MAULDIN

BY CALDER BROTHERS

# *PARTS & SERVICE MANUAL*

# *MODEL 1450/3000/4000*

**Document: 1450/3000/4000 Parts & Service Manual Rev. 1.5**

**Covers Serial Number Range:**

**018-XC14CGH1YG-00018 thru _____**

**SOLD & SERVICED BY**

# TABLE OF CONTENTS

**ITEM** **PAGE**

# ***NOTES***

Serial Number Range: 018-XC14CGH1YG-00018 thru _____

# IMPORTANT SAFETY INFORMATION

Most accidents involving roller maintenance are caused by failure to observe basic safety rules or precautions. An accident can often be avoided by recognizing potentially hazardous situations before an accident occurs.

Read and understand all safety precautions and warnings, before operating or performing lubrication and maintenance on this roller.

***WARNING***: IMPROPER OPERATION, LUBRICATION OR MAINTENANCE OF THIS ROLLER CAN BE DANGEROUS AND COULD RESULT IN INJURY OR DEATH.

***WARNING***: DO NOT OPERATE THIS ROLLER UNTIL YOU READ AND UNDERSTAND THE INSTRUCTIONS IN THE ***OPERATION SECTION*** OF THIS MANUAL.

***WARNING***: DO NOT PERFORM ANY LUBRICATION AND MAINTENANCE ON THIS ROLLER UNTIL YOU READ AND UNDERSTAND THE INSTRUCTIONS IN THE ***MAINTENANCE SECTION*** OF THIS MANUAL.

# SERVICE WARNING

Operating personnel must perform service checks regularly to be sure systems are in good operating condition. If abnormal conditions are detected, inform maintenance personnel immediately.

Check all systems for proper operation. Check chassis and all components for physical damage and security of all fasteners and connectors.

Serial Number Range: 018-XC14CGH1YG-00018 thru _____

# FLUID CAPACITIES AND RECOMMENDATIONS

| FLUID | CAPACITY | RECOMMENDATION |
|---|---|---|
| Engine oil | Varies with engines | High quality CC/CD multi-grade lubricating oil. Above 14 deg. F use 15W40 or 20W40. |
| Hydraulic | 7 U.S gal | High quality anti-wear hydraulic oil (Original equipment, Gulf C-3 torque fluid). |
| Grease | As required | N.G.L.I. consistency #2, high temperature, anti-friction, bearing lubricating grease. |
| Engine coolant | Varies with engines | High quality<br>Above 14 deg. F |
| Gasoline<br>Diesel | 3 ½ U.S gal<br>3 ½ U.S. gal | Regular, unleaded, non-alcohol blend.<br>above 40°, (5° C), use No. 2-D.<br>Below 40°, (5° C), use No. 1-D. Power loss up to 4% can be expected due to lower viscosity |

# LUBRICATION AND SERVICE PROCEDURES

## Air Filters

***IMPORTANT***: Service the engine air filters only when the need is indicated by the air cleaner service indicator, (if equipped), or in accordance with the preventative maintenance decal. Excessive service will cause premature wear.

1. Engine Main Element

   a. Unbuckle clips to remove element container end cap.
   b. Pull gently to remove main element.
   c. Use compressed air with an element-cleaning nozzle

***IMPORTANT:*** Main element should be replaced after six cleanings or 500 hours use.

***IMPORTANT***: Do not attempt to clean element using a standard air nozzle. Do not strike element on a hard surface. Either action will damage the element.

Serial Number Range: 018-XC14CGH1YG-00018 thru _____

2. Engine Safety Element

***IMPORTANT***: Do not remove safety element under heavy dust or blowing conditions (in the field). Even slight amounts of dust entering the engine can lead to premature wear.

Inspect safety element for contamination and physical damage.

***IMPORTANT***: When safety element is dirty, it should be replaced. Do not attempt to clean.

## Battery

***CAUTION***: BATTERY ELECTROLYTE IS A CAUSTIC ACID. KEEP IT AWAY FROM SKIN AND EYES. IF CONTACT OCCURS, FLUSH THE AFFECTED AREA WITH LOTS OF WATER.

***CAUTION***: DISCONNECT GROUND CABLE FROM THE NEGATIVE BATTERY POST BEFORE ATTEMPTING TO SERVICE OR REMOVE BATTERY.

1. Removal:

   a. Disconnect ground (negative) cable from battery (-) terminal.
   b. Remove battery retaining rod.
   c. Disconnect positive cable from battery (+) terminal.

2. Cleaning:

   a. Remove battery, following correct procedures.
   b. Thoroughly clean terminals with a battery-cleaning tool.
   c. Mix a paste solution of baking soda and water and apply to battery and terminals.
   d. Rinse battery and roller area near battery liberally with water.

3. Installation:

   a. Clean battery, following correct procedures.
   b. Be certain battery area is clean and clear of debris.
   c. Install battery and retaining rod.
   d. Connect positive (+) cable to terminal.

***CAUTION***: DO NOT CONNECT NEGATIVE (GROUND) TERMINAL FIRST. ARCING CAN OCCUR, POSSIBLY CAUSING SEVERE BURNS AND/OR BATTERY EXPLOSION.

Serial Number Range: 018-XC14CGH1YG-00018 thru _____

e. Connect negative (-) terminal

4. Charging:

Connect charger leads to proper battery terminals then proceed according to charger manufacturer's instructions.

5. Storage:

a. Remove and clean battery, following correct procedures.
b. Bring battery to full charge, following charger manufacturer's instructions.
c. Store in a cool dry place where there is no possibility of freezing.

***NOTE***: Check battery every 30 days during storage and return to full charge if necessary.

## Engine and Engine Filters

1. Initial Break-In:

Proper break-in procedures are a must to realize maximum engine power output and longest engine life. Engine should show noticeable power gain through the first 30 hours service. Power gain will continue until approximately 200 hours if properly broken-in.

***IMPORTANT***: Do not operate engine above 3/4 throttle, for the first 25 hours.

***IMPORTANT***: Use full throttle only for short intervals during the first 25 hours.

***IMPORTANT***: Do not "lug" engine during the break-in period.

***IMPORTANT***: Replace the original oil and oil filters after the first 20 hours of operation.

2. Fuel Filters:

Both fuel filters are disposable.

***CAUTION***: BOTH DIESEL FUEL AND GASOLINE ARE HIGHLY FLAMMABLE AND EXPLOSIVE UNDER CERTAIN CONDITIONS. DO NOT SMOKE OR ALLOW SPARKS OR OPEN FLAME WHEN HANDLING.

Serial Number Range: 018-XC14CGH1YG-00018 thru _____

To Change:

a) Stop engine. Wait 15 minutes for engine and surrounding parts to cool before proceeding.
b) Unscrew and discard existing filters.
c) Fill new filter with clean fuel.
d) Lightly coat the seal ring with oil, then screw on filter until seal meets flange.
e) Tighten an additional 1/2 to 3/4 turns by hand.

***IMPORTANT***: Do not over tighten.

3. Oil and Oil Filter Changing:

a) Stop engine. Wait 15 minutes or engine oil to cool before proceeding.
b) Drain crankcase.
c) Unscrew and discard existing filters.
d) Fill new elements with fresh oil.
e) Lightly coat the seal rings with oil, and then screw on filters until seals meet flanges.
f) Tighten an additional 1/2 to 3/4 turns by hand.
***IMPORTANT***: Do not over tighten.
g) Fill crankcase to correct level.
h) Start engine and run at low idle. Have an assistant visually check seal areas for leaks.
i) Stop engine. Wait a few minutes, and then check engine oil level once again.

## Hydraulic System

Hydraulic Fluid Change:

a) Stop engine. Allow system pressure to drop and remove filler cap.
b) Remove suction hose and drain into appropriate container for disposal.
c) Remove hydraulic filter. Replace filter element and reinstall.
d) Replace fluid to approximately 1" from top of reservoir. Operate roller and recheck level.
e) Check visually for oil leaks.

Serial Number Range: 018-XC14CGH1YG-00018 thru _____

***NOTE***: Each roller should be thoroughly inspected after each use and during maintenance cycle for:

a) Tightness of mounting bolts and attaching hardware on bearings, couplings, frame, etc.
b) Leaks, cracks and loose electrical and fluid fittings.
c) Malfunctioning indicators or controls.
d) Worn or damaged tires.
e) Cleanliness.

## TROUBLESHOOTING

1. General:

- Proper troubleshooting begins with an organized approach to the problem at hand. Begin with investigation of the most probable cause, following the guidelines below.
- Study the problem thoroughly before taking action!
- Did warning signs precede the problem? If so, what were they? What would they indicate?
- Is scheduled maintenance current on all parts and systems involved?
- Has similar trouble occurred before? What action was taken at that time?
- Can engine be operated without further damage?

***CAUTION***: IF RUNNING INSPECTION MUST BE MADE, GET ASSISTANCE. OPERATOR SHOULD REMAIN SEATED ON ROLLER THROUGHOUT INSPECTION. SET PARKING BRAKE. MAKE SURE TRANSMISSION IS IN NEUTRAL POSITION.

- Check the most convenient things first.
- Don't begin major work before checking all other possibilities.
- Reconsider all known facts and clues before proceeding to more in-depth work.
- Correct the basic cause.

Serial Number Range: 018-XC14CGH1YG-00018 thru _____

- Remember, failure of a certain part may be caused by malfunction of another part or system

2. Troubleshooting chart:

The troubleshooting chart lists problems that might be encountered in the operation of the vehicle. The remedies listed may direct the repairman to a possible faulty component.

***WARNING***: THE TROUBLESHOOTING CHART AND PROCEDURES OUTLINED IN THIS SECTION SHOULD NOT BE ATTEMPTED BY OTHER THAN EXPERIENCED MECHANICS OR PERSONNEL UNDER THE DIRECT SUPERVISION OF AN EXPERIENCED MECHANIC. FAILURE TO COMPLY MAY RESULT IN DAMAGE TO EQUIPMENT AND/OR INJURY OR DEATH TO PERSONNEL.

A. Engine

For engine troubleshooting see charts indicating faults and recommended repair procedures. Refer to engine Manufacturer's Operation and Maintenance Manual.

If your particular problem is not covered or you are unsure of what steps to take, contact your dealer for assistance.

B. Transmission

1. Vehicle fails to move under power:

a) Inadequate oil level in hydraulic reservoir.
b) Control cable broken or loose.
c) Driveline mechanical failure.
d) Inadequate oil flow through transmission suction filter.

2. Vehicle moves in neutral:

a) Stroke control needs adjustment.
b) Control cable damage.

For detailed troubleshooting information on hydrostatic transmission, refer to Trouble Shooting Manual, Sundstrand Hydrostatic Transmissions, available from a Sundstrand representative or dealer.

Serial Number Range: 018-XC14CGH1YG-00018 thru _____

C. Electrical System

| Engine Status | Voltmeter Reading | Indicates | To Correct |
|---|---|---|---|
| Running | 13.5 - 14 Volts | Normal Condition | |
| Running | Less than 13.5 or more than 14 Volts | Alternator or Regulator Malfunction | Contact Dealer |
| Won't Start | 12-12.5 Volts | Weak battery | Charge |
| Won't Start | Less than 12 Volts | Weak battery or Defective Cell | Charge or Replace |
| Stopped | Excessive current Draw | Short Circuit | Inspect System |

D. Hydraulic System

- Thoroughly review description of hydraulic system.
- Use logical steps to determine cause of malfunction.
- Identify the function or functions that require troubleshooting.
- If possible, trace malfunction to source: pump, control, motor or cylinder.
- Determine pressure operating the function as specified:

**HYDRAULIC SYSTEM PRESSURES**

Priority circuit, Sundstrand pump: 900psi
Main circuit Sundstrand pump: 2500psi

**HYDRAULIC SYSTEM FLOWS**

Priority circuit, Sundstrand pump: 2gpm
Main circuit, Sundstrand pump: 8gpm

Serial Number Range: 018-XC14CGH1YG-00018 thru _____

(Actual flow determined by engine rpm's)

| Problem | Possible Cause | To Correct |
|---|---|---|
| No Power or Inadequate Power | Worn or Malfunctioning pump or motor. | Repair or replace pump or motor. |
| | Stuck relief valve cartridge. | Repair or replace. |
| | Low system pressure caused by worn pump. | Repair or replace pump. |
| Surging of hydraulic items | Air in system due to low level of oil, cavitating pump, leaky fittings, pinched hose, etc. | Add oil, tighten fittings, reroute hose(s). |

## Removal and Installation of Equipment

1. Preparation

***WARNING***: BEFORE PERFORMING INSTALLATION OR REMOVAL PROCEDURES, THE FOLLOWING PRECAUTIONS MUST BE ADHERED TO IN ORDER TO PREVENT POSSIBLE DAMAGE TO EQUIPMENT OR INJURY OR DEATH TO PERSONNEL.

***WARNING***: TURN THE ENGINE OFF BY TURNING THE IGNITION SWITCH TO OFF. DISCONNECT THE BATTERY CABLES BEFORE SERVICING THE ENGINE START OR STOP CIRCUITS. DISCONNECTING BATTERY NEGATIVE GROUND BEFORE REMOVING OR CONNECTING THE POSITIVE BATTERY CABLE CAN PREVENT SHORT CIRCUITING OF THE BATTERY BY TOOLS.

Serial Number Range: 018-XC14CGH1YG-00018 thru _____

## Recommended Preventive Maintenance Intervals

| INTERVAL | ITEM | PROCEDURE |
|---|---|---|
| Initial Break-In (After 1st 50 hours) | Hydraulic Filter | Change |
| | Engine Oil & Filter | Change |
| | Hydraulic Leaks | Inspect & Tighten as required |
| | Loose Nuts & Bolts | Inspect & Tighten as required |
| Daily or 10 hours | Hydraulic oil level | Inspect & add as necessary |
| | Engine oil level | Inspect & add as necessary |
| | Engine air cleaner system | Check service indicator and/or inspect |
| | Engine coolant level system | Inspect & add as necessary |
| | Radiator | Clean and inspect |
| | Fuel system | Drain water from separator |
| 100 hours | All 10 hour Items | As above |
| | Steering rod ends | Grease |
| | Bearings | Grease |
| | Tires (optional tow package) | Check pressure |
| 250 hours | All 100 hour items | As above |
| | Engine air cleaner | Replace element |
| | Engine crankcase | Drain and refill* |
| | Engine oil filter | Replace* |
| | Fuel tank | Drain water and sediment |
| | Hydraulic filter | Replace* |
| 500 hours | All 250 hour items | As above |
| | Fuel filters | Replace |
| | Engine | Have serviced by authorized Dealer |
| 1000 hours | All 500 hour items | As above |
| | Hydraulic system | Drain and refill |

*Change after first 50 hours service, every 250 thereafter.

Serial Number Range: 018-XC14CGH1YG-00018 thru _____

# MAULDIN™

## CALDER BROTHERS CORPORATION

### (LIMITED) PRODUCT WARRANTY

Calder Brothers Corporation warrants that the Roller under this program will be free from defects in material and workmanship for a period of (12) twelve months from date of installation. Written notice of any claimed defect must be given to Calder Brothers Corporation within the warranty period and within (30) thirty days after such defect is discovered. Liability under this warranty is limited to replacing or repairing, at Calder Brothers Corporation's election, any part or parts deemed defective after examination by Calder Brothers Corporation or an Authorized Service Representative. Any roller or any of its parts returned by customer to Calder Brothers Corporation or an Authorized Service Representative via prepaid transportation and which is found to be defective will be repaired or replaced and returned to the customer via prepaid surface transportation within the continental United States. Should any part be found not defective, Calder Brothers Corporation or an Authorized Service Representative may charge inspection and handling to the customer.

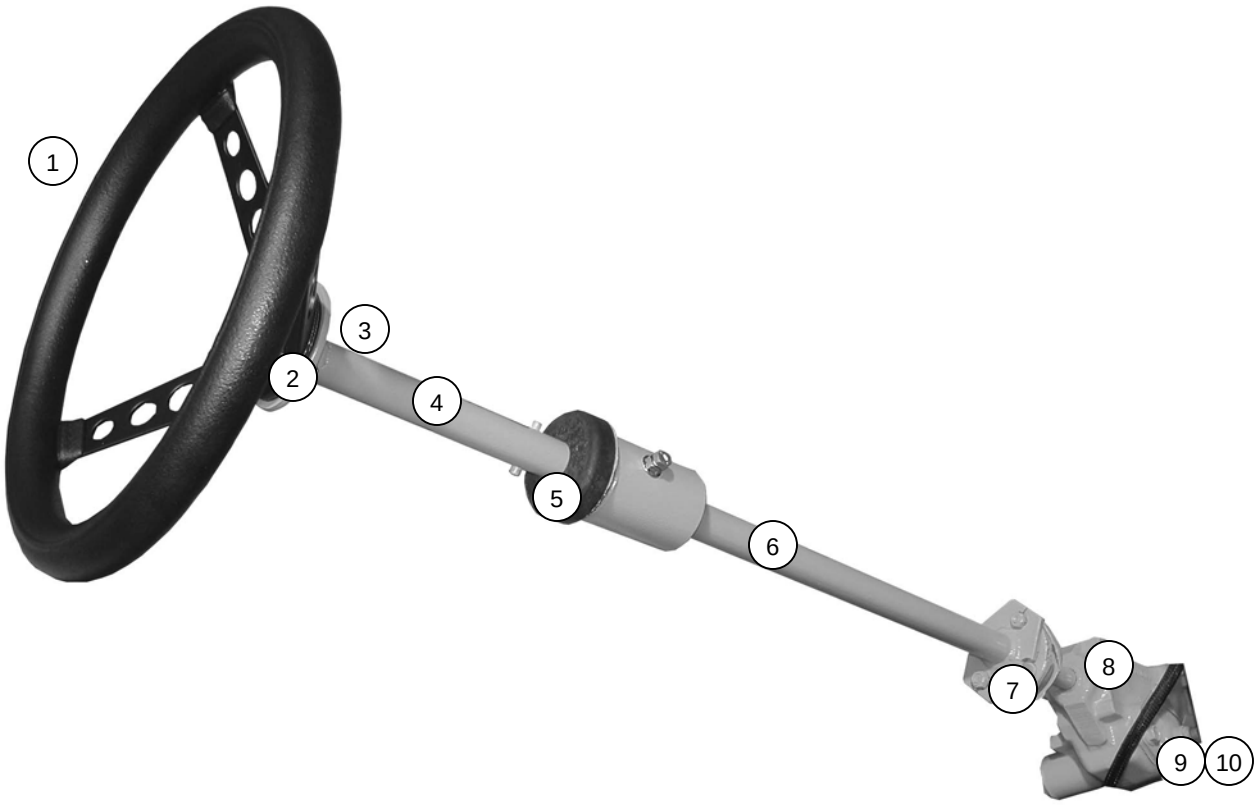
**EXCLUSIONS:**
This warranty does not apply to routine wearable parts of the Mauldin roller such as seals, points, plugs, hoses or similar items. This warranty does not extend to any roller or part replaced or repaired under this warranty. This warranty does not cover any repair or replacement labor of any part or parts found defective after examination by Calder Brothers Corporation or an Authorized Service Representative. This warranty does not apply to defects caused by casualty or unreasonable use, including faulty repairs by others and failure to provide reasonable and necessary maintenance.

THIS WARRANTY SET FORTH HEREIN IS IN LIEU OF AND EXCLUDES ANY AND ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, ARISING BY OPERATION OF LAW OR OTHERWISE, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, AND CUSTOMER WAIVES ANY OBLIGATION OF LIABILITY OF CALDER BROTHERS CORPORATION ARISING IN TORT OR STRICT LIABILITY IN TORT, OR FOR LOSS OR USE, REVENUE OR PROFIT WITH RESPECT TO MAULDIN ROLLER AND/OR PARTS FOR ANY LIABILTIY OF CUSTOMER TO ANY THIRD PARTY, OR FOR OTHER DIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES.

# ***NOTES***

Serial Number Range: 018-XC14CGH1YG-00018 thru _____

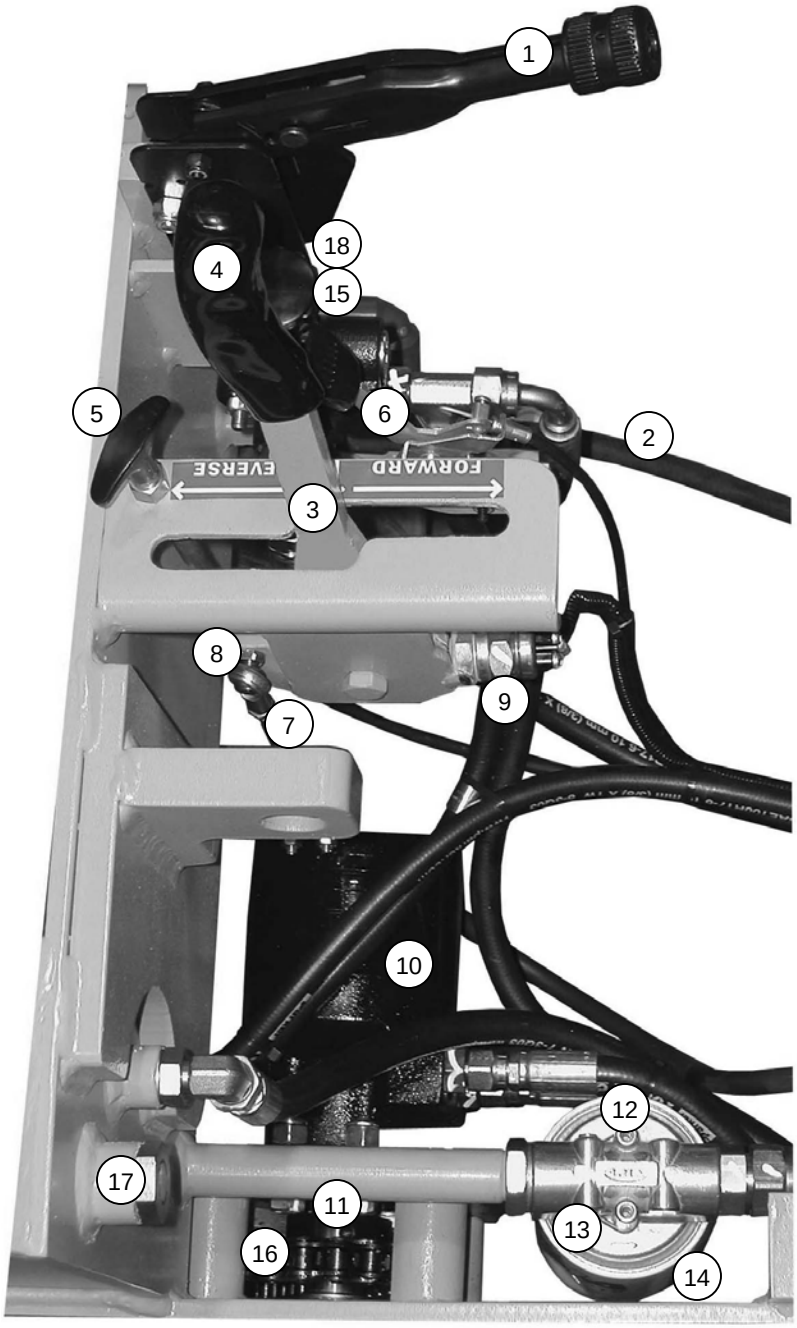
# STEERING ASSEMBLY




1. Steering Wheel ..... 050-0030
2. Steering Wheel Mounting Disk (Rubber) ..... 015-0074
3. Steering Shaft Assembly ..... 082-0013
   4. Steering Shaft ..... 082-0013A
   5. Steering Shaft Bushing ..... 050-0004
   6. Steering Column ..... 082-0008
7. Control Box Mounting Bushing ..... 050-0068
8. Steering Control Box ..... 050-0031
9. Steering Box Control Arm (from steering box to linkage assy) (not shown) ... 050-0032
10. Steering Linkage Assembly (not shown) ..... *See Drum-Front*

Serial Number Range: 018-XC14CGH1YG-00018 thru _____

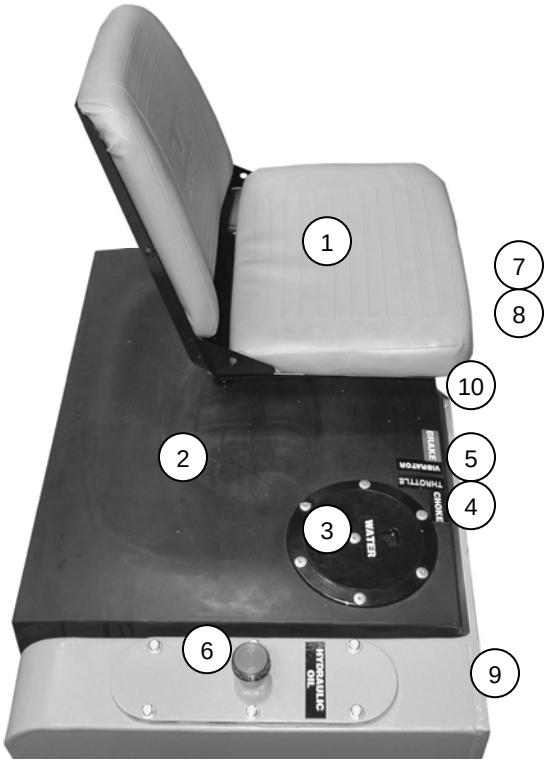
# DRIVE COMPARTMENT




1. Brake Handle.....050-0018
2. Brake Cable.....050-0008
3. Drive Handle.....083-0024
4. Drive Handle Grip .....050-0334
5. Choke Cable.....050-0025
6. Throttle Cable.....050-0024
7. Drive Cable.....050-0008
8. Drive Cable Ball Joint .....030-0237
9. Neutral Safety Switch .....020-0002
10. Drive Motor.....013-0010
11. Drive Motor Shaft Sprocket .....015-0014
12. Hydraulic Filter Assembly .....021-0001
13. Hydraulic Filter Head .....021-0087B
14. Hydraulic Filter Element.....021-0002
15. Vibrator Valve.....017-0005
16. Drive Chain Assembly .....*See Drum-Rear*
17. Hydraulic Tank Sight Guide.....*See Tank Assy*
18. Brake Handle Mounting Yoke...030-0179

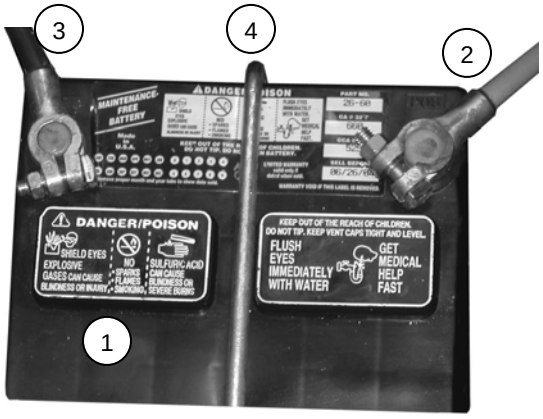
Serial Number Range: 018-XC14CGH1YG-00018 thru _____

## SEAT & TANK ASSEMBLY




1. Seat Assembly ..... 050-0017
2. Water Tank Assembly ..... 081-0029
   3. Inspection Cap ..... 050-0026
   4. Ball Valve ..... 017-0043
   5. Water Tank Filter ..... 021-0059
6. Hydraulic Tank Breather Cap .... 050-0016
7. Fuel Tank (not shown) ..... 050-0027
   8. Fuel Tank Cap (not shown) ..... 050-0188
9. Hydraulic Tank Sight Guide ..... 060-0068
10. Seat Stand ..... 082-0079

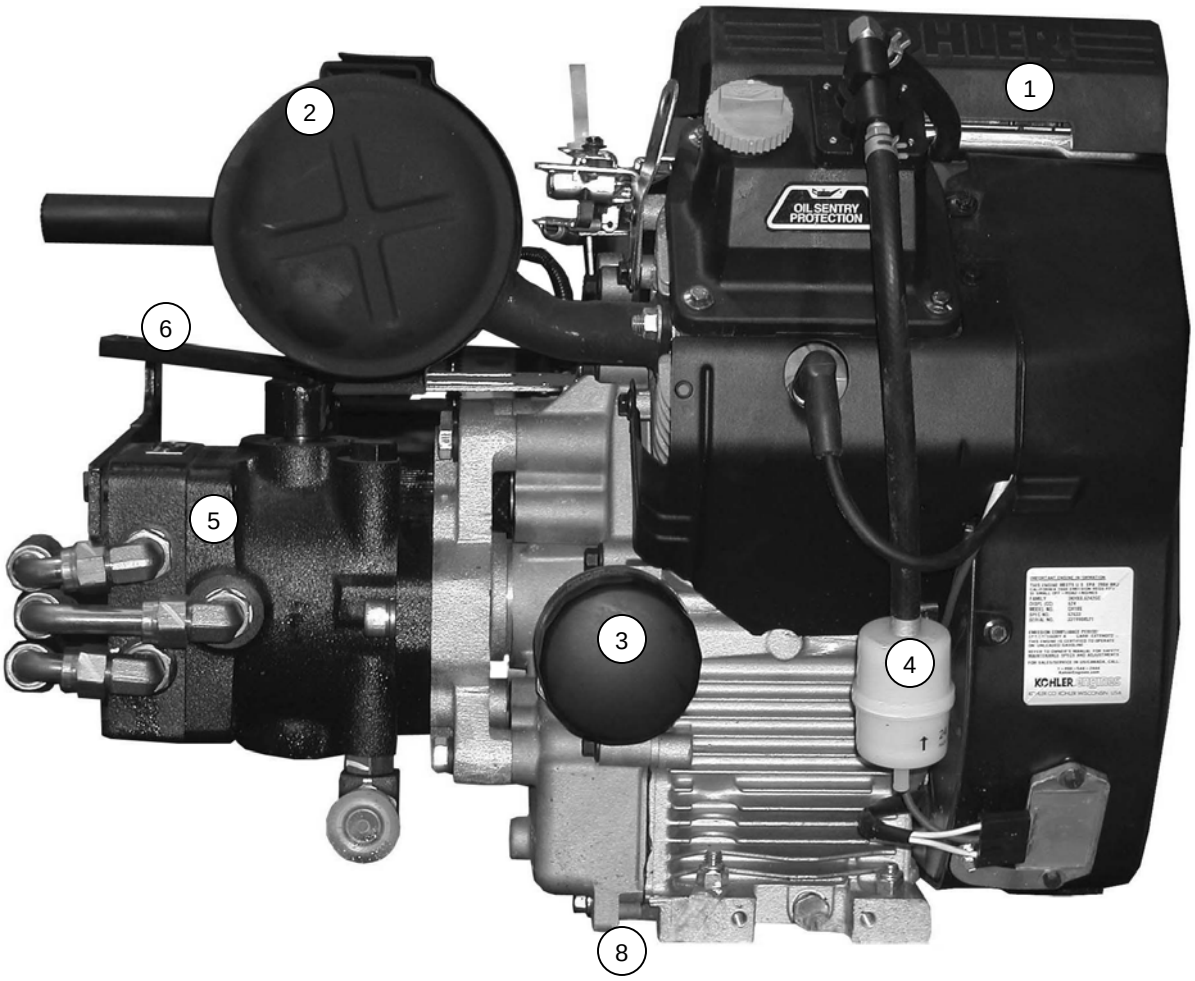
## BATTERY ASSEMBLY




1. Battery ..... 020-0019
2. Battery Cable (Positive) ..... 020-0361
3. Battery Cable (Negative) ..... 020-0318
4. Battery Retaining Rod ..... 093-0046

Serial Number Range: 018-XC14CGH1YG-00018 thru _____

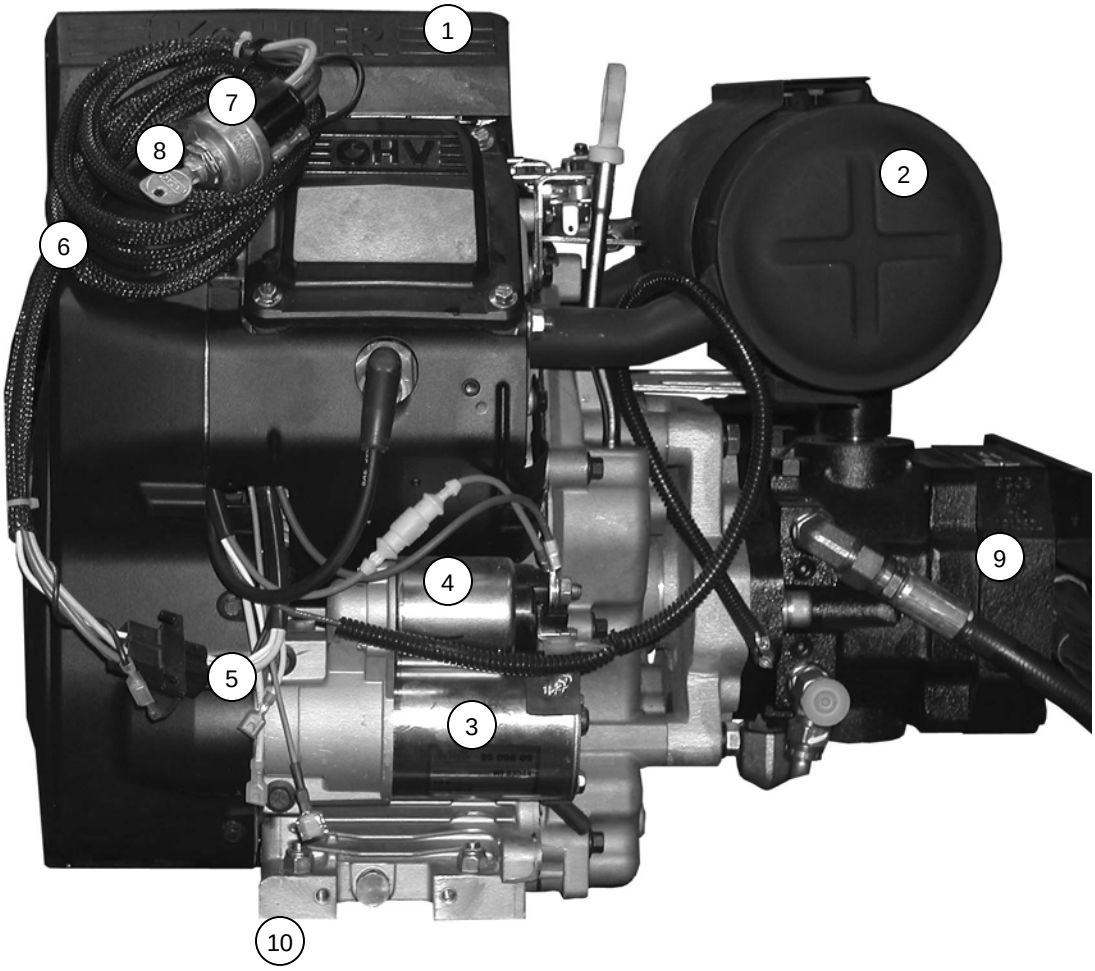
# ENGINE ASSEMBLY – FRONT




1. Kohler CH18S Engine ..... 010-0275
   2. Muffler ..... 010-0302
   3. Engine Oil Filter ..... 021-0026
   4. Fuel Filter ..... 021-0027
5. Main Drive Pump ..... 011-0138
6. Drive Pump Control Arm ..... 082-0021
7. Drive Pump Control Arm Ball Joint (not shown) ..... 030-0237
8. Rubber Engine Mount (x4) (not shown) ..... *See Engine-Rear*

Serial Number Range: 018-XC14CGH1YG-00018 thru _____

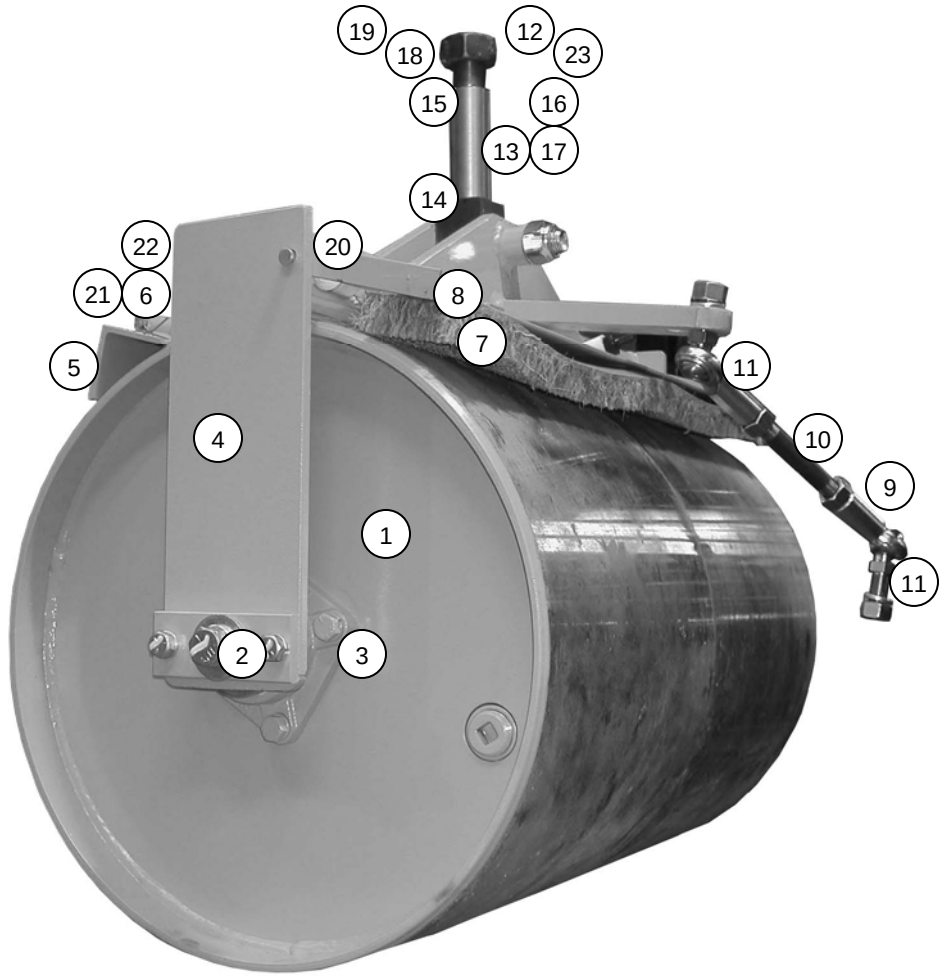
# ENGINE ASSEMBLY – REAR




1. Kohler CH18S Engine ..... *See Engine-Front*
2. Muffler ..... *See Engine-Front*
3. Starter ..... 010-0375
4. Starter Solenoid ..... 020-0085
5. Engine Wiring Harness (Engine Side) ..... 010-0312A
6. Engine Wiring Harness (Ignition Switch Side) ..... 010-0312
7. Ignition Switch ..... 020-0088
8. Ignition Keys (Set) ..... 010-0209
9. Main Drive Pump ..... *See Engine-Front*
10. Rubber Engine Mount (x4) (not shown) ..... 050-0260

Serial Number Range: 018-XC14CGH1YG-00018 thru _____

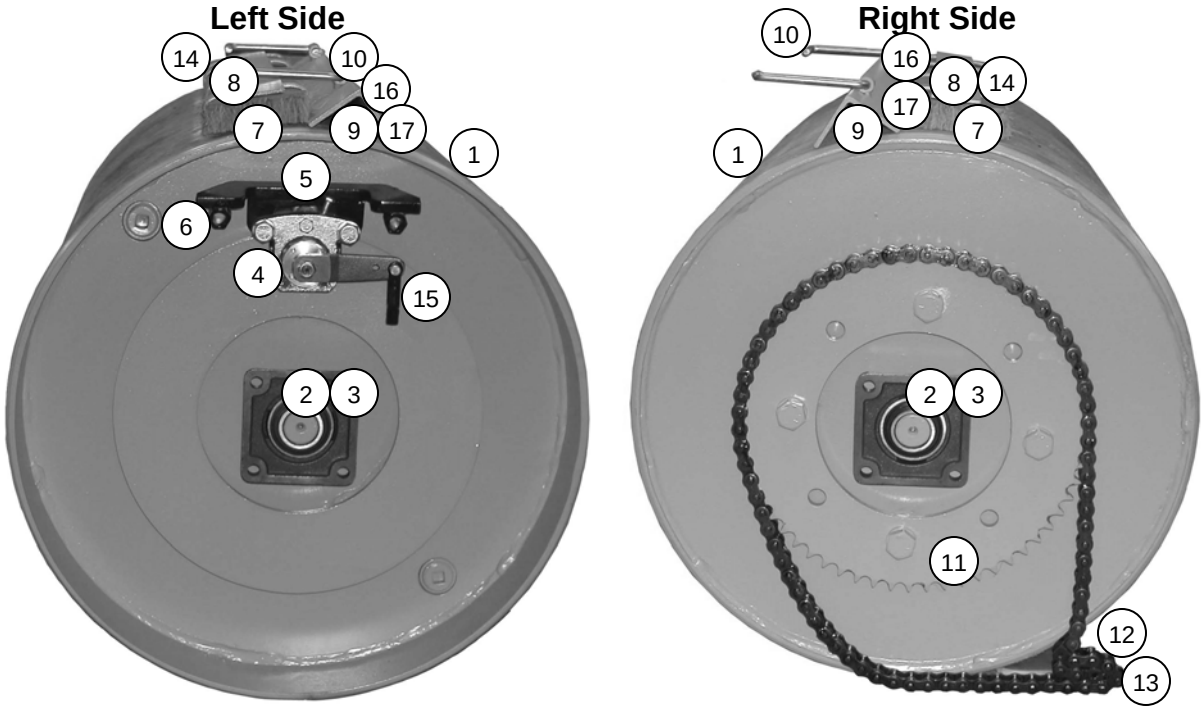
# DRUM ASSEMBLY - FRONT




1. Front Drum Assembly (1450) ..... 082-0014
   Front Drum Assembly (3000) ..... 082-0015
   Front Drum Assembly (4000) ..... 082-0016
   2. Front Drum Shaft ..... 083-0008
   3. Drum Shaft Bearing (x4) ..... 018-0001
4. Front Drum Mounting Frame ..... 082-0017
5. Front Drum Scraper ..... 082-0018
6. Scraper Hanger (x2) ..... 083-0011
7. Front Mat ..... 083-0009
8. Front Mat Mounting Frame ..... 083-0027
9. Steering Linkage Assembly ..... 082-0012A
   10. Steering Linkage Rod ..... 082-0012
   11. Steering Linkage Ball Joint (x2) ..... 050-0009
12. King Pin Assembly ..... 083-0003A
   13. King Pin ..... 083-0003
   14. Thrust Washer (not shown) ..... 083-0002
   15. Cover Washer (not shown) ..... 083-0004
   16. King Pin Bearing (x2) *(not shown)* ..... 018-0030
   17. King Pin Race (x2) *(not shown)* ..... 018-0024
   18. Castle Nut ..... 083-0005
   19. Cotter Pin (not shown) ..... 030-0202
20. Water Spray Pipe (Front) ..... 083-0029
21. Scraper Spring (x2) ..... 050-0006
22. Scraper Spring Retaining Washer (push-on) (x2) ..... 030-0359
23. King Pin Dust Cover *(not shown)* ..... 050-0266

Serial Number Range: 018-XC14CGH1YG-00018 thru _____

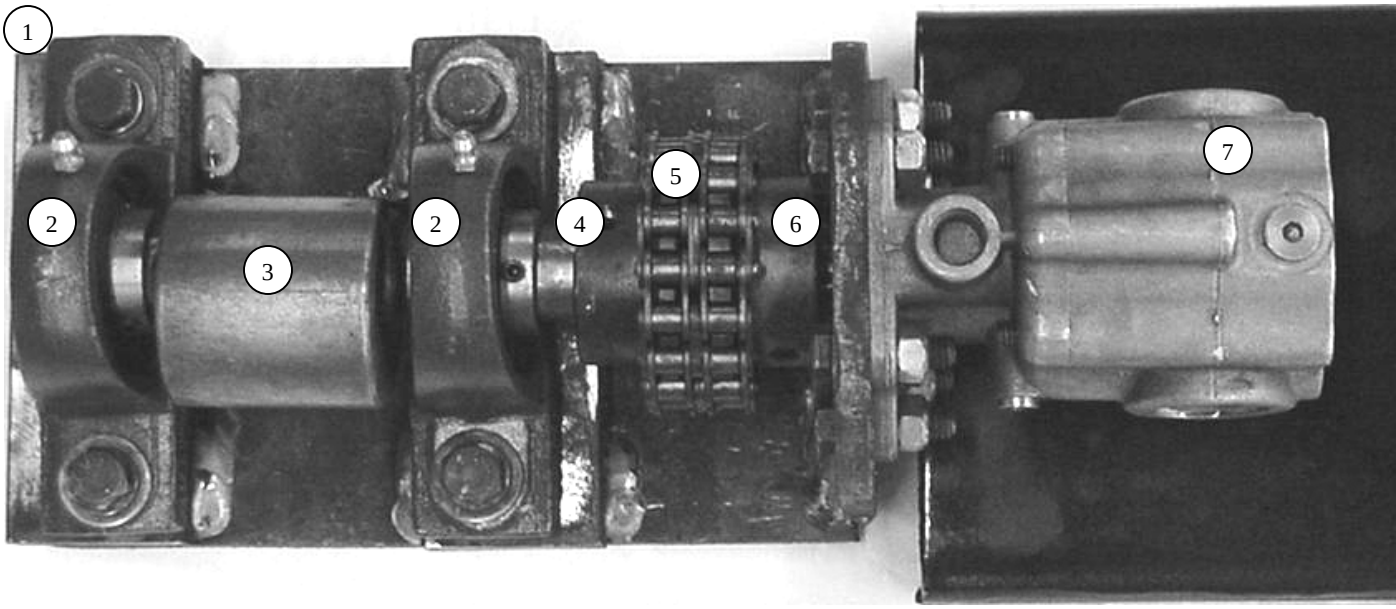
# DRUM ASSEMBLY – REAR




1. Rear Drum Assembly (1450 Model) ..... 082-0003
   Rear Drum Assembly (3000 Model) ..... 082-0004
   Rear Drum Assembly (4000 Model) ..... 082-0005
2. Rear Drum Shaft ..... 082-0071
3. Drum Shaft Bearing (x2) ..... *See Drum-Front*
4. Brake Assembly ..... 050-0029
5. Brake Pads ..... 050-0060
6. Brake Assembly Mounting Bracket ..... 082-0051
7. Rear Mat ..... 083-0010
8. Rear Mat Mounting Frame ..... 083-0028
9. Rear Drum Scraper ..... 082-0019
10. Scraper Hanger (x2) ..... *See Drum-Front*
11. Rear Drum Drive Sprocket ..... 015-0003
12. Drive Chain Assembly ..... 081-0015
13. Drive Chain Master Link ..... 015-0052
14. Water Spray Pipe (Rear) *(not shown)* ..... 083-0030
15. Brake Arm Mounting Yoke ..... 030-0179
16. Scraper Spring (x2) ..... *See Drum-Front*
17. Scraper Spring Retaining Washer (push-on) (x2) ..... *See Drum-Front*

Serial Number Range: 018-XC14CGH1YG-00018 thru _____

# VIBRATOR ASSEMBLY




1. Vibrator Assembly Complete ..... 081-0025
   2. Pillow Block Bearing ..... 018-0002
   3. Vibrator Shaft ..... 092-0074
   4. Vibrator Shaft Coupling Half ..... 015-0033
   5. Coupling Chain ..... 015-0044
   6. Vibrator Motor Coupling Half ..... 015-0119
   7. Vibrator Motor ..... 013-0007

# ***NOTES***