

MF35

service
manual

Service Manual for all MF35 tractors

MASSEY-FERGUSON

35 TRACTOR

WORKSHOP SERVICE MANUAL

SECTION A

INTRODUCTION

FE-35 Tractor

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FE-35 TRACTOR

SECTION B

GENERAL SPECIFICATION AND DATA

This specification initially gives data of the normal width agricultural tractor, less engine. For Engine Data see pages B19 (Petrol), B27 (V.O.), B29 (L.O.), and B29 (23C Diesel), and B43, 3-A-152 Diesel.

For data of other FE-35 Tractors, Vineyard, Industrial, etc. see Section T.

Tractor Codes:		Engines—continued	High Altitude Petrol H
Chassis	Standard S		Diesel (23C) D
	Vineyard V		Diesel (3-A-152) N
	Industrial J		Vaporising Oil K Lamp Oil L
Engines	Petrol G	Other Variations	Single Clutch F
			Dual Clutch M

The De Luxe version of the Tractor is fitted with Dual Clutch, live P.T.O., Tractormeter, and cushion seat.

Overall Dimensions

Wheelbase	72" (1830 mm.)
Normal Track	Front — 48" (1219 mm.)
	Rear — 52" (1320 mm.)
Track Adjustment	Front — 48" — 80" (1219 mm. — 2032 mm.)
	Rear — 48" — 76" (1219 mm. — 1930 mm.)
Turning Circle Diameter	Using Independent Brakes 17' 6" (5334 mm.)
	Without Brakes 19' 3" (5867 mm.) (with track widths 48" front and rear).
Ground Clearance	Under centre — 12 $\frac{3}{4}$ " (321 mm.)
	Under axle — 21" (533 mm.)
Overall Length	117" (2972 mm.)
Overall Width	At normal track 64" (1630 mm.)
Overall Height	54" (1372 mm.)

Tyres

Tyre Pressures	Front — 4 × 19 — 26 lbs. (1.8 kg.)
	Rear — 10 × 28 — 12 lbs. (0.8 kg.)

Weight (with fuel, oil and water)

	Basic Model	De Luxe Model
Diesel (23C)	3158 lbs. (1432 kg.)	3198 lbs. (1451 kg.)
Diesel (3-A-152)	3175 lbs. (1440 kg.)	3185 lbs. (1445 kg.)
Carburettor	2982 lbs. (1352 kg.)	3022 lbs. (1371 kg.)

Fill-Up Data

Engine Sump	12 pints (6.8 litres)
Transmission	6.6 Imp. gallons (30.28 litres)
Air Cleaner	$\frac{1}{2}$ pint (.43 litres)
Steering	1.8 pints (.946 litres)
Belt Pulley	1 $\frac{1}{2}$ pints (.852 litres)

				Cooling System	Fuel Tanks
Diesel (23C) ...	...	...	...	15 pints (8.5 litres)	7½ Imp. gallons (34 litres)
Diesel (3-A-152) ...	...	...	...	10½ pints (5.96 litres)	8½ Imp. gallons (39 litres)
Petrol ...	...	...	...	15 pints (8.5 litres)	9½ Imp. gallons (42 litres) including 1 Imp. gallon (4.5 litres) reserve.
V.O. ...	...	...	...	15 pints (8.5 litres)	V.O. — 8½ Imp. gallons (37.5 litres)
L.O. ...	...	...	...	17 pints (9.66 litres)	Petrol — 1 Imp. gallon (4.5 litres)
					L.O. — 8¼ Imp. gallons (37.5 litres)
					Petrol — 1 Imp. gallon (4.5 litres)

Performance	Diesel		Petrol		V.O.	L.O.
	23C	3-A-152*	6.0 : 1	6.6 : 1		
Brake H.P. (Bare Engine) ...	37.25	37	37.25	38.0	30.5	29.0
Belt H.P. (Bare Engine) ...	35.9	—	34.5	36.2	28.8	26.3
Drawbar H.P. ...	31.5	—	29.5	30.5	23.3	20.7
H.P. available at P.T.O. ...	34	35	34	35	27.5	26

*Subject to official confirmation

TIGHTENING TORQUES

Front Axle	lbs./ft	kg./m.
Centres to Right-hand and Left-hand		
Axles	90 — 100	12.443 — 13.83
Spindle Arm	45 — 50	6.221 — 6.913
Radius Rod to Axle	90 — 100	12.443 — 13.83
Clamp—Steering Drag Link	6 — 8	.830 — 1.106
Front Axle Pin	75 — 80	10.369 — 11.060
Tool Box to Radius Arm	10	1.383
Front Engine Support	75 — 80	10.369 — 11.060
Rear Axle		
Battery Carrier to Axle	45 — 50	6.221 — 6.913
P.T.O. Bearing Retainer	45 — 50	6.221 — 6.913
Differential Case	47 — 53	6.498 — 7.328
Crown Wheel	80 — 90	11.060 — 12.443
Oil Trough, Differential Housing	6 — 8	.830 — 1.106
Bearing Retainer Stud	45 — 50	6.221 — 6.913
Check Chain Anchor	45 — 50	6.221 — 6.913
Step Board Attachment	45 — 50	6.221 — 6.913
Fenders and Wheels		
Front Wheel Hub	55 — 60	7.604 — 8.295
Rim to Disc	90 — 100	12.443 — 13.83
Wheel Disc—Rear	90 — 100	12.443 — 13.83
Fenders to Axle	60 — 70	8.295 — 9.678
Brake and Clutch Linkage		
Shoulder Bolt, Clutch Pedal	24 — 26	3.318 — 3.595
Left Hand Brake Pedal Attachment	45 — 50	6.221 — 6.913
Clutch Pedal	45 — 50	6.221 — 6.913
Combined Brake Arm	45 — 50	6.221 — 6.913
Centre Housing		
Axle Shaft Housing to Centre		
Housing— $\frac{1}{2}$ " Studs	70 — 75	9.678 — 10.369
Housing— $\frac{7}{16}$ " Studs	45 — 50	6.221 — 6.913
Hydraulic Lift Cover (Seat Studs)	45 — 50	6.221 — 6.913
Upper Link Attachment	45 — 50	6.221 — 6.913
Hydraulic Lift Arm	30 min.	4.148 min.
Hydraulic Lift Cover	45 — 50	6.221 — 6.913
Side Cover to Centre Housing	30 — 35	4.148 — 4.839
Transmission Case		
Steering Housing to Transmission Case		
Case	30 — 35	4.148 — 4.839
Steering Tube Housing Steering Unit	24 — 26	3.318 — 3.595
Starter Motor to Case (Diesel)	45 — 50	6.221 — 6.913
Transmission Case to Engine	45 — 50	6.221 — 6.913
Radius Rod to Transmission Case	45 — 50	6.221 — 6.913
Centre Housing to Transmission Case	45 — 50	6.221 — 6.913
Transmission Case to Engine	45 — 50	6.221 — 6.913
Starter Motor to Case (Petrol)	45 — 50	6.221 — 6.913
Hydraulics		
Valve Chamber Clamp Bolts.	50 — 55	6.913 — 7.604

DIMENSIONS AND TOLERANCES

Component Details	Dimensions New		Clearances New		Remarks
	Ins.	mm.	Ins.	mm.	
Transmission					
Selector Mechanism					
Shifter Rail Dia. ... ..	.7475	18.986			
	.7465	18.961			
			.004	.1016	
			.001	.0254	
Shifter Rail: Bore in Casing	.7485	19.012			
	.7505	19.063			
Plunger Spring Details ...	Free Length $1\frac{1}{32}$ " (26.19 mm.)				
	Solid Length .68" (17.27 mm.)				
	Fitted Load 15 lbs. \pm 1 lb. (6.80 kg. \pm .454 kg.)				
	Nominal fitted length .81" (20.57 mm.)				
Thickness of Change Speed Shifter Forks at Pressure Faces ... ..	.308	7.823			
	.304	7.722			
			.010	.254	
			.002	.0508	
Width of Groove in Coupling Connectors ... ..	.314	7.976			
	.310	7.874			
Thickness of Planetary Shifter Fork at Pressure Face ...	.308	7.823			
	.304	7.722			
			.010	.254	
			.002	.0508	
Width of Groove in Planetary Coupling ... ..	.314	7.976			
	.310	7.874			
Sliding Spur Gears					
Mainshaft: Spline for Inter- mediate and High Speed and Low Speed Gears ...	18 teeth	Minor Diameter	1.6913	42.959	
		Major Diameter	1.6915	42.964	
			1.965	49.911	
			1.960	49.784	
Spline in Mainshaft Gears ...	18 teeth	Minor Diameter	1.700	43.18	
		Major Diameter	1.705	43.31	
			2.0240	51.410	
			2.0390	51.791	
Countershaft Spline for Gears	17 teeth	Minor Diameter	1.9710	50.063	
		Major Diameter	1.9535	49.619	
			2.2398	56.891	
			2.2328	56.713	
Spline in Countershaft Gears	17 teeth	Minor Diameter	2.005	50.927	
		Major Diameter	2.000	50.800	
			2.250	57.150	
			2.260	57.404	
Gearbox Ratios:					
Constant Mesh P.T.O. and Transmission Gears Ratio: 2.78 : 1					
Sliding Spur Gears	1st	3 : 1			
	2nd	2 : 1			
	3rd	1.09 : 1			
	Reverse	2.20 : 1			
Epicyclic Reduction Unit ...	4 : 1				
Backlash between mating gears	.003"-.007" (.076-.178 mm.).				
Endfloat	Shafts are supported in ball bearings, require no shims, pre-load or adjustment.				

Component Details	Dimensions New		Clearances New		Remarks
	Ins.	mm.	Ins.	mm.	
Main Shaft Front Bearing					
Housing Bore for Bearing ...	3.1495	79.997			
	3.1501	80.013			
			-.0001	-.003	
			+.010	+.254	
Bearing Ext. Dia. ...	3.1496	80.000			
	3.1491	79.987			
Bearing Int. Dia. ...	1.5743	39.987			
	1.5748	40.000			
			-.0009	-.023	
			+.0001	+.003	
	1.5752	40.010			
	1.5747	39.997			
Main Shaft Rear Bearing					
Housing Bore for Bearing ...	3.5432	89.997			
	3.5440	90.017			
			+.0013	+.033	
			-.0001	-.003	
Bearing Ext. Dia. ...	3.5433	90.000			
	3.5427	89.985			
Bearing Int. Dia. ...	1.9685	50.000			
	1.9680	49.987			
			+.0001	+.003	
			-.0009	-.023	
Shaft ...	1.9689	50.010			
	1.9684	49.997			
Countershaft Front Bearing					
Housing Bore for Bearing ...	3.9377	100.017			
	3.9369	99.997			
			+.0013	+.033	
			-.0001	-.003	
Bearing Ext. Dia. ...	3.9370	100.000			
	3.9364	99.984			
Bearing Int. Dia. ...	2.1648	54.986			
	2.1654	55.002			
			+.0001	+.003	
			-.0011	-.028	
Shaft ...	2.1659	55.014			
	2.1653	54.998			
Countershaft Rear Bearing					
Housing Bore for Bearing ...	3.5440	90.018			
	3.5432	89.997			
			+.0013	+.033	
			-.0001	-.003	
Bearing Ext. Dia. ...	3.5433	90.000			
	3.5427	89.985			
Bearing Int. Dia. ...	1.9680	49.987			
	1.9685	50.000			
			+.0001	+.003	
			-.0009	-.023	

Component Details	Dimensions New		Clearances New		Remarks
	Ins.	mm.	Ins.	mm.	
Shaft	1.9689	50.010			
	1.9684	49.997			
Countershaft Forward Auxiliary Bearing (De Luxe Tractors Only)					
Bearing Bore in Housing ...	3.1500	80.010			
	3.1490	79.985			
			+.0009	+.023	
			-.0006	-.015	
Bearing Ext. Dia.	3.1496	80.000			
	3.1491	79.987			
Bearing Int. Dia.	1.5743	39.987			
	1.5748	40.000			
			+.0001	+.003	
			-.0008	-.020	
Shaft	1.5751	40.008			
	1.5747	39.997			
Clutch Pilot Bearing					
Recess in Flywheel for Clutch Pilot Bearing	1.573	39.954			
	1.574	39.980			
			-.0013	-.033	
			-.0008	-.020	
Pilot Bearing Ext. Dia. ...	1.5743	39.987			
	1.5748	40.000			
Pilot Bearing Int. Dia. ...	.6689	16.990			
	.6694	17.003			
			.0003	.007	
			.0012	.030	
Main Drive Shaft Pinion Spigot Dia. ... ..	.6686	16.982			
	.6682	16.972			
Main Drive Shaft Retainer					
Bore in Retainer for front and middle bearings (De Luxe Tractors only)	3.1503	80.018			
	3.1493	79.992			
			+.0012	+.030	
			-.0003	-.008	
Bearings Ext. Dia.	3.1496	80.000			
	3.1491	79.987			
Bearings Int. Dia.	1.9680	49.987			
	1.9685	50.000			
			+.0001	+.002	
			-.0009	-.023	
Dia. of P.T.O. Main Drive Shaft Pinion	1.9689	50.010			
	1.9684	49.997			
Bore in Retainer for Rear Bearing Assy. (Standard and De Luxe Tractors) ...	3.1503	80.018			
	3.1493	79.992			
			+.0012	+.030	
			-.0003	-.008	

Component Details	Dimensions New		Clearances New		Remarks
	Ins.	mm.	Ins.	mm.	
Bearing Ext. Dia.	3.1496	80.000			
	3.1491	79.987			
Bearing Int. Dia.	1.5743	39.987			
	1.5748	40.000			
			+.0001	+.003	
			-.0008	-.020	
Dia. of Main Drive Shaft	1.5751	40.008			
Pinion	1.5747	39.997			
Oil Seals					
Bore in Main Drive Shaft	2.251	57.175			
Retainer for Front Oil Seal	2.249	57.125			
(De Luxe Tractors) ...			-.011	-.279	
			-.005	-.127	
Oil Seal Ext. Dia.	2.260	57.404			
	2.256	57.302			
Oil Seal Int. Dia.	1.75	44.45			Mean Dia.
P.T.O. Main Drive Shaft	1.747	44.374			
Pinion	1.753	44.526			
Bore in Main Drive Shaft	2.251	57.175			
Retainer for Front Oil Seal	2.249	57.125			
(Standard Tractors) ...			-.011	-.279	
			-.001	-.0254	
Oil Seal Ext. Dia.	2.260	57.404			
	2.252	57.201			
Oil Seal Int. Dia.	1.125	28.575			Mean Dia.
P.T.O. Main Drive Shaft	1.128	28.651			
Pinion Dia.	1.122	28.499			
Bore in P.T.O. Main Drive	1.563	39.700			
Shaft Pinion for Oil Seal	1.561	39.649			
(De Luxe Tractors) ...			.000	.000	
			.012	.300	
Oil Seal Ext. Dia.	1.573	39.954			
	1.563	39.700			
Oil Seal Int. Dia.	1.125	28.575			Mean Dia.
Main Drive Shaft Pinion ...	1.128	28.651			
	1.122	28.499			
Epicyclic Assembly					
Bore in Epicyclic Carrier for	.748	18.999			
Planetary Pinion Shaft ...	.749	19.025			
			-.0018	-.046	
			-.0011	-.028	
Dia. of Shaft ... ..	.7501	19.053			
	.7498	19.045			
Dia. of Rollers ... ..	.1244	3.160			
	.1242	3.155			

Component Details	Dimensions New		Clearances New		Remarks
	Ins.	mm.	Ins.	mm.	
Dia. of Planetary Pinion	.990	25.146			
Washer ... ..	.984	24.993			
			.0158	.401	
			.0093	.236	
Planetary Pinion Int. Dia. ..	.9998	25.315			
	.9993	25.382			
Reverse Shaft Cluster					
Inside Dia. of Gears	1.2524	30.531			
	1.2530	30.556			
Dia. of Roller Bearings ... ..	.1260	3.200			
	.1258	3.195			
Dia. of Shaft	1.000	25.4			
	.9995	25.387			
Hydraulic Pump					
	Constant running, positive displacement four cylinder, scotch-ycke piston type pump "floating" in the tractor centre housing.				
Speed ... ..	.36 X engine speed. Oscillating control valve.				
Earlier Type (Fitted up to Tractor Serial No. 65684).					
Bore ... ..	.80" (20.32 mm.)				
Test Data	Minimum delivery to be 2.8 Imp. gallons (12.72 litres) per minute at zero/lb. sq. in. at 720 pump r.p.m. (2000 engine r.p.m.).				
Later Type (Fitted to Tractor Serial No. 65685 and subsequent).					
Bore ... ..	.915" (23.24 mm.)				
Test Data	Minimum delivery to be 3.333 Imp. gallons (15.14 litres) at 1500 p.s.i. (105.5 kg./sq. cm.) at 720 pump r.p.m. (2000 engine r.p.m.) with oil at a maximum viscosity of 250 S.U.S.				
Note : Approximate oil temperatures corresponding to a maximum viscosity of 250 S.U.S.					
	S.A.E. 80 — 130°F. (54.4°C.)				
	S.A.E. 40 — 135°F. (57.2°C.)				
	S.A.E. 50 — 150°F. (65.6°C.)				
Hydraulic System Safety Relief Valve					
Nominal Setting	2,500 lb. sq. in. (175.8 kg./sq. cm.)				
Test Data	The valve must begin to open at a minimum static pressure of 2300 lb/sq. in. (161.7 kg/sq.cm.) The maximum pressure must not exceed 2800 lb. sq. in. (196.9 kg./sq. cm.) when by-passing 2 Imp. gallons (9.1 litres) per minute. S.A.E. 50 oil at 110°-140°F. (43.3°-60°C.).				
Lifting Capacity—Lower Links					
	Early Tractors		Later Tractors		
	(Up to Serial No. 65684)		(Serial No. 65685 onwards)		
Max. Weight which can be lifted from the lowest position	1,500 lbs. (680.4 kg.)		2,500 lbs. (1134 kg.)		
Recommended Max. Weight for field work and slow speed transport	1,700 lbs. (771 kg.)		2,600 lbs. (1179.3 kg.)		
Recommended Max. Weight for road work in transport position	1,270 lbs. (576 kg.)		1,800 lbs. (816.5 kg.)		

Component Details	Dimensions New		Clearances New		Remarks
	Ins.	mm.	Ins.	mm.	
Hydraulic Tapping Points					
Three Pick-Up Points in lift cover—					
Thread Sizes—Top ... ..	...	...	...	...	...
Laterals ... ..	...	...	...	...	...
Oil Capacity					
(Supplying Hydraulic System, Transmission and Rear Axle)					
6.6 Imp. gallons (30.28 litres)					
Maximum of 1½ gallons (6.81 litres) may be withdrawn for operating external services.					
Hydraulic Lift Assembly					
Breakout Spring	Free Length	6 13/16" (173.038 mm.)			
	Solid Length	3 11/16" (93.663 mm.)			
	Rate:	To support 38 lbs. ± 2¼ lbs. (17.24 kg. ± 1.247 kg.) at a length of 4.75" (120.65 mm.)			
		To support 47½ lbs. ± 3½ lbs. (21.432 kg. ± 1.474 kg.) at a length of 4.25" (107.95 mm.)			
Control Spring	Free Length	5.38" (136.652 mm.)			
		5.32" (135.128 mm.)			
	Rate:	7,700 lb. in. ± 700 lb. in. (8,870 kg. cm. ± 807 kg. cm.)			
Hydraulic Cylinder					
Earlier Type (Fitted up to Tractor Serial No. 65684)					
Hydraulic Cylinder Bore	2.5010	63.525			
	2.4995	63.487	.0040	.1016	
			.0015	.038	
Hydraulic Cylinder Piston Dia.	2.497	63.4238			
	2.498	63.4492			
Piston Ring Groove Width ... ..	.1255	3.1877			
	.1265	3.2131	.0035	.089	
			.0015	.038	
Piston Ring Width ... ..	.124	3.1496			
	.123	3.1242			
Piston Ring Gap (closed) ... ..	.0025	.0635			
	.0075	.1905			
Later Type (Tractor Serial No. 65685 and subsequent)					
Hydraulic Cylinder Bore	2.9995	76.187			
	3.001	76.225	.0040	.1016	
			.0015	.038	
Hydraulic Cylinder Piston Dia.	2.998	76.149			
	2.997	76.124			
Piston Ring Groove Width...	.1255	3.188			
	.1265	3.213	.0035	.089	
			.0015	.038	
Piston Ring Width ... ..	.124	3.150			
	.1235	3.136			
Piston Ring Gap (closed) ... ..	.0075	.1905			
	.0025	.0635			

Component Details	Dimensions New		Clearances New		Remarks
	Ins.	mm.	Ins.	mm.	
Camshaft					
Bore for Bearing in Front and Rear Housings	1.6208 1.6198	41.168 41.143			
			— .0002 — .0017	— .005 — .043	
Bearing Outside Dia. ...	1.6215 1.6210	41.186 41.174			
Bearing Internal Dia. ...	1.3780 1.3775	35.001 34.988			
			.0035 .0025	.089 .064	
Shaft Dia.	1.3750 1.3745	34.925 34.912			
Control Valve					
Bore in Rear Housing for Control Valve Washers ...	.926 .924	23.520 23.470			
			.004 .001	.102 .025	
Outside Dia. of Control Valve Washers ... ..	.923 .922	23.444 23.419			
Internal Dia. of Control Valve Washers ... ..	.5002 .5000	12.705 12.700			
			.0006 .0002	.015 .005	Selectively assembled to a mean clearance of .0004" (.010 mm.)
Control Valve Dia. ... ..	.4998 .4996	12.695 12.690			
Cam Blocks and Pistons					
Piston (Inside Dia.)	2.322 2.325	58.979 59.055			
			.008 .002	.203 .051	
Cam Block	2.320 2.317	58.928 58.852			
Pistons and Valve Chambers					
Inlet and Outlet Valves					
Bore in Inlet Valve Stem ...	.157 .156	3.988 3.962			
			.003 .001	.076 .025	
Outlet Valve Stem ... ..	.155 .154	3.940 3.912			
Earlier Pumps (Up to Tractor Serial No. 65684)					
Diameter of Piston ... ..	.8010 .8005	20.345 20.333			
			.0025 .001	.064 .025	
Diameter of Bore ... ..	.802 .803	20.371 20.396			

Component Details	Dimensions New		Clearances New		Remarks
	Ins.	mm.	Ins.	mm.	
Later Pumps (Tractor Serial No. 65685 onwards)					
Diameter of Piston ... ..	.9130	23.19			
	.9125	23.18			
			.0025	.064	
			.001	.025	
Diameter of Bore ... ..	.914	23.22			
	.915	23.24			
Power Take-Off Shaft					
No. of Splines	6				
Major Diameter	1.371/1.373"	(34.82/34.87 mm.)			
Minor Diameter	1.098/1.108"	(27.89/28.14 mm.)			
Width of Splines ... ..	.338/.340"	(8.58/8.64 mm.)			
Length suitable for Drive Attachment	2.78"	(70.6 mm.)			
Diameter of hole	$\frac{3}{8}$ "	(8.33 mm.)			
Distance of hole from Shaft End ... ..	.625"	(15.88 mm.)			
Dimensions of Groove ...	Bottom dia.	1.160/1.155"	(29.46/29.34 mm.)		
	Radius	.265"	(6.73 mm.)		
Distance of Groove from Shaft End	1 $\frac{1}{8}$ "	(28.6 mm.)			
Width of Groove in P.T.O. Pinion (Ground speed P.T.O. driven gear) ...	.375	9.525			
	.379	9.626			
			.011	.279	
			.003	.076	
Dia. of P.T.O. Coupler at Pressure End ... ..	.372	9.449			
	.368	9.347			
Ground Speed P.T.O. ...	Backlash between ground P.T.O. driven gear and ground P.T.O. drive gear: .003/.007" (.076/.178 mm.).				
Rear Bearing and Seal					
Bore in centre housing for P.T.O. Seal Retainer ...	3.252	82.601			
	3.250	82.550			
			.007	.1778	
			.002	.0508	
P.T.O. Seal Retainer Outside Dia.	3.248	82.499			
	3.245	82.423			
P.T.O. Seal Retainer Inside Dia.	2.687	68.250			
	2.685	68.199			
			-.0075	-.1905	
			-.0025	-.0634	
P.T.O. Seal Outside Dia. ...	2.6925	68.390			
	2.6895	68.313			
Housing Bore for Bearing ...	2.9533	75.014			
	2.9527	74.999			
			+.001	+.025	
			-.0001	-.003	
Bearing—Outside Dia. ...	2.9528	75.001			
	2.9523	74.987			

Component Details	Dimensions New		Clearances New		Remarks
	Ins.	mm.	Ins.	mm.	
Single Clutch					
Diameter	Carburettor Engine Tractors ... 9" (228.6 mm.) Diesel Engine Tractor (23C) ... 10" (254 mm.) Diesel Engine Tractor (3-A-152)... 11" (279 mm.)
Clutch Springs	9" Clutch ... 9 black clutch springs Fitted Load 150/160 lb. (68.04/72.57 kg.) 10" Clutch ... 12 green clutch springs Fitted Load 105/115 lb. (47.63/52.2 kg.) 11" Clutch ... 12 yellow clutch springs Fitted Load 84 lb. (38.1 kg.) ± 5%
Clutch Pedal Free Movement	3/8" (19 mm.) This dimension taken between upper side of pedal and underside of footrest bracket.
Toggle Release Levers	Height (from flywheel face) 9" Clutch ... 1.895" (48.133 mm.) 10" Clutch ... 1.995" (50.673 mm.) 11" Clutch ... 4 13/32" + .0625 (111.919 + 1.588 mm.) - .0000 (- .000 mm.) Height (from spacer segments) 11" Clutch ... 2.65"-2.72" (67.310-69.088 mm.)
Movement of Lever Ends	9" and 10" ... .531" (13.49 mm.) 11" ... .654" (16.61 mm.) Variation in toggle lever height should not exceed .015" (.381 mm.)
Dual Clutch					
87 mm. and 23C Engines					
Transmission Disc	11" dia. (279.4 mm.)
P.T.O./Hydraulic Pump Disc	9" dia. (228.6 mm.)
Thrust Springs	2, Belleville Type Load (see Fig. 5, page 1.4) at .075" (1.905 mm.) deflection 510/440 lb. (231.33/199.58 kg.) at .065" (1.651 mm.) deflection 1080/960 lb. (489.89/435.45 kg.)
Clutch Pedal Free Movement	3/8" (9.5 mm.) This dimension taken between upper side of pedal and underside of footrest bracket.
Toggle Release Levers	Height (from flywheel face) 3 13/32" (96 mm.) Movement of lever ends .531 (13.49 mm.) Variation in toggle lever height should not exceed .015" (.381 mm.)
Adjusting Screws	Clearance between screw heads and rear pressure plate (P.T.O./Hydraulic pump drive) .088/.092" (2.24/2.34 mm.)
3-A-152 Engine					
Transmission Disc	11" dia. (279.4 mm.)
P.T.O./Hydraulic Pump Disc	9" dia. (228.6 mm.)
Thrust Springs	11" disc operated by 12 yellow clutch springs. Fitted load 84 lb. (38.1 kg.) ± 5%. 9" disc operated by Belleville spring. Load—released position .75" (19.05 mm.) height: 510-440 lb. (231-200 kg.) Load—engaged position .065" (1.65 mm.) deflection 1080-960 lb. (490-435 kg.)
Clutch Pedal Free Movement	3/8" (9.5 mm.) This dimension taken between upper side of pedal and underside of footrest bracket.
Toggle Release Levers	Height (from flywheel face) 4 13/32" + .0625 (111.919 + 1.588 mm.) - .0000 (- .000 mm.) Height (from spacer segments) 2.65-2.72" (67.310-69.088 mm.) Movement of lever ends .654" (16.61 mm.). Variation in toggle lever height should not exceed .015" (.381 mm.)

Component Details	Dimensions New		Clearances New		Remarks
	Ins.	mm.	Ins.	mm.	
Adjusting Screws					Clearance between screw heads and rear pressure plate (P.T.O./Hydraulic pump drive) .088/.092" (2.24/2.34 mm.)
Rear Axle					
Crown Wheel and Pinion Ratio					6.16 : 1
Backlash—Crown Wheel and Pinion ... ..					.008-.016" (.203-.406 mm.)
Clearance between thrust block and crown wheel					.013-.020" (.330-.508 mm.)
					Controlled by shims between thrust block and housing
Axle Shaft Bearing end float ... ..					.002-.008 (.051-.203 mm.)
					Controlled by shims between brake backplate and axle housing gaskets
Rear Axle					
Half Shafts and Axle Housings					
Half Shaft Dia.	2.252	57.200			
	2.251	57.175			
			— .000	— .000	
			— .002	— .051	
Inside Dia. of Bearing	2.251	57.175			
	2.250	57.150			
Outside Dia. of Bearing	4.126	104.800			
	4.125	104.775			
			— .0025	— .0635	
			— .0005	— .0127	
Bore for Bearing in Retainer	4.1245	104.762			
Assembly	4.1235	104.737			
Bore for Oil Seal in Retainer	3.6215	91.986			
Assembly	3.6245	92.062			
			— .0095	— .216	
			— .0015	— .038	
Outside Dia. of Oil Seal	3.630	92.202			
	3.626	92.100			
Half Shaft Dia. at Oil Seal	2.749	69.825			
	2.751	69.875			
Half Shaft Dia. for Collar	2.2515	57.188			
	2.2510	57.175			
			— .008	— .203	
			— .006	— .152	
Collar	2.2450	57.023			
	2.2435	56.985			
Recess in Axle Housing for	2.876	73.050			
Inner Oil Seal	2.874	73.000			
			— .007	— .1778	
			— .001	— .0254	
Outside Dia.—Inner Oil Seal	2.881	73.177			
	2.877	73.075			
Half Shaft Dia. at Inner Oil	2.128	54.051			
Seal	2.123	53.924			
Clearance between ends of axles	.002"-.008" (.051-.203 mm.)				
Differential					
Axle Housing Bores for Bear-	4.4365	112.687			
ing Assys.	4.4355	112.662			
			— .003	— .076	
			— .001	— .025	

Component Details	Dimensions New		Clearances New		Remarks
	Ins.	mm.	Ins.	mm.	
Bearing—Outside Dia. ...	4.4385	112.738			
	4.4375	112.713			
Bearing—Inside Dia. ...	2.6256	66.690			
	2.6250	66.675			
			— .0035	— .089	
			— .0014	— .036	
Differential Gear Case Dia. for Bearings ...	2.6285	66.764			
	2.6270	66.726			
Pinion Pilot Bearing					
Bore in Centre Housing ...	2.440	61.976			
	2.439	61.951			
			.0028	.071	
			.0006	.015	
Bearing—Outside Dia. ...	2.4384	61.925			
	2.4372	61.905			
Bearing—Inside Dia. ...	1.1811	30.000			
	1.1807	29.900			
			— .0012	— .031	
			— .0003	— .008	
Pinion Dia. ..	1.1819	30.020			
	1.1814	30.008			
Driving Pinion Sleeve and Bearing Assembly					
Sleeve—Inside Dia. ...	3.749	95.225			
	3.748	95.199			
			— .003	— .076	
			— .001	— .025	
Bearing Cup — Outside Dia.	3.751	95.275			
	3.750	95.250			
Bearing—Inside Dia. ...	1.7500	44.450			
	1.7506	44.465			
			— .0004	— .010	
			— .002	— .051	
Pinion Dias. for Bearings ...	1.751	44.475			
	1.752	44.501			
			.0005	.013	
			.0016	.041	
	1.7495	44.437			
	1.7490	44.425			
Front Axle					
Front Axle and Centre Pin Assembly					
(Up to Tractor Serial No. 4859)					
Centre Axle Bore for Bush ...	1.912	48.565			
	1.910	48.514			
			— .0055	— .140	
			— .002	— .051	
Centre Bush Ext. Dia. ...	1.9155	48.654			
	1.914	48.616			
Centre Bush Int. Dia. ...	1.7615	44.742			
	1.7675	44.895			
			.021	.533	
			.014	.356	
Pin Dia. ...	1.7480	44.399			
	1.7465	44.361			
Bores for Pin in Front Axle Support ...	1.748	44.399			
	1.750	44.450			

Component Details	Dimensions New		Clearances New		Remarks
	Ins.	mm.	Ins.	mm.	
(Tractor Serial No. 4860)					
Centre Axle Bore for Bush...	2.058	52.273			
	2.057	52.248			
			— .0055	— .140	
			— .003	— .076	
Centre Bush Ext. Dia. ...	2.0625	52.388			
	2.0610	52.349			
Centre Bush Int. Dia. ...	1.7615	44.742			
	1.7675	44.894			
			.0135	.343	
			.021	.533	
Pin Dia. ...	1.7480	44.399			
	1.7465	44.361			
Bores for Pin in Front Axle Support ...	1.748	44.399			
	1.750	44.450			
Front Axle and Spindle Assemblies					
Bore of Outer Axle for	1.3745	34.912			Hand Press Fit
Spindle Bushes ...	1.3735	34.889			
Ext. Dia. Spindle Bushes ...	1.3745	34.912			
	1.3735	34.889			
Int. Dia. Spindle Bushes ...	1.250	31.750			
	1.249	31.725			Reamed in position
			.0035	.089	
			.005	.127	
Spindle Shaft Dia. ...	1.2455	31.636			
	1.2450	31.623			
Hub					
Bore for Oil Seal ...	2.685	68.199			
	2.683	68.148			
			— .009	— .229	
			— .005	— .127	
Oil Seal Outside Dia. ...	2.692	68.377			
	2.690	68.326			
Bore for Inner Bearing ...	2.4395	61.963			
	2.4405	61.989			
			— .0025	— .064	
			— .0005	— .013	
Inner Bearing—Outside Dia.	2.442	62.027			
	2.441	62.001			
Inner Bearing—Inside Dia. ...	1.2505	31.763			
	1.2500	31.750			
			— .001	— .025	
			— .000	— .000	
Shaft Dia. ...	1.2500	31.750			
	1.2495	31.737			
Bore for Outer Bearing ...	1.9365	49.187			
	1.9375	49.212			
			— .012	— .292	
			— .0005	— .013	
Outer Bearing—Outside Dia.	1.948	49.479			
	1.938	49.225			

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