



MH/HP Hot Tap Tool

Operation Manual

Metal Samples Company

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I. General Welding Instructions for Installing Access Fitting

1. Determine if the system in which the access fitting is to be placed will permit welding.
2. Remove plug assembly from nipple prior to welding.
3. Protect internal and external threads from weld splatter with an asbestos cloth wrapped around the body and dampened on the outside only.
4. Place nipple on line and align, orientating groove in nipple directly on the center line of the downstream side of the line.
5. Establish proper weld gap by placing 1/16" spacer rods under the fitting.
6. Most steels should be preheated prior to welding when the fluid or metal temperature is less than 50° F.
7. Arc welding should be used to minimize warpage.
8. Preheat nipple body to 400° F and tack weld, using AWS 1/8" welding rod of proper grade.
9. Remove weld gap spacers. Remove tack weld slag.
10. Tie root pass into tack weld to make complete fusion. Apply stringer bead around base of fitting, removing slag each pass.
11. Tempil sticks should be used to ensure the nipple body temperature does not exceed 1000° F.
12. Apply continuous cover beads to fill the bevel.
13. Apply post weld temperature of 600° F for fifteen (15) minutes and wrap with thermal cloth and allow to cool.
14. Hot tapping will be necessary for lines in service.

Note: Weld time is approximately one (1) hour with welder and helper.

The procedure described above is for general nipple installation reference. Metal Samples **shall not** be held responsible or liable in any way for loss or damage resulting therefrom, or any regulations with which they may conflict.

II. Hot Tap Procedures

A. General

After an access nipple has been welded to a line, the procedures outlined below should be followed to ensure a safe and satisfactory installation.

B. Safety of Location

Although the Metal Samples' Hot Tap equipment provides double sealing against any possible leakage of product during the hot tap procedure, the following precautions should be observed.

1. Where tapping below grade level, excavations should permit rapid access and exit by personnel. If necessary to remove fumes or flammable vapors, some positive method of ventilation should be provided.
2. Where tapping above ground in a congested area, necessary precautions should be taken to prevent trapping of personnel.
3. Where tapping into a line that contains toxic product, the vent connection on the Metal Samples Hot Tap Valve should be piped away from the tapping location.

C. Weld and Nipple Test Prior To Tapping

1. Weld

Visually examine the weld for proper configuration, surface cracks, etc. Ultrasonic, dye penetrant, magnetic particles, etc., also may be used to test the soundness of the weld.

2. Nipple

Visually examine the inside of the nipple to ensure that excessive weld spatter, or material, is not present. Too much material will prevent proper insertion of the Hot Tap Cutter. If spatter in the nipple bore cannot be dislodged by hand, insert the 1.375" diameter Reamer, Part # HA102004, and remove spatter.

Visually examine the tapered seat to ensure that the seat has not been damaged during nipple installation. If the tapered seat is damaged, the following procedure should be followed:

Refer to **Figure 4**.

- a. Insert Seat Reaming Assembly into Nipple
Note: If difficulties are encountered in inserting tool due to weld spatter, or other material in the threads, use Thread Chaser (MH Part # HA102009 / HP Part # HA102038).
- b. Hand tighten the Drive Mandrel (Item 3) until the Reamer (Item 4) is in contact with the tapered seat of the Nipple.
- c. Rotate the Reamer (Item 4) by hand while slowly advancing the Drive Mandrel. **DO NOT** use a power source for reaming.
- d. **DO NOT OVER REAM!** The Seat Reaming Assembly should be removed after small advancement of the Drive Mandrel and the seat examined.
- e. After each tool removal, including the final removal, the seat Reamer and the Nipple should be wiped clean of cuttings.

3. Hydrostatic Test

- a. If the Nipple is positioned on the top of the line, pour in about two inches of test liquid.
- b. Install Weld and Seal Test Fixture Assembly (MH Part # HA102019 / HP Part # HA102017) in Nipple and tighten. The Test Fixture is also designed to check the Nipple to ensure that no clearance problems will be encountered when the Hot Tap Cutter is installed. (NOTE: **DO NOT OVER TORQUE!**) If difficulty is encountered in fully inserting the Test Fixture, insert the 1.375" Reamer, Part # HA102004, and ream to bottom. Clean out Nipple after reaming.
- c. Attach pump to Fixture and apply pressure. This pressure should be at least 150% of maximum anticipated working pressure. **DO NOT** exceed 9000 psi.
- d. Pressure should be maintained at least fifteen (15) minutes or as specified.
- e. If pressure cannot be maintained without additional pumping, three problem areas can exist:
 1. Weld
 2. Seal
 3. Pump Check Valve

If the weld or seal are leaking, they can be visually observed. If the pump check valve is leaking, continued pumping will allow observation of either a weld or seal leak. (NOTE: Pump should be repaired as soon as possible).

- f. If the seal leaks, two possible problems exist:
 1. Tapered Seat is damaged
 2. O-Ring on Fixture is damaged

If the Tapered Seat is damaged, follow the procedure outlined in Section II, C, 2.
If the O-Ring is damaged, replace.

D. Tapping Procedure

1. Install Hot Tap Cutter Assembly (MH Part# HA102010 / HP Part# 102015) in Nipple Body

- a. Cutter should be pressure tested before installation using the Metal Samples Cutter Test Assembly (MH Part # HA102012 / HP Part # HA102020).
- b. After Cutter Assembly is installed in Nipple and tightened, rotate the Cutter Shaft to be sure the shaft rotates freely, using Bushing Insertion Tool, Part # PR6483.

2. Install Service Valve

- a. Install the valve with the valve open.
- b. Close the valve to ensure that no interference exists between the Cutter Body and the valve ball.

3. Install Hot Tap Tool

- a. Hot Tap Tool should be pressure tested before installation using the Metal Samples Hot Tap and Retrieval Tool Test Assembly, Part # HA102013. Charge tool with cutting oil after it has been screwed onto valve or adapter.
- b. Open Service Valve.
- c. Check to make sure the Drive Screw of the Hot Tap Tool is in the fully retracted position.
- d. Position Hot Tap Tool on the Service Valve and tighten.
- e. Close Service Valve to ensure that no interference exists between the Hot Tap Tool Shaft and the valve ball.
- f. Reopen Service Valve and pressure test the complete installation.
Note: This procedure should be used to provide a test of all connection seals.
- g. Advance the Drive Screw of the Hot Tap Tool until the tab on the end of the Hot Tap Tool Drive Shaft contacts the Cutter Shaft.

1. Nipples Horizontal and on the Top of Line

As a rule, the tab will not position itself immediately into the hex in the Cutter Shaft. Maintaining a light pressure on the contact, hand rotate the Hot Tap Shaft using the Hot Tap Turning Handle, Part # HA102007, until you feel the hex engage. Once engaged, the Drive Screw should advance freely for about three (3) turns. This positions the hex in the bottom of the Cutter Shaft slot. Cutting is ready to commence.

2. Nipple on Bottom of Line

Since the Cutter Shaft may be down, advancement and rotation of the Drive Shaft will allow the hex to engage the shaft.

NOTE: Rotation should be smooth. If a thumping or jumping is noticed, the hex is not engaged on the shaft.

4. Cutting Procedure

- a. Measure the location of the Drive Screw for a check on depth of cut.
- b. Remove all load from the Hot Tap Tool Drive Shaft and start rotation.
 1. The cut should be started by manual rotation for a total travel of at least 1/8".
 2. Slowly advance the Drive Shaft while rotating. AT NO TIME should an operator or an air drive wrench be loaded enough to make rotation difficult.
 3. Where manual rotation is used, continuous turning rather than ratcheting is recommended for a faster cut and to minimize the possibility of breaking the cutter teeth.
 4. If air drive is used, be sure that the maximum rotational speed of the drive does not exceed 400 RPM.
 5. DO NOT back off the Drive Screw of the Hot Tap Tool more than three (3) revolutions after cutting commences. If necessary for some reason, be sure and repeat the steps in Section II, D, 3, g to ensure that the hex is still engaged on the shaft.
 6. After every 2-3mm drilling of pipe, use magnetic swab along with the Mechanical Retrieval Tool to remove metal shavings.
- c. To help determine the required cutter travel from contact of the Cutter to a full cut of 1 3/8" diameter, the following formula can be used as a guide:

$$\text{Cutter Travel Required} = \frac{OD}{2} - x$$

$$\text{Where: } x = \sqrt{\left(\frac{id}{2}\right)^2 - .473}$$

Example:

6 5/8" O.D. Schedule 80 Pipe

Pipe Wall = 0.432"

I.D. = 6.625 - 2 (0.432") = 5.761"

$$x = \sqrt{\left(\frac{5.761}{2}\right)^2 - .473} \quad x = 2.797$$

$$\text{Cutter Travel Required} = \frac{6.625}{2} - 2.797 = .516''$$

- d. When the Cutter breaks through the pipe wall, the internal pressure of the line starts acting against the diameter of the Cutter Shaft. This load causes a noticeable increase in the force required to advance the Hot Tap Tool Drive Screw but does not appreciably affect the force required for rotation. Be sure to continue to maintain the load on the Cutter so that rotation is not difficult, either for an operator or an air wrench.
- e. When the Hole Cutter completes the cut, the Hot Tap Tool Drive Shaft will rotate freely. As soon as this is felt, stop rotation. The Drive Screw can be advanced slightly to ensure a full cut but should not be extended into the line. This prevents flow from washing out the shavings and assists in containing the plug in the Cutter.
- f. After the cut is complete, rotate the Hot Tap Tool Drive Screw to the fully retracted position while holding the Hot Tap Tool Drive Shaft to prevent rotation. Close the Service Valve and remove the Hot Tap Tool. Bleed pressure off prior to removing Hot Tap Tool from line.

5. Completion Procedure

- a. Install Retrieval Tool on the Service Valve after testing with Hot Tap Tool and Retrieval Tool Test Assembly, Part # HA102013.
- b. Open the Service Valve, advance the Retrieval Tool Shaft to engage the Cutter Body. (Note: See Retrieval Tool Operating Procedure.)
- c. Rotate Retrieval Tool counterclockwise to remove Cutter Assembly.

Caution: If pressure has not been equalized between the line and the Retrieval Tool after a maximum of five (5) revolutions of the Retrieval Tool Shaft, equalize the pressure between the line and the Retrieval Tool before continuing. This equalization will prevent a surge when the last thread of the Cutter Body is disengaged. A surge can cause extremely rapid rotation of the Retrieval Tool Handwheel.

The problem of not equalizing is especially prevalent when tapping a Nipple attached to the bottom of the line because of the tendency of the shavings to gravitate to the equalization areas provided.

- d. After Cutter Assembly is disengaged, retract into the Retrieval Tool and close the Service Valve.
 - 1. If the MH Adapter Assembly with Collet Latch, Part # PS5554158, disengages from the Cutter Assembly because shavings have lodged it in the Nipple, re-engage the Collet and screw the Cutter Assembly back into the Nipple.

Note: It may be necessary to remove the Collet from the Retrieval Tool to accomplish this re-engagement, since the Cutter Body can be rotating freely on the Cutter Shaft.

2. Retract the Retrieval Tool, close the Service Valve, remove the Retrieval Tool. Remove the Adapter Assembly from the Retrieval Tool and install the Hot Tap Overshoot Tool, Part # HA102014.

Reinstall the Retrieval Tool, open the Service Valve and advance the Retrieval Tool Shaft until contact is made with the Cutter Assembly. Maintaining a light pressure on the Handwheel, rotate the Retrieval Tool counterclockwise to engage the left-hand threads of the Adapter with the left-hand threads on top of the Cutter Body.

After the threads are engaged, continue rotating counterclockwise. The Retrieval Tool Handwheel will rotate in as the left-hand threads are engaging and then reverse after the left-hand threads have reached their stop and the Cutter Assembly is being unscrewed from the Nipple. After the Cutter Assembly is free from the Nipple, direct force on the Handwheel is used to free the Cutter Assembly from the Nipple.

- e. Where the Nipple is installed on the bottom of the line, install a Surge Tube Assembly, Part # HA102005, when available, in the Service Valve. Open the Service Valve and flow into the Surge Tube Assembly. This will wash cuttings from the Nipple.
- f.
 1. Remove the Cutter Assembly from the Retrieval Tool.
 2. Install MH Hot Tap Adapter Assembly, HA102001158, on the Retrieval Tool Adapter.
 3. Insert the Magnetic Swab Assembly, HA102003, in the Adapter with the indentation below the Set Screw Hole. Reinsert Set Screw and tighten.
 4. Reposition Retrieval Tool on the Service Valve, open the valve and advance the Retrieval Tool Shaft clockwise until resistance is felt.
 5. Maintaining a steady forward pressure on the Handwheel, rotate the Retrieval Tool Shaft clockwise until no additional forward movement is possible.
 6. To remove, rotate counterclockwise while maintaining a steady backward pressure on the Handwheel. Retract completely, close the Service Valve and remove the Retrieval Tool.

Note: If a large number of shavings are present, repeat the swab operation after removing all possible cuttings from the Magnetic Swab Assembly.

- g.
 1. Install Thread Chaser in Adapter (MH Part # HA102009 / HP Part # HA102038), reposition Retrieval Tool, open Service Valve, and advance Retrieval Tool Shaft until resistance is felt.
 2. Rotate Retrieval Tool clockwise to chase threads. When a stop is reached, do not continue rotation, or damage to the seat can occur.
 3. To remove, rotate counterclockwise until the Thread Chaser is disengaged, then remove.
- h. Repeat steps in section “f” above with Magnetic Swab Assembly.

- i.
 1. Remove MH Hot Tap Adapter Assembly, HA102001158, from the Retrieval Tool Adapter.
 2. Install Access Fitting Plug as required on the Retrieval Tool Adapter, reposition Retrieval Tool, open Service Valve and install Access Fitting Plug in the Nipple. Retract Retrieval Tool.
 3. Bleed pressure from the Retrieval Tool to ensure that the Access Fitting is properly sealed.
 4. Remove Retrieval Tool.
 5. Remove Service Valve.
 6. Install Protective Cover on Nipple.
 7. Operation is complete.

E. General Notes

1. If the seal in the Cutter Assembly starts leaking during a tapping operation, the tapping can continue, but it is recommended that the Cutter be removed for replacement or repair before continuing. Use the Magnetic Swab Assembly to clean out the Nipple before reinstalling the Cutter Assembly.
2. If it becomes apparent that no penetration of the pipe wall is being made, do not continue rotation. Remove the Cutter Assembly and examine. If the Cutter Teeth are shattered or worn down due to excessive pressure, a new Cutter should be installed after cleaning with the Magnetic Swab Assembly.
3. APS5554158 MH Adapter Assembly is provided with the HP Hot Tap Tool for use with the cutter assembly, magnetic swab assembly, seat reamer and bore reamer.
4. The MH Hot Tap Adapter Assembly HA102001158 must be installed on the MH adapter (PS5554158) before attaching the magnetic swab, bore reamer, seat reamer and MH Thread Chaser. If the MH Hot Tap Adapter Assembly is installed onto the attachments first, then it will not attach to the MH Adapter.
5. If Metal Samples Hot Tap equipment is used on any other than Metal Samples access fittings, clearance of the cutter should be verified prior to tapping operation. This is to ensure that no interference exists between the Cutter Body and the access fitting inside diameter.
6. Metal Samples Hot Tap equipment is designed and must be used in conjunction with Metal Samples Service Valve and Retrieval Tool.
7. For severely damaged threads, Metal Samples offers a thread tap (HA102016) that is intended to cut threads. HA102038 is intended to chase and clean threads only.

III. Hot Tap Tool Servicing Procedures

To disassemble the Hot Tap Tool, the following sequence should be followed:
(Refer to **Figure 1.**)

1. Drive out Item 24 (Spirol Pin) and remove Item 25 (Upper Stop Ring).
2. Loosen Item 16 (Set Screw) and unscrew Item 17 (Bearing Cap).
3. Remove Items 18, 19, 20, 21, and 22 from Shaft and Bearing Cap.
Note: When reinstalling, be sure that parts are reinstalled as shown on assembly.
4. Remove Item 14 (Drive Tube).
5. Remove Item 15 (Upper Sleeve Bearing).
6. Remove Item 1 (Drive Shaft) by pulling through the front of the tool.
7. Remove Item 5 (Truarc Ring / Snap Ring) using Internal Snap Ring Pliers, Part # PR6479.
8. Unscrew Item 9 (Lower Bushing) using 1 3/8" Hex Socket.
9. Remove Item 10 (Lower Sleeve Bearing).
10. Remove Item 6 (Omniseal).
11. Clean and regrease* all parts and reinstall in reverse sequence with the following exception:

When installing shaft, be sure to use the Seal Insertion Ring. Unless the Ring is used, the Omniseal will be damaged. After the Shaft is in position, be sure to remove the Seal Insertion Ring.

*Recommended Grease - Molykote BR2 Plus or equivalent.

IV. Cutter Assembly Servicing Procedures

After each tap is made, the Cutter Assembly should be completely disassembled and cleaned using the following procedures:

(Refer to **Figure 7.**)

1. Drive out Item 7 (Spirol Pin) and remove the Cutter.
2. Clean Shaft thoroughly then push through Item 4 (Omniseal).
3. Remove Item 3 (Cutter Bushing).
4. Remove Item 4 (Omniseal).
5. Clean all parts thoroughly, regrease and reinstall.
6. Reposition Cutter on Shaft and drive in Spirol Pin.

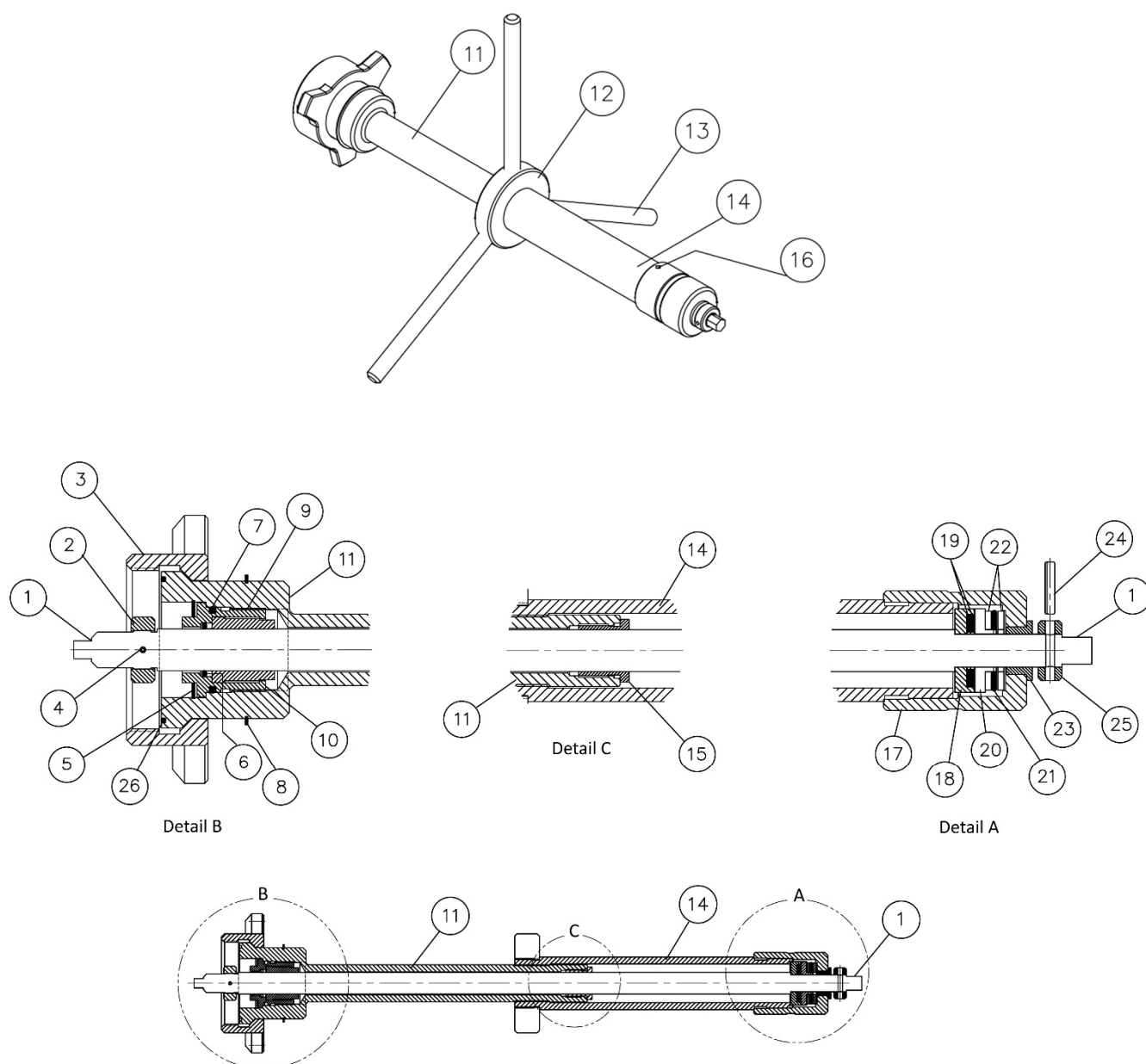


Figure 1. Hot Tap Tool (HA102101)

<u>Description</u>	<u>Part #</u>	<u>Description</u>	<u>Part #</u>
1 Drive Shaft	PR6491110	14 Drive Tube	PR6489707
2 Lower Stop Ring	PR6494158	15 Upper Sleeve Bearing	PR6498
3 Hammer Union (ACME)	PR6290C25	16 Set Screw	09158E3716CP0375
4 Spirol Pin	PR6493138	17 Bearing Cap	PR6506158
5 Truarc Ring	PR6516413	18 Bellville Spring Retainer	PR6499158
6 Omniseal	PR6472	19 Bellville Spring (2 required)	PR6507141
7 O-Ring	PR6456370	20 Bearing Guide	PR6500158
8 Spirol Ring	PR6265138	21 Needle Bearing	PR6508
9 Lower Bushing	PR6497707	22 Bearing Race (2 required)	PR6509
10 Lower Sleeve Bearing	PR6496	23 Drive Cap Bearing	PR6501
11 Body	PR6490110	24 Spirol Pin	PR6510138
12 Drive Ring	PR6495158	25 Upper Stop Ring	PR6488158
13 Handle (3 required)	PR6278158	26 O-Ring Dash #149	PR6285834

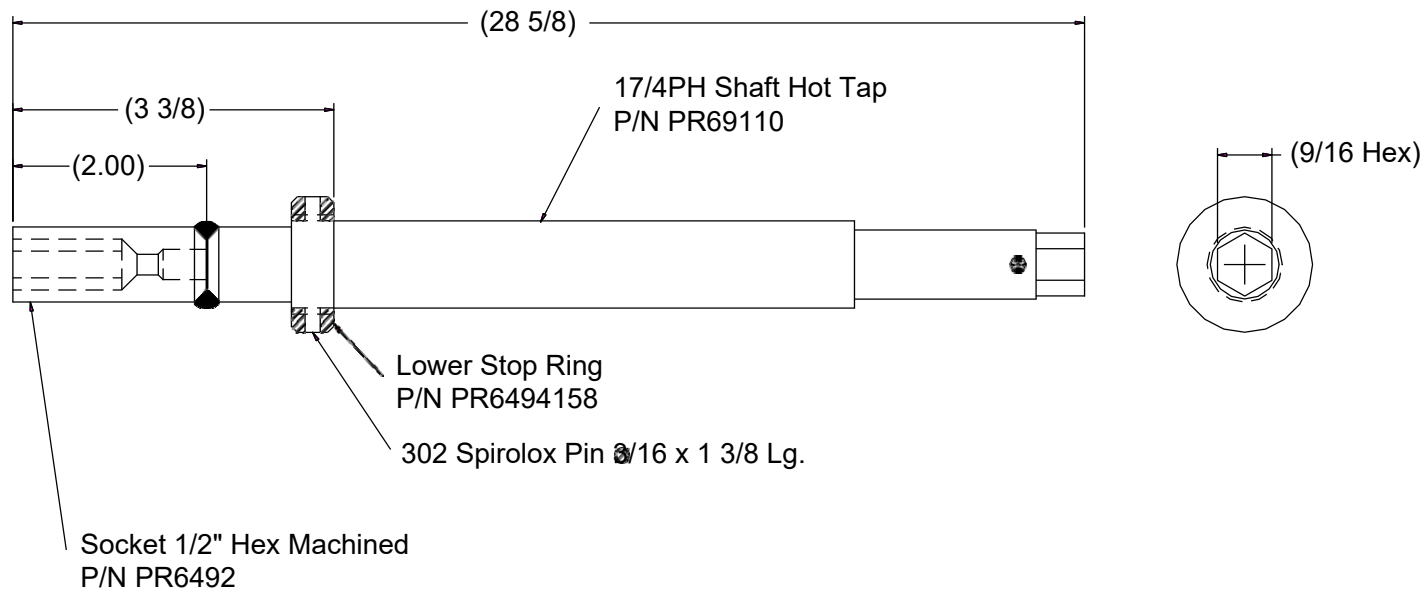


Figure 2. Shaft Assembly (HA102011)

Length = 12 inches

Ream Diameter = 1.370 inches

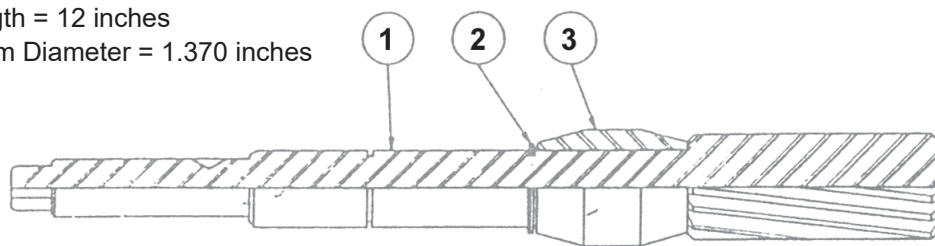
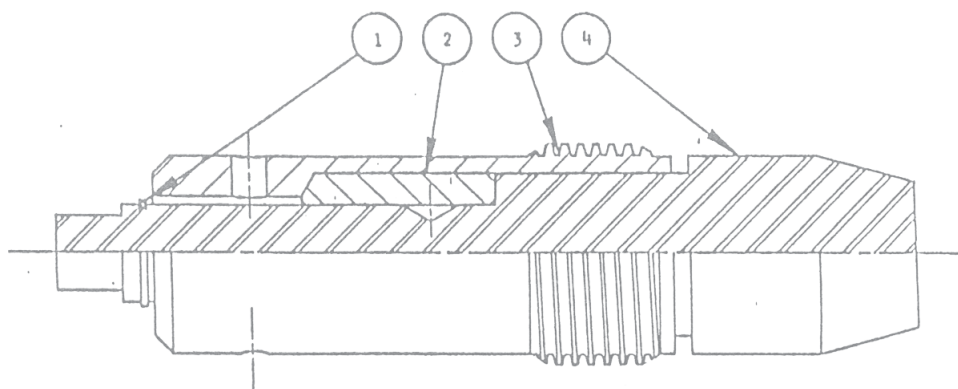


Figure 3. Bore Reamer Assembly (HA102004)

	<u>Description</u>	<u>Part #</u>
1	Reamer	PR6518
2	Spirol Ring	PR6418158
3	Guide	PR6512377



**Figure 4. MH Seat Reaming Assembly (HA102008)
HP Seat Reaming Assembly (HA102018)**

	<u>Description</u>	<u>MH Part #</u>	<u>HP Part #</u>
1	Truarc ring	PR6517413	PR6517413
2	Bearing	PR6583	PR6583
3	Drive Mandrel	PR6584158	PR6586158
4	Seat Reamer	PR6585240	PR6585240

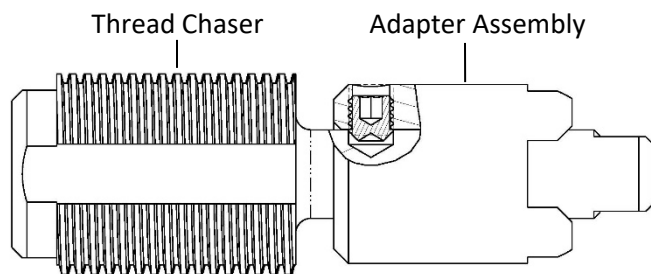


Figure 5A.
MH Thread Chaser with
Adapter Assembly (HA102009)

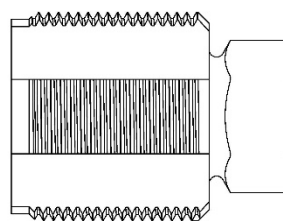


Figure 5B.
HP Thread Chaser
(HA102038)

<u>Description</u>	<u>MH Part #</u>	<u>HP Part #</u>
Thread Chaser	HA102002240	HA102038
Adapter Assembly	HA102001158	N/A – no adapter

Metal Samples also offers an HP Thread Tap Assembly for Repairing Damaged Threads (HA102016). Contact Metal Samples for details.

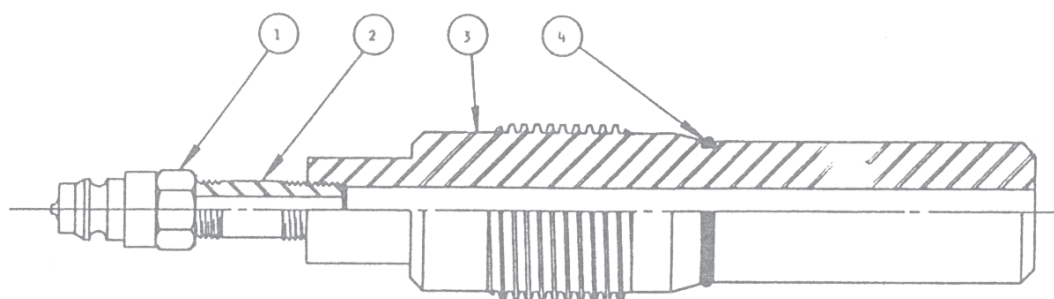
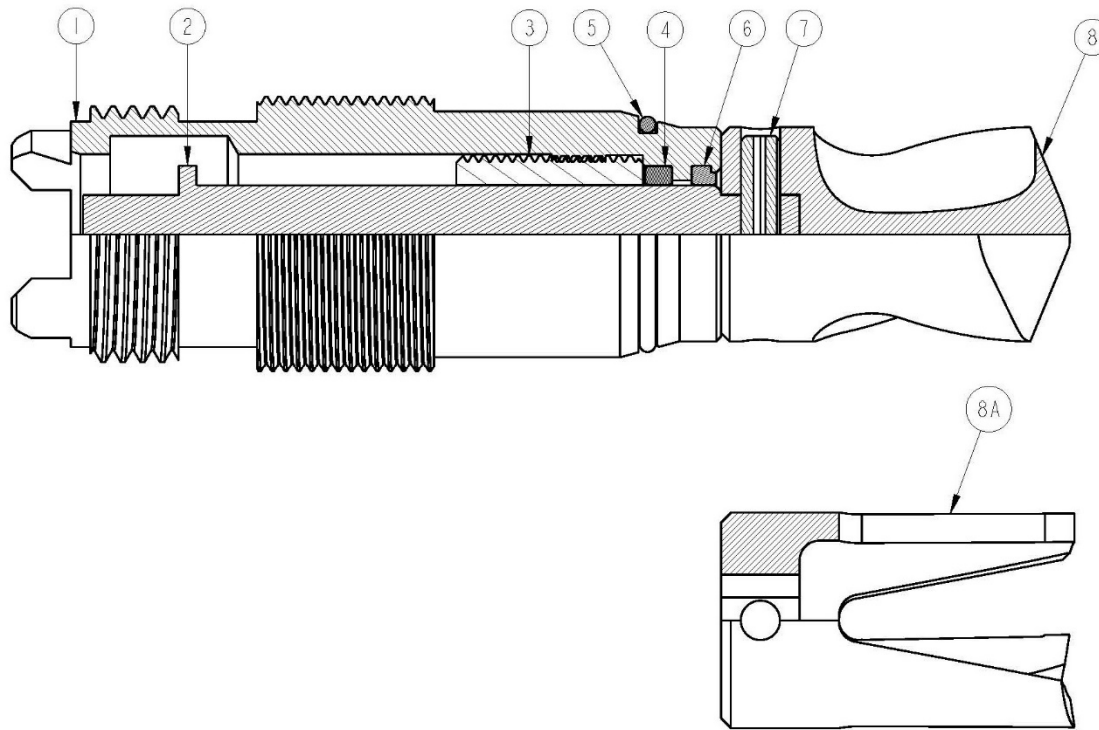


Figure 6. **MH Weld & Seal Test Assembly (HA102019)**
 HP Weld & Seal Test Assembly (HA102017)

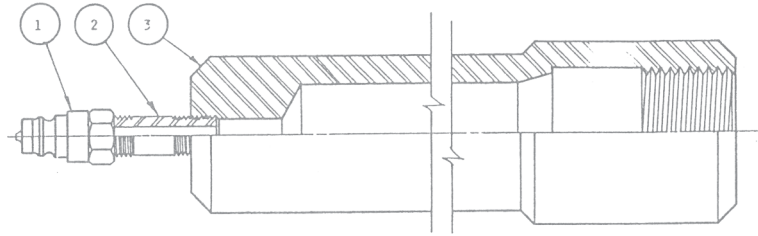
	<u>Description</u>	<u>MH Part #</u>	<u>HP Part #</u>
1	Male Quick Disconnect	PR6519	PR6519
2	1/4" NPT x 2" Nipple	PR65201410200	PR65201410200
3	Plug	PR6603158	PR6521158
4	O'Ring	PR6280370	HA700266785



**Figure 7. MH Cutter Assembly (HA102010)
HP Cutter Assembly (HA102015)**

	<u>Description</u>	<u>MH Part #</u>	<u>HP Part #</u>
1	Cutter Body, 5/8 Nip.	PR6481707	PR6675707
2	Cutter Shaft	PR6476110	PR6476110
3	Cutter Bushing, bronze	PR6482	PR6482
4	Omniseal	PR6471	PR6471
5	O-ring .103" x 1.174"	PR6280370	PR6280370
6	Ring Rod Wiper	PR6474980	PR6474980
7	Spirol Pin .250" x 1.000"	PR6485138	PR6485138
8	Drill Bit	HA102035	HA102034
8A	Cutter*	HA102006656	HA102022656

* Optional item. Sold separately.



**Figure 8. MH Cutter Test Fixture Assembly (HA102012)
HP Cutter Test Fixture Assembly (HA102020)**

	<u>Description</u>	<u>MH Part #</u>	<u>HP Part #</u>
1	Male Quick Disconnect	PR6519	PR6519
2	1/4" x 2" Nipple	PR65201410200	PR65201410200
3	Body	PR6502377	PR6632377

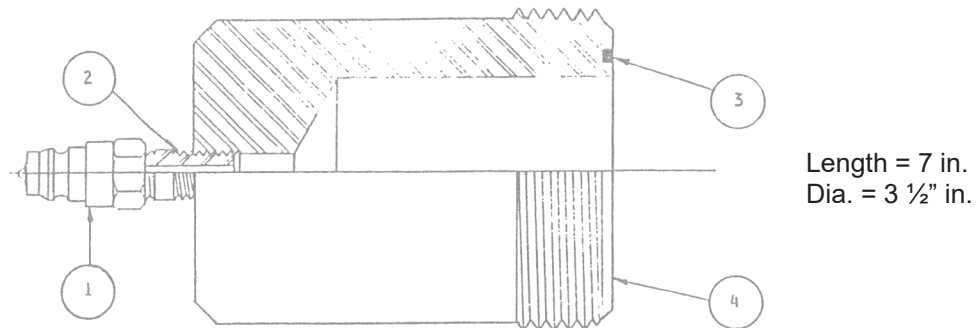


Figure 9. Retrieval Tool Test Assembly (HA102013)

	<u>Description</u>	<u>Part #</u>
1	Male Quick Disconnect	PR6519
2	1/4" x 2" Nipple	PR65201410200
3	O'Ring	PR6303370
4	Body	PR6511377

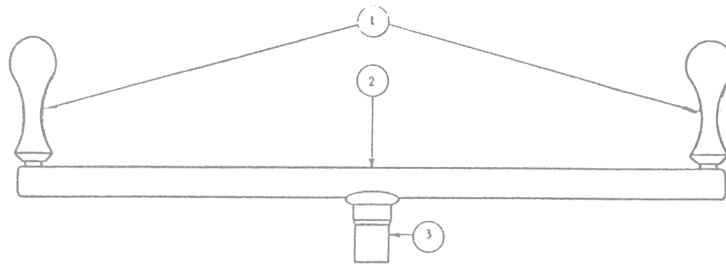


Figure 10. Turning Handle Assembly (HA102007)

	<u>Description</u>	<u>Part #</u>
1	Handle	PR6486413
2	Shaft	02377R00750
3	Socket	PR6487

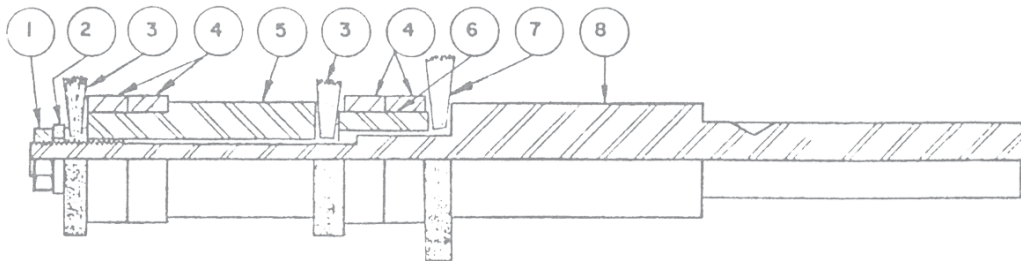


Figure 11. Magnetic Swab Assembly (HA102003)

	<u>Description</u>	<u>Part #</u>
1	Nut 0.375-24 Hex Fin SS316	09158E3724HN0000
2	Wash Fit 0.390 x 0.625 x 0.032 SS	09158E3700FW0000
3	Brsh .375 x 1.375 Dia Steel Rd	PR6524
4	Mag Rng 1.000 x 1.300 x .438	P1042
5	Magnetic Swab Spacer Lower	PR6514158
6	Magnetic Swab Spacer Upper	PR6513158
7	Brsh .375 x 1.750 Dia Steel Rd	PR6525
8	Magnetic Swab, Mandrel	PR6515158

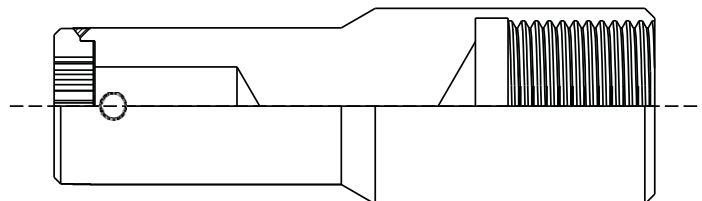


Figure 12. Hot Tap Overshoot Tool (HA102014)



MH HOT TAP TOOL PARTS LIST

<u>Description</u>	<u>Part Number</u>
Hot Tap Tool Assembly	HA102101
Includes:	
Case	PS5604A69
Instruction Manual	n/a
Bore Reamer Assembly	HA102004
Seat Reamer Assembly	HA102008
Thread Chaser Assembly	HA102009 (1)
Weld and Seal Test Assembly	HA102019
Cutter Assembly MH 5-7/8"NIP	HA102010
Cutter Test Assembly	HA102012
Retriever/Hot Tap Tool Test Assembly	HA102013
Turning Handle Assembly	HA102007
Hot Tap Overshoot Tool	HA102014
Magnetic Swab Assembly	HA102003
Drive Ring Handles (3ea)	PR6278158 (2)
Hot Tap Tool Set	PS5599

(1) includes MH Hot Tap Adapter Assembly HA102001158

(2) located in Hot Tap Tool Set



MH HOT TAP TOOL SET PARTS LIST

<u>Description</u>	<u>Part Number</u>
Hot Tap Tool Set	PS5599
Includes:	
3/32" Allen Wrench	PR6478
3/16" Allen Wrench	PR6532
Internal Snap Ring Pliers	PR6479
Female Quick Coupling	PR6477
Seal Insertion Ring	PR6480
1-3/8" Hex Socket	PR6433
Spanner Wrench	PR6356
½" Drive, T Handle	PR6357
External Snap Ring Pliers	PR6484
Hammer 2-1/2# Deadblow Non-Spark	PR6358
Seal Repair Kit	KR1007
Includes:	
Buna N O-Ring #123	PR6280370
Viton O-Ring #149	PR6285834
Buna N O-Ring #222	PR6456370
Variseal Shaft Seal #208	PR6471
Variseal Shaft Seal #212	PR6472
Buna N O-Ring #230	PR6303370
Polyurethane Rod Wiper 5/8"	PR6474980



HP HOT TAP TOOL PARTS LIST

<u>Description</u>	<u>Part Number</u>
Hot Tap Tool Assembly	HA102102
Includes:	
Case	PS5604A69
Instruction Manual	n/a
Bore Reamer Assembly	HA102004
Seat Reamer Assembly	HA102018
Thread Chaser Assembly	HA102038
Weld and Seal Test Assembly	HA102017
Cutter Assembly HP 5-1/4"NIP	HA102015
Cutter Test Assembly	HA102020
Retriever/Hot Tap Tool Test Assembly	HA102013
Turning Handle Assembly	HA102007
Hot Tap Overshoot Tool	HA102014
Magnetic Swab Assembly	HA102003
Drive Ring Handles (3ea)	PR6278158 (1)
Hot Tap Tool Set	PS5599
MH Hot Tap Adapter Assembly	HA102001158
MH Adapter Assembly	PS5554158

(1) located in Hot Tap Tool Set



HP HOT TAP TOOL SET PARTS LIST

<u>Description</u>	<u>Part Number</u>
Hot Tap Tool Set	PS5599
Includes:	
3/32" Allen Wrench	PR6478
3/16" Allen Wrench	PR6352
Internal Snap Ring Pliers	PR6479
Female Quick Coupling	PR6477
Seal Insertion Ring	PR6480
1-3/8" Hex Socket	PR6433
Spanner Wrench	PR6356
½" Drive, T Handle	PR6357
External Snap Ring Pliers	PR6484
Hammer 2-1/2# Deadblow Non-Spark	PR6358
MH Adapter Handle	PR6700
Seal Repair Kit	KR1007
Includes:	
Buna N O-Ring #123	PR6280370
Viton O-Ring #149	PR6285834
Buna N O-Ring #222	PR6456370
Variseal Shaft Seal #208	PR6471
Variseal Shaft Seal #212	PR6472
Buna N O-Ring #230	PR6303370
Polyurethane Rod Wiper 5/8"	PR6474980