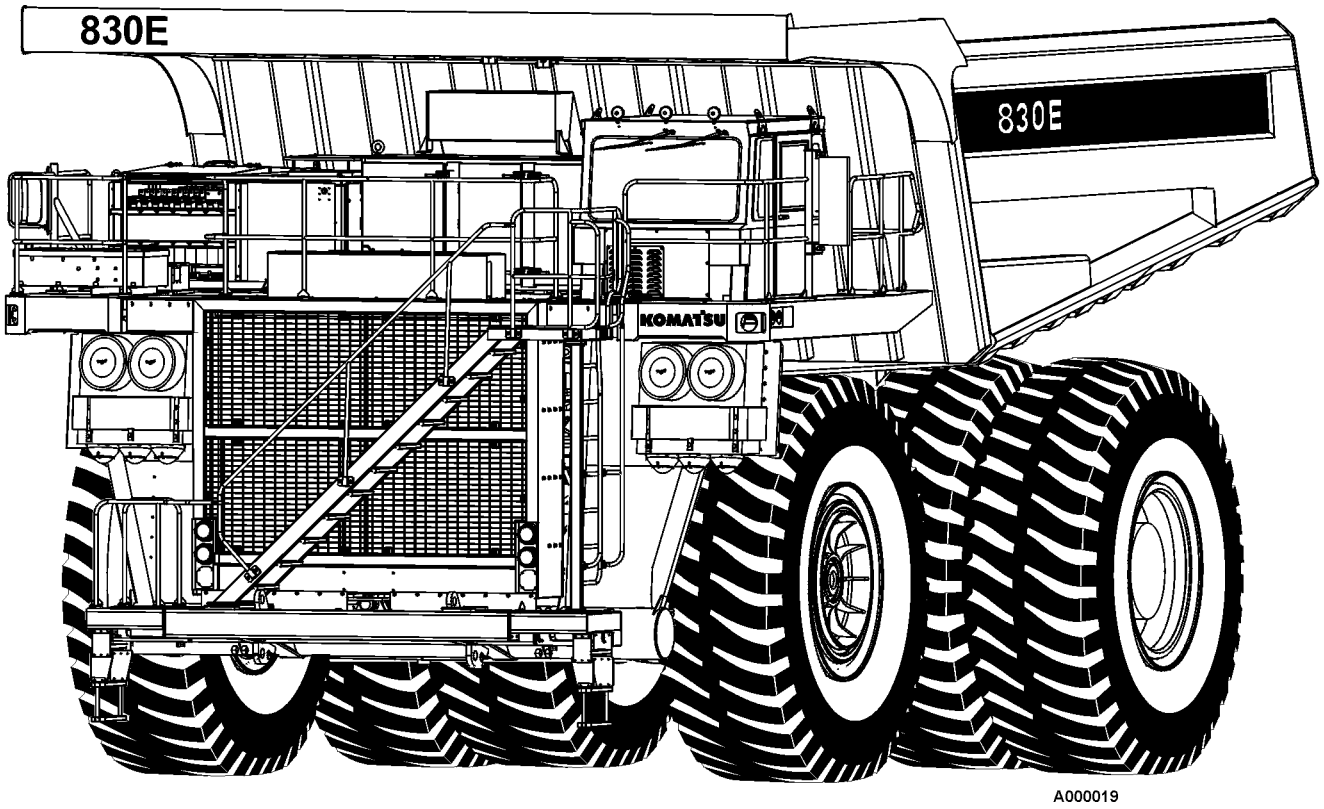

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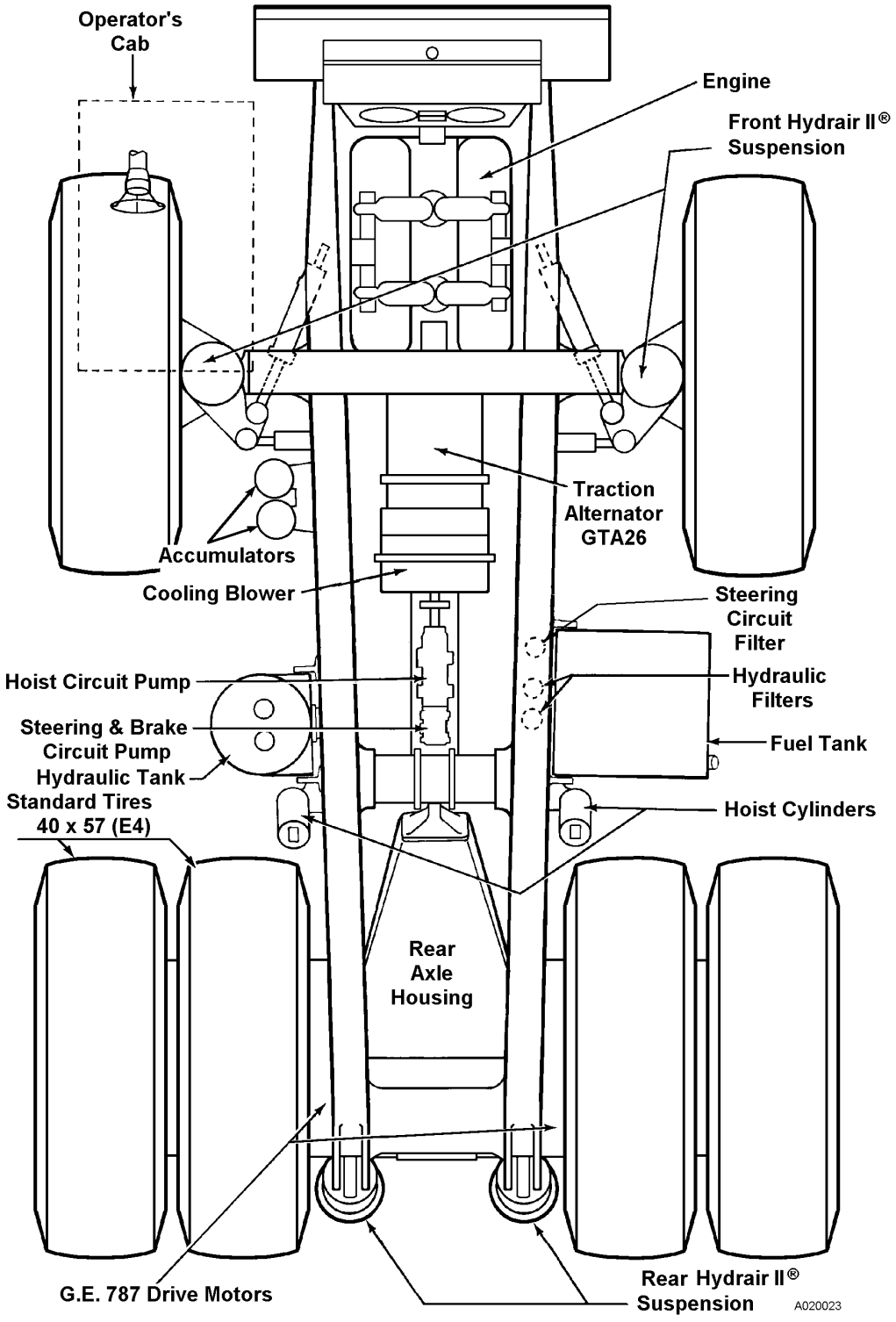
KOMATSU MODEL 830E TRUCK



830E MAJOR COMPONENTS

TIRES

HANDLING TIRES

If tires are not used under the specified conditions, they may overheat and burst or be cut and burst by sharp stones on rough road surfaces. This may lead to serious injury or damage.

To maintain safety, always keep to the following conditions:

- Inflate the tires to the specified pressure. Abnormal heat is generated particularly when the inflation pressure is too low.
- Use the specified tires.

The tire inflation pressure and permissible speeds are general values. The actual values may differ depending on the type of tire and the condition under which they are used. For details, please consult the tire manufacturer.

If the tires become hot, a flammable gas is produced, and this may ignite. It is particularly dangerous if the tires become overheated when the tires are under pressure. If the gas generated inside the tire ignites, the internal pressure will suddenly rise, and the tire will explode, and this may lead to serious personal injury. Explosions differ from punctures or tire bursts, because the destructive force is extremely large. Therefore, the following operations are strictly prohibited when the tire is under high internal pressure:

- Welding the rim
- Building fires or carrying out welding near the wheel or tire.

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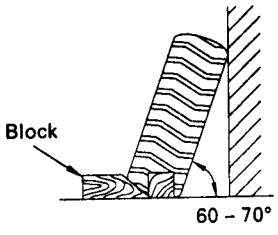
If the proper procedure for carrying out maintenance or replacement of the wheel or tire is not used, the wheel or tire may burst and cause serious injury or damage. When carrying out such maintenance, please consult the authorized regional Komatsu America Corp. distributor, or the tire manufacturer.

STORING TIRES AFTER REMOVAL

- As a basic rule, store the tires in a warehouse which unauthorized persons cannot enter. If the tires are stored outside, always erect a fence around the tires and put up “No Entry” and other warning signs that even young children can understand.
- Stand the tire on level ground, and block it securely so that it cannot roll or fall over.
- If the tire should fall over, get out of the way quickly. The tires for construction equipment are extremely heavy, so trying to hold the tire may lead to serious injury.



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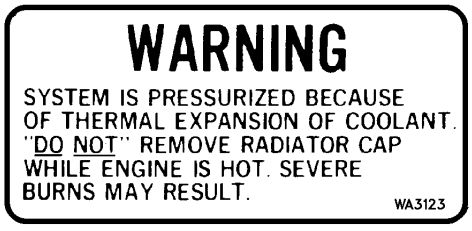
PREPARATION FOR STORAGE

For long term idle periods, proper preparation will pay large dividends in time and money when future operation of the vehicle is scheduled.

1. Engine should be prepared for storage according to instructions found in the engine manufacturers manual.
2. Transmission should be prepared for storage. Instruction will be found in the transmission Service Manual. Several storage variations are given.
3. The vehicle should be in top operating condition with all discrepancies corrected. Paint should be in good condition, no rust or corrosion, all exposed, machined or unpainted surfaces should be coated with a good rust preventative grease.
4. After the vehicle has been parked in its storage location, all hydraulic cylinders, including Hydrair suspensions (Trucks), should be retracted as much as possible (steering cylinders centered). Wipe the exposed portion of all cylinder rams clean and, coat (including seals on ends of barrel) with good preservative grease.
5. If long term storage is anticipated, the vehicle should be blocked up with the tires clear of the ground or floor to remove vehicle weight from the tires. Lower air pressure in the tires to 15-25 psi (103-172 kPa). Completely cover the tires with tarpolins to minimize rubber oxidation and deterioration.
6. (Trucks equipped with air-actuated park brake) With air tanks pressurized and parking brake valve "Off", remove a clevis pin from the brake actuator linkage. This will relieve spring pressure from applying the parking brake while the vehicle is idle. Replace clevis pin in link to prevent loss. Tag steering wheel with a parking brake disconnected tag.
7. Drain air tank(s) completely (if equipped). When tank compartments are empty, fog the inside of each tank compartment with a light application of preservative oil to deter rust and corrosion.

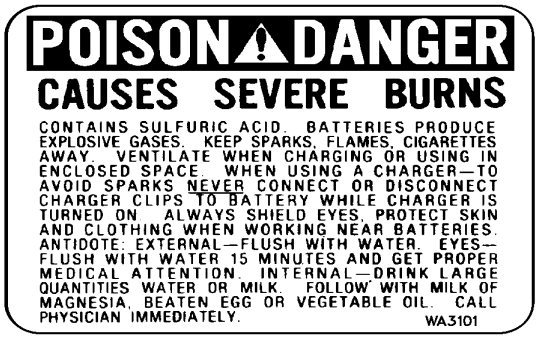


8. Clean the radiator; refer to Engine Service Manual and the Vehicle Service Manual for the proper cleaning instructions.
9. The cooling system should be completely drained, chemically flushed, and refilled with a conditioned water/antifreeze solution suitable for the lowest temperature anticipated.
   Refer to Section "P", Fluid Specifications and Charts, of the Shop Manual for the proper antifreeze and conditioner concentrations. After refilling the system, always operate the engine until the thermostats open to circulate the solution through the cooling system.

NOTE: NEVER store a vehicle with a dry cooling system.

10. New hydraulic filters should be installed and the hydraulic tank fully serviced with Type C-4 oil as specified in Section "P", Lubrication and Service, of the Shop Manual.

Any operating fluid, such as hydraulic oil, escaping under pressure can have sufficient force to enter a person's body by pentrating the skin. Serious injury and possible death may result if proper medical treatment by a physician familiar with this injury is not received immediately.



11. Disconnect batteries, If possible, batteries should be removed and stored in a battery shop or a cool dry location on wooden blocks. Do not store batteries on a concrete floor. Clean battery compartment, remove all corrosion and paint compartment with acid proof paint.
12. Wheel axle housings and final drives should be fully serviced with prescribed lubricants. Seal all vents.

3. Remove access covers at front, right side of the engine flywheel housing. Install engine barring tool as shown in Figure 4-3.

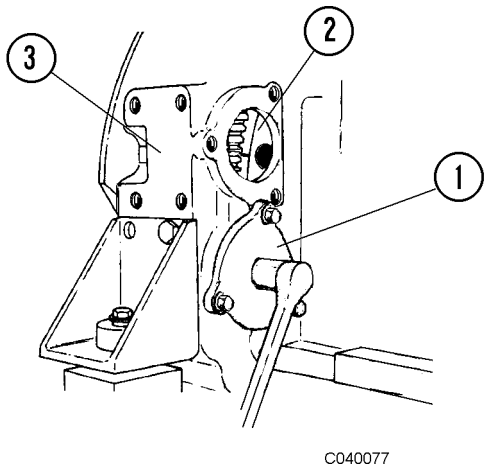


FIGURE 4-3. ACCESS TO ALTERNATOR/ ENGINE DRIVE RING CAPSCREWS

1. Engine Barring Tool
2. Access Hole
3. Flywheel Housing

4. Reach through the access opening and remove twelve [12] capscrews (6, Figure 4-4) joining the engine drive ring (7) to the alternator rotor (8). (Rotate crankshaft with barring tool to align each capscrew with access hole.)

⚠ IMPORTANT ⚠

Be certain all capscrews have been removed!

5. Remove sixteen [16] capscrews (3) securing flywheel housing adapter (2) to the alternator housing (1).

NOTE: The clearance between the head of the capscrew (3) and the Flywheel Housing (4) will not permit complete removal of the capscrews at all locations. Be sure all the capscrew threads are completely disengaged from the alternator housing (1).

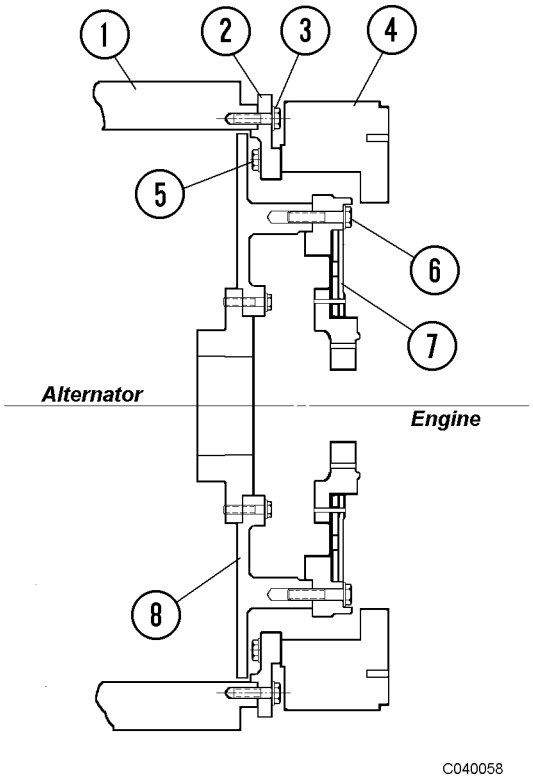


FIGURE 4-4. ALTERNATOR TO ENGINE MOUNTING

1. Alternator
2. Flywheel Housing Adapter
3. Capscrew (16 each)
4. Flywheel Housing
5. Capscrew
6. Capscrew (12 each)
7. Engine Drive Ring
8. Alternator Rotor

6. Take up slack in hoist and remove capscrews and lockwashers (1, Figure 4-2) securing the alternator to the cradle structures.
7. Keep alternator as level as possible and move away from engine.
8. Note shim location and quantity. Retain shims for possible use during reinstallation.
9. For further disassembly instructions for the alternator refer to the General Electric Service Manual.

FRAMES

Every few seconds the system also collects “frames” which are bits of time. The time duration of each frame is set using the PTU, in increments of 0.01 seconds. Frames are collected right after all of the systems' input/output functions (events) are complete, as a record of system function at the time of the event.

Each frame contains 40 floating point values, all digital input and output values, the state machine's current state at the time of the event.

Each time an event is reported, a frame (known as the trigger frame) is kept for that event until the event is erased.

WINDOWS

Some events may also have frame “windows” - a collection of 51 frames, that is, all the frames that occur for 40 frames before the event, a frame at the event, and 10 frames after the event.

The system will save each event window for the first 16 events that are qualified to have windows. They will be saved until the event is erased. After 16 windows are stored, no additional windows can be stored.

SYSTEM CATEGORIES

All of the possible events which can occur have been programmed to fall into eight different categories, to enable the system to respond correctly. They are:

Active Events Count

This is the current number of events of this type which are “active”, i.e., which may affect truck operation.

Decay Active Events Count Time

This is the time in seconds which specified the rate at which the Active Events Count “decays”, allowing a certain number of events to occur ”normally” over a given time frame without affecting truck operation.

Lockout DOS Limit

This controls how often a truck operator may reset the operating restrictions caused by an event type, using the Dump Override Switch (DOS) switch in the cab.

If the Active Events Count is equal to the Lockout DOS Limit for a given type, the Override switch (DOS) will have no effect on operating restrictions caused by that event. The Active Events Count (for that type) will not be decayed by the Decay Active Events Count.

Running Count

This is the total count of all events of this type seen since Running Count was last cleared by the PTU.

Life Count

This is the total count of all events of this type ever recorded. The maximum number which can be recorded is 4,294,967,295. When this number is reached, the count will roll over.

Accept Limit

This is the number of events of this type that will be recorded by the system. See the discussion under Limits On Resetting Faults.

Window Captures Allowed Limit

This tells how many windows will be captured for events of this type, subject to space restrictions. When the window capture limit is exceeded, only a single frame of data is saved.

Window Captures Count

This is the count of windows saved for this event type. This value is incremented by 1 each time a window is saved for this event type. It is decremented or cleared when events are cleared by the PTU.

LIMITS ON RESETTING FAULTS

In the fault system, there are three limits associated with resetting faults:

Accept limit (accept_limit)

This is the limit on the number of faults which may be stored. When the limit of a given fault is exceeded, the oldest event of this type recorded without a window will be replaced with the new event, it will not be overwritten. The system does not allow events with windows to be overwritten. If the oldest event has a window, the oldest non-window event will be overwritten.

TABLE IV. STATISTICAL DATA CODES - PROFILES

PAR No.	DESCRIPTION	COUNT CONDITIONS	BUCKET No.	CURRENT VALUE (AMPS)
80	M1 Amps Propel (In seconds)	This is a histogram of Motor #1 armature current in propulsion mode. . . . . Sample time is 1.0 second . . . . The clock will start whenever propulsion mode is selected. The histogram breaks the current spectrum into 17 buckets defined at right, and displays the time spent in each bucket.	1	500 & below
			2	501 to 750
			3	751 to 850
			4	851 to 950
			5	951 to 1050
			6	1051 to 1150
			7	1151 to 1250
			8	1251 to 1350
81	M2 Amps Propel (In seconds)	This is a histogram of Motor #2 armature current in propulsion mode. . . . . Sample time is 1.0 second . . . . The clock will start whenever propulsion mode is selected. The histogram breaks the current spectrum into 17 buckets defined at right, and displays the time spent in each bucket.	9	1351 to 1450
			10	1451 to 1550
			11	1551 to 1800
			12	1801 to 2150
			13	2151 to 2300
			14	2301 to 2600
			15	2601 to 2900
			16	2901 to 3200
			17	3201 & above

PAR No.	DESCRIPTION	COUNT CONDITIONS	BUCKET No.	CURRENT VALUE (AMPS)
82	M1 Amps Retard (in seconds)	This is a histogram of Motor #1 armature current in retard mode. . . . . Sample time is 1.0 second . . . . The clock will start whenever retard mode is selected. The histogram breaks the current spectrum into 17 buckets defined at right, and displays the time spent in each bucket.	1	200 & below
			2	201 to 300
			3	301 to 400
			4	401 to 500
			5	501 to 600
			6	601 to 700
			7	701 to 800
			8	801 to 900
83	M2 Amps Retard (in seconds)	This is a histogram of Motor #2 armature current in retard mode. . . . . Sample time is 1.0 second . . . . The clock will start whenever retard mode is selected. The histogram breaks the current spectrum into 17 buckets defined at right, and displays the time spent in each bucket.	9	901 to 1000
			10	1001 to 1100
			11	1101 to 1200
			12	1201 to 1350
			13	1351 to 1450
			14	1451 to 1550
			15	1551 to 1650
			16	1651 to 1750
			17	1751 & above

3.0 ANALOG INPUT SIGNALS TEST - FL275 CARD PANEL

The PTU will be used to test analog inputs to the FL275 panel analog I/O Card, to verify proper truck wiring, control panel wiring and component operation.

- Connect PTU at control cabinet as described previously.
- Turn PTU On and type "`gemenu3e`" (or "`gemenu`") at the DOS "C:>" prompt. Press [ENTER].

3.1 Setup Analog Input Monitor Screen on PTU

1. With control power On, select "PTU TALK TO TRUCK" on **GE OHV STATEX III MENU**. Press [ENTER] key.
2. At "Enter your name:" type your name. Press [ENTER] key.
3. At "Enter your password:" type your password. Press [ENTER] key.
4. The **GE STATEX III PTU MAIN MENU** should appear on the screen.
5. Move cursor to select "NORMAL OPERATION". Press [ENTER] key.
   a. A screen will appear that states: "Selection of NORMAL OPERATION gives truck control to the driver. Continue?"
   b. With the cursor next to "Yes", press [ENTER].
6. The **NORMAL OPERATION MENU** should appear on the screen.
7. Move cursor to select "MONITOR ANALOG INPUT CHANNELS". Press [ENTER] key.
8. The **MONITOR ANALOG INPUT CHANNELS** screen, Figure 3-10. should appear.

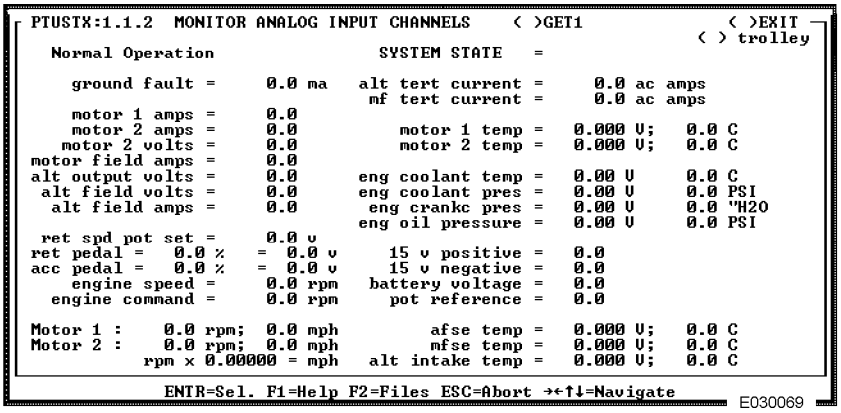


FIGURE 3-10. MONITOR ANALOG INPUT CHANNELS SCREEN

6. With a fork lift supporting the hub and spindle assembly as shown in Figure 3-4, move to clean work area for repair.

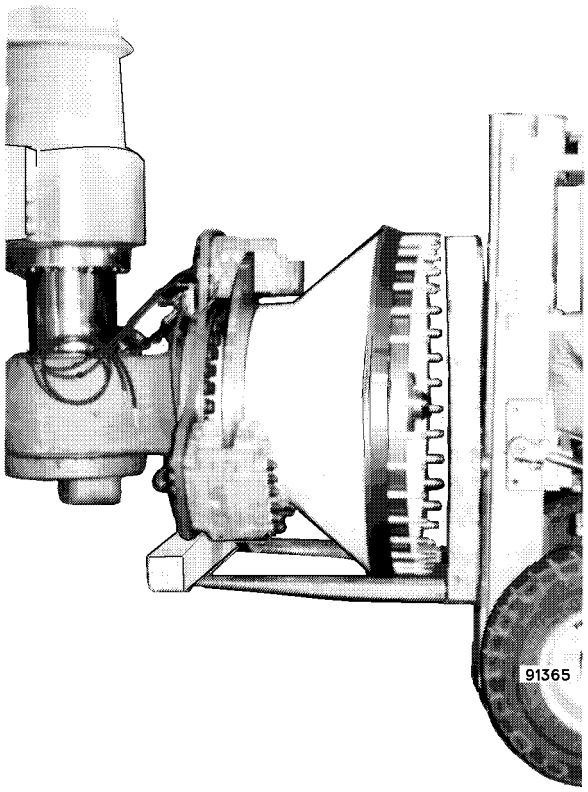


FIGURE 3-4. SPINDLE ANE WHEEL HUB REMOVAL

Installation

1. Clean spindle bore and suspension rod taper so they are free of all rust, dirt, etc. Clean and check the tapped holes in bottom of Hydrair® piston for damaged threads. Retap holes, if necessary, with 1.250 in. - 12NF tap.
2. Lubricate spindle bore and suspension rod taper with multi-purpose grease Number 2 with 3% Molybdenum Disulphide.

NOTE: Never use any lubricants on the spindle bore containing copper, such as many "anti'-seize" compounds. Products containing copper will contribute to corrosion in this area.

3. Position spindle and wheel hub assembly on fork lift or similar lifting device as shown in Figure 3-4.
4. Raise the spindle and wheel hub assembly into position.
5. Secure spindle to suspension using retainer plate (2, Figure 3-2) and capscrews (1). Tighten capscrews using the following procedure:
   a. Tighten capscrews (1) uniformly to **500 ft. lbs. (678 N.m)** torque.
   b. Continue to tighten capscrews in increments of **250 ft. lbs. (339 N.m)** to obtain a final torque of **1580 ft. lbs. (2142 N.m)**.
6. If removed, install steering arm (4). Clean and check the tapped holes in bottom of spindle for damaged threads. Retap holes, if necessary

   830E, AFE 32 . . . . . 1.125 in. - 12NF tap

   830E, AFE 50 . . . . . 1.25 in. - 12NF tap
7. Install capscrews (5) and torque to:

   830E, AFE 32 . . . . . 1430 ± 200 ft. lbs.

   . . . . . (1940 ± 271 N.m)

   830E, AFE 50 . . . . . 1995 ± 100 ft. lbs.

   . . . . . (2705 ± 135 N.m)
8. Install steering cylinder and tie rod in their respective mounting holes on the spindle. Tighten retaining nuts to **525 ± 52 ft. lbs. (712 ± 71 N.m)** torque. Connect lubrication lines.
9. Rotate the wheel hub to position the fill plug at the 12 o'clock position. Remove the fill plug and level plug. Fill wheel hub assembly at fill hole with SAE 80W-90 oil. When properly filled, oil should be present at the level (lower) hole. Replace fill and level plugs.
10. Install junction block with the spacer, capscrews, and flat washers.
11. Attach supply lines to brake calipers and connect main supply lines to connection on frame. Bleed brakes according to "Bleeding Brakes", Section "J".
12. Install wheel and tires as described in "Front Wheel and Tire Installation".

OILING AND CHARGING PROCEDURE

GENERAL

These procedures cover the Oiling and Charging of HYDRAIR®II suspensions on Komatsu Electric Drive Dump Trucks.

Suspensions which have been properly charged will provide improved handling and ride characteristics while also extending the fatigue life of the truck frame and improving tire wear.

NOTE: Inflation pressures and exposed piston lengths are calculated for a normal truck gross vehicle weight (GVW). Additions to truck weight by adding body liners, tailgates, water tanks, etc. should be considered part of the payload. Keeping the truck GVW within the specification shown on the Grade/ Speed Retard chart in the operator cab will extend the service life of the truck main frame and allow the HYDRAIR®II suspensions to produce a comfortable ride.

⚠WARNING

All HYDRAIR®II suspensions are charged with compressed nitrogen gas with sufficient pressure to cause injury and/or damage if improperly handled. Follow all safety instructions, cautions, and warnings provided in the following procedures to prevent any accidents during Oiling and Charging.

Proper charging of HYDRAIR®II suspensions requires that three basic conditions be established in the following order:

1. Oil level must be correct.
2. Suspension piston rod extension for nitrogen charging must be correct.
3. Nitrogen charge pressure must be correct.

For best results, HYDRAIR® II suspensions should be charged in pairs (fronts together and rears together). If rears are to be charged, the fronts should be charged first.

NOTE: For longer life of suspension components, a Friction Modifier must be added to the suspension oil. See Specifications Chart, Figure 4-5 at the end of this chapter.

NOTE: Set up dimensions specified in the charts must be maintained during oiling and charging procedures. However, after the truck has been operated, these dimensions may vary.

EQUIPMENT LIST

- HYDRAIR® Charging Kit
- Jacks and/or Overhead Crane
- Support Blocks (Front and Rear) for:
  Oiling Height Dimensions
  Nitrogen Charging Height Dimensions
- HYDRAIR® Oil (See Specifications Chart)
- Friction Modifier (See Specifications Chart)
- Dry Nitrogen (See Specifications Chart)

HYDRAIR® CHARGING KIT

Assemble service kit as shown in Figure 4-1 and attach to container of pure dry nitrogen (8).

Installation of Charging Kit

1. Remove protective covers and charging valve caps from suspensions to be charged.
2. Turn "T" handles (1, Figure 4-1) of adapters (2) completely counterclockwise.

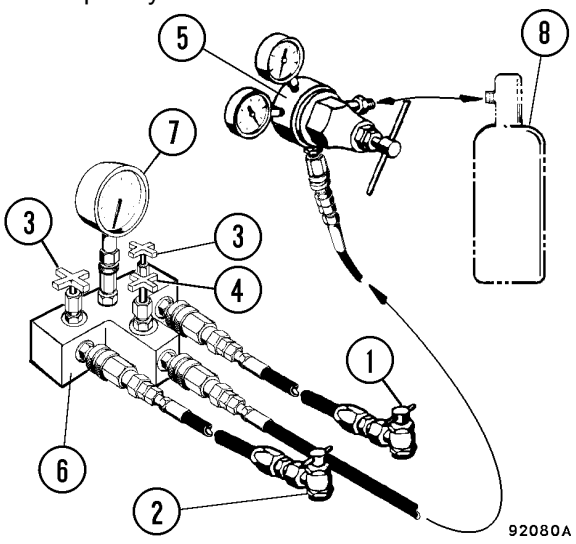


FIGURE 4-1. HYDRAIR® CHARGING KIT

NOTE: Arrangement of parts may vary fron illustration above, depending on Charging Kit P/N.

1. “T” Handle Valve
2. Charging Valve Adapter
3. Manifold Outlet Valves (from gauge)
4. Inlet Valve (from regulator)
5. Regulator Valve (Nitrogen Pressure)
6. Manifold
7. Charging Pressure Gauge (Suspensions)
8. Dry Nitrogen Gas (Specifications Figure 4-5)

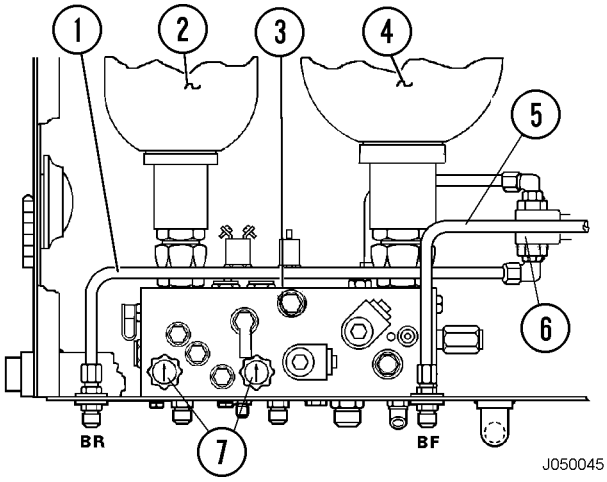


FIGURE 5-5. BRAKE MANIFOLD AND COMPONENTS

1. "BR" Hydraulic Tube
2. Rear Brake Accum.
3. Brake Manifold
4. Front Brake Accum.
5. "BF" Hydraulic Tube
6. Brake Lock Shuttle Valve
7. Brake Accumulator Bleed Valves

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BRAKE BLEEDING PROCEDURES

Attach brake lines and bleed brake calipers according to the following instructions.

1. Fill hydraulic tank following procedure in Section "P", *Hydraulic Tank Service*.
2. Close brake accumulator drain valves (7, Figure 5-5), if open.
3. Securely attach bleeder hose to highest bleeder valve of each caliper, direct hose away from brake assembly and into a container to catch excess oil.
4. With engine at idle make partial brake application of service brake pedal:
   a. Maintaining partial application, open bleeder valve until a clean stream of oil is discharged from caliper.
   b. Close bleeder valve.
5. Repeat above steps until all air is bled from all calipers.
6. Check hydraulic tank oil level as bleeding takes place. Maintain correct oil level as needed.

⚠WARNING

Before returning truck to production, all new brake linings must be burnished. Refer to "Service Brake Conditioning".

HYDRAULIC TANK BREATHERS

There are two breather filters (3, Figure 3-16) located on top of the hydraulic tank to allow air in and out of the tank. The filters should be replaced at the interval specified on the lubrication chart.

Keep the area around the breather filters clean and free of debris build up. If there is any sign that the breather filters are oil soaked, replace the filters as soon as possible and check for proper oil level. Once the breather filters become oil soaked, they will plug very quickly.

NOTE: Plugged breather filters can cause pressure build up inside the hydraulic tank and can cause the service brakes to drag.

HOIST CIRCUIT FILTERS

Two hoist circuit filters (Figure 3-18) are located on the fuel tank below the right frame rail. The filters provide secondary filtering protection for hydraulic oil flowing to the hoist valve and hoist circuit components.

An indicator switch (5) is designed to alert the operator of filter restriction before actual bypass occurs. The switch contacts close at 35 psi (241 kPa) to actuate a warning lamp on the overhead display panel. Actual filter bypass occurs at 50 psi (345 kPa).

NOTE: When the engine is initially started and the hydraulic oil is cold, the warning lamp may actuate. Allow the hydraulic system oil to reach operating temperature before using the warning lamp as an indicator to change the element.

Refer to Section P, "*Lubrication and Service"* for recommended normal filter element replacement interval. Earlier replacement may be required if the restriction indicator lamp turns on.

Premature filter restriction may indicate a system component failure and signal a service requirement before extensive secondary damage can occur.

NOTE: An early indication of the filter warning light at first installation may be due to restriction in the filter as it cleans the system. Unless the fluid appears contaminated or has a strong foul odor, do not change the oil; replace only the filter element.

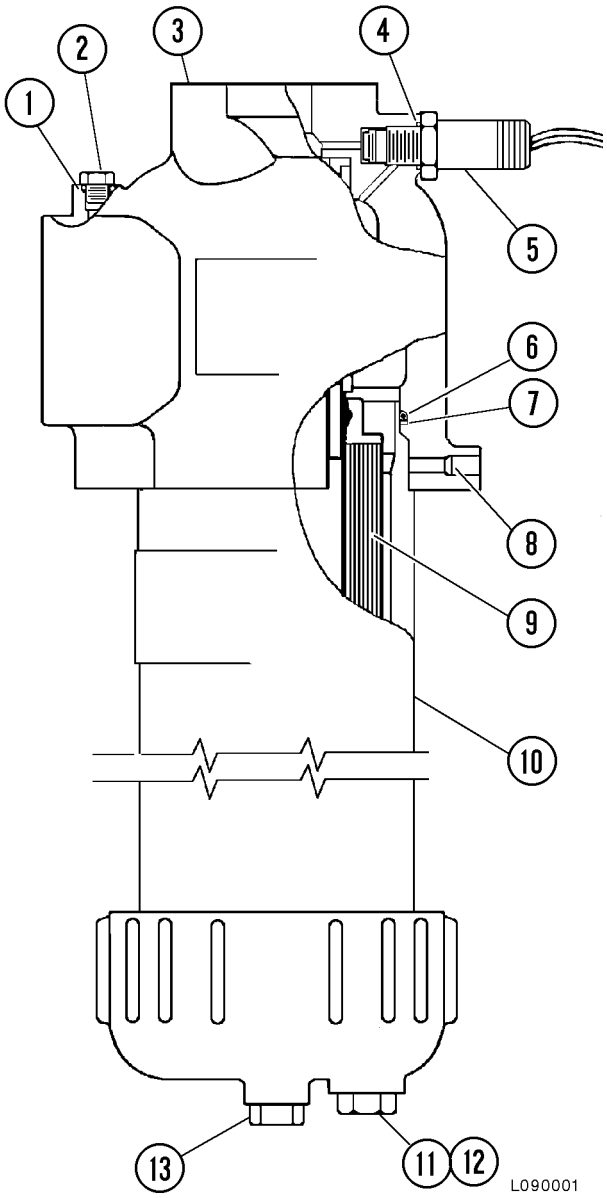

FIGURE 3-18. HOIST CIRCUIT FILTER ASSEMBLY

1. O-Ring
2. Plug
3. Filter Head
4. O-Ring
5. Indicator Switch
6. O-Ring
7. Backup Ring
8. Setscrew
9. Filter Element
10. Bowl
11. Bleed Plug
12. O-Ring
13. Bottom Plug

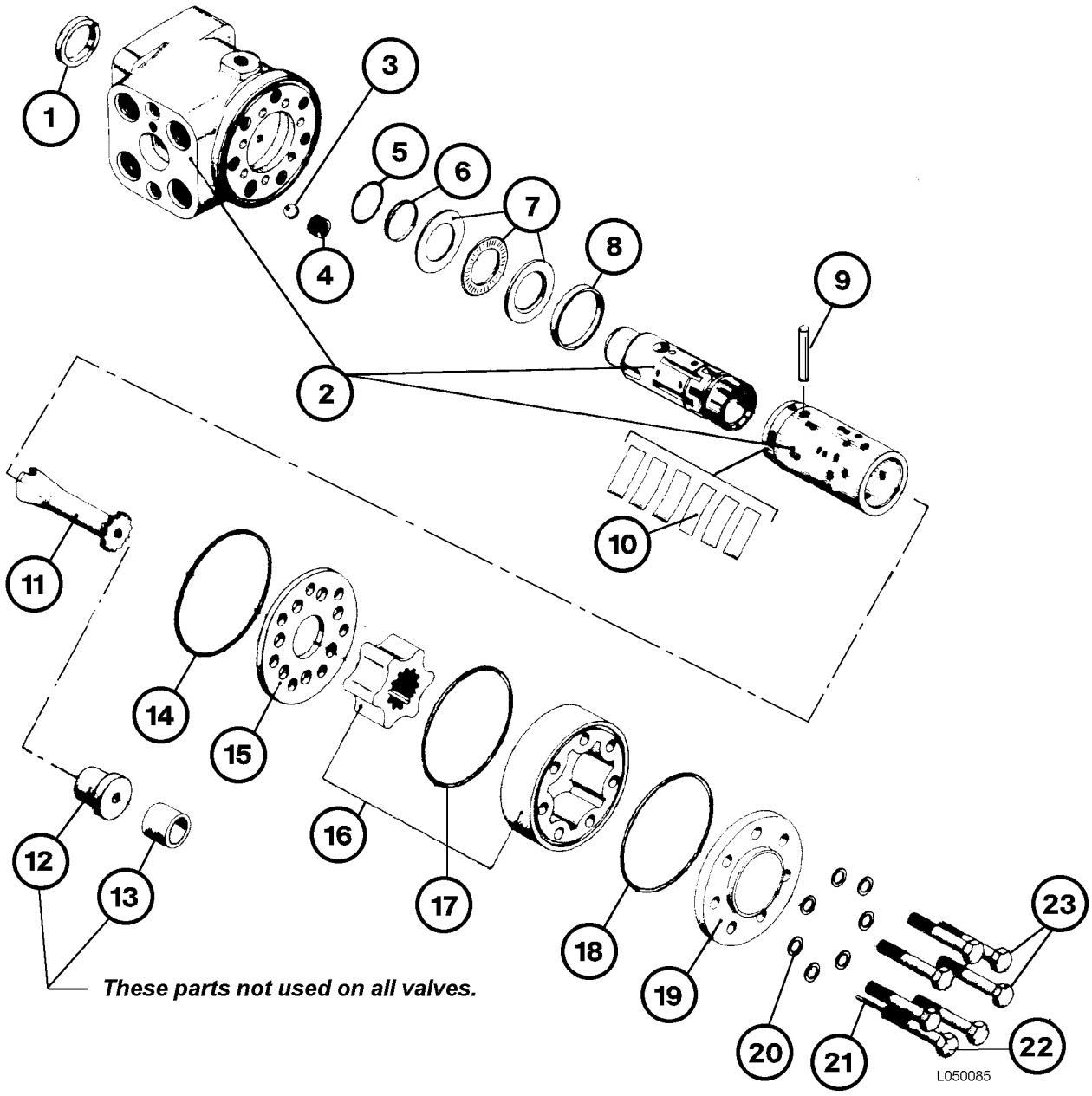

FIGURE 5-17. STEERING CONTROL UNIT

1. Dust Seal
2. Housing & Spools
3. Ball
4. Threaded Bushing
5. O-Ring
6. Kin Ring
7. Bearing Assembly
8. Ring
9. Pin
10. Neutral Position Springs
11. Cardan Shaft
12. Spacer
13. Tube
14. O-Ring
15. Distribution Plate
16. Gear Wheel Set
17. O-Ring
18. O-Ring
19. End Cover
20. Washers
21. Rolled Pin
22. Capscrews with Pin
23. Capscrews

COUNTERBALANCE MANIFOLD

The counterbalance manifold is located to the rear of the hoist valve. The internal counterbalance valve relieves excessive pressure that can develop in the annulus area of the hoist cylinders if the load sticks to the tail of the body as the body goes overcenter while dumping.

Figures 8-23 through 8-25 show the proper placement of the O-rings and backup-rings on the needle valve, counterbalance valve and the cavity plug.

For information on how the counterbalance valve functions, see “Hoist Circuit Operation”, this section. For adjusting of the counterbalance valve, refer to the “Hydraulic Checkout Procedure” in this Section.

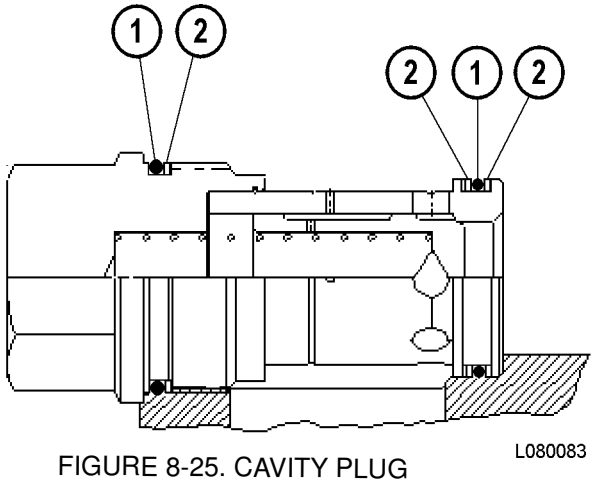

FIGURE 8-25. CAVITY PLUG

1. O-Rings 2. Backup-Rings

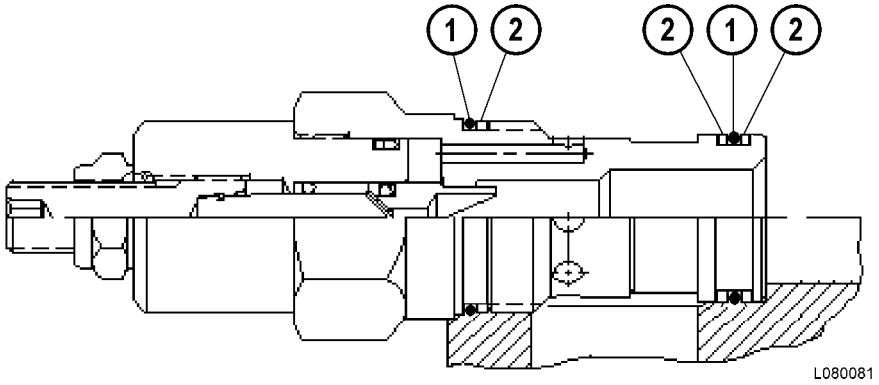

FIGURE 8-23. NEEDLE VALVE

1. O-Rings 2. Backup-Rings

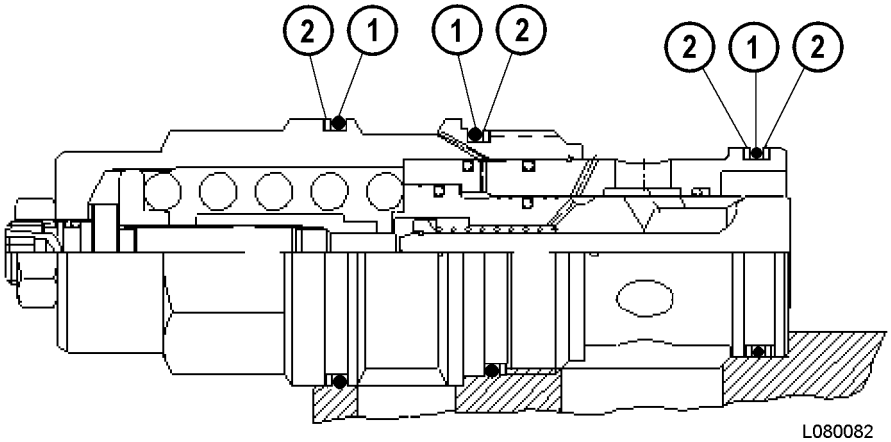

FIGURE 8-24. COUNTERBALANCE VALVE

1. O-Rings 2. Backup-Rings

SERVICE TOOLS AND EQUIPMENT

RECOVERY/RECYCLE STATION

Whenever refrigerant must be removed from the system, a dual purpose station as shown in Figure 9-3, performs both recovery and recycle procedures which follows the new guidelines for handling used refrigerant. The recovered refrigerant is recycled to reduce contaminants, and can then be reused in the same machine or fleet.

To accomplish this, the recovery/recycle station separates the oil from the refrigerant and filters the refrigerant multiple times to reduce moisture, acidity, and particulate matter found in a used refrigerant.

NOTE: To be re-sold, the gas must be "reclaimed" which leaves it as pure as new, but requires equipment normally too expensive for all but the largest refrigeration shops.

Equipment is also available to just remove or extract the refrigerant. Extraction equipment does not clean the refrigerant - it is used to recover the refrigerant from an AC system prior to servicing.

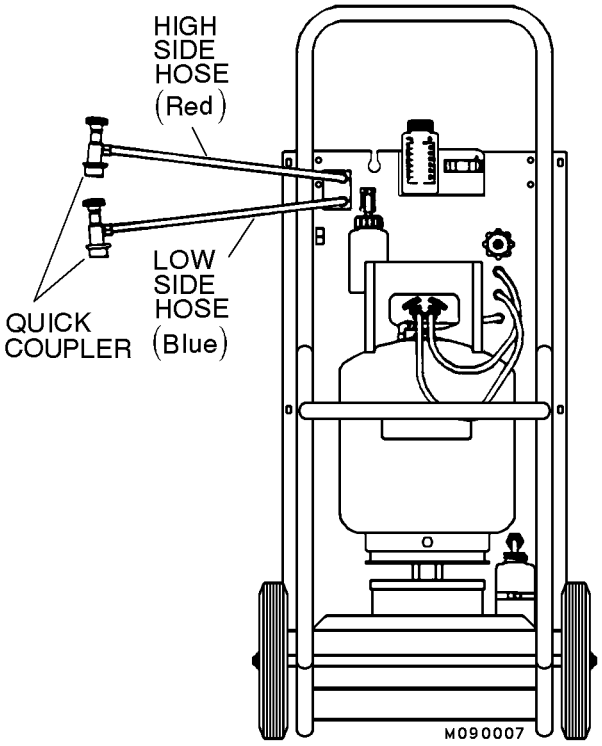

FIGURE 9-3. RECOVERY / RECYCLE STATION

⚠CAUTION

Mixing different types of refrigerant will damage equipment. Dedicate one recovery/recycle station to each type of refrigerant processing to avoid equipment damage. DISPOSAL of the gas removed requires laboratory or manufacturing facilities.

Test equipment is available to confirm the refrigerant in the system is actually the type intended for the system and has not been contaminated by a mixture of refrigerant types.

Recycling equipment must meet certain standards as published by the Society of Automotive Engineers and carry a UL approved label. The basic principals of operation remain the same for all machines, even if the details of operation differ somewhat.

LEAK DETECTOR

The electronic detector (Figure 9-4) is very accurate and safe. It is a small hand-held device with a flexible probe used to seek refrigerant leaks. A buzzer, alarm or light will announce the presence of even the smallest leak.

Some leak detectors are only applicable to one type of refrigerant. Ensure the leak detector being used applies to the refrigerant in the system.

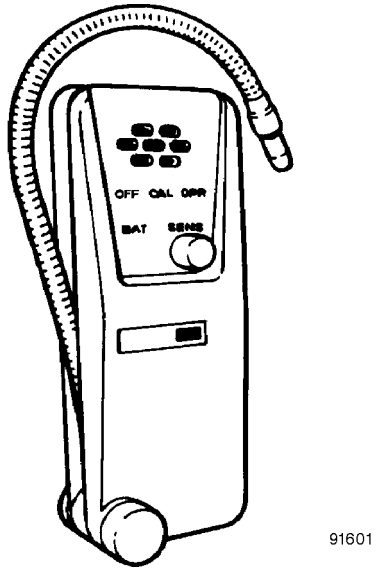

FIGURE 9-4. TYPICAL ELECTRONIC LEAK DETECTOR