



<b>EU DECLARATION OF CONFORMITY</b> <b>COUNCIL DIRECTIVE 98/37/EC and/or 2006/42/EC</b> CE DECLARATION DE CONFORMITE AVEC DIRECTIVE 98/37/EC et/ou 2006/42/EC	
Date of Issue:	17 NOV 09
Directive:	Machinery Directive on machinery safety, 98/37/EC and/or 2006/42/EC
Conforming Machinery:	Automotive Transmission Fluid Exchanger Model: TS410, TSD440, TSD450, TSD650 Serial Number: As stamped on Nameplate
Manufacturer:	Norco Industries, Inc. 2600 Jeanwood Drive Elkhart, IN 46514 USA
Authorised Representative:	Person's Name: Frank Casale Title: Director of Sales Company Name: Flo-Dynamics Street Address: 2600 Jeanwood Drive City Postal Code: 46514 Country: USA Tel: 574-262-3400 Fax: 574-264-2366
Harmonised Standards Referenced or Applied:	
EN ISO 12100-1:2003	Safety of machinery. Basic concepts, general principles for design.
EN ISO 12100-2:2003	Safety of machinery - Basic concepts, general principles for design - Part 2: Technical principles - /A1
EN 60529:1992	Specification for degrees of protection provided by Enclosures (IP Code).
EN ISO 14121-1:2007	Safety of Machinery – Risk Assessment – Part 1: Principles
Specifications with which Conformity is Declared:	Essential Health and Safety Requirements of Annex 1 of the Machinery Directive
We hereby certify that the machinery described above conforms with the essential health and safety requirements of Council Directive 98/37/EC and/or 2006/42/EC on the approximation of the laws of the Member States relating to the safety of machinery.	
Signed:	
Signatory:	Printed Name: Frank Casale Title: Director of Sales Company Name: Flo Dynamics

DECLARATION OF NOISE EMISSION	
The Norco Industries, Inc. Automotive Transmission Fluid Exchanger Model TS410, TSD440, TSD450, TSD650 noise emission levels per ISO EN 11202 are as follows:	
Work place noise level (Work Cycle) – Exchange Cycle	75.5 dB (A)
Ambient Correction Factor K3A calculated according to ISO EN 11204 Appendix A.	4 dB (A)
Measurements were made at a height of 1.5 m from the floor and 1 m from the equipment.	
The difference between the extraneous noise level and the sound intensity level at each measuring point is > 6 dB (A)	
The figures quoted are emission levels and are not necessarily safe working levels. While there is a correlation between the emission and exposure levels this cannot be used reliably to determine whether or not further precautions are required.	
Factors that influence the actual level of exposure of the workforce include characteristics of the work room, the other sources of noise, etc. such as the number of machines and other adjacent processes. Also, the permissible level of exposure can vary from country to country.	
This information, however, will enable the user of the machine to make a better evaluation of the hazard and risk.	
	Norco Industries, Inc. 2600 Jeanwood Drive Elkhart, IN 46514 USA
	



# TABLE OF CONTENTS

<b>INTRODUCTION to the TS650M .....</b>	<b>3</b>
<b>I. SAFETY INFORMATION .....</b>	<b>4</b>
- Section 1.01: Important Safety Notice.....	4
- Section 1.02: Important Safety Instructions.....	6
<b>II. SYSTEM FEATURES &amp; SPECIFICATIONS .....</b>	<b>10</b>
- Section 2.01: Features.....	10
- Section 2.02: Dimensions & Technical Specifications.....	11
- Section 2.03: Environmental, Transportation & Handling.....	12
- Section 2.04: Machine Overview.....	13
<b>III. OPERATING PROCEDURES .....</b>	<b>14</b>
- Section 3.01: Suggested Additional Tools.....	14
- Section 3.02: Basic Operating Instructions.....	16
- Section 3.03: Additional Instructions.....	18
- Section 3.04: Technical Support Contact Information.....	18
<b>IV. HOSES &amp; ADAPTERS .....</b>	<b>19</b>
- Section 4.01: Hoses.....	19
- Section 4.02: Adapters.....	19
<b>V. TROUBLESHOOTING &amp; MAINTENANCE .....</b>	<b>20</b>
- Section 5.01: Common Problems & Solutions.....	20
- Section 5.02: Maintenance Procedures.....	20
<b>VI. REPLACEMENT PARTS .....</b>	<b>21</b>
- Section 6.01: Replacement Part List.....	21
- Section 6.02: Replacement Part Illustrations.....	22
- Section 6.03: Ordering Information.....	23
<b>LIMITED WARRANTY .....</b>	<b>24</b>



## INTRODUCTION to the TS650M

*Congratulations on the purchase of your Flo-Dynamics TS650M 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. 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 TS650M 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 TS650M 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.**
- **The TS650M hooks up directly to one of the vehicle's transmission cooler lines.**
- **The ATF fluid exchange, from setup to finish, typically takes 15 minutes or less.**

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 TS650M before performing your first ATF exchange.**

**Actual machine may not contain the features depicted and may vary from photos.**

# I. SAFETY INFORMATION

## 1.01 IMPORTANT SAFETY NOTICE

For your safety, read this manual thoroughly before operating your TS650M unit. Your TS650M 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 TS650M, 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 TS650M 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**



**Tipping Hazard**



**Mandatory Ear Protection**



**Slipping Hazard**



**Team Lift**

## 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 TS650M.**
- **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, fluids, and other debris.

- **Wear safety goggles and protective clothing, user and bystander.**
- **Clean up any spilled fluid to reduce the likelihood of slipping.**

*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.**

- Clean up any spilled fluid to reduce the likelihood of slipping.
- Dispose of used fluid according to environmental laws and regulations.

*Although automatic transmission 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 TS650M 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**



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 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 "EMERGENCY STOP" button located on the control panel to stop an exchange.**

*Battery explosion can cause injury.*

## ⚠ 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.*

## ⚠ WARNING

Emergency Switching Off (ESO).

- **The Battery Clips serve as an Emergency Switching Off (ESO) device for this equipment. In the event of an emergency, if it is necessary to remove power from the Fluid Exchanger, remove the battery clips from the car battery.**

## ⚠ 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, see "Appendix C – Replacement Parts" 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.
- 2 people required when lifting heavy objects.
- Do not operate this machine on an incline of more than 8 degrees.
- 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 TS650M. 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 TS650M is not designed for any other purpose than the exchanging of automatic transmission fluid.

*Operation of your TS650M 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 TS650M is fully automatic. Refer to your control panel at all times.
- Never pull on the power cables or service hoses to transport the TS650M. 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

#### **Mechanical Features**

- Accurate sensor technology allows optimum fluid level to be maintained in vehicle's transmission
- Two in-line 22-micron absolute fluid filters capture microscopic particles and contaminants.
- Easy to use adapters allow quick hookup to virtually any automobile make and model, saving time and money.
- Clear sight glasses give visual confirmation of new and used fluid movements.
- Ergonomically correct working height means greater productivity, less stress and strain.
- Durable roto-cast polyethylene body and tanks prevent vehicle damage. The unit is also lightweight and durable, for easier handling and longer life
- Large 5-inch locking caster wheels make machine easy to maneuver.
- Easy-access service panel provides hassle-free operations for greater efficiency.

#### **Electronic Features**

- Self-contained battery cables hook up to the vehicle's 12-volt battery
- Automatic monitoring of fluid in new and used fluid tanks assures safe operation
- Accurate sensor technology
- LCD counter display with cumulative ATF options
- Ability to exchange anywhere from 1 to 23 quarts in 1 quart intervals
- Fluid measurements can be changed from quarts to liters
- Drain used fluid tank (no need to tip machine upside-down)
- Drain new fluid tank
- Ability to pause machine during exchange to change transmission filter
- Battery backup allows machine to resume where it left off should it lose power
- Add new fluid to transmission in 1/4 quart increments (approx. 1/8" on the dipstick)
- Remove fluid from transmission in 1/4 quart increments (approx. 1/8" on the dipstick)
- Cycle valves feature allows you to electronically clean out valves
- Totalizer check (indicates lifetime use)
- Interactive menu:
  - "Auto Prime" feature automatically primes the system
  - Indicate new fluid volume
  - Indicate used fluid capacity
  - Read battery voltage

## 2.02 DIMENSIONS & TECHNICAL SPECIFICATIONS

### **DIMENSIONS:**

49" Tall x 24" Wide x 27" Deep

#### **Service Hoses:**

10' outside of machine

#### **Wheels:**

5" locking casters (front); 10" casters (back)

#### **Fluid Tanks:**

(2) 28-Quart New Fluid Tank

(1) 28-Quart Used Fluid Tank

#### **Weight:**

95 lbs

### **TECHNICAL SPECIFICATIONS:**

**Input Voltage:** 12 VDC from vehicle battery

**Fuse:** 15 Amp

**Full Load Current:** 36 FLA

**Largest Load:** M1

**Power:** 150W

**Max. Hydraulic Working Pressure:** 60 PSI/ 4.1 Bars

**Fluid Sensors:** Accurate sensor technology

**Filters:** 25-micron absolute fluid filters

**Operating Temperature:** 60° to 150°F (15° to 65°C)

**Year of Construction:** 2010

## **2.03 ENVIRONMENTAL & TRANSPORTATION / HANDLING**

### **Operating Temperature:**

This equipment will operate correctly in its intended ambient, at a minimum between +5°C and +40°C.

### **Relative Humidity:**

The equipment will operate correctly within an environment at 50% RH, +40°C. Higher RH may be allowed at lower temperatures.

Measures shall be taken by the Purchaser to avoid the harmful effects of occasional condensation.

### **Altitude:**

This equipment will operate correctly up to 1000m above mean sea level.

### **Transportation and Storage:**

This equipment will withstand, or has been protected against, transportation and storage temperatures of -25°C to +55°C and for short periods up to +70°C.

It has been packaged to prevent damage from the effects of normal humidity, vibration and shock.

## 2.04 MACHINE OVERVIEW



\* Actual machine may not contain the features depicted and may vary from photos.

## III. OPERATING PROCEDURES

### 3.01 SUGGESTED ADDITIONAL TOOLS

#### **⚠ CAUTION**

- Frequently inspect and clean any tools used, and lubricate all non-sealed ratchet mechanisms with light oil.
- The use of any other accessories not specified in this manual may create a hazard.
- Read, understand and follow Safety Instructions in the front pages of this manual and on product safety labels.

#### **Line Wrenches**

3/8"  
7/16"  
1/2"  
9/16"  
5/8"  
11/16"  
3/4"

#### **End Wrenches**

3/8"  
7/16"  
1/2"  
9/16"  
5/8"  
11/16"  
3/4"

#### **Hex Wrenches**

1/8"  
11/16"

#### **Nut Drivers (American)**

3/16"  
1/4"  
5/16"  
3/8"  
7/16"

#### **Nut Drivers (Metric)**

6 mm  
8 mm  
9 mm  
10 mm  
11 mm  
12 mm  
13 mm  
14 mm

#### **Filter Band Clamp**

*For replacing canister filters*

#### **Metric End or Line Wrenches**

10 mm  
11 mm  
12 mm  
13 mm  
14 mm  
15 mm  
16 mm  
17 mm  
18 mm  
19 mm  
20 mm

#### **Screwdrivers**

##### **Phillips**

1 long  
1 short

##### **Standard**

1 long  
1 short

**⚠ DANGER**

- Vent vehicle's exhaust away from work area.
- Do not breathe exhaust.
- Read, understand and follow Safety Instructions in the front pages of this manual and on product safety labels.

**⚠ WARNING**

- Wear safety goggles and protective clothing, user and bystander.
- Do not operate the TS650M in the vicinity of open containers of flammable liquids such as gasoline.
- This machine is equipped to operate on 12-volt DC power only.
- 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.
- Keep yourself, clothing, battery cables and service hoses clear of moving parts such as fan blades, belts and pulleys.
- Unless instructed otherwise, set parking brake and put gear selector in park.
- Do not leave a running vehicle unattended.
- 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.

**⚠ CAUTION**

- Use this equipment only as described in this manual. Use only the manufacturer's recommended attachments.
- Do not operate this machine on an incline of more than 8 degrees.
- 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 TS650M. Damage may occur to these components, or machine may tip over.
- Servicing, transporting, or storing this machine in an attitude other than the normal operating position can result in fluid spillage and/or component damage.
- The TS650M is fully automatic. Refer to your control panel at all times.

**⚠ CAUTION**

- Flushing high mileage cars that have not been previously serviced can cause operating problems in the transmission.

## 3.02 BASIC OPERATING INSTRUCTIONS

### IMPORTANT

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

New transmission fluid **MUST** be 60°F or above for optimal performance.

### CHANGING LANGUAGE

1. Connect machine to battery
2. Press 3
3. Select the desired languages
4. Disconnect from battery
5. Connect to battery

### FIRST TIME OPERATION (*Priming the System*)

*(Only necessary when machine is received, before first operation.)*

**System must be primed before first use.**

1. Connect machine to battery
2. Make sure fluid is in new fluid tank
3. Connect the red and black service hoses together using the adapters
4. Press 0
5. Press 5
6. Press START

### Select New Fluid Tank

1. Press 0
2. Press ▼
3. Press 0
4. Press 1 or 2 to select the desired tank.

### TRANSMISSION FLUID EXCHANGE (Normal Mode)

1. Connect battery leads.
2. Locate and disconnect the most easily accessible hose or fitting at the radiator end of the transmission cooler system.
3. Connect red & black service hoses to quick-disconnect adapters on ends of adapter hoses.
4. Press 1 to select "Inline Exchange".
5. Select quantity using the ▲ and ▼ buttons, and press START.
6. Press 1 for normal exchange
7. Start vehicle's engine, and press START to confirm choices. Exchange will begin. *Once the exchange has begun, press the STOP button once to pause the machine. Press START to resume from pause. Press STOP a second time to cancel the exchange.*
8. When exchange is finished, the unit will beep and display "Complete".
9. You may top off or remove fluid by using the "ADD FLUID" or "REMOVE FLUID" buttons.
10. Press 0 to return to the main menu.



## TRANSMISSION FLUID EXCHANGE (Cleaning Mode)

1. Connect battery leads.
2. Locate and disconnect the most easily accessible hose or fitting at the radiator end of the transmission cooler system.
3. Connect red & black service hoses to quick-disconnect adapters on ends of adapter hoses.
4. Press 1 to select "Inline Exchange".
5. Select quantity using the ▲ and ▼ buttons, and press START.
6. Press 2 for Cleaning exchange
7. Start vehicle's engine, check for any leaks and check the vehicle's fluid level. Press START to confirm choices.. *Once the unit has begun, the unit will run a 10 minute cleaning process and automatically perform the exchange. press the STOP button once to pause the machine. Press START to resume from pause. Press STOP a second time to cancel the exchange.*
8. When exchange is finished, the unit will beep and display "Complete"
9. Press start to resume.

### Filter Change Process

10. Press 2 for filter change
11. Select the amount of fluid to be removed and press start
12. Shut off engine and replace Vehicle's filter
13. Press start
14. Select the amount fluid to be added to the vehicle, start the vehicle's engine and press start.
15. Check the vehicle's fluid level
16. You may top off or remove fluid by using the "ADD FLUID" or "REMOVE FLUID" buttons.
17. Press 0 to return to the main menu.
18. Shut off engine and disconnect hoses and adapters from vehicle
19. Reconnect fittings
20. Start Engine and check for leaks.
21. Check fluid level.

### 3.03 ADDITIONAL INSTRUCTIONS

**Add 1 Quart**

1. Press 0
2. Press 3

**Remove 1 Quart**

1. Press 0
2. Press 4

**Drain Waste Fluid Tank**

1. Connect to battery
2. Connect open end adapter to red hose. Make sure all other hoses are disconnected
3. Press 0
4. Press ▼
5. Press 7
6. Unit will shut off when complete

**Drain New Fluid Tank**

1. Connect to battery
2. Connect open end adapter to red hose. Make sure all other hoses are disconnected
3. Press 0
4. Press ▼
5. Press 6
6. Unit will shut off when complete

**Prime the Machine**

1. Connect to battery
2. Make sure fluid is in new fluid tank
3. Connect the red and black service hoses together using the adapters
4. Press 0
5. Press 5
6. Press START

**Switch Hoses**

1. Turn vehicle off
2. Switch hoses
3. Restart vehicle
4. Press START
5. Press 3

**Shift to Neutral**

1. Shift vehicle to neutral
2. Press START

### 3.04 TECHNICAL SUPPORT CONTACT INFORMATION

If you experience any problems or have any questions, call technical support at:

**800-303-5874, 574-262-3400 or e-mail [fcasale@norcoind.com](mailto:fcasale@norcoind.com)**

## IV. HOSES & ADAPTERS

### ⚠ CAUTION

- Do not replace worn parts individually. If adapter hose fittings become worn, see “Appendix C – Replacement Parts” to order new hoses.
- The use of any other accessories not specified in this manual may create a hazard.
- Read, understand and follow Safety Instructions in the front pages of this manual and on product safety labels.

### 4.01 HOSES



**941801- Hose #51**  
(Mates with #52)

Used for priming the machine



**941802- Hose #52**  
(Mates with #51)

Used for priming the machine



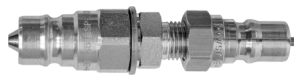
**941809- Hose #59**

Used for draining the tanks

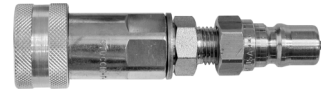
### 4.02 ADAPTERS



**940831**  
Master Hose Connector



**941747W**  
Mercedes Master Connector  
Male Coupler

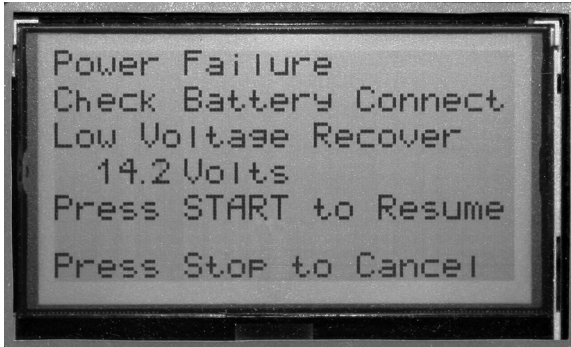


**941748W**  
Mercedes Master Connector  
Female Coupler

## V. TROUBLESHOOTING & MAINTENANCE

### 5.01 COMMON PROBLEMS / SOLUTIONS

**Problem:** "Power Failure" screen displays

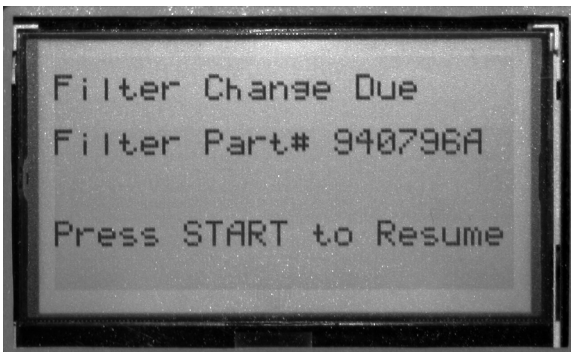


**Solution 1:** Check battery connection. Make sure there are no loose connections, and the machine's battery clips are not reversed. Remove all corrosion from the battery terminals. Make sure vehicle's A/C system is turned off.

**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.

### 5.02 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.*

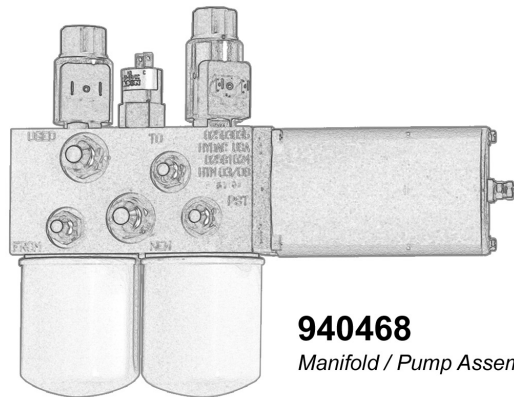
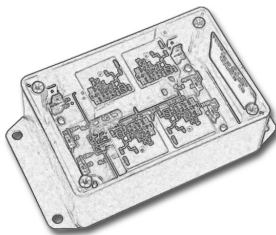
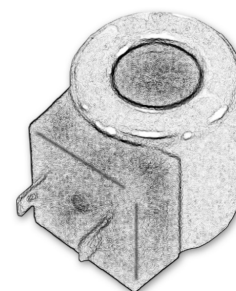
• **Periodically Wipe Down Exterior using a soft, damp cloth.**

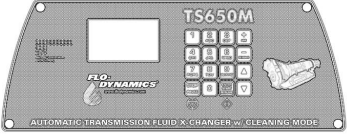


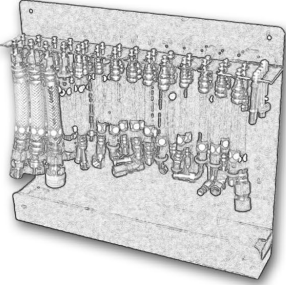
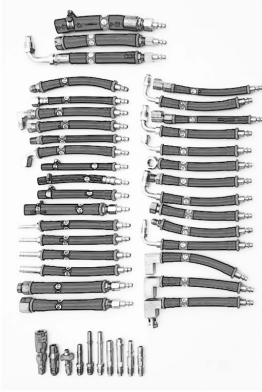
## VI. REPLACEMENT PARTS

### 6.01 REPLACEMENT PART LIST

Part #	Description
<b>941750W</b>	Control Panel w/ Electronic Board & Label
<b>940304</b>	Battery Cable Assembly
<b>941617W</b>	Motor Control Box
<b>942004</b>	Sensor Rod
<b>941307</b>	5/8" Fluid Tube
<b>941226</b>	Fluid Tube Elbow Fitting
<b>940468</b>	Manifold / Pump Assembly
<b>940843</b>	Pressure Switch ( <i>Factory preset to 6 psi</i> )
<b>940839</b>	3/2 Solenoid Valve [ <i>Short</i> ] (S2)
<b>940840</b>	3/2 Solenoid Valve [ <i>Tall</i> ] (S1)
<b>940841</b>	Coil with Spade Connector [ <i>Short</i> ] (S2)
<b>940842</b>	Coil with Spade Connector [ <i>Tall</i> ] (S1)
<b>940831</b>	Master Hose Connector
<b>941623</b>	Service Hose (Black)
<b>941622</b>	Service Hose (Red)
<b>940999</b>	Standard Adapter Set
<b>941220</b>	Wall Mounted Hose Rack ( <i>Adapters Not Included</i> )
<b>R942118</b>	Locking Caster Wheel
<b>941300</b>	10" Wheel
<b>940796A</b>	Canister Filter
<b>R942129</b>	New Fluid Screen
<b>941740</b>	Operations Manual
<b>941742</b>	Quick Start Instructions
<b>941743</b>	Quick Start Instructions: <i>Additional Functions</i>

## 6.02 REPLACEMENT PART ILLUSTRATIONS

**940468***Manifold / Pump Assembly***941617W***Motor Control Board***942004***Sensor Rod***941307***5/8" Fluid Tube***941226***Fluid Tube Elbow Fitting***940843***Pressure Switch***940839***3/2 Solenoid Valve [Short] (S2)***940840***3/2 Solenoid Valve [Tall] (S1)***940841 or****940842***Coil with Spade Connector  
Short (S2) or Tall (S1)*

 <p><b>941750W</b> Control Panel w/ Electronic Board &amp; Label</p>	 <p><b>940796A</b> Canister Filter</p>	 <p><b>R942129</b> New Fluid Screen</p>
 <p><b>941220</b> Wall Mounted Hose Rack (Adapters Not Included)</p>	 <p><b>941300</b> 10" Wheel <b>R942118</b> Locking Caster</p>	 <p><b>940999</b> Standard Adapter Set</p>

## 6.03 ORDERING INFORMATION

To order replacement parts for the Flo-Dynamics TS650M, call:

**800-303-5874, 574-262-3400 or [mgehrke@norcoind.com](mailto:mgehrke@norcoind.com)**

## LIMITED ONE (1) YEAR WARRANTY

### Flo-Dynamics TS650M

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.



