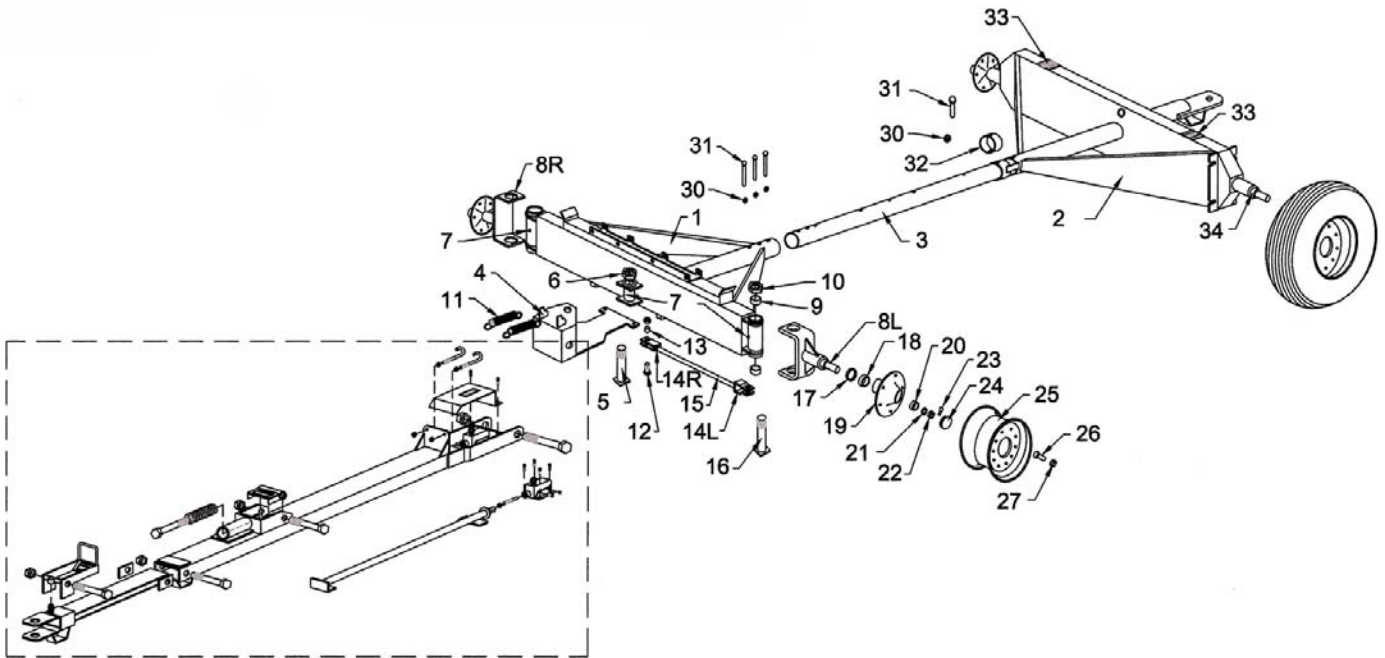


# OPERATOR'S MANUAL

Set-Up Instructions and Parts Catalog for

## Model 1688 Running Gear



**16 Ton Capacity**

**Short Turn Design  
Optional Hydraulic Drum Brakes**



**J. & M. Manufacturing Co., Inc.**  
P.O. Box 547  
Fort Recovery, OH 45846

Phone: (419) 375 2376 Fax: (419) 375-2708  
E-mail: [sales@jm-inc.com](mailto:sales@jm-inc.com) Website: [www.jm-inc.com](http://www.jm-inc.com)

REV-08-20-09

**TO THE DEALER:**

Read manual instructions and safety rules. Make sure all items on the Dealer's Pre-Delivery and Delivery Check Lists in the Operator's Manual are completed before releasing equipment to the owner.

The dealer must complete the Warranty Registration Card attached to the front inside cover of this manual and return to J. & M. Mfg. Co., Inc. at the address indicated on the card. **Warranty claims will be denied if the Warranty Registration Card has not been completed and returned.**

**EXPRESS WARRANTY:**

J. & M. Mfg. Co. Inc. warrants against defects in construction or materials for a period of ONE year. We reserve the right to inspect and decide whether material or construction was faulty or whether abuse or accident voids our guarantee.

Warranty service must be performed by a dealer or service center authorized by J. & M. Mfg. Co. Inc. to sell and/or service the type of product involved, which will use only new or remanufactured parts or components furnished by J. & M. Mfg. Co. Inc. Warranty service will be performed without charge to the purchaser for parts or labor based on the Warranty Labor Times schedule. Under no circumstance will allowable labor times extend beyond the maximum hours indicated in the Warranty Labor Times schedule for each warranty procedure. The purchaser will be responsible, however, for any service call and/or transportation of the product to and from the dealer or service center's place of business, for any premium charged for overtime labor requested by the purchaser, and for any service and/or maintenance not directly related to any defect covered under the warranty. Costs associated with equipment rental, product down time, or product disposal are not warrantable and will not be accepted under any circumstance.

Each warranty term begins on the date of product delivery to the purchaser. Under no circumstance will warranty be approved unless (i) the product warranty registration card (attached to the inside of the Operator's Manual) has been properly completed and submitted to the equipment manufacturer. This Warranty is effective only if the warranty registration card is returned within 30 days of purchase.

This warranty does not cover a component which fails, malfunctions or is damaged as a result of (i) improper modification or repair, (ii) accident, abuse or improper use, (iii) improper or insufficient maintenance, or (iv) normal wear or tear. This warranty does not cover products that are previously owned and extends solely to the original purchaser of the product. Should the original purchaser sell or otherwise transfer this product to a third party, this Warranty does not transfer to the third party purchaser in any way. J. & M. Mfg. Co. Inc. makes no warranty, express or implied, with respect to tires or other parts or accessories not manufactured by J. & M. Mfg. Co. Inc. Warranties for these items, if any, are provided separately by their respective manufacturers.

**THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES OR CONDITIONS, EXPRESS, IMPLIED OR STATUTORY, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE.**

In no event shall J. & M. Mfg. Co. Inc. be liable for special, direct, incidental or consequential damages of any kind. The exclusive remedy under this Warranty shall be repair or replacement of the defective component at J. & M. Mfg. Co. Inc.'s option. This is the entire agreement between J. & M. Mfg. Co. Inc. and the Owner about warranty and no J. & M. Mfg. Co. Inc. employee or dealer is authorized to make any additional warranty on behalf of J. & M. Mfg. Co. Inc.

The manufacturer reserves the right to make product design and material changes at any time without notice. They shall not incur any obligation or liability to incorporate such changes and improvements in products previously sold to any customer, nor shall they be obligated or liable for the replacement of previously sold products with products or parts incorporating such changes.

**SERVICE:**

The equipment you have purchased has been carefully manufactured to provide dependable and satisfactory use. Like all mechanical products, it will require cleaning and upkeep. Lubricate the unit as specified. Observe all safety information in this manual and safety signs on the equipment.

For service, your authorized J. & M. dealer has trained mechanics, genuine J. & M. service parts, and the necessary tools and equipment to handle all your needs.

Use only genuine J. & M. service parts. Substitute parts may void the warranty and may not meet standards required for safe and satisfactory operation. Record the model number and serial number of your equipment in the spaces provided:

Serial # \_\_\_\_\_ Purchase Date: \_\_\_\_\_ Purchased From: \_\_\_\_\_

Please provide this information to your dealer to obtain the correct parts:

## MODEL 1688 - 16 TON RUNNING GEAR Specifications

|                                |                       |
|--------------------------------|-----------------------|
| Capacity                       | 16 Ton                |
| Weight (with tires)            | 2,250 lbs.            |
| Width (c/c of tires)           | 87"                   |
| Spindle Size                   | 3" diameter (sleeved) |
| Spring Balance Tongue          | Dual Spring           |
| Ground Height (to top of axle) | 26"                   |
| Rocking Bolster                | Optional              |
| Tongue, Adj. Quick Hitch       | Standard              |
| Adjustable Center Pole         | Standard              |
| Pull Through Rear Hitch        | Standard              |
| Hydraulic Brake System         | Two Wheel Drum        |
| Wheels – 8 Bolt                | 22.5 x 13.5           |
|                                |                       |
|                                |                       |
|                                |                       |





### GENERAL INFORMATION

#### TO THE OWNER:

The purpose of this manual is to assist you in operating and maintaining your running gear in a safe manner. Read it carefully. It furnishes information and instructions that will help you achieve years of dependable performance and help maintain safe operating conditions. If this machine is used by an employee or is loaned or rented, make certain that the operator(s), prior to operating:

1. Is instructed in safe and proper use.
2. Reviews and understands the manual(s) pertaining to this machine.

Throughout this manual, the term **IMPORTANT** is used to indicate that failure to observe can cause damage to equipment. The terms **CAUTION**, **WARNING** and **DANGER** are used in conjunction with the Safety-Alert Symbol, (a triangle with an exclamation mark), to indicate the degree of hazard for items of personal safety. When you see this symbol, carefully read the message that follows and be alert to the possibility of personal injury or death.

|   |   |
|---|---|
|  | This Safety-Alert symbol indicates a hazard and means <b>ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!</b>  |
|  | Indicates an imminently hazardous situation that, if not avoided, will result in death or serious injury.   |
|  | Indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury, and includes hazards that are exposed when guards are removed. |
|  | Indicates a potentially hazardous situation that, if not avoided, may result in minor or moderate injury.   |
| <b>IMPORTANT</b>  | Indicates that failure to observe can cause damage to equipment.  |
| <b>NOTE</b>   | Indicates helpful information.  |

## GENERAL INFORMATION (continued)

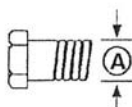
### BOLT TORQUE CHART

Always tighten hardware to these values unless a different torque or tightening procedure is listed for a specific application.


Fasteners must always be replaced with the same grade as specified in the manual parts list.

Always use the proper tool for tightening hardware. SAE for SAE hardware and Metric for metric hardware.

Make sure fastener threads are clean and you start the thread engagement properly. All torque values are given to specification used on hardware defined by SAE J1701 & J1701M (Jul 96).




**SAE SERIES TORQUE CHART**




SAE Bolt Head Identification

**SAE Grade 2 (No Dashes)**

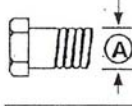


**SAE Grade 5 (3 Radial Dashes)**




**SAE Grade 8 (6 Radial Dashes)**

| Diameter (Inches) <sup>(A)</sup> | Wrench Size | MARKING ON HEAD |     |          |     |          |      |
|----------------------------------|-------------|-----------------|-----|----------|-----|----------|------|
|                                  |             | SAE 2           |     | SAE 5    |     | SAE 8    |      |
|                                  |             | Lbs.-Ft.        | N-m | Lbs.-Ft. | N-m | Lbs.-Ft. | N-m  |
| 1/4                              | 7/16"       | 6               | 8   | 10       | 13  | 14       | 18   |
| 5/16                             | 1/2"        | 12              | 17  | 19       | 26  | 27       | 37   |
| 3/8                              | 9/16"       | 23              | 31  | 35       | 47  | 49       | 67   |
| 7/16                             | 5/8"        | 36              | 48  | 55       | 75  | 78       | 106  |
| 1/2                              | 3/4"        | 55              | 75  | 85       | 115 | 120      | 163  |
| 9/16                             | 13/16"      | 78              | 106 | 121      | 164 | 171      | 232  |
| 5/8                              | 15/16"      | 110             | 149 | 170      | 230 | 240      | 325  |
| 3/4                              | 1-1/8"      | 192             | 261 | 297      | 403 | 420      | 569  |
| 7/8                              | 1-5/16"     | 306             | 416 | 474      | 642 | 669      | 907  |
| 1                                | 1-1/2"      | 467             | 634 | 722      | 979 | 1020     | 1383 |




**METRIC SERIES TORQUE CHART**



Metric Bolt Head Identification

**Metric Grade 8.8**



**Metric Grade 10.9**

| Diameter & Thread Pitch (Millimeters) <sup>(A)</sup> | Wrench Size | COARSE THREAD   |          |             |          | FINE THREAD |          |             |          | Diameter & Thread Pitch (Millimeters) <sup>(A)</sup> |
|--|-------------|-----------------|----------|-------------|----------|-------------|----------|-------------|----------|--|
|  |             | MARKING ON HEAD |          |             |          |             |          |             |          |  |
|  |             | Metric 8.8      |          | Metric 10.9 |          | Metric 8.8  |          | Metric 10.9 |          |  |
|  |             | N-m             | Lbs.-Ft. | N-m         | Lbs.-Ft. | N-m         | Lbs.-Ft. | N-m         | Lbs.-Ft. |  |
| 6 x 1.0  | 10 mm       | 8               | 6        | 11          | 8        | 8           | 6        | 11          | 8        | 6 x 1.0  |
| 8 x 1.25   | 13 mm       | 20              | 15       | 27          | 20       | 21          | 16       | 29          | 22       | 8 x 1.0  |
| 10 x 1.5   | 16 mm       | 39              | 29       | 54          | 40       | 41          | 30       | 57          | 42       | 10 x 1.25  |
| 12 x 1.75  | 18 mm       | 68              | 50       | 94          | 70       | 75          | 55       | 103         | 76       | 12 x 1.25  |
| 14 x 2.0   | 21 mm       | 109             | 80       | 151         | 111      | 118         | 87       | 163         | 120      | 14 x 1.5   |
| 16 x 2.0   | 24 mm       | 169             | 125      | 234         | 173      | 181         | 133      | 250         | 184      | 16 x 1.5   |
| 18 x 2.5   | 27 mm       | 234             | 172      | 323         | 239      | 263         | 194      | 363         | 268      | 18 x 1.5   |
| 20 x 2.5   | 30 mm       | 330             | 244      | 457         | 337      | 367         | 270      | 507         | 374      | 20 x 1.5   |
| 22 x 2.5   | 34 mm       | 451             | 332      | 623         | 460      | 495         | 365      | 684         | 505      | 22 x 1.5   |
| 24 x 3.0   | 36 mm       | 571             | 421      | 790         | 583      | 623         | 459      | 861         | 635      | 24 x 2.0   |
| 30 x 3.0   | 46 mm       | 1175            | 867      | 1626        | 1199     | 1258        | 928      | 1740        | 1283     | 30 x 2.0   |

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## **SAFETY RULES**

### **ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!**

Safety is a primary concern in the design and manufacture of our products. Unfortunately, our efforts to provide safe equipment can be erased by an operator's single careless act. In addition, hazard control and accident prevention are dependent upon the awareness, concern, judgment, and proper training of personnel involved in the operation, transport, maintenance and storage of equipment.

Make certain that the operator(s), prior to operating is instructed in safe and proper use and reviews and understands the manual(s) pertaining to this machine.

Read this manual before you operate this machine. If you do not understand any part of this manual, or need more information, contact the manufacturer or your authorized dealer.

### **SAFETY**

Understand that your safety and the safety of other persons are measured by how you service, and operate this machine. Know the positions and functions of all controls before you try to operate them. Make sure to check all controls in a safe area before starting your work.

The safety information given in this manual does not replace safety codes, federal, state or local laws. Make certain your machine has the proper equipment as designated by local laws and regulations.

A frequent cause of personal injury or death is from persons falling off equipment and being run over. Do not permit persons to ride on this machine.

Travel speeds should be such that complete control and machine stability is maintained at all times. Where possible, avoid operating near ditches, embankments and holes. Reduce speed when turning, crossing slopes and rough, slick or muddy surfaces.

Collision of high speed road traffic and slow moving machines can cause personal injury or death. On roads, use flasher lights according to local laws. Keep slow-moving-vehicle emblem visible. Pull over to let faster traffic pass.

Never adjust, service, clean, or lubricate running gear until all power is shut off.

Keep all safety shields in place.

Keep hands, feet, hair and clothing away from moving parts while unit is in operation.

Make sure that everyone is clear of equipment before applying power or moving the machine.

Make sure that the implement is fastened securely to the tractor by using the proper hitch pin, clip and safety chains.

Never overload the running gear. Overloading the running gear is dangerous and can cause extensive damage.

Do NOT exceed speeds in excess of 20 MPH. Rim, hubs and bearings are designed for heavy loads at slow speeds. Also be sure slow moving vehicle emblem is attached to rear of wagon.

Before unhooking the implement from the towing unit, be sure to properly block the wheels to prevent the implement from moving.

## SAFETY SIGNS

**IMPORTANT:** Install new safety signs if the old signs are destroyed, lost, painted over or cannot be read. When parts are replaced that have safety signs, make sure you install a new sign with each new part. New signs are available from the manufacturer or your authorized dealer.

### DECAL PARTS LIST

| Item # | Part #  | Description                  |
|--------|---------|------------------------------|
| 1      | DC-111  | Caution: Keep Lug Nuts Tight |
| 2      | DC-113  | Caution: Check Fluid Level   |
| 3      | DI-114M | J&M Oval - Medium            |

## SET-UP INSTRUCTIONS

**IMPORTANT:** Set-up work to be performed by qualified servicemen only.

1. Mount tires on the wheels and inflate per tire manufacturer's recommendations and instructions.
2. Mount the tires to the hubs and tighten the flat hub nuts to 400 ft. lb. torque. Check the hub nuts after the first hour of operation, then every 10 hours of operation for the first 40 hours of use. These nuts must be kept tight at all times. Wheels that are improperly installed on the running gear, resulting in product failure, will nullify the warranty and shift the burden of liability to the owner/operator of the equipment.
3. Slide the coupling pole through the rear A-Frame, inserting the collar to coupling pole and through the front A-Frame. When mounting to a 440SD or 540SD Gravity Wagon, the spacing on the coupling pole (approximate distance between holes on the coupling pole) should be 44" (Measured between the closest two bolts). The distance from the center of axle to center of axle is approximately 124".
4. Fasten the tongue to the front of the assembly using the tongue bolt and hex nuts. Attach the tongue springs to the brackets on the tongue and hitch assembly.
5. Mount the brakes lines from the rear of the master cylinder to the Drum Brakes according to the Tongue Assembly and Brake Lines and Fittings drawing located in the Repair Parts Section of this manual. Be careful not to over tighten the fittings and strip the threads. Use care in shaping brake lines to avoid sharp bends or kinks. Be sure to use a "Double-Flaring" type of tool on steel tubing to assure tight leak proof connections. Be sure and use hydraulic rubber hoses at points of flexing. Anchor hose ends to avoid stress on tubing. Always use DOT 5 Silicone Brake Fluid or equivalent.

## SET-UP INSTRUCTIONS (continued)

**IMPORTANT: Set-up work to be performed by qualified servicemen only.**

6. Adding Brake Fluid to the Master Cylinder. **IMPORTANT:** Do NOT shake the brake fluid container. **AVOID** agitating the system when bleeding. Do NOT “pump” the brake plunger. Instead, depress and release slowly.

Fill the master cylinder carefully, pouring the fluid down the side of the reservoir to minimize air entrainment.

### **METHOD ONE (requires two people)**

Close all bleed screws.

Start with the wheel furthest from the master cylinder. Slip a transparent bleed hose on the bleeder stem and place the other end of the hose in a clean container which is partially filled with fluid at all times.

The first person depresses the brake plunger **SLOWLY** (take 3-5 seconds). **THEN** the second person opens the bleed screw. He then closes the bleed screw **BEFORE** the first person **SLOWLY** releases the plunger (3-5 seconds). Continue until there is no evidence of air in the bleed hose. Continue with remaining wheels working from the longest to the shortest distance from the master cylinder. Top off master cylinder as needed to prevent reintroducing air into the lines.

#### **REMEMBER:**

- 1) Depress plunger slowly
- 2) Open bleed screw
- 3) Close bleed screw
- 4) Release plunger slowly

### **METHOD TWO (one person)**

Attach bleed hose to rear wheel as in method one. Open bleed screw. **SLOWLY** depress plunger (3-5 seconds). Repeat until line is air free. Close bleed screw. Top off master cylinder as needed to prevent reintroducing air into the lines.

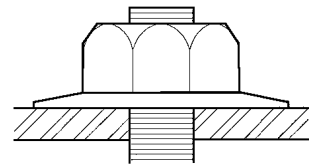
Repeat with remaining wheel.

Contamination with dirt, water, petroleum products or other materials may result in brake failure or costly repairs.

7. **IMPORTANT:** Make sure to properly attach the gravity box (or other equipment) to the running gear. Bolt all four corners of the gravity box to the running gear. If the box is used in rough terrain and it is not equipped with a rocking bolster, bolt a minimum of two corners and chain (or cable) the remaining two corners to allow more box flexibility.

### **MOUNTING WHEELS**

The adjacent diagram shows the proper way to mount wheels with straight holes (22.5x13.5 wheels). Use flange wheel nut (valve stem is on the outward side of the tire). Wheels that are improperly installed on running gears, resulting in product failure, will nullify warranty and shift the burden of liability to the owner/operator of the equipment.



## OPERATION INSTRUCTIONS // MAINTENANCE

### **WARNING - BE CERTAIN THAT ALL POWER IS SHUT OFF BEFORE SERVICING EQUIPMENT.**

Before equipment is put into service:

Has this manual and the operator's manual of the gravity box been read and clearly understood by the operator(s) of this machine?

Have all braces, bolts, nuts, lug bolts and lug nuts been checked to ensure that they are properly fastened?

Is the running gear properly fastened to the tractor? Use a good quality hitch pin with clip and safety chains.

### **SAFETY CHAIN USER INSTRUCTIONS**

- a) Secure the safety chain by looping it around the tongue support located on the underside of the outer tongue. Extend the chain through the support located on the underside of the inner tongue and connect to the towing machine's attaching bar.
- b) Be sure to run the safety chain through the support on the underside of the inner tongue. This will provide an intermediate support for the safety chain.
- c) Do NOT allow more slack than necessary for articulation (max. 9 inches).
- d) Do NOT use any intermediate support as the attaching point.
- e) Store the safety chain by securing it around the tongue supports.
- f) Replace the safety chain if one or more links or end fittings are broken, stretched or otherwise damaged or deformed.

Have all danger, warning, caution and important signs on the equipment been read and clearly understood? If employees or others use or are near this equipment, make sure they also have read and understood all danger, warning, caution and important signs on the equipment and have also read the operator's manual.

Have the wheel bearings been inspected? Repack with grease if needed. Grease both the tongue bolt and the hitch bolt.

### **BRAKING SYSTEM REQUIREMENTS:**

#### **WARNING - Tow Loads Safely**

Stopping distance increases with speed and weight of towed loads, and on slopes. Towed loads with or without brakes that are too heavy for the tractor or are too fast can cause loss of control. Consider the total weight of the equipment and its load.

Observe these recommended maximum road speed, or local speed limits which may be slower:

- If towed equipment DOES NOT have brakes, do not travel more than 32 km/hr (20 mph) and do not tow loads more than 1.5 times the tractor weight.
- If towed equipment DOES have brakes, do not travel more than 40 km/hr (25 mph) and do not tow loads more than 4.5 times the tractor weight.
- 

Ensure the load does not exceed the recommended weight ratio. Use additional caution when towing loads under adverse conditions, when turning and on inclines.

## OPERATION INSTRUCTIONS / MAINTENANCE (continued)

### IMPORTANT:

Keep the tires properly inflated (approx. 80 psi). Both under and over inflation can greatly reduce tire life.

Inspect bracing and welds and repair if needed. Failure to repair could cause extensive damage and greatly reduce the life of the unit.

Inspect tie rods and replace the bronze bushings in the steering assembly when needed.

Repack the bearings in the hub assemblies once a year or as needed. Use a good quality bearing lubricant such as Bearing Gard MK1 or equivalent. NOTE: Grease zerks on hubs caps are for between scheduled service lubrication.

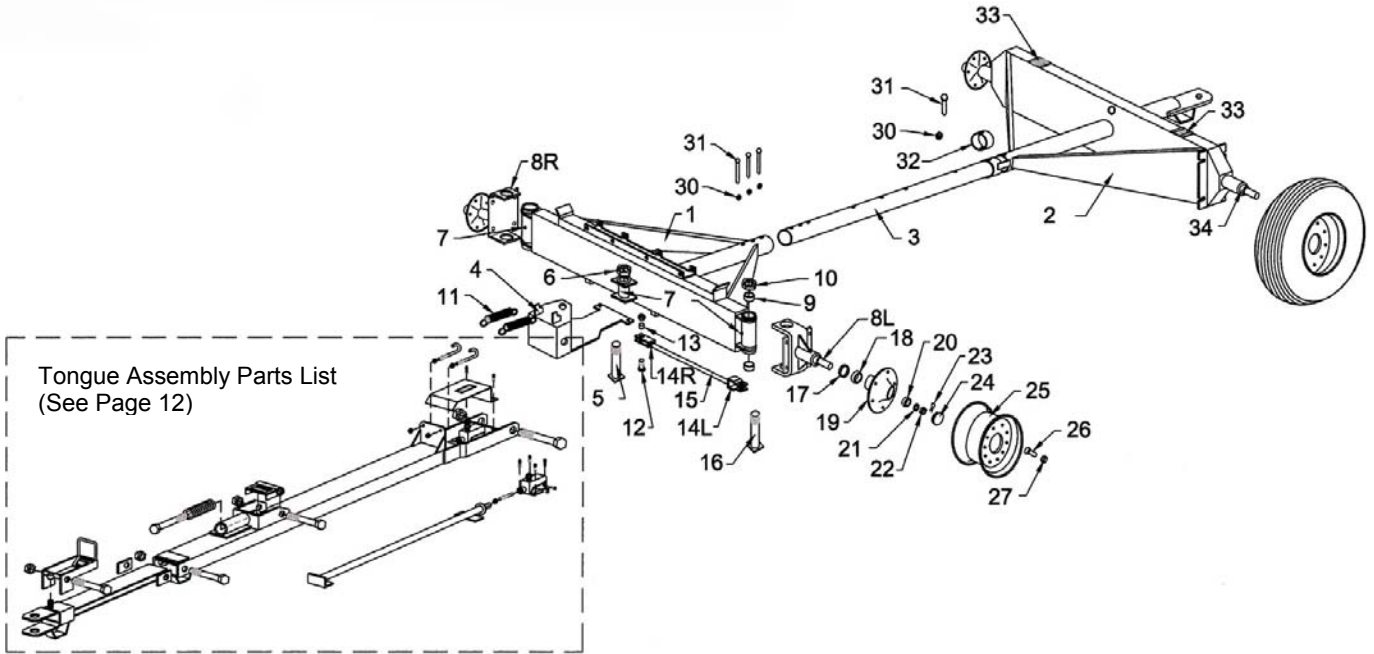
If equipped with brakes, inspect the drums periodically for wear and for brake line damage. Check fluid in the master cylinder and inspect for dirt or corrosion on the inside wall of the master cylinder. Clean and replace with new Silicone Brake Fluid (DOT 5) if needed. Wagons with brakes should be stored in a clean, dry place when not in use.

### ADJUSTING THE DRUM BRAKES

IMPORTANT: When adjusting drum brakes, rotate the wheel and drum in a **forward** rotation only.

The brake adjustment nut is located behind a slot at the bottom of the backing plate. Tighten the nut until you cannot rotate the wheel by hand, then back off the adjustment 18 to 20 notches.

## MODEL 1688 RUNNING GEAR REPAIR PARTS LIST

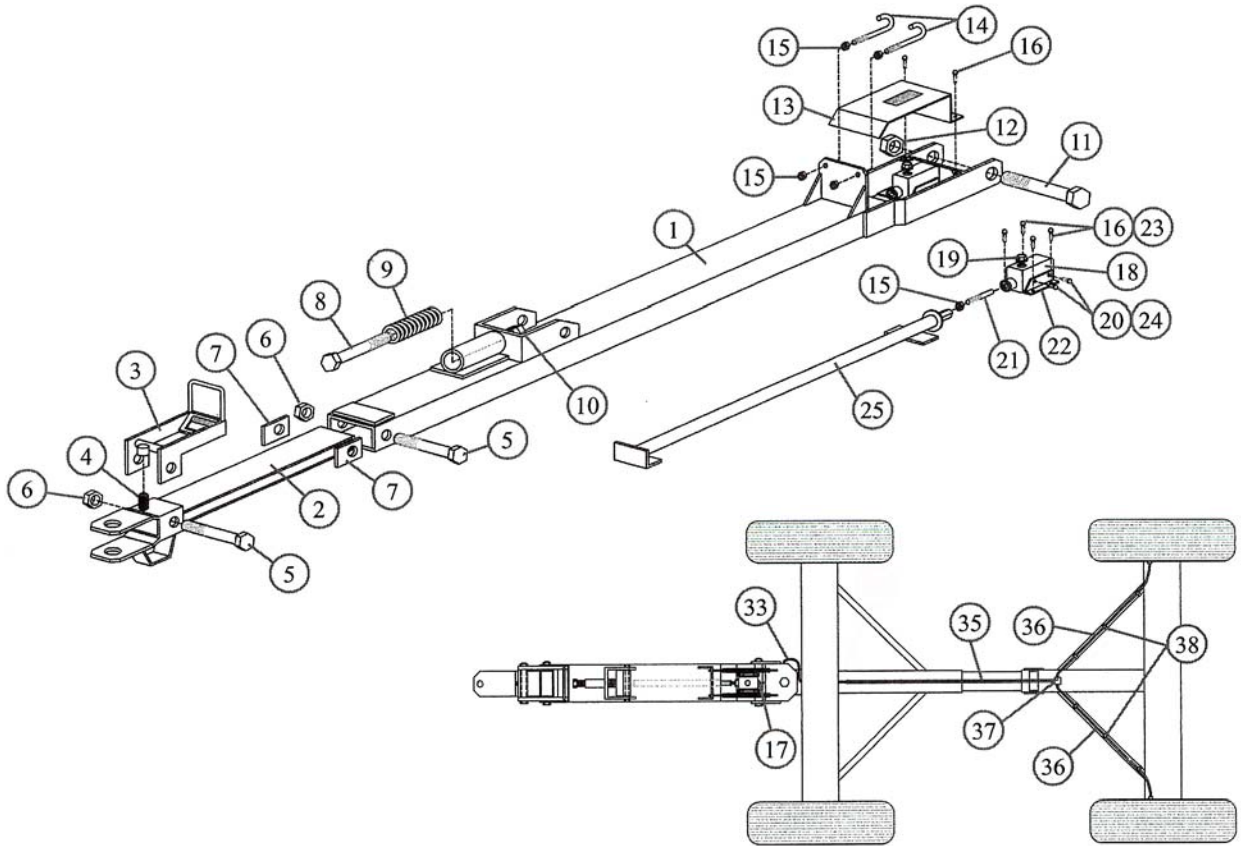


### PARTS LIST

| #   | Part #  | Description   |
|-----|---------|---|
| 1   | FA-16   | Front Axle Weldment (A-Frame Only) Less Wheels and Tongue |
| 2   | RA-16   | Rear Axle Weldment (A-Frame Only) Less Wheels and Brakes  |
| 3   | CP-16   | Coupling Pole with Rear Hitch                             |
| 4   | HW-16   | Hitch Weldment (for two spring connections)               |
| 5   | KP-1215 | King Pin  |
| 6   | HN-114  | 1 1/4" Hex Nut  |
| 7   | 1633    | Grease Fitting  |
| 8L  | SA-16L  | Spindle & "U" Assembly (left)                             |
| 8R  | SA-16R  | Spindle & "U" Assembly (right)                            |
| 9   | EB-134  | 1 3/4" Bronze Bushing                                     |
| 10  | HN-134  | 1 3/4" Hex Nut  |
| 11  | TS-615  | Tongue Spring   |
| 12  | SB-34   | 3/4" Step Bolt  |
| 13  | BB-34   | 3/4" Bronze Bushing                                       |
| 14L | TRE-1L  | Tie Rod End (L/H)   |
| 14R | TRE-1R  | Tie Rod End (R/H)   |
| 15  | TR-20   | Tie Rod, 1" dia.  |
| 16  | SPB-134 | Spindle Bolt 1 3/4" x 13 1/2"                             |
| 17  | 29968   | Grease Seal   |
| 18  | 387-AS  | Inner Bearing (large)                                     |

| #  | Part #       | Description  |
|----|--------------|--|
| 19 | 107751       | Hub, Including Lug Bolts, Nuts and Races (for Non-Brake Wheel) |
| 19 | 107751-B     | Hub, Faced for Brakes, Including Nuts and Races (Brakes)       |
| 20 | 105771       | Outer Bearing (small)  |
| 21 | 106247       | Spindle Washer   |
| 22 | 106248       | Slotted Spindle Nut  |
| 23 | CP-316       | Cotter Pin   |
| 24 | 103213       | Dust Cap   |
| 25 | WR-22.5-13.5 | Wheel Rim, 8 hole, 22.5x13.5                                   |
| 26 | WB-15        | Wheel Stud   |
| 27 | WN-15F       | Wheel Nut  |
| 28 | 382A         | Inner Cup (large)  |
| 29 | 105770       | Outer Cup (small)  |
| 30 | 1LN          | 1" Lock Nut  |
| 31 | 1634G5B      | 1" x 6 3/4" Grade 5 Bolt                                       |
| 32 | CL-412       | Collar to Coupling Pole  |
| 33 | 212314-RP    | 2 1/2" x 3 1/4" Rubber Plate                                   |
| 34 | RS-16        | 3" Rear Spindle, Straight                                      |
|    |              |  |
|    |              |  |
|    |              |  |

**MODEL 1688 RUNNING GEAR REPAIR PARTS LIST FOR HYDRAULIC DRUM BRAKES**  
**Tongue Assembly and Brake Lines and Fittings**

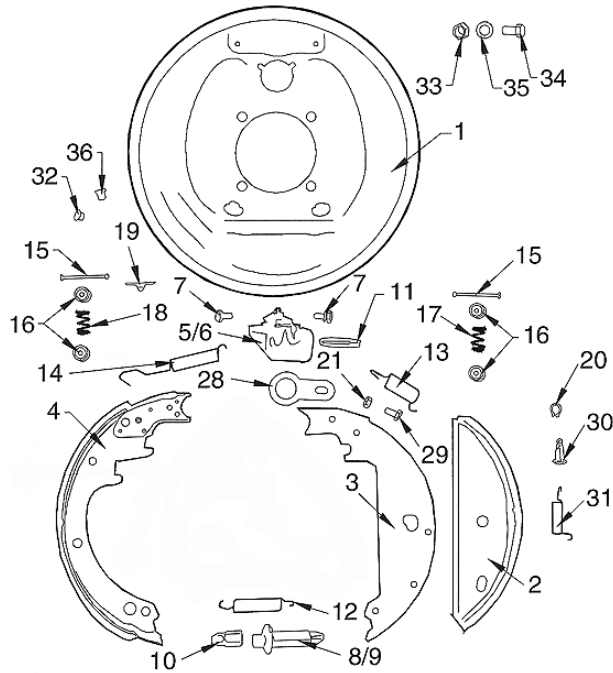


**PARTS LIST**

| #  | Part #    | Description                  |
|----|-----------|------------------------------|
| 1  | OTW-1324  | Outer Tongue Weldment        |
| 2  | ITW-1324  | Inner Tongue Weldment        |
| 3  | TL-1324   | Tongue Latch                 |
| 4  | SS-615NS  | Small Spring In Latch        |
| 5  | 17G2B     | 1" x 7" Grade 2 Bolt         |
| 6  | 1LN       | 1" Lock Nut                  |
| 7  | BL-58     | Brake Limiter                |
| 8  | 19G8B     | 1" x 9" Grade 8 Bolt         |
| 9  | CS-178714 | Compression Spring           |
| 10 | 1RN       | 1" Regular Nut               |
| 11 | TB-1315   | Tongue Bolt                  |
| 12 | HN-114    | 1 1/4" Hex Nut               |
| 13 | SMC-1     | Shield for Master Cylinder   |
| 14 | 124-JB    | 1/2" x 4" J-Bolt             |
| 15 | 12-N      | 1/2" Regular Nut             |
| 16 | 381-FB    | 3/8" x 1" Flange Bolt        |
| 17 | FMC-015   | Fitting for Master Cylinder  |
| 18 | MCA-DR1   | Master Cylinder Assembly     |
| 19 | RMCM-1324 | Replacement Cap (M/Cylinder) |
| 20 | 383G8B    | 3/8" x 3" Grade 8 Bolt       |

| #  | Part #    | Description                    |
|----|-----------|--------------------------------|
| 21 | PRE-1     | Plunger Rod End                |
| 22 | MBMC-DR2  | Mounting Bracket (2 pcs) (M/C) |
| 23 | 38-FN     | 3/8" Flange Nut                |
| 24 | 38-LN     | 3/8" Lock Nut                  |
| 25 | PP-1D     | Plunger Pole                   |
| 26 | RB-1415   | Rubber Boot on M/Cylinder      |
| 27 | GR-1415   | Rubber Grommet                 |
| 28 | SKMC-1324 | Seal Kit for Master Cylinder   |
| 29 | DOT5-BF   | Container DOT 5 Brake Fluid    |
| 31 | 107751-B  | Hub, Faced for Brakes          |
| 32 | BS-24     | Bleeder Stem                   |
| 33 | HH-1425   | 1/4" x 25" Hydraulic Hose      |
| 35 | ST-96     | 3/16" Brake Line x 96"         |
| 36 | ST-53     | 3/16" Brake Line x 53"         |
| 37 | 10606     | Tee                            |
| 38 | SC-1324   | Spring Clip                    |
|    |           |                                |
|    |           |                                |
|    |           |                                |
|    |           |                                |

**MODEL 1688 RUNNING GEAR REPAIR PARTS LIST FOR HYDRAULIC DRUM BRAKES**  
**Drum Brake Assembly**



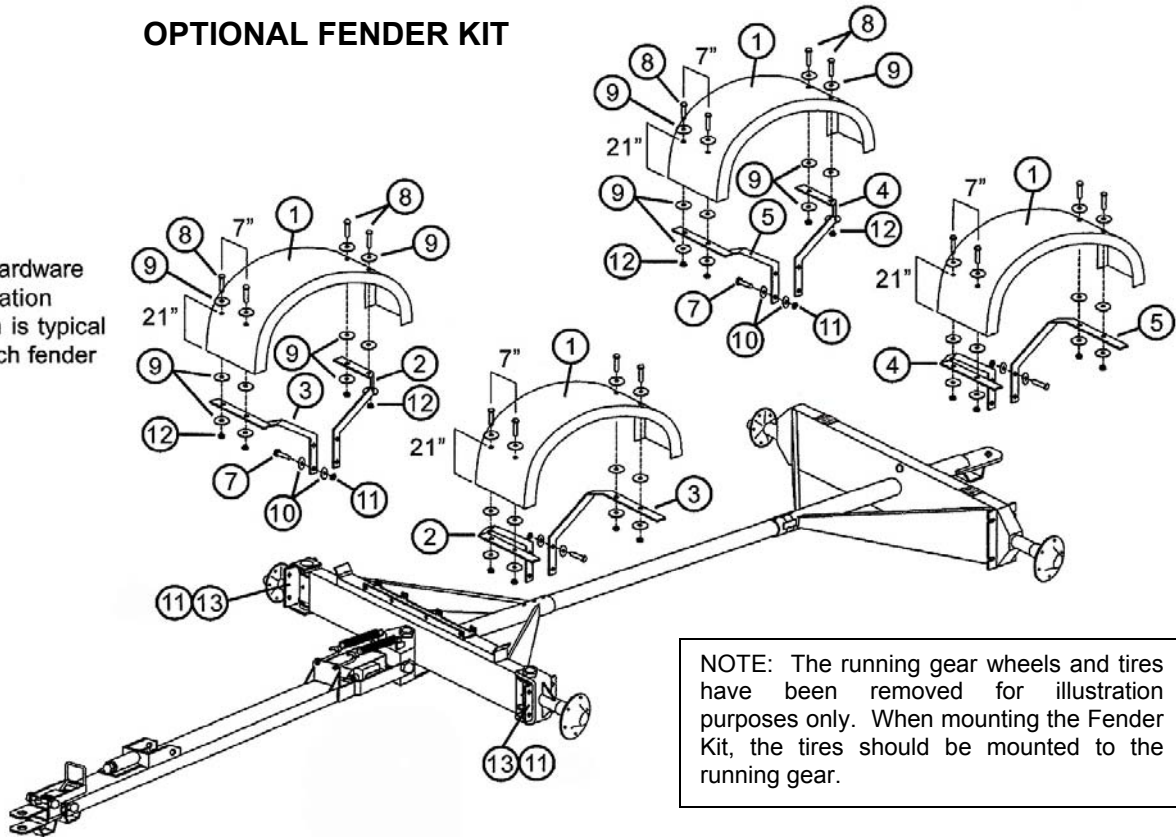
**PARTS LIST**

| #  | Part #  | Description                       |
|----|---------|-----------------------------------|
| 1  | 24737   | Back Plate Assembly               |
| 2  | 9739    | Front Brake Shoe Assembly         |
| 3  | 9745    | Front Shoe Lever                  |
| 4  | 9775    | Rear Shoe Lever                   |
| 5  | 9776    | Wheel Cylinder Assembly – Right   |
| 6  | 9777    | Wheel Cylinder Assembly – Left    |
| 7  | 23457   | Screw & Lockwasher                |
| 8  | 23324   | Adjusting Screw                   |
| 9  | 23324PN | Pivot Nut                         |
| 10 | 9782    | Socket – Adjusting Screw          |
| 11 | 9783    | Push Rod – Wheel Cylinder         |
| 12 | 9784    | Spring Adjusting Screw (Yellow)   |
| 13 | 9785    | Spring – Front Lever (Red)        |
| 14 | 9786    | Spring – Rear Shoe (Orange)       |
| 15 | 9788    | Pin – Shoe Hold Down              |
| 16 | 9789    | Cup – Shoe Hold Down              |
| 17 | 9790    | Spring – Front Hold Down (Yellow) |
| 18 | 9791    | Spring – Rear Hold Down (Black)   |
| 19 | 9254    | Cover Plate – Adjusting Hole      |
| 20 | 7778    | Retaining Ring                    |

| #  | Part # | Description                                      |
|----|--------|--|
| 21 | 17406  | Hex – Locknut 5/16" NC                           |
| 28 | 9743   | Travel Link                                      |
| 29 | 7949   | Travel Link Bolt – Hex Cap Screw 5/16" NC x 5/8" |
| 30 | 12560  | Front Shoe Pin w/o Park Link                     |
| 31 | 6814   | Spring – Front Shoe                              |
| 32 | 9797   | Plug – Plastic                                   |
| 33 | 7972   | Hex Nut 1/2" NF                                  |
| 34 | 7955   | Cap Screw 1/2" NF x 1"                           |
| 35 | 7937   | Lockwasher 1/2"                                  |
| 36 | 9404   | Plug – Plastic                                   |
| 39 | 15845  | Wheel Cylinder Repair Kit 1 1/8"                 |
| 40 | DRBA-L | Drum Brake Cluster Assy (left)                   |
| 40 | DRBA-R | Drum Brake Cluster Assy (right)                  |
| 41 | 15DB   | 13" Brake Drum (4 1/2" pilot)                    |
|    |        |  |
|    |        |  |
|    |        |  |
|    |        |  |

## OPTIONAL FENDER KIT

The hardware installation shown is typical for each fender



NOTE: The running gear wheels and tires have been removed for illustration purposes only. When mounting the Fender Kit, the tires should be mounted to the running gear.

### Installation Instructions

**Step One** – Secure the Bracket Plates to the U-Assemblies located on the front spindles using three 1/2" x 2" grade 5 bolts and 1/2" flange nuts.

**Step Two** – Loosely fasten each set of front and rear Fender Brackets to the mounting plate located on the front and rear spindle assemblies using four 1/2" x 2 1/2" grade 5 bolts, eight 1/2" regular washers and four 1/2" flange nuts. Do Not Tighten the brackets.

**Step Three** – Mark and drill two 9/16" diameter holes on the front and rear ends of the fender. To properly seat the fender over the tire, the holes should be evenly spaced along the width of the fender, located 7" apart and 21" from the bottom edge.

**Step Four** – Secure each fender to the mounting brackets using four 1/2" x 1 1/2" grade 5 bolts, twelve 1/2" oversized washers and four 1/2" regular nuts. The head of the bolt should be placed on the top side of the fender with one oversized washer on each side of the fender and another oversized washer on the bottom side of the mounting bracket. Do Not Tighten.

**Step Five** – Adjust the fender to ensure it is properly located around the tire. Tighten the mounting brackets to the spindle assemblies and the fenders to the mounting brackets.

### PARTS LIST

| # | Part #   | Description                | Qty |
|---|----------|----------------------------|-----|
| 1 | PF-4     | Plastic Fender             | 4   |
| 2 | FMB-16A  | Fender Mounting Bracket    | 2   |
| 3 | FMB-16B  | Fender Mounting Bracket    | 2   |
| 4 | FMB-16C  | Fender Mounting Bracket    | 2   |
| 5 | FMB-16D  | Fender Mounting Bracket    | 2   |
| 6 | FBP-2    | Bracket Plate              | 2   |
| 7 | 12212G5B | 1/2" x 2 1/2" Grade 5 Bolt | 16  |
| 8 | 12112G5B | 1/2" x 1 1/2" Grade 5 Bolt | 16  |
| 9 | 12OSW    | 1/2" Oversized Washer      | 48  |

| #  | Part # | Description            | Qty |
|----|--------|------------------------|-----|
| 10 | 12RW   | 1/2" Regular Washer    | 54  |
| 11 | 12FN   | 1/2" Flange Nut        | 22  |
| 12 | 12RN   | 1/2" Regular Nut       | 16  |
| 13 | 122G5B | 1/2" x 2" Grade 5 Bolt | 6   |
|    |        |                        |     |
|    |        |                        |     |
|    |        |                        |     |
|    |        |                        |     |

