

RESTRICTED

The information given in this document is not to be communicated either directly or indirectly to the Press or to any person not authorised to receive it.

**6-FT. WADING INSTRUCTIONS
FOR
CHURCHILL
I—VI.**

INCLUDING III. (75 mm.) AND IV. (75 mm.)

CHILWELL CATALOGUE No. 62/708

This publication has been produced to the instructions of
The CHIEF INSPECTOR of FIGHTING VEHICLES
to whom all communications should be addressed

*(This publication supersedes 6-ft. Wading Instructions Churchill I—IV,
Chilwell Catalogue No. 62/673, dated December 1943)*

FIRST EDITION

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March, 1944

FOREWORD

Complete instructions are given in this manual for sealing the "Churchill" to wade through water six feet deep. The sealing operations must be carried out conscientiously and thoroughly, *and as laid down in the following pages*, if they are to be successful. Nothing can be omitted and no "short cuts" are permissible. Every detail in the instructions must be followed carefully and no operation should be hurried to such an extent that the work is not one hundred per cent. satisfactory.

The statement that a part must be clean and dry, for instance, means exactly what it says. The part must be *really clean* and *really dry*. Nearly is not good enough.

The crew of the tank are responsible for most of the work, but Fitters and Electricians will be required for certain operations. These operations, and the respective duties of the Fitters and Electricians, are clearly detailed in the following pages.

The sealing instructions are arranged in stages or groups and the individual operations are set out in the sequence in which they must be carried out on the vehicle.

The respective groups are as follows :—

		<i>Approx. Man-hours Reqd.</i>	
		<i>Crew.</i>	<i>Fitters.</i>
Stage 1.	Instructions to Unit in the Field ...	200	25
" 2.	Instructions to Unit at Embarkation Point ...	40	—
" 3.	Instructions to Unit after Embarkation ...	4	—
" 4.	Instructions to Unit on and after Landing ...	—	—
" 5.	Maintenance Immediately after Landing ...	—	—
" 6.	Maintenance as Soon as Possible after Landing ...	—	—

The kits of materials required to carry out these operations are listed in detail on pages 6 to 10, and a clear guide is given to the methods of using the various sealing compounds on page 11.

SUPERVISION IS VITAL

An officer must be detailed to supervise sealing, and to be responsible for passing all work as satisfactory. What faults to look for are noted on page 13.

It is best to detail an N.C.O. to oversee the sealing of the troop or squadron commander's vehicle and so allow the troop or squadron commander to carry out this supervision.

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IMPORTANT

BEFORE SEALING

It is essential to inspect the vehicle *before* starting the sealing operations to make sure that the following parts are fitted.

1. A duct seating frame and inside trunking on both side louvres.
2. A duct seating frame on top of the rear louvre.
3. A frame on the rear louvre lower opening.
 - (a) Some vehicles are fitted with a central trailer towing bracket.
 - (b) On other vehicles, where the above bracket is not fitted a dummy plate is fitted.
4. Square flanges welded to the ends of silencer pipes.
5. A release gear bracket welded to the top centre of the engine roof plate.
6. Non-welded instead of welded-head bolts fitted to lower holes of trailer towing hook bracket.
7. Turret outside rear stowage bin modified to clear release gear tongue (Churchill III. only).

If any or all of these parts are not fitted, the vehicle should be passed immediately to R.E.M.E. Workshops for the work to be done according to D.M.E. Circulars A.700/1, A.700/2 and A.1020. The sealing cannot be started until the vehicle is complete with these parts.

TESTING SEALING

Experience has proven that a 3-ft. test in fresh water (see item 29) is sufficient preliminary check on 6-ft. sealing.

After fitting louvre ducts and exhaust pipes (see item 57) make the following check if an opportunity occurs. In darkness lower an inspection lamp down each louvre duct and carefully examine all joints from the outside, looking for any sign of light.

SPECIAL WATERPROOFING KITS

(See detailed lists on pages 7 to 10)

<i>Kit</i>	<i>Part No.</i>	<i>Description</i>	<i>Issue Basis</i>
Churchill, A.1 ...	TP.18762	Ironmongery (5 in. Rear Louvres) ...	1 per tank 1 per Squadron as spares
OR			
Churchill, A.2 ...	TP.18763	Ironmongery (8 in. Rear Louvres) ...	1 per tank 1 per Squadron as spares
Churchill, B ...	TP.18806	Special Electrical Fittings; Electrician's and Fitter's Tools	Supplied in Kit A, but separately packed.
Churchill, C ...	TP.18764	Sealing Fabrics, Sealing Compounds, Wiring Harness and Accessories	1 per tank 2 per Squadron as spares
Churchill, D ...	TP.18814	Sealing Compound, etc., Composite	1 per tank 2 per Squadron as spares
Churchill, E ...	TP.18800	Explosives ...	1 per tank 2 per Squadron as spares
Churchill, F ...	T.P.23415	Sealing Compounds and Fabrics (Supplementary)	1 per tank 2 per Squadron as spares

GENERAL NOTES ON SPECIAL KITS

Kit A.1 or A.2 contains the ironmongery and miscellaneous accessories required in Unit Lines by the tank crew to carry out operations necessary in the field and subsequently after embarkation. (Air Duct and Release Gear Drawing TP. 18650 enclosed with each kit shows method of assembly ducts, etc., and how to differentiate between vehicles with 5 in. and 8 in. rear louvres.)

Kit B contains the special fittings and tools required in Unit Lines by Squadron fitters and electricians to carry out operations necessary in the field.

Kit C contains the sealing fabric, sealing compounds, wiring harness and general accessories required in Unit Lines by the tank crew to carry out operations necessary in the field. All material left over must be carried forward to the point of embarkation.

Kit D contains the sealing compounds, etc., held in reserve, required at the point of embarkation by the tank crew. Remainder of Kits C and D, required after embarkation, must be carried forward in the vehicle.

NOTE.—Kit D is boxed separately but packed with Kit C. It must NOT be used in Unit Lines.

Kit E contains all explosive stores required in Unit Lines by the crew to carry out operations in the field and at the point of embarkation.

Kit F contains the supplementary sealing compounds and fabrics required in the field and at the point of embarkation.

Further supplies of all materials listed in Kits "C" and "D," other than waterproofing fabric patterns, can be obtained on application to the Commandant, Chilwell. Indents should be forwarded, with a covering letter, for the attention of O. i/c., P.2A (Wading).

TRAINING

The ironmongery in Kits A.1 and A.2 must be recovered and reconditioned as necessary during and after training so that it can be used for the final sealing of the vehicle.

Drawing No.	Part No.	DESIGNATION.	No. per Vehicle.	Remarks.
	<i>Section LVI/VH</i>			
TP.18762	CH.457	KIT "A/I," CHURCHILL	1	
TP.18561	TP.18561	GEAR, RELEASE, AIRDUCT	1	For 5" rear louvres.
TP.6043	TP.6043	Bolt, $\frac{3}{8}$ " \times 1" (MT5/FB106/8D) ...	3	Securing release gear to mounting bracket.
TP.6156	TP.6156	Nut, $\frac{3}{8}$ " (MT5/19623) ...	3	
TP.6355	TP.6355	Washer, spring, Grover, $\frac{3}{8}$ " ...	3	
TP.18589	TP.18589	Air duct, inlet, side ...	2	
TP.18581	TP.18581	Eye-bracket ...	6	For inlet airducts.
TP.6028	TP.6028	Bolt, $\frac{5}{16}$ " \times 1" (MT5/FB105/8D) ...	12	Securing eye-brackets.
TP.6155	TP.6155	Nut, $\frac{5}{16}$ " (MT5/18336) ...	12	
TP.18582	TP.18582	Tee-bolt, side (4 spare) ...	10	
TP.6158	TP.6158	Nut, $\frac{1}{2}$ " (MT5/15844) ...	12	For inlet airducts.
TP.18596	TP.18596	Seal, rubber, 50 $\frac{1}{2}$ " long ...	4	
TP.18598	TP.18598	Seal, rubber, 8 $\frac{5}{8}$ " long ...	4	
TP.18587	TP.18587	Air duct, outlet, rear ...	1	
TP.18581	TP.18581	Eye-bracket ...	4	For outlet airduct.
TP.6028	TP.6028	Bolt, $\frac{5}{16}$ " \times 1" (MT5/FB105/8D) ...	8	Securing eye-brackets.
TP.6155	TP.6155	Nut, $\frac{5}{16}$ " (MT5/18336) ...	8	
TP.18600	TP.18600	Tee-bolt, rear (2 spare) ...	6	
TP.6158	TP.6158	Nut, $\frac{1}{2}$ " (MT5/15844) ...	8	For outlet airduct.
TP.18595	TP.18595	Seal, rubber, 58 $\frac{3}{4}$ " long ...	2	
TP.18599	TP.18599	Seal, rubber, 8 $\frac{1}{8}$ " long ...	2	
TP.18568	TP.18568	"Y-ROD," AIRDUCT, RIGHT	1	
TP.6158	TP.6158	Nut, $\frac{1}{2}$ " (MT5/15844) ...	2	For right "Y-rod."
TP.6333	TP.6333	Washer, plain, $\frac{1}{2}$ " (MT5/9731) ...	2	
TP.18569	TP.18569	"Y-ROD," AIRDUCT, LEFT	1	
TP.6158	TP.6158	Nut, $\frac{1}{2}$ " (MT5/15844) ...	2	For left "Y-rod."
TP.6333	TP.6333	Washer, plain, $\frac{1}{2}$ " (MT5/9731) ...	2	
TP.18560	TP.18560	VEE-ROD, AIRDUCT ...	1	
TP.18573	TP.18573	Bracket, extension, air duct ...	2	For Vee-rod.
TP.6158	TP.6158	Nut, $\frac{1}{2}$ " (MT5/15844) ...	4	
TP.6333	TP.6333	Washer, plain, $\frac{1}{2}$ " (MT5/9731) ...	4	
TP.18584	TP.18584	Pipe, extension, exhaust, right ...	1	
TP.18585	TP.18585	Pipe, extension, exhaust, left ...	1	Flange may be already welded—one to each pipe extension.
TP.17556	TP.17556	Exhaust flange ...	2	
TP.18586	TP.18586	Gasket, exhaust pipe flange ...	2	For exhaust pipe flanges.
TP.6030	TP.6030	Bolt, $\frac{5}{16}$ " \times 1 $\frac{1}{4}$ " (MT5/FB105/10D) ...	8	
TP.6155	TP.6155	Nut, $\frac{5}{16}$ " (MT5/18336) ...	8	
TP.6354	TP.6354	Washer, spring, Grover, $\frac{5}{16}$ " ...	8	
TP.18575	TP.18575	Clamp, exhaust pipe extension ...	2	
TP.18574	TP.18574	Tie-bar, exhaust pipe extension ...	1	For tie-bar.
TP.18594	TP.18594	Stay, exhaust pipe extension ...	2	
TP.6155	TP.6155	Nut, $\frac{5}{16}$ " (MT5/18336) ...	4	
TP.17895	TP.17895	Panel, framing, outlet ...	2	
TP.18797	TP.18797	Plate, blanking, gearbox ...	1	TG/A823.
TP.18821	TP.18821	Gasket, gearbox blanking plate ...	2	
TP.18711	TP.18711	Gasket, final drive filler plug ...	2	
TP.16085	TP.16085	Gasket, brake drum driving flange ...	6	
TP.18747	TP.18747	Plug, towing eye, lower, rear ...	2	Tecalemit.
TP.18823	TP.18823	Grease-gun, special ...	1	
TP.5139	TP.5139	Rope, hemp, 2", 20' ...	1	
TP.18650	TP.18650	Drawing, instructional, airducts and release gear	1	
TP.18984	TP.18984	Label, tie-on ...	25	
		Instruction book ...	1	
TP.18806	CH.459	Kit "B" ...	1	

Drawing No.	Part No.	DESIGNATION.	No. per Vehicle.	Remarks.
	<i>Section LVI/VH</i>			
TP.18763	CH.458	KIT "A/2," CHURCHILL	1	For 8" rear louvre.
TP.18561	TP.18561	GEAR, RELEASE, AIRDUCT	1	
TP.6043	TP.6043	Bolt, $\frac{3}{8}$ " \times 1" (MT5/FB106/8D) ...	3	Securing release gear to mounting bracket.
TP.6156	TP.6156	Nut, $\frac{3}{8}$ " (MT5/19623) ...	3	
TP.6355	TP.6355	Washer, spring, Grover, $\frac{3}{8}$ " ...	3	
TP.18589	TP.18589	Air duct, inlet, side ...	2	
TP.18581	TP.18581	Eye-bracket ...	6	For inlet air duct.
TP.6028	TP.6028	Bolt, $\frac{5}{16}$ " \times 1" (MT5/FB105/8D) ...	12	Securing eye-brackets.
TP.6155	TP.6155	Nut, $\frac{5}{16}$ " (MT5/18336) ...	12	
TP.18582	TP.18582	Tee-bolt, side (4 spare) ...	10	For inlet air duct.
TP.6158	TP.6158	Nut, $\frac{1}{2}$ " (MT5/15844) ...	12	
TP.18596	TP.18596	Seal, rubber, 50 $\frac{1}{2}$ " long ...	4	
TP.18598	TP.18598	Seal, rubber, 8 $\frac{5}{8}$ " long ...	4	
TP.18601	TP.18601	Air duct, outlet, rear ...	1	
TP.18581	TP.18581	Eye-bracket ...	4	For outlet air duct.
TP.6028	TP.6028	Bolt, $\frac{5}{16}$ " \times 1" (MT5/FB105/8D) ...	8	Securing eye-brackets.
TP.6155	TP.6155	Nut, $\frac{5}{16}$ " (MT5/18336) ...	8	
TP.18600	TP.18600	Tee-bolt, rear (2 spare) ...	6	For outlet air duct.
TP.6158	TP.6158	Nut, $\frac{1}{2}$ " (MT5/15844) ...	8	
TP.18595	TP.18595	Seal, rubber, 58 $\frac{3}{4}$ " long ...	2	
TP.18597	TP.18597	Seal, rubber, 11 $\frac{1}{4}$ " long ...	2	
TP.18568	TP.18568	"Y-ROD," AIRDUCT, RIGHT	1	
TP.6158	TP.6158	Nut, $\frac{1}{2}$ " (MT5/15844) ...	2	For right "Y-rod."
TP.6333	TP.6333	Washer, plain, $\frac{1}{2}$ " (MT5/9731) ...	2	
TP.18569	TP.18569	"Y-ROD," AIRDUCT, LEFT	1	
TP.6158	TP.6158	Nut, $\frac{1}{2}$ " (MT5/15844) ...	2	For left "Y-rod."
TP.6333	TP.6333	Washer, plain, $\frac{1}{2}$ " (MT5/9731) ...	2	
TP.18560	TP.18560	VEE-ROD, AIRDUCT	1	
TP.6158	TP.6158	Nut, $\frac{1}{2}$ " (MT5/15844) ...	2	For Vee-rod
TP.6333	TP.6333	Washer, plain, $\frac{1}{2}$ " (MT5/9731) ...	2	
TP.18584	TP.18584	Pipe, extension, exhaust, right ...	1	Flange may be already welded—one to each pipe extension.
TP.18585	TP.18585	Pipe, extension, exhaust, left ...	1	
TP.17556	TP.17556	Exhaust flange ...	2	
TP.18586	TP.18586	Gasket, exhaust pipe flange ...	2	
TP.6030	TP.6030	Bolt, $\frac{5}{16}$ " \times 1 $\frac{1}{4}$ " (MT5/FB105/10D) ...	8	For exhaust pipe flanges.
TP.6155	TP.6155	Nut, $\frac{5}{16}$ " (MT5/18336) ...	8	
TP.6354	TP.6354	Washer, spring, Grover, $\frac{5}{16}$ " ...	8	
TP.18575	TP.18575	Clamp, exhaust pipe extension ...	2	
TP.18574	TP.18574	Tie-bar, exhaust pipe extension ...	1	
TP.18594	TP.18594	Stay, exhaust pipe extension ...	2	
TP.6155	TP.6155	Nut, $\frac{5}{16}$ " (MT5/18336) ...	4	For tie-bar.
TP.17895	TP.17895	Panel, framing, outlet ...	2	
TP.18797	TP.18797	Plate, blanking, gearbox ...	1	
TP.18821	TP.18821	Gasket, gear box blanking plate ...	2	TG/A823
TP.18711	TP.18711	Gasket, final drive, filler plug ...	2	
TP.16085	TP.16085	Gasket, brake drum driving flange ...	6	
TP.18747	TP.18747	Plug, towing eye, lower, rear ...	2	
TP.18823	TP.18823	Grease-gun, special ...	1	Tecalemit.
TP.5139	TP.5139	Rope, hemp, 2", 20' long ...	1	
TP.18650	TP.18650	Drawing, instructional, air duct and release gear	1	
TP.18984	TP.18984	Label, tie-on ...	25	
		Instruction book ...	1	
TP.18806	CH.459	Kit "B" ...	1	

Drawing No.	Part No.	DESIGNATION.	No. per Vehicle.	Remarks.
	<i>Section LVI/VH</i>			
TP.18806	CH.459	KIT " B " CHURCHILL	1	
TP.18751	TP.18751	Seal, mounting ring	1	For rotary base junction.
TP.18807	TP.18807	Guide, seal	1	
TP.18808	TP.18808	Cap, bearing, with seal	1	
TP.18809	TP.18809	Nut, bearing	1	
TP.18810	TP.18810	Cover, band ; with breathers	1	For traverse dynamo.
TP.18812	TP.18812	Tube, rubber, oil resisting, $\frac{3}{8}$ " I/D × $\frac{1}{2}$ " O/D × 48" long	2	
TP.18811	TP.18811	Fuse, 6-amp. (MT ₄ /LV/FA6)	2	Rolls. Plan manila, size 2F.
TP.18874	TP.18874	Tape, masking, 2" wide × 50 yds....	1	
TP.18984	TP.18984	Label, tie-on	1	
	<i>Section LV6</i>			
TP.18764	MT₁₅/NIV/222	KIT " C " & " D " CHURCHILL	1	
	MT₁₅/NIV/213	KIT " C, " CHURCHILL	1	
		KIT FABRIC	1	
TP.18765		Turret collar	1	
TP.18766		Mounting, Turret gun	1	
TP.18767		Turret gun muzzle	1	
TP.18768		Front gun	1	
TP.18769		Front fan vent	1	
TP.18770		Battery recess	1	
TP.18771		Spare patch	1	
TP.18772		Smoke mortar	1	
TP.18774		Turret collar, 2-pdr.	1	
TP.18775		Mounting, 2-pdr. and Besa	1	
TP.18776		Turret gun muzzle	1	
TP.18778	MT ₁₅ /NIV/193	Bostik cleaner	2	1 quart tins.
TP.18779	MT ₁₅ /NIV/192	Bostik " C "	5	1 quart tins.
TP.18780	MT ₁₅ /NIV/191	Bostik " AA "	5	1 quart tins.
TP.18781	MT ₁₅ /NIV/194	Bostik " 692 "	4	Tubes
TP.18782	MT ₁₅ /NIV/195	Boscoprene " 551 " (Part A)	1	$\frac{1}{2}$ pint tin.
TP.18783	MT ₁₅ /NIV/196	Boscoprene " 551 " (Part B)	1	Bottle.
TP.18785	MT ₁₅ /NIV/197	Bostikote machine ; with tape and charge	1	
TP.18784	MT ₁₅ /NIV/198	Bostikote tape (60 yds. roll)	1	Spare.
TP.18819	MT ₁₅ /NIV/199	Bostikote charge	1	
TP.18786	MT ₁₅ /NIV/200	W.D. pressure plastic, 802	2	1 off 8 lbs., 1 off 2 lbs.
TP.23427	MT ₁₅ /NIV/438	Asbestos Compound	1	7 lb. tins.
TP.18787	MT ₁₅ /NIV/201	Grease, G.S.	2	7 lb. tins.
TP.18788	MT ₁₅ /NIV/202	Grease, H.M.P.	3	2 lb. tins.
TP.18789	MT ₁₅ /NIV/203	Lanolin	2	1 lb. tins.
TP.18790	MT ₁₅ /NIV/204	Paint, anti-corrosive	1	2 pint tin.
TP.18791	MT ₁₅ /NIV/206	Brush, paint, 2"	2	
TP.18792	MT ₁₅ /NIV/207	Brush, paint, 1"	1	
TP.18793	MT ₁₅ /NIV/208	Brush, wire, scaling	1	
TP.18794	MT ₁₅ /NIV/209	Scissors, 7"	1	
TP.18795	MT ₁₅ /NIV/205	Tape, insulating, $\frac{1}{2}$ ", 2 oz.	4	
TP.18796	MT ₁₅ /NIV/210	Knife, putty	1	
	MT ₁₅ /NIV/211	Scraper	1	
TP.18875	MT ₁₅ /NIV/215	Chalk	2	Sticks.
	MT₁₅/NIV/212	KIT, WIRING HARNESS ;		
		WITH PLUG	1	Set.
TP.19002	MT ₁₅ /NIV/364	Pullthrough, single, Mk. IVB	2	

Drawing No.	Part No.	DESIGNATION.	No. per Vehicle.	Remarks.
		KIT " C " AND " D " CHURCHILL (contd.)		
TP.I8814	Section LV6 MT15/NIV/223	KIT " D," CHURCHILL ...	1	
TP.I8779	MT15/NIV/192	Bostik " C " ...	1	1 quart tin.
TP.I8780	MT15/NIV/191	Bostik " AA " ...	1	1 quart tin.
TP.I8781	MT15/NIV/194	Bostik " 692 " ...	1	Tube.
TP.I8786	MT15/NIV/200	W.D. pressure plastic, 802 ...	2	1 off 8 lbs., 1 off 2 lbs.
TP.I8787	MT15/NIV/201	Grease, G.S. ...	1	7 lb. tin.
TP.I8791	MT15/NIV/206	Brush, paint, 2" ...	1	
TP.I8795	MT15/NIV/205	Tape, insulating, $\frac{1}{2}$ ", 2 oz. ...	1	
		KIT " E " CHURCHILL	1	
TP.I8800		Cordtex, 236" long ; with end caps	1	For turret.
TP.I8804		Cordtex, 48" long ; with end caps ...	1	For front gun.
TP.I8802		Cordtex, 24" long ; with end caps ...	1	For front fan vent.
TP.I8801		Cordtex, 72" long ; with end caps ...	2	For rear lower louvre.
TP.I8803				
TP.I8805		Detonator, electric, No. 33 ...	6	
		KIT " F " CHURCHILL		
TP.23415		Asbestos Compound ...	6	7 lb. tin.
TP.23427	MT15/NIV/438	Muzzle cover ...	1	For turret gun, Churchill III, IV, Vand VI.
TP.23428				
TP.23429	ZA.15437	Hand microphone waterproof bag ...	3	
TP.I8780	MT15/NIV/191	Bostik " AA " ...	2	1 quart tins.
TP.23552	<u>III</u> →	Air duct release cable assy. ...	1	For use on Churchill III.

GENERAL NOTES ON SEALING MATERIALS

Read this carefully before starting.

CLEANING MATERIALS.

Wire Brush.—For cleaning caked mud from the hull before using petrol or cleaner. Use great care when working near sealed joints, or the wire brush may damage the sealing compound.

Stirrup Pump.—For washing down the hull, especially in corners not easily reached by the wire brush.

Clean Rag or Cotton Waste.—Used with petrol or Bostik Cleaner No. 1.

Petrol.—Used for cleaning very dirty or oily surfaces, but all such places must be finally cleaned with Bostik Cleaner No. 1. When cleaning near a previously sealed joint, use Cleaner No. 1 only—*not* petrol.

Bostik Cleaner No. 1.—Used for the final cleaning of surfaces before sealing; also for cleaning existing sealed joints where repair is necessary. Apply sparingly.

Do not use Bostik Cleaner No. 1 as a thinner for any of the sealing materials.

Note.—Stirrup pumps should be made available on loan from existing unit equipment.

An order to seal vehicles should automatically confer authority for the issue of petrol for cleaning purposes.

SEALING MATERIALS.

NOTE.—BEFORE USING ANY OF THE SEALING MATERIALS THE PREPARED SURFACE MUST BE THOROUGHLY CLEAN AND DRY.

W.D.P.P.—A red waterproof plastic capable of standing up to some pressure. Supplied in tins. Should be applied in thin ribbons in a pliable state for the best results. Bostik "C" should be applied on top to secure fabric or sealing tape. The plastic becomes too hard for "working" in cold weather but can be made pliable by standing the tin in hot water.

Asbestos Compound.—Is a high melting point compound used for sealing cracks, and the seams of such parts as hatches. It is tenacious but easily worked. It must be applied thickly, with all edges "feathered" off and with the top smoothed over to present an unbroken surface.

Bostik "C."—An adhesive compound supplied in tins. Should be applied thinly with a soft brush. Used as a primer for sealing compounds, and as a paint for jointing fabric to fabric

or fabric to metal. The primed surfaces must be allowed to become "tacky" before making the joint. In dry sunny conditions the compound becomes tacky quickly, but in damp conditions it may require about 30 minutes. *Always replace the lid on the tin after use.*

Bostik "AA."—A sealing cement supplied in tins—identified by a green band painted round the tin. Should be applied thinly with a soft brush direct on to the prepared surface. Used for sealing rivet and bolt heads, small cracks in existing sealed seams, on top of fabric, and on top of W.D.P.P. and Asbestos Compound where necessary. *Always replace the lid after use.*

Bostik "692."—A sealing cement supplied in tubes, operated by a winding key at the bottom. Applied by holding nozzle to prepared surface and turning key. Used for filling broken seams and large cracks after applying Bostik "C." In cold weather, warm the tube slightly to give an even flow. *Always replace the cap after use.* If the cement is too stiff to enter a crack, a putty knife or similar tool can be used to work it in.

Boscoprene 551 (Part A).—A sealing compound supplied in tins. Sets without coming into contact with air. *Boscoprene 551 (Part B) must be added to it before use.*

Boscoprene 551 (Part B).—A solvent for the above, supplied in small bottles. Shake the bottle well, add the whole quantity to the Boscoprene 551 (Part A), and mix well by stirring. *Must be used immediately after mixing.* Applied to a joint, such as a belly inspection cover, the Boscoprene mixture should set hard in about 8 hours. Finally, seal the joint and exposed Boscoprene with Bostik "AA."

Bostikote Tape.—A waterproof tape supplied in a roll contained in a box, together with a container of suitable primer. The primer is automatically applied as the tape is pulled through.

Pierce a small hole in the top of the container to allow air to enter. Tape over this hole when the container is not in use.

If plain tape is required, remove the roll and container from the box, turn the container upside down, release the two small screws and take the container off. Stand the roll the right way up again and pull the tape.

In cold weather, warm the container slightly to allow the primer to flow freely. The Bostikote tape is used for sealing joints, such as engine and

gearbox door openings, and over plugs of W.D.P.P.

Fabric Covers.—Waterproof fabric which must be handled with care and kept clean. Used for sealing turret ring, gun apertures, etc., and should always be fitted with the shiny side outwards. Supplied in pieces shaped ready for fitting, but some small trimming will be required.

The positions the fabric pieces are to occupy are stencilled on the inside, i.e., "6-Pounder and Besa." Examine the covers before fitting for any holes or thin places. Repair by means of a fabric patch stuck on with Bostik "C."

Use Bostik "C" to attach covers to metal surfaces, and allow the Bostik to become tacky before making the joint.

When the joint has set (after about one hour), paint over the edges of the fabric with Bostik "AA."

GREASES.

Grease G.S.—Standard Army issue. Used where ease of operation and protection against sea water is required. Apply by coating all parts concerned.

Grease H.M.P.—A high melting point grease used where temperatures are fairly high. Also used as a sealing agent. Apply by smearing on the parts concerned.

Lanolin.—A yellow grease used for protecting electrical parts such as plug and socket connections. Apply as directed in instructions.

PAINT.

Anti-Corrosive Paint.—A blue paint used to protect metals from the effects of sea water. Apply with a small brush. *Two* coats must be applied.

CORDTEX AND FITTINGS.

Cordtex.—An explosive in the form of a flexible cord. Used for blowing off fabric, etc. **Do not allow Bostik compound to touch the Cordtex** or the cord will be damaged and will not explode when required.

Detonator No. 33 Electric.—An electric-type detonator used for firing the Cordtex. Attach the detonator near to the end of the Cordtex with the detonator pointing in the direction of the Cordtex run, and secure it with insulation tape. Attach the detonator leads to the wiring harness with insulation tape.

Wrap the Cordtex locally for about 3 in. with insulation tape where the Bostikote tape is used for fixing the Cordtex to the vehicle, so that the Bostikote does not come in contact with the cord.

Wiring Harness.—A wiring harness consists of one or more lengths of flex attached to a suitable adaptor, ready for coupling up.

FOR EFFICIENT SEALING.

Apply Bostik "C" or "AA" with what can be described as a stippling motion. Get plenty of the compound on the brush, and work it into the surface until there is an even covering of compound. **Bostik "AA" must be worked right into seams. Do not just draw the brush straight along a seam, or merely dab on the compound.**

Bostik "C" and "AA" must be made easily workable by stirring thoroughly before use. If stirring alone is not enough, warm the compound by standing the tin in hot water. **Do not get any water into the tin.**

Brushes of 1 in. width, and one of 2 in. width, are supplied with the kits of sealing materials. Before use soak all brushes to stop the bristles

falling out, and check that the 1 in. brush has bristles 1 in. long (i.e., the diameter of a half-penny), and the 2 in. brush $1\frac{1}{4}$ in. long (i.e., the diameter of a penny). If the bristles are longer cut them off to these lengths. Cut the bristles square.

Allocate the brushes as follows:—

One 1 in. brush for Bostik "AA" and Boscoprene.

One 1 in. brush for anti-corrosive paint.

The 2 in. brush for dusting, and then for applying Bostik "C."

Keep used brushes soaked in Bostik cleaner.

CLEAN BEFORE YOU SEAL.

SPECIAL INSTRUCTIONS

INSPECT SEALING FOR :—

Cleaning before putting on the sealing compounds.

Waste of materials through painting Bostik alongside, instead of *into* the joints ; leaving the lids off tins ; failure to clean brushes.

Efficiency of all sealing. Bostik and paint must be applied in an unbroken film. Check

that this is so in all awkward corners. Pressure plastic and grease must present an unbroken surface, and the pressure plastic must be firmly pressed down at the edges. Fabric must be folded neatly, with no gaps in sticking down the edges.

Completion of all items in these instructions, and that work has been done according to the instructions.

IMPORTANT

The vehicle must not be driven more than 75 miles after the completion of Stage 1 sealing.

Vehicles have been immobilised through their tracks rusting up during a protracted sea voyage. This can be prevented by oiling the tracks. A USED PETROL TIN MUST BE FILLED WITH WASTE ENGINE OIL AND STOWED IN THE VEHICLE FOR THIS PURPOSE.

Sheet the vehicle over as soon as possible after embarkation to minimise damage from corrosion caused by salt water or spray.

SMEAR THE TRACKS WITH THE WASTE OIL BROUGHT FOR THIS PURPOSE.

See that the oil is applied liberally enough to soak around the track pins. If the sea passage is protracted, apply oil daily.

WHEN LEAVING THE LANDING CRAFT KEEP GOING AT ALL COSTS, SO AS NOT TO OBSTRUCT FOLLOWING VEHICLES.

Stage I. INSTRUCTIONS TO UNIT IN THE FIELD

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Stage I. INSTRUCTIONS TO UNIT IN THE FIELD

For complete lists of operations see page 14

1. CHECK STORES : CARRY OUT SERVICE AND MAINTENANCE.

TOOLS—

Vehicle Kit and Special Tecalet Gun, Part No. TP.18823.

MATERIALS—

As Maintenance Schedule.

G.S. Grease—12 lbs. approx. (Bogie Fulcrum).

Check stores against kit lists on pages 6 to 10.

Carry out routine maintenance generally as laid down in Vehicle Instruction Book for Daily and 250 Miles with the following important variation.

The fulcrum shafts *must* for this occasion be filled with G.S. grease and a special lubricating gun is supplied for this purpose.

Remove the nipple in both ends of each fulcrum shaft and apply the gun direct to the open hole. Fill the shaft *completely* and make sure that all nipples are replaced after greasing.

The axle shafts must *not* be greased.

Other servicing may be necessary in addition to the routine mentioned above, but all such work is detailed in the proper places in this book.

2. DRESS REHEARSAL OF FITTING IRONMONGERY (Louvre Ducts, Release Gear, Exhaust Pipe Extensions).

TOOLS—

Vehicle Kit.

MATERIALS—

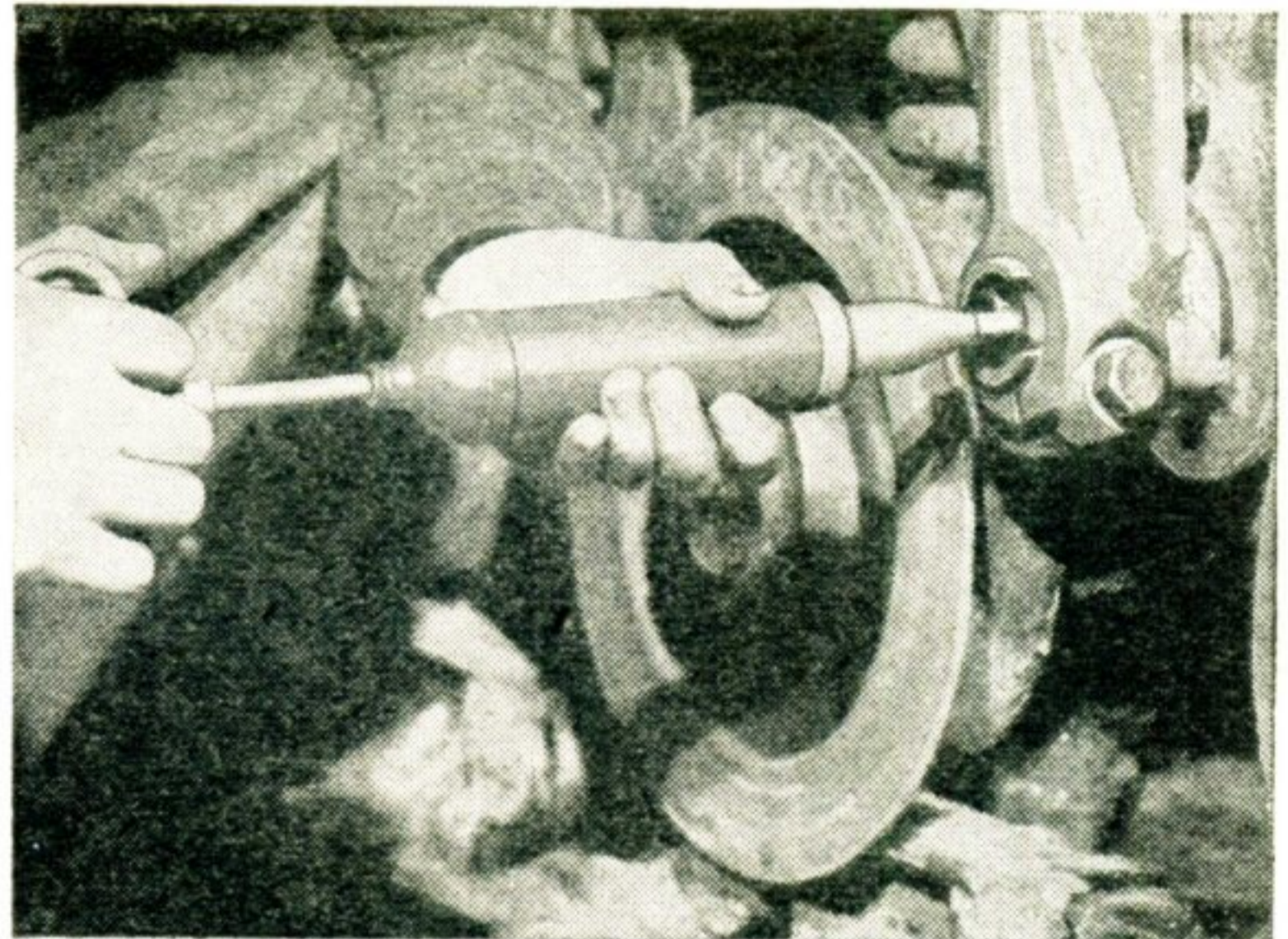
Kit A.1 (TP.18762) or A.2 (TP.18763)—excluding miscellaneous accessories.

For Churchill III use cable assembly TP 23552 from Kit F.

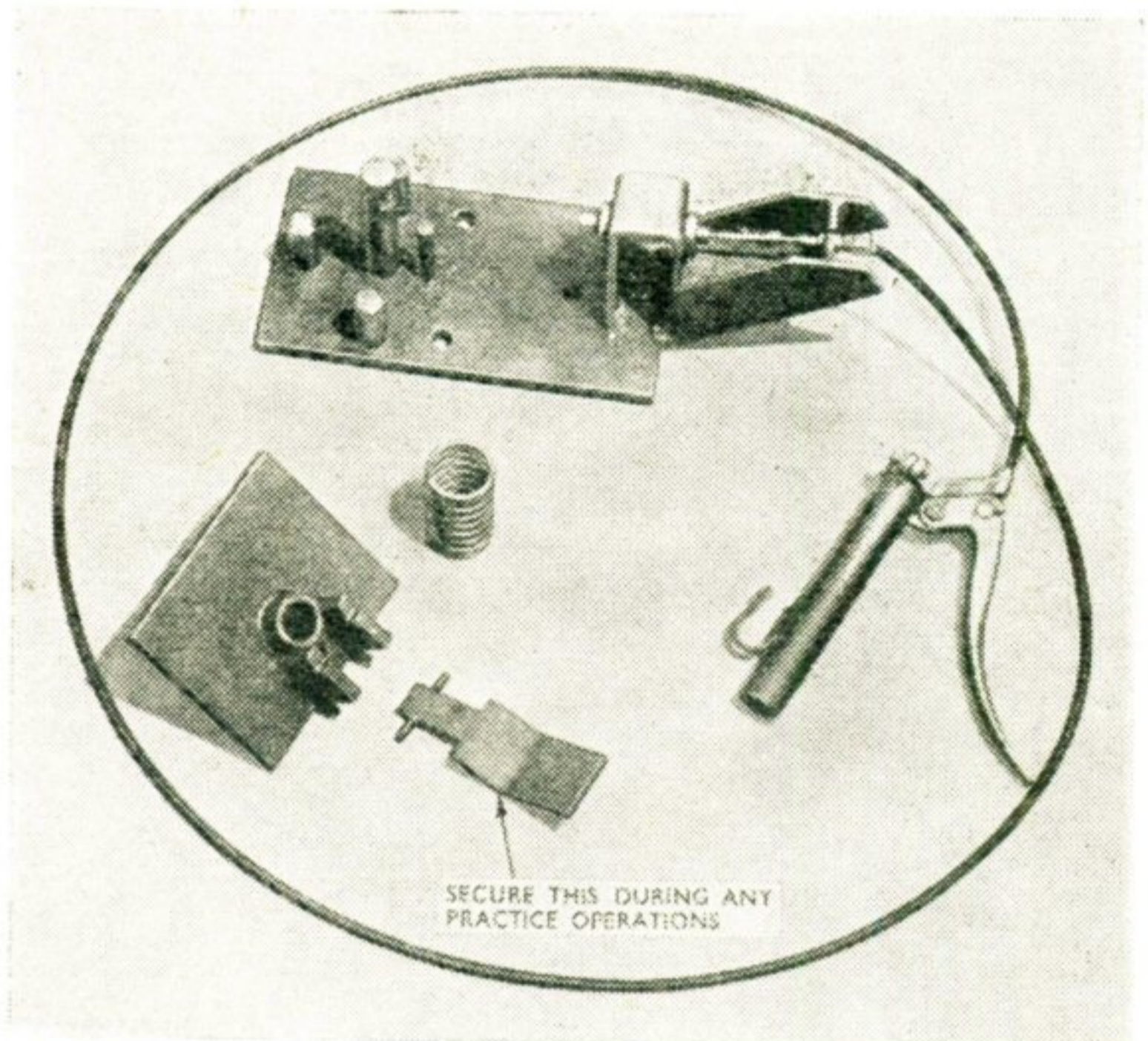
Note.—During training this material should be recovered, reconditioned as necessary and kept for final use.

Check rear duct for width and see that the kit is the correct one. The kit for vehicles with 5-in. rear ducts is TP.18762 and for 8-in. ducts TP.18763.

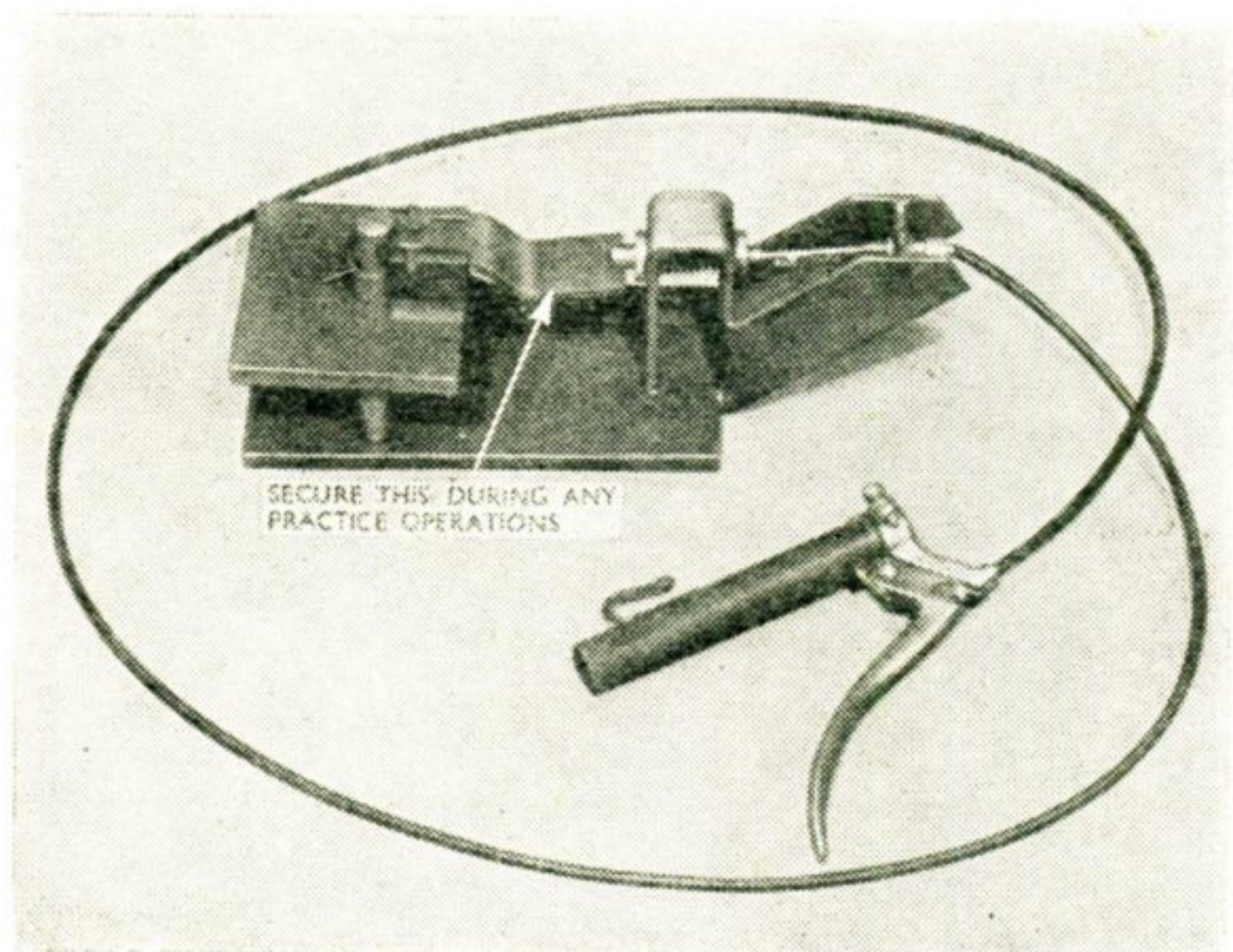
Check all three ducts for faults in welded seams and apply Bostik "AA" at any doubtful places. Apply Bostik "AA" around all "T" bolt brackets and bolts.



OPERATION 1. Filling bogie fulcrum shafts with grease.



OPERATION 2 (a). Air duct release gear—exploded view.



OPERATION 2 (b). Air duct release gear assembled.

Check that the exhaust pipes do not project through the flanges in the engine pipes.

Bolt the loose flanges to the engine flanges and insert exhaust pipe extensions into the loose flanges. Line up pipe extensions and adjust stay rods as necessary. Weld loose flanges to exhaust pipe extensions if not already welded.

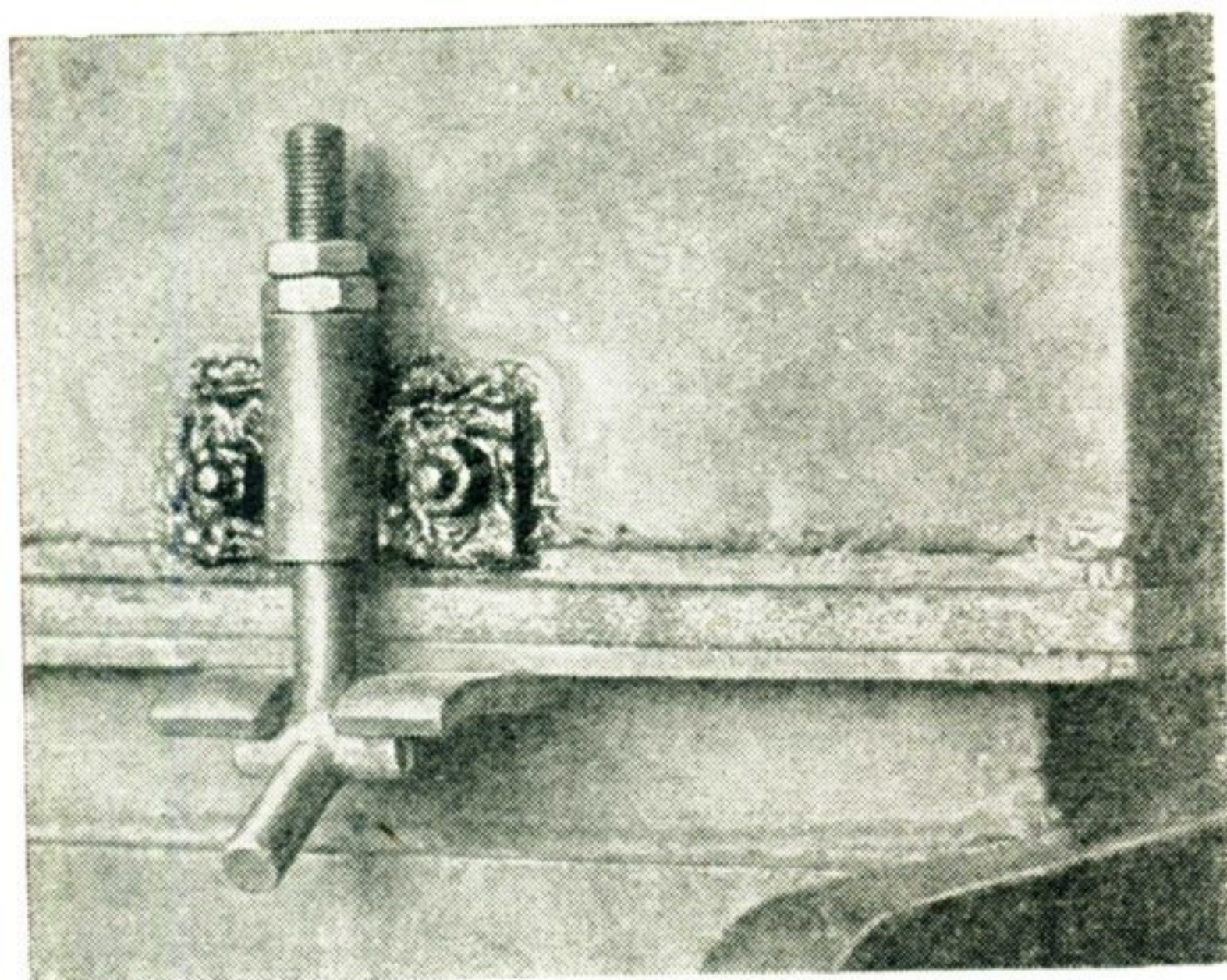
After welding insert the gaskets between the flanges and re-adjust the stay rods as necessary.

Check the top faces of the side louvre and rear top louvre frames for flatness—rectify if necessary—then clean all faces. Lay the soft rubber seals evenly in position—temporarily retain in position by a light application of Bostik "C" at one or two places.

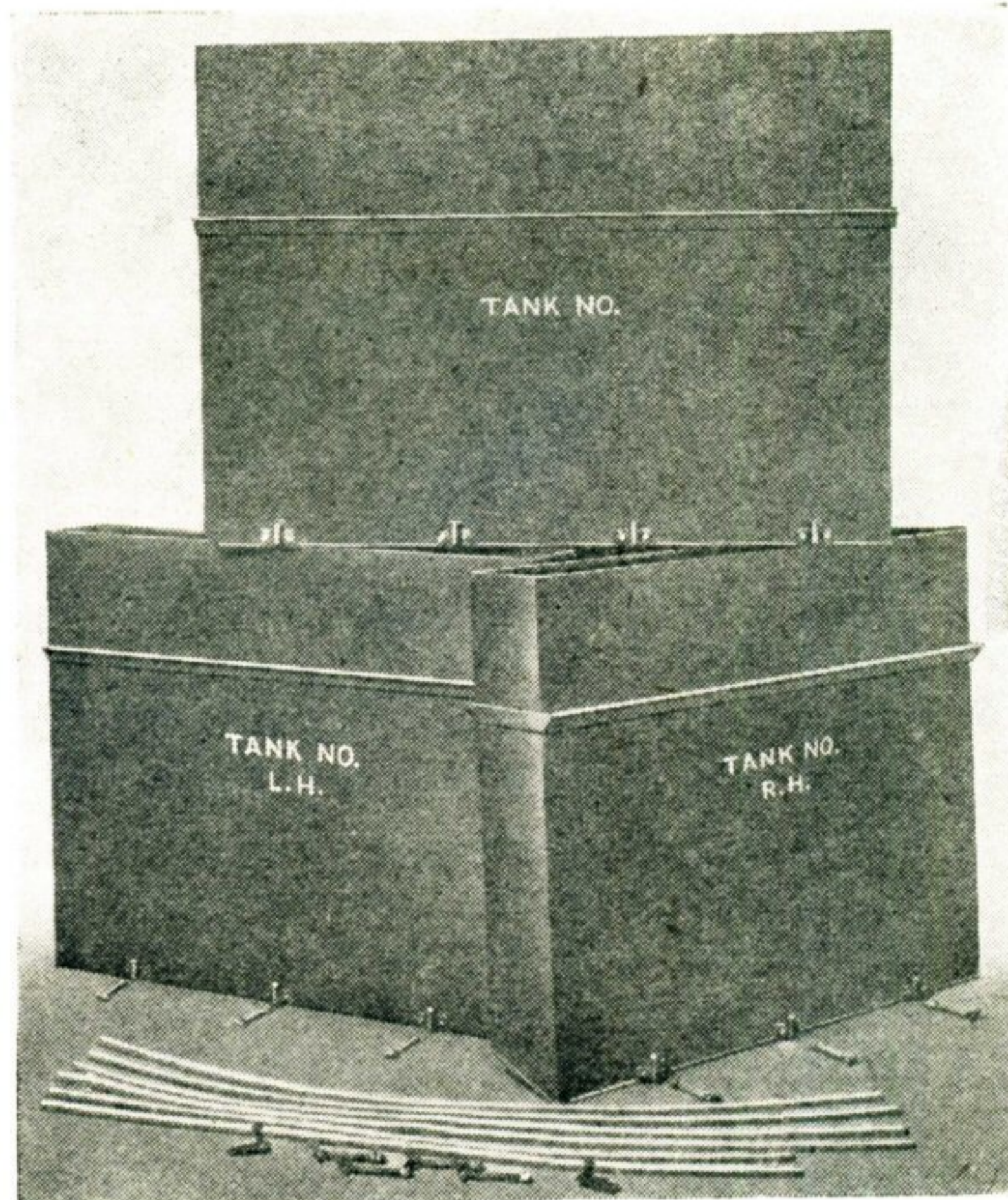
Bolt the release gear into position on the engine roof plate and hang the release cable and operating handle inside the commander's escape hatch to check if the cable is long enough. Drop the three louvre stay rods in position before fitting the retainer and tongue piece. *SPECIAL GEAR III*

Offer up all three louvre ducts so that they sit evenly on the rubber seals and square to the frame. Check that the "T" bolt heads are fully in the slots and adjust if necessary. "T" bolts with straight tails are for securing side louvre ducts and those with bent tails are for rear louvre ducts. Check that the "Y" stay rods are correct and adjust by bending the ends if necessary. (NOTE: The "Y" rods must come over the top of the exhaust pipe extensions).

When the louvre ducts are erected on their seatings, the stay rods should be completely slack, so that they fall easily over the dowel pins in the release gear, thus allowing the gear to be closed and the trip lever inserted without use of undue force.



OPERATION 2 (c). Fixing of rear louvre "T" bolt.



OPERATION 2 (d). Air ducts and details.

Adjust the "T" bolt nuts and "Y" stay rod turnbuckle so that the duct can be rocked slightly on its seat to an equal amount outwards and inwards. To ensure an even pressure on the rubber seal, tighten the "T" bolt nuts and "Y" stay rod turnbuckle at the same time, giving the nuts one turn each for every one and a half turns of the turnbuckle. Tighten all lock nuts.

When fitting the rear top louvre duct, make sure that the tail of the "T" bolt points to the rear of the vehicle.

With the gun in the 12 o'clock position, check that the turret bin does not foul the "Y" rods.

Before checking the operation of the release gear, put up some temporary strings to prevent the ducts falling off. String both side ducts across the "Y" stay rod bolts near to the top of the duct, and string the rear duct to both exhaust pipe extensions. Tie string across the tongue piece on the release gear, to make sure it is not lost when released.

Paint "R.H." and "L.H." on the appropriate side louvre ducts, and paint the vehicle number on all three ducts ready for stowage.

Grease or oil the moving parts of the release gear and all bolts and nuts and replace it in the box in which it was packed.

Remove the soft rubber seals from all louvres, clean and stow inside the vehicle for use in Stage 3.

3. REMOVE TRAILER TOWING HOOK.

TOOLS—

Vehicle Kit.

MATERIALS—

Bostikote Tape.

Bostik "C."

Asbestos Compound.

Disconnect the remote control cable from the towing hook and withdraw it through the hole in the top framing. Secure it with strips of Bostikote tape inside the hull.

Remove the towing hook, together with the two lower bolts and nuts which hold it to the hull, and stow these parts inside the vehicle.

Paint the rubber grommet where the cable enters the duct frame with Bostik "C" and plug the hole with Asbestos Compound.

4. STRIP HULL FOR EXAMINATION.

TOOLS—

Vehicle Kit.

Remove both side louvres.

Remove mudguard centre sections at the turret.

Take particular note of how to re-assemble the centre section as it will be finally offered up with the turret fabric in position. Rehearse the re-fitting of this section.

Remove the gearbox roof plate and lift it clear of the vehicle.

Remove all belly inspection plates.

CAUTION.—A considerable number of bolts and nuts will be removed in this stripping. Keep them in groups with the corresponding parts, to avoid shortages and confusion when re-fitting.

5. INSPECT ALL HULL SEALING.

TOOLS—

Brush, Wire Scaling—Part No. TP.18793.

Brush, Paint, 2 in.—Part No. TP. 18792.

Stirrup Pump (one per 3 vehicles).

Putty Knife.

MATERIALS—

Petrol.

Bostik Cleaner No. 1.

Cotton Waste or Rag.

Sealing Tape (from Bostikote Machine).

Bostik "692."

Bostik "AA."

Bostik "C."

W.D.P.P.

Chalk.

Clean the hull all over—especially around all plate joints, rivets and bolt heads—to remove all mud and grease. Use the wire brush to remove caked mud, taking great care not to damage the sealing compound already in position at the plate joints. Study the photographs on pages 18 and 19 before starting.

Use a stirrup pump for the final wash down and finish by wiping with rag. The hull must be *really dry* at the point of application before any sealing operations are attempted.

Inspect the hull sealing carried out by the manufacturers as some touching up may be required. Mark any doubtful places with chalk during inspection.

Bear in mind, where sealing compounds have to be applied, that these materials may be in short supply and are expensive. Use sufficient to make an effective seal but don't apply wasteful or excessive quantities.

Check for missing bolts, especially along the pannier floor, hull floor, and belly inspection covers, and if any holes or any stripped bolts (especially in belly inspection covers) are found, fit replacement bolts.

Check for loose or missing rivets, especially along the pannier and hull floors. Treat loose rivets by cleaning round the rivet head and plate and applying a shallow dome of W.D.P.P. painted over with Bostik "AA." Where a rivet is missing fill the hole with a suitable bolt and seal with Bostik "AA."

Check for unsealed rivet heads. Clean locally where necessary with cleaner, allow to dry and apply a little Bostik "AA."

Clean out the exposed ends of any holes which come through to the outside (such as the speedometer bracket bolt heads) and fill with Bostik "AA."

Where a large part of a hull seam is faulty or missing, clean out locally, paint with Bostik "C" and fill with Bostik "692." Small holes or cracks in seams should be cleaned and filled with Bostik "AA," making sure the hole or crack is really filled.

The following photographs (5(a) to 5(e)) show the hull sealing as carried out by the manufacturer, and likely to need attention.

5(a). General view of Front End.

5(b). Sealing of Pannier Front Sloping Plate and Roof Plates.

5(c). Sealing of Rear Vertical Outside Plate.

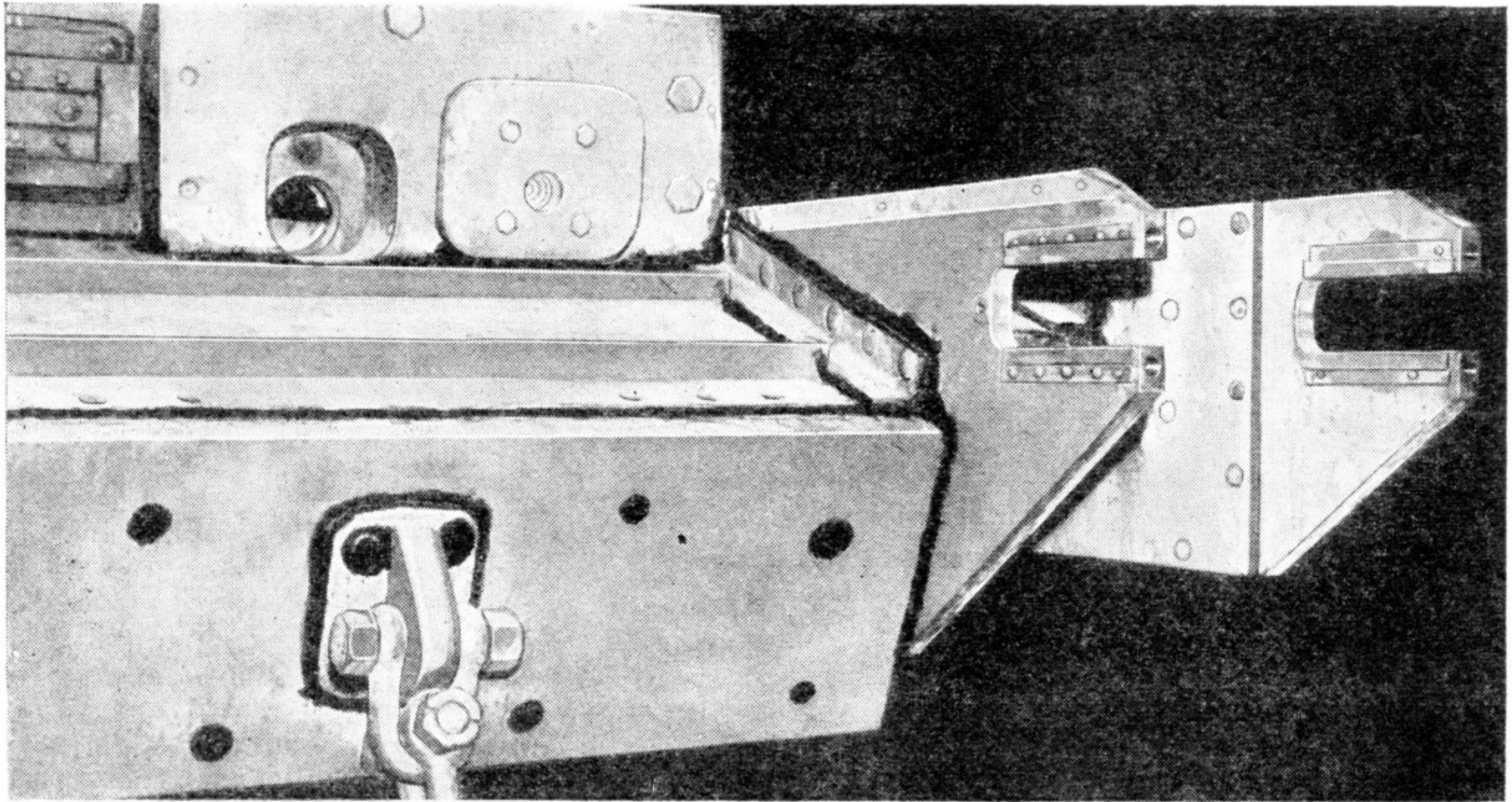
5(d). Sealing of Pannier Door Frame and end of Pannier Armour Plate.

5(e). Engine Roof.

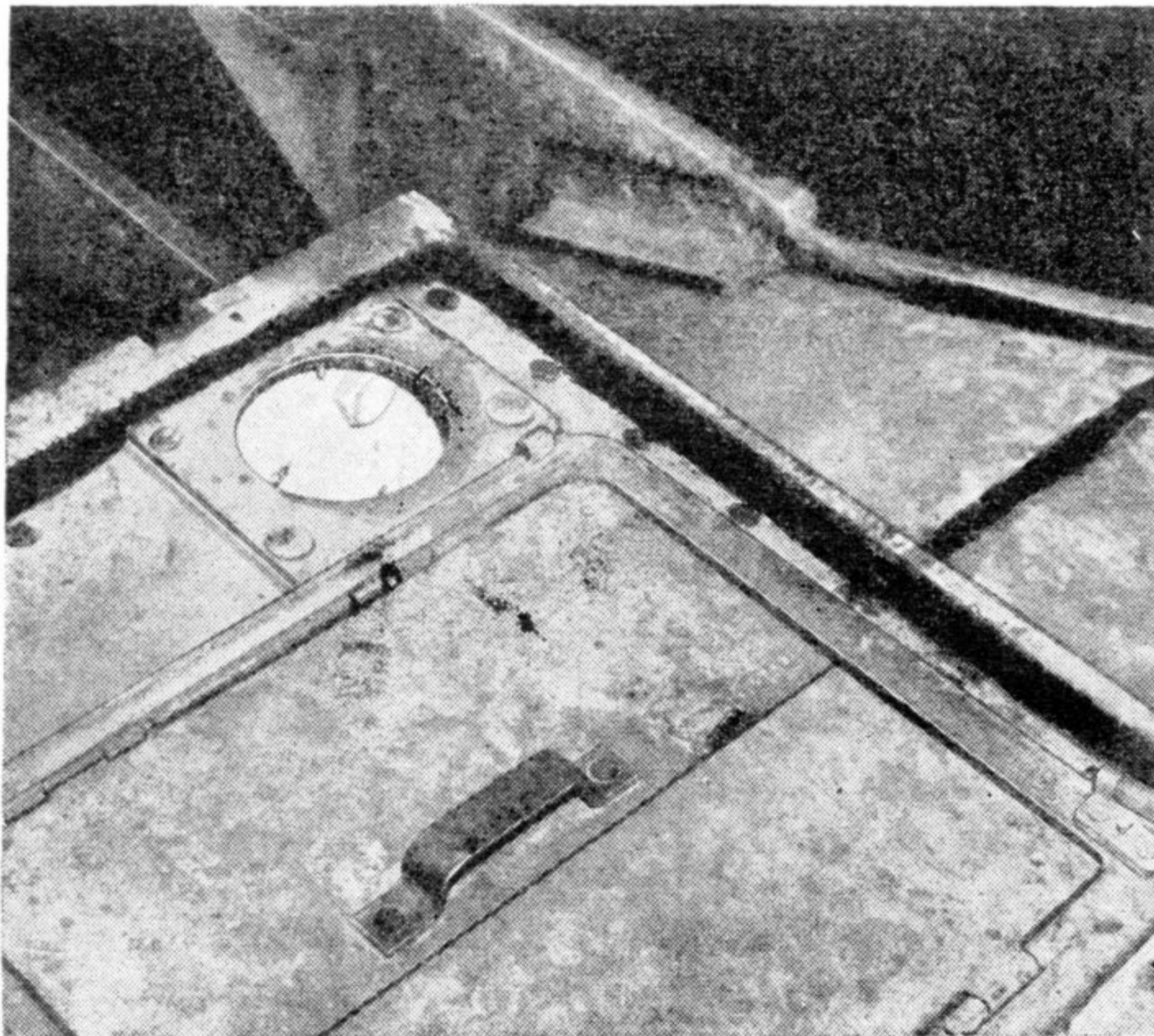
ILLUSTRATIONS OF HULL SEALING

Carried out by manufacturers

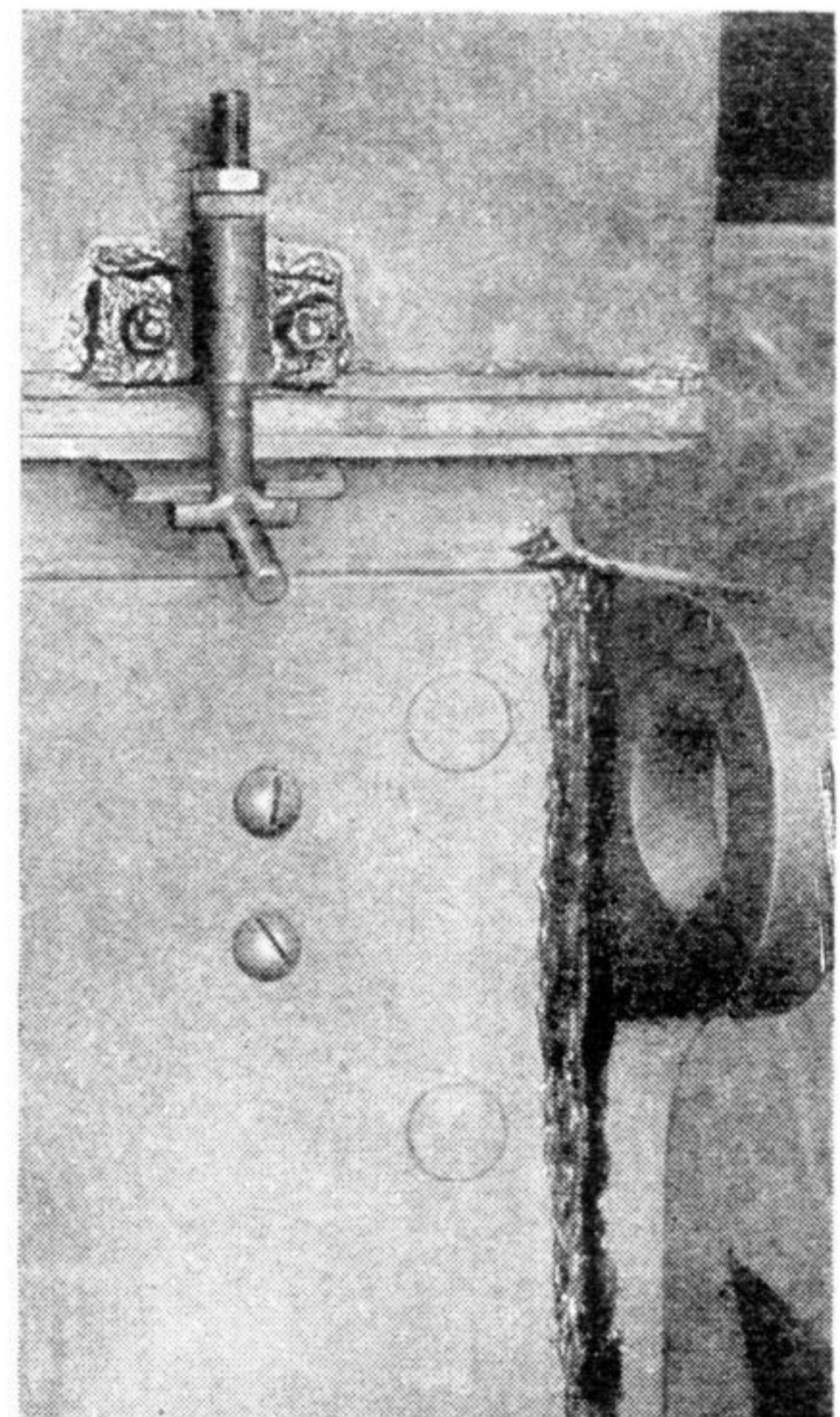
(See reference on page 17)



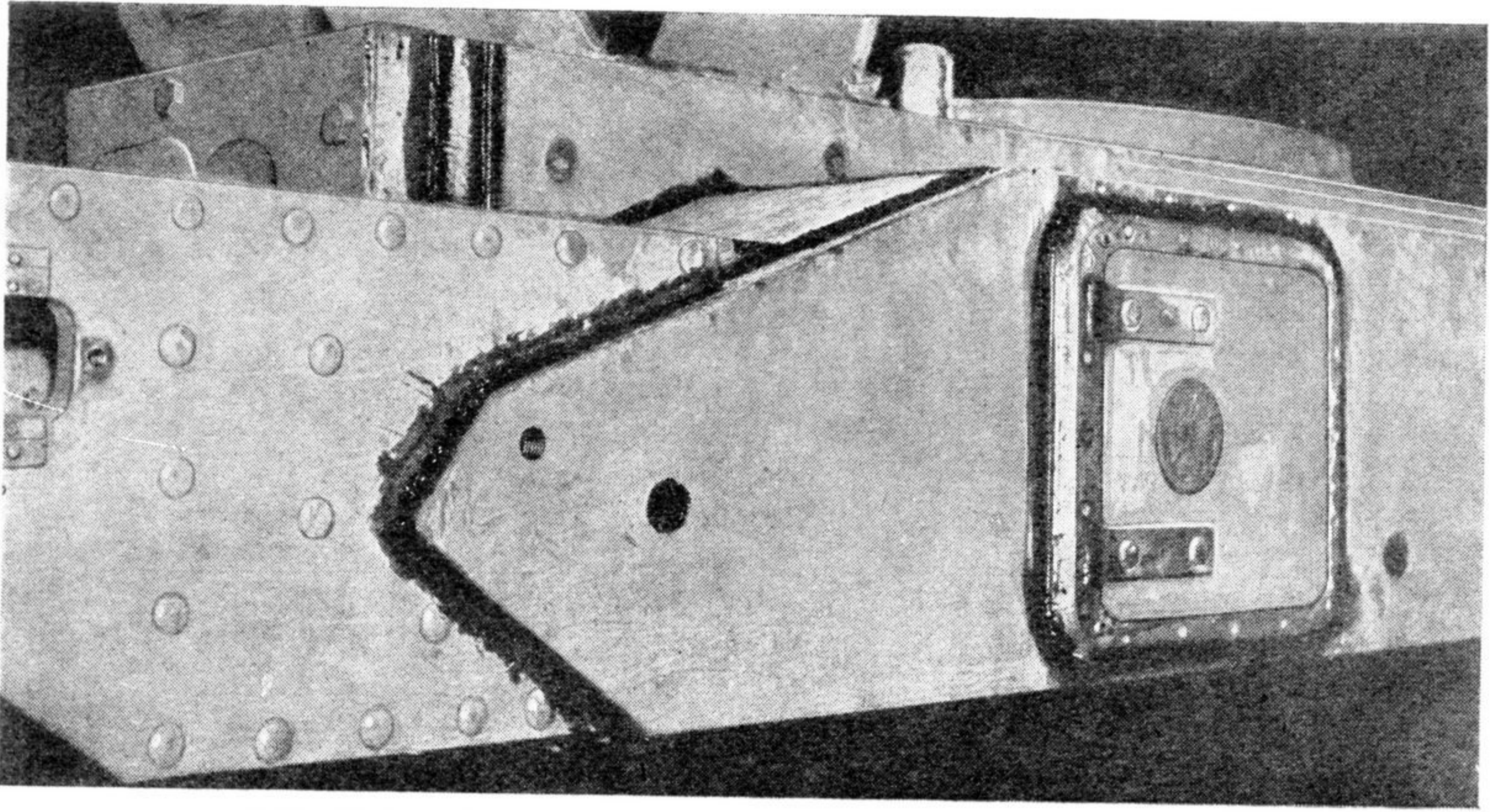
OPERATION 5 (a). General view of hull—front end.



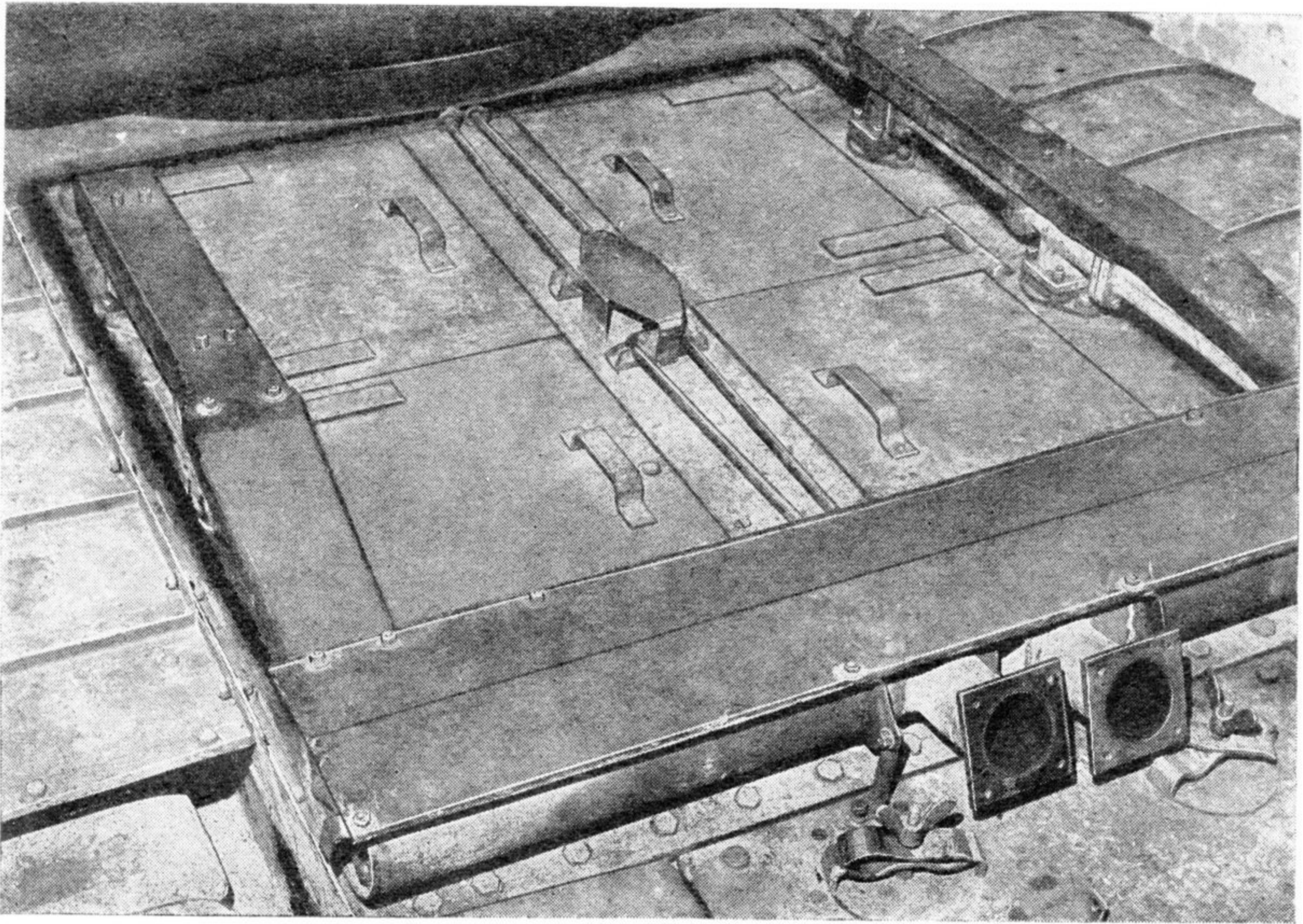
OPERATION 5 (b). Sealing of pannier front sloping plate and roof plates.



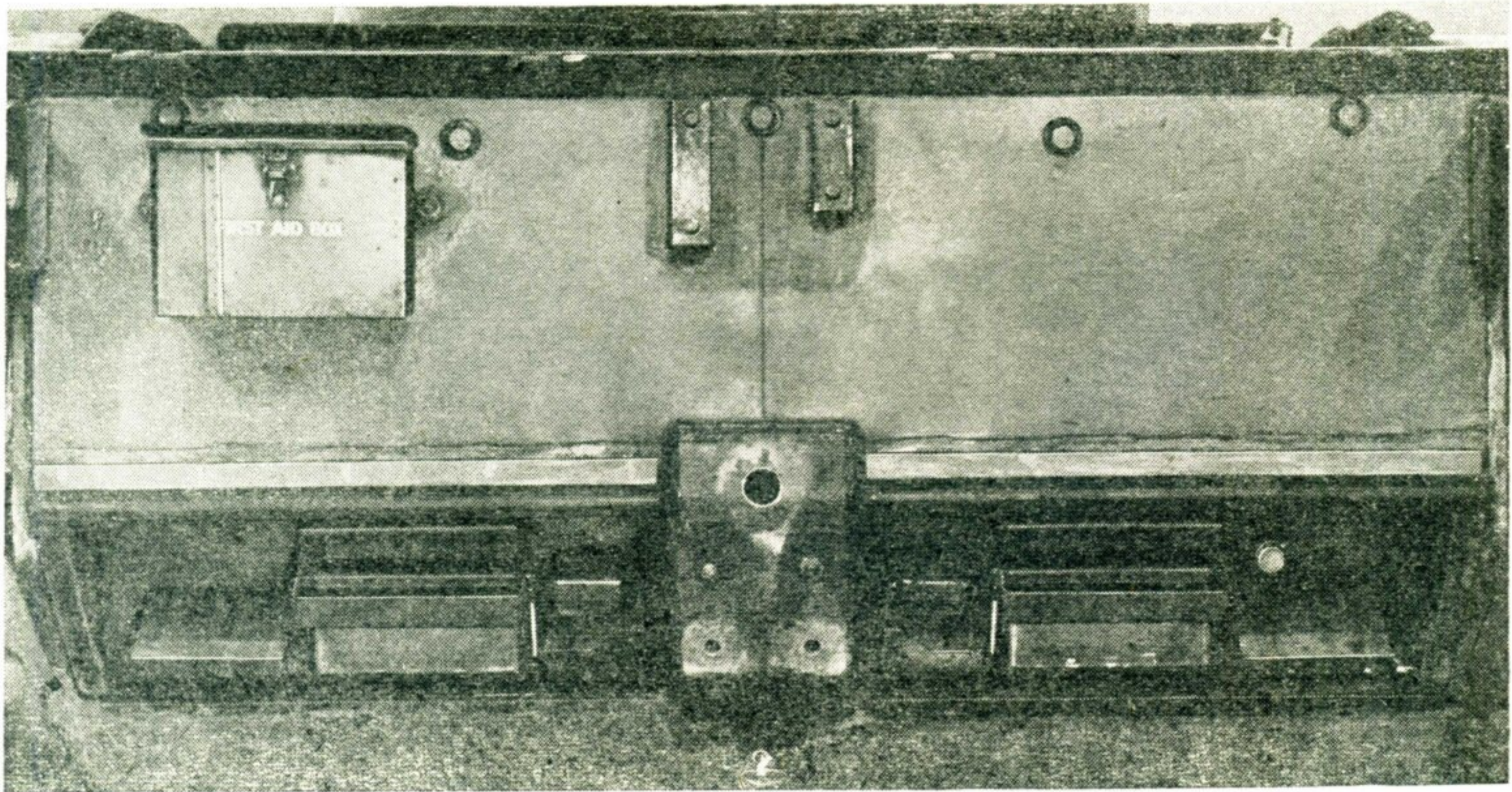
OPERATION 5 (c). Sealing of rear vertical plate.



OPERATION 5 (d). Sealing of pannier door frame and pannier armour plate.



OPERATION 5 (e). Engine roof plate.



OPERATION 6. Lower apertures prior to checking cover plates.

6. CHECK FIT OF REAR LOUVRE COVER PLATE.

TOOLS—

Vehicle Kit.

MATERIALS—

	Part No.	No. off.
Rear Outlet Framing		
Panel Assembly	TP.17895	2

Examine the framing round the rear louvre lower opening for damage. Straighten bent frames and repair broken frames as necessary to form a seating for the dished covers.

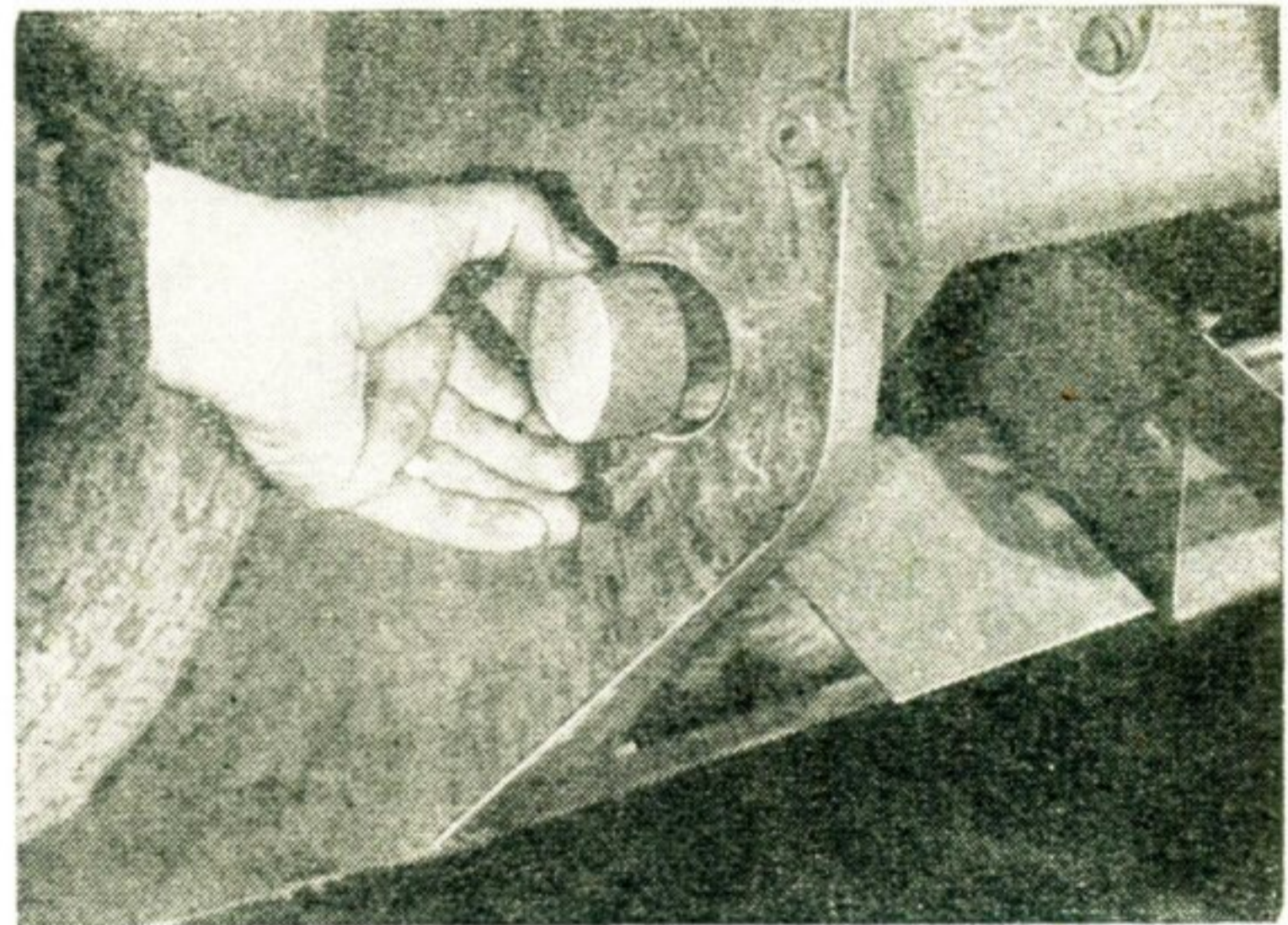
Offer up the two dished covers (*i.e.*, the rear outlet framing panel assemblies) to ensure that they fit and are reasonably flat with no big gaps between the mating surfaces. Make sure that the slots in the frame are large enough for the wiring harness to pass through.

Mark the covers with the vehicle number, and R.H. and L.H. respectively.

7. PLUG REAR LOWER TOWING EYE HOLES.

MATERIALS—

	Part No.	No. off.
Rear Lower Towing Eye		
Plug	TP.18747	2
Petrol		—
Bostik Cleaner No. 1 ...		—
Rag or Waste		—
W.D.P.P.		—



OPERATION 7. Plugging rear lower towing eye.

Bostikote Tape,

5 in. × 3 in.... ... 8

Clean the metal around each of the two lower towing eye holes and blank off the holes with the wooden plugs. Complete the seal by covering the plugged holes with two strips of Bostikote tape on each side of each plug, and cover with tape with Bostik "AA."

8. SEAL REAR LOUVRE LOWER OPENING.

TOOLS—

Vehicle Kit.

Brush, Paint, 2 in.—Part No. TP.18791.

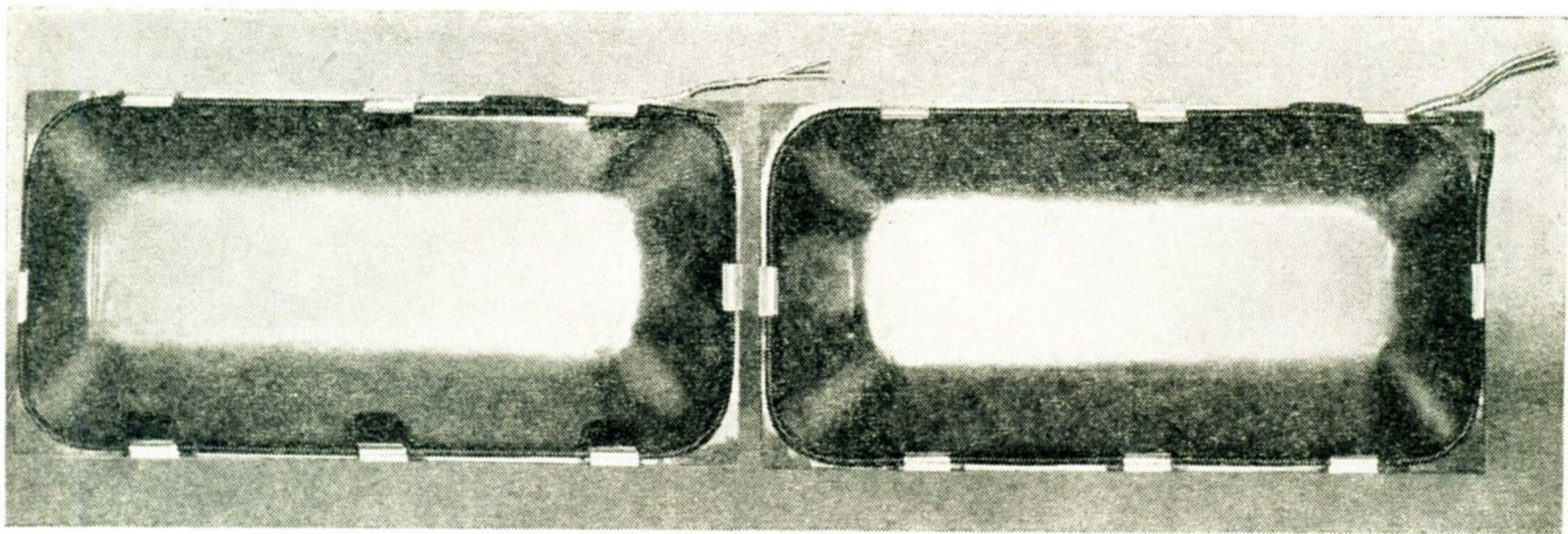
MATERIALS—

	Part No.	No. off.
Rear Outlet Framing Panel Assembly ...	TP.17895.	2
Petrol		—
Bostik Cleaner No. 1 ...		—
Rag or Waste		—
Cordtex 6 ft. length ...		2 <i>WAS 1/4</i>
Insulation Tape from Roll		—
Sealing Tape 1½ × 3 ...		12 pieces from Bostikote Machine.
Wiring Harness Assembly	TP.18749	1
Detonators		2
Bostik "AA"		—

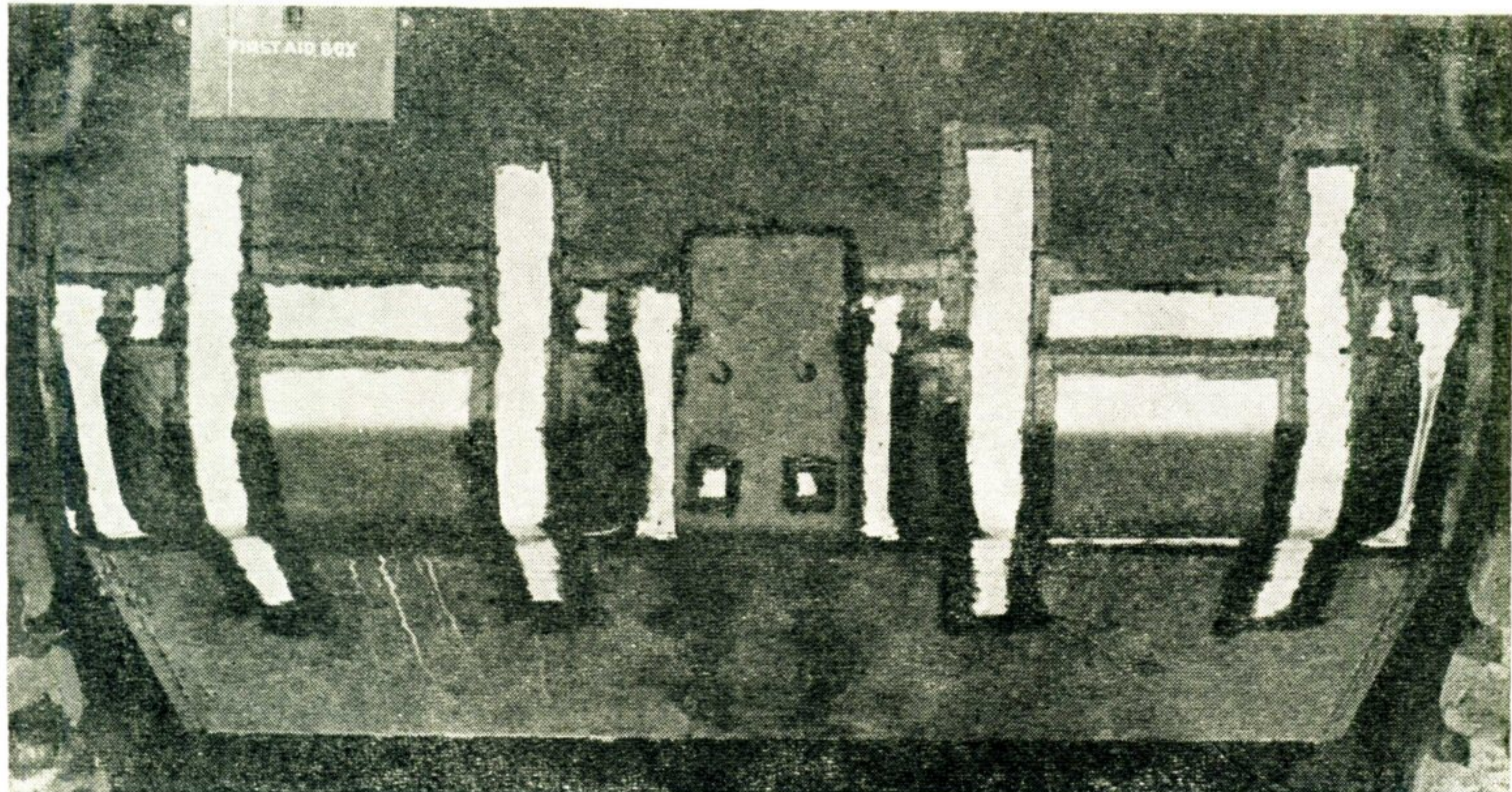
Bostik "C"	—
W.D.P.P.	—

Plug the two lower towing hook bracket holes with W.D.P.P. and cover them with Bostikote tape. Build up a fillet of W.D.P.P. around the two upper fixed bolts where they project through the bracket, and cover the threads with G.S. grease. Paint round the bracket and over all bolts with Bostik "AA."

Prepare the two lengths of Cordtex by attaching one detonator to each, about 3 in. from one end, with insulation tape. To prevent the Cordtex from being damaged by Bostik "C" completely cover both lengths of Cordtex with 12 in. strips of insulation tape.



OPERATION 8 (a). Rear outlet framing panel assembly with Cordtex.



OPERATION 8 (b). Rear louvre lower opening sealed.

Fix the lengths of Cordtex around the outer edge of the dished covers, using strips of plain Bostikote tape, spaced about every 12 in. Attach the tape to the cover with Bostik "C." Position the detonator leads of the Cordtex so that they coincide with the slots in the frame attached to the hull.

Remove the rear lamp cover and bulb and stow them.

Plug in the adaptor and check the harness with the inspection lamp.

Switch off the rear lamp and tape the switch—with masking tape—to prevent accidental operation.

Clean with petrol and cleaner the frames on the hull, and inspect the flanges on the Cordtexed covers for cleanliness and dryness.

Offer up the right-hand cover and attach the detonator wires to the short ends of the wiring harness. Bind each exposed joint in the wires with insulation tape.

Arc-weld the dished cover to the hull frame at the centre point of each of the four sides. The weld must not exceed half an inch as excess weld will prevent the covers from being blown off when required.

Paint the frame on the hull and on the Cordtex side of the covers with a 2 in. band of Bostik "C" and allow both to become tacky. Fit the cover and frame it all round with strips of Bostikote tape. Attach two further strips of tape, equally spaced, across the dished part of the cover and fix the ends to the hull 6 in. beyond the joint. After one hour, paint all edges of the tape with Bostik "AA."

Repeat the above operations for the left-hand cover.

9. REMOVE AND SEAL TRAVERSE DYNAMO.

TOOLS—

Vehicle Kit.

Scissors—Part No. TP.18794.

Brush, Wire Scaling—Part No. TP.18793.

Brush, Paint, 1 in.—Part No. TP.18791.

MATERIALS—

Gearbox Blanking Plate—Part No. TP.18797.

New Bearing Cap, complete with Seal (driving end)—Part No. TP.18808.

New Bearing Nut (driving end)—Part No. TP.18809.

New Band Cover complete with Breathers (long portion only)—Part No. TP.18810.

Petrol.

Bostik Cleaner No. 1.

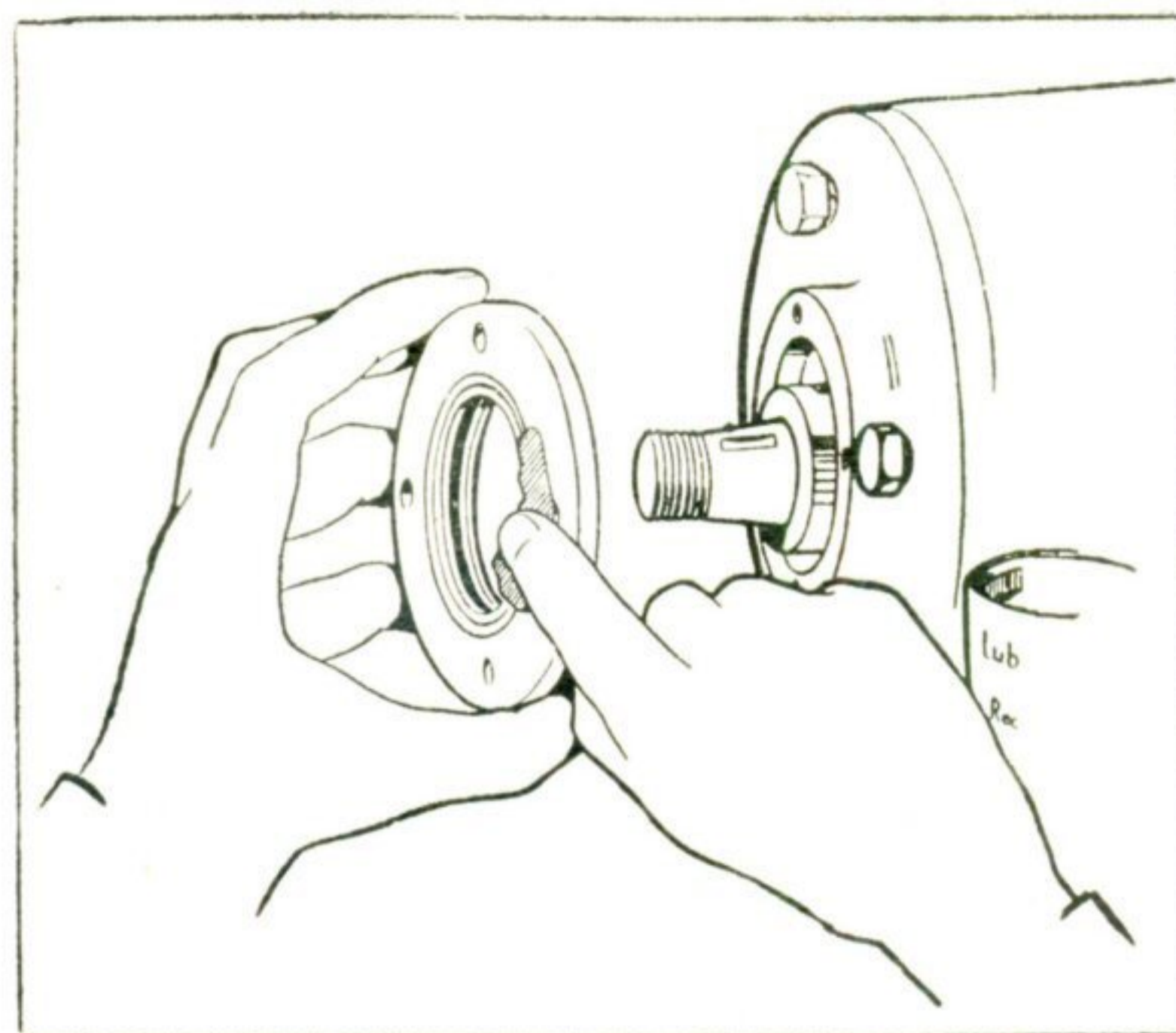
Rag or Waste.

Bostik "AA."

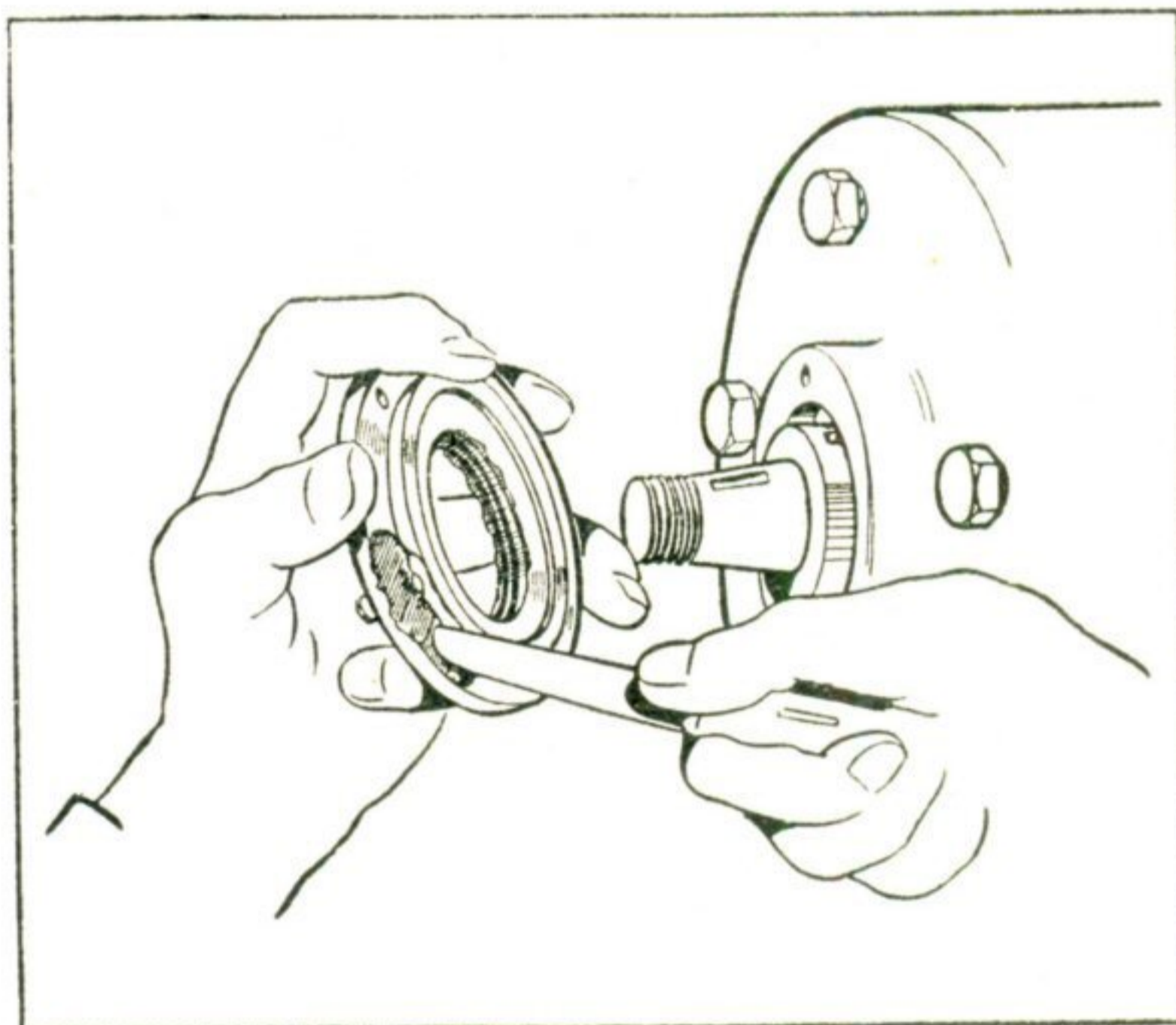
Insulating Tape, from roll.

Anti-corrosive Paint.

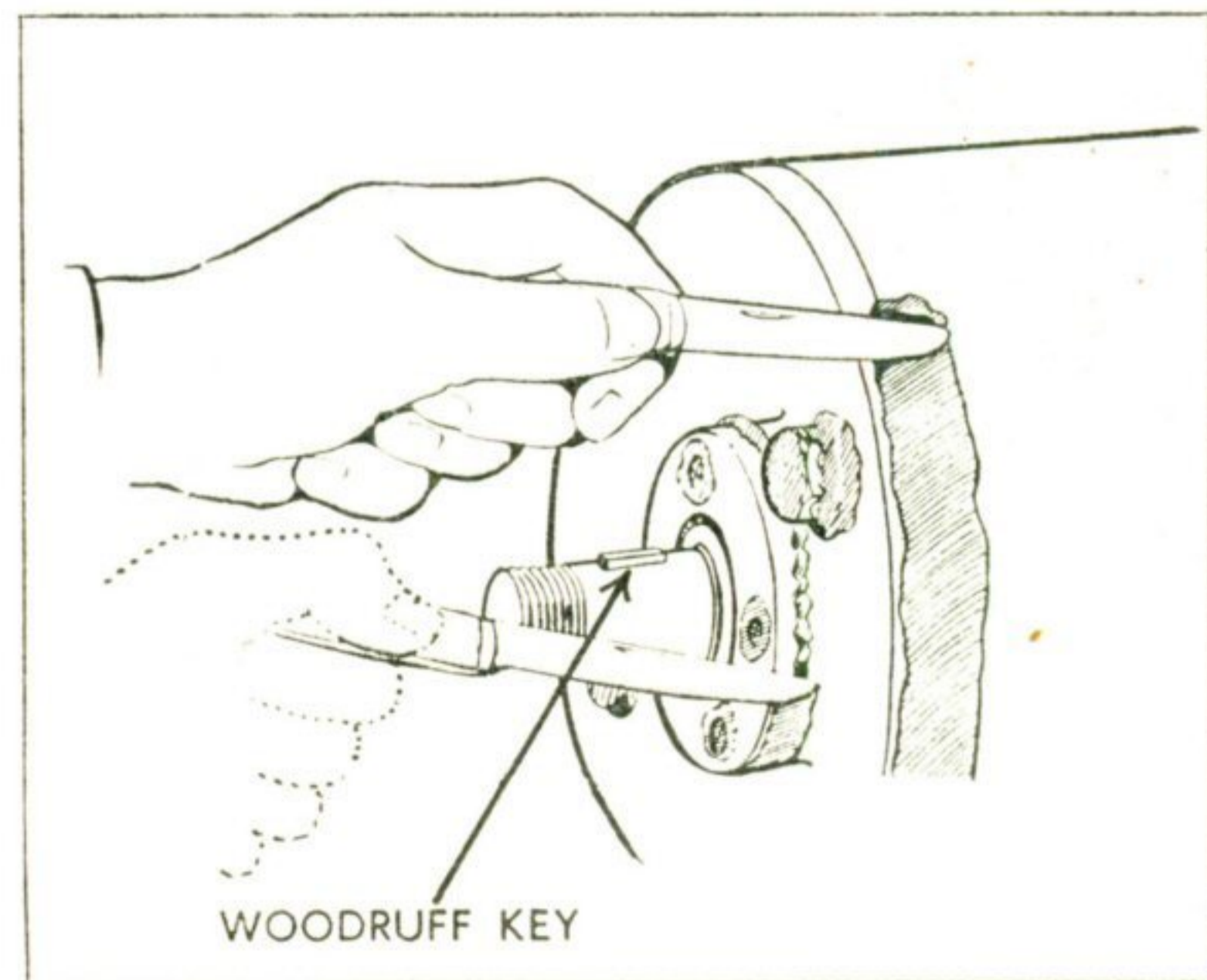
Grease H.M.P.



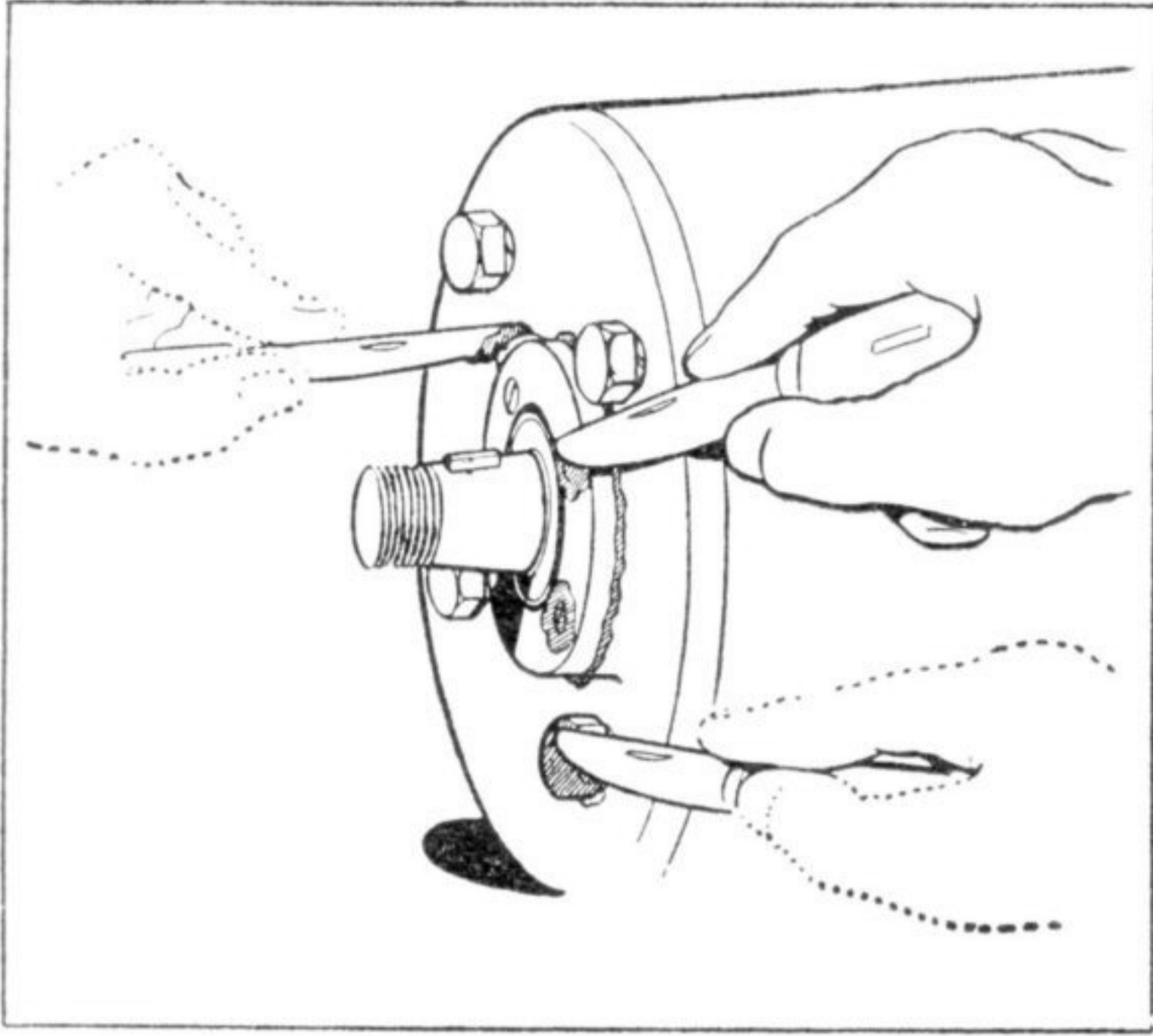
OPERATION 9. Diagram 1.



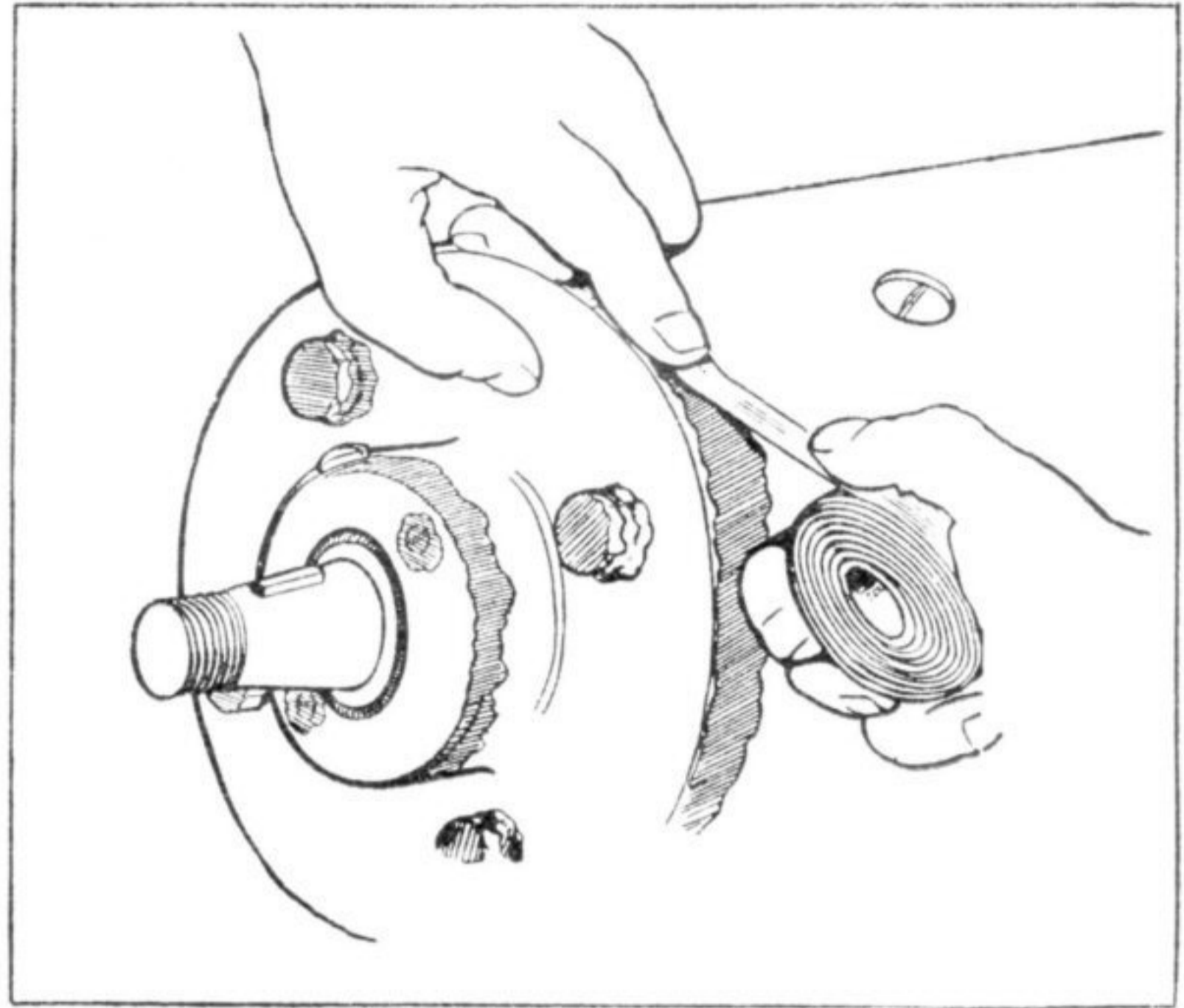
OPERATION 9. Diagram 2.



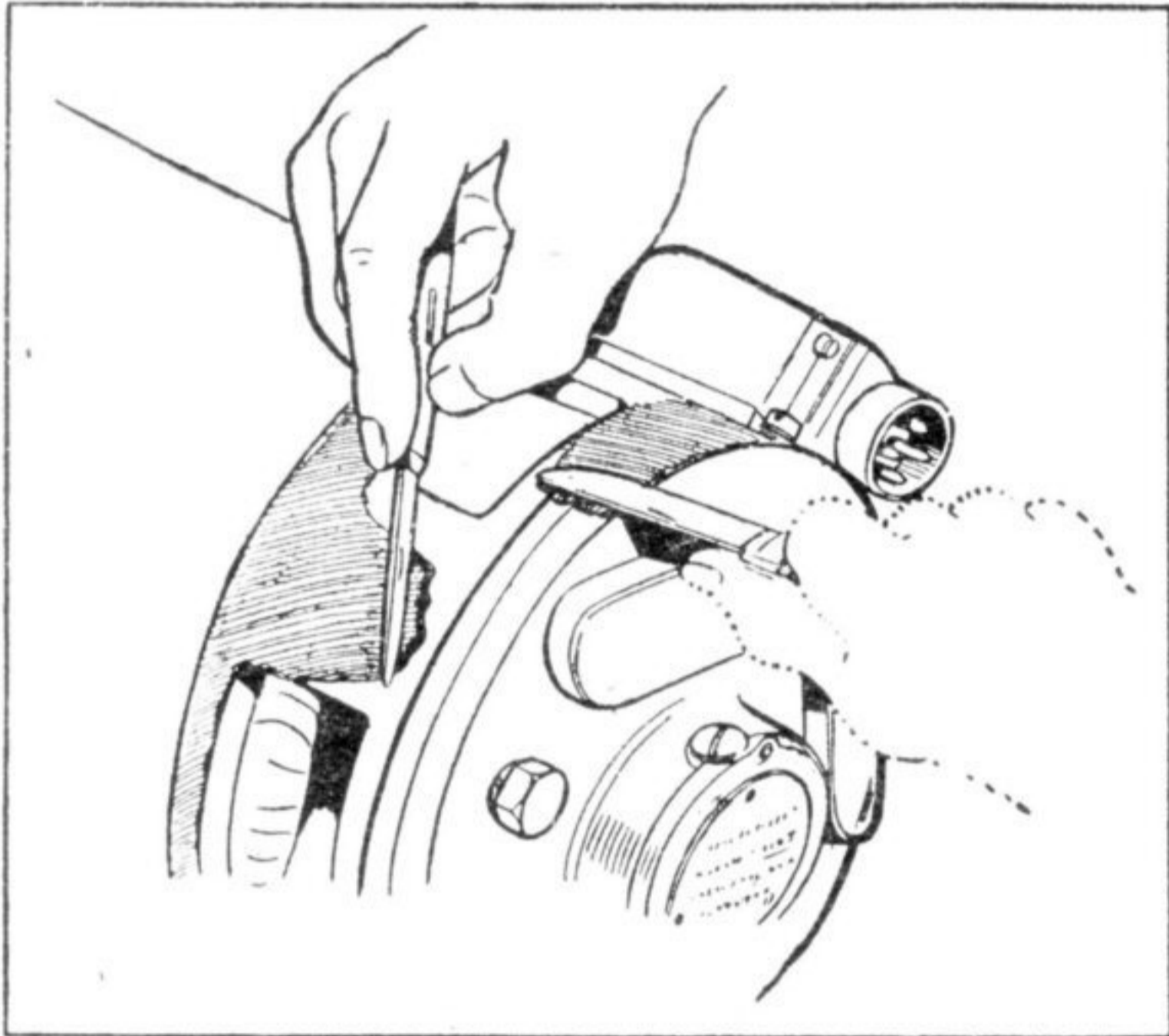
OPERATION 9. Diagram 3.



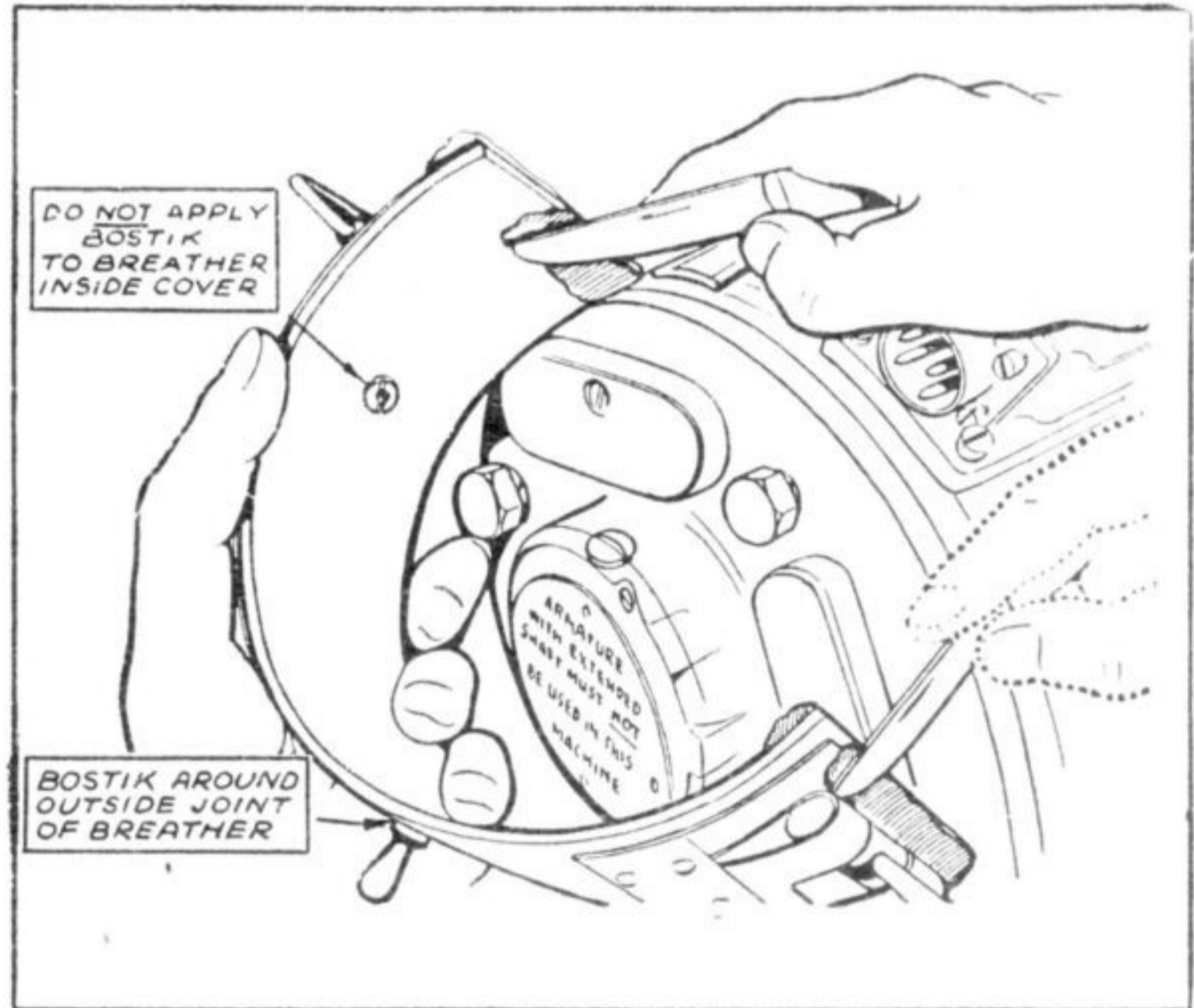
OPERATION 9. Diagram 4.



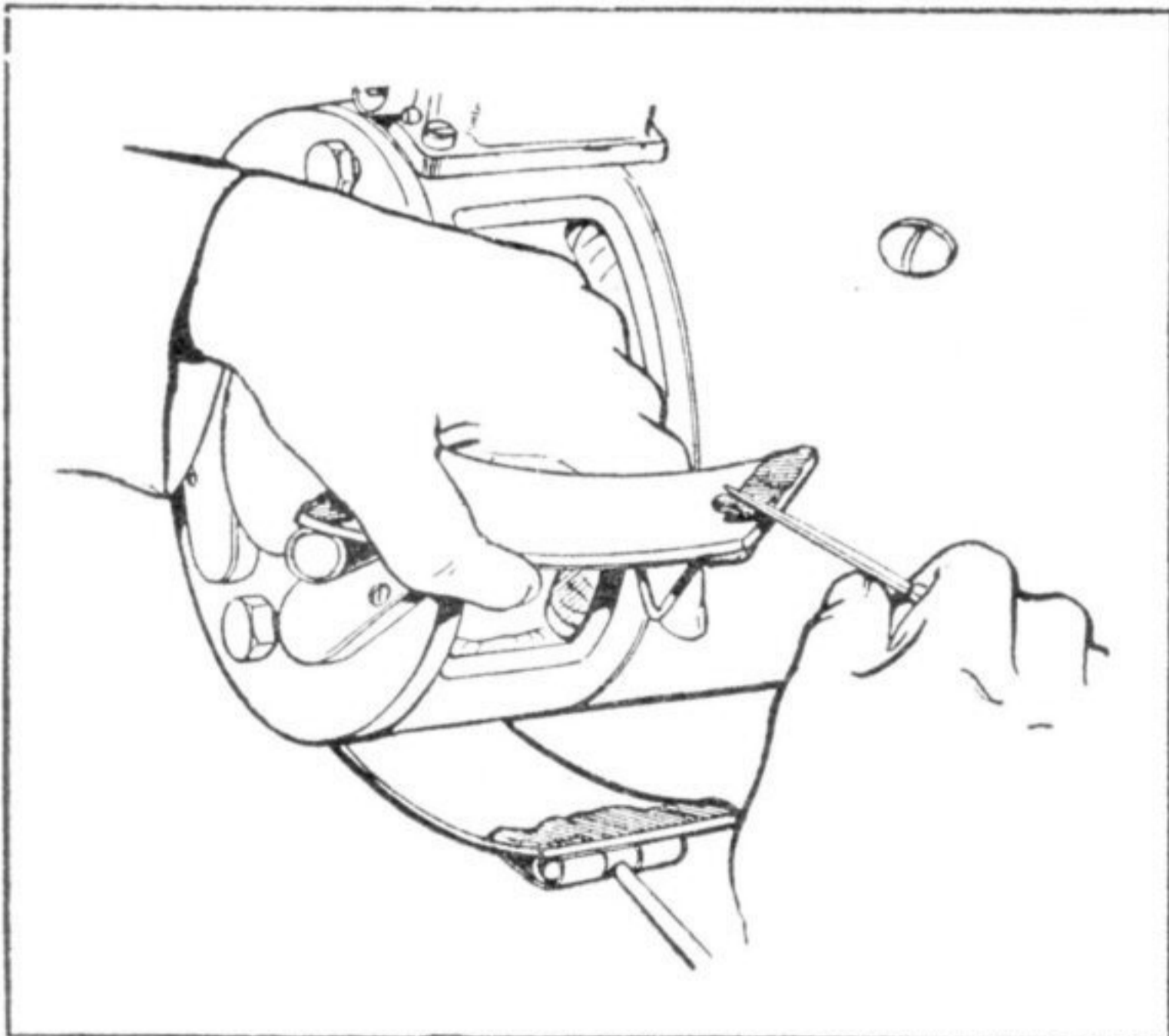
OPERATION 9. Diagram 5.



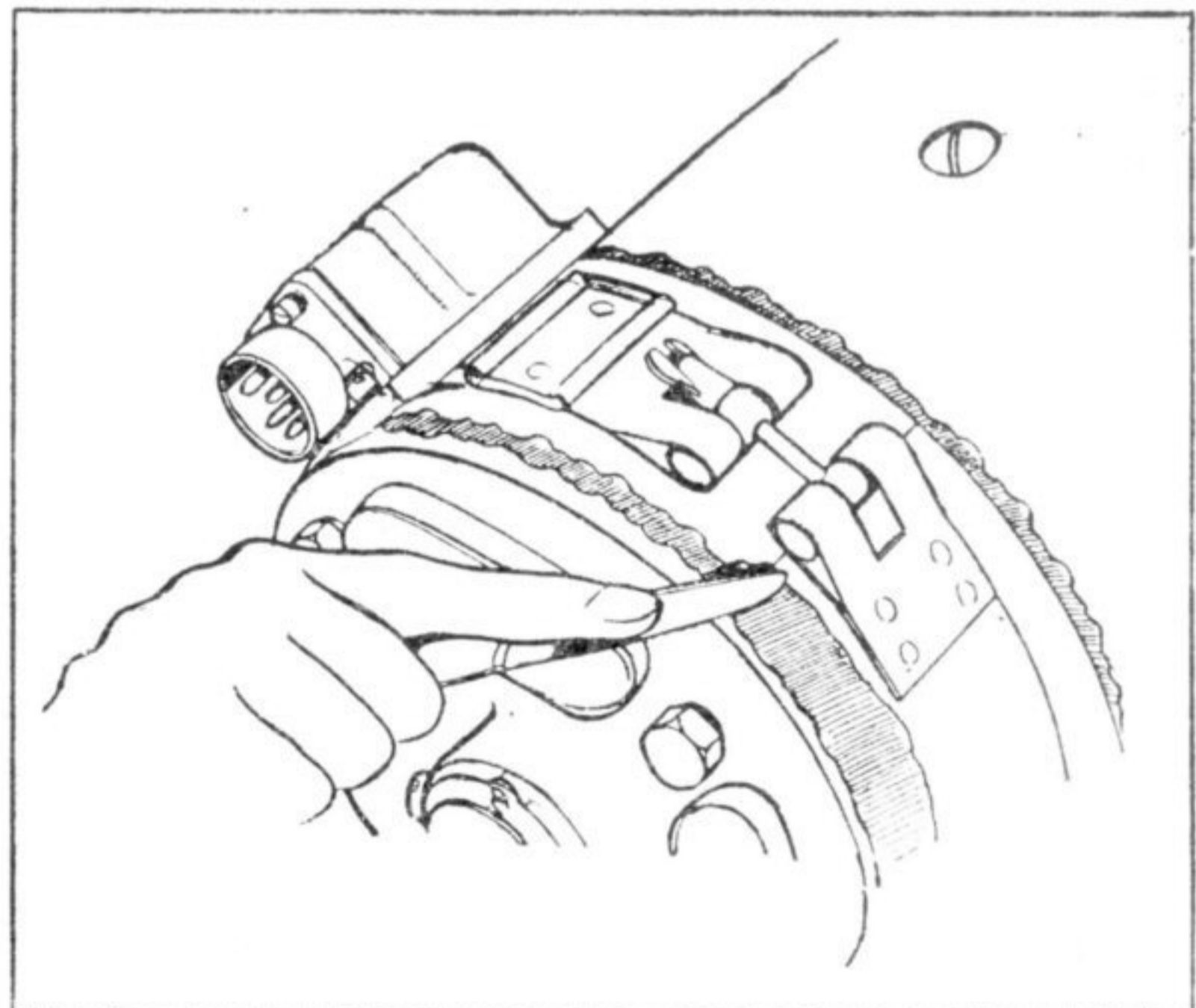
OPERATION 9. Diagram 6.



OPERATION 9. Diagram 7.



OPERATION 9. Diagram 8.



OPERATION 9. Diagram 9.

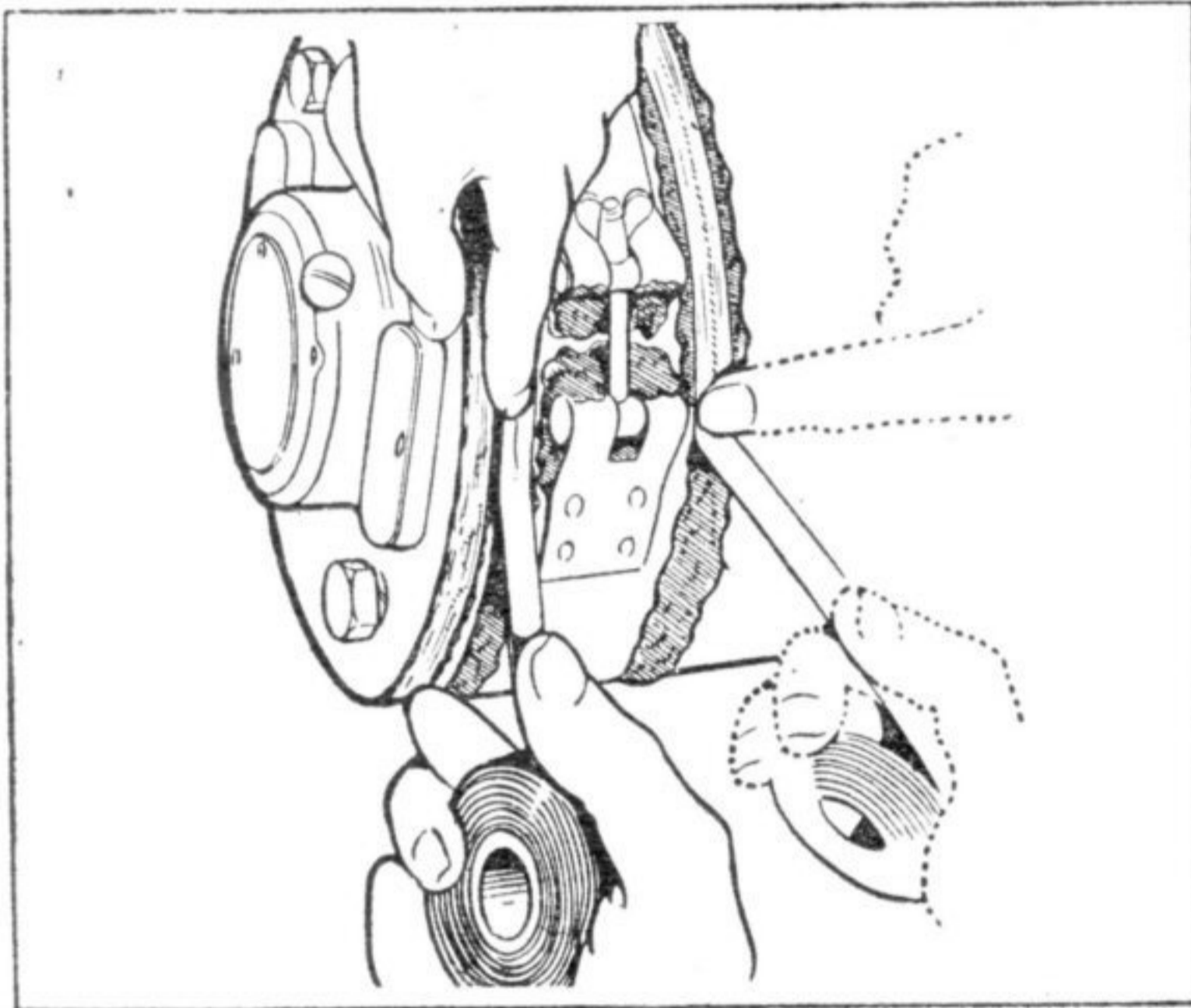
Removal (By Fitter.)

Remove the compressor and power take-off housing from the top of the gearbox, and fit the blanking plate over the hole. Release the dynamo cradle straps and remove the dynamo. If the compressor has run more than 400 miles since overhaul, it should be overhauled by the fitter as detailed in the Instruction Book.

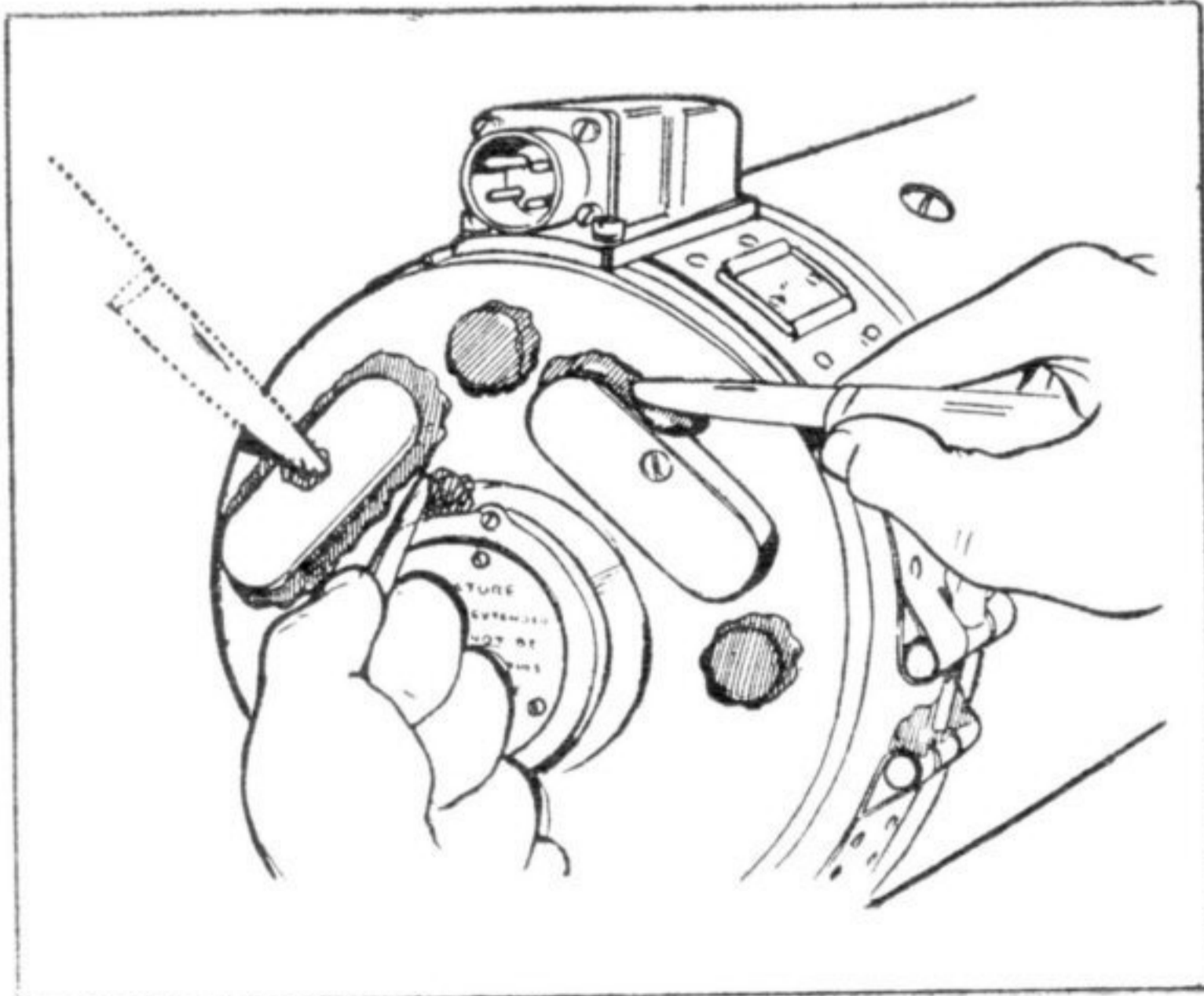
DYNAMOS ALREADY WATERPROOFED.

If the dynamo has a blue band painted around the casing it will have been waterproofed by the manufacturers. The only additional waterproofing required is detailed below:—

- (a) See Diagram 9. Seal the joint between the edges of the band cover with Bostik "AA."
- (b) See Diagram 10. Apply insulating tape firmly over the commutator endshield joint between the outside flange and the yoke, also over the joint between the edges of the band cover and the yoke.



OPERATION 9. Diagram 10.



OPERATION 9. Diagram 12.

- (c) See Diagram 11. Cover insulating tape with Bostik "AA."

FINISH.

Paint the dynamo liberally all over with anti-corrosive paint. Allow to dry thoroughly, and then apply a second coat.

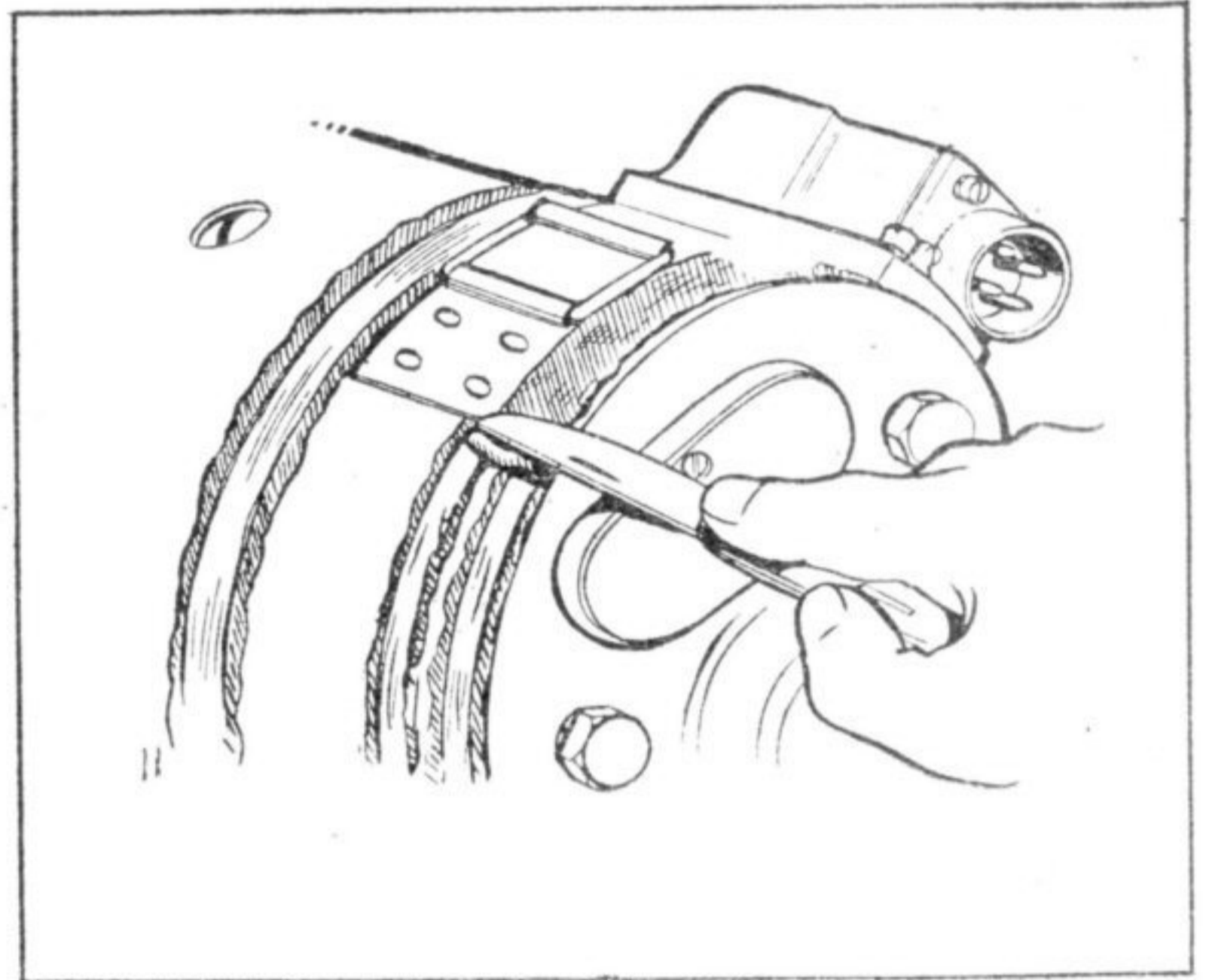
If the dynamo has NOT a blue band round the casing it must be waterproofed as follows:—

Waterproofing (By Electrician).

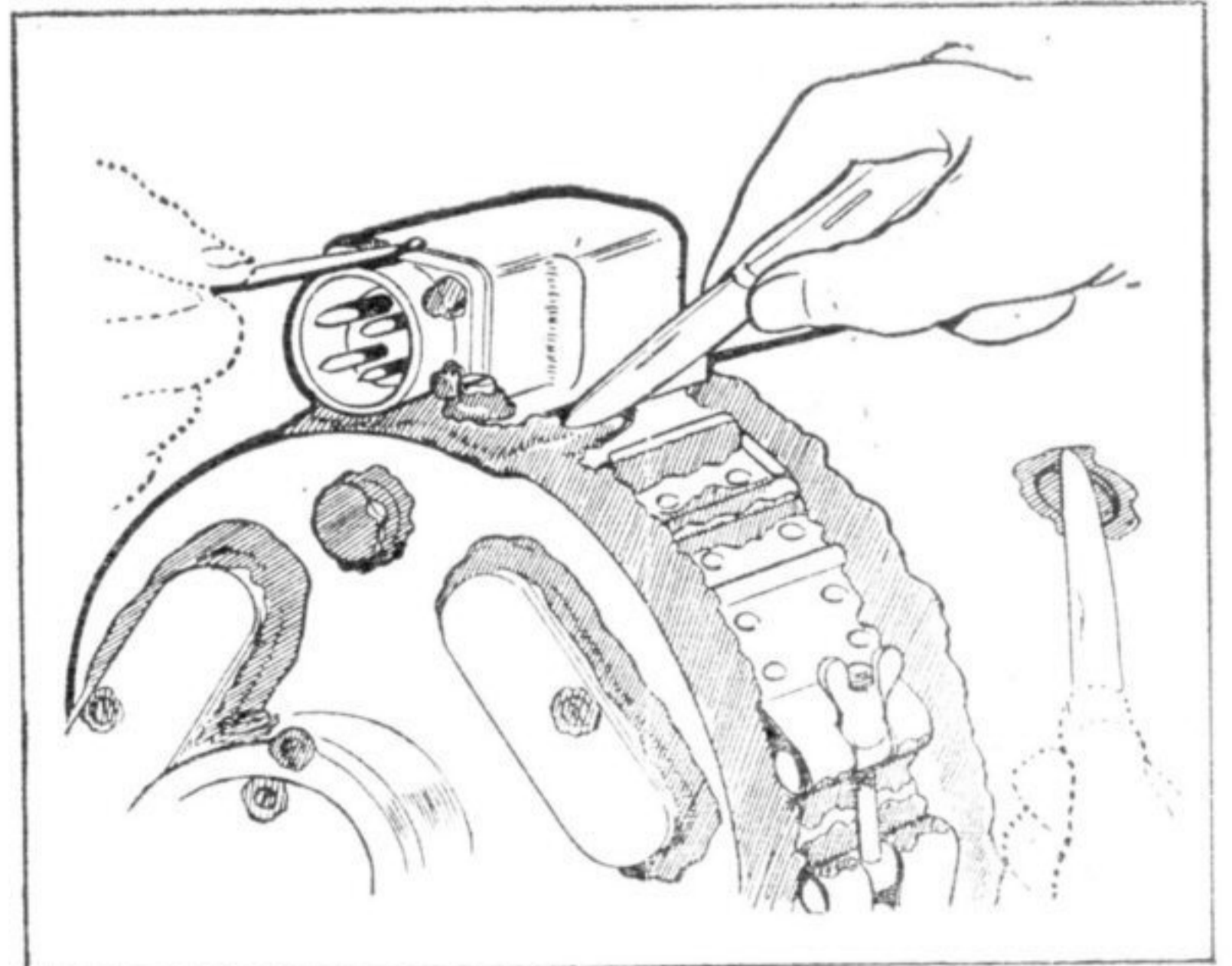
Clean every part of the dynamo, first with petrol and finally with Bostik Cleaner. Allow to dry completely. Paint or plating showing signs of flaking should be removed with the wire brush.

Driving End.

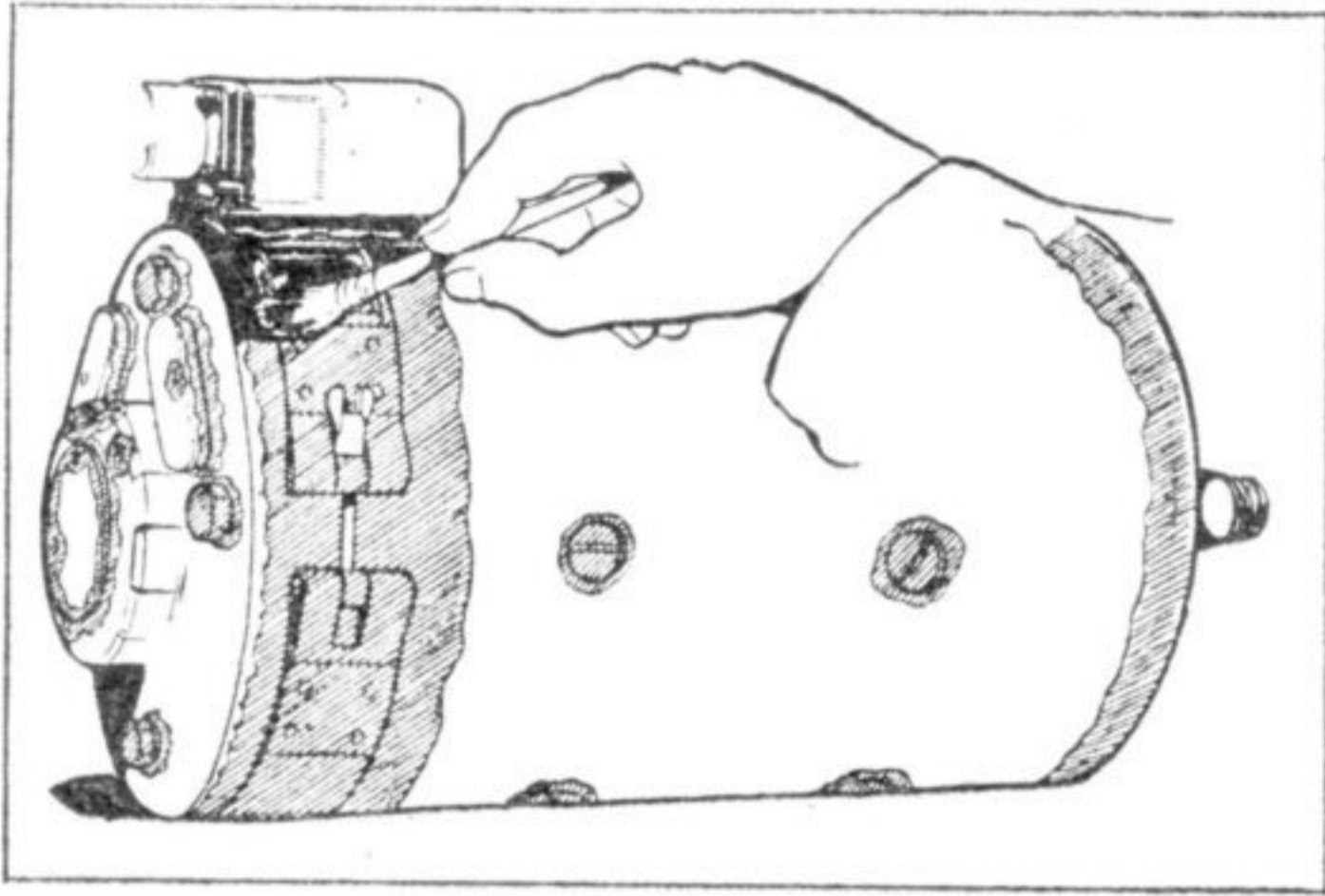
Remove the Woodruff key from the shaft. Take off the bearing end cap. Extract the grub screw from the bearing nut. Remove the bearing nut. Fit the new bearing nut and tighten securely.



OPERATION 9. Diagram 11.



OPERATION 9. Diagram 13.



OPERATION 9. Diagram 14.

A grub screw is not required for the new bearing nut.

See Diagram 1.—Smear the inside of the seal in the bearing end cap with H.M.P. grease, and pack completely with grease all grooves in the exterior and interior of the seal.

See Diagram 2.—Smear the interior flange face of the new bearing end cap with Bostik "AA." Insert the four countersunk screws into the bearing end cap and smear each screw with Bostik "AA." Fit the cap and tighten the screws securely.

See Diagram 3.—Seal round the bearing end cap and bearing housing outside diameter with Bostik "AA." Smear the driving endshield joint between the outside flange and yoke face with Bostik "AA."

See Diagram 4.—Cover completely with Bostik "AA" the nuts and spring washers on the main fixing bolts, the lubricator plug and the screws holding the bearing end cap.

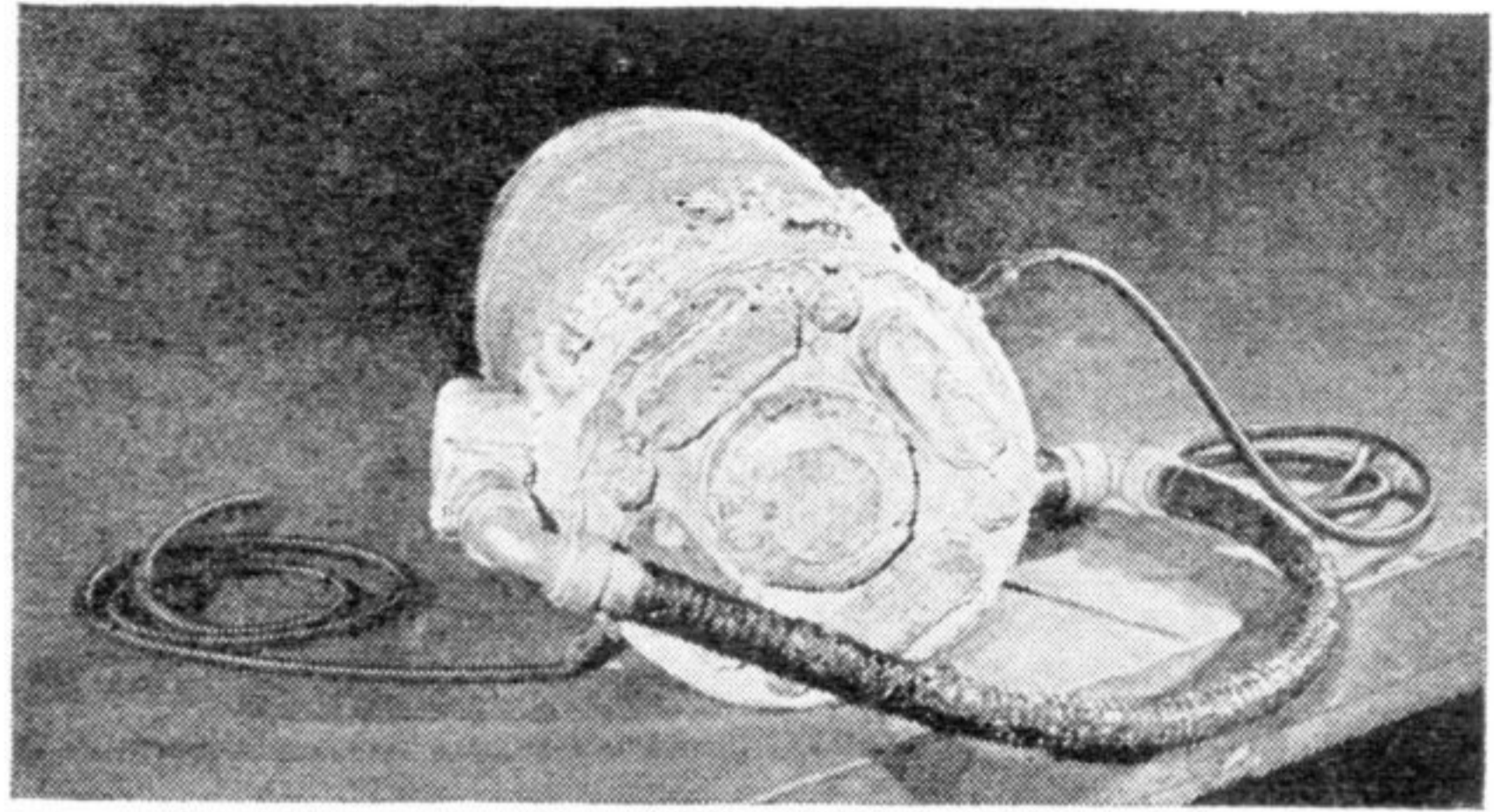
See Diagram 5.—Fit insulating tape over the Bostik "AA" at the driving endshield joint between the outside flange and the yoke face. Cover the outside of the tape with Bostik "AA."

Band Cover.

See Diagram 6.—Remove both portions of the band cover. Check the brushes for freedom in their holders. Smear all over the recessed yoke portion for the band cover with Bostik "AA," working a liberal quantity into the corners of the grooves around the complete diameter. Smear the commutator endshield joint between the outside flange and yoke with Bostik "AA."

See Diagram 7.—Apply Bostik "AA" along the inside edge at the clip ends of the new band cover (long portion); also round the outside flange joint of the breathers. Do not get any Bostik inside the breathers.

See Diagram 8.—Apply Bostik "AA" along the inside edges of the clip ends of the old band



OPERATION 9. Traverse dynamo sealed.

cover (short portion). Place both portions of the band cover in position on the dynamo so that the breathers are at the top of the dynamo when fitted to the vehicle. Smear Bostik "AA" along the inside and outside of the free ends. Tighten down securely by means of the wing nut.

See Diagram 9.—Seal the joint between the edge of the band cover and the yoke with Bostik "AA."

See Diagram 10.—Apply insulating tape firmly over the commutator endshield joint between the outside flange and the yoke; also over the joint between the edges of the band cover and the yoke.

See Diagram 11.—Cover the insulating tape with Bostik "AA."

Commutator Endshield.

See Diagram 12.—Tighten all fixing screws holding the moulded covers over the brush gear screws.

Apply Bostik "AA" round the joint between the moulded covers and the endshield, and fill up the fixing screw holes. Cover completely with Bostik "AA" all main fixing screw heads and spring washers; also the fixing screw holes in the bearing housing and the lubricator plug.

Smear Bostik "AA" around the joint of the riveted end plate on the bearing housing.

Terminal Block and Pole Screws.

See Diagram 13.—Smear Bostik "AA" around the joint of the terminal block and yoke, and the joint between the terminal block and plug flange. Cover all nuts and washers fixing the terminal block, and the plug screw and washers, with Bostik "AA." Fill in the pole screw holes with Bostik "AA." Level off.

Finish.

See Diagram 14.—Paint the dynamo liberally all over with anti-corrosive paint. Allow to dry thoroughly, and then apply a second coat.

10. PROTECT SUPPRESSOR UNIT ON GEARBOX FLOOR.

(By Electrician).

Examine the suppressors to determine whether the unit is filled with bitumen to the latest change. The change, if it has been carried out, will be indicated by the addition of three metal filler hole discs in the top face of the unit, and no action will be required.

If the modification has not been made, a new bitumen-filled unit must be obtained and fitted at the time the traverse dynamo is waterproofed.

11. REMOVE AND SEAL STARTER MOTOR.

TOOLS—

Scissors—Part No. TP.18794.
Brush, Paint, 2 in.—Part No. TP.18791.
Brush, Paint, 1 in.—Part No. TP.18792.
Vehicle Kit.

MATERIALS—

Petrol.
Bostik Cleaner No. 1.
Rag or Waste.
Bostik "AA."
W.D.P.P.
Anti-corrosive Paint.
Roll Electrician's Insulating Tape, $\frac{1}{2}$ in. wide.

The Fitter will remove the starter and pass it to the Electrician.

The Electrician will waterproof the starter as follows :—

Clean every part of the starter first with petrol and finally with Bostik Cleaner.

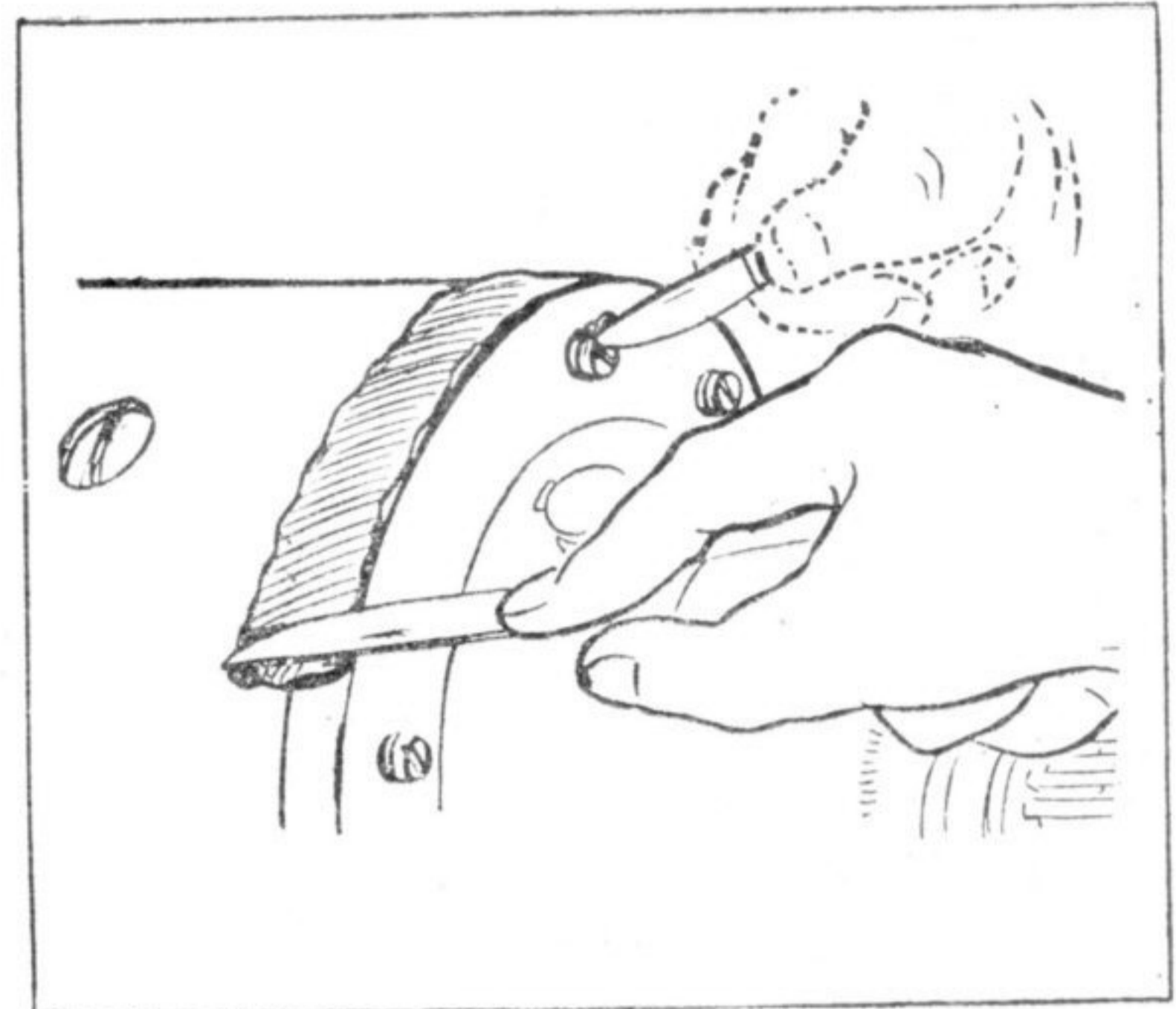
Allow it to dry thoroughly. Remove any paint or plating which shows signs of flaking with an abrasive.

Driving Endshield and Pole Screws.

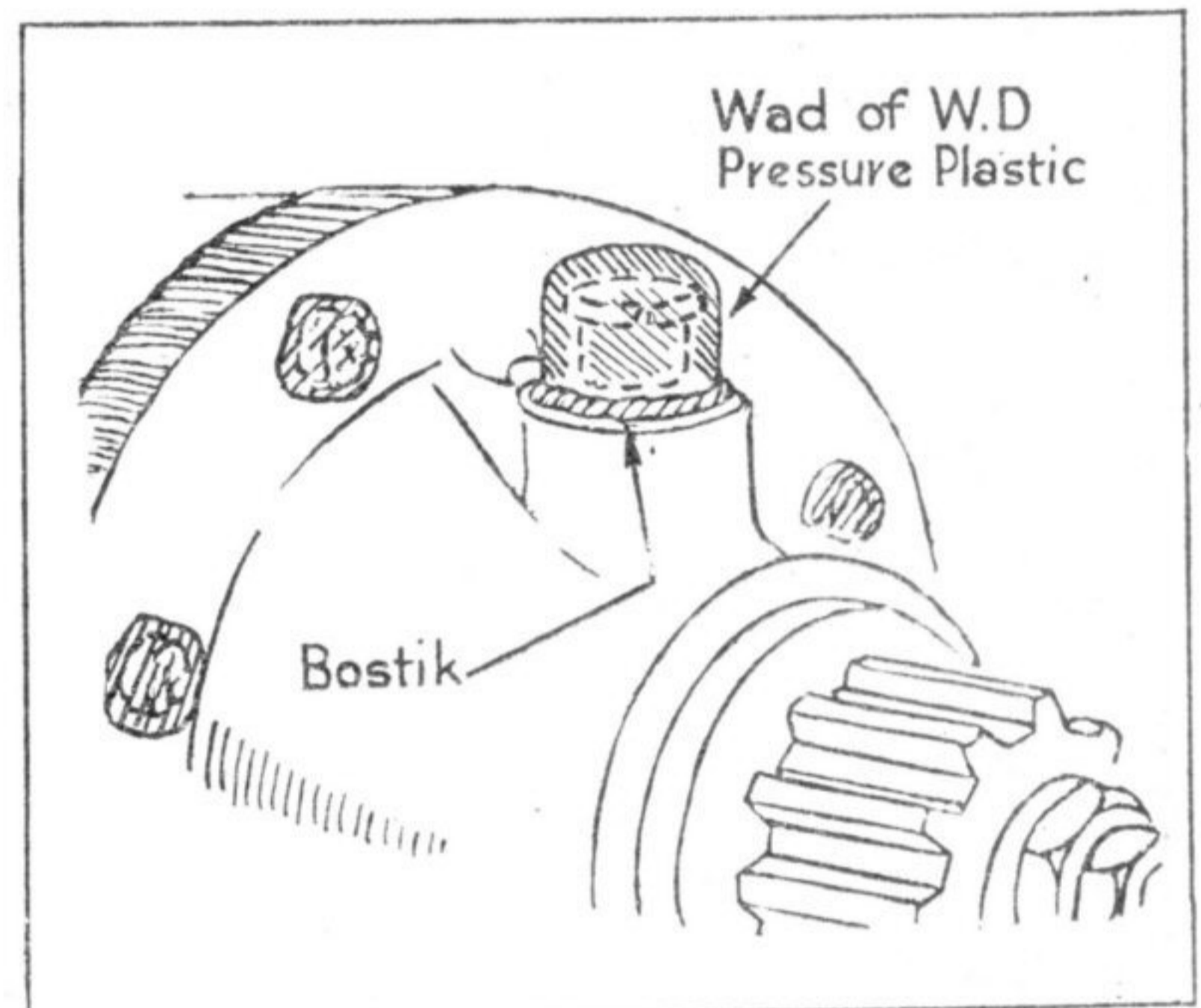
See *Diagram 1*.—Tighten the screws holding the driving endshield, and cover the shield completely with Bostik "AA." Smear the flange joint between the driving endshield and the yoke with Bostik "AA."

See *Diagram 2*.—Apply Bostik "AA" round the joint between the oiler and the endshield. Oil the bearing and cover the oiler completely with W.D.P.P.

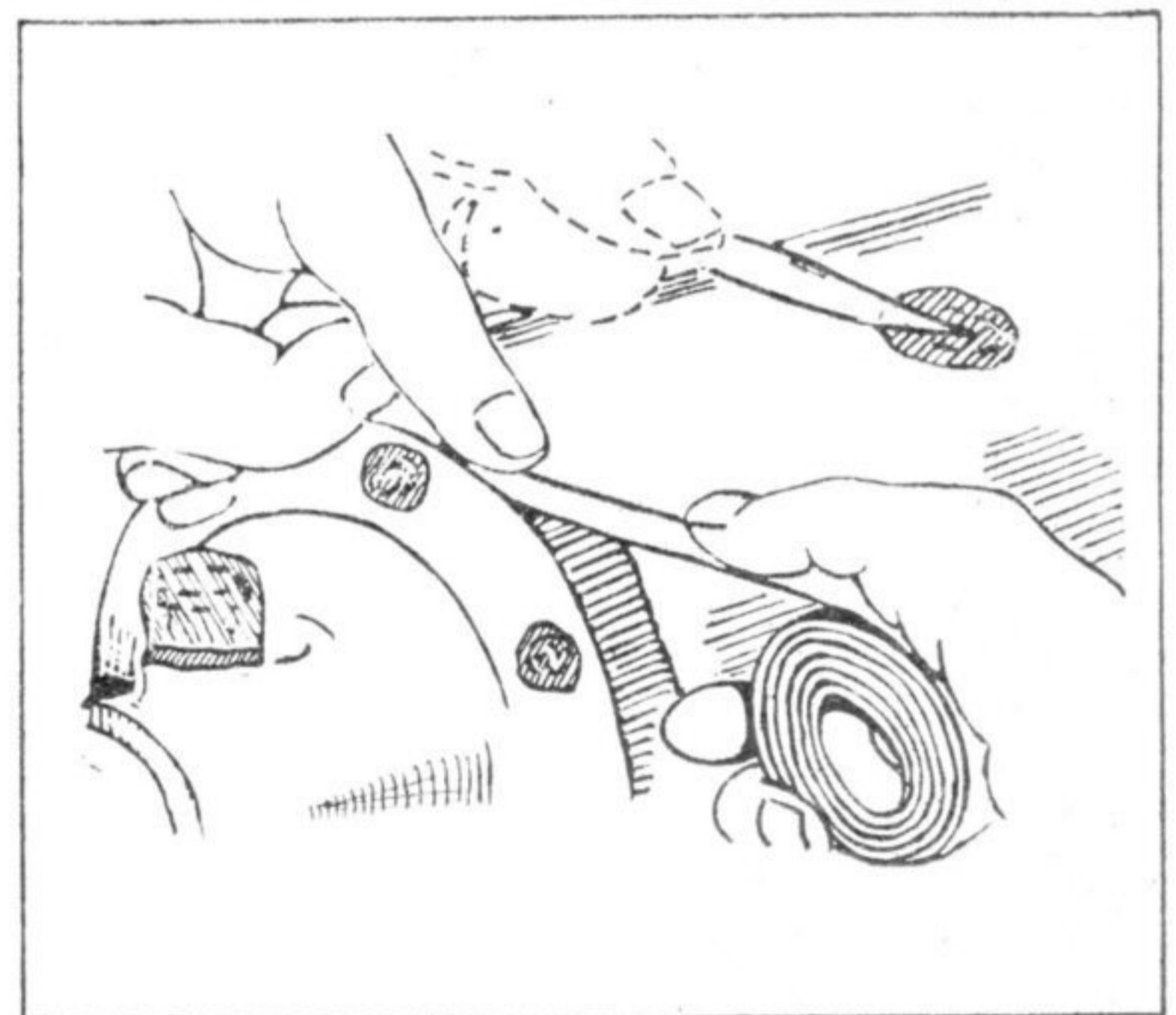
See *Diagram 3*.—Apply Bostik "AA" to the flange joint between the driving endshield and the yoke, and cover with insulating tape. Cover the



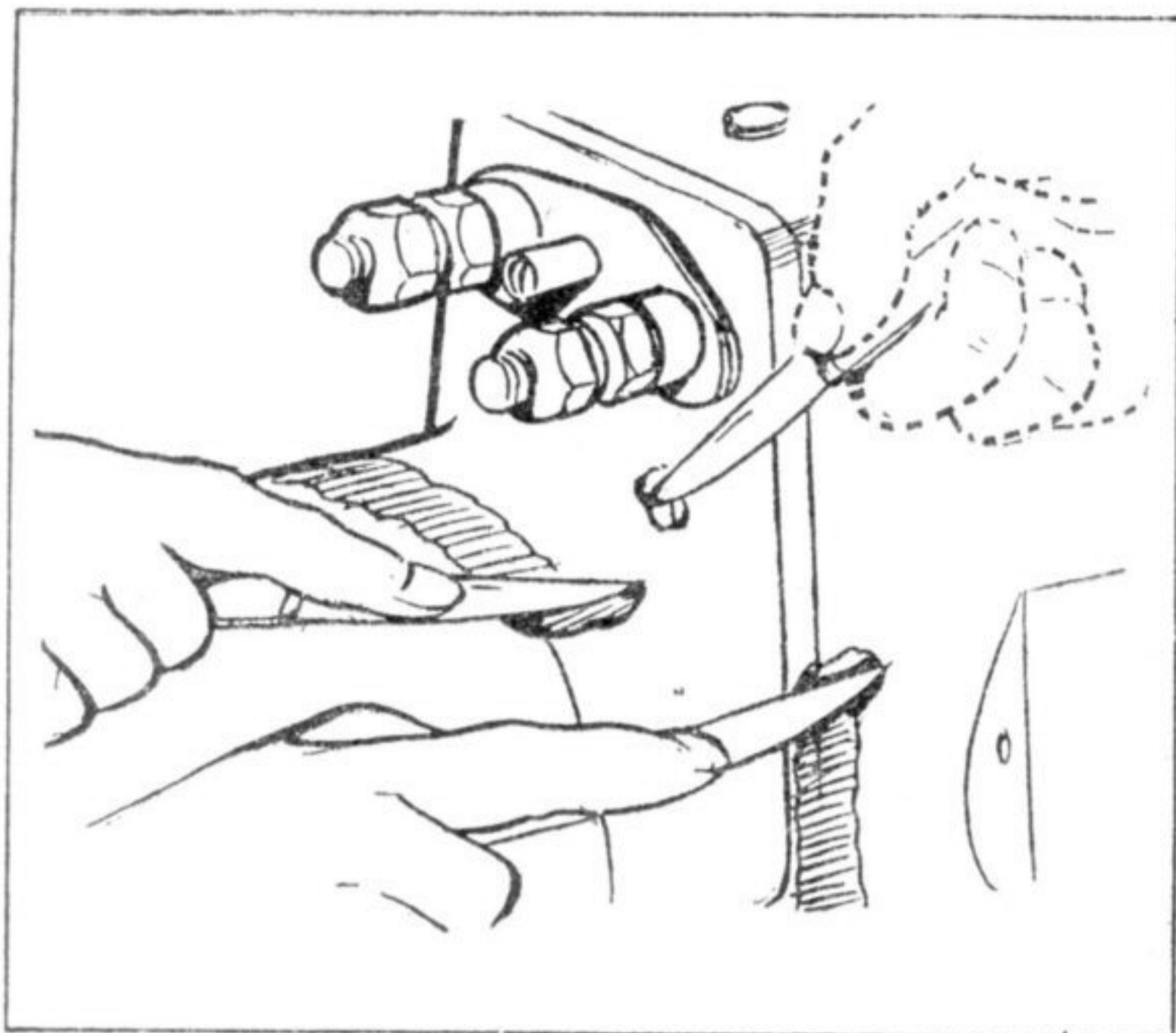
OPERATION 11. Diagram 1.



OPERATION 11. Diagram 2.



OPERATION 11. Diagram 3.



OPERATION II. Diagram 4.

outside of the tape with Bostik "AA." Fill up the pole screw holes with Bostik "AA" and level off.

Commutator Endshield.

See Diagram 4.—Smear the joint between the endshield and the yoke and the joint between the end cover and the commutator endshield with Bostik "AA."

See Diagram 5.—Apply insulating tape over the Bostik "AA" at both joints, and cover the outside of the tape with Bostik "AA." Cover the screw ends fixing the solenoid switch and projecting through the endshield above the yoke with Bostik "AA."

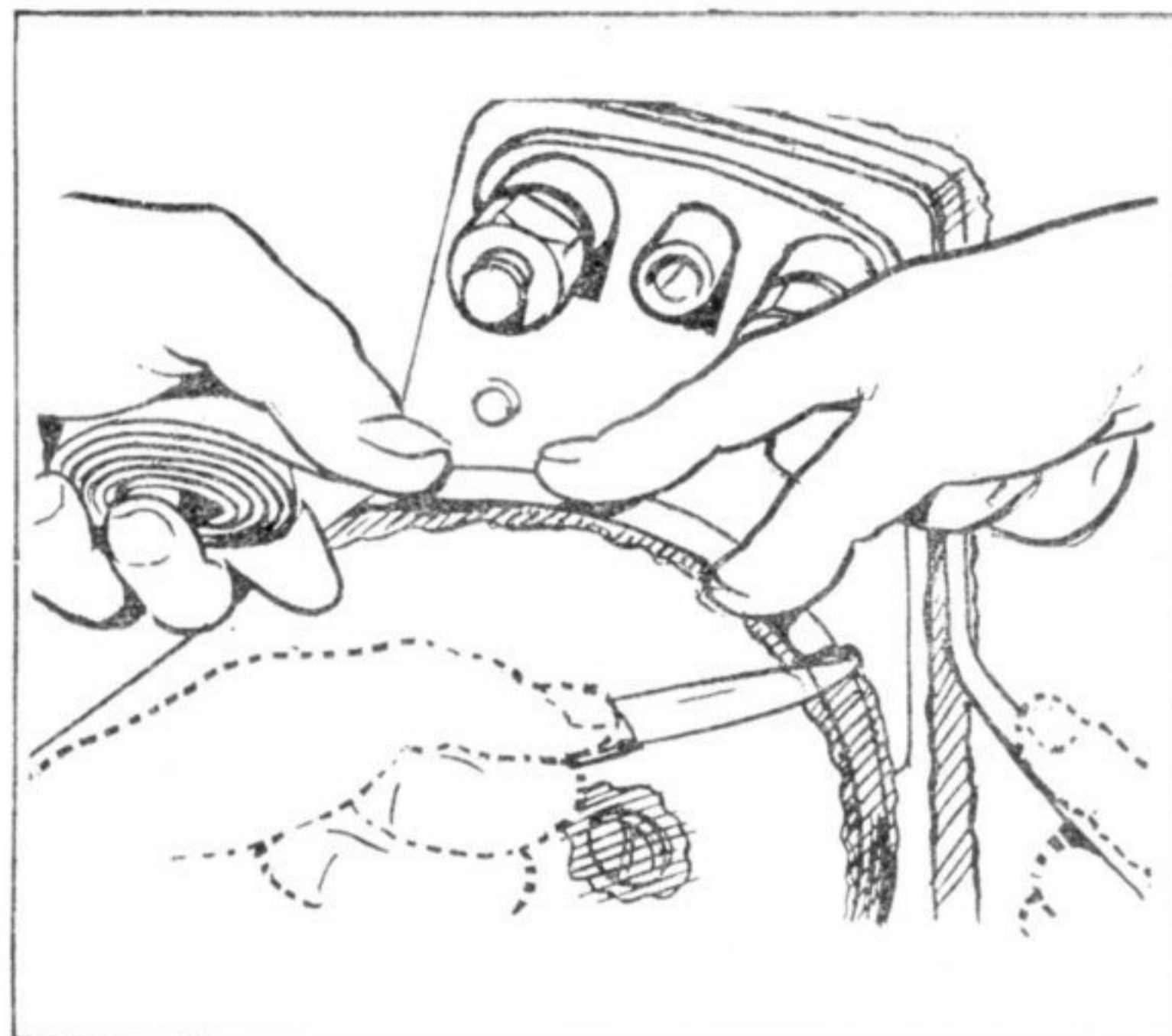
Terminals.

See Diagram 6.—Remove the main terminal nuts, washers and loose collars. Smear the thread of each terminal near the insulator with Bostik "AA," cover one face of the loose terminal collars with Bostik "AA" and replace the collars with the prepared face towards the insulator.

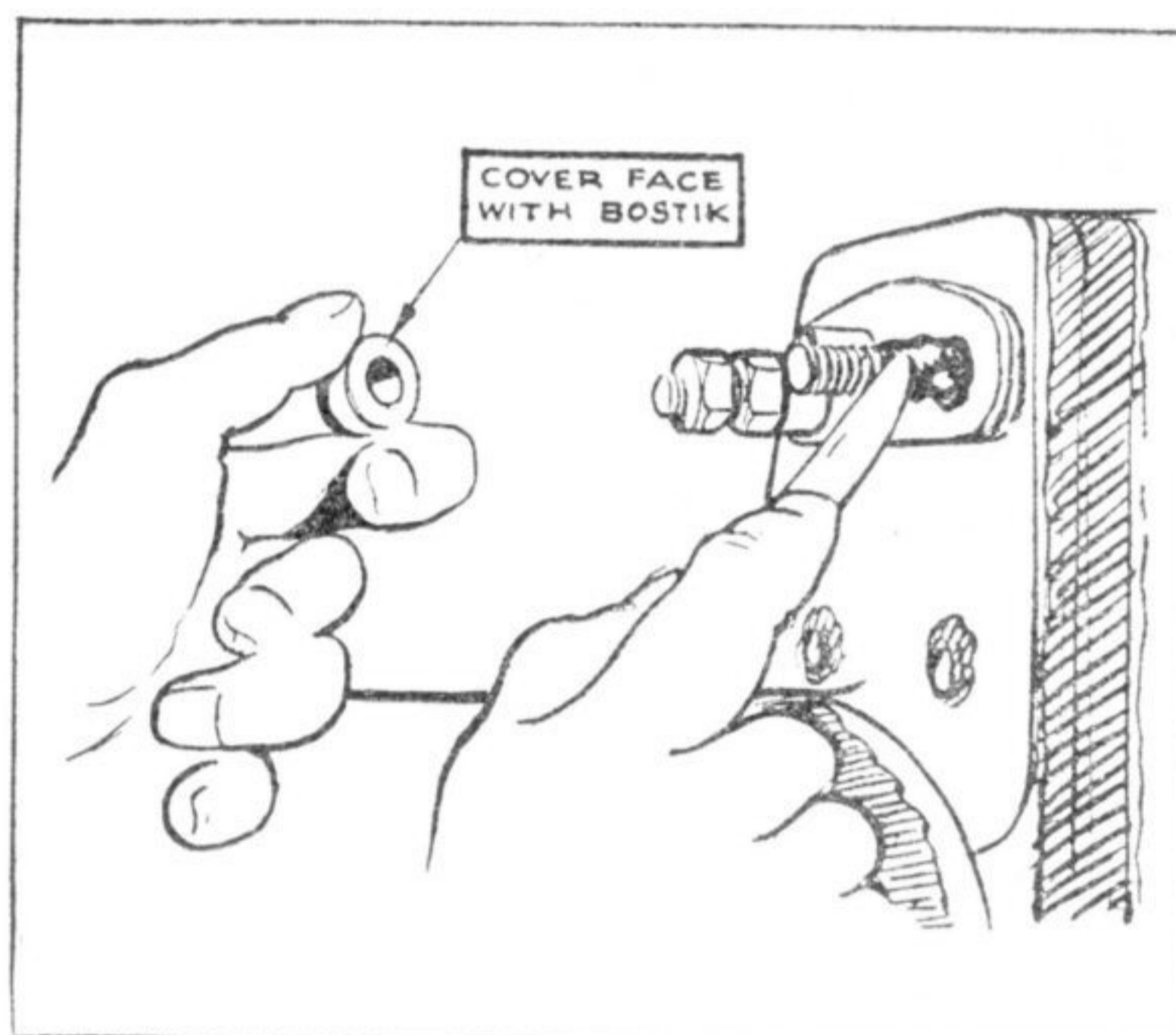
See Diagram 7.—Replace the terminal nuts and spring washers and tighten firmly. Level out the Bostik "AA" squeezed out under pressure between the collars and the insulator. Apply Bostik "AA" round the joint between the small terminal and the insulator. Apply Bostik "AA" all round the edge of the terminal insulating plate.

End Cover.

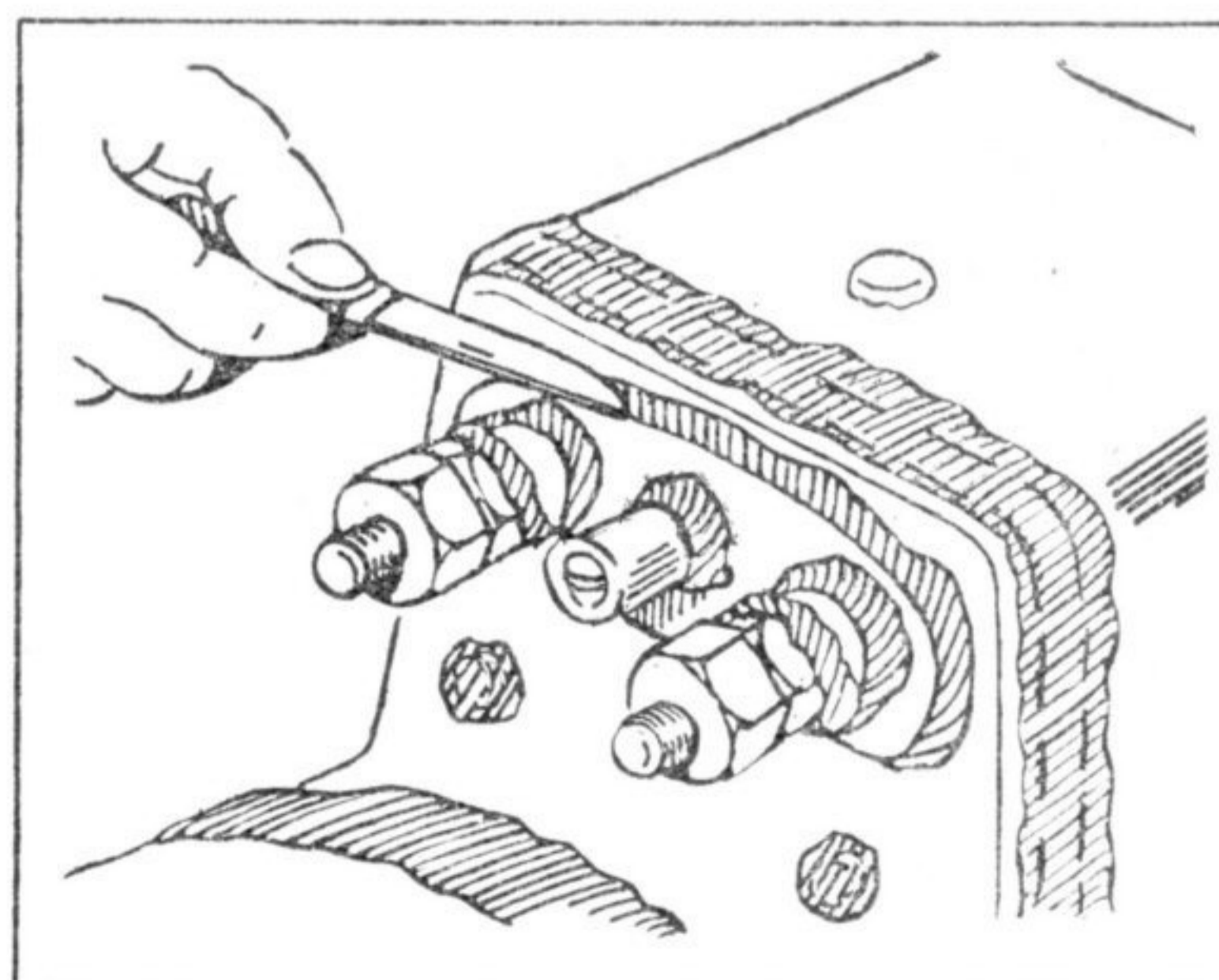
Diagram 8.—Completely cover the breather and the seal with Bostik "AA" from the outside. Smear the rivet heads on the side of the cover with Bostik "AA." Apply Bostik "AA" liberally to the nuts and washers holding the cover in position.



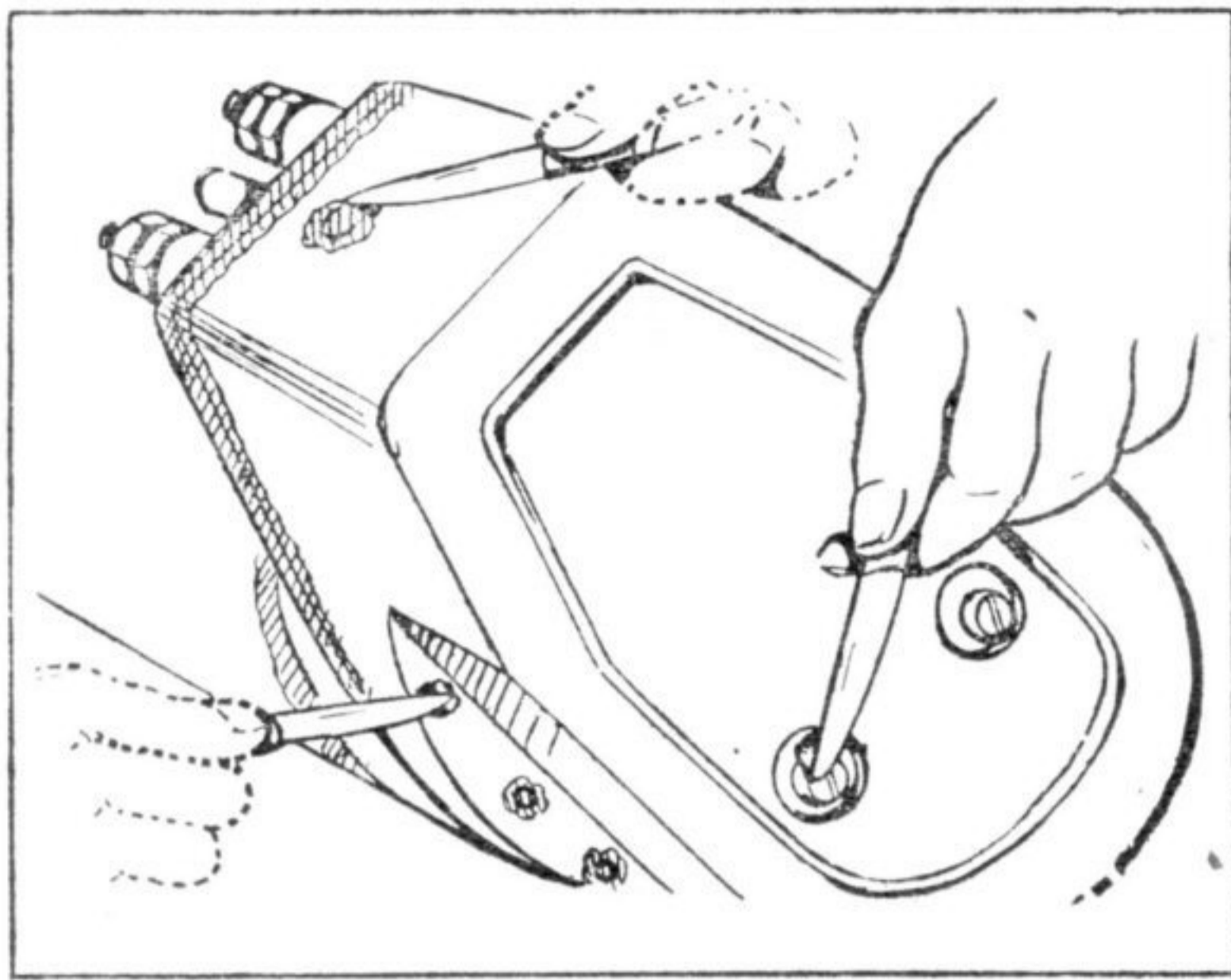
OPERATION II. Diagram 5.



OPERATION II. Diagram 6.



OPERATION II. Diagram 7.



OPERATION 11. Diagram 8.

Finish.

Paint liberally all over with anti-corrosive paint. Allow to dry, and then apply a second coat.

12. SEAL ROTARY BASE JUNCTION.

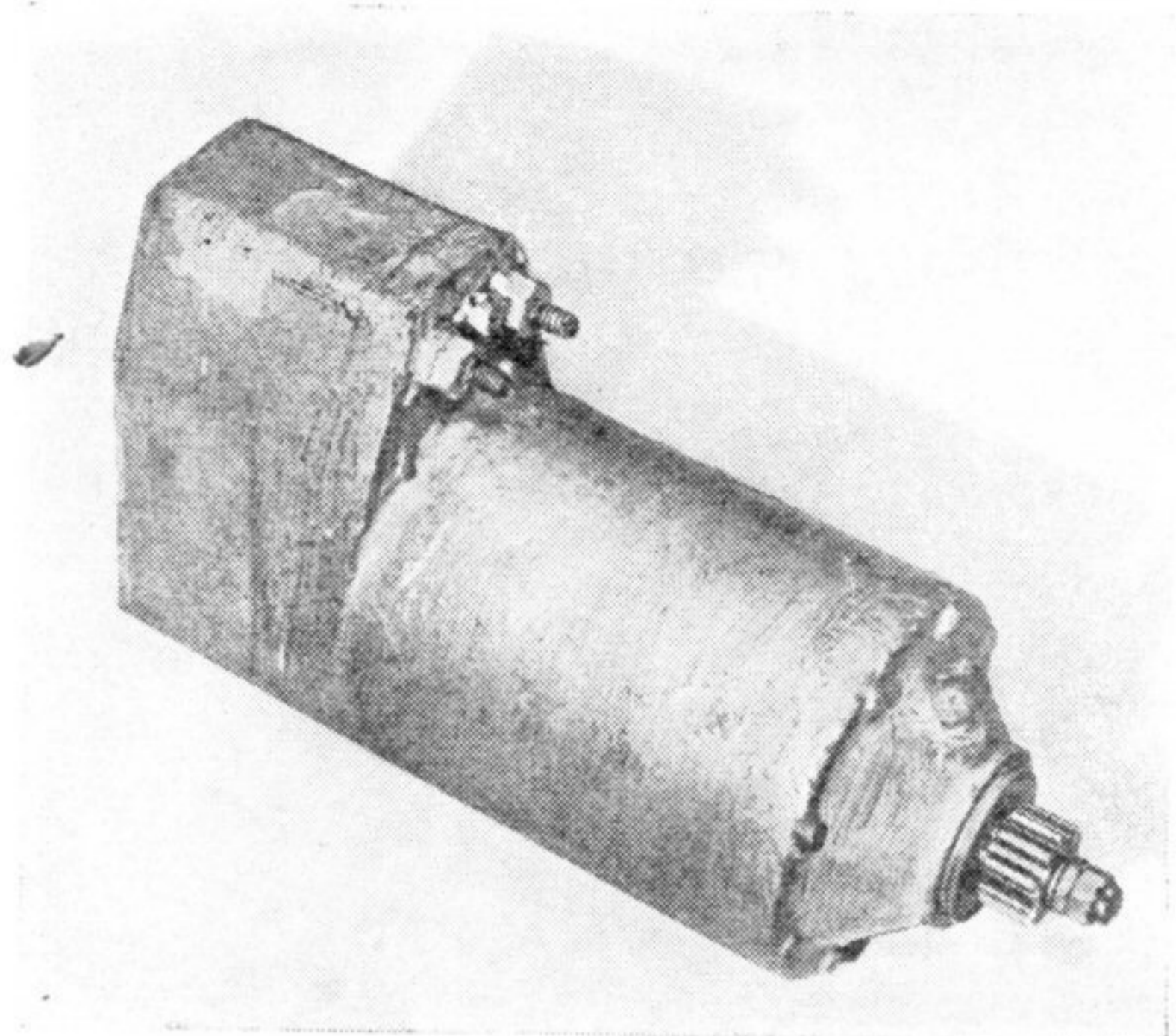
(By Electrician).

TOOLS—

- Vehicle Kit and 2 B.A. Box Spanner—Part No. TP.18822.
- Mounting Ring Seal Guide—Part No. TP.18807.
- Brush, Paint, 2 in.—Part No. TP.18791.

MATERIALS—

- Rotary Junction Mounting Ring Seal—Part No. TP.18751.
- W.D.P.P.



OPERATION 11. Starter motor sealed.

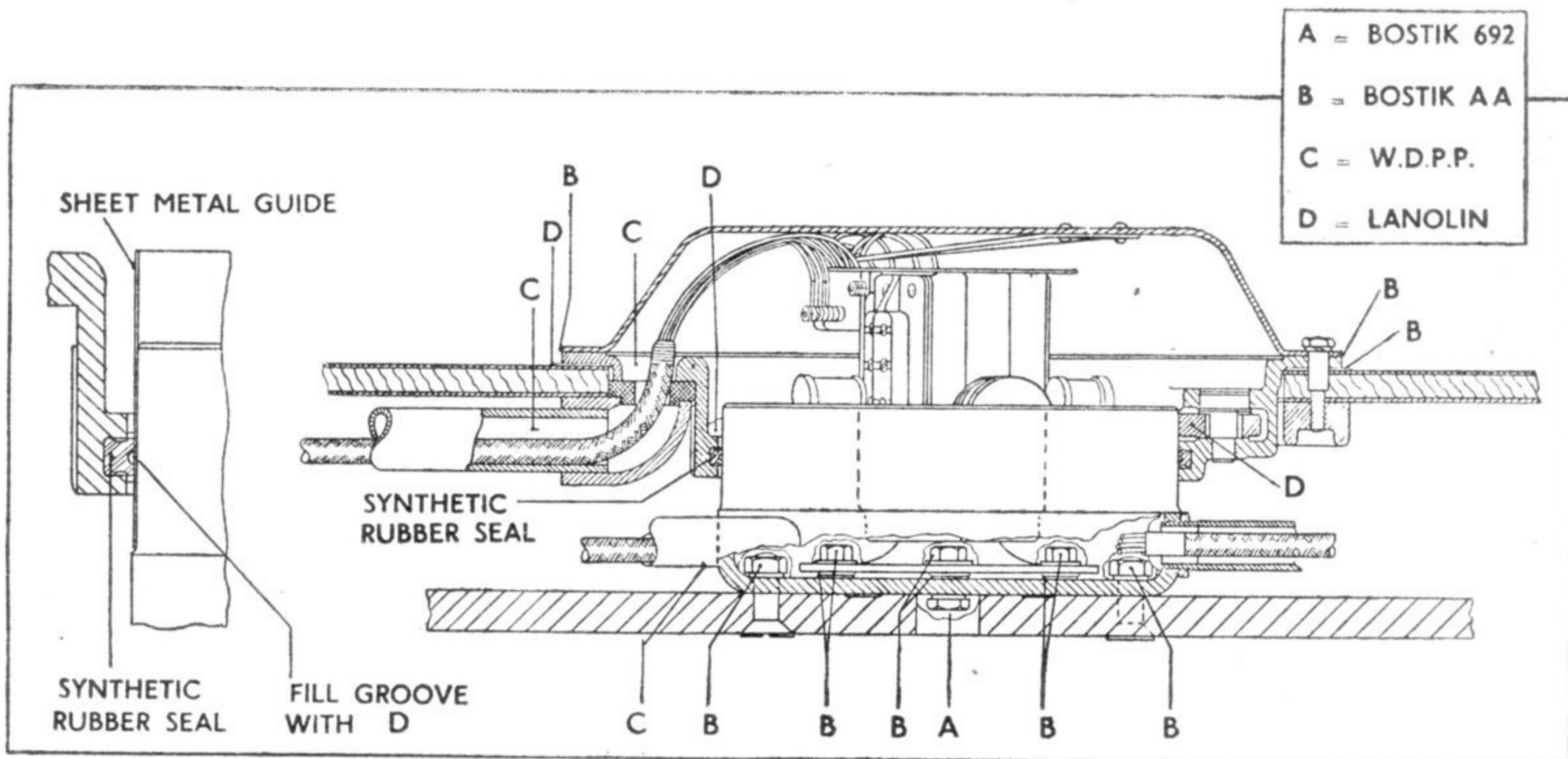
- Lanolin.
- Bostik "AA."
- Bostik "692."

The procedure for sealing the rotary base junction is as follows:—

Remove the top cover.

Disconnect each wire separately and mark it with the corresponding terminal number. Remove the base junction and mounting ring.

Thoroughly seal the nuts attaching the junction housing to the hull floor with Bostik "AA." Seal the countersunk head screws under the belly of the vehicle with Bostik "AA." Seal over the drain plug with Bostik "692."



OPERATION 12. Sealing of rotary base junction.

Plug the floor conduit apertures into the housing with W.D.P.P. Force the plastic into the conduit liberally, and seal it firmly round the cables.

Refit the base junction, applying Bostik "AA" under the feet before fitting, and seal over the bolt heads with Bostik "AA." Re-make the lower connections.

Fit the new synthetic rubber seal (V.M. Part No. TP.18751) into the groove in the mounting ring.

Make sure that there are no burrs on the lower edge of the mounting ring seal guide and coat the strip thoroughly with Lanolin. Fill up the groove in the rubber seal with Lanolin. Insert the guide into the seal, taking great care that the edges of the seal are not lipped back at any point. Gently lower the mounting ring into place and withdraw the guide.

Pack the mounting ring rollers with Lanolin.

Pack W.D.P.P. down the rotating conduit apertures to seal the cables.

Pour melted Lanolin down between the housing and the ring.

Re-make the top connections and pack W.D.P.P. into the rotating conduit apertures so that the cable entries are completely sealed.

Apply Bostik "AA" liberally round the cover seating face on the mounting ring and also on the cover. Refit the cover and bolt down securely. Finish off by sealing round the edges of the cover and mounting ring with Bostik "AA."

13. PROTECT PLUG AND SOCKET CONNECTIONS.

TOOLS—

Brush, Paint, 1 in.—Part No. T.P.18792.

Brush, Paint, 2 in.—Part No. TP.18791.

MATERIALS—

Lanolin.

Bostik "AA."

Insulation Tape—from roll.

Anti-corrosive Paint.

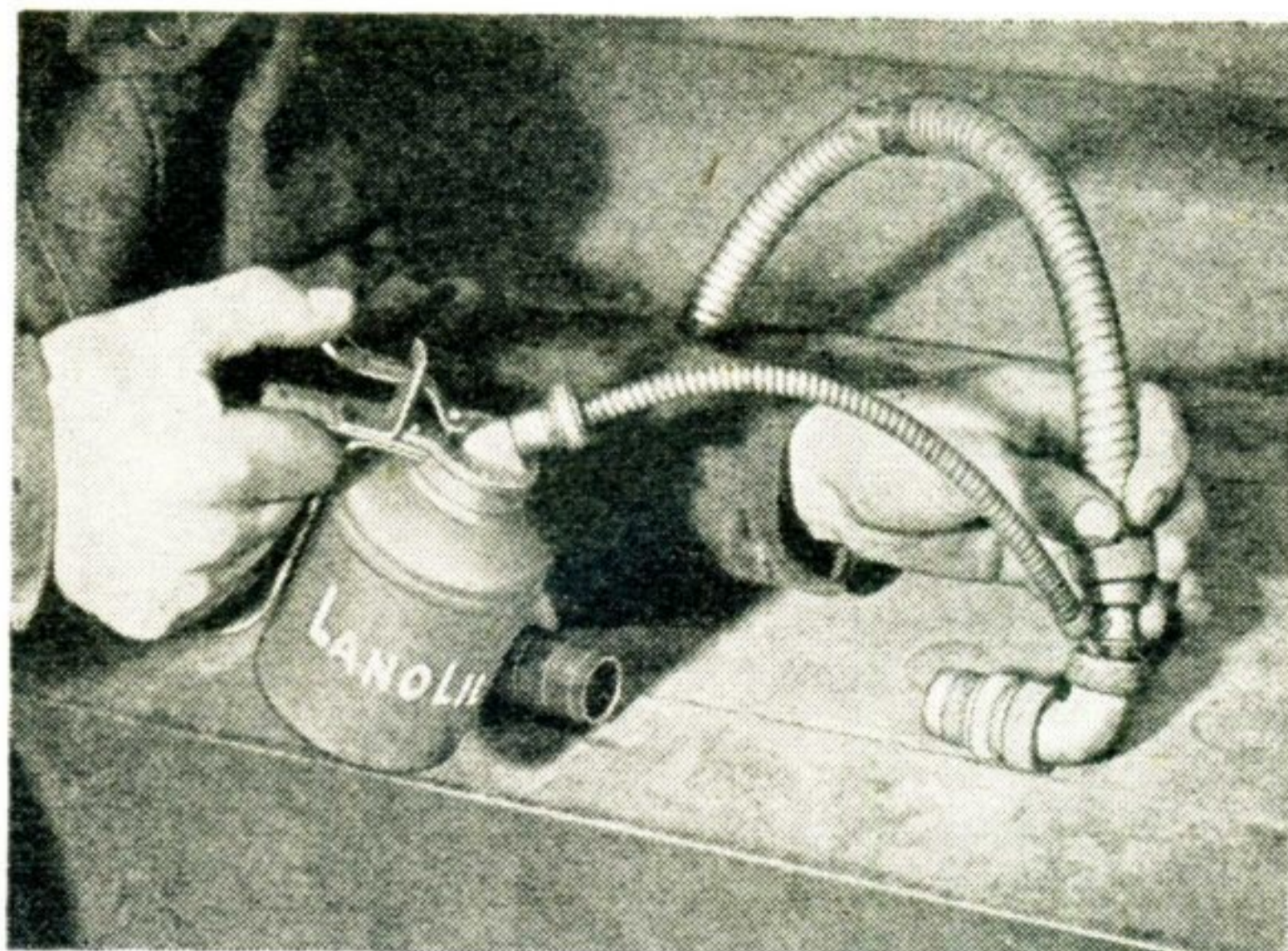
The following is a list of the plug and socket connections which must be treated.

Rotary base to suppressor unit on gearbox floor—1 straight connection.

Traverse dynamo to suppressor unit cable—2 elbow connections. (Before applying Lanolin treatment—see below—this cable must be taped overall with insulation tape and painted with Bostik "AA.")

Engine dynamo—1 straight connection.

Lower bulkhead junction box—1 elbow and 1 straight connection on engine side; 1 straight connection on fighting compartment side. (NOTE.



OPERATION 13. Filling plug and socket connections with Lanolin.

Treatment of the lower bulkhead junction box may have been carried out by the manufacturers. If it has, the cable from the R.H. side of the L.H. ignition filter unit (the lower gland nearest to the base plate) will be taped over and no further treatment of the box is required.

The following operations are necessary to gain access to the lower bulkhead junction box if it has not already been treated in production.

Remove the stowage bins and the R.H. triangular bulkhead plate.

Drain the water from the R.H. engine bank and save it for re-use.

Remove the R.H. water filler pipe.

Treatment. (All plugs and sockets listed above.)

(a) Thoroughly clean out an oil can with petrol and clean the spout as well by squirting petrol through it. Dry the can and fill it with Lanolin. Stand the can in boiling water so that the Lanolin is melted.

(b) Pull back the ring nut on the cable conduit of straight and elbow sockets and fill the socket shells and elbows completely with melted Lanolin by squirting from the oil can. (Do not force back the conduit and screening, or the cable may be damaged.)

(c) Fill up the plug body on the vehicle unit with Lanolin, screw home the socket shell, and do up the locking ring.

(d) Paint the whole connection with anti-corrosive paint, allow to dry thoroughly and then apply a second coat.

Finally, remove the cover of the junction box (if not already treated), fill the box with Lanolin and replace the cover.

Replace all removed parts and refill the right-hand engine bank.

14. SEAL INSTRUMENT PANEL.

TOOLS—

Vehicle Kit and Pliers, Cone—Part No. TP.18813.

MATERIALS—

Grease, G.S.
Lanolin.
Asbestos Compound.

Seal all joints and welded edges round the panel box with Asbestos Compound.

Seal round the speedometer drive and capillary tube entries with Asbestos Compound.

Fill up the 5 plug connections on the panel with Lanolin. Screw the sockets home and cover liberally with Asbestos Compound.

Remove the fuse box cover. Check that all circuits are functioning correctly.

Smear Grease, G.S., liberally on and around the switch and instrument face rims and fuse box.

15. SEAL FRONT LAMPS.

TOOLS—

Brush, Paint, 2 in.—Part No. TP.18791.

MATERIALS—

Asbestos Compound.
Bostik "AA."

Thoroughly clean all round the joint of the lamp mounting channel and hull and round all lamps. Liberally apply Asbestos Compound round all channel joints, all lamp rims and bases and over side lamp front connection covers. Paint over with Bostik "AA."

16. PROTECT IGNITION STOP SWITCH.

MATERIAL—Lanolin.

Remove the switch box cover and thoroughly smear the interior of the box, switch, and wires with Lanolin.

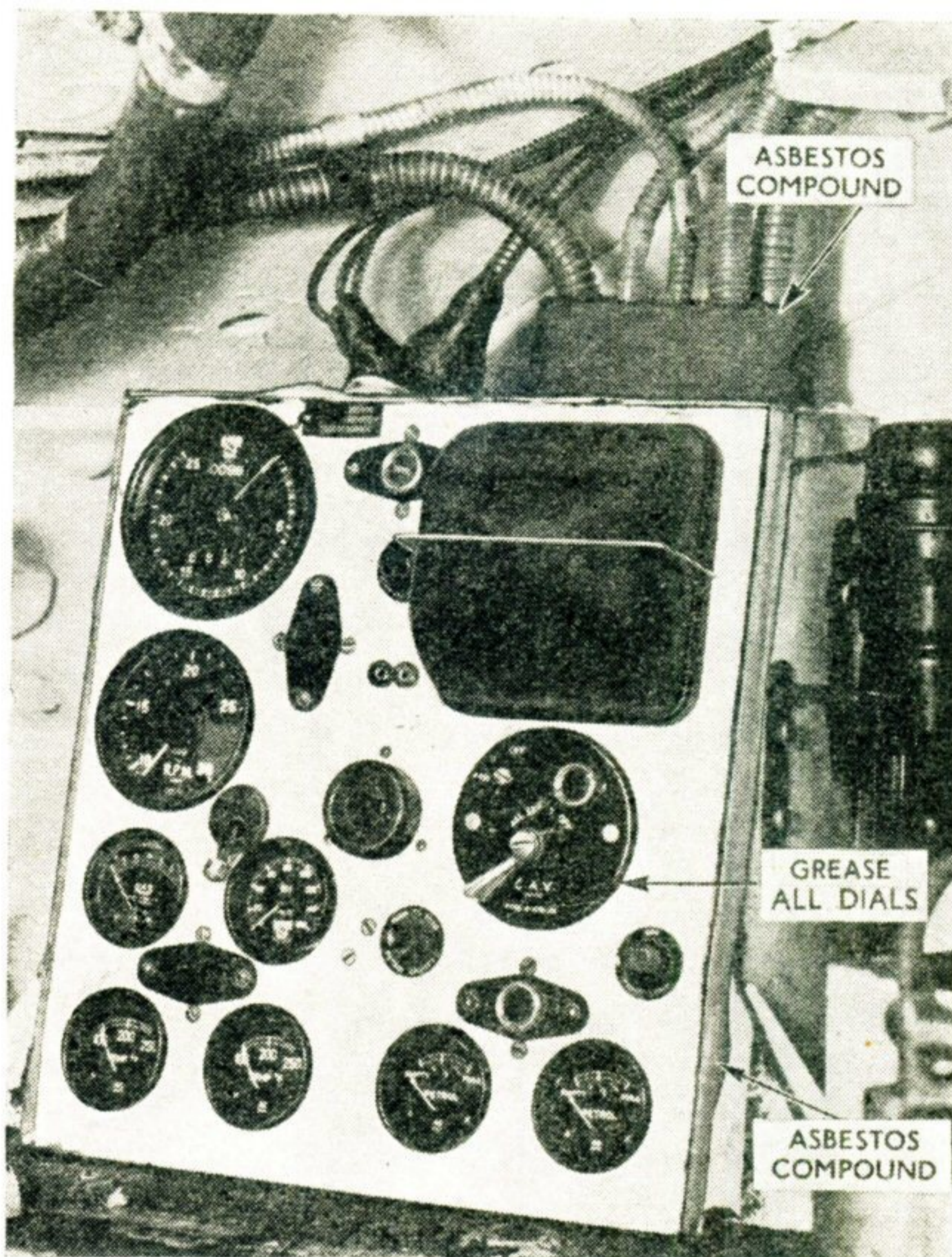
Remove the connecting socket, fill the plug body with Lanolin and replace the socket. Fill up the back of the socket by squirting melted Lanolin from an oil can into the shell. Do up the ring nut.

17. PAINT OR GREASE INTERNAL PARTS.

TOOLS—

Brush, Paint, 1 in.—Part No. TP.18792.

MATERIALS—Anti-corrosive Paint. Grease G.S.
Grease H.M.P.



OPERATION 14. Sealing of instrument panel.

Painting.

Paint the following parts with two coats of anti-corrosive paint, allowing the first coat to dry before applying the second :—

In Engine Compartment.

Throttle control return spring.
Economy light switch (R.H. rear carburettor).
Tachometer generator.
Ki-gass unions.
Petrol unions.
Oil pipe unions.
Electrical connections.
All petrol tank connections.

In Gearbox Compartment.

Infantry gong switch on rear hull plate, R.H. side.

Greasing.

Coat the following parts liberally with H.M.P. grease :—

In Engine Compartment.

Carburettor and governor controls.
All sliding and moving joints on choke controls.

Coat the following parts liberally with G.S grease :—

In Gearbox Compartment.

Clutch shaft sliding sleeve, and trunnion blocks. Also screwed adjustment on rod between cylinder and lever.

In Driving Compartment.

All petrol control joints.

All choke control lever joints.

18. REFIT TRAVERSE DYNAMO.

(By Fitter.)

TOOLS—

Vehicle Kit.

MATERIALS—

Rubber Tubing—Part No. TP.18812—2 off.

Insulation Tape—from roll.

Use great care in handling the waterproofed dynamo; and avoid knocking the seals and band cover breathers when fitting the dynamo to the vehicle.

Before fitting the dynamo, attach the rubber tubes to the breathers. Bind insulation tape round the tubing on the breather, leaving the end of the tubing clear of tape.

Fit the dynamo into its cradle and secure it in position. Adjust the belt tension.

Run the breather tubes up the dynamo belt adjusting bolt and tape them to the bolt. Bend over the tubing so that the end of the tube is pointing downwards, and tape it in this position, taking care not to crush or kink the tubing.

Refit the air compressor.

19. REFIT STARTER MOTOR.

(By Fitter.)

TOOLS—

Vehicle Kit.

Brush, Paint, 1 in.—Part No. TP.18792.

MATERIALS—

Petrol.

Cotton Waste or Rag.

Anti-corrosive Paint.

Use great care in handling the waterproofed starter motor, and avoid knocking the sheet metal end cover.

Clean with petrol the terminal ends and 4 or 5 inches of the insulation on the starter cables. Refit the starter motor. Correct fitting of the dowel in the starter body is facilitated by suspending a mirror on the oil sump and using a lamp on the outside of the engine, so that the dowel and

locating hole can be observed through the hole in the vehicle floor. Reconnect the cables to the starter and paint the terminals and the cleaned portion of the cables with anti-corrosive paint, applying a second coat when the first is dry. Refit the rubber boots over the terminals.

20. GREASE GEAR CONTROLS.

Cover with G.S. grease the lower ends of the change speed rod connections and the rocking arm pivot pins.

Cover with grease the selector rod ends where they enter the gearbox.

Pack grease round the ball end at the change speed gate, and on the rods for a distance of about 6 in. where they enter the gate housing on each side.

Grease all screw threads on the change speed rods.

21. SEAL BELLY INSPECTION COVERS.

TOOLS—

Vehicle Kit.

Brush, Paint, 2 in.—Part No. TP.18791.

MATERIALS—

Petrol.

Bostik Cleaner No. 1.

Rag or Waste.

Boscoprene 551 A and B.

Bostik "AA."

Clean all belly covers, and the corresponding joint faces on the hull, first with petrol and then with Bostik cleaner.

Treat each cover as follows :—

Paint the mating surfaces of the hull and cover fairly thickly with the Boscoprene mixture 551. Dip the fixing screws in Boscoprene. Replace the plate in position and bolt down tightly.

Leave the joint for at least 8 hours to set, and then seal the exposed Boscoprene with Bostik "AA."

NOTE.—If, after sealing, it becomes necessary to remove a cover for any reason, it must be resealed as above.

22. SEAL RADIATOR DRAIN TUBES.

TOOLS—

None.

MATERIALS—

Petrol.

Bostik Cleaner No. 1.

Rag or Waste.

Bostik "C."

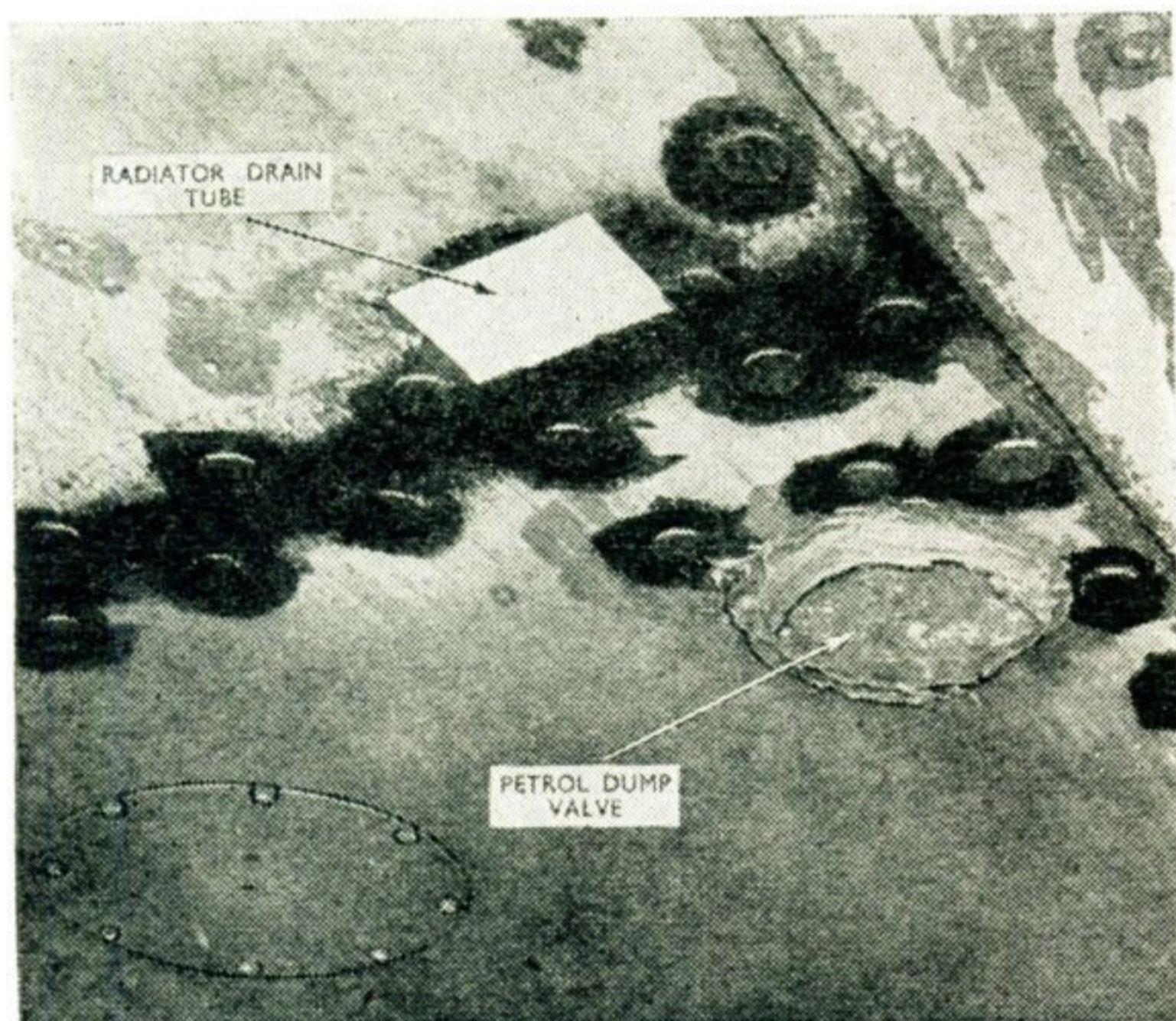
W.D.P.P.

Bostikote Tape, 6 in. × 3 in.—2 pieces.

Thoroughly clean the inside of each drain tube and the hull bottom for 6 in. diameter round it and allow to dry completely. Fill the bottom end of the drain tube with a bung of W.D.P.P. 1 in. thick.

Paint the exposed end of the plastic and about 2 in. all round the hull plate with Bostik "C."

Attach a strip of Bostikote tape to cover the W.D.P.P., and after one hour cover the tape with Bostik "AA."



OPERATIONS 22 and 23. Sealing of petrol dump valve and radiator drain tube.

WAS 24 **23. SEAL PETROL DUMP VALVE.**

TOOLS—
None.

MATERIALS—
Petrol.
Bostik Cleaner No. 1.
Rag or Waste.
Grease H.M.P.

Thoroughly clean the mating surfaces of the hull and the valve seat, and check the fit of the faces to make sure that the cover will close firmly. Cover the mating surfaces with H.M.P. grease and close the valve.

Smear H.M.P. grease liberally round the edges of the closed valve.

Do not use the valve prior to landing unless it is really necessary to do so. If it has to be opened the sealing operations must be carried out again.

WAS 25 **24. SEAL SHELL RELEASE HATCH.**

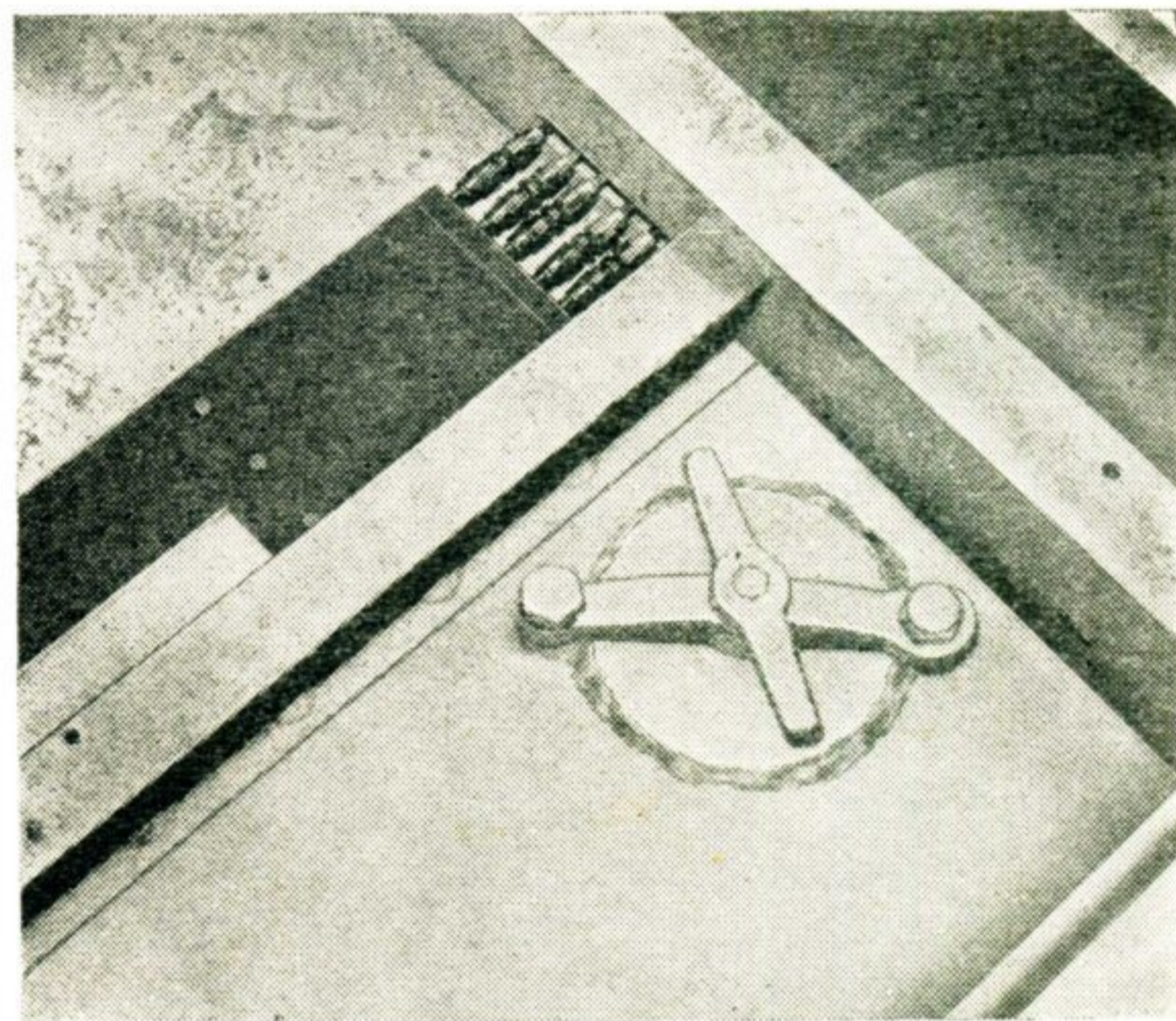
TOOLS—
Vehicle Kit.

MATERIALS—
Petrol.

Bostik Cleaner No. 1.
Rag.
Asbestos Compound. *REVISED*

Remove the cover, clean the mating surfaces of the hull and the plate, and check that both surfaces are reasonably flat.

Liberally cover the joint faces with Asbestos Compound grease, replace the cover and secure it firmly with the clamp.



OPERATION 24. Shell release hatch after sealing has been carried out.

WAS 26 **25. REPLACE MUDGUARDS AND GEAR BOX ROOF PLATE.**

TOOLS—
Vehicle Kit.
Brush, Paint, 2 in.—Part No. TP.18791.

MATERIALS—
Grease G.S.
Bostik "AA."

Replace mudguard centre sections at the turret. Offer up the centre section to make sure that it will go readily into position when it is fitted later with the turret fabric in position. *This will prevent possible damage to the fabric and the need for patching.*

Replace the gearbox roof plate and tighten all bolts securely. Check that the doors close properly and that they can be locked by using the key carried by the crew.

26. SEAL IDLER ADJUSTMENT.

MATERIAL—
Grease, G.S.
Lubricate both idler units with C.600 until oil exudes.

Cover the idler adjusting screws, slides and nut with a liberal coating of G.S. Grease.

27. SEAL PANNIER SIDE DOORS.

MATERIALS—

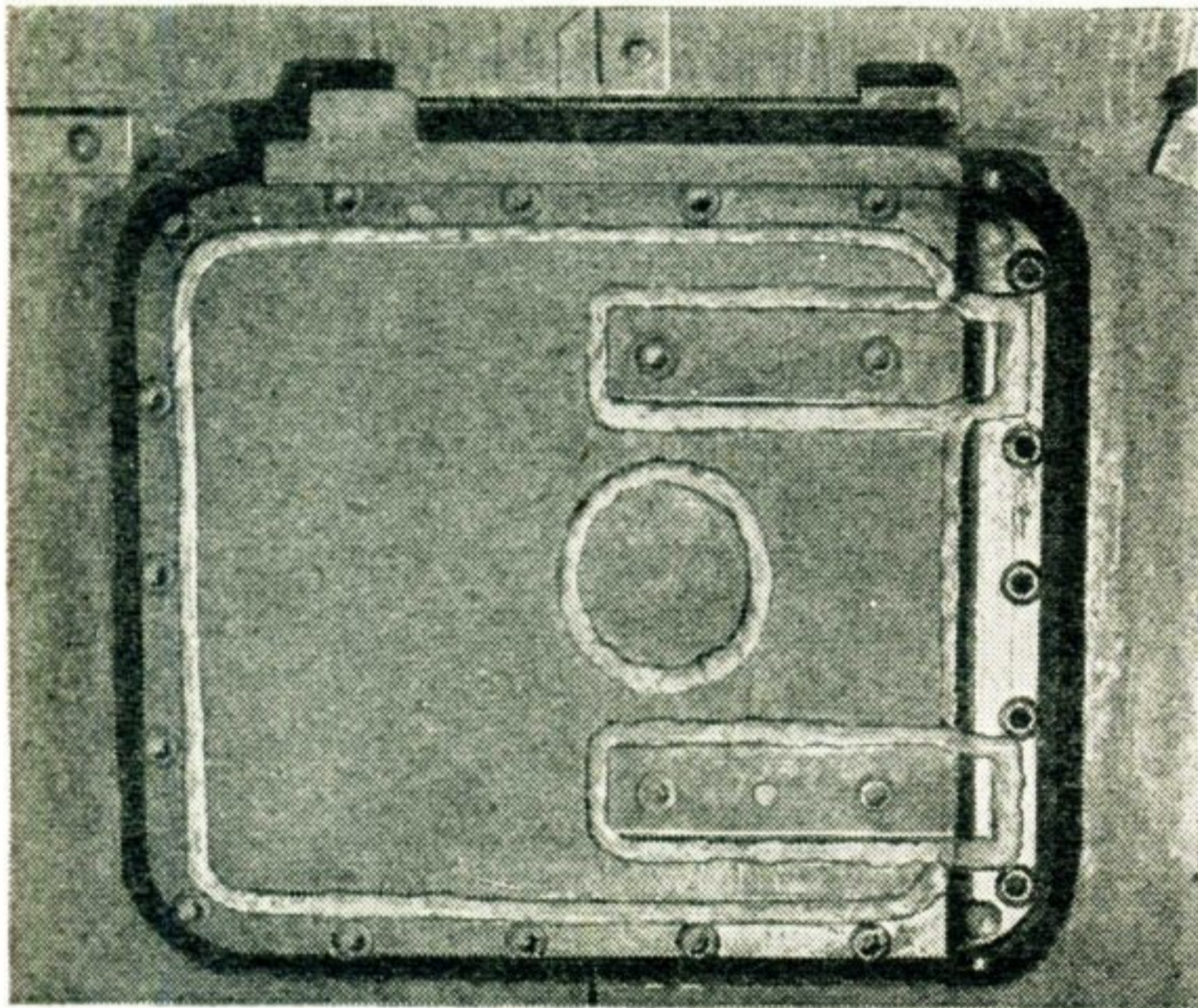
Petrol.
Bostik Cleaner No. 1.
Rag or Waste.
Asbestos Compound. *REVISED*
Bostik "AA."
Grease G.S.

Make sure that any stowage items and tools which are to be stowed with the doors open are in place. Open the doors and apply G.S. grease to the mating surfaces of the door and the door frame. Apply the grease on the inner side of the door face up to the groove and take care to fill the grooves in the door completely.

Smear the revolver port mating surfaces with G.S. grease and close tightly.

Close the pannier doors and secure them very firmly.

REVISED
Using petrol and cleaner, remove dirt and grease from all pannier door and revolver port joints on the outside; also from around the door hinges. Apply Asbestos Compound liberally round all door and hinge joints, at the top and bottom of the hinge pins, and over the lubricators. Paint over with Bostik "AA."



OPERATION 27. Pannier door sealed with Asbestos Compound.

28. GENERAL CHECK-OVER OF VEHICLE.

Fit 6 amp. fuse in spot lamp box in turret, and check circuit by plugging in inspection lamp.

Check all exterior and interior lighting.

Check 2-pin sockets on instrument panel by plugging in inspection lamp.

Check radio and I.C.

Check ventilation fans.

Check infantry gong.

Start engine and check operation.

Check turret power traverse.

Any defects found must be rectified immediately.

29. TEST HULL IN FRESH WATER—3 ft. DEEP.

Stand the vehicle in water 3 ft. deep for half an hour to check the hull sealing. Make periodic checks for hull leakage and mark any leak for later attention.

Pay particular attention to the petrol dump valve, and if leakage occurs seal the outer joint of the valve to the hull with Asbestos Compound after test.

30. GUN MAINTENANCE.

WAS 9
Carry out a thorough maintenance routine on all guns.

Test and align gun-sights.

Prepare the bores of the guns as follows:—

Oil the bore and the chamber. Take a piece of rope or strong cord about 30 in. longer than the gun, and make a loop at one end. Feed this lanyard through the bore from the muzzle end, and pass a piece of dry clean rag through the loop, large enough to fit tightly in the gun muzzle. Pull on the other end of the lanyard until the rag has formed a good tight bung.

Fit the canvas covers over the gun muzzles.

Check that the free end of the rope is clear of the breech, and close the chamber with a piece of oiled rag. Make sure it is a tight fit.

(For Besa gun use pull-through TP.19002 in Kit.)

31. SEAL ENGINE COVER DOORS.

TOOLS—

Key carried by Crew.

Scissors—Part No. T.P.18794.

Brush, Wire Scaling—Part No. TP.18793.

Brush, Paint, 2 in.—Part No. TP.18791.

MATERIALS—

Bostik Cleaner No. 1.

Waste.

Bostik "C."

Bostik "AA."

W.D.P.P.

Bostikote Tape.

Check petrol, oil and water levels.

Engine Doors.

Do not seal the rear R.H. engine door at this stage. Check that the door will open fully for access to the oil filler with the turret at 12 o'clock.

VERY IMPORTANT.

Operation 28. GENERAL CHECK-OVER OF VEHICLE

The third line in this Operation—"Check all exterior and interior lighting"—must be deleted.

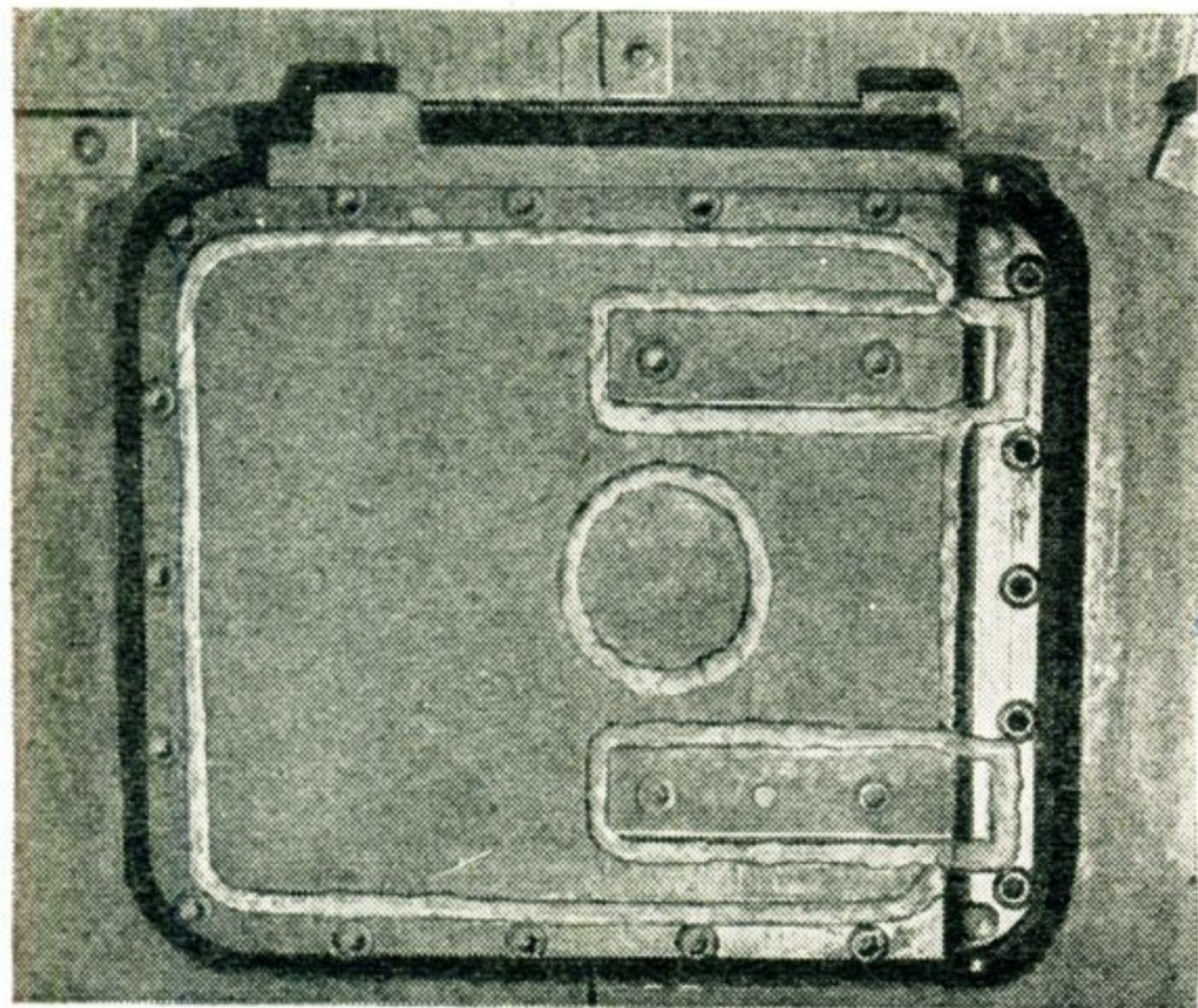
Asbestos Compound. *REVISED*
Bostik "AA."
Grease G.S.

Make sure that any stowage items and tools which are to be stowed with the doors open are in place. Open the doors and apply G.S. grease to the mating surfaces of the door and the door frame. Apply the grease on the inner side of the door face up to the groove and take care to fill the grooves in the door completely.

Smear the revolver port mating surfaces with G.S. grease and close tightly.

Close the pannier doors and secure them very firmly.

REVISED Using petrol and cleaner, remove dirt and grease from all pannier door and revolver port joints on the outside; also from around the door hinges. Apply Asbestos Compound liberally round all door and hinge joints, at the top and bottom of the hinge pins, and over the lubricators. Paint over with Bostik "AA."



OPERATION 27. Pannier door sealed with Asbestos Compound.

28. GENERAL CHECK-OVER OF VEHICLE.

Fit 6 amp. fuse in spot lamp box in turret, and check circuit by plugging in inspection lamp.

~~Check all exterior and interior lighting.~~

Check 2-pin sockets on instrument panel by plugging in inspection lamp.

Check radio and I.C.

Check ventilation fans.

Check operation.

traverse.

must be rectified imme-

29. TEST HULL IN FRESH WATER— 3 ft. DEEP.

Stand the vehicle in water 3 ft. deep for half an hour to check the hull sealing. Make periodic checks for hull leakage and mark any leak for later attention.

Pay particular attention to the petrol dump valve, and if leakage occurs seal the outer joint of the valve to the hull with Asbestos Compound after test.

30. GUN MAINTENANCE.

Carry out a thorough maintenance routine on all guns.

Test and align gun-sights.

Prepare the bores of the guns as follows:—

Oil the bore and the chamber. Take a piece of rope or strong cord about 30 in. longer than the gun, and make a loop at one end. Feed this lanyard through the bore from the muzzle end, and pass a piece of dry clean rag through the loop, large enough to fit tightly in the gun muzzle. Pull on the other end of the lanyard until the rag has formed a good tight bung.

Fit the canvas covers over the gun muzzles.

Check that the free end of the rope is clear of the breech, and close the chamber with a piece of oiled rag. Make sure it is a tight fit.

(For Besa gun use pull-through TP.19002 in Kit.)

31. SEAL ENGINE COVER DOORS.

TOOLS—

Key carried by Crew.

Scissors—Part No. T.P.18794.

Brush, Wire Scaling—Part No. TP.18793.

Brush, Paint, 2 in.—Part No. TP.18791.

MATERIALS—

Bostik Cleaner No. 1.

Waste.

Bostik "C."

Bostik "AA."

W.D.P.P.

Bostikote Tape.

Check petrol, oil and water levels.

Engine Doors.

Do not seal the rear R.H. engine door at this stage. Check that the door will open fully for access to the oil filler with the turret at 12 o'clock.

Open the doors and clean all mating surfaces. Lock the remaining three doors and fill the hole containing the locking bolt with W.D.P.P.

Clean the top faces of the doors and the hull plate about 2 in. on each side of the joints, first with the scaling brush and then with petrol and No. 1 cleaner.

Fill any large gaps (at hinges, etc.) with W.D.P.P. and smooth off all sharp edges, also with plastic.

Apply a coat of Bostik "C" to the cleaned surfaces and allow it to become tacky. Stick primed Bostikote tape over the joints, and after one hour, paint the edges of the tape with Bostik "AA."

Cut the tape locally at the exhaust pipes and paint the remaining part of the tape liberally with Bostik "AA."

Inspect all roof plate bolts, and clean and paint any doubtful places with Bostik "AA."

GR. PUT BACK (WASSI)

32. CHECK STOWAGE.

Traverse the turret gun to 12 o'clock. Inspect the stowage in the turret compartments and make sure that all items which cannot be stowed with the gun in this position are already in place.

It is essential to do this now as the turret must be locked in the 12 o'clock position when sealed.

33. SEAL TURRET.

TOOLS—

- Vehicle Kit.
- Brush, Wire Scaling—Part No. TP.18793.
- Knife, Putty — Part No. TP.18796.
- Scissors—Part No. TP.18794.
- Brush, Paint, 2 in.—Part No. TP.18791.

MATERIALS—

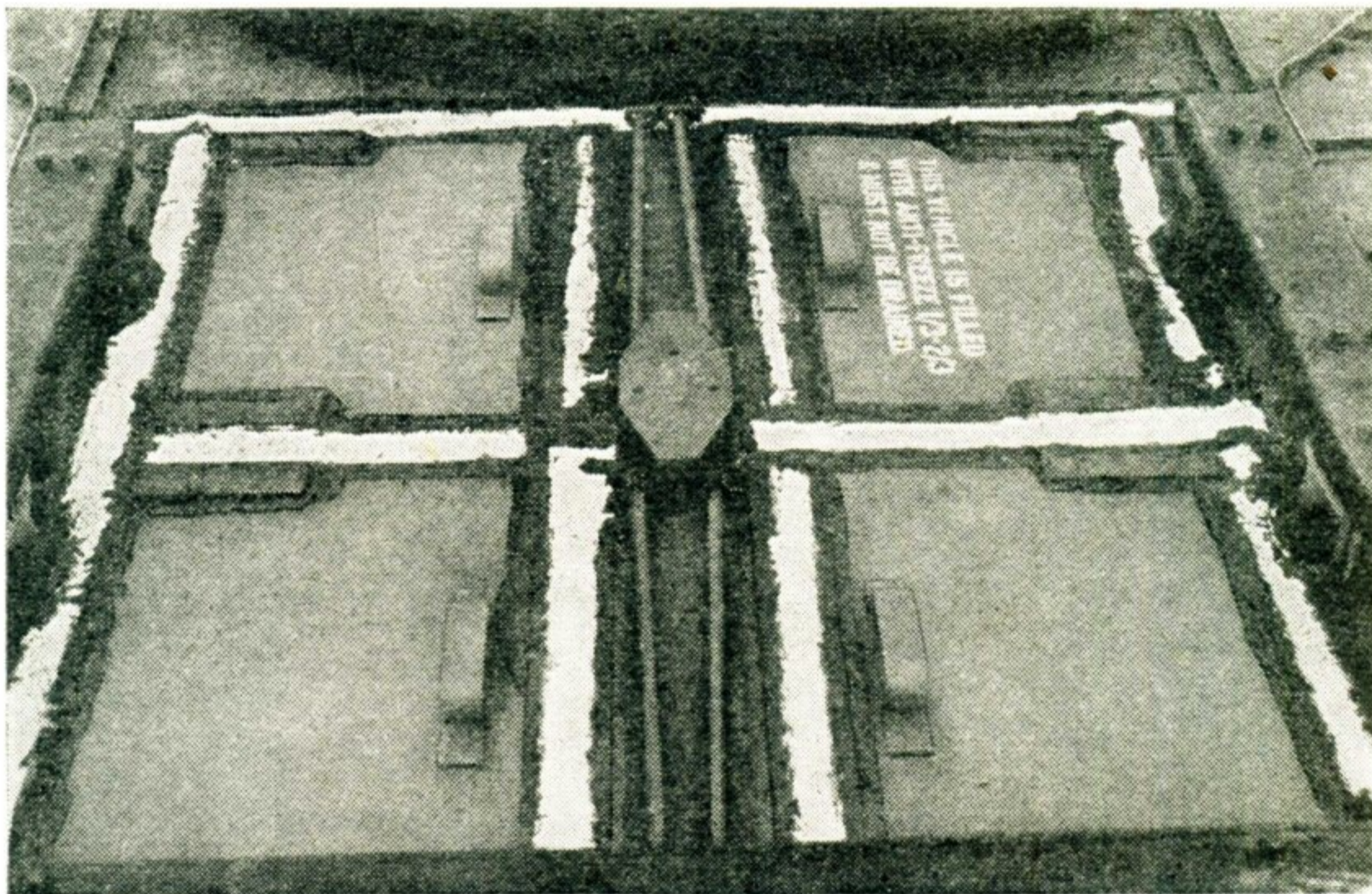
- Petrol.
- Bostik Cleaner No. 1.
- Rag or Waste.
- Cordtex, 28 ft. length.
- Two Detonators.
- Wiring Harness Assembly—Part No. T.P.18748.
- Turret Collar Sealing Fabric—Churchill III, IV, V and VI—Part No. TP.18765.
- Turret Collar Sealing Fabric—Churchill I and II—Part No. TP.18774.
- Asbestos Compound.

W.D.P.P. ~~DELETED~~ ON VII

- Bostik "C."
- Bostik "AA."
- Bostikote Tape, 1½ in. × 3 in.—20 pieces.
- Insulation Tape—from roll.
- Chalk.

Remove the outside bins and the flag bag.

On all turrets seal all cracks round the revolver ports and gun removal aperture with Asbestos Compound and seal the bolt heads with Bostik "AA."



OPERATION 31. Engine cover doors sealed.

Clean the turret ring on the hull roof thoroughly with petrol and cleaner, including the joint of the ring to the hull.

Clean all round the turret wall to the top surface with the wire brush and finish with petrol and cleaner.

"CHURCHILL" III, IV, V and VI.

From the inside of the turret pass the loose ends of the wiring harness through the nearest hole to the 8 o'clock position, plug in the connection to the spot lamp switch box on the nearside of the turret and test the flex by means of an inspection lamp at the free ends.

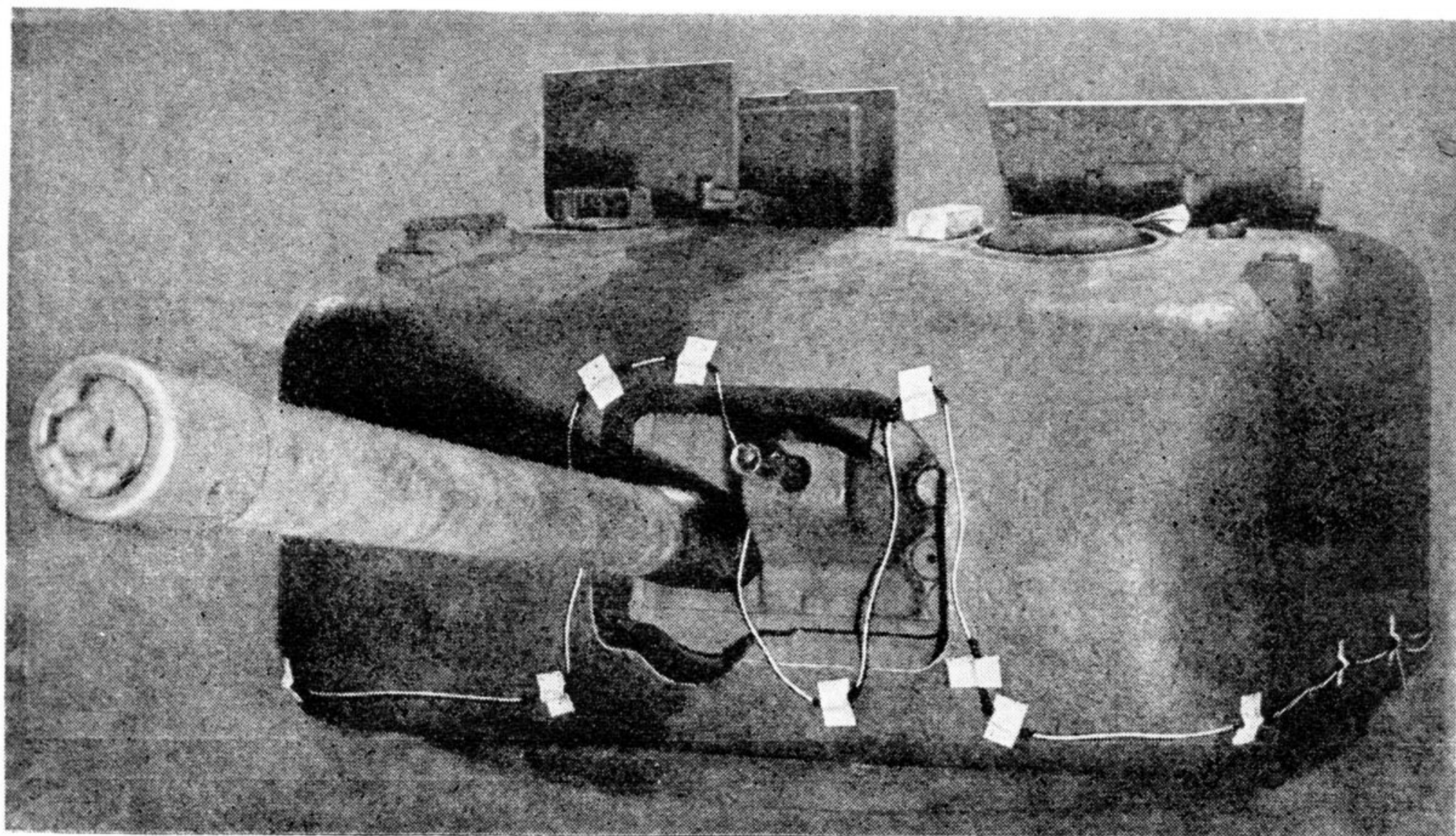
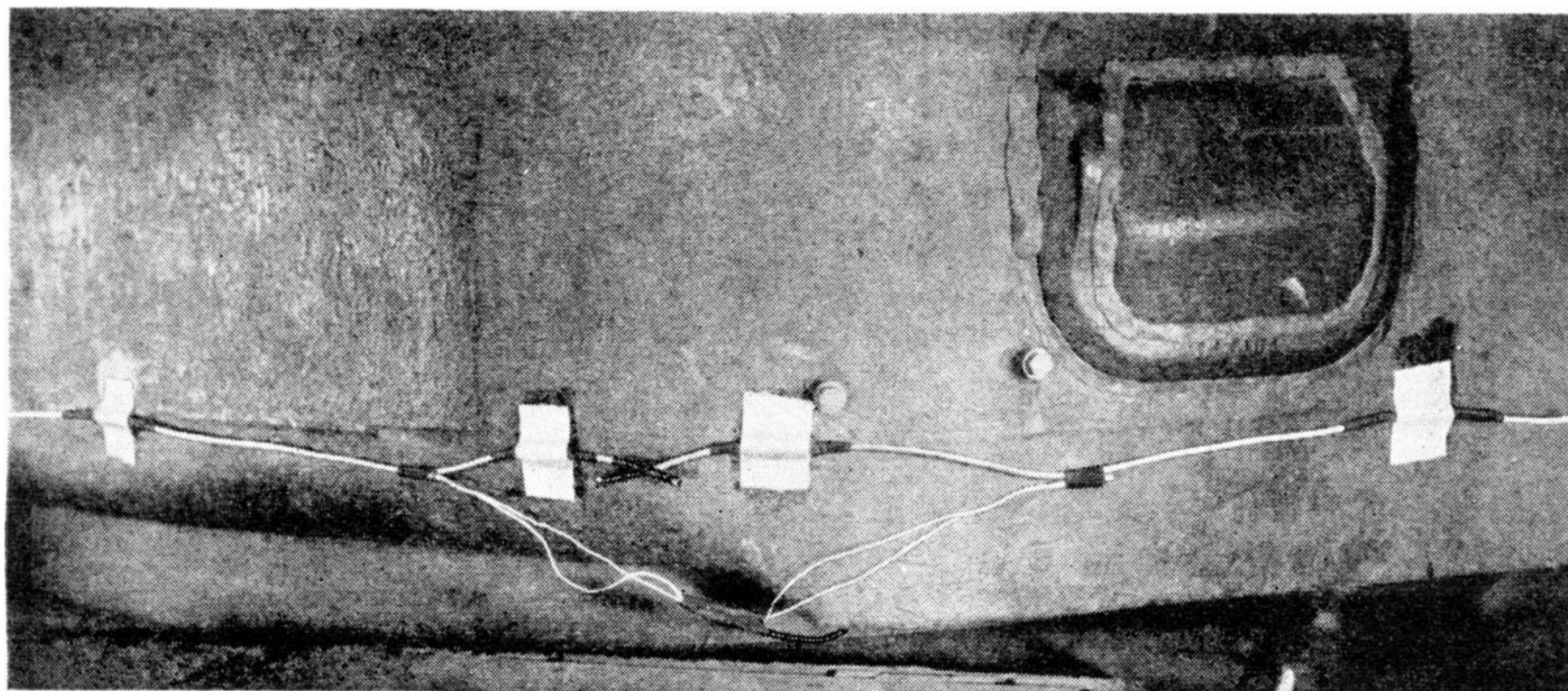
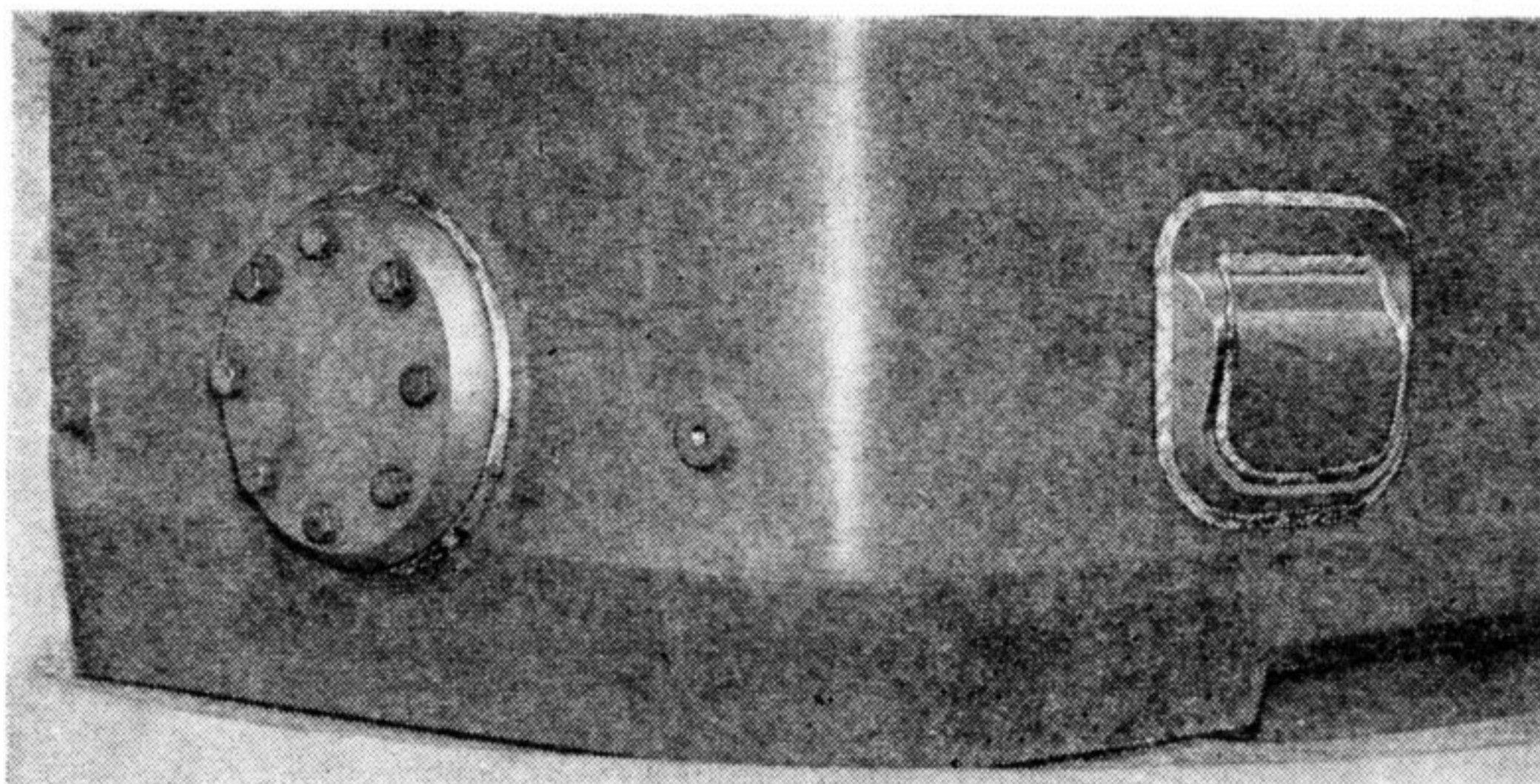
Remove the plug and—with masking tape—**tape up the spot lamp switch in the "off" position so that it cannot be operated accidentally.**

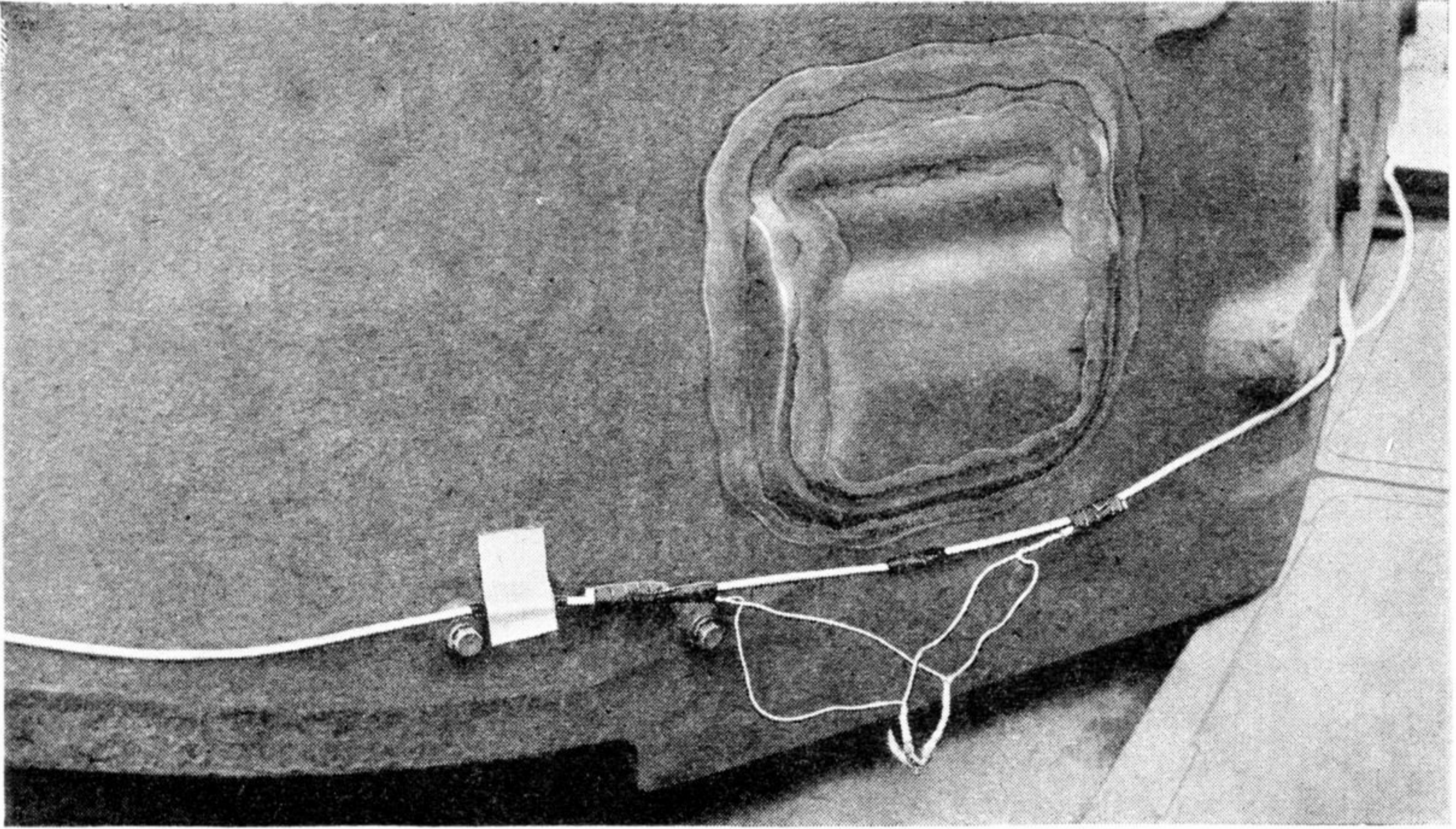
Start the Cordtex with the end half-way between 7 and 8 o'clock, and fix it with Bostikote tape 12 in. from the end, and not more than 3 in. above the top of the turret ring. (NOTE.—The Cordtex must be bound for a distance of 3 in. with

OPERATION 33 (a). Right : sealing of turret revolver port and rear cover.

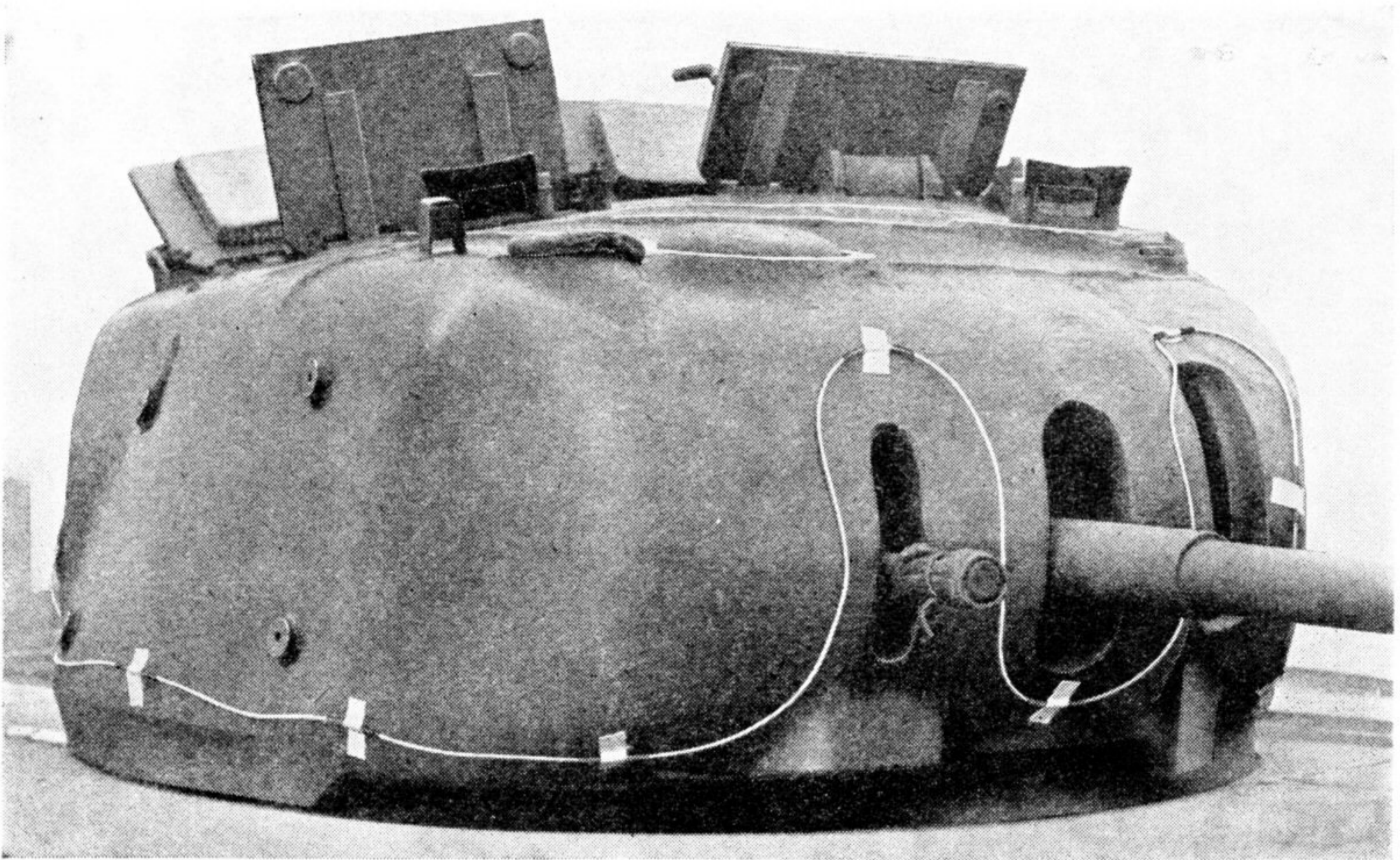
OPERATION 33 (b). Centre : turret Cordtex and detonators.

OPERATION 33 (c). Bottom : Cordtex round gun aperture (Churchill III, IV, V and VI).





OPERATION 33 (d). Cordtex and detonators with flexible lead-in (2 pounder turret).



OPERATION 33 (e). Cordtex round gun aperture (2 pounder turret).

insulation tape before the Bostikote tape is fixed so that the Bostikote does not touch the Cordtex.)

Take the Cordtex round to the front face of the turret, up over the telescope sight opening, down under the Besa, up over the 6-pounder, and down to a position not more than 3 in. above the turret ring. Continue at this level round the turret until it reaches the 8 o'clock position, securing the Cordtex with Bostikote tape (over insulation tape) about every 12 in. The Cordtex ends should overlap each other slightly. Secure a detonator—the leads pointing to the short end of the Cordtex—with insulation tape to each end of the Cordtex, so that the detonators are about 12 in. apart with the leads pointing to the 8 o'clock position.

Attach the free ends of the harness to the detonator leads.

"CHURCHILL" I AND II.

From the inside of the turret, pass the loose ends of the wiring harness through the nearest hole to the 8 o'clock position, plug in the connection to the spot lamp switch box on the nearside of the turret and test the flex by means of an inspection lamp at the free ends. Remove the plug and—with masking tape—**tape up the spot lamp switch so that it cannot be operated accidentally.**

Start the Cordtex with the end half-way between 7 and 8 o'clock, and fix it with Bostikote tape 12 in. from the end, and not more than 3 in. above the top of the turret ring. (NOTE.—*Whenever the Cordtex is secured by sealing tape it must be covered for a distance of 3 in. with insulation tape first so that the Bostikote does not touch the Cordtex.*)

Take the Cordtex round to the front face of the turret, up over the telescope sight opening, down

under the 2-pounder, up over the Besa, and down to a position not more than 3 in. above the turret ring. Continue at this level round the turret until it reaches the 8 o'clock position, securing the Cordtex with Bostikote tape (over insulation tape) about every 12 in. The Cordtex ends should overlap each other slightly. Secure a detonator—the leads pointing to the short end of the Cordtex—with insulation tape to each end of the Cordtex, so that the detonators are about 12 in. apart with the leads pointing to the 8 o'clock position.

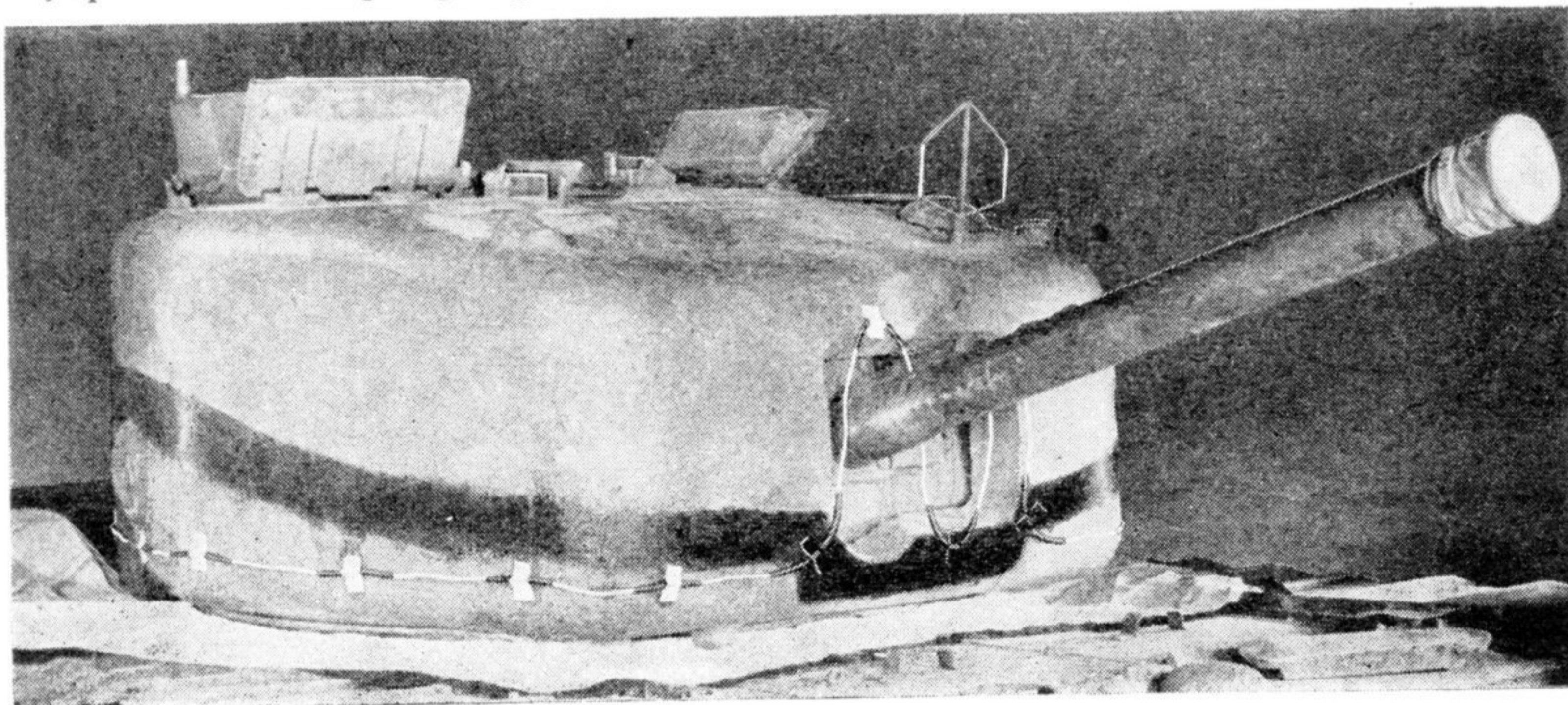
Attach the free ends of the harness to the detonator leads.

Fitting the Fabric (Churchill I-VI).

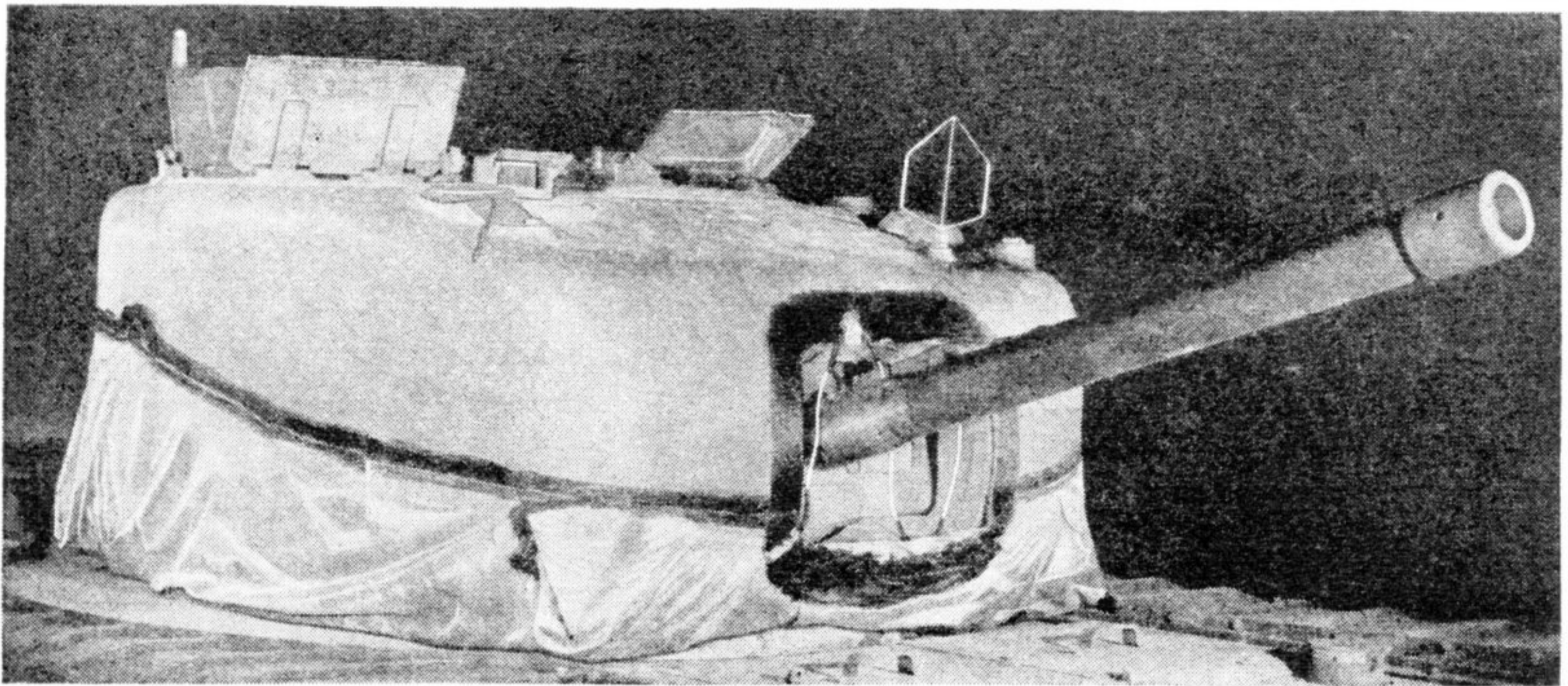
Before starting the sealing operations, examine the fabric for damage and rectify as necessary. Set the gun at 12 o'clock, and offer up the fabric to the turret, to see if it fits. The join in the fabric should be at 12 o'clock and the narrowest part at 9 o'clock. The top edge of the fabric crosses the Cordtex at the gun aperture at two places, and the Cordtex *must* be bound with insulation tape, for a distance of 3 in. above and 3 in. below the edge of the fabric.

All sealing of the turret ring is started from 12 o'clock, and it will be necessary to start with the turret gun at 3 o'clock.

With the turret gun at 3 o'clock, paint the turret ring at 12 o'clock to its full depth with Bostik "C." Rotate the turret slowly clockwise, painting the full width of the turret ring all the way round as the rotation continues. Avoid filling the seam between the turret and the turret ring with Bostik "C," but make sure the joint between the turret ring and the roof plate is sealed. Allow the Bostik "C" to become tacky on the ring.



OPERATION 33 (f). Turret fabric prepared for sealing to turret wall.



OPERATION 33 (g). Turret fabric sealed.

Paint the inner side of the bottom edge of the fabric to a depth of 2 in. with Bostik "C" and allow it to become tacky.

With the turret at 3 o'clock, seal the beginning of the inner side of the bottom edge of the fabric to the turret ring at 12 o'clock. Rotate the turret slowly clockwise, sealing the inner side of the fabric to the turret ring all the way round as the rotation continues. When the operation is complete, there should be an over-lap of approximately 3 in. at 12 o'clock. If the over-lap is excessive, cut the fabric to length. Make sure the over-lap joint is thoroughly sealed. Now fit the centre portion of the mudguards as it is necessary to rotate the turret for this operation and the turret must next be sealed.

Lock the turret with the gun at 12 o'clock. Press the fabric close against the turret wall and mark a line with chalk where the top edge of the fabric finishes. (When securing the fabric to the turret, the top edge should be 1 in. below this chalk line.) Paint a band of Bostik "C" 3 in. wide, with the top edge of the band 1 in. below the chalk line, and paint the inner side of the top edge of the fabric to a depth of 2 in. Allow *both* to become tacky.

Seal the top edge of the fabric to the turret wall, 1 in. below the chalk line, doing each side of the gun aperture first, and stretching the fabric slightly in an outwards direction. Now trim the fabric to the lower edge of the gun aperture, and seal the over-lap at the 12 o'clock position. If the over-lap exceeds 3 in., trim to size. Continue along both sides of the turret at the same time, sealing the top edge of the fabric 1 in. below the chalk line. Pleats in the fabric will be necessary, and the exposed edge of the pleats should

point to the rear. Finally, seal the fabric round the back of the turret, 1 in. below the chalk line, making pleats where necessary.

Wherever bosses for mounting the external stowage fixtures are covered by the fabric, a hole must be cut in the fabric large enough to allow the boss to protrude through the hole, and the fabric must be sealed to the turret immediately round the boss with Bostik "C."

After one hour, inspect all joints, including *all* pleats, and make good any faults with Bostik "C." If there are no faults, paint all round the top edge with Bostik "AA." If there are faults to make good, leave the rectified parts for another hour before painting round the top edge with Bostik "AA."

34. SEAL TURRET GUN APERTURE.

TOOLS—

None.

MATERIALS—

Petrol.

Bostik Cleaner No. 1.

Rag or Waste.

Sealing Fabric "Churchill" III, IV, V and VI
—Part No. TP.18766.

OR

Sealing Fabric "Churchill" I and II—
Part No. TP.18775.

Spare Patch—Part No. TP.18771.

Bostik "C."

Bostik "AA."

Insulation Tape—from roll.

Chalk.

"CHURCHILL" III, IV, V and VI.

Slit the small end of the sealing fabric just sufficiently to pass over the 75 mm. muzzle brake, or the balance weight on the 6 pdr. and 95 mm.

Offer up the fabric cover over the gun aperture, keeping the barrel end of the fabric 12 in. from the aperture. Mark with chalk where the edges of the fabric meet the turret. Paint the turret wall inside the chalk marks with a 2 in. band of Bostik "C," and paint the inner side of the top edge of the fabric to a depth of 2 in. Allow *both* to become tacky.

Bostik must not be allowed to touch the Cordtex at any time.

Seal the fabric to the turret wall, making pleats where necessary, and after one hour, finish the fabric edges with Bostik "AA."

Pull the barrel end of the fabric cover back and paint the gun barrel with Bostik "C." Replace the cover, overlap the slit and seal with Bostik "C." Seal the end with two layers of insulation tape.

"CHURCHILL" I AND II.

Telescope Aperture Cover—Spare Patch.

Offer up the spare patch over the telescope opening and cut the patch to size so that it overlaps the Cordtex by 4 in. all round. On the right-hand side it should touch the gun aperture, so that the gun aperture cover will overlap the patch. Mark the position with a chalk line and protect the Cordtex with insulation tape wherever the patch crosses the Cordtex. Paint a 2 in. band of Bostik "C" inside the chalk line and also on the inside edges of the fabric. Allow both to become tacky—*Bostik must not be allowed to*

touch the Cordtex at any time—and secure the patch to the turret wall.

Gun Aperture Cover.

Offer up the fabric cover over the gun aperture, keeping the barrel end of the fabric about 12 in. from the aperture. Mark with chalk where the edges of the fabric meet the turret. Paint the turret wall inside the chalk marks with a 2 in. band of Bostik "C," and paint the inner side of the top edge of the fabric to a depth of 2 in. Allow *both* to become tacky.

Bostik must not be allowed to touch the Cordtex at any time.

Seal the fabric to the turret wall making pleats where necessary, and, after one hour finish all fabric edges with Bostik "AA."

Pull the barrel end of the fabric cover back and paint the gun barrel with Bostik "C." Replace the cover and seal the end with two layers of insulation tape.

35. SEAL TURRET GUN MUZZLES.

TOOLS—

Brush, Paint, 2 in.—Part No. TP.18791.

MATERIALS—

Petrol.

Bostik Cleaner No. 1.

Rag or Waste.

Turret Gun Muzzle Sealing Fabric.

Churchill III and IV—Part No. TP.18767.

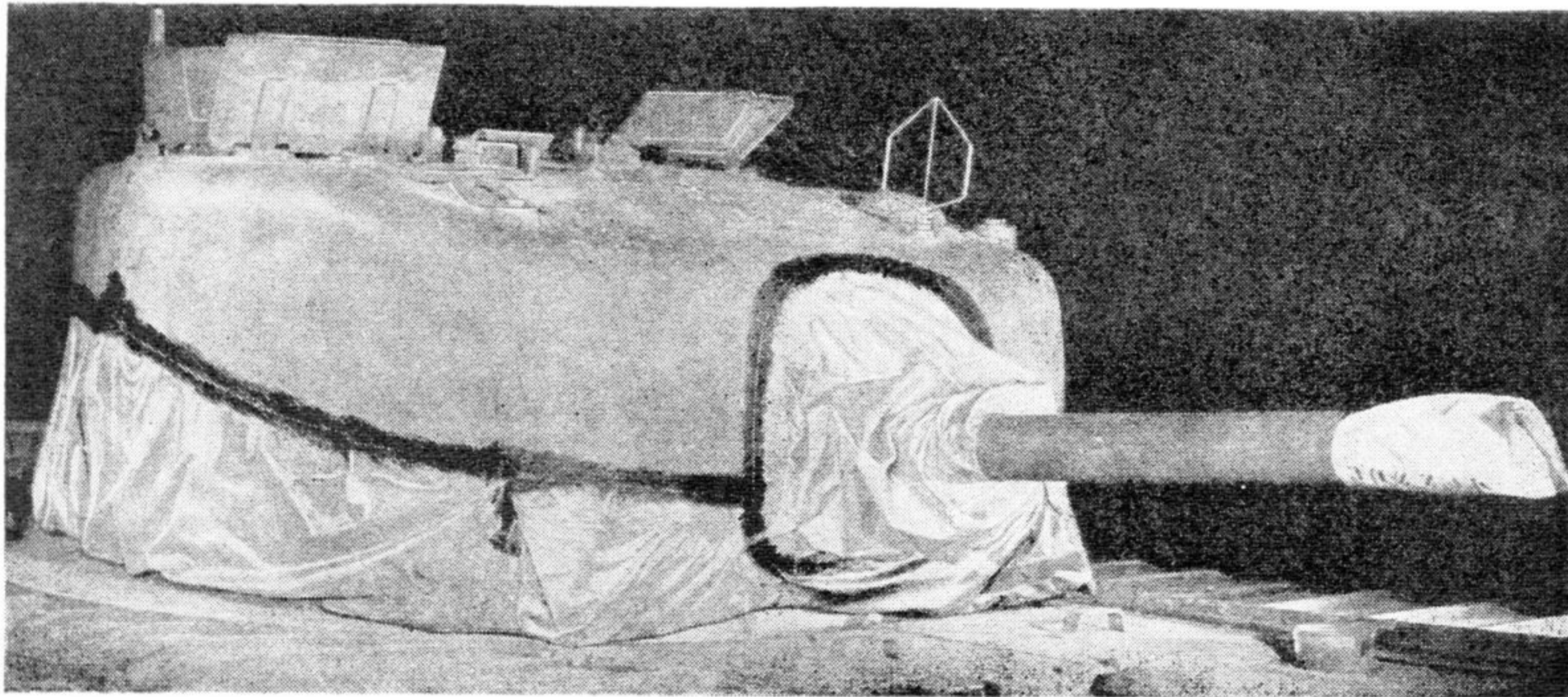
Churchill V and VI —Part No. TP.23428.

Churchill I and II —Part No. TP.18776.

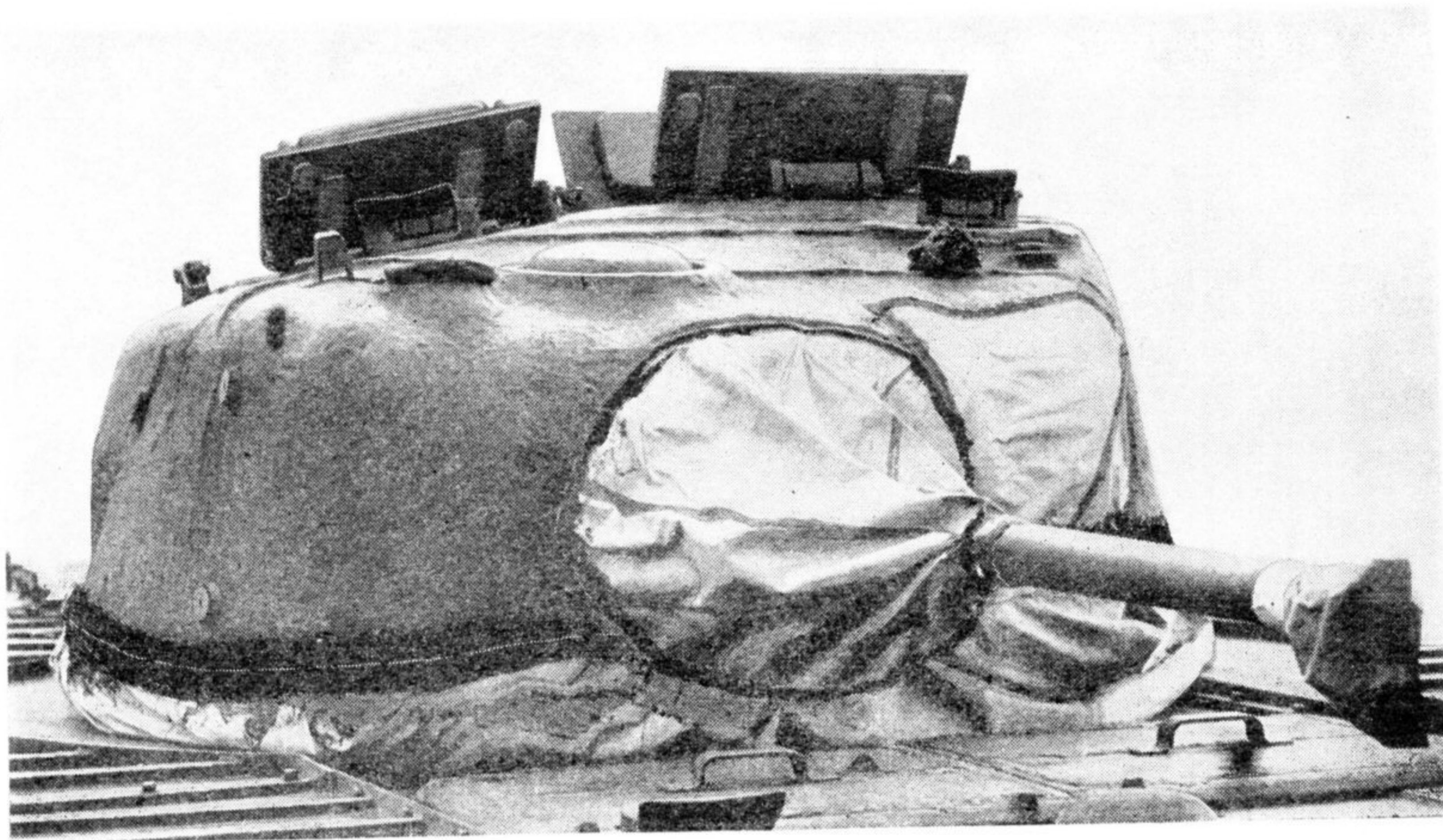
Bostik "C."

Insulation Tape—from roll.

Chalk.



OPERATIONS 34 and 35. Turret gun aperture and muzzle fabric sealed (Churchill III, IV, V and VI).



OPERATION 34 (b). Turret, gun aperture and muzzle fabric sealed (2 pound turret).

Remove the canvas muzzle covers.

Clean the gun barrel about 15 in. from the muzzle end, offer up the muzzle cover and mark the position. Paint a 2 in. band of Bostik "C" round the gun barrel forward of the chalk line, and fit the cover. Seal by binding two layers of insulation tape around the edge of the fabric cover.

36. SEAL SMOKE MORTAR OPENING.

TOOLS—

None.

MATERIALS—

Petrol.

Bostik Cleaner No. 1.

Rag or Waste.

Smoke Mortar Sealing Fabric—Part No. TP.18772.

Bostik "C."

Remove the canvas cover and stow it inside the vehicle. Attach the fabric cover over the smoke mortar opening with a band of Bostik "C" no wider than 1 in.

37. SEAL AERIAL BASES AND PROTECT HAND MICROPHONES.

TOOLS—

None.

MATERIALS FOR AERIAL BASES—

Petrol.

Bostik Cleaner No. 1.

Rag or Waste.

Bostik "AA."

Seal round the joints of both aerial bases and all attaching bolts with Bostik "AA."

MATERIALS FOR HAND MICROPHONES—

Waterproof Bags—TP.23429 (3 off).

Stow all turret hand microphones in waterproof bags.

38. SEAL TURRET PERISCOPES.

TOOLS—

None.

MATERIALS—

Petrol.

Bostik Cleaner No. 1.

Rag or Waste.

Asbestos Compound. — REVERSED

Grease, G.S.

Anti-Dim.

Undo the periscope housing at the hinge joint and remove the top prism. Clean the prism casing, coat it with G.S. grease and replace it in the housing. Remove any excess grease from the junction between the prism casing and the periscope housing. Re-make the periscope housing.

Lock the periscope in the required position.
Clean the joint between the top prism and the rotating armour case and smear it liberally with Grease, G.S.

Carefully clean the joint between the rotating armour case and the roof, and apply Asbestos Compound all round the joint.

Give the prism outside glass a coat of Anti-Dim.

39. SEAL CUPOLA BALL RACES.

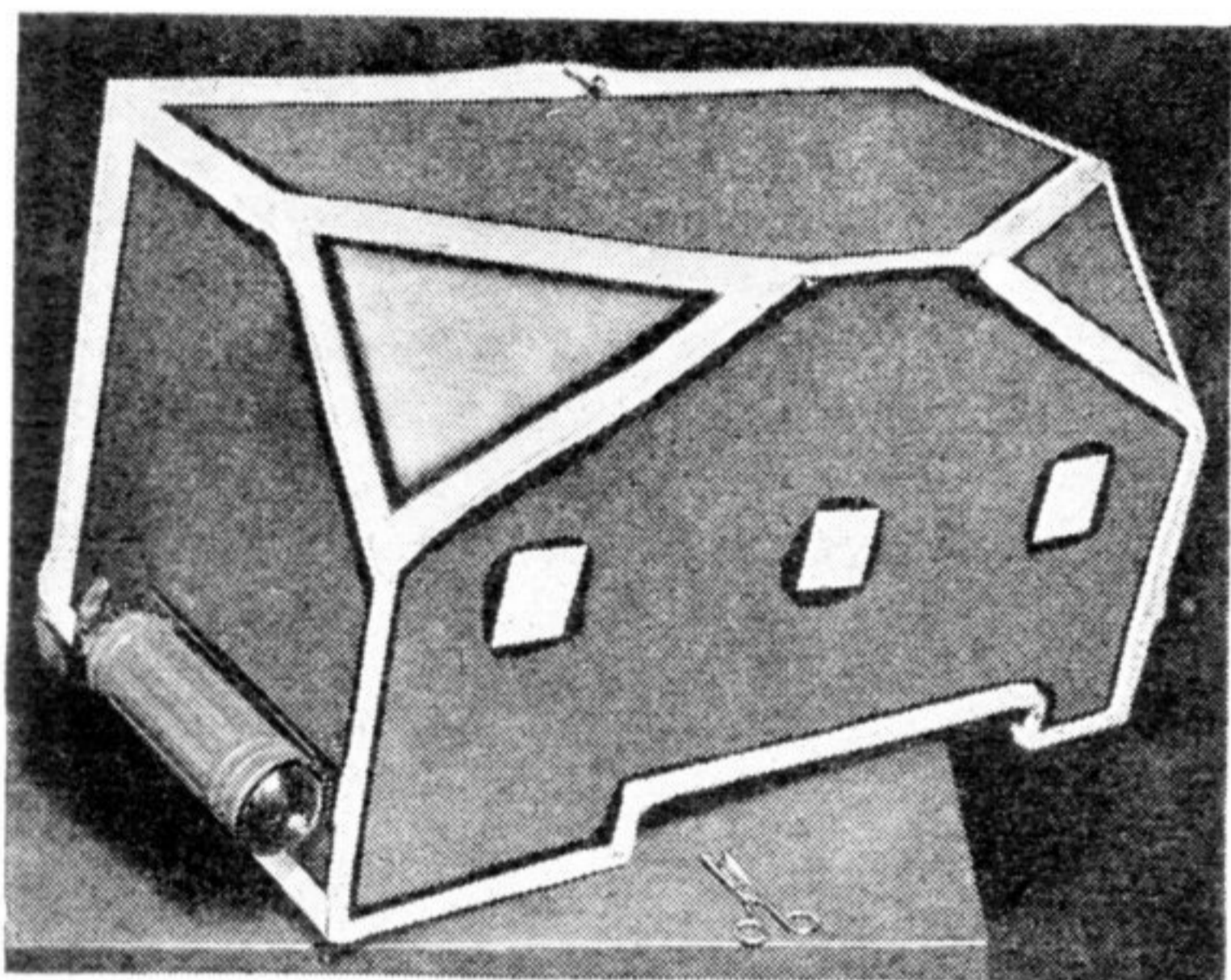
TOOLS—

None.

MATERIAL—

Grease G.S.

Cover liberally with G.S. grease the race rings and balls of the cupola ball races.



OPERATION 40. Sealing of turret bin.

40. SEAL OUTSIDE STOWAGE BINS.

TOOLS—None.

MATERIALS—

Petrol.

Bostik Cleaner No. 1.

Rag or Waste.

Bostikote Tape.

Cover the drain holes in the bottom of the bins and seal all seams with Bostikote tape.

The lid will be sealed later when the equipment is finally stowed.

Refit the bin or bins.

RAISED ON IT

41. REPLACE FLAG BAG.

TOOLS—Vehicle Kit.

MATERIALS—None.

Refit flag bag in its correct position.

42. FIT BATTERY RECESS APRON.

TOOLS—

Brush, Paint, 2 in. — Part No. TP.18791.

MATERIALS—

Battery Recess Sealing Fabric — Part No. TP.18770.

Bostik "C."

Clean the vertical face at the top of the battery recess, and paint a 2 in. wide band on it with Bostik "C." Paint a similar band of Bostik "C," 2 in. wide, along the inner side of one of the short edges of the fabric. Allow both surfaces to become tacky and secure the fabric apron, so that it hangs down over the battery recess.

43. SEAL FRONT GUNNER'S ESCAPE DOORS.

TOOLS—

Key carried by Crew.

Brush, Wire Scaling—Part No. TP.18793.

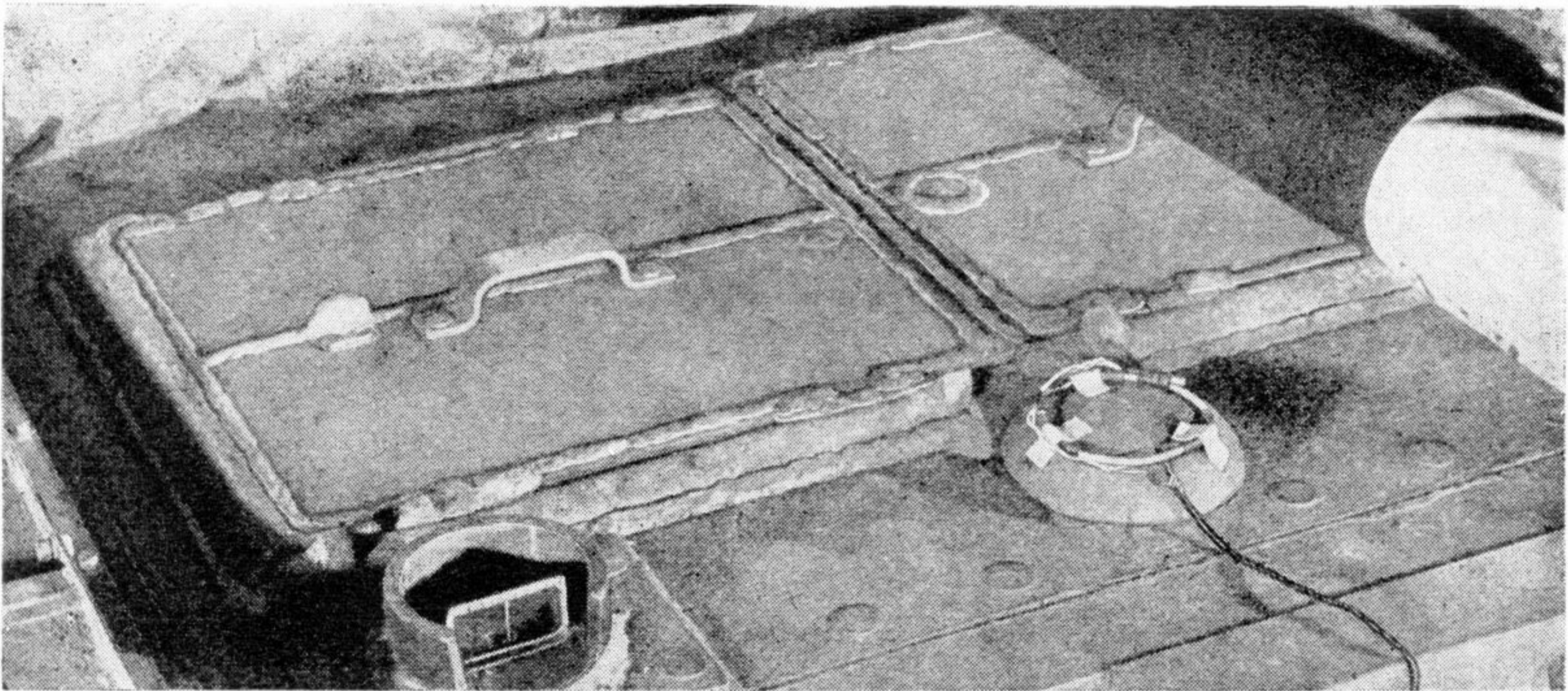
MATERIALS—

Petrol.

Bostik Cleaner No. 1.



OPERATION 42. Apron over battery recess.



OPERATIONS 43 and 56. Sealing of front gunner's and driver's escape doors in hull roof.

Rag or Waste.

Asbestos Compound. *REVISED*

REVISED Open the escape doors and clean the drain channels on the edges of the doors and door openings with the wire brush, followed with petrol and cleaner. Close and lock the doors, and force Asbestos Compound into all visible joints, including the recesses for the locks. Make sure that the holes leading through the corners of the frames into the drain channels are sealed with Asbestos Compound. Check the sealing round the door frames and repair as necessary with Asbestos Compound. *REVISED*

Build up the recess between the ventilation dome and the door frame with Asbestos Compound for about 4 in. long to give a smooth surface suitable for fitting fabric.

The driver's escape doors are sealed in Stage 3.

44. SEAL FRONT PERISCOPES.

TOOLS—

None.

MATERIALS—

Petrol.

Bostik Cleaner No. 1.

Rag or Waste.

Asbestos Compound. *REVISED*

Grease, G.S.

Anti-Dim.

Undo the periscope housing at the hinge joint and remove the top prism. Clean the prism casing, coat it with G.S. grease and replace it in the housing. Remove any excess grease from the junction between the prism casing and the periscope housing. Re-make the periscope housing.

Lock the periscope in the required position.

Clean the joint between the top prism and the rotating armour case and smear it liberally with Grease, G.S. *not Lenoche.*

REVISED Carefully clean the joint between the rotating armour case and the roof, and apply Asbestos Compound all round the joint.

Give the prism outside glass a coat of Anti-Dim.

45. SEAL FRONT FAN VENTILATION DOME.

TOOLS—

Brush, Wire Scaling—Part No. TP.18792.

Brush, Paint, 2 in.—Part No. TP.18791.

MATERIALS—

Petrol.

Bostik Cleaner No. 1.

Rag or Waste.



OPERATION 45. Cordtex fitted to front fan ventilation dome.

Cordtex—2 ft. 0 in. long.
Detonator.
Wiring Harness Assembly—Part No. TP. 18750.
Front Fan Vent Sealing Fabric—Part No. T.P.18769.
Bostik “AA.”
Bostik “C.”
Bostikote Tape—1½ in. × 3 in.—3 pieces.
Asbestos Compound. *REVISED*
Insulation Tape—from roll.
Chalk.

Pass the free ends of the wiring harness through the lower right-hand corner of the gun mounting, with the gun elevated and locked. Plug in the adaptor to the instrument panel socket and test the free ends with an inspection lamp. Remove the plug, and **tape over the two pins with insulation tape to prevent accidental plugging in.**

Clean with petrol and cleaner the ventilation dome and the surface for about 12 in. around the dome.

Attach the detonator about 4 in. from one end of the Cordtex—with the leads pointing to the short end of the Cordtex—and bind with insulation tape. Arrange the Cordtex around the dome as shown in the illustration with the detonator at 12 o'clock and decide the best position for securing strips. Cover the Cordtex with insulation tape for about 3 in. at each of these positions and secure the Cordtex to the roof with the Bostikote tape.

Offer up the fabric patch and mark the position with chalk. Paint a 2 in. band of Bostik “C” inside the chalk line, and on the inside edges of the fabric. Allow both to become tacky. Fit the fabric so that it is loose over the dome, and pleat it as required. After one hour, paint the edges with Bostik “AA.”

46. SEAL FRONT GUN.

TOOLS—

Brush, Wire Scaling—Part No. TP.18792.
Brush, Paint, 2 in.—Part No. TP.18791.
Scissors—Part No. TP.18794.

MATERIALS—

Petrol.
Bostik Cleaner No. 1.
Rag or Waste.
Cordtex—4 ft. long.
Detonator.
Wiring Harness Assembly—Part No. TP.18750.
(Already fitted.)
Front Gun Sealing Fabric—Part No. TP.18768.
Spare Patch—TP.18771—for “Churchill” I only.
Bostikote Tape—1½ in. × 3 in.—5 pieces.
Bostik “C.”

Bostik “AA.”
Bostik “692.”
Asbestos Compound. *REVISED*
Insulation Tape—from roll.
Chalk.

“CHURCHILL” II, III, IV, V and VI.

The wiring harness is already fitted under operation No. 45, “Sealing Front Fan Ventilation Dome.”

Clean with petrol and cleaner the front plate round the gun aperture and for about 6 in. down the front sloping plate. Fill the corner between the front vertical plate and the front sloping plate with Asbestos Compound to form an easy curve.

Attach the detonator about 4 in. from one end of the Cordtex—with the leads pointing to the short end of the Cordtex—and bind it with insulation tape.

Offer up the Cordtex to fit round the gun aperture in the front plate, half an inch from the edge, with the detonator at the lower right-hand corner, and decide the best positions for securing strips. Cover the Cordtex with insulation tape for about 3 in. at each of these positions, and secure the Cordtex to the front vertical plate with Bostikote tape.

Offer up the fabric bag with the edges 5 in. from the edges of the gun aperture; this will bring the bottom edge approximately 3 in. down the front sloping plate. Mark the front plate with chalk round the edges of the fabric, and paint a 2 in. band of Bostik “C” inside the chalk line. Paint a 2 in. band of Bostik “C” on the inside edges of the fabric bag and allow all Bostik “C” surfaces to become tacky. Secure the bag, pleating it as necessary, and after one hour, paint round the edges with Bostik “AA.”

“CHURCHILL” I.

The wiring harness is already fitted under operation No. 45, “Sealing Front Fan Ventilation Dome” (page 42).

Clean with petrol and cleaner the front plate round the gun aperture and for about 6 in. down the front sloping plate. Fill the corner between the front vertical plate and the front sloping plate with W.D.P.P. to form an easy curve.

Attach the detonator about 4 in. from one end of the Cordtex—with the leads pointing to the short end of the Cordtex—and bind it with insulation tape.

Offer up the Cordtex to fit round the gun aperture in the front plate, half an inch from the edge, with the detonator at the lower right-hand corner, and decide the best positions for securing strips.

Cover the Cordtex with insulation tape for about 3 in. at each of these positions and secure the Cordtex to the front vertical plate with Bostikote tape.

Cut a hole in the front end of the fabric bag large enough to slide over the gun barrel.

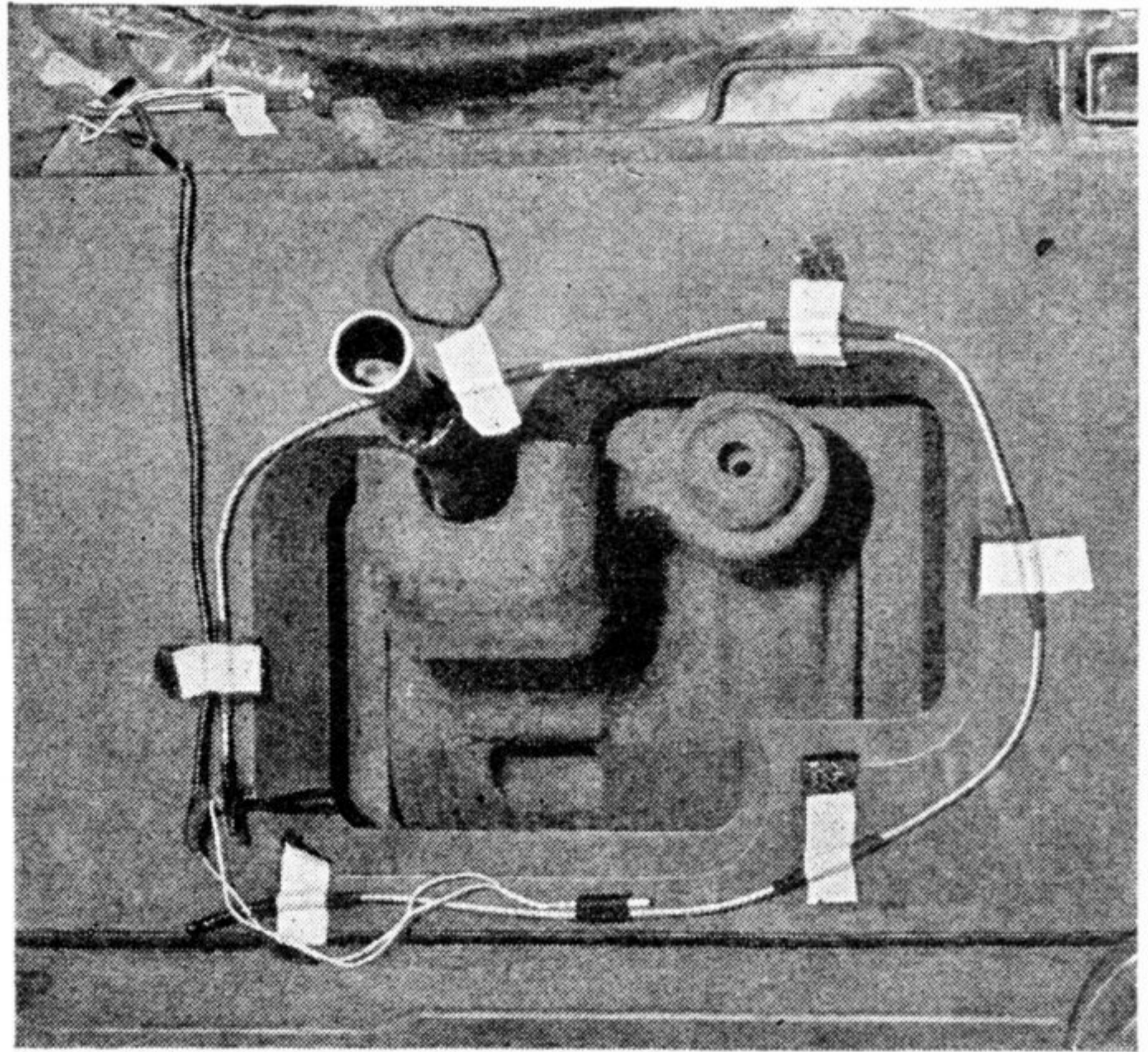
Offer up the fabric cover with the edges 5 in. from the edges of the gun aperture; this will bring the bottom edge approximately 3 in. down the front sloping plate. Mark the front plate with chalk round the edges of the fabric, and paint a 2 in. band of Bostik "C" inside the chalk line. Paint a 2 in. band of Bostik "C" on the inside edges of the fabric cover, and allow all Bostik "C" surfaces to become tacky. Secure the cover, pleating it as necessary, and after one hour, paint round the edges with Bostik "AA."

Slide the fabric cover back towards the front plate, make a line on the gun barrel 12 in. from the front plate, and clean with petrol and cleaner a band 6 in. wide round the gun barrel towards the front plate. Mark a line 9 in. from the front plate, and paint a band of Bostik "C" 2 in. wide on the side of the line towards the front plate. Allow to become tacky, pull the cover level with the edge of the chalk line and secure it. Finally, seal the cover by binding two layers of insulation tape over the edge of the fabric.

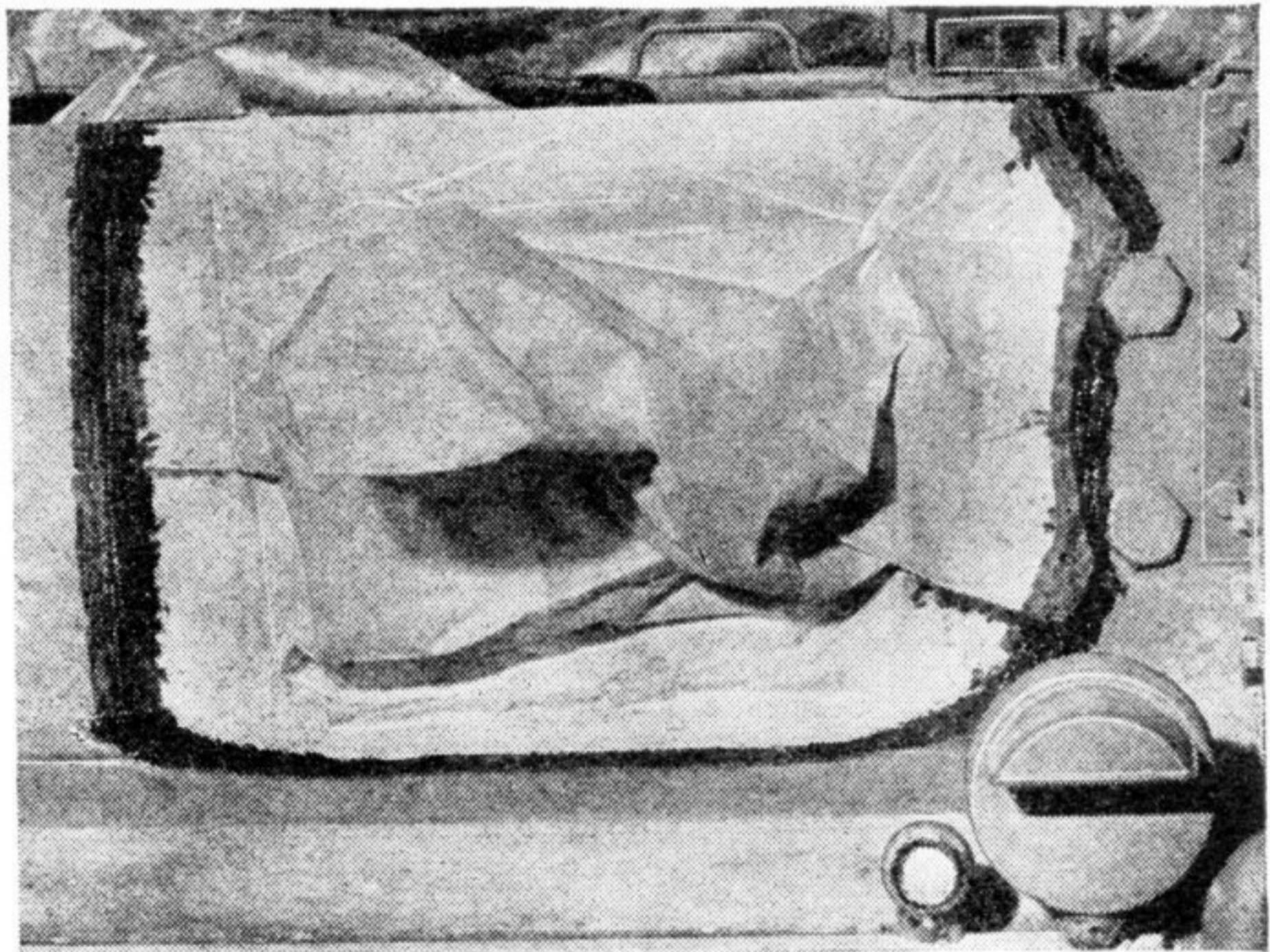
Gun Muzzle.

Clean the gun barrel about 15 in. from the muzzle end. Then—round the gun muzzle—form the "Spare patch, sealing fabric, Part No. TP.18771," into a cover similar to the turret gun muzzle cover, and mark the position.

Paint a 2 in. band of Bostik "C" round the gun barrel forward of the chalk line, and fit the cover. Seal the cover by binding two layers of insulation tape round the edge of the fabric.



OPERATION 46 (a). Front gun Cordtex.



OPERATION 46 (b). Front gun sealed (Churchill II, III, IV, V and VI).

47. REFIT SIDE LOUVRES.

TOOLS—

Vehicle Kit.

MATERIALS—

Petrol.

Bostik Cleaner No. 1.

Rag or Waste.

Asbestos Compound.

Bostik "AA."

REVISED

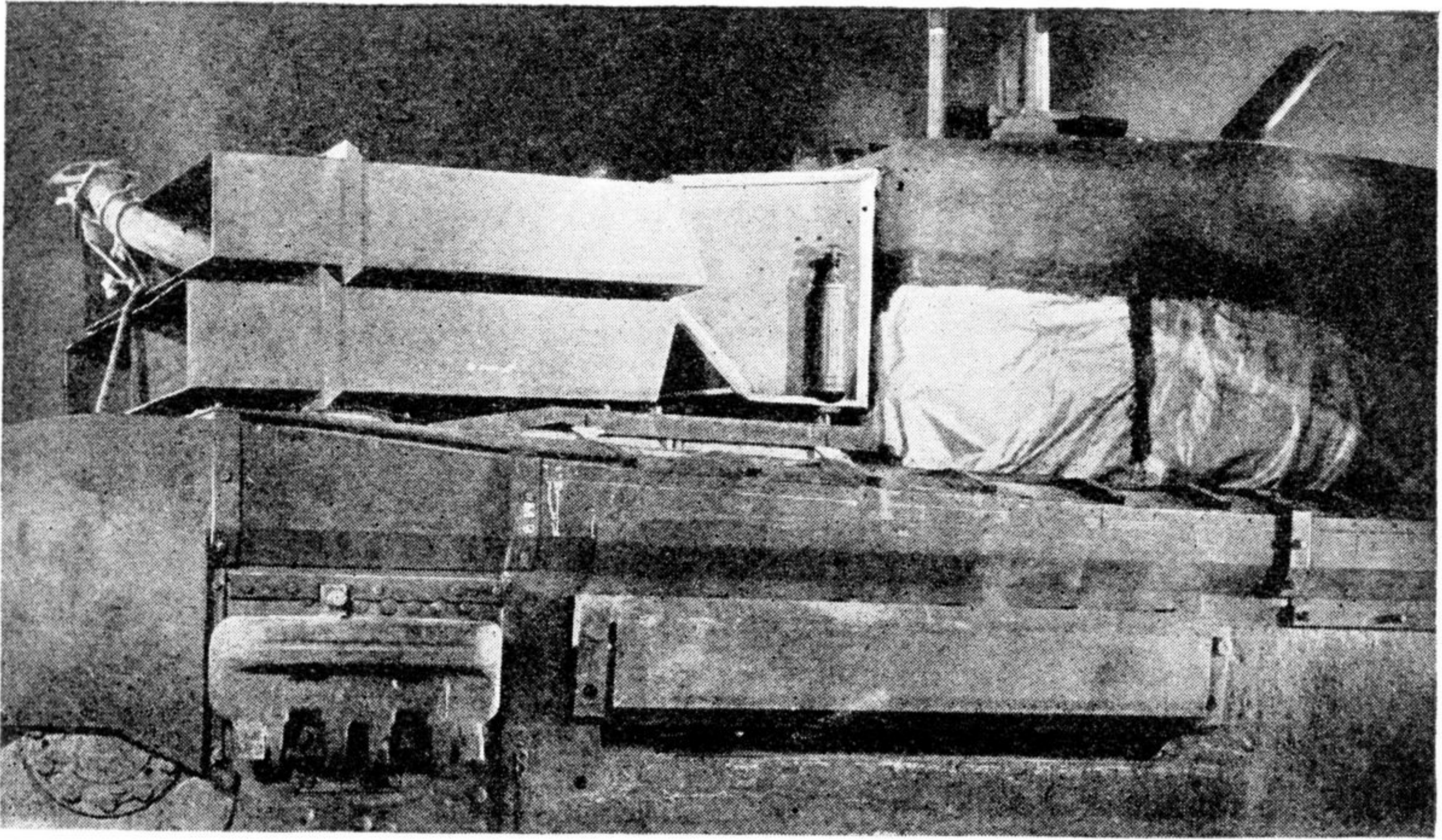
IF GOING BY RAIL.

Inspect the hull and louvre mating faces and clean off any projecting welds flush to the hull. Do not *refit* the louvres at this stage.

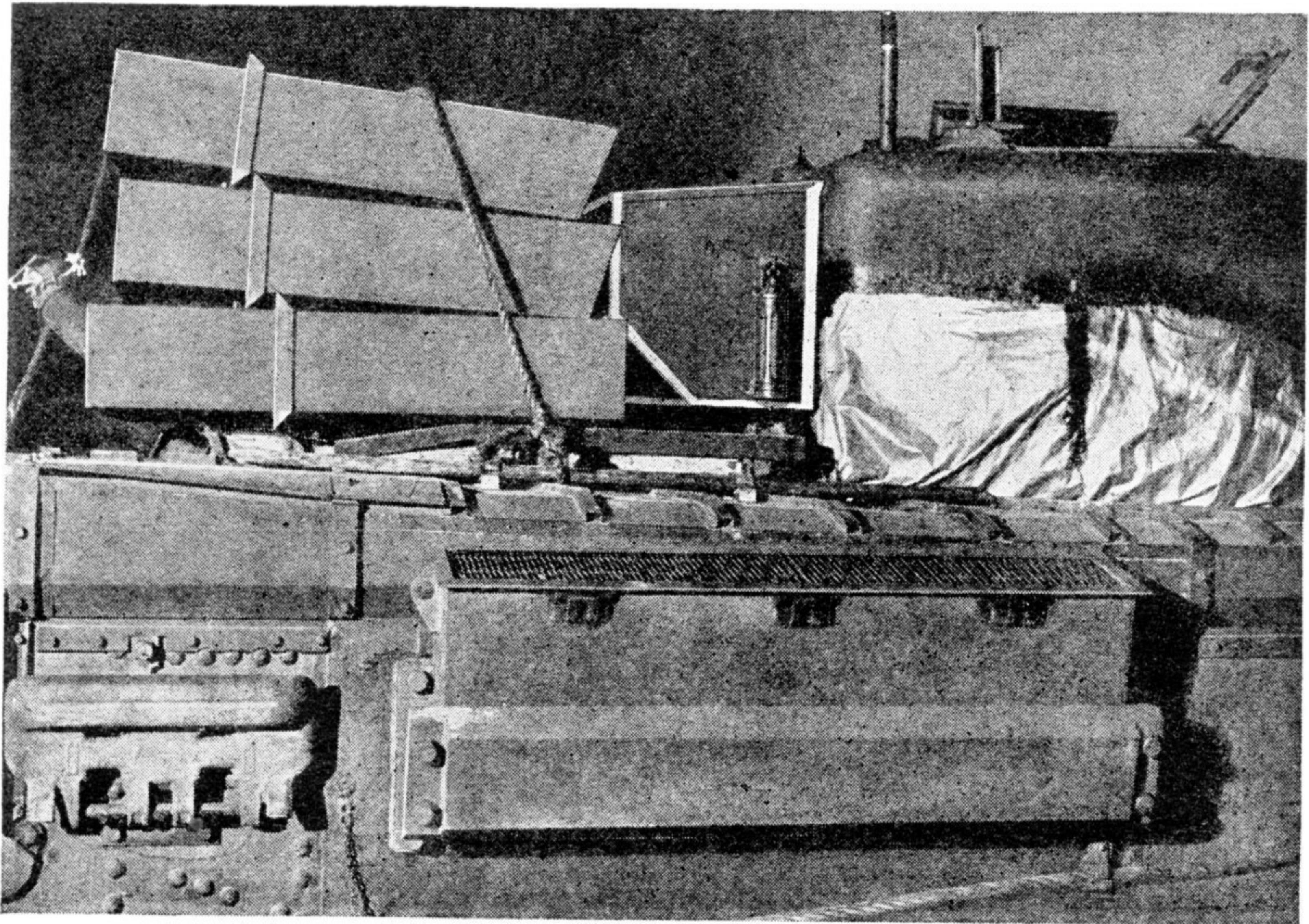
IF GOING BY ROAD.

Examine louvre body and trunking for damage or broken welds. Repair where necessary.

Inspect the hull and louvre mating faces and clean off any projecting welds flush to the hull.



OPERATION 48 (a). Parts stowed for *rail* transport.



OPERATION 48 (b). Parts stowed for *road* transport.

REVISÉD
Clean with petrol and cleaner the mating faces of the hull and the louvres. Apply Asbestos Compound liberally to the mating face of the louvres and fit the louvres. *The Asbestos Compound seal must not be damaged in fitting.* (A good joint will be shown by the Asbestos Compound being squeezed out all round the edges of the louvres.)

Finish the sealing by pressing into the joint the Asbestos Compound which has been squeezed out, and paint over with Bostik "AA."

Replace the tow ropes, etc.

NOTE.—*Check the louvre bolts for tightness after 24 hours as the Asbestos Compound will then have settled down.*

STRESS =
48. BEFORE DEPARTURE FOR EMBARKATION.

WAS 30
MATERIALS—

Track Rope, from Vehicle Kit, and additional rope as required.

IF GOING BY RAIL.

Stow the side louvres—less armour plate—on

the rail flat under the tank. Stow the rear air duct on the flat under the tank.

Fit the side louvre armour plates on the hull side, covering the gap in the hull. Hold them in position by fitting bolts in the two top holes.

Stow all stay rods under the silencers and secure them there. *Keep clear of the turret fabric.*

Stow the two side ducts on top of the engine compartment and secure them with rope. Stow the exhaust pipe extensions inside the lower duct and secure them in position.

Stow the box containing the release gear and other parts inside the vehicle.

After de-training, stow the rear air duct on top of the two inlet ducts and secure it there.

IF GOING BY ROAD.

Stow all stay rods under the silencers and secure them there. *Keep clear of the turret fabric.*

Stow the three air ducts on top of the engine compartment and secure them with rope. Stow the exhaust pipe extensions inside the lower duct and secure them in position.

Stow the box containing the release gear and other parts inside the vehicle.

REAR PANELS REVISED

IMPORTANT.—The vehicle must not be driven more than 75 miles after the completion of Stage I sealing.

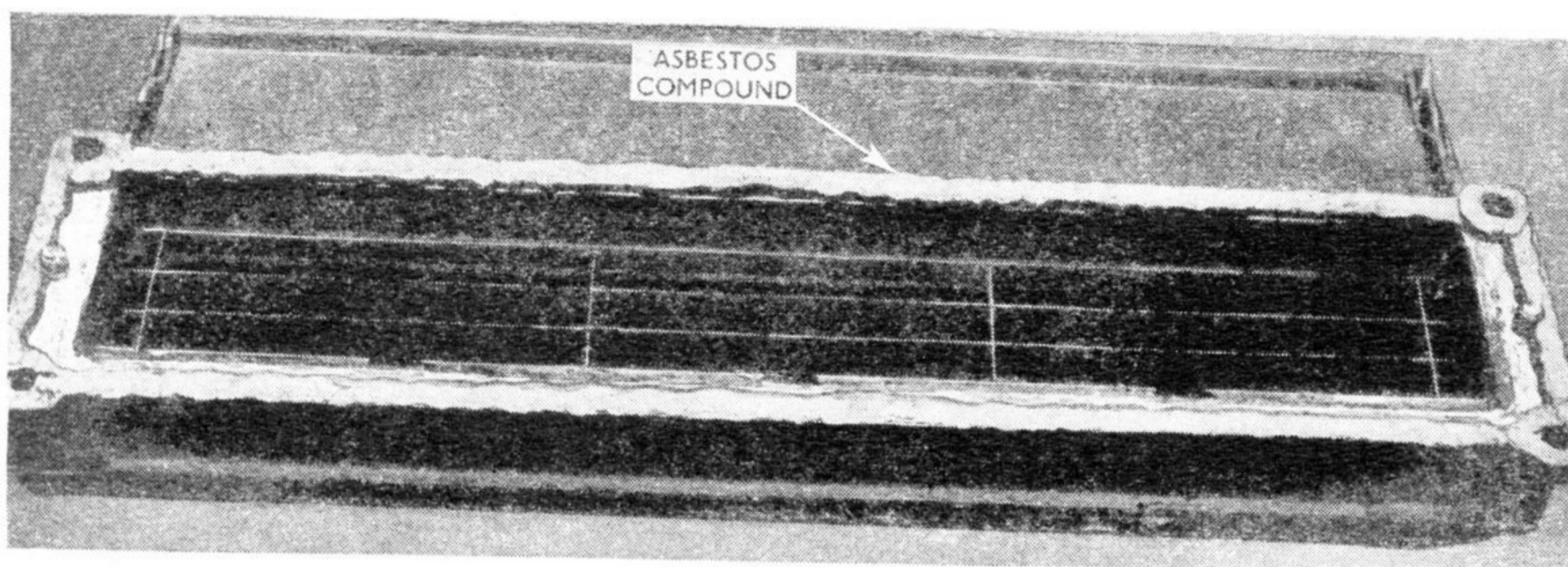
Vehicles have been immobilised through their tracks rusting up during a protracted sea voyage. This can be prevented by oiling the tracks. **A used petrol tin must be filled with waste engine oil and stowed in the vehicle for this purpose.**

Stage 2

INSTRUCTIONS TO UNIT AT EMBARKATION POINT

Comprising the following operations

- | | |
|----------------------------------|---|
| 49. Replenish Bogie Axle Shafts. | 52. Protect External Fittings. |
| 50. Refit Side Louvres. | 53. Seal Right-hand Rear Engine Cover Door. |
| 51. Final Check on Hull Sealing. | 54. Seal Gearbox Cover Doors. |



OPERATION 50 (a). Side louvre prepared with Asbestos Compound ready for fitting to hull.

49. REPLENISH BOGIE AXLE SHAFTS.

WAS 52. Lubricate all *bogie axle shafts* with C.600 in the normal way.

50. REFIT SIDE LOUVRES. (On vehicles sent by rail.)

WAS 53. TOOLS—Vehicle Kit.

MATERIALS—

Petrol.

Bostik Cleaner No. 1.

Rag or Waste.

Asbestos Compound, Bostik "AA." *REVISED*

Examine louvre body and trunking for any damage or broken welds and repair if necessary.

Clean with petrol and cleaner the mating faces of the hull and the louvres. Apply Asbestos Compound liberally to the mating face of the louvre and fit the louvre. *The Asbestos Compound seal must not be damaged in fitting.* (A good joint will be shown by the Asbestos Compound being squeezed out all round the edges.)

REVISED Finish the sealing by pressing into the joint the Asbestos Compound which has been squeezed out and paint over with Bostik "AA."

Replace the tow ropes, etc.

NOTE.—Check the louvre bolts for tightness after 24 hours, as the Asbestos Compound will have settled down.

51. FINAL CHECK OF HULL SEALING

WAS 54 Carry out a general inspection of the sealing, giving particular attention to the following:—

All belly covers.

Sealing of engine cover doors and roof escape doors.

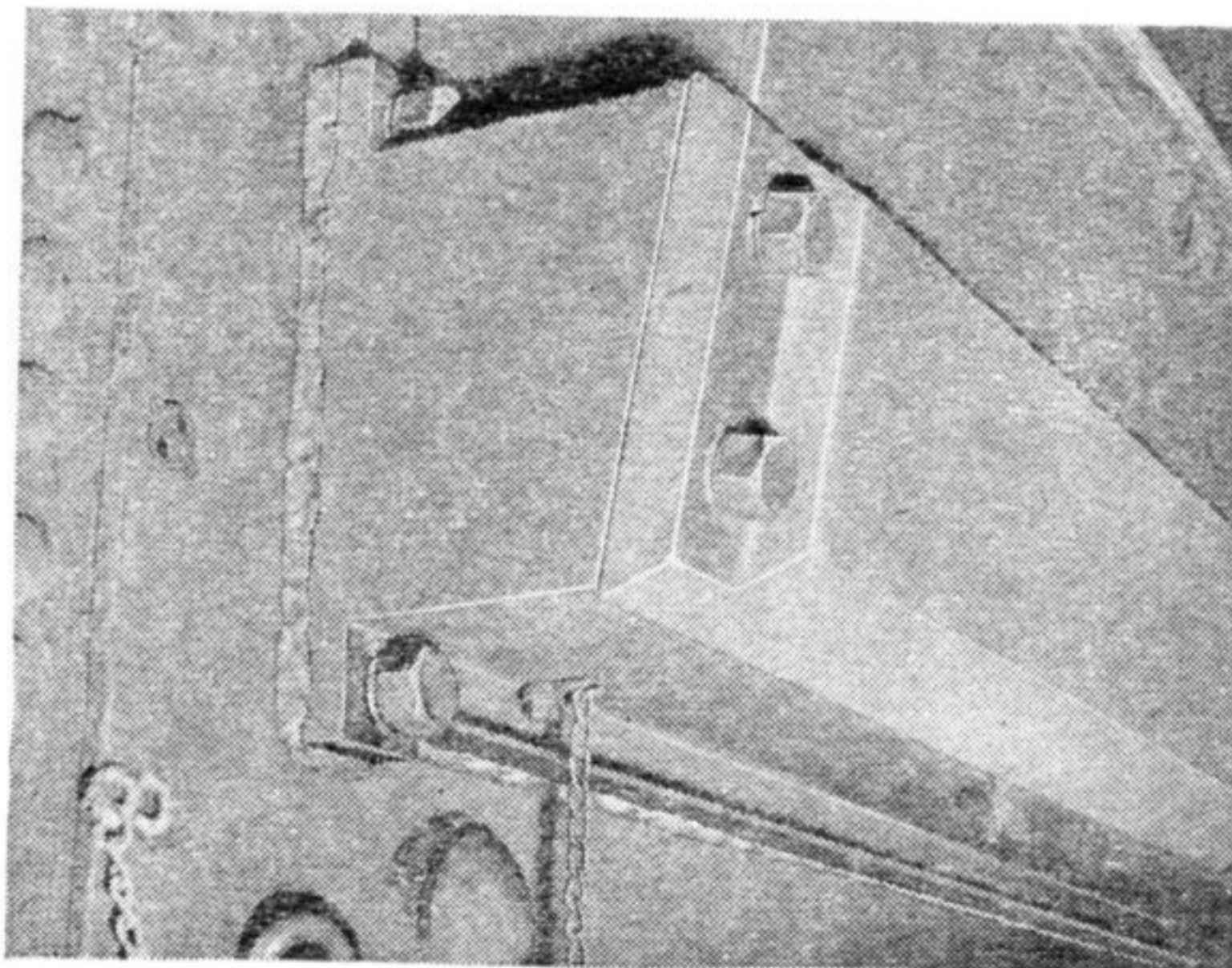
Sealing of rear louvre lower opening.

Sealing of side louvres.

All fabric joints.

Check fabric for holes.

Repair any defects immediately.



OPERATION 50 (b). Side louvre fitted.

52. PROTECT EXTERNAL FITTINGS.

MATERIAL—

Grease G.S.

Smear the fire extinguishers all over, including the vent hole, with G.S. grease. Cover with G.S. grease all stowage fixture bolts on the outside of the tank.

53. SEAL RIGHT-HAND REAR ENGINE COVER DOOR.

TOOLS—

Key carried by Crew.

Brush, Wire Scaling—Part No. TP.18793.

Scissors—Part No. TP.18794.

Brush, Paint, 2 in.—Part No. TP.18791.

MATERIALS—

Petrol.

Bostik Cleaner No. 1.

Rag or Waste.

W.D.P.P.

Bostik "AA."

Bostik "C."

Bostikote Tape.

Check and replenish engine oil before sealing.

Clean the mating surfaces of the door. Lock the door and fill the hole containing the locking bolt with W.D.P.P.

Brush and clean with petrol and cleaner the top faces of the door and the hull plate for a distance of about 2 in. on each side of the joint.

Fill any large gaps at the hinges, etc., with W.D.P.P. and smooth off all sharp edges with W.D.P.P.

Apply a coat of Bostik "C" on the cleaned surfaces and allow them to become tacky. Stick primed Bostikote tape over the joints, and after one hour, paint the edges of the tape with Bostik "AA."

Cut the tape locally at the exhaust pipes and paint the remaining part of the tape liberally with Bostik "AA."

Inspect all roof plate bolts, and clean and paint any doubtful places with Bostik "AA."

Clean and seal round the junction of all exhaust pipes and the hull roof with a ribbon of W.D.P.P.

54. SEAL GEARBOX COVER DOORS.

TOOLS—

Key carried by Crew.

Scissors—Part No. TP.18794.

Brush, Wire Sealing—Part No. TP.18793.

MATERIALS—

Rag or Waste.

Petrol.

Bostik Cleaner No. 1.

W.D.P.P.

Bostik "C."

Bostikote Tape.

Bostik "AA."

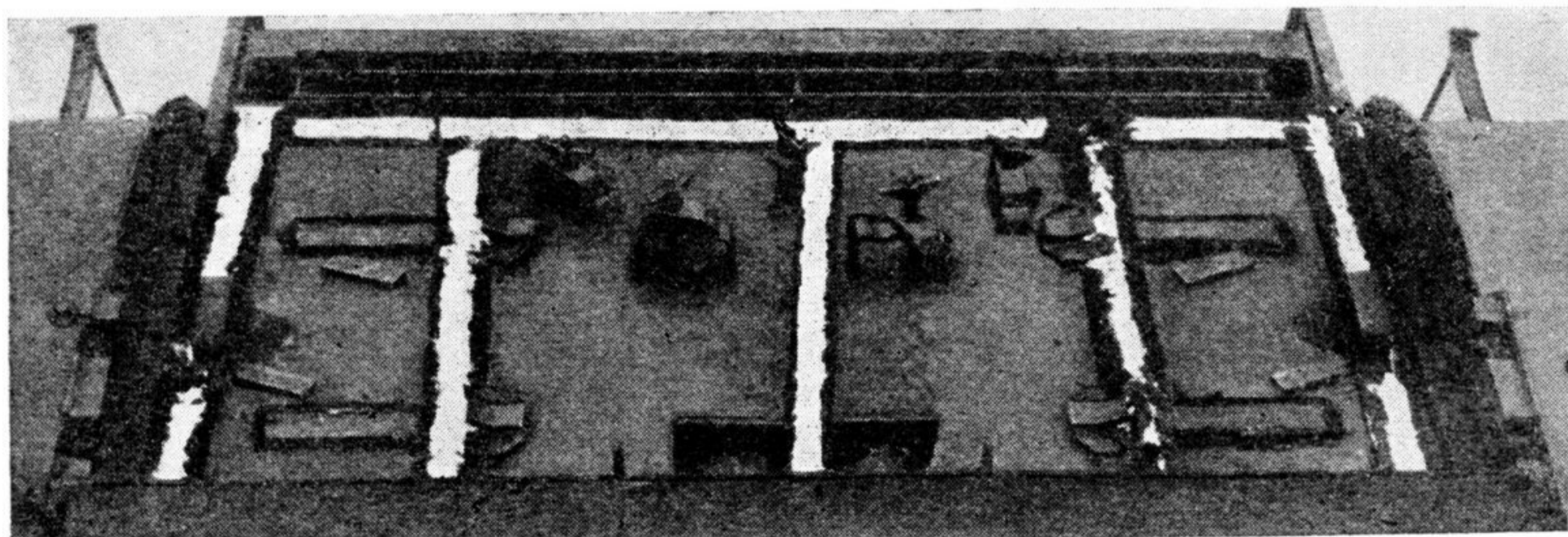
Open both doors and clean the mating surfaces. Fill both sets of tanks with petrol. Do not overfill. Lock the doors and fill the locking bolt holes with W.D.P.P.

Brush the top faces of the door and hull plate for about 2 in. on each side of the joints and clean the surfaces after brushing with petrol and cleaner.

Fill any large gaps at the hinges, etc., with W.D.P.P. and smooth off all sharp edges with W.D.P.P.

Apply a coat of Bostik "C" on the cleaned surfaces and leave to become tacky. Stick primed Bostikote tape over the seams and cut the tape locally to fit round the bolt heads. After one hour, paint all edges of the tape with Bostik "AA."

Clean and paint all bolt heads round the roof plate with Bostik "AA."



OPERATION 54. Gearbox cover doors sealed.

Stage 3

INSTRUCTIONS TO UNIT AFTER EMBARKATION

Comprising the following operations

- WAS 58
WAS 43
WAS 59.
55. Seal Driver's Vision Door.
 56. Seal Driver's Escape Door.
 57. Fit Louvre Ducts and Exhaust Pipes.

58. Final Check of W.D.P.P. and Asbestos Compound Sealing.
59. Seal Lids of Outside Bins.
60. Prepare Gun Bores for Firing.

55. SEAL DRIVER'S VISION DOOR.

WAS 55

MATERIALS—

Bostik Cleaner No. 1.
Rag or Waste.
Asbestos Compound. *REVISED*
Bostik "AA."
Grease G.S.

Open the vision and wicket doors, clean the mating surfaces and coat the inner surfaces with G.S. grease for about 1½ in. wide. Close the door and lock it firmly.

Clean with cleaner all door seams, the hinge joint and the exposed top of the hinge pin.

REVISED
Seal all above points with a liberal coating of Asbestos Compound, making sure that they are all water-tight. Paint over with Bostik "AA."

56. SEAL DRIVER'S ESCAPE DOORS.

TOOLS—

Key carried by Crew.
Brush, Wire Scaling—Part No. TP.18793.

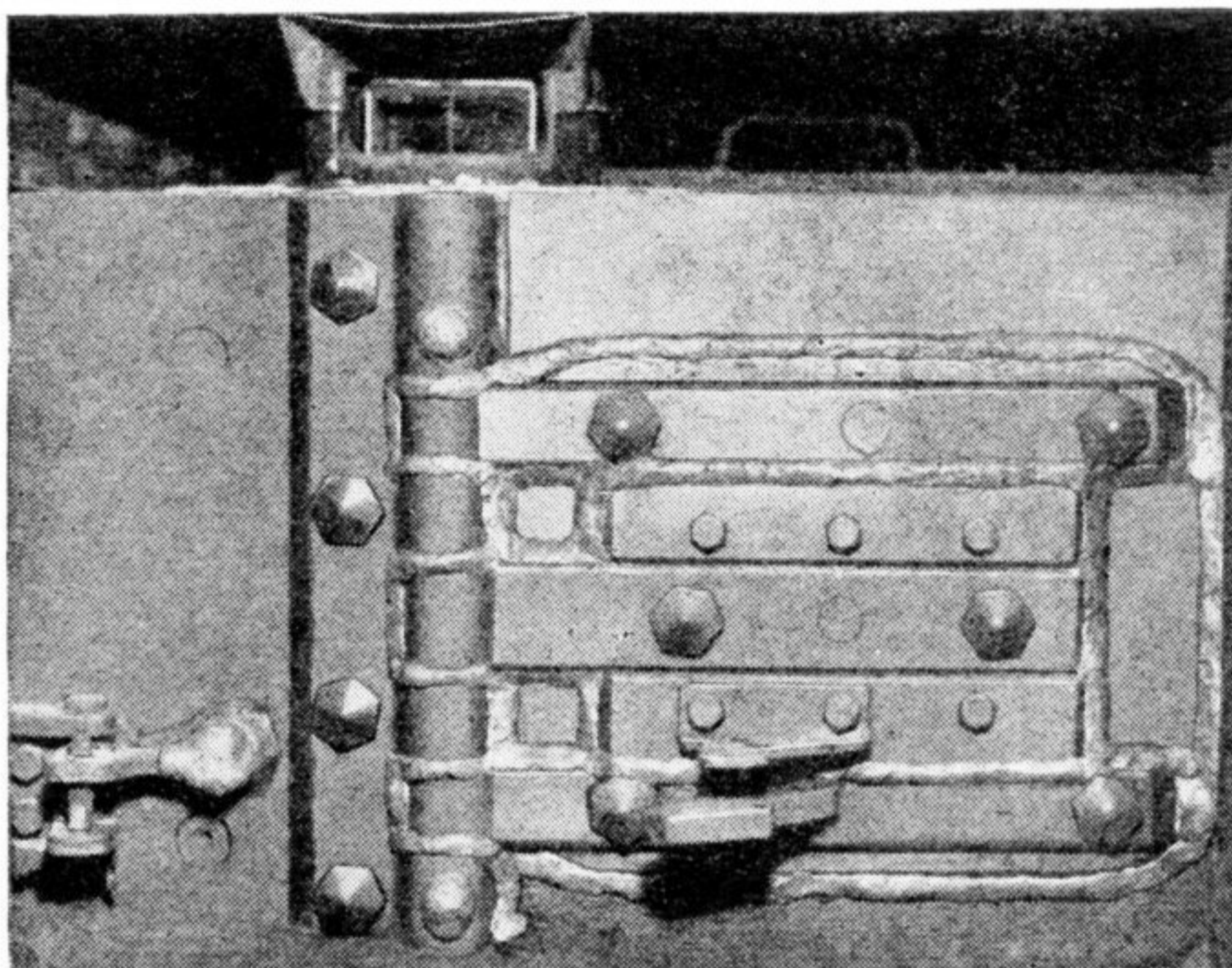
WAS PART OF 43.

MATERIALS—

Petrol.
Bostik Cleaner No. 1.
Rag or Waste.
Asbestos Compound. *REVISED*

Open the escape doors and clean the drain channels on the edges of the doors and door openings with the wire brush, followed with petrol and cleaner. Close and lock the doors, and force Asbestos Compound into all visible joints, including the recesses for the locks. Make sure that the holes leading through the corners of the frames into the drain channels are sealed with Asbestos Compound. Check the sealing round the door frames and repair as necessary with Asbestos Compound.

NOTE.—*This sealing, together with the sealing of the front gunner's escape doors (Operation 43), is illustrated on page 42.*



OPERATION 55. Driver's vision door sealed.

57. FIT LOUVRE DUCTS AND EXHAUST PIPES.

WAS 59

TOOLS—

Vehicle Kit.

MATERIALS—

Bostik Cleaner No. 1.
Rag or Waste.
Grease G.S.

Fit the gaskets and erect the exhaust extension pipes and stays.

Inspect all duct rubber seatings to ensure that they are in good order, and repair if necessary.

REVISED
Clean the top faces of the side louvre and rear top louvre frames, and rub over all frame surfaces with rag dipped in cleaner to remove any oil. Apply Bostik "C" thinly with a brush and leave to become tacky. When tacky lay the soft rubber seals evenly in position on the frames, *taking care not to stretch the rubber.* Keep the top face of the rubber seals free from Bostik "C."

Allow at least 30 minutes for seals to dry before erecting ducts.

Clean with cleaner all rubber seatings and cover them liberally with G.S. grease.

Check all three ducts for faults in the welded seams, and apply Bostik "AA" at any doubtful places. Apply Bostik "AA" round all "T" bolt brackets and bolts.

Bolt the release gear into position on the engine roof plate, and hang the release cable and operating handle inside the Commander's escape hatch. *The release gear can be operated once only, so take great care that it is not operated accidentally.*

Close the non-locking escape hatch. Turn the locking handle on the other door into the locked position and lower the door so that the locking handle prevents the door closing. *This is the minimum opening that can be allowed for the admission of air, particularly for the carburettors.*

Offer up all three louvre ducts so that they sit evenly on the rubber seals and square to the frame. Check that the "T" bolt heads are fully in the slots and adjust if necessary.

When the louvre ducts are erected on their seatings, the stay rods should be completely slack, so that they fall easily over the dowel pins in the release gear, thus allowing the gear to be closed and the trip lever inserted without use of undue force.

Adjust the "T" bolt nuts and "Y" stay rod turnbuckle so that the duct can be rocked slightly on its seat to an equal amount outwards and inwards. To ensure an even pressure on the rubber seal, tighten the "T" bolt nuts and "Y" stay rod turnbuckle at the same time, giving the nuts one turn each for every $1\frac{1}{2}$ turns of the turnbuckle. Tighten all the lock nuts.

When fitting the rear top louvre make sure that the tail of the "T" bolt head points to the rear of the vehicle.

58. FINAL CHECK OF W.D.P.P. AND ASBESTOS COMPOUND SEALING.

Inspect all places sealed with W.D.P.P. or Asbestos Compound paying special attention to the pannier doors, front roof doors, both side louvres and vision door.

Repair any defects immediately.

59. SEAL LIDS OF OUTSIDE BINS.

MATERIALS—

Bostik Cleaner No. 1.

Rag or Waste.

Bostikote Tape.

Check that all equipment has been stowed. Clean with cleaner all joints of the lid and the bin and seal them with Bostikote tape.

60. PREPARE GUN BORES FOR FIRING.

NOTE.—*This operation should be carried out on the craft at the last convenient moment before landing.*

Remove the oily rag from the chamber.

Pull the rope lanyard through the barrel from the breech end—if possible, in one quick movement.

Dry-clean the chamber, using a piece of rag wrapped round the hand for the large bore and a chamber stick (a stick with rag wrapped round one end) for the small bores.

IMPORTANT

Sheet the vehicle over as soon as possible after embarkation to minimise damage from corrosion caused by salt water or spray.

Smear the tracks with the waste oil brought for this purpose.

See that the oil is applied liberally enough to soak around the track pins. If the sea passage is protracted apply oil daily.

When leaving the landing craft keep going at all costs, so as not to obstruct following vehicles.

Stage 4

INSTRUCTIONS TO UNIT ON AND AFTER LANDING

61. REMOVE SEALING FABRICS AND IRONMONGERY.

The Tank Commander is responsible for the following operations, which should be carried out in the order stated.

A. Jettison Turret Sealing Fabric.—Remove the tape from the spot lamp switch and, when the depth of water is approximately 3 feet, plug in the adaptor, switch on at the spot lamp switch and *switch "off" again as soon as the explosion occurs.*

B. Jettison Air Ducts.—Operate the cable release handle, and the ducts will fall clear of the vehicle. Throw the release handle well to the rear of the vehicle, so that there is no danger of the cable being caught in the turret when traversing later.

C. Jettison Front Sealing Fabrics.—Remove the tape from the adaptor plug and, when the vehicle is in less than one foot of water, insert the plug in the inspection lamp socket. *Remove it as soon as the explosion occurs.*

D. Jettison Rear Louvre Covers.—Remove the tape from the tail-lamp switch, switch on, and *switch off again as soon as the explosion occurs.*

E. Removal of Muzzle Covers.—H.E. MUST NOT BE FIRED FROM ANY GUN UNTIL THE FABRIC COVER HAS BEEN REMOVED. A.P. or Smoke Shell is suitable as a first shot to remove the muzzle covers.

Stage 5

MAINTENANCE IMMEDIATELY AFTER LANDING

62. OPERATIONS PERFORMED WITHOUT LEAVING TANK.

If any water has entered, open the shell release hatch and petrol dump valve to allow it to escape.

Remove the W.D.P.P. plugs from the radiator drain tubes by lifting the cap and pushing the plug downwards.

Remove and jettison the turret and front gun fabric wiring harnesses.

Open the wicket in the driver's vision door and operate it a few times to clear away the sealing materials.

Operate all periscopes several times to ensure free movement.

Stage 6

MAINTENANCE AS SOON AS POSSIBLE AFTER LANDING

63. FULL SERVICE MAINTENANCE.

Open the roof escape doors, and clear away the asbestos compound from the drain channel and drain hole.

Open the vision and wicket door, and clear away all asbestos compound.

Open the pannier side doors, and clear away all asbestos compound.

Clear asbestos compound from all periscopes.

Unseal the engine and gearbox cover doors.

Remove the extension exhaust pipes and all stays.

Remove all duct jettison gear.

Remove the rear louvre harness and replace the rear lamp.

Remove the turret generator rubber vent pipes.

Dismantle all periscopes for clearing and cleaning.

Carry out daily maintenance as directed in the Instruction Book.

Operate all petrol cocks several times to prevent rusting up, *and do this daily for some days.*

Operate both steering and main brakes several times, to prevent rusting up *and do this daily for some days.*