From: FP Product Application Support
To: Luke Wisniewski
Subject: RE: Gates General Inquiry - Luke
Date: Wednesday, July 10, 2024 3:24:31 PM
Attachments: image002.png
image003.png
image004.png
image005.png
image006.png
image007.png

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Hi Luke,

Yes, the BlackGold PowerBraid hose has a two-wire reinforcement, which is very similar to the G2XH hose.

Thanks,

Briana

FP Technical Support
Fluid Power Application Engineering

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Gates
330 Inverness Drive South
Englewood, CO 80112 USA
d: [redacted]
e: [redacted]
Gates.com

From: Luke Wisniewski [redacted]>
Sent: Wednesday, July 10, 2024 12:53 PM
To: FP Product Application Support <[redacted]>
Subject: RE: Gates General Inquiry - Luke

Hi Briana,

Thank you for your response and information. The owner has since replaced the hose with a Gates 8PB4300 Back Gold® PowerBraid™ 3670-0803 Hydraulic Hose - 0.50 in ID, 0.82 in OD, 4300 psi Working Pressure, 17200 psi burst pressure. Which appears to be comparable to the Global G2XH -2 wire braid? Do you agree?

I look forward to your reply.

Thanks again for all your help and assistance.

Best Regards,

Luke Wisniewski

Sr. Marine Investigator
Office of Marine Safety
National Transportation Safety Board
490 L'Enfant Plaza East, S.W.
Washington, DC 20594
Office: [redacted]
Cell: [redacted]
[redacted]

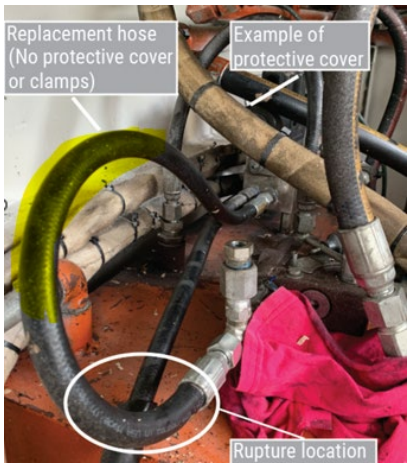
From: FP Product Application Support [redacted]
Sent: Wednesday, July 10, 2024 1:00 PM
To: Luke Wisniewski [redacted]
Subject: RE: Gates General Inquiry - Luke

[CAUTION] This email originated from outside of the organization. Do not click any links or open attachments unless you recognize the sender and know the content is safe.

Hi Luke,

Thank you for that information. Since this hose was in service for 3 ½ years, we believe that the hose assembly ruptured because of movement causing the hose assembly to fatigue over time. The highlighted portion below is unsupported allowing for the hose to move. Below are some suggestions we came up with.

1. Clamp (P-clip) the current hose to provide support so it helps movement fatigue (not sure if this is possible?)
2. Shorten the length of the hose and add in 90 degree fittings and adapters to try to reroute the hose assembly (pages 55 and 56 of Safe Hydraulics brochure goes over hose assembly routing tips)
3. Use a different hose that has a two braid reinforcement instead of one braid reinforcement that G1 hose has (options screenshotted below, G2XH, M4K)



GLOBAL G2XH 2-WIRE BRAID XTREME® HEAT HOSE - SAE 100R2 TYPE AT

WIRE BRAID

RECOMMENDED FOR	Extremely high–temperature high–pressure hydraulic applications where pressure or temperature requirements exceed SAE 100R2, ISO 1436 2SN R2 and EN 853 2SN or where resistance to either petroleum–base or phosphate ester fluids is required. Meets SAE J1942 requirements.
TUBE	Black, oil and chemical resistant, synthetic rubber (CPE). See Hose Stock Characteristics.
REINFORCEMENT	Two braids of high–tensile steel wire.
COVER	Blue, oil and abrasion resistant, thin synthetic rubber (CSM). See Hose Stock Characteristics.
TEMPERATURE RANGE	Petroleum–base fluids: –40°F to +300°F (–40°C to +149°C). Phosphate esters fluids as recommended by the fluid manufacturer, but within a range of –40°F to +212°F. For water emulsions: Max. +225°F Pressure lines, Max +180°F Return lines.
COUPLING RECOMMENDATION	GlobalSpiral™ Couplings (G20) Section E GlobalSpiral™ Plus Couplings (–24 and –32) (G22) Section E MegaCrimp® Couplings (G25) Section G Stainless Steel Braid Couplings (–24 and –32) (G17) Section H (See Crimp Data Manual 428–7365 or eCrimp)

Meets Flame Resistance Acceptance Designation "MSHA 2G".

Part No.	Description	Product No.	Standard Pack					
85798	4G2XH X50FT	4657-4008	1	1/4	.59	6000	24000	4.0
70966	4G2XHXREEL	4657-2541	550	1/4	.59	6000	24000	4.0
85799	6G2XH X50FT	4657-4009	1	3/8	.74	5000	20000	5.0
70967	6G2XHXREEL	4657-2542	400	3/8	.74	5000	20000	5.0
85800	8G2XH X50FT	4657-4010	1	1/2	.86	4250	17000	7.0

GLOBAL M4K MEGA4000™ HOSE - SAE 100R19

WIRE BRAID

RECOMMENDED FOR	High–pressure hydraulic applications. Exceeds ISO 18752 Grade B, SAE 100R19 and ISO 11237 R19. Allows for tighter minimum bend radius, increased working pressure and improved impulse cycles than industry standards. Provides greater performance, flexibility, easier routing and plumbing of mobile and stationary hydraulic platforms.
TUBE	Black, oil resistant, synthetic rubber (Nitrile). See Hose Stock Characteristics.
REINFORCEMENT	Two braids of high–tensile steel wire.
COVER	Black, oil, abrasion and weather resistant, synthetic rubber (Nitrile and PVC), with color coded layline. Also available with unique abrasion resistant MegaTuff® or XtraTuff® covers. See Hose Stock Characteristics.
TEMPERATURE RANGE	–40°F to +212°F (–40°C to +100°C). For water emulsions see Temperature Limits Table.
COUPLING RECOMMENDATION	GlobalSpiral™ Couplings (–6 through –16) (G20) Section E MegaCrimp® Couplings (–4 through –12) (G25) Section G Stainless Steel Braid Couplings (–4 through –8) (G17) Section H Stainless Steel Spiral Couplings (–12 and –16) (G18) Section F (See Crimp Data Manual 428–7365 or eCrimp)

Meets Flame Resistance Acceptance Designation "MSHA 2G" and ISO 11237 R19. Tested to Industry Leading 600,000 impulse cycles.

Part No.	Description	Product No.	Standard Pack					
85616	4M4K X50FT	4657-1238	1	1/4	.55	4000	16000	1.5
	4M4KXBALE	4657-5779	5600	1/4	.55	4000	16000	1.5
70829	4M4KXREEL	4657-1467	440	1/4	.55	4000	16000	1.5
70457	5M4KXREEL	4657-8015	350	5/16	.61	4000	16000	1.8
85617	6M4K X50FT	4657-4867	1	3/8	.70	4000	16000	2.0
	6M4KXBALE	4657-5775	3800	3/8	.70	4000	16000	2.0
70821	6M4KXREEL	4657-1458	330	3/8	.70	4000	16000	2.0
85618	8M4K X50FT	4657-4868	1	1/2	.82	4000	16000	2.8
	8M4KXBALE	4657-5776	2200	1/2	.82	4000	16000	2.8
70822	8M4KXREEL	4657-1459	220	1/2	.82	4000	16000	2.8
85619	10M4K X50FT	4657-4869	1	5/8	.99	4000	16000	3.0

Thanks,

Briana

FP Technical Support
Fluid Power Application Engineering

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330 Inverness Drive South
Englewood, CO 80112 USA
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e: [redacted]
Gates.com

From: Luke Wisniewski <[redacted]
Sent: Wednesday, July 10, 2024 9:44 AM
To: FP Product Application Support [redacted]
Subject: RE: Gates General Inquiry - Luke

Hi Briana,

Please find below responses to your questions are in blue text.

1. What is the application pressure? Working pressure was approximately 1,000 psi Are there any pressure spikes? None reported. Max pressure of the steering gear pump was 2,000 psi.
2. Does the hose have any movement when in operation? Unknown
3. How long has this hose been in service/how long did it last before rupturing? Approximately 3.5 years.
4. Based on the photo of similar configuration, was this ruptured hose also bent right after the fitting/coupling? Yes, the photograph below shows the replaced hydraulic hose (same length and configuration) with the ruptured location from the previous hose circled. The ruptured hose was removed by the operator. No photographs were taken of the ruptured hosed in place after the incident.

Best Regards,

Luke Wisniewski

Sr. Marine Investigator
Office of Marine Safety
National Transportation Safety Board
490 L'Enfant Plaza East, S.W.
Washington, DC 20594
Office: [redacted]
Cell: [redacted]
Fax: [redacted]

From: FP Product Application Support [redacted]
Sent: Wednesday, July 10, 2024 10:53 AM
To: Luke Wisniewski [redacted]
Subject: RE: Gates General Inquiry - Luke

Hi Luke,

I wanted to speak with the rest of my team on their thoughts on this hose failure before emailing back with suggestions. Below are some questions we came up with. We just wanted to know some more information before we give suggestions/recommendations.

1. What is the application pressure? Are there any pressure spikes?
2. Does the hose have any movement when in operation?
3. How long has this hose been in service/how long did it last before rupturing?
4. Based on the photo of similar configuration, was this ruptured hose also bent right after the fitting/coupling?

Thanks,

Briana

FP Technical Support
Fluid Power Application Engineering

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Gates.com

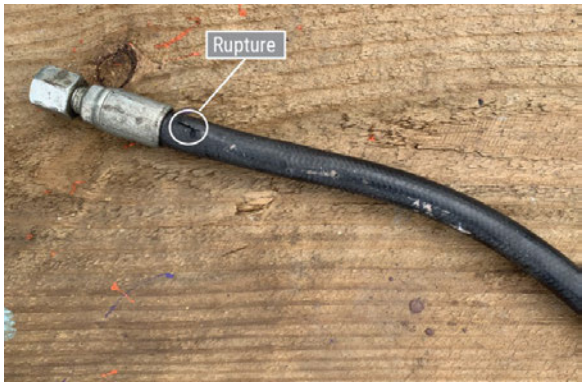
From: Luke Wisniewski <[redacted]>

Sent: Tuesday, July 9, 2024 2:38 PM
To: FP Product Application Support[redacted]>
Subject: RE: Gates General Inquiry - Luke

Hi Briana,

Thank you for the SAFE HYDRAULICS manual from February 2022 on helpful suggestions / recommendations on design, installation, maintenance and other activities involving hose
assemblies in hydraulic systems.

The 1/2“ hose in question, was on a hydraulic steering pump assembly onboard a towing vessel. Specs on the hose was: Gates 8G1 spiraled reinforcement hydraulic hose with four layers (plies) with the following markings/specifications: 1/2" (12.5 mm) Gates (manufacture) 8G1 (model /name) wire braid hose with a minimum work pressure of 16.0 MPa (2325 PSI), minimum burst pressure 9,300 PSI, ISO 1436, 1SN R1ATS / EN853 1SN / SAE 100R1AT, Flame Resistant MSHA 2G-11C, AM100718, 1577, -40F to 212F, meets ISO 15540 / ISO 15541, Engineering in USA Made in Mexico, 01:23:59. AM – Mexico 10 – October, 07 – Day, 2018 - Year



The ruptured hose was configured similar to the below photograph of the replacement hose. The hose burst was near the coupling, approximately facing the 1 o’clock position.

Additionally photographs of the damage hose are attached. I currently do not possess the specs on the crimp OD or fitting other than what is show in the photographs.

Request your assistance to identify what you (the manufacture) believe caused this hydraulic hose the rupture and what lessons learned a technician or operator can take away from this type of failure.

Thank you again for your assistance. I look forward to your reply.

Best Regards,

Luke Wisniewski

Sr. Marine Investigator

Office of Marine Safety
National Transportation Safety Board
490 L'Enfant Plaza East, S.W.
Washington, DC 20594
Office: [redacted]
[redacted]

From: FP Product Application Support <[redacted]
Sent: Tuesday, July 9, 2024 3:44 PM
To: Luke Wisniewski[redacted]
Subject: FW: Gates General Inquiry - Luke

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From: FP Product Application Support[redacted]
Sent: Tuesday, July 9, 2024 1:37 PM
To: [redacted]
Subject: RE: Gates General Inquiry - Luke

Hi Luke,

See attached.

Thanks,

Briana

FP Technical Support
Fluid Power Application Engineering

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Gates
330 Inverness Drive South
Englewood, CO 80112 USA
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[redacted]
Gates.com

From: Cognito Forms[redacted]
Sent: Tuesday, July 9, 2024 1:32 PM
To: FP Product Application Support[redacted]
Subject: Gates General Inquiry - Luke

Gates Corporation

Gates General Inquiry

You have received a new form submission from the Gates.com Contact Us General Inquiry Form. Please review the details and respond as necessary. For any questions on this form, please contact the Gates Digital Group

Entry Details

SELECT YOUR REGION	United States & Canada
TOPIC	Industrial Hose & Hydraulics Technical & Engineering Support
FIRST NAME	Luke
LAST NAME	Wisniewski
COMPANY	National Transportation Safety Board

CITY	Washington DC
POSTAL CODE	20594
EMAIL	[redacted]
QUESTIONS OR COMMENTS	Looking to speak with Ms. Jana Eyler, Gates Quality Manager at Gates Corporation in Iola, Kansas about a Gates 1/2" 8G1 hydraulic hose. Hose details listed below. 1/2" (12.5 mm) Gates (manufacture) 8G1 (model /name) wire braid hose with a minimum work pressure of 16.0 MPa (2325 PSI), minimum burst pressure 9,300 PSI, ISO 1436, 1SN R1ATS / EN853 1SN / SAE 100R1AT, Flame Resistant MSHA 2G-11C, AM100718, 1577, -40F to 212F, meets ISO 15540 / ISO 15541, Engineering in USA Made in Mexico, 01:23:59. AM – Mexico 10 – October, 07 – Day, 2018 - Year

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