2140 Tractor
Technical Manual

CONTENTS

CONTENTS (Contd.)

Section 10
General

CONTENTS OF THIS SECTION

GROUP 00 – SPECIFICATIONS AND SPECIAL TOOLS

GROUP 05 – PREDELIVERY, DELIVERY AND AFTER-SALES INSPECTIONS

GROUP 10 – LUBRICATION AND SERVICE

GROUP 15 – TUNE-UP

GROUP 20 – TRACTOR SEPARATION (Tractors without Increased Lift Capacity)

GROUP 25 – TRACTOR SEPARATION (Tractors with Increased Lift Capacity)

Group 00
Specifications and Special Tools

Specifications

Serial Numbers

The engine serial number is stamped into the plate located on the lower front right-hand side of the cylinder block.

NOTE: When ordering engine parts, quote all digits of serial number stamped on the plate.

The plate showing the tractor serial number is located on the right-hand side of the front axle carrier.

NOTE: When ordering tractor spare parts (excluding engine parts), quote all digits and letters of serial number stamped on the plate.

A plate showing the tractor type, transmission serial number, cone point measurement etched into pinion face of differential drive shaft as well as reduction of differential is located on the right-hand side of the transmission case.

Model Numbers

The fuel injection pump, fuel injection nozzles, alternator, starting motor, hydrostatic steering valve, compressor of air conditioning system (when equipped) and hydraulic pump have model numbers to facilitate identification of different makes of a given unit.

Engine

Number of cylinders		4
Cylinder liner bore	106.5 mm	4.19 in.
Stroke	110 mm	4.33 in.
Displacement	3920 cm^3	239 cu.in.
Compression ratio		16.8 : 1
Maximum torque at 1600 rpm	270 Nm	199 ft-lb
Firing order		1 - 3 - 4 - 2
Valve clearance (engine hot or cold)		
Intake valve	0.35 mm	0.014 in.
Exhaust valve	0.45 mm	0.018 in.

Fast idle speed . . . . . 2610 to 2660 rpm

Slow idle speed . . . . . 700 to 800 rpm

Rated engine speed . . . . . 2500 rpm

Working speed range . . . . . 1600 to 2500 rpm

Flywheel horsepower at engine rated speed — 2500 rpm

According to DIN 70020 . . . . . 60 kW 82 hp

PTO* horsepower at engine rated speed — 2500 rpm

According to DIN 70020 . . . . . 54 kW 74 hp

According to SAE J816b . . . . . 54 kW 72 hp

Lubrication system . . . . . Full internal force feed system with full flow filter

Engine Clutch . . . . . Single dry disk clutch with torsion damper, foot-operated

Cooling System

Type . . . . . Pressurized system with centrifugal pump

Temperature regulation . . . . . Thermostat

Fuel System

Type . . . . . Direct injection

Fuel injection pump timing to engine . . . . . TDC

Fuel injection pump type . . . . . Distributor type

up to engine serial no. 526 865 CD . . . . . Roto Diesel No. R 3443 F 680
from engine serial no. 526 866 CD . . . . . Roto Diesel No. R 3443 F 910

Air cleaner . . . . . Dry-type air cleaner with secondary (safety) element

* With the engine run in (above 100 hours of operation) and having reached operating temperature (engine and transmission); measured by means of a dynamometer. Permissible variation ± 5 % .

Electrical System

Batteries ..... 2 x 12 volts, 55 Ah
Tractors with SG2 cab ..... 2 x 12 volts, 55 Ah or 66 Ah

Alternator with internal regulator
Tractors without operator's cab ..... 14 volts, 33 or 55 amps.
Tractors with operator's cab ..... 14 volts, 55 amps.

Starting motor ..... 12 volts, 3 kW (4 hp)

Battery terminal grounded ..... negative

Synchronized Transmission

Type ..... Synchronized transmission

Gear selections ..... 8 forward and 4 reverse

Gear shifting ..... Two forward groups and one reverse group
Synchronized forward and reverse shifting within groups

Collar Shift Transmission

Type ..... Helical gears

Gear selections ..... 8 forward, 4 reverse speeds

Gear shifting ..... Two forward ranges, One reverse range

Hi-Lo Shift Unit

Type ..... Hydraulic gear reduction unit which can be shifted under load with "wet" multiple disk clutch and brake packs

Travel speed decreases in each gear by ..... Approx. 20 %

Shifting to reduced (Lo) speed ..... Preloaded cup springs

Shifting to normal (Hi) speed ..... Hydraulic

Creeper Transmission

Type ..... Synchronized reduction unit

Travel speed decreases in low (I) and reverse ranges by ..... approx. 79 %

Shifting both ranges ..... Mechanical and not under load

Differential and Final Drives

Type of differential ..... Spiral bevel gears

Type of final drive ..... Planetary reduction drive

Differential Lock

Operation ..... Hand or foot operated

Disengage ..... Will disengage automatically as soon as traction has equalized

PTO

Type ..... Independent of transmission, can be engaged and disengaged under load

PTO speeds with engine speed of:

2400 rpm* or 2040 rpm** ..... 540 rpm

2400 rpm ..... 1000 rpm

(changing PTO stub shaft or handshift change)

PTO clutch ..... Hydraulically operated "wet" disk clutch

PTO brake ..... Hydraulically operated "wet" disk brake

PTO SPEEDS (in rpm)

Engine speed	540 rpm shaft	1000 rpm shaft
800	180* or 210**	335
2400* or 2040**	540	1000
2500	565* or 660**	1040
2660	600* or 705**	1110

Mechanical Front Wheel Drive

Type ..... Engaged hydraulically, under full load with "wet" disk clutch

Control ..... Electrical/hydraulic solenoid switch

Engagement ..... Preloaded cup springs

Disengagement ..... Hydraulic

* up to tractor serial no. 507 867 L
** From tractor serial no. 507 868 L

Hydrostatic Steering ..... Without mechanical linkage between steering valve and the front wheels

Power Steering ..... Hydraulically operated steering linkage

Manual Steering ..... Recirculating ball bearing type

Foot Brakes ..... Self-adjusting, hydraulically operated "wet" disk brakes

Handbrake ..... Mechanically operated band-type locking brake acting on the differential

Hydraulic System

Type	Closed center, constant pressure system		
Standby pressure*	19000 kPa	190 bar	2760 psi
Operating pressure**	17000 kPa	170 bar	2470 psi
Hydraulic pump	4 or 8-piston pump with variable displacement		

Capacities

Fuel tank		
Plastic tank	102 liters	26.9 U.S.gals.
Metal tank	90 liters	23.8 U.S.gals.
Cooling system		
Without operator's cab	13 liters	3.4 U.S.gals.
With operator's cab	15 liters	4 U.S.gals.
Engine crankcase		
Without filter change	8 liters	2.1 U.S.gals.
With filter change	8.5 liters	2.25 U.S.gals.
Transmission - Hydraulic system (including oil reservoir and oil cooler)		
Synchronized transmission		
Initial filling	64 liters	16.9 U.S.gals.
Oil change	56 liters	14.8 U.S.gals.
Collar shift transmission		
Initial filling	52 liters	13.75 U.S.gals.
Oil change	44 liters	11.6 U.S.gals.
Oil reservoir	4 liters	1.1 U.S.gals.
Oil cooler	2 liters	0.5 U.S.gals.

On tractors for Canada only:
* 15500 kPa 155 bar 2250 psi
** 14000 kPa 140 bar 2050 psi

Capacities (Contd.)

Mechanical front wheel drive

Front axle housing		
up to serial no. 449 999 L	6.5 liters	1.7 U.S.gals.
from serial no. 450 000 L	7.0 liters	1.85 U.S.gals.
Wheel hub housing, each		
up to serial no. 449 999 L	1.0 liter	0.3 U.S.gals.
from serial no. 450 000 L	0.75 liter	0.2 U.S.gals.
Belt pulley	1.0 liter	0.3 U.S.gals.

Travel Speeds ..... see Operator's Manual

Front and Rear Wheels

Tires, tread widths. tire pressures and ballast weights ..... see Operator's Manual

Dimensions and Weights ..... see Operator's Manual

Predelivery, Delivery and After-Sales Inspections

ENGINE SPEEDS

Slow idle	700 to 800 rpm
Fast idle	2610 to 2660 rpm
Rated speed	2500 rpm

FAN BELT

The fan belt should have 19 mm (3/4 in.) flex with 90 N (20 lb) pull midway between crankshaft and alternator or water pump (use a spring scale).

COMPRESSOR BELT

The compressor belt should have 19 mm (3/4 in.) flex with 60 N (13 lb) pull midway between pulleys.

BATTERIES

Specific gravity at an electrolyte temperature of 20°C (68°F)

Normal and arctic conditions	1.28
Tropical conditions	1.23

CLUTCH OPERATING ASSY.

Tractors without Cab or with OPU

Clutch pedal free travel	approx. 25 mm 1 in.

Tractors with SG2 Cab

Slave cylinder operating rod, stroke	8.5 to 12.0 mm 5/16 to 15/32 in.

FRONT WHEEL TOE-IN

Tractors without front wheel drive	3 to 6 mm	0.12 to 0.25 in.
Tractors with MFWD	0 to 3 mm	0 to 0.12 in.

TORQUES FOR HARDWARE

Front wheel rim to hub		
Tractors without front wheel drive	180 Nm	130 ft-lb
Tractors with MFWD	300 Nm	220 ft-lb
Axle knees to axle center, cap screws	400 Nm	300 ft-lb

Tractors with Hydrostatic Steering

Tie rod clamps		
Cap screw M 10	55 Nm	40 ft-lb
Cap screw M 12	90 Nm	65 ft-lb
Tie rod tube, cap screw	55 Nm	40 ft-lb

Tractors with Power Steering or Manual Steering

Outer clamp of tied rod, cap screw	90 Nm	65 ft-lb
Inner clamp of tie rod, cap screw	55 Nm	40 ft-lb

TORQUES FOR HARDWARE (Contd.)

Rear wheels		
Rear wheels to axle	400 Nm	300 ft-lb
Wheel disk to hub (rack-and-pinion axle)	400 Nm	300 ft-lb
4-post roll guard		
Roll guard to fender, cap screws	120 Nm	85 ft-lb
U-bolt hex. nuts	130 Nm	95 ft-lb
2-post roll guard		
To final drive housings, cap screws	230 Nm	170 ft-lb
Both supports to crossbar, cap screws	230 Nm	170 ft-lb
Rear wheel fenders to final drive housings, hex. nuts	130 Nm	95 ft-lb
SG2 cab rubber mounting blocks, hex. nuts	200 Nm	145 ft-lb

Lubrication and Service

CAPACITIES

Engine crankcase		
without filter change	8 liters	2.1 U.S.gals.
with filter change	8.5 liters	2.25 U.S.gals.
Hydraulic clutch operating system	300 cm^3	10.5 fl.oz.

Cooling System

without operator's cab	13 liters	3.4 U.S.gals.
with operator's cab	15 liters	4.0 U.S.gals.
Transmission - Hydraulic system (including oil reservoir and oil cooler)		
Synchronized transmission		
Initial filling	64 liters	16.8 U.S.gals.
Oil change	56 liters	14.8 U.S.gals.
Collar shift transmission		
Initial filling	52 liters	13.75 U.S.gals.
Oil change	44 liters	11.6 U.S.gals.
Mechanical front wheel drive		
Front axle housing		
up to serial no. 449 999 L	6.5 liters	1.7 U.S.gals.
from serial no. 450 000 L	7.0 liters	1.85 U.S.gals.
Wheel hub housing, each		
up to serial no. 449 999 L	1.0 liter	0.3 U.S.gals.
from serial no. 450 000 L	0.75 liter	0.2 U.S.gals.
Belt pulley	1 liter	0.3 U.S.gals.

SERVICE INTERVALS

Checking crankcase oil level ..... every 10 hours

Changing engine oil ..... every 200 hours

Changing engine oil filter ..... every 200 hours

Checking fuel filter ..... every 10 hours

Changing fuel filter ..... every 1000 hours

Checking transmission/hydraulic system oil level ..... every 50 hours

Changing transmission/hydraulic system oil filter ..... every 500 hours

Changing transmission/hydraulic oil ..... every 1000 hours

Changing hydrostatic steering filter ..... every 1000 hours

Cleaning hydraulic pump strainer ..... every 1000 hours

Checking MFWD oil level ..... every 100 hours

MFWD oil change ..... every 1000 hours

Cleaning and packing front wheel bearings ..... every 1000 hours

Lubricating grease fittings

Mechanical front wheel drive universal-jointed shaft ..... every 50 hours
in wet and muddy conditions ..... every 10 hours

Front axle and front axle bearings ..... every 50 hours
in wet and muddy conditions ..... every 10 hours

Clutch throw-out bearing grease fitting (when equipped) ..... every 100 hours

Rear axle bearings ..... every 500 hours
in wet and muddy conditions ..... every 10 hours

Three-point hitch ..... every 200 hours

Front hitch ..... every 200 hours

Front PTO drive shaft ..... every 200 hours

Tune-Up

PTO horsepower* at 2500 rpm rated engine speed

According to DIN 70020	.54 kW	74 hp
According to SAE J 816b	.54 kW	72 hp

Slow idle ..... 700 to 800 rpm

Fast idle ..... 2610 to 2660 rpm

Rated engine speed ..... 2500 rpm

Air intake system vacuum ..... .3.5 to 6.0 kPa	35 to 60 mbar	14 to 25 in. water head
Air cleaner restriction warning switch closes at a vacuum of ..... .5.5 to 6.5 kPa	55 to 65 mbar	22 to 26 in. water head
Radiator cap high pressure valve opens at ..... .40 to 50 kPa	0.4 to 0.5 bar	6 to 7 psi
Radiator cap low pressure valve opens at ..... .0 to 4 kPa	0 to 0.04 bar	0 to 0.6 psi

FAN BELT

Fan belt should have 19 mm (3/4 in.) flex with 90 N (20 lb) pull midway between crankshaft and alternator or water pump (use a spring scale).

COMPRESSOR BELT

Compressor belt should have 19 mm (3/4 in.) flex with 60 N (13 lb) pull midway between pulleys.

* With the engine run in (more than 100 hours of operation) and having reached operating temperature (engine and transmission); measured by means of a dynamometer. Permissible variation ± 5 %.

Tractor Separation

TORQUES FOR HARDWARE (TRACTORS WITHOUT INCREASED LIFTING CAPACITY)

Front axle carrier to engine block		
front attaching cap screws (4 used)	230 Nm	170 ft-lb
rear attaching cap screws (2 used)	180 Nm	130 ft-lb
Front axle carrier to oil pan, cap screws	400 Nm	300 ft-lb
Hydraulic pump drive shaft, cap screws	50 Nm	35 ft-lb
Jointed shaft flange to front axle drive hub (tractors with MFWD), cap screws	75 Nm	55 ft-lb
Drag link* to bell crank or steering arm, slotted nut**	75 Nm	55 ft-lb
Clutch housing to engine block		
cap screws	230 Nm	170 ft-lb
hex. nuts	230 Nm	170 ft-lb
Oil pan to clutch housing, cap screws	230 Nm	170 ft-lb
Clutch housing to transmission, cap screws	160 Nm	120 ft-lb
Transmission case drain plugs	135 Nm	100 ft-lb
Retainer of hydraulic lines to clutch housing, cap screw	45 Nm	32 ft-lb
Final drive housings to transmission case, cap screws	120 Nm	85 ft-lb
Rockshaft housing to transmission case, cap screws	120 Nm	85 ft-lb
Rear wheels to rear axle	400 Nm	300 ft-lb
Wheel disk to hub (on tractors equipped with rack-and-pinion axle)	400 Nm	300 ft-lb
4-post roll guard		
Roll guard to fender, cap screws	120 Nm	85 ft-lb
U-bolt hex. nuts	130 Nm	95 ft-lb
2-post roll guard		
To final drive housings, cap screws	230 Nm	170 ft-lb
Both supports to crossbar, cap screws	230 Nm	170 ft-lb

* On tractors with power or manual steering

** *NOTE: If cotter pin cannot be inserted when tightening to the specified torque, turn nut to next slot and secure with cotter pin.*

Basic weight to front axle carrier, cap screws	400 Nm	300 ft-lb
Drawbar to transmission case, cap screws	120 Nm	85 ft-lb

OPU Cab

Cab to rubber bearing block, slotted nuts*	10 to 20 Nm	7 to 14 ft-lb
Rubber bearing block to bearing and pivot brackets, cap screws	50 Nm	35 ft-lb
Bearing pivot bracket to final drive housing, cap screws	100 Nm	70 ft-lb
Bearing bracket to battery box, cap screws	50 Nm	35 ft-lb
Battery box to flywheel housing,		
upper cap screw	200 Nm	145 ft-lb
lower cap screws	100 Nm	70 ft-lb

SG2 Cab

Cab to rubber bearing blocks, cap screws and hex. nuts	200 Nm	145 ft-lb

** NOTE: Insert cotter pin within specified torque.*

Standard Torques

Recommended torques in Nm, mkp and ft-lb for UNC and UNF cap screws						
Head marking (identifying strength)	  or 10.9*			  or 12.9**		
Thread-O.D. (In.)	Nm	mkp	ft-lb	Nm	mkp	ft-lb
1/4	15	1.5	10	20	2	15
5/16	30	3	20	40	4	30
3/8	50	5	35	70	7	50
7/16	80	8	55	110	11	80
1/2	120	12	85	170	17	120
9/16	180	18	130	240	24	175
5/8	230	23	170	320	32	240
3/4	400	40	300	580	58	425
7/8	600	60	445	930	93	685
1	910	91	670	1400	140	1030
1-1/8	1240	124	910	1980	198	1460
1-1/4	1700	170	1250	2800	280	2060

NOTE: A variation of ± 10% is permissible for all torques indicated in this chart.

Torque figures indicated above and in the Specification sections of this manual are valid for non-greased or non-oiled threads and heads unless otherwise specified. Therefore, do not grease or oil bolts or cap screws unless otherwise specified in this manual.

* Tempered steel high strength bolts and cap screws
** Tempered steel extra high strength bolts and cap screws

Recommended torques in Nm, mkp and ft-lb for metric cap screws									
Head marking (identifying strength)	8.8*			10.9**			12.9***		
Thread-O.D. (mm)	Nm	mkp	ft-lb	Nm	mkp	ft-lb	Nm	mkp	ft-lb
M5	7	0.7	5	9	0.9	6.5	10	1	8.5
M6	10	1	8.5	15	1	10	20	2	15
M8	30	3	20	40	4	30	40	4	30
M10	50	5	35	80	8	60	90	9	70
M12	100	10	75	140	14	100	160	16	120
M14	160	16	120	210	21	155	260	26	190
M16	240	24	175	350	35	260	400	40	300
M20	480	48	355	650	65	480	780	78	575
M24	820	82	605	1150	115	850	1350	135	995
M30	1640	164	1210	2250	225	1660	2700	270	1990
M36	2850	285	2110	4000	400	2950	4700	470	3465

NOTE: A variation of ± 10% is permissible for all torques indicated in this chart.

Torque figures indicated above and in the Specification sections of this manual are valid for non-greased- or non-oiled threads and heads unless otherwise specified. Therefore, do not grease or oil bolts or cap screws unless otherwise specified in this manual.

* Regular bolts and cap screws
** Tempered steel high strength bolts and cap screws
*** Tempered steel extra high strength bolts and cap screws

Recommended torques in Nm, mkp and ft-lb for pipe and hose connections						
	with O-rings			with cone		
Thread size	Nm	mkp	ft-lb	Nm	mkp	ft-lb
3/8-24 UNF	7.5	0.75	5.5	8	0.8	6
7/16-20 UNF	10	1	7	12	1.2	9
1/2-20 UNF	12	1.2	9	15	1.5	11
9/16-18 UNF	15	1.5	11	25	2.5	18
3/4-16 UNF	25	2.5	20	45	4.5	35
7/8-14 UNF	40	4	30	60	6	45
1-1/16-12 UNC	60	6	45	100	10	75
1-3/16-12 UNC	70	7	50	120	12	90
1-5/16-12 UNC	80	8	60	140	14	105
1-5/8-12 UNC	110	11	80	190	19	140
1-7/8-12 UNC	150	15	110	220	22	160

Special Tools

Tune-Up

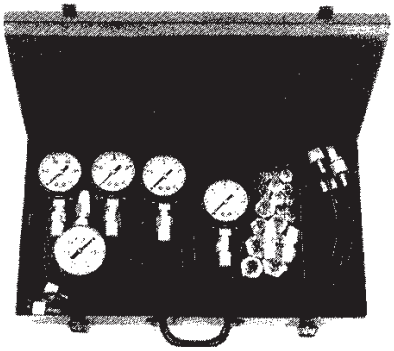
Tools	Description and Part No.	Use
 L30515A	FKM 10002	Measuring air intake system vacuum

Fig. 1 — Pressure Gauge Set

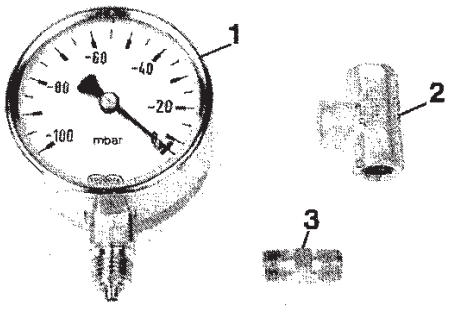
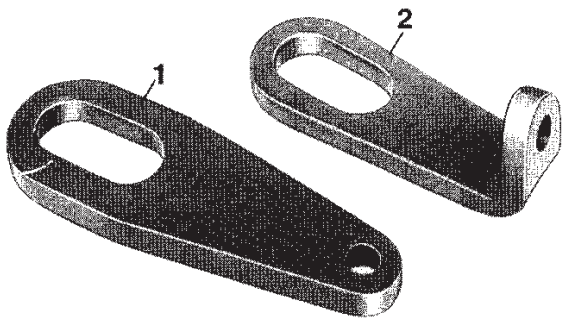
 L106472	Vacuum gauge and connector FKM 10310 Consisting of: 1 Vacuum gauge FKM 10242 2 T-piece FKM 10308 3 Connector FKM 10309	Measuring air intake system vacuum

Fig. 2 — Vacuum Gauge and Connectors

Tool	Description and Part No.	Use

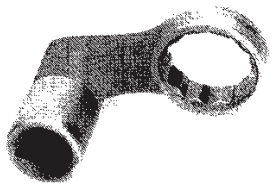
Tractor Separation



L23985

	1 Lifting eye, straight JD-244-1 2 Lifting eye, bent JD-244-2	Tractor separation

Fig. 3 — Lifting Eyes, Straight and Bent

Tool	Description and Part No.	Use
	KJD 10129	Separating between engine and clutch housing on tractors with SG2 cab

L107 001

Fig. 4 — Special Spanner

Removing rockshaft (tractors with OPU)

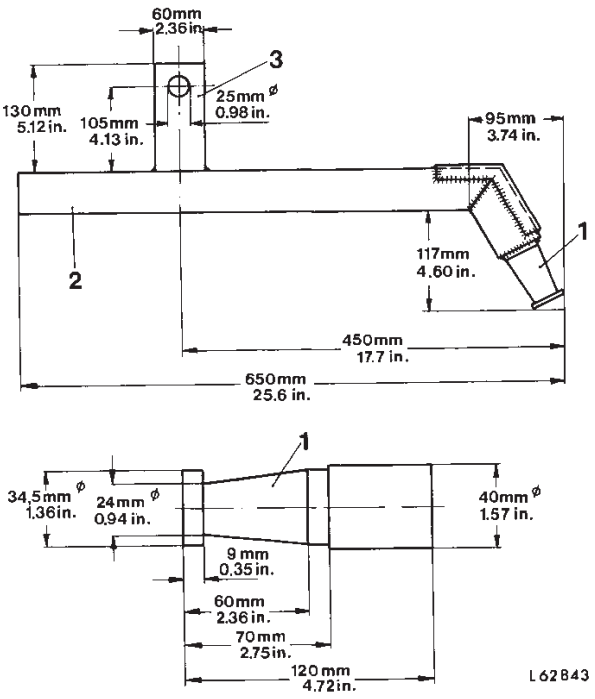


Fig. 5 — Tool for Removing Rockshaft (Self-Manufacture)

1 Round material 40 x 120 mm (1.57 x 4.72 in.)
2 Pipe 48 x 3.5 x 650 mm (1.89 x 0.14 x 25.6 in.)
3 Flat metal 60 x 12 x 130 mm (2.36 x 0.47 x 5.12 in.)

Tractor Separation (Contd.)

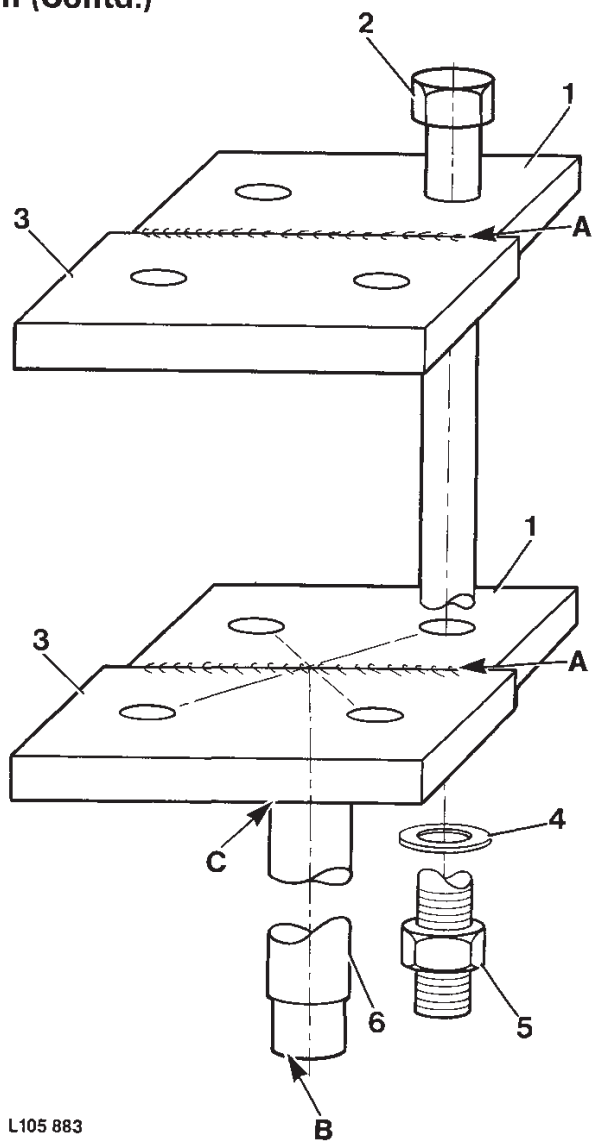


Fig. 6 – Holding Device (Self-Manufacture), Removal of Final Drive Assemblies

A Weld both retaining plates together
C Weld round steel in center of both plates
1 Retaining plate T 25671 (2 used)
2 Cap screw L 29785 (2 used)
3 Retaining plate T 32429 (2 used)
B Adapter lug diameter to fit bore of trolley jack
4 Washer 14 H 1698 (2 used)
5 Hex. nut 14 H 1039 (2 used)
6 Round steel 50 x 250 mm (1.97 x 9.84 in.)

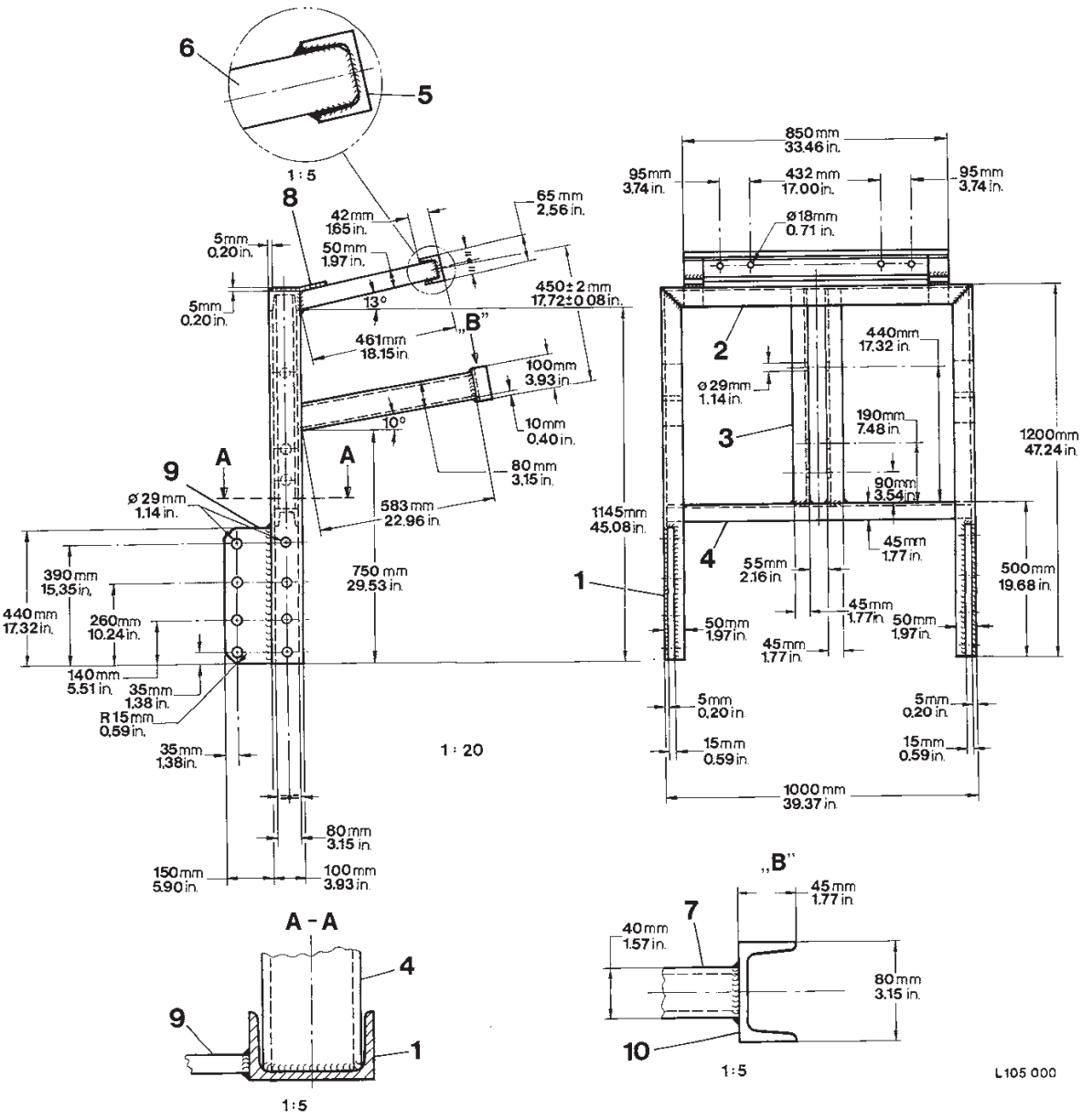
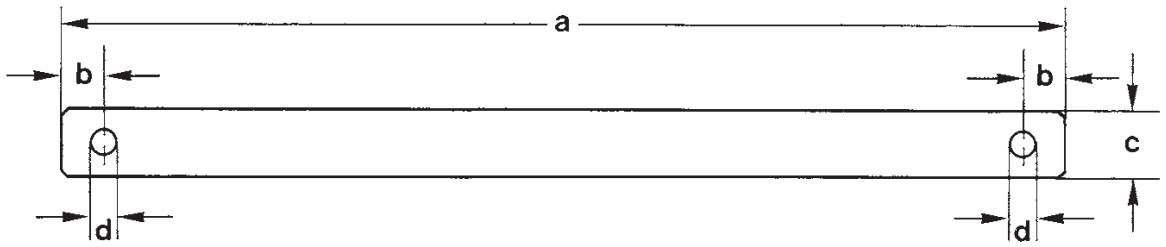


Fig. 7 – Lifting Device (Self-Manufacture), Removal of SG2 Cab (Quality Grade ST 37)

1 U-profile steel 100 x 1200 mm (3.94 x 47.24 in.) (2 used)
2 U-profile steel 100 x 1000 mm (3.94 x 39.37 in.) (1 used)
3 U-profile steel 80 x 694 mm (3.15 x 27.32 in.) (1 used)
4 U-profile steel 80 x 988 mm (3.15 x 38.9 in.) (1 used)
5 U-profile steel 65 x 850 mm (2.56 x 33.46 in.) (1 used)
6 Square steel 50 x 50 x 461 mm (1.97 x 1.97 x 18.15 in.) (2 used)
7 Square tubular steel 80 x 40 x 5 x 583 mm (3.15 x 1.58 x 0.2 x 22.95 in.) (2 used)
8 Flat steel 50 x 5 x 190 mm (1.97 x 0.2 x 7.48 in.) (2 used)
9 Flat steel 150 x 15 x 440 mm (5.9 x 0.59 x 17.32 in.) (2 used)
10 U-profile steel 80 x 100 mm (3.15 x 3.94 in.) (2 used)

Tractor Separation (Contd.)



L105 887

Fig. 8 – Steel Shaft (Self-Manufacture) for SG2 Cab Lifting Device

a 1100 mm (43.31 mm)
b 25 mm (0.98 in.)
c Diameter 22 mm (0.87 in.) with Cat. I draft links
29 mm (1.14 in.) with Cat. II draft links
d Diameter 5 mm (0.2 in.)

Group 05
Predelivery, Delivery and After-Sales Inspections

The John Deere Delivery Receipt, when properly filled out and signed by the dealer and customer, verifies that the predelivery and delivery services were satisfactorily performed. When delivering this machine, give the customer his copy of the delivery receipt and the operator's manual. Explain their purpose to him.

To promote complete customer satisfaction, a predelivery inspection including mending of possible shipping damage and giving the finishing touches to the tractor, is of prime importance to the dealer.

After the first 100 operating hours an inspection should be performed by the dealer to make sure that the tractor is in proper operating condition.

The predelivery and after-sale inspection check lists in the operator's manual will be completed by the dealer when the inspections are being performed. He will then forward them to the sales branch service department.

Tractor Storage

When storing a new tractor, proceed as follows:

Short-Term (Under 30 Days)

1. Fill fuel tank. This prevents condensation of moisture in tank.
2. Check engine oil level, transmission-hydraulic oil level, and coolant level. Add oil or coolant if necessary. During cold weather, be sure coolant contains sufficient anti-freeze.
3. Check electrolyte level in batteries. If electrolyte does not cover plates, add distilled water. Make sure batteries are fully charged.
4. Store tractor in a dry, protected place. If necessary to store tractor outside, cover it with a protective material. Protect tires from heat, sunlight, and petroleum products.

Long Term (Over 30 Days)

To protect engine, fuel system, transmission and hydraulic system, use the AR 41785 rust inhibitor. The above part no. includes one can of rust inhibitor, masking tape and protective caps to cover all engine openings.

Protect as follows:

1. Add 255 cm^3 (9 oz.) of rust inhibitor to the engine oil.
2. Add 205 cm^3 (7 oz.) of rust inhibitor to the oil in the transmission/hydraulic system on tractors with collar shift transmission and 250 cm^3 (8.5 oz.) on tractors with synchronized transmission.
3. Drain fuel tank, pour 170 cm^3 (6 oz.) of rust inhibitor into the empty tank and add approx. 10 liters (2.6 U.S. gals.) of fuel. Start engine and operate it at fast idle for 15 to 20 minutes to distribute the mixture through the whole fuel system. While the engine is running, operate the complete hydraulic system several times. Shut off engine in time to leave some fuel in the tank. Then allow the engine to cool down for 15 to 20 minutes.
4. Prepare 15 cm^3 (0.5 oz.) of rust inhibitor for each cylinder. Remove plug of intake manifold or connecting pipe of starting fluid adapter at

the intake manifold, whichever applies, Inject rust inhibitor into the intake manifold. Pull out shut-off knob and crank engine with starter several times.

However, do not allow the engine to start. Otherwise the whole procedure must be repeated.

After the rust inhibitor has been added, the engine may not be started again.

IMPORTANT! Rust inhibitor agents evaporate very easily. For this reason, seal all openings after the inhibitor has been added. Also, always keep the inhibitor container closed.

5. Fill the fuel tank.
6. Remove batteries. Add distilled water, if necessary. Charge the batteries and store in a cool, dry place where they will not freeze.
7. Seal all openings such as the vent tube and exhaust outlet.
8. Slacken fan belt and air conditioning compressor belt (if equipped).
9. Replace or repair damaged parts. Touch up any painted surfaces which are scratched or chipped.
10. Coat exposed metal surfaces, such as axles and piston rods of hydraulic cylinders, with grease or corrosion preventative.
11. Store the tractor in a dry, protected place. If the tractor is stored outside, cover it with a waterproof tarpaulin.
12. Block up the tractor so that tires do not touch the ground. Protect tires from heat and sunlight.

Removing the Tractor from Storage

1. Remove all protective coverings.
2. Check crankcase and transmission/hydraulic system oil levels.
3. Check coolant level.
4. Check tire inflation pressure.
5. Install batteries and connect cable and ground strap.
6. Adjust fan belt and compressor belt (if equipped) tension.
7. Carry out 500-hour check.
8. Run engine at approx. 1500 rpm for some minutes. Check all systems before placing tractor under load.

IMPORTANT! With engine shut-off knob pulled out, turn over engine by means of starting motor until engine oil pressure has built up (engine oil pressure indicator light goes out). Then push in engine shut-off knob and run engine at approximately 1900 rpm.

Predelivery Inspection

Before delivering the tractor to the customer, the following checks and services should be performed by the dealer:

Engine

LEAKS

Check engine and fuel lines for leaks. Repair as necessary.

CHECKING CRANKCASE OIL LEVEL

NOTE: Tractor should be on a level surface when oil level is checked. If it is not, check only to make sure the crankcase is not dry. Recheck oil level later, when tractor is on level ground.

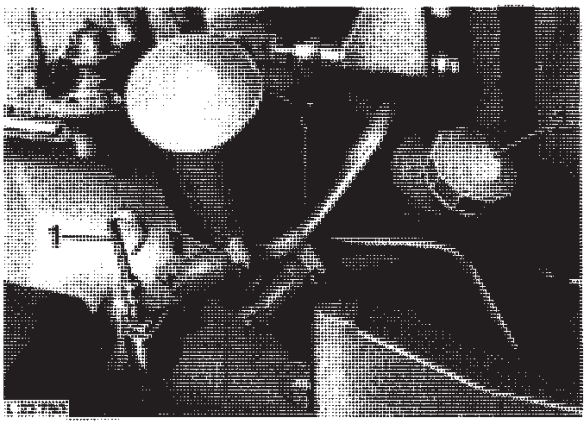


Fig. 1 — Engine Oil Dipstick and Filler Cap

1 Dipstick
2 Filler cap

1. Pull out dipstick 1 (fig. 1) and check oil level.
2. If necessary, add oil to bring oil level to top mark on dipstick. Use John Deere Torq-Gard Supreme engine oil SAE 10W-20 or an equivalent oil (see group 10).

CHECKING COOLANT LEVEL

Fig. 2 — Radiator Filler Cap

1. Remove radiator filler cap and check coolant level. Coolant level must be midway between the filler neck and top of radiator core.
2. If necessary, add coolant to obtain this level.

John Deere Engine Cooling Fluid is filled into the cooling system at the factory. It protects the engine against corrosion and against frost down to -36°C (-35°F).

IMPORTANT: Use only John Deere Engine Cooling Fluid in the cooling system, independent of the season.

If no John Deere Engine Cooling Fluid is available use a mixture of 50 % ethylene-glycol antifreeze/ anticorrosion inhibitor and 50 % clear, soft water. This mixture gurantees engine protection against corrosion and against frost down to -36°C (-35°F).

Never use any cooling system sealing additives.

IDLE SPEEDS

1. Check slow and fast idle speeds and adjust, if necessary.
2. Slow idle speed: 700 to 800
3. Fast idle speed: 2610 to 2660
4. Warm up engine to operating temperature and check speeds. Adjust if necessary (see Section 30, Group 20).

ENGINE SHUT–OFF CABLE

1. Check operation of shut-off cable. Move hand throttle lever completely forward and idle engine for 1 to 2 minutes.
2. Completely pull out shut-off knob, making sure engine stops immediately.
3. If necessary, adjust shut-off cable (see Section 30, Group 20).

AIR CLEANER AND SAFETY ELEMENT

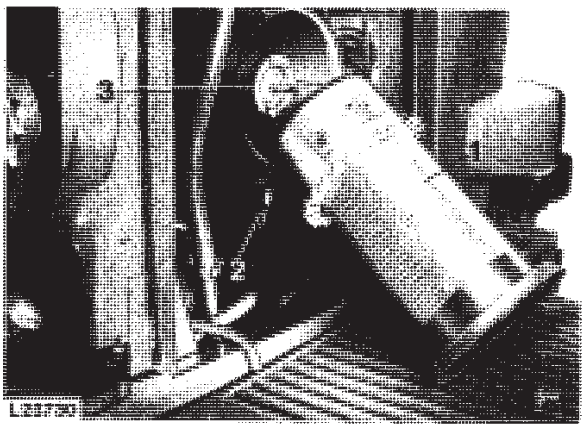


Fig. 3 — Air Cleaner and Safety Element

1 Air cleaner element
2 Dust unloading valve
3 Safety element

1. Check air cleaner and safety elements for proper installation.
2. Make sure that dust unloading valve 2 (fig. 3) (rubber cap) is installed on air cleaner.

AIR INTAKE CONNECTIONS

Check air intake connections for tightness. Tighten any loose clamps.

EXHAUST STACK

1. Install exhaust stack, making sure it is in vertical position.
2. Install exhaust stack flap with flap hinge at the rear (as seen in direction of forward travel). When closed, flap should not contact exhaust stack end. If necessary, clamp flap to exhaust stack to obtain a clearance of 2 mm (1/16 in.) between flap and stack end.

CHECKING V-BELT TENSION

Fan Belt

The fan belt should have 19 mm (3/4 in.) flex with 90 N (20 lb) pull midway between crankshaft and alternator or water pump (use a spring scale).

Compressor Belt (if equipped)

Compressor belt should deflect 19 mm (3/4 in.) when a 60 N (13 lb) force is applied midway between pulleys.

Electrical System

BATTERIES

1. Check battery terminals and battery cable ends. If they are corroded, clean and coat them with petroleum jelly.
2. Check electrolyte level in each battery cell. Add distilled water if necessary to bring level above cell plates.
3. If batteries are not fully charged, charge them. Remove cell caps before charging the battery.

Important Notes

1. **If the engine is to be run for a short time without battery (using a slave battery for starting), do not, under any circumstances, interrupt the circuit by switching off the main switch before stopping the engine by means of the fuel pump shut-off cable. Further it is recommended to use additional current (lights) while engine is running. Do not run engine at a speed above 1000 rpm. Insulate battery end of disconnected starter cable properly to avoid damage to alternator and regulator.**

On tractors with operator's cab: Do not connect ground strap of slave battery to cab.

2. **Connect batteries or battery charger in the proper polarity ("+" and "–"). If they are improperly connected, the rectifier diodes will be immediately destroyed.**

START SAFETY SWITCH

1. Move range shift lever into neutral or "park"* position.

2. Check function of start safety switch. Replace switch when necessary (see Section 40, Group 15).

LIGHTING SYSTEM

1. Check lighting system and repair if necessary. Replace any defective bulbs (see Section 40, Group 20).

2. Check headlight adjustment and correct, if necessary (see Section 40, Group 20).

OPERATOR'S CAB CONTROLS

Fan Switch

Open air outlets. Check fan switch 2 (fig. 4 or 5) for proper operation.

Heater Switch

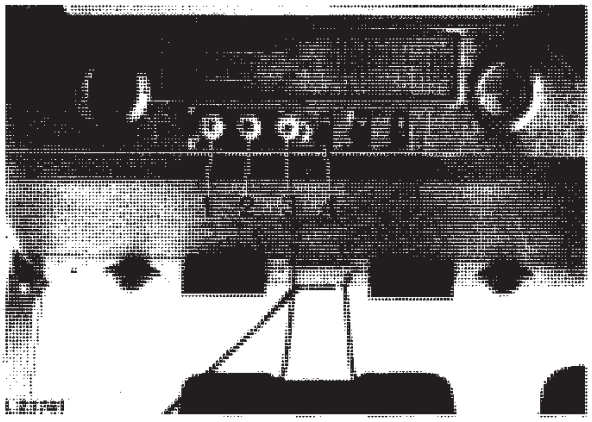


Fig. 4 – Operator's Cab Controls (OPU Cab)

1 Heater switch
2 Fan switch
3 Thermostat switch (air conditioning)
4 Windshield wiper switch

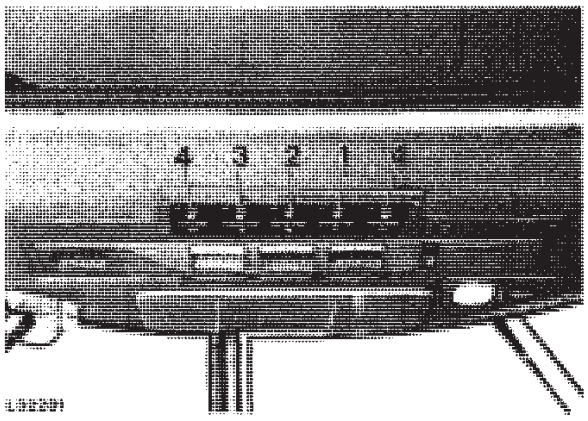


Fig. 5 – Operator's Cab Controls (SG2 Cab)

1 Heater switch
2 Fan switch
3 Thermostat switch (air conditioning)
4 Windshield wiper switch

* On tractors equipped with collar shift transmission and parking lock only.

With fan operating, check heater switch 1 (fig. 4 or 5) for proper operation. For this purpose, turn switch on tractors equipped with OPU cab to the **left** and with SG2 cab to the **right**. Making sure that warm air enters cab (with engine et operating temperature).

Thermostat Switch (Tractors with Air Conditioning)

With fan operating, check infinitely variable thermostat switch (if equipped) for proper operation. Turn off heater. Turn thermostat switch 3 clockwise, making sure cool air enters cab. If switch does not operate correctly, see Section 90, Group 05.

Windshield Wiper Switch

Check windshield wiper switch for proper operation.

CONTROLS AND INSTRUMENTS

Check controls and instruments for proper operation.

NOTE: On tractors equipped with collar shift transmission: Transmission oil pressure indicator light will glow only when a malfunction occurs.

Power Train

CHECKING TRANSMISSION/HYDRAULIC SYSTEM OIL LEVEL

1. With the tractor on level ground, run the engine 2 to 3 minutes.
2. Place range and gear shift lever in neutral position.
3. Apply handbrake.
4. Lower draft links.
5. Run engine at slow idle (700 to 800 rpm).
6. Pull out dipstick and wipe clean.
7. Insert dipstick. Remove dipstick and check oil level.

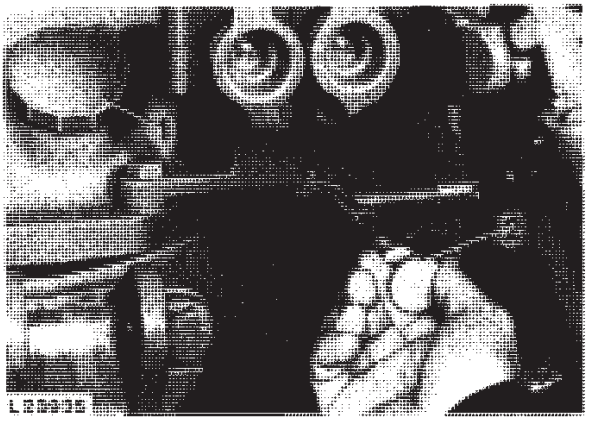


Fig. 6 — Transmission/Hydraulic System Dipstick and Filler Cap

1 Filler cap
2 Dipstick

8. If necessary, add John Deere Hy-Gard Transmission and Hydraulic Oil or equivalent oil to bring oil level to top mark on dipstick.

NOTE: Types of oil not meeting our specifications will not give satisfactory service and may result in eventual damage.

TRANSMISSION

1. Check transmission for proper operation.
2. While driving tractor, shift transmission through all gears. If transmission does not function properly, refer to Section 50, Group 30 and 35 or 40.

DIFFERENTIAL LOCK

Check differential lock for proper operation. If you find any problem refer to Section 50, Group 45.

INDEPENDENT PTO

1. Check PTO operation. For this purpose, run engine and move PTO control lever to engaged and disengaged position. If PTO does not operate properly, refer to Section 50, Group 55.