AT/AE MECHANICAL CONTEST

SHIELDED METAL ARC WELDING
(SMAW)

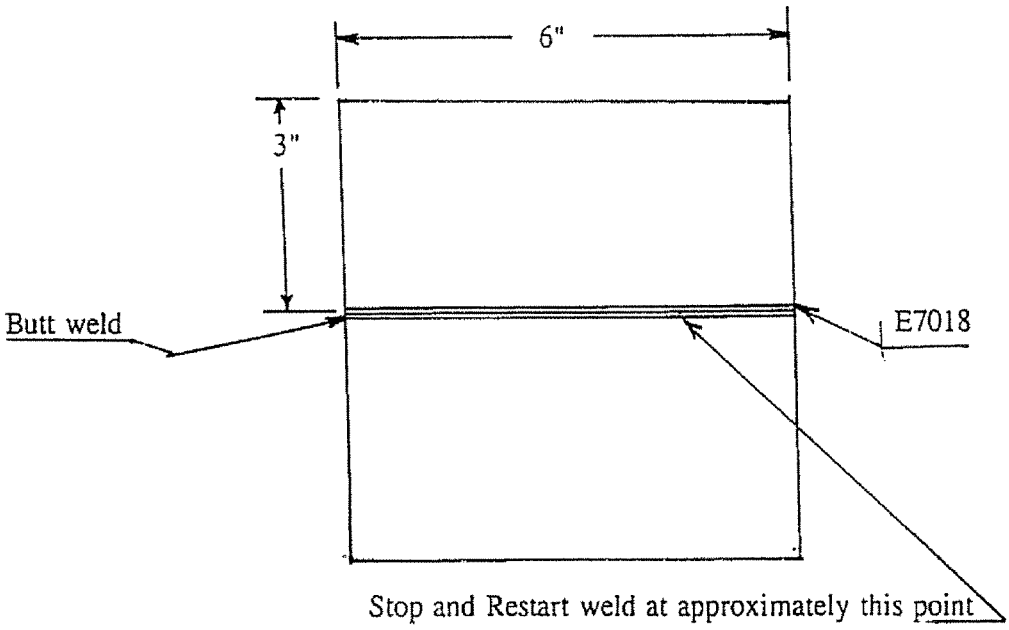
1. Position two 3"X 6"X 1/4" steel plates in the flat position for a butt weld. The weld weld joint should be 6" long.

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 provided a flawless joint.

5. Clean the weld joint and have the judge to evaluate. (note the drawing below)



SHIELDED METAL ARC WELDING
(SMAW)

AT/AE MECHANICAL SKILL CONTEST

(Judges circle rating) Contestant Number_____

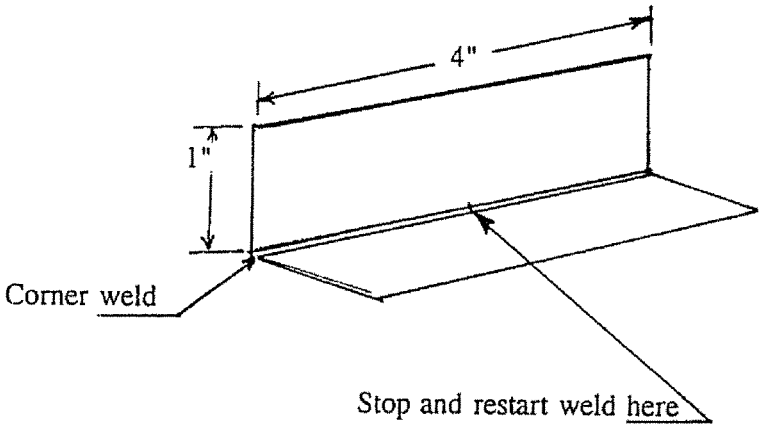
CATEGORY						COMMENTS
Safety:						
Welding Hood	10	8	6	4	2	
Jacket	10	8	6	4	2	
Gloves	10	8	6	4	2	
Welding Process:						
Welding Quality	10	8	6	4	2	
Rod Angle	10	8	6	4	2	
Bead Width/Angle	10	8	6	4	2	
Penetration	10	8	6	4	2	
Straightness	10	8	6	4	2	
No Excess Spatter	10	8	6	4	2	
Stop Puddle	10	8	6	4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

code: < B74 > C:\WP\SMAW MECH

AT/AE MECHANICAL CONTEST

GAS METAL ARC WELDING
(GMAW)

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 at the point it was stopped to provide a flawless joint.
5. Clean the weld joint and have the judge to evaluate. (Note the drawing below)



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:						
Weld Quality	10	8	6	4	2	
Gun Angle	10	8	6	4	2	
Bead Width/Height	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						
Column Points						
TOTAL POINTS						

code: <B74> C:\WP\GMAW.MEC

AT/AE MECHANICAL CONTEST

OXYACETYLENE BRAZING

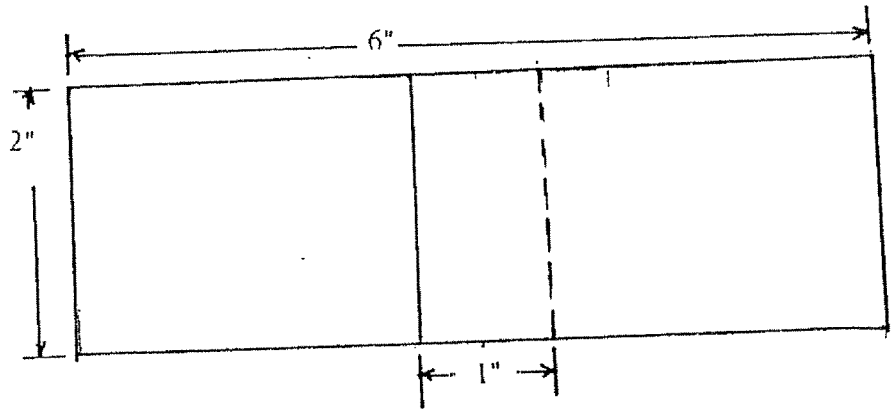
1. Position two 2" X 4" X 18ga. steel plates so that a 1" overlap joint is created a completed plate with dimensions of 2" X 6".

2. Braze both lap joints.

3. Clean the weld joints and have the judge evaluate when completed.

(Note the drawing below)

Braze lap joint



0XYACETYLENE 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 Dist.	10	8	6	4	2	
Overall Appearance	10	8	6	4	2	
Following Procedures	10	8	6	4	2	
Column Points						
TOTAL POINTS						

code: <B74> C:\WP\MECH.BRZ

AT/AE MECHANICAL CONTEST

OXYACETYLENE CUTTING

(OFC-A)

PRESSURE SETTINGS:

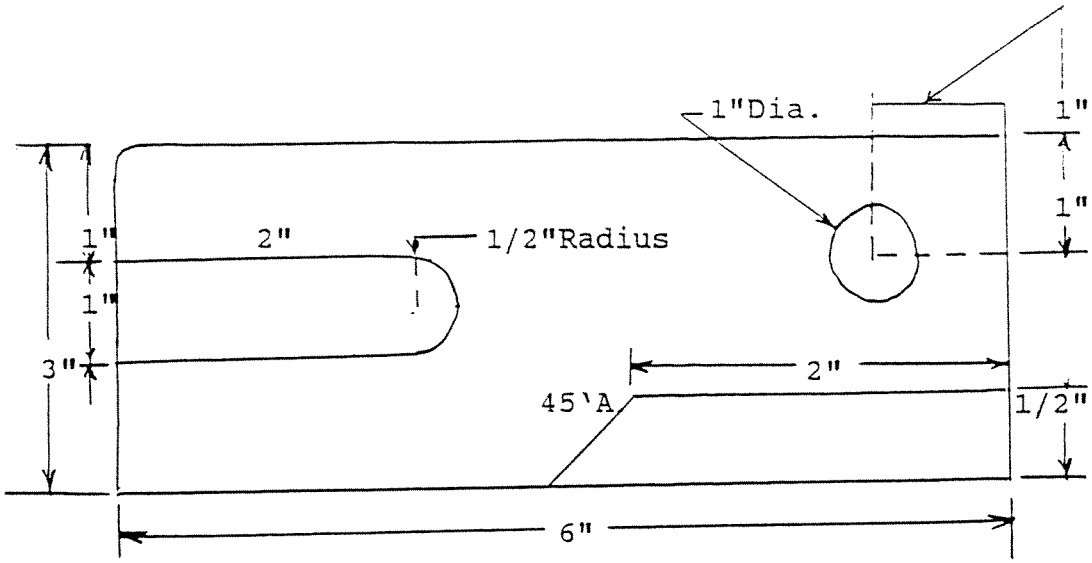
Oxygen	25 pounds
Acetylene	7 pounds

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.



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0XYACETYLENE 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						

code: < B74 > C:\WP\MECH.OCW

TOOL DESCRIPTIONS

revised _____

Open End Wrench - a wrench with two open ends

Box End Wrench - a high torque wrench with two closed ends

Combination Wrench - a wrench with both open and closed ends

Ratchet - a wrench with ratchet movement, used with a socket

Allen Wrench – a tool used to tighten/loosen allen screws

Pipe Wrench - has adjustable jaw that tightens to hold tight when torque is applied to handle

Combination Slip Joint Pliers - Pliers with a joint adjustable to multiple positions in order to increase the opening of the jaws

Linemen's Pliers - pliers used to do electrical work

Diagonal Cutters - cutters used as side cutters to cut wire

Needle Nose Pliers - pliers that come to a point

Curved Claw Hammer - hammer used to do construction work

Sledge Hammer - a heavy weight hammer with a long handle used for hitting objects

Ball-Peen Hammer - a hammer with a round point on one end and a flat head on the other end

Rubber Mallet - a light soft faced hammer that does not dent objects when struck

Cold Chisel - a chisel, which has a flat tip and used to notch and move stuck bolts

Round Chisel - a chisel with a round tip

Flat Blade Screwdriver - a screwdriver with a flat tip

Phillips Screwdriver - a screwdriver that has a head that ridges intersect like an X

Offset Screwdriver - a screwdriver with screw heads offset 90 degrees from each other and is used to remove or replace screws in tight areas

Power Drill - used with a drill bit to drill holes

Hacksaw - saw used to cut metal or plastic

Bolt Cutters - used to cut bolts

Tin Snips - used to cut thin sheet metal

Round Punch - A punch used to reduce a hammers force to a small area

Pin Punch - used to drive out small objects, cotter keys and key locks

Center Punch - used to mark metal or plastic for drilling

Flat File - use to sharpen blades

Half Round File - used to remove metal burrs from inside large round objects

Triangular File - use to remove metal burrs from L shaped objects

Round File - used to remove metal burrs from small round objects

Machinist Vice - light weight vice for general shop use

General Utility Vice - heavy weight vice for heavy shop work

Outside Caliper - used to measure outside diameter of an object

Inside Caliper - used to measure inside diameter of an object

Micrometer - precise measurement device often found in machine shops and used for measuring the outside of objects

Feeler Gauge - used for setting air gaps on various objects such as spark plugs

Metal Framing Square - measurement device often used in construction for cutting straight lines and 90 degree angles

Steel Tape Measure - most frequently used as a measuring device and measuring tape is coiled inside a small case

Combination Square - an adjustable square with grooved 12-inch metal rule

Wood Clamp - clamp used to hold pieces of wood in place

Utility Knife - a common tool used in various trades and crafts for a variety of cutting purposes

Drill Bit - detachable cutting tool used to cut circular holes; the cutting end of a drill

Bar Clamp - designed for spanning wide work. It has a metal bar with screw clamps and an adjustable stop mounted on the bar.

Locking Pliers - pliers that can be locked in place

Adjustable Wrench - wrench that is adjustable to different sized nuts and bolts

Socket - Receptacle used to tighten or loosen hex shaped fasteners to be used with a ratchet or other square- drive device

Flat Nail Bar - A flat hand bar of steel with a slightly bent, wedge-shaped end, which is sometimes forked. Used as a pry or lever.

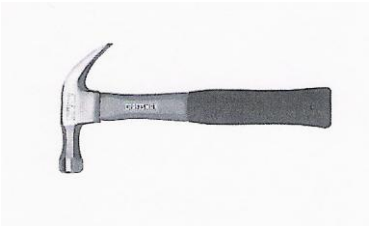
Slip-joint Pliers - Pliers with a joint adjustable to two positions in order to increase the opening of the jaws

Wire Brush – Tool with wood or plastic handle used for cleaning rust, scale, corrosion and dirt from metal and tools.

C-Clamp – A C shaped clamping device typically used to hold a wood or metal work piece

Tool Identification

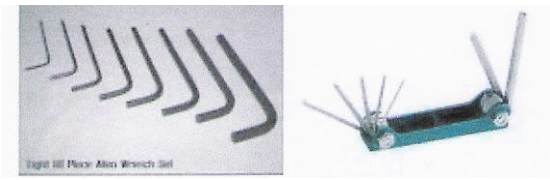
Sledge Hammer



Curved Claw Hammer

Ball Pen Hammer

Rubber Mallet



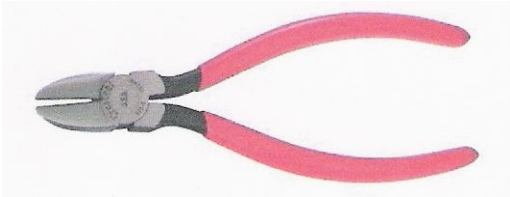
Hex Allen Wrench

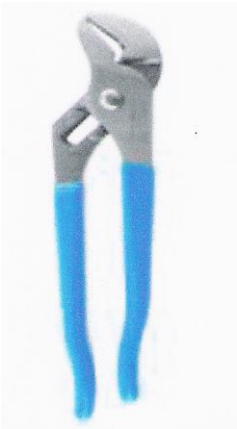
Combination Wrench

Open End Wrench

Adjustable Wrench **Box End Wrench**

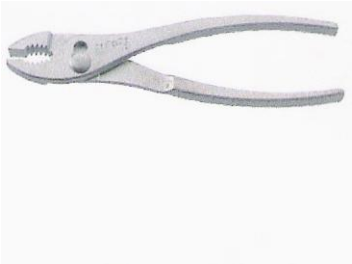
Socket **Ratchet** **Pipe Wrench**





Diagonal Cut Pliers **Combination Slip-Joint Pliers**

Slip Joint Pliers



Needle Nose Pliers

Locking Pliers

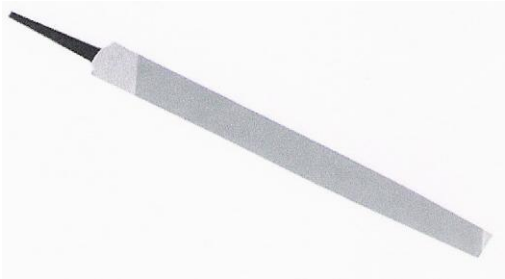
Lineman's Pliers

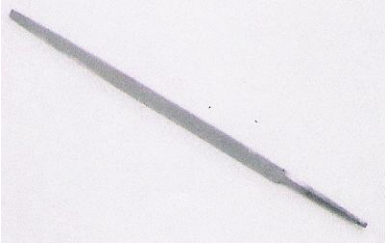
Bolt Cutter

Tin Snips

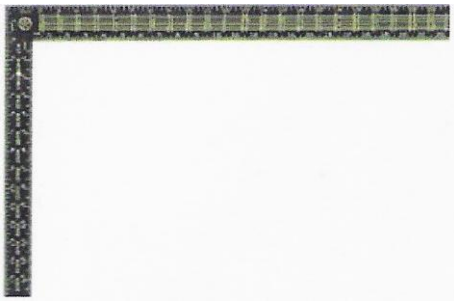
Offset Screwdriver **Phillips Screwdriver** **Flat Blade Screwdriver**

Round File **Half Round File**



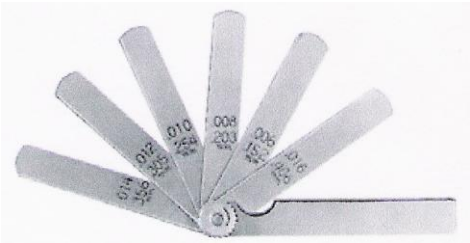


Flat File **Triangular File**

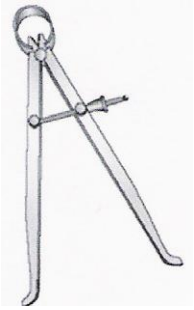


Micrometer **Combination Square** **Metal Framing Square**

Steel Tape Measure



Feeler Gauge



Outside Caliper

Inside Caliper

Round Nose Chisel

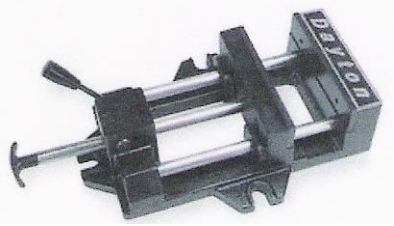
Cold Chisel

Center Punch

Pin Punch

Round Punch

General Utility Vise



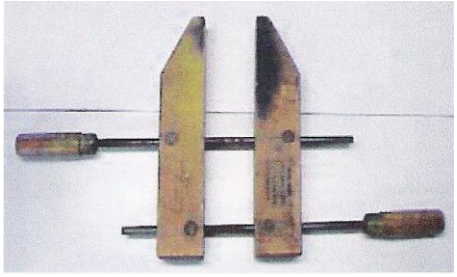
Machinist's Vise

Wire Brush

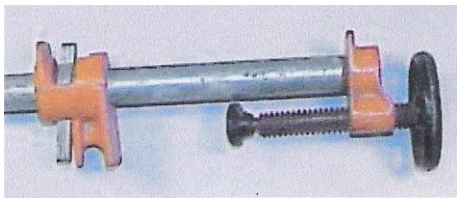
Hacksaw

Power Drill

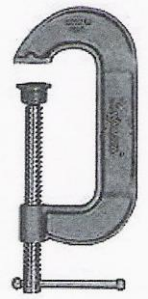
Drill Bit



Wood Clamp



Bar Clamp



C-Clamp

Flat Nail Bar

Utility Knife

CONTEST MATERAIL LIST- TOOL IDENTIFICATION CONTEST

2	6x6 Blocks of Wood
1	3/8 Hex Bolt
2	3/8 Flat Washer
1	3/8 Lock Washer
1	3/8 Nut

TOOLS NEEDED

Wood Clamp
7/16 Drill Bit
Tape Measure
Framing Square
9/16 Box End Wrench
9/16 Socket and Ratchet

Contest host will include 10 additional tools that would not be used to complete the task.

Tool Identification Contest
Rating Sheet

Contestant No._____

#1	Tool Name	Yes	No	Comments
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
	Tool Name Score 50 Possible/5 per tool	Total Score #1_____		

#2	Tool Retrieval	Yes	No	Comments
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
	Tool Retrieval Score 50 Possible/5 per tool	Total Score #2_____		

Skill Demonstration

		10 pts	8 pts	6 pts	4 pts	2 pts	0 pts
1	**Safety**	**Wears safety glasses**					**Has to be reminded**
2	**Tool Selection** 7/16 drill bit & Cordless/electric drill, wood clamp or vise, tape measure or framing square, 9/16 box end wrench, ratchet and 9/16 socket	**Chooses 5 correct tools**	**Chooses 4 correctly**	**Chooses 3 correctly**	**Chooses 2 correctly**	**Chooses 1 correctly**	**Chooses 0 correct tools**
3	**Hole Placement** Uses corner to corner technique or measures twice in both directions to find center	**Located Center**					**Off center**
4	**Correct use of tools**	**Uses all tools correctly**	**Uses 4 correctly**	**Uses 3 correctly**	**Uses 2 correctly**	**Uses 1 correctly**	**Uses none correctly**
5	**Correct order of Fasteners** Bolt, flat washer (through wood), flat washer, lock washer, and nut	**Correct order**	**4 in correct order**	**3 in correct order**	**2 in correct order**	**1 in correct order**	**0 In correct order**
	Skill Demonstration Score (50 Possible)			**Total Score #3_____**			

Time Started _____ Time Finished _____

*******Time will be a factor if there is a tie*******

#1 Tool Name Score (50 Possible) _____

#2 Tool Retrieval Score (50 Possible) _____

#3 Skill Demonstration Score (50 Possible) _____

#4 Vocabulary Test Score (100 Possible) _____

Student Resume' yes 0 points / no -12 points _____

JUDGES' FINAL SCORE (250 POSSIBLE) _____

Tool Identification

Contestant No._____

1. A wrench with two open ends.

    a. Box End Wrench
    b. Combination Wrench
    c. Hex Allen Wrench
    d. Open End Wrench

2. A high torque wrench with two closed ends.

    a. Box End Wrench
    b. Combination Wrench
    c. Hex Allen Wrench
    d. Open End Wrench

3. A wrench with both open and closed ends.

    a. Box End Wrench
    b. Combination Wrench
    c. Hex Allen Wrench
    d. Open End Wrench

4. A wrench with ratchet movement, used with a socket.

    a. Adjustable Wrench
    b. Hex Allen Wrench
    c. Pipe Wrench
    d. Ratchet Wrench

5. A tool used to tighten/loosen Allen screws.

    a. Box End Wrench
    b. Combination Wrench
    c. Hex Allen Wrench
    d. Open End Wrench

6. A tool that has an adjustable jaw that tightens to hold tight when torque is applied to handle.

    a. Adjustable Wrench
    b. Hex Allen Wrench
    c. Pipe Wrench
    d. Ratchet Wrench

7. Pliers commonly used for turning and holding nuts and bolts, with a joint adjustable to multiple positions in order to increase the opening of the jaws.

a. Diagonal Cut Pliers
b. Lineman's Pliers
c. Needle Nose Pliers
d. Combination Slip Joint Pliers

8. Pliers used to do electrical work.

a. Diagonal Cut Pliers
b. Lineman's Pliers
c. Needle Nose Pliers
d. Slip Joint Pliers

9. Cutters used as side cutters to cut wire.

a. Diagonal Cut Pliers
b. Lineman's Pliers
c. Needle Nose Pliers
d. Slip Joint Pliers

10. Pliers that come to a point.

a. Diagonal Cut Pliers
b. Lineman's Pliers
c. Needle Nose Pliers
d. Slip Joint Pliers

11. A hammer used to do construction work.

a. Ball Peen Hammer
b. Curved Claw Hammer
c. Shop Hammer
d. Sledge Hammer

12. A heavy weight hammer with a long handle used for hitting objects.

a. Ball Peen Hammer
b. Curved Claw Hammer
c. Shop Hammer
d. Sledge Hammer

13. A hammer with a round point on one end and a flat head on the other end.

a. Ball Peen Hammer
b. Curved Claw Hammer
c. Shop Hammer
d. Sledge Hammer

14. Clamp for spanning wide work. It has a metal bar with screw clamps and an adjustable stop mounted on the bar.

a. Bar Clamp
b. Flat Nail Bar
c. Utility Knife
d. Wood Clamp

15. A light hammer that does not dent objects when struck.

a. Ball Peen Hammer
b. Curved Claw Hammer
c. Shop Hammer
d. Sledge Hammer

16. A chisel, which has a flat tip used to notch and move stuck bolts.

a. Cold Chisel
b. Flat Nail Bar
c. Round Nose Chisel
d. Round Punch

17. A chisel with a round tip.

a. Cold Chisel
b. Flat Nail Bar
c. Round Nose Chisel
d. Round Punch

18. Pliers that can be locked in place.

a. Diagonal Cut Pliers
b. Locking Pliers
c. Needle Nose Pliers
d. Slip Joint Pliers

19. Wrench that is adjustable to different sized nuts and bolts.

a. Adjustable Wrench
b. Hex Allen Wrench
c. Pipe Wrench
d. Ratchet Wrench

20. A screwdriver with a flat tip.

    a. Drill Bit
    b. Flat Blade Screwdriver
    c. Offset Screwdriver
    d. Phillips Screwdriver

21. A screwdriver that has a head with ridges that intersect like an X.

    a. Drill Bit
    b. Flat Blade Screwdriver
    c. Offset Screwdriver
    d. Phillips Screwdriver

22. A screwdriver with screw heads offset 90 degrees from each used to remove or replace screws in tight areas.

    a. Drill Bit
    b. Flat Blade Screwdriver
    c. Offset Screwdriver
    d. Phillips Screwdriver

23. Used with a drill bit to drill holes.

    a. General Utility Vise
    b. Hacksaw
    c. Machinist Vise
    d. Power Drill

24. A tool used to cut metal or plastic.

    a. General Utility Vise
    b. Hacksaw
    c. Machinist Vise
    d. Power Drill

25. Used to cut bolts.

    a. Bolt Cutter
    b. Diagonal Cut Pliers
    c. Machinist Vise
    d. Tin Snips

26. Used to cut thin sheet metal.

    a. Bolt Cutter
    b. Diagonal Cut Pliers
    c. Machinist Vise
    d. Tin Snips

27. Reduces hammer force to a small area.

a. Center Punch
b. Drill Bit
c. Pin Punch
d. Round Punch

28. Used to drive out small objects, cotter keys, and key locks.

a. Center Punch
b. Drill Bit
c. Pin Punch
d. Round Punch

29. Used to mark metal or plastic for drilling.

a. Center Punch
b. Drill Bit
c. Pin Punch
d. Round Punch

30. Used to sharpen blades.

a. Flat File
b. Half Round File
c. Round File
d. Triangular File

31. Used to remove metal burrs from inside large round objects.

a. Flat File
b. Half Round File
c. Round File
d. Triangular File

32. Used to remove metal burrs from L shaped objects.

a. Flat File
b. Half Round File
c. Round File
d. Triangular File

33. Used to remove metal burrs from inside small round objects.

a. Flat File
b. Half Round File
c. Round File
d. Triangular File

34. A lightweight vise for general shop use.

a. General Utility Vise
b. Hacksaw
c. Machinist Vise
d. Power Drill

35. A heavy weight vise for heavy shop work.

a. General Utility Vise
b. Hacksaw
c. Machinist Vise
d. Power Drill

36. Used to measure outside diameter of an object.

a. Feeler Gauge
b. Inside Caliper
c. Outside Caliper
d. Steel Tape Measure

37. Used to measure inside diameter of an object.

a. Feeler Gauge
b. Inside Caliper
c. Outside Caliper
d. Steel Tape Measure

38. Precise measurement device often found in machine shops and used for measuring to 1000th of an inch.

a. Feeler Gauge
b. Micrometer
c. Outside Caliper
d. Steel Tape Measure

39. Used for setting air gaps on various objects such as spark plugs.

a. Feeler Gauge
b. Micrometer
c. Outside Caliper
d. Steel Tape Measure

40. Measurement device often used in construction for marking straight lines and 90-degree angles.

a. Framing Square
b. Inside Caliper
c. Outside Caliper
d. Steel Tape Measure

41. Most frequently used measuring device. Measuring tape is coiled inside a small case.

a. Framing Square
b. Inside Caliper
c. Outside Caliper
d. Steel Tape Measure

42. An adjustable square with grooved 12-inch metal rule.

a. Combination Square
b. Framing Square
c. Outside Caliper
d. Steel Tape Measure

43. Receptacle used to tighten or loosen hex shaped fasteners to be used with a ratchet or other square-drive device.

a. Adjustable Wrench
b. Drill Bit
c. Pipe Wrench
d. Socket

44. A clamp used to hold pieces of wood in place.

a. Flat Nail Bar
b. Utility Knife
c. Wire Brush
d. Wood Clamp

45. A detachable cutting tool used to cut circular holes; the cutting end of a drill.

a. Center Punch
b. Drill Bit
c. Pin Punch
d. Round Punch

46. A flat hand bar of steel with a slightly bent wedge-shaped end, which is sometimes forked, used as a pry bar or lever.

a. C-Clamp
b. Flat Nail Bar
c. Utility Knife
d. Wood Clamp

47. Pliers with a joint adjustable to two positions in order to increase the opening of the jaws.

a. Diagonal Cut Pliers
b. Lineman's Pliers
c. Needle Nose Pliers
d. Slip Joint Pliers

48. A tool with a wood or plastic handle and steel wire bristles used for cleaning rust and removing paint.

a. Flat Nail Bar
b. Utility Knife
c. Wire Brush
d. Wood Clamp

49. C-shaped clamping device typically used to hold a wood or metal work piece.

a. C-Clamp
b. Flat Nail Bar
c. Utility Knife
d. Wood Clamp

50. A cutting tool used in various trades and crafts for a variety of purposes.

a. Flat Nail Bar
b. Utility Knife
c. Wire Brush
d. Wood Clamp

Tool Identification

Key

1. A wrench with two open ends.

    a. Box End Wrench
    b. Combination Wrench
    c. Hex Allen Wrench
    d. Open End Wrench

2. A high torque wrench with two closed ends.

    a. Box End Wrench
    b. Combination Wrench
    c. Hex Allen Wrench
    d. Open End Wrench

3. A wrench with both open and closed ends.

    a. Box End Wrench
    b. Combination Wrench
    c. Hex Allen Wrench
    d. Open End Wrench

4. A wrench with ratchet movement, used with a socket.

    a. Adjustable Wrench
    b. Hex Allen Wrench
    c. Pipe Wrench
    d. Ratchet Wrench

5. A tool used to tighten/loosen Allen screws.

    a. Box End Wrench
    b. Combination Wrench
    c. Hex Allen Wrench
    d. Open End Wrench

6. A tool that has an adjustable jaw that tightens to hold tight when torque is applied to handle.

    a. Adjustable Wrench
    b. Hex Allen Wrench
    c. Pipe Wrench
    d. Ratchet Wrench

7. Pliers commonly used for turning and holding nuts and bolts, with a joint adjustable to multiple positions in order to increase the opening of the jaws.

a. Diagonal Cut Pliers
b. Lineman's Pliers
c. Needle Nose Pliers
d. Combination Slip Joint Pliers

8. Pliers used to do electrical work.

a. Diagonal Cut Pliers
b. Lineman's Pliers
c. Needle Nose Pliers
d. Slip Joint Pliers

9. Cutters used as side cutters to cut wire.

a. Diagonal Cut Pliers
b. Lineman's Pliers
c. Needle Nose Pliers
d. Slip Joint Pliers

10. Pliers that come to a point.

a. Diagonal Cut Pliers
b. Lineman's Pliers
c. Needle Nose Pliers
d. Slip Joint Pliers

11. A hammer used to do construction work.

a. Ball Peen Hammer
b. Curved Claw Hammer
c. Shop Hammer
d. Sledge Hammer

12. A heavy weight hammer with a long handle used for hitting objects.

a. Ball Peen Hammer
b. Curved Claw Hammer
c. Shop Hammer
d. Sledge Hammer

13. A hammer with a round point on one end and a flat head on the other end.

a. Ball Peen Hammer
b. Curved Claw Hammer
c. Shop Hammer
d. Sledge Hammer

14. Clamp for spanning wide work. It has a metal bar with screw clamps and an adjustable stop mounted on the bar.

a. Bar Clamp
b. Flat Nail Bar
c. Utility Knife
d. Wood Clamp

15. A light hammer that does not dent objects when struck.

a. Ball Peen Hammer
b. Curved Claw Hammer
c. Rubber Mallet
d. Sledge Hammer

16. A chisel, which has a flat tip used to notch and move stuck bolts.

a. Cold Chisel
b. Flat Nail Bar
c. Round Nose Chisel
d. Round Punch

17. A chisel with a round tip.

a. Cold Chisel
b. Flat Nail Bar
c. Round Nose Chisel
d. Round Punch

18. Pliers that can be locked in place.

a. Diagonal Cut Pliers
b. Locking Pliers
c. Needle Nose Pliers
d. Slip Joint Pliers

19. Wrench that is adjustable to different sized nuts and bolts.

a. Adjustable Wrench
b. Hex Allen Wrench
c. Pipe Wrench
d. Ratchet Wrench

20. A screwdriver with a flat tip.

a. Drill Bit
b. Flat Blade Screwdriver
c. Offset Screwdriver
d. Phillips Screwdriver

21. A screwdriver that has a head with ridges that intersect like an X.

a. Drill Bit
b. Flat Blade Screwdriver
c. Offset Screwdriver
d. Phillips Screwdriver

22. A screwdriver with screw heads offset 90 degrees from each used to remove or replace screws in tight areas.

a. Drill Bit
b. Flat Blade Screwdriver
c. Offset Screwdriver
d. Phillips Screwdriver

23. Used with a drill bit to drill holes.

a. General Utility Vise
b. Hacksaw
c. Machinist Vise
d. Power Drill

24. A tool used to cut metal or plastic.

a. General Utility Vise
b. Hacksaw
c. Machinist Vise
d. Power Drill

25. Used to cut bolts.

a. Bolt Cutter
b. Diagonal Cut Pliers
c. Machinist Vise
d. Tin Snips

26. Used to cut thin sheet metal.

a. Bolt Cutter
b. Diagonal Cut Pliers
c. Machinist Vise
d. Tin Snips

27. Reduces hammer force to a small area.

a. Center Punch
b. Drill Bit
c. Pin Punch
d. Round Punch

28. Used to drive out small objects, cotter keys, and key locks.

a. Center Punch
b. Drill Bit
c. Pin Punch
d. Round Punch

29. Used to mark metal or plastic for drilling.

a. Center Punch
b. Drill Bit
c. Pin Punch
d. Round Punch

30. Used to sharpen blades.

a. Flat File
b. Half Round File
c. Round File
d. Triangular File

31. Used to remove metal burrs from inside large round objects.

a. Flat File
b. Half Round File
c. Round File
d. Triangular File

32. Used to remove metal burrs from L shaped objects.

a. Flat File
b. Half Round File
c. Round File
d. Triangular File

33. Used to remove metal burrs from inside small round objects.

a. Flat File
b. Half Round File
c. Round File
d. Triangular File

34. A lightweight vise for general shop use.

a. General Utility Vise
b. Hacksaw
c. Machinist Vise
d. Power Drill

35. A heavy weight vise for heavy shop work.

a. General Utility Vise
b. Hacksaw
c. Machinist Vise
d. Power Drill

36. Used to measure outside diameter of an object.

a. Feeler Gauge
b. Inside Caliper
c. Outside Caliper
d. Steel Tape Measure

37. Used to measure inside diameter of an object.

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