



Reference:
P/N 790-039

UNIVERSAL and 302 FOLLOW-UP UNITS

ISSUE:
October/87

Wagner Follow-up Units are devices to electronically transmit the rudder angle information to amplifiers in various types of Wagner equipment. The Follow-up Unit is basically a potentiometer driven through linkage and gears and contained in a waterproof housing. The Universal Follow-up Unit contains a single potentiometer. The Model 302 Follow-up Unit contains, as an option, one extra potentiometer and up to two sets of limit switches for limiting the rudder angle travel should it be necessary. The Universal Follow-up Unit is pre-wired with five feet (1.5 m) of cable. The Model 302 Follow-up Unit is not pre-wired. All connections to the Model 302 are at a terminal strip. The type of follow-up may be identified through part numbers as follows:

UNIVERSAL FOLLOW-UP UNIT

PART NO.	DESCRIPTION
530-148	One potentiometer

MODEL 302 FOLLOW-UP UNIT

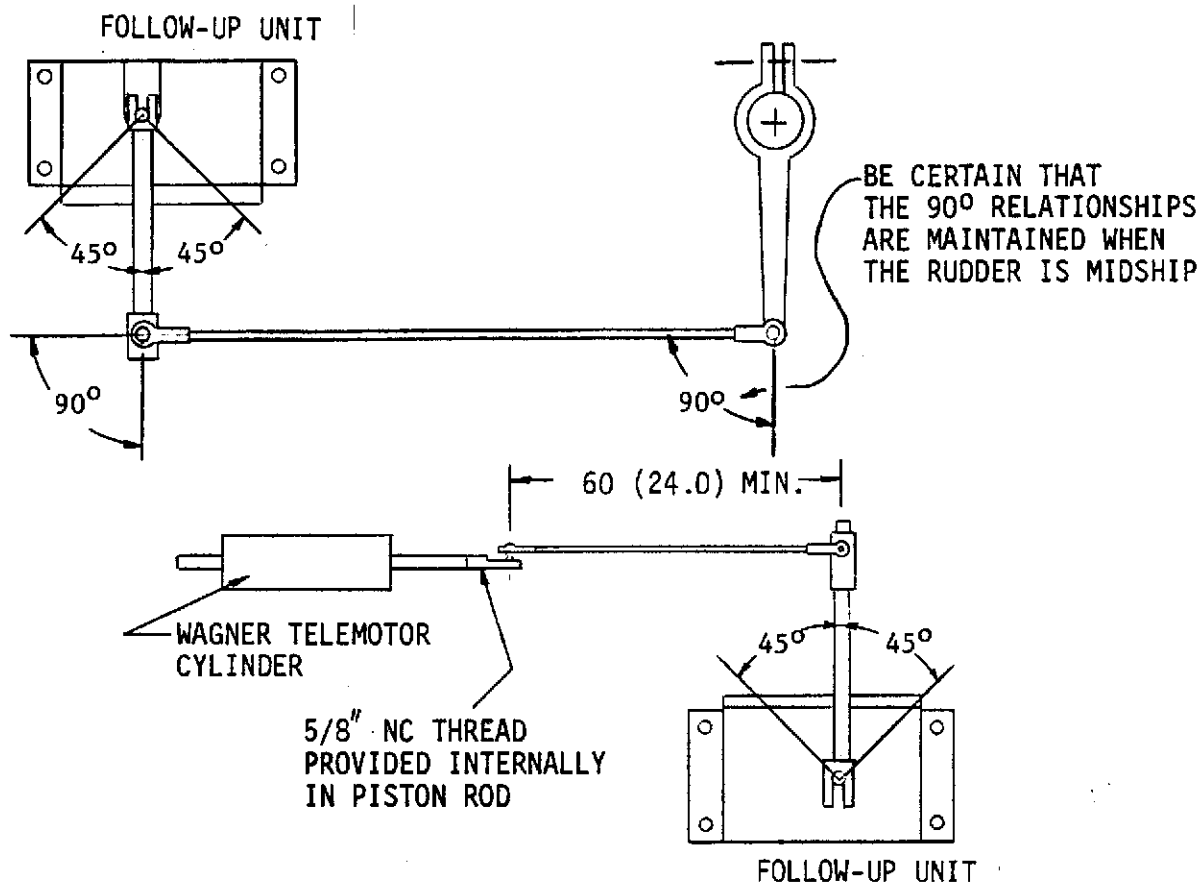
PART NO.	DESCRIPTION
530-038	One potentiometer and one set of limit switches (PS)
530-039	Two potentiometers and one set of limit switches (PPS)
530-040	One potentiometer and two sets of limit switches (PSS)
530-041	Two potentiometers and two sets of limit switches (PPSS)

MOUNTING THE FOLLOW-UP UNIT

The follow-up units must be mounted near the steering gear as shown in the following drawing. Use the overall dimensions drawings to obtain the mounting bolt details.

Note that steering gears employing the Accumotor (telemotor) systems, often referred to as hunting gear, must drive the follow-up linkage from the hunting gear cylinder. The follow-up unit should be mounted at least two feet (0.6 m) from the telemotor cylinder in order to ensure linear motion. Follow-up Units are frequently premounted if supplied at the same time with an Accumotor system. In all cases, except when using a Mark 6 Autopilot, the follow-up lever must stroke through 2 X 45 degrees regardless of the steering gear angle.

MOUNTING THE FOLLOW-UP UNIT



WARNING

It is extremely important that all mechanical connections to the follow-up unit, including hold-down bolts, linkage, and rudder stock, are tightened securely and prevented from loosening through vibration. Use positive locking devices on all connections. A loose mechanical connection can cause loss of steering control.

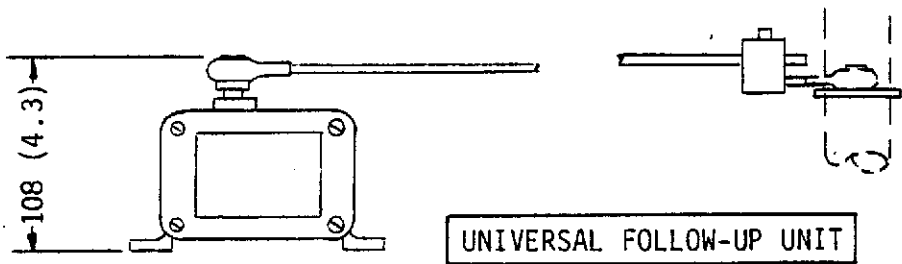
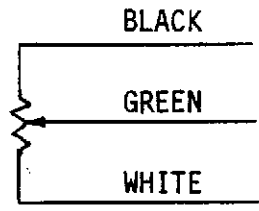
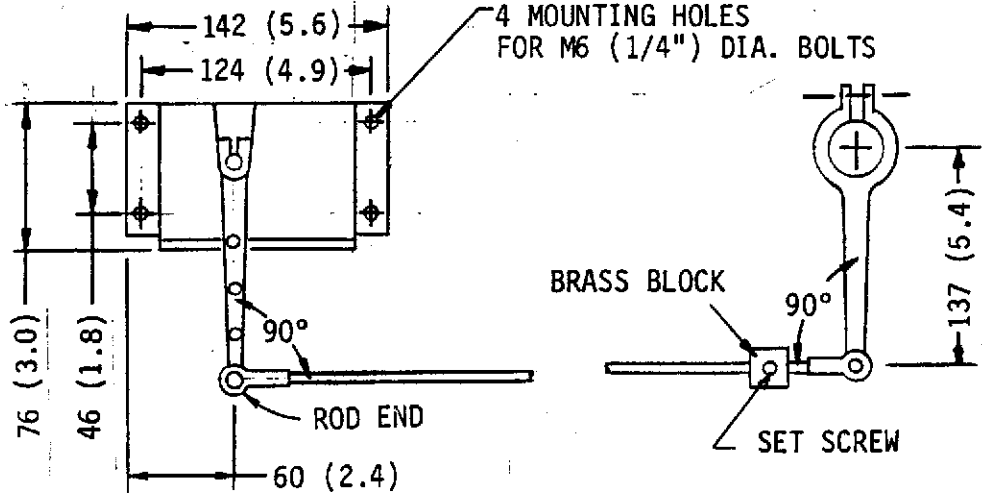
WIRING THE FOLLOW-UP UNIT

WARNING

It is extremely important that all electrical connections are secure and adequately insulated. A loose, broken wire, or short circuit could cause an erroneous steering command or loss of steering control.

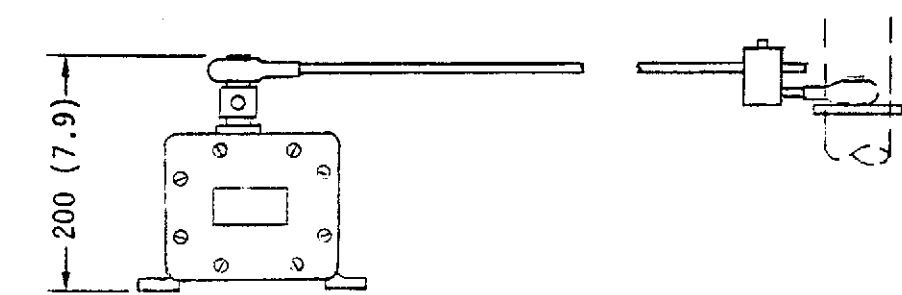
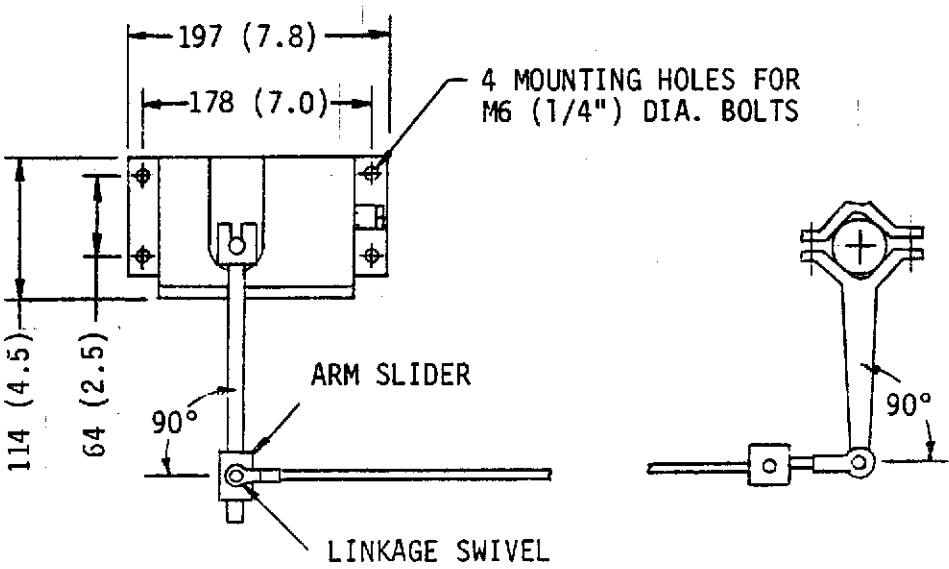
Wiring a Universal Follow-up Unit is very simple since only one potentiometer is included with this model. Wiring instructions are normally supplied with equipment using this follow-up unit.

Due to the numbers of options available with the Model 302 Follow-up Unit, specific drawings are generally prepared for each application. All connections to the Model 302 Follow-up Unit are at a terminal strip found inside the housing.

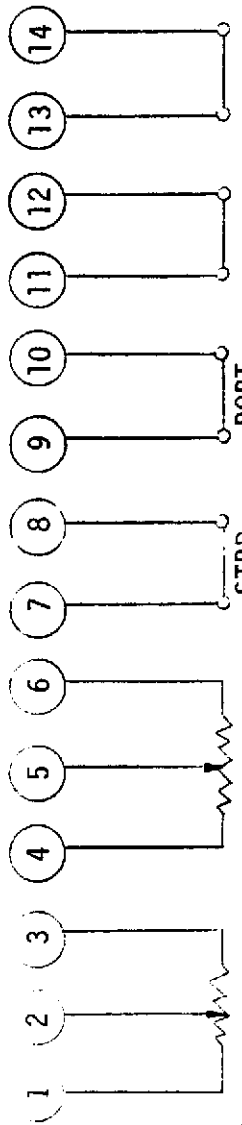


ALL DIMENSIONS MM (IN.)

NOTE:
 THE STEERING FOLLOW-UP POTENTIOMETER,
 THE RUDDER ANGLE INDICATOR
 POTENTIOMETER AND MICRO SWITCHES
 ARE NOT SUPPLIED WITH EVERY UNIT.
 THE EXTENT OF SUPPLY DEPENDS ON
 THE TYPE OF SYSTEM SPECIFIED.

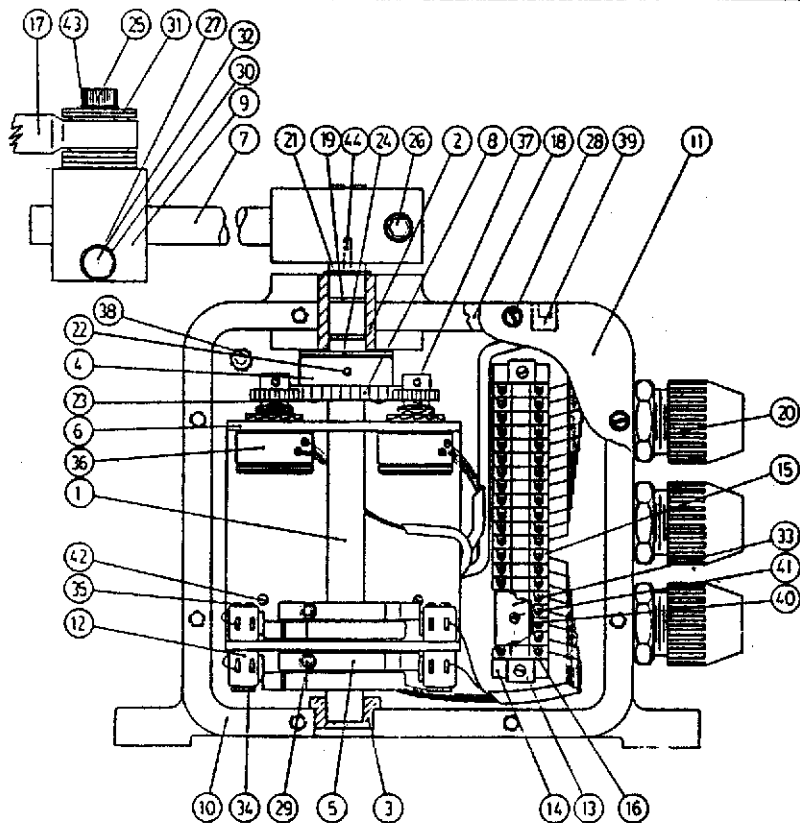


MODEL 302 FOLLOW-UP UNIT



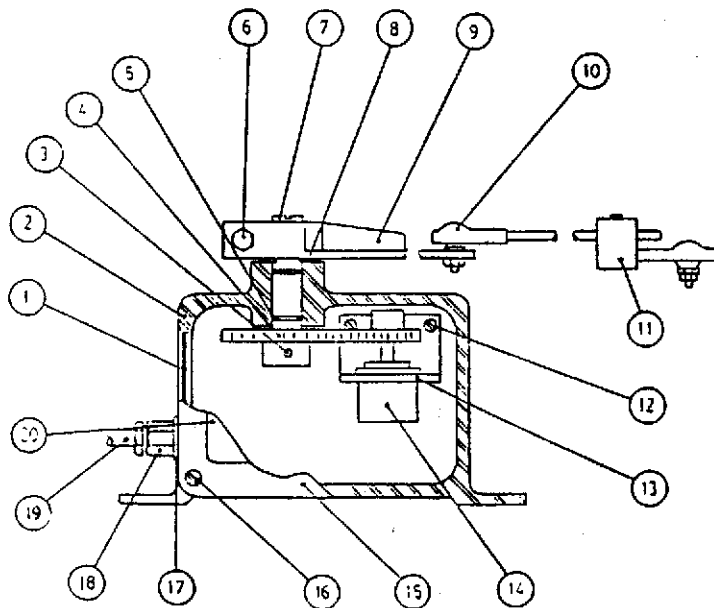
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 POTENTIOMETER AND MICRO SWITCHES
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INTERNAL WIRING




MODEL 302 FOLLOW-UP UNIT

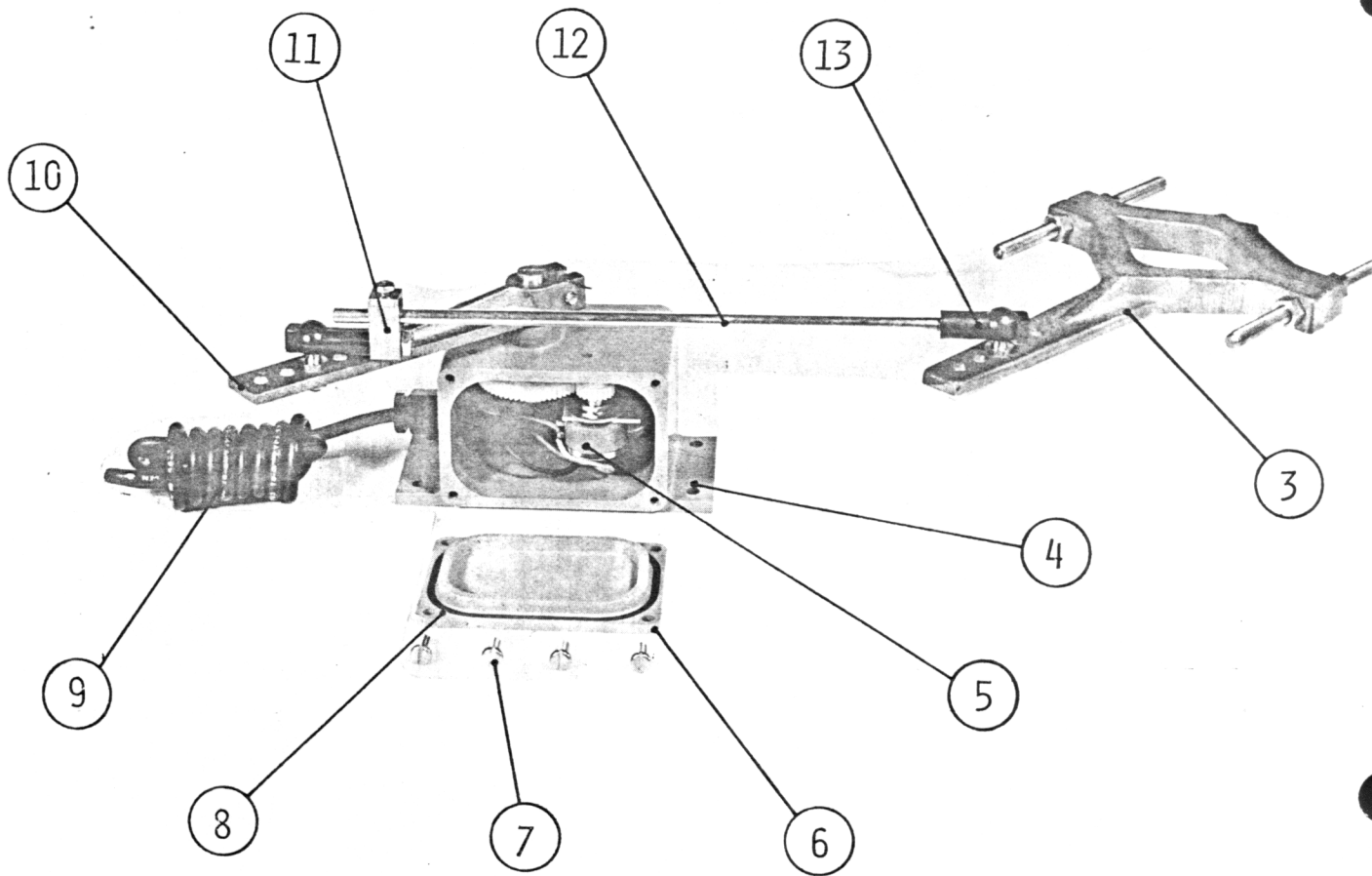
ITEM	QTY	PART NO.	DESCRIPTION
1	1	690-139	SHAFT
2	1	600-035	TOP BEARING
3	1	600-140	BOTTOM BEARING
4	1	690-140	GEAR COLLAR
5	1	690-141	GEAR
6	1	670-063	POTENTIOMETER BRACKET
7	1	690-163	ARM
8	1	600-156	GEAR
9	1	690-113	ARM SLIDER
10	1	690-541	HOUSING
11	1	690-541	HOUSING LID
12	4	212-001	SWITCH
13	2	430-042	TERMINAL END
14	1	430-051	TERMINAL TRACK
15	4	430-053	TERMINAL STRIP
16	1	430-041	TERM END SECTION
17	2	600-047	SWIVEL
18	1	617-015	HOUSING GASKET
19	2	615-010	O-RING
20	1	610-019	CABLE CLAMP
21	1	600-002	SNAP RING
22	2	600-090	SETScrew
23	1	600-011	MACHINE SCREW
24	1	604-011	WASHER
25	1	600-187	CAPSCREW
26	1	600-191	CAPSCREW
27	1	600-017	HEX NUT
28	1	600-060	MACHINE SCREW
29	1	600-048	CAPSCREW
30	1	604-034	LOCKWASHER
31	1	604-009	WASHER
32	1	600-114	CAPSCREW
33	1	670-160	TERMINAL BRACKET
34	4	602-015	HEX NUT
35	4	600-219	MACHINE SCREW
36	2	600-011	POTENTIOMETER SUB-ASSY
37	1	600-048	ROLL PIN
38	2	41-110002	PIPE IN UG
39	2	41-110003	PIPE PLUG
40	1	600-075	GROMMET
41	2	600-031	MACHINE SCREW
42	4	600-033	MACHINE SCREW
43	1	604-038	LOCKWASHER
44	1	690-180	SPRING POST

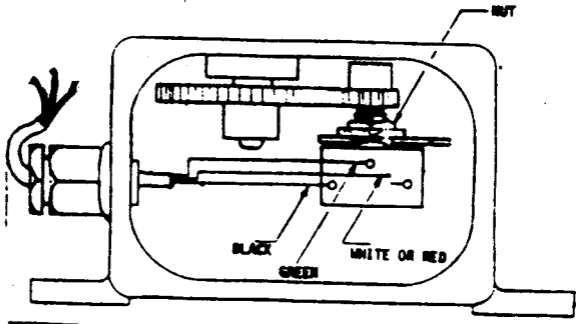


UNIVERSAL FOLLOW-UP UNIT

ITEM	QTY	PART NO.	DESCRIPTION
1	1	615-005	O-RING
2	1	600-105	HOUSING
3	1	600-032	ROLL PIN
4	1	690-107	GEAR (62T)
5	2	615-010	O-RING
6	1	600-114	CAPSCREW
7	1	690-010	SHAFT
8	1	600-002	SNAP RING
9	1	690-298	LEVER ARM
10	1	690-004	SWIVEL ARMY
11	1	690-005	BRASS BLOCK & SWIVEL
12	2	600-072	CAPSCREW
13	1	670-022	BRACKET (POT)
14	1	690-013	POT & GEAR ASSY
15	1	690-106	COVER (HOUSING)
16	4	600-081	CAPSCREW
17	1	610-011	WASHER (NYLON)
18	1	610-009	GRAND CABLE
19	50	790-101	CABLE
20	1	660-005	LABEL

DETAIL	QUANTITY	DESCRIPTION	MATERIAL
 WAGNER ENGINEERING LTD. 16 00STICK PLACE, NORTH VANCOUVER B. C. CANADA V7M 3S1 <small>Manufacturers of MARINE HYDRAULIC STEERING GEARS and AUTOMATIC PILOTS</small>			
TITLE PARTS LIST FOR UNIVERSAL AND MODEL 302 FOLLOW-UP UNITS			
<small>DRAWN</small> N/L G	<small>DATE</small> OCT/87	<small>SCALE</small> —	<small>QUOTE NO</small> —
<small>REVISION NOTES</small>		<small>DRAWING NO</small> C-7-202	<small>REV.</small> B





NOTE: TO INSURE PROPER GEAR BACKLASH,
INSERT PLASTIC POTENTIOMETER
PACKAGING BAG BETWEEN MESHED GEARS
AS ILLUSTRATED. PRESS GEARS
TOGETHER FIRMLY AND TIGHTEN NUT.

