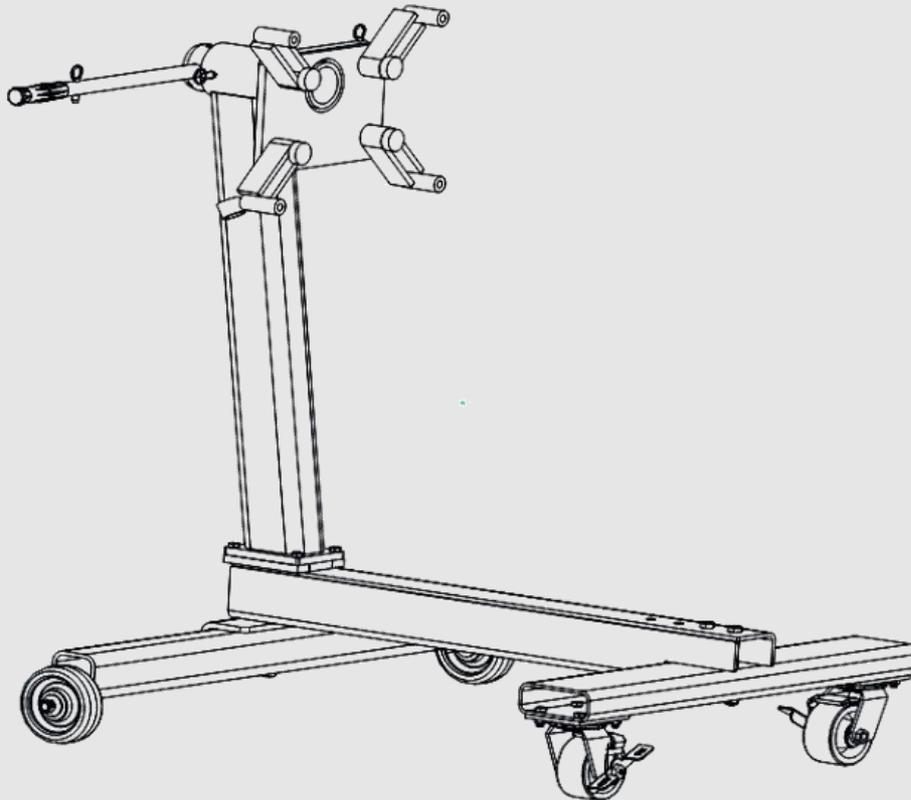


MAHLE AES-1000

EN

Operation Manual
Engine Stand





**EVERY PERSON WHO OPERATES THIS
EQUIPMENT NEEDS TO KNOW AND
UNDERSTAND ALL OF THE INFORMATION IN
THIS MANUAL – FAILURE TO DO SO COULD
RESULT IN SERIOUS INJURY OR DEATH.**



**READ THIS MANUAL
CAREFULLY AND RETAIN
FOR YOUR RECORDS**

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1. Safety Regulations

1.1 Warnings

-  Failure to follow all of these safety instructions can lead to severe injury or death from a sudden loss of the load. Contact the manufacturer using the contact information printed on the back cover of this manual if you have any questions.
-  Anyone who operates this product must read and understand all the instructions and warnings provided with this stand before being allowed to use it. All operators must be careful, competent, trained, and qualified in the safe operation of the stand. The owner (or other responsible individual) must ensure that any operator observes the proper safety procedures for using this stand at all times. If the operator does not read well or is not fluent in English, the owner / manager must read and review the instructions and warnings in the manual with the operator in the operator's native language to be sure that the operator will use the stand properly.
-  The owner / manager must keep this manual for future reference, and make sure the warning labels on the product are always legible and intact. Replacement labels and manuals are available from the manufacturer. Call the manufacturer using the contact information on the back cover of this manual if you have any questions.
-  Wear eye protection that meets the requirements of ANSI Z87.1 and OSHA.
-  Make sure the load does not exceed the maximum capacity of the stand. Maximum capacity is 1000 lb / 454 kg. Do not exceed. Overloading can result in equipment failure.
-  Never use parts, attachments, or accessories that have not been provided by the manufacturer. Do not use

hardware with a lower grade than what is provided by the manufacturer.

-  No Alterations shall be made to this product
-  Always use caution while operating this device and remain mindful of how the stand and load will react during operation. Do not use anything other than the supplied handle to rotate the engine.
-  Off-center loads may make the load and handle rotate in either direction when the rotational locking Pin is removed.
-  Never load stand abruptly. Load stand slowly and carefully.
-  Always use Rotation Locking Pin when loading or moving stand.
-  Always release Rotation Locking Pin slowly and carefully.
-  Always keep the engine's center of gravity aligned with the Mounting Plate's axis of rotation. Ensure engine is fully secured to Mounting Plate before placing on stand.
-  Always maintain control of Rotation Handle and use caster brakes while loading and operating engine stand.
-  Always maintain control of Rotation Handle and use caster brakes while loading and operating engine stand.
-  Always use engine stand on a hard level surface capable of supporting the load. Be sure surface is clean and free of debris, cracks, and chips. Avoid any uneven or dirty surfaces when moving loaded engine stand.
-  Never mount anything other than automotive engines.
-  Never mount an engine that extends beyond the front caster tube.
-  Never use accessories or attachments that were not supplied by the manufacturer.

2. Foreword

2.1 From the manufacturer

Thank you for your purchase. To complement the offering of A/C, fluid and nitrogen service equipment, MAHLE Service Solutions has partnered with Gray Manufacturing to provide the highest quality hydraulic and pneumatic equipment available for the professional service technician. This equipment adheres to high standards promised in the MAHLE guarantee including the assurance of innovation and reliability that comes with the Gray Manufacturing name. Please contact MAHLE Service Solutions' customer service at (800) 468-2321 or tech.mss@us.mahle.com with any comments or questions.

3. Symbols Use

3.1 Signal words

Signal words call attention to a safety message or messages, or a property damage message or messages, and designate a degree or level of hazard seriousness. Signal words used in this manual include:

Keyword	Probability of occurrence	Severity of danger if instructions not observed
DANGER	Immediate impending danger	Death or severe injury.
WARNING	Possible impending danger	Death or severe injury
CAUTION	Possible dangerous situation	Minor injury
NOTICE	Possible damage to property	Possible property damage

4. Responsibilities

4.1 Receiving inspection

Before attempting to operate this equipment, thoroughly read and understand this manual. Completely remove all tape and packaging. Inspect the equipment immediately upon delivery. If shipping damage is evident, inform the delivering carrier immediately and contact the manufacturer using the contact information on the back cover of this manual.

4.2 Owner and/or operator responsibilities

The owner of this equipment must read these instructions and maintain them for future reference and for instructing any other users of the equipment. The owner is responsible for keeping all warning labels and instruction manuals legible and intact. Replacement labels and literature are available from the manufacturer. The owner must never authorize or allow anyone to use this equipment until the operator has read and understood the information in this manual and on the accompanying labeling on the equipment itself.

If this equipment is being used in an occupational setting (or workplace), the employer should ensure that all personnel working with and around the equipment know of the risks associated with its use. Personnel involved in the use and operation of this equipment shall be careful, competent, trained, and qualified in the safe operation of the equipment and its proper use when servicing motor vehicles and their components. Safety information provided with this equipment should be emphasized by the employer and understood by each employee. The employer must make this manual available to all personnel using this equipment and all personnel must read and understand the contents of this manual. If the operator is not fluent in English, the manufacturer's instructions and warnings shall be read to and discussed with the operator in the operator's native language by the employer, making sure that the operator comprehends its contents and observes the proper procedures for use of this equipment.

5. Specifications

5.1 AES-1000

Model AES-1000	US units	Metric units
Maximum capacity	1000 lbs	454 kg
Overall width	41 in	104.1 cm
Overall length	41.5 in	105.4 cm
Overall height	49.5 in	125.7 cm
Maximum swing radius	31 in	78.8 cm
Handle length	31 in	78.8 cm
Weight	163 lb	74 kg

6. Product Description

6.1 Component identification

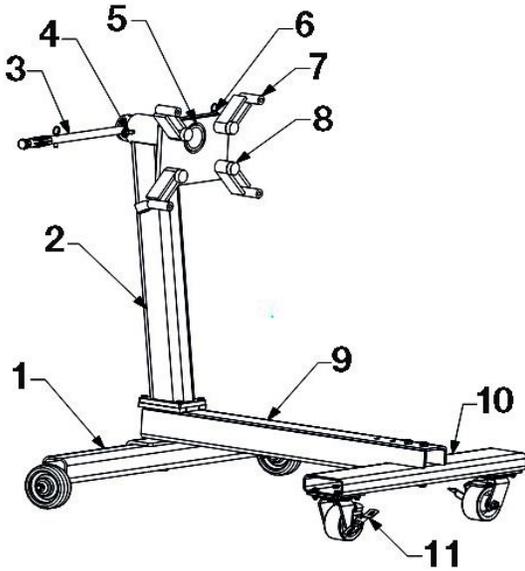


Fig. 1: AES-1000 Side view

- 1 Rear castor tube
- 2 Rear post
- 3 Rotation handle
- 4 Rotation locking pin
- 5 Head plate
- 6 Handle retention pin
- 7 Mounting bracket
- 8 Mounting bracket retention pins
- 9 Main tube
- 10 Front castor tube
- 11 Castor brake

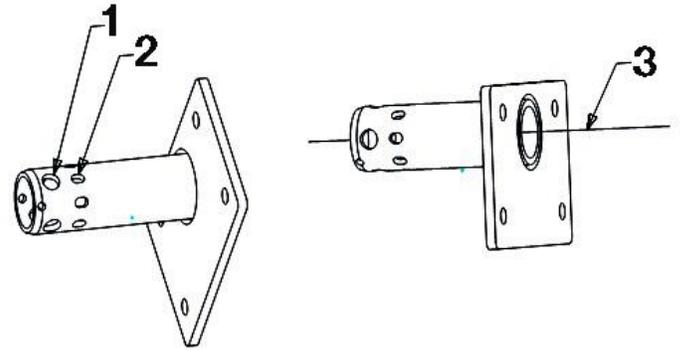


Fig. 2: Head plate

- 1 Handle holes
- 2 Rotation locking holes
- 3 Axis of rotation

7. Assembly

7.1 AES-1000 assembly

⚠ Use care while assembling engine stand. Parts are heavy and awkward to handle. Have another person assist with assembly where necessary.

Use figure to assist in assembly of engine stand. If assembly instructions are not understood, contact the manufacturer using the contact information printed on the back cover of this manual for assistance.

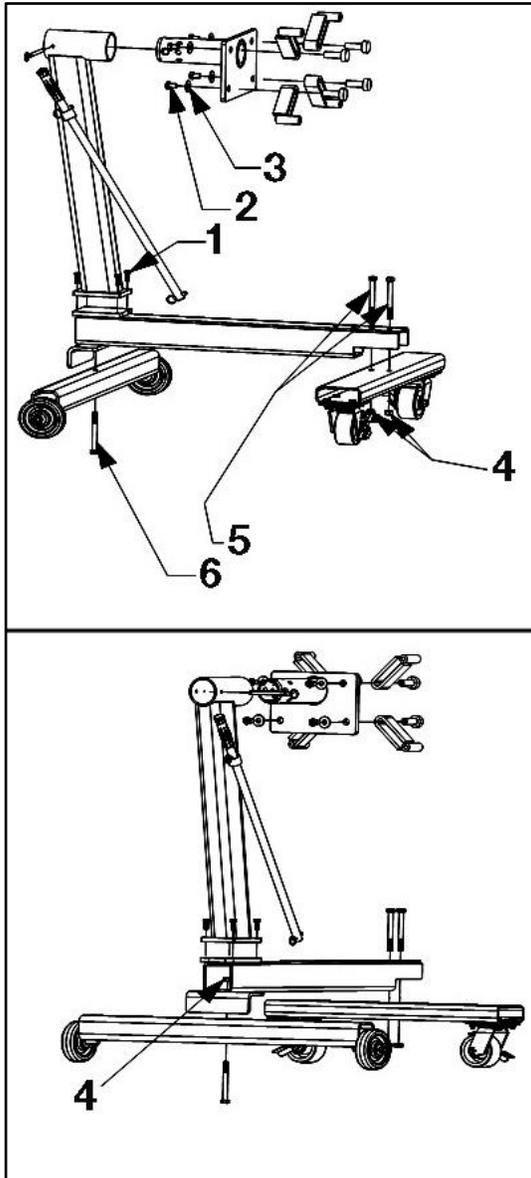


Fig. 3: Rear subassembly

- 1 1" 3/8-24UNF Grade 5 Capscrew (4)
- 2 3/4" 1/2-13UNC Grade 8 Capscrew (4)
- 3 1/2" Grade 9 USS Flat Washer (4)
- 4 1/2-13UNC nut
- 5 5"L, 1/2-13UNC Grade 5 Capscrew
- 6 4-1/2"L, 1/2-13UNC Grade 5 Capscrew

1. Use (1) 1/2-13UNC grade 5 capscrew 4-1/2" long to fasten the Rear Caster Tube to the Main Tube. Use (2) 1/2-13UNC grade 5 capscrew 5" long to fasten the Front Caster Tube to the Main Tube. Torque hardware to 60 ft-lbs minimum (Fig. 3).
2. Use (4) 3/8-24UNF grade 5 capscrews 1" long to fasten Post to Main Tube. Torque to 60 ft-lbs minimum.
3. Insert Mounting Plate into Post and insert Rotation Locking Pin through Post and Mounting Plate Rotation Locking Holes to hold Mounting Plate in place.
4. Insert the Mounting Bracket Retention Pins into the Mounting Brackets and use (4) 1/2-13UNC grade 8 capscrews 3/4" long and (4) 1/2" grade 9 USS flat washers to fasten them to the Mounting Plate.

8. Operation

⚠ WARNING - This section discusses the appropriate and safe methods for using the stand. Failure to follow all of the steps outlined in this section could result in serious injury or death.

8.1 Mounting an engine

The engine stand is designed to hold and rotate automotive engines weighing no more than 1000 pounds.

1. Prepare the engine to be mounted to the stand. Remove the bell housing and any other components that will be in the way of attaching the Mounting Plate to the engine.
2. Remove the Mounting Plate from the stand with Mounting Brackets attached.
3. Loosely attach Mounting Brackets to engine using appropriately sized grade 8 capscrews and washers. Capscrews should have at minimum, 1 inch of thread engagement with the engine.

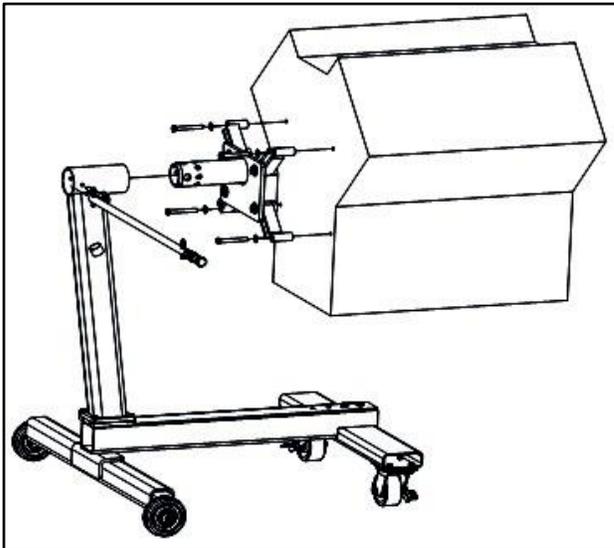


Fig. 4: Mounting engine to stand

4. Align Mounting Plate's axis of rotation with engine's center of gravity.
5. Tighten capscrews to engine then Mounting Bracket Retention Pins to at least 60 ft-lbs of torque while maintaining alignment of Mounting Plate's axis of rotation and engine's center of gravity.
6. Apply grease to tube of Mounting Plate.
7. Using a shop crane or other suitable means, move engine into position and insert Mounting Plate into engine stand. Follow instructions provided with equipment used to move engine.
8. Insert stand's handle and Rotation Locking Pin, and slowly transfer engine's weight to engine stand.
9. Rotate engine by holding engine in place, slowly removing Rotation Locking Pin, and carefully rotating engine to locking position closest to desired position.
10. Insert Rotation Locking Pin before releasing handle
11. Move the stand to the desired work location. Once finished moving the stand, use the brakes on the Casters to prevent movement.

8.2 Dismounting an engine

1. Prepare engine for moving and engine's destination for accepting engine.
2. Using a shop crane or other suitable means, capture engine and transfer engine's weight to equipment being used to move engine. Follow instructions provided with equipment used to move engine.
3. Remove stand's handle and Rotation Locking Pin, and slowly remove engine and Mounting Plate from stand.
4. Remove Mounting Plate from engine and return to stand.

9. Maintenance and Inspection

⚠ WARNING - The engine stand must be inspected according to the requirements of this section. Failure to properly inspect the engine stand could lead to severe injury or death. The engine stand must be removed from service and inspected immediately if it is subjected to an abnormal load or a shock load. If any irregularities or problems are detected during an inspection, the engine stand must be removed from service immediately and repaired. Contact the manufacturer using the contact information printed on the back cover of this manual.

9.1 Inspection – before each use

Visual inspection of the engine stand must be made before each use. The engine stand should be immediately removed from service if any of the following conditions are detected or observed:

- Any part is cracked, chipped, bent, or shows signs of excessive wear or any other type of damage.
- The Post or either Caster Tube is loose on the Main Tube.
- The wheels and/or casters do not roll freely or the axles appear bent or otherwise damaged.
- Any abnormal condition or sign of damage that suggests the engine stand will not work properly.
- Verify that all warning and instructions decals are in place and legible before the lift is put back in service. If any decals are missing or illegible, contact the manufacturer for replacements.

⚠ If any irregularities or problems are detected during an inspection, the stand must be removed from service immediately and repaired. Contact the manufacturer using the contact information on the back cover of this manual.

9.2 Periodic inspection

The engine stand owner (or a knowledgeable person appointed by the owner) must give the engine stand a more thorough inspection weekly (if it is used on a daily basis) or monthly (if used less frequently). In addition to a visual inspection (as described above in Section 4.1), the inspector should also operate the engine stand to assist in identifying any problems that might exist. The engine stand must be removed from service and repaired if the engine stand appears damaged, if it is badly worn, or if it operates abnormally.

- Check that all hardware is properly tightened and in good condition
- Ensure that the axis of rotation of the Posts is level.
- Check that the Mounting Plates, Mounting Brackets, and mounting hardware are not bent or stretched.
- Check that the Rotation Locking Pin is not damaged in any way and can be easily installed and removed.

9.3 Maintenance instructions

⚠ WARNING - All inspection and maintenance procedures must be performed after the engine stand has been removed from service. Failure to do this may result in personal injury and/or property damage.

- All warning and capacity labels should be readable and complete. Wash external surfaces of stand, labels, and decals with a mild soap solution.
- Lightly oil or grease any places where the paint has worn off to prevent corrosion and lubricate movement.
- Lubricate the tube on the Mounting Plate before each use. There is a grease zerk located on the Post tube to aid in lubrication after the engine has been mounted.
- Grease wheel axles.

11. Notes



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