

Hypertherm®

HySpeed® HT2000®

Preventive Maintenance Program



Instruction Manual

809020 | Revision 0 | English

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One of Hypertherm's long-standing core values is a focus on minimizing our impact on the environment. Doing so is critical to our, and our customers', success. We are always striving to become better environmental stewards; it is a process we care deeply about.

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HySpeed HT2000 ***Preventive Maintenance Program***

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809020
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September 2015

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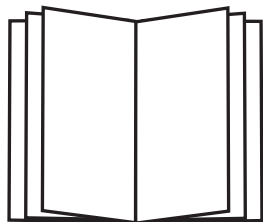
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WARNING!



Before operating any Hypertherm equipment, read the safety instructions in your product's manual and in the *Safety and Compliance Manual* (80669C). Failure to follow safety instructions can result in personal injury or in damage to equipment.

Copies of the manuals may accompany the product in electronic and printed formats. You can also obtain copies of the manuals, in all languages available for each manual, from the "Downloads library" at www.hypertherm.com.

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Preventive Maintenance Program

Overview

Hypertherm plasma systems can operate in harsh conditions for many years. To maintain system performance, minimize operating costs, and lengthen system life, follow the maintenance procedures given in this Preventative Maintenance Program (PMP).

Hypertherm made this PMP specifically for your plasma system. The PMP has two parts: a cleaning and inspection schedule and a component replacement schedule.

If you have questions about how to maintain your plasma system, contact your OEM or regional Hypertherm Technical Service team. You can find contact information for each regional office at www.hypertherm.com on the “Contact us” page.

This document refers to your system’s instruction manual. If you do not have your instruction manual, you can find it in the Hypertherm downloads library:

1. Go to www.hypertherm.com.
2. Click **Downloads library**.
3. Enter your instruction manual's part number in the **Part number** field.
 - ❑ *HySpeed HT2000 Plasma Arc Cutting System Instruction Manual: 802070*

Cleaning and inspection schedule

This is a schedule for cleaning and inspections. The PMP has instructions for each task. These instructions help your personnel understand what to do and what to look for during each task. Usually, operators can do the daily, weekly, and bi-monthly tasks, and maintenance personnel can do the monthly, bi-annual, and annual tasks.

A maintenance log is in the back of this manual. You can make photocopies of the maintenance log to record tasks.

Table 1

Maintenance task or activity	Daily	Weekly	Bi-Monthly	Monthly	Bi-Yearly	Yearly
<i>Do a check of the gas flow settings</i>	X					
<i>Examine the torch and consumables</i>	X					
<i>Examine the torch leads</i>	X					
<i>Examine all of the hoses and hose fittings</i>	X					
<i>Clean inside of the power supply</i>		X				
<i>Clean the torch threads and the ring inside of the torch main body</i>		X				
<i>Do a check of the cooling fans</i>		X				
<i>Do a check of the coolant level</i>		X				
<i>Examine the air filter inside of the power supply</i>			X			
<i>Clean the coolant pump strainer</i>			X			
<i>Make sure that the system is correctly grounded</i>				X		
<i>Examine the exterior of the power supply</i>				X		
<i>Examine and clean the interior of the power supply</i>				X		
<i>Examine the coolant filter in the power supply</i>				X		
<i>Test the rate of coolant flow to the torch</i>				X		
<i>Test the rate of coolant return from the torch</i>				X		
<i>Look for coolant leaks</i>				X		
<i>Clean the torch threads and the rings inside of the torch main body</i>				X		
<i>Examine and lubricate all of the O-rings</i>				X		
<i>Examine the optional water tube (if applicable) and the torch main body</i>				X		
<i>Examine the torch insulator for cracks</i>				X		
<i>Examine the retaining cap and shield</i>				X		
<i>Examine all of the hoses and hose fittings</i>				X		
<i>Examine all of the torch leads</i>				X		
<i>Examine all of the cables and cable connections</i>				X		
<i>Do tests for gas leaks</i>				X		

Maintenance task or activity	Daily	Weekly	Bi-Monthly	Monthly	Bi-Yearly	Yearly
Examine the air filter in the power supply				X		
Examine the remote high-frequency console (if applicable)				X		
Examine the motor valve console				X		
Examine the gas console				X		
Replace the coolant and the coolant filter					X	
Clean the coolant pump strainer					X	
Do all maintenance tasks (see page 19)					X	
Replace all service parts (see page 34)					X	
Do all maintenance tasks (see page 19)						X
Replace all service parts (see page 34)						X

Daily

Do a check of the gas flow settings

- When you use oxygen, nitrogen, or argon-hydrogen as the plasmas gas, make sure that the regulator setting for the gas supply is 8.2 bar +/- 0.7 bar (120 psi +/- 10 psi).
- When you use air as the plasma gas, make sure that the regulator setting for the gas supply is 6.2 bar +/- 0.7 bar (90 psi +/- 10 psi).
- Make sure that the regulator setting for shield gas is 6.2 bar +/- 0.7 bar (90 psi +/- 10 psi).



If you changed consumable parts or if the power supply is off for more than 1 hour, purge the gas line before use. To purge the gas lines, leave the system in test preflow mode for 1 minute. See your system's instruction manual for information on how to do this.



See *Gas requirements* and *Daily start-up* in your system's instruction manual for information about correct gas flow settings and about how to adjust preflow and cut flow gases.

Examine the torch and consumables

Always examine the torch main body and consumables before you cut. Worn or damaged parts can cause gas and water leaks, which can affect the cut quality.

1. Examine the consumables for pitting and burn marks.
2. Replace any consumable that has damage or excess wear.



See *Cut charts and consumable parts index* and the *Parts list* in your system's instruction manual for information on replacement parts.

3. Examine the torch insulator for cracks.

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4. If you find cracks in the torch insulator, replace the entire torch main body.



Installation in your system's instruction manual for information on how to do this.

5. Examine all of the O-rings on the torch main body and the consumables for damage or excess wear. Replace any O-ring or consumable that has damage or excess wear.



Receptacle O-rings and O-rings on the torch main body are available as part of a kit. Other O-rings are included with the consumables. See *Parts list* and *Changing consumable parts* in your system's instruction manual for information about replacement parts.

6. Examine all of the O-rings for the correct amount of lubricant. The O-rings should look shiny. Too much lubricant can prevent gas flows.

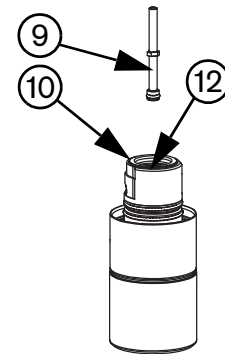
7. If you find excess lubricant, remove it.



See *Examine and lubricate all of the O-rings* on page 25 of this manual for information on how to do this.

8. Examine the retaining cap and shield:

- ❑ Make sure that the retaining cap and shield are tight to the torch main body. Tighten loose connections, if found, but do not over tighten.
- ❑ Make sure that the gas holes along the edge of the shield are not blocked with debris. If you cannot remove the blockage in the gas holes, replace the shield.
- ❑ Make sure that the center hole in the shield is not blocked with debris. If you cannot remove the blockage in the center hole, replace the shield.
- ❑ Make sure that the shield does not have any nicks, gouges, or signs of arcing. If you find damage, excess wear, or signs of arcing, replace the shield.



9. If the torch has an optional water tube to cool the electrode:

- ❑ Examine the water tube for bends and pitting. See *Examine the optional water tube (if applicable) and the torch main body* on page 25 of this manual for information on how to do this.
- ❑ If you find bends and pitting, replace the water tube. See *Changing the water tube* in your system's instruction manual for information on how to do this.

10. Examine the nozzle and electrode mating surfaces on the torch main body. Look for pitting, damage, and excess wear.

11. Replace any consumable that has damage, or excess wear.

12. Use a clean cloth to clean the internal and external surfaces of the torch main body. Use a cotton swab for internal surfaces that are not easy to reach.



Make sure that you do not leave any cotton fibers on the inner surfaces of the torch main body.

13. Use compressed air to remove any remaining particles from the torch main body.

Examine the torch leads

1. Examine the torch leads for kinks, cracks, cuts, or excessive wear. Replace any torch lead that has kinks, damage, or excess wear.
2. Make sure that all connections between the torch and torch leads are tight. Tighten loose connections if found, but do not over tighten.

Examine all of the hoses and hose fittings

1. Examine all of the air hoses and coolant hoses for:

- ❑ Scrapes, cuts, or holes
- ❑ Chemical spills or burns
- ❑ Kinks or bends that can cause a restriction



Make sure to examine the following hoses:

- hoses connected to the motor valve
 - gas hoses between the gas console and motor valve
 - the off-valve hose between the off valve and the torch main body
2. If the cutting table uses a power track system to support hoses between the power supply and gas console, examine the position of the hoses in the power track. Make sure that these hoses do not kink, bend, or twist during cutting table operation.
 3. Examine all of the hose fittings at the rear of the torch. Damage to the threads on the hose fittings can indicate that over tightening has occurred.
 4. If the hose fittings at the rear of the torch have damage or excess wear, replace the entire torch main body.



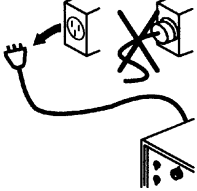


See *Installation* in your system's instruction manual for information on how to do this.



5. Replace any hose that has damage or excess wear.


Weekly

Clean inside of the power supply

		WARNING! ELECTRIC SHOCK CAN KILL
		Disconnect electric power before performing any maintenance. All work requiring removal of the power supply cover must be performed by a qualified technician. See the safety information provided with your product for more safety precautions.

1. Disconnect the electric power to the power supply.
2. Remove the top and side panels of the power supply.
3. Blow out or vacuum any accumulation of dust and particles from:
 - ☐ The top and side panels
 - ☐ The inside of the power supply
 - ☐ The fans

	CAUTION!
	Static electricity can damage circuit boards. Use proper precautions when handling printed circuit boards. Store PC boards in anti-static containers. Wear a grounded wrist strap when handling PC boards.

4. Remove dust and particles from the circuit boards.
 -  Be careful not to damage the circuit boards.
5. Install the top and side panels of the power supply before you reconnect the power supply to electric power.

Clean the torch threads and the ring inside of the torch main body

Damage to the torch threads or to the ring inside of the torch main body usually results from unsatisfactory cleaning of the torch and retaining cap threads. Unsatisfactory cleaning can cause dirt and particulates to accumulate in the torch threads or cause pitting on the ring inside of the torch main body.

1. Clean all threads on the front of the torch head with a cotton swab, pipe cleaner, or clean cloth that is moistened with clean water. Do not use alcohol.



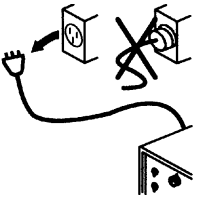
2. Examine the ring inside of the torch main body. Look for pitting.
3. If the pitting on the ring is slight, the torch could be repaired. Contact your OEM or regional Hypertherm Technical Services to assess the damage.
4. If the ring inside of the torch main body cannot be repaired, replace the entire torch main body.
5. If there is no pitting, damage, or excess wear on the ring inside of the torch main body, clean the ring with a cotton swab that is moistened with clean water. Do not use alcohol.

Do a check of the cooling fans

Make sure that the cooling fans are:

- Moving freely
- Not making excess noise
- Not clogged
- Not showing signs of damage or excess wear

Do a check of the coolant level

		<p>WARNING!</p> <p>ELECTRIC SHOCK CAN KILL</p>
		<p>Disconnect electric power before performing any maintenance.</p> <p>All work requiring removal of the power supply cover must be performed by a qualified technician.</p> <p>See the safety information provided with your product for more safety precautions.</p>

1. Disconnect the electric power to the power supply.
2. Remove the rear panel of the power supply and find the coolant reservoir.
3. Make sure that the coolant reservoir is full of coolant.
4. If the level of the coolant is below the top of the reservoir, refill the coolant reservoir with coolant (028872).


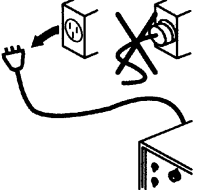


See *Torch coolant requirements* in your system's instruction manual.

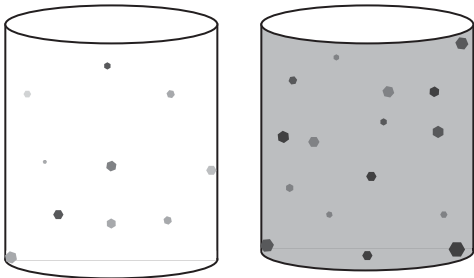
5. Record the number of liters (US gallons) that your system requires in *Coolant requirements* on page 47 of this manual.
6. Install the rear cover of the power supply before you reconnect the power supply to electric power.

Bi-monthly

Examine the air filter inside of the power supply




	<p>WARNING! ELECTRIC SHOCK CAN KILL</p>
	<p>Disconnect electric power before performing any maintenance.</p> <p>All work requiring removal of the power supply cover must be performed by a qualified technician.</p> <p>See the safety information provided with your product for more safety precautions.</p>

1. Disconnect the electric power to the power supply.
2. Remove the front panel of the power supply to expose the air filter.
3. Examine the air filter for contamination.
 - ❑ If you find moisture, oil, or a large quantity of solid contamination, replace the air filter (027441).
 - ❑ If you find a moderate quantity of solid contamination, such as dust, blow air through the air filter or use suction to clean it.
4. If the original air filter looks clean, return it to the air filter housing.
5. Install the front panel of the power supply before you reconnect the power supply to electric power.



Monthly

Make sure that the system is correctly grounded


			<p>WARNING!</p> <p>ELECTRIC SHOCK CAN KILL</p>
<p>Make sure the equipment remains properly grounded at all times in compliance with local and national regulations. Failure to follow proper grounding techniques can result in serious personal injury or death.</p>			

Make sure that all components of the system are individually grounded to a driven earth ground. Do a check that:

- Unless noted, use only 110 mm² (8 AWG) welding cables for the electromagnetic interference (EMI) ground cables.
- The cutting table is used for the common, or star, EMI ground point and should have threaded studs welded to the table with a copper bus bar mounted on them. A separate bus bar should be mounted on the gantry as close to each motor as possible. If there are motors at each end of the gantry, run a separate EMI ground cable from the far motor to the gantry bus bar. The gantry bus bar should have a separate, heavy EMI ground cable 21.2 mm² (4 AWG; 047031) to the table bus bar. The EMI ground cables for the torch lifter and the RHF console must each run separately to the table ground bus.
- A ground rod that meets all applicable local and national electrical codes must be installed within 6 m (20 ft) of the cutting table. This is a potential earth (PE) ground and should be connected to the cutting table ground bus bar using 13.3 mm² (6 AWG) green and yellow grounding cable (047121) or equivalent.
- For the most effective shielding, use the Hypertherm CNC interface cables for I/O signals, serial communication signals, between plasma systems in multi-drop connections, and for interconnections between all parts of the Hypertherm system.
- All hardware used in the ground system must be brass or copper. While you can use steel studs welded to the cutting table for mounting the ground bus, no other aluminum or steel hardware can be used in the ground system.
- AC power, PE, and service grounds must be connected to all equipment according to local and national codes.
- For a system with a remote high frequency console (RHF), the positive, negative, and pilot arc leads should be bundled together for as long a distance as possible. The torch lead, work lead, and the pilot arc (nozzle) leads may be run parallel to other wires or cables only if they are separated by at least 150 mm (6 inches). If possible, run power and signal cables in separate cable tracks.
- For a system with an RHF console, the ignition console should be mounted as closely as possible to the torch, and must have a separate ground cable that connects directly to the cutting table ground bus bar.
- Each Hypertherm component, as well as any other CNC or motor drive cabinet or enclosure, must have a separate ground cable to the common (star) ground on the table. This includes the ignition console, whether it is bolted to the plasma system or to the cutting table.
- The metal braided shield on the torch lead must be connected firmly to the ignition console and to the torch. It must be electrically insulated from any metal and from any contact with the floor or building. The torch lead can be run in a plastic cable tray or track, or covered with a plastic or leather sheath.
- The torch holder and the torch breakaway mechanism – the part mounted to the lifter, not the part mounted to the torch – must be connected to the stationary part of the lifter with copper braid at least 12.7 mm (0.5 inches) wide. A separate cable must run from the lifter to the gantry ground bus bar. The valve assembly should also have a separate ground connection to the gantry ground bus bar.

Preventive Maintenance Program


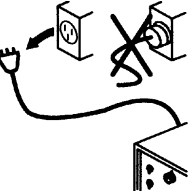
- If the gantry runs on rails that are not welded to the table, then each rail must be connected with a ground cable from the end of the rail to the table. The rail ground cables connect directly to the table and do not need to connect to the table ground bus bar.
- If you are installing a voltage divider board, mount it as closely as possible to where the arc voltage is sampled. One recommended location is inside the plasma system enclosure. If a Hypertherm voltage divider board is used, the output signal is isolated from all other circuits. The processed signal should be run in twisted shielded cable (Belden 1800F or equivalent). Use a cable with a braided shield, not a foil shield. Connect the shield to the chassis of the plasma system and leave it unconnected at the other end.
- All other signals (analog, digital, serial, and encoder) should run in twisted pairs inside a shielded cable. Connectors on these cables should have a metal housing. The shield, not the drain, should be connected to the metal housing of the connector at each end of the cable. Never run the shield or the drain through the connector on any of the pins.

 See *Module grounding and grounding checks* in your system’s instruction manual for information on how to ground the system.

Examine the exterior of the power supply

Examine the exterior of the power supply for damage. If there is damage, make sure that it does not affect safe operation of the power supply. If you have concerns, contact your OEM or regional Hypertherm Technical Services to assess the damage.

Examine and clean the interior of the power supply

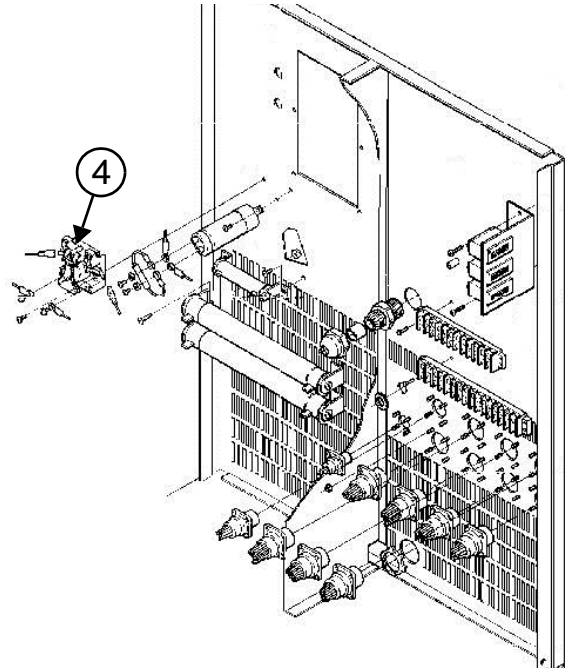
	<p>WARNING!</p> <p>ELECTRIC SHOCK CAN KILL</p>
	<p>Disconnect electric power before performing any maintenance.</p> <p>All work requiring removal of the power supply cover must be performed by a qualified technician.</p> <p>See the safety information provided with your product for more safety precautions.</p>

1. Disconnect the electric power to the power supply.
2. Remove the top and side panels of the power supply.
3. Examine the interior of the power supply:
 - ❑ Examine the wiring harnesses. If any wiring harness has damage or excess wear, replace it.
 - ❑ Look for loose connections. Tighten loose connections, if found, but do not over tighten.
 - ❑ Look for areas of discoloration due to overheating. If you see signs of overheating, look for the source. If you discover the source of overheating or if you find parts with damage or excess wear, replace them.

4. Examine the pilot arc relay inside the rear wall of the power supply:
 - a. Remove the pilot arc relay.
 - b. Examine the contacts inside of the pilot arc relay. Look for black or rough surfaces.
 - c. If you find black or rough surfaces, replace the pilot arc relay.
 - d. Reinstall of the pilot arc relay.



Be careful that you do not pinch the wires between the cover and the center panel.



5. Blow out or vacuum any accumulation of dust and particles from:
 - ☐ The top and side panels
 - ☐ The inside of the power supply
 - ☐ The fans



CAUTION!



Static electricity can damage circuit boards. Use proper precautions when handling printed circuit boards.

Store PC boards in anti-static containers.

Wear a grounded wrist strap when handling PC boards.

6. Remove dust and particles from circuit boards.



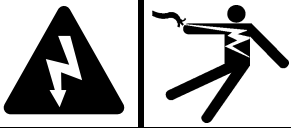
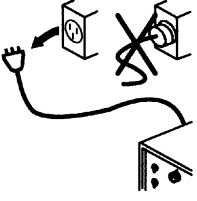
Be careful not to damage the circuit boards.

7. Install the top and side panels of the power supply before you reconnect the power supply to electric power.


Preventive Maintenance Program

Examine the coolant filter in the power supply

A dirty coolant filter can slow the flow of coolant to the torch, which will cause the LED coolant flow indicator to illuminate.

	<p>WARNING!</p> <p>ELECTRIC SHOCK CAN KILL</p>
	<p>Disconnect electric power before performing any maintenance.</p> <p>All work requiring removal of the power supply cover must be performed by a qualified technician.</p> <p>See the safety information provided with your product for more safety precautions.</p>

- 1. Disconnect the electric power to the power supply.
- 2. Examine the rear of the power supply and find the housing for the coolant filter.
- 3. Remove the coolant filter housing from the rear of the power supply and examine the coolant filter.

 The coolant filter changes to a brown color when dirty.

- 4. If the coolant filter looks dirty, replace it (027005). If the coolant filter looks clean, return it to the coolant filter housing.
- 5. Install the coolant filter housing into the rear of the power supply.
- 6. Reconnect the electric power to the power supply.

Test the rate of coolant flow to the torch

The best rate of coolant flow to the following torches is approximately 4 liters per minute (4 L/min) (1 US gal/min):

- HySpeed HT2000 machine torch with valve and 50.8 mm (2 in.) diameter sleeve (standard body) (128381)
- HySpeed HT2000 machine torch with valve and 50.8 mm (2 in.) diameter sleeve (stainless steel body) (128367)
- HySpeed HT2000 machine torch with 44.5 mm (1-3/4 in.) diameter sleeve (standard body) (128141)
- HyPro2000 quick disconnect torch with valve (standard body) (220921)
- HT2000 high precision torch with valve (standard body) (120356)
- HyPro2000 straight machine torch with valve (standard body) (220961)

To test the rate of coolant flow to the torch:

- 1. Get an empty container with an approximate capacity of 4 liters (1 US gallon).
- 2. Turn OFF the electric power to the power supply.
- 3. Remove the following from the torch:
 - ❑ Retaining cap

- ☐ Shield
 - ☐ Electrode
 - ☐ Nozzle
 - ☐ Swirl ring
4. Install the retaining cap on the torch again. Do **not** install the electrode, nozzle, swirl ring, or shield.
 5. Put the container under the torch.
 6. Turn ON the electric power to the power supply.
 7. Hold down the ON button on the power supply for 1 minute.
 8. After 1 minute, release the ON button on the power supply.
 9. Examine the coolant in the container.
 10. If the torch delivers at least 4 L/min (1 US gal/min), then the rate of coolant flow to the torch is satisfactory.
 11. If the coolant flow is satisfactory, install the following consumables on the torch again:
 - ☐ Electrode
 - ☐ Nozzle
 - ☐ Swirl ring
 - ☐ Shield
 12. If the torch delivers less than 4 L/min (1 US gal/min), then the rate of coolant flow is not satisfactory.
 13. If the flow rate is not satisfactory, see *Check the pump, motor and solenoid valve* in your system's instruction manual.

Test the rate of coolant return from the torch

The best rate of coolant return from the following torches is approximately 2.6 liters per minute (2.6 L/min) (3/4 US gal/min):

- HySpeed HT2000 machine torch with valve and 50.8 mm (2 in.) diameter sleeve (standard body) (9128381)
- HySpeed HT2000 machine torch with valve and 50.8 mm (2 in.) diameter sleeve (stainless steel body) (128367)
- HySpeed HT2000 machine torch with 44.5 mm (1-3/4 in.) diameter sleeve (standard body) (128141)
- HyPro2000 quick disconnect torch with valve (standard body) (220921)
- HT2000 high precision torch with valve (standard body) (120356)
- HyPro2000 straight machine torch with valve (standard body) (220961)

To test the rate of coolant return from the torch:

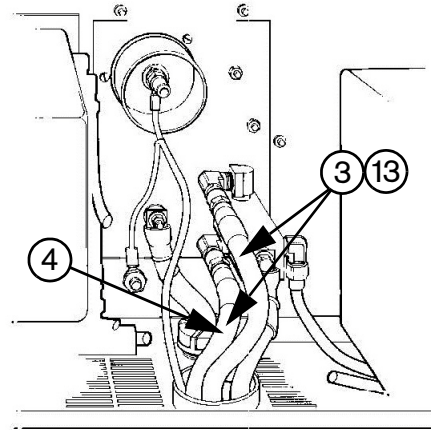
1. Get an empty container with an approximate capacity of 4 liters (1 US gallon).
2. Turn OFF the electric power to the power supply.

Preventive Maintenance Program

3. Find the 2 coolant hoses that come out of the rear of the cathode block at the rear of the power supply.



Both hoses are black. One hose has a green band. One hose has a red band.



4. Remove the hose with the red band from the cathode block.
5. Place the open end of the hose with the red band into the container.
6. Turn ON the electric power to the power supply.
7. Hold down the ON button on the power supply for 30 seconds, while the coolant flows from the hose with the red band.
8. After 30 seconds, release the ON button on the power supply.
9. Examine the coolant in the container.
10. If the container is approximately 1/2 full after 30 seconds, then the return flow rate is satisfactory.
11. If the container is not 1/2 full after 30 seconds:
 - a. Repeat *step 7 – step 10* for 1 minute.
 - b. After 1 minute, examine the coolant in the container.
 - If the container is approximately 3/4 full after 1 minute, then there is a problem with either the flow switch or the coolant filter. If the container is approximately 3/4 full after 1 minute, go to *step 12*.
 - If the container is less than 3/4 full after 1 minute, see *Verify flow rate to torch* in your system's instruction manual.
12. If the container is approximately 3/4 full after 1 minute, look at the LED that indicates coolant flow.
 - a. If the LED is illuminated, replace the flow switch.
 - b. If the LED is not illuminated, replace the coolant filter.
13. Reconnect the hose with the red band to the cathode block.
14. Install the rear panel of the power supply before you reconnect the power supply to electric power.

Look for coolant leaks

Examine the power supply for coolant leaks. Primary locations for coolant leaks include the following:

- the back of the power supply
- at the remote high-frequency console, if the system has a one
- at the torch main body


Make sure that the coolant reservoir is full with coolant. If the level of the coolant is below the top of the reservoir, refill the coolant reservoir with coolant (028872).

Clean the torch threads and the rings inside of the torch main body


See *Clean the torch threads and the ring inside of the torch main body* on page 16 of this manual for instructions.

Examine and lubricate all of the O-rings

1. Examine all of the O-rings in the torch main body. Look for damage or excess wear.
2. Replace any O-ring that has damage or excess wear.

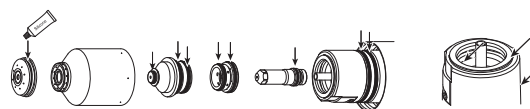
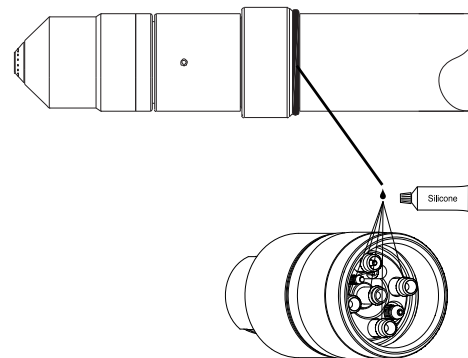
 Receptacle O-rings and torch O-rings for the torch main body are available as part of a kit. Other O-rings are included with the consumables. See *Parts list* in your system's instruction manual.

3. Apply a thin film of silicone lubricant (027055) to all O-rings.

 The O-rings should look shiny. Too much lubricant can prevent gas flow. Remove excess lubricant if found.


4. Install all O-rings so they fit snugly.

5. Examine all threaded consumables, and remove any dirt from the threads.




Examine the optional water tube (if applicable) and the torch main body

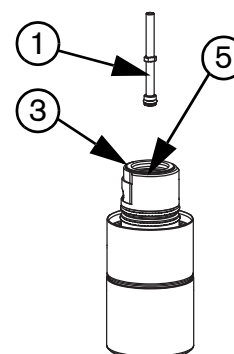
1. If the torch has an optional water tube to cool the torch electrode, examine the water tube for bends and pitting.
2. If you find bends or pitting, replace the water tube.

 See *Changing the water tube* in your system's instruction manual for information on how to do this.

3. Examine the nozzle and electrode mating surfaces on the torch main body. Look for damage or pitting.
4. If any consumable has damage or excess wear, replace it.
5. Use a clean cloth to clean the internal and external surfaces of the torch main body. Use a cotton swab for internal surfaces that are not easy to reach.

 Make sure that you do not leave any cotton fibers on the inner surfaces of the torch main body.

6. Use compressed air to remove any remaining particles from the torch main body.



Examine the torch insulator for cracks

Examine the torch insulator for cracks. If you find cracks in the torch insulator, replace the entire torch main body.

Preventive Maintenance Program

Examine the retaining cap and shield

1. Make sure that the retaining cap and shield are tight to the torch main body. Tighten loose connections if found, but do not over tighten.
2. Examine the retaining cap and shield. If you find any consumable with damage or excess wear, replace it.

Examine all of the hoses and hose fittings

See *Examine all of the hoses and hose fittings* on page 15 of this manual for instructions.

Examine all of the torch leads

1. Examine all of the torch leads for kinks, cracks, cuts, or excessive wear. Replace any torch lead that has damage or excess wear.
2. Make sure that all connections between the torch and torch leads are tight, but do not over tighten.
3. If the cutting table uses a power track to support hoses that connect the power supply and the gas console, examine the position of the hoses in the power track. Make sure that they do not kink, bend, or twist during cutting table operation.
4. Replace any lead or lead fitting that has damage or excess wear.

Examine all of the cables and cable connections

1. Examine all of the cables for damage or excess wear:
 - ❑ If the system has the optional remote high-frequency console, examine the control cables that connect the remote high-frequency console and the gas console to the power supply.
 - ❑ If the system has the optional Initial Height Sense (IHS), examine the cables that connect the inductive probes to the IHS console.
2. If the outside insulation on a cable is damaged or cut, examine the wires inside.
3. Replace any cable or cable fitting that has damage or excess wear.

Examine the gas line connections




CAUTION!

Do not clean brass connections with ammonia-based cleaners. Ammonia causes crack and become brittle.


1. Use the provided plug to obstruct the inlet gas fitting on the gas console.
2. Increase the plasma gas pressure to 8.3 bar (120 psi).

3. Close the plasma gas valve at the source. Watch for a pressure drop.

 If the supply line from the source is a hose, there can be a 0.3 bar to 0.5 bar (5 to 7 psi) decrease because of hose length.

4. If the pressure continues to drop, try to find the leak:


- a. Spray all of the gas lines and connections with soapy water.
- b. If bubbles appear on a gas line or on a connection, replace the gas line or tighten the connection.

 If you cannot find the source of the leak, contact Hypertherm Technical Service for recommended action.


5. Repeat *step 1 – step 4* for the nitrogen gas supply source, except increase the pressure to 10.34 bar (150 psi) for nitrogen gas.
6. Repeat *step 1 – step 4* for the air, carbon dioxide (or argon-hydrogen), and methane gas supply source (or sources, as applicable), except increase the pressure to 6.2 bar (90 psi) for these gases.
7. If the system operates on compressed air:
 - a. Make sure that a filter system is in place to prevent oil or moisture from entering the plasma system.
 - b. Examine all filters and oil separators. Replace any filter or oil separator that looks dirty.

Do tests for gas leaks

1. Place the gas console in the Test PreFlow mode.

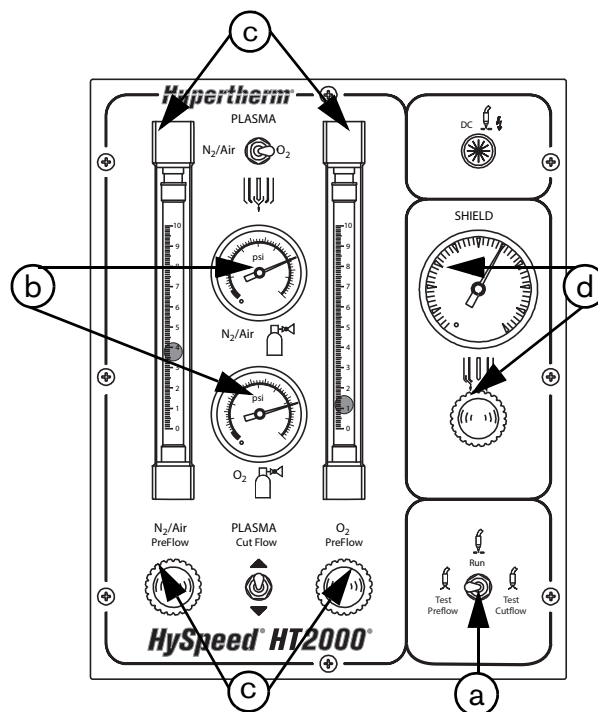
 Detailed descriptions of the front panel of the gas console can be found in *Front panel controls and indicators* in your system's instruction manual.

2. If you changed consumable parts or if the power supply has been off for more than 1 hour, purge the gas line before use. To purge the gas lines, leave the system in test preflow mode for 1 minute.

 See your system's instruction manual for information on how to do this.


3. Adjust the settings on the front panel of the gas console to the appropriate preflow gas settings:

- a. Set the Test Preflow/Run/Test Cut Flow Toggle Switch to Test PreFlow.
- b. Make sure that both of the plasma gas pressure gauges on the gas console are set at 8.2 bar (120 psi).
- c. Use the oxygen and/or nitrogen-air PreFlow Meter Adjust knob to adjust the PreFlow Gas Flow Rate percentage (%) to match the Cut chart specifications.




Preventive Maintenance Program


- d. Use the Shield Gas Adjust knob adjust the shield gas press to match the Cut chart specifications.

 Cut chart specifications can be found in your system’s instruction manual.

4. Disconnect the off-valve solenoid from the gas console.

 If the digital pressure indicator does not slowly decrease to zero, then there is a leak. The pressure gauges on the gas console should maintain their pressure. If either the oxygen or nitrogen pressure gauge decreases by more than 0.1 bar (2 psi) in 10 minutes, than there is an unacceptable leak. Contact your OEM or regional Hypertherm technical service team if you need advice on how to find and resolve an unacceptable leak.

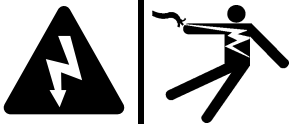
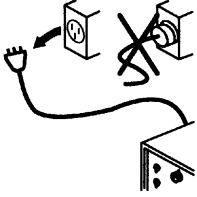
5. If you suspect a gas leak, try to find the source:
- a. Close the shut-off valves for the oxygen and nitrogen supplies at the source.
 - b. Spray all of the gas lines and connections with soapy water.
 - c. If bubbles appear on a gas line or connection, replace the gas line or tighten the connection.

 If you cannot find the source of the leak, contact Hypertherm Technical Service for recommended action.

Examine the air filter in the power supply

See *Examine the air filter inside of the power supply* on page 18 of this manual for instructions on how to do this.


Examine the remote high-frequency console (if applicable)

	<p>WARNING!</p> <p>ELECTRIC SHOCK CAN KILL</p>
	<p>Disconnect electric power before performing any maintenance.</p> <p>All work requiring removal of the power supply cover must be performed by a qualified technician.</p> <p>See the safety information provided with your product for more safety precautions.</p>

If the system has an optional remote high-frequency console:


1. Disconnect the electric power to the remote high-frequency console.
2. Examine the exterior of the remote high-frequency console:
 - a. Make sure that the exterior door opens and closes properly.
 - b. Make sure that the connections are tight for all hoses, cables, and leads. Tighten loose connections if found, but do not over tighten.
3. Open the door on the remote high-frequency console.
4. Examine the interior of the remote high-frequency console:

- a. If you find moisture, use a clean cloth to dry the interior of the remote high-frequency console and then contact Hypertherm Technical Service for recommended action.
- b. Make sure that the connections are tight for all hoses, cables, and leads. Tighten loose connections if found, but do not over tighten.
- c. Blow out or vacuum any accumulation of dust and particles.
- d. Examine the spark gap assembly:
 - Make sure that the 3 electrodes are 0.508 mm (0.200 in.) apart. Contact your OEM or regional Hypertherm technical service team if you need advice on how to measure the distances between the electrodes.
 - Make sure that the ends of the 3 electrodes are flat and clean.

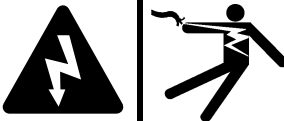
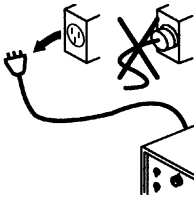
 If needed, use a diamond file to clean the electrodes.

- e. Make sure that the wiring connections to the spark gap assembly are tight.

5. Close the door on the remote high-frequency console before you reconnect the remote high-frequency console to electric power.

 Keep the doors closed at all times, except when you do maintenance or clean the remote high-frequency console.

Examine the motor valve console

	WARNING! ELECTRIC SHOCK CAN KILL
	<p>Disconnect electric power before performing any maintenance.</p> <p>All work requiring removal of the power supply cover must be performed by a qualified technician.</p> <p>See the safety information provided with your product for more safety precautions.</p>

1. Disconnect the electric power to the motor valve console.
2. Examine the exterior of the motor valve console:
 - a. Make sure that the side panel opens and closes properly.
 - b. Make sure that the connections for all hoses, cables, and leads are tight. Tighten loose connections if found, but do not over tighten.
 - c. Make sure that there are no leaks.
3. Open the side panel of the motor valve console.
4. Examine the interior of the motor valve console:
 - a. If you find moisture, use a clean cloth to dry the interior of the motor valve console and then contact Hypertherm Technical Service for recommended action.


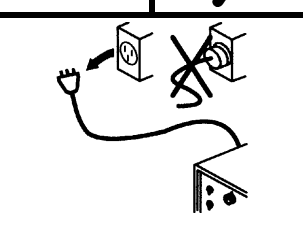
Preventive Maintenance Program

- b.** Make sure that the connections are tight for all hoses, cables, and leads. Tighten loose connections if found, but do not over tighten.
 - c.** Examine the hoses, cables, and leads for kinks, cracks, cuts, or excessive wear. Replace any hose, cable, or lead that has damage or excess wear.
 - d.** Blow out or vacuum any accumulation of dust and particles.
- 5.** Close the side panel of the motor valve console before you reconnect the motor valve console to electric power.



Keep the side panel closed at all times, except when you do maintenance or clean the motor valve console.

Examine the gas console

	<p>WARNING!</p> <p>ELECTRIC SHOCK CAN KILL</p>
	<p>Disconnect electric power before performing any maintenance.</p> <p>All work requiring removal of the power supply cover must be performed by a qualified technician.</p> <p>See the safety information provided with your product for more safety precautions.</p>

- 1.** Disconnect the electric power to the gas console.
- 2.** Examine the exterior of the gas console:
 - a.** Make sure that the connections are tight for all hoses, cables, and leads. Tighten loose connections if found, but do not over tighten.
 - b.** Make sure that there are no leaks.
 - c.** Examine the flow meters for damage, including broken glass tubes (“float stops”) inside. Replace any flow meter or float stop that has damage or excess wear.
 - d.** Examine the pressure gauges for damage. Replace any pressure gauge that has damage.



See *Part's list* in your system's instruction manual for information on replacement parts.

- 3.** Remove the rear panel from the gas console.
- 4.** Examine the interior of the gas console:
 - a.** Make sure that the connections are tight for all hoses, cables, and leads. Tighten loose connections if found, but do not over tighten.
 - b.** Blow out or vacuum any accumulation of dust and particles.
- 5.** Install the rear panel of the gas console before you reconnect the gas console to electric power.



Keep the rear panel on at all times, except when you do maintenance or clean the gas console.

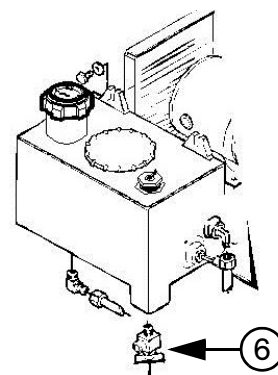
Bi-yearly

Replace the coolant and the coolant filter

1. Get an empty container with an approximate capacity of 11.4 liters (3 US gallons).
2. Disconnect the electric power to the power supply.
3. Remove the rear panel of the power supply and find the coolant reservoir.
4. Remove the cap from fill inlet on the coolant reservoir to allow the coolant reservoir to vent.
5. Place the 11.5 liter (3 US gallons) container under the drain on the bottom of the coolant reservoir.
6. Remove the drain cap from the coolant reservoir; allow the coolant to flow into the container.



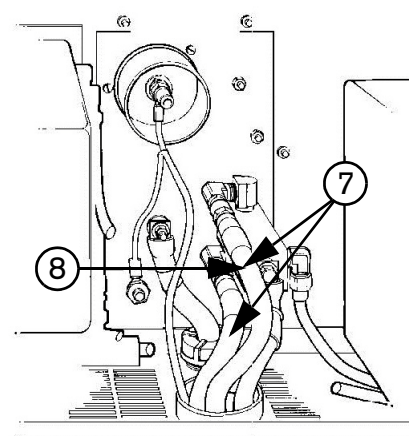
For older systems, there may be no drain or the drain may be in a different location. Siphon coolant out of the coolant reservoir, if needed.



7. Find the 2 coolant supply hoses that exit the rear of the cathode block at the rear of the power supply.



Both hoses are black. One hose has a green band. One hose has a red band.

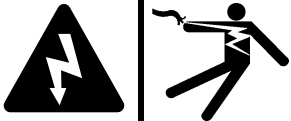
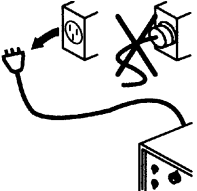


8. Remove the hose with the green band from the cathode block.
9. Blow clean, dry, oil-free air at 5.5 – 8.3 bar (80 – 120 psi) into the hose with the green band until coolant ceases to flow into the coolant reservoir.
10. Remove the reservoir drain cap, if applicable.
11. Remove the coolant filter housing from the rear of the power supply.
12. Drain any coolant from the coolant filter housing into the container, if needed.
13. Dispose of the used coolant and coolant filter according to local regulations.
14. Insert a new coolant filter (027005) into the coolant filter housing.
15. Screw the coolant filter housing back into the rear of the power supply.
16. Make sure that the coolant reservoir is full of coolant.
17. If the level of the coolant is below the top of the reservoir, fill the coolant reservoir with coolant (028872).
18. Screw on the fill inlet cap on the coolant reservoir.
19. Install the rear panel of the power supply before you reconnect the power supply to electric power.

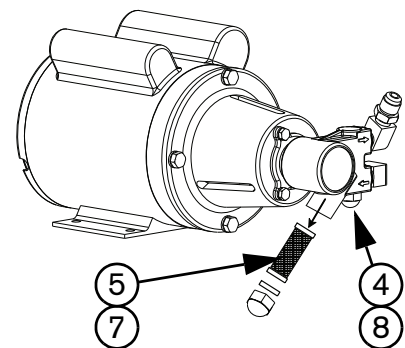
Preventive Maintenance Program

20. Record the number of liters (US gallons) that your system requires in *Coolant requirements* on page 47 of this manual.

Clean the coolant pump strainer

	<p>WARNING!</p> <p>ELECTRIC SHOCK CAN KILL</p>
	<p>Disconnect electric power before performing any maintenance.</p> <p>All work requiring removal of the power supply cover must be performed by a qualified technician.</p> <p>See the safety information provided with your product for more safety precautions.</p>

1. Disconnect the electric power to the power supply.
2. Remove the coolant pump from the power supply to reduce the risk that debris will fall into the strainer housing.
3. Drain the coolant from the coolant reservoir, if not already drained. See *Replace the coolant and the coolant filter* on page 31.
4. Remove the nut from the strainer housing to release the coolant pump strainer.
5. Remove the coolant pump strainer from the strainer housing.
6. Clean the coolant pump strainer:
 - a. Clean it in a solution of mild soap and water.
 - b. Flush it with clean, running water.
7. Insert the coolant pump strainer into the strainer housing.
8. Install the nut to hold the coolant pump strainer in place.
9. Examine the coolant filter.
10. If the coolant filter looks clean, install the coolant filter housing.
11. If the coolant filter looks dirty, replace the coolant filter (027005).
12. Make sure that the coolant reservoir is full of coolant.
13. If the level of the coolant is below the top of the reservoir, refill the coolant reservoir with coolant (028872).
14. Screw on the fill inlet cap.
15. Install the rear panel of the power supply before you reconnect the power supply to electric power.



Do all maintenance tasks

See *Monthly* on page 19 of this manual.

Replace all service parts

See *Component replacement schedule* on page 34 of this manual.

Yearly

Do all maintenance tasks

See *Monthly* on page 19 of this manual.

Replace all service parts

See *Component replacement schedule* on page 34 of this manual.

Component replacement schedule

This is a list of components and their recommended replacement schedule. The schedule uses total arc hours to estimate when to replace components. The use of cumulative arc hours is the most accurate method to estimate when you need to replace a component. For more information about how to calculate arc hours, contact your OEM manufacturer.

Your cutting area and operations can have an effect on this schedule. See *Cutting area and operation effects* on page 36 of this manual.

See *HT2000 preventive maintenance kits* on page 35 for a list of HT2000 Preventive Maintenance kits and for the part number and quantity of each item in every kit.

Item Number	Quantity	Component	Cumulative number of arc hours											
			300	600	900	1,200	1,500	1,800	2,100	2,400	2,700	3,000	3,300	3,600
027005	1	Coolant filter element	X	X	X	X	X	X	X	X	X	X	X	X
028872	4	Coolant solution 30/70*	X	X	X	X	X	X	X	X	X	X	X	X
003249	1	Main contactor		X		X		X		X		X		X
–	1	Torch main body***		X		X		X		X		X		X
003021	1	Pilot arc relay		X		X		X		X		X		X
128384	1	Coolant pump				X				X				X
–	1	Torch leads**				X				X				X
004061	3	Spark gap electrode				X				X				X
129840	1	Off-valve assembly						X						X
027080	2	Cooling fan						X						X
027079	1	Cooling fan						X						X
129150	1	High voltage transformer										X		
041534	1	Power distribution board										X		
–	1	Pilot arc lead**										X		
–	1	Gas leads**										X		

* The number of liters/US gallons you need depends on the length of the leads. See your system's instruction manual for more information, then record this number in *Coolant requirements* on page 47 of this manual.

** Part numbers are system dependent. See *Part numbers for hoses, leads, and cables* on page 41 for reorder information.

*** Part numbers are system dependent. See *HT2000 preventive maintenance kits* on page 35 for configurations.

HT2000 preventive maintenance kits

Kit part number	Kit description	Part description	Part number	Quantity in kit
128907	Preventive maintenance kit with standard torch main body (120584), for systems that use the standard torch main body	Pilot arc relay	003021	1
		Main contactor	003249	1
		Lens: white	005089	1
		Light bulb	005149	1
		Coolant filters	027005	2
		Coolant	028882	8 US gallons
		Torch main body	120584	1
228840	Preventive maintenance kit with stainless steel torch main body (120356), for systems that use the stainless steel torch main body	Pilot arc relay	003021	1
		Main contactor	003249	1
		Lens: white	005089	1
		Light bulb	005149	1
		Coolant filters	027005	2
		Coolant	028882	8 US gallons
		Torch main body	120356	1
228774	Preventive maintenance kit with HyPro2000 quick disconnect torch main body (220921), for systems that have been upgraded to the HyPro2000 quick disconnect torch main body	Pilot arc relay	003021	1
		Main contactor	003249	1
		Lens: white	005089	1
		Light bulb	005149	1
		Air filters	015299	3
		Coolant filters	027005	2
		Coolant	028882	8 US gallons
		Torch main body	220921	1

Preventive Maintenance Program

Kit part number	Kit description	Part description	Part number	Quantity in kit
228911	Preventive maintenance kit with HyPro2000 straight torch main body (220961). for systems that have been upgraded to the HyPro2000 straight torch main body	Pilot arc relay	003021	1
		Main contactor	003249	1
		Lens: white	005089	1
		Light bulb	005149	1
		Air filters	015299	3
		Coolant filters	027005	2
		Coolant	028882	8 US gallons
		Torch main body	220961	1
		O-rings	044026	2
		Water tube	220521	1
		Silicone lubricant	027055	1

Cutting area and operation effects

The *Component replacement schedule* is for reference only. Your cutting area conditions and operations can have an effect on your component replacement schedule.

Wear decreases system performance and component life. The most common conditions and operations that can increase the wear on some components in your plasma system include:

- *External cutting area*
- *Incoming air supply quality*
- *Metal dust inside of the power supply cabinet*
- *Consumable use*
- *Cut cycle time*

If any of these conditions or operations apply, adjust your replacement schedule as suggested.

How much you need to adjust your replacement schedule depends on how bad the condition is. If you have questions about your replacement schedule, contact your OEM or regional Hypertherm Technical Services team.

External cutting area

Consumables and torch assemblies stored in dirty cutting areas with no protection can collect contamination, such as dirt and metal dust. If this contamination gets into the torch or coolant, it can cause the following problems:

- Prevent O-rings and seals on the torch heads and receptacles from sealing
- Increase wear on torch heads and receptacles

- Increase wear on the coolant pump
- Cause unsatisfactory operation of the coolant flow switch



It can help to flush the coolant system or clean the flow switch. But, it can be necessary to replace the coolant switch to fully repair the operation of the coolant loop system.

The best solution is to store consumables and torch assemblies in a clean, protective space. Another solution is to use compressed air to clean these parts before you use them.

If you cannot store your consumables and torch heads in a protective space, you can replace the following components more frequently:

Description	Part number
Torch assembly: HySpeed HT2000 machine torch with valve and 50 mm (2 in.) diameter sleeve (standard body)	128381
Torch assembly: HySpeed HT2000 machine torch with valve and 50 mm (2 in.) diameter sleeve (stainless steel body)	128367
Torch assembly: HySpeed HT2000 machine torch with 44 mm (1-3/4 in.) diameter sleeve (standard body)	128141
Torch assembly: HyPro2000 quick disconnect torch with valve (standard body)	220921
Torch assembly: HT2000 high precision torch with valve (standard body)	120356
Torch assembly: HyPro2000 straight machine torch with valve (standard body)	220961
Torch main body only: HySpeed HT2000 machine torch (standard body)	120584
Torch main body only: HySpeed HT2000 machine torch (stainless steel body)	120356
Sleeve, HyPro2000 torch mounting, 279.4-mm X 50.8-m (11-in. X 2-in.) (standard body)	220943
Sleeve, HyPro2000 torch mounting, 279.4-mm X 44.45-m (11-in. X 1-3/4-in.) (standard body)	220942
Sleeve, HySpeed2000 torch mounting, 279.4-mm X 44.45-mm (11-in. X 2-in.) (standard body)	120894
Sleeve, HySpeed2000 torch mounting, 279.4-mm X 44.45-mm (11-in. X 1-3/4-in.) (standard body)	020431
Sleeve, HySpeed2000 torch mounting, 279.4-mm X 44.45-mm (11-in. 1-3/4-in.) (stainless steel body)	020041
Kit: HySpeed HT2000 Consumable Starter Kit	128824
Kit: HT2000 standard consumable parts	028602
Kit: HySpeed HT2000 consumable parts	128825
Kit: Beveling consumable parts	128406

Preventive Maintenance Program

Incoming air supply quality

To maintain system performance, it is important that the incoming air supply is clean. If the air supply has dirt, oil, or water in it, components can become clogged or defective. An air supply of bad quality can cause the following problems:

- Decrease air flow
- Increase system errors
- Decrease cut quality and performance

Oil in the torch head can cause a fire when the oil reacts with the oxygen cutting process. Also, unwanted material in pressure sensors can cause false pressure readings.

The best solution, if possible, is to improve the quality of the air supply. Contact your OEM or regional Hypertherm Technical Service team if you need advice on how to improve the quality of your air supply.

If you cannot change your air supply quality, you can replace the following components more frequently:

Description	Part number
Fan assembly, 225 CFM: includes 027080 fan and fan guard	129307
Fan only: 225 CFM, 120 VAC, 50Hz – 60Hz (16.19 cm, 6.375 in.)	027080
Fan assembly, 450 CFM – 550 CFM, 120 VAC, 50Hz – 60Hz: includes 027079 fan and fan guard	129308
Fan only: 450 CFM – 550 CFM, 120 VAC, 50Hz – 60Hz (22.23 cm; 8-3/4 in.)	027079
Air filter, fiberglass (60.98-cm X 60.98-cm X 5.08-cm) (24-in. X 24-in. X 2-in.)	027441
Heat exchanger assembly MAX200: includes water/air heat exchange fan 027978	029324
Water/air heat exchanger fan	027978
Gas console pressure switch (5.51 bar / 80 psi)	005243
Gas console solenoid valve: 10.34 bar / 150 psi, Manf 120V 2-way NC)	006109
Gas console pressure gauge: 6.89 bar / 100 psi (6.35 cm / 2.5 in. diameter)	022008
Gas console pressure gauge: 11.03 bar / 160 psi (5.08 cm / 2 in. diameter)	022020

Metal dust inside of the power supply cabinet

Plasma cutting makes metal dust. If metal dust collects inside the plasma power supply, it can decrease the life of the fans and coolant pump motor.

The main power supply, chopper, or heat exchanger fans can operate more slowly, or failure of the fans can occur. This can cause temperature-related errors. The coolant pump motor can become too hot and operate incorrectly.

The best solution to extend the life of the fans and coolant pump motor is to clean inside the power supply. For instructions, see *Clean inside of the power supply* on page 16.

If metal dust has collected inside the power supply, you can replace the following components more frequently:

Description	Part number
Fan only: 225 CFM, 120 VAC, 50Hz – 60Hz	027080
Fan only: 450 CFM – 550 CFM, 120 VAC, 50Hz – 60 Hz	027079
Air filter, fiberglass (60.98-cm X 60.98-cm X 5.08-cm) (24-in. X 24-in. X 2-in.)	027441
Water/air heat exchanger only	027978
Water pump assembly	129252
Kit: Water pump motor (1/3 HP Carbon 230/50-60)	128385
Kit: Water pump motor (264.98 L/min., 70 US gallons/min. positive displace)	128384
Water/air heat exchanger fan	027978

Consumable use

If you let consumables reach complete failure, they can melt. Copper pieces can then break off and go into the coolant. In the coolant, these pieces can cause the following problems:

- Decrease coolant flow
- Increase coolant flow errors
- Cause damage to the consumables
- Cause coolant to leak at the check vale when you change the consumables
- Cause inaccurate coolant flow readings
- Decrease the life of the coolant pump
- Decrease the lief of the check valve

When you do maintenance, examine the coolant filter for copper pieces. If you find copper pieces in the coolant filter, replace both the coolant filter and the coolant. If a coolant flow error occurs after you replace the coolant filter and coolant, use the troubleshooting procedure in your system's instruction manual to find the correct action.

The best solution is to follow the usage guidelines for your consumables. However, if overuse occurs, you can replace the following components more frequently:

Description	Part number
Coolant reservoir	002304
Coolant	028872
Coolant filter element	027005
Gauge, coolant level	022036

Preventive Maintenance Program

Description	Part number
Coolant level switch, assembly, 1/2 NPT	129618
Coolant flow switch, 0.5 GPM	029361
Coolant check valve	006053
Coolant temperature switch, assembly (72.2°C / 162°F)	029323

Cut cycle time

When the cut-cycle is very short, relays operate more frequently. The system also pierces more frequently. Examples of this type of cycle are when you cut many small holes or make markings for numbers and letters. These types of operations can cause the following problems:

- Increase wear on pilot arc relay contact pads
- Increase wear on the starting components, such as the high-frequency transformer and the high-frequency ignition board
- Increase misfires and error codes

If your cut-cycle is short, you can replace the following components more frequently:

Description	Part Number
Pilot arc relay	003021
Pilot arc lead	System dependent
Main contactor (90 A, 3P, 120 VAC)	003249
Spark gap electrode	004061
Off-valve assembly*	129470
Cable, torch off-valve	123185
Hose (off valve assembly to torch main body) (for both standard and stainless steel torch bodies)	024355
Hose (motor-valve box to off-valve assembly) (for both standard and stainless steel torch bodies)	024354
High voltage transformer	129150
Power distribution board	041534
Torch main body (HySpeed HT2000) machine torch (standard body)	120584
Torch main body (HySpeed HT2000) machine torch (stainless steel body)	120356

* Off-valve assembly is required with the optional 44.45 mm (1-3/4 in.) mounting sleeve (020431).

Part numbers for hoses, leads, and cables

Hoses

Oxygen supply hoses (oxygen supply to gas console)

Part number	Length	Part number	Length
024204	4.6 m (15 ft)	024450	35.1 m (115 ft)
024205	7.6 m (25 ft)	024516	36.6 m (120 ft)
024155	15.3 m (50 ft)	024490	38.1 m (125 ft)
024398	22.9 m (75 ft)	024159	45.8 m (150 ft)
024487	25.9 m (85 ft)	024470	54.9 m (180 ft)
024206	30.5 m (100 ft)	024333	61 m (200 ft)
024481	33.6 m (110 ft)	—	—

Nitrogen supply hoses (nitrogen supply to gas console)

Part number	Length	Part number	Length
024505	1.8 m (6 ft)	024116	30.5 m (100 ft)
024210	3 m (10 ft)	024482	33.6 m (110 ft)
024203	4.6 m (15 ft)	024451	35.1 m (115 ft)
024232	6.1 m (20 ft)	024517	36.6 m (120 ft)
024134	7.6 m (25 ft)	024491	38.1 m (125 ft)
024211	10.7 m (35 ft)	024120	45.8 m (150 ft)
024112	15.3 m (50 ft)	024185	54.9 m (180 ft)
024148	22.9 m (75 ft)	024124	61 m (200 ft)
024488	25.9 m (85 ft)	—	—

Plasmas preflow gas hoses (gas console to motor valve console)

Part number	Length	Part number	Length
024317	1.5 m (5 ft)	024031	12.2 m (40 ft)
024026	3 m (10 ft)	024207	13.7 m (45 ft)
024027	4.6 m (15 ft)	024340	15.3 m (50 ft)
024017	6.1 m (20 ft)	024419	17.1 m (56 ft)
024028	7.6 m (25 ft)	024127	18.3 m (60 ft)
024029	9.2 m (30 ft)	024343	22.9 m (75 ft)
024030	10.7 m (35 ft)	024344	30.5 m (100 ft)

Plasma cut flow gas hoses (gas console to motor valve console)

Part number	Length	Part number	Length
024316	1.5 m (5 ft)	024310	12.2 m (40 ft)
024307	3 m (10 ft)	024323	13.7 m (45 ft)
024320	4.6 m (15 ft)	024311	15.3 m (50 ft)
024308	6.1 m (20 ft)	024420	17.1 m (56 ft)
024321	7.6 m (25 ft)	024367	18.3 m (60 ft)
024309	9.2 m (30 ft)	024357	22.9 m (75 ft)
024322	10.7 m (35 ft)	024358	30.5 m (100 ft)

Preventive Maintenance Program

Shield gas hoses (shield gas supply to gas console)

Part number	Length	Part number	Length
024043	1.2 m (4 ft)	024486	25.9 (85 ft)
024341	3 m (10 f)	024115	30.5 m (100 ft)
024200	4.6 m (15 ft)	024452	33. 6 (110 ft)
024342	6.1 m (20 ft)	024449	35.1 m (115 ft)
024133	7.6 m (25 ft)	024515	36.6 m (120 ft)
024448	10.7 m (35 ft)	024395	38.1 m (125 ft)
024407	13.7 m (45 ft)	024119	45.8 m (150 ft)
024012	15.3 m (50 ft)	024480	51.9 m (170 ft)
024472	18.3 m (60 ft)	024184	54.9 m (180 ft)
024147	22.9 m (75 ft)	024123	61 m (200 ft)

Shield gas hoses (gas console to remote high-frequency console)

Part number	Length	Part number	Length
024348	1.5 m (5 ft)	024352	12.2 m (40 ft)
024313	3 m (10 ft)	024353	13.7 m (45 ft)
024302	4.6 m (15 ft)	024304	15.3 m (50 ft)
024349	6.1 m (20 ft)	024305	22.9 m (75 ft)
024303	7.6 m (25 ft)	024306	30.5 m (100 ft)
024350	9.2 m (30 ft)	024312	45.8 m (150 ft)
024351	10.7 m (35 ft)	—	—

Shield gas hoses (gas console to remote high-frequency console)

Part number	Length	Part number	Length
024061	1.5 m (5 ft)	024092	12.2 m (40 ft)
024063	3 m (10 ft)	024403	13.7 m (45 ft)
024065	4.6 m (15 ft)	024096	15.3 m (50 ft)
024067	6.1 m (20 ft)	024174	18.3 m (60 ft)
024069	7.6 m (25 ft)	024468	22.9 m (75 ft)
024071	9.2 m (30 ft)	024523	30.5 m (100 ft)
024356	10.7 m (35 ft)	—	—

Argon/hydrogen gas hoses (argon/hydrogen console to torch)

Part number	Length	Part number	Length
024354	3 m (10 ft)	024370	12.2 m (40 ft)
024355	3.7 m (12 ft)	024443	15.3 m (50 ft)
024368	6.1 m (20 ft)	024467	22.9 m (75 ft)
024369	9.2 m (30 ft)	—	—

Cooling system hoses (sets of 2: 1 red, 1 green) (power supply to remote high-frequency console)

Part number	Length	Part number	Length
028760	0.9 m (3 ft)	128078	25.9 m (85 ft)
028860	2.1 m (7 ft)	028444	30.5 m (100 ft)
028652	3 m (10 ft)	028902	33.6 m (110 ft)
028440	4.6 m (15 ft)	028896	35.1 m (115 ft)
028653	6.1 m (20 ft)	128129	36.6 m (120 ft)
028441	7.6 m (25 ft)	028747	38.1 m (125 ft)
028442	15.3 m (50 ft)	028445	45.8 m (150 ft)
128052	18.3 m (60 ft)	128064	53 m (175 ft)
028443	22.9 m (75 ft)	028637	61 m (200 ft)

Remote high frequency console hoses (remote high-frequency console to gas console)

Part number	Length	Part number	Length
028683	10 ft (3 m)	028687	30 ft (9.1 m)
028684	15 ft (4.6 m)	028688	35 ft (10.6 m)
028685	20 ft (6.2 m)	028689	50 ft (15 m)
028686	25 ft (7.6 m)	—	—

Gas console hoses (gas console to motor valve)

Part number	Length	Part number	Length
028622	3 m (10 ft)	028627	10.6 m (35 ft)
028623	4.6 m (15 ft)	028654	15 m (50 ft)
028624	6.2 m (20 ft)	028655	23 m (75 ft)
028625	7.6 m (25 ft)	028656	30 m (100 ft)
028626	9.1 m (30 ft)	—	—

Leads**Shielded torch leads**

Part number	Part 1	Part 2	Part 3	Part 4	Length
028657	023429	024221	023032	023032	3 m (10 ft)
028658	023430	024222	023034	023034	4.6 m (15 ft)
028659	023431	024223	023012	023012	6.1 m (20 ft)
028546	023326	024192	023013	023013	7.6 m (25 ft)
028660	023432	024224	023014	023014	9.2 m (30 ft)
028661	023433	024225	023015	023015	10.7 m (35 ft)
028662	023434	024226	023016	023016	12.2 m (40 ft)
028663	023435	024227	023387	023387	13.7 m (45 ft)
028547	023327	024193	023199	023199	15.3 m (50 ft)
028767	023773	024404	023772	023772	16.9 m (55 ft)
028768	023515	024259	023052	023052	18.3 m (60 ft)

Preventive Maintenance Program

Negative lead and work cable (power supply to remote high-frequency console)

Part number	Length	Part number	Length
023755	1.2 m (4 ft)	023406	22.9 m (75 ft)
023920	2.4 m (8 ft)	123074	25.9 m (85 ft)
023508	3 m (10 ft)	023407	30.5 m (100 ft)
023403	4.6 m (15 ft)	023964	33.6 m (110 ft)
023404	7.6 m (25 ft)	023959	35.1 m (115 ft)
023968	9.2 m (30 ft)	123144	36.6 m (120 ft)
023986	10.7 m (35 ft)	023738	38.1 m (125 ft)
023405	15.3 m (50 ft)	023408	45.8 m (150 ft)
123041	18.3 m (60 ft)	023644	61 m (200 ft)

Power supply leads (power supply to remote high-frequency console)

Part number	Length	Part number	Length
028604	7.6 m (25 ft)	028607	30 m (100 ft)
028605	15 m (50 ft)	028608	45 m (150 ft)
028606	23 m (75 ft)	028651	61 m (200 ft)

Cables

Pilot arc cables (power supply to remote high-frequency console)

Part number	Length	Part number	Length
023754	1.2 m (4 ft)	023966	30.5 m (100 ft)
023919	2.4 m (8 ft)	023634	33.6 m (110 ft)
023987	3 m (10 ft)	023961	35.1 m (115 ft)
023631	7.6 m (25 ft)	123146	36.6 m (120 ft)
023632	15.3 m (50 ft)	023740	38.1 m (125 ft)
123043	18.3 m (60 ft)	023635	45.8 m (150 ft)
023633	22.9 m (75 ft)	023652	61 m (200 ft)
123076	25.9 m (85 ft)	—	—

HT2000 remote high frequency (RHF) console leads (power supply to remote high-frequency console)

Part number	Length	Part number	Length
023756	0.9 m (3 ft)	123075	25.9 m (85 ft)
023921	2.1 m (7 ft)	023613	30.5 m (100 ft)
023988	3 m (10 ft)	023965	33.6 m (100 ft)
023550	4.6 m (15 ft)	023960	35.1 m (115 ft)
023610	7.6 m (25 ft)	123145	36.6 m (120 ft)
023611	15.3 m (50 ft)	023739	38.1 m (125 ft)
123042	18.3 m (60 ft)	023614	45.8 m (150 ft)
023612	22.9 (75 ft)	023645	61 m (200 ft)

Gas console cables (power supply to gas console)

Part number	Length	Part number	Length
023989	3 m (10 ft)	123077	25.9 m (85 ft)
023549	4.6 m (15 ft)	023608	30.5 m (100 ft)
023605	7.6 m (25 ft)	023963	35.1 m (115 ft)
023757	11.6 m (38 ft)	123147	36.6 m (120 ft)
023606	15.3 m (50 ft)	023743	38.1 m (125 ft)
123044	18.3 m (60 ft)	023609	45.8 m (150 ft)
023607	22.9 m (75 ft)	023953	61 m (200 ft)

Motor valve console cables (power supply to motor valve console)

Part number	Length	Part number	Length
023551	4.6 m (15 ft)	023593	30.5 m (100 ft)
023590	27.6 m (25 ft)	123078	33.6 m (110 ft)
023776	10.7 m (35 ft)	023967	36.6 m (120 ft)
023591	15.3 m (50 ft)	123143	39.7 m (130 ft)
023592	22.9 m (75 ft)	023594	45.8 m (150 ft)
123045	25.9 m (85 ft)	023658	61 m (200 ft)

Machine interface cables (power supply to machine I/O)

Part number	Length	Part number	Length
023841	1.8 m (6 ft)	123080	25.9 m (85 ft)
023842	4.6 m (15 ft)	023847	30.5 m (100 ft)
023843	7.6 m (25 ft)	023962	35.1 m (115 ft)
023844	10.7 m (35 ft)	123148	36.6 m (120 ft)
023845	15.3 m (50 ft)	023848	38.1 m (125 ft)
123047	18.3 m (60 ft)	023849	45.8 m (150 ft)
023846	22.9 m (75 ft)	023850	61 m (200 ft)

Machine interface V/C cables (power supply to machine computer)

Part number	Length	Part number	Length
023902	1.8 m (6 ft)	023855	22.9 m (75 ft)
023851	4.6 m (15 ft)	023856	30.5 m (100 ft)
023852	7.6 m (25 ft)	023903	38.1 m (125 ft)
023853	10.7 m (35 ft)	023857	45.8 m (150 ft)
023854	15.3 m (50 ft)	023858	61 m (200 ft)

Remote V/C cables (power supply to digital (DR)/Programmable (PR) V/C)

Part number	Length	Part number	Length
023990	2.1 m (7 ft)	123188	36.6 m (120 ft)
023911	4.6 m (15 ft)	023882	38.1 m (125 ft)
023878	7.6 m (25 ft)	023883	45.8 m (150 ft)
023879	15.3 m (50 ft)	023884	61 m (200 ft)
123040	18.3 m (60 ft)	023885	76.3 m (250 ft)
023880	22.9 m (75 ft)	023886	83.9 m (275 ft)
123073	25.9 m (85 ft)	023887	91.5 m (300 ft)
023881	30.5 m (100 ft)	—	—

Preventive Maintenance Program

Power supply/programmable remote (PR) cables (power supply to PR V/C)

Part number	Length	Part number	Length
023834	4.6 m (15 ft)	023839	45.8 m (150 ft)
023835	7.6 m (25 ft)	023840	61 m (200 ft)
023836	15.3 m (50 ft)	023899	76.3 m (250 ft)
023837	22.9 m (75 ft)	023900	83.9 m (275 ft)
023838	30.5 m (100 ft)	023901	91.5 m (300 ft)
023898	38.1 m (125 ft)	—	—

Argon/hydrogen console cables (power supply to argon/hydrogen console)

Part number	Length	Part number	Length
023660	4.6 m (15 ft)	023663	22.9 m (75 ft)
023661	7.6 m (25 ft)	023664	30.5 m (100 ft)
023662	15.3 m (50 ft)	023665	45.8 m (150 ft)

Time/counter cables (power supply to timer/counter)

Part number	Length	Part number	Length
023687	3 m (10 ft)	123079	25.9 m (85 ft)
023692	7.6 m (25 ft)	023695	30.5 m (100 ft)
023758	11.6 m (38 ft)	023993	35.1 m (115 ft)
023693	15.3 m (50 ft)	123189	36.6 m (120 ft)
123046	18.3 m (60 ft)	023696	45.8 m (150 ft)
023694	22.9 m (75 ft)	023954	61 m (200 ft)

Hold cables (power supply to power supply)

Part number	Length	Part number	Length
023340	4.6 m (15 ft)	023343	30.5 m (100 ft)
023341	7.6 m (25 ft)	023344	45.8 m (150 ft)
023342	15.3 m (50 ft)	—	—

Water muffler pump cables (power supply to water muffler)

Part number	Length	Part number	Length
023866	15.3 m (50 ft)	023868	30.5 m (100 ft)
023867	22.9 m (75 ft)	—	—

Initial height sensing cables (power supply to initial height sensor)

Part number	Length	Part number	Length
023859	7.6 m (25 ft)	023862	30.5 m (100 ft)
023860	15.3 m (50 ft)	023863	45.8 m (150 ft)
023861	22.9 m (75 ft)	023864	61 m (200 ft)

Initial height sensing cables (initial height sensor to sensors)

Part number	Length m	Part number	Length
023888	0.6 m (2 ft)	023889	0.6 m (2 ft)
023869	12.2 m (40 ft)	023870	12.2 m (40 ft)

System information

Model number

Serial number

System voltage

- ☐ 200 V
- ☐ 208 V
- ☐ 220 V
- ☐ 220 V
- ☐ 240 V
- ☐ 380 V
- ☐ 400 V
- ☐ 415 V
- ☐ 440 V
- ☐ 480 V
- ☐ 600 V

Coolant requirements

- ☐ 11.4 L (3 US gallons)
- ☐ Other:

Preventive Maintenance Program

Notes

[illegible]

Maintenance log for the HySpeed HT2000 (page 1 of 3)

Daily tasks	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31																																					
<i>Do a check of the gas flow settings</i>																																																																				
<i>Examine the torch and consumables</i>																																																																				
<i>Examine the torch leads</i>																																																																				
<i>Examine all of the hoses and hose fittings</i>																																																																				
Weekly tasks	Week 1							Week 2							Week 3							Week 4							Week 5																																							
<i>Clean inside of the power supply</i>																																																																				
<i>Clean the torch threads and the ring inside of the torch main body</i>																																																																				
<i>Do a check of the cooling fans</i>																																																																				
<i>Do a check of the coolant level</i>																																																																				
Bi-monthly task																																																																				
circle one: January February March April May June July August September October November December																																																																				
<i>Examine the air filter inside of the power supply</i>	Week 1																																		Notes:																																	
	Week 2																																		Notes:																																	

Maintenance log for the HySpeed HT2000 (page 2 of 3)

[illegible]

Maintenance log for the HySpeed HT2000 (page 3 of 3)

Monthly tasks (continued)													
circle one:	January	February	March	April	May	June	July	August	September	October	November	December	
<i>Do tests for gas leaks</i>				Notes:									
<i>Examine the air filter in the power supply</i>													
<i>Examine the remote high-frequency console (if applicable)</i>													
<i>Examine the motor valve console</i>													
<i>Examine the gas console</i>													
Bi-yearly tasks													
circle one:	January	June											
<i>Replace the coolant and the coolant filter</i>				Notes:									
<i>Clean the coolant pump strainer</i>													
<i>Do all maintenance tasks</i> (page 19)													
<i>Replace all service parts</i> (page 34)													
Yearly tasks													
<i>Do all maintenance tasks</i> (page 19)				Notes:									
<i>Replace all service parts</i> (page 34)													

