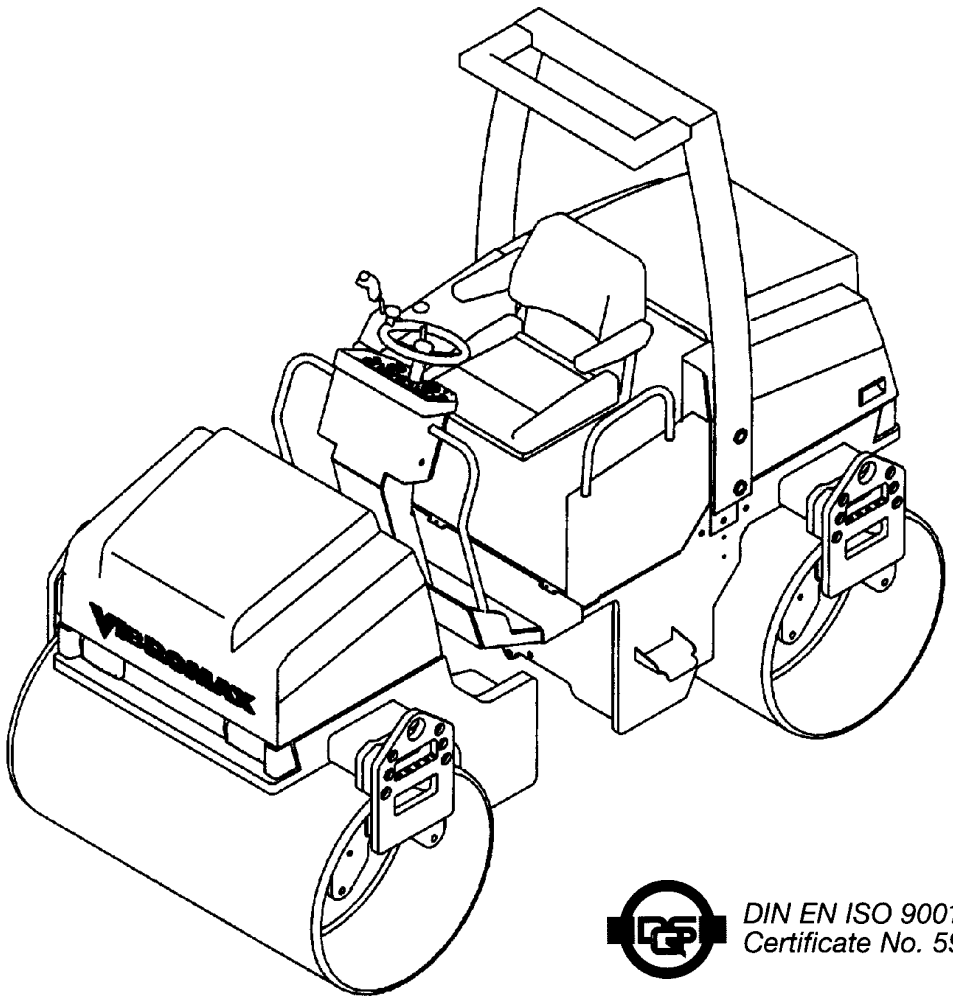
VIBROMAX

355 / 365 TANDEM ROLLER
355K / 365K COMBINATION ROLLER
455 / 465 TANDEM ROLLER
455K / 465K COMBINATION ROLLER

SERVICE MANUAL SM63005

January 2002



DIN EN ISO 9001
Certificate No. 59557-01

MACHINE DESCRIPTION

The Vibromax Model 355/365 is a 3.5 metric ton tandem drum roller with articulated steering, hydrostatic propulsion and a hydrostatic vibratory system. The Model 455/ 465 is a larger 4.5 metric ton tandem drum roller. Both the 3.5 and 4.5 ton machines offer a “K” model option. The “K” model is a combination machine offering a steel front drum and pneumatic tires in place of the rear drum.

Power is provided by a 134.4 cubic inch (2197 cc) Kubota, four cylinder diesel engine, Model V2203-E, rated at 46.6 hp SAE net (34.3 kW) at 2600 RPM.

The operator’s platform was designed using modern techniques to assure good visibility and operator comfort. The operator’s seat box can be tilted forward to gain easy access to the machine’s hydraulic pumps and valves.

Both tandem roller models operate at a vibration frequency of 3300 vibrations per minute (55 Hz). Vibratory operation is available for either the front drum or both drums. A two frequency/two amplitude option is available for both the 3.5 and 4.5 metric ton machines. The second vibration frequency is 3000 vpm. (50 Hz). On the “K” model only the front drum will vibrate.

The hydrostatic drive system allows for infinitely variable ground speed. All machines are equipped with a two speed arrangement which provides greater control in the 0 to 4 mph range. The hydrostatic drive system consists of a piston pump and front and rear drum drive motors. Hydraulic release, spring applied parking brakes are incorporated into the design of the drum motors. On the “K” model two smaller hydraulic motors are used to drive the right and left side pneumatic tires. Brakes are also incorporated into “K” model drive motors.

As a factory option, these machines offer an articulation offset of five inches (127 mm) to the left or right of center position. This feature is most useful when compacting asphalt on tight turns.

These machines are equipped with an intermittent sprinkler system for use in asphalt applications. The water tanks are made of a rust proof synthetic material. The system is a pressure spray type with sprinkler tubes fitted with nozzles. The system controls are designed to allow variable off times in the automatic mode to minimize water usage. The pneumatic “K” model offers separate sprinkler systems for the front and rear of the machine to allow the use of special soap solutions on the rear tires. Both systems have variable controls.

Each drum is equipped with front and rear scrapers. The scrapers are spring loaded against the drum and can easily be moved away from the drum for soil and gravel compaction jobs. Scrapers are also available on the “K” model. A cocoa mat option is also available.

As sold in the United States the machines are fitted with a Roll Over Protective Structure (ROPS). A seat belt is provided as part of the ROPS system.

As sold in the United States the machines are also fitted with a standard Back-up alarm system and an emergency stop system.

All models include a centralized testing station for quick and easy diagnostics for the various hydraulic systems.

Road lights, work lights, FOPS, and a sun roof are four standard options. Other additional equipment such as beacon lights, slow moving machine signs, etc., are available as special order items. If you have special needs please contact your dealer.

Do not make any modifications or repairs to the machine ROPS. If your ROPS is damaged, replace it with new parts. Welding, drilling, etc. can weaken the ROPS structure.

Metal chips or debris can cause eye injury. Wear eye protection when you service this machine. If you use a hammer to drive hardened pins or for other service, use a hammer with a soft face (brass, plastic, etc.).

Unauthorized modifications to cast iron parts can cause injury or death. Welding can cause cast iron parts to break. Do not use welding to repair or attach items to cast iron parts on this machine.

Batteries produce explosive gases. Protect from and flames away. Ventilate when charging. Always wear eye protection when working near batteries. Do not wear jewelry or watch bands when working on batteries.

When you install a battery or use a booster battery, connect the negative ground cable last. When you remove a battery or booster battery, disconnect the negative ground cable first.

Unauthorized modifications to this machine can cause injury or death. Never make modifications to this machine without prior written approval from Vibromax.

The following decal is located on the left side of the engine compartment on the brake hand pump. Check the decal daily. Clean or replace as needed.

DIESEL FUEL SPECIFICATION

If fuel is stored for a long time, foreign particles or water can collect in the fuel storage tank. Many engine problems are caused by contaminated fuel. Store fuel outside and keep the fuel as cool as possible. Drain water from the fuel storage tank at regular intervals.

NOTE: Paraffin crystals will start to form in fuel when the fuel temperature falls below the fuel's cloud point. These paraffin crystals will clog the fuel filter and cause the engine to stop or lose power. At ambient temperatures above 32°F (0°C) use #2 diesel fuel. At temperature below 32°F (0°C) use #1 diesel fuel.

Different brands of fuel can exhibit different properties. Make sure that the #2 diesel fuel you use meets the following minimum requirements.

MINIMUM REQUIREMENTS FOR #2 DIESEL FUEL:

Maximum cloud point	-10°F (-23°C)
Maximum pour point	42°F (6°C) below the lowest ambient air temperature at which the engine must start
Cetane number, min	40 (45 to 55 in winter or at high altitude)
Max. sulphur content, by weight	0.50%
Max. water content & sediment by volume	0.05%
Max. ash content, by weight	0.01%
Max. carbon residue (10% point)	0.20%
Distillation temperature @ 90% point	540 to 625°F (282-329°C)
Distillation temperature @ end point	675°F (357°C)
Minimum flash point	125°F (52°C)
Viscosity at 100°F (38°C)	
Centistokes	2.0 to 4.3
Saybolt Universal Seconds (SUS)	32 to 40
Copper strip test, 3 hours @ 212°F (100°C)	No 3 ASTM
Minimum API gravity	30

ENGINE OVERHAUL

The Kubota Model V2203-E engine in your machine is warranted by Kubota. If you experience problems with your engine during the warranty period, contact your local Kubota repair center. This manual is not intended to supersede engine overhaul material provided by Kubota. Beyond the warranty period, it is highly recommended that you obtain the Kubota Engine Overhaul Manual 97897-01096 from your local dealer for proper overhaul instructions. The Kubota manual is also available through your Vibromax dealer by ordering part# V40102.

KUBOTA ENGINE WARRANTY

LIMITED WARRANTY ON INDUSTRIAL ENGINES AND REPLACEMENT PARTS EFFECTIVE MAY 1, 1988.

Our Warranty To You

We warrant to you, the original purchaser, that all parts (except those referred to below) of your new Kubota industrial engine, and replacement part purchased from an Authorized Kubota Industrial Engine or OEM Distributor in the United States will be free from defects in materials or workmanship during the following periods (Refer to (Kubota) Service Policy Book for further details):

1. Industrial engines excluding any oil field engine or application for 2 years or 2000 hours whichever occurs first.

1a. For 3 years or 3000 hours, excluding oil field engines or applications, a Major Component Warranty (M.C.W.) parts only, is offered. See Service Policy Book for details of coverage for M.C.W.

2. Replacement parts for 90 days.

What We Will Do

We will, at our option, repair or replace any part covered by this warranty which becomes defective, malfunctions or otherwise fails to conform with this warranty under normal use and service during the term of the warranty at no charge for parts or labor (Parts only for M.C.W.)

What You Must Do To Obtain Warranty Service

In order to obtain warranty repairs, you must deliver the product, together with proof of purchase, to an Authorized Kubota Industrial Engine Distributor or Dealer at your expense. The names and addresses of such Authorized Kubota Industrial Engine Distributors are listed in telephone directories or may be obtained by writing or telephoning us (Kubota).

1. Auxiliary power socket: This socket provides an outside source for 12 volt power.

2. Automatic vibration switch, MANUAL/AUTOMATIC: Push this switch IN to turn ON vibration circuits which automatically shut OFF vibration in the neutral travel position. In the OUT position the vibration circuits must be manually controlled by #5 switch.

3. High frequency vibration switch (option): Push the switch in to turn ON the high frequency low amplitude vibration on the two amplitude machines.

4. Low frequency vibration switch (option): Push the switch in to turn ON the low frequency high amplitude vibration on the two amplitude machines.

5. Vibration switch, ON/OFF: When switches #2 through #4 are set the switch on the forward/reverse lever controls vibration ON and OFF. In the AUTOMATIC vibration mode it is not necessary to actuate switch #5.

6. Front pressure sprinkler switch: AUTOMATIC/OFF/MANUAL pressure sprinkler control. Rotate switch clockwise for manual sprinkling or counterclockwise for automatic timed sprinkling. When in the AUTOMATIC position the timed cycle will start with the pump off.

7. Front interval sprinkler control: This potentiometer adjusts the off time interval when the pressure sprinkler switch is in the automatic position.

8. Rear pressure sprinkler switch: AUTOMATIC/OFF/MANUAL pressure sprinkler control. Rotate switch clockwise for manual sprinkling or counterclockwise for automatic timed sprinkling. When in the AUTOMATIC position the timed cycle will start with the pump off.

9. Rear interval sprinkler control: This potentiometer adjusts the off time interval when the pressure sprinkler switch is in the automatic position.

All components on a ladder diagram are labeled by a letter and a number. The letters on Vibromax diagrams are standard to all Vibromax diagrams and have the following designations:

D Delay relay

E Element (headlight, tail lights, panel lights, etc.)

F Fuse

G Battery, alternator

H Indicator (panel indicator light, horn, alarm)

K Relay

M Motor

P Gauges (hour meter, temperature gauge, etc.)

R Resistor

S Switch

V Diode

X Connector

Y Solenoid control valve

An identification chart on the diagram lists each component, the component description and its location on the diagram by line number.

The layout of all Vibromax electrical diagrams is similar in regards to the location of components. The battery will always be located on line 1, starter on line 2, alternator on line 3, etc. Slight variations can be seen on different models, but the major components will be located in the same general area of the diagram. This similar layout makes locating components easier as you become more familiar with the drawings.
Other items which may help you understand the diagram:

All drawings are shown without power

All components are shown in the OFF position

All relay contact #87 are normally open contacts

All relay contact #87a are normally closed contacts

Relay terminal #30 is power to the contacts (when possible)

Relay terminal #87 or #87a is power from the contacts (when possible)

Power to the control coil of the relay is always terminal #86

Ground for the relay control coil is always terminal #85

VOLTAGE CHECKS AT ALTERNATOR

With the engine OFF, connect the positive lead of a voltmeter to the B+ terminal and connect the negative lead to a good engine ground. The meter should read the system (12) volts.

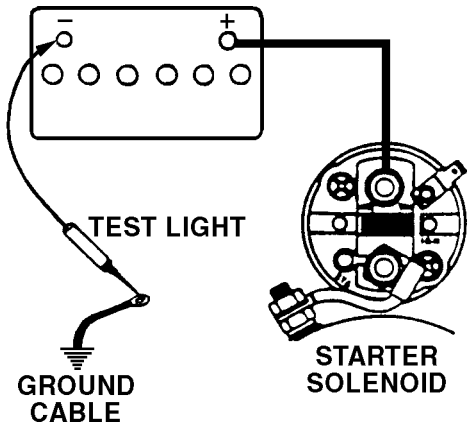
If no voltage is indicated, move the positive lead to the starter solenoid. If the proper voltage is recorded at the starter solenoid, the cable between alternator B+ and the solenoid is defective.

If there is still no voltage indicated, move the positive lead of the voltmeter to the battery positive terminal. If voltage is recorded, the cable to the starter solenoid is defective or the cable connection is corroded. If no voltage is indicated, check the battery negative ground cable.

To determine if current is available from the ignition switch to the alternator rotor field circuit, turn on the ignition switch, connect the voltmeter positive lead to the wire from the switch and connect the voltmeter negative to a good engine ground. The voltmeter should read system voltage.

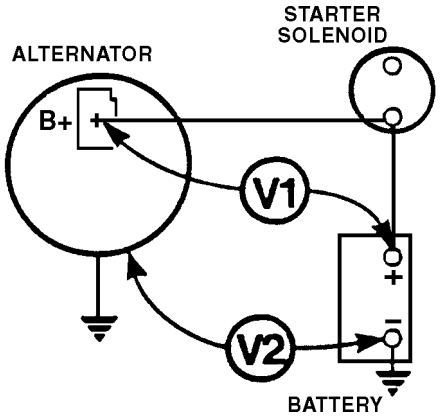
SYSTEM LEAKAGE

Remove the ground cable from the battery. Make sure the ignition switch is in the OFF position. Connect a test lamp between the negative battery post and the battery cable. The lamp should not illuminate with the key in the OFF position. If the lamp does illuminate, this is an indication of a power source going to ground. This will eventually discharge the battery.



CIRCUIT WIRING TEST

To determine if there is excessive resistance in the alternator wiring or connectors, perform the following two tests:
Run the engine at half throttle with the lights on. Place an accurate voltmeter at location shown as “V1” and measure the voltage. It should not exceed 0.5 volts. Place the voltmeter at location shown as “V2” and measure the voltage. It should not exceed 0.25 volts. Excessive voltage in either location is an indication of resistance in the cables or connectors.

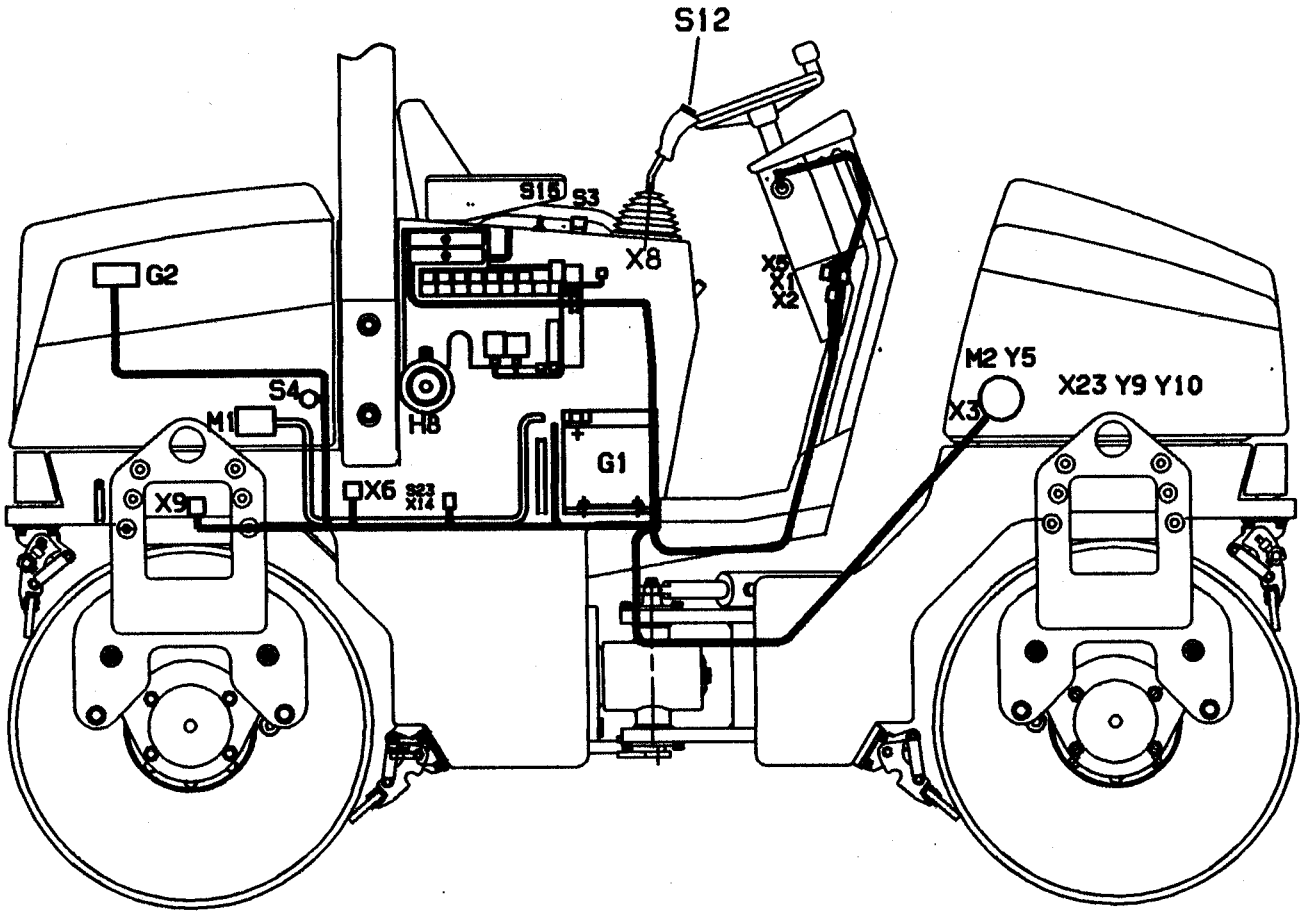


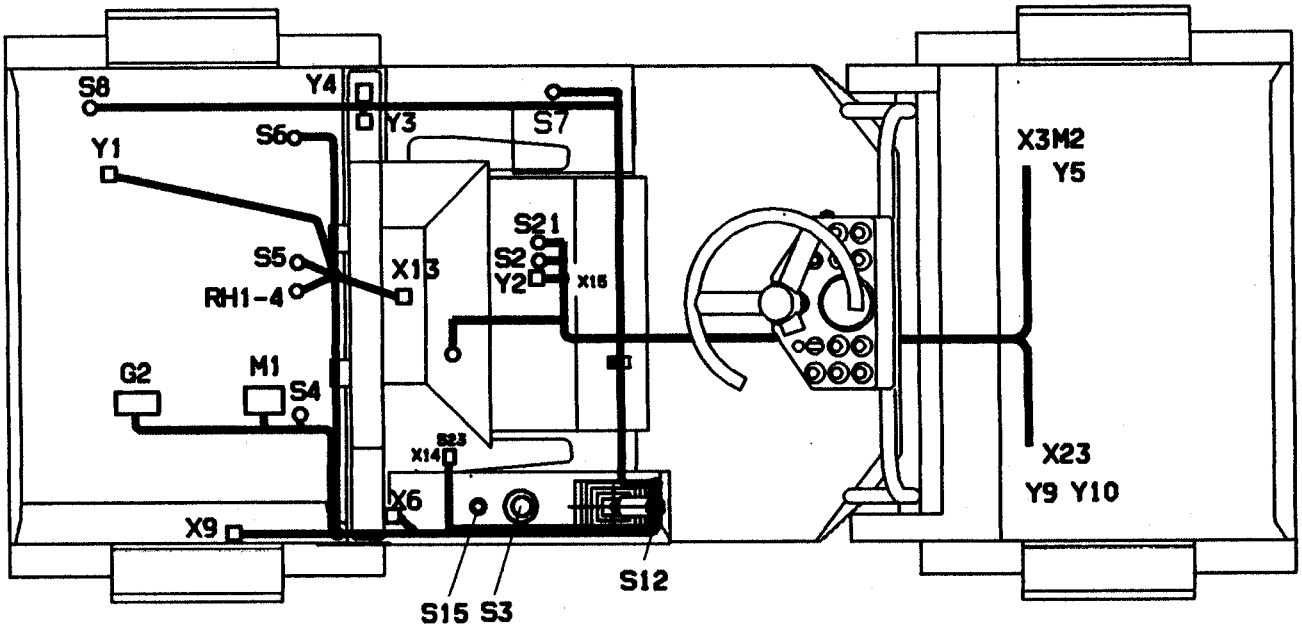
INSTRUMENTATION PANEL

The instrumentation panel receives power through fuse F1, by way of line 15, when the ignition switch is in the “ON” position. Power is provided through indicators H3, H4, H5, H6 and H7 to switches S4, S5, S6, S7 and S8. When a switch is closed, circuit current to ground is completed and the indicator will illuminate.

As a safety feature in the instrumentation circuit, engine shut down will occur if there is a loss of engine oil pressure or if the engine water temperature becomes excessive. Relay K2 [line 14] receives power from the ignition switch, through fuse F1. If switch S4 or switch S5 close during engine operation, ground for K2 relay is activated, opening its normally closed contacts [line 26]. This removes power from the D4 timer relay [line 26] and applies power to solenoid Y1, (line 26) shutting down the engine. A second function of D4 relay is to shut down the engine when the temperature and oil pressure limits are exceeded.

WIRE HARNESS LAYOUT





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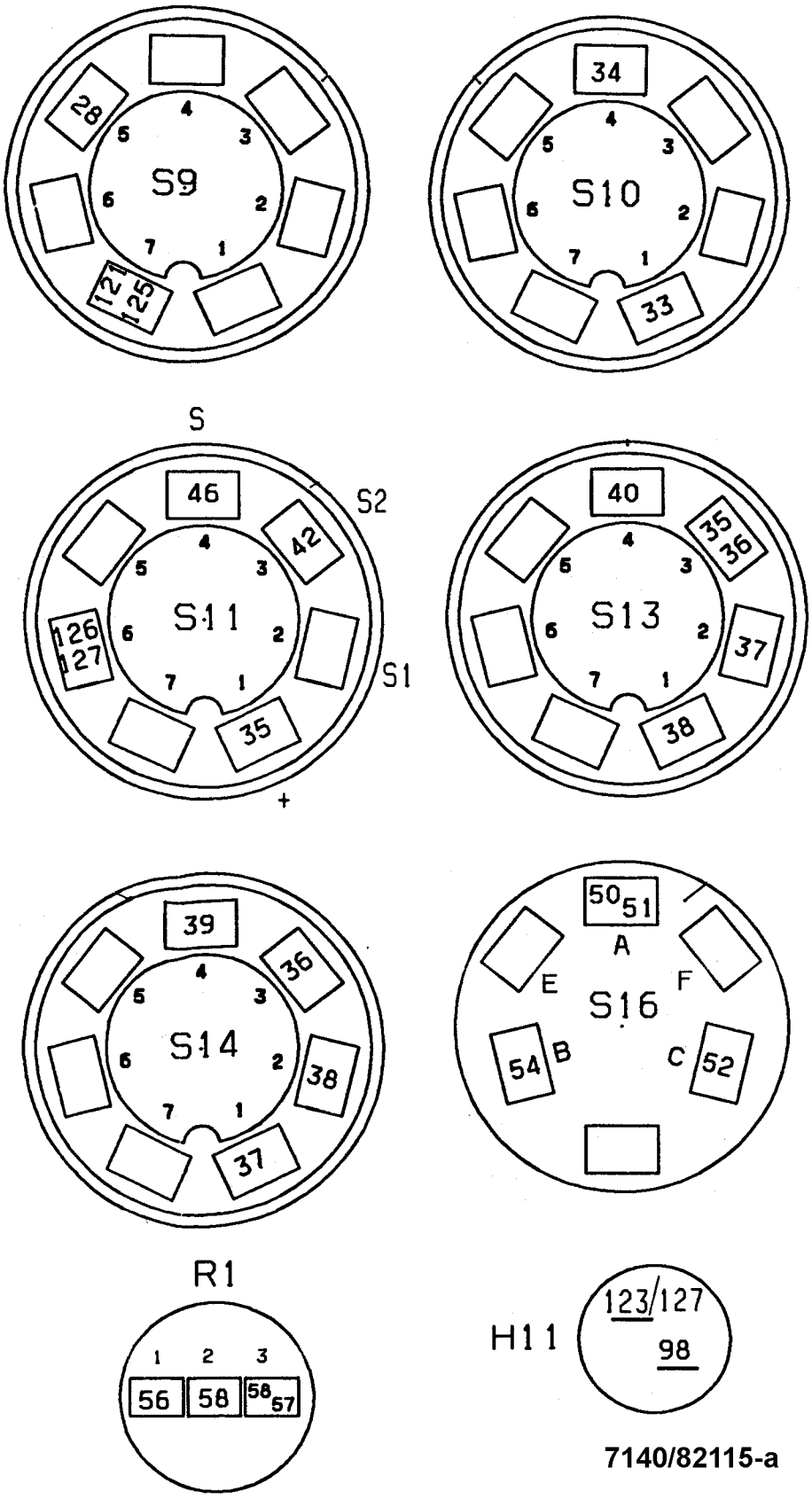
WIRE HARNESS 7140/82115

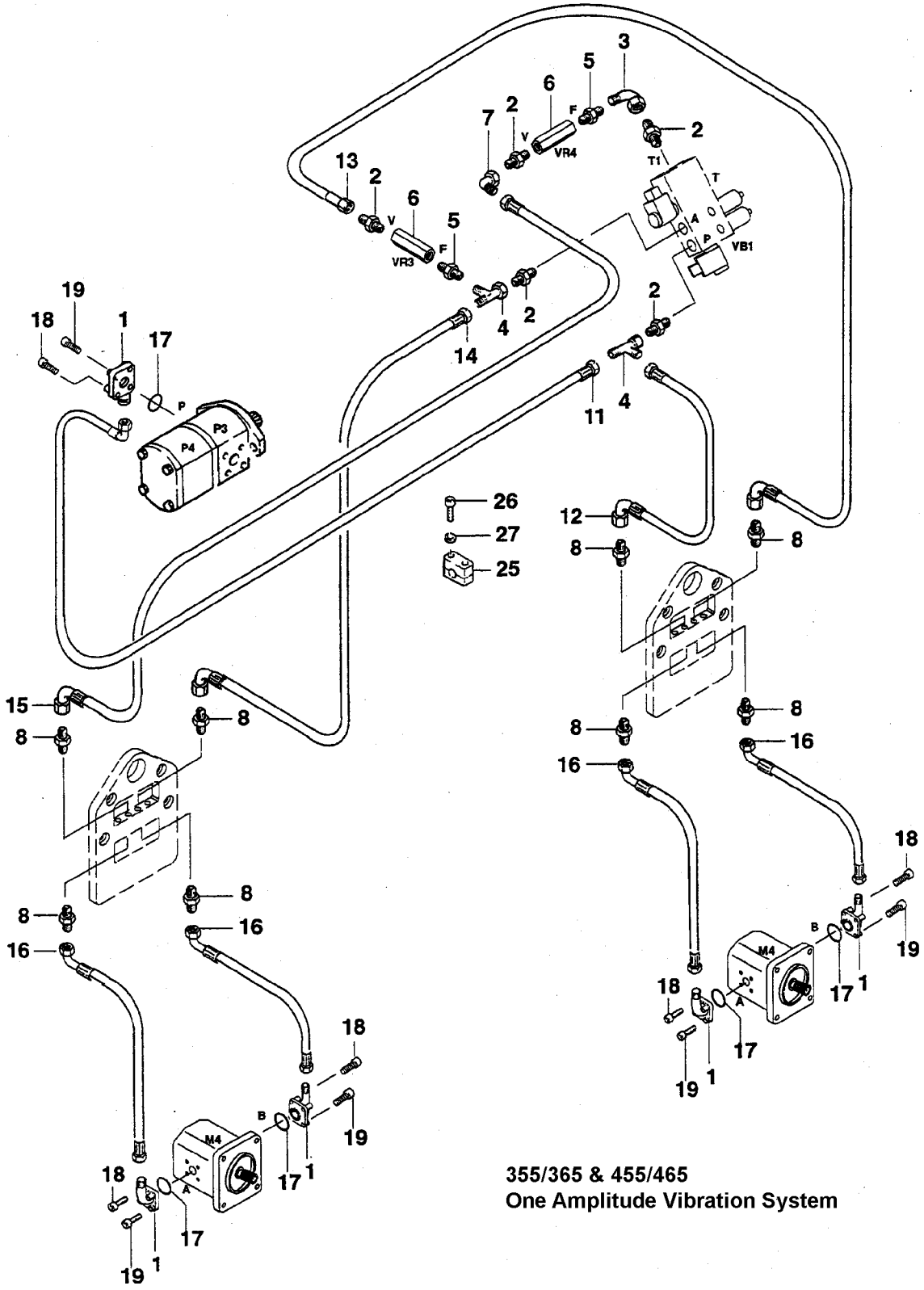
WIRE HARNESS 7140/82115 (instrument panel for two amplitude)



7140/82115-a

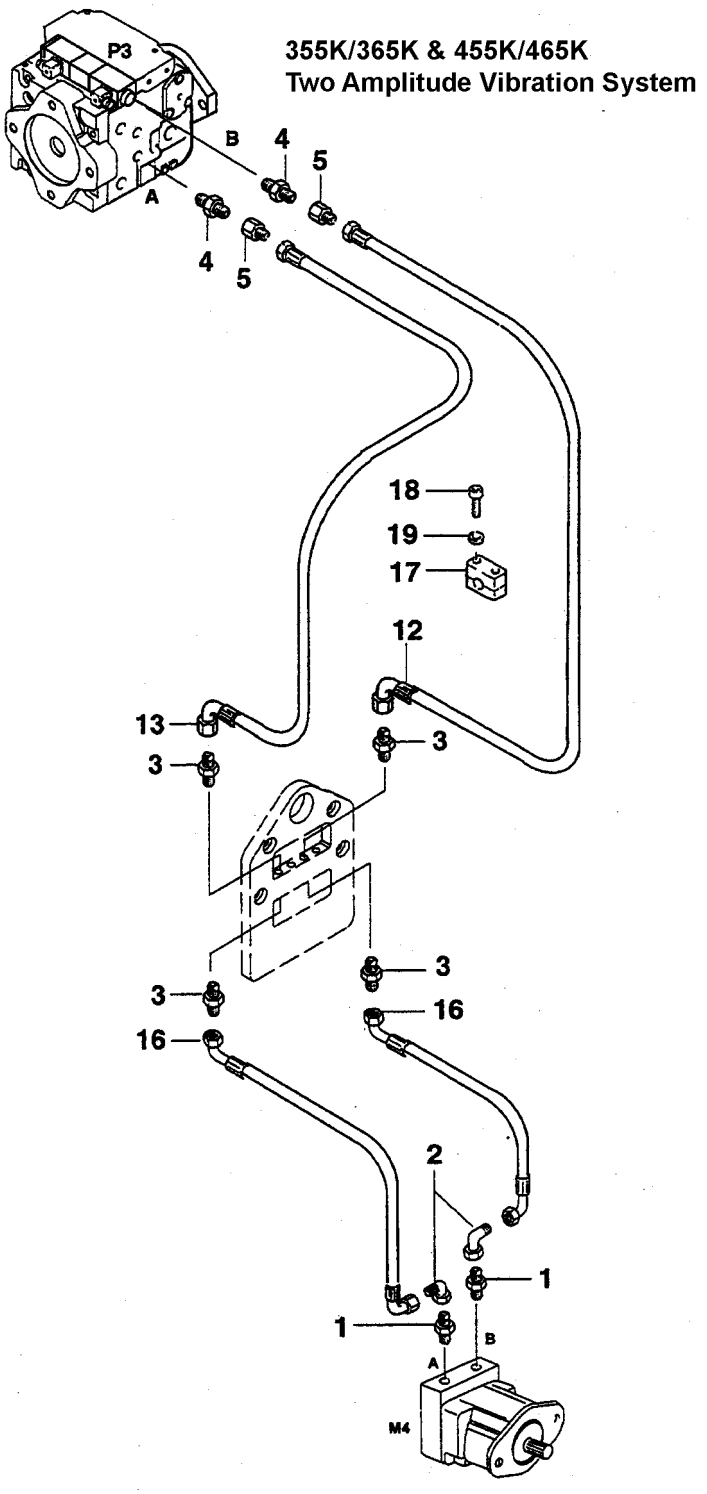
SECTION FOUR

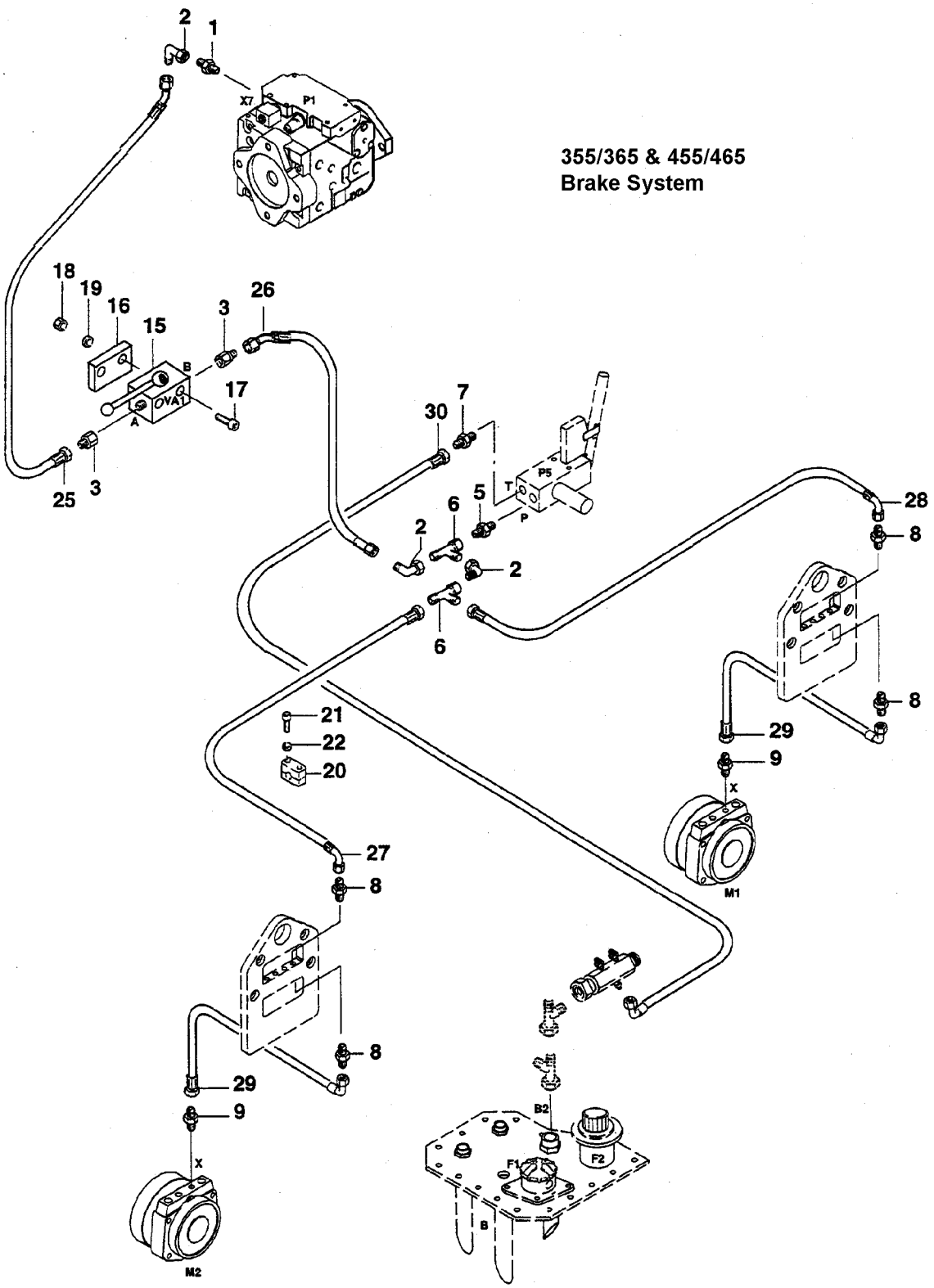
HYDRAULIC SYSTEMS



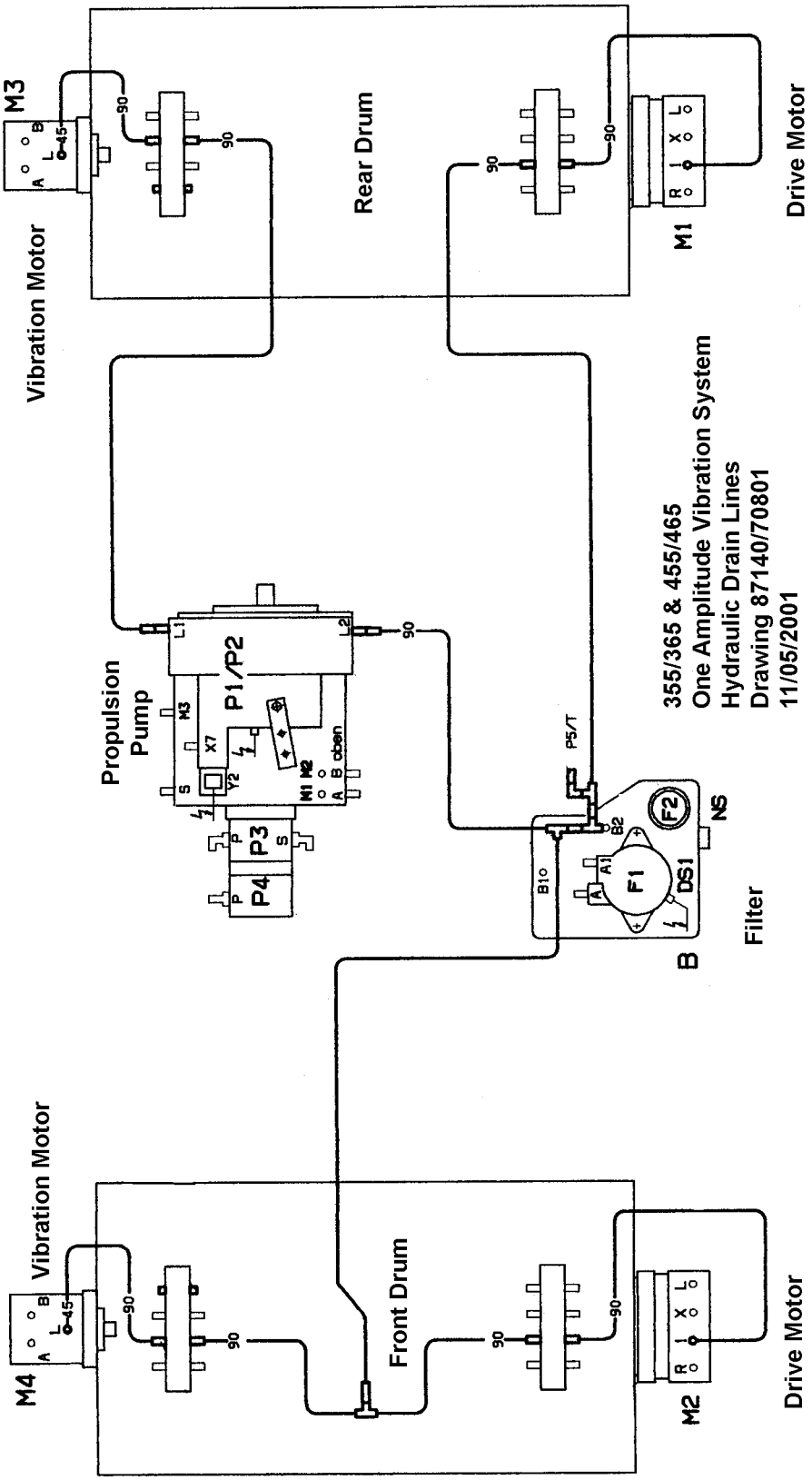
355/365 & 455/465
One Amplitude Vibration System

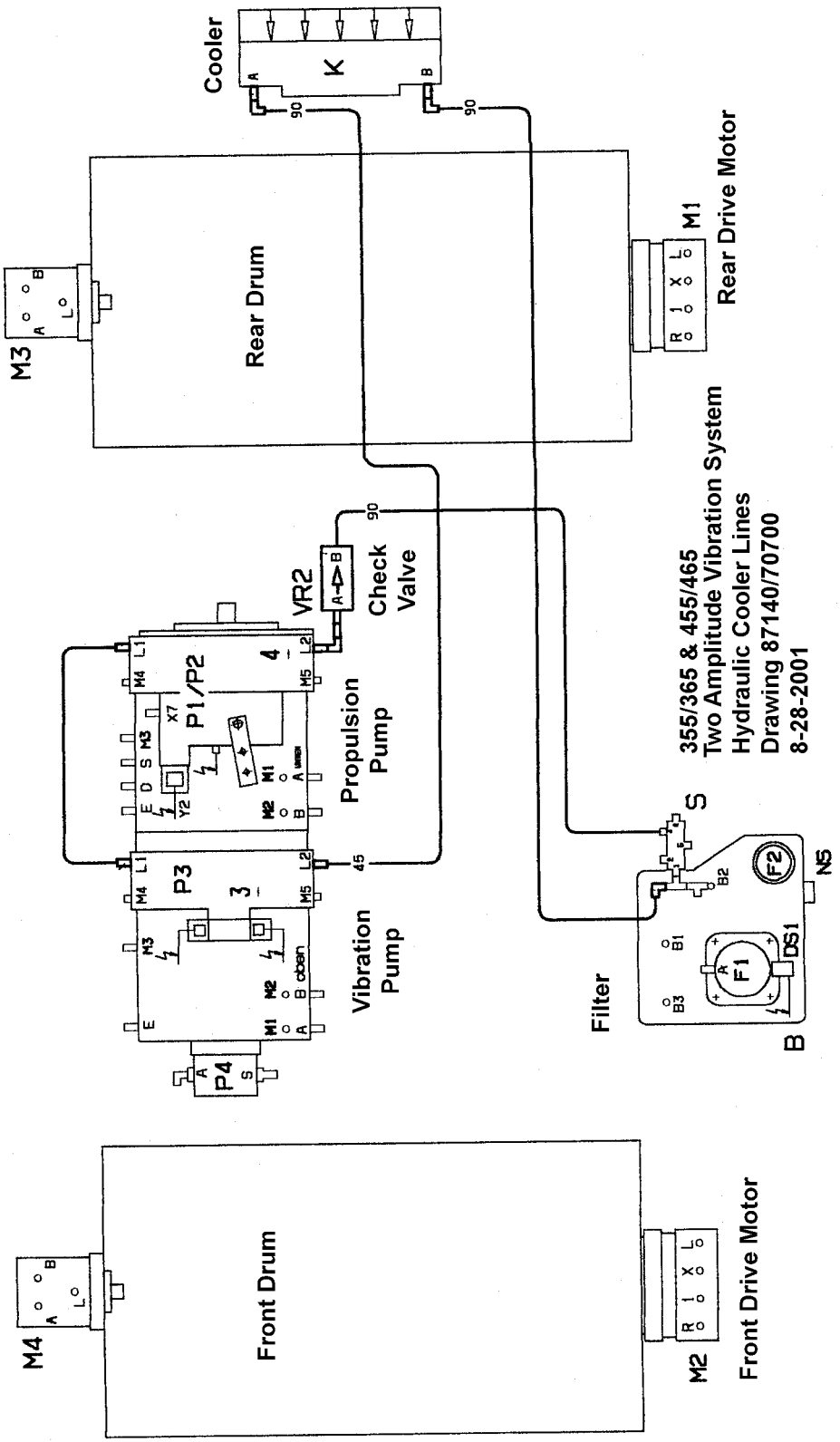
VIBROMAX

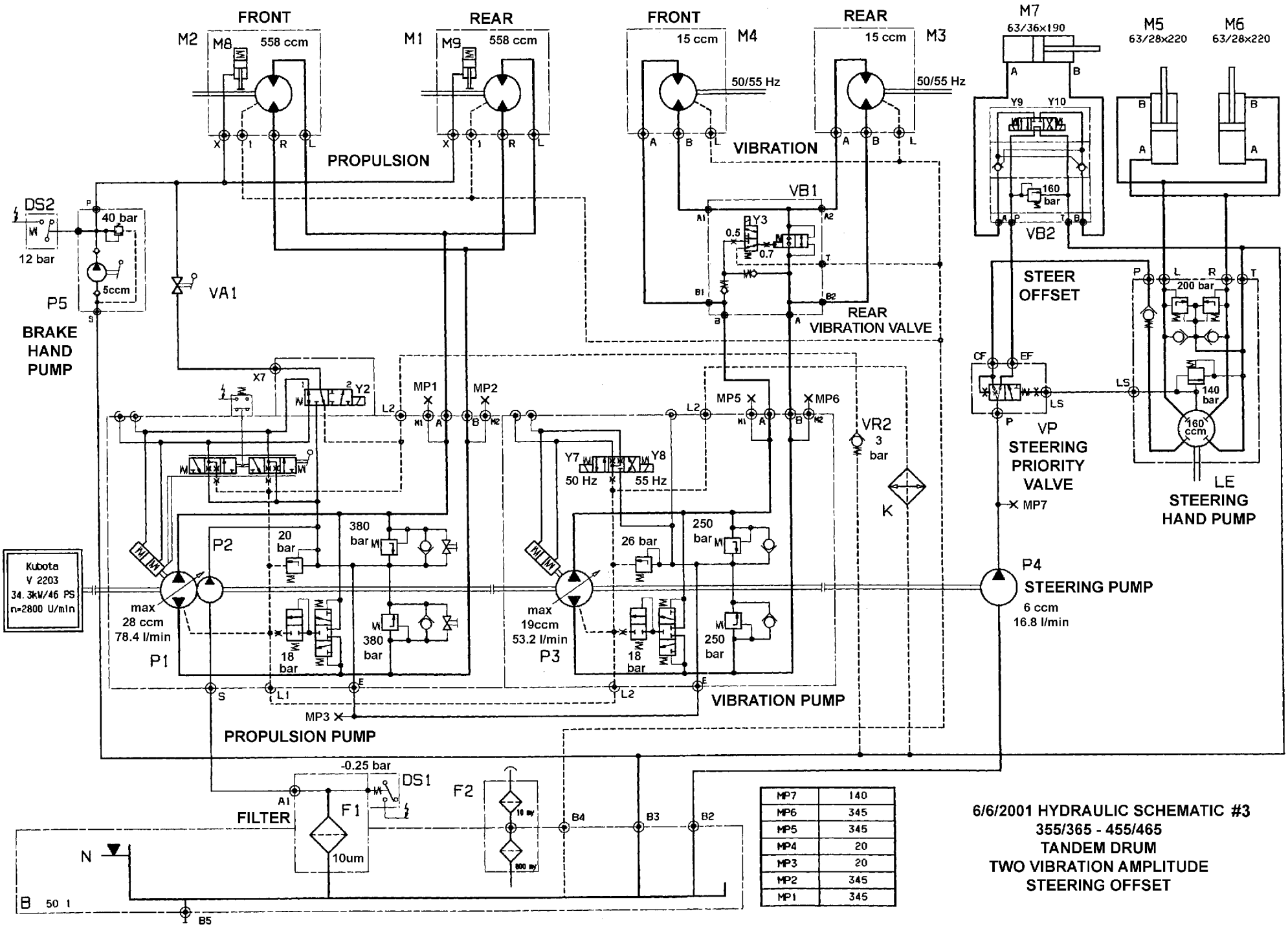

355K/365K & 455K/465K
Two Amplitude Vibration System
P3
B
A
4
5
4
5
18
19
17
12
13
3
3
3
3
16
16
2
1
1
B
A
M4


355/365 & 455/465
Brake System
2
1
X7
P1
18
19
16
15
3
26
B
A
17
25
3
30
7
P5
T
P
5
6
2
2
6
28
8
8
29
9
X
M1
21
22
20
27
8
8
29
9
X
M2
B2
F2
F1
B

HYDRAULIC DRAINS LINES



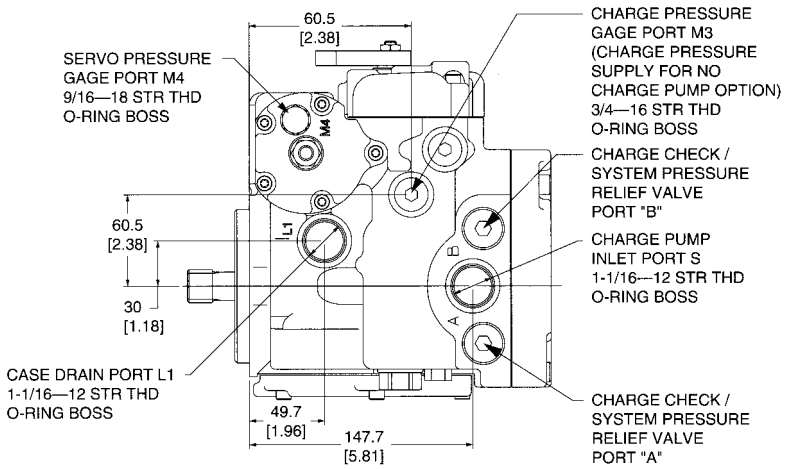

Cooler
K
Rear Drum
M3
M1
Rear Drive Motor
VR2
Check Valve
P1/P2
Propulsion Pump
P3
Vibration Pump
P4
355/365 & 455/465
Two Amplitude Vibration System
Hydraulic Cooler Lines
Drawing 87140/70700
8-28-2001
Filter
F1
F2
DS1
Front Drum
M4
M2
Front Drive Motor



MP7	140
MP6	345
MP5	345
MP4	20
MP3	20
MP2	345
MP1	345

6/6/2001 HYDRAULIC SCHEMATIC #3
355/365 - 455/465
TANDEM DRUM
TWO VIBRATION AMPLITUDE
STEERING OFFSET

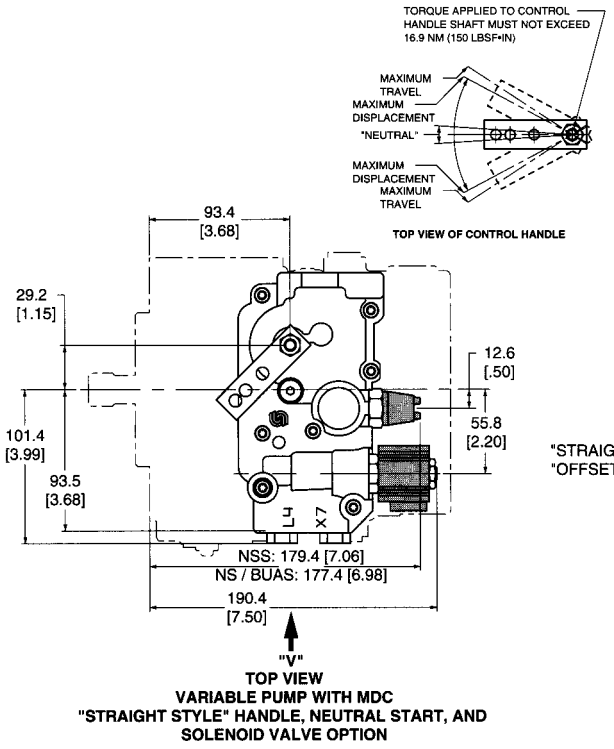
SAUER SUNSTRAND SERIES 42 PUMP



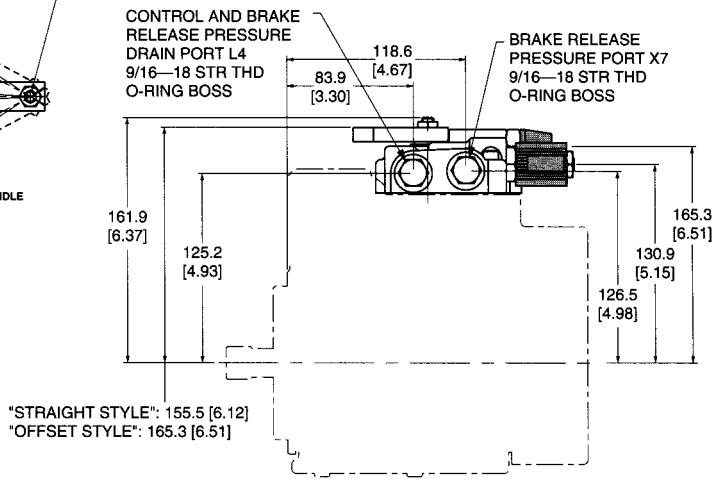
VIEW IN DIRECTION "V"
RIGHT SIDE VIEW (BASE UNIT WITH MDC AND SUCTION FILTRATION)

Manual Displacement Control with Neutral Start Switch and Solenoid Override Valve

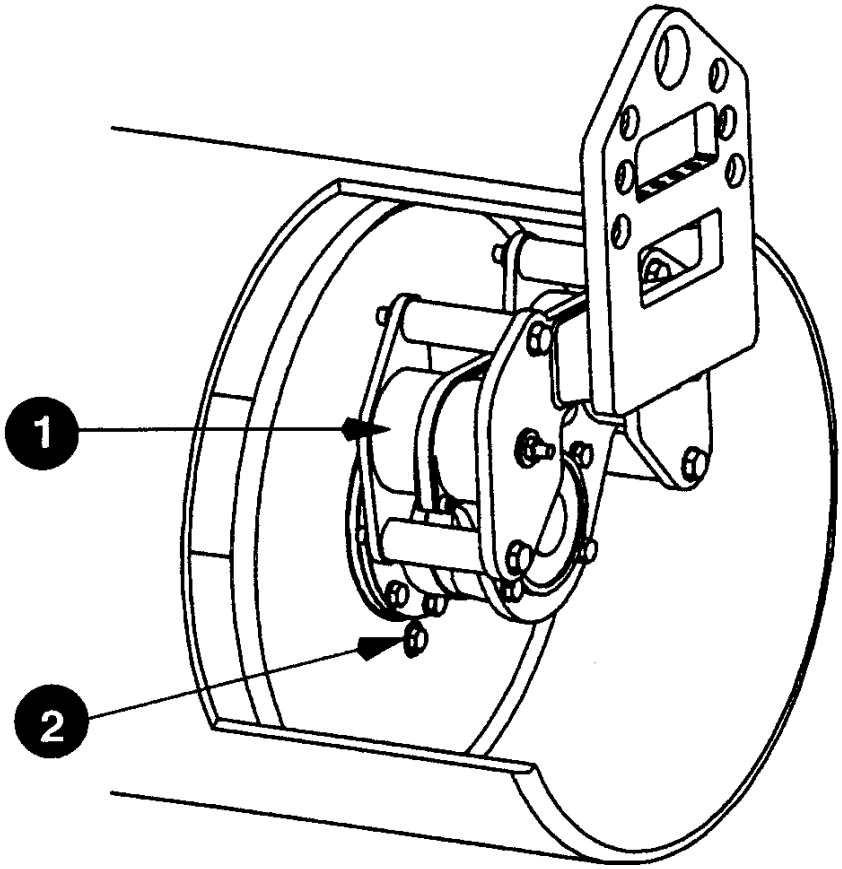
mm
[in.]



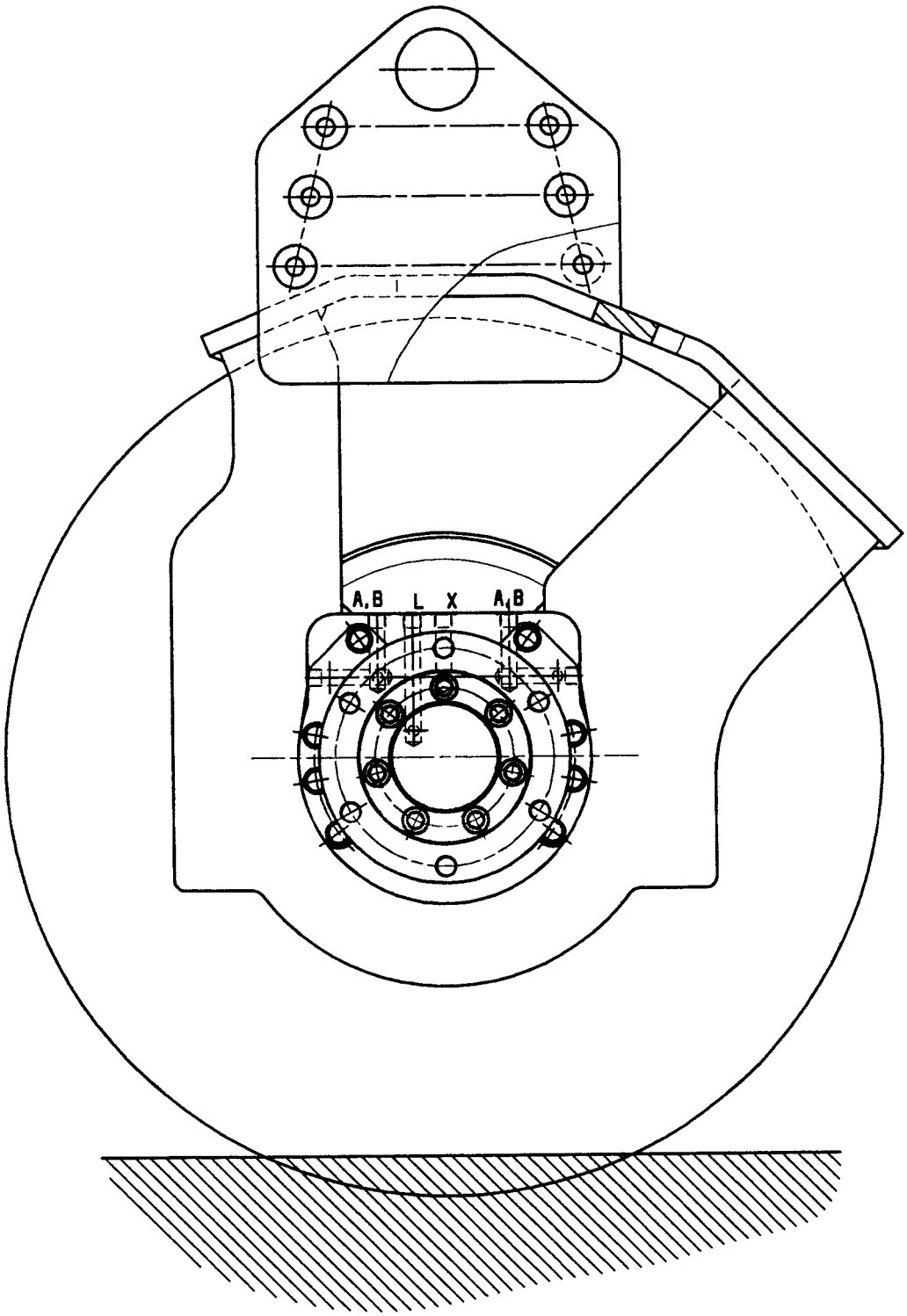
TOP VIEW
VARIABLE PUMP WITH MDC
"STRAIGHT STYLE" HANDLE, NEUTRAL START, AND
SOLENOID VALVE OPTION



VIEW IN DIRECTION "V"
RIGHT SIDE VIEW
VARIABLE PUMP WITH MDC
"STRAIGHT STYLE" HANDLE, NEUTRAL START, AND
SOLENOID VALVE OPTION



1. drum buffers
2. vibration system fill/drain


A,B
L
X
A,B

The 355/365 & 455/465 is equipped with a parking brake system. The brakes are designed into the Poclain MC05 drive motors. These brakes are spring applied and hydraulic pressure released. To make repairs to the brake disks requires removal of the drive motor. Information on diagnosing electrical or hydraulic problems in the brake system can be found in section #3 (electrical overview) and section #4 (hydraulic overview) of this manual.

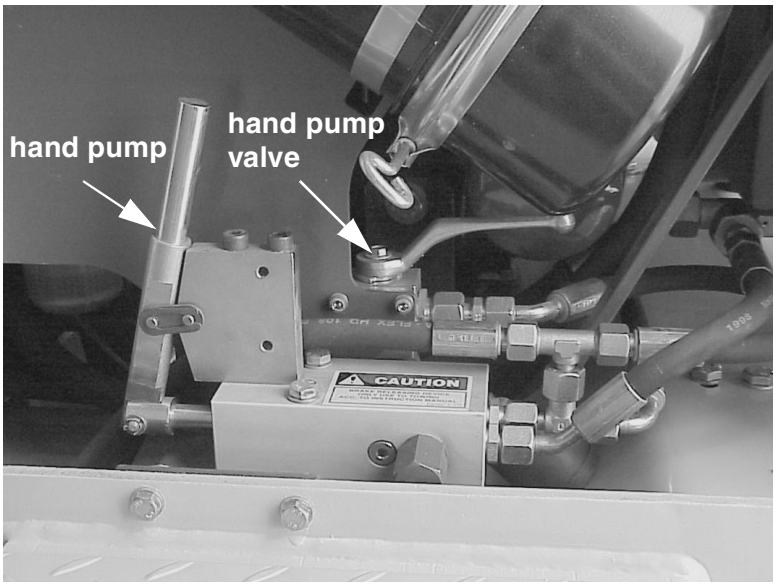
⚠ CAUTION: The Poclain brake disks are installed under a spring load

PARK BRAKE TESTING

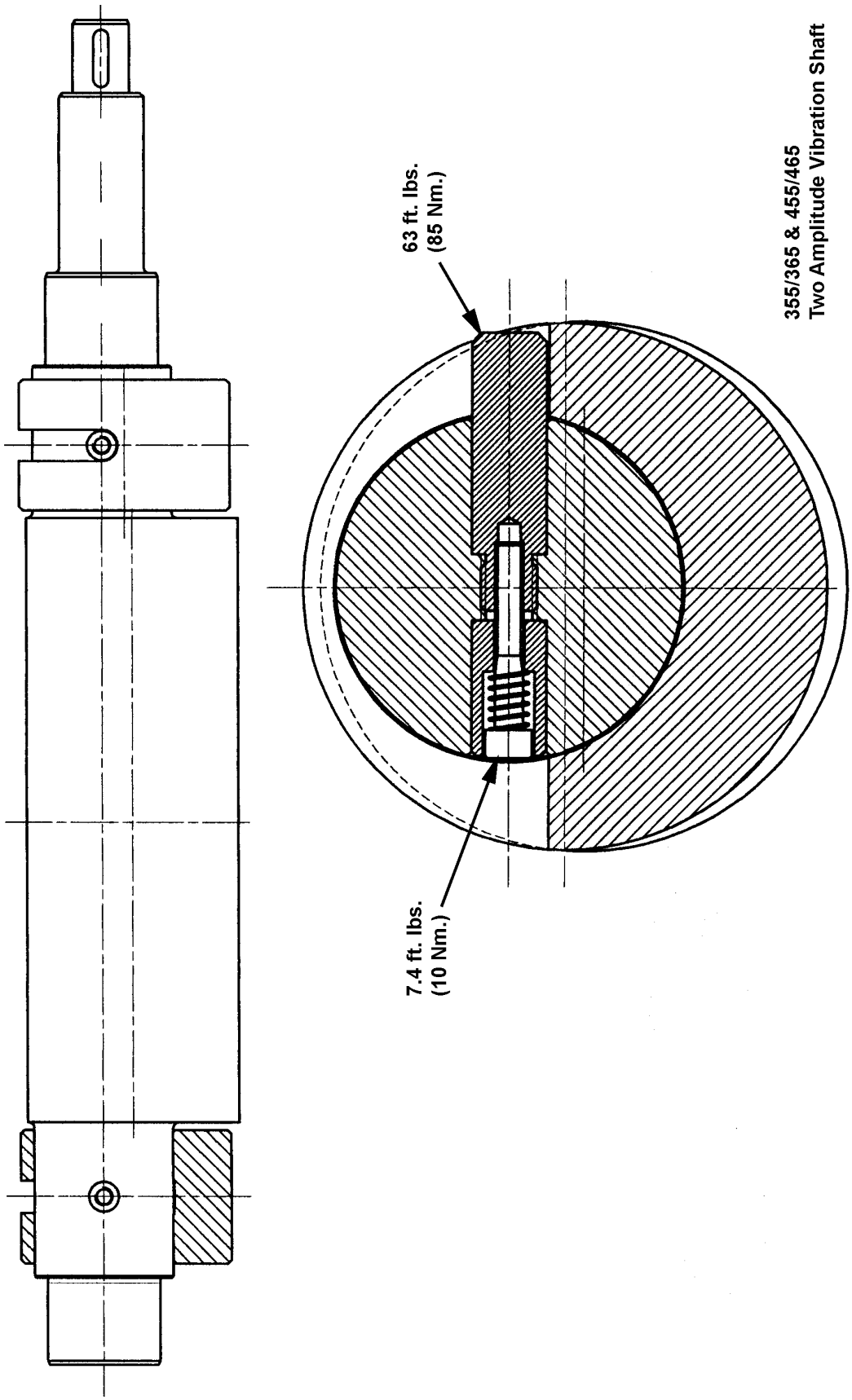
Set the machine up on blocks. Disconnect and cap the brake release lines at the drive motor. Install a 6,000 PSI (450 bar) gauge on each motor supply line (test ports MP1 & MP2). Start the engine and slowly engage the forward/reverse control. The brake should be able to stop drum rotation at the maximum system pressure of 5000 PSI (345 bar). If drum rotation occurs at or below this pressure, the brake discs must be adjusted or replaced.

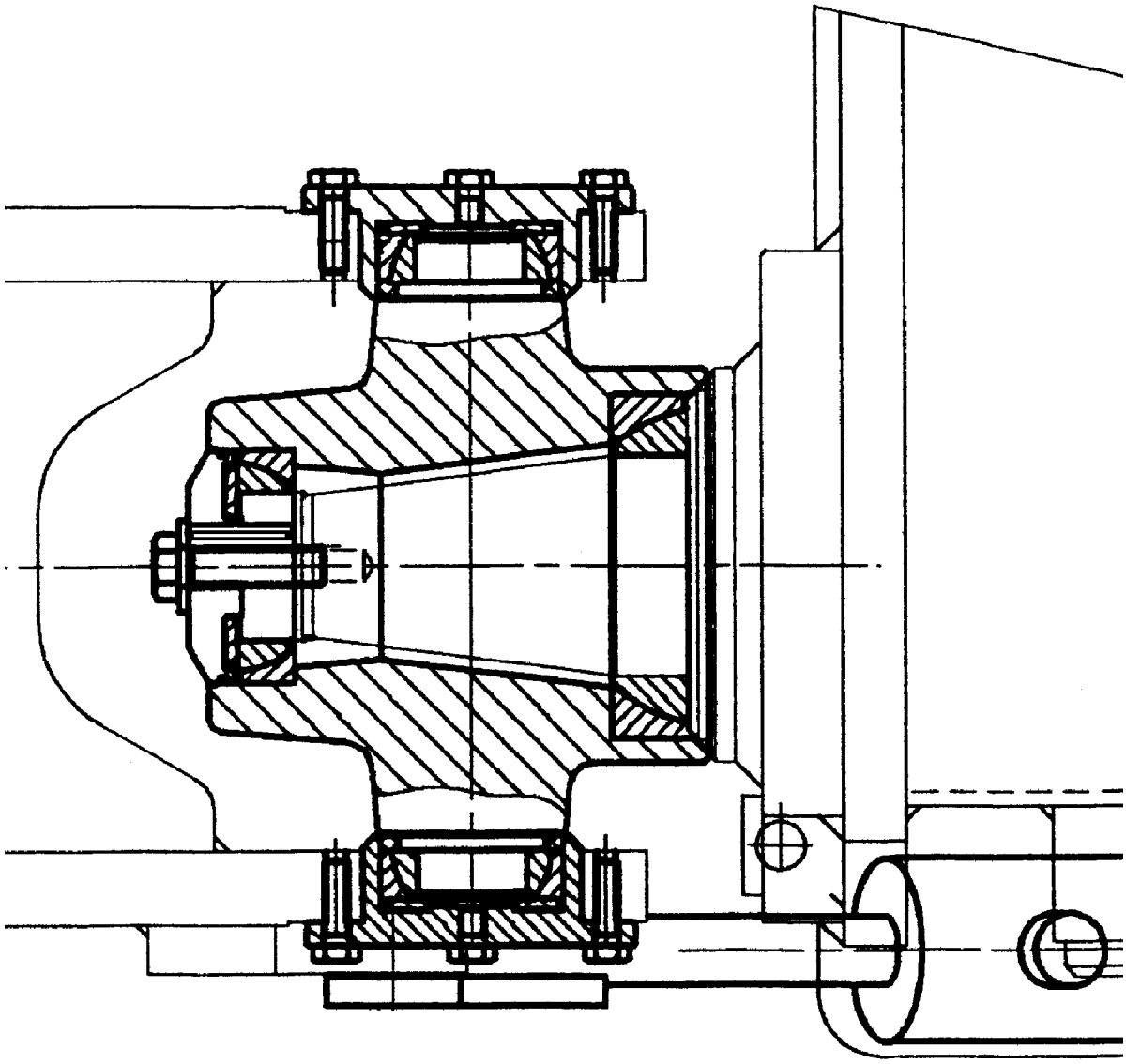
⚠ ***This test should be run if the parking brake has been used as a safety brake on an emergency stop. Poclain further recommends that the brake discs be over-hauled after such safety stops.***

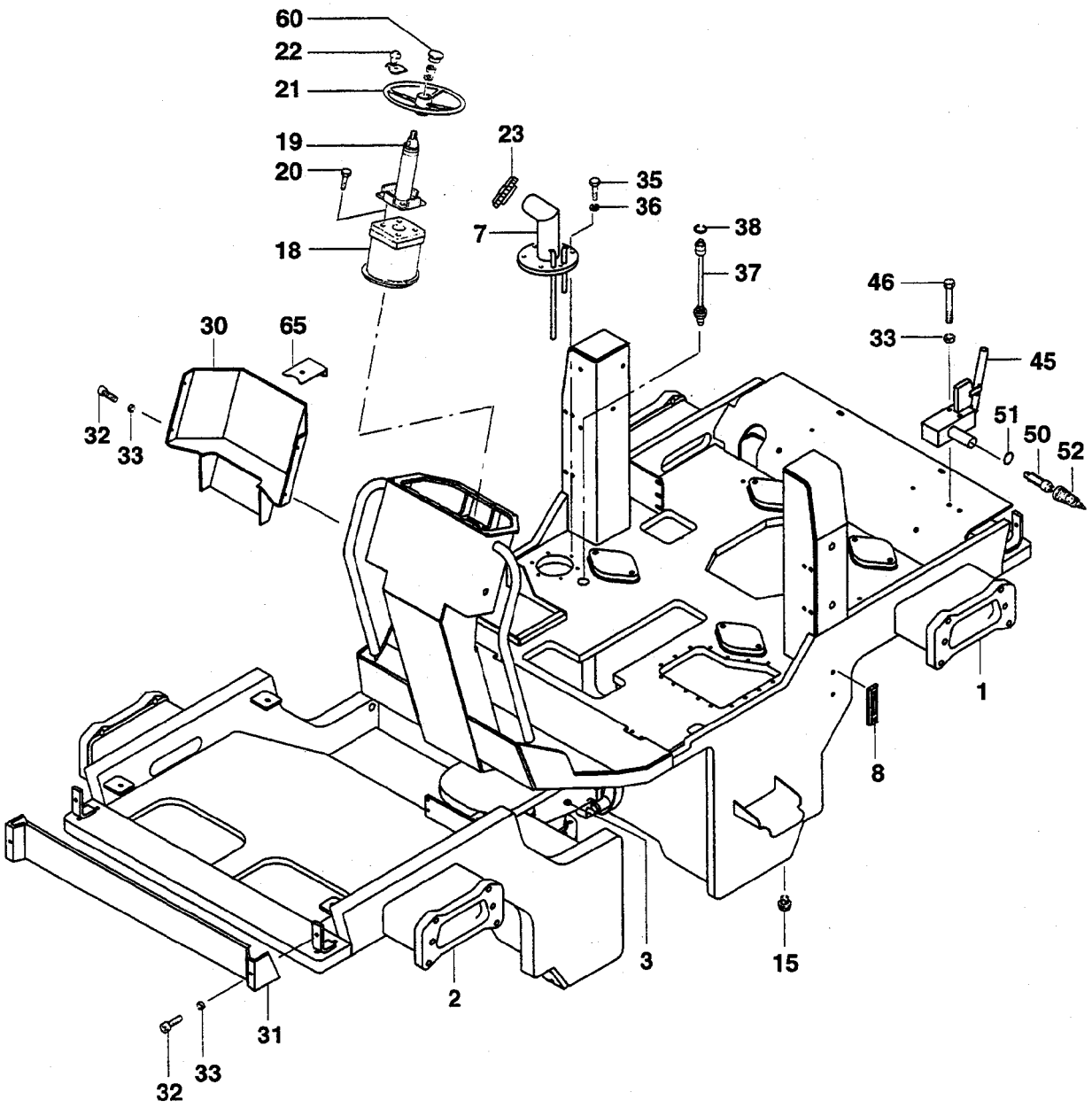
BRAKE RELEASE FOR TOWING



VIBRATION SHAFT (two amplitude)






60
22
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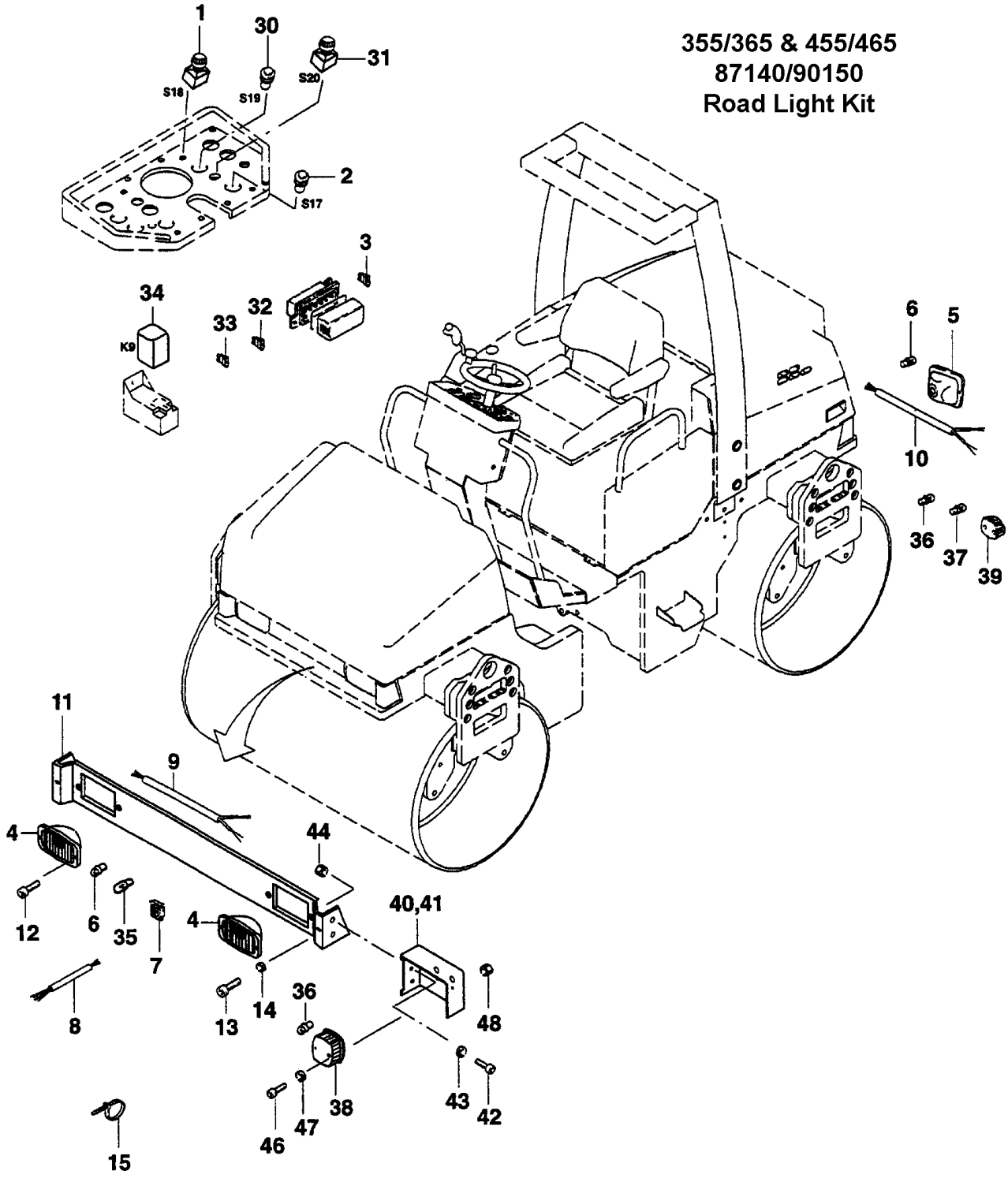
355/365 & 455/465
87140/90150
Road Light Kit
1
30
31
S18
S19
S20
2
S17
3
34
K9
33
32
6
5
10
36
37
39
11
9
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44
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VIBROMAX