240, 245, 260, 265, 285, and 320 Lawn and Garden Tractors

TECHNICAL MANUAL

John Deere
Worldwide Commercial and Consumer Equipment Division

TM1426 (01SEP96)
Replaces TM1426 (01SEP92)

Litho in U.S.A

This technical manual is written for an experienced technician and contains sections that are specifically for this product. It is a part of a total product support program.

The manual is organized so that all the information on a particular system is kept together. The order of grouping is as follows:

- Table of Contents
- Specifications
- Component Location
- System Schematic
- Theory of Operation
- Troubleshooting Chart
- Diagnostics
- Tests & Adjustments
- Repair

NOTE: Depending on the particular section or system being covered, not all of the above groups may be used.

Each section will be identified with a symbol rather than a number. The groups and pages within a section will be consecutively numbered.

All information, illustrations and specifications in this manual are based on the latest information available at the time of publication. The right is reserved to make changes at any time without notice.

We appreciate your input on this manual. To help, there are postage paid post cards included at the back. If you find any errors or want to comment on the layout of the manual please fill out one of the cards and mail it back to us.

CONTENTS

Page

SAFETY

RECOGNIZE SAFETY INFORMATION

T81389

This is the safety-alert symbol. When you see this symbol on your machine or in this manual, be alert to potential for personal injury.

Follow recommended precautions and safe operating practices.

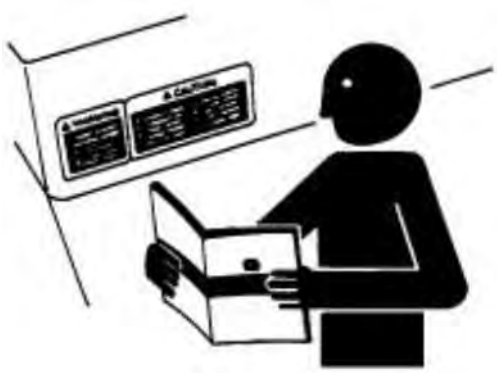
UNDERSTAND SIGNAL WORDS

TS187

A signal word - DANGER, WARNING, or CAUTION - is used with the safety-alert symbol. DANGER identifies the most serious hazards.

DANGER or WARNING safety signs are located near specific hazards. General precautions are listed on CAUTION safety signs. CAUTION also call attention to safety messages in this manual.

FOLLOW SAFETY INSTRUCTIONS



TS201

Carefully read all safety messages in this manual and on your machine safety signs. Keep safety signs in good condition. Replace missing or damaged safety signs. Be sure new equipment components and repair parts include the current safety signs. Replacement safety signs are available from your John Deere dealer.

Learn how to operate the machine and how to use controls properly. DO NOT let anyone operate without instruction.

Keep your machine in proper working condition. Unauthorized modifications to the machine may impair the function and/or safety and affect machine life.

If you DO NOT understand any part of this manual and need assistance, contact your John Deere dealer.

HANDLE FLUIDS SAFELY - AVOID FIRES

TS227

When you work around fuel, DO NOT smoke or work near heaters or other fire hazards.

Store flammable fluids away from fire hazards. DO NOT incinerate or puncture pressurized containers.

Make sure machine is clean of trash, grease, and debris.

DO NOT store oily rages; they can ignite and burn spontaneously.

PREVENT BATTERY EXPLOSIONS

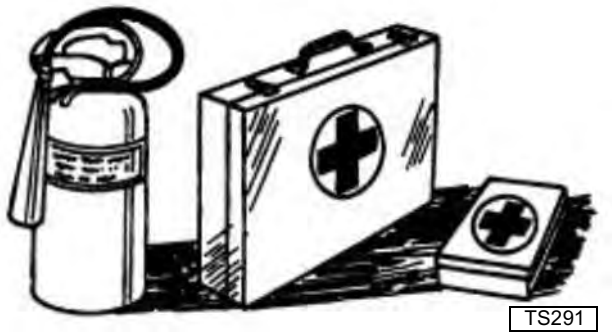
TS204

Keep sparks, lighted matches, and open flame away from the top of battery. Battery gas can explode.

Never check battery charges by placing a metal object across the posts. Use a volt-meter or hydrometer.

DO NOT charge a frozen battery; it may explode. Warm battery to **16°C (60°F)**.

PREPARE FOR EMERGENCIES



TS291

Be prepared if a fire starts.

Keep a first aid kit and fire extinguisher handy.

Keep emergency numbers for doctors, ambulance service, hospital, and fire department near your telephone.

PREVENT ACID BURNS

TS203

Sulfuric acid in battery electrolyte is poisonous. It is strong enough to burn skin, eat holes in clothing, and cause blindness if splashed into eyes.

Avoid the hazard by:

1. Filling batteries in a well-ventilated area.
2. Wearing eye protection and rubber gloves.
3. Avoiding breathing fumes when electrolyte is added.
4. Avoiding spilling or dripping electrolyte.
5. Use proper jump start procedure.

If you spill acid on yourself:

1. Flush your skin with water.
2. Apply baking soda or lime to help neutralize the acid.
3. Flush your eyes with water for **10—15** minutes. Get medical attention immediately.

If acid is swallowed:

1. Drink large amounts of water or milk.
2. Then drink milk of magnesia, beaten eggs, or vegetable oil.
3. Get medical attention immediately.

SERVICE COOLING SYSTEM SAFELY

TS281

Explosive release of fluids from pressurized cooling system can cause serious burns.

Shut off engine. Only remove filler cap when cool enough to touch with bare hands. Slowly loosen cap to first stop to relieve pressure before removing completely.

AVOID HIGH-PRESSURE FLUIDS

X9811

Escaping fluid under pressure can penetrate the skin causing serious injury.

Avoid the hazard by relieving pressure before disconnecting hydraulic or other lines. Tighten all connections before applying pressure.

Search for leaks with a piece of cardboard. Protect hands and body from high pressure fluids.

If an accident occurs, see a doctor immediately. Any fluid injected into the skin must be surgically removed within a few hours or gangrene may result. Doctors unfamiliar with this type of injury should reference a knowledgeable medical source. Such information is available from Deere & Company Medical Department in Moline, Illinois, U.S.A.

PARK MACHINE SAFELY

TS230

Before working on the machine:

- Lower all equipment to the ground.
- Stop the engine and remove the key.
- Disconnect the battery ground strap.
- Hang a “DO NOT OPERATE” tag in operator station.

SUPPORT MACHINE PROPERLY

TS229

Always lower the attachment or implement to the ground before you work on the machine. If you must work on a lifted machine or attachment, securely support the machine or attachment.

DO NOT support the machine on cinder blocks. hollow tiles, or props that may crumble under continuous load. DO NOT work under the machine that is supported solely by a jack. Follow recommended procedures in this manual.

WEAR PROTECTIVE CLOTHING

TS206

Wear close fitting clothing and safety equipment appropriate to the job.

Prolonged exposure to loud noise can cause impairment or loss of hearing.

Wear a suitable hearing protective device such as earmuffs or earplugs to protect against objectionable or uncomfortable loud noises.

Operating equipment safely requires the full attention of the operator. DO NOT wear radio or music headphones while operating machine.

WORK IN CLEAN AREA

T6642EJ

Before starting a job:

- Clean work area and machine.
- Make sure you have all necessary tools to do your job.
- Have the right parts on hand.
- Read all instructions thoroughly; DO NOT attempt shortcuts.

SERVICE MACHINES SAFELY

TS228

Tie long hair behind your head. DO NOT wear a necktie, scarf, loose clothing, or necklace when you work near machine tools or moving parts. If these items were to get caught, severe injury could result.

Remove rings and other jewelry to prevent electrical shorts and entanglement in moving parts.

WORK IN VENTILATED AREA

TS220

WARNING: California Proposition 65 Warning

Gasoline engine exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm.

Engine exhaust fumes can cause sickness or death. If it is necessary to run an engine in an enclosed area, remove the exhaust fumes from the area with an exhaust pipe extension.

If you DO NOT have an exhaust pipe extension, open the doors and get outside air into the area.

ILLUMINATE WORK AREA SAFELY

TS223

Illuminate your work area adequately but safely. Use a portable safety light for working inside or under the machine. Make sure the bulb is enclosed by a wire cage. The hot filament of an accidentally broken bulb can ignite spilled fuel or oil.

REPLACE SAFETY SIGNS

TS201

Replace missing or damaged safety signs. See the machine operator's manual for correct safety sign placement.

USE PROPER LIFTING EQUIPMENT

TS226

Lifting heavy components incorrectly can cause severe injury or machine damage.

Follow recommended procedure for removal and installation of components in the manual.

SERVICE TIRES SAFELY

TS952

Explosive separation of a tire and rim parts can cause serious injury or death.

DO NOT attempt to mount a tire unless you have the proper equipment and experience to perform the job.

Always maintain the correct tire pressure. DO NOT inflate the tires above the recommended pressure. Never weld or heat a wheel and tire assembly. The heat can cause an increase in air pressure resulting in a tire explosion. Welding can structurally weaken or deform the wheel.

When inflating tires, use a clip-on chuck and extension hose long enough to allow you to stand to one side and NOT in front of or over the tire assembly. Use a safety cage if available.

Check wheels for low pressure, cuts, bubbles, damaged rims or missing lug bolts and nuts.

AVOID HEATING NEAR PRESSURIZED FLUID LINES


TS953

Flammable spray can be generated by heating near pressurized fluid lines, resulting in severe burns to yourself and bystanders. DO NOT heat by welding, soldering, or using a torch near pressurized fluid lines or other flammable materials. Pressurized lines can be accidentally cut when heat goes beyond the immediate flame area.

REMOVE PAINT BEFORE WELDING OR HEATING


TS220

Avoid potentially toxic fumes and dust.

Hazardous fumes can be generated when paint is heated by welding, soldering, or using a torch.

Do all work outside or in a well ventilated area. Dispose of paint and solvent properly.

Remove paint before welding or heating.

- If you sand or grind paint, avoid breathing the dust. Wear an approved respirator.
- If you use solvent or paint stripper, remove stripped with soap and water before welding. Remove solvent or paint stripper containers and other flammable material from area. Allow fumes to disperse at least 15 minutes before welding or heating.

USE PROPER TOOLS


TS779

Use tools appropriate to the work. Makeshift tools and procedures can create safety hazards.

Use power tools only to loosen threaded parts and fasteners.

For loosening and tightening hardware, use the correct size tools. DO NOT use U.S. measurement tools on metric fasteners. Avoid bodily injury caused by slipping wrenches.

Use only service parts meeting John Deere specifications.

DISPOSE OF WASTE PROPERLY


TS1133

Improperly disposing of waste can threaten the environment and ecology. Potentially harmful waste used with John Deere equipment include such items as oil, fuel, coolant, brake fluid, filters, and batteries.

Use leakproof containers when draining fluids. DO NOT use food or beverage containers that may mislead someone into drinking from them.

DO NOT pour waste onto the ground, down a drain, or into any water source.

Air conditioning refrigerants escaping into the air can damage the Earth's atmosphere. Government regulations may require a certified air conditioning service center to recover and recycle used air conditioning refrigerants.

Inquire on the proper way to recycle or dispose of waste from your local environmental or recycling center, or from your John Deere dealer.

LIVE WITH SAFETY

TS231

Before returning machine to customer, make sure machine is functioning properly, especially the safety systems. Install all guards and shields.

CONTENTS

Page

GENERAL SPECIFICATIONS

MACHINE SPECIFICATIONS

Model:	240	245	260
ENGINE			
Manufacturer	Kawasaki	Kawasaki	Kawasaki
Model number	FC420V	FC420V	FC540V
Horsepower	14 (10.4 kW)	14 (10.4 kW)	17 (12.6kW)
Type of Valves	Overhead	Overhead	Overhead
Type of Cooling	Air	Air	Air
Number of Cylinders	One	One	One
Crankshaft Alignment	Vertical	Vertical	Vertical
Stroke/Cycle	Four	Four	Four
Bore	89 mm (3.5 in.)	89 mm (3.5 in)	89 mm (3.5 in.)
Stroke	68 mm (2.7 in.)	68 mm (2.7 in.)	86 mm (3.38 in.)
Displacement	423 cm^3	423 cm^3	535 cm^3
	(25.8 cu. in.)	(25.8 cu. in.)	(32.6 cu. in.)
Compression Ratio	8.4:1	8.4:1	8.3:1
Fast Idle (no load)	3350 ± 100 rpm	3350 ± 100 rpm	3350 ± 100 rpm
Slow Idle (no load)	1450 ± 75 rpm	1450 ± 75 rpm	1450 ± 75 rpm
Air Filter	Dry, Replaceable	Dry, Replaceable	Dry, Replaceable
	Foam Pre-Cleaner	Foam Pre-Cleaner	Foam Pre-Cleaner
Crankcase Capacity			
with Filter	1.5 L	1.5 L	1.9 L
	(3.17 U.S. pt)	(3.17 U.S. pt)	(4.0 U.S. pt)
Replaceable Oil Filter	Optional	Optional	Standard
ELECTRICAL SYSTEM			
Charging System	Stator	Stator	Stator
Capacity	14 Amp. Reg.	14 Amp. Reg.	16 Amp. Reg.
Battery Type	BCI Group, U1	BCI Group, U1	BCI Group, U1
Battery Voltage	12 Volts	12 Volts	12 Volts
Battery Reserve			
Capacity at 25 Amp.	41 Min.	60 Min.	41 Min.
Battery Cold Cranking			
Amp. at 0°F	340 Amp.	335 Amp.	340 Amp.
FUEL SYSTEM			
Fuel Tank Capacity	11.4 L (3.0 gal)	11.4 L (3.0 gal)	11.4 L (3.0 gal)
Fuel Type	Unleaded Gasoline	Unleaded Gasoline	Unleaded Gasoline
Fuel Filter	Replaceable In Line	Replaceable In Line	Replaceable In Line

MACHINE SPECIFICATIONS (CONTINUED)

Model:	**240**	**245**	**260**
POWER TRAIN			
Transmission	Gear Transaxle	Hydrostatic	Gear Transaxal
Manufacturer	Kanzaki	Sundstrand	Kanzaki
Lubricant*	J20D	J20D	J20D
S/N(130001-)	Low Viscosity	Low Viscosity	Low Viscosity
	HY-GARD	HY-GARD	HY-GARD
Capacity	3.8 L (1 U.S. gal)	2.5 L (2.6 U.S. qt)	3.8 L (1 U.S. gal)

**DO NOT mix oils when adding oil, make sure color of add lubricant matches existing oil.*

Model:	**265**	**285/320**
ENGINE		
Manufacturer	Kawasaki	Kawasaki
Model Number	FC540V	FD590V
Horsepower	17 (12.6kW)	18 (13.4kW)
Type of Valves	Overhead	Overhead
Type of Cooling	Air	Liquid
Number of Cylinders	One	Two
Crankshaft Alignment	Vertical	Vertical
Stroke/Cycle	Four	Four
Bore	89 mm (3.5 in.)	74 mm (2.9 in.)
Stroke	86 mm (3.36 in.)	68 mm (2.7 in.)
Displacement	535 cm^3	585 cm^3
	(32.6 cu. in.)	(35.7 cu. in.)
Compression Ratio	8.3:1	8.7:1
Fast Idle (no load)	3350 ± 100 rpm	3350 ± 100 rpm
Slow Idle (no load)	1550 ± 75 rpm	1550 ± 75 rpm
Air Filter	Dry, Replaceable	Dry, Replaceable
	Foam Pre-Cleaner	Foam Pre-Cleaner
Crankcase Capacity with Filter	1.8 L	1.9 L
	(3.8 pt.)	(4.0 pt.)
Replaceable Oil Filter	Standard	Standard
Coolant Capacity	N/A	3.1 L (3.3 U.S. Qt.)
ELECTRICAL SYSTEM		
Charging System	Stator	Stator
Capacity	16 Amp. Reg.	16 Amp. Reg.
Battery Type	BCI Group, 22F	BCI Group, 22F
Battery Voltage	12 Volts	12 Volts
Batter Reserve		
Capacity at 25 Amp.	60 Min.	60 Min.
Battery Cold Cranking		
Amp. at 0°F	335 Amp.	335 Amp.

MACHINE SPECIFICATIONS (CONTINUED)

Model:	**265**	**285/320**
FUEL SYSTEM		
Fuel Tank Capacity	11.4 L (3.0 Gal.) (Regular Leaded or Unleaded Gasoline)	11.4 L (3.0 Gal.) (Regular Leaded or Unleaded Gasoline)
Fuel Filter	Replaceable In Line	Replaceable In Line
POWER TRAIN		
Transmission	Hydrostatic	Hydrostatic
Manufacturer	Sundstrand	Sundstrand
Lubricant*	Low Viscosity	Low Viscosity
S/N(130001-)	HY-GARD®	HY-GARD®
Specification	J20D	J20D
Capacity	2.5 L (2.6 U.S. qt.)	2.5 L (2.6 U.S. qt.)

**DO NOT mix oils when adding oil, make sure color of add lubricant matches existing oil.*

CHASSIS DIMENSIONS

Wheelbase ..... 122 cm (47.9 in.)
Overall Length ..... 182 cm (71.5 in.)
With Read Bagger ..... 2.37 m (93.5 in.)
- With Front Quick-Thatch Wts. ..... 2.02 m (79.5 in.)
- With Rear Quick-Thatch Wts. ..... 1.93 m (76 in.)

Overall Height ..... 111 cm (43.6 in.)
Overall Width
- Min. (Tractor Only) ..... 1.0 m (39 in.)
- Max. (Tractor Only) ..... 1.1 m (41.5 in.)
- With 38 in. Mower:
  - Deflector Up ..... 104 cm (41 in.)
  - Deflector Down ..... 136 cm (53.5 in.)
- With Read Bagger ..... 126 cm (49.5 in.)
- With 46 in. Mower:
  - Deflector Up ..... 136 cm (53.5 in.)
  - Deflector Down ..... 145 cm (57 in.)
- With 48 in. Mower:
  - Deflector Up ..... 138 cm (54.5 in.)
  - Deflector Down ..... 157 cm (62.0 in.)
- With 50 in. Mower:
  - Deflector Up ..... 144 cm (56.5 in.)
  - Deflector Down ..... 155 cm (61 in.)

CHASSIS DIMENSIONS (CONTINUED)

OVERALL WIDTH (CONTINUED)

Turning Radius

- Inside Read Wheel ..... 64 cm (25 in.)
- Outside Read Wheel ..... 203 cm (80 in.)

Wheel Tread

- Front ..... 80 cm (31.5 in.)
- Rear (320) ..... 74 cm (29 in.)

TIRES

Type

- Front ..... Turf
- Rear ..... Turf or Bar

Size

- Front ..... 16 x 6.5-8
- Rear ..... 23 x 10.5-12

Inflation Pressure

- Front All (except 32070) - 110 kPa (10-16 psi)
- Front ..... 32070 - 97 kPa (10-14 psi)
- Rear ..... 40 - 70 kPa (6-10 psi)

BRAKES

- (S.N. - 130000) ..... Expanding Shoe
- (S.N. 130001 -) ..... Wet Disc

PTO CLUTCH

- Type ..... Electric

IMPLEMENT LIFT

- All (except 320) ..... Manual W/Depth Stop and Adjustable Lift Spring
- 320 ..... Hydraulic W/Depth Stop and Adjustable Lift Spring

(Specification and design subject to change without notice.)

TEST AND ADJUSTMENT SPECIFICATIONS

ITEM	SPECIFICATION
ENGINE	
Fast Idle (except fuel injected 285)	3350 ± 50 rpm
Slow Idle	1450 ± 75 rpm
Compression (Min.)	
240, 245, 260, 265	483 kPa (71 psi)
285, 320	588 kPa (85 psi)
Intake and Exhaust Valve Clearance (Cold)	
240, 245, 260, 265	0.15 mm (0.006 in.)
285, 320	0.25 mm (0.01 in.)
Crankcase Vacuum (Min.)	
240, 245, 260, 265	25 cm (10 in. water)
285, 320	18 cm (7 in. water)
Oil Pressure (Min.)	240 kPa (35 psi)
Fuel Pump Pressure (Min.)	
240, 245, 260, 265	6 kPa (0.9 psi)
285, 320	19 kPa (2.8 psi)
Fuel Pump Flow (Min.)	
240, 245	80 ml/15 sec. (2.7 oz./15 sec.)
260, 265	90 ml/15 sec. (3 oz./15 sec.)
285, 320	160 ml/15 sec. (5.4 oz./15 sec.)
Fuel Pressure - Fuel Injected 285	274-284 kPa (40-41 psi)
ELECTRICAL	
Regulated Voltage Output	
240, 245	11 amps (Min.) at 12.2-13.8 V
260, 265	13 amps (Min.) at 12.2-13.8 V
285, 320	15 amps (Min.) at 12.1-13.8 V
Unregulated Voltage Output (Min.)	
240, 245	30 V
260, 265	27 V
285, 320	26 V
Stator Resistance	
240, 245, 260, 265	0.24-0.4 ohms
285, 320	0.12-0.19 ohms
Starter Amp Draw (Max.)	
240, 245	60 amps at 500 rpm
260, 265	85 amps at 500 rpm
285, 320	72 amps at 500 rpm
Starter No-Load Amperage (Max.)	
240, 245, 285, 320	50 amps at 6000 rpm
260, 265	50 amps at 5000 rpm
Starter No-Load RPM	
240, 245, 285, 320	6000 rpm
260, 265	5000 rpm

TEST AND ADJUSTMENT SPECIFICATIONS (CONTINUED)

ITEM	SPECIFICATION
ELECTRICAL	
Ignition Coil Air Gap - 240, 245, 260, 265	0.3 mm (0.012 in.)
Ignition Coil Resistance - 240, 245, 260, 265	
Primary Lead and Core	0.48-0.72 ohms
Spark Plug Lead and Core	10.9-16.3 K ohms
Pulsar Coil Resistance - 285, 320	85-270 ohms
Ignition Coil Resistance - 285, 320	
Primary Coil	3.4-4.6 ohms
Secondary Coil	10.4-15.5 K ohms
Core Insulation Continuity	Infinite
Spark Plug Gap:	
240, 245, 260, 265	0.7-0.8 mm (0.028-0.032 in.)
285, 320	0.7 mm (0.028 in.)
PTO Clutch Amp Draw (Min.)	4 amps
PTO Clutch Air Gap	
Warner	0.38-0.64 mm (0.015-0.025 in.)
Ogura	0.30-0.51 mm (0.012-0.020 in.)
Throttle Sensor Resistance - Fuel Injected 285	
Input Terminal	3.3-6.8 K ohms
Output Terminal (idle)	0.2-0.5 K ohms
Throttle Sensor Output Voltage - Fuel Injected 285	0.35-0.38 V
Air Temperature Sensor Resistance - Fuel Injected 285	1.3-7.4 K ohms
Coolant Temperature Sensor Resistance - Fuel Injected 285	1.3-7.4 K ohms
Fuel Injector Resistance - Fuel Injected 285	11.1-12.9 ohms
POWER TRAIN	
Clutch Pedal Spring Length	54-56 mm (2.1-2.2 in.)
Belt Guide Clearance	
Belt Tension and Bellcrank Idler	1-5 mm (0.04-0.2 in.)
Engine Sheave	1-4 mm (0.04-0.16 in.)
Hydrostatic Control Lever Tension	22-36 N (5-8 lbs)
Charge Pressure:	
245, 265, 285	193-490 kPa (28-71 psi)
320	276-621 kPa (40-90 psi)
BRAKES	
Brake Lever Rod Washer to Retainer Clearance	8-14 mm (0.3-0.5 in.)
Brake Rod Cotter Pin to Retainer Clearance 240/260 (130001-)	22-28 mm (0.8-1.1 in.)