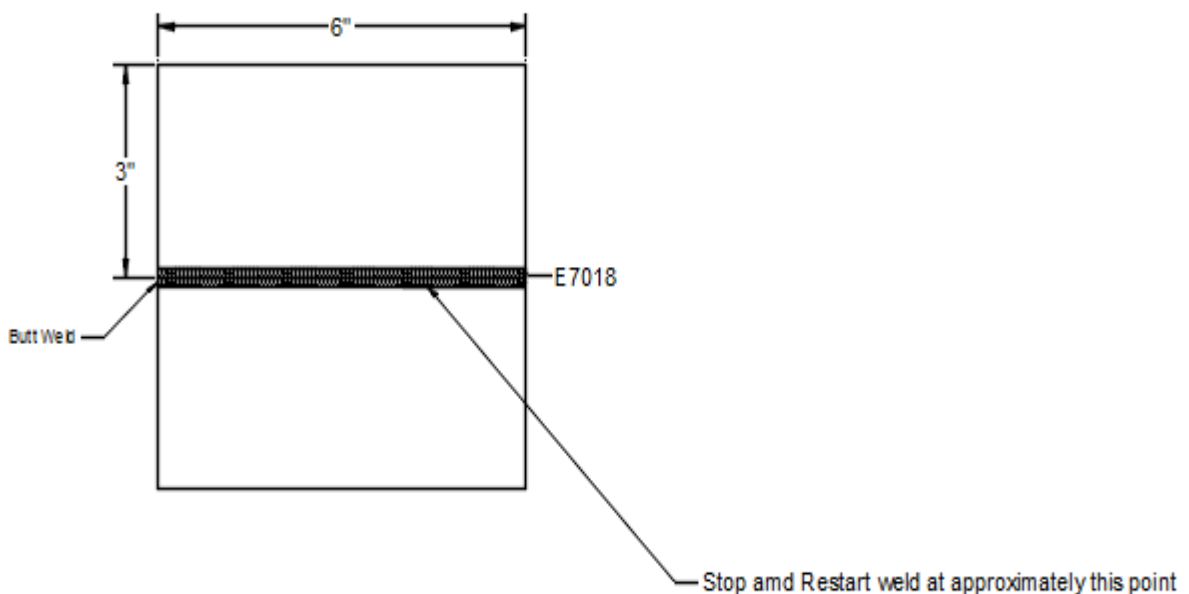


SHEILDED METAL ARC WELDING (SMAW)

AT/AE MECHANICAL CONTEST

1. Position two 3" x 6" x 1/4" steel plates in the flat position for a butt weld. The weld joint should be 6" long.
2. Select to either bevel the metal at the joint or position at the proper distance to obtain the correct penetration.
3. Weld a single pass approximately three fourths of the length of the joint and stop.
4. Restart the weld at the point that it was just stopped to provide a flawless joint.
5. Clean the weld joint and have the judge evaluate. (note the drawing below)
6. There will be a 15 minute time limit for this part.



SHIELDED METAL ARC WELDING
(SMAW)

AT/AE MECHANICAL SKILL CONTEST

(Judges circle rating)

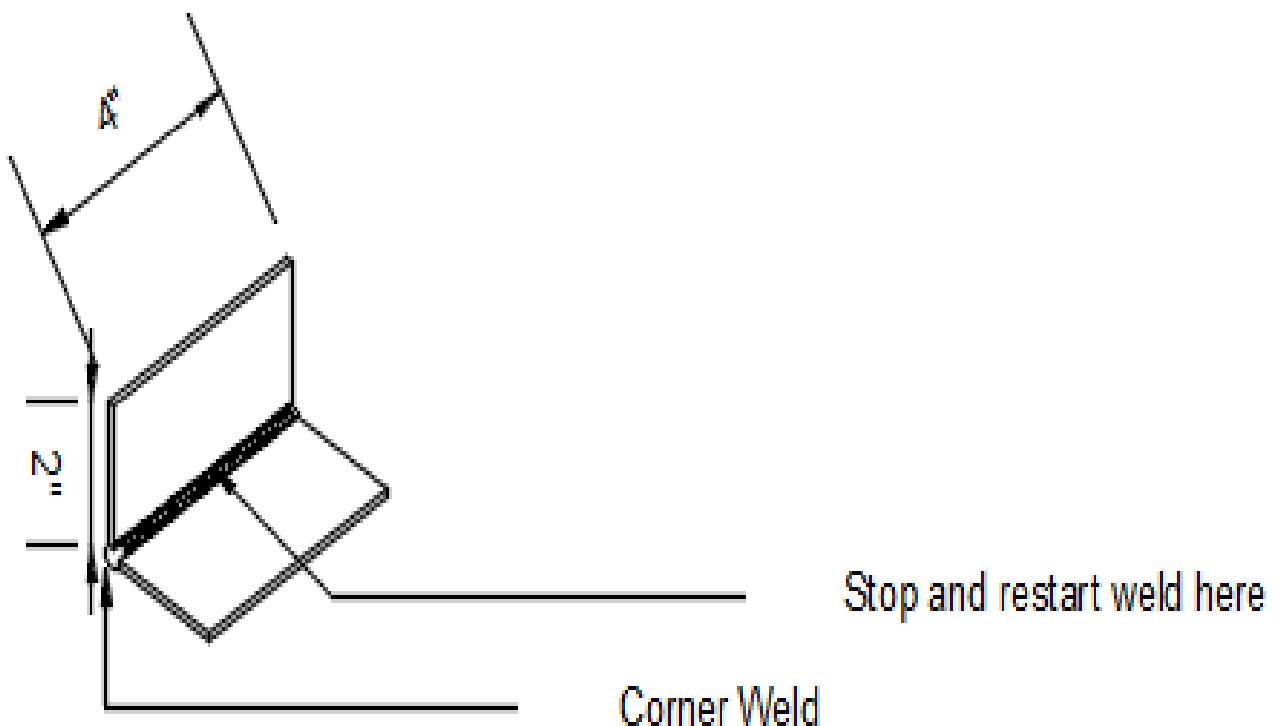
Contestant Number: _____

Category						Comments
Safety:						
Welding Hood	10	8	6	4	2	
Jacket	10	8	6	4	2	
Gloves	10	8	6	4	2	
Welding Process:						
Welding Quality	10	8	6	4	2	
Rod Angle	10	8	6	4	2	
Bead Width/Angle	10	8	6	4	2	
Penetration	10	8	6	4	2	
Straightness	10	8	6	4	2	
No Excess Spatter	10	8	6	4	2	
Stop Puddle	10	8	6	4	2	
Restart Puddle	10	8	6	4	2	
Overall Appearance	10	8	6	4	2	
Following Procedures	10	8	6	4	2	
Column Points						
Total Points						

GAS METAL ARC WELDING
(GMAW)

AT/AE MECHANICAL CONTEST

1. Position two 2" x 4" x 1/8" steel plates so that a corner weld joint can be made.
2. The weld should be in the flat or horizontal position.
3. Weld a single pass one-half the length of the joint and stop.
4. Restart the weld at the point it was stopped to provide a flawless joint.
5. Clean the weld joint and have the judge evaluate. (Note the drawing below)
6. **There will be a 15 minute time limit for this part.**



GAS METAL ARC WELDING

(GMAW)

AT/AE MECHANICAL SKILL CONTEST

(Judges circle rating)

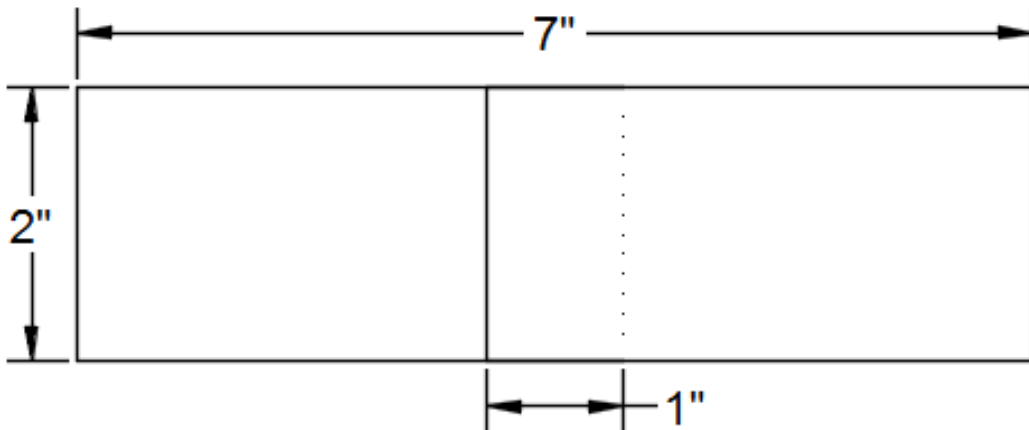
Contestant Number: _____

Category						Comments
Safety:						
Welding Hood	10	8	6	4	2	
Jacket	10	8	6	4	2	
Gloves	10	8	6	4	2	
Welding Process:						
Welding Quality	10	8	6	4	2	
Gun Angle	10	8	6	4	2	
Bead Width/Angle	10	8	6	4	2	
Penetration	10	8	6	4	2	
Straightness	10	8	6	4	2	
Undercut	10	8	6	4	2	
No Excess Spatter	10	8	6	4	2	
Weld Cleaning	10	8	6	4	2	
Overall Appearance	10	8	6	4	2	
Following Procedures	10	8	6	4	2	
Column Points						
Total Points						

OXYACETYLENE BRAZING

AT/AE MECHANICAL CONTEST

1. Position two 2" x 4" x 16ga steel plates so that a 1" overlap joint is created. (Completed plate with dimensions of 2" x 7").
2. Braze both lap joints.
3. Clean the weld joints and have the judge evaluate when completed (Note the drawing below)
4. There will be a 15 minute time limit for this part.



OXYACETYLENE BRAZING

AT/AE MECHANICAL SKILL CONTEST

(Judges circle rating)

Contestant Number: _____

Category						Comments
Safety:						
Welding Hood	10	8	6	4	2	
Jacket	10	8	6	4	2	
Gloves	10	8	6	4	2	
Welding Process:						
Regulator Settings	10	8	6	4	2	
Adjust to Nt. Flame	10	8	6	4	2	
Turn off Procedure	10	8	6	4	2	
Torch Angle	10	8	6	4	2	
Heat Application	10	8	6	4	2	
Proper use of Flux	10	8	6	4	2	
Correct Torch Distance	10	8	6	4	2	
Overall Appearance	10	8	6	4	2	
Following Procedures	10	8	6	4	2	
Column Points						
Total Points						

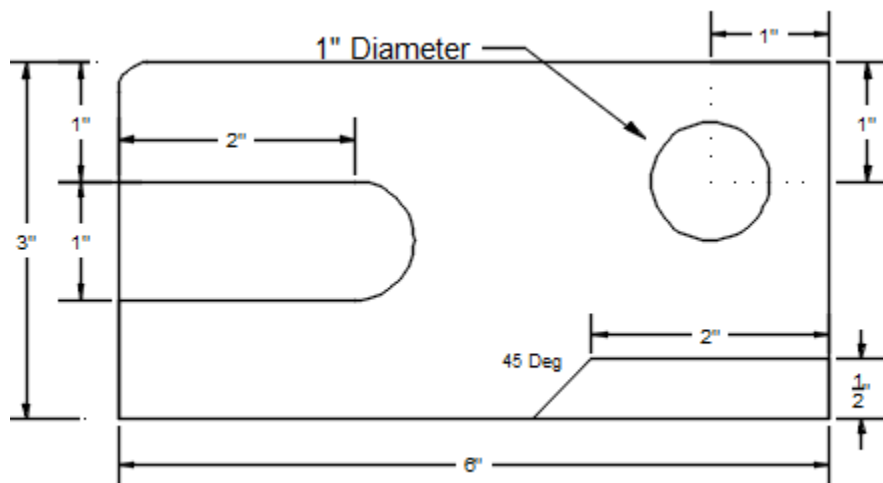
OXYACETYLENE CUTTING
(OFC-A)

AT/AE MECHANICAL CONTEST

PRESSURE SETTINGS:

OXYGEN 25 POUNDS
ACETYLENE 7 POUNDS

1. Mark the 3" x 6" x 1/4" steel project steel plate with soapstone so that a 1" diameter hole can be cut in one corner as indicated in the drawing below.
2. Mark and cut a 1" wide slot 2" deep from the opposite end of the project plate as indicated in the drawing below.
3. Mark and cut a straight line 1/2" from the right bottom corner 2" with a 45 degree angle on the left end, as shown in the drawing below.
4. When finished, adjust working pressure to 0 pounds and bleed lines.
5. 20 minute time limit on this portion.



OXYACETYLENE CUTTING

AT/AE MECHANICAL SKILL CONTEST

(Judges circle rating)

Contestant Number: _____

Category						Comments
Safety:						
Welding Hood	10	8	6	4	2	
Jacket	10	8	6	4	2	
Gloves	10	8	6	4	2	
Welding Process:						
Regulator Settings	10	8	6	4	2	
Adjust to Nt. Flame	10	8	6	4	2	
Turn off Procedure	10	8	6	4	2	
Torch Angle	10	8	6	4	2	
Proper Start	10	8	6	4	2	
Straightness of Cut	10	8	6	4	2	
Correct Torch	10	8	6	4	2	
Overall Appearance	10	8	6	4	2	
Following Procedures	10	8	6	4	2	
Column Points						
Total Points						

THERE WILL BE A 20 MINUTE TIME LIMIT ON THIS PORTION. JUDGES WILL JUDGE THE PROJECT AS IS.

Each contestant must be able to identify the parts of the small engine and be able to give the purpose of each part. The engine parts will be identified on a disassembled engine, not on an assembled engine. The contestant will look at each part and give its name and its purpose to the judge orally*. Each contestant will also take a fill-in-the-blank vocabulary test while in the holding room. There will be a word bank at the top of the test page.

Engine Parts:

Air Cleaner	Exhaust Valve
Armature	Fuel Tank
Camshaft	Flywheel
Carburetor	Flywheel Key
Combustion Chamber	Intake Valve
Connecting Rod	Oil Filter Plug
Crankcase	Piston
Crankshaft	Piston Head
Cylinder	Piston Ring
Cylinder Block	Spark Plug
Cylinder Head	

Each contestant must work independently and without assistance*. Any outside assistance may disqualify the contestant. Contestants will be kept in a holding area until their competition begins.

**Students who communicate through an interpreter may use their interpreter during the oral testing. Students who require reading assistance may request to have the test read to them.*

Small Engine Parts Identification

Information Sheet



Air Cleaner: a device that filters the air that is mixed with the fuel in the engine.



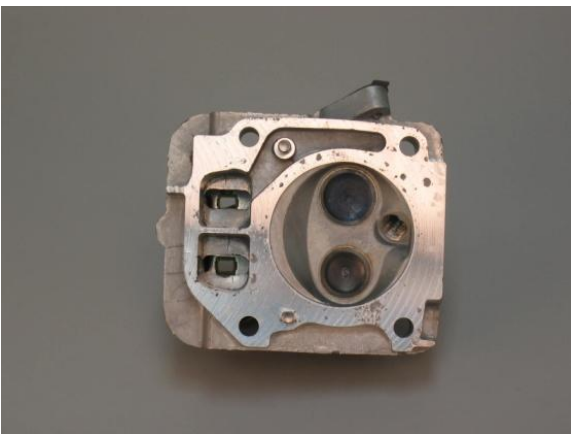
Armature: a part consisting of coils of wire around an iron core that induces an electric current when it is rotated in a magnetic field.



Camshaft: the shaft containing lobes or cams which rotate to raise and lower the valves.



Carburetor: a device for automatically mixing fuel in the proper proportion with air to produce a combustible gas.



Combustion Chamber: the volume of the cylinder above the piston with the piston at top dead center.



Connecting Rod: a rod that connects the piston to the crankshaft.



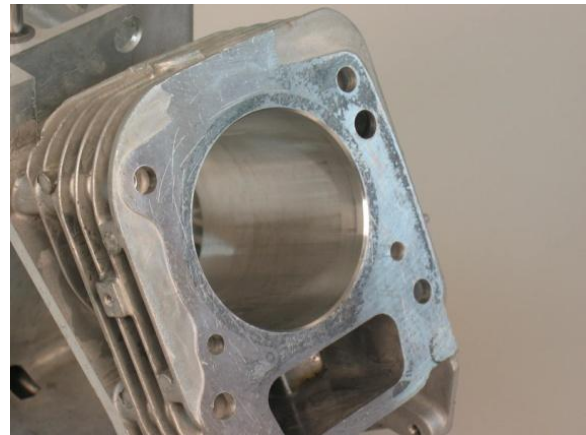
Crankcase: the housing where the crankshaft and many other parts of the engine operate.



Crankshaft: the main shaft of the engine which, in conjunction with the connecting rod, changes the reciprocating motion of the piston into rotary motion.



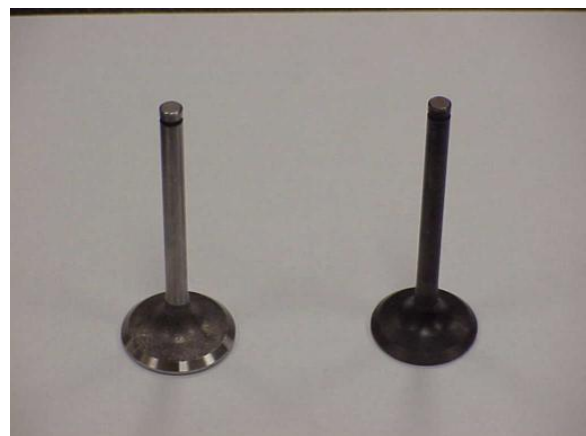
Cylinder: a round hole having some depth bored to receive a piston. Sometimes referred to as a bore or barrel.



Cylinder Block: the largest single part of an engine; the main mass of metal where the cylinders are bored or placed.



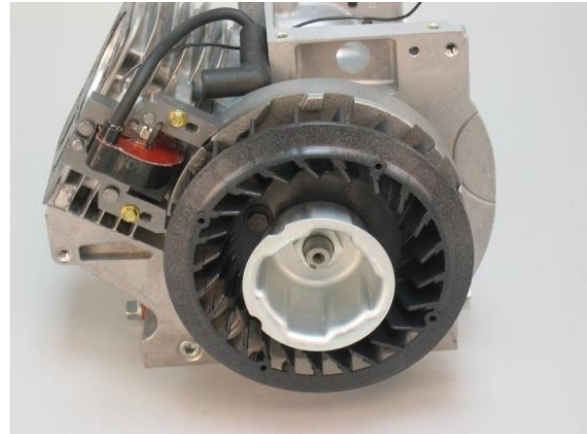
Cylinder Head: a detachable portion of an engine fastened securely to the cylinder block that contains all or part of the combustion chamber.



Exhaust Valve: a valve that permits the remains of the burned fuel to leave the combustion chamber.



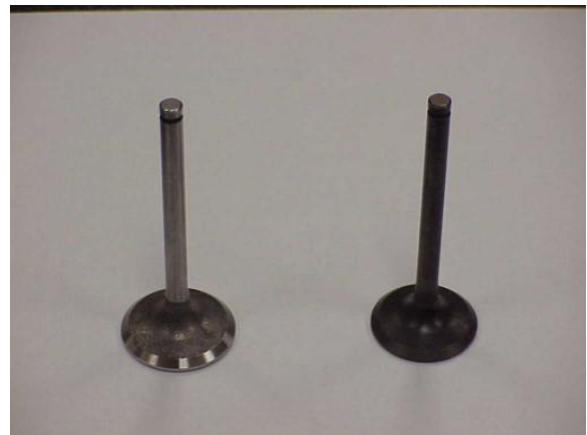
Fuel Tank: the device which contains the fuel to be burned in the engine.



Flywheel: a heavy wheel that maintains the speed of the engine while it is running.



Flywheel Key: a device that holds the flywheel in place.



Intake Valve: a valve that permits the air- fuel mixture to enter the combustion chamber and seals its exit.



Oil Filler Plug: the device that closes the opening where the crankcase is filled with oil.



Piston: a cylindrical part closed at one end that is connected to the crankshaft by the connecting rod.



Piston Head: the part of the piston above the rings.



Piston Rings: expanding rings placed in the grooves of the piston to create a seal that prevents the passage of fluid or gas past the piston.



Spark Plug: a device inserted into the combustion chamber of an engine that contains an insulated control electrode for conducting current.

Contestant # _____

Small Engine Parts Identification

ID and Purpose

Parts	Identification						Definition						Total
Fuel Tank	10	8	6	4	2	0	10	8	6	4	2	0	
Spark Plug	10	8	6	4	2	0	10	8	6	4	2	0	
Cylinder Block	10	8	6	4	2	0	10	8	6	4	2	0	
Armature	10	8	6	4	2	0	10	8	6	4	2	0	
Air Cleaner	10	8	6	4	2	0	10	8	6	4	2	0	
Crankshaft	10	8	6	4	2	0	10	8	6	4	2	0	
Intake Valve	10	8	6	4	2	0	10	8	6	4	2	0	
Piston Head	10	8	6	4	2	0	10	8	6	4	2	0	
Piston Ring	10	8	6	4	2	0	10	8	6	4	2	0	
Connecting Rod	10	8	6	4	2	0	10	8	6	4	2	0	
Piston	10	8	6	4	2	0	10	8	6	4	2	0	
Camshaft	10	8	6	4	2	0	10	8	6	4	2	0	
Cylinder Head	10	8	6	4	2	0	10	8	6	4	2	0	
Exhaust Valve	10	8	6	4	2	0	10	8	6	4	2	0	
Flywheel	10	8	6	4	2	0	10	8	6	4	2	0	
Flywheel Key	10	8	6	4	2	0	10	8	6	4	2	0	
Crankcase	10	8	6	4	2	0	10	8	6	4	2	0	
Oil Filler Plug	10	8	6	4	2	0	10	8	6	4	2	0	
Carburetor	10	8	6	4	2	0	10	8	6	4	2	0	
Cylinder	10	8	6	4	2	0	10	8	6	4	2	0	
Combustion Chamber	10	8	6	4	2	0	10	8	6	4	2	0	
Total Score (420 points possible)													