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TÜV SÜD America Attestation: 72109498-NGV3.1

ATTESTATION

Attestation Number: 72109498-NGV3.1-2014

Issued To: Swagelok Company
29500 Solon Road
Solon, OH 44139 USA

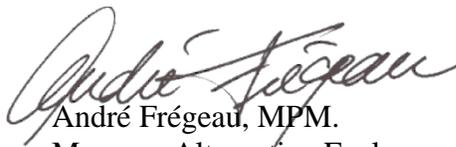
Standard: Fuel system components for compressed natural gas
powered vehicles
ANSI / CSA NGV 3.1-2014.

Components: See list in 2nd page of this attestation.

As an independent inspection agency, TÜV SÜD America attests that representative components listed in the 2nd page of this attestation have met all the design and test qualification requirements of Fuel system components for compressed natural gas powered vehicles per ANSI / CSA NGV 3.1-2014.

These components were designed and tested for use with compressed natural gas. These components should be installed, used, and maintained in accordance with the manufacturer's instructions.

Prepared and approved by:



André Frégeau, MPM.
Manager Alternative Fuels
TÜV SÜD America,
Industry Service Division
10/11/2016.





TÜV SÜD America Attestation: 72109498-NGV3.1

List of Components attested to NGV3.1-2014 standard

Hoses:

Type	Hose Size	Drawing #	Service Pressure (psi / bar)	Temperature Rating (°F / °C)
NG-	4	SS-NGS4-NGV-APPROVAL, Rev. -	3600 / 248	-40°F to +185°F / -40°C to +85°C
	6	SS-NGS6-NGV-APPROVAL, Rev. -	3600 / 248	-40°F to +185°F / -40°C to +85°C
	8	SS-NGS8-NGV-APPROVAL, Rev. -	3600 / 248	-40°F to +185°F / -40°C to +85°C
NG-T	4	SS-NGT4-NGV-APPROVAL, Rev. -	3600 / 248	-40°F to +185°F / -40°C to +85°C
	6	SS-NGT6-NGV-APPROVAL, Rev. -	3600 / 248	-40°F to +185°F / -40°C to +85°C
	8	SS-NGT8-NGV-APPROVAL, Rev. -	3600 / 248	-40°F to +185°F / -40°C to +85°C

- NOTES:
- 1.) EC1 AND EC2 REPRESENT THE END CONNECTIONS FROM TABLE 1.
 - 2.) XX = CUSTOMER REQUESTED LENGTH IN INCHES, ALSO XXCM FOR LENGTH IN CENTIMETERS
 - 3.) BULK LABELS ARE PLACED A MAX. OF EVERY 45cm [18"] ALONG HOSE
 - 4.) BULK LABELS ARE NOT REQUIRED IF THE LAY LINE CONTAINS NGV 3.1 / 4.2 INFORMATION.
 - 5.) LABELS AND/OR LAY LINE NGV 3.1 / 4.2 INFORMATION IS VISIBLE BETWEEN SPRING COILS.
 - 6.) -S AFTER XX = WITH HOSE-LENGTH SPRING GUARD.
-S7 AFTER XX = WITH 12.7cm [5"] LONG SPRING GUARD ON ONE END.
-X AFTER XX = STANDARD SPRING CUFFS REMOVED.
 - 7.) EXACT MINIMUM ASSEMBLY LENGTH IS DETERMINED BY END CONNECTION AND SPRING SELECTIONS. GENERAL MINIMUM LENGTH WITH BOTH SPRINGS OR S OPTION = 18", WITH S7 OPTION = 14", WITH X OPTION = 9".
 - 8.) PLACEMENT AND ATTACHMENT METHOD OF WARNING TAG VARIES WITH HOSE CONFIGURATION.
 - 9.) ADDITIONAL INFORMATION MAY BE PRESENT ON HOSE LAY LINE.

SEE NGS-4-NGV-BULK-TAG

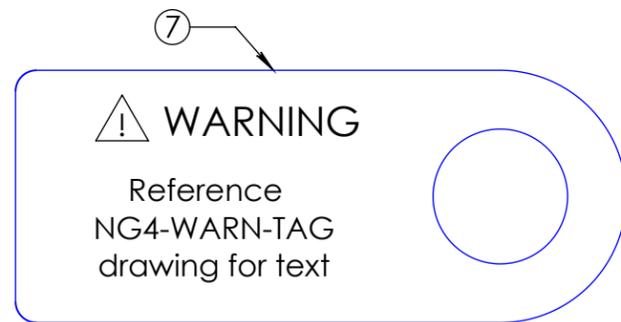
BULK LABEL

LABEL DESCRIPTION:
BLACK ALUMINUM LABEL W/SILVER TEXT
ADHESIVE TYPE = 3M 468

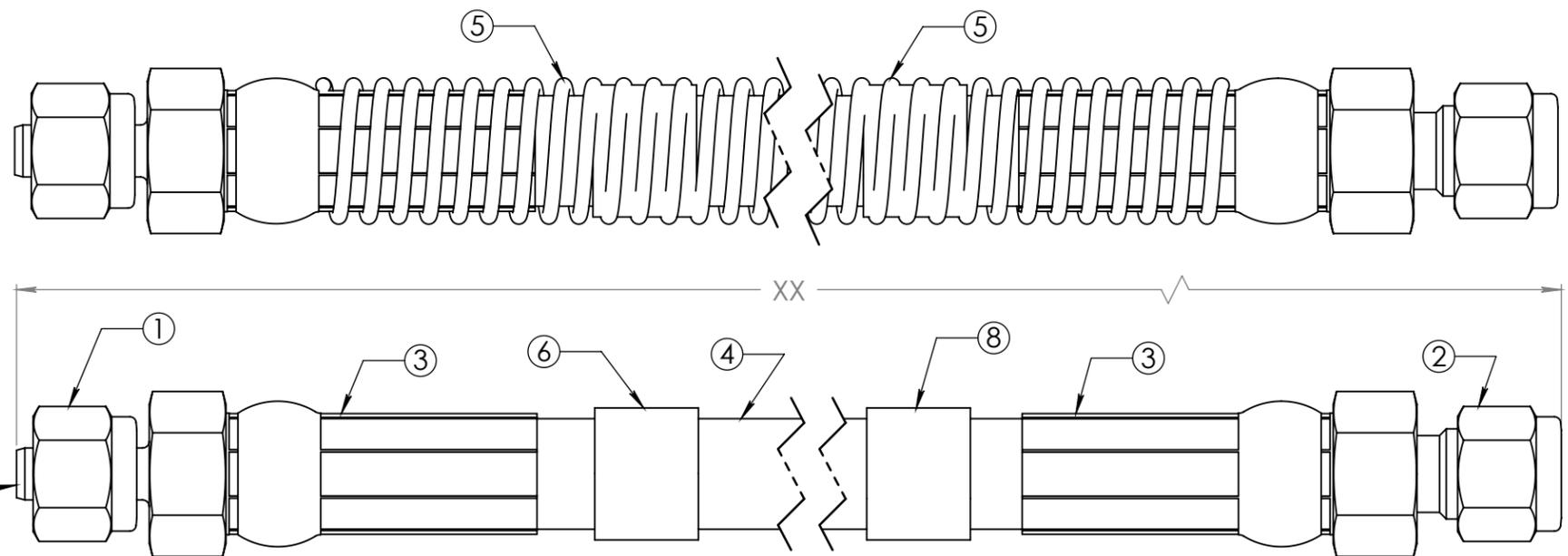
SEE NG-NGV-ASSEMBLY-TAG

ASSEMBLY LABEL

LABEL DESCRIPTION:
BLACK ALUMINUM LABEL W/SILVER TEXT
ADHESIVE TYPE = 3M 468



OPTIONAL ASSEMBLY WITHOUT SPRING GUARD



DESCRIPTION: 1/4" THERMOPLASTIC HOSE APPROVAL DRAWING

MATERIAL: HOSE - THERMOPLASTIC POLYURETHANE OVER SYNTHETIC FIBER BONDED TO NYLON CORE.

SPECIFICATION: NGV 3.1-2014 / NGV 4.2-2014

SWAGELOK® NG-4-NGV-093

1/4" I.D. -40°C to +85°C NGV3.1 CLASS B [248 BAR SP]
Mo/Yr Lot XXXXXX NGV4.2 CLASS A/D [345 BAR MAWP]

LAY LINE

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TITLE APPROVAL DRAWING

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SAP CHANGE NUMBER

DCN-00086053

Swagelok

DWG. NO. SS-NGS4-NGV-APPROVAL

SHEET 1 of 2
SCALE NONE

REV. -

TABLE 1 - END CONNECTION OPTIONS

END CONNECTION	SIZE	PART NUMBER DESIGNATOR FOR EC1, EC2
SWAGELOK TUBE FITTING	FRACTIONAL - 1/4"	S4
	METRIC - 8MM	G8
	METRIC - 6MM	G6
SWAGELOK TUBE ADAPTER	FRACTIONAL - 3/8"	T6
	FRACTIONAL - 1/4"	T4
	METRIC - 8MM	E8
	METRIC - 6MM	E6
MALE PIPE THREADS, NPT	FRACTIONAL - 1/4"	P4
SAE 37° (JIC) FEMALE SWIVEL	FRACTIONAL - 1/4"	A4
MALE SAE	FRACTIONAL - 1/4"	R4

TABLE 2 - BILL OF MATERIALS

ITEM	DESCRIPTION
1	END CONNECTION 1 (EC1)
2	END CONNECTION 2 (EC2)
3	SHELL
4	HOSE
5	302 SS SPRING GUARD (5")
6	ASSEMBLY LABEL
7	WARNING TAG
8	BULK LABEL (NOTE 4)

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SAP CHANGE NUMBER

DCN-00086053



DWG. NO. SS-NGS4-NGV-APPROVAL

SHEET 2 of 2
SCALE NONE

REV. -

- NOTES:
- 1.) EC1 AND EC2 REPRESENT THE END CONNECTIONS FROM TABLE 1.
 - 2.) XX = CUSTOMER REQUESTED LENGTH IN INCHES, ALSO XXCM FOR LENGTH IN CENTIMETERS
 - 3.) BULK LABELS ARE PLACED A MAX. OF EVERY 45cm [18"] ALONG HOSE
 - 4.) BULK LABELS ARE NOT REQUIRED IF THE LAY LINE CONTAINS NGV 3.1 / 4.2 INFORMATION.
 - 5.) LABELS AND/OR LAY LINE NGV 3.1 / 4.2 INFORMATION IS VISIBLE BETWEEN SPRING COILS.
 - 6.) -S AFTER XX = WITH HOSE-LENGTH SPRING GUARD. -S7 AFTER XX = WITH 12.7cm [5"] LONG SPRING GUARD ON ONE END. -X AFTER XX = STANDARD SPRING CUFFS REMOVED.
 - 7.) EXACT MINIMUM ASSEMBLY LENGTH IS DETERMINED BY END CONNECTION AND SPRING SELECTIONS. GENERAL MINIMUM LENGTH WITH BOTH SPRINGS OR S OPTION = 18", WITH S7 OPTION = 14", WITH X OPTION = 9".
 - 8.) PLACEMENT AND ATTACHMENT METHOD OF WARNING TAG VARIES WITH HOSE CONFIGURATION.
 - 9.) ADDITIONAL INFORMATION MAY BE PRESENT ON HOSE LAY LINE.

SEE NGS-6-NGV-BULK-TAG

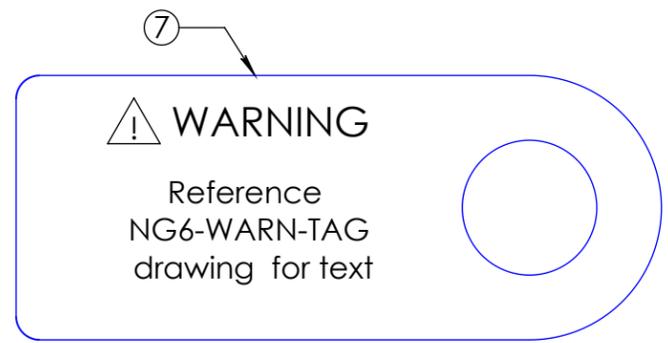
BULK LABEL

LABEL DESCRIPTION:
BLACK ALUMINUM LABEL W/SILVER TEXT
ADHESIVE TYPE = 3M 468

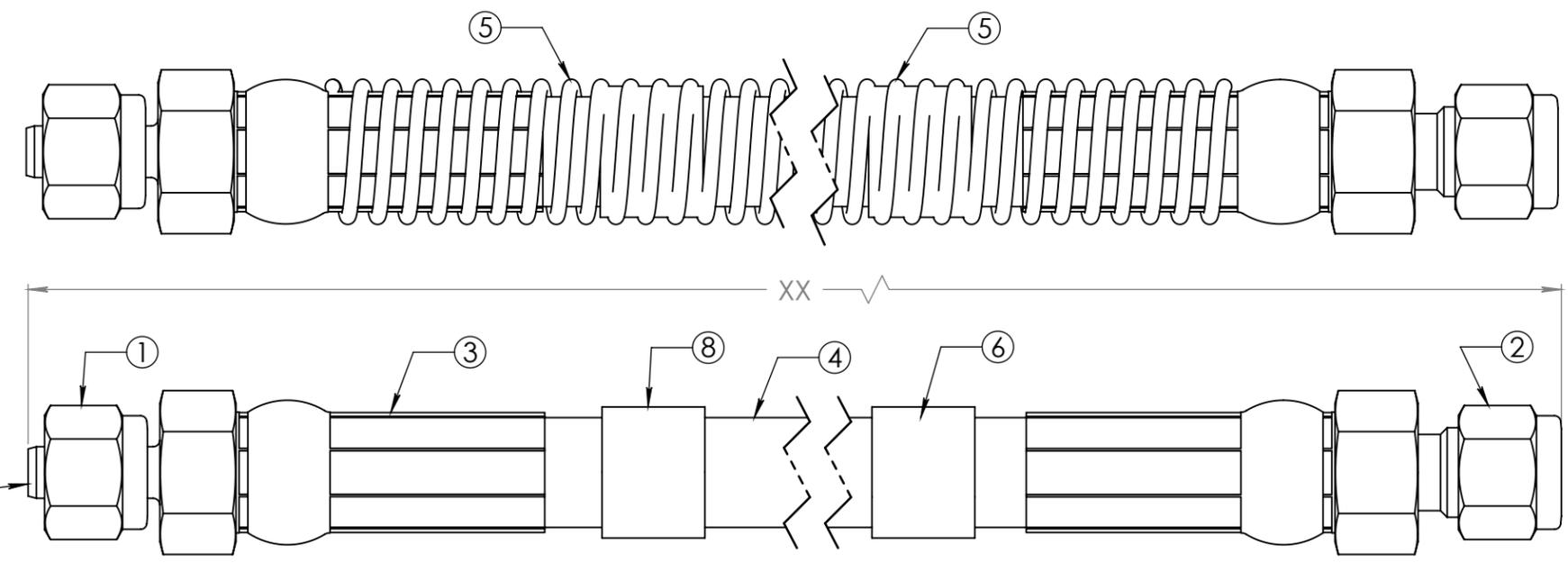
SEE NG-NGV-ASSEMBLY-TAG

ASSEMBLY LABEL

LABEL DESCRIPTION:
BLACK ALUMINUM LABEL W/SILVER TEXT
ADHESIVE TYPE = 3M 468



OPTIONAL ASSEMBLY WITHOUT SPRING GUARD



DESCRIPTION: 3/8" THERMOPLASTIC HOSE APPROVAL DRAWING

MATERIAL: HOSE - THERMOPLASTIC POLYURETHANE OVER SYNTHETIC FIBER BONDED TO NYLON CORE.

SPECIFICATION: NGV 3.1-2014 / NGV 4.2-2014

SWAGELOK® NG-6-NGV-093

3/8" I.D. -40°C to +85°C NGV3.1 CLASS B [248 BAR SP]
Mo/Yr Lot XXXXXX NGV4.2 CLASS A/D [345 BAR MAWP]

LAY LINE

NOTE 9

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Swagelok

DWG. NO. SS-NGS6-NGV-APPROVAL

SHEET 1 of 2
SCALE NONE
REV. -

TABLE 1 - END CONNECTION OPTIONS

END CONNECTION	SIZE	PART NUMBER DESIGNATOR
SWAGELOK TUBE FITTING	FRACTIONAL - 3/8"	S6
	METRIC - 10MM	G1
SWAGELOK TUBE ADAPTER	FRACTIONAL - 1/2"	T8
	FRACTIONAL - 3/8"	T6
	METRIC - 10MM	E1
MALE PIPE THREADS, NPT	FRACTIONAL - 3/8"	P6
	FRACTIONAL - 1/4"	P4
SAE 37° (JIC) FEMALE SWIVEL	FRACTIONAL - 3/8"	A6
MALE SAE	FRACTIONAL - 3/8"	R6

TABLE 2 - BILL OF MATERIALS

ITEM	DESCRIPTION
1	END CONNECTION 1 (EC1)
2	END CONNECTION 2 (EC2)
3	SHELL
4	HOSE
5	302 SS SPRING GUARD (5")
6	ASSEMBLY LABEL
7	WARNING TAG
8	BULK LABEL (NOTE 4)

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SAP CHANGE NUMBER

DCN-00086053



DWG. NO. SS-NGS6-NGV-APPROVAL

SHEET 2 of 2
SCALE NONE

REV. -

- NOTES:
- 1.) EC1 AND EC2 REPRESENT THE END CONNECTIONS FROM TABLE 1.
 - 2.) XX = CUSTOMER REQUESTED LENGTH IN INCHES, ALSO XXCM FOR LENGTH IN CENTIMETERS
 - 3.) BULK LABELS ARE PLACED A MAX. OF EVERY 45cm [18"] ALONG HOSE
 - 4.) BULK LABELS ARE NOT REQUIRED IF THE LAY LINE CONTAINS NGV 3.1 / 4.2 INFORMATION.
 - 5.) LABELS AND/OR LAY LINE NGV 3.1 / 4.2 INFORMATION IS VISIBLE BETWEEN SPRING COILS.
 - 6.) -S AFTER XX = WITH HOSE-LENGTH SPRING GUARD. -S7 AFTER XX = WITH 12.7cm [5"] LONG SPRING GUARD ON ONE END.
 - X AFTER XX = STANDARD SPRING CUFFS REMOVED.
 - 7.) EXACT MINIMUM ASSEMBLY LENGTH IS DETERMINED BY END CONNECTION AND SPRING SELECTIONS. GENERAL MINIMUM LENGTH WITH BOTH SPRINGS OR S OPTION = 18", WITH S7 OPTION = 14", WITH X OPTION = 9".
 - 8.) PLACEMENT AND ATTACHMENT METHOD OF WARNING TAG VARIES WITH HOSE CONFIGURATION.
 - 9.) ADDITIONAL INFORMATION MAY BE PRESENT ON HOSE LAY LINE.

SEE NGS-8-NGV-BULK-TAG

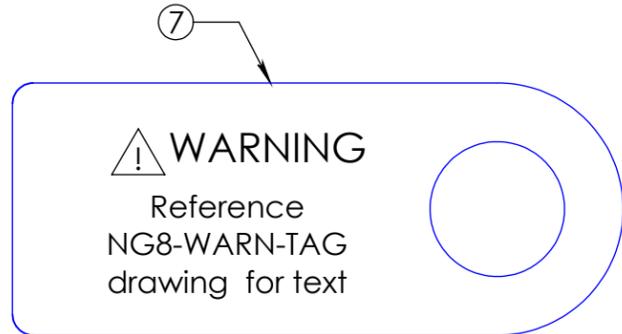
BULK LABEL

LABEL DESCRIPTION:
BLACK ALUMINUM LABEL W/SILVER TEXT
ADHESIVE TYPE = 3M 468

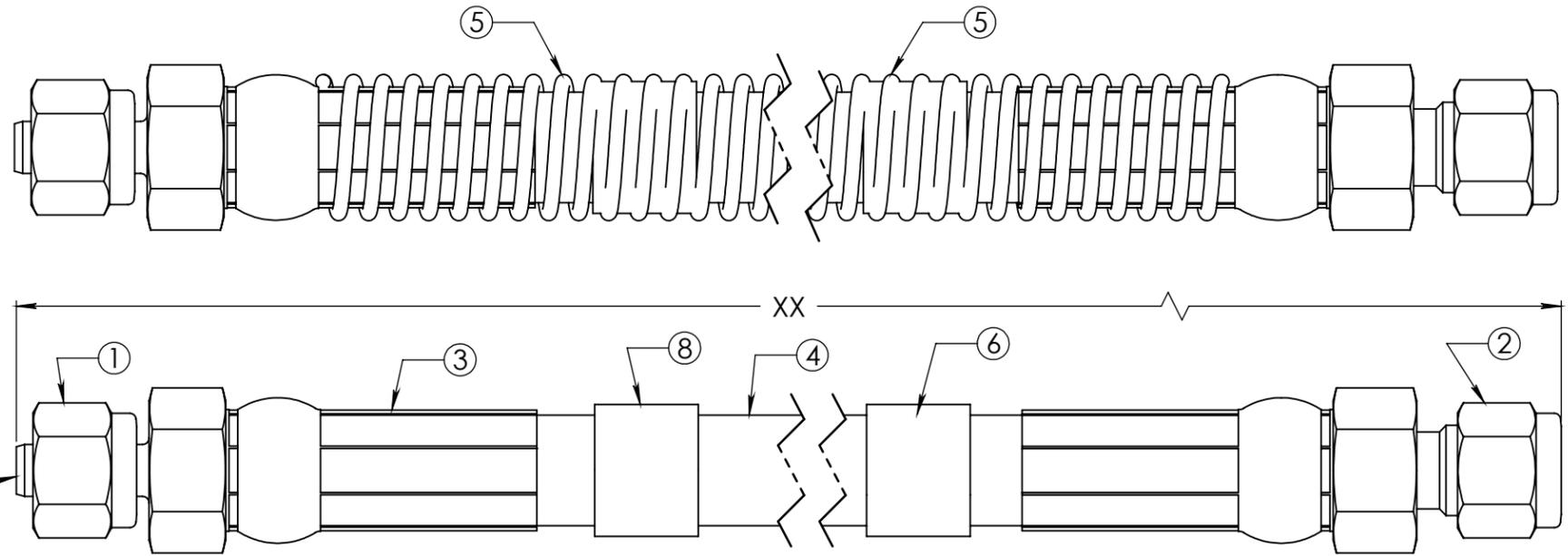
SEE NG-NGV-ASSEMBLY-TAG

ASSEMBLY LABEL

LABEL DESCRIPTION:
BLACK ALUMINUM LABEL W/SILVER TEXT
ADHESIVE TYPE = 3M 468



OPTIONAL ASSEMBLY WITHOUT SPRING GUARD



DESCRIPTION: 1/2" THERMOPLASTIC HOSE APPROVAL DRAWING

MATERIAL: HOSE - THERMOPLASTIC POLYURETHANE OVER SYNTHETIC FIBER BONDED TO NYLON CORE.

SPECIFICATION: NGV 3.1-2014 / NGV 4.2-2014

SWAGELOK® NG-8-NGV-093 1/2" I.D. -40°C to +85°C NGV3.1 CLASS B [248 BAR SP] Mo/Yr Lot XXXXXX NGV4.2 CLASS A/D [345 BAR MAWP]

LAY LINE

NOTE 9

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SAP CHANGE NUMBER

DCN-00086053



DWG. NO. SS-NGS8-NGV-APPROVAL

SHEET 1 of 2
SCALE NONE

REV. -

TABLE 1 - END CONNECTION OPTIONS

END CONNECTION	SIZE	PART NUMBER DESIGNATOR
SWAGELOK TUBE FITTING	FRACTIONAL - 1/2"	S8
	METRIC - 12MM	G2
SWAGELOK TUBE ADAPTER	FRACTIONAL - 1/2"	T8
	FRACTIONAL - 5/8"	T5
	METRIC - 12MM	E2
MALE PIPE THREADS, NPT	FRACTIONAL - 1/2"	P8
SAE 37° (JIC) FEMALE SWIVEL	FRACTIONAL - 1/2"	A8

TABLE 2 - BILL OF MATERIALS

ITEM	DESCRIPTION
1	END CONNECTION 1 (EC1)
2	END CONNECTION 2 (EC2)
3	SHELL
4	HOSE
5	302 SS SPRING GUARD (5")
6	ASSEMBLY LABEL
7	WARNING TAG
8	BULK LABEL (NOTE 4)

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DWG. NO. SS-NGS8-NGV-APPROVAL

SHEET 2 of 2
SCALE NONE

REV. -

- NOTES:
- 1.) EC1, EC2, EC3, and EC4 REPRESENT THE END CONNECTIONS FROM TABLE 1.
 - 2.) XX = CUSTOMER REQUESTED LENGTH IN INCHES, YY = END OFFSET VALUES.
 - 3.) BULK LABELS ARE PLACED A MAX. OF EVERY 45cm [18"] ALONG HOSE.
 - 4.) BULK LABELS ARE NOT REQUIRED IF THE LAY LINE CONTAINS NGV 3.1 / 4.2 INFORMATION.
 - 5.) LABELS AND/OR LAY LINE NGV 3.1 / 4.2 INFORMATION IS VISIBLE BETWEEN SPRING COILS.
 - 6.) -X AFTER YY = STANDARD SPRING CUFFS REMOVED.
 - 7.) EXACT MINIMUM ASSEMBLY LENGTH IS DETERMINED BY END CONNECTION AND OFFSET SELECTIONS. GENERAL MINIMUM LENGTH OF 36".
 - 8.) PLACEMENT AND ATTACHMENT METHOD OF WARNING TAG VARIES WITH HOSE CONFIGURATION.
 - 9.) ADDITIONAL INFORMATION MAY BE PRESENT ON HOSE LAY LINE.

SEE NGT-4-NGV-BULK-TAG

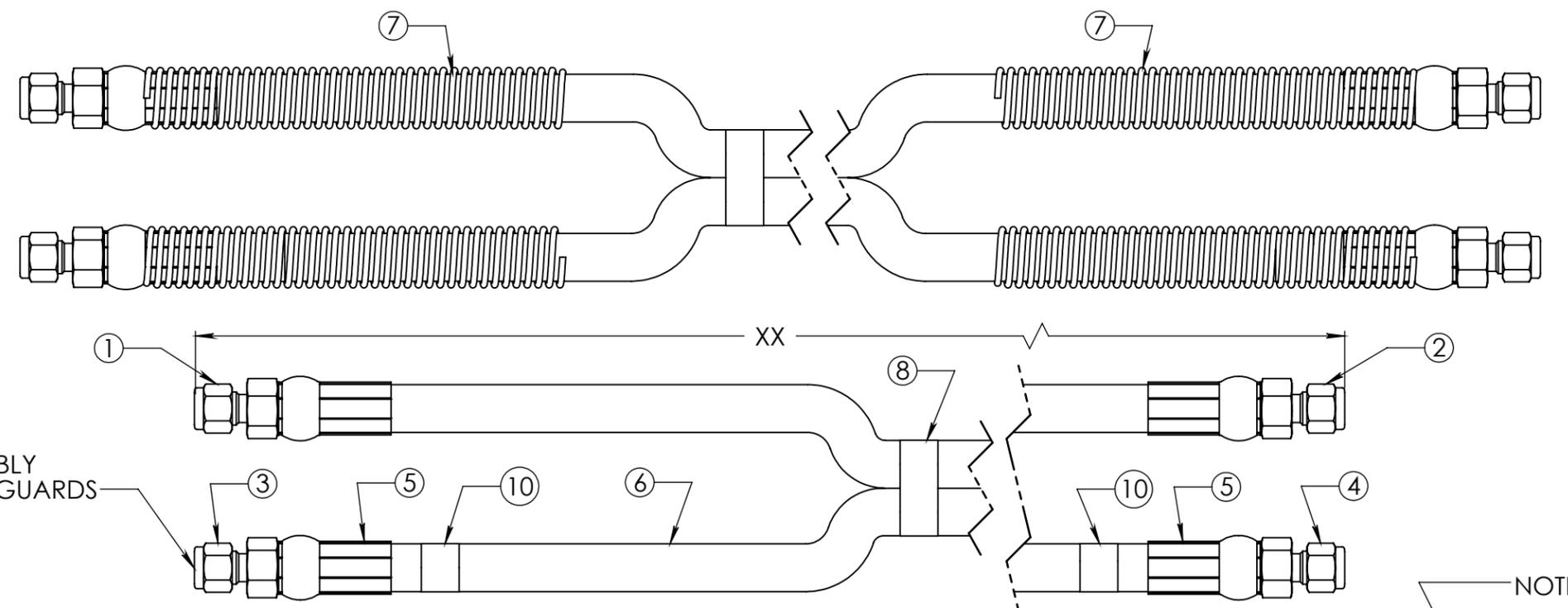
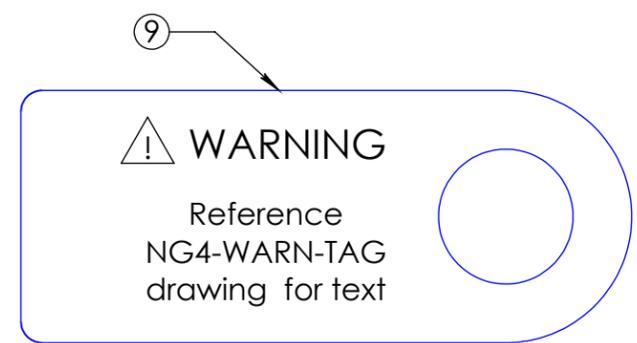
BULK LABEL

LABEL DESCRIPTION:
BLACK ALUMINUM LABEL W/SILVER TEXT
ADHESIVE TYPE = 3M 468

SEE NG-NGV-ASSEMBLY-TAG

ASSEMBLY LABEL

LABEL DESCRIPTION:
BLACK ALUMINUM LABEL W/SILVER TEXT
ADHESIVE TYPE = 3M 468



OPTIONAL ASSEMBLY WITHOUT SPRING GUARDS

DESCRIPTION: 1/4" THERMOPLASTIC HOSE APPROVAL DRAWING

MATERIAL: HOSE - THERMOPLASTIC POLYURETHANE OVER SYNTHETIC FIBER BONDED TO NYLON CORE.

SPECIFICATION: NGV 3.1-2014 / NGV 4.2-2014

SWAGELOK® NG-4T-NGV-093

1/4" I.D. -40°C to +85°C NGV3.1 CLASS B [248 BAR SP]
Mo/Yr Lot XXXXXX NGV4.2 CLASS A/D [345 BAR MAWP]

LAY LINE

NOTE 9

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SAP CHANGE NUMBER

DCN-00086053



DWG. NO. SS-NGT4-NGV-APPROVAL

SHEET 1 of 2
SCALE NONE

REV. -

TABLE 1 - END CONNECTION OPTIONS

END CONNECTION	SIZE	PART NUMBER DESIGNATOR FOR EC1, EC2, EC3, EC4
SWAGELOK TUBE FITTING	FRACTIONAL - 1/4"	S4
	METRIC - 8MM	G8
	METRIC - 6MM	G6
SWAGELOK TUBE ADAPTER	FRACTIONAL - 3/8"	T6
	FRACTIONAL - 1/4"	T4
	METRIC - 8MM	E8
	METRIC - 6MM	E6
MALE PIPE THREADS, NPT	FRACTIONAL - 1/4"	P4
SAE 37° (JIC) FEMALE SWIVEL	FRACTIONAL - 1/4"	A4
MALE SAE	FRACTIONAL - 1/4"	R4

TABLE 2 - BILL OF MATERIALS

ITEM	DESCRIPTION
1	END CONNECTION 1 (EC1)
2	END CONNECTION 2 (EC2)
3	END CONNECTION 3 (EC3)
4	END CONNECTION 4 (EC4)
5	SHELL
6	HOSE
7	302 SS SPRING GUARD (5")
8	ASSEMBLY LABEL
9	WARNING TAG
10	BULK LABEL (NOTE 4)

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DWG. NO. SS-NGT4-NGV-APPROVAL

SHEET 2 of 2
SCALE NONE

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 - 5.) LABELS AND/OR LAY LINE NGV 3.1 / 4.2 INFORMATION IS VISIBLE BETWEEN SPRING COILS.
 - 6.) -X AFTER YY = STANDARD SPRING CUFFS REMOVED.
 - 7.) EXACT MINIMUM ASSEMBLY LENGTH IS DETERMINED BY END CONNECTION AND OFFSET SELECTIONS. GENERAL MINIMUM LENGTH OF 36".
 - 8.) PLACEMENT AND ATTACHMENT METHOD OF WARNING TAG VARIES WITH HOSE CONFIGURATION.
 - 9.) ADDITIONAL INFORMATION MAY BE PRESENT ON HOSE LAY LINE.

SEE NGT-6-NGV-BULK-TAG

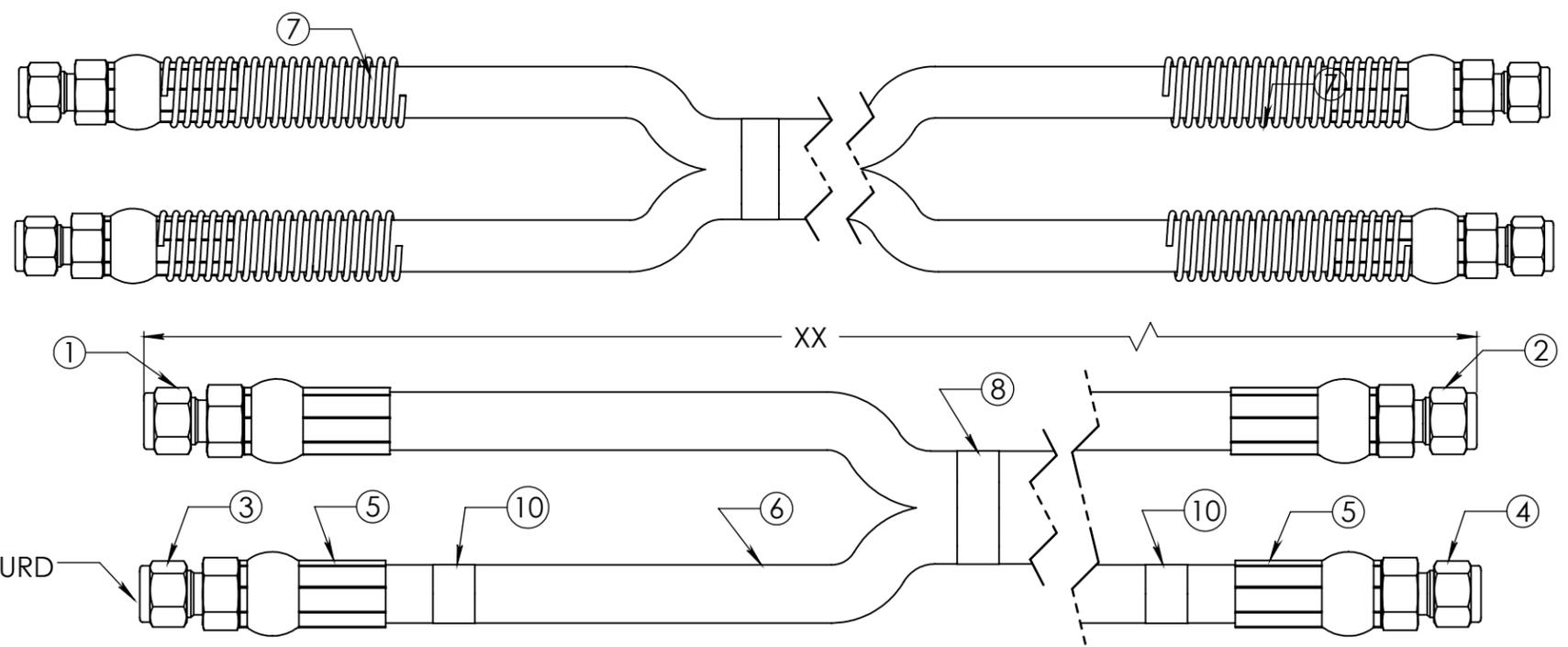
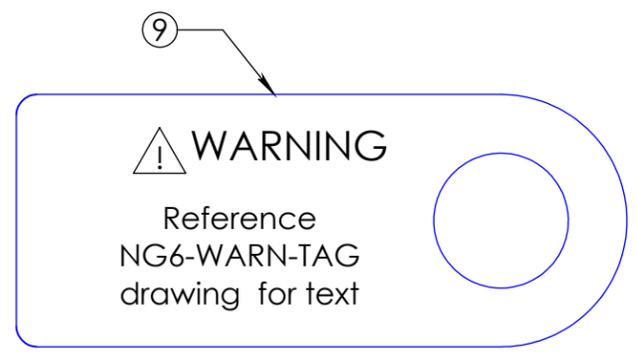
BULK LABEL

LABEL DESCRIPTION:
BLACK ALUMINUM LABEL W/SILVER TEXT
ADHESIVE TYPE = 3M 468

SEE NG-NGV-ASSEMBLY-TAG

ASSEMBLY LABEL

LABEL DESCRIPTION:
BLACK ALUMINUM LABEL W/SILVER TEXT
ADHESIVE TYPE = 3M 468



OPTIONAL ASSEMBLY WITHOUT SPRING GAURD

DESCRIPTION: 3/8" THERMOPLASTIC HOSE APPROVAL DRAWING

MATERIAL: HOSE - THERMOPLASTIC POLYURETHANE OVER SYNTHETIC FIBER BONDED TO NYLON CORE.

SPECIFICATION: NGV 3.1-2014 / NGV 4.2-2014

SWAGELOK® NG-6T-NGV-093 3/8" I.D. -40°C to +85°C NGV3.1 CLASS B [248 BAR SP] Mo/Yr Lot XXXXXX NGV4.2 CLASS A/D [345 BAR MAWP]

LAY LINE

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Swagelok

DWG. NO. SS-NGT6-NGV-APPROVAL

SHEET 1 of 2
SCALE NONE
REV. -

TABLE 1 - END CONNECTION OPTIONS

END CONNECTION	SIZE	PART NUMBER DESIGNATOR
SWAGELOK TUBE FITTING	FRACTIONAL - 3/8"	S6
	METRIC - 10MM	G1
SWAGELOK TUBE ADAPTER	FRACTIONAL - 1/2"	T8
	FRACTIONAL - 3/8"	T6
	METRIC - 10MM	E1
MALE PIPE THREADS, NPT	FRACTIONAL - 3/8"	P6
	FRACTIONAL - 1/4"	P4
SAE 37° (JIC) FEMALE SWIVEL	FRACTIONAL - 3/8"	A6
MALE SAE	FRACTIONAL - 3/8"	R6

TABLE 2 - BILL OF MATERIALS

ITEM	DESCRIPTION
1	END CONNECTION 1 (EC1)
2	END CONNECTION 2 (EC2)
3	END CONNECTION 3 (EC3)
4	END CONNECTION 4 (EC4)
5	SHELL
6	HOSE
7	302 SS SPRING GUARD (5")
8	ASSEMBLY LABEL
9	WARNING TAG
10	BULK LABEL (NOTE 4)

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DWG. NO. SS-NGT6-NGV-APPROVAL

SHEET 2 of 2
SCALE NONE

REV. -

- NOTES:
- 1.) EC, EC2, EC3, AND EC4 REPRESENT THE END CONNECTIONS FROM TABLE 1.
 - 2.) XX = CUSTOMER REQUESTED LENGTH IN INCHES, YY = END OFFSET VALUES.
 - 3.) BULK LABELS ARE PLACED A MAX. OF EVERY 45cm [18"] ALONG HOSE
 - 4.) BULK LABELS ARE NOT REQUIRED IF THE LAY LINE CONTAINS NGV 3.1 / 4.2 INFORMATION.
 - 5.) LABELS AND/OR LAY LINE NGV 3.1 / 4.2 INFORMATION IS VISIBLE BETWEEN SPRING COILS.
 - 6.) -X AFTER YY = STANDARD SPRING CUFFS REMOVED.
 - 7.) EXACT MINIMUM ASSEMBLY LENGTH IS DETERMINED BY END CONNECTION AND OFFSET SELECTIONS. GENERAL MINIMUM LENGTH OF 36".
 - 8.) PLACEMENT AND ATTACHMENT METHOD OF WARNING TAG VARIES WITH HOSE CONFIGURATION.
 - 9.) ADDITIONAL INFORMATION MAY BE PRESENT ON HOSE LAY LINE.

SEE NGT-8-NGV-BULK-TAG

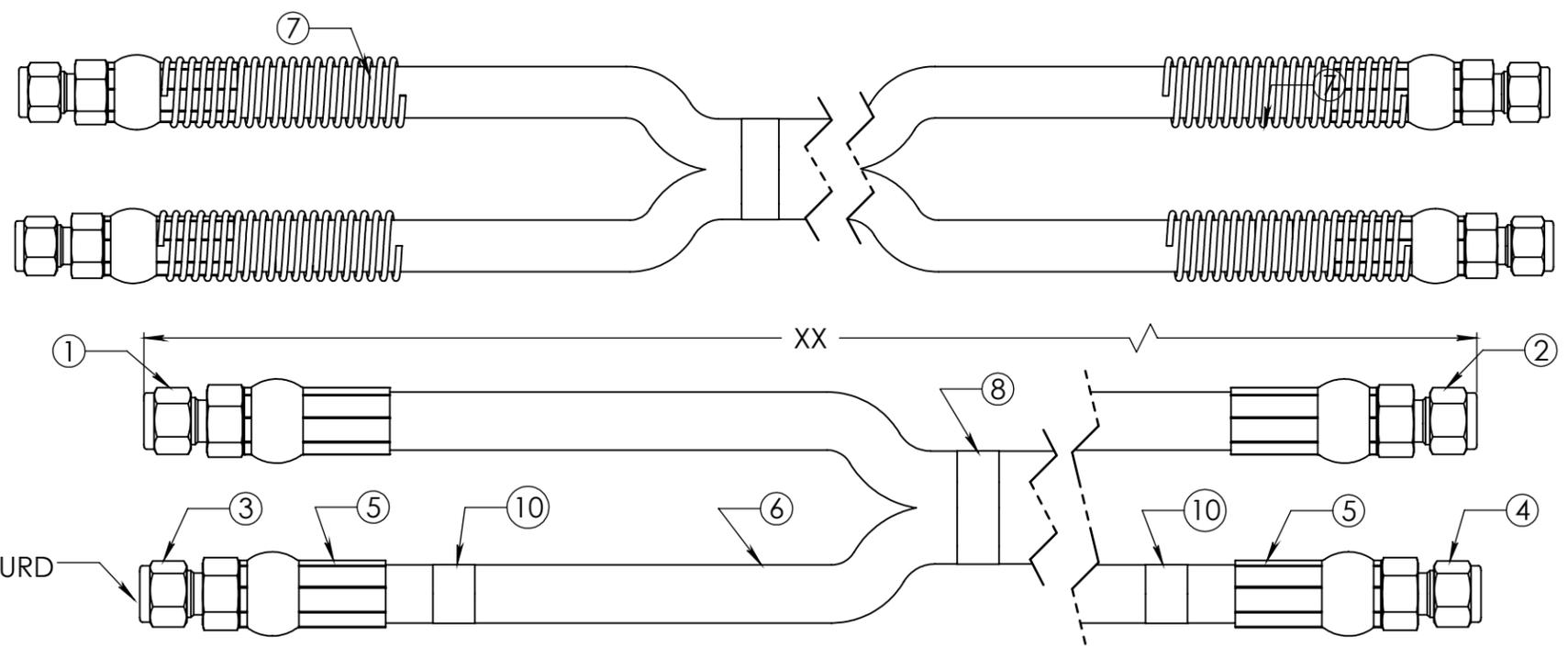
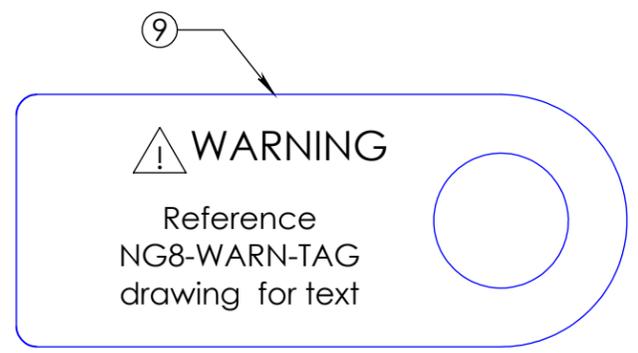
BULK LABEL

LABEL DESCRIPTION:
BLACK ALUMINUM LABEL W/SILVER TEXT
ADHESIVE TYPE = 3M 468

SEE NG-NGV-ASSEMBLY-TAG

ASSEMBLY LABEL

LABEL DESCRIPTION:
BLACK ALUMINUM LABEL W/SILVER TEXT
ADHESIVE TYPE = 3M 468



OPTIONAL ASSEMBLY WITHOUT SPRING GAURD

DESCRIPTION: 1/2" THERMOPLASTIC HOSE APPROVAL DRAWING

MATERIAL: HOSE - THERMOPLASTIC POLYURETHANE OVER SYNTHETIC FIBER BONDED TO NYLON CORE.

SPECIFICATION: NGV 3.1-2014 / NGV 4.2-2014

SWAGELOK® NG-8T-NGV-093 1/2" I.D. -40°C to +85°C NGV3.1 CLASS B [248 BAR SP] Mo/Yr Lot XXXXXX NGV4.2 CLASS A/D [345 BAR MAWP]

LAY LINE

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TABLE 1 - END CONNECTION OPTIONS

END CONNECTION	SIZE	PART NUMBER DESIGNATOR
SWAGELOK TUBE FITTING	FRACTIONAL - 1/2"	S8
	METRIC - 12MM	G2
SWAGELOK TUBE ADAPTER	FRACTIONAL - 1/2"	T8
	FRACTIONAL - 5/8"	T5
	METRIC - 12MM	E2
MALE PIPE THREADS, NPT	FRACTIONAL - 1/2"	P8
SAE 37° (JIC) FEMALE SWIVEL	FRACTIONAL - 1/2"	A8

TABLE 2 - BILL OF MATERIALS

ITEM	DESCRIPTION
1	END CONNECTION 1 (EC1)
2	END CONNECTION 2 (EC2)
3	END CONNECTION 3 (EC3)
4	END CONNECTION 4 (EC4)
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