

SMITHCO

Wayne, Pennsylvania 19087

**SERVICE
MANUAL**

**V-STAR
MODEL # 94-201 & 94-401**

**For Customer Service
Call: (888) 422-5173**

Starting Serial # V192

Revised March, 2003

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SMITHCO V-STAR

The SMITHCO V-STAR is a field developed tool designed to condition the surface of putting greens, lawn bowling greens, and tee boxes.

The V-STAR is built of the finest and heaviest material utilized on each part to insure longevity. The frame is fabricated out of ten gauge steel to provide weight to the machine and prevent warping. The steering has been especially engineered for operator comfort to alleviate fatigue during prolonged use.

Before placing the V-STAR into service it must be serviced.

Operator familiarization should be conducted before use of the V-STAR on the greens. Improper handling of the V-STAR could cause damage to the turf. Read Operator's Manual before using this unit on the greens.

Each Golf Course Superintendent should plan a cutting pattern of his greens.

The V-STAR should be lubricated frequently with any grade of machine oil at all moving joints, and the bearings that are furnished with grease fittings should be greased with any good grade Lithium or equivalent water repellent grease. The transaxle uses 3w nondetergent oil.

Good maintenance and regular servicing will insure that longevity of your SMITHCO V-STAR. Support is readily available from your local distributor or SMITHCO.

SERVICE CHART



Before servicing or making adjustments to the machine, stop engine, set park brake, block wheels and remove key from ignition.



Follow all procedures and **ONLY** use parts prescribed by the manufacturer. Read the engine manual before maintenance.

	Daily	As Required	100 Hours	200 Hours	250 Hours	300 Hours	400 Hours	Every 500 Hours/Yearly
§ Engine Oil	C		R	R		R	R	R
Engine for Leaks and Loose Parts	C		C	C		C	C	C
□ Air Cleaner (Paper Element)		C	C	C		C	C	R
≡ Spark Plugs		R		C			C	R
Idle Speed					C			C
Belts	C				C			C
* Tire Pressure	C		C	C		C	C	C
Fuel Level	C	C						
Fuel Filter		R						R
Battery Electrolyte Level			C	C		C	C	C
Clean Battery Terminals					C			C
≡Torque Lug Nuts				C			C	C
Lubricate			C	C		C	C	C

C = Check or Clean at specified intervals

R = Replace at specified intervals

*** Tire pressure: 5 psi (0.35 bar)**

≡ Torque tire nuts after the first 10 hours and every 200 hours there after (64 to 74 ft/lb (87-100 NM))

§ Change oil and filter after first 5 hours.

≡ Gap .03 (.76 mm) Torque to 18-22 ft/lb (24-30 Nm)

□ Clean more often under dusty conditions or when airborne debris is present, replace air cleaner parts, if very dirty.

The suggested maintenance checklist is not offered as a replacement for the manufacturer's engine manual but as a supplement. You must adhere to the guidelines established by the manufacturer for warranty coverage. In adverse conditions such as dirt, mud or extreme temperatures, maintenance should be more frequent

END USER'S SERVICE CHART

	Daily	As Required	100 Hours	200 Hours	250 Hours	300 Hours	400 Hours	Every 500 Hours/Yearly
§ Engine Oil								
Engine for Leaks and Loose Parts								
□ Air Cleaner (Paper Element)								
= Spark Plugs								
Idle Speed								
Belts								
* Tire Pressure								
Fuel Level								
Fuel Filter								
Battery Electrolyte Level								
Clean Battery Terminals								
=Torque Lug Nuts								
Lubricate								

C = Check or Clean at specified intervals

R = Replace at specified intervals

*** Tire pressure: 5 psi (0.35 bar)**

= Torque tire nuts after the first 10 hours and every 200 hours there after (64 to 74 ft/lb (87-100 NM)

§ Change oil and filter after first 5 hours.

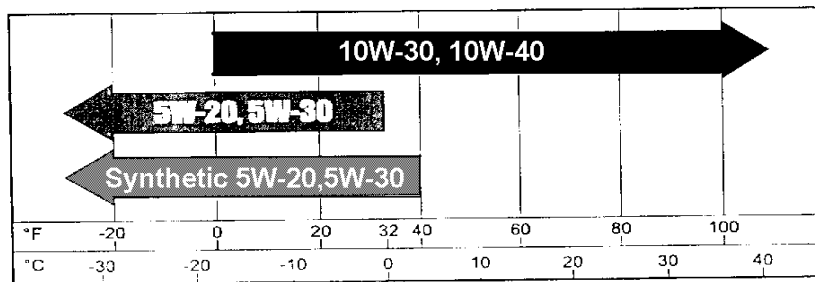
= Gap .03 (.76 mm) Torque to 18-22 ft/lb (24-30 Nm)

□ Clean more often under dusty conditions or when airborne debris is present, replace air cleaner parts, if very dirty.

ENGINE

Change and add oil according to chart below. Do not overfill. Use a high quality detergent oil. Use no special additives with recommended oils. Do not mix oil with gasoline.

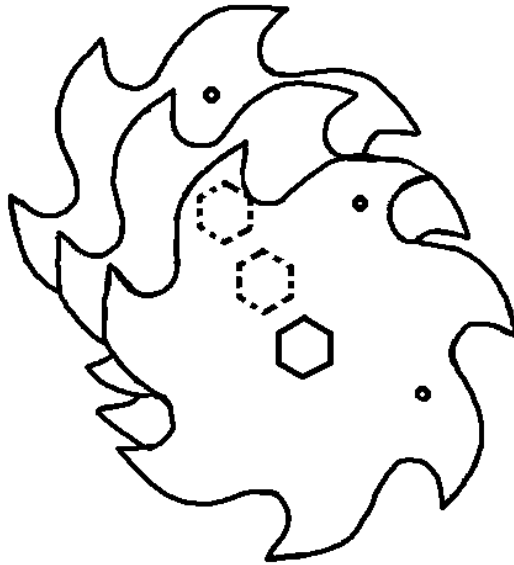
SAE VISCOSITY GRADES



Starting Temperature Range Anticipated Before Next Oil Change

NOTE: Use of multi-viscosity oils (10W-30, etc.) will result in increased oil consumption. Check oil level more frequently if using these types of oils.

BLADE REPLACEMENT



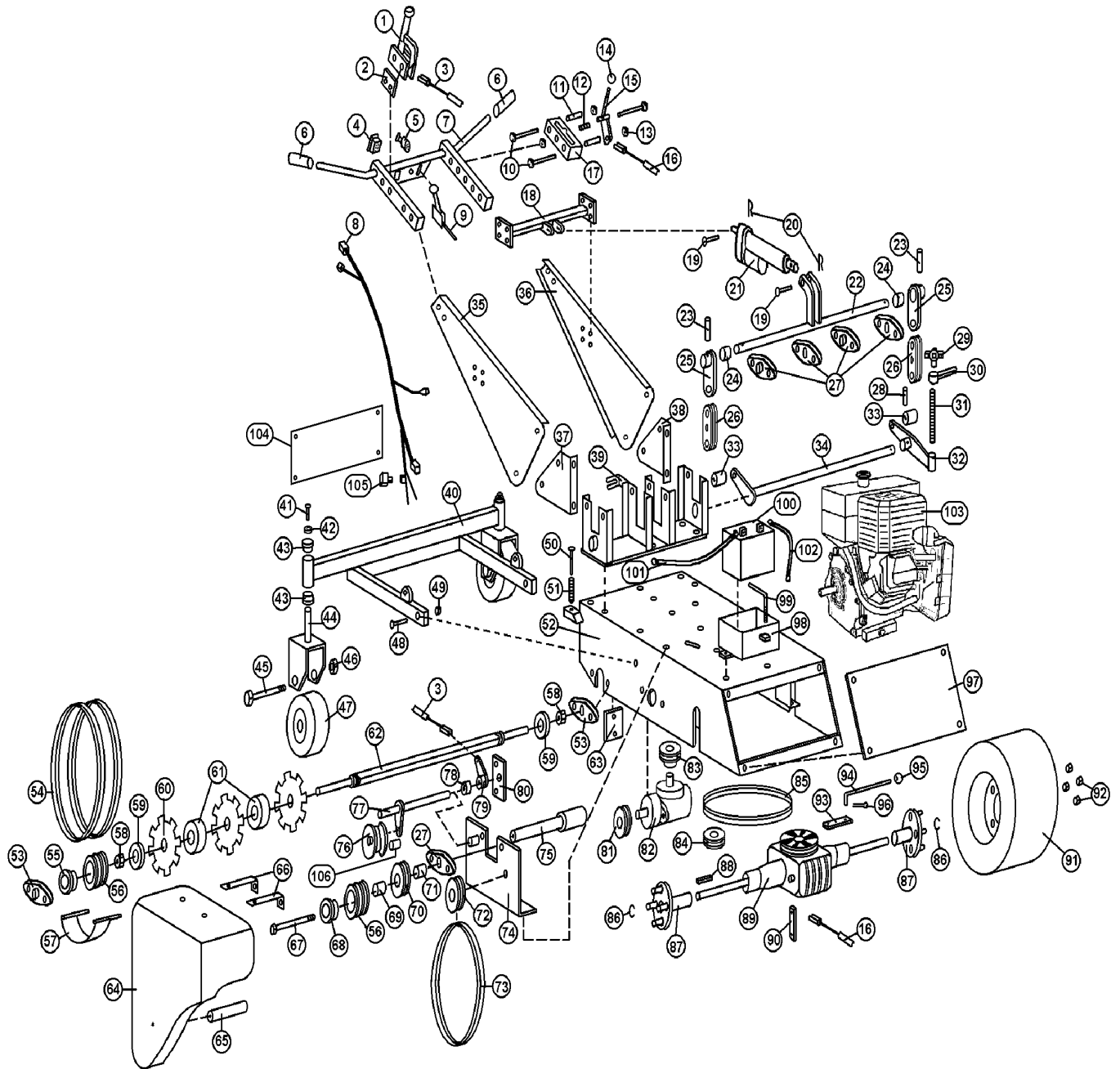
1. Remove blade assembly from unit.
2. Once blade assembly is out, starting at the left side of the assembly remove the 2-bolt flanged bearing and then loosen 1" nut and remove.
3. At this time, it is **very important** that you look at the arrangement of the blades and how they are aligned on the shaft before removing.
4. Remove all blades and spacers from the shaft.
5. Now the new blades can be installed on shaft. Make sure that the small hole on the blade is rotated one turn each time to rotate blade as per drawing above. **Note: Make sure the rotations of the blades are going forward with the unit.**
6. After blades and spacers have been installed on the shaft and before tightening down locknut, you should use a liquid locktite on the threads to ensure nut from backing off.
7. Place blade assembly back on unit and secure. When engaging, always test blade alignment at very low rpm.

STORAGE

When storing, remove the key from the key switch to avoid unauthorized persons from operating machine.

1. Before storing, clean machine thoroughly.
2. Check bolts and nuts, tighten as necessary.
3. Make all repairs that are needed and remove any debris.
4. Remove the battery, adjust the electrolyte level and recharge it. Store the battery in a dry, dark place.
5. Store in a clean and dry area, but NOT near a stove, furnace or water heater which uses a pilot light or any device that can create a spark.
6. Engines stored over 30 days need to be protected or drained of fuel to prevent gum from forming in a fuel system or on essential carburetor parts. Check the engine manual and follow the instructions for the storage of the engine.

94-201 & 94-401 V-STAR DRAWING



94-201 & 94-401 V-STAR PARTS LIST

REF#	PART#	DESCRIPTION	QTY.
1	44-763	Parking Brake Lever	1
2	940-234	Engagement Lever Mounting Plate	1
3	44-001	Control Cable	1
4	730-220	Actuator Switch	1
5	932-071	Key Switch	1
6	720-011	Handle Grip	2
7	940-215	Handle Bar Assembly	1
8	940-130	Wiring Harness f/94-201 Vanguard	1
8	940-131	Wiring Harness f/94-401 Honda	1
9	44-715	Throttle Cable	1
11	730-052	Spacer 3/4" x 1/2"	1
13	940-237	Caster Bracket	1
14	940-240	Shifter Handle	1
15	932-022	Seal	2
16	940-241	Shift Cable	1
17	40-168	Cotter Pin 1/8" x 1"	2
18	940-216	Actuator Mount	1
19	88-021	Clevis Pin 1/2" x 2 1/2"	2
20	400-307	Hitch Pin #16	2
21	732-117	Actuator 12V / 4" Stroke/1000#	1
22	940-204	Actuator Shaft	1
23	940-136	1/2" Roll Pin	2
24	940-229	1" Spacer	2
25	940-205	Lift Arm	2
26	940-211	Connecting Arm	2
27	720-004	1" Bearing	5
28	940-135	Roll Pin 3/8" x 1 1/2"	2
29	940-112	Height Adjustment Knob	1
30	940-113	Height Adjustment Lock Handle	1
31	940-112-1	Height Adjustment Bolt	1
32	940-207	Height Adjustment Arm	1
33	940-208	Height Adjustment Roller	2
34	940-206	Height Adjustment Shaft	1
35	940-213	Upright Handle Right	1
36	940-214	Upright Handle Left	1
37	940-220	Handle Bracket Right	1
38	940-221	Handle Bracket Left	1
39	940-203	Lift Assembly	1
40	940-239	Rear Axle Assembly	1
41	400-025	1" Bolt	2
42	400-203	3/8" Washer	2

94-201 & 94-401 PARTS LIST (continued)

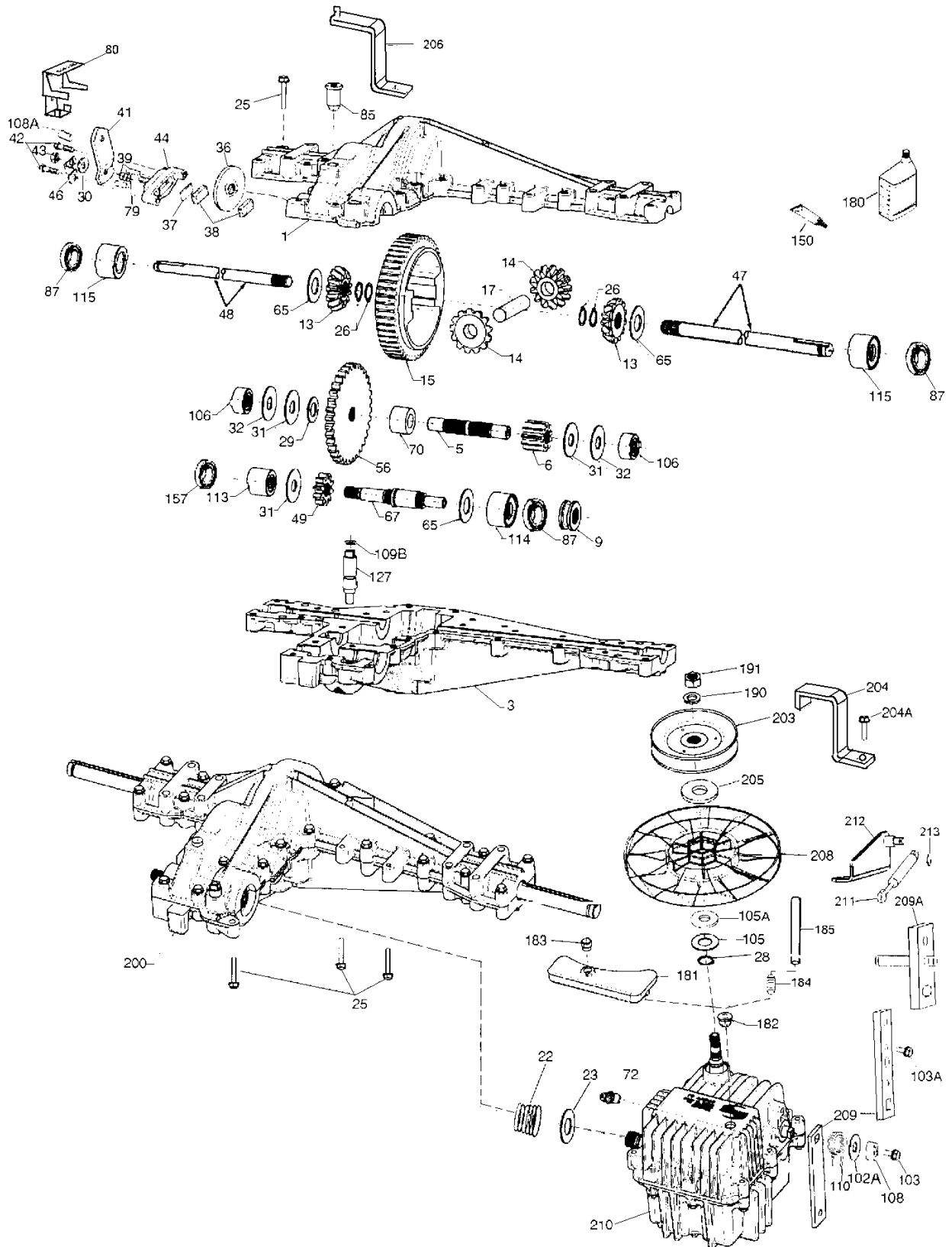
REF#	PART#	DESCRIPTION	QTY.
43	932-023	Bearing	2
44	940-238	Rear Caster	1
45	44-023	Caster Axle	1
46	40-166	Machine Bushing 5/8" x 14GA	1
47	29-597	Caster Wheel	2
48	400-017	Bolt 3/8" x 2"	2
49	400-116	3/8" Lock Nut	2
50	940-005	Stop Pin	2
51	940-129	Stop Pin Spring	2
52	940-200	Frame	1
53	940-118	7/8" Bearing	2
54	940-114	6945 Belt 45"	2
55	940-109	7/8" Bushing w / 3/16" Key	1
56	940-107	Pulley Sheave	2
57	940-139	Pulley Guard	1
58	940-002	1" Locknut	2
59	940-003	Shaft Washer	2
60*	940-120	1mm Blade	15
	940-121	2mm Blade	15
	940-122	3mm Blade	15
61	940-123	Spacer 1" PVC	14
62	940-001	Hex Blade Shaft	1
63	940-235	Cover Plate	1
64	940-117	Belt Guard	1
65	940-137	Belt Guard Shaft	1
66	940-138	Belt Guard Bracket	2
67	940-126	7/16" x 7" FT Bolt	1
68	709-202	Pulley Bushing 1" SH1	1
69	940-231	Spacer	1
70	709-212	Pulley BS30x1"	1
71	940-230	Spacer	1
72	44-762	Idler Pulley	1
73	709-602	Belt 3310	1
74	940-212	Shaft Mounting Bracket	1
75	940-004	Extension Shaft	1
76	44-716	Idler Pulley	1
77	940-209	Reel Engagement Shaft	1
78	702-139	5/8" Set Collar	1
79	940-223	Shift Engagement Arm	1
80	940-210	Engagement Shaft Bracket	1
81	940-111	BS30 x 7/8 Pulley w/ 7/32" Key	1
82	940-127	Gear Box	1
83	940-119	BK30 x 7/8 Pulley w/ 3/16" Key	1

94-201 & 94-401 PARTS LIST (continued)

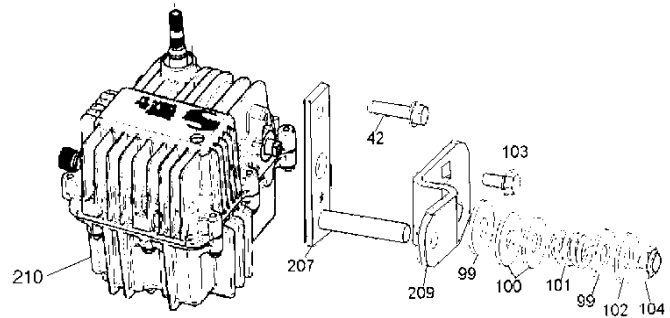
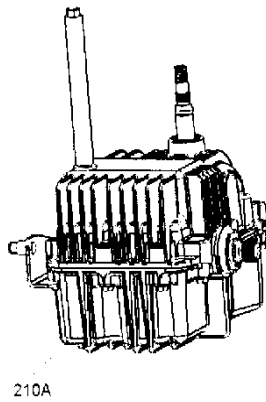
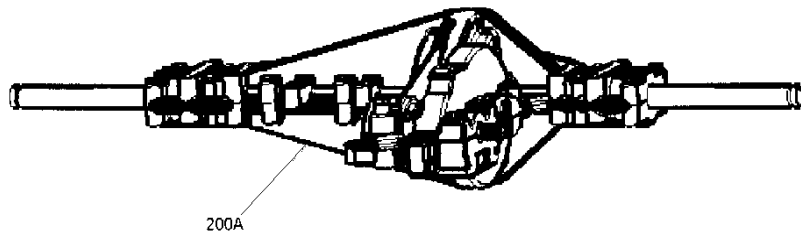
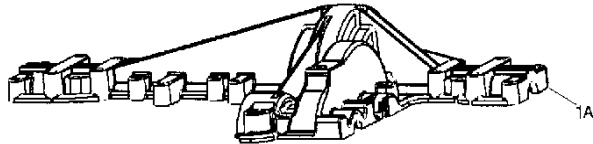
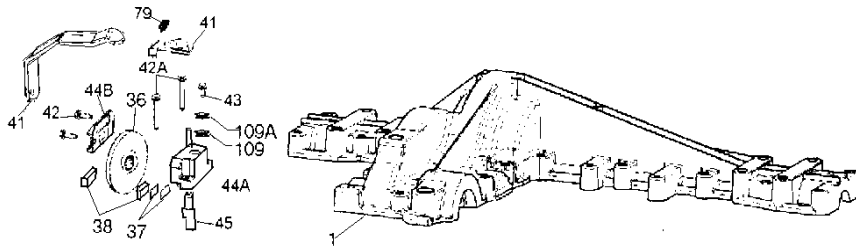
REF#	PART#	DESCRIPTION	QTY.
84	44-762	Idler Pulley	1
85	709-196	Belt 3300	1
86	940-007	3/4" Clip	2
87	940-006	Axle Hub	2
88	1088	3/16" x 1" Key	2
89	940-128	Hydraulic Transaxle	1
90	940-222	Shift Arm	1
91	2774	Wheel & Tire	2
92	1187	Lug Nut	8
93	940-226	Neutral Arm	1
94	940-227	Neutral Rod	1
95	940-227-1	Neutral Knob	1
96	40-168	1/8" x 1" Cotter Pin	1
97	940-201	Front Cover	1
98	720-074	Battery Box	1
99	720-080	Battery Hold Down	1
100	720-076	Battery	1
101	940-140	Battery Wire (Positive)	1
102	940-141	Battery Wire (Negative)	1
103	940-116	13 hp Vanguard Engine f/ 94-201	1
103	940-132	13 hp Honda Engine f/94-401	1
104	940-202	Rear Cover	1
105	940-228	Circuit Breaker	1
106	940-232	Idler Spacer	1

NOTE: The 2mm blade comes standard with all V-Star's. If you would like a different blade you must place an order for them.

940-128 TRANSAXLE DRAWING



940-128 TRANSAXLE DRAWING (continued)



940-128 TRANSAXLE PARTS LIST

REF#	PART#	DESCRIPTION	QTY.
1	940-128-1	Cover LH (mach)	1
3	940-128-3	Case LJ (cast)	1
5	940-128-5	Counter Shaft	1
6	940-128-6	Spur Gear 11T	1
9	940-128-9	Neutral Sleeve	1
13	940-128-13	Bevel Gear 13T (Incl. 14)	2
14	940-128-14	Bevel Gear 13T (Incl. 13)	2
15	940-128-15	Ring Gear 54T	1
17	940-128-17	Drive Pin	1
22	940-128-22	Spring	1
23	940-128-23	Washer .750ID x .032T	1
25	940-128-25	Screw 1/4 – 20 x 1.25	27
26	940-128-26	Retaining Ring	4
28	940-128-28	Retaining Ring	1
29	940-128-29	Washer .627ID x .091W	1
30	940-128-30	Washer .312ID x .059W	1
31	940-128-31	Washer .563ID x .062W	3
36	940-128-36	Brake Disk	1
37	940-128-37	Brake Pad Plate	1
38	940-128-38	Brake Pad	2
39	940-128-39	Dowel Pin 5/16" x 3/4"	2
41	940-128-41	Brake Lever	1
42	940-128-42	Screw, 1/4 – 20 x 1.375	2
43	940-128-43	Locknut 5/16 – 24	1
44	940-128-44	Brake Pad Holder	1
46	940-128-46	Bracket	1
47	940-128-47	Axle	1
48	940-128-48	Axle	1
49	940-128-49	Spur Gear 18T	1
56	940-128-56	Spur Gear 81T	1
65	940-128-65	Washer .750ID x .56W	3
67	940-128-67	Brake Shaft	1
80	940-128-80	Brake Lever Guide	1
85	940-128-85	Oil Fill Plug	1
87	940-128-87	Oil Seal .750	1
103	940-128-103	Screw 1/4 – 28 x .490	1
103A	940-128-103A	Screw, 1/4 – 28 x .406	2
105	940-128-105	Washer .625ID x .057W	1
106	940-128-106	Needle Bearing & Sleeve Assembly	2
108	940-128-108	Spacer .510ID	1
109	940-128-109	O-Ring .364ID	1
110	940-128-110	Neutral Return Spring	1
113	940-128-113	Sleeve Assembly (Incl. 157)	1

940-128 TRANSAXLE PARTS LIST (Continued)

REF#	PART#	DESCRIPTION	QTY.
114	940-128-114	Sleeve Assembly (Incl. 87)	1
115	940-128-115	Sleeve Assembly (Incl. 87)	2
127	940-128-127	Shift Lever Assembly (Incl. 109)	1
150	940-128-150	Liquid Gasket RTV Silicon	1
157	940-128-157	Oil Seal	1
180	940-128-180	Gear Oil	1
182	940-128-182	Grommet	1
183	940-128-183	Relief Valve	1
184	940-128-184	Hose Barb	1
185	940-128-185	Tubing 1/2 x 5	1
190	940-128-190	Washer .443ID x .109W	1
191	940-128-191	Nut 7/16 – 20	1
200	940-128-200	Differential (Gear Reduction Drive)	1
203	940-128-203	Pulley & Hub Assembly	1
208	940-128-208	Fan	1
209	940-128-209	Control Lever	1
210	940-128-210	Hydro Module LH (Foot Control)	1

LIMITED WARRANTY

SMITHCO warrants this product to be free from defects in material and workmanship under normal use for one year from the date of purchase by the original user. (60 days if product is used for rental purposes.) All warranty claims must be handled through a SMITHCO authorized dealer or by SMITHCO, INC. All transportation charges must be paid by the purchaser.

There is no further express warranty. All implied warranties, including those of merchantability and fitness for a particular purpose, are limited to one year. (60 days if product is used for rental purposes) from date of purchase by the original user, and, to the extent permitted by law any and all implied warranties are excluded and disclaimed after the expiration of such period.

All incidental and consequential damages, including pick-up and delivery of the unit, communication, mileage charges and/or rental of a replacement unit during repair, are not covered under this warranty, or is any loss of income and/or other loss resulting from the failure of the product to function due to a warranty defect.

The following items are not covered under the SMITHCO warranty and are warranted by their respective manufacturer.

- a) Engine and engine parts including starters, generators, alternator and filters.
- b) Transaxle, differentials, gear boxes, and mechanical pumps.
- c) Hydrostatic transmissions, hydraulic pumps and motors.
- d) Batteries
- e) Wheels and tires.

A copy of the warranty for the above items is furnished if necessary with each SMITHCO product.

Some states do not allow limitations on how long an implied warranty lasts, or the exclusion of limitations of incidental or consequential damages, so the above limitations or exclusions may not apply to you. This warranty gives you specific legal rights, and you may also have other rights, which vary from state to state.

Federal law now requires disclosure of the warranty which applies to this product prior to the sale to a consumer. Please leave this statement attached to the product and allow the buyer to remove it after purchase.

SMITHCO
Wayne, Pennsylvania 19087

