3M Dual Airline Supplied Air Respirators

User Instructions

Important: Keep these *User Instructions* for reference

⚠WARNING

This product helps protect against certain airborne contaminants. **Misuse may result in sickness or death.** For proper use, see supervisor, *User Instructions* or call 3M in U.S.A., 1-800-243-4630. In Canada, call Technical Service at 1-800-267-4414.

TABLE OF CONTENTS

GENERAL SAFETY INFORMATION

Intended Use

The 3M™ Half Facepieces 6000[1] and 7500[2] Series, Full Facepiece 7800S, 6000[3]/6000DIN, and FF-400 Series Respirators can be converted to continuous flow, supplied air respirators when used with the 3M™ Dual Airline Breathing Tubes SA-1500 and SA-2500.

These facepieces can also be converted to combination air purifying/supplied air respirators when the 3M™ Combination Dual Airline Breathing Tubes SA-1600 and SA-2600[4] are used in conjunction with certain NIOSH approved 3M™ 6000 Series Cartridges and Prefilters and 2000 Series Filters.

These conversions require one of the dual airline positive pressure adapter kits (see the "System Components and Replacement Parts" section of these *User Instructions*).

[1]07024, 07025 and 07026 are automotive product numbers for the 6100, 6200 and 6300 half facepieces.
[2]37081, 38082, 37083 are automotive product numbers for the 7501, 7502 and 7503 half facepieces.
[3]07138, 07139, 07140 are automotive product numbers for the 6700, 6800 and 6900 full facepieces.
[4]37001 is an automotive product number for SA-2600.

Listing of Warnings and Cautions within these User Instructions

⚠ WARNING

Failure to follow these instructions may reduce respirator performance, overexpose you to contaminants, and **may result in sickness or death.**

- This product helps protect against certain airborne contaminants. For proper use, see supervisor, *User Instructions* or call 3M in U.S.A., 1-800-243-4630. In Canada, call Technical Service at 1-800-267-4414.

- Each person using these respirators must read and understand the information in these *User Instructions* before use. Respirators must be used in accordance with these *User Instructions*, and must not be used by untrained or unqualified persons.

- Not all 3M™ 6000 Series Cartridge/2000 Series Filter combinations are approved for use with the 3M™ SA-1600/SA-2600 Combination Dual Airline Breathing Tubes. Review the NIOSH approval label prior to using the equipment.

- To meet the NIOSH requirement 42 CFR 84, Subpart 84.150 for minimum and maximum airflow (4 to 15 cfm, 113 to 425 lpm), the air control valves approved for use with the 3M™ Dual Airline Respirators must be operated within the supply pressure ranges and hose lengths stated in the "Air Supply Requirements" table in these *User Instructions*.

- You must comply with Occupational Safety and Health Administration (OSHA) standard 29 CFR 1910.134, which states that, "Airline couplings shall be incompatible with outlets for other gas systems to prevent inadvertent servicing of airline respirators with nonrespirable gases or oxygen". In Canada, refer to CSA standard Z180.1 or the requirements of the authority having jurisdiction in your region.

- Your employer must provide compressed breathing air that meets at least the requirements of the specification for Grade D breathing air, as described in the Compressed Gas Association Commodity Specification G-7.1 in the United States. In Canada, refer to CSA standard Z180.1 table for the quality of compressed breathing air.

- The line pressure must be kept within safe limits, 125 psig (8.75 kg/cm^2) maximum. Dirt, oil and water, unless trapped or filtered out, may continue downstream in concentrated form and adversely affect the performance of the respirator.

- If the facepiece is to be used as an air purifying facepiece (without using the 3M SA-1600 or SA-2600 combination dual airline breathing tubes), the inhalation valves MUST be replaced in the facepiece before use.

- Failure to use thread tape when replacing the breathing tube may result in damage to the female threads in the cap of the air control valve and prevent a tight fit and result in leakage.

- Do not wear this respirator to enter areas for which it is not NIOSH certified or designed, including areas where:
  - Atmospheres are oxygen deficient
  - Contaminant concentrations are unknown
  - Contaminant concentrations are Immediately Dangerous to Life or Health (IDLH)
  - Contaminant concentrations exceed the Maximum Use Concentration (MUC) determined using the Assigned Protection Factor (APF) for the specific respirator system or the APF mandated by specific government standards, whichever is lower.

- Contaminants that are dangerous to your health include those that you may not be able to see or smell. Leave the contaminated area immediately if any of the following conditions occur.
  - Any part of the system becomes damaged
  - Airflow into the respirator decreases or stops
  - Breathing becomes difficult
  - You feel dizzy or your vision is impaired
  - You taste or smell contaminants
  - Your face, eyes, nose or mouth become(s) irritated
  - You suspect that the concentration of contaminants may have reached levels at which this respirator may no longer provide adequate protection.

- DO NOT remove the facepiece nose cup. The Dual Airline is only approved for use with the nose cup installed.

- Do not enter a contaminated area until the respirator system has been properly donned. Do not remove the respirator before leaving the contaminated area.

- If this respirator system fails any of the requirements of the user inspection and performance check, do not use the respirator until all necessary repairs have been made and the respirator passes the performance check.

- Before using any respirator with a negative or positive pressure tight-fitting facepiece, the employee must be fit tested with the same make, model, style and size of respirator that will be used. Fit

testing is required by OSHA's Respiratory Protection standard 29 CFR 1910.134. In Canada, follow CSA standard Z94.4 or the requirements of the authority having jurisdiction in your region.

- As part of a good industrial hygiene program and as stated in the OSHA respiratory protection standard 29 CFR 1910.134 and in the CSA standard Z94.4 "Selection, Use and Care of Respirators", a tight fitting facepiece must not be worn with beards or other facial hair or other conditions that prevent a good seal between the face and the sealing surface of the respirator.

- Never modify or alter this respirator. Repair or replace parts only with approved 3M components.

CAUTION:

Do not immerse the air regulator or low pressure connector in water; doing so may saturate the foam spring valve with water. Failure to dry the foam may result in the growth of mold or mildew.

Important

Before use, wearer must read and understand these *User Instructions*. Keep these *User Instructions* for reference.

Respirator Selection and Training

Use of these respirators must be in accordance with applicable health and safety standards, respirator selection tables contained in such publications as American National Standards Institute (ANSI) Z88.2-1992, Canadian Standards Association (CSA) Standard Z94.4 or pursuant to the recommendations of an industrial hygienist. The employer must have a written respirator program in place that complies with the Occupational Safety and Health Administration (OSHA) respiratory protection standard found in 29 CFR 1910.134 prior to using any respirator. In Canada, follow CSA standard Z94.4 or the requirements of the authority having jurisdiction in your region.

Before use, the employer must assure that each respirator user has been trained by a qualified person in the proper use and maintenance of the respirator according to the instructions contained in these *User Instructions* and other applicable *User Instructions.*

⚠WARNING

Failure to follow these instructions may reduce respirator performance, overexpose you to contaminants, and **may result in sickness or death.**

- Each person using these respirators must read and understand the information in these *User Instructions* before use. Respirators must be used in accordance with these *User Instructions*, and must not be used by untrained or unqualified persons.

- Not all 3M™ 6000 Series Cartridge/2000 Series Filter combinations are approved for use with the 3M™ SA-1600/SA-2600 Combination Dual Airline Breathing Tubes. Review the NIOSH approval label prior to using the equipment.

NIOSH Approvals

The 3M™ Dual Airline Systems utilizing the SA-1500, SA-2500, SA-1600 or SA-2600 breathing tubes are NIOSH approved for use as Type C, continuous flow supplied air respirators. When using SA-1600 or SA-2600 combination breathing tubes without cartridges or filters, 3M™ 6880 Bayonet Caps are required.

Additionally, the 3M dual airline systems utilizing the 3M SA-1600 or SA-2600 combination dual airline breathing tubes are NIOSH approved for use as combination, air purifying, air supplied respirators. The approval numbers for these respirator systems can be obtained by referencing the NIOSH approval labels.

When disconnected from the air source, the 3M SA-1600 and SA-2600 combination dual airline breathing tubes, used in conjunction with approved facepieces, cartridges and filters convert to an air purifying respirator. Depending on the contaminant and concentration levels, this may facilitate entry and egress from the work area, while maintaining respiratory protection.

Note: The assigned protection factor for the respirator varies depending upon the mode of operation. Reference the assigned protection factor table.

Assigned Protection Factor

Assigned Protection Factor

Respirator Description	Air Purifying Mode	Continuous Flow SAR Mode
SA-1600 or SA-2600 with half facepiece.	10 x PEL	50 x PEL (w/cartridges or 3M™ 6880 caps)
SA-1600 or SA-2600 with full facepiece.	50[1] x PEL	1000 x PEL (w/cartridges or 3M 6880 caps)
SA-1500 or SA-2500 with half facepiece.	N/A	50 x PEL
SA-1500 or SA-2500 with full facepiece.	N/A	1000 x PEL

1. The respirator wearer must be fit tested using a quantitative fit test method in order to use an assigned protection factor greater than 10 when used as a negative pressure air purifying respirator.

Note: Assigned protection factors (APFs) may vary for specific standards as promulgated by OSHA. Where applicable, refer to the substance specific standard for APFs that may differ from the above table. In Canada, follow CSA standard Z94.4 or the requirements of the authority having jurisdiction in your region.

NIOSH Cautions and Limitations

A– Not for use in atmospheres containing less than 19.5 percent oxygen.

B– Not for use in atmospheres immediately dangerous to life or health.

C– Do not exceed maximum use concentrations established by regulatory standards.

D– Air-line respirators can be used only when the respirators are supplied with respirable air meeting the requirements of CGA G-7.1 Grade D or higher quality.

E– Use only the pressure ranges and hose lengths specified in the User's Instructions.

G– If airflow is cut off, switch to filter and/or cartridge or canister and immediately exit to clean air.

H– Follow established cartridge and canister change schedules or observe ESLI to ensure that cartridges and canisters are replaced before breakthrough occurs.

I– Contains electrical parts which have not been evaluated as an ignition source in flammable or explosive atmospheres by MSHA/NIOSH.

J– Failure to properly use and maintain this product could result in injury or death.

K– The Occupational Safety and Health Administration regulations require gas-proof goggles to be worn with this respirator when used against formaldehyde.

L– Follow the manufacturer's User's Instructions for changing cartridges, canister and/or filters.

M– All approved respirators shall be selected, fitted, used, and maintained in accordance with MSHA, OSHA, and other applicable regulations.

N– Never substitute, modify, add, or omit parts. Use only exact replacement parts in the configuration as specified by the manufacturer.

O– Refer to User's Instructions, and/or maintenance manuals for information on use and maintenance of these respirators.

P– NIOSH does not evaluate respirators for use as surgical masks.

S– Special or critical User's Instructions and/or specific use limitations apply. Refer to User's Instructions before donning.

S-Special or Critical User's Instructions

Remove the inhalation valves from the half or full facepiece respirator prior to the installation of the combination dual airline breathing tubes SA-1600 or SA-2600 with filters and/or cartridges. Store the inhalation valves so they remain flat and free of contamination.

Air Supply Requirements for 3M™ Dual Airline Systems with FF-400 Full Facepiece Respirators

3M™ Dual Airline and FF-400 Series system approvals allow you to combine up to three W-9435 or W-9445 hoses (25, 50 or 100 ft) in any combination not to exceed 300 ft. The W-2929 and W-3020 hoses can only be used in single lengths of 25, 50, or 100 ft. No connections are allowed. Refer to the table below for supply air pressure requirements for approved combinations.

Air Control Valve	High Pressure Hoses W-9435[1] & W-9445[1] (3/8" ID)	High Pressure Hose W-2929[2] Coiled (3/8" ID)	Low Pressure Hose W-3020[3] (1/2" ID)	Supply Pressure Range
SA-1009 Requires 21-65 psig (145-448 kN/m^2)	25 - 100 ft (7.6-30.5 m)	25, 50 or 100 ft (7.6, 15.2 or 30.5 m)	N/A	21-44 psig (145-303 kN/m^2)
	125 - 200 ft (38.1-61.0 m)	N/A	N/A	24-55 psig (165-379 kN/m^2)
	225 - 300 ft (68.6-91.4 m)	N/A	N/A	26-65 psig (179-448 kN/m^2)
SA-1029 Requires 8-17 psig (55-117 kN/m^2)	N/A	N/A	25 ft (7.6 m)	8-16 psig (55-110 kN/m^2)
	N/A	N/A	50 ft (15.2 m)	9-16 psig (62-110 kN/m^2)
	N/A	N/A	100 ft (30.5 m)	10-17 psig (69-117 kN/m^2)

[1] The 3M™ Supplied Air Hoses W-9435 (07010, 07011, 07012 are automotive product numbers for W-9435-25, W-9435-50, W-9435-100) and W-9445 are approved for use only in the lengths shown in the table. Hoses of 25 and 50-foot lengths cannot be combined. Hoses of 100-foot length may be combined up to a maximum of 300 feet (3 sections).

[2] The 3M™ Supplied Air Hose W-2929 can only be used in single lengths of 25, 50 or 100 feet (7.6, 15.2 or 30.5 meters).

[3] The 3M™ Supplied Air Hose W-3020 (07033, 07034, 07035 are automotive product numbers for W-3020-25, W-3020-50 and W-3020-100) can only be used in single lengths of 25, 50 or 100 feet (7.6, 15.2 or 30.5 meters).

Air Supply Requirements for 3M™ Dual Airline Systems

(For all NIOSH approved facepieces except FF-400 Series Full Facepiece Respirators)

Air Control Valve	High Pressure Hoses W-9435[1], W-9445[1], W-2929[2] (3/8" ID)	Low Pressure Hoses W-3020[3] (1/2" ID)	Supply Pressure Range
SA-1009 Requires 16 to 38 psig (110 to 262 kN/m^2)	25 ft (7.6 m)	N/A	16-24 psig (110-166 kN/m^2)
	50 ft (15.2 m)	N/A	17-26 psig (117-179 kN/m^2)
	100 ft (30.5 m)	N/A	18-27 psig (124-186 kN/m^2)
	200 ft (61.0 m)	N/A	21-33 psig 145-228 kN/m^2
	300 ft (91.4 m)	N/A	25-38 psig (172-262 kN/m^2)
SA-1029 Requires 8 to 17 psig (55 to 117 kN/m^2)	N/A	25 ft (7.6 m)	8-16 psig (55-110 kN/m^2)
	N/A	50 ft (15.2 m)	9-16 psig (62-110 kN/m^2)
	NA	100 ft (30.5 m)	10-17 psig (69-117 kN/m^2)

[1] The 3M™ Supplied Air Hoses W-9435 (07010, 07011, 07012 are automotive product numbers for W-9435-25, W-9435-50, W-9435-100) and W-9445 are approved for use only in the lengths shown in the table. Hoses of 25 and 50-foot lengths cannot be combined. Hoses of 100-foot length may be combined up to a maximum of 300 feet (3 sections).

[2] The 3M™ Supplied Air Hose W-2929 can only be used in single lengths of 25, 50 or 100 feet (7.6, 15.2 or 30.5 meters).

[3] The 3M™ Supplied Air Hose W-3020 (07033, 07034, 07035 are automotive product numbers for W-3020-25, W-3020-50 and W-3020-100) can only be used in single lengths of 25, 50 or 100 feet (7.6, 15.2 or 30.5 meters).

SPECIFICATIONS

⚠WARNING

Failure to follow these instructions may reduce respirator performance, overexpose you to contaminants, and **may result in sickness or death.**

- To meet the NIOSH requirement 42 CFR 84, Subpart 84.150 for minimum and maximum airflow (4 to 15 cfm, 113 to 425 lpm), the air control valves approved for use with the 3M™ Dual Airline Respirators must be operated within the supply pressure ranges and hose lengths stated in the "Air Supply Requirements" table in these *User Instructions*.

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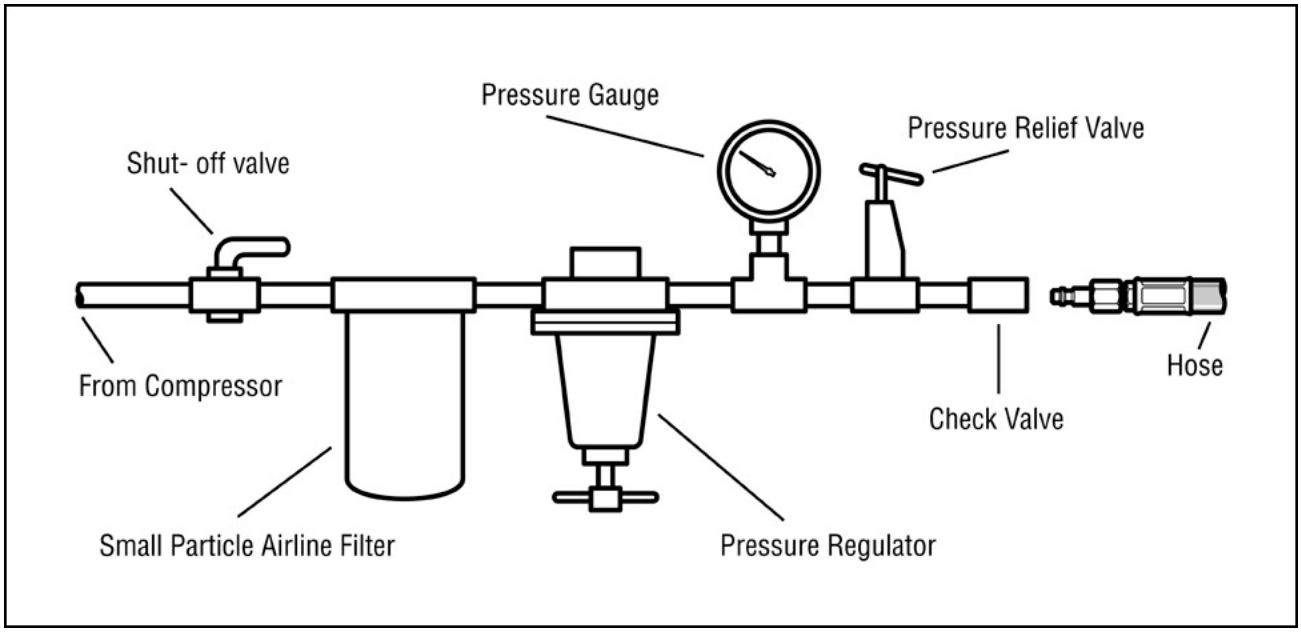
- Your employer must provide compressed breathing air that meets at least the requirements of the specification for Grade D breathing air, as described in the Compressed Gas Association Commodity Specification G-7.1 in the United States. In Canada, refer to CSA standard Z180.1 table for the quality of compressed breathing air.

- The line pressure must be kept within safe limits, 125 psig (8.75 kg/cm^2) maximum. Dirt, oil and water, unless trapped or filtered out, may continue downstream in concentrated form and adversely affect the performance of the respirator.

Discussion on Respirable Air

Many older compressed air systems may have air that is unfit for human use without secondary air treatment. This is due largely to the presence of objectionable oil vapors and odors. Rules and regulations governing air quality when using compressed air for respiration are quite specific. Precautions must be observed when using compressed air for breathing purposes.

Fig. 1



Oil mist from the compressor lubricating oil must not be present when the air reaches the air control device. Excessive amounts of water vapor and any particulate matter should also be removed as they may result in unpredictable behavior of the air control device. The schematic diagram (Fig. 1) of the air purifier and pressure regulator equipment shows what should be installed in the main airline ahead of the connection for breathing air hoses.

If a pre-assembled air filtering and regulating device is desired, 3M offers several compressed air filter and regulator panel assemblies. These assemblies contain a specially designed filter cartridge to help remove oil mist and vapors, condensed moisture, particulates, odors and vapors. They come completely assembled and are ready for connection between the compressor or compressed air bottle and the supplied air respirator system. Note: Use of these devices does not ensure the delivery of Grade D breathable air.

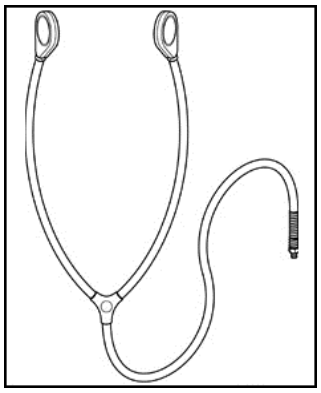
Note: Carbon monoxide

Although it is theoretically possible that oil lubricated compressors can create carbon monoxide (CO) if the compressor overheats, studies have shown that the location of the compressor's air intake is the most likely source of carbon monoxide contamination[1]. According to OSHA regulation [29 CFR (1910.134)(i)], periodic CO monitoring, rather than continuous CO monitoring with an alarm, is acceptable if the oil lubricated compressor is equipped with a high temperature alarm and automatic shut-down. In Canada, follow CSA standard Z94.4 or the requirements of the authority having jurisdiction in your region.

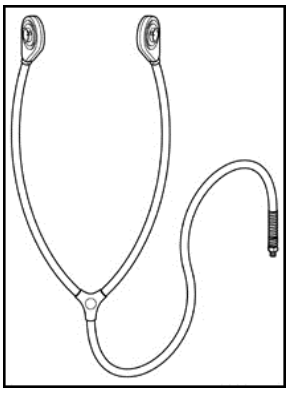
[1] Formation of carbon monoxide in air compressors, Am. Ind. Hyg. Assoc. J (40), June 1979, pp. 548-551.

SYSTEM COMPONENTS AND REPLACEMENT PARTS

This section serves as an illustration of the major components of the 3M™ Dual Airline Systems, not including the half or full facepiece respirator. A descriptive listing of the individual components is found later in this section.



SA-2500



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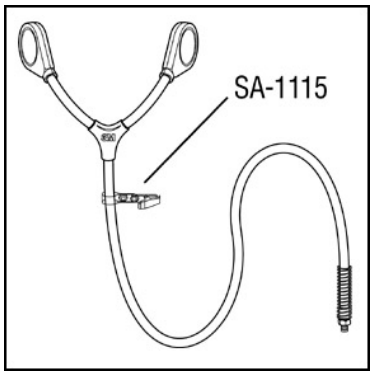

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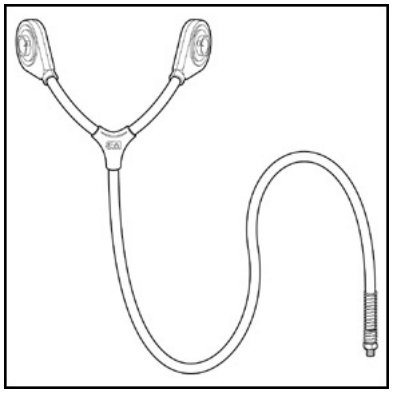
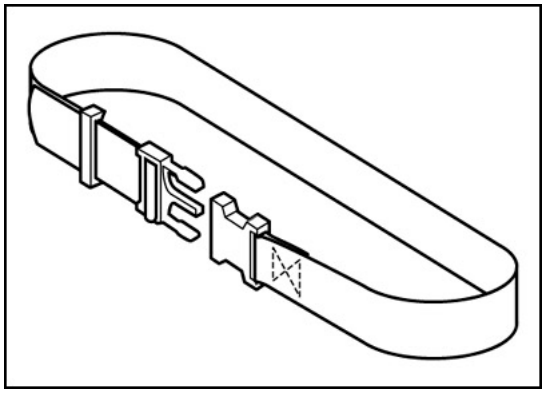


SA-1600



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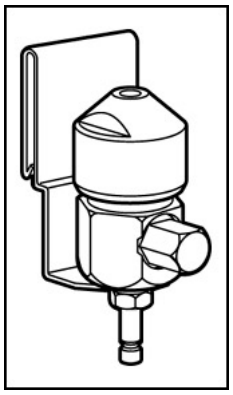
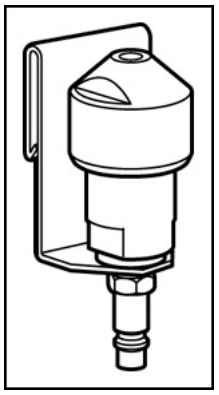
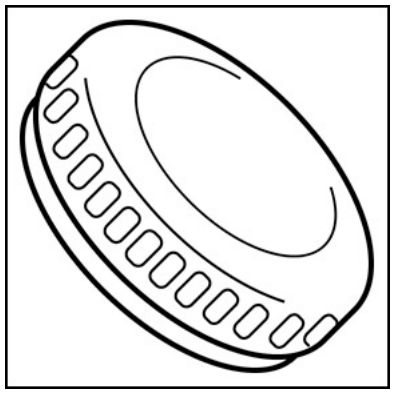


SA-1009



SA-1029



6880

3M™ Dual Airline Replacement Parts

Product Number	AAD Number*	Description of Front-Mounted Dual Airline Components
SA-1000		Front-Mounted Adapter Kit (includes SA-1500 breathing tube and SA-1007 regulator assembly)
SA-1000LP		Front-Mounted Adapter Kit, Low Pressure (includes SA-1500 breathing tube and SA-1027 low pressure connector assembly)
SA-1500	07147	Front-Mounted Breathing Tube
SA-1600		Combination Front-Mounted Breathing Tube
SA-1100		Combination Front-Mounted Adapter Kit (includes SA-1600 breathing tube and SA-1007 regulator assembly)
SA-1100LP		Combination Front-Mounted Adapter Kit, Low Pressure (includes SA-1600 breathing tube and SA-1027 low pressure connector assembly)

Product Number	AAD Number*	Description of Back-Mounted Dual Airline Components
SA-2000		Back-Mounted Adapter Kit (includes SA-2500 back-mounted breathing tube and SA-1007 regulator assembly)
SA-2000LP		Back-Mounted Adapter Kit, Low Pressure (includes SA-2500 back-mounted breathing tube and SA-1027 low pressure connector assembly)
SA-2500	07148	Back-Mounted Breathing Tube
SA-2600	37001	Combination Back-Mounted Breathing Tube
SA-2100		Combination Back-Mounted Adapter Kit (includes SA-2600 back-mounted breathing tube and SA-1007 regulator assembly)
SA-2100LP		Combination Back-Mounted Adapter Kit, Low Pressure (includes SA-2600 back-mounted breathing tube and SA-1027 low pressure connector assembly)
Product Number	**AAD Number***	**Description of Air Control Valves, Connectors and Fittings**
SA-1007	07153	Air Regulating Valve Assembly, Industrial Interchange Fitting (includes SA-1009 valve and GVP-127 belt)
SA-1009	07149	Air Regulating Valve, Industrial Interchange
SA-1027	07154	Connector Assembly, Low Pressure (includes SA-1029 connector and GVP-127 web belt)
SA-1029	07150	Connector, Low Pressure
GVP-127	07152	Waist Belt, Web (up to ~ 46”)
W-2963	07045	Waist Belt, Cotton (up to ~ 43”)
W-3217		Waist Belt, Vinyl (up to ~ 54”)
520-02-23		Waist Belt, Decontaminable (up to ~ 50”)
6880	37002	Bayonet Caps (10 caps/case)
W-1279-2		Plug, 1/4 in Body Size, 1/4 in MPT, Industrial Interchange (High Pressure)
W-3186-2		Plug, 1/4 in Body Size, 1/4 in MPT, Schrader (High Pressure)
W-3251-2		Plug, 1/2 in Body Size, 1/4 in MPT, Schrader (Low Pressure)
W-3252-2		Plug, 3/8 in Body Size, 1/4 in MPT, Industrial Interchange (Low Pressure)

* 3M Automotive Aftermarket Division (AAD). AAD part numbers are catalog numbers only. NIOSH approved by the corresponding 3M OH&ES Division product number.

3M™ Dual Airline System Kits for Automotive Industry Users

AAD Product Number*	Description of Back-Mounted Low Pressure Combination Dual Airline Kits
37030	Half Facepiece Kit [includes 07025 medium half facepiece, 37001 combination breathing tube, 07154 connector assembly, 07034 low pressure hose, 50 ft, 07046 organic vapor cartridges (1 pair), 07054 filter retainers (1 pair), and 07194 filters, P95 (two pair)]
37031	Half Facepiece Kit [includes the same components as the 37030 kit, except with 07026 large half facepiece.]
37032	Full Facepiece Kit [includes the same components as the 37030 kit, except with 07139 medium full facepiece and 1 pack (25 ea.) 07142 faceshield covers]
37033	Full Facepiece Kit [includes the same components as the 37030 kit, except with 07140 large full facepiece and 1 pack (25 ea.) 07142 faceshield covers]
AAD Product Number*	**Description of Back-Mounted High Pressure Combination Dual Airline Kits**
37034	Half Facepiece Kit [includes 07025 medium half facepiece, 37001 combination breathing tube, 07153 air regulator assembly, 07011 high pressure hose, 50 ft, 07046 organic vapor cartridges (1 pair), 07054 filter retainers (1 pair), and 07194 filters, P95 (2 pair)]
37035	Half Facepiece Kit [includes the same components as the 37034 kit, except with 07026 large half facepiece.]
37036	Full Facepiece Kit [includes the same components as the 37034 kit, except with 07139 medium full facepiece. and 1 pack (25 ea.) 07142 faceshield covers]
37037	Full Facepiece Kit [includes the same components as the 37034 kit, except with 07140 large full facepiece and 1 pack (25 ea.) 07142 faceshield covers]

* 3M Automotive Aftermarket Division (AAD). The 07XXX and 37XXX AAD numbers are catalog numbers only.

ASSEMBLY

⚠WARNING

Failure to follow these instructions may reduce respirator performance, overexpose you to contaminants, and **may result in sickness or death.**

- If the facepiece is to be used as an air purifying facepiece (without using the 3M SA-1600 or SA-2600 combination dual airline breathing tubes), the inhalation valves MUST be replaced in the facepiece before use**.**

- Failure to use thread tape when replacing the breathing tube may result in damage to the female threads in the cap of the air control valve and prevent a tight fit and result in leakage.

The instructions for converting 3M half and full facepiece respirators for dual airline supplied air applications are presented in this section. To set up a correct and complete assembly, follow the directions below. Refer to the NIOSH approval label for approved respirator configurations.

3M™ Half Facepiece Respirators
(6000 Series Shown)

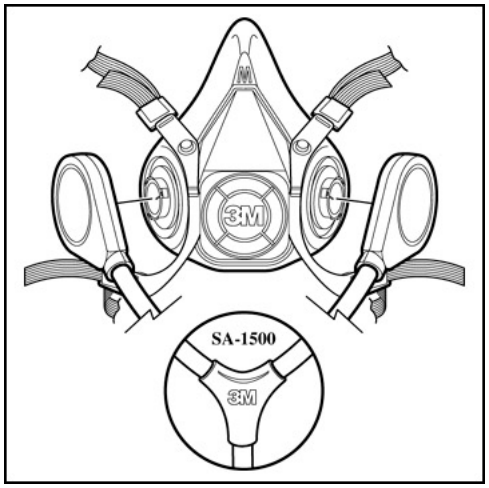


Fig. 2

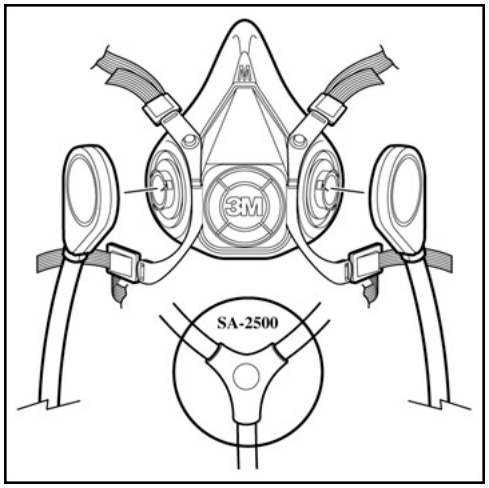


Fig. 3

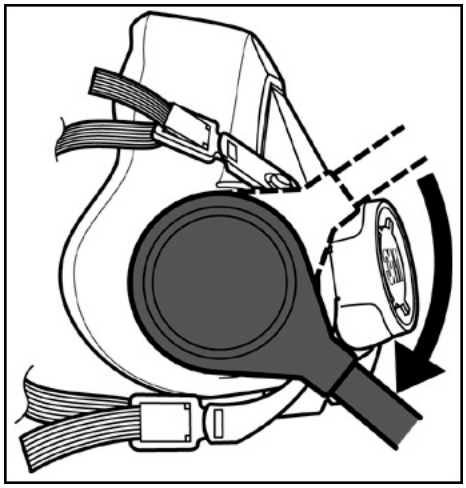


Fig. 4

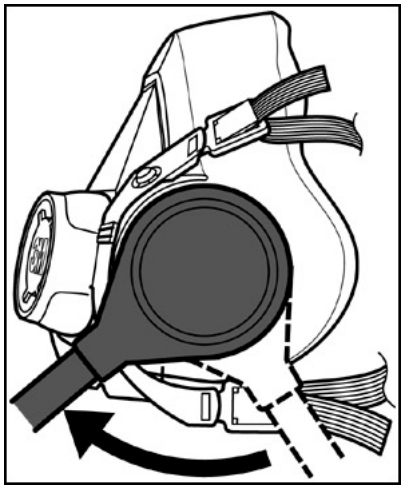


Fig. 5

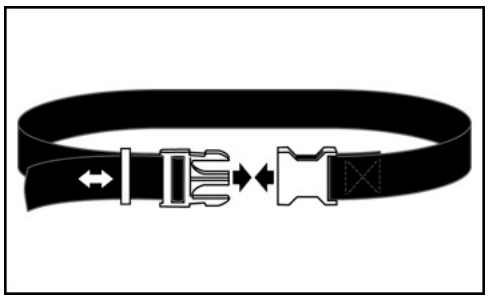


Fig. 6

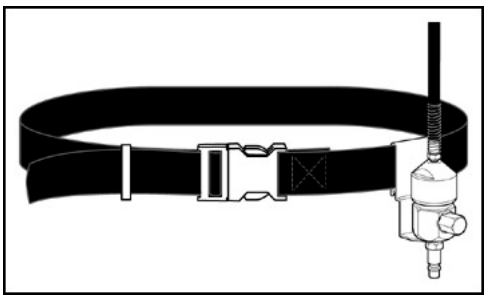


Fig. 7

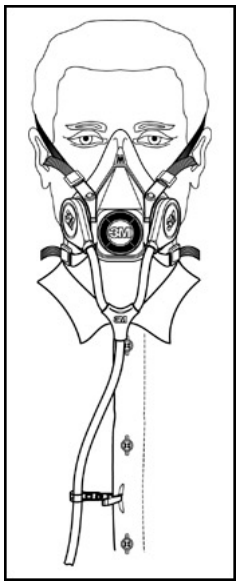


Fig. 8

1. Hold the half facepiece in front of you so that the 3M logo on the half facepiece is facing you. Align the two branches of the breathing tube over the two bayonet mounts on the half facepiece. For the 3M™ SA-1500 or SA-1600 Breathing Tubes, make sure that the 3M logo on the breathing tube and on the half facepiece are both facing towards you. For the 3M™ SA-2500 or SA-2600 breathing tubes, make sure that the 3M logo on the breathing tube is facing in the opposite direction to the 3M logo on the half facepieces. (Fig. 2 and 3)
2. Twist each branch of the breathing tube clockwise a quarter turn until it is firmly seated in the bayonet and cannot be turned further. Do not forcibly overturn as the bayonet could be damaged. (Fig. 4 and 5).
3. Place the belt around the waist and adjust for size and comfort. (Fig. 6)
4. Place the metal belt clip of the air regulator/connector on the belt. (Fig. 7)
5. On the 3M SA-1500 or SA-1600 breathing tubes, use the clip to secure the tube to your clothing. (Fig. 8)

3M™ Full Facepiece Respirators
(7000 Series Shown)

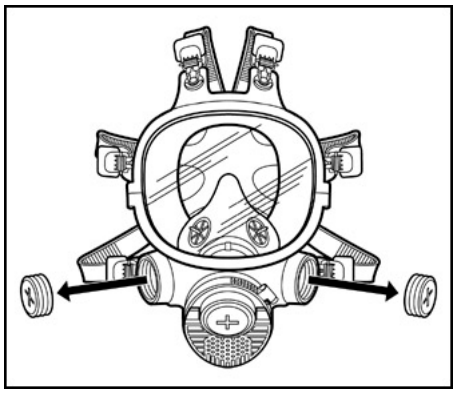


Fig. 9

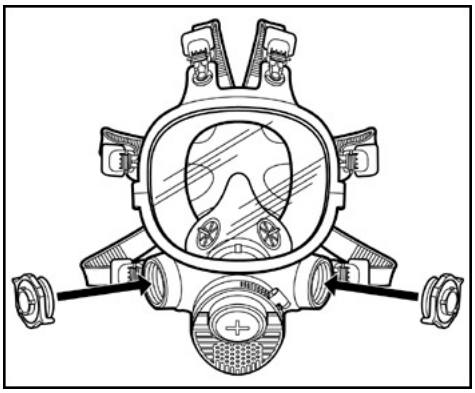


Fig. 10

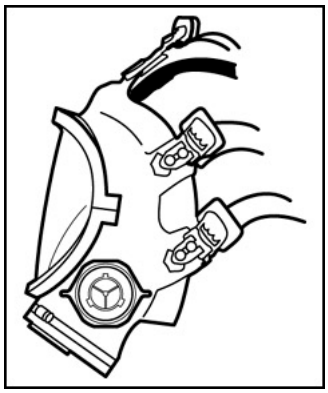


Fig. 11

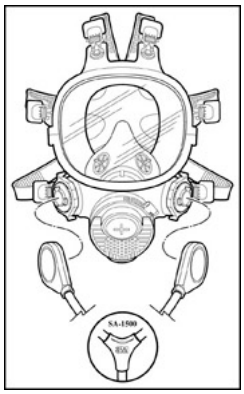


Fig. 12

Fig. 13

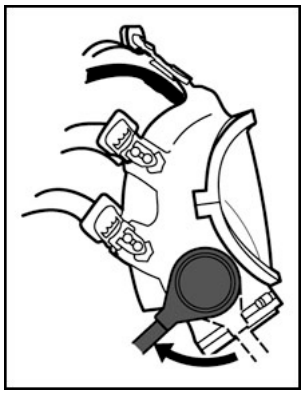


Fig. 14

Fig. 15

Note: If your 3M 7800S full facepiece is already equipped with 3M™ 701 Bayonet Adapters, steps 1-3 may be omitted.

1. Remove the 3M™ 7890 Plugs, if not already fitted with 3M 701 adapter. (Fig. 9)
2. The 3M 701 adapter allows you to attach the dual airline breathing tube to the 7800S full facepiece. (Fig. 10)
3. Thread the assembled 701 adapter into the cartridge connector port – do not tighten (the orange gasket will be facing outward). Align the small solid bayonet lug to the bottom of the facepiece lens and tighten the nut. Place another 701 adapter in the opposite cartridge connector port following the same procedure. (Fig. 11)
4. Align the two branches of the breathing tube over the bayonet mounts on the facepiece. For the 3M™ SA-1500 or SA-1600 Breathing Tubes, make sure that the 3M logo on the breathing tube and front of the facepiece are both facing towards you. For the 3M™ SA-2500 or SA-2600 Breathing Tubes, make sure that the 3M logo on the breathing tube is facing in the opposite direction to the 3M logo on the front of the facepiece. (Fig. 12)
5. Twist each branch of the breathing tube clockwise a quarter turn until it is firmly seated in the bayonet and cannot be turned further. Do not forcibly overturn as the bayonet could be damaged. (Fig. 13 and 14) 3M SA-2500/SA-2600 back-mounted breathing tubes shown.
6. Full facepiece respirators with DIN connections only. Install 7890 plug in center port. (Fig. 15)

Assembly of 3M™ Combination Dual Airline Respirator with Cartridges and Filters
The SA-1600 (front-mounted) and SA-2600 (back-mounted) versions of the 3M™ Dual Airline Breathing Tubes allow the use of selected, NIOSH-approved 3M™ 6000 Series Cartridges and 2000 Series Filters. For the listing of approved cartridges and filters, please reference the NIOSH approval label.

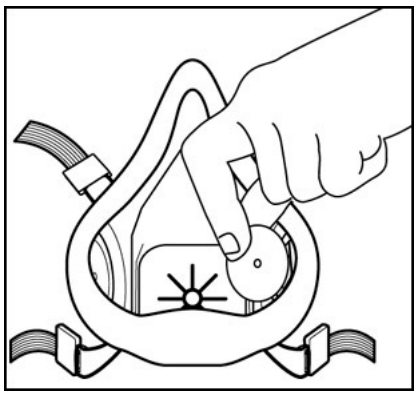


Fig. 16

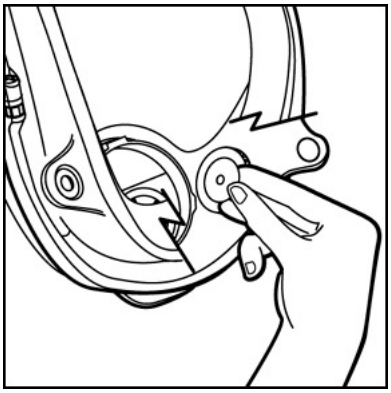


Fig. 17

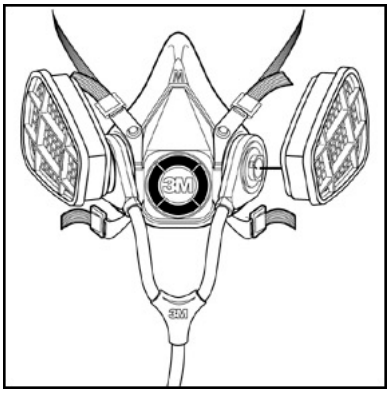


Fig. 18

To assemble the 3M dual airline breathing tubes with cartridges and/or filters, do the following:
1. Remove the inhalation valves from the half or full facepiece and store them so they remain flat. (Fig. 16 and 17)
2. Attach the 3M SA-1600 or SA-2600 combination dual airline breathing tubes to the facepiece per the procedures outlined previously in these *User Instructions*. The process is identical to the attachment of the 3M SA-1500 and SA-2500 models.
3. Make a selection of cartridge and/or filter that meets your respiratory protection requirements, and attach to the outer bayonets on the 3M SA-1600 or SA-2600 combination dual airline breathing tubes. (Fig. 18)
4. Don the facepiece per the procedures outlined in the "Donning" section.
5. After being properly fit tested, perform a positive and negative user seal check per the procedures outlined later in this section. **If a proper fit cannot be obtained, see your supervisor. Do not enter the contaminated area.**
6. Attach a supplied air hose to the 3M SA-1009 air regulator or the SA-1029 low pressure connector and adjust the air pressure to the manufacturer's specified setting for the length of supplied air hose employed.

Using the 3M™ Combination Dual Airline Breathing Tubes without Cartridges and Filters
To use the 3M combination dual airline breathing tubes (SA-1600 and SA-2600) without cartridges or filters, attach a 3M™ 6880 Bayonet Cap to each outer bayonet mount on the dual airline breathing tube. As a straight, Type C, continuous flow supplied air respirator, the Assigned Protection Factor is 50 times the PEL or TLV guidelines for the half facepiece respirators, and 1000 x the PEL or TLV guidelines for the full facepiece respirators. In Canada, follow CSA standard Z94.4 or the requirements of the authority having jurisdiction in your region.

Replacing 3M™ Airline Fittings and Breathing Tubes
Prior to using the respirator, it must be equipped with the proper airline fittings. To assist in meeting the OSHA requirements for airline fittings, 3M™ Dual Airline Respirators are approved with several types of quick disconnect designs. See the "Dual Airline Replacement Parts" section for a complete listing of 3M fittings.

To replace a plug on an air control valve:
1. Secure the valve in a padded vise and use a wrench to remove the plug.

2. Apply pipe thread tape to the threads of the new plug and tighten the replacement plug into the valve.
3. Attach the hose to a compressed air source with 38 psig (262 KN/m^2). Use soapy water on the fittings to confirm a tight fit. Leakage in the connection will cause bubbles to form. Do not use if a tight fit is not confirmed.

To replace a dual airline breathing tube

1. Remove the breathing tube using 2 wrenches; one for the breathing tube fitting and the other to hold the air control valve on the flat sides of the cap.
2. Apply pipe thread tape to the threads of the replacement breathing tube, hand thread the breathing tube into the air control valve and tighten using the two wrenches.

OPERATING INSTRUCTIONS

⚠WARNING

Failure to follow these instructions may reduce respirator performance, overexpose you to contaminants, and **may result in sickness or death.**

- Do not wear this respirator to enter areas for which it is not NIOSH certified or designed, including areas where:
  - Atmospheres are oxygen deficient
  - Contaminant concentrations are unknown
  - Contaminant concentrations are Immediately Dangerous to Life or Health (IDLH)
  - Contaminant concentrations exceed the Maximum Use Concentration (MUC) determined using the Assigned Protection Factor (APF) for the specific respirator system or the APF mandated by specific government standards, whichever is lower.
- Contaminants that are dangerous to your health include those that you may not be able to see or smell. Leave the contaminated area immediately if any of the following conditions occur.
  - Any part of the system becomes damaged
  - Airflow into the respirator decreases or stops
  - Breathing becomes difficult
  - You feel dizzy or your vision is impaired
  - You taste or smell contaminants
  - Your face, eyes, nose or mouth become(s) irritated
  - You suspect that the concentration of contaminants may have reached levels at which this respirator may no longer provide adequate protection
- DO NOT remove the facepiece nose cup. The Dual Airline is only approved for use with the nose cup installed.
- Do not enter a contaminated area until the respirator system has been properly donned. Do not remove the respirator before leaving the contaminated area.

- If you have any doubts about the applicability of this equipment to your job situation, see your supervisor, consult an industrial hygienist or call 3M Occupational Health and Environmental Safety Division, Technical Service, in U.S.A. at 1-800-243-4630. In Canada, call Technical Service at 1-800-267-4414.

- Before using any respirator with a negative or positive pressure tight-fitting facepiece, the employee must be fit tested with the same make, model, style and size of respirator that will be used. Fit testing is required by OSHA's Respiratory Protection standard 29 CFR 1910.134. In Canada, follow CSA standard Z94.4 or the requirements of the authority having jurisdiction in your region.

- As part of a good industrial hygiene program and as stated in the OSHA respiratory protection standard 29 CFR 1910.134 and in the CSA standard Z94.4 "Selection, Use and Care of Respirators", a tight fitting facepiece must not be worn with beards or other facial hair or other conditions that prevent a good seal between the face and the sealing surface of the respirator.

General Instructions

1. Observe all WARNINGS contained in these *User Instructions* when using this product. Failure to do so may result in improper usage and **could result in sickness or death.**
2. Ensure that the equipment has been inspected, assembled and checked for performance as prescribed in these *User Instructions*.
3. Never alter or modify this respirator.
4. A Qualitative Fit Test (QLFT) or Quantitative Fit Test (QNFT) is required for all tight fitting supplied air respirators per OSHA respiratory protection standard 29 CFR 1910.134. In Canada, follow CSA standard Z94.4 or the requirements of the authority having jurisdiction in your region.
5. The useful service life of chemical cartridges will depend on the rate of airflow through the cartridges, specific type, volatility and concentration of the contaminants and environmental conditions such as humidity, pressure and temperature. Replace cartridges in accordance with an established change schedule or end of service life indicator (ELSI). Replace cartridges immediately if smell, taste or irritation from contaminants is detected. Filters must be replaced immediately if they become damaged, soiled or if increased breathing resistance occurs. N-series filters should not be used in environments containing oil aerosols. R-series filters may be limited to 8 hours continuous or intermittent use if oil aerosols are present. In environments containing only oil aerosols, P-series filters should be replaced after 40 hours of use or 30 days, whichever is first.

Performance Check

To be performed prior to each use of the respirator.

General Information

1. Check 3M™ Supplied Air Hose and Breathing Tube for any leaks, tears or generally worn conditions. Replace if damaged.
2. Inspect the facepiece to ensure it is in good operating condition.
3. Make sure that the dual airline breathing tube is securely attached to the facepiece and the air regulator or low pressure connector.
4. Verify that the pressure of the air supply remains within the stated pressure range for the hose length being used (see the System Description and Replacement Parts Section).

5. Connect the supplied air hose to the air control valve and the source of compressed air. A continuous airflow into the facepiece should occur. If a continuous flow is absent, do not use the unit. Remove the respirator from service and review troubleshooting guidelines.

3M™ Air Regulating Valve SA-1009

This valve is designed to operate at the higher pressure ranges available on large, stationary compressors. This regulator has adjustable airflow by means of an airflow control knob. This knob can be turned 360 degrees, increasing and decreasing the air flowing into the facepiece as the knob is turned.

1. Adjust the supply pressure to a value within the pressure range specified in the Air Supply Requirements table in "Specifications" section of this *User Instruction* for the given length of hose.
2. Turn the control knob on the valve housing until a comfortable airflow is obtained. Note that although the flow is adjustable, as long as the pressure is within the manufacturer's specified pressure range, the flow into the respirator will always meet the NIOSH required airflow.

3M™ Low Pressure Connector SA-1029

This valve is designed for use with low pressures associated with portable pumps (although, with proper pressure regulation, they can be used on full-size industrial compressors) and does not have an adjustable control on the valve itself. Airflow is determined by the supply pressure only.

1. Adjust the supply pressure to a value within the pressure range specified in the Air Supply Requirements table in "Specifications" section of this *User Instruction* for the given length of hose.
2. Set the supply pressure for the airflow that is most comfortable but still within the specified range.

Donning

Donning and Adjusting 3M™ Half Facepiece Respirators
(6000 Series shown)

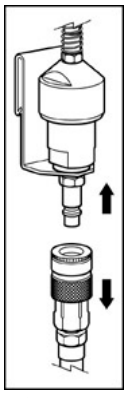


Fig. 19

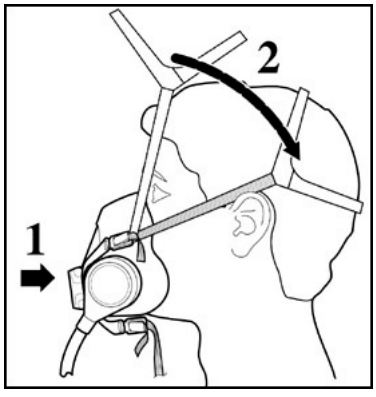


Fig. 20

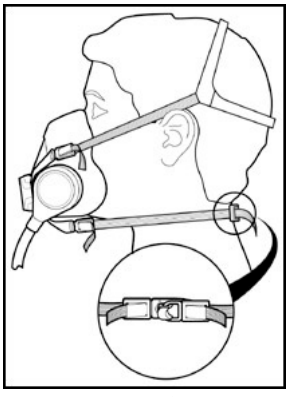


Fig. 21

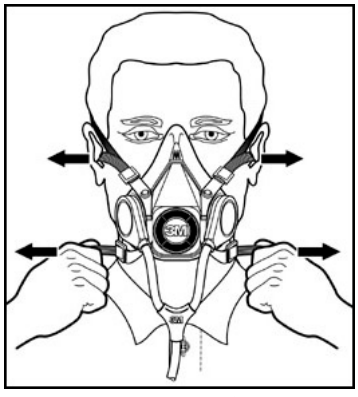


Fig. 22

1. Ensure the 3M supplied air hose is connected to the air control valve or low pressure connector. To connect, pull back on the socket end of the supplied air hose while inserting it onto the plug end of the air control device. (Fig. 19)
2. Place the respirator over the mouth and nose. (Fig. 20)
3. Pull the head harness over the crown of the head. (Fig. 20)

4. Take the bottom straps in both hands, place the straps around the back of the head and hook together. (Fig. 21)
5. Pull the ends of the head harness and bottom straps to adjust the tightness. (Fig. 22) DO NOT over tighten (Strap tension may be decreased by pushing out on backside of buckles). Perform a user seal check as described in the "User Seal Check" section, before each use.

Donning and Adjusting 3M™ Full Facepiece Respirators
(7800S Series shown)

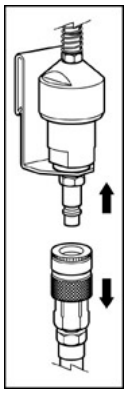


Fig. 23

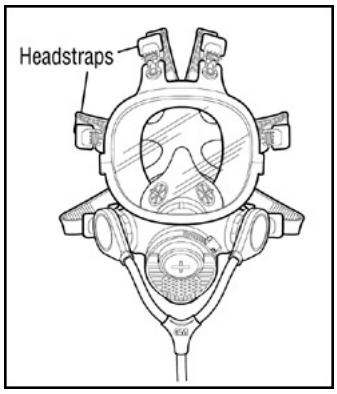


Fig. 24

Fig. 25

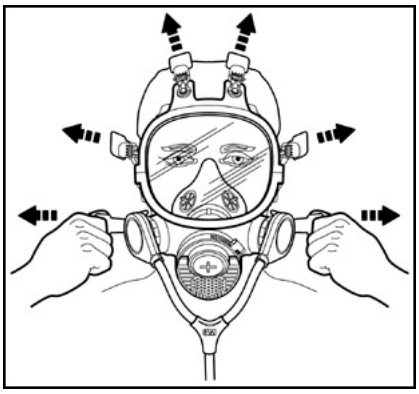


Fig. 26

1. Ensure the 3M supplied air hose is connected to the air control valve or low pressure connector. To connect, pull back on the socket end of the supplied air hose while inserting it onto the plug end of the air control device. (Fig. 23)
2. Loosen all head straps on the full facepiece. (Fig. 24)
3. Place facepiece on face and pull head harness to the back of the head. (Fig. 25)
4. Start with the neck straps and adjust for tightness. Tighten all straps. (Fig. 26) Perform a user seal check as described in the "User Seal Check" section, before each use.

User Seal Checks – Must be Performed Each Time Respirator is Worn

Always check the seal of the respirator on your face before entering a contaminated area.

User Seal Check for 3M™ Breathing Tubes SA-1500 or SA-2500
If using the 3M™ SA-1500 or SA-2500 Breathing Tubes, disconnect the 3M™ Supplied Air Hose from the 3M™ Dual Airline Air Regulator or Low Pressure Connector. (Fig. 25) Inhale gently. If the facepiece collapses slightly, a proper fit has been obtained. If air leakage is detected, reposition the respirator on the face and/or readjust the tension of the straps to eliminate leakage. Reconnect the supplied air hose to the 3M air regulator or low pressure connector.
If you cannot achieve a proper fit, DO NOT enter the contaminated area. See your supervisor.

Note: As soon as the hose is disconnected from the air regulator or low pressure connector, most facepieces will collapse immediately. Be ready to reconnect the hose to the valve to prevent any discomfort.

User Seal Check for Combination Breathing Tubes SA-1600 or SA-2600
If using the 3M™ SA-1600 or SA-2600 Combination Breathing Tubes in conjunction with 3M™ 6000 Series Cartridges or 2000 Series Filters, follow the appropriate positive and negative pressure user seal check instructions:

Positive Pressure User Seal Check
Place the palm of your hand over opening in exhalation valve cover and exhale gently. If the facepiece bulges slightly and no air leaks are detected between your face and the facepiece, a proper fit has been obtained. If faceseal air leakage is detected, reposition the respirator on your face and/or readjust the tension of the elastic straps to eliminate the leakage.
If you cannot achieve a proper fit, DO NOT enter the contaminated area. See your supervisor.

Negative Pressure User Seal Check for 3M™ Filters 2000 Series
Place your thumbs onto the center portion of the filters, restricting the airflow through filters, and inhale gently. If you feel the facepiece collapse slightly and pull closer to your face with no leaks between the face and facepiece, a proper seal has been obtained. If faceseal air leakage is detected, reposition the respirator on the face and/or readjust the tension of the straps to eliminate the leakage. **If you cannot achieve a proper fit, DO NOT enter the contaminated area. See your supervisor.**

Negative Pressure User Seal Check for 3M™ Cartridges 6000 Series
Place the palms of the hands to cover the face of the cartridge or open area or the 3M™ 501 Prefilter Retainer, when the retainer is attached to the cartridge, to restrict airflow. Inhale gently. If you feel the facepiece collapse slightly and pull closer to your face with no leaks between the face and facepiece, a proper seal has been obtained. If faceseal air leakage is detected, reposition the respirator on the face and/or readjust the tension of the straps to eliminate the leakage.
If you cannot achieve a proper fit, DO NOT enter the contaminated area. See your supervisor.

Negative Pressure User Seal Check for 3M™ 7093/7093C Filter
Using hands, press or squeeze filter covers toward facepiece and inhale gently. Be careful not to disturb the position of the respirator. If you feel the facepiece collapse slightly and pull closer to your face with no leaks between the face and facepiece, a proper seal has been obtained. If faceseal air leakage is detected, reposition the respirator on the face and/or readjust the tension of the straps to eliminate the leakage.
If you cannot achieve a proper fit, DO NOT enter the contaminated area. See your supervisor.

Note: Before assigning any respirator to be worn in a contaminated area, a qualitative or quantitative fit test must be performed per applicable requirements of OSHA respiratory standard 29 CFR 1910.134. In Canada, follow the requirements of the authority having jurisdiction and CSA standard Z94.4.

Note: Use of the 3M 501 filter retainer may aid the respirator wearer in conducting a negative user seal check with 6000 series cartridges.

INSPECTION, CLEANING AND STORAGE

Before cleaning the 3M™ Dual Airline Systems, the components described in this section should be disassembled and inspected for signs of damage due to impact, rough handling, or normal wear that might reduce the degree of protection provided by the unit. Replace damaged parts immediately.

⚠WARNING

Never modify or alter this respirator. Repair or replace parts only with approved 3M components. **Failure to do so may adversely affect product performance and result in sickness or death.**

Cleaning/Disinfecting

Use caution if using solvents to clean the dual airline system. Certain organic solvents may chemically attack the materials used in the 3M™ Dual Airline Breathing Tubes. Follow the procedures outlined below.

1. Disconnect the dual airline breathing tube from the facepiece.
2. Remove all other parts from the facepiece, i.e. head strap assembly, positive pressure connectors and exhalation valve assembly.
3. Wash the respirator facepiece in warm water with a neutral detergent. Wipe down the exterior of the breathing tube with a cloth dampened with this cleaning solution. Be careful not to let any of the solution enter into the breathing tube. Other detergents can be used, but should be tested first for adverse reaction.
4. Do not use detergents which contain lanolin or other oils since they may soften and/or distort the facepiece lens.
5. Rinse in clean water. Water temperature should not exceed 120˚ F (49˚ C).
6. Dry in uncontaminated ambient air. If using forced air, do not exceed 120˚ F (49˚ C).
7. Disinfect facepiece by soaking in a solution of quaternary ammonia disinfectant or sodium hypochloride (1 oz [30 ML} household bleach in 2 gallons [7.5 L} of water), or other disinfectant. Rinse in fresh, warm water and air dry in non-contaminated atmosphere.

Inspecting the Facepiece

This respirator must be inspected before each use to ensure it is in good operating condition. Any damaged or defective parts must be replaced before use. The following procedure is suggested:

1. Check the facepiece and breathing tube for cracks, tears and dirt. Be certain the facepiece, especially the faceseal area, is not distorted. The material must be pliable, not stiff.
2. Make sure that head straps are intact and have good elasticity.
3. Examine all plastic parts for signs of cracking or fatiguing.
4. Remove the exhalation valve cover and examine the valve and valve seat for signs of dirt, distortion, cracking or tearing. Snap the exhalation valve cover back into place.
5. Examine the bayonet lugs for signs of unusual wear. Examine the orange gasket for signs of wear.
6. Repair or replace parts only with the 3M components approved for this system.

Inspecting the Air Control Valves

The regulators and connectors have no moving parts except for the airflow adjustment knob on the 3M™ SA-1009 Air Regulator, so there is very little that will require maintenance. If the air from the compressor or pump meets regulatory requirements, the spring check valve inside of these regulators and connectors should continue to operate normally for a long period of time. It is recommended that you follow these maintenance guidelines for the 3M SA-1009 regulator and SA-1029 connectors:

1. Waist belt (GVP-127) - The waist belt may be hand laundered with mild detergent, a clean water rinse and air dried.
2. Air regulator (SA-1009) and low pressure connector (SA-1029) – Clean the exterior of the valve or connector as needed by wiping down with a damp cloth. Blow clean with compressed air.

CAUTION:

Do not immerse the air regulator or low pressure connector in water; doing so may saturate the foam spring valve with water. Failure to dry the foam may result in the growth of mold or mildew.

Storage

The respirator should be placed in a clean container or bag and stored at ambient temperature in a dry, uncontaminated area protected from bright sunlight.

TROUBLESHOOTING

Use the table below to help identify possible causes and corrective action for problems you may experience.

Problem	Possible Cause	Corrective Action
You smell or taste contaminants or irritation occurs, or breathing becomes difficult or dizziness or other distress occurs	Equipment malfunction Incorrect assembly Misuse Pressure not within manufacturer's guidelines	Leave the work area immediately and notify your supervisor. Do not use the dual airline system until the performance check in the "Assembly Section is completed and the equipment is checked by your supervisor. If using the combination dual airline breathing tubes in air purifying mode, replace the cartridges or filters.
Decrease or loss of airflow	Supplied air hose is kinked, split or restricted. Breathing tube disconnected at the facepiece or at air control valve. Supplied air hose disconnected at air control valve or filter and regulator panel. Decrease in pressure at filter and regulator panel.	Remove kink or equipment that may have rolled onto the hose. Replace hose if cut or split. Ensure breathing tube is connected. Inspect and reconnect hose fittings. Check pressure and readjust to required pressure based upon hose length and 3M air control valve used (SA-1009 or SA-1029). Replace old, dirty filter(s) in filter and regulating panel that could be restricting airflow.
Breathing tube cracks or ruptures	Contact with organic solvents	Clean only with warm water and mild detergent.

IMPORTANT NOTICE

WARRANTY: In the event any 3M OH&ESD product is found to be defective in material, workmanship, or not in conformation with any express warranty for a specific purpose, 3M's only obligation and your exclusive remedy shall be, at 3M's option, to repair, replace or refund the purchase price of such parts or products upon timely notification thereof and substantiation that the product has been stored, maintained and used in accordance with 3M's written instructions.

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FOR MORE INFORMATION

In United States, contact:
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Technical Assistance: 1-800-243-4630
For other 3M products:
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