CONTENTS

SECTION 10—GENERAL
  Group 5—General Tractor Specifications
  Group 10—Predelivery, Delivery, and After-Sale Services
  Group 15—Tune-Up
  Group 20—Lubrication
  Group 25—Separation
  Group 30—Specifications and Special Tools

SECTION 20—ENGINE
  Group 5—General Information and Diagnosis
  Group 10—Cylinder Head, Valve Train, and Camshaft
  Group 15—Cylinder Block, Liners, Pistons, and Rods
  Group 20—Crankshaft, Main Bearings, and Flywheel
  Group 25—Lubricating System
  Group 30—Cooling System
  Group 35—Specifications and Special Tools

SECTION 30—FUEL SYSTEM
  Group 5—Diagnosing Malfunctions
  Group 10—Air Intake System
  Group 15—Diesel Fuel System
  Group 20—Speed Control Linkage
  Group 25—Specifications and Special Tools

SECTION 40—ELECTRICAL SYSTEM
  Group 5—Information and Wiring Diagrams
  Group 10—Delcotron Charging Circuit
  Group 15—Delco-Remy Starting Circuit
  Group 20—John Deere Starting Circuit
  Group 25—Lighting and Accessory Circuits
  Group 30—Specifications and Special Tools

SECTION 50—POWER TRAIN
  Group 5—Perma-Clutch
  Group 10—Creeper Transmission
  Group 15—Syncro-Range Transmission
  Group 20—Quad-Range Transmission
  Group 25—Power Shift Transmission
  Group 30—Differentiaf
  Group 35—Final Drive
  Group 40—Hi-Crop Final Drive
  Group 45—PTO, Perma-Clutch
  Group 50—PTO, Power Shift
  Group 55—Power Front-Wheel Drive
  Group 60—Specifications and Special Tools

SECTION 60—STEERING AND BRAKES
  Group 5—General Information

SECTION 70—HYDRAULIC SYSTEM
  Group 5—General Information
  Group 6—General Hydraulic System Diagnosis and Tests
  Group 10—Main Reservoir, Filters, Valves, and Oil Cooler
  Group 15—Hydraulic Pumps
  Group 20—Early Model Power Steering
  Group 22—Late Model Power Steering
  Group 25—Power Brakes
  Group 30—Selective Control Valve, Breakaway Couplers, and Remote Cylinders
  Group 35—Specifications and Special Tools

SECTION 80—MISCELLANEOUS
  Group 5—Front Axles
  Group 10—Air Conditioning System
  Group 15—Heating System
  Group 20—Specifications and Special Tools

All information, illustrations and specifications contained in this technical 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.
GROUP 5—SPECIFICATIONS

General Tractor Specifications ............................................ 5-1

GROUP 10—PREDELIVERY, DELIVERY, AND AFTER-SALE SERVICES

Predelivery Services .......................................................... 10-1
Delivery Services ............................................................... 10-3
After-Sale Services ............................................................. 10-4

GROUP 15—TUNE-UP

Preliminary Engine Testing .................................................. 15-1
Engine Tune-Up ................................................................. 15-1
Engine Final Testing ........................................................... 15-2
Tractor Tune-Up ................................................................. 15-3

GROUP 20—LUBRICATION

Lubrication Chart ............................................................... 20-1
Engine Lubricating Oils ....................................................... 20-2
Transmission-Hydraulic Oil ................................................... 20-2
Greases ............................................................................. 20-2
Storing Lubricants ............................................................... 20-2

GROUP 25—SEPARATION

Removing Sound-Gard Body .................................................. 25-1
Installing Sound-Gard Body ................................................... 25-3
Separating Engine from Clutch Housing .................................. 25-3
Removing Engine ............................................................... 25-5
Separating Tractor Front End from Engine ............................... 25-6
Separating Clutch Housing from Transmission Case ................. 25-7
Removing Rear Axle Housing ................................................. 25-9

GROUP 30—SPECIFICATIONS AND SPECIAL TOOLS ..................... 30-1

Group 5

GENERAL TRACTOR SPECIFICATIONS

PTO HORSEPOWER (Official test at 2200 engine rpm): ............... 125.88

ENGINE:
Type ................ 6-cylinder, in-line, valve-in-head, diesel, turbocharged
Bore and stroke ............ 4 1/4 in. x 4 3/4 in.
Displacement ................ 404 cu. in.
Compression ratio .......... 15.5 to 1
Firing order ................ 1-5-3-6-2-4
Valve clearance ....... Intake—0.018 in.  Exhaust—0.028 in.
Injection pump timing ........ TDC

Engine Speeds:
Working range ......... 1500 to 2200 rpm
Maximum transport speed  2400 rpm

Engine speeds:
Slow idle .................. 800 rpm
Fast idle .................... 2400 rpm

LUBRICATION SYSTEM:
Full pressurized with full-flow micronic oil filter, water cooled oil cooler, and bypass valves for filter and cooler.

FUEL SYSTEM:
Type .................. Direct Injection
Filters ............... Two-stage with replaceable impregnated paper element
Injection pump type .... Multiple plunger, in-line
Air cleaner .......... Dry type, with safety element

COOLING SYSTEM:
Type .................. Pressurized with centrifugal pump
Temperature control .... Heavy-duty thermostats

CAPACITIES:
Fuel tank ............ 48 U.S. gals.
Cooling system ......... 30 U.S. qts.
Crankcase (with filter change) .... 17 U.S. qts.
Transmission—hydraulic system (add 4 1/2 gals. to capacity if equipped with Power Front Wheel Drive):
Quad-range or Syncro-range .... 13 U.S. gals.
Power shift transmission .... 11 U.S. gals.
Hi-crop final drive housing .... 1 1/4 U.S. qts.

SYNCRO-RANGE TRANSMISSION:
Type ........ Syncro-range, constant mesh
Section 20
ENGINE

CONTENTS OF THIS SECTION

GROUP 5—GENERAL INFORMATION AND DIAGNOSIS
General Information .................................. 5-2
Diagnosing Engine Malfunctions ................... 5-2

GROUP 10—CYLINDER HEAD, VALVES, AND CAMSHAFT
General Information .................................. 10-1
Diagnosing Valve Train Malfunctions ............... 10-1
Cylinder Head and Valves
Removal and Repair .................................. 10-2
Assembly and Installation ............................ 10-3
Valve Clearance Adjustment .......................... 10-4
Camshaft
Removal ............................................... 10-4
Repair .................................................. 10-5
Installation .......................................... 10-5

GROUP 15—CYLINDER BLOCK, LINERS, PISTONS AND RODS
General Information .................................. 15-1
Diagnosing Malfunctions ............................. 15-1
Removal .............................................. 15-2
Repair
Pistons ................................................ 15-2
Liners .................................................. 15-3
Rods .................................................... 15-4
Assembly ............................................. 15-4
Installation .......................................... 15-5

GROUP 20—CRANKSHAFT, MAIN BEARINGS, AND FLYWHEEL
General Information .................................. 20-1
Diagnosing Malfunctions ............................. 20-1
Removal .............................................. 20-1

Inspection and Repair
Crankshaft and Flywheel ............................. 20-1
Main Bearings and Journals ....................... 20-2
Damper Pulley ....................................... 20-3
Rear Crankshaft Oil Seal, Housing, and Wear Sleeve ........ 20-3
Front Oil Seal and Wear Sleeve ..................... 20-3
Installation .......................................... 20-3
Final Installation .................................... 20-5

GROUP 25—LUBRICATION SYSTEM
General Information .................................. 25-1
Diagnosing Malfunctions ............................. 25-1
Removal .............................................. 25-1
Crankshaft and Flywheel ............................. 20-1
Main Bearings and Journals ....................... 20-2
Damper Pulley ....................................... 20-3
Rear Crankshaft Oil Seal, Housing, and Wear Sleeve ........ 20-3
Front Oil Seal and Wear Sleeve ..................... 20-3
Installation .......................................... 20-3
Final Installation .................................... 20-5

GROUP 30—COOLING SYSTEM
General Information .................................. 30-1
Diagnosing Malfunctions ............................. 30-1
Radiator and Fan ..................................... 30-1
Water Pump .......................................... 30-1
Water Manifold and Thermostats .................... 30-3

GROUP 35—SPECIFICATIONS AND SPECIAL TOOLS
Cylinder Head, Valves, and Camshaft .............. 35-1
Cylinder Block, Liners, Pistons and Rods .......... 35-1
Crankshaft, Main Bearings and Flywheel .......... 35-2
Lubrication System .................................. 35-2
Cooling System ...................................... 35-3
Engine Break-In ..................................... 35-3
Special Tools ....................................... 35-4
Removal

Remove the floor mat, floor panel, and foot rest panel.

Disconnect the vertical control rod (A, Fig. 5) from outer arm (B). Remove rear control rod (C). Disconnect the control cable or rod from inner arm (D).

To remove the speed control arm shaft (E), drive out the spring pin securing inner arm to shaft. Drive out spring pin securing speed shaft arm (F) to shaft. Remove arms from shaft, and pull out shaft. Remove spring (G) to separate arms. Remove bushings.

The foot pedal (H) may be removed from the control support by loosening round head bolt on pedal arm (I). Pull out pedal from pedal support (J). Remove two bushings from pedal support.

Installation

Insert shaft (E) into platform support, with end of shaft having hole farthest from the end facing toward middle of tractor. Position nylon bushings on shaft so that large shoulder of bushing will be against the inner and outer arms.

Install inner arm (D) on shaft with large shoulder toward the outside, and secure with spring pin. Install spring (G) on outer arm (B) and shaft arm (F). Make sure that ends of spring are in their respective notches.

Insert outer arm assembly into position and push shaft through outer arm assembly. Secure shaft arm to shaft with spring pin.

Install bushings in pedal support (J). Insert pedal through bushings.
# ELECTRICAL SYSTEM

**GROUP 5—INFORMATION AND DIAGRAMS**

<table>
<thead>
<tr>
<th>Component</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Information</td>
<td>5-2</td>
</tr>
<tr>
<td>Batteries</td>
<td>5-3</td>
</tr>
<tr>
<td>Circuit Breakers</td>
<td>5-4</td>
</tr>
<tr>
<td>Key Switch</td>
<td>5-4</td>
</tr>
<tr>
<td>Sound-Gard Body Relay</td>
<td>5-4</td>
</tr>
<tr>
<td>Harness Replacement</td>
<td>5-5</td>
</tr>
<tr>
<td>Wiring Diagrams</td>
<td>5-6</td>
</tr>
<tr>
<td>Power Front-Wheel Drive</td>
<td>5-19</td>
</tr>
<tr>
<td>Electrical Remote Control</td>
<td>5-26</td>
</tr>
</tbody>
</table>

**GROUP 6—ELECTRICAL SYSTEM DIAGNOSIS**

<table>
<thead>
<tr>
<th>Component</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrical Diagnosis Kit</td>
<td>6-1</td>
</tr>
<tr>
<td>Electrical System Diagnosis</td>
<td>6-2</td>
</tr>
</tbody>
</table>

**GROUP 10—DELCOTRON CHARGING CIRCUIT**

<table>
<thead>
<tr>
<th>Component</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Information</td>
<td>10-1</td>
</tr>
<tr>
<td>Operation</td>
<td>10-1</td>
</tr>
<tr>
<td>Diagnosis and Tests</td>
<td>(See Group 6)</td>
</tr>
<tr>
<td>Repair</td>
<td>10-6</td>
</tr>
<tr>
<td>Assembly</td>
<td>10-10</td>
</tr>
<tr>
<td>Installation</td>
<td>10-11</td>
</tr>
</tbody>
</table>

**GROUP 15—DELCO-REMY STARTING CIRCUIT**

<table>
<thead>
<tr>
<th>Component</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Information</td>
<td>15-1</td>
</tr>
<tr>
<td>Operation</td>
<td>15-1</td>
</tr>
<tr>
<td>Diagnosis and Tests</td>
<td>(See Group 6)</td>
</tr>
<tr>
<td>Repair</td>
<td>15-4</td>
</tr>
<tr>
<td>Assembly</td>
<td>15-5</td>
</tr>
<tr>
<td>Installation</td>
<td>15-6</td>
</tr>
<tr>
<td>Making Special Tools</td>
<td>15-6</td>
</tr>
</tbody>
</table>

**GROUP 20—JOHN DEERE STARTING CIRCUIT**

<table>
<thead>
<tr>
<th>Component</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Information</td>
<td>20-1</td>
</tr>
<tr>
<td>Operation</td>
<td>20-1</td>
</tr>
<tr>
<td>Diagnosis and Tests</td>
<td>(See Group 6)</td>
</tr>
<tr>
<td>Repair</td>
<td>20-4</td>
</tr>
<tr>
<td>Assembly</td>
<td>20-6</td>
</tr>
<tr>
<td>Installation</td>
<td>20-7</td>
</tr>
<tr>
<td>Making Special Tools</td>
<td>20-7</td>
</tr>
</tbody>
</table>

**GROUP 25—LIGHTING AND ACCESSORY CIRCUITS**

<table>
<thead>
<tr>
<th>Component</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lamps</td>
<td>25-1</td>
</tr>
<tr>
<td>Headlamp Adjustment</td>
<td>25-2</td>
</tr>
<tr>
<td>Instrument Cluster</td>
<td>25-3</td>
</tr>
<tr>
<td>Electric Starting Aid</td>
<td>25-5</td>
</tr>
<tr>
<td>Horn</td>
<td>25-6</td>
</tr>
<tr>
<td>Radio and Tape Player</td>
<td>25-6</td>
</tr>
<tr>
<td>Wipers</td>
<td>25-7</td>
</tr>
<tr>
<td>Blower Switch</td>
<td>25-8</td>
</tr>
<tr>
<td>Additional Accessories</td>
<td>25-8</td>
</tr>
</tbody>
</table>

**GROUP 30—SPECIFICATIONS AND SPECIAL TOOLS**

<table>
<thead>
<tr>
<th>Component</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Batteries</td>
<td>30-1</td>
</tr>
<tr>
<td>Circuit Breakers</td>
<td>30-1</td>
</tr>
<tr>
<td>Power Front-Wheel Drive</td>
<td>30-1</td>
</tr>
<tr>
<td>Sound-Gard Body Relay</td>
<td>30-1</td>
</tr>
<tr>
<td>Delcotron Charging Circuit</td>
<td>30-1</td>
</tr>
<tr>
<td>Starting Circuit</td>
<td>30-2</td>
</tr>
<tr>
<td>Lighting and Accessory Circuits</td>
<td>30-4</td>
</tr>
<tr>
<td>Special Tools</td>
<td>30-6</td>
</tr>
<tr>
<td>Making Special Tools</td>
<td>30-7</td>
</tr>
</tbody>
</table>

Litho in U.S.A.
Section 50

POWER TRAIN

CONTENTS OF THIS SECTION

GROUP 5—PERMA-CLUTCH
General Information .................. 5-2
Diagnosing Malfunctions .............. 5-4
Testing ................................ 5-8
Shafts and Controls
Removal ................................ 5-10
Repair ................................ 5-12
Assembly ................................ 5-12
Adjustments .......................... 5-13
Clutch Assembly
Removal ................................ 5-14
Repair ................................ 5-14
Assembly ................................ 5-15
Adjustment ............................ 5-16

GROUP 10—CREEPER TRANSMISSION
General Information .................. 10-1
Creeper Planetary
Diagnosing Malfunctions .............. 10-3
Removal .............................. 10-3
Assembly ................................ 10-5
Installation ............................ 10-6
Eight-Speed Transmission
Diagnosing Malfunctions .............. 10-7
Removal .............................. 10-7
Repair ................................ 10-8
Installation ............................ 10-11
Adjustment ............................ 10-13

GROUP 15—SYNCRO-RANGE TRANSMISSION
General Information .................. 15-1
Diagnosing Malfunctions .............. 15-2
Removal .............................. 15-2
Repair ................................ 15-3
Installation ............................ 15-6
Adjustment ............................ 15-9

GROUP 20—QUAD-RANGE TRANSMISSION
General Information .................. 20-1
Diagnosing Malfunctions .............. 20-5
Testing ................................ 20-5
Two-Speed Power Shift Planetary
Removal .............................. 20-6
Assembly and installation ................ 20-9
Eight-Speed Transmission
Removal ................................ 20-10
Repair ................................ 20-12
Assembly ................................ 20-13
Range and Speed Selector Assembly
Removal ................................ 20-16
Assembly and Adjustment .............. 20-17

GROUP 25—POWER SHIFT TRANSMISSION
General Information .................. 25-1
Diagnosing Malfunctions .............. 25-11
Testing ................................ 25-12
Repair ................................ 25-14
Torsional Damper ...................... 25-14
Clutch Pack ........................... 25-15
Planetary Pack ......................... 25-17
Reduction Gear Train .................. 25-22
Park Pawl ............................. 25-23
Speed Selector Assembly ................ 25-24
Pedal Valve and Oil Pressure
Regulating Valve ...................... 25-25
Transmission Control Valve
and Shift Valve ....................... 25-27
Adjustments ........................... 25-29

GROUP 30—DIFFERENTIAL
General Information .................. 30-1
Removal ................................ 30-1
Repair ................................ 30-2
Adjustment ............................ 30-3
Lock Valve Test and Adjustment ........ 30-4

GROUP 35—FINAL DRIVE

GROUP 40—HI-CROP FINAL DRIVE

GROUP 45—PTO, PERMA-CLUTCH
General Information .................. 45-1
Diagnosing Malfunctions .............. 45-1
Removal ................................ 45-1

GROUP 50—PTO, POWER SHIFT
General Information .................. 50-1
Diagnosing Malfunctions .............. 50-1
Removal ................................ 50-1
Testing ................................ 50-1
Adjustment ............................ 50-3

GROUP 55—POWER FRONT-WHEEL DRIVE
General Information .................. 55-1
Diagnosing Malfunctions .............. 55-4
Removal ................................ 55-5
Repair ................................ 55-6
Assembly ................................ 55-10
Adjustments ........................... 55-12

GROUP 60—SPECIFICATIONS AND
TOOLS ..................................... 60-1
DISASSEMBLY

Remove cotter pin (Fig. 4), drive shaft nut, and drive shaft gear.

Use a brass drift to remove drive shaft and adapter from drive shaft housing. Be careful not to damage oil seals in housing.

Drain oil, and remove bearing cover (2, Fig. 3) and housing cover (34) from drive gear housing.

Bend down lock washer tang (5, Fig. 3) and remove lock nuts (4), lock washer, spacer (6) and drive gear retaining snap ring (10). Before driving axle out of housing, insert spacers between each side of the gear hub and the drive gear housing. This will distribute the load and prevent damage to the housing.

REPAIR

If roller bearings (2, Fig. 1) or bearing cup (6) require replacement, drive new parts tight against shoulder.

If drive shaft inner bearing oil seal (7, Fig. 1) requires replacement, install in housing with spring side facing driver.

If drive shaft outer bearing oil seal (14, Fig. 1) requires replacement, install in adapter with spring side facing driver.

Litho in U.S.A.
# CONTENTS OF THIS SECTION

<table>
<thead>
<tr>
<th>Group</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>5-4</td>
</tr>
<tr>
<td>6</td>
<td>6-1</td>
</tr>
<tr>
<td>10</td>
<td>10-1</td>
</tr>
<tr>
<td>15</td>
<td>15-1</td>
</tr>
<tr>
<td>20</td>
<td>20-1</td>
</tr>
<tr>
<td>22</td>
<td>22-1</td>
</tr>
<tr>
<td>25</td>
<td>25-1</td>
</tr>
<tr>
<td>30</td>
<td>30-1</td>
</tr>
<tr>
<td>35</td>
<td>35-1</td>
</tr>
<tr>
<td>40</td>
<td>40-1</td>
</tr>
<tr>
<td>70</td>
<td>5-1</td>
</tr>
</tbody>
</table>

## HYDRAULIC SYSTEM

### GROUP 5—GENERAL INFORMATION
- General Information: 5-4

### GROUP 6—GENERAL HYDRAULIC SYSTEM TESTS AND DIAGNOSIS
- General Information: 6-1
- Safety: 6-1
- Special Tools: 6-2
- How To Use Step Charts: 6-4
- Heating Hydraulic Oil: 6-5
- Preliminary Checks: 6-6
- Synchro- and Quad-Range Tractor Charts: 6-8
- Power Shift Tractor Charts: 6-25

### GROUP 10—RESERVOIR, FILTER, VALVES, AND OIL COOLER
- Reservoir and Filter: 10-1
- Hydraulic Oil Relief and Check Valves: 10-1
- Operation: 10-1
- Removal and Repair: 10-3
- Pressure Control Valve: 10-5
  - Operation: 10-5
  - Test and Diagnosis: 10-6
  - Repair: 10-6
- Oil Cooler: 10-6

### GROUP 15—HYDRAULIC PUMPS
- Transmission Pumps: 15-1
  - Operation: 15-1
  - Diagnosing Malfunctions: 15-2
  - Testing: 15-2
  - Repair: 15-3
- Main Pump: 15-4
  - Operation: 15-5
  - Test and Diagnosis: 15-6
  - Removal and Repair: 15-7
  - Adjustment: 15-10

### GROUP 20—EARLY MODEL POWER STEERING
- General Information: 20-1
- Operation: 20-2
- Test and Diagnosis: 20-4
- Air Check and Bleed Testing: 20-6
- Steering Valve: 20-8
  - Adjustment: 20-8
  - Steering Motor: 20-12

### GROUP 22—LATE MODEL POWER STEERING
- General Information: 22-1
- Operation: 22-2
- Diagnosing Malfunctions: 22-7
- Metering Pump: 22-9
- Steering Valve: 22-12
- Steering Motor: 22-13

### GROUP 25—POWER BRAKES
- General Information: 25-1
- Operation: 25-1
- Diagnosing Malfunctions: 25-3
- Brake Cylinders, Shoes and Discs: 25-3
- Brake Valve: 25-3
- Pedal Adjustment: 25-6
- Bleeding: 25-5
- Brake Accumulator: 25-7
- Accumulator Pre-Charge: 25-8
- Accumulator Test: 25-8

### GROUP 30—ROCKSHAFT AND IMPLEMENT HITCHES
- General Information: 30-1
- Operation: 30-2
- Testing and Diagnosis: 30-4
- Rockshaft Housing: 30-5
- Rockshaft Valve Assembly: 30-7
- Load Control Assembly: 30-10
- Adjustment: 30-12
- 3-Point Hitch: 30-14

### GROUP 35—SELECTIVE CONTROL VALVE, BREAKAWAY COUPLER AND REMOTE CYLINDER
- General Information: 35-1
- Operation: 35-2
- Testing and Diagnosis: 35-4
- Remote Cylinder Assembly: 35-7
- Adjustment: 35-8
- Remote Cylinder: 35-10

### GROUP 40—SPECIFICATIONS AND SPECIAL TOOLS
**Section 80**

**CONTENTS OF THIS SECTION**

<table>
<thead>
<tr>
<th>GROUP</th>
<th>CONTENTS</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>5 - FRONT AXLES</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adjustable Tread Axle</td>
<td>5-1</td>
<td></td>
</tr>
<tr>
<td>Power Front Wheel Drive Axle</td>
<td>5-4</td>
<td></td>
</tr>
<tr>
<td>Tricycle Axles</td>
<td>5-5</td>
<td></td>
</tr>
<tr>
<td><strong>10 - AIR CONDITIONING SYSTEM</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>System Operation</td>
<td>10-1</td>
<td></td>
</tr>
<tr>
<td>System Cycle</td>
<td>10-1</td>
<td></td>
</tr>
<tr>
<td>Superheat Shutoff Switch</td>
<td>10-3</td>
<td></td>
</tr>
<tr>
<td>Electrical Testing</td>
<td>10-3</td>
<td></td>
</tr>
<tr>
<td>Thermal Fuse</td>
<td>10-3</td>
<td></td>
</tr>
<tr>
<td>Refrigerant Couplings</td>
<td>10-5</td>
<td></td>
</tr>
<tr>
<td>Service Valves</td>
<td>10-6</td>
<td></td>
</tr>
<tr>
<td>Compressor</td>
<td>10-7</td>
<td></td>
</tr>
<tr>
<td>Receiver-Dryer</td>
<td>10-9</td>
<td></td>
</tr>
<tr>
<td>Regulatory Controls</td>
<td>10-9</td>
<td></td>
</tr>
<tr>
<td><strong>15 - AIR CONDITIONING SYSTEM TESTS and DIAGNOSIS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>General Information</td>
<td>15-1</td>
<td></td>
</tr>
<tr>
<td>Safety Precautions</td>
<td>15-2</td>
<td></td>
</tr>
<tr>
<td>Connecting the Manifold Gauge Set</td>
<td>15-3</td>
<td></td>
</tr>
<tr>
<td>Diagnosis and Testing</td>
<td>15-4</td>
<td></td>
</tr>
<tr>
<td>Discharging the System</td>
<td>15-23</td>
<td></td>
</tr>
<tr>
<td>Flushing the System</td>
<td>15-23</td>
<td></td>
</tr>
<tr>
<td>Adding Refrigerant Oil</td>
<td>15-24</td>
<td></td>
</tr>
<tr>
<td>Purgin the System</td>
<td>15-25</td>
<td></td>
</tr>
<tr>
<td>Evacuating the System</td>
<td>15-25</td>
<td></td>
</tr>
<tr>
<td>Charging the System</td>
<td>15-26</td>
<td></td>
</tr>
<tr>
<td>Leak Testing</td>
<td>15-27</td>
<td></td>
</tr>
<tr>
<td><strong>20 - AIR CONDITIONING SYSTEM REPAIR</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Compressor</td>
<td>20-1</td>
<td></td>
</tr>
<tr>
<td>Leak Testing Compressor</td>
<td>20-9</td>
<td></td>
</tr>
<tr>
<td>Shaft Seal Leak Test</td>
<td>20-9</td>
<td></td>
</tr>
<tr>
<td>Volumetric Efficiency Test</td>
<td>20-10</td>
<td></td>
</tr>
<tr>
<td>Installation</td>
<td>20-11</td>
<td></td>
</tr>
<tr>
<td>Condenser</td>
<td>20-12</td>
<td></td>
</tr>
<tr>
<td>Receiver-Dryer</td>
<td>20-13</td>
<td></td>
</tr>
<tr>
<td>Evaporator</td>
<td>20-13</td>
<td></td>
</tr>
<tr>
<td>Expansion Valve</td>
<td>20-15</td>
<td></td>
</tr>
<tr>
<td>Temperature Control Switch</td>
<td>20-15</td>
<td></td>
</tr>
<tr>
<td>Thermostatic Safety Switch</td>
<td>20-17</td>
<td></td>
</tr>
<tr>
<td>Compressor Relief Valve</td>
<td>20-17</td>
<td></td>
</tr>
<tr>
<td>Pressurizer Blowers and Switch</td>
<td>20-18</td>
<td></td>
</tr>
<tr>
<td>Air Filters</td>
<td>20-19</td>
<td></td>
</tr>
<tr>
<td><strong>25 - HEATING SYSTEM</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>System Operation</td>
<td>25-1</td>
<td></td>
</tr>
<tr>
<td>Diagnosis and Testing</td>
<td>25-2</td>
<td></td>
</tr>
<tr>
<td>System Components</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heater Valve</td>
<td>25-3</td>
<td></td>
</tr>
<tr>
<td>Heater Core</td>
<td>25-3</td>
<td></td>
</tr>
<tr>
<td>Heater Blowers</td>
<td>25-4</td>
<td></td>
</tr>
<tr>
<td>Heater Pipes and Hoses</td>
<td>25-4</td>
<td></td>
</tr>
<tr>
<td><strong>30 - SPECIFICATIONS AND SPECIAL TOOLS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Specifications</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Front Axles</td>
<td>30-1</td>
<td></td>
</tr>
<tr>
<td>Air Conditioning System</td>
<td>30-1</td>
<td></td>
</tr>
<tr>
<td>Heating System</td>
<td>30-2</td>
<td></td>
</tr>
<tr>
<td>Hose and Tubing Connections</td>
<td>30-3</td>
<td></td>
</tr>
<tr>
<td>Torque Charts</td>
<td>30-3</td>
<td></td>
</tr>
<tr>
<td>Special Tools</td>
<td>30-2</td>
<td></td>
</tr>
</tbody>
</table>

---

**Adjustable Tread Axle Removal**

Remove steering gear arm-to-steering motor spindle cap screws, and remove steering gear arm (Fig. 1) from spindle.

Install JDG-7 front lift bracket (Fig. 2), and fasten to an overhead hoist.

---

*Litho in U.S.A.*
THERMOSTATIC SAFETY SWITCH

General Information
The safety switch is clamped to the refrigerant pipe at the condenser outlet, as shown in Fig. 32. Its purpose is to prevent the refrigerant in the high pressure side of the system from becoming too high in temperature, thus too high in pressure.

When the temperature becomes too high, a snap-acting disk in the switch opens, breaking the circuit to operate the compressor clutch. When the temperature is reduced to a safe operating level, the snap-acting disk automatically closes, allowing the circuit to be completed. Refer to Section 40, Group 5 for wiring diagrams.

Removal
Remove the ignition key from switch to prevent accidental operation of electric motors and switches.

Remove the side grille screen. Disconnect the wiring leads (Fig. 32).

Disengage mounting clip from refrigerant pipe and remove switch.

Repair
The switch is not repairable, and must be replaced with a new one when found defective.

COMPRESSOR RELIEF VALVE

General Information
The compressor relief valve (Fig. 6) is a pressure regulating control. If the system discharge pressure exceeds 440 psi, the valve will open automatically and stay open until the pressure recedes. The valve will then close automatically.

If the relief valve opens, a loud popping noise will be heard. In addition, some oil may be ejected through the valve. Correct any condition that would cause this valve to open.

Removal
Close the service valves (front-seat) and discharge the refrigerant from compressor.

Slowly remove the valve from compressor in case some high pressure still remains.

Repair
The valve cannot be repaired. If the valve does not operate properly or has been damaged, replace with a new one.

Before replacing valve, make sure that there is not a malfunction somewhere else in the system.

Installation
Install valve on compressor.
Add refrigerant as required (page 80-10-8).
Perform operational test (page 80-10-5).