Workshop service manual N° 3378177 M1

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1 . INTRODUCTION

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A . Reading the manual

General

The aim of this manual is to assist Distributors and Dealer to put AGCO tractors into service and ensure their efficient maintenance and repair.
By following the methods outlined in the manual and where necessary by using the specialised service tools indicated, the necessary maintenance operations can be carried out within the times specified in the Repair Times Schedule.

Page numbering

Example: 7C01.3
This manual is divided into chapters and sections, with each page providing the following information:
7 = Chapter
C = Section
01 = Sequence number in the section
3 = Page number in the section.

At the bottom of the page is shown the issue number and date.

Using the manual

To facilitate searching, at the beginning of each chapter is an index showing the different sections contained in the chapter. Then, at the beginning of each section, is a list of contents.

Meaning of symbols

circle (..) : identifies the component part only

Amendments

Amended pages are issued using precisely the same numbering system as the previous pages: only the issue number and the date are changed.
The old pages should be removed from the manual and destroyed.

Service tools

During operations where a specific service tool needs to be used, the tool reference number is specified.

Repairs and replacement of parts

When replacing parts, it is essential that only AGCO original spare parts are used.
Special attention should be paid to the following facts concerning the carrying out of repairs and the fitting of spare parts and replacement accessories.
The fitting of spare parts, other than AGCO original spare parts can compromise the safety of the tractor.
In certain countries, the legislation actually forbids the fitting of parts that do not comply with the tractor manufacturer's specifications. All tightening torques indicated in the manual must be scrupulously complied with.
At specific locations, locking devices are fitted. If any locking device is damaged during disassembly, a new locking device must be fitted.
Fitting spare parts other than AGCO original spare parts voids the warranty of the tractor since all AGCO parts are guaranteed by the manufacturer. AGCO Distributors and Dealers are required to supply original spare parts only.

Repair Times Schedule

The chapters in the Repair Times Schedule are identical to those found in this Workshop Manual.

B . General specifications

Engine

Specifications	8210	8220 / 8220 Xtra	8240 / 8240 Xtra	8250 / 8250 Xtra
PERKINS ENGINE	1006	1006		
VALMET ENGINE			620	634
Number of cylinders	6	6	6	6
Turbocharger	Yes	Yes	Yes	Yes
Air / Air intercooler		Yes	Yes	Yes
Bore (mm)	100	100	108	108
Stroke (mm)	127	127	120	134
Capacity (l)	6	6	6.6	7.4
Rated power (ISO Kw)	113	119.5	125 / 142	136 / 159
At engine speed (rpm)	2200	2200	2200	2200
Maximum torque (ISO Nm)	620	663	727 / 855	797 / 920
Engine speed at maximum torque	1400	1400	1400	1400
Idle speed	950	950	950	950
Maximum power speed (rpm)	2200	2200	2200	2200
Maximum speed at no load (rpm)	2354	2354	2354	2354
Lubrication: By gear pump - suction strainer and interchangeable external cartridge filters				
Valves: Overhead valves operated by pushrods				
Rocker arm clearance (cold)				
- Inlet - mm (inches)	0.20	0.20	0.35	0.35
- Exhaust - mm (inches)	0.45	0.45	0.35	0.35
Engine oil cooler	Yes	Yes	Yes	Yes

Injection and air filter

	8210	8220 / 8220 Xtra	8240 / 8240 Xtra	8250 / 8250 Xtra
Fuel filter	Yes	Yes	Yes	Yes
No. of elements	2	2	2	2
Injection pump	Lucas	Lucas	Stanadyne/Bosch	Bosch
Injectors and nozzle holder	Lucas	Lucas	Stanadyne	Stanadyne
Two-stage air filter, a dry filter element with a filter-clogging indicator.				
Start up in cold weather			Thermostart	

Introduction

Specifications	8260 / 8260 Xtra	8270 / 8270 Xtra	8280 / 8280 Xtra
VALMET ENGINE	634	645	645
Number of cylinders	6	6	6
Turbocharger	Yes	Yes	Yes
Air / Water intercooler	Yes / No	Yes / No	Yes / No
Air / Air intercooler	No / Yes	No / Yes	No / Yes
Bore (mm)	108	111	111
Stroke (mm)	134	145	145
Capacity (l)	7.4	8.4	8.4
Rated power (ISO Kw)	162 / 172	181 / 192	200 / 212
At engine speed .	2200	2200	2200
Maximum torque (ISON Nm)	878 / 980	1002 / 1120	1150 / 1260
Engine speed at maximum torque	1400	1400	1400
Idle speed	950	950	950
Maximum power speed (rpm)	2200	2200	2200
Maximum speed at no load (rpm)	2354	2354	2354
Lubrication: By gear pump - suction strainer and interchangeable external cartridge filters			
Valves: Overhead valves operated by pushrods			
Rocker arm clearance (cold)			
- Inlet - mm (inches)	0.35	0.35	0.35
- Exhaust - mm (inches)	0.35	0.35	0.35
Engine oil cooler	Yes	Yes	Yes

Injection and air filter

	8260 / 8260 Xtra	8270 / 8270 Xtra	8280 / 8280 Xtra
Fuel filter	Yes	Yes	Yes
No. of elements	2	2	2
Injection pump	Bosch	Bosch	Bosch
Injectors and nozzle holder	Stanadyne	Stanadyne/Bosch	Stanadyne/Bosch
Two stage air filter, dry filter element with filter clogging indicator.			
Start up in cold weather		Thermostart	

Introduction

Road speeds at 2200 rpm - Dynashift transmission with creeper unit - Heavy Duty reduction drive units - 20.8R38 tyres.

RANGE			FORWARD		REVERSE	
			Heavy Duty reduction drive unit km/h	Heavy Duty reduction drive unit km/h	Heavy Duty reduction drive unit km/h	Heavy Duty reduction drive unit km/h
TORTOISE	**1**	A	2.36	0.6	2.3	0.6
		B	2.76	0.7	2.7	0.7
		C	3.26	0.8	3.19	0.8
		D	3.81	0.9	3.74	0.9
	2	A	3.58	0.9	3.51	0.9
		B	4.19	1	4.1	1
		C	4.94	1.2	4.84	1.2
		D	5.79	1.4	5.67	1.4
	3	A	5.11	1.2	5.01	1.2
		B	5.98	1.5	5.86	1.4
		C	7.06	1.7	6.92	1.7
		D	8.27	2	8.1	2
	4	A	6.96	1.7	6.82	1.7
		B	8.14	2	7.98	1.9
		C	9.61	2.3	9.42	2.3
		D	11.25	2.7	11.02	2.7
HARE	**1**	A	7.77	1.9	7.61	1.9
		B	9.09	2.2	8.91	2.2
		C	10.73	2.6	10.51	2.6
		D	12.56	3.1	12.3	3
	2	A	11.79	2.9	11.55	2.8
		B	13.8	3.4	11.55	2.8
		C	16.29	4	15.95	3.9
		D	19.06	4.7	18.67	4.6
	3	A	16.84	4.1	16.5	4
		B	19.71	4.8	19.31	4.7
		C	23.27	5.7	22.79	5.6
		D	27.23	6.6	26.68	6.5
	4	A	22.92	5.6	22.45	5.5
		B	26.83	6.5	26.28	6.4
		C	31.67	7.7	31.02	7.6
		D	37.06	9	36.31	8.9

Introduction

Road speeds at 2200 rpm - Full Powershift transmission AG150, sealed Heavy Duty reduction drive units - 20.8R38 tyres.

RANGE	FORWARD (km/h)	REVERSE (km/h)
1	2.28	2.28
2	2.94	3.8
3	3.8	4.32
4	4.32	6.33
5	4.91	7.21
6	5.59	10.54
7	6.33	12.01
8	7.21	17.57
9	8.18	
10	9.31	
11	10.54	
12	12.01	
13	13.62	
14	15.52	
15	17.57	
16	22.69	
17	29.28	
18	37.82	

Introduction

Road speeds at 2200 rpm - Full Powershift transmission AG150, sealed Heavy Duty reduction drive units with creeper unit - 20.8R38 tyres.

RANGE	FRONT (km/h)	REAR (km/h)
1	0,6	0,6
2	0,7	0,9
3	0,9	1,1
4	1,1	1,5
5	1,2	1,8
6	1,4	2,6
7	1,5	2,9
8	1,8	4,3
9	2,0	
10	2,3	
11	2,6	
12	2,9	
13	3,3	
14	3,8	
15	4,3	
16	5,5	
17	7,1	
18	9,2	

Introduction

Road speed at 2200 rpm - AG250 Full Powershift Transmission, double drive units - 650 / 85R38 tires

RANGE	FRONT (km/h)	REAR (km/h)
1	2.40	2.40
2	3.10	4.00
3	4.00	4.60
4	4.60	6.70
5	5.10	7.60
6	5.90	11.10
7	6.70	12.70
8	7.60	18.50
9	8.60	
10	9.80	
11	11.10	
12	12.70	
13	14.30	
14	16.30	
15	18.50	
16	23.90	
17	30.90	
18	39.80	

Introduction

Road speed at 2200 rpm AG250 Full Powershift Transmission, double drive units - 650 / 85R38 tires with gearbox

RANGE	FRONT (km/h)	REAR (km/h)
1	0.60	0.60
2	0.80	1.00
3	1.00	1.10
4	1.10	1.60
5	1.30	1.90
6	1.40	2.70
7	1.60	3.10
8	1.90	4.50
9	2.10	
10	2.40	
11	2.70	
12	3.10	
13	3.50	
14	4.00	
15	4.50	
16	5.80	
17	7.50	
18	9.70	

Introduction

Electrical circuit

Voltage :	12 volt, negative to ground
Batteries :	2 maintenance-free batteries
Alternator :	120 Amp.
Starter safety :	Controlled by clutch pedal
Headlights :	European dipped beam 40/45 W
Parking lights :	5 W
Direction indicators :	21 W
Number plate light :	10 W
Work lights :	55 W - H3
Dials and signal lamp lighting :	3 W - 2 W - 1,2 W
Roof light:	10 W

Cooling system

Mode :	Thermostat controlled, open temperature: 82° C.
Fan:	Viscostatic releasable type
Water pump :	- gear-driven in 8210 / 8220 / 8270 / 8280 tractors - belt-driven in 8240 / 8245 / 8250 / 8260 tractors
Fan belt tension :	15 mm (0.6") to 20 mm (0.8") on the longest run

Transmission

Dynashift gearbox with mechanical reverse shuttle	- 32 forward speeds - 32 reverse speeds - four ratios selectable without declutching - synchromesh reverse shuttle
• Clutch :	- wet clutch : 8210 / 8220 : 6 plates 8240 : 7 plates 8250 : 8 plates
• ¼ Creeper gearbox :	- 48 forward speeds - 48 reverse speeds
• Filtering	- 1 x 60 micron suction strainer
Dynashift gearbox with power shuttle	- 32 forward speeds - 32 reverse speeds - four ratios selectable without declutching - power shuttle
• 8210 - 8220 power shuttle	- clutch controlled - 6 forward speed discs - 5 reverse speed discs
• 8240 power shuttle	- clutch controlled - 7 forward speed discs - 6 reverse speed discs
• 8250 power shuttle	- clutch controlled - 8 forward speed discs - 6 reverse speed discs
• ¼ Creeper gearbox :	- 48 forward speeds - 48 reverse speeds
• Filtering	- 1 x 60 micron suction strainer

Introduction

Full Powershift gearbox :
- 17 or 18 forward speeds (depending on 30 km/h or 40 km/h version)
- 8 reverse speeds

• Clutches : 9 clutches controlled by solenoid valves

• ¼ ratio creeper gearbox :
- 34 or 36 forward speeds (depending on 30 km/h or 40 km/h version)
- 16 reverse speeds

• Hydraulics : 1 "Gerotor" pump - Capacity 110 l/min at 2200 rpm provides (for lubrication and supply of clutches, cooling system and boosting of) the master cylinders.

• Filtering : 1 x 150 micron suction strainer, located inside the housing. External 15-micron filter, 3-way filter protects solenoid valves from particles.

Final reduction drive units

Reduction drive units: Epicyclical, located in rear axle housings.

Reduction ratios:

8210/8220 Heavy duty	6.21:1
8220/8240/8245 Heavy duty sealed compartment	6.21:1
8240 / 8245 / 8250 / 8260 Composite	7.14:1
8260 / 8270 / 8280 Dual	9.47:1

Front axle with 2-wheel drive

• Optional in 8210 to 8260 tractors

Front axle with 4-wheel drive

Suspension : Option available on models Carraro 20.29 and 20.43 (8210 to 8250) only

Clutch mechanism: Electro-hydraulically controlled from a button on the armrest inside the cab.

Differential lock: Differential lock coupling is electro-hydraulically controlled.
Lock :
- oil-bath clutch on Carraro (20.29 and 20.43) and Dana AG280 front axles
- hydromechanical dog coupling on Dana AG155 and AG200 front axles.

Gear ratios:

8210 / 8220 / 8240	AG155	20,872/1	up to K137012
8210 / 8220 / 8240	20.29	20,769/1	from K137013
8240 /8245 /8250 /8260	AG200	20.475/1	
8250	20.43	20.769/1	From K116015
8250 Xtra	20.48	20.945/1	
8270 / 8280	APL5052	20.475/1	Up to L074008
8270 : 8280	AG280	20.363/1	From L074009

Power take-off

• interchangeable shaft : 540 (6 splines) or 1000 rpm (21 splines) at engine speed of 2000 rpm.

• Shiftable : with 540 rpm or 1000 rpm interchangeable end

• 750 rpm economy PTO : 750 rpm at engine speed of 2000 rpm
6 splines, shaft Ø 35 mm
20 splines shaft Ø 44.5 mm or
21 splines shaft Ø 35 mm

Hydraulic circuit

Closed centre hydraulic circuit with flow and pressure regulation.
2 possible circuits :

- 110 l/min at 200 bar
- 150 l/min at 200 bar, optionally available on 8200 tractors only if they are equipped with a Full Powershift gearbox

Booster pump: maximum flow 150 l/min or 215 l/min (o 150 l/min hydraulic circuit) at 2200 rpm guaranteeing a constant 5 bar boost for the variable displacement pump, also provides lubrication for the rear axle.

Low-pressure circuit (17 bar) supplies the following functions :

4 WD clutch	Engine clutch (mechanical reverse shuttle)
Differential lock	Power shuttle
Power take-off clutch	Hare / Tortoise range (Heavy Duty gearbox)

Low pressure circuit for Full Powershift gearbox
- the Full Powershift gearbox has its own low pressure pump that ensures lubrication of the transmission and operation of these clutches at a 17 bar pressure

High-pressure circuit: maximum pump flow 110 l/min or 150 l/min (optionally) at 2200 rpm, maximum pressure 200 bar that supplies:

the steering	the 17 bar valve
the auxiliary spool valves	the hydraulic lift system

Filtering : 1 x 150 micron suction strainer located on the left-hand side of the transmission housing.
Main external high-pressure 15-micron oil filter, located on the right-hand side of the transmission housing.

Hydraulic lift

Type: 3-point, category 3
Lift rams: dia. 95 (8210, 8220, 8240, 8250) quantity 2 - capacity (see table)

Position of lift rod on drawbar (mm)	Length of lift rod (mm)	Horizontal drawbar (Kg)	Drawbar in transport position (Kg)
547.5	824	7149	9365
	918	7373	8627
600	824	7769	9865
	918	7927	9109

Lift rams: dia. 105 (8260 to 8280) quantity 2 - capacity (see table)

Position of lift rod on drawbar (mm)	Length of lift rod (mm)	Horizontal drawbar (Kg)	Drawbar in transport position (Kg)
Mini 530.4	838	8741	11387
	915	8994	10656
Maxi 580.9	838	9475	12001
	915	9667	11252

Brakes

Type : disc brakes, two discs per wheel with double reduction unit constant flow lubrication, external dia. 313 mm.
Lining internal dia. : 239 mm.
Operation : Hydraulic, using two master cylinders.
Parking brake : operates on intermediate shaft of drive pinion.
Park lock : mechanically locks the intermediate shaft of the drive pinion.

Rear differential lock

Type :
- 8210 to 8250 : Hydro-mechanical , standard torque
- 8210 to 8250 : 5'' or 7'' multidisc (according to version) in oil bath, standard torque
- 8260 to 8280 : 7'' Multi-disc in oil bath, hypoid torque

Control: Electrically controlled hydraulics.

Introduction

Steering

Type: Hydrostatic, telescopic or fixed tilting steering column double action steering ram (8200 with Dana or Carraro front axle), two double action steering rams (8270 and 8280 with APL5052 front axle only).

Wheels

Front (4 wheel drive): adjustable steel rims
Rear: steel rims (fixed or adjustable), manually adjustable pressed steel rim with cast iron disc.

Capacities

Fuel tank with additional reserve :	8210/8220/8240/8250/8260 :	410 l
	8270/8280 :	456 l
Cooling system	8210/8220 :	28,5 l
	8240 to 8280 :	34 l
Engine sump	8210/8220 :	15,6 l
	8240 :	20 l
	8250/8260/8270/8280 :	19 l
Transmission / rear axle Dynashift gearbox (Heavy Duty)	8210/8220 :	123 l
Transmission / rear axle Full Powershift gearbox(Heavy Duty)	8210/8220 :	157 l
Transmission / rear axle Dynashift gearbox (Heavy Duty sealed)	8220/8240 :	120 l
Transmission / rear axle Full Powershift (Heavy Duty sealed)	8220/8240 :	150 l
Transmission / rear axle Dynashift gearbox (Composite)	8240/8250 :	114 l
Transmission / rear axle Full Powershift gearbox (Composite)	8240/8245/8250/8260 :	147 l
Transmission / rear axle Full Powershift gearbox (double drive unit)	8260/8270/8280 :	156 l

Note: Transmission/rear axle assembly filling tolerances ± 5 l.

Introduction

AG155 and AG200 front axle assembly	8210 to 8260	10.2 l
APL5052 front axle assembly	8270/8280	10 l
AG280 front axle assembly	8270/8280	16 l
20.29ACP and 20.43ACP fixed front axle assembly	8210 to 8250	6 l
20.29S and 20.43S suspension front axle assembly	8210 to 8250	8.6 l
20.48ACP fixed front axle assembly	8250 Xtra	10 l
20.48S suspension front axle assembly	8250 Xtra	10 l

AG 155H front final drive unit (each)	8210 to 8240	1.6 l
20.29 or 20.43 front final drive unit (each)	8210 to 8250	1.3 l
20.48 front final drive unit (each)	8250 Xtra	1.9 l
AG 200 front final drive unit (each)	8240/8245/8250/8260	1,8 l
APL 5052 front final drive unit (each)	8270/8280	4 l
AG280 front final drive unit (each)	8270/8280	2.7 l

Heavy Duty Sealed Rear final drive unit (each)	8220/8240	3,6 l
Composite rear final drive drive units (each)	8240/8245/8250/8360	4,5 l

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