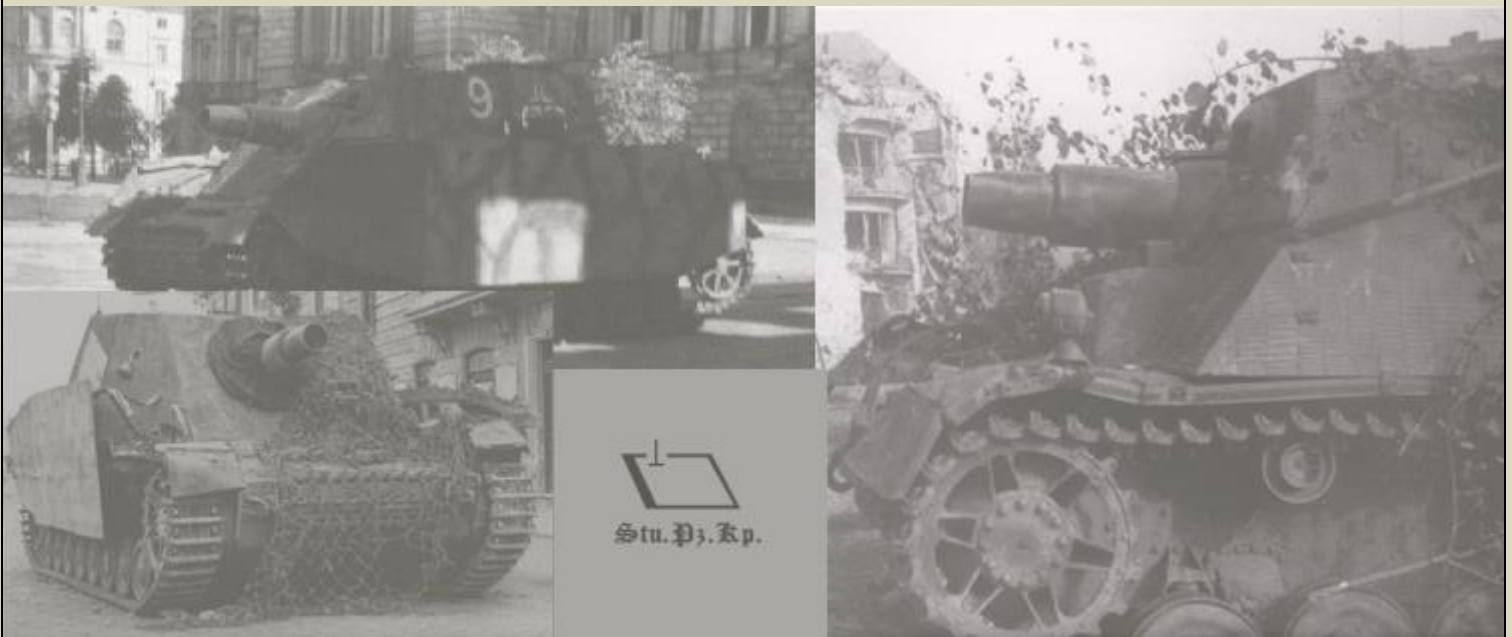


## ***US MILITARY INTELLIGENCE REPORT***

**[Remote-Controlled Demolition Vehicle, BIVc]  
SUPPLEMENTAL**



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APO 887

ETO ORDNANCE TECHNICAL INTELLIGENCE REPORT NO. 126A

3 March, 1945

SUBJECT: Remote-Controlled Demolition Vehicle, B IV c. - Supplemental

Observations by: Capt. D.M. Gilles, Ord. Tech. Intell. Sec. Ord. Service, Hq. Com.Z., ETOUSA, and T/Sgt. T.J. Wheatley, Ord. Tech. Intel. Team "C".

1. General:

A further examination of the German B IV c remote-controlled demolition vehicle described in ETO Ord Technical Intelligence Report No. 126 has been made and the additional information obtained is given to supplement that report.

2. Chassis:

A small plate welded on the lower right corner of the rear hull plate lists two serial numbers, one of which is the engine number and the other apparently the chassis number. The engine numbers of two vehicles examined were 190326 \* O<sup>2</sup> 74 \* and 190334 \* O<sup>2</sup> 74 \* and the chassis numbers were 361375 and 361379 respectively.

The sheet metal sections covering the top of the hull are 5/32" thick. Air inlet louvers are built into the sections covering the engine and right forward compartments, and consist of 1/16" thick raised plates with screened openings on each side.

3. Engine:

The engine is equipped with a Solex down-draft carburetor type FJP II. The shielded Bosch ignition system is a conventional 12-volt system with coil and distributor. The 12-volt starting motor is mounted on the left side of the engine and is equipped with a solenoid starting switch. The 12-volt generator is mounted on the left of the engine and is belt driven from the crankshaft. Markings on the generator are: "Bosch RJN 180/12/1300 R22".

#### 4. Cooling System:

The air flow for cooling is from the air inlets in the hull top, past the engine, through the radiator, and out through a shutter on the top rear of the hull. This shutter is manually controlled from the driver's compartment. , The left cooling fan is belt driven from the crankshaft and the right fan is belt driven from the left fan. An additional belt from the right fan is used to drive the hydraulic unit of the remote control equipment. A centrifugal water pump is mounted on the engine cylinder block and is belt driven, in common with the generator from the crankshaft.

A schematic diagram of the cooling and preheating system is attached as appendix "B".

Photo #1, Appendix "A"., illustrates the hand pump, heat-transfer unit and the oil-cooler for the fluid coupling.

#### 5. Power Train:

The fluid coupling, transmission, controlled differential and final drive units were not disassembled. They are, however, very similar to those of the BIV vehicle described in School of Tank Technology Preliminary Report No. 23 "German Radio Controlled Demolition Vehicle BIV". As the weight of the BIVc is greater than that of the BIV, it is possible that different gear ratios are used.

Hydraulic brakes for stopping the vehicles are mounted against the inside of the hull sides and are connected into the drive between the controlled differential and final drives. The brakes are of the internal expanding type similar to the "Lockheed" brake. A foot pedal, master cylinder and reservoir are mounted on the floor of the driver's compartment.

#### 6. Instrument Panel and Manual Controls.

The instruments are mounted on a panel in front of the driver. They consist of a speedometer; engine tachometer, oil pressure gage and water-temperature indicator; oil-pressure gage and oil-temperature indicator for the fluid coupling. (Photo #4. Appendix "A").

For manual operation of the vehicle, steering is accomplished by means of a horizontal steering bar mounted in back of the instrument panel (not visible in photo 49. This bar is pivoted in the center and connected by cables to the steering brakes. Two gear shift levers are provided at the driver's right, one for the forward-reverse gears and one for the high-low gears. An accelerator pedal is operated by the driver's right foot and the brake pedal by his left foot. A parking brake lever at the driver's left applies both steering brakes. A lever which controls the radiator shutter is mounted on the floor to the right of the driver's seat. A three-position fuel tank valve having one line running to the bottom of the fuel tank, one to the side of the fuel tank and one to the fuel pump is mounted above the driver's right shoulder as is the carburetor choke control. (Photo #5/1 and 5/2, Appendix "A").

The ignition and light switches are on the instrument -panel.

## 7. Hydraulic System.

When the vehicle is operating under remote control, the controls are actuated by hydraulic cylinders connected by lines to the hydraulic unit in the engine compartment. (Photo #1/11, Appendix "A"). This unit contains a pump, hydraulic valves, electric relays and an oil reservoir. Electrical impulses from the control system operate the hydraulic valves which direct the hydraulic pressure to the appropriate cylinders at the controls.

Each of the steering brakes has a hydraulic cylinder connected directly to the hydraulic unit. The forward-reverse gear shift is operated by two hydraulic cylinders each of which is connected to a hydraulic relay control unit. (Photo #5/6, Appendix "A"). Five lines connect the relay control unit to the main hydraulic unit. This relay unit consists of a piston and piston-rod connected to a large coil spring of considerable tension and two spring-loaded hydraulic valves which control the flow of the fluid. It appears that the purpose of the relay is to provide a greater quantity of hydraulic fluid under pressure for moving the gear shift than can be provided by the hydraulic unit. When the engine is started, fluid is pumped into the cylinder, moving the piston back against the spring tension. The valves are operated by pressure lines from the unit and connect the cylinder to the control cylinders of the gear shift.

## 8. Remote control units. (Photo #6, Appendix "A")

- a. The radio receiver, control box, hydraulic unit and decoding relay appear to be the same as on other B IV vehicles previously reported.
- b. The radio receiver frequency code was erroneously reported in the preliminary report. The correct making is 017/V.
- c. The following markings are on the decoding relay unit:

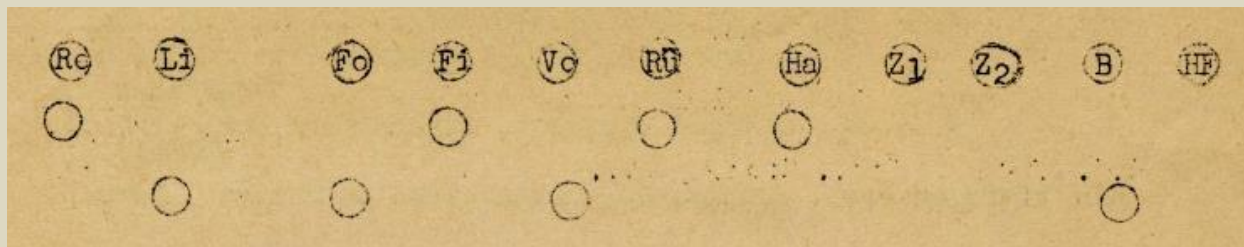
ZGR Nr. 656  
fuw Bauj 43

Achtung  
Keine Luftsauerstoffbatterie einbauen!  
(Do not use wet storage battery)

- d. The charge release unit incorporates a safety distance switch driven from the controlled differential. This switch is of the cam type and is driven through a worm and worm-wheel. It appears that the switch prevents the charge from being detonated until aft(r the vehicle has traveled a predetermined distance. The unit has a lever on the left side within reach of the driver. There are three positions of the lever: (1) forward position, which permits release of the charge IT, remote control and sets the safety distance switch, (2) center position which releases the hook holding the top of the charge container (Photo #2/8 Appendix "A"), and (3) rear position, which is the safe, or travelling, position

#### 9. Remote control units. (Photo #6, Appendix "A")

The set of push buttons below the windows of the control box on the vehicle (Photo #5/4, Appendix "A") permits the testing of the control units of the vehicle, Lay out and lettering of the windows and push buttons are as follows:



The significance of the lettering on all of the windows is not known. It is presumed that Z1 and Z2 pertain to the release and detonation of the charge. In operation of the vehicle under remote control, pressing in the button under window "Ha" starts the rotary converter that supplies current to the control equipment. Holding in the buttons under the windows "Re" and "Li" cause the vehicle to turn right and left respectively. The button under window "Fo" applies both steering brakes and closes the throttle, bringing the vehicle to an abrupt stop. "Fi" and "Va" control the throttle position, "Fi" being half-speed and "Vo" being full speed. No response was obtained from the buttons under "Rü" and "B" on the vehicle examined. It appears, however, that the "Rü" is reverse and causes the gears to shift into the reverse position. Probably the gears are returned to the forward position by pressing button "Fi".

A rotary magnetic switch located at the right front of the engine compartment and driven by a flexible cable from the camshaft appears to be for the purpose of restarting the engine if it stops while the vehicle is under remote control. Two contact points are held apart when the engine is running and close when the engine stops. When operating the vehicle examined, it was necessary to use the regular starting control; but it is thought that the wiring of the automatic circuit was not in order.

A similar switch is located in the forward compartment and is belt driven from the propeller shaft (Photo #3/9, Appendix "A"). It appears that its purpose is to prevent shifting the forward-reverse gears while the vehicle is in motion.

#### 10. Demolition Switches:

Two detonating switches of the same type used on earlier B IV models are located in the floor, one on either side of the forward compartment. (Photo #5/8, Appendix "A"). These switches appear to be intended to detonate the charge in the event that the vehicle runs over and explodes a mine.

For the Chief Ordnance Officer,

Incls:                      Appendix "A" (Photo No.1 through 6)  
                                Appendix "B" (Schematic Diagram)

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## Appendix A

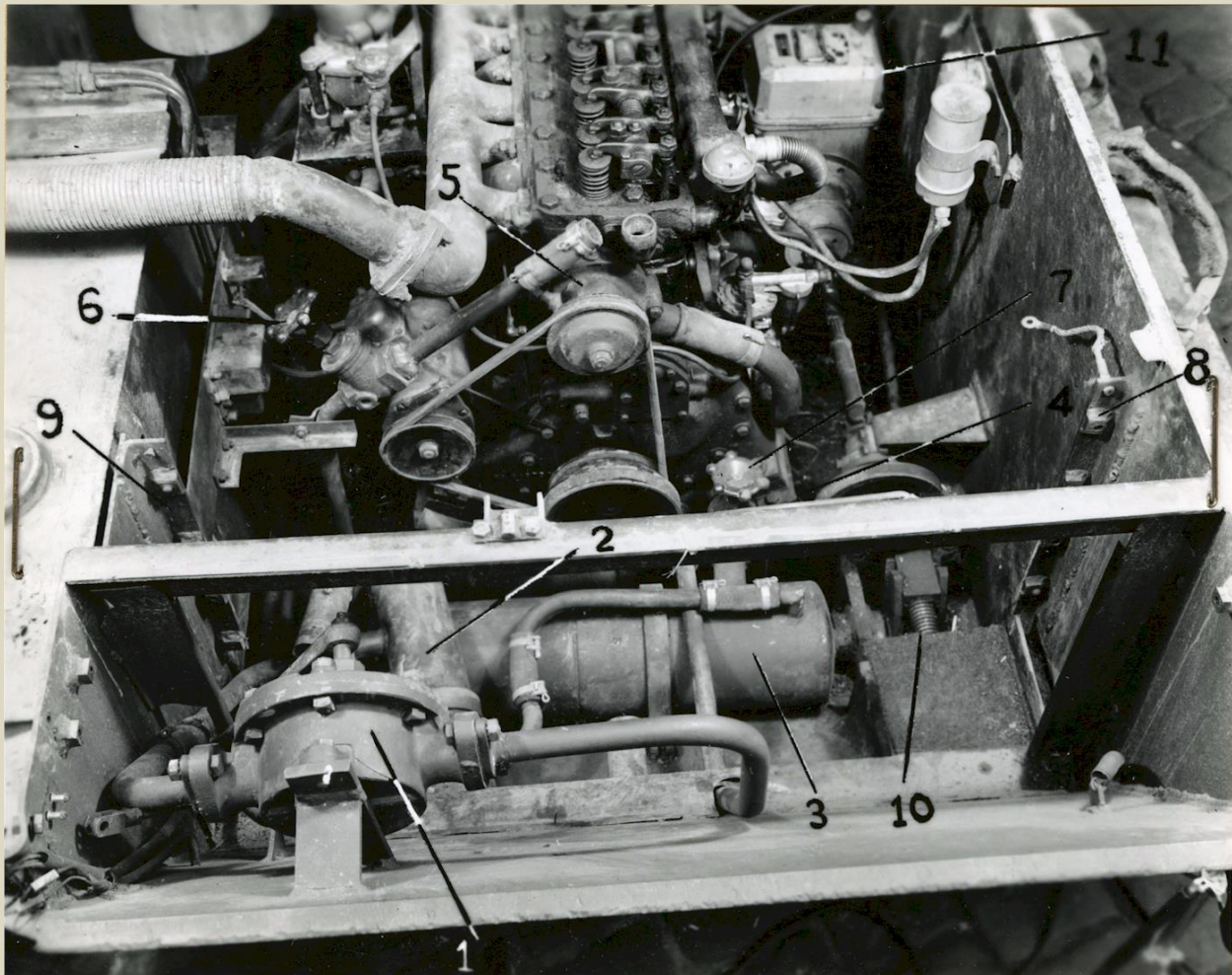


Photo 1: Engine compartment and cooling system.

- |                                   |   |
|-----------------------------------|---|
| 1. Manually operated water pump.  | 6. Cooling system valve (No.3 in diagram, Appen. "B") |
| 2. Heat transfer unit.            | 7. Cooling system valve (No.1 in diagram, Appen "B")  |
| 3. Oil cooler for fluid coupling. | 8/9. Brackets for mounting radiator.                  |
| 4. Oil cooler for engine.         | 10. Track adjustment.                                 |
| 5. Engine water pump.             | 11. Hydraulic unit for remote control.                |

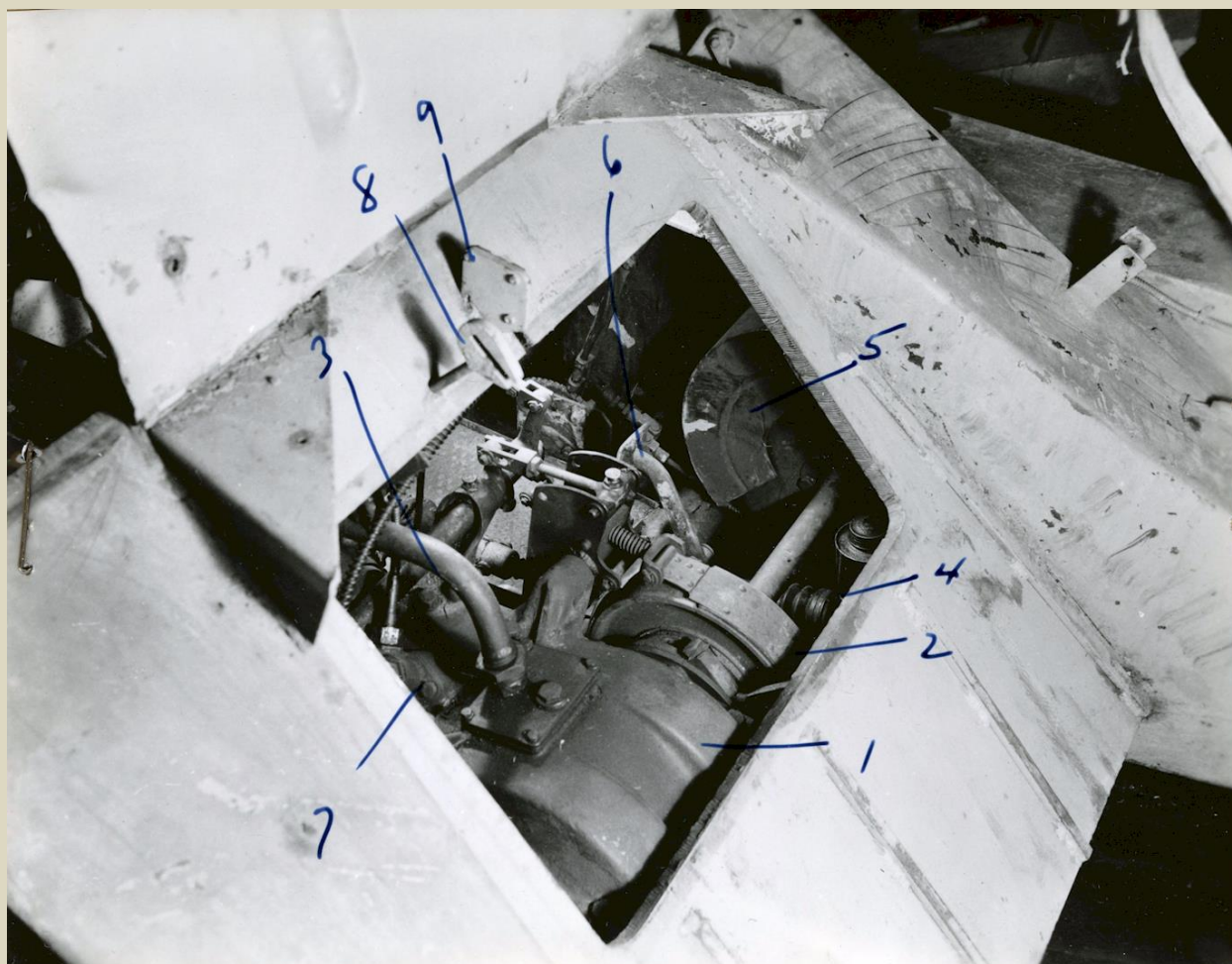


Photo 2: View of power train through opening in front plate.

- |                                |   |
|--------------------------------|---|
| 1. Controlled differential.    | 6. Brake pedal.   |
| 2. Left steering brake.        | 7. Drive for speedometer and safety distance switch.                                    |
| 3. Oil line from transmission. | 8. Locking hook for demolition charge.  |
| 4. Foot brake master cylinder. | 9. Bracket for mounting junction box for connections to detonators and explosive bolts. |
| 5. Left hydraulic brake.       |   |



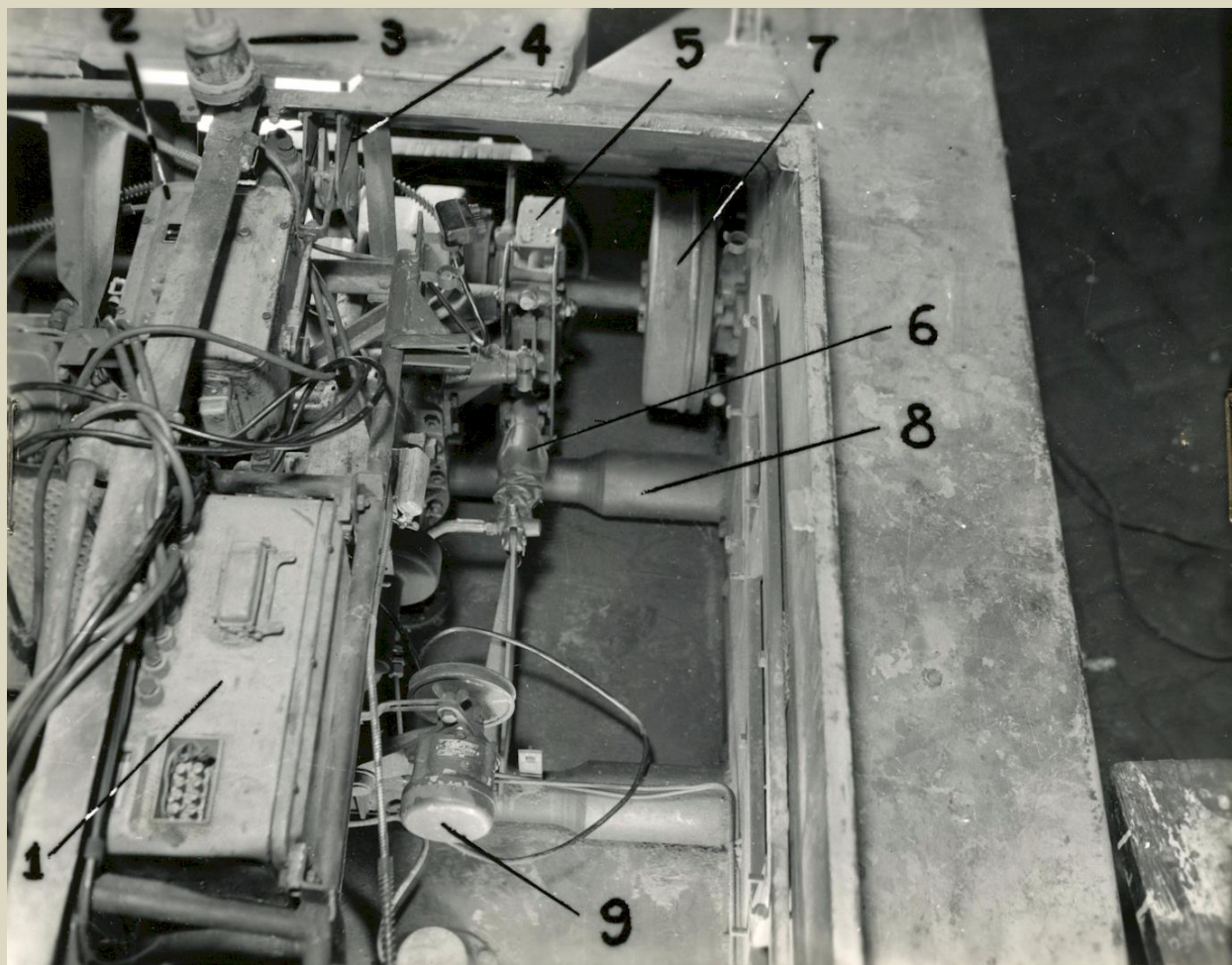


Photo 3: Left side of forward compartment. (Part of control equipment has been removed).

- |                              |   |
|------------------------------|---|
| 1. Control box.              | 6. Hydraulic control cylinder for right steering brake. |
| 2. Charge release unit.      | 7. Hydraulic brake.                                     |
| 3. Antenna base.             | 8. Housing of torsion bar.                              |
| 4. Charge release mechanism. | 9. Belt-driven magnetic switch.                         |
| 5. Right steering brake.     |   |

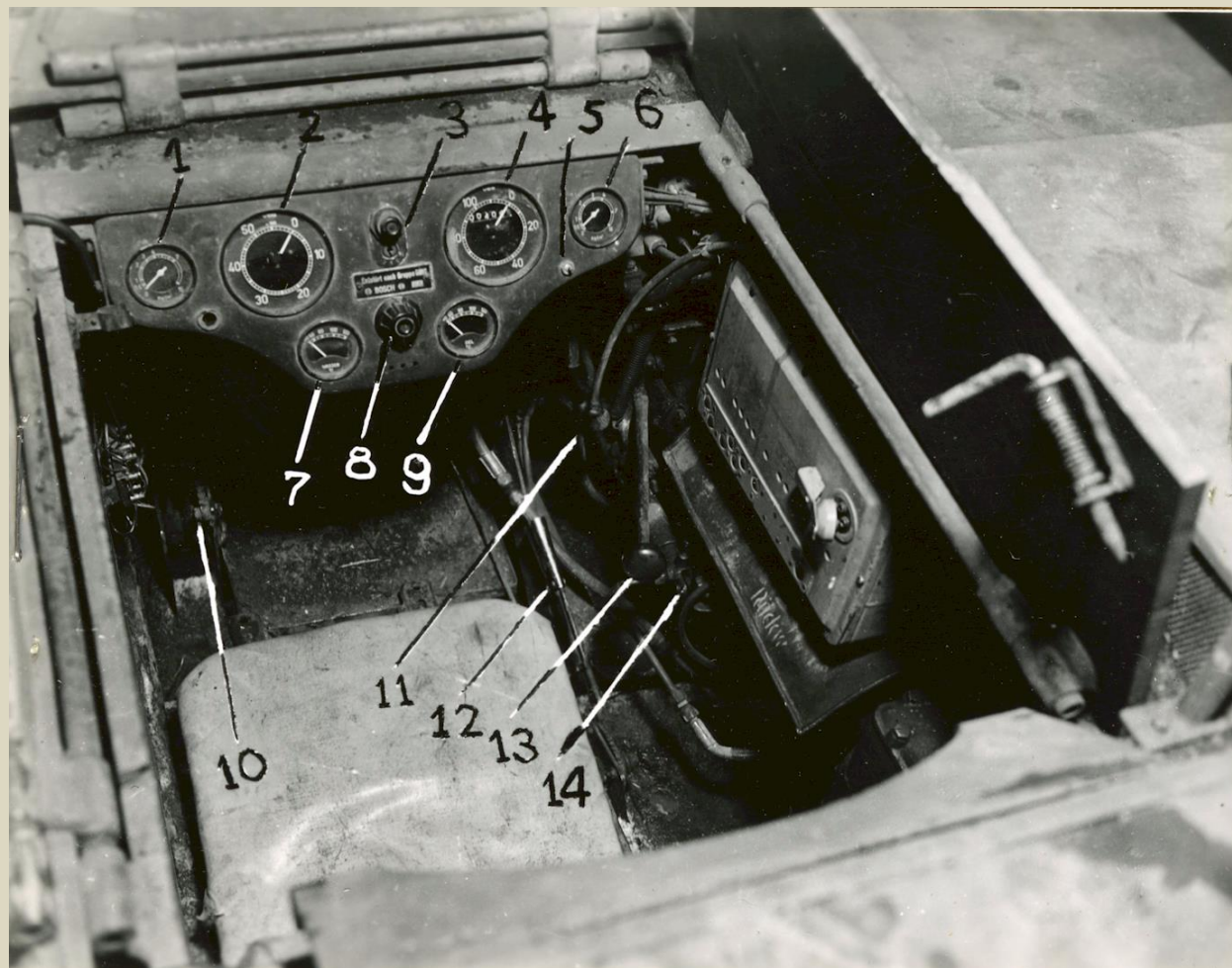


Photo 4: Driver's compartment.

- |  |  |
|--|--|
| 1. Engine oil pressure gage.                           | 8. Light switch.                                       |
| 2. Engine tachometer.                                  | 9. Fluid coupling oil temperature indicator.           |
| 3. Ignition switch and starter button.                 | 10. Parking brake lever.                               |
| 4. Speedometer   | 11. Low range gear shift lever.                        |
| 5. Push-pull switch for change-over to remote control. | 12. Radiator shutter control lever.                    |
| 6. Transmission oil pressure gage.                     | 13. Forward-reverse gear shift lever.                  |
| 7. Water temperature indicator.                        | 14. Rear Hydraulic cylinder for forward-reverse lever. |



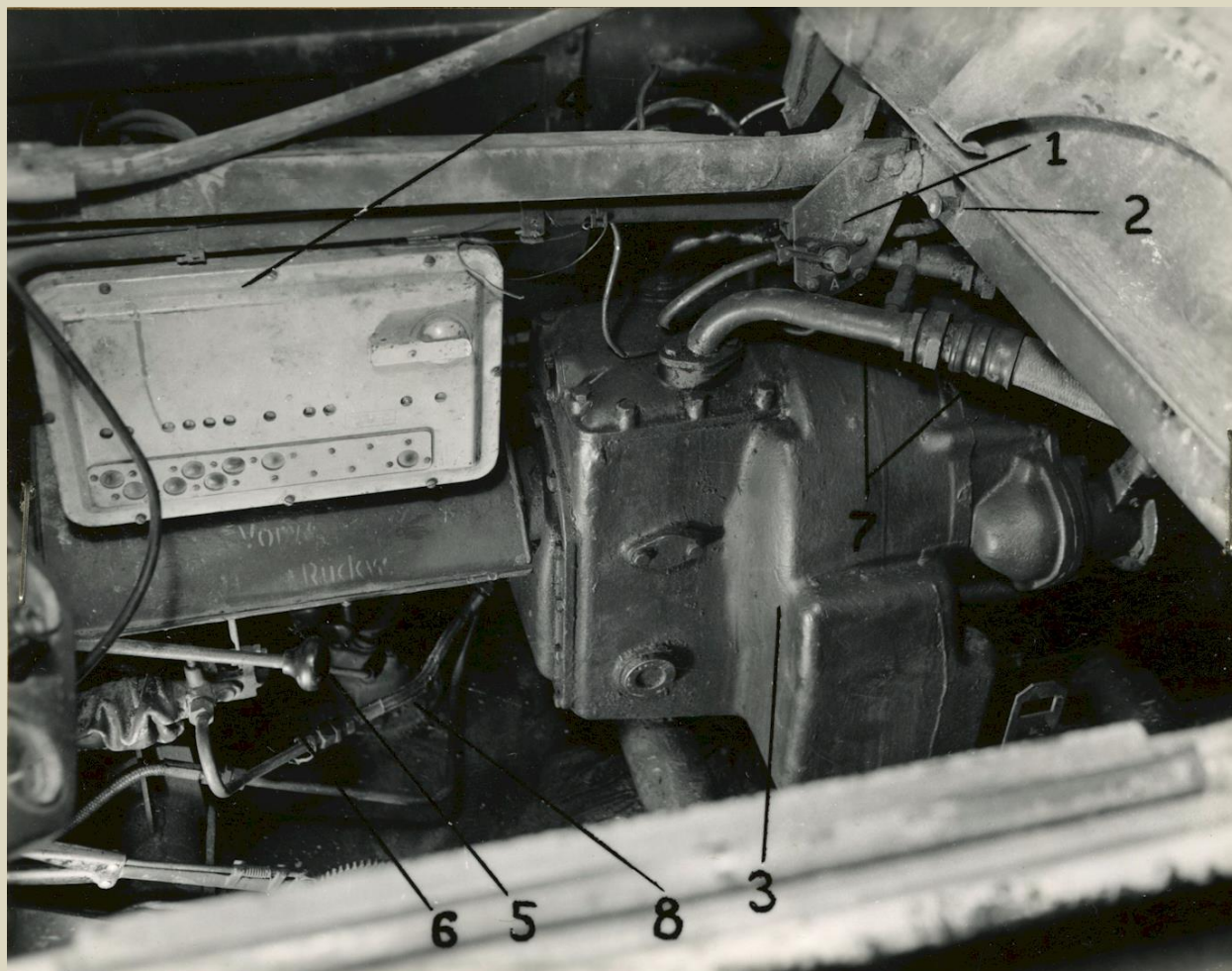


Photo 5: Control box and fluid coupling.

- |                                |   |
|--------------------------------|---|
| 1. Fuel valve.                 | 5. Forward-reverse gear shift lever.                  |
| 2. Engine choke control.       | 6. Hydraulic cylinder for forward-reverse gear shift. |
| 3. Housing for fluid coupling. | 7. Oil lines from fluid coupling to oil cooler.       |
| 4. Control box.                | 8. Detonation switch.                                 |

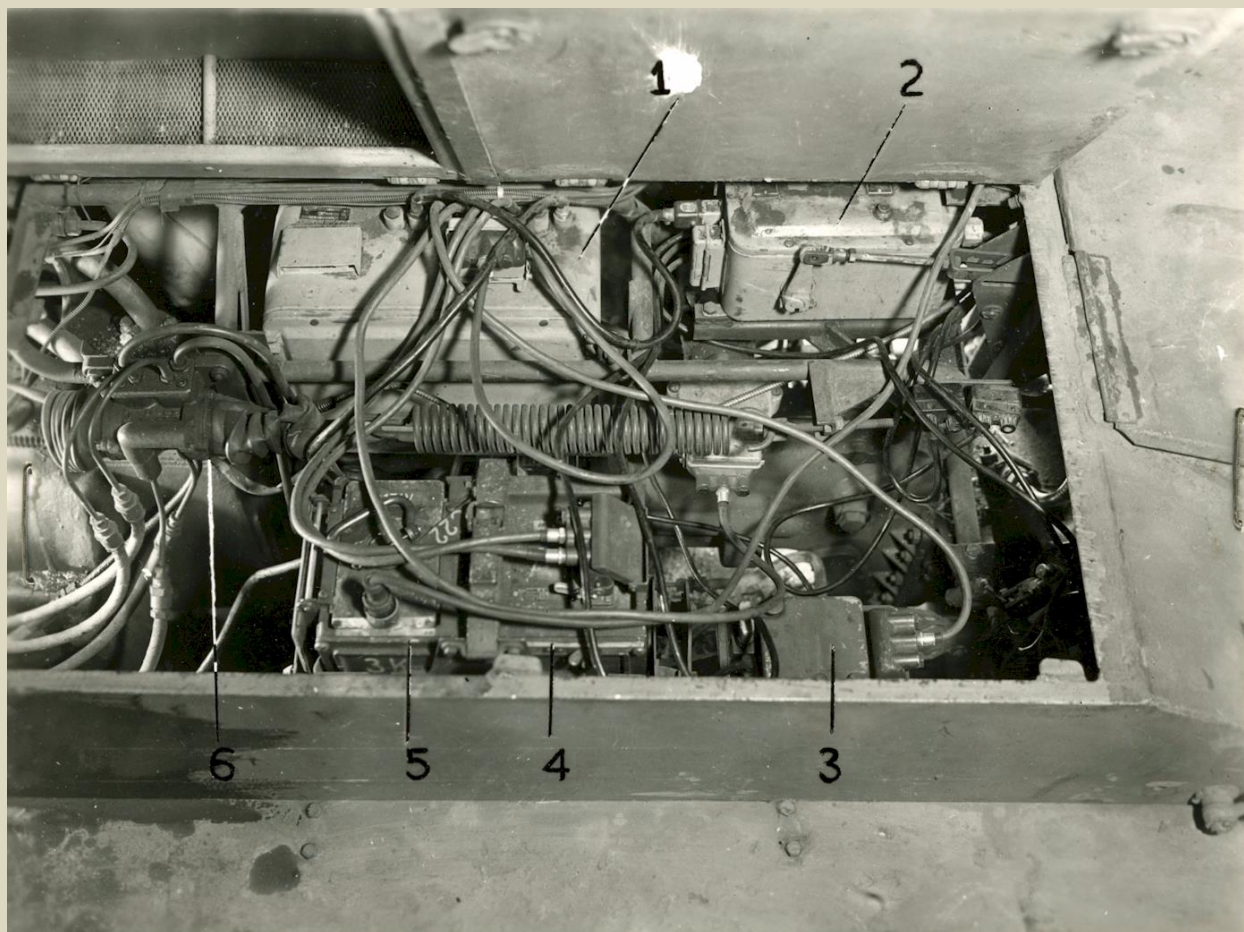
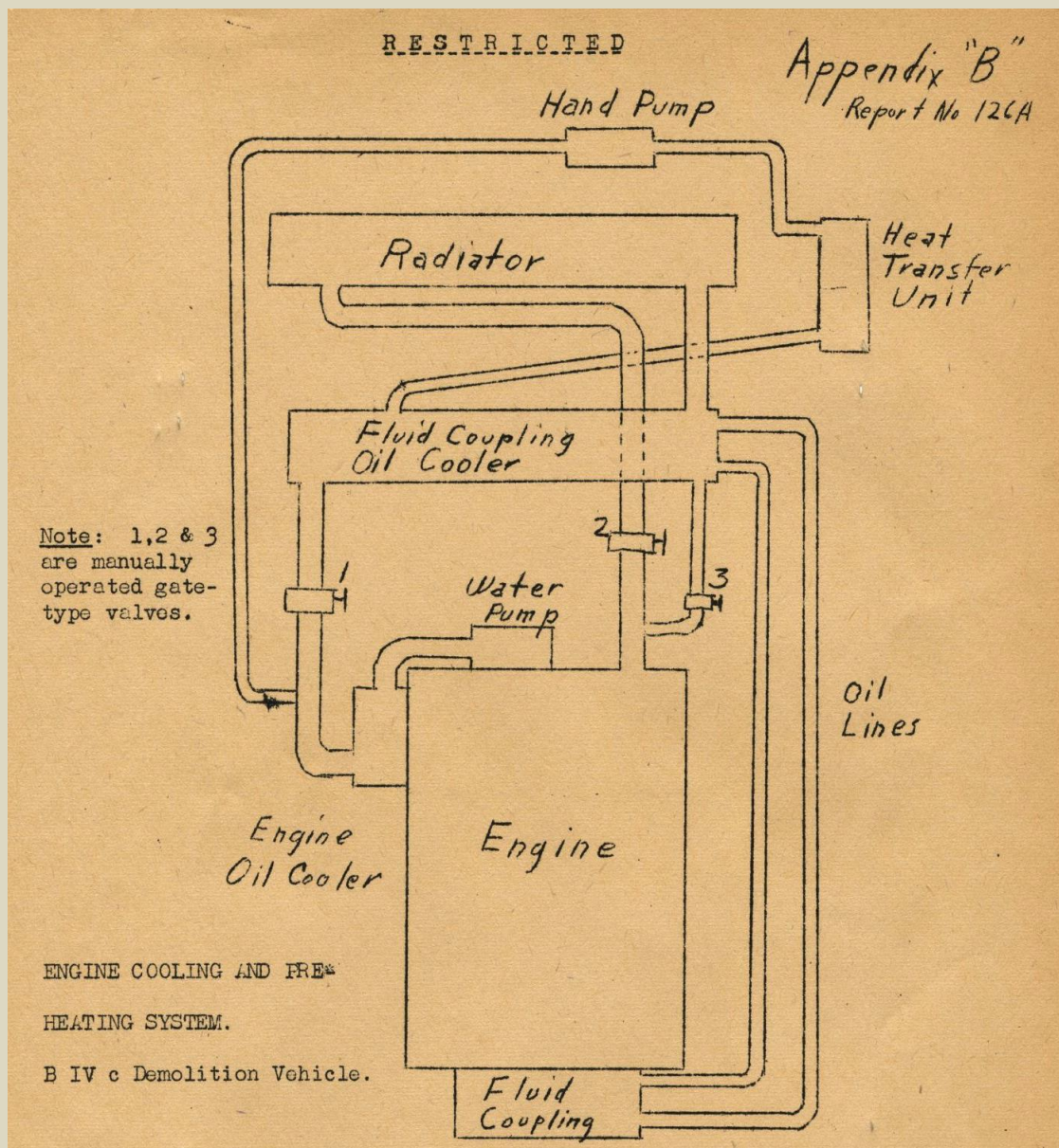


Photo 6: Remote control equipment.

- |                         |                     |
|-------------------------|---------------------|
| 1. Control box.         | 4. Radio unit.      |
| 2. Charge release unit. | 5. Radio receiver   |
| 3. Decoding relay.      | 6. Hydraulic relay. |



## Appendix B



## Operation:

For normal running, valves 1 and 2 are open and valve 3 is closed. Flow of coolant is from the engine to radiator, to fluid coupling oil cooler, to engine oil cooler, to water pump and return to engine.

To pre-heat coolant for cold weather starting, valves 1 and 2 are closed and valve 3 is opened. A blow torch is directed inside the heat transfer unit and the coolant is circulated by the hand pump. Flow is from the engine to fluid coupling oil cooler, to heat transfer unit, to hand pump, to engine oil cooler and return to engine through water pump.

After the coolant is heated, the valves are set for normal running before the engine is started.