



# TOTALIZER-TRANSMITTER

MODEL TR04-2

## OPERATION AND MAINTENANCE MANUAL PARTS LIST

FEATURING:

\*SEALED HOUSING

\*STANDARD TOTALIZER ASSEMBLY

\*MAGNETICALLY ACTUATED REED SWITCH



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## WARRANTY

This Warranty shall apply to and be limited to the original purchaser consumer of any McCrometer product. Meters or instruments defective because of faulty material or workmanship will be repaired or replaced, at the option of McCrometer, free of charge, FOB the factory in Hemet, California, within a period of one (1) year from the date of delivery.

Repairs or modifications by others than McCrometer or their authorized representatives shall render this Warranty null and void in the event that factory examination reveals that such repair or modification was detrimental to the meter or instrument. Any deviations from the factory calibration require notification in writing to McCrometer of such recalibrations or this Warranty shall be voided.

In case of a claim under this Warranty, the claimant is instructed to contact McCrometer, 3255 W. Stetson Ave., Hemet, California 92545, and to provide an identification or description of the meter or instrument, the date of delivery, and the nature of the problem.

The Warranty provided above is the only Warranty made by McCrometer with respect to its products or any parts thereof and is made expressly in lieu of any other warranties, by course of dealing, usages of trade or otherwise, expressed or implied, including but not limited to any implied warranties of fitness for any particular purpose or of merchantability under the uniform commercial code. It is agreed this Warranty is in lieu of and buyer hereby waives all other warranties, guarantees or liabilities arising by law or otherwise. Seller shall not incur any other obligations or liabilities or be liable to buyer, or any customer of buyer for any anticipated or lost profits, incidental or consequential damages, or any other losses or expenses incurred by reason of the purchase, installation, repair, use or misuse by buyer or third parties of its products (including any parts repaired or replaced); and seller does not authorize any person to assume for seller any other liability in connection with the products or parts thereof. This Warranty cannot be extended, altered or varied except by a written instrument signed by seller and buyer.

This Warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

McCrometer reserves the right to make improvements and repairs on product components which are beyond the Warranty period at the manufacturer's option and expense, without obligation to renew the expired Warranty on the components or on the entire unit. Due to the rapid advancement of meter design technology, McCrometer reserves the right to make improvements in design and material without prior notice to the trade.

All sales and all agreements in relation to sales shall be deemed made at the manufacturer's place of business in Hemet, California and any dispute arising from any sale or agreement shall be interpreted under the laws of the State of California.

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TOTALIZER-TRANSMITTER  
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\* For Conversion From Old Style Totalizer to TR04-2 Only.

\*\* For Conversion From CN06 to TR04-2 Only.  
(Serial # 821935 and Lower, .100 Dia. Shaft Tip)

**I. DESCRIPTION**

**MODEL TR04-2 TOTALIZER-TRANSMITTERS** provide a totalization of flow volume and a pulse rate output signal of one contact per totalizer hand revolution when mounted on any McCrometer meter (some meters must be equipped with a special adapter ring, part #2-4108). Construction of the totalizer-transmitter features a hermetically sealed housing. The totalizer-transmitter is mechanically driven by the meter mechanism and features a six digit, straight reading type totalizer with a full 3 inch diameter, 100 division center sweep dial that permits extremely accurate readings for timing purposes in determining flow rates. The totalizer dial can be furnished in gallons, cubic feet, acre feet, or any standard liquid measuring units. The transmitter utilizes a durable magnetically actuated reed switch. The bonnet, with padlock hasp, is o-ring sealed to the meter head.

**II. SPECIFICATIONS**

**ACCURACY** plus or minus 2% within the range specified for each meter size.

**TEMPERATURE RANGE** 140° F maximum. Consult factory for special construction for higher temperatures.

**FLOW RANGE** acceptable for each totalizer-transmitter unit is the same as that for the meter to which the unit mounts.

**OUTPUT SIGNAL** Pulse rate: one contact per revolution of totalizer sweep hand.

**SWITCH RATING** Contact Rating - 10 watts  
Switching Voltage - 200 VDC Max.  
Switching Current - 0.5 Amp.-Max.  
Carry Current - 1.2 Amp.-Max.  
Initial Contact Resistance - .100 Ohms-Max.  
Capacitance - 0.2 Picofarads-typ.  
Note: Switch contact normally open.

**MATERIALS** used in construction are chosen for their durability and immunity to the corrosive effects of atmospheric moisture and of the liquids measured by the meter assembly.

**SHIPPING WEIGHT** 4 pounds

**OPTIONAL EQUIPMENT** includes switches rated for various applications. Consult factory for special applications.

**ORDERING INFO** customer must specify: Serial number of the meter unit to be mounted, or change gear and dial on the totalizer that is going to be replaced.

**TOTALIZER-TRANSMITTER  
INSTALLATION**

**III. UNPACKING.** When unpacking the unit, any damage due to rough or improper handling should be reported to the transportation firm and McCrometer. If for any reason it is determined that the unit or parts of the unit should be returned to the factory, please contact McCrometer for clearance prior to shipment. Each unit must be properly packaged to prevent any further damage. The factory assumes no responsibility for equipment damage in return shipment due to improper packaging. The shipping carton contains the following items:

- Model TR-04-2 ..... 1
- Mounting Equipment as required ..... -
- Operation and Maintenance Manual ..... 1

**IV. INSTALLATION** is normally made at the factory when the meter is assembled, but may be made in the field. Depending on what situation exists, various steps for installation apply and the procedures are outlined below.

**1. REMOVE BONNET** from existing meter head by removing mounting screws. Remove existing totalizer from meter head by removing mounting screws and lifting unit off.

**2. CLEAN METER HEAD** of all dirt, glue, and other foreign material.

**\*3. ADAPTER PLATE** (part #2-4108), and gasket (part #1-1558-3 must be attached to the top of the meter head on the old style LP21 (3 hole bolt circle) and all ML45, ML47, and ML49 meters. Adapter plate can be secured to the meter head by three mounting screws (part #1-1116-8-12) after the gasket has been centered on the head. Throughout the manual the top of the adapter plate will be referred to as the top of the meter head.

**\*\*4. VERTICAL SHAFT REMOVAL** can be accomplished by removing the two screws inside the meter head which secure the vertical shaft collar and bearing assembly to the meter head. Remove the A-drive gear from the vertical shaft after loosening the set screw in the gear hub. Spin the vertical shaft collar and bearing assembly gently, checking for any sign of wear. If collar and bearing assembly are all right remove from shaft by loosening set screw in hub and sliding off. Collar and bearing assembly will be used on the new vertical shaft.

**\*\*5. REPLACEMENT VERTICAL SHAFT** should be inspected to be sure it is not bent or damaged. Insert new shaft gently into the gearbox through the opening in the top

of the meter head. Rotate the shaft gently until it is engaged in the driven miter gear shaft of the miter gear frame assembly. Replace the collar & bearing assembly and secure the two screws that hold it in place. Do not overtighten the screws as this can cock the bearing and bind the vertical shaft. Tighten set screw in the hub. Turn the top of the vertical shaft to check for any bind or drag. Should any bind or drag be apparent, it can usually be corrected by adjusting the vertical shaft collar and bearing assembly. Loosen the set screw in the hub and slide the shaft downward until it rests firmly against the driven miter gear shaft, then lift up about 1/64". Tighten set screw.

**6. TOTALIZER DRIVE MAGNET ASSEMBLY** can now be placed on the vertical shaft, hub down. (Totalizer drive magnet will be in place already if replacing a standard totalizer.) Position the face of the magnet 1/16" below the top surface of the meter head. Adjustments can be made by loosening the socket head set screw in the side of the totalizer drive magnet assembly and sliding it up and down the vertical shaft as desired. Always be sure the set screw is tightened into the flat on the vertical shaft when adjustments are completed.

**7. TOTALIZER-TRANSMITTER** and bonnet assembly should be placed on the meter head in the desired position after the bonnet o-ring (#2) has been covered with a thin coat of silicone grease. Secure four screws (#3).

**8. TRANSMITTER WIRING** can be accomplished by following the wiring diagram on page 7.

**TOTALIZER-TRANSMITTER  
OPERATION AND MAINTENANCE MANUAL**

**V. MCCROMETER** products have been carefully designed to be as maintenance-free as possible. Periodic preventive maintenance, however, is highly recommended and should be practiced according to schedule to ensure continuous accuracy and trouble-free performance of your transmitter. The maintenance and inspection procedure can also be used as a guide to locating a problem in the unit that may be the cause of abnormal operation.

**VI. WORKING AREA** chosen for cleaning and inspection of the internal components should be clean to reduce the chance of dust or dirt particles being introduced into the transmitter mechanism.

**VII. TOTALIZER-TRANSMITTER ASSEMBLY (#8)** service should include cleaning and inspection of the unit, noting any excessive wear on the change gear (#6 & #7) that may lead to operational problems in the unit.

**\* For Conversion From Old Style Totalizer to TR04-2 Only.**

**\*\* For Conversion From CN06 to TR04-2 Only.  
(Serial # 821935 and Lower, .100 Dia. Shaft Tip)**

**1. BONNET MOUNTING SCREWS (#3)** should be removed and the entire bonnet (#1) lifted off the meter.

**2. TOTALIZER-TRANSMITTER** is contained within the totalizer bonnet (#1) and held in place by a base cup (#4). It should not be necessary to remove the totalizer (#8) during inspection of the totalizer change gears (#6 & #7) during inspection; however, removal of the base cup (#4) is necessary for inspection of the totalizer change gears (#6 & #7). Removal of the base cup (#4) can be accomplished by inserting a small screwdriver into the two cutouts and prying upward under the edge.

**3. TOTALIZER CHANGE GEARS (#6 & #7)** should be inspected for any signs of wear. Both the A-(drive) gear and B-(driven) gear are attached to the lower portion of the totalizer assembly (#9). Spin the floating totalizer driven magnet in the center of the totalizer bottom (#9) to make certain it spins freely without bind or drag. The bottom of the totalizer has the letter "A" molded next to the A-drive gear shaft, and the letter "B" next to the B-driven gear shaft.

**4. TOTALIZER DRIVE MAGNET ASSEMBLY** located in the meter head at the top of the vertical shaft assembly should be checked and adjusted, if necessary, to position it 1/16" below the top surface of the meter head. Adjustments can be made by loosening the socket head set screw in the side of the totalizer drive magnet assembly and sliding it up or down the vertical shaft as desired. (See meter service manual.)

**5. DIAL REPLACEMENT** can be made at this time, if desired, and requires that the sweep hand (#12) first be removed by twisting the hand and lifting it off at the same time. Remove the two dial mounting screws (#11), lift the dial (#10) off the top plate (#14), replace with a new dial, and secure with the mounting screws (#11). Replace the sweep hand (#12) on the center shaft. The hand should be pointing to the same position as it was when it was removed.

**6. TRANSMITTER SWITCH (#32)** connections should be checked to be sure they are securely in place.

**VIII. TROUBLESHOOTING** the transmitter is necessary if it is determined that the meter assembly and instrument are working properly but the transmitter is not functioning.

**1. CONTINUITY CHECK** should be performed on the transmitter, at the instrument, by using an ohm meter wired between the black and white transmitter lines. (See wiring diagram.) With the instrument disconnected and the meter operating (totalizer movement), the ohm meter should read 0 ohms once every totalizer sweep hand revolution. If the ohm meter responds to the test then the instrument is the probable cause of the problems.

**2. TRANSMITTER LINES** should be checked, at the junction box, if the ohm meter didn't respond to the above test.

Connect the ohm meter (as described above) to the transmitter lines (in the junction box) and check continuity. If the ohm meter responds to this test then the transmitter lines between the junction box and the instrument are the probable cause of the problem.

**3. SWITCH & BLOCK ASSEMBLY** should be checked if the continuity checks showed that no contact was being made. Remove the bonnet as described in Section VII steps 1-2. The reed switch and mounting block assembly (#32) should be positioned vertically directly adjacent to the actuator. As the actuator (#34) turns with the odometer worm (#25), it should actuate the reed switch (#32). If the switch and block assembly (#32) have become damaged or the switch reeds have fused or burnt, the unit must be returned for repair.

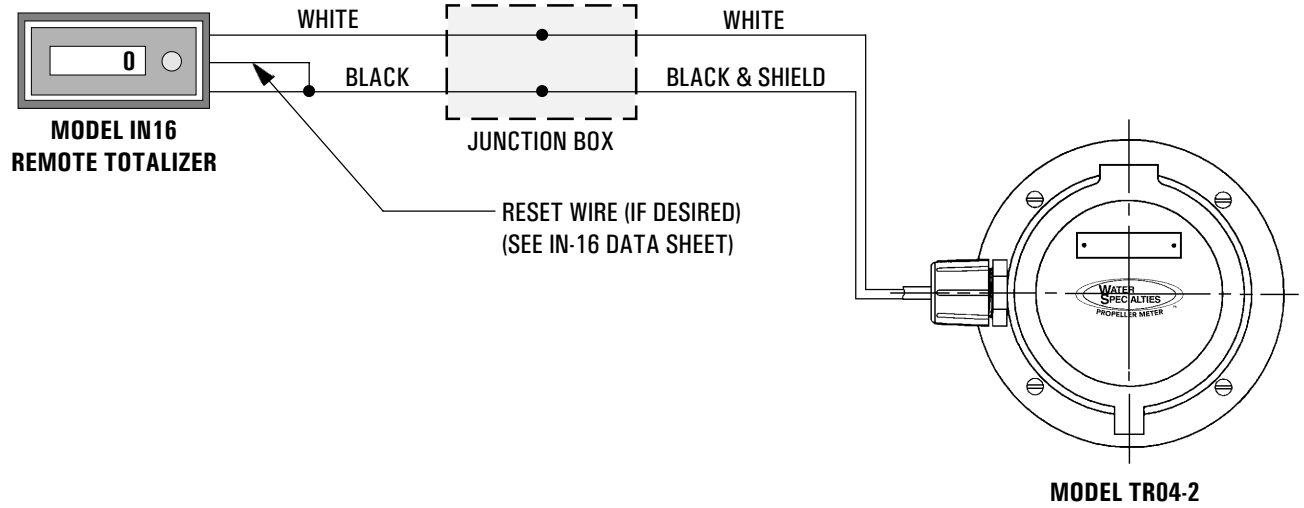
**IX. INSPECTION** of all internal totalizer parts that may be replaced in the field has been accomplished at this point. Should any of the totalizer parts, upon inspection, appear to be damaged or excessively worn, they must be replaced to ensure proper meter operation and prevent further damage.

**X. REASSEMBLY** is necessary at this point. Before reassembling, make certain that the unit is cleaned of any dust or dirt. Costs for replacement parts not covered by warranty are available from current parts and price list. If it is determined that the unit should be returned for repair, please notify McCrometer prior to shipment. Each unit must be properly packaged to prevent damage to the unit in shipment.

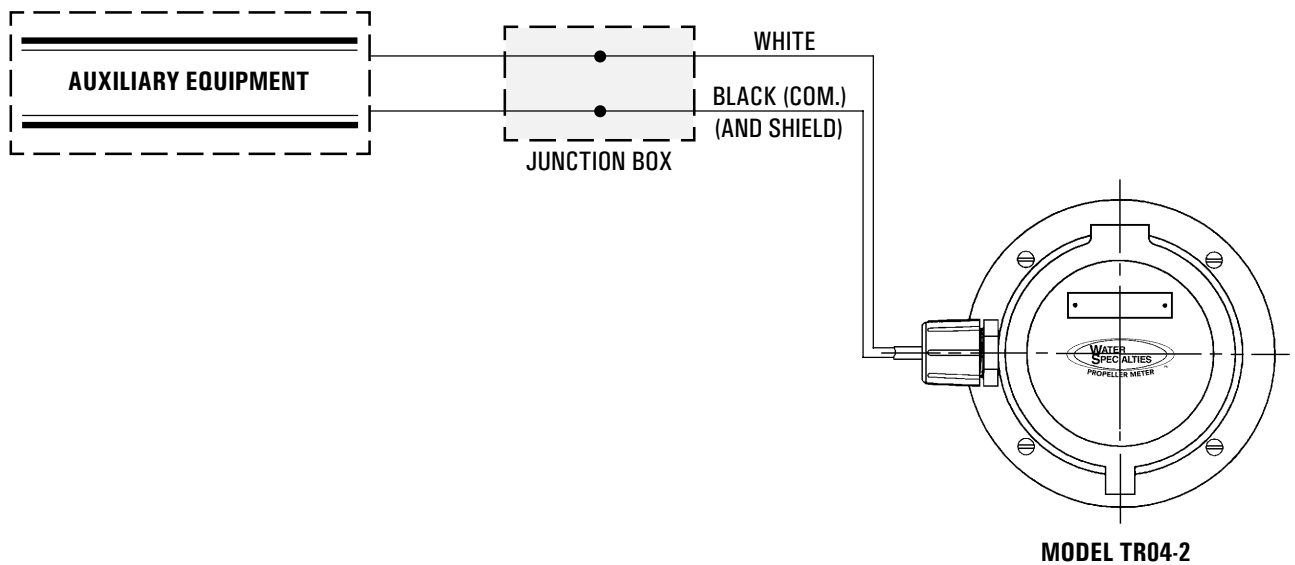
**1. REINSTALL TRANSMITTER** on meter head by following steps 6 through 8 of Section IV.

# NOTES

## WIRING WHEN USED WITH MODEL IN16



## WIRING WHEN USED WITH AUXILIARY EQUIPMENT



# TOTALIZER-TRANSMITTER

## MODEL TR04-2

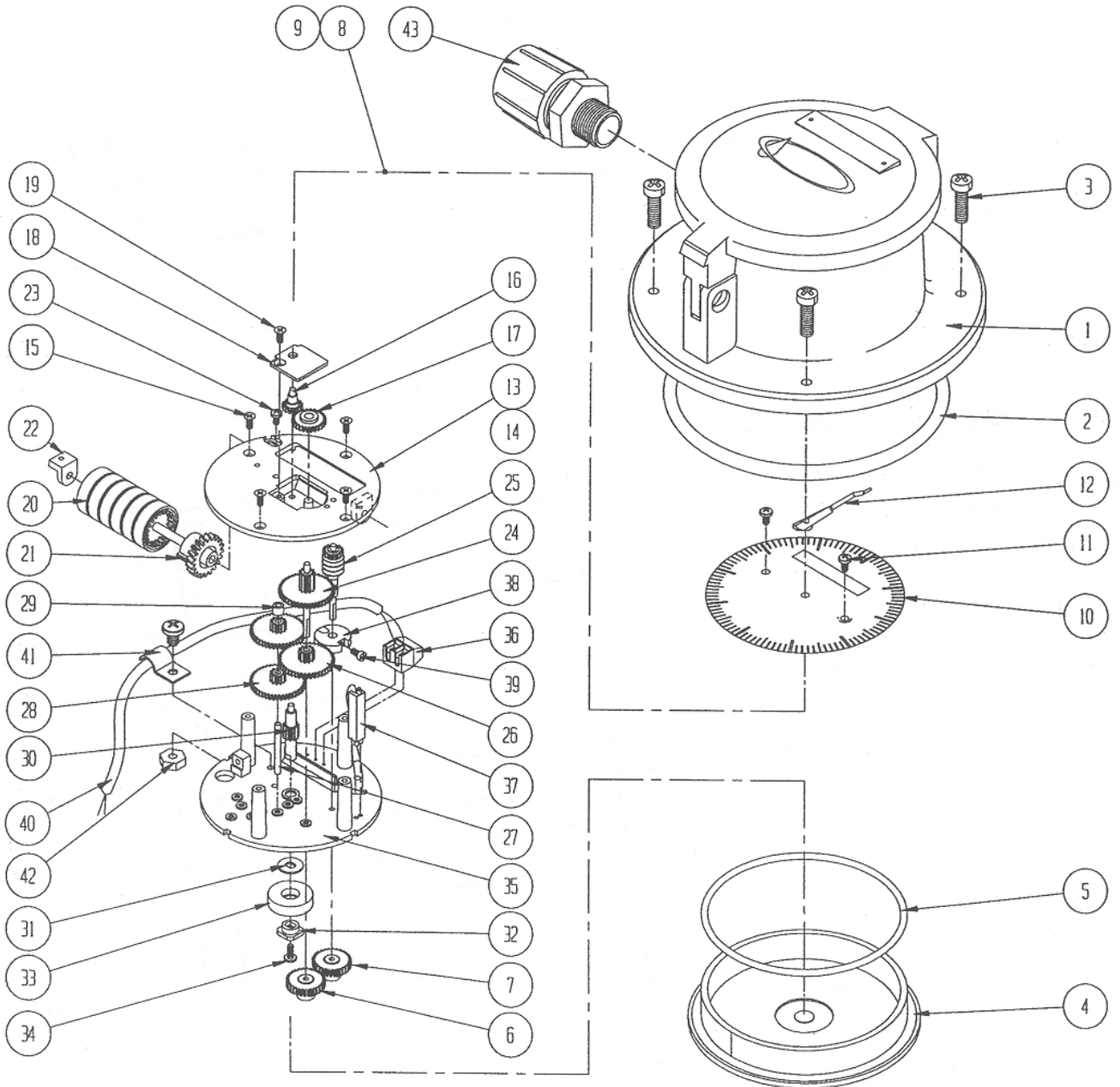
### PARTS LIST

NO.	QTY.	PART NUMBER	DESCRIPTION
1	1	7-TR04-2	MODEL TR04-2 TOTALIZER-TRANSMITTER
	1	5-4316-2	TOTALIZER BONNET ASSEMBLY W/ WATER TIGHT CONNECTOR
	1	1-4317-2	TOTALIZER BONNET LID W/ PIN
2	1	1-1551-38	O-RING TOTALIZER BONNET
3	4	1-1115-10-10	SCREW, BONNET MOUNTING (ea.)
4	1	1-4318	TOTALIZER BASE CUP
5	1	1-1551-17	O-RING, BASE CUP
6	1	3-4045	A-GEAR ASSEMBLY (SPECIFY # OF TEETH)
7	1	3-4045	B-GEAR ASSEMBLY (SPECIFY # OF TEETH)
8	1	5-TR04-2	TOTALIZER TRANSMITTER MECHANISM (SPECIFY DIAL)
9	1	5-4260	TOTALIZER ASSEMBLY (256/1) (SPECIFY RATIO)
	1	3-4260	TOTALIZER
10	1	2-2310-B	TOTALIZER DIAL (SPECIFY)
11	2	1-1113-3-3	SCREW, DIAL MOUNTING (ea.)
12	1	1-4276	SWEEP HAND
13	1	3-4269-1	TOP PLATE & ODOMETER ASSEMBLY (ITEMS 14 THRU 23)
14	1	2-4269-1	TOP PLATE
15	4	1-1116-3-4	SCREW, TOP PLATE MOUNTING (ea.)
16	1	1-4272	SWEEP HAND SHAFT
17	1	1-4271	SWEEP HAND IDLER GEAR
18	1	1-4273	SWEEP HAND IDLER COVER
19	1	1-1116-3-4	SCREW, IDLER COVER MOUNTING
20	1	1-1605-2	ODOMETER
21	1	1-4274	ODOMETER DRIVE GEAR
22	1	1-4275	ODOMETER END SUPPORT PLATE
23	1	1-1113-3-3	SCREW, ODOMETER END SUPPORT PLATE MTG.
24	1	3-4287	A-GEAR SHAFT AND 44 x 11 TOOTH GEAR ASSEMBLY
25	1	3-4270	ODOMETER WORM & CHANGE GEAR SHAFT ASSEMBLY
26	1	1-4282	44 x 11 TOOTH GEAR WITH HUB
27	1	2-4285	IDLER SHAFT
28	1	1-4286	IDLER GEAR
29	1	1-4283	GEAR SPACER HUB
30	1	1-4280	DRIVE SHAFT
31	1	1-4328	DRIVEN MAGNET WASHER
32	1	1-4281	DRIVEN MAGNET HUB
33	1	1-1601-9	4 POLE DRIVEN MAGNET
34	1	1-1113-2-4	SCREW, MAGNET MTG.
35	1	1-4267	BOTTOM PLATE
36	1	1-1707-23	TERMINAL BLOCK
37	1	3-4335-2	TRANSMITTER REED SWITCH & MOUNTING BLOCK ASSEMBLY
38	1	3-4329	REED SWITCH ACTUATOR ASSEMBLY
39	1	1-1115-2-3	SCREW, STAINLESS STEEL FILL. HD.
40	1	1-1701-2	TRANSMITTER CABLE
41	1	3-1708-2	STRAIN RELIEF ASSEMBLY
42	1	1-1201-6	NUT, 6-32 HEX BRASS
43	1	3-4334	WATERTIGHT CONNECTOR
-	1	1-1607-5	DESICCANT CAPSULE

**CONSULT FACTORY FOR PRICING.**



# TOTALIZER - TRANSMITTER MODEL TR04-2



# NOTES



