



Rotating Barrel Control Gun --- O&M Manual

**HG-40K Rotary
Barrel Gun
Part #60-072-001**

ADVANCED PRESSURE SYSTEMS

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SECTION	CONTENTS	PAGE
1	Description of the APS COBRA	2
2	Safety Considerations	3
3	Risks Associated with the Use of this Equipment	3
4	Operating Specifications	4
5	Necessary Additional Equipment	4
6	How to Hook It Up	5
7	Connecting System Components	5-6
8	Regular Maintenance	7
9	Parts List and Assembly Diagram of APS COBRA	8-9
10	List of Recommended Spare Parts	9

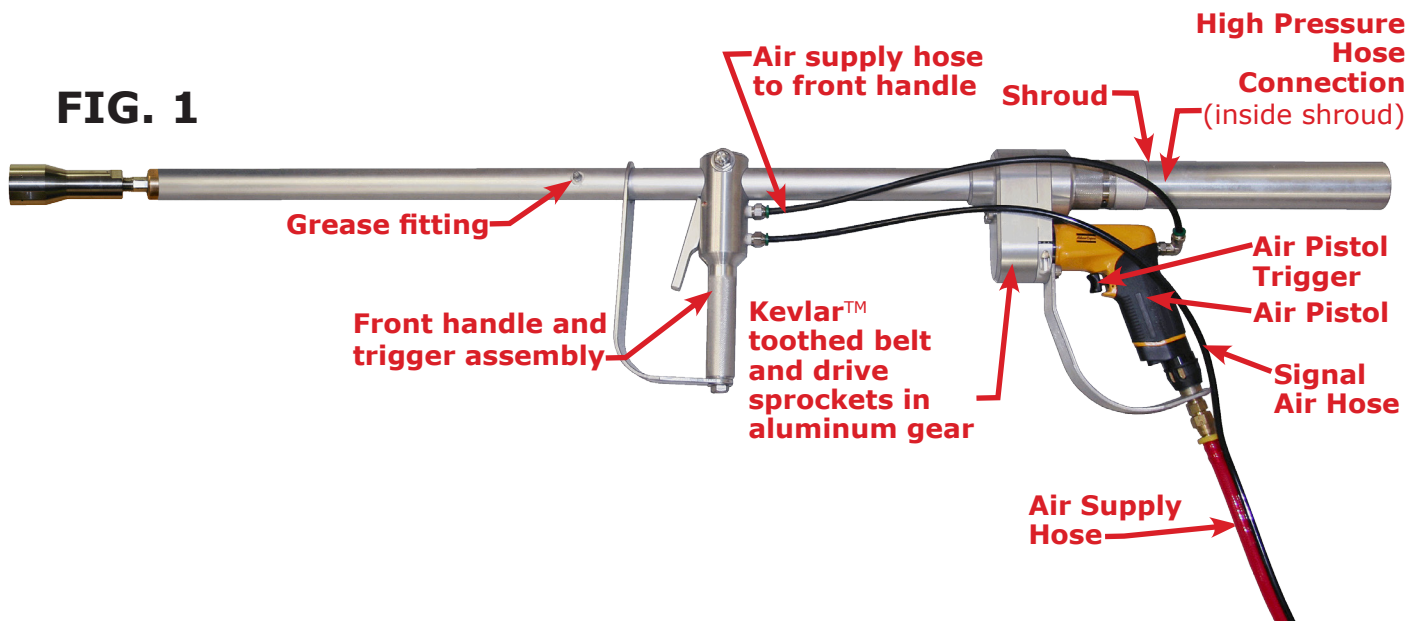


Section 1

Description of the APS COBRA Rotary Barrel GUN.

The **APS COBRA** (see Fig.1) is a rotary barrel gun designed for operation at 40,000 PSI. The rotary action of the barrel is powered by an off-the-shelf pistol grip air motor supplied by a leading manufacturer of air powered tools. The air motor drives the barrel by means of a toothed Kevlar™ belt and sprockets encased in an aluminum gearbox. The barrel rotates inside a tubular barrel shroud, where it is supported and stabilized in

a series of bearings. The high pressure water is introduced into the barrel through a swivel assembly at the back of the gun. The shaft of this swivel is supported by a precision thrust bearing and a smaller ball bearing. Connection to the inlet hose is through a stationary coupling which houses a replaceable swivel seal. This part is the primary maintenance item for the gun.



The gun features dual triggers, both of which must be activated to enable the gun to operate and deliver high pressure flow to the nozzle. High pressure air (90 psi) from a main control valve assembly is supplied to the gun through a 25 ft. long 3/8" polyurethane air hose, which connects to the handle of the air pistol. When the trigger on the pistol is depressed, the motor commences to drive the rotary barrel. At the same time a small portion of the air flows forward to a secondary front handle through 1/8" dia. tube. Activation of

the trigger on the front handle enables air pressure to be built up in a second small signal tube connected to the front handle, and this pressure is the signal back to the main control valve to allow high pressure water flow to commence. This main control valve, which controls the air supply and the high pressure water flow, is commonly referred to as a "tumble box". The APS version of this valve is the **Tri-Mode Valve** (see Necessary Additional Equipment).

Safety Considerations

- 1) Follow all safety recommendations when using this or any related equipment.
- 2) DO NOT EXCEED THE STATED OPERATING PRESSURE for this equipment.
- 3) Allow only personnel who are fully trained to operate this or any associated equipment.
- 4) Before operating this or any associated equipment, carry out an inspection to ensure that it is in good condition, and does not show any signs of abuse. Check for missing or damaged components, including trigger guards, hose shrouds and damaged or worn hoses. If any problems are found or suspected, make sure they are checked and corrected before using the equipment.
- 5) DO NOT TIE, TAPE OR IN ANY WAY SECURE TRIGGERS IN THE ACTIVATED POSITION.
- 6) DO NOT ATTEMPT TO DEFEAT ANY SAFETY DEVICES ON THIS OR ANY HIGH PRESSURE EQUIPMENT.

Section 3

Risks associated with the use of this equipment.

It is recommended that this equipment is used with a front barrel that is 48" long, when measured from the gear case at the front of the air motor to the end of the rotating barrel. This will prevent the operator from being able to direct high pressure jets onto his feet. (see also Recommended Safety Equipment) In some special applications, such as confined spaces or where there is difficult access, shorter barrels are used, and depending on the specific circumstances, special care should be exercised to prevent the risk of an operator hitting any part of his own body. Special care could include protective clothing, or a specially designed shield.

The other most likely cause of operator injury associated with this gun is from a supply hose failure. This is a concern common to all water blasting guns regardless of the operating pressure or type. The **APS** COBRA has an aluminum shroud extending from the back of the swivel assembly, which covers the connection of the hose to the gun, which is the most common point of failure. It is essential to include the supply hose in the pre-operating check of the gun and any associated equipment. Most 40,000 PSI supply hoses can be provided with an abrasion shield, which helps minimize damage to the hose. Burst shields can also be installed, but they are very heavy and so more difficult to use.

Section 4

Operating Specifications

- 1) Maximum supply pressure of water to the gun = 40,000 PSI
 - 2) Maximum flow of water = 7 GPM
 - 3) Maximum operating speed of rotation = 4,000 RPM (3,000 – 3,500 RPM Recommended)
 - 4) Maximum air pressure supply to gun = 100 PSI
-

Section 5

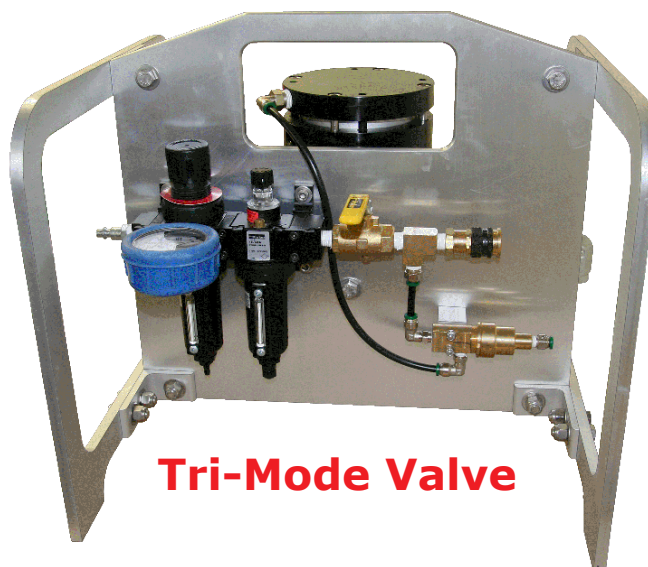
Necessary Additional Equipment

The safe and efficient operation of the **APS COBRA** requires the use of a control valve, for the supply of air and high pressure water to the gun. **APS** produces an excellent control system, which is the **TRI-MODE VALVE**.

The **APS COBRA** is designed to operate with this equipment and its use will ensure that all of the controls will function smoothly and reliably.

The **TRI-MODE VALVE** is so called because it can be set up to operate in three distinct ways. It can

operate as a dump valve, letting the system pressure reduce to zero each time that the gun ceases operation. It can operate as pressure sustaining valve, or pressurized dumping valve, where the unused flow is wasted through a pre-sized nozzle on the dump side, thereby maintaining pressure in the system. It can also be used in a dry shut-off mode, in which the dump port is plugged and the unused flow is diverted back to the pump through an un-loader system. These modes of operation are discussed in the O & M Manual for the **TRI-MODE VALVE**.



Tri-Mode Valve

How to Hook Up the APS COBRA (into a system with Pump & Tumble Box)

There are three major elements, which comprise a system.

They are:

Element #1 - a pump, usually with an onboard air compressor,

Element #2 - a “tumble box” (e.g. TRI-MODE VALVE) and

Element #3 - an **APS COBRA** rotary style gun.

The pump (Element #1 in the system) can be any of the 40,000 PSI units available on the market. Flow and nozzles must be chosen so as not to exceed the maximum flow of 7 GPM through the gun. A supply hose will carry the high pressure flow to the tumble box, where it will connect to the flow control valve.

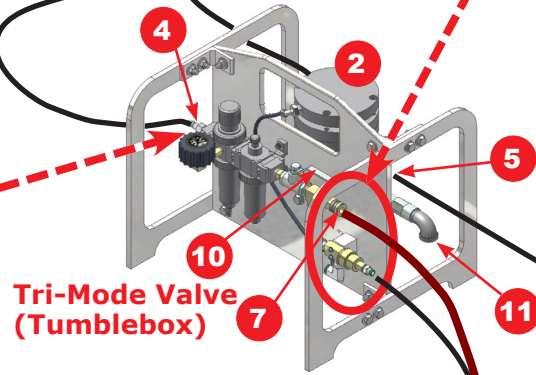
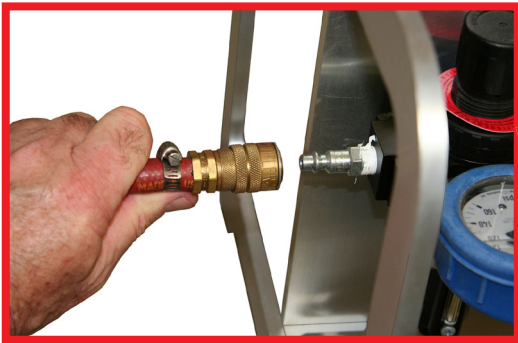
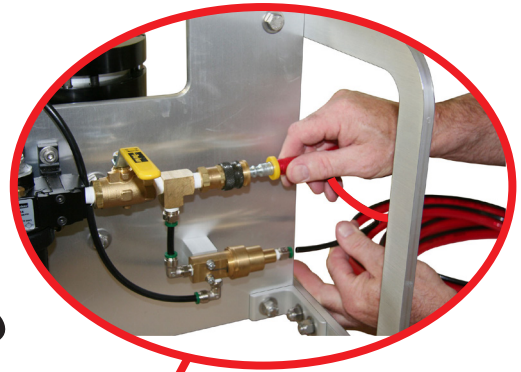
The tumble box (Element #2 in the system) controls the high pressure flow from the pump to the gun. It also controls the compressed air flow to operate the gun and it uses air to operate the flow control valve to permit the high pressure flow to the gun (see O & M Manual for TRI-MODE Valve). The APS COBRA rotary style gun (Element 3) in the system is where the work is done.

To connect the system components proceed as follows:

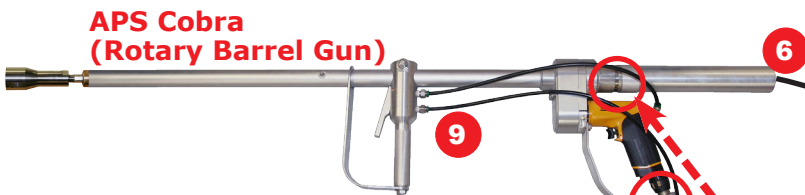
- Connect high pressure supply hose from pump (1) to Tri-Mode Flow Control Valve (2).
 - Connect compressor (3) to air side of Tri-Mode (4).
 - Connect high pressure hose from Tri-Mode Flow Control Valve (5) to back of APS COBRA rotary gun (6).
 - Connect the air Supply/signal hose from Tri-Mode air side (7) to the inlet to the air pistol inlet (8) and the smaller signal hose to the front handle of the APS COBRA (9).
 - The system is now ready to start.
 - **Start the pump and bring it up to pressure.** (It is assumed for the purposes of this O & M Manual that the Tri-Mode Valve will be operating in the pressure dump mode. For other methods of setting up the Tri-Mode Valve see the separate O & M Manual for that product). Check to see that water is dumping from the dump port (11) of the Tri-Mode Valve.
 - Open the air valve (10), **WARNING: THE GUN IS READY TO OPERATE.**
 - Make sure that the gun is pointed in a safe direction, and then squeeze both the trigger on the air pistol and on the front handle at the same time. The gun will commence to operate. It is now ready for use.
- (Note:** The main air supply hose and the signal hose are joined together along their length to form a single unit).
- Before starting the compressor make sure that the main valve (10) on the air side the Tri-Mode Valve is closed.



Pump with Compressor



Tri-Mode Valve (Tumblebox)



APS Cobra (Rotary Barrel Gun)



Regular Maintenance of the APS COBRA

Regular maintenance of the APS COBRA must include keeping the gun as clean as possible. Any residue from blasting operations should be washed off with clean water, and the gun wiped down with a dry rag, prior to placing in storage. The air motor trigger should be lubricated with light grade machine oil.

Lubrication

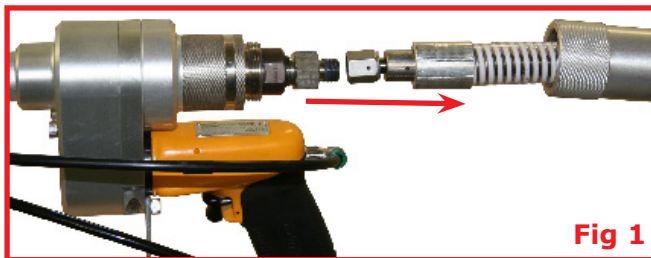
Apply grease, using a grease gun to the following locations after every 40 to 50 hours of operation.



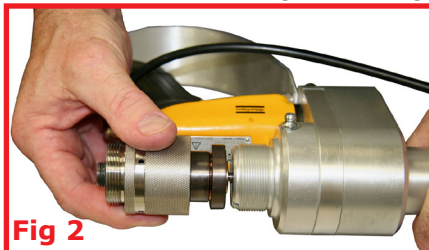
Swivel Seal Replacement

Replacement of the swivel seal is a routine procedure after every 40 to 80 hours of use.

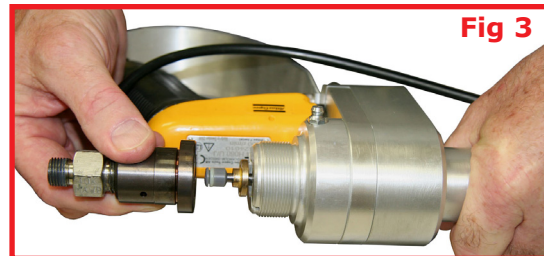
Step 1: Unscrew the Hose Protector from the back of the APS COBRA, and disconnect the high pressure hose from the Inlet Adapter (Fig 1).



Step 2: Unscrew the Swivel Bearing Retaining Cap from the gun (Fig 2), and pull the Inlet Adapter straight back away from the Swivel Housing (Fig 3).



Step 3: The swivel Seal is located in the recess in the front of the Inlet Adapter. Remove the old seal and clean the swivel shaft with a clean rag. Inspect all components for wear or damage and replace as necessary.



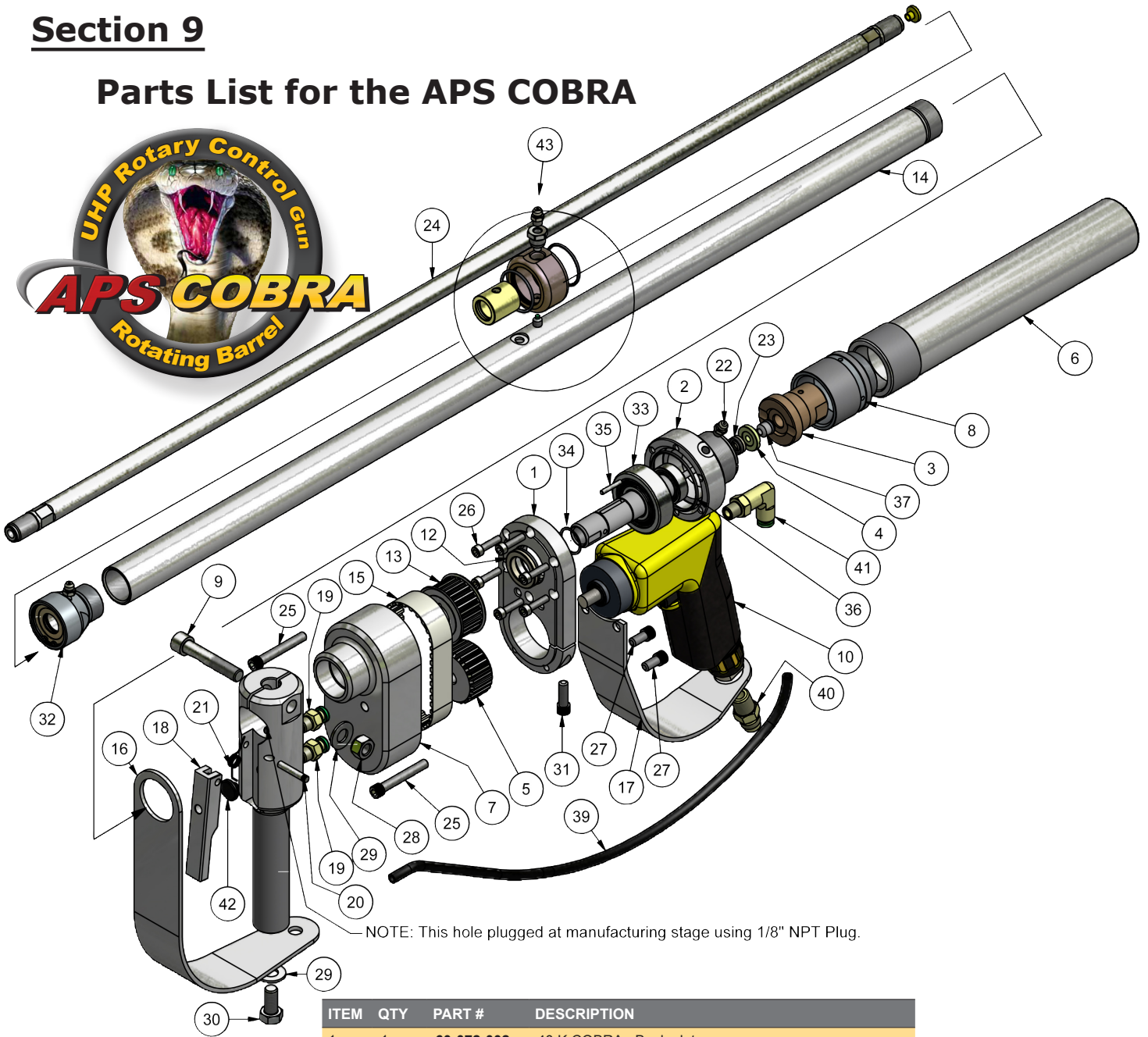
Step 4: Install a new seal onto the swivel shaft (Fig 4). (Note: the chamfered end of the seal mates with the brass sealing ring). Apply lithium grease to the chamfered part of the seal where it meets the sealing ring.



Step 5: Apply a small amount of grease to the inside of the Inlet Adapter, and reinstall it over the new seal, pushing it down firmly to cover the brass sealing ring. Replace the retaining cap and the hose protector. Reconnect the hose and the gun is now ready to operate.

Section 9

Parts List for the APS COBRA



NOTE: This hole plugged at manufacturing stage using 1/8" NPT Plug.

ITEM	QTY	PART #	DESCRIPTION
1	1	60-072-002	40 K COBRA - Back plate
2	1	60-072-004	40K COBRA - Swivel bearing housing
3	1	60-072-005	40K COBRA - Swivel inlet adapter
4	1	60-072-006	40K COBRA - Swivel seal back up ring
5	1	60-072-007	40K COBRA - Pulley, drill motor. Alum. 26 pitch drive
6	1	60-072-008	40K COBRA - Hose protector
7	1	60-072-009	40K COBRA - Belt drive cover
8	1	60-072-010	40K COBRA - Bearing retaining cap
9	1	60-072-012	40K COBRA - Cam Stud/Barrel shroud
10	1	60-072-013	40K COBRA - Barrel shroud
11	1	60-072-015	40K COBRA - Front handle
12	1	60-072-016	Grease seal
13	1	60-072-020	40K COBRA - Timing/Drive sprocket
14	1	60-072-019	40K COBRA - Barrel shroud
15	1	60-072-022	Timing/Drive Belt
16	1	60-072-027	40K COBRA - Air Motor trigger guard

Section 9

Parts List for the APS COBRA (Cont'd.)

ITEM	QTY	PART #	DESCRIPTION
17	1	60-072-028	40K COBRA - Front handle trigger guard
18	1	60-072-025	40K COBRA - Trigger, Front handle
19	2	60-072-031	Connector - 1/8" NPT Prestolok
20	1	60-072-032	40K COBRA - Front handle trigger pin
21	1	60-072-033	40K COBRA - Front handle trigger pin
22	1	60-072-023	Grease zerk
23	1	60-072-026	Oil/Grease seal
24	1	60-072-035	40K COBRA - Barrel 9/16"-18 UHM B/E x 34-3/16" long
25	2	10-001-175	SHCS 1/4"-20 x 1-3/4" long
26	6	10-008-075	SHCS 10-32 x 3/4" long.
27	2	10-001-050	SHCS 1/4"-20 x 1/2" long
28	1	10-100-002	3/8"-16 Nylon Lock Nut
29	2	10-010-001	Flat washer 3/8" SS
30	1	10-016-075	Hex. bolt, 3/8"-16 x 3/4" long SS.
31	1	10-003-075	SHCS 1/4"-28 x 3/4" long
32	1	60-072-070	Front bearing assembly
33	1	60-072-141	40K COBRA - Shaft/Bearing assembly
34	1	60-072-037	Spiral retaining clip
35	1	60-072-038	Keyway pin
36	1	30-002-031	O-Ring, 2-013 Buna 70 Dur.
37	1	60-072-049	40K COBRA - Swivel shaft seal
38	1	60-072-041	40K Brass button seal J/S
39	1	60-072-040	1/4" air tubing
40	1	60-072-042	Fitting 3/8" JIC x 1/4" NPT
41	1	60-072-039	Swivel elbow - 1/4" x 1/8" NPT Prestolok
42	1	60-072-034	Ribber insert for front trigger
43	1	60-072-024	Center Barrel Bearing Assembly

Section 10

Recommended Spare Parts

The recommended spare parts for "field servicing" are limited to the following:

- 1) Swivel Seal – Part No. 60-072-049
- 2) Swivel Seal Brass sealing ring – Part No. 60-072-006
- 3) Inlet Adapter – Part No. 60-072-005
- 4) Brass button seals – Part No. 60-072-041

Recommended spare parts for shop servicing, in addition to the list for "field servicing" would include:

- 1) Swivel Shaft – Part No. 60-072-003
- 2) Spiral Retaining Clip – Part No. 60-072-037
- 3) Swivel Housing grease seal (small) – Part No. 60-072-026
- 4) Swivel Housing grease seal (large) – Part No. 60-072-016
- 5) Timing Belt – Part No. 60-072-022
- 6) O-Ring – Part No. 30-002-031
- 7) Air Tubing – Part No. 60-072-040



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