

PHOENIX MINING & TRANSIT SYSTEMS



PHOENIX

Since 1985

**Serving the needs of transit systems worldwide for
over 30 years**

TRANSIT SYSTEMS CATALOG 2019

Revised and Printed JANUARY 2019

All specifications in this catalog are subject to change without notice.

PHOENIX MINING & TRANSIT SYSTEMS

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PHOENIX MINING & TRANSIT SYSTEMS

TRANSIT SYSTEMS CATALOG



Since 1985

INTRODUCTION TO CATALOG 2018-19

For over 30 years Phoenix Mining Equipment, Inc. (dba Phoenix Mining & Transit Systems) established in 1985, has been a leading US manufacturer of overhead electrical hardware for DC electric haulage in underground mines and public transit systems.

Our 30 plus years of consistent growth and success has been the result of quality parts, timely deliveries and very competitive pricing.

We invite your questions, and are pleased to provide drawings, samples and references on request.

NOTE

This catalog is solely designed to illustrate the PHOENIX line of transit products and is not intended as a technical or engineering document. Consult factory for exact technical information and specifications.

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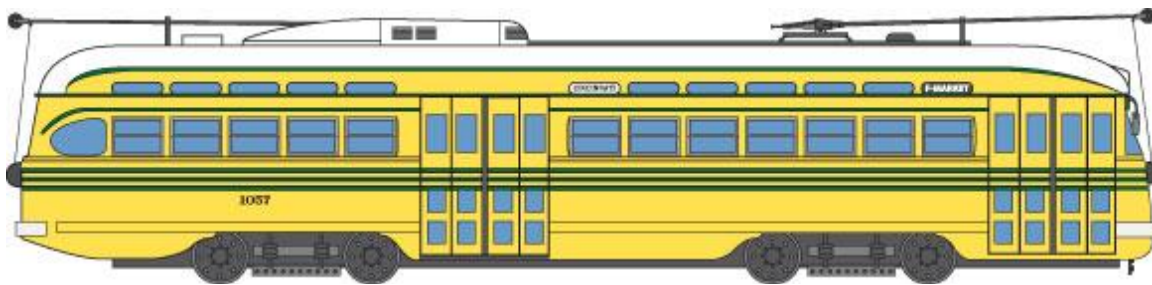
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NOTE

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NOTE !!!

Impulse Part Numbers have been incorporated into this catalog in an effort to make it easier to compare and identify PHOENIX products. A Cross Reference Guide has also been included at the back.

Please note that a single item can carry several Impulse part numbers – all of which may not be listed in the Cross Reference Guide or shown in this catalog. It is recommended that if you are not familiar with PHOENIX products, or cannot find the part number you are looking for that you consult the factory.

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INSULATED SPAN WIRE HANGERS



Catalog No. 8220



Catalog No. 8225

Utilized as a basic insulating unit for overhead trolley construction. Attaches to 3/16" to 1/2" wire rope and will allow adjustments of up to 14 degrees of the bell hanger and clamp to compensate for wire sag.

Clamp and metal shell are manufactured of malleable iron, hot dip galvanized; threaded rod is stainless steel; hex nuts are bronze; and insulator is PHOENIX Catalog No. 8525.

Catalog Nos. 8220-2 and 8225-2 are identical to Catalog Nos. 8220 and 8225 except they are provided with an electric grade, skytone gray, PVC shell in lieu of the standard malleable iron for an extra measure of safety.

Catalog No.	Impulse P/N	Description	Wt./Ea.
8220	19360-2000	Insulated Span Wire Hanger	3.0#
8225	691837	Adjustable Height Span Hanger	3.2#
8220-1	N/A	Hanger with PVC Shell	2.8#
8225-1	N/A	Adjustable Hanger w/ PVC Shell	3.0#

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INSULATED BARN HANGER



The outer shell is malleable iron, HDG. The steel stud is threaded 5/8"-11 X 7/8". Tested to 7,500 volts di-electric and rated for 7,500 pounds pull strength. Designed for overhead attachment by lag screw.

Catalog No.	Impulse P/N	Description	Wt./Ea.
7312	11553-2000	Insulated Barn Hanger	1.8 #

UNIVERSAL INSULATOR



Manufactured with a steel boss (5/8"-11 thread X 7/8") and a steel stud (5/8"-11 thread) 3/4", 7/8" or 1 1/4" in length, fixed in place by a malleable iron yoke casting held in high strength, skytone gray, glass reinforced polyester. All insulators are tested to 15,000 volts di-electric strength and rated for 10,000 pounds pull and 3,000 pounds cantilever strength.

Catalog No.	Impulse P/N	Description	Wt./Ea.
8525	16835-2000	Insulator with 3/4" Stud	1.0#
8525 LS	20560-2000	Insulator with 1 1/4" Stud	1.1#
8525-78	19305-3015	Insulator with 7/8" Stud	1.1#

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TYPE CC CAP & CONE INSULATORS – 750 VOLTS

PHOENIX Type CC Cap and Cone Insulators are made of skytone gray, high strength, electrical grade, thermo set, molded Phenolic. The steel stud in the cap is threaded 5/8"-11 x 1 1/4". These insulators may be used with all standard cap and cone style hanger bodies manufactured by The Ohio Brass Co. and Impulse.



Catalog No. 7314



Catalog No. 7315

Catalog No.	Impulse P/N	Description	Wt./Ea.
7314	5440-2000	Cap Insulator with 5/8" Stud	0.8#
7315	5441-2000	Cone Insulator for 5/8" Stud	0.3#

TYPE CC CURVE HANGERS

PHOENIX Type CC Single and Double Curve Hangers are manufactured of high strength bronze alloy to assure maximum resistance to environmental forces.



Catalog No. 7313



Catalog No. 7318

Catalog No.	Impulse P/N	Description	Wt./Ea.
7313	10437-2000	Single Curve Hanger	2.9#
7317	10441-2000	Single Curve – Casting Only	2.0#
7318	10442-2000	Double Curve Hanger	3.6#
7319	10446-2000	Double Curve – Casting Only	2.7#

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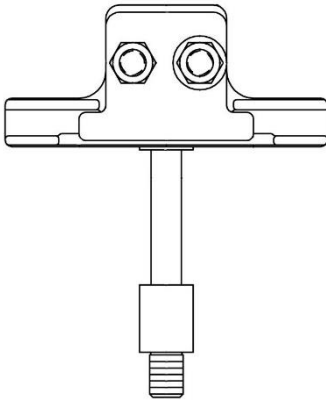
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TYPE EZ INSULATED SPAN WIRE HANGER



Used to suspend trolley wire hardware from wire rope – minimum slip strength of 1,000 pounds. Manufactured of high strength bronze alloy, with PHOENIX Universal Insulator (Catalog No. 8525).

Catalog No.	Impulse P/N	Description	Wt./Ea.
7427	677427	Type EZ Span Wire Hanger	4.8#
7427-1		Type EZ Hanger-Uninsulated	3.8#



TYPE KW HANGER

For suspending trolley wire clamps and other hardware from 1/4" to 1/2" spanwire. End fittings and clamp are aluminum bronze; insulator rod is 5/8" epoxy fiberglass; and U-bolt and all fasteners are stainless steel.

Rated for 600 VDC and up to 5,000 pounds of force - Adjustable up to 15 degrees axial rotation

Catalog No.	Impulse P/N	Description
100073	56489-3001	Type KW Hanger
100073-E	56489-3002	Type KW Hanger w/ Eye
100073-1	56648-3001	Epoxy Fiberglass Rod w/ End Fittings ONLY
100073-2		Clamp Assembly - Only

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**TYPE HS TROLLEY WIRE CLAMPS FOR ALL GROOVED
TROLLEY WIRES**

This versatile clamp is used most often in municipal transit and catenary applications in conjunction with PHOENIX Catalog Number 8220, Insulated Span Wire Hanger. PHOENIX Type HS Trolley Wire Clamps are made of malleable iron, hot dip galvanized, or high strength bronze alloy. All clamps utilize high strength, hollow, bronze screws.

Catalog Number 5666 and 5669 are identical to the standard bronze clamps except that one of the cover plates has a 1/4" thick tab projecting upward for bolting to feeder taps.



Catalog No. 5669



Catalog No. 5667



Catalog No. 5476

Catalog No.	Impulse P/N	Description	Wt./Ea.
5664	19438-2000	12" Clamp – Malleable Iron- HDG	1.6#
5665	19440-2000	14" Clamp – Malleable Iron - HDG	1.7#
5666	19439-2000	12" Clamp w/ Feeder Tab (All Bronze)	1.8#
5667	19441-2000	14" Clamp w/ Feeder Tab (All Bronze)	2.1#
5668	19879-2000	12" Clamp - Bronze	1.5#
5669	19880-2000	14" Clamp – Bronze	1.8#
5671	21088-2000	Cover Plate w/ Feeder Tab - Only	0.3#
5476	16227-2000	Type HS Trolley Wire Clamp	0.5#
5663		Hollow Bronze Screw - ONLY	0.05#

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12" BRONZE TROLLEY WIRE CLAMP



This sturdy clamp is useful for supporting the trolley wire in curve situations where the wire is pulled horizontally. Manufactured of high strength bronze alloy, clamping action provided by six (6) hollow bronze screws broached for a 5/16" hex wrench. Boss is tapped 5/8"-11 X 11/16". Clamp supports the wire for its entire 12" under run length and may be used on all grooved trolley wire.

Catalog No.	Description	Wt./Ea.
7543	12 Inch Bronze Trolley Wire Clamp	2.25#



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**TYPE RH ENCIRCLING TROLLEY WIRE CLAMP FOR
ROUND AND GROOVED TROLLEY WIRES**



End Detail



Catalog No. 5675

Type RH Trolley Wire Clamps encircle the trolley wire allowing clamp replacement regardless of the condition of the groove on the old trolley wire.

Manufactured of high strength bronze alloy for maximum corrosion resistance. Clamping force provided by six (6) hollow bronze screws broached for a 5/16" hex wrench. Boss is tapped 5/8"-11 x 11/16".

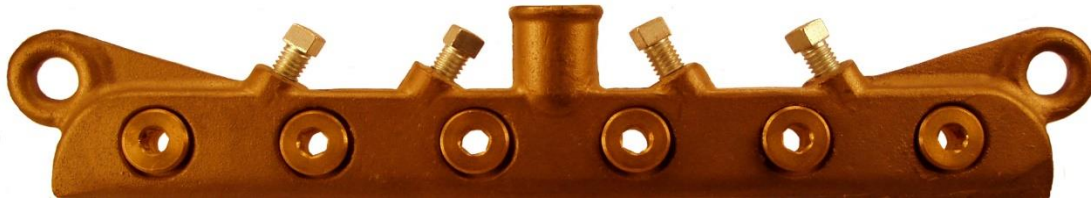
Under run length 13 inches.

Catalog No.	Description	Wire Size	Wt./Ea.
5675	Type RH Trolley Wire Clamp	2/0	3.25#
5676	Type RH Trolley Wire Clamp	4/0	3.25#

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DOUBLE TROLLEY WIRE STRAIN CLAMP



Used to take up strain in trolley wire in both directions and/or to support wire from an insulated hanger. Manufactured of high strength bronze alloy. Six (6) hollow bronze screws provide horizontal pressure on the wire. Four (4) 3/8", stainless steel, square head, cut point set screws provide vertical grip. Boss is tapped 5/8"-11 and under run length is 12" inches. Clamp may be used on all grooved trolley wire.

Catalog No.	Impulse P/N	Description	Wt./Ea.
7542	17700-2000	Double Trolley Wire Strain Clamp	2.8#



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TROLLEY WIRE DEAD END CLAMPS



PHOENIX Type HS Dead End Clamp: Designed to be used with 2/0 to 6/0 Grooved, Figure 8 and No. 9 Section trolley wire. Manufactured of high strength bronze alloy. Three (3) hollow bronze screws hold upper lobe of trolley wire. Two (2) stainless steel cut point set screws provide vertical tension. Under run length is 7" inches.

Catalog No.	Impulse P/N	Description	Wt./Ea.
7540	17278-3003	Type HS Trolley Wire Dead End	1.3#

PHOENIX Trolley Wire Dead End: Clamp does **NOT** permit passage of the collector. Clevis allows for easy attachment to turnbuckle or wire rope. Standard clamp is malleable iron, hot dip galvanized, also available in bronze. Clamping action provided by two carriage bolts, lock washers and hex nuts.



Catalog No.	Description	Wt./Ea.
8236	Trolley Wire Dead End Clamp	2.9#



PHOENIX Type D Trolley Wire Dead End Clamp: Body is made of Aluminum Bronze with stainless steel compression sleeve

Catalog No.	Impulse P/N	Description	Wt./Ea.
7547	15964-2000	4/0 Trolley Wire Dead End	2.66#
7548	21326-2000	2/0 Trolley Wire Dead End	2.66#

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SPLICERS FOR GROOVED TROLLEY WIRE



Manufactured of high strength bronze alloy. Four (4) 7/16"-14 X 1" zinc plated, dichromate dipped, square head, cut point set screws located at an angle to the wire provide tension grip. A stainless steel 1/4"-20 x 1/2" cap screw at both ends of the splicer helps dampen vibration.

Catalog No.	Impulse P/N	Trolley Wire Size	Wt./Ea.
9150	16607-2000	2/0 Grooved	1.2#
9157	16608-2000	3/0 Grooved	1.5#
9155	16685-2000	4/0 Grooved	1.5#
9154	54944-3001	2/0 to 4/0 Grooved	1.2#
9160	16146-2000	350 MCM High Speed Splicer	2.8#
9100	19451-4002	Set Screw for Splicers	0.1#

SPLICER FOR GROOVED, FIGURE 8 AND NO. 9 SECTION TROLLEY WIRE



Made of high strength bronze alloy, the splicer is designed to grip only the upper portion of the wire. The two halves are secured by four (4) hollow bronze screws broached for a 5/16" hex wrench and two (2) 3/8" set screws provide vertical tension.

Under run length is 7 3/4 inches.

Catalog No.	Impulse P/N	Trolley Wire Size
9147	22270-2000	2/0 to 6/0 Grooved, Figure 8 & No.9 Section

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SPLICERS FOR GROOVED AND ROUND TROLLEY WIRE

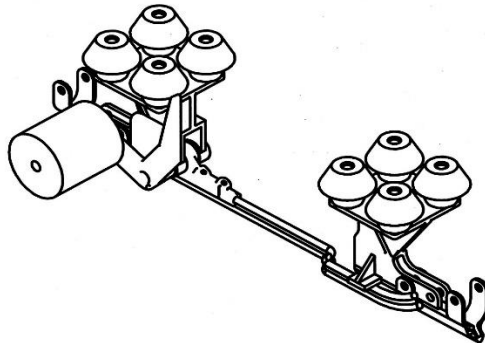


Manufactured of high strength bronze alloy. Six (6) zinc plated, dichromate dipped, square head, cut point set screws provide tension grip. Holes in sides and top permit visual assurance that wire is properly situated in splicer.

Overall length is 20 inches.

Catalog No.	Impulse P/N	Trolley Wire Size	Wt./Ea.
8078	12473-2000	1/0 to 2/0 Round and Grooved	2.1#
8079	12474-2000	3/0 Round and Grooved	2.3#
8080	12475-2000	4/0 Round and Grooved	2.4#

DOOR BRIDGE



Catalog No. 2402

Available in either bronze or cast aluminum, PHOENIX Door Bridges are designed to accommodate a wide variety of door types. Consult factory with your exact specifications.

Catalog No.	Impulse P/N	Description	Wt./Ea.
2401	24001-3007	36" Door Bridge for Shoe	73#
2402		36" Door Bridge for Pantograph	73#

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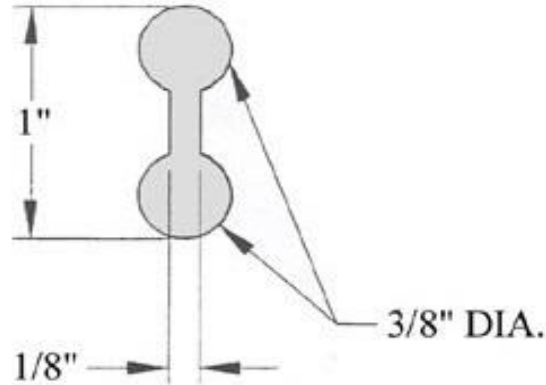
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REVERSIBLE SPACER BAR AND HARDWARE

PHOENIX SPACER BARS



Spacer Bars can be used to form special curve or work assemblies; emergency repair situations; and in the trolley garage in lieu of trolley wire. Available in CDS 102 Copper Alloy or steel, hot dip galvanized and furnished in standard 18 and 12-foot lengths. Spacer bar is symmetric, 1" high with a 3/8" circular lobe on each end allowing worn bars to be reused by simply turning them upside down.

Catalog No.	Impulse P/N	Description	Wt./Ea.
4000	18718-3001	18 Ft. Spacer Bar – CDS 102 Copper	17.8#
4005	57262-4001	12 Ft. Spacer Bar – Steel, HDG	12.0#

SPACER BAR SPLICER



Made of high strength bronze alloy, the splicer is designed to grip only the upper lobe of the spacer bar. Four (4) stainless steel, 1/2"-13 square head, cut point, set screws located at an angle provide tension grip.

Under run length is 10 inches.

Catalog No.	Impulse P/N	Description	Wt./Ea.
4002	18553-2000	Splicer for Spacer Bar	1.5#

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REVERSIBLE SPACER BAR AND HARDWARE

SUSPENSION CLAMPS FOR SPACER BAR



Clamp is designed to support spacer bar from insulated hangers. Manufactured of high strength bronze ally, this clamp incorporates two (2) counter sunk hollow bronze screws for tightening and is recommend for all collectors.

Catalog No.	Impulse P/N	Description	Wt./Ea.
4001	18554-2000	Bronze Spacer Bar Suspension Clamp	0.7#

TIPS FOR SPACER BAR



4003

4004

Tips are for connecting spacer bar to overhead frogs, crossovers, section insulators, and other special assemblies. Manufactured of high strength bronze alloy with steel, zinc plated, dichromate coated, set screws.

Catalog No.	Impulse P/N	Description	Wt./Ea.
4003	18430-2000	Spacer Bar Tip with Clevis	1.5#
4004	18431-2000	Spacer Bar Tip with Tongue	1.3#

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TYPE HS CATENARY HANGER FOR TROLLEY WIRE



PHOENIX TYPE HS Catenary Hangers are designed to be suspended from an overhead messenger wire by an annealed copper or stainless steel rod and stainless steel keeper. Rod must be ordered separately – consult factory. Clamps will fit 2/0 to 4/0 Grooved trolley wire.

Manufactured of high strength bronze alloy, clamping action provided by a single hollow bronze screw broached for a 5/16” hex wrench.

Catalog No.	Impulse P/N	Description	Rod Size
1810	16095-3001	HS Catenary Clamp - Only	1/4 inch
1811	16095-3003	HS Catenary Clamp - Only	3/8 inch
18100		HS Catenary Clamp Assembly	

TYPE CHM CATENARY HANGER – MESSENGER WIRE CLAMP



Replacements for Ohio Brass Type CHM Catenary Hangers, PHOENIX Type CHM Catenary Hangers are used to support the secondary messenger wire in standard and custom compound catenary systems.

Manufactured of high strength bronze alloy, clamping action provided by a single bronze bolt, lock washer and hex nut. Designed to be used with 1/4” annealed copper or stainless steel connecting rod.

Catalog No.	Impulse P/N	Messenger Wire Size	Wt./Ea.
8040	13916-3030	1/2 Inch Nominal	0.4#
8022	13916-3013	5/8 Inch Nominal	0.6#
8020	13916-3017	1 Inch Nominal	0.8#

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TYPE N CATENARY FROG AND STABILIZER



Catalog No. 6024-3

Manufactured of high strength bronze alloy. Four (4) HDG steel 1/2"-13 square head bolts, lock washers and hex nuts provide clamping action. Available in 2 or 3 wire configurations.

Catalog No.	Impulse P/N	Description	Wt./Ea.
6024	16351-3004	Catenary Frog - 2 Wire	1.4#
6024-3	16351-3003	Catenary Frog - 3 Wire	1.9#



Catalog No. 9703

Jaws are high strength bronze alloy, connecting pipe is 1/2" steel, HDG and all other fittings are malleable iron, HDG. Fasteners are steel, HDG, and the cotter key is stainless steel. It is necessary to specify desired length between the center of the eye and the center of the trolley wire.

Catalog No.	Impulse P/N	Description
9703	56569-3003	Non-Adjustable Catenary Steady Assembly
9704		Adjustable Catenary Steady Assembly
9705	55755-3001	Swivel Clamp Assembly - Only

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PHOENIX MINING & TRANSIT, INC.

P.O. Box 14179, Cincinnati, Ohio 45250

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PULL OFF ARMS



Designed to be used with suspension brackets and insulators to support the trolley wire on curves without interfering with the collector - especially in areas with super elevation. Manufactured of 1 1/4-inch square steel tubing and 1/2 inch plate steel all HDG. PHOENIX pull off arms can be made to customers' exact specifications.

Catalog No.	Impulse P/N	Description	Wt./Ea.
7486	60437-3002	Type AE Pull Off Arm – 48” Long	13.0#
7487		Type SF Pull Off Arm – 42” Long	12.4#

SINGLE AND DOUBLE CURVE PULL OVER YOKES



Catalog No. 7484



Catalog No. 7485

Manufactured of high strength bronze alloy. PHOENIX Pull-Overs are supplied complete with stainless steel, 5/8”-11, stud and bronze cap nut.

Catalog No.	Impulse P/N	Description	Wt./Ea.
7484	14072-2000	Single Pull-Over – Eye & Eye	1.6#
7494	12788-2000	Single Pull-Over – Eye & Clevis	2.0#
7485	14073-2000	Double Pull-Over – Eye & Eye	2.6#
7495	12790-2000	Double Pull-Over – Clevis & Clevis	3.2#

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DUPLEX CLAMPS FOR TROLLEY WIRE



Catalog No. 8009 Catalog No. 8008

Made of high strength bronze alloy with a single high strength hollow bronze screw, broached for a 5/16" hex wrench.

Catalog No.	Impulse P/N	Lower Jaw Size Trolley Wire	Upper Jaw Size Trolley Wire
8008	15490-2000	2/0 to 350 MCM Grooved, Fig. 8 and No. 9 Section	2/0 to 350 MCM
8009	16103-2000	2/0 to 350 MCM Grooved	2/0 to 250MCM
8015	16103-2000	4/0 to 350 MCM Grooved Trolley Wire	4/0 Grooved Trolley Wire
8016	16373-3001	4/0 to 350 MCM Grooved Trolley Wire	4/0 Grooved Trolley Wire



Standard clamp is high strength bronze alloy, also available in malleable iron, HDG. The center bolt, lock washer and hex nut are HDG steel.

Catalog No.	Impulse P/N	Lower Jaw Size Trolley Wire	Upper Jaw Size Trolley Wire
8010	14644-2000	2/0 to 350 MCM Grooved, Fig. 8 and No. 9 Section	4/0 to 6/0 Grooved, Round, Fig. 8, and No. 9 Section

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TROLLEY WIRE TO FEEDER CABLE DUPLEX CLAMPS



Made of a bronze alloy. Secured by a single steel, HDG, bolt, lock washer and hex nut.

UPPER JAW: Feeder Cable: 4/0 to 6/0

LOWER JAW: Trolley Wire: 2/0 to 6/0 Grooved, Figure 8 and No. 9 Section

Catalog No.	Impulse P/N	Description	Wt./Ea.
8001	13853-3006	Trolley and Feeder Duplex Clamp	1.2#



Manufactured of high strength bronze alloy and held together by a single hollow bronze screw.

Lower jaw will accommodate 2/0 to 6/0 Grooved and No. 9 Section trolley wires.

Catalog No.	Description	Feeder Cable	Wt./Ea.
8005	Trolley and Feeder Duplex Clamp	500 MCM	0.6#
8006	Trolley and Feeder Duplex Clamp	750 MCM	0.6#

VERTICAL FEEDER CABLE DUPLEX CLAMP



Manufactured of high strength bronze alloy. Secured by a single steel, HDG bolt, lock washers and hex nut.

Catalog No.	Larger Jaw	Smaller Jaw	Wt./Ea.
1501	750 MCM	500 MCM	1.9#
1502	750 MCM	350 MCM	1.9#
1503	500 MCM	350 MCM	1.9#

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500 MCM PARALLEL FEEDER CABLE DUPLEX CLAMPS



Manufactured of high strength bronze alloy. Clamping grip provided by three (3) 1/2-inch, bronze full thread bolts, lock washers and hex nuts.

Catalog No.	Description	Wt./Ea.
1504	500 MCM Parallel Feeder Clamp	2.6#

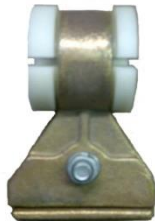
UNIVERSAL FEEDER CABLE DUPLEX CLAMP

Clamp design permits rotation of one side, thus allowing the accommodation of all size feeder cable between 2/0 to 1000 MCM. Double ended castings are made of high strength bronze alloy and secured by a steel, hot dip galvanized, carriage bolt, lock washer and hex nut.



Catalog No.	Impulse P/N	Description	Wt./Ea.
8123	18547-2000	Universal Feeder Duplex Clamp	1.2#

INSULATED FEED SPAN SUPPORT CLAMP



Clamp fits 1/4 to 3/8-inch guy wire and is made of high strength bronze alloy. Clamping grip is provided by a single, steel, HDG, hex bolt, hex nut, and lock washer.

Split nylon spool has 7/8" diameter hole.

Catalog No.	Impulse P/N	Description	Wt./Ea.
9414	17706-2000	Insulated Feed Span Support Clamp	1.2#

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PHOENIX TYPE AP-1 AND AP-2 CURRENT TAPS



Catalog No. 8138 Catalog No. 8122

Designed for tapping current off of the trolley wire. The jaws are designed to grip only the upper lobe of the trolley wire with ample clearance for the free passage of the collector.

Manufactured of high strength bronze alloy. Catalog No. 8122 has a single stainless steel flat head, slotted machine screw for attachment to the trolley wire and the tap wire. Catalog No. 8138 has a feeder lug with a bronze set screw to secure the tap wire.

Catalog No.	Impulse P/N	Description	Tap Size	Wt./Ea.
8122	11160-2000	Type AP-1 Current Tap	#14	0.2#
8138	13684-2000	Type AP-2 Current Tap	#14	0.3#

THREE SCREW BRONZE FEEDER TAP



PHOENIX Three Screw Bronze Feeder Taps are used to connect feeder cable to 2/0 to 6/0 Grooved and Figure 8 trolley wire. Made of high strength bronze alloy, the clamp is held on the upper lobe of the trolley wire by three (3) stainless steel, 1/4"-20 flat head screws. Tap wire is secured in the attached lug by two (2) stainless steel, square head, set screws.

Catalog No.	Description	Wt./Ea.
8819	Three Screw Bronze Feeder Tap	0.84#

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TYPE HS FEEDER TAP



Manufactured of high strength bronze alloy. Clamping force provided by two (2) hollow bronze alloy screws broached for a 5/16" hex wrench. Jaws will accommodate ALL grooved trolley wires. Cover plate with tab is PHOENIX Catalog No. 5671.

Catalog No.	Impulse P/N	Description	Wt./Ea.
5672	54205-3001	Type HS Feeder Tap	1.0#

FLEXIBLE FEEDER TAP AND JUMPER



Catalog No. 7708

PHOENIX Catalog No. 7708, Flexible 3/0 Feeder Tap, attaches to the feeder by means of a bronze clamp with a copper compression lug on the other end. All bolts, lock washer and hex nuts are bronze.

Catalog No. 7709 utilizes bronze duplex clamps to attach to the trolley wire with a copper, compression lug style terminal on the other end, same as on Catalog No.7708.

Catalog No.	Impulse P/N	Description
7708	17708-2000	Flexible Feeder Tap – 2/0 to 4/0 Feeder Wire
7709	60651-3001	Flexible Jumper

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DEEP RUNNER, SOLID BODY, CROSSOVERS



Catalog No 9560

PHOENIX Overhead, Deep Runner, Solid Body Trolley Crossovers are manufactured of high strength bronze alloy and are supplied with steel, HDG, bolts, lock washers and hex nuts. Clevis style ends will accommodate the attachment of standard frog tips.

Tips must be ordered separately

Catalog No.	Impulse P/N	Description	Under Run	Wt./Ea.
9517	17774-2000	17 Degree Crossover*	28"	14.4#
9523	16799-2000	23 Degree Crossover	16"	10.25#
9530	55993-4001	30 Degree Crossover	16"	9.25#
9533	16801-2000	33 Degree Crossover	16"	9.25#
9535	60019-3001	35 Degree Crossover	16"	9.75#
9535HK	N/A	35 Degree Crossover	16"	9.25#
9537	16802-2000	37 Degree Crossover	16"	9.25#
9540	60020	40 Degree Crossover	13 3/4"	9.25#
9545	55991-4001	45 Degree Crossover	13 3/4"	8.7#
9550	60016-3001	50 Degree Crossover	11 1/4"	8.0#
9555	60017-3001	55 Degree Crossover	9 1/4"	7.0#
9555HK	N/A	55 Degree Crossover	9 1/2"	10#
9560	55992-4001	60 Degree Crossover	9 1/2"	7.0#
9570	59018-2000	70 Degree Crossover	8 1/8"	8.5#
9590X	55983-4001	90 Degree Crossover	6 1/2" & 12"	7#

* Catalog No. 9517 is fabricated from steel, hot dip galvanized and is not a bronze casting.

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15 DEGREE MECHANICAL CROSSOVER



Catalog No. 9515M

PHOENIX 15 Degree Mechanical Crossover is an exact duplicate of the unit manufactured by Impulse. All parts are interchangeable.

Catalog No.	Impulse P/N	Description
9515M	22442-2000	15 Degree Mechanical Crossover
1300-0550	21467-2000	Shunt – 5.5”
1300-1075	19277-3003	Shunt – 10.75”
2305	22447-2000	Cover
2310	22448-2000	Crossover Link
2311	23985-4002	½” Bushing for Pivot Bolt
2315	22451-2000	Spring Guard
2316	22444-2000	Pan w/ Bushing and Hex Bolts, Hex Nuts & Lock washers
2330	22446-2000	Runner w/ Roller & Cotter
1370	21501-2000	Bushing for Pan
2330-1	23981-2000	Bronze Runner - Only
2330-2	22451-4001	Roller
2332	22449-2000	Pivot Bolt w/ Bushing, Nut & Washer
2335	22450	Spring
2540	21682	Collar
2541	57917	Spacer Block

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ADJUSTABLE CROSSOVERS

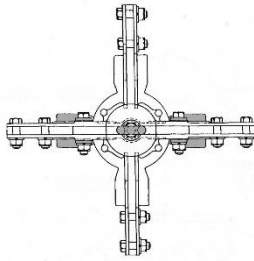


Catalog No. 9017

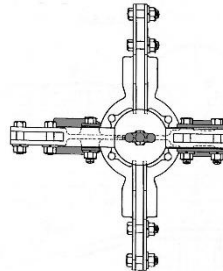
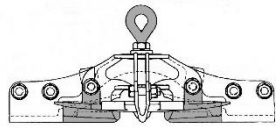
PHOENIX Deep Runner, Live Adjustable Crossover is manufactured of high strength bronze alloy. All fasteners are steel, HDG and hitch pins are stainless steel. Adjust 30 to 90 degrees.

Tips must be ordered separately.

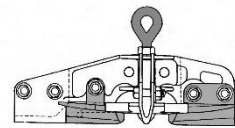
Catalog No.	Description	Under Run	Wt./Ea.
9017	Live Adjustable Crossover	18 1/2"	15#



Catalog No. 9018 – Type TA



Catalog No. 9019 – Type TAS



PHOENIX Type TA and TAS Adjustable Crossovers are adjustable from 40 to 90 degrees. Type TAS has one short leg (5") to provide space for a standard NoBo Section Insulator (Catalog No. 9400). All other legs are 7 1/2". Pan and arcing tips are high strength bronze alloy and fasteners and eyebolt are steel, HDG.

Catalog No.	Impulse P/N	Description	Under Run	Wt./Ea.
9018	16905-2000	Type TA Adjustable X-Over	15"	13.2#
9019	18169-2000	Type TAS Adjustable X-Over	15" & 12 1/2"	12#
9008	18794-2000	Arcing Tip for 7 1/2" Legs		0.7#
9009	18795-2000	Arcing Tip for 5" Short Leg		0.9#

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INSULATED ADJUSTABLE CROSSOVERS



Catalog No. 9020
Adjustable 58 to 65 Degrees



Catalog No. 9021
Adjustable 66 to 90 Degrees

Equal to Type TA and TAS Adjustable Crossovers except at least one leg is modified to provide standard NoBo insulation between trolley wires. The entire under run is renewable. These components are utilized in Type 4XA Insulated Adjustable Crossovers – consult factory for all details.

Catalog No.	Impulse P/N	Description	Under Run	Wt./Ea.
9020	55029-3001	Adjustable X-Over w/ NoBo	27 1/2"	19#
9021	55028-3001	Adjustable X-Over w/ NoBo	35 1/4"	28#
9009	18795-2000	Outer Arcing Tip		0.9#
9010	18796-2000	Inner Arcing Tip		0.7#

**TYPE 4XA INSULATED ADJUSTABLE CROSSOVER
ASSEMBLIES**

Catalog No.	Impulse P/N	X-Over Angle Degrees	Wt./Ea.
4745	18255-2000	40 to 45	97#
4751	18254-2000	46 to 51	94#
4757	18253-2000	52 to 57	92#
4765	18438-2000	58 to 65	97#
4790	18437-2000	66 to 90	97#

Type 2XA Assemblies are also available from PHOENIX - consult factory.

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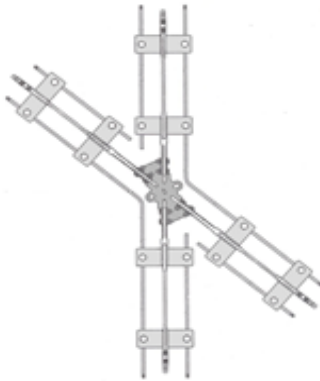
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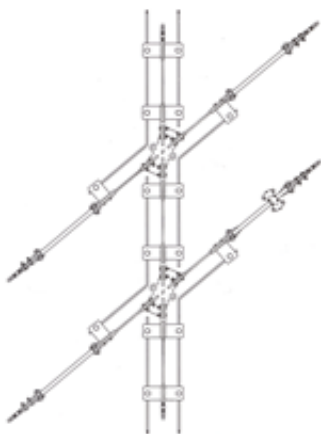
TYPE 1XR, 2XR & 4XR RIGID CROSS OVERASSEMBLIES

PHOENIX Cross Over Assemblies incorporate a combination of Catalog No. 9400, NoBo Section Insulator; Catalog No. 9401, NoBo Section Insulator with Magnetic Blowout; PHOENIX Deep Runner Solid Body Crossovers; and Live Spacers. Listed below are representatives of our entire line - **consult factory for specific layout options.**



Type 1XR

Catalog No.	Impulse P/N	Degree
1823	60890-3001	23
1830	60401-3001	30
1835	675885	35
1837		37
1840	675883	40
1845	675884	45
1850	60354-3001	50
1855	675882	55
1860		60
1870		70
1890		90



Type 2XR

Catalog No.	Impulse P/N	Degree
2823	60304-3001	23
2830		30
2835	60356-3001	35
2837		37
2840	60357-3001	40
2845	60358-3001	45
2850	675878	50
2855	60359-3001	55
2860	675879	60
2870	675880	70
2890		90

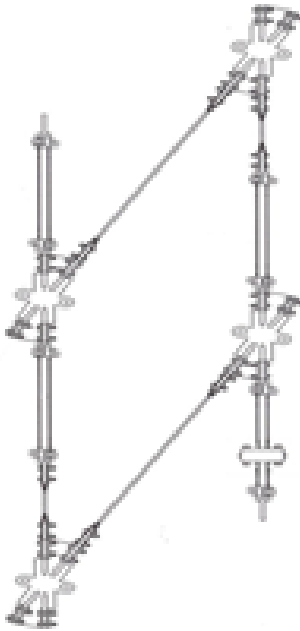
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TYPE 1XR, 2XR & 4XR INSULATED RIGID CROSS OVER ASSEMBLIES – 30 TO 90 DEGREES



Type 4XR

Catalog No.	Impulse P/N	Degree
4823	58849-3001	23
4830	55968-3001	30
4835	673658	35
4837	58862-3001	37
4840	673659	40
4845	55967-3002	45
4850	57875-3001	50
4855	60009-3001	55
4860	55966-3001	60
4870	57194-3001	70
4890	55985-3003	90

LIVE SPACERS



Live Spacers are manufactured from steel, hot dip galvanized. To order use catalog number followed by desired under run length in inches.

Catalog No.	End Configuration
2000-XXXX	Tongue and Tongue
2010-XXXX	Tongue and Clevis
2020-XXXX	Clevis and Clevis

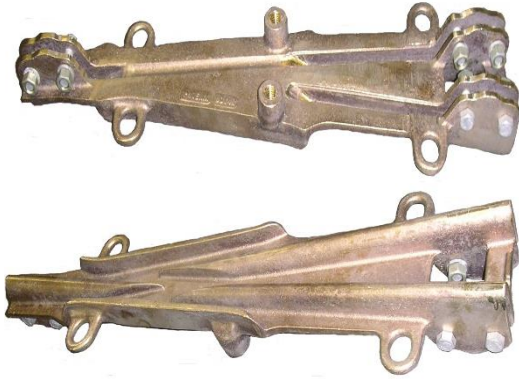
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OVERHEAD 10 DEGREE SOLID BODY FROGS

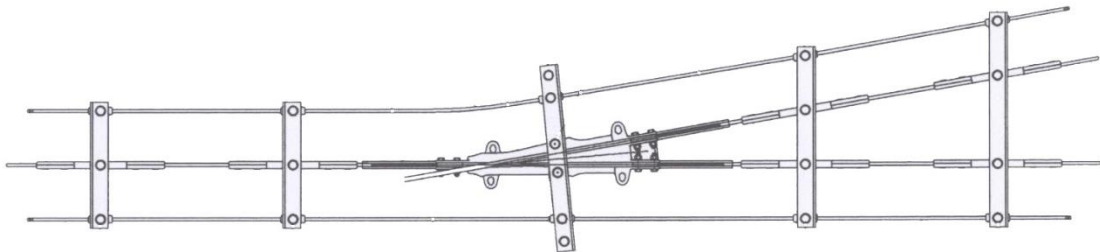


PHOENIX 10 Degree Overhead Solid Body Trolley Frogs are manufactured of high strength bronze alloy and are supplied with steel, HDG, bolts, lock washers and hex nuts in the clevis ends to accommodate the attachment of tips

Tips must be ordered separately.

Catalog No.	Impulse P/N	Under Run	Description	Wt. Ea.
9014	20770-2000	22"	Frog – Right 10 Degree	12.8#
9015	20771-2000	22"	Frog – Left 10 Degree	12.8#
9016	16969-2000		Yoke - Only	2.5#

10 DEG. FROG ASSEMBLIES WITH GLIDERS FOR LRV



Catalog No. 9029

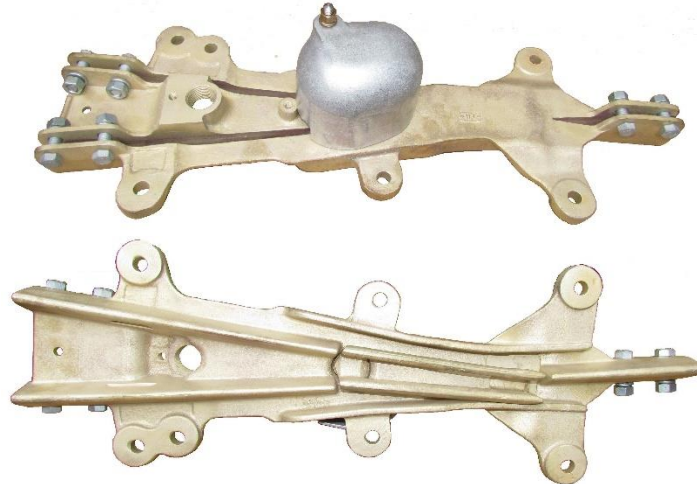
Glides are made from copper spacer bar (Catalog No. 4000). They are supported by steel, HDG, angle iron and held in place by standard spacer bar clamps (Catalog No. 4001). The frog is a bronze solid body, 10-degree, deep runner (Catalog No. 9014 or 9015) with Type BR tips (Catalog No. 9646 or 9648). Trolley wire is secured by 14" Type HS Clamps (Catalog No. 5665).

Catalog No.	Impulse P/N	Description
9028	675888	Right Hand – 10 Deg. Frog w/ Gliders for LRV
9029	675889	Left Hand – 10 Deg Frog w/ Gliders for LRV

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12 DEGREE SPRING FROGS



PHOENIX 12 Degree Spring Frogs are designed for use in locations where operation is in one direction only. All components may be used to repair units manufactured by Impulse. Under run length is 25 inches.

Catalog No.	Impulse P/N	Description	Wt./Ea.
9030	20660-2000	12 Degree Wye Spring Frog	18#
9031	20134-2000	12 Degree Right Hand Spring Frog	18#
9032	20136-2000	12 Degree Left Hand Spring Frog	18#
9035	22273-2000	Wye Frog Without Spring	18#
9033	22271-2000	12 Degree RH Frog Without Spring	18#
9034	22272-2000	12 Degree LH Frog Without Spring	18#
9030-1	20658-2000	Wye Pan w/ Oil-less Bushing & Bolts	15.5#
9031-1	20343-2000	RH Pan w/ Oil-less Bushing & Bolts	15.5#
9032-1	20344-2000	LH Pan w/ Oil-less Bushing & Bolts	15.5#
1018	21509-2000	Cover – Aluminum	0.8#
1019	21510-2000	Cover Stud – Stainless Steel	0.1#
1020	21508-2000	Lever - Bronze	0.4#
1021	18261-2000	Coil Spring	0.03#
1300-0600	21467-2000	Shunt – Copper	0.07#
1370	21501-2000	Oil-less Bushing	0.45#
1390	19662-2000	Right Hand Moveable Runner	1.5#
1400	19663-2000	Left Hand Moveable Runner	1.5#

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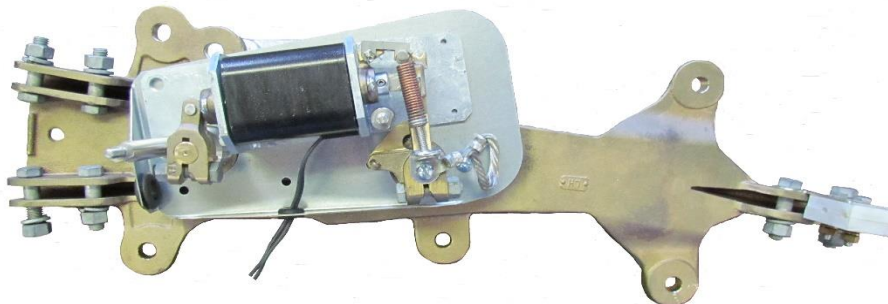
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12 DEGREE ELECTRIC FROGS



PHOENIX 12 Degree Electric Frogs are exact duplicates of units manufactured by Impulse, and, prior to that, WABCO. All parts are interchangeable. Consult factory for complete parts and configuration. Under run length is 25 inches.

Catalog No.	Description
9070	Wye Electric Frog
9071	Right Hand Electric Frog
9072	Left Hand Electric Frog
9070-P	Wye Electric Frog-Power On / Power Off
9071-P	RH Electric Frog-Power On / Power Off
9072-P	LH Electric Frog-Power On / Power Off



Catalog No. 9072 – Left Hand Electric Frog (shown without cover)

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COMPONENT PARTS FOR
12 DEGREE ELECTRIC FROGS

Catalog No.	Impulse P/N	Description
9070-1	20658-2000	Pan Wye w/ Oil-less Bushing and Clevis Bolts
9071-1	20344-2000	Pan RH w/ Oil-less Bushing and Clevis Bolts
9072-1	20343-2000	Pan LH w/ Oil-less Bushing and Clevis Bolts
1200	18663-2000	Wire Support (Not Shown)
1230	21474-2000	Tube
1240	21473-2000	Support Clip for Tube
1300-0600	21467-2000	Shunt (6")
1310	21468-2000	Frog Lever (Bronze)
1350	21466-2000	Frog Pin w/ Cotter (3/16")
1360	21559-2000	Frog Spring Bracket (Steel)
1370	21501-2000	Oil-less Bushing
1390	19662-2000	Moveable Runner – RH or V (Bronze)
1400	19663-2000	Moveable Runner – LH or V (Bronze)
1410	19664-2000	Reset Deflector - RH
1420	19665-2000	Reset Deflector - LH
1430	21462-2000	Reset Lever (Bronze)
1440	21463-2000	Lever Stop (Bronze)
1450	22432-2000	Cover Plate Assembly
1460	21465-2000	Cover Support Stud – 9/16" Steel
1475	22430-2000	Cover (Plastic)
1480	16012-2000	Coil Spring (Steel)
1490	20288-2000	Coil Spring (Bronze)
1500	19666-2000	Plunger Assembly
1610	21475-2000	Rocker Assembly (Steel)
1620	20359-2000	Voltage Coil (Electric)
1621	19660-2000	Voltage Coil (Power On – Power Off)
1630	21477-2000	Flange (Bronze)
1640	21545-2000	Coil Stand - Only
1650	21483-2000	Pin 5/32"
1660	21585-2000	Shunt (5")
1670	21476-2000	Plunger Tube
1925	56645-3001	Lever Stop Assembly (Part Nos.1310, 1440 & 1480)

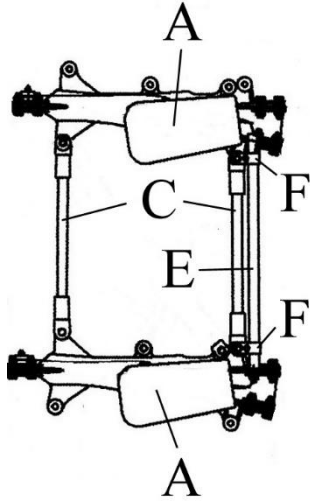
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PHOENIX MINING & TRANSIT SYSTEMS

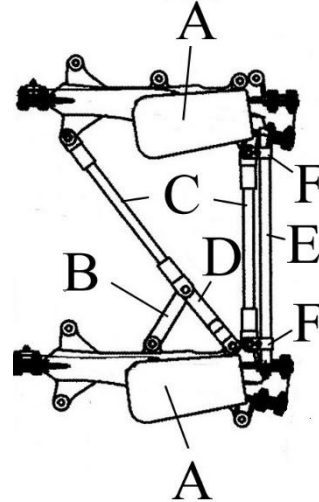
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OVERHEAD FROG SUB-ASSEMBLY



Type A



Type B

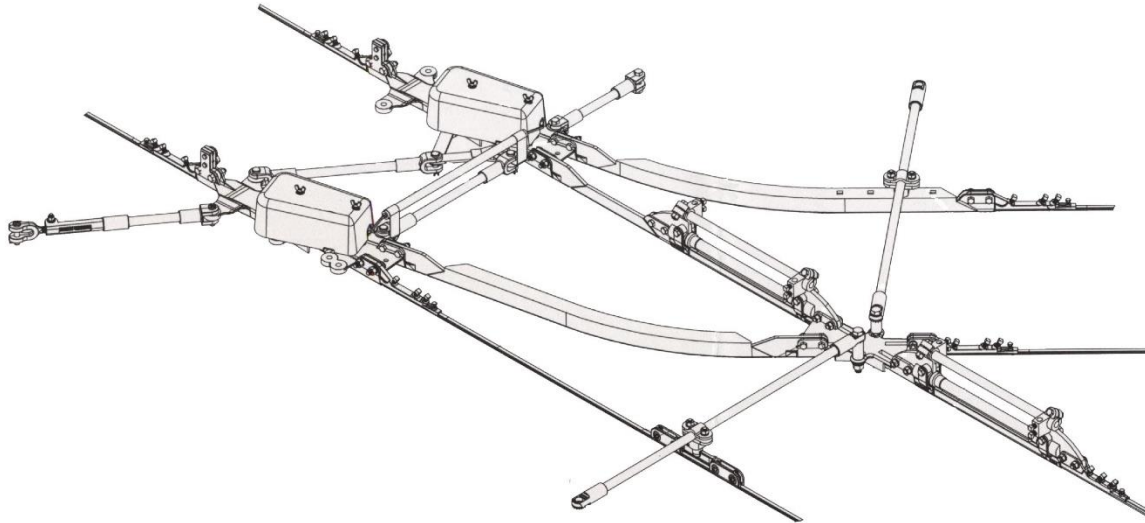
Item	Catalog No.	Impulse P/N	Description
	9100-R		Right Hand Sub Assembly – Spring Frog
	9100-L		Left Hand Sub Assembly – Spring Frog
	9100-RE		Right Hand Sub Assembly – Electric Frog
	9100-LE		Left Hand Sub Assembly – Electric Frog
	9100-RP		Right Hand Sub Assembly – Power On-Power Off
	9100-LP		Left Hand Sub Assembly – Power On-Power Off
A			Frog – As Specified
B	5916	21893-2000	Guard – Steel, HDG
C	7850-175	54960-6175	7/8” Rod Style Insulator
D	5915	22901-3001	Link Assembly – Steel, HDG
E	1230	21474-2000	Insulator Tube for Lead Wires (Electric Frogs Only)
F	1240	21473-2000	Clip / Tube Support (Electric Frogs Only)

Place an A or B after Catalog Number to designate configuration required.

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COMPLETE FROG AND CROSSOVER ASSEMBLIES



Insulation in Straight Line

Catalog No.	Description
5715	15 Degree Assembly
5723	23 Degree Assembly
5730	30 Degree Assembly
5735	35 Degree Assembly
5740	40 Degree Assembly
5745	45 Degree Assembly

Insulation in Curve

Catalog No.	Assembly
6015	15 Degree Assembly
5923	23 Degree Assembly
5930	30 Degree Assembly
5935	35 Degree Assembly
5940	40 Degree Assembly
5945	45 Degree Assembly

PHOENIX Frog and Crossover Assemblies are available as fully assembled units or as individual parts. All components may be substituted for their equivalents manufactured by Impulse.

Please consult the factory for your desired layout and frog type.

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TYPE T TIPS



Type T Tips are manufactured of high strength bronze alloy. The wire is securely held in place by two (2) zinc plated, dichromate dipped, set screws located at an angle to the wire and vibration is dampened by a single 1/4" stainless steel set screw set at the end of the tip.

Under run length is 4 3/4 inches.

Catalog No.	Impulse P/N	Description	Wire Size	Wt./Ea.
9622	16831-2000	Type T Tip	2/0 Grooved	0.95#
9624	18210-2000	Type T tip	4/0 Grooved	0.95#

TYPE TC TIPS



Type TC Tips are similar to the Type T Tip except that they are designed for applications requiring a clevis fitting to accommodate a tongue end. Two (2) steel, HDG, bolts, lock washers and hex nuts are provided for attachment.

Under run length is 7 1/4 inches.

Catalog No.	Impulse P/N	Description	Wire Size	Wt./Ea.
9632	17795-2000	Type TC Tip	2/0 Grooved	1.5#
9634	17797-2000	Type TC Tip	4/0 Grooved	1.5#

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TYPE TL TIPS



Type TL Tips are elongated to permit the insertion of a 3” wire plug at the inner side of the tip. This plug can readily be replaced when worn as opposed to cutting and splicing the trolley wire. The wire is secured in place by three (3) zinc plated, dichromate dipped, set screws. Wire vibration is dampened by a single 1/4” stainless steel set screw.

Under run length is 7 3/4 inches.

Catalog No.	Impulse P/N	Description	Wire Size	Wt./Ea.
9602	22433-2000	Type TL Tip	2/0 Grooved	1.4#
9604	23720-3003	Type TL Tip	4/0 Grooved	1.4#

TYPE TCL TIPS



Type TCL Tips are similar to the Type TL Tips except that they are designed for applications requiring a clevis fitting to accommodate a tongue end. Two (2) steel, HDG, bolts, lock washers and nuts are provided for attachment.

Under run length is 8 3/4 inches.

Catalog No.	Impulse P/N	Description	Wire Size	Wt./Ea.
9612	54950-3001	Type TCL Tip	2/0 Grooved	1.7#
9614	54950-3002	Type TCL Tip	4/0 Grooved	1.7#

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TYPE TR TIPS



Designed for systems with carbon shoe collectors on round or grooved wire. Type TR Tips are made of high strength bronze alloy. The wire is secured in place by two (2) zinc plated, dichromate dipped, 7/16" set screws.

Under run length is 7 inches.

Catalog No.	Impulse P/N	Description	Wire Size	Wt./Ea.
9652	19345-2000	Type TR Tip	2/0 Grooved and Round	1.3#
9654	18211-2000	Type TR Tip	4/0 Grooved and Round	1.3#

TYPE TCR TIPS



PHOENIX Type TCR Tips are similar to the Type TR Tips except that they are designed for applications requiring a clevis fitting to accommodate a tongue end. Two (2) steel, HDG, bolts, lock washers and nuts are provided for attachment.

Under run length is 9 5/8 inches.

Catalog No.	Impulse P/N	Description	Wire Size	Wt./Ea.
9651	19347-2000	Type TCR Tip	2/0 Grooved and Round	2.2#
9653	17800-2000	Type TCR Tip	4/0 Grooved and Round	2.2#

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TYPE BR TIPS



Type BR Tips are made of high strength bronze alloy. Clamping provided by three (3) hollow bronze screws, broached for a 5/16" hex wrench. Tip encircles wire; therefore, in maintenance and replacement situations the condition of the trolley wire will not affect the usefulness of the tip.

Catalog No.	Impulse P/N	Wire Size	Wt./Ea.
9646	69072-3001	2/0 Grooved and Round	1.8#
9648	69072-3002	4/0 Grooved and Round	1.8#

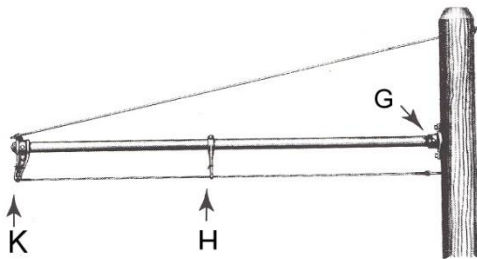
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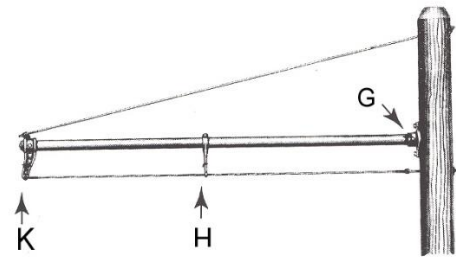
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PHOENIX FLEXIBLE POLE BRACKETS



Type F



Type E

Standard parts are manufactured of ductile iron, hot dip galvanized, but all parts are also available in high strength bronze alloy for maximum service life. All set screws and other fasteners are zinc plated, dichromate dipped, steel. Pipe and span wire are not included.



3126
Part G



3111
Part H



3112
Part H-Insulated



3091
Part K



7647
Part I

Catalog No.	Impulse P/N	Description	Pipe Size	Wt./Ea.
3091	14245-2000	Part K Fitting	2"	3.7#
3111	11817-2000	Part H Fitting	2"	1.8#
3112	12592-2000	Part H - Insulated	2"	1.8#
3126	11811-2000	Part G Fitting	2"	2.3#
7647	N/A	Part I Fitting	N/A	2.4#
3092	11933-2000	Eyebolt – Only (Part I)	N/A	0.66#

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NOBO STYLE SECTION INSULATOR



Catalog No. 9400

Phoenix NOBO Style Section Insulators are a standard component incorporated in curve segments, turnouts and virtually all overhead assemblies. Constructed of fiberglass tension and compression rods (both covered in shrink wrap rubber tubes); an insulating runner made of premium, high strength, electrical grade, thermo-set polyester; and high strength bronze end fittings - End fittings will accommodate all PHOENIX and Impulse standard clevis type frog tips.

Standard units are “Long” with a 14 1/2” runner, “Short” with a 10” runner and “Extended” with a 29 15/16” runner.

With an ultimate tensile strength of 12,000 pounds, safely allowing working loads in excess of 6,000 pounds, the PHOENIX NoBo Style Section Insulators are strong and rugged enough for all standard applications.

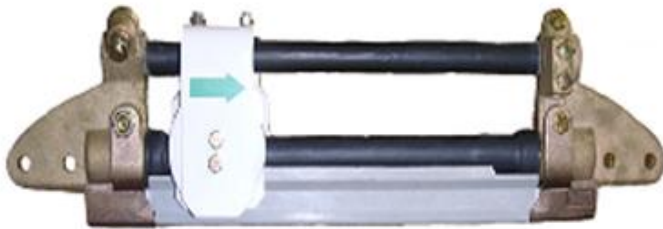
Catalog No.	Description	Voltage
9400	Long Section Insulator-14 ½ ” Runner	1,500 VDC
9500	Short Section Insulator-10” Runner	700 VDC
9300	Extended Section Insulator-29 15/16” Runner	1,500 VDC

All PHOENIX NoBo Style Section Insulators and component parts are interchangeable with their Impulse equivalents. See page 35 for complete parts list and cross reference.

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PHOENIX MINING & TRANSIT SYSTEMS
P.O. BOX 14170, CINCINNATI, OHIO 45250
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**SUSPENSION YOKE AND MAGNETIC BLOWOUT
FOR NOBO SECTION INSULATORS**



Catalog No. 9501

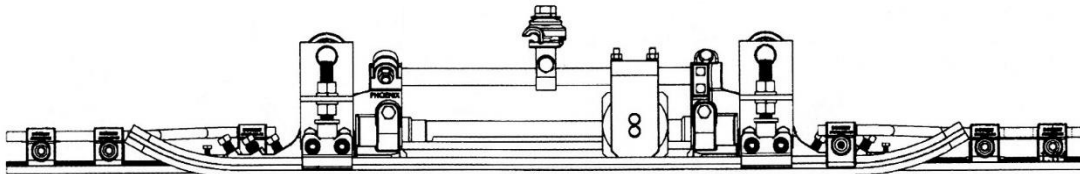


Catalog No. 9416



Catalog No. 9402

**SECTION INSULATORS FOR SHOE AND PANTOGRAPH
WITH ATTACHED GLIDERS**



Catalog No. 9403-10

Available with Jumpers for commutating applications, Magnetic Blowout and Suspension Yoke as needed – consult factory for complete details.

Catalog No.	Impulse P/N	Description
9400-03	54674-3003	Section Insulator w/ Glides
9402-06	54674-3006	Section Insulator w/ Glides and Yoke
9400-04	54674-3004	Section Insulator w/ Glides and Jumpers
9402-05	54674-3005	Section Insulator w/ Glides, Jumpers and Yoke
9403-10	60376- 3001	Section Insulator w/ Glides, Jumpers, Yoke and Magnetic Blowout

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NOBO STYLE SECTION INSULATORS

Catalog Numbers & Cross Reference

Section Insulators with 14 1/2" Runner – Under Run Length 19 3/4"

Catalog No.	Impulse P/N	Description	Wt./Ea
9400	55025-3001	19 3/4" Section Insulator - Complete	10.2#
9401	55030-3001	19 3/4" Section Insulator w/ Magnetic Blow Out	13.8#
9402	55025-3002	19 3/4" Section w/ Suspension Yoke	12.0#
9403	55030-3002	19 3/4" Section Insulator w/ Yoke & Blow Out	15.8#
9405	56391-4001	Insulator Runner – 14 1/2" Only	1.06#
9410	55070-4201	Compression Rod - Only	0.7#
9411		Tension Rod - Only	1.6#
9405-9407		Kit: Two (2) End Clips and One (1) Runner	2.3#

Section Insulators with 10" Runner – Under Run Length 15 1/4"

9500	55025-3003	15 1/4" Section Insulator - Complete	9.6#
9501		15 1/4" Section Insulator w/ Magnetic Blow Out	13.4#
9502	55025-3004	15 1/4" Section Insulator w/ Suspension Yoke	11.6#
9503		15 1/4" Section Insulator w/ Yoke & Blow Out	15.4#
9505	56551-4001	Insulator Runner – 10" Only	0.6#
9510	55070-4202	Compression Rod - Only	0.6#
9511	55022-3002	Tension Rod - Only	1.4#

Section Insulators with 24 15/16" Runner – Under Run Length 30 1/8"

9300	56389-3003	30 1/8" Section Insulator - Complete	11.6#
9301	56389-3001	30 1/8" Section Insulator w/ Magnetic Blow Out	15.4#
9302		30 1/8" Section Insulator w/ Suspension Yoke	13.6#
9303		30 1/8" Section Insulator w/ Yoke & Blow Out	17.4#
9305	56388-4006	Insulated Runner – 24 15/16" Only	1.2#
9310	55070-4205	Compression Rod - Only	1.4#
9311		Tension Rod - Only	2.9#

Parts Common to All

9406	55025-3005	Suspension Yoke - Only	1.2#
9407	55024-4001	End Clip – High Strength Bronze	0.6#
9408		Left Hand End – High Strength Bronze	2.85#
9409		Right Hand End – High Strength Bronze	2.85#
9416	57201-3001	Magnetic Blow Out Assembly	3.8#

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NON-DIRECTIONAL TROLLEY CONTACTOR
600 Volts DC – 2/0 to 4/0 Grooved Trolley Wire and Spacer Bar



Catalog No. 4901



Catalog No. 4902

Used to activate signaling, frogs or other electrical devices by tapping current from the trolley wire when collector is present.

PHOENIX Non-Directional Trolley Contactors are made of corrosion resistant materials and for added protection are enclosed in a molded, skytone gray, PVC enclosure. Contact runners extend 1/16” below the bottom of the trolley wire and require a force of two (2) pounds to move them outward and activate the attached device (Required force can be readily altered by adjusting spring tension).

Catalog No.	Impulse P/N	Description	Wt./Ea.
4901	22549-2000	Non Directional Trolley Contactor for 2/0 to 4/0 Grooved Trolley Wire	6.6#
4902	54671-3001	Non Directional Trolley Contactor for Shoe and Pantograph on LRV	7.3#
4903	22550-2000	Non Directional Trolley Contactor for Spacer Bar – Shoe Only	6.6#
4904		Non-Directional Trolley Contactor For Spacer Bar – Pantograph & Shoe	7.3#

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COMPONENT PARTS
NON-DIRECTIONAL TROLLEY CONTACTOR

All PHOENIX contactor components will fit and are interchangeable with the contactors manufactured by Impulse.

Catalog No.	Impulse P/N	Description
4920	22405-2000	End Clamp for Contactor – Trolley Wire
4921	21558-2000	End Clamp for Contactor – Spacer Bar
4922	22543-2000	Contacto Spring
4923	23774-4003	Contacto Support Yoke
4924	22400-2000	Shunt – Copper
4925	22398-2000	Contact Bar for Shoe - Only
4926	22547-2000	Bracket- Complete
4927	N/A	PVC Cover
4928	54671-3002	Contact Bar for Shoe and Pantograph/ LRV
4929	22548-2000	3/4" Fiber Reinforced Rod
4930	21540-2000	Fiber Insulator Sleeve

INSULATED LEAD WIRE CLAMP



Provides insulated support for lead wires from PHOENIX Non-Directional Contactor to associated electrical device.

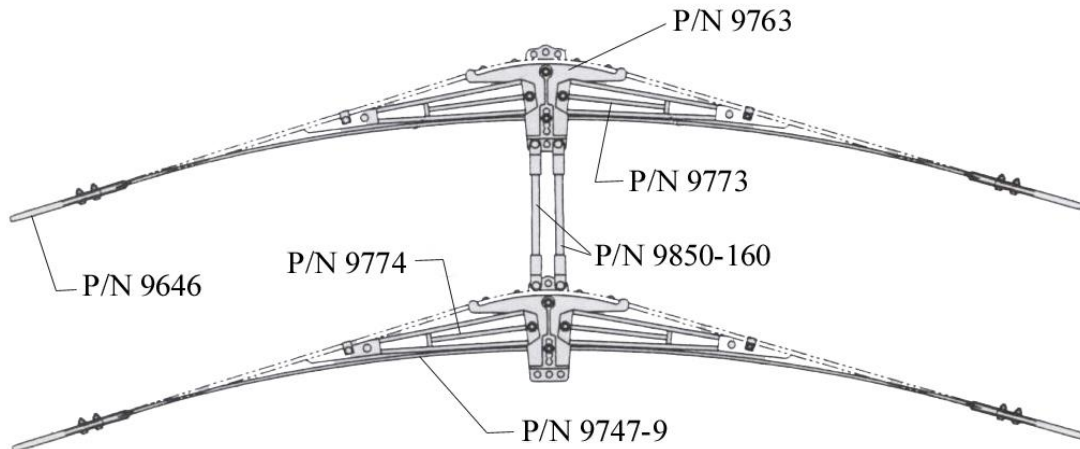
Manufactured of high strength bronze alloy. Clamp is held securely to upper lobe of trolley wire by a high strength, hollow bronze screw. Electrical insulation is assured by a 2 1/2" long phenolic tube secured in the upper jaws of the clamp.

Catalog No.	Impulse P/N	Description	Wt./Ea.
9413	19655-2000	Insulated Lead Wire Clamp	0.5#

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C-2 TYPE CURVE SEGMENTS
Double Trolley Wire



Catalog No. 9828

PHOENIX C-2 Type Curve Segments are direct replacements for the original Type C-2 Segments manufactured by the Ohio Brass Co., and now produced by ImpulseNC, Inc. The C-2 Segments may be purchased as complete units, or as individual parts. Runners and guards are steel, HDG, and the tips and strain plates are high strength bronze alloy. Standard complete units are supplied with Type BR Tips.

All bolts, nuts and lock washers are steel, HDG.

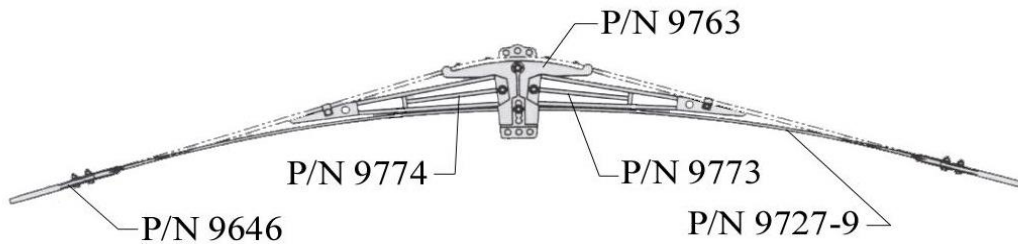
C-2 Type Curve Segments – Complete with Tips
For Double Trolley Wire

Catalog No.	Impulse P/N	Degree Angle	Wire Size	Runner Length	Wt./Ea.
9805	22301-3019	5-12	2/0	8 ft.	46#
9813	22302-3009	13-27	2/0	8 ft.	58#
9828	22303-3008	28-47	2/0	9 ft.	80#
9912	22301-3020	5-12	4/0	8 ft.	46#
9927	22302-3010	13-27	4/0	8 ft.	58#
9947	22303-3009	28-47	4/0	9 ft.	80#

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C-2 TYPE CURVE SEGMENTS
Single Trolley Wire



Catalog No. 9828 -1

PHOENIX C-2 Type Curve Segments for single trolley wire are direct replacements for the original Type C-2 Segments manufactured by the Ohio Brass Co. To order place “-1” behind the Catalog Number of the corresponding Double Trolley Wire curve segment.

FLEXIBLE CURVE SEGMENTS



Manufactured of steel, hot dip galvanized. Clamping force provided by stainless steel, hollow bronze screws, broached for a 5/16” hex wrench.

Catalog No.	Impulse P/N	Degree Angle	Length	Wt./Ea.
2203	58686-3001	3 - 5	23 7/16”	6.9#
2205	58686-3006	3 - 5	15”	5.5#
2208	58686-3002	5 - 8	47 1/16”	11.75#
2210	58686-3003	8 - 10	70 11/16”	14.8#
2215	58686-3004	10 - 15	94 5/16”	18.99#
2230	58686-3005	15 - 30	117 15/16”	23.5#

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C-2 TYPE CURVE SEGMENTS – COMPONENT PARTS

Strain Plates



Catalog No 9761
Shown in Bronze



Catalog No 9762
Shown in Bronze



Catalog No 9763
Shown in Ductile Iron

All strain plates for PHOENIX C-2 Type Curve Segments are manufactured of high strength bronze alloy or ductile iron, HDG, as requested. All bolts, nuts and lock washers are steel, HDG. PHOENIX Strain Plates may be used in Impulse and Ohio Brass C-2 Curve Segments.

Anti-Trapping Guards



Left Hand Guard – Catalog No.9774

PHOENIX Anti-Trapping Guards (Catalog Nos. 9771, 9772, 9773 and 9774) are manufactured of steel, HDG, and all fasteners are steel, HDG for maximum service life. PHOENIX Guards may be used in Impulse and Ohio Brass C-2 Curve Segments.

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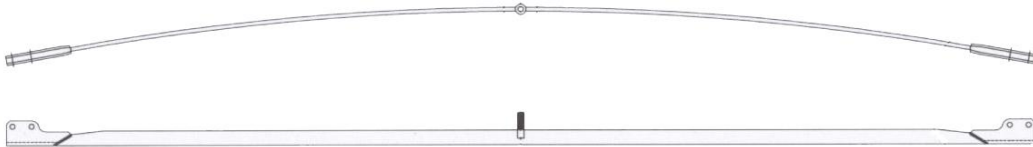
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C-2 TYPE CURVE SEGMENTS – COMPONENT PARTS

C-2 Type Runners



Phoenix C-2 Type Runners may be used as replacements in any Impulse or Ohio Brass Type C-2 Curve Segment. Manufactured of steel, hot dip galvanized. List length required after Catalog Number, for example an 8-foot runner for a 5 to 12-degree curve segment would be designated as Catalog No. 9712-8.

Component Parts

Catalog No.	Impulse P/N	Description	Wt. /Ea.
9712- 6		6 Foot Runner Only – 5-12 Degrees	11#
9712- 8	21375-2000	8 Foot Runner Only – 5-12 Degrees	15#
9727- 8	21376-2000	8 Foot Runner Only – 13-27 Degrees	15#
9747- 9	21377-2000	9 Foot Runner Only – 28-47 Degrees	17#
9761	20290-2000	C-2 Strain Plate 5 to 12 Degrees	5#
9762	20291-2000	C-2 Strain Plate 13 to 27 Degrees	6#
9763	20293-2000	C-2 Strain Plate 28 to 47 Degrees	9#
9646	69072-3001	2/0 Type BR Frog Tip	1.6#
9648	69072-3002	4/0 Type BR Frog Tip	1.6#
7850-160	54960-6160	Rod Strain Insulator (13 to 47 Degrees)	2.8#
7850-175	54960-6175	Rod Strain Insulator (5 to 12 Degrees)	2.5#
9771	20294-2000	Right Hand Guard (13 to 27 Degrees)	1.5#
9772	20295-2000	Left Hand Guard (13 to 27 Degrees)	1.5#
9773	20296-2000	Right Hand Guard (28 to 47 Degrees)	5.0#
9774	20297-2000	Left and Guard (28 to 47 Degrees)	5.0#
9770	55888-3001	Clip for Guard – Stainless Steel	0.1#
9770J	55888-3001	J-Bolt for Guard	0.1#

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INSULATED HANGER SYSTEMS

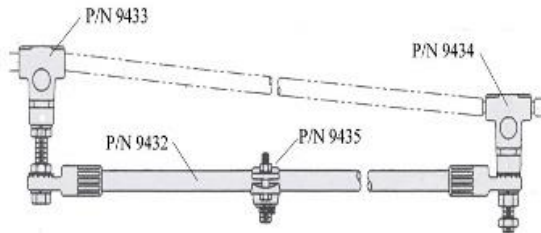
Hanger assemblies are suspended from the feeder cable by two supports, Catalog No. 9433 (malleable iron, HDG) and the live hanger support, Catalog No. 9434 (bronze alloy), which is designed to feed the trolley wire directly through the clamp. Electrical insulation between the two (2) trolley wires is provided by Catalog No. 9432, a 7/8" diameter epoxy-fiberglass rod. The trolley wire support clamps, Catalog No. 9435 (bronze alloy) are easily adjusted horizontally along the rod to assure proper alignment and spacing of the trolley wires.

Curve Hangers utilize the same trolley wire support clamps and 7/8" rod, but are fitted with adjustable arms, Catalog No. 9436, with serrated eyes on each end to assure proper alignment.

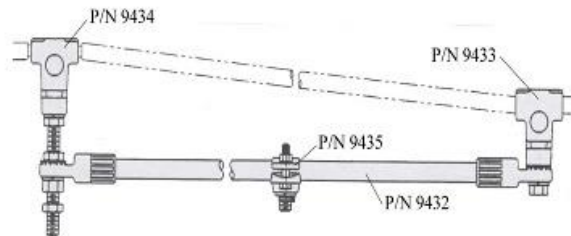
All PHOENIX Hanger Systems, parts and components can be used interchangeably with their Impulse equivalents.

Catalog No.	Impulse P/N	Description
9420	54937-3001	Positive Span Hanger – Complete
9430	54936-3001	Negative Span Hanger - Complete
9440	54962-3001	Double Curve Hanger – Complete (Two Adjustable Arms – Catalog No. 9436)
9441	54962-3002	Single Curve Hanger – Complete (One Adjustable Arm – Catalog No. 9436)
9451	55011-3001	Type PH-7 Span Hanger
9452	54999-3001	Type PH-1, Non Adjustable Span Hanger
9432	54980-6385	Standard Insulator Rod – 38 1/2 inches
9433	54936-3005	Hanger Support Clamp – Bronze
9434	54936-3006	Live Hanger Support Clamp - Bronze
9421	21417-2000	3 1/4" Bronze Stud for Hanger Support Clamp
9422	21418-2000	6 3/16" Bronze Stud for Hanger Support Clamp
9435	54962-3003	Trolley Wire Support Clamp - Bronze
9436	54986-4001	Adjustable Arm
5900	60118-3002	Feeder Span Hanger

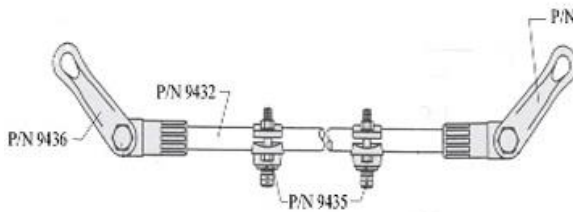
INSULATED HANGER SYSTEMS



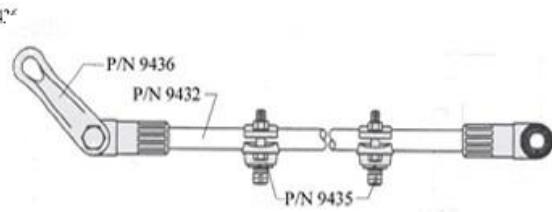
POSITIVE SPAN HANGER
CATALOG NO. 9420



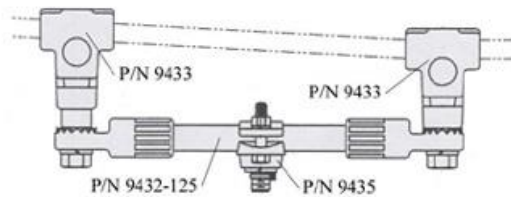
NEGATIVE SPAN HANGER
CATALOG NO. 9430



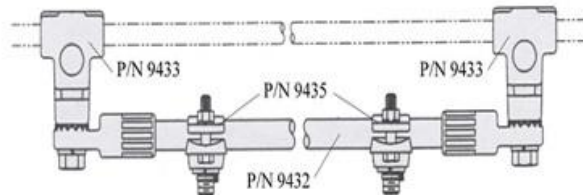
CURVE HANGER
CATALOG NO. 9440



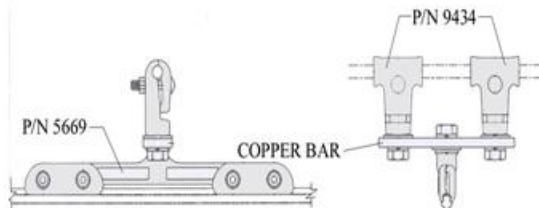
SINGLE CURVE HANGER
CATALOG NO. 9441



NON-ADJUSTABLE SPAN HANGER
CATALOG NO. 9451



TYPE PH-1 SPAN HANGER
CATALOG NO. 9452



FEEDER SPAN HANGER
CATALOG NO. 5900



TROLLEY WIRE
SUPPORT CLAMP
CATALOG NO. 9435



LIVE HANGER
SUPPORT
CATALOG NO. 9434

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ROD STYLE STRAIN INSULATORS



Used to dead-end guy and span wire where electrical insulation is required, and to suspend and insulate overhead frog and crossover assemblies.

Incorporating 5/8" or 7/8" diameter, epoxy-fiberglass rod, grade 10, and painted with gray alkyd paint. End fittings are made of malleable iron, HDG, and swaged to the ends of the rod. Minimum ultimate breaking strength 10,000 pounds and maximum working load 5,000 pounds.

Catalog No.	Impulse P/N	Rod Size	End Fittings
5850-XX.X	54985-6XXX	5/8"	Clevis and Clevis in Same Plane
7850-XX.X	54975-6XXX	7/8"	Clevis and Clevis in Same Plane
5851-XX.X	54984-6XXX	5/8"	Clevis and Clevis at Right Angle
7851-XX.X	54995-6XXX	7/8"	Clevis and Clevis at Right Angle
5852-XX.X	55263-6XXX	5/8"	Eye and Eye in Same Plane
7852-XX.X	56262-6XXX	7/8"	Eye and Eye in Same Plane
5853-XX.X	56261-6XXX	5/8"	Eye and Eye at Right Angle
7853-XX.X	56203-6XXX	7/8"	Eye and Eye at Right Angle
5854-XX.X	54961-6XXX	5/8"	Eye and Clevis in Same Plane
7854-XX.X	60360-6XXX	7/8"	Eye and Clevis in Same Plane
5855-XX.X	55289-6XXX	5/8"	Eye and Clevis at Right Angle
7855-XX.X	55339-6XXX	7/8"	Eye and Clevis at Right Angle

XX.X denotes the desired length in inches to 1/10 of an inch. Measurement to be the distance between the centerline of the clevis pin, or the outer edge of the inside of the eye - whichever is applicable.

Items with a clevis end can be provided with stainless steel rollers upon request.

Consult factory should you have any questions.

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INSULATOR YOKE – TYPE S



Catalog No 4245
 Shown in HDG Steel

Used in the installation of overhead construction in which stick insulators are required. Designed with 2 3/4” spacing between the center of the eyes to separate the insulators and equally distribute the load. Clevis bolt is fitted with spool to ease wire rope attachment. Standard yoke is manufactured of high strength bronze alloy, available in HDG steel upon request. Clevis rivet and cotter pin are stainless steel.

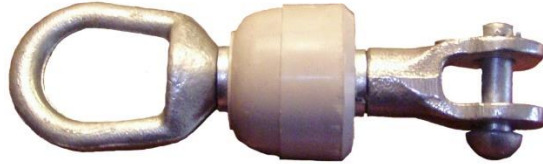
Catalog No.	Impulse P/N	Description	Wt./Ea.
4245	20189-2000	Insulator Yoke – Type S	1.50#



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STRAIN INSULATORS



9247



9247-2

Used to dead-end guy and span wire. Manufactured with any combination of eye, clevis, 5/8”-11 boss and 5/8”-11 stud. All end fittings are malleable iron, HDG. The Insulator is PHOENIX Catalog No. 8525 tested to 15,000 volts dielectric strength and 10,000 pounds pull (tensile) strength.

For units with double insulators place “-2” after the Catalog No. – see illustration above.

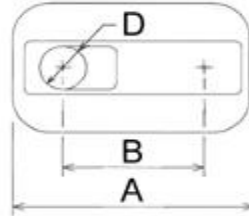
Catalog No.	Impulse P/N	End Fittings	Wt./Ea.
9243		Stud and Stud	1.06#
9244		Eye and Boss	1.25#
9245		Eye and Stud	1.41#
9246	22480-2000	Eye and Eye in Same Plane	1.65#
9246-90	24501-3002	Eye and Eye Perpendicular	1.65#
9247	22478-2000	Eye and Clevis in Same Plane	1.90#
9247-90	24499-3002	Eye and Clevis Perpendicular	1.90#
9248		Clevis and Boss	1.50#
9249		Clevis and Stud	1.68#
9250	22482-2000	Clevis and Clevis in Same Plane	2.10#
9250-90	24499-3003	Clevis and Clevis Perpendicular	2.10#
9253		Boss and Boss	1.23#

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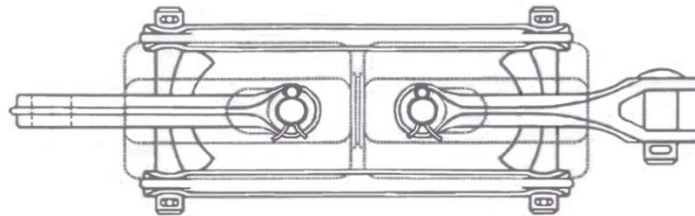
PORCELAIN STRAIN INSULATORS



Manufactured of skytone gray electrical grade wet ware porcelain.

Catalog No.	A	B	D	Overall Diameter	Ultimate Strength	ANSI Class	Wt./Ea.
6502	3 1/2"	1 3/4"	5/8"	2 1/2"	10000#	54-1	1.28#
6504	4 1/4"	2 5/8"	7/8"	2 7/8"	12000#	54-2	1.78#
6506	5 1/2"	3 1/8"	1"	3 3/8"	20000#	54-3	3.68#

PORCELAIN STRAIN INSULATOR ASSEMBLIES



Catalog No. 8631

Consist of two Porcelain Strain Insulators (Catalog No. 6504) clamped in a malleable iron, HDG, strain fitting. Clamp saddles are bronze alloy.

Maximum working load 6,000 pounds.

Catalog No.	Description	Wt./Ea.
8631	Complete Assembly- Eye & Clevis	7.25#
8636	Complete Assembly – Clevis & Clevis	7.25#
8637	Complete Assembly – Eye & Eye	7.25#
8632	Clevis Fitting - Only	1.0#
8633	Eye Fitting – Only	1.0#
8634	Intermediate Fitting – Only	1.8#
8634-1	Connecting Arm - Only	0.5#
8635	Shim (Saddle) Only - Bronze	0.3#

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INSULATED TURNBUCKLES

Used for dead-ending trolley wire and feeder cable and insulating messenger, guy and span wires. Incorporating PHOENIX Spool Insulator, Catalog No. 8525, and various combinations of eye, clevis, hook and stud fittings. All fittings are threaded 5/8"-11.



Catalog No.	Description	End Fittings	Wt./Ea.
7578	12" Insulated Turnbuckle	Eye and Eye	4.92#
8910	12" Insulated Turnbuckle	Hook and Eye	4.68#
9242	12" Insulated Turnbuckle	Eye and Clevis	4.72#
10050	12" Insulated Turnbuckle	Eye and Stud	4.75#
10057	12" Insulated Turnbuckle	Hook and Clevis	4.93#
10060	12" Insulated Turnbuckle	Hook and stud	4.80#

BULL RINGS



Manufactured of drop-forged steel, hot dip galvanized.

Catalog No.	Impulse P/N	Description
8911	18562-2000	3" X 5/8" – Ultimate Strength 18,000 Pounds
8912	18567-2000	3" X 3/4" – Ultimate Strength 25,000 Pounds

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FEEDER CABLE STRAIN CLAMPS



Manufactured of bronze, and all fasteners are HDG steel.

Catalog No.	Description	Feeder Cable Size	Wt./Ea.
5859	Feeder Cable Clamp with Clevis	1/0 to 500 MCM	3.19#
5860	Feeder Cable Clamp with Eye	4/0 to 500 MCM	1.60#
5861	Guy Wire Clamp with Eye	3/8" Guy Wire	1.65#
5862	Guy Wire Clamp with Clevis	3/8" Guy Wire	1.7#
8762	Feeder Cable Clamp with Eye	500 to 1000 MCM	2.6#
8483	Feeder Cable Clamp with Clevis	500 to 1000 MCM	2.9#

FEEDER CABLE DEAD END



Body and keeper are high strength bronze alloy, and cadmium plated. Cable is secured by eight (8) 1/2" HDG, steel machine bolts, lock washers and hex nuts.

Catalog No.	Description	Feeder Cable Size	Wt./Ea.
8628	Feeder Cable Dead End	500 to 700 MCM	9.9#
8629	Feeder Cable Dead End	750 to 1000 MCM	9.5#

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INSULATED FEEDER CABLE STRAIN CLAMPS



Catalog No. 1626



Catalog No. 8887

Body and keeper are high strength bronze alloy, and the four (4) steel square head machine bolts, lock washers and hex nuts are hot dipped galvanized. Boss is threaded 5/8"-11 and inclined at 20 degrees.

Working load 3,000 pounds (500 MCM), ultimate load 6,000 pounds.

Catalog No.	Description	Feeder Wire Size	Wt./Ea.
1626	Strain Clamp with 5/8"-11 Boss	1/0 to 500 MCM	2.0#
8887	Insulated Strain Clamp w/ Clevis	1/0 to 500 MCM	3.3#
8887-1	Insulated Strain Clamp w/ Eye	1/0 to 500 MCM	3.3#

END FITTINGS WITH 5/8"-11 BOSS



Catalog No. 9054



Catalog No. 9055

Catalog No.	Description
9052	5/8"-11 X 1 7/8" Stud – Stainless Steel
9053	5/8"-11 X 1 3/8" Stud - Stainless Steel
9054	Eye with 5/8"-11 Boss - Steel, HDG
9055-R	Clevis with 5/8"-11 Boss and Rivet – Malleable Iron, HDG

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THRU-BOLT FEEDER SUSPENSION CLAMP



Used to support feeder cable from any insulated hanger with a 5/8"-11 stud. Manufactured of malleable iron, hot dip galvanized, with a 5/8"-11 x 11/16" boss. The cable is secured in the clamp by a cover plate and carriage bolt, and may be installed without taking the clamp down or apart.

Catalog No.	Description	Feeder Sizes	Wt./Ea.
9260	Thru-Bolt Feeder Clamp	500 to 1590 MCM	0.9#

HORIZONTAL PIPE ADAPTERS AND PIPE CLAMPS



Horizontal Pipe Adapter
Catalog No. 7732



Pipe Clamp with Clevis
Catalog No. 7812

Manufactured of malleable iron, hot dip galvanized or bronze. Set screw, stud and U-bolts are 5/8" – 11, steel, hot dip galvanized.

Catalog No.	Impulse P/N	Description	Pipe Size	Wt./Ea.
8209	14356-2000	Horizontal Pipe Adapter	1 1/4"	2.05#
7732	12811-2000	Horizontal Pipe Adapter	1 1/2"	2.2#
7811	18802-2000	Horizontal Pipe Adapter	2"	2.2#
7810	56034-3001	Pipe Clamp w/ Stud	2"	3.0#
7812	55375-3001	Pipe Clamp w/ Clevis	2"	3.5#

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FEEDER CABLE TERMINALS, AND TEE CONNECTORS



TERMINAL



TEE CONNECTOR

PHOENIX Feeder Cable Terminals and Tee Connectors are manufactured of high strength bronze alloy and zinc chromate plated. All fasteners are stainless steel socket head set screws.

The design of these parts permits the user to field assemble any combination of terminals and tees to create a custom splicer or tee branch.

Catalog No. TERMINAL	Catalog No. TEE CONNECTOR	Feeder Cable Size	Wt./Ea.
7764	7764T	4/0 to 250 MCM	1.3#
7765	7765T	350 MCM	1.5#
7766	7766T	500 to 600 MCM	2.4#
7767	7767T	750 to 795 MCM	2.9#



Splicer made from two (2) PHOENIX Feeder Cable Terminals

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RAILBONDS AND CROSSBONDS

Manufactured from the best quality 61 strand, soft drawn, 4/0 copper wire. Terminals are crimped by hydraulic press and welded to assure maximum strength. Designed to be spot welded to the rail and may be reclaimed.



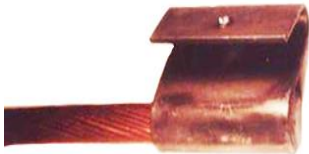
Catalog No. 4059



Catalog No. 4061



Catalog No. 4062



Catalog No.4063



Catalog No. 4064



Catalog No.4065

BOOTLEG BOXES

PHOENIX fabricates Boot Leg Boxes from ¼" plate steel for the back and base. The sides are cut from hot rolled steel channel beams and the tops are ¼" diamond pattern steel plate. All seams are welded their entire length and the completed unit is hot, dip galvanized. The tops are secured by four (4) countersunk, stainless steel machine screws and provided with pick holes.

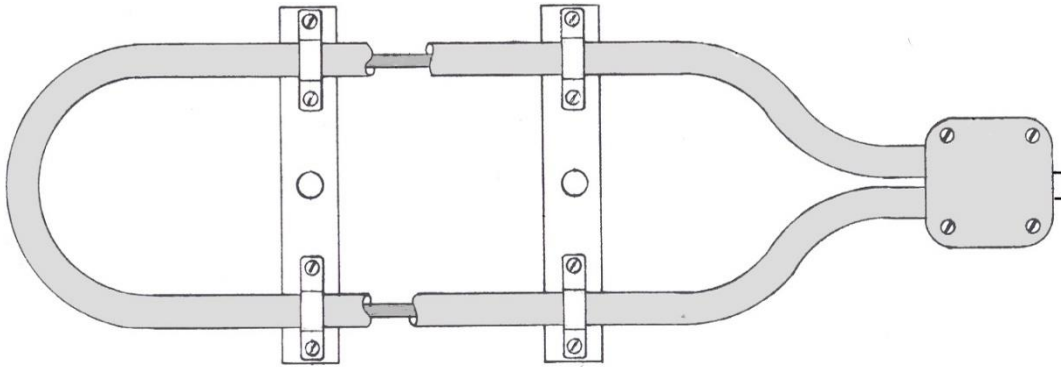
All boxes are made to order, per customer's drawing and specifications. Consult factory for complete details and pricing.

Catalog No.	Description – W x L x H
3811	Boot Leg Box – 8 ¼" x 10" x 7"
3812	Boot Leg Box – 8 ¼" x 10" x 6"
3813	Boot Leg Box – 8" x 10" x 6 ½"

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ICS ANTENNAE ASSEMBLY



Catalog No. 9450

Body is PVC, junction box is super tough nylon and supports are GPO-3 Grade Fiberglas. Junction box is filled with Polyester Resin. All incidental fasteners and clamps are stainless steel. Entire unit is painted with gray alkyd enamel paint. Overall length is 44 1/8 inches.

Catalog No.	Impulse P/N	Description	Wt./Ea.
9450	320310-4X	ICS Antennae Assembly	2.3#
9450-1		ICS Antennae Assembly with External Terminals	2.3#



Catalog No. 9450

Secured to trolley wire with two Type HS Trolley Wire Clamps – clamps must be ordered separately.

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PHOENIX MINING EQUIPMENT, INC. TERMS OF SALE AND WARRANTY

ACCEPTANCE: This document supersedes all other agreements, oral or written, and all other communications between parties suggesting additional or different terms. This represents the final and complete understanding of the parties and may be amended or cancelled only by written agreement signed by both parties. This agreement expressly limits acceptance to these terms; no order shall have any force or until acknowledged in writing by SELLER; and any proposal for different terms or any attempt by BUYER to vary the terms herein is hereby deemed material and rejected. BUYER's receipt of any portion of the goods shall constitute acceptance of this Agreement and all the terms and conditions.

TERMS OF PAYMENT: Net payment is due thirty (30) days from date of invoice. A late charge of 1% per month will be added to unpaid balances. BUYER shall reimburse seller for any and all costs incurred in collecting amounts past due.

INSECURITY: If SELLER shall have any reasonable grounds for insecurity with respect to BUYER's ability to make payments when due, SELLER may decline to provide goods to BUYER except upon full payment in advance.

RISK OF LOSS: All risk of loss or damage to goods shipped hereunder shall pass to BUYER upon delivery of goods to BUYER, to BUYER's designated agent, or to a carrier for delivery to BUYER whichever occurs first.

DELIVERY: All delivery dates are estimates. SELLER shall not be liable for any claim, loss, or expense of any kind whatsoever brought about by delays in delivery. BUYER shall inspect goods within ten calendar days following delivery and promptly notify SELLER in writing of any claim that goods are defective or that BUYER is rejecting goods.

IMPROVEMENT IN GOODS: Seller reserves the right, at any time, to make any changes or changes in the design or specifications of the goods, or any part thereof, which SELLER, in its sole discretion, believes will constitute an improvement in such goods or part thereof.

INDEMNIFICATION: If goods are manufactured in accordance with specifications, designs or other directions provided by BUYER, BUYER shall indemnify, defend and hold harmless SELLER against all claims, losses, liabilities, attorney's fees which SELLER may incur or become liable to pay with respect to such goods, including (without limitation) claims relating to noncompliance with any federal, state or local regulations and any and all third party claims relating to said goods. BUYER shall also indemnify and hold harmless SELLER against all claims, expenses, attorney's fees and expenses which SELLER may incur or become liable to pay which arise because of (1) Improper installation or storage (2) accident, damage, abuse or misuse (3) abnormal operating conditions or applications (4) applications or operating conditions above rated capacity of the goods (5) applications or operating conditions not made known or contemplated by SELLER at the time of sale or (6) use of goods varying in any degree from that for which the goods were designed.

FORCE MAJEURE: SELLER shall not be liable for any delay in or failure of performance due to any contingency beyond which SELLER has no reasonable control, including without limitation; an act of God: civil commotion; sabotage; labor dispute; fire or explosion; accident; inability to obtain suitable or sufficient labor, power or materials; delay of carrier; embargo; or any law, ordinance, rule or regulation whether valid or not.

TERMINATION AND RE-STOCKING CHARGES: Should BUYER cancel or terminate an order, for any reason, prior to shipment, BUYER shall pay to seller a Cancellation Charge equal to (1) all costs and expenses incurred by SELLER in regards to the cancelled order up to the date of cancellation plus (2) as liquidated damages and not as a penalty, an amount equal to 10% of the cancelled order. If BUYER wishes to return goods which have been received and accepted, BUYER must first receive written authorization to return the goods, and if approved will be charged a re-stocking fee of 25% of the sale price of the goods to the BUYER. All monies received for the order in excess of the 25% re-stocking charge will be returned to the BUYER in the form of a credit to be applied against future purchases, but must be exercised within one calendar year from date of issue.

ASSIGNMENT: This agreement is NOT assignable.

JURISDICTION: The laws of the State of Ohio shall be used to interpret this agreement.

WARRANTY AND LIMITATIONS

SELLER warrants to BUYER that (1) it has good title to the goods,(2) that goods will conform to all descriptions and specifications incorporated herein, and (3) the goods will be free of defects in materials and workmanship for a period of one year from the date of Seller's shipment of goods to BUYER. THESE ARE SELLER'S ONLY WARRANTIES. SELLER MAKES NO OTHER WARRANTY OF ANY KIND WHATSOEVER, EXPRESSED OR IMPLIED. SELLER'S liability to BUYER, or anyone claiming through BUYER, with respect to any claim or loss arising out a transaction with SELLER or alleged to have resulted from an act or omission of SELLER, whether in tort, contract, or otherwise, shall be limited to the repair or replacement of the goods or part thereof by SELLER. In no case will SELLER be liable for any bodily injury, death, or property damage resulting from or in any way arising out of the goods or their sale, use or manufacture. IN NO EVENT SHALL SELLER BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES, LOSSES OR EXPENSES ARISING OUT OF ANY TRANACTION WITH BUYER. If BUYER modifies or repaired goods, or if goods are not installed or used as SELLER intended, this WARRANTY is void.

PHOENIX MINING & TRANSIT SYSTEMS
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**PHOENIX MINING & TRANSIT SYSTEMS
CATALOG 2013**



CROSS REFERENCE GUIDE

Part 1: Impulse to PHOENIX

Part 2: PHOENIX to Impulse

Revised and Updated January 2019

**ADVISORY CONCERNING PART NUMBERS AND
CROSS REFERENCE**

This is a “GUIDE” only!

Please note that a single item can carry several Impulse part numbers – all of which may not be listed in this Cross Reference Guide or shown in this catalog. Further, Impulse has resurrected older (sometimes obsolete) part numbers and assigned them to new, current items, the result being one part number may represent two different items. It is highly recommended that if you are not familiar with PHOENIX products, or cannot find the part number you are looking for that you consult the factory.

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PART 1

CROSS REFERENCE GUIDE – IMPULSE to PHOENIX

IMPULSE	PHOENIX
00000-4443	9590-4
5440-2000	7314
5441-2000	7315
10432-2000	7320
10437-2000	7313
10441-2000	7317
10443-2000	7318
10446-2000	7319
10571-2000	5860
10572-2000	8762
11032-2000	7521
11160-2000	8122
11553-2000	7312
11811-2000	3126
11817-2000	3111
11933-2000	3092
12473-2000	8078
12474-2000	8079
12475-2000	8080
12591-2000	3112
12788-2000	7494
12790-2000	7495
12811-2000	7732
13722-2000	100245
13684-2000	8138
13853-3006	8001
13916-3013	8022
13916-3017	8020
13916-3030	8040
14072-2000	7484
14073-2000	7485
14228-2000	6024
14245-2000	3091
14356-2000	8209
14375-2000	7312
14573-4001	100403-2

IMPULSE	PHOENIX
14629-2000	8239
14644-2000	8010
14846-2000	9260
14497-3001	8629
15205-2000	7491
15275-2000	8628
15276-2000	8629
15277-2000	8631
15278-2000	8632
15279-2000	8633
15280-2000	8634
15333-2000	8629
15490-2000	8008
15573-2000	9055-R
15575-2000	9054
15964-2000	7547
16012-2000	1480
16095-3001	1810
16095-3003	1811
16103-2000	8009
16103-2000	8015
16146-2000	9160
16227-2000	5476
16351-3003	6024-3
16351-3004	6024
16373-3001	8016
16607-2000	9150
16608-2000	9157
16633-2000	8635
16685-2000	9155
16713-2000	8236
16786-2000	2000-4525
16787-2000	2000-3200
16788-2000	2000-2800
16789-2000	2000-2375
16790-2000	2000-2087

IMPULSE	PHOENIX
16792-2000	2000-1525
16794-2000	2000-1100
16795-2000	2000-0878
16796-2000	2000-5588
16799-2000	9523
16800-2000	9530
16801-2000	9533
16802-2000	9537
16831-2000	9622
16835-2000	8525
16865-2000	9545
16868-2000	2000-1975
16905-2000	9018
16907-2000	7540
16950-2000	2000-5225
16969-2000	9016
17278-3003	7540
17375-3033	2000-6369
17700-2000	7542
17702-2000	2010-0438
17703-2000	2010-1212
17704-2000	2010-3244
17705-2000	2000-6625
17706-2000	9414
17707-2000	9414-1
17708-2000	7708
17774-2000	9517
17775-2000	9527
17795-2000	9632
17797-2000	9634
17800-2000	9653
18143-2000	2010-1663
18144-2000	2000-3600
18145-2000	2000-4050
18146-2000	2000-4800
18147-2000	2000-10500

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18149-2000	2000-7850
18150-2000	2000-7500
18151-2000	2000-7050
18152-2000	2000-6250
18169-2000	9019
18210-2000	9624
18211-2000	9654
18232-2000	5910
18253-2000	4757
18254-2000	4751
18258-2000	2000-1450
18259-2000	2000-1712
18255-2000	4745
18256-2000	2000-1012
18257-2000	2000-1225
18261-2000	1021
18324-2000	2010-2100
18430-2000	4003
18442A	4890-1
18431-2000	4004
18437-2000	4790
18438-2000	4765
18516-3007	9131-1
18518-4002	9085
18519-3008	9132-1
18547-2000	8123
18553-2000	4002
18554-2000	4001
18562-2000	8911
18567-2000	8912
18617-2000	2010-2550
18618-2000	2010-0700
18619-2000	2010-3619
18620-2000	2010-4481
18624-2000	2010-2100
18625-2000	2010-2850

IMPULSE	PHOENIX
18626-2000	2010-4044
18627-2000	2010-5700
18628-2000	2010-5300
18630-2000	2010-8525
18663-2000	1200
18716-2000	5745-3R
18717-2000	5745-3L
18718-3001	4000
18802-2000	7811
18794-2000	9008
18795-2000	9009
18796-2000	9010
18869-2000	9535
18937-2000	9550
18938-2000	9560
18939-2000	2010-0575
18944-2000	5736-L
18945-2000	5736-R
19110-2000	2010-0825
19111-2000	2010-1025
19114-2000	2010-1425
19115-2000	2010-2200
19116-2000	2010-2275
19117-2000	2010-2400
19118-2000	2010-2650
19119-2000	2010-2750
19120-2000	2010-3150
19121-2000	2010-3387
19122-2000	2010-3500
19123-2000	2010-3700
19124-2000	2010-1550
19125-2000	2000-2412
19126-2000	2000-2675
19127-2000	2000-3000
19128-2000	2000-3400
19129-2000	2000-3987

IMPULSE	PHOENIX
19130-2000	2000-4125
19131-2000	2000-4250
19132-2000	2000-4575
19133-2000	2000-4750
19134-2000	2000-5075
19135-2000	2000-5325
19257-2000	2000-5850
19277-3003	1300-1075
19293-3007	5668
19305-3015	8525-78
19333-2000	9555
19345-2000	9652
19347-2000	9651
19360-2000	8220
19434	5908
19435	5909
19438-2000	5664
19439-2000	5666
19440-2000	5665
19441-2000	5667
19451-4002	9100
19455-3066	2000-6368
19456-3037	2010-4400
19456-3039	2010-4625
19503-2000	5730-1R
19504-2000	5730-1L
19505-2000	5745-3R
19506-2000	5745-3L
19540-2000	5723-3L
19542-2000	5923-1R
19545-2000	5923-1L
19575-4001	9772-1
19655-2000	9413
19660-2000	1621
19662-2000	1390
19663-2000	1400

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19664-2000	1410
19665-2000	1420
19666-2000	1500
19746-2000	5745-LE
19775-2000	9171-PC
19776-2000	9072-PC
19777-2000	9071-PS
19778-2000	9072-PS
19879-2000	5668
19880-2000	5669
20134-2000	9031
20135-2000	9031
20136-2000	9032
20137-2000	9032
20189-2000	4245
20215-2000	5745-2
20228-2000	9071
20229-2000	9072
20288-2000	1490
20290-2000	9761
20291-2000	9762
20293-2000	9763
20294-2000	9771
20295-2000	9772
20296-2000	9773
20297-2000	9774
20305-3011	9031
20305-3012	9032
20343-2000	9031-1
20344-2000	9032-1
20359-2000	1620
20560-2000	8525-LS
20658-2000	9030-1
20660-2000	9030
20661-2000	9030
20700-2000	5945-1R

IMPULSE	PHOENIX
20701-2000	5945-1L
20708-2000	9070-L
20707-2000	9070-R
20737-2000	5917
20747-2000	9436
20748-2000	9642
20749-2000	9644
20754-2000	9017
20770-2000	9014
20771-2000	9015
20795	5917L
20965-2000	5923-5R
20966-2000	5923-5L
20984-2000	5945-2
20985-2000	5930-5R
20986-2000	5930-5L
21023-2000	2000-6675
21028-2000	5915
21085-2000	2000-7475
21086-2000	2000-4887
21087-2000	2000-5537
21088-2000	5671
21089-2000	4245
21095-2000	5923-3R
21096-2000	5923-3L
21101-2000	5930-3R
21102-2000	5930-3L
21103-2000	5945-3R
21104-2000	5945-3L
21105-2000	5623-2
21106-2000	5925-2
21108-2000	5930-2
21109-2000	5930-4
21109-2000	5923-4
21110-2000	5945-4
21113-2000	2000-6825

IMPULSE	PHOENIX
21204-2000	2000-0750
21205-2000	2000-1887
21206-2000	2000-10625
21207-2000	2000-9200
21213-2000	2000-5181
21215-2000	2010-1194
21216-2000	2010-1331
21217-2000	2010-2150
21218-2000	2010-2456
21219-2000	2010-2912
21220-2000	2010-3300
21221-2000	2010-8644
21222-2000	2010-7212
21224-2000	2010-4556
21225-2000	2010-3100
21226-2000	2010-1744
21227-2000	2010-1500
21231-2000	2010-4444
21232-2000	2010-1044
21250-2000	2010-4875
21251-2000	2010-3187
21252-2000	2010-3463
21326-2000	7548
21361-2000	2010-3650
21375-2000	9712-6
21376-2000	9727-8
21377-2000	9747-9
21417-2000	9421
21418-2000	9422
21462-2000	1430
21463-2000	1440
21465-2000	1460
21466-2000	1350
21467-2000	1300-0550
21468-2000	1310
21473-2000	1240

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21474-2000	1230
21475-2000	1610
21476-2000	1670
21477-2000	1630
21483-2000	1650
21454-2000	5911
21501-2000	1370
21509-2000	1018
21510-2000	1019
21508-2000	1020
21540-2000	4930
21542-2000	1385
21543-2000	1380
21545-2000	1640
21548-2000	100423
21550-2000	8220-3
21558-2000	4921
21559-2000	1360
21584-2000	2020-0650
21585-2000	1660
21682	2540
21728-4001	3093
21728-4001	3094
21880-2000	2010-4300
21893-2000	5916
22096-2000	9773
22096-3020	2010-1194
22096-3022	2010-2150
22139-4001	5945-5R
22139-4001	5923-5R
22139-4002	5945-5L
22139-4002	5923-5L
22240-2000	9419-9
22262-2000	5818
22270-2000	9147
22271-2000	9033

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22272-2000	9034
22290-2000	9416
22301-3017	9805-15
22301-3018	9912-1
22301-3019	9805
22301-3020	9912-6
22302-3007	9813-15
22302-3008	9927-1
22302-3009	9813
22302-3009	9813
22302-3010	9927
22303-3007	9828-15
22303-3008	9828
22303-3009	9947
22398-2000	4925
22400-2000	4924
22405-2000	4920
22430-2000	1475
22432-2000	1450
22433-2000	9602
22442-2000	9515-M
22444-2000	2316
22446-2000	2330
22447-2000	2305
22448-2000	2310
22449-2000	2332
22450	2335
22451-2000	2315
22451-4001	2330-2
22454-2000	9260
22455-2000	9260
22478-2000	9247
22480-2000	9246
22482-2000	9250
22484-2000	9405
22543-2000	4922

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22547-2000	4926
22548-2000	4929
22549-2000	4901
22550-2000	4903
22798-2000	5859
22799-2000	8483
22901-3001	5915
22902-4001	5916
23133-3004	5914-1
23720-3003	9604
23774-4003	4923
23774-4005	4924
23981-2000	2330-1
23985-4002	2311
24001-3007	2101
24499-3002	9247-90
24499-3003	9250-90
24501-3002	9246-90
30504-3060	6504
31502-3060	6502
31506-3060	6506
52110-3001	10050
54205-3001	5672
54427-3001	7813
54671-3001	4902
54671-3002	4928
54674-3003	9400-03
54674-3004	9400-04
54674-3005	9402-05
54674-3006	9402-06
54936-3001	9430
54936-3005	9433
54936-3006	9434
54937-3001	9420
54944-3001	9154
54950-3001	9612

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IMPULSE	PHOENIX
54950-3002	9614
54960-6160	7850-160
54960-6175	7850-175
54960-7002	7850-160
54960-7004	7850-175
54961-6XX	5854-XXX
54961-6127	5854-125
54961-6195	5854-195
54962-3001	9440
54962-3002	9441
54962-3003	9435
54975-6XX	7850-XXX
54975-6121	7850-121
54980-6385	9432
54982-3001	5917
54982-3002	5917-3
54982-3003	5917-3
54982-3008	5917-8
54982-3009	5919-9
54984-6XX	5851-XXX
54985-6XX	5850-XXX
54986-4001	9436
54990-6265	5850HS-265
54995-6XX	7851-XXX
54999-3001	9452
55011-3001	9451
55016-3001	5919
55015-3002	5918
55016-3002	5914
55022-3002	9511
55024-4001	9407
55025-3001	9400
55025-3002	9402
55025-3003	9500
55025-3004	9502
55025-3005	9406

IMPULSE	PHOENIX
55028-3001	9021
55029-3001	9020
55030-3001	9401
55030-3002	9403
55070	100244
55070-4201	9410
55070-4202	9510
55070-4205	9310
55263-6XX	5852-XXX
55289-6XX	5855-XXX
55339-6XX	7855-XXX
55375-3001	7812
56593-3001	5945-RE
55629-6150	5852HS-150
55706-6150	5855HS-150
55755-3001	9705
55790-6150	5850-150
55888-3001	9770
55888-3001	9770J
55901-3001	9530
55902-3001	9545
55903-3001	9560
55904-3001	9590X
55959-3001	5723-RE
55959-3002	5723-LE
55961-3001	5923-LE
55964-3001	6015-RE
55965-3001	4890-3
55965-3003	4890-1
55965-3006	4890-2
55966-3010	4860-1
55966-3002	4860-2
55967-3001	4845-3
55967-3002	4845-1R
55967-3003	4845-2L
55967-3009	4845-1

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55979-3002	5715-L-02
55979-3011	6015-R-11
55979-3012	6015-L-12
55981-3002	5715-R-02
55981-3009	5715-R
55981-3010	5715-L
55983-4001	9590-X
55991-4001	9545
55992-4001	9560
55993-4001	9530
56024-3001	100286
56592-3001	5745-R
56592-3002	5745-L
56645-3001	1925
56956-3001	5730-R
56595-3009	5945-R
56595-3010	5945-L
56596-3002	5730-L
56597-3001	5930-R
56597-3002	5930-L
56597-3014	5730-L
56034-3001	7810
56034-3002	7814
56034-4001	7810-1
56062-3002	100271
56088-4002	200250
56088-4004	200375
56203-6XX	7853-XXX
56212-3001	9523M
56261-6XX	5853-XXX
56262-6XX	7852-XXX
56273-6160	7850-160
56358-3001	8220-5
56388-4006	9305
56389-3001	9301

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56391-4001	9405
56489-3001	100073
56489-3002	100073-E
56551-4001	9505
56569-3001	9703-360
56569-3002	9703-720
56569-3003	9703-245
56569-3004	9703-430
56574-3001	100291
56574-3002	100293
56590-XXX	9418-XXX
56591-XXX	9419-XXX
56592-3001	5745-R
56592-3002	5745-L
56593-3001	5945-RE
56593-3002	5945-LE
56595-3009	5945-R-09
56595-3010	5945-L-10
56596-3001	5730-R-01
56596-3002	5730-L-02
56597-3001	5930-R-01
56597-3002	5930-L-02
56626-4003	100290
56626-4004	100290-5
55629-6150	5852HS-151
56645-3001	1925
56648-3001	100073-1
56909-3001	100121
56909-3002	100569
56909-3010	100420
57123-3001	5936-R
57123-3002	5936-L
57183-3004	100424-200
57183-3006	100424-150
57191-3003	9550

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57194	4870
57201-3001	9416
57234-3001	2714
57262-4001	4005
57564-3002	100300
57695-4001	100800
57823-8080	9702
57857	4850-1
57857	4850-2
57904-3001	5745-RE
57904-3002	5745-LE
57917	2541
58686-3001	2203
58686-3002	2208
58686-3003	2210
58686-3004	2215
58686-3005	2230
58686-3006	2205
58821-6121	5850-121R
58849	4823
58862-3005	4837
58887-3004	100416
58960-6115	7850-115
59018-2000	9570
59059	4875
59290	4827
59290-3001	1827
59687-3001	100423
59902-3001	9545
56909-3001	100121-157
56909-3002	100121-125
56909-3003	100121-164
56909-3004	100121-135
56909-3005	100121-130
59971-3001	201375
59971-3002	201500

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60009-3001	4855-1
60009-3003	4855-2
60016-3001	9550
60017-3001	9555
60018-3001	9570
60019-3001	9535
60020-3001	9540
60021-3001	5476
60118-3002	5900
60188-3001	100247
60301-3001	2815
60304-3001	2823
60354-3001	1850
60355-3001	2827
60356-3001	2835
60357-3001	2840
60358-3001	2845
60359-3001	2855
60360-6XX	7854-XXX
60376-3001	9403-10
60401-3001	1830
60437-3002	7486
60651-3001	7709
60743-3001	2890
60779	100404
60890-3001	1823
61033-3001	1890-A
69072-3001	9646
69072-3002	9648
70709-2000	100244
86661-2000	100246
93734	100251
95683-3006	100288
95683-3008	100283
95683-3015	10315
95683-3032	10319

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320310-4X	9450
673658	4835
673659	4840
674210	100263
674754	100264
675884	1845
675685	9014
675686	9015
675882	1855
675883	1840
675884	1845
675885	1835
675878	2850
675888	9028
675879	2860
675880	2870
675881	2875
675888	9028
675889	9039
675890	2823
677427	7427
678316	100403-1
679446	100044
691837	8225
694206-3001	OTC-34T
700340-2	100259

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1018	21509-2000
1019	21510-2000
1020	21508-2000
1021	18261-2000
1200	18663-2000
1230	21474-2000
1240	21473-2000
1300-0600	21467-2000
1300-1075	19227-3003
1310	21468-2000
1350	21466-2000
1360	21559-2000
1370	21501-2000
1380	21543-2000
1385	21542-2000
1390	19662-2000
1400	19663-2000
1410	19664-2000
1420	19665-2000
1430	21462-2000
1440	21463-2000
1450	22432-2000
1460	21465-2000
1475	22430-2000
1480	16012-2000
1490	20288-2000
1500	19666-2000
1610	21475-2000
1620	20359-2000
1621	19660-2000
1630	21477-2000
1640	21545-2000
1650	21483-2000
1660	21585-2000
1670	21476-2000
1810	16095-3001

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1811	16095-3003
1823	60890-3001
1827	59290-3001
1830	60401-3001
1835	675885
1840	675883
1845	675884
1850	60354-3001
1855	675882
1890-A	61033-3001
1925	56645-3001
2000-0750	21204-2000
2000-0878	16795-2000
2000-1012	18256-2000
2000-1100	16794-2000
2000-1225	18257-2000
2000-1450	18258-2000
2000-1525	16792-2000
2000-1712	18259-2000
2000-1887	21205-2000
2000-1975	16868-2000
2000-2087	16790-2000
2000-2412	19125-2000
2000-2675	19126-2000
2000-2800	16788-2000
2000-3000	19127-2000
2000-3200	16787-2000
2000-3400	19128-2000
2000-3600	18144-2000
2000-3987	19129-2000
2000-4050	18145-2000
2000-4125	19130-2000
2000-4250	19131-2000
2000-4525	16786-2000
2000-4575	19132-2000
2000-4750	19133-2000

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2000-4800	18146-2000
2000-4887	21086-2000
2000-5075	19134-2000
2000-5181	21213-2000
2000-5225	16950-2000
2000-5325	19135-2000
2000-5538	21087-2000
2000-5588	16796-2000
2000-5850	19257-2000
2000-6250	18152-2000
2000-6368	17375-3033
2000-6368	19455-3066
2000-6625	17705-2000
2000-6675	21023-2000
2000-6825	21113-2000
2000-7050	18151-2000
2000-7475	21085-2000
2000-7500	18150-2000
2000-7850	18149-2000
2000-9200	21207-2000
2000-105	18147-2000
2000-10625	21206-2000
2010-0438	17702-2000
2010-0575	18939-2000
2010-0700	18618-2000
2010-0825	19110-2000
2010-1025	19111-2000
2010-1044	21232-2000
2010-1194	21215-2000
2010-1194	22096-3020
2010-1212	17703-2000
2010-1331	21216-2000
2010-1425	19144-2000
2010-1500	21227-2000
2010-1550	19124-2000
2010-1663	18143-2000

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2010-2100	18624-2000
2010-2150	21217-2000
2010-2150	22096-3022
2010-2200	19155-2000
2010-2275	19116-2000
2010-2400	19117-2000
2010-2456	21218-2000
2010-2550	18617-2000
2010-2650	19118-2000
2010-2750	19119-2000
2010-2850	18625-2000
2010-2912	21219-2000
2010-3100	21225-2000
2010-3150	19120-2000
2010-3187	21251-2000
2010-3244	17704-2000
2010-3300	21220-2000
2010-3387	19121-2000
2010-3463	21252-2000
2010-3500	19122-2000
2010-3619	18619-2000
2010-3650	21361-2000
2010-3700	19123-2000
2010-4044	18626-2000
2010-4300	21880-2000
2010-4400	19456-3037
2010-4444	21231-2000
2010-4481	18620-2000
2010-4556	21224-2000
2010-4619	19456-3038
2010-4625	19456-3039
2010-4875	21250-2000
2010-5300	18628-2000
2010-5700	18627-2000
2010-7212	21222-2000

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2010-8525	18630-2000
2010-8644	21221-2000
2020	21584-2000
2203	58686-3001
2205	58686-3006
2208	58686-3002
2210	58686-3003
2215	58686-3004
2230	58686-3005
2305	22447-2000
2310	22448-2000
2311	23985-4002
2315	22451-2000
2316	22444-2000
2330	22446-2000
2330-1	23981-2000
2330-2	22451-4001
2332	22449-2000
2335	22450
2401	24001-3007
2540	21682
2541	57917
2714	57234-3002
2815	60301-3001
2823	60304-3001
2823	675890
2827	60335-3001
2835	60356-3001
2840	60357-3001
2845	60358-3001
2850	675878
2855	60359-3001
2860	675879
2870	675880
2875	675881
2890	60743-3001

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3091	14245-2000
3092	11933-2000
3093	21728-4001
3094	21728-4001
3111	11817-2000
3112	12591-2000
3126	11811-2000
4000	18718-3001
4001	18554-2000
4002	18553-2000
4003	18430-2000
4004	18431-2000
4005	18718-2000
4005	57262-4001
4245	20189-2000
4745	18255-2000
4751	18254-2000
4757	18253-2000
4765	18438-2000
4790	18437-2000
4823	58849
4827	59290
4830	55968
4835	673658
4837	58862-3005
4840	673659
4845-1	55967-3009
4845-1L	55967-3003
4845-1R	55967-3002
4845-2	55967-3003
4845-3	55967-3001
4850-1	57857
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4855-1	60009-3001
4855-2	60009-3003
4860-1	55966-3010

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4870	57194
4875	59059
4890-1	18442A
4890-1	55965-3003
4890-2	55965-3006
4890-3	55965-3001
4901	22549-2000
4902	54671-3001
4903	22550-2000
4920	22405-2000
4921	21558-2000
4922	22543-2000
4923	23774-4003
4924	22400-2000
4924	23774-4005
4925	22398-2000
4926	22547-2000
4928	54671-3002
4929	22548-2000
4930	21540-2000
5476	16227-2000
5476	60021-3001
5664	19438-2000
5665	19440-2000
5666	19439-2000
5667	19441-2000
5668	19879-2000
5668	19293-3007
5669	19880-2000
5671	21088-2000
5672	54205-3001
5715-L	55981-3002
5715-L	55981-3010
5715-R	55981-3001
5715-L	55981-3009

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5715-R-09	55981-3009
5723-LE	55959-3002
5723-RE	55959-3001
5723-1L	19545
5723-1R	19542
5723-3L	19540-2000
5730-L	56596-3002
5730-R	56596-3001
5730-1L	19503-2000
5730-1R	19504-2000
5730-3L	18718-2000
5730-R-01	56596-3001
5736-L	57123-3002
5736-L	18944-2000
5736-R	57123-3001
5736-R	18945-2000
5745-LE	19746-2000
5745-LE	57904-3002
5745-L	56592-3002
5745-R	56592-3001
5745-RE	57904-3001
5745-3L	18717-2000
5745-3R	18716-2000
5745-2	20215-2000
5745-3L	19506-2000
5745-3R	19505-2000
5850-XXX	54985-6XXX
5850-121R	58821-6121
5850-150	55709-6150
5850HS-265	54990-6265
5851-XXX	54984-6XXX
5852-XXX	55263-6XXX
5852HS-150	55629-6150
5853-XXX	56261-6XXX
5854-XXX	54961-6XXX
5854-125	54961-6127

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5854-195	54961-6195
5855-XXX	55289-6XXX
5855HS-150	55706-9150
5859	22798-2000
5860	10571-2000
5861	10571-2000
5900	60118-3002
5908	19434
5909	19435
5910	18232-2000
5911	21584-2000
5915	21028-2000
5915	22901-3001
5916	21893-2000
5916	22902-4001
5917	20737-2000
5917	54982-3001
5917L	20795-2000
5917L	54982-3002
5917-3	54982-3003
5917-8	54982-3008
5917-9	54982-3009
5918	22262-2000
5918	55016-3002
5919	55016-3001
5923-LE	55961-3001
5923-1L	19545-2000
5923-1R	19542-2000
5923-2	21105-2000
5923-3L	21096-2000
5923-3R	21095-2000
5923-4	21109-2000
5923-5L	20966-2000
5923-5L	22139-4002
5923-5R	20965-2000
5923-5R	22139-4001

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5925-2	21106-2000
5930-L	56597-3002
5930-LE	56425-3006
5930-R	56597-3001
5930-1L	19504-2000
5930-1R	19503-2000
5930-2	21108-2000
5930-3L	21102-2000
5930-3R	21101-2000
5930-4	21109-2000
5930-5L	20986-2000
5930-5R	20985-2000
5945-L	56592-3002
5945-LE	56593-3002
5945-R	56592-3001
5945-RE	56593-3001
5945-1L	20701-2000
5945-1R	20700-2000
5945-2	20984-2000
5945-3L	21104-2000
5945-3R	21103-2000
5945-4	21110-2000
5945-5L	22139-4002
5945-5R	22139-4001
6015-L-12	55979-3012
6015-R-11	55979-3011
6015-RE	55964-3001
6024	14228-2000
6024	16351-3004
6024-3	16351-3003
6502	31502-3060
6504	30504-3060
6506	31506-3060
7312	11553-2000
7312	14375-2000
7313	10437-2000

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7314	5440-2000
7315	5441-2000
7317	10441-2000
7318	10443-2000
7319	10446-2000
7320	10432-2000
7427	677427
7484	14072-2000
7485	14073-2000
7486	60437-3002
7491	15205-2000
7494	12788-2000
7495	12790-2000
7521	11032-2000
7540	17278-3003
7540	16917-2000
7542	17700-2000
7547	15964-2000
7548	21326-2000
7708	17708-2000
7709	60651-3001
7732	12811-2000
7810	56034-3001
7810-1	56034-4001
7811	18802-2000
7812	55375-3001
7814	56034-3002
7850-115	54960-6115
7850-121	54975-6121
7850-160	54960-6160
7850-160	54960-6060
7850-160	54960-7002
7850-175	54960-6175
7850-175	54960-7004
7850-XXX	54975-6XXX
7851-XXX	54995-6XXX

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7852-XXX	56262-6XXX
7853-XXX	56203-6XXX
7854-XXX	60360-6XXX
7855-XXX	55339-6XXX
8001	13853-3006
8008	15490-2000
8009	16103-2000
8010	14644-2000
8015	16103-2000
8016	16373-3001
8020	13916-3017
8022	13916-3013
8040	13916-3030
8078	12473-2000
8079	12474-2000
8080	12475-2000
8122	11160-2000
8123	18547-2000
8138	13684-2000
8209	14356-2000
8220	19360-2000
8220-3	21550-2000
8220-5	56538-3001
8225	691837
8236	16713-2000
8239	14629-2000
8483	22799-2000
8525	16835-2000
8525-78	19305-3015
8525-LS	20560-2000
8628	15275-2000
8629	14497-3001
8629	15276-2000
8631	15277-2000
8632	15278-2000
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8634	15280-2000
8635	16633-2000
8762	10572-2000
8911	18562-2000
8912	18567-2000
9008	18794-2000
9009	18795-2000
9010	18796-000
9014	20770-2000
9014	675685
9015	20771-2000
9015	675686
9016	16969-2000
9017	20754-2000
9018	16905-2000
9019	18169-2000
9020	55029-3001
9021	55028-3001
9028	675888
9030	20660-2000
9030	20661-2000
9030-1	20658-2000
9031	20134-2000
9031	20135-2000
9031	20305-3011
9031-1	20343-2000
9032	20305-3012
9032	20136-2000
9032	20137-2000
9032-1	20344-2000
9033	22271-2000
9034	22272-2000
9035	22273-2000
9039	675889
9054	15575-2000
9055-R	15573-2000

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9070/L	20708-2000
9070/R	20707-2000
9071	20228-2000
9071-P/C	19775-2000
9071-P/S	19777-2000
9072	20229-2000
9072-P/C	19776-2000
9072-P/S	19778-2000
9032-1	20343-2000
9085	18518-4002
9100	19451-4002
9131-1	18516-3007
9132-1	18519-3008
9147	22270-2000
9150	16607-2000
9154	54944-3001
9155	16685-2000
9157	16608-2000
9160	16146-2000
9142-6	95683-3006
9246	22480-2000
9246-90	24501-3002
9247	22478-2000
9247-90	24499-3002
9250	22482-2000
9250-90	24499-3003
9260	14846-2000
9260	22454-2000
9260	22455-2000
9300	56389-3003
9301	56389-3001
9305	56388-4006
9310	55070-4205
9400	55025-3001
9400-03	54674-3003
9400-04	54674-3004

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9401	55030-3001
9402	55025-3002
9402-05	54674-3005
9402-06	54974-3006
9403	55030-3002
9403-10	60376-3001
9405	22484-2000
9405	56391-4001
9406	55025-3005
9407	55024-4001
9410	55070-4201
9413	19655-2000
9414	17706-2000
9414-1	17707-2000
9416	22290-2000
9416	57201-3001
9418-XXX	56590-XXX
9419-9	22240-2000
9419-XXX	56591-XXX
9420	54937-3001
9421	21417-2000
9422	21418-2000
9430	54936-3001
9432	54980-6385
9433	54936-3005
9434	54936-3006
9435	54962-3003
9436	20747-2000
9436	54986-4001
9440	54962-3001
9441	54962-3002
9450	320310-4X
9451	55011-3001
9452	54999-3001
9500	55025-3003
9502	55025-3004

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9510	55070-4202
9511	55022-3002
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9517	17774-2000
9523	16799-2000
9527	17775-2000
9530	16800-2000
9530	55901-3001
9530	55993-4001
9533	16801-2000
9535	18869-2000
9535	60019-3001
9537	16802
9537	58862-3005
9540	60020-3001
9545	16865-2000
9545	55991-4001
9545	59902-3001
9550	18937-2000
9550	57191-3003
9550	60016-3001
9555	19333-2000
9555	60017-3001
9560	18938-2000
9560	55903-3001
9560	55992-4001
9570	59018-2000
9590-X	55983-4001
9590-X	55904-3001
9590-4	00000-4443
9602	22433-2000
9602	69072-3001
9604	23720-3003
9612	54950-3001
9614	54950-3002

PHOENIX	IMPULSE
9622	16831-2000
9624	18210-2000
9632	17795-2000
9634	17797-2000
9642	20748-2000
9644	20749-2000
9646	69072-3001
9648	69072-3002
9651	19347-2000
9652	19345-2000
9653	17800-2000
9654	18211-2000
9702	57823-8080
9703-245	56569-3003
9703-360	56569-3001
9703-430	56569-3004
9703-720	56569-3002
9705	55755-3001
9712-6	21375-2000
9727-8	21376-2000
9747-9	21377-2000
9761	20290-2000
9762	20291-2000
9763	20293-2000
9770	55888-2000
9770J	55888-3001
9771	20294-2000
9772	20295-2000
9772-1	19575-4001
9773	20296-2000
9774	20297-2000
9805	22301-3019
9805-15	22301-3017
9813	22302-3009
9813-1	22302-3011
9813-15	22302-3007

PHOENIX	IMPULSE
9828	22303-3008
9828-15	22303-3007
9912-1	22301-3018
9912-6	22301-3020
9927	22302-3010
9927-1	22302-3008
9947	22303-3009
10050	52110-3001
10315	95683-3015
10316	95683-3018
10319	95683-3032
100044	679466
100073	56489-3001
100073-1	56648-3001
100073-E	56489-3002
100121-125	56909-3002
100121-130	56909-3005
100121-135	56909-3004
100121-157	56909-3001
100121-164	56909-3003
100124	55070
100244	70709-2000
100245	13722-2000
100246	86661-2000
100247	60188-3001
100251	93734
100259	700340-2
100263	674210
100264	674754
100271	56062-3002
100283	95683-3008
100286	56024-3001
100288	95683-3006
100290	56626-4003
100293	56574-3002
100290-5	56626-4004

PART 2

CROSS REFERENCE GUIDE – PHOENIX to IMPULSE

PHOENIX	IMPULSE
100291	56574-3001
100300	57564-3002
100403-1	678316
100403-2	14573-4001
100404	60799
100416	58887-3004
100420	56909-3010
100423	59687-3001
100424-150	57183-3006
100424-200	57183-3004
100569	See 100121
100800	57695-4001
200250	56088-4002
200375	56088-4004
201375	59971-3001
201500	59971-3002
OTC-34T	694206-3001

