

# 12

## TRAILER WIRING & COMMUNICATIONS SYSTEMS

*SYSTÈMES DE COMMUNICATION ET  
FILAGE DE REMORQUES*

*SISTEMAS DE ARNESES PARA  
REMOLQUE / CAJA DE CONEXIÓN*

## GROTE GUARDIAN® SMART SYSTEM

### • REAL-TIME ALERTS

Get real-time alerts about your trailer lighting system sent straight to your smartphone or telematics system. Grote Guardian® samples at a rate of up to 100 times per second, measuring both voltage and current to determine when an event has occurred and let you know immediately.

### • OPTION FOR A GATEWAY DATA NOTIFICATION

Set up a geofence, so any time a trailer enters the lot, it uploads data to a cloud-based server and generates a notification to the maintenance manager of any failures.

### • THE SYSTEM IS HIGHLY VERSATILE

Simply integrating with the trailer via one of three Grote® nosebox options working with both LED and incandescent lights for all trailer types.

### • MAXIMIZE SECURITY AND UPTIME

### • MINIMIZE MAINTENANCE COST AND CSA EXPOSURE



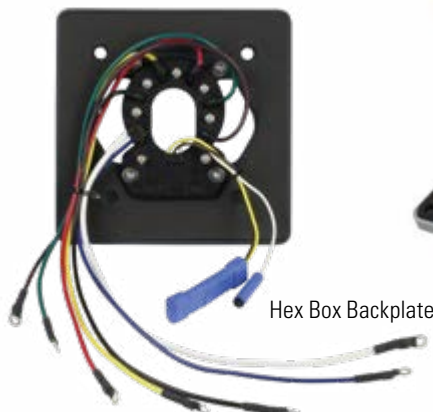
Visit [Grote.com/Guardian](http://Grote.com/Guardian) to learn more and watch Grote Guardian® in action.



G7 Version



Geofence Gateway



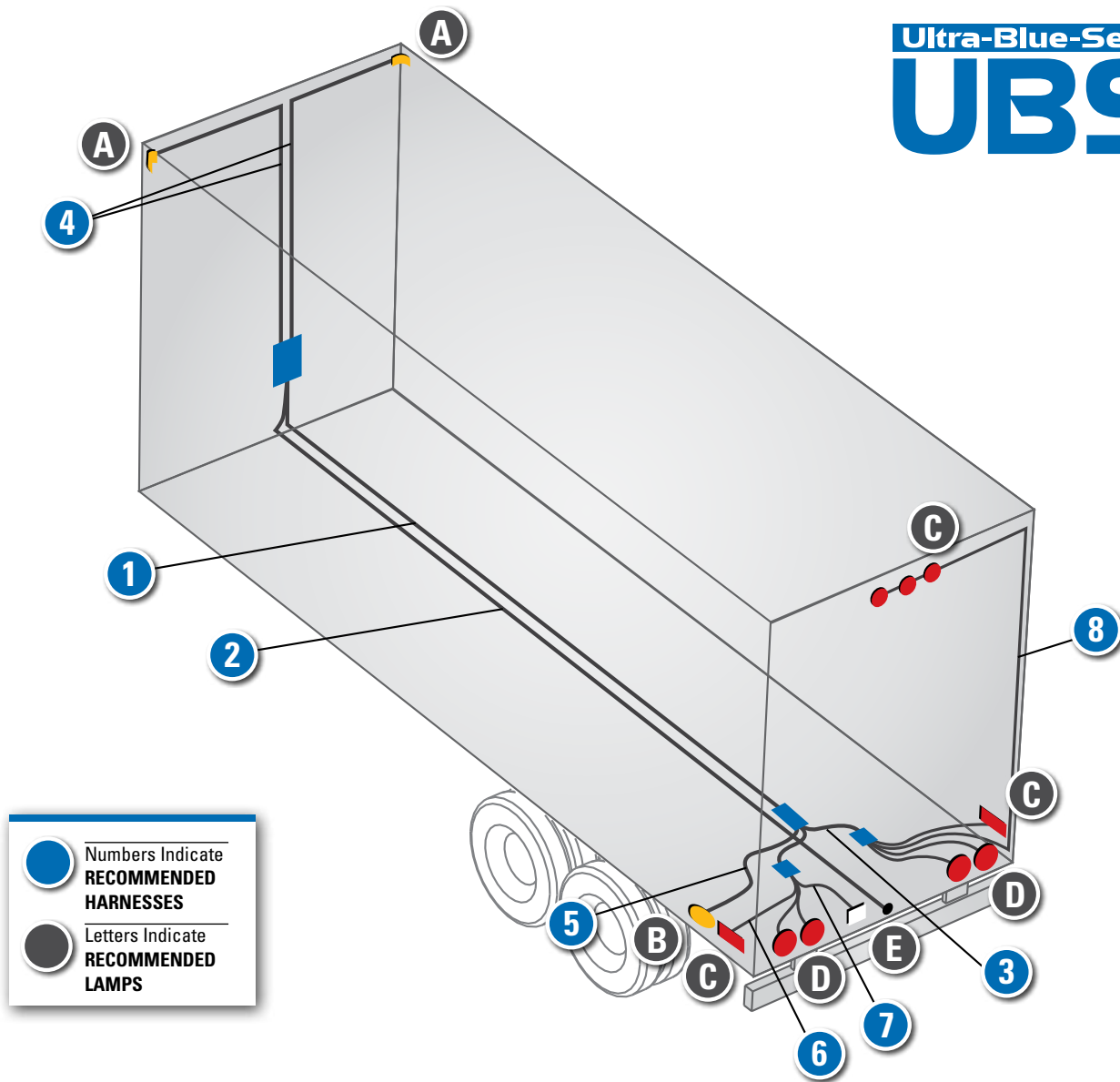
Hex Box Backplate



Ultra Nose Box Gen 3

VMRS Code: 036-009-000

Ultra-Blue-Seal®  
**UBS**



## RECOMMENDED LAMPS

### A FRONT MARKERS

SuperNova® 3" Thin-Line LED Clearance/Marker Lamp	Page 47
SuperNova® Sealed Turtleback® II LED Clearance/Marker Lamp	Page 55
MicroNova® DOT LED Clearance/Marker Lamp	Page 35
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### B ABS

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### C REAR SIDE, CLEARANCE MARKERS & REAR I.D.

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MicroNova® LED Clearance/Marker Lamp	Page 36

### D STOP/TAIL/TURN

SuperNova® 4" LED Stop/ Tail/ Turn Lamp	Page 75
SuperNova® 4" NexGen LED Stop/Tail/Turn	Page 77

### E LICENSE

MicroNova® Multi-Volt LED License Lamp	Page 119
MicroNova® Multi-Volt DOT LED License Lamp	Page 119

## 28' VAN TRAILER ULTRA-BLUE-SEAL® HARNESS SYSTEM

### 1 MAIN HARNESS

Part #	Front Connection	ABS Drop	Wire Gauge	Length	VMRS Code
01-6670-L5	#10 Ring Terminal	60"	1-8, 2-10, 4-12	420"	034-004-023

### 2 PINTLE MAIN

Part #	Forward Connection	Rear Connection	Wire Gauge	Length	VMRS Code
01-6660-K3	#10 Ring Terminal	Push-On	1-8, 2-10, 4-12	420"	034-004-023
66601	#10 Ring Terminal	#10 Ring Terminal	1-8, 2-10, 4-12	420"	034-004-023

### 3 REAR SILL

Part #	Lamp Plug	Curb Side	Road Side	ABS Drop	VMRS Code
01-6758-86	Straight Male Pin	60"	50"	53"	034-004-023
01-6758-87	Straight Male Pin	89"	16"	18"	034-004-023

### 4 FRONT MARKER HARNESS

Part#	Lamp Connection	Power Connection	Length	Side	VMRS Code
66222	.180 Slim-Line Female	.180 Slim-Line Male	96"	Road	034-004-023
05-2018-93	.180 Slim-Line Female	.180 Slim-Line Male	144"	Curb	034-004-023
01-6620-C8	.180 Slim-Line Female	#10 ring terminal	96"	Road	034-004-023
01-6620-C9	.180 Slim-Line Female	#10 Ring Terminal	144"	Curb	034-004-023

### 5 ABS FAULT LAMP HARNESS

Part#	Lamp Connection	Power Connection	Length	VMRS Code
66203	.180 Slim-Line Female	.180 Slim Line Male	72"	034-004-023

### 6 REAR MARKER HARNESS

Part#	Lamp Connection	Power Connection	Length	VMRS Code
01-6707-A9	Turtleback® II	.180 Slim-Line Male	24"	034-004-042
01-6693-74	Thinline LED	.180 Slim-Line Male	24"	034-004-042
05-2018-47	.180 Slim-Line Female	.180 Slim-Line Male	24"	034-004-023

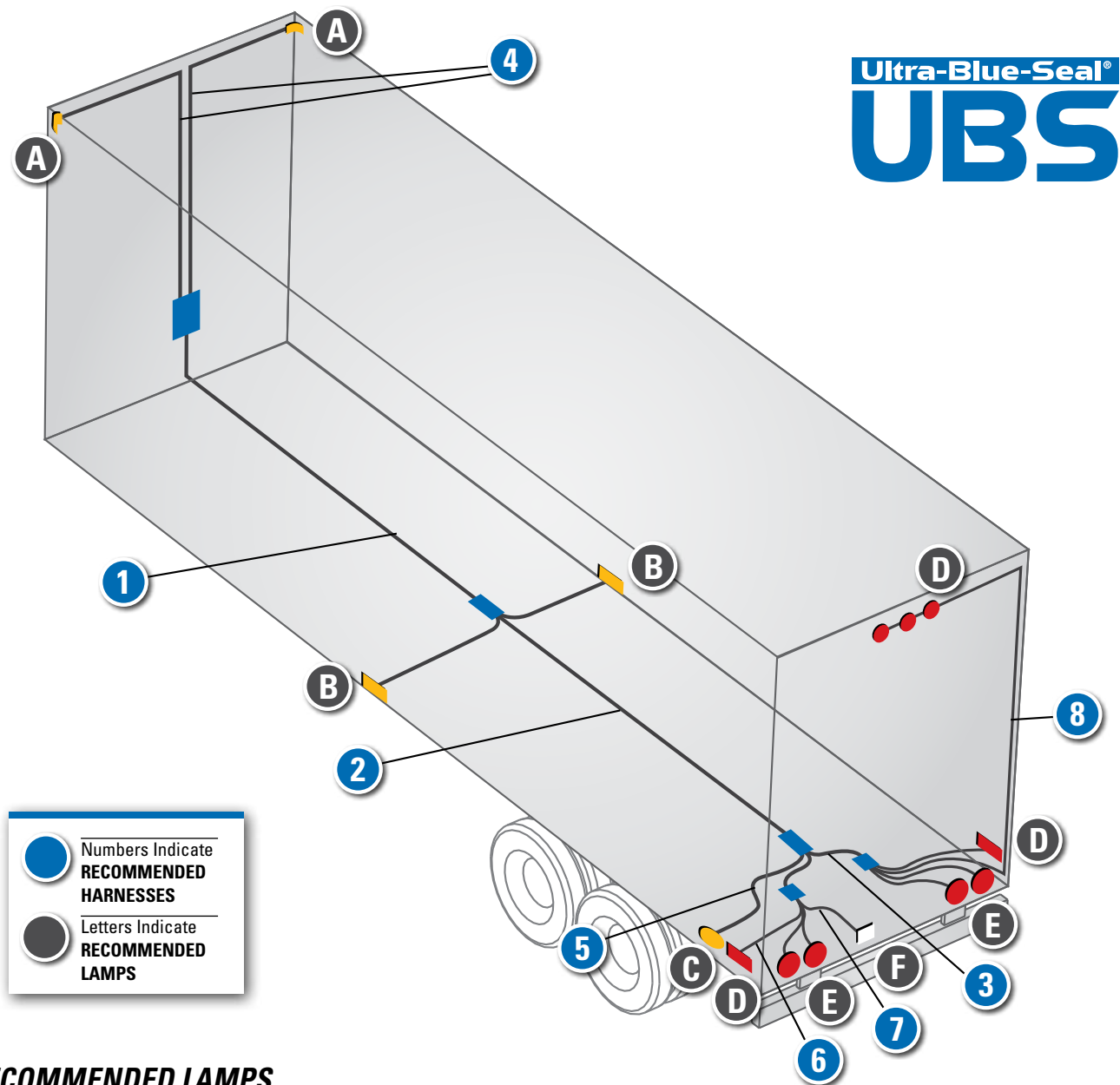
### 7 LICENSE LAMP HARNESS

Part#	Lamp Connection	Power Connection	Length	VMRS Code
66221	.180 Slim-Line Female	.180 Slim-Line Male	60"	034-004-023

### 8 REAR I.D. HARNESS

Part#	Lamp Connection	Power Connection	Length	VMRS Code
01-6707-C3	Turtleback® II	.180 Slim-Line Male	120" w/12" On Center Spacing	034-004-023
66402	Thinline LED	.180 Slim-Line Male	120" w/12" On Center Spacing	034-004-023
01-6621-A9	.180 Slim-Line Female	.180 Slim-Line Male	120" w/12" On Center Spacing	034-004-023

Lamp connection descriptions and information begins on page 255



## RECOMMENDED LAMPS

### A FRONT MARKERS

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MicroNova® LED Clearance/Marker Lamp	Page 36

### B MID-TURN

SuperNova® Oval LED Side Turn/Marker Lamp	Page 86
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### C ABS

MicroNova® DOT LED Clearance/Marker Lamp	Page 35
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### D REAR SIDE, CLEARANCE MARKERS & REAR I.D.

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### E STOP/TAIL/TURN

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### F LICENSE

MicroNova® Multi-Volt LED License Lamp	Page 119
MicroNova® Multi-Volt DOT LED License Lamp	Page 119



**53' VAN TRAILER ULTRA-BLUE-SEAL® HARNESS SYSTEM****1 FORWARD MAIN**

Part #	Front Connection	Curb Side	Road Side	Wire Gauge	Length	VMRS Code
01-6661-A2	Push-On	56"	56"	1-10, 6-12	375"	034-004-023
01-6660-M6	Push-On	108"	15"	1-10, 6-12	375"	034-004-023
01-6605-W3	#10 Ring Terminal	108"	15"	1-10, 6-12	375"	034-004-023
01-6606-X3	#10 Ring Terminal	56"	56"	1-10, 6-12	375"	034-004-023

**2 INTERMEDIATE MAIN**

Part #	Length	ABS Drop	Wire Gauge	VMRS Code
01-6605-W7	342"	132"	1-10, 6-12	034-004-023
01-6605-X4	288"	180"	1-10, 6-12	034-004-023

**3 REAR SILL**

Part #	Lamp Plug	Curb Side	Road Side	ABS Drop	Wire Gauge	VMRS Code
01-6758-86	Straight Male Pin	60"	50"	53"	1-12, 4-14	034-004-023
01-6758-87	Straight Male Pin	89"	16"	18"	1-12, 4-14	034-004-023

**4 FRONT MARKER HARNESS**

Part#	Lamp Connection	Power Connection	Length	Side	VMRS Code
66222	.180 Slim-Line Female	.180 Slim-Line Male	96"	Road	034-004-023
05-2018-93	.180 Slim-Line Female	.180 Slim-Line Male	144"	Curb	034-004-023
01-6620-C8	.180 Slim-Line Female	#10 ring terminal	96"	Road	034-004-023
01-6620-C9	.180 Slim-Line Female	#10 Ring Terminal	144"	Curb	034-004-023

**5 ABS FAULT LAMP HARNESS**

Part#	Lamp Connection	Power Connection	Length	VMRS Code
66203	.180 Slim-Line Female	.180 Slim-Line Male	72"	034-004-023

**6 REAR MARKER HARNESS**

Part#	Lamp Connection	Power Connection	Length	VMRS Code
01-6707-A9	Turtleback® II	.180 Slim-Line Male	24"	034-004-042
01-6693-74	Thinline LED	.180 Slim-Line Male	24"	034-004-042
05-2018-47	.180 Slim-Line Female	.180 Slim-Line Male	24"	034-004-023

**7 LICENSE LAMP HARNESS**

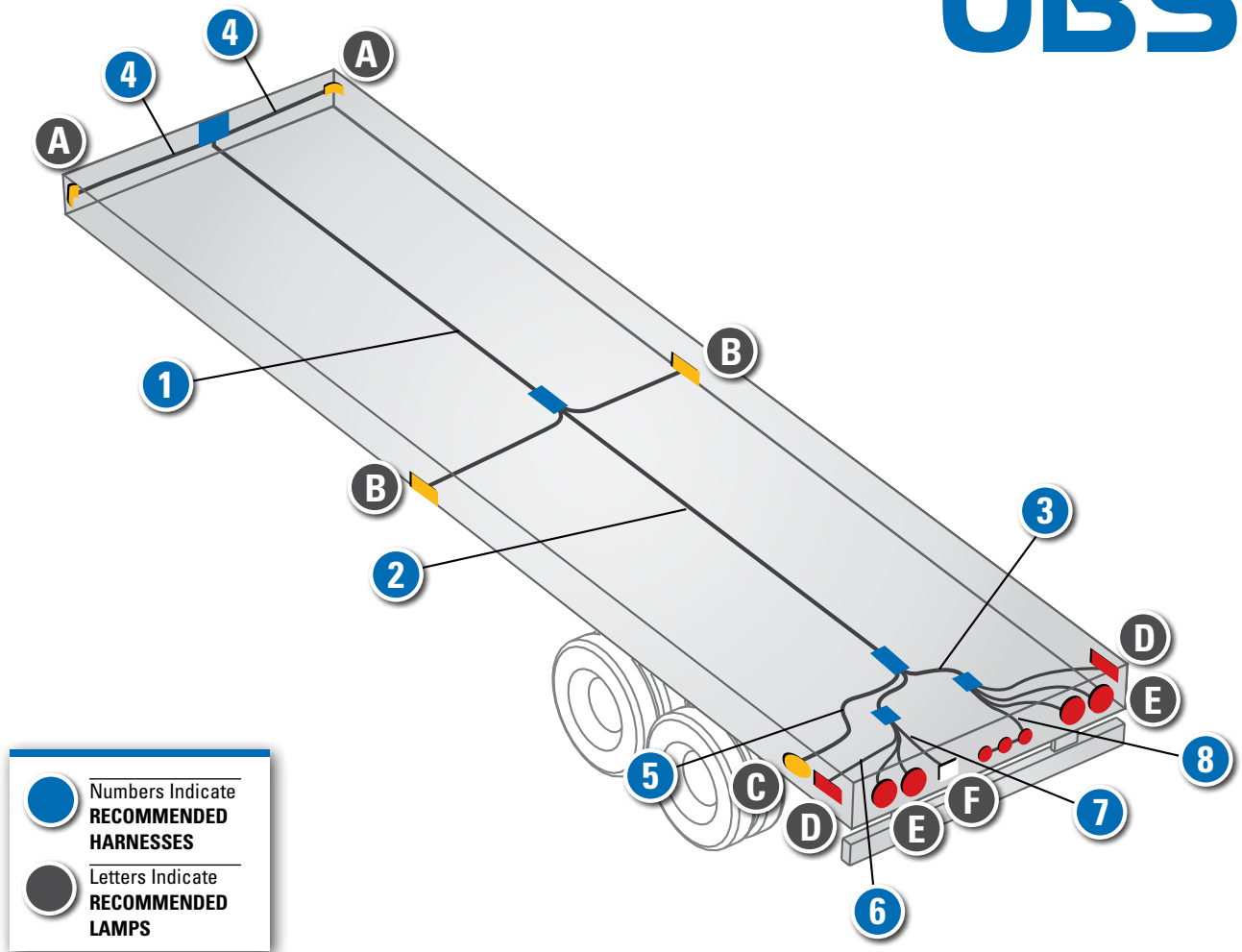
Part#	Lamp Connection	Power Connection	Length	VMRS Code
66221	.180 Slim-Line Female	.180 Slim-Line Male	60"	034-004-023

**8 REAR I.D. HARNESS**

Part#	Lamp Connection	Power Connection	Length	VMRS Code
01-6707-C3	Turtleback® II	.180 Slim-Line Male	120" w/12" On Center Spacing	034-004-023
66402	Thinline LED	.180 Slim-Line Male	120" w/12" On Center Spacing	034-004-023
01-6621-A9	.180 Slim-Line Female	.180 Slim-Line Male	120" w/12" On Center Spacing	034-004-023

Lamp connection descriptions and information begins on page 255

Ultra-Blue-Seal®  
**UBS**



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### F LICENSE

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MicroNova® Multi-Volt DOT LED License Lamp	Page 119

**53' FLATBED ULTRA-BLUE-SEAL® HARNESS SYSTEM****1 MAIN HARNESS**

Part #	Front Connection	Curb Side	Road Side	Wire Gauge	Length	VMRS Code
01-6661-A2	Push-On	56"	56"	1-10, 6-12	375"	034-004-023
01-6660-M6	Push-On	108"	15"	1-10, 6-12	375"	034-004-023
01-6605-W3	#10 Ring Terminal	108"	15"	1-10, 6-12	375"	034-004-023
01-6606-X3	#10 Ring Terminal	56"	56"	1-10, 6-12	375"	034-004-023

**2 INTERMEDIATE MAIN**

Part #	Length	ABS Drop	Wire Gauge	VMRS Code
01-6605-W7	342"	132"	1-10, 6-12	034-004-023
01-6605-X4	288"	180"	1-10, 6-12	034-004-023

**3 REAR SILL**

Part #	Lamp Plug	Curb Side	Road Side	ABS Drop	VMRS Code
01-6758-86	Straight Male Pin	60"	50"	53"	034-004-023
01-6758-87	Straight Male Pin	89"	16"	18"	034-004-023

**4 FRONT MARKER HARNESS**

Part#	Lamp Connection	Power Connection	Length	Side	VMRS Code
01-6620-E9	.180 Slim-Line Female	.180 Slim-Line Male	48"	Road	034-004-023
66222	.180 Slim-Line Female	.180 Slim-Line Male	96"	Curb	034-004-023
01-6620-F1	.180 Slim-Line Female	.180 Slim-Line Male	48"	Road	034-004-023
01-6620-C8	.180 Slim-Line Female	#10 Ring terminal	96"	Road	034-004-023
01-6620-F2	.180 Slim-Line Female Flo-Thru	.180 Slim-Line Male	48"	Road	034-004-023
01-6621-C1	.180 Slim-Line Female Flo-Thru	.180 Slim-Line Male	96"	Curb	034-004-023
01-6620-F3	.180 Slim-Line Female Flo-Thru	#10 Ring Terminal	48"	Road	034-004-023
01-6621-C3	.180 Slim-Line Female Flo-Thru	#10 Ring Terminal	96"	Curb	034-004-023

**5 ABS FAULT LAMP HARNESS**

Part#	Lamp Connection	Power Connection	Length	VMRS Code
66203	.180 Slim-Line Female	.180 Slim-Line Male	72"	034-004-023

**6 REAR MARKER HARNESS**

Part#	Lamp Connection	Power Connection	Length	VMRS Code
01-6707-A9	Turtleback® II	.180 Slim-Line Male	24"	034-004-042
01-6693-74	Thinline LED	.180 Slim-Line Male	24"	034-004-042
05-2018-47	.180 Slim-Line Female	.180 Slim-Line Male	24"	034-004-023

**7 LICENSE LAMP HARNESS**

Part#	Lamp Connection	Power Connection	Length	VMRS Code
66221	.180 Slim-Line Female	.180 Slim-Line Male	60"	034-004-023

**8 REAR I.D. HARNESS**

Part#	Lamp Connection	Power Connection	Length	VMRS Code
01-6707-C2	Turtleback® II	.180 Slim-Line Male	36" w/12" On Center Spacing	034-004-023
66403	Thinline LED	.180 Slim-Line Male	36" w/12" On Center Spacing	034-004-023
01-6621-C7	.180 Slim-Line Female	.180 Slim-Line Male	36" w/9" On Center Spacing	034-004-023

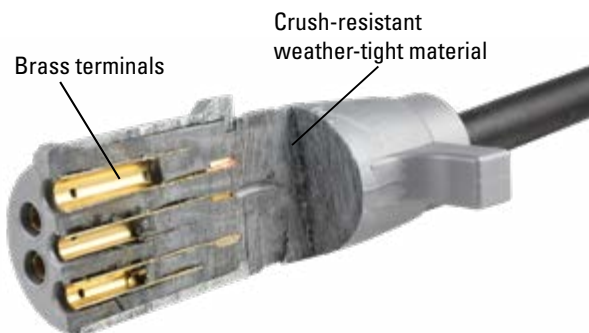
Lamp connection descriptions and information begins on page 255



## GROTE® ULTRALINK POWER CORDS: SUPERIOR POWER DELIVERY

Grote's UltraLink Cords provide maximum reliability in the harshest environments. UltraLink Power Cords feature a crush-resistant plug and deliver improved performance, longer wear, and superior conductivity at a competitive price.

### PLUG DESIGN



### CABLE-TO-PLUG SEAL

Cable jacket is molded into the plug, sealing it from the elements and eliminating the need for an additional strain relief.



### BRASS TERMINALS

Two rugged spring clips on each terminal prevent excessive opening of the terminals and greatly reduce intermittent connections.



## ULTRALINK ABS POWER CORDS

UltraLink power cords exceed minimum legal lamp power delivery requirements for single or double trailer configurations • Zinc die-cast plugs are filled with elastomeric material that resists crushing & acts as potting to seal solid brass terminals from moisture • Provides excellent recoil memory, chemical, and abrasion resistance • Adhesive bonds cable to plug, eliminating need for supporting spring and preventing moisture from entering the back of the plug • Solid brass terminals are corrosion resistant, and provide superior current capacity with minimal voltage drop • Advanced polymer jacketing material provides complete sealing and abrasion protection between -55°F and 190°F (premium versions)

### COILED:

<b>87100</b>	1/8, 2/10, 4/12, 12', w/12" Leads, Coiled
<b>87103</b>	1/8, 2/10, 4/12, 12', w/12" Leads, Coiled, Premium
<b>87101</b>	1/8, 2/10, 4/12, 15', w/12" Leads, Coiled
<b>87104</b>	1/8, 2/10, 4/12, 15', w/12" Leads, Coiled, Premium
<b>87105</b>	1/8, 2/10, 4/12, 20', w/36" and 12" Leads, Coiled, Premium
<b>87170</b>	1/8, 2/10, 4/12, 15', w/48" and 12" Leads, Coiled

### STRAIGHT:

<b>87190</b>	1/8, 2/10, 4/12, 7', Straight
<b>87191</b>	1/8, 2/10, 4/12, 8', Straight
<b>87192</b>	1/8, 2/10, 4/12, 9', Straight
<b>87193</b>	1/8, 2/10, 4/12, 10', Straight
<b>87171</b>	1/8, 2/10, 4/12, 12', Straight
<b>87172</b>	1/8, 2/10, 4/12, 15', Straight
<b>87173</b>	1/8, 2/10, 4/12, 20', Straight

**Material:** Polyurethane (Premium), EVA (Standard)

**Regulations / Standards:** SAE J560b™, J2222™, J2394™

**Finish:** Green

**VMRS Code:** 034-003-037



## ULTRALINK POWER CORDS (NON-ABS)

UltraLink power cords exceed minimum legal lamp power delivery requirements for single or double trailer configurations • Zinc die-cast plugs are filled with elastomeric material that resists crushing & acts as potting to seal solid brass terminals from moisture • Adhesive bonds cable to plug, eliminating need for supporting spring and preventing moisture from entering the back of the plug • Solid brass terminals are corrosion resistant, and provide superior current capacity with minimal voltage drop

### COILED:

<b>87110</b>	1/12, 6/14, 12', w/12" Leads
<b>87020</b>	1/10, 6/12, 12', w/12" Leads, HD
<b>87111</b>	1/12, 6/14, 15', w/12" Leads
<b>87023</b>	1/10, 6/12, 15', w/12" Leads, HD
<b>87181</b>	1/10, 6/12, 15', w/48" and 12" Leads, HD
<b>87112</b>	1/12, 6/14, 15', w/72" and 12" Leads
<b>87180</b>	1/10, 6/12, 15', w/72" and 12" Leads, HD

### STRAIGHT:

<b>87182</b>	1/10, 6/12, 15'
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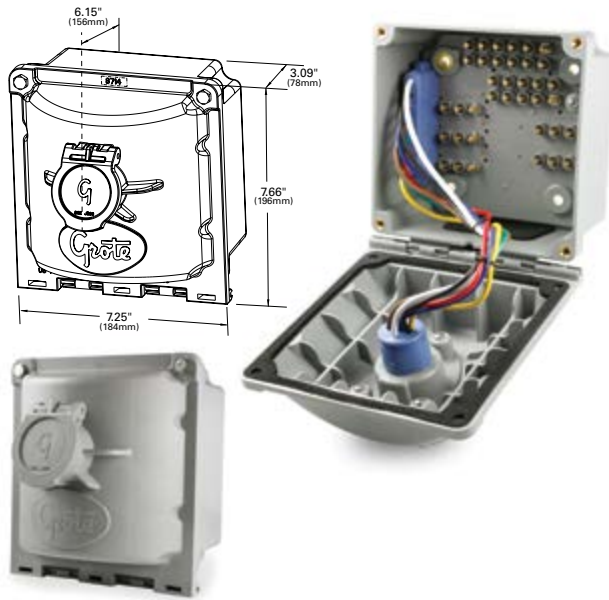
**Material:** EVA (Standard)

**Regulations / Standards:** SAE J560™, J2222™

**Finish:** Black

**VMRS Code:** 034-003-037





## ULTRA NOSE BOX

Replaceable 7-pin insert for easy maintenance • 39-pin connections eliminates overcrowding of wires • Hinged door keeps elements out, while providing easy access • Insert-molded pins helps prevent accidental disconnects

**87141** Gray, Solid Pin

**87151** Gray, Split Pin

**Material:** Nylon

**Regulations / Standards:** SAE J560™

**Finish:** Gray

**Accessory:** 7-pin insert: 97900 (solid pin), 97800 (split pin)

Replacement Door, Largo, Solid Pin: 97831

Rubber Grommet: 97810

Pigtail: 01-6623-P9

20A Circuit Breaker: 01-6624-W4

**VMRS Code:** 034-003-034

## ULTRA-PIN RECEPTACLE TWO-HOLE MOUNT

No-rust, die-cast zinc • Heavy bosses for extra rigidity • Barrel slanted to drain moisture • Mounting holes slotted for universal fit • Floating pins for easy alignment and solid mating • Two male terminals for grounding • Brass pins • 87270 includes 99510 retrofit kit • 99510 consists of 14 terminals and 9 boots

**87250** Receptacle Only, Split Pin

**87860** Receptacle Only, Solid Pin

**87270** Receptacle w/ Terminal Kit, Split Pin

### RETROFIT KIT

**99510** Plug-In Terminal Kit

**99680** Door Replacement Kit

**Material:** Die-cast Zinc

**Regulations / Standards:** SAE J560™

**VMRS Code:** 034-003-034 - 87250, 57260, 87270, 99680  
034-004-023 - 99510

## ULTRA-PIN RECEPTACLE THREE-HOLE MOUNT

No-rust, die-cast zinc • Heavy bosses for extra rigidity • Barrel slanted to drain moisture • Mounting holes slotted for universal fit • Floating pins for easy alignment and solid mating • Two male terminals for grounding • Brass pins • 87240 includes 99510 retrofit kit • 99510 consists of 14 terminals and 9 boots

**87240** Receptacle w/ Terminal Kit, Split Pin

**87220** Receptacle Only, Split Pin

### RETROFIT KIT

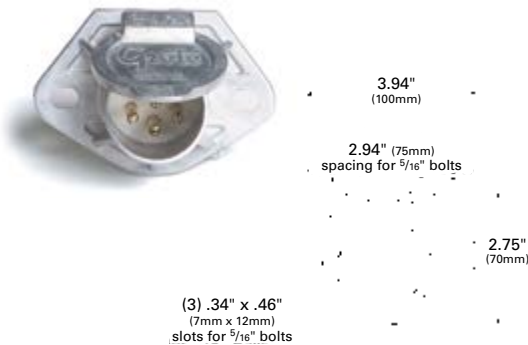
**99510** Plug-In Terminal Kit

**99680** Door Replacement Kit

**Material:** Die-cast Zinc

**Regulations / Standards:** SAE J560™

**VMRS Code:** 034-003-034 - 87240, 87220, 99680  
034-004-023 - 99510  
034-004-075 - 99601



## ULTRA-PIN RECEPTACLE FOUR-HOLE MOUNT NOSE BOX

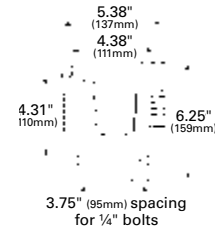
Extra-heavy bosses • Slanted barrel for drainage • Floating pins for easy alignment and solid mating connection • High-impact retainer plate  
• Brass pins • Die-cast aluminum housing resists rust

**87590** Solid Pin

**87830** Split Pin

**Material:** Die-cast Aluminum

**VMRS Code:** 034-003-034



## RECEPTACLE MOUNTING BOX

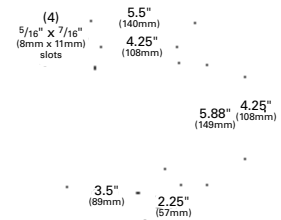
Mounting for 87250, 87860, 87270, 87220, 87850, 87240

**43684** Receptacle Box

**99680** Door Replacement Kit - Used on 87250, 87860, 87270, 87240 and 87220. Kit contains die-cast zinc door, brass hinge pin and spring

**Material:** Cast Aluminum

**VMRS Code:** 034-003-034



## RETROFIT PLUG-IN TERMINAL KIT

**99510** Plug-In Terminal Kit - Plugs into 87220, 87850, 87250, 87860, 87590 and 87830 receptacles • Kit contains 9 boots and 14 terminals • 5 terminals for larger gauge wire

**99680** Door Replacement Kit - Used on 87250, 87860, 87270, 87240 and 87220. Kit contains die-cast zinc door, brass hinge pin and spring

**VMRS Code:** 034-004-023 - 99510

034-003-034 - 99680

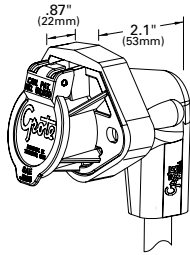
034-004-075 - 99601



99510



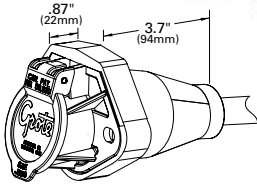
99680



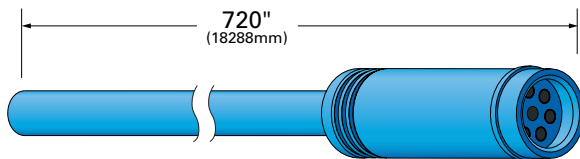
87212



87214

**ULTRA-SEAL G7**

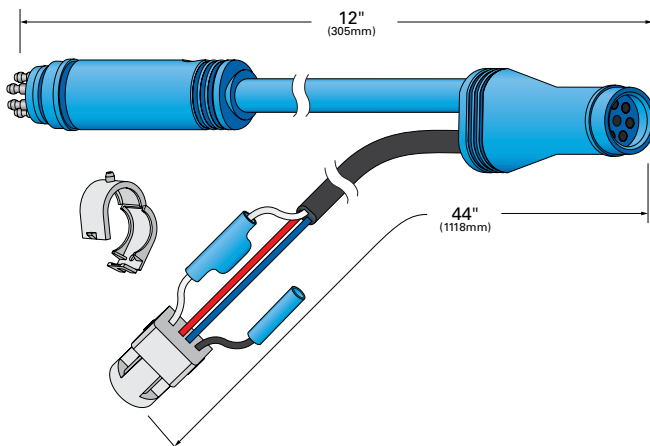
Ultra-Seal G7 is the standard for low-profile, water-resistant harness connection • Spacer made of thicker and harder durometer PVC that resists deforming under mounting pressure • Flush-mount design allows water to be directed away from the wire exit hole in the trailer • Two alignment pins aid in installation, allowing for easier terminal connections • Plug design seals the back of the receptacle • Receptacle is recessed into the gasket for sealing • Receptacle is non-rust, die-cast zinc with solid brass pins

**87214** Straight Plug & Receptacle With 7-Way Female**Length:** 24"/610mm**Gauge:** 1/10, 6/12**87215** Straight Plug & Receptacle With 7-Way Male**Length:** 24"/610mm**Gauge:** 1/8, 2/10, 4/12**87210** 90° Plug & Receptacle With 7-Way Female And Drops For Marker Lamps (Grounded And Black)**Length:** 24"/610mm**Gauge:** 1/10, 6/12**87211** 90° Plug & Receptacle With 7 Standard Females And Drops For Marker Lamps (Grounded And Black)**Length:** 24"/610mm**Gauge:** 1/10, 6/12**87212** 90° Plug & Receptacle Blunt Cut With Drops For Marker Lamps (Grounded And Black)**Length:** 24"/610mm**Gauge:** 1/10, 6/12**VMRS Code:** 034-002-036**ULTRA-BLUE-SEAL® MAIN HARNESS**

Extends from front of nose box or receptacle and provides sealed plug-in connection to real sill harness

**1-8 GAUGE, 2-10 GAUGE, 4-12 GAUGE:****66071** 60' Long**VMRS Code:** 034-004-023**ULTRA-BLUE-SEAL® MAIN HARNESS  
ABS ADAPTER**

Junction between main harness and real sill harness • Provides sealed plug-in connection and a drop-out extension for ABS • Ground return • ABS fault lamp connection

**ABS FAULT LIGHT:****66705** 12" Long**VMRS Code:** 034-004-023

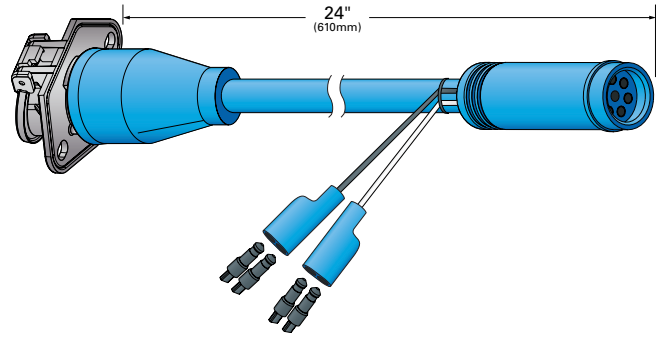


## ULTRA-BLUE-SEAL® 7-CONDUCTOR RECEPTACLE MAIN HARNESS

Ultra-Pin receptacle is overmolded • Two-hole mount, solid pin (87860)

**01-6608-E9** Main Harness with Drop (female 7-way)  
**01-6608-F9** Main Harness (male 7-way)

**VMRS Code:** 034-004-023



## ULTRA-BLUE-SEAL® HARNESS REAR SILL OPTION

All connections weather-sealed by simple, foolproof UBS plugs • Entire harness double-jacketed for extra resistance to road-splash and abrasion  
• Redundant frame ground with ring terminal

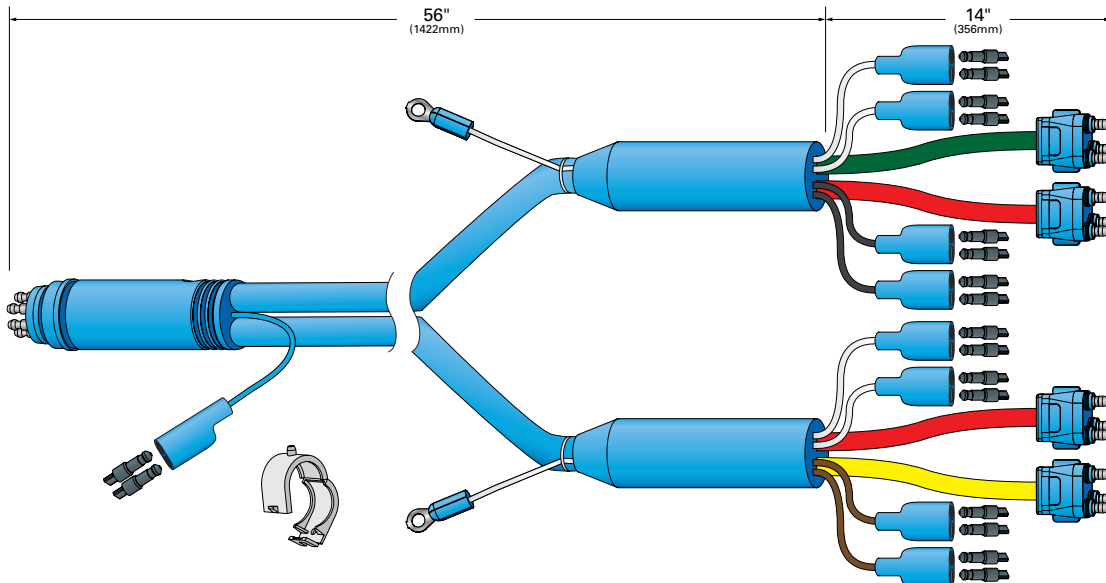
### FOR FEMALE PIN LAMPS:

**67570** 56" Long, Ground Return, Blue Drop  
**67571** 56" Long, Ground Return, ABS Connection

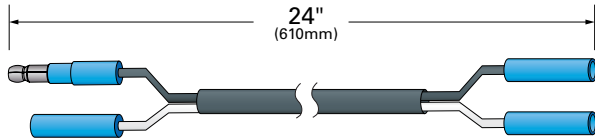
### FOR MALE PIN LAMPS:

**67581** 56" Long, Ground Return, Blue Drop  
**67580** 56" Long, Ground Return, ABS Connection

**VMRS Code:** 034-004-023







### ULTRA-BLUE-SEAL® GROUND RETURN TRACKING HARNESS

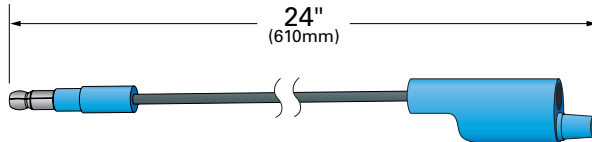
For use with elbow-style rear sill

STANDARD MALE/STANDARD FEMALE TO 2 SLIM-LINE UNDERLAMP FEMALES:

66223 2' Long

66224 3' Long

VMRS Code: 034-004-023



### CUT-TO-FIT® WIRE HARNESS SYSTEMS

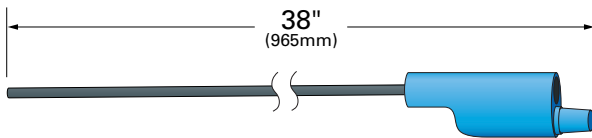
This Cut-To-Fit® Wire Harness System adapts to the standard Grote® Ultra-Blue-Seal® rear sill and main harness • Part number 67271 (24" standard male to Cut-To-Fit® Slim-Line jumper) plugs into rear sill, making a corrosion-proof connection • Cut-To-Fit® jumpers can then be plugged directly into the double Slim-Line plugs • Cut-To-Fit® wire harness mates with the Grote® 7-pin receptacle (nose box) with the use of either the 67260 adapter or the 67250 • All wires 12-gauge

67271 Rear Sill Adapter

67260 Nose Box Adapter

67250 Double Nose Box Adapter

VMRS Code: 034-004-023

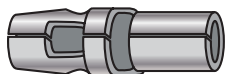


### SLIM-LINE UNDER-LAMP FEMALES (CUT-TO-FIT®)

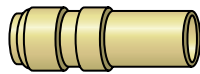
Abrasion-resistant double-jacketed wire lengths with molded-on Slim-Line under-lamp double females includes sealing boot for crimp-on bullet connectors • Blunt-cut, Cut-To-Fit® wires are black

67301 14-Gauge, 3' 2" (38")

VMRS Code: 034-004-023



99500-3



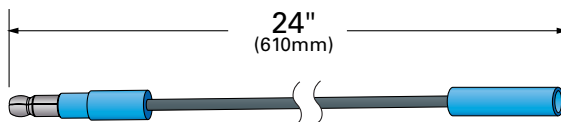
99501-3

### CRIMP-ON .180 BULLET TERMINALS

99500-3 Field Service Terminal for 14-Gauge Wire

99501-3 Field Service Terminal for 12-Gauge Wire

VMRS Code: 034-004-023



### STANDARD MALE TO SLIM-LINE UNDER-LAMP FEMALE

Rear tracking lamp jumper

66170 2' (24")

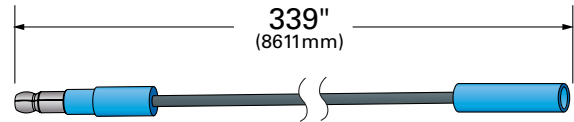
VMRS Code: 034-004-023

## STANDARD MALE TO STANDARD FEMALE

66100 - License lamp jumper (as shown) • 66101 - Intermediate turn signal jumper, use with 66200 from front receptacle

**66100** 4' 4" (50")  
**66101** 28' 3" (339")

VMRS Code: 034-004-023

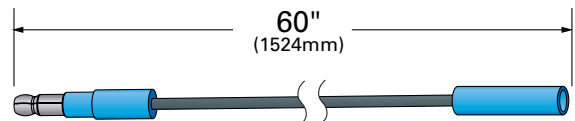


## SLIM-LINE UNDER-LAMP MALE TO STANDARD FEMALE

Jumper to access auxiliary drop-out on rear sill harness

**66110** 5' (60")

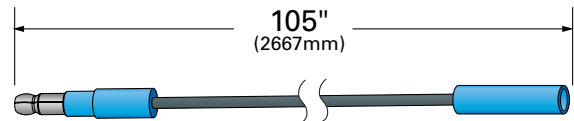
VMRS Code: 034-004-042



## SLIM-LINE UNDER-LAMP MALE TO SLIM-LINE UNDER-LAMP FEMALE

**66162** Intermediate Side Marker Crossover Jumper, 8' 9" (105")

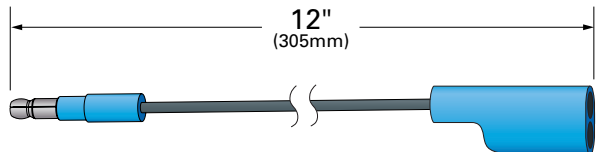
VMRS Code: 034-004-023



## SLIM-LINE UNDER-LAMP MALE TO SLIM-LINE UNDER-LAMP FEMALE

**66160** Multiple ID lamp jumper, 1' (12")  
**66124** Front marker and rear marker lamp jumper, 2' 6" (30")  
**66161** Front lower side marker from front receptacle.  
 Use with 66190, 4' 7" (55")  
**66125** Marker lamp jumper, 7' (84")  
**66123** Marker lamp jumper, 10' 9" (129")  
**66163** Front upper clearance / marker from front receptacle.  
 Use with 66190, 12' 8" (152")  
**66122** Marker lamp jumper 16' (192")  
**66113** Clearance lamp jumper 26' 11" (323")

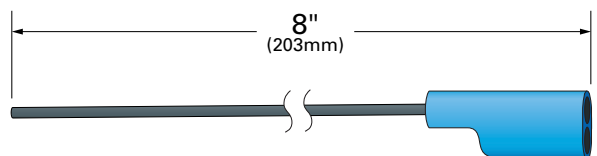
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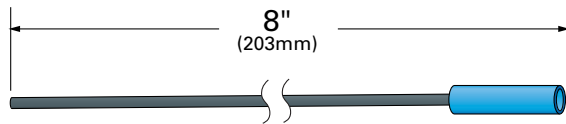


## BLUNT-CUT TO DOUBLE SLIM-LINE UNDER-LAMP FEMALE

**66190** Wire into front receptacle terminals, 8" blunt cut

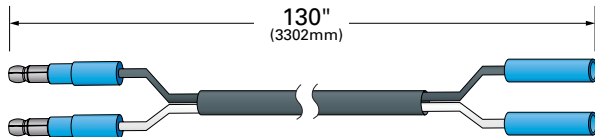
VMRS Code: 034-004-023



**BLUNT-CUT TO STANDARD FEMALE**

**66200** Wire into front receptacle terminals, 8" blunt cut

**VMRS Code:** 034-004-023

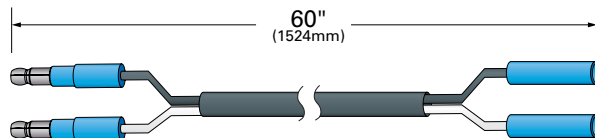
**TWO STANDARD MALES TO TWO SLIM-LINE UNDER-LAMP FEMALES**

66220 - Use the 5306 combination clearance / marker and auxiliary stop / turn signal lamp, use with 66400 when triple-ID / Auxiliary stop is located on upper rail, 10' 10" (130") • Wire is 14 gauge

**66220** ID / auxiliary stop jumper

**66121** Midturn and marker lamp harness, 30' (360")

**VMRS Code:** 034-004-023

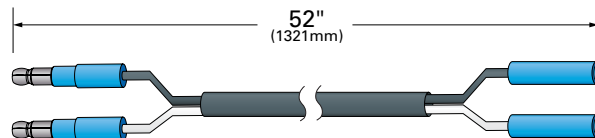
**TWO SLIM-LINE MALES TO TWO SLIM-LINE UNDER-LAMP FEMALES**

**66221** Marker lamp or ABS fault lamp, 5' (60")

**66222** Jumper, 8' (96")

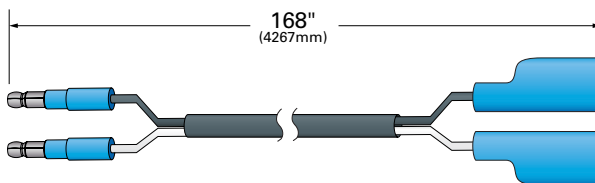
**66164** Jumper, 8' 9" (105")

**VMRS Code:** 034-004-023

**TWO STANDARD MALES TO TWO STANDARD FEMALES**

**66133** Marker lamp jumper, 4' 4" (52")

**VMRS Code:** 034-004-023

**TWO STANDARD MALES TO TWO DOUBLE FEMALES**

**66171** Marker lamp jumper, 14' (168")

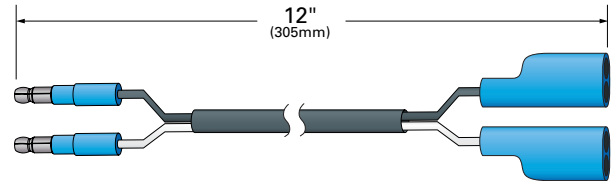
**66145** Marker lamp jumper, 26' (312")

**VMRS Code:** 034-004-023

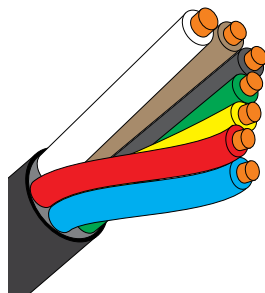
## TWO SLIM-LINE MALE TO TWO DOUBLE FEMALES

- 66165** Marker lamp jumper, 1' (12")
- 66155** Marker lamp jumper, 2' 6" (30")
- 66154** Marker lamp jumper, 4' 7" (55")
- 66153** Marker lamp jumper, 7' (84")
- 66152** Marker lamp jumper, 10' 9" (129")
- 66151** Marker lamp jumper, 12' 8" (152")
- 66150** Marker lamp jumper, 16' (192")
- 66135** Marker lamp jumper, 26' 11" (323")

VMRS Code: 034-004-023

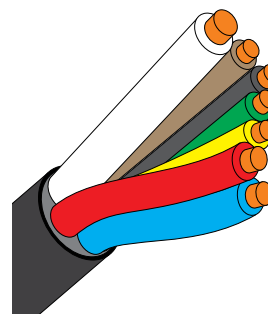


## 7-CONDUCTOR CABLE: (SAE J1067™ AND J560™)



- |        |  |
|--------|--|
| White  | Ground (10 ga.)  |
| Brown  | Tail and license lamp, and clearance lamps (12 ga.)      |
| Black  | Clearance, sidemarker, and identification lamps (12 ga.) |
| Yellow | Left turn signal lamp (12 ga.)                           |
| Green  | Right turn signal lamp (12 ga.)                          |
| Red    | Stop lamps (12 ga.)                                      |
| Blue   | Auxiliary circuit (12 ga.)                               |

## HEAVY DUTY 7-CONDUCTOR CABLE SYSTEM: (SAE J1067™ AND J560™)



- |        |  |
|--------|--|
| White  | Ground (8 ga.)   |
| Brown  | Tail and license lamp, and clearance lamps (12 ga.)      |
| Black  | Clearance, sidemarker, and identification lamps (12 ga.) |
| Yellow | Left turn signal lamp (12 ga.)                           |
| Green  | Right turn signal lamp (12 ga.)                          |
| Red    | Stop lamps (10 ga.)                                      |
| Blue   | Auxiliary circuit (10 ga.)                               |

## WIRE SIZES

No matter what the variety, it's critical to choose the correct wire size for the application. The key information required is the length of wire needed, often referred to as the length of run, and the current load that the conductor is expected to carry in use. Knowing the "length and load" characteristics will take the guesswork out of the choice.

Voltage drop, caused by current draw, is the primary consideration when selecting the proper conductor size. Every conductor has a certain amount of resistance per foot. The longer the distance, the greater the resistance in the circuit. The greater the resistance, the higher the voltage drop caused by the same current. This relationship is defined by Ohm's law (Voltage = Current x Resistance). As distance from the power source increases, there is less voltage available to "push" the current through the

wire. This causes the current to drop. There is also heat buildup as the resistance increases, which also lessens the amount of current flow.

In low-voltage systems, such as vehicles, even a small drop in voltage can have a serious effect on the amount of light a lamp puts out. There's a simple solution. As you get further away from the power source, make the conductor larger. A larger conductor means less resistance.

Using the Wire Size Chart, first find the load in amps on the left edge of the chart. Then find the length of run across the top of the chart. Read down that column until it intersects with the amp load line. The point at which they cross indicates the correct wire size for the job.

Wire Size Chart												
12V (AMP)	24V	48V	Length of Wire (most distant light)									
			10'	20'	30'	40'	50'	60'	70'	80'	90'	100'
Load in Amps	Load in Amps	Load in Amps	Wire Gauge	Wire Gauge	Wire Gauge	Wire Gauge	Wire Gauge	Wire Gauge	Wire Gauge	Wire Gauge	Wire Gauge	Wire Gauge
1	2	4	18	18	18	18	18	18	18	18	18	18
1.5	3	6	18	18	18	18	18	18	18	18	18	18
2	4	8	18	18	18	18	18	18	18	16	16	16
3	6	12	18	18	18	18	18	16	16	16	14	14
4	8	16	18	18	18	16	16	16	14	14	14	12
5	10	20	18	18	18	16	14	14	14	12	12	12
6	12	24	18	18	16	16	14	14	12	12	12	10
7	14	28	18	18	16	14	14	12	12	12	12	10
8	16	32	18	16	16	14	12	12	12	10	10	10
10	20	40	18	16	14	12	12	12	10	10	10	10
11	22	44	18	16	14	12	12	10	10	10	10	8
12	24	48	18	16	14	12	12	10	10	10	8	8
15	30	60	18	14	12	12	10	10	10	8	8	8
18	36	72	16	14	12	10	10	8	8	8	8	8
20	40	80	16	12	12	10	10	8	8	8	8	6

A) DETERMINE THE TOTAL WIRE LENGTH FROM THE POWER SOURCE TO THE MOST DISTANT POINT IN THE CIRCUIT.

B) DETERMINE THE TOTAL ELECTRICAL LOAD ON THE CIRCUIT.

C) FIND THE LOAD ALONG ONE EDGE OF THE CHART DEPENDING ON THE VEHICLE VOLTAGE IN QUESTION, TAKING THE NEXT HIGHER LOAD IF THE INDICATED LOAD FALLS BETWEEN TWO POINTS ON THE CHART.

D) FIND THE CABLE LENGTH REQUIRED ON THE TOP OF THE CHART, TAKING THE NEXT HIGHER LENGTH (IF EXACT LENGTH IS NOT CITED).

E) AT THE INTERSECTION OF THE LENGTH AND LOAD COLUMN, READ THE MINIMUM SIZE WIRE REQUIRED FOR THAT PARTICULAR CIRCUIT.

## WIRE GAUGES

Conductors may be single strand or a group of strands. Stranded conductors are preferred in heavier gauges because they are more flexible and easier to work with than a comparable single strand conductor.

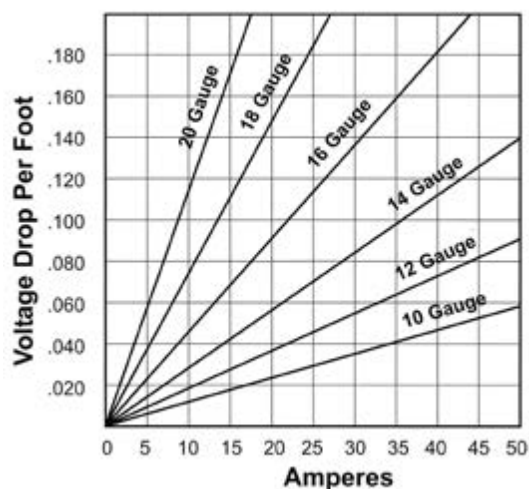
Comparing stranded cable sizes is simple. Stranded cable is compared using a numerical system. For example, 18/24 indicates that the conductor consists of 18 strands of 24-gauge wire. Similarly 12/12 refers to 12 strands of 12-gauge wire.

Gauge refers to the size of the conductor in a wire. The higher the gauge number, the smaller the wire. For example, an 18-gauge wire is smaller than a 12-gauge wire. And a 4-gauge wire has more than twice the diameter of a 10-gauge wire.

When the wire size gets larger, the number reaches #0 gauge or 1/0 (one aught). Additional zeros refer to larger sizes. The next larger size above 1/0 is #00 or 2/0 (two aught).

The capacity of a wire reflects the ability it has to carry electrical current. For example, over a distance of 50 feet, a 12-gauge wire can safely carry 10 amps. Over the same distance a 16-gauge wire can carry 3 amps. Choosing the size wire is made easier using a wire size chart.

Just remember the thicker the wire, the smaller the amperage loss.



## Wire Gauge Chart

GAUGE	S.W.G.	A.W.G. (inches)	A.W.G. (mm)	Actual Size (A.W.G.)
00	0.348	0.368	9,266	
0	0.324	0.325	8,252	
1	0.300	0.289	7,348	
2	0.276	0.258	6,543	
3	0.252	0.229	5,827	
4	0.232	0.204	5,189	
5	0.212	0.182	4,621	
6	0.192	0.162	4,115	
7	0.176	0.144	3,665	
8	0.160	0.129	3,264	
9	0.144	0.114	2,906	
10	0.128	0.102	2,588	
11	0.116	0.091	2,304	
12	0.104	0.081	2,052	
13	0.092	0.072	1,829	
14	0.080	0.064	1,628	
15	0.072	0.057	1,450	
16	0.064	0.051	1,291	
17	0.056	0.045	1,150	
18	0.048	0.040	1,024	
19	0.040	0.036	0,912	
20	0.036	0.032	0,813	
21	0.032	0.029	0,724	
22	0.028	0.025	0,643	

A.W.G. = American Wire Gauge

S.W.G. = Imperial Standard Wire Gauge  
(British legal standard)