not use the correct safety equipment for your job, you can be injured. Always wear clothing that will not catch on objects. Extra safety equipment that can be required includes hard hat, safety shoes, ear protection, eye or face protection, heavy gloves and reflector clothing. 45-3-A



 **WARNING:** When working in the area of the fan belt with the engine running, avoid loose clothing if possible, and use extreme caution. 35-4

 **WARNING:** Whenever the bucket must be raised to aid in servicing, block the loader arms in place with lift cylinder support strut or a suitable safety stand. 23-7-B

 **WARNING:** When doing checks and tests on the equipment hydraulics, follow the procedures as they are written. DO NOT change the procedure. 47-44



WARNING: When putting the hydraulic cylinders on this machine through the necessary cycles to check operation or to remove air from a circuit, make sure all people are out of the way. 47-45



WARNING: Locate the machine on level ground and block the wheels securely before working under the machine. Failure to follow the above procedure can result in personal injury. 46-77



WARNING: Use insulated gloves or mittens when working with hot parts. 47-41A



CAUTION: Pin sized and smaller streams of hydraulic oil under pressure can penetrate the skin and result in serious infection. If hydraulic oil under pressure does penetrate the skin, seek medical treatment immediately. Maintain all hoses and tubes in good condition. Make sure all connections are tight. Make a replacement of any tube or hose that is damaged or thought to be damaged. DO NOT use your hand to check for leaks; use a piece of cardboard or wood. 40-6-A



CAUTION: When removing hardened pins such as a pivot pin, or a hardened shaft, use a soft head (brass or bronze) hammer or use a driver made from brass or bronze and a steel head hammer. 46-17



CAUTION: When using a hammer to remove and install pivot pins or separate parts, using compressed air or using a grinder, wear eye protection that completely encloses the eyes (approved goggles or other approved eye protectors). 46-13



CAUTION: When servicing or repairing the machine, keep the shop floor and operator's compartment and steps free of oil, water, grease, tools, etc. Use an oil absorbing material and/or shop cloths as required. Use safe practices at all times. 40-8



CAUTION: Use suitable floor (service) jacks or chain hoists to raise wheels or track off the floor. Always block machine in place with suitable safety stands. 40-7-A



CAUTION: Some components of this machine are very heavy. Use suitable lifting equipment or additional help as instructed in this service manual. 40-10

SERVICE MANUAL INTRODUCTION

This service manual has been prepared with the latest service information available. Troubleshooting, removal, disassembly, inspection and installation procedures, and complete specifications and tightening references can be found in most sections. Some sections have drawings without a written procedure because the job is so easily done. This service manual is one of the most important tools available to the service technician.

Right-Hand and Left-Hand

The terms right-hand and left-hand and front and rear as used in this manual indicate the right and left sides, and front and rear of the machine as seen from the operator's seat for correct operation of the machine or attachment.

Text

If the service manual is for more than one machine or different models of components (planetary axles, gear boxes, control valves, etc.) the procedures have the steps necessary to service each model.

Table of Contents

A Table of Contents is in the front of this manual. The Table of Contents shows the main divisions and the sections that are in each division. The individual sections, where necessary, have a Table of Contents on the second page of that section.

Page Numbers

All page numbers are made of two numbers separated by a dash, such as 4002-9. The number before the dash is the section number. The number following the dash is the page number in that section. Page numbers will be found at the upper right or left of each page. -

Illustrations

Illustrations are put as near as possible to the text and are to be used as part of the text.

Torque Specifications

The most common grades of fasteners (bolts, nuts, and screws) used on Case machines are grade 5 and grade 8. See page 1001-6 for torque specifications and identification marks.

The specifications in this section are standard torque values and are to be used on all fasteners during assembly and installation unless special torque values are shown in a section.

Rev. May 1982

P.I.N., Serial and Model Numbers

When replacement parts are needed, it is necessary to give the parts department one or all of the numbers. The model number is normally found on the Product Identification Number plate or Serial Number plate.

The Product Identification Number (P.I.N.) and serial numbers will be found in the following locations.

Machine - Product Identification Number plate fastened to the front frame above the parking brake.

1.8 Litre Diesel Engine - A serial number plate is on the left-hand side of the engine below the preheaters.

2.1 Litre Diesel Engine - A serial number is stamped on the left-hand side of the engine in front of the tachometer drive.

ROPS - Serial number plate fastened to the left-hand side of the ROPS.

Forklift - Serial number is stamped on the right-hand side of the outer frame assembly.

Components - A serial number plate is on many components such as starters, alternators, pumps, etc.

Classification of Lubricants

The SAE number is the viscosity of engine oils; for example, SAE 30, a single viscosity oil. SAE 10W30 is a variable viscosity oil.

The API classification (SD, CD, etc.) is the oil performance in terms of engine usage. Only oil specified in Section 1002 can be used. These oils have the needed chemical additives to give maximum engine protection. Both the SAE grade and API classification must be found on the container.

Gear Lubricant and Grease

Gear lubricant and grease for each application is specified in Section 1002.

Decals and Painting

All decals about operation of the machine and/or attachments must be in a condition so that you can read the decals easily. Replace any decal that is damaged or cannot be read.

All decals that start with the words WARNING, CAUTION, or DANGER must be in a condition so that you can read the decals easily. Replace any decal that is damaged or cannot be read.

When you paint the machine or attachment, put covers over the good decals and remove the decals which have damage or cannot be read easily. Use enamel thinner to make the decal easier to remove.

Remove the old decal before you install a new decal. Use enamel thinner to make the old decal easier to remove.

Special Tools

Special tools are needed to remove and install, disassemble and assemble, check and adjust some component parts of this machine. Some special tools can be easily made locally and the necessary information to make the tool is in this service manual. Other special tools are more difficult to make locally and are available from Service Tools in the U.S. and from Jobborn Manufacturing in Canada. Use these tools according to the instructions in this service manual for your personal safety and to do the job correctly.


Order special tools from either of the following companies:


Service Tools
P.O. Box 314
Owatonna, Minnesota 55060

Jobborn Manufacturing Co.
97 Frid Street
Hamilton, Ontario L8P 4M3
Canada

U.S. AND METRIC TORQUE SPECIFICATIONS

Torque values for all situations unless special torque is specified

Grade 5 Bolts, Nuts, and Studs			
			
Thread Size	Pound-Feet	Newton metres	Kilogram metres
1/4 - 20	7-9	9-12	1.0-1.2
1/4 - 28	11-13	15-18	1.5-1.8
6.4 mm			
5/16 - 18	10-15	15-20	1.4-2.1
5/16 - 24	15-20	20-25	2.1-2.8
7.9 mm			
3/8 - 16	20-25	25-35	2.8-3.4
3/8 - 24	25-30	35-40	3.4-4.1
9.5 mm			
7/16 - 14	30-40	40-55	4.1-5.5
7/16 - 20	35-45	45-60	4.8-6.2
11.1 mm			
1/2 - 13	50-60	70-80	6.9-8.3
1/2 - 20	60-70	80-95	8.3-9.7
12.7 mm			
9/16 - 12	70-90	95-120	9.7-12.4
9/16 - 18	80-100	110-135	11.0-13.8
14.3 mm			
5/8 - 11	100-120	135-160	13.8-16.6
5/8 - 18	120-150	160-200	16.6-20.7
15.9 mm			
3/4 - 10	180-220	245-300	24.9-30.4
3/4 - 16	200-240	270-325	27.7-33.2
19.0 mm			
7/8 - 9	290-350	390-475	40.1-48.4
7/8 - 14	325-400	440-540	44.9-55.3
22.2 mm			
1 - 8	430-530	580-720	59.4-73.3
1 - 12	480-580	650-785	66.4-80.2
25.4 mm			
1-1/8 - 7	540-660	730-895	74.7-91.2
1-1/8 - 12	595-725	805-980	82.3-100.2
28.6 mm			
1-1/4 - 7	755-925	1025-1255	104.4-127.9
1-1/4 - 12	830-1010	1125-1370	114.8-139.6
31.8 mm			
1-3/8 - 6	990-1210	1340-1640	136.9-167.3
1-3/8 - 12	1135-1385	1540-1860	156.9-191.5
34.9 mm			
1-1/2 - 6	1315-1610	1780-2180	181.8-222.6
1-1/2 - 12	1475-1800	2000-2440	203.9-248.9
38.1 mm			

Grade 8 Bolts, Nuts, and Studs			
			
Thread Size	Pound-Feet	Newton metres	Kilogram metres
1/4 - 20	5-10	7-15	.7-1.4
1/4 - 28	10-15	15-20	1.4-2.1
6.4 mm			
5/16 - 18	15-20	20-30	2.1-2.8
5/16 - 24	20-25	30-35	2.8-3.4
7.9 mm			
3/8 - 16	30-40	40-50	4.1-5.5
3/8 - 24	35-40	40-55	4.8-5.5
9.5 mm			
7/16 - 14	40-60	55-80	5.5-8.3
7/16 - 20	55-65	75-90	7.6-9.0
11.1 mm			
1/2 - 13	70-90	95-120	9.7-12.4
1/2 - 20	80-100	110-135	11.1-13.8
12.7 mm			
9/16 - 12	100-120	135-160	13.8-16.6
9/16 - 18	120-140	160-190	16.6-19.4
14.3 mm			
5/8 - 11	150-190	200-260	20.7-26.3
5/8 - 18	160-200	220-270	22.1-27.7
15.9 mm			
3/4 - 10	250-310	340-420	34.6-42.9
3/4 - 16	290-350	390-475	40.1-48.4
19.0 mm			
7/8 - 9	415-505	560-685	57.4-69.8
7/8 - 14	450-550	610-745	62.2-76.0
22.2 mm			
1 - 8	610-750	870-1015	84.3-103.7
1 - 12	665-815	900-1105	91.9-112.7
25.4 mm			
1-1/8 - 7	865-1055	1170-1430	119.6-145.9
1-1/8 - 12	970-1190	1315-1610	134.1-164.5
28.6 mm			
1-1/4 - 7	1225-1495	1660-2025	169.4-206.7
1-1/4 - 12	1350-1650	1830-2235	186.6-228.1
31.8 mm			
1-3/8 - 6	1600-1960	2170-2655	221.2-271.0
1-3/8 - 12	1835-2245	2490-3045	253.8-310.4
34.9 mm			
1-1/2 - 6	2125-2595	2880-3520	293.8-358.8
1-1/2 - 12	2395-2925	3245-3965	331.1-404.4
38.1 mm			

TORQUE SPECIFICATIONS - STEEL HYDRAULIC FITTINGS

Tube OD Hose ID	Thread Size	Pound- Feet	Newton metres	Kilogram metres
37 Degree Flare Fittings				
1/4 in 6.4 mm	7/16-20	6-12	8-16	0.8-1.7
5/16 in 7.9 mm	1/2-20	8-16	11-21	1.1-2.2
3/8 in 9.5 mm	9/16-18	10-25	14-33	1.4-3.5
1/2 in 12.7 mm	3/4-16	15-42	20-56	2.1-5.8
5/8 in 15.9 mm	7/8-14	25-58	34-78	3.5-8.0
3/4 in 19.0 mm	1-1/16-12	40-80	54-108	5.5-11.1
7/8 in 22.2 mm	1-3/16-12	60-100	81-135	8.3-13.9
1.0 in 25.4 mm	1-5/16-12	75-117	102-158	10.4-16.2
1-1/4 in 31.8 mm	1-5/8-12	125-165	169-223	17.3-22.8
1-1/2 in 38.1 mm	1-7/8-12	210-250	285-338	29.0-34.6

Tube OD Hose ID	Thread Size	Pound- Feet	Newton metres	Kilogram metres
Straight Threads with O-ring				
1/4 in 6.4 mm	7/16-20	12-19	16-25	1.7-2.6
5/16 in 7.9 mm	1/2-20	16-25	22-33	2.2-3.5
3/8 in 9.5 mm	9/16-18	25-40	34-54	3.5-5.5
1/2 in 12.7 mm	3/4-16	42-67	57-90	5.8-9.3
5/8 in 15.9 mm	7/8-14	58-92	79-124	8.0-12.7
3/4 in 19.0 mm	1-1/16-12	80-128	108-174	11.1-17.8
7/8 in 22.2 mm	1-3/16-12	100-160	136-216	13.8-22.1
1.0 in 25.4 mm	1-5/16-12	117-187	159-253	16.2-25.9
1-1/4 in 31.8 mm	1-5/8-12	165-264	224-357	22.8-36.5
1-1/2 in 38.1 mm	1-7/8-12	250-400	339-542	34.6-55.3

Split Flange Mounting Bolts			
Size	Pound- Feet	Newton metres	Kilogram metres
5/16-18	15-20	20-27	2.1-2.8
3/8-16	20-25	26-33	2.8-3.5
7/16-14	35-45	47-61	4.7-6.2
1/2-13	55-65	74-88	7.6-9.0
5/8-11	140-150	190-203	19.4-20.7

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NOTES

Section 1002

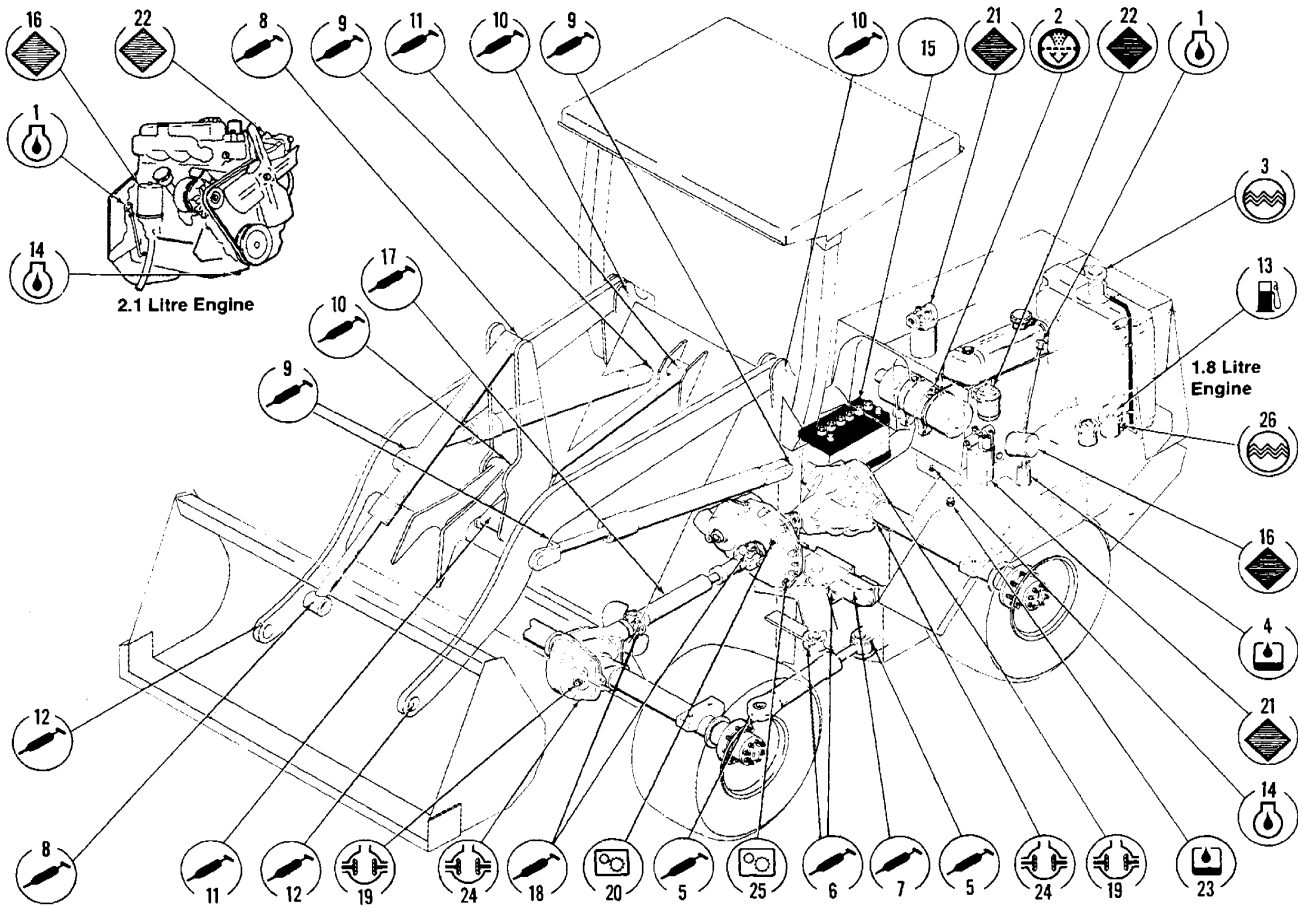
MAINTENANCE AND LUBRICATION

Written In *Clear
And
Simple
English*

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LOADER SERVICE POINTS



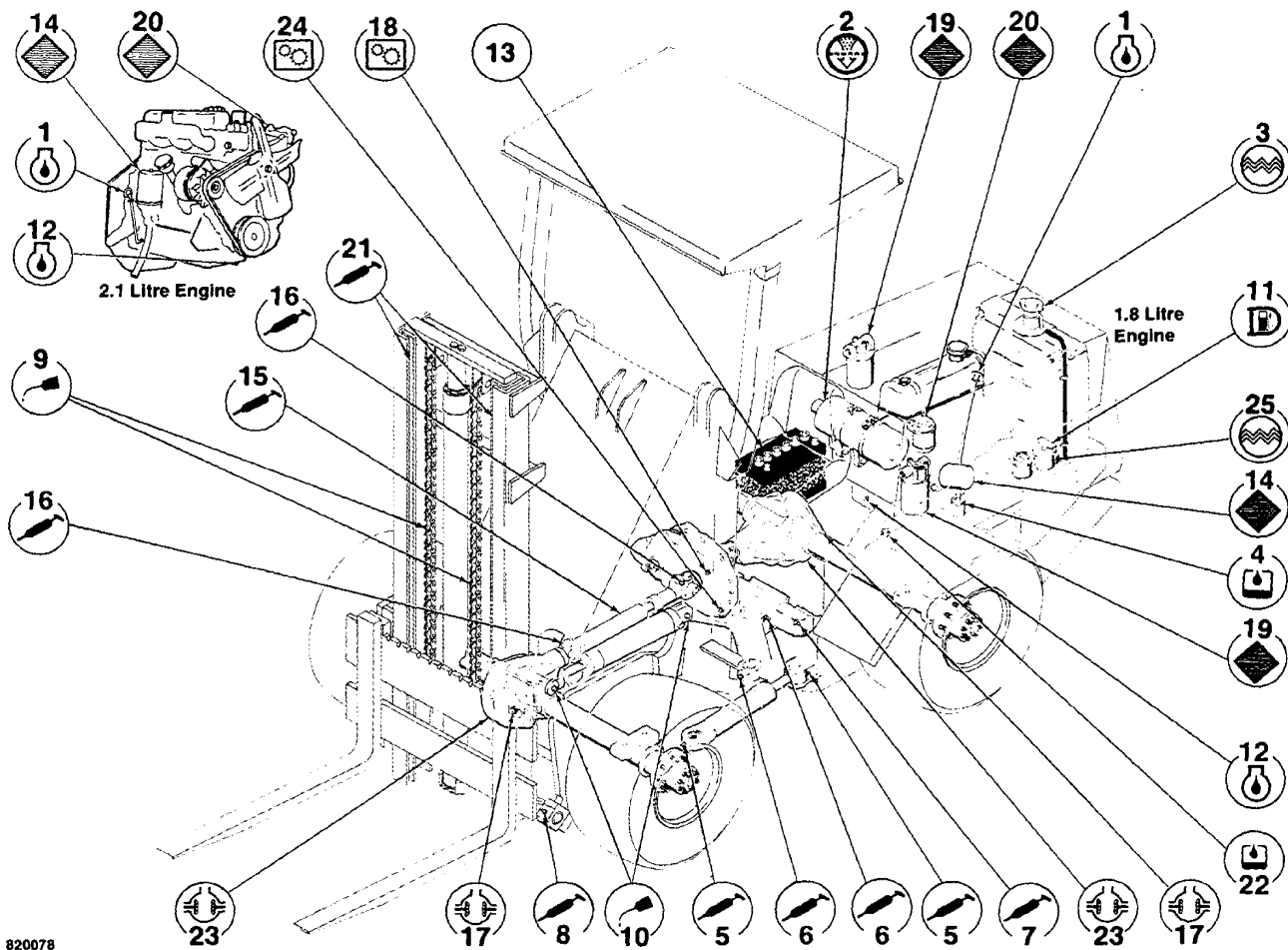
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REF NO. SERVICE POINT	SERVICE REQUIRED	FREQUENCY
1 Engine Oil Dipstick 2 Engine Air Cleaner 3 Radiator 4 Hydraulic Oil Reservoir 5 Steering Cylinder (both ends) 6 Center Pivot Grease Fitting (2 places) 7 Slide Grease Fitting (2 places if equipped) 8 Bucket Cylinder Pivots 9 Lift Cylinder Pivots 10 Lift Arm Pivots 11 Bucket Leveler Arm (3 places) 12 Bucket Pivots	*Check level - fill as required Check and service as required Check coolant level. Add coolant as required Check level - fill as required Lubricate with No. 2 Lithium Base Grease Lubricate with No. 2 Lithium Base Grease Lubricate with No. 2 Lithium Base Grease Lubricate with No. 2 Lithium Base Grease Lubricate with No. 2 Lithium Base Grease Lubricate with No. 2 Lithium Base Grease Lubricate with No. 2 Lithium Base Grease Lubricate with No. 2 Lithium Base Grease	Daily or after every 10 hours of operation
13 Fuel Tank	Fill at the end of each day of operation	Daily
14 Engine Oil Drain	*Drain and fill with new oil	After every 50 hours of operation
15 Battery	Check and service as required	After every 50 hours of operation or weekly
16 Engine Oil Filter 17 Drive Shaft Grease Fitting 18 Front and rear U-Joint Grease Fitting 19 Front and rear Axles 20 2-Speed Transmission	*Replace with new filter Lubricate with No. 2 Lithium Base Grease Lubricate with No. 2 Lithium Base Grease Check fluid level - fill as required Check fluid level - fill as required	After every 100 hours of operation
21 Hydraulic Oil Filters 22 Fuel Filter	**Replace with new filters Replace with new filter	After every 250 hours of operation
23 Hydraulic Oil Reservoir Drain 24 Front and Rear Axle Drain 25 2-Speed Transmission Drain	Drain and fill with new oil Drain and fill with new oil Drain and fill with new oil	After every 100 hours of operation or yearly
26 Radiator Drain	Drain and flush cooling system. Fill with new coolant	After every 2000 hours or yearly

*The engine oil and filter must be changed initially after the first 25 hours of operation. Check oil level at 3 hour intervals during this period.

**The hydraulic oil filters must be changed initially after the first 25 hours of operation.

FORKLIFT SERVICE POINTS



820078

REF NO. SERVICE POINT	SERVICE REQUIRED	FREQUENCY
1 Engine Oil Dipstick 2 Engine Air Cleaner 3 Radiator 4 Hydraulic Oil Reservoir 5 Steering Cylinder (both ends) 6 Center Pivot Grease Fitting (2 places) 7 Slide Grease Fitting (2 places if equipped) 8 Mast Tilt Pivots (2) 9 Forklift Chain 10 Mast Tilt Cylinders	*Check level - fill as required Check and service as required Check coolant level. Add coolant as required Check level - fill as required Lubricate with No. 2 Lithium Base Grease Lubricate with No. 2 Lithium Base Grease Lubricate with No. 2 Lithium Base Grease Lubricate with No. 2 Lithium Base Grease Lubricate with Case Chain and Cable Lubricant (Part No. B17082) Lubricate with Case Chain and Cable Lubricant (Part No. B17082)	Daily or after every 10 hours of operation
11 Fuel Tank	Fill at the end of each day of operation	Daily
12 Engine Oil Drain	*Drain and fill with new oil	After every 50 hours of operation
13 Battery	Check and service as required	After every 50 hours of operation or weekly
14 Engine Oil Filter 15 Drive Shaft Grease Fitting 16 Front and Rear U-Joint Grease Fitting 17 Front and Rear Axles 18 2-Speed Transmission	*Replace with new filter Lubricate with No. 2 Lithium Base Grease Lubricate with No. 2 Lithium Base Grease Check fluid level - fill as required Check fluid level - fill as required	After every 100 hours of operation
19 Hydraulic Oil Filters 20 Fuel Filter 21 Forklift Mast Slides	**Replace with new filters Replace with new filter Lubricate with No. 2 Lithium Base Grease	After every 250 hours of operation
22 Hydraulic Oil Reservoir Drain 23 Front and Rear Axle Drain 24 2-Speed Transmission Drain	Drain and fill with new oil Drain and fill with new oil Drain and fill with new oil	After every 1000 hours of operation or yearly
25 Radiator Drain	Drain and flush cooling system. Fill with new coolant	After every 2000 hours or yearly

*The engine oil and filter must be changed initially after the first 25 hours of operation. Check oil level at 3 hour intervals during this period.

**The hydraulic oil filters must be changed initially after the first 25 hours of operation.

FLUIDS AND LUBRICANTS

Component	Capacity		Specifications
	U.S.	Metric	
Fuel tank	13.2 gallons	49.8 litres	Diesel Fuel, See Operators Manual
Engine crankcase, 1.8 litre diesel engine			Case HDM Oil Alternate engine oil: CD-Commercial class D
Without filter change	4.0 quarts	3.8 litres	Above 68° F (20° C) SAE 30
With filter change	5.0 quarts	4.8 litres	15 to 85° F (-10 to 30° C) SAE 20W
			Below 32° F (0° C) SAE 10W
Engine crankcase, 2.1 litre diesel engine			Case HDM Oil Alternate engine oil: CD-Commercial class D
Without filter change	6.0 quarts	5.7 litres	Above 104° F (40° C) SAE 40
With filter change	7.0 quarts	6.7 litres	25 to 104° F (-5 to 40° C) SAE 30
			10 to 25° F (-15 to -5° C) SAE 20W20
			Below 10° F (-15° C) SAE 10W
Hydraulic oil reservoir	10.0 gallons	38 litres	Automatic transmission fluid (ATF) type "F"
Hydraulic system	15.0 gallons	57 litres	
Transmission	2.7 pints	1.3 litres	Multipurpose Gear Lubricant (API-GL-5) SAE 80-90
Front and Rear Axles (each)	4.0 quarts	3.8 litres	Multipurpose Gear Lubricant (API-GL-5) SAE 80 - 90. IMPORTANT: <i>If the axle has a limited slip differential, the lubricant must have a limited slip additive.</i>
Engine cooling system			Mix an ethylene glycol coolant with water for the lowest outside temperature that is expected. The mixture must be at least 50/50.
1.8 litre diesel engine	8.0 quarts	7.6 litres	
2.1 litre diesel engine	10.0 quarts	9.5 litres	
Battery	As required		Add drinking water or distilled water
Grease fittings	As required		Number 2 Lithium base grease



1.8 Litre Diesel Engine

REPAIR OPERATION MANUAL

Publication Part No. AKM 3934 (2nd Edition)

Published by Austin Morris Limited
A subsidiary of BL Cars Limited

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SPECIFICATION

Purchasers are advised that the specification details set out in this Manual apply to a range of engines and not to any particular engine. For the specification of any particular engine purchasers should consult their supplier.

The manufacturers reserve the right to vary their specifications with or without notice, and at such times and in such manner as they think fit. Major as well as minor changes may be involved in accordance with the manufacturer's policy of constant product improvement.

Whilst every effort is made to ensure the accuracy of the particulars contained in this Manual, neither the manufacturer nor the supplier, by whom this Manual is supplied, shall in any circumstances be held liable for any inaccuracy or the consequences thereof.

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MAINTENANCE 10

Routine Maintenance Operations

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