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Lubrication Manual

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LUBRICATION MANUAL

IOWA

DEPARTMENT OF TRANSPORTATION

HIGHWAY DIVISION

MAINTENANCE DEPARTMENT

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Scheduled Maintenance

A motor equipment maintenance program, to be fully effective, must be designed to take advantage of all personnel contacts with the equipment. Drivers and operators are the first line of defense against equipment wear, failure, and damage. The party servicing equipment is certainly the second line of defense. The services which both categories perform, and reports which the operator passes on to his supervisor, will significantly curb the ultimate maintenance cost.

The third point of contact is the shop mechanic. The more thorough the reports he receives from the equipment operator, the more quickly will he be guided to sources and causes of trouble. Reports received from the equipment operator must be thorough, so that sources and causes of trouble can be located quickly. The fleet maintenance program, however, must not rely solely on him for detection of reporting of maintenance requirements. The maintenance supervisor must develop and plan his own scheduled "preventative maintenance" program for systematic servicing and inspection of equipment at predetermined mileage or engine hour intervals; guidelines are provided in the "Lubrication Recommendations" furnished for each location which comply with manufacturers requirements.

Service Station Servicing

Operators and drivers of motor equipment must be required to inspect the unit to which they have been assigned at the start and completion of their operating shift. Defects should be noted and reported that could cause the equipment to become damaged or unsafe.

Services that must be performed during each fueling of an equipment unit are to:

- a. check all oil level in crankcase;
- b. check tires for proper inflation and condition;
- c. check electrolyte in battery; and
- d. check radiator coolant level AFTER ENGINE HAS BEEN ALLOWED TO COOL.

Scheduled Maintenance

Servicing the odometer or hour meter is the key to the entire program, and all personnel associated with the operation and maintenance should see that these instruments are in satisfactory operating condition.

Scheduled maintenance inspections normally are divided into three classes:

Class A. Includes all lubrication and mechanical services recommended by the manufacturer, plus inspection and checking of all components and parts related to the safe operation of the equipment.

Class B. Includes all of the above elements plus a check and inspection of components having a high rate of wear or deterioration or a proven need for adjustment.

Class C. Includes all elements of A and B plus a thorough inspection of all remaining components and assemblies of the unit.

Equipment Assignment

Assignment of equipment to a competent operator and alternate operator should be made to insure responsibility for care of the unit. Familiarization with the equipment and attachments must be assured to obtain a high standard of efficiency. Abuse of equipment or neglect should be reported to the supervisor and it is a responsibility of all persons using state equipment to keep it in a clean presentable condition.

Lubrication

Today's vehicles of the passenger carrying light duty classification require very little greasing of steering components or chassis parts. The manufacturers recommendations are listed by class in the "Lubrication Recommendations" for each specific make, year and model vehicle.

Oil Change

Crankcase oil and filter changes vary with the class of equipment and the type operation it is subjected to. Specific intervals are listed for each class of equipment and the description of products to be used. This information meets with the manufacturers requirements in prolonging the life of the equipment and is within all warranty conditions they have set. When changing oil from manufacturers oil to D.O.T. oil - do not mix. Flush out all manufacturers oil before refilling with D.O.T. oil.

Other Services

Emission controls, PCV valves, pumps and other components required by law shall be serviced and kept operative throughout the life of the vehicle and shall not be modified, removed or rendered inoperative.

Wheel bearings, brakes and brake adjusters shall be serviced annually and wheel bearings repacked with grease. Brake adjustments should be performed according to the recommendation of the manufacturer either by mileage, time, or need.

Service Bulletins

Service bulletins will be prepared and issued as supplemental information to the "Lubrication Recommendations", as new developments occur in the Department of Transportation fleet. These bulletins should be distributed to operators and mechanics and then filed with this book for future reference.

Following are general recommendations for various phases of equipment care:

Recommend use of magnetic drain plug on transmissions, transfer cases and differential case.

Greasing

Greasing of cars, panels, and pickups is to be done at a maximum of 4,000 mile intervals, trucks at 2,000 miles or 100 hours and after storm or extreme conditions, motor graders, and crawler type tractors and draglines daily. However, if equipment is in need of a greasing before this mileage or period has been acquired, see that it is greased. When the specific recommendations for any unit state otherwise, follow that recommendation. Grease fittings should be cleaned before and after greasing. HD and EHD shall be greased every 500 miles.

For miscellaneous equipment for which there is no lubrication sheet, follow manufacturer's instructions. If in doubt, take your problem up with your foreman or mechanic.

Any unit in water or excessive dust or sand, is to be greased daily. Grease fittings should be cleaned before and after greasing.

Greasing service which is required only at time of assembly, or which involves adjustment of vital parts is left to the mechanic and therefore not listed generally.

Multi-purpose grease is a specially compounded grease to be used for wheel bearings, chassis, and water pump. It should not be used for critical lubrications calling for an extreme pressure grease. When special grease not stocked by Inventory Management is required in small quantities, it should be purchased locally.

Transmission Lubricants

Seasonal change of summer and winter grades of transmission and differential lubricants are to be made somewhat in line with the weather conditions, normally during the months of April and October. This will be true of all equipment unless recommendations for specific equipment state otherwise or unless seasonal use of equipment eliminates the need of change of grades or lubricants. Recommend use of magnetic drain plug on transmissions and transfer case and differential case. Transfer cases shall be checked daily when unit is being used for snow removal operation.

Oil Change

Our equipment shall be fitted with oil filters and approved type air cleaners, and these units are to be serviced as required by the accessory manufacturer. If it is not so equipped, check with the District Mechanic.

Please note the following recommendations as to oil changes:

Oil and filter pack must be changed, regardless of color, at a maximum of 4,000 miles in cars, pickups and light duty trucks. Class 4, 5, and 6 and at a maximum of 60 hours on motor graders and tractor equipment. Lubricating oil in four-wheel-drive trucks rotary snow plows, pulvi-mixers, etc., (in all units assigned to heavy maintenance operations or extremely dusty conditions) must be changed regardless of color at a maximum of 500 miles or 30 hours. (See Service Bulletin #2, for Idle Equipment) Service air cleaners daily or twice daily if necessary. Watch oil and filters carefully. Watch oil gauge and if pressure drops, check crankcases for oil pump clogging. Do not operate motors with oil pressure below normal unless mechanic gives you special permission to do so. Oil is to be checked daily for proper level. Drain crankcase while oil is hot. Report discoloration of oil which may be caused by raw fuel or water leaking into crankcase. On late model H.D. four-wheel drive trucks, check individual lubrication sheets, special notes.

Clean sump thoroughly when changing element. Small sander motors, power broom motors, and kindred equipment should have the oil and filter pack changed daily, and air cleaner and breather equipment serviced twice daily if needed.

Wheel Bearings

It is essential that wheel bearings be checked periodically for grease requirements and adjustments. See your mechanic for servicing of wheel bearings. Coat inside of hubs and spindles with thin coating of grease when packing. Do not over-lubricate. All wheeled vehicles shall be checked annually for wheel bearing lubrication, brake linings and adjustments, both "A" and "B" equipment.

Needle Bearing Universal Joints

Use low pressure hand gun only such as the #4015-A Alemite gun, to avoid undue pressure which will destroy oil seals for which lubrications sheets recommend multi-purpose grease.

Hypoid Oil (Do not use in Transmission and Transfer Case)

Points at which hypoid oil is used require watching. When oil turns a yellow color, immediately drain, flush and replace with fresh oil. Kerosene is satisfactory for flushing hypoid oils.

Transmission and Differential Lubricants

Maintain proper oil levels in the transmission and differential. Do not add our oils to those furnished to you in new machines. These oils may not mix without causing damage. Do not overfill gear boxes. Drain, flush, and refill with our own lubricants as soon as the manufacturer's recommendations permit. Units without drain plugs should be cleaned and flushed using a Rose suction gun. Recommend use of magnetic drain plug on transmission and transfer case.

Crankcase Ventilation Valve

Positive crankcase ventilation valve should be replaced at 12,000 miles if it is not type that can be cleaned.

Service Bulletins

For further information regarding the care and maintenance of motor vehicles and equipment consult the service bulletin.

NOTE: At the time seasonal lubrication services are performed, we can prevent a great deal of glass breakage, if all glass channels are coated with a silicone spray. This material is available at all automotive jobbers in small pressurized containers.

LUBRICANTS

Below is a table showing the various grades of oil carried in stock at Ames and the size container in which they are packaged.

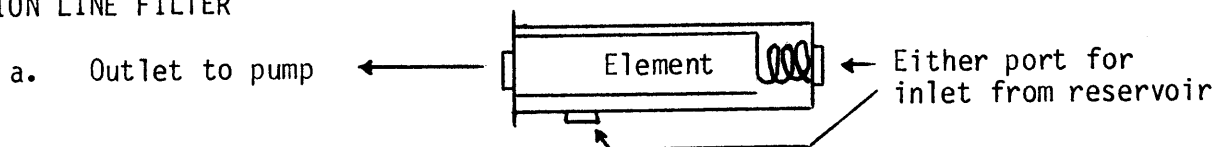
<u>Heavy Duty MIL-L-46152 Lubricating Oil</u>	<u>SAE Service Designation</u>	<u>Package</u>	<u>Sold By</u>
SAE - 10W-30	SE/CC	220 qts.	qt.
SAE - 20W-40		220 qts.	qt.
SAE - 50	SE/CC	60 qts.	qt.
SAE - 30 H.D.	SE/CD	220 qts.	qt.
 <u>Transmission Gear Oil API GL-1 & GL-2</u>			
SAE - 90		15 gal.	drum
SAE - 140		15 gal.	drum
 <u>Hypoid Differential Oil, MIL-L-2105C (Differentials only)</u>			
SAE - 80W-90		15 gal.	drum
SAE - 85W-140		15 gal.	drum
 <u>Hydraulic Hoist Oil</u>			
Grade - 5W		30 gal.	drum
 <u>Hydraulic Transmission Fluid</u>			
		15 gal.	drum
 <u>Automatic Transmission Oil;</u>			
Dexron 015-022700		qt.	qt.
015-022710		15 gal.	gallon
 <u>Others</u>			
Ford Lub., Hyd. M2C53A-293-627900		5 gal.	can
Ford Lub., M2C41 -015-022710		5 gal.	can
Chrysler Corp. Diff. Additive 219-492750		qt.	qt.
John Deere, Hyd. Trans. - 293-627900		5 gal.	can

Hydraulic System Oil Filters (gasoline powered)

Trucks with hydraulic systems are equipped with Gresen filters in the pressure side and others in both the pressure and suction lines. These are Gresen filters and those in the suction side require a #100 mesh screen which should be removed, checked and cleaned every 6 months. Those in the pressure, or return line are #33 micron paper, throw-away type replaceable every 6 months. Lenz filters are needed for all diesel M.D. trucks, 1978 and later.

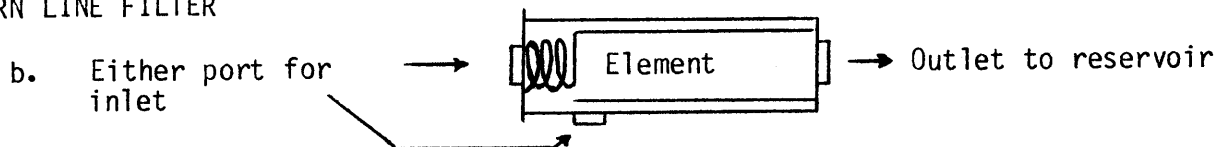
Mounting and installation of filter elements are as follows:

SUCTION LINE FILTER



Inlet port is the side or bottom port and outlet port is from top or base of filter with spring at bottom of canister. This application uses a 100 wire mesh element, Gresen No. 3280-001, IDOT Stock No. 430-010025. This element may be cleaned and reused.

RETURN LINE FILTER



Inlet is the side or top port and outlet is bottom port of filter with spring at top of base of filter. This application uses a 33 micron paper element, Gresen No. 3278-001, IDOT Stock No. 430-010000 which cannot be cleaned and reused.

Seals used with the suction type filter installation are Gresen No. 3282-001, IDOT Stock No. 430-010050 and Gresen No. 3060-001, IDOT Stock No. 430-008000.

Seal used with return line filter installation is Gresen No. 3055-001, IDOT Stock no. 430-007925.

These filters have been correctly installed prior to issue, however, the above information is furnished for guidance of all concerned when filters have to be removed for servicing and are reinstalled.

Diesel powered trucks are equipped with Lenz Filters. 1978 and older diesel trucks use Lenz filter #800 PR-8-13; DOT Stock No. 221000 798.

Diesel trucks 1979 and newer use Lenz filter 10 micron #880 PR-8-15; DOT Stock No. 221000 800.

Batteries

Automotive batteries can be extremely dangerous and all personnel should be instructed in proper procedures for the use of jumper cables when attempting to start a vehicle with a dead battery and in battery charging. During charging, the chemical process creates hydrogen which in combination with oxygen in the air could cause an explosive mixture which will readily ignite with any spark. In order to minimize the possibility of an explosion and reduce the danger of injury, the following cautions and procedures should be observed.

A. Use of Jumper Cables

1. Use safety goggles if available.
2. Check battery vent caps to be sure vent holes are open on both the dead battery and on the battery being used to provide the booster charge.
3. It is important when starting a vehicle that the vent caps are in place and tight to avoid electrolyte spray.
4. Inspect dead batteries to assure battery is not frozen (frozen batteries may explode when charge is applied-frozen batteries must be thawed before charging).
5. Connect one end of the red lead positive connector to the positive terminal in the dead battery.
6. Connect the other end of red lead to positive terminal on the good battery.
7. Connect one end of black connector to negative terminal of the good battery.
8. Connect other end of black connector to a good ground on the engine at least 12 inches away from the battery. Connection must be made to a heavy piece of metal such as a head bolt, manifold bolt, etc. (do not use connections to air cleaners or thin metal projections).

B. Battery Charging

1. Use safety goggles if available.
2. It is important when charging batteries that the vent holes in the caps are open and the caps are in place and tight to avoid electrolyte spray.
3. Be sure switch on battery charger is off and selector for 6 or 12 volt is set for proper voltage.
4. Connect clamps to battery terminal posts using care to assure positive lead to positive terminals and negative lead to negative terminal.
5. Turn on switch to battery charger.
6. When battery is fully charged, turn switch off on battery charger before disconnecting leads from the battery terminals.

These procedures are designed to minimize the possibility of igniting gases should a spark occur and, if an explosion does occur, personal danger would be minimized by the individual being away from the battery. In the event any personnel are involved in a battery explosion, it is important for all of the acid to be washed off immediately and the eyes thoroughly flushed. Immediately after flushing, the assistance of a physician or a hospital should be obtained.

Anti Freeze

Permanent type anti freeze is used in the cooling systems of vehicles of the fleet and is available through the central warehouse. Protection is specified for a minus twenty eight degrees, (-28°F) and all units should be checked with a hydrometer on or about October 15 each year. A 50-50 mixture of anti freeze and water should be in the radiator year around and should be completely changed every two years. Add rust inhibitor each year that the coolant is not completely changed.

When changing coolant, the system should be thoroughly flushed, all hoses inspected and an anti rust additive added to the new solution. Nalcool 2000 inhibitor is recommended and is available through the central warehouse.

Do not attempt to salvage anti freeze that has been in use for two years, it should be disposed of so it cannot be put back in a cooling system.

Note: Be sure to drain roller drums or any other equipment using water, at this time to prevent freeze damage.

Warranty

Arrangements with suppliers of Iowa Department of Transportation equipment provide for warranties beginning when issued to the field. All locations should report potential warranty problems to District Mechanics or Office Managers who in turn will contact the Office of Equipment Services in Ames. An identifying equipment number with a description of the deficiency or problem should be furnished and arrangements will be made with servicing dealers or the manufacturer to make correction.

Tires

The fleet has a wide variety of types of tires on equipment, fiber-glass, nylon, rayon, bias belted and radial in both conventional and mud or snow tread. Radials must not be mounted on a vehicle of the first six classes of equipment along with any nylon, rayon or bias belted. These classes of equipment must be all radial, because steering geometry and control of the vehicle is changed when tires are mixed.

Rotation of radial tires on light vehicles is different than other type tires, as radials are meant to rotate in the same direction as when installed originally. Keep them on the same side of the vehicle and move from front to rear. An exception to this rule is on front wheels of heavy trucks, these can be moved from one side to the other.

All tires are stamped with a recommended tire inflation pressure which should be maintained for proper tire wear and handling of vehicle.

Cleaning of Vehicles

Interior of vehicles should be cleaned by vacuum cleaner, brush or air pressure hose. Washing with liquids creates rusting of the floor boards under the mats and is not recommended.

Operators are responsible to maintain the cleanliness of the vehicle they are driving and to insure a presentable image to the public.

Facilities for washing are available at the Highway Maintenance garages, the Central Motor Pool at Ames, and drive thru washers throughout the state, which charge up to approximately \$2.00 and which is reimburseable through the payroll sheets. Service stations are not recommended because of the high cost for this service.

Diesel Fuel

Diesel engine equipment being used in winter operations should use a 50-50 mixture of number 1 and 2 diesel fuel or straight number 1. Use of number 2 at low temperatures will "jell" in tanks and filters and stop running.

LUBRICATION & MAINTENANCE

Equipment 1/4 Ton Pickup Make Chevrolet

Class 3 Model Luv

UNIT	KIND OF LUBRICANT	SAE		REMARKS
		Summer	Winter	
Engine	Lube Oil	10W40	10W40	4,000 miles
Automatic Transmission	Dexron R-II	Drain, replace filter & refill every 30,000 miles		
Transmission	Engine Oil	SAE 30	SAE 30	See Note A
Differential	Hypoid	80W90	80W90	See Note B
General Chassis	Multi-purpose grease			4,000 miles
Steering Gear	Hypoid	80W90	80W90	
Wheel Bearings	Multi-purpose grease			See Note C
Distributor Adv. Mechanism	Lube Oil	10W40	10W40	
All Linkage Pivot Points	Lube Oil	10W40	10W40	
Air Cleaner				See note D @ 30,000 miles
Hydraulic Clutch	Heavy Duty Brake Fluid			DOT 3
Hydraulic Brakes	Heavy Duty Brake Fluid			DOT 3
Parking Brake Cables	Multi-purpose grease			

Note A: Replace manual transmission lubricant after first 7,500 miles and every 30,000 miles thereafter.
 Note B: Replace lubricant after first 7,500 miles and every 30,000 miles thereafter.
 Note C: Repack front and rear wheel bearings every 30,000 miles.
 Note D: Operation of vehicle in dusty areas will necessitate more frequent element replacement.

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LUBRICATION & MAINTENANCE

Equipment 1/2 & 3/4 Ton Pickups, Vans Make Ford
 Class 3,4, & 5 Model F100, F150, F250

UNIT	KIND OF LUBRICANT	SAE		REMARKS
		Summer	Winter	
Engine	Lube Oil	10W40	10W40	4,000 miles
Automatic Transmission	Type F	Drain, repl. filter, every 24,000 miles		refill
Transmission	Transmission Oil	90	90	
Differential	Hypoid Oil	80W-90	80W-90	See note "A"
General Chassis	Multi purpose			4,000 miles
Power Steering	Power steering fluid			D6AZ-1958 2-A
Steering Gear	Ford Lube			C3AZ-1957 8-A
Wheel Bearings	Multi purpose grease			Only front wheels annually
Air Cleaner				12,000 miles
Brakes	Heavy Duty Brake Fluid			

Note A: For Equi-lock axles use Ford CIAZ-19580-E or F with 1 oz. of additive Ford #C1AA-19B546A, per pint of lube. Purchase locally.

LUBRICATION & MAINTENANCE

Equipment Crew Cabs and Scouts Make International
 Class 5 & 6 Model Intnl 1210 and Scout

UNIT	KIND OF LUBRICANT	SAE		REMARKS
		Summer	Winter	
Engine	Lube Oil	10W40	10W40	4,000 miles
Differential	Hypoid Oil	80W90	80W90	
General Chassis	Multi purpose grease			4,000 miles
Clutch Release Bearing	Multi purpose grease			As required
Power Steering	Dexron			
Steering Gear	Transmission Oil	90	90	
Propeller Shaft Center Bearing	Multi purpose grease			
Transmission	Transmission Oil	90	90	
Automatic Transmission	Dexron		Drain, change filter @ 24,000	
Distributor Shaft	Lube Oil			At plug at grease cup
Distributor Shaft	Multi-purpose grease	10W 40	10W40	
Propeller shaft slip joint	Multi-purpose grease			
Propeller Shaft	Multi-purpose grease			Hand gun See note "A"
Universal Joint	Multi-purpose grease			
Air cleaner				12,000 miles

Note A: Remove grease plug, insert grease fittings and fill with lubricant.
 Replace grease plug.

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LUBRICATION & MAINTENANCE

Equipment Crew Cab Make Dodge
 Class 6 Model D 200, D 300

UNIT	KIND OF LUBRICANT	SAE		REMARKS
		Summer	Winter	
Engine	Lube Oil	10W40	10W40	Change at 4,000 miles
Transmission	Transmission Oil	90	90	
Differentials	Hypoid Differential Oil	80W90	80W90	Use additive fo limited slip*
General Chassis	Multi-purpose grease			Service at 1,000 miles
Steering Gear	Hypoid Differential Oil	80W90	80W90	
Needle Bearing				
Universal Joint	Multi-purpose grease			Hand gun
Air Cleaner- Oil Bath	Lube Oil	10W40	10W40	1,000 miles
Front Axle Universal Drive Joint & Steer. Knuckle	- Multi-purpose grease			1,000 miles
Transfer Case	Transmission Oil	90	90	
Winch	Transmission Oil	90	90	
Power Steering	Mo-Par #208 4329			

* Limited slip additive DOT #219-650,000.

LUBRICATION & MAINTENANCE

Equipment Truck, M.D. Diesel Make Ford 1978 and NewerClass 7 Model F7000, LN7000

UNIT	KIND OF LUBRICANT	SAE		REMARKS
		Summer	Winter	
Engine Diesel	Lube Oil	10W40	10W40	Chg. oil & filter every 100 hrs.
Transmission	Engine Oil	50	50	Annually
Differential	Hypoid Differential Oil	80W90	80W90	Clean vent chg. grease annually
General Chassis	Multi-purpose grease			100 hrs or after storms
Power Steering Unit	Type F Automatic Transmission			
Universal Joint				
Needle Bearings	Multi-purpose grease			Hand Gun Only
Propeller Shaft				
Slip Joint	Multi-purpose grease			
Air Cleaner				Change when indicated
PCV Diaphragm				Change annually
Front and Rear Wheel Bearings	Multi-purpose grease			Clean and pack annually
Differential Elec. Shaft Unit	Hoist Oil	5W	5W	
Hydraulic Pump Chain Driven Case	Dexron Automatic Trans.			100 hours
Hydraulic System	Hydraulic Hoist Oil	5W	5W	
Hydraulic Line Filter				Annually
Linkage-Clevis Pins, Pivot & Sliding Surf.	Lube Oil	10W40	10W40	
Fuel Filter				Annually
Water Separator				Inspect Daily

LUBRICATION & MAINTENANCE

Equipment Truck MD gas Make International
 Class 8 Model 1600, 1700

UNIT	KIND OF LUBRICANT	SAE		REMARKS
		Summer	Winter	
Engine	Lube Oil	10W40	10W40	Change oil & filter at 100 hours.
Transmission	Transmission Oil	90	90	Change Annually
Differential	Hypoid Differential Oil	80W90	80W90	Clean vent Change Annually
General Chassis	Multi purpose grease			100 hours or after storm
Power Steering Unit	Dexron			
Steering Gear	Hypoid Differential Oil	80W90	80W90	
Universal Joint	Multi purpose grease			Hand gun only
Needle Bearings	Multi purpose grease			
Propeller Shaft	Multi purpose grease			
Slip Joint	Multi purpose grease			
Air Cleaner	Lube oil	10W40	10W40	As Needed
Oil Bath	Lube oil	10W40	10W40	
Distributor Bush.	Lube oil	10W40	10W40	
Distributor	Multi purpose grease			Sparingly
Tachometer Drive	Multi purpose grease			Hand gun only
Front & Rear	Multi purpose grease			Clean and pack
Wheel Bearings	Multi purpose grease			Annually
Differential	Hoist oil	5W	5W	
Elec. Shift Unit	Hoist oil			
Brakes	Heavy duty brake fluid DOT #3			
Clutch	Multi purpose grease			Sparingly
Throwout Bearing.	Multi purpose grease			Hand gun only
Propeller Shaft	Multi purpose grease			Sparingly
Center Bearing	Multi purpose grease			Hand gun only
Linkage-Clevis Pins, Pivot & Sliding Surf.	Lube Oil	10W40	10W40	
Fuel Filter				Annually

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LUBRICATION & MAINTENANCE

Equipment Truck M.D. gas Make Ford
 Class 8 Model All models 1966 through 1976

UNIT	KIND OF LUBRICANT	SAE		REMARKS
		Summer	Winter	
Engine Gasoline	Lube Oil	10W40	10W40	Change oil & Filter every 100 hrs.
Transmission	Trans Oil	90	90	Prior to 1972 change Annual*
Differential	Hypoid Differential Oil	80W-90	80W-90	Clean vent, change grease annually
General Chassis	Multi purpose grease			100 hours or after storm
Power Steering Unit	Type F Automatic Transmission			
Universal Joint				
Needle Bearings	Multi purpose grease			Hand gun only
Propeller Shaft Slip Joint	Multi purpose grease			
Air Cleaner				
Oil Bath	Lube Oil	10W40	10W40	As needed
Distributor Bushing	Lube Oil	10W40	10W40	
Front and Rear Wheel Bearings	Multi purpose grease			Clean & pack annually
Differential Elec. Shifting Unit	Hoist Oil	5W	5W	
Hydraulic Pump Chain Drive Case	Dexron Automatic Transmission			
Hydraulic System	Hydraulic Hoist Oil	5W	5W	Change Annuall.
Hydraulic Line Filter				Annually
Linkage-Clevis Pins, Pivot & Sliding Surf.	Lube Oil	10W40	10W40	

* 1972 and later use 50W lube oil.

LUBRICATION & MAINTENANCE

Equipment Truck M.D. gas Make Chevrolet GMC
 Class 8 Model A11

UNIT	KIND OF LUBRICANT	SAE		REMARKS
		Summer	Winter	
Engine	Lube Oil	10W40	10W40	Change every 100 hours
Transmission	Transmission Oil	90	90	
Differential	Hypoid Differential Oil	80W-90	80W-90	
General Chassis	Multi purpose grease			100 hours or after storms
Steering Gear	Hypoid Differential Oil	80W-90	80W-90	
Power Steering Unit	Dexron			
Propeller Shaft Slip Joint	Multi purpose grease			100 miles or after storms
Universal Joint Needle Bearings	Multi purpose grease			Hand gun only
Propeller Shaft Center Bearing	Multi purpose grease			
Air Cleaner Dry Type				As needed
Air Cleaner Oil Bath	Lube Oil	10W40	10W40	As needed
Rear Axle Electric Shift	Hoist Oil	5W	5W	At 100 hours
Oil Filter				At 100 hours
Fuel Filter				Annually
Hydraulic Filter				Annually

LUBRICATION & MAINTENANCE

Equipment Truck Make Ford Tandem
 Class 9 Model CT850, LTS900, LT900

UNIT	KIND OF LUBRICANT	SAE		REMARKS
		Summer	Winter	
Engine - Gas & Diesel	Lube Oil	10W40	10W40	60 hrs.
Distributor Shaft	Lube Oil	10W40	10W40	
Dist. W/Tac Drive	Multi-purpose grease			
Air Cleaner - Dry filter				as needed
Air Cleaner - Oil Bath	Lube oil	10W40	10W40	
Automatic Transmission	Type F			
Transmission	H.D. Lube Oil	50	50	
Aux. Transmission	Transmission Oil	90	90	
Differential Front and Rear	Hypoid Oil	80W-90	80W-90	
Propeller Shaft	Multi-purpose grease			
Universal Joints	Multi-purpose grease			
Steering Gear	Hypoid Gear Lube	80W-90	80W-90	
Power Steer	Type F			
Clutch Release Sleeve	Multi-purpose grease			Sparingly
Hydraulic System	Hoist Oil	5W	5W	
Alcohol Evaporator	Denatured Alcohol			Check daily - Do not overfill - keep 2/3 full
Air Tanks				Drain daily-leave open overnight if possible.
Compressor Air Filter				60hours
General Chassis	Multi-purpose grease			60 hours
Fuel Filter				Annually
Air Dryer	Dessicant			Annually
Hydraulic Filter				Annually

LUBRICATION & MAINTENANCE

Equipment Truck Make International
 Class 9, 11 Model VCOF 192A

UNIT	KIND OF LUBRICANT	SAE		REMARKS
		Summer	Winter	
Engine	Lube Oil	10W40	10W40	60 hours
Distributor Shaft Felt	Engine Oil	10W40	10W40	3 or 4 drops
Air Cleaner- Oil Bath	Engine Oil	10W40	10W40	
Transmission	Transmission Oil	90	90	Change annually
Differential Front & Rear & Power Divider	Hypoid Oil	80W-90	80W-90	Change annually
Steering Gear	Hypoid Oil	80W -90	80W-90	
Power Steering	Dexron			Change filter every 2,000 mi.
Compressor Air Strainer				See Note "A"
Air Tank				See Note "B"
General Chassis	Multi-purpose grease			
Propeller Shaft	Multi-purpose grease			
Universal Joint	Multi-purpose grease			Hand gun only
Clutch Release Sleeve	Multi-purpose grease			Sparingly
Wheel Bearings Front & Rear	Multi-purpose grease			Clean & pack annually
Linkage Pivot Pins & Sliding Surfaces	Lube Oil	10W 40	10W 40	Sparingly

NOTE A: Remove compressor air cleaner, wash all parts, saturate curled hair with engine oil and shake excess oil from curled hair before installation.

NOTE B: Drain the reservoirs daily in cold weather and once a week in warm weather.

LUBRICATION & MAINTENANCE

Equipment Truck 4 X 4 Make Ford
 Class 10 Model 1962 thru 1970 Marmon-Herrington & Howe-Coleman

UNIT	KIND OF LUBRICANT	SAE		REMARKS
		Summer	Winter	
Engine Caterpillar Diesel	Lube Oil	10W40	10W40	60 hours
Engine Gasoline	Lube Oil	10W40	10W40	60 hours
Transmission	Lube Oil	50	50	Change Annually
Transfer Case (4 X 4 only)	Transmission Oil	90	90	
Differential Front & Rear	Hypoid Differential Oil	80W-90	80W-90	Change Annually
General Chassis	Multi-purpose grease			60 hours
Front Axle Pivot & Yokes	Multi-purpose grease			Springly
Steering Gear	Hypoid Differential Oil	80W-90	80W-90	
Power Steering Unit	Type F			
Universal Joint				
Needle Bearing	Multi-purpose grease			Hand gun only
Propeller Shaft				
Slip Joint	Multi-purpose grease			
Air Cleaner-Oil Bath	Lube Oil	10W40	10W40	Dry type air cleaner-see "A".
Distributor Shaft	Lube Oil	10W40	10W40	
Air Compressor Filter				See note "B"
Air Tanks				See note "C"
Alcohol Evaporator				See note "D"
Wheel Bearings				Clean & pack annually
Fuel Filters				Semi annually
Oil Filter				60 hours
Fuel/Water Separator				Drain Daily

Note "A": Check Manufacturer's Specifications.

Note "B": Inspect Element, Clean & Replace if necessary every 60 hours.

Note "C": Drain water from air tanks daily.

Note D: Keep jar 2/3/ full of pure methanol 188 proof alcohol, free from inhibitor, clean air intake strainer every 60 hours.

LUBRICATION & MAINTENANCE

Equipment Truck 4 X 4 Make International
 Class 10 Model 1700 & 1800 & C0192 H.D.

UNIT	KIND OF LUBRICANT	SAE		REMARKS
		Summer	Winter	
Engine (gas & diesel)	Lube Oil	10W40	10W40	Chg. oil & filter every 60 hrs.
Transmission	Transmission Oil	90	90	See Note "A"
Differential	Hypoid Differential Oil	80W90	80W90	Clean vent Chg. Annually
General Chassis	Multi-purpose grease			60 hrs. after storm
Power Steering Unit		10W40	10W40	Chg. oil & filter every 20,000 miles
Steering Gear	Hypoid Differential Oil	80W90	80W90	
Universal Joint				
Needle Bearings	Multi-purpose grease			Hand gun only
Propeller Shaft				
Slip Joint	Multi-purpose grease			
Air Cleaner				
Oil Bath	Lube Oil	10W40	10W40	
Distributor Bush.	Lube Oil	10W40	10W40	
Distributor				
Tachometer Drive	Multi-purpose grease			Sparingly Hand gun only
Front & Rear				
Wheel Bearings	Multi-purpose grease			Clean & Pack Annually
Vacuum Brake Cyl				
Piston Type	Use vacuum cylinder oil			
Brakes	DOT #3 Heavy duty brake fluid			DOT #3
Clutch Throwout Brg.	Multi-purpose grease			Sparingly Hand gun only
Propeller Shaft				
Center Bearing	Multi-purpose grease			Sparingly Hand gun only
Linkage-Clevis Pins				
Pivot & Sliding Surf.	Lube Oil	10W40	10W40	
Hydraulic System	Hoist Oil	5W	5W	
Fuel/Water Separator				Drain daily
Air Dryer	Dessicant			Annually
Fuel Filter				Annually

NOTE "A": 1974 IHC 1700 have street L pipe to raise oil level in transmission - fill to this level with 10W40.

LUBRICATION & MAINTENANCE

Equipment Truck Make Oshkosh
 Class 11 Model 1970 Diesel N-255

UNIT	KIND OF LUBRICANT	SAE		REMARKS
		Summer	Winter	
Engine Cat Diesel	Lube Oil	10W40	10W40	Chg at 60 hrs
Transmission	Lube Oil	50	50	Do not use Hypoid or EP
Transfer Case	Lube Oil	50	50	
Differential - Front & Rear	Hypoid Oil	80W90	80W90	Change Annually
General Chassis	Multi-purpose grease			Service at 60 hours
Clutch Release Bearing	Multi-purpose grease			Annually
Power Steering	Lube Oil	10W40	10W40	
Universal Joint Bearing	Multi-purpose grease			Handgun
Propeller Shaft Slip Joint	Multi-purpose grease			60 hrs.
Air Brakes	Air Comp. Filter			60 hrs.
Alcohol Evaporator	Denatured Alcohol			Check Daily kee 2/3 full
Air Cleaner - Dry				Service as Needed
Fuel Filter				Change Annual Spring
Air Tanks				Drain Daily
Tachometer Drive	Lubriplate 630A			2 strokes, handgun, 60 hrs.

1980

LUBRICATION & MAINTENANCE

Equipment Truck Make FWD
 Class 11 Model 367W all to 1963 incl.

UNIT	KIND OF LUBRICANT	SAE		REMARKS
		Summer	Winter	
Engine (Diesel & Gas)	Lube Oil	10W40	10W40	60 hrs.
Transmission	Transmission Oil	140	90	
Transfer Case and Auxiliary Trans.	Transmission Oil	140	90	
Front & Rear Differential	Hypoid Differential Oil	80W90	80W90	Level 1" below top level of filter plug.
General Chassis	Multi-purpose grease			60 hours
Clutch Release Bearing	Multi-purpose grease			
Steering gear	Transmission Oil	140	90	
Universal Joint	Multi-purpose grease			
Propeller Shaft	Multi-purpose grease			
Slip Joint	Multi-purpose grease			
Wheel Bearings	Multi-purpose grease			
Water Pump	Multi-purpose grease			
Motor Fan	Multi-purpose grease or Lube Oil	10W40	10W40	As required
Distributor Shaft	Same as Motor Fan			
Generator & Starter	Lube Oil	10W40	10W40	
Air Cleaner - Dry type	Lube Oil	10W40	10W40	As required
Air Cleaner -Oil bath	Lube Oil			
Hydraulic Brakes	HD Brake Fluid			DOT 3
Vacuum Booster Brake	Bendix Vacuum Cylinder Oil			Annually
Front Axle - Shaft Universals	Multi-purpose grease			
Fuel Filter				Semi-annually
Oil Filter				60 hours
Fuel/Water Separator				Drain daily

1980

LUBRICATION & MAINTENANCE

Equipment Truck Make Oshkosh
 Class 11 Model All thru 1970 gas - diesel

UNIT	KIND OF LUBRICANT	SAE		REMARKS
		Summer	Winter	
Engine	Lube Oil	10W40	10W40	Chg. at 60 hrs.
Transmission	Transmission Oil	90	90	
Auxiliary Transmission	Transmission Oil	90	90	
Transfer Case	Transmission Oil	90	90	
Differential Front & Rear	Hypoid Differential Oil	80W90	80W90	
General Chassis	Multi-purpose grease			Service at 60 hours
Clutch Release Bearing	Multi-purpose grease			Sparingly
Power Steering	Dexron			
Universal Joint Bearing	Multi-purpose grease			Handgun
Propeller Shaft Slip Joint	Multi-purpose grease			
Water pump	Multi-purpose grease			
Motor Fan	Lube Oil Multi-purpose grease			As required
Distributor Shaft	Lube Oil Multi-purpose grease			As required
Generator & Starter	Lube Oil	10W40	10W40	
Piston Type Vacuum Brake Cylinder	Bendix Vacuum Cyl. Oil			Annually
Air Cleaner - Oil Bath	Lube Oil	10W40	10W40	
Air Cleaner - Dry				

LUBRICATION & MAINTENANCE

Equipment Truck Make Dodge, International
 Class 12 Model CT 900 2010, 2050

UNIT	KIND OF LUBRICANT	SAE		REMARKS
		Summer	Winter	
Engine	Lube Oil	10W40	10W40	60 hours
Distributor Shaft	Lube Oil	10W40	10W40	
Dist. W/Tac Drive	Multi-purpose grease			
Air Cleaner - dry				
Air Cleaner - oil bath	Lube Oil	10W40	10W40	
Transmission	Transmission Oil	90	90	
Aux. Trans.	Transmission Oil	90	90	
Differential Front & Rear	Hypoid Differential Oil	80W90	80W90	
Propeller Shaft	Multi-purpose grease			
Universal Joints	Multi-purpose grease			
Steering Gear	Transmission Oil	90	90	
Power Steer	Lube Oil	10W40	10W40	
Clutch Release Sleeve	Multi-purpose			Sparingly
Hydraulic System	Hoist Oil	5W	5W	
Alcohol Evaporator		Check Daily - do not overfill - keep 2/3 full		
Air Tanks		Drain daily - Leave open overnight if possible		
Compressor Air Filter				60 hours
General Chassis	Multi-purpose grease			60 hours
Air dryer	Dessicant			Annually
Hyd. Filter				Annually
Fuel/Water Separator				Drain Daily
Fuel Filter				Annually
Oil Filter				60 hours

1980

LUBRICATION & MAINTENANCE

Equipment Motor Grader (Maintainer) Make John Deere
 Class 14, 15 Model 570, 670

UNIT	KIND OF LUBRICANT	SAE		REMARKS
		Summer	Winter	
Engine - Diesel	Lube Oil	10W40	10W40	Chg. at 60 hours
Air Cleaner			Replace when shows red	when indicator
Pre Cleaner				Check daily
Circle Drive Gear Box	Transmission Oil	90	90	Blade must be on ground
Tandem Drive	JD 303 DOT #015-o22850			Annually
Transmission	JD 303			Annually
Trans. Filters				Annually
Fuel Filter				Annually
Cylinders, Trunnions	Multi-purpose grease			Daily
Draft Frame, Front Axle	Multi-purpose grease			Daily
All Pivot Points	Multi-purpose grease			Daily
Front Wheels	Multi-purpose grease			Annually
Rear Axle Brgs. 570 only	Multi-purpose grease			Annually
Crankcase vent tube	Remove and Clean			Annually
Oil Filter				60 hours
Water Separator				Drain daily

1980

LUBRICATION & MAINTENANCE

Equipment Motor Grader (Maintainer) Make Caterpillar
 Class 15 Model 12 & 120

UNIT	KIND OF LUBRICANT	SAE		REMARKS
		Summer	Winter	
Engine - Diesel	Lube Oil	10W40	10W40	60 hours
Fuel Injection Pump Housing	Lube Oil	10W40	10W40	60 hours
Transmission and Rear Axle	Transmission Oil	90	90	
Starter Pinion Clutch	Lube Oil	10W40	10W40	
Tandem Drive Housings	Transmission Oil	90	90	Chk. at 120 hrs. Serv. at 400 hrs
General Chassis	Multi-purpose grease			Service at 20 hours
Clutch Release Bearing	Lube Oil	10W40	10W40	Service at 20 hours
Clutch Pilot Bearing	Multi-purpose grease			1 or 2 shots of grease gun sparingly - 240 hrs.
Clutch Release Lever Pins	Multi-purpose grease			Same as clutch pilot bearing
Steering Gear	Transmission Oil	90	90	
Steering Booster Supply Tank	Hydraulic Hoist Oil	5W	5W	Check @ 60 hrs. Serv. @ 400 hrs.
Universal Joint Plain Bearing	Multi-purpose grease			Service at 20 hours
Wheel Bearings - Front	Multi-purpose grease			60 hours
Telescopic Control Shafts	Multi-purpose grease			Install grease fittings
Motor Fan	Multi-purpose grease			Grease sparingly Service at 240 hours.
Crankcase Breather	Lube Oil	10W40	10W40	Service at oil change
Air Cleaner - Oil Bath	Lube Oil	10W40	10W40	As required
Starting Motor - Gas	Lube Oil	10W40	10W40	Service with Diesel Engine
Generator & Starter	Lube Oil	10W40	10W40	
All Control Housings	Transmission Oil	90	90	
Lift Control Unit	Transmission Oil	90	90	

LUBRICATION & MAINTENANCE

Equipment H.D. Motor Grader (Maintainer) Make Huber
 Class 15 & 16 Model D1300, D1400, MDL100

UNIT	KIND OF LUBRICANT	SAE		REMARKS
		Summer	Winter	
Engine	Lube Oil	10W40	10W40	60 hours and filter
Transmission	Lube Oil	10W40	10W40	Annually
Final Drive	Lube Oil	10W40	10W40	Annually
General Chassis	Multi-purpose grease			Service at 20 hours
Steering Gear	Multi-purpose grease			Check every 25 hours
Fan Hub	Multi-purpose grease			Sparingly where required
Wheel Bearings	Multi-purpose grease			
Hydraulic Control System	Hoist Oil	10W40	10W40	
Starter	Lube Oil	10W40	10W40	2 wicks - Tube at removal
Air Cleaner - Dry				
Tandem Drive Chains	Transmission Oil	90	90	Annually
Hydraulic Controls	Hoist Oil			
Circle Gear Case	Transmission Oil	90	90	Annually
Grease Fittings	Multi-purpose grease			Daily

Air Box Drains - Check @ 200 hours for air flow, clean @ 500 hours.

Fuel Filters - Drain sediment daily, change @ 300 hours.

LUBRICATION & MAINTENANCE

Equipment EXHD Motor Grader (Maintainer)

Make Adams

Class 16

Model LW 440,550

UNIT	KIND OF LUBRICANT	SAE		REMARKS
		Summer	Winter	
Engine - Diesel	Lube Oil	10W40	10W40	60 hours
Air Cleaner	Lube Oil	10W40	10W40	As required
Upper Transmission	Transmission Oil	90	90	
General Chassis	Multi-purpose grease			Service at 20 hours
Circle Reverse	Hypoid Oil	140	140	
Circle, Reverse, Transfer	Transmission Oil	90	90	
Power Steering Gear	Transmission Oil	140	140	
Power Steering Gear Valve Housing	Transmission Oil	140	140	
Gear Shift Housing	Transmission Oil	90	90	
Lateral Shaft	Hypoid Differential Oil	140	140	
Lateral Shaft Reduction	Hypoid Differential Oil	140	140	
Blade Lift	Hypoid Differential Oil	140	140	
Blade Lift Reduction	Hypoid Differential Oil	140	140	
Hydraulic System	Hydraulic Hoist	5W	5W	
Front Wheel Lean	Hypoid Differential Oil	140	140	
Scarifier Lift and Reduction	Hypoid Differential Oil	140	140	
Wheel Bearings	Multi-purpose grease			
Power Box	Untreated Lube Oil	30	30	
Power Box Drive	Transmission Oil	90	90	
Power Box Drive with Pump Adaptor	Transmission Oil	90	90	
Power Transmission and Final Drive	Transmission Oil	90	90	
Tandem Drive	Lube Oil	10W40	10W40	

LUBRICATION & MAINTENANCE

Equipment EX HD Motor Grader (Maintainer) **Make** Champion
Class 16 **Model** 560 HD

UNIT	KIND OF LUBRICANT	SAE		REMARKS
		Summer	Winter	
Engine	Lube Oil	10W40	10W40	Change at 60 hours
Transmission	Lube Oil	10W40	10W40	Annually
Final Drive	Hypoid Differential Oil	80W90	80W90	Annually
Tandem	Transmission Oil	90	90	Annually
Main Hyd. and Hyd. Steering	Hoist Oil	5W	5W	
Oil Clutch	Lube Oil	10W40	10W40	
General Chassis	Multi-purpose lube			Every 20 hours
Front Wheel Bearings	Multi-purpose lube			Annually
Brakes	H,D. Brake Fluid			
Air Cleaner	Dry Element			Check dust bowl daily
Engine Air Drain Boxes				Check for flow every 60 hours
Fuel Filters				Chg. Annually
Slide Shift Control and Circle				Clean and Lubricate with dry graphite.

LUBRICATION & MAINTENANCE

Equipment EX HD Motor Grader (Maintainer) Make Galion
 Class 16 Model 118

UNIT	KIND OF LUBRICANT	SAE		REMARKS
		Summer	Winter	
Engine	Lube Oil	10W40	10W40	Service at 60 hours
Transmission, Differential	Transmission Oil	90	90	Twice a year seasonal
Transfer Case	Transmission Oil			repack twice a year
Gear Case - Lateral Shift	Multi-purpose		Clean and a year	
Gear Case Steering	Transmission Oil	90	90	Check ea. 60 hrs. Chg. twice a year
General Chassis	Multi-purpose grease			Service at 20 hours
Wheel Bearings	Multi-purpose grease			
Gear Case Circle Rev.	Transmission Oil	90	90	Flush & change twice a year
Tandem Drive	Transmission Oil	90	90	Twice a year seasonal
Engine Fan, Water Pump	Multi-purpose grease			Check at plug every 60 hrs.
Fuel Injector Pump	Lube Oil	10W40	10W40	Chg. when chging engine oil
Starter Generator	Lube Oil	10W40	10W40	60 hours
Distributor Shaft	Multi-purpose grease			50 hrs. remove plug-fitting until grease comes out.
Propeller Shaft - Universal Joints	Multi-purpose grease			Service at 20 hours.
Hydraulic Control System	Hydraulic Oil			Annually
Rear Axle to Tandem Drive Bearing	Multi-purpose grease			Service at 20 hours
Hydraulic System				Service at 60 hours
Air Cleaner	Lube Oil	10W40	10W40	60 hours
Air Cleaner	Lube Oil	10W40	10W40	As required
Oil Filter	Change filter cartridge at each engine oil change.			

NOTE: Care should be taken not to over-grease the rear bearing on the blade left arm shafts as the rear of this shaft is inside the cab and the one on the right side is directly behind the instrument panel and excessive grease could damage the wiring.

1980

LUBRICATION & MAINTENANCE

Equipment EX HD Motor Grader (Maintainer) **Make** Galion
Class 16 **Model** 104H 104 HB

UNIT	KIND OF LUBRICANT	SAE		REMARKS
		Summer	Winter	
Engine	Lube Oil	10W40	10W40	Change at 60 hours
Transmission	Lube Oil	50	50	Seasonal
Final Drive Axle	Hypoid Differential Oil	80W90	80W90	Seasonal
Tandem Drive	Lube Oil	50	50	Seasonal
Circle Reverse Case	Transmission Oil	90	90	60 hours
Hydraulic Control System	Hydraulic Hoist Oil	5W	5W	Check sight gauge w/oil cold before operatin
Oil Clutch	Dexron			Seasonal
General Chassis	Multi-purpose grease			10 hours or daily
Front Wheel Bearings	Multi-purpose grease			Yearly
Brakes	H.D. Brake fluid			
Air Cleaner	Dry Element	Clean element a per manufacturer's instructions. Check dust bowl daily.		
Air Drain Boxes				Check for air flow every 1000 hours.
Starter	Lube Oil	10W40	10W40	Lube at Removal
Fuel Filters				Annually

Tire Pressure - 35 lbs. - can increase 50% for operating on pavement or improved road.

1980

LUBRICATION & MAINTENANCE

Equipment EX HD Motor Grader (Maintainer) **Make** Huber-Warco
Class 16 **Model** 10D W/GM Diesel

UNIT	KIND OF LUBRICANT	SAE		REMARKS
		Summer	Winter	
Engine	Lube Oil	10W40	10W40	Service at 60 hours
Transmission	Transmission Oil Hyd. Hoist Oil	5W	5W	
Final Drive	Hyd. Hoist Oil Transmission Oil	5W	5W	
Pump Drive Housing	Hyd. Hoist Oil Transmission Oil	5W	5W	
General Chassis	Multi-purpose grease			Daily
Clutch Release Bearing	Multi-purpose grease			
Steering Gear Case	Transmission Oil	90	90	
Fan Hub	Multi-purpose grease			Sparingly-Weekly
Wheel Bearings	Multi-purpose grease			
Hydraulic Control System	Hoist Oil	5W	5W	
Chevron Starting System	Chevron Starting Capsule			
Generator	Lube Oil	10W40	10W40	Sparingly
Starter	Lube Oil	10W40	10W40	Sparingly
Air Cleaner Oil Bath	Lube Oil	10W40	10W40	
Tandem Drive Chains	Transmission Oil	90	90	
Hydraulic Controls	Hoist Oil	5W	5W	
Circle Turn Gear Case	Transmission Oil	90	90	

1980

LUBRICATION & MAINTENANCE

Equipment EX HD Motor Grader (Maintainer)

Make Wabco

Class 16

Model 1970 - 440H

UNIT	KIND OF LUBRICANT	SAE		REMARKS
		Summer	Winter	
Engine - Diesel	Lube Oil	30	30	60 hours
Air Cleaner - dry type				Service as recommended by manufacturer
General Chassis	Multi-purpose grease			20 hours
Upper Trans. and Shifter housing	Transmission Oil	90	90	
Circle Reverse Transfer	Transmission Oil	90	90	
Power Box Drive	Transmission Oil	90	90	
Power Box Drive Housing w/Pump Adapter	Transmission Oil	90	90	
Lower Transmission	Transmission Oil	90	90	
Circle Reverse Housing	Transmission Oil	140	140	
Lateral Shift Housing	Transmission Oil	140	140	
Lift Housing	Transmission Oil	140	140	
Lift Reduction Housing	Transmission Oil	140	140	
Front Wheel Lean Housing	Transmission Oil	140	140	
Scarifier Lift Housing	Transmission Oil	140	140	
Blade Lift and Lift Reduction	Transmission Oil	140	140	
Power Box Housing	Engine Oil	30	30	
Steering Gear-Power	Hypoid Oil	80W90	80W90	Mil-L-2105B
Tandems	Engine Oil	10	10	
Oil Clutch	Dexron			
Hydraulic Oil	Hydraulic Hoist	5W	5W	
Brake Master Cyl.	H.D. Brake Fluid			DOT-3
Wheel Bearings	Multi-purpose grease			

LUBRICATION & MAINTENANCE

Equipment Truck M.D. Make Reo
 Class 17 Model F231L

UNIT	KIND OF LUBRICANT	SAE		REMARKS
		Summer	Winter	
Engine	Lube Oil	10W40	10W40	Change oil & filter every 60 hr.
Air Cleaner Oil Bath	Engine Oil	10W40	10W40	Same viscosity used in crankcase
Transmission	Transmission Oil	90	90	Chg. Annually
Differential	Hypoid	80W90	80W90	Clean vent, chg. annually
Steering Gear	Hypoid	80W 90	80W90	
Distributor Bushing	Engine Oil	10W40	10W40	
General Chassis	Multi-purpose grease			60 hours
Universal Joint	Multi-purpose grease			Hand gun only
Needle Bearings	Multi-purpose grease			
Propeller Shaft Slip Joint	Multi-purpose grease			
Propeller Shaft Center Bearing	Multi-purpose grease			hand gun only
Wheel Bearings	Multi-purpose grease			Clean and pack Annually
Vacuum brake cyl. Piston Type	Use vacuum cylinder oil			
Brakes	H.D. Brake Fluid DOT #3			
Linkage-clevis pins, Pivots & Sliding Surf.	Engine Oil	10W40	10W40	
Winch	Hypoid Oil	80W90	80W90	Flush and chg. annually

LUBRICATION & MAINTENANCE

Equipment H.D. Crawler Tractor Make Caterpillar (diesel)
 Class 20 Model D7

UNIT	KIND OF LUBRICANT	SAE		REMARKS
		Summer	Winter	
Engine - Diesel	Lube Oil	10W40	10W40	Service at 60 hours
Air Cleaner - oil bath	Lube Oil			As required
Transmission	Transmission Oil	140	90	
Starting Motor	Lube Oil	10W40	10W40	Service at 60 hours
Fuel Injection Pump Housing	Lube Oil	10W40	10W40	Drain & refill with motor
General Chassis	Multi-purpose grease			Daily
Clutch Release Shifter Collar	Transmission Oil	140	90	
Generator and Starter Drive	Lube Oil	10W40	10W40	Sparingly in generator
Front Idlers	Transmission Oil	140	90	Service daily
Track Rollers	Transmission Oil	140	90	Service daily
Clutch Drive Plate Bearing	Multi-purpose grease			
Final Drives	Transmission Oil	140	90	
Track Carrier Rollers	Transmission Oil	140	90	Service daily

LUBRICATION & MAINTENANCE

Equipment MD Crawler Tractor W/Loader **Make** John Deere
Class 21 **Model** JD 450

UNIT	KIND OF LUBRICANT	SAE		REMARKS
		Summer	Winter	
Engine	Lube Oil	10W40	10W40	Chg. 60 hrs.
General Chassis	Multi-purpose grease			Daily
Track Idler and Rollers	Multi-purpose grease			See note "A" 60 hours
Loader Pressure Fittings	Multi-purpose grease			Daily
Air Cleaner - Oil Bath				60 hours
Pump Sediment Bowl			Check for	water or
Fuel Transfer			dirt daily	
Fuel Filters			Drain any	water or dirt
Sediment Bowls			deposit daily	daily
Hydraulic System	JD 303			Chg. annually
Clutch				2 strokes
Throwout Bearing	Multi-purpose grease			every 50 hrs.
Final Drives	John Deere Type 303 Special Purpose Oil			Annually
Transmission	John Deere Type 303 Special Purpose Oil			Annually
Starter	Lube Oil	10W40	10W40	Annually
Fuel Filters				Annually

Note "A": Use only special grease gun furnished for track lubrication. Pump grease into idler and roller fittings ONLY until increased resistance is felt on level of grease gun. Grease at 10 hrs. intervals when operating in deep mud or water.

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LUBRICATION & MAINTENANCE

Equipment MD Crawler Tractor Make Allis Chalmers

Class 21 Model HD4

UNIT	KIND OF LUBRICANT	SAE		REMARKS
		Summer	Winter	
Engine	Lube Oil	10W40	10W40	60 hours
Torque Converter & Shuttle				
Clutch	Dexron			Annually
Fuel Filter				Clean annually in spring
Hydraulic Reservoir	Lube Oil	10W40	10W40	Annually
Transmission	Lube Oil	10W40	10W40	Annually
Final Drive	Transmission Oil	90	90	Annually
Air Cleaner - Dry Type				Annually
Track Idler and Rollers	Transmission Oil	90	90	100 hours
Hydraulic Suction Line				
General Chassis	Multi- purpose grease			Daily

LUBRICATION & MAINTENANCE

Equipment L.D. Wheel Tractor Make Ford Dearborn
 Class 22 Model BC 25

UNIT	KIND OF LUBRICANT	SAE		REMARKS
		Summer	Winter	
Engine	Lube Oil	10W40	10W40	Service at 60 hours
Transmission	Ford Special Hyd. Oil DOT #293-627900			Annually. See note A & B
Differential	Ford Special Hyd. Oil DOT #293-627900			Annually See note A
Hydraulic System 600 & 900 Series	Ford Special Hyd. Oil DOT #2930627900			Annually
Power Steering	DOT #015-22710			
Steering Gear	Ford Special Hyd. Oil DOT #293-627900			
General Chassis	Multi-purpose grease			Daily
Air Cleaner - Oil Bath	Lube Oil	10W40	10W40	Service daily
Generator Bearings	Lube Oil	10W40	10W40	
Distributor	Lube Oil	10W40	10W40	
	MOWER UNIT			
Grease Fittings	Multi-purpose grease	Every 4 hours of operation except around Pitman - there every 2 hours		

Note "A": Transmission, differential and hydraulic system - when draining them, be sure to remove all three (3) plugs. On 600 series - when checking hydraulic oil level, be sure always that all hydraulic cylinders are fully extended.

Note "B": Selectomatic Transmission - Use Dexron.

LUBRICATION & MAINTENANCE

Equipment L D Wheel Tractor **Make** Massey Ferguson
Class 22 **Model** MF 12

UNIT	KIND OF LUBRICANT	SAE		REMARKS
		Summer	Winter	
Engine	Lube Oil	10W40	10W40	Change every 25 hours
Rear Axle	Transmission Oil	90	90	Drain Annually
Hydrostatic Trans.	Dexron			See note "A"
General Chassis	Multi-purpose grease			Every 50 hours
Air Cleaner				See note "B"
	EVERY 100 HOURS CLEAN AND PACK			
Front Axle				
Front Axle Spindle				
Clutch Pedal Pivot				
Idler Pivot				
Hydra Speed Cam				
Spring Tube				
	MOWER			
General Lubrication	Multi-purpose grease			Every 4 hours
Gear Box	Multi-purpose grease			3/4 full annua
Roller	Lube Oil	10W40	10W40	Every 4 hours

Note "A": In dusty conditions drain transmission every 25 hours, normal condition every month.

Note "B": Check daily, clean if necessary and replace every month.

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LUBRICATION & MAINTENANCE

Equipment MD Wheel Tractor Make Massey Ferguson
 Class 23 Model 245 W/ triumph mower

UNIT	KIND OF LUBRICANT	SAE		REMARKS
		Summer	Winter	
Engine	Lube Oil	10W40	10W40	Change every 60 hours
Trans. & Differential	Hyd. Trans. Fluid	DOT #015-022850		
Hyd. System	Hyd. Trans. Fluid	DOT #015-022850		See note "A"
Power Steering	Hyd. Trans. Fluid	DOT #015-022850		
General Chassis	Multi-purpose grease			At 60 hours
Air Cleaner	Dry Type	Replace yearly		Clean at 60 hours
Fuel Filter	Drain as necessary			Check for water
Auxiliary Hyd. System				Operator Manual 18
Front Wheel Bearings	Multi-purpose grease			Annually
Mower Oil Reservoir	Lube Oil	10W40	10W40	Level of Sight Glass
Pitman & Knife Head	Multi-purpose grease			Several times daily
Mower Oil	Multi-grade	10W40	10W40	Heavy duty
Mower Filter	100 Micron Reusable			Clean every 20 hrs.

Note "A": Clean strainer and refill with Hyd. Trans. Fluid every 500 hrs. or annually.

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LUBRICATION & MAINTENANCE

Equipment Wheel Tractor Make John Deere
 Class 23, 24 Model 301A, 401C, 400

UNIT	KIND OF LUBRICANT	SAE		REMARKS
		Summer	Winter	
Engine Diesel	Lube Oil	10W40	10W40	Change every 60 hrs.
Trans. & Differential	Hyd. Trans. Fluid			Annually
Hydraulic System	Hyd. Trans. Fluid			Annually
Pivot Points Chassis	Multi purpose			2 shots
Front Wheels	Multi purpose			2 shots
Rear Axle Bearings	Multi-purpose			Annually
Oil Filter	Fram PH 20			Change every 60 hrs.
Air Cleaner	Dry Type	Check Daily		Replace annual.
Hyd. System Filter	Replaceable			Change every 60 hrs.
Fuel Filter	Replaceable			Annually
Battery				Service at 60 hours
Starter	Lube Oil	10W40	10W40	

NOTE: Hyd. Trans. Fluid available under #015-022850

LUBRICATION & MAINTENANCE

Equipment Dragline Make Schield Bantam
 Class 26 Model All

UNIT	KIND OF LUBRICANT	SAE		REMARKS
		Summer	Winter	
Engine	Lube Oil	10W40	10W40	60 hours
Drive Chain	Lube Oil	10W40	10W40	See note "A"
General Chassis	Multi-purpose grease			60 hours
Clutch Release Brg. and Camshaft Brg.	Multi-purpose grease			
Water Pump	Multi-purpose grease			
Motor Fan	Multi-purpose grease			
Generator & Starter	Lube Oil	10W40	10W40	
Vertical Swingshaft Bearings	Multi-purpose grease			See note "B"
Pillow Block Bearings	Multi-purpose grease			Twice yearly
Open Gears	Pressurized Spray Gear & Cable Compound			8 hours or daily
Air Cleaner, Oil Bath	Lube Oil	10W40	10W40	As required
Turntable Rollers	Multi-purpose grease			Daily
All Boom Pullies & Crane Carrier	Multi-purpose grease			Daily
Wheel Bearings	Multi-purpose grease			Annually
Transmission	Trans Oil	90	90	
Transfer Case		90	90	
Differential Front & Rear	Hypoid Oil	80W90	80W90	Annually
Steering Gear	Trans Oil	90	90	

NOTE "A": On 1964 Bantam Model T-35, lubricate drive chain with 10W40 Lube Oil, check every 8 hours, clean and refill every 2,000 hours or yearly.

NOTE "B": Some models permanently greased at the factory. On unit with fittings every 60 hours until grease appears at vent holes.

LUBRICATION & MAINTENANCE

Equipment Dragline Make Sargent
 Class 26 Model All with crane carrier

UNIT	KIND OF LUBRICANT	SAE		REMARKS
		Summer	Winter	
Engine	Lube Oil	10W40	10W40	60 hours
Transmission	Transmission Oil	90	90	
Auxiliary Trans.	Transmission Oil	90	90	
Differential Front & Rear	Hypoid Differential Oil	80W90	80W90	
General Chassis	Multi-purpose grease			60 hours
Steering Gear	Hypoid Differential Oil	80W90	80W90	
Universal Joint	Multi-purpose grease			Hand gun
Needle Bearing	Multi-purpose grease			
Propeller Shaft	Multi-purpose grease			
Slip Joint	Multi-purpose grease			
Front Axle Shaft Universals	Multi-purpose grease			Every 100 hours or 1,000 mi.
Distributor Shaft	Lube Oil	10W40	10W40	
Generator and Starter	Lube Oil	10W40	10W40	
Air Cleaner, Oil Bath	Lube Oil	10W40	10W40	As required
Water Pump	Multi-purpose grease			100 hours
Motor Fan	Lube Oil	10W40	10W40	100 hours
Turntable Ball and Roller Bearings	Multi-purpose grease			As required Buy locally as required
Open Gears	Gear and Cable Compound			
Drive Chain	Lube Oil	10W40	10W40	
Clutch Release Brgs.	Multi-purpose grease			100 hours
Wheel Bearings	Multi-purpose grease			Seasonal

LUBRICATION & MAINTENANCE

Equipment Dragline Make Little Giant
 Class 26 Model M38A1

UNIT	KIND OF LUBRICANT	SAE		REMARKS
		Summer	Winter	
Engine (Dragline)	Lube Oil	10W40	10W40	60 hours
Engine (Carrier)	Lube Oil	10W40	10W40	60 engine hrs.
Transmission	Transmission Oil	90	90	
Auxiliary Transmission	Transmission Oil	90	90	
Differential	Hypoid Differential Oil	80W90	80W90	
Steering Gear	Hypoid Differential Oil	80W90	80W90	
Chassis (All fittings)	Multi-purpose grease			Service every 20 hours
Turn Table Assembly	Multi-purpose grease			Daily
Bull Gear	Open Gear Compound			Daily
Vertical Swing Shaft Assembly	Multi-purpose grease			Daily
Jack Shaft	Multi-purpose grease			Seasonal and Sparingly
Horizontal Swing Shaft	Multi-purpose grease			Seasonal and Sparingly
Bevel Gears	Open Gear Compound			Daily
Chain Drive Assembly	H.D. Lube Oil model (1969) and later	10W40	10W40	30 hours
Chain Drive Assembly	Transmission oil - models prior to 1969	90	90	30 hours
Drive Gears (ALL)	Pressurized Open Gear Compound			Use daily
Clutch Assembly	Multi-purpose grease			60 hours
Clutch Assembly (Oil Hole)	Lube Oil	10W40	10W40	60 hours
Boom and Lead Pulleys	Multi-purpose grease			Daily
Gear Case	Trans oil	90	90	
Taglines	Trans oil	90	90	Do not overfill

NOTE: Swing pinion and swing gear open gear compound daily.

LUBRICATION & MAINTENANCE

Equipment Tractor W/Rotary Mower Make Massey Ferguson w/Sunmaster Mower
 Class 30 Model MF-150 (MF366C)

UNIT	KIND OF LUBRICANT	SAE		REMARKS
		Summer	Winter	
Engine	Lube Oil	10W40	10W40	60 hours
Transmission and Differential	M.F. Oil Spec. #M-1129			Annually
Hydraulic System	M.F. Oil Spec. #M-1129			Annually
Power Steering	Dexron			Seasonally
Steering Gear Housing	Hypoid Oil	90	90	
General Chassis	Multi-purpose grease			Daily
Air Cleaner, Dry Type				Daily
Distributor	Lube Oil	10W40	10W40	
Generator & Starter	Lube Oil	10W40	10W40	
Blade Spindle Assembly	Multi-purpose grease			Daily
Universal Joints	Multi-purpose grease			Daily with handgun
Chain Case	Transmission Oil	90	90	Annually
Gear Case	Transmission Oil	140	140	Annually
General Chassis	Multi-purpose grease			Daily

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LUBRICATION & MAINTENANCE

Equipment Rotary Snow Plow Make Sno-Go
 Class 34 Model TU 3

UNIT	KIND OF LUBRICANT	SAE		REMARKS
		Summer	Winter	
Engine -AC Diesel	Lube Oil	10W40	10W40	Every 60 hrs. Springly Annually
Pilot Bearing	Lubriplate 630A			
Clutch Release Bearing	Lubriplate 630A			
Clutch Housing Drive Bearing	Lubriplate 630A			Every 4 hours
Universal Joint Plain Bearing	Lubriplate 630A			Every 4 hours
Chain and Sprocket Case	Lube Oil - Non Detergent	20	20	Buy locally
Auger Drive Chain	Transmission Oil	90	90	Every 4 hours
Auger Bearings	Lubriplate 630A			Every 4 hours
Hydraulic Systems	Hydraulic Hoist Oil	5W	5W	
Gear Case on Blower Fan	Transmission Oil	90	90	Every 4 hours
Air Cleaner Dry type				Check daily for moisture Annually after winter
Fuel Filter				

Note: See truck sheet for carrier service.

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LUBRICATION & MAINTENANCE

Equipment M.D. Loader Make John Deere
 Class 37 Model 544

UNIT	KIND OF LUBRICANT	SAE		REMARKS
		Summer	Winter	
Engine	Lube Oil	10W40	10W40	60 hours
Air Cleaner	Dry Element			Red indicated
Transmission	Hydraulic Transmission Fluid	C-2	C-2	Annually
Loader Reservoir	John Deere purpose	*303	*303	Annually
General Chassis	Multi-purpose grease			Every 60 hrs.
Boom and Loader Hinge Points	Multi-purpose grease			Daily
Front & Rear Differentials	John Deere	*303	*303	Annually
Steering Gear	Hydraulic Transmission Fluid	C-2	C-2	60 hours
Front Drive Shaft Bearing	Multi-purpose grease			Daily
Axle Bearing	Multi-purpose grease			Daily
Starter	Lube Oil	10W40	10W40	Saturate wicks
Generator				
Universal Joint	Multi-purpose grease			Every 60 hrs.

NOTE: * DOT #303-293-627900

LUBRICATION & MAINTENANCE

Equipment M.D. Loader **Make** Case

Class 37 **Model** W-7, W-9, W-10, W-14

UNIT	KIND OF LUBRICANT	SAE		REMARKS
		Summer	Winter	
Engine - Diesel	Lube Oil	10W40	10W40	60 hours
Engine - Gas	Lube Oil	10W40	10W40	60 hours
Transmission and Torque Converter	Dexron			1000 hours
Differential	Hypoid	80W90	80W90	1000 hours
Fuel Injection Pump	Lube Oil	10W40	10W40	60 hours
Hydraulic System	Dexron			Annually
Power Steering and Power Brake System	Dexron			Chg. element every 1000 hrs
Planetary Housing	Transmission Oil	90	90	1000 hours
Steering Gear Housing	Trans. Oil	90	90	
Generator	Lube Oil	10W40	10W40	
Starter	Lube Oil	10W40	10W40	Service only at overhaul
Air Cleaner - Dry				Service as recommend by mfg
General Chassis	Multi-purpose grease			Serv. at 20 hr
Fuel Filter				Annually
Hyd. Filter				Annually

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LUBRICATION & MAINTENANCE

Equipment 3-5 Ton Roller -Self Propelled Make 1976 Ferguson
 Class 55 Model w/Sunstrand Hydrosatic Drive

UNIT	KIND OF LUBRICANT	SAE		REMARKS
		Summer	Winter	
Engine	H.D. Lube Oil	10W40	10W40	Serv. at 60 hr. Serv. as rec. by mfg.
Air Cleaner	Dry Element			
Hydrostatic Transmission	Dexron Fluid			See note "A"
Planetary Gear Drive	Transmission Oil	90	90	Chg. annually
General Chassis etc.	Multi-purpose grease			As required
Guide Roll Axle and Compression Roll Brgs.	Multi-purpose grease			See note "B"
King Pin	Multi-purpose grease			See note "C"
Trailing Wheel Bearings	Multi-purpose grease			Annually
Spindle Guide Blocks				See note "D"
Brake Linkage Bell Crank				See note "E"
Chain	Chain Spray			Every 4 hrs. In fall drain water
Drums				

- Note "A": This unit has the Sunstrand hydrostatic transmission. Change filter each 50-75 hours of operation and change fluid annually. Any oil additions should be filtered into the reservoir.
- Note "B": Pump in grease until the old grease is pushed out around the edge of the bearing collers. Grease weekly.
- Note "C": Repack upper and lower bearings annually.

(OVER)

Note "D": Keep light coat of oil or grease on these blocks at all times.

Note "E": There are two bell cranks on the inside of engine compartment that must be greased weekly. To grease the lower bell crank remove the inspection plate in the lower front corner. This particular bell crank is often overlooked and binds up, making braking difficult.

LUBRICATION & MAINTENANCE

Equipment Mixer Pulverizer Make Seaman
 Class 59 Model All except self propelled

UNIT	KIND OF LUBRICANT	SAE		REMARKS
		Summer	Winter	
Engine-Waukesha	Lube Oil	10W40	10W40	60 hours
Trans., Front	Transmission Oil	140		Annually
Trans., Rear	Transmission Oil	140		Annually
Differential, Axle	Hypoid Oil	140		Annually
Final Drives, Axle	Hypoid Oil	140		Annually
Rotor Gear Housing	Hypoid Oil	140		Annually
General Chassis	Multi-purpose grease			Daily
Universal Joints				Handgun
Needle Bearing	Multi-purpose grease			60 hours
Propeller Shaft	Multi-purpose grease			60 hours
Slip Joint	Multi-purpose grease			60 hours
Motor Fan	Multi-purpose grease			As required
Clutch Throwout Bearing	Multi-purpose grease			As required
Clutch Pilot Bearing	Multi-purpose grease			Sparingly 60 hours
Air Cleaner - Oil Bath	Lube Oil	10W40	10W40	Daily
Breather	Lube Oil	10W40	10W40	Daily
Generator & Starter	Lube Oil	10W40	10W40	
Distributor Shaft	Multi-purpose grease			
Distributor Auto. Adv.	Lube Oil	10W40	10W40	
Water Pump	Multi-purpose grease			
Hyd. System	Hydraulic Hoist Oil	5W	5W	
Pinion Shaft	Multi-purpose grease			Ea. 30 hours.

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LUBRICATION & MAINTENANCE

Equipment Self Propelled Mixer Pulverizer **Make** Seaman & Wall
Class 59 **Model** GS 7 Gas & Diesel

UNIT	KIND OF LUBRICANT	SAE		REMARKS
		Summer	Winter	
Engine	Lube Oil	10W40	10W40	60 hours
Air Cleaner Oil Bath	Lube Oil	10W40	10W40	60 hours or as required
Universal Joints	Transmission Oil	140		8 hours
Clutch Release Bearing	Multi-purpose grease			60 hours
Spring Shackles	Multi-purpose grease			8 hours
Steering Linkage	Multi-purpose grease			8 hours
Torque Tube Bearing	Transmission Oil	140		60 hours
Motor Housing	Hypoid Oil	140		Annually
Differential	Hypoid Oil	140		Annually
Final Drive	Hypoid Oil	140		Annually
Second Speed Aux. Trans.	Transmission Oil	140		Annually
Fifth Speed Transmission	Transmission Oil	140		Annually
Steering Gear	Hypoid Oil	140		
Hydraulic Oil Reservoir	Hoist Oil	5W	5W	
Generator & Starter	Lube Oil	10W40	10W40	

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LUBRICATION & MAINTENANCE

Equipment Air Compressor Make Worthington
 Class B Grp 092, 093 Model All Except Rotary

UNIT	KIND OF LUBRICANT	SAE		REMARKS
		Summer	Winter	
Engine	Lube Oil	10W40	10W40	Change every 60 hrs.
General Chassis	Multi-purpose grease			Annually
Clutch Release Bearing	Multi-purpose grease			60 hours
Clutch Shoe Pins	Multi-purpose grease			60 hours
Wheel Bearings	Multi-purpose grease			60 hours
Water Pump	Multi-purpose grease			60 hours
Distributor	Lube Oil	10W40	10W40	
Generator & Starter	Lube Oil	10W40	10W40	
Air Cleaner, Oil Bath	Lube Oil	10W40	10W40	
Oil Cups	Lube Oil	10W40	10W40	
Governor and Throttle Linkage	Lube Oil	10W40	10W40	
Pilot Bearing	Multi-purpose grease			
Compressor	Lube Oil	10W40	10W40	Change every 60 hrs.
Compressor Intercooler Fan	Multi-purpose grease			
Motor Fan	Multi-purpose grease			
Oil Filter				60 hours

LUBRICATION & MAINTENANCE

Equipment Air Compressor Make Ingersoll Rand
 Class B Grp 093 Model 250

UNIT	KIND OF LUBRICANT	SAE		REMARKS
		Summer	Winter	
Engine Diesel	Lube Oil	10W40	10W40	60 hours
Compressor	Lube Oil	10W40	10W40	500 hours or annually
Fuel Filters				Annually
Chassis	Multi-purpose grease			
Air Cleaner	Dry Element			
Compressor Oil Filter Oil Line Screen and Orifice				Service at every oil change Clean at 1000 hours annually
Chassis	Multi-purpose grease			
Wheel Bearings	Multi-purpose grease			Annually

Note: Drain condensate from receiver separator daily.

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