John Deere 410 Loader Backhoe

John Deere 410 Loader Backhoe Technical Repair Manual

Model: 410 Loader Backhoe | Manual Number: TM-1037

1. Introduction

This technical service manual, TM-1037, provides comprehensive repair and maintenance information for the John Deere 410 Loader Backhoe. It is designed for technicians and individuals performing service operations on the machine. The manual contains detailed procedures, specifications, and diagrams to assist in accurate diagnosis and repair.

Models Covered: 410 Loader Backhoe
Manuals Included: Technical (Service) Manual (TM-1037)
Total Pages: 350

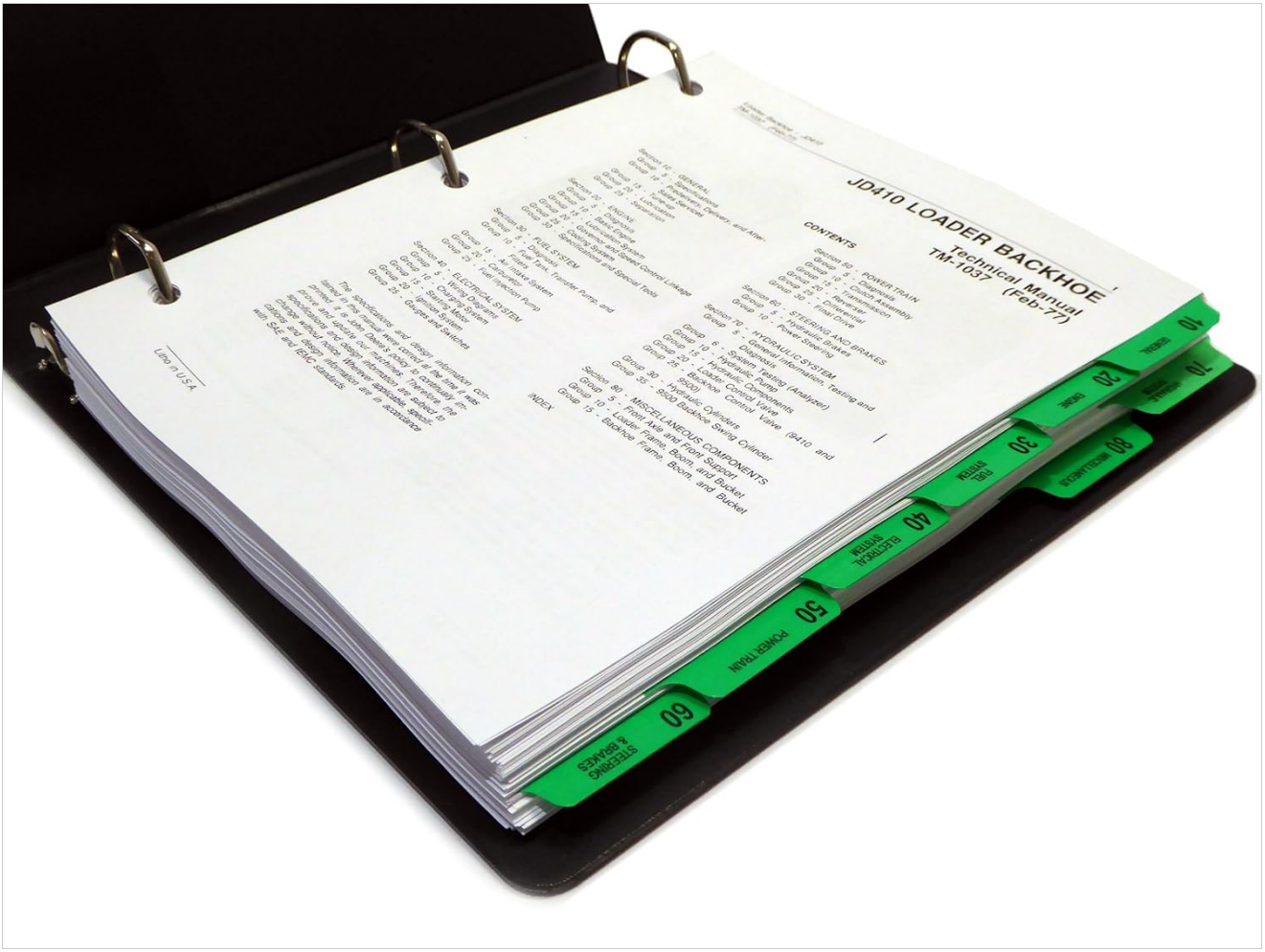


Figure 1: Front cover and initial pages of the John Deere 410 Loader Backhoe Technical Manual, showing the table of contents and section dividers.

2. Manual Overview and Usage

This manual is organized into sections, each covering a specific system or component of the 410 Loader Backhoe. Each section is further divided into groups, providing detailed information on diagnosis, testing, and repair procedures. Refer to the table of contents at the beginning of the manual for a complete listing of sections and groups.

Information regarding specifications and design was current at the time of printing. John Deere's policy is to continuously improve its machines, therefore specifications and design are subject to change without notice. Always refer to the latest information available.

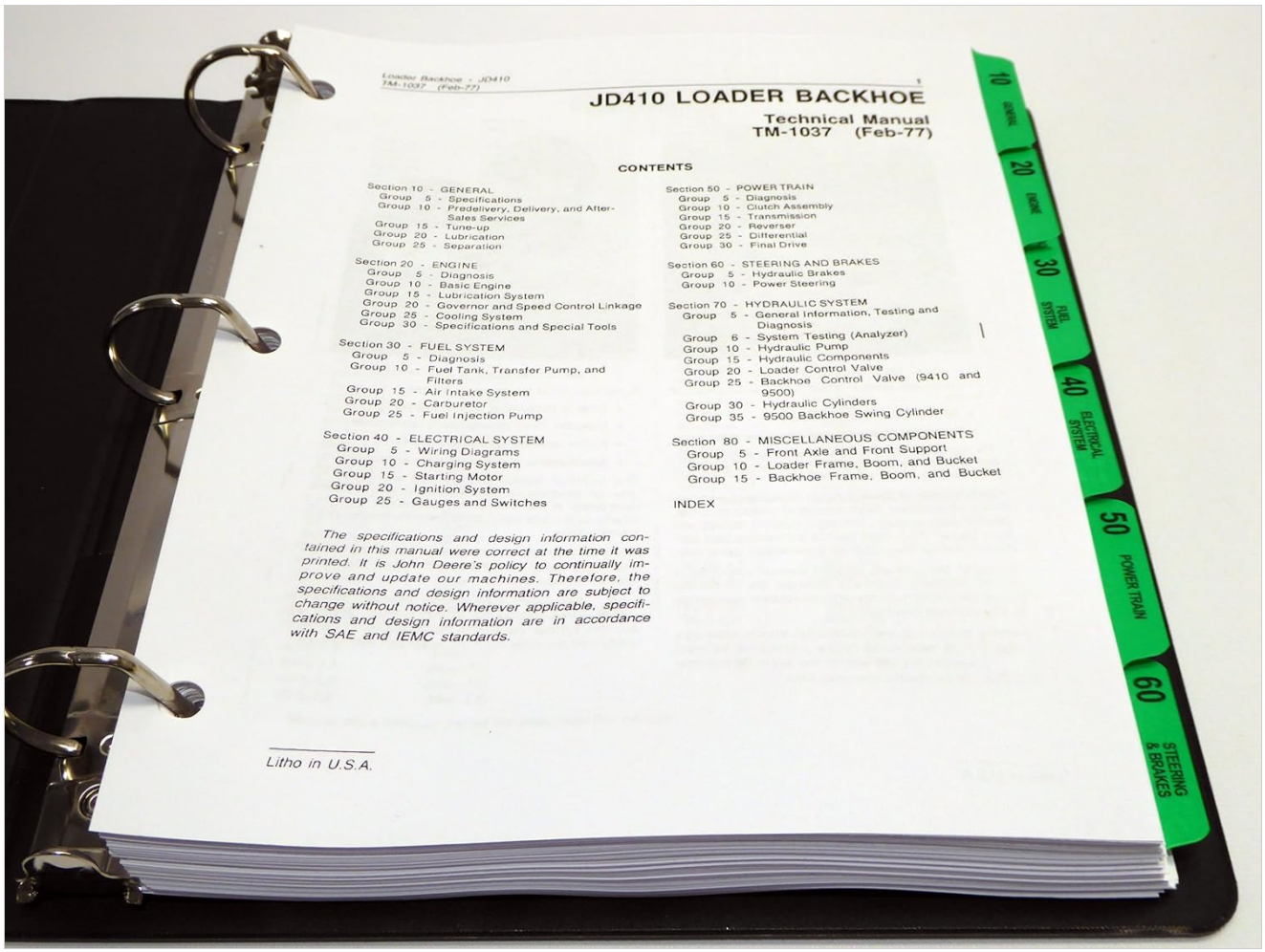


Figure 2: A closer view of the manual's contents page, detailing sections such as General, Engine, Fuel System, Electrical System, Power Train, Steering and Brakes, Hydraulic System, and Miscellaneous Components.

3. General Safety and Repair Practices

Always prioritize safety when performing any repair or maintenance. Read and understand all safety warnings and instructions provided in this manual and on the machine itself. Use appropriate personal protective equipment (PPE) and ensure the machine is properly secured and de-energized before beginning work.

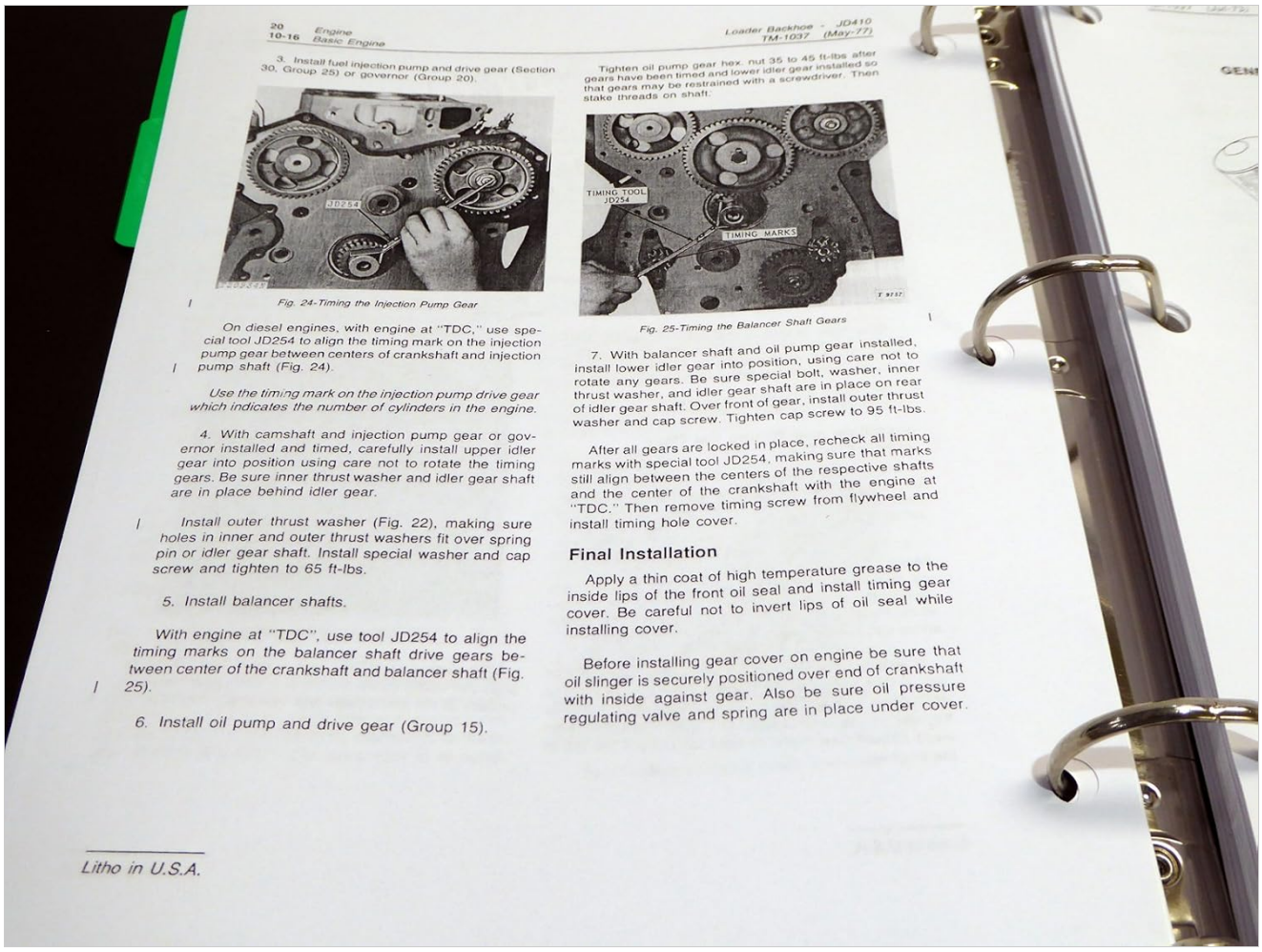
- **Disconnect Power:** Always disconnect the battery or other power sources before working on electrical components.
- **Support Machine:** Use appropriate stands or blocks to support the machine when working underneath it.
- **Cleanliness:** Maintain a clean work environment to prevent contamination of components.
- **Proper Tools:** Use only the correct tools for each task to prevent damage to parts or injury.

4. Engine System

This section covers the diagnosis, repair, and maintenance of the John Deere 410 Loader Backhoe's engine system. It includes procedures for engine disassembly, inspection, assembly, and adjustments such as timing and fuel system calibration.

4.1 Engine Timing

Accurate engine timing is crucial for optimal performance. This involves setting the injection pump gear and balancer shaft gears correctly. Refer to the specific instructions and diagrams for precise timing procedures.



20
10-16 Engine
Basic Engine

Loader Backhoe - JD410
TM-1037 (May-77)

3. Install fuel injection pump and drive gear (Section 30, Group 25) or governor (Group 20).

Fig. 24-Timing the Injection Pump Gear

On diesel engines, with engine at "TDC," use special tool JD254 to align the timing mark on the injection pump gear between centers of crankshaft and injection pump shaft (Fig. 24).

Use the timing mark on the injection pump drive gear which indicates the number of cylinders in the engine.

4. With camshaft and injection pump gear or governor installed and timed, carefully install upper idler gear into position using care not to rotate the timing gears. Be sure inner thrust washer and idler gear shaft are in place behind idler gear.

Install outer thrust washer (Fig. 22), making sure holes in inner and outer thrust washers fit over spring pin or idler gear shaft. Install special washer and cap screw and tighten to 65 ft-lbs.

5. Install balancer shafts.

With engine at "TDC", use tool JD254 to align the timing marks on the balancer shaft drive gears between center of the crankshaft and balancer shaft (Fig. 25).

6. Install oil pump and drive gear (Group 15).

Tighten oil pump gear hex. nut 35 to 45 ft-lbs after gears have been timed and lower idler gear installed so that gears may be restrained with a screwdriver. Then stake threads on shaft.

Fig. 25-Timing the Balancer Shaft Gears

7. With balancer shaft and oil pump gear installed, install lower idler gear into position, using care not to rotate any gears. Be sure special bolt, washer, inner thrust washer, and idler gear shaft are in place on rear of idler gear shaft. Over front of gear, install outer thrust washer and cap screw. Tighten cap screw to 95 ft-lbs.

After all gears are locked in place, recheck all timing marks with special tool JD254, making sure that marks still align between the centers of the respective shafts and the center of the crankshaft with the engine at "TDC." Then remove timing screw from flywheel and install timing hole cover.

Final Installation

Apply a thin coat of high temperature grease to the inside lips of the front oil seal and install timing gear cover. Be careful not to invert lips of oil seal while installing cover.

Before installing gear cover on engine be sure that oil slinger is securely positioned over end of crankshaft with inside against gear. Also be sure oil pressure regulating valve and spring are in place under cover.

Litho in U.S.A.

Figure 3: Manual page illustrating the process of timing the injection pump gear and balancer shaft gears, including the use of a timing tool and torque specifications.

4.2 Fuel System - Carburetor

The carburetor is a key component of the fuel system, responsible for mixing air and fuel. This section provides detailed diagrams and part lists for the carburetor, aiding in its disassembly, cleaning, and reassembly.

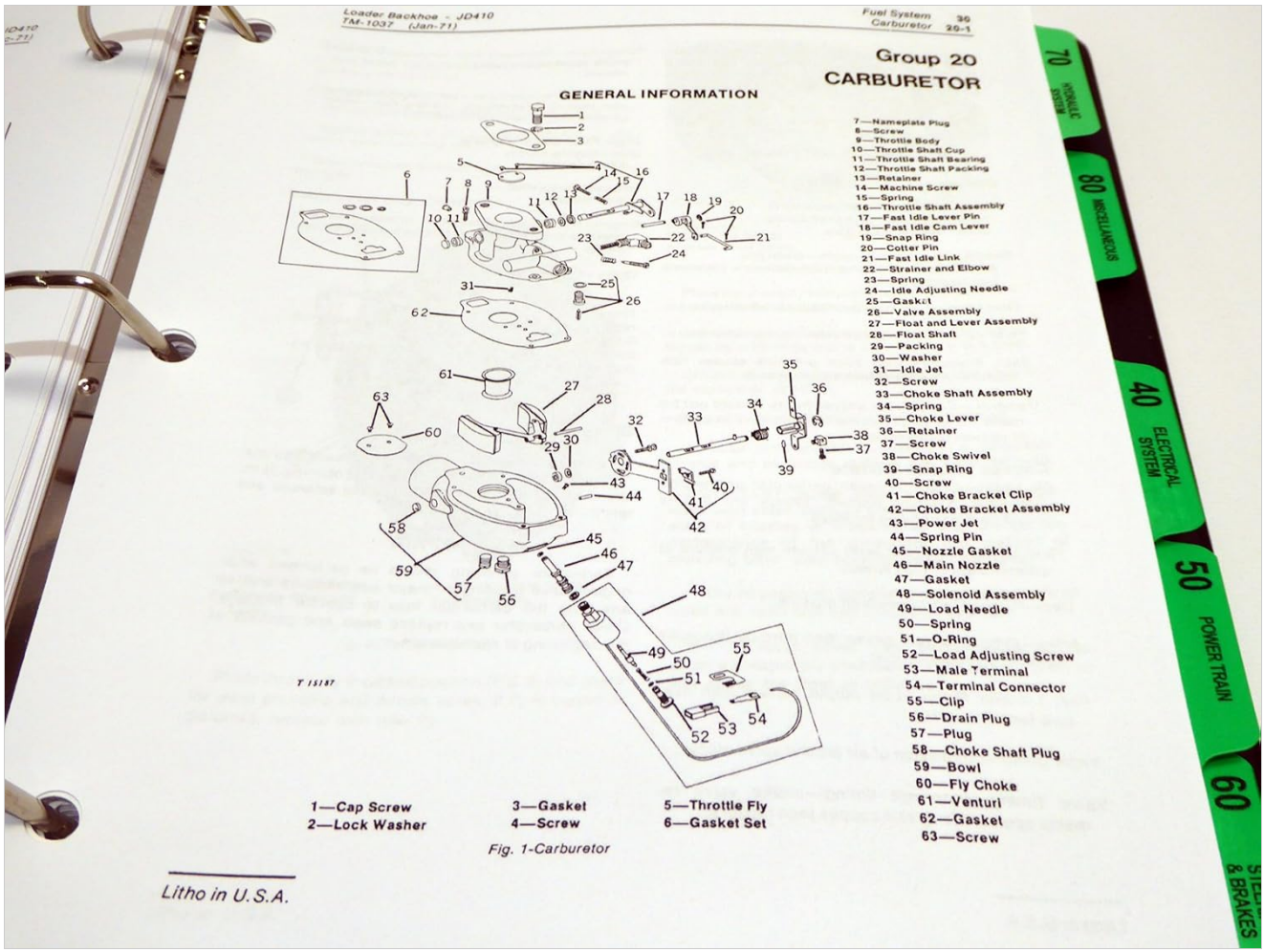


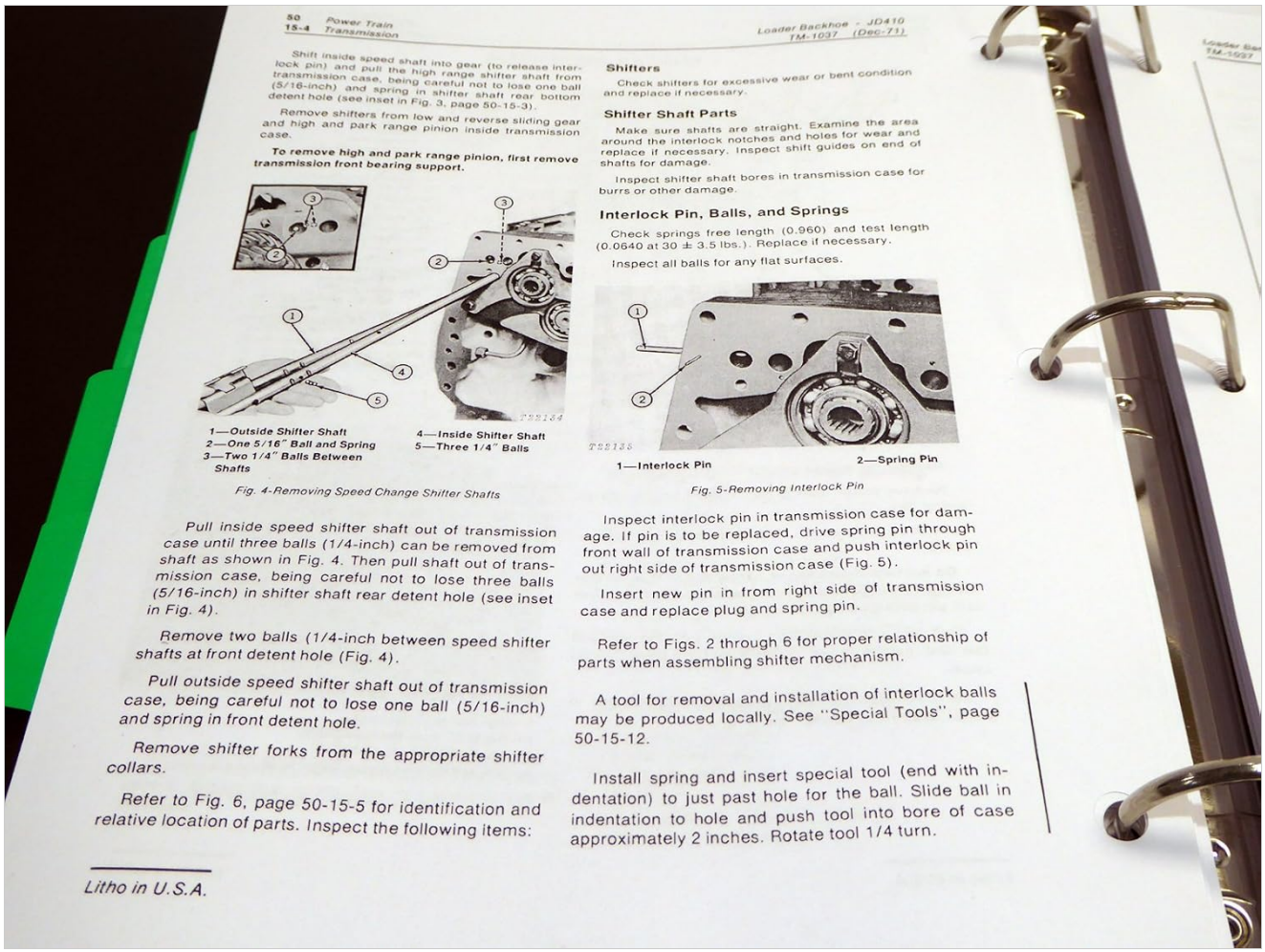
Figure 4: An exploded view diagram of the carburetor, with each component numbered and listed for identification during service and repair.

5. Power Train System

The power train system transmits power from the engine to the wheels and implements. This section details the repair and maintenance of components such as the transmission, shifters, and clutch mechanisms.

5.1 Shifters and Interlock Pins

Proper functioning of the shifters and interlock pins is essential for smooth gear changes. This section provides instructions for inspecting, removing, and installing shifter components and checking interlock balls and springs.



50 Power Train
15-4 Transmission

Loader Backhoe - JD410
TM-1037 (Dec-71)

Shift inside speed shaft into gear (to release interlock pin) and pull the high range shifter shaft from transmission case, being careful not to lose one ball (5/16-inch) and spring in shifter shaft rear bottom detent hole (see inset in Fig. 3, page 50-15-3).

Remove shifters from low and reverse sliding gear and high and park range pinion inside transmission case.

To remove high and park range pinion, first remove transmission front bearing support.

1—Outside Shifter Shaft
2—One 5/16" Ball and Spring
3—Two 1/4" Balls Between Shafts
4—Inside Shifter Shaft
5—Three 1/4" Balls

Fig. 4-Removing Speed Change Shifter Shafts

Pull inside speed shifter shaft out of transmission case until three balls (1/4-inch) can be removed from shaft as shown in Fig. 4. Then pull shaft out of transmission case, being careful not to lose three balls (5/16-inch) in shifter shaft rear detent hole (see inset in Fig. 4).

Remove two balls (1/4-inch between speed shifter shafts at front detent hole (Fig. 4).

Pull outside speed shifter shaft out of transmission case, being careful not to lose one ball (5/16-inch) and spring in front detent hole.

Remove shifter forks from the appropriate shifter collars.

Refer to Fig. 6, page 50-15-5 for identification and relative location of parts. Inspect the following items:

Shifters

Check shifters for excessive wear or bent condition and replace if necessary.

Shifter Shaft Parts

Make sure shafts are straight. Examine the area around the interlock notches and holes for wear and replace if necessary. Inspect shift guides on end of shafts for damage.

Inspect shifter shaft bores in transmission case for burrs or other damage.

Interlock Pin, Balls, and Springs

Check springs free length (0.960) and test length (0.0640 at 30 ± 3.5 lbs.). Replace if necessary.

Inspect all balls for any flat surfaces.

1—Interlock Pin
2—Spring Pin

Fig. 5-Removing Interlock Pin

Inspect interlock pin in transmission case for damage. If pin is to be replaced, drive spring pin through front wall of transmission case and push interlock pin out right side of transmission case (Fig. 5).

Insert new pin in from right side of transmission case and replace plug and spring pin.

Refer to Figs. 2 through 6 for proper relationship of parts when assembling shifter mechanism.

A tool for removal and installation of interlock balls may be produced locally. See "Special Tools", page 50-15-12.

Install spring and insert special tool (end with indentation) to just past hole for the ball. Slide ball in indentation to hole and push tool into bore of case approximately 2 inches. Rotate tool 1/4 turn.

Litho in U.S.A.

Figure 5: Manual page showing diagrams of the transmission shifter shafts and interlock pin assembly, along with instructions for removal, inspection, and installation.

5.2 Reverser Clutch Control Valve

The reverser clutch control valve manages the engagement and disengagement of the forward and reverse clutches. This section includes diagrams of the hydraulic circuit and components of the control valve.

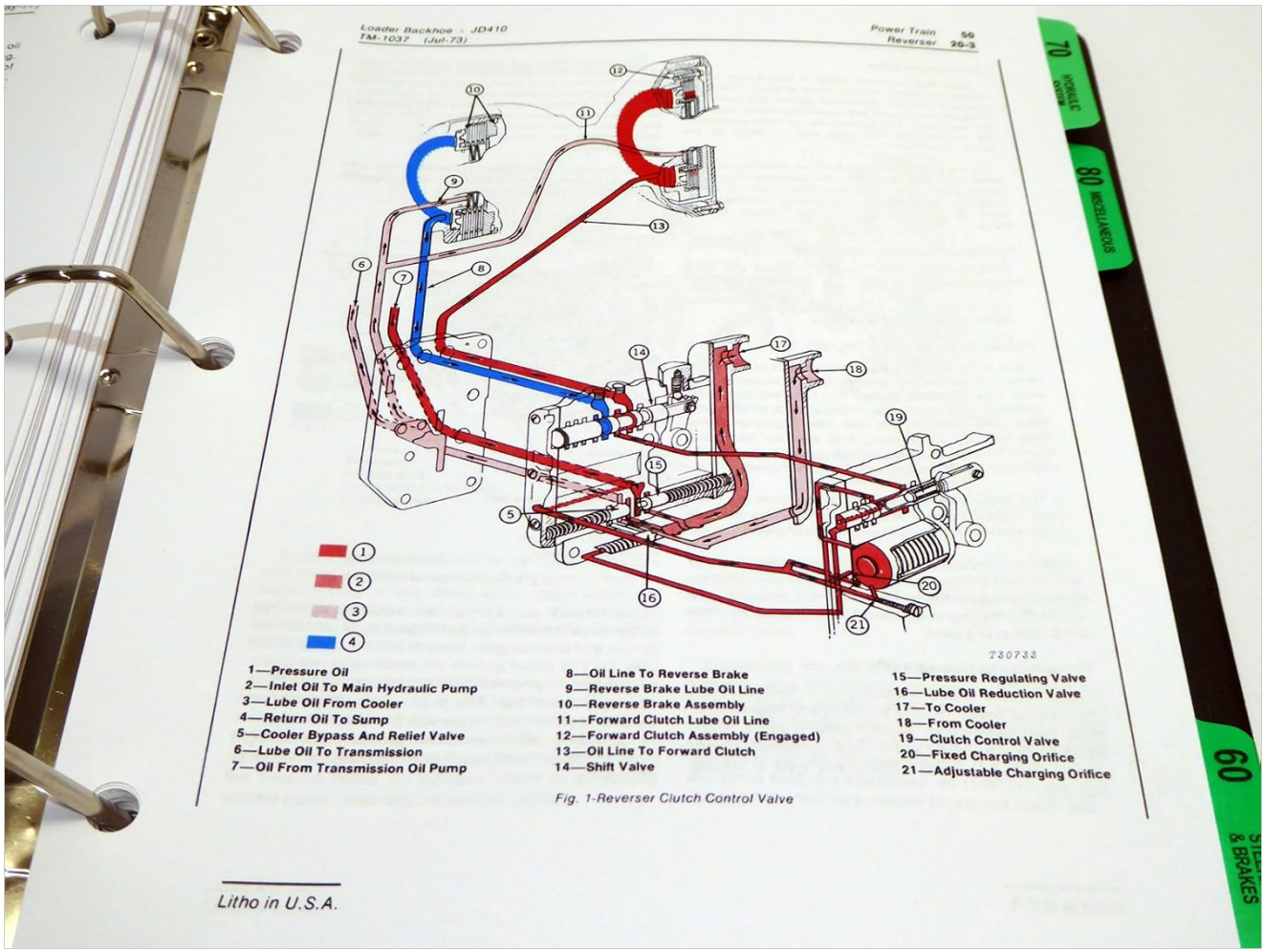


Figure 6: A detailed hydraulic schematic illustrating the reverser clutch control valve, showing pressure lines, oil flow, and various components involved in its operation.

6. Hydraulic System

The hydraulic system powers the loader and backhoe functions. This section provides information on hydraulic pumps, valves, cylinders, and associated controls, including diagnosis and repair procedures.

6.1 Locking Control Valve (9500 Backhoe)

The locking control valve for the 9500 Backhoe ensures the backhoe remains in position during transport or when not in use. This section explains its general operation, engaged and disengaged positions, and repair details.

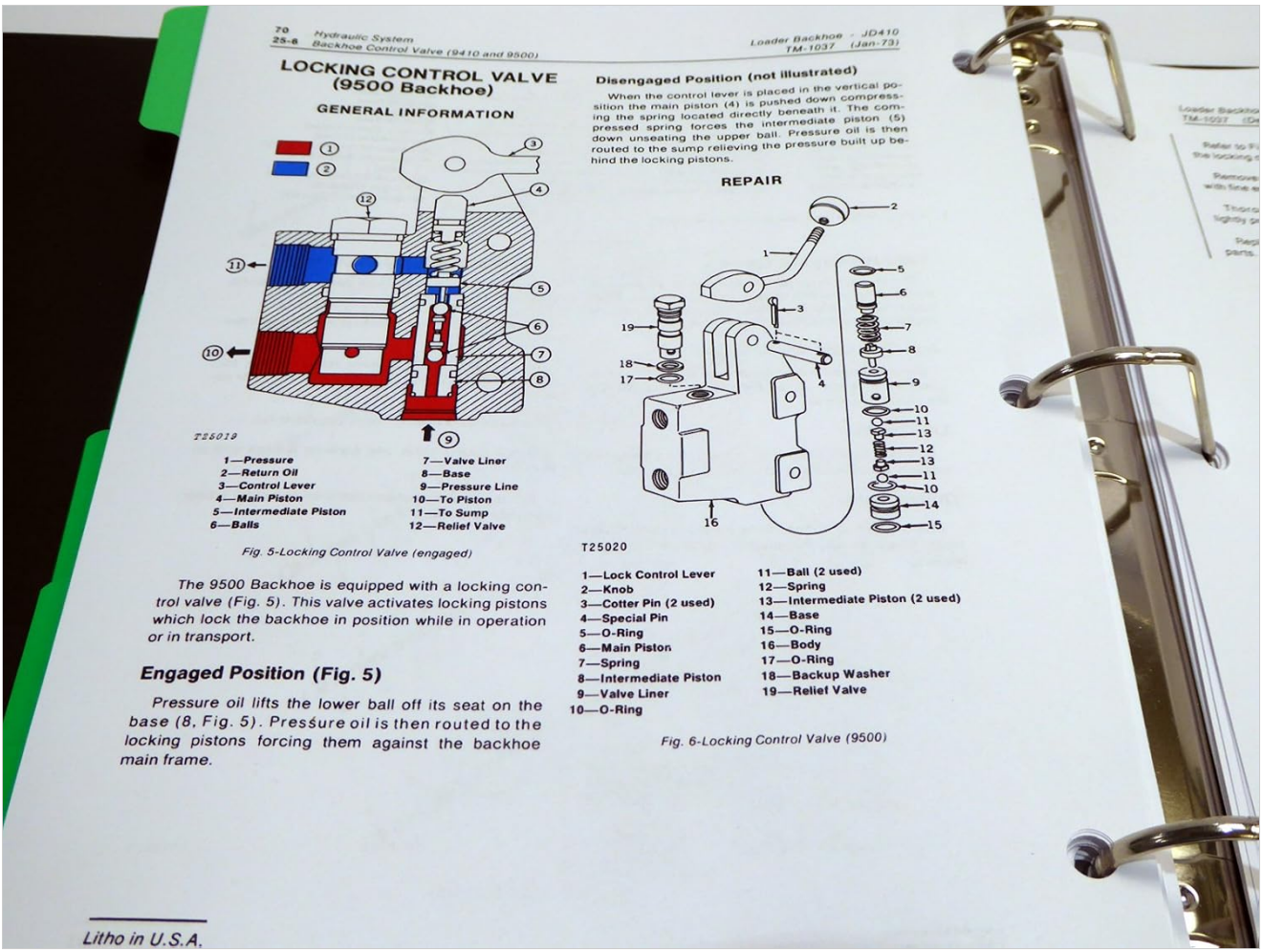


Figure 7: Diagrams illustrating the internal workings of the 9500 Backhoe locking control valve in both engaged and disengaged positions, along with a list of its components.

6.2 9500 Backhoe Swing Cylinder

The swing cylinder enables the backhoe to rotate. This section describes the rotary, vane-type, double-acting swing cylinder, its components, and procedures for its removal and repair.

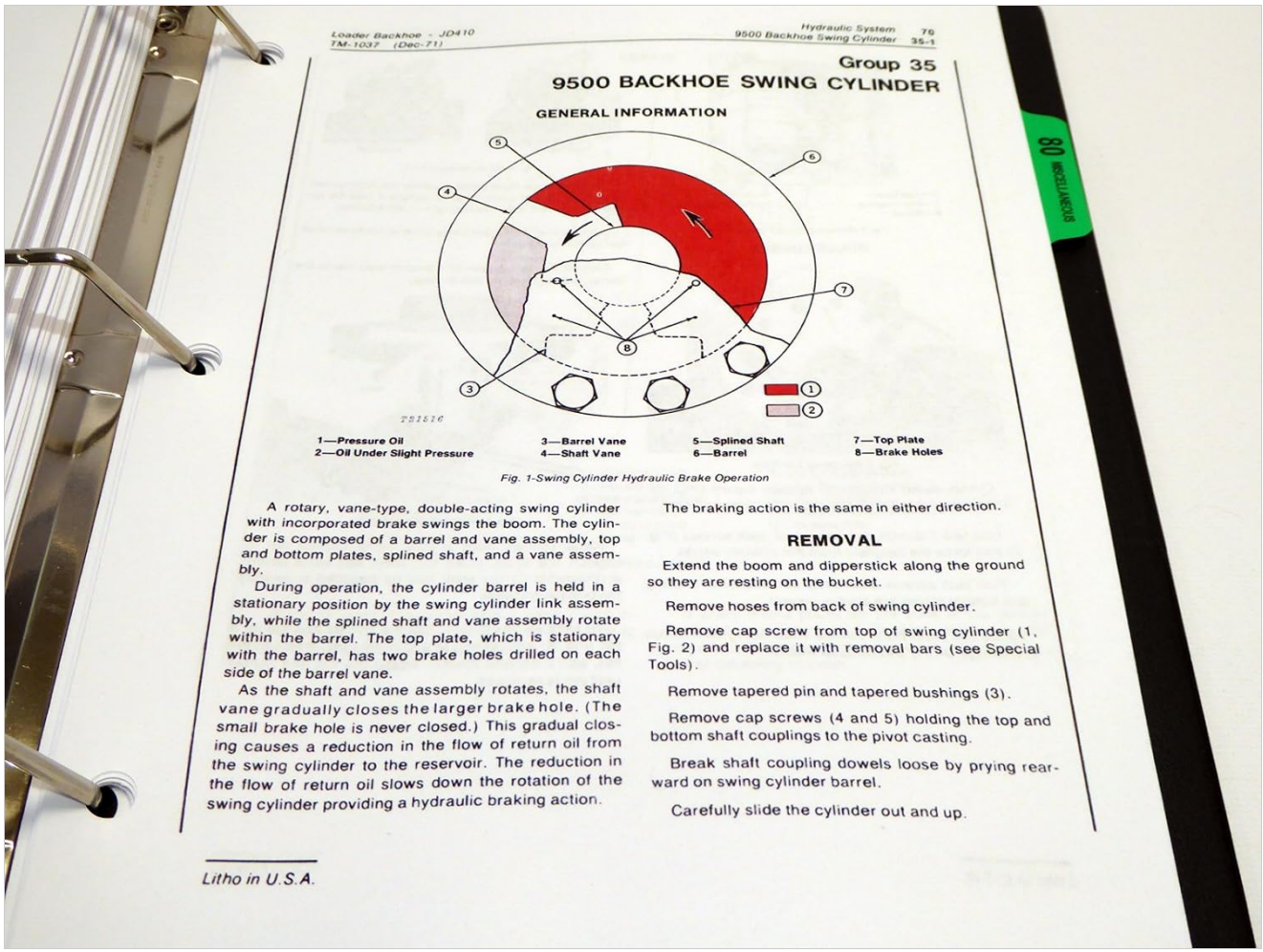


Figure 8: A diagram of the 9500 Backhoe swing cylinder, detailing its internal structure and components, alongside instructions for its removal from the machine.

7. Electrical System

This section provides information on the electrical components of the 410 Loader Backhoe, including wiring diagrams, charging system, starting system, and gauges. It covers troubleshooting and repair of electrical faults.

8. Miscellaneous Components

This section addresses the repair and maintenance of other critical components not covered in previous sections, such as the loader frame, backhoe frame, boom, and bucket assemblies.

9. Specifications

This section provides technical specifications and data for the John Deere 410 Loader Backhoe, including dimensions, weights, fluid capacities, and torque values. Always refer to these specifications when performing repairs or adjustments.

Specification	Value
ASIN	B076ZZJXKC
Publisher	TechMedia
Publication Date	January 1, 1977

Specification	Value
Language	English
Print Length	350 pages
Item Weight	7 pounds

10. Support Information

For additional technical assistance, parts information, or specific repair inquiries not covered in this manual, please contact an authorized John Deere dealer or service center. Always provide your machine's model and serial number when seeking support.

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