Electric Eel®

MODEL 325

Sewer and Industrial Pipeline Cleaning Machine

Operator's Manual

! ! DANGER ! !

FOR YOUR SAFETY

Before you operate or maintenance this equipment, READ this manual carefully and completely!

Purchase Date: _____

Serial Number: _____

! ! DANGER ! !

TO PREVENT SERIOUS BODILY INJURY AND AVOID DANGER FROM ROTATING CABLES AND EQUIPMENT:

General Safety

1. **ALWAYS** wear **HEAVY** reinforced leather gloves and **SAFETY** glasses when operating this equipment.
2. Place this machine within 8 feet of inlet, and **NEVER** add more than **ONE 8' SECTION** of cable at a time between sewer opening and machine.
3. **NEVER** handle rotating cable or cable under tension.
4. **DO NOT WEAR** loose clothing or jewelry while operating this machine.
5. The Model 325 Sewer Cleaning Machine should be **OPERATED BY ONE PERSON ONLY.** Additional personnel in the work area should observe all safety instructions.
6. Wear rubber soled **NON-SLIP SHOES, HEAVY LEATHER** gloves, and **EYE Protection**.
7. **ALWAYS AVOID** direct contact of skin, facial area and especially the EYES with drain water. Chemical compounds used in drains can result in serious burns and other injuries.
8. **REPLACE** fittings, cables, and any rotating parts as soon as they become visibly worn. **REPLACE** any cables which become fractured, bent, kinked, or are otherwise damaged.
9. **NEVER** attempt to service equipment beyond the recommendations on the operating instructions. All other servicing should be referred to qualified Electric Eel service personnel.
10. To maintain safe operation, **USE ONLY** identical replacement parts and cables from Electric Eel.

11. **ALWAYS KEEP CLEAR** of rotating shafts, pulleys, belts, or other rotating parts.
12. **DO NOT** continue to operate machine when cleaning tool becomes stuck in obstruction. **EXCESS TORQUE ON A CABLE COULD CAUSE IT TO FRACTURE. RELEASE CABLE TENSION** to prevent unnecessary build-up of torque on the cable. Keep machine under control at all times. (Refer to operating instructions to free cleaning tool).
13. **NEVER HANDLE ANY CABLE UNDER TENSION.* ALWAYS** relieve tension on the cable.
14. **NEVER** force a tool and cable into pipeline blockage. This may overload the cable or tool and cause it to fracture.
15. Use CORRECT TOOL for the job or application. Check the tool chart and use the proper tool for the size of the line being cleaned.
16. To maintain safe and efficient operation CLEAN THOROUGHLY all cables and tools with water after use. Acids in the drain and sewer lines can attack and deteriorate the metal of the cables and tools. Deterioration can cause premature fracture or breakage in tools or cable.

***Relieve all tension build-up before attempting to handle cable.**

WARNING!
DO NOT HANDLE ROTATING CABLE

FOREWORD

The Model 325 gasoline powered Electric Eel with heavy duty Dual Cable is designed for cleaning 4″ to 14″ diameter sewers and industrial waste lines for distances up to 500′.

The 8 ft. Dual Cable sections, which are joined with instant snap-lock couplings, are self-feeding in either direction. This cable requires no forcing, rodding or manual handling while it is rotating.

A complete line of cleaning tools is available for various types of stoppages — as well as for starting and finishing in pipelines of different sizes.

The power unit is equipped with a safety clutch which provides overload protection for the cable and the cleaning tools. If this clutch is kept in proper adjustment, it will provide adequate power to clear pipeline stoppages and to prevent undue strain on all components of the machine.

THE CABLE

READ ALL SAFETY INFORMATION THOROUGHLY BEFORE OPERATING OR MAINTAINING THIS EQUIPMENT!

The Dual Cable is composed of a right hand wound, open spaced, outer spring and a left hand wound, close spaced, inner spring which are joined at each end with couplings. This construction provides a strong, flexible cable that self-feeds through the pipeline in either direction.

Cable sections are joined to each other—and tools are joined to cables—by merely pressing together and turning a quarter turn to engage the snap lock pin. Cables and cleaning tools are disconnected by using the spanner wrench, as shown in Figure 1 below.

Regular Dual Cable is recommended for use in 3″ to 10″ diameter lines—and through 4″ and larger "P" traps. Heavy Duty Dual Cable is recommended for use in 4″ to 14″ diameter lines for distances up to 500 ft. The Dual Cable sections require very little maintenance—usually just an occasional oiling of the snap lock pin in the male coupling. If the cables are to be stored for several weeks between jobs, a light coating of oil will prevent rusting. Damaged cables can be repaired easily by writing us for Sheet I-3 "Dual Cable Repair" and doing the work yourself—or by shipping the cables to our factory where they will be rebuilt promptly at an average cost of less than two-thirds the price of new cable. Exact cost of repair is determined by condition.

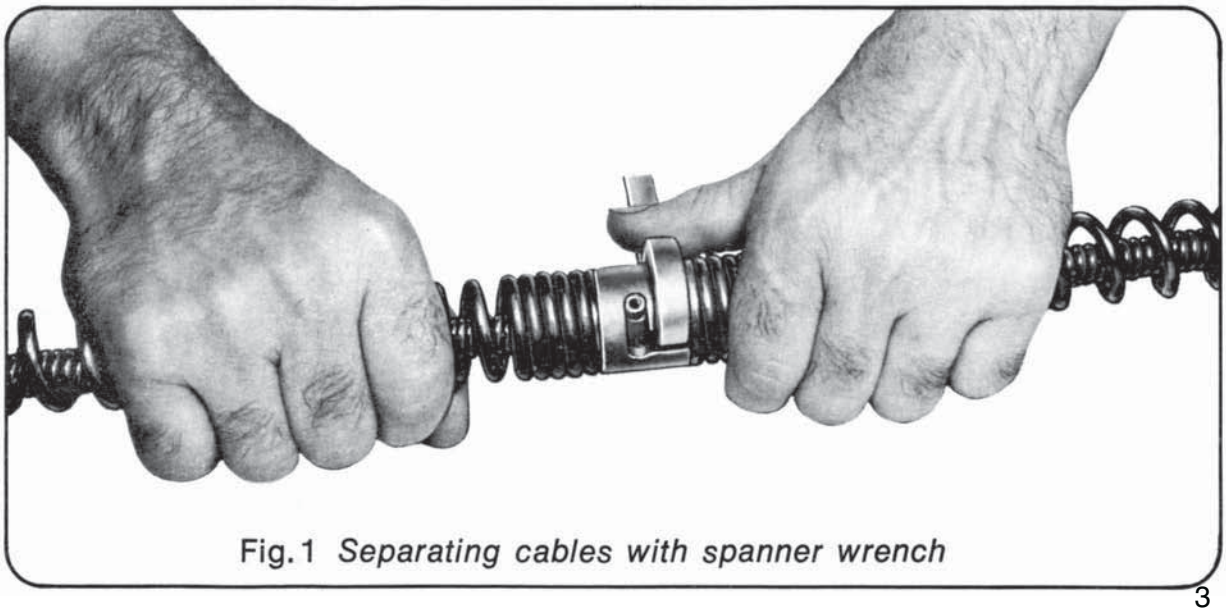

Fig. 1 *Separating cables with spanner wrench*

THE POWER UNIT

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A 5 H.P., 4 cycle gasoline engine with 6 to 1 reduction gearing provides ample power to handle the toughest jobs. This engine should be serviced in accordance with the instructions on the engine nameplate and in the engine manufacturer's service manual.

Power is transmitted from the engine to the transmission through an automotive type Rockford clutch, which is disengaged by depressing the foot pedal at the rear of the unit.

The Warner gear transmission, which has 3 forward speeds and one reverse speed, rotates the cable at the following R.P.M.'s in the gears shown below with the engine at full throttle:

First Gear	350 R.P.M.
Second Gear	650 R.P.M.
Third Gear	1050 R.P.M.
Reverse Gear	350 R.P.M.

For proper lubrication of the power unit, see Figure 5 at the rear of this manual.

A safety clutch is attached to the front end of the countershaft and is equipped with a female coupling for attaching the Dual Cable. This clutch is designed to protect the cable and cleaning tools against overloading. Clutch tension can be increased by tightening the two adjusting screws on the clutch face — or can be decreased by loosening the same two screws. In all cases, the two screws must be tightened or loosened an equal amount.

The recommended clutch tension setting is 125 to 150 inch lbs. torque. If a torque wrench is not available, an approximate setting can be made by attaching one section of cable to the machine — and then adjusting the clutch so that it will slip when the rotating cable is gripped firmly with both hands. BE SURE TO MAKE THIS ADJUSTMENT WITH THE MACHINE IN SECOND GEAR — AND WEAR HEAVY LEATHER GLOVES WHEN GRASPING THE ROTATING CABLE.

OPERATOR MUST BE THOROUGHLY FAMILIAR WITH ALL SAFETY INSTRUCTIONS BEFORE OPERATING THIS EQUIPMENT

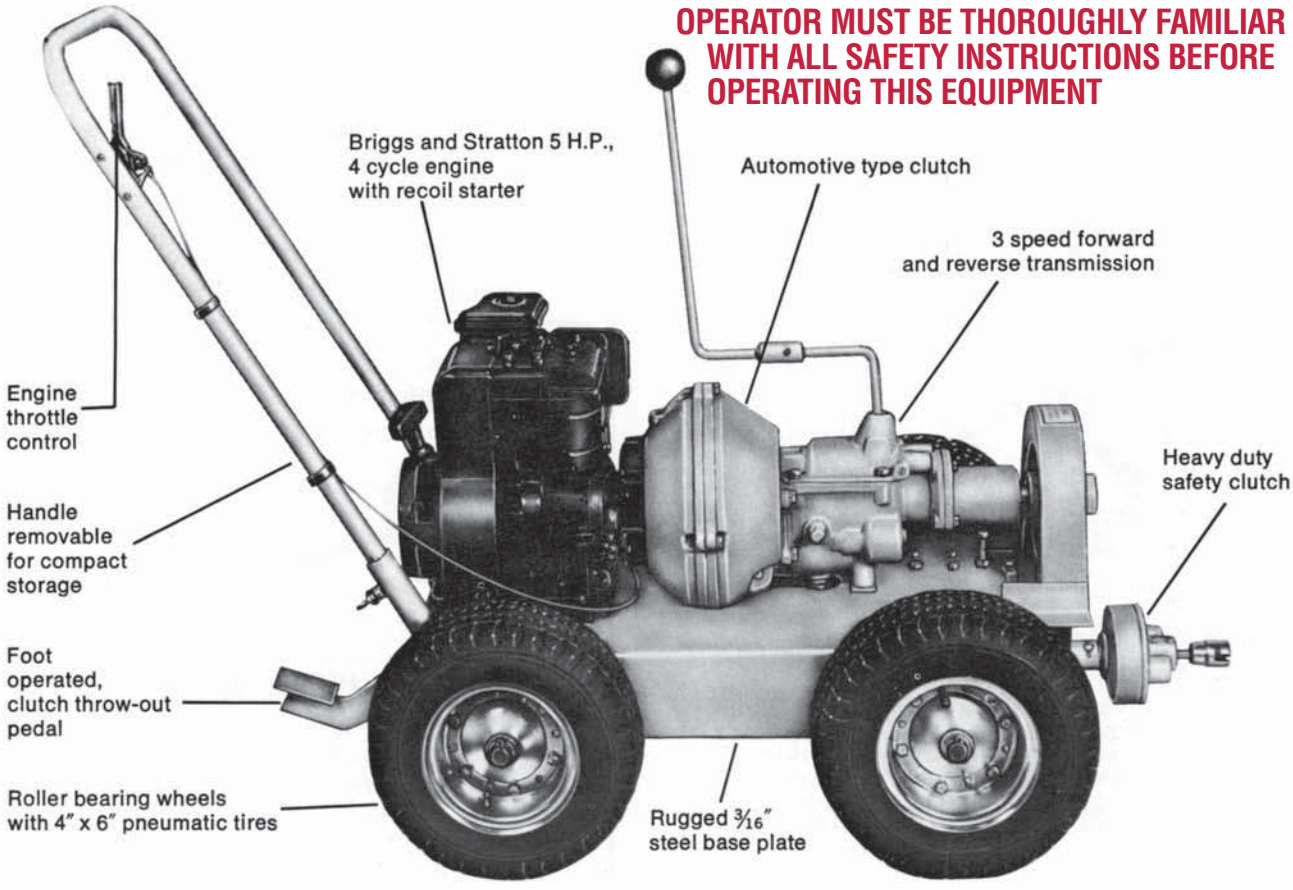


Fig. 2 *Model 325 power unit*

CLEANING TOOLS

READ ALL SAFETY INFORMATION THOROUGHLY BEFORE OPERATING OR MAINTAINING THIS EQUIPMENT!

HDD-2T. Starting tool for 4" dia. pipelines with "P" trap.

A-2DC. Starting tool for 3" or 4" dia. pipelines.

A-2-3DC. Tool for enlarging opening made by A-2DC tool in difficult obstructions.

HDD-4S. Heavy duty clean-up tool for 4" dia. pipelines.

HDD-5S. Heavy duty clean-up tool for 6" dia. pipelines.

HDD-7S. Heavy duty clean-up tool for 8" dia. pipelines.

HDD-7. Tool for retrieving objects from pipelines.

HDD-6. Finishing tool for 6" dia. pipelines.

HDD-8. Finishing tool for 8" dia. pipelines.

HDD-10. Finishing tool for 10" dia. pipelines.

HDD-12. Finishing tool for 12" and 14" dia. pipelines.

SA-4 SAND AUGER TOOL. A 4" diameter auger to which a spade type tool can be attached at the front end. Very good for culverts under roadways. Throws sand and gravel like a ground hog. Needs to be worked back and forth for best results.

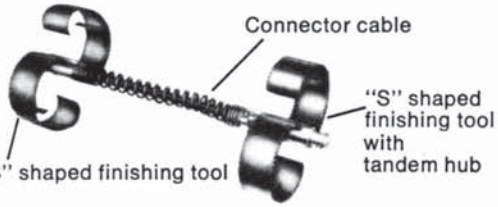
The cleaning tools shown on this page fall basically into two categories: (1) starting tools which have drill or spade points, and (2) finishing tools which usually are of a flat spring design with serrated edges. 3" and 4" diameter lines can usually be cleaned by using the starting tool to make the initial opening—and then using the finishing tool for the second run through the line.

Larger diameter lines, if badly blocked, usually require more than two runs through the line. Progressively larger cleaning tools should be used on each run until the line is cleaned to its original diameter.

Since the Dual Cable imparts a whipping action to the cleaning tool, the opening made in the pipeline obstruction is approximately ½" to 1" larger in diameter than the cleaning tool.

ACCESSORY TOOLS

A swivel cable puller can be attached to the front end of the dual cable and fed through the pipeline between manholes. Stranded steel cable then can be attached to the cable puller and threaded back through the pipeline in preparation for a bucketing operation.



The HDD-6, HDD-8, HDD-10 and HDD-12 cleaning tools can be used in tandem by adding a connector cable and matching cleaning tool with tandem hub (as shown). This arrangement assures a thorough finishing operation in 6", 8", 10", 12" or 14" dia. pipelines.

OPERATION

WARNING!
DO NOT HANDLE ROTATING CABLE

If at all possible, you should determine the nature and approximate location of the stoppage before starting the job. Usually a sewer line obstruction is removed by running the cleaning tool downstream until the obstruction is reached. The cleaning tool reduces the obstruction to small pieces, which are then washed downstream by the flow of water. In such cases, you should use as much water in the line as possible.

Sometimes it is necessary to work upstream, especially in cases where the distance between manholes exceeds the cable length. Running the cleaning tool upstream is often most effective in removing sand, silt and other sediments because it augers the deposit back toward the operator where it can be removed.

When cleaning a pipeline with an opening that cannot be easily approached by the power unit, such as in a trench or manhole, a guide tube should be used to protect the cable from kinkage or entanglement with objects outside the pipeline. When using the guide tube in a manhole, it should be set up with the guide tube jack holding it firmly at the top of the manhole (as shown in Fig. 3). Before placing the guide tube in the manhole, be sure to thread the cable through the tube and attach the cleaning tool.

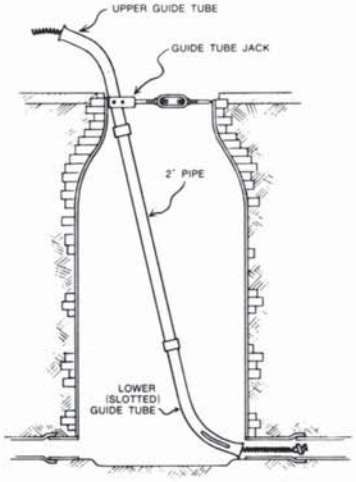


Fig. 3


Fig. 4

If space permits, attach two or three cable sections to the machine at a time. The open spaced, right hand wound construction of the outer cable member provides a self-feeding action and exerts an even pressure against the pipeline stoppage. If the safety clutch slips, put the machine in reverse and back away momentarily from the obstruction. Repeated slippage may indicate a broken or damaged pipeline.

The feeding tool (Fig. 4) is designed to assist the regular Dual Cable through a "P" trap. However, it can be used to assist the forward progress of cable that is being run upstream whenever considerable grade is encountered in the pipeline.

If possible, avoid slack in the cable between the machine and the pipeline opening—as this is the area where cable, under tension, will have a tendency to kink and become damaged.

Normally, the machine is operated in second or third gear when feeding the cable into the pipeline. First gear would be used only when starting into a completely blocked pipeline. Reverse gear is used when the cable is being withdrawn from the pipeline or when it is necessary to back away momentarily from an obstruction which has caused the safety clutch to slip.

PARTS LIST

NOTE: Parts List Illustration Fig.5 with Item Numbers on Back Page

READ ALL SAFETY INFORMATION THOROUGHLY BEFORE OPERATING OR MAINTAINING THIS EQUIPMENT!

Item No.	Part No. / Description	Amt
1	L-2 Handle	1
2	325E-61/2 6 1/2 HP Engine	1
3	GE-1A Welded Base Assembly	1
4	CSHH5161834 5/16-18 x 3/4" Cap Screw Hex Head	9
5	CSHH1420114 1/4-20 x 1 1/4" Cap Screw Hex Head	2
6	GE-2 Clutch Pedal Bracket	1
7	GE-3 Clutch Pedal	1
8	SS3816234SH 3/8-16 x 2 3/4" Sq Head Set Screw	2
9	WK9 #9 Woodruff Key	2
11	325-RGBS Ring Gear	1
12	PP18 1/8" Pipe Plug	2
13	R-2 Clutch Housing (Rear)	1
14	OBSS116131678 Olite Bushing	1
15	GE-7 Clutch Flywheel	1
16	OBSS162210 Olite Bushing	1
17	325-CPP Clutch Pressure Plate	1
18	R-1 Clutch Housing (Front)	1
19	325-CTOB Clutch Throw Out Bearing	1
20	BT-92 Transmission	1
21	GE-19A Gear Shift Extension (Includes Item 22)	1
22	SS51618516 5/16-18 x 5/16" Set Screw	1
23	GE-4**** Extension Shaft Coupling	1
24	GE-8***** Extension Housing	1
25	WK9**** #9 Woodruff Key	2
26	6304ZZ**** Ball Bearing	1
27	RR206**** Retaining Ring	1
29	SS5161834 5/16-18 x 3/4" Set Screw	6
30	4L320 V-Belts	2
31	GE-21 Large Pulley	1
32	RP141 1/4 x 1" Spirol Pin for GE4A	1
33	CSHH5161834 5/16-18 x 3/4" Cap Screw Hex Head	9
34	NU11412J** 1 1/4 x 12 Jam Nut	1
35	GE-17** Front Bearing Retainer	1
36	OBSS202616** Olite Bushing	1
37	GE-9**** Extension Shaft	1
38	GE-18**** Bearing Bracket	1
39	CSHH51618114 5/16-18 x 1 1/4" Cap Screw	6
40	SS3816234SH 3/8-16 x 2 3/4" Sq Head Set Screw	2
41	CSHH51618114 5/16-18 x 1 1/4" Cap Screw	6
42	E-2*** Clutch Friction Disc	2
43	GE-33*** Pressure Plate	1
44	E-4*** Clutch Spring	2
45	GE-31*** Clutch Body Cover	1
46	E-7*** Clutch Adjusting Screw	2
47	SS5161834 5/16-18 x 3/4" Set Screw	6
48	325-RGCG Gasket	1
49	10515CR Oil Seal	1
50	GT10 Thrust Bearing	1
51	GE-12 Clutch Rod	1
52	325-CFDA Clutch Friction Disc Assembly	1
53	CSHH38161 3/8-18 x 1" Cap Screw Hex Head	8
54	GE-6 Hinge Pin	1
55	GE-5 Clutch Throw Out Fork (Includes GE-5-4)	1
57	CSHH516181 5/16 x 1" Cap Screw Hex Head	6
58	GE-15 Counter Shaft Pin	1
59	CB3816112 3/8-16 x 1 1/2" Carriage Bolt	4
60	GE-11* Counter Shaft Plate	1
61	325-WP4106 Wheel & Hub Assembly	4
62	GE-10 Counter Shaft Assembly Bracket	1
63	GE-16* Counter Shaft	1
64	325-PB* Pillow Blocks	2
65	SS5161838 5/16-18 x 3/8" Set Screw	1
66	GE-20 Sm Pulley	1
67	K3161 3/16 x 3/16 x 1" Key	2
68	GE-16-1 Counter Shaft Adapter	1
69	F-10* Pin	2
70	GE-30*** Clutch Body	1
71	GE-32*** Drive Member	1
72	MS142058FLH*** Screw	6
73	SC-14 Cable Drive Shaft	1
74	RP316118 3/16 x 1 1/8" Spirol Pin	1
75	SC-10 Cable Drive Fitting	1
	325-GSK Gear Shift Knob	1
	325-TC Throttle Cable	1
	DL-4 Thumb Screw for Handle	2
	#4 x 3/8 Drive Screw	4
	GE-16A* Counter Shaft Assembly Consists of: Items 60, 63, 64, 68 & 69	1
	GE-17A** Front Bearing Assembly Consists of: Items 34, 35 & 36	1
	GE-22 Belt Guard	1
	GE-30A*** Drive Clutch Assembly Consists of: Items 42, 43, 44, 45, 46, 70, 71 & 72	1
	GE-4A**** Extension Shaft Assy Consists of: Items 23, 25, 26, 27 & 37	1
	GE-5-4 Throw-Out Folk Fingers	2
	GE-8A***** Extension Housing Assy Consists of: GE-4A and Item 24	1
	SC-14A Cable Drive Shaft Assembly Consists of: Items 73, 74 & 75	1

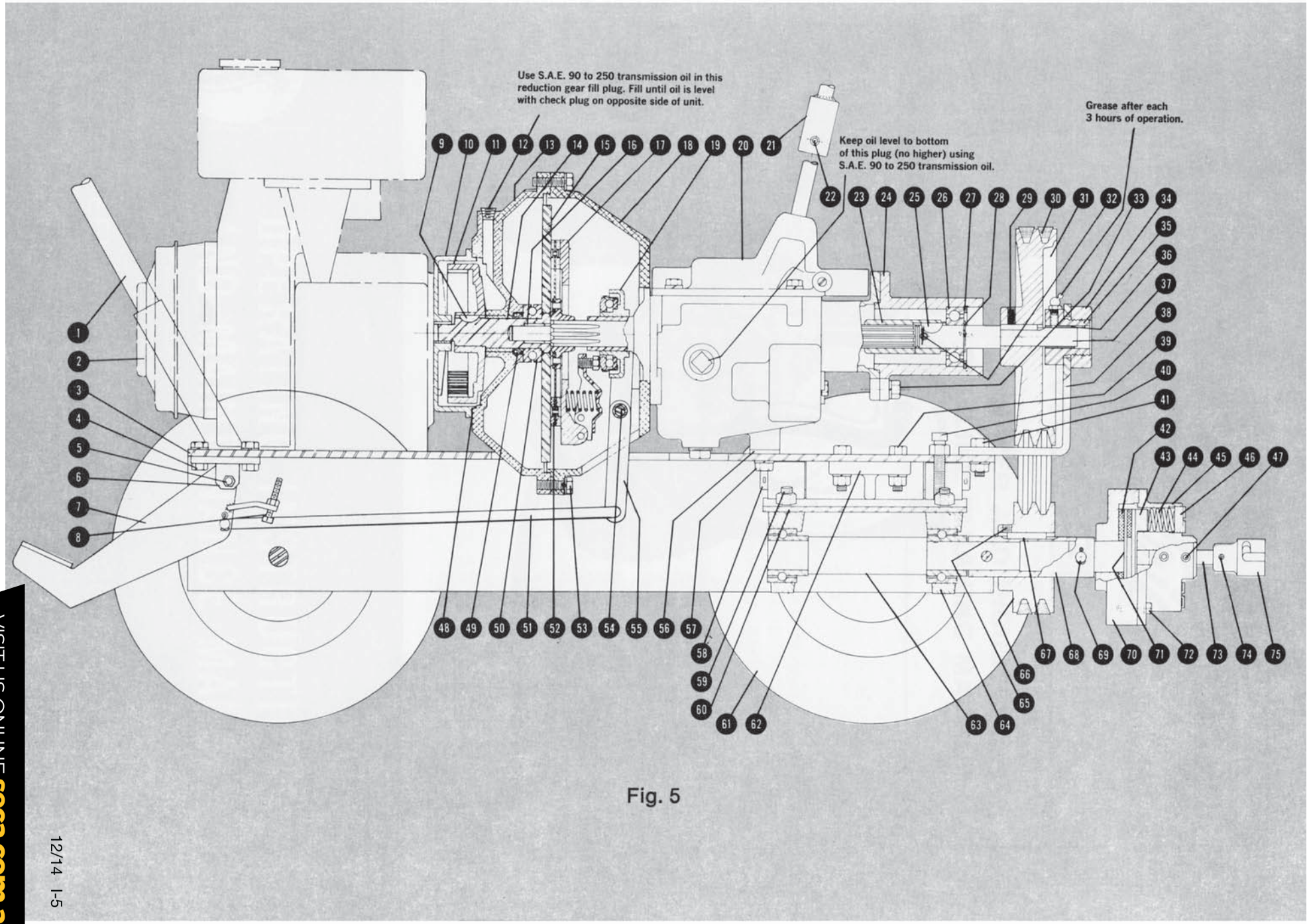


Fig. 5