
SECTION 9 - OPTIONS

LUBRICATION SYSTEM	
AUTOMATIC	
AUTOMATIC LUBRICATION SYSTEM (HYDRAULICALLY OPERATED ROTARY PUMP)	M1756
HYDRAULICALLY OPERATED ROTARY GREASE PUMP	M1757
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HUBODOMETER

DESCRIPTION AND LOCATION

The hubodometer is a cylindrical device mounted in the center of a front wheel assembly (generally the left front). The device is secured to a special hubcap assembly and has a digital read-out face.

OPERATION

The hubodometer measures the distance the truck travels in miles or kilometers. Since the device measures the distance by the number of revolutions of the tire, the hubodometers are each calibrated by tire size and desired output.

NOTE: *The operation of this device is independent of the direction of rotation. Therefore, hubodometers may be used on either the left or right side of the truck.*

MAINTENANCE AND ADJUSTMENT

The hubodometer requires no maintenance and has no adjustment. Make sure that all mounting hardware is properly installed and tightened and the device is kept clean.

If the device is not operating properly, it must be replaced.

If the tire size is changed, a new, properly specified hubodometer must be installed to maintain proper readings.

REMOVAL

The hubodometer may be removed as follows:

1. Remove the capscrews securing the hubcap to the wheel assembly.

2. Remove the entire hubcap assembly from the wheel assembly.

3. Remove the nut from the stud securing the hubodometer to the attachment bracket.

4. Remove the hubodometer.

SERVICE

The hubodometer is not considered serviceable and should be replaced as an assembly.

INSTALLATION

The hubodometer may be installed as follows:

1. Position the hubodometer on the attachment bracket in the hubcap assembly.

2. Secure in position with the nut on the stud through the attachment bracket.

3. Install the hubcap assembly on proper wheel assembly, securing with the capscrews and washers.

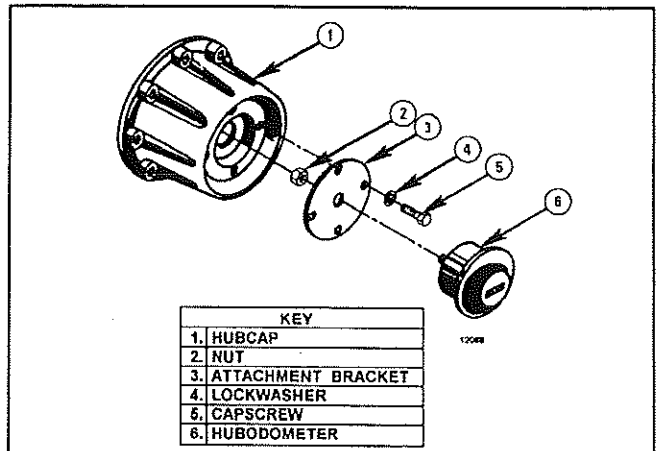


FIGURE 1 - HUBODOMETER ASSEMBLY

TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSES	CORRECTIVE ACTION
Unit fails to change reading	Unit internally damaged or defective	Replace unit.
Unit obviously inaccurate	Unit not right for tire size	Replace with appropriate hubodometer.
	Unit internally damaged or defective	Replace unit.

CENTRAL SERVICE SYSTEM

DESCRIPTION AND LOCATION

The central service system is a series of hoses and special fittings designed to provide improved service of various fluids on the truck. Typically the quick disconnect or similar fittings are grouped together at a convenient location on the truck, with each fitting serving a specific function.

OPERATION

The system may contain any combination of couplings or fittings, typically specified by the customer to match the delivery systems in use at the location.

As commonly equipped, the system provides for the filling and/or draining of engine oil and coolant, hydraulic oil, and automatic lubrication system grease. In some applications provisions for fuel filling is also included as is the shop air coupling.

Typically each of the couplings is of a different size or type and are distinctly labeled to minimize the chance of improper coupling.

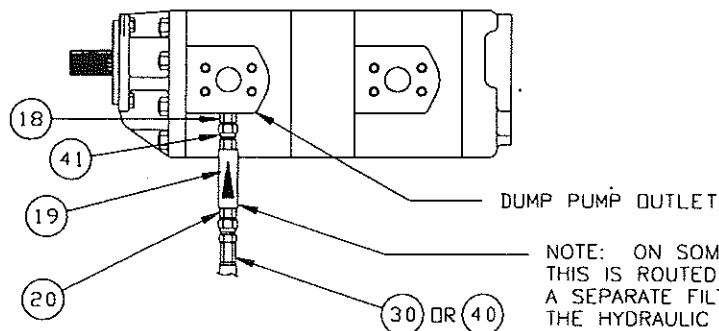
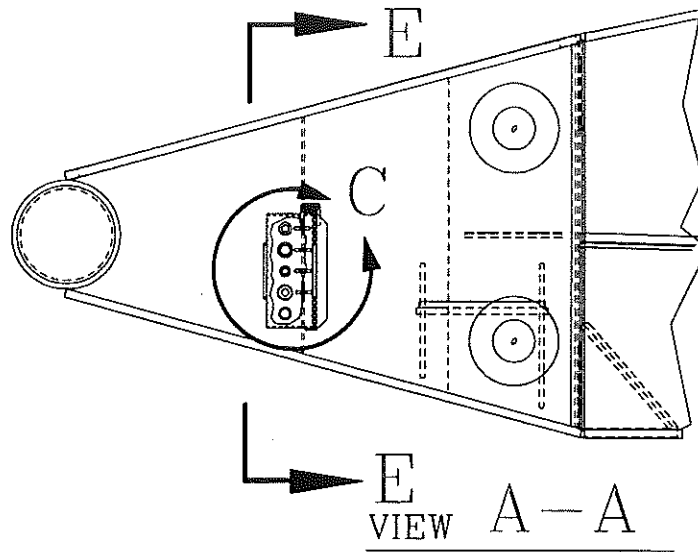
MAINTENANCE AND ADJUSTMENT

Periodic maintenance of the system should include the following:

1. Before working on any portion of the system, park the truck in a SAFE POSITION, securing by means other than the truck's friction brake system.
2. The central service couplings on both the source and the receiver should be cleaned before, and the appropriate plugs or covers installed immediately after each use.
3. The mating fittings should be checked periodically for proper fit and evidence of damage or leakage. Repair or replace as required.
4. The hose assemblies and fittings should be inspected for evidence of kinks, damage, wear, or other problems. Repair or replace as required.

SERVICE

Refer to the appropriate vendor's material for more detailed information if required.

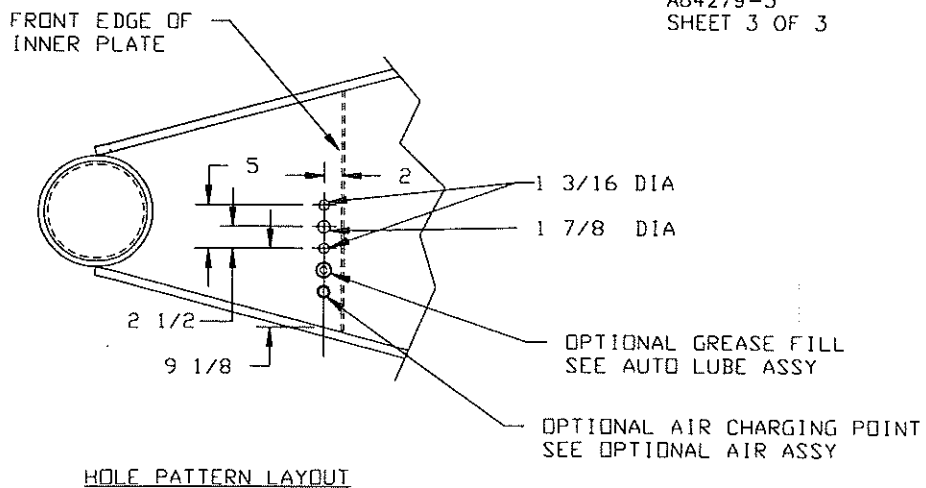
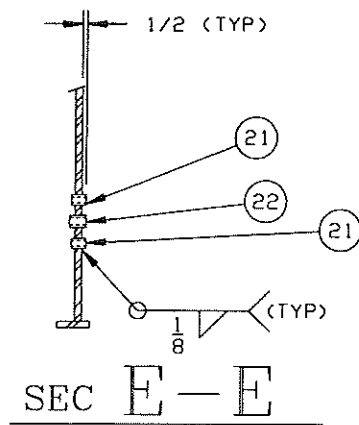
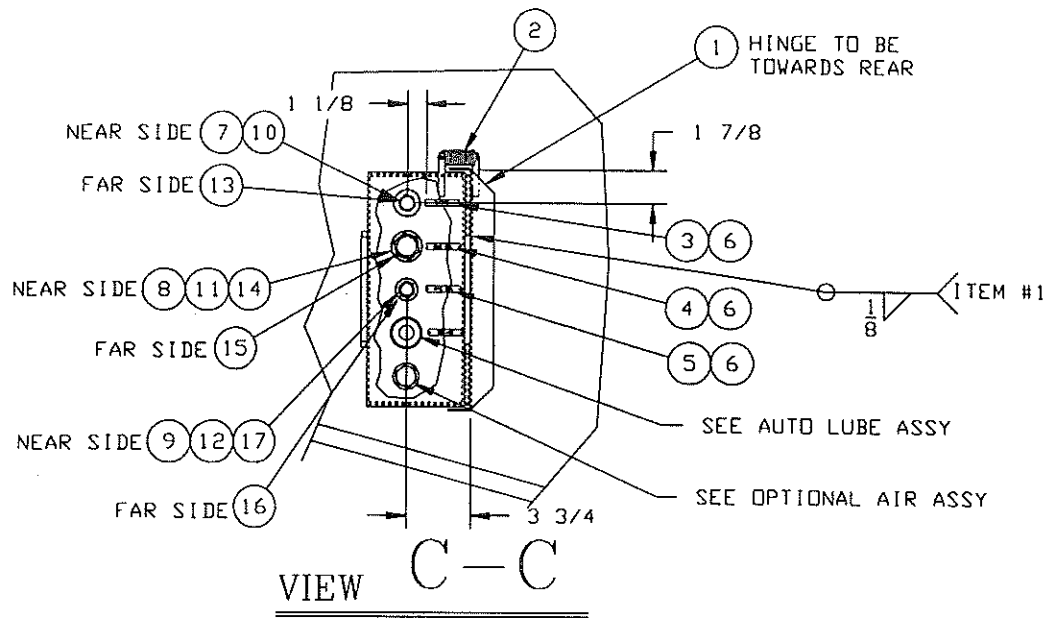


VIEW B-B

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SHEET 2 OF 2

KEY			
01.	CENTRAL SERVICE COVER	23.	NOT USED
02.	SPRING	24.	BUSHING
03.	NAMEPLATE - ENGINE COOLANT	25.	90 DEGREE ADAPTER
04.	NAMEPLATE - ENGINE OIL	26.	HOSE ASSEMBLY
05.	NAMEPLATE - HYDRAULIC OIL	27.	STRAIGHT ADAPTER
06.	DRIVE SCREW	28.	HOSE ASSEMBLY
07.	VALVE NIPPLE	29.	NOT USED
08.	VALVE NIPPLE	30.	HOSE ASSEMBLY
09.	VALVE NIPPLE	31.	CUSHION CLAMP
10.	DUST CAP	32.	CUSHION CLAMP
11.	DUST CAP	33.	BOLTING PAD
12.	DUST CAP	34.	CAPSCREW
13.	STRAIGHT ADAPTER	35.	LOCKWASHER
14.	BUSHING	36.	TIE WRAP
15.	ADAPTER	37.	NOT USED
16.	ADAPTER	38.	NOT USED
17.	BUSHING	39.	NOT USED
18.	ADAPTER	40.	NOT USED
19.	CHECK VALVE	41.	STRAIGHT ADAPTER
20.	SHORT STRAIGHT ADAPTER	42.	CLAMP HALVES
21.	PIPE COUPLING	43.	CAPSCREW
22.	PIPE COUPLING		

FIGURE 1 - CENTRAL SERVICE SYSTEM (TYPICAL) - CONTINUED



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FIGURE 1 - CENTRAL SERVICE SYSTEM (TYPICAL) - CONTINUED

AUTOMATIC LUBRICATION SYSTEM INJECTORS

DESCRIPTION AND LOCATION

The injectors on the automatic lubrication system are the cylindrical assemblies mounted on manifolds at various locations on the truck frame and components.

OPERATION

The function of the injectors is to meter the flow of grease from the central reservoir and pump assembly to the individual points actually being lubricated. The operation of the injector is in four basic stages.

Stage 1

The injector piston is in its normal or rest position. The discharge chamber is filled with lubricant from the previous cycle. Under the pressure of incoming lubricant, the slide valve is about to open the passage leading to injector.

Stage 2

When the slide valve uncovers the passage, lubricant is admitted to the measuring chamber above the injector piston which forces the lubricant from the discharge chamber through the outlet port to the hose leading to the lubricated item.

Stage 3

As the injector completes its stroke, it pushes the slide valve past the passage, stopping further admission of lubricant to the passage and measuring chamber. The injector piston and slide valve remain in this position until the lubricant pressure in the supply line is vented (relieved at the pump).

Stage 4

After venting, the injector spring expands, causing the slide valve to move. This results in the passage and discharge chamber being connected by a valve port. Further expansion of the spring cause the piston to move upward, forcing the lubricant in the measuring chamber through the passage and valve port to refill the discharge chamber.

The injector is now ready for the next cycle.

MAINTENANCE AND ADJUSTMENT

Periodic maintenance of the injectors should include the following:

NOTE: *Preventive maintenance should be performed frequently to ensure proper operation of the system. Damage to bearings and other moving components can be avoided.*

1. Clean the system components.
2. Inspect the manifolds, injectors, and lubrication lines for evidence of dirt, damage, wear or leaks. Repair or replace as required.
3. Check the mounting hardware for tightness.
4. Inspect each lubricated point for proper lubrication levels. The injector may be adjusted for the correct discharge as follows (as shown in Figure 2):
 - a. Remove the cover cap and loosen the locknut (3).
 - b. Increase the lubricant flow by turning the adjustment screw (2) out (counterclockwise). Decrease the flow by turning the adjustment screw in (clockwise).
 - c. Tighten the locknut and install the cover cap.

REMOVAL (Figure 2)

The injector manifolds may be removed as follows:

1. Park the truck in a **SAFE POSITION**. It must be secured by means other than the truck's friction brake system.
2. Release all entrapped pressure in the entire automatic lubrication system.
3. Remove the inlet and outlet hoses from all injectors on the manifold. Plug or cap all openings. Label each to aid in installation.
4. Loosen the capscrews and remove the manifold from the mounting surface.

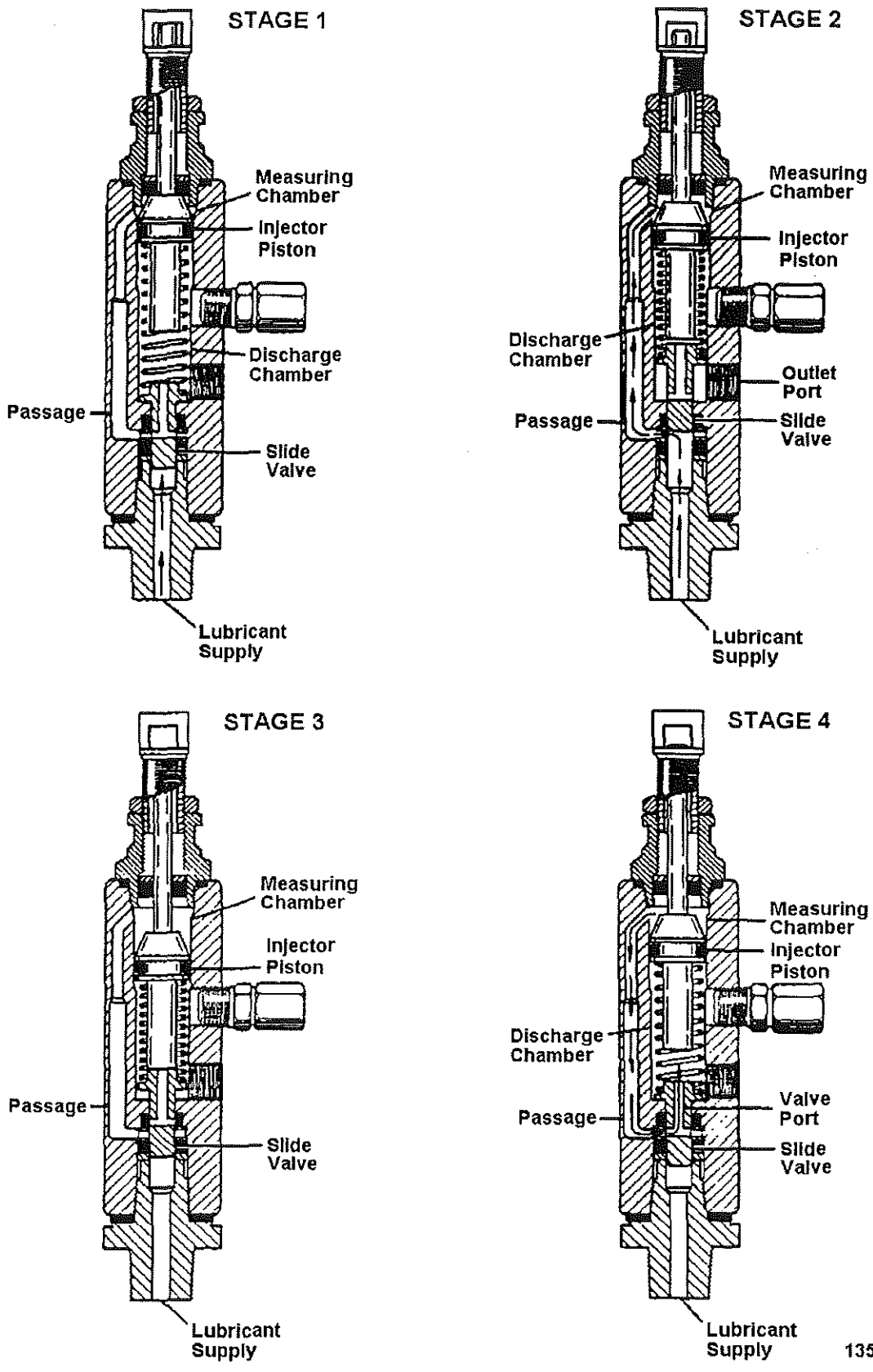


FIGURE 1 - INJECTOR OPERATION

13555

DISASSEMBLY (Figure 2)

The individual injectors may be removed from the manifold and service as follows:

1. Place the manifold assembly in a clean work area.
2. While holding the outer body of the injector (8), loosen and remove the adapter bolt (19) and gasket (5) of the desired injector.

NOTE: Use extra care during the removal process as other internal components may exit with the adapter bolt.

3. Remove the locknut (3).
4. Remove the piston stop plug (4) from the top of the injector.

NOTE: Again, use extra care during the removal process as other internal components may exit with the stop plug.

5. Remove all remaining internal components.

INSPECTION AND REPAIR (Figure 2)

The injectors and manifold assemblies may be serviced as follows:

1. Clean all metal parts in solvent and dry with compressed air. Inspect for evidence of wear, damage, or leakage. Repair or replace as required.
2. Inspect all seals for evidence of leakage or damage. If found, repair or replace the items responsible. Replace all seals during the reassembly process.

ASSEMBLY

The individual injectors may be reassembled and installed on the manifold as follows:

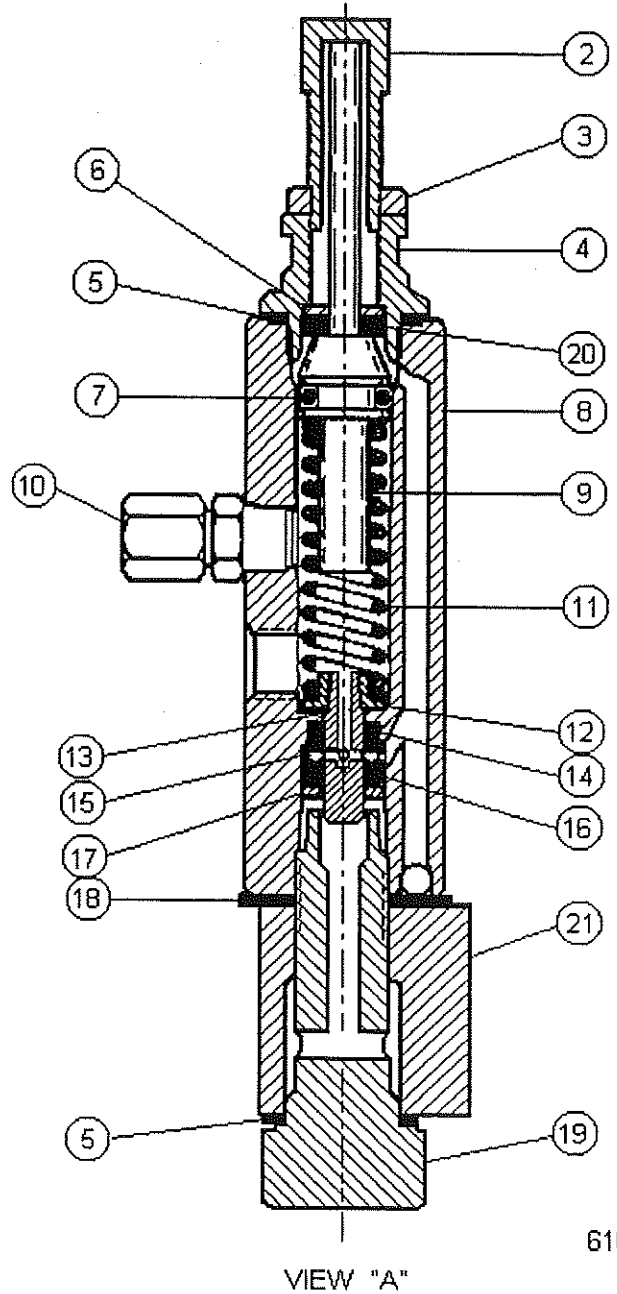
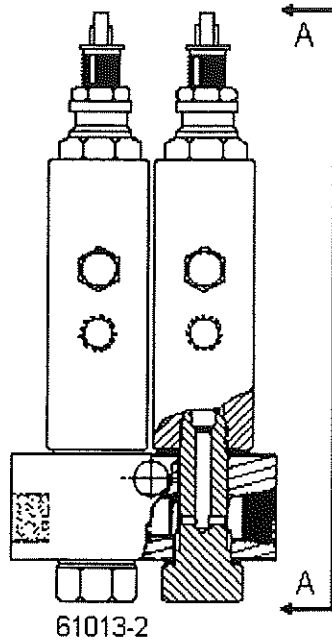
1. Place the manifold and injector assembly parts in a clean work area.
2. Install the internal components as shown in Figure 2.
3. Install the piston stop plug (4) with a new gasket (5) on the top of the injector. Tighten to 25 to 30 ft.-lbs. (35 to 40 Nm).
4. Install the locknut (3).
5. While holding the outer body of the injector (8), install the adapter bolt (19) and gasket (5) of the desired injector. Tighten to 45 to 50 ft.-lbs. (60 to 65 Nm).

NOTE: Use extra care during the installation process as internal components may attempt to exit the bottom opening.

INSTALLATION (Figure 2)

The injector manifold may be installed as follows:

1. Position the manifold on the mounting surface and secure with the appropriate capscrews and washers.
2. Install the inlet and outlet hoses from all injectors on the manifold.
3. Purge all air from the lines and injectors as outlined in the system procedures in Section 9 - Options.
4. Test the operation of the system and adjust the injector output as outlined in the instructions in Maintenance and Adjustment.



KEY	
01.	Injector Assembly
02.	Adjusting Screw
03.	Locknut
04.	Piston Stop Plug
05.	Gasket
06.	Washer
07.	Viton O-ring
08.	Injector Body Assembly
09.	Piston Assembly
10.	Fitting Assembly
11.	Plunger Spring
12.	Spring Seat
13.	Plunger
14.	Viton Packing
15.	Inlet Disc
16.	Viton Packing
17.	Washer
18.	Gasket
19.	Adapter Bolt
20.	Viton Packing
21.	Manifold

NOTE: A typical two injector manifold configuration is shown. The one, three and four injector versions are similar.

FIGURE 2 - INJECTOR MANIFOLD ASSEMBLY

CIRCULATING ENGINE OIL SUPPLY SYSTEM

DESCRIPTION AND LOCATION

The complete system consists of the following parts:

1. The tank package, includes a supply tank with a relief valve, pumping unit, filter, filler, and associated hardware. Different versions of the tank may be horizontally or vertically mounted on the main frame or superstructure, as required by the installation.
2. The sump adapter, includes the withdrawal tube through which the oil is drawn from the crankcase, connecting the withdrawal hose line to the pumping unit.
3. The LED monitor, mounted on the pumping unit, provides a method of monitoring system operation.
4. Withdrawal and return hoses, connecting the engine crankcase and the respective pumping units.
5. The oil pressure switch, mounted on the engine, to allow the system to operate only when the engine is actually operating.

OPERATION (Figure 1)

The extended service system has two primary functions:

1. To expand (typically nearly double) the volume of oil in the system. This normally allows the oil to operate at a cooler temperature and to extend the operational time between normal oil changes if allowed by the engine manufacturer's normal procedures.

2. Assist in maintaining the proper operating oil level in the engine crankcase or sump and to provide a method of checking this level without removing dipsticks.

NOTE: Even with the system operating, it is recommended that the oil level in the crankcase be physically checked by the appropriate means on a regular basis.

The oil is circulated between the engine crankcase and the supply tank by two 24 Vdc driven pumps in a single pumping unit.

Pump 1 draws the oil from the crankcase at a preset control point. Any oil above this point is withdrawn from the crankcase and is transferred to the tank. This lowers the level in the crankcase until air is drawn into the system.

The air reaching the pumping unit activates Pump 2, which returns the oil from the tank to the crankcase and raise the crankcase level until air is no longer drawn by

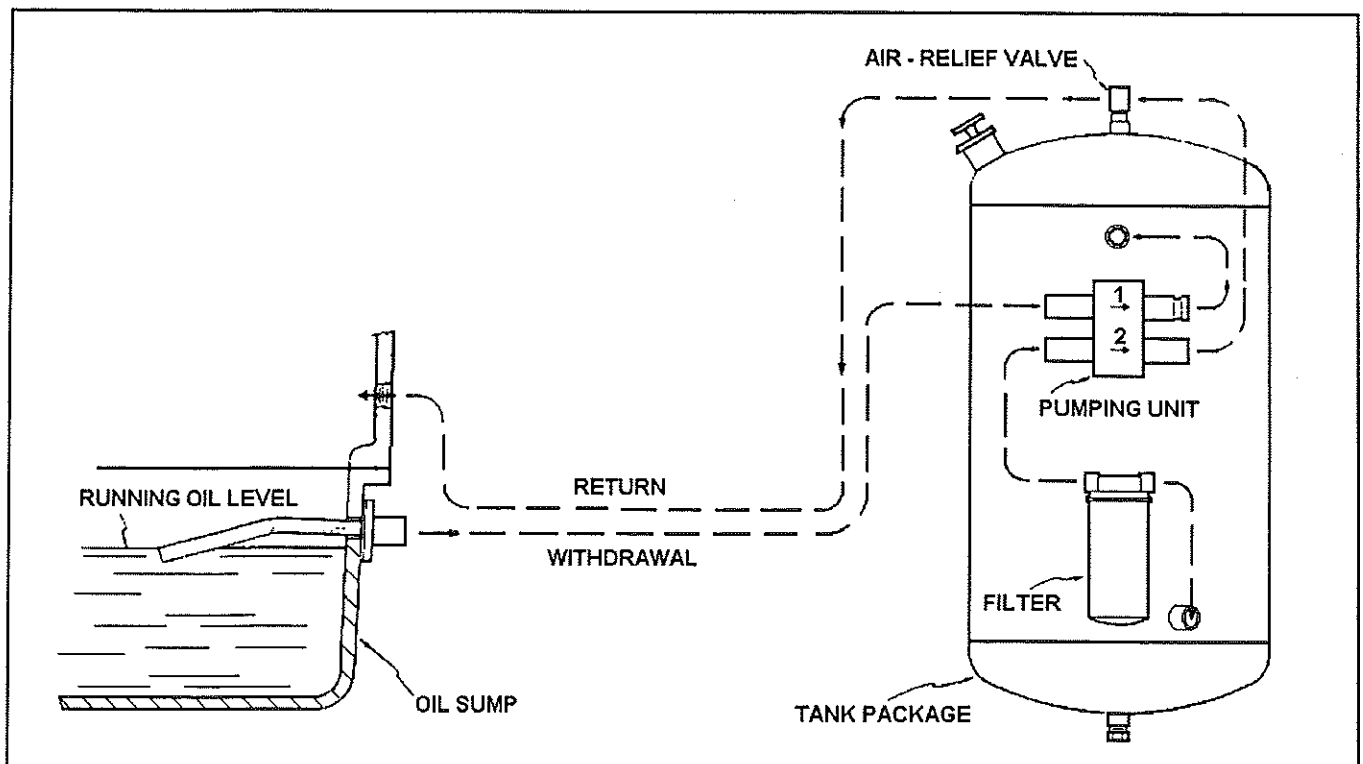


FIGURE 1 - SYSTEM OPERATION (13645)

Pump 1. Pump 2 then stops operating.

The running level is adjusted continuously at the control point by alternating between withdrawal and return oil at the crankcase.

Pump operation is constantly monitored by a LED monitoring system. The monitor signals the operating state of the supply system by responding to the state of Pump 2.

1. When only Pump 1 is running, the signal output to Pump 2 is steady. This indicates that the crankcase running oil level is above the preset control point and is being drawn down by Pump 1.

2. Regular pulsation of the LED indicates that the crankcase running level is low and that Pump 2 is delivering oil from the supply tank to the crankcase.

3. When the running level is at the control point, either air or oil could be drawn as the system attempts to control an already correct level. In this case, there is frequent alternating between operation and non-operation of Pump 2 and the monitoring signal is irregular pulsing.

A normally open pressure switch, preset to close at 4 psi (28 kPa), allows the system to operate only when the engine is actually running.

MAINTENANCE AND ADJUSTMENT

Periodic maintenance of the system should include the following:

1. Inspect all components, hosing, and wiring for proper installation and evidence of wear, damage or, leakage. Repair or replace as required.

NOTE: All hoses should be routed to avoid air traps, sharp edges and excess heat.

2. Check the operation of the system with the engine running as follows:

a. Verify that the level of oil in the engine crankcase is at the normal operating level.

b. Start the engine and allow to operate at a steady low idle speed for at least one minute.

c. Verify that the LED on the monitor pulses irregularly. This indicates that a stable operating level has been reached. If not, determine the cause and correct

before placing the vehicle back into service.

NOTES:

1. If the indicator is steady (not pulsing), it indicates that the crankcase oil level is above the preset control point and being drawn down by Pump 1.

2. If the indicator is pulsing regularly, it indicates that the crankcase running oil level is low and Pump 2 is delivering oil from the supply tank.

3. If it is necessary to test the system without the engine running, it may be done as follows:

a. Verify that the engine crankcase is filled to the static, or non-operating, full level.

b. Verify that the supply tank is filled to approximately 3/4 of its capacity or if so equipped, to the upper sight glass.

c. Install a jumper on the oil pressure switch to allow the system to operate without the engine running oil pressure signal.

d. Turn on the Master Switch.

e. Verify that Pump 1 begins to operate.

NOTES:

1. If there is enough oil in the crankcase, oil should be drawn by Pump 1 to fill the withdrawal line. After the oil has reached the pumping unit, the monitor should give a steady signal.

2. Delivery of Pump 1 can be checked by loosening the outlet fitting until oil appears. When testing is complete, retighten the fitting.

f. Verify the operation of Pump 2 as follows:

NOTE: The normal operation of Pump 2 is controlled by air reaching Pump 1. To properly test statically, this condition is being simulated.

(1) With Pump 1 operating, loosen the withdrawal hose connection.

(2) Verify that Pump 2 begins to operate and deliver oil. This may be done by loosening the fittings on the outlet of the pump.

g. Retighten all fittings loosened for testing.

h. Remove the jumper wire on the system oil pressure switch.

4. When changing the engine oil:

a. Drain all oil from both the engine crankcase and the supply tank and close all of the drains.

b. Change all engine oil filters and the filter element on the pumping unit.

c. Refill the crankcase and supply tank with oil to the normal operating levels.

NOTE: *If the volume of the oil filters is known, extra oil may be added to the crankcase to compensate for their filling during the initial start-up process.*

d. Start the engine and allow to idle.

e. Verify the normal operation of the circulation system - irregular pulsing of the LED monitor.

NOTES:

1. *If the indicator's operation is steady, it indicates over-filling of the crankcase (with respect to the preset operating level) and system is lowering the crankcase oil level.*

2. *If the indicator's operation is a regular pulsing, it indicates the crankcase oil level is low and is raising the level.*

3. *The system will achieve the desired operating level by itself, but oil may need to be added to or removed from the supply tank to prevent an under or over fill condition there.*

SERVICE

Normal system servicing is limited to testing as outlined in Maintenance and Adjustment and replacement of components. Additional information includes:

1. Withdrawal tube:

a. The open end should be pointed down and away from operating components and known points of oil delivery or turbulence. These irregular conditions could provide incorrect "signals" to the system and result in improper operation and damage to the system and its components.

b. The withdrawal tube should be installed to provide a normal operating or control level of approximately midway between the running High or Full and Low or Add indications on the oil level dipstick or sight glass.

c. To change the oil level, it is recommended that the withdrawal tube be trimmed as required. The tube, fittings, and other component should not be bent.

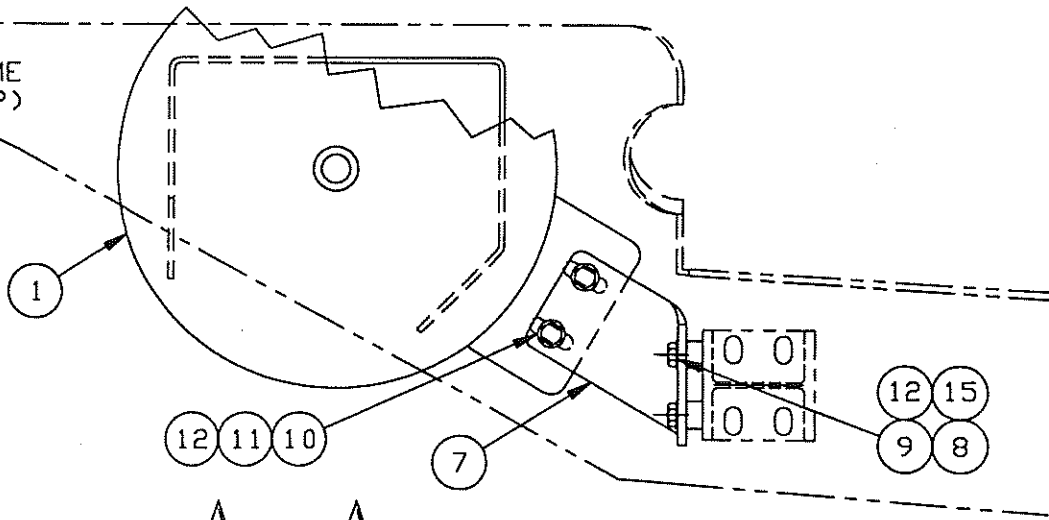
2. Hoses

a. All hoses should be routed to avoid unnecessary length and large reverse slope air traps. They should be kept from the proximity to exhausts and other sources of potential heat or damage and possible contact with metal edges or other sources of mechanical damage.

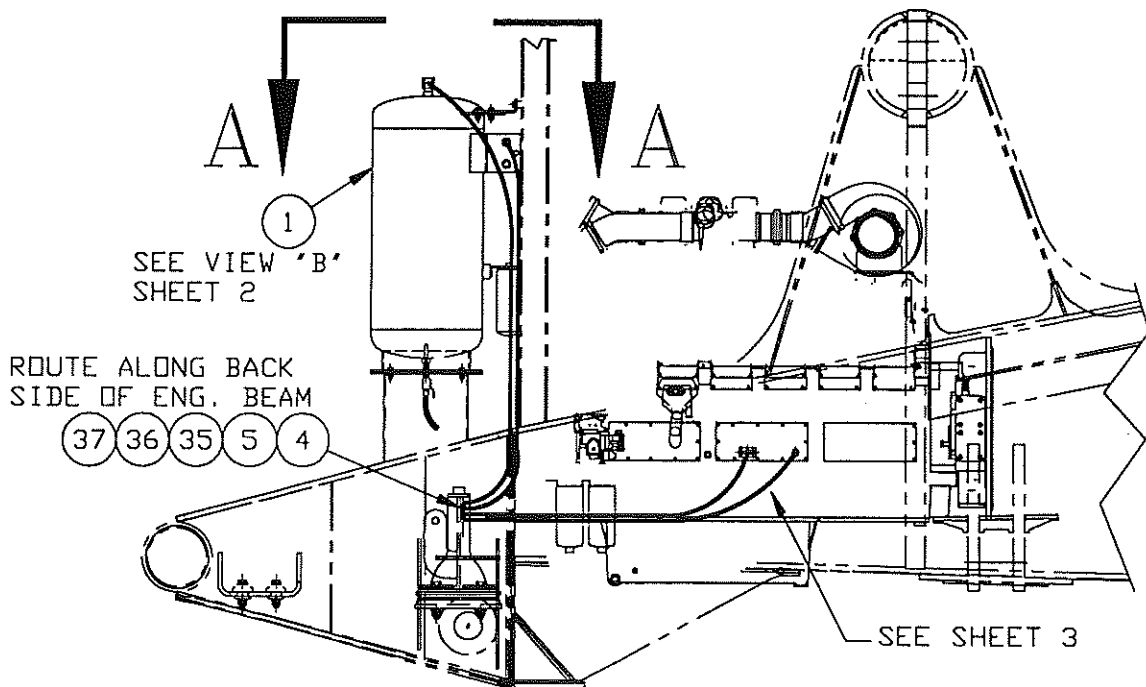
b. All hoses should be secured by the appropriate clips, brackets, or ties to avoid excessive movement during normal operation.

c. Withdrawal and return sump adapters and hose connections must be securely installed at all times.

(REF. RIGHT
SIDE FRAME
RAIL TOP)



VIEW A-A



VIEW FROM INSIDE
RIGHT FRAME RAIL

FIGURE 2 - TYPICAL ENGINE OIL CIRCULATING (EXTENDED SERVICE) SYSTEM
(A84809A, SHEET 1 OF 3)

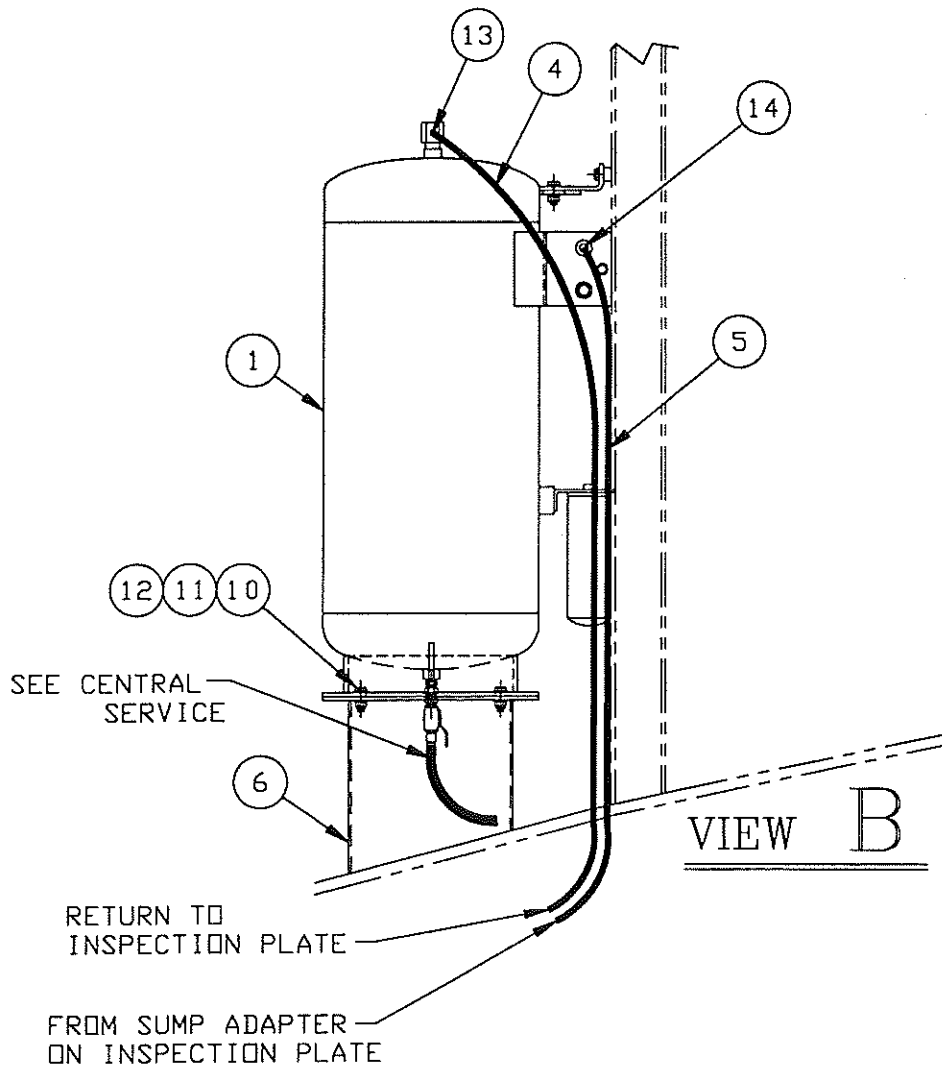
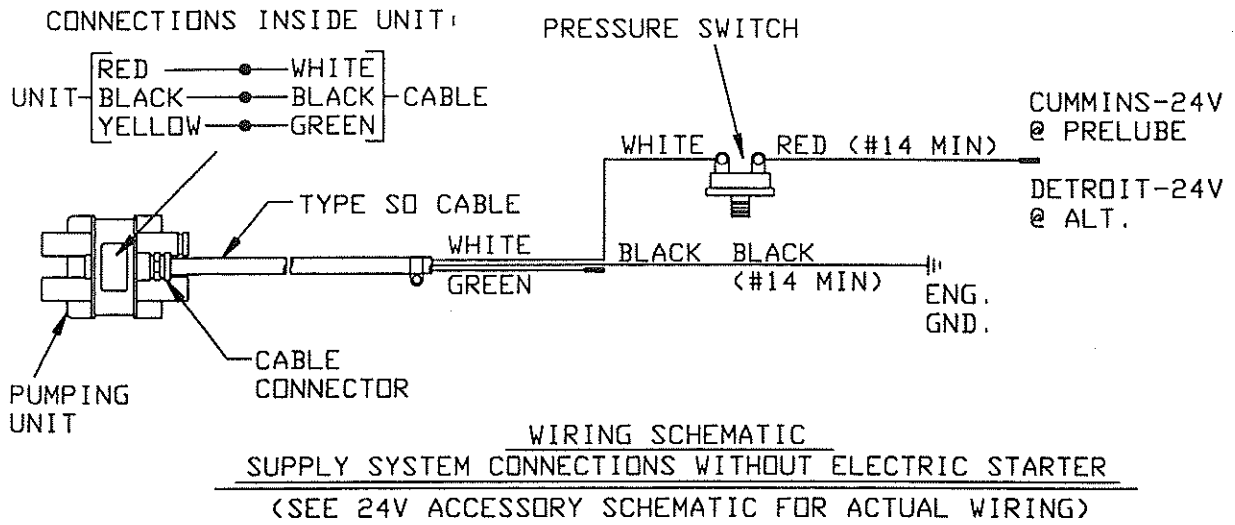
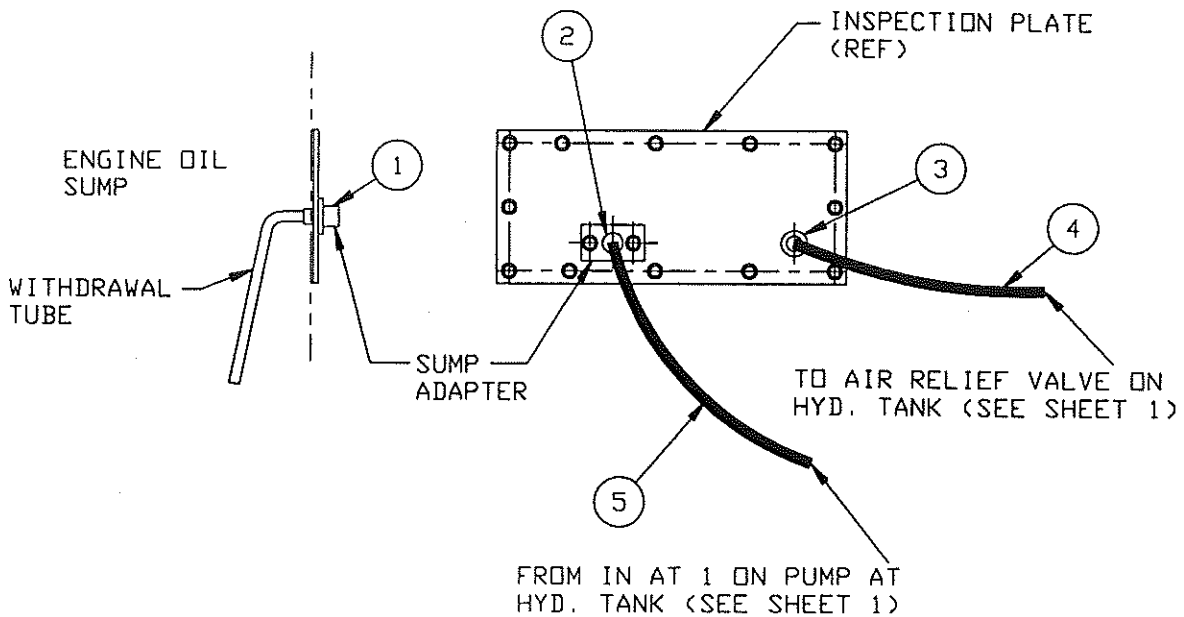


FIGURE 2 - TYPICAL ENGINE OIL CIRCULATING (EXTENDED SERVICE) SYSTEM
 (A84809A, SHEET 2 OF 3)



KEY		A84809A	
01.	EXTENDED SERVICE KIT (TANK AND PUMPING UNIT)	16.	THROUGH 25 NOT USED
02.	ADAPTER FITTING	26.	LOCKWASHER
03.	ADAPTER FITTING	27.	MACHINE SCREW
04.	HOSE ASSEMBLY	28.	ELECTRICAL CABLE
05.	HOSE ASSEMBLY	29.	ELECTRICAL TERMINAL
06.	TANK BRACKET	30.	ELECTRICAL TERMINAL
07.	UPPER TANK BRACKET	31.	ELECTRICAL TERMINAL
08.	BOLTING PAD	32.	ELECTRICAL TERMINAL
09.	CAPSCREW	33.	NUT
10.	CAPSCREW	34.	FLATWASHER
11.	LOCKNUT	35.	FLATWASHER
12.	FLATWASHER	36.	LOCKWASHER
13.	ADAPTER	37.	CAPSCREW
14.	ADAPTER	38.	TUBE CLAMP
15.	LOCKWASHER	39.	TUBE CLAMP

FIGURE 2 - TYPICAL ENGINE OIL CIRCULATING (EXTENDED SERVICE) SYSTEM (A84809A, SHEET 3 OF 3)

AUTOMATIC LUBRICATION SYSTEM (WITH HYDRAULICALLY DRIVEN ROTARY GREASE PUMP)

DESCRIPTION AND LOCATION (Figure 1)

The automatic lubrication system provides regular, periodic lubrication to grease points by means of a hydraulically operated pump, an electric timer, and lubricant injectors. The pump assembly is located on the superstructure and is mounted directly on the lubricant container. The electric timer is labeled with numbers that represent time in minutes, and is generally mounted inside the cab. The lubricant injectors are connected to the grease lines and are mounted near designated grease points.

For various reasons, not all of the components on the truck can be served by the system. The exact location of the automatic lubrication assemblies and the number of items served vary, depending on the special requirements of the mine.

OPERATION (Figure 1)

The function of the automatic lubrication system is to maintain proper lubrication levels at various bearing points on the truck. Instead of operating continuously, however, the system periodically cycles as follows:

NOTE: *Detailed information about those components contained in the pump assembly and injectors are outlined in their separate information in Section 9 - Options.*

The pump is driven by the rotary motion of the hydraulic motor. This rotary motion is converted to reciprocating motion through an eccentric crank mechanism. The reciprocating action causes the pump cylinder to move up and down. The pump is of positive displacement; double acting design with grease output occurring during both the up and down strokes of the pump.

During the down stroke the pump cylinder is extended into the grease. Through the combination of shovel action and vacuum generated in the pump cylinder chamber, the grease is forced into the pump chamber. Simultaneously, grease is discharged through the outlet of the pump. The volume of grease during the intake is twice the amount of grease output during each cycle.

During the upstroke, the inlet check function closes, and one half of the grease taken in during the previous stroke is transferred through the outlet check function to the outlet port.

An integral pump control manifold is incorporated into the motor to control the input flow and pressure of hydraulic oil that provides the operating power.

An electric timer assembly controls the operation of the system solenoid and the operation of the pump. The pressurization of the grease supply system controls the operation of the individual injectors when it reaches the preset operating level.

Several optional alternative and/or additional provisions are available for the system.

1. A separate warning indicator to indicate when the system is operating properly.
2. A separate manual activation switch to allow manual system testing and activation when desired.
3. Remote or ground level central service filling provisions to permit filling the central reservoir from pressurized sources, with and without automatic reservoir level monitoring provisions.

MAINTENANCE AND ADJUSTMENT

Periodic maintenance should include the following steps:

1. Park the truck in a SAFE POSITION. It must be secured by means other than the truck's friction brake system.

NOTE: *Preventive maintenance should be performed frequently to ensure proper operation of the system. Damage to bearings and other moving components can be avoided.*

2. Inspect the lubrication system components for evidence of dirt, damage, wear or leaks.
3. Clean and inspect the system components.
4. Check the mounting hardware for tightness.
5. Verify that all connections are tight, clean and free of leaks. All hoses should be secured firmly without kinks and routed away from all moving parts.
6. Maintain an adequate level of lubricant in the reservoir to ensure proper operation of the system, and to avoid

KEY				A85984	
01.	Grease Pump	57.	Lockwasher	119.	Hose Assembly
02.	Grease Container	58.	Flatwasher	120.	Hose Assembly
03.	Grease Container Lid	59.	Capscrew	121.	Hose Assembly
04.	Flange Gasket	60.	Locknut	122.	Hose Assembly
05.	4 Injector Manifold	61.	Hose Assembly	123.	Hose Assembly
06.	3 Injector Manifold	62.	Hose Assembly	124.	Hose Assembly
07.	2 Injector Manifold	63.	Hose Assembly	125.	Hose Assembly
08.	Lube Injector Bracket	64.	Not Used	126.	Hose Assembly
09.	Adapter Fitting	65.	Not Used	127.	Hose Assembly
10.	Not Used – Reflects Optional Equipment	66.	Not Used	128.	Hose Assembly
		67.	Cap Cover	129.	Hose Assembly
11.	Breather	68.	Not Used	130.	Hose Assembly
12.	– 19. Not Used – Reflects Optional Equipment	69.	Not Used	131.	Hose Assembly
		70.	Not Used	132.	Hose Assembly
20.	Vent Valve	71.	Hose Assembly	133.	Adapter Fitting
21.	Adapter Fitting	72.	Hose Assembly	134.	Not Used
22.	Not Used	73.	Not Used	135.	Hose Assembly
23.	Not Used	74.	Not Used	136.	Hose Assembly
24.	Adapter Fitting	75.	Connector	137.	Support Clamp Assembly
25.	Hose Assembly	76.	Adapter Fitting	138.	Pipe Plug
26.	Hose Assembly	77.	Adapter Fitting	139.	Adapter Fitting
27.	Reducer Bushing	78.	Mounting Clip	140.	Not Used
28.	Pipe Tee	79.	Adapter Fitting	141.	Not Used
29.	Reducer Bushing	80.	Adapter Fitting	142.	Not Used
30.	Pressure Gauge	81.	Not Used	143.	Vent Valve Support
31.	Adapter Fitting	82.	Adapter Fitting	144.	Not Used
32.	Hose Assembly	83.	Pipe Plug	145.	Relay
33.	Pressure Switch	84.	Not Used	146.	Not Used
34.	Adapter Fitting	85.	Nameplate (Grease)	147.	Grease Fitting
35.	Male Quick Coupling (Reflects Optional Equipment)	86.	Drive Screw	148.	Not Used
		87.	Not Used	149.	Pipe Plug
36.	Female Quick Coupling (Reflects Optional Equipment)	88.	Capscrew	150.	Not Used
		89.	Locknut	151.	Capscrew
37.	Adapter Fitting	90.	- 100. Reflects Opt. Equipment (Not Necessarily Shown)	152.	Grease Pump Gasket
38.	Hose Assembly			153.	Cable
39.	Edge Trim	101.	Cushion Clamp	154.	Terminal
40.	Capscrew	102.	Cushion Clamp	155.	Terminal
41.	Flatwasher	103.	Adapter Fitting	156.	Conduit
42.	Locknut	104.	Cushion Clamp	157.	Not Used
43.	Not Used	105.	Tie Wrap	158.	Terminal
44.	Pipe Plug	106.	Tie Wrap	159.	Terminal
45.	Adapter Fitting	107.	Hose Assembly	160.	Not Used
46.	Adapter Fitting	108.	Hose Assembly	161.	Pushbutton Switch
47.	Not Used	109.	Hose Assembly	162.	– 168. Not Used
48.	Fitting	110.	Hose Assembly	169.	Pipe Plug
49.	Tube Clamp	111.	Hose Assembly	170.	Not Used
50.	Not Used	112.	Hose Assembly	171.	Not Used
51.	Bolting Pad	113.	Hose Assembly	172.	Not Used
52.	Not Used	114.	Hose Assembly	173.	Not Used
53.	Not Used	115.	Hose Assembly	174.	Not Used
54.	Not Used	116.	Hose Assembly	175.	Tie Wrap
55.	Not Used	117.	Hose Assembly		
56.	Capscrew	118.	Hose Assembly		

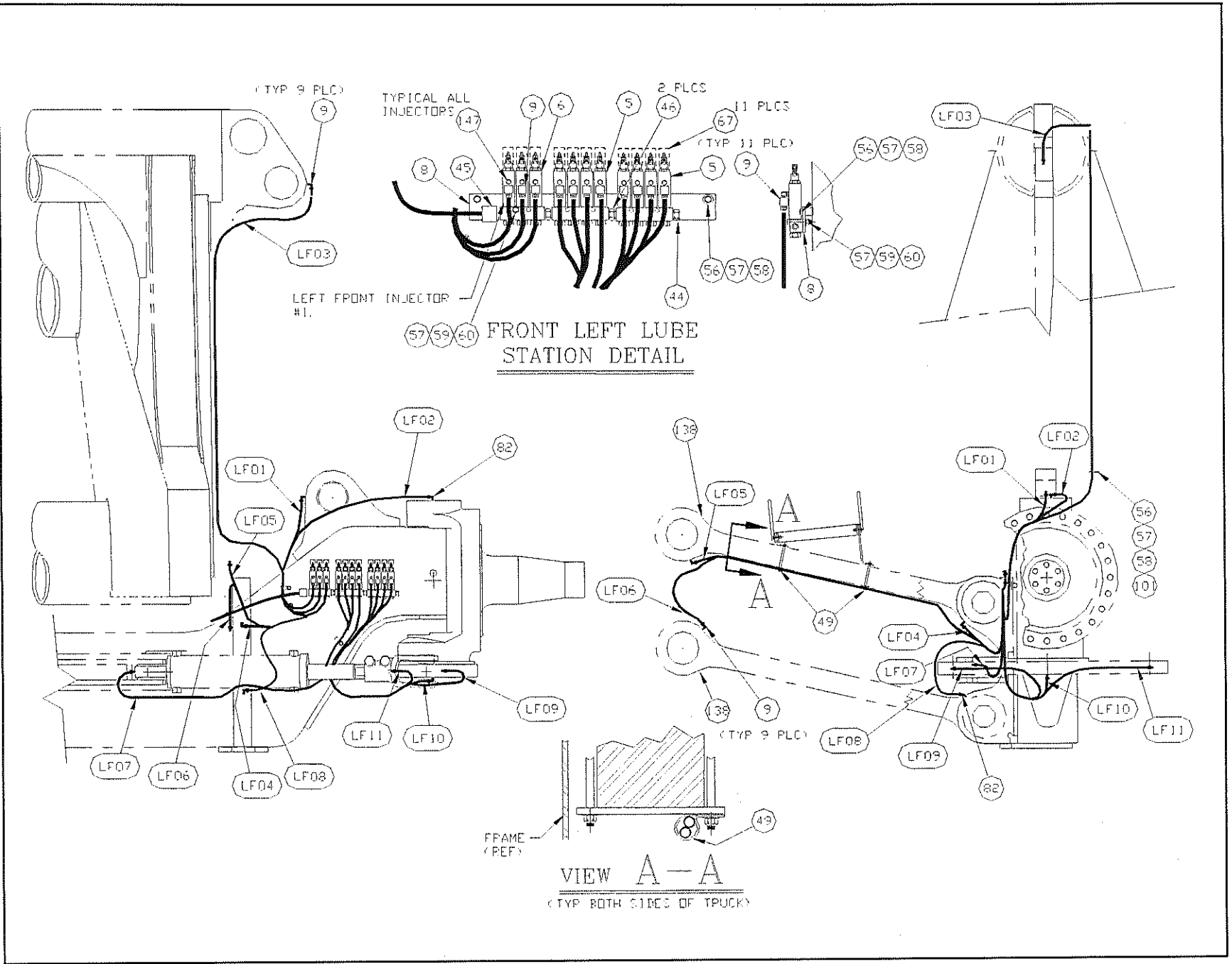


FIGURE 1 - AUTOMATIC LUBRICATION SYSTEM (A85984, SHEET 1 OF 10)

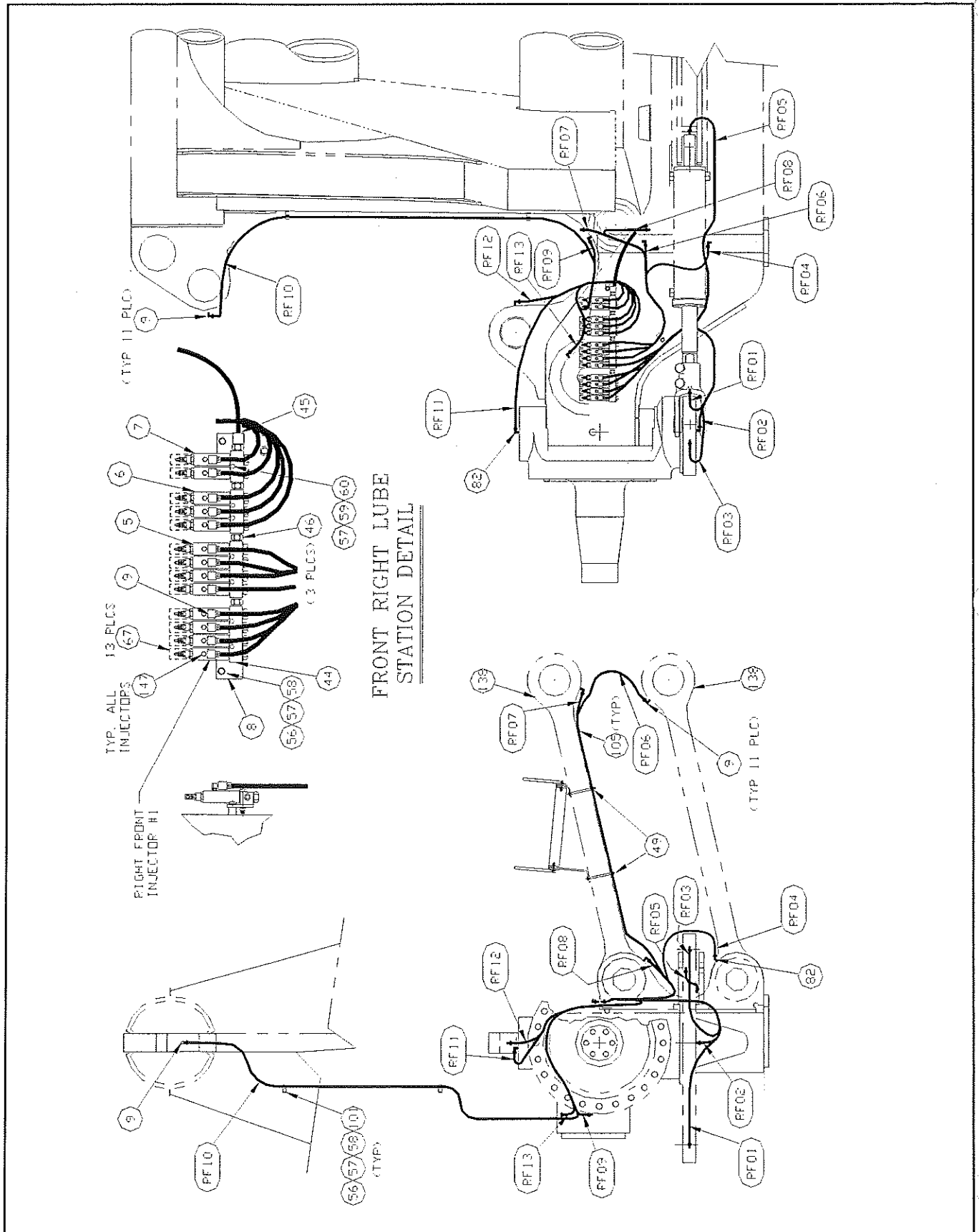


FIGURE 1 - AUTOMATIC LUBRICATION SYSTEM (A85984, SHEET 2 OF 10)

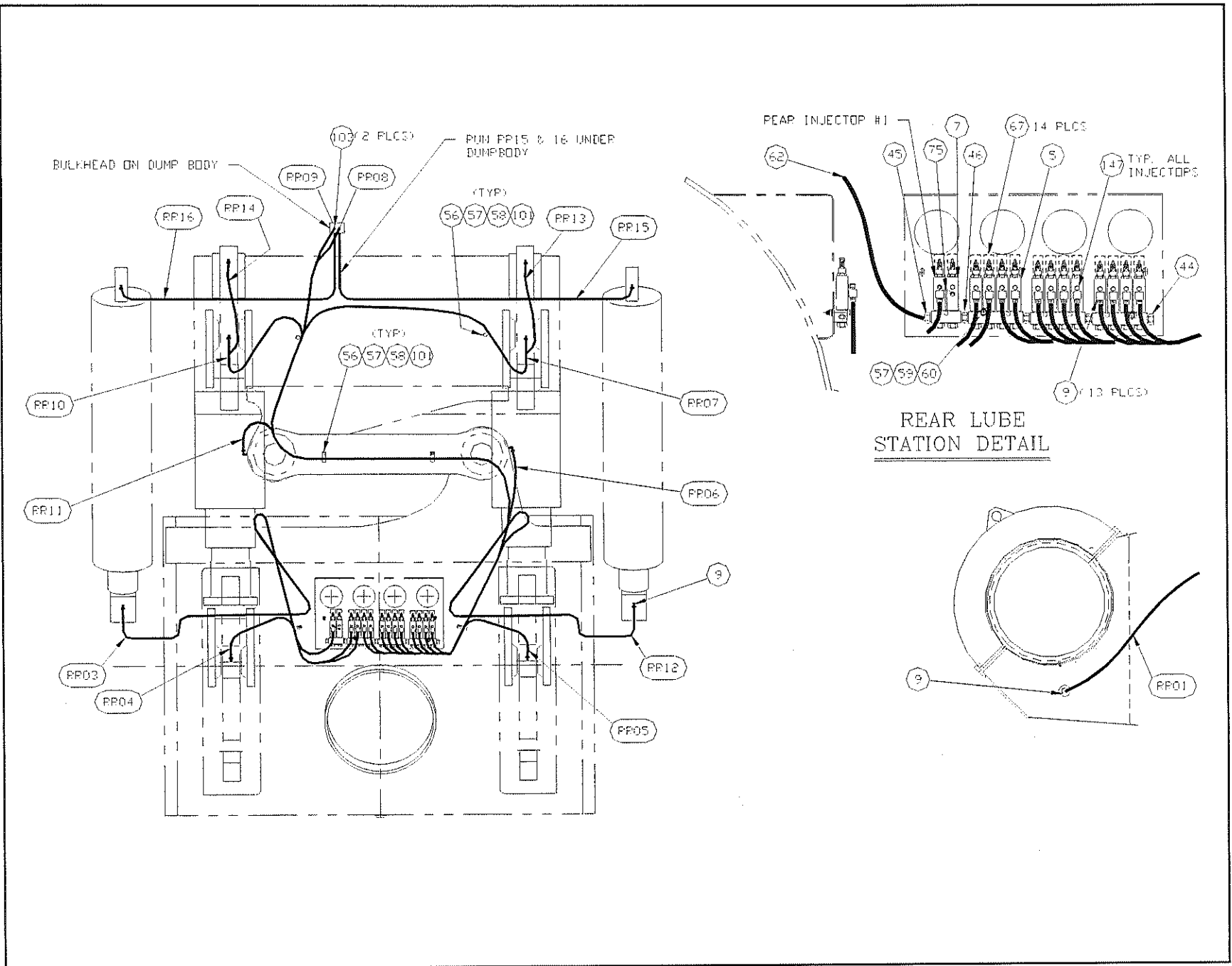


FIGURE 1 - AUTOMATIC LUBRICATION SYSTEM (A85984, SHEET 3 OF 10)

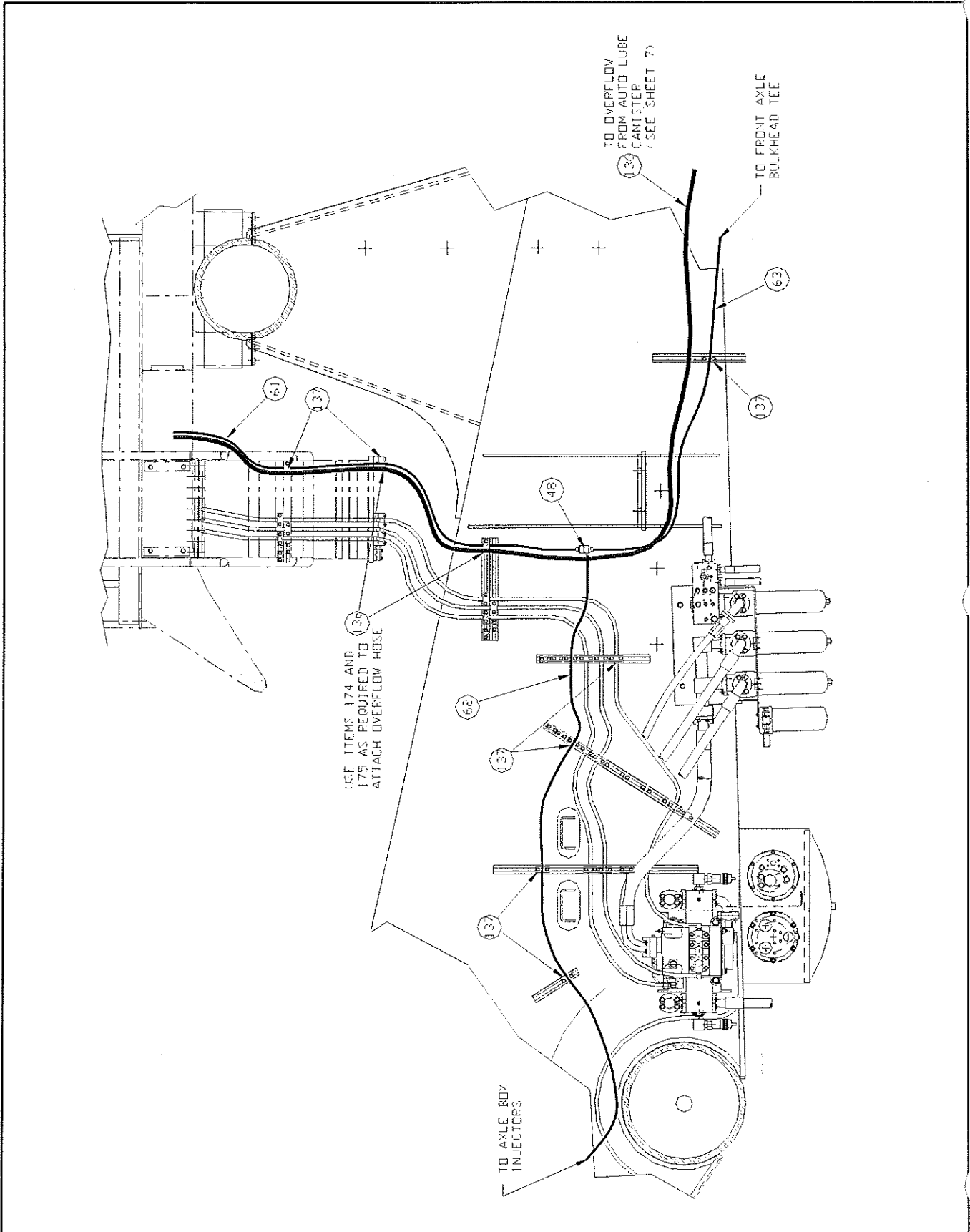


FIGURE 1 - AUTOMATIC LUBRICATION SYSTEM (A85984, SHEET 4 OF 10)

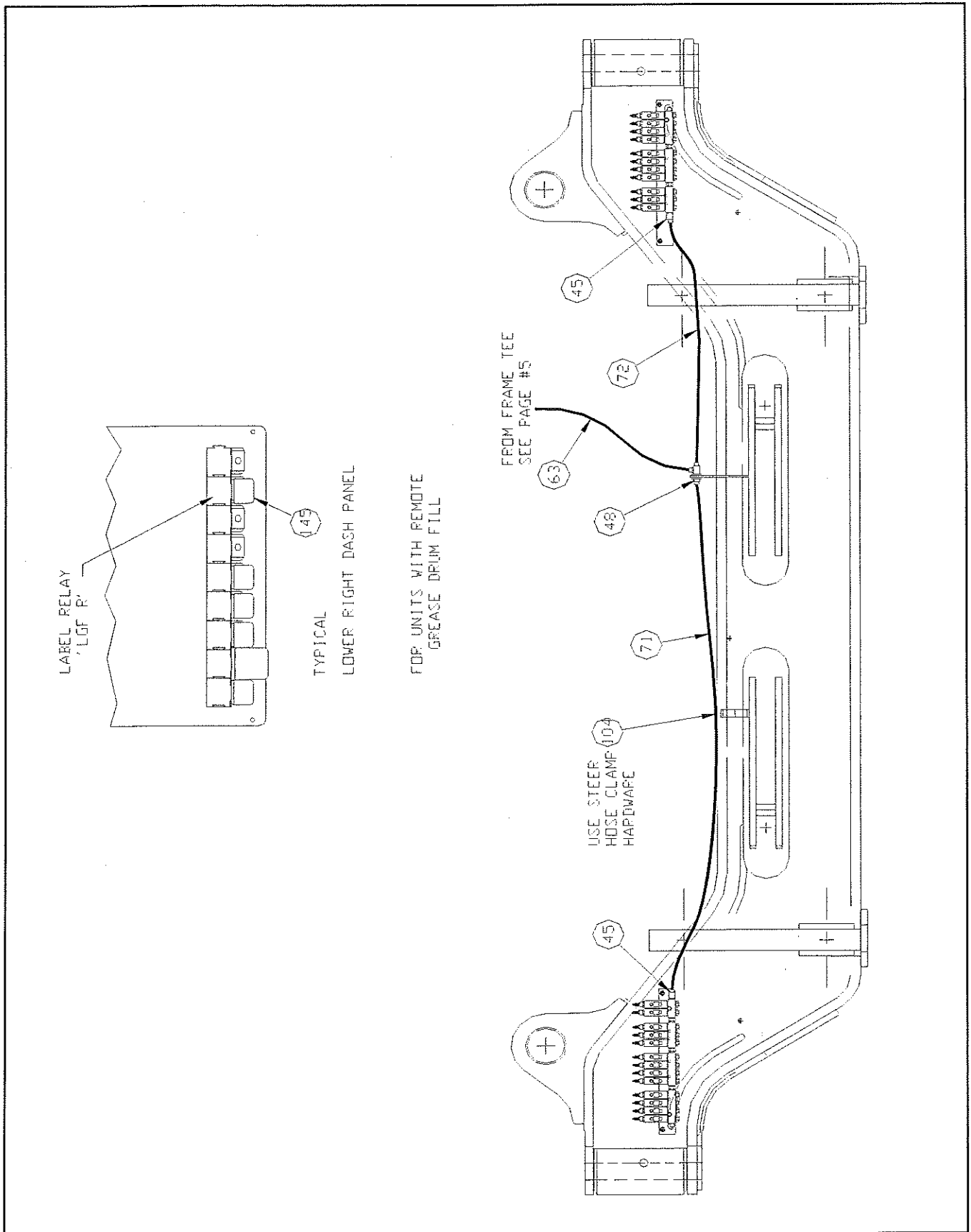
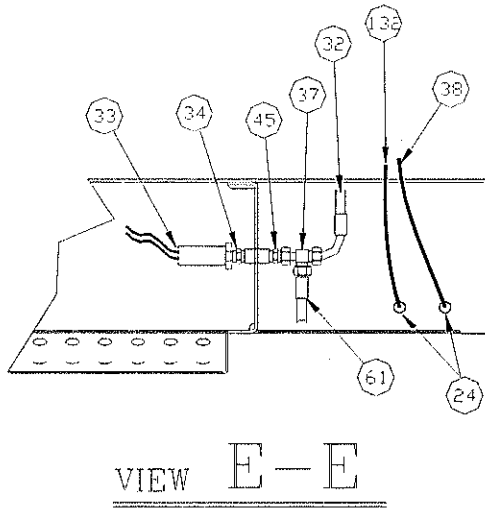
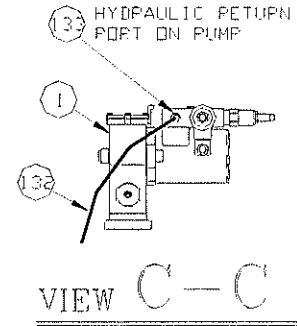
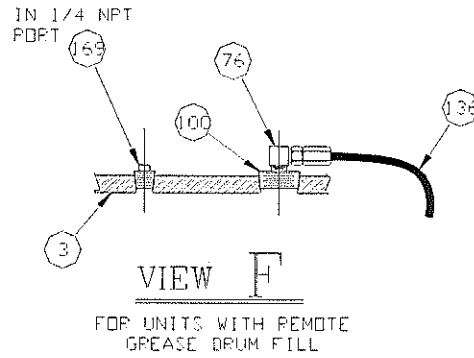
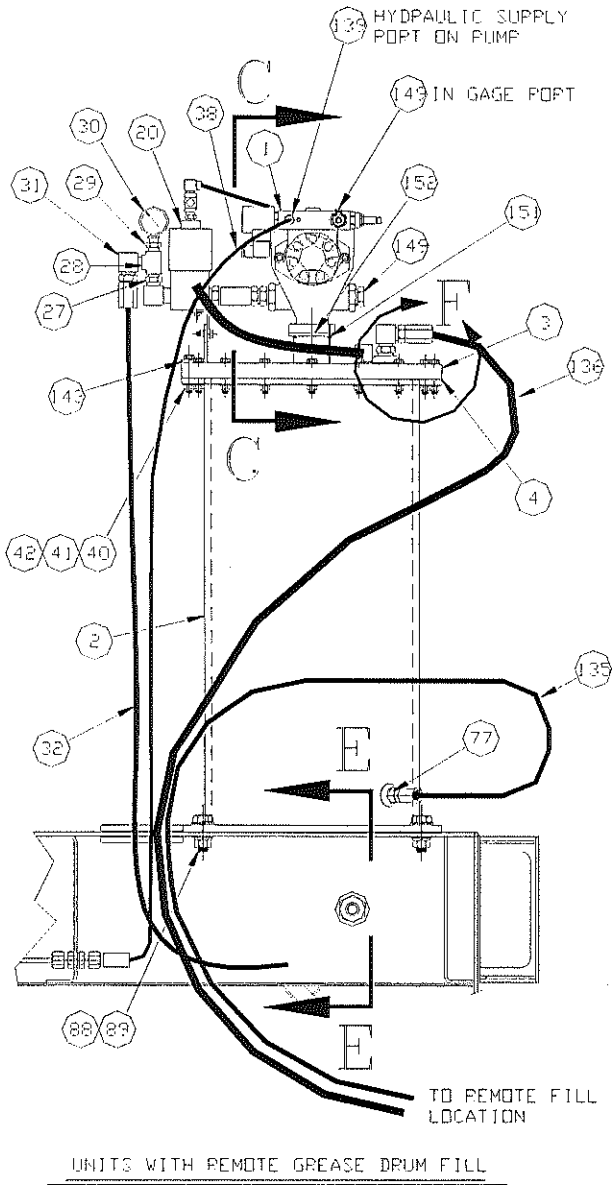


FIGURE 1 - AUTOMATIC LUBRICATION SYSTEM (A85984, SHEET 5 OF 10)

FIGURE 1 - AUTOMATIC LUBRICATION SYSTEM (A85984, SHEET 6 OF 10)



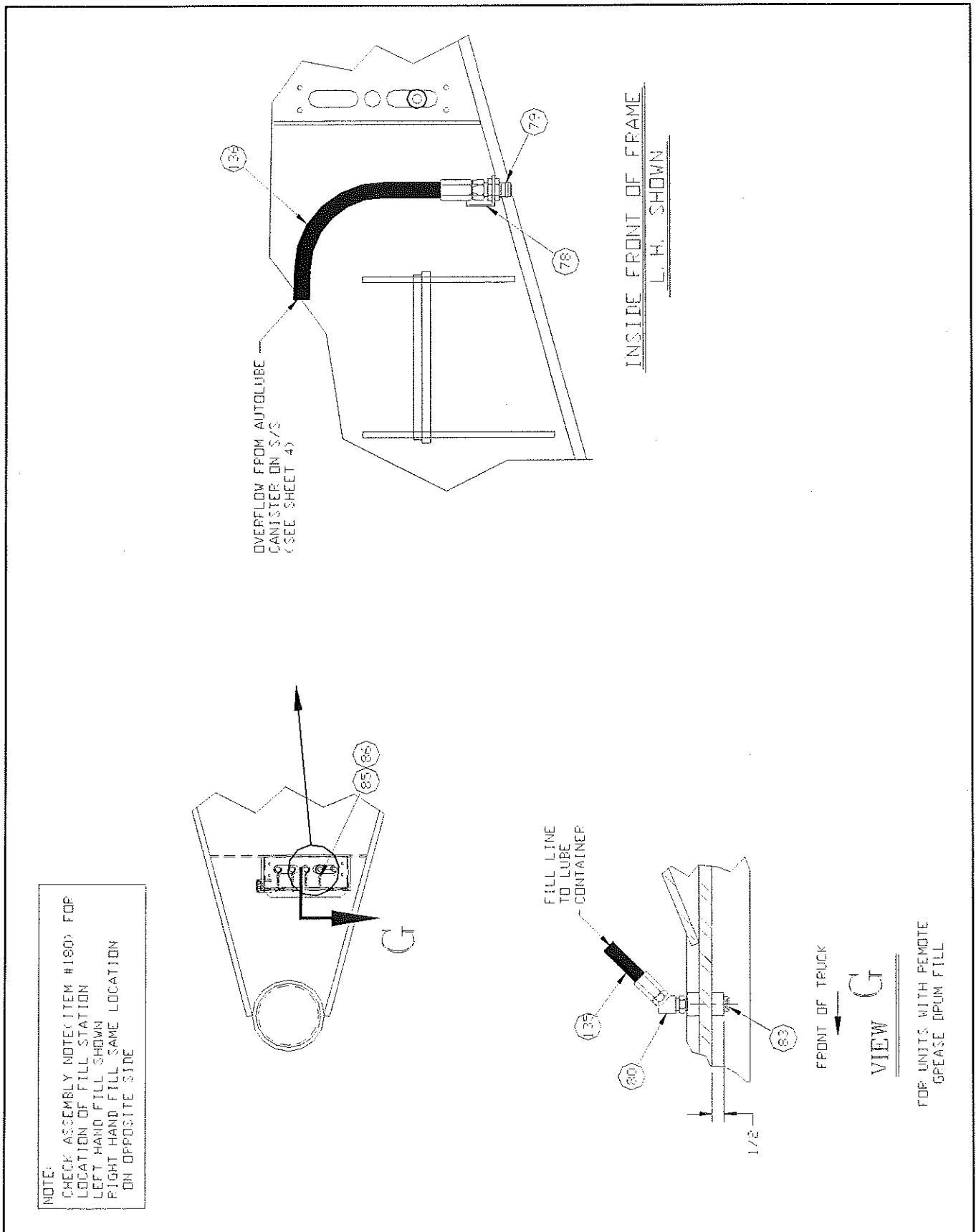


FIGURE 1 - AUTOMATIC LUBRICATION SYSTEM (A85984, SHEET 7 OF 10)

HOSE NO	ITEM NO.	LOCATION
LF01	107	FROM LEFT FRONT INJECTOR #1 TO BOTTOM SUSPENSION PIN
LF02	108	FROM LEFT FRONT INJECTOR #2 TO TOP OF KINGPIN
LF03	109	FROM LEFT FRONT INJECTOR #3 TO TOP SUSPENSION PIN
LF04	110	FROM LEFT FRONT INJECTOR #4 TO REAR TOP TRAILING ROD PIN
LF05	111	FROM LEFT FRONT INJECTOR #5 TO FRONT TOP TRAILING ROD PIN
LF06	112	FROM LEFT FRONT INJECTOR #6 TO FRONT BOTTOM TRAILING ROD PIN
LF07	113	FROM LEFT FRONT INJECTOR #7 TO STEERING CYLINDER PIN AT ANCHOR
LF08	114	FROM LEFT FRONT INJECTOR #8 TO REAR BOTTOM TRAILING ROD PIN
LF09	115	FROM LEFT FRONT INJECTOR #9 TO STEERING CYLINDER PIN AT ARM
LF10	116	FROM LEFT FRONT INJECTOR #10 TO BOTTOM OF KINGPIN
LF11	117	FROM LEFT FRONT INJECTOR #11 TO TIE ROD PIN

LUBE HOSES ON
LEFT FRONT
LUBE STATION

FIGURE 1 - AUTOMATIC LUBRICATION SYSTEM (A85984, SHEET 8 OF 10)

AUTOMATIC LUBRICATION SYSTEM

(WITH HYDRAULICALLY DRIVEN ROTARY GREASE PUMP)

UNIT RIG

HOSE NO	ITEM NO.	LOCATION
RF01	117	FROM RIGHT FRONT INJECTOR #1 TO TIE ROD PIN
RF02	116	FROM RIGHT FRONT INJECTOR #2 TO BOTTOM OF KINGPIN
RF03	115	FROM RIGHT FRONT INJECTOR #3 TO STEERING CYLINDER PIN AT ARM
RF04	114	FROM RIGHT FRONT INJECTOR #4 TO REAR BOTTOM TRAILING ROD PIN
RF05	113	FROM RIGHT FRONT INJECTOR #5 TO STEERING CYLINDER PIN AT ANCHOR
RF06	112	FROM RIGHT FRONT INJECTOR #6 TO FRONT BOTTOM TRAILING ROD PIN
RF07	111	FROM RIGHT FRONT INJECTOR #7 TO FRONT TOP TRAILING ROD PIN
RF08	110	FROM RIGHT FRONT INJECTOR #8 TO REAR TOP TRAILING ROD PIN
RF09	118	FROM RIGHT FRONT INJECTOR #9 TO INBOARD PANHARD ROD PIN
RF10	109	FROM RIGHT FRONT INJECTOR #10 TO TOP SUSPENSION PIN
RF11	108	FROM RIGHT FRONT INJECTOR #11 TO TOP OF KINGPIN
RF12	107	FROM RIGHT FRONT INJECTOR #12 TO BOTTOM SUSPENSION PIN
RF13	119	FROM RIGHT FRONT INJECTOR #13 TO OUTBOARD PANHARD ROD PIN

LUBE HOSES ON
RIGHT FRONT
LUBE STATION

FIGURE 1 - AUTOMATIC LUBRICATION SYSTEM (A85984, SHEET 9 OF 10)

HOSE NO	ITEM NO.	LOCATION
RR01	121	FROM REARLUBE INJECTOR #1 TO NOSE CONE BUSHING
RR02	075	FROM REARLUBE INJECTOR #2 TO REARLUBE INJECTOR #1
RR03	120	FROM REARLUBE INJECTOR #3 TO BOTTOM LEFT DUMP CYLINDER PIN
RR04	122	FROM REARLUBE INJECTOR #4 TO BOTTOM LEFT SUSPENSION PIN
RR05	123	FROM REARLUBE INJECTOR #5 TO BOTTOM RIGHT SUSPENSION PIN
RR06	124	FROM REARLUBE INJECTOR #6 TO RIGHT PANHARD ROD PIN
RR07	127	FROM REARLUBE INJECTOR #7 TO TOP RIGHT SUSPENSION PIN
RR08	125	FROM REARLUBE INJECTOR #8 TO DUMPBODY BULKHEAD RIGHT HOLE
RR09	125	FROM REARLUBE INJECTOR #9 TO DUMPBODY BULKHEAD LEFT HOLE
RR10	128	FROM REARLUBE INJECTOR #10 TO TOP LEFT SUSPENSION PIN
RR11	129	FROM REARLUBE INJECTOR #11 TO LEFT PANHARD ROD PIN
RR12	120	FROM REARLUBE INJECTOR #12 TO BOTTOM RIGHT DUMP CYLINDER PIN
RR13	130	FROM REARLUBE INJECTOR #13 TO RIGHT DUMP BODY PIVOT BUSHING
RR14	131	FROM REARLUBE INJECTOR #14 TO LEFT DUMP BODY PIVOT BUSHING
RR15	126	FROM DUMPBODY BULKHEAD RIGHT HOLE TO TOP RIGHT DUMP CYLINDER PIN
RR16	126	FROM DUMPBODY BULKHEAD LEFT HOLE TO TOP LEFT DUMP CYLINDER PIN

LUBE HOSES ON
REAR LUBE
STATION

FIGURE 1 - AUTOMATIC LUBRICATION SYSTEM (A85984, SHEET 10 OF 10)

TROUBLESHOOTING CHART

PROBLEM/ CONDITION	POSSIBLE CAUSE	CORRECTIVE ACTION
(1) Pump does not run.	(1) No pressure indicated on system gauge.	
	(a) Closed shut off valve in the supply line.	(a) Open the shut off valve.
	(b) No power to the solenoid valve.	(b) Correct the electrical fault.
	(c) Non-operating solenoid valve.	(c) Replace the solenoid.
	(d) System Pressure reducing valve is set too low.	(d) Test, adjust, repair, or replace the pressure reducing valve.
	(e) Hydraulic fluid supply is insufficient.	(e) Test the supply pressure and flow of the hydraulic supply. Repair or replace as required.
	(2) Pressure is indicated on the system gauge.	
	(a) Close hydraulic fluid outlet line.	(a) Check the outlet line for obstruction. Repair or replace as required.
	(b) Flow control valve is fully closed.	(b) Readjust the valve to 3/4 turn open.
	(c) Pump is stalled due to grease backpressure.	(c) Test the operation of the vent valve. Repair or replace as required.
(2) Pump speeds up or runs erratically.	(3) Pump is seized or damaged.	(3) Disassemble the pump and repair or replace the damaged seized components.
	(1) Low level of grease or reservoir is empty.	(1) Refill reservoir.
	(2) Follower plate is stuck and separated from the grease.	(2) Check the follower plate and container for evidence of wear or damage. Repair or replace as required.
(3) Pump runs, but the output of grease is low.	(3) Pump piston or check valves are worn.	(3) Disassemble the pump and repair or replace the damaged or worn components.
	(1) Insufficient hydraulic fluid supply.	(1) Test the hydraulic supply flow. Adjust the flow control valve to obtain the required flow rate. Repair or replace as required.
	(2) Inlet pressure set too low.	(2) Increase the system operating pressure by adjusting the pressure reducing valve.
(4) Weepage from the housing cover.	(3) Faulty inlet or discharge check valves.	(3) Repair or replace as required.
	(1) Cup seal or O-ring worn or damaged.	(1) Check, repair, or replace as required.
(5) Pump becomes noisy.	(1) No oil in crankcase.	(1) Add crankcase oil as outlined in the instructions on the hydraulic pump assembly in Section 9 - Options.
	(2) Worn wrist pin bushing.	(2) Disassemble the pump and repair or replace the damaged or worn components.
(6) Pump does not build pressure.	Foreign material holding lower check assembly open.	(1) Dismantle, clean, repair or replace as required. Consider installing inlet screen.
		(2) Check grease supply for contamination.

priming the system should it run dry.

NOTE: *Do not allow the grease reservoir to run dry. This could result in damage to lubricated parts on the truck, and will require the automatic lubrication system to be primed.*

7. Check the operation and setting of the electric timer setting as follows:

NOTES:

1. *The electrical timers are mounted in the cab and are accessed through the dash access panel to the right of the steering wheel.*
2. *These times are typical and may be adjusted for site and environmental differences.*

a. Set the "Off" timer for 15 minutes.

b. Set the "On" timer to 1 minute.

c. Mark the timers and knobs to indicate the settings made.

8. Inspect each injector for the correct discharge adjustment. To adjust an injector for the desired discharge rate, proceed as outlined in the instructions in Section 9 - Options.

9. If it has been determined that there is air in the lines, the air should be removed from the system. Once the air has been removed, the cause should be determined.

NOTE: *Air in the supply and feed lines (injector to bearing) can be a major cause of the lubrication system not to operate properly. Air pockets in the lubricant will prevent the pump from building up lubricant pressure.*

Entrapped air may be removed from the system as follows:

a. Park the truck in a SAFE POSITION. It must be secured by means other than the truck's friction brake system.

b. Remove the plug from the tee or injector manifold closest to the pump.

c. Start the pump.

d. When grease flows freely from the plug opening, stop the pump and replace the plug. Repeat this procedure on the next tee or manifold downstream from the pump, and progressively work to the last and longest supply line run.

e. After all air is expelled and all plugs are replaced, the pump will build up lubricant pressure and complete its operating cycle.

10. Check that the outlet grease flow from the pump has been regulated to 2500 to 2800 psi (17 240 to 19 305 kPa). If not, pressure reducing valve and flow control valve, respectively, can be readjusted as follows:

a. Pressure control valve

(1) Loosen the locknut on the valve by turning counter-clockwise.

(2) Rotate the valve stem counter-clockwise until it no longer turns.

NOTE: *The valve stem will unscrew until it reaches the stop. It will not come off. This is the minimum pressurized setting.*

(3) Turn the Master and Battery Isolation switches. Temporarily adjust the timers to allow the system to operate and the pump stalls against the pressure.

(4) Rotate the valve stem clockwise until the grease pressure is 2500 to 2800 psi (17 240 to 19 305 kPa) and the system cycles.

(5) Cause the system to cycle again and verify the operating pressure.

(6) When the adjustment is complete, turn the locknut on the valve stem clockwise to secure.

b. Flow control valve

(1) Loosen the locknut on the flow control valve by turning counter-clockwise.

(2) Adjust the flow rate by turning the valve stem clockwise to reduce the flow and counter-clockwise to increase the flow.

NOTES:

1. *There are approximately 2-1/2 turns from the fully opened to the fully closed positions.*

2. *A typical initial setting is midway, approximately 1-1/4 from the ends of the travel.*

3. *The valve stem will not come out when fully open as there is a stop in this position.*

(3) When the adjustment is complete, turn the locknut on the valve stem clockwise to secure.

When components require replacement, shut off hydraulic pressure to the system, and make sure the truck's Master Switch is Off before doing any work. If a component tubing or hose is removed, the system may have to be primed manually.

NOTE: *When installing the cover on the reservoir:*

- 1. Apply RTV Sealant to both sides of the gasket.*
- 2. Install the capscrews from the bottom side of the lid. Coat the threads with Loctite 242 (or equivalent) and tighten to 6 ft-lb (8 Nm). Do not over tighten as this may distort the gasket.*

SERVICE

Servicing of the grease pump and injector assemblies is outlined in their separate instructions contained in Section 9 - Options.

HYDRAULICALLY OPERATED ROTARY GREASE PUMP

DESCRIPTION AND LOCATION (Figure 1)

The components included in this part of the automatic lubrication assembly are those mounted on the superstructure, including the grease reservoir and the equipment on and around the top of the assembly.

OPERATION

The rotary motion of the hydraulic motor drives the pump. This rotary motion is converted to reciprocating motion through an eccentric crank mechanism. The reciprocating action causes the pump cylinder to move up and down. The pump is of positive displacement, double acting design with grease output occurring during both the up and down strokes of the pump.

During the down stroke the pump cylinder is extended into the grease. Through the combination of shovel action and vacuum generated in the pump cylinder chamber, the grease is forced into the pump chamber. Simultaneously, grease is discharged through the outlet of the pump. The volume of grease during the intake is twice the amount of grease output during each cycle.

During the upstroke, the inlet check function closes, and one half of the grease taken in during the previous stroke is transferred through the outlet check function to the outlet port.

An integral pump control manifold is incorporated into the motor to control the input flow and pressure of hydraulic oil that provides the operating power.

TROUBLESHOOTING

The troubleshooting of the components in this portion of the assembly is included in the detailed explanation in the system information in Section 9 - Options.

MAINTENANCE AND ADJUSTMENT (Figure 1)

Periodic maintenance should include the following steps:

1. Park the truck in a SAFE POSITION. It must be secured by means other than the truck's friction brake system.

NOTE: Preventive maintenance should be performed frequently to ensure proper operation of the system. Damage to bearings and other moving components can be avoided.

2. Inspect the pump and related lubrication system components for evidence of dirt, damage, wear or leaks.

3. Clean and inspect the system components. Not any material in or on the inlet strainer (63) if so equipped.

4. Check the mounting hardware for tightness.

5. Verify that all connections are tight, clean and free of leaks. All hoses should be secured firmly without kinks and routed away from all moving parts.

6. At regular intervals, (typically approximately 100 hours), check the fluid level in the pump crankcase as follows:

a. Remove pipe plug (45) from the pump housing (46).

b. Verify that the oil level is at the center of the pipe plug opening.

c. If more oil is needed, add SAE 10W-30 motor oil until it reaches the proper level. Do not overfill.

NOTE: In arctic climate operating conditions, it is recommended that Mobil Aero HFA Low Temperature Hydraulic Fluid (or equivalent) be substituted as the lubricating fluid.

d. Install the pipe plug (45) into the pump housing (46).

7. At 500 hour intervals, change the in the pump crankcase as follows:

a. Remove pipe plug (45) from the pump housing (46). Allow the oil to drain into an appropriate container.

b. Verify that all the oil is out of the crankcase. Remove any remaining by the necessary means.

c. Refill with SAE 10W-30 motor oil until it reaches the proper level. Do not overfill. Approximately 10 fluid ounces (300 milliliters) will be required.

NOTE: In arctic climate operating conditions, it is recommended that Mobil Aero HFA Low Temperature Hydraulic Fluid (or equivalent) be substituted as the lubricating fluid.

d. Install the pipe plug (45) into the pump housing (46).

REMOVAL

The grease pump assembly may be removed as follows:

1. Park the truck in SAFE POSITION. It must be secured by means other than the truck's friction brake system.
2. Remove the hardware securing the lid and pump assembly to the top of the reservoir can.

NOTE: *There are a number of variations to the reservoir assembly. See the drawing in the system information in Section 9 - Options for detailed illustrations.*

3. Remove the lid and pump assembly.

DISASSEMBLY (Figure 1)

The grease pump assembly may be disassembled as follows:

1. Remove the four socket head capscrews (33).
2. Carefully separate the manifold (37) from the hydraulic motor assembly (42). Do not pry the components apart. Use extra care not to damage or mar the mating surfaces.
3. Remove the pipe plug (45) and drain the crankcase oil from the pump housing (46).
4. Remove the six self-threading screws (29).
5. Remove the housing cover (30) and the cover gasket (31).
6. If so equipped, remove the inlet strainer (63) from the tube assembly.
7. Remove the retaining ring (57).
8. Pull the shovel plug (56) from the housing tube (55).
9. Remove the two socket head screws (44).
10. Separate the hydraulic motor (42) from the pump housing (46).
11. Remove the two outlet pin nuts (50) from the pump housing (46).
12. Remove the pump subassembly (1 through 28) from the pump housing (46).

NOTE: *Pushing the subassembly up with a wooden or plastic rod $\frac{3}{4}$ inch (19 mm) O. D. against the check seat housing is typically found to be helpful.*

13. Remove the housing tube (55) from the pump housing (46) by inserting the $\frac{3}{4}$ inch (19 mm) rod through the inlet holes on the bottom of the housing tube and unscrewing it.

14. Remove the bronze bearing (51), O-ring (52), and back-up washer (53) from the housing tube (55).

15. Remove the crankrod assembly (1 through 8) from the pump by:

- a. Unscrewing the button head screws (12).
- b. Pulling out the wrist pin bushings (13).

16. Remove the check seat housing (28) from the reciprocating tube (21).

NOTE: *There is a 3/8-inch Allen head socket in the throat of the check seat housing to ease removal.*

17. Unscrew the wrist pin anchor (14) from the reciprocating tube (21).

18. Pull the plunger assembly (9 through 20) from the reciprocating tube (21).

19. Using a $\frac{1}{2}$ inch (12 mm) wooden or plastic rod, push the cup seal (22) and the pump cylinder (24) from the reciprocating tube (21).

20. Remove the pump plunger (20) from the plunger link rod (17).

NOTE: *A spanner wrench (for 3/8-inch diameter tube with 1/8-inch pins) that uses the holes in the pump plunger is required.*

21. Unscrew the plunger link rod (17) from the plunger tube (11).

22. Slide off the cup seal (16), the back-up washer (15), and the wrist pin anchor (14).

23. Unscrew the plunger tube (11) from the outlet pin (9).

24. To dismantle crank rod assembly (1 through 8), remove the flathead screws (1) and the inner and outer weights (2 and 3).

25. Remove the retaining rings (6).

26. Press the crank eccentric (7) out of the ball bearing (8).

NOTE: *Be sure to support the ball bearing (8) on the inner race to prevent damage.*

INSPECTION AND REPAIR

The disassembled pump may be serviced as follows:

1. Clean all metal parts in solvent and dry with compressed air. Inspect for evidence of wear, damage, or leakage. Repair or replace as required.

2. Inspect all seals and gaskets for evidence of leakage or damage. If found, repair or replace the items responsible. Replace all seals during the reassembly process.

ASSEMBLY (Figure 1)

The grease pump assembly may be assembled as follows:

IMPORTANT:

1. *Start all fasteners by hand to avoid stripped threads during the assembly process.*
2. *Use Loctite 242 (or equivalent) on all torqued threaded connections. Extreme care must be exercised to prevent excess compound from flowing into critical areas such as clearance fits, ball checks, etc. Allow a minimum of 30 minutes of cure time before operating the pump.*
3. *Prior to assembly, verify that all components are clean and free of damage, high spots, or burrs. Coat all items and bores with hydraulic oil compatible with that in the truck's hydraulic system*

1. Press the crank eccentric (7) into the ball bearing (8).

NOTE: *Be sure to support the ball bearing (8) on the inner race to prevent damage.*

2. Install the retaining rings (6).

3. To assemble the crank rod assembly (1 through 8), install the flathead screws (1) and the inner and outer weights (2 and 3).

4. After coating the threads with Loctite 242 (or equivalent), install the plunger tube (11) onto the outlet pin (9). Torque to 100 to 110 inch-lb (11 to 12 Nm).

5. Install the cup seal (16), the back-up washer (15), and

the wrist pin anchor (14).

6. After coating the threads with Loctite 242 (or equivalent), install the plunger link rod (17) onto the plunger tube (11). Torque to 100 to 110 inch-lb (11 to 12 Nm).

7. After coating the threads with Loctite 242 (or equivalent), install the pump plunger (20) onto the plunger link rod (17). Torque to 100 to 110 inch-lb (11 to 12 Nm).

NOTE: *A spanner wrench (for 3/8-inch diameter tube with 1/8-inch pins) that uses the holes in the pump plunger is required.*

8. Using a 1/2 inch (12 mm) wooden or plastic rod, push the cup seal (22) and the pump cylinder (24) onto the reciprocating tube (21).

9. Install the plunger assembly (9 through 20) into the reciprocating tube (21).

10. After coating the threads with Loctite 242 (or equivalent), install the wrist pin anchor (14) into the reciprocating tube (21). Torque to 20 to 25 ft-lb (27 to 34 Nm).

11. Install the check seat housing (28) into the reciprocating tube (21).

12. Install the crankrod assembly (1 through 8) from the pump by installing the:

a. Wrist pin bushings (13).

b. Button head screws (12), after coating the threads with Loctite 242 (or equivalent). Torque to 100 to 110 inch-lb (11 to 12 Nm).

13. Install the bronze bearing (51), O-ring (52), and back-up washer (53) into the housing tube (55).

14. Install the pump subassembly (1 through 28) into the pump housing (46).

NOTE: *Pushing the subassembly up with a wooden or plastic rod 3/4 inch (19 mm) O. D. against the check seat housing is typically found to be helpful.*

15. After coating the threads with Loctite 242 (or equivalent), install the housing tube (55) from the pump housing (46) by inserting the 3/4 inch (19 mm) rod through the inlet holes on the bottom of the housing tube and tightening it. Torque to 20 to 25 ft-lb (27 to 34 Nm).

16. After coating the threads with Loctite 242 (or equivalent), install the two outlet pin nuts (50) into the pump

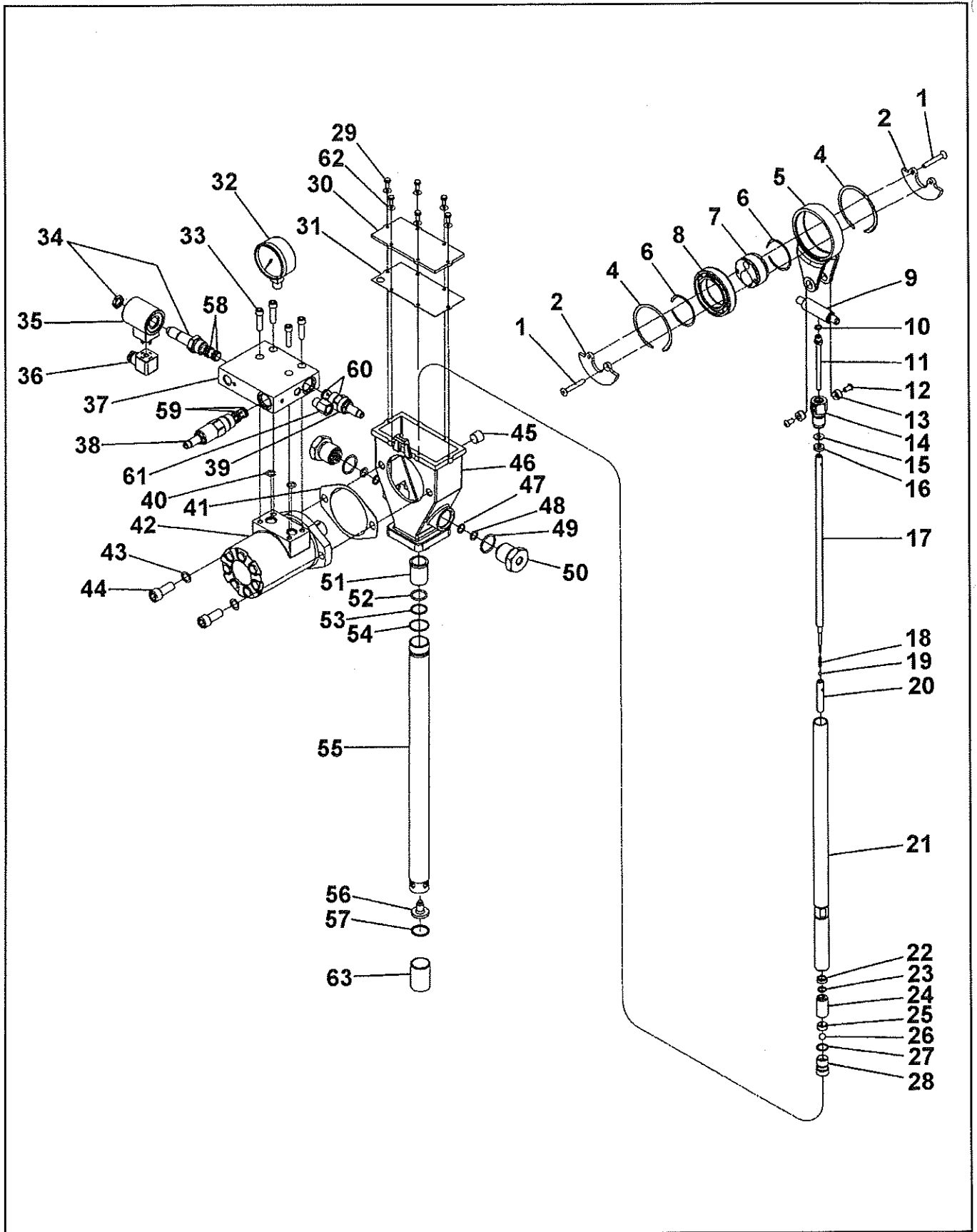


FIGURE 1 - HYDRAULICALLY OPERATED GREASE PUMP (56341)

KEY				56341	
01.	Flathead Screw	22.	Cup Seal	43.	Washer
02.	Outer Weight	23.	O-ring (Polyurethane)	44.	Socket Head Screw
03.	Inner Weight	24.	Pump Cylinder	45.	Pipe Plug
04.	Retainer Ring	25.	Ball Cage	46.	Pump Housing
05.	Crankrod	26.	Ball	47.	Back-up Ring (Nitrile)
06.	Retaining Ring	27.	O-ring (Nitrile)	48.	O-ring (Nitrile)
07.	Crank Eccentric	28.	Check Seat	49.	O-ring (Nitrile)
08.	Ball Bearing	29.	Self Threading Screw (#8-1/2)	50.	Outlet Pin Nut
09.	Outlet Pin	30.	Housing Cover	51.	Bronze Bearing
10.	O-ring (Nitrile)	31.	Cover Gasket (Nitrile)	52.	O-ring (Nitrile)
11.	Plunger Tube	32.	Pressure Gauge	53.	Back-up Washer
12.	Button Head Screw	33.	Socket Head Screw	54.	O-ring (Nitrile)
13.	Wrist Pin Bushing	34.	Solenoid Valve Cartridge	55.	Housing Tube
14.	Wrist Pin Anchor	35.	Solenoid Valve Coil (24 Vdc)	56.	Shovel Plug
15.	Back-up Washer	36.	Solenoid Connector	57.	Retaining Ring
16.	Cup Seal (Polyurethane)	37.	Manifold	58.	Seal Kit
17.	Plunger Link Rod	38.	Pressure Reducing Valve	59.	Seal Kit
18.	Spring	39.	Flow Control Valve	60.	Seal Kit
19.	Ball	40.	O-ring (Nitrile)	61.	Orifice Fitting
20.	Pump Plunger	41.	Motor Gasket	62.	Gaskets
21.	Reciprocating Tube	42.	Hydraulic Motor	63.	Inlet strainer

housing (46). Torque to 30 to 35 ft-lb (41 to 47 Nm).

17. Install the hydraulic motor (42) onto the pump housing (46).

18. Install the two socket head screws (44).

19. Install the shovel plug (56) onto the housing tube (55).

20. Install the retaining ring (57).

21. If so equipped, install and the inlet strainer (63) onto the housing assembly. Secure with the setscrew.

22. Install the housing cover (30) with the cover gasket (31).

23. Install the six self-threading screws (29).

24. Refill the pump crankcase with SAE 10W30 oil as outlined in the instructions in Maintenance and Adjustment.

NOTE: In arctic climate operating conditions, it is recommended that Mobil Aero HFA Low Temperature Hydraulic Fluid (or equivalent) be substituted as the lubricating fluid.

25. Install the pipe plug (45).

26. Carefully install the manifold (37) to the hydraulic motor

assembly (42). Use extra care not to damage or mar the mating surfaces.

27. Install the four socket head capscrews (33).

INSTALLATION

The pump assembly may be installed as follows:

1. Install the lid and pump assembly onto the top of the reservoir can.

NOTE: There are a number of variations to the reservoir assembly. See the drawing in the system information in Section 9 - Options for detailed illustrations.

2. Secure lid with the appropriate hardware for the application.

3. Refill the reservoir as required with the appropriate grease.

4. Purge all air from the pump and remainder of the system as outlined in the instruction on Maintenance and Adjustment in the information on the system in Section 9 - Options.

5. Test the operation of the system as outlined in the instruction on the system in Section 9 - Options.

