410 and 510 Round Balers

JOHN DEERE

TECHNICAL MANUAL

410 and 510
Round Balers

TM1194 (01JUL77) English

John Deere Ottumwa Works
TM1194 (01JUL77)

LITHO IN U.S.A.
ENGLISH

410 and 510 ROUND BALERS

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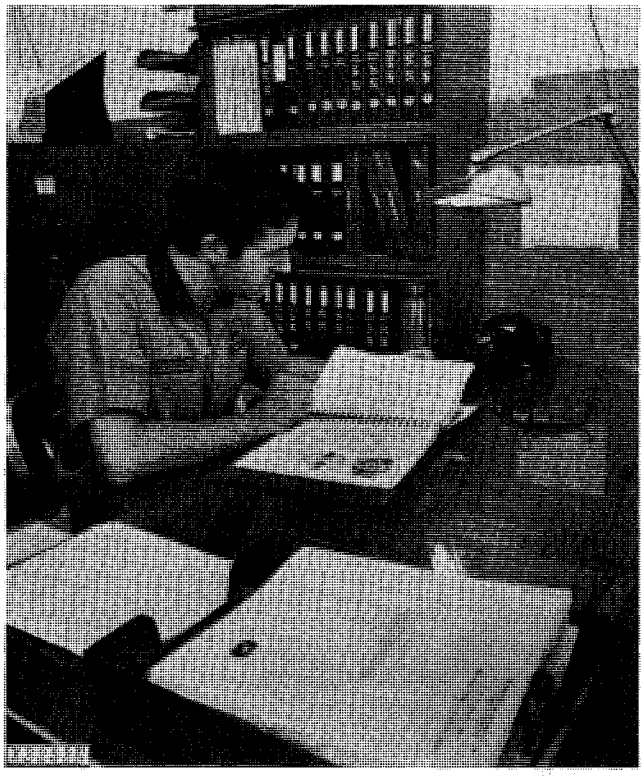
INTRODUCTION



Use FOS Manuals for Reference

Use Technical Manuals for Actual Service

This technical manual is part of a twin concept of service:

The two kinds of manuals work as a team to give you both the general background and technical details of shop service.

•FOS Manuals—for reference

Fundamentals of Service (FOS) Manuals cover basic theory of operation, *fundamentals* of trouble shooting, *general* maintenance, and *basic* types of failure and their causes. FOS Manuals are for training new people and for reference by experienced technicians.

When a service technican should refer to a FOS Manual for more information, a FOS symbol like the one at the left is used in the TM to identify the reference.

•Technical Manuals—for actual service

Technical Manuals are concise service guides for a *specific* machine. Technical manuals are on-the-job guides containing only the vital information needed by an experienced technician.

Some features of this technical manual:

- *Table of contents at front of manual*
- *Exploded views showing parts relationship*
- *Photos showing service techniques*
- *Specifications grouped for easy reference*

This technical manual was planned and written for you—a service technician. Keep it in a permanent binder in the shop where it is handy. Refer to it whenever in doubt about correct service procedures or specifications.

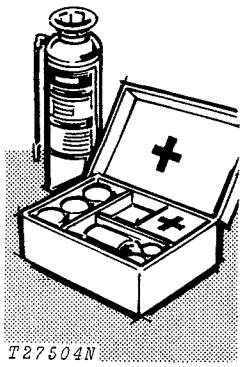
Using the technical manual as a guide will reduce error and costly delay. It will also assure you the best in finished service work.

SAFETY AND YOU

T27999N

INTRODUCTION

This safety alert symbol identifies important safety messages in this manual and on the balers. When you see this symbol, be alert to the possibility of personal injury and carefully read the message that follows.



T27504N

Be prepared if an accident or fire should occur. Know where the first aid kit and the fire extinguishers are located in your area—know how to use them.

SERVICE AREA

Keep the service area clean and dry. Wet or oily floors are slippery. Wet spots can be dangerous when working with electrical equipment.

Make sure the service area is adequately vented.

Periodically check the shop exhaust system for leakage. Engine exhaust gas is dangerous.

Be sure all electrical outlets and tools are properly grounded.

Use adequate light for the job at hand.

AVOID FIRE HAZARDS

E11866N

Don't smoke while refueling or handling highly flammable material.

Engine should be shut off when refueling.

Use care in refueling if the engine is hot.

Don't use open pans of gasoline or diesel fuel for cleaning parts. Good commercial, nonflammable solvents are preferred.

Don't allow sparks or open flame near batteries.

Don't smoke near a battery.

Never check fuel, battery electrolyte or coolant levels with an open flame.

Never use an open flame as a light anywhere on or around the equipment.

CLEANING THE ROUND BALER

E14806N

Always stop the tractor engine before cleaning the baler.

FLUIDS UNDER PRESSURE

Escaping fluid under pressure can have sufficient force to penetrate the skin, causing serious personal injury. Before disconnecting lines, be sure to relieve all pressure. Before applying pressure to the system, be sure all connections are tight and that lines, pipes and hoses are not damaged. Fluid escaping from a very small hole can be almost invisible. Use a piece of cardboard or wood, rather than hands, to search for suspected leaks.

If injured by escaping fluid, see a doctor at once. Serious infection or reaction can develop if proper medical treatment is not administered immediately.

Don't forget the hydraulic system may be pressurized! To relieve pressure, follow the instructions in this technical manual.

When checking hydraulic pressure, be sure to use the correct test gauge for the pressure in the particular system.

PERSONAL SAFETY

T27502

Always avoid loose clothing or any accessory—flopping cuffs, dangling neckties and scarves—that can catch in moving parts and put you out of work. Always wear your safety glasses while on the job.

Before removing any shielding, stop tractor engine. Take all objects from your pockets which could fall. Don't let adjusting wrenches fall into opened areas.

Don't attempt to check belt tension while the tractor engine is running.

Avoid working on equipment with the tractor engine running. If it is necessary to make checks with the engine running, ALWAYS USE TWO PEOPLE—one, the operator, at the controls, the other checking the machine, always in view of the operator. Also, place the transmission in neutral, set the brake, and apply any safety locks provided. KEEP HANDS AWAY FROM MOVING PARTS.

Use extreme caution when raising gate or testing round baler.

Section 10
GENERAL

CONTENTS OF THIS SECTION

Group 5
SPECIFICATIONS

Bale

Diameter:
- 410 ..... 5 ft. (1.5 m)
- 510 ..... 6 ft. (1.8 m)

Width:
- 410 ..... 4 ft. (1.2 m)
- 510 ..... 5 ft. 3 in. (1.6 m)

Weight:
- 410 ..... Approx. 850 lbs. (386 kg)
- 510 ..... Approx. 1700 lbs. (771 kg)

Pickup

Width:
- 410 ..... 5 ft. (1.5 m)
- 510 ..... 6 ft. (1.8 m)

Cylinder Diameter
- 410 and 510 ..... 10 in. (254 mm)

Teeth:
- 410 ..... 32 double teeth and 4 single teeth
- 510 ..... 48 double teeth

Speed:
- 410 and 510 ..... 118 rpm

Weight:
- 410 ..... 2950 lbs. (1338 kg)
- 510 ..... 3895 lbs. (1767 kg)

SPECIFICATIONS—Continued

Size of tractor recommended:

410 ..... Minimum 40 horsepower (30 kW)*
510 ..... 70 hp (52 kW) minimum*
*With dual hydraulics or single hydraulics with use of selector control valve attachment.

Drive Protection:

410 and 510 ..... Slip Clutch

Tires:

410 ..... 9.5L-14 4-ply rating
Inflation pressure ..... 193 kPa [1.7 bar] (28 psi)
510 ..... 11L-14 6-ply rating
Inflation pressure ..... 193 kPa [1.7 bar] (28 psi)

PTO shaft speed:

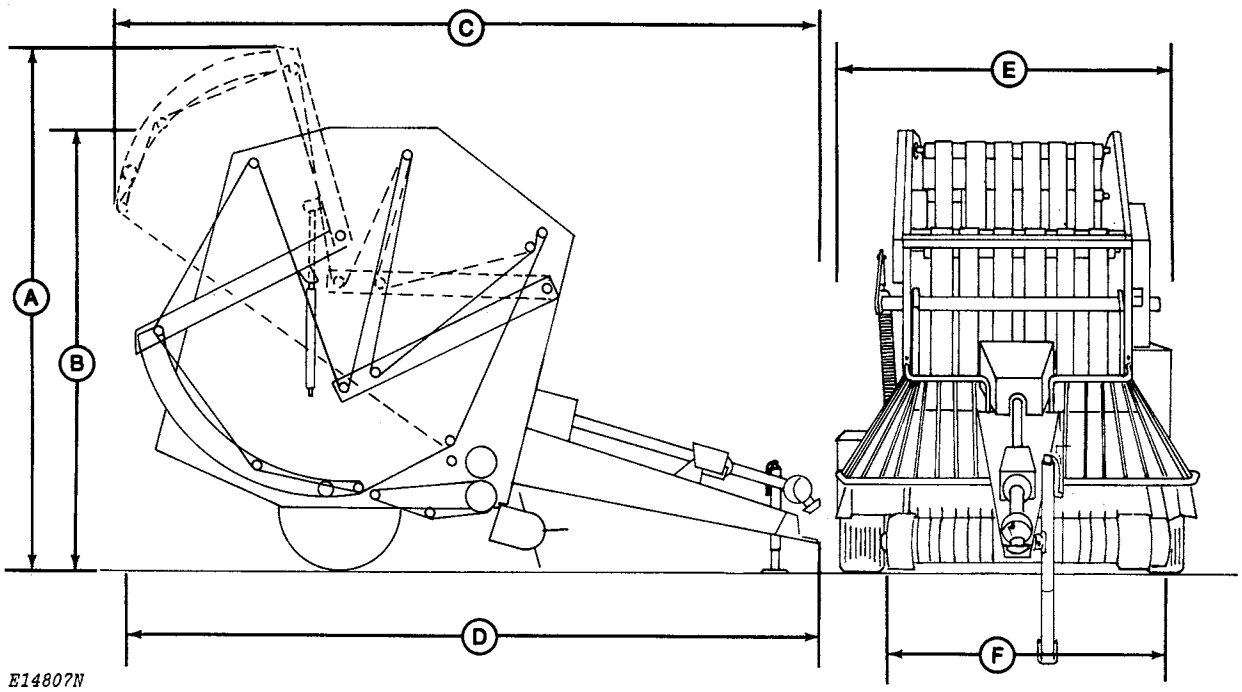
410 ..... ASAE-SAE standard (540 rpm)
510 ..... ASAE-SAE standard (540 rpm) optional 1000 rpm

Transmission:

Gears
410 ..... 90° bevel gear drive; 1:1 gear ratio
510 ..... 90° bevel gear drive; 1:1.35 gear ratio
Capacity
410 ..... 2-1/2 U.S. pints (1.2 l) SAE 85-140 API-GL5
510 ..... 2 U.S. qts. (1.9 l) SAE 85-140 API-GL5

Belts:

Upper
410 ..... 6 rubber coated belts
510 ..... 9 rubber coated belts
Lower
410 ..... 5 individual rubber coated belts
510 ..... 7 individual rubber coated belts



A—Height (gate open)
- **410** ..... **9 ft. 9 in. (2.9 m)**
- **510** ..... **10 ft. 10 in. (3.3 m)**

B—Height (gate closed)
- **410** ..... **8 ft. 4 in. (2.5 m)**
- **510** ..... **9 ft. 1 in. (2.8 m)**

C—Length (gate open)
- **410** ..... **14 ft. 8 in. (4.5 m)**
- **510** ..... **15 ft. 7 in. (4.7 m)**

D—Length (gate closed)
- **410** ..... **13 ft. 1 in. (4 m)**
- **510** ..... **14 ft. 1 in. (4.3 m)**

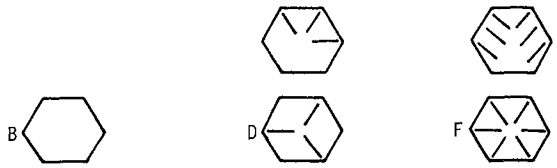
E—Pickup Width
- **410** ..... **5 ft. (1.5 m)**
- **510** ..... **6 ft. (1.8 m)**

F—Width
- **410** ..... **6 ft. 10 in. (2.1 m)**
- **510** ..... **8 ft. 2 in. (2.5 m)**

Fig. 1-Dimensions of 410 - 510 Round Balers

TORQUE CHART

RECOMMENDED TORQUE IN FT-LBS (Nm)
COARSE AND FINE THREADS



Bolt Diameter	Plain Head	Three Dashes	Six Dashes
1/4	Not used	10 (14)	14 (19)
5/16	Not used	20 (27)	30 (41)
3/8	Not used	35 (47)	50 (68)
7/16	35 (47)	55 (75)	80 (108)
1/2	55 (75)	85 (115)	120 (163)
9/16	75 (102)	130 (176)	175 (237)
5/8	105 (142)	170 (230)	240 (325)
3/4	185 (251)	300 (407)	425 (576)
7/8	160 (217)	445 (603)	685 (929)
1	250 (339)	670 (908)	1030 (1397)
1-1/8	330 (447)	910 (1234)	1460 (1980)
1-1/4	480 (651)	1250 (1695)	2060 (2793)

E11579N

The types of bolts and cap screws are identified by head markings as follows:

Plain Head: regular machine bolts and cap screws.

3-Dash Head: tempered steel high-strength bolts and cap screws.

6-Dash Head: tempered steel extra high-strength bolts and cap screws.

Machine bolts and cap screws 7/8-inch and larger are sometimes formed hot rather than cold, which accounts for the lower torque.

Group 10
DIAGNOSING MALFUNCTIONS

The majority of operating problems that occur with the round balers can be sometimes traced to improper adjustment or delayed service. The following malfunctions are designed to help you when a problem develops by suggesting a problem cause and the recommended solution.

These suggested malfunctions should be applied with caution. Make certain that the source of the problem is not located someplace other than where the problem exists. A thorough understanding of the round baler is a must if operating problems are to be corrected satisfactorily.

Hay Wraps Around Rollers

Windrows light and/or short hay.

Recommended larger windrows and slow tractor speed to 1700-1800 rpm.

Moisture content too high or wet "slugs" in bottom of windrows.

Moisture content of hay should be between 20 to 25 per cent.

"Barrel" Shaped Bale

Windrow not proper width.

Weaving too often and baling more hay in the center of the bale.

See How The Bale is Formed, page 10-15-3.

"Cone" Shaped Bale

Not baling enough hay on small end of cone.

See How The Bale is Formed, page 10-15-3.

Compression spring broken on one end.

Ends of Bale Not Square

Not crowding hay into sides of pickup when baling.

Unable to Make a Bale

Baler being operated in hay or straw with the rear gate unlatched.

The gate must always be latched when starting and while baling.

Top Belts Not Turning

Rubber worn on upper drive roll.

See page 20-25-4.

PTO slip clutch slipping.

Adjust drive slip clutch. See page 20-20-9.

Material too wet.

Not weaving properly.

See page 10-15-3.

Excessive bale density.

Move tension spring to forward hole. See page 10-15-5.

Bottom Belts Not Turning

Lower belt tension springs not adjusted.

Adjust lower belt tension springs. See page 20-25-13.

Compression spring broken.

Replace spring.

DIAGNOSING MALFUNCTIONS—Continued

Broken Top Belt

Material wet causing hay to build up on rollers.

Not weaving properly when starting to bale, causing the end belts to go under the bale.

See page 10-15-3.

Lacing worn.

Repair belt. See page 40-10-1.

Slip clutch frozen or not adjusted properly.

Adjust drive slip clutch, see page 20-20-9.

Plugging on either end between starting and scraper rolls with outside belts forced inward.

See remedy for problem of "Plugging Between Starter and Scraper Rolls....." page 10-10-3.

Hay Passes Through Baler

Gate is not all the way down, adjusted properly, or latched.

Adjust gate latch. Make sure gate is latched when in "home" position. See page 20-25-16.

Relief valve pressure is too low.

See page 30-10-8.

Top or bottom belts not turning.

Belts not tensioned properly. See page 20-25-13 or 20-25-15.

Twine Not Going Around Bale

Twine not threaded properly.

Check baler for proper threading. See page 50-10-10.

Twine not being fed in with hay.

Continue feeding hay until twine goes between compression rolls. See page 10-15-4.

Build-up on top compression roll.

Clean compression roll. See page 10-15-5.

Build-up on lower feed roll.

Remove build-up from lower feed roll. Continue baling whenever beginning tying cycle. See page 10-15-3.

Not Enough Twine On Bale

Flow control valve not adjusted properly.

Adjust flow control valve. See page 30-15-5.

Oil filter screen plugged.

See page 30-15-4.

Twine Cutter Not Cutting

Anvil arm not tensioned properly.

Adjust tension. See page 50-10-7.

Anvil not parallel to knife.

Model anvil arm. See page 50-10-7.

Twine cutter out of adjustment.

Adjust knife, see page 50-10-7.

Dull knife.

Sharpen knife, see page 50-10-6.

Top Belts Not Tracking Properly

Belts not equal length.

Remove and repair belts to within 2 inches (51 mm) of each other in length. See page 40-10-1.

Top rollers bent due to foreign objects or bale made too large.

Belt not cut squarely.

Remove and cut ends squarely. See page 40-10-1.