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**FARMALL® 30A**  
**FARMALL® 35A**  
**Tier 4B (final)**  
Compact Tractor

**SERVICE MANUAL**

**Part number 47881876**  
1<sup>st</sup> edition English  
January 2016





## SERVICE MANUAL

Farmall® 30A 33 HP compact tractor, TIER 4B (final).  
Farmall® 35A 37 HP compact tractor, TIER 4B (final).

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## Link Product / Engine

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| Product  | Market Product | Engine      |
|--|----------------|-------------|
| Farmall® 30A 33 HP compact tractor, TIER 4B (final). | North America  | N843T-F-24  |
| Farmall® 35A 37 HP compact tractor, TIER 4B (final). | North America  | N843LT-F-27 |

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## INTRODUCTION

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## INTRODUCTION

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(\*) See content for specific models

## Foreword

This repair manual provides the technical information needed to properly service the CASE IH models Farmall 30A and 35A tractors. Use this manual in conjunction with the operator's manual for complete operation, adjustment, and maintenance information

On CASE IH equipment, left and right are determined by standing behind the unit, looking in the direction of travel.

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## Foreword

|              |    |
|--------------|----|
| Farmall® 30A | NA |
| Farmall® 35A | NA |

Soil, air, and water quality is important for all industries and life in general. When legislation does not yet rule the treatment of some of the substances that advanced technology requires, sound judgment should govern the use and disposal of products of a chemical and petrochemical nature.

Familiarize yourself with the relative legislation applicable to your country, and make sure that you understand this legislation. Where no legislation exists, obtain information from suppliers of oils, filters, batteries, fuels, anti-freeze, cleaning agents, etc., with regard to the effect of these substances on man and nature and how to safely store, use, and dispose of these substances. Your CASE IH dealer can also provide assistance.

## Helpful hints

- Avoid the use of cans or other inappropriate pressurized fuel delivery systems to fill tanks. Such delivery systems may cause considerable spillage.
- In general, avoid skin contact with all fuels, oils, acids, solvents, etc. Most of these products contain substances that may be harmful to your health.
- Modern oils contain additives. Do not burn contaminated fuels and or waste oils in ordinary heating systems.
- Avoid spillage when you drain fluids such as used engine coolant mixtures, engine oil, hydraulic fluid, brake fluid, etc. Do not mix drained brake fluids or fuels with lubricants. Store all drained fluids safely until you can dispose of the fluids in a proper way that complies with all local legislation and available resources.
- Do not allow coolant mixtures to get into the soil. Collect and dispose of coolant mixtures properly.
- Do not open the air-conditioning system yourself. It contains gases that should not be released into the atmosphere. Your CASE IH dealer or air-conditioning specialist has a special extractor for this purpose and can recharge the system properly.
- Repair any leaks or defects in the engine cooling system or hydraulic system immediately.
- Do not increase the pressure in a pressurized circuit as this may lead to a component failure.

## Battery recycling

Batteries and electric accumulators contain several substances that can have a harmful effect on the environment if the batteries are not properly recycled after use. Improper disposal of batteries can contaminate the soil, groundwater, and waterways. CASE IH strongly recommends that you return all used batteries to a CASE IH dealer, who will dispose of the used batteries or recycle the used batteries properly. In some countries, this is a legal requirement.



NHIL14GEN0038AA 1

## Mandatory battery recycling

**NOTE:** The following requirements are mandatory in Brazil.

Batteries are made of lead plates and a sulfuric acid solution. Because batteries contain heavy metals such as lead, CONAMA Resolution 401/2008 requires you to return all used batteries to the battery dealer when you replace any batteries. Do not dispose of batteries in your household garbage.

Points of sale are obliged to:



























- Accept the return of your used batteries
- Store the returned batteries in a suitable location
- Send the returned batteries to the battery manufacturer for recycling

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## International symbols

|              |    |
|--------------|----|
| Farmall® 30A | NA |
| Farmall® 35A | NA |

As a guide to the operation of the machine, various universal symbols have been utilized on the instruments, controls, switches, and fuse box. The symbols are shown below with an indication of their meaning.

|  |  |   |  |
|--|--|---|--|
|  Thermostart starting aid     |  Radio                          |  PTO                           |  Position Control                     |
|  Alternator charge            |  KAM Keep alive memory          |  N Transmission in neutral     |  Draft Control                        |
|  Fuel level                   |  Turn signals                   |  Creeper gears                 |  Accessory socket                     |
|  Automatic Fuel shut-off      |  Turn signals -one trailer      |  Slow or low setting           |  Implement socket                     |
|  Engine speed (rev/min x 100) |  Turn signals -two trailers     |  Fast or high setting          |  %age slip                            |
|  Hours recorded               |  Front windshield wash/wipe     |  Ground speed                  |  Hitch raise (rear)                   |
|  Engine oil pressure         |  Rear windshield wash/wipe     |  Differential lock            |  Hitch lower (rear)                  |
|  Engine coolant temperature |  Heater temperature control   |  Rear axle oil temperature   |  Hitch height limit (rear)          |
|  Coolant level              |  Heater fan                   |  Transmission oil pressure   |  Hitch height limit (front)         |
|  Tractor lights             |  Air conditioner              |  FWD engaged                 |  Hitch disabled                     |
|  Headlamp main beam         |  Air filter blocked           |  FWD dis-engaged             |  Hydraulic and transmission filters |
|  Headlamp dipped beam       |  Parking brake                |  Warning!                    |  Remote valve extend                |
|  Work lamps                 |  Brake fluid level            |  Hazard warning lights       |  Remote valve retract               |
|  Stop lamps                 |  Trailer brake                |  Variable control            |  Remote valve float                 |
|  Horn                       |  Roof beacon                  |  Pressurized! Open carefully |  Malfunction! See Operator's Manual |
|  |  Warning! Corrosive substance |   |  Malfunction! (alternative symbol)  |

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## Safety rules

|              |    |
|--------------|----|
| Farmall® 30A | NA |
| Farmall® 35A | NA |

**CALIFORNIA  
PROPOSITION 65 WARNING**

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.

Battery post, terminals and related accessories contain lead and lead compounds.

**Wash hands after handling**

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## Safety rules

|              |    |
|--------------|----|
| Farmall® 30A | NA |
| Farmall® 35A | NA |

### Personal safety



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible death or injury.

Throughout this manual and on machine decals, you will find the signal words DANGER, WARNING, and CAUTION followed by special instructions. These precautions are intended for the personal safety of you and those working with you.

Read and understand all the safety messages in this manual before you operate or service the machine.

**!** DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury. The color associated with DANGER is RED.

**!** WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury. The color associated with WARNING is ORANGE.

**!** CAUTION, used with the safety alert symbol, indicates a hazardous situation which, if not avoided, could result in minor or moderate injury. The color associated with CAUTION is YELLOW.

### FAILURE TO FOLLOW DANGER, WARNING, AND CAUTION MESSAGES COULD RESULT IN DEATH OR SERIOUS INJURY.

### Machine safety

**NOTICE:** Notice indicates a situation which, if not avoided, could result in machine or property damage. The color associated with Notice is BLUE.

Throughout this manual you will find the signal word Notice followed by special instructions to prevent machine or property damage. The word Notice is used to address practices not related to personal safety.

### Information

**NOTE:** Note indicates additional information which clarifies steps, procedures, or other information in this manual.

Throughout this manual you will find the word Note followed by additional information about a step, procedure, or other information in the manual. The word Note is not intended to address personal safety or property damage.

### ACCIDENT PREVENTION

Most accidents or injuries that occur in workshops are the result of a non compliance to simple and fundamental safety regulations. For this reason, IN MOST CASES THESE ACCIDENTS CAN BE AVOIDED by foreseeing possible causes and consequently acting with the necessary caution and care.

Accidents may occur with all types of machines, regardless of how well the machine in question was designed and built.

A careful and informed service technician is the best guarantee against accidents.

Decisive awareness of the most basic safety rule is normally sufficient to avoid many serious accident.

**▲ WARNING**

**Unexpected machine movement!**

**Disengage power, shut down the tractor, and be sure that all moving parts have stopped before servicing, adjusting, cleaning, or unclogging the equipment.  
Failure to comply could result in death or serious injury.**

W0924A

**▲ WARNING**

**Pressurized system!**

**Never attempt to drain fluids or remove filters when the engine is running. Turn off the engine and relieve all pressure from pressurized systems before servicing the machine.  
Failure to comply could result in death or serious injury.**

W0905A

**SAFETY REQUIREMENTS FOR FLUID POWER SYSTEMS AND COMPONENTS - HYDRAULICS (EUROPEAN STANDARD PR EM 982)**

Flexible hose assemblies must not be constructed from hoses which have been previously used as part of a hose assembly.

Do not weld hydraulic piping.

When flexible hoses or piping are damaged, replace them immediately.

It is forbidden to modify a hydraulic accumulator by machining, welding or any other means.

Before removing hydraulic accumulators for servicing, the liquid pressure in the accumulators must be reduced to zero.

Pressure check on hydraulic accumulators shall be carried out by method recommended by the accumulator manufacturer.

Care must be taken not to exceed the maximum allowable pressure of the accumulator. After any check or adjustment there must be no leakage of gas.

**SAFETY RULES**

A careful operator is the best operator. Most accidents can be avoided by observing certain precautions. To help prevent accidents, read and take the following precautions before operating this tractor. Equipment should be operated only by those who are responsible and instructed to do so.

**THE TRACTOR**

1. Read the Operator's Manual carefully before using the tractor. Lack of operating knowledge can lead to accidents.
2. Use an approved roll bar and seat belt for safe operation. Overturning a tractor without a roll bar can result in death or injury. If your tractor is not equipped with a roll bar and seat belt, see your CASE IH Dealer.
3. Always use the seat belt. The only instance when the seat belt should not be used is if the roll bar has been removed from the tractor or folding ROPS is in down position.
4. If a front end loader is to be installed, always use a FOPS (Falling Object Protective Structure) canopy to avoid injury from falling objects.
5. Use the handholds and step plates when getting on and off the tractor to prevent falls. Keep steps and platform cleared of mud and debris.
6. Do not permit anyone but the operator to ride on the tractor. There is no safe place for extra riders.
7. Keep all safety decals clean of dirt and grime, and replace all missing, illegible, or damaged safety decals. See the list of decals in the Decal section of this manual.

**SERVICING THE TRACTOR**

1. The cooling system operates under pressure which is controlled by the radiator cap. It is dangerous to remove the cap while the system is hot. Always turn the cap slowly to the first stop and allow pressure to escape before removing the cap entirely.



## INTRODUCTION

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2. Keep any type of open flame away from the tractor and do not smoke while refueling. Wait for the engine to cool before refueling.
3. Keep the tractor and equipment, particularly brakes and steering, maintained in a reliable and satisfactory condition to ensure your safety and comply with legal requirements.
4. Keep open flame or cold weather starting aids away from the battery to prevent fires or explosions. Use jumper cables according to instructions to prevent sparks which could cause explosion.
5. Stop the engine before performing any service on the tractor.
6. Escaping hydraulic/diesel fluid under pressure can penetrate the skin causing serious injury. If fluid is injected into the skin, obtain medical attention immediately or gangrene may result.
  - DO NOT use your hand to check for leaks.
  - Use a piece of cardboard or paper to search for leaks.
  - Stop the engine and relieve pressure before connecting or disconnecting lines.
  - Tighten all connections before starting the engine or pressurizing lines.
7. Do not modify or permit anyone else to modify or alter this tractor or any of its components or functions without first consulting a CASE IH Dealer.
8. The fuel oil in the injection system is under high pressure and can penetrate the skin. Unqualified persons should not remove or attempt to adjust a pump, injector, nozzle, or any other part of the fuel injection system. Failure to follow these instructions can result in serious injury.
9. Continuous long-term contact with used engine oil may cause skin cancer. Avoid prolonged contact with used engine oil. Wash skin promptly with soap and water.
10. Some components of your tractor, such as gaskets and friction surfaces (brake linings, clutch linings, etc.) may contain asbestos. Breathing asbestos dust is dangerous to your health. You are advised to have any maintenance or repair on such components carried out by an authorized CASE IH Dealer. However, if service operations are to be undertaken on parts that contain asbestos, the essential precautions listed below must be observed:
  - Work out of doors or in a well ventilated area.
  - Dust found on the tractor or produced during work on the tractor should be removed by extraction, not by blowing.
  - Dust waste should be dampened, placed in a sealed container, and marked to ensure safe disposal.
  - If any cutting, drilling, etc. is attempted on materials containing asbestos, the item should be dampened and only hand tools or low speed power tools used.

### OPERATING THE TRACTOR

1. Before starting the tractor, apply the parking brake, place the PTO lever in the 'OFF' position, the lift control lever in the down position, the remote control valve levers in the neutral position, and the transmission in neutral.
2. Always sit in the tractor seat when starting the engine or operating controls. Do not start the engine or operate controls while standing beside the tractor.
3. Do not bypass the neutral start switches. Consult your CASE IH Dealer if your neutral start controls malfunction. Use jumper cables only in the recommended manner. Improper use can result in tractor runaway.
4. Avoid accidental contact with the gear shift lever while the engine is running, as this can cause unexpected tractor movement.
5. Before getting off the tractor, disengage the PTO, turn the engine off, and apply the parking brake. Never get off the tractor while it is in motion.
6. Do not park the tractor on a steep incline.
7. Do not operate the tractor engine in an enclosed building without adequate ventilation. Exhaust fumes can cause death or illness.
8. If the power steering or engine ceases operating, stop the tractor immediately.
9. Pull only from the drawbar or the lower link drawbar in the down position. Use only a drawbar pin that locks in place. Pulling from the tractor rear axle or any point above the axle may cause the tractor to upset.
10. If the front end of the tractor tends to rise when heavy implements are attached to the three-point hitch, install front end or front wheel weights. Do not operate the tractor with a light front end.

## INTRODUCTION

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11. Always set the hydraulic selector lever in position control when attaching or transporting equipment. Ensure hydraulic couplers are properly mounted and will disconnect safely in case of accidental detachment of implement
12. Do not leave equipment in the raised position.
13. Use the flasher/turn signal lights and SMV signs when traveling on public roads both day and night (unless prohibited by law).
14. When operating at night, adjust lights to prevent blinding oncoming drivers.

### DRIVING THE TRACTOR

1. Watch where you are going, especially at row ends, on roads, around trees and low hanging obstacles.
2. To avoid upsets, drive the tractor with care and at a safe speed. Use extra caution when operating over rough ground, when crossing ditches or slopes, and when turning corners.
3. To provide two-wheel braking, lock tractor brake pedals together when transporting on roads.
4. Do not coast or free wheel down hills. Use the same gear when going downhill as is used when going uphill.
5. Any towed vehicle with a total weight exceeding that of the towing tractor should be equipped with brakes for safe operation.
6. If the tractor becomes stuck or the tires become frozen to the ground, back up the tractor to prevent upset.
7. Always check overhead clearance, especially when transporting the tractor.
8. When operating at night, adjust lights to prevent blinding oncoming drivers.

### OPERATING THE PTO

1. When operating PTO driven equipment, shut off the engine and wait until the PTO stops before getting off the tractor and disconnecting the equipment.
2. Do not wear loose clothing when operating the power take-off or when near rotating equipment.
3. When operating stationary PTO driven equipment, always place all gear shift levers in neutral position.
4. To avoid injury, do not clean, adjust, unclog, or service PTO driven equipment when the tractor engine is running.
5. Ensure the PTO master shield is installed at all times. Always replace the PTO shield cap when the PTO is not in use.

### DIESEL FUEL

1. UNDER NO CIRCUMSTANCES should gasoline, alcohol, or blended fuels be added to diesel fuel. These combinations can create an increased fire or explosive hazard. Such blends are more explosive than pure gasoline in a closed container such as a fuel tank. DO NOT USE THESE BLENDS.
2. Never remove the fuel cap or refuel with the engine running or hot.
3. Do not smoke while refueling or when standing near fuel.
4. Maintain control of the fuel filler pipe nozzle when filling the tank.
5. Do not fill the fuel tank to capacity. Allow room for expansion.
6. Wipe up spilled fuel immediately.
7. Always tighten the fuel tank cap securely.
8. If the original fuel tank cap is lost, replace it with a CASE IH approved cap. A non-approved, proprietary cap may not be safe.
9. Keep equipment clean and properly maintained.
10. Do not drive equipment near open fires.
11. Never use fuel for cleaning purposes.
12. Arrange fuel purchases so that winter grade fuels are not held over and used in the spring.

### SAFETY FRAME (ROPS)

Your CASE IH tractor is equipped with a safety frame. It must be maintained in a serviceable condition. Be careful when driving through doorways or working in confined spaces with low headroom.

UNDER NO CIRCUMSTANCES should you:

- Modify, drill, or alter the safety frame in any way. Doing so may render you liable to legal prosecution.
- Attempt to straighten or weld any part of the main frame or retaining brackets which have suffered damage. Doing so may weaken the structure and endanger your safety.
- Secure any parts on the main frame or attach your safety frame with anything other than the special high tensile bolts and nuts specified.
- Attach chains or ropes to the main frame for pulling purposes.
- Take unnecessary risks even though your safety frame affords you the maximum protection possible.

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## Basic instructions - Important notice regarding equipment servicing

|              |    |
|--------------|----|
| Farmall® 30A | NA |
| Farmall® 35A | NA |

All repair and maintenance work listed in this manual must be carried out only by qualified dealership personnel, strictly complying with the instructions given, and using, whenever possible, the special tools.

Anyone who performs repair and maintenance operations without complying with the procedures provided herein shall be responsible for any subsequent damages.

The manufacturer and all the organizations of its distribution chain, including - without limitation - national, regional, or local dealers, reject any responsibility for damages caused by parts and/or components not approved by the manufacturer, including those used for the servicing or repair of the product manufactured or marketed by the manufacturer. In any case, no warranty is given or attributed on the product manufactured or marketed by the manufacturer in case of damages caused by parts and/or components not approved by the manufacturer.

The information in this manual is up-to-date at the date of the publication. It is the policy of the manufacturer for continuous improvement. Some information could not be updated due to modifications of a technical or commercial type, or changes to the laws and regulations of different countries.

In case of questions, refer to your CASE IH Sales and Service Networks.

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## Basic instructions - Shop and Assembly

|              |    |
|--------------|----|
| Farmall® 30A | NA |
| Farmall® 35A | NA |

### SHIMMING

For each adjustment operation, select adjusting shims and measure individually using a micrometer, then add up the recorded values. Do not rely on measuring the entire shimming set, which may be incorrect, or the rated value indicated on each shim.

### ROTATING SHAFT SEALS

For correct rotating shaft seal installation, proceed as follows:

- before assembly, allow the seal to soak in the oil it will be sealing for at least thirty minutes.
- thoroughly clean the shaft and check that the working surface on the shaft is not damaged.
- position the sealing lip facing the fluid; with hydrodynamic lips, take into consideration the shaft rotation direction and position the grooves so that they will deviate the fluid towards the inner side of the seal.
- coat the sealing lip with a thin layer of lubricant (use oil rather than grease) and fill the gap between the sealing lip and the dust lip on double lip seals with grease.
- insert the seal in its seat and press down using a flat punch or seal installation tool. Do not tap the seal with a hammer or mallet.
- whilst inserting the seal, check that it is perpendicular to the seat; once settled, make sure that it makes contact with the thrust element, if required.
- to prevent damaging the seal lip on the shaft, position a protective guard during installation operations.

### O-RING SEALS

Lubricate the O-RING seals before inserting them in the seats, this will prevent them from overturning and twisting, which would jeopardise sealing efficiency.

### SEALING COMPOUNDS

Apply one of the following sealing compounds on the mating surfaces when specified: SILMATE® RTV1473, or LOCTITE® RTV 598™ or LOCTITE® INSTANT GASKET 587 BLUE. Before applying the sealing compound, prepare the surfaces as directed on product container or as follows:

- remove any incrustations using a metal brush.
- thoroughly de-grease the surfaces using a locally approved cleaning agent such as safety solvent or brake parts cleaner.

### SPARE PARTS

Only use "CNH Original Parts" or "CASE IH Parts".

Only genuine spare parts guarantee the same quality, duration and safety as original parts, as they are the same parts that are assembled during standard production. Only "CNH Original Parts" or "CASE IH Parts" can offer this guarantee.

When ordering spare parts, always provide the following information:

- machine model (commercial name) and serial number
- part number of the ordered part, which can be found in the "Microfiches" or the "Service Parts Catalogue", used for order processing

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## PROTECTING THE ELECTRONIC/ ELECTRICAL SYSTEMS DURING CHARGING OR WELDING

To avoid damage to the electronic/electrical systems, always observe the following:

1. Never make or break any of the charging circuit connections, including the battery connections, when the engine is running.
2. Never short any of the charging components to ground.
3. Always disconnect the ground cable from the battery before arc welding on the combine or on any header attached to the combine.
  - position the welder ground clamp as close to the welding area as possible
  - if welding in close proximity to a computer module, then the module should be removed from the combine
  - never allow welding cables to lay on, near or across any electrical wiring or electronic component while welding is in progress
4. Always disconnect the negative cable from the battery when charging the battery in the combine with a battery charger.

**NOTICE:** If welding must be performed on the unit, either the combine or the header (if it is attached), the battery ground cable must be disconnected from the combine battery. The electronic monitoring system and charging system will be damaged if this is not done.

Remove the battery ground cable. Reconnect the cable when welding is completed.



### WARNING

**Battery acid causes severe burns. Batteries contain sulfuric acid. Avoid contact with skin, eyes or clothing. Antidote - EXTERNAL: flush with water. INTERNAL: drink large quantities of water or milk. Follow with milk of magnesia, beaten egg or vegetables oil. Call physician immediately. EYES: flush with water for 15 minutes and get prompt medical attention.**

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## TOOLS

The tools that CASE IH suggests and illustrate in this manual have been:

- specifically researched and designed for use with CASE IH machines
- essential for reliable repair operations
- accurately built and rigorously tested so as to offer efficient and long-lasting operation

By using these tools, repair personnel will benefit from:

- operating in optimal technical conditions
- obtaining the best results
- saving time and effort
- working in safe conditions

**NOTE:** The terms "front", "rear", "right-hand" and "left-hand" (when referred to different parts) are determined from the rear, facing in the direction of travel of the machine during operation.

## Basic instructions hardware

|              |    |
|--------------|----|
| Farmall® 30A | NA |
| Farmall® 35A | NA |

### General

Your tractor has been built using metric hardware.

**NOTE:** Be sure to use the hardware specified when using tapped holes, as trying to install a metric bolt in an inch thread, or an inch bolt in a metric thread, will damage the thread.

Certain hardware must be tightened to specific torque specifications. If specific torque specifications are not noted, tighten the hardware to the standard torque chart specification listed in this manual.

### Plating

Hardware used on CASE IH balers is plated with zinc chromate (gold color). Gold colored hardware has different torquing requirements from unplated or zinc plated (silver color) hardware because of the difference in the coefficient of friction of the plating material. The torque charts in this manual list the correct specifications for gold, silver, and unplated bolts.

### Nut tightening

Whenever possible, the nut should be tightened, not the head of the bolt. When tightening using the bolt head, the clamp load can be lost because some of the torque applied twists the bolt instead of tensioning (stretching) it. The tension on the bolt is what holds the joint together.

Approximately 90% of the torque applied during assembly goes to overcoming friction between the parts. The other 10% is used to tension (stretch) the bolt. After assembly, the frictional forces disappear, which is the basis for the saying 'If it does not fail during assembly, it will not fail in service.' The bolt may later fail due to other factors, but not from being over tightened.

### Locknuts

Most locknuts are coated with a special lubricant that is dry to the touch. Anytime a locknut is used, a lower than normal torque is required. Refer to the torque charts in this manual for specific values.

### Jam nuts

When using a jam nut to lock a regular nut, the jam nut should be installed first and tightened to one half the recommended torque, then held in place while installing a regular nut to the recommended torque.

### Thread lubrication

The addition of antiseize compound, Molykote, oil, graphite, or any other lubricant to a bolt decreases the friction between it and a nut. This makes it necessary to reduce the recommended torque to prevent over tensioning of the bolt. When using the torque charts in this manual, decrease the value by 20% whenever a lubricant is used.

## Torque Specification Tables

|              |    |
|--------------|----|
| Farmall® 30A | NA |
| Farmall® 35A | NA |

### Standard Bolt Hardware & Hydraulic Connector Torques, Specifications and Information

This specification establishes general torque values to be used in bolted joints for metric and inch hardware. This specification is assumed to apply unless another specification (standard or specified requirement) is indicated in the repair manual.

NOTE: These Standards do not include electrical or hydraulic components, they are referred to in their specific charts or tables.

#### INCH 'NON-FLANGED' HARDWARE AND LOCKNUTS {MINIMUM HARDWARE TIGHTENING TORQUES}

| IN NEWTON-METERS (FOOT-POUNDS) FOR NORMAL ASSEMBLY APPLICATIONS |                           |                    |                           |                    |                           |                    |                 |                 |
|---|---------------------------|--------------------|---------------------------|--------------------|---------------------------|--------------------|-----------------|-----------------|
| Nominal Size  | SAE GRADE 2               |                    | SAE GRADE 5               |                    | SAE GRADE 8               |                    | LOCKNUTS        |                 |
|   | Unplated or Plated Silver | Plated w/ZnCr Gold | Unplated or Plated Silver | Plated w/ZnCr Gold | Unplated or Plated Silver | Plated w/ZnCr Gold | Gr.B w/Gr5 Bolt | Gr.C w/Gr8 Bolt |
| 1/4   | 6.2 (55)*                 | 8.1 (72)*          | 9.7 (86)*                 | 13 (112)*          | 14 (121)*                 | 18 (157)*          | 8.5 (75)*       | 12.2 (109)*     |
| 5/16  | 13 (115)*                 | 17 (149)*          | 20 (178)*                 | 26 (229)*          | 28 (21)                   | 37 (27)            | 17.5 (155)*     | 25 (220)*       |
| 3/8   | 23 (17)                   | 30 (22)            | 35 (26)                   | 46 (34)            | 50 (37)                   | 65 (48)            | 31 (23)         | 44 (33)         |
| 7/16  | 37 (27)                   | 47 (35)            | 57 (42)                   | 73 (54)            | 80 (59)                   | 104 (77)           | 50 (37)         | 71 (53)         |
| 1/2   | 57 (42)                   | 73 (54)            | 87 (64)                   | 113 (83)           | 123 (91)                  | 159 (117)          | 76 (56)         | 108 (80)        |
| 9/16  | 81 (60)                   | 104 (77)           | 125 (92)                  | 163 (120)          | 178 (130)                 | 229 (169)          | 111 (82)        | 156 (115)       |
| 5/8   | 112 (83)                  | 145 (107)          | 174 (128)                 | 224 (165)          | 244 (180)                 | 316 (233)          | 153 (113)       | 215 (159)       |
| 3/4   | 198 (146)                 | 256 (189)          | 306 (226)                 | 397 (293)          | 432 (319)                 | 560 (413)          | 271 (200)       | 383 (282)       |
| 7/8   | 193 (142)                 | 248 (183)          | 495 (365)                 | 641 (473)          | 698 (515)                 | 904 (667)          | 437 (323)       | 617 (455)       |
| 1   | 289 (213)                 | 373 (275)          | 742 (547)                 | 960 (708)          | 1048 (773)                | 1356 (1000)        | 654 (483)       | 924 (681)       |

NOTE: Torque values shown with \* are inch pounds.

**NOTICE:** Values shown on these charts are minimum hardware tightening torques unless otherwise stated.

#### METRIC 'NON-FLANGED' HARDWARE AND LOCKNUTS {MINIMUM HARDWARE TIGHTENING TORQUES}

| IN NEWTON-METERS (FOOT-POUNDS) FOR NORMAL ASSEMBLY APPLICATIONS |           |               |           |               |            |               |                   |
|---|-----------|---------------|-----------|---------------|------------|---------------|-------------------|
| Nominal Size  | CLASS 5.8 |               | CLASS 8.8 |               | CLASS 10.9 |               | LOCK-NUTS         |
|   | Unplated  | Plated w/ZnCr | Unplated  | Plated w/ZnCr | Unplated   | Plated w/ZnCr | Cl.8 w/Cl8.8 Bolt |
| M4  | 1.7 (15)* | 2.2 (19)*     | 2.6 (23)* | 3.4 (30)*     | 3.7 (33)*  | 4.8 (42)*     | 2.3 (20)*         |
| M6  | 5.8 (51)* | 7.6 (67)*     | 8.9 (79)* | 12 (102)*     | 13 (115)*  | 17 (150)*     | 7.8 (69)*         |
| M8  | 14 (124)* | 18 (159)*     | 22 (195)* | 28 (21)       | 31 (23)    | 40 (30)       | 19 (169)*         |
| M10   | 28 (21)   | 36 (27)       | 43 (32)   | 56 (41)       | 61 (45)    | 79 (58)       | 38 (28)           |
| M12   | 49 (36)   | 63 (46)       | 75 (55)   | 97 (72)       | 107 (79)   | 138 (102)     | 66 (49)           |
| M16   | 121 (89)  | 158 (117)     | 186 (137) | 240 (177)     | 266 (196)  | 344 (254)     | 164 (121)         |
| M20   | 237 (175) | 307 (226)     | 375 (277) | 485 (358)     | 519 (383)  | 671 (495)     | 330 (243)         |
| M24   | 411 (303) | 531 (392)     | 648 (478) | 839 (619)     | 897 (662)  | 1160 (855)    | 572 (422)         |

NOTE: Torque values shown with \* are inch pounds.