PT 1000™

HIGH-PERFORMANCE REAR LOADER

SERVICE MANUAL

ISSUED APRIL 2016

TP1PT1-SM-0416

Environmental Solutions Group
201 W. Main Street, Ste 300
Chattanooga, TN 37408
Heil Customer Care: 866.275.4345

WARNING

IF INCORRECTLY USED, THIS EQUIPMENT CAN CAUSE SEVERE INJURY. THOSE WHO USE AND MAINTAIN THE EQUIPMENT SHOULD BE TRAINED IN ITS PROPER USE, WARNED OF ITS DANGERS, AND SHOULD READ AND FULLY UNDERSTAND THIS ENTIRE MANUAL BEFORE ATTEMPTING TO SET UP, OPERATE, ADJUST OR SERVICE THE EQUIPMENT. KEEP THIS MANUAL FOR FUTURE REFERENCE

IMPORTANT SAFETY NOTICE

Proper service and repair are important to the safe, reliable operation of the Heil Co.'s products. Service procedures recommended by Heil are described in this service manual and are effective for performing service operations. Some of these service operations may require the use of tools or blocking devices specially designed for the purpose. Special tools should be used when and as recommended. It is important to note that some warnings against the use of specific methods that can damage the product or render it unsafe are stated in the service manual. It is also important to understand these warnings are not exhaustive. Heil could not possibly know, evaluate and advise the service trade of all conceivable ways in which service might be done or of the possible hazardous consequences of each method. Consequently, Heil has not undertaken any such broad evaluations. Accordingly, anyone who uses service procedures or tools which are not recommended by Heil must first satisfy himself thoroughly that neither his safety nor the product safety will be jeopardized by the method he selects.

"Heil Environmental, as manufacturer of the equipment that is covered by this manual, is providing a product to the user who has acknowledged to have superior knowledge of the conditions of the use to which the product will be put. Heil Environmental relies upon the user's superior knowledge in specifying any changes or modifications including, but not limited to, the inclusion or non inclusion of options that are required by the user and the Heil product, and for the particular application of the user relative to the Heil product."

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SECTION 1
GENERAL INFORMATION

PT 1000™
General Information

INTRODUCTION

The following sections are a guide for maintenance and service of the Heil unit. The sections cover preventive maintenance, adjustment, and troubleshooting hints. Before performing maintenance, check the work area carefully to find all the hazards present and make sure all necessary safeguards or safety devices are used to protect all persons and equipment involved. In order to diagnose a problem quickly and effectively, a service person must be thoroughly familiar with the machine.

This section explains the system and its major components. Diagrams and schematics of the electrical and hydraulic systems are in the Service Manual Schematics section.

NOTICE

For CNG units, this Service Manual should be used in conjunction with any associated CNG System Manufacturer's Operation and Maintenance Manuals. Always read and understand all associated manuals alongside the Heil Parts and Service Manual and Heil Operation Manual before operating or servicing the unit.

IMPORTANT!

- Before starting any maintenance, study this section of the manual.
- Read all hazard warnings and decals on the unit.
- Clear the area of other persons before performing any maintenance.
- Know and understand safe use of all controls.
- It is your responsibility to understand and follow manufacturer’s instructions on equipment and care.

SERVICE/PARTS ASSISTANCE

Assistance in troubleshooting repair and service is available by contacting the authorized Heil Dealer in your area. Parts are available at your Heil Dealer or through Heil. Heil personnel are trained to give prompt, professional assistance.

ALWAYS give the unit serial number in all correspondence relating to the equipment.

See the back cover of this manual for Heil contact information.

PRECAUTIONARY STATEMENTS

Listed below are the definitions for the various levels of hazards. It is important that the operators of this equipment and people who service units read and understand all warnings as they relate to this equipment operation.

- **DANGER** – indicates a hazardous situation, which if not avoided WILL result in DEATH or SERIOUS INJURY if you do not follow proper instructions.
- **WARNING** – indicates a hazardous situation, which if not avoided COULD result in DEATH OR SERIOUS INJURY if you do not follow proper instructions.
- **CAUTION** – indicates a hazardous situation, which if not avoided COULD result in MINOR to MODERATE INJURY if you do not follow proper instructions.
- **NOTICE** – addresses practices not related to personal injury, such as property damage or damage to the equipment.

The following warnings are generally in the Operator's Manual for each specific unit or are generic safety messages if an Operator's Manual does not have these safety messages. Other safety alert messages may be in other sections of the Parts and Service Manual or in an Operator's Manual. You must read and obey all safety alert messages in any manual produced by Heil to support your unit.

⚠ WARNING

Failure to follow all instructions and safety precautions in this manual, in the Service Manual, in other manufacturer's manuals and on the safety decals attached to the product could result in serious injury or death to operators or bystanders and/or damage to property. Do not operate this vehicle before you read and understand the Operation Manual, the Parts Service Manual for this unit, other applicable manufacturer's manuals and the safety decals on the product. Each operator of this unit must read and understand all directions in this manual before they first operate this vehicle. Keep this manual in the cab for new operators and to remind all operators about safe use.

⚠ WARNING

Never weld on a compressed natural gas vehicle unless the compressed natural gas fuel system has been purged with inert gas.

⚠ DANGER

Do not operate the unit or perform repair or maintenance procedures on the unit until you read and understand all of the instructions in this manual. Failure to do so can result in death or serious injury to operators or bystanders.

⚠ DANGER

Make sure the unit is on firm, stable ground before you raise the body and clear the area of all unnecessary people. Do not prop a body unless it is on firm, stable ground. A unit not on firm, stable ground can roll when raising or propping the body. This can cause death or serious injury to you or bystanders.

⚠ DANGER

Always prop the tailgate when you leave it raised for maintenance, service or cleaning procedures. Any part of your body between the unit's body and the tailgate while you prop the tailgate or when the tailgate is propped is dangerous. Death or serious injury can occur if any part of your body is between the tailgate and the body if the tailgate suddenly closes.

⚠ DANGER

A tailgate in motion is dangerous. Serious injury or death can occur if a person is struck by a moving tailgate or becomes trapped between the tailgate and the body. Clear the area near the tailgate of all unnecessary people before you lower the tailgate.

⚠ DANGER

The packer and crusher panels are dangerous. They can cause death or serious injury if a person is inside the hopper. Make sure no one is inside the hopper before you begin a packer or crusher function. Put the unit in the Lock-Out/Tag-Out mode if it is necessary to enter the hopper area.

⚠ DANGER

Keep all parts of your body out from underneath the unit's body and away from the cylinders when raising or lowering the body. Serious injury or death will occur if the unit's body suddenly lowers and traps a part of your body.

⚠ DANGER

Do not raise a body that has refuse while you do maintenance or service procedures. Refuse in the body can make the unit unstable. Always unload refuse from the body before you raise it for maintenance or service procedures. Always use the body props when you raise the body for maintenance or service procedures.

⚠ DANGER

A full or partially full load of refuse is dangerous while you lower the body with inoperative controls. Refuse in the body can make the unit unstable and cause it to overturn. Serious injury or death can occur if the unit overturns due to instability caused by the loaded refuse. REMOVE the refuse before you block the body.

⚠ DANGER

Lifting equipment that does not have sufficient lifting capability is dangerous. Equipment can fail and cause death or serious injury to the operator or bystanders. Make sure the lifting equipment has sufficient lifting capability and clear ALL persons not involved with the procedure away from the area.

⚠ DANGER

The lifting equipment can fail. Serious injury or death can occur if the lifting equipment breaks and the body falls or the unit rolls over. Do not place your body or limbs between the unit's body and chassis while you remove the body-supporting timbers. Be attentive and prepared to move quickly away from the unit in the event there is an equipment failure.

⚠ DANGER

Contact of the unit with overhead electric lines is dangerous. Death or serious injury can occur. Make sure there is adequate overhead clearance before you raise the container. If the unit does make contact with overhead electric lines do not touch any metal in the cab. Stay in the unit until help arrives..

⚠ WARNING

Make sure the unit is in the Lock-Out/Tag-Out mode when you do maintenance or service procedures, or when you go in the hopper, climb in or on the body or on equipment. Equipment can be operated when the unit is not in the Lock-Out/Tag-Out mode. When the unit is not in the Lock-Out/Tag-Out mode, equipment operated while you do maintenance or service procedures, go in the hopper or climb in or on the body or on equipment can cause death or serious injury.

⚠ WARNING

Moving equipment can be dangerous to bystanders. Death or serious injury can occur if a person is in the wrong area or is not attentive to the operations. Clear the area of all unnecessary people before you operate the controls.

⚠ WARNING

Raising the body with the tailgate closed can damage the underride bumper. The under ride bumper can hit the ground when the tailgate is not fully raised before you raise the body. Death or serious injury can occur and also cause damage to the unit.

⚠ WARNING

Clear all people of the area before you lift a refuse container. Make sure the refuse is secure in the refuse container before you lift the container. Loose refuse can fall and cause death or serious injury.

⚠ WARNING

The hydraulic fluid can be under pressure and can spray while you open the connection. Hydraulic fluid can cause damage to your eyes, hands or skin. Wear protective eye glasses, gloves and other clothing as necessary to protect you from the hydraulic fluid.

⚠ WARNING

A unit that needs service or repair can malfunction and create a dangerous condition. A part failure during operation can cause death or serious injury to a person or damage to the unit. Repair or replace any failed or defective part immediately

⚠ WARNING

Improper dumping of the refuse can cause the unit to tip or rollover. Death or serious injury can occur if the unit rolls or tips over. Empty as much refuse as you can with the packer panel before you raise the body.

⚠ WARNING

Do not move the unit forward or backwards excessively fast (lurch) to dump the refuse load. Excessively fast movements with the body raised can make the body unstable and tip or roll the unit over. This can result in death or serious injury to the operator and damage the unit. Use only sufficient movement to loosen the load so that it will leave the body.

⚠ WARNING

Isopropyl alcohol is flammable and is harmful to eyes and skin. Keep isopropyl alcohol away from heat or open sources of ignition. Flush eyes and skin with water for 15 minutes after contact. Seek immediate medical help.

⚠ WARNING

A container that is not locked to the container lift mechanism is dangerous. The container can fall off the container lift mechanism and cause death or serious injury. Make sure you engage and lock the container latch bars before you lift the container.

⚠ WARNING

Grabbing a refuse container with too much pressure can damage the container. Pieces of the container can “fly” off the container and cause moderate or minor injury to a bystander. Use enough pressure with the grabber to raise the container with the lift arm and not damage the container.

NOTICE

Do not move the unit forward or backwards excessively fast (lurch) to dump the refuse load. Excessively fast movements with the body raised puts a very high load on the body raise cylinders and could damage one or both cylinders and make the body unstable unable to lower. Inspect the cylinders after you dump each load and replace if necessary.

NOTICE

Do not operate the unit or perform repair or maintenance procedures on the unit until you read and understand the instructions in this manual. Failure to do so can result in damage to the unit or other property. If you do not understand a procedure or instruction, tell the owner or the designated person immediately. Do not operate the unit if you do not understand all procedures and instructions in this manual. The owner or designated person can contact your Heil dealer or Heil for additional help. See the Operator's Manual or Service Manual for contact information.

NOTICE

Grabbing a refuse container with too much pressure can damage the container. The container can become unusable. Use enough pressure with the grabber to raise the container with the lift arm and not damage the container.

NOTICE

Always use your employer's Lock-Out/Tag-Out procedures. If your employer does not have Lock-Out/Tag-Out procedures, use the procedures that follow. Contact your supervisor or ESG Technical Service if you have any questions about Lock-Out/Tag-Out procedures.

NOTICE

You can order Lock-Out/Tag-Out Tags through your Heil Dealer or through Heil.

LOCK-OUT/TAG-OUT PROCEDURES

NOTICE

Always use your employer's Lock-Out/Tag-Out procedures. If your employer does not have Lock-Out/Tag-Out procedures, use the procedures that follow. Contact your supervisor or Heil Technical Service if you have any questions about Lock-Out/Tag-Out procedures.

Put the unit in a Lock-Out/Tag-Out mode:

- BEFORE you enter the unit's body
- BEFORE you do maintenance, repair or cleaning procedures on the unit.

Figure 1. Lock-Out/Tag-Out (Do Not Operate) Tag

Follow These Steps:

1. APPLY the brakes. MAKE SURE the brakes do not let the unit move and they work properly.
2. Chock all wheels.
3. SET the tailgate props when you raise the tailgate for service, maintenance or cleaning.
4. SET the body props when you raise the body for service, maintenance or cleaning.
5. When there are in-cab controls, turn the ignition switch to ON then:
   a. Move the switches of the hydraulic controls. This relieves the pressure in the cylinders.
   b. Turn the ignition switch to OFF.
6. When there are no in-cab controls, move the outside control levers to relieve the pressure in the cylinders.
7. Put a LOCK-OUT/TAG-OUT Tag onto the steering wheel.
8. Remove the ignition key from the cab, lock the vehicle, and put the key in a secure location.
9. You can order Lock-Out/Tag-Out Tags (Part Number 212-1586) through your Heil Dealer or through Heil.

STORING REFUSE IN THE BODY

Heil does not recommend storing refuse in the body overnight. The different types of debris and corrosive elements usually collected can cause severe corrosion inside the body decreasing the life of your body. This corrosion can affect unloading and decrease the structural life of the body. In addition, storing refuse in the body overnight can increase the risk of fire.

MAINTENANCE/LUBRICATION INFORMATION

Before performing maintenance, check the job carefully to find all the hazards present and make sure all safe guards or safety devices are in place to protect all persons and equipment involved.

WINCH GEAR OIL

When the unit has a winch option, check the level of the winch's gear oil every 40 hours of operation. Fill as needed with AGMA Grade 5 EP (90wt.) for an 8,000 lb. winch and AGMA Grade 7 EP (140 wt.) for a 12,000 lb. winch.

GREASE LUBRICANT RECOMMENDATION

Use a grease gun. Before engaging grease gun, clean the fitting. Always pump enough grease to purge the joint of contaminated grease and wipe off the excess grease. Lubricate a unit as given on the lubrication decal on the unit and in the Parts and Service Manual and Operator's Manual. Use NLGI 000 grease.

OIL LUBRICANT RECOMMENDATION

Use only non-detergent engine oil to lubricate all moveable mechanical parts not furnished with grease fittings. Apply sufficient oil to give good lubrication, but do not bathe parts in oil. Always wipe off excess oil.

HYDRAULIC OIL SPECIFICATIONS

Heil hydraulic oil (MV32) contains the following specifications.

Gravity	API (ASTM D-287) 31.0
Specific Gravity @ 60°F (15.6°C)	(ASTM D-287) 0.8780
Flash Point	(ASTM D-92) 410°F
Pour Point	(ASTM D-97) -60°F
Viscosity @100°F @210°F	 SUS (ASTM D-445 & ASTM D-2161) 153 SUS (ASTM D-445 & ASTM D-2161) 47.3
Viscosity Index	(ASTM D-2270) 155
Rust Protection	(ASTM D-665 A & B) Pass
Foam Test	(ASTM D-892) Pass
Four-Ball Wear Test	(ASTM D-4172) (40kg, 1800RPM, 130°F, 1 hr) 0.66
Zinc %wt.	(XRF) .04

The following oils by brand name are approved for use in the hydraulic system on this equipment and considered to be all temperature hydraulic fluids.

- Shell Tellus T32
- Mobil DTE 13M
- Texaco Rando HDZ 32

STANDARD TORQUE DATA FOR NUTS AND BOLTS

The following recommended torque data is for use as a general guideline. Recommended torque, in foot pounds, for all Standard Application nuts and bolts provided in the following table.

NOTICE

Torque specifications on a drawing override torque values in the Standard Torque Data for Nuts and Bolts Table.

- All thread surfaces are clean and lubricated with SAE-30 engine oil. See notice above.
- Joints are rigid, that is no gaskets or compressible materials are used
- When re-using nuts or bolts use minimum torque values

STANDARD TORQUE DATA FOR NUTS AND BOLTS TABLE

Bolt Size (D)	Nut Type (STD/Lock)	Thread Turns per Inch (p)	Grade	Heil Plain Dry Condition Torque Value (ft-lbs)	Heil Zinc Plated Fastener Torque Value (ft-lbs)	Heil Lubricated Fastener Torque Value (ft-lbs)	Heil Deformed Lock Nut Torque Value (ft-lbs)
1/4	STD	20	5	9	8	6	
0.25			8	13	12	8	
		28	5	10	9	7	
			8	15	13	10	
	Lock	20	5				6
			8				8
		28	5				7
			8				10
5/16	STD	18	5	19	17	12	
.3125			8	27	24	17	
		24	5	21	19	14	
			8	29	27	19	
	Lock	18	5				12
			8				17
		24	5				14
			8				19
3/8	STD	16	5	33	30	22	
.375			8	47	42	31	
		24	5	38	34	25	
			8	54	48	35	
	Lock	16	5				22
			8				31

STANDARD TORQUE DATA FOR NUTS AND BOLTS TABLE

Bolt Size (D)	Nut Type (STD/Lock)	Thread Turns per Inch (p)	Grade	Heil Plain Dry Condition Torque Value (ft-lbs)	Heil Zinc Plated Fastener Torque Value (ft-lbs)	Heil Lubricated Fastener Torque Value (ft-lbs)	Heil Deformed Lock Nut Torque Value (ft-lbs)
		24	5				25
			8				35
7/16	STD	14	5	53	48	35	
.4375			8	76	68	49	
		20	5	60	54	39	
			8	84	76	55	
	Lock	14	5				35
			8				49
		20	5				39
			8				55
1/2	STD	13	5	82	73	53	
.500			8	115	104	75	
		20	5	92	83	60	
			8	130	117	84	
	Lock	13	5				53
			8				75
		20	5				60
			8				84
9/16	STD	12	5	118	106	77	
.5625			8	166	150	108	
		18	5	131	118	85	
			8	186	167	121	
	Lock	12	5				77
			8				108
		18	5				85
			8				121
5/8	STD	11	5	162	146	106	
.625			8	230	207	149	
		18	5	184	166	120	
			8	260	234	169	
	Lock	11	5				106
			8				149

STANDARD TORQUE DATA FOR NUTS AND BOLTS TABLE

Bolt Size (D)	Nut Type (STD/Lock)	Thread Turns per Inch (p)	Grade	Heil Plain Dry Condition Torque Value (ft-lbs)	Heil Zinc Plated Fastener Torque Value (ft-lbs)	Heil Lubricated Fastener Torque Value (ft-lbs)	Heil Deformed Lock Nut Torque Value (ft-lbs)
		18	5				120
			8				169
3/4	STD	10	5	288	260	188	
0.750			8	408	367	265	
		16	5	322	290	209	
			8	455	409	295	
	Lock	10	5				188
			8				265
		16	5				209
			8				295
7/8	STD	9	5	465	418	302	
0.8750			8	657	591	427	
		14	5	513	461	333	
			8	724	652	471	
	Lock	9	5				302
			8				427
		14	5				333
			8				471
1	STD	8	5	697	627	453	
1.0000			8	984	886	640	
		14	5	782	704	508	
			8	1105	994	718	
	Lock	8	5				453
			8				640
		14	5				508
			8				718
1-1/8	STD	7	5	869	782	565	
1.1250			8	1395	1256	907	
		12	5	975	877	634	
			8	1564	1408	1017	
	Lock	7	5				565
			8				907

STANDARD TORQUE DATA FOR NUTS AND BOLTS TABLE

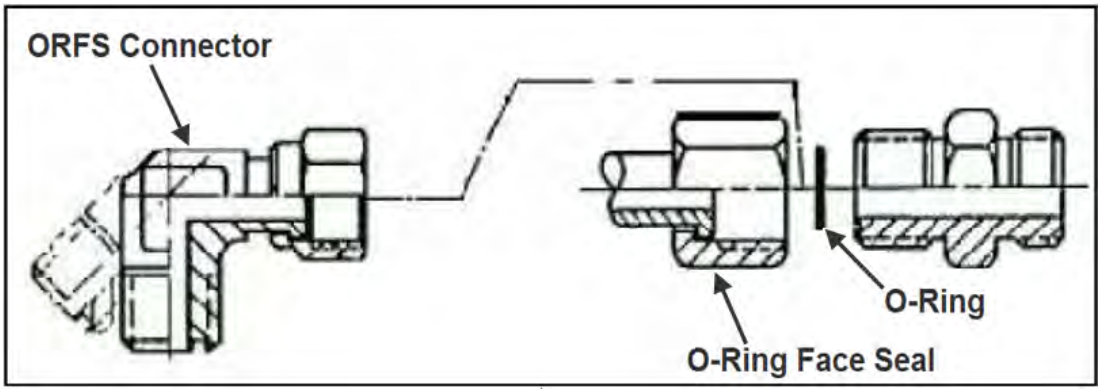
Bolt Size (D)	Nut Type (STD/Lock)	Thread Turns per Inch (p)	Grade	Heil Plain Dry Condition Torque Value (ft-lbs)	Heil Zinc Plated Fastener Torque Value (ft-lbs)	Heil Lubricated Fastener Torque Value (ft-lbs)	Heil Deformed Lock Nut Torque Value (ft-lbs)
		12	5				634
			8				1017
1-1/4	STD	7	5	1227	1104	797	
1.2500			8	1969	1772	1280	
		12	5	1358	1222	883	
			8	2179	1961	1417	
	Lock	7	5				797
			8				1280
		12	5				883
			8				1417
1-3/8	STD	6	5	1608	1447	1045	
1.3750			8	2580	2322	1677	
		12	5	1830	1647	1190	
			8	2938	2644	1909	
	Lock	6	5				1045
			8				1677
		12	5				1190
			8				1909
1-1/2	STD	6	5	2134	1921	1387	
1.5000			8	3425	3083	2226	
		12	5	2401	2161	1561	
			8	3854	3468	2505	
	Lock	6	5				1387
			8				2226
		12	5				1561
			8				2505

BOLT TYPE IDENTIFICATION CHART

IH Type	S.A.E. Grade	Description	Bolt Head Marking**
1	1 or 2	No radial lines. Low or medium carbon steel not heat treated. NOT USED, replace with same grade bolt.	
5	5	Three radial lines. Quenched and tempered medium carbon steel.	
8	8	Six radial lines. Quenched and tempered special carbon or alloy steel	

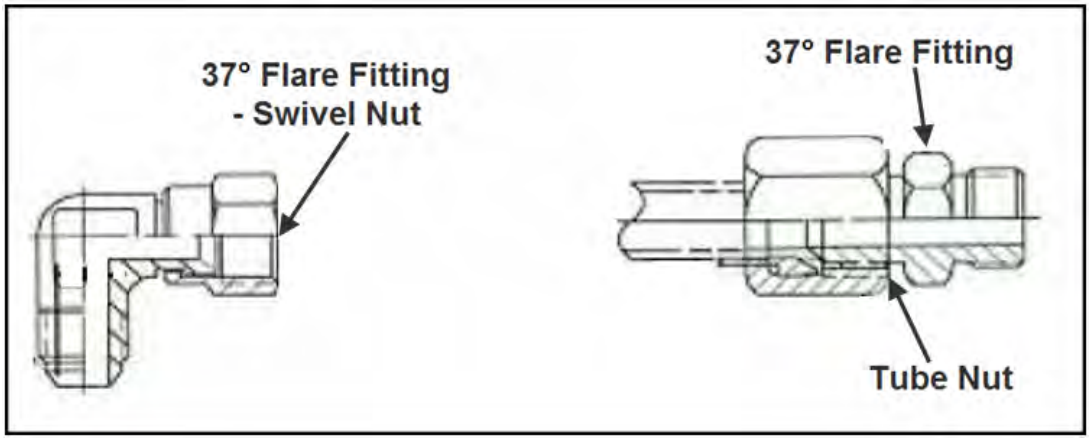
TORQUE FOR HYDRAULIC TUBES AND FITTINGS

Flat Face ORFS Fittings		
	SET WRENCH TO	
Nominal Tube OD	Torque Wrench Setting	Alternate Torque Units
1/4"	21 ft-lbs.	250 in-lbs.
3/8"	33.5 ft-lbs.	400 in-lbs.
1/2"	50 ft-lbs.	600 in-lbs.
5/8"	50 ft-lbs.	600 in-lbs.
3/4"	75 ft-lbs.	900 in-lbs.
1"	105 ft-lbs.	1260 in-lbs.
1-1/4"	130 ft-lbs.	1560 in-lbs.
1-1/2"	178.5 ft-lbs.	2140 in-lbs.



TORQUE FOR HYDRAULIC TUBES AND FITTINGS (CONTINUED)

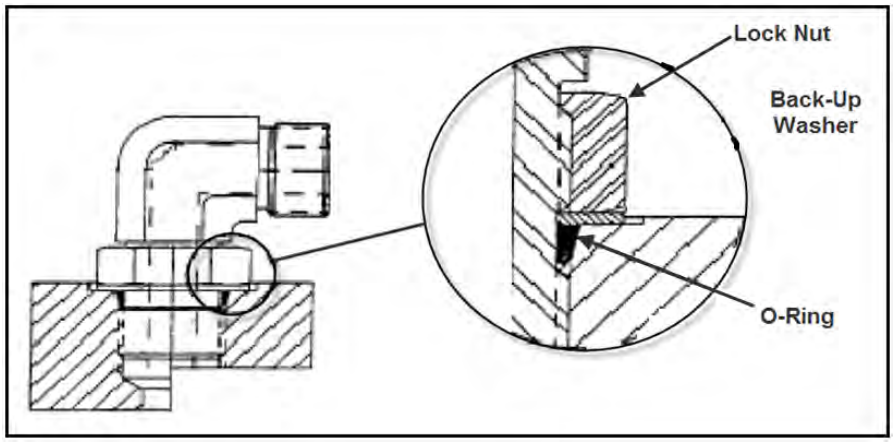
37 Degree Flare (JIC) Fittings		
	SET WRENCH TO	
Nominal Tube OD	Torque Wrench Setting	Alternate Torque Units
1/8"	6.5 ft-lbs.	80 in-lbs.
3/16"	9 ft-lbs.	110 in-lbs.
1/4"	12.5 ft-lbs.	150 in-lbs.
5/16"	16.5 ft-lbs.	200 in-lbs.
3/8"	21 ft-lbs.	250 in-lbs.
1/2"	41 ft-lbs.	490 in-lbs.
5/8"	64 ft-lbs.	770 in-lbs.
3/4"	89 ft-lbs.	1070 in-lbs.
7/8"	105 ft-lbs.	1260 in-lbs.
1"	130 ft-lbs.	1560 in-lbs.
1-1/4"	142.5 ft-lbs.	1710 in-lbs.
1-1/2"	178.5 ft-lbs.	2140 in-lbs.
2"	250 ft-lbs.	3000 in-lbs.



TORQUE FOR HYDRAULIC TUBES AND FITTINGS (CONTINUED)

From SAE J2593 Table 7		
Boss (ORB)	**(STEEL) SET WRENCH TO**	
Nominal Tube OD	**Torque Wrench Setting**	**Alternate Torque Units**
3/16"	9 ft-lbs.	110 in-lbs.
1/4"	16.5 ft-lbs.	200 in-lbs.
5/16"	21 ft-lbs.	250 in-lbs.
3/8"	29 ft-lbs.	350 in-lbs.
1/2"	64 ft-lbs.	770 in-lbs.
5/8"	89 ft-lbs.	1070 in-lbs.
3/4"	130 ft-lbs.	1560 in-lbs.
7/8"	178.5 ft-lbs.	2140 in-lbs.
1"	224 ft-lbs.	2690 in-lbs.
1-1/4"	250 ft-lbs.	3000 in-lbs.
1-1/2"	300 ft-lbs.	3600 in-lbs.
ALUMINIUM SET		
Torque Wrench Setting	**Alternate Torque Units**	
6 ft-lbs.	70 in-lbs.	
11 ft-lbs.	130 in-lbs.	
14 ft-lbs.	170 in-lbs.	
21 ft-lbs.	250 in-lbs.	
37.5 ft-lbs.	450 in-lbs.	
54 ft-lbs.	650 in-lbs.	
91.5 ft-lbs.	1100 in-lbs.	
116.5 ft-lbs.	1400 in-lbs.	
146 ft-lbs.	1750 in-lbs.	
154 ft-lbs.	1850 in-lbs.	
200 ft-lbs.	2400 in-lbs.	

TORQUE FOR HYDRAULIC TUBES AND FITTINGS (CONTINUED)



SPLIT- FLANGE (Half Clamp) CONNECTORS (Code 61)				
		SET WRENCH TO		
Nominal Tube OD	Bolt Size	Bolt Torque [ft-lbs]	Bolt Torque [in-lbs]	ALUMINUM Ft-lbs [in-lbs]
1/2"	5/16-18 x 1.25	17 ft-lbs.	200 in-lbs.	12 [130]
3/4"	3/8-16 x 1.25	25 ft-lbs.	300 in-lbs.	17 [200]
1"	3/8-16 x 1.25	32 ft-lbs.	380 in-lbs.	21 [250]
1-1/4"	7/16-14 x 1.50	41 ft-lbs.	490 in-lbs.	27 [320]
1-1/2"	1/2-13 x 1.50	53 ft-lbs.	640 in-lbs.	35 [420]
2"	1/2-13 x 1.50	61 ft-lbs.	730 in-lbs.	40 [480]
2-1/2"	1/2-13 x 1.75	86 ft-lbs.	1030 in-lbs.	56 [670]
3"	5/8-11 x 1.75	144 ft-lbs.	1730 in-lbs.	94 [1130]
3-1/2"	5/8-11 x 2.00	125 ft-lbs.	1500 in-lbs.	82 [980]
4"	5/8-11 x 2.00	125 ft-lbs.	1500 in-lbs.	82 [980]
5"	5/8-11 x 2.25	125 ft-lbs.	1500 in-lbs.	82 [980]

SPLIT- FLANGE (Half Clamp) CONNECTORS (Code 62)				
		SET WRENCH TO		
Nominal Tube OD	Bolt Size	Bolt Torque [ft-lbs]	Bolt Torque [in-lbs]	ALUMINUM Ft-lbs [in-lbs]
1/2"	5/16-18 x 1.25	17 ft-lbs.	200 in-lbs.	12 [130]
3/4"	3/8-16 x 1.25	30 ft-lbs.	360 in-lbs.	20 [240]
1"	3/8-16 x 1.25	46 ft-lbs.	550 in-lbs.	30 [360]
1-1/4"	1/2-13 x 1.75	69 ft-lbs.	830 in-lbs.	45 [540]
1-1/2"	5/8-11 x 2.25	125 ft-lbs.	1500 in-lbs.	82 [980]
2"	3/4-10 x 2.75	209 ft-lbs.	2510 in-lbs.	136 [1640]

COLD WEATHER WARMUP PROCEDURE

When ambient air temperature is cold (below 0 degrees F), it is necessary to warm up the unit's hydraulic oil before you start your daily route operation, check the oil level, or adjust hydraulic pressure settings. The hydraulic oil is sufficiently warmed when the temperature is between 120° and 160°F.

⚠ WARNING

Moving parts on the unit are dangerous. Serious injury or death can occur if a person is struck by the equipment. Clear all people from the area before you operate the unit.

Follow the steps below to warm up the hydraulic oil.

1. START the TRUCK and let the engine idle.
2. APPLY the PARKING BRAKE and make sure it holds.
3. ENGAGE the HYDRAULIC PUMP for approximately five minutes.
4. MAKE SURE the AREA IS CLEAR of all unnecessary people BEFORE you operate the controls.
5. OPERATE the PACKER EXTEND and PACKER RETRACT functions through ten (10) cycles while the engine idles. See the Operator's Manual for operation instructions.
6. Make sure the oil temperature on the site gauge is between 120° and 160°F. If not, repeat step 5.
7. Check for fluid leaks. Repair if necessary.
8. The unit is now ready to go on route.

BATTERY DISCONNECT SWITCH

The battery box is typically located on the streetside of the chassis frame near the front of the body, however it can be mounted at a different location on different chassis. Become familiar with the location of the battery box and battery disconnect switch on your unit.

1. You must turn the battery disconnect switch to the OFF position whenever the unit is shut off for any length of time – especially when the unit will be left unattended.
2. You must turn the battery disconnect switch to the ON position whenever you will use the unit.
3. You must check the position of the battery disconnect switch as part of the daily inspection.

NOTICE

Battery cables must be securely anchored and not rubbing other equipment. Cable insulation must be free of damage and abrasion. Inspect weekly.

NOTICE

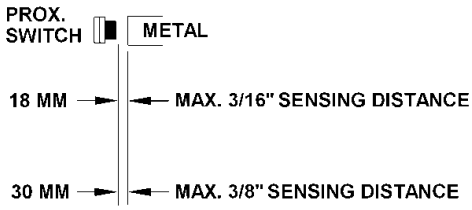
Always disconnect the battery before welding on the chassis or body.

PROXIMITY SWITCH TROUBLESHOOTING

When one or more of a unit's functions do not operate properly and there are proximity switches in the circuits of the unit for these functions, refer to the following table as a guide to find the problem(s).

NOTICE

Heil proximity switches have a Light Emitting Diode (LED) on the switch to indicate that the switch is sensing metal. The light changes color when the switch senses metal. Green indicates the switch is ON. Yellow indicates the switch senses metal. Some proximity switches only have the yellow light.

PROXIMITY SWITCH TROUBLESHOOTING TABLE	
Probable Cause	**Remedy**
Loose or corroded electrical connections.	Replace the electrical connections.
Damaged Switch A. Cracked Ferrite core causing the fine internal wire to break. B. Cracked Ferrite core – but wire is not broken – the sensitivity of switch will increase which causes sensing distance to increase or switch work intermittently as the temperature changes.	• DO NOT strike switch to make it work. • DO NOT damage the switch when you adjust it. • DO NOT adjust switch too close to the metal it is sensing.
Voltage spikes from truck chassis electrical system will break down the internal electronics of the proximity switch.	1. Make sure the power source from the chassis manufacturer is clean. 2. The body electrical system is protected from voltage spikes.
Improper Sensing Range	Adjust proximity switches to sense metal as follows: 
If the controller input light stays on when a switch is unplugged **(the signal wire is carrying +12V DC)**	Check the proximity switch electrical circuits for the source of the problem.
If proximity switch LED light is NOT ON.	1. Check the fuse relay block (Half/Packs with IFM controllers). The fuse/relay box is located in the cab. Or Check the in-line fuses (Side Loaders with IFM controllers). The in-line fuses are located in the cab. 2. Unplug proximity switch. 3. Check the power wire (terminal C) for +12 VDC with a multi-meter. 4. Check ground signal with multi-meter for continuity to chassis ground. 5. Check the signal wire for continuity to appropriate controller input terminal. (Refer to SM9.) 6. If all three (3) wires are good, replace the proximity switch.

DECALS ON THE UNIT

Make sure you can read all hazard and instruction decals. Clean decals if you cannot read the words. See for directions on cleaning decals.

Replace any decal that is damaged, missing, or is not readable.

When you replace a part that has a decal, make sure a new decal is installed on the new part. See the Parts and Service manual for a complete decal kit and individual decals. Order the decal kit or individual decals from your Heil Dealer or from Heil.

DECAL CARE

It is important that the decals are properly cleaned to make sure that they are readable and do not come off the unit. Use the following steps to clean the decals.

A. General Instructions

Following these instructions helps the decals adhere longer.

- Wash the decals with a blend of mild car wash detergent and clean water
- Rinse with clean water
- Let the vehicle air-dry or dry with a micro-fiber cloth
- Do not allow fuels to stay in contact with the decal for an extended period of time. Remove the fuel contamination as quickly as possible
- Do not use carnauba-based wax over the decals
- Do not use a mechanical brush while washing the decals.

B. Pressure Washer Precautions

Pressure washing can cause damage to decals. It can cause the edges of the decals to lift and peel the decal away from the unit. Over time, the decal can fade, crack or chip away.

Use pressure washing only when other cleaning methods are not effective. If you use a pressure washer, use the following precautions.

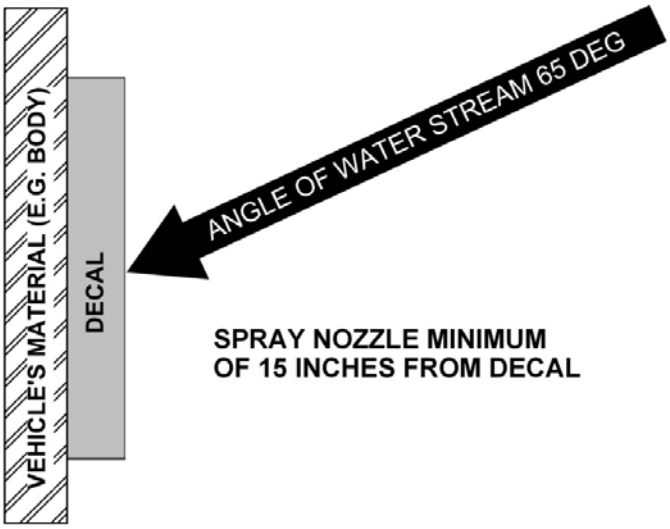
- Spray nozzle opening: 40° wide pattern
- Spray angle: 65° from vehicle' s body (do not use sharp angles – this can lift the decals from the unit)
- Distance of nozzle to decal: 15" minimum
- Water pressure: <= 800 psi
- Length of time: not more than 30 sec.
- NEVER use a "turbo pressure nozzle".

C. Remove Difficult Debris

When normal cleaning procedures do not remove difficult debris from the decals, try the following:

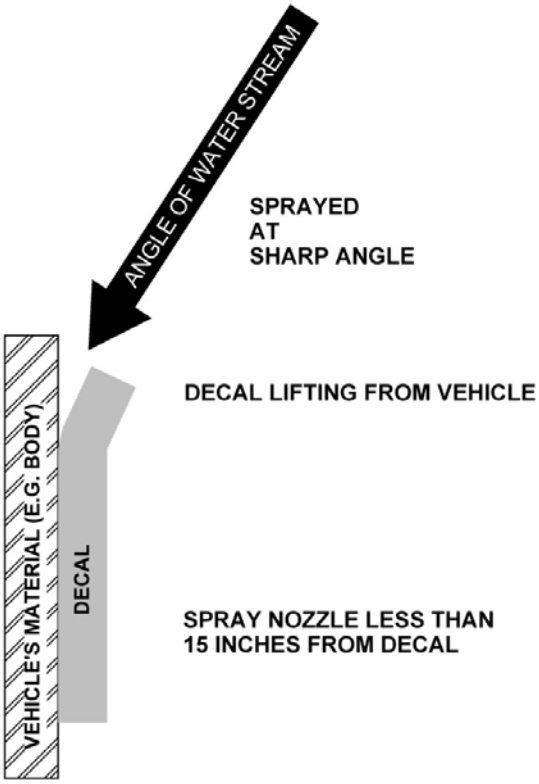
- Spot clean the decal with Isopropyl Alcohol and a micro-fiber cloth (rag)
- If these methods do not work on a problem area, call a Heil Dealer or Heil Customer Support.

DECAL CARE (CONTINUED)



RECOMMENDED TECHNIQUE

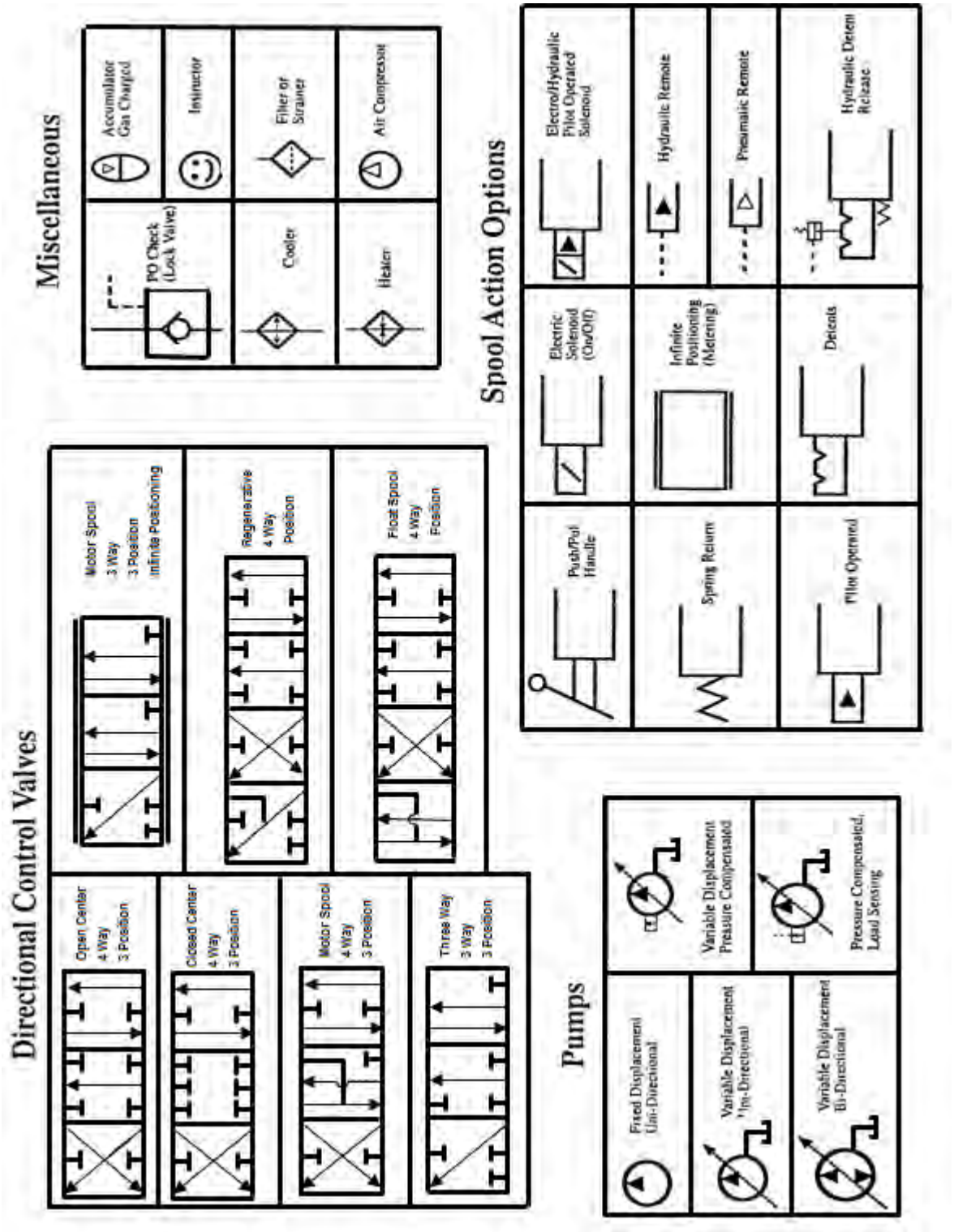
Figure 2. Recommended Technique



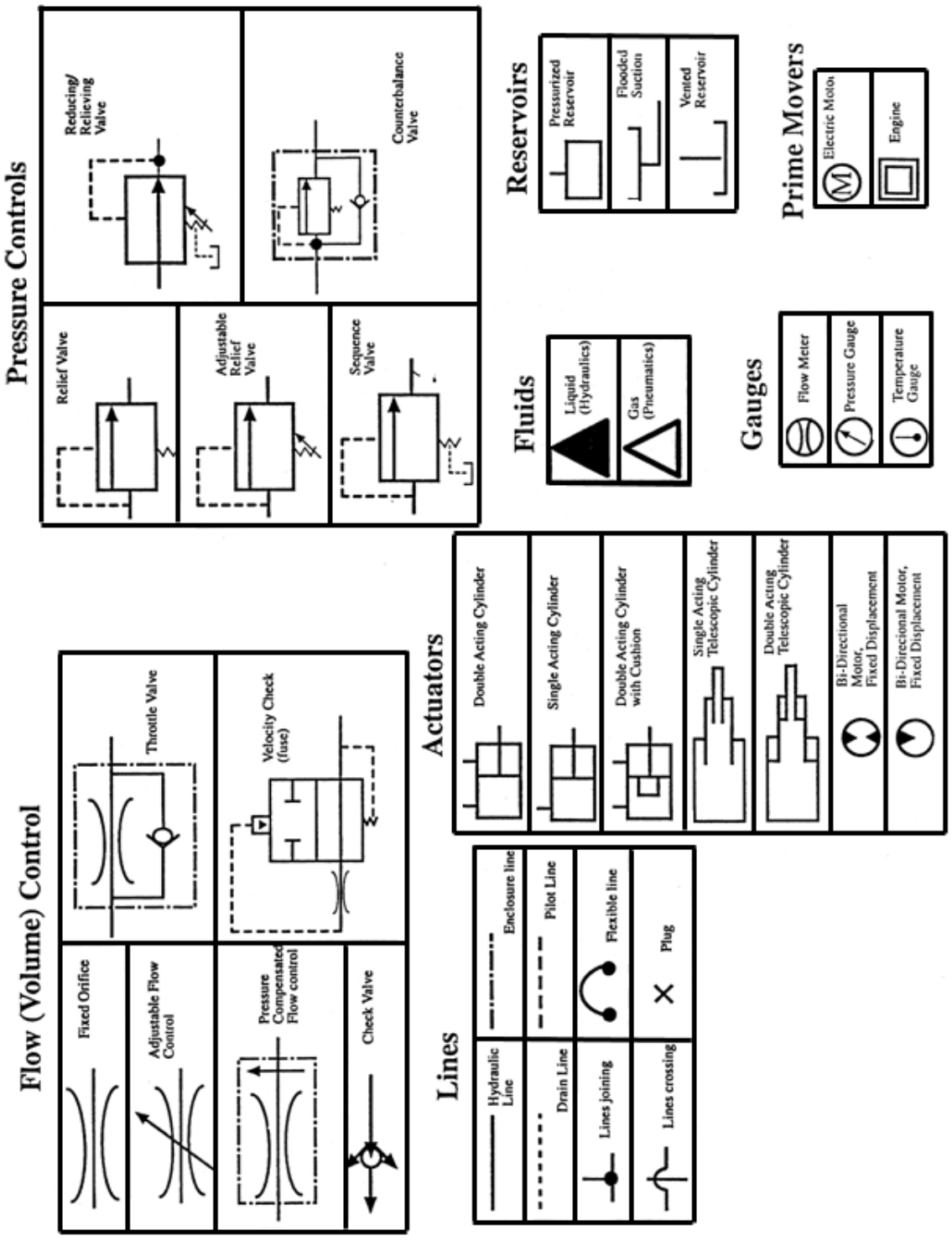
INCORRECT TECHNIQUE

Figure 3. Incorrect Technique

HYDRAULIC SYMBOLS

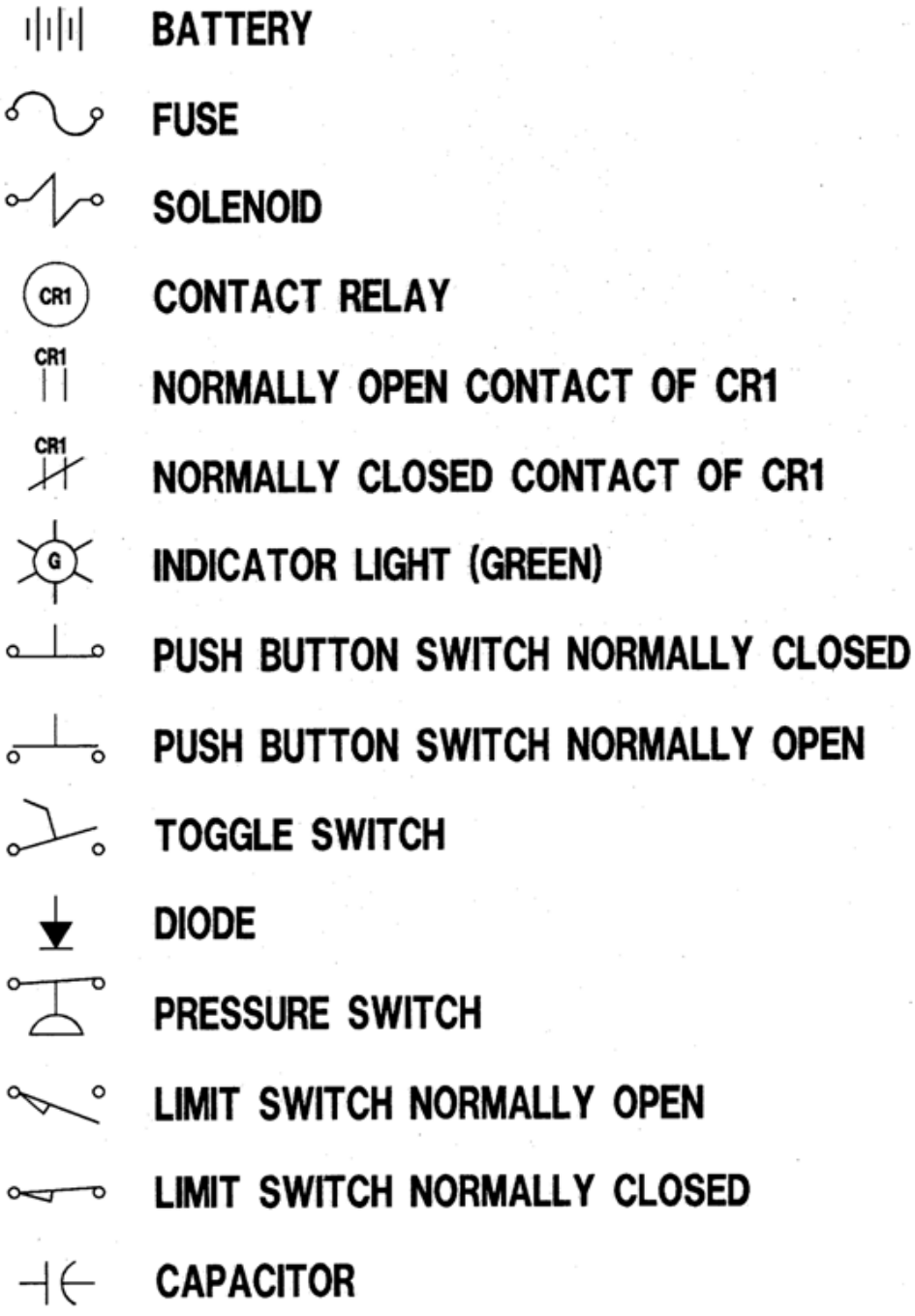


HYDRAULIC SYMBOLS (CONTINUED)



ELECTRICAL SYMBOLS

SYMBOL DEFINITIONS



PT 1000™
NOTES

SECTION 2
PUMPS

TANDEM O.I.G.A.I. PUMP

Front Loaders, Rear Loaders, Recycle 2000, and Liberty

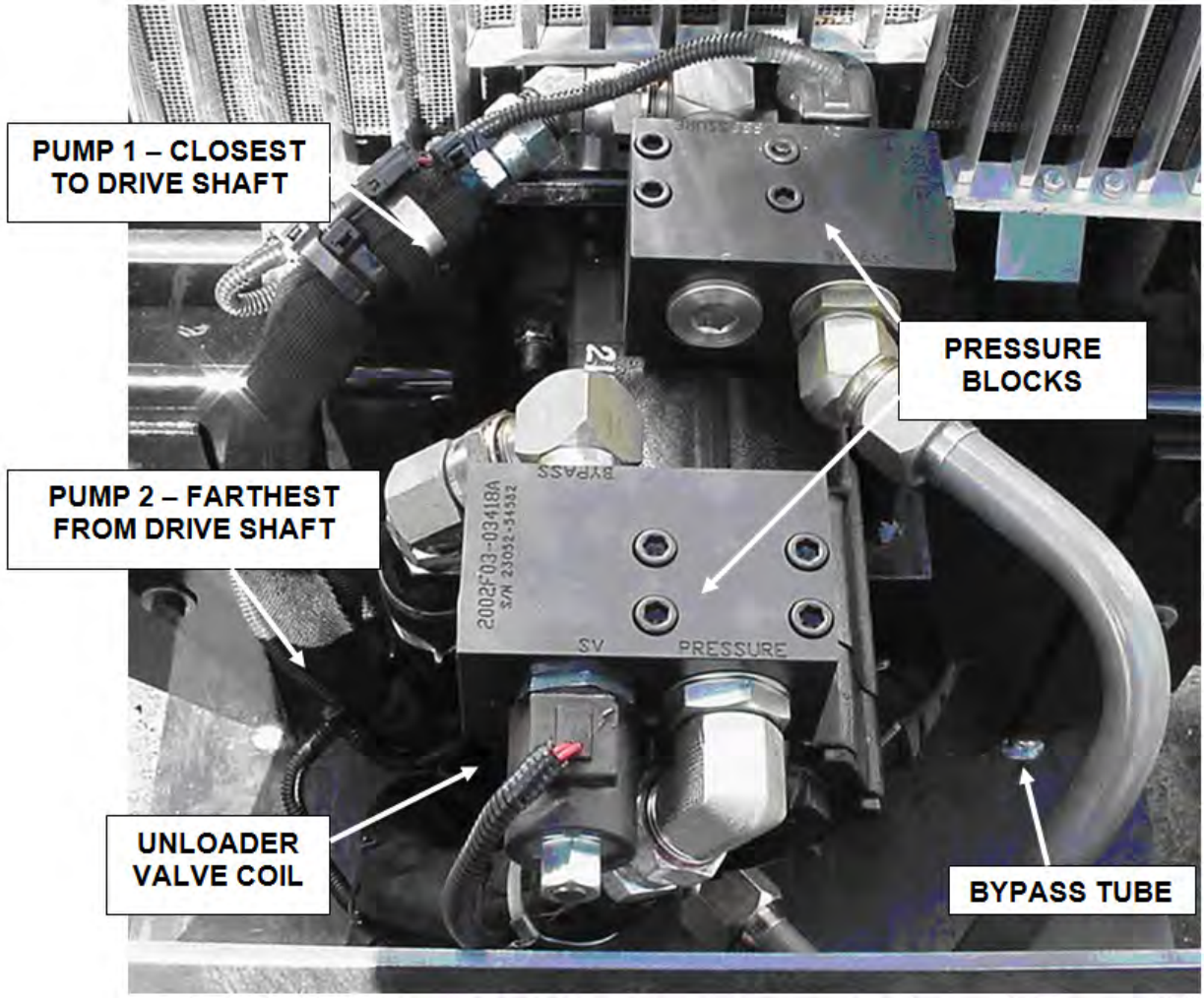
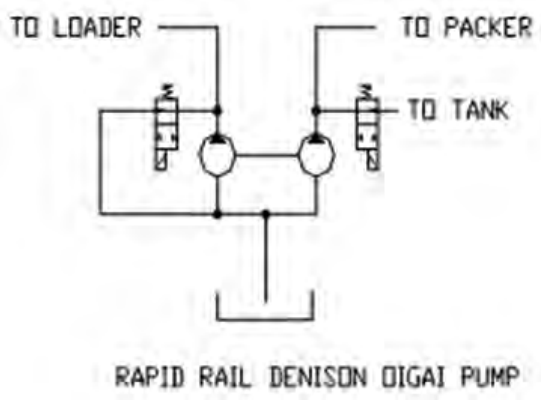


Figure 4. Tandem O.I.G.A.I. Pump



This is the Hydraulic Controls Operate-In-Gear-At-Idle (OIGAI) System. The pump section (pump 1) closest to the input shaft operates the lift and shuts off first. The pump section (pump 2) farthest from the input shaft operates the packer and stays on at higher RPMs.

TANDEM VANE PUMP O.I.G.A.I. HYDRAULIC SYSTEM TROUBLESHOOTING

The Operate-in-Gear-at-Idle (OIGAI) system is designed to perform the loading operations at standard idle speed. It is comprised of two major components, the monoblock tandem vane pump and attached unloader valve assembly.

On the OIGAI Rear End Loader (REL) systems the P1 closest to the pump input shaft while the P2 farthest from the input shaft supplies flow to the complete hydraulic systems.

The unloader valve assemblies consist of a manifold (pressure) block, a normally open (N.O. or NO) cartridge valve and a 12VDC-solenoid coil. In operation mode, the current is supplied to the valve coil causing the valve to close, forcing pump flow to the hydraulic circuit. In bypass mode, the coil is de-energized causing the valve to open, allowing the oil to re-circulate either back to tank or to the pump inlet.

A. Troubleshooting

The symptoms of a problem in the pump circuit are either slow operation or no operation at all.

There are three primary causes for the pump circuit to not operate properly:

- Low or no voltage to the unloader valve coil.
- Malfunction in the unloader valve assembly.
- Internal problem with the pump.

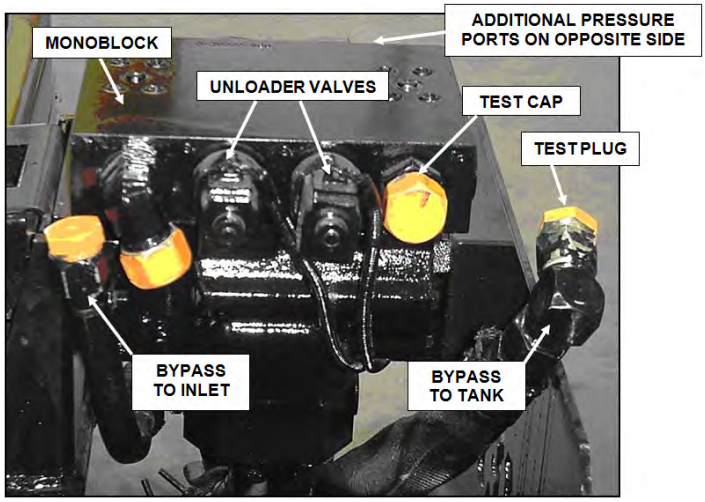
Perform the following test after finding that there is insufficient or no flow to the loader and/or body valves.

1. Check the Electrical Supply to the Unloader Valve Coils
   a. With the system turned on and the engine operating at idle, test the voltage at the coil. It should read a minimum of 10 VDC. If proper voltage is present and the problem persists, proceed to step 2. If the voltage is below 10 VDC, check the electrical system for problems that can cause a drop or loss of voltage to the unloader valve solenoid coil. Some examples are a broken or shorted wire, blown fuse, fault in the side door switch (if equipped), no alternator input or a failed PLC calibration.
   b. Use an ohm meter to check resistance in the coil. If the measurement is less than 5 ohms or more than 20 then the circuit coil is damaged. If the coil is damaged, replace the coil.
2. Eliminate the Unloader Valve from the Circuit
   a. With the engine off, Cap and plug the tube connection for the bypass to the pump inlet. This forces all oil to the hydraulic circuits as if the pump is on. (NOTE: Pump control switches in the cab are no longer effective.)
   b. Restart the truck and test the functions. If the hydraulic system functions return to normal operation (speed and pressure within specifications), replace or repair the unloader assembly.

TANDEM VANE PUMP O.I.G.A.I. HYDRAULIC SYSTEM TROUBLESHOOTING (CONTINUED)

NOTICE

If flow is present check the main relief valves for proper adjustment and operation.



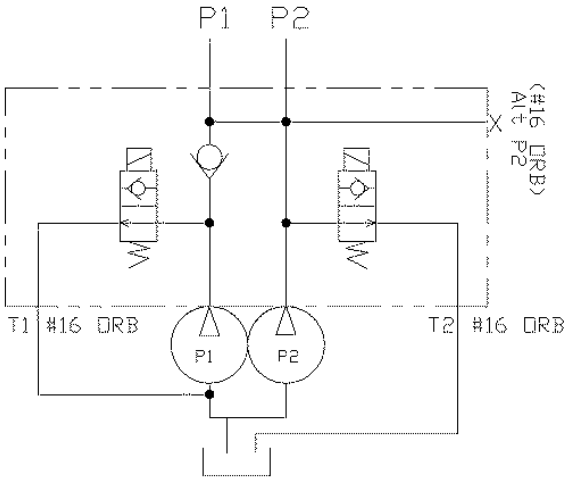


Figure 5.

TANDEM VANE PUMP WITH MONOBLOCK CONTROL MANIFOLDS, NON-O.I.G.A.I. COMBINED FLOW

Combined Flow – DP7000 Auto Side Loader, F4000 O.I.G.A.I., PT1000 O.I.G.A.I.

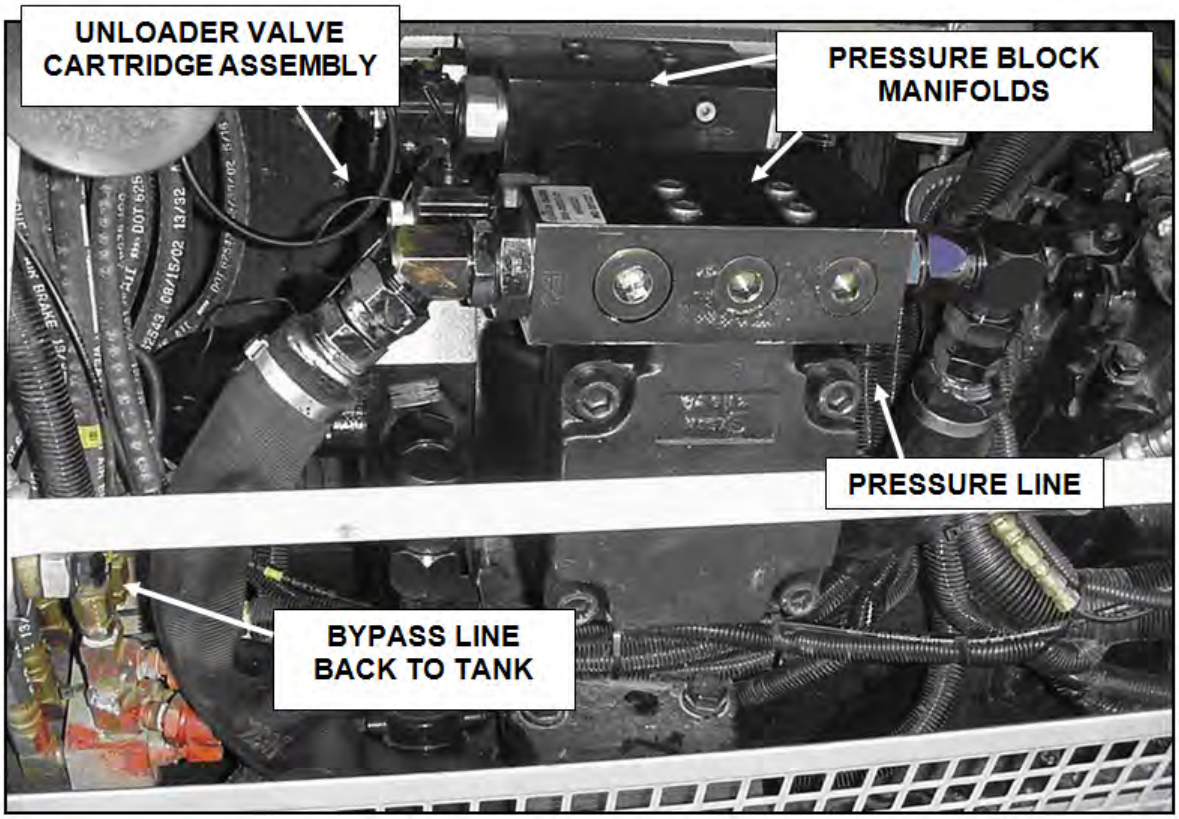
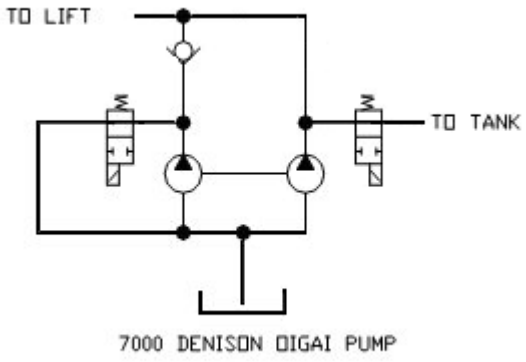


Figure 6.



This pump uses three manifolds to direct the flow of oil away from the pump to the system pressure circuit.

The two pressure block manifolds each contain an unloader valve cartridge and coil assembly to activate the system and an internal one-way check valve for each pump circuit.

The pump closest to the input shaft shuts OFF first at lower RPMs while the pump farthest from the input shaft stays ON at higher RPMs.

PT 1000™
NOTES

SECTION 3
BODY AND TAILGATE

PT 1000™
Body and Tailgate

SPECIFICATIONS

A. Body

Hydraulic Oil Tank ..... 24 Gal.
Hydraulic Oil System Capacity ..... 36-1/2 Gal.
Hydraulic In-Tank Oil Filter 10-Micron
Hydraulic Tank Suction Strainer 140-Micron
Hydraulic Cylinders:
Ejector;
20 yd ..... 4-Stage Telescopic x 110.12” Stroke
25 yd ..... 4-Stage Telescopic x 129” Stroke
Main System Relief Valve Pressure ..... 2750 PSI

B. Tailgate

Hydraulic Cylinders:
Blade (lower panel) .....4” Bore x 21-5/8” Stroke
Slide .....4-1/2” Bore x 26-1/2” Stroke
Tailgate Raise.....3” Bore x 31” Stroke
Container Arm .....3” Bore x 18-7/16” Stroke
Roll Bar..... 2-1/2” Bore x 3” Stroke
Reeving ..... 5-1/2” Bore x 55.75” Stroke
Tailgate Valve:
Blade (Lower Panel) Detent..... 2500 PSI
Blade Back-Off Relief ..... 3900 PSI
Optional Mechanism (Winch, Roll Bar)..... 1400 PSI
Upper Panel Detent – Mechanical Both Ways..... - - - -
Tailgate Packer Mechanism Cycle Times (Empty Hopper);
Complete Cycle..... 16 to 18 Seconds
Reload ..... 5 to 6 Seconds

BODY NOMENCLATURE

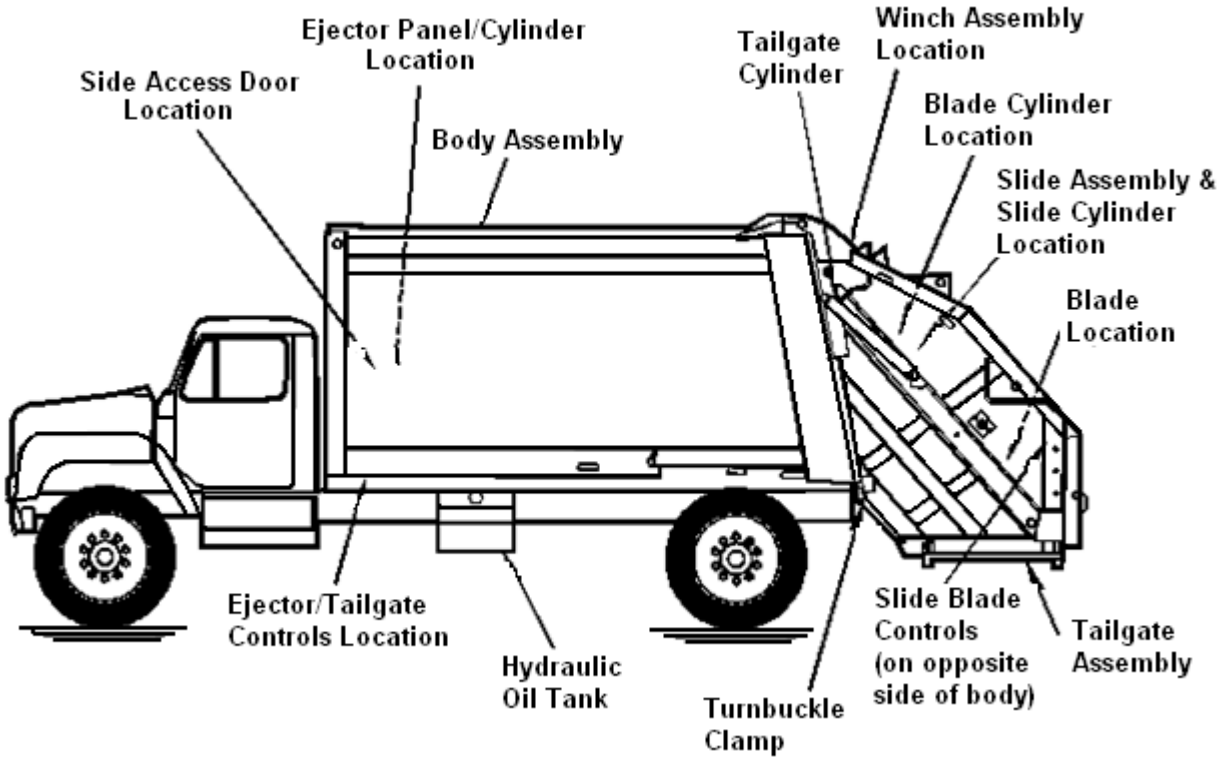


Figure 7. Body Nomenclature

TAILGATE SUPPORT PROPS

Two support props are on the unit and must be used whenever the tailgate is opened for service or maintenance. Both props must be used.

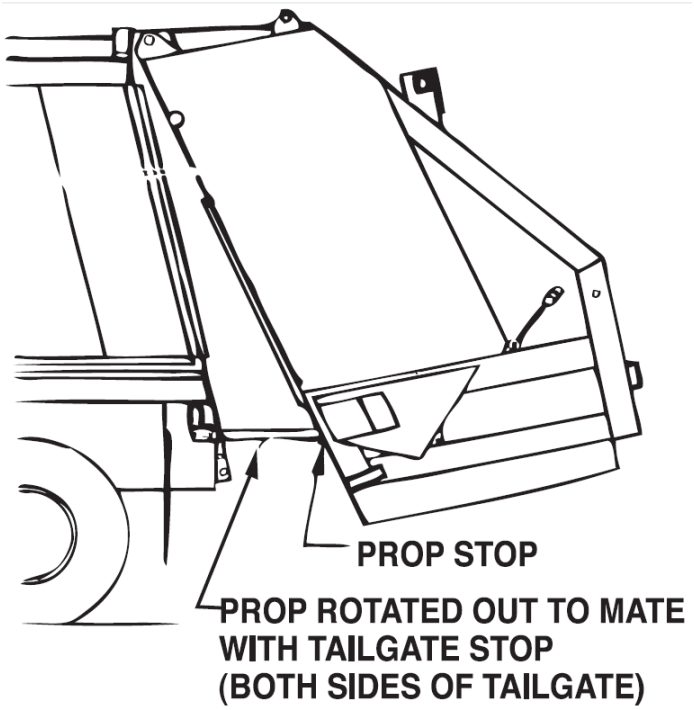


Figure 8. Tailgate Support Props

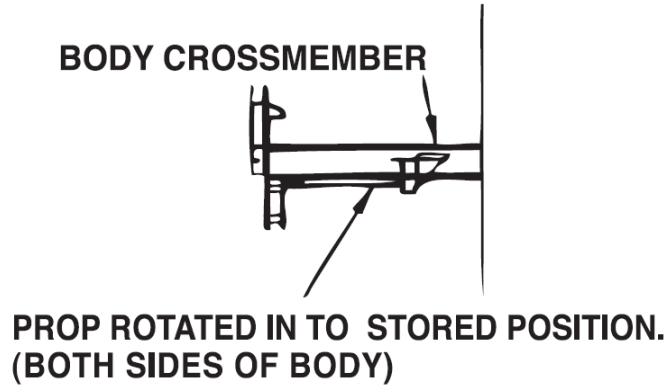


Figure 9. Tailgate Support Props

SIDE ACCESS DOOR

A side access door is installed on the street side of the body. This door will provide access to the hopper area for cleanout purposes. Be sure door is closed and latched properly at all times.

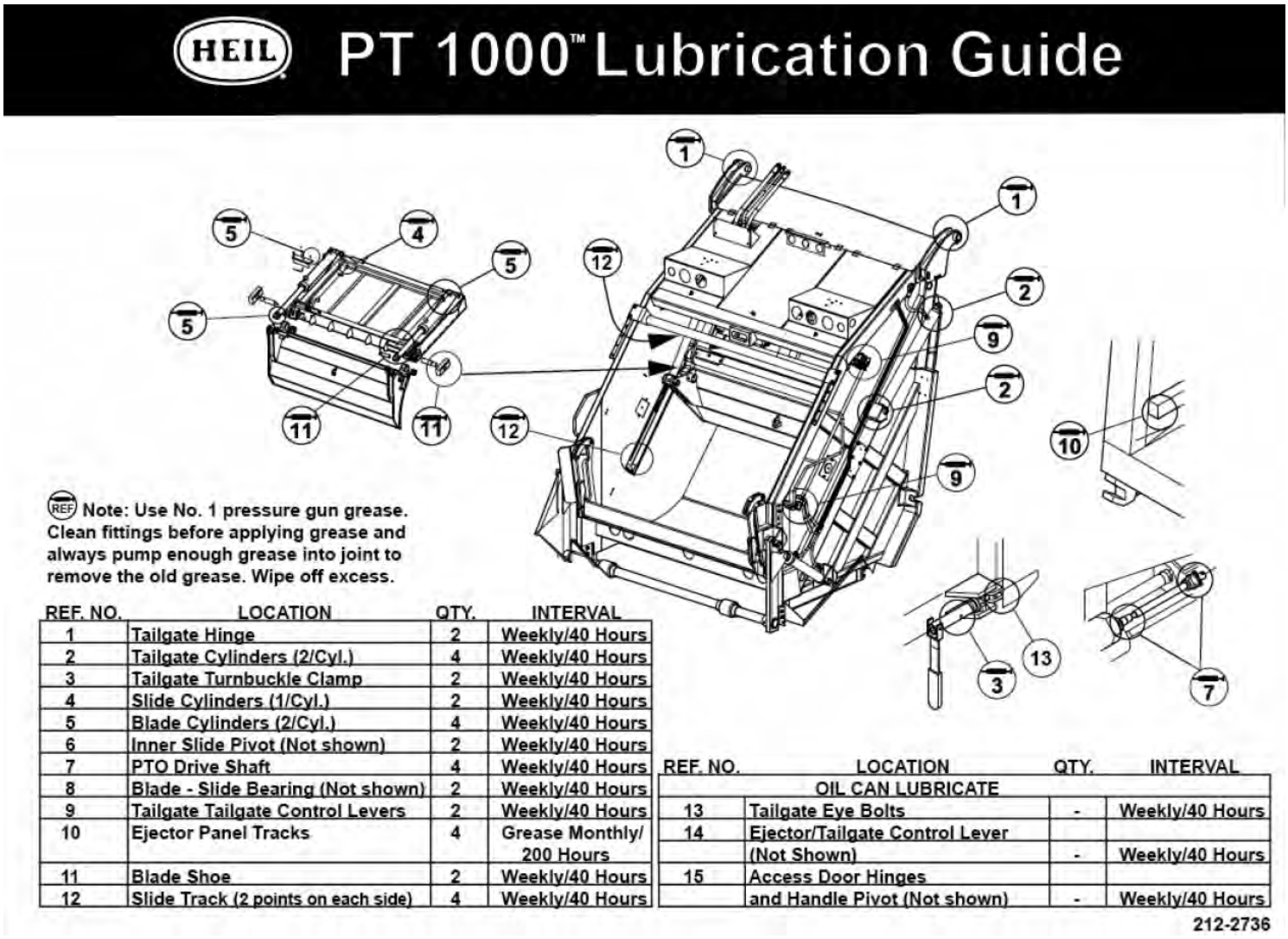
⚠ WARNING

Make sure the unit is in the Lock-Out/Tag-Out mode when you do maintenance or service procedures, when you go in the hopper, enter the side access door, or climb on the body or equipment. Equipment can be operated when the unit is not in the Lock-Out/Tag-Out mode. When the unit is not in the Lock-Out/Tag-Out mode, equipment operated while you do maintenance or service procedures, enter the hopper or climb on the body or equipment can cause serious injury or death.

Figure 10. Optional Street Side Access Door

BODY LUBRICATION GUIDE

Clean fittings before applying grease and always pump enough grease into joint to remove the old grease. Wipe off excess grease. Lubricate moveable mechanical parts without fittings every 60 days with non-detergent engine oil.



REF. NO.	LOCATION	QTY.	INTERVAL
1	Tailgate Hinge	2	Weekly/40 Hours
2	Tailgate Cylinders (2/Cyl.)	4	Weekly/40 Hours
3	Tailgate Turnbuckle Clamp	2	Weekly/40 Hours
4	Slide Cylinders (1/Cyl.)	2	Weekly/40 Hours
5	Blade Cylinders (2/Cyl.)	4	Weekly/40 Hours
6	Inner Slide Pivot (Not shown)	2	Weekly/40 Hours
7	PTO Drive Shaft	4	Weekly/40 Hours
8	Blade - Slide Bearing (Not shown)	2	Weekly/40 Hours
9	Tailgate Tailgate Control Levers	2	Weekly/40 Hours
10	Ejector Panel Tracks	4	Grease Monthly/ 200 Hours
11	Blade Shoe	2	Weekly/40 Hours
12	Slide Track (2 points on each side)	4	Weekly/40 Hours

REF. NO.	LOCATION	QTY.	INTERVAL
	OIL CAN LUBRICATE		
13	Tailgate Eye Bolts	-	Weekly/40 Hours
14	Ejector/Tailgate Control Lever (Not Shown)	-	Weekly/40 Hours
15	Access Door Hinges and Handle Pivot (Not shown)	-	Weekly/40 Hours

212-2736

Figure 11. Lubrication Guide

DESCRIPTION OF PACKING CYCLE

Normal sequence of the packing operation is as follows:

1. First Half of Packing Cycle

   When the slide reaches the bottom position in the cycle, the packing mechanism will stop automatically.

2. Second Half of Packing Cycle

   To begin second half of operation, push in on both levers. Packing mechanism will stop when second half of cycle is completed. The tailgate throttle control switch is connected to the slide spool linkage. Each control lever can be operated separately, but throttle advance will only occur when the slide lever is engaged.

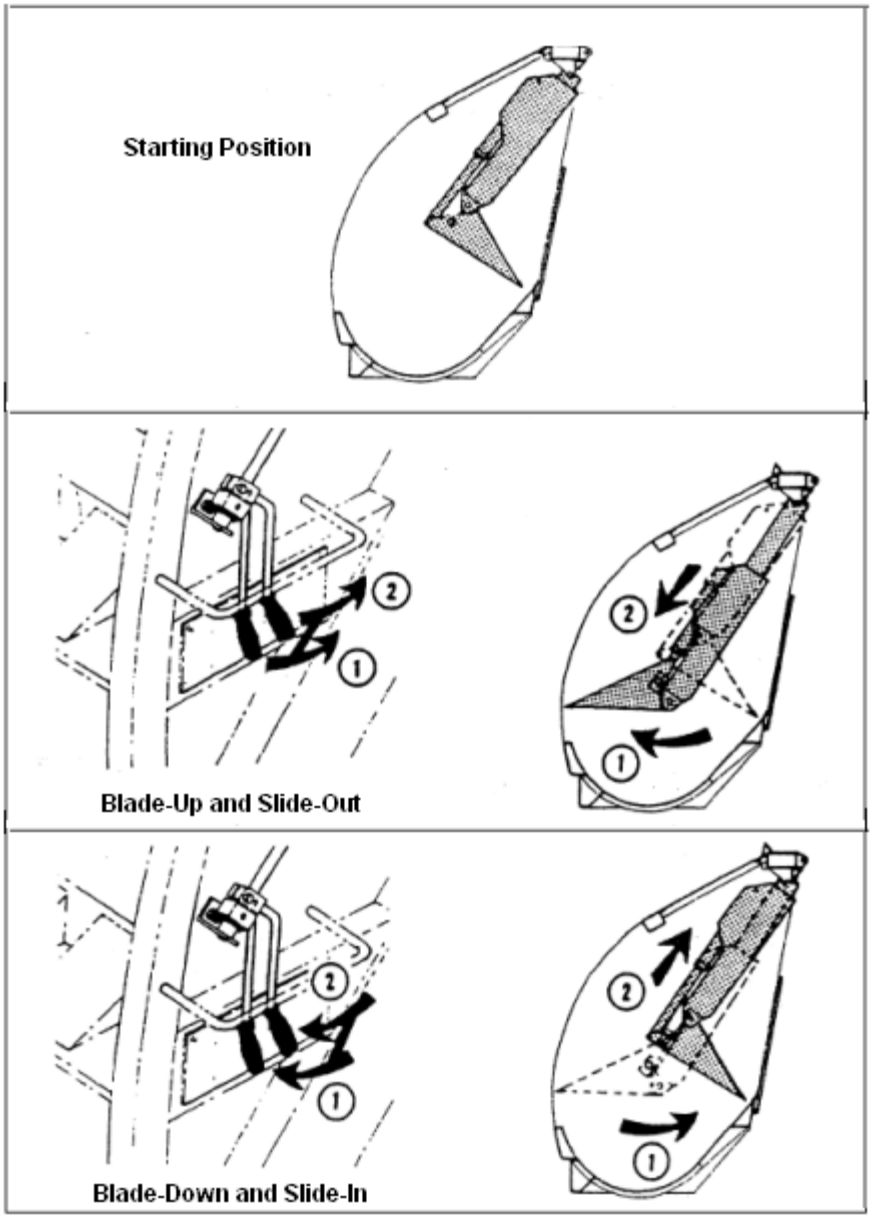


Figure 12. Packing Cycle

NEUTRAL INTERLOCK (ELECTRONIC CONTROLLED ENGINES)

The neutral interlock features on this unit MUST NOT be altered in any way. This includes, but not limited to, bad wiring, incorrect programming, or unintended use of these features. Wiring of these systems is shown in the Schematics section 89.

⚠ WARNING

Changing or altering any neutral interlock features could result in property damage, personal injury or death!

WELDING AND ELECTRONIC DEVICES / ELECTRICAL LUBRICANTS

Before welding on any unit with electronic devices like the Cortex Controller™, electronic control units (ECUs), and proximity switches complete the following procedures.

⚠ WARNING

Never weld on a compressed natural gas vehicle unless the compressed natural gas fuel system has been purged with inert gas. See Service Manual Section 1.

- Disconnect all battery connections.
- Place welding ground as close as possible to the area that is being repaired.
- Disconnect the Cortex Controller and all other electronic control units (ECUs).
- If welding within 24 inches of a proximity switch, remove the switch from the unit.

NOTICE

Failure to follow these procedures may cause damage to the devices. The damage comes from the inability of the devices to withstand the amperage, open circuit voltage and magnetic flux a welder can produce.

Electrical Anti-Corrosion Lubricant

It is very important that all Packard connectors are properly lubricated. The following compounds, by brand name, or functional equivalents, are approved for use.

- Truck-Lite Corrosion Preventive Compound
- GB ox-gard, anti-oxidant compound
- Burndy Penetrox A electrical joint compound.

These lubricants may be obtained at an electrical supply store.

SECTION 4
MAINTENANCE AND ADJUSTMENT

BODY DAILY CHECKLIST

Make sure you perform a daily check of the unit. Refer to the Operator's Manual for the Daily Checklist. Many checks in the Daily Checklist are maintenance related, such as checking tire pressures and hoses for wear and damage.

DAILY CHECKLIST MAINTENANCE ITEMS	
ITEM	**REQUIRED ACTION**
Low air pressure in tires	Inflate the tire to the correct air pressure given on the tire.
Worn tire	Replace when the wear is greater than allowed by law or before the tread is no longer visible.
Damaged tire	Replace immediately **BEFORE** going on route.
Hydraulic pump leaks	Determine the cause of the leak and repair immediately.
Damaged hydraulic pump	Repair or replace **IMMEDIATELY.**
Loose or missing hardware for the hydraulic pump	Tighten loose hardware. Replace missing hardware immediately.
Damaged decal or decal not readable	Replace decal immediately.
Low level of hydraulic oil	Fill the hydraulic oil tank immediately.
Worn or damaged hoses	Replace immediately.
Leaks at cylinders, hoses or fittings	Tighten loose connection.
Loose or missing hardware	Tighten loose connections. Replace missing hardware.
Worn fiber guards	Replace hoses/fittings as necessary. Install new fiber guard on new hoses.
Worn or damaged tailgate lock components	Replace worn or damaged components.
Loose or missing tailgate lock hardware	Tighten loose hardware. Replace missing hardware.
Damaged tailgate seal	Replace seal.
Body structure has loose or missing hardware	Tighten loose hardware. Replace missing hardware.
Body structure has cracked weld joints	Repair immediately.
Body mounting brackets have loose hardware, damaged hardware or cracked welds	Tighten loose hardware. Replace missing hardware. Repair cracked welds.
Air regulator	90 PSI, typically located at front of body.

BODY PREVENTIVE MAINTENANCE CHART

Preventive maintenance must be performed to ensure the safe and reliable operation of your unit. Use the chart below as a guideline for when essential items should checked and serviced. Severe use or adverse conditions may require more frequent maintenance.

BODY PREVENTIVE MAINTENANCE CHART						
	*HOURS OF OPERATION					
COMPONENT/SYSTEM	**8**	**40**	**200**	**1000**	**2000**	**CHECK/SERVICE**
Hydraulic System	☑					Check oil level – add if necessary
		☑				Check cylinders, pump, hoses, tubes, fittings, and adapters for leaks. Check hoses for cracks, crushes, and cover blisters. Repair or replace if necessary with genuine Heil parts. Any replacement hose should be the same size and pressure rating as listed on the original OEM hose.
		☑				Check Control valve seals for leaks. Repair or replace if necessary.
				☑		Replace filter after first 30 days of operation, then every 6 months or 1000 hours of operation OR when filter bypass light is ON.
				☑		Replace tank breather/filter every time you replace filter element.
					☑	Drain, flush, and refill. Change filter element.
Electrical, Battery Cables	☑					Check for proper operation.
		☑				Check battery cables from battery to starter for loose cables, rubbing or damage and abrasions to cables. Replace if necessary.
Operator Controls	☑					
Front Mount Pump or Power Take-Off (PTO)		☑				Check seals for leaks and operation. Replace if necessary
		☑				Check drive line for smooth operation. Replace as necessary.
		☑				Check set screws for tightness. Tighten as necessary.
		☑				Make sure keys are in place. Replace if necessary.
			☑			Remove the pump's 40blt flange about 2 inches from the PTO and apply grease to female pilot of PTO pump flange. Failure to lubricate female pilot of PTO as given may cause damage to the pump shaft.
					☑	Drain, flush and refill. Change filter element.

BODY PREVENTIVE MAINTENANCE CHART						
*HOURS OF OPERATION						
COMPONENT/SYSTEM	**8**	**40**	**200**	**1000**	**2000**	**CHECK/SERVICE**
Grease Fittings		☑				Lubricate as shown on Body Lube Chart.
Body Undercoating					☑	Inspect body undercoating and repair as necessary.
Fork Bearing Block Bolts (Front Loaders Only)			☑			For Front Loaders Only, each of the four fork bearing block bolt torques should be 460 Ft-Lbs.
Calibrate Cylinder Sensors (Odyssey Front Loader Models Only)					☑	For Odyssey models only, calibrate cylinder sensors. See Service Manual - **Odyssey Cylinder Sensors Calibration**.
Tailgate Seal Integrity	☑					
* Daily = 8 hrs. Weekly = 40 hrs. Monthly = 200 hrs. 6 Months = 1000 hrs. Yearly = 2000 hrs.						

PACK/EJECT CYLINDERS MAINTENANCE

Heil Environmental recommends completing the following tasks to make sure the pack/eject cylinders are working properly and not damaged.

⚠ WARNING

Make sure the unit is in the Lock-Out/Tag-Out mode when you do maintenance or service procedures, or when you go in the hopper, climb on the body or equipment. Equipment can be operated when the unit is not in the Lock-Out/Tag-Out mode. When the unit is not in the Lock-Out/Tag-Out mode, equipment operated while you do maintenance or service procedures, go in the hopper or climb on the body or equipment can cause serious injury or death.

DO

DAILY

1. Remove all trash, metal, etc. from behind the packer panel.
2. Visually inspect packer tracks and hopper floor for excessive wear or damage. Repair or replace if necessary

WEEKLY

1. Inspect pack/eject cylinder pins (both ends) for wear or damage. Replace if necessary.
2. Grease all pins.

DO NOT

1. Damage cylinder rod by striking it with any piece of metal, shovel, etc, when cleaning behind the panel.
2. Leave trash, metal, etc. behind the packer panel to accumulate as damage to cylinder may occur.

⚠ WARNING

Failure to follow these instructions can result in damage to the Heil body, truck chassis or can cause personal injury!

PREPARING THE UNIT TO CHECK THE OIL LEVEL

Before checking the oil level or adding oil, make sure the unit is in the following position with all cylinders collapsed:

- Truck – on level ground
- Tailgate and Body – fully down and locked
- Ejector Panel – at the front of the body
- Packer Panel – in the in-transit position with all cylinders retracted

The oil tank is mounted behind the chassis cab. The oil level in the standard tank must be kept between the low and full marks as indicated on the sight gauge. See the figure below.

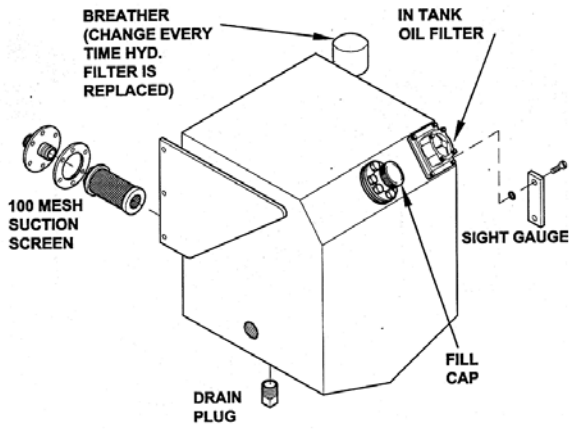


Figure 13. Hydraulic Oil Tank and Sight Gauge

CHECK OIL LEVEL

Check the hydraulic oil level (after warning up the oil) daily or every eight (8) hours, whichever comes first. Fill as necessary.

Important: Contamination is a hydraulic system's worst enemy. Do not let dirt enter the system. Use a clean rag and remove dirt or other contamination around any system component before you disconnect or remove it. While you fill the reservoir, filter the oil through a 200 mesh (or finer) screen. Never use a cloth to filter the oil.

WHEN TO CHANGE OIL FILTER ELEMENT

Change the filter more often under certain conditions such as an extremely dusty atmosphere or area. Use only Heil replacement filters. Purchase the filter element from your local Heil distributor.

Change the filter element every 1000 hours or every six (6) months or when indicated by the filter monitor light located in the cab.

DRAIN AND CLEAN THE HYDRAULIC OIL TANK

Change the hydraulic oil at least annually or every 2000 hours of operating time, whichever comes first.

Remember that almost all hydraulic system malfunctions can be traced to dirt in the fluid. When working with the hydraulic system, the hands, tools, working area and parts must be as clean as possible.

⚠ CAUTION

Wear proper eye protection when you are working on or around hydraulic lines or components. Wear proper eye protection and avoid contact with hydraulic oil if possible. Never check for oil leaks with your hands.

To drain and clean the hydraulic oil tank, follow these steps:

1. Disengage the pump, shut off the engine and remove the ignition key.

⚠ WARNING

Make sure the unit is in the Lock-Out/Tag-Out mode when you do maintenance or service procedures, or when you go in the hopper, climb in or on the body or on equipment. Equipment can be operated when the unit is not in the Lock-Out/Tag-Out mode. When the unit is not in the Lock-Out/Tag-Out mode, equipment operated while you do maintenance or service procedures, go in the hopper or climb in or on the body or on equipment can cause serious injury or death.

NOTICE

If your employer or company has Lock-Out/Tag-Out procedures that are different from the following procedures, use your employer's or company's procedures. If your employer or company does not have Lock-Out/Tag-Out procedures, use the procedures that follow.

2. Contact your supervisor if you have any questions about Lock-Out/Tag-Out procedures. If your supervisor has any questions, that person can contact ESG Technical Service. Perform the **Lock Out/Tag Out procedures** 9.
3. Remove the fill cap from the top of the tank.
4. Remove the drain plug from the bottom of the tank so that the oil drains into a container.
5. While fluid is draining from the tank, remove and replace the filter/breather assembly. Change the assembly every time the in-tank filter is replaced.
6. To drain the entire hydraulic system, disconnect all hoses at the adapter and drain the hoses into a container.
7. Remove and replace the in-tank filter as described in **Change the Hydraulic Oil Filter**.
8. Remove the outlet flange and 100 mesh suction strainer to gain access to the tank inside.
9. Remove sediment from the tank bottom.
10. Install the outlet flange with a new gasket and the 100 mesh suction strainer into the tank.
11. Install the drain plug in the tank bottom.
12. Reconnect and tighten all hose connections that were disconnected.

DRAIN AND CLEAN THE HYDRAULIC OIL TANK (CONTINUED)

NOTICE

Before filling the tank be sure the funnel is clean and 200 mesh (or finer) screen is used to strain the hydraulic oil.

13. Fill tank with recommended oil, checking the sight gauge as you fill. Refer to **Hydraulic Oil Specifications** 10.
14. Check the entire system to make sure all connections are tight and no leaks are found.
15. Start the truck's engine and engage the pump.

⚠ WARNING

Moving equipment can be dangerous to bystanders. Serious injury or death can occur if a person is in the wrong area or is not attentive to the operations. Clear the area of all unnecessary people before you operate the controls.

16. Operate the packing panel through 10 cycles to be sure all air is out of the circuits.
17. Operate the automated container lift mechanism.
18. Operate tailgate – full up and full down.
19. Operate body raise (dump units) – full up and full down.
20. With the packing panel in the retracted position and lift in the in-transit position, check tank oil level. If necessary, add recommended as described under **Check Oil Level** 46.

PURGE THE HYDRAULIC SYSTEM

If the hydraulic system becomes contaminated because of component failure or some other reason, you must purge the hydraulic system.

To purge the system, follow these steps:

1. Extend the packer/ejector cylinder to lower the oil level in the tank.
2. Remove and replace the in-tank oil filter element in the tank.
3. Engage the packer/ejector control lever and allow the oil to circulate through the new filter, cleaning the oil.

NOTICE

Before filling the tank be sure the funnel is clean and 200 mesh (or finer) screen is used to strain the hydraulic oil.

4. Repeat the procedure as necessary until the system is purged.

NOTICE

If contaminated hydraulic oil reaches the cylinders, the unit may need to be removed from service until the contamination is removed. For more information, contact the Heil Technical Services.

PRESSURE ADJUSTMENT PROCEDURES

Before starting any pressure adjustments, the hydraulic oil must be at or near the operating temperature. See **Cold Weather Warm-Up Procedure** 19 in Section 1 of the Service Manual.

TWO-STAGE RELIEF VALVE (UNITS SERIAL NUMBER THROUGH 1301089)

The two-stage relief valve used in the tailgate valve is adjustable only on the LOW setting. The HIGH setting is preset at 1400 PSI. The low setting is 500 PSI.

A. Checking Low Pressure Settings

1. Release any pressure from the tailgate circuit by placing the tailgate in the closed position.
2. Start the engine, engage the pump and lock the tailgate to the body with the tailgate clamps.
3. Pull the ejector panel control lever to extend the panel to bottom out the ejector cylinder.
4. At engine idle, read the pressure on the pressure gauge. It should read 500 PSI.
5. If pressure is incorrect, adjust the pressure setting.

B. Adjusting the Low Pressure Setting

1. Turn OFF engine, remove ignition key and disengage the pump.
2. Remove the hydraulic tube located between the duo-press valve and the tailgate section.

NOTICE

Do not actuate the tailgate raise lever when the hydraulic tube is removed.

3. Loosen the lock nut on back of duo-press valve and turn the assembly IN (clockwise) to increase pressure and OUT (counterclockwise) to decrease pressure.
4. If correct pressure is not attained, repeat steps 1 thru 3 above.
5. When correct pressure is attained, reinstall hydraulic tube to ejector and tailgate sections.

UNDERBODY VALVE RESISTANCE RELIEF (UNITS SERIAL NUMBER 1301090 AND AFTER)

The resistance valve is located in the ejector section of the underbody valve and preset at 2250 PSI.

When the slide panel moves refuse from the hopper into the body, resistance will begin to increase quickly. As resistance increases, pressure within the slide cylinders increases and when the pressure passes through 2250 PSI, the valve will open momentarily allowing the ejector panel to slide back into the body for the refuse to enter, approximately 2 inches.

The valve will close when the slide kicks out at 2500 PSI.

When packing a light load, the panel may move approximately one inch and if packing a heavy load the panel may move as much as three inches, depending on refuse moisture content, compactability, etc.

If load is too light, be sure system pressure is correct and the slide and blade kick-outs are properly set.

NOTICE

Make sure the correct blade back-off relief is installed in the tailgate valve, the cap is stamped 3900 PSI.

A. Resistance Relief Valve Adjustment

If adjustment to the resistance relief is required, perform the following steps.

1. Loosen lock nut on the adjustment screw.
2. If loads are light and the ejector panel reached the front of the body, turn adjustment screw in (clockwise) 1/8 turn.
3. Retighten lock nut and check load weights.
4. If the ejector panel stalled before reaching the front of the body, turn adjusting screw out (counterclockwise) 1/8 turn.
5. Repeat steps 1 thru 4 to increase or decrease resistance as necessary to get desired payloads.

NOTICE

The effectiveness of the resistance valve setting can only be determined by fully loading the unit. The initial valve setting (starting point) can be made by turning the adjuster screw all the way in and backing it out 1 ½ turns.

PRIMARY (UNDERBODY) VALVE

This 2-lever, 3-section air controlled valve is located under the front left side (street) of the body. It controls the ejector panel and tailgate raise/lower functions. See the Operation Manual for operational information.

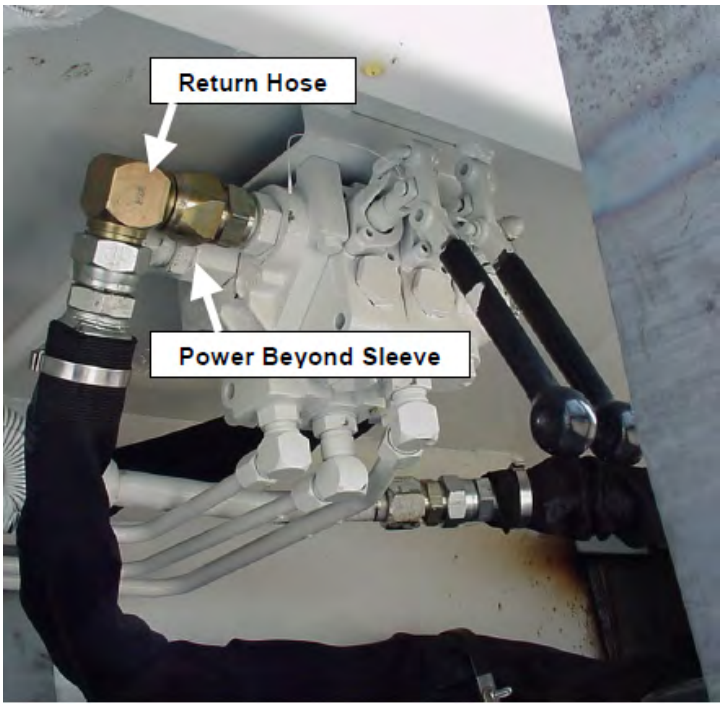


Figure 14. Primary Underbody Valve

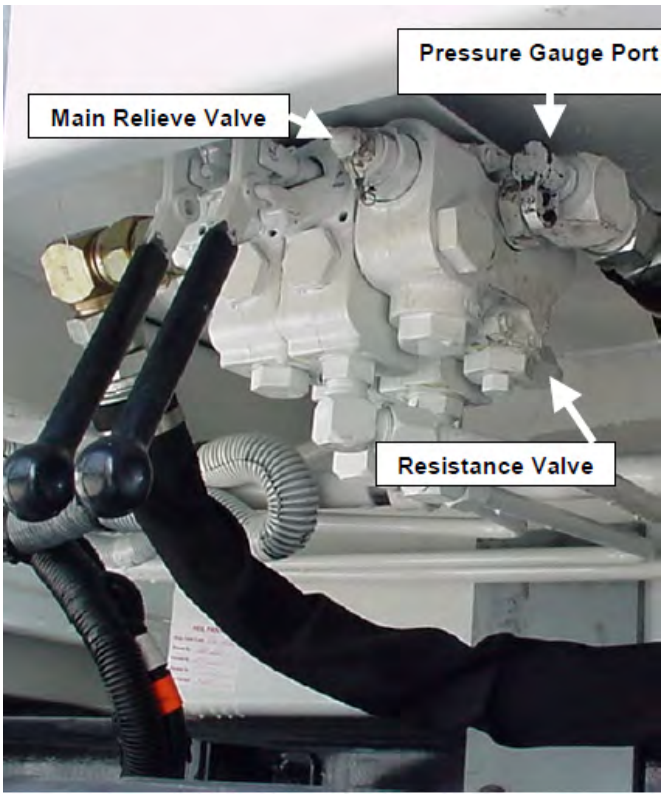


Figure 15. Main Relieve Valve, Pressure Gauge Port and Resistance Valve

PRIMARY (UNDERBODY) VALVE WITH RESISTANCE RELIEF UNITS (SERIAL NUMBER 1301090 AND AFTER)

The resistance valve is located in the ejector section of the underbody valve and preset at 2250 PSI. When the slide panel moves refuse from the hopper into the body, resistance will begin to increase quickly. As resistance increases, pressure in the base side of the ejector cylinder increases. When the ejector cylinder pressure reaches 2250 PSI, the valve will open momentarily allowing the ejector panel to slide back into the body approximately 2 inches so refuse can enter. The valve will close when the slide kicks out at 2500 PSI. When packing a light load, the panel may move approximately one inch and if packing a heavy load the panel may move as much as three inches, depending on refuse moisture content, compact ability, etc. If the load is too light, be sure the system pressure is correct and the slide and blade kick-outs are properly set.

NOTICE

Make sure the correct blade back-off relief is installed in the tailgate valve; the cap is stamped 3900 PSI.

NOTICE

The resistance relief is NOT interchangeable with the Duo-Press Relief.

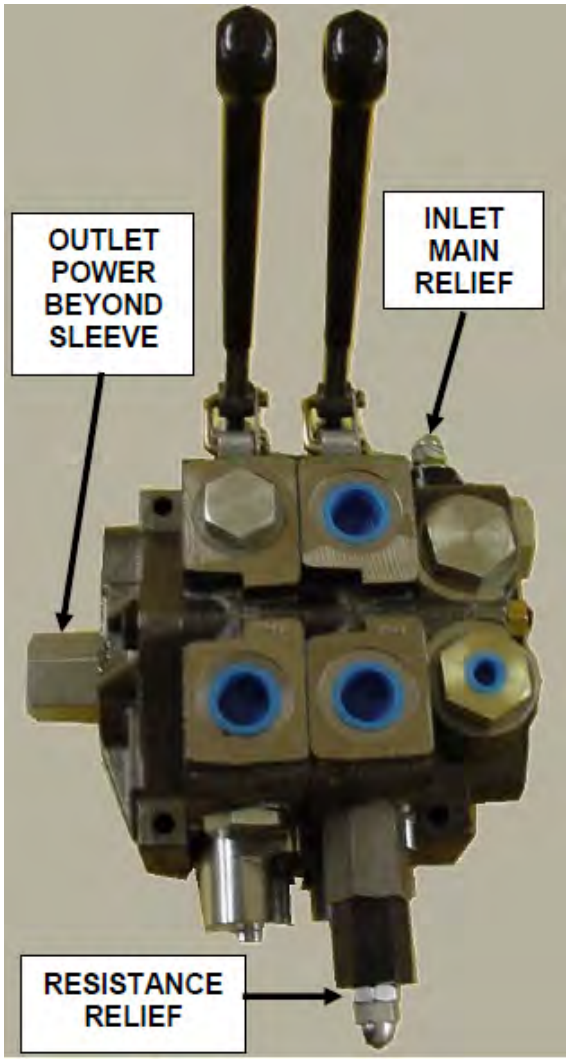


Figure 16. Primary Valve with Resitance Relief

INSTALLATION OF 3900PSI TAILGATE BLADE BACK-OFF RELIEF

1. Remove existing 2900 PSI relief valve from body. Verify that there is no sign of debris or old “O”-ring left inside from the removed 2900 psi relief valve.

Figure 17. Clean O-Ring

2. Install the 3900 PSI relief valve in place of the 2900 PSI. Tighten Valve with wrench on rear flats until the small “O”-ring is seated properly. Tighten second (Large) “O”-ring nut.

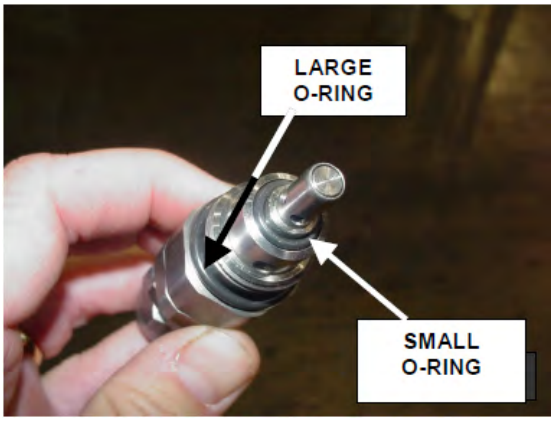


Figure 18. Large and Small O-Rings

3. Make sure that there is only one small “O”-Ring installed when re-assembling the valve to the body.

Figure 19. O-Ring

DISASSEMBLY/ASSEMBLY OF VALVE SECTION

1. Mark each valve section numerically to avoid incorrect reassembly.
2. Remove three (3) assembly stud nuts from the inlet section using a 9/16" thin wall socket. See the figure below.
3. Remove valve sections by sliding from assembly studs.
4. Remove and discard o-rings in each section. Thoroughly clean o-ring counterbores and ground surfaces of each section.
5. Replace the four O-rings in each section.
6. Replace valve sections on assembly studs in the same manner in which they were removed. O-ring counterbores should be to the left when facing "A" portend of the valve.

NOTICE

Use care in replacing valve sections to avoid dislodging O-Rings from counterbores.

7. Reassemble three (3) stud nuts on stud assembly; torque nuts evenly to 32 ft./lbs.

⚠ CAUTION

Do NOT use lock washers with stud nuts. If stud nuts are NOT tightened to the proper torque, valve spools may bind or stick or cause section seals to extrude.

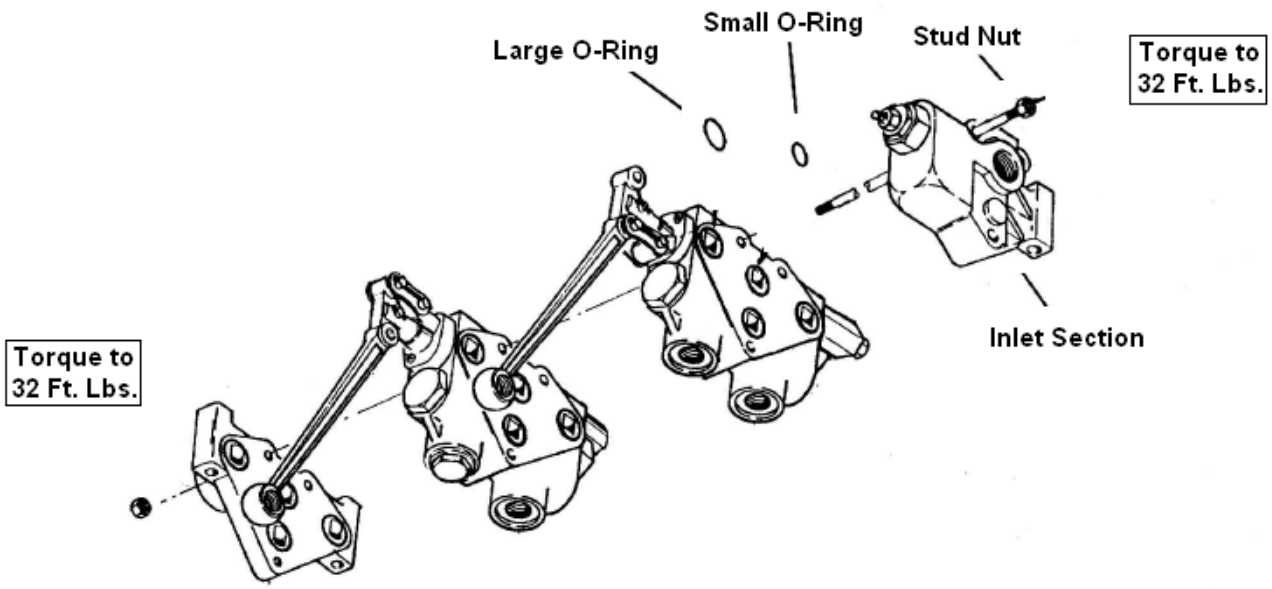


Figure 20. Valve Sections

REPLACING SPOOL SEALS

1. Remove bonnet assembly parts from back of valve section. Keep parts in order of disassembly, see the figure below.
2. Remove complete handle assembly from spool on the front of valve section, see the figure below.

NOTICE

Do NOT remove spool as the seals can be replaced externally. Prevent spool from turning or moving by inserting a screw driver through clevis slot or running a rod through clevis slot and using a handle. Do NOT hold the spool with a wrench. This will destroy spool finish.

3. Remove retainer plate washer, back-up washer and spool seal, see the figure below.
4. Thoroughly clean counterbore.
5. Lightly oil new seal and slide over spool and insert in seal counterbore. Put washers back on spool and reassemble handle assembly. Torque screws evenly to 10 ft./lbs.
6. Reassemble bonnet assembly, making sure it goes together in same order as when removed.
7. Torque bonnet screws evenly to 10 ft./lbs.

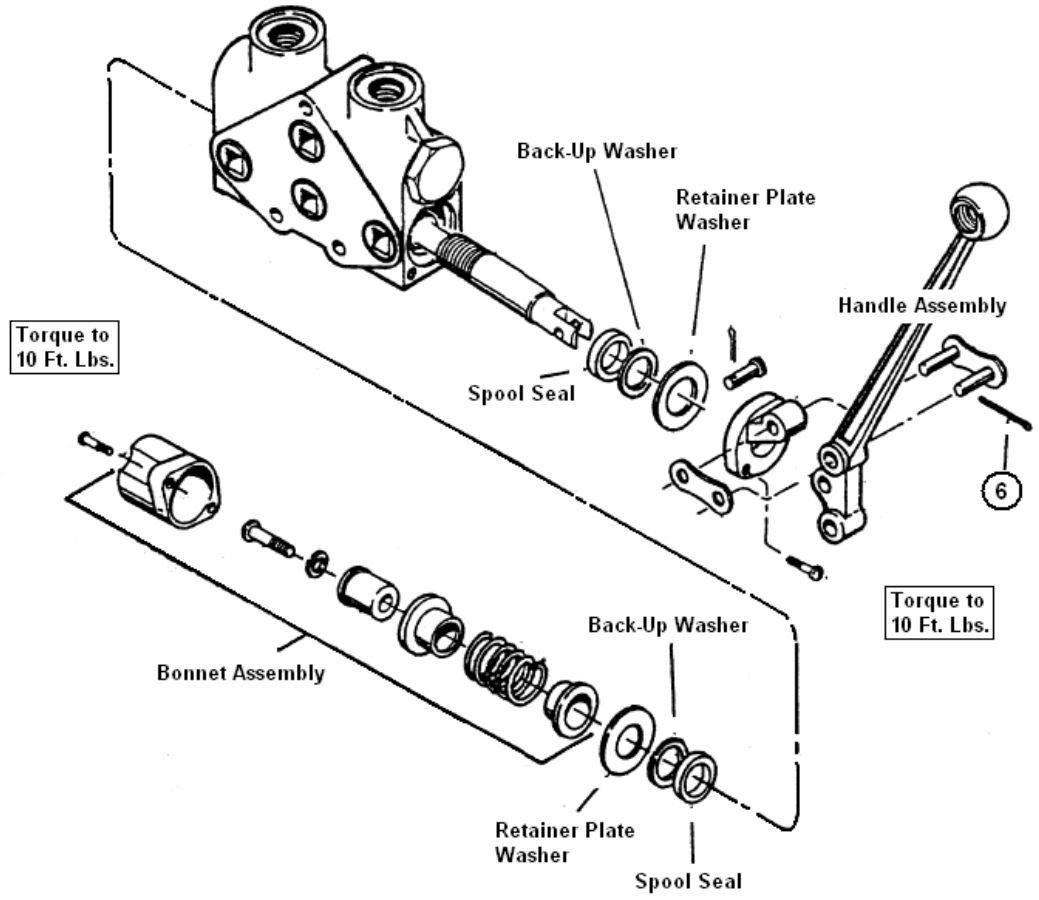
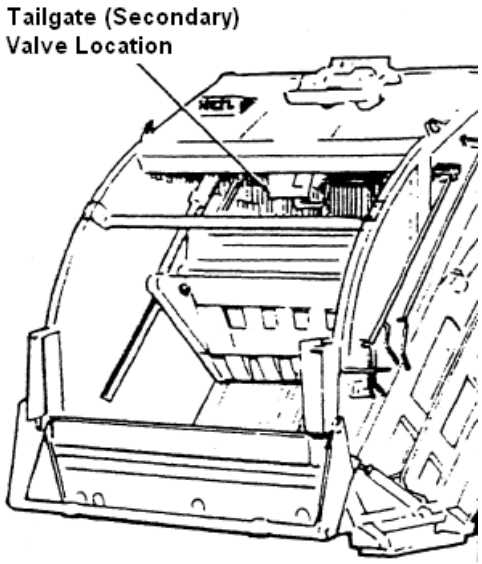


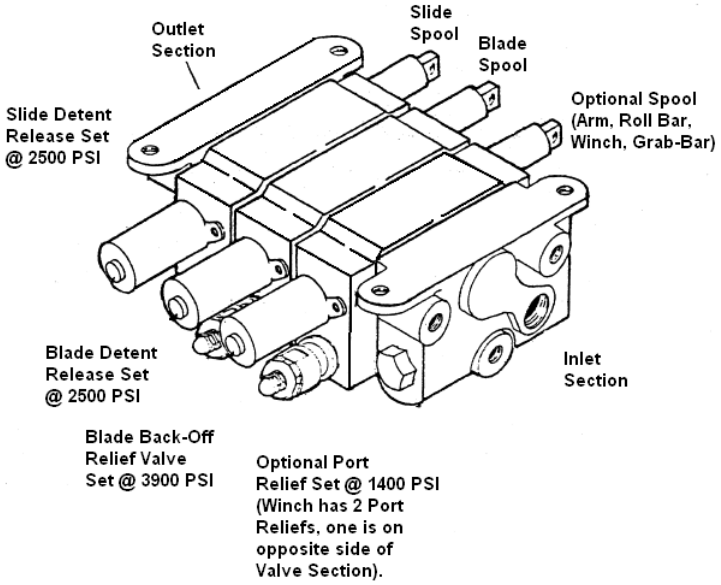
Figure 21. Spool Seals

SECONDARY (TAILGATE) VALVE

This valve controls the packing mechanism through the complete cycle. With this control valve, the position of the blade and slide and their respective cylinders can be positioned as desired. (Refer to Operator's Manual for complete operational instructions). This valve uses separate valve sections that are bolted together.



22. Tailgate Valve Location



23. Tailgate Valve Nomenclature

TAILGATE VALVE LINKAGE ADJUSTMENT

1. Loosen the jam nut behind the yoke.
2. Screw the yoke out (clockwise) to pull levers closer to the unit. Screw yoke in (counter-clockwise) to pull levers away from the unit.
3. Re-assemble and check. The levers need to be in the same relative position to each other and not hit the body or the lever guard. After the proper position is attained, tighten the jam nut against the yoke and re-install linkage to valve spool.

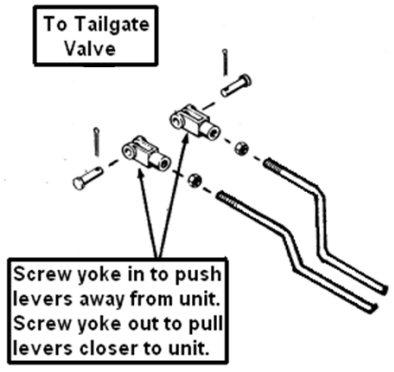
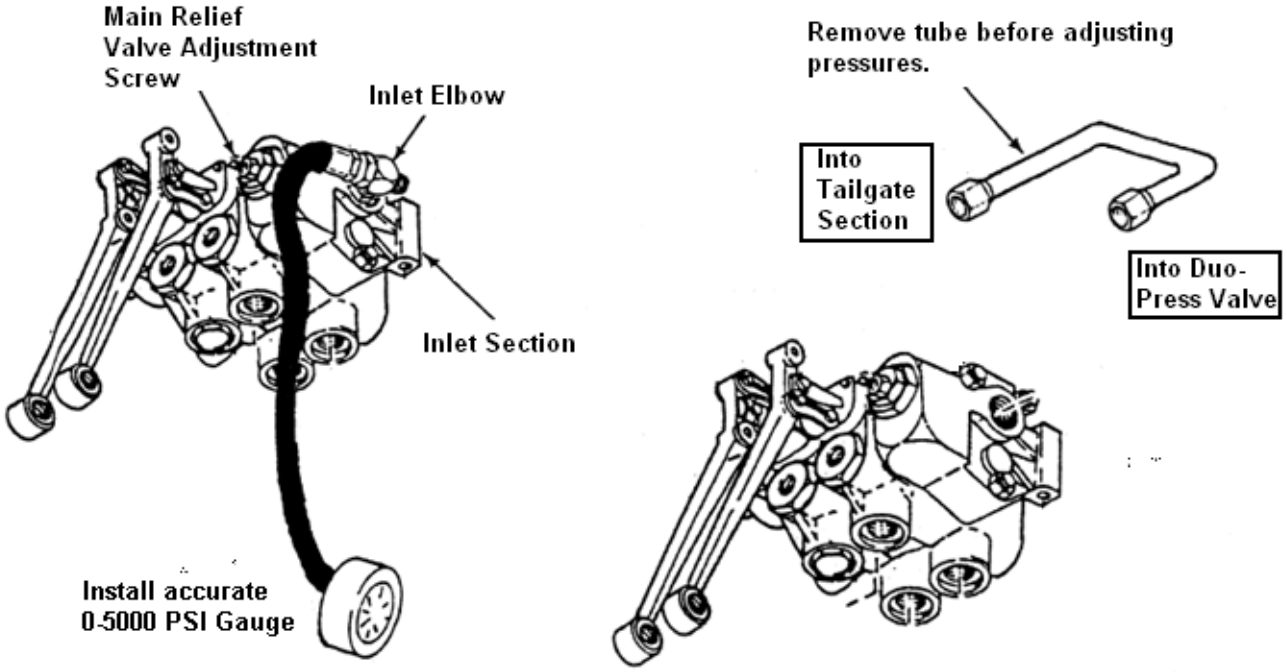


Figure 24. Tailgate Valve Linkage Adjustment

MAIN RELIEF VALVE

The main relief valve is located in the inlet section and is an adjustable relief set at 2750 PSI. See adjusting procedures on next page to set relief. All adjustments must be made with throttle advance switch depressed.



25. Main Relief Valve

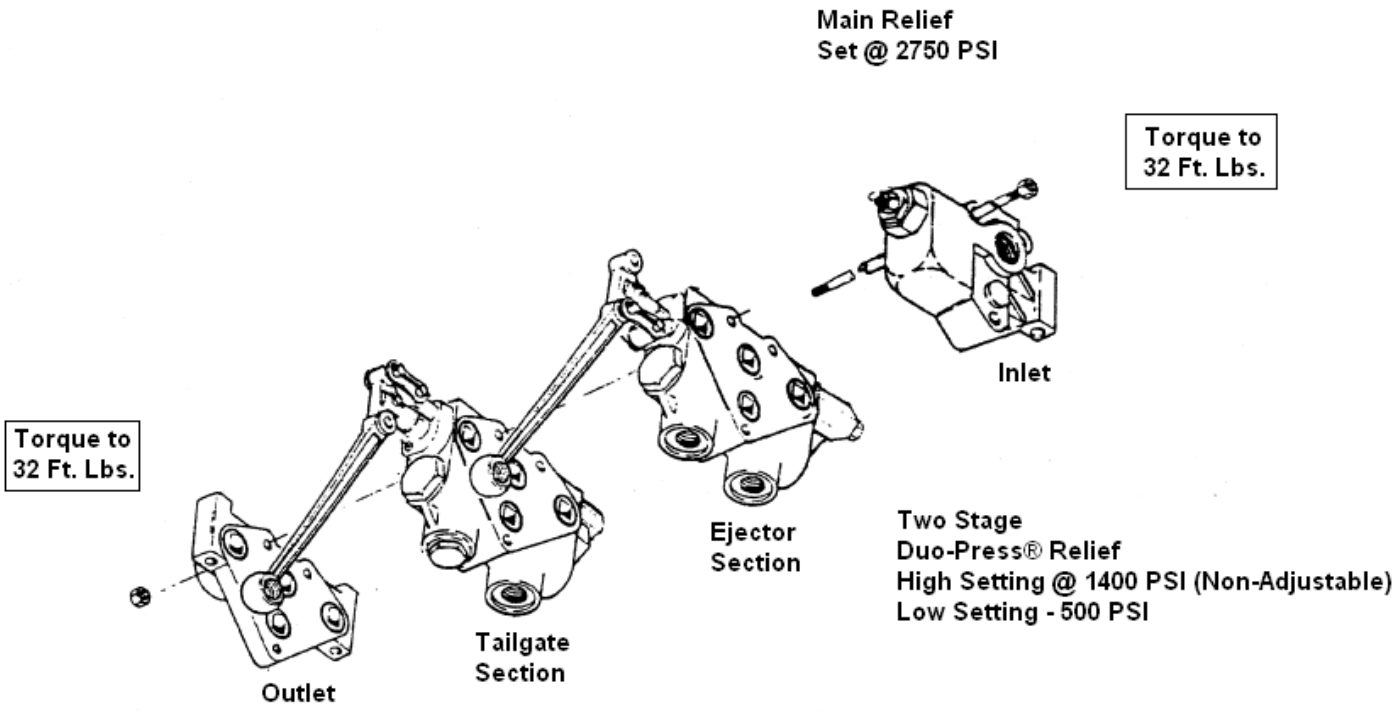


Figure 26. Main Relief Valve (Exploded View)

BLADE AND SLIDE DETENT ADJUSTMENT PROCEDURE

Each spool is held in the shifted position by a detent mechanism until the stroke of its cylinders has been completed. At this point hydraulic pressure increases to a predetermined point then the detent mechanism shifts the spool back to neutral. To adjust and check the operation, refer to this procedure: Install a 5000 PSI gauge in the Primary Control Valve at the 90° elbow tapped for 1/4" NPT gauge connection.

A. Blade Detent Adjustment

Blade Kick-Out Pressure is 2350 PSI.

⚠ WARNING

Do NOT stand in or on the hopper sill while adjustments are being made on the packing mechanism with the machine running.

1. Position the packing mechanism to blade-down and slide-out.
2. Turn OFF the PTO (or front mount pump).
3. Turn OFF ignition, remove key, and follow a lock out procedure.
4. Remove blade control linkage on secondary valve. Engage blade spool by hand (in either direction).
5. Engage blade spool by hand (in either direction).
6. Lower main relief pressure in Primary (Underbody) Valve two (2) turns out (counterclockwise). Refer to **Pressure Adjustment Settings**.
7. Start engine.
8. Engage PTO (or front mount pump).

⚠ WARNING

Be sure all persons are clear of the packing mechanism.

9. Depress engine throttle advance.
10. Slowly increase the main relief pressure and note the pressure when the spool kicks out of detent (returns to neutral). See chart for correct kick-out pressure for your unit.
11. If setting is incorrect, remove the rubber plug on the end of the blade spool to expose the detent release adjustment screw. See the figure on the next page.
12. Insert screwdriver and turn adjustment screw in (clockwise) to increase kick-out pressure or out (counter-clockwise) to lower kick-out pressure. One full revolution of the adjustment screw is approximately equal to an 800 PSI (5.5MPa) change in the kick-out pressure.

NOTICE

Be careful not to force the adjusting screw or it may deform the internal adjusting rod and make the valve inoperative. Be sure the internal spool does not turn in the valve while making this adjustment by holding the linkage end of the spool being adjusted, see Figure 18. Blade/Slide Spool Detent Mechanism.

BLADE AND SLIDE DETENT ADJUSTMENT PROCEDURE

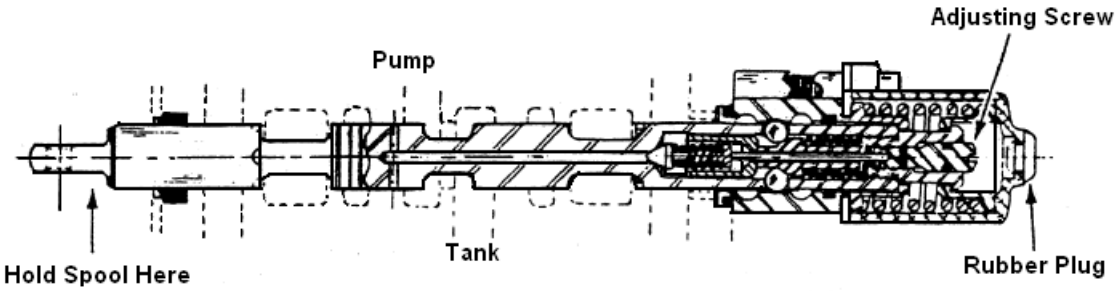


Figure 27. Blade / Slide Spool Detent Mechanism

B. Slide Detent Adjustment

Slide Kick-Out Pressure is 2500 PSI.

1. Position the packing mechanism to blade-down and slide-out.
2. Turn off PTO (or front mount pump).
3. Turn off engine, remove keys and follow **Lock-Out/Tag-Out procedures** 9.
4. Remove slide control linkage on secondary valve (bottom valve spool).
5. Follow the same procedure to check and set slide detent pressure as blade detent adjustment (except operate slide spool).
6. After detent pressures are set, re-connect all linkages and reset the main relief pressure. Refer to **Pressure Adjustment Settings**.

SLIDE WEAR STRIPS

Slide wear strips on a standard model are bronze and should be greased weekly by applying a line of grease on the exposed portion of the wear bar when extended, both inside and outside. Refer to **Body Lubrication Guide** and Lubrication Guide Decal on the unit. Replacement is necessary before the slide wear strips wear down to the button head cap-screws that secure them. Fully extend the slide and inspect the two outer wear strips from inside the tailgate. Inspect the underside wear strips from inside the body.

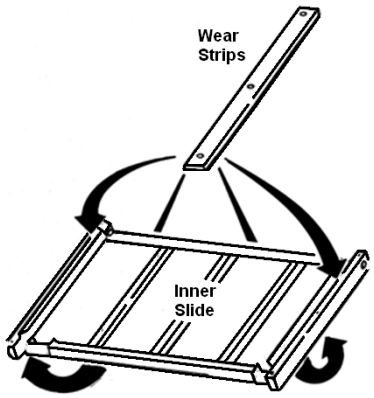


Figure 28. Slide Wear Strips

OPTIONAL CONTAINER MECHANISM ADJUSTMENT PROCEDURE

Install a 5000 PSI gauge in the Primary Valve at the 90° elbow tapped for 1/4” NPT gauge connection; make sure gauge has been checked for accuracy.

A. Winch

1. Disengage PTO.
2. Remove the hoses or tubes and fittings connecting the valve to winch at the Secondary Valve ports.
3. Install "O" rings plugs in two secondary valve ports.
4. Engage PTO.
5. Depress throttle advance and engage the winch control lever in both directions.
6. The pressure should read 1400 PSI ± 100 PSI for 8000# and 12,000# winches.
7. If pressure is incorrect, make the necessary adjustment by the following procedure:
   a. Remove the cover nut which will expose the adjustment screw.
   b. Pull spool out to adjust relief on detent cup end.
   c. Push spool in to adjust relief on spool yoke end.
   d. Loosen the leek nut.
   e. Turn adjustment screw clockwise (IN) to increase the pressure, counterclockwise (OUT) to decrease the pressure.
   f. After proper pressure is reached tighten the locknut and re-install cover nut.
8. Reconnect fittings, hoses or tubes; if applicable.

B. Container Mechanism or Roll Bar (Without Winch- Single Mechanism)

1. Engage PTO.
2. Depress throttle advance and engage mechanism control lever until cylinders bottom out (check in both directions).
3. The pressure should read 1400 PSI ± 100 PSI in with cylinders extended.
4. If pressure is incorrect, make the necessary adjustment by the following procedure:
   a. Remove the cover nut which will expose the adjustment screw.
   b. Pull spool out to adjust relief on detent cup end.
   c. Push spool in to adjust relief on spool yoke end.
   d. Loosen the lock nut.
   e. Turn adjustment screw clockwise (IN) to increase the pressure, counterclockwise (OUT) to decrease the pressure.
   f. After proper pressure is reached tighten the lock nut and re-install cover nut.

BLADE BACK-OFF RELIEF ADJUSTMENT

A relief is provided in the tailgate valve to allow the lower panel to back off slightly (2 to 5 inches of cylinder stroke) during the final stages of packing the load. If the cylinders back-off excessively (5 to 7 inches of cylinder stroke), the back-off relief needs to be adjusted or replaced.

For proper relief adjustment procedures, contact Heil Technical Services at 866-310-4345 for further instructions.

THROTTLE ADVANCE PROXIMITY SWITCH ADJUSTMENT

The PT 1000™ has an engine throttle switch which is automatically actuated. The function of the switch is to speed up the truck engine to the proper setting to achieve the correct compaction cycle time. The switch actuator is connected to the slide spool only. Since both control levers are moved simultaneously, the slide is not active until the blade spool is in neutral. The slide is last part of both cycles; therefore it keeps the throttle engaged through that entire portion of the cycle. The valve spool travel from neutral to full engagement of the spool is about 5/16” (8mm) in both directions. The proximity switch should be adjusted so it engages the throttle half way between neutral and full detent of the slide spool in each direction.

A. Throttle Advance Proximity Switch Adjustment

The throttle advance proximity switch is located on the outside of the tailgate. Adjust by loosening the clamps on the striker side left to right as needed to trigger the proximity switch when the valve is activated.

B. Tolerance

Proximity switch should actuate when spool travels 5/32" (4mm) ± 1/16" (1.6mm) from the neutral position in either direction.

TROUBLESHOOTING

TROUBLE	PROBABLE CAUSE	REMEDY
Sticking plungers	1. Excessively high oil temperature 2. Dirt in oil 3. Valve warped from mounting 4. Excessive high pressure in valve 5. Handle or linkage binding 6. Plunger bent 7. Return spring damaged 8. Spring or detent cap binding 9. Valve not at opening temperature	1. Eliminate restriction in hydraulic lines and filtering system. 2. Change oil, clean system. 3. Loosen and check valve. 4. Check with gauge on inlet and cylinder lines. 5. Free up linkage. 6. Replace valve. 7. Replace faulty parts. 8. Loosen cap, re-center and retighten. 9. Let system warm up.
Leaking seals	1. Paint on or under seal 2. Excessive back pressure 3. Dirt under seal 4. Scored plunger 5. Loose seal plates 6. Cut or scored seal	1. Remove and clean. 2. Open line to reservoir. 3. Replace valve. 4. Clean and tighten. 5. Replace faulty parts.
Detent control fails to hold	1. Worn detent cam 2. Spring or ball broken or deformed 3. Plunger stroke restricted 4. Weight of lever excessive 5. Cycle time too fast	1. Replace worn parts. 2. Replace damaged parts. 3. Check linkage. 4. Check linkage and mechanism. 5. Check cycle time.
Unable to move plunger in or out	1. Dirt in valve 2. Plunger cap full of oil 3. Bind in linkage	1. Clean and flush out. 2. Replace seals. 3. Free up linkage.
Load will not hold	1. Cylinder leaking or worn 2. Oil bypassing valve plunger 3. Port relief valve not holding	1. Check cylinders. 2. Replace valve. 3. Remove and clean.
Poor hydraulic system performance or failure	1. Defective pump 2. Dirt in relief valve 3. Relief valve defective 4. Worn cylinders 5. Load too heavy 6. Internal valve crack 7. Plunger not at full stroke 8. Reservoir low on oil 9. System filter clogged 10. Line restricted 11. Ejector cylinder leakage 12. Duo-press not properly adjusted 13. Blade back off relief stuck open	1. Check pressure or replace. 2. Disassemble and clean. 3. Check as per instructions. 4. Repair or replace. 5. Check line pressure. 6. Replace valve. 7. Check movement and linkage. 8. Add oil. 9. Replace filter. 10. Check lines. 11. Check for internal bypassing and external leakage. 12. Replace relief cartridge. 13. Check pressure and adjust as specified.
Outer Slide Drifts down	1. Regenerative spool stuck 2. Slide Cylinder bypassing	1. Free spool or replace valve. 2. Inspect Slide Cylinder for bypass.
Excessive Heat	1. Control Valve spool partially shifted 2. Restriction in line or valve	1. Lubricate and free up linkage. 2. Remove restriction.

TROUBLESHOOTING

TROUBLE	PROBABLE CAUSE	REMEDY
Throttle with no advance	1. Air leak or line breakage 2. Air line obstruction 3. Cable disconnected	1. Trace air lines back to supply and repair leaks. 2. Clean air lines and valves back to supply. 3. Tighten attaching hardware or replace faulty part.

REPAIRING CRACKED WELD JOINTS

Repair all cracked weld joints immediately after finding cracked weld joints. If you are unsure of the proper repair procedure, call Heil Technical Services at 866-310-4345.

OIL LUBRICANT RECOMMENDATION

Use only non-detergent engine oil to lubricate all moveable mechanical parts not furnished with grease fittings. Apply sufficient oil to give good lubrication, but do not bathe parts in oil. Always wipe off excess.

GREASE LUBRICANT RECOMMENDATION

Use a grease gun. Before engaging grease gun, clean the fitting. Always pump enough grease to purge the joint of contaminated grease and wipe off the excess. Lubricate a unit as given on the lubrication decal on the unit and in the Body Lubrication Guide paragraph of this section.

Use grade NLG1000 grease or equivalent.

TAILGATE LUBRICATION

See **Grease Lubrication Recommendation** 62 and **Body Lubrication Guide** in this section.

INSPECT PROXIMITY SWITCHES

See **Proximity Switch Troubleshooting** 20 for recommended procedures for inspecting proximity switches.

CLEAN AND INSPECT THE TAILGATE SEAL

Periodically check the tailgate seal to make sure it mates properly with the body and inspect for possible wear, damage or leaking. Replace the seal as necessary. See the figure below.

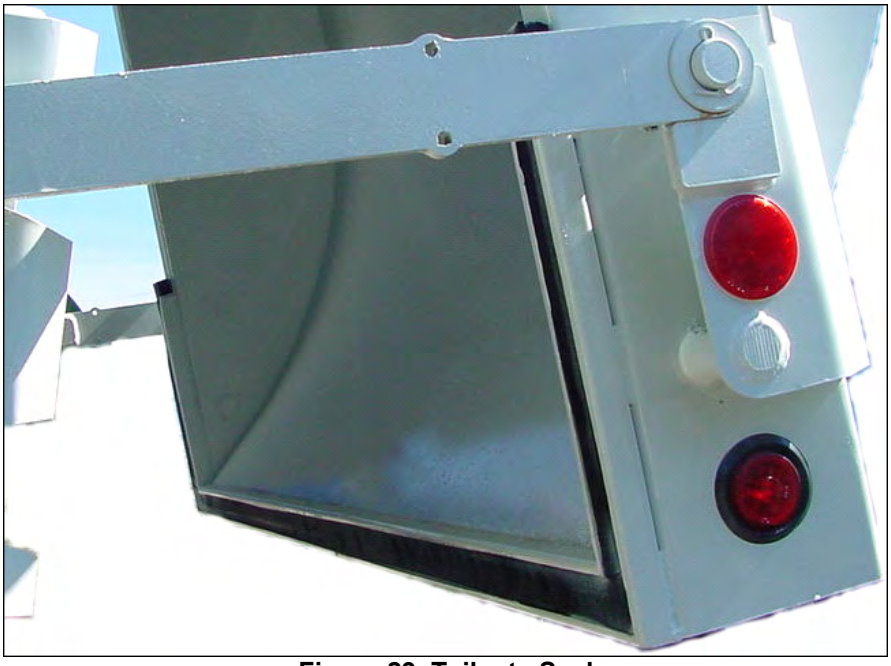


Figure 29. Tailgate Seal

PT 1000™
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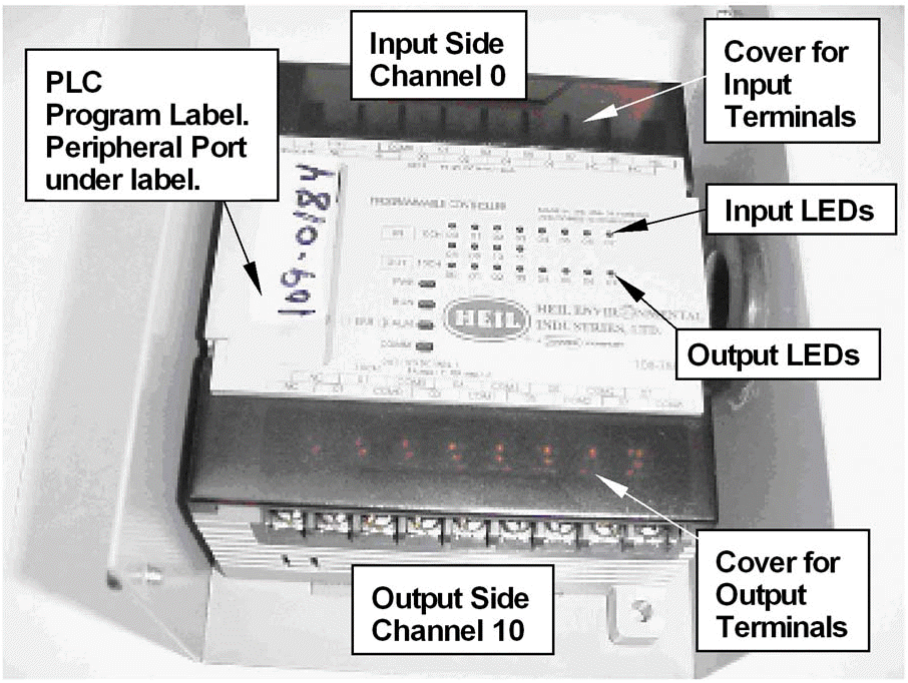
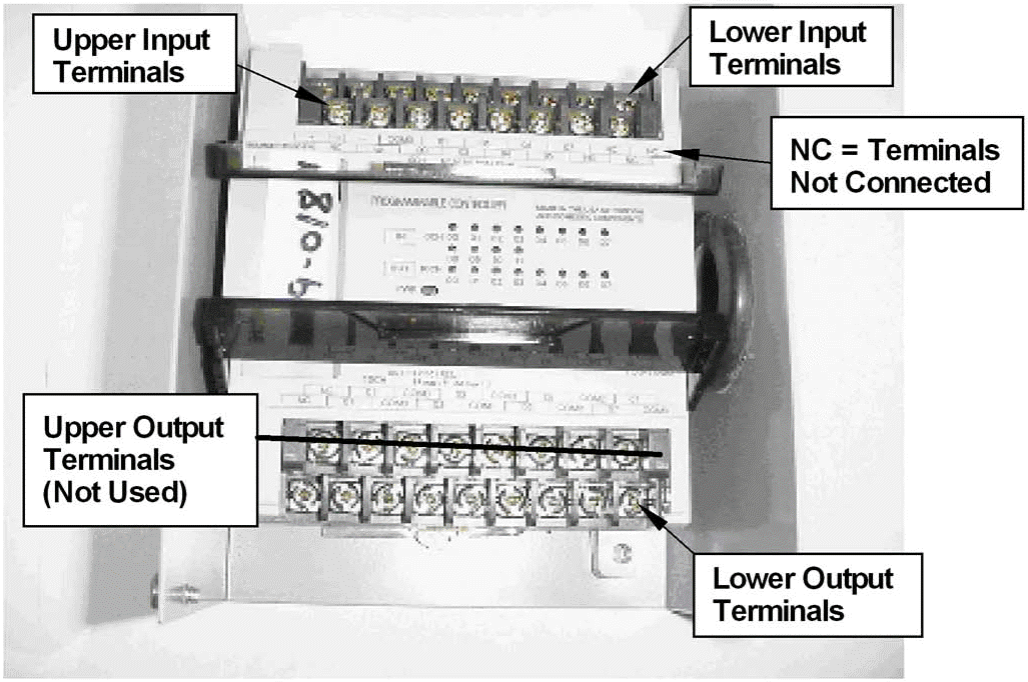
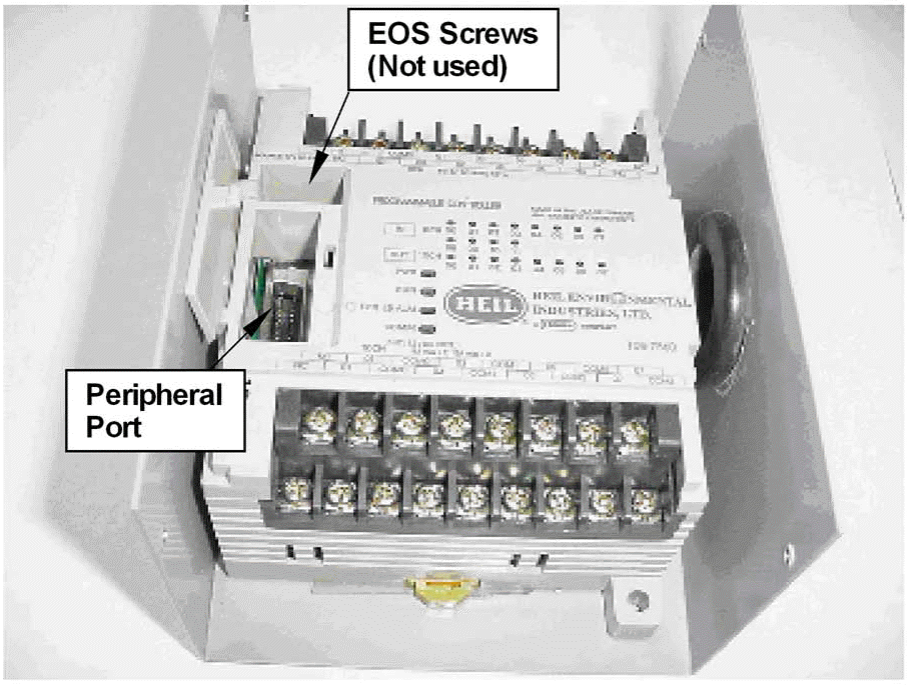
SECTION 5
BODY CONTROLLER HARDWARE

PLC ASSEMBLY IN ENCLOSURE AND COVER REMOVED VIEWS

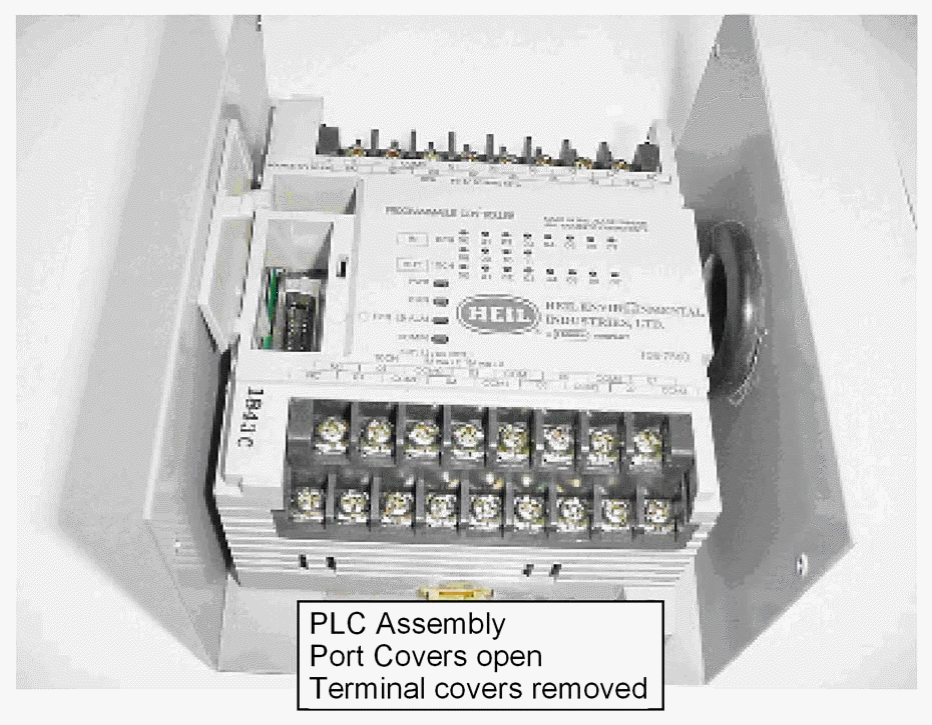


2. TERMINALS AND PERIPHERAL PORT





PORT COVERS OPENED AND TERMINAL COVERS REMOVED

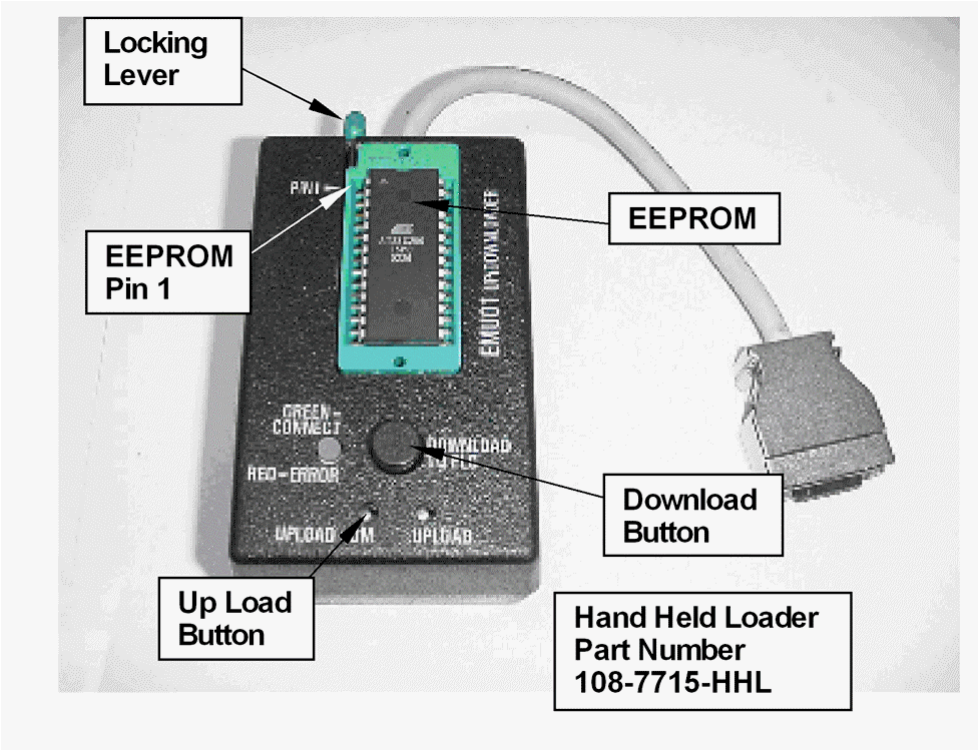


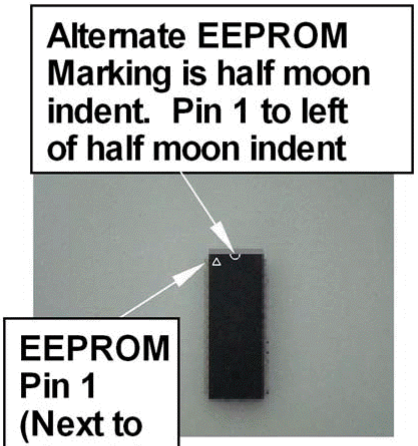
Various vehicle applications use the Mni PLC. These applications require two (2) Electronic Over Speeds (EOS). These applications generally use a tandem pump. The EOS set points are part of the PLC program, therefore you do not need the EOS screws.

The Mini PLC is a sourcing system that requires positive input signals.

The Mini PLC does not have a replaceable memory battery.

HAND HELD LOADER PROGRAMMER





HAND HELD LOADER PROGRAMMING PROCEDURES

A. Downloading Program to PLC

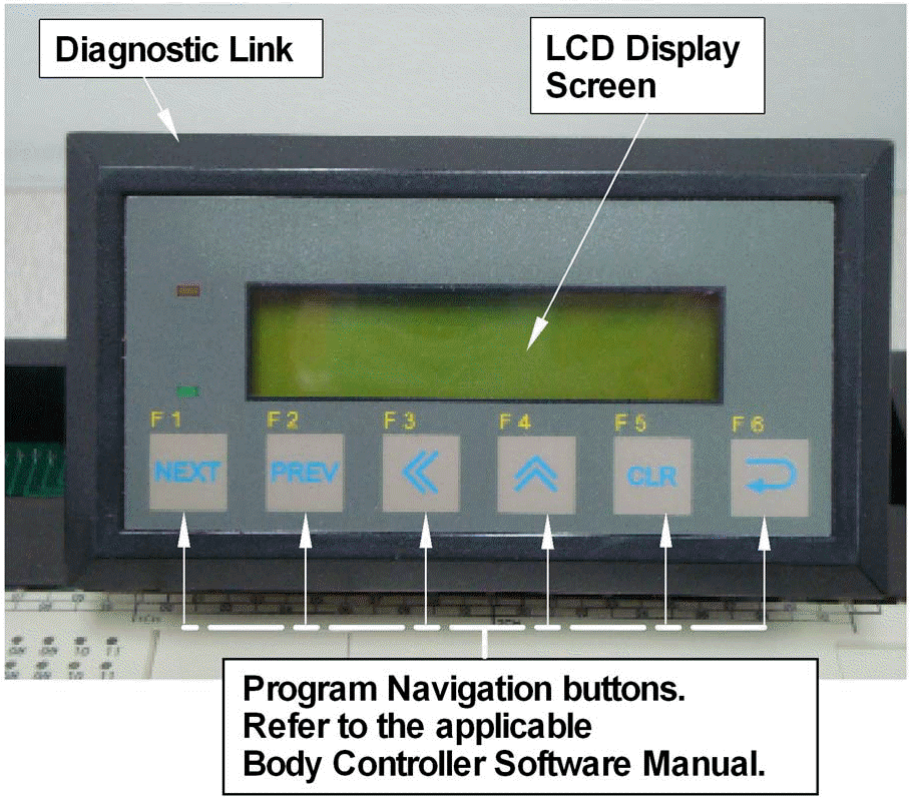
1. Use the instructions that follow to download a program from an EEPROM in the Hand held Loader (loader) into the PLC's memory.
2. Make sure you have an EEPROM (PN 108-7715-EEP) with the correct program,
3. Move the loader's locking lever UP.
4. Put the EEPROM in the loader (PN 108-7715-HHL) with EEPROM's Pin 1 in the Pin 1 slot of the loader.
5. Move the locking lever DOWN and make sure it locks. This secures the EEPROM in the loader.
6. Open the cover for the PLC's Peripheral Port and attach the loader's cable connector to the Peripheral Port.
7. Turn the igintiion power ON. The green light on the loader should be ON.
8. PRESS the DOWNLOAD TO PLC button once and wait for the green light to stop flashing.
9. Turn the ignition power OFF.
10. Wait 5 seconds and turn the ignition power ON again. The green light should be ON.
11. PRESS the DOWNLOAD TO PLC button again and wait for the green light to stop flashing.
12. Turn the ignition power OFF.
13. Remove the loader's cable connector from the Peripheral Port and close the Peripheral Port's cover.
14. Program installation is complete.

B. Uploading Program to Hand Held Loader

1. Use the instructions that follow to upload a program from the PLC's memory to an EEPROM in the loader.
2. Make sure you have a blank EEPROM.
3. Move the loader's locking lever UP.
4. Put the EEPROM in the loader with the EEPROM's Pin 1 in the Pin 1 slot of the loader.
5. Move the locking lever DOWN and make sure it locks. This secures the EEPROM in the loader.
6. Open the cover for the PLC's Peripheral Port and attach the loader's cable connector to the Peripheral
7. Port.
8. Turn the ignition power ON. The green light on the loader should be ON.
9. PRESS the UPLOAD + DM button once and wait for the green light to stop flashing.
10. Turn the ignition power OFF.
11. Remove the loader's cable connector from the Peripheral Port and close the Peripheral Port's cover.
12. The upload of the PLC's program to the loader's EEPROM is complete.

NOTE: There is no memory in the loader without an EEPROM installed in the loader.

DIAGNOSTIC LINK



The Diagnostic Link (PN 108-7715-DIS) is a hand-held tool that connects to the PLC's Peripheral Port with a Communication Cable (PN 108-7715-CAB).

Refer to the applicable Body Controller Software manual for the specific instructions for a PLC program.

You use the Diagnostic Link to:

- Perform the calibration setup for a newly installed PLC (password required)
- Monitor input status
- Monitor output status
- Test output device circuits by forcing outputs to ON
- View system parameters (password required)
- View faults
- View fault history.

PT 1000™
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SECTION 6
BODY CONTROLLER SOFTWARE

PROGRAM 109-0201
REAR LOADER PACK ON THE FLY

PT 1000™
BODY CONTROLLER SOFTWARE

PURPOSE

The purpose of this document is to detail the operation of the Pack on the Fly Programable Logic Controller for rear loaders.

Revision History

REVISION	DATE	DESCRIPTION
Initial	12/19/08	Initial Release of documentation

.1 OUTPUT CHART

Chart below shows PLC output and functions.

OUTPUTS POWERED	EOS FUNCTION
10.01	Pump #1
10.03	Pump #2
10.05	Not Used
10.07	Not Used

Display only outputs (i.e. not connected to the “real world”.)

OUTPUTS NON-POWERED	FUNCTION
10.00	Not Used
10.02	Engine Speed Fault
10.04	Not Used
10.06	Calibration Set Indicator

.2 INPUT CHART

Chart below shows PLC input and functions.

INPUTS POWERED	EOS FUNCTION
0.00	Alternator Input
0.01	Tach Calibration Input #1
0.02	Tach Calibration Input #2
0.03	Not used
0.04	High Flow Request
0.05	Low Torque Pressure Switch

0.06	Not used
0.07	Not used

2.0 Inputs

-

- **0.00 Alternator "R" Stator -** This Input monitors the Engine Speed via the Alternator R Stator Pulse. The R Stator Pulse typically is a –1.4-volt minimum to +15 volt maximum square wave of which the frequency varies relative to engine speed. The engine RPM is determined by counting the pulses of the Square wave and scaling ratio to engine speed. The alternator signal voltage should read 6.5 – 7 volts at the 0.00 input terminal with a digital volt ohmmeter.

- **0.01 Tach Cal Input 1 -** This input is used to program PLC for EOS settings ONLY! ***Not used during normal operation.***

- **0.02 Tach Cal Input 2 -** This input is used to program PLC for EOS settings ONLY! ***Not used during normal operation.***

- **0.03 Not Used**– No Connection

- **0.04 High Flow** – This Input monitors the high flow request switches. These switches are the equivalent switches used for throttle advance on throttle advance equipped unit. This is a momentary switch located on the left front corner of the body, a limit switch operating off the control rods, and optional switches located in the rear control stations.

- **0.05 Pressure Switch -** This Input monitors the low torque pressure switch. The pressure switch will provide a +12 volt signal when the switch set point is exceeded. ***This input will turn off pump 2.***

- **0.06 Not Used** – No Connection.

- **0.07 Not Used** – No Connection.

3.0 OUTPUTS

10.01 Pump P1 - This output operates Pump P1. This pump will only operate at rpms less than 1000. A high transmission temp signal or a low torque pressure switch signal will disconnect this pump.

Conditions Necessary to Turn 10.01 "ON"

Function or Component	Status	I/O #
A. Alternator	Good	0.00 (See note)
B. Low Torque switch	Off	0.05
C. Tailgate Slide Switch (Throttle Adv.)		On 0.04

Note: With the above conditions met 10.01 will turn on when:

1. Pump switch is on.
2. Engine speed is greater than 550 RPM (below 333 RPM is an engine speed fault), below 800 RPM to engage and will disengage at 1000 RPM.
3. The low torque pressure switch is below its set point.

10.03 Pump P2 - This output operates Pump P2. This pump will engage up to 1800 rpm and disengage at 2000 rpm. A high transmission temp signal or an engine droop signal will disconnect this pump.

Conditions Necessary to Turn 10.03 "ON"

Function or Component	Status	I/O #
A. Alternator	Good	0.00 (See note)

Note: With the above conditions met 10.03 will turn on when:

1. Pump switch is on.
2. Engine speed is greater than 550 rpm (below 333 RPM is an engine speed fault), below 1800 RPM to engage and will disengage at 2000 RPM.

10.06 Calibration Indicator - This output is a display only output and does not connect to the “real world”. It indicates the PLC is in calibration mode. It is not used in normal operation

Conditions Necessary to Turn 10.07 “ON”

Function or Component	Status	I/O #
A. Calibration input 1	On	0.01
B. Calibration input 2	On	0.02

Note: The plc is placed in calibration mode by jumping a +12 volt signal to input 0.01 and 0.02. After 10 seconds the R-stator signal is stored into the PLC memory and used to calculate engine speed. The engine speed must be held at 1000 rpms for 10 seconds. Output 10.06 will be on after the 10 seconds have elapsed and will remain on until the power on inputs 0.01 or 0.02 is removed.

PROGRAM 109-0205-001 - MINI PLC

TO BE SUPPLIED
Contact Customer Support for more information.

PROGRAM 109-0224 - MINI PLC

TO BE SUPPLIED
Contact Customer Support for more information.

PROGRAM 109-0266
WHELEN STROBE CONTROLLER

PT 1000™
BODY CONTROLLER SOFTWARE

PURPOSE

The purpose of this document is to detail the operation of the Whelen Strobe controller for Rear Loader units.

PLC HARDWARE

Heil Model SYSMAC CPM1A Programmable Logic Controller used for sourcing system applications.

1.01: POWER SUPPLY

The PLC power supply is standard 12 volts DC chassis voltage. Power enters the PLC assembly through the input side of the PLC. Power supply is also used to power the output side of the PLC for component operation.

1.02: INDICATOR LIGHTS

Located on the face of the PLC are the Power, Run, Comm, and Error / Alarm indicator lights. The ***power indicator*** should be “ON” when the PLC has power. The ***Run indicator*** should be “ON” when the program is running. The ***Comm light*** comes on when the PLC module is communicating with other devices connected through the peripheral or RS-232C serial port. The ***error light*** indicates that an error has occurred in either the PLC program or the PLC’ s Central Processing Unit (CPU). In the event the ***error light*** begins to flash or is on continuously, contact H.E.I.L. product support.

1.03: INPUTS

The PLC inputs are +12V DC activated. All of the switches (proximity, pressure, toggle, push buttons and relays), used for inputs to the PLC, send a +12V DC signal to turn the input on. When the input is on, a corresponding LED indicator light, located on the face of the PLC, will also be on. **Refer to drawing 372-1828-011.**

1.04: OUTPUTS

The PLC will analyze the inputs and based upon the logic of the programming will produce the appropriate +12 volt DC outputs. When an output is on, a corresponding LED indicator light, located on the face of the PLC will also be on. **Refer to drawing 372-1828-011.**

1.05: PLC FUSING

The PLC is equipped with fuse, located in the control box. Control power to the PLC is done using the “E-Stop” switch located on the control box and located on the body of the vehicle.

1.06: OUTPUT CHART

Chart below shows PLC output and functions.

OUTPUT FUNCTIONS			
B01	Not Used		10.00
B02	WHELEN STROBE OUTPUT		10.01
B03	Not Used		10.02
B04	Not Used		10.03
B05	Not Used		10.04
B06	Not Used		10.05
B07	Not Used		10.06
B08	Not Used		10.07

1.07: INPUT CHART

Chart below shows PLC input and functions.

INPUT FUNCTIONS			
A01	PUMP ON SIGNAL (WIRE #623)		0.00
A02	REVERSE SIGNAL		0.01
A03	LEFT TURN SIGNAL (POST FLASHER)		0.02
A04	RIGHT TURN SIGNAL (POST FLASHER)		0.03
A05	Not Used		0.04
A06	Not Used		0.05
A07	Not Used		0.06
A08	Not Used		0.07

Section 2: PLC Calibration Setup

There is no calibration required for this program.

Section 3: Default Parameters

There are no default parameters for this program.

Section 4: I/O Functions

The following sheets detail the functionality as well as provide circuit diagrams for each of the input and output function provided through the PLC.

A01 Input Function – Pump On Signal (Wire #623) (In Cab Input 0.00)

This circuit monitors the pump on signal.

A02 Input Function – Reverse Signal (In Cab Input 0.01)

This circuit monitors the Chassis Reverse Signal.

A03 Input Function – Left Turn Signal (In Cab Input 0.02)

This circuit monitors the Left Turn signal, post flasher.

A04 Input Function – Right Turn Signal (In Cab Input 0.03)

This circuit monitors the Right Turn signal, post flasher.

4.02: Standard Output Functions

B01 Output Function – Whelen Strobe (Output 10.01)

This output function controls a relay that controls the Whelen Strobe lights located on the tailgate and on the “A-post” of the cab.

Conditions Necessary to activate the circuit

Function or Component	Channel	LED Lamp	Led Status
A. Pump On signal	0	0	ON
B. Reverse Signal	0	1	ON
C. Left Turn Signal	0	2	OFF
D. Right Turn Signal	0	3	OFF

Note: The output will be energized whenever the either the Pump On signal or the Reverse signal is on unless either of the turn signals are on.

Section 5: Special Features

There are no special features for this program.

Section 6: Diagnostics

6.01: Testing I/O Voltage

To test the voltage at an input or output terminal a Digital Multi Meter is always the best tool. Incandescent test lights cannot be used to test inputs from certain electronic input devices, the amperage required to light and incandescent tester may exceed the maximum output of the device. If using a test light it must be an LED type tester. Upon inspection of the PLC assembly, note that there are through holes in the upper circuit boards. These holes provide test probe access to the lower I/O terminals.

6.02: Monitoring Input Status

Input status can be determined by the state of the LED indicators located on the face of the PLC.

6.03: Monitoring Output Status

Output status can be determined by the state of the LED indicators located on the face of the PLC.

6.04: Diagnostic Beep Codes

There are no diagnostic beep codes for this product.

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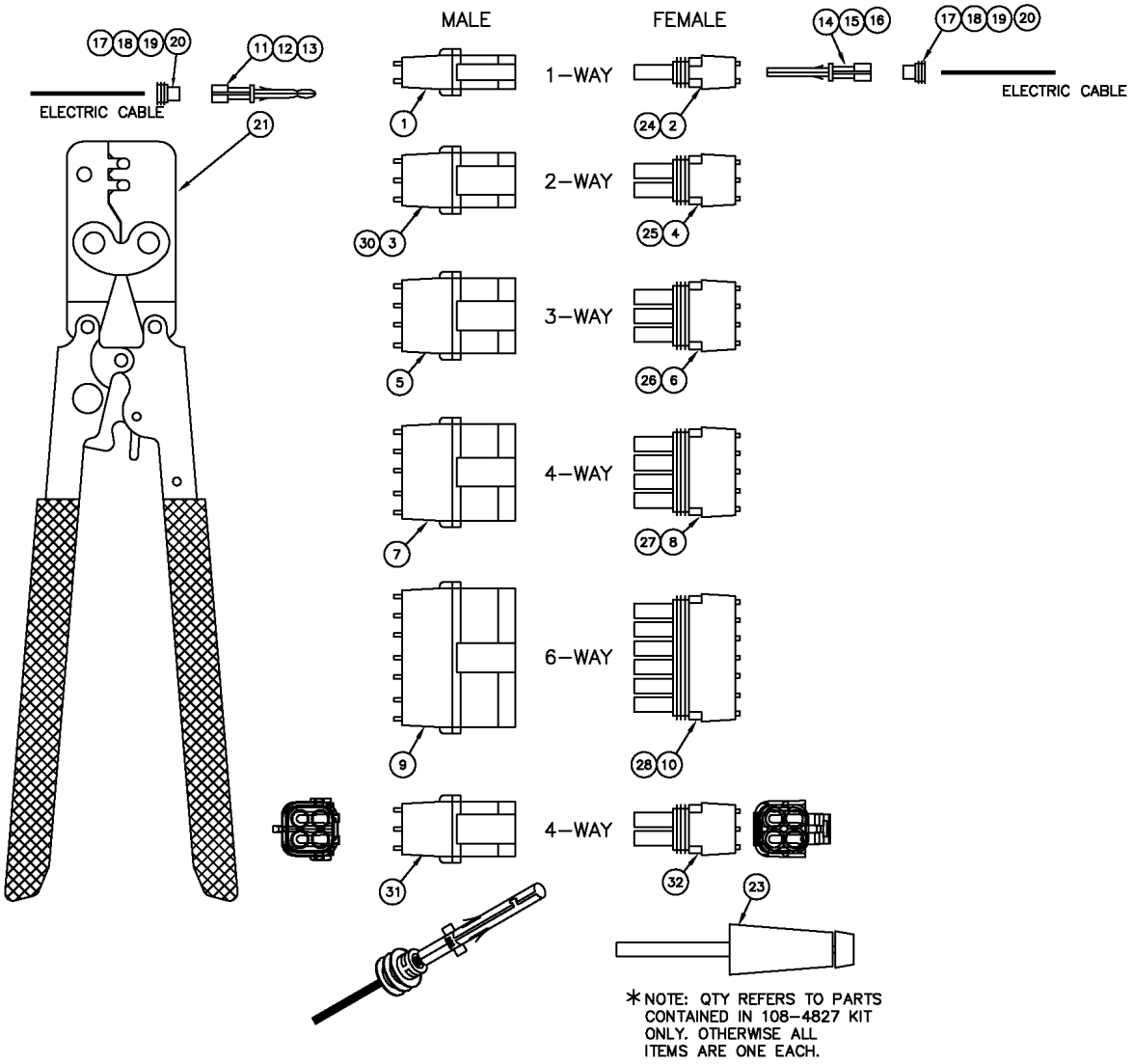
NOTES

SECTION 7
SCHEMATICS

PT 1000™
Schematics

PACKARD CONNECTION KIT, 108-4827

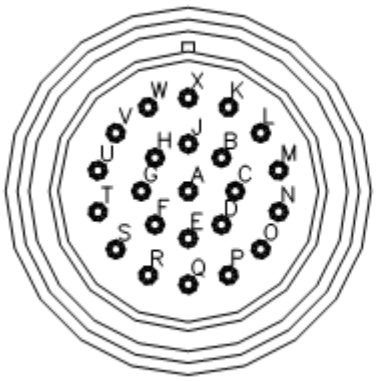


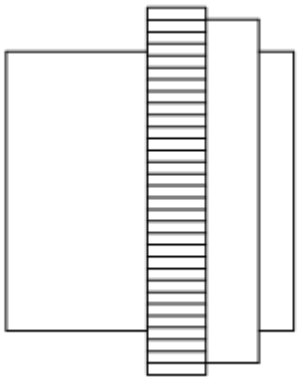
PACKARD CONNECTION KIT, 108-4827

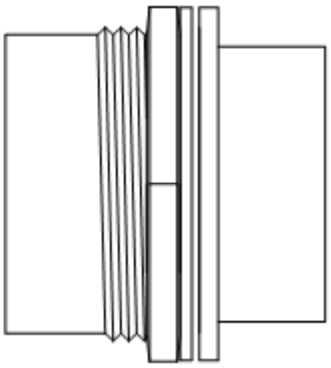
ITEM	PART NO.	DESCRIPTION	EFF	QTY
-	108-4827	KIT, Packard connection	-	REF
1	108-4827-001	CONNECTION, 1-Way Male	-	20
2	108-4827-002	CONNECTION, 1-Way Female	-	20
3	108-4827-003	CONNECTION, 2-Way Male	-	20
4	108-4827-004	CONNECTION, 2-Way Female	-	20
5	108-4827-005	CONNECTION, 3-Way Male	-	20
6	108-4827-006	CONNECTION, 3-Way Female	-	20
7	108-4827-007	CONNECTION, 4-Way Male	-	20
8	108-4827-008	CONNECTION, 4-Way Female	-	20
9	108-4827-009	CONNECTION, 6-Way Male	-	20
10	108-4827-010	CONNECTION, 6-Way Female	-	20
11	108-4827-110	TERMINAL, Male (18-20 AWG)	-	60
12	108-4827-111	TERMINAL, Male (16-14 AWG)	-	200
13	108-4827-112	TERMINAL, Male (10-12 AWG)	-	60
14	108-4827-120	TERMINAL, Female (18-20 AWG)	-	60
15	108-4827-121	TERMINAL, Female (16-14 AWG)	-	200
16	108-4827-122	TERMINAL, Female (10-12 AWG)	-	60
17	108-4827-130	SEAL, Cable – (20 GA)	-	20
18	108-4827-131	SEAL, Cable – (18 GA)	-	100
19	108-4827-132	SEAL, Cable – (16-14 GA)	-	400
20	108-4827-133	SEAL, Cable – (12 GA)	-	100
21	108-4827-134	PLUG, Cavity	-	20
22	108-4828-001	TOOL, Installation	-	1
23	108-4828-002	TOOL, Removal	-	1
24	108-4827-014	SEAL, 1-Way Female Connection	-	A/R
25	108-4827-015	SEAL, 2-Way Female Connection	-	A/R
26	108-4827-016	SEAL, 3-Way Female Connection	-	A/R
27	108-4827-017	SEAL, 4-Way Female Connection	-	A/R
28	108-4827-018	SEAL, 6-Way Female Connection	-	A/R
29	108-4827-200	GREASE, Trucklite, NYK	-	A/R
30	108-4827-020	CONNECTION, 2-Way Male	-	A/R
31	108-4827-211	CONNECTION, 4 Way Male	-	A/R
32	108-4827-212	CONNECTION, 4 Way Female	-	A/R

PT 1000™
Schematics

CONNECTORS, PLUGS, PINS AND ACCESSORIES FOR DEUTSCH ELECTRICAL PARTS, 108-4815





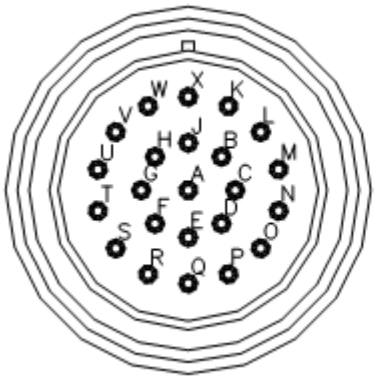


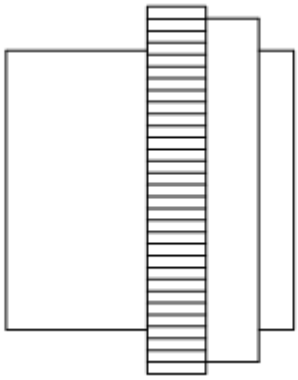
PINS AND SOCKETS

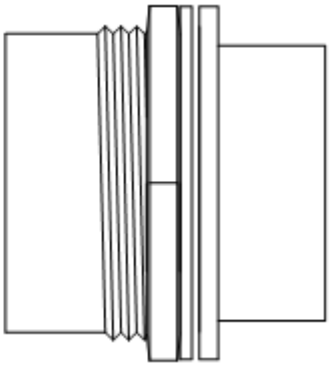
108-4815-101	PIN (6 GA)
108-4815-102	SOCKET (6 GA)
108-4815-103	SEALING PLUG (6 GA)
108-4815-104	PIN (8-10 GA)
108-4815-105	SOCKET (8-10 GA)
108-4815-106	SEALING PLUG (8-10 GA)
108-4815-107	PIN (12-14 GA)
108-4815-108	SOCKET (12-14 GA)
108-6461-100	SEALING PLUG (12-14 GA)
108-4815-110	PIN (16-18 GA)
108-4515-111	SOCKET (16-18 GA)
108-6461-100	SEALING PLUG (16-18 GA)
108-4815-112	PIN (20-24 GA)
108-4815-113	SOCKET (20-24 GA)
108-4815-114	SEALING PLUG (20-24 GA)
108-4815-300	SOCKET (10 GA)
108-4815-301	SOCKET (12-14 GA)
108-4815-302	SOCKET (12-16 GA)
108-4815-303	SOCKET (14-18 GA)
108-4815-304	SOCKET (16-22 GA)
108-4815-400	PIN (10 GA)
108-4815-401	PIN (12-14 GA)
108-4815-402	PIN (12-16 GA)
108-4815-403	PIN (14-18 GA)
108-4815-404	PIN (16-22 GA)
108-4815-405	PIN (16-18 GA)
108-4815-407	SOCKET (16-18 GA)

GOLD PINS & SOCKETS

108-4815-120	PIN (12-14 GA)
108-4815-121	SOCKET (12-14 GA)
108-4815-124	PIN (14-16 GA)
108-4815-125	SOCKET (14-16 GA)
108-4815-122	PIN (16-18 GA)
108-4815-123	SOCKET (16-18 GA)
108-4815-126	PIN (20-24 GA)
108-4815-127	SOCKET (20-24 GA)







PLASTIC CONNECTOR SHELLS

108-4815-018	8 (Socket) PLUG (12 GA)
108-4815-020	21-PIN RECEPTACLE
108-4815-021	21-PIN SOCKET
108-4815-022	19-PIN RECEPTACLE
108-4815-023	19-PIN SOCKET
108-4815-024	23-PIN RECEPTACLE
108-4815-025	23-PIN SOCKET
108-4815-030	31 PIN RECEPTACLE
108-4815-031	31 SOCKET PLUG
108-4815-032	16 PIN PLUG
108-4815-033	16 SOCKET RECEPTACLE
108-4815-034	16 PIN RECEPTACLE
108-4815-035	16 SOCKET RECEPTACLE
108-4815-036	16 PIN RECEPTACLE
108-4815-037	29 PIN RECEPTACLE
108-4815-038	9 SOCKET RECEPTACLE
108-4815-068	29 SOCKET PLUG WITH RING ADAPTER
108-4815-069	9 SOCKET PLUG WITH RING ADAPTER
108-4815-070	8 PIN RECEPTACLE (12-16)
108-4815-071	8 PIN PLUG (12-16)
108-4815-420	21 PIN RECEPTACLE
108-4815-430	31 PIN RECEPTACLE
108-4815-424	23 PIN RECEPTACLE
108-4815-425	9 PIN PLUG
108-4815-432	9 PIN RECEPTACLE
108-4815-431	21 PIN PLUG
108-4815-019	14 PIN PLUG
108-4815-200	47 PIN PLUG
108-4815-201	47 PIN RECEPTACLE
108-4815-202	47 PIN RECEPTACLE
108-4815-203	21 PIN PLUG

ACCESSORIES

108-4815-150	PANEL NUT, 24 SHELL
108-4815-151	LOCKWASHER, 24 SHELL
108-4815-152	STRAIN RELIEF STRAIGHT 24
108-4815-153	STRAIN RELIEF 90° 24
108-4815-154	PANEL NUT, 18 SHELL
108-4815-155	LOCKWASHER, 18 SHELL
108-4815-156	STRAIN RELIEF STRAIGHT 18
108-4815-157	STRAIN RELIEF 90° 18

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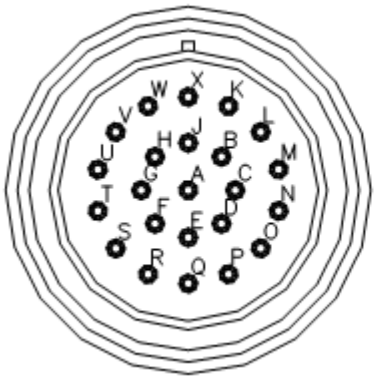

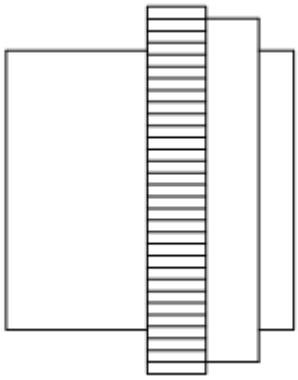

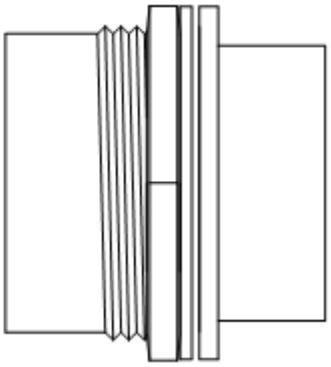

ACCESSORIES - Continued

108-4815-158	REMOVAL TOOL (6 GA)
108-4815-159	REMOVAL TOOL (8-10 GA)
108-4815-160	REMOVAL TOOL (12-14 GA)
108-4815-161	REMOVAL TOOL (16-18 GA)
108-4815-162	REMOVAL TOOL (20-24 GA)
108-4815-163	CRIMP TOOL (12-24 GA)
108-4815-164	CRIMP TOOL (6-10 GA)
108-4815-165	RECEPTACLE CAP. 18 PIN
108-4815-166	RECEPTACLE CAP, 24 PIN
108-4815-167	PLUG CAP, 18 PIN
108-4815-168	PLUG CAP, 24 PIN
108-4815-169	****
108-4815-170	DT SCREWDRIVER TOOL
108-4815-180	PANEL NUT, 18 SHELL
108-4815-181	LOCKWASHER, 18 SHELL
108-4815-186	BACKSHELL, 90º, 24 SHELL
108-4815-187	BACKSHELL, STRAIGHT, 24
108-4815-188	LG COMPRESSION BACKSHELL
108-4815-189	LG COMPRESSION NUT
108-4815-190	SM COMPRESSION BACKSHELL
108-4815-191	SM COMPRESSIONS NUT
108-4815-192	BACKSHELL, 90º, 18 SHELL
108-4815-193	BACKSHELL, STRAIGHT 18

KIT 108-4815 IS COMPRISED OF THE FOLLOWING:
- 108-4815-021
- 108-4815-121
- 108-4815-124
- 108-4815-150
- 108-4815-151

KIT 108-4815-027 IS COMPRISED OF THE FOLLOWING:
- 108-4815-021
- 108-4815-121
- 108-4815-125

DEUTSCH CONNECTION KIT, 108-6461-PC

ITEM	PART NO.	DESCRIPTION	EFF	QTY
-	108-6461-PC	KIT, Deutsch Connection	-	REF
1	108-6461-003P	PLUG, 3-Way	-	15
2	108-6461-003PW	WEDGE, 3-Way Plug	-	15
3	108-6461-003PB	BOOT, 3-Way Plug	-	15
4	108-6461-003R	RECEPTACLE, 3-Way	-	15
5	108-6461-003RW	WEDGE, 3-Way Receptacle	-	15
6	108-6461-003RB	BOOT, 3-Way Receptacle	-	15
7	108-6461-004P	PLUG, 4-Way	-	3
8	108-6461-004PW	WEDGE, 4-Way Plug	-	3
9	108-6461-004PB	BOOT, 4-Way Plug	-	3
10	108-6461-004R	RECEPTACLE, 4-Way	-	3
11	108-6461-004RW	WEDGE, 4-Way Receptacle	-	3
12	108-6461-004RB	BOOT, 4-Way Receptacle	-	3
13	108-6461-006P	PLUG, 6-Way	-	3
14	108-6461-006PW	WEDGE, 6-Way Plug	-	3
15	108-6461-006PB	BOOT, 6-Way Plug	-	3
16	108-6461-006R	RECEPTACLE, 6-Way	-	3
17	108-6461-006RW	WEDGE, 6-Way Receptacle	-	3
18	108-6461-006RB	BOOT, 6-Way Receptacle	-	3
19	108-6461-008P	PLUG, 8-Way	-	9
20	108-6461-008PW	WEDGE, 8-Way Plug	-	9
21	108-6461-008PB	BOOT, 8-Way Plug	-	9
22	108-6461-008R	RECEPTACLE, 8-Way	-	9
23	108-6461-008RW	WEDGE, 8-Way Receptacle	-	9
24	108-6461-008RB	BOOT, 8-Way Receptacle	-	9
25	108-6461-012P	PLUG, 12-Way	-	3
26	108-6461-CPW	WEDGE, 12-Way Plug	-	3
27	108-6461-CPB	BOOT, 12-Way Boot	-	3
28	108-6461-012R	RECEPTACLE, 12-Way	-	3
29	108-6461-CRW	WEDGE, 12-Way Receptacle	-	3
30	108-6461-CRB	BOOT, 12-Way Receptacle	-	3
31	108-6461-100	PLUG, Sealing	-	25
32	108-6461-101	PIN, Gold Plated	-	200
33	108-6461-102	SOCKET, Gold Plated	-	200
34	108-6461-200	CRIMPER, Production	-	1
35	108-6461-201	CRIMPER, Field Kit	-	1
36	108-6461-202	REMOVAL TOOL	-	1

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DEUTSCH DT SERIES CONNECTOR KITS, 108-8411

ITEM	PART NO.	DESCRIPTION	EFF	QTY
-	108-8411	KITS, Deutsch Connector, DT Series	-	REF
1	108-8411-001	KIT, Deutsch Connector, DT Series	-	REF
-	108-8411-02R	RECEPTACLE, 2-Way	-	1
-	108-4815-120	PIN, Gold 12 AWG	-	2
-	108-8411-2RW	RECEPTACLE, 2-Way Wedge	-	1
-	108-6461-100	PLUG, Sealing	-	2
-	108-8411-2RB	BOOT, Receptacle	-	1
2	108-8411-002	KIT, Deutsch Connector, DT Series	-	REF
-	108-8411-02P	PLUG, 2-Way	-	1
-	108-4815-121	PIN, Gold 12 AWG	-	2
-	108-8411-2PW	PLUG, 2-Way Wedge	-	1
-	108-6461-100	PLUG, Sealing	-	2
-	108-8411-2RB	BOOT, Plug	-	1
3	108-8411-003	KIT, Deutsch Connector, DT Series	-	REF
-	108-8411-04R	RECEPTACLE, 4-Way	-	1
-	108-4815-120	PIN, Gold 12 AWG	-	4
-	108-8411-4RW	RECEPTACLE, 4-Way Wedge	-	1
-	108-6461-100	PLUG, Sealing	-	2
-	108-8411-4RB	BOOT, Receptacle	-	1
4	108-8411-004	KIT, Deutsch Connector, DT Series	-	REF
-	108-8411-04P	PLUG, 4-Way	-	1
-	108-4815-121	PIN, Gold 12 AWG	-	4
-	108-8411-4PW	PLUG, 4-Way Wedge	-	1
-	108-6461-100	PLUG, Sealing	-	2
-	108-8411-4PB	BOOT, Plug	-	1
5	108-8411-005	KIT, Deutsch Connector, DT Series	-	REF
-	108-8411-22R	RECEPTACLE, 2-Way Mounted	-	1
-	108-4815-120	PIN, Gold 12 AWG	-	2
-	108-8411-2RW	RECEPTACLE, 2-Way Wedge	-	1
-	108-6461-100	PLUG, Sealing	-	2
-	108-8411-2RB	BOOT, Receptacle	-	1
6	108-8411-006	KIT, Deutsch Connector, DT Series	-	REF
-	108-8411-24R	RECEPTACLE, 4-Way Mounted	-	1
-	108-4815-120	PIN, Gold 12-AWG	-	4
-	108-8411-4RW	RECEPTACLE, 4-Way Wedge	-	1
-	108-6461-100	PLUG, Sealing	-	2
-	108-8411-4RB	BOOT, Receptacle	-	1

DEUTSCH DT SERIES CONNECTOR KITS - BOOT, 108-6461

ITEM	PART NO.	DESCRIPTION	EFF	QTY
-	108-6461	KITS, Deutsch Connection, DT Series	-	REF
1	108-6461-3PB	BOOT, 3-Way Plug	-	A/R
2	108-6461-3RB	BOOT, 3-Way Receptacle	-	A/R
3	108-6461-4PB	BOOT, 4-Way Plug	-	A/R
4	108-6461-4RB	BOOT, 4-Way Receptacle	-	A/R
5	108-6461-6PB	BOOT, 6-Way Plug	-	A/R
6	108-6461-6RB	BOOT, 6-Way Receptacle	-	A/R
7	108-6461-8PB	BOOT, 8-Way Plug	-	A/R
8	108-6461-8RB	BOOT, 8-Way Receptacle	-	A/R
9	108-6461-CPB	BOOT, 12-Way Plug	-	A/R
10	108-6461-CRB	BOOT, 12-Way Receptacle	-	A/R
11	108-6461-2PB	BOOT, 2-Way Plug	-	A/R
12	108-6461-2RB	BOOT, 2-Way Receptacle	-	A/R

DEUTSCH DT SERIES CONNECTOR KITS - STRAIGHT, 108-6461

ITEM	PART NO.	DESCRIPTION	EFF	QTY
-	108-6461	KITS, Deutsch Connection, DT Series	-	REF
1	108-6461-001	KIT, Deutsch Connector, DT Series, Straight	-	REF
-	108-6461-03P	PLUG, 3-Way	-	1
-	108-6461-3PW	PLUG, 3-Way Wedge	-	1
-	108-6461-102	SOCKET, Gold Plated	-	3
-	108-6461-100	PLUG, Sealing	-	2
-	108-6461-027	PLUG, 3-Way Straight Backshell	-	1
2	108-6461-002	KIT, Deutsch Connector, DT Series, Straight	-	REF
-	108-6461-03R	RECEPTACLE, 3-Way	-	1
-	108-6461-3RW	RECEPTACLE, 3-Way Wedge	-	1
-	108-6461-101	PIN, Gold Plated	-	3
-	108-6461-100	PLUG, Sealing	-	2
-	108-6461-015	RECEPTACLE, 3-Way Straight Backshell	-	1
3	108-6461-003	KIT, Deutsch Connector, DT Series, Straight	-	REF
-	108-6461-04P	PLUG, 4-Way	-	1
-	108-6461-4PW	PLUG, 4-Way Wedge	-	1
-	108-6461-102	SOCKET, Gold Plated	-	4
-	108-6461-100	PLUG, Sealing	-	1
-	108-6461-029	PLUG, 4-Way Straight Backshell	-	1
4	108-6461-004	KIT, Deutsch Connector, DT Series, Straight	-	REF
-	108-6461-04R	RECEPTACLE, 4-Way	-	1
-	108-6461-4RW	RECEPTACLE, 4-Way Wedge	-	1
-	108-6461-101	PIN, Gold Plated	-	4
-	108-6461-100	PLUG, Sealing	-	1
-	108-6461-017	RECEPTACLE, 4-Way Straight Backshell	-	1
5	108-6461-005	KIT, Deutsch Connector, DT Series, Straight	-	REF
-	108-6461-06P	PLUG, 6-Way	-	1
-	108-6461-6PW	PLUG, 6-Way Wedge	-	1
-	108-6461-102	SOCKET, Gold Plated	-	6
-	108-6461-100	PLUG, Sealing	-	1
-	108-6461-031	PLUG, 6-Way Straight Backshell	-	1
6	108-6461-006	KIT, Deutsch Connector, DT Series, Straight	-	REF
-	108-6461-06R	RECEPTACLE, 6-Way	-	1
-	108-6461-6RW	RECEPTACLE, 6-Way Wedge	-	1
-	108-6461-101	PIN, Gold Plated	-	6
-	108-6461-100	PLUG, Sealing	-	1
-	108-6461-019	RECEPTACLE, 6-Way Straight Backshell	-	1
7	108-6461-007	KIT, Deutsch Connector, DT Series, Straight	-	REF
-	108-6461-08P	PLUG, 8-Way	-	1
-	108-6461-08PW	PLUG, 8-Way Wedge	-	1
-	108-6461-102	SOCKET, Gold Plated	-	8
-	108-6461-100	PLUG, Sealing	-	1
-	108-6461-033	PLUG, 8-Way Straight Backshell	-	1

DEUTSCH DT SERIES CONNECTOR KITS - STRAIGHT - 108-6461, CONTINUED

ITEM	PART NO.	DESCRIPTION	EFF	QTY
-	108-6461	KITS, Deutsch Connection, DT Series	-	REF
8	108-6461-008	KIT, Deutsch Connector, DT Series, Straight	-	REF
-	108-6461-08R	RECEPTACLE, 8-Way	-	1
-	108-6461-8RW	RECEPTACLE, 8-Way Wedge	-	1
-	108-6461-101	PIN, Gold Plated	-	8
-	108-6461-100	PLUG, sealing	-	1
-	108-6461-021	RECEPTACLE, 8-Way Straight Backshell	-	1
9	108-6461-009	KIT, Deutsch Connector, DT Series, Straight	-	REF
-	108-6461-12P	PLUG, 12-Way	-	1
-	108-6461-CPW	PLUG, 12-Way Wedge	-	1
-	108-6461-102	SOCKET, Gold Plated	-	12
-	108-6461-100	PLUG, Sealing	-	3
-	108-6461-035	PLUG, 12-Way Straight Backshell	-	1
10	108-6461-010	KIT, Deutsch Connector, DT Series, Straight	-	REF
-	108-6461-12R	RECEPTACLE, 12-Way	-	1
-	108-6461-CRW	RECEPTACLE, 12-Way Wedge	-	1
-	108-6461-101	PIN, Gold Plated	-	12
-	108-6461-100	PLUG, Sealing	-	3
-	108-6461-023	RECEPTACLE, 12-Way Straight Backshell	-	1
11	108-6461-011	KIT, Deutsch Connector, DT Series, Straight	-	REF
-	108-6461-02P	PLUG, 2-Way	-	1
-	108-6461-2PW	PLUG, 2-Way Wedge	-	1
-	108-6461-102	SOCKET, Gold Plated	-	2
-	108-6461-100	PLUG, Sealing	-	1
-	108-6461-025	PLUG, 2-Way Straight Backshell	-	1
12	108-6461-012	KIT, Deutsch Connector, DT Series, Straight	-	REF
-	108-6461-02R	RECEPTACLE, 2-Way	-	1
-	108-6461-2RW	RECEPTACLE, 2-Way Wedge	-	1
-	108-6461-101	PIN, Gold Plated	-	2
-	108-6461-100	PLUG, Sealing	-	1
-	108-6461-013	RECEPTACLE, 2-Way Straight Backshell	-	1
13	108-7142	KIT, 12-Way Panel Mount Receptacle	-	REF

DEUTSCH DT SERIES CONNECTOR KITS - 90° - 108-6461, CONTINUED

ITEM	PART NO.	DESCRIPTION	EFF	QTY
-	108-6461	KITS, Deutsch Connection, DT Series	-	REF
1	108-6461-041	KIT, Deutsch Connector, DT Series, 90º	-	REF
-	108-6461-03P	PLUG, 3-Way	-	1
-	108-6461-3PW	PLUG 3-Way Wedge	-	1
-	108-6461-102	SOCKET, Gold Plated	-	3
-	108-6461-100	PLUG, Sealing	-	2
-	108-6461-028	PLUG, 3-Way, 90º Backshell	-	1
2	108-6461-042	KIT, Deutsch Connector, DT Series, 90º	-	REF
-	108-6461-03R	RECEPTACLE, 3-Way	-	1
-	108-6461-3RW	RECEPTACLE, 3-Way Wedge	-	1
-	108-6461-101	PIN, Gold Plated	-	3
-	108-6461-100	PLUG, Sealing	-	2
-	108-6461-016	RECEPTACLE, 3-Way 90º Backshell	-	1
3	108-6461-043	KIT, Deutsch Connector, DT Series, 90º	-	REF
-	108-6461-04P	PLUG, 4-Way	-	1
-	108-6461-4PW	PLUG, 4-Way Wedge	-	1
-	108-6461-102	SOCKET, Gold Plated	-	4
-	108-6461-100	PLUG, Sealing	-	1
-	108-6461-030	PLUG, 4-Way 90º Backshell	-	1
4	108-6461-044	KIT, Deutsch Connector, DT Series, 90º	-	REF
-	108-6461-04R	RECEPTACLE, 4-Way	-	1
-	108-6461-4RW	RECEPTACLE, 4-Way Wedge	-	1
-	108-6461-101	PIN, Gold Plated	-	4
-	108-6461-100	PLUG, Sealing	-	1
-	108-6461-018	RECEPTACLE, 4-Way 90º Backshell	-	1
5	108-6461-045	KIT, Deutsch Connector, DT Series, 90º	-	REF
-	108-6461-06P	PLUG, 6-Way	-	1
-	108-6461-6PW	PLUG, 6-Way Wedge	-	1
-	108-6461-102	SOCKET, Gold Plated	-	6
-	108-6461-100	PLUG, Sealing	-	1
-	108-6461-032	PLUG, 6-Way 90º Backshell	-	1
6	108-6461-046	KIT, Deutsch Connector, DT Series, 90º	-	REF
-	108-6461-06R	RECEPTACLE, 6-Way	-	1
-	108-6461-6RW	RECEPTACLE, 6-Way Wedge	-	1
-	108-6461-101	PIN, Gold Plated	-	6
-	108-6461-100	PLUG, Sealing	-	1
-	108-6461-020	RECEPTACLE, 6-way 90º Backshell	-	1
7	108-6461-047	KIT, Deutsch Connector, DT Series, 90º	-	REF
-	108-6461-08P	PLUG, 8-Way	-	1
-	108-6461-8PW	PLUG, 8-Way Wedge	-	1
-	108-6461-102	SOCKET, Gold Plated	-	8
-	108-6461-100	PLUG, Sealing	-	1
-	108-6461-034	PLUG, 8-Way 90º Backshell	-	1

DEUTSCH DT SERIES CONNECTOR KITS - 90° - 108-6461, CONTINUED

ITEM	PART NO.	DESCRIPTION	EFF	QTY
-	108-6461	KITS, Deutsch Connection, DT Series	-	REF
8	108-6461-048	KIT, Deutsch Connector, DT Series, 90º	-	REF
-	108-6461-08R	RECEPTACLE, 8-Way	-	1
-	108-6461-8RW	RECEPTACLE, 8-Way Wedge	-	1
-	108-6461-101	PIN, Gold Plated	-	8
-	108-6461-100	PLUG, Sealing	-	1
-	108-6461-022	RECEPTACLE, 8-Way 90º Backshell	-	1
9	108-6461-049	KIT, Deutsch Connector, DT Series, 90º	-	REF
-	108-6461-12P	PLUG, 12-Way	-	1
-	108-6461-CPW	PLUG, 12-Way Wedge	-	1
-	108-6461-102	SOCKET, Gold Plated	-	12
-	108-6461-100	PLUG, Sealing	-	3
-	108-6461-036	PLUG, 12-Way 90º Backshell	-	1
10	108-6461-050	KIT, Deutsch Connector, DT Series, 90º	-	REF
-	108-6461-12R	RECEPTACLE, 12-Way	-	1
-	108-6461-CRW	RECEPTACLE, 12-Way Wedge	-	1
-	108-6461-101	PIN, Gold Plated	-	12
-	108-6461-100	PLUG, Sealing	-	3
-	108-6461-024	RECEPTACLE, 12-Way 90º Backshell	-	1
11	108-6461-051	KIT, Deutsch Connector, DT Series, 90º	-	REF
-	108-6461-02P	PLUG, 2-Way	-	1
-	108-6461-2PW	PLUG, 2-Way Wedge	-	1
-	108-6461-102	SOCKET, Gold Plated	-	2
-	108-6461-100	PLUG, Sealing	-	1
-	108-6461-026	PLUG, 2-Way 90º Backshell	-	1
12	108-6461-052	KIT, Deutsch Connector, DT Series, 90º	-	REF
-	108-6461-02R	RECEPTACLE, 2-Way	-	1
-	108-6461-2RW	RECEPTACLE, 2-Way Wedge	-	1
-	108-6461-101	PIN, Gold Plated	-	2
-	108-6461-100	PLUG, Sealing	-	1
-	108-6461-014	RECEPTACLE, 2-Way 90º Backshell	-	1

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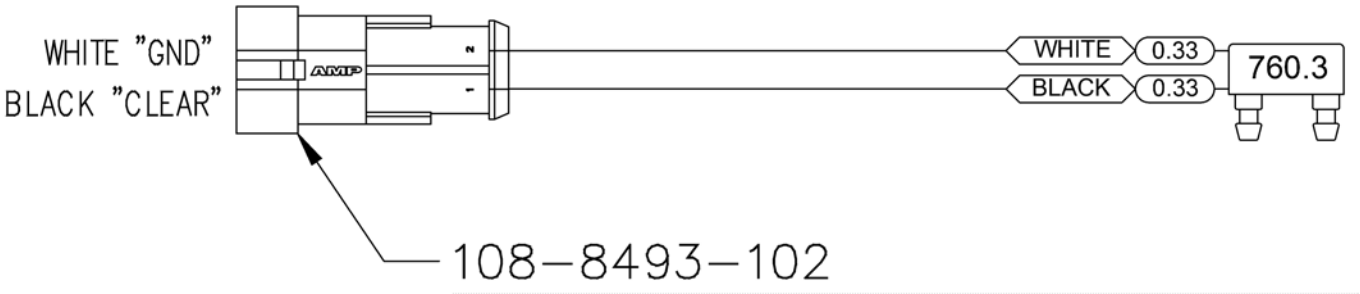
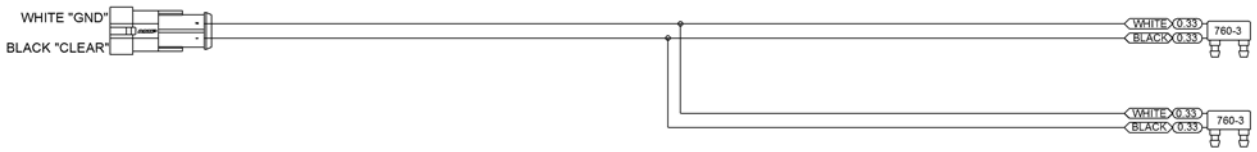
AMP. LED TO PL2 PC RATED MARKER/CLEARANCE LIGHT ADAPTER PLUG - 108-8398-001



AMP. LED TO 2 PL2 PC RATED MARKER/CLEARANCE LIGHT ADAPTER PLUG – 108-8398-002



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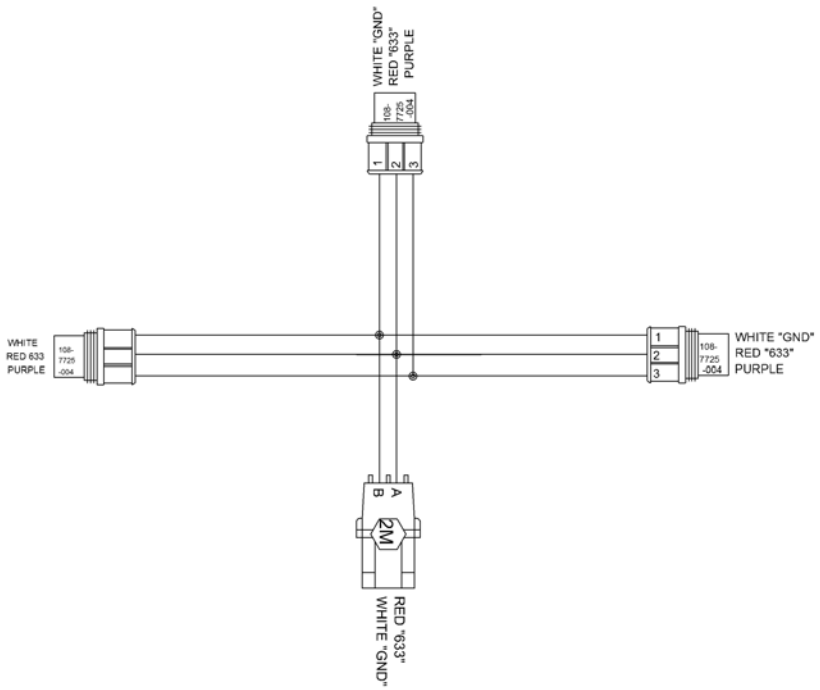
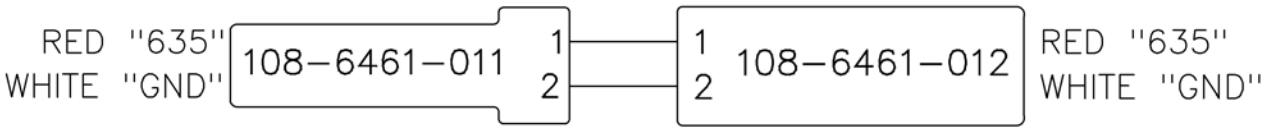
OVAL STROBE ADD-ON LIGHT HARNESS - 263-1201-004



200” 360º STROBE LIGHT HARNESS – 263-1476-001



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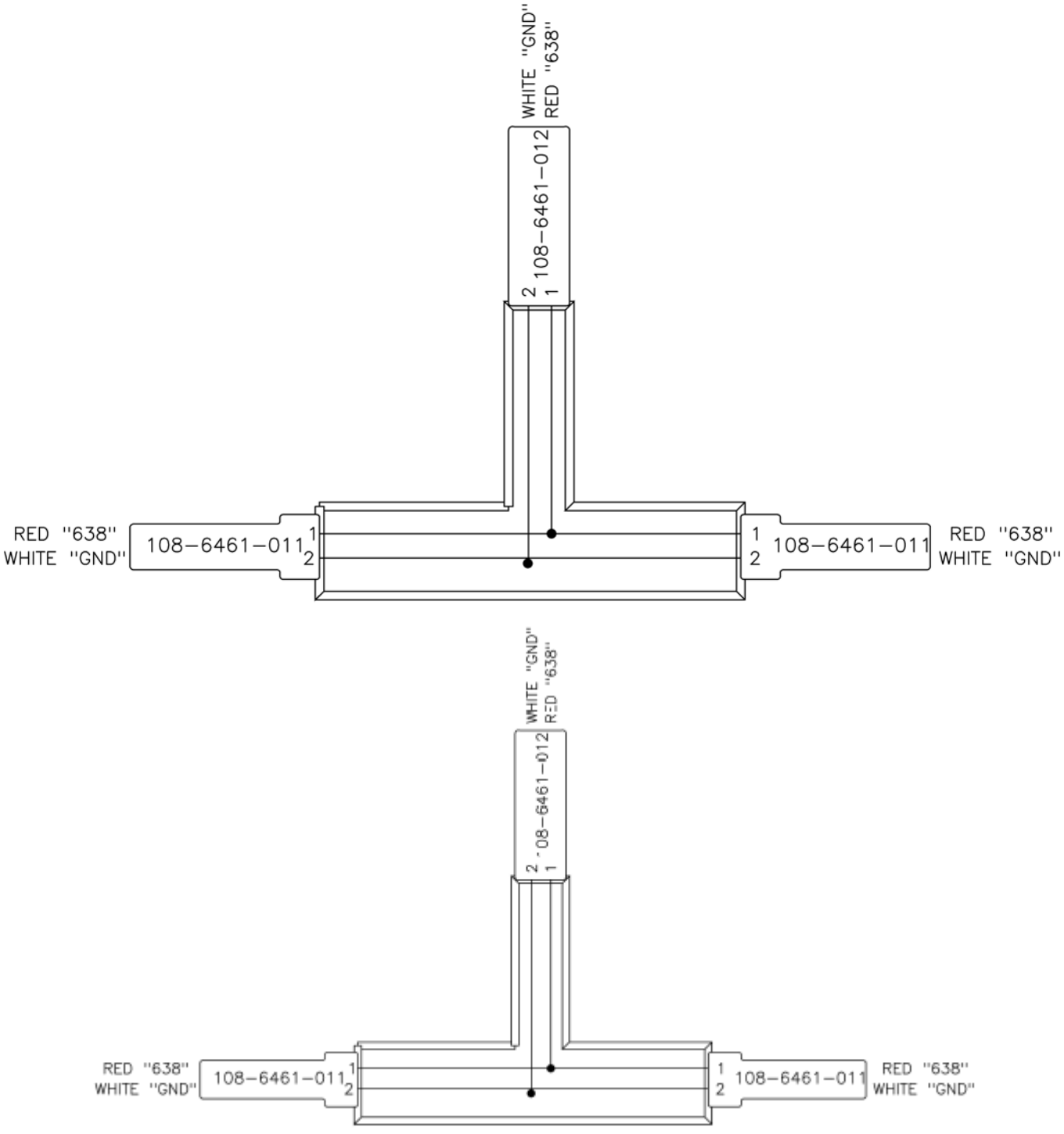
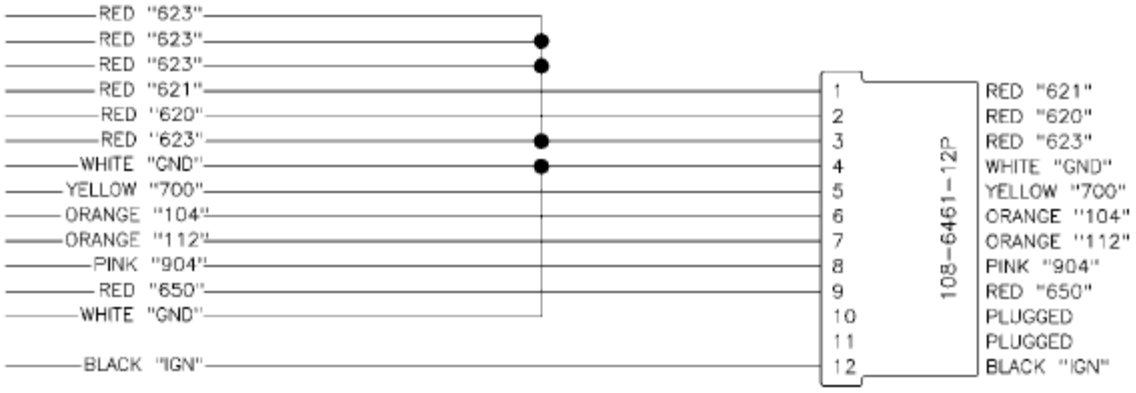
OUTSIDE WORK LIGHT HARNESS - 263-1489



MINI-PLC HARNESS – 263-1490



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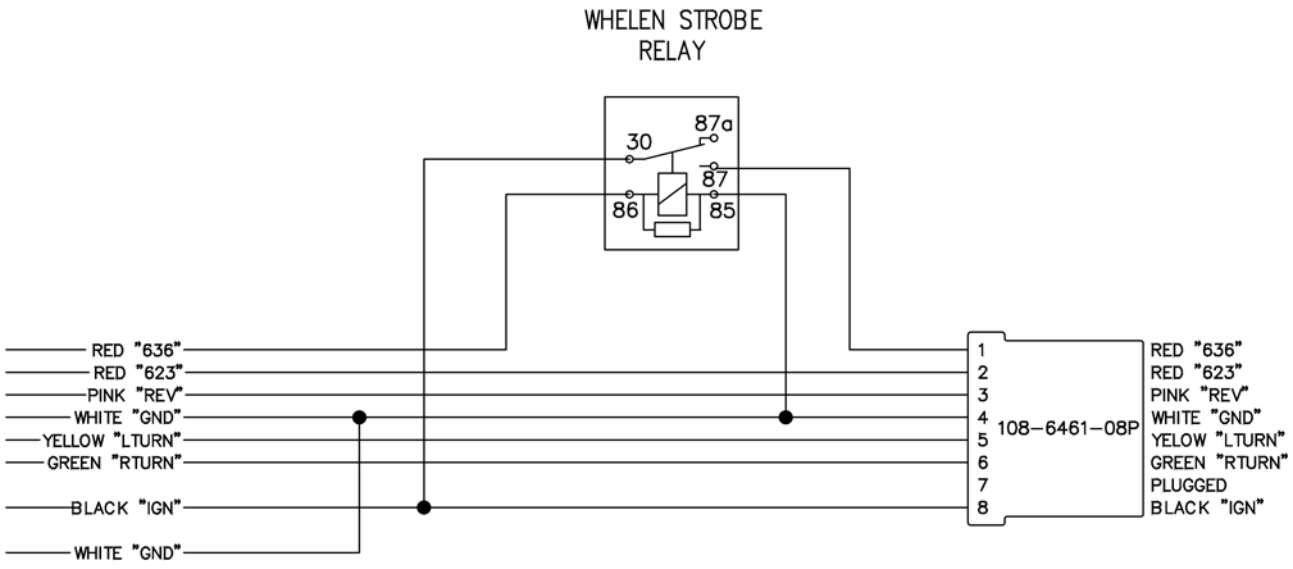
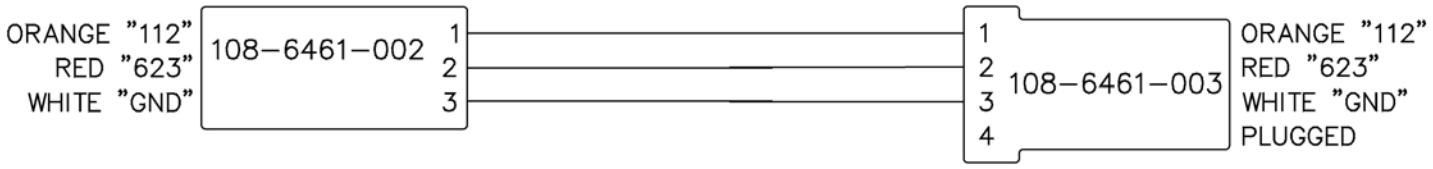
WHELEN MINI-PLC HARNESS – 263-1490-001

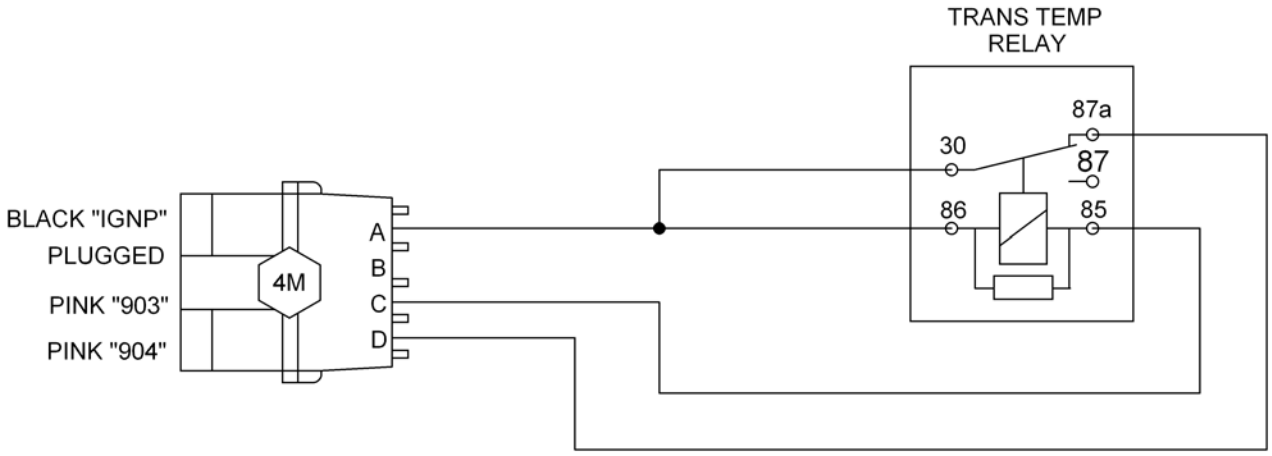


TANDEM PUMP PRESSURE SWITCH HARNESS - 263-1491

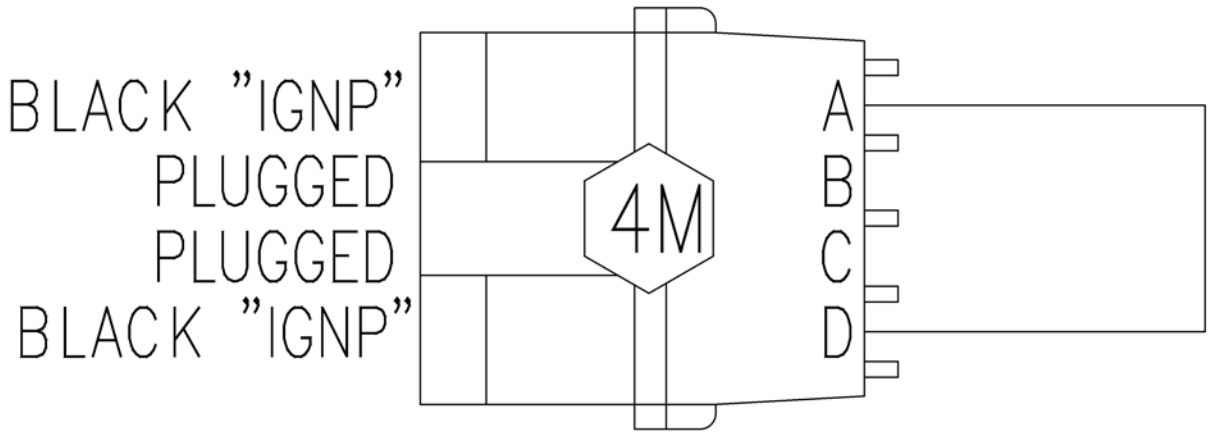


PT 1000™
Schematics

TRANSMISSION TEMPERATURE RELAY HARNESS - 263-1492

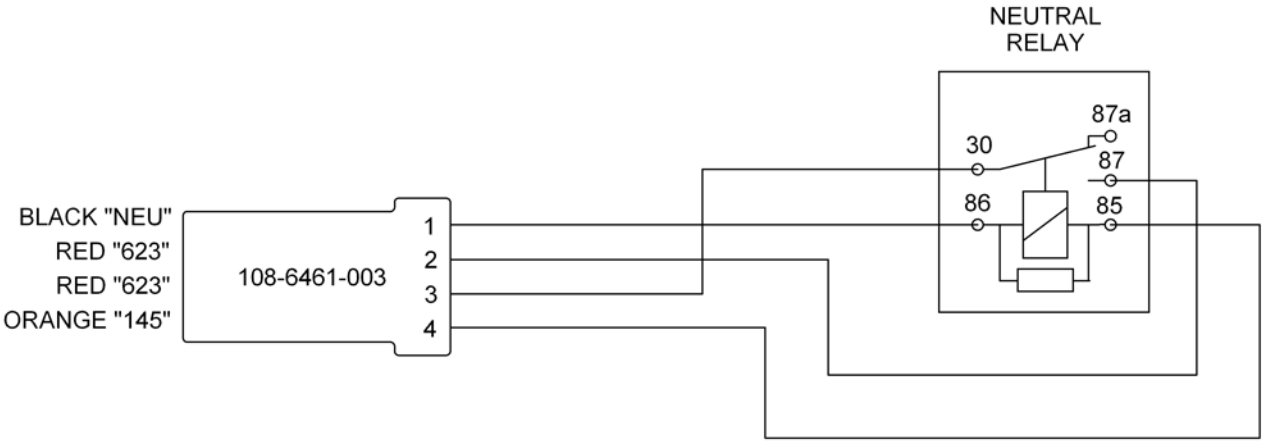


TRANSMISSION TEMPERATURE JUMPER HARNESS - 263-1492-001

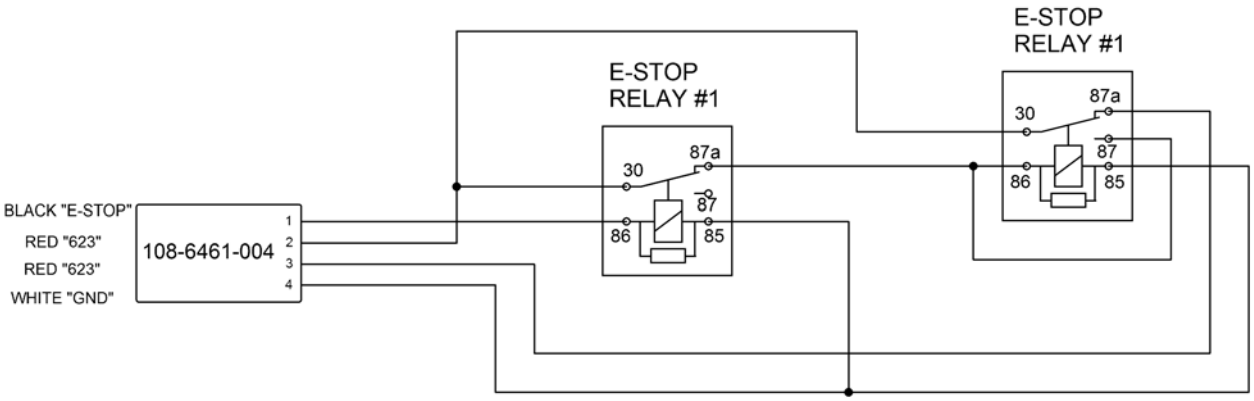


PT 1000™
Schematics

RELAY HARNESS - 263-1493

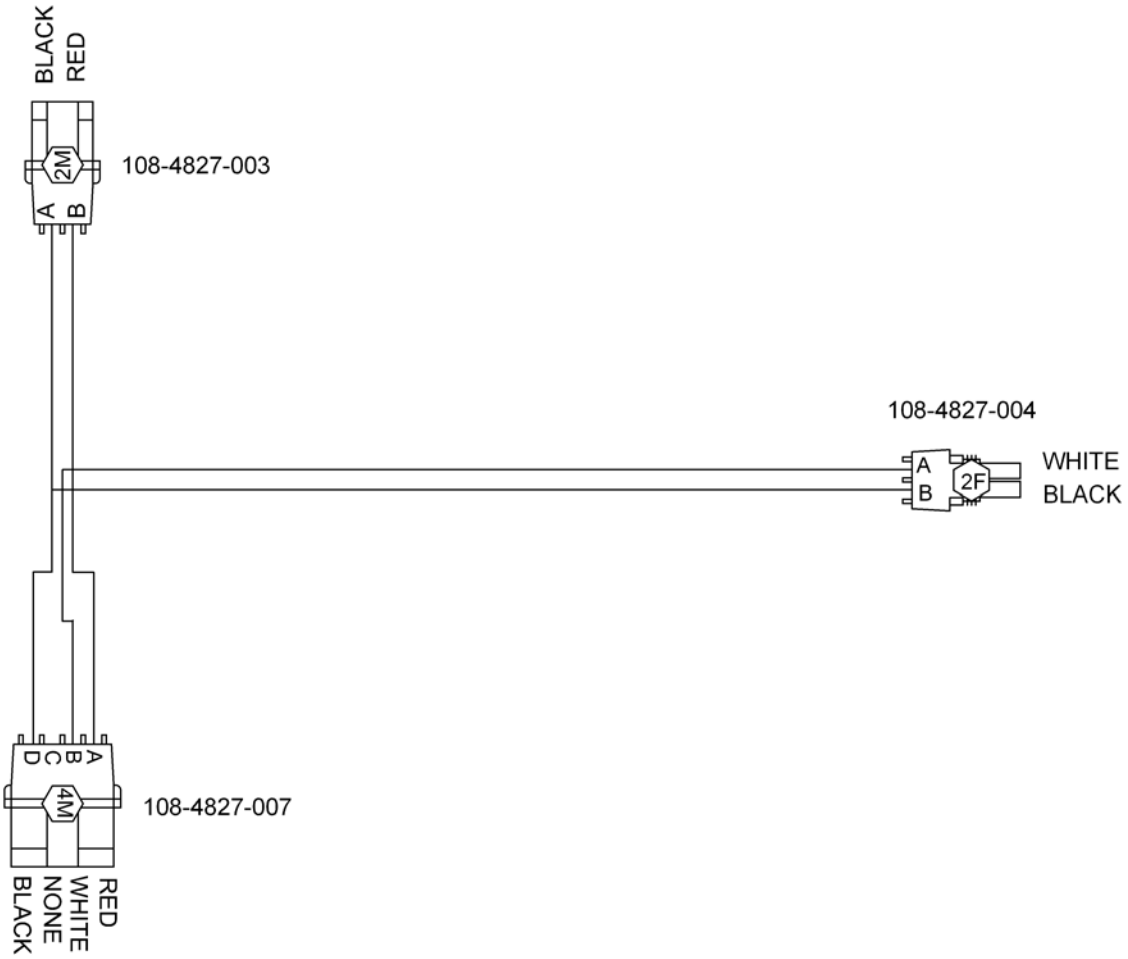


E-STOP RELAY HARNESS, 263-1498

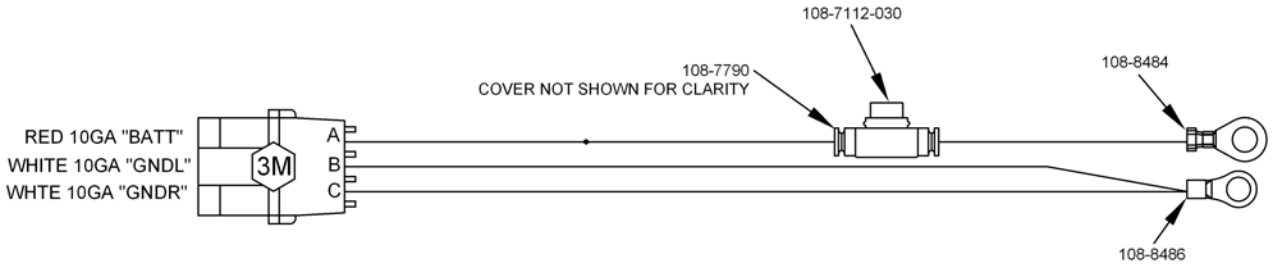


PT 1000™
Schematics

BACK-UP ALARM HARNESS - 263-1501



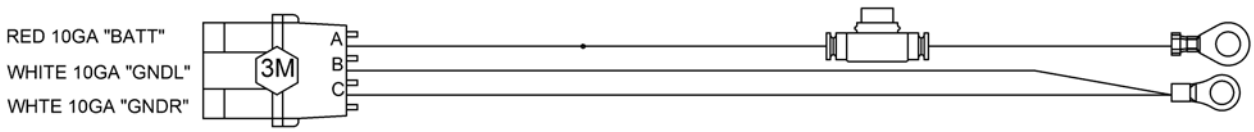
BATTERY CONNECTION HARNESS UNITS, 263-1506



NOTE:
ASSEMBLY SHOULD BE LOOMED. RED (POWER) WIRE SHOULD BE LOOMED SEPARATELY FROM THE TWO WHITE (GROUND) WIRES.

PT 1000™
Schematics

BATTERY CONNECTION HARNESS UNITS, 263-1506-001

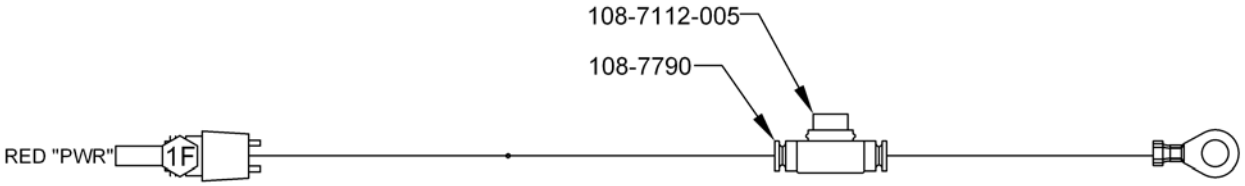


NOTE:
ASSEMBLY SHOULD BE LOOMED. RED (POWER) WIRE SHOULD BE LOOMED SEPARATELY FROM THE TWO WHITE (GROUND) WIRES.

REVERSE CONNECTION BATTERY HARNESS - 263-1506-100

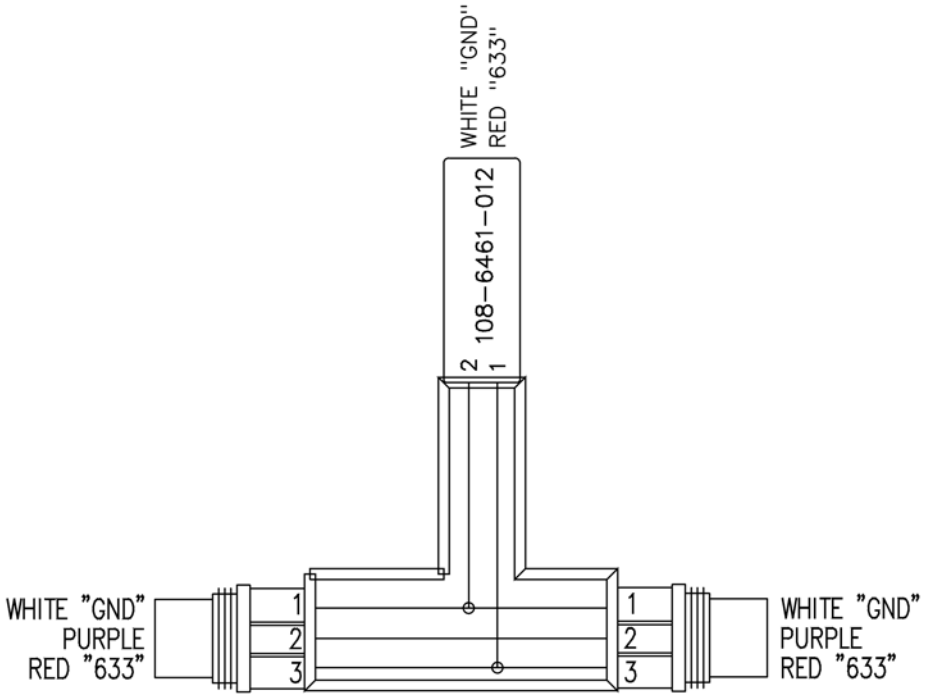
PT 1000™
Schematics

REVERSE MOTION SENSOR BATTERY HARNESS - 263-1506-200



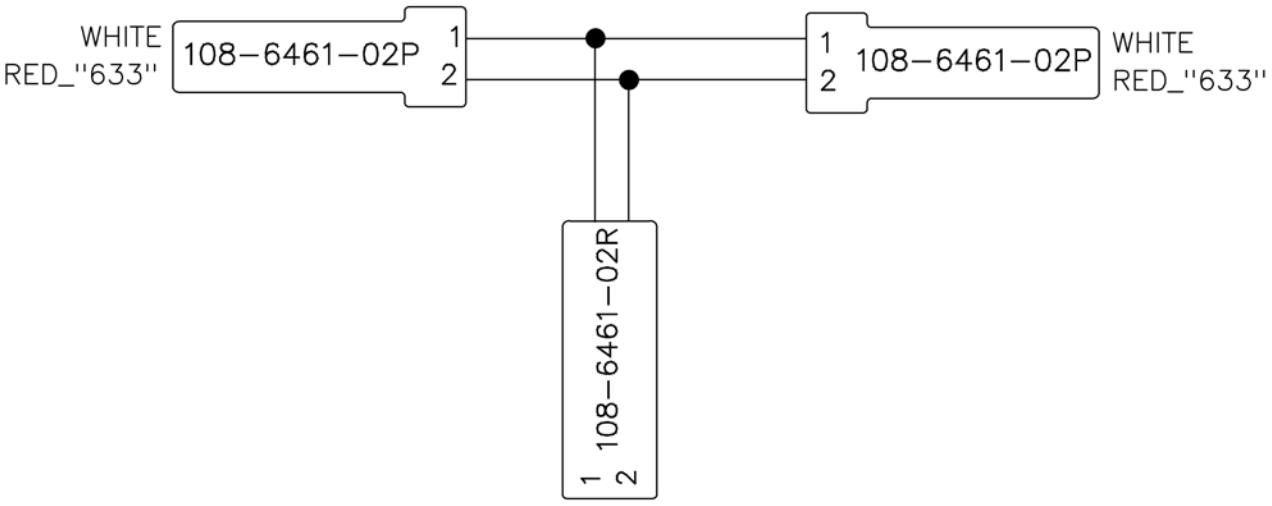
NOTE:
ASSEMBLY SHOULD BE LOOMED.

OVAL STROBE LIGHT HARNESS - 263-1507

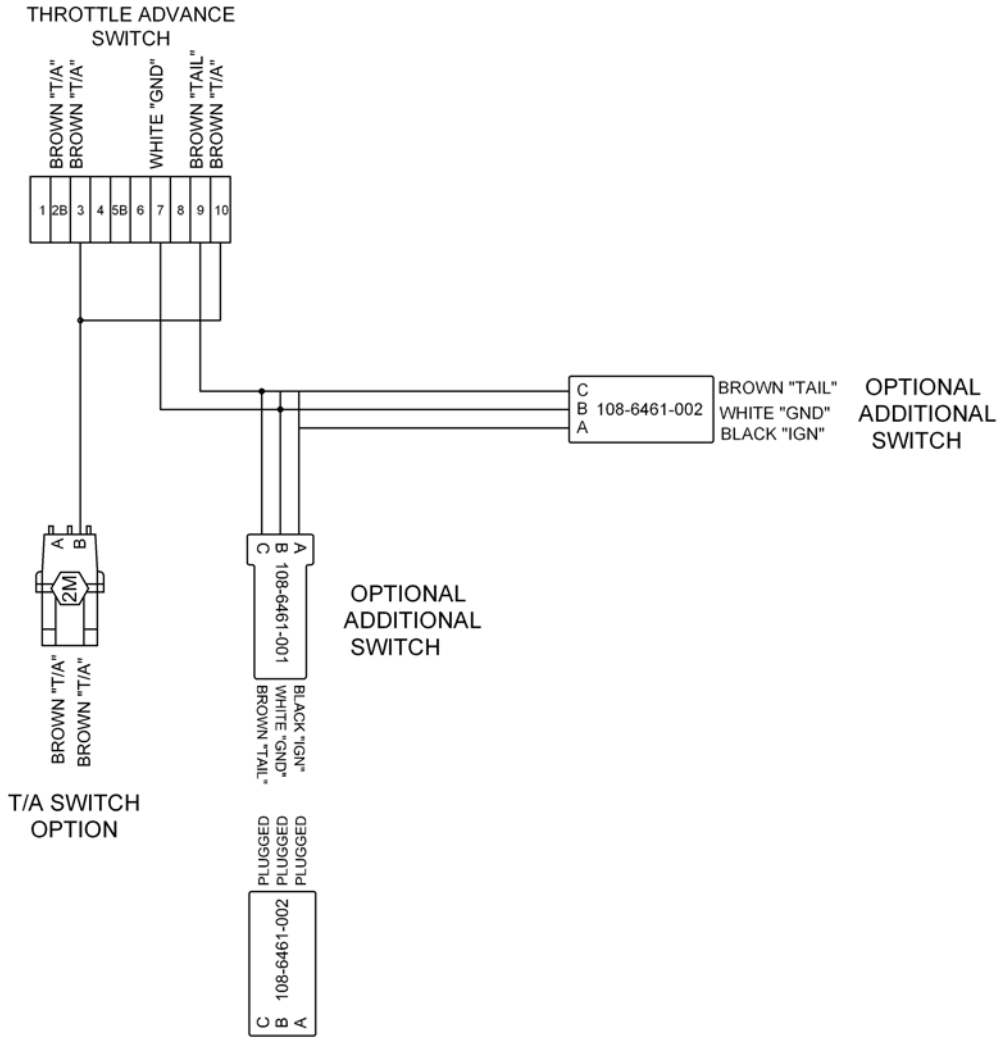


PT 1000™
Schematics

360º STROBE LIGHT HARNESS - 263-1508

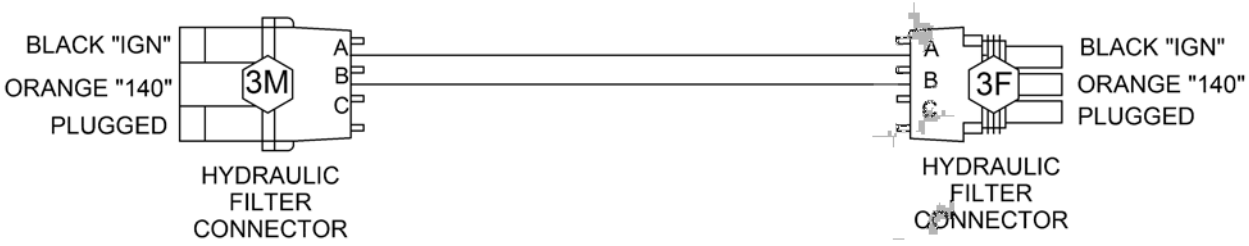


THROTTLE ADVANCE SWITCH HARNESS - 263-1556

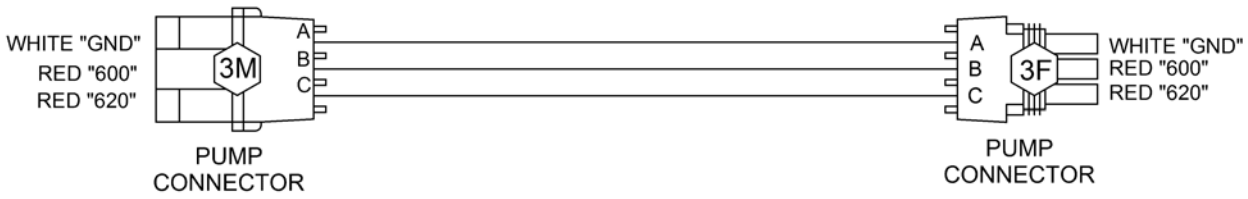


PT 1000™
Schematics

BYPASS FILTER JUMPER HARNESS, 263-1562-060

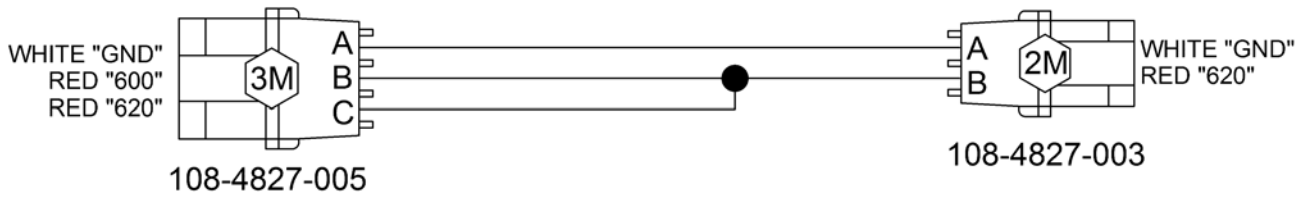


PUMP JUMPER HARNESS UNIT, 263-1563-048

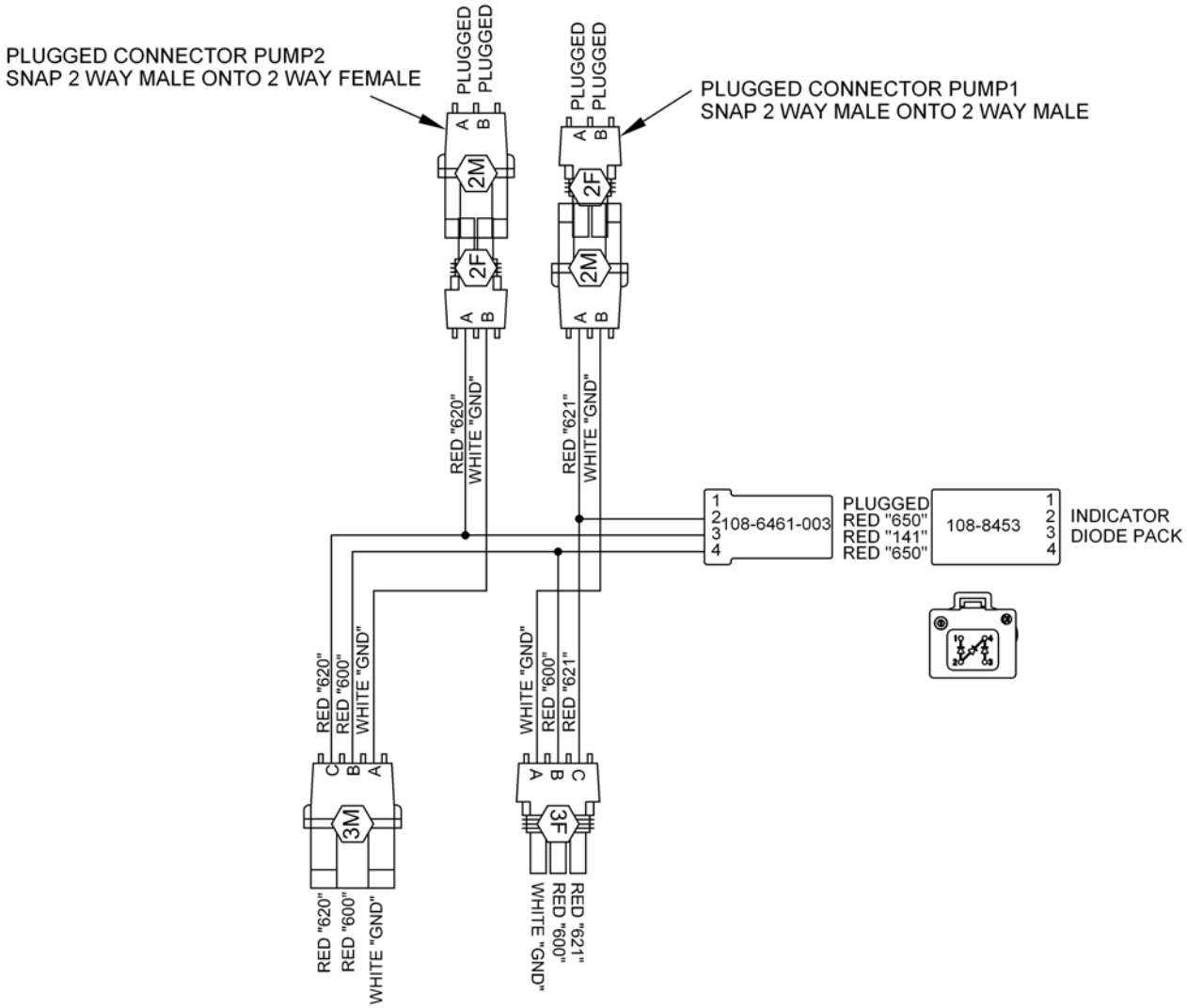


PT 1000™
Schematics

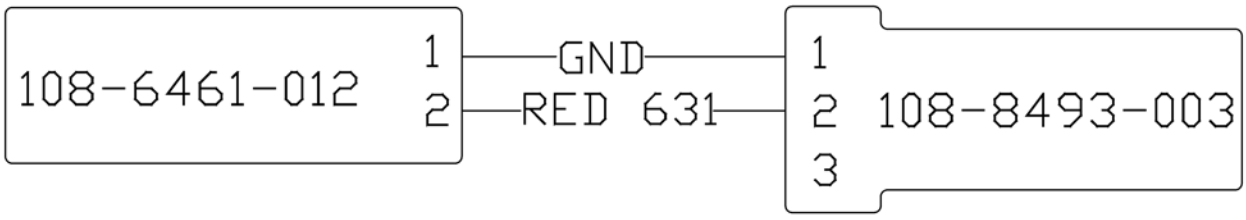
FRONT PUMP JUMPER HARNESS – 263-1563-080



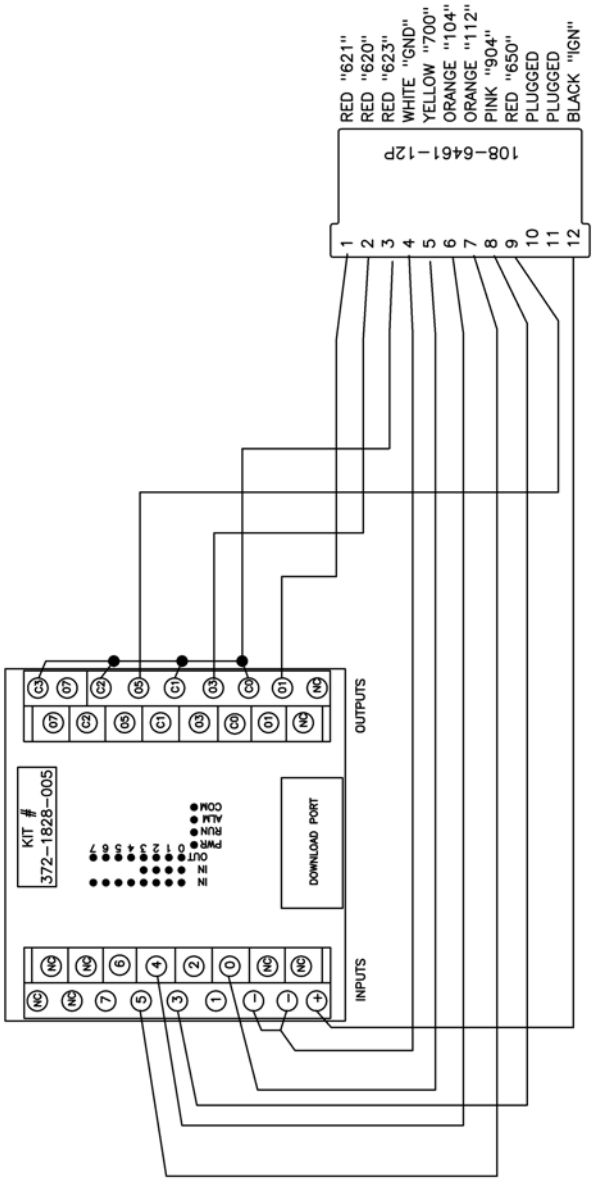
OAI PUMP ADAPTER HARNESS - 263-1592



STROBE LIGHT JUMPER HARNESS – 263-1629

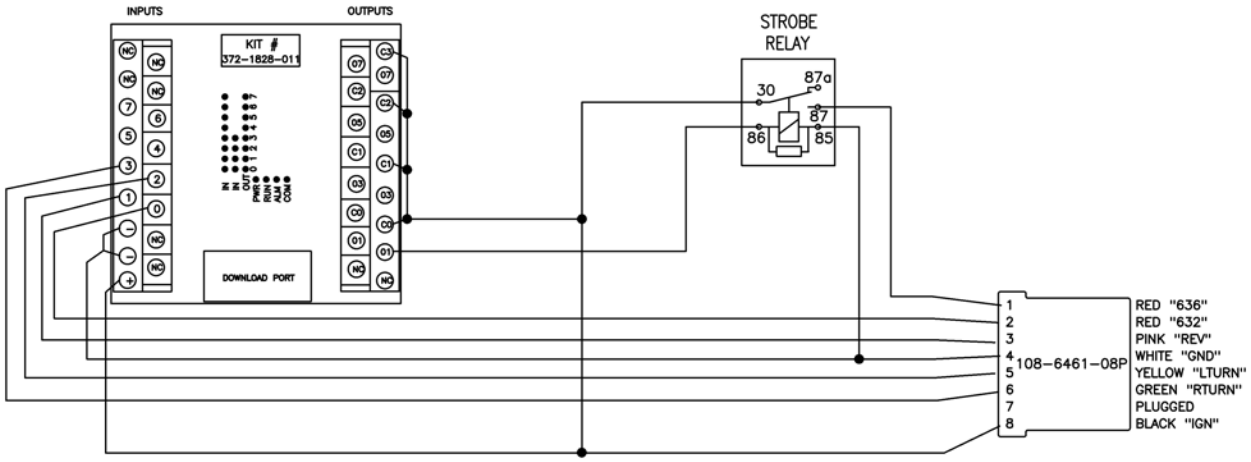


MINI-PLC KITS - 372-1828-009

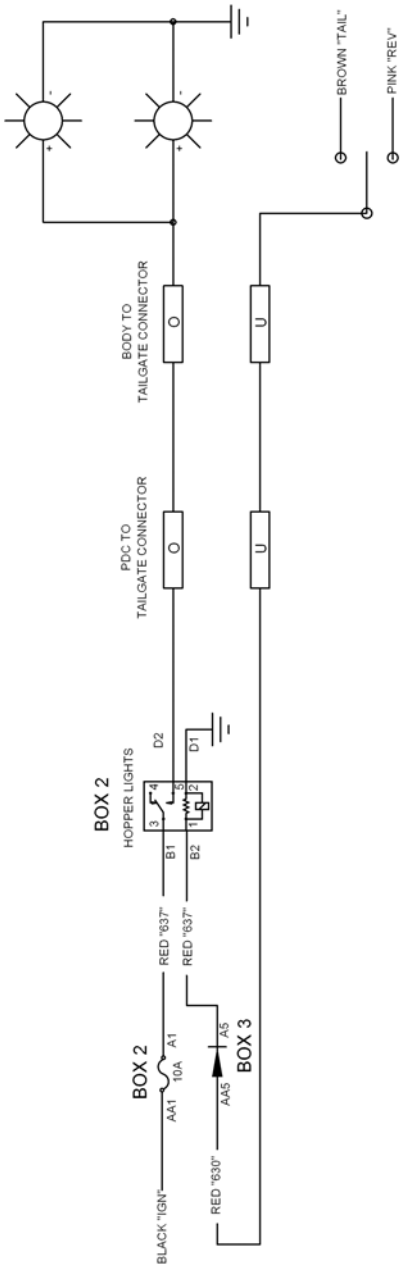


PT 1000™
Schematics

WHELEN MINI-PLC KIT - 372-1828-011

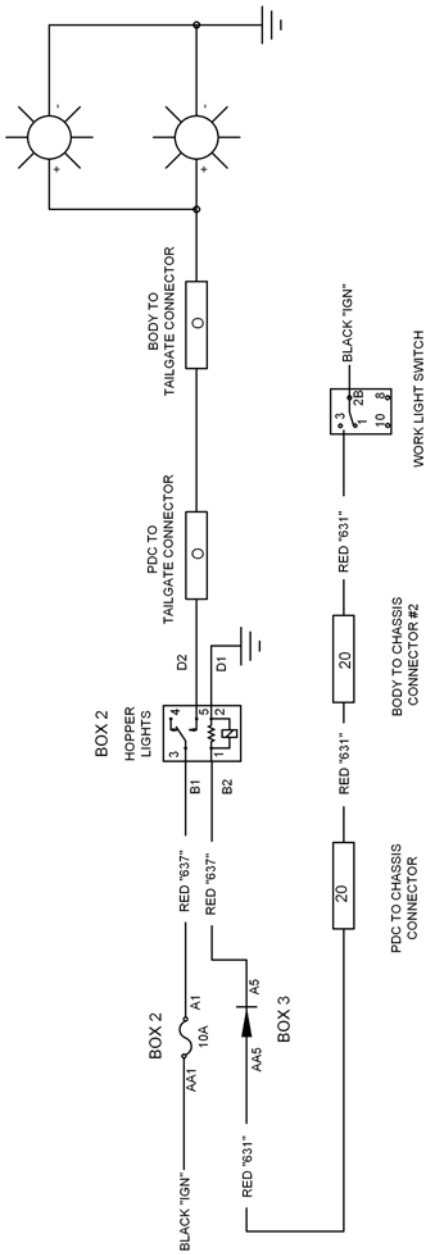


HOPPER TAIL/REVERSE LIGHT ACTIVATED SCHEMATIC - 701-8872-002

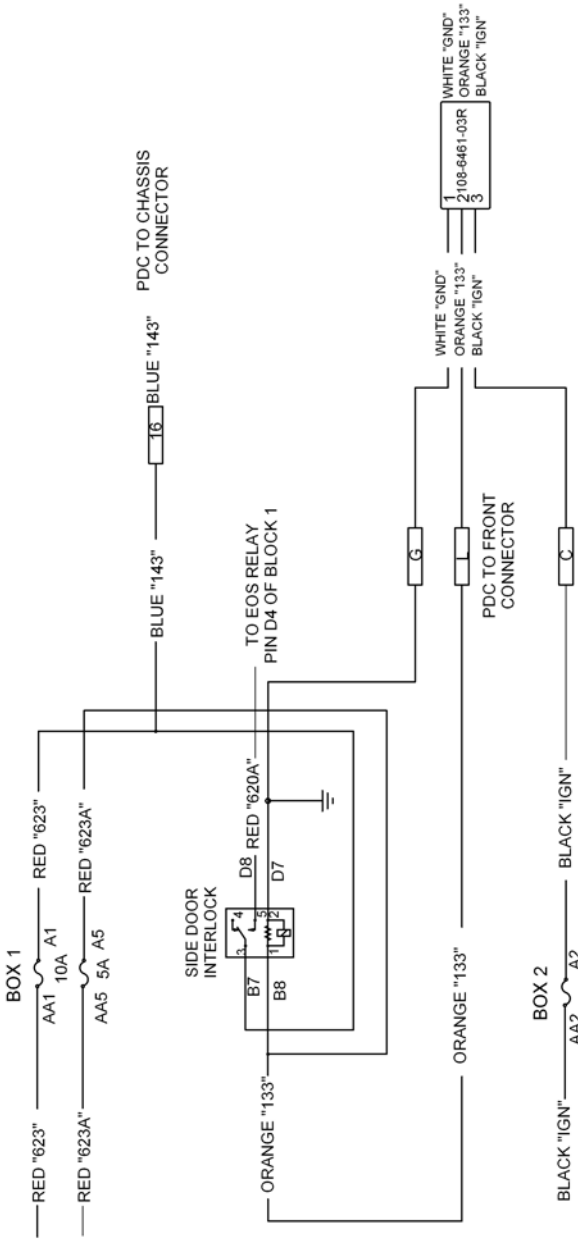


PT 1000™
Schematics

HOPPER LIGHT IN CAB SWITCH ACTIVATED SCHEMATIC - 701-8872-003

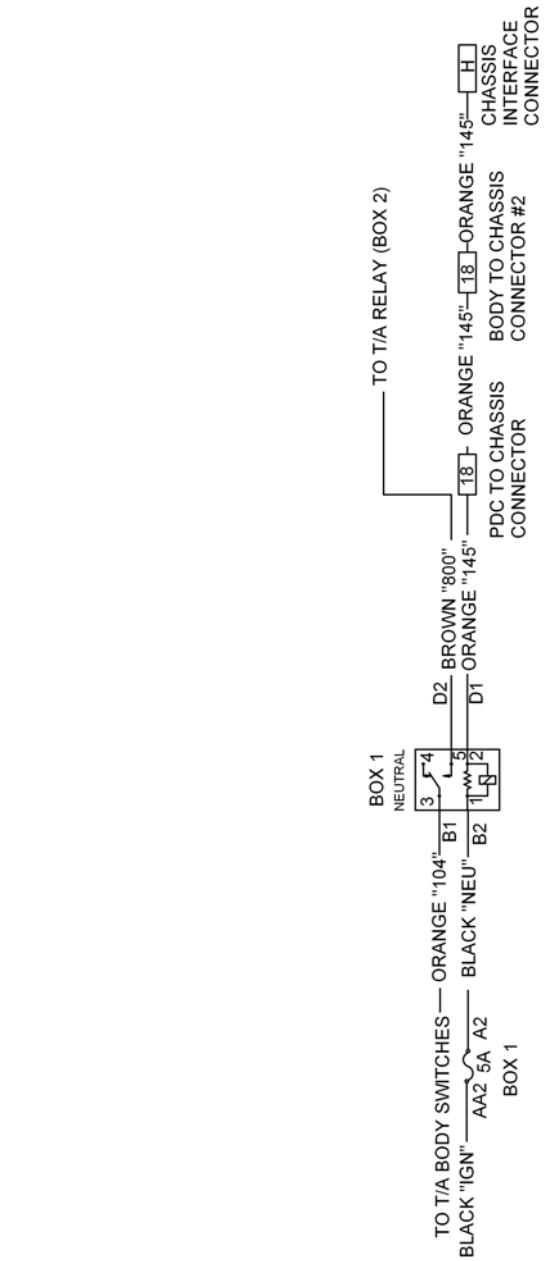


SIDE DOOR INTERLOCK SCHEMATIC - 701-8872-005

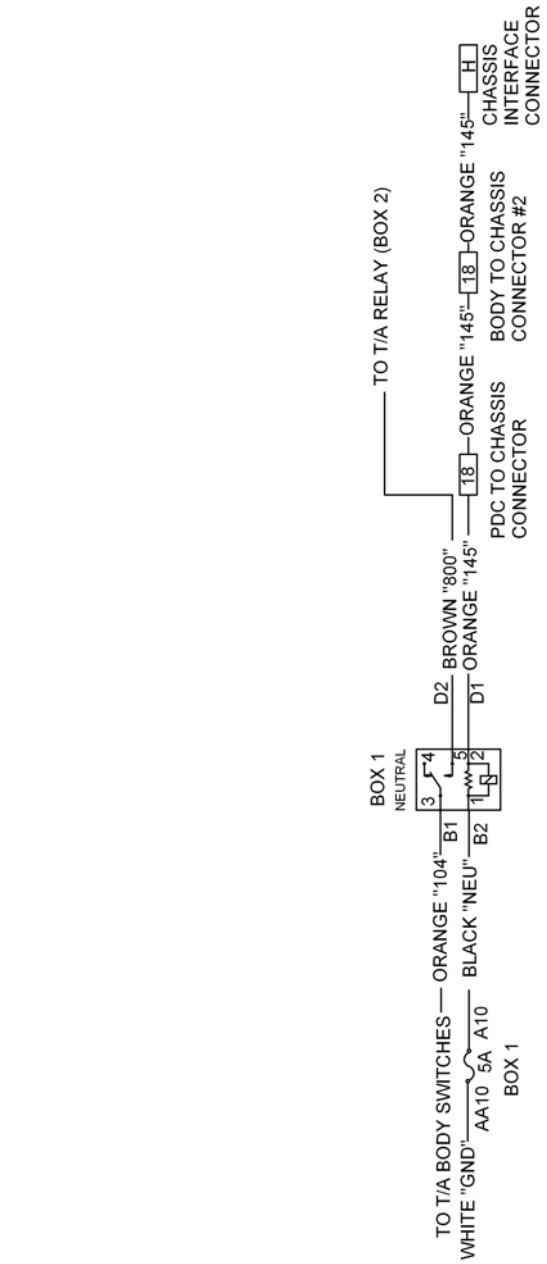


PT 1000™
Schematics

LS ACTIVE INPUT NEUTRAL SCHEMATIC - 701-8872-007

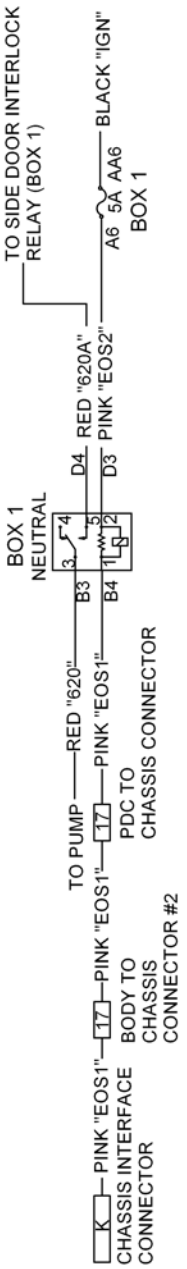


HS ACTIVE INPUT NEUTRAL SCHEMATIC - 701-8872-008

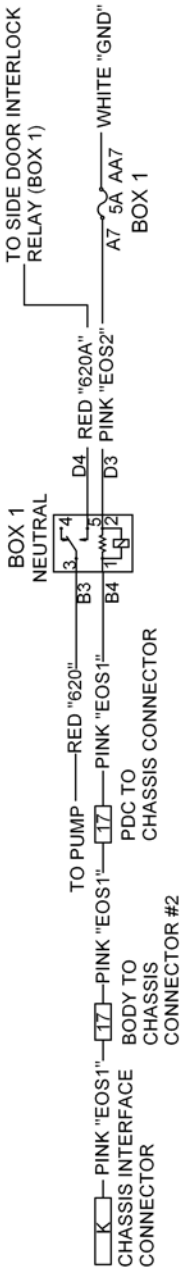


PT 1000™
Schematics

ALLISON EOS GEN. IV 1000/2000 SCHEMATIC - 701-8872-009

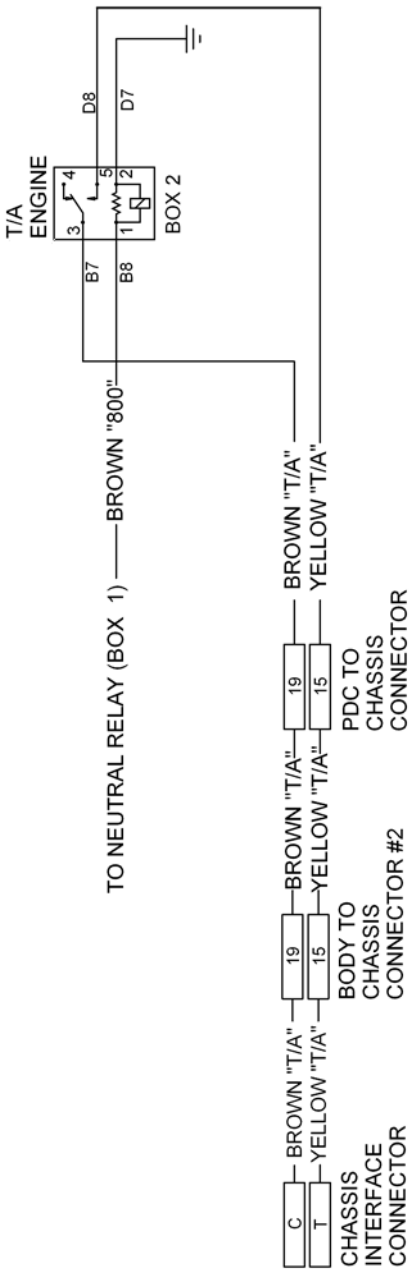


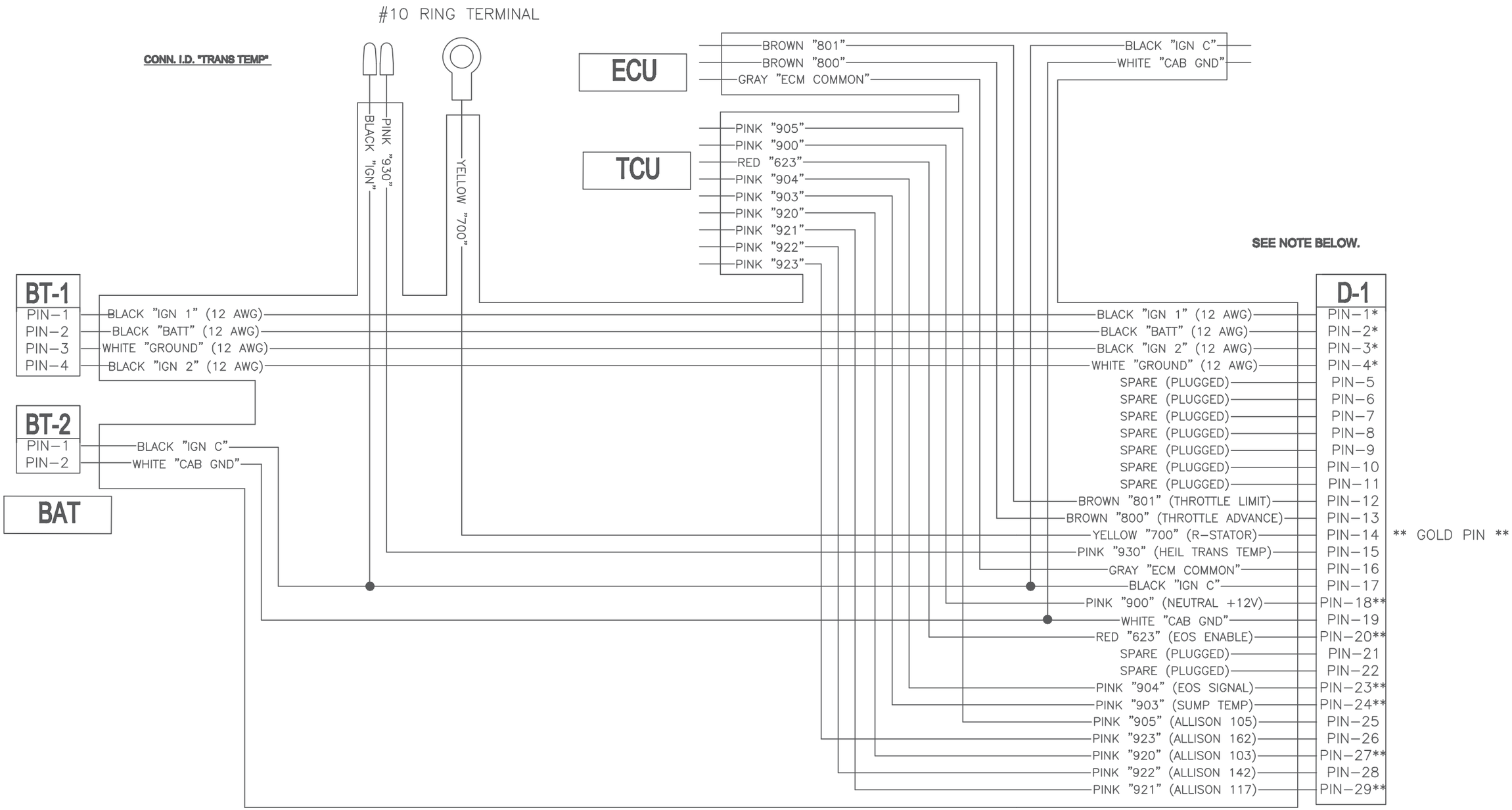
ALLISON EOS GEN. IV 3000/4000 SCHEMATIC - 701-8872-010



PT 1000™
Schematics

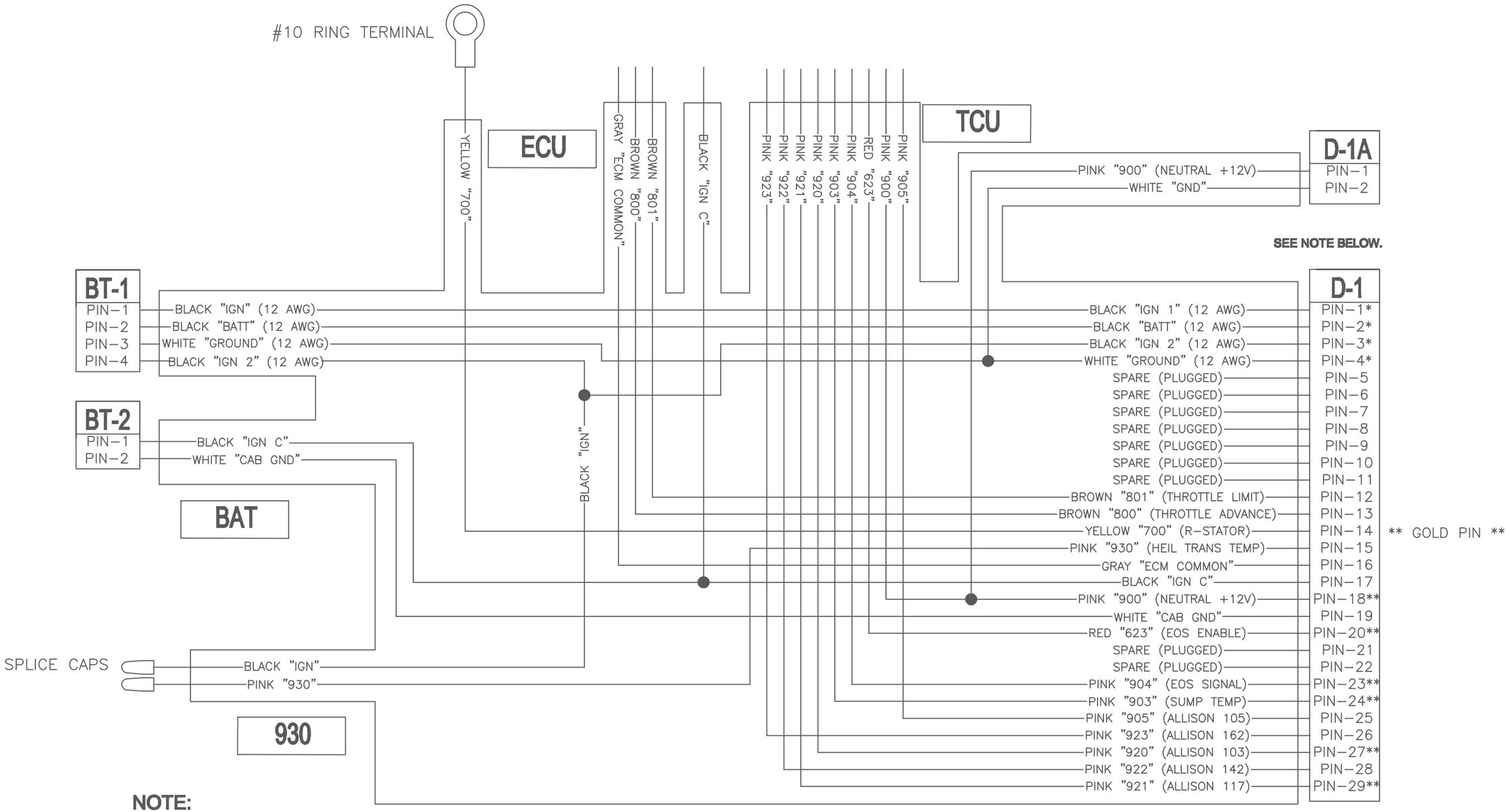
THROTTLE ADVANCE SCHEMATIC - 701-8872-011





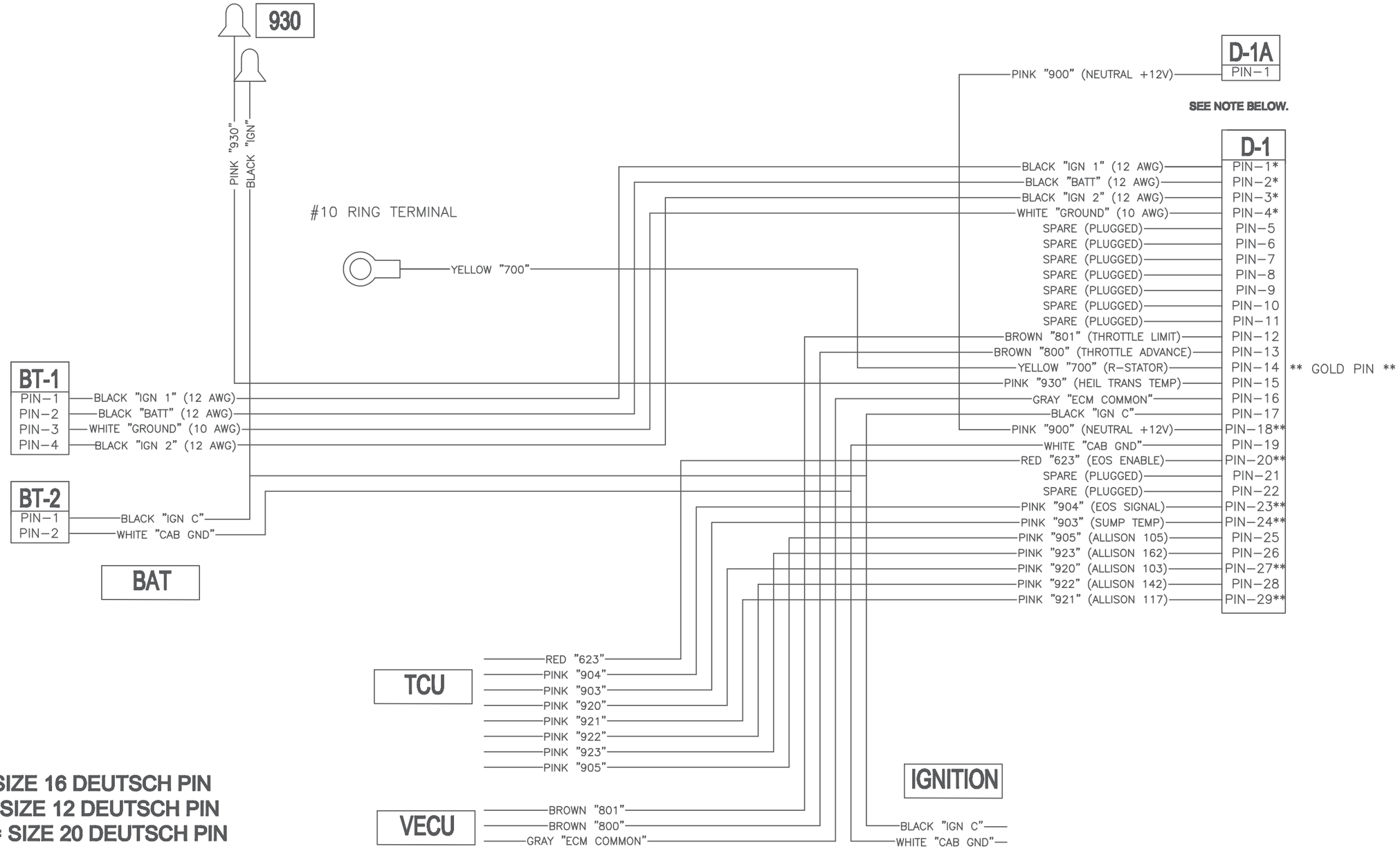
NOTE:
PIN-X = SIZE 16 DEUTSCH PIN
PIN-X* = SIZE 12 DEUTSCH PIN
PIN-X = SIZE 20 DEUTSCH PIN**

CCC Chassis Interface Harness
263-1471-001
09/29/2009



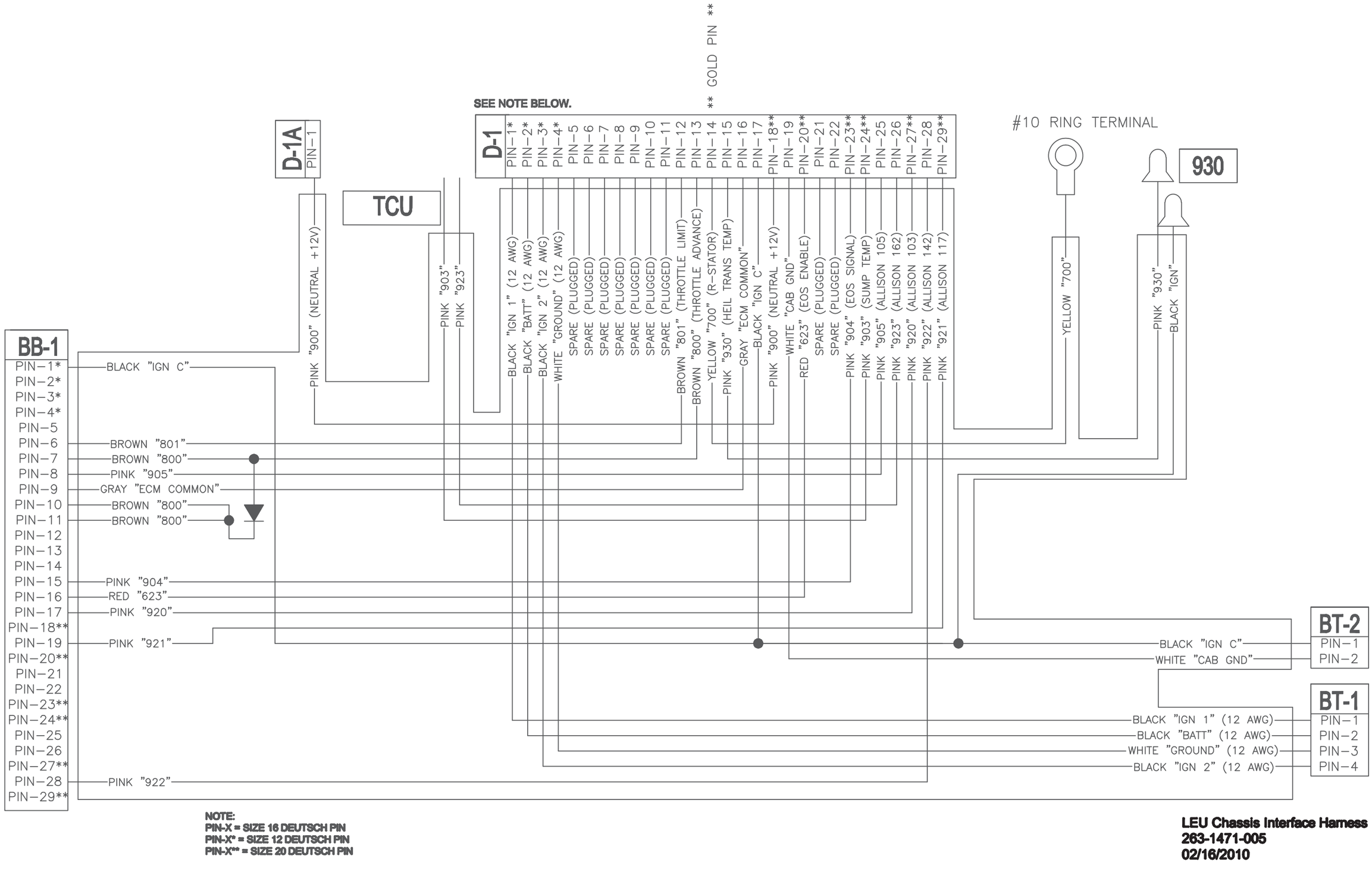
NOTE:
PIN-X = SIZE 16 DEUTSCH PIN
PIN-X* = SIZE 12 DEUTSCH PIN
PIN-X = SIZE 20 DEUTSCH PIN**

Condor Chassis Interface Harness
263-1471-002
09/29/2009



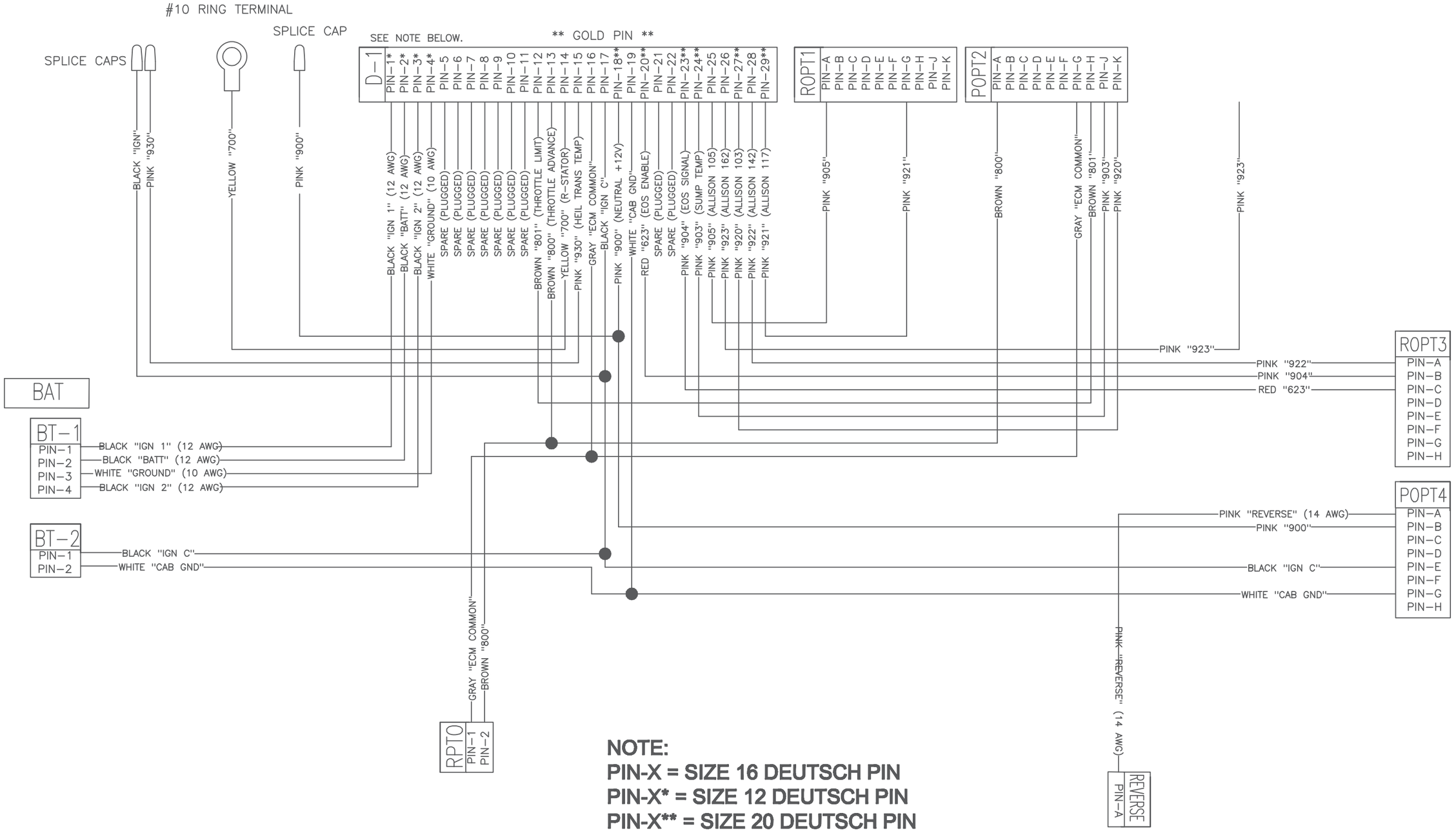
NOTE:
PIN-X = SIZE 16 DEUTSCH PIN
PIN-X* = SIZE 12 DEUTSCH PIN
PIN-X = SIZE 20 DEUTSCH PIN**

Granite Chassis Interface Harness
263-1471-003
01/21/2011

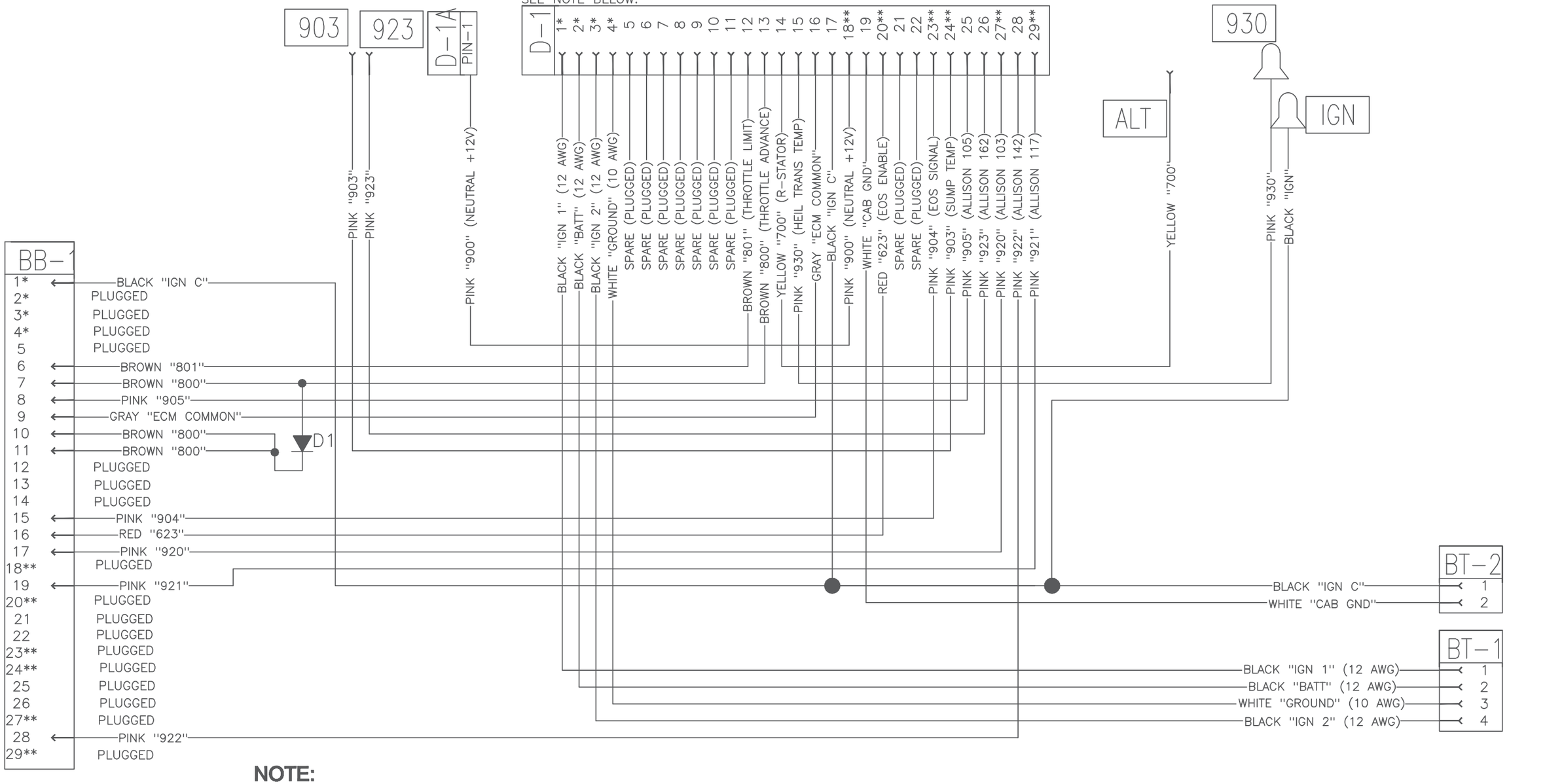


NOTE:
PIN-X = SIZE 16 DEUTSCH PIN
PIN-X* = SIZE 12 DEUTSCH PIN
PIN-X = SIZE 20 DEUTSCH PIN**

LEU Chassis Interface Harness
263-1471-005
02/16/2010

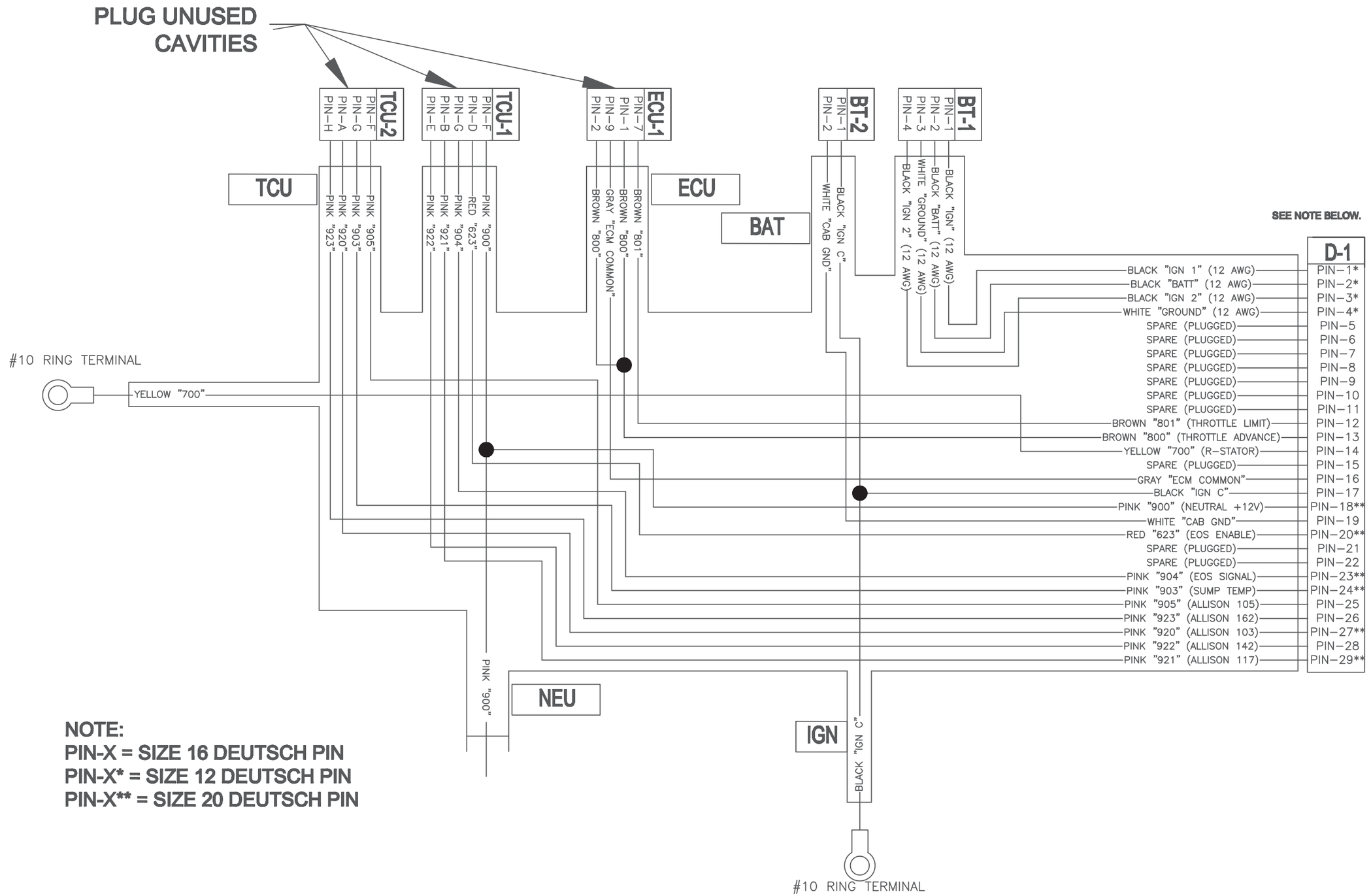


ACX Chassis Interface Harness
263-1471-006
03/23/2011



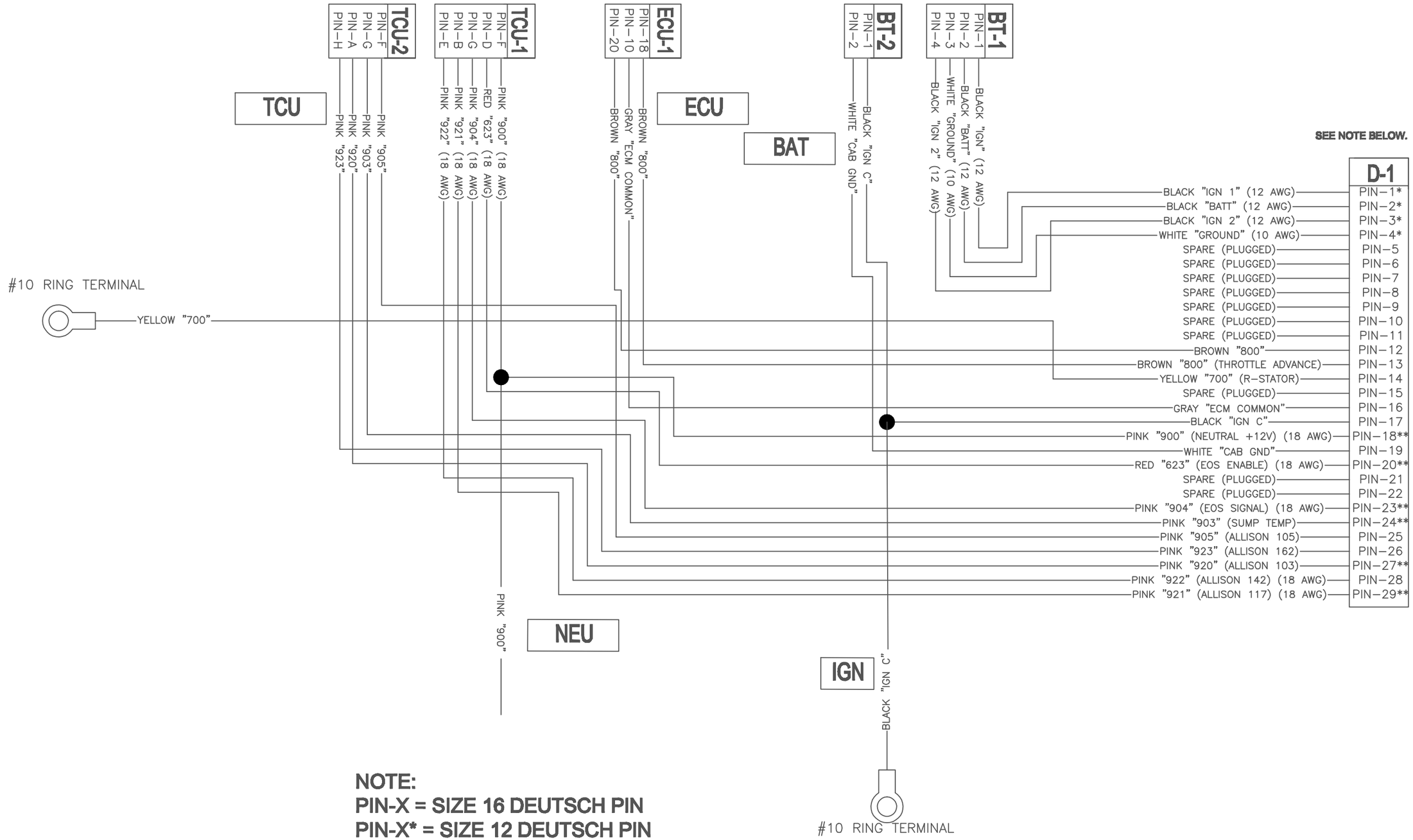
NOTE:
PIN-X = SIZE 16 DEUTSCH PIN
PIN-X* = SIZE 12 DEUTSCH PIN
PIN-X = SIZE 20 DEUTSCH PIN**

MRU Chassis Interface Harness
263-1471-007
10/13/2010



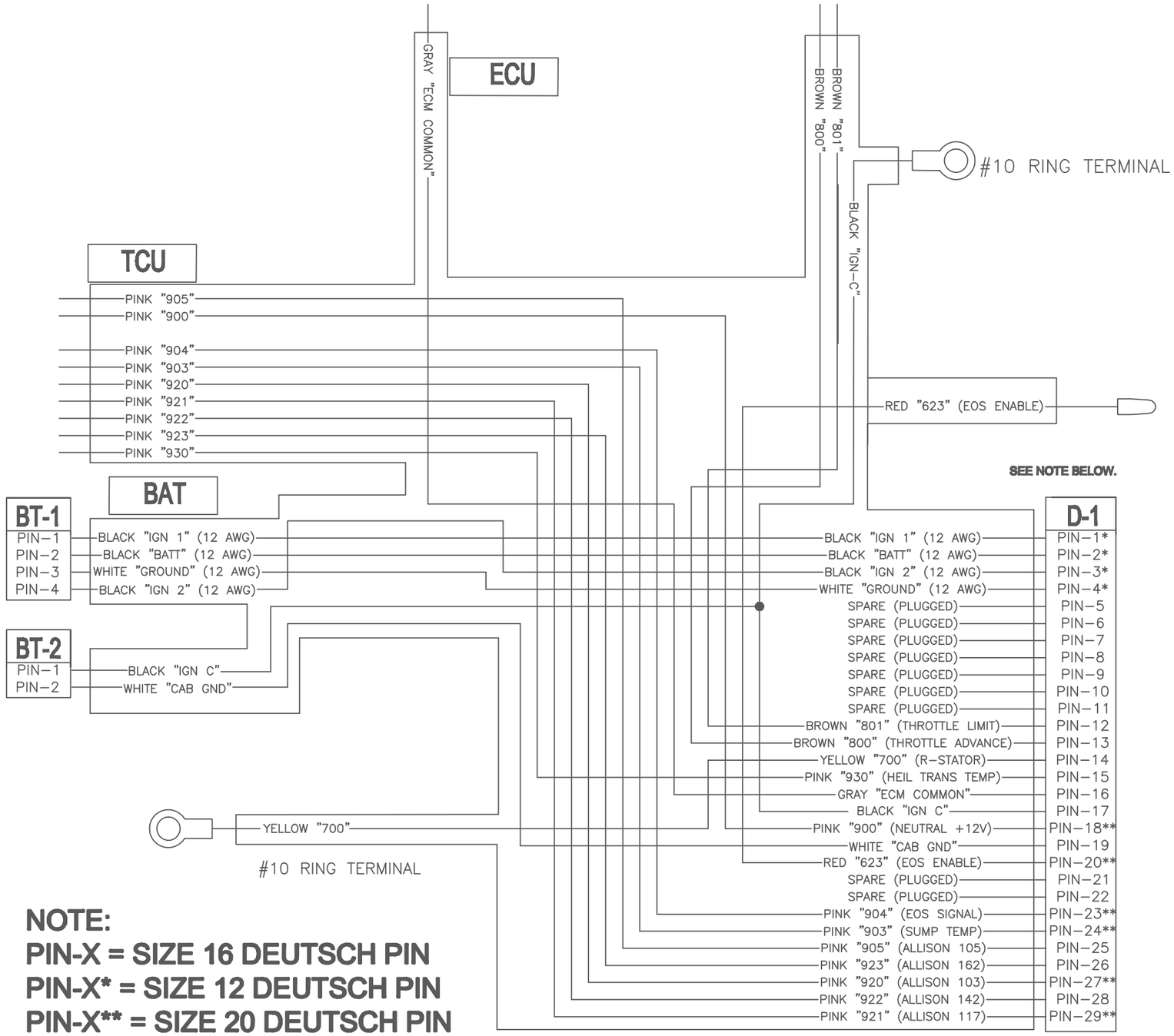
NOTE:
PIN-X = SIZE 16 DEUTSCH PIN
PIN-X* = SIZE 12 DEUTSCH PIN
PIN-X = SIZE 20 DEUTSCH PIN**

Non-RPM International Chassis Interface Harness
263-1471-008
08/02/2010



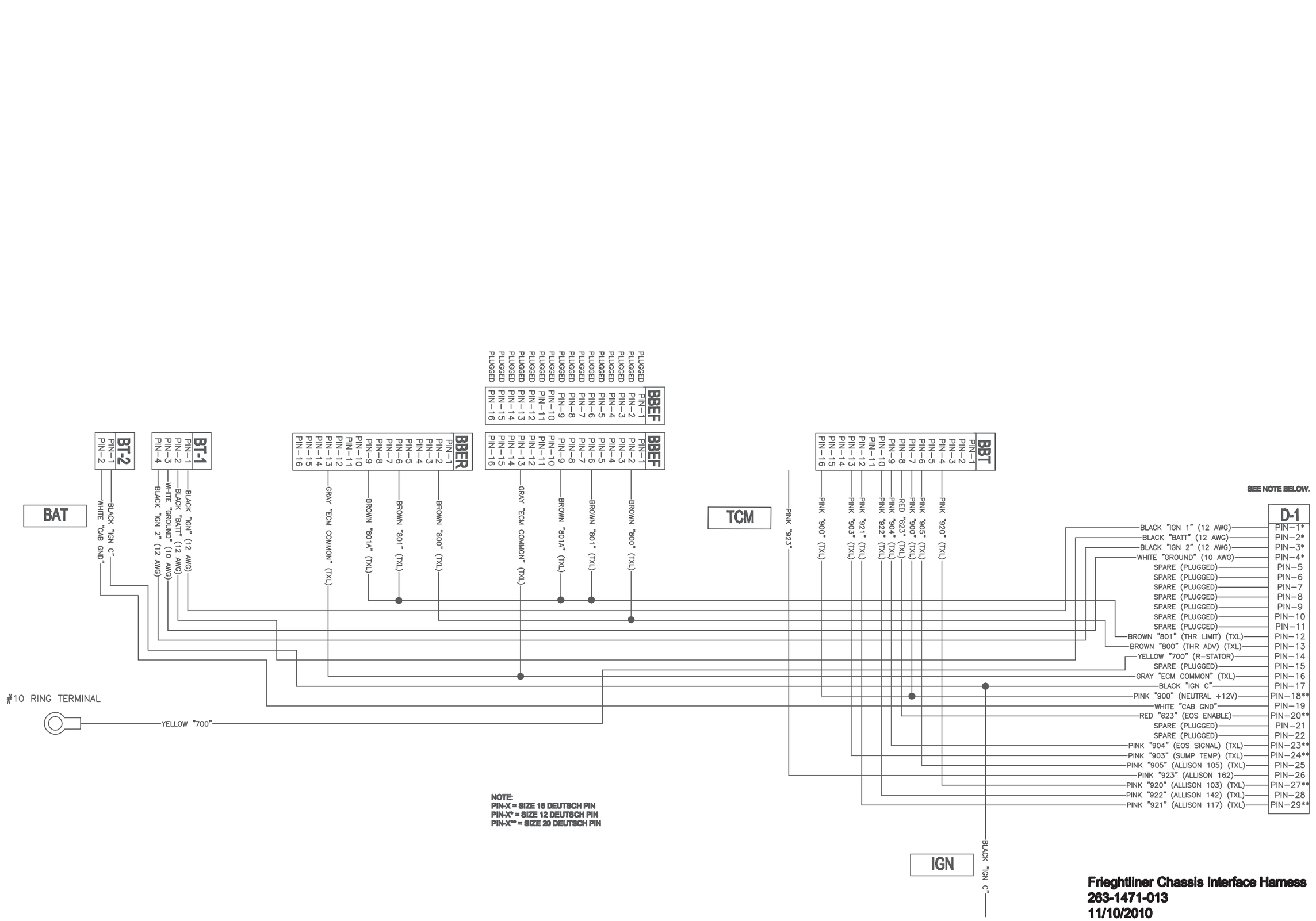
NOTE:
PIN-X = SIZE 16 DEUTSCH PIN
PIN-X* = SIZE 12 DEUTSCH PIN
PIN-X = SIZE 20 DEUTSCH PIN**

International VZA Chassis Interface Harness
263-1471-009
01/16/2012



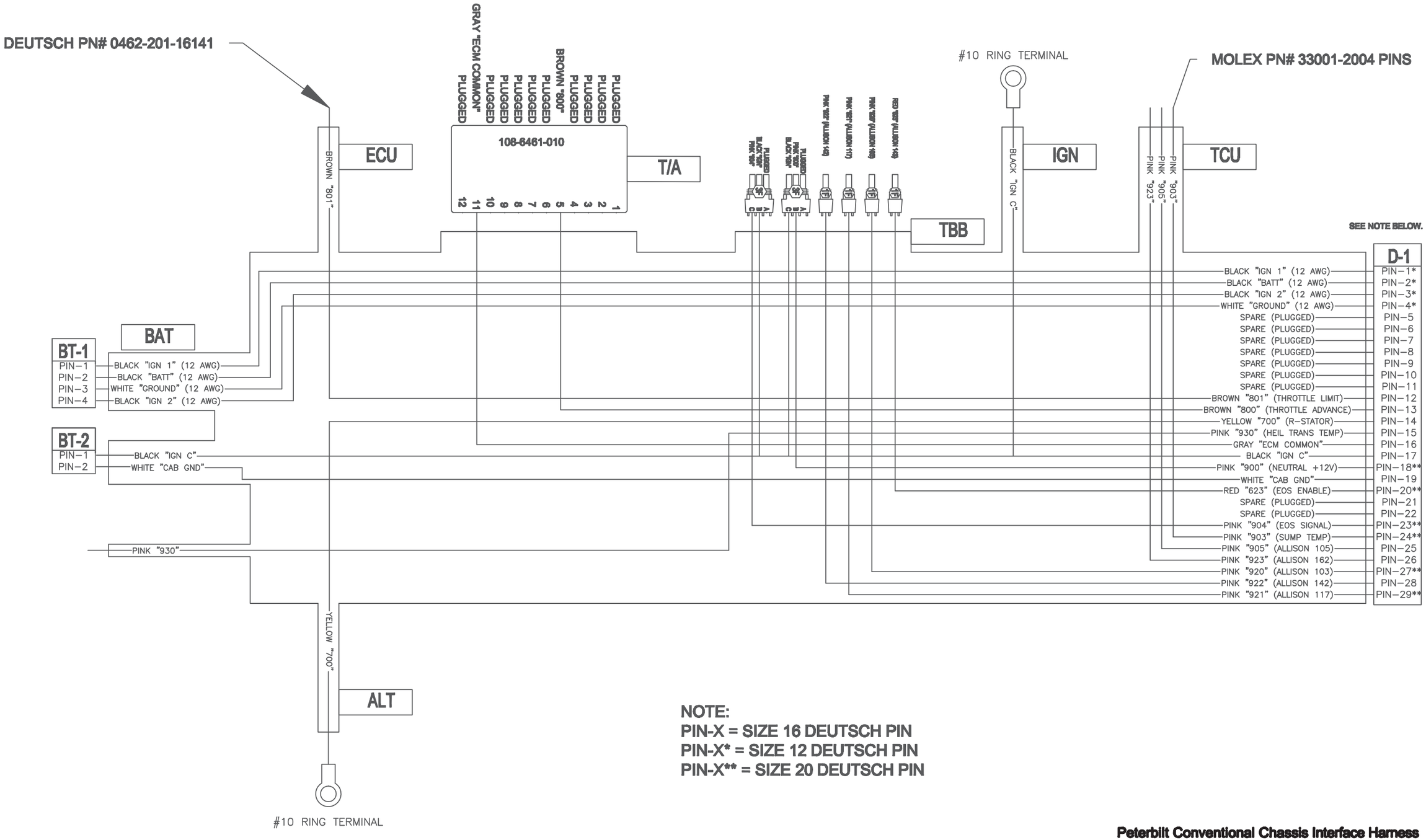
NOTE:
PIN-X = SIZE 16 DEUTSCH PIN
PIN-X* = SIZE 12 DEUTSCH PIN
PIN-X = SIZE 20 DEUTSCH PIN**

Peterbilt Cab Over Chassis Interface Harness
263-1471-012
05/10/2010



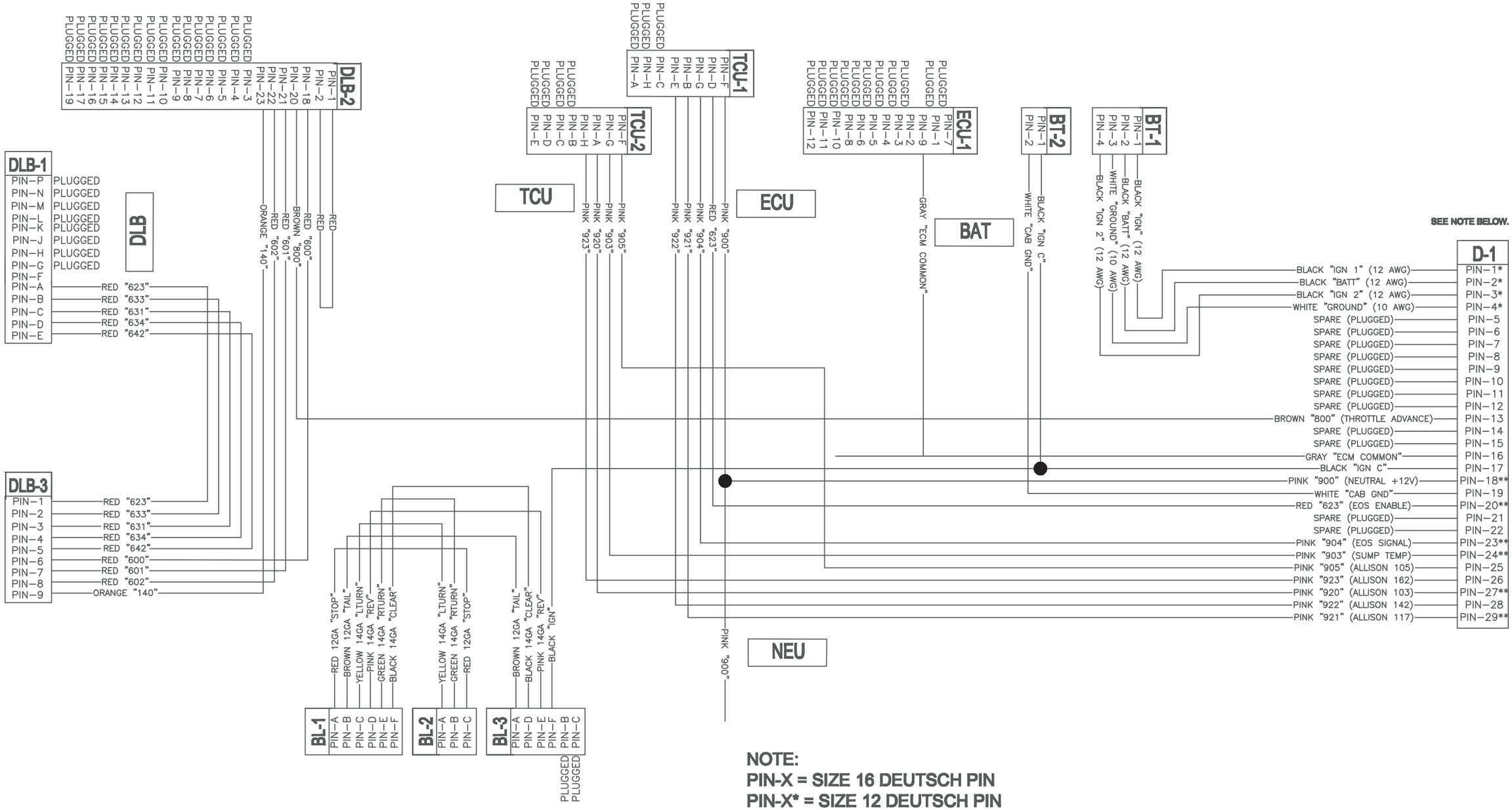
NOTE:
PIN-X = SIZE 16 DEUTSCH PIN
PIN-X* = SIZE 12 DEUTSCH PIN
PIN-X** = SIZE 20 DEUTSCH PIN

Frieghtliner Chassis Interface Harness
263-1471-013
11/10/2010



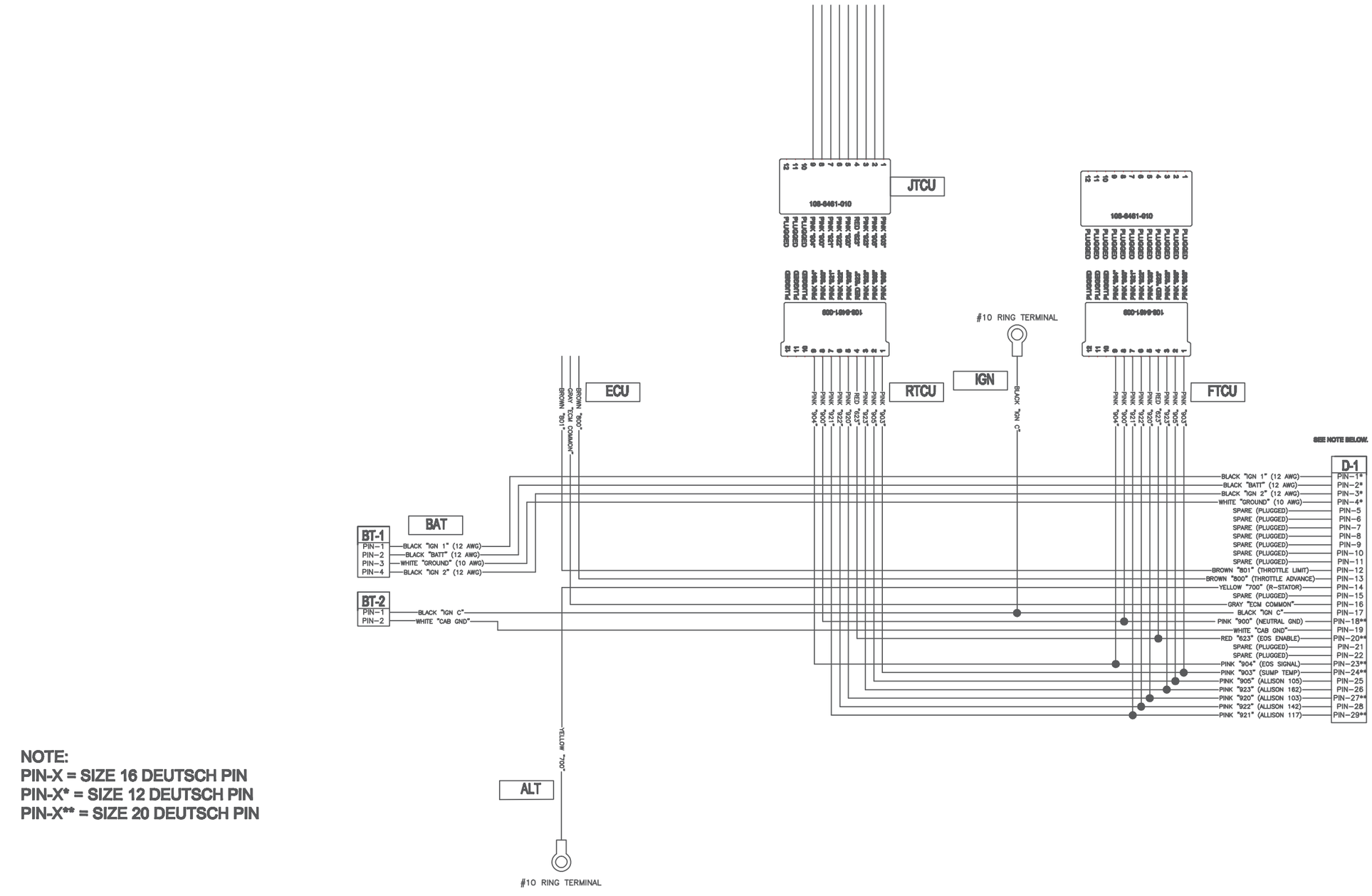
NOTE:
PIN-X = SIZE 16 DEUTSCH PIN
PIN-X* = SIZE 12 DEUTSCH PIN
PIN-X = SIZE 20 DEUTSCH PIN**

Peterbilt Conventional Chassis Interface Harness
263-1471-014
01/14/2010



NOTE:
PIN-X = SIZE 16 DEUTSCH PIN
PIN-X* = SIZE 12 DEUTSCH PIN
PIN-X = SIZE 20 DEUTSCH PIN**

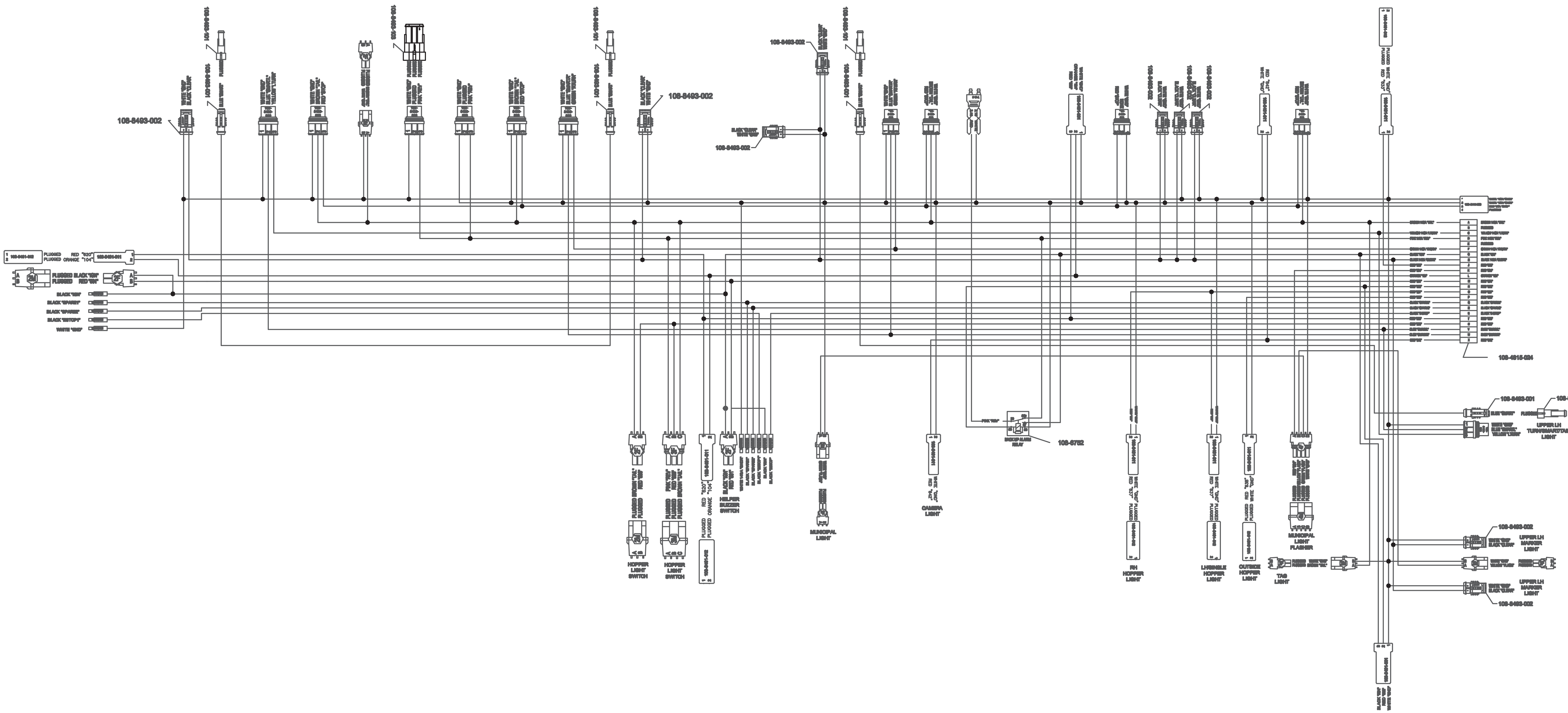
DLB International Chassis Interface Harness
263-1471-015
01/258/2013



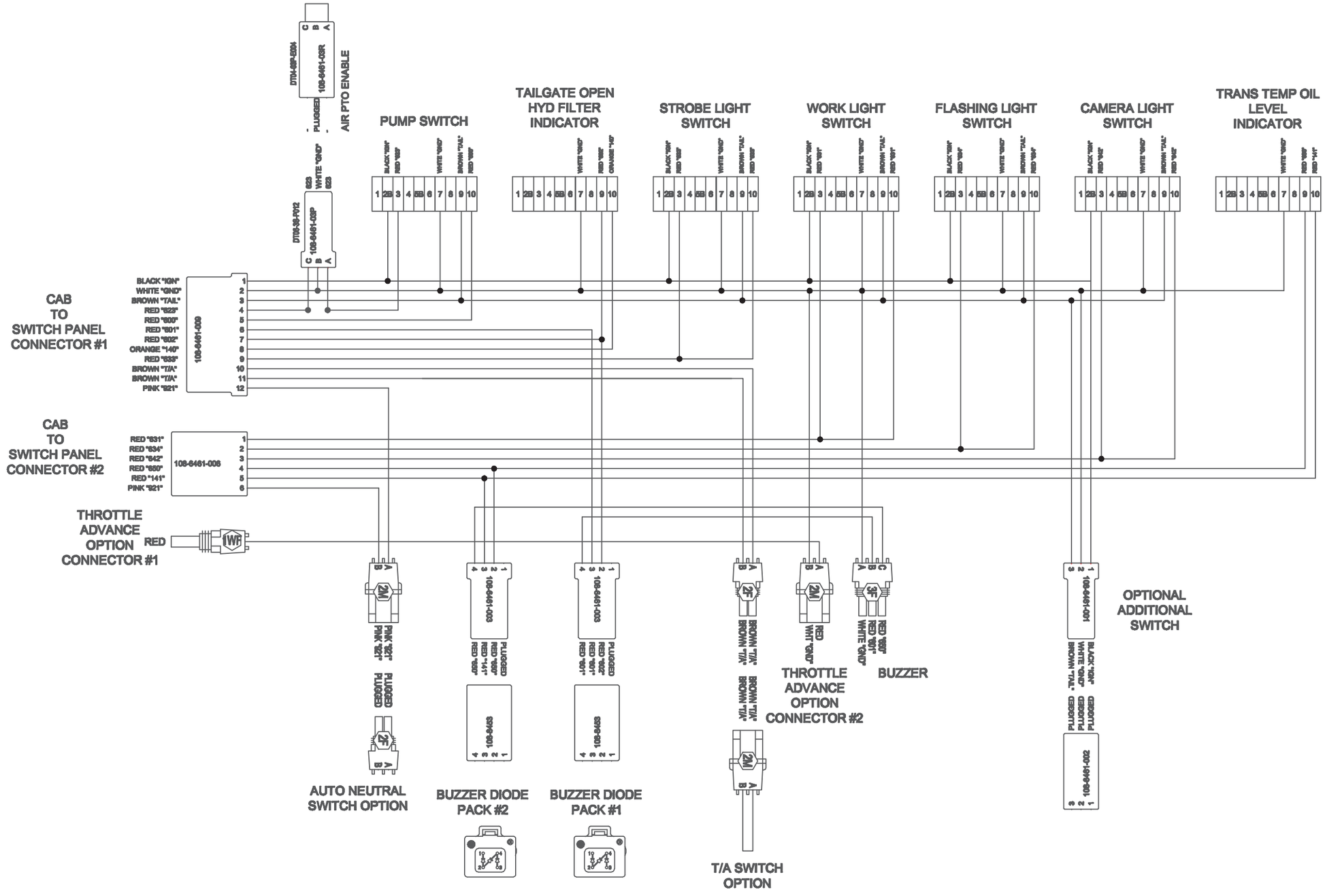
NOTE:
PIN-X = SIZE 16 DEUTSCH PIN
PIN-X* = SIZE 12 DEUTSCH PIN
PIN-X = SIZE 20 DEUTSCH PIN**

Kenworth Conventional Chassis Interface Harness
263-1471-016
11/15/2010

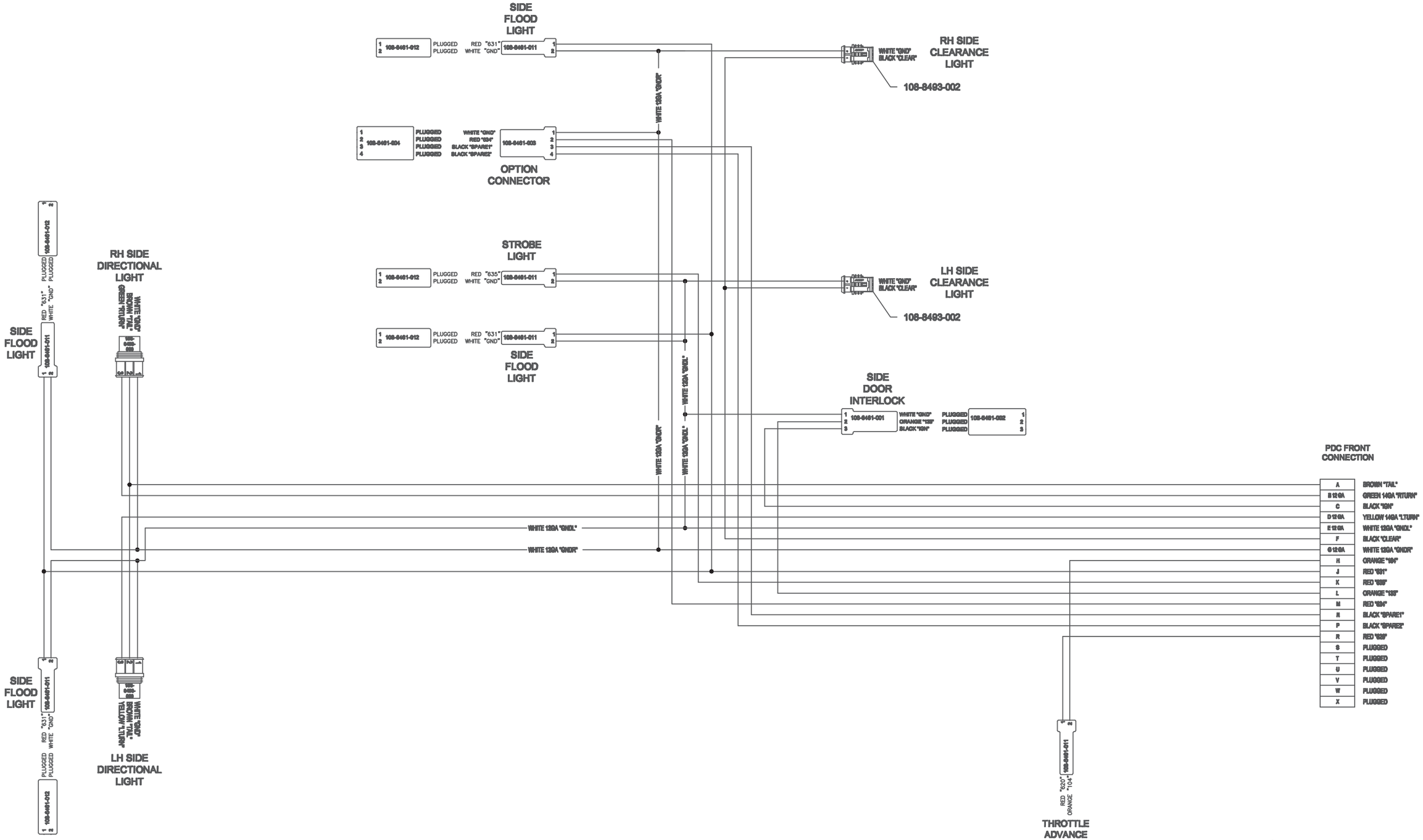
LED Cab to Body Jumper Harness
263-1477
11/05/2008



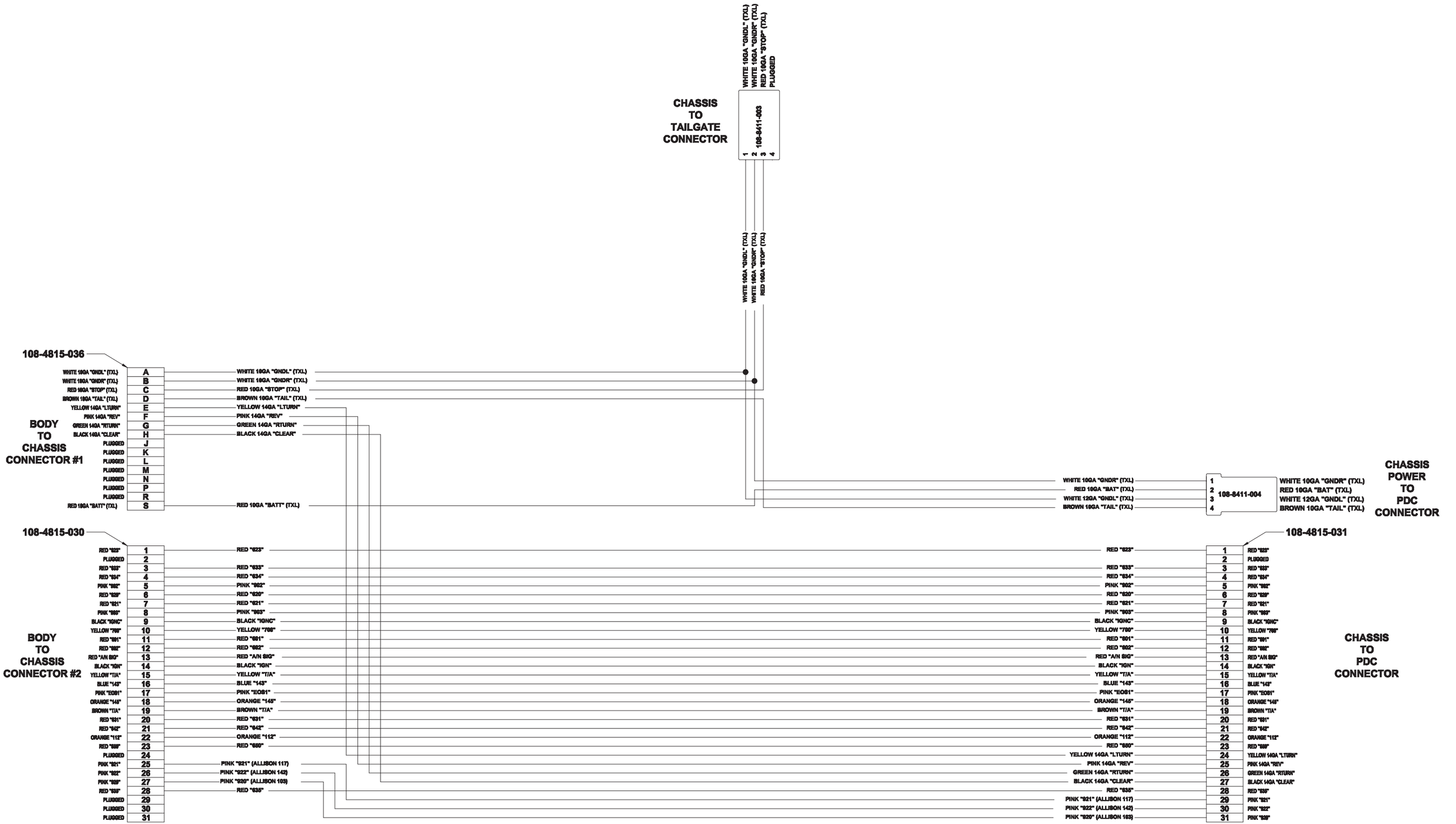
Tailgate Harness
263-1509
08/06/2010



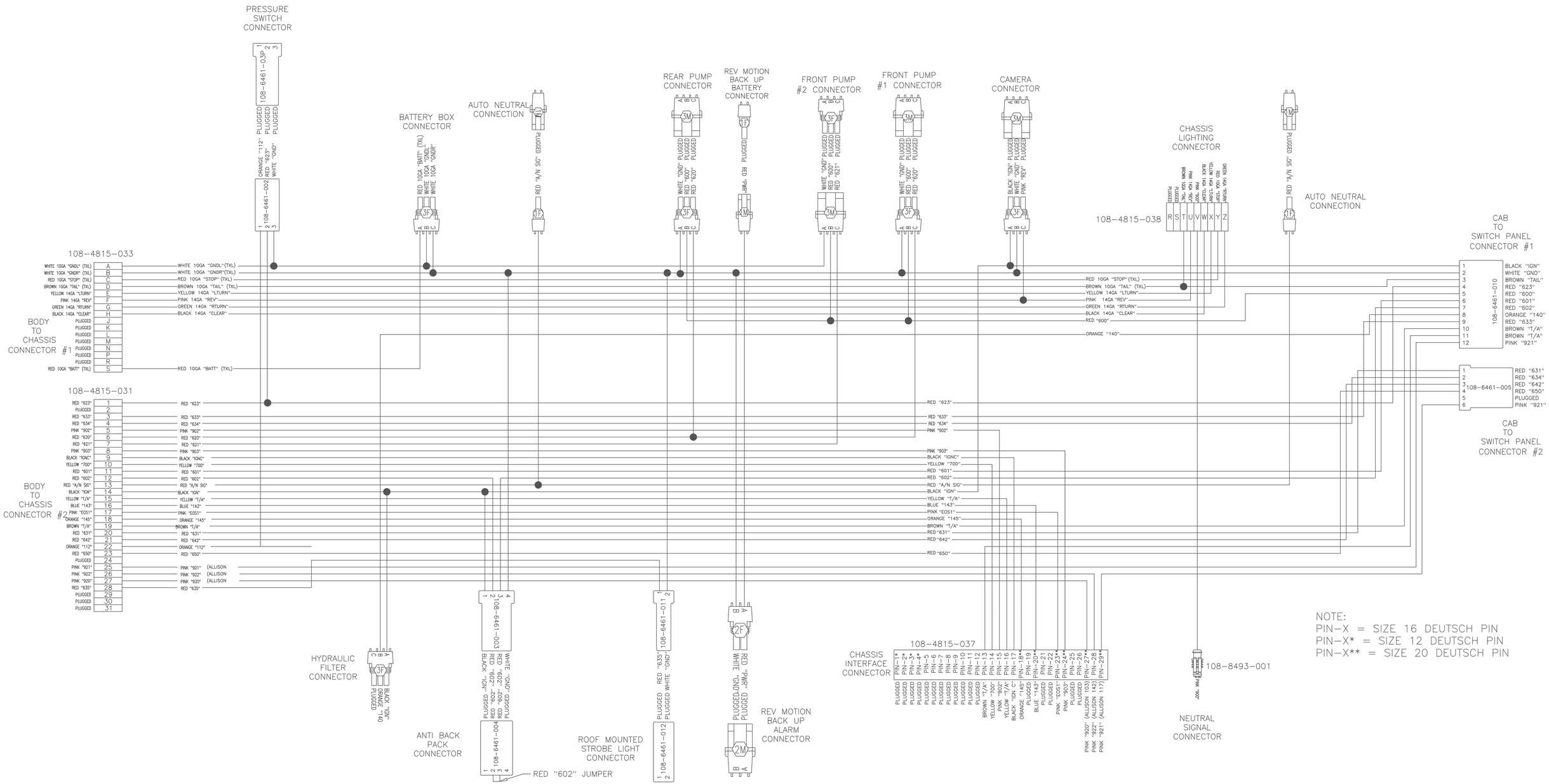
Switch Panel Harness
263-1484-001
02/04/2011



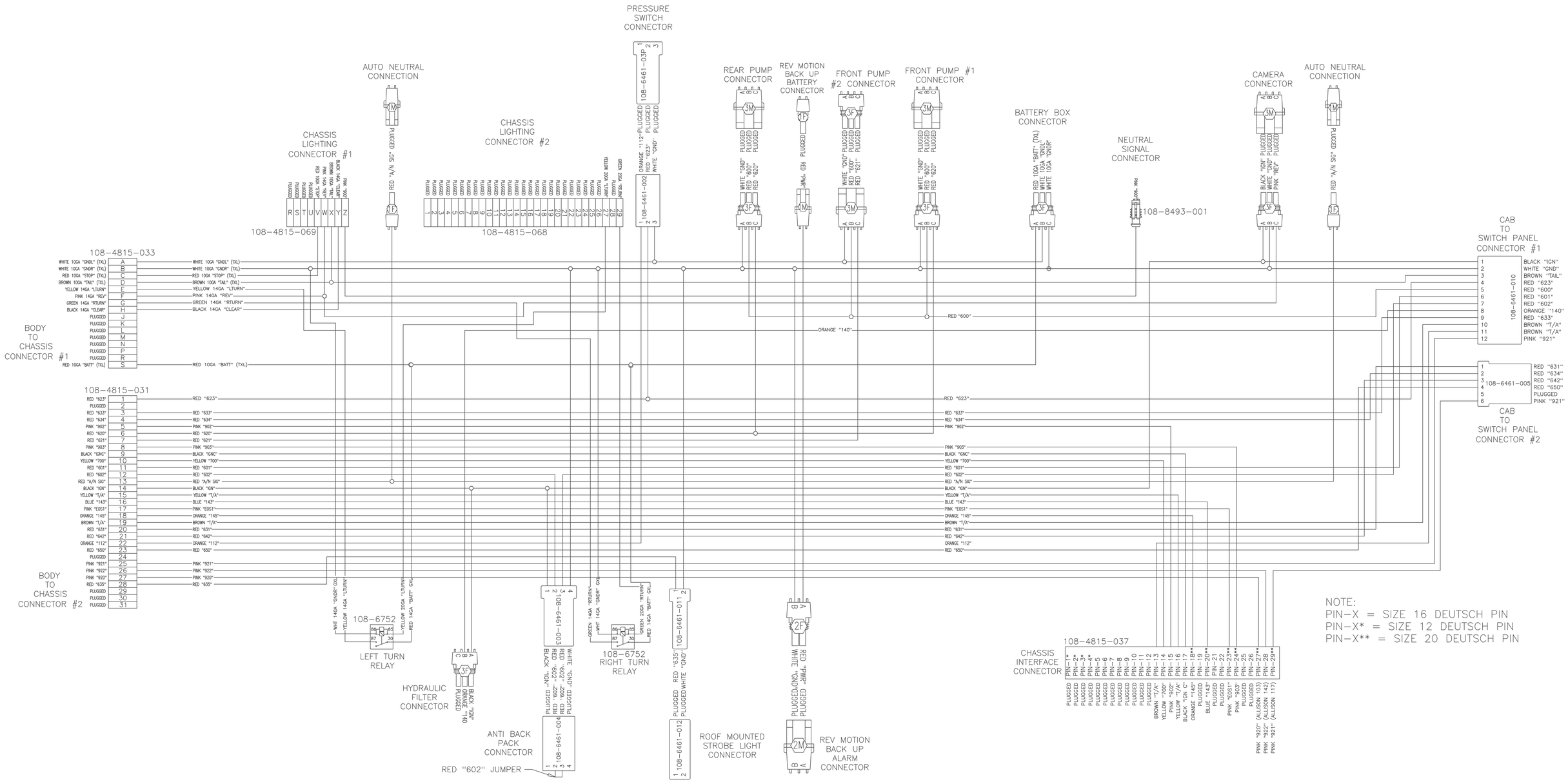
PDC to Front Body Harness
263-1470-001
02/09/2010



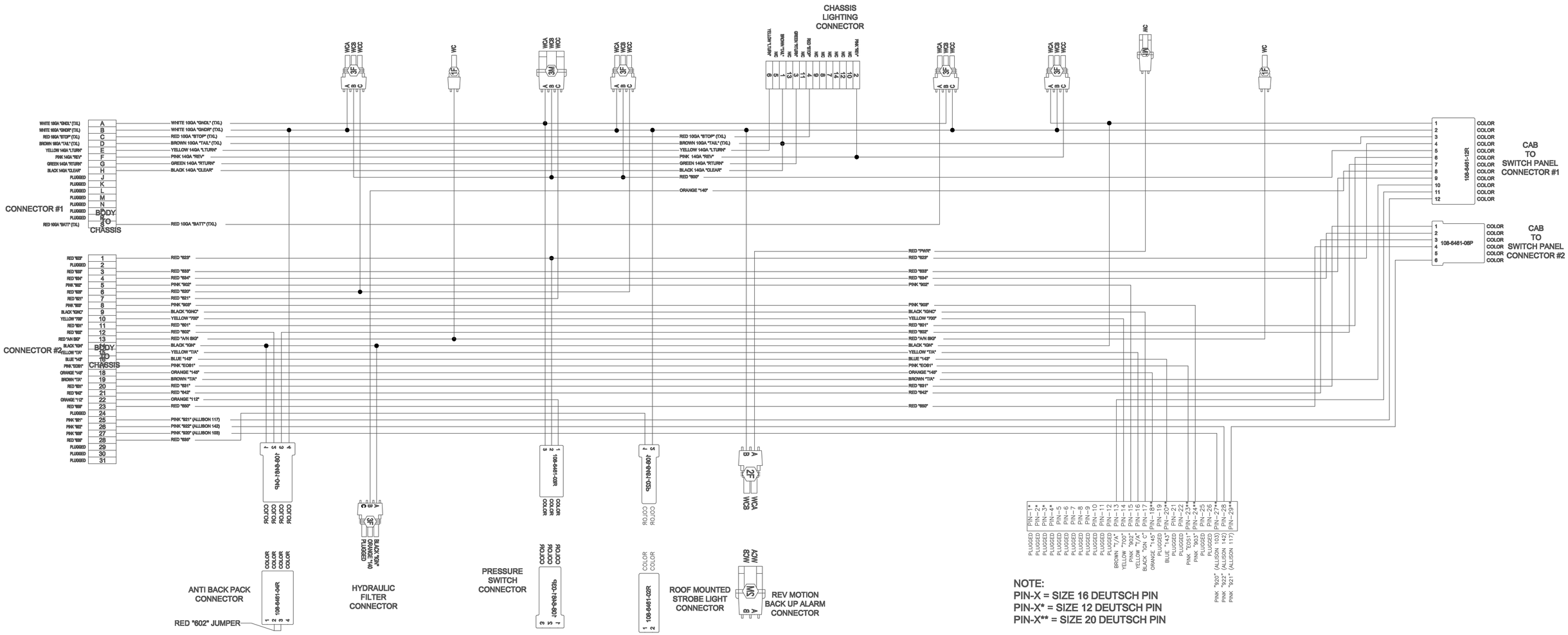
PDC To Chassis Harness
263-1470-003
02/05/2010



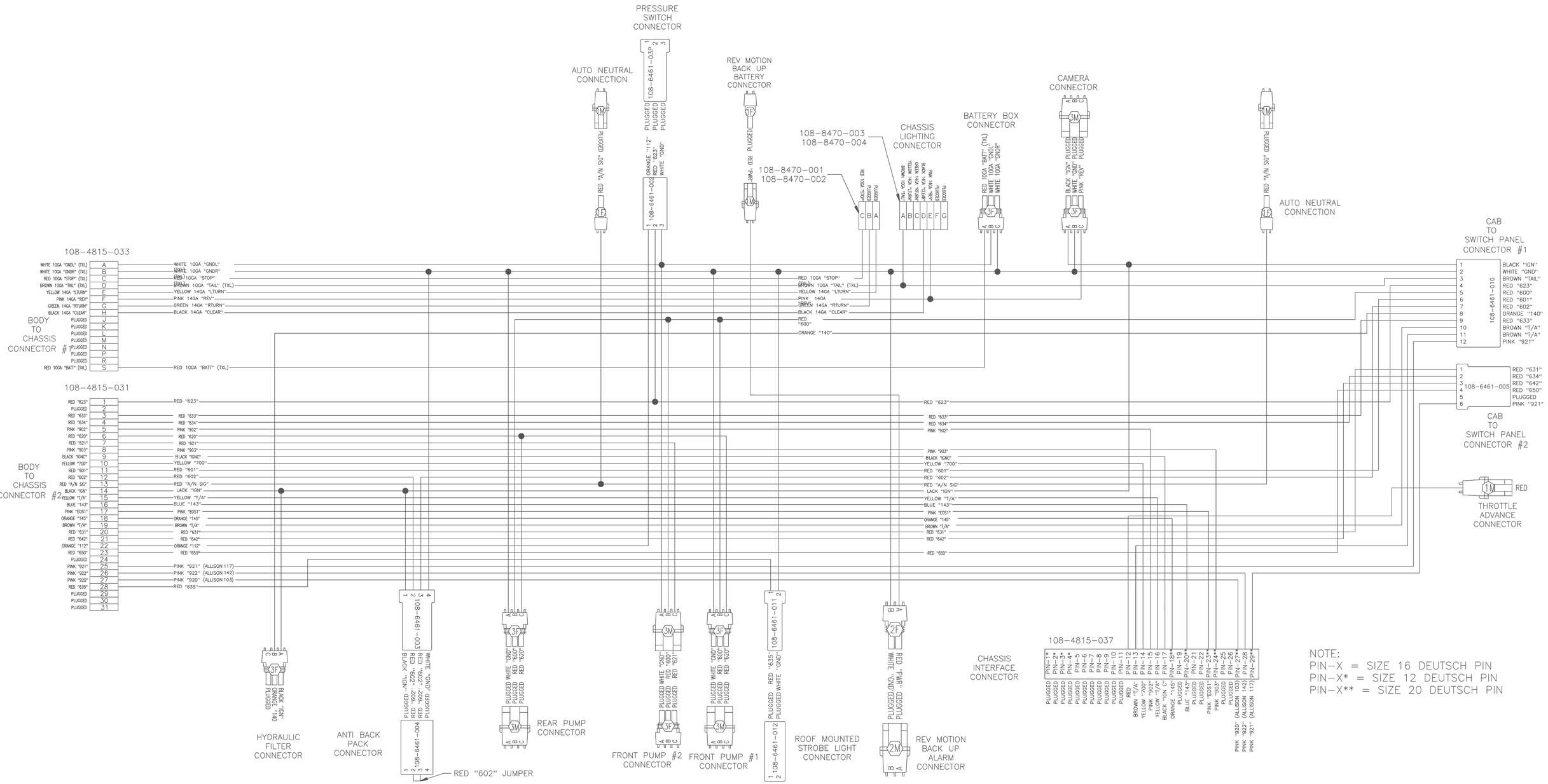
Mack MRU Cab To Body Harness
263-1482-001
20/05/2011



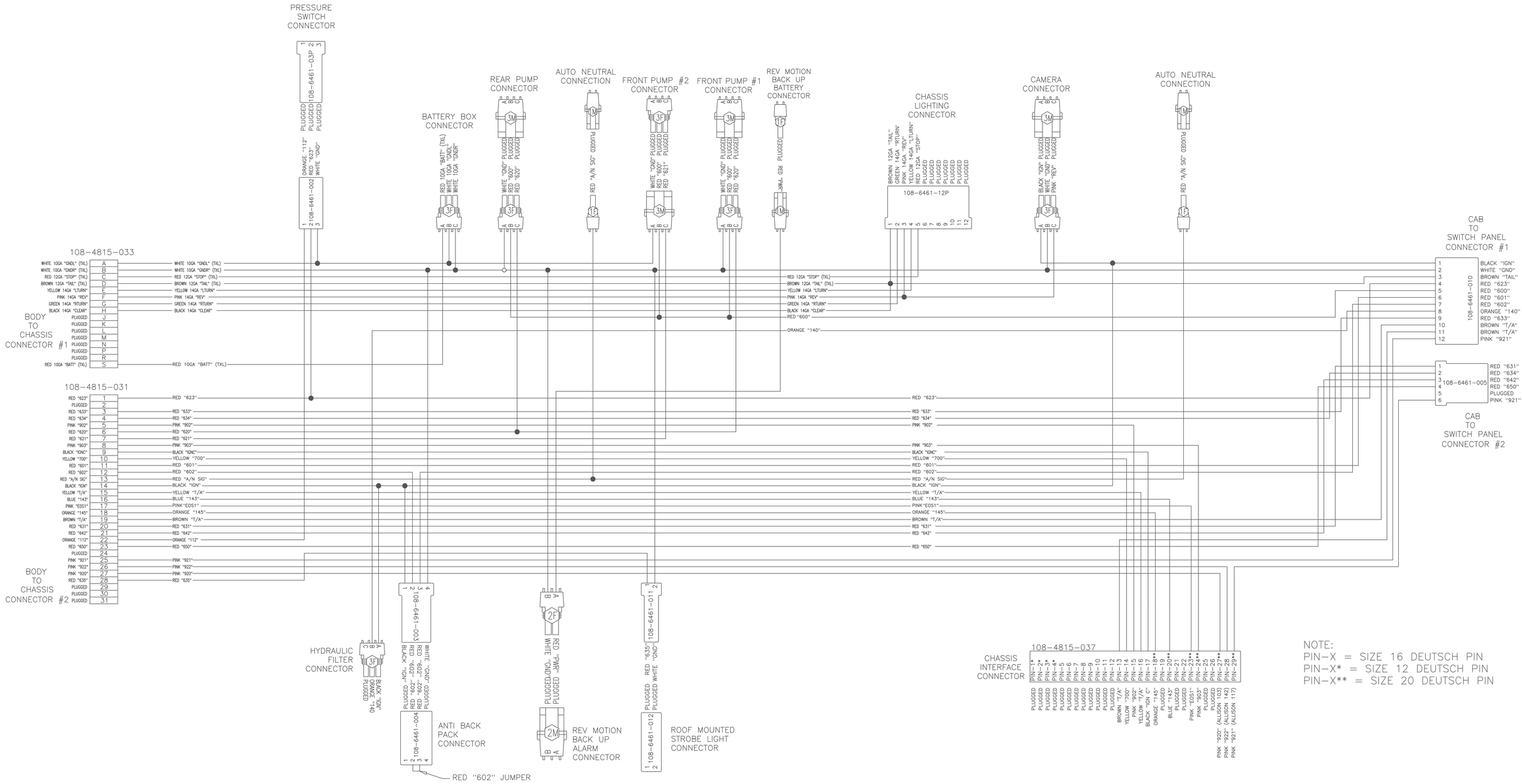
Mack Granite Cab To Body Harness
263-1482-002
14/09/2011



Freightliner Cab To Body Harness
263-1482-003
03/07/2012

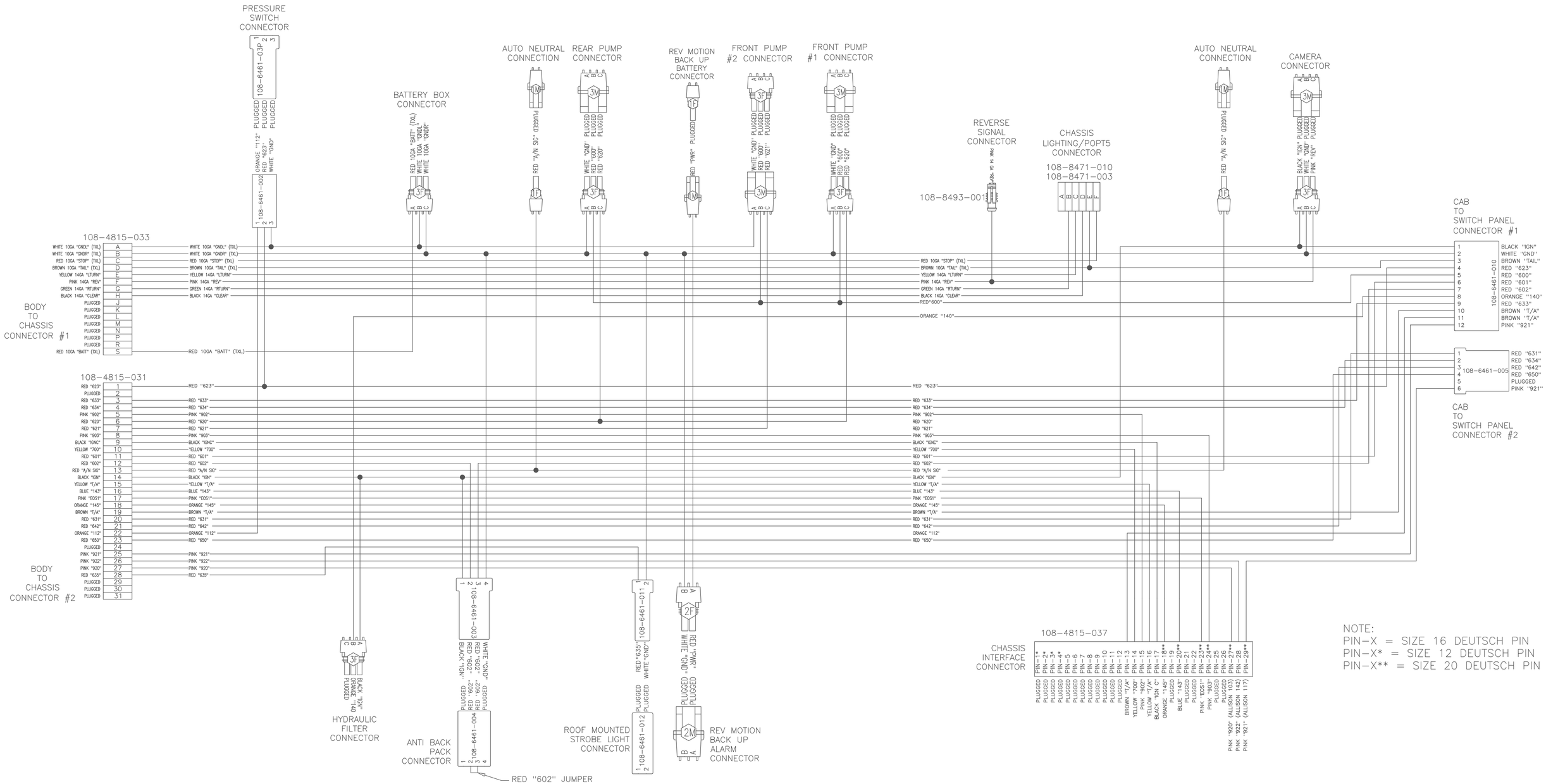


International Pedestal Mount Cab To Harness
263-1482-004
02/04/2011

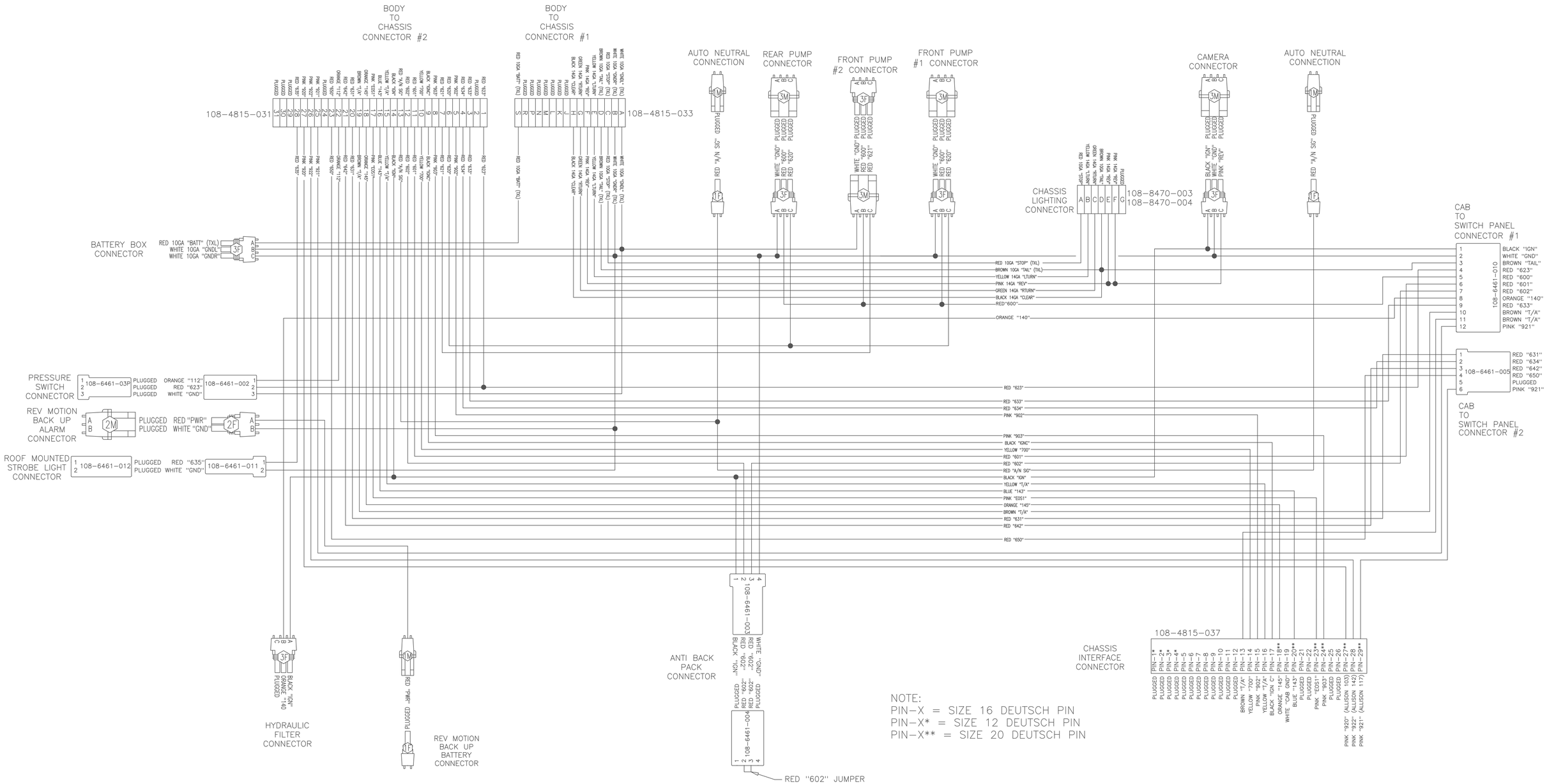


NOTE:
PIN-X = SIZE 16 DEUTSCH PIN
PIN-X* = SIZE 12 DEUTSCH PIN
PIN-X** = SIZE 20 DEUTSCH PIN

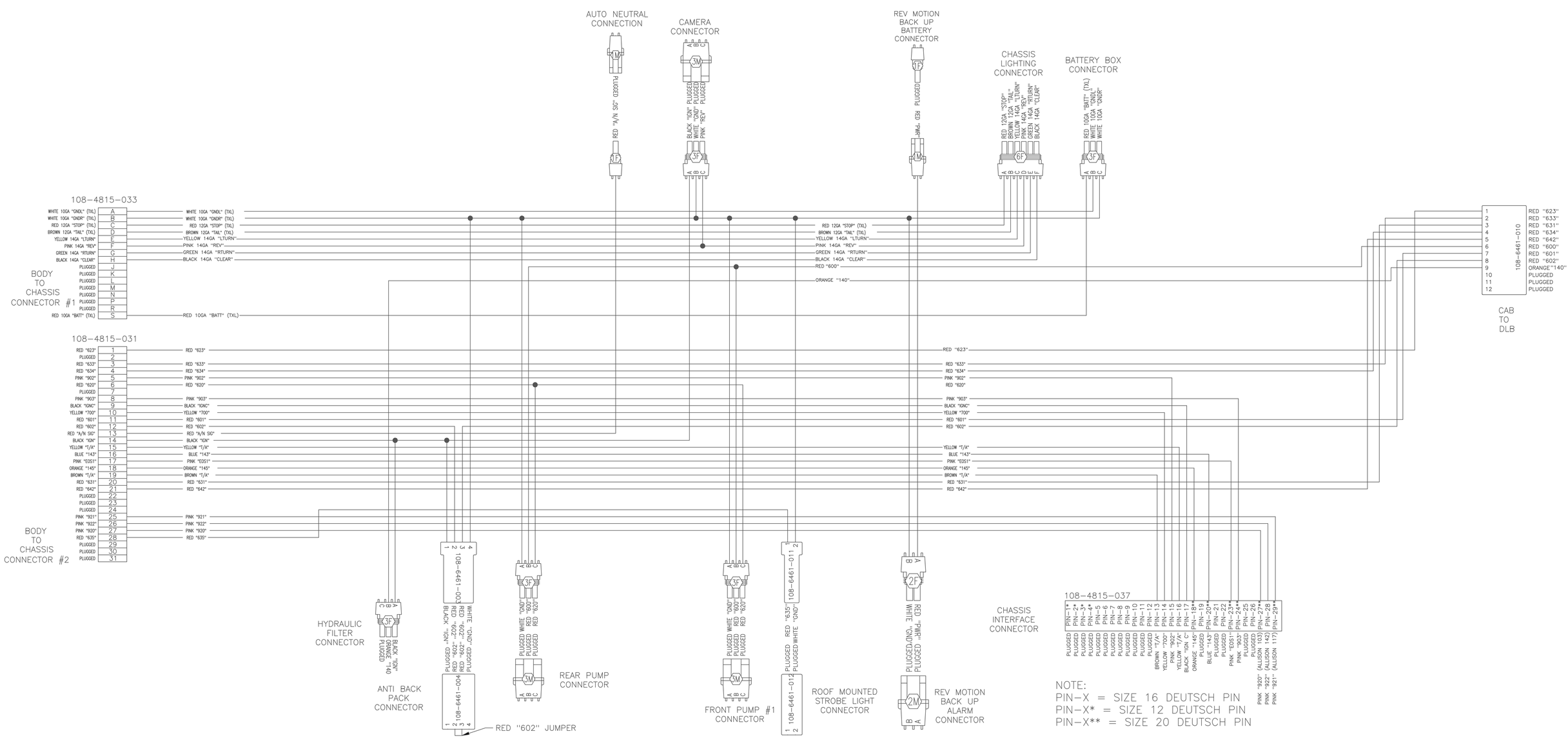
CCC Cab To Body Harness
263-1482-005
04/20/2011



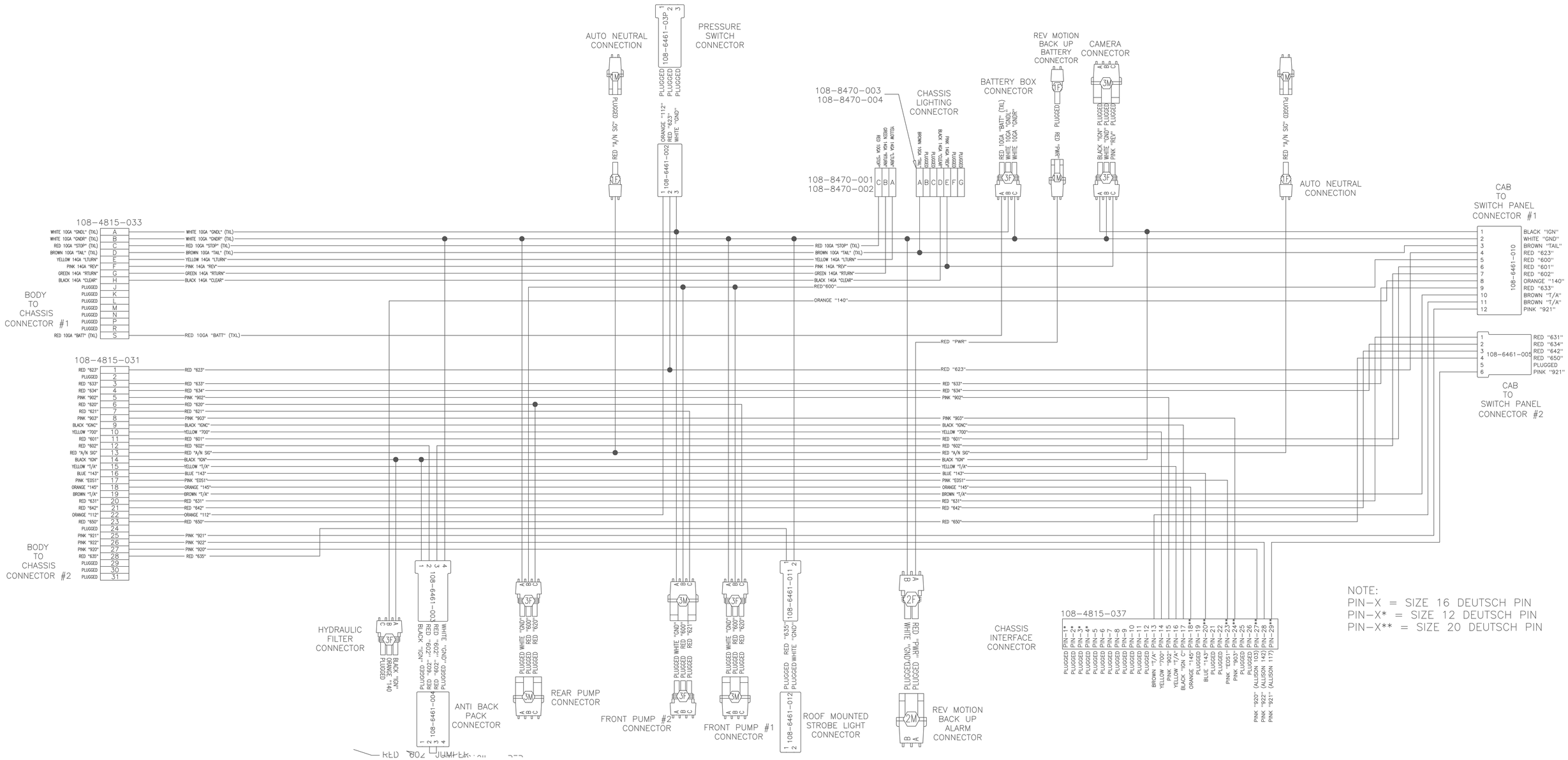
Autocar ACX Cab To Body Harness
263-1482-006
09/23/2010



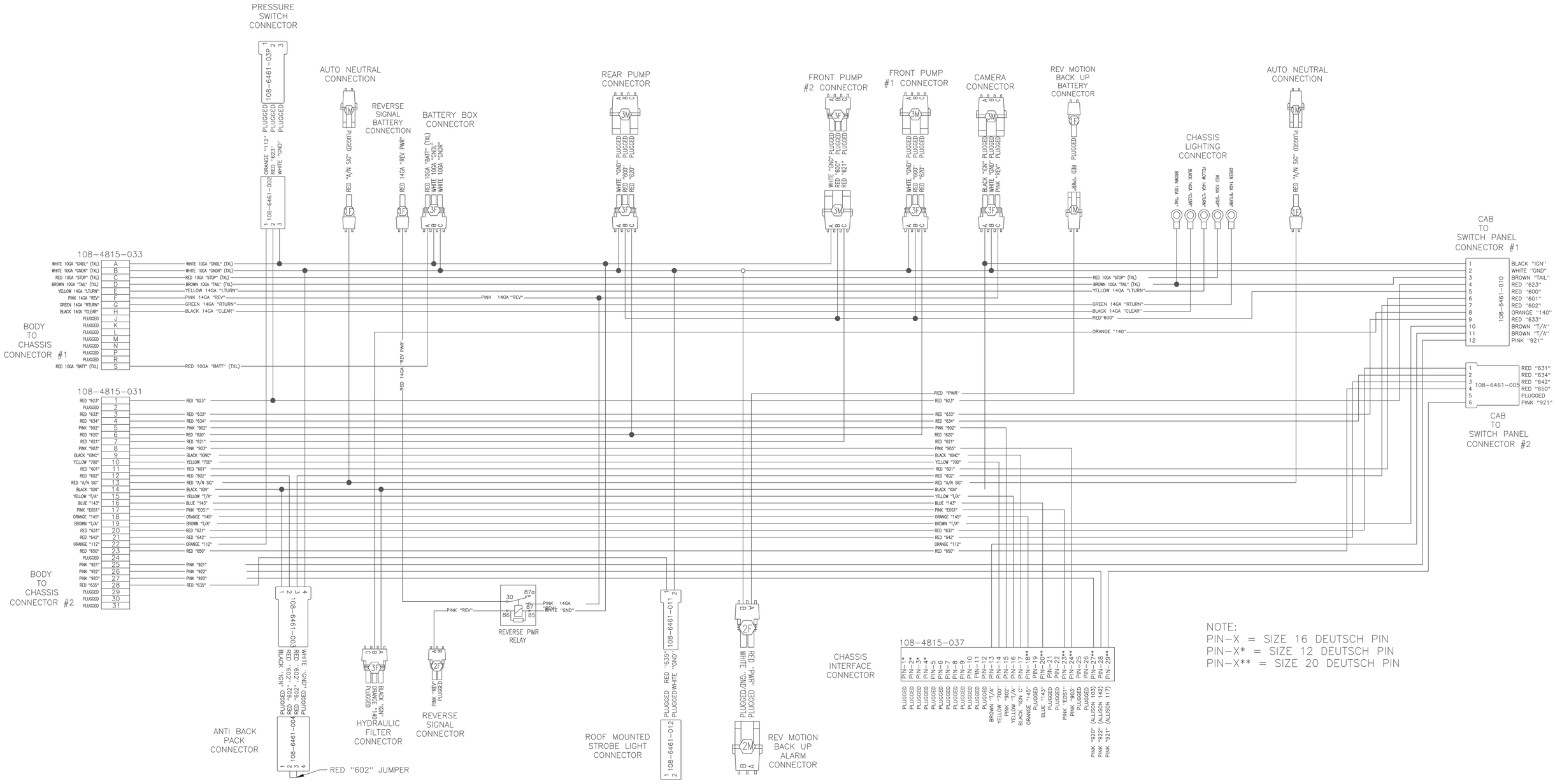
American Lafrance Cab To Body Harness
263-1482-007
08/10/2010



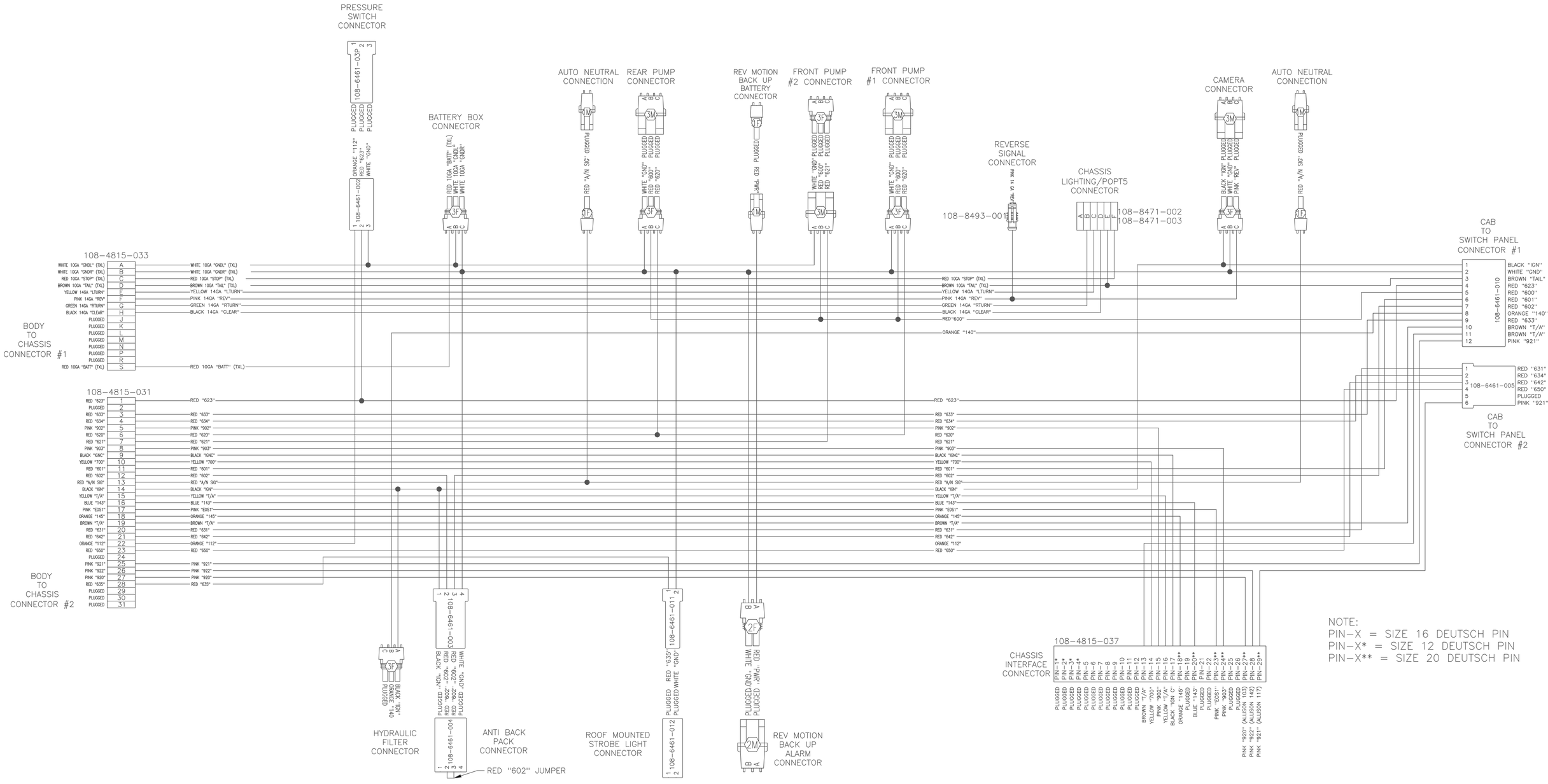
DLB International Cab To Body Harness
263-1482-008
08/10/2010



International Panel Mount Cab To Body Harness
263-1482-009
08/10/2010

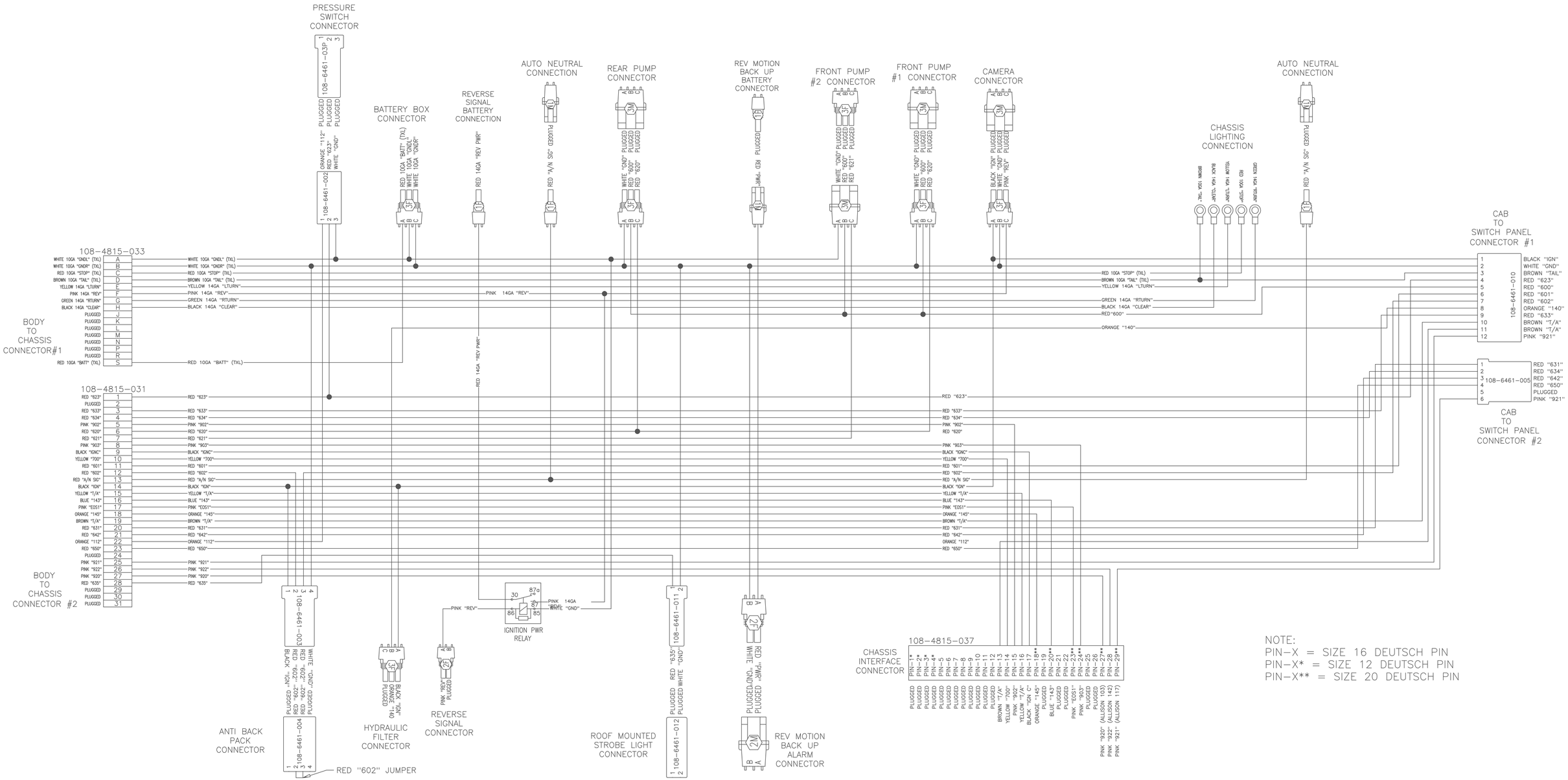


Peterbilt COE Cab To Body Harness
263-1482-011
08/10/2010

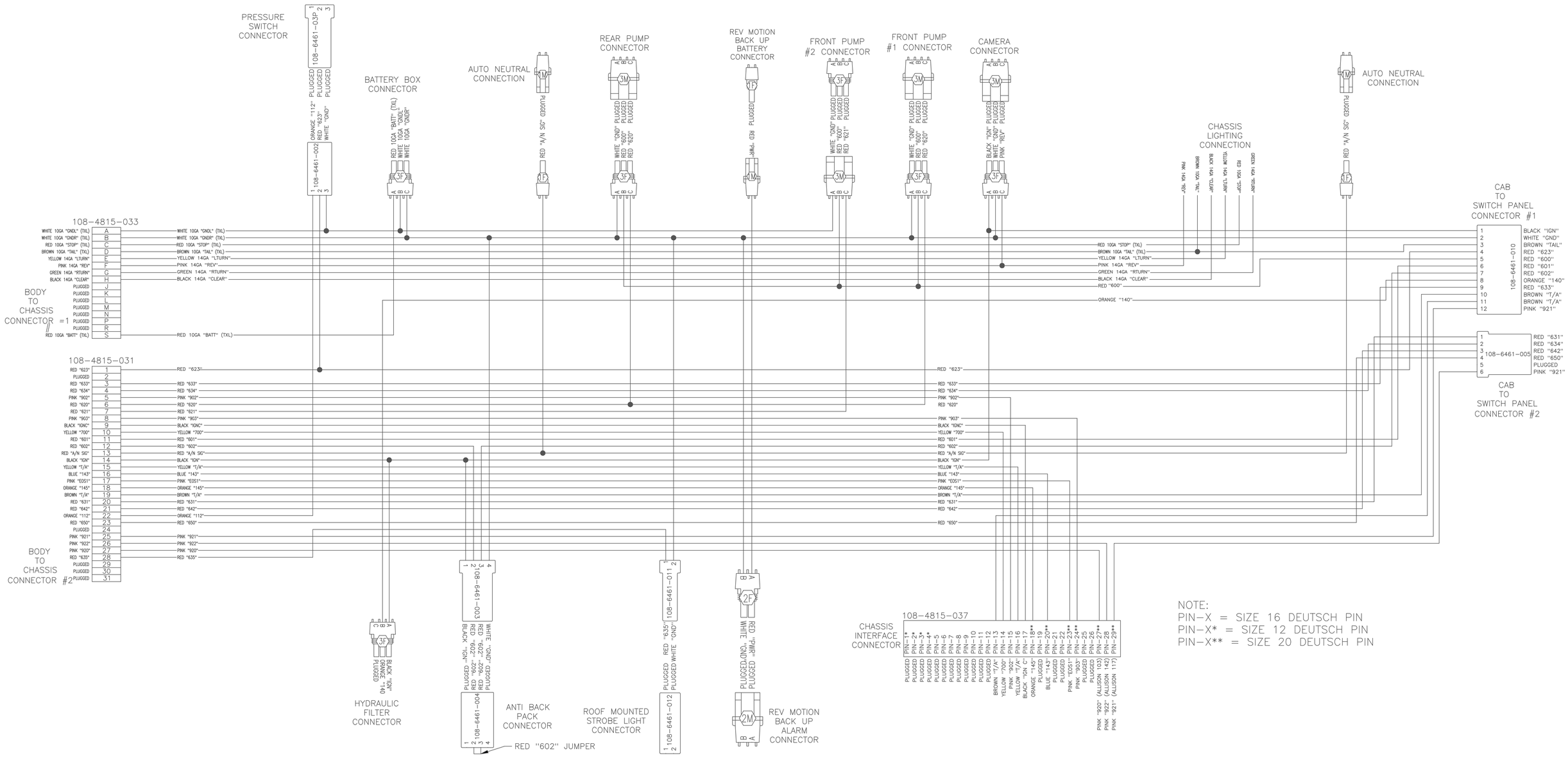


NOTE:
PIN-X = SIZE 16 DEUTSCH PIN
PIN-X* = SIZE 12 DEUTSCH PIN
PIN-X** = SIZE 20 DEUTSCH PIN

Autocar WXLL Cab TO Body Harness
263-1482-012
08/10/2010



Peterbilt Conventional Cab To Body Harness
263-1482-013
08/10/2010

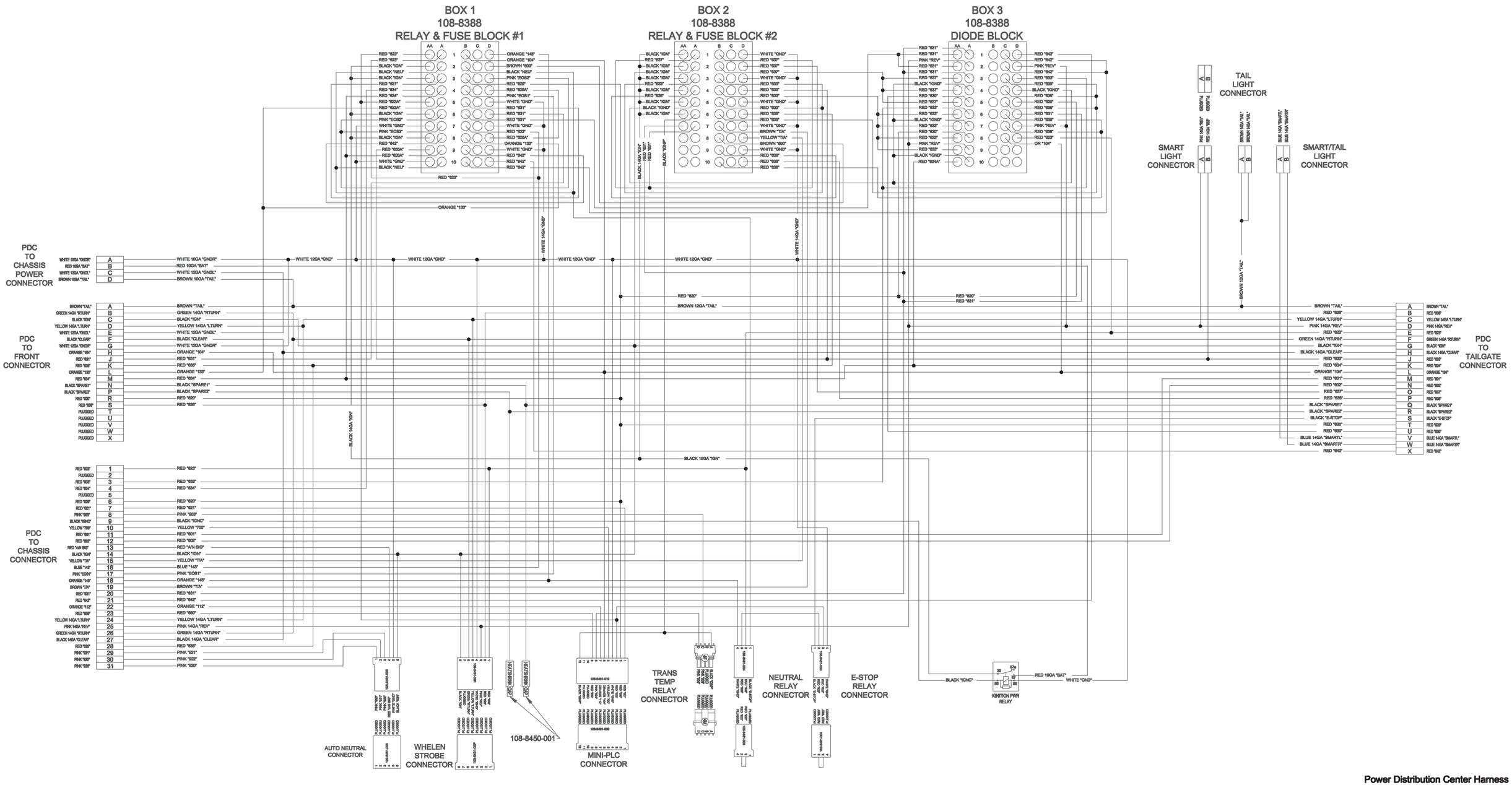


NOTE:
PIN-X = SIZE 16 DEUTSCH PIN
PIN-X* = SIZE 12 DEUTSCH PIN
PIN-X** = SIZE 20 DEUTSCH PIN

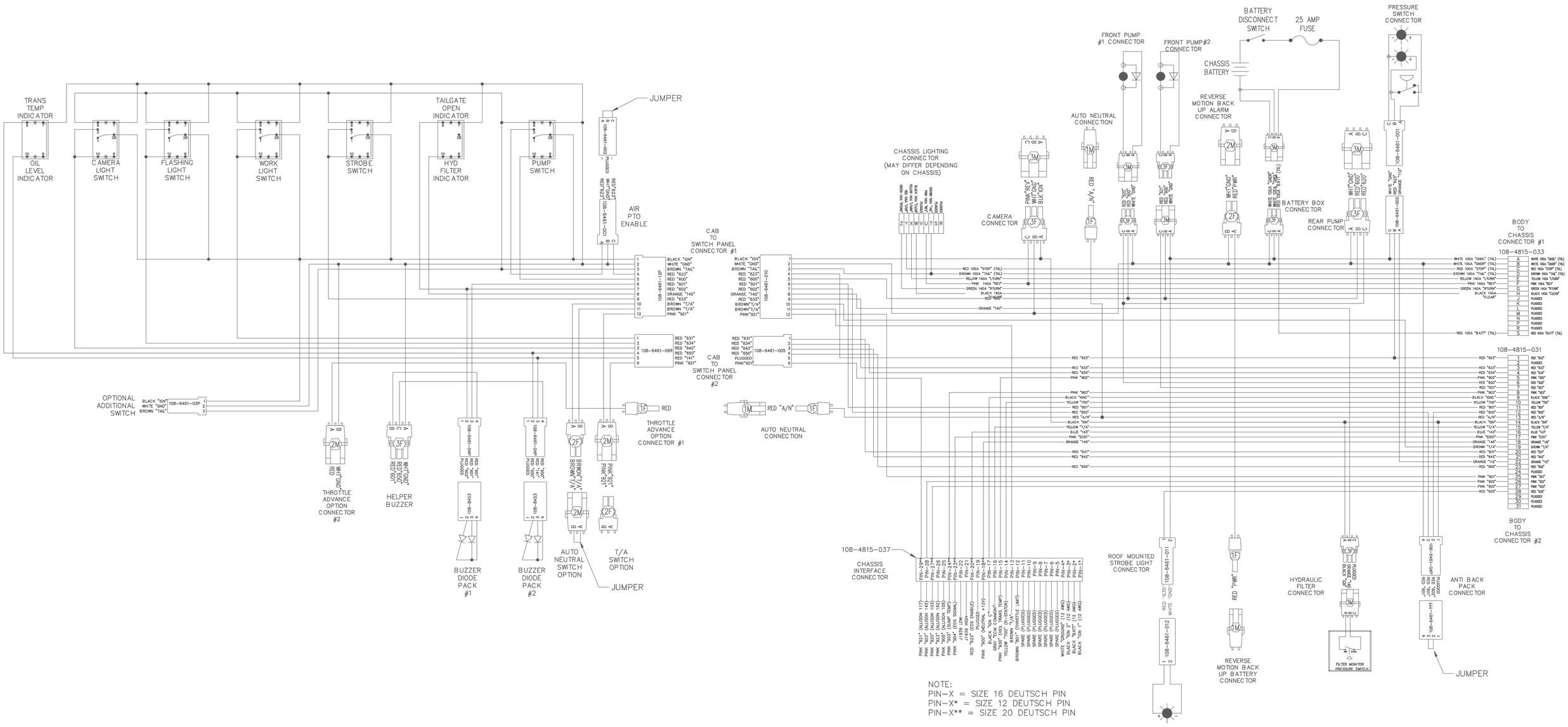
Kenworth Conventional Cab To Body Harness
263-1482-014
01/10/2010

LOWER LH MARKER LIGHT
LOWER LH SMART LIGHT SYNC
LOWER LH TURN/SMART/TAIL LIGHT
LOWER LH STOP/TAIL LIGHT
TAG LIGHT
LOWER LH REVERSE LIGHT
LOWER RH REVERSE LIGHT
LOWER RH STOP/TAIL LIGHT
LOWER RH TURN/SMART/TAIL LIGHT
LOWER RH SMART LIGHT SYNC
LOWER RH MARKER LIGHT
UPPER RH MARKER LIGHT
UPPER RH SMART SYNC
UPPER RH TURN/SMART/TAIL LIGHT
UPPER RH STOP/TAIL LIGHT
BACK UP ALARM
WHELEN STROBES CENTER
THROTTLE ADVANCE SWITCH
ID LIGHT
CAMERA LIGHT
UPPER LH STOP/TAIL LIGHT
STROBE LIGHT
108-8493-002
108-8493-101
108-8493-001
108-6752
TAILGATE POWER CONNECTOR
TAILGATE CONNECTOR
108-4815-024
THROTTLE ADVANCE SWITCH
HELPER BUZZER SWITCH
WHELEN STROBE SIDE
MUNICIPAL LIGHT
CAMERA LIGHT
HOPPER LIGHT SWITCH
HOPPER LIGHT SWITCH
THROTTLE ADVANCE SWITCH
HELPER BUZZER SWITCH
WHELEN STROBE SIDE
RH HOPPER LIGHT
LH/SINGLE HOPPER LIGHT
OUTSIDE HOPPER LIGHT
TAG LIGHT
MUNICIPAL LIGHT FLASHER
MUNICIPAL LIGHT
TAILGATE OPEN PROX
UPPER LH SMART SYNC
UPPER LH TURN/SMART/TAIL LIGHT
UPPER LH MARKER LIGHT
UPPER LH MARKER LIGHT
BACK UP ALARM RELAY

Whelen Tailgate Harness
263-1509-001
02/28/2011

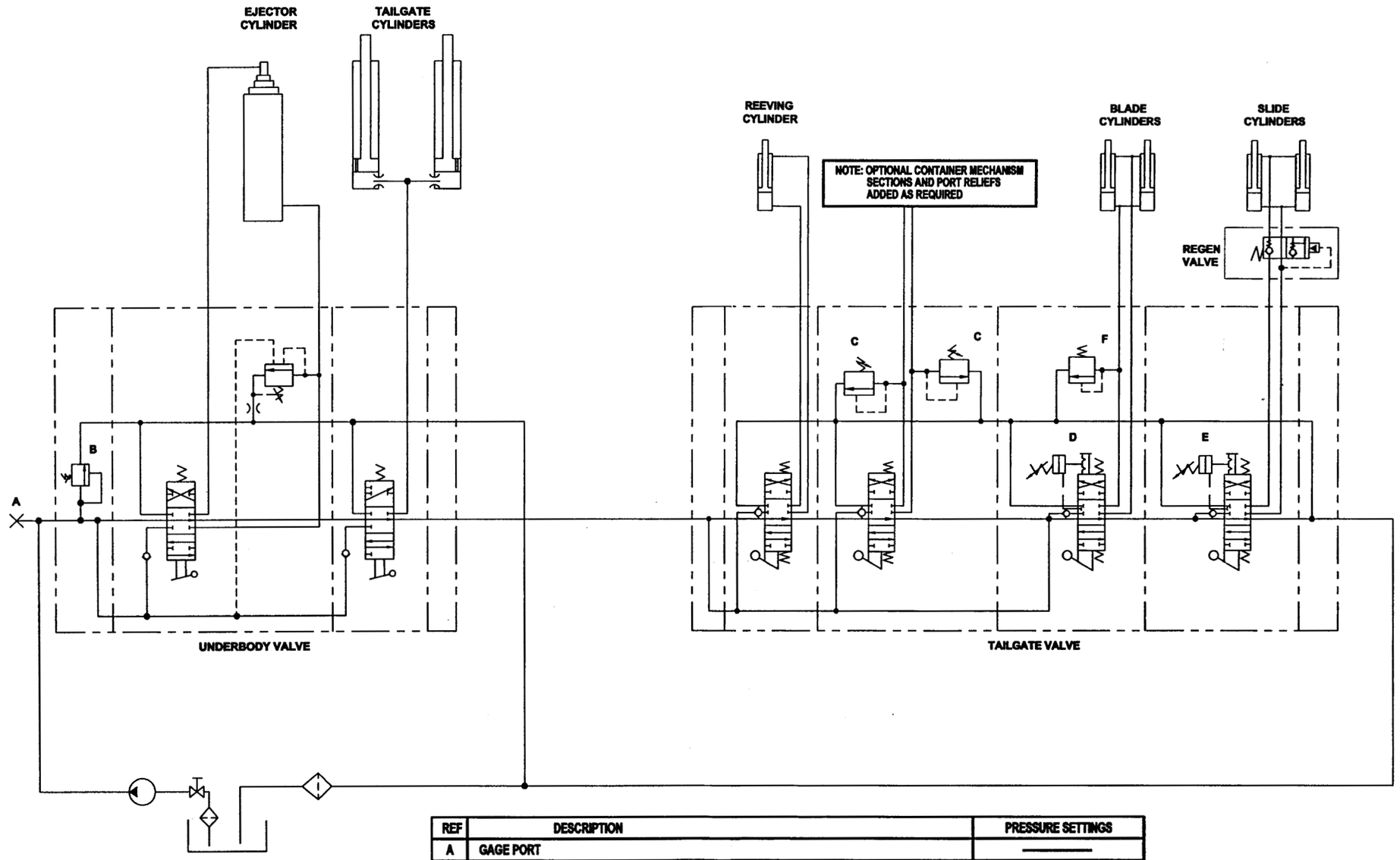


Power Distribution Center Harness
263-1469
03/25/2011



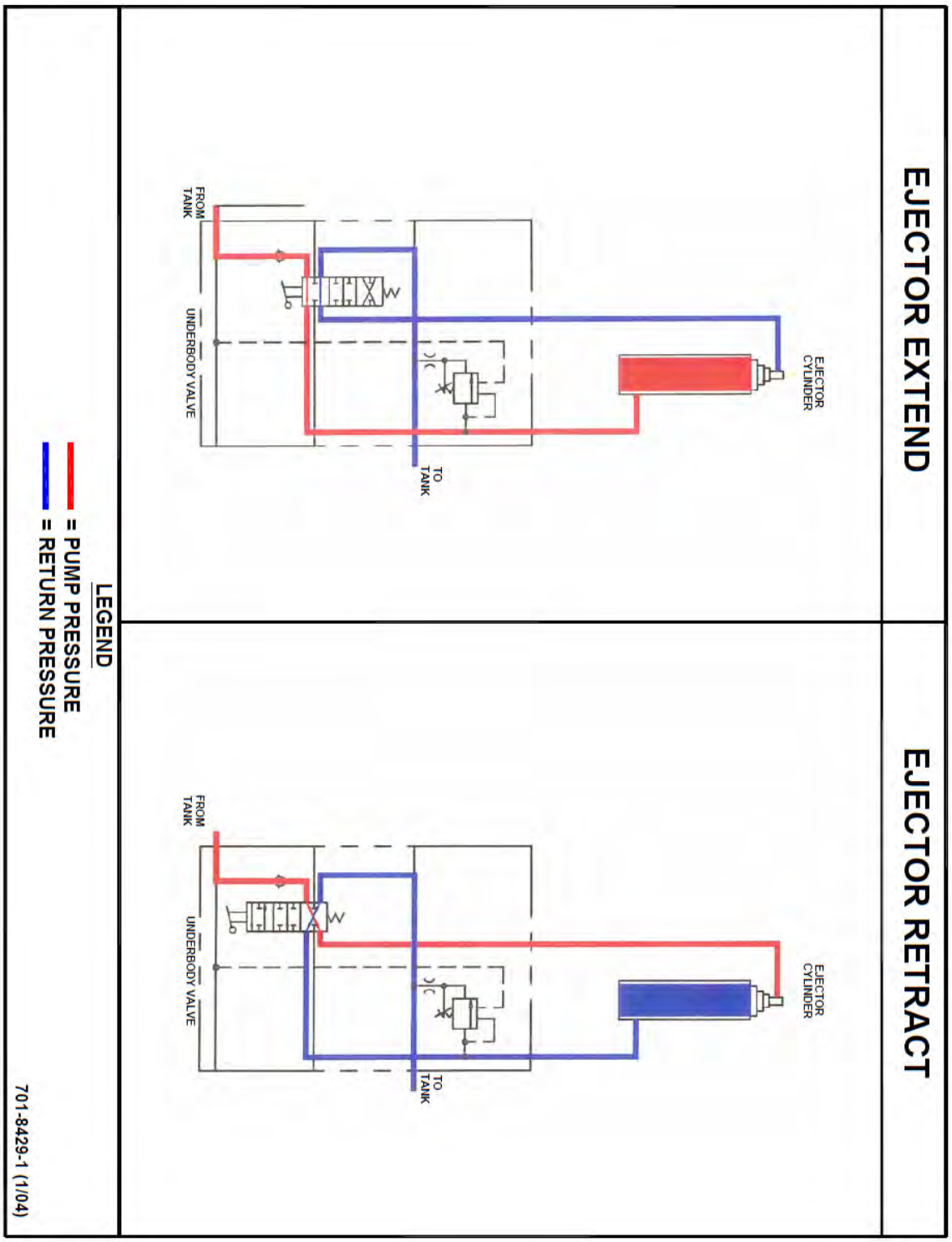
Cab to Body Schematic
701-8872-001
01/27/2012

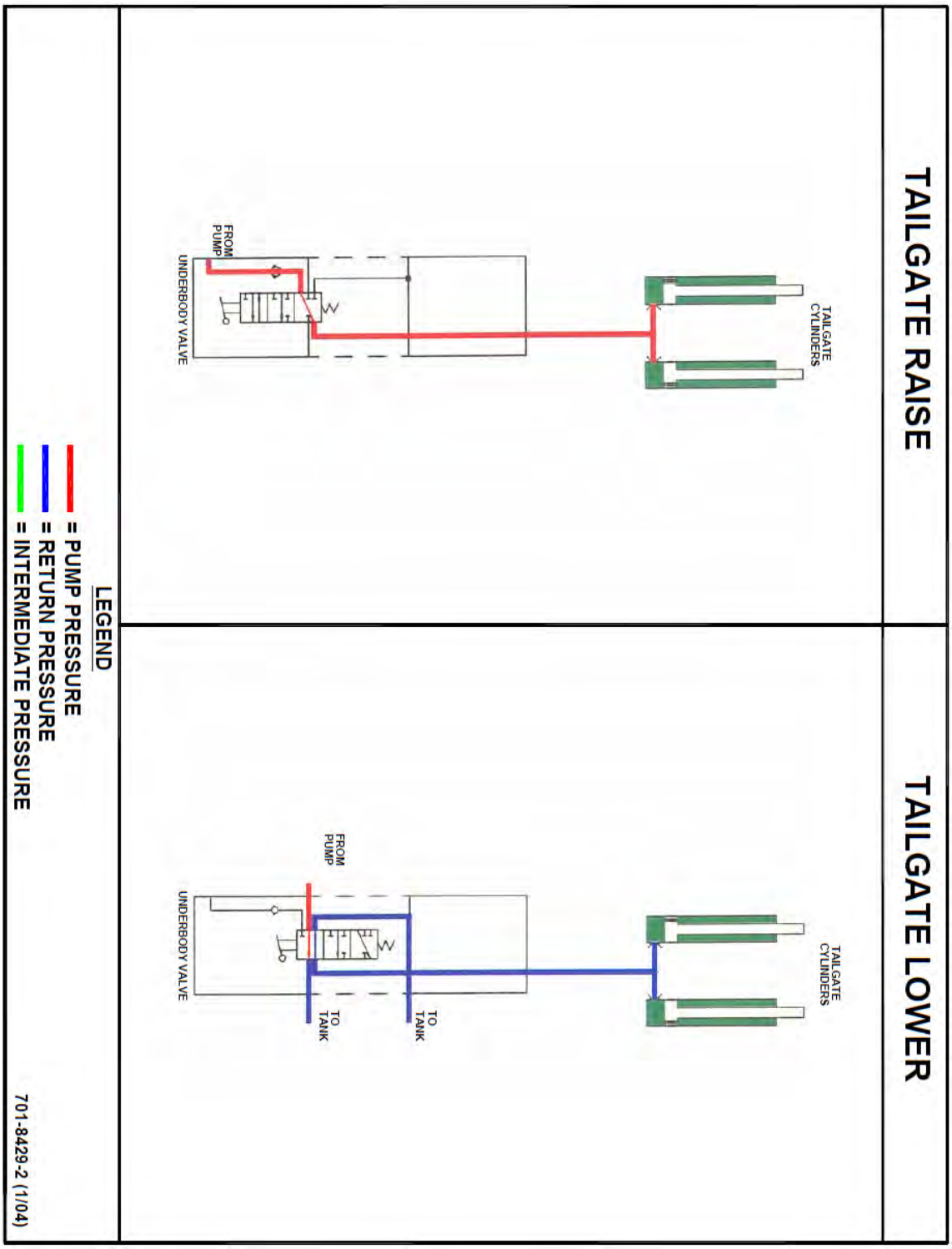
PT 1000 - HYDRAULIC SCHEMATIC



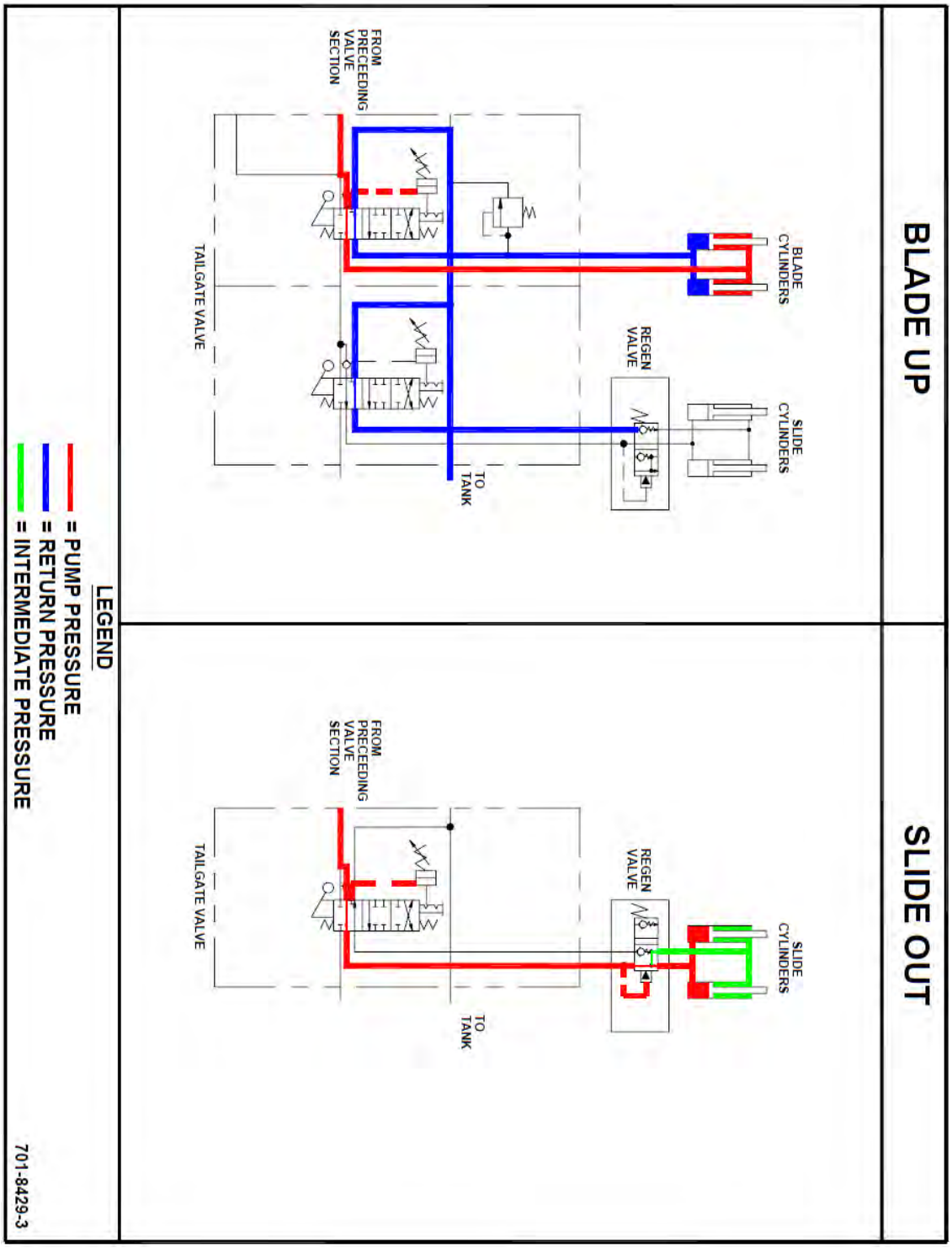
REF	DESCRIPTION	PRESSURE SETTINGS
A	GAGE PORT	———
B	MAIN RELIEF	2750 PSI
C	OPTIONAL CONTAINER MECHANISM RELIEFS	1400 PSI
D	BLADE PANEL DETENT	2500 PSI
E	SLIDE PANEL DETENT	2500 PSI
F	BLADE PANEL BACK-OFF	3900 PSI

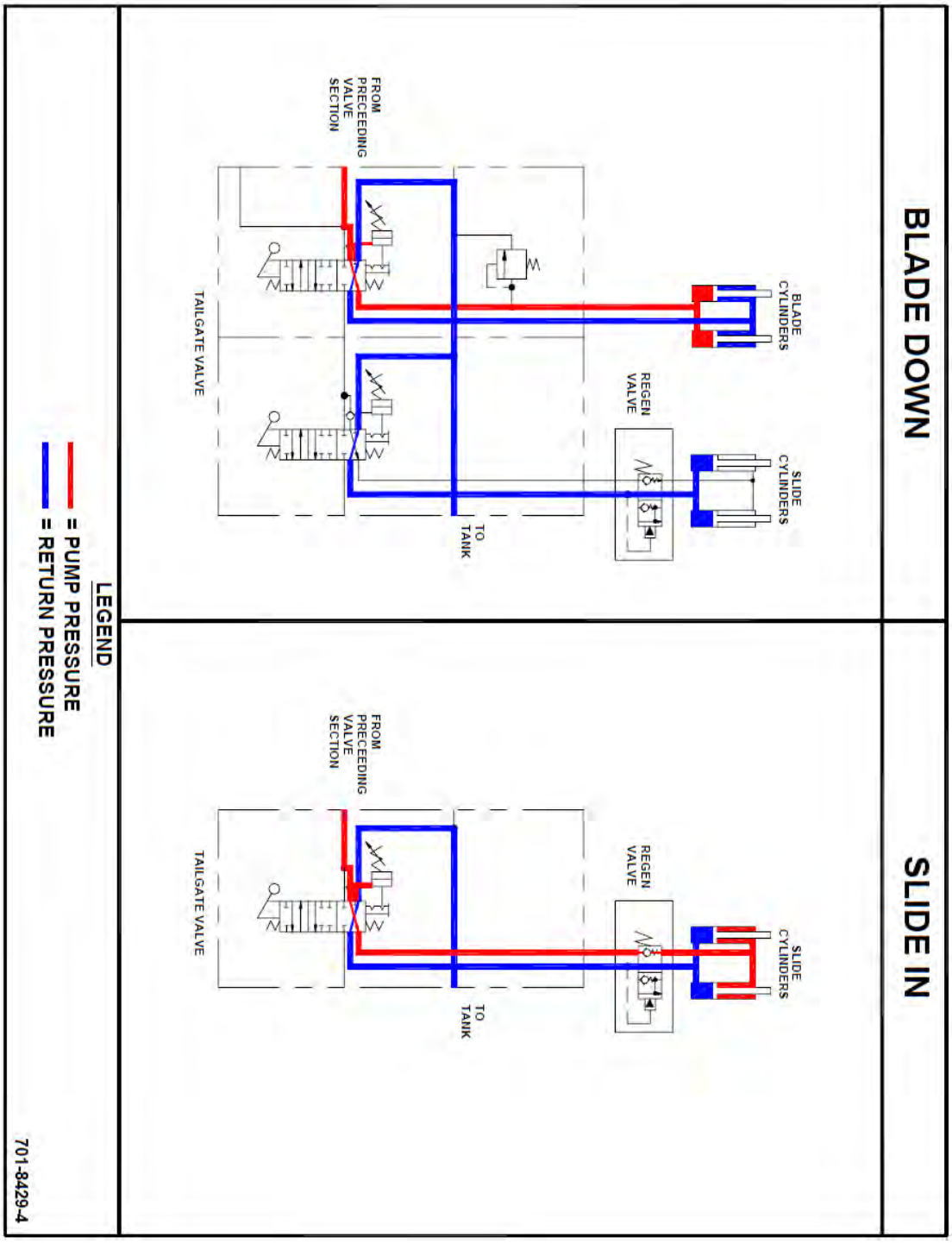
PT 1000™
Schematics



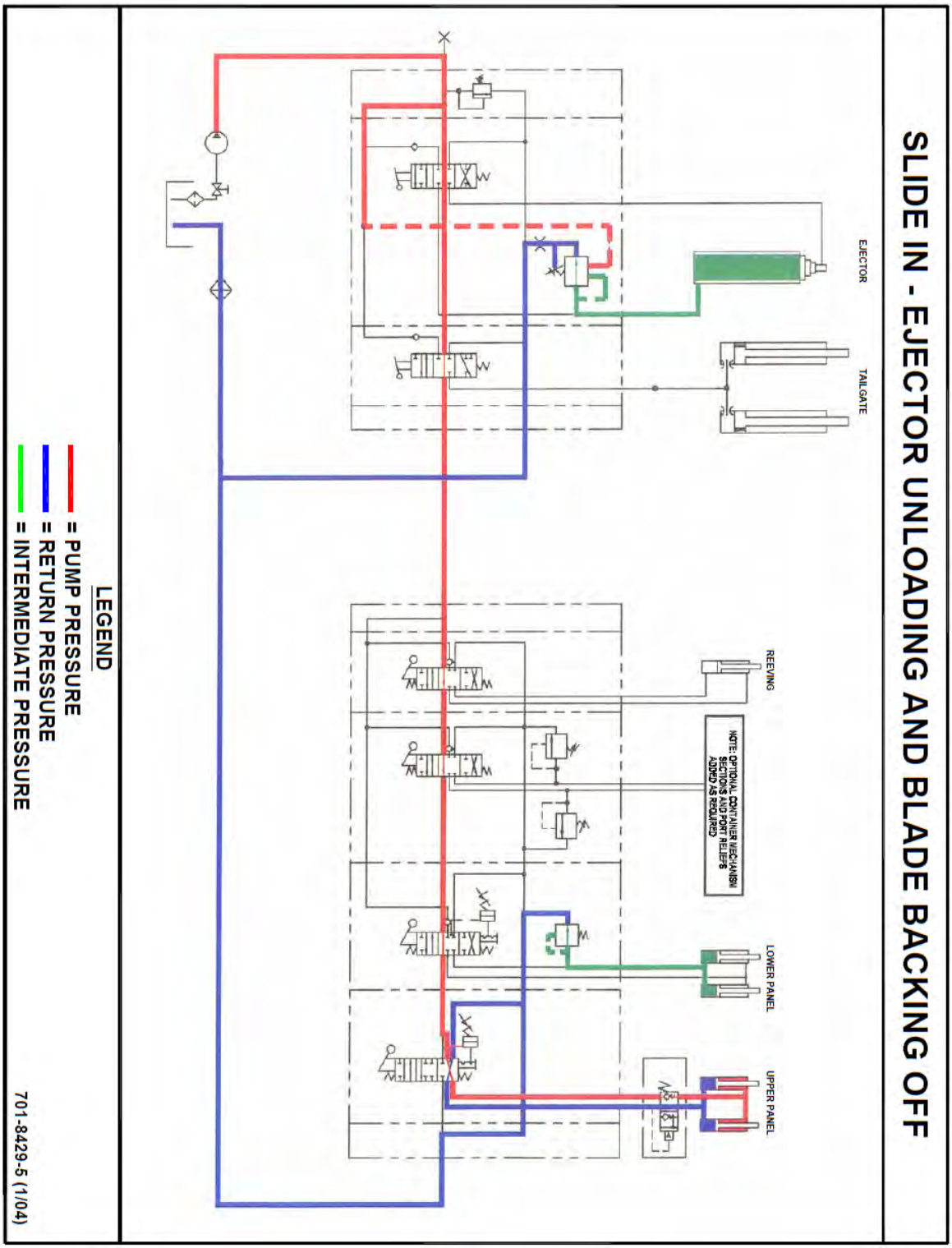


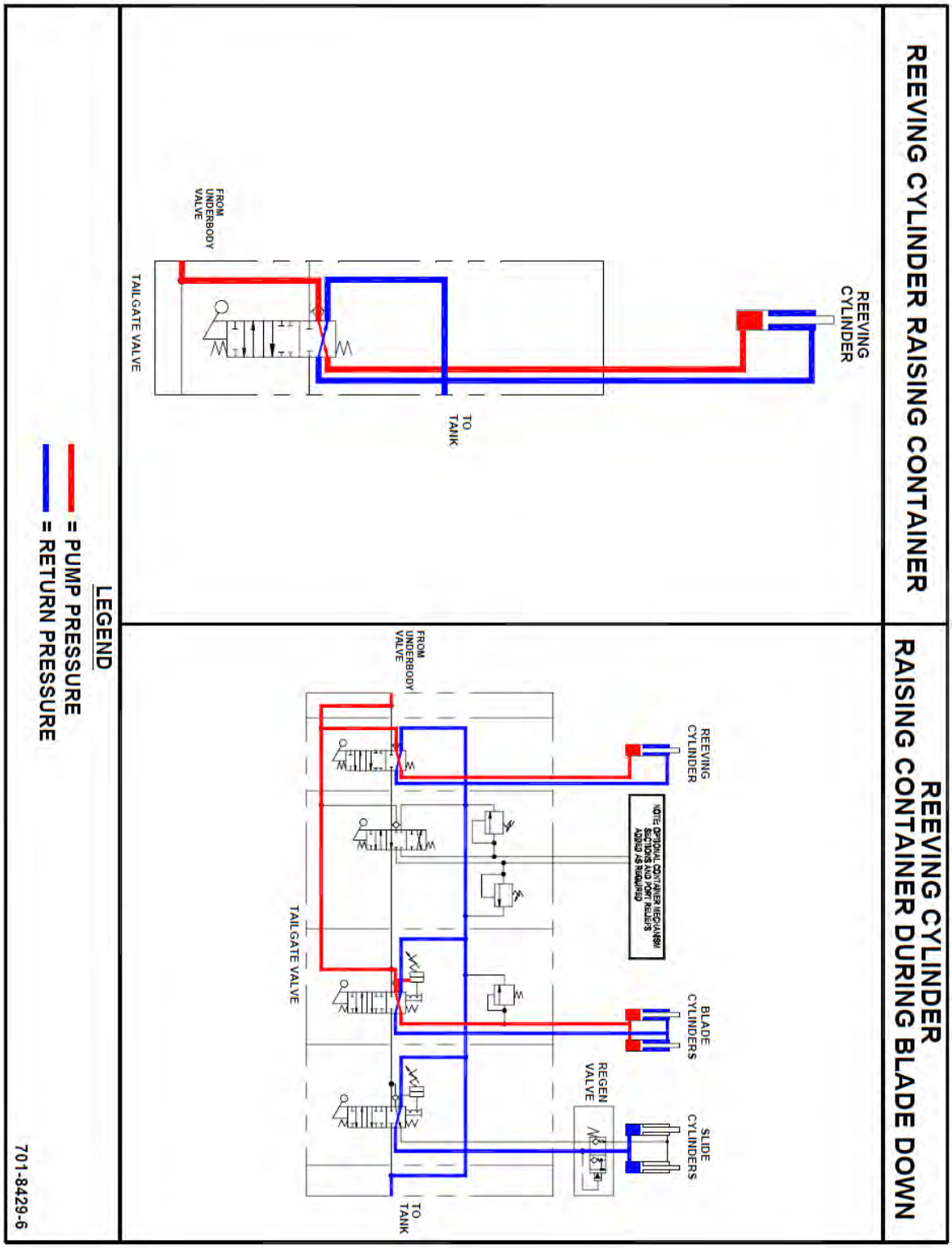
PT 1000™
Schematics



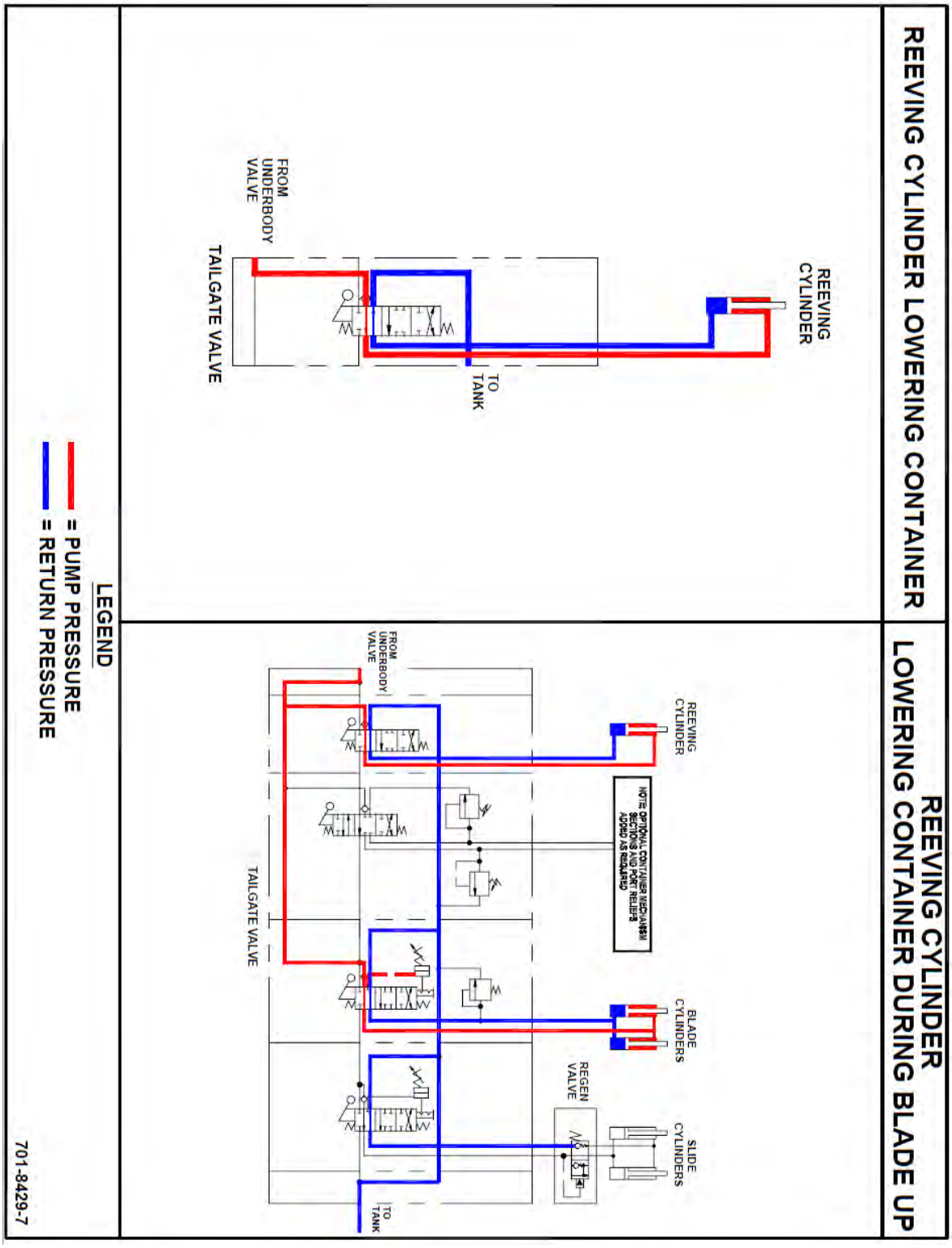


PT 1000™
Schematics





PT 1000™
Schematics



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PT 1000™
MANUAL ORDER FORM

To purchase a printed copy of the Parts Manual or complete Parts and Service Manual, fax or make a PDF copy of this form and send to your local Heil dealer.

Do you want a Parts Section ONLY? _____ Yes or No

Do you want the complete Parts and Service Manual? _____ Yes or No

The order number for the Parts Manual ONLY is:

TP1PT1-PM-0416

The order number for the complete Parts and Service Manual is:

TP1PT1-PSM-0416

UNIT SERIAL NUMBER: _____

NAME: _____

COMPANY: _____

PHYSICAL ADDRESS: _____

CITY: _____

STATE: _____ ZIP CODE: _____

CONTACT PHONE NUMBER: _____

PT 1000™
NOTES

HEIL ENVIRONMENTAL WARRANTY STATEMENT

The Heil Co. d/b/a Heil Environmental ("Heil") warrants its solid waste collection equipment to be free from defects in material and workmanship under normal use for a period of one (1) year or 2000 hours of operation (whichever comes first) from the date of equipment In-Service or during the period of coverage offered by an extended warranty program, when proper service and maintenance as described in Heil Service Bulletins and Parts & Service Manuals are performed. The standard or extended equipment warranty is not transferable except for sales demonstration units.

This warranty is expressly limited to the repair or replacement of any component or part thereof, of any such refuse or recycling collection body manufactured by Heil that is proven to Heil's satisfaction to have been defective in material or workmanship. Such components or parts shall be repaired or replaced at Heil's option without cost to the standard purchaser for parts and labor provided such unit is returned to an authorized Heil Distributor for replacement or repair. The repair or replacement must be made during the standard or extended warranty coverage period. Before any warranty can be allowed on new equipment, a validated warranty registration form must be on file with Heil's Customer Service Department within sixty (60) days of the equipment's In-Service date. Wear items are excluded from warranty coverage.

All OEM service parts sold by Heil have a six (6) month warranty from the date of purchase. Aftermarket parts purchased from Heil are supported by a 90-day warranty. The parts warranty covers parts only, providing that factory inspection reveals a defect in material or workmanship. Labor, troubleshooting, equipment downtime, etc. is not covered under the parts warranty policy.

HEIL MAKES NO OTHER WARRANTY, EXPRESSED OR IMPLIED, AND MAKES NO WARRANTY OF MERCHANTABILITY OR OF FITNESS FOR ANY PARTICULAR PURPOSE. HEIL DOES NOT ASSUME ANY LIABILITY OR ACCEPT CLAIMS FOR LOSS OF PROFITS, PRODUCT DOWN TIME OR ANY OTHER DIRECT, INCIDENTAL OR INDIRECT CONSEQUENTIAL LOSSES, COSTS, DAMAGES OR DELAYS.

Any improper use, operation beyond rated equipment or component capacity, substitution of parts that are not Heil-approved, or any alteration or repair by others in such a manner as in Heil's sole judgment affect the product operation or integrity shall void the warranty.

Other than the extension of the standard warranty period purchased under a supplemental Heil Extended Warranty Program, no employee or representative is authorized to modify this warranty in any way nor shall any other warranties be granted. No dealer-supplied warranty program is endorsed or supported by Heil.

Heil retains the right to modify its factory warranty program prospectively at any time.

Revised 1/2013

www.heil.com

Customer Care:
866-ASK-HEIL
(866-275-4345)

Heil Environmental
4301 Gault Avenue North
Fort Payne, AL 35967-9984

Parts Central:
800-528-5308

Technical Service:
866-310-4345
TechSupport@DoverESG.com