wagner

A Division of Allied Systems Company

Maintenance & Lubrication

CP160

Contents

Maintenance and Lubrication

General

A machine that receives regular care from its operators and mechanics generally rewards them with decreased downtime and greater reliability. With the help of the information in this section, you should be able to maintain your Coil Packer at top operating efficiency. The maintenance and lubrication procedures given here can be performed with a minimum of shop tools.

Safety Precautions

Before performing any maintenance or lubrication, review the following safety precautions. They're included for your protection.

1. **Read This Manual.**
   Be sure you understand the procedures outlined in this manual before attempting to carry them out. Pay particular attention to any safety warnings presented. If you have any questions, don't hesitate to ask your Allied Systems Company Representitive.

2. **Perform Maintenance on Level Ground.**
   The machine should be on level ground and clear of traffic lanes whenever possible. The parking brake should be set and the wheels blocked.

3. **Remove Load.**
   The machine should be unloaded, with the unit down.

⚠ WARNING

WARNING: Never rely on the hydraulics to support any part of the machine during maintenance or lubrication. If necessary, support components with appropriate safety stands. NEVER stand under a component that is supported only by the hydraulics. Make sure it is resting on its mechanical stops or safety stands.

4. **Install Swivel Locking Pin.**
   All articulating drive units are equipped with these pins. Always install this pin when working in the area of the swivel hinge. The machine must be on a level surface. A single swivel locking pin can be installed with the bogie turned right or left. Both pins can be used to lock the bogie in a straight line with the Coil Packer. See Figure 4-1.

NOTE: Never operate the Coil Packer with the locking pins in the locked position. Damage to the machine could result.

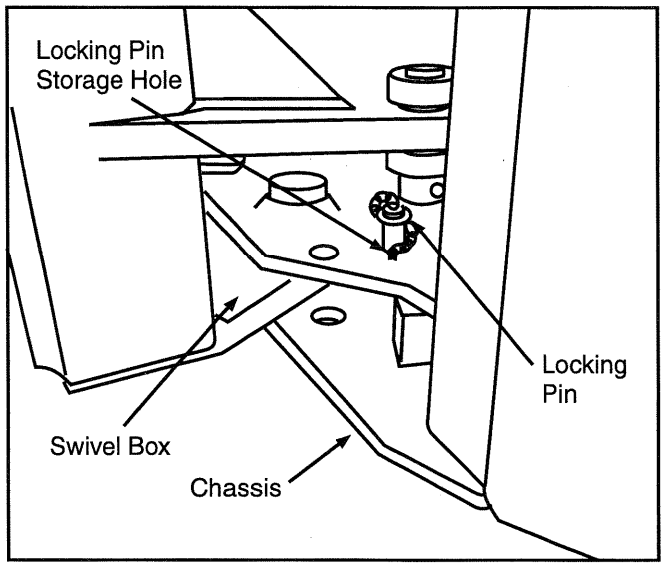

Figure 5-1: Swivel Locking Pin

5. **Stop the Engine.**
   Before performing any maintenance or lubrication, remove the key from the switch, or tag the key swtich with "DO NOT START" to ensure the engine is not inadvertently started.

⚠ WARNING

WARNING: Before performing any maintenance or lubrication, remove the key from the switch, or tag the key switch "DO NOT START", to ensure that the engine is not inadvertently started.

6. **Use Safe Ladders/Scaffolding.**
   Due to the extreme height of the upper lube points, it is essential to personnel safety that safe ladders, personnel lifts and/or scaffolding be used while servicing. These areas can be dangerously slick under wet, frosty or oily conditions.

Preventive Maintenance

Preventive maintenance is a system that is designed to detect problem areas and prevent equipment failure before trouble can develop to a critical point. The system is based on a series of maintenance checks and servicing points. To be effective, a preventive maintenance program demands strict adherence to a planned schedule of maintenance.

predict component life and helps avoid operating equipment to destruction, by replacing parts before they fail.

- Allows Planning of Daily Production - by knowing the condition of available equipment.

- Allows Planning of Maintenance Man Hours - by distribution of duties and necessary lead time for parts ordering.

- Provides Complete History of Equipment - based on performance, frequency and type of repairs and actual man hours expended on maintenance.

Establishing a Preventive Maintenance Program
The key to an effective preventive maintenance program is diligence in following a maintenance schedule set at regular planned intervals. Such intervals should be made compatible with the nature of operation of the equipment and with the capabilities of the maintenance facility. In any event, the intervals and inspection requirements must be planned, regular, and consistent.

This program proposes the following basic schedule which is based on intervals generally used and accepted.

Specific maintenance should be completed using the following intervals:

- 10 hours (each shift or daily)
- 50 hours (weekly)
- 250 hours (monthly)
- 500 hours (quarterly)
- 1000 hours (semi-annually)
- 2500 hours (annually)

Each successive schedule (e.g. weekly, monthly, quarterly, etc.) builds on the former and is accumulative in nature. For example, when performing monthly maintenance, the mechanic will first take note of the shift maintenance reports and remedy any discrepancy; then comply with the shift and weekly maintenance, and in addition will perform the checks specified in the monthly schedule.

Maintenance Record Keeping
The importance of good record keeping cannot be overemphasized. Each scheduled maintenance form should be checked off as the inspections and service is performed. Quantities of replenished lubricants should be recorded, as well as hydraulic pressure readings. All discrepancies should be recorded whether remedied or pending. Operators and mechanics should sign off forms and return them to the maintenance supervisor for approval and retention in an equipment unit file.

Accurately recorded maintenance forms will give the maintenance personnel an overall view of how particular equipment is holding up under normal operating conditions. Good records, and the ease by which they can be reviewed also enable maintenance personnel to identify and evaluate problem areas and allow adjustment in the maintenance scheduling for their particular operation.

Shift Maintenance

Shift maintenance is where preventive maintenance begins. The operator normally completes this inspection. It consists of the routine servicing and lubrication of the machine's major systems. On a daily basis, the operator is in a position to identify, remedy and/or record potential problem areas and is able to quickly recognize any change in the performance of his machine. The comments he records on the shift maintenance report become a valuable tool to the maintenance department, and is an important ingredient to the overall success of a preventive maintenance program.

Shift Maintenance Checklist
A recommended checklist is given here as an aid in developing a practical shift maintenance program if one has not been developed by your company. A shift maintenance report, based on this checklist, should be used to report defects found when making maintenance checks at the beginning of each shift.

Your company may have a different reporting method, however, it is usually a requirement that this form be filled out at the end of each shift. Accurate shift maintenance reports can help your company anticipate maintenance problems and take action to prevent costly failures.

Using the Checklist
The reference numbers in the left-hand column of the checklist indicate the physical location of each check point or lubrication point as it appears on the shift maintenance diagram. Circled reference numbers on the diagram indicate lubrication points. Boxed numbers indicate maintenance checkpoints.

Shift maintenance details are provided in 5-11, Maintenance Procedures. These procedures consist of checks that can be performed by the operator.

Scheduled Maintenance

Periodic scheduled maintenance is intended to be performed in a complete maintenance facility by trained mechanics. The timely scheduling and completion of these periodic inspections by the maintenance department will determine the length of downtime of a particular machine. Therefore, maintenance scheduling becomes a critical factor in the effective use of man hours and the availability of service-

able equipment.

Scheduled Maintenance Checklist
Actual operating environment governs the maintenance schedule. Some checks should be performed more often under severe conditions, such as heavy dust, extreme temperatures or extremely heavy loads.

These maintenance checklists are designed to be used as a guide until adequate experience is obtained in establishing a schedule to meet your specific needs.

A detailed list of component checks is provided with a suggested schedule basis given in hours of operation, or calendar time.

The engine manufacturer's operation and maintenance manual should be consulted for additional engine related checks and/or details.

A maintenance schedule should be established using these checklists as a guide. The result will be a maintenance program to fit your specific operation.

Using the Checklist
Although specific maintenance is identified in these checklists, location and procedure references are not provided in the columns.

Scheduled maintenance is normally carried out by trained mechanics, who are knowledgeable of the equipment systems and component locations. Scheduled maintenance procedures can be found by referring to the appropriate section of the service manual.

Scheduled Oil Sampling

Use scheduled oil sampling (SOS) to monitor machine condition and maintenance requirements. Oil samples from engine, transmission, axles, and hydraulic system should be taken when the oil is hot and well mixed to ensure an accurate analysis. Contact your Allied Representitve for complete information and assistance in establishing a scheduled oil sampling analysis program for your equipment.

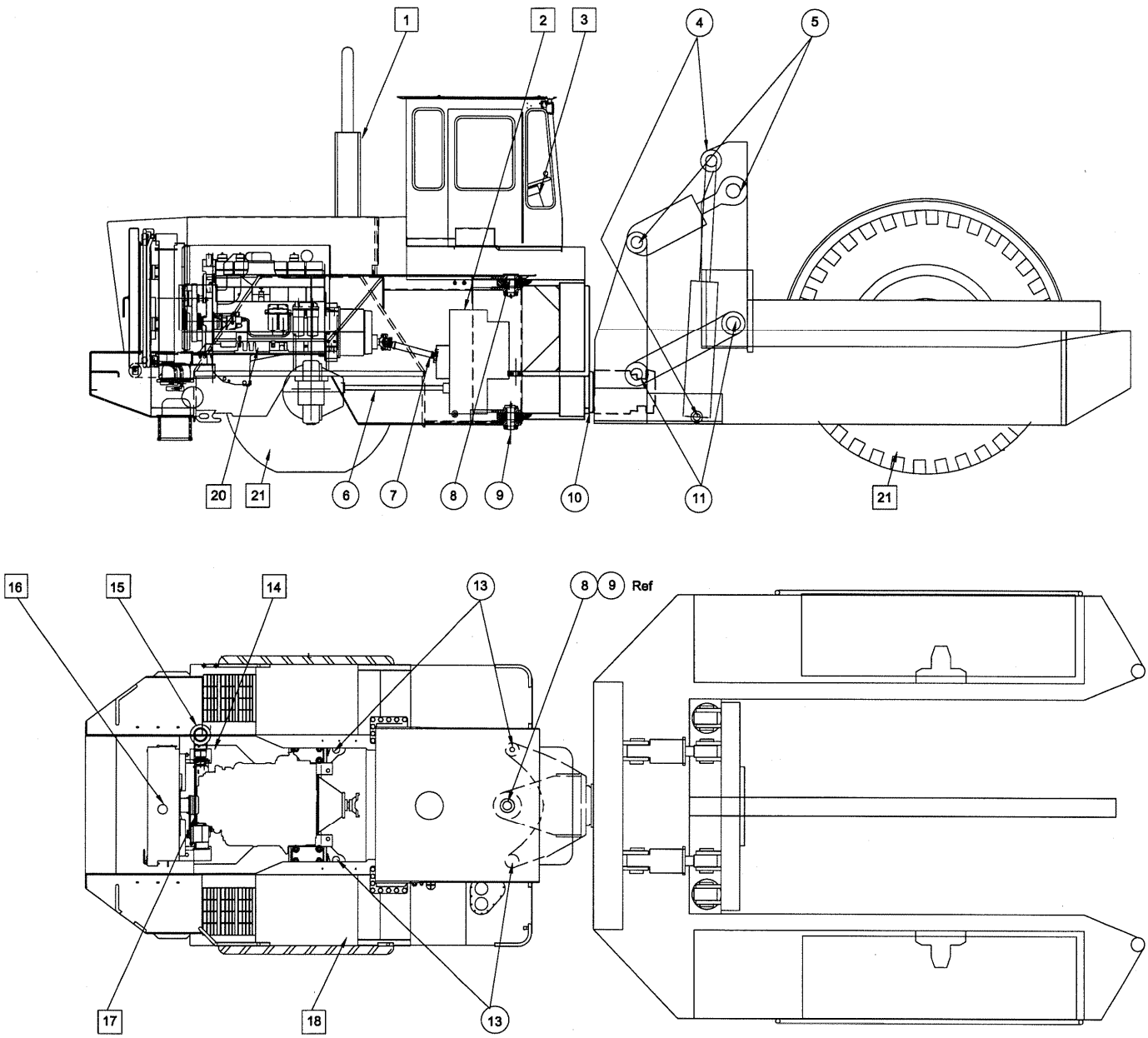

Figure 5-2: Daily Maintenance and Service Check Points

Daily Maintenance & Lubrication

The chart shown above includes all points referenced in the Daily Maintenance and Lubrication Check List shown on the following page.

◯ Circled Numbers Indicate Lubrication Points

□ Boxed Numbers Indicate Maintenance Check Points

Note: Due to variations in engine types and models, the indicated location of engine filters (fuel, oil, coolant, etc.) are not shown. Consult your specific engine service manual for exact locations.

⚠ WARNING

WARNING: Due to the extreme height of the upper lube points and maintenance check points, it is essential to personnal safety that safe ladders and/or scafolding be used while servicing. These areas can be dangerously slick under wet, frosty, icy, snowy or oily conditions.

Daily Maintenance and Lubrication Check List

10 HOURS OR DAILY

Before Engine Startup, Check the Following

Item		OK	No	Add
20	Engine (Check oil level, check for leaks)	____	____	_____
18	Hydraulic Tank (Check oil level, check for leaks)	____	____	_____
16	Radiator and Oil Cooler (Check coolant level, check for leaks, are fins clean and unobstructed?)	____	____	
15	Air Cleaner (Check indicator, clean or change element, empty dust cup)	____	____	
17	Engine Belts (Check for adjustment and wear)	____	____	
21	Wheels and Tires (Check condition and pressure)	____	____	_____
2	Transmission Oil Level (At "add" mark when cold)	____	____	_____

After Engine Startup, Check the Following

Item		OK	No	Add
20	Engine (Does it sound normal?)	____	____	
14	Air Intake System (Check for leaks and damage)	____	____	
1	Exhaust System (Check for leaks and excessive smoke)	____	____	
3	Instruments (Check for normal readings)	____	____	
2	Transmission (Check oil level, check for leaks)	____	____	_____

Note Anything Abnormal or In Need of Repair

Lights _____ Defroster _____ Reverse Warning Horn _____

Horn _____ Windshield Wipers _____ _____

Heater _____ Air Conditioner _____ _____

Operator _____ Supervisor _____ Date _____

Model _____ Serial Number _____ Hour Meter _____

Lubrication Points

10 HOURS OR DAILY

Before Engine Startup, Check the Following

Item		No. of Fittings
(13)	Steering Cylinder Pins	4
(4)	Hoist Cylinder Pins	2
(5)	Dump Cylinder Pins	4
(11)	Bogie to Probe Link Pins	2
(8)	Hinge Pin (Upper) *	1
(9)	Hinge Pin (Lower) *	1

50 HOURS OR WEEKLY

(6)	Driveline, Transmission to Axle	3
(7)	Driveline, Converter to Transmission	3
(10)	Swivel Bearing	1

* Use handgun or low pressure adapter; lubricate sparingly

Service Maintenance Check Lists

50 HOURS OR WEEKLY

Item	OK	No	Add/Repair
1. Repeat daily maintenance & lubrication check list	____	____	
2. Check for fluid leaks (oil, fuel and water) and correct	____	____	____
3. Check brakes for adjustment and wear	____	____	____
4. Check wheel lug nuts and studs mechanically	____	____	____
5. Record engine RPM (at idle, high free idle and converter stall)	____	____	
6. Empty dust cap bowl on air filter	____	____	
7. Check transmission oil level (at operating temperature)	____	____	____
8. Check battery electrolyte level	____	____	____
9. Check for structural damage (inspect chassis & attachments for bending, cracking & broken welds)	____	____	____

250 HOURS OR MONTHLY

Item	OK	No	Add/Repair
1. Repeat 50 hour check	____	____	
2. Take engine oil sample for analysis *	____	____	
3. Change engine oil and all filters *	____	____	____
4. Check axle differential and planetary oil level	____	____	____
5. Change cooling system filter (if so equipped)	____	____	____
6. Check all hydraulic pressures and record (see hydraulic schematic)	____	____	
7. Check fire suppression actuator (if so equipped)	____	____	____
8. Check disc brake calipers, pads, rotors and lines	____	____	____
9. Grease all non-Lube-For-Life drivelines	____	____	
10. Check and adjust the parking brake	____	____	

IMPORTANT: Consult the engine manufacturer's Operation and Maintenance Manual for additional engine related checks and/or details.

500 HOURS OR QUARTERLY

Item	OK	No	Add/Repair
1. Repeat 250 hour check	____	____	
2. Take oil samples of transmission, axle and hydraulic systems *	____	____	
3. Drain and refill transmission, change filter *	____	____	____
4. Service fuel filters *	____	____	____
5. Service hydraulic filters *	____	____	____
6. Inspect brake systems & components	____	____	____

1000 HOURS OR SEMI-ANNUALLY

Item	OK	No	Add/Repair
1. Repeat 500 hour check	____	____	
2. Change hydraulic oil and filters *	____	____	____
3. Clean and flush cooling system	____	____	____
4. Check pins and bushings for wear	____	____	____

2500 HOURS OR ANNUALLY

Item	OK	No	Add/Repair
1. Repeat 1000 hour check	____	____	
2. Drain, flush and refill differentials *	____	____	____
3. Drain, flush and refill planetaries *	____	____	____
4. Check and recharge accumulators, record pressure	____	____	____
5. Replace hoses as required, steam clean engine, tighten mounting bolts and turbocharger mounting bolts	____	____	____
6. Drain hydraulic tank, flush tank and refill	____	____	____

* Normal drain period and filter change intervals are for average environmental and duty-cycle conditions. Severe or sustained high operating temperatures or very dusty atmospheric conditions will cause accelerated deterioration and contamination. Change intervals should be adjusted according to the results of oil sampling analysis. Consult your Wagner dealer for assistance in establishing an oil sampling program for your equipment.

IMPORTANT: Consult the engine manufacturer's Operation and Maintenance Manual for additional engine related checks and/or details.

Repairs

Problem: _____

_____

_____

_____

_____

_____

Parts: _____

_____

_____

_____

_____

_____

Mechanic: _____ Hours Labor: _____

Operator: _____ Supervisor: _____

Machine Model _____ Equipment No: _____

Date: _____ Shift: _____ Hour Meter: _____

Maintenance Procedures

General
The following maintenance procedures should be performed at the beginning of each work shift. The number before each maintenance procedure corresponds with the numbers given in the Daily Maintenance and Service Check Points (Fig. 5-2). This provides an additional aid in locating each check point.

Before Starting Engine

20 **Engine Oil Level**
The oil level should be checked prior to starting the engine. Make sure that the area around the dipstick is clean and the machine is sitting on level ground.

NOTE: A 15-minute drain-back time is recommended is the engine has been running.

The oil level must be maintained between the "L" (low) mark and the "H" (high) mark, but as close to the "H" mark as possible.

NOTICE

CAUTION: Never operate the engine with the oil level below the "L" mark or above the "H" mark. Refer to the engine's Operation and Maintenance Manual for detailed engine service information.

Use only approved engine oil (see Lubricant Specifications, page 5-14). Do not overfill. Check engine for leaks.

18 **Hydraulic Oil Level**
Always check the hydraulic oil level prior to operation. The dipstick and fill pipe are located on the RH chassis deck, to the right of the operator's cab.

NOTICE

CAUTION: Always open the tank breather petcock (located on the breather pipe) before removing the dipstick, filler cap or in-tank filter cover plate. Failure to vent the tank ican result in injury or a substantial oil spill. Be sure to close the petcock before operating the machine.

The oil level should be checked with the hoist cylinders retracted (down). The oil level should be at or near the "H" (high) mark on the dipstick. Fill with approved hydraulic fluid as required (see Lubricant Specifications, page 5-14). Do not overfill.

16 **Engine Coolant Level**
Daily inspection of the coolant level is recommended. Cooling systems using anti-aeration baffles restrict visual observation of the true coolant level. Although the coolant can be seen, the system may not be full. To gain a true fill, add water slowly up to the bottom of the fill neck and allow a 30-second settling period. Remember to compensate for the loss of anti-freeze when adding water.

⚠ WARNING

WARNING: Never remove the radioator cap if the engine is hot. The coolant will be under pressure and could flash to steam with explosive force, causing severe burns. Remove the readiator cap only when the engine is cool.

NOTE: If the engine is hot, the coolant level will be higher than when it is cold.

Inspect the radiator daily for restrictions caused by leaves, paper or bent fins. Inspect the radiator cap, hoses and connectors for any signs of leakage or damage.

15 **Air Cleaner**
The air cleaner is a cyclonic-type, dry air filter. A service indicator shows the condition of the filter. The indicator will show in the green zone when the filter is clean. The indicator will show red when the filter is restricted. If red appears in the indicator window, clean or change the element and press the reset button on the indicator.

17 **Engine Belts**
Check the tension of the drive belts by pressing with the thumb halfway between the pulleys. The belt should not deflect more than the values shown in the table (Fig. 5-3). If any belt is loose or worn, report to maintenance for corrective action.

Engine	Belt Deflection Inches (mm)
Cummins	3/8 to 5/8 (9.5 to 15.9)
Caterpillar	1/2 to 3/4 (13 to 19)

Figure 5-3: Engine Belt Deflection

After Starting the Engine

20 **Engine**
After starting, check that the engine runs and sounds normal. It should come up to operating temperature within a few minutes after starting. If you notice unusual noises or excessive smoke, have maintenance check it out.

3 **Instruments**
Check all the instruments for normal readings immediately after starting the engine. Make sure that temperatures are within acceptable limits. Also, check that all controls function properly. They should be smooth and responsive.

14 **Air Intake System**
Inspect all connections for damage and air leaks. Look for damaged fittings and loose connections. Do not operate the machine if leaks are present. Dirt could enter the engine intake and cause severe damage.

1 **Exhaust System**
Check for exhaust leaks. Make sure that exhaust gases are not entering the operator's cab. Mounting brackets must be in place and all connections tight. Check for excessive smoke.

2 **Transmission Oil Level**
The level should be checked after engine warm-up, with 180° to 200° showing on the transmission temperature parameter. The dipstick and fill tubes are located on the chassis deck, directly above the transmission. Check the level with th engine running at idle, at operating temperature, and with the transmission in neutral. The level should be between the "H" (high) and "L" (low) marks. Fill with approved fluid only. See Lubricant Specifications on page 5-14. Do not overfill. Inspect for leaks.

Operator Troubleshooting

The following tables list the most common problems that may be encountered by operators. If the problem cannot be solved using the corrective actions listed in this table, notify maintenance personnel.

Engine *

Symptom	Probable Cause	Corrective Action
Engine turns over but fails to start	Emergency shutdown control pulled out	Push control in
	Fuel tank empty	Fill tank
	Fuel shutoff valve at tank closed	Open valve
	Fuel filter blocked	Replace filter
Engine fails to turn over	Battery disconnect switches open	Close switches
	Transmission not in neutral	Place lever in neutral
	Battery low	Having charging system checked
	Battery terminals corroded or loose	Clean and tighten terminals
Engine runs unsteadily and power output low	Insufficient fuel supply	Clean fuel strainers, replace filter, fill tank, tighten fuel lines
	Contaminated fuel	Drain tank and lines, clean strainers, replace fuel
	Wrong fuel	Drain tank and fill with proper fuel
	Air intake restricted	Remove restriction
Exhaust smokes badly	Too much oil in sump	Drain to proper level
	Air intake restricted	Remove restriction
Engine overheats	Radiator fins restricted	Clean fins
	Low coolant level	Check coolant level, fill as needed
Engine oil pressure low	Low oil level	Check oil level
	Oil leaks	Tighten connections
	Contaminated oil	Change oil and filters

Transmission/Converter *

Symptom	Probable Cause	Corrective Action
Transmission or converter overheats	Low oil level	Fill to proper level
	Oil cooler restricted	Remove restriction
Lack of power	Low engine rpm at converter stall	Have engine checked (governor)

Wet Disc Brake System

Symptom	Probable Cause	Corrective Action
Brakes won't release	Loss of oil—please refer to Service Manual	Have maintenance check system
Loss of braking efficiency—**please refer to Service Manual**	Air in hydraulic brake system	Check the pump
	Loss of accumulator pressure	Have maintenance check system
	Low system pressure	Wait for system pressure to recharge

* Also refer to the manufacturer's Operation and Maintenance Manual for additional information

Hydraulic System

Symptom	Probable Cause	Corrective Action
No response to controls	Closed tank shutoff valve	Open valve
	Low oil level	Fill tank to proper level
Sluggish operation or response to controls	Hydraulic oil cold	Allow adequate warm-up time
	Low oil level	Fill tank to proper level
	Suction leak	Correct suction leak
	Plugged tank breather	Replace breather
	Restriction in circuit	Remove restriction, check filters
	Pump speed too slow	Check engine speed
Excessive noise	Cavitation	Eliminate restriction in suction line Replace tank breather
	Aeration due to insufficient oil	Fill tank to proper level Correct suction leak
	Tubing vibrating	Tighten mounting clamps
Hydraulic system overheating	Low oil level	Fill tank to proper level
	Operating over pressure reliefs	Correct operating procedure

Electrical System

Symptom	Probable Cause	Corrective Action
Engine fails to turn over	Battery disconnect switch(es) open	Close switch(es)
	Neutral start switch open	Place transmission shift lever in neutral
	Battery low	Have start/charge system tested
	Battery terminals corroded or loose	Clean and tighten terminals
	Other connections loose	Tighten connections
Voltmeter indicates discharge	Alternator drive belt slipping	Tighten or replace belt
	Loose or corroded battery connections	Clean and tighten terminals

Maintenance Specifications

Most of the required maintenance specifications, such as the hydraulic pressure relief settings, can be obtained from the Service Manual and the hydraulic schematic.

Wheel Nut Torque

Front ..... 500 ft-lb (678 N • m)
Rear ..... 315 ft-lb (427 N • m)

Tire Inflation Pressure

Front (30.00 x 51) ..... 100 psi max. (690 kPa)
Rear (29.5 x 29) ..... 55 psi max. (380 kPa)

Lubricant Selection and Specifications

The efficiency and useful life of mechanical equipment is as dependent on proper lubrication as on proper engineering design. The importance of proper lubrication is increased because of the greater loads and pressures imposed on present day mobile heavy equipment. For this reason, we are vitally interested in promoting widespread usage of the best possible lubricants for Allied Systems Company products.

Because many brands of fluid are available, it is not practical to test each one. Selecting the correct fluid should be done with the help of a reputable oil supplier who is responsible for the quality of the fluid. Our lubricant recommendations are based on commercial products that have given satisfactory results in normal operation. In all cases, the lubricant supplier assumes all responsibility for the performance of his product and for product liability.

Listed below are the lubricants used for initial factory fill:

Engine ..... Mobil Delvac 1300 Super 15W-40
Transmission/Converter ..... Mobilfluid 424
Drive Axle ..... Mobilube HD 80W-90
Hydraulic System ..... Mobil DTE 13M
Hydraulic Brake System ..... Mobil Multi-Purpose ATF
General Lubrication ..... Mobilgrease Special No. 2

The above lubricants will be used on all WAGNER units unless the sales order specifies that the unit is to be operated in extreme climatic conditions.

Allied Systems Company requires that lubricants meet, or exceed, the specifications of the oils listed above to avoid component failure and for warranty consideration. If a cross reference to Mobil Oil Corporation specifications is required, please consult your local lubricant dealer.

When changing fluids use the following guidelines:

- Add only filtered fluids.
- It is important to service filters and breathers at the proper hourly intervals.
- If adding lubricants other than what is currently in the reservoir, a warranty of compatibility should be obtained from the oil supplier.
- When the fluid is changed due to changes in ambient temperatures, the system should be completely drained and the fluid replaced.