

WORKSHOP SERVICE MANUAL

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1 . INTRODUCTION

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Introduction

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Introduction

A . Using the manual

General

The purpose of this manual is to assist Distributors and Dealers in the efficient installation, maintenance and repair of MASSEY FERGUSON machinery. Carrying out the procedures as detailed, together with the use of special tools where appropriate, will enable the operations to be completed within the time stated in the repair time schedule.

Page numbering

Example : 7C01-3

This manual is divided into parts and sections. Each page contains the following information :

- 7 = Section
- C = Part
- 01 = Sequence number within the Part
- 3 = Page number within the Part

The issue number and the date are indicated at the bottom of the page.

Using the manual

To assist with locating information, each section of the manual is preceded by an index listing the Parts contained in that section.

The preliminary operations to be carried out in order to reach the item involved are listed at the beginning of each Part.

Items are indicated by means of identification marks (circles, squares, triangles).

Meaning of identification marks

- circle ○ (..) identifies part only
- square □ [..] identifies part and indicates an adjustment
- triangle Δ /.. identifies part and indicates an important point to be noted during removal or refitment

Amendments

Amended pages will be issued carrying the same page number as previous pages : only the issue number and the date will change.

Old pages should be destroyed.

Special tools

Where the use of a special tool is necessary in an operation, the tool number is shown following the instruction requiring its use.

Repairs and replacements

When parts have to be replaced, it is essential that only genuine MASSEY FERGUSON parts are used.

Attention is particularly drawn to the following points concerning repairs and the fitting of replacement parts and accessories.

Safety features embodied in the tractor may be impaired if other than genuine parts are fitted.

In certain territories, legislation prohibits the fitting of parts not to the tractor manufacturer's specification.

Torque wrench setting figures given in the Workshop Manual must be strictly adhered to. Locking devices must be fitted where specified. If the efficiency of a locking device is impaired during removal it must be renewed.

The tractor warranty may be invalidated by the fitting of other than genuine MASSEY FERGUSON parts. All MASSEY FERGUSON replacement parts have the full backing of the manufacturer's warranty. MASSEY FERGUSON Distributors and Dealers are obliged to supply only genuine service parts.

Repair time schedule

The sections in the repair time schedule are identical to those in the workshop manual. The Repair Time Schedule is available, under publication number 3378043M1.

**Introduction****B . Specifications****Engine**

Characteristics	MF 6110	MF 6120	MF 6130	MF 6140	MF 6150	MF 6160	MF 6170	MF 6180	MF 6190
PERKINS Model	4.41	4.41	1004.4TLR	1004.4T2	1004-4THR2	1006-6 HR4	1006-6.HR3	1006-6TLR2	1006-THR2
Number of cylinders	4	4	4	4	4	6	6	6	6
Turbocharger	-	-	yes	yes	yes	-	-	yes	yes
Bore, (mm.)	101.1	101.1	100	100	100	100	100	100	100
Stroke, (mm.)	127	127	127	127	127	127	127	127	127
Cubic capacity (litre)	4100	4100	4000	4000	4000	6000	6000	6000	6000
Maxi. engine power DIN (KW)	51.5	58,9	62,6	66,2	69,9	73,5	81	88,3	95,6
P.T.O. power DIN (KW)	47	53	57	59,8	64	68	74	82,3	88,3
At engine speed of rev/min	2200	2200	2200	2200	2200	2200	2200	2200	2200
Maximum torque (Nm)	265	286	325	359	386	403	440	490	530
Engine speed at maximum torque	1400	1400	1400	1400	1200	1200	1200	1400	1400
Idling speed rev/min	750	750	750	850	850	850	850	850	1000
Maximum rated speed rev/min	2200	2200	2200	2200	2200	2200	2200	2200	2200
Maximum no load speed rev/min	2350	2350	2310	2310	2310	2310	2310	2310	2310
Permissible front P.T.O. power at 2200 rev/min (kW)	All the engine power						75		
Maximum torque							328		
Lubrication	Gear type pump - strainer on suction side and external canister type filter(s).								
Valves	Overhead, push-rod operated								
Valves clearance (Cold)									
- Inlet - mm (in)	0.30 (0.012)			0.20 (0.008)					
- Exhaust - mm (in)	0.30 (0.012)			0.45 (0.018)					
Engine oil cooler	no	no	yes	yes	yes	no	no	yes	yes

Fuel system and air cleaner

Supply pump	ACDELCO			
Fuel filter with sediment bowl	Yes			
Number of elements	1		2	
Injection pump	CAV	Lucas		Stanadyne
Injectors and nozzle holders	Lucas		CAV	Stanadyne
Cold weather starting	Thermostart			
Air Cleaner: Two-stage air filter with removable elements for servicing, with centrifugal prefilter and clogging indicator (warning lamp).				



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Electrical system

Voltage:	12 volts negative earth.
Batteries:	2 maintenance free batteries.
Safety start:	operated by the clutch pedal.
Headlights:	European code 40/45 W
Sidelights:	5 W
Rear/brake lights:	21/5 W
Direction indicators:	21 W
Number plate light:	10 W
Work lamps:	55 W - iodine type H3
Instrument panel lighting and warning lights:	3 W - 2 W - 1.2 W
Roof light:	10 W

Cooling

Operation:	Centrifugal pump and pressurised radiator, regulated by thermostat Opening temperature : 82° C (179.2° F) controlled by thermostat.
Fan:	6110/6120/6130/6140/6150 : belt drive 6150: viscostatic 6160/6170/6180/6190 : viscostatic model gear driven water pump.
Belt deflection: (on the longest span)	19 mm (4 cyl. engine), 10 mm (6 cyl. engine).

Transmission



Clutch :	Spring-loaded multiple-disc clutch of oil bath type - 4 discs Pressure-loaded multiple-disc clutch of oil bath type - 5 discs
6110/6120/6130/6140/6150/6160 6170/6180/6190	- 16 or 32 speeds
Gearbox :	- 16 forward speeds
Without Dynashift :	- 16 reverse speeds - reverse shuttle (synchronised)
Creeper gear (option)	Ratio 4 to 1
Super creeper gear (option)	Ratio 7.8 to 1
Dynashift gearbox :	- 32 front speeds - 32 rear speeds - four selectable ratios without declutching - reverse shuttle (synchronised)

VISIBLE-RESULTS





Introduction

Road speeds at 2200 rev/min
6110/6120/6130/6140 - 16.9 - 34 tyres

Speed	Range	Speed-shift	16 SPEED 30 KPH				16 SPEED 40 KPH			
			FORWARD		REVERSE		FORWARD		REVERSE	
			KPH	MPH	KPH	MPH	KPH	MPH	KPH	MPH
1	LOW 	Slow	1.91	1.19	1.86	1.16	2.45	1.52	2.38	1.48
		Fast	2.45	1.52	2.38	1.48	3.10	1.92	3.01	1.87
2		Slow	2.93	1.82	2.85	1.77	3.70	2.30	3.59	2.23
		Fast	3.70	2.30	3.59	2.23	4.68	2.91	4.55	2.83
3		Slow	4.05	2.52	3.94	2.45	5.12	3.18	4.97	3.09
		Fast	5.12	3.18	4.97	3.09	6.48	4.03	6.30	3.91
4		Slow	5.87	3.65	5.70	3.54	7.42	4.61	7.21	4.48
		Fast	7.42	4.61	7.21	4.48	9.38	5.83	9.12	5.67
5	HIGH 	Slow	7.78	4.83	7.56	4.70	9.83	6.11	9.55	5.94
		Fast	9.83	6.11	9.55	5.94	12.43	7.72	12.08	7.51
6		Slow	11.75	7.30	11.42	7.10	14.86	9.28	14.48	8.97
		Fast	14.85	9.23	14.43	8.97	18.77	11.67	18.25	11.34
7		Slow	16.26	10.10	15.80	9.82	20.56	12.79	19.98	12.42
		Fast	20.56	12.79	19.98	12.42	25.98	16.15	25.26	15.70
8		Slow	23.55	14.64	22.89	14.23	29.76	18.50	28.92	17.97
		Fast	29.76	18.50	28.92	17.97	37.62	23.38	36.57	22.72

6150/6160/6170 -16.9 - 38 tyres

Speed	Range	Speed-shift	16 SPEED 30 KPH				16 SPEED 40 KPH			
			FORWARD		REVERSE		FORWARD		REVERSE	
			KPH	MPH	KPH	MPH	KPH	MPH	KPH	MPH
1	LOW 	Slow	1.92	1.19	1.86	1.16	2.43	1.51	2.36	1.46
		Fast	2.43	1.51	2.36	1.46	3.07	1.91	2.98	1.85
2		Slow	2.90	1.81	2.81	1.74	3.67	2.28	3.57	2.21
		Fast	3.67	2.28	3.57	2.21	4.64	2.88	4.51	2.80
3		Slow	4.01	2.50	3.90	2.42	5.08	3.16	4.94	3.07
		Fast	5.08	3.16	4.94	3.07	6.42	3.99	6.24	3.88
4		Slow	5.81	3.62	5.64	3.50	7.35	4.57	7.15	4.44
		Fast	7.35	4.57	7.15	4.44	9.29	5.78	9.03	5.61
5	HIGH 	Slow	7.71	4.80	7.49	4.66	9.74	6.06	9.47	5.90
		Fast	9.74	6.06	9.47	5.90	12.31	7.66	11.96	7.43
6		Slow	11.64	7.24	11.31	7.03	14.72	9.15	14.31	8.89
		Fast	14.72	9.15	14.31	8.89	18.60	11.56	18.08	11.23
7		Slow	16.11	10.02	15.66	9.73	20.37	12.66	19.80	12.30
		Fast	20.37	12.66	19.80	12.30	25.74	16.00	25.02	15.55
8		Slow	23.33	14.50	22.67	14.09	29.49	18.33	28.66	17.81
		Fast	29.49	18.33	28.66	17.81	37.27	23.17	36.22	22.51





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Introduction

Road speeds at 2200 rev/min
6180/6190 - 20.8 - 38 tyres

Speed	Range	Speed-shift	16 SPEED 30 KPH				16 SPEED 40 KPH			
			FORWARD		REVERSE		FORWARD		REVERSE	
			KPH	MPH	KPH	MPH	KPH	MPH	KPH	MPH
1	LOW 	Slow	2.54	1.57	2.53	1.57	2.54	1.57	2.53	1.57
		Fast	3.22	2.00	3.20	1.99	3.22	2.00	3.20	1.99
2		Slow	3.84	2.38	3.82	2.37	3.84	2.38	3.82	2.37
		Fast	4.86	3.02	4.83	3.00	4.86	3.02	4.83	3.00
3		Slow	5.32	3.30	5.29	3.28	5.32	3.30	5.29	3.28
		Fast	6.73	4.18	6.69	4.18	6.73	4.18	6.69	4.15
4		Slow	7.71	4.42	7.66	4.76	7.71	4.42	7.66	4.76
		Fast	9.74	6.05	9.69	6.02	9.74	6.05	9.69	6.02
5	HIGH 	Slow	10.22	6.35	10.16	6.31	10.22	6.35	10.16	6.31
		Fast	12.91	8.02	12.84	7.98	12.91	8.02	12.84	7.98
6		Slow	15.43	9.59	15.34	9.53	15.43	9.59	15.34	9.53
		Fast	19.51	12.12	19.39	12.05	19.51	12.12	19.39	12.05
7		Slow	21.36	13.27	21.23	13.19	21.36	13.27	21.23	13.19
		Fast	27.00	16.78	26.84	16.68	27.00	16.78	26.84	16.68
8		Slow	30.92	19.21	30.74	19.10	30.92	19.21	30.74	19.10
		Fast					39.09	24.29	38.86	24.15

Road speeds "Dynashift" at 2200 rev/min -
6110 to 6140 - 13.6R38 tyres

RATIO		FORWARD		REVERSE		
		KPH	MPH	KPH	MPH	
	1	A	2.04	1.27	2.06	1.28
		B	2.39	1.49	2.41	1.50
		C	2.82	1.75	3.10	1.93
		D	3.30	2.05	3.33	2.07
	2	A	3.47	2.16	3.50	2.18
		B	4.06	2.52	4.10	2.55
		C	4.79	2.98	4.83	3.00
		D	5.61	3.49	5.66	3.52
	3	A	4.57	2.84	4.61	2.87
		B	5.34	3.32	5.39	3.35
		C	6.31	3.92	6.37	3.96
		D	7.38	4.59	7.45	4.63
	4	A	6.18	3.84	6.24	3.88
		B	7.23	4.49	7.30	4.54
		C	8.54	5.30	8.62	5.36
		D	9.99	6.21	10.08	6.27
	1	A	7.65	4.76	7.72	4.80
		B	8.96	5.57	9.05	5.63
		C	10.57	6.57	10.67	6.64
		D	12.38	7.69	12.50	7.78
	2	A	13.00	8.08	13.13	8.17
		B	15.22	9.46	15.36	9.55
		C	17.97	11.16	18.14	11.28
		D	21.03	13.07	21.23	13.21
	3	A	17.12	10.64	17.28	10.75
		B	20.03	12.45	20.22	12.58
		C	23.65	14.69	23.88	14.85
		D	27.68	17.20	27.94	17.38
	4	A	23.16	14.39	23.38	14.54
		B	27.11	16.84	27.37	17.02
		C	32.00	19.88	32.31	20.10
		D	37.45	23.27	37.81	23.52

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Road speeds "Dynashift" at 2200 rev/min - 6150 to 6170 - 16.9R38 tyres

RATIO	FORWARD		REVERSE		
	KPH	MPH	KPH	MPH	
1	A	2.04	1.27	2.06	1.28
	B	2.39	1.48	2.41	1.50
	C	2.82	1.75	3.10	1.93
	D	3.30	2.05	3.33	2.07
2	A	3.47	2.15	3.50	2.18
	B	4.06	2.52	4.10	2.55
	C	4.79	2.98	4.83	3.00
	D	5.60	3.48	5.65	3.51
3	A	4.56	2.83	4.60	2.86
	B	5.34	3.32	5.39	3.35
	C	6.30	3.92	6.36	3.96
	D	7.38	4.58	7.45	4.63
4	A	6.17	3.84	6.22	3.87
	B	7.22	4.49	7.29	4.53
	C	8.53	5.30	8.61	5.36
	D	9.98	6.20	10.07	6.26
1	A	7.65	4.75	7.72	4.80
	B	8.95	5.56	9.04	5.62
	C	10.56	6.56	10.66	6.63
	D	12.36	7.68	12.48	7.76
2	A	12.99	8.07	13.12	8.16
	B	15.20	9.45	15.34	9.54
	C	17.95	11.15	18.12	11.27
	D	21.00	13.05	21.20	13.19
3	A	17.10	10.62	17.26	10.74
	B	20.01	12.43	20.20	12.56
	C	23.62	14.68	23.84	14.83
	D	27.65	17.18	27.92	17.37
4	A	23.14	14.38	23.36	14.53
	B	27.08	16.83	27.34	17.01
	C	31.96	19.86	32.26	20.07
	D	37.41	23.25	37.77	23.49

Road speeds "Dynashift" at 2200 rev/min - 6180/6190 - 18.4R38 tyres

RATIO	FORWARD		REVERSE		
	KPH	MPH	KPH	MPH	
1	A	2.09	1.30	1.97	1.23
	B	2.45	1.52	2.31	1.44
	C	2.89	1.80	2.72	1.69
	D	3.38	2.10	3.19	1.98
2	A	3.55	2.21	3.35	2.08
	B	4.16	2.58	3.92	2.44
	C	4.91	3.05	4.63	2.88
	D	5.75	3.57	5.42	3.37
3	A	4.68	2.91	4.41	2.74
	B	5.47	3.40	5.16	3.21
	C	6.46	4.01	6.85	4.26
	D	7.56	4.70	7.13	4.43
4	A	6.33	3.93	5.97	3.71
	B	7.41	4.60	6.99	4.35
	C	8.74	5.43	8.24	5.13
	D	10.23	6.36	9.65	6.00
1	A	7.84	4.87	7.39	4.60
	B	9.17	5.70	8.65	5.38
	C	10.83	6.73	10.21	6.35
	D	12.67	7.88	11.95	7.43
2	A	13.32	8.28	12.56	7.81
	B	15.59	9.69	14.70	9.14
	C	18.50	11.43	17.35	10.79
	D	21.54	13.38	20.31	12.63
3	A	17.53	10.89	16.53	10.28
	B	20.52	12.75	19.35	12.04
	C	24.22	15.05	22.84	14.21
	D	28.35	17.61	26.73	16.63
4	A	23.72	14.74	22.37	13.91
	B	27.76	17.25	26.18	16.28
	C	32.77	20.36	30.90	19.22
	D	38.36	23.83	36.17	22.50

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February 1995

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Introduction

Final reduction units

Reduction units :	epicyclic, in the rear axle housings.
Reduction ratios :	6110/6120/6130/6140 (normal duty) 4.714 to 1
	6150/6160/6170 (heavy duty) 5.077 to 1
	6180/6190 5.571 to 1

Power take-off

Independent power take-off (IPTO)
P.T.O. ratio

Proportional to the engine speed. Hydraulic clutch.
540 rev/min at 1980 engine rev/min
1000 rev/min at 2000 engine rev/min

Speed changing
(according to model)

Either by changing shafts :
- 540 rev/min shaft, 35 mm (1³/₈ in) diameter, 6 splines.
- 1000 rev/min shaft, 35 mm (1³/₈ in) diameter, 21 splines
Or by external selection lever on rear L.h.s.
- shaft 35 mm - 6 splines

"Economy" independant power
take-off (optional extra)

The normal 540 and 1000 rev/min p.t.o. speeds can be
obtained at the above stated engine speeds or at 1550
engine rev/min by selecting the "economy" ratio.
Lever in the cab.

Control

Ground speed P.T.O.
(optional extra)

An addition to the independent P.T.O.

Control

Lever in the cab.

Speed : MF 6110/6120/6130/6140

- 540 rev/min - 7.87 revolutions of the p.t.o. shaft for 1 turn of
the wheel axle.
- 1000 rev/min - 14.83 revolutions of the p.t.o. shaft for 1 turn
of the wheel axle.

Speed : MF 6150/6160/6170

- 540 rev/mn - 8.48 revolutions of the p.t.o. shaft for 1 turn of
the wheel axle.
- 1000 rev/mn - 15.54 revolutions of the p.t.o. shaft for 1 turn
of the wheel axle.

Speed : MF 6180/6190

- 540 rev/mn - 8.23 revolutions of the p.t.o. shaft for 1
revolution of the wheel.
- 1000 rev/mn - 15.08 revolutions of the p.t.o. shaft for 1
revolution of the wheel.

Front power take-off (optional extra)

Control

Hydraulic clutch mechanism controlled by a button in
the cab.

Ratio

1000 rev/min at 2040 engine rev/min. - 2.04. : 1

Four-wheel drive front axle

Clutch mechanism
Differential Lock

Hydraulic, electrically actuated by push button in the cab
Front and rear differential lock-hydraulic with electrical control.

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Introduction

Hydraulics

Two stage gear pump, driven directly by the engine, supplies :

1st Stage

This circuit supplies 29 l/min (6.4 Imp. gal/min) (7.6 US gal/min) at maximum engine speed.

Maximum pressure : 17 bar

1. Hydrostatic steering

Hare/Tortoise range gear

Differential lock (rear and front)

I.P.T.O. clutch

P.T.O. brake

Front P.T.O. (if fitted)

Four-wheel drive (if fitted)

Top up of brake master cylinder and clutch master cylinder

Clutch control valve (pressure loaded)

Lubrication of gearbox, P.T.O. and rear axle

Gearbox front unit (Speedshift or Dynashift)

Electro-hydraulic reverse shuttle (if fitted)

2nd Stage

This circuit supplies 50 l/min (11 Imp. gal/min) (13.2 US gal/min)

Maximum pressure : 185 bar

2. Trailer brake supply

Auxiliary hydraulic system

Hydraulic lift.

Filtration

External 150-micron throwaway, canister type suction strainer.
External 15 micron High pressure filter.

Hydraulic lift

Type : 3-point, Category 2 or 3, with fixed, telescopic or quick attach hook type ball ends (according to model).

Rams : 2. Lifting force (see charts)

MF 6110/6120/6130/6140 - Rams Ø 57 mm (2.24 in)

Position of lift rod on lower links mm (in)	Length of lift rods mm (in)	Lower links horizontal Kg (Lb)	Lower links fully raised Kg (Lb)
508 (20)	565 (22.2) 765 (30.1)	2885 (6360) 3010 (6636)	3825 (8433) 3165 (6977)
608 (24)	565 (22.2) 765 (30.1)	- 3430 (7562)	4190 (9237) 3485 (7683)

MF 6150/6160/6170 - Rams Ø 66 mm (2.59 in)

Position of lift rod on lower links mm (in)	Length of lift rods mm (in)	Lower links horizontal Kg (Lb)	Lower links fully raised Kg (Lb)
550 (21.6)	595 (23.4) 827 (32.5)	4350 (9590) 4276 (9427)	5194 (11451) 4308 (9497)
650 (25.6)	595 (23.4) 827 (32.5)	5740 (12654) 4788 (10556)	5689 (12541) 4703 (10368)

MF 6150/6160 - Rams Ø 57 mm (2.24 in)

Position of lift rod on lower links mm (in)	Length of lift rods mm (in)	Lower links horizontal Kg (Lb)	Lower links fully raised Kg (Lb)
550 (21.6)	595 (23.4) 827 (32.5)	3192 (7037) 3138 (6918)	3812 (8404) 3162 (6971)
650 (25.6)	595 (23.4) 827 (32.5)	4213 (9286) 3514 (7747)	4175 (9204) 3452 (7610)

MF 6180/6190 - Rams Ø 73 mm (2.87 in)

Position of lift rod on lower links mm (in)	Length of lift rods mm (in)	Lower links horizontal Kg (Lb)	Lower links fully raised Kg (Lb)
550 (21.6)	595 (23.4) 827 (32.5)	5425 (11960) 5000 (11023)	6510 (14352) 5087 (11215)
650 (25.6)	595 (23.4) 827 (32.5)	8090 (17835) 5717 (12604)	7117 (15690) 5595 (12335)

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for your reading.**

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