

# 840, 940, 1040 and 1140 Tractors



## TECHNICAL MANUAL 840, 940, 1040 and 1140 Tractors

TM4353 (01JUN82) English

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**TM4353 (01JUN82)**

LITHO IN U.S.A. (REVISED)  
ENGLISH



**840, 940, 1040 and 1140 Tractors**  
**Technical Manual**  
**TM-4353**

**CONTENTS**

**SECTION 10 — GENERAL**

- Group 00 — Specifications and special tools
- Group 05 — Pre-delivery, delivery and after-sale inspections
- Group 10 — Lubrication and periodic service
- Group 15 — Engine and tractor tune-up
- Group 20 — Tractor separation

**SECTION 20 — ENGINE**

- Group 00 — Specifications and special tools
- Group 05 — Description, diagnosing malfunctions
- Group 10 — Cylinder head, valves and camshaft
- Group 15 — Cylinder block, liners, pistons and connecting rods
- Group 20 — Crankshaft, main bearings and flywheel
- Group 25 — Timing gear train
- Group 30 — Lubrication system
- Group 35 — Cooling system

**SECTION 30 — FUEL AND AIR INTAKE SYSTEM**

- Group 00 — Specifications and special tools
- Group 05 — General information, diagnosing malfunctions
- Group 10 — Fuel tank, water trap, fuel transfer pumps and fuel filter
- Group 15 — Roto Diesel fuel injection pump
- Group 20 — Fuel injection nozzles
- Group 25 — Cold weather starting aids
- Group 30 — Speed control linkage
- Group 35 — Air cleaner

**SECTION 40 — ELECTRICAL SYSTEM**

- Group 00 — Specifications and special tools
- Group 05 — Description and diagnosing malfunctions
- Group 10 — Wiring harnesses
- Group 15 — Controls and instruments
- Group 20 — Lighting systems
- Group 25 — Wiring diagrams
- Group 30 — Starting motor
- Group 35 — Alternator

**SECTION 50 — POWER TRAIN**

- Group 00 — Specifications and special tools
- Group 05 — Description, operation and lubricating system
- Group 10 — Clutch operating linkage
- Group 15 — Engine clutches
- Group 20 — Hi-Lo shift unit
- Group 25 — Creeper transmission
- Group 30 — Transmission shift linkage
- Group 35 — Synchronized transmission and transmission oil pump
- Group 40 — Collar shift transmission and transmission oil pump
- Group 45 — Differential
- Group 50 — Final drives
- Group 55 — Independent PTO
- Group 60 — Continuous-running PTO
- Group 65 — Mechanical front wheel drive

## CONTENTS (Contd.)

### SECTION 60 – STEERING SYSTEM AND BRAKES

- Group 00 – Specifications and special tools
- Group 05 – Power steering
- Group 10 – Manual steering
- Group 15 – Brakes

### SECTION 70 – HYDRAULIC SYSTEM

- Group 00 – Specifications and special tools
- Group 05 – Description, diagnosing malfunctions and pressure tests
- Group 10 – Oil reservoir, filter, valves and oil cooler
- Group 15 – Hydraulic pumps
- Group 20 – Rockshaft
- Group 25 – Selective control valves (spool type)
- Group 30 – Selective control valves (poppet valve type)
- Group 35 – Hose couplers
- Group 40 – Remote cylinder

### SECTION 80 – MISCELLANEOUS

- Group 00 – Specifications and special tools
- Group 05 – Front axle
- Group 10 – Belt pulley
- Group 15 – Front and rear wheels
- Group 20 – Axle trailer hitch

### SECTION 90 – OPERATOR'S CAB

- Group 00 – Specifications and special tools
- Group 05 – Cab ventilation and heating
- Group 10 – Operator's seats
- Group 15 – Operator's cab
- Group 20 – Roll guard

## Section 10

# General

### CONTENTS OF THIS SECTION

#### GROUP 00 — SPECIFICATIONS AND SPECIAL TOOLS

|                                                             | Page  |
|-------------------------------------------------------------|-------|
| Specifications . . . . .                                    | 00-3  |
| Serial numbers . . . . .                                    | 00-3  |
| Model numbers . . . . .                                     | 00-3  |
| Engine . . . . .                                            | 00-3  |
| Engine clutch . . . . .                                     | 00-4  |
| Cooling system . . . . .                                    | 00-5  |
| Fuel system . . . . .                                       | 00-5  |
| Electrical system . . . . .                                 | 00-5  |
| Synchronized transmission . . . . .                         | 00-5  |
| Collar shift transmission . . . . .                         | 00-5  |
| Hi-Lo shift unit . . . . .                                  | 00-6  |
| Creeper transmission . . . . .                              | 00-6  |
| Differential and final drives . . . . .                     | 00-6  |
| Differential lock . . . . .                                 | 00-6  |
| PTO . . . . .                                               | 00-6  |
| Mechanical front wheel drive . . . . .                      | 00-7  |
| Power steering . . . . .                                    | 00-7  |
| Manual steering . . . . .                                   | 00-7  |
| Foot brakes . . . . .                                       | 00-7  |
| Handbrake . . . . .                                         | 00-7  |
| Hydraulic system . . . . .                                  | 00-8  |
| Capacities . . . . .                                        | 00-8  |
| Travel speeds . . . . .                                     | 00-9  |
| Front and rear wheels . . . . .                             | 00-9  |
| Dimensions and weights . . . . .                            | 00-9  |
| Predelivery, delivery and after-sales inspections . . . . . | 00-10 |
| Lubrication and service . . . . .                           | 00-11 |
| Tune-up . . . . .                                           | 00-12 |
| Tractor separation . . . . .                                | 00-13 |
| Standard torques . . . . .                                  | 00-14 |
| Special tools . . . . .                                     | 00-16 |

#### GROUP 05 — PREDELIVERY, DELIVERY AND AFTER-SALES INSPECTIONS

|                                  | Page  |
|----------------------------------|-------|
| Tractor storage . . . . .        | 05-1  |
| Predelivery inspection . . . . . | 05-2  |
| Delivery inspection . . . . .    | 05-9  |
| After-sales inspection . . . . . | 05-10 |

#### GROUP 10 — LUBRICATION AND SERVICE

|                                   |      |
|-----------------------------------|------|
| Lubrication and service . . . . . | 10-1 |
|-----------------------------------|------|

#### GROUP 15 — TUNE-UP

|                                        |      |
|----------------------------------------|------|
| Preliminary engine testing . . . . .   | 15-1 |
| Dynamometer test . . . . .             | 15-1 |
| Testing compression pressure . . . . . | 15-2 |
| Tune-up . . . . .                      | 15-3 |
| Checking tractor operation . . . . .   | 15-8 |
| Standard torques . . . . .             | 15-9 |

#### GROUP 20 — TRACTOR SEPARATION

|                                                           |       |
|-----------------------------------------------------------|-------|
| Separating between engine and tractor front end . . . . . | 20-1  |
| Removal and installation of engine . . . . .              | 20-5  |
| Removal and installation of clutch housing . . . . .      | 20-8  |
| Removal and installation of final drives . . . . .        | 20-11 |
| Removal and installation of rockshaft . . . . .           | 20-13 |
| Removal and installation of operator's cab . . . . .      | 20-15 |

# 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 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, and hydraulic pump have model numbers to facilitate identification of different makes of a given unit.

### Engine

|                                      |                                   |           |
|--------------------------------------|-----------------------------------|-----------|
| Number of cylinders .....            |                                   | 3         |
| Cylinder liner bore .....            | 106.5 mm (4.19 in.)               |           |
| Stroke .....                         | 110 mm (4.33 in.)                 |           |
| Displacement .....                   | 2940 cm <sup>3</sup> (179 cu.in.) |           |
| Compression ratio .....              | 16.8 : 1                          |           |
| Maximum torque                       |                                   |           |
| 840 at 1300 rpm .....                | 135 Nm                            | 100 ft-lb |
| 940 at 1300 rpm .....                | 150 Nm                            | 110 ft-lb |
| 1040 at 1400 rpm .....               | 165 Nm                            | 122 ft-lb |
| 1140 at 1400 rpm .....               | 185 Nm                            | 136 ft-lb |
| Firing order .....                   | 1 - 2 - 3                         |           |
| Valve clearance (engine hot or cold) |                                   |           |
| Intake valve .....                   | .035 mm                           | 0.014 in. |
| Exhaust valve .....                  | .045 mm                           | 0.018 in. |

## Fast idle speed

840 and 940 ..... 2560 rpm

1040 and 1140 ..... 2660 rpm

Slow idle speed ..... 800 rpm

## Rated engine speed

840 and 940 ..... 2400 rpm

1040 and 1140 ..... 2500 rpm

## Working speed range

840 and 940 ..... 1300 to 2400 rpm

1040 and 1140 ..... 1400 to 2500 rpm

## Flywheel horsepower according to DIN 70020

at engine rated speed of 2400 rpm

840 ..... 28 kW      38 hp

940 ..... 32 kW      44 hp

at engine rated speed of 2500 rpm

1040 ..... 37 kW      50 hp

1140 ..... 41 kW      56 hp

## PTO\* horsepower according to DIN 70020

at engine rated speed of 2400 rpm (without mid PTO)

840 ..... 25 kW      34 hp

940 ..... 29 kW      39 hp

at engine rated speed of 2500 rpm

1040 ..... 33 kW      45 hp

1140 ..... 37 kW      50 hp

## PTO\* horsepower according to DIN SAE J 816 b

at engine rated speed of 2500 rpm

1040 ..... 32 kW      43 hp

1140 ..... 36 kW      48 hp

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

**Engine Clutch** ..... Single dry disk with torsion damper or dual-stage dry disk,  
foot-operated

\* 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  $\pm 5\%$ .

## 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             |
| 840 .....                                  | Roto Diesel Nr. R 3432 F 720 |
| 940 .....                                  | Roto Diesel Nr. R 3432 F 710 |
| 1040 .....                                 | Roto Diesel Nr. R 3432 F 690 |
| 1140 .....                                 | Roto Diesel Nr. R 3432 F 700 |

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

## Electrical System

|                                       |                          |
|---------------------------------------|--------------------------|
| Batteries .....                       | 2 x 12 volts, 55 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<br>Synchronized forward and reverse shifting<br>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

### INDEPENDENT PTO

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

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

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

### CONTINUOUS – RUNNING PTO

Type ..... Independent of transmission, with engine dual stage clutch

**PTO SPEEDS (in rpm) — Tractors with mid PTO**

| Engine speed | 540 rpm shaft | 1000 rpm shaft |
|--------------|---------------|----------------|
| 800          | 210           | 385            |
| 2075         | 540           | 1000           |
| 2400         | 625           | 1160           |
| 2560         | 665           | 1230           |

**PTO SPEEDS (in rpm) — Tractors without mid PTO**

| Engine speed | 540 rpm shaft | 1000 rpm shaft |
|--------------|---------------|----------------|
| 800          | 180           | 335            |
| 2400         | 540           | 1000           |
| 2500         | 565           | 1040           |
| 2560         | 575           | 1065           |
| 2660         | 600           | 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

**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 .....                                                                                      | 78 liters   |  | 20.6 U.S.gals. |
| Metal tank .....                                                                                        | 62.5 liters |  | 16.5 U.S.gals. |
| Cooling system                                                                                          |             |  |                |
| Without operator's cab .....                                                                            | 10.5 liters |  | 1.8 U.S.gals.  |
| With operator's cab .....                                                                               | 15.5 liters |  | 4.1 U.S.gals.  |
| Engine crankcase                                                                                        |             |  |                |
| Without filter change .....                                                                             | 6.5 liters  |  | 1.7 U.S.gals.  |
| With filter change .....                                                                                | 7 liters    |  | 1.8 U.S.gals.  |
| Transmission - Hydraulic system (including oil reservoir and oil cooler on 940, 1040 and 1140 tractors) |             |  |                |
| Synchronized transmission                                                                               |             |  |                |
| Initial filling — 840 .....                                                                             | 53 liters   |  | 14 U.S.gals.   |
| — 940, 1040, 1140 .....                                                                                 | 59 liters   |  | 15.6 U.S.gals. |
| Oil change — 840 .....                                                                                  | 45 liters   |  | 11.9 U.S.gals. |
| — 940, 1040, 1140 .....                                                                                 | 51 liters   |  | 13.5 U.S.gals. |
| Collar shift transmission (without mid PTO)                                                             |             |  |                |
| Initial filling — 840 .....                                                                             | 41 liters   |  | 10.8 U.S.gals. |
| — 940, 1040, 1140 .....                                                                                 | 47 liters   |  | 12.4 U.S.gals. |
| Oil change — 840 .....                                                                                  | 33 liters   |  | 8.7 U.S.gals.  |
| — 940, 1040, 1140 .....                                                                                 | 39 liters   |  | 10.3 U.S.gals. |
| Collar shift transmission (with mid PTO)                                                                |             |  |                |
| Initial filling — 840 .....                                                                             | 36 liters   |  | 9.5 U.S.gals.  |
| — 940 .....                                                                                             | 42 liters   |  | 11.1 U.S.gals. |
| Oil change — 840 .....                                                                                  | 28 liters   |  | 7.4 U.S.gals.  |
| — 940 .....                                                                                             | 34 liters   |  | 9.0 U.S.gals.  |
| Oil reservoir .....                                                                                     | 4 liters    |  | 1.1 U.S.gals.  |
| Oil cooler .....                                                                                        | 2 liters    |  | 0.5 U.S.gals.  |
| Mechanical front wheel drive                                                                            |             |  |                |
| Front axle housing .....                                                                                | 5.3 liters  |  | 1.4 U.S.gals.  |
| Wheel hub housing, each .....                                                                           | 0.75 liter  |  | 0.2 U.S.gals.  |
| Belt pulley .....                                                                                       | 1 liter     |  | 0.3 U.S.gals.  |

On tractors for Canada only:

\* 15500 kPa 155 bar 2250 psi  
 \*\* 14000 kPa 140 bar 2050 psi

**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 .....     | 800 rpm  |
| Fast idle           |          |
| 840 and 940 .....   | 2560 rpm |
| 1040 and 1140 ..... | 2660 rpm |
| Rated speed         |          |
| 840 and 940 .....   | 2400 rpm |
| 1040 and 1140 ..... | 2500 rpm |

### FAN BELT

The fan belt should have 19 mm (0.75 in.) flex with 90 N (20 lb) pull midway between crankshaft and alternator or water pump (use a spring scale).

### CLUTCH PEDAL

|                                |                        |
|--------------------------------|------------------------|
| Clutch pedal free travel ..... | approx. 25 mm<br>1 in. |
|--------------------------------|------------------------|

### FRONT WHEEL TOE-IN

|                             |           |                  |
|-----------------------------|-----------|------------------|
| Tractors without MFWD ..... | 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

|                                                      |        |           |
|------------------------------------------------------|--------|-----------|
| Start safety switch in rockshaft housing, max. ....  | 50 Nm  | 35 ft-lb  |
| Front wheel rim to hub                               |        |           |
| Tractors without MFWD .....                          | 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 |
| Tie rod outer clamp, cap screw .....                 | 110 Nm | 80 ft-lb  |
| Tie rod inner clamp, cap screw .....                 | 40 Nm  | 30 ft-lb  |
| Rear wheels to rear axle .....                       | 240 Nm | 175 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                                    |        |           |
| Supports to crossbar, cap screws .....               | 230 Nm | 170 ft-lb |
| U-bolt hex. nuts .....                               | 230 Nm | 170 ft-lb |
| Rear fender to final drive housing, cap screws ..... | 130 Nm | 95 ft-lb  |

## Lubrication and Service

### CAPACITIES

#### Engine crankcase

|                       |            |               |
|-----------------------|------------|---------------|
| Without filter change | 65 liters  | 1.7 U.S.gals. |
| With filter change    | 7.0 liters | 1.8 U.S.gals. |

#### Transmission - Hydraulic system (including oil reservoir and oil cooler on 940, 1040 and 1140 tractors)

##### Synchronized transmission

|                       |           |                |
|-----------------------|-----------|----------------|
| Initial filling — 840 | 53 liters | 14 U.S.gals.   |
| — 940, 1040, 1140     | 59 liters | 15.6 U.S.gals. |
| Oil change — 840      | 45 liters | 11.9 U.S.gals. |
| — 940, 1040, 1140     | 51 liters | 13.5 U.S.gals. |

##### Collar shift transmission (without mid PTO)

|                       |           |                |
|-----------------------|-----------|----------------|
| Initial filling — 840 | 41 liters | 10.8 U.S.gals. |
| — 940, 1040, 1140     | 47 liters | 12.4 U.S.gals. |
| Oil change — 840      | 33 liters | 8.7 U.S.gals.  |
| — 940, 1040, 1140     | 39 liters | 10.3 U.S.gals. |

##### Collar shift transmission (with mid PTO)

|                       |           |                |
|-----------------------|-----------|----------------|
| Initial filling — 840 | 36 liters | 9.5 U.S.gals.  |
| — 940                 | 42 liters | 11.1 U.S.gals. |
| Oil change — 840      | 28 liters | 7.4 U.S.gals.  |
| — 940                 | 34 liters | 9.0 U.S.gals.  |

Oil reservoir . . . . . 4 liters 1.1 U.S.gals.

Oil cooler . . . . . 2 liters 0.5 U.S.gals.

#### Mechanical front wheel drive

|                         |             |               |
|-------------------------|-------------|---------------|
| Front axle housing      | 5.3 liters  | 1.4 U.S.gals. |
| Wheel hub housing, each | 0.75 liters | 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 | 100 hours  |
| Changing engine oil filter                        | every | 200 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 |
| Cleaning hydraulic pump strainer                  | every | 1000 hours |
| Checking MFWD oil level                           | every | 50 hours   |
| MFWD oil change                                   | every | 1000 hours |
| Cleaning and packing front wheel bearings         | every | 1000 hours |
| Lubricating grease fittings                       |       |            |
| Front axle and front axle bearings                | every | 50 hours   |
| Rear axle bearings                                | every | 500 hours  |
| in wet and muddy conditions                       | every | 10 hours   |
| Three-point hitch                                 | every | 200 hours  |

## Tune-Up

PTO horsepower\* at 2400 rpm rated engine speed (without mid-PTO)

|                         |     |       |       |
|-------------------------|-----|-------|-------|
| According to DIN 70020, | 840 | 25 kW | 34 hp |
|                         | 940 | 29 kW | 39 hp |

PTO horsepower\* at 2500 rpm rated engine speed

|                           |      |       |       |
|---------------------------|------|-------|-------|
| According to DIN 70020,   | 1040 | 33 kW | 45 hp |
|                           | 1140 | 37 kW | 50 hp |
| According to SAE J 816 b, | 1040 | 32 kW | 43 hp |
|                           | 1140 | 36 kW | 48 hp |

Compression ..... 2100 kPa      21 bar      300 psi

Slow idle ..... 800 rpm

Fast idle

|               |          |
|---------------|----------|
| 840 and 940   | 2560 rpm |
| 1040 and 1140 | 2660 rpm |

Rated engine speed

|               |          |
|---------------|----------|
| 840 and 940   | 2400 rpm |
| 1040 and 1140 | 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

Blow-by at crankcase vent tube, max.

|               |                       |             |
|---------------|-----------------------|-------------|
| 840 and 940   | 1.9 m <sup>3</sup> /h | 67 cu.ft./h |
| 1040 and 1140 | 2.1 m <sup>3</sup> /h | 74 cu.ft./h |

Thermostat opens at ..... 82° C      180° F

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 0.4 bar      0 to 0.6 psi

## FAN BELT

Fan belt should have 19 mm (0.75 in.) flex with 90 N (20 lb) pull midway between crankshaft and alternator or water pump (use a spring scale).

\* 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  $\pm 5\%$

## Tractor Separation

### TORQUES FOR HARDWARE

|                                                                                            |        |           |
|--------------------------------------------------------------------------------------------|--------|-----------|
| 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 |
| Hydraulic pump drive shaft, cap screws . . . . .                                           | 50 Nm  | 35 ft-lb  |
| Jointed shaft flange to front axle drive hub<br>(tractors with MFWD), cap screws . . . . . | 35 Nm  | 25 ft-lb  |
| Drag link to bell crank and steering arm,<br>slotted nuts* . . . . .                       | 75 Nm  | 55 ft-lb  |
| Clutch housing to engine block                                                             |        |           |
| cap screws . . . . .                                                                       | 230 Nm | 170 ft-lb |
| hex. nuts . . . . .                                                                        | 325 Nm | 240 ft-lb |
| Clutch housing to transmission case, cap screws . . . . .                                  | 160 Nm | 120 ft-lb |
| Retainer of hydraulic lines to clutch housing,<br>cap screw . . . . .                      | 45 Nm  | 30 ft-lb  |
| Final drive housing to transmission case,<br>cap screws . . . . .                          | 120 Nm | 85 ft-lb  |
| Rockshaft housing to transmission case,<br>cap screws . . . . .                            | 120 Nm | 85 ft-lb  |
| Rear wheels to rear axle . . . . .                                                         | 240 Nm | 175 ft-lb |
| 4-Post roll guard                                                                          |        |           |
| Roll guard to fender frame, cap screws . . . . .                                           | 120 Nm | 85 ft-lb  |
| U-bolts to rear axle housings, hex. nuts . . . . .                                         | 130 Nm | 95 ft-lb  |
| 2-Post roll guard                                                                          |        |           |
| Supports to crossbar, cap screws . . . . .                                                 | 230 Nm | 170 ft-lb |
| U-bolts to rear axle housings, hex. nuts . . . . .                                         | 230 Nm | 170 ft-lb |
| Rear fenders to final drive housings, hex. nuts . . . . .                                  | 130 Nm | 95 ft-lb  |
| Drawbar to transmission case, cap screws . . . . .                                         | 120 Nm | 85 ft-lb  |
| Basic weight to front axle carrier, cap screws . . . . .                                   | 400 Nm | 300 ft-lb |

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

**TORQUES FOR HARDWARE (Contd.)****Operator's Cab**

|                                                                           |             |               |
|---------------------------------------------------------------------------|-------------|---------------|
| Cab to rubber mounting block, slotted nuts* . . . . .                     | 10 to 20 Nm | 7 to 14 ft-lb |
| Rubber bearing block to mounting and pivot brackets, cap screws . . . . . | 50 Nm       | 35 ft-lb      |
| Mounting pivot bracket to final drive housing, cap screws . . . . .       | 100 Nm      | 70 ft-lb      |
| Mounting 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      |

\* NOTE: Insert cotter pin within specified torque.

**Standard Torques**

| Recommended torques in Nm and ft-lb for UNC and UNF cap screws |                                                                                                                                                                                  |       |                                                                                                                                                                                      |       |
|----------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| Head marking<br>(Identifying strength)                         |   or 10.9* |       |   or 12.9** |       |
| Thread-O.D.<br>(in.)                                           | Nm                                                                                                                                                                               | ft-lb | Nm                                                                                                                                                                                   | ft-lb |
| 1/4                                                            | 15                                                                                                                                                                               | 10    | 20                                                                                                                                                                                   | 15    |
| 5/16                                                           | 30                                                                                                                                                                               | 20    | 40                                                                                                                                                                                   | 30    |
| 3/8                                                            | 50                                                                                                                                                                               | 35    | 70                                                                                                                                                                                   | 50    |
| 7/16                                                           | 80                                                                                                                                                                               | 55    | 110                                                                                                                                                                                  | 80    |
| 1/2                                                            | 120                                                                                                                                                                              | 85    | 170                                                                                                                                                                                  | 120   |
| 9/16                                                           | 180                                                                                                                                                                              | 130   | 240                                                                                                                                                                                  | 175   |
| 5/8                                                            | 230                                                                                                                                                                              | 170   | 320                                                                                                                                                                                  | 240   |
| 3/4                                                            | 400                                                                                                                                                                              | 300   | 580                                                                                                                                                                                  | 425   |
| 7/8                                                            | 600                                                                                                                                                                              | 445   | 930                                                                                                                                                                                  | 685   |
| 1                                                              | 910                                                                                                                                                                              | 670   | 1400                                                                                                                                                                                 | 1030  |
| 1-1/8                                                          | 1240                                                                                                                                                                             | 910   | 1980                                                                                                                                                                                 | 1460  |
| 1-1/4                                                          | 1700                                                                                                                                                                             | 1250  | 2800                                                                                                                                                                                 | 2060  |

NOTE: A variation of  $\pm 10\%$  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 and ft-lb for metric cap screws |       |       |         |       |          |       |
|-----------------------------------------------------------|-------|-------|---------|-------|----------|-------|
| Head marking<br>(identifying<br>strength)                 | 8.8 * |       | 10.9 ** |       | 12.9 *** |       |
| Thread-O.D.<br>(mm)                                       | Nm    | ft-lb | Nm      | ft-lb | Nm       | ft-lb |
| M5                                                        | 7     | 5     | 9       | 6.5   | 10       | 8.5   |
| M6                                                        | 10    | 8.5   | 15      | 10    | 20       | 15    |
| M8                                                        | 30    | 20    | 40      | 30    | 40       | 30    |
| M10                                                       | 50    | 35    | 80      | 60    | 90       | 70    |
| M12                                                       | 100   | 75    | 140     | 100   | 160      | 120   |
| M14                                                       | 160   | 120   | 210     | 155   | 260      | 190   |
| M16                                                       | 240   | 175   | 350     | 260   | 400      | 300   |
| M20                                                       | 480   | 355   | 650     | 480   | 780      | 575   |
| M24                                                       | 820   | 605   | 1150    | 850   | 1350     | 995   |
| M30                                                       | 1640  | 1210  | 2250    | 1660  | 2700     | 1990  |
| M36                                                       | 2850  | 2110  | 4000    | 2950  | 4700     | 3465  |

NOTE: A variation of  $\pm 10\%$  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 and ft-lb for pipe and hose connections |              |       |           |       |
|-------------------------------------------------------------------|--------------|-------|-----------|-------|
| Thread size                                                       | with O-rings |       | with cone |       |
|                                                                   | Nm           | ft-lb | Nm        | ft-lb |
| 3/8-24 UNF                                                        | 7.5          | 5.5   | 8         | 6     |
| 7/16-20 UNF                                                       | 10           | 7     | 12        | 9     |
| 1/2-20 UNF                                                        | 12           | 9     | 15        | 11    |
| 9/16-18 UNF                                                       | 15           | 11    | 25        | 18    |
| 3/4-16 UNF                                                        | 25           | 20    | 45        | 35    |
| 7/8-14 UNF                                                        | 40           | 30    | 60        | 45    |
| 1-1/16-12 UNC                                                     | 60           | 45    | 100       | 75    |
| 1-3/16-12 UNC                                                     | 70           | 50    | 120       | 90    |
| 1-5/16-12 UNC                                                     | 80           | 60    | 140       | 105   |
| 1-5/8-12 UNC                                                      | 110          | 80    | 190       | 140   |
| 1-7/8-12 UNC                                                      | 150          | 110   | 220       | 160   |

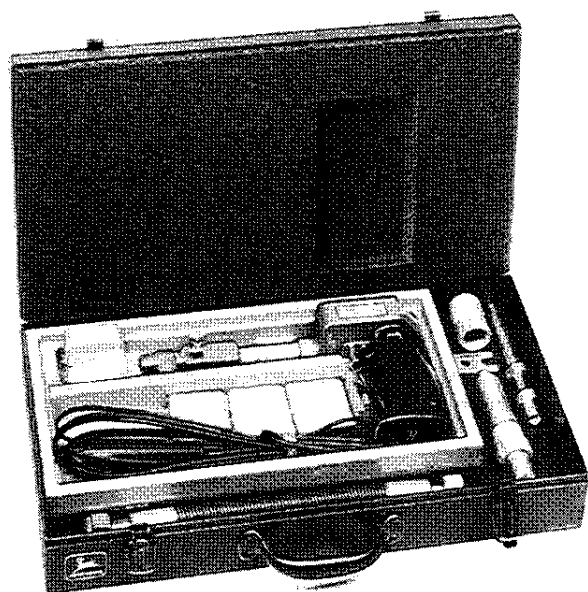
## Special Tools

### Tune-Up

#### Tool

#### Description and Part No.

#### Use

Compression tester  
kitChecking engine com-  
pression

FKM 10021

L30722

Fig. 1 — Compression Tester Kit

#### Pressure test kit

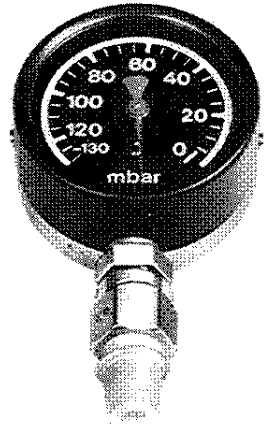
Measuring air intake  
system vacuum

FKM 10002



L30515

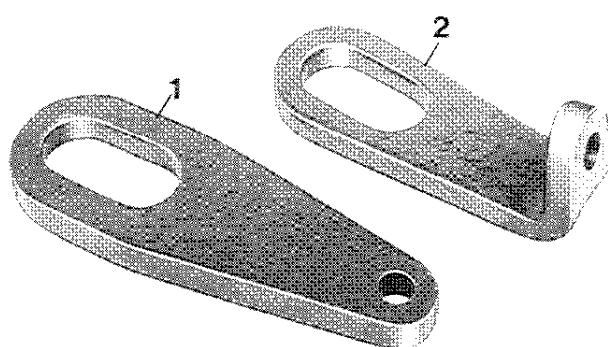
Fig. 2 — Pressure Gauge Set

| Tool                                                                              | Description and Part No.  | Use                                   |
|-----------------------------------------------------------------------------------|---------------------------|---------------------------------------|
|  | Vacuum gauge<br>FKM 10242 | Measuring air intake<br>system vacuum |

L 30913

Fig. 3 — Vacuum Gauge

## Tractor Separation



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

Tractor separation

L 23985

Fig. 4 — Lifting Eyes, Straight and Bent

## Tractor Separation (Contd.)

| Tool                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Description and Part No. | Use                                               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|---------------------------------------------------|
| <p>Technical drawing of the tool for removing a rockshaft. The drawing shows two views: a side view and a cross-sectional view. The side view shows a horizontal pipe (2) with a flat metal plate (3) attached to its top. A round material (1) is attached to the end of the pipe. Dimensions are given in mm and inches. The cross-sectional view shows the internal structure of the tool, including the round material (1) and the pipe (2).</p> | —                        | Removing rockshaft (tractors with operator's cab) |

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.)

**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 another 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 220 cm<sup>3</sup> (7.5 oz.) of rust inhibitor to the engine oil.
2. Add 185 cm<sup>3</sup> (6.5 oz.) of rust inhibitor to the oil in the transmission/hydraulic system with collar shift transmission and 230 cm<sup>3</sup> (8 oz.) in the transmission/hydraulic system with synchronized transmission.
3. Drain fuel tank, pour 150 cm<sup>3</sup> (5 oz.) of rust inhibitor into the empty tank and add approx. 10 liters (2.6 U.S. gals.) of fuel. Start engine and run 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 c.c. (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.
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.
7. Carry out 500-hour check.
8. Run engine at approx. 1500 rpm for some minutes. Check all systems before placing tractor under load.

## Predelivery Inspection

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

### Engine

#### LEAKS

1. 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.*

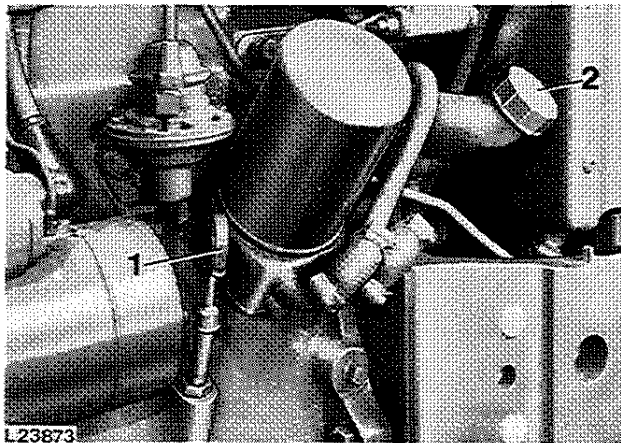


Fig. 1 — Engine Oil Dipstick and Filler Cap

- 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

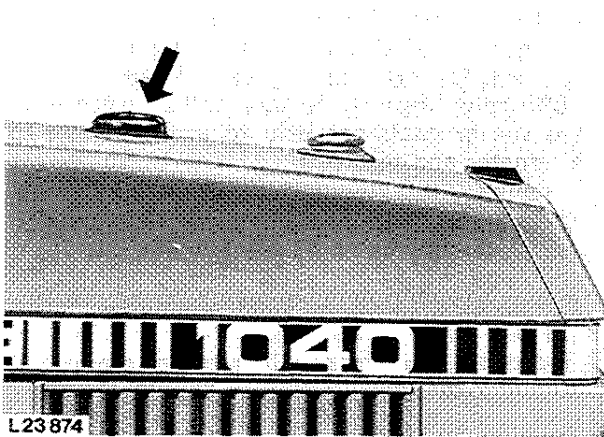


Fig. 2 — Radiator Filler Cap

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  $-36^{\circ}\text{C}$  ( $-35^{\circ}\text{F}$ ).

**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 guarantees engine protection against corrosion and against frost down to  $-36^{\circ}\text{C}$  ( $-35^{\circ}\text{F}$ ).

Never use any cooling system sealing additives.

#### IDLE SPEEDS

1. Warm up engine to operating temperature and check slow and fast idle speeds. Adjust, if necessary (see Section 30, Group 30).
2. Slow idle speed: 750 rpm
3. Fast idle speed:
  - Tractors 840 and 940: 2560 rpm
  - Tractors 1040 and 1140: 2660 rpm

#### 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 30).

## AIR CLEANER AND SAFETY ELEMENT

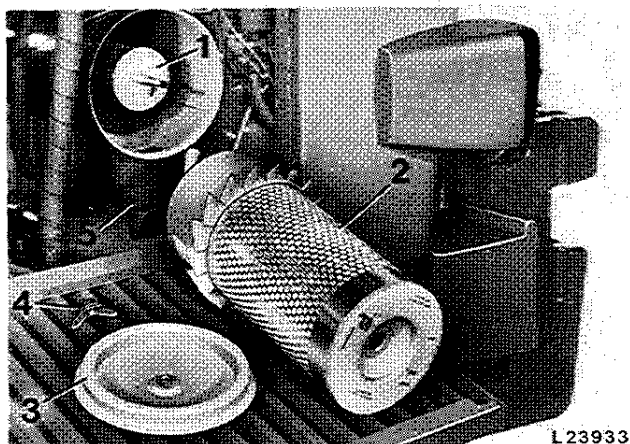


Fig. 3 – Air Cleaner and Safety Element

- |                       |                        |
|-----------------------|------------------------|
| 1 Safety element      | 4 Wing nut             |
| 2 Air cleaner element | 5 Dust unloading valve |
| 3 Cover               |                        |

1. Check air cleaner and safety elements for proper installation.
2. Make sure that dust unloading valve 5 (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 (0.08 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).

## 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.

