TRAINING REFERENCE GUIDE

QUICK REFERENCE

Service Training

PREVOST.

Prevost Service Training

The Information Given In This Guide Is For Reference and Training Purposes Only!

All Up To Date Service Information Can Be Found At Our Web-Site

www.prevostcar.com

Safety!

We always include hands on exercises as part of our Factory Training; please keep in mind all Prevost coaches have the ability to start from the front as well as the rear of the coach**.** When we are troubleshooting on the coaches make an extra effort to know where everyone's hands are.

It is always a good practice to have the rear run switch in the off position when the engine compartment is open.

Quick Reference Service Information

*To be completed At 3,000 To 5,000 miles 4830 to 8050 Kilometers

Detroit Diesel Series 60

1994 to 2006 Detroit Diesel engine oil and filter change recommendation is 12,000 to15, 000 miles.
DDC does not require break-in service

EPA 2007 Detroit Diesel engine oil and filter change recommendation is 31,250 to 35K miles.
DDC does not require break-in service

Non EGR *SAE 15W40 CH-4

EGR Engine *SAE 15W40 CI-4

US 07 EGR Engine * SAE 15W40 CJ4

All oils are backwards compatible when using ULSD at 15 parts per million.

Cooling System Maintenance;

Service Coolant strainer located in the evaporator compartment, this strainer is designed to catch any debris before it gets to the water valve. With the addition of the new air operated water valve the strainer is no longer needed.
Engine coolant is comprised of Anti-Freeze / water 50/50 mix & supplemental coolant additives.

Non EGR Engines;

Anti-Freeze must meet Detroit Diesel specifications GM-6038M, ASTM D-4985, or RP-329.
These are low silicate, Diesel formulations and Are the correct Anti-Freeze to use. Other specification Anti-freeze are not to be used; They can damage the cooling system components.

EGR Engines; See Mi 04-06

Anti-Freeze must meet Detroit Diesel specifications
Must use a phosphorous & nitrate free coolant in order to meet DDC specification 7SE298 or TMC RP-329 Type A Formulation. Former coolant was GREEN new engine coolant is FUCHSIA (purplish red) in color. Do not mix the two refer to Section 05 of your Maintenance Manual for flushing the cooling system.
Supplemental coolant additives are chemicals which prevent corrosion, scale, and cavitation in the cooling systems. These are often referred to as Nalcool, test strips or liquid chemical test systems are available to test the strength of supplemental coolant additives in the system
These are depleted over time and should be checked every with every service and adjusted as needed

Volvo D13 Engine;

At 31,250 miles first oil change
Volvo approved filters & oil required for 31,250 mile change interval.
SAE 15W40 CJ4

Coolant for Volvo D13;

Volvo 20358716 50/50 / Texaco CPS 227998 50/50, CAN * / Chevron CPS 227805 50/50, USA *
Texaco CPS 227997 100%

Differential Oil Change;

Replace oil with lubricant of correct spec and viscosity for your climate and duty cycle. Approved Drive Axle Lubricants See Meritor (TP-9539)

Quick Reference Service Information

***To be completed at 3,000 To 5,000 miles 4830 to 8050 Kilometers**

*Windshield Wipers;

Coaches that are equipped with BOSCH wipers, it is recommended to remove and re-torque wiper arm to 22Ft. Lbs.

US07 90 Degree fan Drive:

Synthetic Gear Lubricant SAE 75W-90 Every 50,000

ZF AS-Tronic Transmission;

Prior to EPA07 every 2 years or 185,000 miles Castrol Syntrans SAE 75W85
After EPA07 every 3 years or 300,000 miles ZF-ECOLITE fluid.

Volvo I-Shift Transmission;

For normal usage, change the transmission oil every 800 000 km (500,000 miles) or every 5 years, whichever comes first.
For severe usage, change the transmission oil every 400 000 km (250,000 miles) or 3 years, whichever comes first.

Castrol Syntrans SAE 75W-85 oil, VOLVO Part No. 85121104
ExxonMobil 97307 spec synthetic oil is approved for use

Allison World Transmission;

Since January 2002 all Allison Transmissions are factory filled with Castrol TranSynd.
Therefore it is no longer required to do any break in service.
For fluid filter change interval recommendations and the latest approved fluids refer to;
www.allisontransmission.com
Fluids; http://www.allisontransmission.com/service/autoapp/172/viewpage.jsp?ThisPage=3

• TES 295 Approval Number	Approved Marketer	Product Brandname
AN-011001	Castrol Heavy Duty Lubricants	TranSynd
AN-031002	BP Lubricants	Autran Syn 295
AN-031003	Cognis Corporation	Emgard 2805
AN-031004	International Truck & Engine Company	Fleetrite Synthetic ATF
AN-051005	ExxonMobil Lubricants and Petroleum Specialties Company	Mobil Delvac Synthetic ATF
AN-071006	John Deere & Company	HD SynTran
AN-1010007	Volvo Trucks North America	Bulldog Synthetic ATF

Fluid and filter change intervals can be located at;
http://www.allisontransmission.com/service/changeinterval/

Important note; recommendations are based on using Allison High Capacity Filters.

Fluid and Filter Change Interval Calculator

Step 1, pick transmission type B500

STEP 2 — Answer these questions about your vehicle.

Is the prognostic feature enabled for your transmission? Consult your Operator's Manual for how to determine if Prognostics is turned on.	○ Yes ◉ No or Not Sure
What model year is your TCM calibration?	◉ Prior to 2009 ○ 2009 ○ 2010 or Later
Is the transmission equipped with an output retarder, or is it used in an application with a duty cycle greater than one (1) stop per mile?	○ Yes ◉ No
What type of fluid does the transmission currently contain? *	○ 100% Allison Approved TES 295 fluid (no mixture) ○ 100% Allison Approved TES 389 fluid or mixture of Allison Approved TES 389/TES 295 fluid ◉ Other

START OVER NEXT

For the model you requested	
Transmission	**B 500**
Fluid Type	**100% Allison Approved TES 295 fluid.**
Vocation	**General**
Allison Transmission requires the following change intervals (only valid when using an Allison High-Capacity Filter)	
Transmission Fluid	**300,000 miles (480 000 km) 48 months 6,000 hours**, whichever comes first.
Main Filter	**75,000 miles (120 000 km) 36 months 3,000 hours**, whichever comes first.
Internal Filter Screen	**Overhaul**
Lube/Auxiliary Filter	**75,000 miles (120 000 km) 36 months 3,000 hours**, whichever comes first.

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NOTES

NOTE:

Extended filter change intervals are only valid with the use of Allison Transmission high-capacity filters. For specific Allison Part Numbers, refer to Service Tip #1099.

Local conditions, severity of operation or duty cycle may require more or less frequent fluid change intervals that differ from the published recommended fluid change intervals of Allison Transmission.

Change fluid/filters after recommended mileage, months elapsed, or hours in operation, whichever occurs first.

Transmission protection and fluid change intervals can be optimized by the use of fluid analysis. **Filters must be changed at or before recommended intervals.**

Generation 4 Allison Transmissions with Prognostics; fluid and filter changes are performed every 60 months or when indicated by the TCM

For the model you requested	
Transmission	**B 500 with Prognostics enabled**
Model Year of TCM/Calibration	**2010 or Later**
Fluid Type	**100% Allison Approved TES 295 fluid.**
Vocation	**General**
Allison Transmission requires the following change intervals	
Transmission Fluid	**When indicated by controller** or **60 months**, whichever comes first.
Main Filter	**When indicated by controller** or **60 months**, whichever comes first.
Internal Filter Screen	**Overhaul**
Lube/Auxiliary Filter	**When indicated by controller** or **60 months**, whichever comes first.

BACK START OVER PRINT THIS PAGE

NOTES

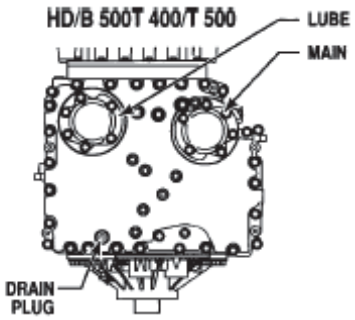
NOTE:

Extended filter change intervals are only valid with the use of Allison Transmission high-capacity filters. For specific Allison Part Numbers, refer to Service Tip #1099.

Local conditions, severity of operation or duty cycle may require more or less frequent fluid change intervals that differ from the published recommended fluid change intervals of Allison Transmission.

Change fluid/filters after recommended mileage, months elapsed, or hours in operation, whichever occurs first.

Transmission protection and fluid change intervals can be optimized by the use of fluid analysis. **Filters must be changed at or before recommended intervals.**



When Changing From Dexron III To TranSynd Please Install;
(TranSynd Only Decal) PREVOST PART # 071249

Lubricant Specifications;

Please note the above information is subject to change. Refer to your Prevost Car Operator's and Maintenance manual for up to date information concerning oil specifications and required maintenance.

FLUIDS & LUBRICANTS		
REF	**DESCRIPTION**	**SPECIFICATIONS**
A	Engine Oil	VOLVO D13 SAE Viscosity Grade: 10W-30 API Classification CJ-4 meeting Volvo specification **VDS-4**
B	Power Steering Oil	Automatic Transmission Oil, Dexron-III
C	Engine Coolant	VOLVO D13 Texaco or Chevron Extended Life Coolant (ELC) 50% antifreeze/water solution is normally used
D	A/C Compressor Oil	Central HVAC system: Polyolester oil, HFC 134a compatible; Castrol SW-68 (POE) or equivalent Small HVAC system: PAG oil
E	Differential Oil	Multigrade gear oil meeting MIL-L-2105-D: 85W140. If temperature drops below 10°F (-12°C), 80W90 should be used. Below -15°F (-26°C), 75W90 should be used. (In extreme conditions or for better performance, full synthetic gear oil can be used)
F	Differential Oil (Full Synthetic)	Multigrade gear oil meeting MIL-L-2105-D: 85W140. If temperature drops below 10°F (-12°C), 80W90 should be used. Below -15°F (-26°C), 75W90 should be used.
G	Cooling Fan Gearbox Oil	Synthetic gear lubricant 75W-90
H	Allison Automatic Transmission Oil	Castrol TranSynd™ Synthetic Transmission Fluid for Allison or TES 295 approved equivalent
I	Allison Automatic Transmission Oil	Dexron-VI® or approved equivalent 1 Schedule 1 TES-389 fluids;
J	Volvo I-Shift Transmission	Castrol Syntrans Grade SAE 75W-85 synthetic oil
K	Multi Purpose Grease	Good quality lithium-base grease: NLGI No.2 Grade is suitable for most temperatures NLGI No.1 Grade is suitable for extremely low temperatures
L	Multi Purpose Grease	Molykote longterm 2/78 grease

Section 24 Lubrication Schedule

Odometer reading [1] (miles / km)
For higher odometer readings, repeat at the frequency interval established

LUBRICATION AND SERVICING SCHEDULE	Item	Months	6 250 / 10 000	12 500 / 20 000	18 750 / 30 000	25 000 / 40 000	31 250 / 50 000	37 500 / 60 000	43 750 / 70 000	50 000 / 80 000	56 250 / 90 000	62 500 / 100 000	68 750 / 110 000	75 000 / 120 000	81 250 / 130 000	87 500 / 140 000	93 750 / 150 000	100 000 / 160 000	106 250 / 170 000	112 500 / 180 000	118 750 / 190 000	125 000 / 200 000	131 250 / 210 000	137 500 / 220 000	143 750 / 230 000	150 000 / 240 000	185 000 / 300 000	200 000 / 320 000	225 000 / 360 000	250 000 / 400 000	275 000 / 440 000	300 000 / 500 000	500 000 / 800 000	600 000 / 960 000	LUBRICANT /FLUID [2]
			proceed to maintenance operation at																								each							
GENERAL																																			
Flexible hoses, thoroughly inspect all hoses	-	12								•								•								•									
01 ENGINE																																			
Air cleaner, inspect and clean	30			•		•		•		•		•		•		•		•		•		•		•									
Air cleaner, replace element according to restriction indicator	30	24																																	
Air pre-cleaner, check discharge tube	-	6	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•									
Engine oil and filter, change (normal[3] operation condition) **Volvo recommends 35,000miles/55,000km**	24						•					•					•					•													A
Engine oil and filter, change (heavy[3] operation condition)	24					•				•				•				•				•				•									A
Valves and injectors, initial adjust	-	12																				•													
Valves and injectors, check and adjust	-	24																												•					
Drive belts, check	-	36																														•			
03 FUEL																																			
Primary & secondary fuel filters, change at every engine oil change **Volvo recommends 35,000miles/55,000km**	21 22						•					•					•					•													
Preheater fuel filter , replace	50									•								•								•									
04 EXHAUST AND AFTERTREATMENT SYSTEM																																			
Aftertreatment fuel injector, clean at 4500 hours or as per mileage	-																									•									
DPF filter, clean at 4500 hours or as per mileage	-																													•					
DEF tank, drain and clean with water, clean filler neck strainer	32	12																								•									
DEF pump, replace filter element	32	36																								•									
05 COOLING																																			
Cooling fan gearbox, check oil level and add if necessary	25	6		•		•		•		•		•		•		•		•		•		•		•		•									G
Cooling fan gearbox, change oil	25	12								•								•								•									G
Coolant surge tank, test coolant solution	27	12		•		•		•		•		•		•		•		•		•		•		•		•									
Coolant filter, change (with Extended Life Coolant)	28	12																								•									
Cooling system, drain, flush & refill (with Extended Life Coolant) (may require "extender")	27	48																																•	C
06 ELECTRICAL																																			
Battery terminals, clean and coat terminals	-	12																																	

[1] Proceed to maintenance operation at distance indicated on odometer or specified number of month, whichever comes first.
[2] See paragraph 2.2 of this section for lubricant specifications.
[3] Normal=fuel consumption more than 6 MPG (less than 39 L/100km) ; Heavy= fuel consumption between 4.7 MPG and 6 MPG (between 39 L/100km and 50 L/100km)

PA1578 SECTION 24 REVISED OCTOBER 2011

TABLE A

Notes;____

Section 24 Lubrication Schedule

LUBRICATION AND SERVICING SCHEDULE	Item	Months	Odometer reading [1] (miles / km) For higher odometer readings, repeat at the frequency interval established																																LUBRICANT /FLUID [2]
			6 250 / 10 000	12 500 / 20 000	18 750 / 30 000	25 000 / 40 000	31 250 / 50 000	37 500 / 60 000	43 750 / 70 000	50 000 / 80 000	56 250 / 90 000	62 500 / 100 000	68 750 / 110 000	75 000 / 120 000	81 250 / 130 000	87 500 / 140 000	93 750 / 150 000	100 000 / 160 000	106 250 / 170 000	112 500 / 180 000	118 750 / 190 000	125 000 / 200 000	131 250 / 210 000	137 500 / 220 000	143 750 / 230 000	150 000 / 240 000	185 000 / 300 000	200 000 / 320 000	225 000 / 360 000	250 000 / 400 000	275 000 / 440 000	300 000 / 500 000	500 000 / 800 000	600 000 / 960 000	
			proceed to maintenance operation at																								each								
Bosch HD10 alternator brushes, check and replace if necessary (commuter application)	-	-								•								•								•									
Bosch HD10 alternator brushes, check and replace if necessary (for applications other than commuter)	-	-																•																	
07 TRANSMISSION [4]																																			
Allison transmission filled with non-TranSynd or non-TES 295 fluid – Refer to TABLE 1 in Section 07: Transmission for fluid and filter change	20																																		I
Allison transmission filled with TranSynd or TES295 synthetic fluid only, no mixture[5], with **Prognostics mode disabled** – Refer to TABLE 2 in Section 07: Transmission for fluid and filter change	20																																		H
Allison transmission filled with TranSynd or TES295 synthetic fluid only, no mixture with **Prognostics mode enabled** [5, 6] – Change fluid & filters when indicated by TRANSMISSION SERVICE indicator or 60 month (five years) whichever occurs first. In addition, change filters with every fluid change.	20	60																																	H
Transmission oil cooler, replace unit if vehicle is equipped with transmission retarder	-	24																																	
Volvo I-Shift Transmission **(extended oil drain)**, change fluid & filter if filled with Castrol Syntrans SAE 75W85	20	60																															•		J
Volvo I-Shift Transmission, change fluid & filter when not using Castrol Syntrans SAE 75W85	20	36																												•					J
09 PROPELLER SHAFT																																			
Universal joint and slip joint, grease fittings	18	6	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•									K
10 FRONT AXLE																																			
Hub unit and swivel assembly, Maintenance Manual sec.10 See GKN AXLE LTD Service Manual paragraph 1-Lubrication	8	12								•								•								•									

[4] Allison Transmission recommends that customers use fluid analysis as the primary method for determining fluid change intervals. In the absence of a fluid analysis program, the fluid change interval listed in the charts above and below should be used. Change filters according to the charts above and below even is a fluid analysis shows that the fluid doesn't need to be changed.

[5] When the transmission contains a mixture of fluids (defined as the quantity of non-TranSynd/ non-TES 295 fluid remaining in the transmission after a fluid change combined with the quantity of TranSynd™ required to fill the transmission to the proper level), perform the fluid and filter change according to the non-TranSynd™/non-TES 295 intervals.

[6] Extended TranSynd™/TES 295 fluid and filter change intervals are only allowed with Allison High-Capacity filters. If using Gold Series filter, refer to TABLE 3 in Section 7 of this manual for proper fluid and filter change intervals.

PA1578 SECTION 24 REVISED OCTOBER 2011

TABLE A

Notes;____

Section 24 Lubrication Schedule

Odometer reading [1] (miles / km)
For higher odometer readings, repeat at the frequency interval established

LUBRICATION AND SERVICING SCHEDULE	Item	Months	6 250 / 10 000	12 500 / 20 000	18 750 / 30 000	25 000 / 40 000	31 250 / 50 000	37 500 / 60 000	43 750 / 70 000	50 000 / 80 000	56 250 / 90 000	62 500 / 100 000	68 750 / 110 000	75 000 / 120 000	81 250 / 130 000	87 500 / 140 000	93 750 / 150 000	100 000 / 160 000	106 250 / 170 000	112 500 / 180 000	118 750 / 190 000	125 000 / 200 000	131 250 / 210 000	137 500 / 220 000	143 750 / 230 000	150 000 / 240 000	185 000 / 300 000	200 000 / 320 000	225 000 / 360 000	250 000 / 400 000	275 000 / 440 000	300 000 / 500 000	500 000 / 800 000	600 000 / 960 000	LUBRICANT /FLUID [2]
			proceed to maintenance operation at																								each							
11 REAR AXLE																																		
Differential, check oil level, add if necessary	17	6				•				•				•				•				•				•									E
Differential, change oil, clean breathers	17	12																•																	E
Differential, change oil, clean breathers (with full synthetic oil)	17	48																												•					E
Tag axle lever pivot, grease one fitting on each pivot	19	6	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•									K
12 BRAKE & AIR																																		
Air tanks, drain water from all tanks	-	12		•		•		•		•		•		•		•		•		•		•		•		•									
Accessories air filter, change filter element	2	24																•																	
Air dryer, change cartridge	13	24																•																	
Brake pads, check pad wear indicator and perform caliper slide check	-	12		•		•		•		•		•		•		•		•		•		•		•		•									
14 STEERING																																		
Drag link ends, grease one fitting at each end	3	6	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•									K
Relay rod ends, grease one fitting at each end (VIP only)	-	6	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•									K
Steering tie rod ends, grease one fitting at each end	5	6	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•									K
Idler arm, grease fitting (VIP only)	-	6	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•									K
Bell crank, grease fitting (VIP only)	-	6	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•									K
Steering damper cylinder, grease one fitting at rod end	9	6	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•									K
Steering knuckle pins, grease two fittings per knuckle	8	6	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•									K
Power steering reservoir, replace oil and filter cartridges	23	12								•								•								•									B
16 SUSPENSION																																		
Upper A-Arm ball joint, grease fitting	6	6	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•									L
22 HEATING & AIR CONDITIONING																																		
A/C compressor, check oil level, add if necessary	44	6	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•									D
A/C receiver tank, check refrigerant level, add if necessary	42	6	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•									
Refrigerant moisture indicator, replace filter dryer unit according to moisture indicator (as needed)	43	6	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•									
HVAC air filters, clean or replace all elements	41 45	6		•		•		•		•		•		•		•		•		•		•		•		•									

Odometer reading [1] (miles / km)
For higher odometer readings, repeat at the frequency interval established

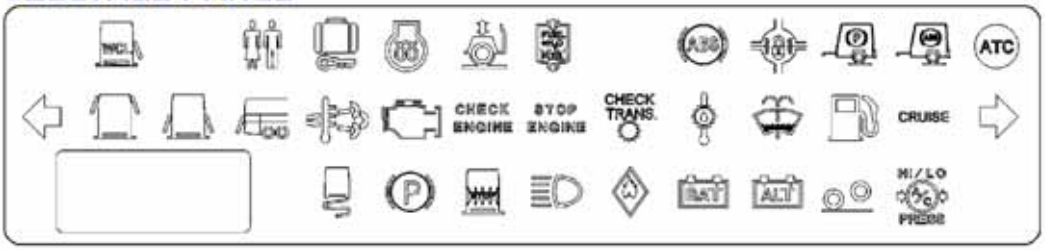
LUBRICATION AND SERVICING SCHEDULE	Item	Months	6 250 / 10 000	12 500 / 20 000	18 750 / 30 000	25 000 / 40 000	31 250 / 50 000	37 500 / 60 000	43 750 / 70 000	50 000 / 80 000	56 250 / 90 000	62 500 / 100 000	68 750 / 110 000	75 000 / 120 000	81 250 / 130 000	87 500 / 140 000	93 750 / 150 000	100 000 / 160 000	106 250 / 170 000	112 500 / 180 000	118 750 / 190 000	125 000 / 200 000	131 250 / 210 000	137 500 / 220 000	143 750 / 230 000	150 000 / 240 000	185 000 / 300 000	200 000 / 320 000	225 000 / 360 000	250 000 / 400 000	275 000 / 440 000	300 000 / 500 000	500 000 / 800 000	600 000 / 960 000	LUBRICANT /FLUID [2]
			proceed to maintenance operation at																								each							
Parcel rack fan air filters, clean or replace	47	6		•		•		•		•		•		•		•		•		•		•		•		•									
Condenser discharge tube, qty:2, check to see if clogged [7]	-	3																																	
Front discharge tube, qty:2, check to see if clogged [8]	-	3																																	
Evaporator discharge tube, qty:6, check to see if clogged	-	3																																	
Evaporator motor, condenser motor, recirculating pump drive motor, inspect brush, replace if necessary	-	12								•								•								•									

Notes;____

QUICK REFERENCE GUIDE

Particularities of vehicles with exhaust gas aftertreatment system

TELLTALE PANEL



High Exhaust System Temperature Lamp (HEST LAMP)

While regeneration is in progress, this indicator lamp illuminates when the vehicle speed is less than 5 mph (8 km/h) and the exhaust gas temperature at the DPF outlet is greater than 977°F (525°C).

Take note that if the vehicle is being driven, this indicator lamp will illuminate for 20 seconds as the temperature at the DPF reaches 977°F (525°C) and then, will turn off.

WARNING

During regeneration, exhaust temperature may reach up to 1200°F (650°C) at the particulate filter. When parking the vehicle, if this warning light is illuminating, make sure that the DPF outlet diffuser is away from people or any flammable materials, vapors or structures.

Malfunction Indicator Lamp (MIL)

Indicates a failure of an Emission Control device. May illuminate at the same time as the «Check Engine» (Amber Warning Lamp). The lamp will go out when the fault is inactive. Vehicle can be driven to end of shift. Call for service.

Check Engine (Amber Warning Lamp)

Indicates a minor fault detected by the engine electronic control module (ECM). This warning lamp is illuminated for all active faults.

The warning lamp will remain *ON* until the malfunction has been corrected. Vehicle can be driven to end of shift. Call for service.

A diagnostic code will be stored in the memory.

STOP Engine (Red Stop Lamp)

Illuminates when a potential engine damaging fault is detected. Immediately park the coach in a safe place and stop the engine.

Flashes when Engine Protection Shutdown occurs. When a problem is detected, the engine power will automatically begin to decrease gradually, followed by full shutdown after 30 seconds. The Engine Protection Shutdown may be bypassed by using the «Engine Stop Override» switch on the L.H. lower control panel. Use only in order to move the vehicle to a safe parking place and then shutdown the engine. Call for service.

NOTE

Once the engine is stopped, it cannot be restarted until the problem has been corrected. A diagnostic code will be stored in memory.

NEW ROCKER SWITCH ON L.H. DASHBOARD PANEL

Manual Regeneration / Stop Regeneration Switch

Manual Regeneration Request

The «DPF Regeneration Lamp» illuminates to notify the driver of the need and urgency of a manual stationary regeneration.

If stationary regeneration is not performed, this telltale will blink, indicating that a stationary regeneration is required immediately. If stationary regeneration is still not performed, "engine power derate and shutdown" sequence may occur.

To initiate a stationary regeneration:

- Park the vehicle in a clear area, vehicle speed must be 0 mph (0km/h);
- Engine must be on normal idle and fully warmed up (coolant temperature above 140°F/60°C);
- Apply service brake and set the transmission to the neutral "N" position.
- Apply parking brake.
- Release parking brake and then apply parking brake once again (this sequence is required to enable the stationary regeneration);
- **Press** and hold for 5 seconds the top-most switch position to initiate a manual stationary regeneration;

The regeneration will begin. Turn off the air conditioning to reduce engine load. The engine idling speed will increase to 1600 rpm. Once the regeneration is completed, the engine speed will return to normal idle.

Stop/Inhibit Regeneration

Press down to cancel a regeneration that is in progress or to inhibit a pending regeneration. Use this function to move the vehicle to a safe parking place. Releasing the parking brakes will also cancel the regeneration.

Illuminates to indicate the system's acknowledgement of regeneration inhibit request and to remind the driver that regenerations have been or will be inhibited.

NOTE

STATIONARY REGENERATION

This process requires the vehicle to be parked while the driver or a maintenance technician initiates the regeneration process.

NOTE

To initiate a stationary regeneration while the Engine Protection Shutdown sequence has already started, you must press and hold both the «Engine Stop Override» switch and the «Manual Regeneration» switch at the same time until the regeneration starts. Once started, the regeneration may last for only a few minutes and engine may shut down again. Repeat the operation as required until the stationary regeneration can be completed.

CAUTION

Before initiating stationary regeneration or using the inhibit regeneration function, read carefully and understand paragraph EXHAUST AFTERTREATMENT SYSTEM in Chapter 4: Other Features for complete information concerning regeneration precautions. Ignoring them could result in extensive damage and/or serious personal injury.

EXHAUST GAS AFTERTREATMENT

Aftertreatment system

The workhorse behind clean emissions technology is an exhaust Aftertreatment Device (ATD), which replaces today's muffler. The ATD primary function is to capture and oxidize (regenerate) the particulate matter (soot) in the engine exhaust gas. The ATD is split into two main sections. The exhaust gas first enters the Diesel Oxidation Catalyst (DOC) and then flow through the Diesel Particulate Filter (DPF); together they capture and regenerate the soot on a regular or passive basis. Through constant monitoring of the exhaust gas temperature and the system back pressure, the ECM is able to manage regeneration.

PASSIVE Regeneration

Passive regeneration is the process by which the particulate matter is oxidized due to the heat generated by the engine internal combustion process. However, exhaust temperature must be above 572°F (300°C) to initiate the oxidation catalyst that precedes the filter substrate. During normal highway operation, exhaust temperatures alone are usually high enough to oxidize accumulating soot. In low ambient temperatures, however, or in some stop-and-go applications, the system needs a little help to regenerate, or clean itself. This process is called "active" regeneration.

ACTIVE Regeneration

When required, the ECM activates two key upstream systems that assist in a process called "active" regeneration when the engine internal combustion process alone does not generate enough heat. The first is an Intake Throttle Valve which can be actuated to help increase the Aftertreatment Device temperature which speeds the regeneration. The second system is the Dosing System, which injects a mist of diesel fuel into the exhaust system to increase and maintain the Aftertreatment temperature. Exhaust temperature must again be above 572°F (300°C) to initiate the oxidation catalyst, which in turn oxidizes the injected diesel fuel molecules to achieve up to 1200°F (650°C) exhaust temperature at the particulate filter. This process of "active regeneration" takes place during the normal operation cycle of the vehicle without charges in performance or control for the operator.

STATIONARY Regeneration

In a small number of specific engine duty cycles, the ECM may not be capable of completing an active regeneration. In these situations, the operator will be notified that a "stationary" regeneration may be required. A DPF telltale light will illuminate indicating the need for user interaction. The lamp gives the operator a grace period to allow this process to take place at a time when most convenient for the operator. This process requires the vehicle to be parked while a driver or maintenance technician initiates the regeneration process. Once initiated, the stationary regeneration process will be complete in about 20 to 45 minutes.

The driver will be notified of the need for a stationary regeneration (parked) by illumination of the «DPF Regeneration Lamp».

The sequence of indicator lamp(s) is as follow:

LEVEL 1  (solid)

REGENERATION NEEDED

Diesel particulate filter is becoming full.

The «DPF Regeneration Lamp» will be illuminated prior to any engine protection measures being taken. Once this lamp is lit, the stationary regeneration (parked) process should be initiated.

LEVEL 2  (flashing)

REGENERATION REQUIRED

Diesel particulate filter is full.

If no DPF regeneration occurs after the initial «DPF Regeneration Lamp» illumination, the lamp will begin blinking and a stationary regeneration should be initiated as soon as possible in order to prevent from entering into Level 3.

LEVEL 3  (flashing) + **CHECK ENGINE**

ATD SERVICE REQUIRED

ENGINE DERATE ACTIVE

Diesel particulate filter is overfull.

If the flashing «DPF Regeneration Lamp» is still ignored, the «Check Engine» will illuminate. at that time, engine performance is limited. Perform a parked regeneration IMMEDIATELY to avoid further derate and prevent from entering into Level 4.

LEVEL 4  (flashing) + **STOP ENGINE**

ATD SERVICE REQUIRED

ENGINE DERATE ACTIVE

A serious engine problem has occurred. The DPF may be over its maximum capacity.

If a stationary regeneration is still not initiated, a standard Engine Protection Shutdown sequence will occur. All of the following dashboard lamps will be present:

Blinking «DPF Regeneration Lamp»;
Solid «Check Engine» lamp;
Solid «Stop Engine» lamp.

Once engine derate and/or shutdown sequence is completed, a stationary regeneration must occur to continue vehicle operation. If the driver continues to operate the vehicle without regeneration, additional measures will be taken to protect the engine and ATD from damage, up to and including engine shutdown. Parked regeneration might no longer be possible.

NOTE

At starting of the engine, if a stationary regeneration is required, the engine coolant temperature must reach 140°F (60°C) before any stationary regeneration may be initiated and completed. Permit the engine to idle for a short while or drive the vehicle until engine temperature increases sufficiently.

WARNING

Do not initiate a stationary regeneration in a closed area like a garage. Stationary regenerations must be undertaken outdoors only.

WARNING

During stationary regeneration, exhaust temperature may reach up to 1200°F (650°C) at the particulate filter. Before initiating stationary regeneration, make sure that the DPF outlet diffuser is clear of objects and that no one is working near the DPF outlet diffuser.

WARNING

Hot surfaces. Keep yourself clear of all hot After Treatment Device components, particularly during and after active or stationary regeneration. Hot surfaces can cause serious burns.

CARE AND MAINTENANCE

Diesel Particulate Filter

Besides trapping soot, the DPF (Diesel Particulate Filter) also traps the ash that has been generated when additives in engine oil are burned. However, unlike soot, ash cannot be oxidized. The ash that accumulates in the filter will eventually cause an increase in exhaust back pressure. The ECM will constantly monitor the ash accumulation and forecast the approximate time until DPF ash cleaning is required. This information is stored in the ECM. This allows you the opportunity to plan for the DPF ash cleaning interval. If ash cleaning is not performed proactively, and the back pressure increases beyond the system limit, the ECM will flag the amber warning light on the telltale panel, notifying the operator an ash cleaning is required. Clean remanufactured DPF cartridge will be available on an exchange basis. For most vehicle applications and duty cycle, this will occur after approximately 200,000-400,000 miles (320,000-640,000 km) of operation.

WARNING

External and internal temperatures remain hot long after engine has been shutdown. Allow the Aftertreatment Device and DPF to cool before handling. Wear protective clothing and glove while servicing.

TECHNICAL INFORMATION

Fuel type

EPA-07 engines are designed to run on **Ultra Low Sulfur Diesel** (ULSD) fuel, which can contain no more than 15 ppm sulfur.

CAUTION

ULSD fuel is necessary to avoid fouling the engine's Aftertreatment Device (ATD).

CAUTION

Owners of 2007 and later model year on-highway diesel engine must refuel only with ULSD fuel.

Oil specifications

Use SAE 15W-40, low ash formulation designated API CJ-4 in EPA-07 engines.

CAUTION

CJ-4 contains less than 1% ash which is key to achieving maximum diesel particulate filter cleaning intervals. Use of high ash engine oils will reduce the cleaning interval on the Diesel Particulate Filter (DPF). DPF regenerates the combustible soot, but the ash (a product of the oil lubricant package) slowly accumulates in the channels of the DPF.

PREVOST

EXHAUST AFTERTREATMENT SYSTEM - QUICK REFERENCE GUIDE

There are four indicator lights and one gauge related to the aftertreatment system on the instrument cluster

Aftertreatment system malfunction (malfunction indicator light)

Indicates a failure of an emission control device. May illuminates at the same time as the CHECK amber warning light. This light will go out after 3 completed *ignition on-ride-ignition off* cycles. Vehicle can be driven to end of shift. Call for service.

High exhaust system temperature (HEST light)

This indicator light is for your information only. It illuminates to notify the driver of potentially hazardous exhaust gas temperature at the exhaust system diffuser.

Take note that if the vehicle is being driven, this indicator lamp will illuminate for 20 seconds as the temperature at the DPF reaches 977°F (525°C) and then, will turn off.

WARNING

During regeneration, exhaust temperature may reach up to 1200°F (650°C) at the particulate filter. When parking the vehicle, if this telltale light is illuminating, make sure that the exhaust system diffuser is away from people or any flammable materials, vapors or structures.

DPF regeneration request

Illuminates (steady) to notify the driver that a manual regeneration will be required soon. There is no urgency as long as this indicator light doesn't blink.

Low DEF level

Illuminates when there is less than 2.6 gallons (10 liters) of DEF left in the tank.

This indicator light starts flashing when there is only 0.6 gallons (2.5 liters) left in the tank. If the vehicle is kept in operation with an empty DEF tank, and engine derate will eventually occur, followed by a 5 mph speed limitation.

DEF level gauge

Indicates the amount of DEF (Diesel Exhaust Fluid) remaining in the DEF tank. The DEF tank is considered as being full when it contains 16 gallons (60 liters) of DEF. DEF consumption will be approximately 2% of the diesel fuel consumed.

Initiating stationary (parked) regeneration

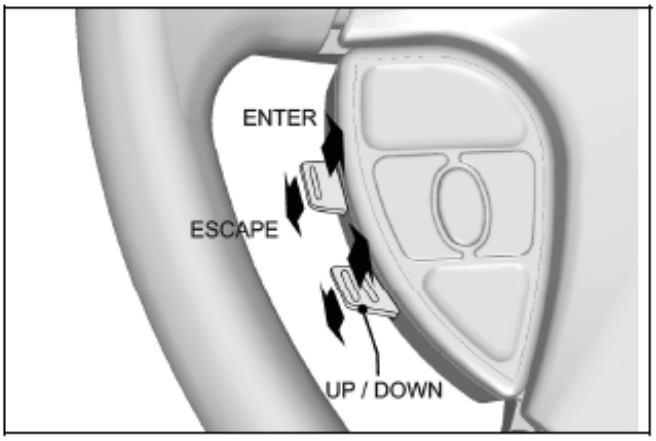
The DPF REGENERATION REQUEST indicator light illuminates to notify the driver that a manual (stationary) regeneration will be required soon.

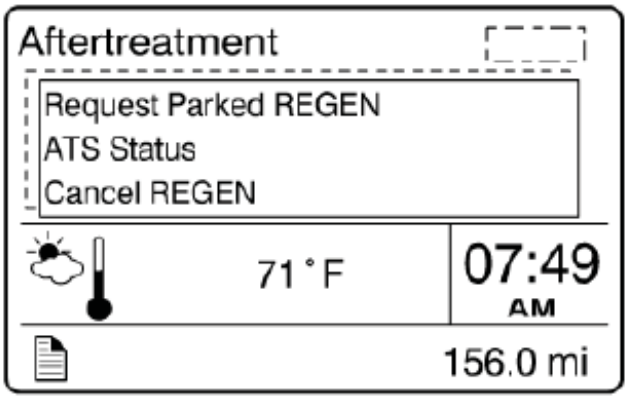
DPF REGENERATION indicator light

If stationary regeneration is not performed, this telltale light will eventually blink, indicating that a stationary regeneration is required immediately. If stationary regeneration is still not performed, "engine power derate and shutdown" sequence may occur as per level 1 to level 4 sequence.

To initiate a stationary regeneration:

- Park the vehicle in a clear area, vehicle speed must be 0 mph (0 km/h);
- Engine must be on normal idle and fully warmed up (coolant temperature above 140°F/60°C);
- Apply parking brake and set the transmission to neutral (N).
- Press ENTER or ESCAPE button on the steering wheel and then get to the Driver Information Display AFTERTREATMENT menu. Using the UP/DOWN button on the steering wheel, select sub-menu REQUEST PARKED REGEN and press ENTER button to confirm and initiate regeneration.





The regeneration will begin. Turn off the air conditioning to reduce engine load. The engine idling speed will increase to 1600 rpm. Once the regeneration is completed, the engine speed will return to normal idle.

Voluntary interruption of a stationary regeneration

It is possible to interrupt a stationary regeneration at all time. To do so, set the ignition key to the OFF position or get to the Driver Information Display AFTERTREATMENT menu, select Cancel REGEN and press ENTER button to confirm. You can stop regeneration simply by releasing the parking brake. Use this procedure in order to move the vehicle in a safe area.

If regeneration is interrupted, it is very important to reinitiate the regeneration as soon as possible.

Diesel particulate filter clogging sequence

LEVEL 1  solid	REGENERATION NEEDED Diesel particulate filter is becoming full The DPF REGENERATION indicator light illuminates to notify the driver that a stationary regeneration (parked) will be required soon. When this light is lit, initiate stationary regeneration process at an appropriate time of day. **THERE IS NO URGENCY AT THIS LEVEL.**
LEVEL 2  blinking	REGENERATION REQUIRED Diesel particulate filter full If no DPF regeneration occurs after the initial DPF REGENERATION indicator light illumination, the light will start blinking and a stationary regeneration should be initiated as soon as possible in order to prevent from entering into Level 3.
LEVEL 3  blinking +  CHECK	ATD SERVICE REQUIRED ENGINE DERATE ACTIVE Diesel particulate filter overfull If the blinking DPF REGENERATION indicator light is still ignored, the CHECK amber warning light will illuminate. In that situation, engine performance is limited. Perform a parked regeneration IMMEDIATELY to avoid further engine derate and prevent from entering into Level 4.
LEVEL 4  blinking +  CHECK +  STOP	ATD SERVICE REQUIRED ENGINE SHUTDOWN ACTIVE A serious engine problem has occurred. The DPF may be over its maximum capacity. If a stationary regeneration is still not initiated, a standard Engine Protection Shutdown sequence will occur. All of the following dashboard lamps will be present: Blinking DPF REGENERATION indicator light; Solid CHECK amber warning light; Solid STOP warning light. Once engine derate and/or shutdown sequence is completed, a stationary regeneration must occur to continue vehicle operation. If the driver continues to operate the vehicle without regeneration, additional measures will be taken to protect the engine and ATD from damage, up to and including engine shutdown. Parked regeneration might no longer be possible.

The exhaust aftertreatment system consists of two units, the filtration and regeneration unit and the selective catalytic reduction (SCR) unit.

Selective catalytic reduction unit

Selective Catalytic Reduction (SCR) is a technology that uses Diesel Exhaust Fluid (DEF) and a catalytic converter to reduce nitrogen oxides (NOx) emissions.

SCR is an exhaust aftertreatment system that injects small amount of DEF into the exhaust gas between the DPF and the selective reduction catalytic converter. DEF turns to ammonia and carbon dioxide when heated. The exhaust stream then passes over a catalyst, the ammonia reacts with the NOx to form nitrogen and water vapor.

The basic elements of the SCR system consist of a 15.9 gallons (60 liters) DEF tank complete with pump, lines and heating system, a dosing injector, a catalytic converter and the control and monitoring system. DEF consumption is related to fuel consumption. In order to meet EPA2010 requirements, DEF tanks are sized so one refill will be necessary every two refill of the fuel tank.

Filtration and regeneration unit

The main purpose of the filtration and regeneration unit is to capture and oxidize (regenerate) the particulate matter (soot) in the engine exhaust gas. The exhaust gas first enters the Diesel Oxidation Catalyst (DOC) and then flow through the Diesel Particulate Filter (DPF); together they capture and regenerate the soot on a regular or passive basis. Through constant monitoring of the exhaust gas temperature and the system back pressure, the engine control module is able to manage regeneration.

Passive regeneration

Passive regeneration is the process by which the particulate matter is oxidized due to the heat generated by the engine internal combustion process. During normal highway operation, exhaust temperatures alone are usually high enough to oxidize accumulating soot. In low ambient temperatures, however, or in some stop-and-go applications, the system needs a little help to regenerate, or clean itself. This process is called “active” regeneration.

Active regeneration

Active regeneration is necessary when the engine internal combustion process alone does not generate enough heat. A dosing system injects a mist of diesel fuel into the exhaust system to increase and maintain the aftertreatment system temperature. Exhaust temperature must be above 572°F (300°C) to initiate the oxidation catalyst, which in turn oxidizes the

injected diesel fuel molecules to achieve up to 1200°F (650°C) exhaust temperature at the particulate filter. This process of active regeneration takes place during the normal operation cycle of the vehicle without charges in performance or control for the operator. EPA2010 compliant Volvo engines produce less soot, so less active or stationary regeneration will be required.

Stationary (parked) regeneration

In a small number of specific engine duty cycles, engine control module may not be capable of completing an active regeneration. In these situations, the operator will be notified that a stationary or parked regeneration may be required. A DPF telltale light will illuminate indicating the need for user interaction. The lamp gives the operator a grace period to allow this process to take place at a time when most convenient for the operator. This process requires the vehicle to be parked while a driver or maintenance technician initiates the regeneration process using the DID menus. Once initiated, the stationary regeneration process will be complete in about 45 minutes.

The driver will be notified of the need for a stationary regeneration (parked) by illumination of the DPF REGENERATION telltale light.

NOTE

At starting of the engine, if a stationary regeneration is required, the engine coolant temperature must reach 140°F (60°C) before any stationary regeneration may be initiated and completed. Permit the engine to idle for a short while or drive the vehicle until engine temperature increases sufficiently.

WARNING

Do not initiate a stationary regeneration in a closed area like a garage. Stationary regenerations must be undertaken outdoors only.

WARNING

During stationary regeneration, exhaust temperature may reach up to 1200°F (650°C) at the particulate filter. Before initiating stationary regeneration, make sure that the DPF outlet diffuser is clear of objects and that no one is working near the DPF outlet diffuser.

Hot surfaces. Keep yourself clear of all hot Aftertreatment Device components, particularly during and after active or stationary regeneration. Hot surfaces can cause serious burns.

Diesel particulate filter cleaning

Besides trapping soot, the also traps the ash that has been generated when additives in engine oil are burned. However, unlike soot, ash cannot be oxidized. The ash that accumulates in the filter will eventually cause an increase in exhaust back pressure. The ECM will constantly monitor the ash accumulation and forecast the approximate time until DPF ash cleaning is required. This information is stored in the ECM. This allows you the opportunity to plan for the DPF ash cleaning interval. If ash cleaning is not performed proactively, and the back pressure increases beyond the system limit, the ECM will flag the amber warning light on the telltale panel, notifying the operator an ash cleaning is required. Clean remanufactured DPF cartridge will be available on an exchange basis. For most vehicle applications and duty cycle, this will occur after approximately 250,000 miles (400,000 km) of operation.

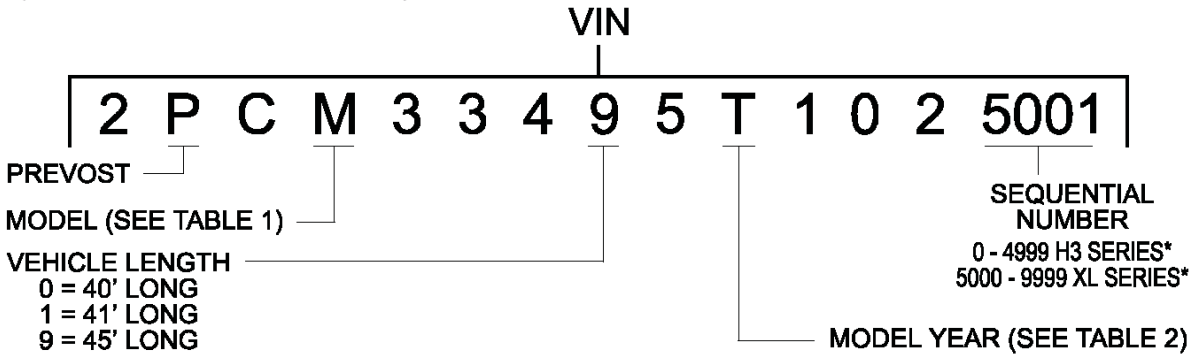
MAINTENANCE INFORMATION

Mi00-08

DATE : March 2000	SECTION : 00 - General
SUBJECT : UNDERSTANDING THE VIN	

DESCRIPTION

With the addition of the XLII coach and bus shell, some code letters in the vehicle identification number (VIN) have been added. The following information explains the contents and structure of the VIN:



(*) For vehicle model years 1996 (T) and up only.

VIN Vehicle Identification Number: A structured combination of characters assigned to a vehicle by the manufacturer for identification purposes.

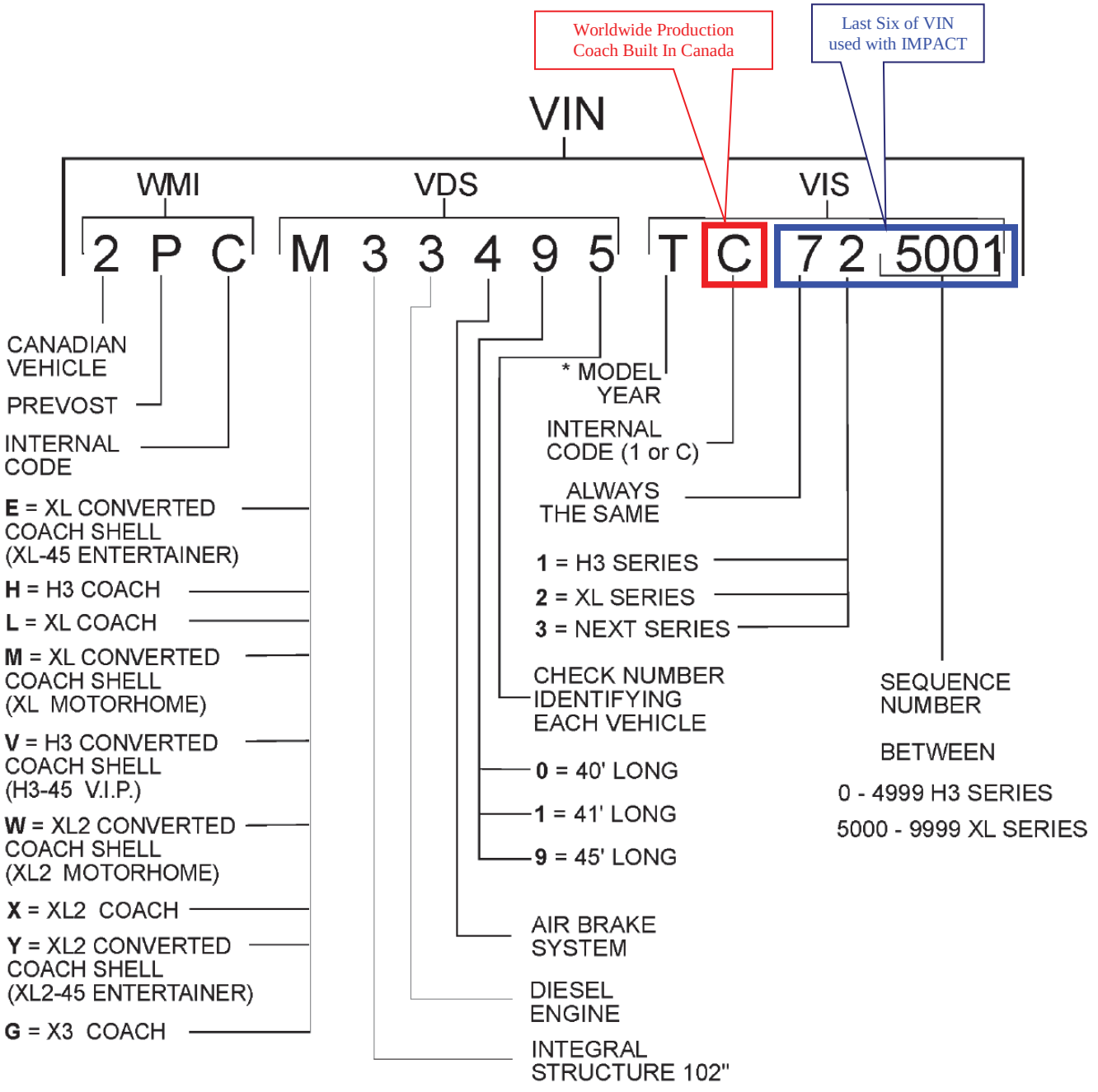
TABLE 1: CHARACTER IDENTIFYING THE VEHICLE MODEL TYPE (4th POSITION IN THE VIN)

Series	Bus shell (Motorhome)	Bus shell (Entertainer)	Passenger coach
Le Mirage XL	M	E	L
Le Mirage XLII	W	Y	X
H3	V	---	H

TABLE 2: CHARACTER IDENTIFYING THE VEHICLE MODEL YEAR (10th POSITION IN THE VIN)

Year	Code	Year	Code	Year	Code	Year	Code
1980	A	1990	L	2000	Y	2010	A
1981	B	1991	M	2001	1	2011	B
1982	C	1992	N	2002	2	2012	C
1983	D	1993	P	2003	3	2013	D
1984	E	1994	R	2004	4	2014	E
1985	F	1995	S	2005	5	2015	F
1986	G	1996	T	2006	6	2016	G
1987	H	1997	V	2007	7	2017	H
1988	J	1998	W	2008	8	2018	J
1989	K	1999	X	2009	9	2019	K

VIN Changes with Introduction of Volvo Engine



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Serial Number	Year	Serial Number	Year
915 - 924	1967	2565 - 2709	1979
925 - 926	1968	2710 - 2855	1980
929 - 930	1969	B	1981
931 - 943	1968	C	1982
944 - 949	1969	D	1983
950 - 959	1968	E	1984
960 - 980	1969	F	1985
981 - 999	1970	G	1986
2001 - 2009	1970	H	1987
2010	1971	J	1988
2011 - 2012	1970	K	1989
2013 - 2040	1971	L	1990
2041	1972	M	1991
2042	1971	N	1992
2043	1972	P	1993
2044	1971	R	1994
2045	1972	S	1995
2046 - 2047	1971	T	1996
2048 - 2080	1972	V	1997
2081	1973	W	1998
2082 - 2084	1972	X	1999
2085 - 2178	1973	Y	2000
2179 - 2213	1974	1	2001
2214	1975	2	2002
2215 - 2233	1974	3	2003
2234	1975	4	2004
2235 - 2241	1974	5	2005
2247 - 2329	1975	6	2006
2330 - 2408	1976	7	2007
2409 - 2453	1977	8	2008
2454 - 2564	1978	9	2009

Media Session Training

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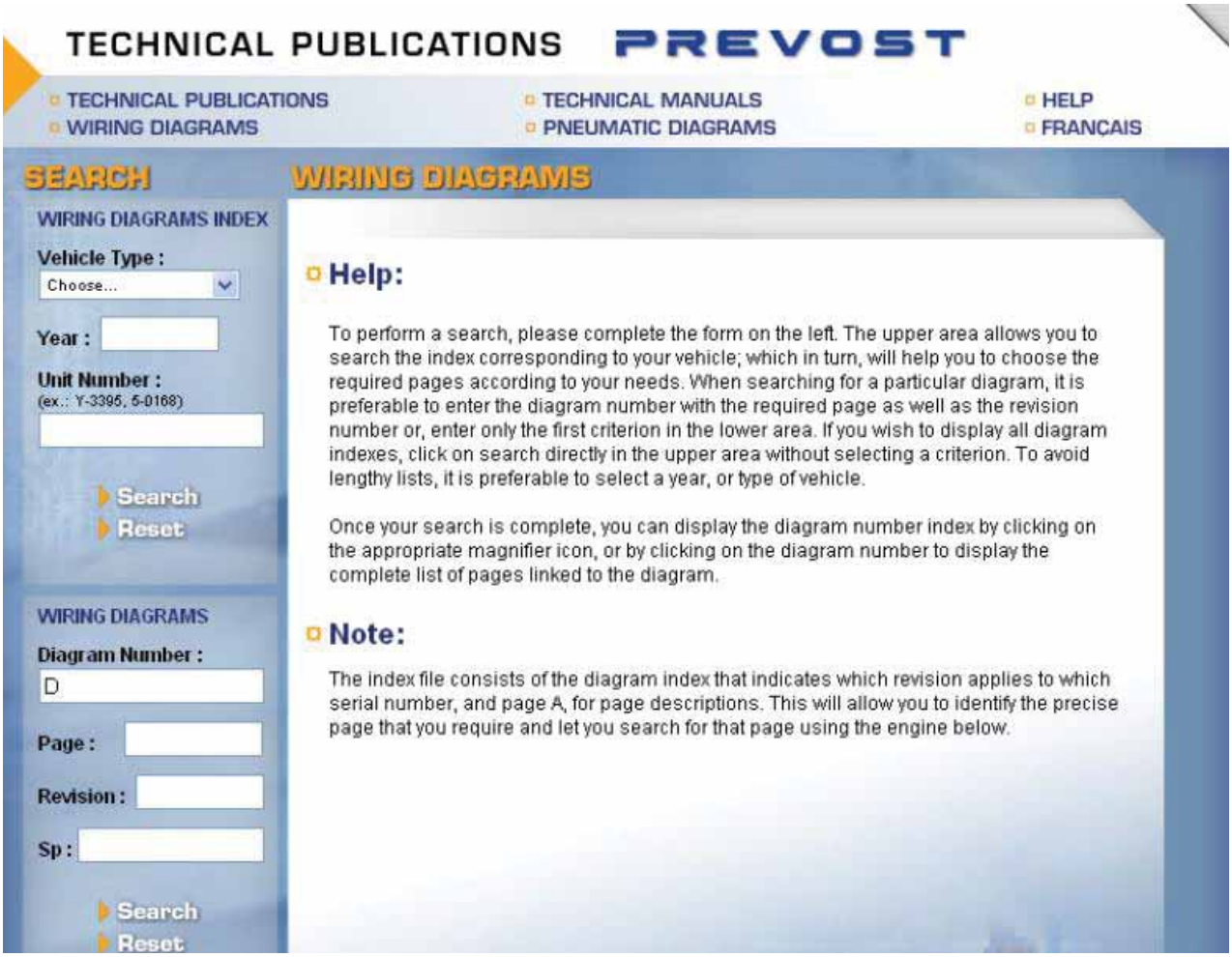

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Media Session Training

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Pneumatic System Tank Draining Procedure

Ensure Technician has correct diagram for the system being worked on.

DO NOT DRAIN AIR BAG (SERIES) TANKS

This will empty the corresponding air bag lowering the coach.

Take a moment to get familiar with the system your working on and the location of all tanks, color code will help identify each tank.

Color	Circuit
Red	Secondary
Green	Primary and Delivery
Yellow	Parking Brake
Blue	Suspension
Black	Accessory
Brown	Trailer Brake

1) **Start engine, pump brakes to 90psig, allow compressor to run to cut off pressure**
2) **Note pressure and shut off engine**
3) **From under the coach, listen for any leaks. Note and repair as required Restart this procedure if leaks were found and repaired**
4) **Verify no pressure drop on gauge.**
5) **Open Wet Tank drain valve and drain completely; close drain. Note and record moisture / oil contamination.**
6) **Check Primary and secondary air gauges. Still should read 120-130**
7) **Open Primary brake tank drain valve and drain completely; Close drain. Note and record moisture / oil contamination.**
8) **Check Secondary brake tank pressure should still read 120-130**
9) **Open Secondary break tank drain valve and drain tank completely; Note and record moisture / oil contamination.**
10) **Open Accessory tank drain valve and drain tank completely; Note and record moisture / oil contamination.**
11) **Ensuring all valves are closed, start engine, note time required for air pressure to reach cut off pressure.**
12) **Document in vehicle file to build a history for coach.**

Background Introduction:

Multiplexed electronic architecture is progressively introduced on Prevost line of products. Launched with the H3 coaches in February 2005, ViP bus shells will follow later in the year. The XLII coaches and bus shells, for their part, will be in production in 2006.

Prevost's Multiplexed VIP shells will incorporate electrical interfaces for converters. Those interface points are the only connections allowed with the bus multiplex electronic architecture.

Prevost' objective is to maintain for converters, the same connections available for non-multiplexed shells, while maintaining the integrity of the bus shell Multiplexed system.

This document defines the converter's electrical interfaces planned on the VIP Multiplexed bus shells.

Revision history

Revision	Date	Issuer	Description
Rev 1-4	May 16, 2006	D. Gravel	Section 4: Description of the Transmission Neutral and Park Brake signal was wrong (inverted logic)
Rev 1-3	May 9, 2006	D. Gravel	Section 4, Pinout revised to match electrical schematics page 36.1
Rev 1-2	Oct 17, 2005	D. Gravel	Section 5 added. Inputs for Slide-Out TellTale and transmission interlock
Rev 1-1	April 11, 2005	D. Gravel	Section 3): Number of Tell Tales available to converters reduced from 7 to 5.
Rev 1-0	Feb 8, 2005	D. Gravel	First Issue

1) Trailer Lights

Pin #	Signals provided:	Voltage	Max current
1, 8	GND	0V	20 Amp
2	Backup Lights	12 V	4 Amp
3	Left Flasher	12 V	8 Amp
4	Brake lights	12 V	8 Amp
5	Right Flasher	12 V	8 Amp
6	Markers Lights	12 V	8 Amp
7	ABS Power	12 V	10 Amp

A Connector located in the Engine compartment is provided standard on all VIP Multiplexed shells.
The connector is a Deutsch 12 pins DT06 Series located in the engine compartment.
At vehicle delivery, the connector is capped with plug.

Mating connector Prevost PN # 563613 (Deutsch PN: DT04-12SA)
Socket Terminals Prevost PN # 562481 (Deutsch PN: 0460-215-16141).

2) Power terminal strips

Note:

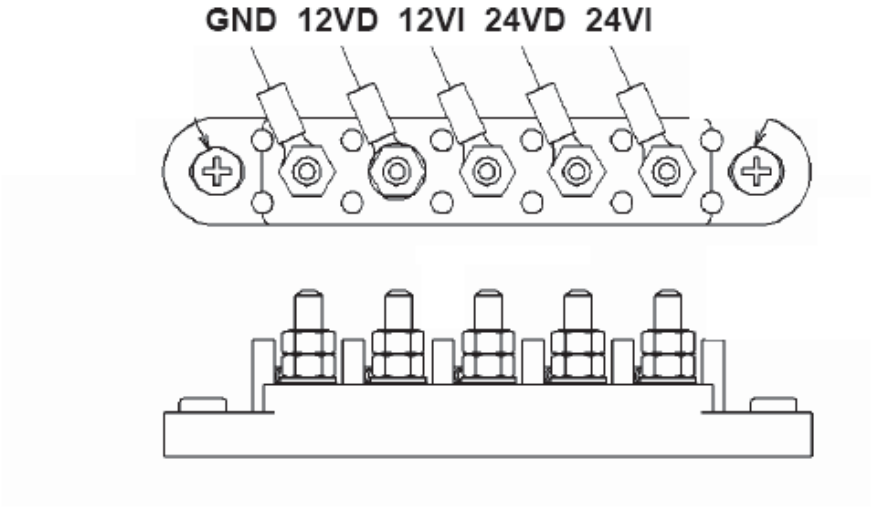
Loads connected to "Battery direct" supply should be considered for battery discharge since it will drain current on a permanent basis when the vehicle is parked. Typical use should be for devices that need small current for a short period of time, for example to recharge cell phone batteries.

If larger loads are connected to Battery direct supply, they must incorporate a timer device that automatically shuts off the device within 15 minutes after the vehicle ignition is turned OFF.

One way to implement a 15 minutes timer is to use the "Wake-Up" signal described in section 4 to command a relay.

a) Front terminal strip

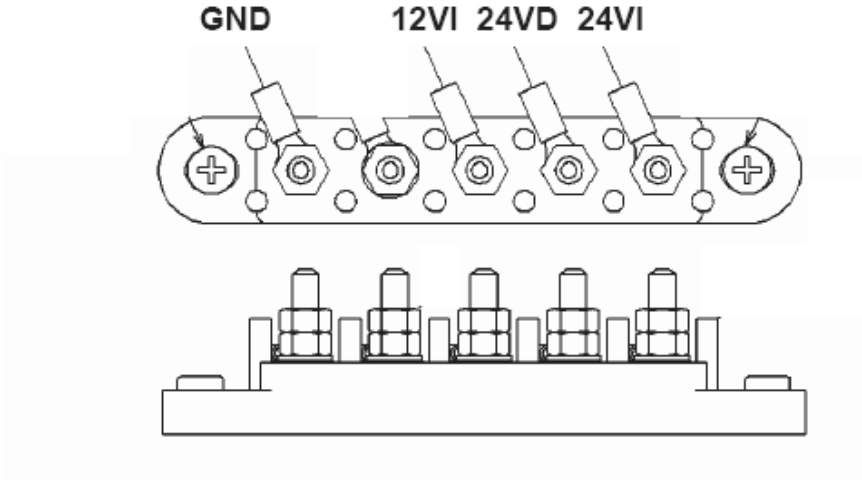
5 "screw type" studs for ¼ inches ring terminals.
Located in the front electrical junction box.



Power Provided	Description	Fuse Rating	Maximum current
+24 VI	24 Volt Ignition	15 Amp	12 Amp
+24 VD	24 Volt Battery Direct	7.5 Amp	5 Amp
+12 VI	12 Volt Ignition	15 Amp	12 Amp
+12 VD	12 Volt Battery Direct	15 Amp	12 Amp

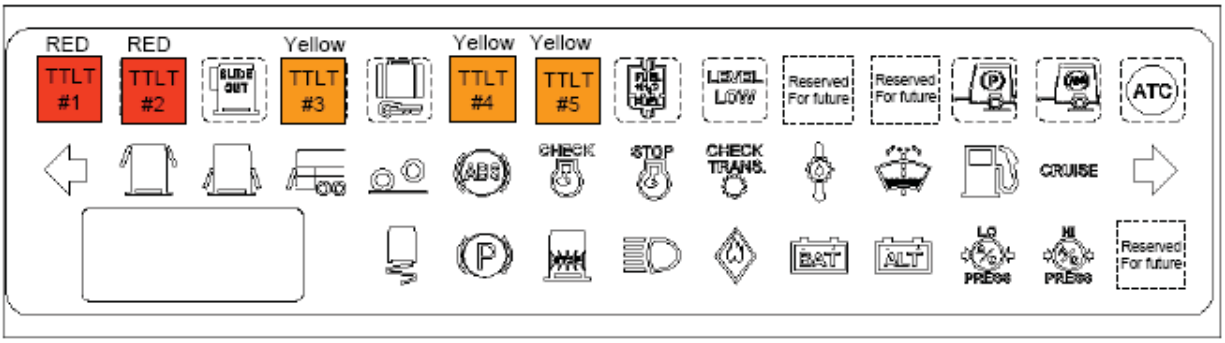
b) Rear Terminal strip

4 "screw type" studs for ¼ inches ring terminals.
Located in the battery electrical junction box.



Available connections	Description	Fuse Rating	Maximum current
+24 VI	24 Volt Ignition	7.5 Amp	5 Amp
+24 VD	24 V Battery Direct	15 Amp	12 Amp
+12 VI	12 V Ignition	10 Amp	8 Amp

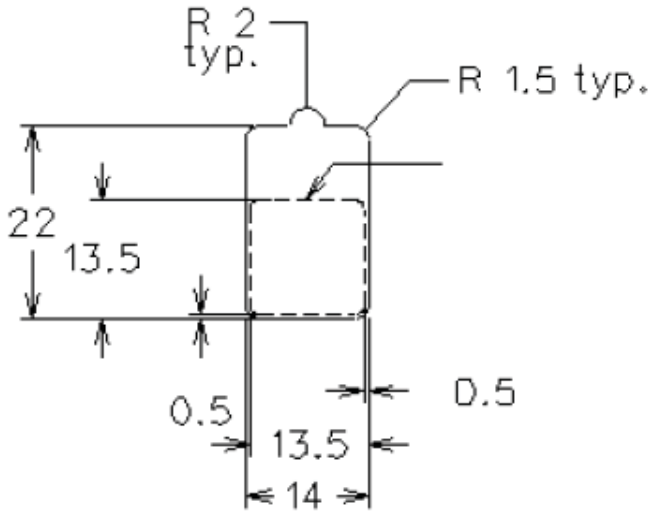
3) TellTale Lights



There are 5 Telltales available to converters. Two(2) red TellTales (#1 and 2) and five(3) Yellow (Amber) TellTales.

Specific icons or text can be inserted in the 5 telltale free spots of the top row. Each converter have to define the symbol or text applicable to its specific application and procure these in the form of a reverse contrast transparent films.
The icons do not need to be colored. The color comes from the LED lights behind the telltale.

TellTale Icons dimensions:



Dimensions in mm

Electrical connections:

A 12 positions Deutsch DT-06 series connector located below the front electrical panel provides input connection to the telltale.

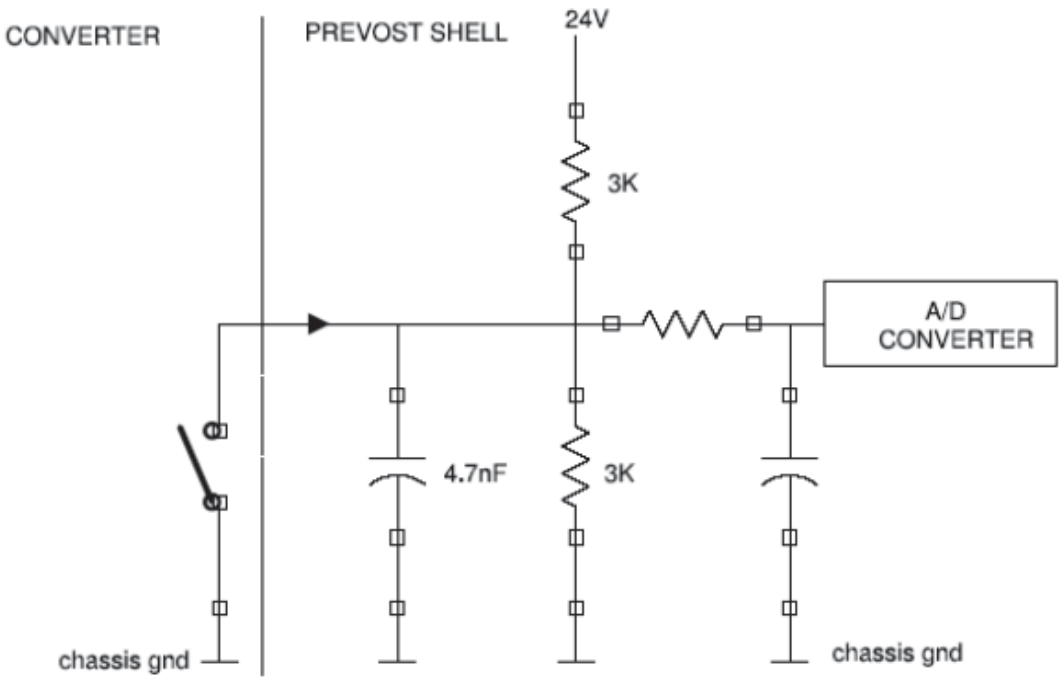
Mating connector Prevost PN: 563227 (Deutsch PN: DT06-12SB)
Socket Terminals Prevost PN # 562482 (Deutsch PN: 0462-209-16141).

Pin #	Description	Pin #	Description
1	TellTale 1 (Red)	5	TellTale 5 (Yellow)
2	TellTale 2 (Red)		
3	TellTale 3 (Yellow)		
4	TellTale 4 (Yellow)		

TellTale input specifications:

Active State (Input contact closed)
Sourcing current : 8 ma
Max allowed voltage drop across contact : 3 Volt

Inactive state (Input contact opened)
Voltage on Input: 12 V
Max allowed leakage current across contact: 3 ma



Rev: 1-4

4) Vehicle information Signals

The vehicle information signals are output signals that provide status information about the vehicle.

The connection to these signals is available from a Deutsch DT-06 connector located below the Front electrical panel.

Mating Connector Prevost PN: 563226 (Deutsch PN: DT06-12SA)
Socket Terminals Prevost PN # 562482 (Deutsch PN: 0462-209-16141).

Notes:

- The load connected on each output must be non inductive (No motors) and limited to 1 Amp maximum.
- The load must be isolated from the house battery supply using an interfacing dry contact relay or optocoupler. Do not connect directly to an input of an electronic module that gets its power supply from the house battery.

Pin #	Signals Provided	Description	Active Voltage	Max. Current
1	"Wake-Up" Ignition	Active when the Multiplexed system is waked-up. The multiplexed system wakes-up when the front door is unlocked or when the Ignition key is turned ON and remains awake for 15 minutes after the Ignition Key is turned OFF.	24 V	1 Amp
2	Transmission Neutral	Active when the Transmission is at Neutral position. Note: This signal remains valid for 15 minutes after turning the Ignition Key OFF.	24 V	1 Amp
3	Reverse Gear engaged	Active when the transmission is engaged in Reverse gear. Note: This signal remains valid for 15 minutes after turning the Ignition Key OFF.	24 V	1 Amp
4	Park Brake	Active when the park Brake is Applied. Note: This signal remains valid for 15 minutes after turning the Ignition Key OFF.	24 V	1 Amp

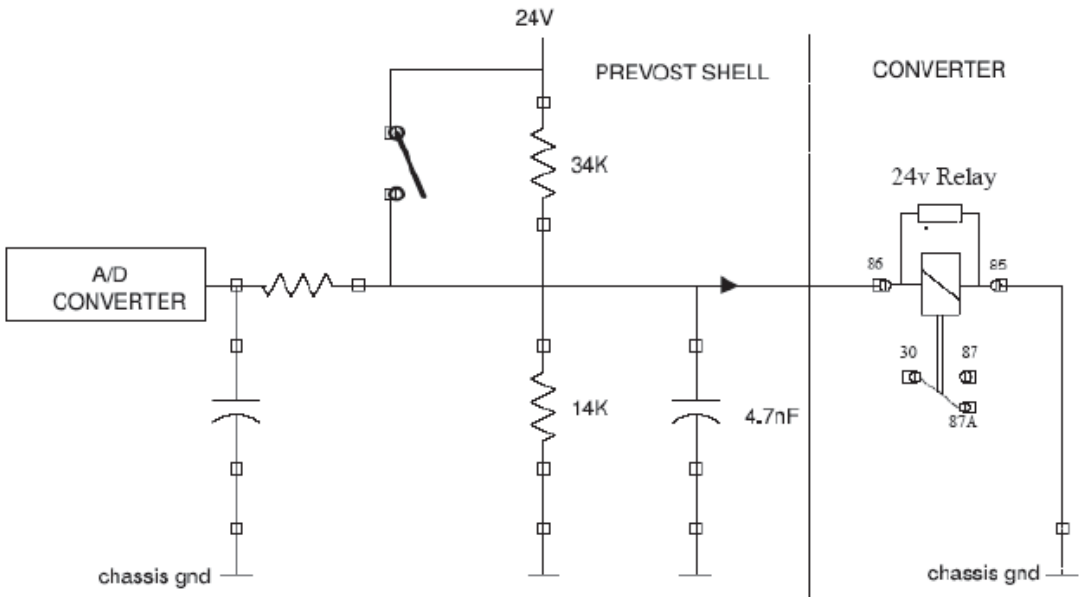
Rev: 1-4

Pin #	Signals Provided	Description	Active Voltage	Max. Current
5	Ignition	Active when the Ignition key is On.	24 V	1 Amp
6	Engine Run	Active when the Engine RPM is above 400 RPM.	24 V	1 Amp
7	Front Slide Retracting	Active when the front slide is retracting	24 V	1 Amp
8	Front slide Extending	Active when the front slide is extending	24 V	1 Amp
9	Rear Slide retracting	Active when the ear slide is retracting.	24 V	1 Amp
10	Rear Slide Extending	Active when the Rear slide is extending	24 V	1 Amp
11	Speed Signal Pulse 1	Pulses at frequency proportional to the transmission shaft speed. (16 pulses per shaft revolution) Constant Pulse Duty cycle of 50 % +/- 5 %.	12 V	8 ma
12	Speed Signal Pulse 2	Pulses at frequency proportional to the vehicle speed. (4000 pulses per Km) Constant pulse width of 4 msec	8 to 10 V	10 ma

Output Typical Circuit: (Pin # 1 to 10)

Active State
Max. current : 1 A
Min. output voltage: 22.5 V

Inactive state
Open circuit Voltage : 8 V
Leakage current: 0.8 ma



5) Slide-Out TellTale and Interlock

Connector C50 pin 1: TellTale and interlock

Providing a GND input signal on the connector C50 pin 1 does lock out the transmission and light up the Slide-out TellTale.

Connector C50 is located in the rear electrical junction box (battery box).

This input have the same specification than the TellTale inputs described in section 3.

Notes

Background Introduction:

Prevost's Multiplexed VIP and MTH shells incorporate electrical interfaces for converters. Those interface points are the only connections allowed with the bus multiplex electronic architecture.

Prevost' objective is to maintain for converters, the same connections available for non-multiplexed shells, while maintaining the integrity of the bus shell Multiplexed system.

This document defines the converter's electrical interfaces available on the H and X series Multiplexed bus shells.

Revision history

Revision	Date	Issuer	Description
3-0	June 16,2010	D. Gravel	New US10 Cluster. Section 3 Telltale lights reworked to introduce Pop-ups.
Rev 2-1	Dec 18, 2006	D. Gravel	Page 6 and 7, Possible confusion due to Converter interface connectors identified in the text as DT-06. Text changed to DT-04. Mating parts listed were correct.
Rev 2-0	Sept 25, 2006	D. Gravel	Text was generalized to cover X MTH Shells
Rev 1-4	May 16, 2006	D. Gravel	Section 4: Description of the Transmission Neutral and Park Brake signal was wrong (inverted logic)
Rev 1-3	May 9, 2006	D. Gravel	Section 4, Pinout revised to match electrical schematics page 36.1
Rev 1-2	Oct 17, 2005	D. Gravel	Section 5 added. Inputs for Slide-Out TellTale and transmission interlock
Rev 1-1	April 11, 2005	D. Gravel	Section 3): Number of Tell Tales available to converters reduced from 7 to 5.
Rev 1-0	Feb 8, 2005	D. Gravel	First Issue

1) Trailer Lights

Pin #	Signals provided:	Voltage	Max current
1, 8	GND	0V	20 Amp
2	Backup Lights	12 V	4 Amp
3	Left Flasher	12 V	8 Amp
4	Brake lights	12 V	8 Amp
5	Right Flasher	12 V	8 Amp
6	Markers Lights	12 V	8 Amp
7	ABS Power	12 V	10 Amp

A Connector located in the Engine compartment is provided standard on all Multiplexed shells.
The connector is a Deutsch 12 pins DT06 Series located in the engine compartment.
At vehicle delivery, the connector is capped with plug.

Mating connector Prevost PN # 563613 (Deutsch PN: DT04-12SA)
Socket Terminals Prevost PN # 562481 (Deutsch PN: 0460-215-16141).

2) Power terminal strips

Note:

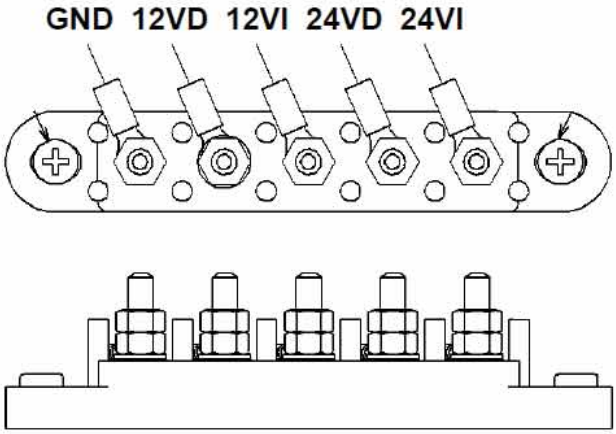
Loads connected to "Battery direct" supply should be considered for battery discharge since it will drain current on a permanent basis when the vehicle is parked. Typical use should be for devices that need small current for a short period of time, for example to recharge cell phone batteries.

If larger loads are connected to Battery direct supply, they must incorporate a timer device that automatically shuts off the device within 15 minutes after the vehicle ignition is turned OFF.

One way to implement a 15 minutes timer is to use the "Wake-Up" signal described in section 4 to command a relay.

a) Front terminal strip

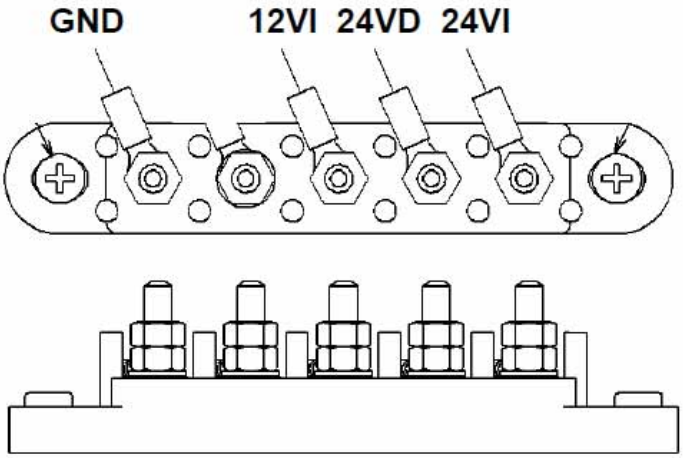
5 "screw type" studs for ¼ inches ring terminals.
Located in the front electrical junction box.



Power Provided	Description	Fuse Rating	Maximum current
+24 VI	24 Volt Ignition	15 Amp	12 Amp
+24 VD	24 Volt Battery Direct	7.5 Amp	5 Amp
+12 VI	12 Volt Ignition	15 Amp	12 Amp
+12 VD	12 Volt Battery Direct	15 Amp	12 Amp

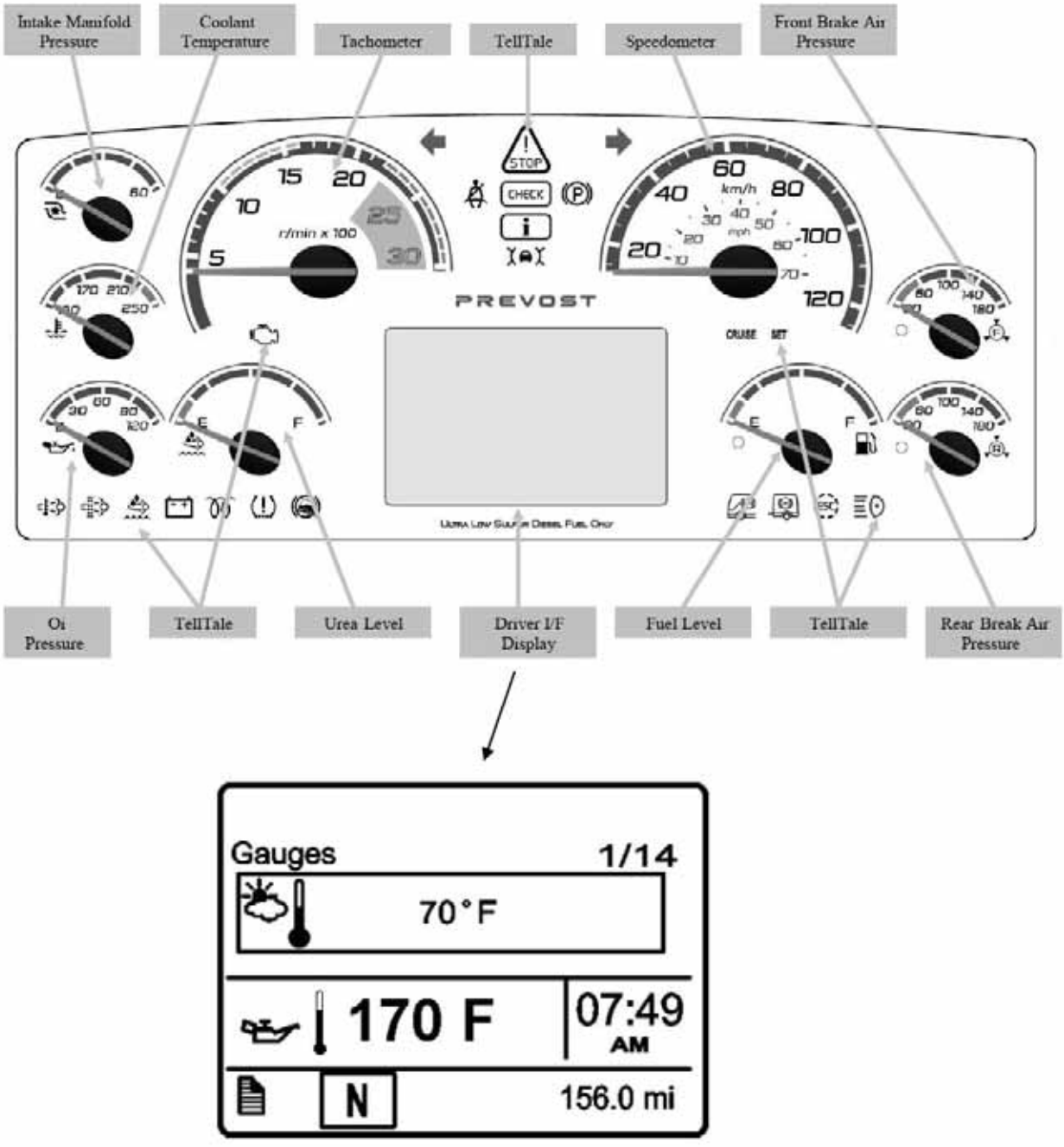
b) Rear Terminal strip

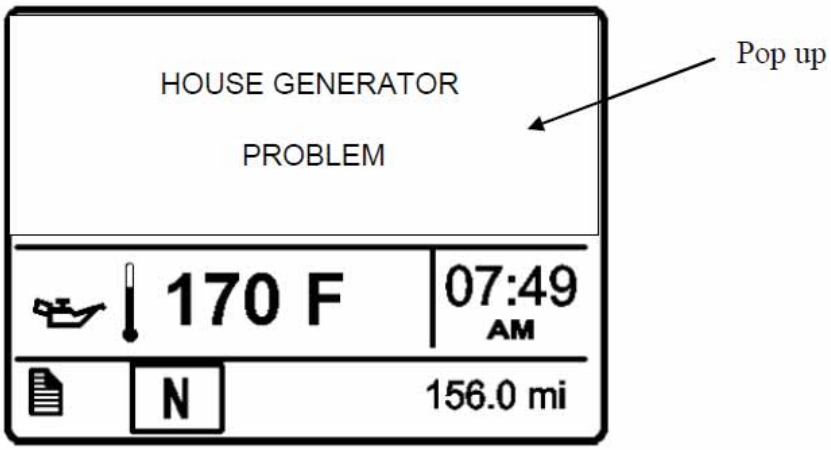
4 "screw type" studs for ¼ inches ring terminals.
Located in the battery electrical junction box.



Available connections	Description	Fuse Rating	Maximum current
+24 VI	24 Volt Ignition	7.5 Amp	5 Amp
+24 VD	24 V Battery Direct	25 Amp	12 Amp
+12 VI	12 V Ignition	10 Amp	8 Amp

3) Pop-ups available to converters





There are 8 Popups available to converters.

HOUSE GENERATOR PROBLEM	RETRACT SLIDES PRIOR TO DEPARTURE
SHORE POWER CORD STILL OUT	ROOF ANTENNAS EXTENDED
HOUSE ALTERNATOR 1 or 2 IN FAULT	CLOSE FRONT BUMPER
AWNING WINDOWS OPENED	STORE SIDE AWNINGS

Connector CC1:
A 12 positions Deutsch DT-04 series connector located below the front electrical panel controls the activation of these popups.

The 8 pop-ups are triggered by applying a GND on the corresponding pin of this connector.

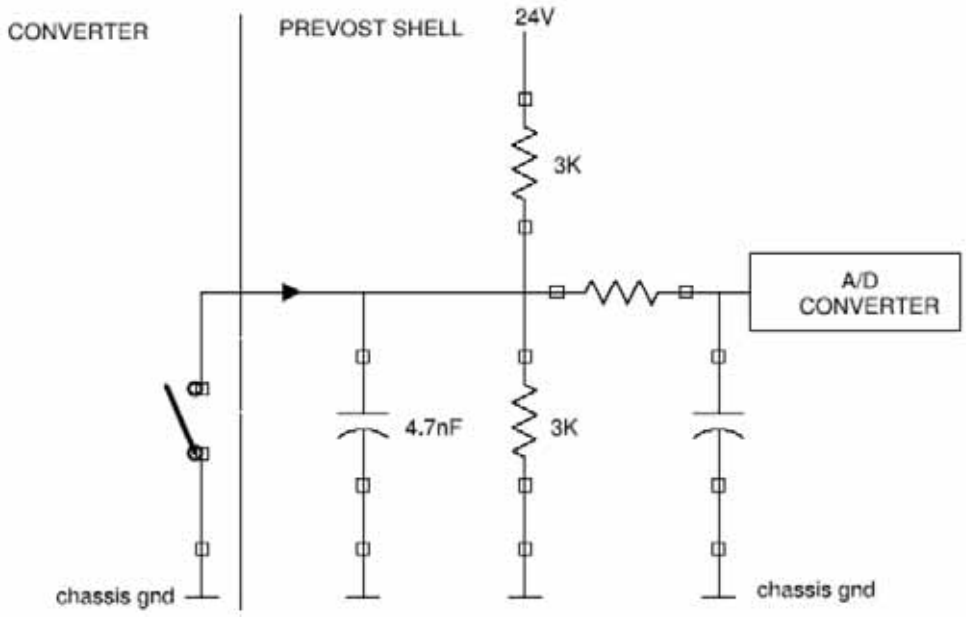
Mating connector Prevost PN: 563227 (Deutsch PN: DT06-12SB)
Socket Terminals Prevost PN # 562482 (Deutsch PN: 0462-209-16141).

Pin #	Popup	Pin #	Popup
1	Retract Slides	5	House Generator problem
2	Roof Antennas	6	
3	Bumper	7	
4	Side Awning	8	Shore Power Cord
9	House Alternator	10	Awning Window

Connection specifications:

Active State (Input contact closed)
Sourcing current : 8 ma
Max allowed voltage drop across contact : 3 Volt

Inactive state (Input contact opened)
Voltage on Input: 12 V
Max allowed leakage current across contact: 3 ma



4) Vehicle information Signals

Connector CC2:
The vehicle information signals are output signals that provide status information about the vehicle.

The connection to these signals is available from a Deutsch DT-04 connector located below the Front electrical panel.

Mating Connector Prevost PN: 563226 (Deutsch PN: DT06-12SA)
Socket Terminals Prevost PN # 562482 (Deutsch PN: 0462-209-16141).

Notes:

- The load connected on each output must be non inductive (No motors) and limited to 1 Amp maximum.
- The load must be isolated from the house battery supply using an interfacing dry contact relay or optocoupler. Do not connect directly to an input of an electronic module that gets its power supply from the house battery.

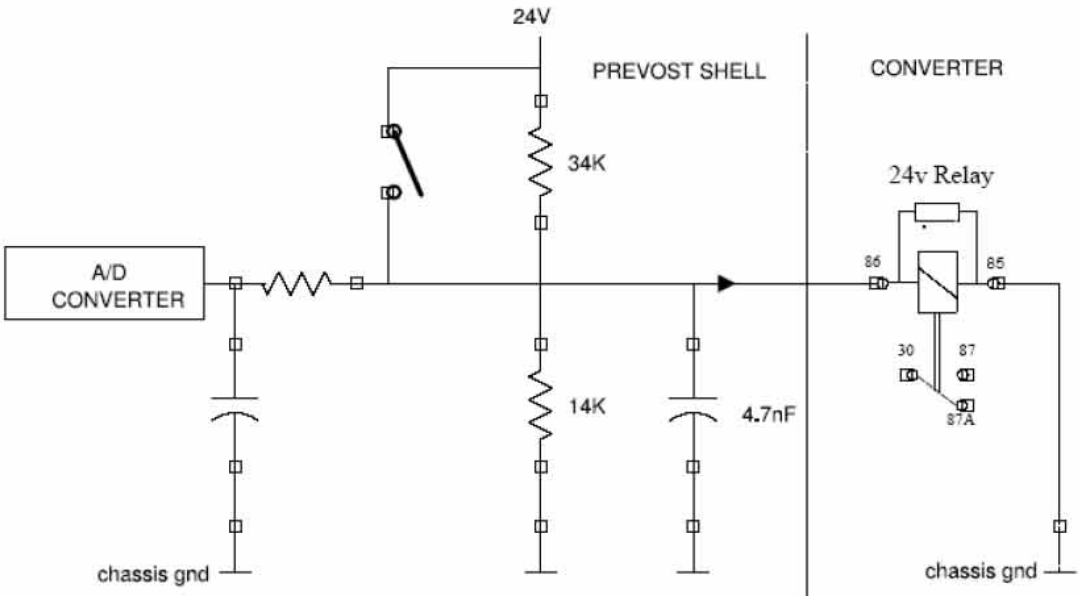
Pin #	Signals Provided	Description	Active Voltage	Max. Current
1	"Wake-Up" Ignition	Active when the Multiplexed system is waked-up. The multiplexed system wakes-up when the front door is unlocked or when the Ignition key is turned ON and remains awake for 15 minutes after the Ignition Key is turned OFF.	24 V	1 Amp
2	Reverse Gear engaged	Active when the transmission is engaged in Reverse gear. Note: This signal remains valid for 15 minutes after turning the Ignition Key OFF.	24 V	1 Amp
3	Transmission Neutral	Active when the Transmission is at Neutral position. Note: This signal remains valid for 15 minutes after turning the Ignition Key OFF.	24 V	1 Amp
4	Park Brake	Active when the park Brake is Applied. Note: This signal remains valid for 15 minutes	24 V	1 Amp

Pin #	Signals Provided	Description	Active Voltage	Max. Current
		after turning the Ignition Key OFF.		
5	Ignition	Active when the Ignition key is On.	24 V	1 Amp
6	Engine Run	Active when the Engine RPM is above 400 RPM.	24 V	1 Amp
7	Front Slide Retracting	Active when the front slide is retracting	24 V	1 Amp
8	Front slide Extending	Active when the front slide is extending	24 V	1 Amp
9	Rear Slide retracting	Active when the ear slide is retracting.	24 V	1 Amp
10	Rear Slide Extending	Active when the Rear slide is extending	24 V	1 Amp
11	Speed Signal Pulse 1	Pulses at frequency proportional to the transmission shaft speed. (16 pulses per shaft revolution) Constant Pulse Duty cycle of 50 % +/- 5 %.	12 V	8 ma
12	Speed Signal Pulse 2. **(Not Available)**	Pulses at frequency proportional to the vehicle speed. (4000 pulses per Km) Constant pulse width of 4 msec. **(Not Available)**	8 to 10 V	10 ma

Output Typical Circuit: (Pin # 1 to 10)

Active State
Max. current : 1 A
Min. output voltage: 22.5 V

Inactive state
Open circuit Voltage : 8 V
Leakage current: 0.8 ma



Precautions to be observed before welding

Caution: *Cut off battery power in main power compartment using battery safety switch.*

1. Disconnect *"Ground"* cables from battery terminals**.**

Note: ***Disconnect "Ground" cables only.***

2. Disconnect all electronic control modules (radio & control head, HVAC, TTLT cluster Volvo). You must also disconnect alternator module located in front service compartment (main power compartment on H3).
3. Disconnect three wiring harness connectors from ECM (Electronic Control Module). The ECM is mounted on the starter side of the engine.
4. For vehicles equipped with an Allison (or ZF-Astronic) automatic transmission, disconnect three wiring harness connectors from ECU (Electronic Control Unit). The ECU is located in front service compartment (main power compartment on H3).
5. For vehicles equipped with WCL system, disconnect electronic controller connector.
6. For vehicles equipped with ABS (Anti-Lock Brake System), disconnect wiring harness connectors from ABS Electronic Control Unit. The ABS Electronic Control Unit is located in front service compartment.
7. **Cover electronic control components and wiring to protect from hot sparks, etc.**
8. **Do not connect ground clamps to electronic control components.**
9. **Do the appropriate welding on vehicle.**

Caution: ***Position welding machine ground clamp as close as possible to the work.***

10.When welding is complete, reconnect ECM, automatic transmission and ABS electronic control units, etc.

11. Complete by reconnecting *"Ground"* cables to battery terminals**.**

STEEL – STEEL WELDING

Caution: *Before welding, disconnect electronic modules and battery terminals.*

Warning: *Welding surfaces must be free of scale, slag, rust, paint, grease, humidity or other foreign material that would render welding impossible.*

Warning: *Only a qualified and experienced person must do welding.*

? FCAW (Flux Cored Arc Welding) process ;

? Electrode wire conforms to A5.20 AWS (American Welding Society) specifications ;

? **E4801T-9-CH, type electrode wire with 0,045" diameter (1,14 mm) ;**

Material Thickness	Voltage	Current	Wire Feed Rate	Shielding Gas
1/8" to ½"	**26 ± 2 volts**	**260 Amps**	**450 ipm. approx.**	**75% argon – 25% CO2 or 100% CO2**

If necessary and with great care to prevent perforating the material, it is possible to use a conventional electric arc welding machine according to the following specifications:

? SMAW (Shielded Metal-Arc Welding) process ;

? Welding rod conforms to A5.1 of AWS (American Welding Society) specifications; E 7018 type welding rod with 1/8" diameter (3,2 mm).

Precautions to be observed before welding

? Current: 100 amperes to 150 amperes; optimum at 120 amps.

It is important to grind weld bead starts and stops and also to grind arc strikes from surfaces.

STEEL - STAINLESS STEEL OR STAINLESS STEEL - STAINLESS STEEL WELDING

Caution: *Before welding, disconnect electronic modules and battery terminals.*

Warning: *Welding surfaces must be free of scale, slag, rust, paint, grease, humidity or other foreign material that would render welding impossible.*

Warning: *Only a qualified and experienced person must do welding.*

? GMAW (Gas Metal-Arc Welding) process;

? Welding wire conforms to AWS (American Welding Society) A5.9 specifications;

? 308LSi type welding wire with 0.035" diameter (0,9 mm);

STEEL - STAINLESS STEEL WELDING

Steel Thickness	SS Thickness	Voltage	Current	Wire Feed Rate	Shielding Gas
Less than 1/8”	**Any type**	**20±1.5 volts**	**130±15 Amps**	**290 ipm approx.**	**90% He, 7.5% Ar, 2.5% CO2**
1/8” and more	**Any type**	**22±1.5 volts**	**160±15 Amps**	**330 ipm approx.**	**90% He, 7.5% Ar, 2.5% CO2**

STAINLESS STEEL - STAINLESS STEEL WELDING

SS Thickness	Voltage	Current	Wire Feed Rate	Shielding Gas
Any type	**20 ± 1.5 volts**	**130 ± 15 Amps**	**290 ipm approx.**	**90% He – 7.5% Ar, 2.5% CO2**

If necessary and with great care to prevent perforating the material, it is possible to use a conventional electric arc welding machine according to the following specifications:

? SMAW (Shield Metal-Arc Welding) process;

? Welding rod conforms to AWS (American Welding Society) A5.4 specifications; 308L-17 type welding rod with 3/32" diameter (2,4 mm);

? **Current: - 50 amperes to 90 amperes, optimum at 60 amperes.**

It is important to grind weld bead starts and stops and also to grind arc strikes from surfaces.

MULTIPLEX MODULES DISCONNECTION PROCEDURE PRIOR TO WELDING

PROCEDURE NO: PR060034	REVISION 4 2007-05-31

Material : N/A

Equipment(s) : Phillips-head screwdriver
Ratchet handle
3/8" socket
Electric tape
Long nose pliers

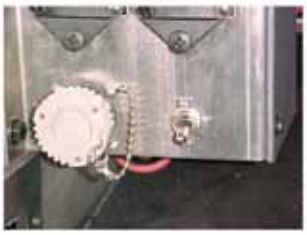
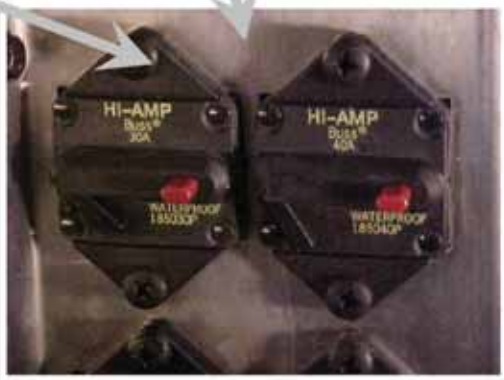
Reference schematics: N/A

Safety rules :
- Wear safety goggles
- Set the battery master switch to the OFF position first

Recommendations: **This procedure should be performed by qualified personnel only.**

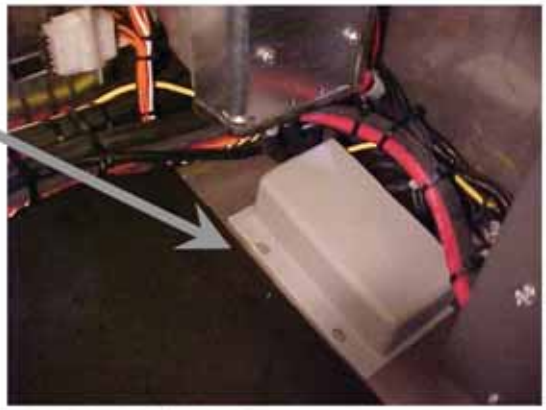
	Effective
Revision 0 : Issued with multiplex	
Revision 1 : Modified for Fire Protection System and also for VIP with multiplex	
Revision 2 : Step 5 modified for introduction of VIP with multiplex	**-0436**
Revision 3 : Step 1.15 added C397 **Addition of SECTION 2 for X3 Coaches** **Addition of SECTION 3 for XLII MTH**	
Revision 4 : Modified for introduction of CPC module for VIP,H3 Coach, X3	**7-0942VIP** **8-1037 H3** **8-9282 X3**

SECTION 1 H3 Coaches & VIP

1.00	**Location: Main power compartment and dashboard** Set the battery master switch to the OFF position. Place the ignition switch to the OFF position.	 
1.05	**Location: Main power compartment** Trip circuit breakers CB2, CB4, CB6 Push the red button to open the circuit	 

1.10 **Location: Main power compartment**

Remove the protective cover



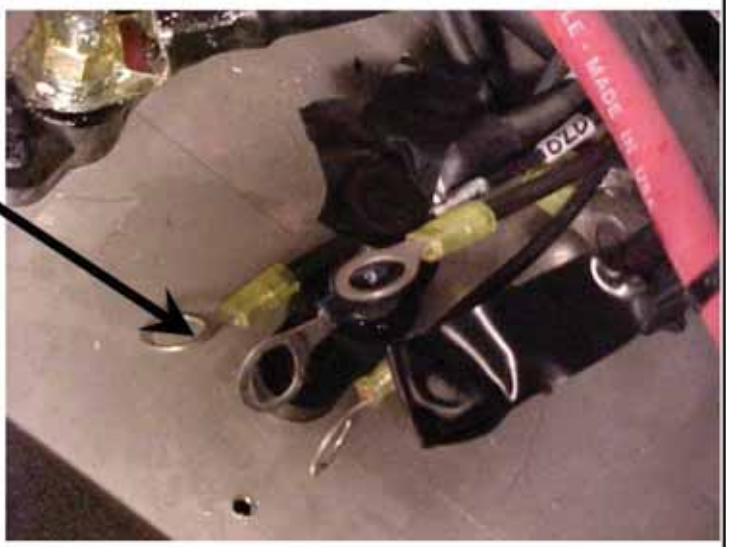
⚠ WARNING ⚠

LIVE WIRE

This 12-volt terminal remains energized

Disconnect the electronic ground terminals from the stud

Using electric tape, insulate the 2 largest gage wires. Make sure the ring terminals do not touch each others and the vehicle body.



NOTE

With disconnection of the electronic ground terminals, disconnecting the engine ECM, transmission TCM and the dashboard electronic components (telltale module, HVAC module, radio, control head, …) is not required.

1.15 **Location: Main power compartment**

Disconnect the electronic modules :

Disconnect the I/O A and I/O B modules

Disconnect C397

Disconnect connector C717

Unplug 3 connectors per I/O B modules

Unplug 3 connectors on the I/O A module

1.20 **Location: Front electrical compartment**

VIP + COACH: Disconnect the I/O A, I/O B, ABS, master ID, CECM and CPC modules. Unplug connector C92

VIP: Disconnect all keyless module connectors.

Unplug 3 connectors per I/O B modules and 3 connectors per I/O A modules.

Unplug 2 connectors from the ABS module

Unplug 1 connector from the master ID

Disconnect CPC connectors

Unplug 3 connectors from the CECM

Unplug connector C92

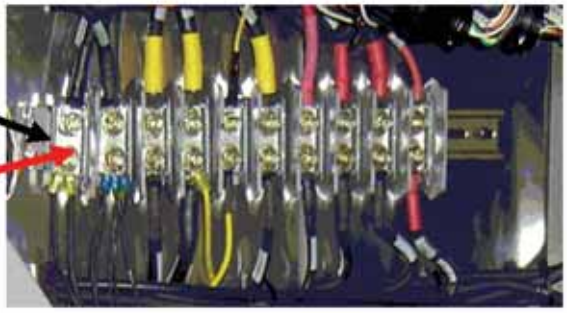
1.25	**Location: pneumatic accessory panel inside right console** Remove the access panel on the right console (R.H. side of dashboard) Disconnect both I/O B modules	
1.30	**Location: Evaporator compartment** Remove the protective cover and disconnect the I/O B module	

1.40	**Kidde Automatic Fire Detection and Suppression System (optional)** Disconnect C466 Kidde AFSS module is located on the lateral control panel.	
1.45	When all the previous steps are done, you can do welding on the vehicle	**ENSURE THAT THE WELDING GROUND RETURN CLAMP IS WELL SECURED AND MAKES A GOOD ELECTRICAL CONTACT WITH A LARGE METALLIC AREA OF THE CHASSIS LOCATED NEAR THE WELDING POINT AS MUCH AS POSSIBLE.**
1.50	**When welding is completed, reconnect all the modules.** Make sure that the connectors locking tab are well engaged	**BE CAREFUL TO MAKE THE PROPER CONNECTIONS, IF NOT, SOME SYSTEMS OR COMPONENTS MAY NOT BE USABLE**

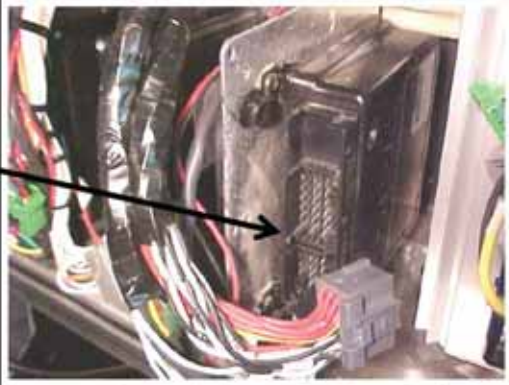
Notes

SECTION 2 X3 Coaches

2.00	**Location: Rear electrical compartment and dashboard** Set the battery master switch to the OFF position. Place the ignition switch to the OFF position.	 
2.05	**Location: Rear electrical compartment** Trip circuit breakers CB2-CB4-CB6 located on rear junction panel Push the red button in to open the circuit	 

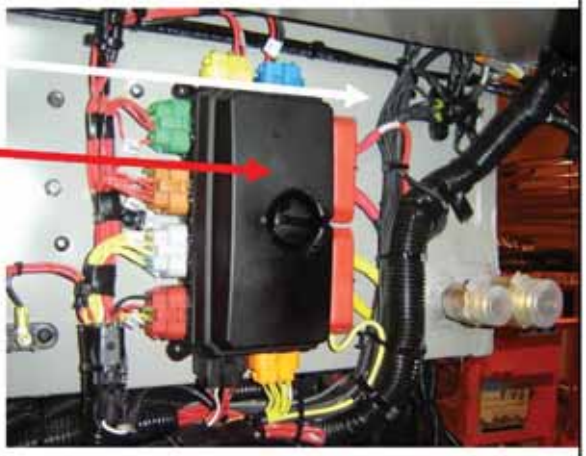
2.10	**Location: Rear electrical compartment** Disconnect the electronic ground terminals from this stud **Warning: The remaining terminals may still be energized** Use electric tape; make sure that cables do not touch each others and the vehicle body. *NOTE* ***With disconnection of the electronic ground terminals, disconnecting the engine ECM, transmission TCM and the dashboard electronic components (telltale module, HVAC module, radio, control head, …) is not required.***	
2.15	**Location: Rear electrical compartment** Disconnect the electronic modules: Disconnect all I/O A and I/O B modules Disconnect C397 and C717 Disconnect 3 connectors from each I/O B module Disconnect 3 connectors from each I/O A module	

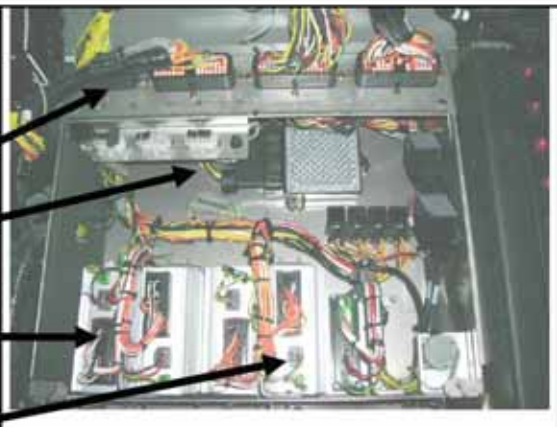
Notes;_____

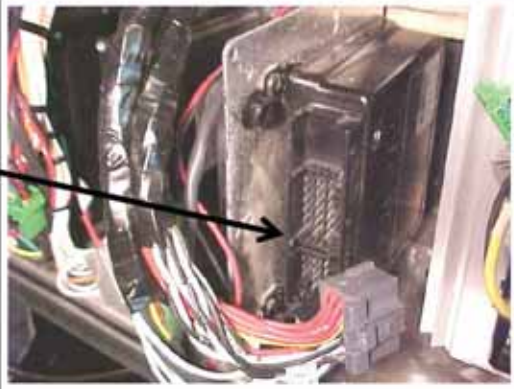
2.20	**Location: front electrical compartment** Disconnect I/O A, I/O B, ABS, master ID, CECM and CPC modules and also disconnect connector C92 Disconnect the 3 connectors from the I/O B and I/O A modules	
	Disconnect the 2 connectors from the ABS module	
	Disconnect CPC connectors	
	Disconnect connector from master ID	

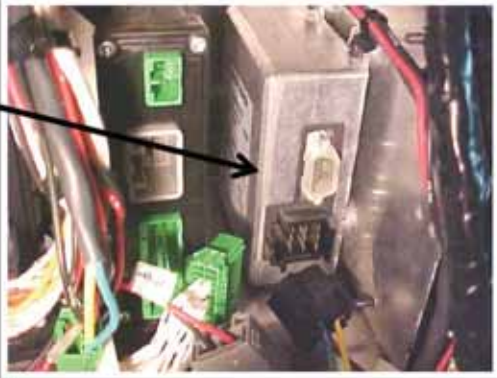
	Disconnect the 3 connectors from CECM	
	Disconnect connector C92	
2.25	**Location: Entrance door & wiper control panel** Remove windshield wiper motor access panel and disconnect both I/O B modules	
2.30	When all the previous steps are done, you can do welding on the vehicle	**ENSURE THAT THE WELDING GROUND RETURN CLAMP IS WELL SECURED AND MAKES A GOOD ELECTRICAL CONTACT WITH A LARGE METALLIC AREA OF THE CHASSIS LOCATED NEAR THE WELDING POINT AS MUCH AS POSSIBLE**
2.40	**When welding is completed, reconnect all the modules.** Make sure that the connectors locking tab are well engaged!	**BE CAREFUL TO MAKE THE PROPER CONNECTIONS, IF NOT, SOME SYSTEMS OR COMPONENTS MAY NOT BE USABLE**

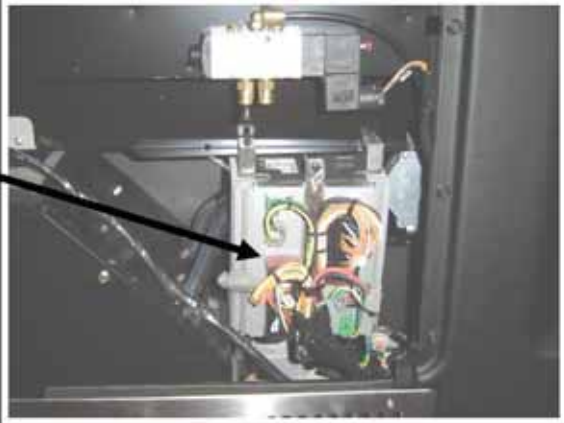
SECTION 3 XLII MTH

2.00	**Location: Dashboard** Place the ignition switch to the OFF position.	
2.05	**Location: Engine compartment R. H. side area** Trip circuit breakers CB1-CB2 located on circuit breaker panel. Push the blue button in to open the circuit	
2.10	**Location: Rear Junction Box** Disconnect the electronic ground terminals from this stud. **Warning: The remaining terminals may still be energized.** Use electric tape; make sure that cables do not touch each others and the vehicle body. *NOTE* ***With disconnection of the electronic ground terminals, disconnecting the engine ECM, transmission TCM and the dashboard electronic components (telltale module, HVAC module, radio, control head, ...) is not required.***	

2.15	**Location: Rear Junction Box** Disconnect the electronic modules: Disconnect all I/O A and I/O B modules Disconnect C397 Disconnect transmission module (A1) Disconnect 3 connectors from each I/O B Disconnect 3 connectors from each I/O A	

2.20	**Location: Front Electrical Compartment** Disconnect I/O A, I/O B, ABS, master ID, CECM, CPC, keyless modules and also disconnect connector C92. Disconnect 3 connectors from the I/O B and I/O A modules Disconnect connectors from Keyless module	
	Disconnect 2 connectors from ABS module	

Disconnect connectors from CPC	
Disconnect connector from master ID	
Disconnect 3 connectors from CECM	
Disconnect connector C92 [redacted]	

	Location: Wiper Control Panel Remove windshield wiper motor access panel And disconnect I/O B modules	
2.30	When all the previous steps are done, you can do welding on the vehicle	**ENSURE THAT THE WELDING GROUND RETURN CLAMP IS WELL SECURED AND MAKES A GOOD ELECTRICAL CONTACT WITH A LARGE METALLIC AREA OF THE CHASSIS LOCATED NEAR THE WELDING POINT AS MUCH AS POSSIBLE**
2.35	**When welding is completed, reconnect all the modules.** Make sure that the connectors locking tab are well engaged!	**BE CAREFUL TO MAKE THE PROPER CONNECTIONS, IF NOT, SOME SYSTEMS OR COMPONENTS MAY NOT BE USABLE**

Notes;_____

NUMBER: 14–**60**–00 Rev. **S.M. REF.:** 8.2 **ENGINE:** 60 **DATE:** August 2000

REVISION: A vertical bar indicates change. Please discard Service Information 14–60–00 dated July plus manual attachment pages and file this in its place.

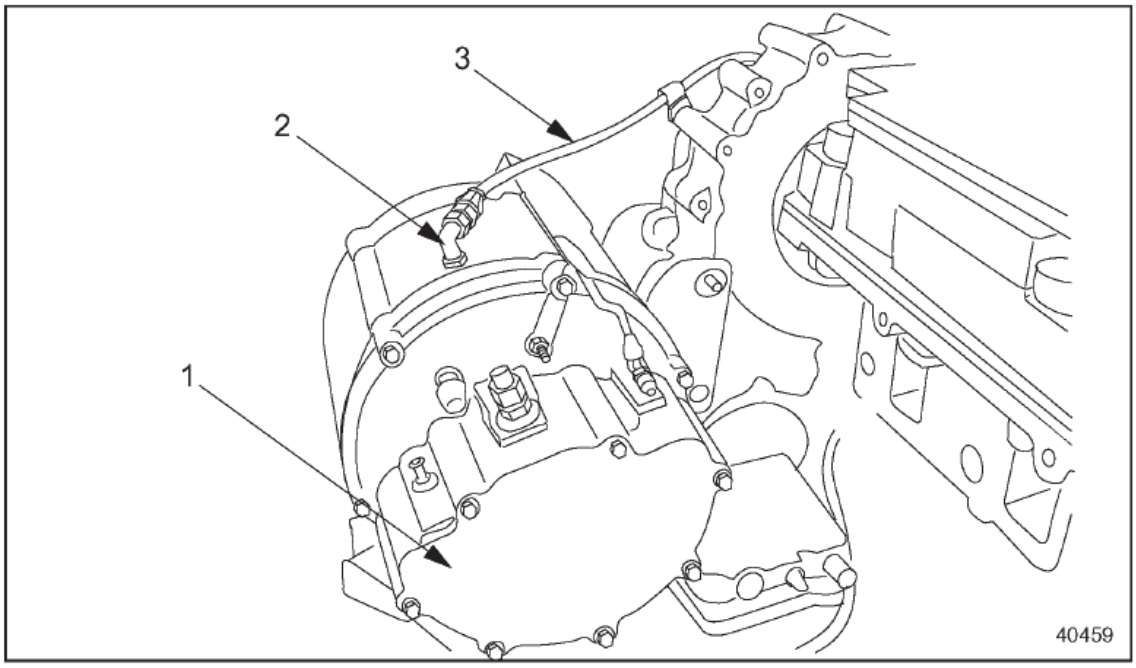
SUBJECT: IMPROVED VENT LINE ON 50DN ALTERNATOR

INTRODUCTION

To provide improved venting of the oil-cooled 50DN alternator on Series 60 engines, a larger diameter vent line is now used. This change took effect in June 2000.

DETAILS AND REASON

A larger diameter vent line has been released to provide improved venting for the oil-cooled 50DN alternator. The improved venting system uses a No. 6 steel-braided hose in place of the former No. 4 hose. See Figure 1.

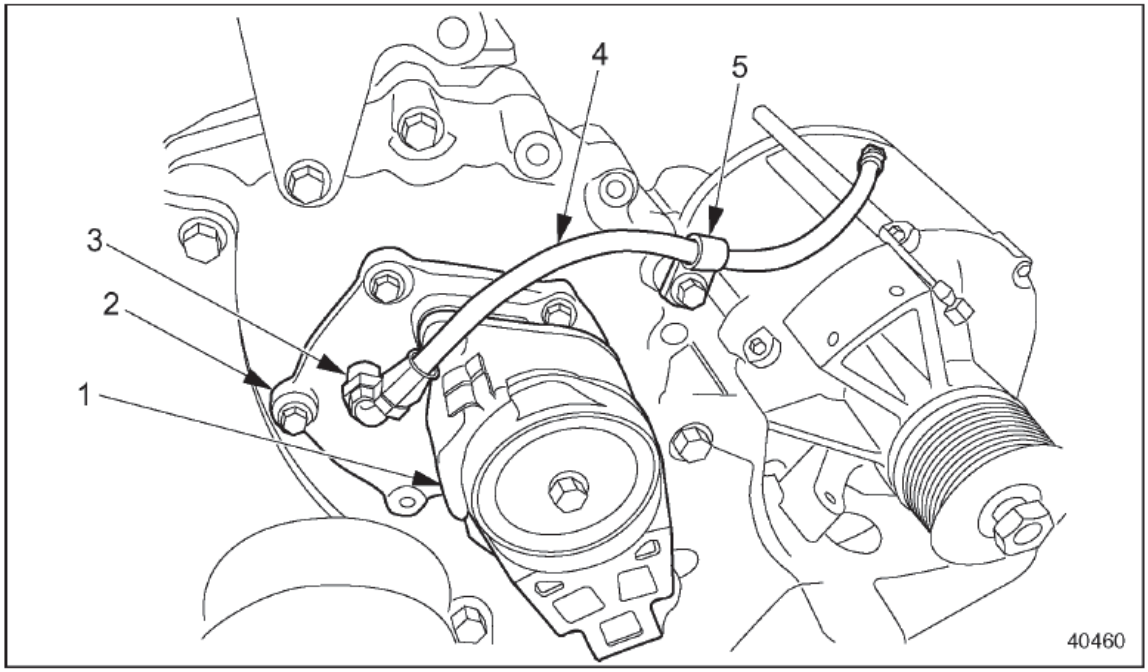


1. 50DN Alternator Assembly
2. Elbow, 3/8 in. Flare to 1/4 in. NPTF, 90 Degree
3. Vent Line, Alternator

Figure 1 Vent Line Installed in 50DN Alternator

The larger I.D. of the hose provides improved venting and helps eliminate the potential for vent line plugging. This improvement helps avoid high oil levels in the alternator, which can lead to insufficient cooling of alternator components. The improved line can help extend alternator life.

To conform with this change, a 90 degree, 3/8 in flared elbow is now installed in the 1/4 in. NPTF alternator vent hole. In addition, the engine vent line attachment location has been changed from the back of the gear case to a tapped hole in the drive belt auto-tensioner mounting plate. See Figure 2.



1. Auto Tensioner Assembly
2. Mounting Plate, Auto Tensioner Assembly
3. Connector, 3/8 in. Flared to 1/4 in. NPTF, Straight
4. Vent Line, Alternator
5. Clip, Hose

Figure 2 Vent Line Installed in Auto Tensioner Mounting Plate

The parts required for the change to the improved vent line are listed in Table 1.These parts are available in service kit P/N 23528624.

Part Number	Quantity	Description
FAHP0190	1	Hose Asm., No. -6 X 21.40 L. H&P FC186
8929833	1	Connector, 3/8 in. Flared to 1/4 in. NPTF, Straight, Brass
8924998	1	Elbow, 90 Degree, 3/8 in. Flared to 1/4 in. NPTF, Brass
2476234	1	Clip, .500 Dia. Hose, 3/8 in. Bolt Hole
8924380	1	Plug, 1/8 in. NPTF Sq. Skt. Head, Coated
18SP527	1	Installation Instructions

Table 1 Improved Vent Line Components (Service Kit P/N 23528624)

INSTALLATION OF THE IMPROVED VENT LINE

The improved vent line is installed between the alternator case and the drive belt auto-tensioner mounting plate on the gear case cover. Existing Series 60 engines with auto tensioner assemblies and engines with former manual drive belt tensioner assemblies may be modified to accept the improved vent line. Use the following procedures:

Installation of Vent Line in Drive Belt Auto Tensioner Assembly Mounting Plate

On engines with current drive belt auto tensioner assemblies, install the improved vent line between the alternator and the tensioner mounting plate as follows:

CAUTION:

To avoid injury from hot surfaces, allow engine to cool before removing any component.

CAUTION:

To avoid injury from accidental engine start-up when servicing the engine, disconnect/disable the starting system.

ITEMS TO CHECK WHEN REPLACING A 50 DN ALTERNATER

1) Ensure the replacement alternater is up to date on Delco recommended improvements.
Check with Delco or your supplier/rebuilder for information this.

2) Ensure alteranter is correct for volt and amp rating.
Sometimes the wrong alternater is pulled from the shelf.

3) Ensure the oil feed line to and the oil drain line from the alternater **and** all associated fittings are free and clear.
On Series 60 applications the oil feed line originates down near the air compressor.

4) Ensure alternater oil drain line is free and clear of any restrictions. Use air line to ensure drain line is free all the way into the oil pan or remove drain line and visually inspect.

5) If required, update the vent line into the alternater. The new vent line is part of a non-warranty update from Detroit Diesel. The old #4 Aeroquip line is discarded and its source plugged. The new line is a #6 Aeroquip and it is installed at a new location on the gear case. **SEE DETROIT DIESEL BULLETIN 14-60-00!**

6) There is no separate ground for the 50DN. Ensure the mounting pads for the alternater on the cradle are free of rust and corrosion. If there is corrosion in this area it can cost you amps!

7) Ensure the correct length bolts are used in the alternater. On the pulley end these bolts thread into open holes. On the **rectifier end**, however, the bolts thread into blind bushings and **if the bolts are too long,** they can damage the stator. There is maximum of .600" case penetration (threading) allowed.

ITEMS TO CHECK WHEN REPLACING A 50 DN ALTERNATER

8) Torque the four retaining bolts using a calibrated torque wrench. The two bolts at the pulley end of the alternater thread into 1/2x13 open holes threaded into the alternater case. Their torque is 65-75 pounds foot. The two bolts that thread into the stator case thread into 1/2x13 bushings and are torqued to 55-65 pounds foot.

9) Use hardened washers under the bolt heads. If standard washers are used they can deform and allow the alternater to move.

10) **Ensure all cables and wires are securely clamped to the alternater in accordance with Prevost installation or bulletins. Ensure cable and wires are completely secured throughout their entire length.**

11) Upon installation do not task the alternater until it is oil charged. On Series 60, just leave the belt off, and run the engine for a few minutes. On Series 92/71, leave the field wire disconnected and run the engine for a few minutes.

This will allow the alternater to become oil charged BEFORE you task it with a charging load.

12) On Series 60, ensure there is a spare belt in the road kit and ensure this is the correct belt for the application.

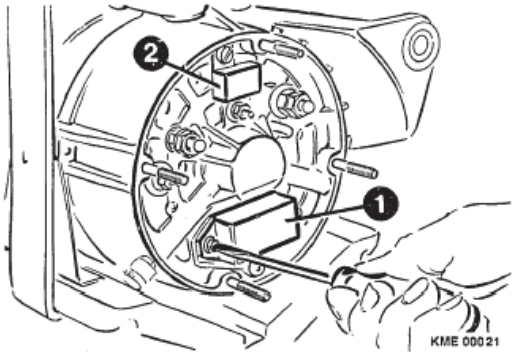


Figure 6 Voltage Regulator (1) and Suppression Capacitor (2)

9.2.1 Brush Replacement

1. The exposed length of the carbon brushes must be measured to determine if they require replacement. Measure the length of each brush. If the exposed brush length is less than 7 mm (0.276"), the brush must be replaced. (Figure 7)

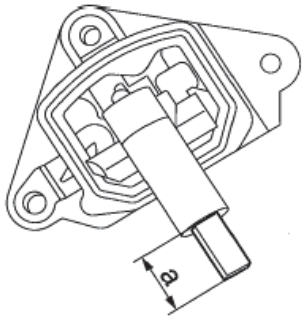


Figure 7 Brush Length Measurement

2. To replace the brushes, the brush lead must be unsoldered and the brush removed from the regulator.
3. Insert the new brush into the regulator and solder the brush lead to the regulator.

Note: Use only rosin-core solder to attached the brush lead.

4. Check the brushes for freedom of movement after they are soldered.
5. Measure the exposed length of the new brushes. The exposed length should be 16 mm (0.630")

9.3 Noise Suppression Capacitor Testing and Removal

1. Disconnect the suppression capacitor from terminal B+.

2. Connect Multimeter MMD 302 (Bosch Number 0 684 500 302) or equivalent to the lead of the suppression capacitor and the B- terminal of the alternator. (Figure 8)

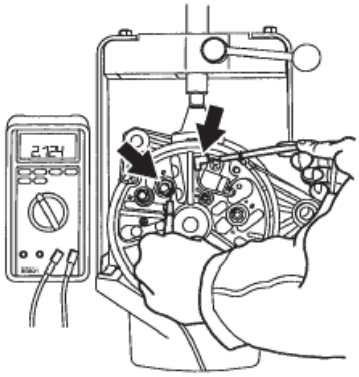


Figure 8 Testing of Suppression Capacitor

3. Measure the capacitance of the suppression capacitor. If the capacitance does not read between 1.8 and 2.6 μF (microfarad), the capacitor must be replaced.

4. Remove the screw that secures the suppression capacitor and remove capacitor.

Note: After removing the suppression capacitor from the alternator, the capacitor lead should be shorted to the capacitor-mounting strip to discharge the capacitor. Failure to do so may cause the capacitor to discharge while being cleaned.

Bosch Recommends:

100K miles brush / regulator replacement
200K miles bearing replacement

For complete repair instructions see:
Bosch repair and testing instructions for the T-1 Alternator
Electrical System of the Prevost Manual

MAINTENANCE INFORMATION Mi11-13

DATE : MARCH 2011	SECTION : 06 - Electrical
SUBJECT : BOSCH HD10 ALTERNATOR • BRUSH REPLACEMENT	

DESCRIPTION

Use the following procedure to perform the replacement of the Bosch HD10 alternator brush holder when required.

BOSCH HD10 ALTERNATOR SERVICING SCHEDULE	
DESCRIPTION	ODOMETER READING
Commuter application, check alternator brush and replace if necessary	Every 50 000 miles / 80 000 km
All other applications, check alternator brush and replace if necessary	Every 100 000 miles / 160 000 km

Replacement parts:

Part No.	Description	Qty
20523391	Brush holder (including brushes) and voltage regulator assembly	1

NOTE

Material can be obtained through regular channels.

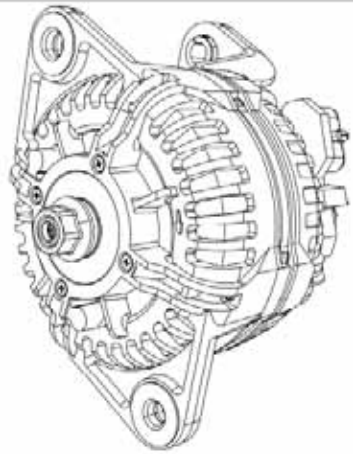


FIGURE 1: BOSCH HD10 ALTERNATOR

HOW TO IDENTIFY WHICH ALTERNATOR IS DEFECTIVE

ALTERNATOR telltale

When an alternator is not charging, the instrument cluster ALTERNATOR telltale will illuminate.

To identify which alternator is defective (1=lower alternator, 2=upper alternator), proceed as follows:

1) On the DID (Driver Information Display), select DIAGNOSTICS menu *(on older vehicles equipped with the Message Center Display, perform a system diagnostic by selecting SYSTEM DIAGNOSTIC).*

2) Select VIEW ACTIVE FAULTS and then ELECTRICAL SYSTEM *(on vehicle equipped with the Message Center Display, select FAULT DIAGNOSTIC and then ELECTRICAL SYSTEM).*

3) The active electrical system faults will appear. Scroll through the active faults. You will find one of the following messages:

MID (188) ELECTRICAL SYSTEM
PSID 34 ALTERNATOR 1
FMI (5) OPEN CIRCUIT

MID (188) ELECTRICAL SYSTEM
PSID 35 ALTERNATOR 2
FMI (5) OPEN CIRCUIT

PROCEDURE

DANGER

Park vehicle safely, apply parking brake, stop engine and set battery master switch(es) to the OFF position prior to working on the vehicle.

1. Disconnect the electrical harnesses and remove the alternator from the vehicle.

2. Remove the cover located on the rear side of the alternator. To do so, unscrew nut A (2x) and screw B.

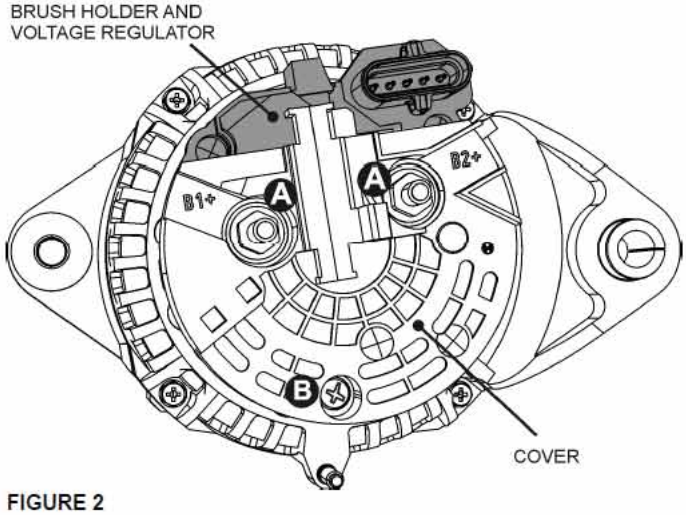


FIGURE 2

3. Dismount the brush holder and voltage regulator assembly. To do so, remove the 3 screws indicated with arrows.

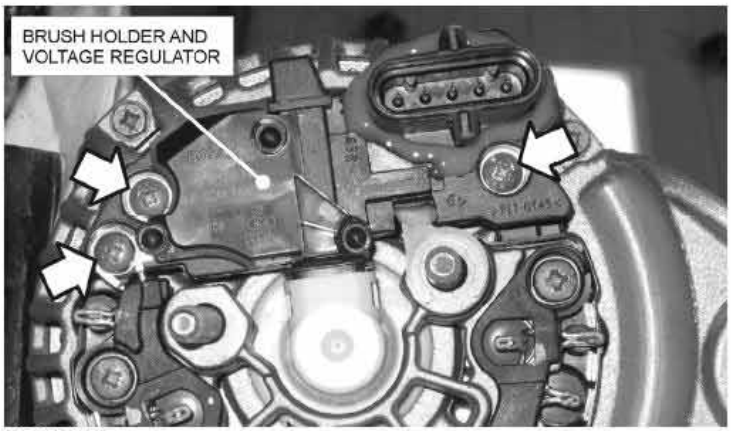


FIGURE 3

When new, the actively useful carbon brush length is about 9/16" (14mm)

FIGURE 4: BRUSH HOLDER AND VOLTAGE REGULATOR ASSEMBLY

4. Install the new brush older and tighten the screws indicated on figure 3.
5. Reinstall the cover. Tighten screw B and nut A (2x).
6. Reinstall the lower alternator loosely.
7. Connect ground harness and (+) positive cable on the lower alternator as shown on figure 5.
8. Reinstall the upper alternator loosely.
9. Connect ground harness and (+) positive cable on the upper alternator as shown on figure 5.

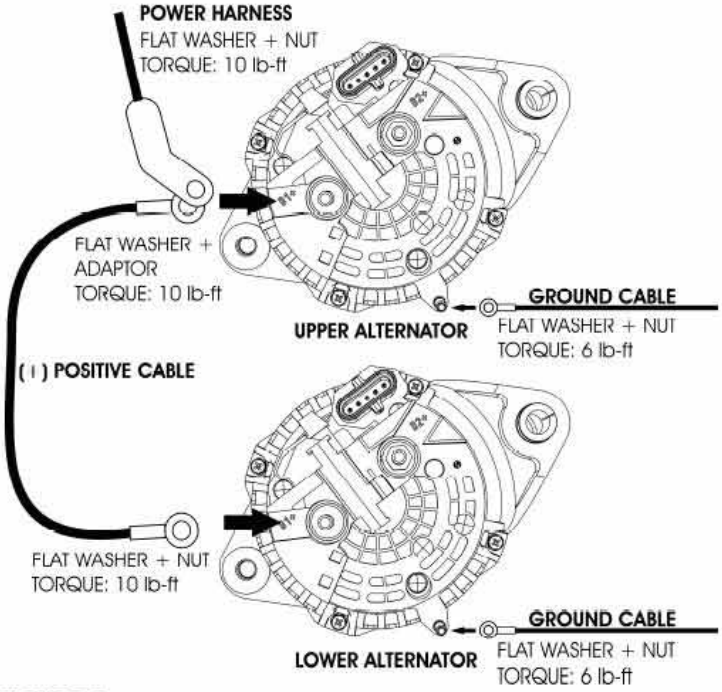


FIGURE 5

10. In order to assure proper installation, it is important to tighten the alternator mounting bolts in the following order.

1st Nut A, 43 lb-ft.

2nd Nut B, 43 lb-ft (2x).

3rd Nut C, 80 lb-ft (2x).

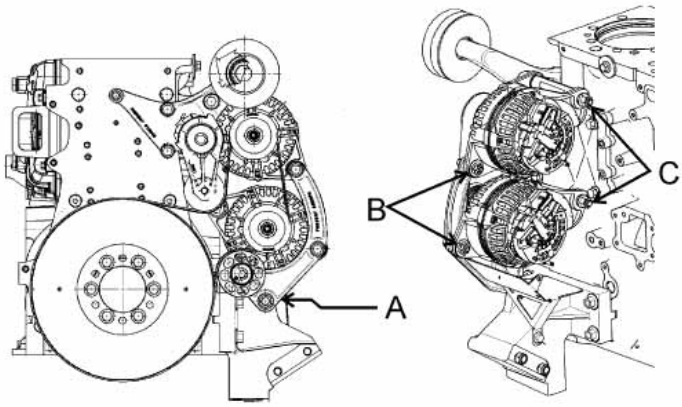


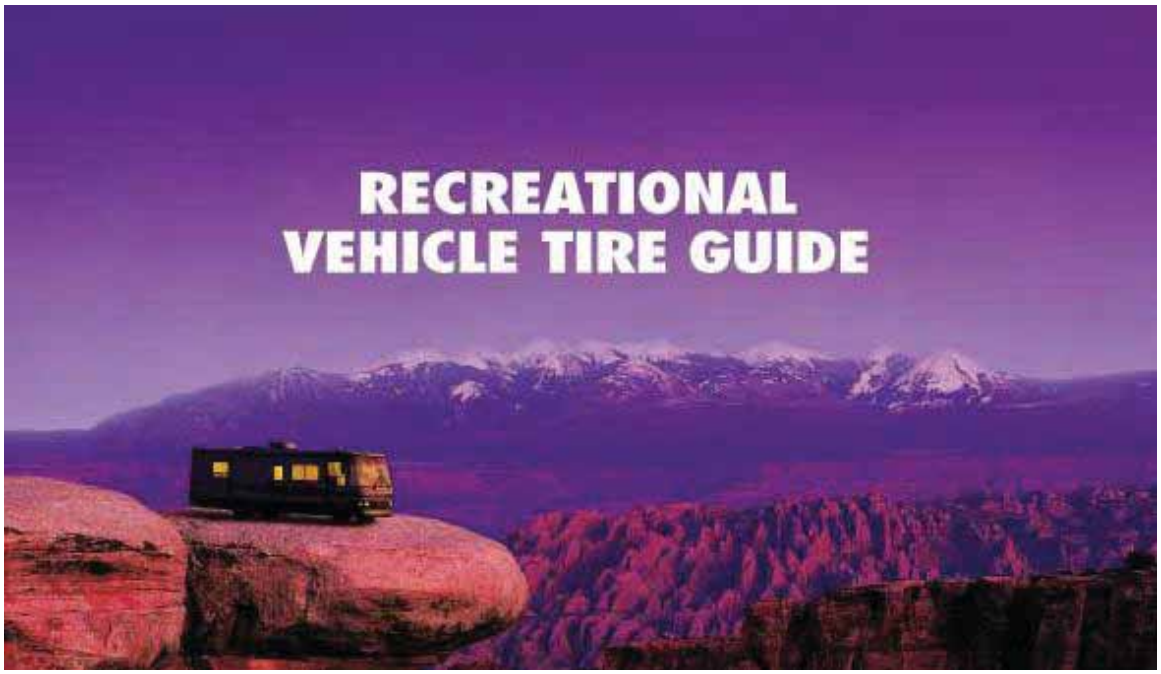
FIGURE 6

11. On the upper alternator, connect the power harness onto the adaptor. Tighten nut to 10 lb-ft.
12. Connect the 5-pin connector on both alternators.
13. Apply protective rubber coating (p/n 684013) or similar product on the stud terminals, washers and nuts.

NOTE
Inspection and replacement of wear items such as alternator brushes is part of normal vehicle maintenance. Note that no reimbursement is awarded for carrying out this preventive maintenance.

Notes

Information Available at Michelin.com



315/80R22.5 LR L

LOAD PER WHEEL POSITION

MAX LOAD PER TIRE

psi kPa	85 590	90 620	95 660	100 690	105 720	110 760	115 790	120 830	125 860	130 900
lbs.Single	6415	6670	6940	7190	7440	7610	7920	8270	8810	9090
lbs.Dual	11680	12140	12790	13090	13540	13880	14420	15220	16020	16540
kg.Single	2910	3030	3150	3260	3370	3450	3590	3750	3980	4125
kg.Dual	5300	5500	5800	5940	6140	6300	6540	6900	7240	7500

NEW PRODUCT BULLETIN

March 17, 2003

365/70R22.5 XZA® LRL (MSPN 71842)

Michelin is pleased to announce the addition of the 365/70R22.5 XZA® tire to its product offering. It is designed to provide excellent mileage, traction, and even wear in long haul and highway applications. This tire has a single load-carrying capacity of 4750 kg (10,500 lb) at 860 kPa (125 psi) and is approved for operating speeds up to 75 mph*.

XZA®

- **Longer original treadlife and reduced irregular wear in high speed, low scrub applications due to innovative decoupling groove design**
- **Long even wear and exceptional handling through stabilized contact patch using patented unique Infini-coil Technology™**
- **Long wear from full 19/32 original tread depth**
- **Traction and enhanced lateral control offered by unique siping technology**
- **Rectangular bead bundle helps "strap" the tire to the wheel**
- **Easy mounting and demounting with Michelin's rounded bead toe design**

* Exceeding the legal speed limit is neither recommended nor endorsed.

MICHELIN

Specifications for Tread Design: XZA©

Dimension	Load Range	MSPN	Loaded Radius		O/A Diameter		O/A Width		App Rim	RPM	Tread Depth	
			In.	mm.	In.	mm.	In.	mm.			32nds	mm.
365/70R22.5	LRL	71842	19.6	497	42.5	1080	14.3	363	10.5*	490	19	14.7

Dimension	Load Range	Max. Load Single		Max. Load Dual		Max. Pressure		Max. Speed *		Tire Weight	
		lbs.	kg.	lbs.	kg.	psi	kPa	mph	kph	lbs.	kg.
365/70R22.5	LRL	10500	4750	NA	NA	125	860	75	120	159	72

* Exceeding the legal speed limit is neither endorsed nor recommended.

Load/Inflation Table

Dimension	Load Range	psi		75	80	85	90	95	100	105	110	115	120	125
		kPa		520	550	590	620	660	690	720	760	790	830	860
365/70R22.5	L	lbs. per axle	S	13960	14700	15420	16140	16850	17560	18260	18960	19640	20400	21000
			D											
		kg. per axle	S	6360	6640	7020	7320	7680	7960	8240	8600	8880	9240	9500
			D											

Michelin® tires and tubes are subject to a continuous development program. Michelin North America, Inc. reserves the right to change product specifications at any time without notice or obligation.

Full width protector ply helps protect working plies from bruising and penetration, lowering downtime.

Unique siping technology helps provide excellent traction and enhance lateral control.

Innovative decoupling groove design allows for improved treadlife and reduced irregular wear.

Five steel belt crown package offers excellent protection against penetrating thereby helping to extend casing life.

Unique Infini-coil Technology™ helps eleminate casing growith at operating temperature, promoting driver comfort and excellent vehicle stability.

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NPS-03-01 MWT42427 (3/03)

Notes;