





10 POWER TOOLS AND SHOP EQUIPMENT

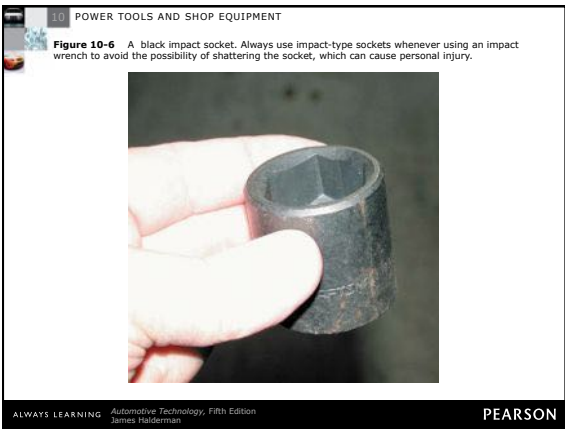
REAL WORLD FIX

The Case of the Rusty Air Impact Wrenches

In one busy shop, it was noticed by several technicians that water was being pumped through the air compressor lines and out of the vents of air impact wrenches whenever they were used. It is normal for moisture in the air to condense in the air storage tank of an air compressor. One of the routine service procedures is to drain the water from the air compressor. The water had been drained regularly from the air compressor at the rear of the shop, but the problem continued. Then someone remembered that there was a second air compressor mounted over the parts department. No one could remember ever draining the tank from that compressor. After that tank was drained, the problem of water in the lines was solved. The service manager assigned a person to drain the water from both compressors every day and to check the oil level. The oil in the compressor is changed every six months to help ensure long life of the expensive compressors.

ALWAYS LEARNING Automotive Technology, Fifth Edition James Halderman PEARSON








10 POWER TOOLS AND SHOP EQUIPMENT


Figure 10-8 This typical die grinder surface preparation kit includes the air-operated die grinder, as well as a variety of sanding discs for smoothing surfaces or removing rust.



ALWAYS LEARNING Automotive Technology, Fifth Edition James Halderman PEARSON

10 POWER TOOLS AND SHOP EQUIPMENT

Figure 10-9 A fluorescent trouble light operates cooler and is safer to use in the shop because it is protected against accidental breakage where gasoline or other flammable liquids would happen to come in contact with the light.



ALWAYS LEARNING Automotive Technology, Fifth Edition James Halderman PEARSON

10 POWER TOOLS AND SHOP EQUIPMENT

WARNING

Do not use incandescent trouble lights around gasoline or other flammable liquids. The liquids can cause the bulb to break and the hot filament can ignite the flammable liquid.

ALWAYS LEARNING Automotive Technology, Fifth Edition James Halderman PEARSON

10 POWER TOOLS AND SHOP EQUIPMENT

Figure 10-10 A typical pedestal grinder with a wire wheel on the left side and a stone wheel on the right side. Even though this machine is equipped with guards, safety glasses or a face shield should always be worn when using a grinder or wire wheel.



ALWAYS LEARNING Automotive Technology, Fifth Edition James Halderman PEARSON

10 POWER TOOLS AND SHOP EQUIPMENT


Figure 10-11 A typical vise mounted to a workbench.



ALWAYS LEARNING Automotive Technology, Fifth Edition James Halderman PEARSON

10 POWER TOOLS AND SHOP EQUIPMENT

Figure 10-12 A hydraulic press is usually used to press bearings on and off on rear axles and transmissions.



ALWAYS LEARNING Automotive Technology, Fifth Edition James Halderman PEARSON



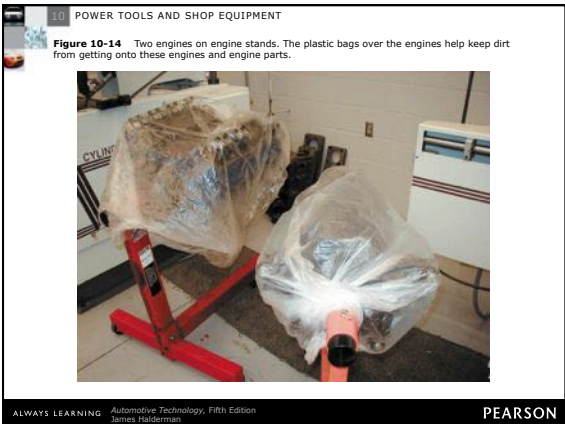
10 POWER TOOLS AND SHOP EQUIPMENT

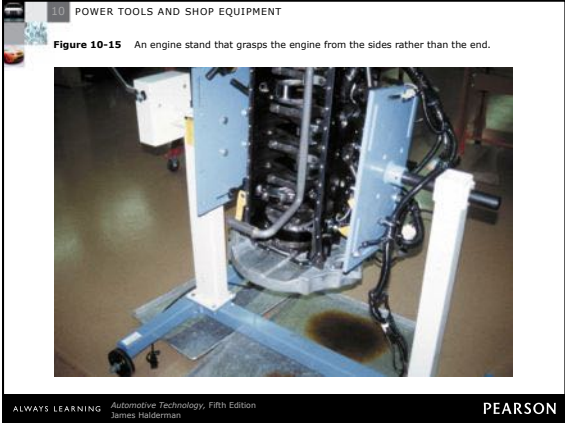
TECH TIP

Cover Work While Pressing

Whenever pressing on a bearing or other component, use an old brake drum over the shaft and the bearing. In the event the bearing shatters during the pressing operation, the brake drum will prevent the parts of the bearing from flying outward where they could cause serious personal injury.

ALWAYS LEARNING Automotive Technology, Fifth Edition James Halderman PEARSON










10 POWER TOOLS AND SHOP EQUIPMENT

SETUP AND LIGHTING A TORCH 3 Each tank has a regulator assembly with two gauges. The high pressure gauge shows tank pressure, and the low pressure gauge indicates working pressure.



ALWAYS LEARNING Automotive Technology, Fifth Edition James Halderman PEARSON

10 POWER TOOLS AND SHOP EQUIPMENT


SETUP AND LIGHTING A TORCH 4 Open the oxygen tank valve fully, and open the acetylene tank valve 1/2 turn.



ALWAYS LEARNING Automotive Technology, Fifth Edition James Halderman PEARSON

10 POWER TOOLS AND SHOP EQUIPMENT

SETUP AND LIGHTING A TORCH 5 Open the oxygen valve on the torch handle 1/4 turn in preparation for adjusting oxygen gas pressure.



ALWAYS LEARNING Automotive Technology, Fifth Edition James Halderman PEARSON

10 POWER TOOLS AND SHOP EQUIPMENT


SETUP AND LIGHTING A TORCH 6 Turn the oxygen regulator valve clockwise and adjust oxygen gas pressure to 20 PSI. Close the oxygen valve on the torch handle.



ALWAYS LEARNING Automotive Technology, Fifth Edition James Halderman PEARSON

10 POWER TOOLS AND SHOP EQUIPMENT

SETUP AND LIGHTING A TORCH 7 Open the acetylene valve on the torch handle 1/4 turn and adjust acetylene gas pressure to 7 PSI. Close the acetylene valve on the torch handle.



ALWAYS LEARNING Automotive Technology, Fifth Edition James Halderman PEARSON

10 POWER TOOLS AND SHOP EQUIPMENT

SETUP AND LIGHTING A TORCH 8 Open the oxygen valve on the torch handle 1/4 turn and use an appropriate size tip cleaner to clean the tip orifice. Finish by closing the oxygen valve.



ALWAYS LEARNING Automotive Technology, Fifth Edition James Halderman PEARSON

10 POWER TOOLS AND SHOP EQUIPMENT


SETUP AND LIGHTING A TORCH 9 Put on leather gloves and open the acetylene valve on the torch handle 1/4 turn. Use a flint striker to ignite the acetylene gas exiting the torch tip.



ALWAYS LEARNING Automotive Technology, Fifth Edition James Halderman PEARSON

10 POWER TOOLS AND SHOP EQUIPMENT

SETUP AND LIGHTING A TORCH 10 Adjust the acetylene valve until the base of the flame just touches the torch tip. Slowly open the oxygen valve on the torch handle and adjust for a neutral flame (blue cone is well-defined).



ALWAYS LEARNING Automotive Technology, Fifth Edition James Halderman PEARSON

10 POWER TOOLS AND SHOP EQUIPMENT

SETUP AND LIGHTING A TORCH 11 Once work is complete, extinguish the flame by quickly closing the acetylene valve on the torch handle. Be prepared to hear a loud "pop" when the flame goes out. Close the oxygen valve on the torch handle.



ALWAYS LEARNING Automotive Technology, Fifth Edition James Halderman PEARSON

10 POWER TOOLS AND SHOP EQUIPMENT


SETUP AND LIGHTING A TORCH 12 Close the valves on both tanks and turn the regulator handles CCW until they no longer contact the internal springs. Open the gas valves briefly on the torch handle to release gas pressure from the hoses. Close the gas valves on the torch handle and put away the torch assembly.



ALWAYS LEARNING Automotive Technology, Fifth Edition James Halderman PEARSON

10 POWER TOOLS AND SHOP EQUIPMENT


HEATING METAL 1 Heating attachments include ordinary heating tips, middle and right and a "rosebud" (left). Ordinary heating tips work fine for most purposes, but occasionally the rosebud is utilized when a great deal of heat is needed.



ALWAYS LEARNING Automotive Technology, Fifth Edition James Halderman PEARSON

10 POWER TOOLS AND SHOP EQUIPMENT


HEATING METAL 2 Note that while acetylene tank pressures are relatively low, the oxygen tank can be filled to over 2,000 PSI. This can represent a serious hazard if precautions are not taken. Be absolutely certain that the tanks are chained properly to the cart before attempting to move it!



ALWAYS LEARNING Automotive Technology, Fifth Edition James Halderman PEARSON

10 POWER TOOLS AND SHOP EQUIPMENT

HEATING METAL 3 Any time heating or cutting operations are being performed, be sure that any flammables have been removed from the immediate area. A fire blanket may be placed over floor drains or other objects to prevent fires. A fire extinguisher should be on hand in case of an emergency.



ALWAYS LEARNING Automotive Technology, Fifth Edition James Halderman PEARSON

10 POWER TOOLS AND SHOP EQUIPMENT

HEATING METAL 4 Be sure to wear appropriate personal protective equipment during heating and cutting operations.



ALWAYS LEARNING Automotive Technology, Fifth Edition James Halderman PEARSON

10 POWER TOOLS AND SHOP EQUIPMENT

HEATING METAL 5 Note that heating operations should be performed over steel or firebrick. Never heat or cut steel close to concrete, as it could cause the concrete to explode.



ALWAYS LEARNING Automotive Technology, Fifth Edition James Halderman PEARSON

10 POWER TOOLS AND SHOP EQUIPMENT


HEATING METAL 6 When heating steel, move the torch in a circular pattern to prevent melting of the metal. Don't hold the torch too close to the work as this will cause a "snapping" or "backfire" that can extinguish the flame.



ALWAYS LEARNING Automotive Technology, Fifth Edition James Halderman PEARSON

10 POWER TOOLS AND SHOP EQUIPMENT


CUTTING METAL 7 Affix the cutting attachment to the torch handle. Note that the cutting attachment has a cutting handle and a separate oxygen valve.



ALWAYS LEARNING Automotive Technology, Fifth Edition James Halderman PEARSON

10 POWER TOOLS AND SHOP EQUIPMENT


CUTTING METAL 8 Fully open the oxygen valve on the torch handle. Oxygen flow will now be controlled with the valve on the cutting attachment.



ALWAYS LEARNING Automotive Technology, Fifth Edition James Halderman PEARSON

10 POWER TOOLS AND SHOP EQUIPMENT


CUTTING METAL 9 Oxygen gas pressure should be adjusted to 30 PSI whenever using the cutting attachment. Acetylene pressure is kept at 7 PSI.



ALWAYS LEARNING Automotive Technology, Fifth Edition James Halderman PEARSON

10 POWER TOOLS AND SHOP EQUIPMENT


CUTTING METAL 10 Open the acetylene valve on the torch handle 1/4 turn and light the torch. Adjust the flame until its base just touches the cutting tip. Slowly open the oxygen valve on the cutting attachment and adjust the flame until the blue cone is well-defined.



ALWAYS LEARNING Automotive Technology, Fifth Edition James Halderman PEARSON

10 POWER TOOLS AND SHOP EQUIPMENT

CUTTING METAL 11 Direct the flame onto a thin spot or sharp edge of the metal to be cut. This will build the heat quicker in order to get the cut started.



ALWAYS LEARNING Automotive Technology, Fifth Edition James Halderman PEARSON

10 POWER TOOLS AND SHOP EQUIPMENT

CUTTING METAL 12 When the metal glows red, depress the cutting handle and move the torch to advance the cut. You will need to move the torch faster when cutting thinner pieces of steel. On thicker pieces, point the cutting tip into the direction of the cut.



ALWAYS LEARNING Automotive Technology, Fifth Edition
James Halderman

PEARSON
