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BARCO GASOLINE HAMMERS AND DRILLERS

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1. GENERAL

1.01 The Barco gasoline hammers and drillers are tools comparatively new to the construction forces. Unless they are operated in accordance with instructions furnished, satisfactory performance cannot be expected. An instruction book furnished with each tool by the manufacturer explains in detail how the tools work and how they should be operated and maintained. This Section is issued since the instruction book will not always be available to those who may be required to operate a tool. It provides only operating information and only for a tool which has been properly maintained. Those responsible for maintaining and repairing the tool should consult the manufacturer's instruction book whenever information other than is herein provided, is required.

2. DESCRIPTION

2.01 There are four different Barco tools as follows:

Model H-6 Hammer (Paving Breaker)

Weight: Tool only, 94 lbs.

Model J-2 Hammer (Paving Breaker)

Weight: Tool only, 79 lbs.

Model J-2A Driller (Rock Drill)

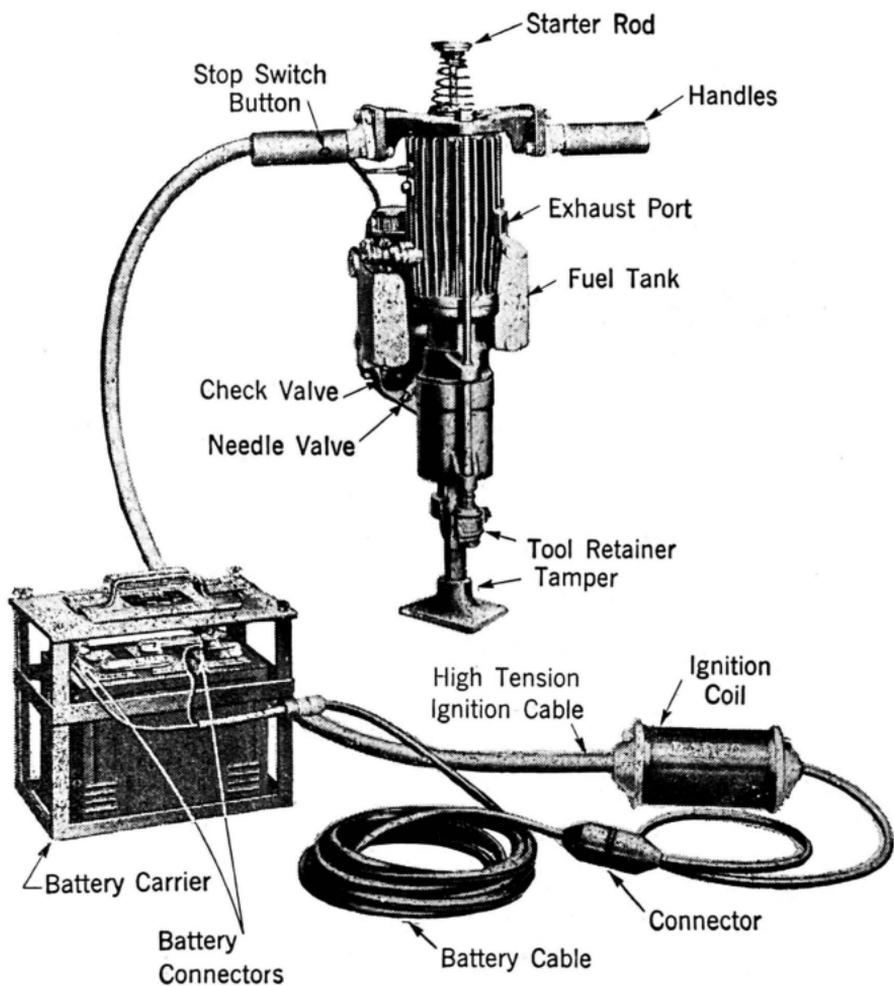
Weight: Tool only, 84 lbs.

Model J-2 Driller (Rock Drill)

Weight: Tool only, 85 lbs.

2.02 **The Model H-6 Hammer** is the most powerful of the Barco tools. It is used where hard thick concrete is encountered on which the performance of the lighter J-2 hammer would be too slow.

2.03 **The Model J-2 Hammer** is similar to the Model H-6, but lighter, slightly smaller and less powerful. It can be converted to a Model J-2A Driller by substituting and adding a few parts.

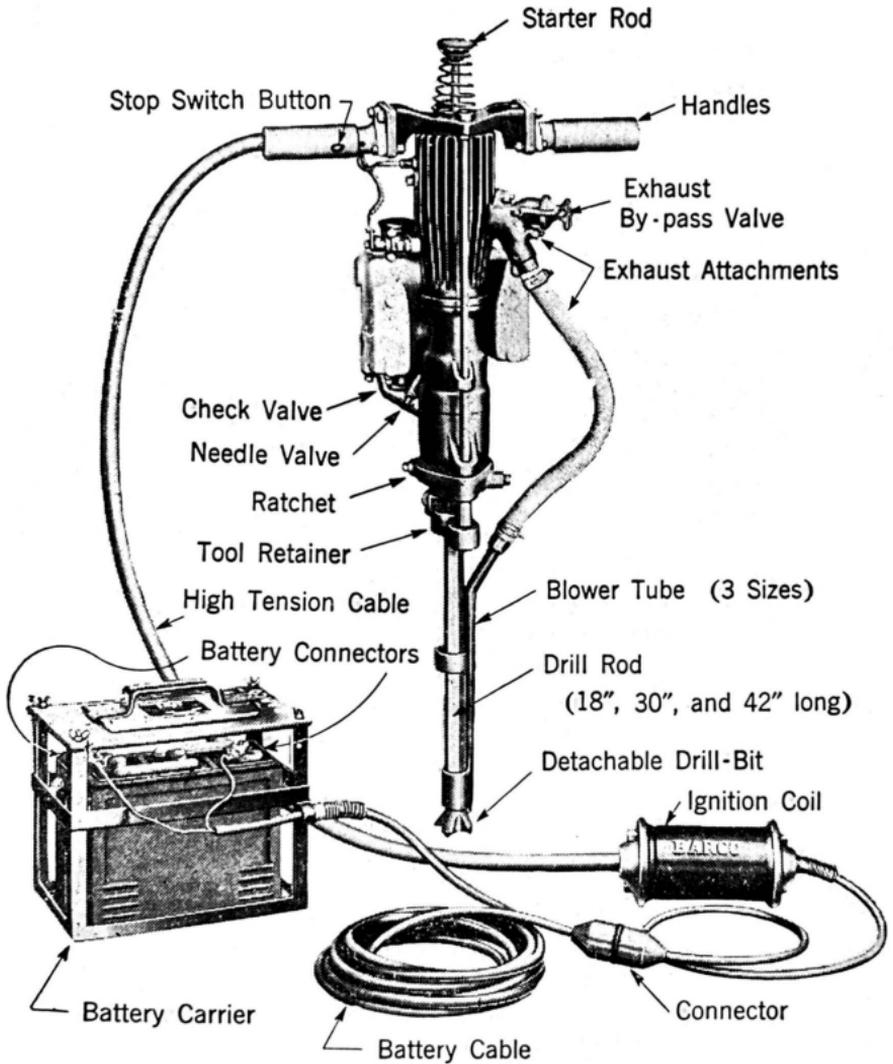


BARCO GASOLINE HAMMER

Model H-6 takes $1\frac{1}{8}$ " \times 6" Hexagon Shank Tool Steels

Model J-2 takes 1" \times $4\frac{1}{4}$ " Hexagon Shank Tool Steels

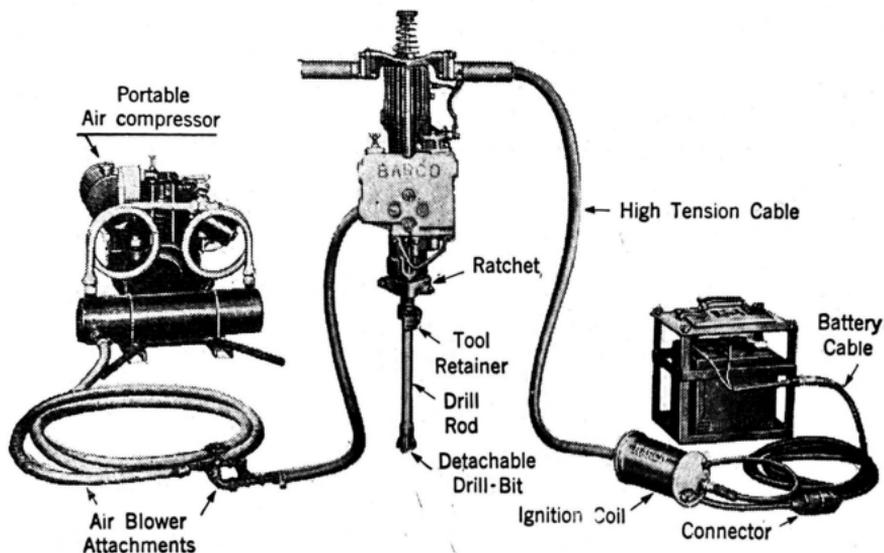
2.04 **The Model J-2A Driller** is basically a J-2 Hammer modified for rock drilling work. It has a built-in ratchet to assist in manually rotating the drill steel while drilling and is provided with exhaust blower attachments for automatically clearing the hole of chips as it is drilled. The exhaust blower is effective in holes down to about 3 feet deep.



BARCO J-2A DRILLER

Takes 1" x 3/4" Hexagon Shank Solid Detachable-bit Drill Rods

2.05 **The Model J-2 Driller** differs from the J-2A Driller, in that it uses compressed air for blowing out the chips instead of the exhaust from the hammer. It can be used to drill holes down to about eight feet deep, however, a small portable air compressor and air blower hose with suitable fittings and valves are required with this tool.



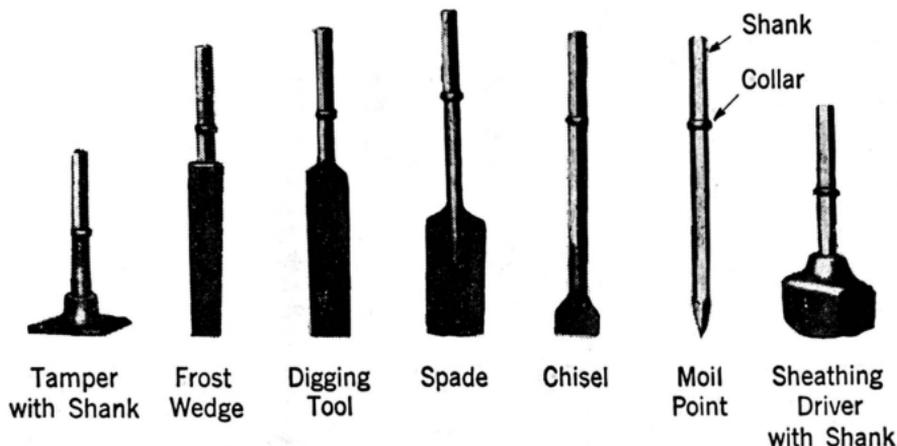
BARCO J-2 DRILLER

Takes 1" x 4¼" Hexagon Shank Hollow Center Detachable-bit Drill Rods

3. TOOL STEELS FOR HAMMERS—DESCRIPTION AND SIZES REQUIRED

3.01 The different tool steels used with the Barco H-6 and J-2 Hammers and the shank sizes required are shown below.

TOOLS FOR BARCO HAMMERS



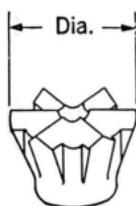
H-6 takes tools with $1\frac{1}{8}$ in. \times 6 in. Hexagon Shank
J-2 takes tools with 1 in. \times $4\frac{1}{4}$ in. Hexagon Shank

4. DRILL RODS AND BITS—DESCRIPTION AND SIZES REQUIRED

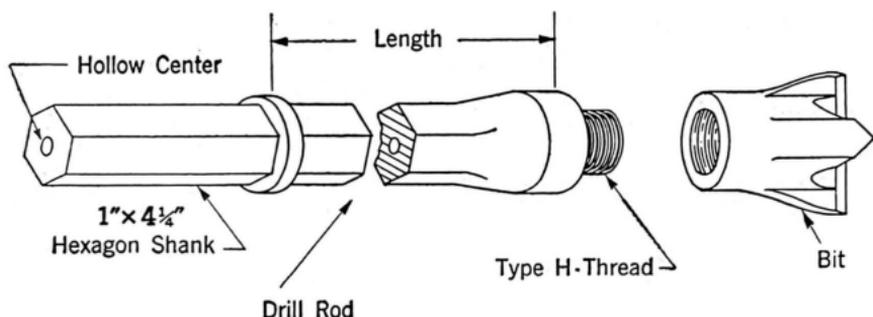
4.01 Detachable-bit type drills such as shown in the following figure are used with the Barco J-2A and J-2 Drillers. The lengths of rods required and whether solid or hollow-center will depend upon the depth of hole to be drilled and the model Barco driller used. The proper lengths to use for each model, the size of shank, and whether solid or hollow-center rods are required are covered in 4.02 and 4.03. There are two styles of bits. Cross-bits (4 point) are used in hard rock and rose-bits (6 point) are used in comparatively soft rock. The bits are available in different diameters. The proper diameters to use are covered in 4.04.



Cross Bit
For Hard Rock



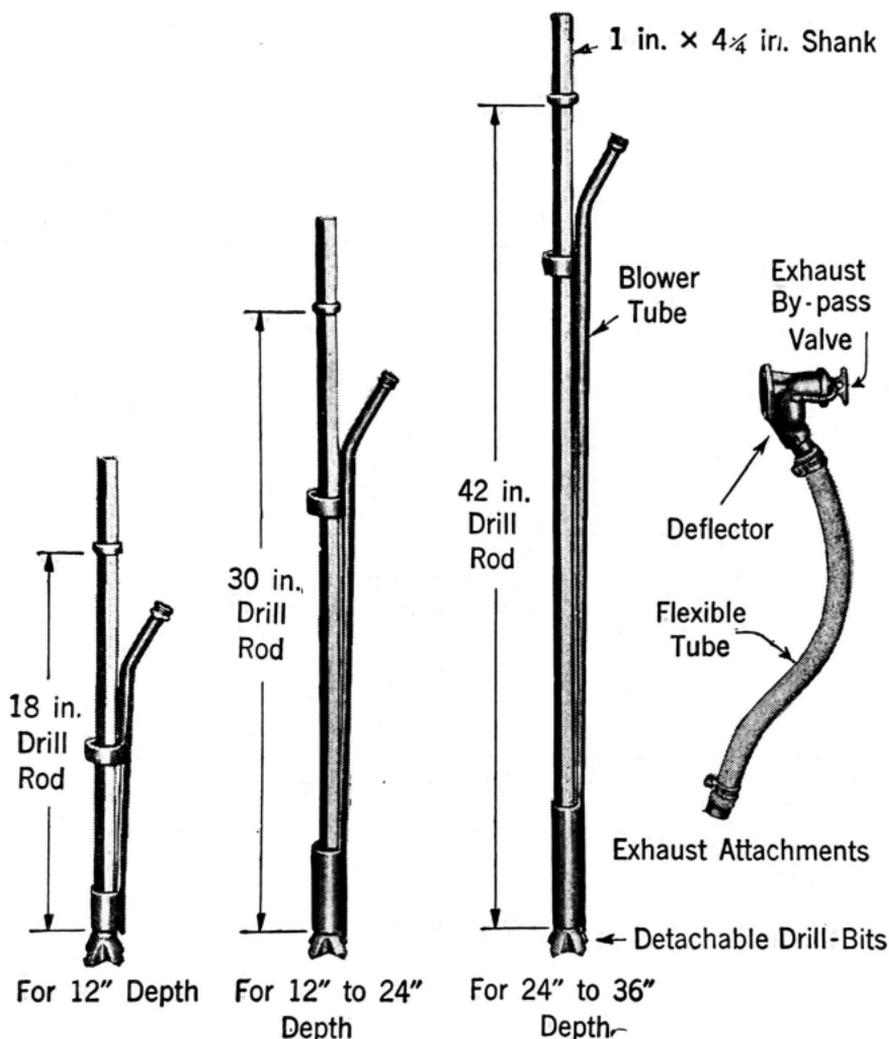
Rose Bit
For Soft Rock



J-2A Driller takes Solid Rods 18", 30" and 42" long
 J-2 Driller takes Hollow Center Rods 2 Ft. to 8Ft. long

DETACHABLE - BIT DRILL RODS & BITS

4.02 The Model J-2A Driller requires solid drill rods 18, 30 and 42 inches long with 1" x 4-1/4" hexagon shank and type H thread. Other lengths than those mentioned will not properly fit the blower tubes. Hollow-center drill rods may be used if the holes are plugged at both ends with wood or metal plugs which will prevent dust and chips from entering the hammer mechanism. The 18" rod is used at the start and successively longer rods are used as the depth of hole reaches the limit of the blower tube length. The depths of holes for each of the three different drill rod lengths and their respective blower tubes are shown in the following figure.



Use Solid Drill Rods 18, 30 or 42 inches long with 1 in. x 4 $\frac{1}{4}$ in. Hexagon Shank and Type H Thread for Timken Detachable-Bit

EXHAUST BLOWER TUBES AND ATTACHMENTS

FOR

BARCO J-2A DRILLER

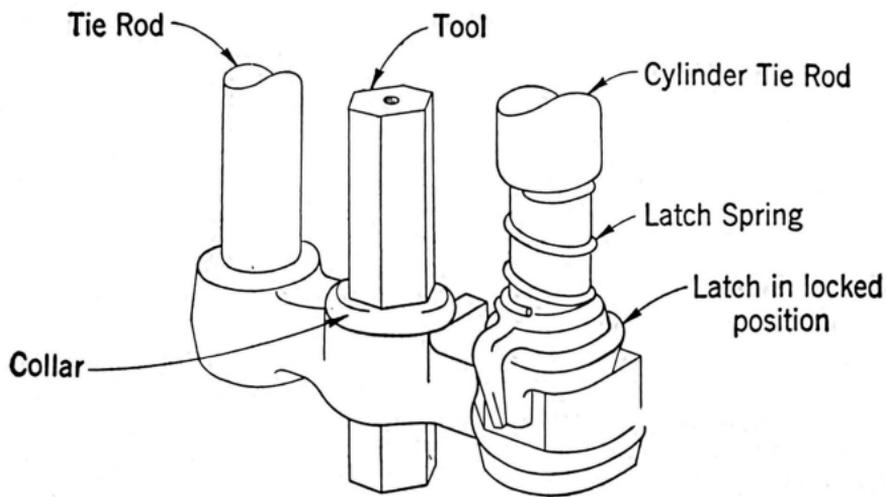
4.03 The Model J-2 Driller requires hollow-center drill rods with 1" x 4-1/4" hexagon shank and type H thread. Hollow-center rods are required in order to provide a passage for the compressed air used with this model for clearing the hole of chips as it is drilled. A 2-foot drill rod is used at the start and successively longer rods are used as the depth of hole reaches the limit of the drill rod length. The hollow-center drill rods are available in different lengths starting with 2 feet and increasing in 1-foot increments up to 8 feet long.

4.04 Detachable drill-bits are available in different gauge diameters starting with 1-3/8" and increasing in 1/8" increments up to 2-3/8". In order to provide sufficient clearance in the hole, each time a change in drill rod length is made the next smaller size bit to the one just previously used, is employed. When using the J-2A Driller with exhaust blower attachments the bit selected at the start is such that the hole will be finished with a 2" bit in order to have a hole large enough to take the exhaust blower tube. When using the J-2 Driller employing compressed air for cleaning the hole the bit selected at the start is such that the hole will be finished with a 1-3/8" bit.

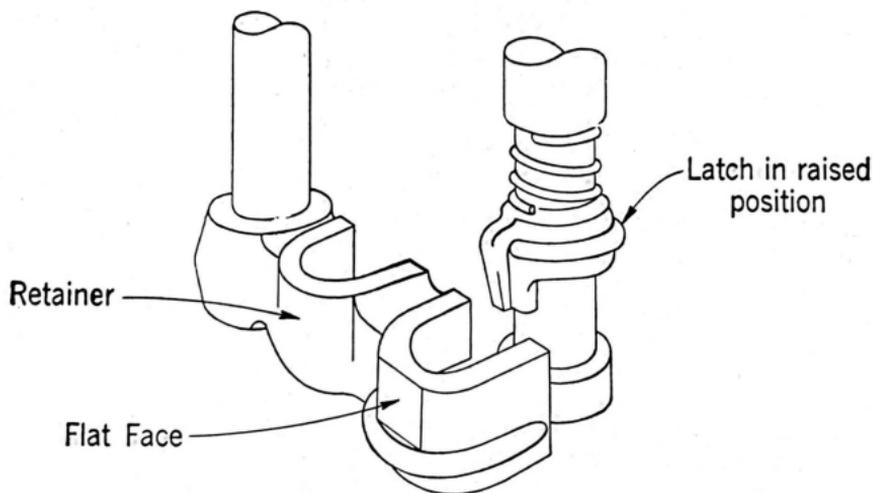
5. TOOL RETAINER

5.01 The Barco hammers and drillers are provided with a tool retainer which when locked in place partly encircles the tool steel below its collar in order to prevent the tool steel or rock drill from falling out. The tool retainer is locked in place by a latch on the lower end of one of the cylinder tie rods. The tool retainer should be locked with the latch before the tool is operated.

5.02 To open the tool retainer lift the latch and swing the retainer which hinges on the opposite cylinder tie rod, to one side sufficiently to permit removal or insertion of the tool steel.



Closed & Locked in Place



Unlocked & Partially Opened

TOOL RETAINER

5.03 To close the tool retainer, hold the latch in the raised position, swing the retainer so that the opening in its free end engages the lower end of the cylinder tie rod, and drop the latch so that its finger is against the flat face on the

retainer thus locking itself and the retainer in place. The retainer should partially encircle the tool below the collar.

6. GASOLINE FUEL MIXTURE

6.01 The fuel required by the Barco tools consists of a mixture of gasoline and oil. Successful operation can only be obtained if the proper mixture of the right kind of gasoline and oil is used.

6.02 Use regular grade gasoline. Do not use High Test or Aviation gasoline. In hot weather use third grade gasoline, if it can be obtained. A supply of about one quart gasoline will be required for each hour of continuous operation.

6.03 Use only SAE No. 70 Viscosity Automobile Engine Oil. The amount of oil which will be required will vary with each tool and the operating conditions. A supply of one quart of oil for each gallon of gasoline on hand should be ample in any case.

6.04 The amount of oil that should be used in the gasoline is indicated below. Mix the oil and gasoline thoroughly in a separate closed container by shaking vigorously for about three minutes. Never pour oil unmixed with gasoline into the fuel tank.

Amount of Oil Required in Gasoline

<u>Model</u>	<u>Initial Filling for Starting and 1/2 Hour Operation</u>	<u>For Continuous Operation After First 1/2 Hour</u>
H-6 Hammer	1 pt. oil per gal. of gasoline	1-1/2 pts. oil per gal. of gasoline
J-2 Hammer	3/4 " " " " " "	for all models
J-2 Driller	3/4 " " " " " "	except as noted
J-2A Driller	3/4 " " " " " "	below.

Note: In very hot weather or when operating in a confined space where circulation of cooling air is restricted, as in a trench, as much as 2 pts. of oil per gal. of gasoline may be required. A good rule to follow is to use a mixture with just sufficient oil to cause the exhaust to show a blue smoke. If a hammer which is in good adjustment continually stops while working under hot conditions, it is usually a sign of an inadequate amount of oil in the gasoline, however, no more than 2 pints per gallon of gasoline should ever be required.

6.05 The fuel tanks on the Barco tools hold about one quart which is sufficient for about one hour's operation. If more than a single filling of mixture is prepared at one time, keep the excess supply in an approved safety can tagged with information that it contains a special fuel mixture for the Barco hammer and showing the proportions of the mixture. Avoid mixing larger quantities than will be required on a particular job.

7. LUBRICATION

7.01 The oil in the gasoline lubricates the tool. No other lubrication is required.

8. STARTING

8.01 Unless the starting operations are performed as described, satisfactory results cannot be expected. When a tool is to be started for the first time, proceed as follows:

(a) Place the tool on a tamper and see that the battery end of the battery cable is connected to the battery. Connect the other end of the cable to the connector on the end of the ignition coil cable. On J-2A Drillers open the exhaust by-pass valve.

(b) Fill the fuel tank about 1/2 full with the proper mixture of fuel and lubricating oil for starting. (See 6.04.)

(c) Open needle valve 1-1/4 turn from closed position and prime by lifting the check valve with finger until fuel drips freely. Then immediately push down on starting rod with a quick stroke and when all the way down, quickly release all pressure on it allowing rod to return freely. As the starting rod comes up, the tool will either fire, or a buzz in the ignition coil will be heard. As soon as the buzz is heard, push starter rod down again and release as before. Tool should start within four to six such attempts and run for a short interval. When it stops, push starter rod down again once and release. If no firing occurs after rod returns prime again and repeat operation described above until tool runs continuously or operates at least one or more strokes for each push on starter.

(d) When, after each push on starter, tool operates for one or only a few strokes, mixture is too rich and needle valve should now be turned to correct running position, that is, it should be screwed in about 1/2 turn from the original opening of 1-1/4 turn. Start tool again and if it continues to run without stopping, needle valve is set at correct cold running position. If it stops after a short

interval and does not fire when starter is pushed, needle valve is set too lean in which case it should be opened a notch or two. However, if after stopping, the tool fires only one or a few strokes for each push on starter, the needle valve is still set too rich and should be closed a notch and started again. When tool runs without stopping, needle valve is set at correct cold running position.

(e) After correct cold running position of needle valve is determined, subsequent cold starts are made with a 1/2 turn greater opening. When temperature is below freezing, however, start should be made with the needle 1 to 1-1/2 turns greater opening than correct cold running position. When starting in extremely cold weather (below zero), pour about a teaspoonful of gasoline into exhaust port while the starter rod is pushed down, open needle valve 1 to 1-1/2 turns more than correct cold running position and proceed as outlined in (c) and (d) above. As soon as a too rich mixture is indicated, set needle valve to cold running position. Then repeat pushes on starter until excess fuel is expelled and tool starts.

(f) When tool is in operation always run as lean as possible. Adjustment of needle valve will vary two or three notches between first cold running position and position at maximum heat, so gradually close needle valve one notch at a time until leanest running mixture is obtained.

9. STOPPING

9.01 To stop the Barco tool, push the stop switch button on the handle.

9.02 If after stopping there will be no further need for the tool during the day, drain the fuel tank. Drained fuel may be saved for subsequent use. Fuel left in the fuel tank deteriorates in a comparatively short time and deteriorated fuel will make starting difficult.

10. REMOVING CARBON

10.01 Remove any carbon from the inside top edge of the cylinder exhaust port. Carbon accumulation at this point will cause hard starting and loss of power. Remove the carbon by scraping with a tool such as a screwdriver.

11. OPERATING

11.01 After the tool has been started as explained in Part 8 and warmed up by running 2 or 3 minutes, stop and remove from tamper, insert desired tool steel and secure in

place by closing tool retainer. When using J-2A Driller, the drill steel, blower tube and exhaust attachments should be assembled as shown in 2.04. Close by-pass valve using gloved hand or pliers in order to avoid being burned if hot. When using J-2 Driller connect air compressor and air blower attachments as shown in 2.05.

11.02 Raise tool to upright position, allow fuel tank side to lean against body and start by pushing down on starter rod.

11.03 When using hammer for such work as breaking pavement, control of tool in moving between cuts is best maintained if weight of tool is partially supported by allowing fuel tank to rest against upper leg.

11.04 When drilling with J-2A or J-2 Driller hold drill vertically and rotate entire tool about 1/2 turn back and forth by means of handles. Ratchet should turn drill rod in one direction only.

11.05 When using J-2 Driller keep hole clean as it is being drilled by blowing out with air. A foot controlled air valve on the air blower attachments facilitates turning the air on and off as required.

12. EQUIPMENT AND MATERIALS REQUIRED ON JOB

12.01 In addition to the Barco tool with its associated battery, cable and coil, plus blower tubes and exhaust attachments in the case of the J-2A Driller, and a portable air compressor and air blower attachments in the case of the J-2 Driller, the following additional equipment, tools and materials are required on the job.

Tamper (see 3.01) required for starting.

Tool steels for hammer (see 3.01).

Drill rods and bits for driller (see 4.01 to 4.04 inclusive).

Gasoline (see 6.02 for kind and quantity).

Engine oil (see 6.03 for kind and quantity).

Pint measure, funnel and empty safety can for preparing fuel mixture (see 6.04 and 6.05).

Goggles.

13. SAFETY PRECAUTIONS

13.01 Do not operate Barco tools inside of buildings, man-holes or other locations unless there is adequate ventilation which will remove exhaust gases satisfactorily.

13.02 Take all necessary precautions which appertain to the handling of gasoline when preparing the fuel mixture and filling the fuel tank.

13.03 Tool steels in hammers and drillers may break during operation and when this occurs the hammer or drill may drop on to the operator's feet unless proper precautions are taken. It is advisable whenever operating the tool to place the feet in such position as to minimize the possibility of the tool dropping on one's toes in case the tool steel breaks.

13.04 When packing the tool away at the end of the day or job be sure that all gasoline has been removed.

13.05 Always grasp the tool by its handles in order to avoid being burned in case the tool is still hot from operation.

13.06 In handling the tool during operation keep the exhaust port side away from the body in order to avoid the possibility of burns from the exhaust.

13.07 Wear approved goggles whenever harmful chips or dust might fly during operation of the tools.