

Owner's Manual & Safety Instructions

Save This Manual Keep this manual for the safety warnings and precautions, assembly, operating, inspection, maintenance and cleaning procedures. Write the product's serial number in the back of the manual near the assembly diagram (or month and year of purchase if product has no number). Keep this manual and the receipt in a safe and dry place for future reference.

CENTTECH®

ITEM 40963

TIMING LIGHT



REV 12i

Visit our website at: <http://www.harborfreight.com>
Email our technical support at: tech@harborfreight.com

When unpacking, make sure that the product is intact and undamaged. If any parts are missing or broken, please call 1-800-444-3353 as soon as possible.

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No portion of this manual or any artwork contained herein may be reproduced in any shape or form without the express written consent of Harbor Freight Tools. Diagrams within this manual may not be drawn proportionally. Due to continuing improvements, actual product may differ slightly from the product described herein. Tools required for assembly and service may not be included.

⚠WARNING

**Read this material before using this product.
Failure to do so can result in serious injury.
SAVE THIS MANUAL.**

Specifications

Power Input	12 VDC
Bulb	AGA0314TSC Xenon
Lead Length	4 FT.
Timing Advance	0° to 60° in 2° Increments

Important Safety Information

1. **Work area safety**
 - a. Keep work area clean and well lit. *Cluttered or dark areas invite accidents.*
 - b. Keep children and bystanders away while operating a diagnostic tool. *Distractions can cause you to lose control.*
2. **Electrical safety**
 - a. Do not expose diagnostic tools to rain or wet conditions. *Water entering a diagnostic tool will increase the risk of electric shock.*
 - b. Do not abuse the cords. Never use the cords for carrying, pulling or unplugging the diagnostic tool. Keep cords away from heat, oil, sharp edges or moving parts. *Damaged or entangled cords increase the risk of electric shock.*
3. **Personal safety**
 - a. Stay alert, watch what you are doing and use common sense when operating a diagnostic tool. Do not use a diagnostic tool while you are tired or under the influence of drugs, alcohol or medication. *A moment of inattention while operating diagnostic tools may result in serious personal injury.*
 - b. Use safety equipment. Always wear eye protection. *Safety equipment such as dust mask, non-skid safety shoes, hard hat, or hearing protection used for appropriate conditions will reduce personal injuries.*
 - c. Avoid accidental starting. Ensure the switch is in the off-position before plugging in. *Carrying diagnostic tools with the finger on the switch or plugging in diagnostic tools that have the switch on invites accidents.*
 - d. Do not overreach. Keep proper footing and balance at all times. *This enables better control of the diagnostic tool in unexpected situations.*
 - e. Dress properly. Do not wear loose clothing or jewelry. Keep hair, clothing and gloves away from moving parts. *Loose clothes, jewelry or long hair can be caught in moving parts.*

4. Diagnostic tool use and care

- a. Do not force the diagnostic tool. Use the correct diagnostic tool for the application. *The correct diagnostic tool will do the job better and safer at the rate for which it was designed.*
- b. Do not use the diagnostic tool if the trigger does not turn it on and off. *Any diagnostic tool that cannot be controlled with the trigger is dangerous and must be repaired.*
- c. Store idle diagnostic tools out of the reach of children and do not allow persons unfamiliar with the diagnostic tool or these instructions to operate the diagnostic tool. *Diagnostic tools are dangerous in the hands of untrained users.*
- d. Maintain diagnostic tools. Check for misalignment or binding of moving parts, breakage of parts and any other condition that may affect the diagnostic tool's operation. If damaged, have the diagnostic tool repaired before use. *Many accidents are caused by poorly maintained diagnostic tools.*
- e. Use the diagnostic tool and accessories, in accordance with these instructions and in the manner intended for the particular type of diagnostic tool, taking into account the working conditions and the work to be performed. *Use of the diagnostic tool for operations different from those intended could result in a hazardous situation.*

5. Service

- a. Have the diagnostic tool serviced by a qualified repair person using only identical replacement parts. *This will ensure that the safety of the diagnostic tool is maintained.*

Specific Safety Rules

1. Maintain labels and nameplates on the tool. These carry important safety information. If unreadable or missing, contact Harbor Freight Tools for a replacement.
2. Avoid unintentional starting. Prepare to begin work before connecting the tool.
3. This product is not a toy. Keep it out of reach of children.
4. People with pacemakers should consult their physician(s) before use. Electromagnetic fields in close proximity to heart pacemaker could cause pacemaker interference or pacemaker failure. Caution is necessary when near coil, spark plug cables, or distributor of running engine. Engine should be off during distributor adjustment.
5. **WARNING:** Handling the cord on this product will expose you to lead, a chemical known to the State of California to cause cancer, and birth defects or other reproductive harm. Wash hands after handling. (California Health & Safety Code § 25249.5, *et seq.*)



SAVE THESE INSTRUCTIONS.

Operation Tips

Timing Light Basics

Automobile engines work by mixing air, fuel and a spark to ignite the fuel/air mixture, creating an explosion, that powers the vehicle. Maximum power from the explosion must be delivered to the engine at a precise instant. Attaining that precise instant is called "Timing". Timing is essential for fuel economy and power. Automobile engine manufacturers determine the exact timing necessary for every engine they build. Normal engine and ignition system wear causes the timing to change, reducing both fuel efficiency and power.

Engine manufacturers use two terms when describing timing, "advanced" and "retarded". Timing is advanced when the spark occurs before the piston reaches the top of a cylinder. Timing is retarded when the spark occurs after the piston has started down in the cylinder. Timing is changed by adjusting the ignition distributor.

To set timing, the engine manufacturer provides "timing marks" on the engine's vibration damper. Read the vehicle's manual or contact the manufacturer for the location of timing marks on the engine. Also, refer to the vehicle service manual or contact the manufacturer for the timing specifications for the particular engine.

When to Check Timing

The instant that the spark plug fires is determined by the opening of the distributor ignition breaker points and will change any time the point gap or dwell angle is changed. Normal wear on the breaker point rubbing block will change the dwell and effect the timing.

Most late model vehicles are equipped with "breakerless electronic ignition systems" and will not allow a change in timing, because there are no breaker points. The Timing Light can still be used to note changes in the timing caused by problems in the ignition system or for resetting the timing when components are changed (i.e. removed and/or replaced).

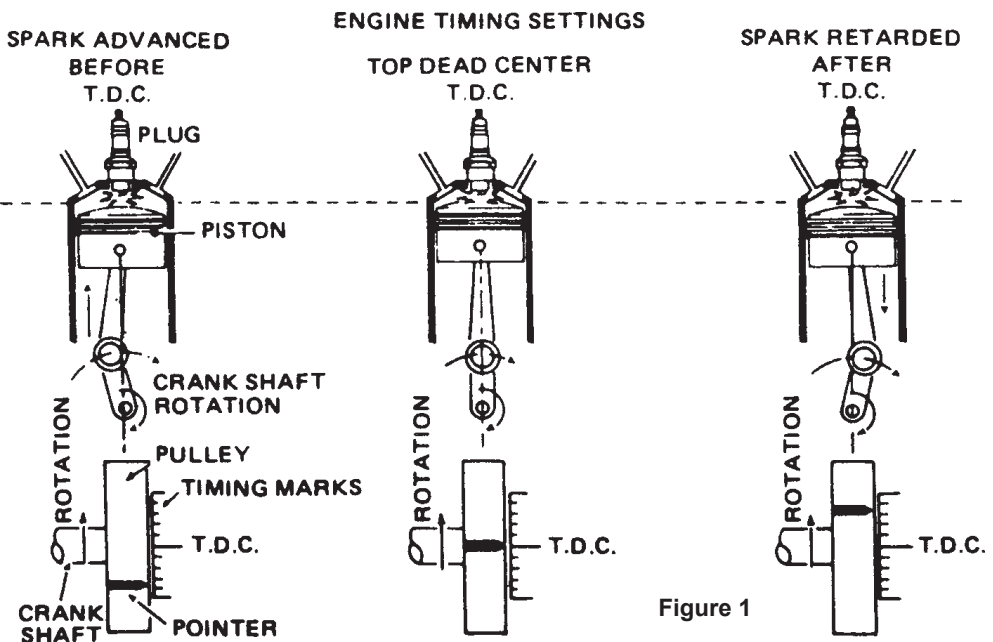


Figure 1

Operating Instructions



Read the **ENTIRE IMPORTANT SAFETY INFORMATION** section at the beginning of this document including all text under subheadings therein before set up or use of this product.

Note: These general instructions will not apply to all engine designs and/or vehicles. Consult your engine manufacturer's service instructions which supersede these instructions.

1. Locate the engine's timing mark by referring to the vehicle's engine manual or contacting the manufacturer. Refer to the vehicle's manual or contact the manufacturer for the timing specifications of the engine being tested.
2. Start the engine and run for 5-15 minutes until normal operating temperature is reached.
3. Stop engine.
4. Turn the Timing Advance Knob on the back of the timing light to 0°.
5. If the vehicle specifications and instructions require it, locate the vacuum line that attaches to the ignition distributor vacuum advance and disconnect the line and plug the end of it. A golf tee or small pencil may be used to plug the line.

Note: The Spark Plug Clamp is fragile and may break if dropped or struck sharply.

6. Connect the timing light to the 12 V Battery, and connect the Spark Plug Clamp to the Spark Plug Wire as shown. The spark plug clamp must be connected with the arrow on the clamp pointing towards the spark plug.

Timing Light Hook Up

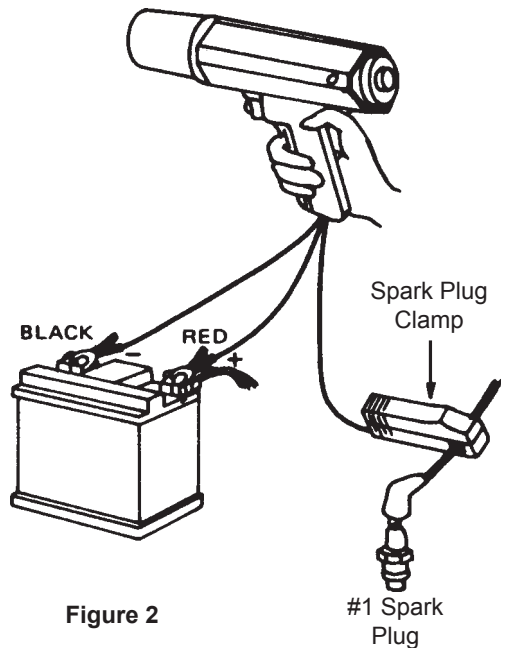


Figure 2

7. Start the engine and operate at idle speed.

WARNING! Be careful working around a running engine. Moving belts and fans can cause severe injury if contacted. Metal engine parts are very hot. Do not contact any part of the engine.

8. Squeeze the trigger on the timing light and direct the flash onto the engine timing marks to obtain a reading. Compare the reading from the timing mark to the reading in the manufacturer's specifications. If the timing does not match with the timing listed in the manufacturer's specifications, adjust the timing.

Timing Adjustment

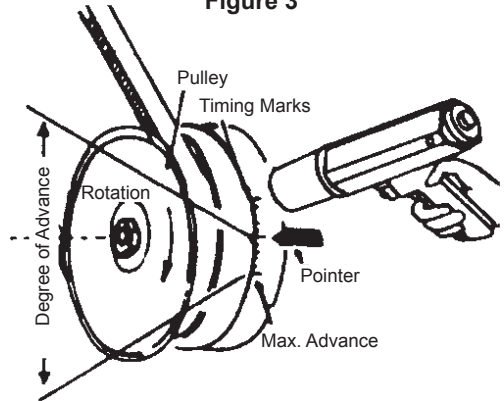
1. With the Engine stopped, loosen the bolt that locks down the distributor, but do not fully remove it.
It should be loose enough so that you can rotate the distributor back and forth. Do not over-loosen the bolt or allow the distributor to move on its own.
2. Start the engine and run until it reaches the standard operating temperature.
3. Direct the beam from Timing Light at the timing marks and slowly rotate the distributor in very small increments. Rotate the distributor either right or left until the timing lines¹ are lined up (in line with the pointer). See Figure 3.
4. Stop the engine.
5. Tighten the distributor lock down bolt using care not to change the position of the distributor.
6. Start the engine and recheck the timing. If the timing is incorrect, the distributor may have moved while bolting it down. Reset the timing.
7. If you have no other tests to perform with the Timing Light, turn off the engine and reconnect the vacuum line. If you have further tests, first check to see if the vacuum line needs to be connected for those tests.

¹ Many vehicles have two timing marks: One at TDC and another at 10° before TDC.

Testing Centrifugal Advance

1. With the timing light still connected and the vacuum line still not attached, speed the engine up slowly to the manufacturer's specified speed for this test (often 2000 RPM) and watch the timing mark.
2. The timing mark should move steadily, without jumping. See Figure 3.

Figure 3



3. If the mark stays stationary or moves erratically, the Centrifugal Advance (or other automatic timing advances) should be repaired by a certified mechanic.
4. Turn the timing advance knob on the back of the timing light up slowly until the timing mark moves to **TDC** or **0**.
5. The reading on the timing advance scale indicates the amount of centrifugal advance. Compare with vehicle service manual.

Testing Vacuum Advance

1. Speed the engine up slowly to the manufacturer's specified speed for this test (often 2000 RPM) and leave the vacuum line detached from the distributor.
2. Aim the Timing Light at the timing marks and turn the timing advance knob on the back of the timing light up slowly until the timing mark moves to **TDC** or **0**.
3. Connect the vacuum line to the distributor.
4. If the timing mark stays still, the trouble could be a plugged line, a leaky diaphragm, or a frozen distributor plate. See a certified mechanic if the mark doesn't move.
5. Read the amount of vacuum advance from the timing marks on the engine. Compare with vehicle service manual.

Checking Distributor Cam Wear

1. This test is done after the timing has been set and the timing light lines up with the reference pointer for cylinder number 1.

2. Connect the Timing Light to the spark plug wire directly opposite (180°) from the number 1 cylinder on the distributor cap. See Figure 4.

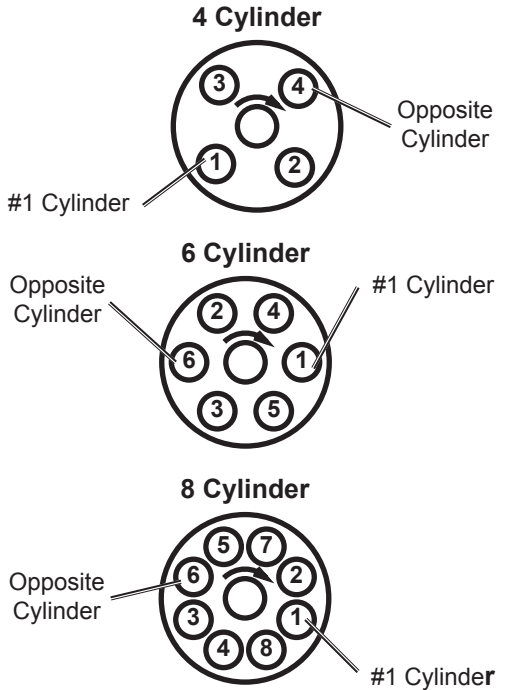


Figure 4

Note: The opposite cylinder is opposite the #1 Cylinder on Distributor Cap.

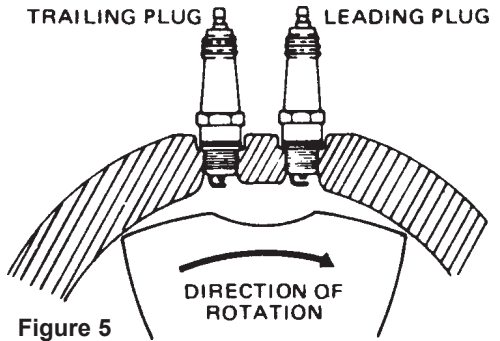
3. Start the engine and aim the Timing Light towards the timing mark. The reading should be the same as when the Timing Light was connected to the number 1 cylinder wire. If not, the probable cause is a worn out distributor cam, bushing, or bearing, or bent distributor shaft. Contact a qualified service technician for repairs.

Small Engine Timing

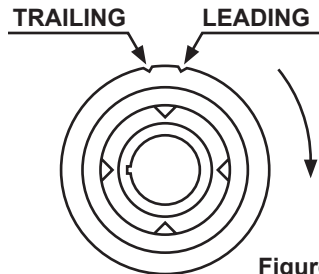
1. The Timing Light can be used to test the timing on any combustion engine that utilizes an impulse or magneto ignition, such as motorcycles, lawn mowers, or outboard motors. If the product does not have a 12 V battery then use an external battery.
2. Connect a ground from the external battery's Negative Post to the engine.
3. Connect the red clip of the Timing light to the Positive Terminal of the Battery and the black clip to the Negative Terminal of the Battery. Connect the Spark Plug Clamp of the Timing Light to the spark plug wire with the arrow pointing towards the spark plug.

Rotary Engine Timing

1. Connect the red and black power leads to the battery. Connect the Spark Plug Clamp to the wire for the leading spark plug on the front rotor housing.



2. Start engine and run it at idle speed.
3. Aim the Timing Light at the timing indicator pin of the front cover.



4. Loosen the distributor locking nuts and rotate the leading side distributor body until the timing mark on the eccentric shaft pulley is in line with the timing indicator pin.
5. Tighten locking nuts and recheck timing.
6. Repeat this process to set the trailing side distributor timing.

Maintenance and Servicing



Procedures not specifically explained in this manual must be performed only by a qualified technician.

⚠️ WARNING

TO PREVENT SERIOUS INJURY FROM SHOCK OR FIRE:

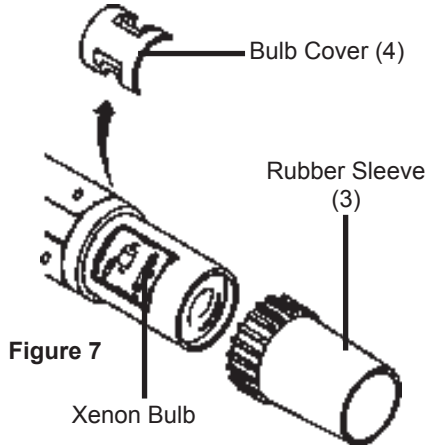
Disconnect from the vehicle battery before performing any inspection, maintenance, or cleaning procedures.

TO PREVENT SERIOUS INJURY FROM TOOL FAILURE:

Do not use damaged equipment. If abnormal noise or vibration occurs, have the problem corrected before further use.

1. **BEFORE EACH USE**, inspect general condition of tool. Check for loose hardware, misalignment or cracked or broken parts, damaged electrical wiring, and any other condition that may affect its safe operation.
2. **AFTER USE**, wipe external surfaces of the tool with clean cloth.

3. To check the Lamp:
 - a. Remove Rubber Sleeve (3) from nozzle of the Timing Light.



- b. Remove the Bulb Cover (4).
- c. The Xenon Bulb may develop a black spot around the anode; this is normal. If the bulb turns completely black however, a new timing light is needed. The bulb is permanently soldered in place and cannot be replaced.

Troubleshooting

Problem	Possible Causes	Likely Solutions
No flash	<ol style="list-style-type: none"> 1. Switch in "OFF" position. 2. Battery clips connected backward. 3. Poor connection of clips. 	<ol style="list-style-type: none"> 1. Move switch to "ON" position. 2. Reverse the battery clip connections. 3. Clean battery post and reconnect.
No flash but double check indicator is "ON"	<ol style="list-style-type: none"> 1. Spark Plug Clamp flipped backwards. 2. Weak ignition or spark plug. 3. Faulty lamp. 	<ol style="list-style-type: none"> 1. Make sure arrow on clamp points to #1 plug. 2. Connect to other plugs or spark plug wires. Repair Gap. 3. A new timing light is needed.
Light flashes intermittently	Timing Light Spark Plug Clamp wire lying on, or near to, the other spark plug wires.	Route Spark Plug Clamp wire away from the other spark plug wires.



Follow all safety precautions whenever diagnosing or servicing the tool. Disconnect power supply before service.

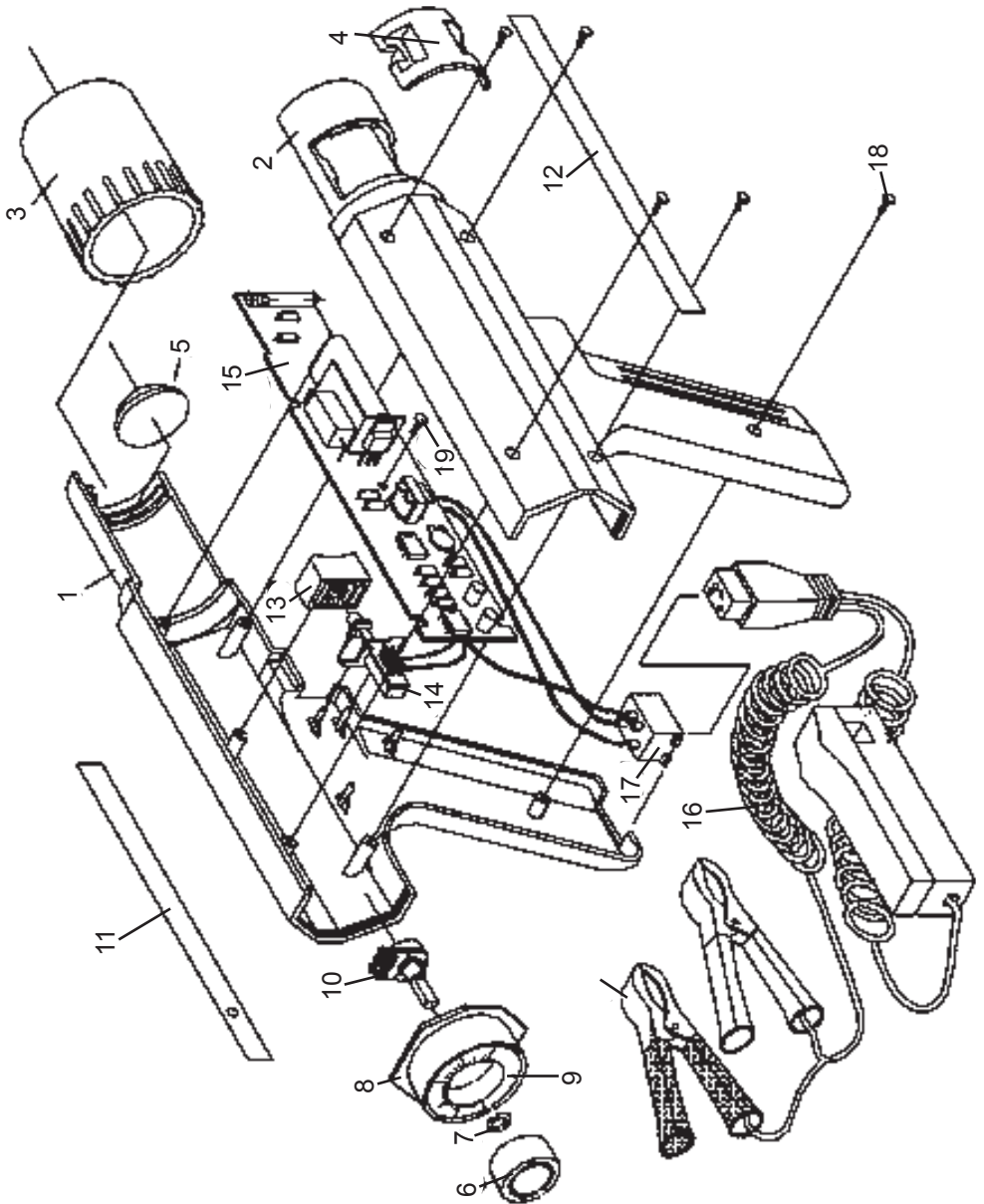
Parts List

Part	Description	Q'ty
1	Left Housing	1
2	Right Housing	1
3	Rubber Sleeve	1
4	Bulb Cover	1
5	Lens	1
6	Timing Advance Knob	1
7	Nut	1
8	Rear Cover	1
9	Dial Scale	1
10	Tension Meter	1
11	Left Tag	1
12	Right Tag	1
13	Trigger	1
14	Internal Switch	1
15	Board	1
16	Clamp Cable	1
17	Cable Connector	1
18	Screw (M3x10)	5
19	Screw (M3x6)	1

PLEASE READ THE FOLLOWING CAREFULLY

THE MANUFACTURER AND/OR DISTRIBUTOR HAS PROVIDED THE PARTS LIST AND ASSEMBLY DIAGRAM IN THIS MANUAL AS A REFERENCE TOOL ONLY. NEITHER THE MANUFACTURER OR DISTRIBUTOR MAKES ANY REPRESENTATION OR WARRANTY OF ANY KIND TO THE BUYER THAT HE OR SHE IS QUALIFIED TO MAKE ANY REPAIRS TO THE PRODUCT, OR THAT HE OR SHE IS QUALIFIED TO REPLACE ANY PARTS OF THE PRODUCT. IN FACT, THE MANUFACTURER AND/OR DISTRIBUTOR EXPRESSLY STATES THAT ALL REPAIRS AND PARTS REPLACEMENTS SHOULD BE UNDERTAKEN BY CERTIFIED AND LICENSED TECHNICIANS, AND NOT BY THE BUYER. THE BUYER ASSUMES ALL RISK AND LIABILITY ARISING OUT OF HIS OR HER REPAIRS TO THE ORIGINAL PRODUCT OR REPLACEMENT PARTS THERETO, OR ARISING OUT OF HIS OR HER INSTALLATION OF REPLACEMENT PARTS THERETO.

Assembly Diagram



Limited 90 Day Warranty

Harbor Freight Tools Co. makes every effort to assure that its products meet high quality and durability standards, and warrants to the original purchaser that this product is free from defects in materials and workmanship for the period of 90 days from the date of purchase. This warranty does not apply to damage due directly or indirectly, to misuse, abuse, negligence or accidents, repairs or alterations outside our facilities, criminal activity, improper installation, normal wear and tear, or to lack of maintenance. We shall in no event be liable for death, injuries to persons or property, or for incidental, contingent, special or consequential damages arising from the use of our product. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation of exclusion may not apply to you. THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS.

To take advantage of this warranty, the product or part must be returned to us with transportation charges prepaid. Proof of purchase date and an explanation of the complaint must accompany the merchandise. If our inspection verifies the defect, we will either repair or replace the product at our election or we may elect to refund the purchase price if we cannot readily and quickly provide you with a replacement. We will return repaired products at our expense, but if we determine there is no defect, or that the defect resulted from causes not within the scope of our warranty, then you must bear the cost of returning the product.

This warranty gives you specific legal rights and you may also have other rights which vary from state to state.

Record Serial Number Here: _____

Note: If product has no serial number, record month and year of purchase instead.

Note: Some parts are listed and shown for illustration purposes only, and are not available individually as replacement parts.

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