



Tools Engine Hoist

Manual

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For parts and technical support, call the  Tools Support Center at (800) .

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Safety

Introduction



Read and follow these safety instructions before using this product. Failure to do so can result in serious person injury. Task and equipment specific warnings, cautions, and instructions are included in equipment documentation where appropriate. Make sure all equipment documentation is accessible to persons operating or servicing equipment. Keep this manual in a safe and dry place for future reference.

Qualified Personnel



Equipment owners are responsible for making sure that equipment is installed, operated, and serviced in a safe manner. Equipment owners must become familiar with the safety rules and procedures outlined in this manual.

Intended Use



Use of equipment in ways other than those described in the documentation may result in injury to persons or damage to property.

Some examples of unintended use of equipment include:

- making unauthorized modifications
- using incompatible or damaged parts
- using unapproved auxiliary equipment
- operating equipment in excess of maximum ratings


Regulations and Approvals

NOTE: Make sure all equipment is rated and approved for the environment in which it is used. Warranty may be voided if instructions for installation, operation, and service are not followed.

Personal Safety



To prevent serious personal injury follow these instructions.

- Understand and follow all instructions contained within this manual before operating the engine hoist.
- Heed all OSHA requirements if utilizing this equipment in industrial applications.
- Do not operate the engine hoist unless all parts are intact and operating properly.
- Maintain a clean work space while utilizing the engine hoist.
- Do not allow bystanders, children, and pets into work space while utilizing the engine hoist.
- Do not use the engine hoist while under the influence of alcohol and/or drugs.
- Do not exceed the rated capacity of the engine hoist.
- Do not use the engine hoist on a surface that is not level.
- Do not use engine hoist on soft surfaces.
- Ensure all slings and chains used with the engine hoist have a rated capacity greater than the load lifted.
- To avoid tipping or impact injuries, do not allow the lifted load to swing or drop violently.
- To avoid tipping, locate the lifted load to the lowest position before moving or repositioning the engine hoist.
- Do not make any alterations to the engine hoist.
- The safety valve is preset and is not adjustable. Do not make any adjustments to the safety valve.
- Keep clear of moving equipment.
- Follow the manufacturer's instructions regarding the location of safe engine lift points.
- Cease use of the engine hoist immediately if it can not be utilized in a safe manner.
- Wear ANSI approved safety goggles, gloves, and steel toe work shoes while using the engine hoist.
- Do not exceed the boom capacity rating. Capacity decreases as the boom extends.
- Only utilized replacement parts supplied by  Tools Corporation.

Disposal

Dispose of equipment and materials used in conjunction with operation and servicing in accordance with federal, state, and local laws.

Description

Engine Hoist Major Components

See Figure 1.

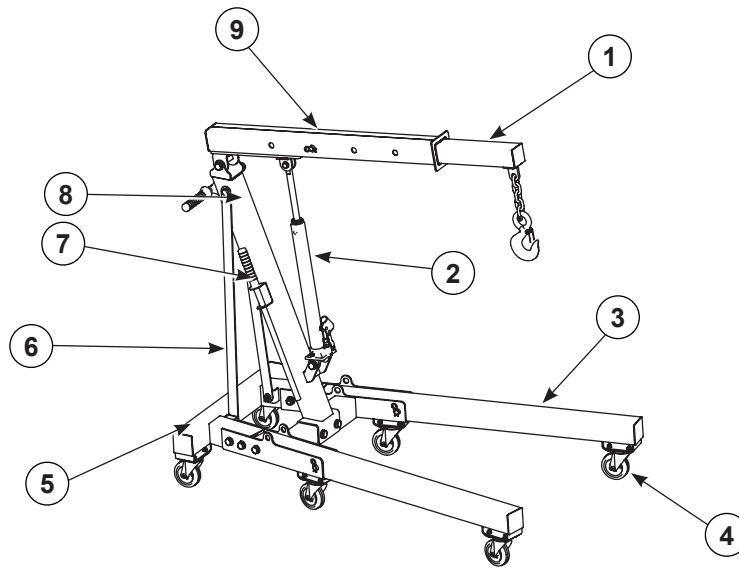


Figure 1 Engine Hoist Major Components

- | | | |
|-------------------|--------------------|----------------------|
| 1. Boom extension | 4. Caster assembly | 7. Ram lever |
| 2. Ram | 5. Base | 8. Boom support post |
| 3. Leg | 6. Support | 9. Boom |

Specifications

Table 1 Specifications

Component	Maximum Capacity	Figure 2 Position
Boom	1/4 ton	A
	1/2 ton	B
	3/4 ton	C
	1 ton	D
Ram	3 Ton	

Note: Boom extension removed for illustrative purposes only.

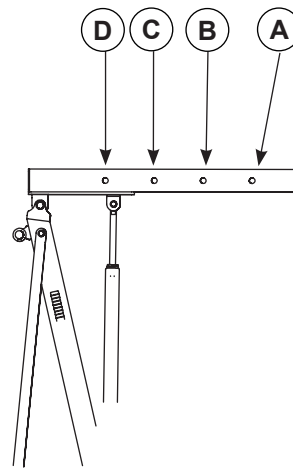


Figure 2 Boom Load Specification

Fastener Reference

A box containing all fasteners needed to assemble the engine hoist has been included with the shipment. Fasteners included are located in separate cells lettered A through O. The fasteners detailed in Table 2 correspond with those depicted by the illustrations shown in the *Setup Section*.



WARNING: To ensure safe operation, be sure to select the correct fastener when assembling the engine hoist.

Table 2 Fastener Reference

Fastener	Fastener Location	Notes	Qty.
Cotter pin	A		5
Hex bolt	B	M10x1.25x0.75 in.	24
Hex bolt	C	M12x1.25x0.75 in.	4
Hex bolt	D	M14x1.25x1.50 in.	1
Hex bolt	E	M14x1.25x2.50 in.	2
Hex bolt	F	M14x1.25x3.50 in.	2
Hex bolt	G	M14x1.25x3.75 in.	2
Lock washer	H	M10	24
Lock washer	I	M12	4
Lock washer	J	M14	14
Nut	K	M10x1.25	24
Nut	L	M12x1.25	4
Nut	M	M14x1.25	7
Pin	N	M12	1
Pin	O	M14	2

Setup

Step 1: Caster to Base Installation

See Figures 3 and 4. Also, refer to Figure 1.

1. See Figure 3. Position caster assembly (3) to base (1).
2. Install bolt (2) to caster assembly and base (1).
3. See Figure 4. Position lock washer (5) and nut (4) into base slot.
4. Utilizing a wrench or equivalent tool, tighten nut (4) to 40.6 ft-lb (55 N•m).



CAUTION: Secure nut (4) while tightening bolt (2) to ensure proper torque.

5. Repeat steps above to install remaining caster assemblies.

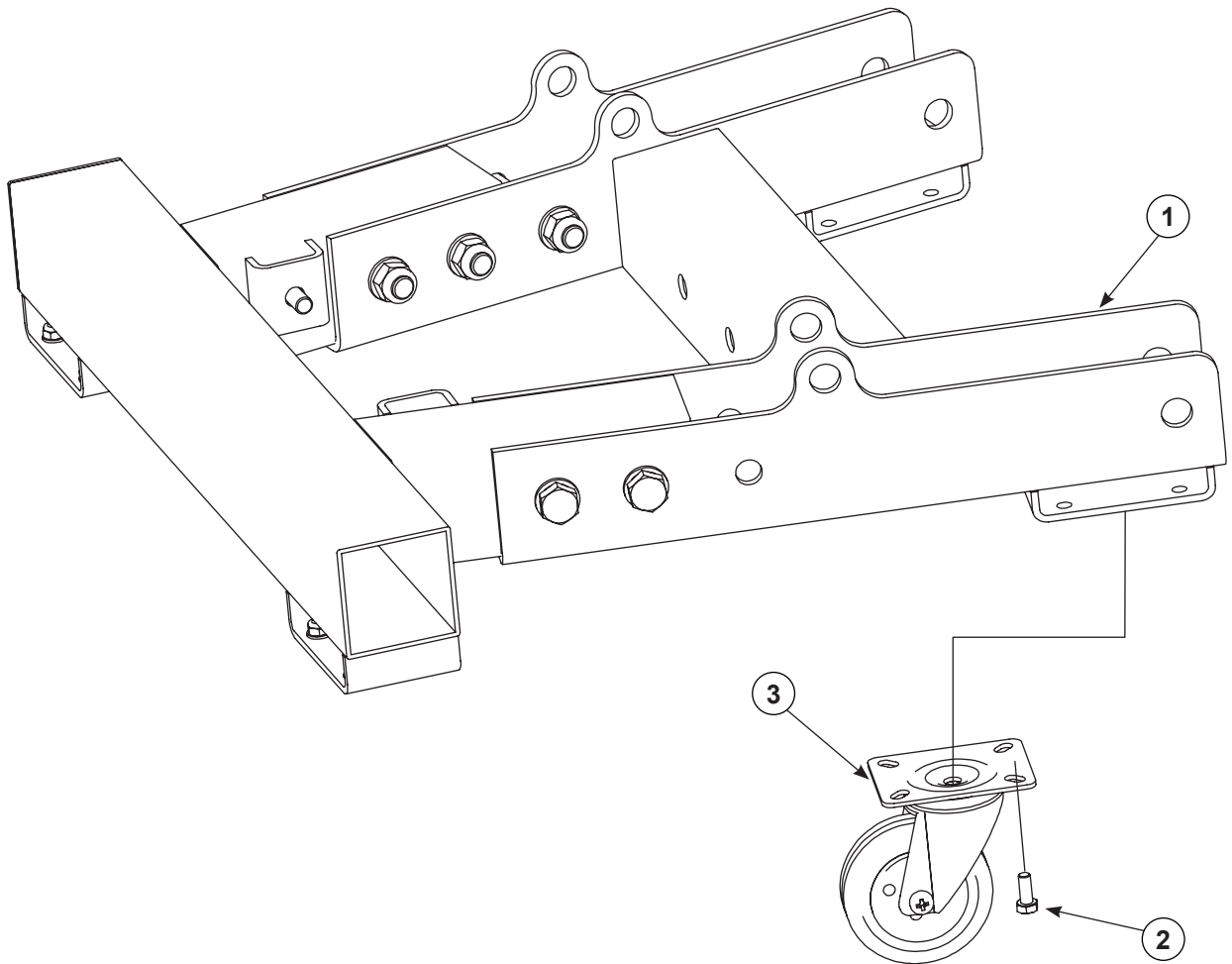


Figure 3 Caster Assembly Installation To Base (1 of 2)

1. Base
2. Bolt (M10x1.25x0.75 in.)
3. Caster assembly

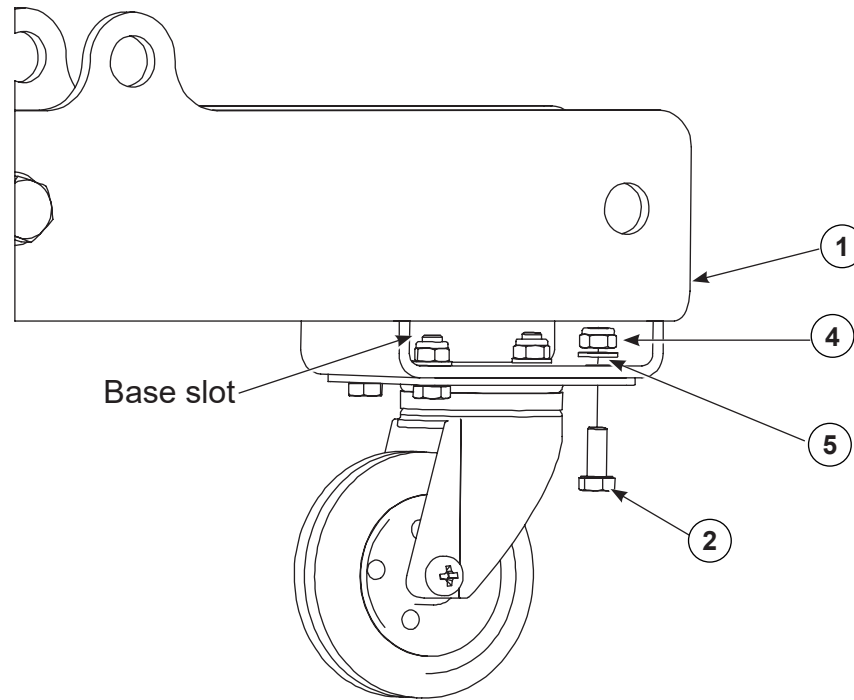


Figure 4 Caster Assembly Installation To Base (2 of 2)

- | | |
|-----------------------------|----------------------|
| 1. Base | 4. Nut (M10x1.25) |
| 2. Bolt (M10x1.25x0.75 in.) | 5. Lock washer (M10) |

Step 2: Caster to Leg Installation

See Figures 5 and 6. Also, refer to Figure 1.

1. See Figure 5. Position caster assembly (3) to leg (6).
2. See Figure 6. Install bolt (2) to caster assembly (3) and leg (6).
3. Position lock washer (5) and nut (4) into base slot.
4. Utilizing a wrench or equivalent tool, tighten bolt (2) to 40.6 ft-lb (55 N•m).



CAUTION: Secure nut (4) with a wrench or equivalent tool while tightening bolt (2) to ensure proper torque.

5. Repeat steps above to install remaining caster assembly.



Figure 5 Caster Assembly Installation To Leg (1 of 2)

3. Caster assembly

6. Base

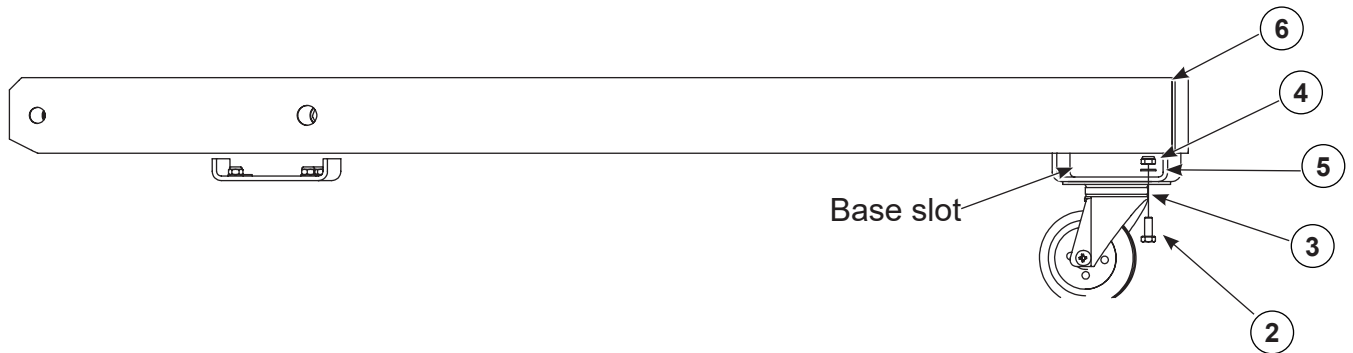


Figure 6 Caster Assembly Installation To Leg (2 of 2)

2. Bolt (M10x1.25x0.75 in.)

5. Lock washer (M10)

3. Caster assembly

6. Base

4. Nut (M10x1.25)

Step 3: Leg to Base Installation

See Figure 7 and refer to Figure 1.

1. Position leg (6) into base (1).



WARNING: Fitment of the leg to the base presents a pinch hazard. Follow all precautions listed in the *Safety Section*.



CAUTION: Ensure the holes in the leg align with those in the base.

2. Install pin (8) to join leg (6) to base (1).
3. Install bolt (9) and lock washer (10) to join leg (6) to base (1).
4. Install lock washer (10) and nut (11) to bolt (9).
5. Utilizing a wrench or equivalent tool, tighten nut (11) to 118.0 ft-lb (160 N•m).



CAUTION: Secure bolt (9) with a wrench or equivalent tool while tightening nut (11) to ensure proper torque.

6. Insert cotter pins (7) into pin (8).
7. Repeat steps above to install opposing leg.

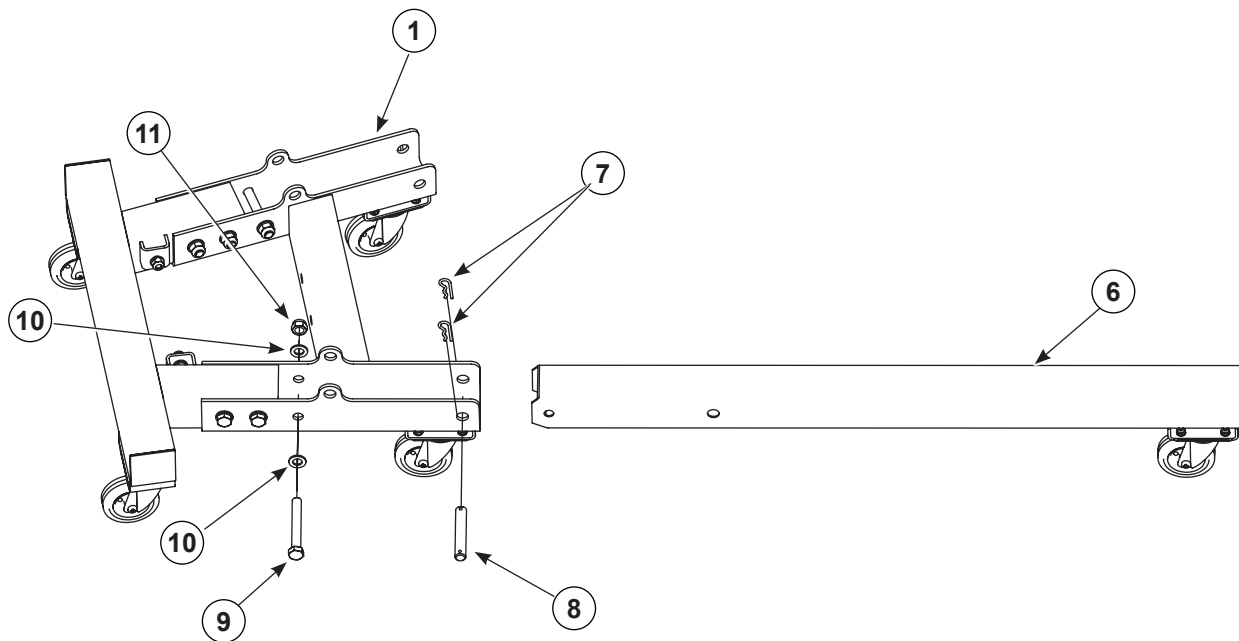


Figure 7 Leg Installation To Base

- | | | |
|---------------|-----------------------------|--------------------|
| 1. Base | 8. Pin (M14) | 11. Nut (M14x1.25) |
| 6. Leg | 9. Bolt (M14x1.25x3.75 in.) | |
| 7. Cotter pin | 10. Lock washer (M14) | |

Step 4: Boom Support Post Installation to Base

See Figures 8 and 9. Also, refer to Figure 1.

1. See Figure 8. Position boom support post (12) onto base (1).



WARNING: Fitment of the boom support post to the base presents a pinch hazard. Follow all precautions listed in the *Safety Section*.



CAUTION: Ensure the holes in the boom support post align with those in the base.

2. See Figure 9. Install lock washer (10) and bolt (13) to join boom support post to base.

3. Install lock washer (10) and nut (11) to bolt (13).

4. Utilizing a wrench or equivalent tool, tighten nut (11) to 118.0 ft-lb (160 N•m).



CAUTION: Secure bolt (13) with a wrench or equivalent tool while tightening nut (11) to ensure proper torque.

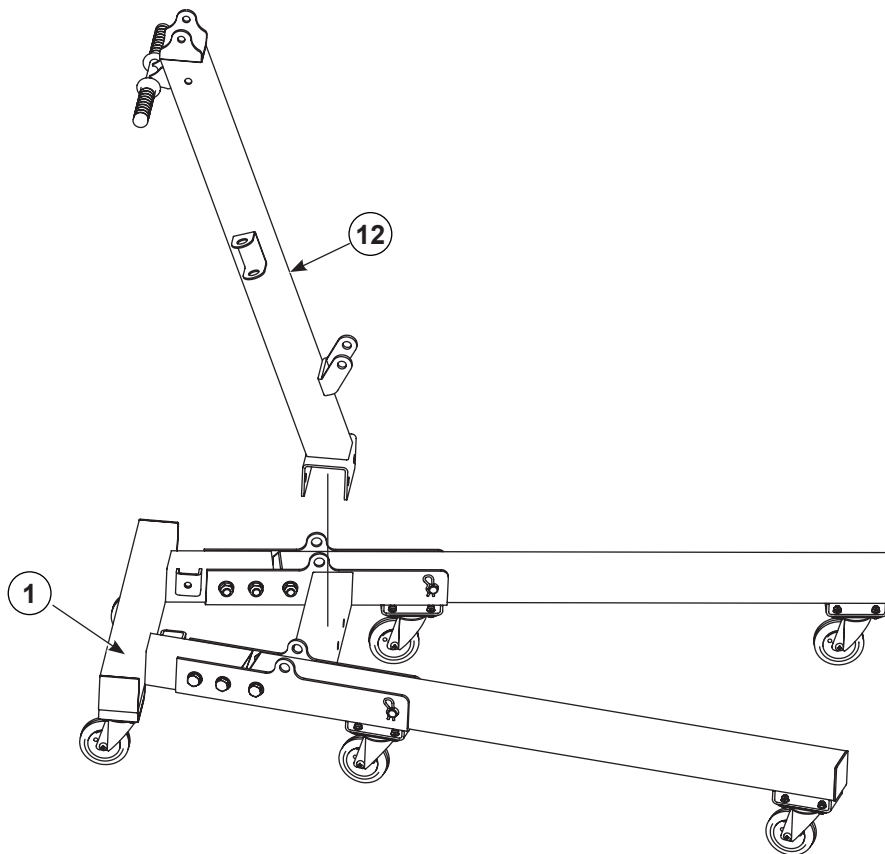


Figure 8 Boom Support Post Installation to Base (1 of 2)

1. Base

12. Boom support post

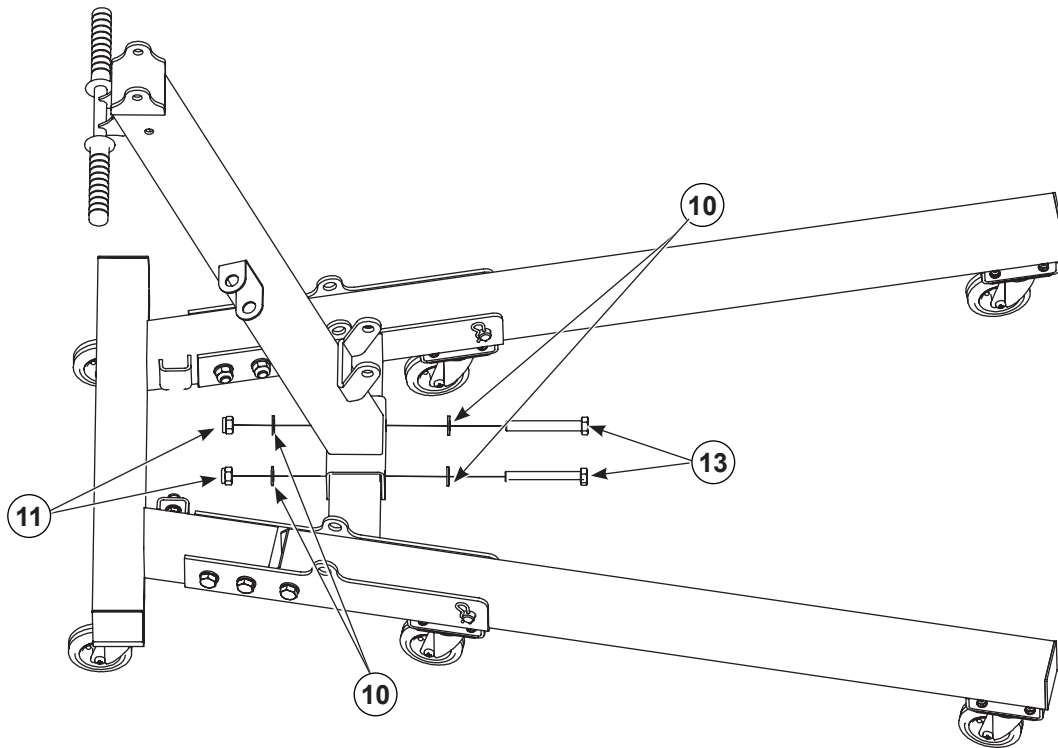


Figure 9 Boom Support Post Installation to Base (2 of 2)

10. Lock washer (M14)

13. Bolt (M14x1.25x3.50 in.)

11. Nut (M14x1.25)

Step 5: Support Installation

See Figures 10 and 11. Also, refer to Figure 1.

1. See Figure 10. Connect lower end of support (14) to base (1).
2. Align upper end of support (14) with boom support post (15).
3. See Figure 11. Loosely install lock washer (16) and bolt (17) to connect support (14) to boom support post.
4. Loosely install lock washer (16) and nut (18) to lower end of support (14).
5. Utilizing a wrench or equivalent tool, tighten bolt (17) and nut (18) to 73.8 ft-lb (100.0 N•m).

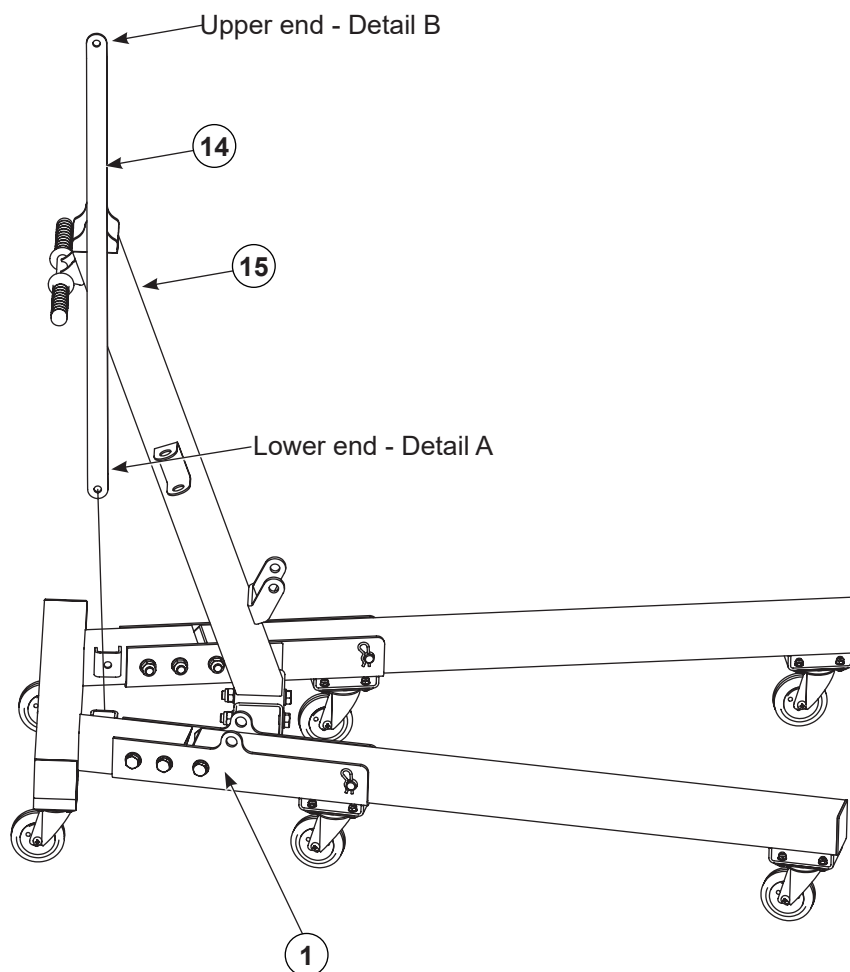


Figure 10 Support Installation (1 of 2)

1. Base

15. Boom support post

14. Support

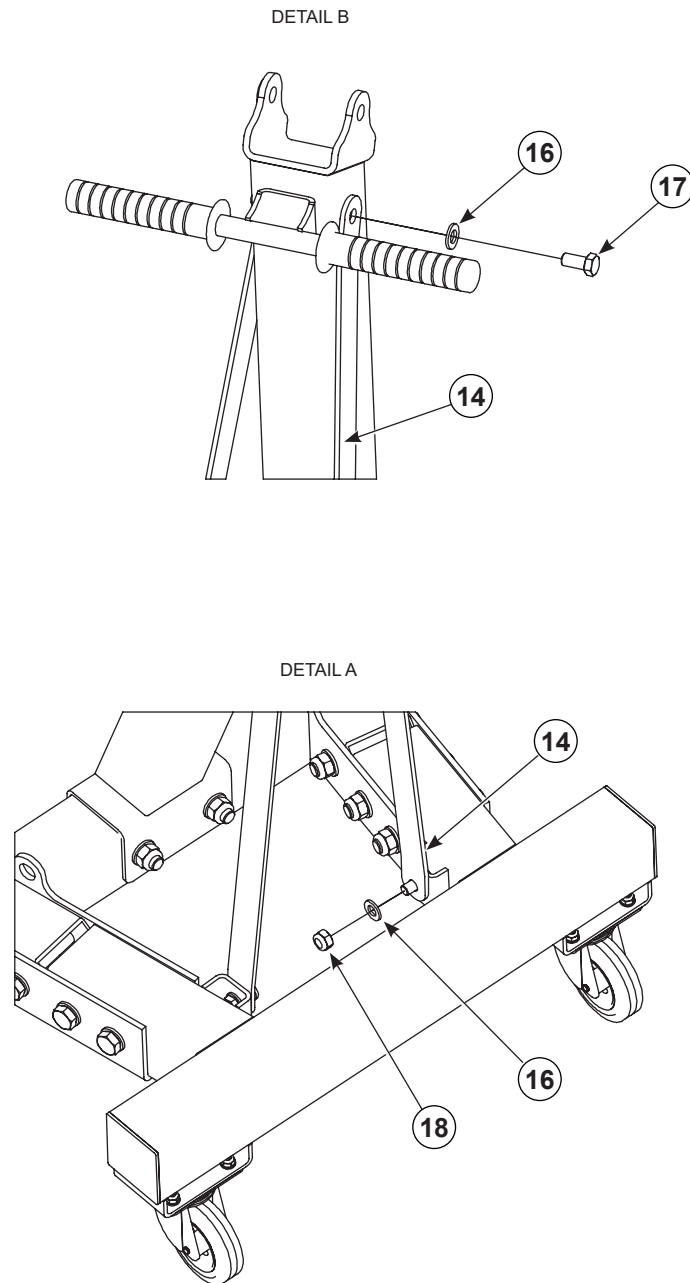


Figure 11 Support Installation (2 of 2)

14. Support

16. Lock washer (M12)

17. Bolt (M12x1.25x0.75 in.)

18. Nut (M12x1.25)

Step 6: Ram Installation

See Figures 12 and 13. Also, refer to Figure 1.

1. See Figure 12. Position ram (19) to boom support post (12).
2. See Figure 13. Install lock washer (10) and bolt (20) to mount ram to boom support post.
3. Utilizing a wrench or equivalent tool, tighten bolt (20) and nut (11) to 118.0 ft-lb (160 N•m).



CAUTION: Secure nut (11) with a wrench or equivalent tool while tightening bolt (20) to ensure proper torque.

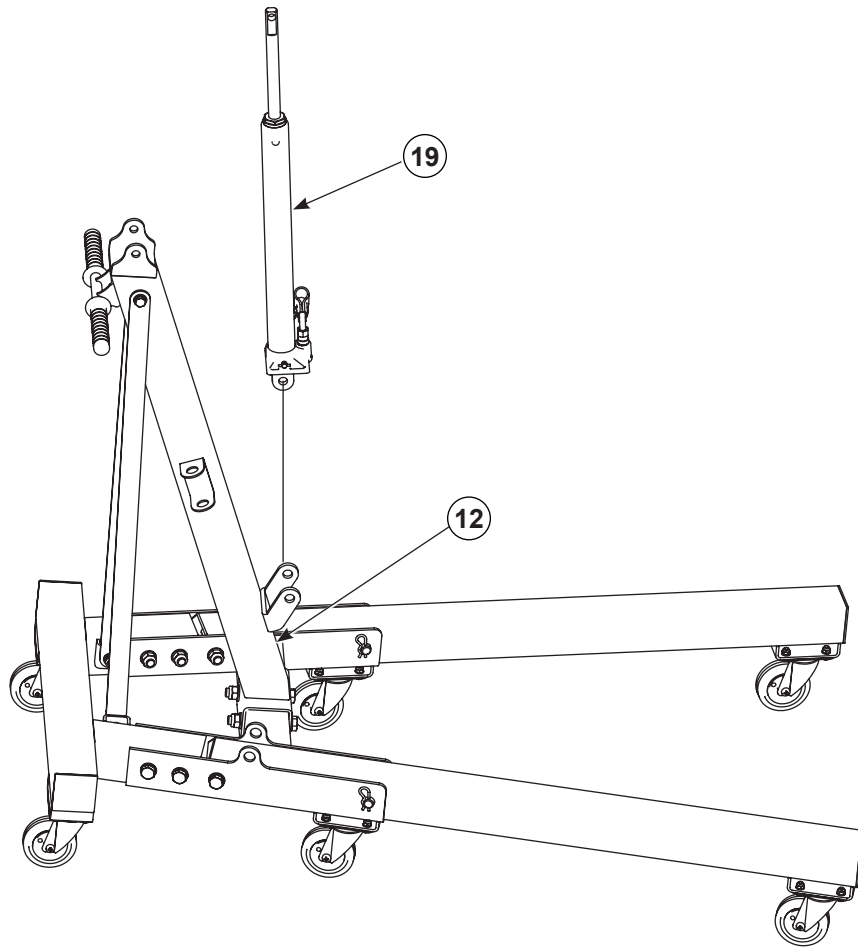


Figure 12 Ram Installation (1 of 2)

12. Boom support post

19. Ram

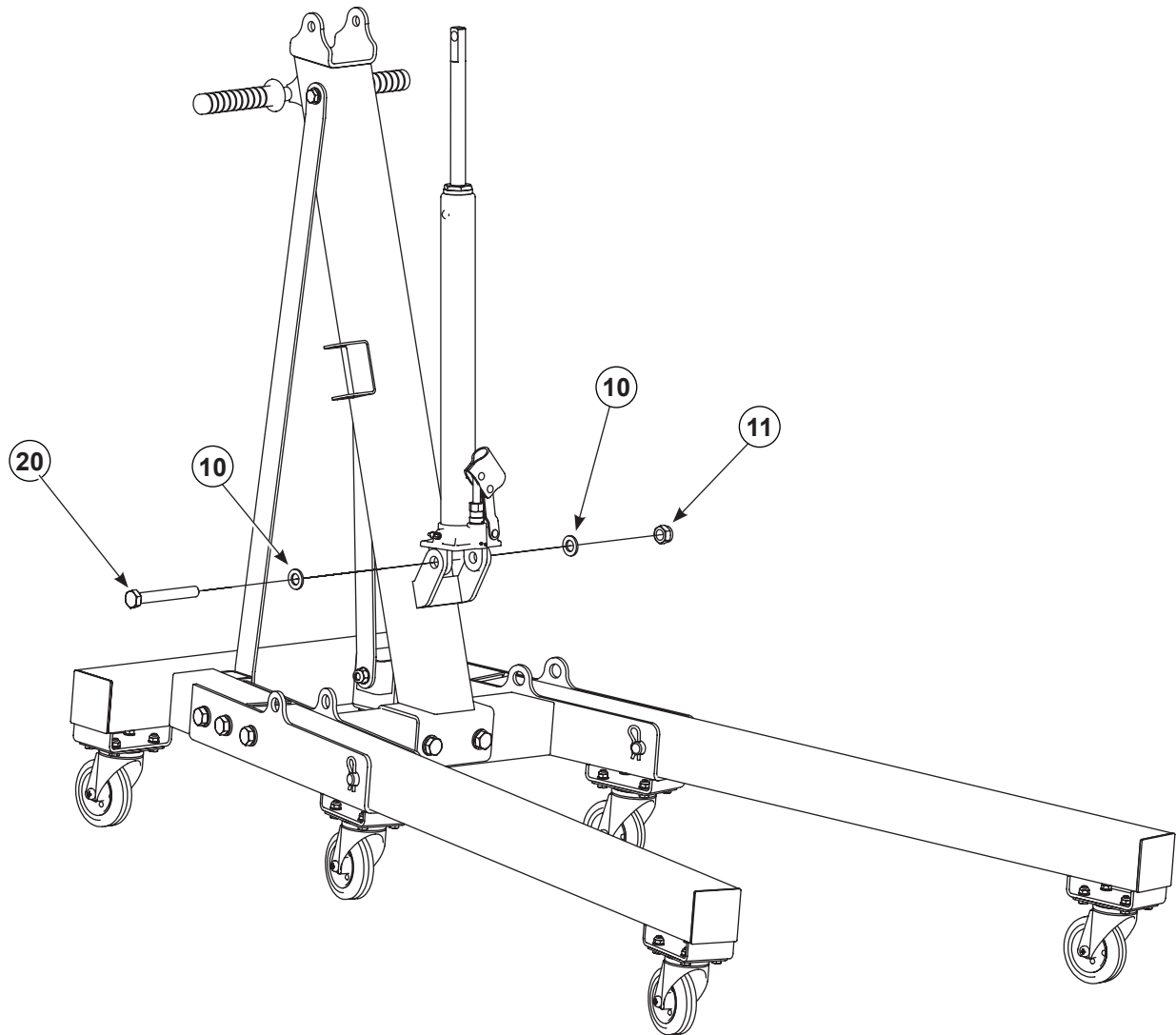


Figure 13 Ram Installation (2 of 2)

10. Lock washer (M14)

20. Bolt (M14x1.25x2.50)

11. Nut (M14x1.25)

Step 7: Boom Installation

See Figures 14 through 16. Also, refer to Figure 1.

1. See Figure 14. Position boom (23) to boom support post (12) and ram (20).
2. See Figure 15. Loosely install lock washer (10), nut (11), and bolt (20).
3. See Figure 16. Loosely install lock washer (10), nut (11), and bolt (21).
4. See Figure 15. Utilizing a wrench or equivalent tool, tighten bolt (20) and nut (11) to 118.0 ft-lb (160 N•m).



CAUTION: Secure nut (11) with a wrench or equivalent tool while tightening bolt (20) to ensure proper torque.

5. See Figure 16. Utilizing a wrench or equivalent tool, tighten bolt (21) and nut (11) to 118.0 ft-lb (160 N•m).



CAUTION: Secure nut (11) with a wrench or equivalent tool while tightening bolt (21) to ensure proper torque.

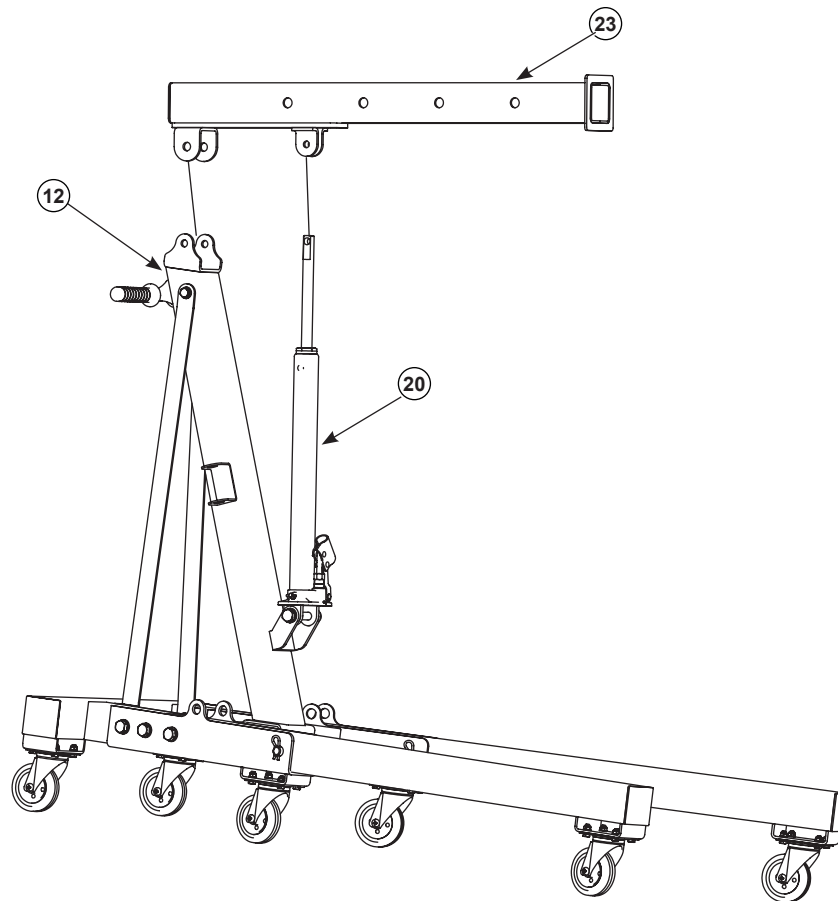


Figure 14 Boom Installation (1 of 3)

12. Boom support post

23. Boom

20. Ram

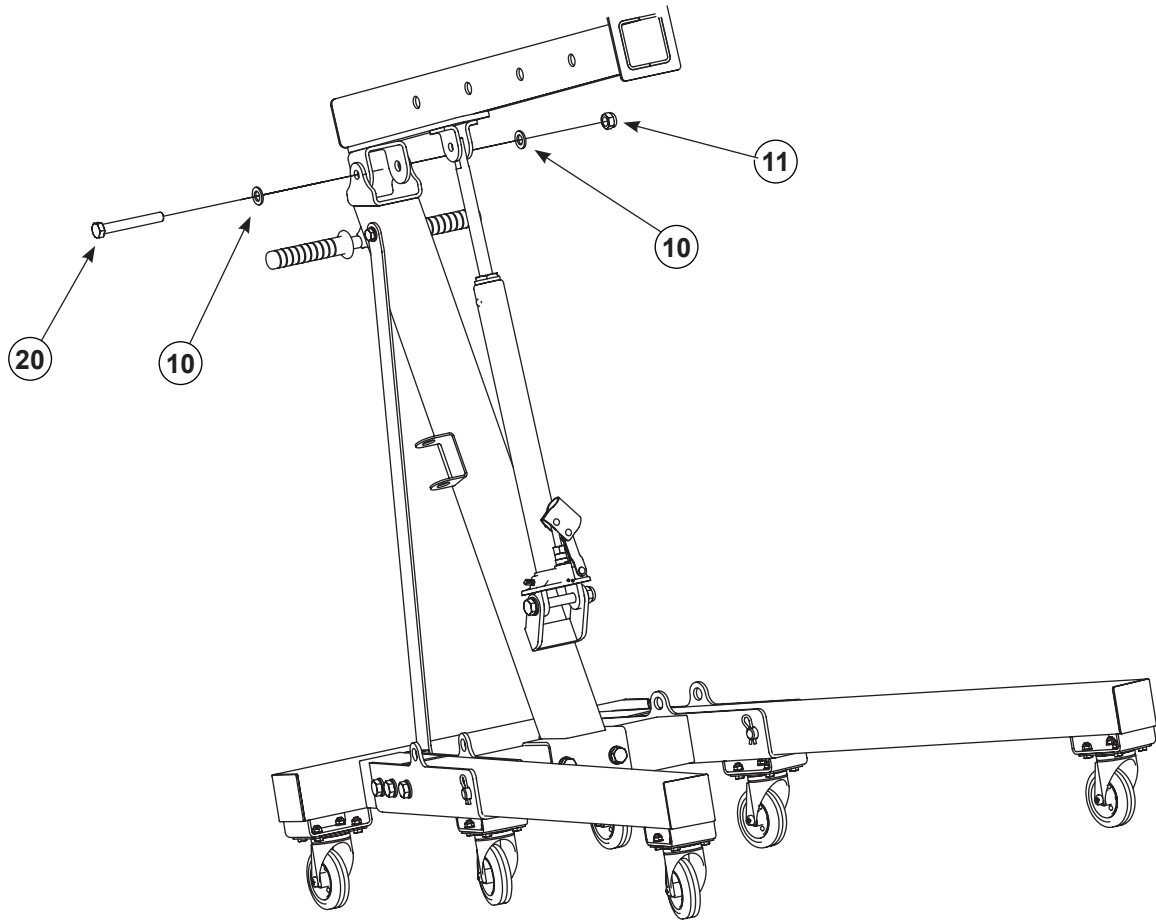


Figure 15 Boom Installation (2 of 3)

10 Lock washer (M14)

20. Bolt (M14x1.25x2.50)

11. Nut (M14x1.25)

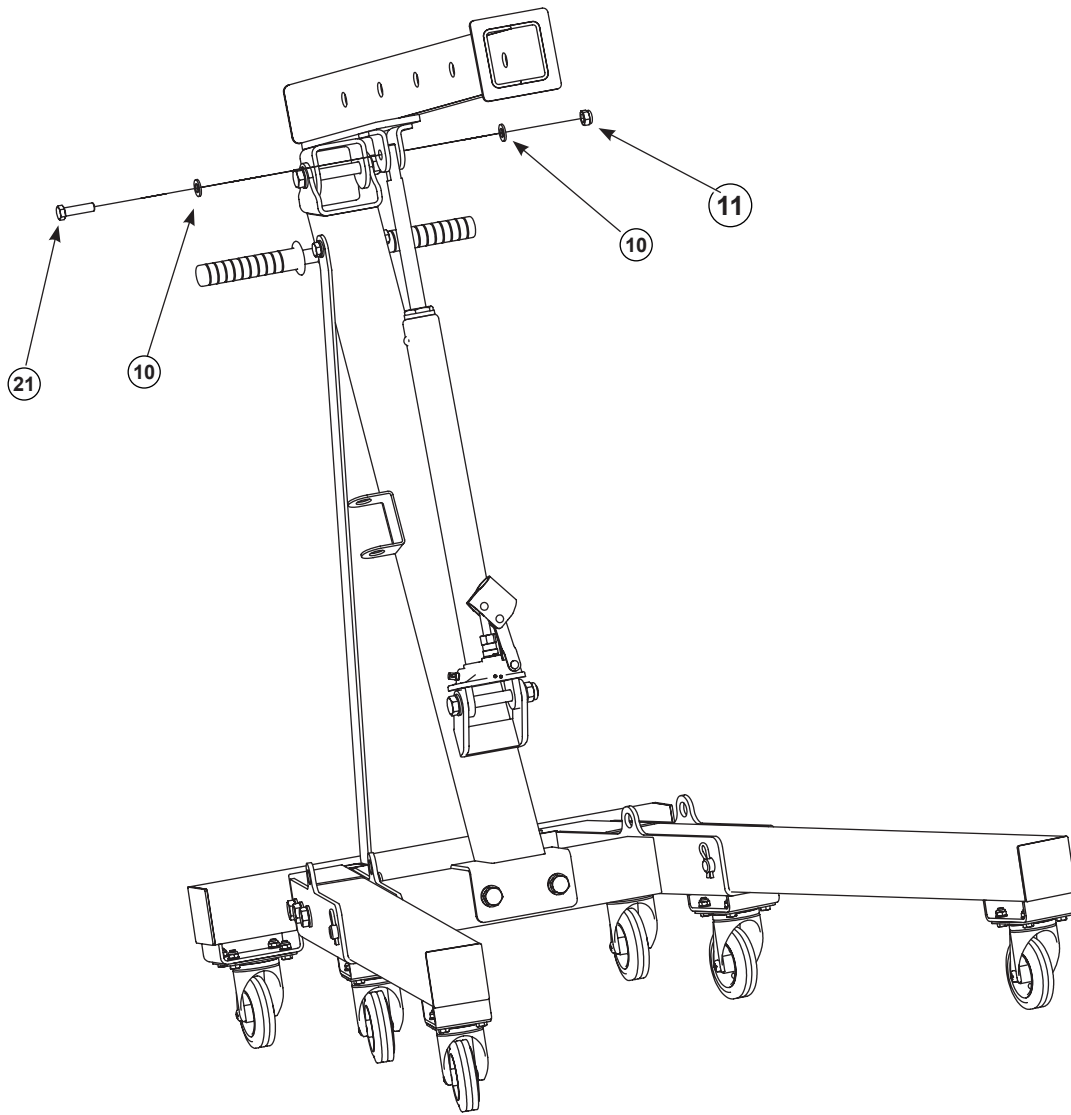


Figure 16 Boom Installation (3 of 3)

10 Lock washer (M14)

21. Bolt (M14x1.25x1.50)

11. Nut (M14x1.25)

Step 8: Boom Extension Installation

See Figure 17; Refer to Figure 1 and Table 1.

1. Slide boom extension (24) into boom (23).
2. Install pin (25) into corresponding slot in boom to support desired load.
3. Install cotter pin (7) into pin (25)



WARNING: Refer to Table 1 to ensure boom extension is adjusted properly to support load.

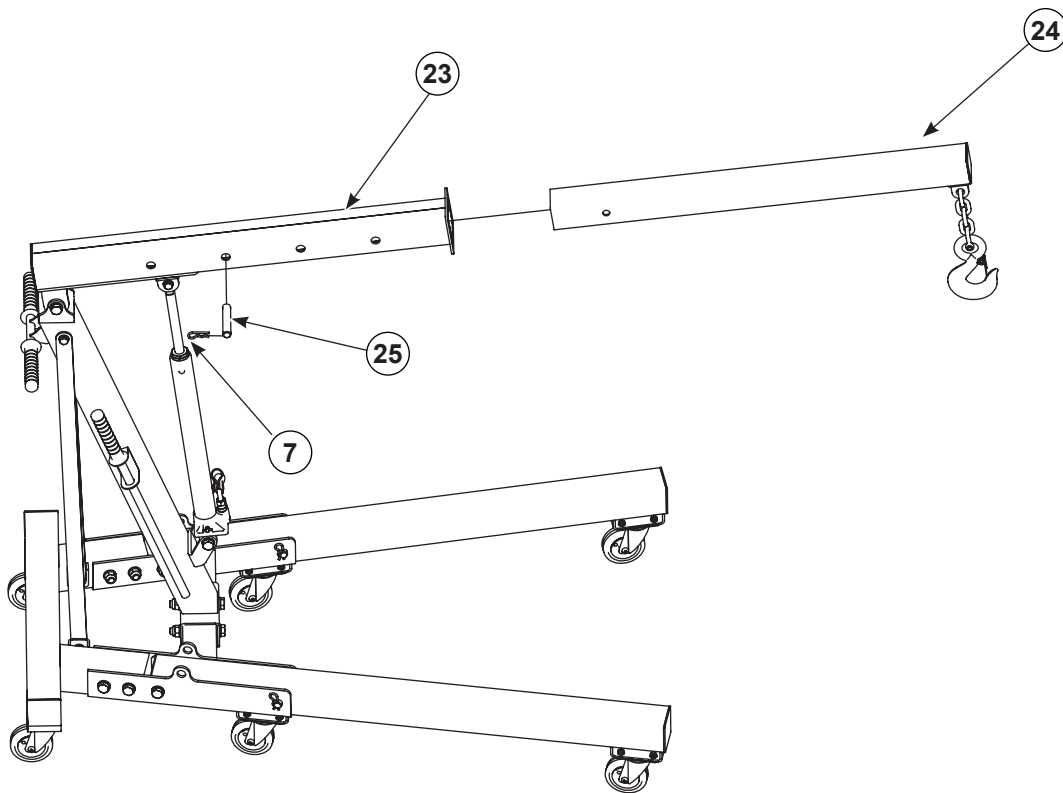


Figure 17 Boom Extension Installation

7. Cotter pin

24. Boom extension

23. Boom

25. Pin (M12)

Step 9: Ram Lever Installation

See Figure 18 and refer to Figure 1.

1. Install ram lever (26) into bracket located on boom support post (16).

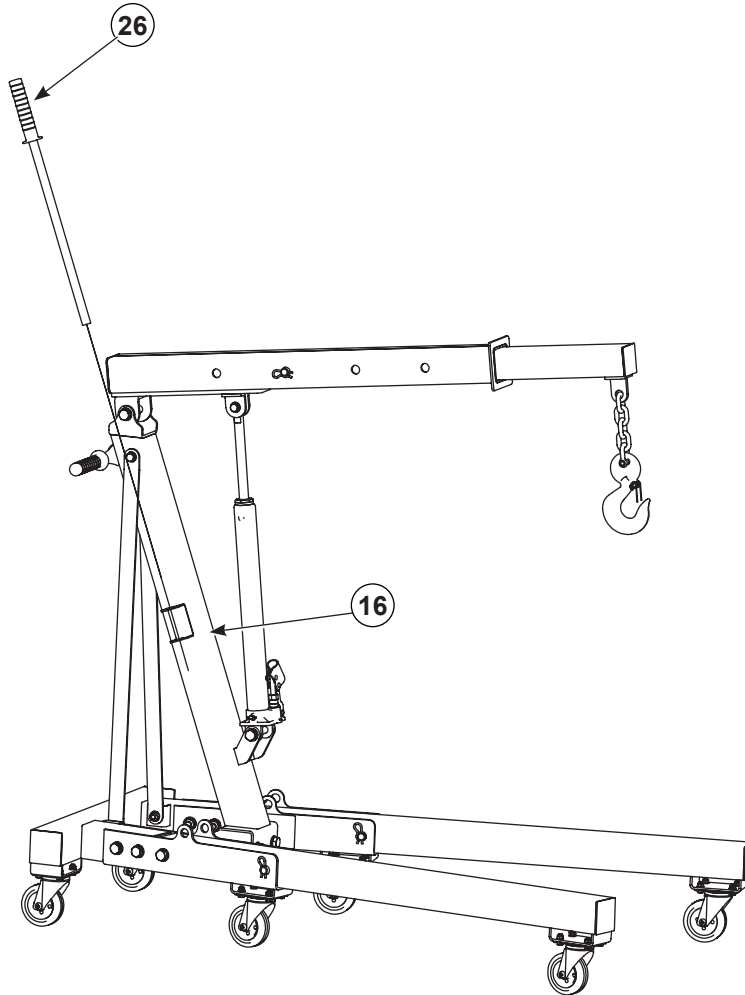


Figure 18 Ram Lever Installation

16. Boom support post

26. Ram Lever

Step 10: Bleed the Ram

Refer to Figure 1.

1. Utilizing the ram lever, open the release valve and completely lower the ram.
2. Remove the oil fill plug and observe the oil level.

NOTE: If the oil level is sufficient, a small amount of oil should seep from the oil fill hole.



CAUTION: Do not allow dirt and debris to contact the oil fill plug.

3. If the oil level is not sufficient, add jack hydraulic oil until it is level with the oil fill hole. Refer to the *Maintenance Section* for the jack hydraulic oil specification.
4. Install the oil fill plug.



CAUTION: Ensure the oil fill plug is free from debris before it is installed.

5. Utilizing the ram lever, place the ram selector in the LIFT position.
6. Apply downward hand pressure to the boom.
7. Utilizing the ram lever, pump the ram several times.
8. Utilizing the ram lever, place the ram selector in the LOWER position.
9. Remove the oil fill plug and observe the oil level.

NOTE: If the oil level is sufficient, a small amount of oil should seep from the oil fill hole.



CAUTION: Do not allow dirt and debris to contact the oil fill plug.

10. If the oil level is not sufficient, add jack hydraulic oil until it is level with the oil fill hole. Refer to the *Maintenance Section* for the jack hydraulic oil specification.
11. Install the oil fill plug.
12. Utilize a low weight load to test equipment operation.
13. Repeat steps 1-12 above until all air has been bled from the system.

Operation



WARNING: Before operating the engine hoist for the first time, ensure the equipment was properly set up. Ensure all fasteners were correctly installed and tightened appropriately. Refer to *Setup Section* for additional information.

Refer to Figure 2; Refer to Table 1 and 2.

1. Properly position the boom extension to accommodate safe lifting of the load.



WARNING: To avoid personal injury or damage to property, locate the hole on the boom with a load limit higher than the weight of the lifted load.

2. Install the pin into the selected boom position.
3. Install the cotter pin into the pin.

WARNING: The cotter pin must be installed to prevent loss of the pin during equipment operation.

4. Reposition to engine hoist boom over the component being lifted.
5. Utilizing the ram lever, place the ram selector in the LOWER position to lower the boom.
6. Attach the hook and chain to the component being lifted.



WARNING: Refer to the vehicle manufacturer's documentation regarding the location of suitable lift points and the use of leveling fixtures and/or slings.

7. Utilizing the ram lever, place the ram selector in the LIFT position to raise the boom and lift the load.



WARNING: Do not allow bystanders, children, and pets into work space while utilizing the engine hoist.

8. Clear the lifted load from any obstructions.
9. Utilizing the ram lever, place the ram selector in the LOWER position to lower the boom.



WARNING: Do not allow bystanders, children, and pets into work space while utilizing the engine hoist.

10. Once the load is securely on the ground or installed to a suitable fixture, remove the hook and chain from the load.



WARNING: Ensure the load is stable prior to removing the hook and chain.

Maintenance

**WARNING:**

- Comply with all requirements listed in the *Safety Section* of this manual.
- Perform periodic maintenance checks to ensure the engine hoist is operating correctly.
- Do not use the engine hoist if parts are deemed defective or inoperable. The frequencies listed are only guidelines. It may be necessary to adjust frequencies due to the operating environment.

Frequency	Task
Each use	Check for loose hardware, binding components, cracked or broken components.
Every three years	Replace hydraulic fluid. Utilize ISO Fluid Type HM,ISO 11158/ATSM 6158-05 or equivalent fluid.

Troubleshooting



WARNING: Follow the safety instructions in this document and all other related documentation.

NOTE: These procedures cover only the most common problems that you may encounter. If you cannot solve the problem with the information given here, contact Tools for assistance.

Corrective Action	Problem					
	Boom lowers under load	Boom will not lift to its maximum height	Oil leaks from ram oil fill plug	Ram fails to lift to weight capacity	Ram lever moves when ram is under load	Ram pump stroke is inefficient
Ensure release valve is completely closed. Bleed trapped air from the system. Refer to <i>Setup, Step 10: Bleed the Ram</i> for additional information.	●	●		●		
Blocked ram relief valve: 1. Lower the boom and securely close the release valve. 2. Manually lift the boom by hand several inches. 3. Open the ram release valve and pull the boom down by hand as quickly as possible. 4. Close the ram release valve and inspect for proper operation. 5. Replace the ram if the corrective action does not resolve the problem.	●	●		●	●	
Ram may be low on oil: 1. Remove the ram oil fill plug. 2. Adjust the oil level. 3. Bleed the ram as required. Refer to <i>Setup, Step 10: Bleed the Ram</i> for additional information.		●		●		●
Ram has too much oil: 1. Remove ram oil fill plug. 2. Inspect oil level and adjust, if necessary.			●			

Parts

Contact [REDACTED] Tools at [REDACTED]-[REDACTED]-[REDACTED] to order replacement parts.

Component	Part Number	Specifications	Qty.	Notes
Base	[REDACTED]		1	A
Boom	[REDACTED]		1	A
Boom extension	[REDACTED]		1	A
Caster assembly	[REDACTED]		6	A,B
Cotter pin	-----		5	C
Hex bolt	-----	M10x1.25x0.75 in.	24	C,D,F
Hex bolt	-----	M12x1.25x0.75 in.	4	C,D,F
Hex bolt	-----	M14x1.25x1.50 in.	1	C,D,F
Hex bolt	-----	M14x1.25x2.50 in.	2	C,D,F
Hex bolt	-----	M14x1.25x3.50 in.	2	C,D,F
Hex bolt	-----	M14x1.25x3.75 in.	2	C,D,F
Leg	[REDACTED]		2	A
Lock washer	-----	M10	24	C,E,F
Lock washer	-----	M12	4	C,E,F
Lock washer	-----	M14	14	C,E,F
Nut	-----	M10x1.25	24	C,D,F
Nut	-----	M12x1.25	4	C,D,F
Nut	-----	M14x1.25	7	C,D,F
Pin	[REDACTED]	M12	1	A,F
Pin	[REDACTED]	M14	2	A,F
Ram	[REDACTED]		1	A
Ram lever	[REDACTED]		1	A

NOTE: A. Refer to Figure 1 to reference component location.

B. Assembly also includes lock washers (M10), nuts (M10x1.25), and bolts (M10x1.25x0.75 in.)

C. Part not saleable. Secure replacement from local source.

D. WARNING: Replace with 316 spec. stainless steel fastener only.

E. Source a stainless steel replacement component to prevent corrosion.

F. Fastener is referenced in *Setup Section*.