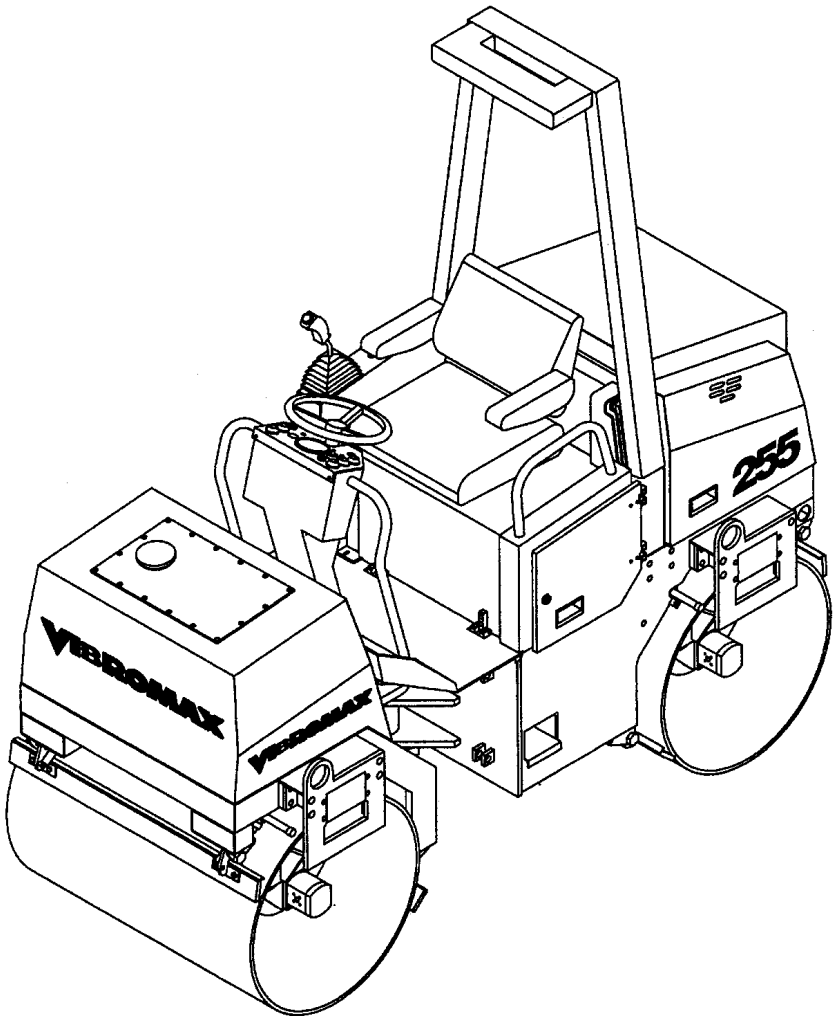
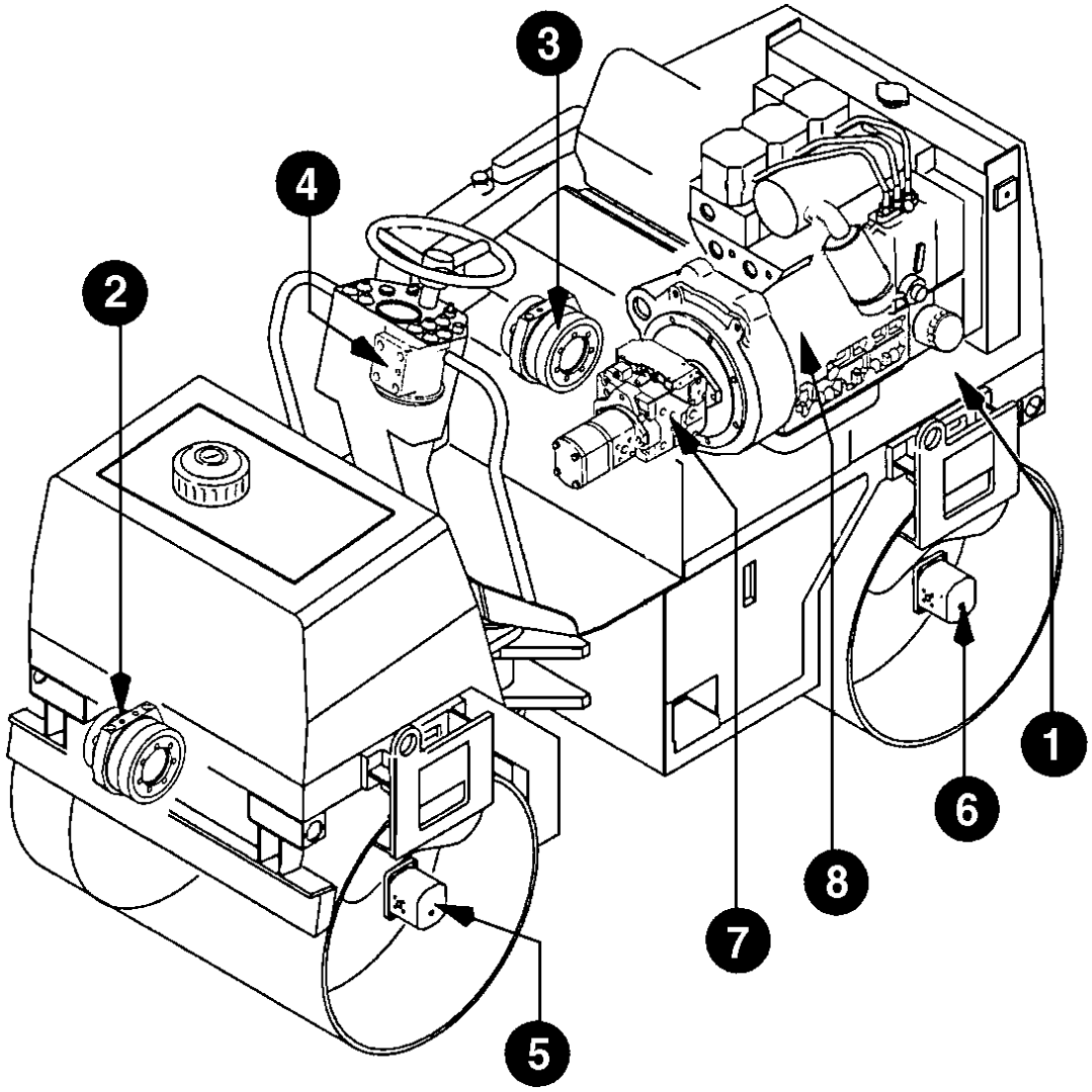
VIBROMAX

255 / 265 TANDEM ROLLER

SERVICE MANUAL SM61005

December 2000

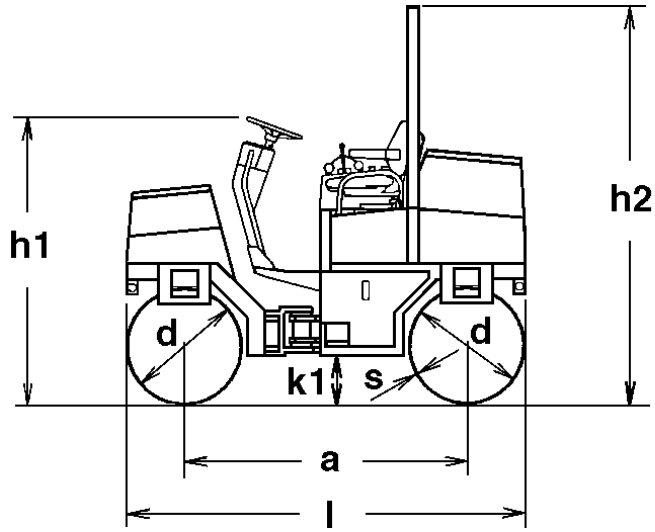




SERIAL NUMBERS

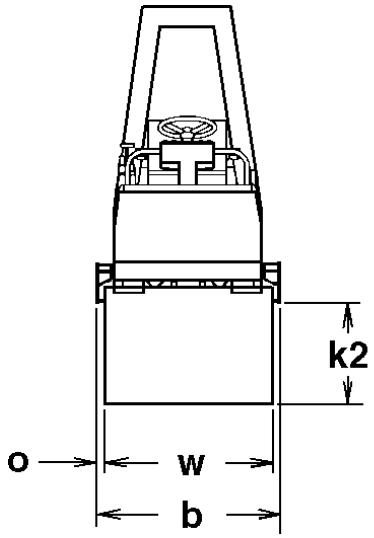
1	Model / Serial Number	
2	Front Drum Drive Motor S/N	
3	Rear Drum Drive Motor S/N	
4	Steering Unit S/N	
5	Front Vibratory Motor S/N	
6	Rear Vibratory Motor S/N	
7	Hydraulic Pumps S/N	
8	Engine S/N	

MACHINE SPECIFICATIONS



SIDE VIEW
255 / 265

	in.	mm
a	66.9	1700
d	27.6	700
h1	67.7	1720
h2	98.4	2500
k1	11.4	290
l	94.5	2400
s	0.5	12



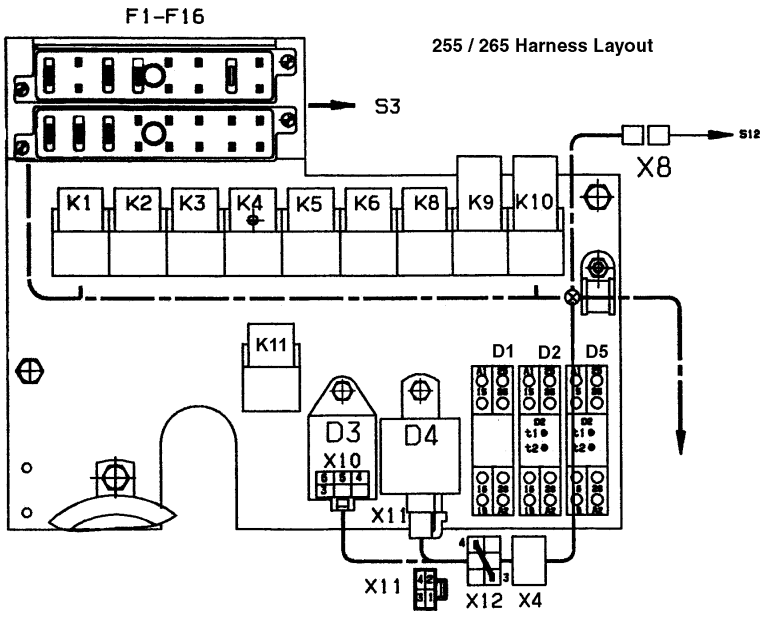
FRONT VIEW
255 / 265

	model	in.	mm
b	255	43.1	1096
	265	51.0	1296
k2	255	22.4	570
	265	22.4	570
o	255	1.9	48
	265	1.9	48
w	255	39.4	1000
	265	47.2	1200

INSTALLATION

1. Install the engine and hydraulic pump assembly using the two lifting eyes provided on the engine.
2. Secure the engine in place with the engine mounts.
3. Connect the vibration control valve by installing the two capscrews.
4. Connect all hydraulic lines to the propulsion, vibration, and steering pumps. Make sure the case drain on the propulsion pump is filled with oil.
5. Connect the propulsion pump control cable and the 2 speed linkage.
6. Connect all pump and engine electrical lines.
7. Connect the engine fuel lines.
8. Connect the flexible tube to the exhaust manifold.
9. Install the radiator and shroud assembly securing it at the buffers.
10. Reinstall the coolant bottle.
11. Reinstall the air cleaner assembly.
12. Connect the engine air inlet hose.
13. Connect the upper and lower hydraulic cooler lines.
14. Connect the upper and lower radiator hoses and clamp in place.
15. Refill the radiator with the proper antifreeze and water mixture.
16. Check the engine oil level.
17. Install the machine's battery.
18. Block the engine fuel lever to allow the engine to crank but not start. Continue cranking the engine until a charge pressure reading can be obtained in the propulsion system at test port MP3.
19. Prime and bleed the engine fuel system.
20. Start the engine and inspect the machine for hydraulic, fuel, and water leaks.
21. Recheck all fluid levels.
22. Install the hood.

RELAY LOCATION CHART



D1 Delay Relay, Seat Monitor Option

D2 Delay Relay, Sprinkler Cycle

D3 Delay Relay, Engine Preheat

D4 Delay Relay, Engine Stop

D5 Delay Relay, Sprinker Optional

K1 Relay, Neutral

K2 Relay, Engine Monitor

K3 Relay, Emergency Off

K4 Relay, Auto Vibration

K5 Relay, Brake Release

K6 Relay, Brake Release

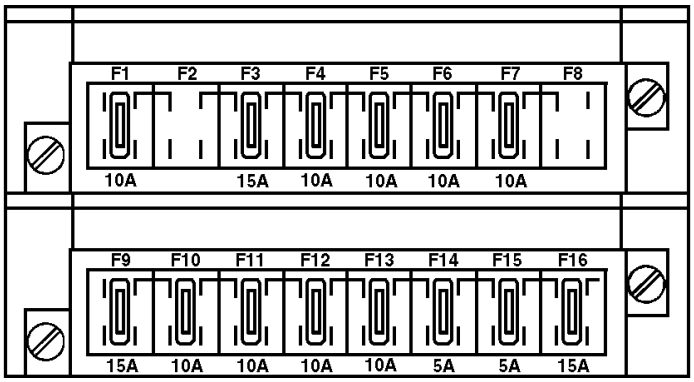
K8 Relay, Sprinkler Pump

K9 Relay, Flashers

K10 Relay, Vibration

K11 Relay, Sprinkler Pump Option

FUSE LOCATION CHART



F1 Warning and Signal Device & Emergency Off Switch

F2 not used

F3 Pressure Sprinkler

F4 Socket and Working Lights

F5 Flasher Device

F6 Back up Alarm

F7 Alternator

F8 Not Used

F9 Parking Brake and Release

F10 Vibratory System

F11 Pressure Sprinkler Control

F12 Lighting System

F13 Flasher Device

F14 Lighting System, Left Side

F15 Lighting System, Right Side

F16 Pressure Sprinkler Optional rear

STARTER/ CHARGING CIRCUIT

The major components of the starter and charging circuit are the starter motor, alternator, battery, the ignition switch, neutral start switch and the pre-heater circuit [lines 0 to 6].

When the ignition switch S1 is turned to the ON position, power from the emergency stop circuit is available through the neutral start switch S2 (located on the propulsion pump) if the machine is in neutral [line 6], through the coil of relay K1 and to ground. The contacts of relay K1 close [line 2], providing a current path between the start terminal 50a on the ignition switch and the starter motor. Turning the ignition switch to the start position will allow the starter to crank the engine.

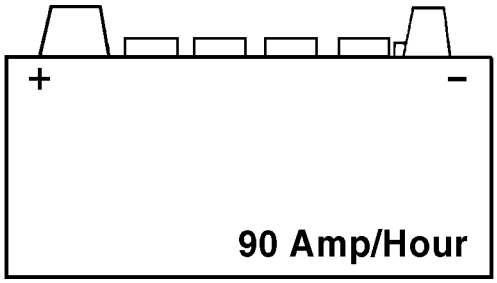
An ignition switch position between ON and START provides power to the engine preheater circuit [lines 0 and 1]. Placing the switch in this position provides current to the pre-heaters [line 0], to the indicator light H0 on the dash and to the heater timer [line 1]. Preheat time is approximately 5 seconds.

When the machine has been started and the alternator [line 4] is producing output current, the alternator indicator light on the dash will extinguish because the alternator regulator, previously at ground, now provides 12 volts which is equal to the current to the indicator light. With 12 volts on both sides of the indicator light, there is no current flow and the light will not glow. The hour meter [line 5] only has power if the alternator is producing power, eliminating hour meter errors if the ignition switch is inadvertently left on.

A mechanical anti-restart feature is incorporated into the ignition switch design.

UNDERSTANDING BATTERIES

A battery is a device which stores chemical energy and converts it into electrical power as required. The amount of electrical energy that a battery is able to supply depends mainly on the actual size of the battery. The capacity of a battery is measured in Amp/ hours.



The rate at which a battery will convert chemical energy into electrical energy will vary according to the temperature. The lower the temperature, the lower the conversion rate. This is often referred to as Cold Cranking Amperage.

⚠

Batteries can be dangerous and should be handled carefully. Battery acid causes severe burns; Avoid contact with skin, eyes or clothing.

NEUTRAL SWITCH CIRCUIT

Besides providing the assurance that the machine will not start unless in neutral, the circuit has other functions. One feature is an automatic vibration control. Relay K4 [line 8] is controlled by the neutral switch, receiving power and controlling the vibration circuit [line 31]. Relay K5 [line 9] will open its contacts [line 20] in neutral, causing the removal of brake release pressure. If the machine is started outside of neutral this prevents machine operation until the machine control lever is returned to neutral. (These circuits will be discussed later). The neutral indicator light H2 [line 10] is also controlled by the neutral switch.

SPRINKLER CIRCUIT ("K" option)

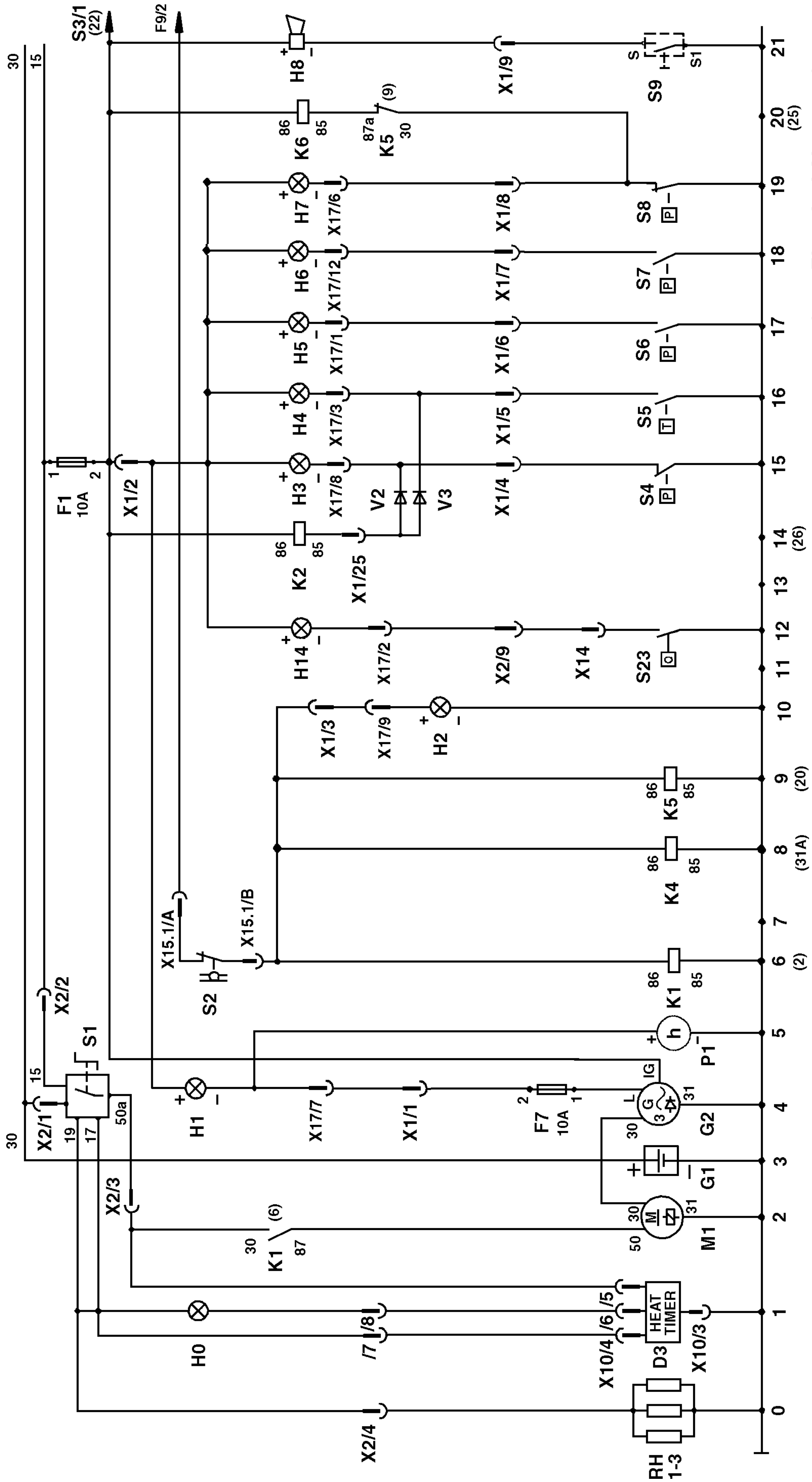
The second sprinkler system used on the "K" model combination roller is identical to the system shown on the previous pages. The sprinkler pump receives its supply power from fuse F16 [line 60], but is controlled by the delay relay D5 circuitry [lines 55 through 58]. Power for fuse F16 is supplied by the ignition switch and is available if the switch is in the on position. Current from fuse F16 passes through the contacts of relay K11 and on to the sprinkler motor, water shutoff solenoid Y6, and to indicator H19. The opening and closing of relay K11 is controlled by the D5 circuitry. fuse F11 supplies power to the sprinkler "ON/OFF" switch S25. In the continuous position, current flows out the C terminal, through the coil of the K11 relay to ground, closing K11 contact [line 60]. In the intermittent position, current passes through switch terminal B to the delay relay D5. D5 produces an on/off interval, dependent on the positioning of potentiometer R2. When in the "ON" phase, current from D5 passes through relay K11 to ground, closing K11 contacts [line 60]. When in the "OFF" phase, there is no current output to the K11 relay.

The delay relay located behind the right side panel and the sprinkler potentiometer on the instrument panel control the sprinkler interval. The delay relay has two adjustments (T1 and T2) for control of the "OFF" and "ON" times of the sprinkler pump. T1 controls "OFF" time and T2 controls "ON" time. Turning either adjustment clockwise increases the "OFF" or "ON" time. The potentiometer on the instrument panel will control the "OFF" time only. Turn the potentiometer counter clockwise to get the minimum "OFF" time and clockwise for maximum "OFF" time. The potentiometer has no control of the "ON" time. When first starting with fresh asphalt, maximum water usage is required so the potentiometer would be set fully counter clockwise. As the drum warms up, less water is required and can be controlled by increasing the sprinkler "OFF" time by turning the potentiometer clockwise.

Adjust the sprinkler controls as follows: Place the potentiometer at minimum (fully counter clockwise). Set delay relay T1 to minimum desired "OFF" time. Set delay relay T2 to maximum desired "ON" time. The factory settings are 10 seconds "OFF" and 10 seconds "ON".

WIRE CHART 7131/80115

No.	Color	From	To
3	red	key switch S1 terminal 30	plug connector X2 port 1
4	red	key switch S1 terminal 15	plug connector X2 port 2
5	black	key switch S1 terminal 50a	plug connector X2 port 3
8	blue	alt. indicator H1 connector X17 port 7	plug connector X1 port 1
12	black-red	hourmeter P1 connector X17 port 13	plug connector X1 port 2
19	black	neutral indicator H2 connector X17 port 9	plug connector X1 port 3
21	green	diode V2 @ H3-	plug connector X1 port 4
22	red-white	diode V3 @ H4-	plug connector X1 port 5
23	brown-red	air filter indicator H5 connector X17 port 1	plug connector X1 port 6
24	green-red	hyd. filter indicator H6 connector X17 port 12	plug connector X1 port 7
26	black-yellow	brake indicator H7 connector X17 port 6	plug connector X1 port 8
28	brown-yellow	horn switch S9 connector port 5	plug connector X1 port 9
33	black-yellow	brake switch S10 connector port 1	plug connector X1 port 10
34	black-yellow	brake switch S10 connector port 4	plug connector X1 port 11
42	gray-green	auto vib. switch S11 connector port 1	plug connector X1 port 12
43	gray	auto vib. switch S11 connector port 4	plug connector X1 port 13
44	gray	front vib. switch S13 connector port 3	plug connector X1 port 16
45	gray	front vib. switch S13 connector port 3	rear vib. switch S14 connector port 3
47	gray	auto vib. switch S11 connector port 4	plug connector X1 port 14
48	gray-violet	front vib. switch S13 connector port 2	plug connector X1 port 17
49	gray-yellow	rear vib. switch S14 connector port 2	plug connector X1 port 18
50	blue	auto sprinkle switch S16 connector port "A"	plug connector X1 port 19
51	blue	auto sprinkle switch S16 connector port "A"	plug connector X20 port 1
52	blue	auto sprinkle switch S16 connector port "C"	plug connector X1 port 24
54	blue	auto sprinkle switch S16 connector port "B"	plug connector X1 port 23
56	blue	sprinkler pot. R1 connector port 1	plug connector X1 port 22
57	blue	sprinkler pot. R1 connector port 3	plug connector X1 port 21
58	blue	sprinkler pot. R1 connector port 3	sprinkler pot. R1 connector port 2
61	blue	sprinkle indicator H13 connector X17 port 4	plug connector X1 port 20
62	black	auxiliary power socket X7+	plug connector X2 port 6
64	red	light switch S18 connector port 1	plug connector X1 port 26
65	yellow-white	light switch S18 connector port 2	plug connector X1 port 27
66	yellow-white	front light connector X5 port 1	plug connector X1 port 29
68	yellow	light switch S18 connector port 3	plug connector X1 port 28
69	yellow	front light connector X5 port 3	plug connector X1 port 30
71	red	hazard light switch S19 connector port 3	plug connector X1 port 32
72	black-red	hazard light switch S19 connector port 1	plug connector X1 port 31
73	black-white	hazard light switch S19 connector port 6	front light connector X5 port 2



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VIBROMAX

PROPULSION SYSTEM

The propulsion, or drive system, consists of an engine driven, Sauer-Sunstrand, Model 42, variable displacement, bi-directional, axial piston pump with a maximum delivery of approximately 18 gallons per minute. The pump supplies oil to a front and a rear MC05 Poclain, fixed displacement drive motor in a parallel path, completing the hydrostatic loop. The pump is servo controlled and activated by a forward/reverse lever on the operator's platform.

A charge pump is built into the propulsion pump and provides all the needed oil for loop charging and for pilot pressure. Oil for the charge pump is drawn from the discharge side of the system filter. A 20 bar (290 PSI) charge relief valve, located at the bottom of the propulsion pump, regulates charge pressure which is used to pressurize the pump/motor loop, to provide pilot oil to the pump servos and to provide pilot pressure for brake release.

Also built into the propulsion pump is a neutral start switch/back up alarm switch located on top of the pump near the forward/reverse lever. Immediately to the right of the switch is a solenoid valve, controlled by the emergency stop circuit and the brake switch, designed to remove pilot pressure to the servo and vent the oil from the brakes when deactivated.

The two drum drive motors, manufactured by Poclain, include a built in multi-plate brake. The motors are of a low speed, high torque design, eliminating the need for costly gear reduction. Hose connections at the top of the motor provide drive oil through ports 1 and 4. Port 2 is the case drain and Port 3 provides pilot pressure for the brake.

The relief valves on the propulsion pump can be opened for towing purposes by depressing the button on the end of each relief valve. Combined with the activation of the brake tow valve, this allows the machine to be towed without damage. The buttons will remained depressed until the engine is started and system charge pressure is obtained.

PROPULSION SYSTEM DIAGNOSTICS

INTERNAL LEAKAGE

All hydrostatic systems require charge pressure to function properly. This is because a hydrostatic system cannot operate at a negative pressure. The charge pump provides a positive pressure to the hydrostatic pump inlet. On the model 255/265, normal charge pressure is about 290 PSI and can be checked at port MP3 on the test station located in the left side of the engine compartment. Hydrostatic systems are designed to leak a small amount of oil from the pumps and motors for lubrication of parts and cooling, and in some instances, leakage is strictly due to operating clearances. The greater the system pressure the higher this leakage rate. Fresh charge oil will make up for normal system losses.

When components fail, leakage under pressure increases tremendously and is noted by a drop in charge pressure (the charge pump is not capable of keeping up with the hydrostatic system leakage rate). The condition of a hydrostatic pump/motor circuit can be determined by a simple charge pressure test at maximum engine RPM and normal operating temperature. Under the previously mentioned conditions (RPM and temperature), compare the charge pressure readings with the hydrostatic system at no load and maximum

STEERING SYSTEM

The steering system consists of a fixed displacement gear pump mounted onto the back of the vibration pump, a steering control valve (steering orbital) and a single steering cylinder. The oil supply for the steering circuit is provided by the common inlet with the vibration pump. Oil from the steering pump enters the steering control valve at port P. If steering is not required, oil will pass through the valve and discharge out port T and return to the filter/ reservoir. Oil in the L and R passages and in the cylinder is trapped and cannot flow, thus the machine maintains its steering direction.

When steering occurs, as dictated by the rotation of the steering wheel, the control valve meters a portion of oil from port P to the L or R passage (dependent upon the direction the wheel is turned) and to the cylinder. The resultant stroking of the cylinder causes the machine to turn. As oil is admitted into one side of the cylinder, oil must discharge from the opposite side and return to the control valve. This return oil discharges to port T and returns through the filter and to the reservoir.

There are three relief valves built into the steering circuit. Steering work pressure is controlled at 2030 psi maximum (140 bar) by a relief valve in port P. Steering work pressure can be checked on port MP7 at the pressure test station. Two port safety reliefs, set at 2900 psi (200 bar), are built into cylinder ports L and R. The port relief valves protect the steering cylinder and work lines from being over pressurized while the oil is trapped by the steering hand valve (orbital motor).

STEERING SYSTEM DIAGNOSTICS

If your steering system has poor performance, the first thing to do is check the pressure at test port MP7 while turning the steering in both directions until the pivot stops are reached. Steering work pressure will be slightly higher in one direction due to the area difference on the steering cylinder, but the system should not be operating at the 2030 psi level except when turning against the pivot stops.

If the pressure at test port MP7 is operating close to, or at 2030 psi, check for mechanical binding in the steering pivot pin.

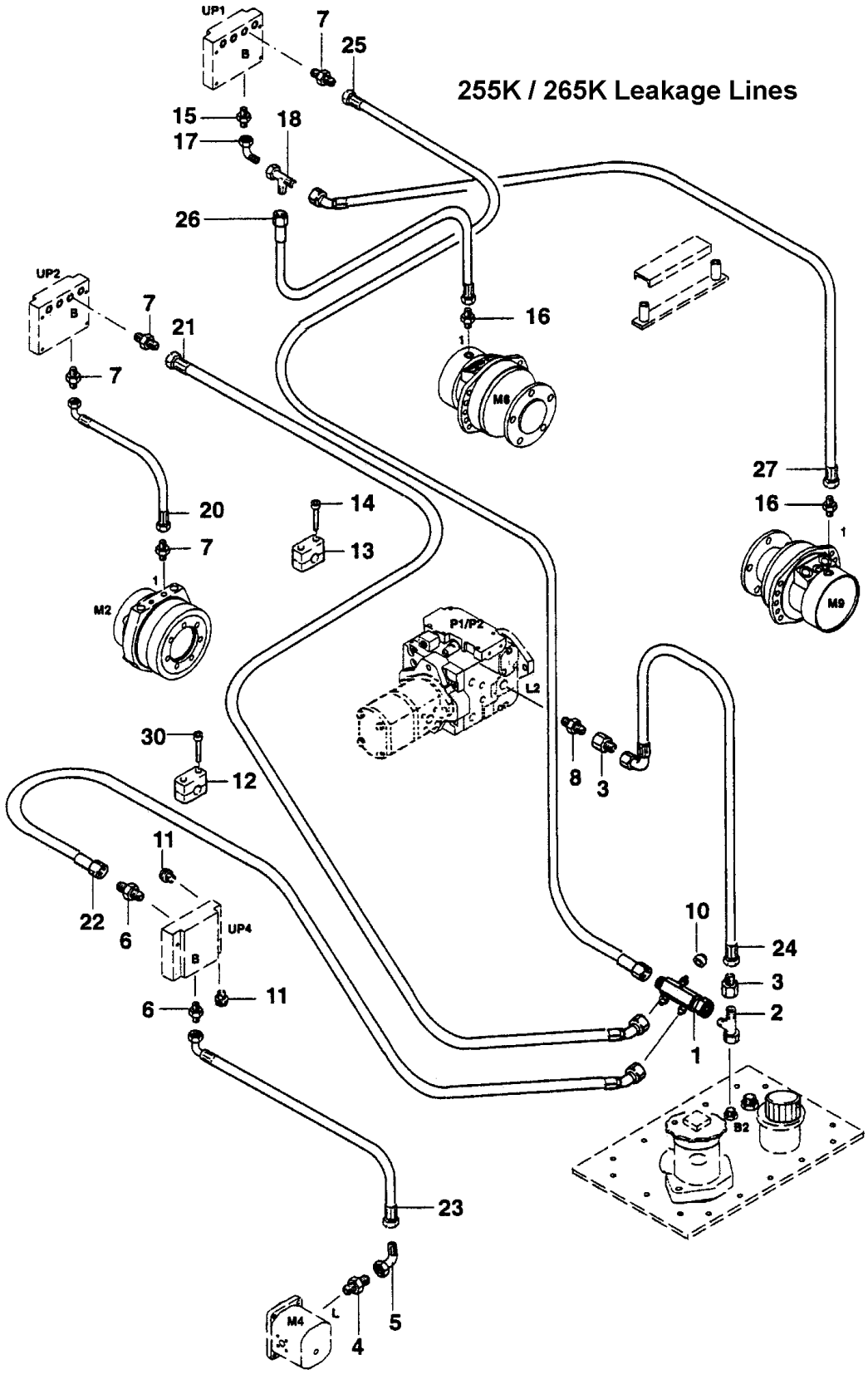
If the pressure at test port MP7 is found to be low, cap the two steering cylinder lines and rerun the pressure test.

If the pressure reading is 2030 psi with the cap lines, check the steering cylinder for internal leakage.

If the pressure is low with the steering cylinder lines capped, the problem is in the steering valve (orbital motor) or the steering pump. The first place to check is the steering valve.

The steering pump can be tested by using a relief valve plumbed directly into the pump outlet line. Start the system with the relief valve backed completely out, then slowly increase the relief setting to 2030 PSI. If you can not develop steering pump pressure of 2030 psi, replace the steering pump.

NOTES


255K / 265K Leakage Lines
UP1
B
7
25
15
18
17
26
UP2
B
7
21
7
16
1
M6
20
14
7
13
1
M2
27
16
1
M9
P1/P2
L2
30
12
8
3
11
22
6
UP4
B
6
11
10
24
3
2
1
B2
23
M4
L
4
5

SECTION FIVE

POWER TRAIN

DRUM REMOVAL

1. Block the machine before start of disassembly.

2. Remove the front or rear drum scraper depending on which drum is to be removed.

3. Remove the left and right cover plates (item #6) by removing the four M8x12 Hex. bolts (item # 38).

4. Although it is not considered necessary to remove the water tank, it can make handling the hydraulic hoses easier. The tank is held in place with four buffer nuts and one water line connection.

5. Disconnect, plug, and tag the hydraulic lines to the drive and vibration motors. The drain line for the front vibration motor can not be loosened until the left front support bracket (item #3) is ready for removal. A check valve located at the support bracket manifold prevents loosening the hose fitting because of a lack of wrench clearance. Removal of this hose connection requires loosening the four socket head capscrews holding the hose manifold. Once the support bracket is free of the drum and machine, the manifold can be pushed in enough to loosen the return hose fitting.

6. Support the frame and remove the four buffer nuts (item #40) for the left and right buffers.

7. Remove the right and left drum support brackets (items #2 & #3) by removing the eight M16x40 Hex. bolts (item #35).

8. The drum is now free to be removed from under the machine. Jack the machine up to get the needed clearance and roll the drum from under the machine.

DRIVE MOTOR REMOVAL

CAUTION: The drum drive motor should not be removed until the drum is removed and sitting on end with the drive motor up. If this procedure is not followed, damage to the exciter shaft bearings may occur.

1. Set the drum on its end with the drive motor facing up.

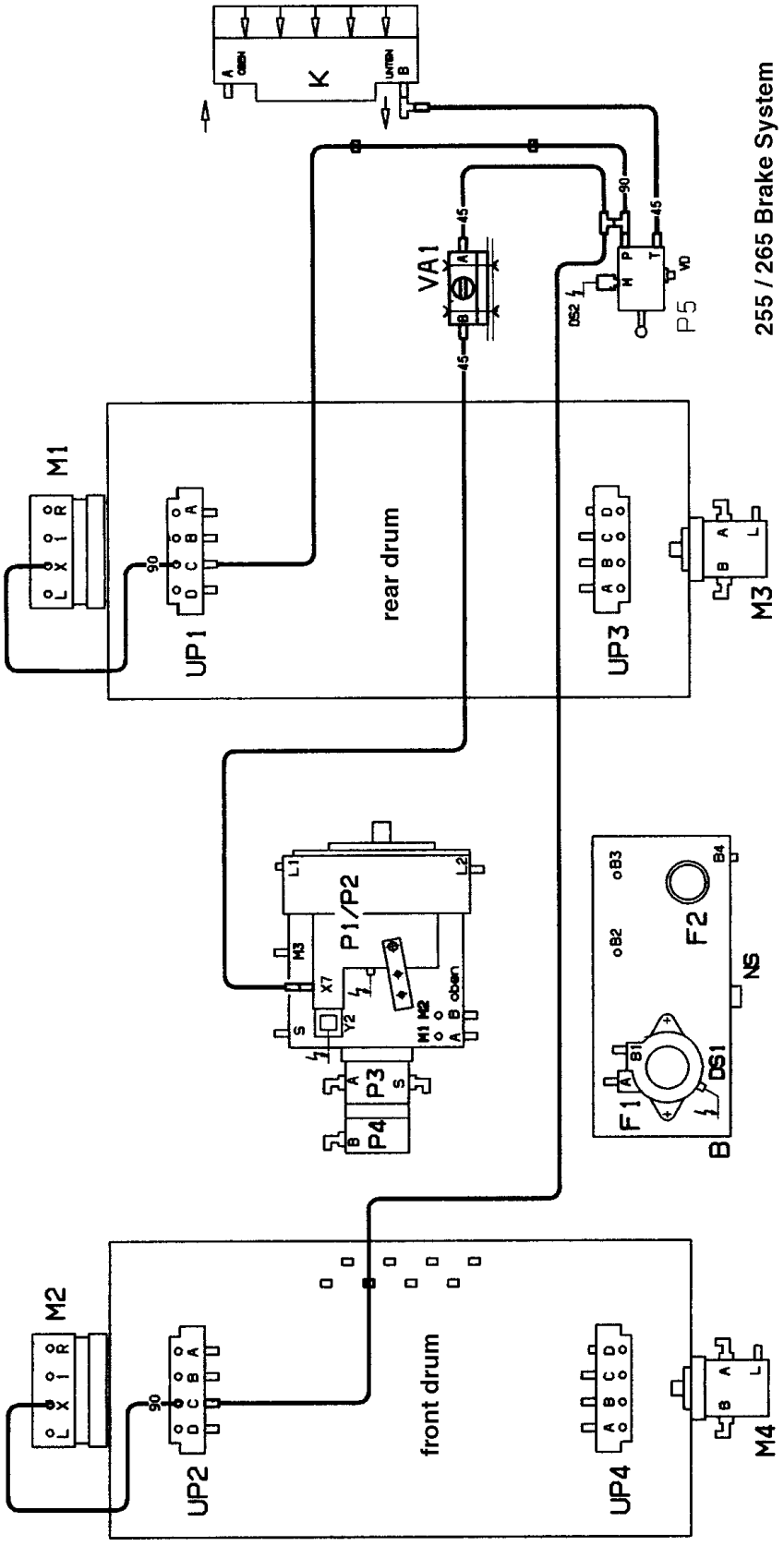
2. Remove the buffer bracket (item #11) by removing the four M16x45 bolts (item #36).

3. Remove the eight M12x35 bolts (item #34) holding the motor adapter flange.

4. Install two of the M12x35 bolts in the two jacking bolt holes in the drive motor flange. Turn the two bolts in at an even rate to jack the motor flange out of the drum.

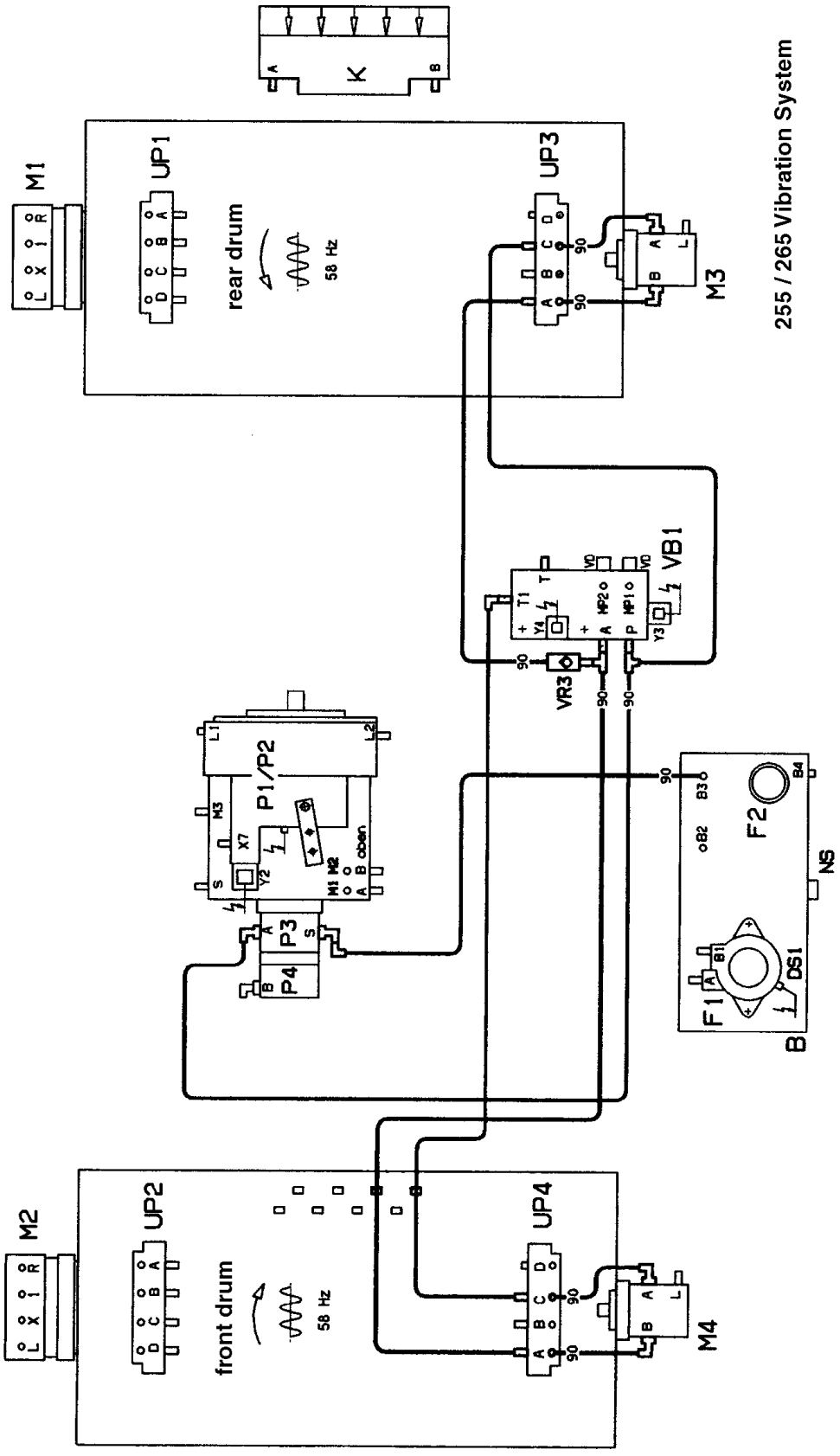
5. Remove the flange and motor as one assembly. The bearing supporting the exciter shaft is also in the motor adapter flange. Motor removal should be done with caution to avoid damage to the exciter shaft and bearings.

6. Remove the seven M16x40 socket head capscrews (item #32) to separate the motor and adapter flange.



255 / 265 Brake System

VIBROMAX


K
M1
UP1
rear drum
58 Hz
UP3
M3
VB1
VR3
P1/P2
P3
P4
F2
F1
DS1
NS
M2
UP2
front drum
58 Hz
UP4
M4

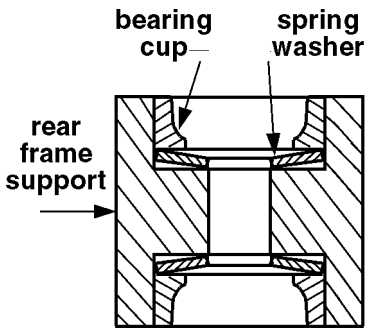
VIBROMAX

SECTION EIGHT

STEERING SYSTEM

STEERING PIVOT ASSEMBLY

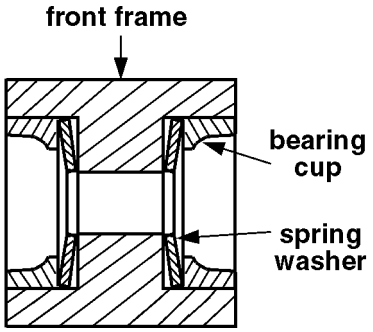
1. Install the spring washers (item #14) and bearing cups (item #13) into the rear frame support. Use only properly sized driving tools to avoid damage to the bearing cups. Note the following drawing for proper installation:



2. Press the bearing cones (item #13) onto the upper and lower bearing caps (item #3).
3. Slide the articulation joint support (item #1) over the rear frame support and block into a proper aligned position.
4. Install the bearing seal into the lower bore of the articulation joint support making sure it is properly seated.
5. Install the lower bearing cap assembly (items #3 & #13) into place.
6. Install the six M10x25 capscrews using Loctite 270. Evenly tighten the capscrews to draw the bearing cap into position.
7. Torque the bearing cap capscrews to 32 ft lbs. (44 Nm).
8. Repeat steps 4 through 7 to install the upper bearing cap.
9. Connect the steering cylinder by installing the pin and pin lock.

HORIZONTAL PIVOT INSTALLATION

1. Install the spring washers (item #17) and bearing cups (item #16) into the front frame support. Use only properly sized driving tools to avoid damage to the bearing cups. Note the following drawing for proper installation:



2. If the bearing pins (item #4) are being replaced, press the new pins into the support plate (item #2) and articulation bearing support (item #1).
3. Press the new bearing cones (item # 16) onto the bearing pins (item #4).
4. Install the front and rear seal rings (item #18) over the bearing cones.
5. Using proper slinging and support procedures lift the front frame assembly into the articulation joint support. Caution must be used to avoid damage to the bearing cup coating.
6. Install the support plate (item #2) into position and secure with the six M16x1.5x60 bolts (item #20) and Loctite 270.
7. Evenly tighten and torque the plate bolts to 140 ft lbs. (190 Nm).

ROPS MAINTENANCE

Before operating the machine, be certain the ROPS is fastened properly and has not been damaged in any way. The seat belt is an important part of the roll-over protective structure. The operator must wear the seat belt at all times when operating the machine.

Perform the following checks every 500 hours.
Note that every ROPS is delivered with a certification tag.

- Check the torque on the ROPS mounting bolts. If necessary retorque the bolts.
- Check the operator's seat and mounting parts for the seat belt. Be certain the seat and seat belt bolts are tight.
- Keep the seat belt clean and dry. Check the seat belt buckle for proper operation. Seat belts should be cleaned with soap and water. Damage can occur if bleach or dye is used.

ROPS DAMAGE

⚠ ***Do not attempt to weld or straighten the ROPS. Do not modify the roll-over protective structure in any manner. Unauthorized modifications such as welding, drilling, cutting or attaching parts could weaken the ROPS structure.***

If the ROPS has been damaged due to machine roll over, by striking an object, or by being hit by an object, the damaged parts must be **REPLACED** before placing the machine into operation. After such damage has occurred, check for the following:

- Check the ROPS for compression, bending, cracks, notches, etc.
- Inspect the ROPS mounting bolts. Retorque the bolts.
- Check the operator's seat and seat belt along with all mounting hardware for signs of damage. Replace all damaged parts.

ROPS BOLT TORQUE

Twelve bolts with washers attach the ROPS to the machine's rear frame. These 16mm grade 8.8 bolts are tightened to a torque of 140 ft. lbs. (190 Nm.).

The optional sunroof is fastened to the ROPS with 4 bolts and washers. Torque on these bolts is 16 ft. lbs. (22 Nm.).

ITEM	PART #	QTY	DESCRIPTION
0	87130/20120	1	Kit, road lights
1	08102/02211	1	Switch, light S18
2	08102/02212	1	Switch, hazard warning S19
3	08102/02136	1	Switch, turning signal S20
4	08102/02121	1	Relay, flasher K9
5	08412/05100	3	Fuse, 10 amp, F5, F12, F13
6	08412/05050	2	Fuse, 5 amp, F14, F15
8	08424/01065	1	Light fixture, left front
9	08424/01070	1	Light fixture, right front
10	07130/20121	1	Cable harness, front
11	08424/01075	1	Light fixture, left rear
12	08424/01080	1	Light fixture, right rear
13	07130/20122	1	Cable harness, rear
14	02023/04016	8	Capscrew, M4x16
15	02204/00004	8	Lockwasher, M4
16	08420/03008	4	Bulb, flasher
17	08420/03009	4	Bulb, working light
18	02322/00021	15	Plastic tie strap

ROAD LIGHT KIT INSTALLATION

Install the front and rear harnesses making sure to string them through the support tubes welded onto the frame. The front harness will plug into connector X5 located in the instrument panel column. The rear harness will plug into connector X9 located in the right side of the engine compartment.

Install the front and rear light fixtures into their proper locations (left or right, etc.).
Lt. front = black/white to turn signal, yellow/white to headlamp.
Rt. front = green/black to turn signal, yellow to headlamp.
Lt. rear = black/white to turn signal, yellow/white to tail lamp.
Rt. rear = green/black to turn signal, yellow to tail lamp.

Install the bulbs into the light fixtures. The larger bulb is for the turn signal.

Install the three instrument panel switches in their proper locations (see drawing)

Install the K9 relay in the proper location under the right side panel.

Install 10 amp fuses in locations F5, F12, and F13 on the fuse rack.

Install 5 amp fuses in locations F14 and F15 on the fuse rack.

Use the plastic tie straps to secure wire harnesses as required.

Test all lights and switches for proper operation.