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## CUSTOMER SERVICE CONTACT INFORMATION

For product information, tech support, or to order replacement parts, call:

**1-800-303-5874**

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.



## INTRODUCTION

to the TSD450 TS

*Congratulations on the purchase of your Flo-Dynamics TSD450 TS automatic transmission fluid exchanging machine!*

Simply put, this machine is the cleanest, safest, easiest, fastest, most thorough, and most cost-efficient method of fluid exchange ever devised. Suddenly, regular automatic transmission maintenance becomes a more realistic proposition. With the TSD450 TS, you can exchange the transmission fluid either through the transmission cooler lines OR through the vehicle's dipstick. Transmission fluid exchanging is cleaner and easier than ever!

### **Transmission Fluid Exchange:**

To attain the highest level of protection for internal transmission components and increase the transmission's life span to the maximum, it is recommended that the transmission's lubrication system is serviced every 15,000 miles (or according to the vehicle owner's manual). The Flo-Dynamics TSD450 TS exchanges virtually all of the used transmission fluid to new, without even requiring the transmission pan to be dropped. There is no spillage, and no mess.

- The TSD450 TS can be used practically anywhere – and with almost any vehicle.
- It is compact, mobile, and self-contained.
- It operates off the 12-volt battery of the vehicle being serviced.
- It does not require a pit, lift, or ramp.
- The TSD450 TS hooks up directly to one of the vehicle's transmission cooler lines for a transmission fluid exchange or through the dipstick.
- The ATF fluid exchange, from setup to finish, typically takes 15 minutes or less for inline mode, and 10 minutes or less for dipstick mode!

No wonder an ATF exchange is the most requested method of preventative automatic transmission maintenance today.

**Please take time to read through this manual to familiarize yourself with the TSD450 TS before performing your first ATF exchange.**

# I. SAFETY INFORMATION

## 1.01 IMPORTANT SAFETY NOTICE

For your safety, read this manual thoroughly before operating your TSD450 TS unit. Your TSD450 TS unit is intended for use by properly trained, skilled professional automotive technicians. The safety messages presented below and throughout this user's manual are reminders to the operator to exercise care when using this unit. Before using your TSD450 TS, always refer to and follow the safety messages and applicable service procedures provided by the manufacturer of the vehicle being serviced.

### • Read All Safety Instructions

Read, understand and follow all safety messages and instructions in this manual. Safety messages in this section of the manual contain a signal word with a three-part message and, in some instances, an icon.

### • Signal Words

The signal word indicates the level of the hazard in a situation:

#### **DANGER**

*Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury to the operator or to bystanders.*

#### **WARNING**

*Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury to the operator or to bystanders.*

#### **CAUTION**

*Indicates a potentially hazardous situation which, if not avoided, may result in moderate or minor injury to the operator or to bystanders.*

#### **IMPORTANT**

*Indicates a situation which, if not avoided, may result in damage to the TSD450 TS or the vehicle being serviced.*

### • Safety Messages

Safety messages in this section contain three different type styles:

- Normal type states the hazard.
- **Bold type** states how to avoid the hazard.
- *Italic type* states the possible consequences of not avoiding the hazard.

## • Safety Symbols

A safety symbol, when present, gives a graphical description of the potential hazard, and how to avoid the hazard:



**Risk of Fire**



**Read Instructions Before Use**



**Risk of Explosion**



**Mandatory Eye Protection**



**Risk of Entanglement**



**Mandatory Protective Gloves**



**Dangerous Fumes**



**Mandatory Protective Clothing**



**Do Not Pull or Move**

## 1.02 IMPORTANT SAFETY INSTRUCTIONS

### DANGER



Engine exhaust contains toxic gases.

- **Vent vehicle's exhaust away from work area.**
- **Do not breathe exhaust.**

*Exhaust gases will cause injury or death.*

### WARNING



Improper use and operation.

- **Read, understand and follow all safety messages and operational procedures in this manual before operating the Flo-Dynamics TSD450 TS.**
- **This equipment should be operated only by qualified personnel.**
- **Use this equipment only as described in this manual.**

*Improper use and operation of this product can result in injury.*

### WARNING



Engine systems can malfunction expelling fuel, oil vapors, hot steam, hot toxic exhaust gases and other debris.

- **Wear safety goggles and protective clothing, user and bystander.**

*Engine systems that fail can cause serious injury.*

### WARNING



Risk of expelling pressurized fluids.

- **Wear safety goggles and protective clothing, user and bystander.**
- **Verify that engine and machine are off before connecting or disconnecting cooler lines and adapter hoses.**
- **Always unplug the machine from its power source when not in use.**
- **Keep the service hoses away from hot or moving engine parts. Hoses can split or burst causing fluid to be expelled.**
- **Tighten all connections properly. Insufficient or excessive torque can result in fluid leakage.**
- **Avoid contact with automatic transmission or power steering fluid.**
- **Treatment methods are as follows:**
  - Eyes:** Flush eyes with plenty of water.
  - Skin:** Wash with soap and water.

**Inhalation:** Move to uncontaminated area.

**Ingestion:** If large amount, get medical attention.

**If any irritation persists, get medical attention.**

- **Dispose of used fluid according to environmental laws and regulations.**

*Although automatic transmission and power steering fluid pose no significant health hazards, some individuals may experience adverse reactions upon contact. Pressurized fluid can cause serious injury.*

## **WARNING**

Risk of unexpected vehicle movement.

- **Block drive wheels before starting vehicle's engine to begin an exchange.**
- **Unless instructed otherwise, set parking brake and put gear selector in park.**
- **Do not leave a running vehicle unattended.**

*A moving vehicle can cause injury.*

## **WARNING**



Engine has moving parts. Risk of entanglement.

- **Do not place tools on fenders or other places in engine compartment.**
- **Keep yourself, clothing, battery cables and service hoses clear of moving parts such as fan blades, belts and pulleys.**

*Contact with moving parts can cause injury.*

## **WARNING**



Risk of fire or explosion.

- **Do not operate the TSD450 TS in the vicinity of open containers of flammable liquids such as gasoline.**
- **Keep hoses and jumper cables away from heat sources and sharp edges.**
- **Do not operate equipment with damaged cords or hoses until they have been examined by a qualified serviceman.**

*Fire or explosion can cause injury.*

## **WARNING**



Risk of fire or explosion. Gases produced by a battery are highly explosive.

- **Wear safety goggles and protective clothing, user and bystander.**
- **This machine is equipped to operate on 12-volt DC power only. A power source greater than this can result in serious injury to the user as well as damage to the machine.**
- **Do not smoke, place metal tools on battery or allow a spark or flame in vicinity of battery.**
- **Clean battery terminals before hooking the machine's battery clips to them. During cleaning, keep airborne corrosion from eyes, nose and mouth.**

- Be sure both battery cables are tightly connected to the battery terminals as instructed before proceeding with a fluid exchange.
- Never remove battery cables from the battery terminals while the machine is operating. Only use the “STOP” button located on the screen to stop an exchange.

*Battery explosion can cause injury.*

## WARNING



Battery acid is a highly corrosive sulfuric acid.

- Wear safety goggles and protective gloves, user and bystander.
- Have plenty of fresh water and soap nearby. If battery acid contacts skin, clothing, or eyes, flush exposed area with soap and water for 10 minutes.
- While cleaning battery's terminals, keep airborne corrosion from eyes, nose and mouth.
- Do not touch eyes while working near battery.

*Battery acid can burn eyes and skin.*

## WARNING



Risk of burns.

- Wear gloves when working near hot engine components.
- Do not touch hot exhaust systems, manifolds, engines, radiators, etc.
- The automatic transmission fluid coming from the vehicle along with some of the machine's components that the fluid comes into direct contact with (i.e. external: hoses and quick-disconnect fittings; internal: hoses and all fittings) may reach temperatures uncomfortable to the touch. Exercise caution in avoiding contact with these items.

*Hot components can cause injury or discomfort.*

## CAUTION

Ratchet mechanisms and tools may slip or break if dirty. Mismatched or partially worn parts can cause ratchet or any tool to slip or break.

- Frequently inspect and clean any tools used, and lubricate all non-sealed ratchet mechanisms with light oil.
- Do not replace worn parts individually. If adapter hose fittings become worn, refer to the “Replacement Parts” section to order new hoses.
- The use of any other accessories not specified in this manual may create a hazard.

*Tools that slip or break can cause injury.*



Risk of injury.

- This equipment should be operated by qualified personnel only.
- Use this equipment only as described in this manual.
- Always unplug the machine from its power source when not in use.
- Loop the power cord loosely in its proper location when machine is not in use.
- Do not operate equipment with a damaged battery cables or hoses, or if the equipment has been dropped or damaged, until it has been examined by a qualified service representative.
- Care should be taken to arrange the battery cables and service hoses so that they will not be tripped over or pulled.
- Never pull on the power cables or service hoses to transport the TSD450 TS. Damage may occur to these components, or machine may tip over.
- Keep area of operation clear of unnecessary tools and equipment. Utilize recessed tool storage areas on the top of the machine.
- Never leave the machine running unattended.
- The TSD450 TS is not designed for any other purpose than the exchanging of automatic transmission and/or power steering fluid.

*Operation of your TSD450 TS unit by anyone other than qualified personnel may result in injury.*

## IMPORTANT

Risk of equipment damage.

- Flushing high mileage cars that have not been previously serviced can cause operating problems in the transmission.
- Connect battery cables to a 12-volt power source only (i.e. vehicle's battery).
- Servicing, transporting, or storing this machine in an attitude other than the normal operating position can result in fluid spillage and/or component damage.
- Use only the manufacturer's recommended attachments.
- The Flo-Dynamics TSD450 TS is fully interactive. Refer to the screen at all times.
- Never pull on the power cables or service hoses to transport the TSD450 TS. Damage may occur to these components, or machine may tip over.
- Periodically clean the machine by wiping down with a clean, soft, dry cloth.

*Improper operation of equipment may result in damage to machine or components.*

**SAVE AND FOLLOW THESE INSTRUCTIONS!**



## II. SYSTEM FEATURES & SPECIFICATIONS

### 2.01 FEATURES

- Easy to use
- Fully Interactive Color Touchscreen
- Selectable units of Quarts or Liters
- Voltage display
- Filter change mode
- Fill mode
- Power loss memory
- Bluetooth capabilities and phone app (if applicable)
- Records services
- Built in adapter charts
- Transfer service history
- Program, monitor and receive notifications on smart phone
- Cooler line and dipstick exchange modes
- Select any quantity from 1-20 quarts
- Power interruption memory
- Drains vehicle's transmission for filter change
- 24-quart new and waste fluid tanks
- Pause button
- Fully automatic operation
- Large 1.75 gallon-per-minute pump performs faster exchanges
- Proven, accurate fluid measurement (+/-3%)
- Individual add and remove fluid buttons

## **2.02 DIMENSIONS & TECHNICAL SPECIFICATIONS**

### **DIMENSIONS:**

39" Tall  
24 3/4" Wide  
25" Deep

#### **Service Hoses:**

10' outside of machine

#### **Wheels:**

5" locking casters (front)  
5" casters (back)

#### **Weight:**

95 lbs

### **TECHNICAL SPECIFICATIONS:**

#### **Power:**

12-Volt DC from vehicle battery

#### **Screen:**

6.25" x 3.5" Fully Interactive Color Touchscreen

#### **Fuse:**

15 Amp

#### **Fluid Sensors:**

Accurate sensor technology

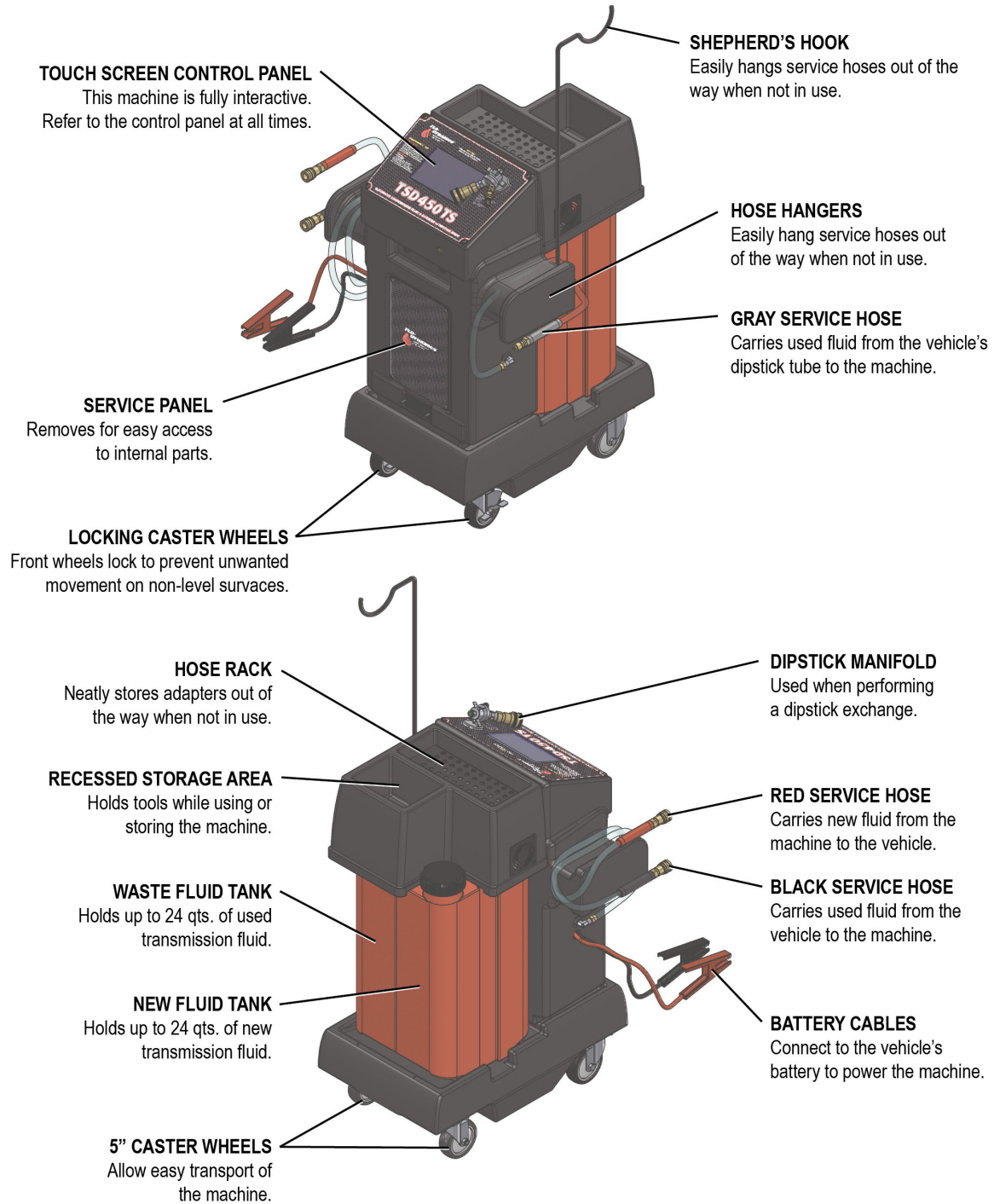
#### **Filters:**

25-micron absolute fluid filters

#### **Operating Temperature:**

65° to 150°F (15° to 65°C)

## 2.03 MACHINE OVERVIEW



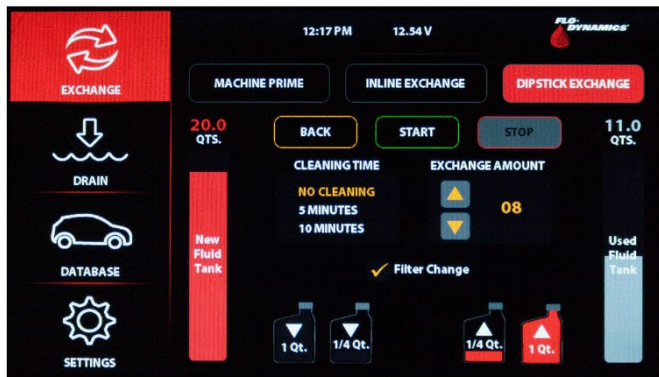
## III. OPERATING INSTRUCTIONS

Turn vehicle's A/C system OFF before starting an exchange.

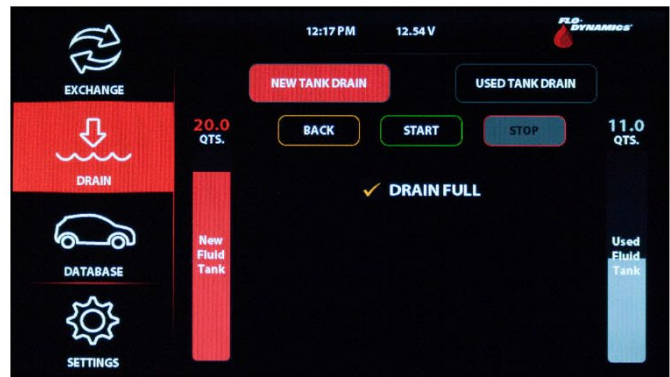
New transmission fluid **MUST** be 65°F or above for optimal performance.

### TOUCH SCREEN MODES

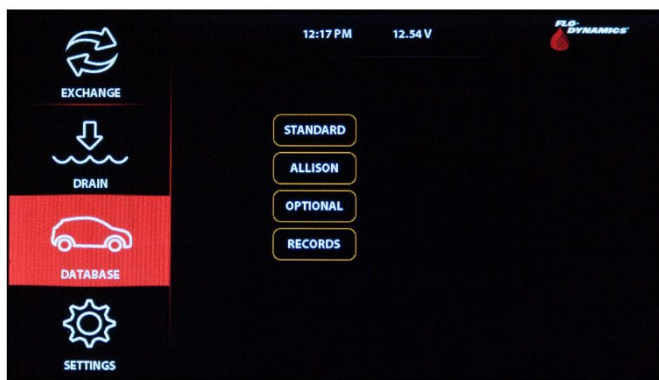
The machine has four basic modes which can be selected by pressing the icons on the left.



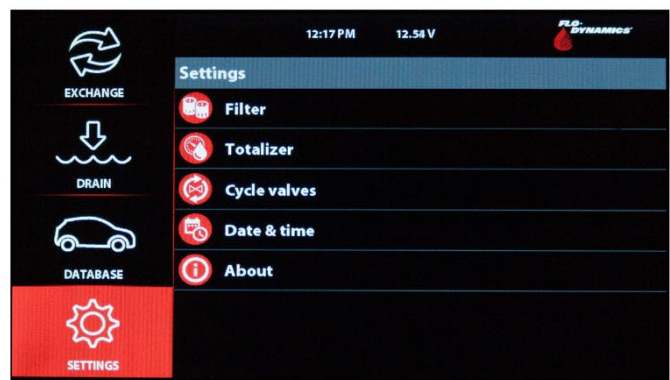
**EXCHANGE MODE**



**DRAIN MODE**



**DATABASE MODE**



**SETTINGS MODE**

### SETTINGS OVERVIEW

#### **FILTER**

Check or reset filter usage.

#### **TOTALIZER**

Shows the total number of quarts exchanged with the machine.

#### **CYCLE VALVES**

Manually cycles the machine's valves.

#### **DATE & TIME**

Set the date and time.

#### **ABOUT**

Shows the model, serial number, software version, and build date.

### PRIMING THE MACHINE

The machine must be primed before performing an exchange for the first time, after a filter change, or after fully draining the fluid tanks.



Connect the battery cables to the vehicle's battery.



Make sure there is fluid in the new fluid tank.  
Connect the red & black service hoses together using any two mating adapters.  
With **EXCHANGE** mode selected, press **MACHINE PRIME**.  
Press **START** to begin priming.

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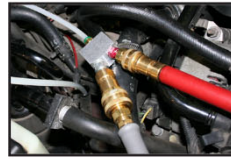
## CONNECTING TO THE VEHICLE

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### INLINE EXCHANGE

Connect appropriate adapters to vehicle's cooler line fittings. Connect red & black service hoses to quick disconnect adapters on ends of cooler line adapters.



### DIPSTICK EXCHANGE

Connect red and gray service hoses to chrome manifold. Insert nylon tube down dipstick tube the same length as dipstick, being careful not to insert too far.

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## PERFORMING AN EXCHANGE

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With **EXCHANGE** mode selected, press either **INLINE EXCHANGE** or **DIPSTICK EXCHANGE** depending on the type of service being performed.

Use the arrow buttons under **EXCHANGE AMOUNT** to set the number of quarts to be exchanged.

If cleaning chemicals are being added, select 5 or 10 minutes under **CLEANING TIME**.

(The cleaning feature delays the beginning of the flush to allow cleaning chemicals to circulate.)

Check the **Filter Change** box if the transmission's filter will be changed (Dipstick exchange only).

Press **START** and follow the on-screen instructions.

If needed, press **PAUSE** while running to pause the exchange. Press **START** to resume. To cancel the exchange, press **STOP**.

Check the fluid level when the exchange is complete.

Use the fluid bottle icons on the bottom of the screen to add or remove fluid in 1/4 qt. or 1 qt. increments.

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## POWER FAILURE MEMORY

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If there is a power failure during a fluid exchange, the procedure can be continued seamlessly.

Simply reconnect the battery cables, and press **Resume**. The exchange will resume where it left off.

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## FILTER CHANGE

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The machine will indicate when the canister filters need to be replaced.

Remove service panel. Use a standard filter band clamp tool to unscrew old filters, and replace them with new filters. Make sure new filters are on tight.

**IMPORTANT:** Machine must be primed after filter change.

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## DRAINING THE TANKS

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Connect any open end adapter to the red hose & insert into an appropriate disposal container.

**Make sure all other hoses are disconnected!**

With **DRAIN** mode selected, press **NEW TANK DRAIN** or **USED TANK DRAIN** depending on which tank you will be draining, and press **START**. To *fully* drain the new fluid tank before changing to a new fluid type, check the **DRAIN FULL** box before starting. **The machine should be primed after a full tank drain.**



## DOWNLOAD OUR **MOBILE APP**

We now offer a mobile app for our Bluetooth enabled machines. Simply visit the iTunes App Store or Google Play Store and search for "TSD450", or scan one of the QR codes below. After installing, simply open the app and pair it to your machine to control it through your phone.



TSD450





## IV. TROUBLESHOOTING & MAINTENANCE

### 4.01 COMMON PROBLEMS / SOLUTIONS

**Problem:** *“Power Failure” screen displays*

**Solution 1:** Check battery connection. Make sure there are no loose connections, and the machine’s battery clips are not reversed. Remove all corrosion from the battery terminals. Make sure vehicle’s A/C system is turned off.

**Solution 2:** The vehicle’s battery is not putting out enough voltage to run the machine. Connect the machine to a better 12V power source. Stand-alone shelf batteries will not work.

### 4.02 MAINTENANCE PROCEDURES

- **Replace Canister Filters** (Part#: 940796A) when machine prompts you to do so:

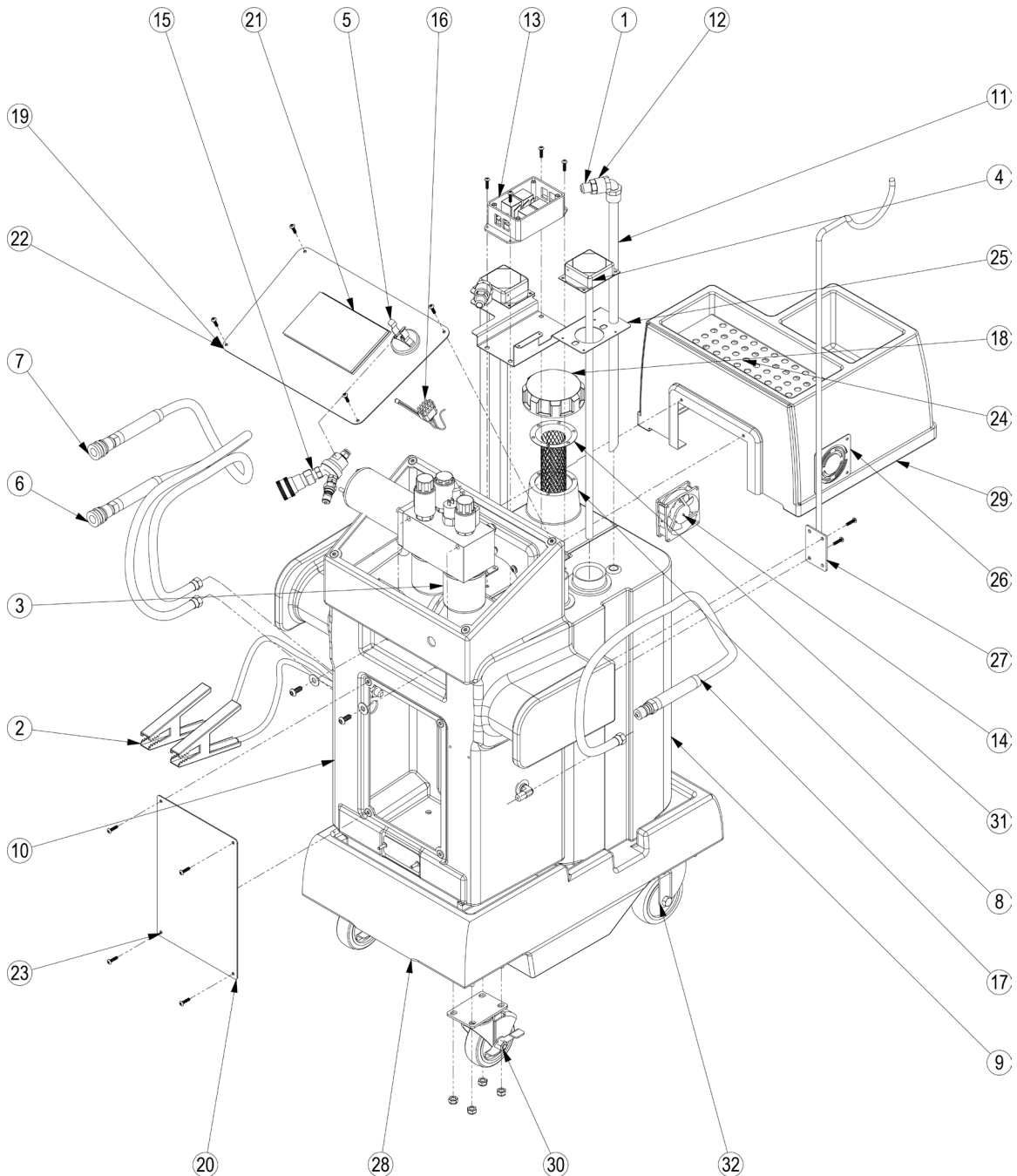
*Use a standard filter band clamp tool to unscrew old filters, and replace them with new filters. Make sure new filters are on tight.*

- **Clean Waste Fluid Screen (Located in bottom of recessed hose tray area)**

*This helps eliminate surface tension caused by debris and contamination from the air. Using a sharp pick, remove screen. Clean using degreaser and brush, and blow out with air compressor.*

- **Periodically Wipe Down Exterior** using a soft, damp cloth.

## V. REPLACEMENT PARTS





ITEM NO.	PART NO.	DESCRIPTION	QTY.
1	940125	MALE CONNECTOR 1/2 NPT 1/2 JIC	2
2	940307	6GA BATTERY CABLES 16 FT	1
3	940468	MANIFOLD W/R PUMP NO PRO PORT	1
4	940474	FLUID LEVEL SENSOR SHORT	2
5	940667	MAGNET THRU-HOLE CUP	1
6	940785	SERVICE HOSE (BLACK)	1
7	940786	SERVICE HOSE (RED)	1
8	941202	NEW FLUID TANK	1
9	941203	USED FLUID TANK	1
10	941205	CONSOLE-BLACK	1
11	941225	TUBE ALUMINUM 5/8 x 23.81	2
12	941226	ELBOW PLASTIC FEM 1/2 NPT x 5/8 TU	2
13	941617W	MOTOR CONTROL BOX	1
14	941655W	COOLING FAN ONLY	1
15	941716W	"Y" MANIFOLD FOR DIPSTICK SERVICE	1
16	941726W	WIRE HARNESS ONLY	1
17	941728	SERVICE HOSE (GREY) TSD SERIES UNITS	1
18	942113	TANK CAP	1
19	40200380	OVERLAY-CONTROL PANEL TSD450 TOUCHSCREEN	1
20	40200913	OVERLAY SERVICE PANEL - GENERIC	1
21	40200982	TOUCHSCREEN CONTROL BOARD (NO BLUETOOTH)	1
	40200318	TOUCHSCREEN CONTROL BOARD (BLUETOOTH ENABLED)	1
22	40300238	CONTROL PANEL	1
23	G940758	SERVICE PANEL	1
24	H940772	HOSE TRAY	1
25	P941234	TANK BRACKET - BLACK	1
26	P941616	COOLING FAN COVER BLACK	2
27	P941725	SHORT SHEPHERD HOOK ASSEMBLY	1
28	R940750	CHASSIS-BLACK	1
29	R940752	ATF TOP-BLACK	1
30	R942118	CASTER 4" W/BRAKE	2
31	R942129	SCREEN BASKET	1
32	R942137	CASTER 4" SWIVEL	2

## LIMITED ONE (1) YEAR WARRANTY

### Flo-Dynamics TSD450 TS

Flo-Dynamics warrants only to the original Purchaser that under normal use, care and service, the Equipment (except as otherwise provided herein) shall be free from defects in material and workmanship for one year from the date of original invoice. External hoses, remote control modules, adapters and all other attachments, supplies and consumables (except as otherwise provided herein) are warranted for 90 calendar days from the date of original invoice. Filter elements are not warranted. Printed circuit boards purchased from, but not installed by Seller are not warranted.

**SELLER'S OBLIGATIONS UNDER THIS WARRANTY ARE LIMITED SOLELY TO THE REPAIR OR, AT SELLER'S OPTION, REPLACEMENT OF EQUIPMENT OR PARTS WHICH TO SELLER'S SATISFACTION ARE DETERMINED TO BE DEFECTIVE AND WHICH ARE NECESSARY, IN SELLER'S JUDGEMENT, TO RETURN THE EQUIPMENT TO GOOD OPERATING CONDITION. NO OTHER WARRANTIES EXPRESS OR IMPLIED OR STATUTORY, INCLUDING WITHOUT LIMITATION ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, SHALL APPLY AND ALL SUCH WARRANTIES ARE HEREBY EXPRESSLY DISCLAIMED.**

This warranty does not cover (and separate charges for parts, labor and related expenses shall apply to) any damage to, malfunctioning, inoperability or improper operation of the Equipment caused by, resulting from or attributable to (A) abuse, misuse or tampering; (B) alteration, modification or adjustment of the Equipment by anyone other than Seller's authorized representatives; (D) improper or negligent use, application, operation, care, cleaning, storage or handling; (E) fire, water, wind, lightning or other natural causes; (F) adverse environmental conditions, including, without limitation, excessive heat, moisture, corrosive elements, or dust or other air contaminants, radio frequency interference, electric power failure, power line voltages beyond those specified for the equipment, unusual physical, electrical or electromagnetic stress, and/or any other condition outside of Seller's environmental specifications; (G) use of the Equipment in combination or connection with other equipment, attachments, supplies or consumables not manufactured or supplied by Seller; or (H) failure to comply with any applicable federal, state or local regulation.

Repairs or replacements qualifying under this Warranty will be performed on regular business days during Seller's normal working hours within a reasonable time following Purchaser's request. **All requests for Warranty service must be made during the stated Warranty period.** This warranty is non-transferable.

