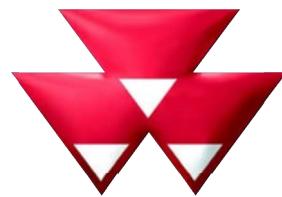


Workshop Service Manual



MASSEY FERGUSON

MF 6700 S series tractors



Beauvais

**AGCO S.A.S. - 41 avenue Blaise Pascal - 60000
Beauvais - France - RC B562 104 539**

© AGCO 2016

**May 2016
ACT0025630
English**

MF 6700 S series tractors

1 Introduction	1-1
 1.1 General	1-3
1.1.1 Using the manual	1-3
1.1.2 General specifications	1-3
1.1.2.1 MF 6700 S Dyna-4 tractors	1-3
1.1.2.2 MF 6700 S Dyna-6 tractors	1-12
1.1.2.3 MF 6700 S Dyna-VT tractors	1-21
1.1.3 Forward speeds	1-30
1.1.3.1 Forward speed with Dyna-4 40 kph transmission and 18.4R38 tires	1-30
1.1.3.2 Forward speed with Dyna-4 40 kph transmission and 20.8R38 tires	1-31
1.1.3.3 Forward speed with Dyna-6 40 kph ECO transmission and 20.8R38 tires	1-32
1.1.3.4 Forward speed with Dyna-6 50 kph transmission and 20.8R38 tires	1-34
1.1.3.5 Forward speed for all models with transmission in Dyna-VT mode	1-36
1.1.4 Dimensions and weights	1-37
1.1.5 Attachment points	1-41
1.1.5.1 Attachment points: MF 6712 S / MF 6713 S / MF 6714 S Dyna-4/Dyna-6 models without front linkage	1-41
1.1.5.2 Attachment points: MF 6712 S / MF 6713 S / MF 6714 S Dyna-4/Dyna-6 models with front linkage	1-43
1.1.5.3 Attachment points: MF 6715 S / MF 6716 S / MF 6718 S Dyna-4/Dyna-6 models without front linkage	1-45
1.1.5.4 Attachment points: MF 6715 S / MF 6716 S / MF 6718 S Dyna-4/Dyna-6 models with front linkage	1-47
1.1.5.5 Attachment points: MF 6713 S / MF 6714 S / MF 6715 S / MF 6716 S / MF 6718 S Dyna-VT models without front linkage:	1-49
1.1.5.6 Attachment points: MF 6713 S / MF 6714 S / MF 6715 S / MF 6716 S / MF 6718 S Dyna-VT models with front linkage	1-51
1.1.6 Capacities	1-52
1.1.7 Conversion table	1-54
1.1.8 Retaining compounds and sealing products	1-55
1.1.9 Tightening torques	1-57
1.1.9.1 Tightening torques for screws and nuts	1-57
1.1.9.2 Tightening torques for hydraulic unions	1-61
 1.2 Adjustments, bleeding and calibrations	1-65
1.2.1 Bleed operations: Dyna-VT - Assisted brake master cylinders	1-65
1.2.1.1 Charge connector	1-65
1.2.1.2 Pressure connector	1-65
1.2.1.3 Bleed screw locations	1-65
1.2.1.4 Procedure for bleeding the assisted braking system	1-66
1.2.2 Bleed operations: Dyna-4/Dyna-6 - Assisted brake master cylinders	1-68
1.2.2.1 Charge connector	1-68
1.2.2.2 Pressure connector - Load Sensing system	1-68
1.2.2.3 Pressure connector - Open Center system	1-68
1.2.2.4 Bleed screw locations	1-69
1.2.2.5 Procedure for bleeding the assisted braking system	1-70
1.2.3 Bleed operations: Dyna-4/Dyna-6 - High-pressure braking	1-72
1.2.3.1 Bleed screw locations	1-72
1.2.3.2 Procedure for bleeding the high-pressure braking system	1-73
1.2.4 Calibrations	1-74
1.2.4.1 Calibrating the automatic disengagement of the differential and 4-wheel drive	1-74
1.2.4.2 Calibration of the forward-travel lever	1-76

1.2.4.3 Forward speed calibration	1-79
1.2.4.4 Calibration of the Dyna-4 and Dyna-6 PowerShuttle transmission	1-79
1.2.4.5 Calibrating the power sensor on the Dyna-6 transmission	1-82
1.2.4.6 Dyna-VT transmission calibrations: Introduction and access to calibration using the instrument panel	1-83
1.2.4.7 Calibration of the high/low speed ranges (Hare/Tortoise) for Dyna-VT	1-84
1.2.4.8 Dyna-VT transmission calibration	1-85
1.2.4.9 Calibration of the Dyna-VT coupler function	1-86
1.2.4.10 Rear power take-off calibration for Dyna-VT	1-87
1.2.4.11 Front power take-off calibration for Dyna-VT	1-88
1.2.4.12 Dyna-VT transmission calibration error code	1-89
1.2.4.13 Calibration of the clutch pedal sensor	1-92
1.2.4.14 Calibration of the throttle pedal sensor	1-93
1.2.4.15 Calibrating the rear linkage	1-93
1.2.4.16 Calibration of the front linkage position sensor	1-95
1.2.4.17 Calibrate the suspended front axle.	1-96
1.2.4.18 Calibrations to be carried out using the diagnostic tool	1-98
2 Separation of assemblies	2-1
2.1 Front linkage	2-3
2.1.1 Removal/refitting	2-3
2.2 Front axle	2-6
2.2.1 Removal/refitting	2-6
2.3 Cooling unit	2-8
2.3.1 Removal/refitting	2-8
2.4 Front frame	2-10
2.4.1 Removal/refitting	2-10
2.5 Engine cover	2-14
2.5.1 Removal/refitting	2-14
2.6 Engine	2-16
2.6.1 Removing and refitting the engine	2-16
2.6.2 Reassembling the engine flywheel	2-20
2.7 Operator environment	2-22
2.7.1 Removal/refitting	2-22
3 Engine	3-1
3.1 Tier 4F/Stage IV SCR Technology engine 4 cylinders	3-3
3.1.1 General	3-3
3.1.1.1 Notice to the technician	3-3
3.1.1.2 Safety instructions	3-3
3.1.1.3 Description of engine types	3-4
3.1.1.4 Location of the engine serial number	3-4
3.1.1.5 Lifting the engine	3-5
3.1.2 Principles of operation	3-6
3.1.2.1 General operating diagram	3-6
3.1.2.2 Mechanical part	3-7
3.1.2.3 Exhaust and intake system	3-9
3.1.2.4 Cooling system	3-11
3.1.2.5 Lubrication system	3-12
3.1.2.6 Fuel system	3-13
3.1.2.7 Electric control circuit	3-14
3.1.2.8 CCV system	3-15
3.1.3 Layout of components	3-16
3.1.3.1 Layout of components in the VRT engine compartment	3-16
3.1.4 Tests and diagnostics	3-17
3.1.4.1 Measuring the engine oil pressure	3-17

3.1.5 Adjustments, bleeding and calibrations	3-18
3.1.5.1 Adjustments	3-18
3.1.5.2 Bleeding	3-19
3.1.6 Disassembly/reassembly	3-20
3.1.6.1 AGCO Power Workshop Service Manual	3-20
3.1.7 Service tools	3-20
3.1.7.1 General	3-20
3.1.7.2 Cylinder block tools	3-20
3.1.7.3 Timing gear and flywheel housing tools	3-21
3.1.7.4 Cylinder head and valve mechanism tools	3-22
3.1.7.5 Crank mechanism tools	3-23
3.1.7.6 Coolant pump tools	3-24
3.1.7.7 Engine control system tools	3-25
3.1.7.8 Maintenance and troubleshooting tools	3-25
3.2 SCR Technology	3-27
3.2.1 General	3-27
3.2.1.1 Notice to the technician	3-27
3.2.1.2 Safety instructions for DEF or AdBlue™ . Identification of hazards	3-28
3.2.1.3 Abbreviations or terms used	3-31
3.2.2 Principles of operation	3-31
3.2.2.1 Principles of operation	3-31
3.2.2.2 Architecture of the VRT 4-cylinder SCR Technology system	3-35
3.2.3 Schematic diagrams	3-36
3.2.3.1 VRT 4-cylinder SCR Technology system schematic diagram	3-36
3.2.4 Layout of components	3-38
3.2.4.1 SCR Technology components for VRT engine	3-38
3.2.5 Disassembly/reassembly	3-40
3.2.5.1 Removing the metering module	3-40
3.2.5.2 Injector	3-42
3.2.5.3 Coolant solenoid valve	3-44
3.2.5.4 DEF or AdBlue™ tank	3-45
3.2.5.5 Removing the DEF or AdBlue™ gage	3-47
3.2.5.6 Catalytic converter or DOC (catalyseur d'oxydation diesel)	3-48
3.2.6 Service tools	3-49
3.2.6.1 General	3-49
3.2.6.2 3rd generation SCR engine - Service tools	3-49
4 Clutch	4-1
4.1 Chapter not used for this model	4-3
5 Gearbox	5-1
5.1 ML140	5-5
5.1.1 General	5-5
5.1.1.1 General	5-5
5.1.1.2 Transmission operating principle	5-5
5.1.1.3 Transmission operating principle diagram	5-9
5.1.1.4 Forward/reverse high-pressure relief valves	5-15
5.1.1.5 Control spool valve	5-17
5.1.1.6 Flushing valve	5-20
5.1.2 Layout of components	5-23
5.1.2.1 Gearbox main components - parts list	5-23
5.1.2.2 Gearbox main components - diagram	5-24
5.1.3 Tests and diagnostics	5-25
5.1.3.1 Hydraulic tests	5-25
5.1.4 Disassembly/reassembly	5-35
5.1.4.1 Disassembling the Dyna-VT module	5-35
5.1.4.2 Reassembling the Dyna-VT unit	5-43

5.1.4.3 Filling the gearbox	5-54
5.1.4.4 Removing/refitting forward (2V3)/reverse (2V4) high-pressure relief valves	5-55
5.1.4.5 Removing/refitting the flushing valve	5-56
5.1.5 Service tools	5-56
5.1.5.1 General	5-56
5.1.5.2 ML130/ML140/ML160/ML180 - Service tools	5-57
5.2 GBA25/General	5-67
5.2.1 General	5-67
5.2.2 Principles of operation	5-70
5.2.2.1 Construction and description	5-70
5.2.2.2 Kinematics of the Dyna-4 GBA25 gearbox	5-75
5.2.2.3 Kinematics of the Dyna-6 GBA25 gearbox	5-78
5.2.2.4 Synchronisers	5-81
5.2.2.5 Main gearbox robotic control	5-83
5.2.3 Layout of components	5-85
5.2.3.1 View of Dyna-4 GBA25 gearbox assembly	5-85
5.2.3.2 View of Dyna-4 GBA25 gearbox assembly	5-87
5.2.3.3 View of Dyna-6 GBA25 gearbox assembly	5-89
5.2.3.4 View of Dyna-6 GBA25 gearbox assembly	5-91
5.2.3.5 Dyna-4 GBA25 gearbox specifications	5-93
5.2.3.6 Dyna-6 GBA25 gearbox specifications	5-94
5.2.3.7 GBA25 gearbox specifications	5-95
5.2.4 Disassembly/reassembly	5-97
5.2.4.1 Dyna-4 GBA25 gearbox disassembly	5-97
5.2.4.2 Dyna-6 GBA25 gearbox disassembly	5-102
5.2.4.3 Synchronizers	5-106
5.3 GBA25/PowerShuttle	5-109
5.3.1 General	5-109
5.3.2 Principles of operation	5-109
5.3.3 Layout of components	5-113
5.3.3.1 View of the GBA25 PowerShuttle assembly	5-113
5.3.3.2 Blown-up view of the GBA25 PowerShuttle	5-115
5.3.4 Disassembly/reassembly	5-117
5.3.4.1 Dyna-4 transmission	5-117
5.3.4.2 Dyna-6 transmission	5-122
5.3.4.3 Disassembling the PowerShuttle	5-127
5.3.4.4 Reassembling the PowerShuttle	5-129
5.3.4.5 Final steps	5-131
5.3.5 Service tools	5-131
5.3.5.1 General	5-131
5.3.5.2 PowerShuttle - Service tools	5-131
5.4 GBA25/Dyna-4 PowerShift module	5-132
5.4.1 Dyna-4 General information	5-132
5.4.2 Dyna-4 Operating principle	5-132
5.4.2.1 Kinematics	5-134
5.4.3 Layout of components	5-141
5.4.3.1 View of Dyna-4 assembly	5-141
5.4.3.2 Dyna-4 blown-up view	5-143
5.4.4 Removing/refitting Dyna-4	5-145
5.4.4.1 Preliminary steps	5-145
5.4.4.2 Removing the Dynashift module	5-145
5.4.4.3 Refitting the Dynashift module	5-147
5.4.4.4 Disassembling the Dynashift module	5-148
5.4.4.5 Reassembling the Dynashift module	5-153
5.4.4.6 Disassembling the planet gears	5-157
5.4.4.7 Reassembling the planet gears	5-158

5.4.4.8 Final steps	5-159
5.4.5 Service tools	5-160
5.4.5.1 General	5-160
5.4.5.2 Powershift module - Service tools	5-160
5.5 GBA25/Dyna-6 PowerShift module	5-161
5.5.1 Dyna-6 - General information	5-161
5.5.2 Dyna-6 Operating principle	5-161
5.5.2.1 Kinematics	5-163
5.5.3 Layout of components	5-171
5.5.3.1 View of Dyna-6 assembly	5-171
5.5.3.2 Dyna-6 blown-up view	5-173
5.5.4 Removing/refitting Dyna-6	5-175
5.5.4.1 Preliminary steps	5-175
5.5.4.2 Removing the Powershift module	5-175
5.5.4.3 Refitting the Powershift module	5-177
5.5.4.4 Disassembling the Dynashift module	5-178
5.5.4.5 Reassembling the Dynashift module	5-182
5.5.4.6 Disassembling the multiplier module	5-185
5.5.4.7 Reassembling the multiplier module	5-186
5.5.4.8 Disassembling the planet gears	5-189
5.5.4.9 Reassembling the planet gears	5-189
5.5.4.10 Final steps	5-190
5.5.5 Service tools	5-191
5.5.5.1 General	5-191
5.5.5.2 Powershift module - Service tools	5-191
5.6 GBA25/Robotic mechanical gearbox	5-193
5.6.1 General	5-193
5.6.2 Principles of operation	5-193
5.6.2.1 Description and kinematics of ratios	5-195
5.6.3 Layout of components	5-199
5.6.3.1 View of the primary and secondary shaft assembly	5-199
5.6.3.2 View of the reverse layshaft and synchroniser control assembly	5-202
5.6.3.3 Blown-up view of the robotic mechanical gearbox	5-204
5.6.4 Disassembly/reassembly	5-207
5.6.4.1 Preliminary steps	5-207
5.6.4.2 Removing the primary and secondary shafts	5-207
5.6.4.3 Refitting the primary and secondary shafts	5-210
5.6.4.4 Disassembling the primary and secondary shafts	5-212
5.6.4.5 Reassembling the primary and secondary shafts	5-215
5.6.4.6 Shimming the primary and secondary shafts in the housing	5-219
5.6.4.7 Adjusting the selector rails and forks	5-221
5.6.4.8 Adjusting the interlock mechanism	5-225
5.6.4.9 Final steps	5-226
5.6.5 Service tools	5-227
5.6.5.1 General	5-227
5.6.5.2 Robotic mechanical gearbox - Service tools	5-227
5.7 GBA25/Super creeper gears	5-228
5.7.1 General	5-228
5.7.2 Principles of operation	5-229
5.7.3 Layout of components	5-232
5.7.3.1 View of the assembly	5-232
5.7.3.2 Blown-up view	5-233
5.7.4 Disassembly/reassembly	5-234
5.7.4.1 Removing/refitting and disassembling/reassembling the epicyclic gear trains	5-234
5.7.4.2 Disassembling the input planet carrier	5-235
5.7.4.3 Reassembling the input planet carrier	5-236

5.7.4.4 Disassembling the output planet carrier	5-237
5.7.4.5 Reassembling the output planet carrier	5-238
5.7.4.6 Final steps	5-240
5.7.4.7 Adjusting the control	5-240
6 Rear Axle	6-1
6.1 HA140	6-7
6.1.1 General	6-7
6.1.1.1 General	6-7
6.1.1.2 Principles of operation	6-7
6.1.1.3 Schematic diagram	6-8
6.1.2 Layout of components	6-9
6.1.2.1 Rear axle main components	6-9
6.1.3 Disassembly/reassembly	6-10
6.1.3.1 Cross section view of the rear axle	6-10
6.2 HA140/Final drives	6-11
6.2.1 General	6-11
6.2.2 Layout of components	6-13
6.2.2.1 Cross-section view of a final drive unit	6-13
6.2.3 Disassembly/reassembly	6-15
6.2.3.1 Removing a final drive unit	6-15
6.2.3.2 Refitting a final drive unit	6-15
6.2.4 Service tools	6-15
6.2.4.1 General	6-15
6.2.4.2 Final drives - Service tools	6-16
6.3 HA140/Differential	6-18
6.3.1 General	6-18
6.3.1.1 General	6-18
6.3.1.2 Principles of operation	6-18
6.3.1.3 Schematic diagram	6-20
6.3.2 Layout of components	6-21
6.3.2.1 Cross section view of the differential	6-21
6.3.2.2 Blown-up view of the pinion	6-22
6.3.2.3 Blown-up view of the differential	6-23
6.3.3 Disassembly/reassembly	6-24
6.3.3.1 Removing the differential	6-24
6.3.3.2 Refitting the differential	6-27
6.3.3.3 Disassembling the pinion	6-35
6.3.3.4 Reassembling the pinion	6-41
6.3.3.5 Disassembling the differential	6-49
6.3.3.6 Reassembling the differential	6-55
6.3.4 Service tools	6-62
6.3.4.1 General	6-62
6.3.4.2 Differential - Service tools	6-63
6.4 HA140/Tractor braking	6-66
6.4.1 General	6-66
6.4.1.1 General	6-66
6.4.1.2 Principles of operation	6-67
6.4.1.3 Hydraulic assistance	6-69
6.4.2 Layout of components	6-70
6.4.2.1 Blown-up view of the rear axle brake system	6-70
6.4.2.2 Layout of components	6-71
6.4.3 Adjustments, bleeding and calibrations	6-73
6.4.3.1 Adjustments	6-73
6.4.3.2 Bleeding	6-75
6.4.4 Disassembly/reassembly	6-79
6.4.4.1 Removing the rear axle brakes	6-79

6.4.4.2 Assembling the rear axle brakes	6-83
6.4.4.3 Removing/refitting the assisted-brake master cylinders	6-88
6.4.5 Service tools	6-91
6.4.5.1 General	6-91
6.4.5.2 Tractor braking - Service tools	6-91
6.5 HA140/Hydraulic trailer braking	6-93
6.5.1 General	6-93
6.5.1.1 Trailer brake unit	6-93
6.5.2 Hydraulic test	6-94
6.6 GPA20 - General	6-96
6.6.1 General	6-96
6.6.2 Principles of operation	6-96
6.6.3 Layout of components	6-97
6.6.3.1 Center housing assembly (longitudinal cross-section)	6-97
6.6.3.2 Center housing assembly (transverse cross-section)	6-98
6.7 GPA20/Heavy Duty and Heavy Duty + final drives	6-99
6.7.1 General	6-99
6.7.1.1 General	6-99
6.7.1.2 Principles of operation	6-99
6.7.2 Layout of components	6-101
6.7.2.1 View of the assembly	6-101
6.7.2.2 Blown-up view	6-103
6.7.3 Disassembly/reassembly	6-105
6.7.3.1 Removing/refitting a final drive	6-105
6.7.3.2 Removing/refitting and disassembling/reassembling a planet carrier	6-106
6.7.3.3 Replacing tapered roller bearings and seals	6-109
6.7.3.4 Shimming the tapered roller bearings of the axle shaft	6-112
6.7.3.5 Replacing a wheel stud	6-116
6.7.4 Service tools	6-116
6.7.4.1 General	6-116
6.7.4.2 GPA20/Final drives - Service tools	6-117
6.8 GPA20/Super Heavy Duty final drives	6-118
6.8.1 General	6-118
6.8.1.1 General	6-118
6.8.1.2 Principles of operation	6-118
6.8.2 Layout of components	6-119
6.8.2.1 View of the assembly	6-119
6.8.2.2 Blown-up view	6-121
6.8.3 Disassembly/reassembly	6-123
6.8.3.1 Removing/refitting a final drive	6-123
6.8.3.2 Disassembling/reassembling the planet carrier	6-124
6.8.3.3 Fitting and shimming the tapered roller bearings of the axle shaft	6-126
6.8.3.4 Replacing a wheel stud	6-128
6.8.4 Service tools	6-129
6.8.4.1 General	6-129
6.8.4.2 GPA20/Final drives - Service tools	6-129
6.9 GPA20/Differential	6-130
6.9.1 General	6-130
6.9.2 Layout of components	6-131
6.9.2.1 View of the assembly	6-131
6.9.2.2 Blown-up view	6-133
6.9.3 Disassembly/reassembly	6-135
6.9.3.1 Removing the left-hand flange and differential lock assembly	6-135
6.9.3.2 Disassembling and reassembling the differential lock assembly	6-136
6.9.3.3 Refitting the left-hand flange and the differential lock assembly	6-137
6.9.3.4 Removing the differential assembly	6-138
6.9.3.5 Disassembling the differential assembly and the crown wheel	6-139

6.9.3.6 Removing and disassembling the gear	6-140
6.9.3.7 Reassembling the crown wheel and the differential assembly	6-142
6.9.3.8 Adjusting the taper distance, refitting and shimming the gear	6-143
6.9.3.9 Refitting and shimming the differential assembly	6-147
6.9.3.10 Adjusting and checking the backlash	6-152
6.9.3.11 Final reassembly	6-156
6.9.4 Service tools	6-157
6.9.4.1 General	6-157
6.9.4.2 GPA20/Differential - Service tools	6-157
6.10 GPA20/Brake pistons	6-158
6.10.1 General	6-158
6.10.2 Principles of operation	6-158
6.10.3 Layout of components	6-159
6.10.3.1 View of the assembly	6-159
6.10.3.2 Blown-up view	6-160
6.10.4 Disassembly/reassembly	6-160
6.10.4.1 Disassembly	6-160
6.10.4.2 Reassembly	6-162
6.11 GPA20/Hand brake unit and control	6-165
6.11.1 General	6-165
6.11.2 Principles of operation	6-165
6.11.3 Layout of components	6-167
6.11.3.1 View of the assembly	6-167
6.11.3.2 Blown-up view - Three disks	6-169
6.11.4 Disassembly/reassembly	6-171
6.11.4.1 Disassembly	6-171
6.11.4.2 Reassembly	6-173
6.11.4.3 Fitting the control	6-178
6.11.4.4 Adjusting the control	6-178
6.12 GPA20/Tractor braking	6-180
6.12.1 Assisted brake master cylinders:	6-180
6.12.1.1 General	6-180
6.12.1.2 Principles of operation	6-181
6.12.1.3 Layout of components	6-182
6.12.1.4 Removing/refitting the assisted-brake master cylinders	6-183
6.12.2 High-pressure braking	6-186
6.12.2.1 General	6-186
6.12.2.2 Principles of operation	6-187
6.12.2.3 Layout of components and designation of hydraulic ports in the high-pressure braking unit	6-189
6.12.2.4 Decompressing the high-pressure braking system	6-190
6.12.2.5 Removing and refitting the high-pressure braking unit	6-190
6.12.3 Load Sensing trailer braking	6-192
6.12.3.1 General	6-192
6.12.3.2 Principles of operation	6-193
6.12.3.3 Schematic diagram	6-195
6.12.3.4 Identification of 110 l/min Load Sensing ports	6-197
6.12.3.5 Removing and refitting the trailer braking unit	6-200
6.12.3.6 Plug tightening torques in the event of maintenance on the spools (2) (6)	6-203
6.12.4 Open Center trailer braking	6-203
6.12.4.1 General	6-203
6.12.4.2 Principles of operation	6-204
6.12.4.3 Identification of pipes, hoses and ports	6-207
6.12.4.4 Identification of channels	6-208
6.12.4.5 Removing and refitting the brake spool valve	6-209
6.12.5 Adjustments, bleeding and calibrations	6-210

6.12.5.1 Assisted brake master cylinders:	6-210
6.12.5.2 High-pressure braking	6-214
6.12.5.3 Pedals	6-216
6.12.6 Service tools	6-217
6.12.6.1 General	6-217
6.12.6.2 Tractor braking - Service tools	6-217
6.13 GPA20/Hitch/Linkage	6-218
6.13.1 Linkage - General	6-218
6.13.2 Hitch - General	6-218
6.13.3 Layout of components	6-219
6.13.3.1 View of the assembly	6-219
6.13.3.2 Blown-up view	6-221
6.13.4 Adjustments, bleeding and calibrations	6-223
6.13.4.1 Adjusting the angular position sensor	6-223
6.13.5 Disassembly/reassembly	6-224
6.13.5.1 Removing the linkage cover plate	6-224
6.13.5.2 Disassembling the linkage cover plate	6-227
6.13.5.3 Reassembling the linkage cover plate	6-228
6.13.5.4 Shimming the linkage shaft	6-230
6.13.5.5 Refitting the linkage cover plate	6-230
6.13.5.6 Disassembling and reassembling a lift ram	6-231
6.14 GPA20+/Hitch/Increased capacity linkage - General	6-233
6.14.1 Linkage - General	6-233
6.14.2 Hitch - General	6-234
6.14.3 Layout of components	6-235
6.14.3.1 View of the assembly	6-235
6.14.3.2 Blown-up view	6-237
6.14.4 Adjustments, bleeding and calibrations	6-239
6.14.4.1 Adjusting the angular position sensor	6-239
6.14.4.2 Adjusting the forward speed sensor	6-243
6.14.5 Disassembly/reassembly	6-244
6.14.5.1 Removing and refitting the increased capacity linkage cover plate	6-244
6.14.5.2 Removing and refitting the increased capacity linkage cover plate	6-248
6.14.5.3 Shimming the linkage shaft	6-256
6.14.5.4 Disassembling and reassembling a lift ram	6-258
6.14.6 Service tools	6-260
6.14.6.1 General	6-260
6.14.6.2 GPA20 +/Hitch/Increased capacity linkage - Service tools	6-260
6.15 Pneumatic trailer braking	6-261
6.15.1 General	6-261
6.15.1.1 GPA20/20+	6-261
6.15.1.2 GPA40 and HA140/180	6-265
6.15.2 Layout of components	6-271
6.15.3 Test and diagnostics	6-272
6.15.3.1 Pneumatic system test	6-272
6.15.3.2 Sealing test on the pneumatic system	6-274
6.15.4 Adjustments, bleeding and calibrations	6-274
6.15.4.1 Adjusting the pressure relief valve	6-274
6.15.4.2 Adjusting the hand brake rod	6-276
6.15.5 Disassembly/reassembly	6-277
6.15.5.1 General	6-277
6.15.5.2 Compressor	6-277
6.15.6 Service tools	6-279
6.15.6.1 General	6-279
6.15.6.2 Pneumatic trailer brake — Service tools	6-279
6.16 Auto-hitch	6-282
6.16.1 General	6-282

6.16.2 Principles of operation	6-282
6.16.3 Layout of components	6-283
6.16.3.1 Blown-up view	6-283
6.16.4 Adjustments, bleeding and calibrations	6-284
6.16.4.1 Adjusting the tie rods and the control	6-284
6.16.5 Disassembly/reassembly	6-286
6.16.5.1 Refitting the frame	6-286
6.17 Rear wheels/hubs	6-288
6.17.1 General	6-288
6.17.2 Disassembly/reassembly	6-291
6.17.2.1 Flanged axle shaft	6-291
6.17.2.2 Straight axle shaft	6-294
6.17.2.3 Adjusting the rear wheel track width	6-296
6.17.2.4 Fitting the rear wheel weights	6-300
7 Power take-off	7-1
7.1 HA140	7-3
7.1.1 General	7-3
7.1.2 Principles of operation	7-4
7.1.3 Layout of components	7-7
7.1.3.1 Cross-section view	7-7
7.1.4 Disassembly/reassembly	7-9
7.1.4.1 Disassembling/reassembling the PTO clutch	7-9
7.1.4.2 Disassembling the PTO shafts	7-13
7.1.4.3 Reassembling the PTO shafts	7-17
7.2 GPA20	7-22
7.2.1 General	7-22
7.2.2 Principles of operation	7-23
7.3 GPA20/Clutch	7-30
7.3.1 General	7-30
7.3.2 Principles of operation	7-30
7.3.3 Layout of components	7-32
7.3.3.1 Parts list	7-32
7.3.3.2 Blown-up view	7-34
7.3.4 Layout of components	7-35
7.3.4.1 View of the assembly	7-35
7.3.5 Disassembly/reassembly	7-37
7.3.5.1 Removing and refitting the PTO clutch	7-37
7.3.5.2 Disassembling/reassembling the clutch	7-38
7.3.6 Service tools	7-40
7.3.6.1 General	7-40
7.3.6.2 GPA20/Clutch - Service tools	7-41
7.4 GPA20/Intermediate shaft/Drive gear/PTO brake	7-42
7.4.1 General	7-42
7.4.2 Principles of operation	7-42
7.4.3 Layout of components	7-44
7.4.3.1 Power take-off (PTO) parts list	7-44
7.4.3.2 Exploded view (2-speed version)	7-45
7.4.3.3 Overview (2-speed version)	7-45
7.4.3.4 Exploded view (4-speed version)	7-46
7.4.3.5 Assembly view (4-speed version)	7-47
7.4.4 Disassembly/reassembly	7-47
7.4.4.1 Removing and refitting the upper shaftline (2-speed version)	7-47
7.4.4.2 Removing/refitting the driving gears (4-speed version)	7-49
7.4.4.3 Shimming the driving gear	7-52
7.4.4.4 Adjustment of the control (4-speed version)	7-53
7.5 GPA20/Output shaft without speed selection	7-55

7.5.1 General	7-55
7.5.2 Layout of components	7-55
7.5.2.1 View of the assembly	7-55
7.5.2.2 Blown-up view	7-56
7.5.3 Disassembly/reassembly	7-57
7.5.3.1 Removing/refitting the rear bearing	7-57
7.5.3.2 Disassembling and reassembling the gears	7-58
7.6 GPA20/Output shaft with speed selection	7-60
7.6.1 General	7-60
7.6.2 Layout of components	7-60
7.6.2.1 Power take-off (PTO) parts list	7-60
7.6.2.2 View of the assembly	7-62
7.6.2.3 Blown-up view	7-65
7.6.3 Disassembly/reassembly	7-66
7.6.3.1 Removing/refitting the rear bearing	7-66
7.6.3.2 Disassembling and reassembling the gears	7-67
7.6.3.3 Shimming the shaft with reinforced sealing	7-70
7.6.3.4 Adjusting the control	7-70
7.7 GPA20/PTO electrohydraulic controls	7-72
7.7.1 General	7-72
7.7.2 Principles of operation	7-72
7.7.3 Layout of components	7-74
7.7.3.1 View of the assembly	7-74
7.7.3.2 Blown-up view	7-75
7.7.4 Disassembly/reassembly	7-75
7.7.4.1 Removing/refitting the 540/1000 control	7-75
7.7.4.2 Removing/refitting the Standard/Economy control	7-77
7.8 GPA20/GSPTO	7-79
7.8.1 General	7-79
7.8.2 Principles of operation	7-79
7.8.3 Layout of components	7-80
7.8.3.1 View of the assembly	7-80
7.8.3.2 Blown-up view	7-81
7.8.4 Disassembly/reassembly	7-81
7.8.4.1 Disassembling and reassembling the PTO	7-81
7.8.4.2 Assembling and adjusting the control	7-84
7.9 Zuidberg front power take-off	7-87
7.9.1 General	7-87
7.9.1.1 General	7-87
7.9.1.2 Principles of operation	7-87
7.9.1.3 Schematic diagrams	7-90
7.9.2 Layout of components	7-91
7.9.2.1 Blown-up view of the PTO unit	7-91
7.9.2.2 Blown-up view of the hydraulic pump and the PTO clutch	7-92
7.9.2.3 Blown-up view of the drive shaft and the oil cooler	7-93
7.9.3 Tests and diagnostics	7-94
7.9.3.1 Hydraulic tests	7-94
7.9.3.2 Electrical tests	7-95
7.9.4 Adjustments, bleeding and calibrations	7-95
7.9.4.1 Draining and changing the filter	7-95
7.9.5 Disassembly/reassembly	7-96
7.9.5.1 Removing and refitting the front power take-off unit	7-96
7.9.5.2 Disassembling and reassembling the front power take-off unit	7-97
8 Front axle	8-1
8.1 DANA 735 front axle	8-3
8.1.1 General	8-3

8.1.1.1 DANA General	8-3
8.1.1.2 Principles of operation	8-3
8.1.1.3 DANA front axle 740/528-529-530-613-614-615 Dimensions - Specifications - Identification	8-4
8.1.1.4 Topping up and checking levels	8-7
8.1.2 Layout of components	8-8
8.1.2.1 Layout of front axle components	8-8
8.1.2.2 View of front axle assembly	8-10
8.1.3 Tests and diagnostics	8-12
8.1.3.1 Troubleshooting	8-12
8.1.4 Disassembly/reassembly	8-14
8.1.4.1 DANA 735 tightening torques	8-14
8.1.4.2 DANA Workshop Service Manuals	8-16
8.2 DANA 740 front axle	8-17
8.2.1 General	8-17
8.2.1.1 DANA General	8-17
8.2.1.2 Principles of operation	8-17
8.2.1.3 DANA front axle 740/553-554-614-615- Dimensions - Specifications - Identification	8-18
8.2.1.4 Topping up and checking levels	8-21
8.2.2 Layout of components	8-22
8.2.2.1 Layout of front axle components	8-22
8.2.2.2 View of front axle assembly	8-24
8.2.3 Tests and diagnostics	8-26
8.2.3.1 Troubleshooting	8-26
8.2.4 Disassembly/reassembly	8-28
8.2.4.1 DANA 740 tightening torques	8-28
8.2.4.2 DANA Workshop Service Manuals	8-30
8.3 HA140/4-wheel drive clutch	8-31
8.3.1 General	8-31
8.3.1.1 General - 4-wheel drive clutch	8-31
8.3.1.2 Four-wheel drive function operating principles	8-31
8.3.2 Layout of components	8-33
8.3.2.1 Cross-section view of the 4-wheel drive clutch	8-33
8.3.2.2 Blown-up view of the 4-wheel drive clutch	8-34
8.3.3 Disassembly/reassembly	8-35
8.3.3.1 Disassembling the 4WD clutch	8-35
8.3.3.2 Reassembling the 4WD clutch	8-39
8.4 HA140/Universal joint shaft brake	8-46
8.4.1 Layout of components	8-46
8.4.1.1 Cross-section view of the universal joint shaft brake	8-46
8.4.1.2 Exploded view of the universal joint shaft brake	8-47
8.4.2 Disassembly/reassembly	8-47
8.4.2.1 Disassembling the universal joint shaft brake	8-47
8.4.2.2 Reassembling the universal joint shaft brake	8-52
8.5 GPA20/4-wheel drive clutch	8-59
8.5.1 General	8-59
8.5.2 Principles of operation	8-59
8.5.3 Layout of components	8-60
8.5.3.1 View of the assembly	8-60
8.5.3.2 Blown-up view	8-62
8.5.4 Disassembly/reassembly	8-63
8.5.4.1 Removing the clutch assembly	8-63
8.5.4.2 Disassembling the clutch	8-65
8.5.4.3 Reassembling the clutch	8-66
8.5.4.4 Refitting the clutch assembly	8-67
8.5.5 Service tools	8-69

8.5.5.1 General	8-69
8.5.5.2 4-wheel drive clutch - Service tools	8-69
8.6 Steering unit/Closed Center	8-71
8.6.1 General	8-71
8.6.2 Hydraulic operating principle	8-72
8.6.2.1 Reaction/non-reaction steering unit	8-73
8.6.3 Electrohydraulic operating principle	8-75
8.6.4 Layout of steering unit components	8-77
8.6.5 Removing and refitting the steering unit	8-77
8.6.5.1 Refitting	8-78
8.7 Steering unit/Open Center	8-79
8.7.1 General	8-79
8.7.2 Principles of operation	8-80
8.7.2.1 Reaction/non-reaction steering unit	8-82
8.7.3 Schematic diagram	8-84
8.7.4 Layout of steering unit components	8-85
8.7.5 Removing and refitting the steering unit	8-85
8.7.5.1 Refitting	8-86
9 Hydraulics	9-1
9.1 HA140/Load Sensing	9-5
9.1.1 General	9-5
9.1.2 Principles of operation	9-5
9.1.3 Trailer brake unit	9-7
9.1.4 Layout of components	9-9
9.1.4.1 Steering and cooling system	9-9
9.1.4.2 High-pressure system	9-11
9.1.4.3 Distribution unit — Power Beyond	9-12
9.1.5 Hydraulic tests	9-14
9.1.5.1 General	9-14
9.1.5.2 Auxiliary hydraulic system	9-14
9.1.5.3 Steering system	9-19
9.1.6 Disassembly/reassembly	9-19
9.1.6.1 Variable displacement pump	9-19
9.1.6.2 Fixed displacement pumps	9-21
9.1.7 Service tools	9-23
9.1.7.1 General	9-23
9.1.7.2 Hydraulic test – Service tools	9-24
9.2 GPA20/Load Sensing	9-30
9.2.1 General	9-30
9.2.2 Principles of operation	9-30
9.2.3 Layout of components	9-32
9.2.3.1 Filtration and cooling	9-32
9.2.3.2 Transmission lubrication system	9-34
9.2.3.3 High-pressure system	9-36
9.2.3.4 Low pressure system	9-37
9.2.3.5 Distribution unit — Power Beyond	9-40
9.2.4 Hydraulic tests	9-40
9.2.4.1 General	9-40
9.2.4.2 High pressure system	9-41
9.2.4.3 Low pressure system (20 bar)	9-47
9.2.4.4 Cooling and lubrication system	9-52
9.2.5 Service tools	9-54
9.2.5.1 General	9-54
9.2.5.2 Hydraulic test – Service tools	9-54
9.3 GPA20/Load Sensing/Right-hand cover plate	9-61
9.3.1 General	9-61

9.3.2 Principles of operation	9-61
9.3.3 Description and operation of the variable displacement pump	9-63
9.3.4 Priority block	9-66
9.3.5 Layout of components	9-71
9.3.5.1 View of the assembly	9-71
9.3.5.2 Blown-up view	9-73
9.3.6 Identification of channels and ports	9-75
9.3.7 Disassembly/reassembly	9-77
9.3.7.1 Removing and refitting the hydraulic cover plate	9-77
9.3.7.2 Removing and refitting the variable displacement pump	9-80
9.3.8 Service tools	9-82
9.3.8.1 General	9-82
9.3.8.2 Load Sensing/Right-hand cover plate - Service tools	9-83
9.4 GPA20/Load Sensing/Left-hand cover plate	9-84
9.4.1 General	9-84
9.4.2 Principles of operation	9-84
9.4.3 Layout of components	9-86
9.4.3.1 View of the assembly	9-86
9.4.3.2 GPA20 exploded view	9-87
9.4.3.3 Identification of ports and channels on the cover plate	9-88
9.4.4 Disassembly/reassembly	9-88
9.4.4.1 Removing/refitting the LS cover plate	9-88
9.4.4.2 Removing and refitting the charge pump	9-88
9.4.4.3 Replacing the charge pump seals	9-91
9.5 Load Sensing/Linkage spool valve	9-94
9.5.1 General	9-94
9.5.2 Principles of operation	9-95
9.5.3 Schematic diagram	9-97
9.5.4 Removing/refitting the linkage spool valve	9-98
9.5.4.1 Removal	9-98
9.5.4.2 Refitting	9-99
9.5.4.3 Disassembly	9-99
9.5.4.4 Reassembly	9-99
9.5.4.5 Final steps	9-99
9.6 Load Sensing/Rear auxiliary spool valves	9-101
9.6.1 General	9-101
9.6.2 Mechanical auxiliary spool valves	9-104
9.6.2.1 Principles of operation	9-104
9.6.2.2 Control cables	9-105
9.6.3 Electrohydraulic auxiliary spool valves	9-105
9.6.3.1 Principles of operation	9-105
9.6.3.2 Working pressure block	9-108
9.6.4 Adjustments and bleeding	9-109
9.6.4.1 Spool valve cables	9-109
9.6.5 Disassembly/reassembly	9-111
9.6.5.1 Removing/refitting the rear spool valves	9-111
9.6.5.2 Spool valve lever	9-113
9.7 Load Sensing/Front auxiliary spool valves	9-115
9.7.1 General	9-115
9.7.2 Principles of operation	9-117
9.7.3 Working pressure block	9-121
9.7.4 Removing/refitting the front spool valves	9-121
9.7.4.1 Removing the front spool valves — Dyna-4 and Dyna-6	9-122
9.7.4.2 Removing the front spool valves — Dyna-VT	9-123
9.7.4.3 Refitting the front spool valves	9-124
9.7.4.4 Disassembling/reassembling the spool valve assembly	9-125
9.8 GPA20/Open Center	9-127

9.8.1 General	9-127
9.8.2 Low-pressure system, low flow rate	9-127
9.8.3 High-pressure system, high flow rate	9-130
9.8.4 Hydraulic tests	9-130
9.8.4.1 General	9-130
9.8.4.2 High flow rate system	9-131
9.8.4.3 Low flow rate system	9-134
9.9 GPA20/Open Center/Right-hand cover plate	9-141
9.9.1 General	9-141
9.9.2 Layout of components	9-142
9.9.2.1 View of external assembly	9-142
9.9.2.2 View of internal assembly	9-144
9.9.3 Blown-up view	9-147
9.9.4 Disassembly/reassembly	9-149
9.9.4.1 Removing/refitting the cover plate	9-149
9.9.4.2 Disassembling/reassembling the high pressure valve	9-152
9.9.4.3 Removing/refitting the pump	9-153
9.10 GPA20/Open Center/Left-hand cover plate	9-154
9.10.1 General	9-154
9.10.2 Layout of components	9-155
9.10.3 Removal/refitting	9-156
9.10.3.1 Removal	9-156
9.10.3.2 Preparing for refitting	9-158
9.10.3.3 Refitting	9-159
9.10.3.4 Final steps	9-159
9.11 GPA20/100 l/min Open Center	9-160
9.11.1 General	9-160
9.11.2 Low-pressure system, low flow rate	9-160
9.11.3 High-pressure system, high flow rate	9-163
9.11.4 Hydraulic tests	9-163
9.11.4.1 General	9-163
9.11.4.2 High flow rate system	9-164
9.11.4.3 Low flow rate system	9-168
9.12 GPA20/100 l/min Open Center/Right-hand cover plate	9-174
9.12.1 General	9-174
9.12.2 Layout of components	9-175
9.12.2.1 View of external assembly	9-175
9.12.2.2 View of internal assembly	9-177
9.12.3 Blown-up view	9-179
9.12.4 Disassembly/reassembly	9-181
9.12.4.1 Removing/refitting the cover plate	9-181
9.12.4.2 Disassembling/reassembling the high pressure valve	9-184
9.12.4.3 Removing/refitting the pump	9-185
9.13 GPA20/100 l/min Open Center/Left-hand cover plate	9-186
9.13.1 General	9-186
9.13.2 Layout of components	9-187
9.13.3 Disassembly/reassembly	9-188
9.13.3.1 Removal/refitting	9-188
9.14 GPA20/Open Center/Linkage spool valve	9-192
9.14.1 General	9-192
9.14.2 Principles of operation	9-192
9.14.3 Layout of components and identification of ports	9-201
9.14.4 Removing/refitting the spool valve	9-202
9.14.4.1 Removal	9-202
9.14.4.2 Preparing for refitting	9-203
9.14.4.3 Refitting	9-203
9.14.4.4 Final steps	9-203

9.15 GPA20/Open Center/Auxiliary spool valves	9-205
9.15.1 General	9-205
9.15.2 Principles of operation	9-207
9.15.2.1 Operation of the flow divider	9-207
9.15.2.2 3-position spool valve, SE/DE with return to neutral by spring	9-208
9.15.2.3 3-position spool valve, SE/DE with automatic return to neutral	9-211
9.15.2.4 3-position SE/DE spool valve with non-return valve and automatic return	9-212
9.15.2.5 Four-position DE spool valve, with automatic return to neutral and floating position	9-214
9.15.3 Schematic diagram	9-216
9.15.4 Layout of components	9-219
9.15.4.1 Blown-up view	9-219
9.15.5 Layout of ports and channels	9-221
9.15.6 Adjustments and bleeding	9-223
9.15.6.1 Adjusting the flow divider	9-223
9.15.7 Disassembly/reassembly	9-223
9.15.7.1 Removing/refitting the spool valves	9-223
9.15.7.2 Fitting and adjusting the control cables	9-225
9.16 GPA20/Open Center/Valve	9-230
9.16.1 General	9-230
9.16.2 Description of the 21-bar low pressure valve	9-230
9.16.3 Layout of components	9-232
9.16.3.1 Identification of ports	9-233
9.16.4 Adjusting the 21 bar valve	9-233
9.16.5 Disassembly/reassembly	9-233
9.16.5.1 Removing/refitting and disassembling/reassembling the 21-bar valve	9-233
9.16.5.2 Assembling the 5 bar valve	9-234
10 Electricity	10-1
10.1 Diagnostic procedure	10-3
10.1.1 List of generic procedures	10-3
10.1.2 Checking the insulation of a harness	10-3
10.1.3 Checking the continuity of a harness	10-3
10.1.4 Checking the CAN network	10-5
10.1.5 Checking a harness	10-7
10.1.6 Measuring a voltage	10-7
10.1.7 Measuring the resistance of a component	10-8
10.1.8 Measuring current	10-8
10.1.9 Hook-on ammeter procedure	10-8
10.1.10 Ammeter procedure	10-9
10.2 Electrical circuit	10-10
10.2.1 General	10-10
10.2.1.1 General	10-10
10.2.1.2 Principles of operation	10-11
10.2.1.3 Electricity - color code	10-11
10.2.1.4 Schematic diagram of the electrical circuit	10-12
10.2.2 Layout of components	10-13
10.3 Fuse box	10-15
10.3.1 General	10-15
10.3.1.1 General	10-15
10.3.1.2 Principles of operation	10-15
10.3.2 Layout of components	10-16
10.3.2.1 Fuse box - Connectors	10-16
10.3.3 Disassembly/reassembly	10-17
10.3.3.1 Tightening torques	10-17
10.3.3.2 Removing and refitting the fuse box	10-17

10.4 Alternator	10-19
10.4.1 Layout of components	10-19
10.4.2 Tests and diagnostics	10-20
10.4.2.1 Alternator - test procedure	10-20
10.4.3 Disassembly/reassembly	10-22
10.4.3.1 Removing and refitting the drive belts	10-22
10.4.3.2 Removing and refitting the alternators	10-23
10.4.4 Service tools	10-24
10.4.4.1 General	10-24
10.4.4.2 Belt - Service tools	10-24
10.5 Starter - General	10-25
10.5.1 General	10-25
10.5.1.1 General	10-25
10.5.1.2 Principles of operation	10-25
10.5.1.3 Schematic diagram	10-26
10.5.2 Layout of components	10-27
10.5.3 Tests and diagnostics	10-28
10.5.3.1 Starter diagnostics	10-28
10.5.4 Disassembly/reassembly	10-28
10.5.4.1 Removing/refitting the starter	10-28
10.6 Battery isolator	10-30
10.6.1 General	10-30
10.6.1.1 Battery isolator	10-30
10.6.1.2 Principles of operation	10-31
10.6.2 Layout of components	10-33
10.7 Triflash triangle - Disassembly/reassembly	10-34
10.7.1 Triflash on standard roof	10-34
10.7.2 Triflash on high-visibility roof	10-37
11 Electronics	11-1
11.1 Diagnostic tool	11-3
11.1.1 Diagnostic tool	11-3
11.2 Telemetry	11-4
11.2.1 General	11-4
11.2.1.1 General	11-4
11.2.1.2 Principles of operation	11-4
11.2.1.3 Schematic diagram	11-6
11.2.2 Telemetry error codes	11-6
11.2.3 Layout of components	11-8
11.2.4 Programming and setting parameters	11-8
11.2.5 Disassembly/reassembly	11-9
11.2.5.1 Access to the AGCOMMAND aerial	11-9
11.2.5.2 Disassembling the AM50 AGCOMMAND unit	11-10
12 Operator environment	12-1
12.1 Standard air conditioning	12-3
12.1.1 General	12-3
12.1.1.1 General	12-3
12.1.1.2 Principles of operation	12-3
12.1.1.3 Technical specifications	12-4
12.1.1.4 Schematic diagram of the air conditioning	12-7
12.1.1.5 Air conditioning hydraulics diagram	12-10
12.1.2 Layout of components	12-11
12.1.2.1 Diagram of the air conditioning compressor	12-11
12.1.2.2 Layout of components	12-12
12.1.3 Tests and diagnostics	12-13
12.1.3.1 Air conditioning tests - General	12-13

12.1.3.2 Air conditioning tests - Air conditioning unit breakdown	12-14
12.1.3.3 Air conditioning tests - Cleaning the system	12-15
12.1.4 Adjustments, bleeding and calibrations	12-16
12.1.4.1 Safety instructions	12-16
12.1.4.2 General maintenance	12-17
12.1.4.3 Adjusting the clutch air gap	12-17
12.1.4.4 Draining the system and checking for leaks	12-18
12.1.4.5 Filling the unit (engine stopped)	12-19
12.1.4.6 Checking pressures	12-21
12.1.5 Disassembly/reassembly	12-22
12.1.5.1 Removing and refitting the roof trim	12-22
12.1.5.2 Removing and refitting the drive belts	12-25
12.1.5.3 Air conditioning - Replacing the dryer	12-26
12.1.6 Service tools	12-28
12.1.6.1 General	12-28
12.1.6.2 Belt - Service tools	12-29
12.2 Self-regulating air conditioning	12-30
12.2.1 General	12-30
12.2.1.1 General	12-30
12.2.1.2 Using the air conditioning system	12-30
12.2.1.3 Fan control	12-30
12.2.1.4 Activating the compressor	12-31
12.2.1.5 Defrosting	12-31
12.2.1.6 Recirculation	12-31
12.2.1.7 Special conditions	12-32
12.2.2 Layout of components	12-32
12.2.2.1 Diagram of the air conditioning compressor	12-32
12.2.2.2 Layout of components	12-33
12.2.2.3 Self-regulating air conditioning - Layout of components	12-34
12.2.3 Tests and diagnostics	12-35
12.2.3.1 Air conditioning tests - General	12-35
12.2.3.2 Air conditioning tests - Air conditioning unit breakdown	12-35
12.2.3.3 Air conditioning tests - Cleaning the system	12-37
12.2.4 Adjustments, bleeding and calibrations	12-37
12.2.4.1 Safety instructions	12-37
12.2.4.2 General maintenance	12-38
12.2.4.3 Adjusting the clutch air gap	12-39
12.2.4.4 Draining the system and checking for leaks	12-40
12.2.4.5 Filling the unit (engine stopped)	12-41
12.2.4.6 Checking pressures	12-42
12.2.5 Disassembly/reassembly	12-44
12.2.5.1 Removing and refitting the roof trim	12-44
12.2.5.2 Removing and refitting the drive belts	12-47
12.2.5.3 Air conditioning - Replacing the dryer	12-48
12.2.6 Service tools	12-50
12.2.6.1 General	12-50
12.2.6.2 Belt - Service tools	12-51
12.3 Mechanical suspension	12-52
12.3.1 General	12-52
12.3.2 Layout of components	12-55
12.3.2.1 View of the assembly	12-55
12.3.3 Disassembly/reassembly	12-56
12.3.3.1 Tightening torques	12-56
12.4 Active mechanical suspension	12-57
12.4.1 General	12-57
12.4.2 Principles of operation	12-61
12.4.3 Schematic diagram	12-63

12.4.4 View of the assembly	12-67
12.4.5 Disassembly/reassembly	12-68
12.4.5.1 Tightening torques	12-68
13 Accessories	13-1
 13.1 accessories kits	13-3
13.1.1 Accessories kits - Engine	13-3
13.1.2 Accessories Kits - Gearbox	13-3
13.1.3 Accessories kits - Rear axle	13-3
13.1.4 Accessories kits - Power take-off	13-4
13.1.5 Accessories kits - Hydraulics	13-4
13.1.6 Accessories kits - Electronics	13-5
13.1.7 Accessories kits - Cab	13-5
14 Service tools	14-1
 14.1 General	14-3
14.1.1 General	14-3
 14.2 Separation of assemblies	14-4
14.2.1 Separation of assemblies - Service tools	14-4
 14.3 Engine	14-5
14.3.1 AGCO Power engine - Service tools	14-5
14.3.1.1 Cylinder block tools	14-5
14.3.1.2 Timing gear and flywheel housing tools	14-6
14.3.1.3 Cylinder head and valve mechanism tools	14-7
14.3.1.4 Crank mechanism tools	14-8
14.3.1.5 Coolant pump tools	14-9
14.3.1.6 Engine control system tools	14-10
14.3.1.7 Maintenance and troubleshooting tools	14-10
14.3.2 3rd generation SCR engine - Service tools	14-11
 14.4 Gearbox	14-12
14.4.1 GBA25	14-12
14.4.1.1 Powershift module - Service tools	14-12
14.4.1.2 PowerShuttle - Service tools	14-13
14.4.1.3 Robotic mechanical gearbox - Service tools	14-13
14.4.2 ML140	14-14
14.4.2.1 ML130/ML140/ML160/ML180 - Service tools	14-14
 14.5 Rear Axle	14-24
14.5.1 GPA20	14-24
14.5.1.1 GPA20/Final drives - Service tools	14-24
14.5.1.2 GPA20/Differential - Service tools	14-24
14.5.1.3 GPA20 +/Hitch/Increased capacity linkage - Service tools	14-25
14.5.1.4 Tractor braking - Service tools	14-26
14.5.2 HA140	14-26
14.5.2.1 Final drives - Service tools	14-26
14.5.2.2 Differential - Service tools	14-28
14.5.2.3 Tractor braking - Service tools	14-30
 14.6 Power take-off	14-33
14.6.1 GPA20	14-33
14.6.1.1 GPA20/Clutch - Service tools	14-33
 14.7 Front axle	14-34
14.7.1 Front axle - Service tools	14-34
14.7.2 4-wheel drive clutch - Service tools	14-35
 14.8 Hydraulics	14-38
14.8.1 Hydraulic test – Service tools	14-38
14.8.2 GPA20/Hydraulic Load Sensing system	14-44
14.8.2.1 Load Sensing/Right-hand cover plate - Service tools	14-44

14.9 Electricity	14-45
14.9.1 Belt - Service tools	14-45
14.10 Electronics	14-46
14.10.1 Harness - Service tools	14-46
14.11 Operator environment	14-56
14.11.1 Belt - Service tools	14-56

Thank you so much for reading.

**Please click the “Buy Now!”
button below to download the
complete manual.**

Buy Now



After you pay.

**You can download the most
perfect and complete manual in
the world immediately.**

Our support email:

ebooklibonline@outlook.com