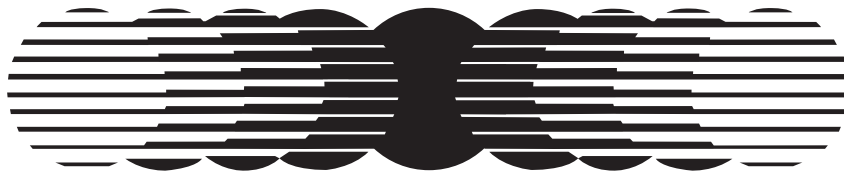


OPERATING MANUAL

2450 SOIL SAMPLER

Amity
TECHNOLOGY



2800 7TH Avenue North
Fargo, ND 58102

Phone: (701) 232-4199
Fax: (701) 234-1716
www.amitytech.com

AMITY TECHNOLOGY, LLC PRODUCT WARRANTY

Amity Technology, LLC warrants to the original purchaser only, each new item of Amity agricultural equipment sold by it to be free of defects in workmanship materials for a period of twelve (12) months from the date the product is delivered to the Purchaser (Warranty Period).

The sole obligation of Amity is limited to the repair or replacement, whichever Amity chooses, of those parts which Amity, in its sole discretion, determines to have failed as a result of a defect in workmanship or material occurring during the Warranty Period. Such defective part will, at the option of Amity, either be repaired or replaced to the Purchaser through an authorized Amity dealer. The Purchaser must, within the Warranty Period, give written notice to an authorized Amity dealer and the dealer will have a reasonable time to repair or replace the defective part. Amity's dealer's claimed labor hours must be fair, reasonable and consistent with industry practice.

This Warranty does not cover damage to other parts of the product caused as a result of delay by the Purchaser to repair or replace defective parts. Amity will not be liable for direct or indirect costs other than those specified and this Warranty specifically excludes damage to crops, loss of use, transportation expense to a dealer, service calls, normal maintenance and upkeep costs, overtime labor costs, and any and all other injuries, claims or consequential damage or other economic loss. This Warranty does not cover damage caused to or by any equipment, accessories or parts attached to or used in connection with Amity equipment. This Warranty shall be void if alteration, modifications or additions are made to Amity products without written consent of Amity, or if in Amity's judgment, the failure was due to abuse or neglect in the operation or maintenance of the product. This Warranty shall only apply if Amity equipment is used for its recommended agricultural purpose. No dealer, salesman, or agent has any authority to alter or amend this Warranty.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, AND THERE IS NO WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

WARRANTY VOID IF NOT REGISTERED

2450 ASSEMBLY

1. Insert the three rubber tie-down mounts (29) into the pick-up truck's stake pockets: one in each of the front pockets and one in the rear or middle stake pocket on the driver's side.



2. Drop the ends of both brace assemblies (8) over the pin on top of cylinder mount (2). Secure them with a flat washer and a hairpin (28).



3. Mount the other end of the brace assemblies (5) to the tie-mounts (29) using T-handles (16). Tighten the T-handles on the adjustment arms (5) to stabilize the cylinder mount (2).



2450 SERIES OPERATING INSTRUCTIONS

Field Preparations

1. Loosen brace assemblies.
2. Adjust soil sampler so that it is vertical from front to back as shown in Figure 11.



Figure 11



Figure 12

3. Adjust sampler from left to right keeping it slightly beyond vertical to the outside as shown in Figure 14. This will compensate for any initial upward movement of the pickup when sampling. Tighten all adjusting bolts.
4. Connect the power and ground cables to the battery. Be sure the red cable is to the positive terminal and the black cable is to the negative terminal.
5. Be sure the power unit reservoir and hydraulic cylinder are full.
6. Rephase hydraulic cylinder by fully raising and lowering hydraulic cylinder 3 or 4 times. This will insure that no air is in the hydraulic system.
7. For monitoring probe depth, mark the front side of the probe with red nail polish, paint or tape at the depth you want to sample.
8. Set the outside rear view mirror to see bottom portion of sampler. When the red line meets the probe guide (bottom plate) the desired depth has been reached.
9. Make sure the cylinder is fully raised and the sampler is adjusted for approximately 10" to 12" of ground clearance before transporting (see Figure 13).

Note: Three quarts of Dextron II automatic transmission fluid is required. (See Assembly Section). Fluid level should be approximately 1" below top of reservoir.

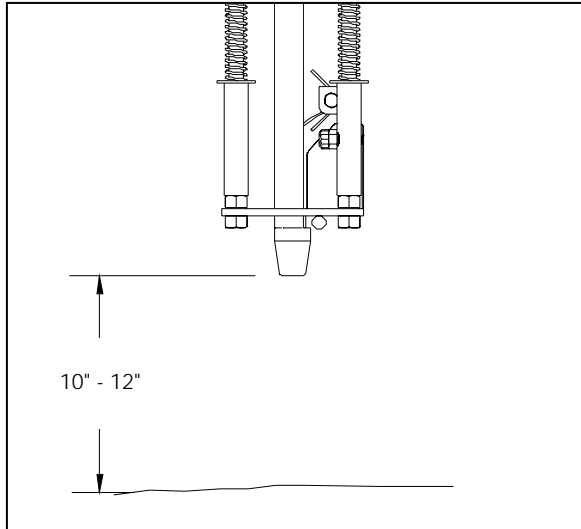


FIGURE 13

CAUTION: STRAP COLLECTION BUCKET INTO TRANSPORT POSITION UNTIL YOU REACH THE WORK SITE.

Never back up with the bucket lowered as damage to bucket and/or probe may result.

IMPORTANT: The scraper is spring loaded and must be installed down as shown in Figure 8.

10. The guide rods should be flush with the nuts on bottom of probe guide. No threads should go beyond the nut.

IMPORTANT: When operating in the field, run the pickup at a higher RPM to insure maximum output of pickup alternator. Running at lower RPM's will cause drainage of pickup battery.

TIP SELECTION

1. Your soil sampler is shipped with one probe and 3 replaceable tips for different soil conditions.
2. The three tips come with a small, medium or large hole in the end. The small hole is usually used for wet conditions.
3. When sampling, try different tips to find the one that gives the best sample.
4. An optional probe with 5 replaceable tips is available.
5. Despite the flexibility offered by the variety of tips, sampling may not be possible if one to the following exist:
 - Excessively dry and hard ground
 - Frozen ground
 - Excessively wet ground

REMEMBER: Soil sampling is like moldboard plowing, if it will not scour, you have three alternatives:

- Try a different tip as provided
- Use PAM lubricant on tip and probe
- Quit sampling and wait for soil conditions to improve

Functions a cutting tip must perform to be successful:

- Compress the soil
- Cut the core
- Allow the core to expand on the back side of the cutting tip immediately.

Concord makes 2 probes with 8 cutting tips available in an effort to match most soil conditions.

HOW THE SAMPLER WORKS

1. Operator drives to sampling site and stops.
2. Hand held control switch is activated until probe reaches desired depth.
3. Switch is then reversed to pull the probe and the sample upwards.
4. While the probe is coming up, a spring loaded scraper automatically retrieves the soil sample through the open side of the probe.
5. At the same time, the core is deposited into the stainless steel collection bucket. Up to thirty 24" samples can be collected in this manner without leaving the pickup cab.
6. When the collection bucket is full the operator removes it and empties the bucket.

SAMPLING:

1. Remove transport strap from bucket.
2. Loosen guide rod lock bolt (see Fig.5)

IMPORTANT: The guide rod lock bolt must be loose during operation of soil sampler to prevent bending of guide rod. The bolt should always be tightened when transporting the soil sampler.

3. Place pickup in park and hold your foot on the brake pedal to insure against pickup movement.

NOTE: If sampling on a side hill, always have sampler on downhill side of pickup.

4. Activate sampler and the probe will enter into the ground filling soil probe

CAUTION: DO NOT ALLOW VEHICLE TO RAISE MORE THAN 4" TO 5". IF PROBING IN HARD SOIL, BALLAST MAY BE ADDED TO THE PICKUP TO ALLOW BETTER SOIL PENETRATION.

5. When probe is raised, soil sample is scraped out of probe into soil bucket.
6. Drive to next location and repeat.

CAUTION: DO NOT BACK UP WITH SOIL BUCKET IN SAMPLING POSITION. DAMAGE TO THE BUCKET OR SAMPLER MAY OCCUR.

7. When the soil bucket is full, remove from sampler and empty contents.
8. Clean probe tip, reattach soil bucket and continue sampling.

SAMPLING IN WET OR STICKY CONDITIONS

PAM cooking spray may be used as a probe lubricant when soil clings to cutting edges or causes tip plugging. Clean soil from tip and spray tip and inside of probe. Each application should be sufficient for 8 to 12 samples.

NOTE: If soil sample does not drop into box or soil remains compacted in probe tip, adjust the scraper mount up or down on probe guide assembly. Adjust by use of bolt and nut.

WD40 is another suitable lubricant. No contamination to the sample will occur. The probe and tips should be coated on the inside with WD40.

REMOVING THE PROBE

1. Fully retract cylinder and tighten guide rod lock bolt.

2. Extend cylinder slightly to make attaching pin accessible and remove spring pressure from the probe.
3. Remove attaching pin and rotate probe out through bottom assembly (see Figure 8).

TO FOLD UNIT FOR TRANSPORT

1. Remove stabilizing arm assemblies and store them in pickup box.
2. Carefully lower the sampling unit to its horizontal position, resting the sampler unit on the vertical stop.
3. Slide the sampler towards the center of the pickup box until the pin is inserted in the transport lock securing the sampler in the transport position. Use the washer and hairpin to secure lock. (Figure 14)

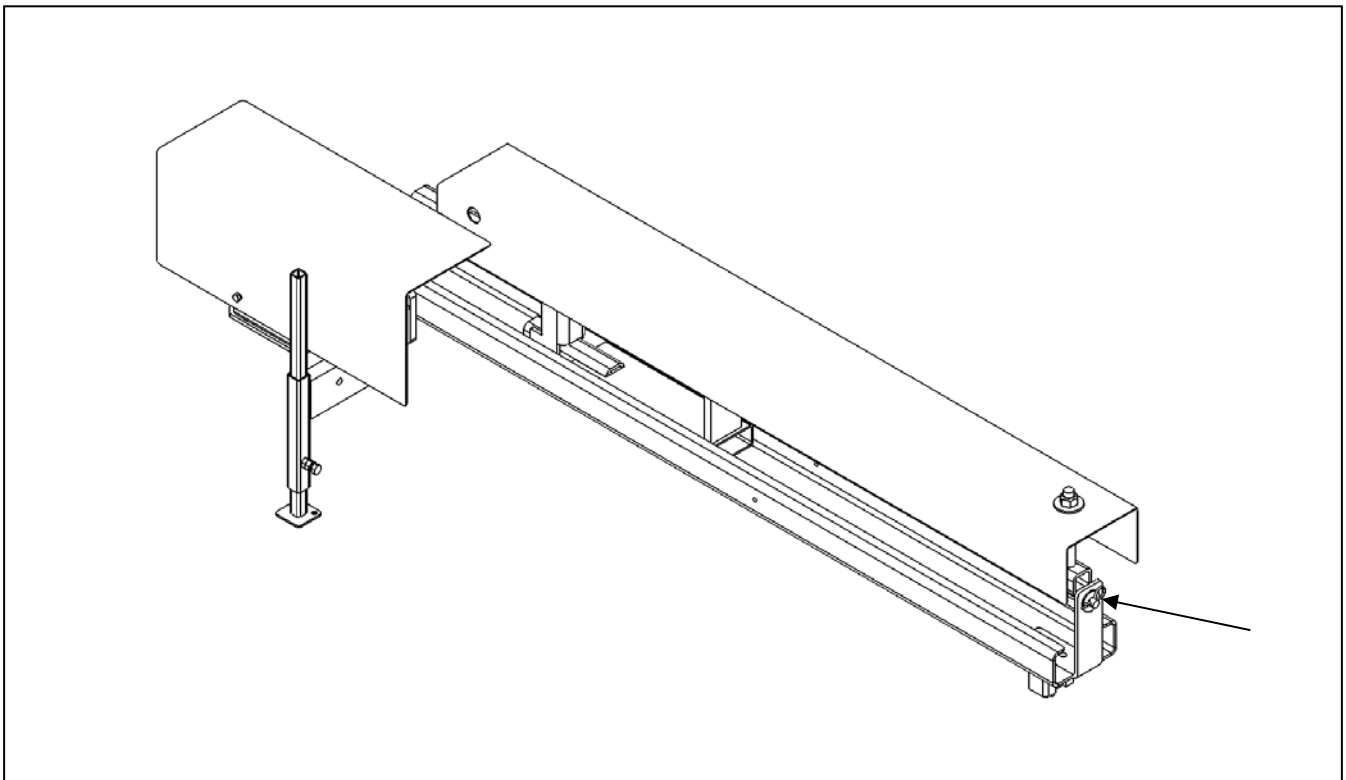


FIGURE 14

MAINTENANCE

General

Daily:

- Check oil level and fill if necessary.
- Keep power unit and wiring free from oil and dirt.
- Tighten all mounting and adjusting hardware.
- Inspect springs and replace if they have lost their compression and will no longer push the probe guide to the ground.

Oil Filter

- Clean screen inside power unit reservoir if probe begins to operate slowly.

2450 SERIES SOIL SAMPLER REFERENCE GUIDE

WARNINGS:

- Always keep hands away from moving parts.
- Always avoid high pressure fluids. Use a piece of cardboard to search for suspected hydraulic leaks.

CAUTIONS:

- Always disconnect power cable from battery before servicing any part of the electrical system. Make all other connections before connecting power cable.
- Use of hydraulic quick couplers is not recommended as they may restrict flow to cylinder.
- Removal of speedy components may cause damage to the mounting and brace assemblies.
- Always disconnect power cable from battery when soil sampler is not in use.
- Never backup when bucket is in field position.
- Do not allow power unit to keep running after cylinder has reached the end of its travel.
- Always strap collection bucket into transport position until you reach the work site.
- Do not allow vehicle to raise more than 4" to 5". If probing in hard soil, ballast may be added to the pickup to allow better soil penetration.

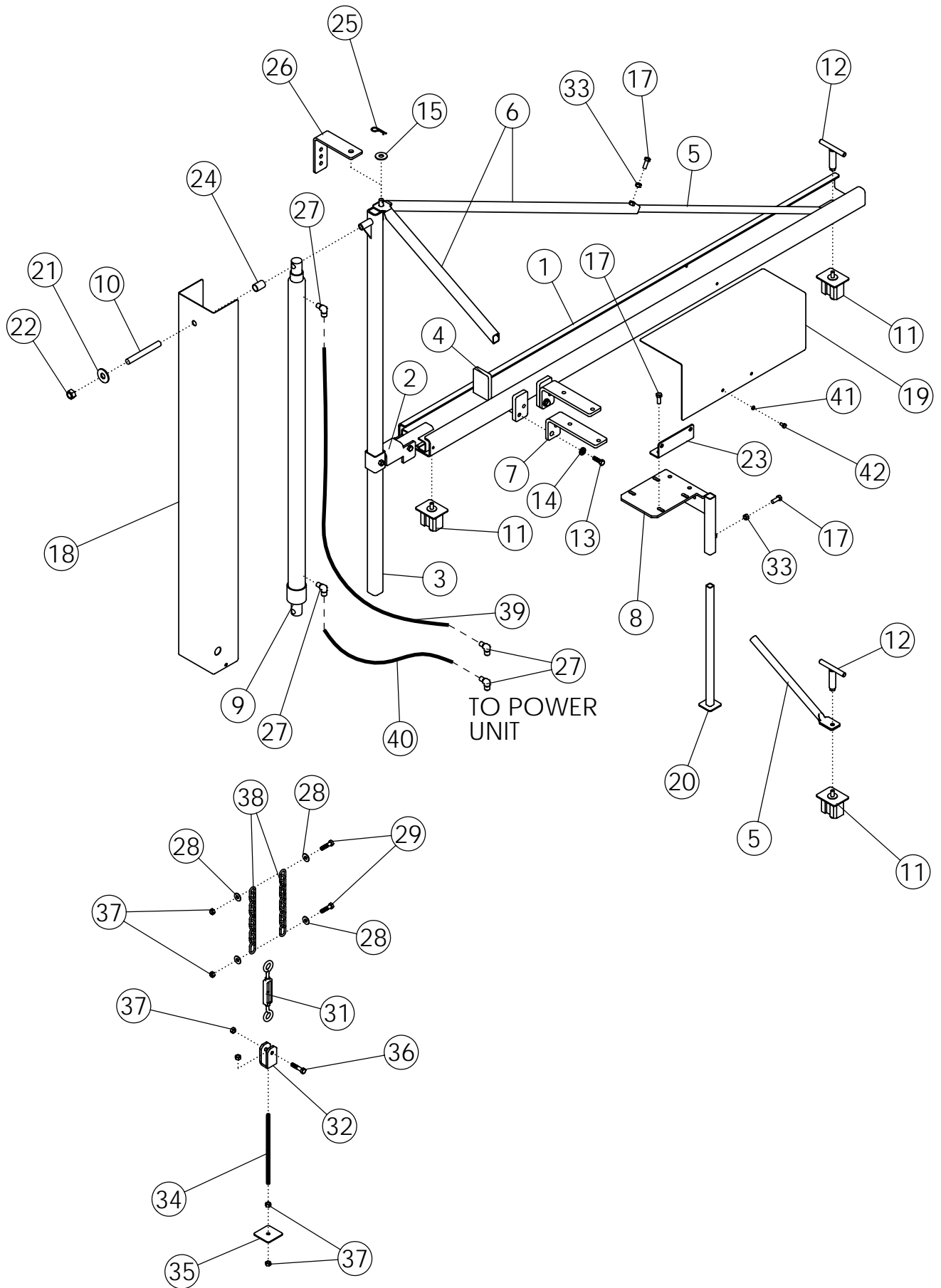
NOTES:

- Three quarts of Dextron II automatic transmission fluid is required.
- If sampling on a side hill, always have sampler on downhill side of pickup.
- If soil sample does not drop into box or soil remains compacted in probe tip, adjust the scraper mount up or down on probe guide assembly.
- The scraper is spring loaded and must be installed down (Figure 10).
- When operating in the field, run the pickup at a higher RPM to insure maximum output of the vehicle alternator. Running at lower RPM will cause drainage of pickup battery. Consideration should be given to installing a heavy duty oversized alternator.
- Majority of service problems are related to poor grounding. Be sure unit is grounded to the battery.
- The guide rod lock bolt must be loose during operation of soil sampler to prevent bending of guide rod. Always tighten guide rod lock bolt when transporting.

TROUBLE SHOOTING

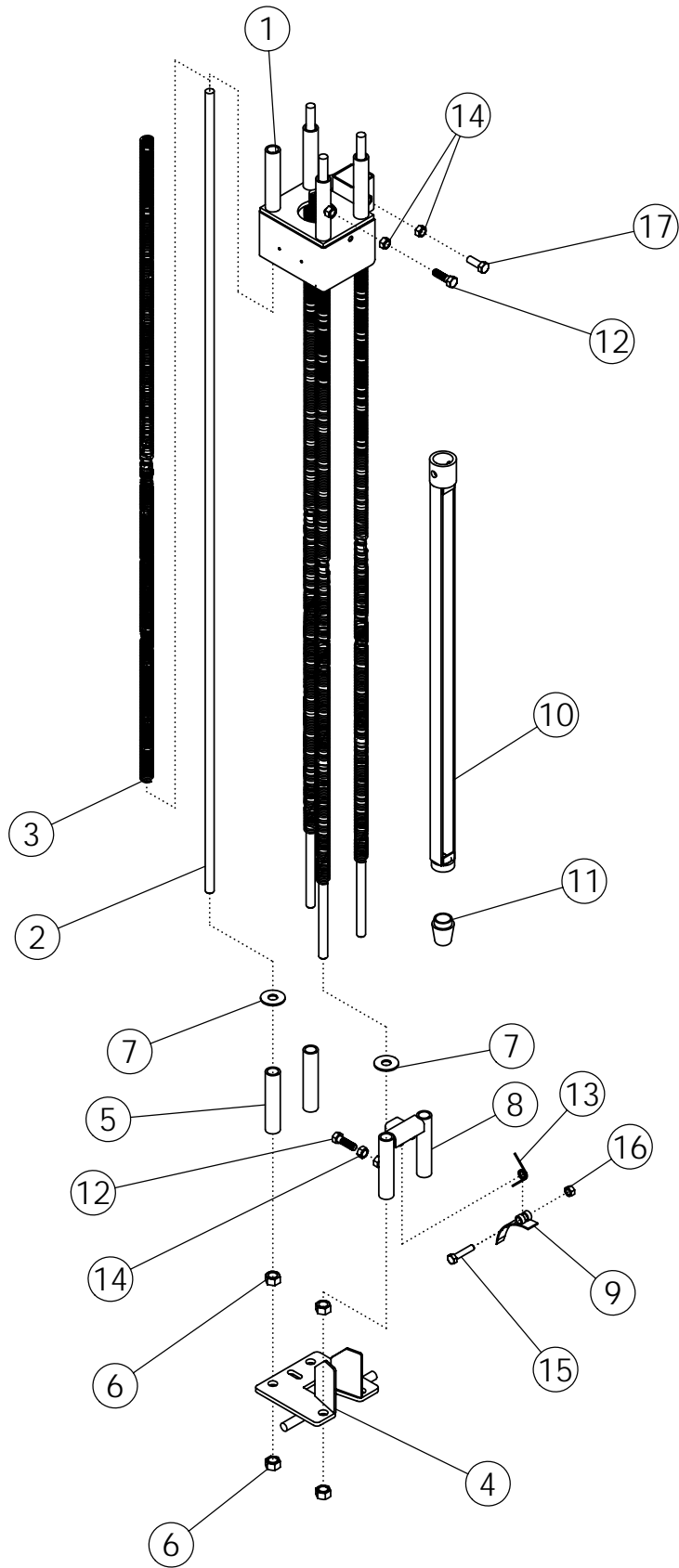
PROBLEM	POSSIBLE CAUSE	POSSIBLE REMEDY
Cab switch is opposite of probe operation	Incorrect wiring	Reverse wires on hydraulic valve coils
Power unit will not run	Power cable disconnected from battery Power unit wired incorrectly Power unit had insufficient ground Vehicle battery insufficiently charged	Connect power cable Compare to wiring diagram in assembly section Check ground to battery on vehicle Charge battery, check vehicle alternator 65-75 amp minimum output required
Motor runs but probe does not raise or lower	Power unit is out of oil Solenoid valve coils bent	Fill reservoir with oil (holds 3 quarts) Remove and replace solenoid valve. Never use solenoid valves as handles when handling power unit
Soil sampler has spongy action	Air in system	Drain foamed oil from power unit, lines and cylinder. Refill with fresh oil
Power unit leaking oil from vent cap	System over full of oil Oil is splashing into vent cap from driving on rough terrain	Check oil level Install a 5" nipple and a female closed coupler between reservoir and cap
Soil probe bending	Soil conditions too hard Operator is allowing vehicle to lift excessively Vehicle has moved during soil sampling Speedy components have been	Wait for soil conditions to improve Keep vehicle from tilting by applying ballast to probe side of vehicle Always have vehicle in park and brake applied while collecting sample. If on a side hill always probe with the sampler on the downhill side of the vehicle. See that probe is properly adjusted so that probe has 10" to 12" of clearance in the up position. Be careful when crossing dead furrows, field edges etc.

PROBLEM	POSSIBLE CAUSE	POSSIBLE REMEDY
Probe operates too slow	Oil filter is plugged	Clean oil filter screen inside power unit reservoir
	Oil is stiff form cold temperature	Use Dextron II automatic transmission fluid for all applications
Pump is cavitating	Oil is low	Fill oil reservoir
	Oil filter screen is dirty	Clean screen
Soil sample does not drop into box	Probe guide is not following probe to ground	Loosen set bolt on rod guide
	Guide rods are bent	Remove and straighten or replace
	Springs have lost compression	Replace springs
	Scraper mounted too low	Adjust scraper
Soil compacted in probe tip	Soil conditions too wet	Wait for conditions to improve
	Wrong tip or probe bing used	Be sure proper tip has been selected
	Soil clinging to tip sides	Thoroughly clean tip, probe and scraper, apply PAM lubricant
	Scraper bent	Straighten or replace scraper
	Loose soil falling in around core	Steer vehicle to the right before stopping to take samples; take sample in the compacted wheel track
	Probe is running into wet zone in lower soil layer	Select proper tip Wait fkor excessive moisture to recede below sampling depth
Power unit runs continually	Tip cutting edge is worn out	Replace with new tip
	Switch is stuck in the on position	Tap on switch case to release switch. If it will not release immediatly, disconnect power cable from battery or damage could result
Probe settles donward when not in use	Hoses are in wrong ports on power unit	Switch hoses on power unit hose to bottom cylinder port should be connected to port 'B' on solenoid valve
	Check valve stuck open	Remove and clean check valve



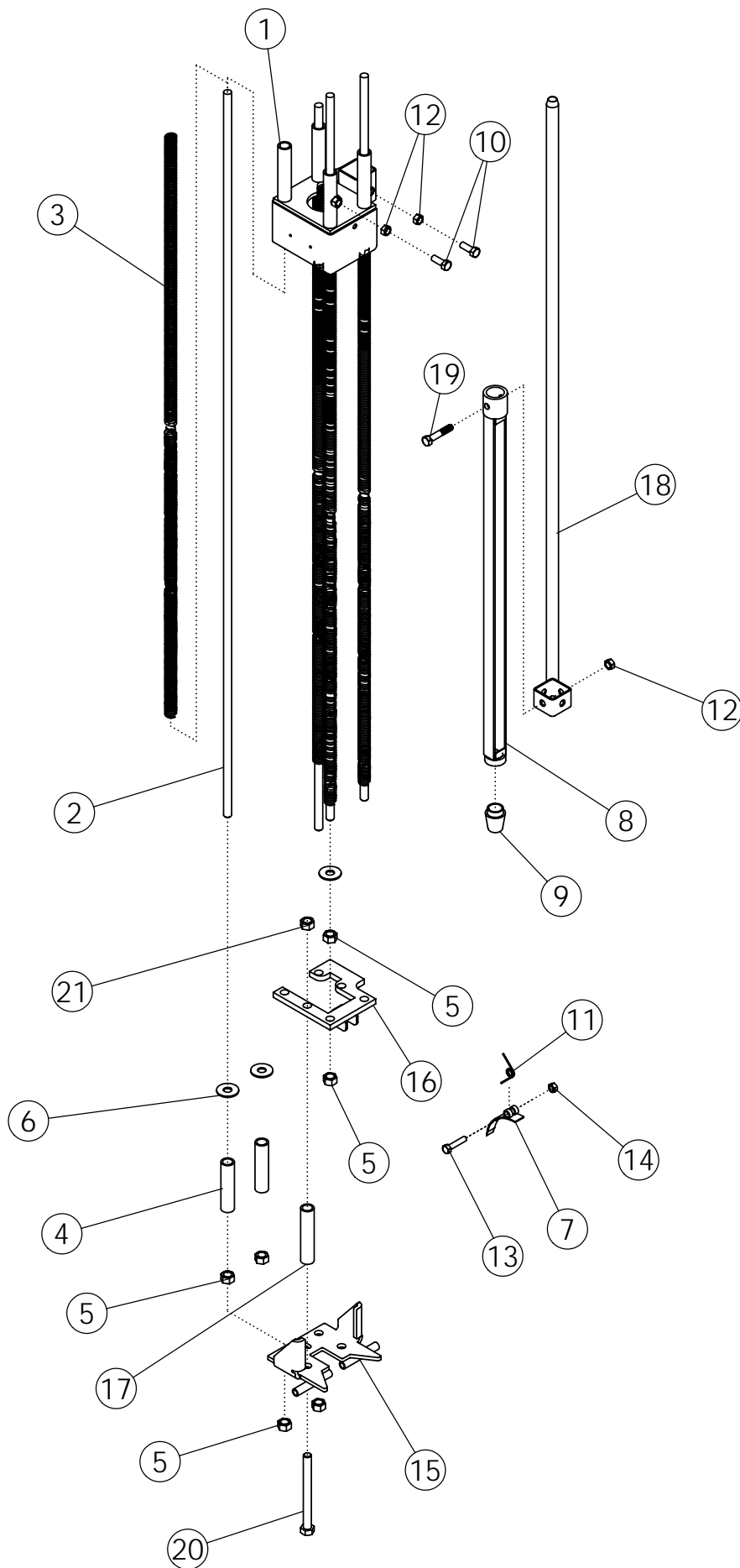
2450 MOUNT ASSEMBLY

ITEM	PART NO.	DESCRIPTION	QTY
1	1040462	WLDMT-CHANNEL	1
2	1040465	WLDMT - PIVOT BRACKET	1
3	1040591	WLDMT 42" CYL ANCHOR TUBE	1
4	1040464	WLDMT-SLIDE TUBE	1
5	1018198	TUBE-BRACE	2
6	1018246	WLDMT-TUBE BRACE	2
7	1030255	BRACKET	2
8	1040414	WLDMT-MOTOR MOUNT	1
9	1040577	CYLINDER-HYDRAULIC 42"	1
10	1023629	ROD-REDI	1
11	1021299	RUBBER MOUNT ASSEMBLY	3
12	1030293	TEE-HANDLE	2
13	1011601	BOLT-HEX: .38 X 1.25 NC GR5 ZP	2
14	1011581	WASHER-LOCK: .50 ZP	2
15	1014443	WASHER-FLAT: .50 ZP	1
16	1011097	NUT-HEX: .50 NC GR2 ZP	2
17	1011600	BOLT-HEX: .38 X 1.00 NC GR5 ZP	1
18	1040588	COVER 42" CYL	1
19	1040549	COVER - POWER PACK	1
20	1040418	WLDMT-TUBE STAND	1
21	1013024	WASHER-FLAT: .63 ZP	1
22	1013302	NUT-NYLOCK: .63 NC GR2 ZP	1
23	1040551	WLDMT-MOUNTING BRACKET	1
24	1021195	SPACER-TUBE	1
25	53687	PIN-HAIR: .14 X 1.94 ZP	1
26	1040467	TRANSPORT LOCK	1
27	1018002	FTG-ELBOW 1501-4-4	4
28	1011599	BOLT-HEX: .38 X .75 NC GR5 ZP	1
29	1011602	BOLT-HEX: .38 X 1.50 NC GR5 ZP	1
30	1015174	BOLT-HEX: .38 X 2.50 NC GR5 ZP	1
31	1018889	TURNBUCKLE EYE TO EYE	1
32	1018252	WLDMT-CLEVIS	1
33	1011576	NUT-HEX: .38 NC GR2 ZP	4
34	1018183	ROD - THREADED	1
35	1031486	PLATE ZP	1
36	1011603	BOLT-HEX: .38 X 1.75 NC GR5 ZP	2
37	1016999	NUT-TOPLOCK: .38 NC GR5 ZP	2
38	1060085	CHAIN-LINK: .188 X 9.000	1
39	1040592	HOSE: .25 X 109.5 4NPTM/4NPTM B5	1
40	1040593	HOSE: .25 X 62.5 4NPTM/4NPTM B4	1
41	1013242	WASHER-LOCK: .25 ZP	2
42	1011595	BOLT-HEX: .25 X 1.25 NC GR5	2
43	1016999	NUT-TOPLOCK: .38 NC GR5 ZP	10



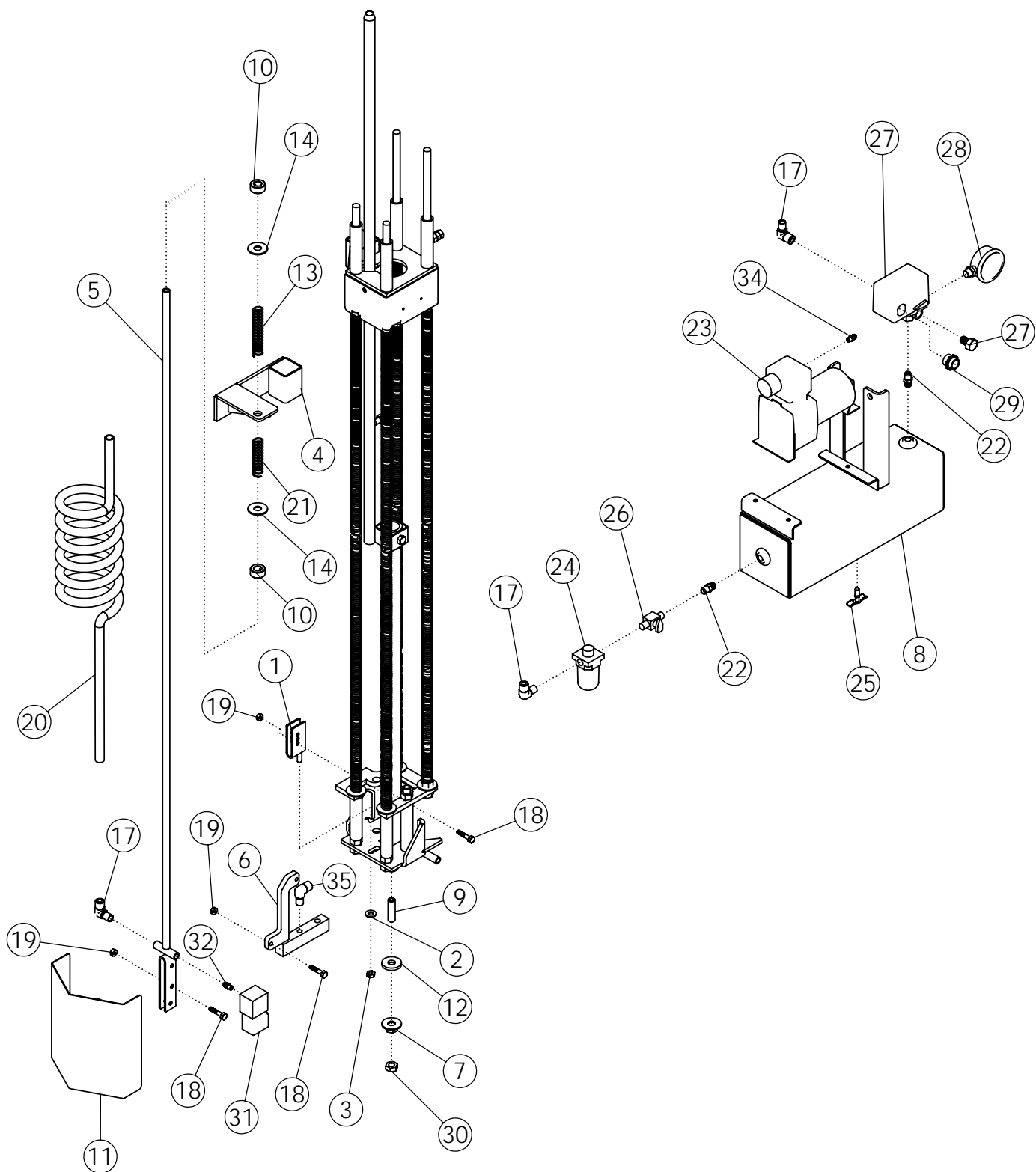
PROBE ASSEMBLY

ITEM	PART NO.	DESCRIPTION	QTY
1	1018249	WLDMT-ROD GUIDE	1
2	1018943	ROD-GUIDE	4
3	1018944	SPRING	4
4	1025604	WLDMT-PROBE GUIDE	1
5	1018244	BUSHING	2
6	1011097	NUT-HEX: .50 NC GR2 ZP	8
7	1011584	WASHER-FLAT: SAE .50 ZP	4
8	1018247	WLDMT-SCRAPER MOUNT	1
9	1018240	SCRAPER	1
10	1031407	WLDMT-PROBE	1
11	1030206	TIP, C#1 WET	1
	1030205	TIP, #2 MEDIUM	
	1030204	TIP, #3 SMALL	
12	1011601	BOLT-HEX: .38 X 1.25 NC GR5 ZP	2
13	1018259	SPRING (MODIFICATION)	4
14	1011576	NUT-HEX: .38 NC GR2 ZP	3
15	1014124	BOLT-HEX: .31 X 1.50 NC GR5 ZP	1
12	1011600	BOLT-HEX: .38 X 1.00 NC GR5 ZP	1



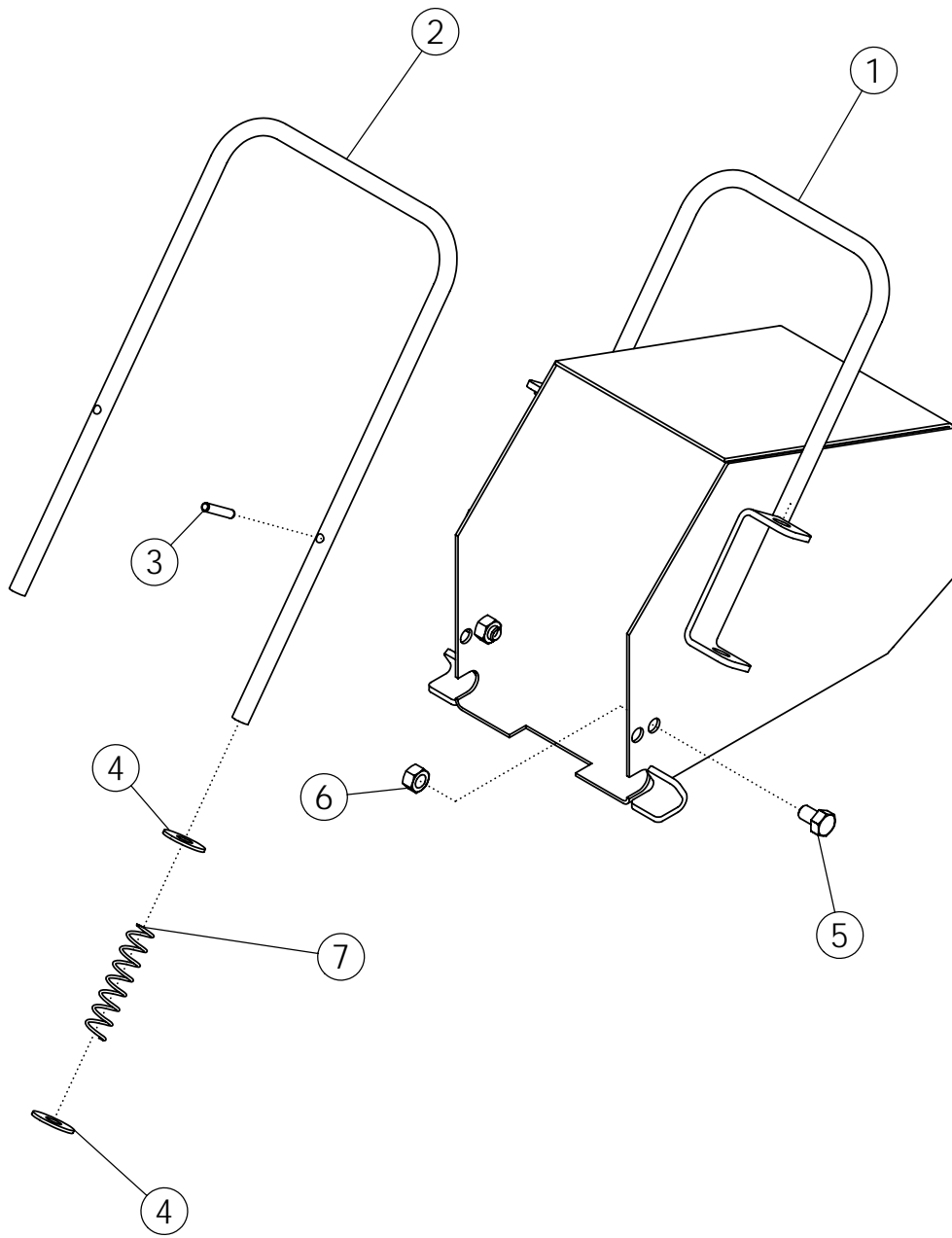
DUAL ZONE PROBE ASSEMBLY

ITEM	PART NO.	DESCRIPTION	QTY
1	1018249	WLDMT-ROD GUIDE	1
2	1018943	ROD-GUIDE	4
3	1018944	SPRING	4
4	1060050	BUSHING-DUAL ZONE	2
5	1011097	NUT-HEX: .50 NC GR2 ZP	8
6	1014443	WASHER-FLAT: .50 ZP	4
7	1018240	SCRAPER	1
8	1031407	WLDMT-PROBE	1
9	1030206	TIP	1
10	1011600	BOLT-HEX: .38 X 1.00 NC GR5 ZP	2
11	1018259	SPRING (MODIFICATION)	1
12	1016999	NUT-TOPLOCK: .38 NC GR5 ZP	3
13	1014124	BOLT-HEX: .31 X 1.50 NC GR5 ZP	1
14	1030700	NUT-TOPLOCK: .31 NC GR5 ZP	1
15	1040366	WLDMT - PROBE GUIDE	1
16	1040353	WLDMT - SCRAPER MOUNT	1
17	1018244	BUSHING	1
18	1040579	WLDMT-TRIGGER TUBE 42" CYL	1
19	1011725	BOLT-HEX: .38 X 2.00 NC	1
20	1016660	BOLT-HEX: .50 X 5.50 NC GR5 ZP	2
21	1011577	NUT-HEX: .50 NC ZP	2



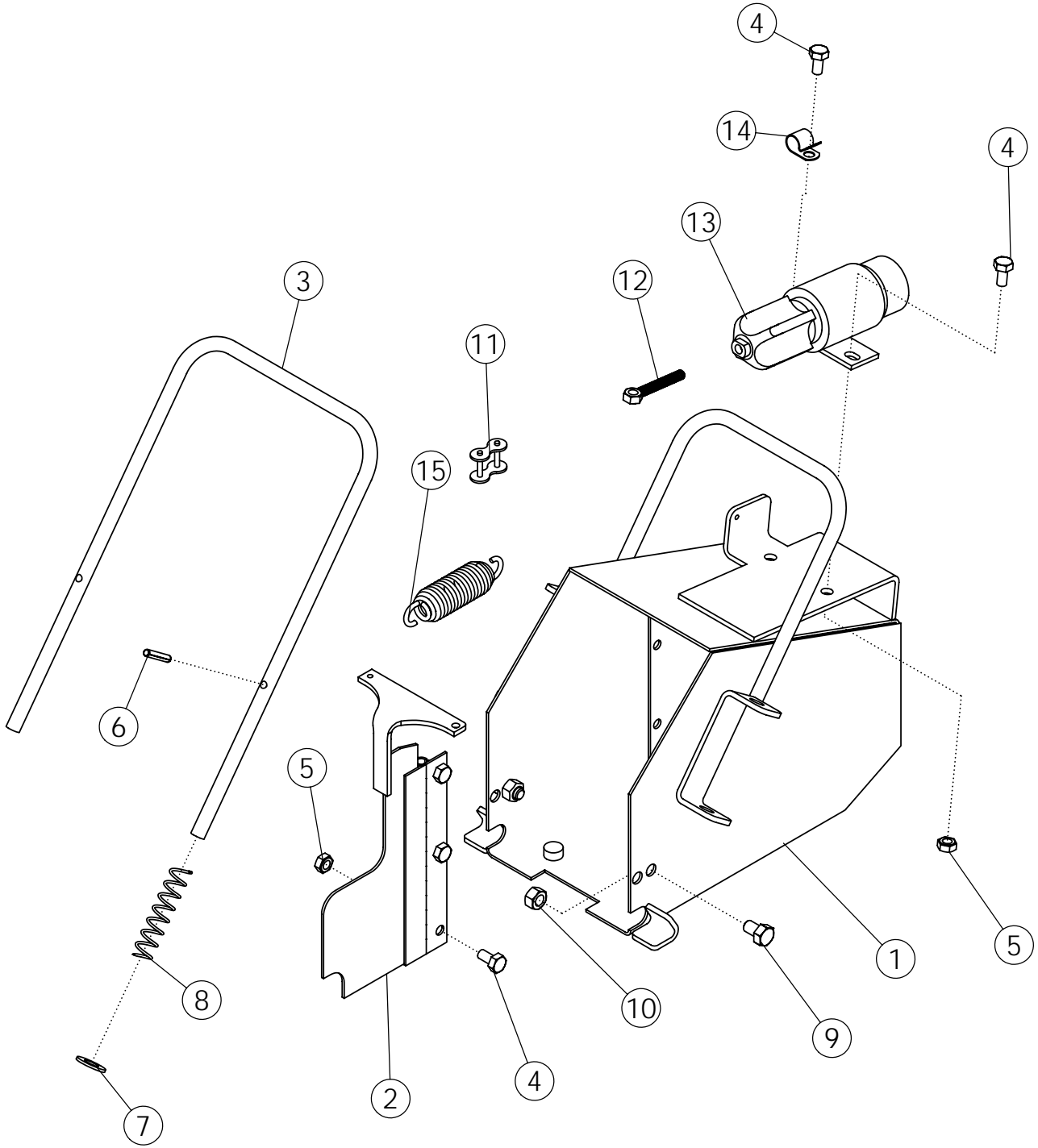
AIRBLAST TIP CLEANER

ITEM	PART NO.	DESCRIPTION	QTY
1	1040221	WLDMT-HOLDER ZP	1
2	1011583	WASHER-FLAT: .31 ZP	1
3	1030700	NUT-TOPLOCK: .31 NC GR5 ZP	1
4	1040254	WLDMT-ROD GUIDE	1
5	1040255	WLDMT-ACTUATOR TUBE	1
6	1040261	WLDMT-AIR INJECTOR ARM	1
7	1040492	WLDMT - SEAL BASE ZP	1
8	1040168	WLDMT-AIR TANK	1
9	1040213	BOLT-ADJUSTMENT	1
10	1040471	.50 COLLAR	2
11	1040470	WLDMT - SHIELD MT.	1
12	1040216	WASHER-RUBBER	1
13	1040473	SPRING-4"	1
14	1014443	WASHER-FLAT: .50 ZP	1
15	1011576	NUT-HEX: .38 NC GR2 ZP	1
16	1011600	BOLT-HEX: .38 X 1.00 NC GR5 ZP	1
17	1015058	ELBOW-STREET	2
18	1013423	BOLT-HEX: .25 X 1.00 NC GR5	4
19	1030946	NUT-TOPLOCK: .25 NC GR5 ZP	4
20	1040478	.38 FLEX HOSE .25 MALE ENDS	1
21	1040474	SPRING-3"	1
22	1040308	CONNECTOR: .50 NM	2
22	1028910	FTG NIPPLE 5404-4-4	2
23	1040486	AIR PUMP C6	1
24	1040488	OILER C2	1
25	1040479	DRAIN COCK: .25 - C9	1
26	1040480	BALL VALVE: .25 - C8	1
27	1040487	PRESSURE SWITCH - C2 PLUG	1 1
28	1040481	GAUGE-PRESSURE: 1/4"MP - C6	1
29	1040308	CONNECTOR: 1/2 " NM	2
30	1011591	NUT-JAM: .50 NC GR2 ZP	1
31	1040472	AIR VALVE - C2	1
32	1040476	FTG. 90, 1/4" TUBE	1
33	1040483	FTG STRAIGHT, 1/4" TUBE	1
34	1011200	1/4" TUBE X 1/8" PIPE 90°	1



BUCKET ASSEMBLY

ITEM	PART NO.	DESCRIPTION	QTY
1	1040552	WLDMT - BUCKET STANDARD	1
2	1040361	HANDLE LATCH	1
3	1025601	PIN-ROLL	2
4	1011828	WASHER-FLAT .38 ZP	4
5	1011596	BOLT-HEX: .31 X .50 NC GR5 ZP	2
6	1030700	NUT-TOPLOCK: .31 NC GR5 ZP	2
7	1025603	SPRING-COMPRESSION	2



DUAL ZONE BUCKET ASSEMBLY

ITEM	PART NO.	DESCRIPTION	QTY
1	1040364	WLDMT - BUCKET	1
2	1040357	WLDMT - HINGE PLATE	1
3	1040361	HANDLE LATCH	1
4	1013243	BOLT-HEX: .25 X .50 NC GR5	5
5	1030946	NUT-TOPLOCK: .25 NC GR5 ZP	5
6	1025601	PIN-ROLL	2
7	1014608	WASHER-FLT: SAE .38 ZP	2
8	1025603	SPRING-COMPRESSION	2
9	1011596	BOLT-HEX: .31 X .50 NC GR5 ZP	2
10	1030700	NUT-TOPLOCK: .31 NC GR5 ZP	2
11	1040494	CONNECTOR LINK	1
12	1040495	WLDMT - ADJUSTMENT SCREW	1
13	1029720	SOLENOID	1
14	1029194	SMALL LINE CLAMP	1
15	1040493	SPRING-DUAL ZONE	1
16	1040496	HARNES (NOT SHOWN)	1