

SECTION 24: LUBRICATION

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1. DESCRIPTION

The efficiency and life of mechanical equipment is largely dependent upon proper lubrication and servicing. All mechanical components rely on a lubrication film between the moving parts to reduce friction, prevent wear, help cool the contacting sliding parts, and keep dirt and wear particles away from mating parts. Proper lubrication depends upon using the right type of lubricant, at proper intervals and filling to proper capacities. Past experience shows that many service problems can be traced to an improper lubricant or to incorrect lubrication procedures.

A comprehensive maintenance and lubrication program is important to ensure the long service life this vehicle was designed for and to avoid costly repairs and associated downtimes caused by premature part failure. The lubrication schedule in this section gives the location of the key service points on the vehicle as well as the lubricant specifications for each component to be serviced. Specific instructions on how to check and service major components are covered in their respective sections in this Maintenance Manual. The recommended lubrication intervals are based on normal operating conditions and mileage accumulation. Shorten the intervals if vehicle operates in more severe conditions. Some parts and equipment referred to in the lubrication schedule are optional and may not be installed on your vehicle. Dispose of used lubricants and filters in an environmentally responsible manner, according to federal and/or local recommendations.

2. BREAK-IN PERIOD MAINTENANCE

Perform the following maintenance after the initial 3,000 miles (4 800 km) of operation. Then perform at the recommended intervals in the lubrication schedule.

1. Drain differential oil and refill with clean oil.*

2. Drain manual transmission oil and refill with clean oil.*
3. Replace or clean standard coolant strainer** and optional coolant filter/conditioner.
4. Replace automatic transmission oil filter and oil.*
5. Lubricate front axle knuckle pins, bushings, tie rod ends, and ball studs of drag link.
6. Drain the radiator fan drive gearbox, preferably while warm, and refill with clean oil.

* Also perform after 3,000 miles (4 800 km) following a major repair.

** Also perform after 3,000 miles (4 800 km) following soldering work done at any point of the cooling system.

3. ENGINE OIL CHANGE

The engine oil change intervals are related to the operating conditions such as vehicle load and speed, and may vary. Prévoist recommends that engine oil and filter change be performed at every 12,500 miles (20 000 km). Check the oil daily with engine stopped. If necessary, add sufficient oil to raise the level to the proper mark on the dipstick.

4. AUTOMATIC TRANSMISSION OIL CHANGE

Change the fluid and internal filters after the first 3,000 miles (4 800 km). Thereafter, oil and filters change should be performed every 25,000 miles (40 000 km) or once a year, whichever comes first. Note that the operating conditions may shorten the oil and filters service intervals. Fluid must be changed whenever there is evidence of dirt or high temperature condition, which would be indicated by discoloration, strong odor, or fluid analysis.

5. FLEXIBLE HOSE MAINTENANCE

The performance of any vehicle is directly related, among other things, to the ability of flexible hoses to supply lubricating oil, air, coolant and fuel. Maintenance of hoses is an important step to ensure efficient, economical and safe operation of the vehicle.

Check hoses daily as part of the walk-around inspection. Examine hoses for leaks, check all fittings, clamps, and ties carefully. Ensure that hoses are not resting or touching shafts, couplings, heated surfaces including exhaust manifold, any sharp edges, or other obviously damaging areas. Since all equipment vibrates to a certain extent, clamps and ties can wear with time. To ensure proper support, inspect fasteners frequently and tighten or replace them as necessary.

Investigate leaks immediately to determine if fittings have loosened or cracked, and if hoses have ruptured or worn through. Take corrective action immediately. Leaks are not only potentially detrimental to vehicle operation, but can also result in added expenses caused by the need to replace fluids.

Warning: Personal injury and/or property damage may result from fire due to the leakage of flammable fluids, such as fuel or lube oil.

The useful service life of a hose is determined by the temperature and pressure of the fluid within it, the time in service, its installation, the ambient temperatures, amount of flexing, and the vibration it is subjected to. With this in mind, we recommend that all hoses be thoroughly inspected at least every 50,000 miles (80 000 km) or once a year for surface damages or indication of damaged, twisted, worn, crimped, brittle, cracked, or leaking lines. Hoses having the outer surface worn through or damaged metal reinforcement should be considered unfit for further service.

It is also recommended that all hoses on this vehicle be replaced during major overhaul and/or after a maximum of five years with hoses of equal or superior quality, compared with the original.

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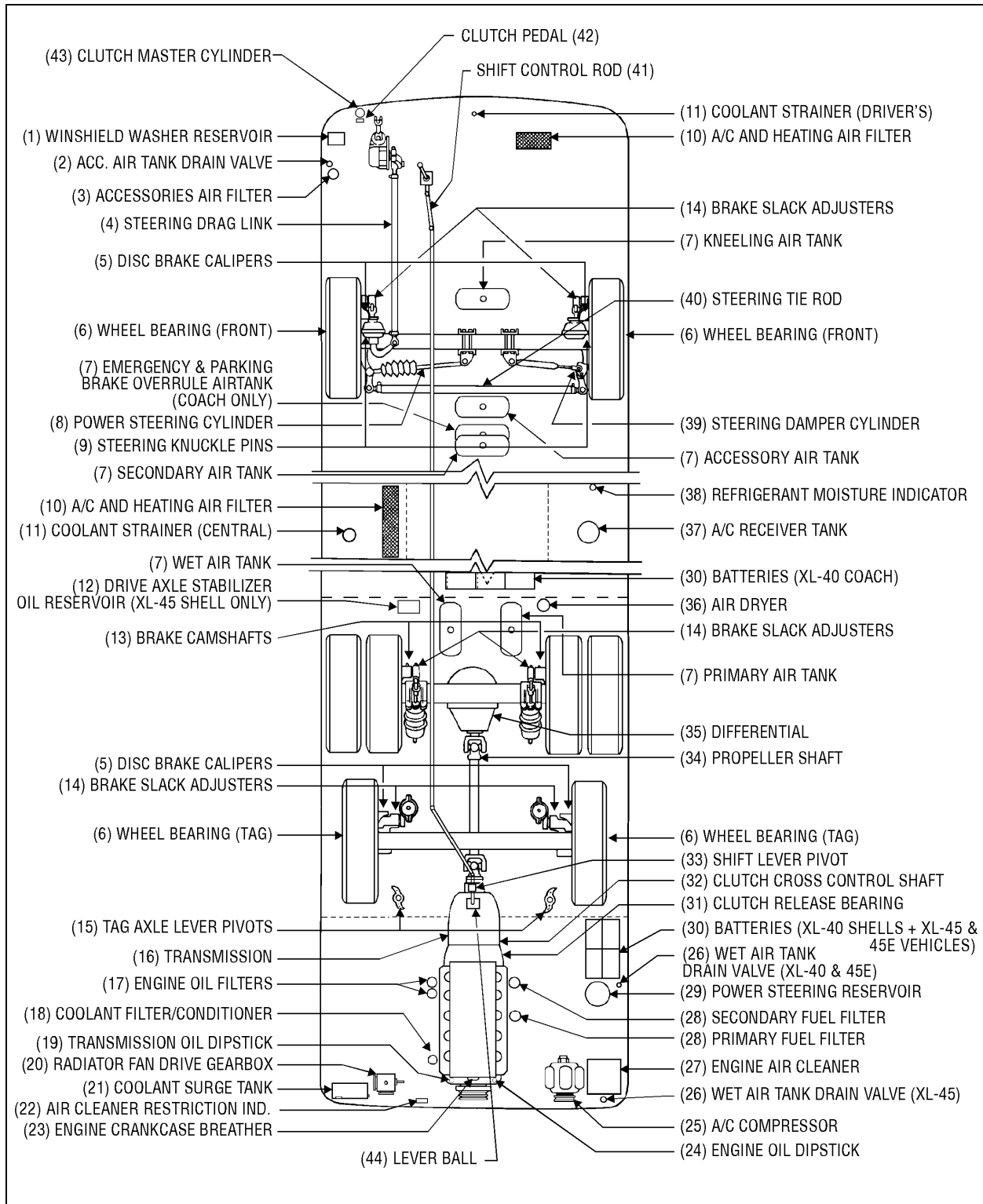


FIGURE 1: LUBRICATION AND SERVICING COMPONENTS

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Note: Before operating vehicle, perform each point listed in section "STARTING AND STOPPING PROCEDURES" under headings "DAILY/ROUTINE INSPECTION" and "RECOMMENDATIONS", starting on page 4-9 in your "OPERATOR'S MANUAL".

6. DAILY WALK-AROUND INSPECTION

It is a good practice to make a basic visual inspection of key areas on the vehicle on a daily basis and to report any problem areas to maintenance personnel for immediate correction. For Converted Vehicles (Shells), perform this walk-around inspection before every trip.

6.1 Outside the Vehicle

ITEM*	DESCRIPTION
---	Check for leaks under vehicle and in engine compartment
---	Check that baggage and service compartment doors close properly
---	Inspect tires and wheels for correct tire pressure, wear or damage, and for missing wheel stud and nuts
1	Check windshield washer fluid level and add if necessary
---	Check condition of windshield wiper blades
---	Verify proper operation of all road lights, signal lights, brake lights, marker lights, and back-up lights; Replace light bulbs as required
2 & 26	Drain accumulated water in accessory and wet air tanks

6.2 Engine Compartment

ITEM*	DESCRIPTION
24	Check engine crankcase oil level; Add if necessary
19	Check transmission oil level (automatic transmission oil level can be checked from pushbutton shift selector); Add if necessary
29	Check power steering reservoir fluid level; Add if necessary
21	Check coolant surge tank fluid level; Add if necessary
28	Drain accumulated water in primary fuel filter/water separator (if equipped)
22 & 27	Check air cleaner restriction indicator, replace air cleaner when red signals locks in full view

* Item numbers refer to Fig. 1.

6.3 Inside the Vehicle

ITEM	DESCRIPTION
---	Check for proper operation of the entrance door
---	Inspect cleanliness in the steps, aisles, seating area, and lavatory (Coach), or driver's area (Shell)
---	Check that emergency exit windows and roof escape hatches can be opened, then close all windows and hatches securely
---	Verify proper operation of windshield wiper/washer
---	Check rear view mirrors for broken glass; Adjust mirrors for adequate rear view vision
---	Start engine and check for proper operation of all gauges and indicator lights
---	Apply brakes and check both primary and secondary pressure gauges
---	Check for proper operation of electric and air horns, and back-up alarm

7. LUBRICATION AND SERVICING SCHEDULE

7.1 Service Every 6,250 Miles (10 000 km) or Twice a Year, Whichever Comes First.

ITEM*	DESCRIPTION	REMARKS	LUBRICANT &/OR PART**
27	Engine Air Cleaner	Inspect and clean, replace element if required	Filter: #530197
5	Disc Brake Calipers	Grease two fittings on each front and tag axles	Lithium-base grease
25	A/C Compressor	Check oil level, add if necessary	Polyolester Oil
37	A/C Receiver Tank	Check refrigerant level, add if necessary	HFC 134a
38	Refrigerant Moisture Indicator	Replace filter dryer unit according to moisture indicator	Filter: #452542 c/w Moisture Indicator
35	Differential	Check oil level, add if necessary	Multigrade gear oil
20	Radiator Fan Drive Gearbox	Check oil level, add if necessary	Synthetic oil: ISO VG 460
34	Propeller Shaft	Grease one fitting on each universal joint and one fitting on slip joint	Lithium-base grease
15	Tag Axle Lever Pivot	Grease one fitting on each pivot	Lithium-base grease
14	Brake Slack Adjuster	Grease one fitting on each slack adjuster (all axles)	Lithium-base grease
39	Steering Damper Cylinder	Grease one fitting at cylinder rod end	Lithium-base grease
8	Power Steering Cylinder	Grease one fitting at each cylinder end	Lithium-base grease
4	Steering Drag Link Ends	Grease one fitting at each end	Lithium-base grease
40	Steering Tie Rod Ends	Grease one fitting at each end	Lithium-base grease
16■	Manual Transmission	Check oil level, add if necessary	Engine oil: SAE 30, 40, 50 or Gear oil: SAE 80, 90
44■	Lever Ball	Grease one fitting	Lithium-base grease
32■	Clutch Cross Control Shaft	Grease three fittings	Lithium-base grease
31■	Clutch Release Bearing	Grease one fitting	Lithium-base grease
---	Alternator Drive Belt	Check belt for wear & also check tension on belt. Refer to "06. ELECTRICAL".	-----

* Item numbers refer to Fig. 1.

** See end of this section for lubricant and part number specifications.

■ With manual transmission only.

7.2 Service Every 12,500 Miles (20 000 km) or Once a Year, Whichever Comes First.

ITEM*	DESCRIPTION	REMARKS	LUBRICANT &/OR PART**
17	Engine	Change oil and filters	Engine oil: SAE 15W40, API CG4 Filters: #510458
28	Fuel Filters	Change primary and secondary fuel filters (Fill with clean fuel before installation)	Primary: #510137 Prim. w/sep.: #531390 or #531407 Secondary: #510128
18	Coolant Filter/Conditioner	See "7.6 Miscellaneous Service"	-----
21	Coolant Surge Tank	Test coolant solution	-----
7	Air Tanks	Drain accumulated water in all tanks	-----
10	A/C and Heating Air Filters	Clean or replace three elements (Shell) Clean or replace two elements (Coach)	Driver's: #871049 Central: #871034 Driver's: #871049 Central: Top - 373336 Bottom (XL-45) - 373337 Bottom (XL-40) - 373338
43■	Clutch Master Cylinder	Check oil level	Brake Fluid (DOT 3)

7.3 Service Every 25,000 Miles (40 000 km) or Once a Year, Whichever Comes First.

ITEM*	DESCRIPTION	REMARKS	LUBRICANT &/OR PART**
16 & 19	Automatic Transmission	Change oil and filters	Dexron-II-E or Dexron-III
42■	Clutch Pedal	Check and adjust if necessary	-----
41■	Shift Control Rod Universal Joints	Grease four fittings	Low Temperature grease
---	Radiator Core	Inspect core exterior. Clean if necessary (dry with compressed air). See "05. COOLING" under "6.1 Maintenance".	Quality grease solvent such as Mineral Spirits

* Item numbers refer to Fig. 1.

** See end of this section for lubricant and part number specifications.

■ With manual transmission only.

7.4 Service Every 50,000 Miles (80 000 km) or Once a Year, Whichever Comes First.

ITEM*	DESCRIPTION	REMARKS	LUBRICANT &/OR PART**
16■	Manual Transmission	Change oil	Engine oil: SAE 30, 40, 50 or Gear oil: SAE 80, 90
44■	Shift Lever Pivot	Dismantle and lubricate all components	Low Temperature Grease
20	Radiator Fan Drive Gearbox	Change oil	Synthetic oil: ISO VG 460
29	Power Steering Reservoir	Replace oil filter cartridge element	Cartridge: #660987
6	Front and Tag Axle Bearings	Repack with grease, or refill to level with differential oil	Lithium-base grease or differential oil
11	Coolant Strainer	Check and clean, change cartridge if required	Central: #871029 Driver's: #870807
23	Engine Crankcase Breather	Clean breather steel mesh	-----
9	Steering Knuckle Pins	Grease two fittings on each knuckle	Lithium-base grease
12	Drive Axle Stabilizer Reservoir (XL-45 Shell only)	Check oil level. Refer to "16. SUSPENSION".	Dexron-II or III
---	Preheater (WEBASTO) Fuel Filter	Replace fuel filter. Test coolant solution	Filter : #871037
---	Flexible Hoses	Thoroughly inspect all hoses (see "5. FLEXIBLE HOSE MAINTENANCE").	-----

7.5 Service Every 100,000 Miles (160 000 km) or Once Every Two Years, Whichever Comes First.

ITEM*	DESCRIPTION	REMARKS	LUBRICANT &/OR PART**
35	Differential	Change oil; Clean breathers	Multigrade gear oil
3	Accessories Air Filter	Change filter element	Filter: #640073
36	Air Dryer	Change cartridge	Cartridge: #641278
13	Brake Camshaft	Grease one fitting on each drive axle drum brake	Lithium-base grease
43■	Clutch Master Cylinder	Drain oil and refill	Brake Fluid (DOT 3)

* Item numbers refer to Fig. 1.

** See end of this section for lubricant and part number specifications.

■ With manual transmission only.

7.6 Miscellaneous Service

ITEM*	DESCRIPTION	REMARKS	LUBRICANT &/OR PART**
21	Cooling System	Drain, flush and refill every two years or 200,000 miles (320 000 km) whichever comes first	Engine coolant
30	Battery Terminals	Clean and coat terminals yearly	Battery terminal coating
---	Discharge Tubes***	Every three months: Check 2 condenser's discharge tubes Check 6 evaporator's discharge tubes Check 2 front discharge tubes	-----
18	Coolant Filter/Conditioner	Replace Precharge Element Filter with a Maintenance Element Filter after 12,500 miles (20 000 km) or after one year, whichever comes first. Then, install a new Maintenance Element Filter and replace every 200,000 miles (320 000 km) or two years, whichever comes first. Note: Every time the cooling system is flushed, drained & cleaned, you must first install a Precharge Element Filter for its required lifespan: then install a Maintenance Element Filter.	Maintenance Filter: #550630 Precharge Filter: #550629

* Item numbers refer to Fig. 1.

** See end of this section for lubricant and part number specifications.

*** Discharge tubes are rubber tubes located under vehicle.

8. LUBRICANT SPECIFICATIONS

ITEM*	DESCRIPTION	SPECIFICATIONS
17	Engine Oil	SAE Viscosity Grade: 15W40 API Classification: CG4
29	Power Steering Oil	Automatic Transmission Oil (Dexron-IIIE or Dexron-III)
21	Engine Coolant	Low silicate, ethylene glycol coolant 50% antifreeze/water solution is normally used Antifreeze concentration should be between 30% and 67%
25	A/C Compressor Oil	Polyolester Oil, HFC 134a compatible: Castrol SW-68 (POE) or equivalent
35	Differential Oil	Multigrade gear oil meeting MIL-L-2105-D: 75W90 for Northern climate 80W140 for Southern climate (In extreme conditions or for better performance, full synthetic gear oil can be used.)
20	Fan Gearbox Oil	Synthetic oil: ISO VG (viscosity grade) 460 Mobil SHC 634 or equivalent
16 & 19	Automatic Transmission Oil	Dexron-IIIE or Dexron-III
16	Manual Transmission Oil	Heavy-duty engine oil meeting MIL-L-2104-C: SAE 30 (Northern climate), SAE 40, SAE 50 Straight mineral gear oil: SAE 80 (Northern climate), SAE 90
43	Clutch Oil	Heavy-duty brake fluid meeting DOT 3 specifications
---	Low Temperature Grease	Good quality low temperature grease; Prolab AF-100, Grade 1, P/N 682307 or equivalent
---	Lithium-base 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

* Item numbers refer to Fig. 1.

9. PART NUMBER SPECIFICATIONS

ITEM*	DESCRIPTION	PRÉVOST NO	SUPPLIER NO
17	Engine Oil Filters	#510458	Detroit Diesel: 25014505 AC Rochester Div. GM: PF2100
29	Power Steering Reservoir Oil Filter	#660528	Garrison Hydraulic: 32516
27	Engine Air Cleaner Filter	#530197	Nelson: 70337-N Baldwin: PA-2839 Donaldson: P52-2874 Fram: CA-7113
38	Refrigerant Filter Dryer Unit	#452542	Alco Controls: EKH 307S (modified)
28	Engine Primary Fuel Filter	#510137	Detroit Diesel: 25014274 AC Rochester Div. GM: TP-915D
28	Engine Primary Fuel Filter with Water Separator (optional)	#531390	Detroit Diesel: 25011910 AC Rochester Div. GM: TP-1057
28	Engine Secondary Fuel Filter	#510128	Detroit Diesel: 25014342 AC Rochester Div. GM: TP-916D
18	Engine Coolant Filter/Conditioner	Maintenance: #550630 Precharge: #550629	Maintenance: Detroit Diesel: 23507545 Nalco Chemical Company: DDF3000 Precharge: Detroit Diesel: 23507189 Nalco Chemical Company: DDF60
10	A/C and Heating Driver's Air Filter	#871049	Permatron Corp.: Model "R"
10	A/C and Heating Central Air Filter	Coach = XL-40: Top - #373336 Bottom: #373338 XL-45's: Top - #373336 Bottom: #373337 Shell = #871034	Permatron Corp.: IN 1X10X37 EXACT Permatron Corp.: Model 13X21X1 IN
16 & 19	Automatic Transmission Oil Filter Kit	#571687	Allison: 29503829
11	Coolant Strainer	Driver's: #870807 Central: #871029	Braukmann: 13-13-00740 Parker: 925566
3	Accessories Air Filter	#640080	Bendix: 222588
36	Air Dryer Cartridge	#641278	Rockwell Wabco: S 432 923 2
---	Preheater (WEBASTO) Fuel Filter	#871037	Webasto: 603.359

* Item numbers refer to Fig. 1.