# CAM-LIFT WHEEL MOVE KIT

## 1500-SERIES S-DRIVE STANDARD CONVEYORS ASSEMBLY MANUAL

**This manual applies to the following models:**

**1565, 1575, 1585, 1590, 15100**

**ORIGINAL INSTRUCTIONS**

Read this manual before using product. Failure to follow instructions and safety precautions can result in serious injury, death, or property damage. Keep manual for future reference.

Part Number: P1512105 R2

Revised: Nov/18

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# 1. Safety

## 1.1. GENERAL SAFETY INFORMATION

The Safety Alert symbol identifies important safety messages on the product and in the manual. When you see this symbol, be alert to the possibility of personal injury or death. Follow the instructions in the safety messages.

Why is SAFETY important?

- Accidents disable and kill.
- Accidents cost.
- Accidents can be avoided.

**SIGNAL WORDS:** Note the use of the signal words **DANGER**, **WARNING**, **CAUTION**, and **NOTICE** with the safety messages. The appropriate signal word for each message has been selected using the definitions below as a guideline.

| **DANGER** | |
|---|---|
|  | Indicates an imminently hazardous situation that, if not avoided, will result in serious injury or death. |

| **WARNING** | |
|---|---|
|  | Indicates a hazardous situation that, if not avoided, could result in serious injury or death. |

| **CAUTION** | |
|---|---|
|  | Indicates a hazardous situation that, if not avoided, may result in minor or moderate injury. |

| **NOTICE** |
|---|
| Indicates a potentially hazardous situation that, if not avoided, may result in property damage. |

**YOU** are responsible for the **SAFE** use and maintenance of your equipment. **YOU** must ensure that you and anyone else who is going to work around the equipment understands all procedures and related **SAFETY** information contained in this manual.

Remember, **YOU** are the key to safety. Good safety practices not only protect you, but also the people around you. Make these practices a working part of your safety program.

**Important:** *Below are general instructions that apply to all safety practices. Any instructions specific to a certain safety practice (e.g., Operational Safety), can be found in the appropriate section. Always read the complete instructional sections and not just these safety summaries before doing anything with the equipment.*

- It is the equipment owner, operator, and maintenance personnel's responsibility to read and understand **ALL** safety instructions, safety decals, and manuals and follow them when assembling, operating, or maintaining the equipment. All accidents can be avoided.

- Equipment owners must give instructions and review the information initially and annually with all personnel before allowing them to operate this product. Untrained users/operators expose themselves and bystanders to possible serious injury or death.
- Use this equipment for its intended purposes only.
- Do not modify the equipment in any way without written permission from the manufacturer. Unauthorized modification may impair the function and/or safety, and could affect the life of the equipment. Any unauthorized modification of the equipment voids the warranty.
- Do not allow any unauthorized person in the work area.

# 1.2. HYDRAULIC SAFETY

- Always place all hydraulic controls in neutral and relieve system pressure before disconnecting from tractor or working on hydraulic system.
- Keep all components in the hydraulic system tightly secured, clean and in good condition.
- Replace any worn, cut, abraded, flattened or crimped hoses.
- Do not attempt any makeshift repairs to the hydraulic fittings or hoses by using tape, clamps or adhesive. The hydraulic system operates under

extremely high-pressure; such repairs will fail suddenly and create a hazardous and unsafe condition.

- Wear proper hand and eye protection when searching for a high-pressure hydraulic leak. Use a piece of wood or cardboard as a backstop instead of hands to isolate and identify a leak.
- Before moving a hydraulic cylinder, ensure that the attached component is safely secured.

| WARNING | |
|---|---|
|  | Hydraulic fluid can cause serious injury if it penetrates the skin. If it does, see a doctor immediately.<br>• Relieve pressure before disconnecting hydraulic line.<br>• Wear proper hand and eye protection and use wood or cardboard, not hands, when searching for leaks. |

# 1.3. ENGINE SAFETY

- Be sure to stop engine and remove key or lock out power before inspecting or servicing engine
- Refer to engine operation manual for further details.

# 1.4. TIRE SAFETY

- Failure to follow proper procedures when mounting a tire on a wheel or rim can produce an explosion that may result in serious injury or death.
- Do not attempt to mount a tire unless you have the proper equipment and experience to do the job.
- Have a qualified tire dealer or repair service perform required tire maintenance.
- When replacing worn tires, make sure they meet the original tire specifications. Never undersize the replacement tire.
- Do not weld to the tire rim with the tire mounted on the rim. This action may cause an explosion which could result in serious injury or death.
- Inflate tires to the manufacturer's recommended pressure.

# 1.5. SAFETY DECALS

- Keep safety decals clean and legible at all times.
- Replace safety decals that are missing or have become illegible. See decal location figures that follow.
- Replaced parts must display the same decal(s) as the original part.
- Replacement safety decals are available **free of charge** from your distributor, dealer, or factory.

## 1.5.1. DECAL INSTALLATION/REPLACEMENT

1. Decal area must be clean and dry, with a temperature above 50°F (10°C).
2. Decide on the exact position before you remove the backing paper.
3. Align the decal over the specified area and carefully press the small portion with the exposed sticky backing in place.
4. Slowly peel back the remaining paper and carefully smooth the remaining portion of the decal in place.
5. Small air pockets can be pierced with a pin and smoothed out using the sign backing paper.

## 1.5.2. SAFETY DECAL LOCATIONS AND DETAILS

Replicas of the safety decals that are attached to the equipment and their messages are shown in the figure(s) that follow. Safe operation of the equipment requires that you familiarize yourself with the various safety decals and the areas or particular functions that the decals apply to, as well as the safety precautions that must be taken to avoid serious injury, death, or damage.

*Batco reserves the right to update safety decals without notice. Safety decals may not be exactly as shown.*

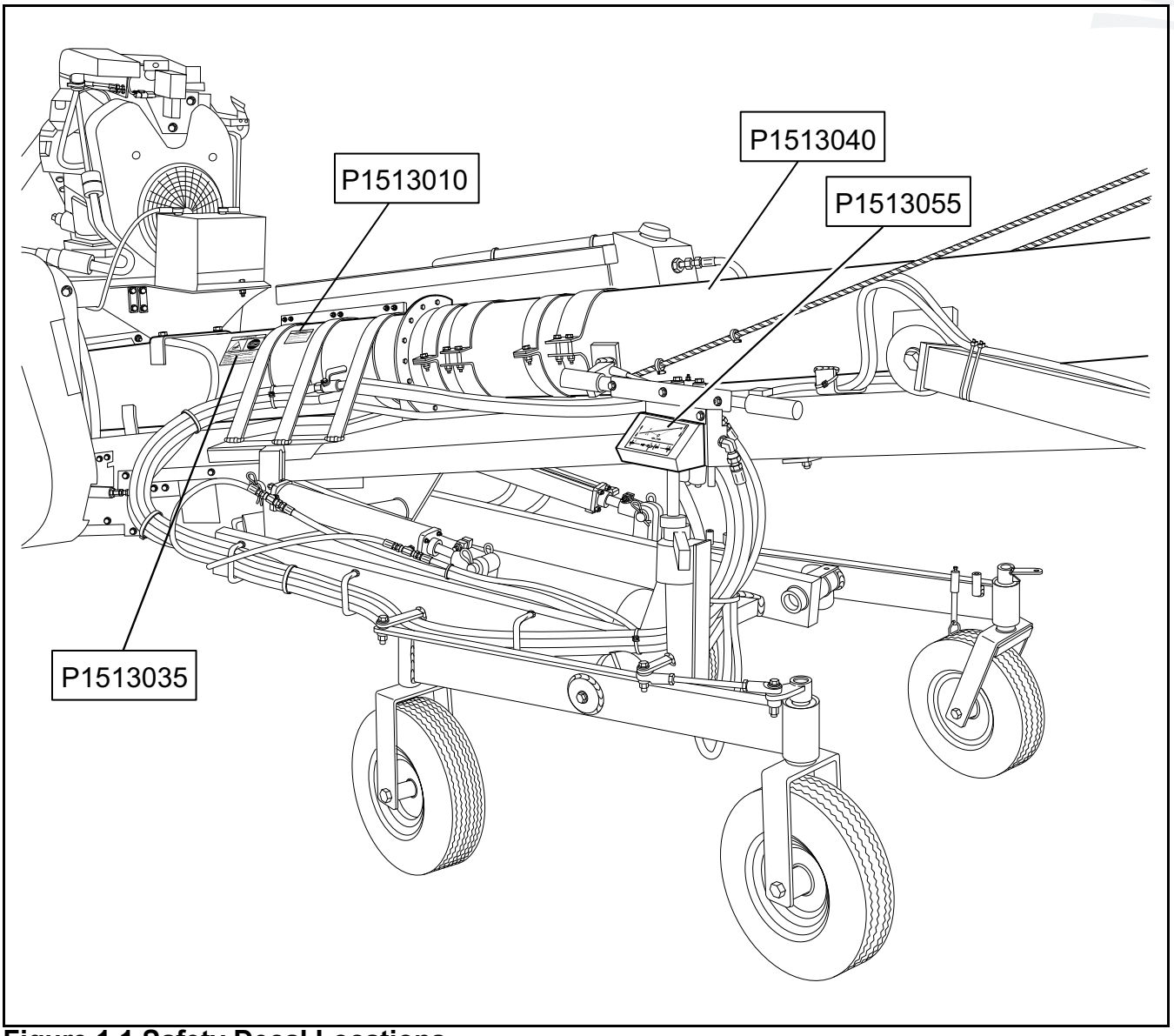



**Figure 1.1 Safety Decal Locations**

**⚠ CAUTION**

To prevent personal injury or damage to equipment, close valve in lift cylinder hydraulic line after raising equipment into position.

DECAL # P1513010

**Figure 1.2 Safety Decal Details (1)**

**⚠ WARNING**

**TRANSPORT HAZARD**

To prevent serious injury or equipment damage, before towing:

- Lift up wheel frame completely and secure with safety chain.
- Pull handle to disengage drive wheel motors.

DECAL # P1513040

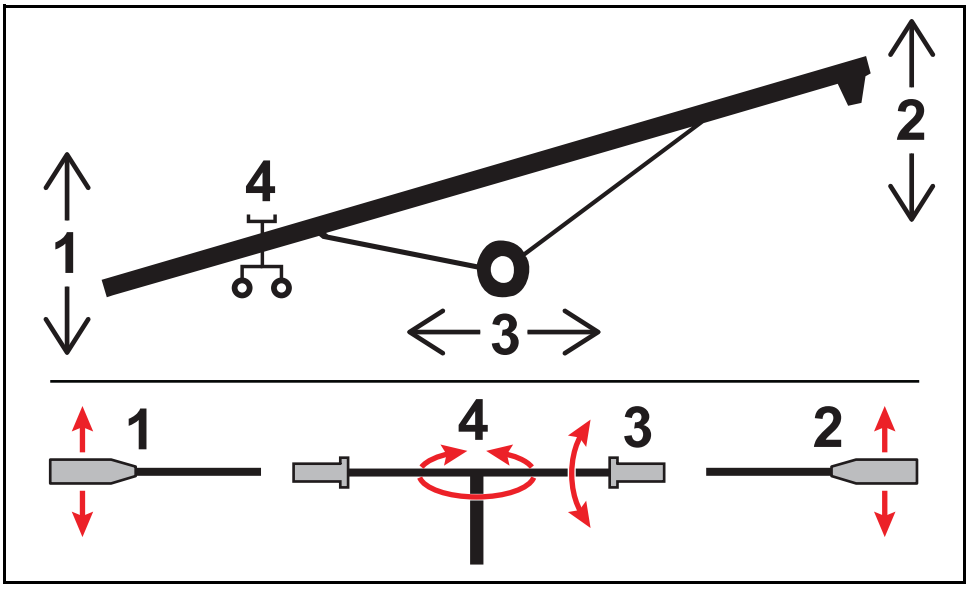
**⚠ WARNING**

**HIGH PRESSURE FLUID HAZARD**

Hydraulic fluid can cause serious injury if it penetrates the skin. If it does, see a doctor immediately.

- Relieve system pressure before repairing, adjusting or disconnecting.
- Wear proper hand and eye protection when searching for leaks. Use wood or cardboard instead of hands.

DECAL # P1513035




DECAL # P1513055

**Figure 1.3 Safety Decal Details (2)**

# 2. Features

**Table 2.1 Cam-Lift Wheel Move Kit - Main Components**

| Item | Description |
|---|---|
| 1 | Cam-Lift |
| 2 | Walking Beam |
| 3 | Control Valve |
| 4 | Wheel Move Base |

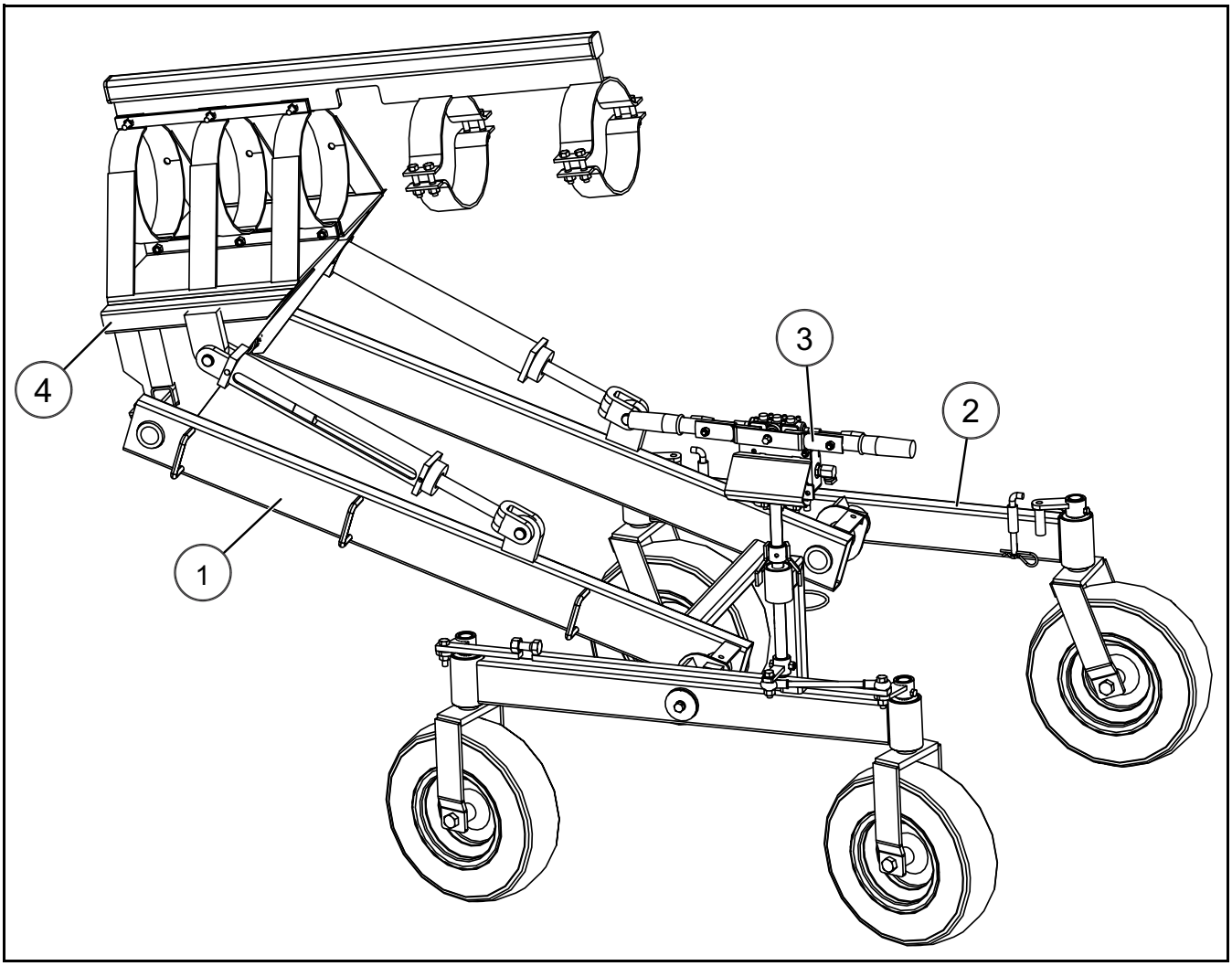



**Figure 2.1 Cam-Lift Wheel Move Kit - Main Components**

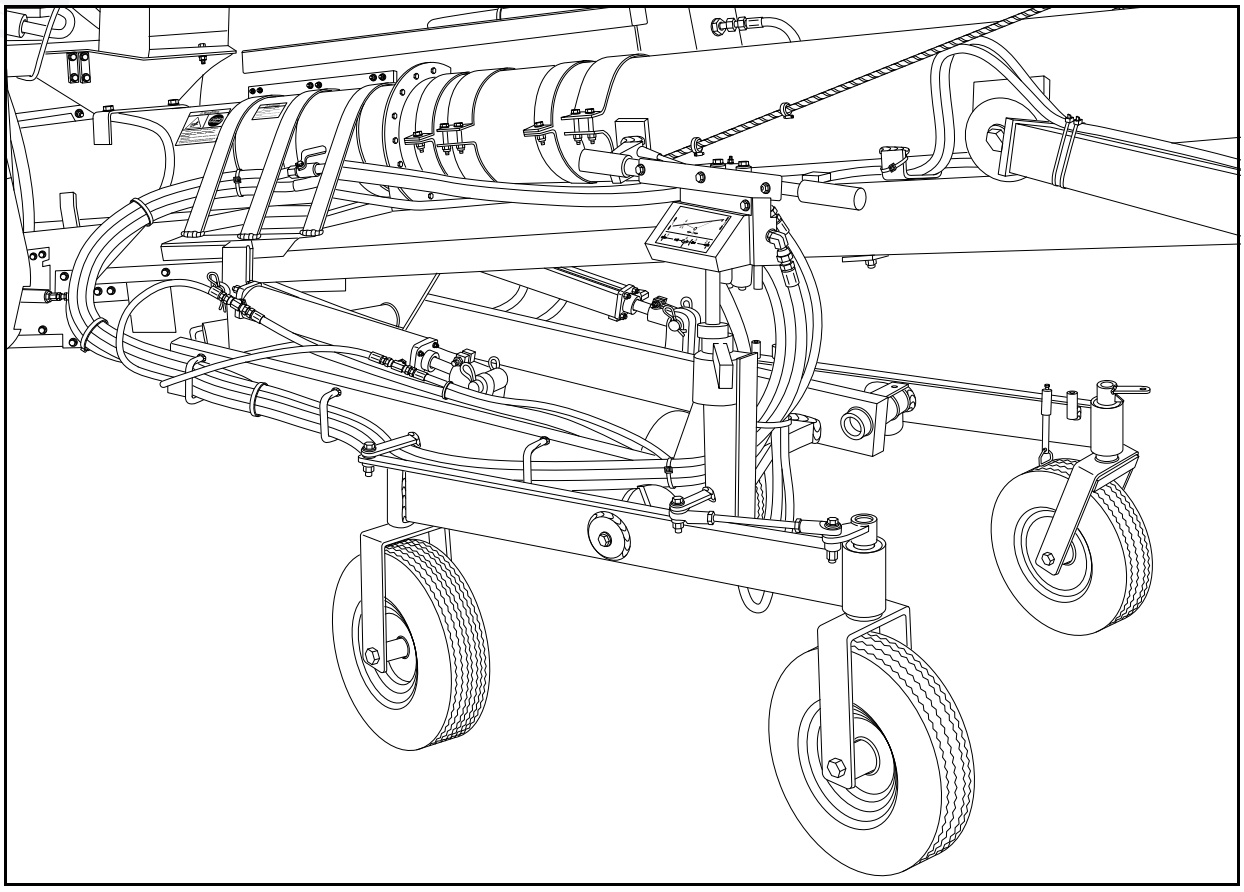


**Figure 2.2 Left-Hand Side of Wheel Move Kit**

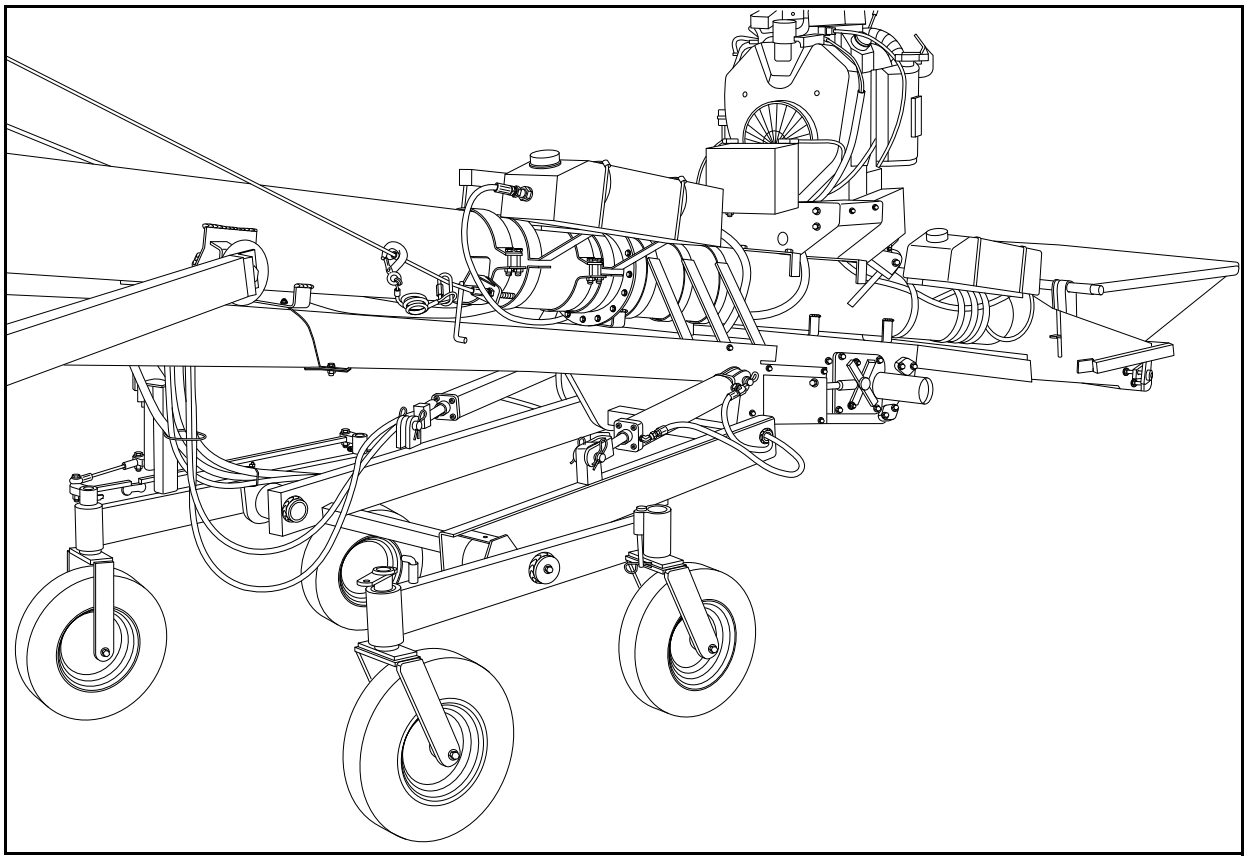


**Figure 2.3 Right-Hand Side of Wheel Move Kit**

# 3. Assembly

**WARNING** *Before continuing, ensure you have read and understand the relevant information in the safety section. Safety information is provided to help prevent serious injury, death, or property damage.*

| CAUTION | |
|---|---|
|  | Ensure the conveyor is in the fully lowered position and on a level surface with the wheels chocked before proceeding with any assembly. |

## 3.1. HYDRAULIC FITTING AND BOLT TIGHTENING

Remember the following basic considerations when tightening hydraulic fittings and bolts:

- Tighten all fasteners to the torque specified in “Bolt Torque” on page 41. Do not replace or substitute bolts, nuts, or other hardware that is of lesser quality than the hardware supplied by the manufacturer.
- All hydraulic fittings should be torqued to the recommended specifications. See “Fitting Torque Values” on page 42.

| NOTICE |
|---|
| Do not over-tighten fittings! Over-tightening hose fittings can crack the fittings or motor body and will void the warranty. |

## 3.2. ASSEMBLY SAFETY

- Read and understand the assembly instructions to get to know the sub-assemblies and hardware that make up the equipment before proceeding to assemble the product.
- Do not take chances with safety. The components are large, heavy, and can be hard to handle. Always use the proper tools, stands, jacks, and hoists for the job.
- Always have two or more people assembling the equipment. Because of the weight, do not attempt assembly alone.

# 3.3. GENERAL ASSEMBLY

1. Select an assembly area that is level, has a firm or hard surface, and is free of debris. Be sure it is large enough to allow access from all sides when the components are being assembled.
2. Bring all the tools, blocks, stands, jacks and hoists to the assembly area before starting.
3. The following tools and equipment are required to assemble the machine:

| | |
|---|---|
| 1 | standard socket set and wrench set |
| 1 | torque wrench |
| 1 | standard 25’ (7.62 m) tape measure |
| 1 | 2’ (0.61 m) level |
| 1 | tire gauge |
| 1 | tire chuck |

| CAUTION | |
|---|---|
|  | Ensure conveyor is in fully lowered position with hopper end on the ground before proceeding with the assembly of the wheel move. |

# 3.4. WHEEL MOVE BASE

1. Noting orientation (see Figure 3.1), attach the wheel move base right (1), mover flange support (11), wheel move base left (2), and 3” U-clamps (12) to the conveyor hopper tube with 1/2” x 2-1/2” bolts (7) and 1/2” locknuts (5) (see Figure 3.2). Tighten the bolts.
2. Connect cam-lift (10) to wheel move base and secure with 1/2” x 4” bolts (6), swivel blocks (4), and 1/2” locknuts (5) (see Figure 3.4).
3. Secure grease fittings (9) to wheel move base (1, 2) and apply grease to each fitting.

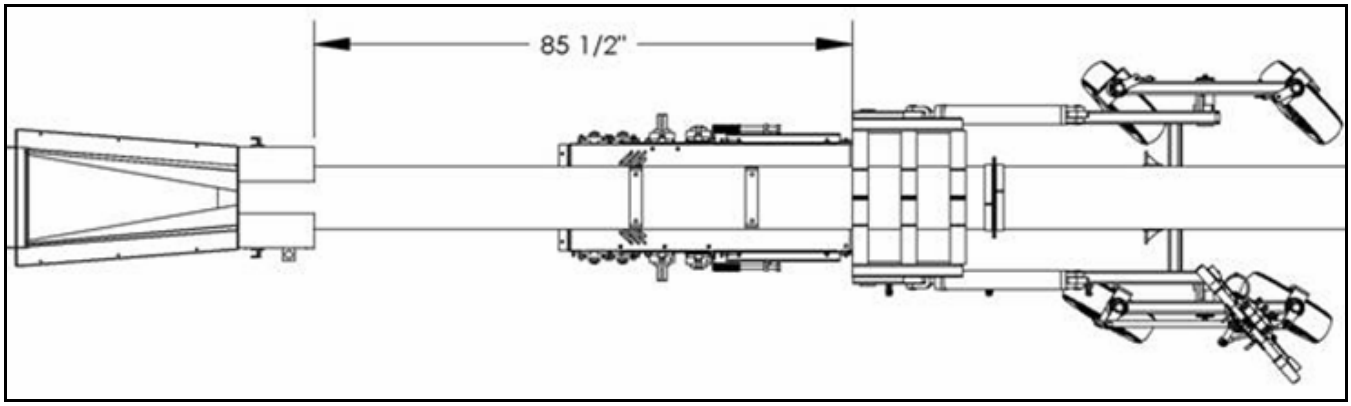



**Figure 3.1 Orientation and Dimension for Mounting Wheel Move to Conveyor Tube**

**Table 3.1 Wheel Move Base Components**

| Item | Description | Quantity |
|---|---|---|
| 1 | WHEEL MOVE BASE RIGHT | 1 |
| 2 | WHEEL MOVE BASE LEFT | 1 |
| 4 | SWIVEL BLOCK | 2 |
| 5 | 1/2” NYLOCK NUT | 18 |
| 6 | 1/2” x 4” HEX BOLT GR8 | 2 |
| 7 | 1/2” x 2-1/2” HEX BOLT GR8 | 16 |
| 9 | 1/4” GREASE FITTING | 2 |
| 10 | CAM-LIFT | 1 |
| 11 | MOVER FLANGE SUPPORT | 1 |
| 12 | 3” U-CLAMP PAINTED | 2 |

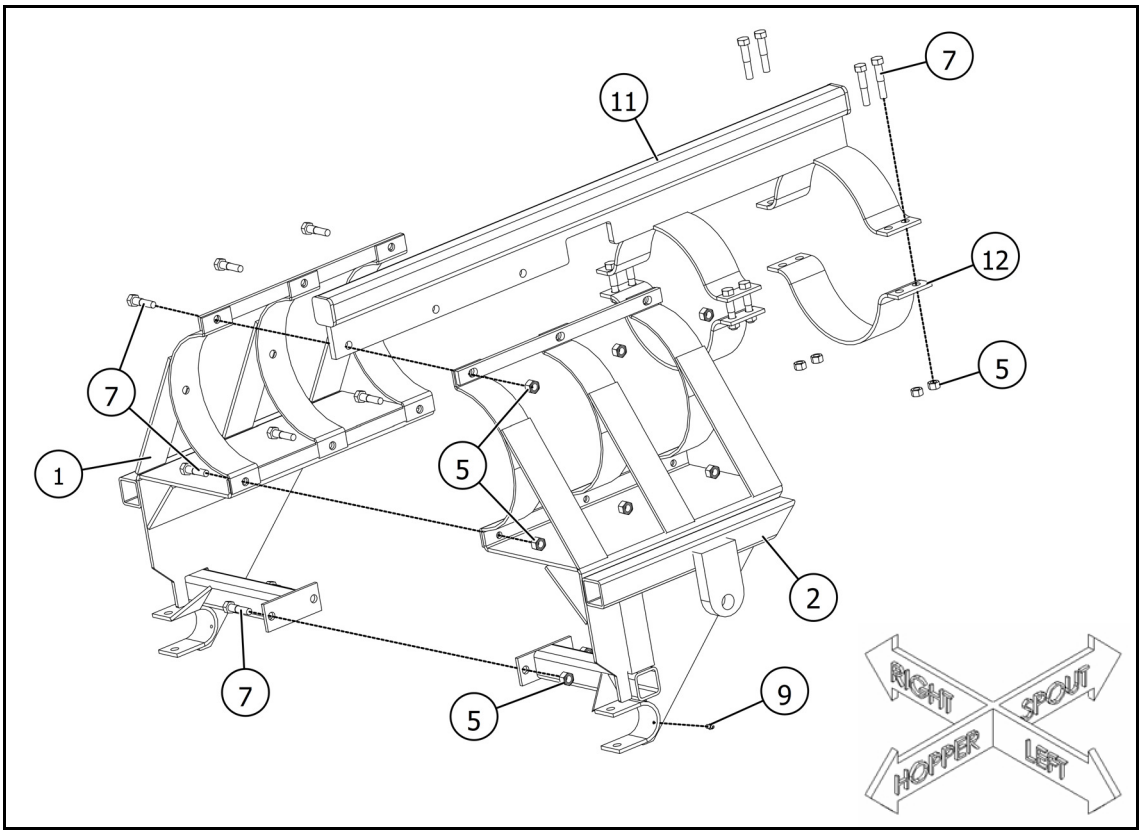



**Figure 3.2 Wheel Move Base**

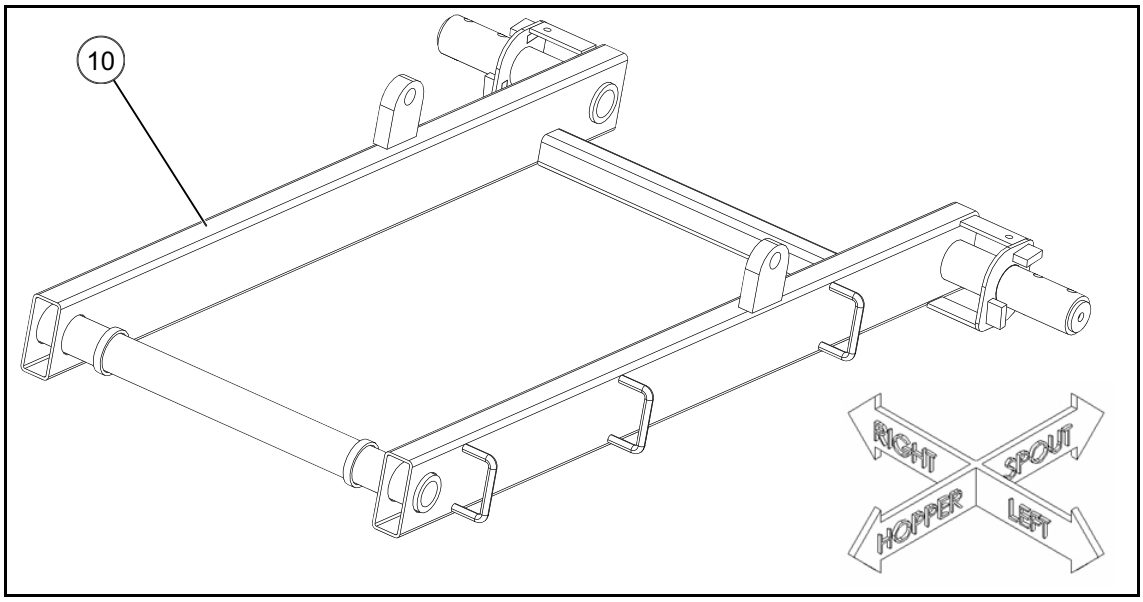



**Figure 3.3 Cam-Lift**

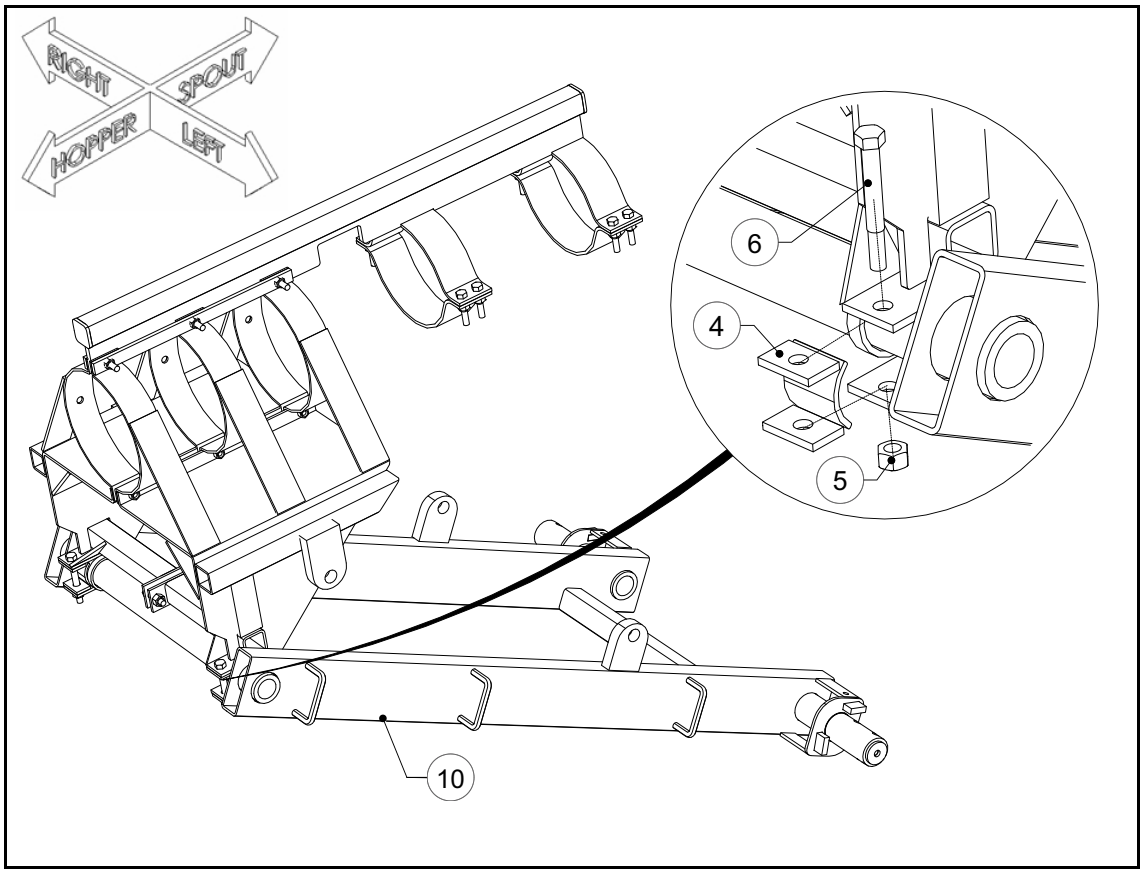



**Figure 3.4 Attaching Cam-Lift to the Wheel Base**

# 3.5. CASTER ASSEMBLY

1. Attach the walking beam (1) to the cam-lift assembly in the orientation shown in Figure 3.5. Secure with a 1/2” x 2” bolt (10), 1/2” lock washer (9), and axle end cap (8).
2. Install two bearings (12) at each end of the walking beam (1) (see Figure 3.6).
3. Insert angled fork (2) on each end of the walking beam (1) in the bearings and locking pipes (3). Fasten the locking pipes with 3/8” x 2-1/2” bolts (4) and 3/8” locknuts (5).
4. Mount the wheels (11) and insert three 3/4” flat washers (15) on each side of each wheel hub. Secure with 3/4” x 7” bolts (6) and 3/4” locknuts (7).
5. Add 1/2” x 5” hitch pins (13) and hair pins (14).

**Table 3.2 Caster Assembly Components**

| Item | Description | Quantity |
|---|---|---|
| 1 | WALKING BEAM | 1 |
| 2 | FORK –ANGLED | 2 |
| 3 | LOCKING PIPE | 2 |
| 4 | 3/8” x 2-1/2” HEX BOLT | 2 |
| 5 | 3/8” NYLOCK NUT | 2 |
| 6 | 3/4” x 7” HEX BOLT | 2 |
| 7 | 3/4” NYLOCK NUT | 2 |
| 8 | END CAP FOR AXLE | 1 |
| 9 | 1/2” LOCK WASHER | 1 |
| 10 | 1/2” x 2” HEX BOLT | 1 |
| 11 | TIRE & WHEEL (4.8-8”) | 2 |
| 12 | 1-1/4” BEARING SAA206 | 4 |
| 13 | 1/2” x 5” HITCH PIN | 2 |
| 14 | 3/16” x 3-1/4” HAIRPIN | 2 |
| 15 | 3/4” FLAT WASHER  PLATED USS | 12 |

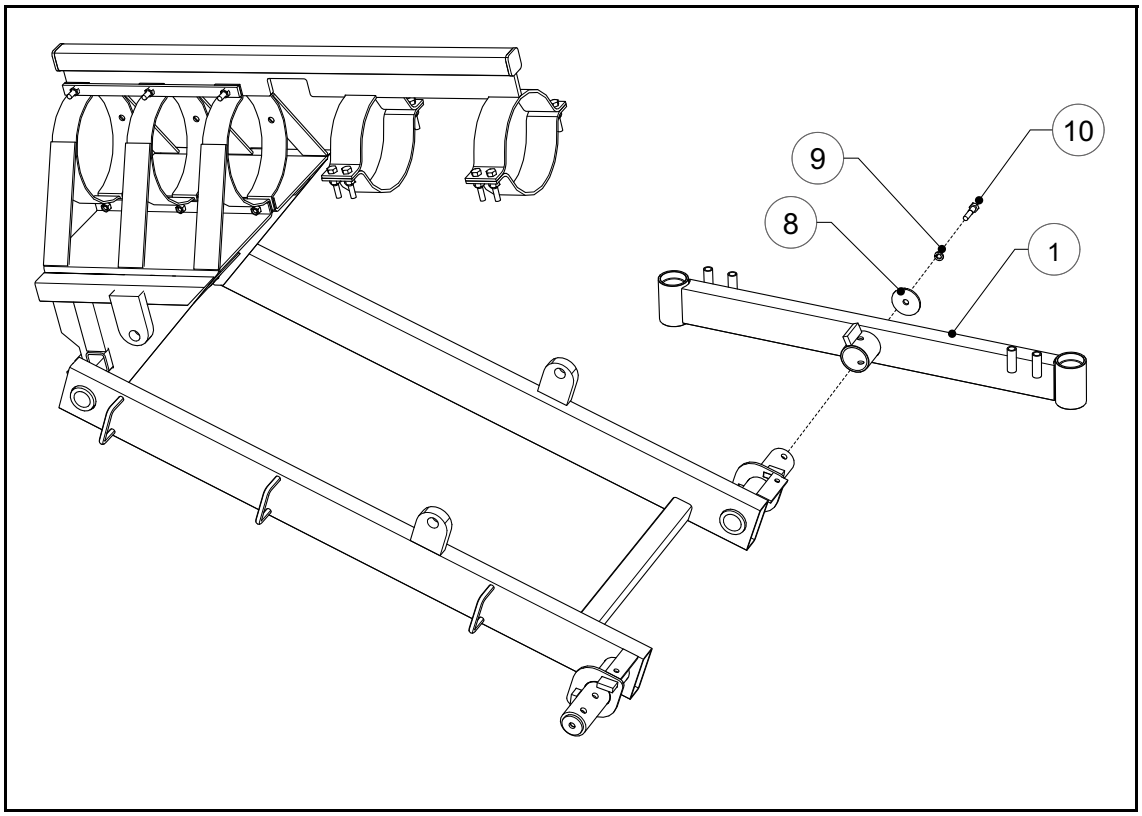



**Figure 3.5 Attaching Walking Beam to the Cam-Lift**

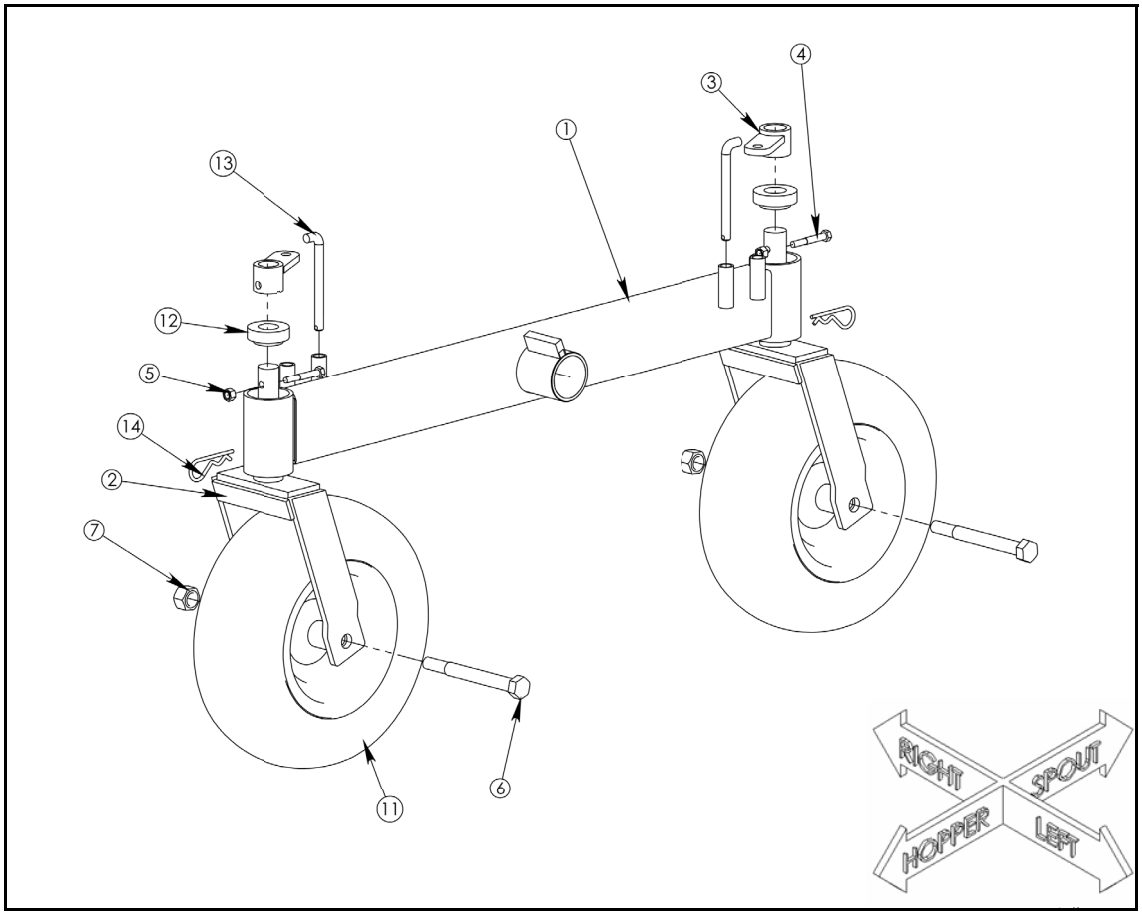



**Figure 3.6 Caster Assembly**

# 3.6. STEERING ASSEMBLY

1. Slide the steering handles (2) onto the steering weldment (1), and fasten the handle joint (3) to the handles with 3/8” x 2” bolts (4) and 3/8” locknuts (5) (see Figure 3.7).
2. Attach the 3-spool valve (6) to the steering weldment (1) with 5/16” x 2-1/2” bolts (7) and 5/16” locknuts (8).
3. Install swivels (9) and elbows (10) in valve (6).
4. Slide steering stop (11) onto steering weldment (1); do not secure set screw.

**Table 3.3 Steering Assembly Components**

| Item | Description | Quantity |
|---|---|---|
| 1 | STEERING WELDMENT | 1 |
| 2 | STEERING HANDLEWITH GRIP | 2 |
| 3 | HANDLE JOINT | 1 |
| 4 | 3/8” x 2” HEX BOLT | 2 |
| 5 | 3/8” NYLOCK NUT | 2 |
| 6 | VALVE - 3 SPOOL - WITH 2 HANDLES | 1 |
| 7 | 5/16” x 2-1/2” HEX BOLT | 2 |
| 8 | 5/16” NYLOCK NUT | 2 |
| 9 | SWIVEL 90 - 8 MORB x 1/2” FPT | 2 |
| 10 | ELBOW #6MORB x 3/8”MJIC 45° | 6 |
| 11 | STEERING STOP | 1 |

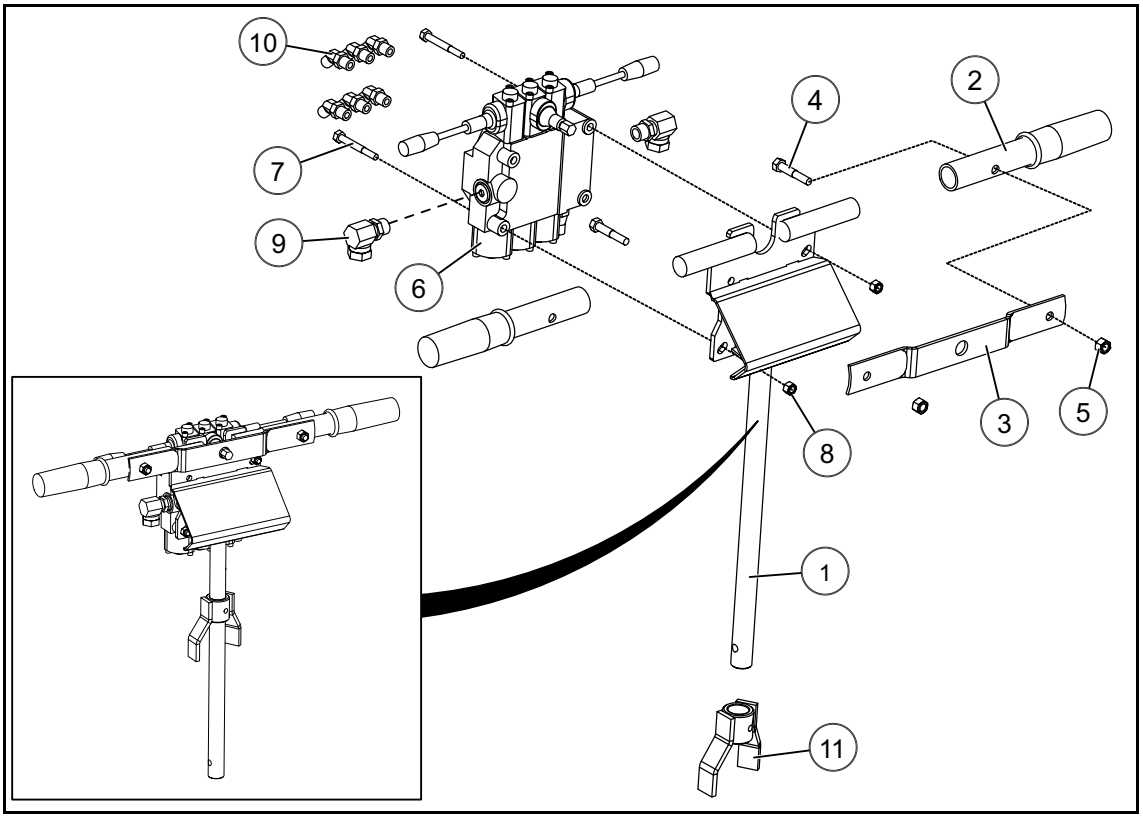



**Figure 3.7 Steering Assembly**

# 3.7. STEERING CASTER ASSEMBLY

1. Attach the walking beam (1) to the cam-lift assembly in the orientation shown in Figure 3.8. Secure with a 1/2” x 2” bolt (12), 1/2” lock washer (11), and axle end cap (10).
2. Install two bearings (8) at each end of the walking beam (1) (see Figure 3.9).
3. Insert straight fork (3) on each end of the walking beam (1) in the bearings and steering pipes (4). Fasten the steering pipes with 3/8” x 2-1/2” bolts (16) and 3/8” locknuts (17).
4. Mount the tires (7) and secure with 3/4” x 7” bolts (14) and 3/4” locknuts (15).
5. Connect the steering link arm (5) and tie rod linkage (6) to the assembly with bolts (12, 19) and 1/2” locknuts (20). Place a 1/2” flat washer (21) on the top and bottom of the tie rod linkage (6) along with the 1/2” x 2-1/2” bolt (19).
6. Slide the steering assembly (2) into the steering pipe welded to the walking beam.
7. Install the retainer with yoke link arm (22) with a 3/8” x 2” bolt (18) and 3/8” locknut (17).
8. Connect the retainer (22) to the tie rod linkage (6) with a 1/2” x 2” bolt (12) and a 1/2” locknut (20). Place a 1/2” flat washer (21) on the top and bottom of the tie rod linkage (6) along with the 1/2” x 2” bolt (12). Adjust until the tie rod is level.
9. Tighten the set screw on the steering stop (Figure 3.7, (5)), once adjusted. Ensure the steering assembly moves easily in both directions without obstruction.

**Table 3.4 Steering Caster Assembly Components**

| Item | Description | Quantity |
|---|---|---|
| 1 | WALKING BEAM – STEERING | 1 |
| 2 | STEERING ASSEMBLY | 1 |
| 3 | FORK – STRAIGHT | 2 |
| 4 | STEERING PIPE | 2 |
| 5 | STEERING LINK ARM | 1 |
| 6 | TIE ROD LINKAGE | 1 |
| 7 | TIRE AND WHEEL (4.8-8”) | 2 |
| 8 | BEARING SAA206 –1-1/4” | 4 |
| 9 | BEARING SAA205 –1” | 2 |
| 10 | END CAP FOR AXLE | 1 |
| 11 | 1/2” LOCK WASHER | 1 |
| 12 | 1/2” x 2” HEX BOLT | 3 |
| 14 | 3/4” x 7” HEX BOLT | 2 |
| 15 | 3/4” NYLOCK NUT | 2 |
| 16 | 3/8” x 2-1/2” HEX BOLT | 2 |
| 17 | 3/8” NYLOCK NUT | 3 |
| 18 | 3/8” x 2” HEX BOLT | 1 |
| 19 | 1/2” x 2-1/2” HEX BOLT | 1 |

**Table 3.4 Steering Caster Assembly Components**

| Item | Description | Quantity |
|---|---|---|
| 20 | 1/2” NYLOCK NUT | 3 |
| 21 | 1/2” FLAT WASHER | 4 |
| 22 | HD CASTER RETAINER CW YOKE LINK ARM | 1 |

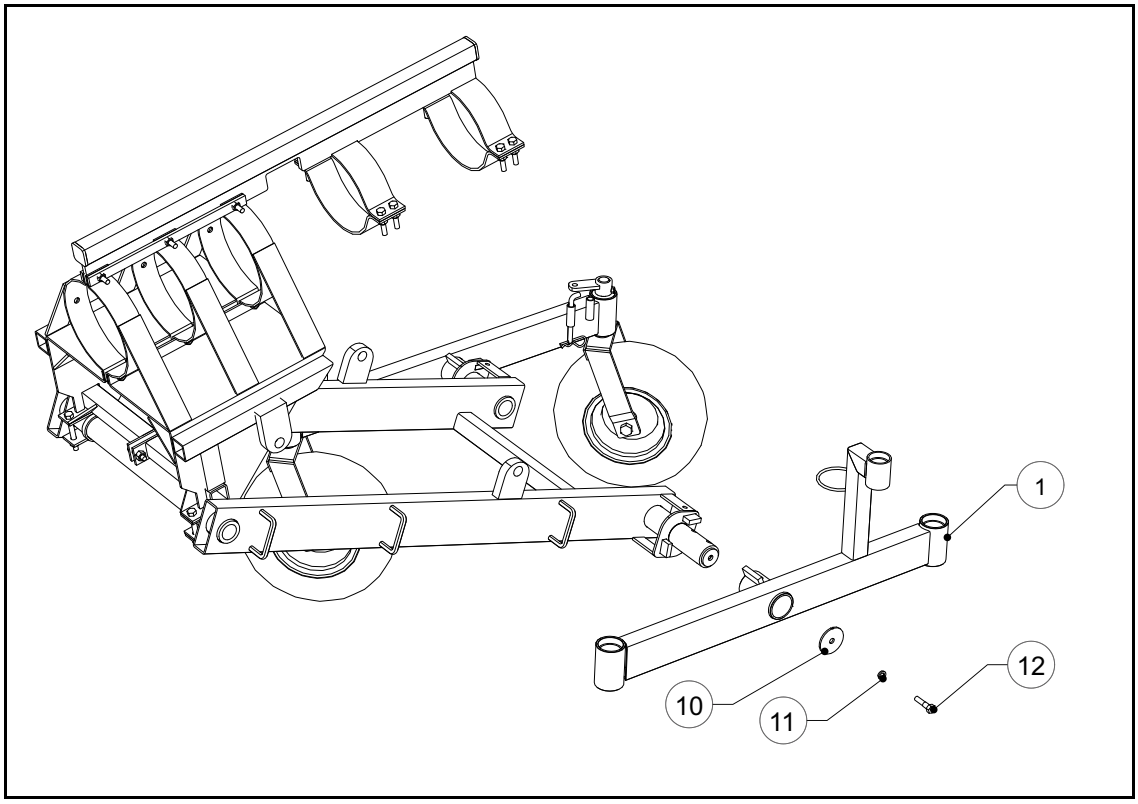



**Figure 3.8 Attaching Walking Beam (Steering) to the Cam-Lift**

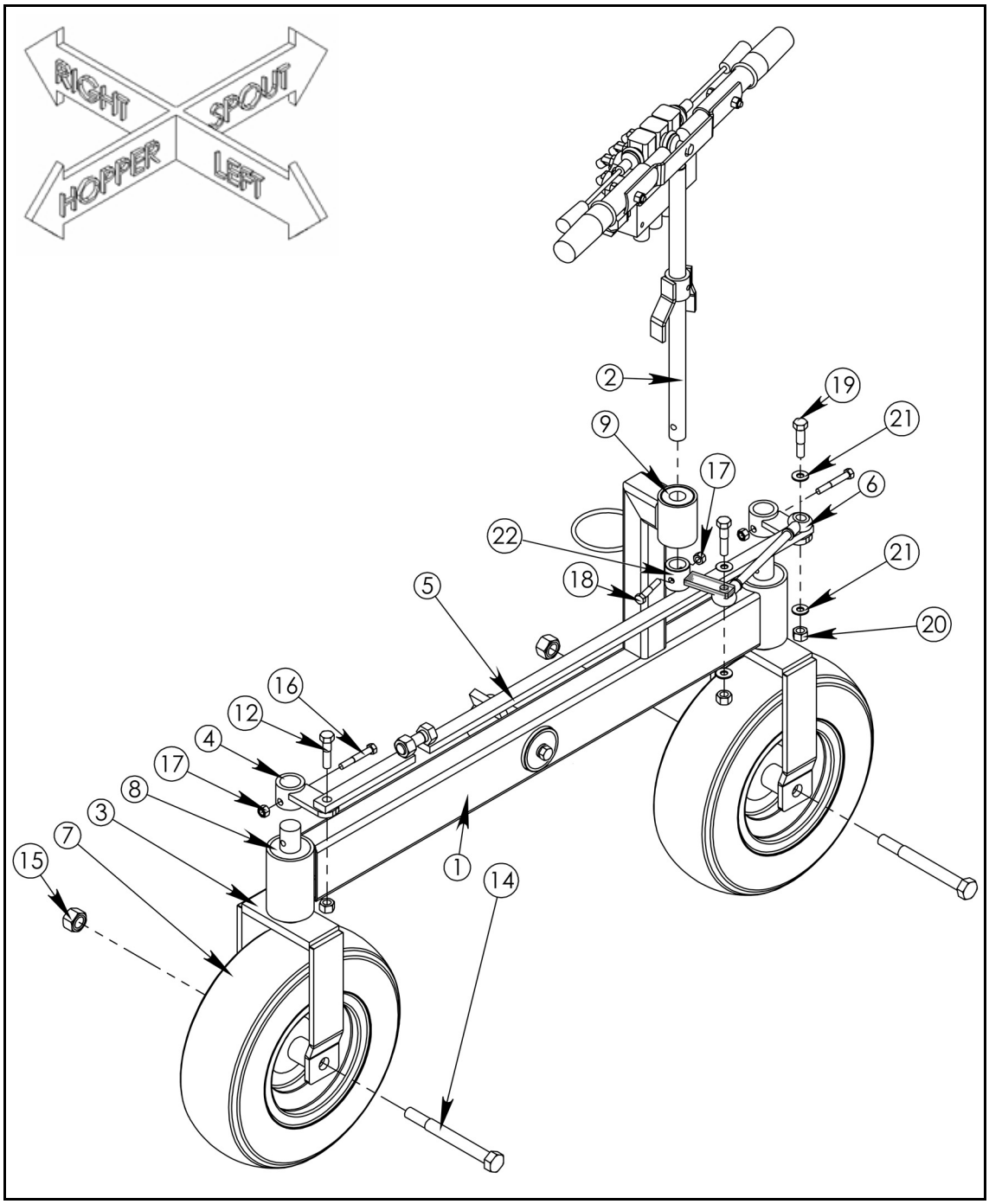



**Figure 3.9 Steering Caster Assembly**

# 3.8. HYDRAULIC CYLINDER INSTALLATION

1. Noting the orientation in Figure 3.10, install hydraulic cylinders (1) on tabs with supplied pins (2) and cotter pins (3). The ports for the fittings should be facing outward (away) from the conveyor tube.

**Table 3.5 Hydraulic Cylinder Components**

| Item | Description | Quantity |
|---|---|---|
| 1 | 2-1/2” x 16” HYD CYLINDER | 2 |
| 2 | CYLINDER PIN | 4 |
| 3 | COTTER PIN | 8 |
| 4 | TEE 3/8 MPT - 3/8 FPT X 3/8 FPT | 2 |
| 5 | SWIVEL 90D - 3/8 MPT X 3/8 FPT | 2 |

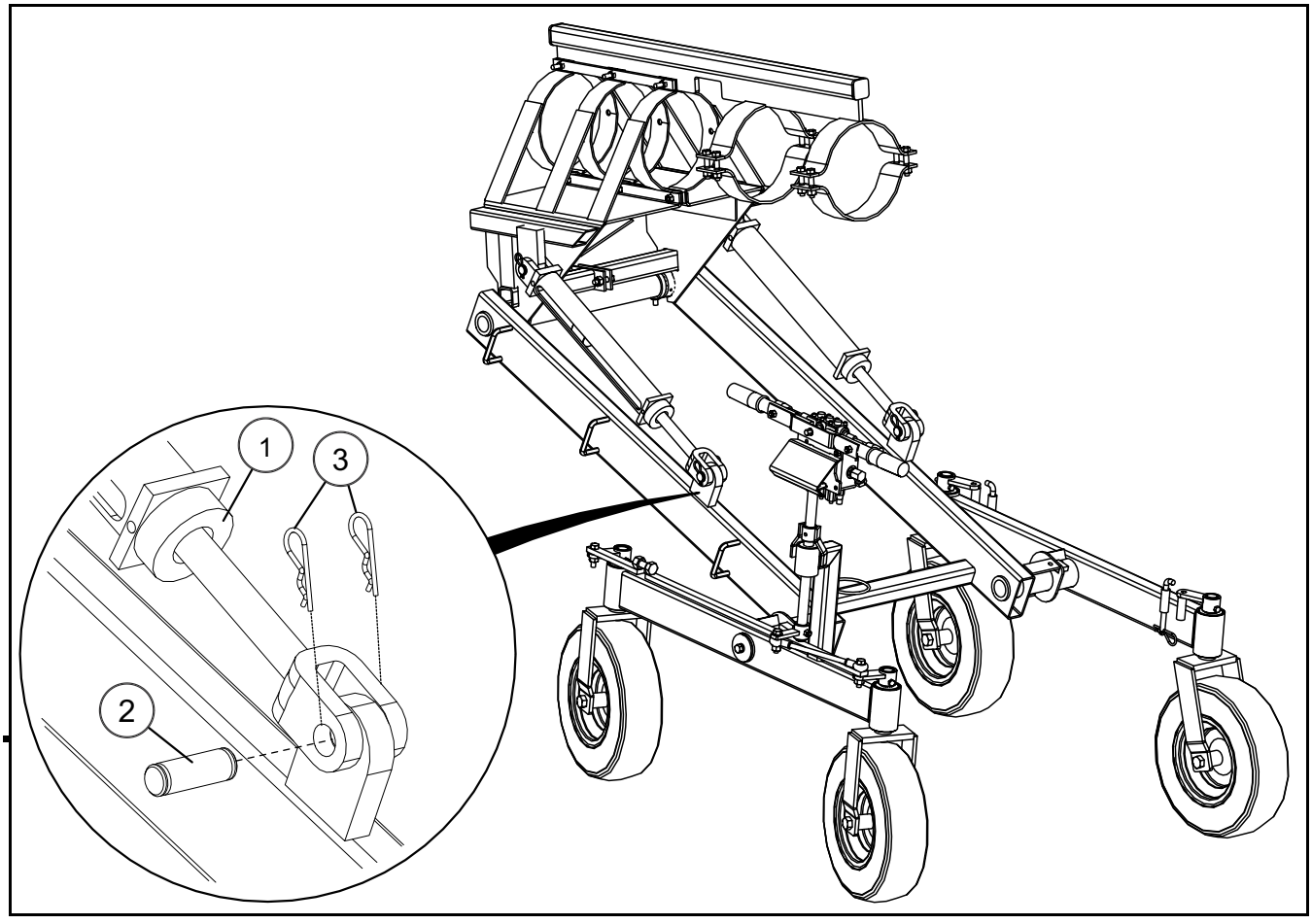



**Figure 3.10 Hydraulic Cylinder Components**

2. Attach hydraulic fittings (4, 5) to the wheel move hydraulic cylinders. See Figure 3.11.

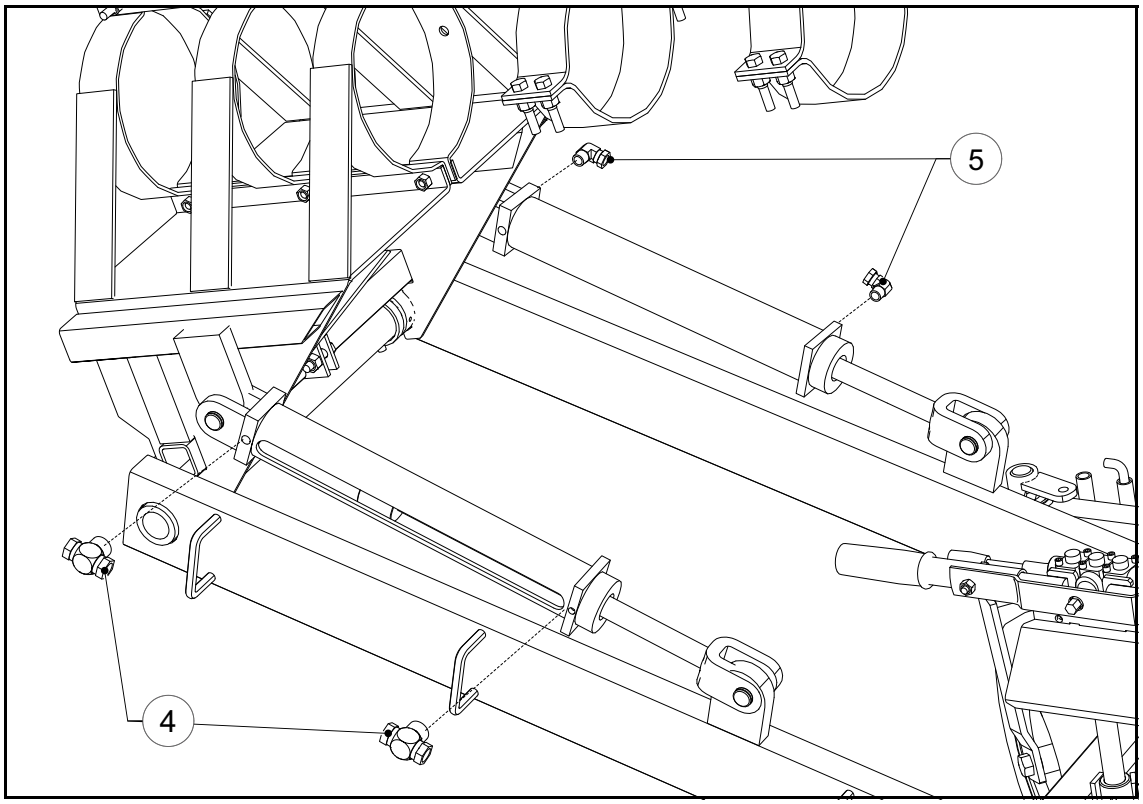



**Figure 3.11 Attaching Fittings to the Wheel Move Hydraulic Cylinders**

# 3.9. WHEEL MOVE DRIVE SYSTEM

**Note:** *Repeat this section for each of the right and left side wheel move drive assemblies. The right and left sides are mirror images.*

1. Fasten motor assembly (1) to wheel move axle (4) using a 1/2” x 2” bolt (5) and 1/2” locknut (2) (see Figure 3.12).
2. Fasten motor assembly (1) at handle to wheel move axle (4) using a 1/2” x 2” bolt (5), 1/2” flat washers (6), and 1/2” flange nuts (3).
3. Fasten the ring gear (7) to the axle with the wheel bolts when installing the conveyor wheels.
4. The cushion block installation (see Figure 3.13) is covered in the hydraulic hose assembly section.

**Table 3.6 Wheel Move Drive System Components**

| Item | Description | Quantity |
|---|---|---|
| 1 | WM DRIVE PINION GEAR ASSY - LEFT | 1 |
| 2 | 1/2” NUT NYLOCK | 2 |
| 3 | 1/2” FLANGE NUT | 4 |
| 4 | WHEEL-MOVE AXLE TAB 3” | 2 |
| 5 | 1/2” x 2” HEX BOLT GR8 | 4 |
| 6 | 1/2” FLAT WASHER PLATED USS | 6 |
| 7 | RING GEAR - C/W MOUNT PLATE | 2 |

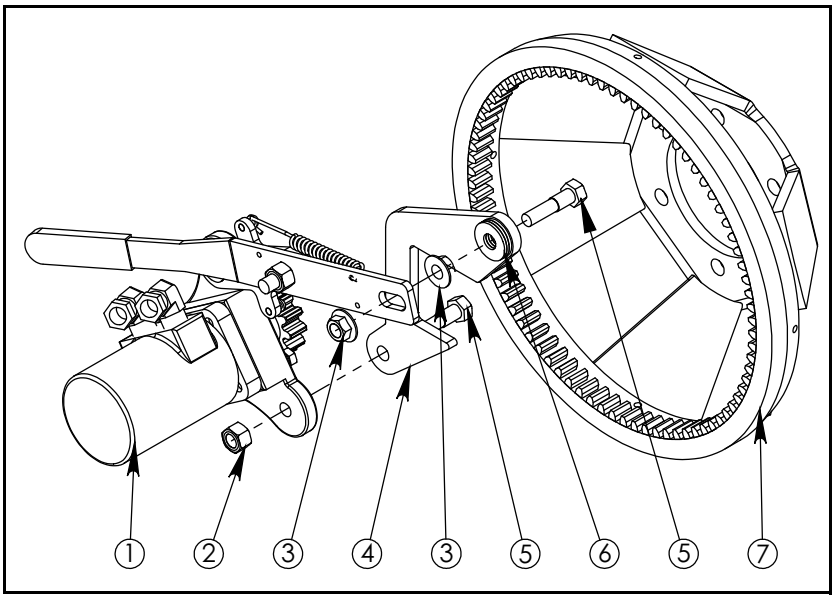



**Figure 3.12 Left Wheel Move Drive Assembly**

**Table 3.7 Wheel Move Hydraulic Components**

| Item | Description | Quantity |
|---|---|---|
| 1 | WHEEL MOVE MOTOR ASM - RIGHT | 1 |
| 2 | CUSHION BLOCK | 1 |
| 3 | WHEEL MOVE MOTOR ASM - LEFT | 1 |

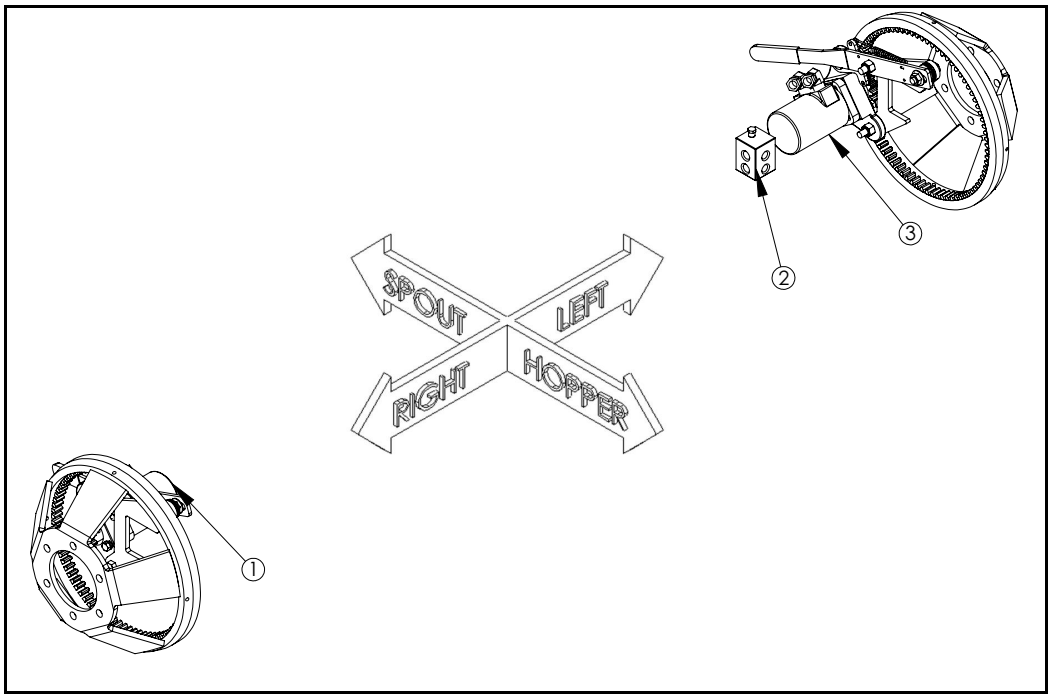



**Figure 3.13 Wheel Move Hydraulic Components**

# 3.10. PINION GEAR ADJUSTMENT

**NOTICE**

Failure to ensure proper gear meshing will result in gear damage.

1. The pinion gear should mesh with the ring gear to provide maximum tooth contact (Figure 3.14).
2. If the pinion gear does not mesh fully with the ring gear, adjust the handle slot bolt (which bolts to the drive mount clamp) so full meshing of pinion gear is achieved when handle is in over-center position (Figure 3.14).
3. **Gear teeth binding**: If the handle will not 'lock' into over-center position, loosen the slot bolt nuts and slide the handle away from the tire.
4. **Insufficient meshing**: If the pinion gear will barely mesh with the ring gear, loosen the slot bolt jam nuts and slide the handle towards the tire until the pinion gear teeth mesh with the ring gear teeth without binding.

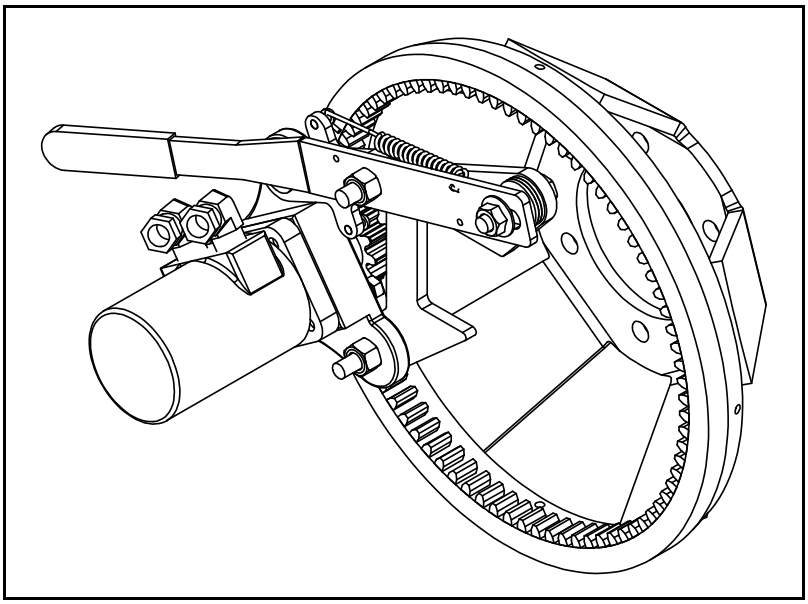


**Figure 3.14 Pinion Gear Adjustment (Left Shown)**

# 3.11. WHEEL MOVE HYDRAULIC HOSE ASSEMBLY

See “Hydraulic Schematic (Overhead View)” on page 30. and Table 3.8 for the quantity of each component used.

**Note:** *Keep hoses and connectors free of dirt while assembling.*

**Note:** *Right-hand (RH) and left-hand (LH) sides — these terms apply when facing in the transport direction.*

### Table 3.8 Hydraulic Schematic Components

| | | | | | | 1565 | 1575 | 1585 | 1590 | 15100 |
|---|---|---|---|---|---|---|---|---|---|---|
| **ITEM** | **PART NUMBER** | **DESCRIPTION** | **FITTINGS** | **FITTINGS** | **QTY** | **LENGTH** | **LENGTH** | **LENGTH** | **LENGTH** | **LENGTH** |
| A1, A2 | P0832019 | 3/8” HOSE | 3/8 MPT | 3/8 MPT | 2 | 7’ 6” (2.29 m) | 7’ 6” (2.29 m) | - | - | - |
| | P0832020 | | | | | - | - | 4’6” (1.37 m) | 4’ 6” (1.37 m) | 4’ 6” (1.37 m) |
| B1, B2 | P0832028 | 3/8” HOSE | 3/8 MPT | 3/8 MPT | 2 | 1’ 8” (0.51 m) | 1’ 8” (0.51 m) | - | - | - |
| | P0832038 | | | | | - | - | 9’ (2.74 m) | 9’ (2.74 m) | 9’ (2.74 m) |
| C1, C2 | P0832045 | 3/8” HOSE | 3/8 FJIC | 3/8 MPT | 2 | 38’ (11.58 m) | 38’ (11.58 m) | - | - | - |
| | P0832050 | | | | | - | - | 45’ (13.72 m) | 45’ (13.72 m) | - |
| | P0832069 | | | | | - | - | - | - | 50’ (15.24 m) |
| D | P0832048 | 3/8” HOSE | 1/2 MPT | 1/2 MPT | 1 | 39’ (11.89 m) | 39’ 11.89 m) | - | - | - |
| | P0832049 | | | | | - | - | 45’ (13.72 m) | 45’ (13.72 m) | - |
| | P0832068 | | | | | - | - | - | - | 52’ 6” (16.00 m) |
| E | P0832041 | 3/8” HOSE | 1/2 MPT | 3/8 FJICX | 1 | 49’ 6” (15.09 m) | 49’ 6” (15.09 m) | - | - | - |
| | P0832042 | | | | | - | - | 55’ 6” (16.92 m) | 55’ 6” (16.92 m) | - |
| | P0832067 | | | | | - | - | - | - | 63’ (19.2 m) |
| F | P0832043 | 3/8” HOSE | 1/2 MPT | 3/8 FJIC | 1 | 10’ 6” (3.20 m) | 10’ 6” (3.20 m) | 10’ 6” (3.20 m) | 10’ 6” (3.20 m) | 10’ 6” (3.20 m) |
| G1 | P0832026 | 3/8” HOSE | 3/8 MPT | 3/8 FJICX | 1 | 7’ (2.13 m) | 7’ (2.13 m) | 7’ (2.13 m) | 7’ (2.13 m) | 7’ (2.13 m) |
| G2 | P0832040 | 3/8” HOSE | 3/8 MPT | 3/8 FJICX | 1 | 5’ 10” (1.77 m) | 5’ 10” (1.77 m) | 5’ 10” (1.77 m) | 5’ 10” (1.77 m) | 5’ 10” (1.77 m) |
| H | P0832053 | 1/2” HOSE | 1/2 MPT | 1/2 MPT | 1 | 11’ 6” (3.51 m) | 11’ 6” (3.51 m) | 11’ 6” (3.51 m) | 11’ 6” (3.51 m) | 11’ 6” (3.51 m) |
| I | P0832031 | 1/2” HOSE | 1/2 MPT | 1/2 MPT | 1 | 15’ (4.57 m) | 15’ (4.57 m) | 15’ (4.57 m) | 15’ (4.57 m) | 15’ (4.57 m) |
| J | P0832019 | 3/8” HOSE | 3/8 MPT | 3/8 MPT | 1 | 7’ 6” (2.29 m) | 7’ 6” (2.29 m) | 7’ 6” (2.29 m) | 7’ 6” (2.29 m) | 7’ 6” (2.29 m) |
| K | P0832029 | 3/8” HOSE | 3/8 MPT | 3/8 MPT | 1 | 5’ 6” (1.68 m) | 5’ 6” (1.68 m) | 5’ 6” (1.68 m) | 5’ 6” (1.68 m) | 4’ 6” (1.37 m) |
| L | 01010148 | 3/4” HOSE | NONE | NONE | 1 | 5’ (1.52 m) | 5’ (1.52 m) | 5’ (1.52 m) | 5’ (1.52 m) | 5’ (1.52 m) |
| 1 | P0861001 | BALL VALVE 1/2” | – | – | 1 | – | – | – | – | – |
| 2 | P029900791 | TEE 3/8 MPT | 3/8 FPT | 3/8 FPT | 2 | – | – | – | – | – |
| 3 | P0820010 | SWIVEL 90D | 8MORB | 1/2 FPT | 2 | – | – | – | – | – |
| 4 | P0820007 | SWIVEL 90D | 3/8 MPT | 3/8 FPT | 2 | – | – | – | – | – |
| 5 | P0821112 | STRAIGHT – SWIVEL | 1/2 MPT | 1/2 FPT | 1 | – | – | – | – | – |
| 6 | P0820013 | SWIVEL 90D | 1/2 MPT | 3/8 FPT | 4 | – | – | – | – | – |

## Table 3.8 Hydraulic Schematic Components

| | | | | | | 1565 | 1575 | 1585 | 1590 | 15100 |
|---|---|---|---|---|---|---|---|---|---|---|
| **ITEM** | **PART NUMBER** | **DESCRIPTION** | **FITTINGS** | **FITTINGS** | **QTY** | **LENGTH** | **LENGTH** | **LENGTH** | **LENGTH** | **LENGTH** |
| 7 | P0821127 | SWIVEL 3/8” | 3/8 MPT | 3/8 FPT | 2 | – | – | – | – | – |
| 8 | P0820611 | ELBOW 45° | 6MORB | 3/8 MJIC | 6 | – | – | – | – | – |
| 9 | P0820001 | SWIVEL 90D | 1/2 MPT | 1/2 FPT | 2 | – | – | – | – | – |
| 10 | P0821129 | SWIVEL | 8MORB | 1/2 FPT | 1 | – | – | – | – | – |
| 11 | P0820702 | HOSE BARB | 10MORB | 3/4 HOSE | 1 | – | – | – | – | – |
| 12 | P0861035 | CHECK VALVE | – | – | 1 | – | – | – | – | – |

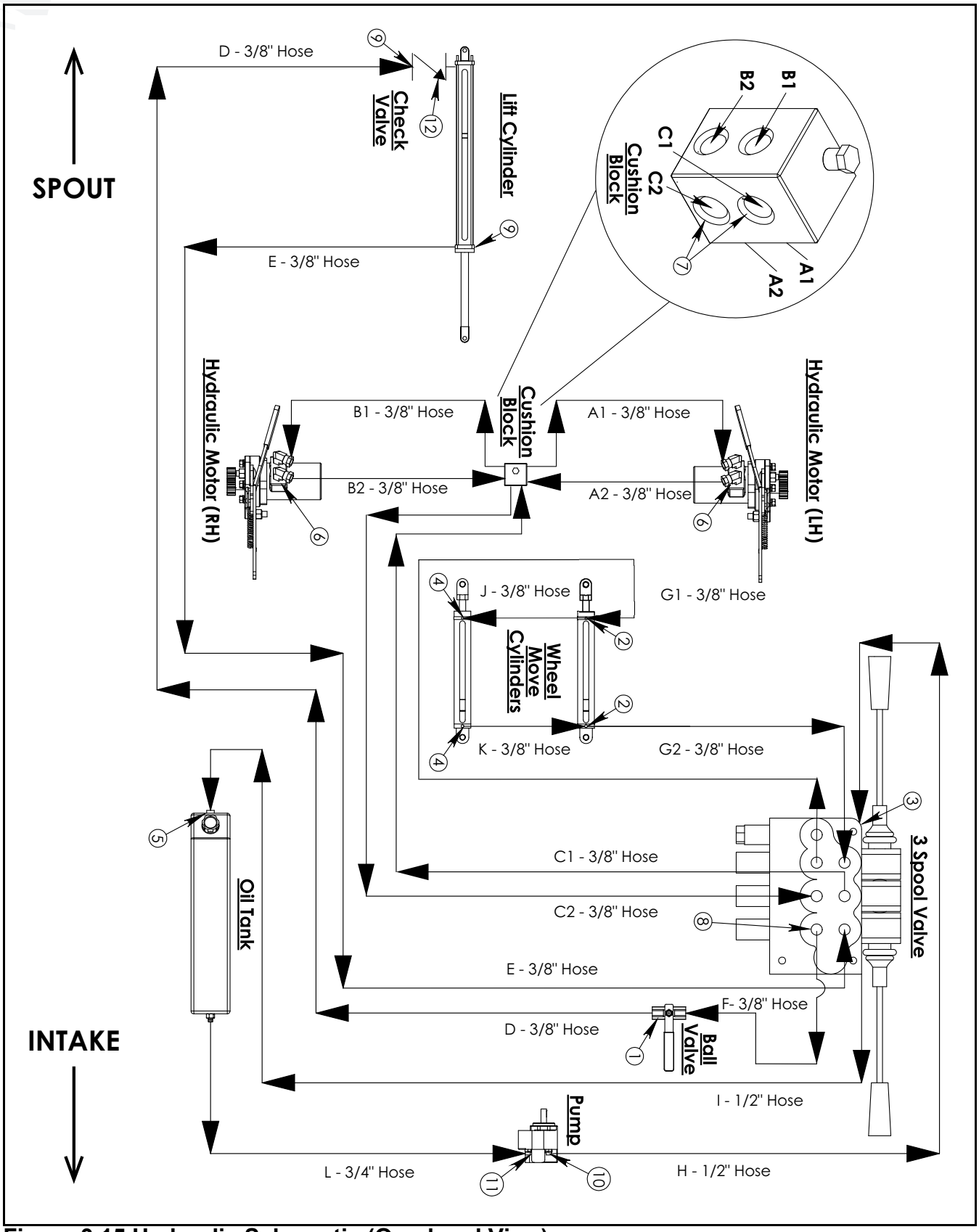



**Figure 3.15 Hydraulic Schematic (Overhead View)**

1. Place cushion block in position shown in Figure 3.16 and attach two 3/8” swivels (7) to ports facing the hopper side.
2. Attach hoses A1, A2, B1, B2, C1, and C2 to the cushion block. Secure cushion block to the main axle with zip ties.
3. Attach hydraulic hoses A1, A2, B1, and B2 to the hydraulic motors (see Figure 3.17).
4. Secure hoses B1 and B2 to main axle with a plastic hydraulic clamp, 1/4" x 3" tek screw, and 1/4" flat washer (see Figure 3.18).
5. Install zip ties on A1, A2, C1, and C2. Route C1 and C2 along the axle arm and secure with 1/4" x 3" tek screws and 1/4" flat washers (see Figure 3.16 and Figure 3.18).

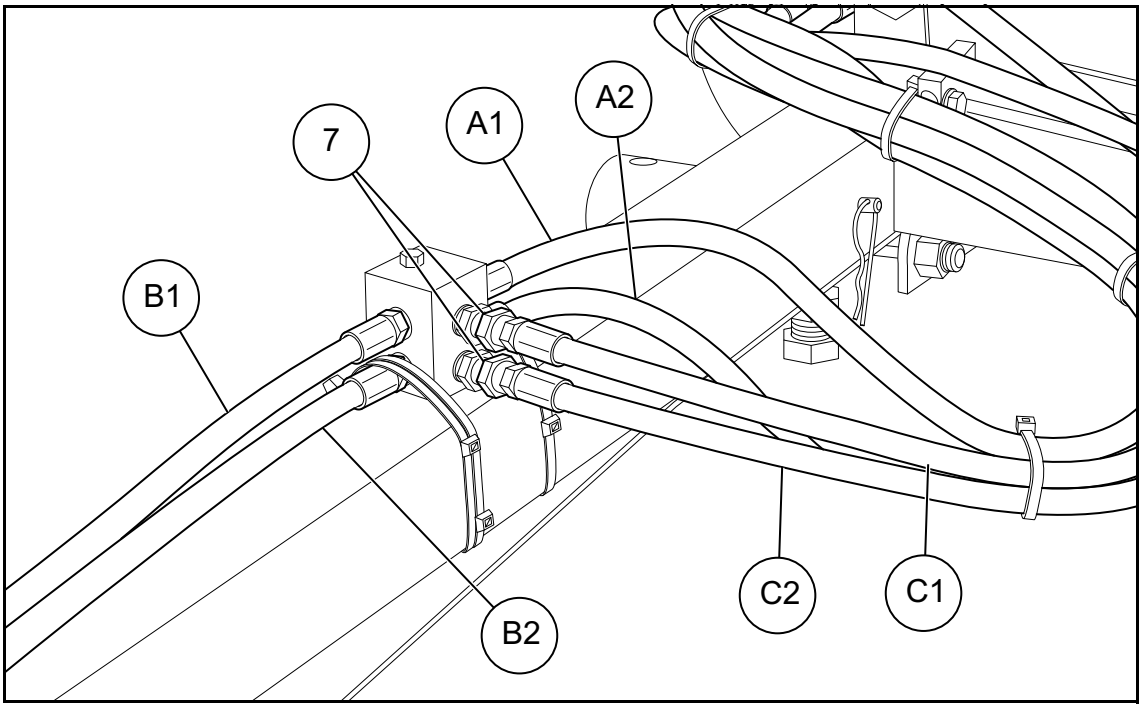



**Figure 3.16 Cushion Block and Hydraulic Hoses**

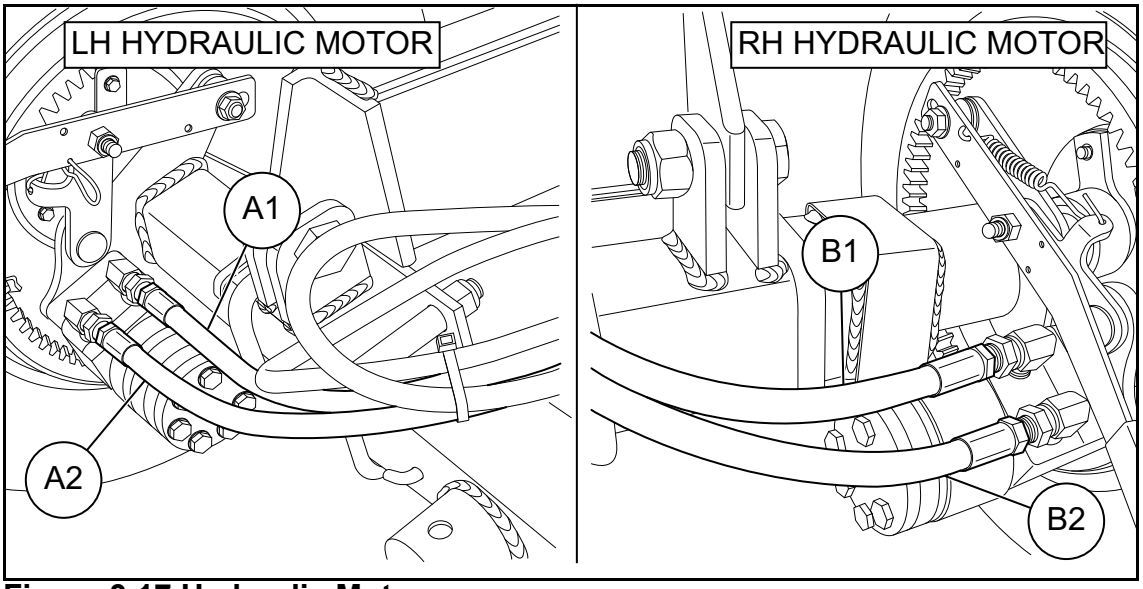



**Figure 3.17 Hydraulic Motors**

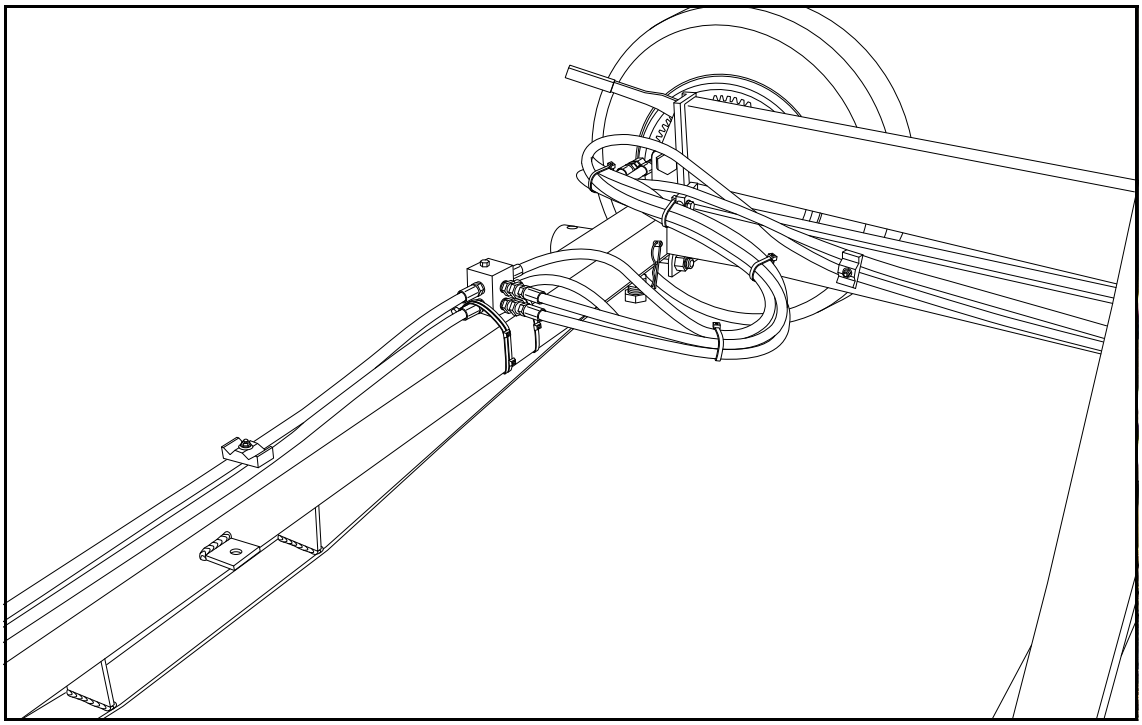


**Figure 3.18 Securing Hoses to the Main Axle and Axle Arm**

6. Attach hoses D and E to the lift cylinder (see Figure 3.19).
7. Secure the lift cylinder hoses to the ladder arm and route back toward the hopper through the brackets under the tube (see Figure 3.20).

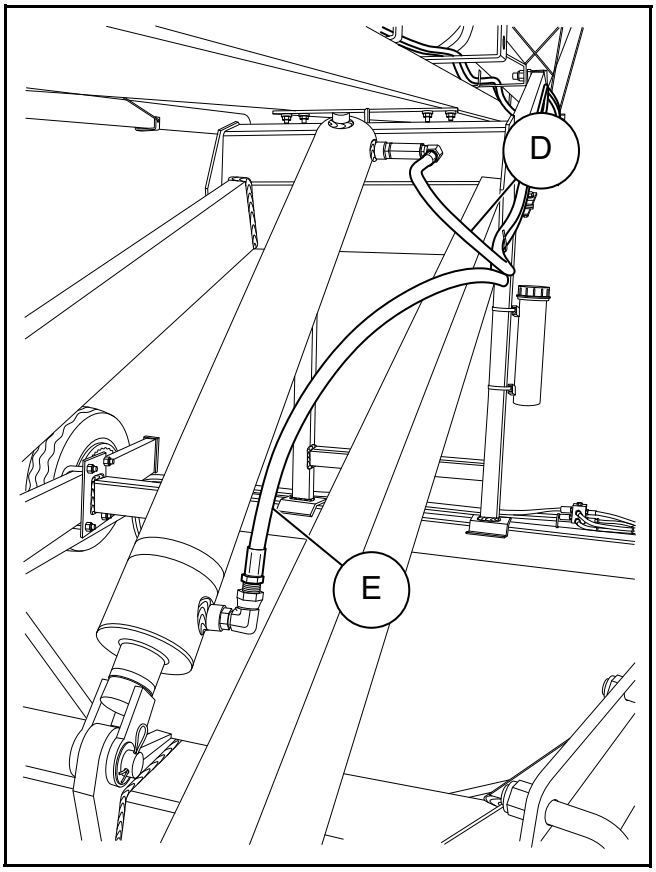



**Figure 3.19 Conveyor Hydraulic Cylinder Hoses**

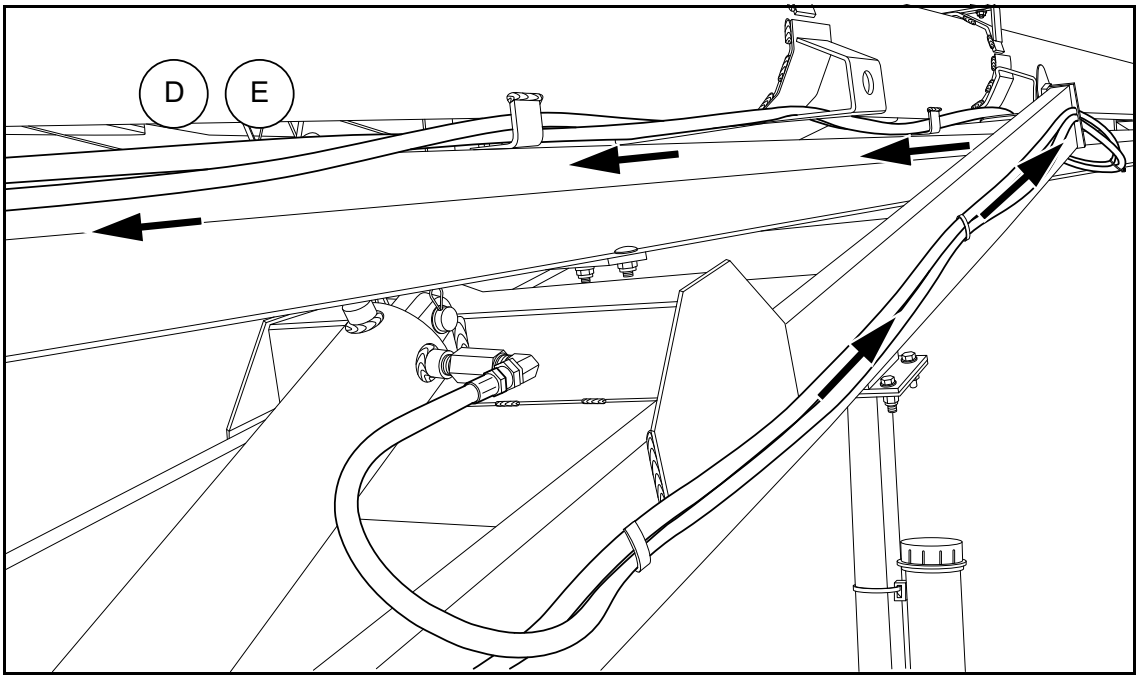



**Figure 3.20 Routing of Lift Cylinder Hydraulic Hoses**

8. Attach ball valve (1) to hose D and connect hose F. Secure ball valve to the wheel move base with zip ties (see Figure 3.21).

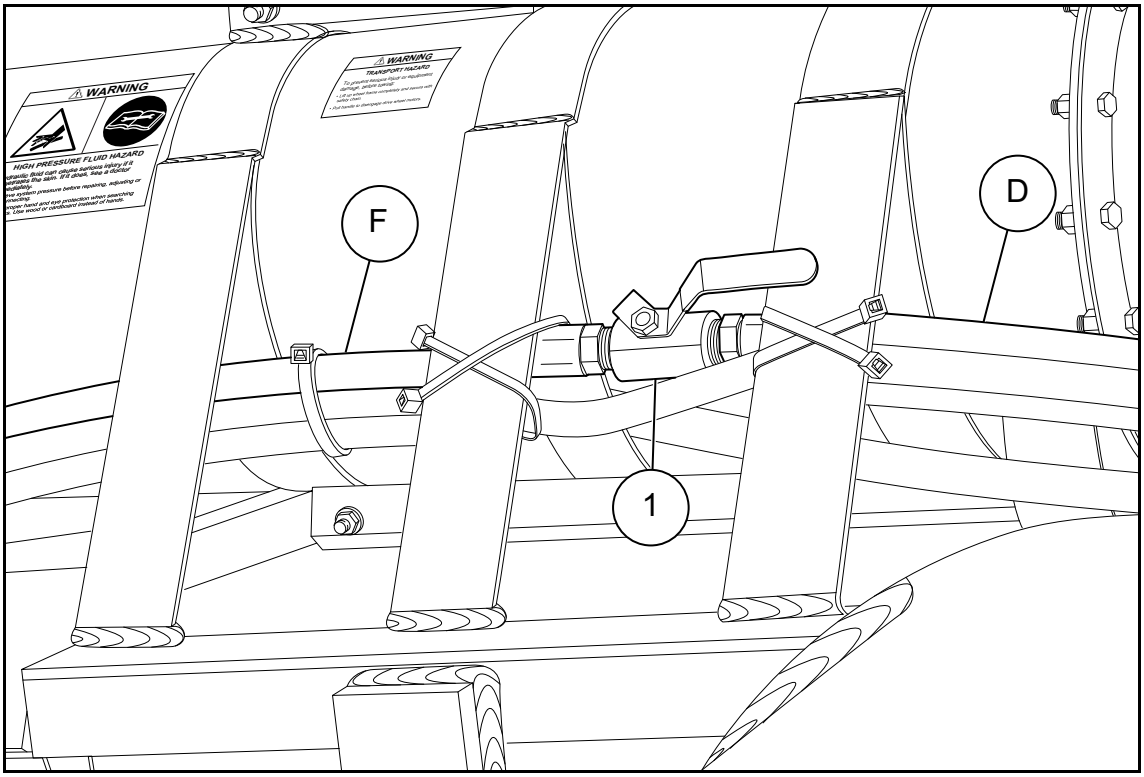



**Figure 3.21 Ball Valve**

9. Attach hoses J and K to the 90-degree fittings on the wheel move hydraulic cylinder. Insert these hoses through the Cam-Lift tube toward the steering side of the wheel move (see Figure 3.22).

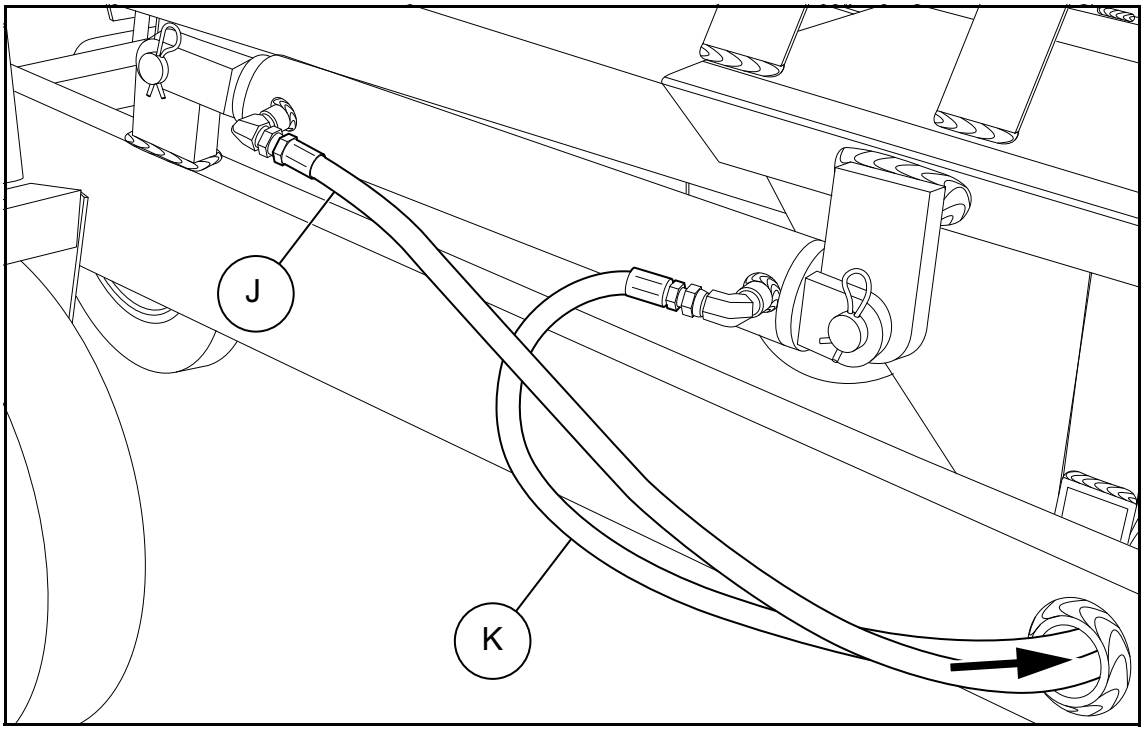



**Figure 3.22 Wheel Move Cylinder**

10. Attach hoses J and K to the tee fittings on the other wheel move hydraulic cylinder (see Figure 3.23). Attach hoses G1 and G2 and route toward the spool valve (see Figure 3.24).

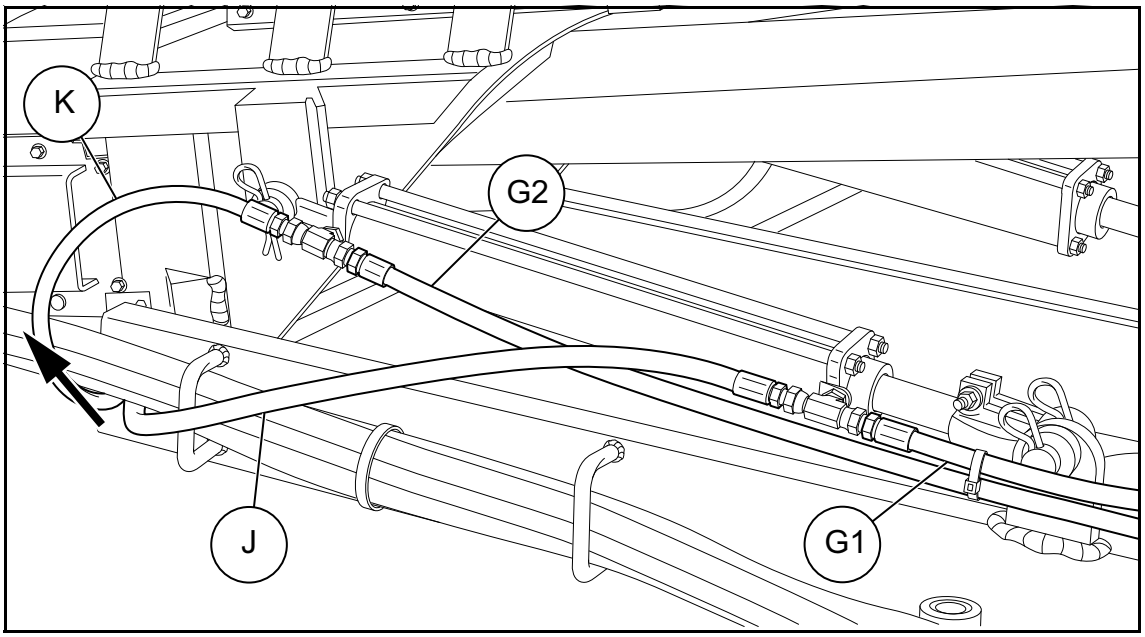



**Figure 3.23 Wheel Move Cylinder (2)**

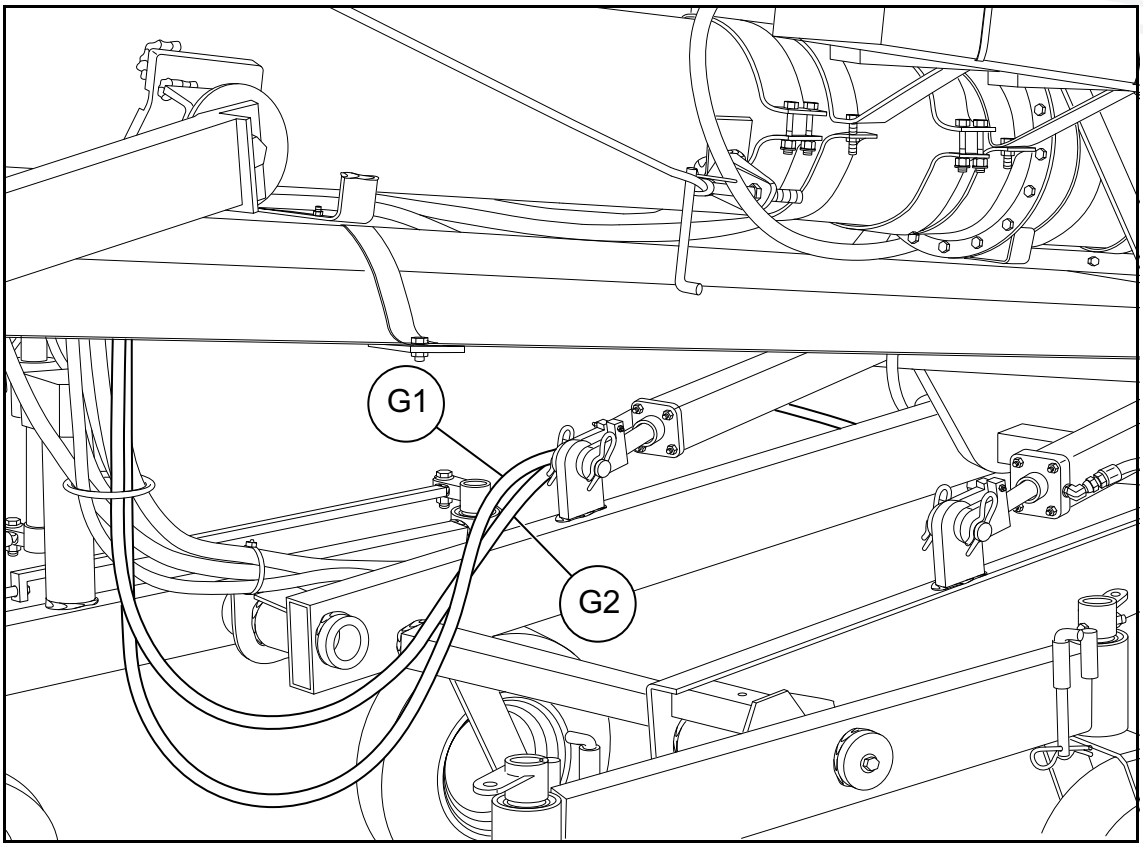



**Figure 3.24 Wheel Move Hydraulic Cylinder Hoses**

11. Attach hose I and L to the oil tank (see Figure 3.25). Pass hose I under the tube toward the spool valve. Attach the other end of hose L to the inlet port of the hydraulic pump.

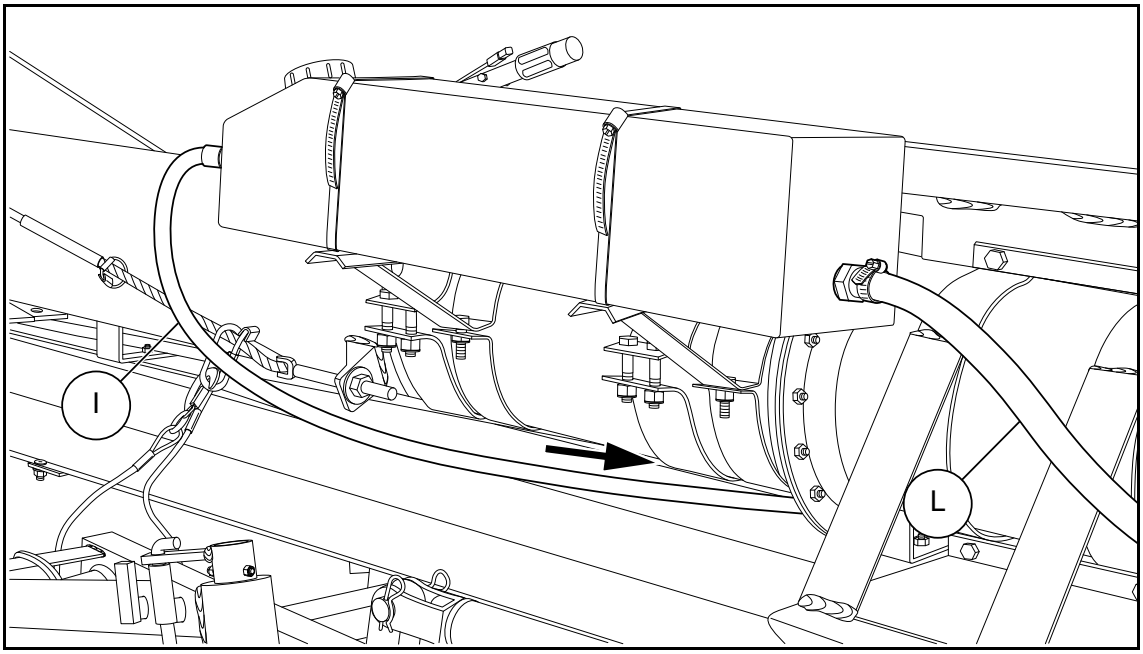



**Figure 3.25 Oil Tank**

**Note:** *The 3/4" hose, "L," installs from tank to pump with the 2 hose clamps listed in the gas wet kit assembly.*

12. Attach hose H to the outlet port of the pump (see Figure 3.26). Route hose H toward the spool valve.

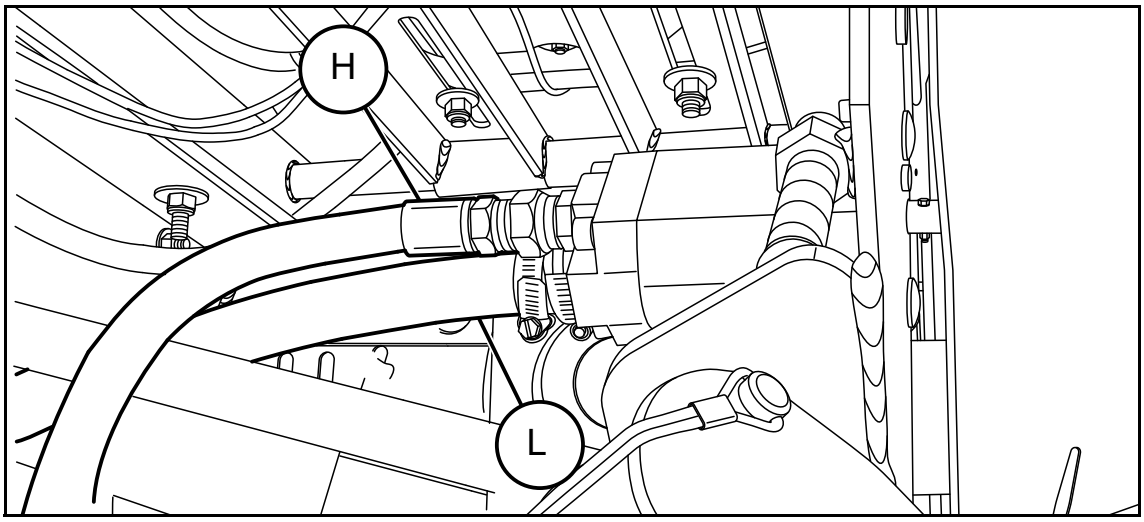



**Figure 3.26 Oil Pump**

13. Insert hoses C1, C2, E, F, I, and H through the loops on the Cam-Lift toward the spool valve (see Figure 3.27).

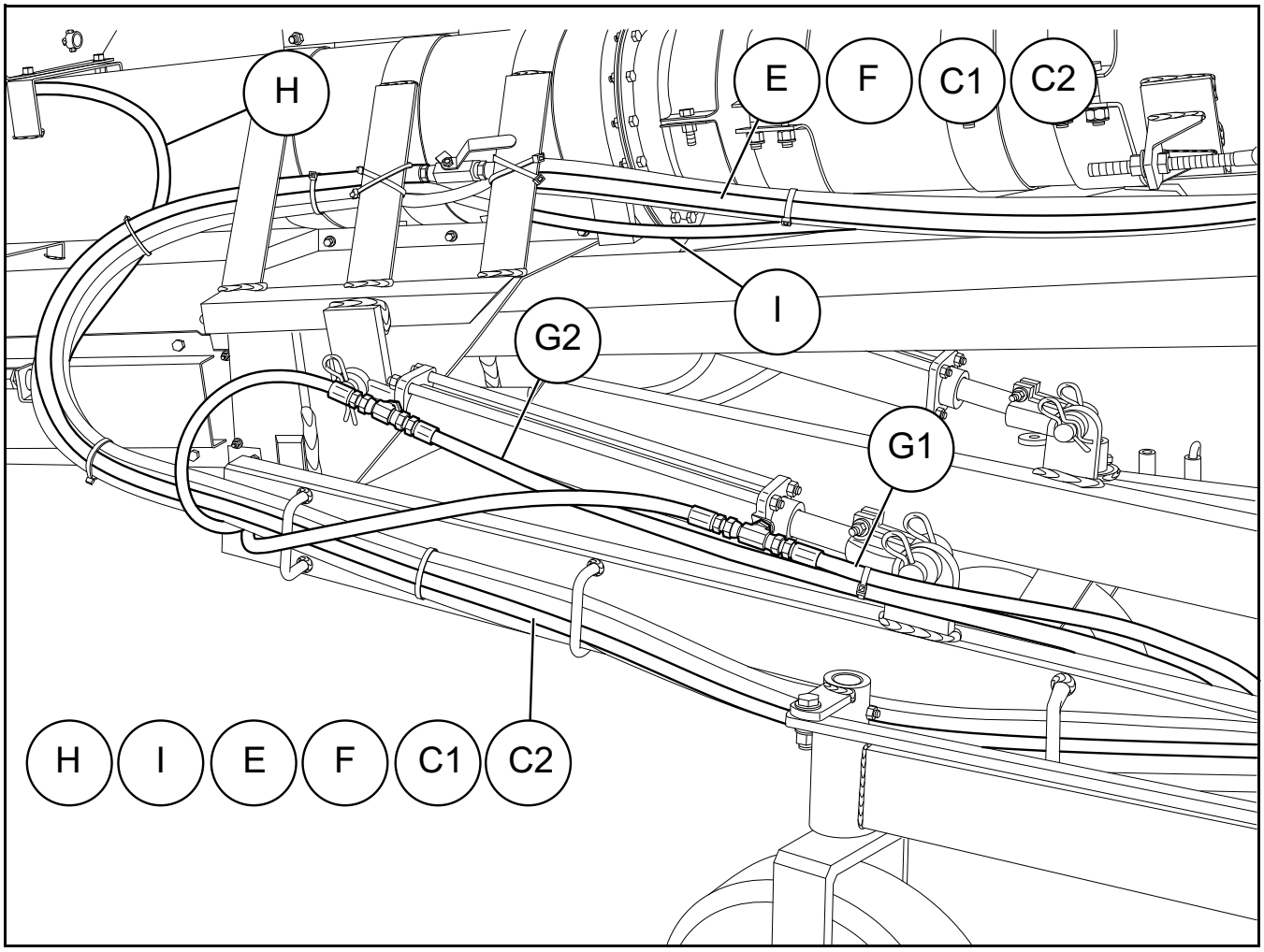



**Figure 3.27 Hydraulic Hoses**

14. Attach hoses to the spool valve as shown in Figure 3.28 and Figure 3.29.

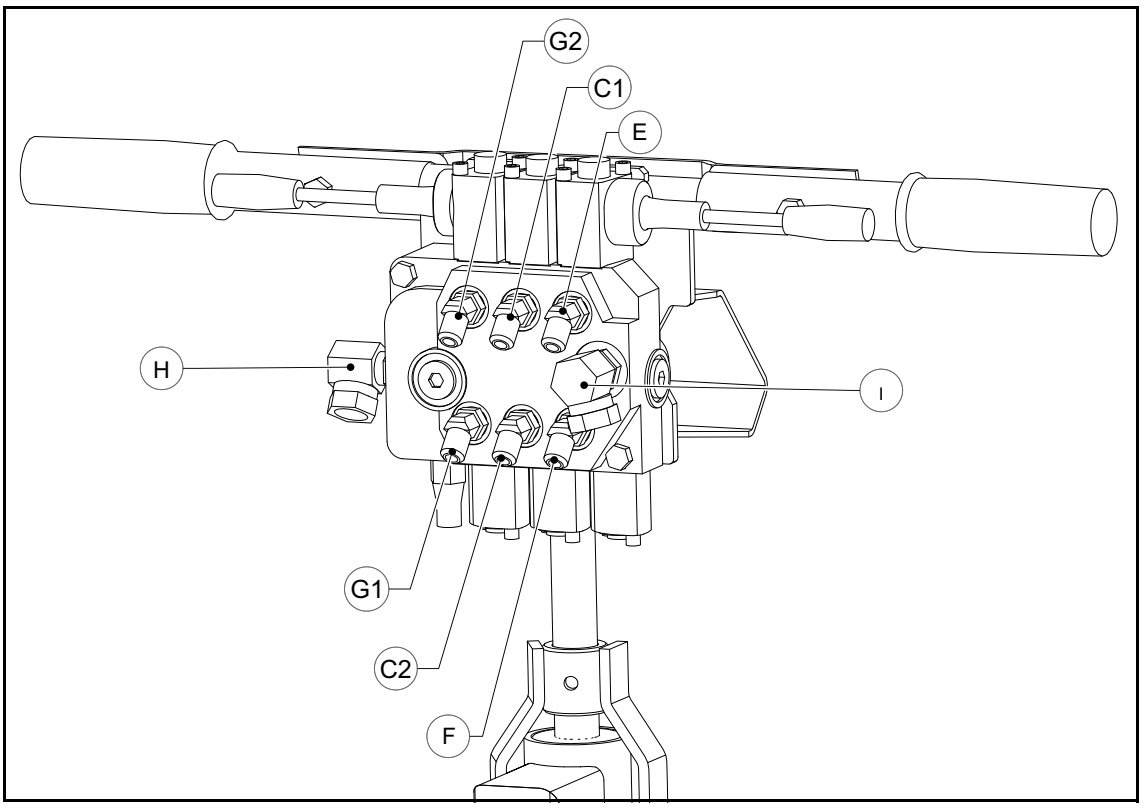



**Figure 3.28 Spool Valve**

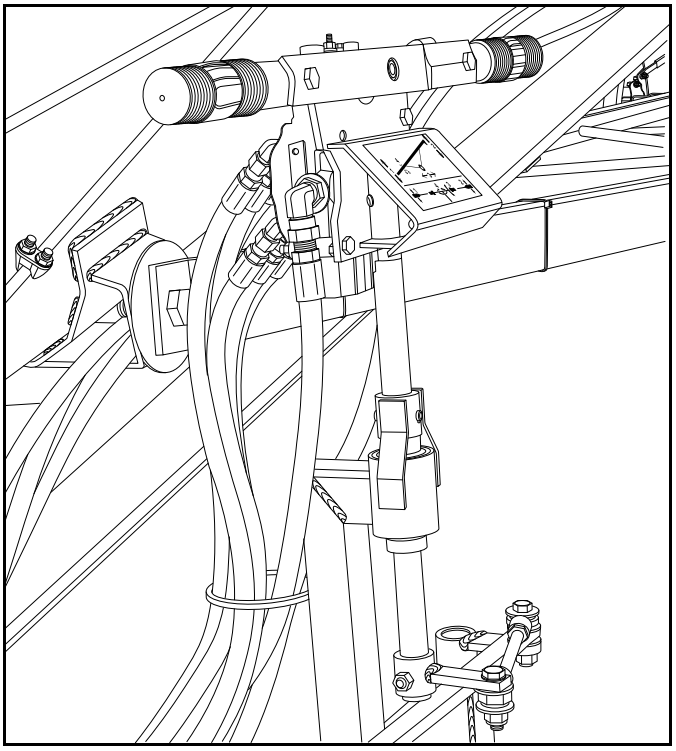


**Figure 3.29 Spool Valve (2)**

15. Tighten fittings after being satisfied that the hoses are in the proper position.
16. Check operation.
17. Secure hoses in place with the cable ties supplied.

# 3.12. HYDRAULIC PRESSURE RELIEF VALVE ADJUSTMENT

**Important:** *Each valve comes pre-set at the right level from the factory. If the controls are acting too fast or "jerky", DO NOT attempt to adjust the pressure, contact Batco for technical assistance.*

# 3.13. ATTACH THE TRANSPORT SAFETY CABLE

Attach the transport safety cable as shown in Figure 3.30.

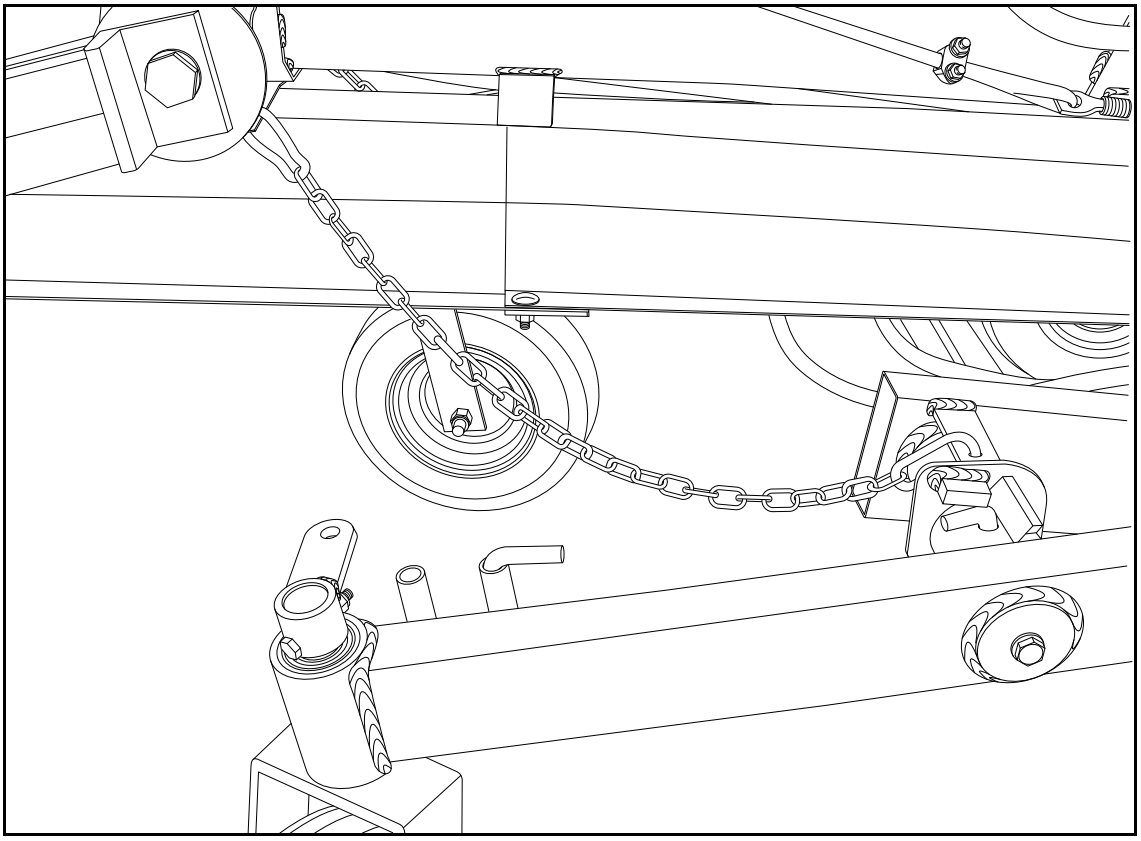


**Figure 3.30 Transport Safety Cable**

# 4. Appendix

## 4.1. BOLT TORQUE

Table 4.1 gives correct torque values for various hardware. Tighten all bolts to the torque specified, unless otherwise noted. Check tightness periodically, using Table 4.1 as a guide. Replace hardware with the same strength bolt.

**Table 4.1 Recommended Bolt Torques[a]**

| Bolt Diameter | Dry or Lubricated | Recommended Torque (ft·lb) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Grade 2 | | Grade 5 | | Grade 8 | | 8.8 S/S | |
| | | Coarse | Fine | Coarse | Fine | Coarse | Fine | Coarse | Fine |
| 1/4" | Dry | 6.3 | 6.3 | 8 | 10 | 12 | 14 | 6.3 | 7.8 |
| | Lubricated | 5.5 | 4.7 | 6.3 | 7.2 | 9 | 10 | - | - |
| 5/16" | Dry | 11 | 12 | 17 | 19 | 24 | 27 | 11 | 11.8 |
| | Lubricated | 8 | 9 | 13 | 14 | 18 | 20 | - | - |
| 3/8" | Dry | 20 | 23 | 30 | 35 | 45 | 50 | 20 | 22 |
| | Lubricated | 15 | 17 | 23 | 25 | 35 | 35 | - | - |
| 7/16" | Dry | 32 | 36 | 50 | 55 | 70 | 80 | 31 | 33 |
| | Lubricated | 24 | 27 | 35 | 40 | 50 | 80 | - | - |
| 1/2" | Dry | 50 | 55 | 75 | 85 | 110 | 120 | 43 | 45 |
| | Lubricated | 35 | 40 | 55 | 65 | 80 | 90 | - | - |
| 9/16" | Dry | 70 | 80 | 110 | 120 | 150 | 170 | 57 | 63 |
| | Lubricated | 55 | 60 | 80 | 90 | 110 | 130 | - | - |
| 5/8" | Dry | 100 | 110 | 150 | 170 | 210 | 240 | 93 | 104 |
| | Lubricated | 75 | 85 | 110 | 130 | 160 | 180 | - | - |
| 3/4" | Dry | 175 | 200 | 260 | 300 | 380 | 420 | 128 | 124 |
| | Lubricated | 130 | 140 | 200 | 220 | 280 | 310 | - | - |
| 7/8" | Dry | 170 | 180 | 430 | 470 | 600 | 670 | 194 | 193 |
| | Lubricated | 125 | 140 | 320 | 350 | 180 | 180 | - | - |
| 1" | Dry | 250 | 280 | 640 | 720 | 910 | 1020 | 287 | 289 |
| | Lubricated | 190 | 210 | 480 | 540 | 680 | 760 | - | - |
| 1-1/8" | Dry | 350 | 400 | 790 | 890 | 1290 | 1440 | 288 | 290 |
| | Lubricated | 270 | 300 | 590 | 670 | 970 | 1080 | - | - |
| 1-1/4" | Dry | 500 | 550 | 1120 | 1240 | 1820 | 2010 | 289 | 291 |
| | Lubricated | 380 | 420 | 840 | 930 | 1360 | 1510 | - | - |
| 1-1/2" | Dry | 870 | 960 | 1950 | 2200 | 3160 | 3560 | - | - |
| | Lubricated | 650 | 730 | 1460 | 1640 | 2370 | 2670 | - | - |

a. Torque value for bolts and cap screws are identified by their head markings. Established at 75% of yield strength of bolt given the cross-sectional area.

**Note:** *Torque figures in table are valid for non-greased or non-oiled threads and head unless otherwise specified. Therefore, do not grease or oil bolts or cap screws unless otherwise specified in this manual. When using locking elements, increase torque values by 5%.*

# 4.2. FITTING TORQUE VALUES

These specifications are for carbon steel. With Zinc plating always lubricate threads and seals. For stainless steel, use the high value of the torque range of steel. For brass, use 70% of the torque value of steel. For mixed metals, use the torque of the lower of the two metals Torque range is normally calculated +/- 10%.

**Table 4.2 Pipe Rigid - Tapered Pipe Threads (NPTF, N/NF) - Carbon Steel**

| Pipe Size | Turns-from-finger | Max ft-lbs | Max N-m |
|---|---|---|---|
| 1/8” (-2) | 3/4 - 1 3/4 | 12 | 16 |
| 1/4" (-4) | 3/4 - 1 3/4 | 25 | 34 |
| 3/8" (-6) | 3/4 - 1 3/4 | 40 | 54 |
| 1/2" (-8) | 1/2 - 1 1/2 | 54 | 73 |
| 3/4" (-12) | 1/2 - 1 1/2 | 78 | 106 |
| 1" (-16) | 1/2 - 1 1/2 | 112 | 152 |
| 1 1/4" (-20) | 1/2 - 1 1/2 | 154 | 209 |
| 1 1/2" (-24) | 1/2 - 1 1/2 | 211 | 286 |
| 2" (-32) | 1/2 - 1 1/2 | 300 | 407 |

**Table 4.3 Pipe Swivel - Straight Pipe Threads (NPSM, N/NFS) - Carbon Steel**

| Pipe Size | Max ft-lbs | Max N-m |
|---|---|---|
| 1/8" (-2) | 12 | 16 |
| 1/4" (-4) | 25 | 3 |
| 3/8" (-6) | 40 | 54 |
| 1/2" (-8) | 54 | 73 |
| 3/4" (-12) | 78 | 106 |
| 1" (-16) | 112 | 152 |
| 1 1/4" (-20) | 154 | 209 |
| 1 1/2" (-24) | 211 | 286 |
| 2" (-32) | 300 | 407 |
| Note: seals on an internal male 30° seat | | |

### Table 4.4 Stud End O-Ring Boss (ORB) SAE (U/UF)

| | | Carbon Steel | |
|---|---|---|---|
| **Tube Size** | **Thread UNF-2A** | **Max ft-lbs** | **Max N-m** |
| -2 | 5/16" - 24 | 6-7 | 8-9 |
| -3 | 3/8" - 24 | 8-9 | 11-12 |
| -4 | 7/16" - 20 | 13-15 | 18-20 |
| -5 | 1/2" - 20 | 17-19 | 23-26 |
| -6 | 9/16" - 18 | 22-24 | 29-33 |
| -8 | 3/4" - 16 | 40-43 | 49-53 |
| -10 | 7/8" - 14 | 43-48 | 59-64 |
| -12 | 1 1'16" - 12 | 68-75 | 93-102 |
| -14 | 1 3/16" - 12 | 90-99 | 122-134 |
| -16 | 1 5/16" - 12 | 112-123 | 151-166 |
| -20 | 1 5/8" - 12 | 146-161 | 198-218 |
| -24 | 1 7/8" - 12 | 154-170 | 209-231 |

### Table 4.5 JIC 37° Flare Tube Fitting (J/JFS)

| Tube Size | Thread UNF-2A | Torque ft-lbs | Torque N-m |
|---|---|---|---|
| -2 | 5/16 - 24 | 6-7 | 8-9 |
| -3 | 3/8 - 24 | 8-9 | 11-12 |
| -4 | 7/16 - 20 | 11-12 | 15-16 |
| -5 | 1/2 - 20 | 14-15 | 19-21 |
| -6 | 9/16 - 18 | 18-20 | 24-28 |
| -8 | 3/4 - 16 | 36-39 | 49-53 |
| -10 | 7/8 - 14 | 57-63 | 77-85 |
| -12 | 1 1/16 - 12 | 79-88 | 107-119 |
| -14 | 1 3/16 - 12 | 94-103 | 127-140 |
| -16 | 1 5/16 - 12 | 108-113 | 147-154 |
| -20 | 1 5/8 - 12 | 127-133 | 172-181 |
| -24 | 1 7/8 - 12 | 158-167 | 215-226 |
| -32 | 2 1/2 - 12 | 245-258 | 332-350 |

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