GILSON COMPANY, INC.

OPERATING MANUAL

Gilson Test-Master® Testing Screens
TM-5, TM-6



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Specifications

Whether you are the owner, employer, operator, or maintenance person for this machine, safety is your responsibility. You are responsible for operating and maintaining this equipment in compliance with these instructions and for using common sense. Review and completely understand the operating and safety instructions before using this machine.

WARNING!

This machine operates on electric current. Improper operation could result in electric shock, electrocution, or an explosion!

1. **ALWAYS** make sure the motor and other electrical components are appropriate and properly configured for your intended use and available power source. The standard Test-Master® comes with a 1/3hp motor wired for 115V/60Hz. Motors are **NOT** explosion-proof.

2. **ALWAYS** check electrical wiring for loose connections and for pinched or frayed wiring.

3. **ALWAYS** use a properly-wired, three-pronged plug, or otherwise ground the machine. Connect the machine to a properly-wired, three-pronged receptacle. Make sure the cord is located where no one will trip or get tangled in it.

4. **ALWAYS** disconnect and lock out power supply before performing maintenance and repairs.

WARNING!

WARNING: **DO NOT** operate the machine without having all doors, covers and guards in place.

WARNING: **DO NOT** bypass or tamper with the safety interlock switch.

WARNING: **USE CAUTION** when loading and unloading trays or aggregate from the machine. Pinch points between the trays are necessary for proper operation.

WARNING: **ALWAYS** level the machine prior to operation.

WARNING: **ALWAYS** unplug or disconnect machine from the power source when the unit is not in operation.

WARNING: Keep all parts of your body, clothing, tools and other objects away from the separator, drive belts, drive pulleys, connecting rods, counterweights and all other moving parts of the machine while it is operating.

WARNING: **ALWAYS** wear safety glasses when operating, maintaining, or repairing this machine.

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1.0 UNPACKING

Your Gilson Test-Master®, crated for shipping, weighs between 600–700lb, depending on which model you have and how many trays are packed inside. Use appropriate equipment to unload and move it.

Wear safety glasses. Cut the banding and lift the carton off. Save the carton until you have inspected the Test-Master® and placed it into service.

Check the machine over, looking for loose screws, indications of a hydraulic leak, or any other damage.

If you find concealed shipping damage after you have signed for the Test-Master®, call the delivering freight carrier immediately for an inspection. Save all the packing materials and leave the Test-Master® just as it is.

When you're sure your Test-Master® is in acceptable condition, remove the trays and dustpan from the machine. To do this, open the doors. Step on the pump pedal and depress it completely, releasing the clamping pressure. Push down on the lower separator frame to be sure that the separator is fully extended. Slide the trays and dustpan out of the Test-Master® and set them aside. Close the doors.

Use proper equipment to lift the Test-Master® off its skid. Save the skid. Keeping the machine as close to the floor as possible, move it to the site where you intend to operate it. Make sure not to drop the machine.

2.0 SETUP

2.1 Site Selection

1. Choose a site where there is a solid, rigid, level floor with adequate space available for installation, operation and maintenance.
2. Make sure your electrical hookup is compatible with the Test-Master® shipped to you and that a grounded, three-pronged receptacle is within reach of the machine or that other properly-grounded electrical power is available for connection by an authorized person.
3. Choose a site with adequate ventilation.

2.2 Leveling

At the operating site, set the Test-Master® on the floor. The machine will rest on three leveling feet, one at each front corner and one at the center back.

NOTE: DO NOT connect electric power until you have leveled the Test-Master®.

Use the following procedure:

1. Open the doors.
2. If there are trays and a pan in the Test-Master®, remove all but the tray in the second position from the top of the separator. Leave this tray extended about 4in from the front of the machine. Otherwise, insert a tray in the second position from the top of the separator, leaving this tray extended about 4in from the front of the machine.
3. Pump the foot pedal with short strokes until the tray is clamped in position.
4. Place a carpenter's level across the extended tray, resting it on the tray's flanges. **DO NOT** place the level on the machine's case.
5. Adjust the three leveling feet until the Test-Master® is level both side-to-side and front-to-back. Whenever possible, adjust by lowering the highest foot so that the Test-Master® stays as close to the floor as possible.
6. When you have leveled the Test-Master® in both directions, tighten the locking nuts on all three feet.
7. Release the clamping pressure by pushing the foot pedal all the way to the floor. Push down on the bottom of the separator unit to be sure that the separator is fully extended.
8. Replace the trays and pan which you removed and close the doors.

NOTE: Whenever you move the Test-Master®, be sure to re-level it before you use it. Follow the leveling instructions provided.

2.3 Initial Testing

NOTE: Be sure to read and understand all safety instructions and initial test instructions before proceeding and follow all these instructions during the testing process.

Read and understand the instructions for operating the Test-Master's timer. Be sure you know how to stop the Test-Master® before you activate the timer.

Make sure that your Test-Master® is electrically configured to be compatible with your power supply and that all wiring is grounded and properly installed.

After leveling the Test-Master® for the first time, run this initial test. With trays and pan in the machine and the doors open:

1. Pump the foot pedal with short strokes until the separator is clamped. Close the doors.
2. Plug in the Test-Master®.
3. Following the timer instructions, set the timer for 10 seconds.
4. Activate the timer to start the Test-Master®.
5. The Test-Master® should run for 10 seconds and stop.
6. If not, check to be sure you have properly connected compatible power to your Test-Master®.
7. Repeat steps 3 and 4. Should the Test-Master® fail to run, an electrical connection has probably come loose in shipping. Call Gilson Company, Inc. Technical Support line at 800.444.1508 (8AM–5PM EST) Monday–Friday.
8. **If there is excessive noise or vibration during the test run**
   a. Recheck to be sure the Test-Master® is level.
   b. Recheck to make sure you have clamped up your separator and trays.
   c. Check to see that the timing belt is properly-seated and tight.
      1) Turn to Section 4.0, Maintenance.
      2) Read and understand the Safety Instructions and Disassembly Instructions.
      3) Complete disassembly steps 1–3.
      4) Inspect the timing belt. If the belt is in place, check to see that it fits tightly.
      5) If the timing belt is loose or has slipped off its pulleys, turn to Maintenance Instructions and complete Disassembly Instructions 4–6. Then find the Timing Belt information in Section 4.0, Maintenance and follow the instructions for adjusting or re-seating the belt.
   d. Look for concealed shipping damage, such as bent, dented, or loose parts.

2.4 Shutdown

Open the doors. Release the clamping pressure by pushing the foot pedal all the way to the floor and pushing down on the lower separator frame until the separator is fully extended. **ALWAYS** leave the trays unclamped and the doors closed when the Test-Master® is not in use.

Unplug or disconnect electric power from the Test-Master®. **DO NOT** reconnect power until you are ready to use the Test-Master®.

NOTE: Whenever you move the Test-Master®, be sure to re-level it before you use it. Follow the leveling instructions provided.

3.0 OPERATING INSTRUCTIONS

Always review and completely understand all safety, operating, and maintenance instructions before you place your Test-Master® into service.

3.1 General Instructions

To clamp trays in place:

1. First be sure they are inserted fully.
2. Pump the foot pedal, using short strokes until trays are clamped and held in place.
3. Close the doors.

To release trays:

1. Open the doors.
2. Depress the pedal to the floor and hold it in place for a moment.
3. Push down on the lower separator frame until the separator is fully extended.

3.2 Timer Setup & Operation

This unit is equipped with an easy-to-operate Gilson interval countdown timer. The timer has a large 0.6in LED display and will operate in four different modes. It is powered by line voltage and will work on power supplies from 100–265 VAC, 50/60Hz, with up to 20 amps Inductive or Resistive current.

NOTE: The main device controlled by the timer may be restricted to operating on a more limited electrical supply range. Check the device carefully to ensure compatibility with your electrical supply.

Current timer mode is indicated by the four red LEDs on the timer face:

- A = MMSS (99min:59sec x 1sec)
- B = HHMM (99hr:59min x 1 min)
- C = SSSS (9999sec x 1sec
- D = MMMM (9999min x 1min)

(H is for hours, M for minutes, and S for seconds.) To adjust the timer mode, press and hold both "UP" and "DOWN" keys at the same time until the display shows the mode. Once the mode letters are displayed, press "UP" or "DOWN" to change modes. Press "START/STOP" to accept new mode.

To set the run time, press either "UP" or "DOWN". The first digit on the right hand side will flash in half-second intervals. Press either arrow key to adjust to the desired value. To enter the displayed digit and move to the next, press "START/STOP". Once the last digit on the left is entered, the timer is ready to start.

Press "START/STOP" to initiate the current run program. Once running, pressing "START/STOP" again will pause the timer with the current amount of time remaining on screen. When allowed to time-out, the timer beeps and displays DONE. Press any key to continue. Setting and Mode values are saved automatically and restored on power-up.

To operate the Test-Master®

1. Make sure your Test-Master® is level, following the procedure provided.
2. Fully insert the trays you need.
3. Clamp the trays in place.
4. Close the doors.
5. Pour your sample into the hopper, making sure not to overload the Test-Master®. The hopper is designed to hold about 1ft³ of sample, but this still could exceed the sample size allowed. Refer to the following section on Sample Sizes.
6. Plug in the Test-Master®.
7. Set the timer and activate it to start the Test-Master®. Refer to the timer instructions.
8. Using both handles on the hopper, lift it to feed the sample into the machine. When the sample is loaded, lower the hopper back into the Test-Master®.
9. When the Test-Master® stops, open the doors.
10. Release the trays.
11. Remove the trays and continue the procedure specified for your test. Manual On Test Sieving Methods (BK-447), an ASTM publication available from Gilson, provides detailed information on test-sizing procedures.
12. Follow Shutdown procedure in Section 2.4.

3.3 Test Times

Times of 5–10 minutes are normal, depending upon material types and sizes. Materials in the fine series range (No. 4 to No. 200) may require more than 15 minutes. The proper test time results in complete separation and sizing of the sample.

You can establish standard test times for different types of samples by looking for complete sample separation. After a test is finished, run each tray separately with a clean pan to see if a significant amount of sample is still passing. If so, lengthen your test time.

3.4 Sample Sizes

The sample capacity of the Test-Master® varies according to the type and size range of the material being tested. Sample size is often established in the test specifications. For example, ASTM C136, specification for "Sieve or Screen Analysis of Fine and Coarse Aggregates," calls for minimum weights of test sample of coarse aggregate (density such as gravel or limestone) as follows:

ASTM C136 SAMPLE SIZES

Nominal Max. Size of Particle, in (mm)		Min. Sample Weight, kg
3/8	(9.5)	1
1/2	(12.5)	2
3/4	(19)	5
1	(25)	10
1.5	(37.5)	15
2	(50)	20
2.5	(63)	35
3	(75)	60
3.5	(90)	100

Normally, these minimum sample sizes (and larger in many cases) can be handled in the Test-Master® in a single batch without difficulty.

Capacity of the Test-Master® for a given sample is based on the amount of material in the tray which has the largest load at the end of the test. This is the limiting tray.

Coarse Materials

The limiting tray should have no more than one layer of particles over the wire cloth area. Overloading will prevent complete and proper aggregate separation in your test.

Capacity is a function of volume, so light materials (lightweight aggregate, coal, wood chips, etc.) must be tested in smaller amounts by weight. High-density ores or pellets may be tested in somewhat larger amounts by weight. Many light materials are also soft and require short test times to avoid degradation of the sample.

If you are running a test which does not require all six trays (seven in TM-6), you can use an intermediate tray to relieve loading on a critical tray, which would allow a larger overall test sample to be run at one time.

Fine Materials

ASTM C136 specifies that at the end of the test, the limiting tray should contain no more than 4g/in^2 of sieving surface. For materials similar in density to sand, this converts to about 1,350g (3lb) on the limiting tray, or a total sample weight of less than 20lb, unless the sizes are evenly distributed among the trays. If the Test-Master® is being used for mass separation rather than for testing, larger amounts of material may be introduced, though sharpness of separation will decrease as the load increases.

3.5 Pan Options

The standard dustpan tray (TS-112) is used in the bottom slot, where it shakes with the screen trays. This arrangement is adequate for most situations.

The stationary pan with adapter (TSA-116) is recommended if the movement of the standard tray makes it difficult to handle fine materials. The adapter fits the bottom vibrating slot and provides a dust seal to the stationary dustpan below.

For separation of fine aggregates, we recommend the use of equipment specifically designed for such testing. Shakers for 8in and 12in test sieves are described in the Gilson catalog and on globalgilson.com. These specially-designed machines will give you an excellent separation of fine aggregates on a routine basis.

4.0 MAINTENANCE

Whether you are the owner, employer, operator, or maintenance person for this machine, safety is your responsibility. You are responsible for operating and maintaining this equipment in compliance with these instructions and for using common sense. Review and completely understand the operating and safety instructions before using this machine.

Before performing any maintenance, always review this manual and be sure you understand the safety, operating, and maintenance instructions. If you have any questions, please call the Gilson Company, Inc. Technical Support line at 800.444.1508 (8am–5pm EST) Monday through Friday.

WARNING!

The Test-Master's® electric motor has internal thermal protection. The motor will automatically shut off if it is overloaded. If this happens, disconnect the power. Otherwise, the motor could restart by itself after it cools down.

ALWAYS disconnect the Test-Master® and lock out the power supply before performing maintenance or repairs.

ALWAYS check electrical wiring for loose connections and for pinched or frayed wires.

ALWAYS wear safety glasses or goggles when you are working with the Test-Master®.

4.1 Preparation for Maintenance

Unplug or disconnect Test-Master® and lock out power.

Read and understand all the safety instructions and the maintenance instructions for the parts you plan to repair.

Use the flowchart in the back of this manual as a guide to move through the various disassembly and repair procedures.

NOTE: When ordering parts for your Test-Master®, you will need to specify the serial number.

4.2 Disassembly

4.2.1 Outer Case Removal

To access internal parts for maintenance, you must remove all or part of the outer case. Refer to the flowchart and these instructions to determine how much disassembly is required for your repair work.

1. **ALWAYS** unplug the Test-Master® and lock out the power supply before beginning disassembly.
2. Open the doors, remove the trays, and set them aside.
3. **Remove the Drive Case Cover**

   From the front of the machine, reach under the cover at its center and locate the head of the mounting screw. Remove the screw, slide the case cover toward you, and lift it off. Now you have access for the following procedures:

   a. Adjust the setting of the pump pedal.
   b. Lubricate bearings.
   c. Tighten the setscrew on the drive pulley.
   d. Check, adjust, or replace the drive belt.
   e. Check tension of the timing belt.

   Follow the instructions found later in this manual. For other procedures, continue disassembly.

4. Remove the four screws at the corners of the top cover, and lift off the cover and hopper.
5. To remove right side cover, first disconnect the timer. The timer-to-motor connection is fastened to the front of the drive case. Remove the tape. **NOTE** that the green sections plug into each other, so that later you will know how to reconnect the timer. Unplug the timer. Support the weight of the right panel with a two-by-four or other block. Remove nine mounting screws from the right side cover, and pull the panel off the machine. Reinstall one of the screws in the second hole from the top of the back cover, to hold this panel in place.
6. Remove the left side cover in the same way. The machine is now accessible for the following procedures:

   a. Adjust, re-seat or replace the timing belt.
   b. Inspect, repair, or replace the tensioning pulley.
   c. Inspect the guide pin assemblies.

4.2.2 Blocking/Unblocking the Separator

For some maintenance procedures, you need to block the separator to hold it in the clamped position **WITHOUT** the use of hydraulics.

1. Find the two notched separator holding plates which are mounted by wing nuts on the guide frame below the separator, one on each side of the Test-Master®. They will be in the down position.
2. Pump up the hydraulic system to clamp the separator. If the hydraulic system is not working, compress the separator manually. Supporting the separator from the bottom, lift the separator into its compressed position so that you can follow step 3.
3. Loosen the wing nuts, rotate the plates upward, and retighten.
4. Release the hydraulic pressure (or lower the separator if you compressed it manually) and the bottom of the separator assembly will come to rest in the notches of the holding plates.

   With the separator BLOCKED, you have access for the following procedures:

   a. Repair or replace guide pin assemblies.
   b. Access hydraulic pump.

   When you have finished your maintenance procedure, UNBLOCK the Separator to restore it to operating condition as follows:

   a. Pump up the hydraulic system to re-clamp the separator.
   b. Return the holding plates to the down position.
   c. Release the pressure.

4.3 Lubrication of Bearings

1. Using a grease gun with a flexible nozzle, lubricate the four shaft bearings, two on each side of the drive case, after about every 360 hours of operation. Apply a lithium-based or lithium-compatible grease.
2. Lubricate the motor end bearings with a few drops of oil as needed, about once a year under normal use.

4.4 Belts

Both the drive belt and the timing belt will wear with use and should be inspected periodically for tension, alignment, and condition. Review and completely understand all safety and maintenance instructions before attempting to inspect or adjust belts. **ALWAYS disconnect and lock out electric power.**

4.4.1 Drive Belt & Pulley

The drive belt sometimes stretches when it is first used, so check its tension after the first day of operation.

1. Follow Disassembly Instructions 1–3 to access the drive belt for inspection and adjustment.
2. The play in the belt should equal 1/64 of the distance between the centers of the pulleys.
3. If the drive belt is too loose, it will slip and the Test-Master® will run too slowly or in spurts.
4. If the drive belt is too tight, it will wear out quickly.

To Adjust Drive Belt Tension

a. Loosen the four motor mounting nuts.
b. Slide the motor forward or back as needed.
c. Retighten the four nuts.
d. To prevent excessive wear on the drive belt, be sure that the motor and drive pulleys are lined up with each other.

To Replace the Drive Belt

a. Loosen the motor mounting nuts as for adjustment.
b. Slide the motor toward the center of the machine to relieve tension on the belt.
c. Slip the belt off the pulleys.
d. Slip the new belt around the pulleys. Adjust the tension as described above before you retighten the mounting nuts.

Drive Pulley

If the drive pulley is loose on the drive shaft, use an allen wrench to tighten its setscrew.

4.4.2 Timing Belt & Tensioning Pulley

The timing belt should fit tightly.

1. A worn or loose timing belt may slip teeth on the pulleys and cause the machine to be out of balance, vibrate excessively and walk.
2. If the timing belt has slipped out of position, inspect it and replace or reseat as required.

Timing Belt Adjustment or Replacement

a. Follow disassembly procedures 1–6.
b. Tighten the belt by adjusting the bolts at the top of the tensioning bracket.
c. To reseat or replace the timing belt, remove the bolts at the top of the tensioning bracket. This allows the bracket to pivot toward the front of the machine, loosening the tension on the timing belt.
d. Remove the screw that secures the tensioning pulley to the bracket.
e. Remove the pulley.
f. Remove the belt. Inspect it for damage and obtain a replacement if necessary.

Tensioning Pulley Inspection

Take this chance to check the condition of the tensioning pulley and its bearings. Spin the pulley on its bearings. If it does not turn smoothly, replace the bearings.

a. Drive out both bearings from one side of the pulley.
b. Press new bearings into place.

Counterweight Alignment

a. Rotate the drive shaft by hand, looking for a mark that indicates the thick part of the eccentric. Turn the shaft until this mark is at the top of the shaft. The connecting rod is now at its highest position and the counterweights are flat-side-up.
b. Rotate the counterweight shaft until its counterweights are flat-side up and parallel to the counterweights on the drive shaft.

Timing Belt Installation

Reinstall the timing belt along with the tensioning pulley:

a. Fit the belt around the front timing pulley and over the top of the middle timing pulley, taking care not to change the rotation of the shafts and counterweights.
b. Insert the tensioning pulley into the loop of the belt.
c. Holding the belt and pulley together, bolt the pulley to the tensioning bracket.
d. Reinstall the upper bolts and adjust them to create the proper tension on the timing belt.
e. Check to be sure that all the counterweights are flat-side-up and parallel to each other and to the top of the drive case.

4.5 Guide Pin Assembly

The separator assembly of the Test-Master® vibrates independently from the frame. Alignment of these components is maintained by four guide pin assemblies; two on each side, one upper and one lower. Each assembly consists of a guide pin, a guide block, a fiber guide bushing, a guide seal, and nuts, bolts, and washers. Shims are used for alignment when a Test-Master® is being assembled. For the system to work properly, all four guide pins must be parallel, and the upper and lower guide pins on each side must be in line.

We recommend periodic inspection of the guide pin assemblies immediately after the Test-Master® has been running. If the guide pins feel hot or are loose, the bushings have worn. At this point you have the option of replacing only the bushings and seals. If the bushings wear out completely, the guide pins will get out of line and cause the Test-Master® to make a loud, hammering noise. You will need to replace the guide pin assemblies in this instance.

Inspection of the bushings and pins requires some disassembly as described below.

Access

1. READ AND UNDERSTAND SAFETY AND DISASSEMBLY INSTRUCTIONS AT THE BEGINNING OF THE MAINTENANCE SECTION AND THE GUIDE PIN REPLACEMENT INSTRUCTIONS.
2. UNPLUG the Test-Master® and LOCK OUT the POWER.
3. LEVEL THE MACHINE, following the instructions in the installation section. You will not be able to complete the guide pin replacement unless the machine frame is level to begin with.
4. Follow Disassembly Instructions 2–6.
5. BLOCK THE SEPARATOR, following disassembly instructions 7–10.
6. CHECK ALL FOUR GUIDE PINS: Try to move each one by hand. If a pin feels hot or if it is loose or wobbly, the bushing inside the guide block has worn out.

Procedure

WORK ON GUIDE PIN ASSEMBLIES ONE AT A TIME. BEFORE WORKING ON A LOWER GUIDE PIN ASSEMBLY, lift the corresponding hydraulic cylinder assembly about 3/8in and move it toward the center of the machine.

1. Loosen guide pin setscrew, and remove the guide pin. Observe the position of the shims that determine the vertical alignment of the guide block.
2. Remove guide bolts, guide block and shims, KEEPING THE SHIMS for reassembly.
3. If you are repairing the guide pin assembly, press out old seal and bushing and press in new ones.
4. Reinstall guide block, including the shims, leaving the guide bolts loose.
   a. If you are installing old guide blocks with new bushings, position the shims as they were.
   b. If you are installing new assemblies, place the shims so that the block is square with the separator guide frame so that the upper and lower guide pins line up with each other.
5. Place a carpenter's level across the top and sides of the separator guide frame and position the guide block so that its top is level.
6. Use the play in guide bolt holes and shims to make fine adjustments to position the guide block. Then tighten the bolts completely.
7. Reinstall the guide pin. COMPLETE THIS INSTALLATION BEFORE PROCEEDING TO REPAIR ANOTHER GUIDE PIN ASSEMBLY.
8. When you have finished with all the guide pin assemblies you plan to work on, run a final alignment check:
   a. Unblock the separator using the procedure in DISASSEMBLY INSTRUCTION 10.
   b. Place several trays in position as though you were preparing to run a test.
   c. Clamp the separator and close the doors.
   d. Run the Test-Master® for ten minutes.
      WARNING! THE TEST-MASTER® IS NOT DESIGNED TO BE OPERATED WITHOUT GUARDS AND COVERS IN PLACE. STAND BACK. KEEP YOURSELF, YOUR CLOTHING, AND ALL OTHER OBJECTS AWAY FROM THE MACHINE.
   e. After the Test-Master® stops, touch the tops of the guide pins. They may be warm, which is normal. If one or more guide pins are hot to the touch, the guide pins are out of alignment. Return to steps 4 and 5 and make adjustments as necessary.

REASSEMBLE THE TEST-MASTER® IN REVERSE ORDER. Make sure all bolts are secure.

BE SURE THE TEST-MASTER® IS LEVEL before placing it into service. **DO NOT** connect electric power until you are ready to operate the Test-Master®.

4.6 Drive Assembly

The drive belt and timing belt and their pulleys have been described earlier.

Maintenance to other parts of the drive assembly require removal of the drive case. Please call Gilson to request instructions for these procedures.

4.7 Hydraulic System

The Test-Master's clamping system consists of a hydraulic pump and two hydraulic cylinder assemblies. The cylinders apply force to the separator, compressing it into the clamped position. The system is pressurized by applying short strokes to the foot pedal. Pressure is released by depressing the foot pedal all the way to the floor and pushing down on the lower frame of the separator. **ALWAYS** leave the separator in the released position when the Test-Master® is not in use.

WHETHER YOU ARE THE OWNER, EMPLOYER, OPERATOR, OR MAINTENANCE PERSON, YOU ARE RESPONSIBLE FOR CONDUCTING MAINTENANCE PROCEDURES ON THE TEST-MASTER® IN COMPLIANCE WITH THE SAFETY PRECAUTIONS AND OTHER INSTRUCTIONS IN THE MANUAL. **BEFORE** YOU BEGIN TO WORK ON THE HYDRAULIC SYSTEM, **ALWAYS** REREAD THE MANUAL AND BE SURE YOU UNDERSTAND BOTH THE SAFETY AND MAINTENANCE INSTRUCTIONS. IF YOU HAVE ANY QUESTIONS, PLEASE CALL GILSON COMPANY, INC. TECHNICAL SUPPORT LINE AT 800.444.1508 (8AM–5PM EST) MONDAY–FRIDAY.

ALWAYS DISCONNECT THE TEST-MASTER® AND LOCK OUT THE POWER SUPPLY BEFORE PERFORMING MAINTENANCE OR REPAIRS.

Pump Pedal Adjustment

If depressing the foot pedal and pushing down on the lower frame of the separator does not completely release hydraulic pressure, adjust the setting of the pump pedal.

1. Follow Disassembly Procedures 1–3.
2. Find the two hex-head cap screws toward the rear of the pedal.
3. Loosen the front screw a quarter turn, and tighten the rear screw a quarter turn.
4. Repeat this adjustment until a complete depression of the foot pedal causes a complete release of pressure in the system.
5. Reinstall front panels, but **DO NOT** reconnect electrical power until you are ready to run a test.

Access to Hydraulic Pump

To check or replace hydraulic oil, return to the disassembly procedure found at the beginning of Section 4.0, Maintenance.

1. READ AND UNDERSTAND SAFETY INSTRUCTIONS, DISASSEMBLY INSTRUCTIONS AND THE PUMP MAINTENANCE INSTRUCTIONS WHICH FOLLOW.
2. Follow Disassembly Procedures 1–4.
3. Follow Disassembly Procedures 7–10.

Now you have access to the hydraulic pump.

Hydraulic Oil

The Test-Master® uses a medium-viscosity, non-foaming hydraulic oil.

To check the level and quality of the hydraulic oil, follow the above access procedures to disassemble the Test-Master® and to block the separator in the closed position. Then proceed:

1. Release pressure and remove the pump cover. The oil level should be 1/4in from the top of the reservoir and the oil should appear clear.
   a. Some discoloration of the oil is acceptable; visible dirt is not acceptable.
   b. Fine aluminum flakes which disintegrate between your fingers are acceptable; aluminum chips are not acceptable.
   c. If oil is not in acceptable condition, proceed to next section, "To Change Hydraulic Oil."
2. If the oil is clean but the level is low, fill to the correct level.
3. Replace the cover and tighten down the screws.
4. Pump up and release the pressure several times to remove air from the system.
5. Reopen the pump and again add oil to 1/4in from the top.
6. Reinstall cover and tighten the screws.
7. Unblock the separator:
   a. Pump up the system to re-clamp the separator and take the pressure off the holding plates.
   b. Return the plates to the down position.
   c. Release the pressure by depressing the foot pedal and pushing down on the lower frame of the separator.
8. Reassemble the Test-Master® in reverse order.
9. Check to be sure the Test-Master® is level before you use it.
10. **DO NOT** connect electrical power until you are ready to operate the machine.

To Change Hydraulic Oil

If the oil is dirty, or if you need to work on the pump, first drain the oil from the system. You will need a clean place to work and a pan to receive the drained oil.

If you have disassembled the Test-Master® to check the hydraulic oil, return to the Disassembly Instructions at the beginning of Section 4.0, Maintenance and follow Step 5 to remove the right (timer side) panel. Otherwise, read, understand, and follow Preparation For Maintenance and Disassembly instructions 1–5 and 7–10.

Then proceed:

1. Release pump pressure.
2. Disconnect pump-to-cylinder hose at the pump end and drain the oil from the hose into the pan.
3. Disconnect the cylinder end of the hose and reconnect the pump end.
4. Apply a few strokes to the pump pedal to drain the oil from the pump into the pan.
5. Remove the pump cover and inspect the inside of the reservoir. If you find sludge in the bottom of the reservoir, clean it out with solvent before refilling with oil.
6. If repairs are to be made, continue disassembly as described below. If you are only replacing hydraulic oil, continue to the next step.
7. Reconnect hose, cylinder end first.
8. Fill the pump with oil to 1/4in from the top.
9. Replace the cover and tighten the screws.

10. Pump up and release the pressure several times to remove air from the system.
11. With the pressure released, remove the cover and add oil to 1/4in from the top.
12. Replace the cover and tighten the screws.
13. Unblock the separator:
    a. Pump up the system to re-clamp the separator and take the pressure off the holding plates.
    b. Return the plates to the down position.
    c. Release the pressure by depressing the foot pedal and pushing down on the lower frame of the separator.
14. Reassemble the Test-Master® in reverse order.
15. Check to be sure the Test-Master® is level before you use it.
16. **DO NOT** connect electrical power until you are ready to operate the machine.

Hydraulic Pump

The hydraulic pump is a low-pressure pump with a cast aluminum body. If your pump leaks or malfunctions, we recommend that you return it to the factory for repair (a three to five day process) or purchase a new pump. Call Gilson for instructions.

It is sometimes possible to repair pumps in the field by replacing parts. Refer to instructions, diagrams, and parts price list. The various springs are **NOT** interchangeable.

Pump Removal

1. READ AND UNDERSTAND SAFETY INSTRUCTIONS, DISASSEMBLY INSTRUCTIONS, AND THE FOLLOWING PUMP REMOVAL AND MAINTENANCE INSTRUCTIONS.
2. Follow Disassembly Procedures 1–5.
3. Follow Disassembly Procedures 7–10.
4. Drain the oil from the hydraulic system according to the instructions given.
5. Disconnect hose from pump.
6. Remove pump mounting screws.
7. Disconnect the pump pedal connecting link.
8. Lift pump out of Test-Master®.

NOTE: When working on the hydraulic pump, take care **NOT** to score surfaces where seals must be maintained.

IMPORTANT! DO NOT REMOVE OR ADJUST THE BYPASS ASSEMBLY.

These parts are assembled and preset at the factory. Any change in the bypass pressure could damage the vibrating assembly of the Test-Master®.

1. Remove parts carefully, so as not to damage the pump casting or any parts to be reinstalled. Balls must **NOT** be nicked or scratched.
2. To reinstall, tap balls gently into their seated position with a soft metal, blunt-ended rod.
3. Use commercial plumber's pipe dope on port plugs.

To Remove Plunger & Replace O-Rings

1. Remove the two plunger guide screws.
2. Slide out plunger and O-Ring assembly.
3. Replace O-Rings.
4. Dip O-Ring end of plunger into hydraulic oil and reinsert it into the pump body.
5. Reinstall the pump in reverse order, using pipe dope on hose fittings.
6. Unblock the separator:
    a. Pump up the system to reclamp the separator and take the pressure off the holding plates.
    b. Return the plates to the down position.
    c. Release the pressure by depressing the foot pedal and pushing down on the lower frame of the separator.
7. Reassemble the Test-Master® in reverse order.
8. Check to be sure the Test-Master® is level before you use it.
9. **DO NOT** connect electrical power until you are ready to operate the machine.

Hydraulic Cylinders

Maintenance to the hydraulic cylinders requires their removal from the Test-Master®. Please call Gilson to request instructions for this procedure.

4.8 Wire Cloth & Screen Trays

Check condition of wire cloth and screen trays both before and after operation.

Wire Cloth

Testing grade wire cloth is a precision instrument and should be treated as such. The ASTM E11 specification permits only very slight variations in average opening and wire diameter of testing grade wire cloth. Abrasion due to normal use and/or improper cleaning and handling can cause wire to be out of specification to a considerable degree before it appears to be worn. Check wire cloth periodically for conformance to specs. Wire cloth may eventually sag, reducing its effective screening area. Wire with 1/4in and coarser openings is rigid and self-supporting. No.5 and finer sizes have hooked edges which interlock with tray side clamps to provide tension adjustment. Trays with No.16 and finer wire cloth have support strip inserts to minimize wear and distortion. Tray backup cloth is available as an option at extra cost if additional support is desired. Tray side clamps for hooked edge wire and flat wire are not interchangeable.

Screen Trays

The life of your screen trays can be prolonged by establishing good procedures for handling and storing trays. Avoid bumping or bending the corners of the tray flanges. Bent flanges "work" during operation of the machine and will eventually break.

5.0 PARTS LISTS & DIAGRAMS

5.1 Replacement Parts List

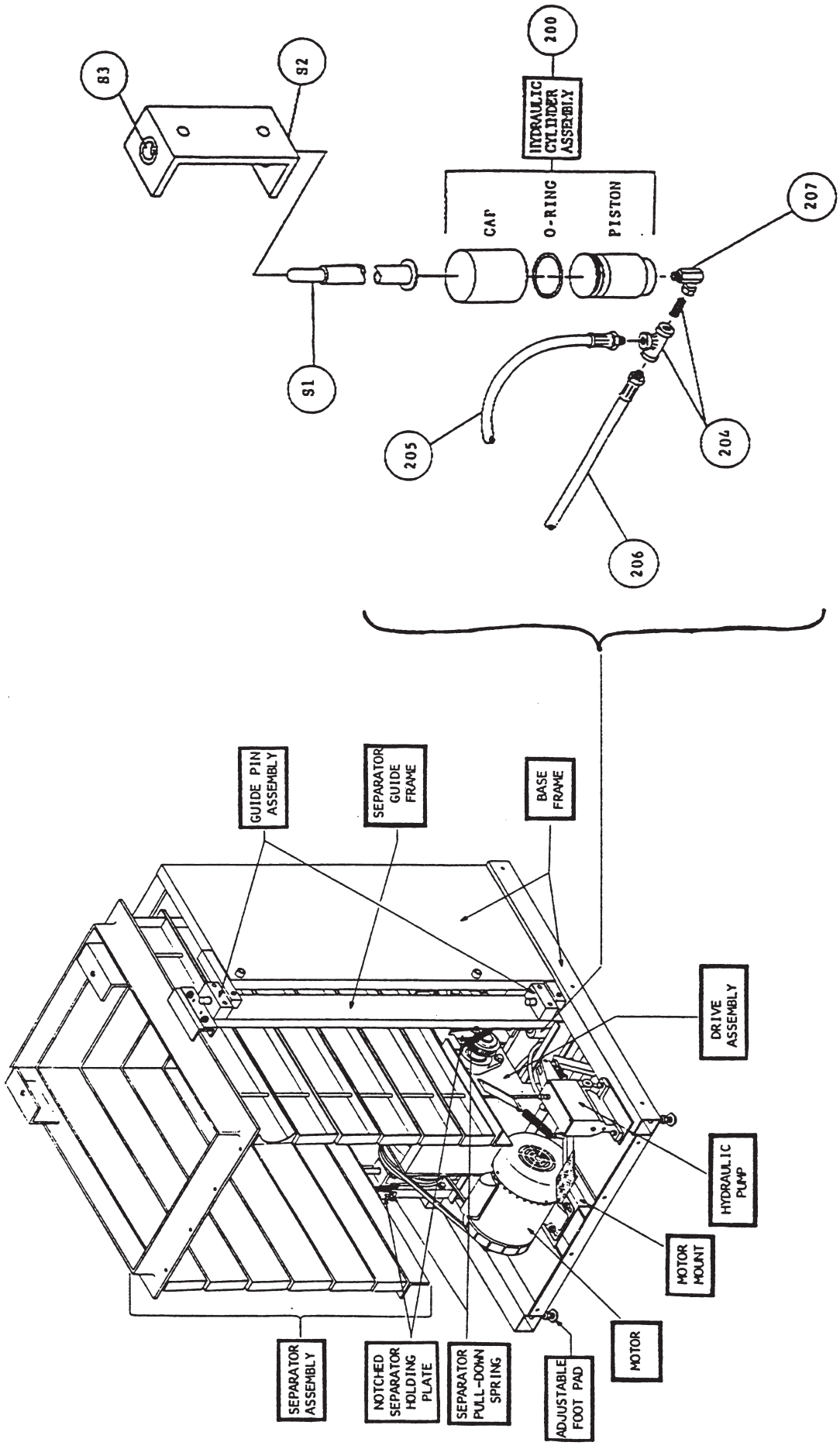
To aid in parts identification, refer to the figures indicated. When ordering, please specify the Model No. and Serial No. which are found on the nameplate of your machine.

Diagram No.	Key No.	Description	No. Req'.	Part No.
REPLACEMENT TRAYS & WIRE CLOTH				
—	—	Screen Tray, complete with Wire Cloth 4in (100mm) to No.4 (4.75mm)	—	TSA-100
—	—	No.5 (4mm) to No.14 (1.4mm)	—	TSA-101
—	—	No.16 (1.8mm) to No.100 (150µm)	—	TSA-102
—	—	No.200 (75µm)	—	TSA-106
—	—	Special Sizes, Over 4in Openings	—	TSA-99
—	—	Punched Plates with Round Openings	—	TSA-115
—	—	"Tyler Standard" Brass, Coarse Series	—	TSA-110
—	—	Standard Dustpan Tray	—	TSA-112
—	—	Stationary Dustpan with Adapter (3in deep)	—	TSA-116
—	—	Inclined Chute Pan (6in high)	—	TSA-117
REPLACEMENT WIRE CLOTH ONLY				
—	—	4in (100mm) to No.4 (4.75mm)	—	TSA-125
—	—	No.5 (4mm) to No.14 (1.4mm)	—	TSA-126A
—	—	No.16 (1.8mm) to No.100 (150µm)	—	TSA-126B
—	—	No.200 (75µm)	—	TSA-127
—	—	Special Sizes, Over 4in Openings	—	TSA-124
—	—	Punched Plates with Round Openings	—	TSA-130
—	—	"Tyler Standard" Brass, Coarse Series	—	TSA-132
—	—	Supporting Backing Cloth	—	TSA-135
—	—	Screen Tray Only, Complete, for Flat Wire Cloth, Coarser than No.4	—	TSA-136
—	—	Screen Tray Only, Complete, for Hooked Wire Cloth, No.5 & Finer	—	TSA-137
—	—	Tray Side Clamp, for Flat Wire Cloth	—	RPTS-TRAY1
—	—	Tray Side Clamp, for Hooked Wire Cloth	—	RPTS-TRAY2
—	—	Tray End Clamp	—	RPTS-TRAY3
—	—	Tray Rubber Corner Gasket	—	RPTS-TRAY4
—	—	Tray Bolt with Nut & Washer	—	—
—	—	Tray Front Baffle	—	RPTS-TRAY6
EXTERIOR PARTS				
—	—	Right (Timer) Side Panel	—	RPTM-ROCASE
—	—	Right Door	—	RPTM-RIGHT DOOR
—	—	Left Side Panel	—	RPTM-LOCASE
—	—	Left Side Door	—	RPTM-LEFT DOOR
—	—	Back Panel	—	RPTM-OCBACK
—	—	Top Cover	—	RPTM-TOP COVER ONLY
—	—	Hopper	—	RPTM-HOPPER
—	—	Door Switch	—	RPTM-SWITCH
—	—	Exterior Door Latch	—	RPTM-DOOR LATCH
—	—	Exterior Door Latch Screws & Washers	—	RPTM-DOOR CLAMP

5.2 Parts List for Diagram 1

Diagram No.	Key No.	Description	No. Req.	Part No.
BASE FRAME & GUIDE PIN ASSEMBLY PARTS				
1	—	Base Frame	1	RPTM-BFGPA1
1	—	Leveling Foot with Jam Nut	3	RPTM-BFGPA2
1	—	Motor Mount with Cap Screws (2) & Lock Washers (2)	1	RPTM-MTRMOUNT
1	—	Guide Pin Assembly, including Guide Block, Guide Pin, Guide Bushing, Seal, Bolts (2), and Washers (2)	4	RPTM-BFGPA4
—	—	Guide Pin Only	4	RPTM-BFGPA5
—	—	Guide Bushing Only	4	RPTM-BFGPA6
—	—	Guide Bolt & Washer Only	8	RPTM-BFGPA7
—	—	Guide Seal Only	4	RPTM-BFGPA8
SEPARATOR & GUIDE FRAME PARTS				
1	—	Separator Assembly for TM-5	1	RPTM-SAGF1
1	—	Separator Assembly for TM-6	1	RPTM-SAGF2
—	—	Separator Assembly-to-Guide-Frame Bolts, Nuts, & Lock Washers	4	RPTM-SEP-FRAME
1	—	Separator Guide Frame	1	RPTM-SEPGDRAME
1	—	Separator Pull-Down Spring	2	RPTM-SAGF5
1	—	Separator Holding Plate with Wing Nut & Lock Washer	2	RPTM-3SHPWN
1	S1	Separator Guide Pin	2	RPTM-KEYS1
1	S2	Separator Guide Pin Bracket	2	RPTM-KEYS2
1	S3	Separator Guide Pin Bracket Bushing	4	RPTM-KEYS3
ELECTRIC & DRIVING PARTS				
1	—	Motor, 115V, 1/3	1	RPTM-MOTOR
1	—	Motor, 230V, 1/3	1	RPTM-MOTOR 230/50
1	—	Motor Mounting Nut with Lock & Flat Washers	4	RPTM-MMNW
1	—	Motor Pulley with Set Screws (2) & Key	1	RPTM-3EDP3
1	—	Drive Belt	1	RPTM-1EDP4
—	—	Timer (for SN 3000 & Newer)	1	RP-TIMER-ART
—	—	Plug-In Power Cord	1	RPTM-EDP14
HYDRAULIC SYSTEM PARTS				
1	200	Hydraulic Cylinder Assembly (Piston, O-Ring, Cap)	2	RPTM-KEY200
1	—	Hydraulic Cylinder O-Ring Only	2	RPTM-KEY200-1
1	204	Tee & Nipple for Pump	1	RPTM-KEY204
1	205	Pump to Cylinder Hose	1	RPTM-KEY205
1	206	Cylinder to Cylinder Hose	1	RPTM-KEY206
1	207	90° Swivel Fitting	3	RPTM-KEY207

5.3 Diagram 1

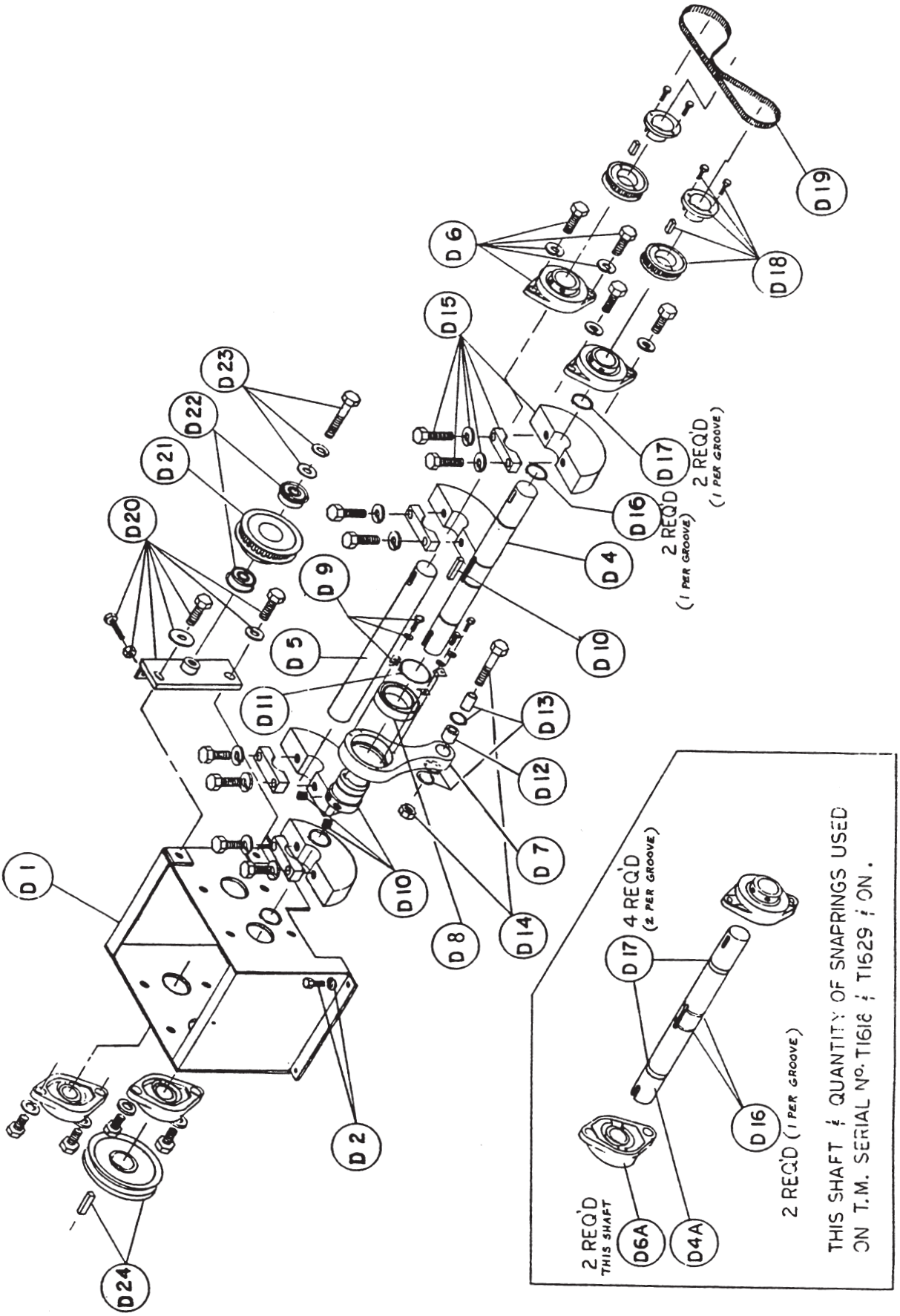


TM-5 & TM-6
Parts Diagram No. 1
(With External Parts Removed)

5.4 Parts List for Diagram 2

Diagram No.	Key No.	Description	No. Req.	Part No.
DRIVE ASSEMBLY PARTS				
2	D1	Drive Assembly Case	1	RPTM-D1
2	D2	Drive Case Mounting Cap Screws & Washers	4	RPTM-D2
2	D3	Drive Assembly Case Cover & Mounting Bolt	1	RPTM-D3
2	D4	Drive Shaft	1	RPTM-D4
2	D5	Counterweight Shaft	1	RPTM-D5
2	D6	Shaft Bearing with Mounting Bolts (2) & Washers	4	RPTM-D6
2	D7	Connecting Rod	1	RPTM-D7
2	D8	Connecting Rod Bearing	1	RPTM-D8
2	D9	Bearing Retaining Clip & Cap Screw	3	RPTM-D9
2	D10	Eccentric with Setscrews (2) & Key	1	RPTM-D10
2	D11	Eccentric Retaining Snap Ring	1	RPTM-D11
2	D12	Wrist Pin Sleeve Bushing (Nonmetallic)	1	RPTM-D12
2	D13	Wrist Pin Sleeve (Steel) with Seals	1	RPTM-D13
2	D14	Wrist Pin Cap Screw with Nut & Lock Washer	1	RPTM-D14
2	D15	Counterweight with Clamp, Screws (2), & Lock Washers	4	RPTM-D15
2	D16	Eccentric Locating Snap Ring	2	RPTM-D16
2	D17	Drive Shaft Locating Snap Ring	2	RPTM-D17
2	D18	Timing Pulley with Bushing, Cap Screws (2), & Key	2	RPTM-D18
2	D19	Timing Belt	1	RPTM-D19
2	D20	Tensioning Bracket	1	RPTM-D20
2	D21	Tensioning Pulley	1	RPTM-D21
2	D22	Tensioning Pulley Bearing	2	RPTM-D22
2	D23	Tensioning Pulley Mounting Cap Screw & Washers	1	RPTM-D23
2	D24	Drive Pulley with Setscrews (2) & Key	1	RPTM-D24

5.5 Diagram 2

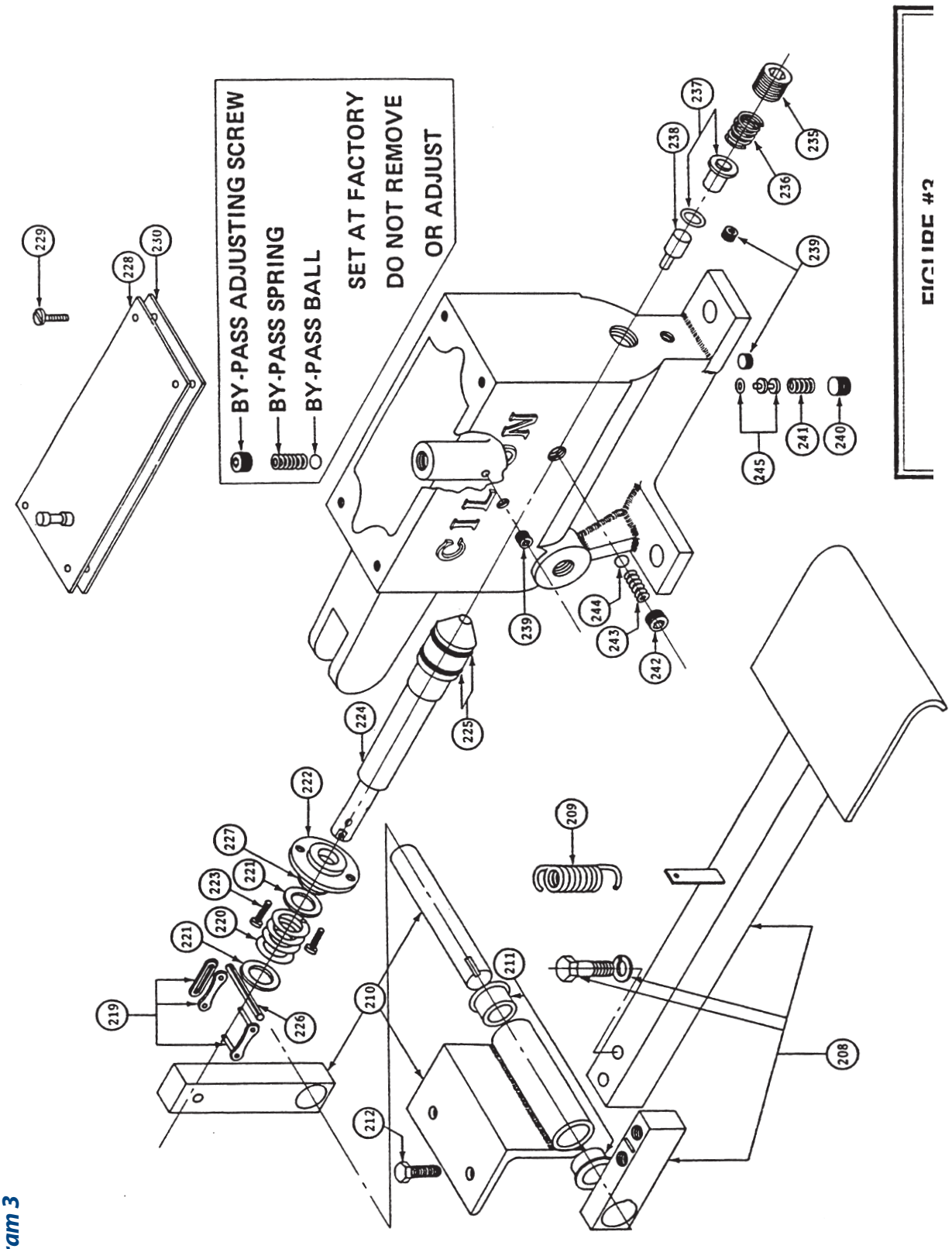


TM-5 & TM-6
Parts Diagram No. 2
(Drive Assembly)

5.6 Parts List for Diagram 3

Diagram No.	Key No.	Description	No. Req.	Part No.
HYDRAULIC SYSTEM PARTS				
3	—	Hydraulic Pump Complete	1	RPTM-PUMP
1	200	Hydraulic Cylinder Assembly (Piston, O-Ring, Cap)	2	RPTM-KEY200
1	—	Hydraulic Cylinder O-Ring Only	2	RPTM-KEY200-1
1	204	Tee & Nipple for Pump	1	RPTM-KEY204
1	205	Pump to Cylinder Hose	1	RPTM-KEY205
1	206	Cylinder to Cylinder Hose	1	RPTM-KEY206
1	207	90° Swivel Fitting	3	RPTM-KEY207
3	208	Pump Pedal with Arm, Cap Screws, Lock Nuts, & Key with /Setscrew	1	RPTM-KEY208
3	209	Pump Pedal Spring	1	RPTM-KEY209
3	210	Pedal to Pump Linkage	1	RPTM-KEY210
3	211	Pedal to Pump Bushing Only	2	RPTM-KEY211
3	212	Pedal to Pump Screw & Lock Washer Only	2	RPTM-KEY212
3	226	Pump Pedal Spring Retain Pin	1	RPTM-KEY226
3	219	Pump Pedal Connecting Link	1	RPTM-KEY219
3	220	Stroke Limiting Spring	1	RPTM-KEY220
3	221	Stroke Limiting Washer	2	RPTM-KEY221
3	222	Plunger Guide & Guide Seal	1	RPTM-KEY222
3	227	Guide Seal Only	1	RPTM-KEY227
3	223	Plunger Guide Screw	2	RPTM-KEY223
3	224	Plunger Only	1	RPTM-KEY224
3	225	Plunger O-Ring	2	RPTM-KEY225
3	228	Pump Cover with Vent	1	RPTM-KEY228
3	229	Pump Cover Screw	4	RPTM-KEY229
3	230	Pump Cover Gasket	1	RPTM-KEY230
3	235	Pressure Release Plug 3/8in	1	RPTM-KEY235
3	236	Pressure Release Spring	1	RPTM-KEY236
3	237	Pressure Release Thrust Pin with O-Ring	1	RPTM-KEY237
3	—	Pressure Release O-Ring Only	1	RPTM-KEY237-1
3	238	Pressure Release Pin	1	RPTM-KEY238
3	239	Port Plug, 1/8 in Pump Body	3	RPTM-KEY239
3	240	Pressure Check Plug, 1/8in Pump Body	1	RPTM-KEY240
3	242	Intake Check Plug, 1/8in Pump Body	1	RPTM-KEY242
3	241	Pressure Check Spring	1	RPTM-KEY241
3	243	Intake Check Spring	1	RPTM-KEY243
3	244	Intake Check Ball	1	RPTM-KEY244
3	245	Pressure Check Thrust Pin with O-Ring	1	RPTM-KEY245
3	—	Pump Mounting Screw with Lock Washer	3	RPTM-KEY245-1

5.7 Diagram 3



TM-5 & TM-6
Parts Diagram No. 3
(Hydraulic Pump & Pedal Parts)

6.0 MAINTENANCE FLOW CHART

