

# MG7000

## Operating Instructions & Parts Manual



*Mandus***Group**

## The MG7000 Hose, Tube and Pipe Cleaning Kit

Qty	Unit of Issue	Contains	Part Number	Nomenclature	NSN
			MG7000	Hose, Tube, and Pipe Cleaning Kit - Includes Projectiles	4940-01-593-7525
			<b>Kit Contents</b>		
1	ea	1	MG-CC	Carrying Case	4940-01-593-7491
1	ea	1	MG-HL-2	Launcher	4940-01-593-7713
1	ea	1	MG-AR1	Adapter Ring	
1	ea	1	MG-H06	Hose Nozzle for #6 hose	4940-01-593-7850
1	ea	1	MG-H08	Hose Nozzle for #8 hose	4940-01-593-7838
1	ea	1	MG-H10	Hose Nozzle for #10 hose	4940-01-593-7855
1	ea	1	MG-H13	Hose Nozzle for #13 hose	4940-01-593-7861
1	ea	1	MG-H16	Hose Nozzle for #16 hose	4940-01-593-7903
1	ea	1	MG-H19	Hose Nozzle for #19 hose	4940-01-593-7905
1	ea	1	MG-H25	Hose Nozzle for #25 hose	4940-01-593-7927
1	ea	1	MG-H32	Hose Nozzle for #32 hose	4940-01-593-8016
1	ea	1	MG-H38	Hose Nozzle for #38 hose	4920-01-593-8116
1	ea	1	MG-T03	Tube Nozzle for #3 tube	4940-01-593-7847
1	ea	1	MG-J06	JIC Nozzle for #6 JIC	4940-01-593-7840
1	ea	1	MG-T06	Tube Nozzle for #6 tube	4940-01-593-8072
1	ea	1	MG-T08	Tube Nozzle for #8 tube	4940-01-593-7849
1	ea	1	MG-J10	JIC Nozzle for #10 JIC	4940-01-593-8024
1	ea	1	MG-T10	Tube Nozzle for #10 tube	4940-01-593-8079
1	ea	1	MG-J13/T13	JIC/Tube Nozzle for #13 JIC/Tube	4940-01-593-8028
1	ea	1	MG-J16/T16	JIC/Tube Nozzle for #16 JIC/Tube	4940-01-593-8041
1	ea	1	MG-J19/T19	JIC/Tube Nozzle for #19 JIC/Tube	4940-01-593-8045
1	ea	1	MG-J25/T22	JIC/Tube Nozzle for #25 JIC #22 Tube	4940-01-593-8050
1	ea	1	MG-J32/T25	JIC/Tube Nozzle for #32 JIC #25 Tube	4940-01-597-2994
1	ea	1	MG-T32	Tube Nozzle for #32 tube	4940-01-593-8126
1	ea	1	MG-4FFORX	FFORX Nozzle	4940-01-593-7727
			<b>Projectiles</b>		
1	Pkg	100	MG07	Cleaning Projectile 7mm	4940-01-598-2182
1	Pkg	100	MG10	Cleaning Projectile 10mm	4940-01-598-2192
1	Pkg	100	MG12	Cleaning Projectile 12mm	4940-01-598-2194
1	Pkg	100	MG14	Cleaning Projectile 14mm	4940-01-598-2195
1	Pkg	100	MG16	Cleaning Projectile 16mm	4940-01-598-2197
1	Pkg	50	MG20	Cleaning Projectile 20mm	4940-01-598-2198
1	Pkg	50	MG26	Cleaning Projectile 26mm	4940-01-598-2199
1	Pkg	40	MG33	Cleaning Projectile 33mm	4940-01-598-2177
1	Pkg	30	MG36	Cleaning Projectile 36mm	4940-01-598-2174
1	Pkg	30	MG40	Cleaning Projectile 40mm	4940-01-598-2137
1	Pkg	20	MG45	Cleaning Projectile 45mm	4940-01-598-2136
1	Pkg	15	MG55	Cleaning Projectile 55mm	4940-01-598-2175
1	Pkg	100	MG-A07	Abrasive Projectile 7mm	4940-01-596-0875
1	Pkg	100	MG-A12	Abrasive Projectile 12mm	4940-01-596-7286
1	Pkg	100	MG-A16	Abrasive Projectile 16mm	4940-01-596-7287
1	Pkg	100	MG-A18	Abrasive Projectile 18mm	4940-01-598-2053
1	Pkg	50	MG-A24	Abrasive Projectile 24mm	4940-01-598-1611
1	Pkg	40	MG-A30	Abrasive Projectile 30mm	4940-01-598-2055

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### To begin operation, the MG-HL Launcher needs to:

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- Have a ½"ID air line connected to filtered air source of 80 psi 110 psi maximum.
  - Have a selected nozzle inserted into the face plate.
  - Have a cleaning projectile loaded in the nozzle.
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## AIR SOURCE

The MG-HL Launchers are supplied with a ½" quick release coupling to ensure proper air flow and a unique 360 degree rotary plug for non-fatigue operator use. The recommended minimum air pressure is min 80 psi to 110 psi max. **The air pressure must not exceed 110 psi.** The air source can be a compressor or suitable nitrogen filled gas bottle (**Never use Oxygen!**). It is strongly recommended that the air line and any connection from the air source to the launcher must be no less than ½" ID. The air or inert gas such as nitrogen should always be regulated to the correct pressure and filtered to assure contaminant free air.



## SAFETY RELEASE BAR

Push the top of the Safety release Forward (as pictured on left) and then down (as pictured on right) to release the faceplate.



## NOZZLE

Drop the face plate down and select a suitable nozzle and adapter ring for the application. The adapter ring, if needed, snaps into the faceplate first. Now you can slide the nozzle into the adapter ring.

## PROJECTILE

Select the projectile from our sizing charts located on pages 6 through 8. Insert the recommended cleaning projectile into the nozzle.



## CLOSING THE FACEPLATE

Again, push the top of the safety release bar forward and then down. Close the faceplate and confirm that the safety release bar locks the faceplate into position.

## SAFETY RELEASE BAR LOCKED AND READY TO FIRE POSITION

The safety release bar and faceplate must always be in the locked position prior to firing the MG-HL2 and MG-HL3.5 Launchers. Failure to secure faceplate and safety release bar in the locked position may cause serious injury to the operator and or damage to the launcher.



## OPERATION

Place the hose, tube or pipe against the nozzle to insure a good air tight seal. Depress the trigger. Keep the trigger depressed until the projectile exits the hose, tube or pipe that you are cleaning.

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## Nozzles

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A range of nozzles are available, allowing the Mandus Group Cleaning System to be used on different sizes and types of hose, tube and pipe, as well as coupling configurations. Special nozzles can be made to suit specific applications.

### The five stock types are:

- **Hose:** The hose nozzle is inserted into the ID of the hose. Hose nozzles also work on pipe, heavy walled tubing and many coupling configurations. It is our most popular nozzle.
- **JIC:** The JIC nozzle has a male flare at the top that will mate against female the JIC on hose and tube assemblies.
- **Tube:** The tube nozzle has a stop on the inside of the tube nozzle that will form an airtight seal when the tube is fully inserted into the nozzle.
- **FFORX:** Special nozzle designed to accommodate -4 Flat Face O-Ring Style Fittings. These fittings may be referred to as Face Seal, Seal Lok or FFORX.
- **Large Universal Nozzle:** This nozzle is similar to our hose style nozzle. It enlarges 55mm (2-1/8") to 90mm (3-1/2") in 10 mm increments. The 10mm increments can be easily cut off to suit your application. The Universal Nozzle can be ordered as P/N UC-U55/90.

### Custom Nozzles:

We can engineer and fabricate special nozzles in your choice of material for difficult or unique applications.



Hose, JIC, Tube & FFORX Nozzle 1/8" to 2"

## Selection of Projectiles

The projectile cleans by being pressed against the internal surface of the hose, tube or pipe. This pressure is achieved as the projectile is approximately 20% to 30% larger than the internal diameter of the hose, tube or pipe. For instance, a 50mm (2") projectile is recommended for a 38mm (1-1/2") hose.

Type	Application
Cleaning (MG)	<b>Hose, tube, or pipe with build up of contamination, surface rust or scale.</b>
Abrasive (A)	<b>Hose, tube, pipe and assemblies. Removes fine particles of loose contamination and can also be used for product purging.</b>
Grinding (GR)	<b>Straight lengths of tube or pipe with greater build up of contamination, surface rust or scale.</b>

NOTE: A Cleaning projectile should always be used after abrasive and grinding projectiles to verify cleanliness.

Individual circumstances may require a smaller or larger projectile. If the projectile is too large it will not leave the nozzle and if it is too small it will not clean effectively. The enormous variety in the types of couplings available today could also mean in some circumstances that the recommended size is inappropriate. When cleaning assemblies, a reduction in projectile size may be appropriate, as all the recommendations are based on the most commonly used coupling sizes.

### Bulk Projectiles

Mandus Group also offers Cleaning Projectiles packaged in bulk quantities. The bulk projectile program complements the Bench Mount Launchers for use in a production type atmosphere. Contact Mandus Group for pricing and package quantities.



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## Recommended Cleaning Procedures

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### HOSE

When hydraulic hose is cut with saws that use metal blades or abrasive wheels a tremendous amount of heat is generated. The heat from the cutting process will cause the rubber dust and metal particle contaminants to stick to the hose tube as they cool. It is vitally important to clean the hose immediately after the cutting process before the contaminants cool and stick to achieve the best results. A Cleaning projectile should be fired through the hose prior to the installation of end connections. Fire one projectile in each direction through the length of the hose. This will allow cleaning in the areas occupied by the insertion of the hose nozzle at either end during the cleaning process. After the crimping or swaging of fittings, a Cleaning projectile should be fired through the entire hose assembly. This projectile will remove the metal flash from the crimping or swaging process. It is also important to tape or cap the end fittings immediately following the last projectile. Taping the hose ends will keep airborne contaminants from entering the hose.

### USED HOSE AND TUBE ASSEMBLIES

Hydraulic hose and tube assemblies from systems that have experienced a failure need to have all of the contaminated oil removed. Disconnect each end of the assembly and secure one end into a projectile catcher. Fire air into the assembly without a projectile for several seconds to remove the excess contaminated hydraulic fluid. Fire 3 to 4 Cleaning projectiles through the assembly to remove contamination. Visibly check the last projectile for contamination. Repeat process until projectile has no signs of rubber or metallic particles on it. If the projectiles continue to show rubber particles the hose may need to be replaced. This is usually a sign of a rubber tube that is failing.

### TUBE

When tubing requires cutting, the ends should be thoroughly deburred prior to use of the cleaning system. A tube nozzle and two Cleaning projectiles may then be implemented to clean the tube. If the tube appears to contain rust, weld slag or other corrosion on the inside surface, then an abrasive projectile should be used first, as many times as necessary to remove the corrosion. Follow by using a Cleaning projectile to ensure proper cleanliness. If flaring is required, this should also be done prior to cleaning. In this case, the use of a JIC nozzle will be necessary to mate properly with the flared end of the tubing. If special fittings are used that require crimping, then the use of a Cleaning Projectile, in addition to the procedure described above, is also recommended after the assembly is completed.

### PIPE

We recommend the use of a grinding projectile when rust is present or an abrasive projectile for cleaning the inside of all types of carbon steel piping products. These projectiles may be used more than once, if necessary, or until they wear out. After several passes with the grinding or abrasive projectiles, a Cleaning projectile should be fired through the pipe, removing and debris left behind by the previous projectiles. This can only be accomplished if the pipe has a relatively smooth surface. Our Grinding projectiles will negotiate sweep elbows only. The Cleaning projectile can also be soaked in corrosion inhibiting chemicals that will in effect be applied to the entire 360 degree inside surface as it passes from one end to the other.

# Hose & Assembly Sizing Chart

## HOSE

HOSE SIZE	NOZZLE	CLEANING PROJECTILE
3/16"	UC-HO6	MG06
1/4"	UC-HO6	MG10 OR MG12
5/16"	UC-HO8	MG12 OR MG14
3/8"	UC-H10	MG14 OR MG16
1/2"	UC-H13	MG18 OR MG20
5/8"	UC-H16	MG22
3/4"	UC-H19	MG26
1"	UC-H25	MG33 OR MG36
1-1/4"	UC-H32	MG40 OR MG45
1-1/2"	UC-H38	MG50 OR MG55
2"	UC-H50	MG60 OR MG65
2-1/2"	UC-U55/90	MG75
3"	UC-U55/90	MG85

Use larger recommended Cleaning Projectile when cutting hose with an abrasive wheel.

## HOSE ASSY W/CODE 61 & 62 FLANGES

FLANGE SIZE	NOZZLE	CLEANING PROJECTILE
1/2"	UC-H10	MG16
3/4"	UC-H16	MG26
1"	UC-H19	MG33
1-1/4"	UC-H25	MG40
1-1/2"	UC-H32	MG50
2"	UC-H38	MG60

## HOSE ASSY W/FFORX FITTING

FFORX SIZE	NOZZLE	CLEANING PROJECTILE
1/4"	UC-4 FFORX	MG06 OR MG07
3/8"	UC-HO6	MG12
1/2"	UC-H10	MG16
5/8"	UC-H13	MG22
3/4"	UC-H16	MG26
1"	UC-H19	MG33
1-1/4"	UC-H25	MG40

## HOSE ASSY W/FJIC FITTINGS

FJIC SIZE	NOZZLE	CLEANING PROJECTILE
1/4"	UC-JO6	MG06 OR MG07
3/8"	UC-J10	MG12
1/2"	UC-J13/T13	MG16
5/8"	UC-J16/T16	MG22
3/4"	UC-J19/T19	MG26
1"	UC-J25/T25	MG33
1-1/4"	UC-J32/T32	MG40
1-1/2"	UC-J38/T38	MG50
2"	UC-J50/T50	MG60

The above sizes are recommendations. Due to different manufacturers, types of fittings, and the amount of contamination in the line, the projectile size may need to be adjusted.



## Hydraulic Tube Sizing Chart

OD X WALL	NOZZLE	CLEAN PROJ.	ABRASIVE PROJ.	OD X WALL	NOZZLE	CLEAN PROJ.	ABRASIVE PROJ.
1/8" X .030"	UC-T03	MG04		1" X .065"	UC-J32/T25	MG33	MG-A30
1/4" X .035"	UC-T06	MG10	MG-A07	1" X .083"	UC-J32/T25	MG33	MG-A30
1/4" X .049"	UC-T06	MG08	MG-A07	1" X .095"	UC-J32/T25	MG33	MG-A30
1/4" X .065"	UC-T06	MG07		1" X .120"	UC-J32/T25	MG30	MG-A28
5/16" X .035"	UC-T08	MG12	MG-A10	1-1/4" X .065"	UC-T32	MG40	MG-A40
3/8" X .035"	UC-T10	MG14	MG-A12	1-1/4" X .083"	UC-T32	MG40	MG-A36
3/8" X .049"	UC-T10	MG14	MG-A12	1-1/4" X .095"	UC-T32	MG40	MG-A36
3/8" X .065"	UC-T10	MG12	MG-A10	1-1/4" X .109"	UC-T32	MG36	MG-A36
1/2" X .035"	UC-J13/T13	MG16	MG-A16	1-1/4" X .120"	UC-T32	MG36	MG-A33
1/2" X .049"	UC-J13/T13	MG16	MG-A16	1-1/2" X .065"	UC-J38/T38	MG50	MG-A45
1/2" X .065"	UC-J13/T13	MG16	MG-A14	1-1/2" X .083"	UC-J38/T38	MG50	MG-A45
1/2" X .083"	UC-J13/T13	MG14	MG-A12	1-1/2" X .095"	UC-J38/T38	MG50	MG-A45
5/8" X .049"	UC-J16/T16	MG22	MG-A20	1-1/2" X .120"	UC-J38/T38	MG50	MG-A45
5/8" X .065"	UC-J16/T16	MG20	MG-A18	1-1/2" X .134"	UC-J38/T38	MG45	MG-A40
5/8" X .083"	UC-J16/T16	MG20	MG-A18	1-1/2" X .148"	UC-J38/T38	MG45	MG-A40
3/4" X .049"	UC-J19/T19	MG26	MG-A24	2" X .065"	UC-J50/T50	MG60	MG-A55
3/4" X .065"	UC-J19/T19	MG26	MG-A24	2" X .095"	UC-J50/T50	MG60	MG-A55
3/4" X .095"	UC-J19/T19	MG22	MG-A20	2" X .109"	UC-J50/T50	MG60	MG-A55
7/8" X .049"	UC-J25/T22	MG33	MG-A30	2" X .120"	UC-J50/T50	MG60	MG-A55
7/8" X .065"	UC-J25/T22	MG30	MG-A28	2" X .134"	UC-J50/T50	MG55	MG-A50
7/8" X .095"	UC-H16	MG28	MG-A26	2" X .180"	UC-J50/T50	MG55	MG-A50
				2" X .188"	UC-J50/T50	MG55	MG-A50

Tubing must be deburred prior to firing projectiles

Depending on the type of contamination present in the tube, abrasive projectiles may be used to remove rust and scale.

Always use a Cleaning projectile after the use of an abrasive projectile.

If the operator is unsure of which type or size projectile to use, please call us for technical assistance.

## Metric Tube Sizing Chart

OD X WALL	NOZZLE	CLEAN PROJ.	ABRASIVE PROJ.	OD X WALL	NOZZLE	CLEAN PROJ.	ABRASIVE PROJ.
3 X .5	UC-T03	MG04		20 X 1.5	UC-H16	MG28	MG-A26
3 X .7	UC-T03	MG03		20 X 2.0	UC-H16	MG26	MG-A24
6 X 1.0	UC-T06	MG08	MG-A07	20 X 2.5	UC-H13	MG24	MG-A22
6 X 1.5	UC-T06	MG07	MG-A06	20 X 3.0	UC-H13	MG22	MG-A20
8 X 1.0	UC-T08	MG10	MG-A08	22 X 1.0	UC-J25/T22	MG30	MG-A28
8 X 1.5	UC-T08	MG08	MG-A07	22 X 1.5	UC-J25/T22	MG28	MG-A26
10 X 1.0	UC-H06	MG14	MG-A12	22 X 2.0	UC-J25/T22	MG28	MG-A26
10 X 1.5	UC-H06	MG12	MG-A10	25 X 2.0	UC-J32/T25	MG33	MG-A30
12 X 1.0	UC-J13/T13	MG16	MG-A14	25 X 2.5	UC-J32/T25	MG30	MG-A28
12 X 1.5	UC-J13/T13	MG14	MG-A14	25 X 3.0	UC-H19	MG28	MG-A26
12 X 2.0	UC-H06	MG12	MG-A12	30 X 2.0	UC-H25	MG36	MG-A33
14 X 1.0	UC-H10	MG18	MG-A16	30 X 2.5	UC-H25	MG36	MG-A33
14 X 1.5	UC-H10	MG16	MG-A16	30 X 3.0	UC-H25	MG33	MG-A30
14 X 2.0	HC-H10	MG16	MG-A14	30 X 4.0	UC-H19	MG40	MG-A30
15 X 1.0	HC-H13	MG20	MG-A18	35 X 2.0	UC-H32	MG45	MG-A40
15 X 1.5	UC-H10	MG18	MG-A16	35 X 3.0	UC-H25	MG40	MG-A40
15 X 2.0	UC-H10	MG16	MG-A16	35 X 4.0	UC-H25	MG36	MG-A36
16 X 1.0	UC-J16/T16	MG22	MG-A20	35 X 5.0	UC-H25	MG36	MG-A33
16 X 1.5	UC-J16/T16	MG20	MG-A18	38 X 2.5	UC-J38/T38	MG50	MG-A45
16 X 2.0	UC-J16/T16	MG18	MG-A16	38 X 3.0	UC-J38/T38	MG50	MG-A45
16 X 2.5	UC-J16/T16	MG16	MG-A16	38 X 4.0	UC-J38/T38	MG45	MG-A40
18 X 1.0	UC-J19/T19	MG26	MG-A24	38 X 5.0	UC-H25	MG40	MG-A40
18 X 1.5	UC-J19/T19	MG24	MG-A22	50 X 5.0	UC-J50/T50	MG55	MG-A50
18 X 2.0	UC-J19/T19	MG22	MG-A20				
18 X 2.5	UC-J19/T19	MG20	MG-18				

Tube must be deburred prior to firing projectiles

Depending on the type of contamination present in the tube, abrasive projectiles may be used to remove rust and scale.

Always use a Cleaning projectile after the use of an abrasive projectile.

If the operator is unsure of which type or size projectile to use, please call us for technical assistance.

## Problem Solving for the User

Problem	Solution
Projectile remains lodged in hose, tube, pipe or assembly.	<ul style="list-style-type: none"> <li>• To clear projectile, operate unit from other end without using a projectile.</li> <li>• Check hose, tube or pipe for leaks, holes, breakage, etc.</li> <li>• Check restrictions in line, i.e. contraction from 10mm to 5mm then expansion to 10mm.</li> <li>• Check projectiles for tear marks.</li> <li>• Check air pressure at air source.</li> <li>• Make sure hose fittings from air source are correct.</li> <li>• Consider using smaller projectile.</li> </ul>
Projectile will not enter hose, tube, pipe or assembly.	<ul style="list-style-type: none"> <li>• Check air pressure, as compressor may not have built up sufficient pressure.</li> <li>• Try smaller projectile.</li> <li>• Make sure quick release coupling is correct size (8mm minimum is required).</li> <li>• Operate unit from other end.</li> <li>• Ensure tube entry is not restricted from process of cutting.</li> </ul>
Launcher will not operate.	<ul style="list-style-type: none"> <li>• Make sure air is connected and turned on.</li> </ul>
Leaking air at hose, tube, pipe or assembly entry.	<ul style="list-style-type: none"> <li>• Hold unit firmly against hose, tube, pipe or assembly to ensure proper seal.</li> </ul>
Contraction of two pipes into one.	<ul style="list-style-type: none"> <li>• Operate pneumatic launcher from one end of two ends in one continuing line.</li> <li>• Operate launcher from other end into the one continuing line.</li> </ul>
Nozzle does not fit into O-ring on launcher easily.	<ul style="list-style-type: none"> <li>• Apply small amount of high grade petroleum jelly to O-ring.</li> </ul>
Trigger jams allowing air to escape.	<ul style="list-style-type: none"> <li>• Release quick release coupling.</li> </ul>