L- Series SG Headgear

User Instructions for L-705SG, L-901SG and L-905SG

Important: Keep these *User Instructions* for reference.

3M Adflo 16-0905-SGXX Powered Air Purifying Respirator
3M 26-5802-30SW Speedglas Fresh Air III Supplied Air Welding Respirator

netzerotools.com

SAFETY GUIDELINES

⚠WARNING

This respirator helps protect against certain airborne contaminants. **Misuse may result in sickness or death.** For proper use, see supervisor, or *User Instructions*.

Listing of Warnings and Cautions in these User Instructions

⚠WARNING

- This product helps protect against certain airborne contaminants. **Misuse may result in sickness or death.** For proper use, see supervisor, *User Instructions*.

- Properly selected, used, and maintained respirators help protect against certain contaminants by reducing airborne concentrations below the Occupational Exposure Limit (OEL). It is essential to follow all instructions and government regulations on the use of this product, including wearing the complete respirator system during all times of exposure in order for the product to help protect the wearer. **Misuse of respirators may result in overexposure to contaminants and lead to sickness or death.** For proper use, see supervisor, refer to the product *User Instructions* or contact 3M Technical Service.
- The headgear and faceshields have each passed their respective ANSI standards (Z89.1-2003 and Z87.1-2003) for flammability requirements. However, under certain circumstances, these products may support a flame. Users must evaluate hazards in the workplace and take appropriate precautions for those hazards. 3M does not recommend the use of these products in areas where contact with an open flame is possible. **Improper use may result in injury or death**.
- 3M does not recommend use of the L-705SG headgear with facial hair that interferes with the faceseal. Users should be clean-shaven where the respirator's faceseal comes into contact with the user's face. **Failure to do so may reduce the effectiveness of the respirator and may result in sickness or death.**
- Failure to fully close the wide view lens retainer latches may alter the ability of the lens to perform properly. The lens meets the requirements of ANSI Z87.1-2003 only when the lens retainer latches are closed.
- Always wear ANSI Z87.1-2003 compliant safety spectacles in addition to any welding headgear. **Failure to do so may result in permanent eye injury and vision loss.** In Canada, follow CSA Z94.3 and/or the requirements of the authority having jurisdiction in your region.
- The Tychem® QC Shroud, L-223 and nylon shroud, L-228 are not intended for welding applications or where high heat or sparks are expected, and are not for use in areas of open flame. **Improper use may result in serious bodily injury or death.**
- If this respirator 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. **Failure to do so may adversely affect respirator performance and result in sickness or death**.
- Failure to maintain the respirator per the manufacturer's guidelines could significantly affect the performance of the respirator, and the level of respiratory protection afforded the wearer. **This could result in sickness or death.**

netzerotools.com

- Never modify or alter this respirator. Repair or replace parts only with approved 3M components. Utilizing components other than those supplied by 3M may affect respirator performance and **result in sickness or death.**
- Do not remove the respirator while in the contaminated area. Always don and remove the respirator in a clean environment. **Failure to do so may expose the wearer to respiratory hazards and may result in sickness and/or death.**
- Before you enter a hazardous atmosphere wearing this respirator, you must inspect the respirator, complete a user performance check, and don the respirator according to the instructions in Section "Operating Instructions" of these *User Instructions* and the *User Instructions* provided with the components of the system you are using. **Failure to do so may affect respirator performance and may result in sickness or death.**
- Always properly assemble and use both the inner shroud and the outer shroud of the L-901SG and L-905SG models. Failure to wear the inner shroud may reduce respirator performance, expose you to contaminants and lead to sickness or death.
- This headgear must not be painted or cleaned with solvents. Any decals applied to the headgear must be compatible with the surface material and known not to affect adversely the characteristics of the materials used in the headgear.
- This headgear is designed to absorb some of the energy of a blow through partial destruction of its component parts and, even though damage may not be readily apparent, any headgear subjected to severe impact should be replaced.

Limitations of Use

- Do not wear this respirator to enter areas where atmospheric concentrations of contaminants are unknown or immediately dangerous to life or health or atmospheres containing less than 19.5% oxygen.
- Do not exceed the Assigned Protection Factor (APF) for the specific respirator system or the APF mandated by specific government standards, whichever is lower.

Important

⚠WARNING

- Contaminants which are dangerous to your health include those which you may not be able to see or smell.
- Leave the contaminated area immediately if:
  - 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

netzerotools.com

Respirator Program Management

⚠WARNING

Properly selected, used, and maintained respirators help protect against certain contaminants by reducing airborne concentrations below the Occupational Exposure Limit (OEL). It is essential to follow all instructions and government regulations on the use of this product, including wearing the complete respirator system during all times of exposure in order for the product to help protect the wearer. **Misuse of respirators may result in overexposure to contaminants and lead to sickness or death.** For proper use, see supervisor, refer to the product *User Instructions* or contact 3M Technical Service.

Occupational use of respirators must be in compliance with applicable health and safety standards. By law US employers must establish a written respiratory protection program meeting the requirements of the OSHA Respiratory Protection Standard 29 CFR 1910.134 and any applicable OSHA substance specific standards. In Canada, CSA standard Z94.4 requirements must be met and/or requirements of the applicable jurisdiction, as appropriate. A summary of the major sections of OSHA 1910.134 are included in Table 1. For additional information on this standard contact OSHA at www.OSHA.gov. Consult an industrial hygienist or call 3M Technical Service with questions concerning applicability of these products to your job requirements**.**

Table 1: Major Sections of OSHA 29 CFR 1910.134

Section	Description
A	Permissible Practice
B	Definitions
C	Respiratory Protection Program
D	Selection of Respirators
E	Medical Evaluation
F	Fit Testing
G	Use of Respirators
H	Maintenance and Care of Respirators
I	Breathing Air Quality and Use
J	Identification of Cartridges, Filters, and Canisters
K	Training and Information
L	Program Evaluation
M	Recordkeeping

Head Protection

When assembled according to these *User Instructions* 3M™ L-705SG, L-901SG and L-905SG assemblies meet the requirements of ANSI Z89.1-2003 for Type II, Class G protective helmets. 3M™ L-901SG and L-905SG assemblies also meet the requirements of CAN/CSA Z94.1-92 for Class G protective helmets.
To comply with ANSI Z89.1-2003 Class II (protection from side impacts) requirements for impact and penetration protection, the L-114 Reinforced Chin Strap must be used in place of the L-112 Chin Strap. **Failure to do so may result in injury or death.**

NIOSH Approval / NIOSH Cautions and Limitations

This headgear is one component of a NIOSH approved respirator system. A complete L-Series SG respirator system must be assembled with one of the NIOSH approved 3M™ Belt-mounted Air Delivery Devices listed in the NIOSH Approval Label, which accompanies the approved powered air or air supply device(s). Refer

to *User Instructions* provided with the approved powered air or air supply device(s) for the listing of the appropriate Cautions and Limitations.

General Description

L-705SG — L-750 hardhat shell, L-113 head suspension, L-124 flame retardant faceseal (or L-120 flame retardant faceseal), L-153SG welding shield (or L-184 high temperature welding shield), L-130 wide view faceshield assembly with attached L-137 wide view faceshield extender, and L-146 welding knob and pivot kit.

L-901SG — L-950 helmet shell, L-113 head suspension, L-130 wideview faceshield assembly, L-141 knob and pivot kit, L-226 inner shroud, and a L-223 Tychem QC outer shroud (or L-228 nylon shroud, L-225 flame retardant shroud or L-227 leather shroud).

L-905SG — L-950 helmet shell, L-113 head suspension, L-153SG welding shield (or L-184 high temperature welding shield), L-130 wide view faceshield assembly, L-146 welding knob and pivot kit, L-226 inner shroud, and a L-225 flame retardant outer shroud (or L-227 leather shroud).

SPECIFICATIONS

Materials:

Hardhat and Helmet Shell:	Polycarbonate/Polyester Resin
Bumpcap Shell:	Nylon/ABS
Jaw:	Polycarbonate/Polyester Resin
Head Suspension:	Hi-Density Polyethylene, Polypropylene and Acetal
Breathing Tube L-122SG:	Vinyl with polyurethane foam liner
Breathing Tube L-122:	Vinyl
Wide View Lens, High Temperature:	Coated Polycarbonate
Wide View Face Shield Assembly:	Polycarbonate/Polyester Resin
Foam Liner:	Polycarbonate/Styrene
Faceseal, Flame Retardant L-120:	SoftGuard,® blue
Faceseal, Flame Retardant L-124:	Polyester, black
Shroud, Standard L-223:	Tychem® QC
Optional Shroud L-228:	Cordura® Nylon
Shroud, Flame Retardant L-225:	Nomex®
Shroud, Welding L-227:	Leather
Welding Shield, L-153SG (standard):	PPA (polyphthalamide)
Silver Front Panel L-154SG:	Zytel®
Welding Shields, L-184 (optional):	Reflective Coated Nylon
Pivot Posts:	Zinc Die Cast
Main Faceshield Gasket:	Nitrile Rubber
Breathing Tube Cover L-199SG	CarbonX®

Temperature Limits:

Helmet and Hardhat:	180° F (82º C)
Welding Shields:	180° F (82º C)
Wide-View Faceshield:	180° F (82º C)
Wide-View Lens, Standard:	Acetate-140° F (60º C)
Wide-View Lens, High Temperature:	Polycarbonate-180° F (82º C)

Breathing Tube:	150° F (65º C)
Breathing Tube Cover L-199SG	180° F (82º C)

Product Weights:
(excludes breathing tube, shroud for 900 series, and auto darkening filter or shade glass)

L-705SG	1350g
L-901SG	1076g
L-905SG	1485g
L-122SG Breathing Tube	369gr
L-122 Breathing Tube	307g
L-223 Tychem® QC shroud	122g
L-228 Cordura® shroud	290g
L-225 Nomex® shroud	190g
L-227 Leather shroud	615g

Expected Useful Life
The L-SG Series headgear must be used and maintained according to these *User Instructions.* The useful life of the headgear and respirator system is variable depending on the use application, environmental conditions and care/maintenance it is subjected to. Repeated or prolonged exposure to impact, chemicals, direct sunlight (ultra violet), and temperature extremes (hot and cold) will shorten the useful life. Avoidance of these conditions along with regular inspection and maintenance (replacement of worn or broken parts) per these *User Instructions* will maximize useful life. Review of the User Performance Check outlined in the "Operating Instructions" section prior to each use will assist in determining when the headgear should be taken out of service.

3M™ SYSTEM COMPONENTS AND REPLACEMENT PARTS

Subassemblies and Replacement Parts

Product #	Description
L-113-2	Head Suspension, includes L-117
L-115-10	Sweat Pad, for use with 3M L-Series Headgear
L-116-2	Head Pad
L-117-2	Hanger Suspension, includes L-116
L-120-5	Faceseal, Flame Retardant SoftGuard®
L-122	Breathing Tube, for use with GVP PAPR
L-122SG	Breathing Tube, for use with Adflo PAPR
L-223-2	Shroud, made of Tychem® QC Fabric
L-124-5	Faceseal, Flame Retardant
L-225-2	Shroud, Flame Retardant
L-226-2	Inner Shroud
L-227	Leather Welding Shroud
L-228-2	Shroud, made of Cordura® Nylon Fabric
L-130	Wide View Faceshield Assembly
L-131-10	Wide View Lens
L-134-10	Latch Kit (latches and posts for L-130)
L-136	Cam Spring Kit
L-137	Wide View Faceshield Extender

L-140-10	Knob
L-141	Knob and Pivot Kit
L-142-2	Welding Gasket, 4 1/2″ x 5 1/4″ (for use with L-184)
L-145-10	Welding Knob
L-146	Welding Knob and Pivot Kit
L-147-2	Welding Lens Retainer Clip (for use with L-184)
L-149-10	Fiber Gasket (or spacer), 4 1/2″ x 5 1/4″ (for use with L-184)
L-153SG	Weld Shield Kit (includes L-154 silver front panel) for use with Speedglas 9100-Series Auto-Darkening Welding Filters
L-154	Silver Front Panel (for use with L-153SG only)
L-163	Foam Liner
L-181	Flow Meter Adapter (for use with GVP PAPR)
L-184	High Temperature Welding Shield, 4 1/2″ x 5 1/4″, for use only with 3M L-705SG Hardhat and L-905SG Helmet
L-191-2	Helmet Latch
L-115-10	Sweat Pad, for use with 3M L-Series Headgear
L-116-2	Head Pad
L-117-2	Hanger Suspension, includes L-116
15-0099-05	3M™ Adflo™ Flow Indicator
15-0099-20	3M™ Adflo™ Flow Indicator Rubber Adapter for SG Type Systems
15-0099-21	3M™ Adflo™ Flow Indicator for SG Type Systems (includes 15-0099-05 and 15-0099-20)

Accessories

L-112-2	Chin Strap, for use with 3M L-Series Headgear
L-114-2	Chin Strap, Reinforced
L-129-2	Flame Retardant Welding Bib
L-132-10	Wide View Lens, High Temperature
L-133-25	Lens Cover
L-133-100	Lens Cover
L-182	Air Deflector
L-183	Headgear Cover
L-199SG	Breathing Tube Cover, High Temperature

Hardhat and Helmets and Shells

L-705SG	Hardhat with Welding Shield and Wide View Faceshield
L-750	Hardhat Shell, for use only with 3M L-700 Series Hardhats
L-901SG	Helmet with Wide View Faceshield
L-905SG	Helmet with Welding Shield and Wide View Faceshield
L-950	Helmet Shell, for use only with the L-900 Series Headgear

Speedglas Auto-Darkening Welding Filters (Refer to *User Instructions* provided with the welding filter)

06-0000-10	142g	3M™ Speedglas™ Auto-Darkening Filter 9100V (standard viewing area)

06-0000-20	155g	3M™ Speedglas™ Auto-Darkening Filter 9100X (large viewing area)
06-0000-30	180g	3M™ Speedglas™ Auto-Darkening Filter 9100XX (extra-large viewing area)

Note: for Speedglas Auto-Darkening Filter 9100 replacement parts, see separate *User Instructions* provided with the welding filter.

ASSEMBLY/MAINTENANCE INSTRUCTIONS

Head Suspension

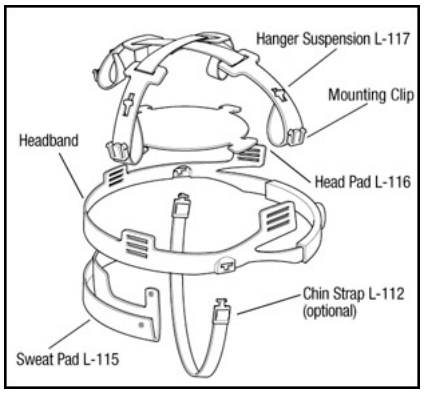

Fig. 1: Components of Head Suspension Assembly L-113

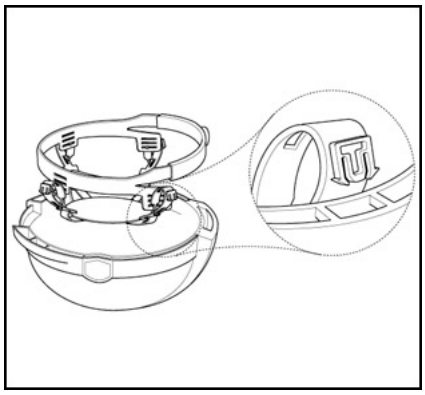

Fig. 2: Removing the Complete Head Suspension Assembly

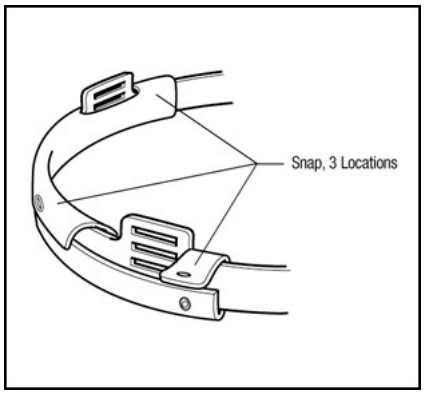

Fig. 3: Installing the L-115 Sweat Pad

Removing and Disassembling the Complete Suspension Assembly

The complete head suspension assembly (L-113) is shown exploded (Fig 1). To remove it from the 3M™ L-Series Headgear and disassemble it for cleaning or repair:

- Turn the headgear upside down.
- Remove the suspension subassembly by pulling out the four mounting clips that hold it into the bottom edge of the headgear (Fig. 2).
- Remove the cloth sweat pad (three snaps).
- Remove the crown pad by pulling it out of the four slots in the suspension subassembly.
- To remove the suspension subassembly from the headband, refer to and turn the four hanger mounting tabs, located on the hanger suspension L-117, a quarter-turn, then pull them out of the slots in the headband (Fig. 1).

Installing the Sweat Pad, L-115

- Wrap the sweat pad around the headband in the area that comes into contact with your forehead (Fig 3).
- Secure the sweat pad by closing the three snaps.

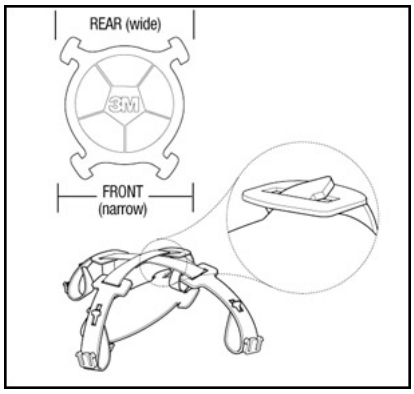

Fig. 3a: Installing the Head Pad

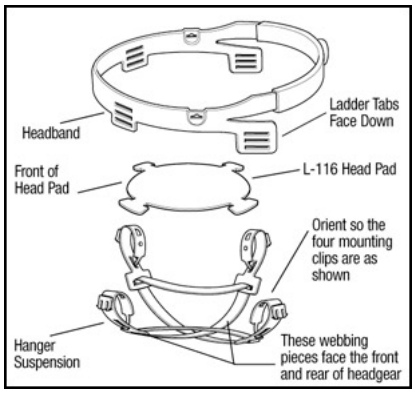

Fig. 4: Orienting the Head Suspension

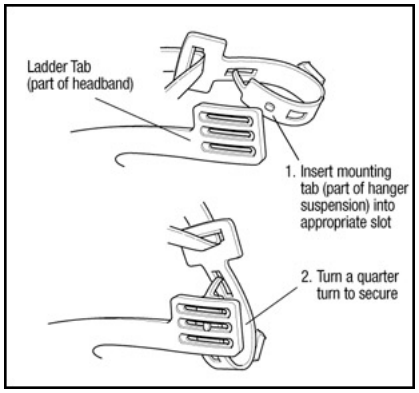

Fig. 5: Installing the Hanger Suspension to the Headband

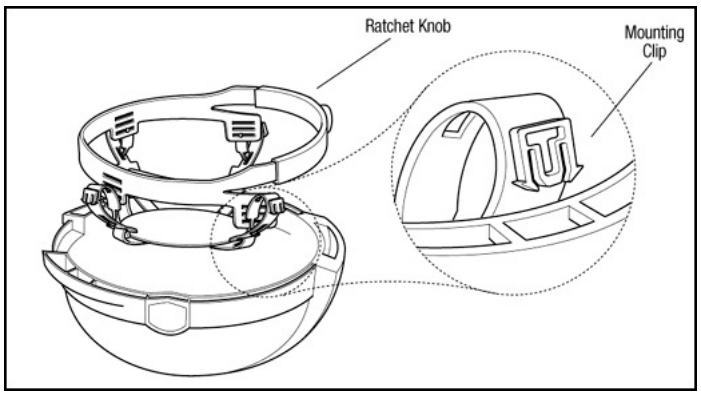

Fig. 6: Installing the Head Suspension, L-113

Installing the Head Pad, L-116

- Orient the head pad such that the padded surface and lettering is facing you (in contact with your head when installed in the headgear).
  - Slip the head pad tabs into the four slots in the hanger suspension (Fig. 3a).

Installing the Hanger Suspension

- Spread out the hanger suspension. Be sure that the four ends with mounting clips are oriented as shown in Fig. 4, and that there are no twists in the webbing.
- Hold the headband over the hanger suspension so the four "ladder" tabs are pointing down (Fig. 4). The two uncrossed webbing pieces in the hanger suspension face the front and rear of the headgear, not the sides. Recheck that the webbing is not twisted.
- Snap the four hanger mounting tabs on the suspension subassembly all the way into the appropriate slots in the ladder. See also "Adjusting the Headgear Position on Your Head" to select the proper slots (Fig. 5 and Fig. 7). Turn the tabs a quarter-turn to secure.

Installing the Complete Head Suspension

- With the headgear upside down, and the foam liner installed (see section Foam Liner L-163, if liner has been removed), hold the head suspension as shown in Fig. 6. The ratchet knob on the head suspension points toward the rear of the headgear.
- Insert the four finger-shaped mounting clips into the matching slots along the edge of the headgear. Push the mounting clips into the pocket until they bottom out and are held securely.
- Re-adjust the position of the headgear and the suspension size as necessary (Fig. 5 and 7)

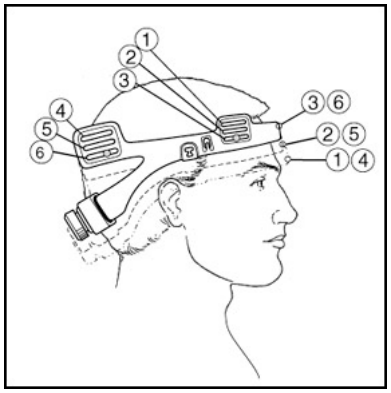

Fig. 7a

Fig. 7b

netzerotools.com

Fig. 7c

Fig. 7d

netzerotools.com

Adjusting the Headgear Position on Your Head

The four hanger mounting tabs of the hanger suspension snap into numbered slots in the headband's "ladder" (Fig. 5 and 7a through 7d). By selecting one of nine possible combinations, the user can adjust the position of the headgear/shield assembly. Hanger suspension adjustments can be made for improved vision and comfort. Turn the hanger mounting tabs a quarter-turn to insert them into the slots. For stability, the headgear should fit as low on the back of your head as is comfortable.

Note: When making hanger suspension adjustments, the operator must assure that the faceseal is in contact with the face to help assure respiratory protection. Also assure that no facial hair interferes with the faceseal as this may adversely affect respiratory performance.

To optimize the comfort and the stability of the headgear on your head, you can adjust how high (or low) the suspension will rest on your head. In Fig. 7a, you can see the headband adjustment slots. These slots are numbered 1-3 at the front of the suspension and 4-6 at the rear of the suspension. By inserting the hanger mounting tab into the appropriately numbered slot you can adjust the height of the suspension as shown (Fig. 7a-d). In positions 3 + 6, the suspension will rest high on the top of your head. In positions 1+ 4, the suspension will rest low on your head, providing maximum stability.

You can also adjust the headgear to tilt forward or backward to improve clearance of the faceshield or welding shields with your chest, or to improve the visibility through the welding lens. The following table describes the various configurations and the appropriate headband adjustment to achieve those desired results (Fig. 7b through 7d).

Desired Effect	**Adjustment Slots to Use**	**Outcome of Adjustment**
Tilt headgear forward (Fig. 7d)	3 + 4	Minimum chest clearance (helps protect the neck from welding burns), improve visibility of welding arc for downward welding, faceseal positioned closer to the neck.
Neutral position (Fig. 7c)	2 + 5 or 1 + 4 or 3 + 6	Medium chest clearance, medium visibility of (depending upon desired suspension height) the welding arc, faceseal positioned at midpoint between neck and chin.
Tilt headgear backwards (Fig.7b)	1 + 6	Maximum chest clearance, positions faceseal closer to chin, improves visibility of welding arc for overhead welding.

Adjusting the Size of the Head Suspension

- Be sure the headgear position is correct (Fig. 7).
- Place the headgear on your head, positioned for normal use. Turn the ratchet knob on the back of the headband until the suspension feels snug but comfortable (Fig. 6). Turn ratchet knob clock-wise to tighten and counter-clockwise to loosen.

Note: On the L-901SG and L-905SG headgear with the shroud installed, you can adjust the ratchet by grasping the knob through the small fabric insert on the rear of the shroud. You should not reach up under the shroud to make adjustments.

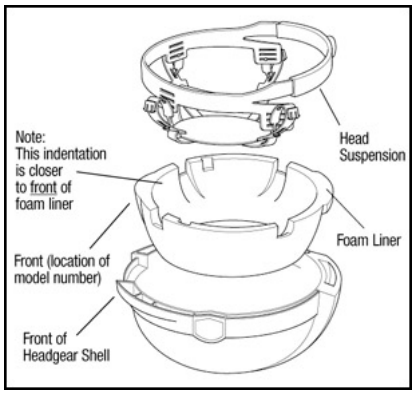

Fig. 8: Installing the Foam Liner

Foam Liner, L-163

Removing the Foam Liner

– Remove the complete head suspension (Fig. 6).
– Lift the foam liner out of the headgear.

Installing the Foam Liner

– With the foam liner oriented such that the model number is toward the front of the hardhat shell, insert the foam liner into the shell (Fig.8). If the liner is hard to install, you are probably inserting it backwards.
– Reinstall the complete suspension assembly to secure the liner.

Note: Cut-out pockets in the foam liner must align with the hanger tabs on the head suspension to allow the head suspension to fit properly into the hardhat.

Extender and Faceseals

Types of Faceseals

Two types of flame-retardant faceseals are available for attaching to the extender on the wide view faceshield of the L-705SG:

Removing the Faceseal from the Extender/Wide View Faceshield Assembly

– Unhook the faceseal from the tabs on each side of the extender (Fig. 11).

Attaching the Faceseal to the Extender/Wide View Faceshield Assembly

– Hold the extender upside-down (Fig. 11).
– Hook the holes in the faceseal over the matching tabs on the extender. The outer tabs (on the sides of the extender) and rear tabs (one on each side as shown in Fig. 11) are for attaching a flame-retardant fabric faceseal.
– All faceseals have an extra section of material on both sides near the rear, with a loop that attaches to a hook on the head suspension L-113.

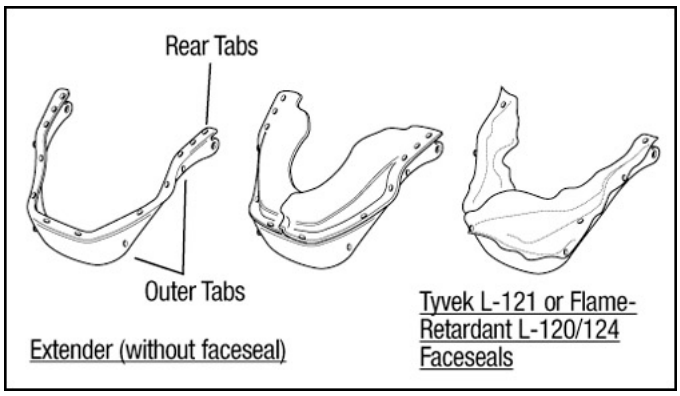

Fig. 11: Removing and Installing the Faceseal

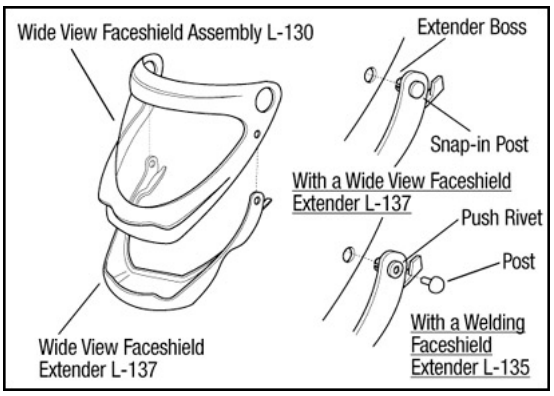

Fig. 12: Removing and Installing the Extender

⚠WARNING

After attaching the faceseal to the extender, place the headgear on your head and lower the faceshield to a normal wearing position. Check to see that the faceseal comes into contact with your face and adjust the head suspension as previously discussed to minimize any gaps. **Failure to do so may reduce the effectiveness of the respirator and may result in sickness or death.**

⚠WARNING

Failure to loop the faceseal onto the hook on the head suspension may prevent a tight faceseal and may result in sickness and/or death due to overexposure to respiratory contaminants.

Attaching the L-137 Extender to a Wide View Faceshield Assembly L-130 (For L-705SG)

– Hook the "chin" of the extender around the faceshield. Align the extender bosses with the holes in the faceshield assembly (Fig. 12).
– Push the extender bosses into the holes.

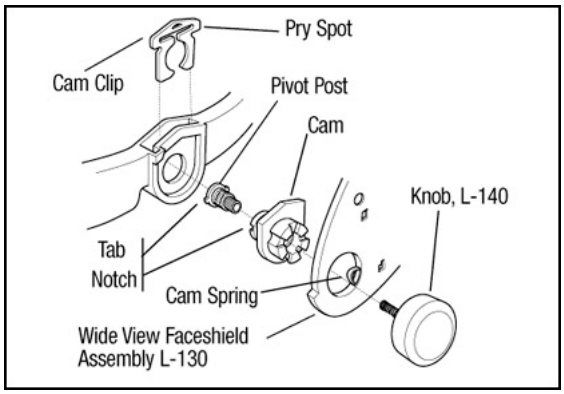

Fig. 13: Removing and Attaching a General Purpose Wide View Faceshield L-130 (L-901SG)

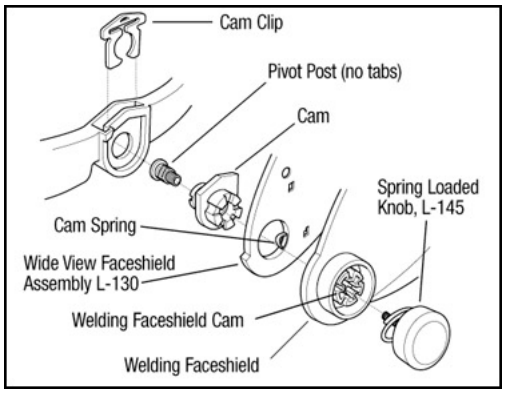

Fig. 15: Removing and Attaching a Combination Faceshield (L-705SG and L-905SG)

Faceshield Assembly

Types of Faceshields

There are two types of faceshield assemblies.

- The L-901SG helmet uses a high temperature faceshield, which consists only of a wide view faceshield assembly L-130.
- The L-705SG and L-905SG headgear use a combination faceshield, which consists of a wide view faceshield assembly L-130 underneath a welding shield assembly (L-153SG or L-184).

Both attach to the headgear using a positioning cam mechanism that is secured by a knob on each side of the headgear (Fig. 13 and 15). The pivot post and knob differ between the general-purpose and welding faceshields.

Note: For clarity, the extender is not shown in these illustrations.

Removing the Faceshield Assembly (all types)

- Unscrew the knobs.
- Separate the faceshield assembly from the headgear.

Removing the Cam Mechanisms (all types)

- With a flat-blade screwdriver inserted into the slot in the cam clip, pull out the cam clip on each side of the headgear.
- Pull out the cam and pivot post.

Installing the Cam Mechanisms

Refer to Fig. 13 or 15. On each side of the headgear:

- Insert the pivot post all the way into the cam (for a wide view faceshield, the tabs on the post must fit into the notches on the cam).
- Insert the cam/pivot back into the headgear.
- Hold the cam/pivot in position, and secure it by inserting the cam clip. Press the clip all the way in.

Attaching a General Purpose Wide View Faceshield, L-130

- Install the cam mechanisms (Fig. 13).
- Fit the faceshield over the headgear.

netzerotools.com

- On one side of the headgear, slip the faceshield opening onto the headgear so that the cam spring on the faceshield fits into the mating groove on the cam (Fig. 13). Secure that side by screwing a L-140 knob into the cam.
- Position the other side in the same way and secure with the other knob.
- Tighten both knobs until snug.

Attaching a Combination Faceshield

- Install the cam mechanisms (Fig. 15).
- Fit the wide view faceshield over the headgear so that the cam spring on the faceshield fits into the mating groove on the cam.
- Hold the wide view faceshield and headgear in place, and fit the welding faceshield (L-153SG or L-184) over the cam. Secure that side by screwing a spring-loaded knob (L-145) through the cams and into the pivot post.
- Attach the other side in the same way. The parts should readily line up. Tighten both knobs until snug. Then loosen the knobs as necessary to adjust the tension.

Chin Strap

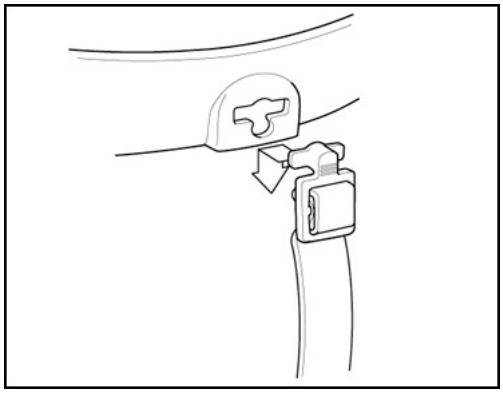

Fig. 16: Installing the Chin Strap

Note: Using the L-112 chin strap is optional for the 3M™ L-Series SG Respirators (Fig 16).

Installing the L-114 Reinforced Chin Strap (for use to comply with ANSI Z89.1-2008)

⚠WARNING

To comply with ANSI Z89.1-2003 Type II (protection from side impacts) requirements for impact and penetration protection, the L-114 Reinforced Chin Strap must be used in place of the L-112 Chin Strap. **Failure to do so may result in injury or death.**

- Remove the cam mechanism from both sides of the headgear per the instructions outlined previously (Fig. 13 and 15).
- Insert the chin strap attachment plate into the pocket that contained the cam clip (Fig. 16).

netzerotools.com

- Reinstall the cam and pivot post making sure they pass through the hole in the chin strap attachment plate.
- Hold the attachment plate against the shell and insert the cam clip so it is to the inside of the headgear.
- Repeat previous steps for the other end of the chin strap.
- Reinstall the faceshield or faceshields.
- Open the chin strap buckle and adjust the strap to a comfortable length.

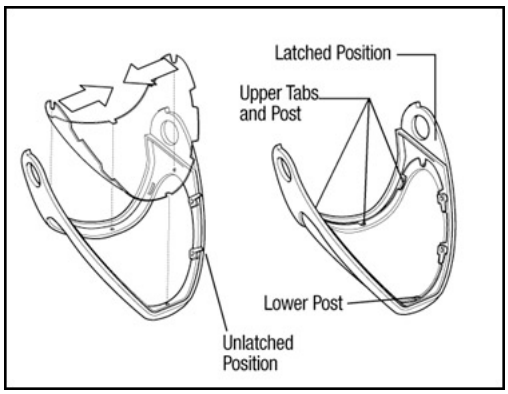

Fig. 18: Removing and Installing the Wide View Lens

Wide View Lens, L-131 or L-132

Removing the Lens

- Detach the faceseal from the hanger hooks on the head suspension.
- Remove the wide view faceshield assembly from the headgear.
- Turn all four L-shaped latches a quarter-turn (all the way against their stops), so they point toward the bottom edge of the faceshield (Fig. 18).
- Flex the lens inward so it is free of the four latches in the wide view faceshield frame. Lift the lens from the frame while sliding out from under the lower post.

Installing the Lens

- Before using, remove the protective film lens coverings from both sides of the lens (if they are present).
- Hold the headgear (or the faceshield assembly, if removed from the headgear) so the faceshield assembly is oriented as shown in Fig. 18.
- Flex the lens to the shape of the faceshield assembly, and slide under the lower post and over the upper post. Press down so that the lens lies between the upper tabs and the four latches.
- Assure that the lens is seated tightly against the sides of the tabs located to the left and right of the upper post. Also assure that the upper and lower posts in the faceshield frame are inserted in the openings in the lens.
- Turn the four latches a quarter-turn (all the way against their stops) to secure the lens in place.

⚠WARNING

Failure to fully close the wide view lens retainer latches may affect lens performance, and may reduce their effectiveness. Assure that the lens is firmly seated against the gasket.

Installing Lens Covers, L-133 on the Wide View Lens (L-131 or L-132)

Lens covers are flat die-cut sheets that fit over the wide view lenses. They protect the lens from scratching and from over-spray of paint and chemicals.

The covers attach to each side of the lens with two-sided tape. Up to five lens covers can be attached, one on top of another, in the same manner. As needed, you can then peel off the outermost cover to improve your vision.

To install a lens cover:
- For best adhesion, be sure the lens is clean. Use warm soapy water, followed by a clean water rinse and air dry. **If needed, use a solvent such as isopropanol only.** Allow the lens to dry completely before attempting to attach a lens cover.
- Align a lens cover to the lens, and hold it in place.
- Peel off the tape on one side of the cover and secure that side of the cover to the lens.
- Smooth the cover carefully across the lens, then peel off the other tape and secure the other side.

Note: Avoid rubbing the lens cover aggressively when adhering it to the lens. Doing so may impart a static charge which will result in small particles (dust, paint aerosols, etc.) being attracted to the lens during use.

Welding Filter, Auto-Darkening (Speedglas™ 9100-Series)

The L-705SG and L-905SG headgear are equipped with the L-153SG welding shield which accommodates Speedglas™ 9100 Series Auto-Darkening Welding Filters (ADFs) only (Fig. 19a). Refer to the *User Instructions* provided with the Speedglas™ ADF.

Removing the ADF
- Remove the silver front panel by pressing up on the silver tabs from the inside of the shield to release the latch mechanism, and then push the tab through the opening (Fig. 19b).
- Remove the ADF by pressing down on the blue tabs from the inside of the shield to release the latch mechanism, and then push the tab through the opening (Fig. 19c).

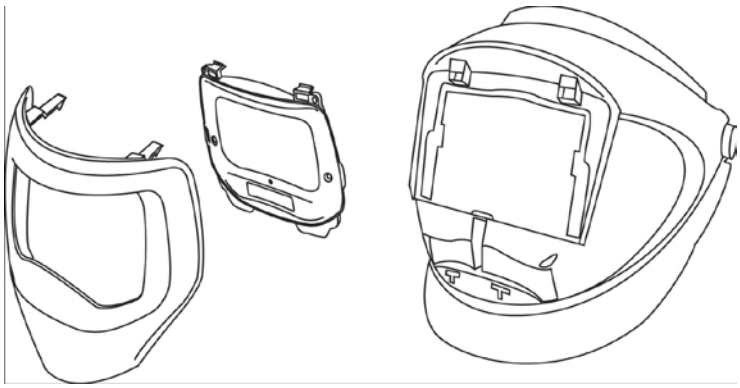

Fig. 19a Exploded Assembly Drawing with 9100 ADF

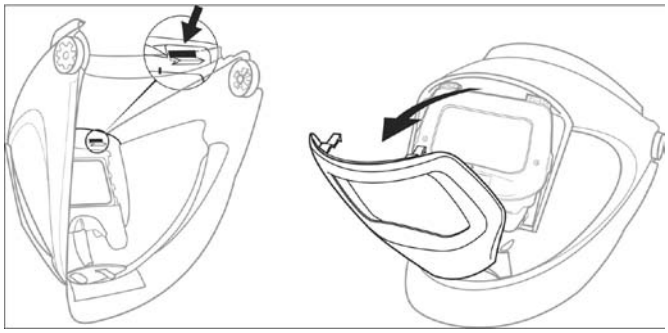

Fig. 19b: Removing the Front Silver Panel – press up then out on the tab in which the arrow is pointing

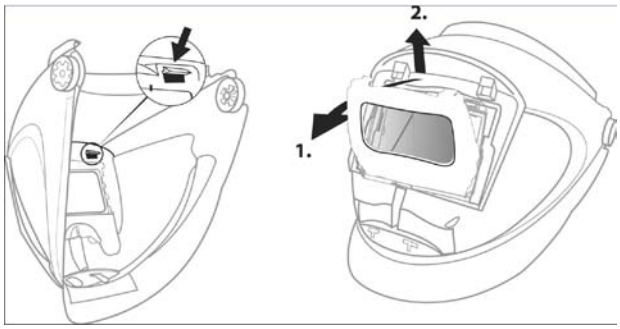

Fig. 19c Removing the 9100 ADF – press down then out on the tab in which the arrow is pointing

Installing the ADF

– Install the ADF by reversing the removal procedure described above. Refer to the *User Instructions* provided with the Speedglas™ ADF for instruction on assembly and use of the ADF. Never begin welding unless the ADF, with inside and outside protection plates, and silver front panel have been properly installed.

Fixed Shade Glass Welding Filters

The optional L-184 high temperature welding shield can be used as an alternate to the L-153SG when standard 4 ½ x 5 ¼ inch fixed shade glass welding filters are preferred.

Removing the Lens Stack

– Remove the welding shield from the headgear.
– Gently pull the wire clip down until it disengages from the two slots in the lens frame and pull up (Fig. 19d).
– Carefully remove the parts in the lens stack.

Installing the Lens Stack

– Hold the welding shield upside down.
– Assemble the lens parts (Fig. 19d). Be sure to stack the parts in the indicated sequence, and (where noted) have them face the direction shown. Use only welding filters that are compliant with ANSI Z87.1-2003, and which have the appropriate shade rating for the application, as per ANSI Z49.1-2005.
– The frame of the lens gasket must point upward, so the remaining items will fit inside.
– The edges of the lens gasket must not be rolled over, because light leaks could result.
– Make sure that the wire retaining clip seats itself completely into the two slots at the bottom of the lens opening.

netzerotools.com

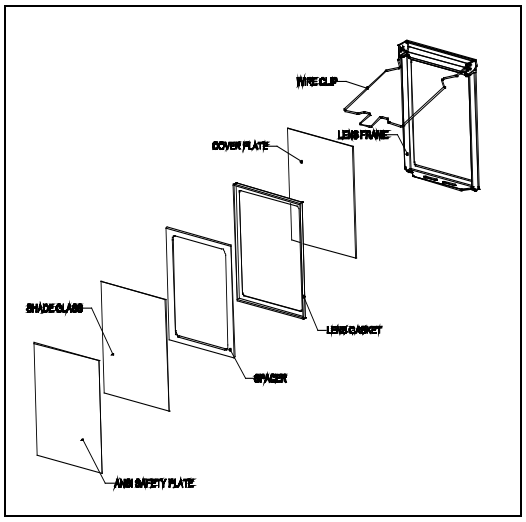

Fig. 19d

Breathing Tube

Attaching the Breathing Tube to the Headgear

Slide the breathing tube into the opening on the rear of the headgear until it snaps into place (Fig. 20). You will clearly hear a "snap" when it is secured.

Disconnecting the Breathing Tube from the Headgear

The breathing tube fits tightly into the headgear. To disconnect, pull the latch slightly away from the headgear at the upper (rounded) end of the tube connector while sliding the connector straight out of the plenum inlet (Fig. 20).

Attaching the Breathing Tube to an Air Source

The breathing tube is attached to the PAPR motor blower or the supplied air valves by screwing the tube into the threaded connectors found on these devices until snug. Refer to the instructions supplied with the specific air source. Note: If breathing tube is to be connected to a 3M™ Adflo™ PAPR motor blower, the attachment consists of a ¼-turn bayonet type connections. Refer to the 3M™ Adflo™ PAPR motor blower user instructions for more information.

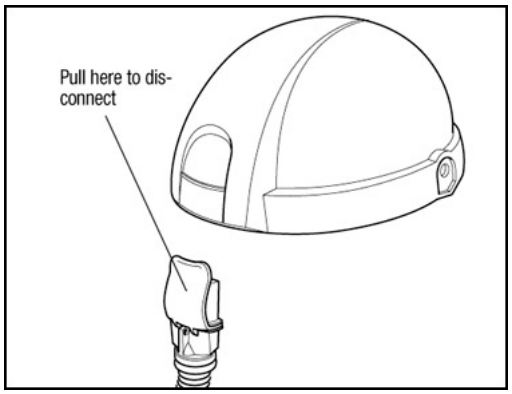

Fig. 20: Attaching/Detaching the Breathing Tube

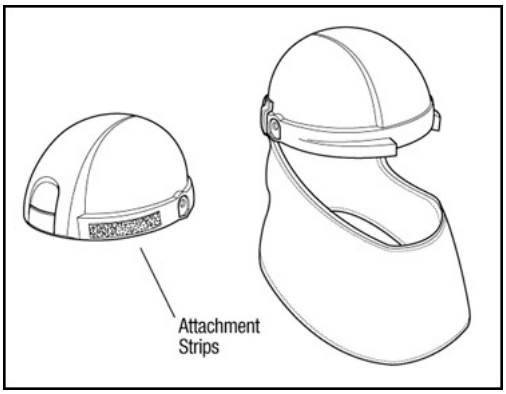

Fig. 21: Attaching the Welding Bib

Flame Retardant Welding Bib, L-129

The bib is attached to the headgear by two matching 3M™ Scotchmate™ strips near the rear (Fig. 21).

Shrouds (L-223, L-225, L-227 and L-228) and Inner Shroud (L-226)

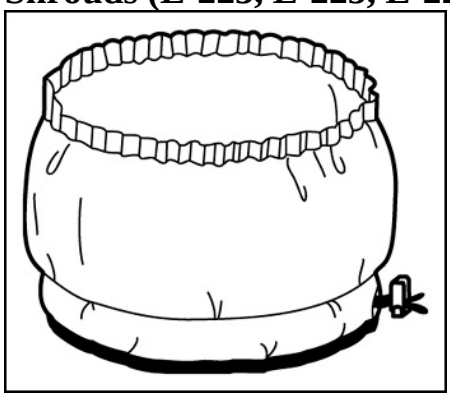

Fig. 22: Inner shroud

Inner shroud, L-226

The inner shroud (Fig. 22) may be attached to the helmet by stretching the elastic of the shroud over the lip of the jaw all the way around the helmet. The lip can be felt through the fabric. Align the inner shroud so the adjustable cord is located in the front of the headgear and hangs below the helmet. Assure that the inner shroud has no gaps around the perimeter while tightening the hose clamp. When donning the headgear using the inner shroud, tighten the adjustable cord until there is less than a two finger gap between your skin and the inner shroud.

Note: Shrouds are only used with L-900SG Series headgear.

⚠WARNING

The Outer Shroud, Standard L-223 and L-228 (Cordura Nylon) are not intended for welding applications or where high heat or sparks are expected. **Improper use may result in serious bodily injury or death.**

Always properly assemble and use both the inner shroud and the outer shroud of the L-901SG and L-905SG models. **Failure to wear the inner shroud may reduce respirator performance, expose you to contaminants and lead to sickness or death.**

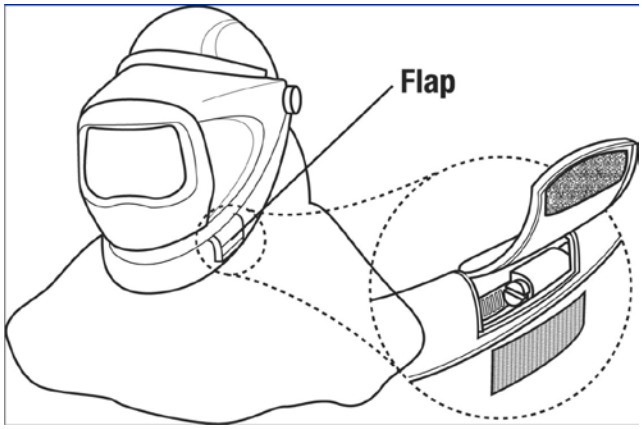

Fig. 23: Removing and Installing the Outer Shroud

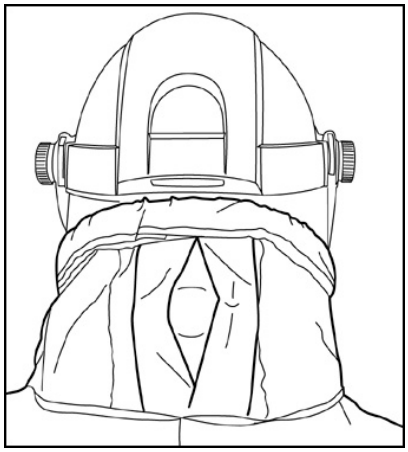

Fig. 24: Outer Shroud fabric insert

Removing the Outer Shroud

- Hold the headgear upside down.
- Lift the 3M™ Scotchmate™ flap on the left side of the shroud (Fig. 23).
- With a flat-blade screwdriver, loosen the hose clamp until the shroud can be slipped off the headgear and removed.

Installing the Outer Shroud

- Hold the headgear upside down.
- Hold the shroud so the small fabric insert faces toward the rear of the headgear. (Fig. 24: This fabric insert allows you to grasp the ratchet knob that adjusts the size of the suspension.)
- Slide the shroud over the inner shroud onto the headgear until the covered metal band is beyond the lip on the headgear on all sides. The lip is easy to feel through the fabric. When done, be sure that the flap is not tucked underneath the metal band and the band is not covering the front latch bolts on the front of the helmet.

Note: To help insure proper installation, feel all the way around to be sure the band is beyond the lip.

- Realign the shroud so the fabric insert is centered on the rear of the headgear.
- Tighten the hose clamp until the shroud is secured on the headgear. Avoid over tightening, as the headgear jaw could be damaged.

L-182 Air Deflector Kit

The standard configuration of L-Series headgear has the airflow directed towards the inside of the faceshield lens. The L-182 Air Deflector Kit is offered as an option, to allow the re-direction of the airflow towards the face and can be used with any of the 3M™ L-Series SG Headgear.

L-183 Headgear Cover (For use with L-901SG)

The L-183 headgear cover is intended for those helmets used in non-welding applications**.** Its purpose is to reduce buildup of particulate on the surface of the headgear shell. The headgear cover is disposable and should be discarded when damaged or soiled.

L-199SG High Temperature Breathing Tube Cover

The L-199SG breathing tube cover is intended to help protect the breathing tube from spark, spatter and other physical damage that may occur in higher heat, more demanding applications. This material is machine washable in cold water with a mild detergent and then air dried.

OPERATING INSTRUCTIONS

⚠ WARNING

Use of equipment described in these *User Instructions* must be in accordance with applicable health and safety standards, respirator selection guidelines contained in such publications as ANSI Z88.2-1992 and CSA Z94.4-1993, or pursuant to the recommendations of an industrial hygienist. **Failure to do so may result in sickness or death.** Respirators using these headgear require a written respirator program in accordance with the OSHA respiratory protection standard found in 29 CFR 1910.134.

Before use, the wearer must be trained by the employer in the proper use and maintenance of these 3M respirators and air supply components, and only in accordance with these *User Instructions*. Each person using these respirators must first read and understand these entire *User Instructions*. **Improper use may result in sickness or death.**

Use of this respirator by untrained or unqualified persons, or use not in accordance with these *User Instructions* **may adversely affect respirator performance and result in sickness or death.** Refer to additional warnings listed in Section "Safety Guidelines" of these *User Instructions*.

If you have any doubts about the applicability of this equipment to your job situation, consult an industrial hygienist or call the Technical Service Department of 3M Occupational Health and Environmental Safety Division.

If this respirator 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. **Failure to do so may adversely affect respirator performance and result in sickness or death.**

Assemble the Respirator System
Read completely and follow the assembly instructions in Section "Assembly/Maintenance Instructions" of these *User Instructions* and the operator's instructions provided with the PAPR or airline components.

Inspect the Respirator Condition Thoroughly
Each time the respirator is used, you must complete the inspection procedures recommended in Section "Cleaning and Inspection".

PAPR and Airline Components
Inspect these components according to the *User Instructions* provided with the specific components.

Complete a User Performance Check

– Prior to connecting the breathing tube to the headgear, complete the performance check and verify that the airflow out of the breathing tube is 6 cfm or higher according to the 3M™ Belt-Mounted Powered Air Purifying Respirator *User Instructions* or that the pressure is within the approved range according to the supplied air valve *User Instructions*.
– Place your hand inside the headgear, in the area above the faceshield. You should feel the air entering the headgear.

netzerotools.com

Donning the Respirator

⚠WARNING

Do not remove the respirator while in the contaminated area. Always donn and remove the respirator in a clean environment. Failure to do so may expose the wearer to respiratory hazards and **could result in sickness and/or death.**

- Verify that the respirator is connected to the proper air source and that air is flowing before donning the respirator.
- For airline, verify line pressure is in required range of air control device.
- Put the respirator on your head so that the faceshield is directly in front of your face.
- Pull the suspension firmly onto your head. If the suspension does not fit your head snugly, adjust the ratchet at the back of the suspension. If the height on your head or the balance of the headgear is not comfortable, remove the headgear and adjust the suspension according to Section "Assembly/Maintenance Instructions" of these *User Instructions*.

Enter the Contaminated Area

⚠WARNING

Before you enter a hazardous atmosphere wearing this respirator, you must inspect the respirator, complete a user performance check, and don the respirator according to the instructions in Section "Operating Instructions" of these *User Instructions* and the *User Instructions* provided with the components of the system you are using. **Failure to do so may affect respirator performance and result in sickness or death.**

Do not wear this respirator to enter areas where atmospheric concentrations of contaminants are unknown or immediately dangerous to life or health; or, in PAPR systems, atmospheres containing less than 19.5% oxygen.

- With the respirator in operation, enter the contaminated area, breathing normally.
- Keep the air supply hose or PAPR assembly away from equipment, vehicles and other physical and chemical hazards.

⚠WARNING

Unless you are unable to breathe, do not remove the respirator while you are in a hazardous atmosphere. The contaminants which are dangerous to your health include those which you may not be able to see or smell. Leave the contaminated area immediately if:

- 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

netzerotools.com

– 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

---

Remove the Respirator in a Clean Area
– Clean your hands of any contaminants before reaching inside the respirator for any reason.
– Refer to Section "Cleaning and Inspection" of these *User Instructions* for cleaning, inspection and storage information.

RESPIRATOR INSPECTION AND CLEANING

The respirator should be inspected before and after use for defects that could affect the performance of the respirator. Following the requirements outlined in 29 CFR 1910.134, the maintenance and inspection program should assure that the user is provided with a respirator that is clean, sanitary, and in good operating condition. The respirator wearer should inspect the equipment prior to each use to assure that it is in proper working condition.

⚠WARNING

Failure to maintain the respirator per the manufacturer's guidelines could significantly affect the performance of the respirator, and the level of respiratory protection afforded the wearer. **This could result in sickness or death.**

This headgear must not be painted or cleaned with solvents. Any decals applied to the headgear must be compatible with the surface material and known not to affect adversely the characteristics of the materials used in the headgear.

This headgear is designed to absorb some of the energy of a blow through partial destruction of its component parts and, even though damage may not be readily apparent, any headgear subjected to severe impact should be replaced.

Wide View Faceshield Assembly Gasket is torn or distorted excessively
This could allow exposure to airborne contaminants. The assembly should be immediately replaced.

Lens latch levers turned "open" or are missing
The visor with lens meets the test requirements of ANSI Z87.1-2003 **only** when the lens is installed and the latch levers are fully closed. If latches are missing, do not use the product. Replace either the entire assembly or the latches that are missing using latch kit L-134.

Wide View Faceshield Assembly Lens is warped
A warped faceshield assembly or lens could result in an inability of the lens to fit properly in the faceshield assembly. If a warped faceshield assembly or lens is used on an L-901SG or L-905SG headgear, the warpage could result in an inability of the faceshield to seal against the jaw. Use of a warped faceshield assembly or lens could result in exposure to airborne contaminants. Replace the entire assembly or lens.

Lens is excessively scratched, cracked or crazed
This could lead to impaired vision, which could result in an accident. Additionally, a lens that is cracked or crazed may result in a reduced ability to pass the impact and penetration test requirements of ANSI Z87.1-2003. Replace lens immediately.

Wide View Faceshield Cam wear
Cam pivot wear will be recognized by an inability to keep the wide view faceshield in the up position, or by the faceshield being "loose" when the shield is closed. To correct the problem, swap the right hand side cam mechanism with the left hand side. If this fails to correct the problem, replace the cam mechanisms using the knob and pivot kit L-141.

Welding shield pivot cam wear
Cam wear will be recognized by an inability to keep the welding shield in the up position, or by the welding shield being "loose" when the shield is closed. To correct the problem, first tighten the knobs making sure you are using the correct L-145 knobs with their springs attached. If that fails to cure the problem, replace the welding shield.

Cam spring broken
Diagnosed by a total inability to keep the faceshield assembly up or down. Replace the wide view faceshield assembly and/or the cam springs using cam spring kit L-136.

Welding shields and filters
Look for damage to the welding shield and filter, or improper fitting of the welding filter assembly or gaskets that could result in light leaks.

Inspection of Head Suspension

Replace the L-133 suspension when damaged or broken

Crown straps are missing or broken
Both of these situations could result in an inability of the headgear to withstand the impact of certain falling objects. The suspension should be replaced immediately.

Suspension mounting hanger clips are worn
This could affect how the headgear withstands an impact if the hanger clip isn't properly engaged. Replace the hanger suspension immediately.

Mounting tabs on the hanger suspension are missing or are not engaged properly in the "ladders" on the headband
This could affect how the headgear withstands an impact if not properly engaged or installed. If the tabs are broken, replace the head suspension immediately. If they are not properly engaged in the headband, install properly.

Breathing tube connector broken
If the connector latch is broken, the breathing tube could fall out. **This could allow exposure to airborne contaminants and could result in sickness or death.** The tube should be immediately replaced.

Breathing tube has cuts or holes
This could allow exposure to airborne contaminants and could result in sickness or death. The tube should be immediately replaced.

Breathing tube engagement point is worn

This could allow the breathing tube to inadvertently fall out resulting in exposure to airborne contaminants. The headtop shell should be immediately replaced.

Jaw is broken or warped (L-901SG and L-905SG only)
The warping could result in an inability of the faceshield to seal against the jaw. This could result in exposure to airborne contaminants. Replace the headgear/jaw assembly (L-950).

Headgear is cracked and/or headgear is damaged as a result of contact with solvents
Inspect the headgear shell for cracks, dents, deep abrasions, chalky appearance, brittleness or fading of color. These signs may indicate damage to the head gear or degradation of the plastic. Both of these situations could result in a reduced ability of the headgear to withstand an impact per ANSI Z89.1-2003 and CSA Z94.1-05 and should be immediately corrected by replacement of the headgear shell (L-750 or L-950). Both of these situations could result in a reduced ability of the headgear to withstand an impact per ANSI Z89.1-2003 and should be immediately corrected by replacement of the headgear shell (L-750 or L-950).

Cam retainer clip is missing or broken
If the retainer clip is broken or missing, the cam will fall out of the headgear. This will prevent proper attachment of the wide view faceshield or welding shield assemblies. If using an L-901SG, replace with an L-141 knob and pivot kit. If using an L-705SG or L-905SG, replace with an L-146 knob and pivot kit.

Spring on L-145 knob detached
Line up straight leg on spring with line on knob. Push spring onto snaps in knob.

The liner has been damaged
Both of these situations could result in a reduced ability of the headgear to withstand an impact per ANSI Z89.1-2003 and should be corrected by replacement of the liner (L-163).

Faceseal is not properly attached
This could result in exposure to airborne contaminants and could result in sickness or death. Install the faceseal per the instructions in these *User Instructions*.

Faceseal is torn, or worn excessively or elastic is stretched-out
This could result in exposure to airborne contaminants and could result in sickness or death. Replace the faceseal immediately.

Inspection of Shrouds (L-901SG and L-905SG only)

All shrouds should be examined for rips, tears, worn stitching, frayed seams or holes of any kind. Replace with new shroud.

Cleaning the 3M™ L-Series SG Headgear

1. Follow the hygiene practices established by your employer for the specific contaminants to which you have been exposed.
2. Wash disassembled components with warm water, a mild detergent and a soft bristle scrub brush or sponge, then rinse with clean water. Do not use any solvents on the headgear itself. **Only isopropanol** may be used to clean the wideview lens.
3. Washing temperatures should not exceed 120°F.
4. Never let water or other liquids enter the L-122SG breathing tube. The foam liner will absorb liquids and can not be adequately dried.

Headgear and Faceshields

netzerotools.com

It is recommended that the headgear and faceshields be disassembled according to the "Assembly/Maintenance Instructions" section of these *User Instructions*.

Do not immerse the Wide View Faceshield Assembly frame in liquid. This could cause separation of the frame gasket from the frame.

⚠WARNING

Do not use strong solvents such as aromatic hydrocarbons or ketones to clean the headgear shell. These solvents can cause deterioration of the shells' ability to withstand impact and penetration. **This could affect respirator performance and result in injury or death**.

Lenses

Only use **isopropanol** or water as a cleaning solution, other solvents may likely cause damage to the lenses. The polycarbonate lens on the L-132 is hard-coated. This should improve the resistance of the lens to chemical attack. However, imperfections in the hard coat and scratches that occur during use may allow solvents to come into contact with the polycarbonate. Certain organic solvents, when allowed to come into prolonged contact with the lens, may cause fogging, crazing or cracking, therefore only use is isopropanol for cleaning.

Breathing Tubes

Use of solvents on the breathing tube may result in softening, which could lead to tears or ruptures. Do not let water or other cleaning fluids enter the interior of the breathing tube.

Faceseals

The fabric faceseals are not intended to be cleaned. Do not launder faceseals, L-120 and L-124, as loss of flame retardant properties will result.

Headpad and Forehead (Sweat) Pad

The headpad of the suspension and the sweat pad may be washed in a respirator dishwasher. At some point, the foam on the sweat pad will begin to degrade and will need to be replaced.

Hanger Suspension

Wash or wipe with clean, damp cloth. Air dry only. Do not use heat. Care must be taken to prevent the webbing from twisting during cleaning.

Shrouds and Welding Bibs

- Welding Bib L-129-2 is made of Indura® Proban® navy cotton. Do not launder the welding bib more than four times as loss of flame retardant properties may result.
- The inner shroud L-226 and outer shroud L-223 both made of Tychem® QC are intended to be disposable. No cleaning is recommended.
- Outer shroud, L-228, is made of Cordura® and laundered at low temperatures with mild detergent. Either air dry or dry on low setting. Do not use chlorine bleach.
- Outer shroud, L-225, is made of flame retardant fabric, Nomex® IIIA. These can be laundered repeatedly in warm water with detergent, without losing the flame retardant properties of the fabric. Either air dry or dry on low settings. Do not use chlorine bleach.
- The leather welding shroud, L-227 should not be cleaned with soap and water.

Storage
Note: 3M recommends that all washed parts be air-dried. Do not use heat.

Store the cleaned respirator in a clean, dry location out of direct sunlight.

netzerotools.com

TROUBLESHOOTING

Problem	Possible Causes	Corrective Action
Poor visibility through faceshield	Faceshield cover is scratched or coated with debris	Remove cover or wipe off debris
	Faceshield is scratched or coated with debris	Replace faceshield, or wipe off debris and consider using faceshield cover
Low airflow – Airline systems	Air supply pressure too low	Adjust supply pressure to within range specified on air regulating valves
	Kink or leak in supply hose	Reposition or replace hose
	Defective air regulating valves	Repair or replace
	Loose supply hose connections	Reconnect fittings
	Supply hose disconnected	Reconnect hose
Low airflow – PAPR systems	Battery needs charging	Switch to fully charged battery
	Filter is loaded	Replace filter
	Motor blower malfunction	Replace motor blower

DISPOSAL

Dispose of equipment that has reached its intended service life in accordance with local regulations.

IMPORTANT NOTICE

Limitation of Liability: 3M shall not be liable or responsible for any loss or damage, whether direct, indirect, incidental, special or consequential, arising out of sale, use or misuse of 3M OH&ESD products, or the user's inability to use such products. THE REMEDIES SET FORTH HEREIN ARE EXCLUSIVE.

FOR MORE INFORMATION and assistance on 3M occupational health and environmental safety products, contact your local 3M representative.

Exported by:
3M Occupational Health and
Environmental Safety Division

Printed in U.S.A.

©3M 2011
98-0060-0133-7/3

3M®, Adflo®, Scotchmate® and Speedglas® are registered trademarks of 3M Company.

Tychem® QC is a DuPont Company registered trademark for its polyethylene coated spun-bonded olefin. Nomex®, Cordura®, Tychem® and Zytel® are registered trademarks of DuPont.

netzerotools.com