

5. MAINTENANCE, REPAIR AND SERVICING

The use of machinery vastly increases labor productivity, but it also provides some problems. Not the least of these is that it requires continuous maintenance, repair and servicing. In our concern for the fire problems caused by the machines and their operators, there is a tendency to overlook the serious fire risks that can occur from such activities. If all maintenance, repair and servicing of mechanical equipment could be done in shops or corporation yards, the threat of wildland fire from these activities would be negligible. This, however, is not the case and such activities often take place in highly fire hazardous situations.

5.1 Welding, Cutting and Grinding

- *PRC §4427 (Clearance and tools required)*
- *Title 14CCR §918.7 (Welding and blasting watch)*

The primary fire risk from these activities is the falling of sparks, slag or hot metal into dry vegetation fuel beds. There is also some risk of ignition of fumes from volatile fuels or solvents. The electric arc and gas flame are heat sources which are seldom allowed contact with vegetation or other fuels.

Welding, cutting, and grinding are common emergency repairs used to repair disabled machinery. This means that the choice of time and location is severely limited or non-existent. The machine may very well be situated in the middle of a hillside covered with dry grass or pine needles. Before any arc is struck or other repair work started, the area should be made as fire safe as possible.

All flammable vegetation and other fuels must be removed for a minimum radius of 10 feet from the work area. Several companies regularly provide 25 feet clearance. Also, firefighting equipment, including a 46 inch round point shovel and a backpack pump water type fire extinguisher, must be provided close by (i.e., less than 25 feet from the activity).

When fire danger rating is “Very High” or a “Red Flag” condition is in effect, or when winds prevail, a larger clearing radius should be employed. When fire danger rating is “Extreme” or a “Red Flag Fire Alert” is in effect, all welding, cutting or grinding activities in the field should be stopped.

Whenever welding, cutting or grinding is done in the field, a fire-watcher should be on hand during the operation and left at the site for at least one hour after the completion of the repair. Keep in mind that a welder wearing a hood or dark goggles can seldom see a vegetation fire.

Spark arrester and clearing requirements, as discussed later, are applicable to portable generators supplying power to arc welders and grinders. It should also be remembered that the responsibility and liability of the operator is the same although it may be shared, when using an independent contract welder rather than an employee. He/she must be sure the professional welder is aware of and follows fire safe practices and complies with the law.

Much of what is discussed above is included in various timber sale and construction contracts, state law, and in some local ordinances. In those jurisdictions where welding permits are required, clearance and fire tool requirements will usually be included among the conditions of the permit. Fire conscious operators will take these precautions voluntarily.

STATE OF CALIFORNIA—RESOURCES AGENCY—DEPARTMENT OF FORESTRY

This Space for Administrative Use Only

Fire Prevention Material Given to Permittee
 Yes No

Field Inspection Made Prior to Issuance
 Yes No

APPLICATION FOR PERMIT TO BURN No. **713139**

Ranger District _____
SHASTA RANGER UNIT

Name of applicant N. M. MADDEN Telephone 854-3210

Mailing address P.O. Box 7 Town REDDING State CA

hereby applies to: (Check applicable block below)

Burn trash in dooryard incinerator

Burn household or dooryard trash in small heaps and piles

Burn small plots of grass or weeds in lots or dooryard premises

Burn small parcels or strips for hazard reduction

Burn agricultural waste

located at/near DUKE ROAD
Street, Road or other identity

SECOND LOT ON LEFT.

in Sec. _____, Twp. _____, R. _____

Crop type _____ Acres/ Tons _____ County of SHASTA, State of California,

Set off fireworks

Other (Explain) WELDING/CUTTING during the period 6/1/99 to 6/30/99

I own or legally control the above-described land. I agree to comply with all fire laws, ordinances, regulations and with all applicable Air Pollution Control District rules and regulations. I further agree to comply with the specific terms of the burning permit issued to me.

Signature of Applicant or Agent _____
Date

BURNING PERMIT

This permit is issued to the above applicant to burn the material at the location described above subject to the following terms:

- No burning shall be undertaken unless weather conditions (particularly the wind) are such that they can reasonably be considered safe (less than fifteen miles per hour during burning period).
- This permit is void during suspension of burning by proclamation of the Director of Forestry (Sections 4423.1-4423.5, Public Resources Code) or local ordinance.
- This permit is valid only on those days which are not prohibited by the State Air Resources Board pursuant to Section 41555 of the Health and Safety Code or by the Local Air Pollution Control District.
- Agricultural waste shall be dried as required, arranged to facilitate efficient burning, free of visible moisture, ignited with approved devices, and be free of other wastes such as tires, rubbish, tar, paper, or construction debris.
- Unless the burning operation authorized by this permit is located in an area cleared of flammable vegetation, it shall be: (a) attended by at least one able-bodied adult person at all times; (b) confined within cleared firebreaks or barriers adequate to prevent it from escaping control; (c) regulated in size at all times to insure proper control by the number of adult persons attending it.
- When the burning operation authorized by this permit is in an incinerator: (a) a minimum clearance of 10 feet from all flammable material must be provided and maintained; (b) all openings must be screened with nonflammable material with holes not larger than 1/4 inch; and (c) must be attended at all times by a responsible person until fire is dead out.
- This permit does not relieve the permittee of any duty to use reasonable and ordinary care to prevent damage to the property of others or injury to persons as prescribed by law.
- Burning shall be confined to hours _____ A.M. to _____ A.M. _____ P.M. to _____ P.M.
- This permit valid during period _____ to _____, 1999.

Other requirements: CLEAR SITE 10 FEET TO BARE SOIL FROM ALL FLAMMABLE MATERIAL, HAVE WATER AND SHOVEL, CHECK SITE FOR ONE-HALF HOUR AFTER WORK HAS BEEN COMPLETED.

SEE REVERSE SIDE FOR FURTHER INFORMATION

FOR INFORMATION CALL: Permit issued 30th day of MAY, 1999.

Burning and Fire Safety _____ DIRECTOR OF FORESTRY

Air Pollution Control _____ By [Signature], Agent

Tina Fire Prevention Spec

IMPORTANT—REVIEW CONDITIONS AND TERMS OF PERMIT

Figure 5-1.
USFS Issued Welding Permit

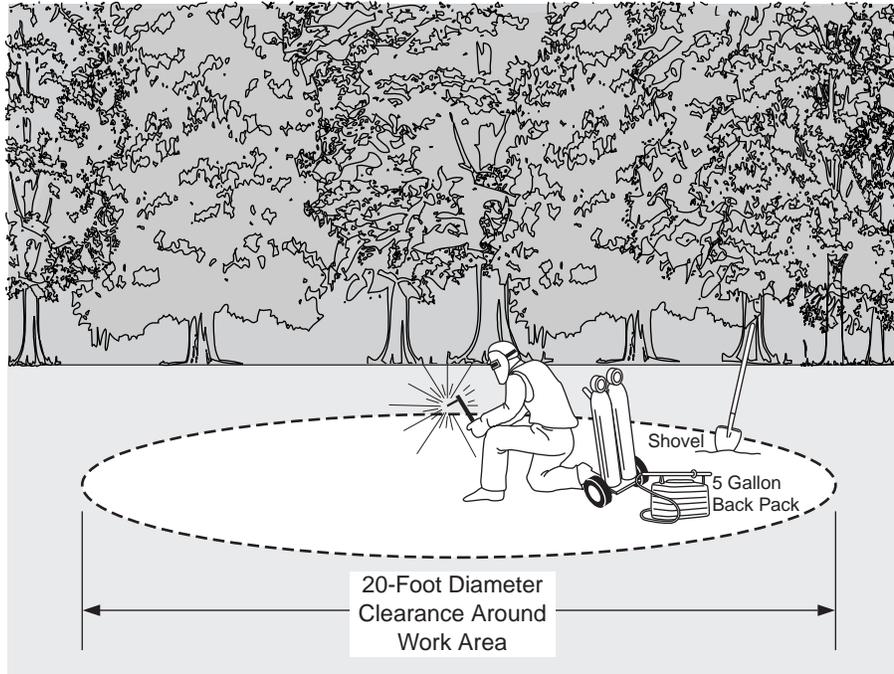


Figure 5-2.
Proper Clearances Around Welding Operation

5.2 Refueling and Lubrication

Whenever possible, refueling and lubrication should be done at properly equipped and cleared shop or yard areas. On logging and many construction operations, this is not reasonably feasible. In these situations, certain precautions should be taken. In the interests of both fire prevention and water pollution control, all drain oil, used oil filters, rags, and other trash should be disposed of by complete removal from the site. These items should be transported to, and deposited in, an appropriate public waste disposal site.

Wheeled or tracked machinery is usually serviced from a truck, which means it will normally be brought to a log landing or other similar cleared area accessible by the service truck. If this is not the case, or if portable equipment (e.g., chain saws or small generators) is being refueled, a clearing to mineral soil for at least a 10-foot radius should be made and the unit to be serviced placed in the center before any fuel transfer takes place. For both fire and personnel safety, all power units should be shutdown and cooled before being serviced. Before restarting, spilled fuel should be wiped off portable units and moved at least 3 feet. The units should then be positioned so that the exhaust points away from the spot where refueling took place.



**Photograph 5-3.
Chain Saw Being Refueled**

Above ground storage of gasoline in quantities in excess of one 55-gallon drum should be avoided. In any event, a clearing of all vegetation and other flammables should be maintained for at least a 15-foot radius from the container and/or pump. Some companies employ a “hotfoot” clearing around fuel storage areas.

Laws, ordinances, or regulations in many places require that a dike of sufficient height and area to retain the entire contents of the tank (in case of rupture or overflow) be constructed around any tank of 500 gallons or larger capacity. Such quantities of fuels should not be stored within 250 feet of a live stream or 50 feet of any vegetation. Fueling hoses should be fitted with automatic closing valves and nozzles to shut off the flow of fuel. This provides safety in case of hose rupture or nozzle dropping.

5.3 Servicing Equipment

The equipment used to supply servicing is subject to the same laws and regulations as the equipment being serviced, and for the same reasons. The exhaust from a pump engine or air compressor engine is just as dangerous as that from a tractor or a truck. Thus, every internal combustion engine from a one horsepower Briggs and Stratton to a 1000 horsepower motor-generator set, must be equipped with a spark arrester. The only exemption is for muffler-equipped engines on trucks, buses and passenger vehicles. All other engines mounted on such vehicles (e.g., to power fire pumps, compressors, generators, etc.), mounted on trailers or skids, or hand portable, must be spark arrester equipped. In addition, if the unit is not mobile or is to be operated in a given location for a time, a clearing of flammable material must be made around it for a radius of at least 10 feet. Firefighting tools must be provided nearby.



**Photograph 5-4.
Generator with Spark Arrester and Clearance**

Service vehicles, including fuel and mechanics' trucks, should be equipped with large (i.e., 20-40 lb.) multipurpose fire extinguishers. The operators of these vehicles should be well trained in the use of extinguishers. Operators are often alone and in remote locations when servicing or repairing machinery. It is therefore important they be capable of quick and effective fire suppression action in case an ignition occurs.



**Photograph 5-5.
Large Fire Extinguisher on Mechanic's Truck**

5.4 Spark Arrester Servicing

Spark arresters are often overlooked or given inadequate attention during servicing of machinery. Every mechanic, operator, and owner knows that the air cleaner on an internal combustion engine must be regularly cleaned or replaced. If it is not, the engine loses power. They are, therefore, conscientious about performing this service. The need for cleaning or emptying the spark arrester is not always apparent. Except in the case of screen-type arresters (usually found only on small multi-position engines), the performance of the engine is not affected. This may cause some operators to disregard routine cleaning. However, when the trap is full (or the screen burned out) the arrester loses its effectiveness causing carbon sparks to be emitted.

Spark arresters should be checked and cleaned often on a regular basis (every 30 days or less). The proper way to do this is to make sure the machine is parked in a cleared fire-safe area. Remove the band or plug, then start the engine and blow out the carbon.



**Photograph 5-6.
Retention Spark Arrester with Band Removed**



**Photograph 5-7.
Retention Spark Arrester with Plug**