

# SERVICE MANUAL

## MC22 / MC28 / MC35 Commercial Mower

Print No. 604.55.081.00



**NEW HOLLAND**

**AGRICULTURE**

Product: New Holland MC22/MC28/MC35 Commercial Mower Service Repair Manual  
Full Download: <https://www.arepairmanual.com/downloads/new-holland-mc22-mc28-mc35-commercial-mower-service-repair-manual/>

# SERVICE MANUAL

## MC22 / MC28 / MC35 Commercial Mower

Print No. 604.55.081.00



Sample of manual. Download All 829 pages at:

<https://www.arepairmanual.com/downloads/new-holland-mc22-mc28-mc35-commercial-mower-service-repair-manual/>



## **CONTENTS**

- SECTION 00 - GENERAL INFORMATION**
- SECTION 10 - ENGINE AND FUEL SYSTEMS**
- SECTION 25 - FOUR WHEEL DRIVE REAR AXLE**
- SECTION 27 - DIFFERENTIAL, AXLES**
- SECTION 31- PTO**
- SECTION 33 – BRAKES**
- SECTION 35 - HYDRAULIC SYSTEM**
- SECTION 41 – STEERING**
- SECTION 44 - TWO-WHEEL DRIVE REAR AXLE**
- SECTION 55 – ELECTRICAL**
- SECTION 90 - PLATFORM**



---

## SECTION 00 - GENERAL INFORMATION

### Chapter 1 - General Information

#### CONTENTS

| Section | Description                               | Page  |
|---------|---|-------|
|         | Introduction .....                        | 00-2  |
|         | Precautionary Statements .....            | 00-3  |
|         | Technical Information .....               | 00-4  |
|         | Safety Precautions .....                  | 00-5  |
|         | Decals .....                              | 00-12 |
|         | Safety Decals .....                       | 00-13 |
|         | Instruction Decals .....                  | 00-14 |
|         | International Symbols .....               | 00-17 |
|         | Specifications .....                      | 00-18 |
|         | Minimum Hardware Tightening Torques ..... | 00-25 |
|         | Special Tools .....                       | 00-27 |
|         | Torque Applications .....                 | 00-28 |
| 00 400  | Lubricants .....                          | 00-29 |
|         | Touch-Up Paint .....                      | 00-30 |
| 00 100  | Pre-Season and Predelivery Service .....  | 00-31 |

## INTRODUCTION

This repair manual provides the technical information needed to properly service the New Holland MC22, MC28, and MC35 tractors. Use this manual in conjunction with the operator's manual for complete operation, adjustment, and maintenance information.

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

# PRECAUTIONARY STATEMENTS

## PERSONAL SAFETY

Throughout this manual and on machine decals, you will find precautionary statements (“**DANGER**”, “**WARNING**”, and “**CAUTION**”) followed by specific instructions. These precautions are intended for the personal safety of you and those working with you. Please take the time to read them.



### **DANGER**



This word “**DANGER**” indicates an immediate hazardous situation that, if not avoided, will result in death or serious injury. The color associated with Danger is **RED**.

---



### **WARNING**



This word “**WARNING**” indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury. The color associated with Warning is **ORANGE**.

---



### **CAUTION**



This word “**CAUTION**” indicates a potentially hazardous situation that, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices. The color associated with Caution is **YELLOW**.

---

**FAILURE TO FOLLOW THE “DANGER”, “WARNING”, AND “CAUTION” INSTRUCTIONS MAY RESULT IN SERIOUS BODILY INJURY OR DEATH.**

## MACHINE SAFETY

The precautionary statement (“**IMPORTANT**”) is followed by specific instructions. This statement is intended for machine safety.

**IMPORTANT:** *The word “IMPORTANT” is used to inform the reader of something he needs to know to prevent minor machine damage if a certain procedure is not followed.*

## INFORMATION

**NOTE:** *Instructions used to identify and present supplementary information.*

## TECHNICAL INFORMATION

### HARDWARE

#### GENERAL

The MC22, MC28, and MC35 tractors have 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 New Holland 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 overtightened.

#### LOCKNUTS

Most locknuts are coated with a special lubricant that is dry to the touch. Any time 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 overtensioning of the bolt. When using the torque charts in this manual, decrease the value by 20% whenever a lubricant is used.

## SAFETY PRECAUTIONS

**The following precautions are suggested to help prevent accidents.  
SEE SPECIFIC INSTRUCTIONS IN TEXT FOR DETAIL.**

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

This cutting machine is capable of amputating hands and feet and throwing objects. Failure to observe the following safety instructions could result in serious injury or death.

### COMMERCIAL MOWER

1. All persons who will operate the unit should read the Operators Manual carefully before using the equipment. Lack of operating knowledge can lead to accidents.
2. Permit only properly trained and qualified persons to operate the unit.
3. Use the step plates when getting on and off the unit to prevent falls. Keep steps and platform cleared of mud and debris.
4. Use an approved Rollover Protective Structure (ROPS) and seat belt for safe operation. Overturning a unit without a ROPS and seat belt can result in death or injury. If the standard ROPS or seat belt has been removed, see your New Holland Dealer for a replacement.
5. Always use the seat belt with ROPS. If the ROPS has been removed, do not use the seat belt.
6. Do not permit anyone but the operator to ride on the unit. There is no safe place for extra riders.
7. Replace missing, illegible, or damaged safety decals.
8. Keep safety decals clean of dirt and grime.

### Servicing the Commercial Mower

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 the pressure to escape before removing the cap entirely.
2. Do not smoke while refueling the unit. Keep any type of open flame away. Wait for the engine to cool before refueling.
3. Keep the Commercial Mower in good operating condition for your safety. An improperly maintained unit can be hazardous.
4. Keep open flame away from battery or cold weather starting aids to prevent fires or explosions. Use jumper cables, according to instructions, to prevent sparks which could cause explosion.
5. Before servicing, park the unit on a firm, level surface and apply the parking brake. Remove the key to prevent accidental start-up.
6. Escaping hydraulic/diesel fluid under pressure can penetrate the skin, causing serious injury.
  - 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.
  - If fluid is injected into skin, obtain medical attention immediately or gangrene may result.
7. Do not modify, alter, or permit anyone else to modify or alter this unit or any of its components, or any unit function without first consulting your New Holland Dealer.

## **SAFETY PRECAUTIONS**

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. Some components on your Commercial Mower, such as gaskets, may contain asbestos. Breathing asbestos dust is dangerous to your health. You are therefore advised to have any maintenance or repair operations on such components carried out by an authorized New Holland Dealer. If, however, 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 unit or produced during work on the unit 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.
10. Continuous long term contact with used engine oil has caused skin cancer in animal tests. Avoid prolonged skin contact with used engine oil. Wash skin promptly with soap and water.
11. Do not work under a raised attachment unless it is securely supported by a suitable hoist or floor jack and multiple jack stands.
12. The ROPS and seat belt must be properly maintained and must not be modified, drilled, or altered in any way. If the ROPS is damaged, it must be replaced and should not be straightened or welded.

### **DRIVING THE COMMERCIAL MOWER**

1. Watch where you are going, especially at row ends, on roads, around trees and low hanging obstacles.
2. To avoid upsets, drive the Commercial mower with care and at speeds compatible with safety, especially when operating over rough ground, when crossing ditches or slopes, and when turning corners.
3. Keep the unit in the same gear when going downhill as used when going uphill. Do not coast or free wheel down hills.
4. When the unit is stuck or tires are frozen to the ground, go up forward to prevent upset.
5. Always check overhead clearance, especially when transporting the Commercial Mower.
6. Avoid quick stops, especially when an attachment is raised or not installed. Quick stops can cause upsets.
7. Do not attach chains or ropes to the ROPS for pulling purposes.

### **OPERATING THE POWER TAKE OFF (PTO)**

Before installing or using PTO-driven equipment, read the manufacturer's manual and review the safety labels attached to the equipment.

1. When operating PTO-driven equipment, shut off the engine and wait until the PTO stops before getting off the unit 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 the gear shift lever in neutral, apply the parking brake and block in front wheels front and back.
4. To avoid injury, do not clear, adjust, unclog or service PTO-driven equipment when the tractor engine is running.

## SAFETY PRECAUTIONS

### OPERATING THE MOWER DECK

1. Release the Commercial Mower HST foot pedal, apply the parking brake, place PTO lever in the "OFF" position, the lift control lever in neutral position and the transmission in neutral before starting the engine.
2. Do not start the engine or operate controls while standing beside the unit. Always sit in the seat when starting the engine or operating controls.
3. Do not bypass the neutral safety start switch. Consult your New Holland Dealer if your neutral safety start controls malfunction.
4. Use jumper cables only in the recommended manner. Improper use can result in the unit running away.
5. Avoid accidental contact with the gear shift lever while the engine is running.
6. Do not get off the Commercial Mower while it is in motion.
7. Disengage the PTO, shut off the engine and apply the parking brake before getting off the unit.
8. Do not park the Commercial Mower on a steep incline.
9. Do not operate the engine in an enclosed building without adequate ventilation. Exhaust fumes can cause death.
10. If the engine operates erratically, stop the engine immediately.
11. Do not leave equipment in the raised position.
12. Do not operate the Commercial Mower or any attachments while under the influence of alcohol, medication, controlled substances or when tired.
13. Do not operate near ditches, holes, embankments or any other terrain which may collapse under machine weight. The risk of machine tip-over increases when the ground is loose or wet.
14. When working in cooperation with other operators, always let others know what you are doing ahead of time.
15. Never try to mount or dismount from a moving unit.
16. Do not operate the Commercial Mower with bare feet. Keep hands, feet and clothing away from power-driven parts.
17. Do not drive the machine on streets or highways. Watch for traffic when you cross roads or operate near roads.
18. Look to the rear before and when backing. You must disengage blades before shifting into reverse. Make sure that the area immediately behind you is clear of obstructions or holes and small children. Use extra caution when the machine is equipped with a grass catcher.
19. Do not cross gravel roads with the PTO engaged.
20. Do not operate the mower deck without locking the hood and seat.
21. Disengage power to the mower deck when transporting or when not in use.
22. Disengage power to the mower deck before backing up. Do not mow in reverse unless absolutely necessary and then only after careful observation of the entire area behind the mower deck.
23. When mowing proceed as follows:
  - a. Mow only in daylight or in good artificial light.
  - b. Never make a cutting height adjustment while the engine is running if the operator must dismount to do so.
  - c. Check the blade mounting bolts for proper tightness at frequent intervals.
  - d. Shut off the engine when removing the grass catcher or clearing the chute.
24. Watch for holes in the terrain and other hidden hazards.
25. Do not stop or start suddenly when going uphill or downhill. Mow up and down the face of steep slopes, never cross the face.
26. Disengage power to attachment(s) and stop the engine before leaving the operators position.
27. Never leave equipment in the raised position.
28. Always keep the discharge side of the cutter directed away from people and objects which could be struck by debris thrown from the cutter.
29. Install Commercial Mower weights to increase stability when operating on slopes.

## SAFETY PRECAUTIONS

30. Avoid quick stops especially when the mower deck is raised. Quick stops will cause upset.
31. Keep all shields in place.
32. Replace safety and warning decals when they become illegible.
33. The vehicle and attachments should be stopped and inspected for damage after striking a foreign object and the damage should be repaired before restarting and operating equipment.
34. Do not lubricate or make mechanical adjustments while the unit is in motion or when the engine is running. However, if minor engine adjustments must be made, apply the parking brake securely, block the wheels and use extreme caution.
35. Periodically maintain the mower deck. Tighten nuts, bolts and fittings periodically for safe operation. Check the blade for tightness.
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 an 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.

### 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 refuelling or when standing near fuel.

### AVOID HIGH-PRESSURE FLUIDS

Escaping fluid under pressure can penetrate the skin causing serious injury. Relieve pressure before disconnecting hydraulic or other lines. Tighten all connections before applying pressure. Keep hands and body away from pinholes and nozzles which eject fluids under high pressure. Use a piece of cardboard to search for leaks.

If ANY fluid is injected into the skin it must be surgically removed within a few hours by a doctor familiar with this type of injury or gangrene may result.

Whenever you see this symbol  it means: **WARNING!**  
**BECOME ALERT! YOUR SAFETY IS INVOLVED!**

## SAFETY PRECAUTIONS

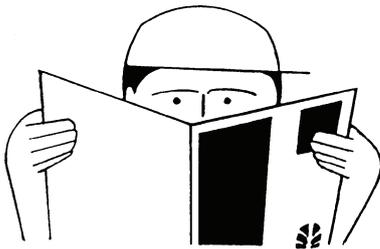
Safety is NO accident

Be alert!



This symbol is used to attract your attention to the safety precautions that should be understood by the operator to avoid accidents.

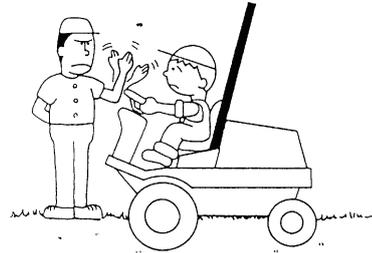
When you see this symbol - HEED ITS WARNING!



- Be sure to read all instructions before operation.
- Use the approved standard Roll Over Protective Structure (ROPS) and seat belt at all times.



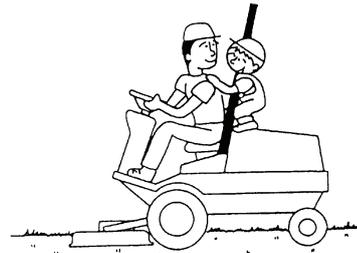
- Improper use of the Commercial Mower can result in injury. Give complete and undivided attention to the work you are doing.
- Know your controls. Know how to stop the unit and engine in an emergency.



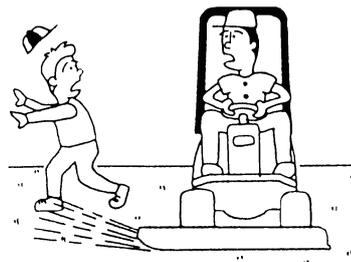
- Do not allow children to operate the Commercial Mower. Anyone else should be properly instructed as to its operation.
- Keep children and pets away. Children and pets should be kept a safe distance away from the mower.
- Stop operation when another person approaches.



- Reduce speed on all side slopes and sharp turns to prevent tipping or losing control.



- Do not allow anyone to ride on the unit or any of its attachments.



- Never allow the mower to discharge grass towards anyone.

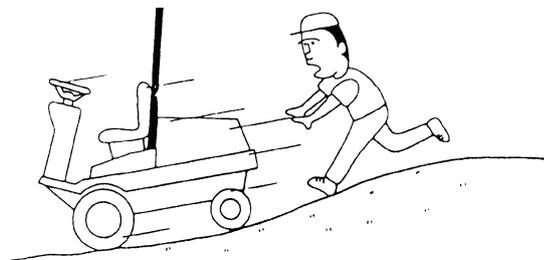
## SAFETY PRECAUTIONS



- All guards must be in place before operating the unit.
- If safety decals become illegible, they should be replaced.
- Make certain the unit or mower deck cannot be started by unauthorized persons before leaving the unit.



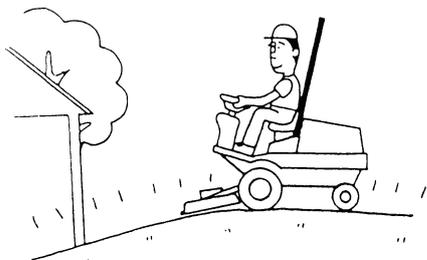
- Do not wear loose fitting clothing that might get caught in mowing parts. Also, keep hands and feet away from moving parts.
- Wear and use any additional safety items such as hard hat, safety boots or shoes, eye and hearing protection, gloves, etc., as appropriate or required.



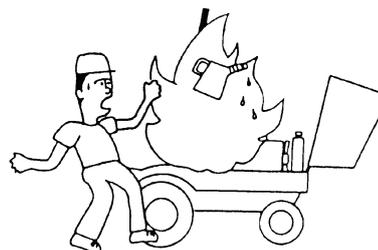
- Set the parking brake and stop the engine before leaving the seat.



- Stop engine before working on mower deck. Stop engine before cleaning discharge chute or making any adjustment, inspection or repairs.
- Periodically maintain the mower. Tighten nuts, bolts and fittings periodically and lubricate the mower for proper and safe operation. Check blades for tightness.

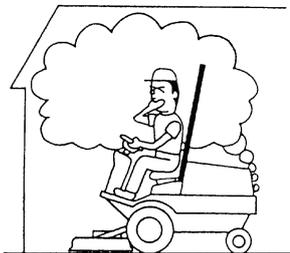


- Be sure the lawn is clean. Remove stones, wires, sticks, toys or anything that might catch or be thrown by the mower blade.

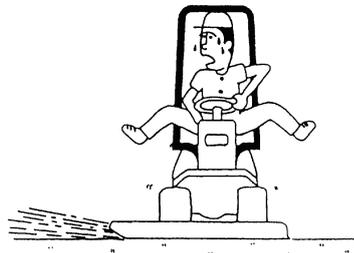


- Never remove the fuel cap or refuel with the engine running or hot. Do not smoke while refuelling or standing near fuel. Wipe up spilled fuel immediately.

## SAFETY PRECAUTIONS



- Do not operate the Commercial Mower in a confined area. Exhaust fumes are dangerous. Only run the engine out of doors.



- Disengage all clutches and place gear shift in neutral before attempting to start engine.
- The discharge guard must be down at all times during mowing operation.
- If the mower strikes a foreign object, stop the mower and engine immediately. Inspect the mower deck for damage. Repair any damage before starting again.

**DECALS**

If safety or instruction decals become damaged or illegible, new decals should be obtained from your New Holland Dealer and placed at their original positions.

|  |  |
|--|--|
| <b>⚠ WARNING</b>   |  |
| <p>FAILURE TO FOLLOW SAFE OPERATING PROCEDURES MAY RESULT IN INJURY.</p> <p>1. READ OPERATOR'S MANUAL.      6. IF MACHINE STOPS GOING UPHILL<br/>                 2. KNOW LOCATION AND FUNCTION OF ALL      DISENGAGE P. T. O. AND BACK SLOWLY DOWN<br/>                 CONTROLS.      7. LOOK TO REAR BEFORE BACKING UP.<br/>                 3. BEFORE LEAVING OPERATOR'S POSITION.      8. REMOVE OBJECTS THAT COULD BE THROWN<br/>                 A. SET PARKING BRAKE.      BY ROTATING BLADES.<br/>                 B. SHUT ENGINE OFF AND REMOVE KEY.      9. NEVER CARRY CHILDREN KEEP PEOPLE AND<br/>                 4. WAIT FOR ALL MOVEMENT TO STOP BEFORE      PETS A SAFE DISTANCE AWAY FORM MACHINE.<br/>                 SERVICING MACHINE.      10. KEEP GUARDS AND SAFETY DEVICE IN<br/>                 5. DO NOT OPERATE MACHINE WHERE IT      PLACE AND WORKING.<br/>                 COULD TIP OR SLIP.</p> <p style="text-align: center;"><small>REPLACEMENT MANUALS ARE AVAILABLE FROM YOUR DEALER</small></p> |  |
| <b>OPERATING INSTRUCTION</b>   |  |
| <p><b>TO START</b></p> <p>1. SIT IN SEAT.<br/>                 2. PLACE SHIFT LEVER IN NEUTRAL.<br/>                 3. PLACE P. T. O. CLUTCH LEVER IN OFF.<br/>                 4. PUT THROTTLE LEVER TO FULL SPEED POSITION.<br/>                 5. PRESS BRAKE PEDAL, OR PULL PARKING BRAKE.<br/>                 6. TURN KEY TO HEAT POSITION AND HOLD<br/>                 UNTIL SIGNAL LAMP GOES OFF.<br/>                 7. TURN KEY TO START POSITION AND HOLD<br/>                 UNTIL ENGINE STARTS, THEN RELEASE KEY.</p>   | <p>8. MOVE THROTTLE LEVER TO MEDIUM POSITION AND<br/>                 ALLOW ENGINE TO WARM UP.<br/> <b>TO STOP</b><br/>                 TURN KEY TO OFF POSITION.</p> <p><b>NOTE</b><br/>                 ENGINE STOPS IF OPERATOR LEAVES SEAT<br/>                 WITH P. T. O. ON AND/OR DRIVE LINE ENGAGED<br/>                 AND/OR PARKING BRAKE IS NOT ENGAGED.</p> |
| <small>390197760</small>   |  |

**WARNING: SAFE OPERATING PROCEDURES**

PART NO: SBA 390197760  
 LOCATION: On the L.H. Fender

|   |
|---|
| <b>⚠ WARNING</b>  |
|   |
| <p><b>AVOID QUICK STOPS</b></p> <ul style="list-style-type: none"> <li>● MOVE VERY SLOWLY WHEN ATTACHMENT IS REMOVED</li> <li>● KEEP ATTACHMENT LOW WHEN TRANSPORTING</li> <li>● REDUCE SPEED ON SLOPES</li> </ul> <p style="text-align: right;"><small>390195260</small></p> |

**WARNING: AVOID QUICK STOPS**

PART NO: SBA 390195261  
 LOCATION: On the Fender Under Seat

|  |
|--|
| <p><b>⚠ WARNING</b></p> <p><b>KEEP HANDS AND CLOTHING AWAY FROM ROTATING FAN AND BELTS TO PREVENT SERIOUS INJURY</b></p> |
|--|

**WARNING: KEEP HANDS AND CLOTHING**

PART NO: SBA 390191352  
 LOCATION: On the Cover of Cooling Fan

**SAFETY DECALS**

**! DANGER**

|  |   |
|--|---|
| <p><b>CAN CAUSE BLINDNESS OR SEVERE INJURY. Protect eyes. Sparks, flames, cigarettes can cause EXPLOSION: Tools and cable clamps can cause sparks. Do not use without instruction.</b></p> | <p><b>Keep vent caps tight and level. CAUSES SEVERE BURNS. Contains sulfuric acid. In event of contact, flush with water and see a doctor. KEEP OUT OF REACH OF CHILDREN.</b></p> |
|--|---|

**DANGER: EXPLOSIVE/ACID - POISON**

PART NO: SBA 390194390

LOCATION: Top of Battery

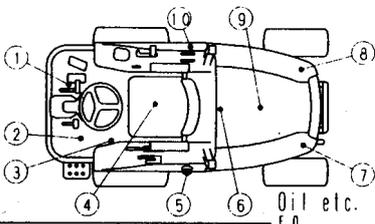
|  |   |   |
|--|---|---|
| <b>! DANGER</b>  |   | <b>! DANGER</b>   |
|  <ul style="list-style-type: none"> <li>• When improperly operated a CM tractor can rollover or upset.</li> <li>• For low clearance use only the ROPS can be lowered. No protection is provided in the lowered position.</li> </ul> | <ul style="list-style-type: none"> <li>• Raise ROPS immediately after low clearance use, or for transport.</li> <li>• When ROPS is lowered, use of seat belt is not recommended.</li> </ul> |  <ul style="list-style-type: none"> <li>• Do not attach ropes or chains to ROPS for pulling purposes. Use of ROPS and seat belt reduce the chance of injury or death if rollover or upset occurs.</li> </ul> |

**DANGER**

PART NO: SBA 390195520

LOCATION: On the ROPS

LUBRICATION AND MAINTENANCE



|    | Lubrication and Maintenance Items | Oil etc. | Capacity (l) | Check intervals (h) | Change intervals (h) | Service points |
|----|-----------------------------------|----------|--------------|---------------------|----------------------|----------------|
| 1  | Pedal shaft                       | C. G.    |              | 50                  |                      | 2              |
| 2  | Lift arm                          | C. G.    |              | 50                  |                      | 2              |
| 3  | Lift cylinder                     | C. G.    |              | 50                  |                      | 4              |
| 4  | Transmission oil                  | H. O.    | 20           | 50                  | 600                  | 1              |
| 5  | Fuel tank                         | F.       | 50           | before starting     |                      | 1              |
| 6  | Radiator                          | C.       | 5            | before starting     |                      | 1              |
| 7  | Steering cylinder                 | C. G.    |              | 50                  |                      | 2              |
| 8  | Rear Axle 4WD                     | H. O.    | 2            | 100                 | 600                  | 1              |
| 9  | Engine oil                        | E. O.    | 5            | 5                   | 100                  | 1              |
| 10 | Battery                           | D. W.    | 25           |                     |                      | 6              |

Oil etc.  
 E. O.  
 Diesel engine oil  
 All season  
 SAE10W/30  
 -5°C-25°C  
 23°F-77°F  
 SAE20W  
 10°C-35°C  
 50°F-95°F  
 SAE30  
 H. O.  
 Hydraulic System  
 and Gear oil  
 ISO VG46  
 C. G.  
 Chassis grease or  
 Universal grease  
 No. 2  
 F: Diesel fuel oil  
 C: LLC  
 D. W.  
 Distilled water  
 NOTE  
 Change engine oil  
 and HYD. oil at  
 first 50 hours.

Also Oil other pins and links as necessary.  
 Capacity of the Engine oil and Radiator coolant  
 for M28.35 are 5 and 5 liters

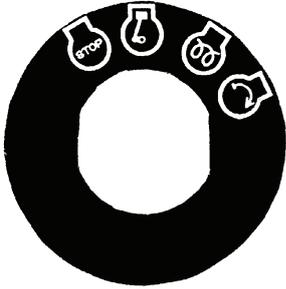
390211740

**LUBRICATION AND MAINTENANCE**

PART NO: SBA 390211740

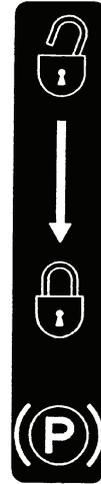
LOCATION: Underside of Hood

INSTRUCTION DECALS



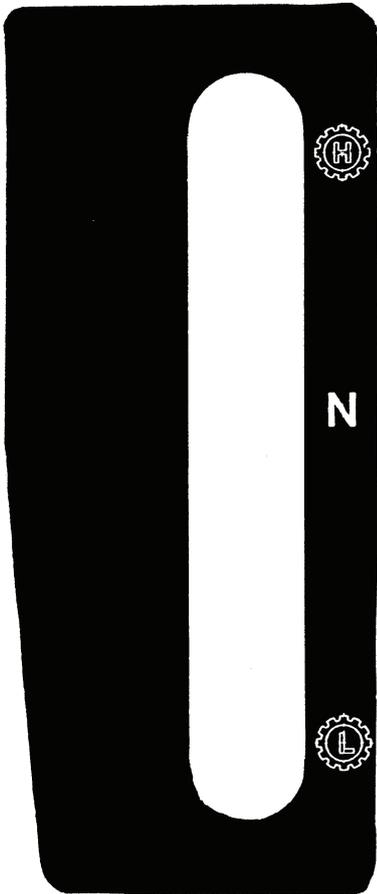
**STARTER SWITCH**

PART NO: SBA 390197280  
LOCATION: On the R.H. of Dash



**PARKING BRAKE**

PART NO: SBA 390197710  
LOCATION: On the L.H. Fender

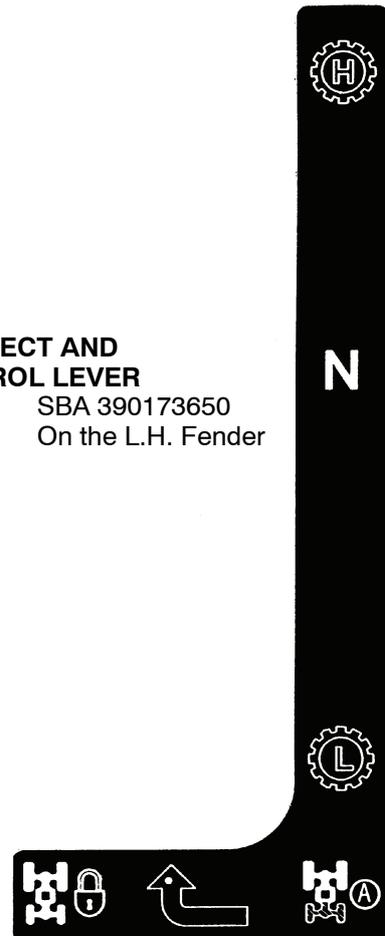


**RANGE SELECT LEVER 2WD**

PART NO: SBA 390173670  
LOCATION: On the L.H. Fender

**RANGE SELECT AND  
FWD CONTROL LEVER**

PART NO: SBA 390173650  
LOCATION: On the L.H. Fender



INSTRUCTION DECALS



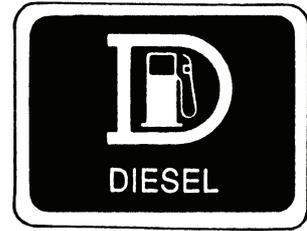
**LIFT CONTROL LEVER**  
PART NO: SBA 390372400  
LOCATION: On the R.H. Fender



**PTO CONTROL LEVER**  
PART NO: SBA 390173600  
LOCATION: On the R.H. Fender



**REMOTE VALVE LEVER (OPT) (Auxiliary)**  
PART NO: SBA 390372410  
LOCATION: On the R.H. Fender



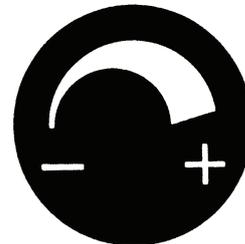
**DIESEL FUEL**  
PART NO: SBA 490991160  
LOCATION: Near the Filler Cap



**ENGINE OIL**  
PART NO: SBA 390230120  
LOCATION: On Engine Oil Filler Cap



**DIFFERENTIAL LOCK**  
PART NO: SBA 390191690  
LOCATION: On Dash Near Pedal



**WEIGHT TRANSFER**  
PART NO: SBA 390372000  
LOCATION: On the Weight Transfer Knob

**PLEASE READ CAREFULLY:**

For a complete list of the predelivery service checks performed by your dealer, refer to the PREDELIVERY SERVICE checklist found at the back of this manual. Keep one copy as your record of the service performed. The other copy should be removed from the manual and kept by your dealer. **MAKE SURE THAT BOTH COPIES ARE COMPLETED AND THAT YOU AND THE DEALER SIGN BOTH COPIES.**

A **PRODUCT IDENTIFICATION PLATE** is located in the front transmission case under the front body of the mower.

The numbers on the plate are important in the event your mower should require future service. For your convenience, have your dealer record these numbers in the appropriate spaces below.

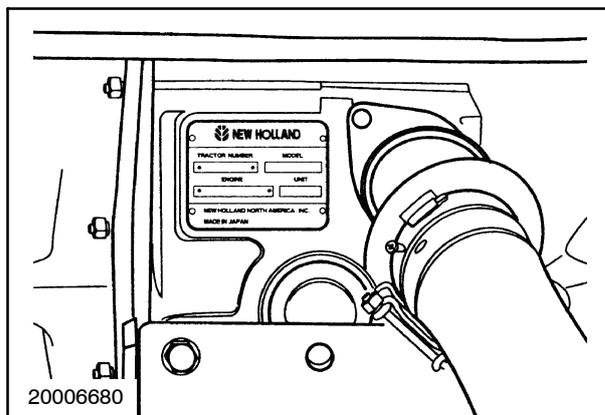
New Holland North America, Inc. is continually striving to improve its products. We reserve the right to change prices, specification, or equipment at any time without notice.

All data given in this book is subject to production variations. Dimensions and weights are approximate only, and the illustrations do not necessarily depict the mower in standard condition. For exact information about any particular mower, please consult your New Holland dealer.

This mower has been designed for doing light work, such as mowing, blowing snow. Do not attempt to use implements that were not designed for this mower, as they may cause damage to the mower.

| TRACTOR NUMBER                  |   | MODEL |
|---------------------------------|---|-------|
| *                               | * |       |
| ENGINE                          |   | UNIT  |
| *                               | * |       |
| NEW HOLLAND NORTH AMERICA, INC. |   |       |
| MADE IN JAPAN                   |   |       |

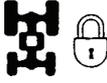
1



2

## INTERNATIONAL SYMBOLS

As a guide to the operation of your Commercial Mower, various universal symbols have been utilized on the instruments and controls. The symbols are depicted and described below.

|   |                          |   |                   |   |                                      |
|---|--------------------------|---|-------------------|---|--------------------------------------|
|    | Hours Recorded           | <b>N</b>  | Neutral           |     | Battery                              |
|    | Engine Water Temperature |    | Diesel Fuel       |     | Power Take-Off (ON)                  |
|    | Air Filter               |    | Glow Plugs        |     | Power Take-Off (OFF)                 |
|    | Engine Oil Pressure      |    | Engine Stop       |     | "Tortoise" - Slow or Minimum Setting |
|   | Full Time 4WD            |   | Engine Oil        |   | "Hare" - FAST or Maximum Setting     |
|  | Auto 4WD                 |  | Engine Start      |   | Warning                              |
|  | Continuously Variable    |  | Parking Brake     |  | Control Lever Hold                   |
|  | Increase                 |  | Lock              |  | Rock Shaft (Raised)                  |
|  | Decrease                 |  | Lock Release      |  | Rock Shaft (Lowered)                 |
|  | Fuel Level               |  | Differential Lock |  | Remote Cylinder (Retracted)          |
|  | High Range               |  | Volume Empty      |  | Remote Cylinder (Extended)           |
|  | Low Range                |  | Volume Full       |   |                                      |

## SPECIFICATIONS

| <b>ENGINE</b>                 | <b>MC22</b>                    | <b>MC28</b>                    | <b>MC35</b>                     |
|-------------------------------|--------------------------------|--------------------------------|---------------------------------|
| Type .....                    | Diesel                         | Diesel                         | Diesel                          |
| Engine Gross Horsepower ..... | 21.5                           | 28                             | 35                              |
| Cylinders .....               | 3                              | 3                              | 3                               |
| Bore .....                    | 77 mm (3.03")                  | 84 mm (3.31")                  | 84 mm (3.31")                   |
| Stroke .....                  | 72 mm (2.83")                  | 80 mm (3.15")                  | 100 mm (3.94")                  |
| Displacement .....            | 61.3 cu. in.<br>(1.005 liters) | 81.2 cu. in.<br>(1.330 liters) | 101.4 cu. in.<br>(1.662 liters) |
| Compression Ratio .....       | 23 : 1                         | 22.5 : 1                       | 22.5 : 1                        |
| Firing Order .....            | 1-2-3                          | 1-2-3                          | 1-2-3                           |
| Low Idle Speed .....          | 1000 RPM                       | 1000 RPM                       | 1000 RPM                        |
| Maximum Speed:                |                                |                                |                                 |
| High Idle .....               | 2940 RPM                       | 2940 RPM                       | 2940 RPM                        |
| Rated .....                   | 2700 RPM                       | 2700 RPM                       | 2700 RPM                        |
| Valve Clearance (Cold):       |                                |                                |                                 |
| Intake .....                  | 0.20 mm (0.008")               | 0.20 mm (0.008")               | 0.20 mm (0.008")                |
| Exhaust .....                 | 0.20 mm (0.008")               | 0.20 mm (0.008")               | 0.20 mm (0.008")                |

### CAPACITIES

|  |                                 |                                 |                                 |
|--|---------------------------------|---------------------------------|---------------------------------|
| Fuel Tank .....  | 13.3 U.S. gal.<br>(50.5 liters) | 13.3 U.S. gal.<br>(50.5 liters) | 13.3 U.S. gal.<br>(50.5 liters) |
| Cooling System .....                                     | 4.4 U.S. qt.<br>(4.2 liters)    | 5.3 U.S. qt.<br>(5.1 liters)    | 5.6 U.S. qt.<br>(5.3 liters)    |
| Engine Crankcase:  |                                 |                                 |                                 |
| Less Filter .....  | 3.5 U.S. qt.<br>(3.3 liters)    | 5.5 U.S. qt.<br>(5.2 liters)    | 5.7 U.S. qt.<br>(5.4 liters)    |
| With Filter Change .....                                 | 3.7 U.S. qt.<br>(3.5 liters)    | 6.0 U.S. qt.<br>(5.7 liters)    | 6.0 U.S. qt.<br>(5.7 liters)    |
| Front Axle & Transmission<br>(Includes Hydraulics) ..... | 5.8 U.S. gal.<br>(22.0 liters)  | 5.8 U.S. gal.<br>(22.0 liters)  | 5.8 U.S. gal.<br>(22.0 liters)  |
| Rear Axle<br>Center Case & Final Case .....              | 2.4 U.S. qt.<br>(2.3 liters)    | 2.4 U.S. qt.<br>(2.3 liters)    | 2.4 U.S. qt.<br>(2.3 liters)    |

SECTION 00 - GENERAL INFORMATION

| <b>COOLING SYSTEM</b>                      | <b>MC22</b>   | <b>MC28</b>   | <b>MC35</b>   |
|--|---|---|---|
| Type .....                                 | Pressurized Liquid w/Recirculating Bypass   | Pressurized Liquid w/Recirculating Bypass   | Pressurized Liquid w/Recirculating Bypass   |
| Water Pump:                                |   |   |   |
| Type .....                                 | Centrifugal   | Centrifugal   | Centrifugal   |
| Drive .....                                | V-Belt  | V-Belt  | V-Belt  |
| Belt Deflection .....                      | 7/16"-9/16"<br>(10 mm-15 mm)<br>when 20-25 lbs.<br>(9-11 kg) thumb<br>pressure is applied<br>midway between<br>belt pulleys | 7/16"-9/16"<br>(10 mm-15 mm)<br>when 20-25 lbs.<br>(9-11 kg) thumb<br>pressure is applied<br>midway between<br>belt pulleys | 7/16"-9/16"<br>(10 mm-15 mm)<br>when 20-25 lbs.<br>(9-11 kg) thumb<br>pressure is applied<br>midway between<br>belt pulleys |
| Fan Diameter .....                         | 305 mm (12.0")  | 340 mm (13.4")  | 360 mm (14.2")  |
| Thermostat:                                |   |   |   |
| Start to Open .....                        | 160° F (71° C)  | 160° F (71° C)  | 160° F (71° C)  |
| Fully Open .....                           | 185° F (85° C)  | 185° F (85° C)  | 185° F (85° C)  |
| Radiator Cap .....                         | 13 PSI<br>(0.9 bar)   | 13 PSI<br>(0.9 bar)   | 13 PSI<br>(0.9 bar)   |
| <b>ELECTRICAL SYSTEM</b>                   |   |   |   |
| Alternator .....                           | 12-volt, Heavy Duty, 40 amps  |   |   |
| Battery .....                              | 12-volt, 53.9 amp hour rating<br>w/ negative ground, 490 CCA  |   |   |
| Starting Motor .....                       | Solenoid Pre-Engaged<br>Reduction   |   |   |
| <b>FUEL SYSTEM</b>                         |   |   |   |
| Fuel Type .....                            | Diesel  | Diesel  | Diesel  |
| Type of Fuel to Use if<br>Above 40°F ..... | No.2 - Diesel<br>Cetane Rating:<br>Minimum 40   | No.2 - Diesel<br>Cetane Rating:<br>Minimum 40   | No.2 - Diesel<br>Cetane Rating:<br>Minimum 40   |
| Type of Fuel to Use if<br>Below 40°F ..... | No.1 - Diesel<br>Cetane Rating:<br>Minimum 40   | No.1 - Diesel<br>Cetane Rating:<br>Minimum 40   | No.1 - Diesel<br>Cetane Rating:<br>Minimum 40   |
| Injection Pump:                            |   |   |   |
| Type .....                                 | In Line   | In Line   | In Line   |
| Timing .....                               | 21.0° BTDC  | 21.0° BTDC  | 18.0° BTDC  |

SECTION 00 - GENERAL INFORMATION

**BRAKES**

|                       | <b>MC22</b>                     | <b>MC28</b>                     | <b>MC35</b>                     |
|-----------------------|---------------------------------|---------------------------------|---------------------------------|
| Type .....            |                                 | Wet Disc Final Brake            |                                 |
| Disc 2 Diameter ..... | 6.1" x 4.84"<br>155 mm x 123 mm | 6.1" x 4.84"<br>155 mm x 123 mm | 6.1" x 4.84"<br>155 mm x 123 mm |

**STEERING**

|                                |                           |                           |                           |
|--------------------------------|---------------------------|---------------------------|---------------------------|
| Type .....                     | Tilt Telescopic Hyd Power |                           |                           |
| Lock-to-Lock:                  |                           |                           |                           |
| 2WD .....                      | R 1.9    L 2.3            |                           |                           |
| FWD .....                      | R 2.1    L 2.5            |                           |                           |
| Toe-in .....                   | 0 - 5 mm<br>(0" - 13/64") | 0 - 5 mm<br>(0" - 13/64") | 0 - 5 mm<br>(0" - 13/64") |
| Turning Radius                 |                           |                           |                           |
| Inside Front Tire (w/o Brakes) |                           |                           |                           |
| 2WD .....                      | 730 mm (28.7")            | 730 mm (28.7")            |                           |
| FWD .....                      | 750 mm (29.5")            | 750 mm (29.5")            | 750 mm (29.5")            |

**POWER TAKE-OFF**

|                         |                  |                  |                  |
|-------------------------|------------------|------------------|------------------|
| Type .....              | Wet multi plates | Wet multi plates | Wet multi plates |
| Shaft PTO .....         | 25.4 mm (1")     | 25.4 mm (1")     | 25.4 mm (1")     |
| Engine Speed @ 2700 RPM |                  |                  |                  |
| PTO RPM .....           | 2209 RPM         | 2209 RPM         | 2209 RPM         |
| Horsepower PTO          |                  |                  |                  |
| Observed .....          | 15.0             | 20.0             | 24.5             |

**HYDRAULIC LIFT SYSTEM**

|                           |                              |                              |                              |
|---------------------------|------------------------------|------------------------------|------------------------------|
| Type .....                | Open Center                  | Open Center                  | Open Center                  |
| Pump Type .....           | Gear                         | Gear                         | Gear                         |
| Pump Capacity .....       | 1.90 U.S. gpm<br>(7.2 l/min) | 2.40 U.S. gpm<br>(9.1 l/min) | 2.40 U.S. gpm<br>(9.1 l/min) |
| at Eng 2700 RPM           |                              |                              |                              |
| System Relief Valve ..... | 1471 PSI                     | 1471 PSI                     | 1471 PSI                     |
| Setting                   | (100 bar)                    | (100 bar)                    | (100 bar)                    |

**TRANSMISSION**

|  |                             |                             |                             |
|--|-----------------------------|-----------------------------|-----------------------------|
| Type .....                               | HST with 2 Range Gear Drive |                             |                             |
| 4WD Drive .....                          | Auto 4WD or Full 4WD        |                             |                             |
| Speed                                    |                             |                             |                             |
| With STD Tire at 2700 RPM Engine Speed   |                             |                             |                             |
| Gear position:                           |                             |                             |                             |
| Forward ; L .....                        | 0-6.03 MPH<br>(0-9.7 Km/h)  | 0-6.03 MPH<br>(0-9.7 Km/h)  | 0-6.03 MPH<br>(0-9.7 Km/h)  |
| Forward ; H .....                        | 0-10.3 MPH<br>(0-16.6 Km/h) | 0-10.3 MPH<br>(0-16.6 Km/h) | 0-10.3 MPH<br>(0-16.6 Km/h) |
| Reverse ; L .....                        |                             | 60%-70% of Forward Speeds   |                             |
| Reverse ; H .....                        |                             | 60%-70% of Forward Speeds   |                             |
| With Large tire at 2700 RPM Engine Speed |                             |                             |                             |
| Gear Position:                           |                             |                             |                             |
| Forward ; L .....                        | 0-6.21 MPH<br>(0-10.0 Km/h) | 0-6.21 MPH<br>(0-10.0 Km/h) | 0-6.21 MPH<br>(0-10.0 Km/h) |
| Forward ; H .....                        | 0-10.7 MPH<br>(0-17.2 Km/h) | 0-10.7 MPH<br>(0-17.2 Km/h) | 0-10.7 MPH<br>(0-17.2 Km/h) |
| Reverse ; L .....                        |                             | 60%-70% of Forward Speeds   |                             |
| Reverse ; H .....                        |                             | 60%-70% of Forward Speeds   |                             |

SECTION 00 - GENERAL INFORMATION

| <b>CAST IRON WEIGHTS</b>           | <b>MC22</b>                          | <b>MC28</b>                          | <b>MC35</b>                          |
|------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|
| Front Wheel .....                  |                                      | 75 lbs. (34 Kg)                      |                                      |
| Rear End .....                     |                                      | 60 lbs. (27 kg)                      |                                      |
| <b>TIRES (Turf)</b>                |                                      |                                      |                                      |
| <b>FRONT; STD</b>                  |                                      |                                      |                                      |
| 2WD .....                          | 23 x 10.50-12 4PR                    | 23 x 10.50-12 4PR                    | -----                                |
| FWD .....                          | 23 x 10.50-12 4PR                    | 23 x 10.50-12 4PR                    | 23 x 10.50-12 4PR                    |
| <b>REAR:</b>                       |                                      |                                      |                                      |
| 2WD .....                          | 20 x 8.00-10 4PR                     | 20 x 8.00-10 4PR                     | -----                                |
| FWD .....                          | 20 x 8.00-10 4PR                     | 20 x 8.00-10 4PR                     | 20 x 8.00-10 4PR                     |
| <b>FRONT; Large</b>                |                                      |                                      |                                      |
| 2WD .....                          | 24 x 13.00-12 4PR                    | 24 x 13.00-12 4PR                    | -----                                |
| FWD .....                          | 24 x 13.00-12 4PR                    | 24 x 13.00-12 4PR                    | 24 x 13.00-12 4PR                    |
| <b>REAR (for Large)</b>            |                                      |                                      |                                      |
| 2WD .....                          | 20 x 8.00-10 4PR                     | 20 x 8.00-10 4PR                     | -----                                |
| FWD .....                          | 20 x 8.00-10 4PR                     | 20 x 8.00-10 4PR                     | 20 x 8.00-10 4PR                     |
| <b>WHEEL BOLT TORQUES</b>          |                                      |                                      |                                      |
| Front; STD .....                   | 148-116 N·m<br>(97 ± 11 ft.-lb.)     | 148-116 N·m<br>(97 ± 11 ft.-lb.)     | 148-116 N·m<br>(97 ± 11 ft.-lb.)     |
| Front; Large .....                 | 148-116 N·m<br>(97 ± 11 ft.-lb.)     | 148-116 N·m<br>(97 ± 11 ft.-lb.)     | 148-116 N·m<br>(97 ± 11 ft.-lb.)     |
| Rear .....                         | 56-44 N·m<br>(37 ± 4.4 ft.-lb.)      | 56-44 N·m<br>(37 ± 4.4 ft.-lb.)      | 56-44 N·m<br>(37 ± 4.4 ft.-lb.)      |
| <b>ROPS ATTACHING BOLT TORQUES</b> |                                      |                                      |                                      |
| ROPS to Lower ROPS .....           | 157 ± 9.8 N·m<br>(116 ± 7.2 ft.-lb.) | 157 ± 9.8 N·m<br>(116 ± 7.2 ft.-lb.) | 157 ± 9.8 N·m<br>(116 ± 7.2 ft.-lb.) |
| Seat Belt .....                    | 50 ± 5.9 N·m<br>(37 ± 4.4 ft.-lb.)   | 50 ± 5.9 N·m<br>(37 ± 4.4 ft.-lb.)   | 50 ± 5.9 N·m<br>(37 ± 4.4 ft.-lb.)   |
| ROPS to Frame .....                | 97 N·m (72 ft.-lb.)                  | 97 N·m (72 ft.-lb.)                  | 97 N·m (72 ft.-lb.)                  |
| <b>WHEEL TREAD SETTINGS</b>        |                                      |                                      |                                      |
| <b>FRONT:</b>                      |                                      |                                      |                                      |
| <b>STD Tire 2WD &amp; FWD</b>      |                                      |                                      |                                      |
| Dished In .....                    | 940 mm (37.00")                      | 940 mm (37.00")                      | 940 mm (37.00")                      |
| Dished Out .....                   | 1100 mm (43.30")                     | 1100 mm (43.30")                     | 1100 mm (43.30")                     |
| <b>Large Tire 2WD &amp; FWD</b>    |                                      |                                      |                                      |
| Dished In .....                    | 990 mm (38.97")                      | 990 mm (38.97")                      | 990 mm (38.97")                      |
| Dished Out .....                   | 1050 mm (41.34")                     | 1050 mm (41.34")                     | 1050 mm (41.34")                     |
| <b>REAR: STD &amp; Large</b>       |                                      |                                      |                                      |
| 2WD .....                          | 990 mm (38.97")                      | 990 mm (38.97")                      | -----                                |
| FWD .....                          | 995 mm (39.17")                      | 995 mm (39.17")                      | 995 mm (39.17")                      |

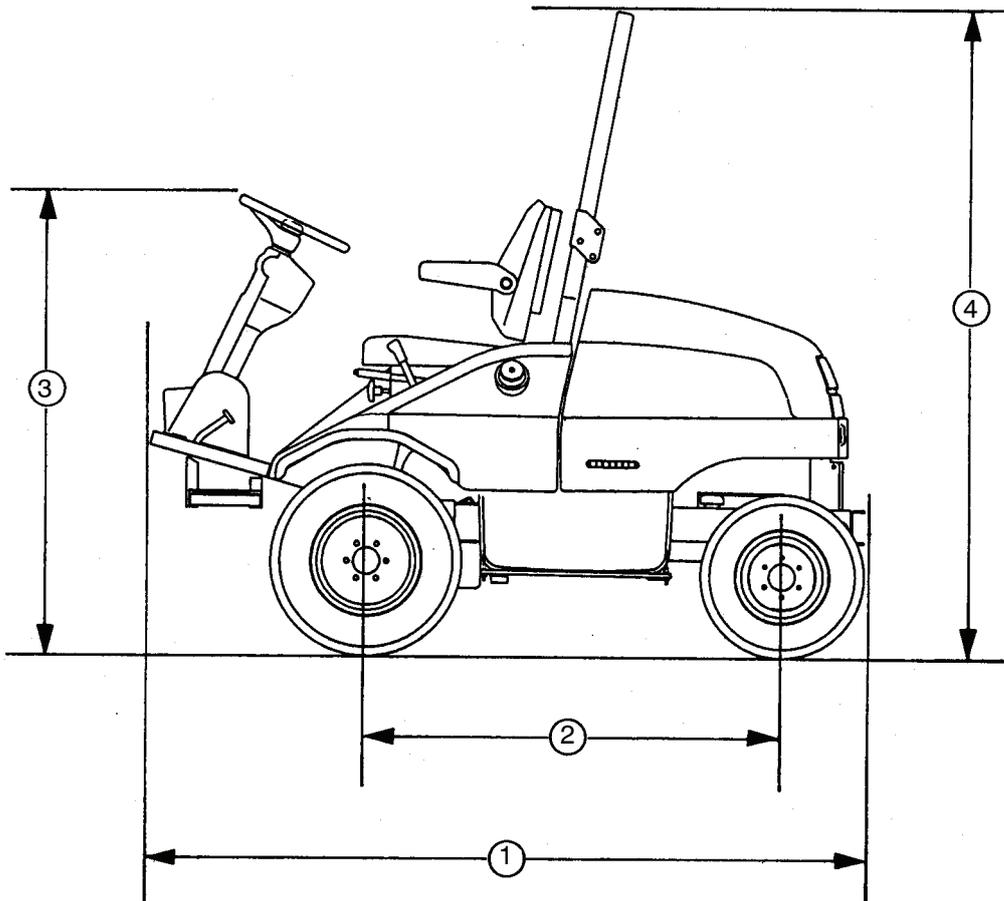
SECTION 00 - GENERAL INFORMATION

---

| <b>WEIGHT</b>        | <b>MC22</b>           | <b>MC28</b>           | <b>MC35</b>           |
|----------------------|-----------------------|-----------------------|-----------------------|
| Std Tires with ROPS: |                       |                       |                       |
| 2WD .....            | 1499 lbs.<br>(680 kg) | 1543 lbs.<br>(700 kg) | -----                 |
| FWD .....            | 1543 lbs.<br>(700 kg) | 1609 lbs.<br>(730 kg) | 1653 lbs.<br>(750 kg) |
| Large Tire With ROPS |                       |                       |                       |
| 2WD .....            | 1521 lbs.<br>(690 kg) | 1565 lbs.<br>(710 kg) | -----                 |
| FWD .....            | 1565 lbs.<br>(710 kg) | 1631 lbs.<br>(740 kg) | 1675 lbs.<br>(760 kg) |

SECTION 00 - GENERAL INFORMATION

| GENERAL DIMENSION  | MC22             | MC28             | MC35             |
|--|------------------|------------------|------------------|
| (1) LENGTH<br>2WD & FWD .....  | 2415 mm (95.1")  | 2415 mm (95.1")  | 2415 mm (95.1")  |
| (2) WHEEL BASE<br>2WD & FWD .....  | 1250 mm (49.2")  | 1250 mm (49.2")  | 1250 mm (49.2")  |
| (3) HEIGHT<br>Center of Steering Wheel (return position)<br>STD Tire ..... | 1390 mm (54.7")  | 1390 mm (54.7")  | 1390 mm (54.7")  |
| (4) Top of ROPS<br>STD Tire:   |                  |                  |                  |
| Up Position .....  | 1930 mm (75.98") | 1930 mm (75.98") | 1930 mm (75.98") |
| Down Position .....  | 1225 mm (48.22") | 1225 mm (48.22") | 1225 mm (48.22") |
| Large Tires:   |                  |                  |                  |
| Up Position .....  | 1935 mm (76.18") | 1935 mm (76.18") | 1935 mm (76.18") |
| Down Position .....  | 1225 mm (48.22") | 1225 mm (48.22") | 1225 mm (48.22") |



SECTION 00 - GENERAL INFORMATION

(5) WIDTH

Rear Axle Outside to Outside:

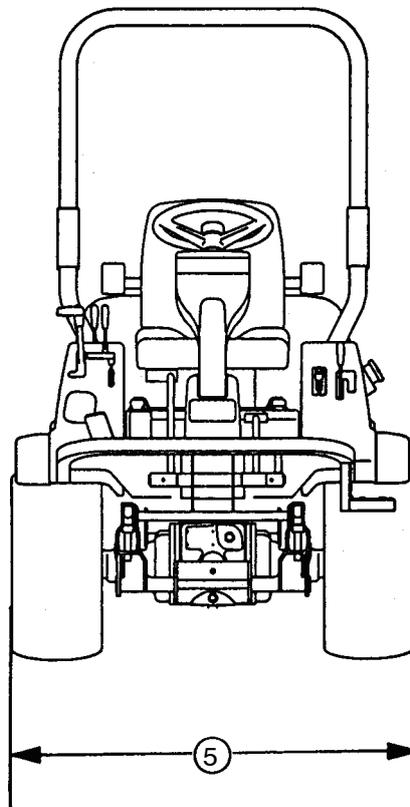
|     |                |                  |                  |                  |
|-----|----------------|------------------|------------------|------------------|
| 2WD | Dished In only | 1185 mm (46.65") | 1185 mm (46.65") | -----            |
| FWD | Dished In only | 1190 mm (46.85") | 1190 mm (46.85") | 1190 mm (46.85") |

Front Axle Outside to Outside:

|                    |            |                  |                  |                  |
|--------------------|------------|------------------|------------------|------------------|
| STD Tire 2WD & FWD |            |                  |                  |                  |
|                    | Dished In  | 1220 mm (48.03") | 1220 mm (48.03") | 1220 mm (48.03") |
|                    | Dished Out | 1370 mm (53.93") | 1370 mm (53.93") | 1370 mm (53.93") |
| Large Tire         |            |                  |                  |                  |
|                    | Dished In  | 1310 mm (51.57") | 1310 mm (51.57") | 1310 mm (51.57") |
|                    | Dished Out | 1370 mm (53.93") | 1370 mm (53.93") | 1370 mm (53.93") |

(6) MINIMUM GROUND CLEARANCE

|            |                |                |                |
|------------|----------------|----------------|----------------|
| STD Tires  | 140 mm (5.51") | 140 mm (5.51") | 140 mm (5.51") |
| Large Tire | 150 mm (5.90") | 150 mm (5.90") | 150 mm (5.90") |



# MINIMUM HARDWARE TIGHTENING TORQUES

IN FOOT POUNDS (NEWTON-METERS) FOR NORMAL ASSEMBLY APPLICATIONS

## INCH HARDWARE AND LOCKNUTS

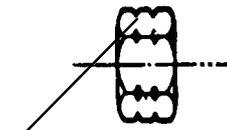
| NOMINAL SIZE | SAE GRADE 2               |                    | SAE GRADE 5               |                    | SAE GRADE 8               |                    | LOCKNUTS        |                 | NOMINAL SIZE |
|--------------|---------------------------|--------------------|---------------------------|--------------------|---------------------------|--------------------|-----------------|-----------------|--------------|
|              | 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          | 55* (6.2)                 | 72* (8.1)          | 86* (9.7)                 | 112* (13)          | 121* (14)                 | 157* (18)          | 61* (6.9)       | 86* (9.8)       | 1/4          |
| 5/16         | 115* (13)                 | 149* (17)          | 178* (20)                 | 229* (26)          | 250* (28)                 | 324* (37)          | 125* (14)       | 176* (20)       | 5/16         |
| 3/8          | 17 (23)                   | 22 (30)            | 26 (35)                   | 34 (46)            | 37 (50)                   | 48 (65)            | 19 (26)         | 26 (35)         | 3/8          |
| 7/16         | 27 (37)                   | 35 (47)            | 42 (57)                   | 54 (73)            | 59 (80)                   | 77 (104)           | 30 (41)         | 42 (57)         | 7/16         |
| 1/2          | 42 (57)                   | 54 (73)            | 64 (87)                   | 83 (113)           | 91 (123)                  | 117 (159)          | 45 (61)         | 64 (88)         | 1/2          |
| 9/16         | 60 (81)                   | 77 (104)           | 92 (125)                  | 120 (163)          | 130 (176)                 | 169 (229)          | 65 (88)         | 92 (125)        | 9/16         |
| 5/8          | 83 (112)                  | 107 (145)          | 128 (174)                 | 165 (224)          | 180 (244)                 | 233 (316)          | 90 (122)        | 127 (172)       | 5/8          |
| 3/4          | 146 (198)                 | 189 (256)          | 226 (306)                 | 293 (397)          | 319 (432)                 | 413 (560)          | 160 (217)       | 226 (306)       | 3/4          |
| 7/8          | 142 (193)                 | 183 (248)          | 365 (495)                 | 473 (641)          | 515 (698)                 | 667 (904)          | 258 (350)       | 364 (494)       | 7/8          |
| 1            | 213 (289)                 | 275 (373)          | 547 (742)                 | 708 (960)          | 773 (1048)                | 1000 (1356)        | 386 (523)       | 545 (739)       | 1            |

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

### IDENTIFICATION CAP SCREWS AND CARRIAGE BOLTS



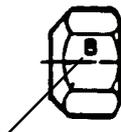
### LOCKNUTS



GRADE IDENTIFICATION  
 GRADE A NO NOTCHES  
 GRADE B ONE CIRCUMFERENTIAL NOTCH  
 GRADE C TWO CIRCUMFERENTIAL NOTCHES



GRADE IDENTIFICATION  
 GRADE A NO MARKS  
 GRADE B THREE MARKS  
 GRADE C SIX MARKS  
 MARKS NEED NOT BE LOCATED AT CORNERS



GRADE IDENTIFICATION

GRADE A NO MARK  
 GRADE B LETTER B  
 GRADE C LETTER C