T A N K T-34-85

Organizational Repair Manual

I N T R O D U C T I O N

The present Manual is intended for the maintenance personnel of repair units and elements. It is the main guiding document for the personnal when performing the running and medium repairs of tank T-34-85.

The scope of work recommended during medium repair of vehicles is given in Appendix 5.

The Manual contains a sequence of operations during replacement (removal and installation) of assemblies (units), during repair (disassembly and assembly) of certain assemblies (units), as well as the specifications for assembling the units and their re-installation.

The term "replacement" of an assembly (unit) implies also the removal of a defective assembly (unit) for eliminating faults, and its re-installation after repairs.

The grounds for replacement and a list of tools and accessories used for performing the above-mentioned operations are given before the description of the technological process used in replacement of assemblies or units.

The technological process of replacement and repair of assemblies (units) is worked out with due regard to the use of the tools contained in the service and SPTA sets of the vehicle, as well as to the use of the standard sets of universal fixtures (ЕКУП) and standard sets of special wrenches (ЕКСК).

The trouble-shooting and repair of parts of the units under disassembly, as well as of one-piece units (e.g. tanks, radiators, etc.) should be performed in compliance with the specifications for trouble-shooting and repair of parts during organizational repair.

The time required for replacement and repair of assemblies and units in man-hours is indicated in Appendix 3 (with no regard to the time spent on preparatory operations).

Perform checking and repair of electrical equipment, communication facilities and measuring instruments in compliance with the existing specifications for organizational repair of the electrical equipment, radio station operating instructions, and instructions for maintenance and checking of measuring instruments adopted in the Armoured Forces.

GENERAL INSTRUCTIONS FOR REPLACEMENT AND REPAIR OF ASS MBLIES AND UNITS

1. During organizational repair of tank, replace the tank assemblies (units) only in case when the troubles d tected cannot be eliminated without removing the assembly (unit) from the tank. Durıng the scheduled medium repair of vehicles, disassemble them with in the scope indicated in Appendix 5.

2. When replacing an assembly (unit), thoroughly check the technical condition of the remaining asseмblies (units) which are not replaced with a view to ensure reliable operation of the vehicle as a whole after replacement.

3. The repair operations sh ld be performed only with tools and fixtures which are in good condition. Prior to t e beginning of work, special attention should be paid to checking the technical c dition of lifting devices and slings. Do not use unserviceable lifting devic s and s ings.

4. The removed fastening parts which are in go d condition should be temporarily (prior to the beginning of assembl) re-installed, if this hampers further disassembly or removal of the unit, they should be placed in the box intended for standard parts. The bolts and nuts with more than two thread turns stripped or faces crumpled should be replaced.

5. All the cotter pins, locking wire, lock washers and packing gaskets should not be installed for the second time.

6. When using the lifting devices, check the hooks and ropes for reliable fastening. The removed assembly (unit) should be installed on a rack or a support. Never keep the assembly (unit) suspended.

7. The cavites of the assemblies and units opened during their removal or disassembly should be closed with paper or cloth and tied up with twine. The ends of the disconnected pipes of the engine cooling, lubricating and fuel systems should be removed during assembly. The lugs of the disconnected electric wires should be insulated with an insulation tape.

8. Prior to re-installing the assembly (unit) into the vehicle, check the following:

- presence and quality of the lubricant filled in the assembly (unit), and whether or not it complies with the season of the year;
- presence and correct cottering and locking of nuts and bolts.

9. The parts of the assemblies (units) to be installed should have no traces of corrosion. The corroded painted ar as of the surface should be cleaned and repainted. Dress all the nicks and burrs on the mounting surf ces and part edges.

10. The bolts, nuts, pipe unions and other parts of the threaded joints, except for those specially mentioned in the specifications, should be uniformly tightened home.

11. The cotter pins should tightly enter the holes. The cotter pin head should not project above the nut slot. The cotter pin ends should be spread along the bolt axis and bent off: one end - onto the bolt, another - onto the nut. Do not loosen nuts upon the end of tightening for aligning the holes for the cotter pin. In case it is impossible to align the holes intended for the cotter pin by tightening up, replace the nut. Do not unscrew or screw on the nuts by means of a cold chisel or a hammer.

12. The felt oil seals installed anew should be impregnated with a special composition in compliance with the Instructions (Appendix 2). The used oil seals good for further service should be, prior to re-installation, impregnated with oil heated up to 40-50°C.

13. All the packing gaskets, connecting hoses of the cooling, lubricating and fuel system pipes, except for the cases specially mentioned in the specifications, should be set on paint (thick-milled iron minium or thick-milled zinc white). When installing the connecting hoses, apply paint only onto the ends of the pipes and branch pipes to be connected. Do not apply paint on the hose.

14. Some gaskets mentioned in the specifications should be set on "Hermetic" varnish (ТУ МХП 1112-44).

Prior to installation of gaskets the joint surfaces of the parts should be thoroughly cleaned and degreased with solvent "645" or with clean gasoline.

A thin layer of "Hermetic" varnish should be applied to the cleaned surface with a brush. Install the gaskets and tighten up the nuts after the applied layer of varnish is slightly dried up.

15. Strip the assemblies into units and parts to the limits ensuring elimination of the defect which caused stripping of the assembly (unit).

16. All the units and parts subject to fault-finding should be washed and wiped dry with clean waste cloth, or blown out with compressed air.

17. When removing and disassembling vital units, or when removing the parts disturbing balancing, make marks on the mating parts and assemble (install) them according to these marks.

18. When pressing out and press-fitting the antifriction bearings, it is necessary to apply efforts to the race which is being pressed off or press-fitted. The roller bearing races are not interchangeable.

19. The threaded holes and fastening parts of the hull, assemblies and units should be washed, blown out with compressed air and lubricated with oil МП-16п before installation.

20. All the pipes should be blown out with compressed air.

21. The quality of the repair performed is checked during stationary and running tests within the scope indicated in the Specifications for testing the assemblies (units) and the vehicle after repair.

22. The instructions for lubricating the parts during assembly of the units indicate only the grade of lubricant (УС, УТ, etc.). Lubricating and filling the assemblies (units) during assembly should be performed according to the Lubrication Chart (Appendix 1). Do not use the lubricants and oils not adopted for the armoured forces supply.

RUNNING GEAR

REPLACEMENT OF TRACK

Replace the track, if, due to wear of track pins and track pin holes, the tension of the track consisting of 70 track shoes is not adjusted properly.

Tools and fixtures: wrench 17 mm; special wrench 34.28.215-1; ratchet wrench 34.28.98c6 ; wire rope 34.28.179c6; crowbar (2 pieces); forcer; sledge hammer; fixture C6-00; track pin removing drift 34.28.014 or 54.28.595; track pin removing drift handle 28.1341-3 or 54.28.984.

Removal of Track

1. Unscrew the bolts fastening the rear mud shield and remove the latter.
2. Unscrew the bolt fastening the front mud shield and throw back the latter.
3. Unlock nut 6 (Fig.1), mount the ratchet wrench on it, and, rotating the nut, disengage the teeth of idler wheel crank 1 from the teeth of idler wheel bracket 3.
4. Unscrew armour plug 18 above worm 19 of the track adjusting mechanism.
5. Mount the wrench on the square head of worm 19 and, turning it, release the track tension.
6. Knock the pin out of the track shoe under the driving or idler wheel, and, moving the vehicle forward or backward, drive it off the track.

Installation of Track

Specifications for Installation:

(a) the track pin heads should face the hull side; all the track shoes joined by the pins should turn in their joints freely, without jamming; the number of shoes in the right- and left-hand tracks should be the same and not less than 70; when using worn track shoes, install them after each two new track shoes;

(b) the normally tensioned track should contact with its middle part the road wheels; the track should not sag.

Sequence of installation of the track:

1. Arrange the track to be mounted in front of the vehicle, before the first road wheel.
2. Start the engine, engage the 1st gear, and drive the vehicle on the spread-out track so that the last road wheel is positioned on the last but one track shoe.

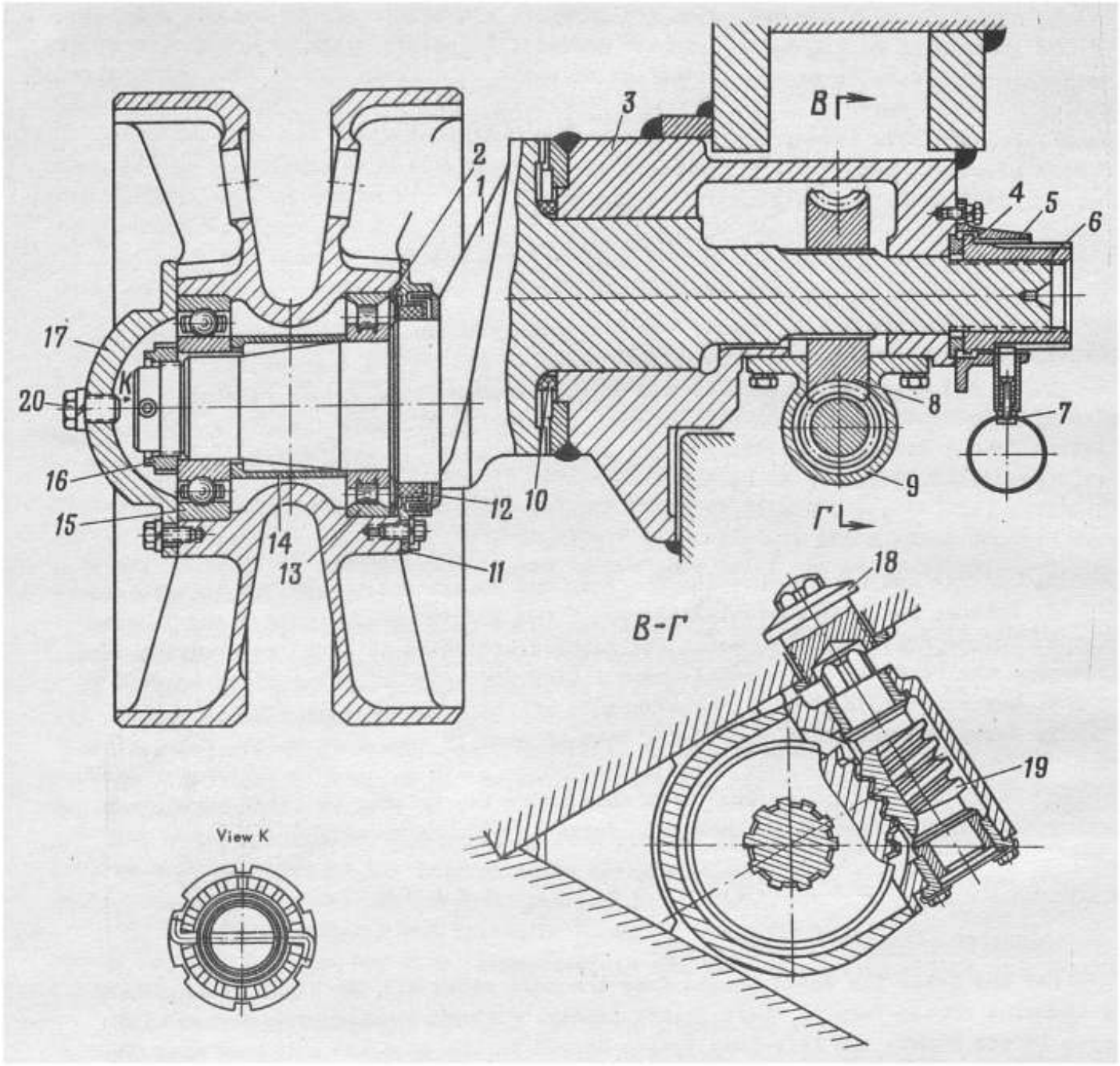

FIG.1. IDLER WHEEL AND TRACK ADJUSTING MECHANISM

1 - idler wheel crank; 2, 4 - rings; 3 - idler wheel bracket; 5 - lock body; 6 - crank nut; 7 - lock; 8 - worm wheel; 9 - worm case; 10 - rubber ring; 11 - labyrinth seal cover; 12 - oil seal; 13 - roller bearing; 14 - spacing bushing; 15 - ball bearing; 16 - nut; 17 - armour cap; 18 - armour plug; 19 - track adjusting mechanism worm; 20 - plug

3. Attach one end of the wire rope to the first track shoe, and the other - to the driving wheel. Pass the wire rope between the discs of the idler wheel and the road wheels.

4. Engage the reverse gear, and, having engaged the steering clutch from the side of the track being mounted (with the opposite steering clutch being disengaged), pull on the upper branch of the track until the track shoe reaches the driving wheel.

5. Disconnect the wire rope from the track and remove it from the driving wheel.

6. Engage the track with the driving wheel. Engage the reverse gear and tension the upper branch of the track.

7. Align the track pin holes of the track shoes of the upper and lower track branches by means of fixture Сб-00 (Fig.2), and connect them by the pin (See Specifications, Item "a").

8. Rotating worm 19 (Fig.1) of the track adjusting mechanism tension the track by wrench 34.28.215-1 (See Specifications, Item "b").

9. Rotating nut 6 by the ratchet wrench, bring the teeth of crank 1 of the idler wheel in mesh with the teeth of bracket 3. To facilitate meshing of the crank teeth with the bracket teeth, fixture Сб-00 may be used (Fig.3).

10. Lock nut 6 (Fig.1) with stop 7. Remove the wrench from worm 19 and screw in armour plug 18 into the hole of the hull front upper plate.

11. Install the rear mud shield and secure it by bolts provided with spring washers.

12. Install the front mud shield and secure it by a bolt provided with a spring washer.

REPLACEMENT OF IDLER WHEEL

Replace the idler wheel, if the following defects are detected:

- cracks in disc, hub or rim;
- destruction of bearings;
- leakage of lubricant through the labyrinth seal and oil seal;
- stripping of more than three thread turns in holes intended for fastening bolts of armour cap or labyrinth seal cover.

Tools and fixtures: wrench 17 mm; socket wrenches 17 and 22 mm; ratchet wrench 34.28.98сб; special wrenches 34.28.215-1, КС-8; crowbar; forcer; drift; sledge hammer; track pin removing rod 34.28.014 or 54.28.595; rod handle 28.1341-3 or 54.28.984; hammer; cold chisel; fixtures Сб-00, УК-1А, УК-8А; can with grease УС, iron oxide red paint or zinc white.

Removal of Idler Wheel

1. Unscrew the bolt fastening the front mud shield and throw back the latter.

2. Relieve the track tension (See "Removal of Track", Items 3-5).

3. Knock out the pin from the track under the idler wheel. Remove the track from the idler wheel.

4. Unscrew the bolts fastening armour cap 17 (Fig.1) to the idler wheel hub. Remove the armour cap.

5. Uncotter and unscrew nut 16 fastening the idler wheel on the crank axle.

6. Mount (Fig.4) fixture УК-1А on the idler wheel hub and remove the idler wheel.

7. Unscrew the bolts fastening cover 11 (Fig.1) of the labyrinth seal. Remove the labyrinth seal cover, oil seal 12 and metal ring 2.

8. Remove bearings 15 and 13 and spacing bushing 14 from the idler wheel hub.

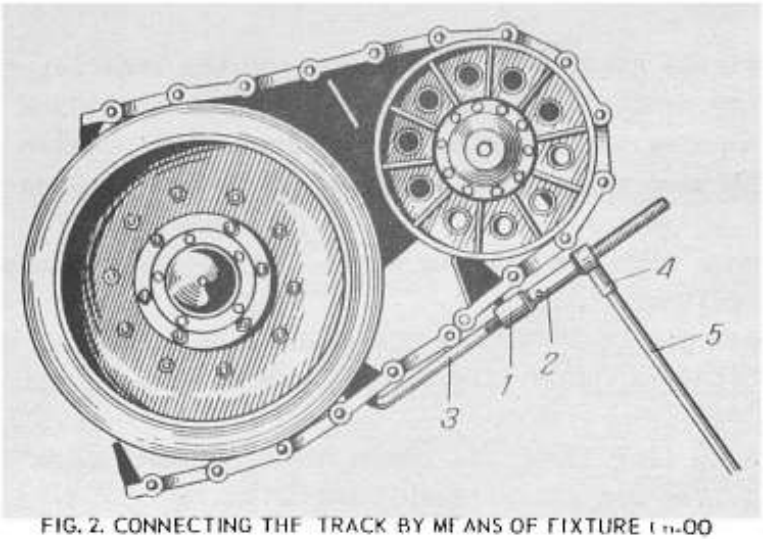

FIG. 2. CONNECTING THE TRACK BY MEANS OF FIXTURE [illegible]

1 - catch, 2 - special nut, 3 bracing hook, 4 ratchet wrench, 5 forcer

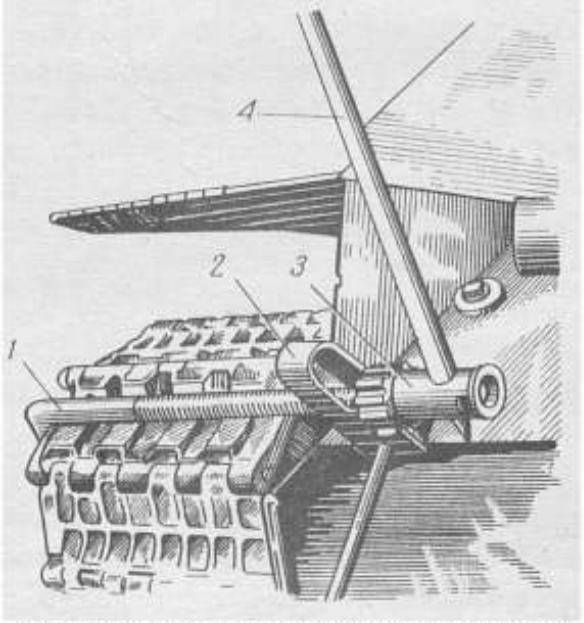

FIG.3. ENGAGING THE CRANK OF TRACK ADJUSTING MECHANISM BY MEANS OF FIXTURE [illegible]

1 - bracing hook, 2 - thrust; 3 - special nut, 4 - forcer

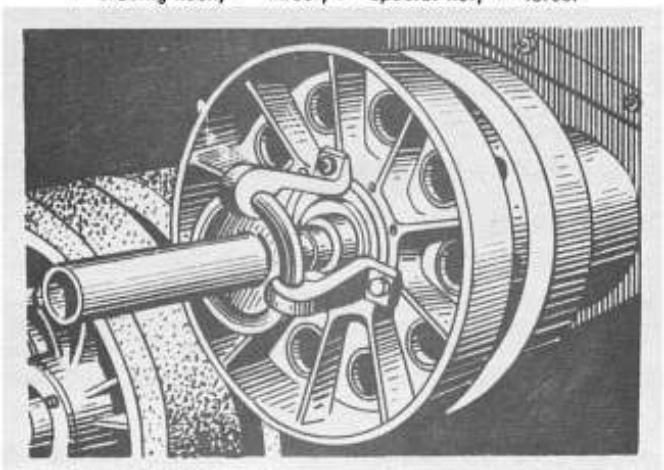

FIG.4. MOUNTING FIXTURE [illegible] FOR PRESSING OFF THE IDLER WHEEL (ROAD WHEEL)

Note. The work indicated in Items 7, 8 is performed during the repair of the idler wheel.

Installation of Idler Wheel

Specifications for installation:

(a) the bearings should be fitted into the idler wheel hub seats so that their end face surfaces thrust against the hub seat shoulders; the outer rings of the bearings in the hub seats should not yield to rotation under the effort of the hand; the inner rings relative to the outer ones should rotate easily, without binding and jamming, under the hand effort. Prior to fitting the bearing hubs into the seats, the former should be lubricated with grease УС ; pack 500 gr of grease УС into the space between the spacing bushing and the hub;

(b) the idler wheel fastening nut should be tightened home until it thrusts against the bearing inner ring end face;

(c) the permissible clearance between the faying surfaces of the armour cap and the disc hub should not exceed 0.3 mm;

(d) the finally installed idler wheel should easily, without jamming, rotate in the bearings under the hand effort; rotation with difficulty due to tight contact of the oil seal is permissible.

Sequence of installation of idler wheel:

1. Mount cover 11 (Fig.1) of the labyrinth seal, oil seal 12 and metal ring 2 on the idler wheel axle.

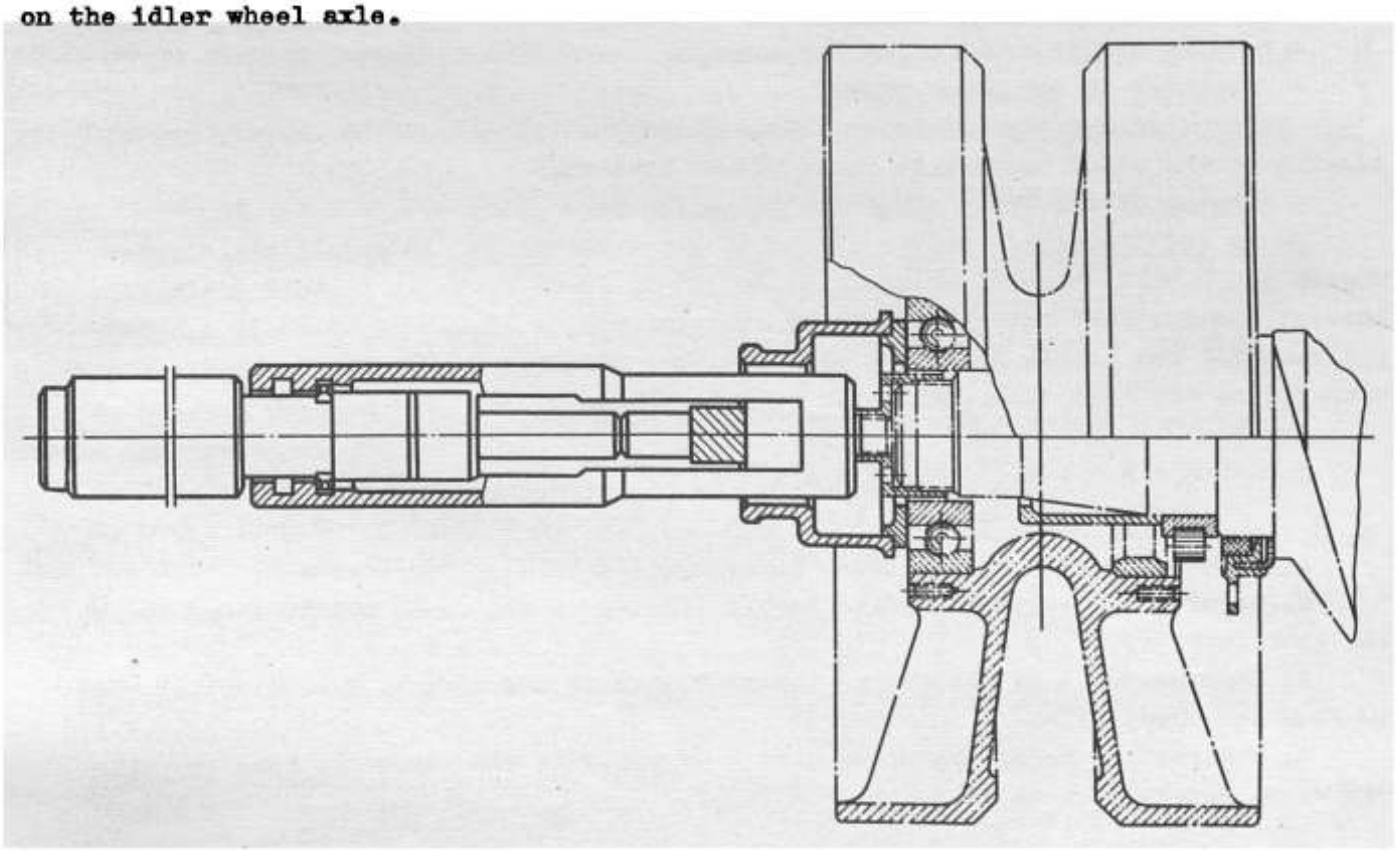

FIG.5. MOUNTING FIXTURE УК-8А FOR PRESSING ON THE IDLER WHEEL

2. Press-fit ball bearing 15 into the idler wheel hub, insert spacing bushing 14 and press-fit roller bearing 13 (See Specifications, Item "a").

3. Screw adapter union УК-8-18 on the threaded end of the idler wheel axle.

4. Mount the idler wheel assembly on the crank axle and install (Fig.5) fixture УК-8А, press-fit the idler wheel on the crank axle, and remove the fixture.

5. Screw on nut 16 (Fig.1) and cotter it (See Specifications, Item "b").

6. Install cover 11 of the labyrinth seal on the wheel hub (on iron oxide red paint or zinc white), and fix it by bolts provided with spring washers.

7. Fill the inner cavity of armour cap 17 with lubricant УС (300 gr). Install it, having preliminarily coated the surfaces with iron oxide red paint or zinc white, and fix it on the hub by bolts provided with spring washers. Tighten the bolts as far as they will go. Check installation of the wheel (See Specifications, Items "c", "d").

8. Mount the track on the idler wheel.

9. Align the holes of track shoes of the upper and lower branches of the track by means of fixture Сб-00 (Fig.2) and connect them with a pin.

10. Adjust the track tension (See "Installation of Track",Items 8-10).

11. Install the front mud shield and secure it by means of a bolt provided with a spring washer.

REPLACEMENT OF IDLER WHEEL CRANK AND TRACK ADJUSTING MECHANISM

Replace the idler wheel crank and track adjusting mechanism, if the following defects are detected:

- cracks on the idler wheel crank of any size and location;
- jamming of the crank in supports;
- bending of the crank which hampers its no mal functioning;
- stripping of the crank thread;
- crumpling and wear of teeth of the crank toothed disc which hampers normal meshing of the crank teeth with those of the bracket;
- jamming of the track adjusting mechanism worm pair.

Tools and fixtures: wrench 17 mm; socket wrenches 14, 17 and 22 mm; ratchet wrench 34.28.98сб; special wrenches 34.28.215-1, КС-8; crowbar; forcer; drift; sledge hammer; hammer; cold chisel; track pin removing rod 34.28.014 or 54.28.595; track pin removing rod handle 28.1341-3 or 54.28.984; fixtures Сб-00, УК-1А, УК-8А; cans with grease УС, iron oxide red paint or zinc white.

Removal of Idler Wheel Crank with Track Adjusting Mechanism

1. Remove the idler wheel (See "Removal of Idler Wheel", Items 1-6).

2. Unscrew the bolts fastening body 5 (Fig.1) of the crank nut lock and remove the lock body.

3. Unscrew nut 6 of the crank, remove the crank and ring 4. Remove rubber ring 10 from the crank axle.

4. Unscrew the bolts fastening case 9 of the worm and remove it complete with the worm. Remove worm wheel 8 from bracket 3.

Installation of Idler Wheel Crank and Track Adjusting Mechanism

Specifications for installation:

(a) the crank tail piece should freely enter the bracket hole; the worm gear should be fitted by hand on the crank splines freely, without jamming; prior to in-