

ALL

TOPIC: Lubrication System

IDENT NO: 12-2698B

SUPERSEDES: 12-2698A

DATE: January 31, 1997

SUBJECT: MICROSPIN™

MODELS AFFECTED: VHP, VGF, AT, F817G, F1197G

The purpose of this updated Service Bulletin is to announce the addition of VGF (Inline), F817G, and F1197G versions of the MICROSPIN™ cleanable lube oil filtering system.

The MICROSPIN™ centrifuge is now available in two sizes, the P/N 489189 for all "V" model VGF, all VHPs and AT engines, and a smaller MICROSPIN™ centrifuge P/N 489300 for VGF (Inline), F817G, and F1197G. The MICROSPIN™ P/N 489300 centrifuge has all of the same advantages as the P/N 489189 MICROSPIN™ centrifuge, only in a smaller size for the smaller engines.

NOTE: F1197G applications are for 1200 rpm and above only. F817G applications are for 900 rpm and above only.

The MICROSPIN™ system consists of two major components, a centrifuge using a removable paper insert (see Figure 1, Figure 2, Figure 5, and Figure 6), and cleanable oil filter elements (see Figure 3). The MICROSPIN™ system cleanable filter elements are installed in the existing lube oil filtration canister. The cleanable filter elements remove particles as small as 25 microns. The centrifuge is installed as a bypass system, working in conjunction with the cleanable filter elements. The centrifuge is driven by the engine's oil pressure. The spinning action of the centrifuge's internal turbine assembly develops a force that exceeds 2000 G's, which compacts the contaminants against the turbine housing. The centrifuge will remove oil contaminating particles as small as 0.5 microns. The MICROSPIN™ system is more environmentally friendly than systems that utilize disposable elements. Cleaning the elements eliminates the expense of replacement elements and the cost of hazardous waste disposal. Table 1 and Table 2, list the available MICROSPIN™ kits and maintenance parts available.

INITIAL MICROSPIN™ CENTRIFUGE INSPECTION (ALL)

1. Inspect the MICROSPIN™ centrifuge for damage that may have occurred during shipping.
2. Remove the plastic plugs from the 0.5 in. (12.7 mm) supply port and the 2 in. (50.8 mm) drain port.

WARNING

Use caution during initial inspection of the MICROSPIN™ centrifuge prior to the unit being installed. The rotor vanes are sharp and could cause severe personal injury.

3. Prior to installation of the MICROSPIN™ centrifuge, free movement of the rotor can be determined by inserting your index finger into the drain port. Lift the rotor to insure end play and then rotate the rotor to insure the rotor spins freely. If restriction is felt, disassemble the centrifuge and determine the cause and its correction.
4. Inspect the cleanable filter elements for holes or damage to the filter screens.

INSTALLATION (MICROSPIN™ P/N 489189)

NOTE: Mounting of the MICROSPIN™ centrifuge should be near the engine, not to exceed a distance of 5 ft. (1.5 m). Since this unit has a gravity flow to the sump, it must also be mounted a minimum of 12 in. (304.8 mm) above the highest oil sump level. Due to the speed at which the centrifuge runs, the unit must be mounted properly as described in the following Steps.

1. Securely mount the MICROSPIN™ centrifuge using three 3/4"-10 bolts to minimize vibration.
2. Pipe the oil return line using an unrestricted 2 in. (50.8 mm) line from the centrifuge back to the engine oil sump (see Figure 1). Insure the return line has a downward slope to the engine, avoiding pockets that would trap oil returning to the sump. The initial length of the return line should not be any longer than 2 ft. (0.61 m) before having the first drop, to a lower level back to the oil pan. This is to prevent too much oil build-up in the centrifuge base.

NOTE: This is a parallel side stream filtering system. Do not change piping to existing filters.

NOTE: This unit must be mounted in a vertical and level position as shown in Figure 1.

3. Pipe the oil supply from the location shown for your engine (see Figure 8 through Figure 15), which is usually right off the engine oil pump. This will achieve maximum efficiency.
4. Install a shutoff valve as shown in Figure 1. This will allow the centrifuge unit to be serviced without shutting down the engine.
5. Install the cleanable filter elements in the current flat top lube oil filtration canister in accordance with existing maintenance procedures.
6. Install each cleanable filter element in the previous style domed top canister using spacer P/N 489265 and spring P/N 489266.

NOTE: Spring P/N 489266 replaces the heavier original spring in the domed canister and the spacer P/N 489265, is installed in the top of the filter element.

INSTALLATION (MICROSPIN™ P/N 489300)

NOTE: Mounting of the MICROSPIN™ P/N 489300 centrifuge should be near the engine not to exceed a distance of 5 ft. (1.5 m), since this unit has a gravity flow to the sump. The initial length of the 2 in. (50.8 mm) exit pipe should not be any longer than 2 ft. (0.61 m) before having the first drop to a lower level back to the oil sump (this is to prevent too much oil build-up in the centrifuge base). It must also be mounted a minimum of 12 in. (304.8 mm) above the highest oil sump level. This unit is designed to be mounted in the vertical position for proper oil flow back to the engine. Due to the speed at which the centrifuge runs, the unit must be mounted properly as described in the following Steps.

1. Securely mount the MICROSPIN™ P/N 489300 centrifuge using four 3/8"-18 bolts to minimize vibration (see Figure 2).
2. Pipe the oil return line using an unrestricted 2 in. (50.8 mm) line from the centrifuge back to the engine oil sump (see Figure 2). Insure the return line has a downward slope to the engine, avoiding pockets that would trap oil returning to the sump. The initial length of the return line should not be any longer than 2 ft. (0.61 m) before having the first drop, to a lower level back to the oil pan. This is to prevent too much oil build-up in the centrifuge base.

NOTE: This is a parallel side stream filtering system. Do not change piping to existing filters.

NOTE: This unit must be mounted in a vertical and level position as shown in Figure 1.

3. Pipe the oil supply from the location shown for your engine (see Figure 16 through Figure 20), which is usually right off the the engine oil pump. This will achieve maximum efficiency.
4. Install a shutoff valve as shown in Figure 1. This will allow the centrifuge unit to be serviced without shutting down the engine.
5. Install the cleanable filter elements in the current filtration canister in accordance with existing maintenance procedures or for the VGF (Inline) engines, replace the spin-on elements with the cleanable spin-on elements assembly P/N 489325.

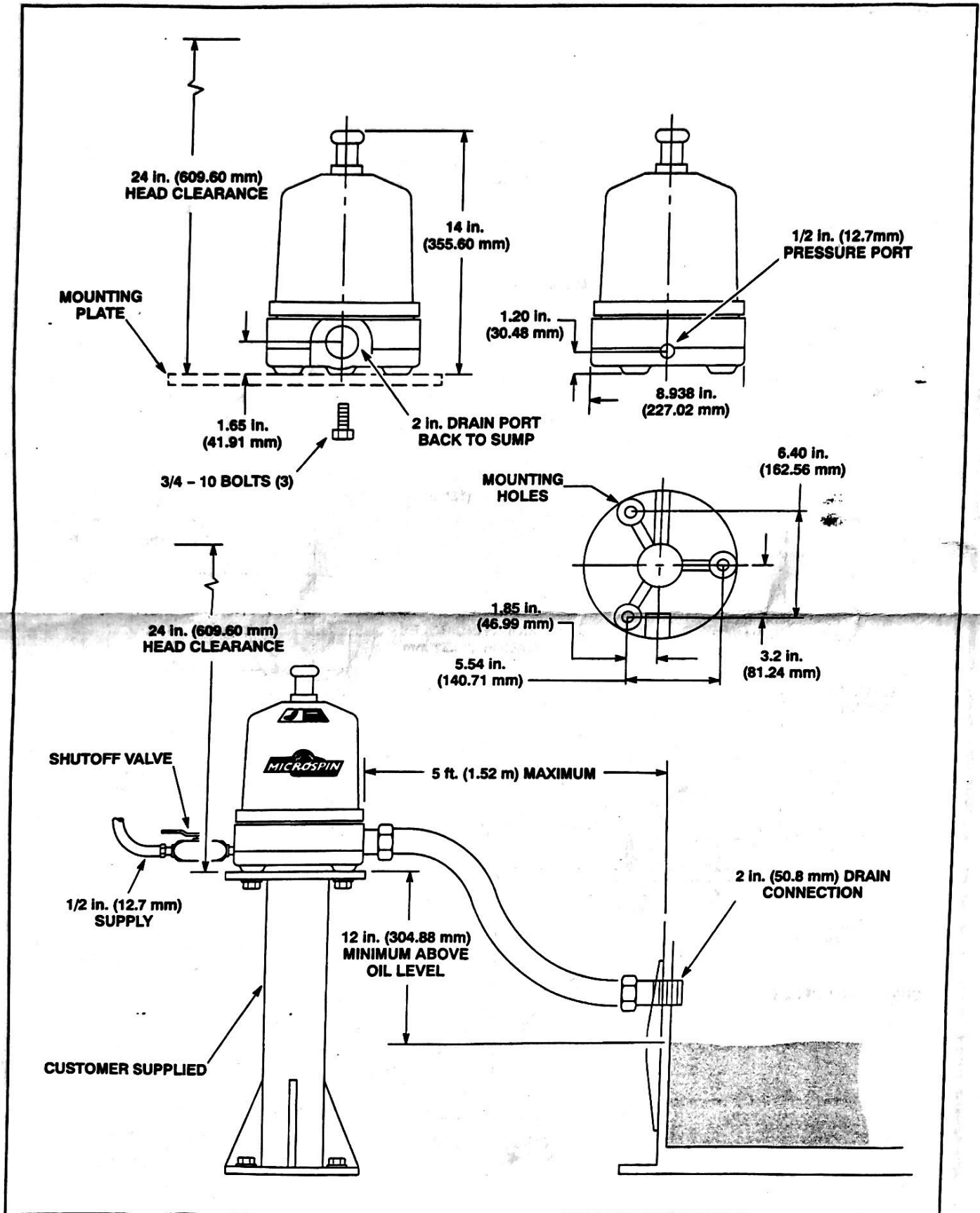


Figure 1. Mounting And Piping Of The MICROSPIN™ P/N 489189 Centrifuge

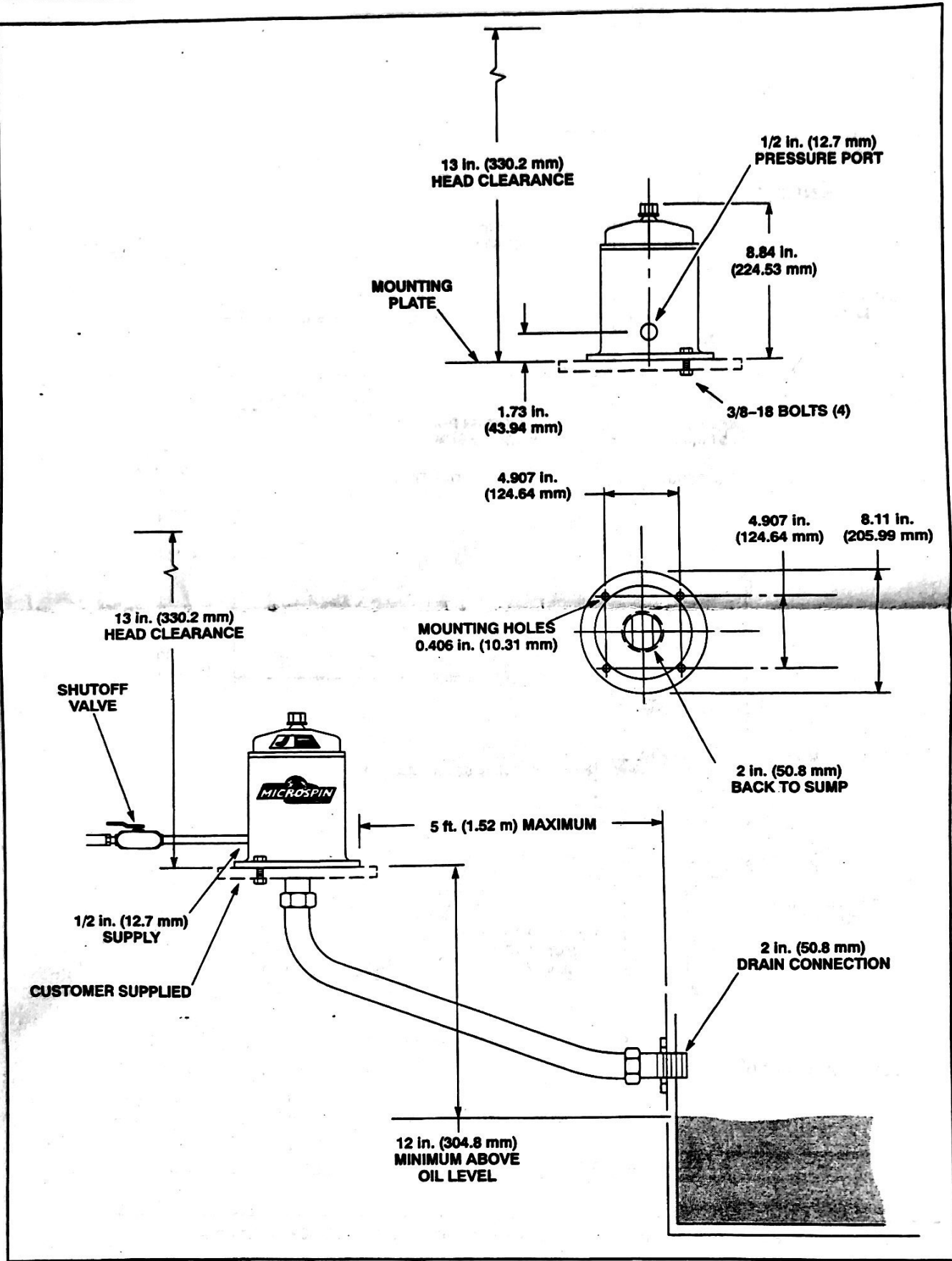


Figure 2. Mounting And Piping Of The MICROSPIN™ P/N 489300 Centrifuge

STARTING (ALL)

To start the unit, open the oil supply valve. It will take a few minutes for the rotor to come up to speed.

SERVICING YOUR MICROSPIN™ CENTRIFUGE (ALL)

Initial servicing should be about four weeks after startup, sooner if the oil is heavily contaminated. A maximum buildup of 0.75 in. (19.05 mm) is allowed on the centrifuge paper insert. Noting the buildup, will help in establishing a cleaning interval.

Centrifuge (ALL)

⚠ WARNING

Solvents may be flammable and give off dangerous fumes, read and follow the manufacture's recommendations to avoid serious personal injury or death.

Under normal operating conditions, the centrifuge should be cleaned and its paper insert removed, at every scheduled oil change, or as experience dictates. The centrifuge can be cleaned while the engine remains running provided the oil supply valve is shut off (see Disassembly for proper procedures).

Cleanable Filter Elements (ALL)

The cleanable oil elements (see Figure 3 and Figure 4), should be removed from the oil filtration canister, and cleaned in a solvent tank at every other regularly scheduled oil change, or when the oil pressure differential between the canister inlet and outlet, exceeds 15 psi (103 kPa). If an oil pressure differential of 2 - 15 psi (14 - 103 kPa), cannot be obtained after normal cleaning, the cleanable filter elements may be ultrasonically cleaned. It is recommended that an oil pressure gauge be installed, to monitor the oil "ΔP" pressure. The engine must be shutdown to service the cleanable oil filters.

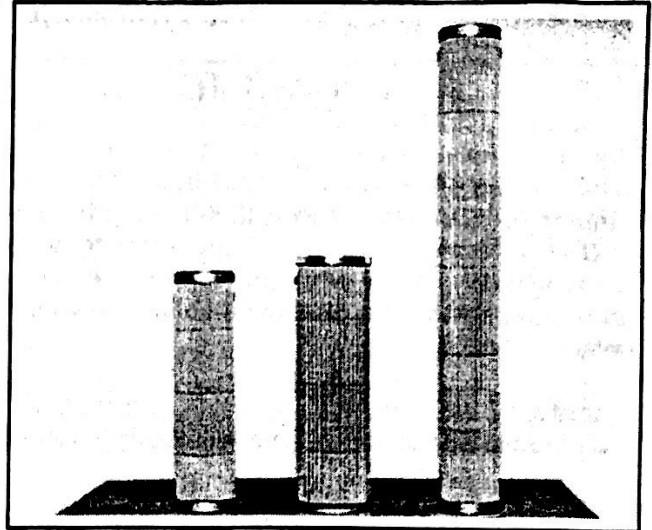


Figure 3. Cleanable Oil Filter Elements - All VHP, AT, F817G, F1197G And VGF (Vee) Engines

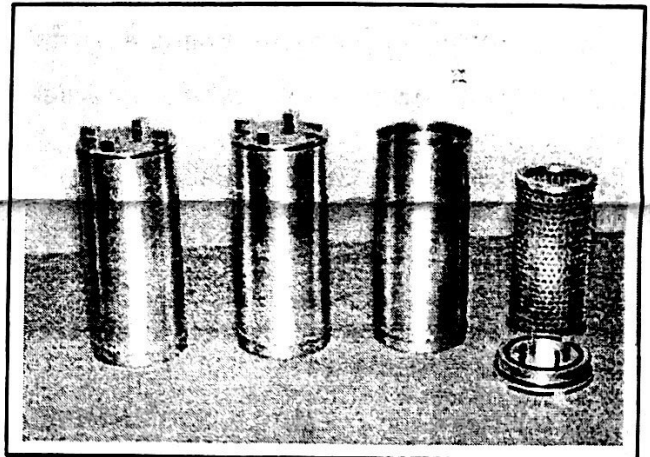


Figure 4. Cleanable Oil Filter Assembly - VGF (Inline)

Disassembly of MICROSPIN™ P/N 489189 Centrifuge

WARNING

The oil supply valve must be shut off before servicing the MICROSPIN™ centrifuge. Allow two minutes before proceeding with servicing the MICROSPIN™ centrifuge to allow the rotor to stop spinning and the oil pressure to drop to zero. Failure to shut off the oil supply valve can cause severe oil burns.

1. Shut off the oil supply valve and wait two minutes for the oil pressure to drop to zero and the rotor to stop spinning.

WARNING

Oil and parts may be extremely hot. Always use caution when servicing the unit to avoid severe personal injury.

2. Loosen and remove the side bell clamp (see Figure 5).

3. Turn the bell knob counterclockwise until it is free.

4. Grasp the top bell knob and remove the bell housing from the base (this will expose the rotor assembly).

5. Insert a screwdriver under the rotor assembly and raise the rotor assembly up 1 - 2 in. (25.4 - 50.8 mm) to allow oil to drain from the rotor into the body base. When the oil is drained from the rotor assembly, lift it straight up until it clears the base shaft.

6. Position the unit on a clean work table, and remove the knurled can nut from the rotor assembly.

CAUTION Use caution during disassembly to avoid damage to the brass bushings.

7. Invert the rotor assembly and place it on a clean work table.

8. Holding the rotor can with both hands, press down until the can separates from the rotor.

9. Clean the baffle screen assembly, rotor and jets. Replace the O-ring if necessary.

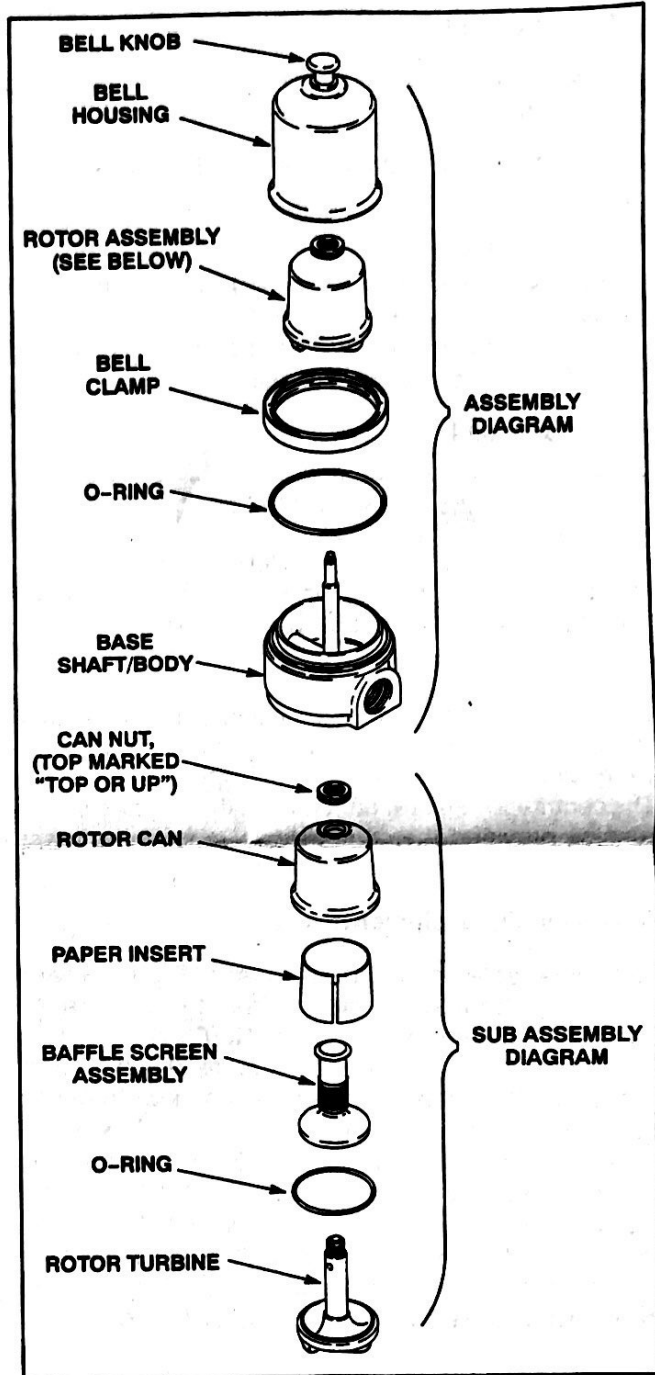


Figure 5. Service And Cleaning Of MICROSPIN™ P/N 489189 Centrifuge

Disassembly of MICROSPIN™ P/N 489300 Centrifuge

⚠ WARNING

The oil supply valve must be shut off before servicing the MICROSPIN™ centrifuge. Allow two minutes before proceeding with servicing the MICROSPIN™ centrifuge to allow the rotor to stop spinning and the oil pressure to drop to zero. Failure to shut off the oil supply valve can cause severe oil burns.

1. Shut off the oil supply valve and wait two minutes for the oil pressure to drop to zero and the rotor to stop spinning.

⚠ WARNING

Oil and parts may be extremely hot. Always use caution when servicing the unit to avoid severe personal injury.

2. Loosen the 3/4 in. (19.05 mm) nut and remove the top cover (see Figure 6). This will separate the cover from the base and expose the turbine assembly.

3. Remove and replace the O-ring if necessary.

4. Lift the rotor assembly up 1 to 2 in. (25.4 to 50.8 mm) to allow the oil to drain from the rotor turbine into the body base. Once the oil stops draining from the turbine assembly, lift it straight up until it clears the base shaft.

5. Loosen the knurled can nut counter-clockwise until it is above the bronze bushing in the rotor turbine assembly. The loose can nut will protect the bushing from damage if the turbine can is difficult to separate from the shaft.

⚠ CAUTION Use caution during disassembly to avoid damage to the top brass bushing.

6. Invert the rotor assembly and place it on a clean work table.

7. Holding the rotor can with both hands, press down until the can separates from the rotor turbine.

8. Turn the knurled can nut counterclockwise until it is free.

9. Remove the turbine and baffle screen from the turbine can.

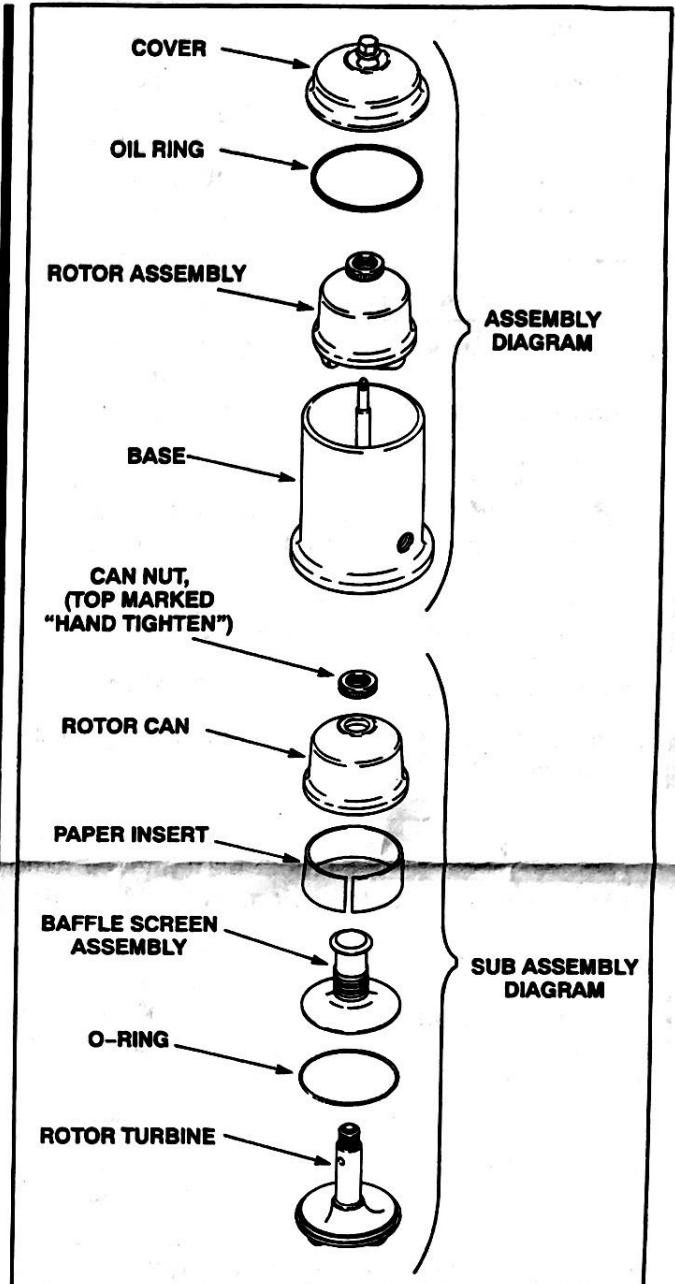


Figure 6. Service And Cleaning Of MICROSPIN™ P/N 489300 Centrifuge

10. Remove and replace the rotor O-ring if necessary.

Cleaning (P/N 489189 And 489300)

1. Remove the paper insert from the rotor can by inserting a narrow flat tool between the paper insert and the rotor can. Run the tool around the inside of the can and remove the paper insert. Clean the contaminant build up in the rotor can, and insert a new paper insert.

WARNING

Solvents may be flammable and give off dangerous fumes. Read and follow the manufacture's recommendations to avoid serious personal injury or death.

CAUTION Remove rubber O-rings prior to placing parts in the solvent tank, to prevent damage to equipment.

2. Clean the baffle screen assembly, rotor turbine, rotor can, covers and jets, in a suitable solvent tank.

Assembly of MICROSPIN™ P/N 489189 Centrifuge

1. Install the Baffle screen and new O-ring on the turbine rotor.

CAUTION The knurled can nut must be tightened hand tight only, or damage to equipment could result.

2. Position the rotor can with a new paper insert in place, (see Figure 5) on the turbine rotor. Insuring that the side of the knurled can nut marked "TOP" or "UP" is on top, (see Figure 7) tighten the knurled can nut, hand tight only, to secure the assembly.

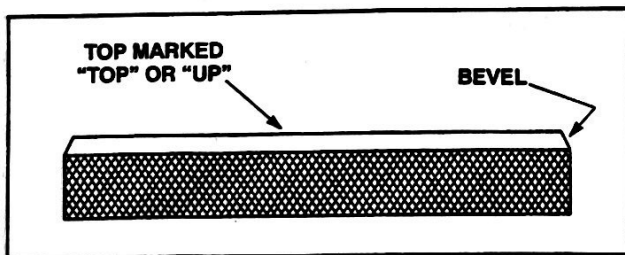


Figure 7. Can Nut - Side View

3. Position the turbine rotor assembly to the base, (over the base shaft). Check to insure that the rotor spins freely.

4. Install the bell housing to the base, using a new O-ring (if necessary) and hand tighten the bell nut.

5. Install and hand tighten the bell housing clamp finger tight.

6. Retighten the bell nut, hand tight.

7. Open the oil supply valve to start the centrifuge. Check for oil leaks.

Assembly of MICROSPIN™ P/N 489300 Centrifuge

1. Install the baffle screen and new O-ring on the turbine.

CAUTION The knurled can nut must be tightened hand tight only, or damage to equipment could result.

2. Position the rotor can with a new paper insert in place, (see Figure 6) on the turbine rotor. Tighten the knurled can nut, hand tight only, to secure the assembly.

3. Position the turbine rotor assembly to the base, (over the base shaft). Check to insure that the rotor spins freely.

4. Install the top cover to the base, using a new O-ring (if necessary) and tighten the 3/4 in. (19.05 mm) hex nut, to secure the cover.

5. Open the oil supply valve to start the centrifuge. Check for oil leaks

Table 1. MICROSPIN™ Cleanable Lube Oil Filtration System Installation Kits, Part Numbers

ENGINE MODEL	P/N
6 Cylinder VHP	G-962-1601
12 Cylinder VHP	G-962-1602
16 Cylinder VHP	G-962-1603
8L-ATGL-All & 12V-ATGL-Dual Starter	G-962-1604
12V-AT27GL-Single Starter Mounted Left Side (Complete Installation Kit)	G-962-1605
12 & 16 Cylinder VGF	G-962-1606
6 & 8 Cylinder VGF	G-962-1607
F817 & F1197	G-962-1608

Table 2. MICROSPIN™ (P/N 489189) Cleanable Lube Oil Filter Component Parts

ENGINE MODEL	DESCRIPTION	P/N
AT, VHP, VGF (VEE)	Maintenance Kit (Centrifuge)	G-962-1600*
AT, VHP, VGF (VEE)	MICROSPIN™ Centrifuge	489189
AT, VHP	Cleanable Filter Element, 32"	489190 (Replaces 168660B) ¹
AT, VHP	Paper Insert	489191
VHP, Intermediate	Cleanable Filter Element, 16"	489301 (Replaces 167602B and 172607) ¹
VHP	Spacer (For use on domed topped canister)	489265
VHP	Spring (For use on domed topped canisters)	489266
VGF (VEE)	Cleanable Filter Element	489237 (Replaces 305351B) ¹
VHP 6 & 12 Cyl, VGF (VEE)	Crankcase Door	A200024G
VHP 16 Cyl	Crankcase Door	A267124B
AT	Crankcase Door	D280170B
ALL	Ball Valve	207585A

NOTE: *MICROSPIN™ Maintenance Kit, (contains Nut O-ring [1], Rotor O-ring [1], Base O-ring [1], Paper Inserts [4]).
¹ Select number of filters required for application.

Table 3. MICROSPIN™ (P/N 489300) Cleanable Lube Oil Filter Component Parts

ENGINE MODEL	DESCRIPTION	P/N
VGF* (Inline), F817, F1197	Maintenance Kit (Centrifuge)	G-962-1620*
VGF (Inline), F817, F1197	MICROSPIN™ (P/N 489300) Centrifuge	489300
VGF (Inline), F817, F1197	Paper Insert	489302
VGF (Inline), F817, F1197	Rotor O-Ring	489303
VGF (Inline), F817, F1197	Cover O-Ring	489304
VGF (Inline), F817, F1197	Cover Nut O-Ring	489305
VGF (Inline)	Cleanable Filter Assembly (includes element and canister)	489325 ¹
VGF (Inline)	Cleanable Filter Element (element only)	489336 ¹
VGF (Inline)	Maintenance Kit (Cleanable Filter Assembly)	G-962-1621
VGF (Inline)	Base O-Ring	489331 ²
VGF (Inline)	Lower Element O-Ring	489332 ²
VGF (Inline)	Upper Element O-Ring	489333 ²
VGF (Inline)	Cover O-Ring	489334 ²
F817, F1197	Cleanable Filter Element, 16"	489301 (Replaces 167602B and 172607) ¹
ALL	Ball Valve	207585A

NOTE: *MICROSPIN™ (P/N 489300) Maintenance Kit, (contains Nut O-ring [1], Rotor O-ring [1], Base O-ring [1], Paper Inserts [4]).
¹ Select number of filters required for application.
² Items contained in Maintenance Kit (Cleanable Filter Assembly) G-962-1621.

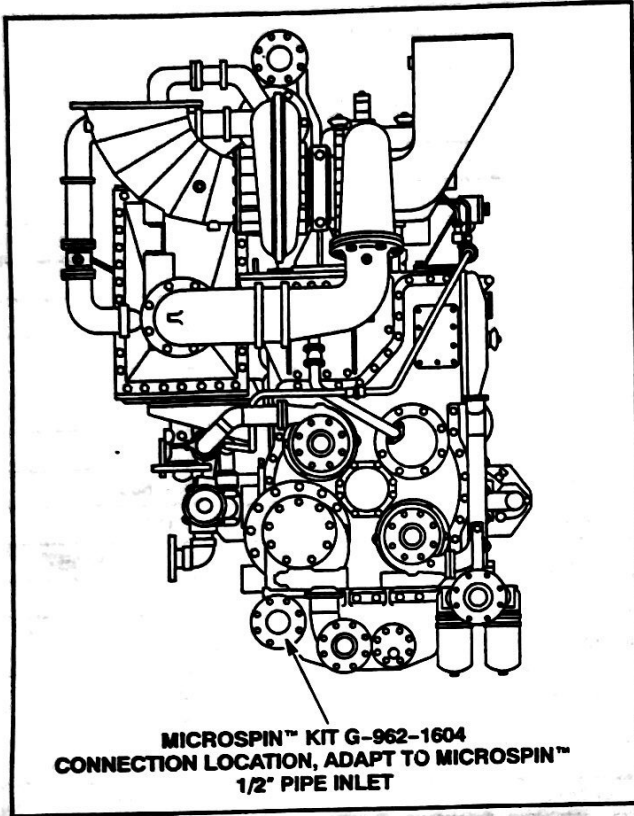


Figure 8. 3L-AT P/N 489189 Connection Locations -
Front View

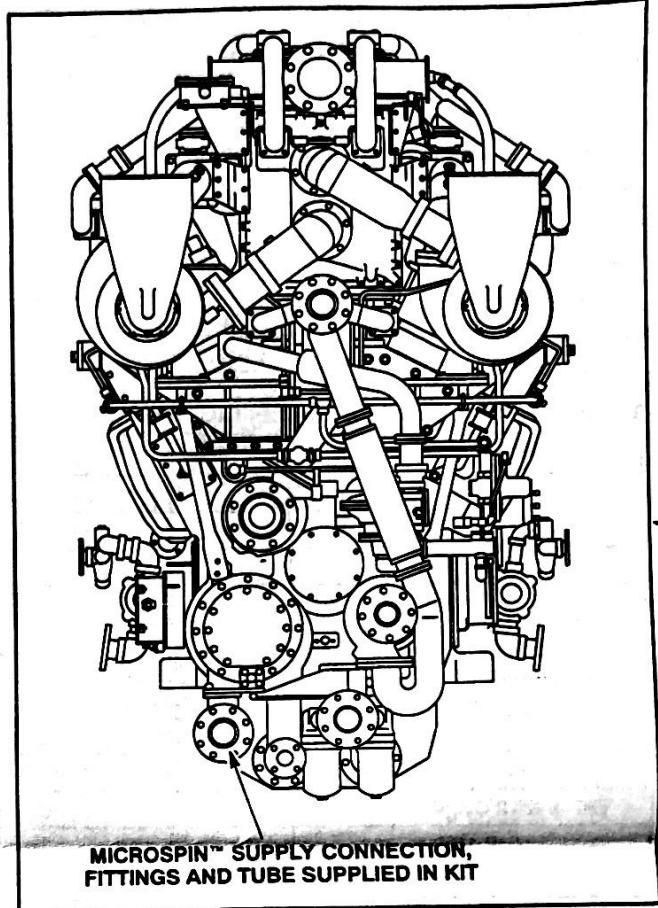


Figure 9. 12V-AT P/N 489189 Connection Locations -
Front View

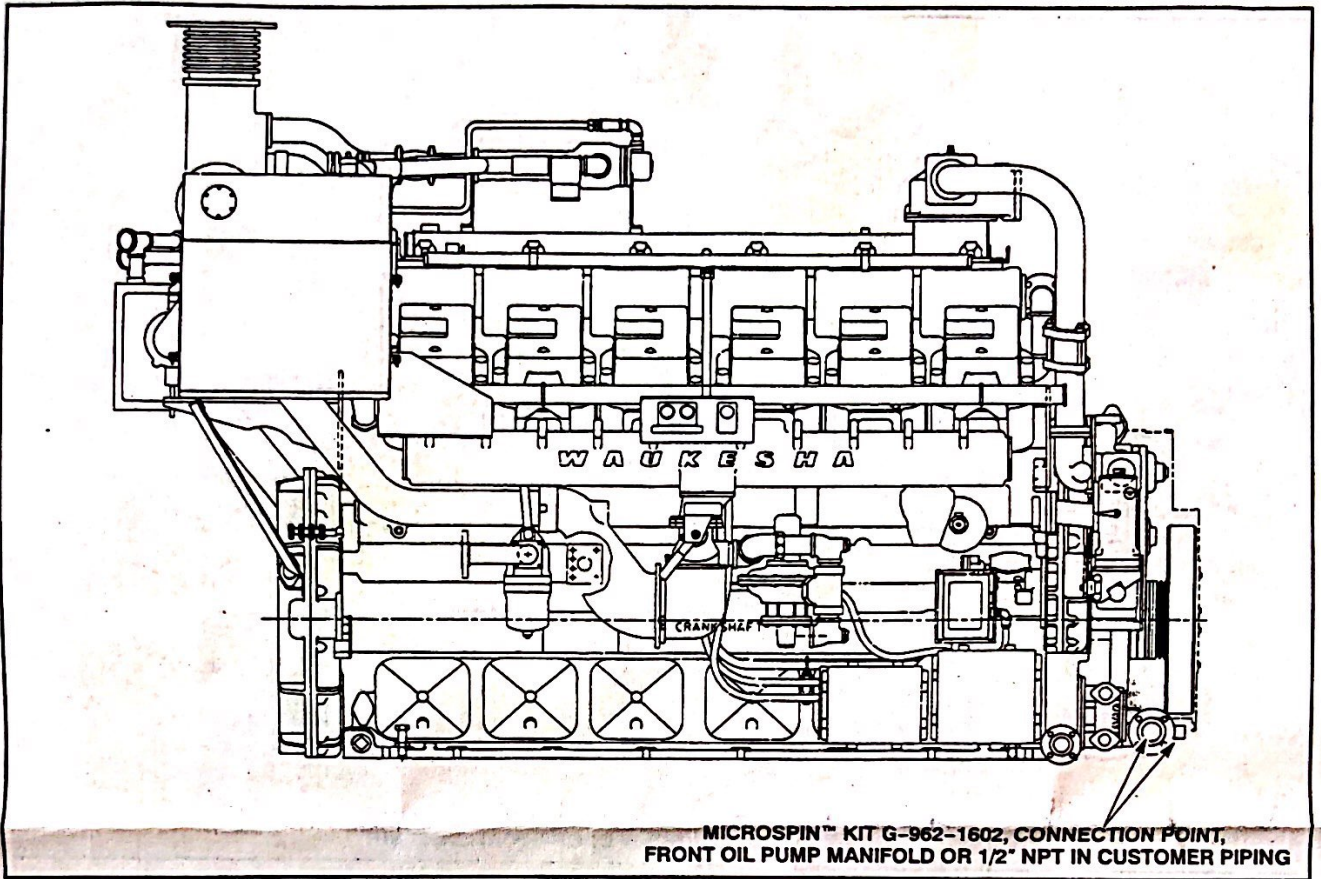


Figure 10. 12 Cylinder VHP P/N 489189 Connection Locations - Right Side View

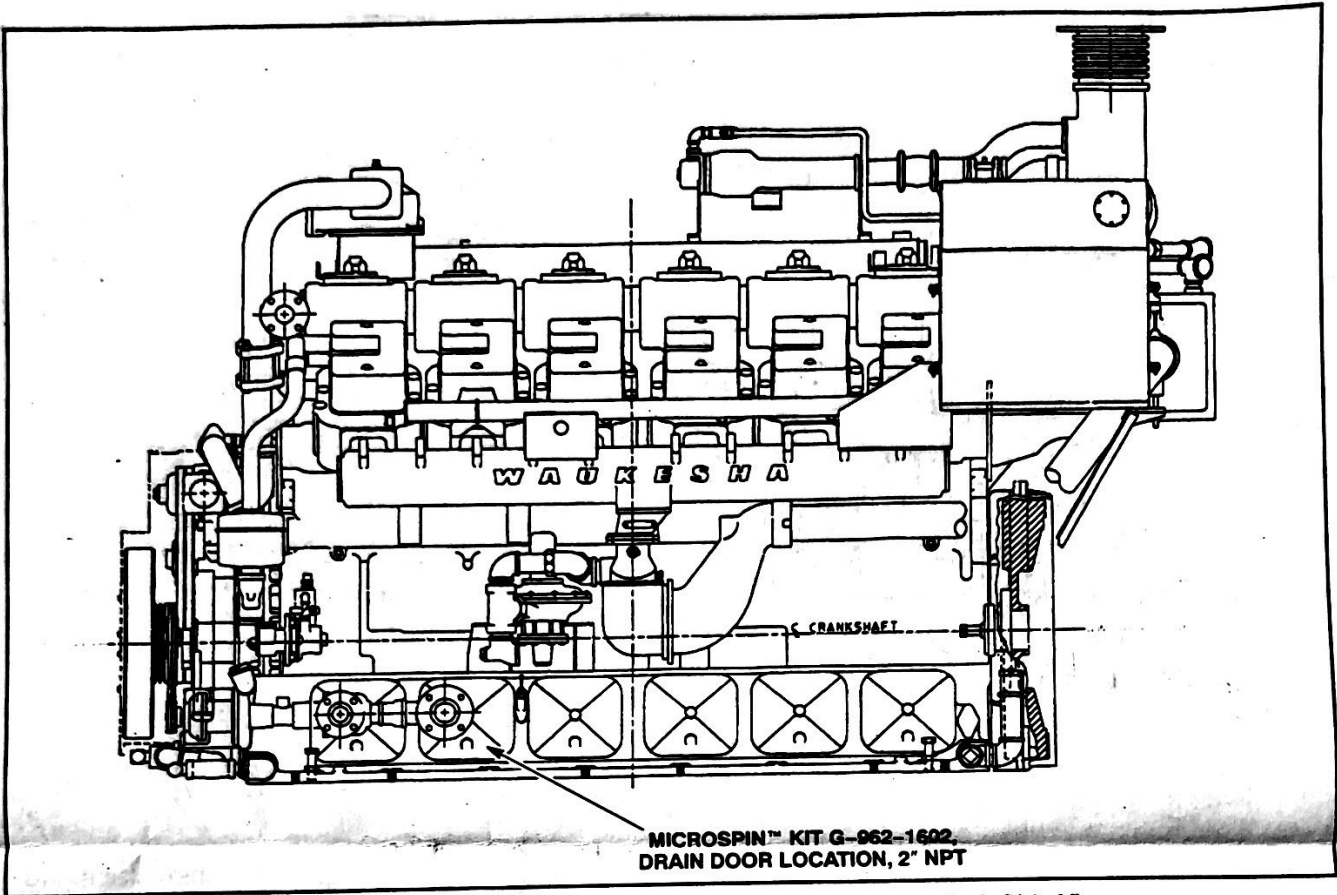


Figure 11. 12 Cylinder VHP P/N 489189 Connection Locations - Left Side View

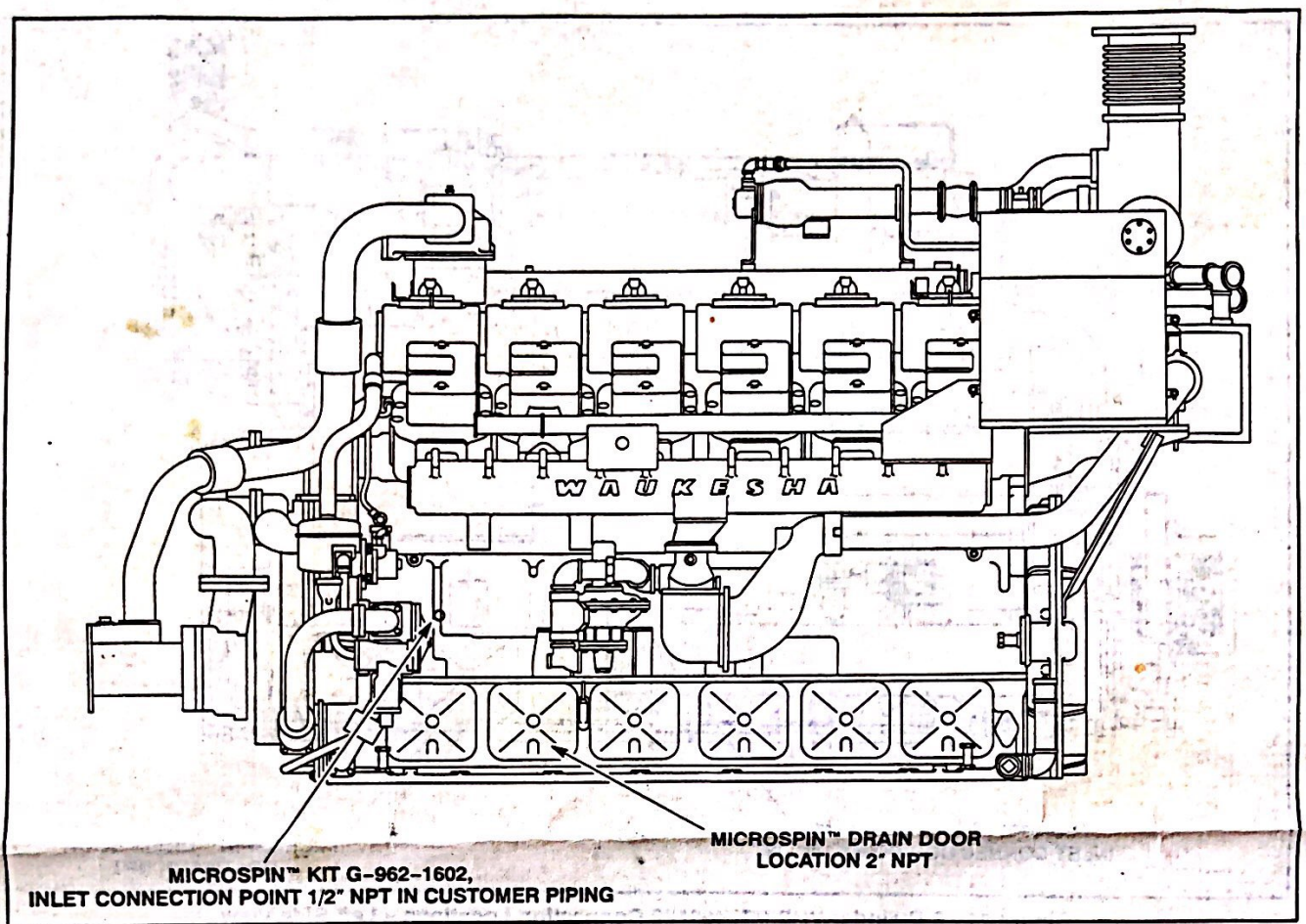


Figure 12. 5115GL P/N 489189 Connection Locations - Left Side View

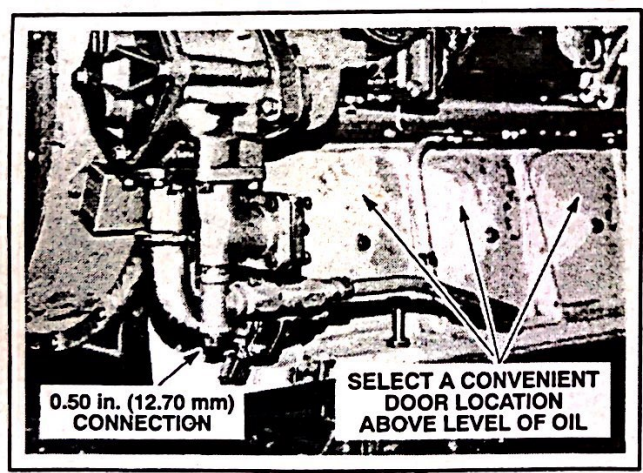


Figure 13. VHP 9390 P/N 489189 Connection Locations - Right Side View

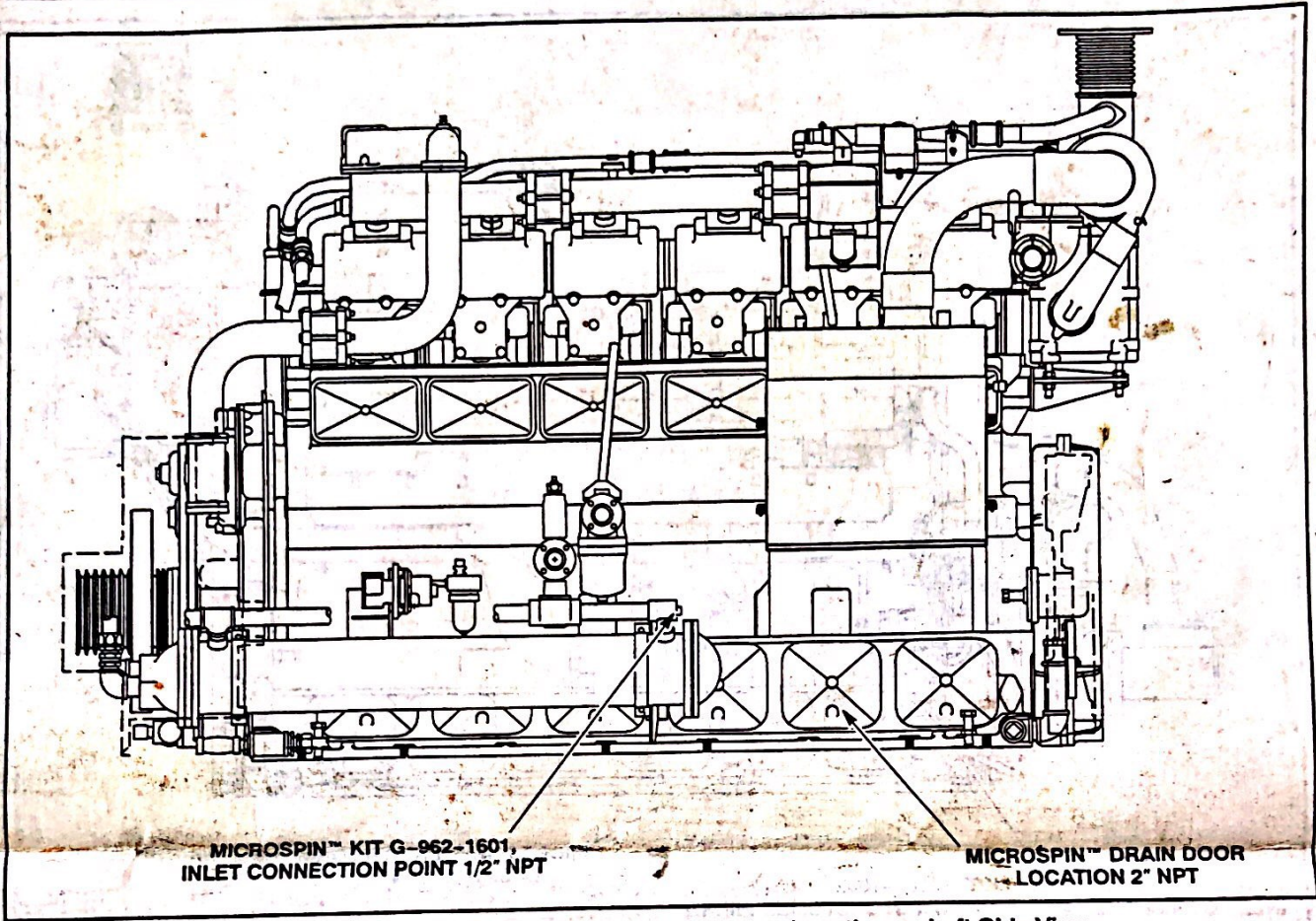


Figure 14.- 6 Cylinder VHP P/N 489189 Connection Locations - Left Side View



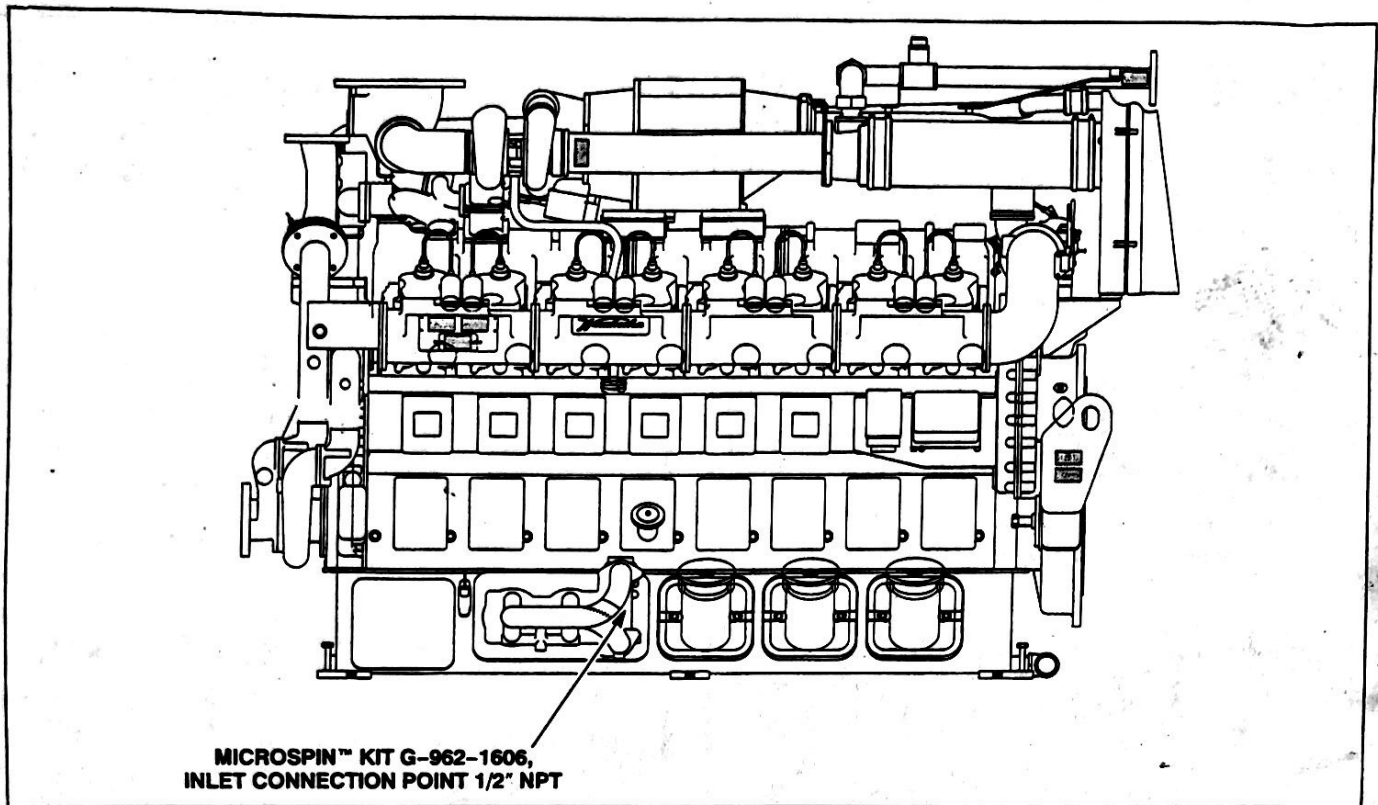


Figure 15. VGF (VEE) P/N 489189 Connection Locations - Left Side View

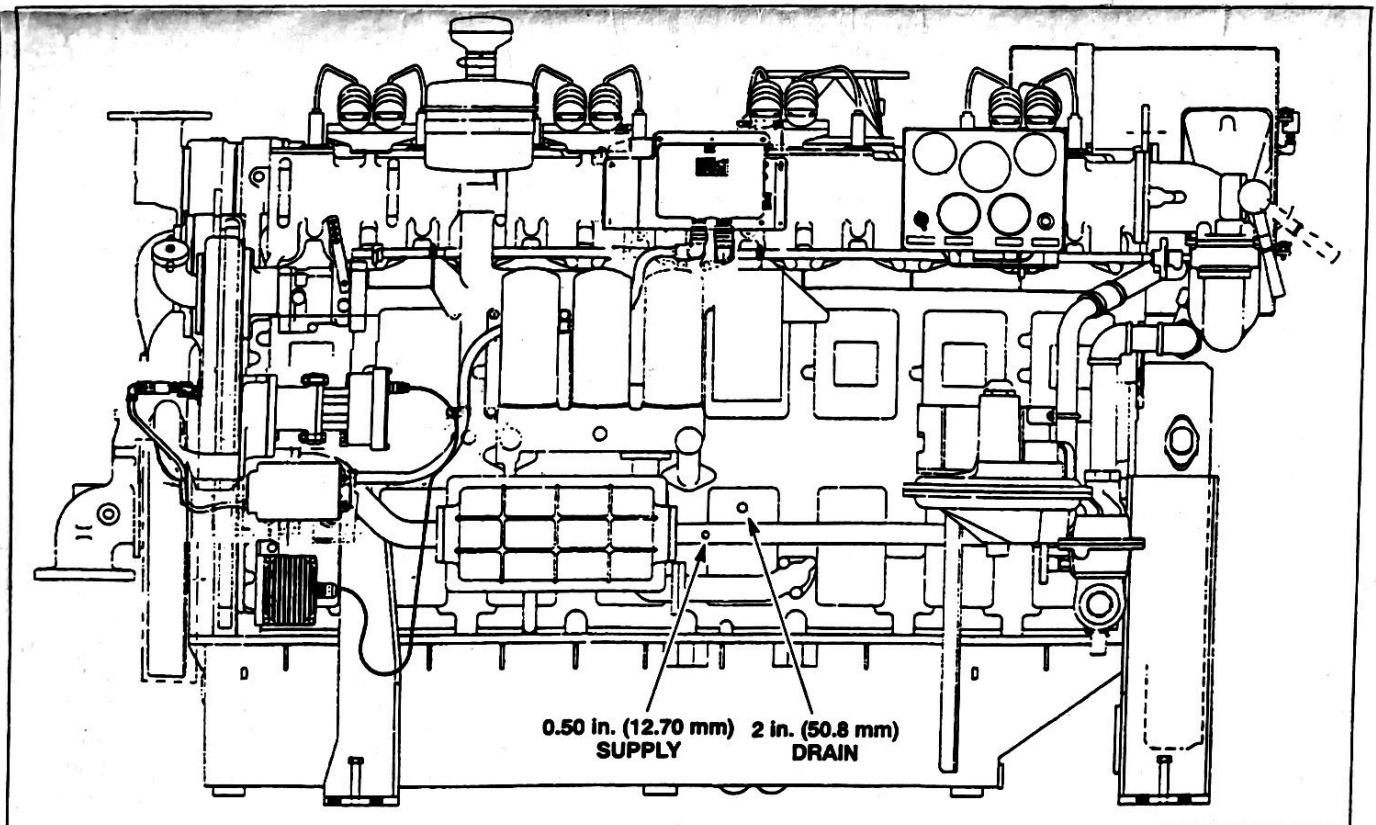


Figure 16. VGF MICROSPIN™ P/N 489300 Centrifuge Connection Locations - Left Side View

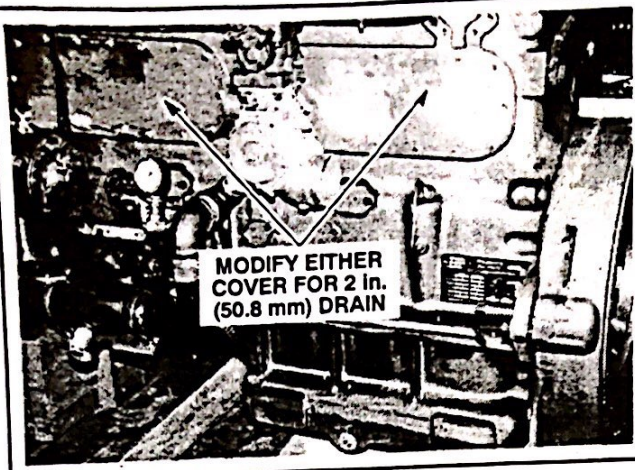


Figure 17. F1197 MICROSPIN™ P/N 489300 Centrifuge Connection Locations - Left Side View

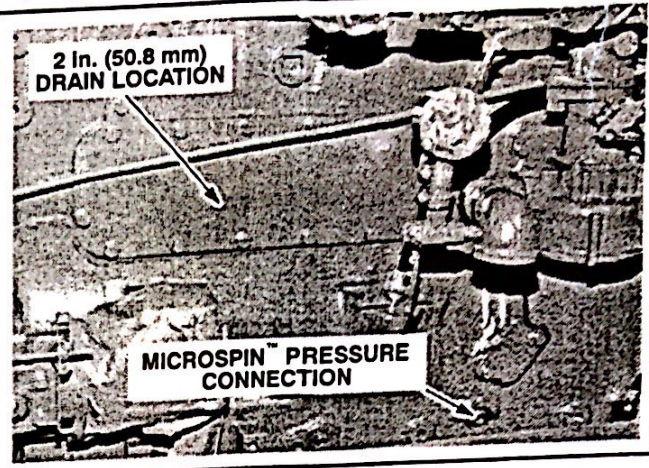


Figure 19. F817 MICROSPIN™ P/N 489300 Centrifuge Connection Locations - Left Side View

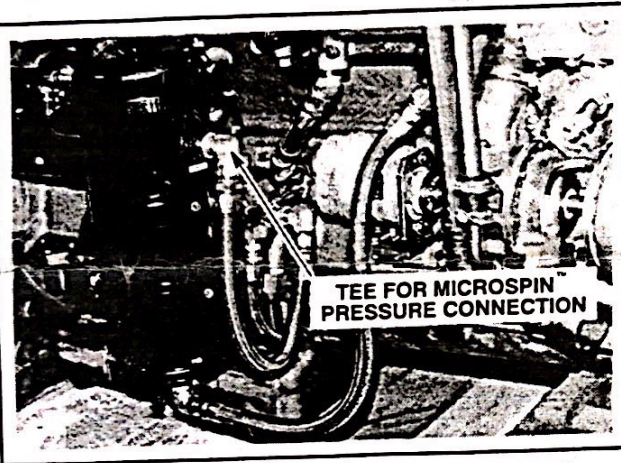


Figure 18. F1197 MICROSPIN™ P/N 489300 Centrifuge Connection Locations - Right Side View

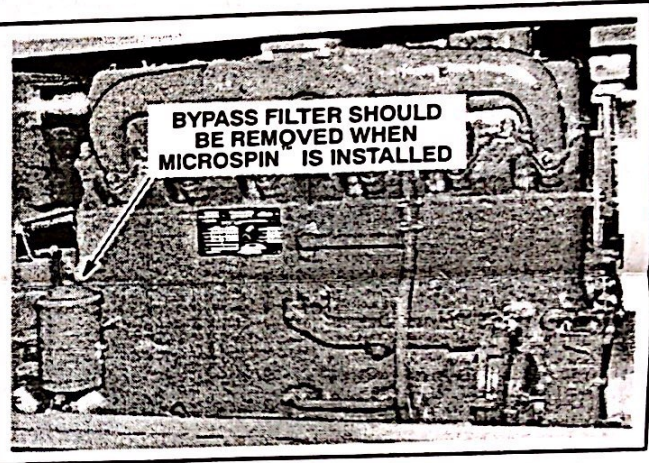


Figure 20. F817 MICROSPIN™ P/N 489300 Centrifuge Connection Locations - Right Side View