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101.11:

9-2350-255-20-1-2-1 / REP. 1-8 / DRAFT

TM 9-2350

**STE-M1/FVS**

**DRAFT  
TECHNICAL MANUAL**

**TR  
US**

**ORGANIZATIONAL MAINTENANCE MANUAL**

**VOLUME II - PART 1  
TROUBLESHOOTING**

**TANK, COMBAT, FULL-TRACK  
105-MM GUN, M1  
(2350-01-061-2445)  
GENERAL ABRAMS**

**This Copy is a Reprint Which Includes  
Change 1, 2, 3, 4, 5, 6, 7, and 8**

**HULL  
NOTE**

**THIS MANUAL TO BE USED WITH STE-M1/FVS  
TEST SET ONLY (SEE CHANGE SHEET 31 JAN 19**

**GENERAL DYNAMICS  
Land Systems Division**

**DAAE07-81-C-0416**

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**WARNING  
RADIOACTIVE MATERIAL**



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**HANDLE CAREFULLY**

**RADIOACTIVE**

The M1 Collimator (Muzzle Reference Sensor) used to compensate for gun tube bend contains the radioactive isotope "tritium" (H-3).

The radioactive material is completely encased within the unit and poses no external radiation threat to the user.

The radioactive material is licensed under Federal Law by the Nuclear Regulatory Commission. The licensee is HQ, US Army ARRCOM, Rock Island, IL 61299. The licensed Health Physicist may be contacted at AUTOVON 793-6982/6989/5843 or commercial (309) 794-6982/6989/5843. Material pertaining to the NRC license, information concerning the safe use and storage of the radioactive material, and fire or other emergencies, should be referred to the licensed Health Physicist.

**WARNING**

The antireflective coating on all infrared optics contains thorium fluoride which is slightly radioactive. The only potential hazard involves ingestion (swallowing or inhaling) of this material. Dispose of broken lens, etc. in accordance with AR385-11.

**DON'T TAKE CHANCES**

**WARNING**

Ammunition containing explosives must be handled with care at all times. The explosive in primers and fuses is very sensitive to shock and high temperature. If ammunition is dropped, thrown, tumbled, or dragged, an explosion may result, causing death or injury and destruction of equipment. Disassembly of ammunition is not authorized.



### WARNING

You can be blinded if you look into a laser beam when you are not wearing laser safety goggles. Never aim the laser rangefinder at personnel.

If laser beam reflects from a flat, mirror-like surface it can blind you unless you are wearing laser safety goggles.

All people who work down range of the laser must wear laser safety goggles. Laser safety goggles, NSN 4240-00-258-2054 or an approved substitute, will protect you.

Treat the rangefinder as a direct-fire weapon, with hazardous range of 8000 meters. Observe the following precautions when rangefinder is being used:

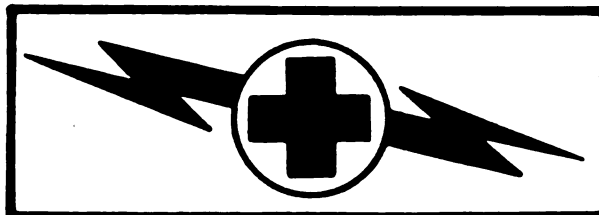
1. Never fire the rangefinder at a target less than 10 meters away.
2. Never fire the rangefinder at flat glass or mirror-like targets.
3. Fire the rangefinder only at approved laser targets on an approved laser-firing range.
4. Report through the chain of command if:
  - (a) An unprotected person may have been in the beam path and closer than 8000 meters when the rangefinder was fired.
  - (b) An unprotected person was looking at a flat glass or mirror-like surface when the rangefinder was fired at it.

### NOTE

Person in charge must arrange for necessary eye examination and report in accordance with AR 385-40.

5. Make sure you get laser safety training before you work near an operating laser.

**WARNING**



**WARNING**

**HIGH VOLTAGE**

is used in the operation of this equipment.

**DEATH ON CONTACT**

may result if personnel fail to observe safety precautions.

Never work on electronic equipment unless there is at least one other person nearby who is familiar with the operation and hazards of that equipment. That person should also be competent in giving first aid. When operators help technicians, they must be warned about dangerous areas.

Whenever possible, shut off the power supply to equipment before beginning work. When working inside the equipment with power off, take special care to ground capacitors likely to hold a dangerous potential.

Be careful not to contact high-voltage connections when installing or operating this equipment.

Whenever possible, keep one hand away from the equipment to reduce the hazard of current flowing through vital organs of the body.

**WARNING**

Do not be misled by the term "low voltage". Voltages as low as 50 volts may cause death.

For artificial respiration, refer to FM 21-11.

**WARNING**

Remove rings, bracelets, wristwatches, and neck chains before working around the tank or other vehicles. Jewelry can catch an equipment and cause injury, or may short across an electrical circuit and cause severe burns or electrical shock.

**WARNING****CARBON MONOXIDE (EXHAUST GAS) CAN KILL YOU**

Carbon monoxide is without color or smell, but can kill you. Breathing air with carbon monoxide produces symptoms of headache, dizziness, loss of muscular control, a sleepy feeling, and coma. Brain damage or death can result from heavy exposure. Carbon monoxide occurs in the exhaust fumes of fuel-burning heaters and internal combustion engines. Carbon monoxide can become dangerously concentrated under conditions of no air movement. Precautions must be followed to insure crew safety when the personnel heater, or main or auxiliary engine of any vehicle is operated for any purpose.

1. **DO NOT** operate personnel heater or engine of vehicle in a closed place unless the place has a lot of moving air.
2. **DO NOT** idle engine for long periods without ventilator blower operation. If tactical situation permits, open hatches.
3. **DO NOT** drive any vehicle with inspection plates, cover plates, or engine compartment doors removed unless necessary for maintenance purposes.
4. **BE ALERT** at all times during vehicle operation for exhaust odors and exposure symptoms. If either are present, **IMMEDIATELY VENTILATE** personnel compartments. If symptoms persist, remove affected crew to fresh air; keep warm; **DO NOT PERMIT PHYSICAL EXERCISE**; if necessary, give artificial respiration, and get immediate medical attention.
5. **BE AWARE**; neither the gas particulate filter unit nor the field protection mask for nuclear-biological-chemical (NBC) protection will protect you from carbon monoxide poisoning.

**THE BEST DEFENSE AGAINST CARBON MONOXIDE POISONING IS GOOD VENTILATION.**

**WARNING**

Be sure vehicle master power is off before you work on any part of the electrical system. You can get electrical shock or burns if power is on.

**WARNING**

Adhesives, solvents, and sealing compounds can burn easily, can give off harmful vapor, and are harmful to skin and clothing. To avoid injury or death, keep away from open fire and use in a well-ventilated area. If adhesive, solvent, or sealing compound gets on skin or clothing, wash immediately with soap and water.

**WARNING**

Fuel is very flammable and can explode easily. To avoid serious injury or death, keep fuel away from open fire and keep fire extinguisher within easy reach when working with fuel. Do not work on fuel system when engine is hot. Fuel can be ignited by hot engine. When working with fuel, post signs that read "NO SMOKING WITHIN 50 FEET OF VEHICLE."

**WARNING**

Soldier must stay in drivers seat when engine is running. To avoid injury, tank must be under control at all times.

**WARNING**

Avoid standing in the direct path of exhaust stream when checking for cooling air flow at rear of tank. Fumes could cause burns or make you sick.

**WARNING**

Engine noise can damage ears. To avoid injury to ears, be sure to wear ear plugs.

**WARNING**

Be alert during personnel heater troubleshooting for exhaust odors and signs of carbon monoxide poisoning. If detected, shut off personnel heater and ventilate vehicle.

HEADQUARTERS  
DEPARTMENT OF THE ARMY  
WASHINGTON, D.C.

**Organizational Maintenance Manual**

**TANK, COMBAT, FULL-TRACKED: 105-MM GUN, M1 HULL**

**(2350-01-061-2445)**

**Reporting Errors and Recommending Improvements**

You can help improve this manual. If you find any mistake or if you know of a way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publication and Blank Forms), or DA Form 2028-2 located in the back of this manual directly to: Program Manager, M1 Tank System DRCPM-GCM-L, Warren, Michigan 48090. A reply will be furnished to you.

**NOTE**

This Volume is divided into three parts: Chapters 1 through 13 are contained in this part, Chapters 14 through 19 are in TM 9-2350-255-20-1-2-2, and Chapters 19.1 and 20 are in TM 9-2350-255-20-1-2-3.

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\*This publication supersedes TM 9-2350-255-20-1-2-1, 15 August 1980, including all changes.



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## CHAPTER 1 GENERAL

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### Section I. SCOPE AND ORGANIZATION

- 1-1. Introduction.** This manual contains instructions for organizational level troubleshooting of the M1 Abrams Tank hull assembly.
- 1-2. Scope.** Detailed troubleshooting procedures for each of the functional groups or systems in the hull assembly are covered in separate chapters in this manual. Other information such as schematic diagrams, functional flow diagrams, and test procedures required for fault isolation are also provided where needed. Figure 20-164 of TM 9-2350-255-20-1-2-3 lists all the common electrical symbols used on the M1 schematic diagrams.
- 1-3. Organization of Manual.** Chapters 2 through 7 of this manual describe the basic approach used for troubleshooting, include system functional descriptions, and provide index tables for locating troubleshooting information. The rest of the manual is divided into chapters and paragraphs that cover each functional equipment group listed under paragraph 1-5.
- 1-4. Reporting Equipment Improvement Recommendations (EIR's).** If your equipment needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design. Tell us why a procedure is hard to perform. Put it on an SF 368 (Quality Deficiency Report). Mail it to us at: Commander, USATACOM, ATTN: DRSTA-M, Warren, Michigan 48090. We'll send you a reply.

### Section II. EQUIPMENT FUNCTIONAL BREAKDOWNS

- 1-5. Functional Grouping of Equipment.** The troubleshooting procedures in this manual are divided into functional groups or systems. Separate chapters are used to cover each functional group. Subsystems within the functional group are covered in separate sections within the chapter. The following functional groups are included:
- a. Suspension System
  - b. Engine
  - c. Fuel Supply System
  - d. Transmission and Final Drive
  - e. Steering System
  - f. Brake System
  - g. Drain Valve System
  - h. Fire Extinguisher System
  - i. Inflatable Seal
  - j. Hull Electrical System
- 1-6. Hull Hydraulic System.** The hull hydraulic system troubleshooting procedures are located in chapter 9 of TM 9-2350-255-20-2-2-1.

Section III. GENERAL INFORMATION

1-7. STE/M1 SETCOM Acronyms and Abbreviations. Table 1-1 is a list of acronyms and abbreviations that you will see displayed on the simplified test equipment/M1 (STE/M1) set communicator (SETCOM) and what they mean.

Table 1-1. STE/M1 Acronym and Abbreviation Index

ACRYM	Abbreviation	Nomenclature	RPSTL Name
AIRSW	AIR CLNR PRESS S	Air Cleaner Clog Pressure Switch	Switch, Pressure
ALT	ALTERNATOR	Alternator	Generator, Engine AC
ATP	—	Alternate Troubleshooting Procedure	—
AUXP	AUX HYDR PWRPACK	Auxiliary Hydraulic Powerpack	HYD Powerpack Assy
AXHPS	AUX HYD PRES SW	Auxiliary Hydraulic Pressure Switch	—
—	BATT/CHARGE SYS	Battery Charging System	—
BATBD	BATT TERMINAL BD	Battery Compartment Terminal Board	Terminal Board
BMACH	BLASTING MACHINE	Blasting Machine	Blasting Machine
—	BO LIGHTS	Blackout Lights	—
*CA—	—	STE/M1 Cable Adapter	—
CANT	CANT UNIT ASSY	CANT Unit Assembly	CANT Unit Assembly
*CB—	—	Circuit Breaker	—
CBRHR	—	Gas Particulate Heater	Heater, Air, Electric
CCBRH	—	Commander's Gas Particulate Heater	Heater, Air, Electric
CCP	CCP	Computer Control Panel	Control Panel, Ballistics
CDOME	COMMANDER'S DOME-LAMP	Domelight Assembly	Dome Light Assembly
CEU	CEU	Computer Electronics Unit	Computer, Ballistics
CFIRE	FIRE SENSR-CENTER	Fire Sensor (Center)	Sensor, Fire
—	CHK CONN	Check Connections	—
CINT	C INTERCOM CNTL	Commander's Intercom Control	GFE
CINTS	CMDR INTERCOM SW	Commander's Handgrip Switch	Switch Assembly, Electrical
CKT	—	Circuit	—
CMOD	—	Control Module	—
CNTLM	CONTROL MODULE	Control Module	—
COAXS	COAX SOLENOID	COAX Gun Solenoid	Solenoid, Electrical
CVALV	CREW VALVE/BOTT	Fire Extinguisher Valve	Valve and Bottle AS
CWSGB	CWS GEARBOX SW A	Gearbox Switch	Connector-Switch
CWSH	CWS CONTROL HNDL	CWS Control Handle Assembly	Control Handle
CWSMB	CWS MOTOR/BRAKE	Azimuth Motor/Brake	Motor-Brake Assembly
CWSPU	CWS PWR CNTL U	Power Control Unit	Power Unit, Control
*CX—	—	STE/M1 Control Cable	—

\*Numbers are displayed on SETCOM in place of dashes.

Table 1-1. STE/M1 Acronym and Abbreviation Index (Continued)

ACRYM	Abbreviation	Nomenclature	RPSTL Name
DAP	DRVR ALERT PANEL	Alert Panel	Panel, Indicator
DBA	—	Diagnostic Breakout Assembly	—
DCBRH	—	Driver's Gas Particulate Heater	Heater, Air, Electric
DDOME	DRVRS DOMELIGHT	Dome Lamp	Dome Light Assembly
DFIRE	FIRE SENSOR - DRVR	Fire Sensor	Sensor, Fire
DINT	D INTERCOM CNTL	Driver's, Intercom Control	GFE
DIP	DIP	Driver's Instrument Panel	Panel, Instrument
DMP	DMP	Driver's Master Panel	Panel, Control, Master
DSFSW	DOOR SAFETY SW	Door Safety Switch	Ready Ammunition Door Safety Switch
ECU	ECU	Electronic Control Unit	Electronic Control
ELSVO	ELEVATION SERVO	Elevation Servo	Servomechanism Assembly
EMFS	ELCT MECH FL SYS	Fuel Metering Module	Electro-Mech Fuel
ENG	—	Engine	—
EOTXM	ENG OIL TEMP XMTR	Engine Oil Temperature (High)	Sensor, Oil Temp
EXCTR	IGNITION EXCITER	Ignition Exciter	Exciter, Ignition
EXT	—	External	—
FC	—	Fire Control	—
FC/SS	—	Fire Control/Stabilization System	—
FEA	FIRE EXT AMP	Fire Extinguisher Amplifier	Amplifier, Control, F
FERSW	FIRE EXT RESET S	Fire Extinguisher Reset Switch	Switch Assembly
FLXFM	FUEL XFER MANF A	Fuel Transfer Manifold	Manifold, Fueling Fuel Transfer
FLXFP	FUEL XFER PUMP	Front Fuel Pump	Pump, Fuel, Cam, Actua
FLXMR	ENG COMP FL XMTR	Engine Comp. Fuel Sensor	Transmitter Liquid
FWRV	—	Forward/Reverse Valve	Housing, Valve, Forward-Reverse
FWSEP	FUEL/WATER SEP	Fuel Water Separator	Separator, Water, Liq.
GAS	GAS	Gunner's Auxiliary Sight	Sight
GCBRH	—	Gunner's Gas Particulate Heater	Heater, Air, Electric
GCH	GNR CNTL HANDLES	Gunner's Control Handles	Grip Assembly, Control
GDOME	GNRS DOMELIGHT	Gunner's Dome Lamp	Dome Light Assembly
GGYRO	GUN GYROSCOPE	Reference Gyro	Gyro Assembly, Rate
GPFLT	GAS PARTIC FLTR	Gas Particulate Blower	Precleaner and Particulate Filter Assembly
GPS	GPS	Gunner's Primary Sight	Sight, Gunner's Primary
GTD	GTD	Gun/Turret Drive Electronic Unit	Turret Drive
GTR	GUN TRUN RSLVR	Gun Trunnion Resolver	Resolver, Electrical
GUNC	GUN CONDUCTER A	Main Gun Primer	—

Table 1-1. STE/M1 Acronym and Abbreviation Index (Continued)

ACRYM	Abbreviation	Nomenclature	RPSTL Name
HANDP HDB	HAND PUMP ASSY HDB	Hand Pump Assembly Hull Distribution Box	Hand Pump Assembly Distribution Box AY, Hull Power
HDV	T HYD PWR DIST V	Turret Hydraulic Power Distribution Valve	Valve, Turret, Hydraulic
HEATP	HEATER FUEL PUMP	Heater, Fuel Pump, Electric	Pump, Fuel, Electrical, Personnel Heater
HGYRO HNB —	HULL GYROSCOPE HNB —	Hull Gyro Hull Networks Box Main Hydraulic Pump	Gyro Assembly, Rate Distribution, Box Pump, Centrifugal
ICU —	ICU IGV ACT	Image Control Unit Inlet Guide Vane Actuator	XM1 TIS TICU Actuator, TGV
IRRU	—	IR Stimulus Unit	—
KNESW	KNEE SWITCH	Knee Switch	Switch Assembly
LDOME LFFXM LFIRE LFLPS LGREN LHEAD LOS LP LPARK LRF LRFLP LTAIL	LDRS DOMELIGHT LFTFR FUEL XMTR FIRE SNSR-LEFT LT FUEL PRESS SW L GRENADE LAUNCH LEFT HEAD LIGHT LOS LOADER'S PANEL L PARK BRAKE SW LRF L REAR FUEL PUMP LEFT TAIL LIGHT	Loader's Dome Lamp Left Front Fuel Sensor Unit Fire Sensor (Left) Left Fuel Pressure Switch Left Grenade Launcher Left Headlamp LOS Electronics Unit Loader's Panel Left Parking Brake Switch Laser Rangefinder Left Rear Fuel Pump Left Tail Light	Dome Light Assembly Transmitter, Liquid Sensor, Fire Switch, Pressure GFE Headlight Electronic Assembly Loader's Panel Switch Assembly, Brake XM1 LRF Pump, Fuel, In-Tank Light Assembly, Clea
*M— — — —	— MAIN RV MAIN V MAIN VLV	Meter Assembly Main Regulator Valve Main Control Valve Main Control Valve	— — — —
MANFA MGSSW MOD V MRS	MANIFOLD ASSY MAIN GUN SAF SW — —	Manifold Assembly Main Gun Safety Switch Modulator Valve Muzzle Reference Sensor	Manifold, Distributi Switch Assembly Valve, Modulator Collimator Assy

\*Numbers are displayed on SETCOM in place of dashes.

Table 1-1. STE/M1 Acronym and Abbreviation Index (Continued)

ACRYM	Abbreviation	Nomenclature	RPSTL Name
NBC NBCHC NBCHD NBCHG NBCHL NH1 NH2 NITEP NPT1 NPT2	NBC CMDRS NBC HEATER DRVRS NBC HEATER GNRS NBC HEATER LDRS NBC HEATER NH SP PICKUP 1 NH SP PICKUP 2 NIGHT PERISCOPE NPT SP PICKUP 1 NPT SP PICKUP 2	NBC Commander's NBC Heater Driver's NBC Heater Gunner's NBC Heater Loader's NBC Heater NH SP Pickup No. 1 NH SP Pickup No. 2 Night Periscope NPT SP Pickup No. 1 NPT SP Pickup No. 2	N.B.C. Heater, Air, Electric Heater, Air Electric Heater, Air, Electric Heater, Air Electric Pickup, Engine Speed Pickup, Engine Speed GFE Speed Pickup Speed Pickup
OILFS OILPS OLVLS	OIL FLTR PRESS S OIL PRESSURE SW OIL LEVEL SW	Clogged Oil Filter Switch Low Oil Pressure Switch Oil Level Switch (Low and Add)	Switch Filter Bypass Sensor, Oil Pressure Switch, Filter, Dual Level
PHEAT PLA PTRLY —	PERSONNEL HEATER — ST PILOT RELAY PTS ACT	Heater, Personnel Power Lever Angle (Throttle Control) Pilot Relay Power Turbine Stator Actuator	Heater, Vehicular, Co Steering Assy, Throt Relay, 100 Amp Actuator, Pt Stator
RADAC REF RFFYM RFIRE RFLPS RFLXM RGREN RHEAD RPARK RRFLP RTAIL RTFAN RVDT	RADIAC REF R FR FUEL XMTR FIRE SNSR-RIGHT RT FUEL PRESS SW REAR FUEL XMTR R GRENADE LAUNCH RIGHT HEAD LIGHT R PARK BRAKE SW R REAR FUEL PUMP RIGHT TAIL LIGHT RIGHT FAN CLUTCH R TRY VAR DIF XFM	Radiac Reference Right Front Fuel Sensor Unit Fire Sensor (Right) Right Fuel Pressure Switch Rear Sponson Fuel Sensor Right Grenade Launcher Right Headlamp Right Parking Brake Switch Right Rear Fuel Pump Right Tail Light Right Fan Clutch Rotary Variable Differential Transformer	GFE — Transmitter, Liquid Sensor, Fire Switch, Pressure Transmitter, Liquid GFE Headlight Switch Assembly, Brake Pump, Fuel, In-Tank Light Assembly Clea Clutch, Magnetic Transformer and Lea
SHIFT SMOKE	SHIFT CNTRL ASSY SMOKE GEN FL PMP	Shift Select Assembly Smoke Generator Fuel Pump	Shift Control Assem Pump Assembly, Subme Generator
SRING	H/TUR SLIP RING	Hull/Turret Slip Ring	Slip Ring Assembly Turret/Hull
SSOL START STOPS	STARTER SOLENOID STARTER STOPLIGHT SWITCH	Starter Solenoid Starter Stop Light Switch	Solenoid Switch Starter Motor Switch Assembly Sto

Table 1-1. STE/M1 Acronym and Abbreviation Index (Continued)

ACRYM	Abbreviation	Nomenclature	RPSTL Name
*TA—	—	Transducer	—
TCH	TANK CMDRS HNDLS	Commander's Control Handles	Control Assembly
TCNTL	THROTTLE CONTROL T	PLA	Steering Assy, Throt
TCP	TCP	Commander's Control Panel	Control Panel Assembly
TEU	THERMAL ELECT U	Thermal Electronics Unit	Electronic Unit, Thermal
TGYRO	TURRET GYROSCOPE	Feed Forward Gyro	Gyro Assembly, Rate
TMP	TEMP	Temperature	—
TNB	TNB	Turret Networks Box	Turret Networks Box
TPCU	THERMAL PWR CNTL	Thermal Power Control Unit	Power Control Unit
TRU	THERMAL RCVR UN	Thermal Receiver	XM1 TIS TRU Unit
TRVMC	TRAVERSING MECH	Azimuth Gear Box	Traversing, Matched Assembly
TRVSV	TRAVERSE SERVO	Azimuth Servo	Servomechanism Assembly, Traverse
T1SNR	T1 TEMP SENSOR	T1 Resistance Probe	Sensor
VBLOW	VENT BLOWER ASSY	Turret Blower	Fan, Tubeaxial
VOLTR	VOLTAGE REG	Voltage Regulator	Regulator, Voltage
XDIFS	XMSN DIFF PRESS	Indicator Differential Pressure Switch	Switch Assy, Pressure
XMSN	XMSN	Transmission	—
XMSOL	XMSN SHIFT SOL	Transmission Shift Solenoids/Speed Sensor	Solenoid, Transmissi
XOILF	XMN MAIN OIL FLT	Transmission Oil Filter Sensor	Filter, Fluid, Pressu Main
XOLXM	XMN OIL LVL XMTR	Transmission Oil Level (Low)	Transmitter, Liquid
XPRES	XMSN OIL PRESS S	Transmission Oil Pressure Switch	Switch, Oil Pressure
XTHRM	XMSN THERMAL SW	Transmission Oil Temperature and Cooling Fan Switch	Switch, Thermostatic
XWIND	X WIND SENSOR	Crosswind Sensor	Sensor, Crosswind
ZDESW	ZERO DEG EL SW	Zero Degree Elevation Switch	Switch Assembly, Zero Degree Elevation
1FIRE	FIRE SENSOR-ENG 1	Fire Sensor No. 1	Sensor, Fire
1SHOT	1 SHOT VALVE/BOTT	Fire Extinguisher Valve	Valve and Bottle As
2FIRE	FIRE SENSOR-ENG 2	Fire Sensor No. 2	Sensor, Fire
2SHOT	2SHOT VALVE/BOTT	Fire Extinguisher Valve	Valve and Bottle As
3FIRE	FIRE SENSOR-ENG 3	Fire Sensor No. 3	Sensor, Fire

\*Numbers are displayed on SETCOM in place of dashes.

1-8. Fault Symptom Number Abbreviations. Table 1-2 is a list of abbreviations used in the fault symptom index number columns. The abbreviations tell you what system/subsystem the fault symptom is in.

**Table 1-2. Fault Symptom Number Abbreviations Index**

Abbreviation	Meaning
AES	Azimuth/Elevation Subsystem
ADC	Ammunition Door Control Subsystem
AHS	Auxiliary Hydraulic Subsystem
ASTS	Auto Self Test & Cable Disconnect Subsystem
BPS	Bilge Pump Sybssystem
CBM	Circuit Breaker Monitor Subsystem
CDM	Cable Disconnect Monitor Subsystem
COMM	Communication System
CS	Computer Subsystem
CWSDS	Commander's Weapon Station Azimuth Drive Subsystem
DVS	Drain Valve System
ECS	Electrical Charging Subsystem
ESS	Engine System
FCS	Firing Circuits Subsystem
FES	Fire Extinguisher System
FSS	Fuel Supply System
GAS	Gunner's Auxiliary Sight Reticle Subsystem
GPS	Gunner's Primary Sight Defroster Subsystem
GPTS	Gas Particulate Subsystem
ISS	Inflatable Seal System
LOS	Line-of-Sight Subsystem
LRF	Laser Rangefinder Subsystem
METS	Manual Elevation and Traverse Subsystem
MHS	Main Hydraulic Subsystem
MM	Maintenance Monitor Subsystem
NPS	Night Periscope System
PBS	Parking Brske Subsystem
PDMPC	Power Distribution/Master Power Control Subsystem
PHS	Personnel Heater Subsystem
PLDS	Panel Lights & Domelights Subsystem (Turret)
PLS	Panel Lights Subsystem (Hull)
SBS	Service Brake Subsystem
SGRS	Smoke Generator Subsystem
SGS	Smoke Gernade System
SS	Steering System
SSS	Suspension System
TCBM	Turret Circuit Breaker Monitor Subsystem
TFD	Transmission & Final Drive
TIS	Thermal Imaging System
TOC	Transmission Oil Cooler
TSS	Transmission Shift Subsystem
VES	Ventilator Blower Subsystem
VELS	Vehicle External Lights & Domelight Subsystem
V/TPC	Vehicle/Turret Power Control Subsystem





## CHAPTER 2 TROUBLESHOOTING DATA

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### Section I. TROUBLESHOOTING APPROACH

**2-1. General.** Troubleshooting is a step-by-step process of finding the cause of problems with the tank. This section explains the overall approach used for troubleshooting. It also describes the index tables and supporting data you will need to use and how to find them in this manual.

**2-2. Troubleshooting Index.** The troubleshooting index (see chapter 3, table 3-1) is the master reference table for locating troubleshooting information for a particular functional group. It lists each group or system and provides a reference, by figure number, to the troubleshooting information for that system.

**2-3. Test Equipment Procedures Index.** The test equipment procedures index (see chapter 4, table 4-1) lists the test equipment and special tools used for troubleshooting and provides a reference, by figure number, to the detailed instructions for their use.

**2-4. Troubleshooting Roadmaps.** Troubleshooting roadmaps (see chapter 5) are provided for each functional system. They give the soldier an overall view of the assemblies or piece parts included in each system.

**2-5. Fault Symptom Indexes.** Separate fault symptom index tables (see chapter 6) are provided for each functional group or system. Each table lists the fault symptoms for the system or subsystem and refers to the TM and paragraph where the troubleshooting procedures for that system can be found. The symptom you have may not be exactly as described in the indexes. Find the symptom that most closely resembles the symptom you have and the referenced troubleshooting procedure. The indexes also contain a Resources Required column that lists the number of personnel required to do each troubleshooting procedure.

**2-6. Troubleshooting Procedures.** The troubleshooting procedures are in the form of fault isolation flowcharts (see sample, chapter 7). Each flowchart begins with a fault symptom that can be seen, felt or heard during operation of the tank without using test equipment. Step-by-step instructions for finding and correcting the fault are given for each symptom. When needed, illustrations are included for the symptom showing locations of all test points and how each troubleshooting step should be done.

**2-7. Alternate Troubleshooting Procedures (ATP).** Alternate troubleshooting procedures (ATP) are also included in this manual. ATP's for organizational-level provide troubleshooting procedures to be used when automated test equipment (ATE) is not available. ATE for troubleshooting the hull systems is identified as Simplified Test Equipment - M1 or the STE/M1 test set. ATP's are for skill level 2 personnel with appropriate MOS training. They are limited to those procedures which can be performed using conventional test equipment available to organizational maintenance personnel.

**2-8. Troubleshooting Approaches.** There are two basic troubleshooting approaches in this manual. The two approaches are:

- a. Primary troubleshooting
- b. Alternate troubleshooting

The following blocks and illustrations are a guide on how and when to use each of these approaches.

**TYPICAL TROUBLESHOOTING APPROACH**

**NOTE**

The typical troubleshooting approach which follows is presented in the same format as the detailed troubleshooting procedure you will be using to identify and correct the problem with the M1 tank.

- 1
- Check the three key steps that make for good troubleshooting.
    - Identify the trouble.
    - Find the right troubleshooting procedure.
    - Use the detailed troubleshooting procedure to locate, and isolate the fault.
- How do you "identify" the symptom?

- 2
- To identify the symptom, look at DA form 2404 filled out by the crew.
  - If not enough information is given to identify the symptom, ask the crew questions and get as much information as possible about the problem.
  - Make sure there was no crew error in following the operator's procedure listed in TM 9-2350-255-10.

EQUIPMENT INSPECTION AND MAINTENANCE WORKSHEET			
1. IDENTIFICATION		2. OPERATOR'S AND USER'S	
UNIT: A CB 1/71-30	PLT Tank M1	OPERATOR'S NAME: [Signature]	DATE: [Blank]
OPERATOR'S NO: 7800P	PLT: [Blank]	APPLICABLE REFERENCE	PLACE
TO: 2350-255-10	NO. DATE: [Blank]	NO. DATE: [Blank]	NO. DATE: [Blank]
<p>INSTRUCTIONS: 1. Complete this form based on the VII applicable to the inspection performed. Following the completion of the inspection, the operator shall indicate the status of the equipment in the following manner:</p> <p>STATUS 1 - Enter the name number.</p> <p>STATUS 2 - Enter the applicable condition status symbol.</p> <p>STATUS 3 - Enter deficiencies and observations.</p> <p>STATUS 4 - Show corrective action for deficiency or shortcoming based on Column 5.</p> <p>STATUS 5 - Indefinite action pending completed corrective action stated in this column.</p>			
<p>ALL INSPECTIONS AND EQUIPMENT CONDITIONS RECORDED ON THIS FORM HAVE BEEN DETERMINED IN ACCORDANCE WITH THE APPLICABLE PROCEDURES AND STANDARDS IN THE TITLE OF THIS REGULATION.</p>			
INSPECTOR'S NAME: [Signature]	NO. DATE: [Blank]	NO. DATE: [Blank]	NO. DATE: [Blank]
NO. DATE: [Blank]	DEFICIENCIES AND SHORTCOMINGS	CORRECTIVE ACTION	STATUS
26	High pump doesn't work		1

DA FORM 2404

**WARNING**

Do not try to operate tank if there is any chance the symptom may injure personnel or damage tank. Example: "No steering control."

**WARNING**

Before operating tank, notify nearby personnel and make sure surrounding area is clear, to prevent injury to personnel or damage to equipment.

3

- If necessary operate the tank to help identify the symptom.
- Now that you have an idea what the symptom is, find the system/subsystem the symptom is listed in.

**NOTE**

If you don't know the system/subsystem that the symptom is in but you have an idea what component is bad, refer to the troubleshooting roadmaps in chapter 5. The troubleshooting roadmaps list the components that are replaced in the troubleshooting procedures and are listed under each system/subsystem. Find the component you think is bad to identify what system/subsystem it will be in.

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4

- Find the system/subsystem in Table 6-1 Hull Systems.

**NOTE**

Symptoms are identified in this manual by fault symptoms.

- Find the Fault Symptom Index table number in column 2.
- Find the fault symptom index page number in column 3.

Did you find the right system/subsystem and fault symptom index?

**CHAPTER 6  
FAULT SYMPTOM INDEXES**

6-1 General This chapter contains symptom indexes which identify the correct procedures for troubleshooting a malfunction in any of the hull systems. For each hull system a fault symptom index history is included. The symptom indexes are listed in Table 6-1 with page number numbers.

**Table 6-1 Hull Systems**

System/Subsystem	Fault Symptom Index	
	Table	Page
Suspension System	0-2	0-2
Engine System	0-3	0-3
Fuel Supply System	0-4	0-6
Transmission and Fuel Drive System	0-5	0-10
Transmission Shift Subsystem		0-10
Transmission Oil Cooler Subsystem		0-12
Steering System	0-6	0-13
Brake System	0-7	0-14
Service Brake Subsystem		0-14
Parking Brake Subsystem		0-14
Drum Valve System	0-8	0-16
Fire Extinguisher System	0-9	0-17
Water Separator and Water Filter Control Subsystem	0-10	0-18
Steering Charging Subsystem		0-19
Cable Reel Control Subsystem		0-20
Circuit Breaker Monitor Subsystem		0-21
Maintenance Monitor Subsystem		0-22
Water Pump Subsystem		0-23
Personnel Heater Subsystem		0-26
Smoke Control Subsystem		0-26
Sludge Pump Subsystem		0-29
Gas Purge Valve Subsystem		0-29
High Pressure Control Subsystem		0-30
Inflatable Boat System	0-11	0-42

**NOTE**  
For hydraulic system troubleshooting procedures refer to TM 9-2350-255-20-2-1

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5

YES

NO

Notify your supervisor.

6

- Find the Fault Symptom Index that Table 6-1 referred you to.
- Find the system/subsystem your system will be under.

**NOTE**

The fault symptom you have may not be exactly as described in the indexes. Find the fault symptom that most closely resembles the fault symptom you have.

- Find the fault symptom you have.

Table 6-10 Hull Electrical System Fault Symptom Index (Continued)

System Or Subsystem Fault Symptom No.	Symptom	Primary Troubleshooting Procedure (PTP)
<b>BILGE PUMP</b>		
SPS 1	Bilge Pump Does Not Work When BILGE PUMP Switch is Set To On	Refer to TM 9 2390 265 30 1.2.2 Para 16.11
SPS 2	Bilge Pump Works, But BILGE PUMP Light Does Not Come On	Refer to TM 9 2390 265 30 1.2.2 Para 16.11
SPS 3	Bilge Pump Works When BILGE PUMP Switch Set To Off	Refer to TM 9 2390 265 30 1.2.2 Para 16.11
SPS 4	Circuit Breaker CB 11 On Hull Network Does Not Reset When MASTER POWER Switch is Set To On	Refer to TM 9 2390 265 30 1.2.2 Para 16.11
<b>Gas Particulate Subsystem</b>		
<b>GAS PARTICULATE HEATER</b>		
GPTS 1	Heater's Gas Particulate Heater Unit Does Not Work	Refer to TM 9 2390 265 30 1.2.2 Para 16.12
GPTS 7	Commander's Gas Particulate Heater Assembly Does Not Work, Commander's And Leader's Heater's On	Refer to TM 9 2390 265 30 1.2.2 Para 16.12
GPTS 8	Commander's Gas Particulate Heater Assembly Does Not Work, Commander's And Leader's Heater's Off	Refer to TM 9 2390 265 30 1.2.2 Para 16.12
GPTS 9	Leader's Gas Particulate Heater Assembly Does Not Work, Commander's And Gunner's Heater's On	Refer to TM 9 2390 265 30 1.2.2 Para 16.12

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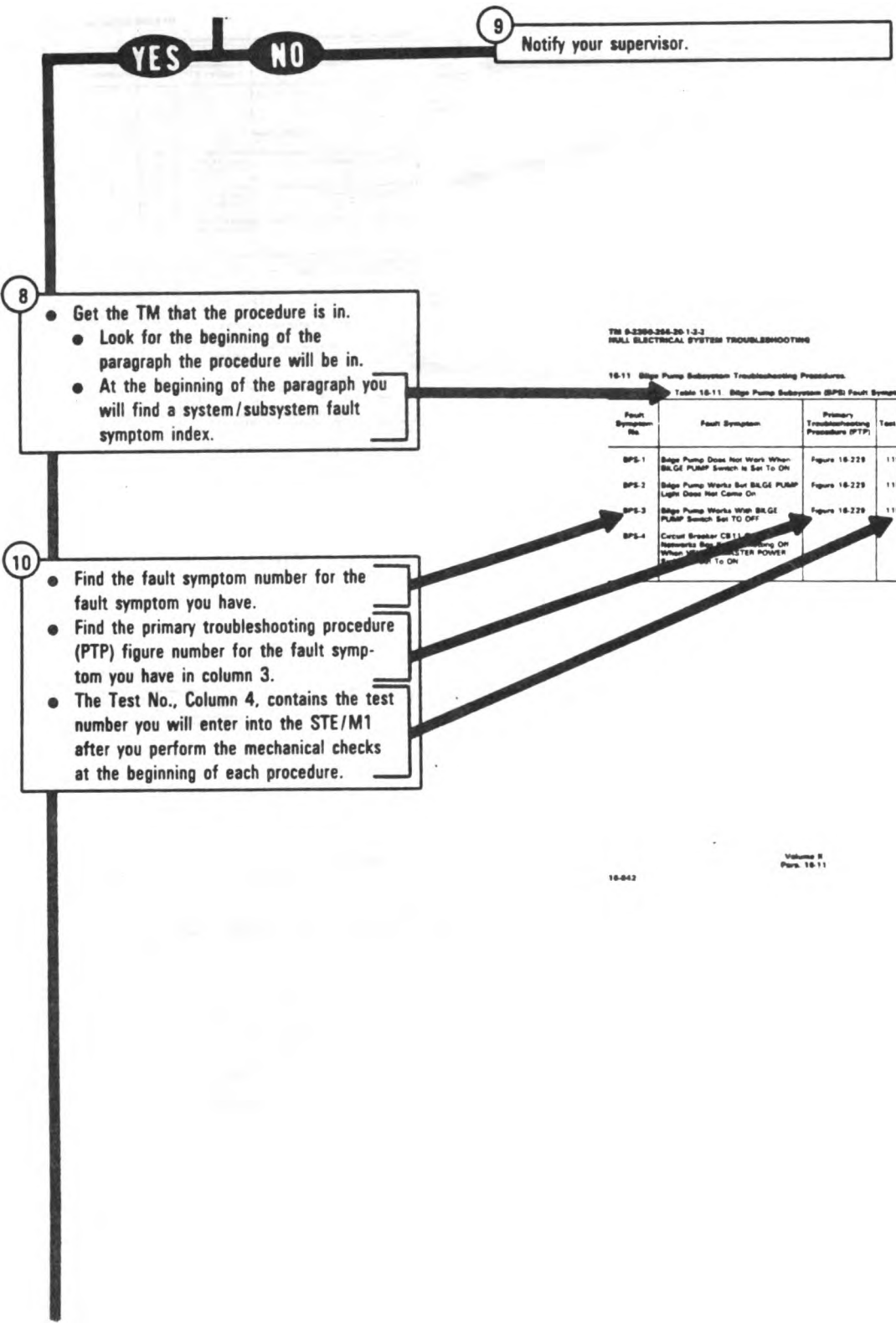
- Find the fault symptom number in column 1.
  - This number will help you find your fault symptom in the Index at the beginning of each paragraph.
- Find the primary troubleshooting procedure (PTP) that you will be using in column 3.
  - This column will tell you the TM and paragraph the troubleshooting procedure will be in.
- Find the resources that will be required in column 4 and 5.
  - These columns tell you if you will be using the STE/M1 and how many personnel will be needed to do the troubleshooting procedures. An (X) in column 4 indicates the STE/M1 test equipment is to be used.

Did you find the right fault symptom index, fault symptom and resources required?

Table 6-10 Hull Electrical System Fault Symptom Index (Continued)

System Or Subsystem Fault Symptom No.	Symptom	Primary Troubleshooting Procedure (PTP)
<b>BILGE PUMP</b>		
SPS 1	Bilge Pump Does Not Work When BILGE PUMP Switch is Set To On	Refer to TM 9 2390 265 30 1.2.2 Para 16.11
SPS 2	Bilge Pump Works, But BILGE PUMP Light Does Not Come On	Refer to TM 9 2390 265 30 1.2.2 Para 16.11
SPS 3	Bilge Pump Works When BILGE PUMP Switch Set To Off	Refer to TM 9 2390 265 30 1.2.2 Para 16.11
SPS 4	Circuit Breaker CB 11 On Hull Network Does Not Reset When MASTER POWER Switch is Set To On	Refer to TM 9 2390 265 30 1.2.2 Para 16.11
<b>Gas Particulate Subsystem</b>		
<b>GAS PARTICULATE HEATER</b>		
GPTS 1	Heater's Gas Particulate Heater Unit Does Not Work	Refer to TM 9 2390 265 30 1.2.2 Para 16.12
GPTS 7	Commander's Gas Particulate Heater Assembly Does Not Work, Commander's And Leader's Heater's On	Refer to TM 9 2390 265 30 1.2.2 Para 16.12
GPTS 8	Commander's Gas Particulate Heater Assembly Does Not Work, Commander's And Leader's Heater's Off	Refer to TM 9 2390 265 30 1.2.2 Para 16.12
GPTS 9	Leader's Gas Particulate Heater Assembly Does Not Work, Commander's And Gunner's Heater's On	Refer to TM 9 2390 265 30 1.2.2 Para 16.12

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 NULL ELECTRICAL SYSTEM TROUBLESHOOTING

18-11 Bilge Pump Subsystem Troubleshooting Procedures.

Table 18-11. Bilge Pump Subsystem (BPS) Fault Symptom Index.

Fault Symptom No.	Fault Symptom	Primary Troubleshooting Procedure (PTP)	Test No.	Alternate Troubleshooting Procedure (ATP) TM 9-2350-255-20-2-2-2
BPS-1	Bilge Pump Does Not Work When BILGE PUMP Switch is Set To ON	Figure 18-228	1150	Figure 18-118
BPS-2	Bilge Pump Works But BILGE PUMP Light Does Not Come On	Figure 18-229	1150	Figure 18-120
BPS-3	Bilge Pump Works With BILGE PUMP Switch Set To OFF	Figure 18-229	1150	
BPS-4	Circuit Breaker CB 11 Tripping Whenever BILGE PUMP Switch is Set To ON			

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TM 9-2350-255-20-1-2-1  
MILL ELECTRICAL SYSTEM TROUBLESHOOTING

10-11 Stage Pump Subsystem Troubleshooting Procedures

Table 10-11 Stage Pump Subsystem (SPS) Fault Symptom Index

Fault Symptom No.	Fault Symptom	Primary Troubleshooting Procedure (PTP)	Test No.	Alternate Troubleshooting Procedure (ATP)
SPS-1	Stage Pump Starts But Stops When CRUISE PUMP Switch is Set To ON	Figure 10-229	1100	Figure 10-110
SPS-2	Stage Pump Starts But BLADE PUMP Locks Down After Cruise On	Figure 10-229	1100	Figure 10-120
SPS-3	Stage Pump Starts With BLADE PUMP Locking Down	Figure 10-230	1100	

**11**

**NOTE**

Do not start any alternate troubleshooting procedure (ATP) until the primary troubleshooting procedure (PTP) tells you to do so.

- The alternate troubleshooting procedure (ATP) column 5 tells you the figure for the procedure you will do to troubleshoot the fault symptom when you do not have STE/M1 components.

**12**

Did you find the primary procedure for the fault symptom you have?

**YES**      **NO**

**13** Notify your supervisor.

**14**

Do you understand all the information in this guide?

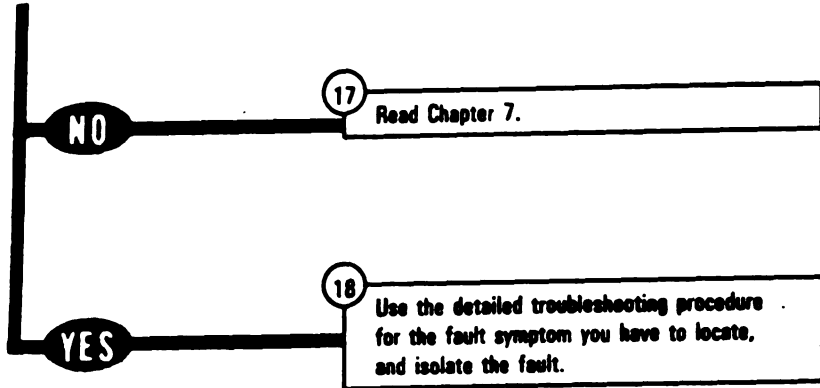
**YES**      **NO**

**15** Ask your supervisor to help you with the part you don't understand.

**16**

Are you familiar with the important troubleshooting information contained in the sample troubleshooting charts in chapter 7?





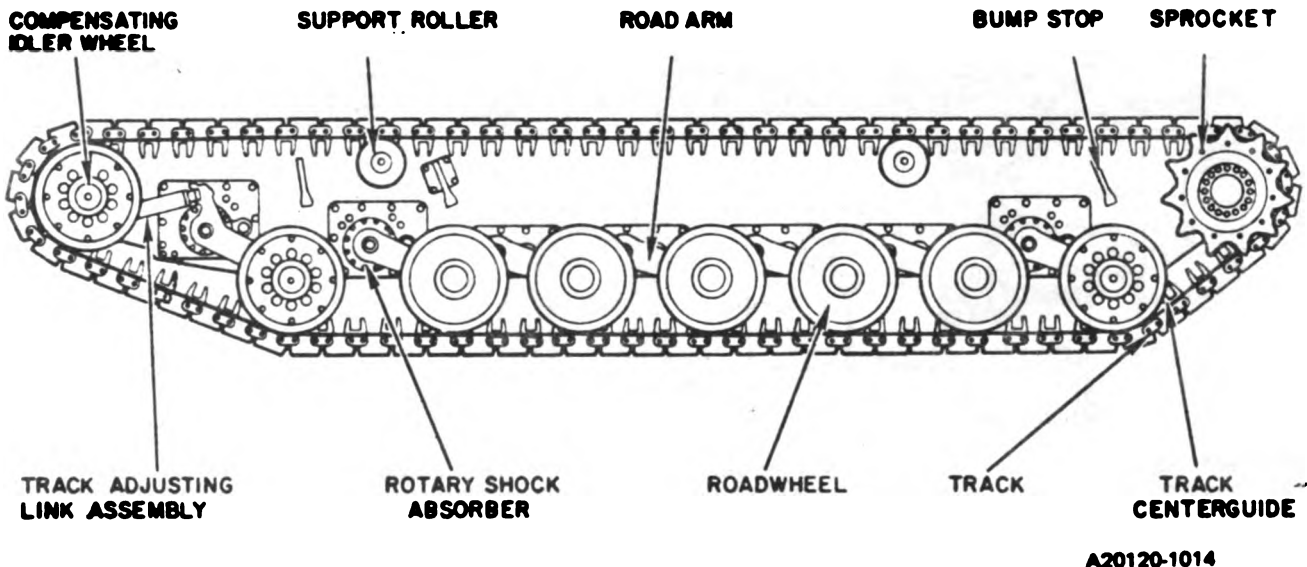
**Section II. FUNCTIONAL DESCRIPTIONS**

**2-9. General.** This section describes the functional systems in the hull. Diagrams are included to help you understand the operation of the systems.

**2-10. Suspension System (See figure 2-1).** The suspension system is made up of two sets of tracks and wheels. One set is on each side of the tank. These components transmit the driving force of the power pack to the ground for moving and steering the tank.

**a. Track.** The track on each side of the tank is called one strand. The strands of track are driven by sprocket and hub assemblies at the rear of the tank. Each strand is made up of 88 track shoes. The track shoes are fastened together by end connectors. Each track shoe contains a centerguide that keeps the track on the wheels. The centerguides run between the two halves of each roadwheel and idler wheel. Each track is tightened or loosened (track tension) by changing the length of an adjusting link that moves the idler wheel. The track is supported between the sprocket and idler wheel on each side of the tank by two support rollers.

**b. Wheels.** There are seven roadwheels, one compensating idler wheel, and two support rollers on each side of the tank. The roadwheels are numbered one through seven. The roadwheels and idler wheels have two narrow wheel-halves separated by a space for the track centerguides to pass through. Steel wearplates on the inside of each wheel half protect the wheels from damage by the track centerguides. The roadwheels are suspended from the hull of the tank by roadarms. The compensating idler wheels are attached to the hull by a track adjusting link on each side of the tank. The track adjusting links can be lengthened or shortened hydraulically to increase or decrease track tension. The two support rollers on each side are single steel wheels that are used to support and guide the upper track tension.



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*Figure 2-1. Suspension System  
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c. Sprocket and Hub Assemblies. One sprocket and hub assembly on each side of the tank transmits power from the powerpack to move the track. The hubs are driven by the transmission through final drive assemblies. The sprockets engage the end connectors on both sides of each track and move the track as the hub turns.

d. Torsion Bars. Each roadarm is connected to a torsion bar that acts as a spring. Each torsion bar passes through the hull and is anchored on the side opposite the roadarm it is attached to. Aluminum covers protect each torsion bar. Access to all torsion bars is provided at both sides of the tank.

e. Shock Absorbers. Oil-filled, rotary shock absorbers are installed at roadwheel positions 1, 2, and 7 on each side of the tank. Bump stops welded to the hull are installed at roadwheel positions 1, 2, and 7 to keep the shock absorbers from moving beyond their limits.

**2-11. Engine System.** (See figure 2-2). The turbine engine system consists of air and fuel control components, combustion chamber, turbines, and exhaust system. The engine burns low-octane diesel fuel mixed with heated and compressed air. Engine starting is automatic after the PUSH TO START switch is depressed on the driver's master panel. If engine speed, temperature, or other critical conditions go out of limits during the start sequence, the start is automatically aborted and the engine shuts down.

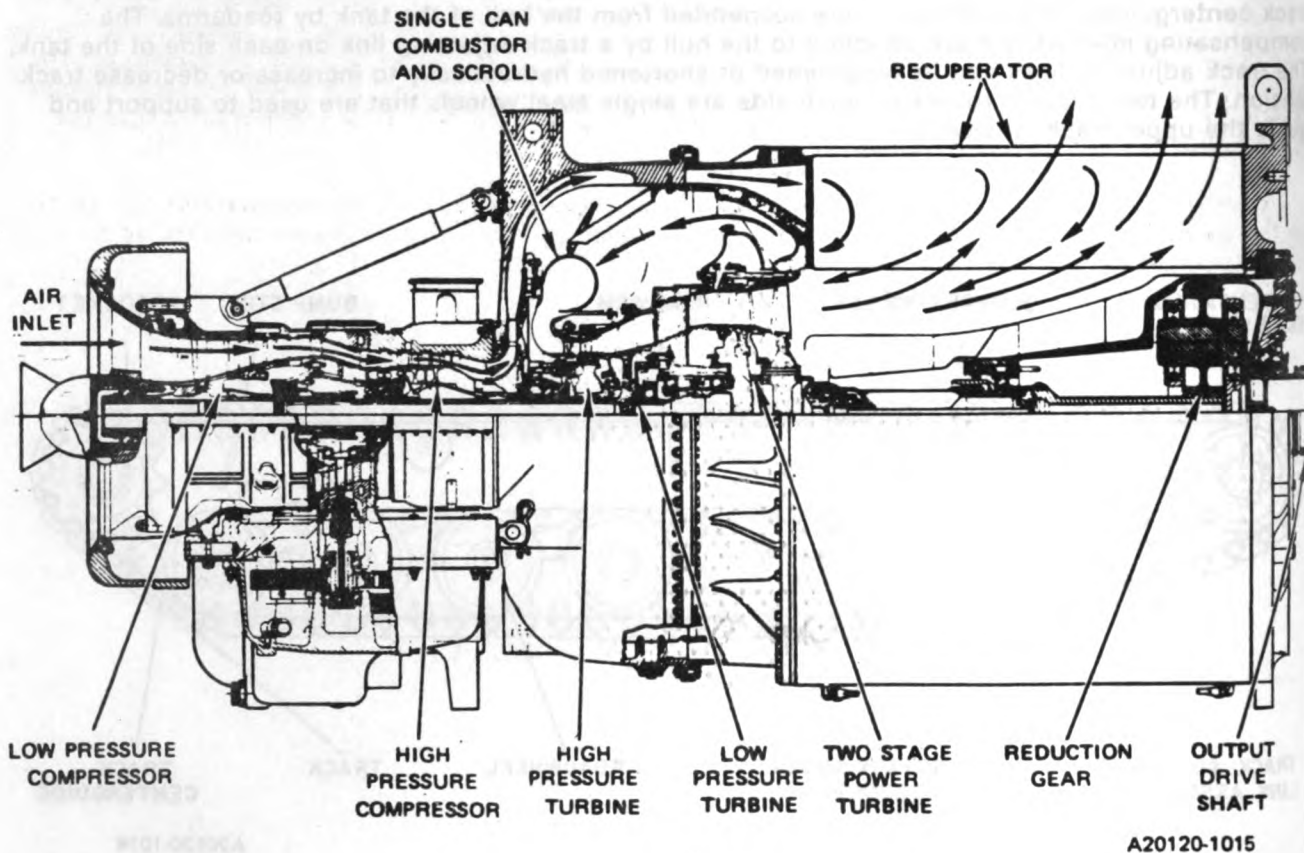


Figure 2-2. Engine System  
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a. Air. Air supply for combustion is drawn from outside the tank by the action of the compressors. The air passes through a precleaner, filter elements, and a plenum duct to the engine air inlet. From the inlet, the air flows through a low-pressure compressor section and then through a high-pressure compressor section. The compressed air then passes into a recuperator that is heated by the engine exhaust. The air heated in the recuperator then flows into the combustion chamber where it mixes with fuel vapor and burns.

b. Fuel. Fuel is fed from the vehicle fuel supply system to the engine Electromechanical Fuel System. The engine Electronic Control unit (ECU) controls the flow of fuel from the Electromechanical Fuel System to the combustion chamber. These two control units automatically provide the correct fuel flow for varying engine operating conditions. They can limit engine power when failure of a component could cause damage to the engine. They also control engine speed and temperature to meet the demands made by the driver through throttle movement.

c. Combustion. Electric ignition in the combustion chamber is used only during the starting cycle to start burning. A continuous flow of air and fuel vapor after the start is completed maintains continuous burning until either the air or the fuel flow is shut off. For normal engine shutdown, the fuel flow is shut off. When air flow is decreased by clogged air filters (or for any other reason), increased burning temperature is sensed by the ECU which sends control signals to the Electromechanical fuel system. The Electromechanical fuel system unit reduces fuel flow to the combustion chamber. This reduces power output until adequate airflow is restored.

d. Turbines. Exhaust gas leaves the combustion chamber through discharge nozzles and forces a two-stage turbine to turn. The high-pressure turbine drives the high-pressure compressor rotor. The low-pressure turbine drives the low-pressure compressor rotor. After leaving the low pressure turbine, the exhaust gas drives a two-stage power turbine. The power turbine supplies the force to turn the engine power output drive shaft through a reduction gearbox.

e. Exhaust. Exhaust gas leaving the power turbine is routed around the recuperator and then into the exhaust duct. Heat from the exhaust gas is transferred to the compressed air passing through the recuperator to enhance burning.

**2-12. Fuel Supply.** (See figure 2-3). Fuel is stored in three tanks: left front, right front, and rear of vehicle. The front tanks are located in the hull to the left and right of the driver. Each front tank contains a fuel fill port with vented cap. The rear tank contains two fuel fill ports with vented caps, one in each sponson.

Fuel lines connect the front tanks to the rear tank through a fuel manifold and transfer pump. Check valves in the fuel lines prevent backward flow. The front tanks feed fuel to the rear tank. The left front tank also feeds fuel directly to the personnel heater.

Fuel flows from the rear tank through a primary inline filter, fuel-water separator, and final engine inline filter to the electromechanical fuel system on the engine. The inline filters and fuel-water separator are located in the engine compartment.

The primary inline filter contains a sensor that senses when the filter is clogged. A manual valve on the fuel-water separator body can be opened to bleed air from the fuel line. A manual fuel shut off valve is located on the right side of the engine compartment near the fuel-water separator. It can be operated from inside the tank or engine compartment.

a. **Rear Tank.** The rear fuel tank is made up of four cells connected by fuel lines to form one tank. One cell is located in each rear sponson. Two main cells are located under the transmission. One fuel pump is located in each main fuel cell. Both pumps begin to operate when the engine START pushbutton is pressed, and run continuously until the engine SHUTOFF switch is activated. Failure of either pump is detected by pressure switches in the fuel lines. The pressure switches turn on REAR FUEL PUMP maintenance monitor caution lights on the driver's instrument panel.

b. **Front Tanks.** The left and right front fuel tanks are each made up of a single fuel cell.

c. **Fuel Level Sensing.** Fuel level sensors in the two front tanks and the left rear main and sponson tanks provide fuel quantity information to the driver's instrument panel. The fuel quantity in either front tank is shown on the FUEL gage when the FUEL TANK SELECTOR switch is set to the position for that tank. The sensors in the rear tank provide total rear tank fuel quantity information on the gage when the FUEL TANK SELECTOR switch is set to the REAR position. The sensor in the left rear main tank includes a low level circuit. When total fuel quantity in the rear tank is one-quarter full or lower, this circuit lights the LOW FUEL LEVEL caution light on the driver's instrument panel which remains on until the tank is three-eighths full. The sensor in the left rear sponson tank includes a high level circuit which stops fuel transfer from the front tanks when the rear sponson tank fuel level is three-quarters full.

d. **Fuel Transfer.** Fuel flow from each front tank to the transfer pump is controlled by solenoid valves in the fuel transfer manifold. Transfer from the front tanks to the rear tank is controlled by the FUEL TANK SELECTOR switch on the driver's instrument panel. When the LOW FUEL LEVEL light is lit, and the selector switch is set to either front position, the valve for the selected front fuel tank will open and the transfer pump will start. The pump will continue to run until the rear tank is three-quarters full or the selector switch is moved to another position. The transfer pump will not start unless the LOW FUEL LEVEL light is lit.

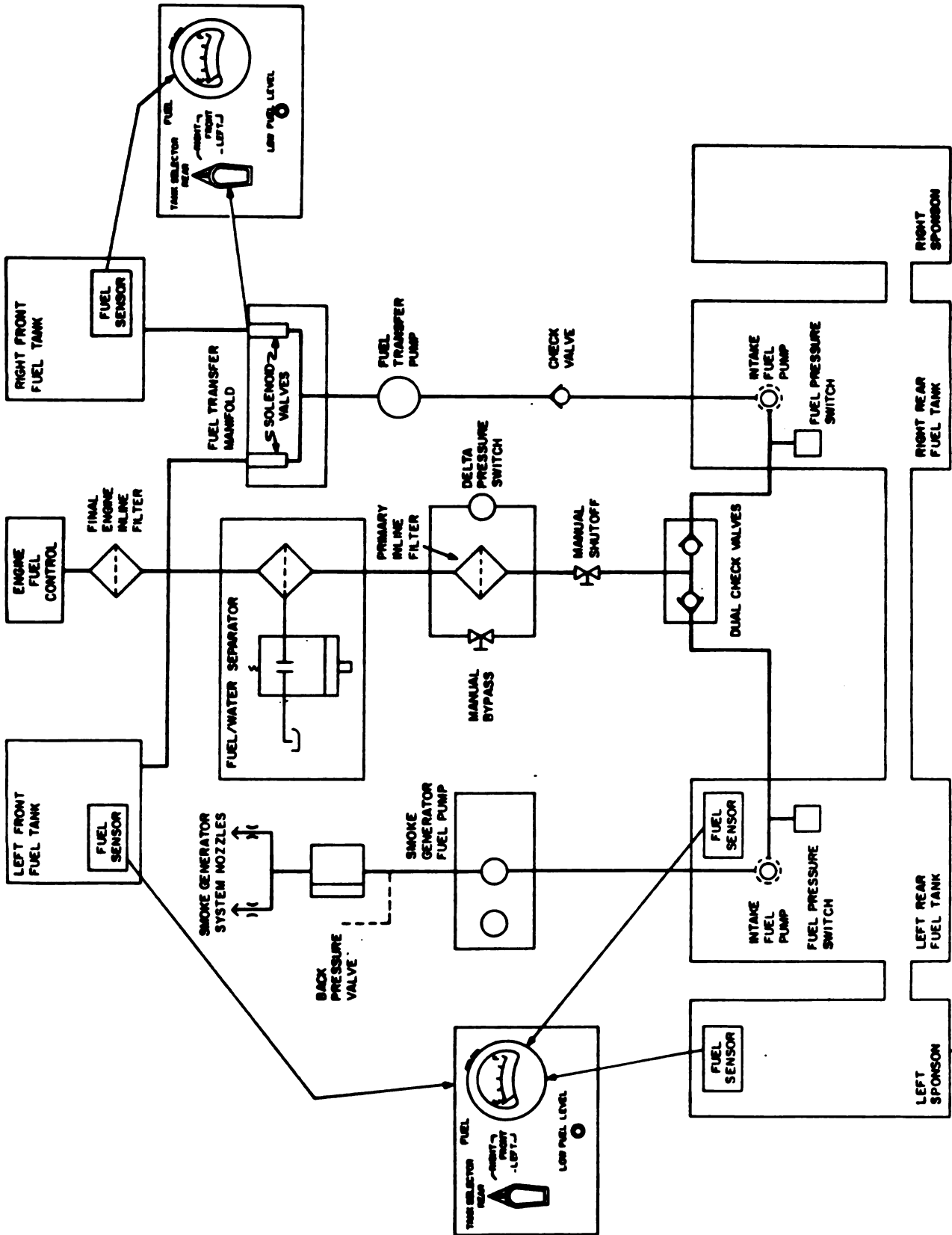


Figure 2-3. Fuel System Functional Block Diagram

**2-13. Transmission and Final Drive System.** The transmission performs three functions: driving, steering, and braking. It takes the engine power output and applies it to the left or right transmission outputs, or both to perform these functions. The transmission power outputs transmit power through a final drive assembly on each side of the tank. A rear power takeoff is provided to drive the alternator. Two front power takeoffs are provided for driving the primary and auxiliary cooling fans.

a. Drive Function. The transmission has four forward gears and two reverse gears. The driver can select low (L) and drive (D) forward ranges and one reverse (R) range on the transmission shift control. In D position the transmission will start the track moving in the second forward gear and shift up automatically as speed and power requirements demand. The transmission will also shift back down (to second gear), as required. In L position the transmission starts the track moving in the lowest forward gear and shifts up or back down as required. In R position the transmission starts the track moving in the lower reverse gear and shifts up or back down as required. Transmission ranges are selected by energizing solenoid valves in the transmission. The solenoids energize when electrical signals are received from the shift select control on the steer-throttle bar.

b. Steering Function. The steer-throttle bar in front of the driver controls direction of tank travel. A mechanical linkage connects this bar to the transmission. The transmission powers both final drives equally and in the same direction for driving straight ahead. If the steer-throttle bar is moved the transmission speeds up one final drive and track and slows down the other final drive and track. The amount of speed difference between the final drives depends on how far the steer-throttle bar is moved. When pivot (PVT) is selected the transmission drives one track forward and the other in reverse causing the track to turn about its center point.

c. Service Brake Function. (See figure 2-4). The transmission contains brake assemblies at each output. Each brake is made up of several plates. Every other plate rotates with the transmission output coupling. The plates between the rotating plates are anchored and do not rotate. Mechanical linkage from the service brake pedal to the transmission opens a valve which applies hydraulic pressure to squeeze the rotating and stationary plates (BRAKE PACKS) together. When the engine is not running, the service brakes will slow the tank. Without the power boost, the service brakes require more pressure on the service brake pedal. A warning light will come on if the service brakes are applied for more than two minutes with the engine running.

d. Parking Brake Function. (See figure 2-4). The parking brake system consists of a foot pedal, hydraulic valve, accumulator, actuator equalizer bar, and ratchet release handle. When the parking brake pedal is pushed hydraulic pressure is sent to the actuator in the turret well. The actuator is connected to an equalizer bar which moves away from the acutater by the hydraulic pressure. The equalizer bar has two cables connected to it which are pulled equally as the equalizer bar moves away from the actuator. These cables are mechanically linked to the same sets of rotating and stationary plates (brake packs) that are used for service braking. The accumulator maintains enough hydraulic pressure for four or five pushes on the parking brake pedal after the engine has shut down. A warning light will come on if the parking brake is on while engine is running.

e. Oil Coolers. The engine and transmission oil cooling systems maintain oil temperatures within acceptable limits under all operating conditions. The primary cooling system consists of a fan, fan drive system, cooling duct, engine oil cooler and transmission oil cooler. When the engine is running the fan drive turns the primary fan to provide airflow to the primary oil coolers. The auxiliary oil cooling system consists of a fan, fan drive system, cooling duct, and transmission oil cooler. If transmission oil temperature exceeds the cooling capacity of the primary cooling system, an electrically controlled clutch automatically engages the auxiliary cooling fan. The auxiliary cooling fan disengages during fording operations. Transmission oil flows through the primary and auxiliary coolers. An oil filter in the transmission prevents dirt from entering the transmission mechanism. A pressure sensor downstream from the filter senses a drop in oil pressure when the filter becomes clogged. The sensor lights the TRANSMISSION OIL FILTER CLOGGED caution light on the driver's instrument panel.

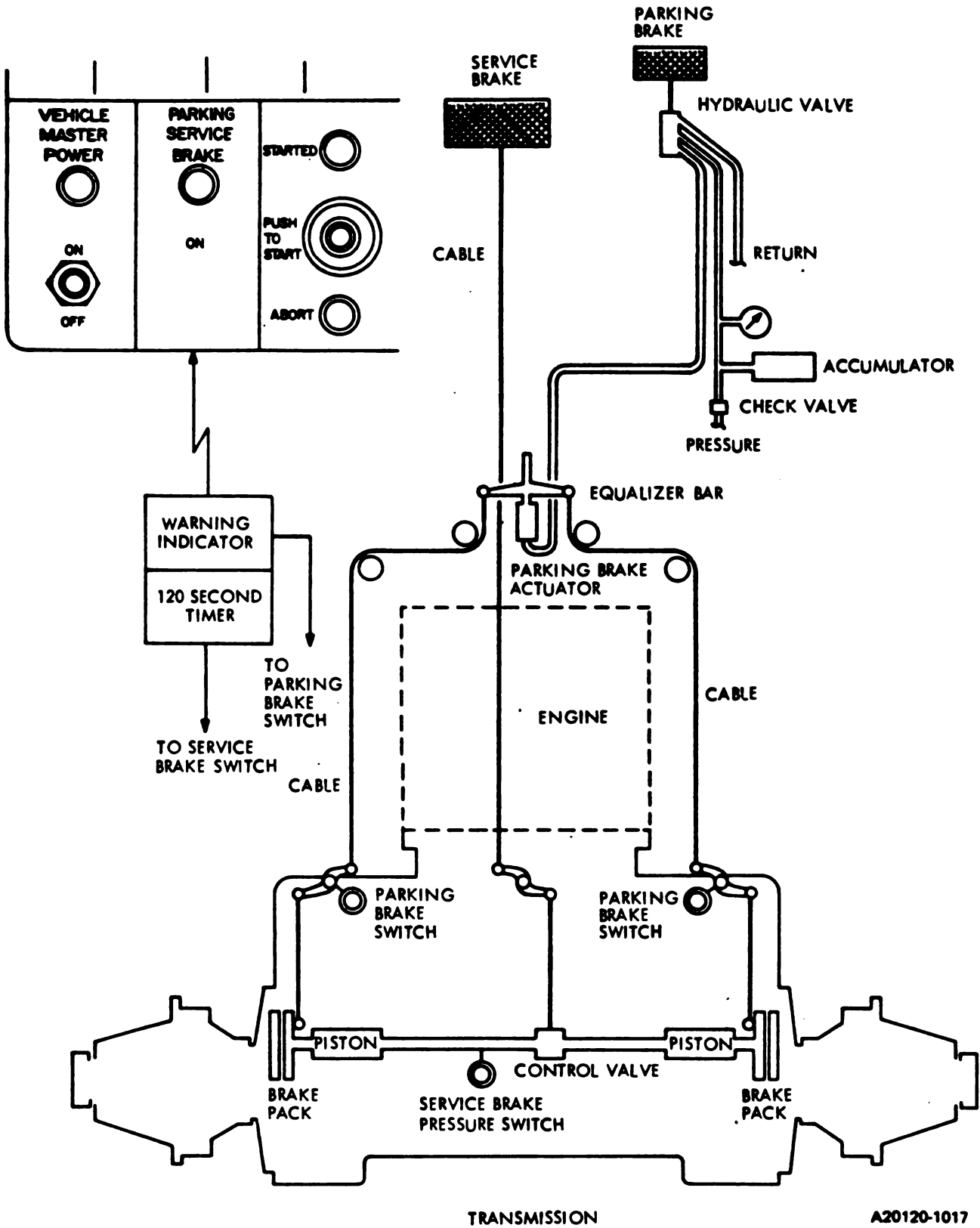


Figure 2-4. Brake System Functional Diagram  
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f. **Final Drives.** The final drives are heavy duty speed reduction gear assemblies that connect the transmission outputs to the tracks through the track drive sprockets. The final drives on the left and right of the transmission are identical planetary gear sets. They step down the transmission output speed and step up the torque. The track drive sprockets are bolted to the final drive output shafts. The final drives are made so that the coupling to the transmission can be disconnected. When the couplings are disconnected, the tank may be towed without turning the transmission outputs.

**2-14. Drain Valve System.** The drain valve system consists of a crew compartment (front) drain and two engine compartment (rear) drains. The control handles for the valves are located to the right of the driver's seat. The handles are mechanically connected to the valves with flexible cables and rods.

**2-15. Fire Extinguisher System.** (See figure 2-5). The fire extinguisher system consists of seven sensors, control amplifier, fire extinguisher bottles, manual control handles and warning lights. There are seven fire sensors; three mounted in the engine compartment, three are in the turret and one is in the driver's compartment. A fire in the crew or engine compartment will trip one or more sensors that send signals to the control amplifier. The control amplifier sends signals to electrically operate the discharge valve on the fire extinguisher bottles.

The engine compartment fire extinguisher system has two bottles which discharge one at a time. When fire sensors in the engine compartment detect a fire one bottle discharges automatically. When this happens, the 1st SHOT DISCHARGED light on the driver's instrument panel lights. At the same time, the MASTER CAUTION light on the driver's alert panel lights. If the FIRE light flashes on the driver's instrument panel, and the 1st SHOT DISCHARGED light on the driver's instrument is not lit, the driver must manually discharge the 1st shot bottle. He does this by pulling the ENGINE FIRE T-handle to his left.

If the engine fire does not go out the FIRE light on the driver's instrument panel, and the ENGINE FIRE warning light on the commander's panel will flash on and off. When this happens, the 2nd SHOT switch on the driver's instrument panel should be turned on. This will shut down the engine, and 18 to 20 seconds later will open the release valve on the second shot engine compartment bottle. If the second shot bottle does not operate automatically or the crew is outside the tank, the second shot can be discharged manually by pulling the ENGINE FIRE handle located on the outside of the tank. This does not automatically shut off the engine. The outside handle is linked mechanically directly to the second shot bottle only.

#### **2-16. Hull Electrical System**

a. **Electrical Charging Subsystem.** (See FO-22) The tank uses a 24 volt direct current electrical system. When the engine is not running, power is supplied by six 12 volt batteries connected in a series-parallel arrangement to provide 24 volts. When the engine is running, power is supplied by an alternator connected to a power take-off on the transmission. The alternator produces 27.5 to 28.5 volts. A voltage regulator monitors the main electrical power and adjusts the output of the alternator to maintain constant voltage. The batteries are charged by the alternator whenever the engine is running.

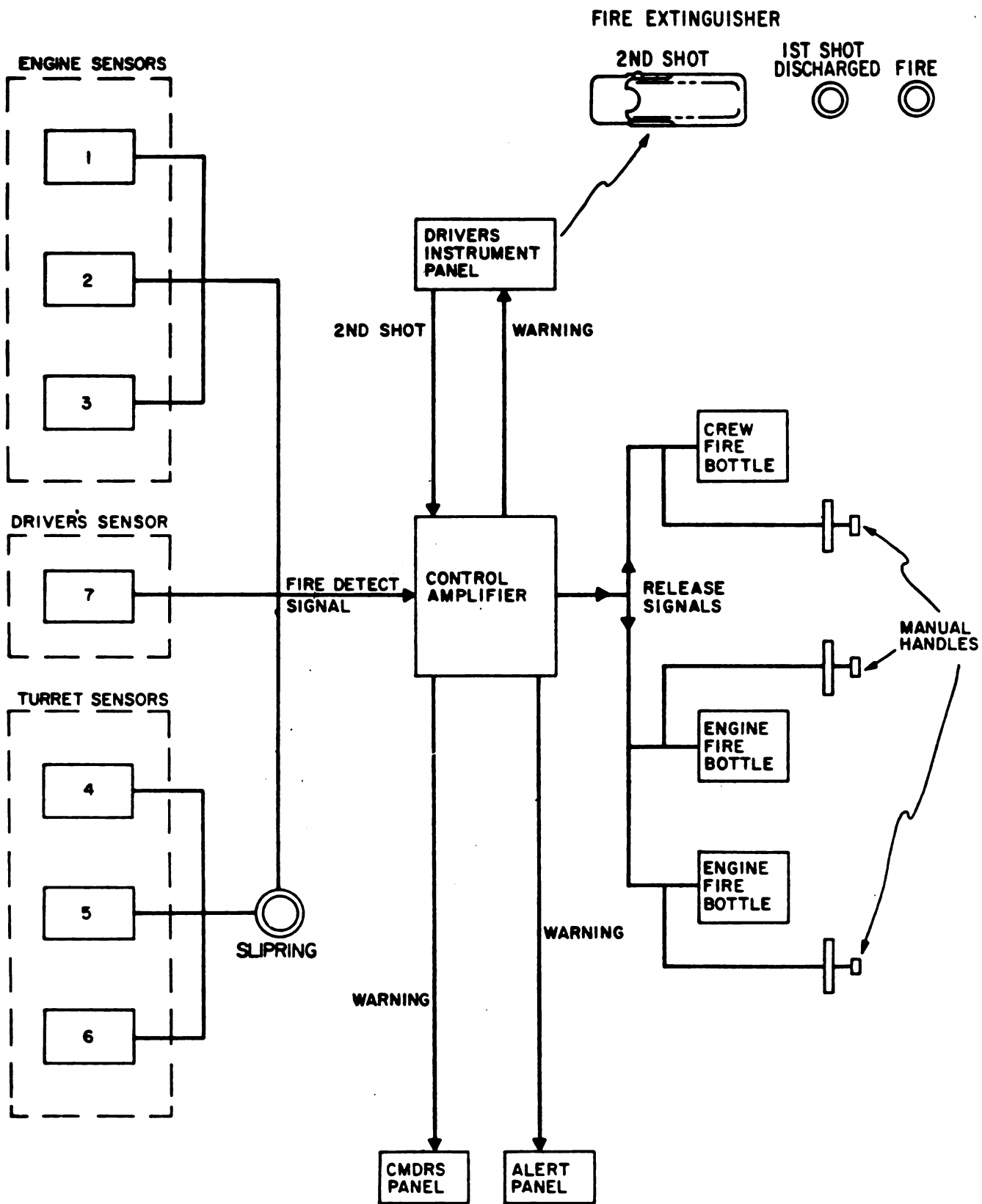


Figure 2-5. Fire Extinguisher System Functional Block Diagram  
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**b. Power Distribution and Control Subsystem.** (See FO-22) The power distribution and control subsystem consists of power distribution box, hull networks box, hull/turret slipring assembly, and turret networks box. Included in this subsystem are the driver's instrument panel, driver's master panel, and commander's control panel.

The power distribution box distributes battery/alternator electrical power to the hull networks box and turret networks box. It contains manual reset circuit breakers for master power control, fire detection and suppression system, voltage regulator and personnel heater. There also are three automatic set-reset circuit breakers for turret master power 1 (communications), turret master power 2, and hull master power. External d.c. power can be applied to the power distribution box through a slave receptacle. It's used mainly for slave starting and for charging the batteries.

The hull networks box distributes electrical power to hull circuits and hull/turret slipring. It provides manual reset circuit breakers for hull circuits. Relays and other control devices are contained within the hull networks box.

The hull turret slipring connects electrical circuits between the hull and turret.

The turret networks box distributes electrical power to turret circuits. It provides manual reset circuit breakers for turret circuits. Relays and other control devices are contained within the turret networks box.

The driver's instrument panel has an ELECTRICAL SYSTEM meter for monitoring main voltage levels. The meter has red, yellow and green bands on the meter face to indicate critical, cautionary, and safe voltage levels. A LOW BAT CHG caution indicator light lights whenever the system is at or below 23.5 volts for 150 seconds or more. The driver's instrument panel also has a CIRCUIT BREAKER OPEN indicator and a CABLE DISCONNECTED indicator light. The CIRCUIT BREAKER OPEN indicator lights if any manual reset hull circuit breaker opens. The CABLE DISCONNECTED indicator lights if any major hull electrical cable becomes disconnected.

Vehicle master power can be turned on from either the commander's panel or driver's master panel. An indicator light for vehicle master power comes on at both the commander's panel and driver's master panel when vehicle master power is on. A LOW BAT CHG indicator light on the commander's panel lights when the LOW BAT CHG light on the driver's instrument panel comes on.

**c. Monitor Subsystem.** (See FO-23) The monitor subsystem consists of sensors that monitor fluid levels, fluid flow, temperatures, pressures, and speeds. Indicator lights on the driver's instrument panel light when any of the sensors sense an abnormal condition. Indicator lights are also located on the alert panel, driver's master panel, and commander's panel. Caution indicator lights are yellow and warning indicator lights are red.

The alert panel is the center of the subsystem. It has a MASTER CAUTION and MASTER WARNING indicator light. The MASTER CAUTION indicator lights when any caution light comes on. The MASTER WARNING INDICATOR lights when any warning light comes on. The alert panel has a reset button, when pressed it will turn the MASTER CAUTION light off. If the MASTER WARNING indicator light is on because of engine overspeed, the MASTER WARNING light will go off when the reset button is pressed. If the MASTER WARNING light is on for any other reason, it will not go off until the problem is corrected. The caution and warning indicator lights that are on will remain on until the problem has been corrected.

**d. Exterior Lights and Domelight Subsystem.** (See figure 2-6) The exterior lights and domelight subsystem consist of two headlights, two taillights and a driver's domelight. All of the exterior lights are controlled by a rotary selector switch on the driver's master panel. Lighting selections are:

- BO-turns blackout lights front and rear on.
- OFF-turns all exterior lights off.
- STOPLIGHT ONLY-turns taillights on only when service brake is pushed.
- SERVICE LIGHTS-turns all exterior lights (front and rear) on.

An ON/OFF toggle switch on the driver's master panel controls the headlights high beam. A HI BEAM indicator lights when the switch is in the ON position. The HI BEAM switch and LIGHTS selector switch control relays are located in the hull networks box. The relays control operating voltages to the exterior lights.

The driver's domelight contains an ON/OFF dimmer control and red/white filter control. Interior lighting is provided to the driver when the control knob on the front of the domelight is rotated clockwise. The driver can adjust the amount of light by turning the control knob clockwise for more light or counterclockwise for less. A lever below the light is turned to select a white or red filtered light.

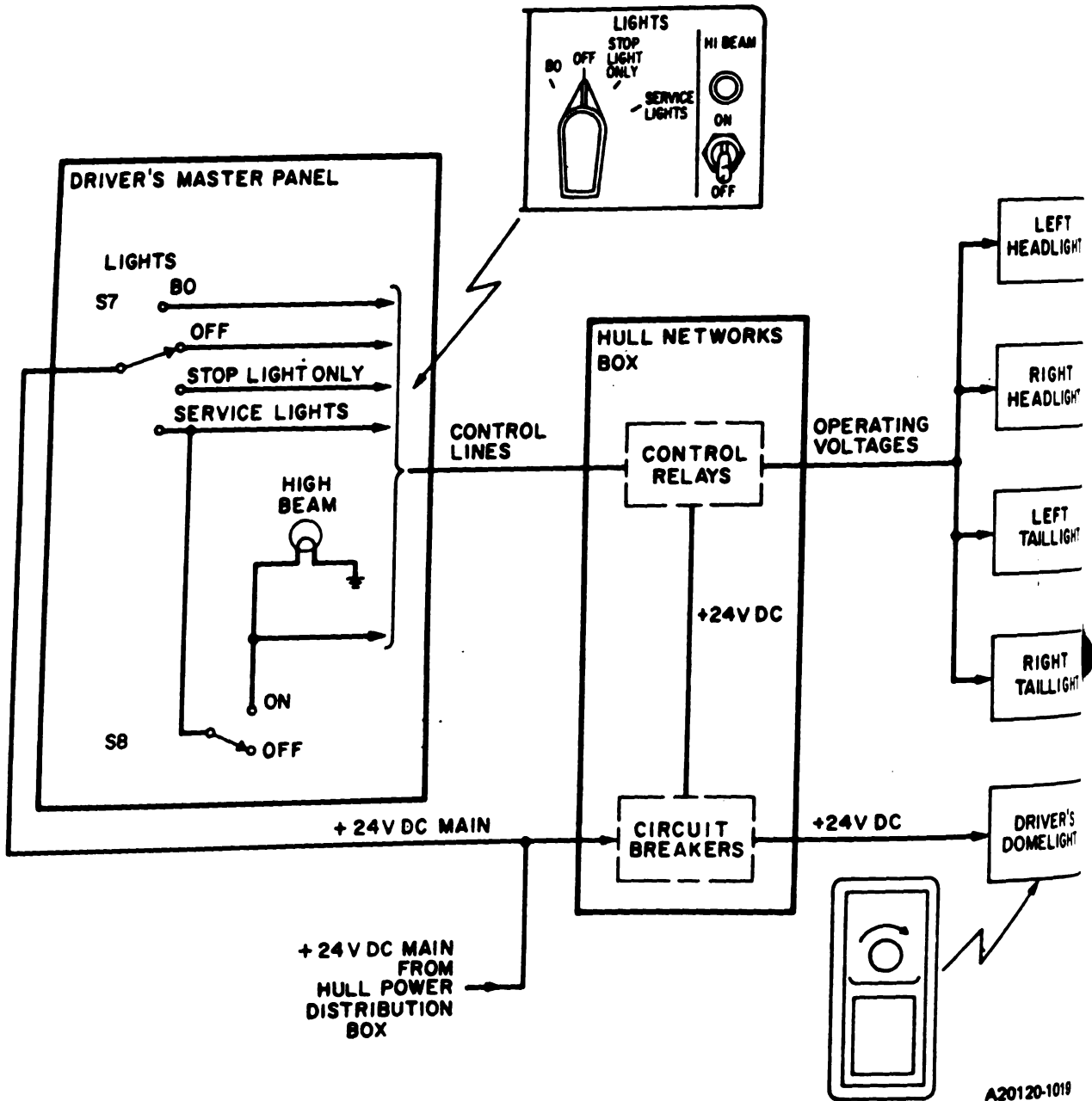
**e. Personnel Heater Subsystem.** (See figure 2-7.) The personnel heater subsystem supplies either heated or unheated air to the driver and turret crew area. Air is blown through metal ducts which run from the heater to outlets at driver's station and turret. The ducts have dampers that can be set by the crew to direct air flow.

The heater uses diesel fuel that is supplied from the left forward fuel tank by an electrically operated fuel pump. Power for the fuel pump is supplied from the heater fuel pump circuit breaker (CB16) on the hull networks box. The personnel heater is controlled by two switches on the driver's master panel. The START, OFF, RUN/FAN toggle switch controls heater operation. A HIGH, LOW toggle switch is used to choose the amount of airflow desired. Power for the fan motor is supplied from the personnel fan circuit breaker (CB17) on the hull networks box. Circuit breaker (CB7) on the power distribution box supplies power for ignition and heater control circuits.

Components in the heater housing consists of: fuel shutoff valve, fuel restrictor valve, flame detection switch, igniter, igniter control unit, overheat switch, and blower fan motor. The personnel heater is located directly behind the left front fuel tank. Heater exhaust is ducted to the outside of the tank at the outer edge of the left front sponson.

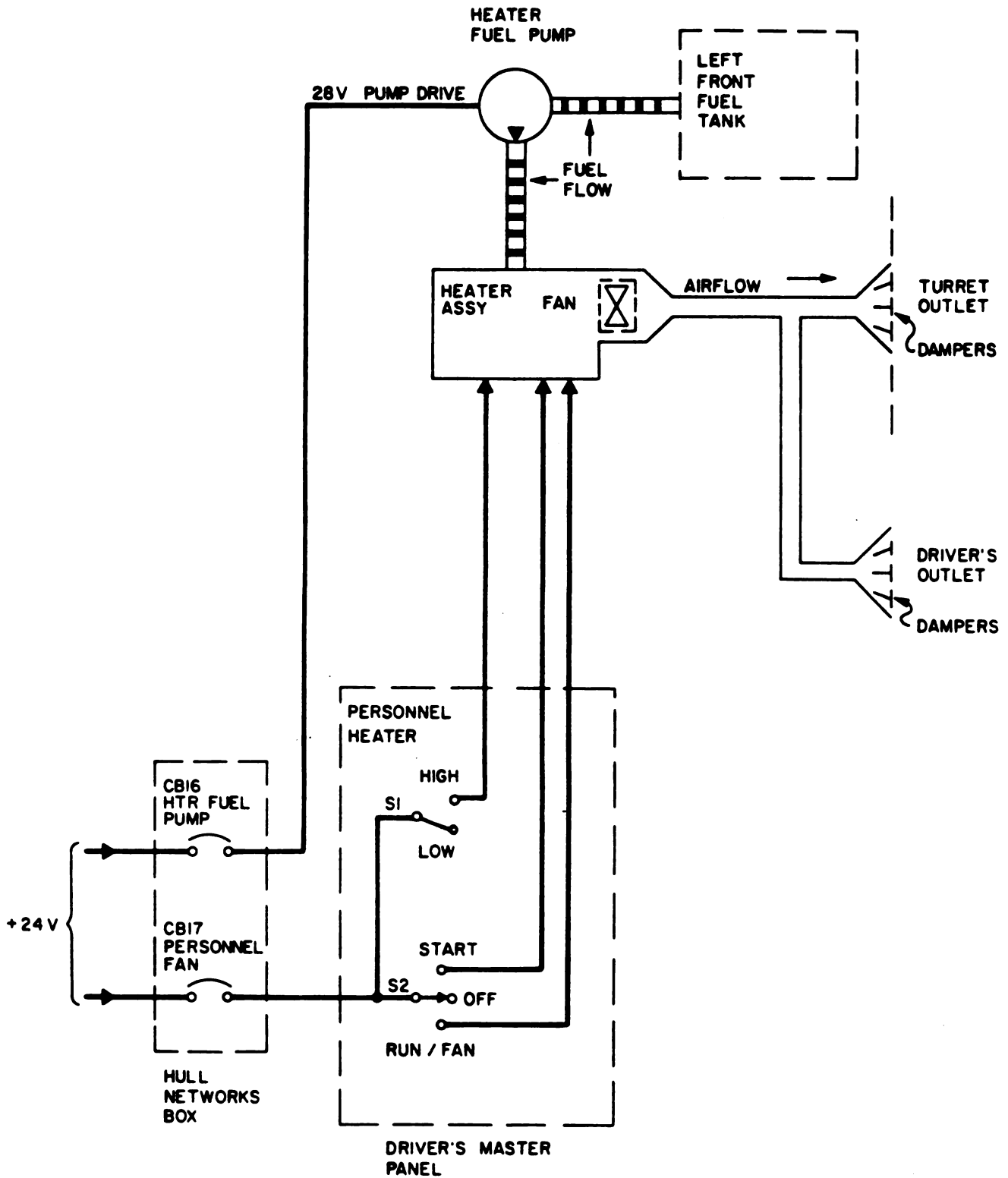
**f. Smoke Generating Subsystem.** The smoke generating subsystem is incorporated into the exhaust system. It consists of a fuel pump, check valve, and nozzles. To generate smoke diesel fuel is pumped to spray nozzles which spray fuel into the rear section of the exhaust duct. The fuel is vaporized by the hot exhaust and then condenses to produce smoke when it enters the cooler outside air. The smoke generator switch and indicator light are on the driver's master panel. The smoke generator will only operate when the engine is running.

**g. Bilge Pump Subsystem.** The bilge pump operates by hydraulic pressure from the main or auxiliary hydraulic system. The pump is located on the right side of the turret well. The bilge pump switch and indicator light are mounted on the driver's master panel.



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Figure 2-6. Exterior Lights and Domelight Functional Block Diagram  
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Figure 2-7. Personnel Heater Functional Block Diagram

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**CHAPTER 3  
TROUBLESHOOTING INDEX**

**Table 3-1. Troubleshooting Index**

<b>System</b>	<b>Troubleshooting Road Maps</b>	<b>Symptom and Resource Table</b>	<b>System Schematics</b>	<b>C Cor Dia</b>
Suspension System	Fig. 5-1	Table 6-2	-	
Engine System	Fig. 5-2	Table 6-3	FO-1	
Fuel System	Fig. 5-3	Table 6-4	FO-2	
Transmission and Final Drive	Fig. 5-4	Table 6-5	FO-3 & FO-4	
Steering System	Fig. 5-5	Table 6-6	-	
Brake System	Fig. 5-6	Table 6-7	FO-5	
Drain Valve System	Fig. 5-7	Table 6-8	-	
Fire Extinguishing System	Fig. 5-8	Table 6-9	FO-6	
Hydraulic System	NOTE: For hydraulic system troubleshooting procedures, TM 9-2350-255-20-2-2-1.			
Hull Electrical System	Fig. 5-9	Table 6-10	FO-7 through FO-21	
Inflatable Seal System	Fig. 5-10	Table 6-11	-	

\*Refer to Chapter 20, Figure 20-134 for cable connector diagrams.





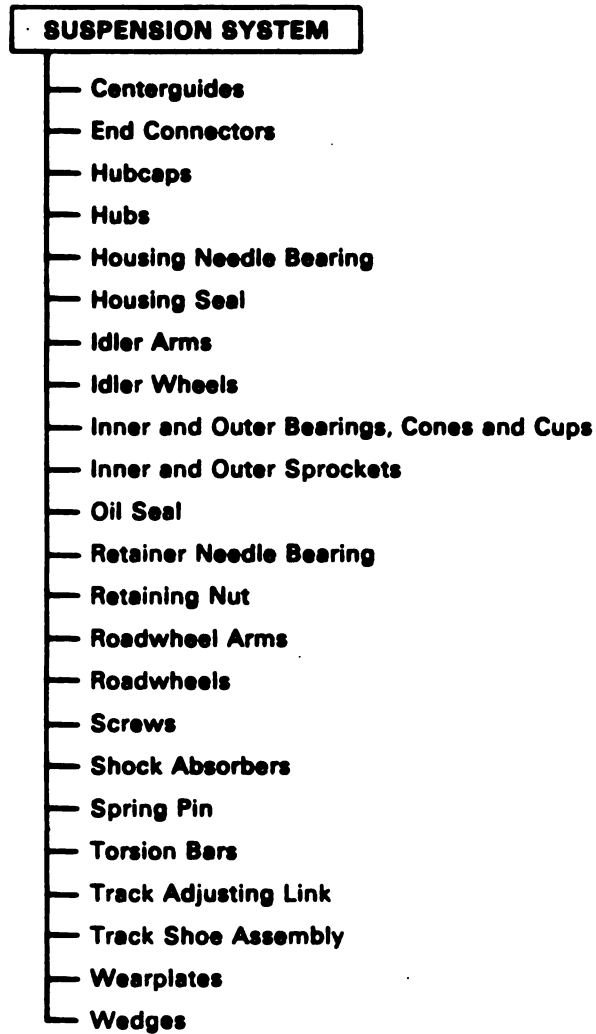
**CHAPTER 4  
TEST EQUIPMENT PROCEDURES INDEX**

**Table 4-1. Test Equipment Procedures Index**

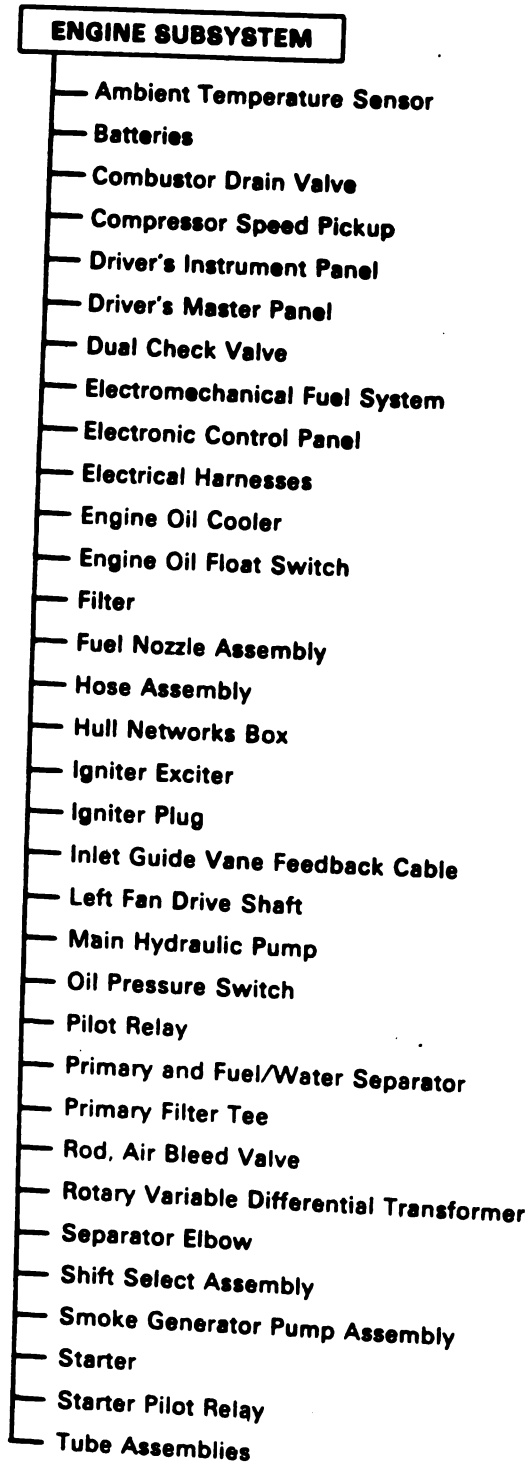
Test Equipment	Tests
<b>Breakout Box</b>  <b>Multimeter AN/URM 105</b>	<b>Common Hookups</b>  <b>General</b> <b>DC Voltage Test</b> <b>AC Voltage Test</b> <b>Resistance Test</b> <b>Shorts Test</b> <b>Continuity Test</b>
<b>Simplified Test Equipment for M1 Main Battle Tank (STE/M1)</b>	<b>Preparing STE/M1 for Operation</b> <b>Shutdown and Stow STE/M1</b> <b>Cable Test</b>



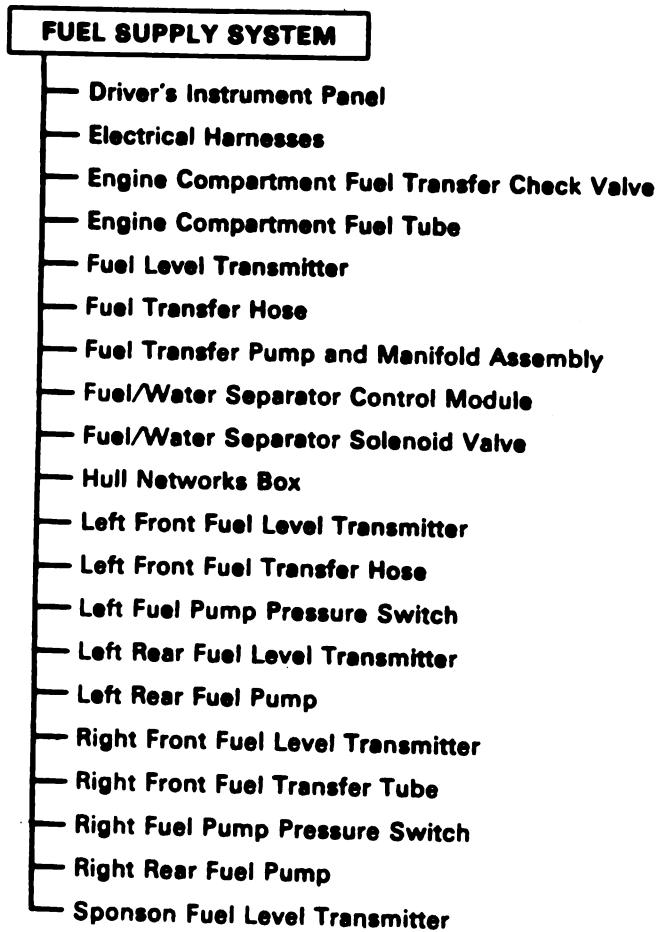
**CHAPTER 5  
TROUBLESHOOTING ROADMAPS**



*Figure 5-1. Suspension System Troubleshooting Roadmap  
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*Figure 5-2. Engine Troubleshooting Roadmap  
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Para. 5-1*



*Figure 5-3. Fuel System Troubleshooting Roadmap*  
**Volume II**  
**Para. 5-1**

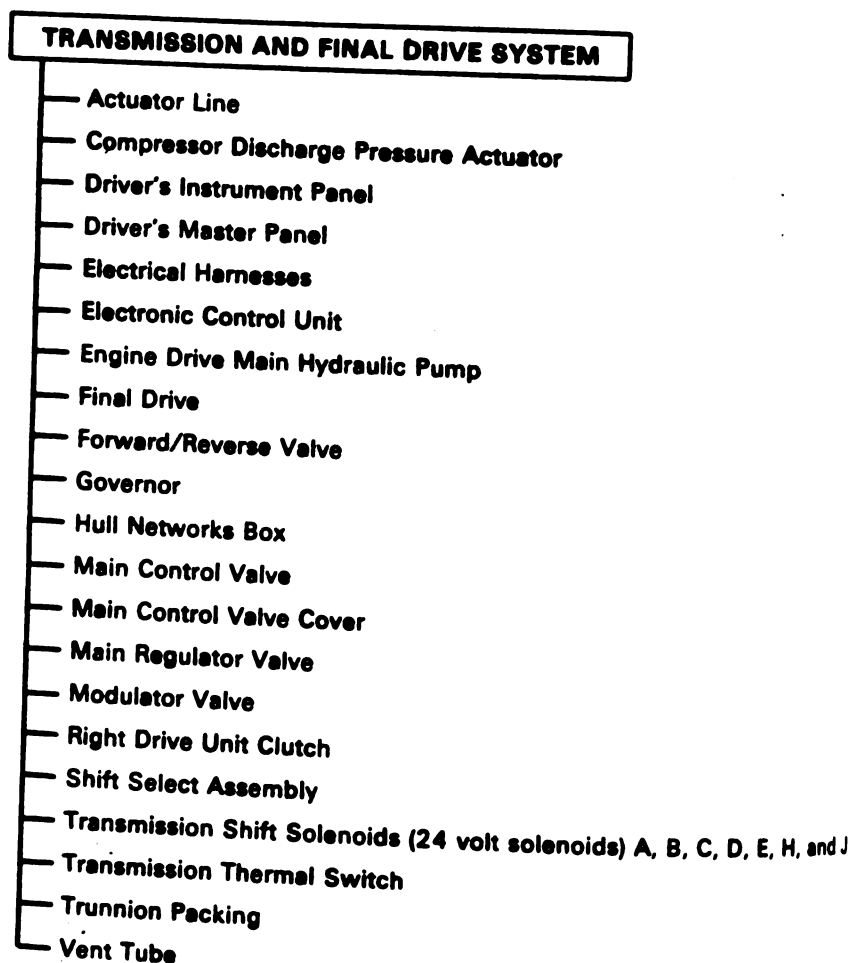


Figure 5-4. Transmission and Final Drive Troubleshooting Roadmap

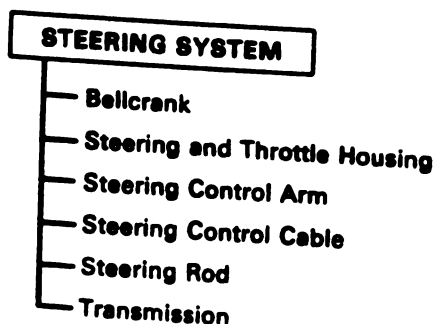
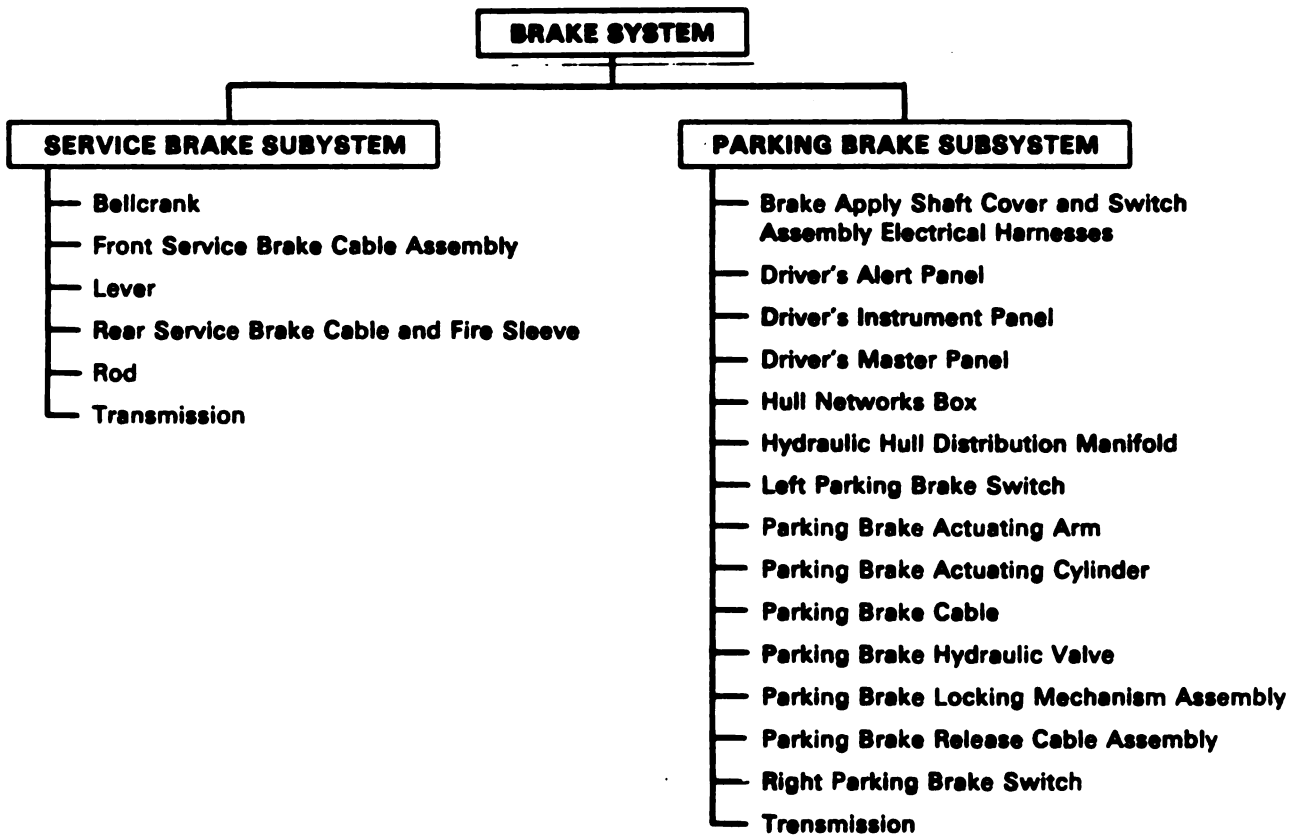


Figure 5-5. Steering System Troubleshooting Roadmap



*Figure 5-6. Brake System Troubleshooting Roadmap*  
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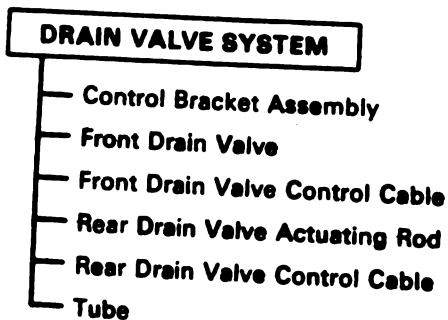


Figure 5-7. Drain Valve System Troubleshooting Roadmap

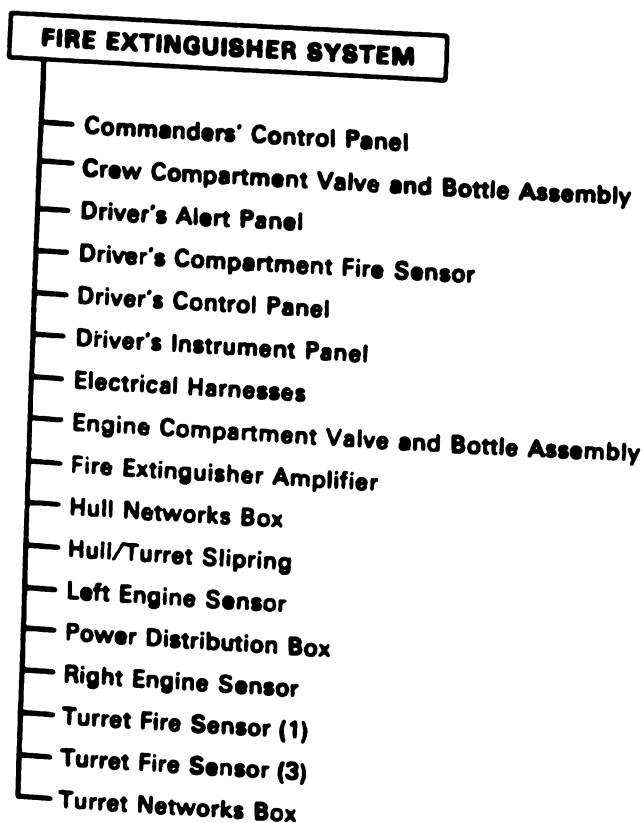


Figure 5-8. Fire Extinguisher System Troubleshooting Roadmap

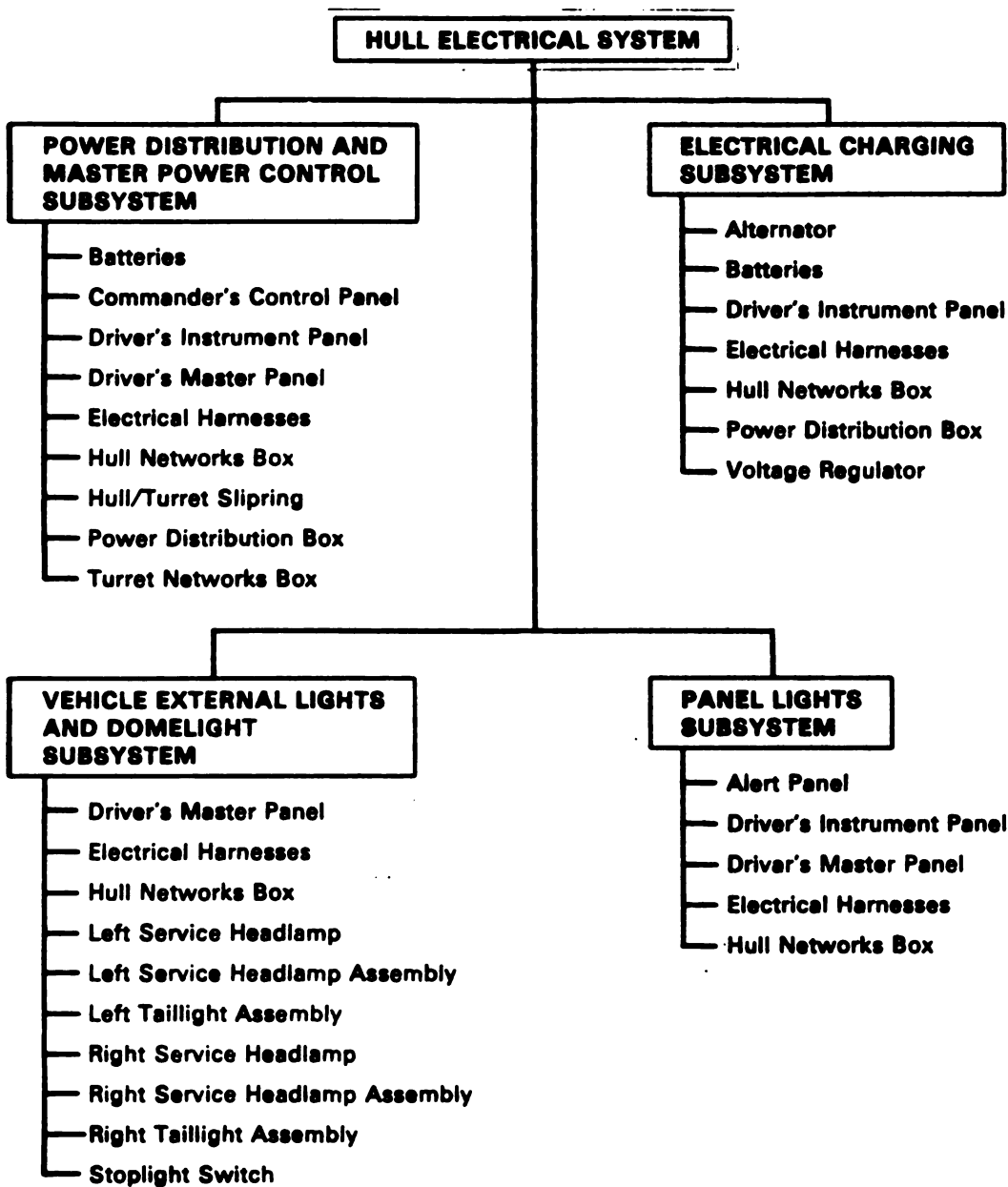


Figure 5-9. Hull Electrical Troubleshooting Roadmap (Sheet 1 of 3)  
Volume II  
Para. 5-1

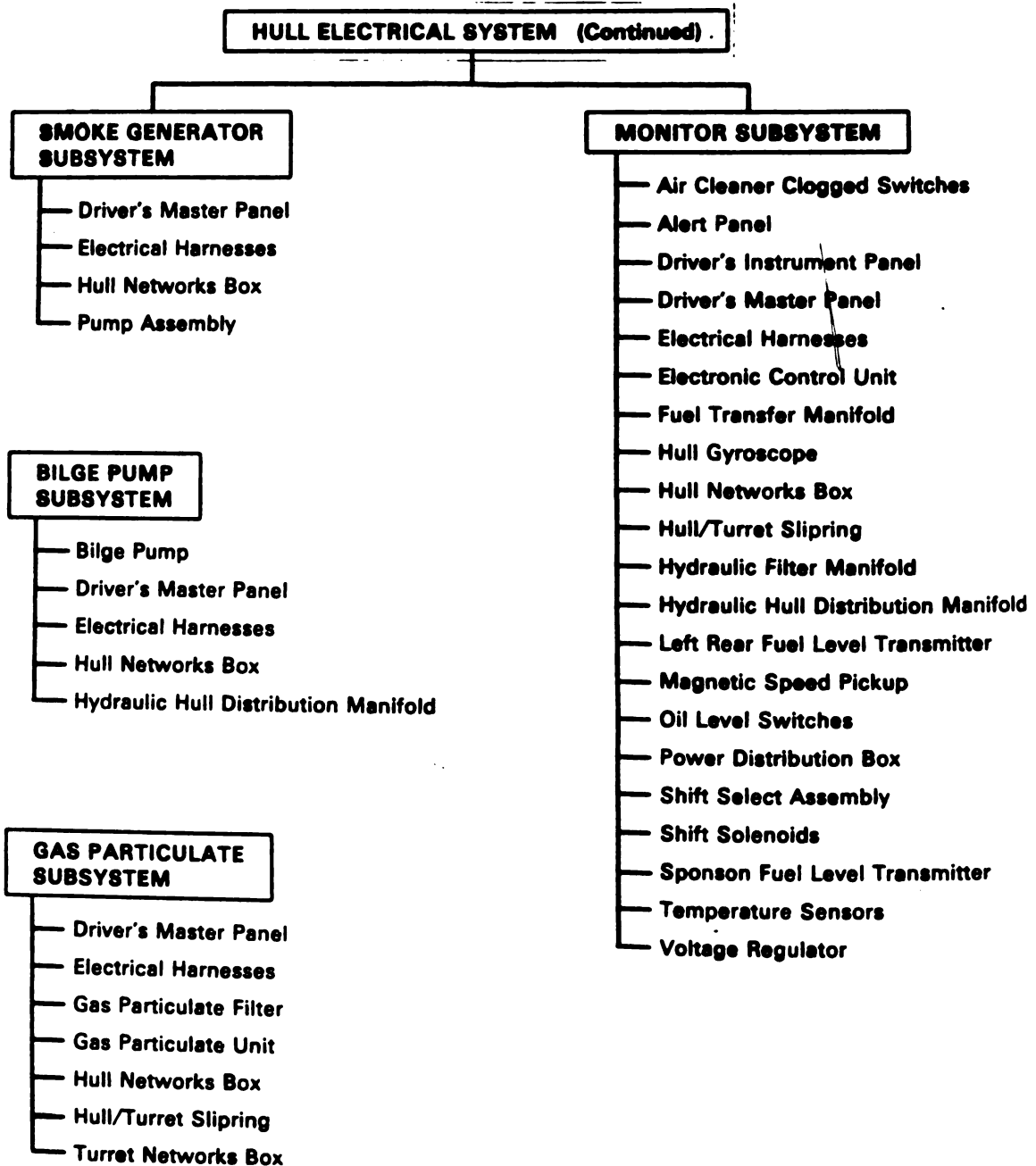


Figure 5-9. Hull Electrical System Troubleshooting Roadmap (Sheet 2 of 3)  
 Volume II  
 Para. 5-1

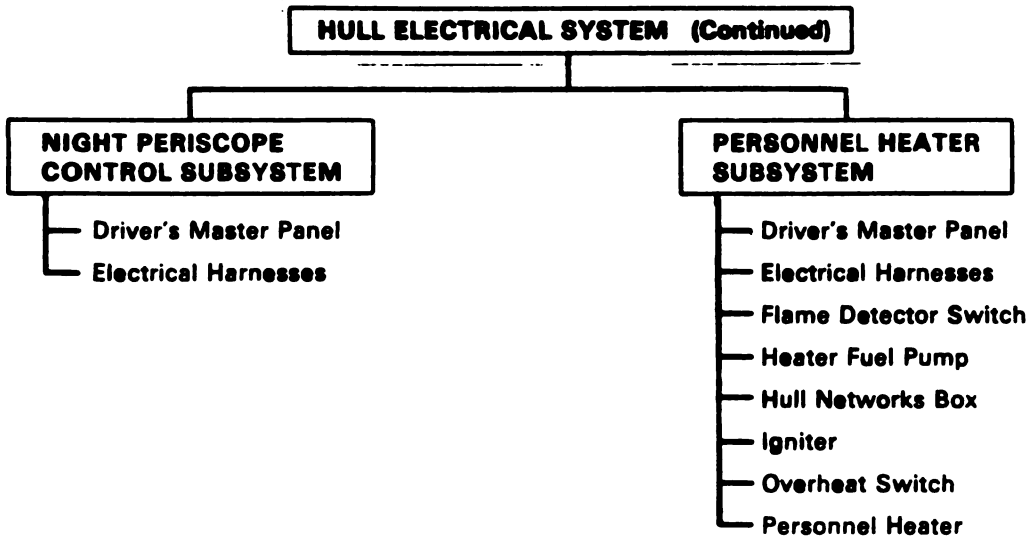


Figure 5-9. Hull Electrical System Troubleshooting Roadmap (Sheet 3 of 3)

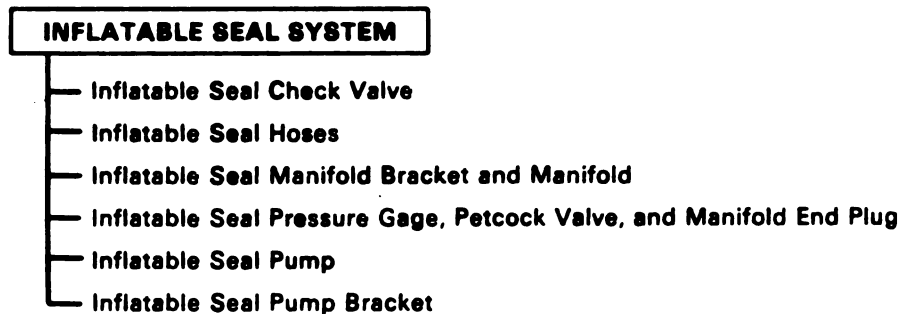


Figure 5-10. Inflatable Seal System Troubleshooting Roadmap



**CHAPTER 6  
FAULT SYMPTOM INDEXES**

**6-1. General.** This chapter contains symptom indexes which identify the correct procedures for troubleshooting a malfunction in any of the hull systems. For each hull system a fault symptom index (T) is included. The symptom indexes are listed in Table 6-1 with page location numbers.

**Table 6-1. Hull Systems**

System/Subsystem	Fault Symptom Index		
	Table	Page	
Suspension System	6-2	6-1	
Engine System	6-3	6-1	
Fuel Supply System	6-4	6-1	
Transmission and Final Drive System	6-5	6-1	
Transmission Shift Subsystem		6-1	
Transmission Oil Cooler Subsystem		6-1	
Steering System	6-6	6-1	
Brake System	6-7	6-1	
Service Brake Subsystem		6-1	
Parking Brake Subsystem		6-1	
Drain Valve System	6-8	6-1	
Fire Extinguisher System	6-9	6-1	
Hull Electrical System	6-10	6-1	
Power Distribution and Master Power Control Subsystem		6-1	
Electrical Charging Subsystem		6-2	
Cable Disconnect Monitor Subsystem		6-2	
Circuit Breaker Monitor Subsystem		6-2	
Maintenance Monitor Subsystem		6-2	
Vehicle External Lights and Dornelght Subsystem		6-2	
Panel Lights Subsystem		6-3	
Personnel Heater Subsystem		6-3	
Smoke Generator Subsystem		6-3	
Bilge Pump Subsystem		6-3	
Gas Particulate Subsystem		6-3	
Night Periscope Control Subsystem		6-4	
Inflatable Seal System		6-11	6-4

**NOTE**  
For hydraulic system troubleshooting procedures, refer to TM 9-2350-255-20-2-2-1.

Table 6-2. Suspension System Fault Symptom Index

System Or Subsystem Fault Symptom No.	Symptom	Primary Troubleshooting Procedure (PTP)	Resources Required	
			STE/M1	Personnel
Suspension System				
<b>SUSPENSION</b>				
SSS-1	Roadwheel Hub Or Idler Hub Is Too Hot	Refer to TM 9-2350-255-20-1-2-1, Para. 8-2		1
SSS-2	Support Roller Hub Is Too Hot	Refer to TM 9-2350-255-20-1-2-1, Para. 8-2		2
SSS-3	Unusual Track Noise	Refer to TM 9-2350-255-20-1-2-1, Para. 8-2		1
SSS-4	Degraded Suspension (Unusually Rough Ride)	Refer to TM 9-2350-255-20-1-2-1, Para. 8-2		2

Table 6-3. Engine System Fault Symptom Index

System Or Subsystem Fault Symptom No.	Symptom	Primary Troubleshooting Procedure (PTP)	Resources Required	
			STE/M1	Personnel
<b>Engine System</b>	<b>ENGINE</b>			
ESS-1	Engine Smokes	Refer to Para. 9-2		2
ESS-25	Oil Consumption Is More Than 1 Quart Per 2.5 Hours	Refer to Para. 9-2		1
	<b>ENGINE ABORT/STARTING</b>			
ESS-2	Engine Does Not Crank - ELECTRICAL SYSTEM Meter Shows Over 12 Volts During Start Attempt And Abort Light Comes On 7.5 Seconds After Start Attempt	Refer to Para. 9-2	X	2
ESS-3	Engine Does Not Crank - ELECTRICAL SYSTEM Meter Shows Over 12 Volts During Start Attempt And ABORT Light Does Not Come On After Start Attempt	Refer to Para. 9-2	X	2
ESS-4	Engine Does Not Crank When STARTER ONLY Switch Is Held In ENGAGED Position - OK In Normal Start Mode	Refer to Para. 9-2		2
ESS-5	Engine Has Low Cranking Speed When Starting	Refer to Para. 9-2	X	2
ESS-6	Engine Aborts Start	Refer to Para. 9-2	X	2
	<b>ENGINE SHUTOFF</b>			
ESS-23	Engine Continues To Run When ENGINE SHUTOFF Switch Is Set To SHUTOFF	Refer to Para. 9-2	X	2
ESS-24	Engine Shuts Down In Less Than 30 Seconds After ENGINE SHUTOFF Switch Is Set To SHUTOFF	Refer to Para. 9-2	X	2



Table 6-3. Engine Symptom Fault Symptom Index (Continued)

System Or Subsystem Fault Symptom No.	Symptom	Primary Troubleshooting Procedure (PTP)	Resources Required	
			STE/M1	Personnel
Engine System (Continued)				
<b>ENGINE POWER LOSS</b>				
ESS-20	Engine Speed Not Controllable While Underway	Refer to Para. 9-2	X	2
ESS-21	Engine Loses Power - FUEL CONTROL FAULTY Light Comes On	Refer to Para. 9-2	X	2
ESS-22	Engine Loses Power - FUEL CONTROL FAULTY Light Stays Off	Refer to Para. 9-2	X	2
<b>ENGINE TACTICAL IDLE</b>				
ESS-16	Engine Idle Speed Does Not Increase When TACTICAL IDLE Switch Is Set To On Or With Transmission Shift Control Set to PVT	Refer to Para. 9-2	X	2
ESS-17	Engine Idle Speed Not At Tactical Idle With Transmission Shift Control Set To PVT, But Engine Speed Increases To Tactical Idle When TACTICAL IDLE Switch Is Set to On	Refer to Para. 9-2	X	2
ESS-18	Engine Idle Speed Not At Tactical Idle With TACTICAL IDLE Switch Set To On, But Engine Speed Increases to Tactical Idle When Transmission Shift Control Is Set To PVT	Refer to Para. 9-2	X	2
ESS-19	Engine Idle Speed At Tactical Idle With Transmission Shift Control Set To N And TACTICAL IDLE Switch Set To OFF	Refer to Para. 9-2	X	2
<b>ENGINE LIGHTS</b>				
ESS-7	Engine Aborts, Engine ABORT Light Stays Off	Refer to Para. 9-2.	X	2
ESS-8	Engine Aborts Or Shuts Down Automatically After ENGINE OIL PRESSURE LOW Light Comes On	Refer to Para. 9-2		2

Table 6-3. Engine System Fault Symptom Index (Continued)

System Or Subsystem Fault Symptom No.	Symptom	Primary Troubleshooting Procedure (PTP)	Resources Required	
			STE/M1	Personnel
Engine System (Continued)				
<b>ENGINE LIGHTS (Continued)</b>				
ESS-9	Engine Starts, ENGINE STARTED Light Does Not Come On	Refer to Para. 9-2	X	2
	Engine Starts And ENGINE STARTED Light Comes On Prior To Start Then Goes Off 10 Seconds After Start	Replace Hull Networks Box. Refer to TM 9-2350-255-20-1-3-4, Para. 11-12	X	2
ESS-11	Engine Starts And ENGINE STARTED LIGHT Comes On Prior To Start And Stays On	Refer to Para. 9-2	X	2
	Engine Started And ENGINE STARTED Light Comes On But Does Not Go Off After 10 Seconds	Replace Hull Networks Box. Refer to TM 9-2350-255-20-1-3-4, Para. 11-12		
ESS-12	Engine Running Normally And FUEL CONTROL FAULTY Light Comes On	Refer to Para. 9-2	X	2
ESS-13	Engine Running And ENGINE OIL LOW Light Comes On, But Engine Oil Level OK	Refer To Para. 9-2		1
ESS-14	Engine Running And ENGINE OIL TEMP HIGH Light Comes On	Refer to Para. 9-2		2
ESS-15	Engine Running And Engine ABORT Light On	Refer To Para. 9-2	X	2
<b>ENGINE CIRCUIT BREAKERS</b>				
ESS-26	Circuit Breaker 7 on Hull Networks Box Keeps Shutting Off During Tank Operation	Refer to TM 9-2350-255-20-1-2-3, Para. 19.1-2		2
ESS-27	Circuit Breaker 10 on Hull Networks Box Keeps Shutting Off During Tank Operation	Refer to TM 9-2350-255-20-1-2-3, Para. 19.1-2		2

Table 6-3. Engine Symptom Fault Symptom Index (Continued)

System Or Subsystem Fault Symptom No.	Symptom	Primary Troubleshooting Procedure (PTP)	Resources Required	
			STE/M1	Personnel
Engine System (Continued)				
<b>ENGINE POWER LOSS</b>				
ESS-20	Engine Speed Not Controllable While Underway	Refer to Para. 9-2	X	2
ESS-21	Engine Loses Power - FUEL CONTROL FAULTY Light Comes On	Refer to Para. 9-2	X	2
ESS-22	Engine Loses Power - FUEL CONTROL FAULTY Light Stays Off	Refer to Para. 9-2	X	2
<b>ENGINE TACTICAL IDLE</b>				
ESS-16	Engine Idle Speed Does Not Increase When TACTICAL IDLE Switch Is Set To On Or With Transmission Shift Control Set to PVT	Refer to Para. 9-2	X	2
ESS-17	Engine Idle Speed Not At Tactical Idle With Transmission Shift Control Set To PVT, But Engine Speed Increases To Tactical Idle When TACTICAL IDLE Switch Is Set to On	Refer to Para. 9-2	X	2
ESS-18	Engine Idle Speed Not At Tactical Idle With TACTICAL IDLE Switch Set To On, But Engine Speed Increases to Tactical Idle When Transmission Shift Control Is Set To PVT	Refer to Para. 9-2	X	2
ESS-19	Engine Idle Speed At Tactical Idle With Transmission Shift Control Set To N And TACTICAL IDLE Switch Set To OFF	Refer to Para. 9-2	X	2
<b>ENGINE LIGHTS</b>				
ESS-7	Engine Aborts, Engine ABORT Light Stays Off	Refer to Para. 9-2.	X	2
ESS-8	Engine Aborts Or Shuts Down Automatically After ENGINE OIL PRESSURE LOW Light Comes On	Refer to Para. 9-2		2

Table 6-3. Engine System Fault Symptom Index (Continued)

System Or Subsystem Fault Symptom No.	Symptom	Primary Troubleshooting Procedure (PTP)	Resources Required	
			STE/M1	Personnel
Engine System (Continued)				
<b>ENGINE LIGHTS (Continued)</b>				
ESS-9	Engine Starts, ENGINE STARTED Light Does Not Come On	Refer to Para. 9-2	X	2
	Engine Starts And ENGINE STARTED Light Comes On Prior To Start Then Goes Off 10 Seconds After Start	Replace Hull Networks Box. Refer to TM 9-2350-255-20-1-3-4, Para. 11-12	X	2
ESS-11	Engine Starts And ENGINE STARTED LIGHT Comes On Prior To Start And Stays On	Refer to Para. 9-2	X	2
	Engine Started And ENGINE STARTED Light Comes On But Does Not Go Off After 10 Seconds	Replace Hull Networks Box. Refer to TM 9-2350-255-20-1-3-4, Para. 11-12		
ESS-12	Engine Running Normally And FUEL CONTROL FAULTY Light Comes On	Refer to Para. 9-2	X	2
ESS-13	Engine Running And ENGINE OIL LOW Light Comes On, But Engine Oil Level OK	Refer To Para. 9-2		1
ESS-14	Engine Running And ENGINE OIL TEMP HIGH Light Comes On	Refer to Para. 9-2		2
ESS-15	Engine Running And Engine ABORT Light On	Refer To Para. 9-2	X	2
<b>ENGINE CIRCUIT BREAKERS</b>				
ESS-26	Circuit Breaker 7 on Hull Networks Box Keeps Shutting Off During Tank Operation	Refer to TM 9-2350-255-20-1-2-3, Para. 19.1-2		2
ESS-27	Circuit Breaker 10 on Hull Networks Box Keeps Shutting Off During Tank Operation	Refer to TM 9-2350-255-20-1-2-3, Para. 19.1-2		2

Table 6-4 Fuel Supply System Fault Symptom Index

System Or Subsystem Fault Symptom No.	Symptom	Primary Troubleshooting Procedure (PTP)	Resources Required	
			STE/M1	Personnel
Fuel Supply System				
<b>FUEL/WATER SEPARATOR</b>				
FSS-14	Fuel/Water Separator Does Not Automatically Discharge Collected Water.	Refer to Para. 10-2		2
<b>FUEL TRANSFER</b>				
FSS-1	Fuel Cannot Be Transferred From Left Front Fuel Tank.	Refer to Para. 10-2		3
FSS-2	Fuel Cannot Be Transferred Or Transfers At A Slow Rate From Right Front Fuel Tank.	Refer to Para. 10-2		3
FSS-12	Fuel Transfers From Left Front Fuel Tank When Right Or Left Front Fuel Tank Is Selected.	Refer to Para. 10-2		3
FSS-13	Fuel Cannot Be Transferred From Right And Left Front Fuel Tanks - LOW FUEL LEVEL Light Is On, Rear Fuel Tank Shows Less Than 1/4 Full On Fuel Gage.	Refer to Para. 10-2		3
	Fuel Transfer From Left Front Fuel Tank Stops When LOW FUEL LEVEL Light Goes Off. Transfer From Right Front Fuel Tank OK.	Replace Driver's Instrument Panel. Refer to TM 9-2350-255-20-1-3-4, Para. 11-14		
	Fuel Transfer From Right Front Fuel Tank Stops When LOW FUEL LEVEL Light Goes Off. Transfer From Left Front Fuel Tank OK.	Replace Driver's Instrument Panel. Refer to TM 9-2350-255-20-1-3-4, Para. 11-14		
	Fuel Transfer Stops Before Rear Fuel Tanks Are 3/4 Filled.	Replace Sponson Fuel Level Transmitter. Refer to TM 9-2350-255-20-1-3-2, Para. 4-7		

Table 6-4. Fuel Supply System Fault Symptom Index (Continued)

System Or Subsystem Fault Symptom No.	Symptom	Primary Troubleshooting Procedure (PTP)	Resources Required	
			STE/M1	Personnel
<b>Fuel Supply System (Continued)</b>				
<b>FUEL TRANSFER (Continued)</b>				
FSS-9	Rear Fuel Tank Overfills.	Refer to Para. 10-2		3
<b>FUEL GAGE</b>				
FSS-5	FUEL Gage Shows Zero In Any FUEL TANK SELECTOR Switch Position.	Refer to Para. 10-2		3
	FUEL Gage Does Not Show Zero When VEHICLE MASTER POWER Switch Is Set To OFF.	Replace Driver's Instrument Panel. Refer to TM 9-2350-255-20-1-3-4, Para. 11-14		
FSS-6	Left Front Fuel Tank Shows Zero On FUEL Gage At All Times - Other Fuel Tanks OK.	Refer to Para. 10-2		3
FSS-7	Right Front Fuel Tank Shows Zero On FUEL Gage At All Times Other Fuel Tanks OK.	Refer to Para. 10-2		3
FSS-8	Rear Fuel Tank Shows 1/2 Full On FUEL Gage After Filling Rear Fuel Tank.	Refer to Para. 10-2		3
FSS-15	FUEL Gage Does Not Show Correct Fuel Levels - All Fuel Tanks Full.	Refer to Para. 10-2		3
FSS-16	Right Front Fuel Tank Shows More Than Full On FUEL Gage At All Times - Other Fuel Tanks OK.	Refer to Para. 10-2		3
FSS-17	Left Front Fuel Tank Shows More Than Full On FUEL Gage At All Times - Other Fuel Tanks OK.	Refer to Para. 10-2		3
FSS-18	Rear Fuel Tank Shows More Than Full On FUEL Gage At All Times - Other Fuel Tanks OK.	Refer to Para. 10-2		3

Table 6-4. Fuel Supply System Fault Symptom Index (Continued)

System Or Subsystem Fault Symptom No.	Symptom	Primary Troubleshooting Procedure (PTP)	Resources Required	
			STE/M1	Personnel
Fuel Supply System (Continued)				

**FUEL SYSTEM LIGHTS**

FSS-3	REAR FUEL PUMP - R Light Comes On After Engine Starts.	Refer to Para. 10-2		3
FSS-4	REAR FUEL PUMP - L Light Comes On After Engine Starts.	Refer to Para. 10-2		3

Table 6-4. Fuel Supply System Fault Symptom Index (Continued)

System Or Subsystem Fault Symptom No.	Symptom	Primary Troubleshooting Procedure (PTP)	Resources Required	
			STE/M1	Personnel
Fuel Supply System (Continued)				
<b>FUEL SYSTEM LIGHTS (Continued)</b>				
FSS-10	LOW FUEL LEVEL Light Does Not Go Off - Fuel Transfer Is Normal.	Refer to Para. 10-2		3
FSS-11	LOW FUEL LEVEL Light Does Not Come On When Rear Fuel Tank Shows Below 1/4 Full On FUEL Gage - Cannot Transfer Fuel.	Refer to Para. 10-2		3
	LOW FUEL LEVEL Light Does Not Come On When Rear Fuel Tanks Show Below 1/4 Full - Fuel Transfers OK.	Replace Driver's Instrument Panel. Refer to TM 9-2350-255-20-1-3-4, Para. 11-14		



Table 6-5. Transmission And Final Drive Fault Symptom Index

System Or Subsystem Fault Symptom No.	Symptom	Primary Troubleshooting Procedure (PTP)	Resources Required	
			STE/M1	Personnel
Transmission And Final Drive System				
<b>TRANSMISSION AND FINAL DRIVE</b>				
TFD-1 Transmission Shift Subsystem	Transmission Leaks Oil.	Refer to TM 9-2350-255-20-1-2-1, Para. 11-2		1
<b>TRANSMISSION SHIFT</b>				
TSS-1	Tank Will Not Move In Forward Or Reverse Ranges.	Refer to TM 9-2350-255-20-1-2-1, Para. 11-3	X	2
TSS-2	Transmission Does Not Shift To Low Range.	Refer to TM 9-2350-255-20-1-2-1, Para. 11-3	X	2
TSS-3	Transmission Does Not Shift To Pivot.	Refer to TM 9-2350-255-20-1-2-1, Para. 11-3	X	2
TSS-4	Transmission Does Not Downshift At Full Steer.	Refer to TM 9-2350-255-20-1-2-1, Para. 11-3		2
TSS-5	Transmission Does Not Downshift.	Refer to TM 9-2350-255-20-1-2-1, Para. 11-3	X	2
TSS-6	Transmission Does Not Upshift.	Refer to TM 9-2350-255-20-1-2-1, Para. 11-3	X	2

Table 6-5. Transmission And Final Drive Fault Symptom Index (Conti

System Or Subsystem Fault Symptom No.	Symptom	Primary Troubleshooting Procedure (PTP)	Resources Required	
			STE/PT	Personnel
<b>TRANSMISSION SHIFT (Continued)</b>				
TSS-7	Transmission Does Not Shift To Reverse Range - OK In Other Ranges.	Refer to TM 9-2350-255-20-1-2-1, Para. 11-3	X	2
TSS-8	Transmission Does Not Shift To Drive Range - OK In Other Ranges.	Refer to TM 9-2350-255-20-1-2-1, Para. 11-3	X	2
TSS-9	Transmission Shifts At Wrong Time.	Refer to TM 9-2350-255-20-1-2-1, Para. 11-3	X	2
TSS-10	Transmission Does Not Shift To Low And Drive Ranges.	Refer to TM 9-2350-255-20-1-2-1, Para. 11-3.	X	2
TSS-11	Transmission Starts Out In Low Range With Shift Selector In Drive.	Refer to TM 9-2350-255-20-1-2-1, Para. 11-3.	X	2
	Transmission Does Not Shift Properly Within Any Range.	Replace Transmission. Notify Support Maintenance.		
	Transmission Operates In One Range But Stalls In All Others Except Neutral.	Replace Transmission. Notify Support Maintenance.		
	Transmission Oil Press Low Light Comes On And Tank Will Not Move With Shift Select In Any Position.	Replace Transmission. Notify Support Maintenance.		

Table 6-5. Transmission And Final Drive Fault Symptom Index

System Or Subsystem Fault Symptom No.	Symptom	Primary Troubleshooting Procedure (PTP)	Resources Required	
			STE/M1	Personnel
Transmission And Final Drive System				
<b>TRANSMISSION AND FINAL DRIVE</b>				
TFD-1	Transmission Leaks Oil.	Refer to TM 9-2350-255-20-1-2-1, Para. 11-2		1
Transmission Shift Subsystem				
<b>TRANSMISSION SHIFT</b>				
TSS-1	Tank Will Not Move In Forward Or Reverse Ranges.	Refer to TM 9-2350-255-20-1-2-1, Para. 11-3	X	2
TSS-2	Transmission Does Not Shift To Low Range.	Refer to TM 9-2350-255-20-1-2-1, Para. 11-3	X	2
TSS-3	Transmission Does Not Shift To Pivot.	Refer to TM 9-2350-255-20-1-2-1, Para. 11-3	X	2
TSS-4	Transmission Does Not Downshift At Full Steer.	Refer to TM 9-2350-255-20-1-2-1, Para. 11-3		2
TSS-5	Transmission Does Not Downshift.	Refer to TM 9-2350-255-20-1-2-1, Para. 11-3	X	2
TSS-6	Transmission Does Not Upshift.	Refer to TM 9-2350-255-20-1-2-1, Para. 11-3	X	2

Table 6-5. Transmission And Final Drive Fault Symptom Index (Conti

Resource TE/M/A	System Or Subsystem Fault Symptom No.	Symptom	Primary Troubleshooting Procedure (PTP)	Resources Required	
				STE/A	Personnel
	Transmission And Final Drive System (Continued)				
<b>TRANSMISSION SHIFT (Continued)</b>					
	TSS-7	Transmission Does Not Shift To Reverse Range - OK In Other Ranges.	Refer to TM 9-2350-255-20-1-2-1, Para. 11-3	X	2
	TSS-8	Transmission Does Not Shift To Drive Range - OK In Other Ranges.	Refer to TM 9-2350-255-20-1-2-1, Para. 11-3	X	2
	TSS-9	Transmission Shifts At Wrong Time.	Refer to TM 9-2350-255-20-1-2-1, Para. 11-3	X	2
	TSS-10	Transmission Does Not Shift To Low And Drive Ranges.	Refer to TM 9-2350-255-20-1-2-1, Para. 11-3.	X	2
	TSS-11	Transmission Starts Out In Low Range With Shift Selector In Drive.	Refer to TM 9-2350-255-20-1-2-1, Para. 11-3.	X	2
		Transmission Does Not Shift Properly Within Any Range.	Replace Transmission. Notify Support Maintenance.		
		Transmission Operates In One Range But Stalls In All Others Except Neutral.	Replace Transmission. Notify Support Maintenance.		
		Transmission Oil Press Low Light Comes On And Tank Will Not Move With Shift Select In Any Position.	Replace Transmission. Notify Support Maintenance.		

Table 6-5. Transmission And Final Drive Symptom Index (Continued)

System Or Subsystem Fault Symptom No.	Symptom	Primary Troubleshooting Procedure (PTP)	Resources Required	
			STE/M1	Personnel
Transmission And Final Drive System (Continued)				
<b>TRANSMISSION CIRCUIT BREAKERS</b>				
TSS-12	Circuit Breaker 6 On Hull Networks Box Keeps Shutting Off During Tank Operation.	Refer to TM 9-2350-255-20-1-2-3, Para. 19.1-3		2
TSS-13	Circuit Breaker 9 On Hull Networks Box Keeps Shutting Off During Tank Operation.	Refer to TM 9-2350-255-20-1-2-3, Para. 19.1-3		2
Transmission Oil Cooler Subsystem				
<b>TRANSMISSION OIL COOLER</b>				
TOC-1	TRANSMISSION OIL TEMP HIGH Light And MASTER WARNING Light Come On But Oil Temperature OK.	Refer to Para. 11-4		2
TOC-2	Transmission OIL TEMP HIGH Light And MASTER WARNING Light Come On But Oil Temperature OK.	Refer to Para. 11-4		2

Table 6-6. Steering System Fault Symptom Index

System Or Subsystem Fault Symptom No.	Symptom	Primary Troubleshooting Procedure (PTP)	Resources Required	
			STE/M1	Personnel
Steering System				
<b>STEERING</b>				
SS-1	No Steering Control.	Refer to TM 9-2350-255-20-1-2-1, Para. 12-2		2
SS-2	Tank Leads To One Side With Steer Bar In Center Position.	Refer to TM 9-2350-255-20-1-2-1, Para. 12-2		2
SS-3	Tank Steers Well In One Direction Only.	Refer to TM 9-2350-255-20-1-2-1, Para. 12-2		2
SS-4	No Full Steer In Either Direction.	Refer to TM 9-2350-255-20-1-2-1, Para. 12-2		2

Table 6-7. Brake System Fault Symptom Index

System Or Subsystem Fault Symptom No.	Symptom	Primary Troubleshooting Procedure (PTP)	Resources Required	
			STE/M1	Personnel
Service Brake Subsystem				
<b>SERVICE BRAKE</b>				
SBS-1	Service Brakes Do Not Stop Or Hold Tank.	Refer to TM 9-2350-255-20-1-2-1, Para. 13-2		2
SBS-2	Service Brakes Lock Or Drag When Attempting To Drive Tank.	Refer to TM 9-2350-255-20-1-2-1, Para. 13-2		2
Parking Brake Subsystem				
<b>PARKING BRAKE</b>				
PBS-4	Parking Brakes Do Not Hold Tank.	Refer to TM 9-2350-255-20-1-2-1, Para. 13-3		2
PBS-5	Parking Brakes Do Not Release.	Refer to TM 9-2350-255-20-1-2-1, Para. 13-3		2
<b>PARKING BRAKE LIGHTS</b>				
PBS-1	PARKING/SERVICE BRAKES Light Is On When All Brakes Are Released.	Refer to TM 9-2350-255-20-1-2-1, Para. 13-3		2
	PARKING/SERVICE BRAKES Light Does Not Light With Either Parking Brake Or Service Brake Pressed.	Replace Driver's Master Panel. Refer to TM 9-2350-255-20-1-3-4, Para. 11-15		
PBS-2	PARKING/SERVICE BRAKES Light does Not Come On When Parking Brake Is Pressed.	Refer to TM 9-2350-255-20-1-2-1, Para. 13-3		2

Table 6-7. Brake System Fault Symptom Index (Continued)

Resources STE/M1	System Or Subsystem Fault Symptom No.	Symptom	Primary Troubleshooting Procedure (PTP)	Resources Required	
				STE/M1	Personnel
	Parking Brake Subsystem (Continued)				
<b>PARKING BRAKE LIGHTS (Continued)</b>					
	PBS-3	PARKING/SERVICE BRAKES Light Does Not Come On When Service Brake Is Pressed For Two Minutes Or More.	Refer to TM 9-2350-255-20-1-2-1, Para. 13-3		2
		PARKING/SERVICE BRAKES Light Comes On Without Two Minute Delay When Service Brake Is Pressed.	Replace Driver's Master Panel. Refer to TM 9-2350-255-20-1-3-4, Para. 11-15		
	PBS-6	MASTER WARNING Light Does Not Come On When Parking Brake Is Pressed.	Refer to TM 9-2350-255-20-1-2-1, Para. 13-3		2
<b>PARKING BRAKE HYDRAULICS</b>					
		Parking Brake System Hydraulic Pressure Gage Shows A Decrease In Pressure During Main Accumulator Pressure Check.	Replace Hydraulic Hull Distribution Manifold. Refer to TM 9-2350-255-20-1-3-3, Para. 8-8		



Table 6-8. Drain Valve System Fault Symptom Index

System Or Subsystem Fault Symptom No.	Symptom	Primary Troubleshooting Procedure (PTP)	Resources Required	
			STE/M1	Personnel
Drain Valve System				
<b>DRAIN VALVES</b>				
DVS-1	Front Drain Valve Won't Open And Close Or Is Clogged.	Refer to TM 9-2350-255-20-1-2-2, Para. 14-2		2
DVS-2	Rear Drain Valves Won't Open And Close Or Are Clogged.	Refer to TM 9-2350-255-20-1-2-2, Para. 14-2		2

Table 6-9. Fire Extinguisher System Fault Symptom Index

System Or Subsystem Fault Symptom No.	Symptom	Primary Troubleshooting Procedure (PTP)	Resources Required	
			STE/M1	Personnel
Fire Extinguisher System				

**FIRE EXTINGUISHER LIGHTS**

FES-5	Driver's MASTER WARNING Light Did Not Come On And Driver's FIRE Light Did Not Flash With Fire In Engine Compartment.	Refer to TM 9-2350-255-20-1-2-2, Para. 15-2	X	2
FES-6	1st SHOT DISCHARGED Light Does Not Come On.	Refer to TM 9-2350-255-20-1-2-2, Para. 15-2	X	2
FES-7	Fire Extinguisher RESET Pushbutton Pressed But 1st SHOT DISCHARGED Light Stays On.	Refer to TM 9-2350-255-20-1-2-2, Para. 15-2	X	2
FES-9	Commander's Control Panel FIRE Light Did Not Come On With Fire In Engine Compartment.	Refer to TM 9-2350-255-20-1-2-2, Para. 15-2	X	2
	ENGINE FIRE Light Comes On But Did Not Flash With Fire In Engine Compartment.	Replace Fire Extinguisher. Refer to TM 9-2350-255-20-1-3-3, Para. 9-5		

**FIRE EXTINGUISHER MALFUNCTION**

FES-2	1st Shot Bottle Discharged MASTER WARNING Light Is On And ENGINE FIRE Light Is Flashing, But No Engine Fire.	Refer to TM 9-2350-255-20-1-2-2, Para. 15-2	X	2
FES-3	Engine 1st Shot Fire Extinguisher Does Not Discharge Automatically - ENGINE FIRE Light On Driver's Instrument Panel Comes On.	Refer to TM 9-2350-255-20-1-2-2, Para. 15-2	X	2
FES-1	Crew Fire Extinguisher Discharged - No Fire Present.	Refer to TM 9-2350-255-20-1-2-2, Para. 15-2	X	2

Table 6-9. Fire Extinguisher System Fault Symptom Index (Continued)

System Or Subsystem Fault Symptom No.	Symptom	Primary Troubleshooting Procedure (PTP)	Resources Required	
			STE/M1	Personnel
Fire Extinguisher System (Continued)				
<b>FIRE EXTINGUISHER MALFUNCTION (Continued)</b>				
FES-8	Crew Fire Extinguisher Does Not Discharge Automatically.	Refer to TM 9-2350-255-20-1-2-2, Para. 15-2	X	2
FES-4	2nd Shot Fire Extinguisher Does Not Discharge When 2nd SHOT FIRE EXTINGUISHER Switch Is Pushed.	Refer to TM 9-2350-255-20-1-2-2, Para. 15-2	X	2
FES-10	Engine Does Not Shut Down And 2nd Shot Bottle Does Not Discharge When 2nd SHOT FIRE EXTINGUISHER Switch Is Pushed.	Refer to TM 9-2350-255-20-1-2-2, Para. 15-2	X	2
	Engine Does Not Shut Down When 2nd SHOT FIRE EXTINGUISHER Switch Is Pushed.	Replace Hull Networks Box. Refer to TM 9-2350-255-20-1-3-4, Para. 11-12		

Table 6-10. Hull Electrical System Fault Symptom Index

System Or Subsystem Fault Symptom No.	Symptom	Primary Troubleshooting Procedure (PTP)	Resources Required	
			STE/M1	Personnel
Power Distribution And Master Power Control Subsystem				

**POWER DISTRIBUTION**

	When VEHICLE MASTER POWER Switch Is Set To ON, REAR FUEL PUMP-R, REAR FUEL PUMP-L, And HYDRAULIC SYSTEM MALFUNCTION Lights Come On.	Replace Driver's Instrument Panel. Refer to TM 9-2350-255-20-1-3-4, Para. 11-14		
PDMPC-1	No Power When VEHICLE MASTER POWER Switch Is Set To ON At Either Commander's Or Driver's Station.	Refer to TM 9-2350-255-20-1-2-2, Para. 16-2	X	2
PDMPC-2	No Power When VEHICLE MASTER POWER Switch Is Set To ON At Driver's Station.	Refer to TM 9-2350-255-20-1-2-2, Para. 16-2	X	2
PDMPC-3	VEHICLE MASTER POWER Cannot Be Turned Off At Commander's Or Driver's Station.	Refer to TM 9-2350-255-20-1-2-2, Para. 16-2	X	2
PDMPC-4	VEHICLE MASTER POWER Cannot Be Turned Off At Driver's Station.	Refer to TM 9-2350-255-20-1-2-2, Para. 16-2	X	2

**VEHICLES MASTER POWER LIGHTS**

VEHICLE MASTER POWER Light Does Not Come On When VEHICLE MASTER POWER Switch Is Set To ON.	Replace Driver's Master Panel. Refer to TM 9-2350-255-20-1-3-4, Para. 11-15		
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Table 6-10. Hull Electrical System Fault Symptom Index (Continued)

System Or Subsystem Fault Symptom No.	Symptom	Primary Troubleshooting Procedure (PTP)	Resources Required	
			STE/M1	Personnel
Power Distribution And Master Power Control Subsystem (Continued)				

**VEHICLES MASTER POWER CIRCUIT BREAKERS**

PDMPC-5	Circuit Breaker CB1 On Power Distribution Box Keeps Shutting Off When VEHICLE MASTER POWER Switch Is Set To ON.	Refer to TM 9-2350-255-20-1-2-2, Para. 16-2	X	2
PDMPC-6	Circuit Breaker CB4 On Power Distribution Box Keeps Shutting Off When VEHICLE MASTER POWER Switch Is Set To ON.	Refer to TM 9-2350-255-20-1-2-2, Para. 16-2	X	2
Electrical Charging Subsystem				

**ELECTRICAL CHARGING**

ECS-1	ELECTRICAL SYTEM Meter Does Not Show Charging When Engine Is Running.	Refer to TM 9-2350-255-20-1-2-2, Para. 16-3	X	2
ECS-2	ELECTRICAL SYSTEM Meter Shows Over 30 VOLTS DC When Engine Is Running.	Refer to TM 9-2350-255-20-1-2-2, Para. 16-3	X	2
ECS-3	ELECTRICAL SYSTEM Meter Shows Zero VOLTS.	Refer to TM 9-2350-255-20-1-2-2, Para. 16-3	X	2
ESC-4	Circuit Breaker CB29 On Hull Networks Box Keeps Shutting Off During Tank Operation.	Refer to TM 9-2350-255-20-1-2-2, Para. 16-3		1

Table 6-10 Hull Electrical System Fault Symptom Index (Continued)

System Or Subsystem Fault Symptom No.	Symptom	Primary Troubleshooting Procedure (PTP)	Resources Required	
			STE/M1	Personnel
<b>ELECTRICAL CHARGING (Continued)</b>				
Electrical Charging Subsystem (Continued)	ELECTRICAL SYSTEM Meter Shows Normal Voltage With Engine Running But LOW BAT CHARGE Light Is ON.	Replace Driver's Instrument Panel. Refer to TM 9-2350-255-20-1-3-4, Para. 11-14		
	ELECTRICAL SYSTEM Meter Does Not Show Zero VOLTS When VEHICLE MASTER POWER Switch Is Set To OFF.	Replace Driver's Instrument Panel. Refer to TM 9-2350-255-20-1-3-4, Para. 11-14		
<b>CABLE DISCONNECT</b>				
Cable Disconnect Monitor Subsystem	CDM-1 CABLE DISCONNECTED Light Comes On - All Cables Are Connected.	Refer to TM 9-2350-255-20-1-2-2, Para. 16-4		2
	CDM-2 CABLE DISCONNECTED Light Does Not Come On When A Cable Is Disconnected - Panel Lights Test Shows CABLE DISCONNECTED Light OK.	Refer to TM 9-2350-255-20-1-2-2, Para. 16-4		1
<b>CIRCUIT BREAKER MONITOR</b>				
HCBM-1	CIRCUIT BREAKER OPEN Light Does Not Come On When Circuit Breaker 5, 6, Or 7 On Power Distribution Box Is In OFF Position.	Refer to TM 9-2350-255-20-1-2-2, Para. 16-5		2

Table 6-10. Hull Electrical System Fault Symptom Index (Continued)

System Or Subsystem Fault Symptom No.	Symptom	Primary Troubleshooting Procedure (PTP)	Resources Required	
			STE/M1	Personnel
Circuit Breaker Monitor Subsystem (Continued)				

**CIRCUIT BREAKER MONITOR (Continued)**

HCBM-2	CIRCUIT BREAKER OPEN Light Does Not Come On When One Or More Circuit Breakers On Hull Networks Box Are In OFF Position.	Refer to TM 9-2350-255-20-1-2-2, Para. 16-5		2
HCBM-3	CIRCUIT BREAKER OPEN Light On Driver's Instrument Panel Cannot Be Reset Using Driver's Alert Panel RESET Switch.	Refer to TM 9-2350-255-20-1-2-2, Para. 16-5		2
HCBM-4	CIRCUIT BREAKER OPEN Light On Driver's Instrument Panel Is On When All Circuit Breakers Are In ON Position.	Refer to TM 9-2350-255-20-1-2-2, Para. 16-5		2

Maintenance Monitor Subsystem

**AIR CLEANER MONITOR**

MM-2	AIR CLEANER CLOGGED FILTER Light Comes On.	Clean Precleaner. Refer to TM 9-2350-255-20-1-3-1, Para. 3-5  Clean Air Cleaner PAC Assembly. Refer to TM 9-2350-255-20-1-3-1, Para. 3-6		
	AIR CLEANER CLOGGED FILTER Light Does Not come On When Filter Is Clogged.	Refer to TM 9-2350-255-20-1-2-2, Para. 16-6	X	2

Table 6-10. Hull Electrical System Fault Symptom Index (Continued)

System Or Subsystem Fault Symptom No.	Symptom	Primary Troubleshooting Procedure (PTP)	Resources Required	
			STE/M1	Personnel
Maintenance Monitor Subsystem (Continued)				
<b>AIR CLEANER MONITOR (Continued)</b>				
MM-3	AIR CLEANER CLOGGED FILTER Light Comes On And Filter Is Not Clogged.	Refer to TM 9-2350-255-20-1-2-2, Para. 16-8	X	2
<b>CIRCUIT BREAKER MONITOR</b>				
MM-14	Circuit Breaker CB5 On Hull Networks Box Keeps Shutting Off During Tank Operation.	Refer to TM 9-2350-255-20-1-2-2, Para. 16-6		2
<b>ENGINE OIL MONITOR</b>				
MM-7	Engine Oil Is Low, But ENGINE OIL LOW Light Does Not Come ON.	Refer to TM 9-2350-255-20-1-2-2, Para. 16-6		1
ESS-3	ENGINE OIL TEMP HIGH Light And MASTER WARNING Light Come On.	Refer to TM 9-2350-255-20-1-2-1, Para. 9-2		2
MM-1	ENGINE OIL CLOGGED FILTER Light Does Not Come On When Filter Is Clogged.	Refer to TM 9-2350-255-20-1-2-2, Para. 16-6	X	2
MM-22	ENGINE OIL CLOGGED FILTER Light Comes On And Filter Is Not Clogged.	Refer to TM 9-2350-255-20-1-2-2, Para. 16-6		2



Table 6-10. Hull Electrical System Fault Symptom Index (Continued)

System Or Subsystem Fault Symptom No.	Symptom	Primary Troubleshooting Procedure (PTP)	Resources Required	
			STE/M1	Personnel
Maintenance Monitor Subsystem (Continued)				

**ENGINE OIL MONITOR (Continued)**

ENGINE OIL CLOGGED FILTER Light Comes On.	Replace Engine Oil Filter. Refer to TM 9-2350-255-20-1-3-1, Para. 2-6	
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**ENGINE RPM MONITOR**

MM-11	Engine RPM Gage Shows Zero With Engine Running.	Refer to TM 9-2350-255-20-1-2-2, Para. 16-6	2
	RPM Gage Does Not Show Zero When VEHICLE MASTER POWER Switch is Set To OFF.	Replace Driver's Instrument Panel. Refer to TM 9-2350-255-20-1-3-4, Para. 11-14	

**FUEL MONITOR**

PRIMARY FUEL CLOGGED FILTER Light Comes On.	<p>Replace The Following Filters: Primary And Fuel Water Separator Filter Elements. Refer to TM 9-2350-255-20-1-3-1, Para. 4-8</p> <p>Fuel Filter Element. Refer to TM 9-2350-255-20-1-3-2, Para. 2-5</p> <p>Inlet Fuel Filters. Refer to TM 9-2350-255-20-1-3-2, Para. 2-5</p>	
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Table 6-10. Hull Electrical System Fault Symptom Index (Continued)

System Or Subsystem Fault Symptom No.	Symptom	Primary Troubleshooting Procedure (PTP)	Resources Required	
			STE/M1	Personnel
Maintenance Monitor Subsystem (Continued)				
<b>FUEL MONITOR (Continued)</b>				
MM-12	FUEL CONTROL FAULTY Light Comes On When VEHICLE MASTER POWER Switch Is Set To ON.	Refer to TM 9-2350-255-20-1-2-2, Para. 16-6		1
MM-15	PRIMARY FUEL CLOGGED FILTER Light Comes On And Filter Is Not Clogged	Refer to TM 9-2350-255-20-1-2-2, Para. 16-6		2
<b>HYDRAULICS MONITOR</b>				
MM-4	HYDRAULIC SYSTEM MALFUNCTION Light On With No Hydraulic Malfunction.	Refer to TM 9-2350-255-20-1-2-2, Para. 16-6	X	2
MM-5	HYDRAULIC SYSTEM MALFUNCTION Light Does Not Come On With Hydraulic Malfunction - Panel Lights Test OK.	Refer to TM 9-2350-255-20-1-2-2, Para. 16-6	X	2
<b>LOW BATTERY CHARGE MONITOR</b>				
MM-16	Driver's LOW BAT CHARGE Light Comes On But Commander's LOW BAT CHG Light Stays Off When ELECTRICAL SYSTEM Meter Shows Less Than 23 VOLTS DC - Panel Lights Test OK.	Refer to TM 9-2350-255-20-1-2-2, Para. 16-6		2
MM-17	Driver's LOW BAT CHARGE Light And Commander's LOW BAT CHG Light Come On - ELECTRICAL SYSTEM Meter Shows 23 VOLTS DC Or More.	Refer to TM 9-2350-255-20-1-2-2, Para. 16-6		2
MM-18	Commander's LOW BAT CHG Light Comes On But Driver's LOW BAT CHARGE Light Stays Off. ELECTRICAL SYSTEM Meter Shows 23 VOLTS DC Or More.	Refer to TM 9-2350-255-20-1-2-2, Para. 16-6		1

Table 6-10 Hull Electrical System Fault Symptom Index (Continued)

System Or Subsystem Fault Symptom No.	Symptom	Primary Troubleshooting Procedure (PTP)	Resources Required	
			STE/M1	Personnel
Maintenance Monitor Subsystem (Continued)				

**LOW BATTERY CHARGE MONITOR (Continued)**

Driver's LOW BAT CHARGE And Commander's LOW BAT CHG Lights Do Not Come On When ELECTRICAL SYSTEM Meter Shows Less Than 23 VOLTS DC.	Replace Driver's Instrument Panel. Refer to TM 9-2350-255-20-1-3-4, Para. 11-14	
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**MASTER CAUTION  
MASTER WARNING MONITOR**

	MASTER CAUTION Light On Driver's Alert Panel Does Not Come On When A Monitor Caution Light Comes On - Panel Lights Test OK.	Replace Driver's Instrument Panel. Refer to TM 9-2350-255-20-1-3-4, Para. 11-14	
MM-26	MASTER CAUTION Light Comes On When VEHICLE MASTER POWER Switch Is Set To ON - All Monitor Caution Lights Are Off And MASTER CAUTION Light Cannot Be Reset.	Refer to TM 9-2350-255-20-1-2-2, Para. 16-6	1
MM-23	MASTER CAUTION Light Does Not Go Off When RESET Pushbutton On Driver's Alert Panel Is Pressed.	Refer to TM 9-2350-255-20-1-2-2, Para. 16-6	1
MM-24	RESET Pushbutton On Driver's Alert Panel Does Not Reset MASTER WARNING Light Or ENGINE OVERSPEED Light After Engine Speed Has Returned To Normal.	Refer to TM 9-2350-255-20-1-2-2, Para. 16-6	2
MM-25	MASTER WARNING Light Comes On When VEHICLE MASTER POWER Switch Is Set To ON - All Monitor Warning Lights Are OFF.	Refer to TM 9-2350-255-20-1-2-2, Para. 16-6	1

Continued

Table 6-10. Hull Electrical System Fault Symptom Index (Continued)

System Or Subsystem Fault Symptom No.	Symptom	Primary Troubleshooting Procedure (PTP)	Resources Required	
			STE/M1	Personnel
Maintenance Monitor Subsystem (Continued)				

**MASTER CAUTION  
MASTER WARNING MONITOR (Continued)**

MASTER WARNING And MASTER CAUTION Lights Go Off When PNL DIM Pushbutton is Pressed.	Replace Driver's Alert Panel. Refer to TM 9-2350-255-20-1-3-4, Para. 11-16		
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**SPEEDOMETER MONITOR**

MM-6	Speedometer Reading Is Incorrect With Engine Running And Tank Moving Or Not Moving.	Refer to TM 9-2350-255-20-1-2-2, Para. 16-6	2
MM-10	Speedometer Shows Zero When Tank Is Moving.	Refer to TM 9-2350-255-20-1-2-2, Para. 16-6	2
	Speedometer Does Not Show Zero When VEHICLE MASTER POWER Switch Is Set To OFF.	Replace Driver's Instrument Panel. Refer to TM 9-2350-255-20-1-3-4, Para. 11-14	

**TRANSMISSION MONITOR**

MM-13	TRANSMISSION OIL PRESS Low Light Comes On, But Transmission OK.	Refer to TM 9-2350-255-20-1-2-2, Para. 16-6	2
MM-20	TRANSMISSION OIL LOW Light Comes On And Oil Level Checks OK.	Refer to TM 9-2350-255-20-1-2-2, Para. 16-6	2

Table 6-10. Hull Electrical System Fault Symptom Index (Continued)

System Or Subsystem Fault Symptom No.	Symptom	Primary Troubleshooting Procedure (PTP)	Resources Required	
			STE/M1	Personnel
Maintenance Monitor Subsystem (Continued)	<b>TRANSMISSION MONITOR (Continued)</b>			
MM-21	TRANSMISSION OIL LOW Light Does Not Come On When Oil Level Is Low-Engine Is Running, And Transmission Shift Control Is Set To N.	Refer to TM 9-2350-255-20-1-2-2, Para. 16-6		2
MM-19	TRANSMISSION OIL CLOGGED FILTER Light Comes On And Filter Is Not Clogged.	Refer to TM 9-2350-255-20-1-2-2, Para. 16-6		2
	TRANSMISSION OIL CLOGGED FILTER Light Comes On.	Remove And Replace MAIN Oil Filter Assembly. Refer to TM 9-2350-255-20-1-3-1, Para. 2-8		
Vehicle External Lights And Dornlight Subsystem	<b>VEHICLE EXTERNAL LIGHTS</b>			
VELS-2	Service Lights Do Not Come On When LIGHTS Switch Is Set To SERVICE LIGHTS Position.	Refer to TM 9-2350-255-20-1-2-2, Para. 16-7		2
	Vehicle External Lights Will Not Come On.	Replace Driver's Master Panel. Refer to TM 9-2350-255-20-1-3-4, Para. 11-15		

Continued

Table 6-10. Hull Electrical System Fault Symptom Index (Continued)

System Or Subsystem Fault Symptom No.	Symptom	Primary Troubleshooting Procedure (PTP)	Resources Required	
			STE/M1	Personnel
Vehicle External Lights And Dornlight Subsystem (Continued)				
<b>VEHICLE EXTERNAL LIGHTS (Continued)</b>				
VELS-17	Service Taillights And Low Beam Service Headlamps Do Not Come On - Service Stoplights OK.	Replace Hull Networks Box. Refer to TM 9-2350-255-20-1-3-4, Para. 11-12		
VELS-17	BO Marker And Bo Stoplights Do Not Come On - All Other External Lights OK.	Refer to TM 9-2350-255-20-1-2-2, Para. 16-7		2
<b>SERVICE HEADLIGHTS</b>				
VELS-3	High Beam Lights In Service Headlamps And HI BEAM Indicator Light Do Not Come On - All Other External Lights OK.	Refer to TM 9-2350-255-20-1-2-2, Para. 16-7		2
VELS-16	HI BEAM Indicator Light Does Not Come On - High Beam Service Headlamps OK.	Refer to TM 9-2350-255-20-1-2-2, Para. 16-7		2
VELS-8	High Beam Light In Left Service Headlamp Assembly Does Not Come On.	Refer to TM 9-2350-255-20-1-2-2, Para. 16-7		2
VELSS-10	High Beam Light In Right Service Headlamp Assembly Does Not Come On.	Refer to TM 9-2350-255-20-1-2-2, Para. 16-7		2
VELS-7	No Lights In Left Service Headlamp Assembly Come On.	Refer to TM 9-2350-255-20-1-2-2, Para. 16-7		2
VELS-6	No Lights In Right Service Headlamp Assembly Come On.	Refer to TM 9-2350-255-20-1-2-2, Para. 16-7		2

Table 6-10. Hull Electrical System Fault Symptom Index (Continued)

System Or Subsystem Fault Symptom No.	Symptom	Primary Troubleshooting Procedure (PTP)	Resources Required	
			STE/M1	Personnel
Vehicle External Lights And Dornelght Subsystem (Continued)				
<b>SERVICE HEADLIGHTS (Continued)</b>				
VELS-9	Low Beam Light In Left Service Headlamp Assembly Does Not Come On.	Refer to TM 9-2350-255-20-1-2-2, Para. 16-7		2
VELS-11	Low Beam Light In Right Service Headlamp Assembly Does Not Come On.	Refer to TM 9-2350-255-20-1-2-2, Para. 16-7		2
	High And Low Beam Service Headlamps Will Not Come On.	Replace Hull Networks Box. Refer to TM 9-2350-255-20-1-3-4, Para. 11-12		
	Only High And Low Beam Service Headlamps Will Come On.	Replace Hull Networks Box. Refer to TM 9-2350-255-20-1-3-4, Para. 11-12		
VELS-19	BO Marker Light In Left Service Headlamp Assembly Does Not Come On.	Refer to TM 9-2350-255-20-1-2-2, Para. 16-7		2
VELS-20	BO Marker Light In Right Service Headlamp Assembly Does Not Come On.	Refer to TM 9-2350-255-20-1-2-2, Para. 16-7		2
<b>SERVICE TAILLIGHTS</b>				
	Both Service Stop Taillights Do Not Come On.	Replace Hull Networks Box. Refer to TM 9-2350-255-20-1-3-4, Para. 11-12		

Table 6-10. Hull Electrical System Fault Symptom Index (Continued)

System Or Subsystem Fault Symptom No.	Symptom	Primary Troubleshooting Procedure (PTP)	Resources Required	
			STE/M1	Personnel
Vehicle External Lights And Dornalight Subsystem (Continued)				
<b>SERVICE TAILLIGHTS (Continued)</b>				
VELS-4	No Lights In Right Taillight Assembly Come On.	Refer to TM 9-2350-255-20-1-2-2, Para. 16-7		2
VELS-5	No Lights In Left Taillight Assembly Come On.	Refer to TM 9-2350-255-20-1-2-2, Para. 16-7		2
VELS-12	Service Light In Left Taillight Assembly Does Not Come On.	Refer to TM 9-2350-255-20-1-2-2, Para. 16-7		2
VELS-13	Service Stoplight In Left Taillight Assembly Does Not Come On.	Refer to TM 9-2350-255-20-1-2-2, Para. 16-7		2
VELS-14	Service Light In Right Taillight Assembly Does Not Come On.	Refer to TM 9-2350-255-20-1-2-2, Para. 16-7		2
VELS-15	Service Stoplight In Right Taillight Assembly Does Not Come On.	Refer to TM 9-2350-255-20-1-2-2, Para. 16-7		2
VELS-1	Service Stop Taillights Do Not Come ON In STOPLIGHTS ONLY Position, All Other External Lights OK.	Refer to TM 9-2350-255-20-1-2-2, Para. 16-7		2
VELS-18	Both BO Stoplights And Left Service Stoplight Do Not Come On.	Refer to TM 9-2350-255-20-1-2-2, Para. 16-7		2
VELS-21	BO Stoplight In Left Taillight Assembly Does Not Come On.	Refer to TM 9-2350-255-20-1-2-2, Para. 16-7		2



Table 6-10. Hull Electrical System Fault Symptom Index (Continued)

System Or Subsystem Fault Symptom No.	Symptom	Primary Troubleshooting Procedure (PTP)	Resources Required	
			STE/M1	Personnel
Vehicle External Lights And Domelights Subsystem (Continued)				
<b>SERVICE TAILLIGHTS (Continued)</b>				
VELS-22	BO Marker Light In Left Taillight Assembly Does Not Come On.	Refer to TM 9-2350-255-20-1-2-2, Para. 16-7		2
VELS-23	BO Stoplight In Right Taillight Assembly Does Not Come On.	Refer to TM 9-2350-255-20-1-2-2, Para. 16-7		2
VELS-24	BO Marker Light In Right Taillight Assembly Does Not Come On.	Refer to TM 9-2350-255-20-1-2-2, Para. 16-7		2
	BO Stoplights And Service Stoplights Do Not Come On - All Other External Lights OK.	Replace Stoplight Switch. Refer to TM 9-2350-255-20-1-3-4, Para. 11-7		
<b>DOMELIGHT</b>				
VELS-25	Driver's Domelight Does Not Come On.	Refer to TM 9-2350-255-20-1-2-2, Para. 16-7		2
	Cannot Vary Brightness Of Driver's Domelight.	Replace Domelight. Refer to TM 9-2350-255-20-1-3-4, Para. 11-8		
	Domelight Stays On When Domelight Switch Is In OFF Position.	Replace Domelight. Refer to TM 9-2350-255-20-1-3-4, Para. 11-8		
	Domelight Lens Does Not Change When Lever Is Moved.	Replace Domelight. Refer to TM 9-2350-255-20-1-3-4, Para. 11-8		

Table 6-10. Hull Electrical System Fault Symptom Index (Continued)

System Or Subsystem Fault Symptom No.	Symptom	Primary Troubleshooting Procedure (PTP)	Resources Required	
			STE/M1	Personnel
<b>EXTERNAL LIGHTS CIRCUIT BREAKERS</b>				
ELS-29	Circuit Breaker CB21 On Hull Networks Box Keeps Shutting Off When LIGHTS Switch Is Set To SERVICE LIGHTS Position.	Refer to TM 9-2350-255-20-1-2-3, Table 20-11.		2
VELS-27	Circuit Breaker CB22 On Hull Networks Box Keeps Shutting Off When LIGHTS Switch Is OFF And VEHICLE MASTER POWER Switch Is Set To ON.	Refer to TM 9-2350-255-20-1-2-3, Table 20-11.		2
VELS-28	Circuit Breaker CB22 On Hull Networks Box Keeps Shutting Off When LIGHTS Switch Is Set To Either STOPLIGHTS ONLY or SERVICE LIGHTS Position.	Refer to TM 9-2350-255-20-1-2-3, Table 20-11.		2
VELS-30	Circuit Breaker CB22 On Hull Networks Box Keeps Shutting Off When LIGHTS Switch Is Set To BO Position.	Refer to TM 9-2350-255-20-1-2-3, Table 20-11.		2
Panel Lights Subsystem				
<b>PANEL LIGHTS</b>				
PLS-6	No Panel Lights Come On When PANEL LIGHTS TEST Pushbutton Is Pressed.  All Lights On Driver's Instrument Panel And ENGINE STARTED And ABORT Lights On Driver's Master Panel Do Not Come On When PANEL LIGHTS TEST Pushbutton Is Pressed.	Refer to TM 9-2350-255-20-1-2-2, Para. 16-8  Replace Driver's Master Panel. Refer to TM 9-2350-255-20-1-3-4, Para. 11-15	X	2

Table 6-10. Hull Electrical System Fault Symptom Index (Continued)

System Or Subsystem Fault Symptom No.	Symptom	Primary Troubleshooting Procedure (PTP)	Resources Required	
			STE/M1	Personnel
Panel Lights Subsystem (Continued)				
<b>DRIVER'S INSTRUMENT PANEL LIGHTS</b>				
PLS-2	Driver's Instrument Panel Lights Do Not Come On-Panel Lights Test OK.	Refer to TM 9-2350-255-20-1-2-2, Para. 16-8	X	2
PLS-3	Brightness Of Driver's Instrument Panel Lights Does Not Vary.	Refer to TM 9-2350-255-20-1-2-2, Para. 16-8	X	2
PLS-7	Driver's Instrument Panel Lights Do Not Come On When PANEL LIGHTS TEST Pushbutton Is Pressed.	Refer to TM 9-2350-255-20-1-2-2, Para. 16-8	X	2
PLS-9	ENGINE FIRE Light Does Not Come On When PANEL LIGHTS TEST Pushbutton Is Pressed.	Refer to TM 9-2350-255-20-1-2-2, Para. 16-8	X	2
PLS-10	Caution (Amber) Lights On Driver's Instrument Panel Do Not Come On When PANEL LIGHTS TEST Pushbutton Is Pressed.	Refer to TM 9-2350-255-20-1-2-2, Para. 16-8	X	2
PLS-11	All Driver's Instrument Panel Warning (Red) Lights Except ENGINE FIRE Stay Off When PANEL LIGHTS TEST Pushbutton Is Pressed.	Refer to TM 9-2350-255-20-1-2-2, Para. 16-8	X	2
PLS-14	MAINTENANCE MONITOR Lights, LOW FUEL LEVEL Light, LOW BAT CHARGE Light, And 1ST SHOT DISCHARGED Light Do Not Come On When PANEL LIGHTS TEST Pushbutton Is Pressed.	Refer to TM 9-2350-255-20-1-2-2, Para. 16-8	X	2
	All Driver's Instrument Panel Warning (Red) Lights Stay Off When PANEL LIGHTS TEST Pushbutton Is Pressed.	Replace Driver's Instrument Panel. Refer to TM 9-2350-255-20-1-3-4, Para. 11-14	X	2

Table 6-10. Hull Electrical System Fault Symptom Index (Continued)

System Or Subsystem Fault Symptom No.	Symptom	Primary Troubleshooting Procedure (PTP)	Resources Required	
			STE/M1	Personnel
Panel Lights Subsystem (Continued)				

**DRIVER'S INSTRUMENT PANEL LIGHTS (Continued)**

Some But Not All MAINTENANCE MONITOR Lights Do Not Come On When PANEL LIGHTS TEST Pushbutton Is Pressed.	Replace Driver's Instrument Panel. Refer to TM 9-2350-255-20-1-3-4, Para. 11-14		
--	---	--	--

**DRIVER'S MASTER PANEL LIGHTS**

PLS-1	Driver's Master Panel Lights Do Not Come On-Panel Lights Test OK.	Refer to TM 9-2350-255-20-1-2-2, Para. 16-8	X	2
PLS-4	Brightness Of Driver's Master Panel Lights Does Not Vary.	Refer to TM 9-2350-255-20-1-2-2, Para. 16-8	X	2
	Driver's Master Panel Lights Do Not Come On When PANEL LIGHTS TEST Pushbutton Is Pressed.	Replace Driver's Master Panel. Refer to TM 9-2350-255-20-1-3-4, Para. 11-15		
	ENGINE STARTED And ABORT Lights Do Not Come On When PANEL LIGHTS TEST Pushbutton Is Pressed.	Replace Driver's Master Panel. Refer to TM 9-2350-255-20-1-3-4, Para. 11-15		

**DRIVER'S ALERT PANEL LIGHTS**

PLS-5	Lights On Driver's Alert Panel Do Not Go To Full Brightness When VEHICLE MASTER POWER Switch Is Set To ON.	Refer to TM 9-2350-255-20-1-2-2, Para. 16-8	X	2
PLS-8	MASTER WARNING Light On Driver's Alert Panel Does Not Come On When PANEL LIGHTS TEST Pushbutton Is Pressed.	Refer to TM 9-2350-255-20-1-2-2, Para. 16-8	X	2

Table 6-10. Hull Electrical System Fault Symptom Index (Continued)

System Or Subsystem Fault Symptom No.	Symptom	Primary Troubleshooting Procedure (PTP)	Resources Required	
			STE/M1	Personnel
Panel Lights Subsystem (Continued)				

**DRIVER'S ALERT PANEL LIGHTS (Continued)**

PLS-13	MASTER WARNING Light Does Not Come On When A Red Warning Light Comes On.	Refer to TM 9-2350-255-20-1-2-2, Para. 16-8	X	2
PLS-12	MASTER CAUTION Light On Driver's Alert Panel Does Not Come On When PANEL LIGHTS TEST Pushbutton Is Pressed.	Refer to TM 9-2350-255-20-1-2-2, Para. 16-8	X	2
	Driver's Alert Panel Lights Do Not Dim When PNL DIM Pushbutton Is Pressed.	Replace Driver's Alert Panel. Refer to TM 9-2350-255-20-1-3-4, Para. 11-16		
	Lights On Driver's Alert Panel Do Not Come On When PANEL LIGHTS TEST Pushbutton Is Pressed.	Replace Driver's Alert Panel. Refer to TM 9-2350-255-20-1-3-4, Para. 11-16		
Personnel Heater Subsystem				

**PERSONNEL HEATER**

PHS-1	Personnel Heater Fan And PERSONNEL HEATER Light Do Not Come On When PERSONNEL HEATER Switch Is Held In START Position.	Refer to TM 9-2350-255-20-1-2-2, Para. 16-9	X	2
PHS-2	Personnel Heater Fan Starts Then Shuts Down When PERSONNEL HEATER Switch Is Held In START Position.	Refer to TM 9-2350-255-20-1-2-2, Para. 16-9	X	2

Continued

Table 6-10. Hull Electrical System Fault Symptom Index (Continued)

System Or Subsystem Fault Symptom No.	Symptom	Primary Troubleshooting Procedure (PTP)	Resources Required	
			STE/M1	Personnel
Personnel Heater Subsystem (Continued)				

**PERSONNEL HEATER (Continued)**

X	PHS-3	Air Does Not Get Warmer When PERSONNEL HEATER HIGH/LOW Temperature Switch Is Set To HIGH Position.	Refer to TM 9-2350-255-20-1-2-2, Para. 16-9	X	2
X	PHS-4	Personnel Heater Fan Does Not Run In RUN/FAN Position With Personnel Heater Off.	Refer to TM 9-2350-255-20-1-2-2, Para. 16-9	X	2
	PHS-5	Personnel Heater Does Not Start-Fan Stays At Low Speed And PERSONNEL HEATER Light Does Not Come On.	Refer to TM 9-2350-255-20-1-2-2, Para. 16-9	X	2
	PHS-6	Heat Does Not Decrease When PERSONNEL HEATER HIGH/LOW Temperature Switch Is Set To LOW Position.	Refer to TM 9-2350-255-20-1-2-2, Para. 16-9	X	2
	PHS-7	Personnel Heater Start Cycle OK But Personnel Heater Does Not Produce Normal Amount Of Heat.	Refer to TM 9-2350-255-20-1-2-2, Para. 16-9	X	2
	PHS-8	Personnel Heater Start Cycle OK But Personnel Heater Shuts Down After Working For A Short Time.	Refer to TM 9-2350-255-20-1-2-2, Para. 16-9	X	2
		PERSONNEL HEATER Light Does Not Come On-Personnel Heater Starts And Works OK.	Replace Driver's Master Panel. Refer to TM 9-2350-255-20-1-3-4, Para. 11-15		
		Personnel Heater Shuts Down Within Three Minutes After PERSONNEL HEATER Switch Is Moved From START to RUN FAN Position.	Replace Driver's Master Panel. Refer to TM 9-2350-255-20-1-3-4, Para. 11-15		

Table 6-10. Hull Electrical System Fault Symptom Index (Continued)

System Or Subsystem Fault Symptom No.	Symptom	Primary Troubleshooting Procedure (PTP)	Resources Required	
			STE/M1	Personnel
<b>Smoke Generator Subsystem</b>				
<b>SMOKE GENERATOR</b>				
SGS-1	Smoke Generator Does Not Produce Smoke. When SMOKE GENERATOR Switch Is Set To On, SMOKE GENERATOR Light Comes On.	Refer to TM 9-2350-255-20-1-2-2, Para. 16-10		2
SGS-4	Smoke Generator Produces Smoke When SMOKE GENERATOR Switch Is Set To OFF, And Engine Running.  With SMOKE GENERATOR Switch ON-Smoke Generator Produces Smoke With Engine Off.	Refer to TM 9-2350-255-20-1-2-2, Para. 16-10  Replace Hull Networks Box. Refer to TM 9-2350-255-20-1-3-4, Para. 11-12		2
<b>SMOKE GENERATOR LIGHT</b>				
SGS-2	SMOKE GENERATOR Light Does Not Come On When SMOKE GENERATOR Switch Is Set To ON-Smoke Generator OK.	Refer to TM 9-2350-255-20-1-2-2, Para. 16-10		2
SGS-3	SMOKE GENERATOR Light And Smoke Generator Are Off With SMOKE GENERATOR Switch In ON Position.  SMOKE GENERATOR Light Stays On After SMOKE GENERATOR Switch Has Been Set To OFF.	Refer to TM 9-2350-255-20-1-2-2, Para. 16-10  Replace Hull Networks Box. Refer to TM 9-2350-255-20-1-3-4, Para. 11-12		2

Table 6-10. Hull Electrical System Fault Symptom Index (Continued)

System Or Subsystem Fault Symptom No.	Symptom	Primary Troubleshooting Procedure (PTP)	Resources Required	
			STE/M1	Personnel
<b>Bilge Pump Subsystem</b>				
<b>BILGE PUMP</b>				
BPS-1	Bilge Pump Does Not Work When BILGE PUMP Switch Is Set To ON.	Refer to TM 9-2350-255-20-1-2-2, Para. 16-11	X	2
BPS-2	Bilge Pump Works, But BILGE PUMP Light Does Not Come ON.	Refer to TM 9-2350-255-20-1-2-2, Para. 16-11	X	2
BPS-3	Bilge Pump Works With BILGE PUMP Switch Set To OFF.	Refer to TM 9-2350-255-20-1-2-2, Para. 16-11	X	2
BPS-4	Circuit Breaker CB11 On Hull Networks Box Keeps Shutting Off When VEHICLE MASTER POWER Switch Is Set To ON.	Refer to TM 9-2350-255-20-1-2-2, Para. 16-11		1
<b>Gas Particulate Subsystem</b>				
<b>GAS PARTICULATE HEATER</b>				
GPTS-1	Driver's Gas Particulate Heater Unit Does Not Work. GAS PARTIC FILTER Light Comes On.	Refer to TM 9-2350-255-20-2-2-2, Para. 13-2		2
GPTS-6	Gunner's Gas Particulate Heater Assembly Does Not Work Commander's And Loader's Heater's OK.	Refer to TM 9-2350-255-20-2-2-2, Para. 13-2		2
GPTS-7	Commander's Gas Particulate Heater Assembly Does Not Work-Gunner's And Loader's Heater's OK.	Refer to TM 9-2350-255-20-2-2-2, Para. 13-2		2
GPTS-8	Loader's Gas Particulate Heater Assembly Does Not Work Commander's And Gunner's Heater's OK.	Refer to TM 9-2350-255-20-2-2-2, Para. 13-2		2



Table 6-10. Hull Electrical System Fault Symptom Index (Continued)

System Or Subsystem Fault Symptom No.	Symptom	Primary Troubleshooting Procedure (PTP)	Resources Required	
			STE/M1	Personnel
<b>GAS PARTICULATE FILTER</b>				
GPTS-2	GAS PARTIC FILTER Light Does Not Come On - All Gas Particulate Heater Units Work.	Refer to TM 9-2350-255-20-2-2-2, Para. 13-2		2
GPTS-3	GAS PARTIC FILTER Light Does Not Come On - Gas Particulate Blower Does Not Work - No Gas Particulate Heater Units Work.	Refer to TM 9-2350-255-20-2-2-2, Para. 13-2		2
GPTS-5	Gas Particulate Blower Does Not Work - GAS PARTIC FILTER Light Comes On.	Refer to TM 9-2350-255-20-2-2-2, Para. 13-2		2
GPTS-9	Gas Particulate Filter Blower And GAS PARTIC FILTER Light Stays On When GAS PARTIC FILTER Switch Is Set To OFF Position.	Refer to TM 9-2350-255-20-2-2-2, Para. 13-2		2
	Gunner's, Commander's, And Loader's Gas Particulate Heater Assemblies Do Not Work - Gas Particulate Blower OK.	Replace Turret Networks Box. Refer to TM 9-2350-255-20-2-3-1, Para. 2-7		
<b>RADIAC</b>				
GPTS-4	Radiac Alarm Does Not Work.	Refer to TM 9-2350-255-20-2-2-2, Para. 13-2		2

Continued

Table 6-10. Hull Electrical System Fault Symptom Index (Continued)

System Or Subsystem Fault Symptom No.	Symptom	Primary Troubleshooting Procedure (PTP)	Resources Required	
			STE/M1	Personnel
Night Periscope Subsystem				
<b>NIGHT PERISCOPE</b>				
NPS-1	Night Periscope Does Not Work But NIGHT PERISCOPE Light Is ON.	Refer to TM 9-2350-255-20-1-2-2, Para. 16-13		1
	Night Periscope Is On When NIGHT PERISCOPE Switch Is Set To OFF.	Replace Driver's Master Panel. Refer to TM 9-2350-255-20-1-3-4, Para. 11-15		
	Night Periscope Works But NIGHT PERISCOPE Light Does Not Come ON.	Replace Driver's Master Panel. Refer to TM 9-2350-255-20-1-3-4, Para. 11-15		
NPS-2	Night Periscope Is On When NIGHT PERISCOPE Switch Is Set to OFF.	Refer to TM 9-2350-255-20-1-2-2, para. 16-13		1

**Table 6-11. Inflatable Seal System Fault Symptom Index**

System Or Subsystem Fault Symptom No.	Symptom	Primary Troubleshooting Procedure (PTP)	Resources Required	
			STE/M1	Personnel
Inflatable Seal System				
<b>INFLATABLE SEAL</b>				
ISS-1	Inflatable Seal Pump Works OK-Turret Seal Pressure Gage Shows No Rise In Pressure.	Refer to TM 9-2350-255-20-1-2-2, Para. 17-2		1
ISS-2	Inflatable Seal Pump Is Hard To Operate-Turret Seal Pressure Gage Shows NO Rise In Pressure.	Refer to TM 9-2350-255-20-1-2-2, Para. 17-2		1
ISS-3	Inflatable Seal Pump Works OK-Turret Seal Pressure Gage Shows Correct Pressure And Then Begins To Show A Loss Of Pressure.	Refer to TM 9-2350-255-20-1-2-2, Para. 17-2		1
	Inflatable Seal Pump Works OK-Turret Seal Pressure Gage Shows No Pressure But Air Flows Out Of Manifold When Petcock Is Opened.	Replace Inflatable Seal Pressure Gage. Refer to TM 9-2350-255-20-1-3-2, Para. 6-9		

## CHAPTER 7 SAMPLE TROUBLESHOOTING CHARTS

Index  
Reserve  
STE/M1

**1. General.** This chapter explains how the troubleshooting and test equipment procedures in this manual could be used. It includes samples of a typical fault isolation flowchart in a troubleshooting procedure. Also, a typical test equipment procedure is explained.

**2. Fault Isolation Flowchart.** The fault isolation flowchart is the basic procedure for finding bad components. It describes and illustrates each step of the troubleshooting procedure with enough detail so that a soldier with little or no experience can find and correct faults. Each flowchart begins with a malfunction symptom that can be seen, felt or heard by one or more members of the crew during operation of the tank. A typical fault isolation flowchart in a troubleshooting procedure can be found in figure 7-1.

**FAULT SYMPTOM.** Provides a fault symptom description and identifying number. This symptom appears in the Fault Symptom Index in chapter 6.

**TEST EQUIPMENT/SPECIAL TOOLS BLOCK.** This block identifies any test equipment or special tools needed to do the troubleshooting procedures.

**EQUIPMENT CONDITION BLOCK.** Clearly states condition of equipment before first step of procedure starts.

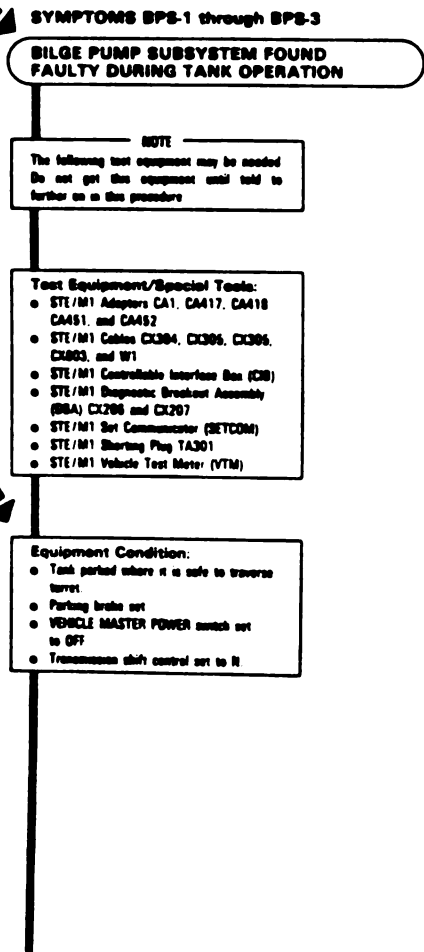


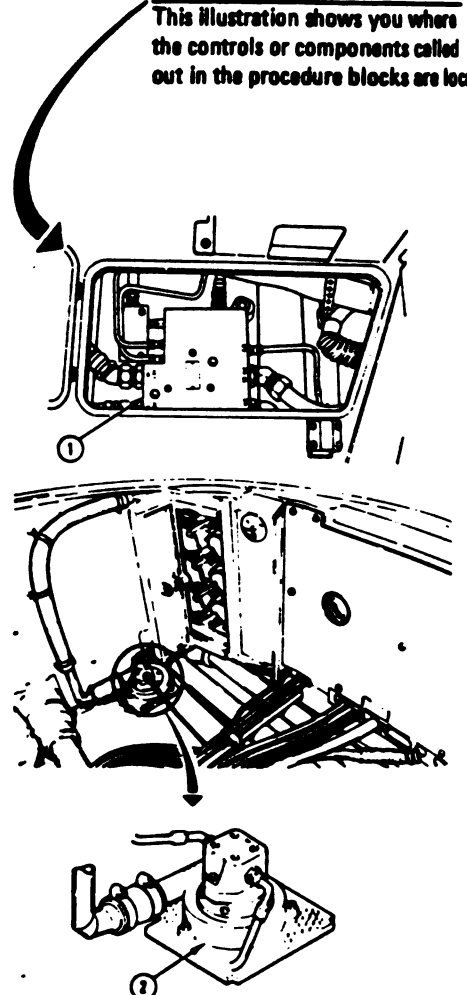
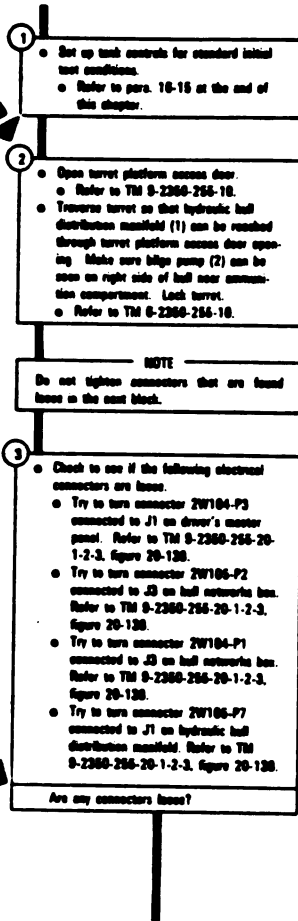
Figure 7-1. Sample Fault Isolation Flowchart (Sheet 1 of 10)  
Volume II  
Para. 7-1

**PROCEDURE ILLUSTRATIONS.**  
This illustration shows you where the controls or components called out in the procedure blocks are located.

**PROCEDURE BLOCK - GENERAL.**  
The top lines tell you what to do and the indented lines tell you how to do it.

**CONNECTOR INSPECTION PROCEDURE BLOCK.** This procedure block tells you to see if any connectors are loose that are part of the subsystem. The figure you refer to for each harness is a diagram showing the harness location in the tank.

**QUESTION BLOCK.** Answer the question yes or no and follow the yes or no line to the next block.



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Figure 7-1. Sample Fault Isolation Flowchart (Sheet 2 of 10)

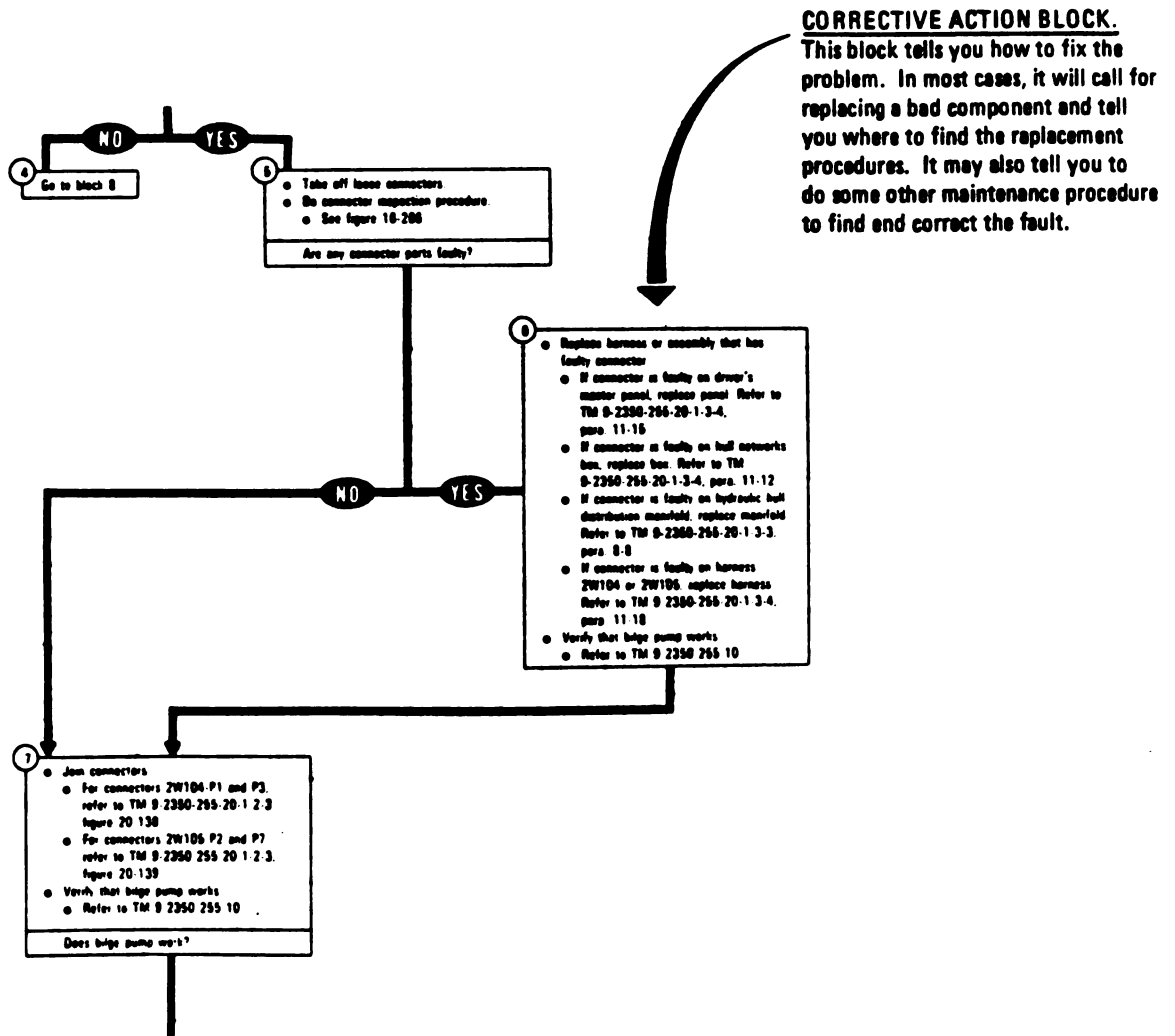


Figure 7-1. Sample Fault Isolation Flowchart (Sheet 3 of 10)

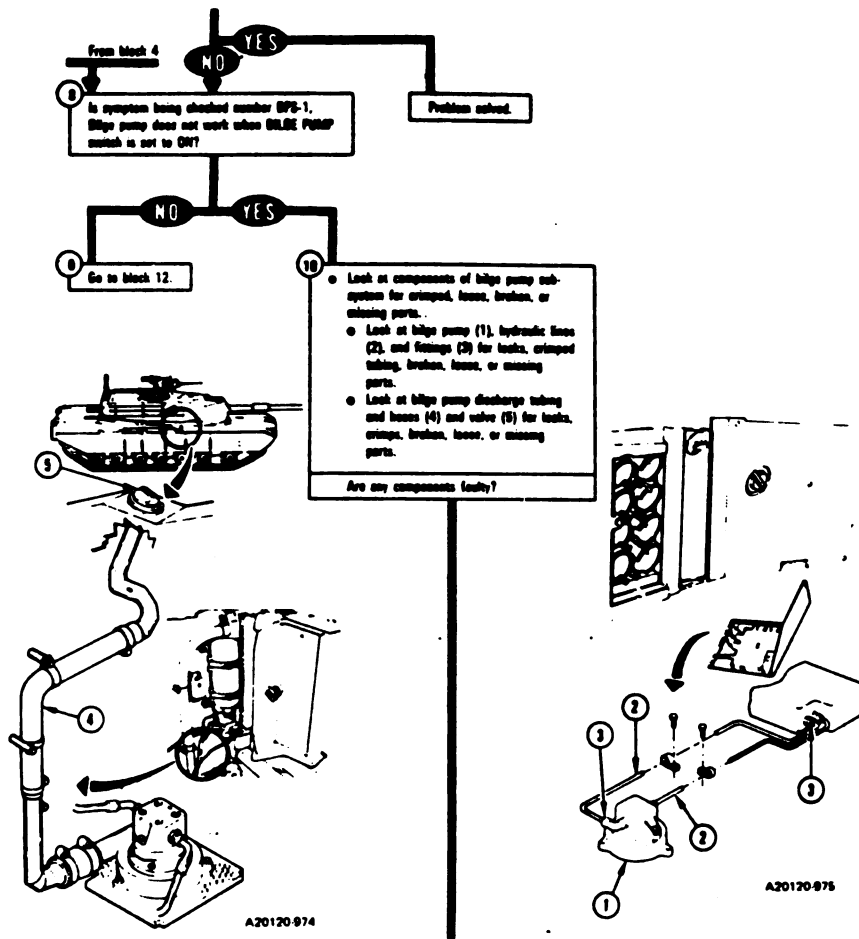


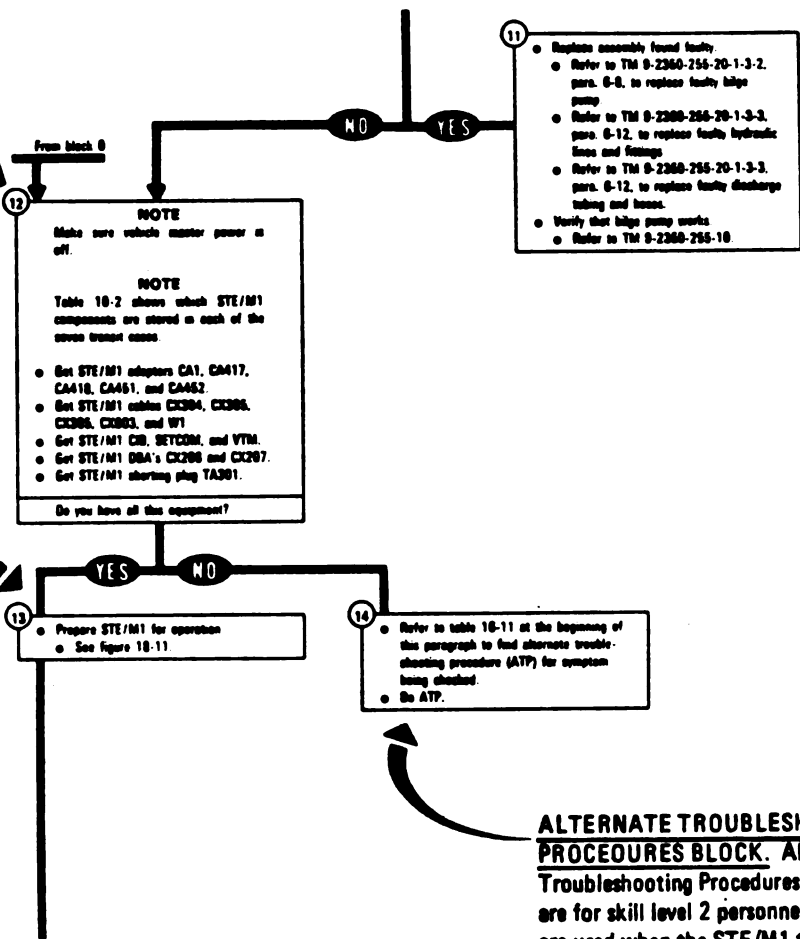
Figure 7-1. Sample Fault Isolation Flowchart (Sheet 4 of 10)

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Para. 7-2

**STE/M1 COMPONENTS LOCATION BLOCK.** This procedure block tells you where to get the STE/M1 components and what components you will need to do the test.

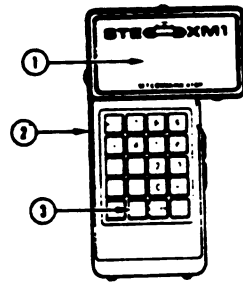
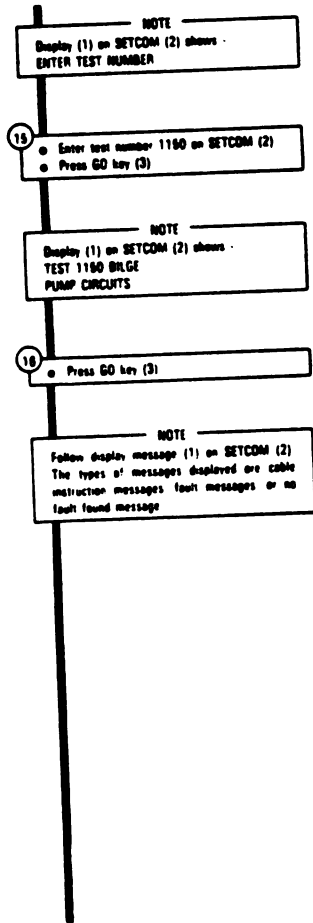
**STE/M1 COMPONENTS TEST BLOCK.** The figure you refer to in this block is a procedure which you will follow to test the STE/M1 components before returning to this procedure.



**ALTERNATE TROUBLESHOOTING PROCEDURES BLOCK.** Alternate Troubleshooting Procedures (ATP's) are for skill level 2 personnel. ATP's are used when the STE/M1 test set is not available.

Figure 7-1. Sample Fault Isolation Flowchart (Sheet 5 of 10)





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Figure 7-1. Sample Fault Isolation Flowchart (Sheet 6 of 10)

Volume II

Para. 7-2

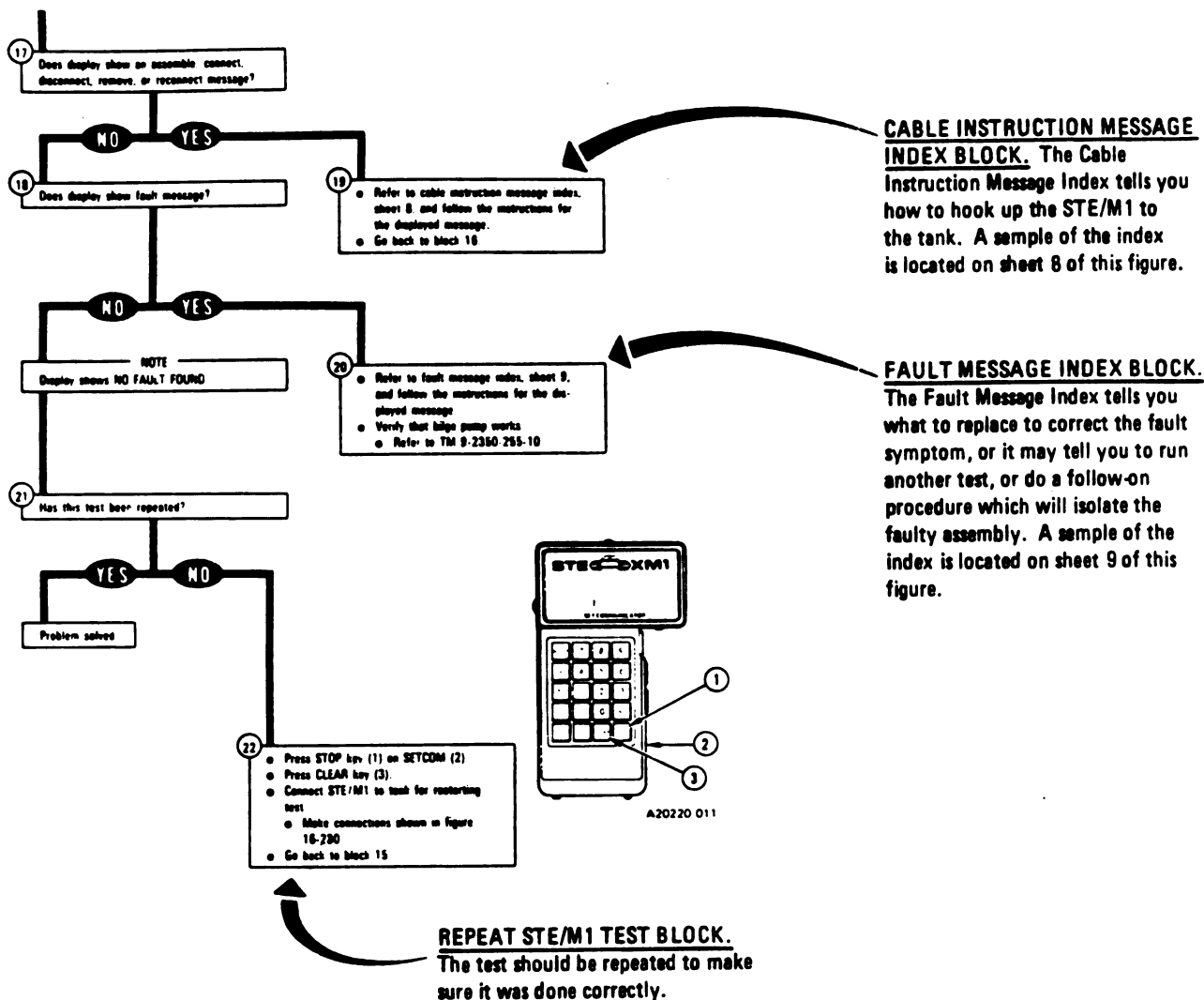


Figure 7-1. Sample Fault Isolation Flowchart (Sheet 7 of 10)

**CABLE INSTRUCTION MESSAGE COLUMN.** This column shows the assemble, connect, disconnect, or reconnect message you see displayed on the STE/M1 SETCOM.

**Blige Pump Subsystem Cable Instruction Message Index**

Cable Instruction Message	Action
ASSEMBLE CIB CABLE, CX206 AND CA417/18	<ul style="list-style-type: none"> <li>● Connect P1 on CIB cable CX304 to P3 on DBA CX206.</li> <li>● Connect P2 on adapter CA417 to P1 on DBA CX206.</li> <li>● Connect P2 on adapter CA418 to P2 on DBA CX206.</li> <li>● See figure 16-233.</li> </ul>
ASSEMBLE CIB CABLE, CX207 AND CA451/52	<ul style="list-style-type: none"> <li>● Connect P1 on CIB cable CX304 to P3 on DBA CX207.</li> <li>● Connect P2 on adapter CA451 to P1 on DBA CX207.</li> <li>● Connect P2 on adapter CA452 to P2 on DBA CX207.</li> <li>● See figure 16-232.</li> </ul>
CONNECT CIB CABLE TO CIB	<ul style="list-style-type: none"> <li>● Connect P2 on CIB cable CX304 to J2 on CIB.</li> <li>● See figure 16-232.</li> </ul>
CONNECT CIB J1 TO HNB TJ1 (CA301)	<ul style="list-style-type: none"> <li>● Connect P1 on adapter CA301 to TJ1 on hull networks box.</li> <li>● Connect P1 on CIB cable CX305 to P2 on adapter CA301.</li> <li>● Connect P2 on CIB cable CX305 to J1 on CIB.</li> <li>● See figure 16-230.</li> </ul>
CONNECT CIB J2 TO DMP TJ1 (CA301)	<ul style="list-style-type: none"> <li>● Connect P1 on adapter CA301 to TJ1 on driver's master panel.</li> <li>● Connect P1 on CIB cable CX304 to P2 on adapter CA301.</li> <li>● Connect P2 on CIB cable CX304 to J2 on CIB.</li> <li>● See figure 16-231.</li> </ul>
CONNECT DBA BETWEEN 2W104 ←→ DMP J1	<ul style="list-style-type: none"> <li>● Connect P1 on adapter CA418 to J1 on driver's master panel.</li> <li>● Connect P1 on adapter CA417 to 2W104-P3.</li> <li>● See figure 16-233.</li> </ul>
CONNECT DBA BETWEEN 2W105 ←→ HNB J3	<ul style="list-style-type: none"> <li>● Connect P1 on adapter CA451 to J3 on hull networks box.</li> <li>● Connect P1 on adapter CA452 to 2W105-P2.</li> <li>● See figure 16-232.</li> </ul>
DISCONNECT 2W104 ←→ DMP J1	<ul style="list-style-type: none"> <li>● Take off 2W104-P3 from J1 on driver's master panel.</li> <li>● Refer to TM 9-2350-255-20-1-2-3, figure 20-138.</li> </ul>
DISCONNECT 2W105 ←→ HNB J3	<ul style="list-style-type: none"> <li>● Take off 2W105-P2 from J3 on hull networks box.</li> <li>● Refer to TM 9-2350-255-20-1-2-3, figure 20-139.</li> </ul>
REMOVE CIB CABLE AND ADAPTER AT DMP TJ1	<ul style="list-style-type: none"> <li>● Take off P1 on adapter CA301 from TJ1 on driver's master panel.</li> <li>● Take off P2 on adapter CA301 from P1 on CIB cable CX304.</li> <li>● Take off P2 on CIB cable CX304 from J2 on CIB.</li> <li>● See figure 16-231.</li> </ul>

**CABLE INSTRUCTION MESSAGE INDEX ACTION COLUMN.** The action column tells you how to assemble, connect, disconnect, or reconnect a vehicle harness, STE/M1 cable(s), or STE/M1 adapter(s) when a cable instruction message is displayed on the STE/M1 SETCOM. A typical illustration which shows you how to do the action required is shown on sheet 10 of this figure.

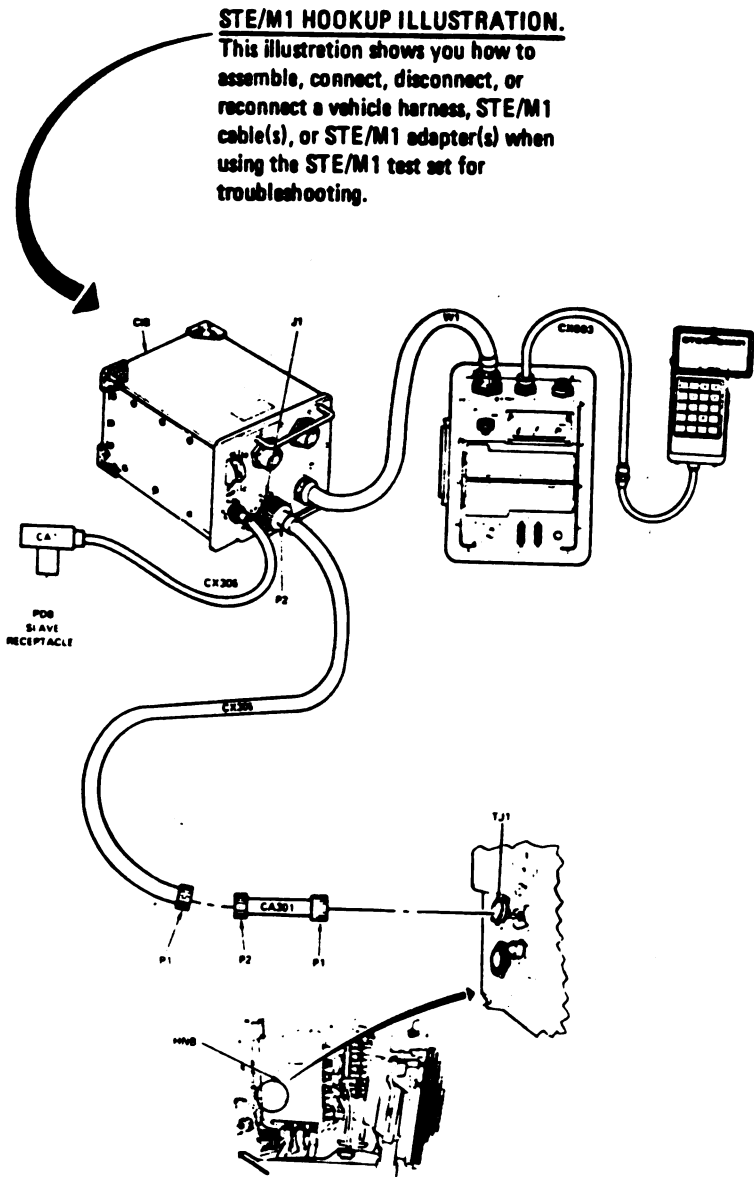
Figure 7-1. Sample Fault Isolation Flowchart (Sheet 8 of 10)

**FAULT MESSAGE COLUMN.** This column shows the fault message you see displayed on the STE/M1 SETCOM.

Blige Pump Subsystem Fault Message Index	
Fault Message	Action
FAULTY AUX HYDRAULIC SYSTEM 115042	<ul style="list-style-type: none"> <li>● Run auxiliary hydraulic system test number 1040</li> <li>● See figure 9-198 in TM 9-2350-255-20-2-2-1.</li> </ul>
FAULTY BATTERY/CHARGING SYS 115003	<ul style="list-style-type: none"> <li>● Charge batteries</li> <li>● Refer to TM 9-2350-255-10.</li> <li>● Go back to block 13.</li> </ul>
FAULTY DMP 115005 115014 115017 115038	<ul style="list-style-type: none"> <li>● Replace driver's master panel</li> <li>● Refer to TM 9-2350-255-20-1-3-4, para. 11-15.</li> </ul>
FAULTY HDM 115007	<ul style="list-style-type: none"> <li>● Replace hydraulic hull distribution manifold</li> <li>● Refer to TM 9-2350-255-20-1-3-3, para. 8-8</li> </ul>
FAULTY HNB 115011 115012 115022 115023 115029 115034 115041	<ul style="list-style-type: none"> <li>● Replace hull networks box</li> <li>● Refer to TM 9-2350-255-20-1-3-4, para. 11-12</li> </ul>
FAULTY HNB DMP OR 2W104 115008	<ul style="list-style-type: none"> <li>● Do follow-on procedure</li> <li>● See figure 16-234</li> </ul>
FAULTY HNB HDM OR 2W105 115013	<ul style="list-style-type: none"> <li>● Do follow-on procedure</li> <li>● See figure 16-235</li> </ul>
FAULTY HNB OR 2W104 115009 115039	<ul style="list-style-type: none"> <li>● Do follow-on procedure</li> <li>● See figure 16-236</li> </ul>
FAULTY HULL PANEL LIGHTS SYS 115024	<ul style="list-style-type: none"> <li>● Run panel lights circuit test number 1070</li> <li>● See figure 16-177</li> </ul>
FAULTY HULL POWER SYS 115018 115033	<ul style="list-style-type: none"> <li>● Run hull power distribution test number 1000</li> <li>● See figure 16-1</li> </ul>
FAULTY 2W105 OR HDM 115035	<ul style="list-style-type: none"> <li>● Do follow-on procedure</li> <li>● See figure 16-237</li> </ul>

**FAULT MESSAGE INDEX ACTION COLUMN.** The action column tells you what to do when a fault message is displayed on the STE/M1 SETCOM.

Figure 7-1. Sample Fault Isolation Flowchart (Sheet 9 of 10)



A30120-00101

Figure 7-1. Sample Fault Isolation Flowchart (Sheet 10 of 10)

Volume II

Para. 7-2

**7-3. Test Equipment Procedures.** The test equipment procedures describe and illustrate how the test equipment is used to make the tests and measurements called for in the troubleshooting procedures. The instructions are very detailed so that a soldier with no previous experience can use the equipment. The test equipment procedures are grouped in a single chapter in the manual and referred to in the individual troubleshooting procedures as needed. A typical test equipment procedure with explanations of the different components of a procedure can be found in-figure 7-2.

**TEST EQUIPMENT SETUP BLOCK.**  
Describes proper position of switches and controls. Also describes proper cable connections to perform the test.

**TEST NAME AND DESCRIPTION.**  
States name of test to be made and description of when to use the test.

**TEST EQUIPMENT ILLUSTRATION.**  
These illustrations locate the different controls and areas on the test equipment that you will use to perform the test.

**DC VOLTAGE TEST - TO MEASURE BATTERY VOLTAGE, CHARGING SYSTEM OUTPUT, AND VOLTAGE AT VARIOUS TEST POINTS**

1 Set selector switch (1) to DC VOLTS range

**NOTE**  
Set selector switch for higher voltage than you expect to measure. For example, to measure 24 volts dc set selector switch at DC VOLTS 100

- 2
- Connect black test lead probe (2) to vehicle ground or negative voltage test point
  - Connect red test lead probe (3) to positive voltage test point
  - If you are not sure of voltage to be measured set selector switch to DC VOLTS 100C for the first reading
  - If first reading is less than 100 volts set selector switch to DC VOLTS 100 and take second reading
  - If second reading is less than 10 volts, set selector switch to DC VOLTS 10 and take third reading
  - If third reading is less than 1 volt set selector switch to DC VOLTS 1

- 3
- Read used portion of AC AND DC VOLTS scale for range chosen by selector switch (1)
  - Meter (4) at right shows readings in table A

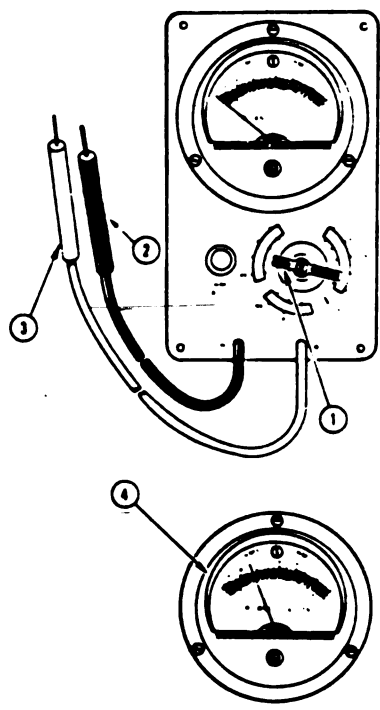


Table A

Switch		Reading
Setting	Scale	
1000 DC V	0 - 10 (Multiply by 100)	200 Volts DC
100 DC V	0 - 10 (Multiply by 10)	20 Volts DC
10 DC V	0 - 10	2 Volts DC
1 DC V	0 - 10 (Divide by 10)	.2 Volt DC

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Figure 7-2. Sample Test Equipment Procedure

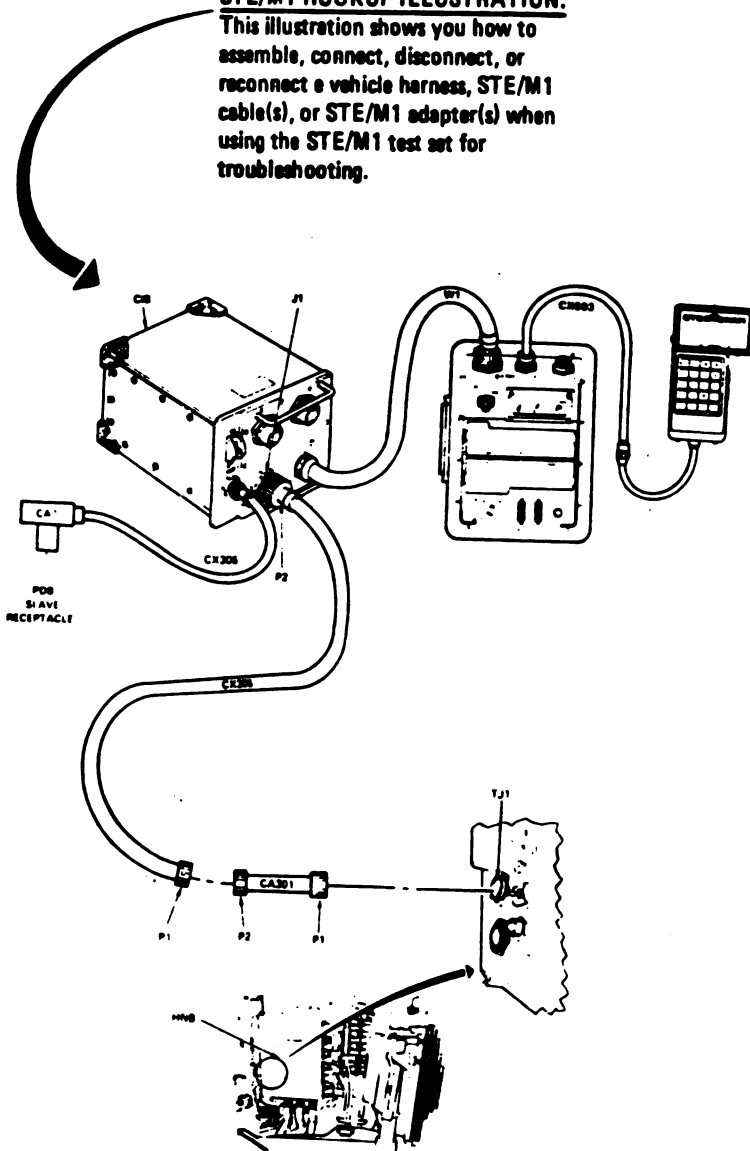
Volume II

Para. 7-3

7-11 / (7-12 blank)

**STE/M1 HOOKUP ILLUSTRATION.**

This illustration shows you how to assemble, connect, disconnect, or reconnect a vehicle harness, STE/M1 cable(s), or STE/M1 adapter(s) when using the STE/M1 test set for troubleshooting.



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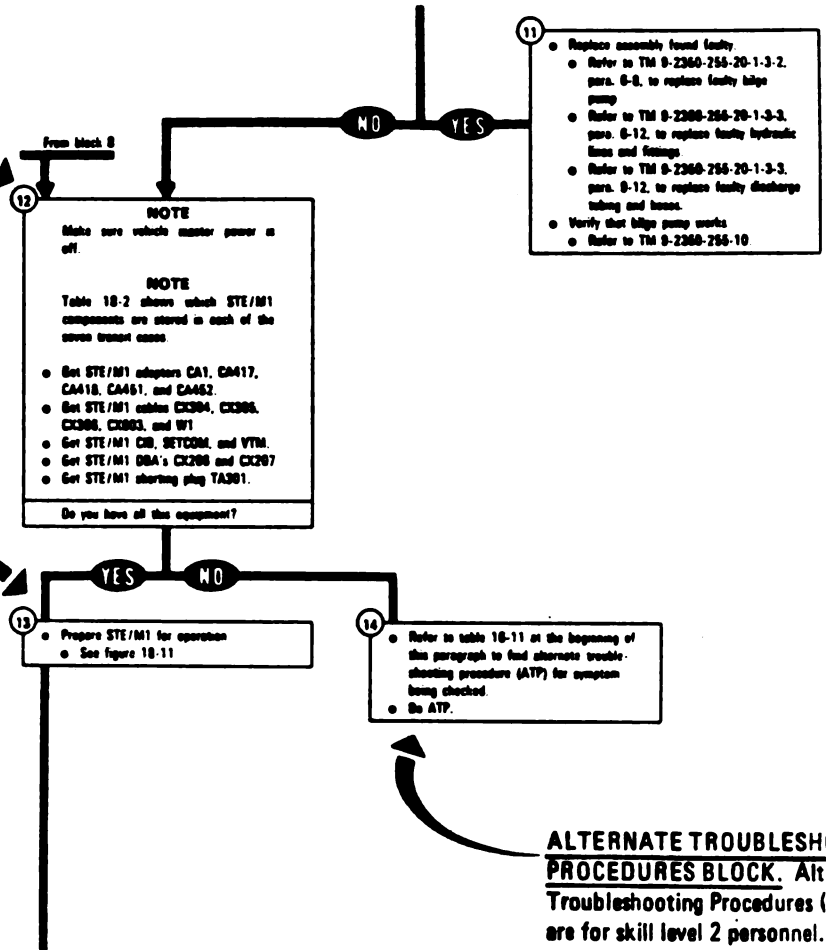
*Figure 7-1. Sample Fault Isolation Flowchart (Sheet 10 of 10)*

**Volume II**

**Para. 7-2**

**STE/M1 COMPONENTS LOCATION CHECK.** This procedure block tells where to get the STE/M1 components and what components you need to do the test.

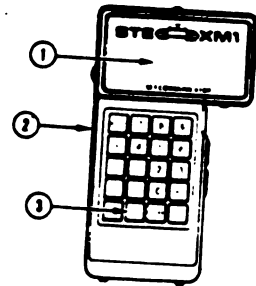
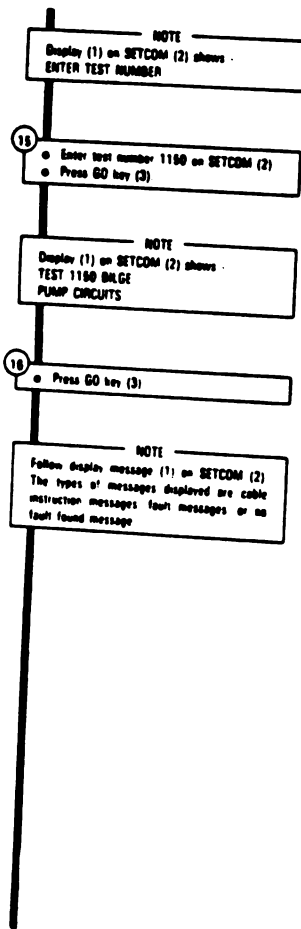
**STE/M1 COMPONENTS TEST CHECK.** The figure you refer to in this block is a procedure which you will follow to test the STE/M1 components before returning to this procedure.



**ALTERNATE TROUBLESHOOTING PROCEDURES BLOCK.** Alternate Troubleshooting Procedures (ATP's) are for skill level 2 personnel. ATP's are used when the STE/M1 test set is not available.

Figure 7-1. Sample Fault Isolation Flowchart (Sheet 5 of 10)

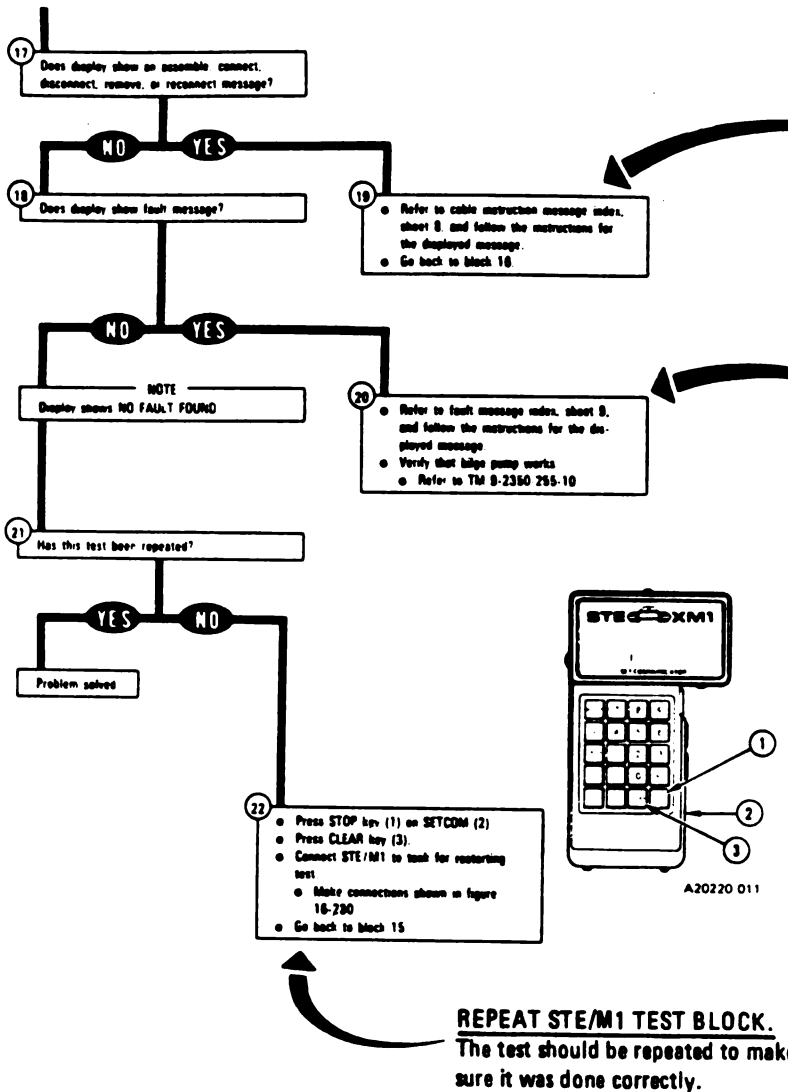




A20220-010

Figure 7-1. Sample Fault Isolation Flowchart (Sheet 6 of 10)

Volume II  
Para. 7-2



**CABLE INSTRUCTION MESSAGE INDEX BLOCK.** The Cable Instruction Message Index tells you how to hook up the STE/M1 to the tank. A sample of the index is located on sheet 8 of this figure.

**FAULT MESSAGE INDEX BLOCK.** The Fault Message Index tells you what to replace to correct the fault symptom, or it may tell you to repeat another test, or do a follow-on procedure which will isolate the faulty assembly. A sample of the index is located on sheet 9 of this figure.

**REPEAT STE/M1 TEST BLOCK.** The test should be repeated to make sure it was done correctly.

Figure 7-1. Sample Fault Isolation Flowchart (Sheet 7 of 10)

**CABLE INSTRUCTION MESSAGE COLUMN.** This column shows the assemble, connect, disconnect, or reconnect message you see displayed on the STE/M1 SETCOM.

**Blige Pump Subsystem Cable Instruction Message Index**

Cable Instruction Message	Action
ASSEMBLE CIB CABLE, CX206 AND CA417/18	<ul style="list-style-type: none"> <li>• Connect P1 on CIB cable CX304 to P3 on DBA CX206.</li> <li>• Connect P2 on adapter CA417 to P1 on DBA CX206.</li> <li>• Connect P2 on adapter CA418 to P2 on DBA CX206.</li> <li>• See figure 16-233.</li> </ul>
ASSEMBLE CIB CABLE, CX207 AND CA451/52	<ul style="list-style-type: none"> <li>• Connect P1 on CIB cable CX304 to P3 on DBA CX207.</li> <li>• Connect P2 on adapter CA451 to P1 on DBA CX207.</li> <li>• Connect P2 on adapter CA452 to P2 on DBA CX207.</li> <li>• See figure 16-232.</li> </ul>
CONNECT CIB CABLE TO CIB	<ul style="list-style-type: none"> <li>• Connect P2 on CIB cable CX304 to J2 on CIB.</li> <li>• See figure 16-232.</li> </ul>
CONNECT CIB J1 TO HNB TJ1 (CA301)	<ul style="list-style-type: none"> <li>• Connect P1 on adapter CA301 to TJ1 on hull networks box.</li> <li>• Connect P1 on CIB cable CX305 to P2 on adapter CA301.</li> <li>• Connect P2 on CIB cable CX305 to J1 on CIB.</li> <li>• See figure 16-230.</li> </ul>
CONNECT CIB J2 TO DMP TJ1 (CA301)	<ul style="list-style-type: none"> <li>• Connect P1 on adapter CA301 to TJ1 on driver's master panel.</li> <li>• Connect P1 on CIB cable CX304 to P2 on adapter CA301.</li> <li>• Connect P2 on CIB cable CX304 to J2 on CIB.</li> <li>• See figure 16-231.</li> </ul>
CONNECT DBA BETWEEN 2W104 ←→ DMP J1	<ul style="list-style-type: none"> <li>• Connect P1 on adapter CA418 to J1 on driver's master panel.</li> <li>• Connect P1 on adapter CA417 to 2W104-P3.</li> <li>• See figure 16-233.</li> </ul>
CONNECT DBA BETWEEN 2W105 ←→ HNB J3	<ul style="list-style-type: none"> <li>• Connect P1 on adapter CA451 to J3 on hull networks box.</li> <li>• Connect P1 on adapter CA452 to 2W105-P2.</li> <li>• See figure 16-232.</li> </ul>
DISCONNECT 2W104 ←→ DMP J1	<ul style="list-style-type: none"> <li>• Take off 2W104-P3 from J1 on driver's master panel.</li> <li>• Refer to TM 9-2350-255-20-1-2-3, figure 20-138.</li> </ul>
DISCONNECT 2W105 ←→ HNB J3	<ul style="list-style-type: none"> <li>• Take off 2W105-P2 from J3 on hull networks box.</li> <li>• Refer to TM 9-2350-255-20-1-2-3, figure 20-139.</li> </ul>
REMOVE CIB CABLE AND ADAPTER AT DMP TJ1	<ul style="list-style-type: none"> <li>• Take off P1 on adapter CA301 from TJ1 on driver's master panel.</li> <li>• Take off P2 on adapter CA301 from P1 on CIB cable CX304.</li> <li>• Take off P2 on CIB cable CX304 from J2 on CIB.</li> <li>• See figure 16-231.</li> </ul>

**CABLE INSTRUCTION MESSAGE INDEX ACTION COLUMN.** The action column tells you how to assemble, connect, disconnect, or reconnect a vehicle harness, STE/M1 cable(s), or STE/M1 adapter(s) when a cable instruction message is displayed on the STE/M1 SETCOM. A typical illustration which shows you how to do the action required is shown on sheet 10 of this figure.

Figure 7-1. Sample Fault Isolation Flowchart (Sheet 8 of 10)

**FAULT MESSAGE COLUMN.** This column shows the fault message you see displayed on the STE/M1 SETCOM.

**Blige Pump Subsystem Fault Message Index**

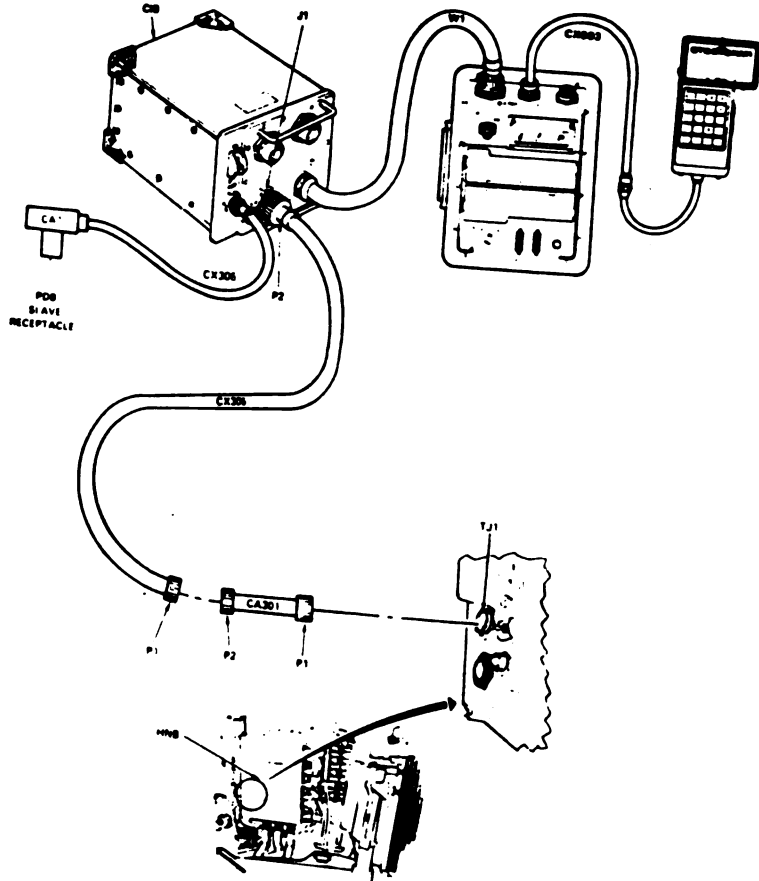
Fault Message	Action
FAULTY AUX HYDRAULIC SYSTEM 115042	<ul style="list-style-type: none"> <li>● Run auxiliary hydraulic system test number 1040</li> <li>● See figure 9-198 in TM 9-2350-255-20-2-2-1.</li> </ul>
FAULTY BATTERY/ CHARGING SYS 115003	<ul style="list-style-type: none"> <li>● Charge batteries</li> <li>● Refer to TM 9-2350-255-10.</li> <li>● Go back to block 13.</li> </ul>
FAULTY DMP 115005 115014 115017 115038	<ul style="list-style-type: none"> <li>● Replace driver's master panel</li> <li>● Refer to TM 9-2350-255-20-1-3-4, para 11-15.</li> </ul>
FAULTY HDM 115007	<ul style="list-style-type: none"> <li>● Replace hydraulic hull distribution manifold</li> <li>● Refer to TM 9-2350-255-20-1-3-3, para 8-8</li> </ul>
FAULTY HNB 115011 115012 115022 115023 115029 115034 115041	<ul style="list-style-type: none"> <li>● Replace hull networks box</li> <li>● Refer to TM 9-2350-255-20-1-3-4, para 11-12</li> </ul>
FAULTY HNB. DMP OR 2W104 115008	<ul style="list-style-type: none"> <li>● Do follow-on procedure</li> <li>● See figure 16-234</li> </ul>
FAULTY HNB HDM OR 2W105 115013	<ul style="list-style-type: none"> <li>● Do follow-on procedure</li> <li>● See figure 16-235</li> </ul>
FAULTY HNB OR 2W104 115009 115039	<ul style="list-style-type: none"> <li>● Do follow-on procedure</li> <li>● See figure 16-236</li> </ul>
FAULTY HULL PANEL LIGHTS SYS 115024	<ul style="list-style-type: none"> <li>● Run panel lights circuit test number 1070</li> <li>● See figure 16-177</li> </ul>
FAULTY HULL POWER SYS 115018 115033	<ul style="list-style-type: none"> <li>● Run hull power distribution test number 1000</li> <li>● See figure 16-1.</li> </ul>
FAULTY 2W105 OR HDM 115035	<ul style="list-style-type: none"> <li>● Do follow-on procedure</li> <li>● See figure 16-237</li> </ul>

**FAULT MESSAGE INDEX ACTION COLUMN.** The action column tells you what to do when a fault message is displayed on the STE/M1 SETCOM.

Figure 7-1. Sample Fault Isolation Flowchart (Sheet 9 of 10)

**STE/M1 HOOKUP ILLUSTRATION.**

This illustration shows you how to assemble, connect, disconnect, or reconnect a vehicle harness, STE/M1 cable(s), or STE/M1 adapter(s) when using the STE/M1 test set for troubleshooting.



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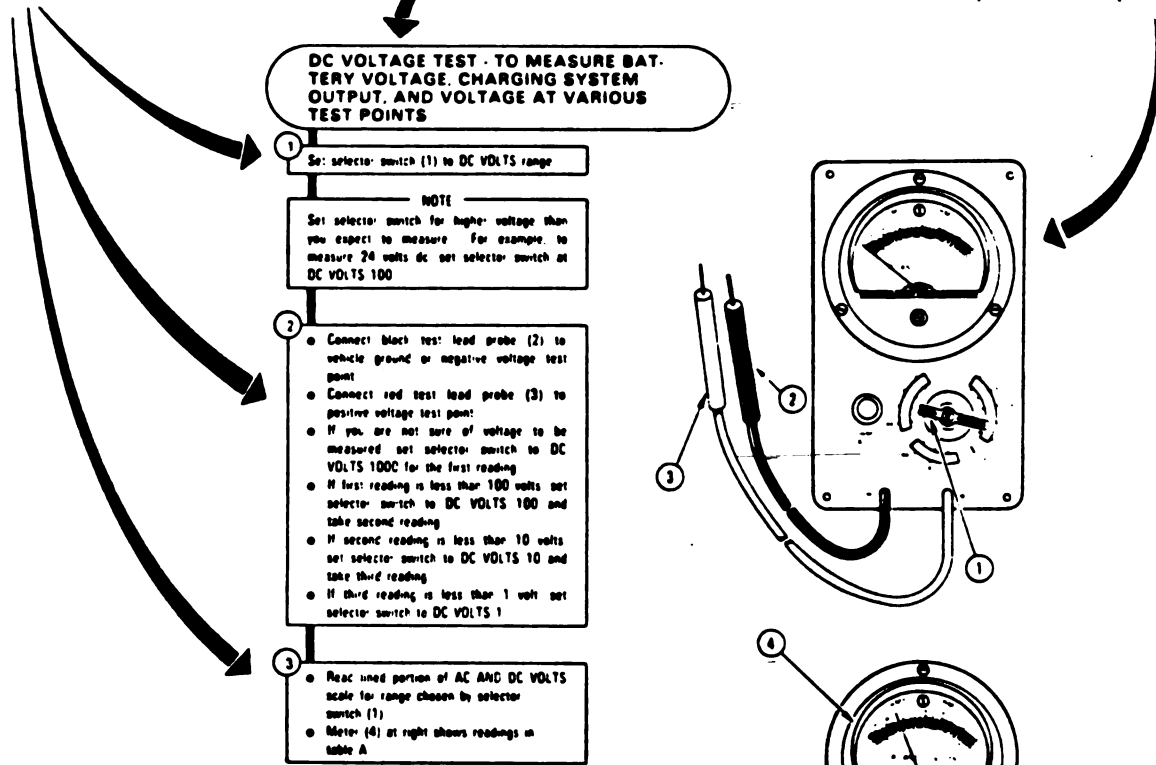
Figure 7-1. Sample Fault Isolation Flowchart (Sheet 10 of 10)

**7-3. Test Equipment Procedures.** The test equipment procedures describe and illustrate how the test equipment is used to make the tests and measurements called for in the troubleshooting procedures. The instructions are very detailed so that a soldier with no previous experience can use the equipment. The test equipment procedures are grouped in a single chapter in the manual and referred to in the individual troubleshooting procedures as needed. A typical test equipment procedure with explanations of the different components of a procedure can be found in-figure 7-2.

**TEST EQUIPMENT SETUP BLOCK.**  
Describes proper position of switches and controls. Also describes proper cable connections to perform the test.

**TEST NAME AND DESCRIPTION.**  
States name of test to be made and description of when to use the test.

**TEST EQUIPMENT ILLUSTRATION.**  
These illustrations locate the different controls and areas on the test equipment that you will use to perform the test.



**DC VOLTAGE TEST - TO MEASURE BATTERY VOLTAGE, CHARGING SYSTEM OUTPUT, AND VOLTAGE AT VARIOUS TEST POINTS**

1 Set selector switch (1) to DC VOLTS range

**NOTE**  
Set selector switch for higher voltage than you expect to measure. For example, to measure 24 volts dc set selector switch at DC VOLTS 100

2

- Connect black test lead probe (2) to vehicle ground or negative voltage test point
- Connect red test lead probe (3) to positive voltage test point
- If you are not sure of voltage to be measured set selector switch to DC VOLTS 1000 for the first reading
- If first reading is less than 100 volts set selector switch to DC VOLTS 100 and take second reading
- If second reading is less than 10 volts set selector switch to DC VOLTS 10 and take third reading
- If third reading is less than 1 volt set selector switch to DC VOLTS 1

3

- Read lined portion of AC AND DC VOLTS scale for range chosen by selector switch (1)
- Meter (4) at right shows readings in table A

Table A

Switch		Reading
Setting	Scale	
1000 DC V	0 - 10 (Multiply by 100)	200 Volts DC
100 DC V	0 - 10 (Multiply by 10)	20 Volts DC
10 DC V	0 - 10	2 Volts DC
1 DC V	0 - 10 (Divide by 10)	.2 Volt DC

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Figure 7-2. Sample Test Equipment Procedure

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Para. 7-3

7-11 / (7-12 blank)



**CHAPTER 8  
SUSPENSION SYSTEM**

**TROUBLESHOOT**

8-1. **General.** This chapter tells you how to troubleshoot the suspension system. The fault symptom index is located at the beginning of the troubleshooting procedures (Paragraph 8-2). The index includes the preventive maintenance checks and actions in TM 9-2350-255-10 have been completed.

sion system. The index includes the preventive maintenance checks and actions before starting a troubleshooting procedure.

The troubleshooting procedures for the symptoms listed will fault include roadarms, roadwheels, drive sprockets, torsion bars, and support rollers, bearings, and track components.

ate components of the suspension system, which include support rollers, bearings, and track components.

8-2. **Suspension System Troubleshooting Procedures.**

**Table 8-1. Suspension System Fault Symptom**

Fault Symptom No.	Fault Symptom	Primary Troubleshooting Procedure (PTP)
SSS-1	Roadwheel Hub Or Idler Hub Is Too Hot	Figure 8-1
SSS-2	Support Roller Hub Is Too Hot	Figure 8-2
SSS-3	Unusual Track Noise	Figure 8-3
SSS-4	Degraded Suspension (Unusually Bumpy Ride)	Figure 8-4
SSS-5	Track Tension Will Not Adjust	Figure 8-5
SSS-6	Tank Does Not Sit Level On Level Ground	Figure 8-6
SSS-7	Shock Absorber Oil Is Milky	Figure 8-7
SSS-8	Roadwheel And Compensating Idler Hub Oil Is Milky	Figure 8-8



**TM 9-2350-255-20-1-2-1  
SUSPENSION SYSTEM TROUBLESHOOTING**

**SYMPTOM SSS-1**

**ROADWHEEL HUB OR IDLER HUB IS TOO HOT**

**Equipment Condition:**

- Tank parked.
- Parking brake set.
- Engine shut down.
- Vehicle master power off.

**WARNING**

- Do not touch hub with bare hands. Hub may be hot and cause severe burns. Use heat protective mittens or wait for hub to cool.
- Do not open two skirts at the same time if they have the same hinge line. Skirt could break off and fall on you.

**NOTE**

Read para. 8-1 before doing any work.

1

- Check oil level in hubcap.
- Refer to TM 9-2350-255-10.

Is oil level low?

**NO**

**YES**

2

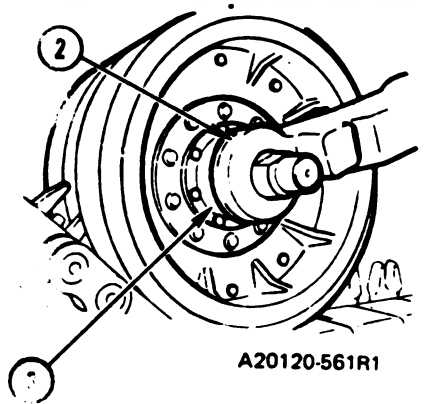
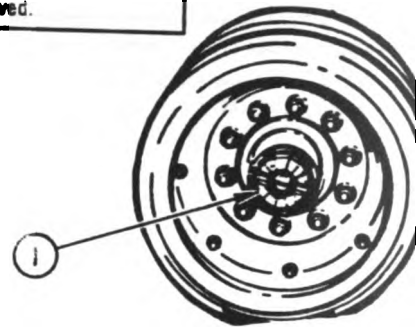
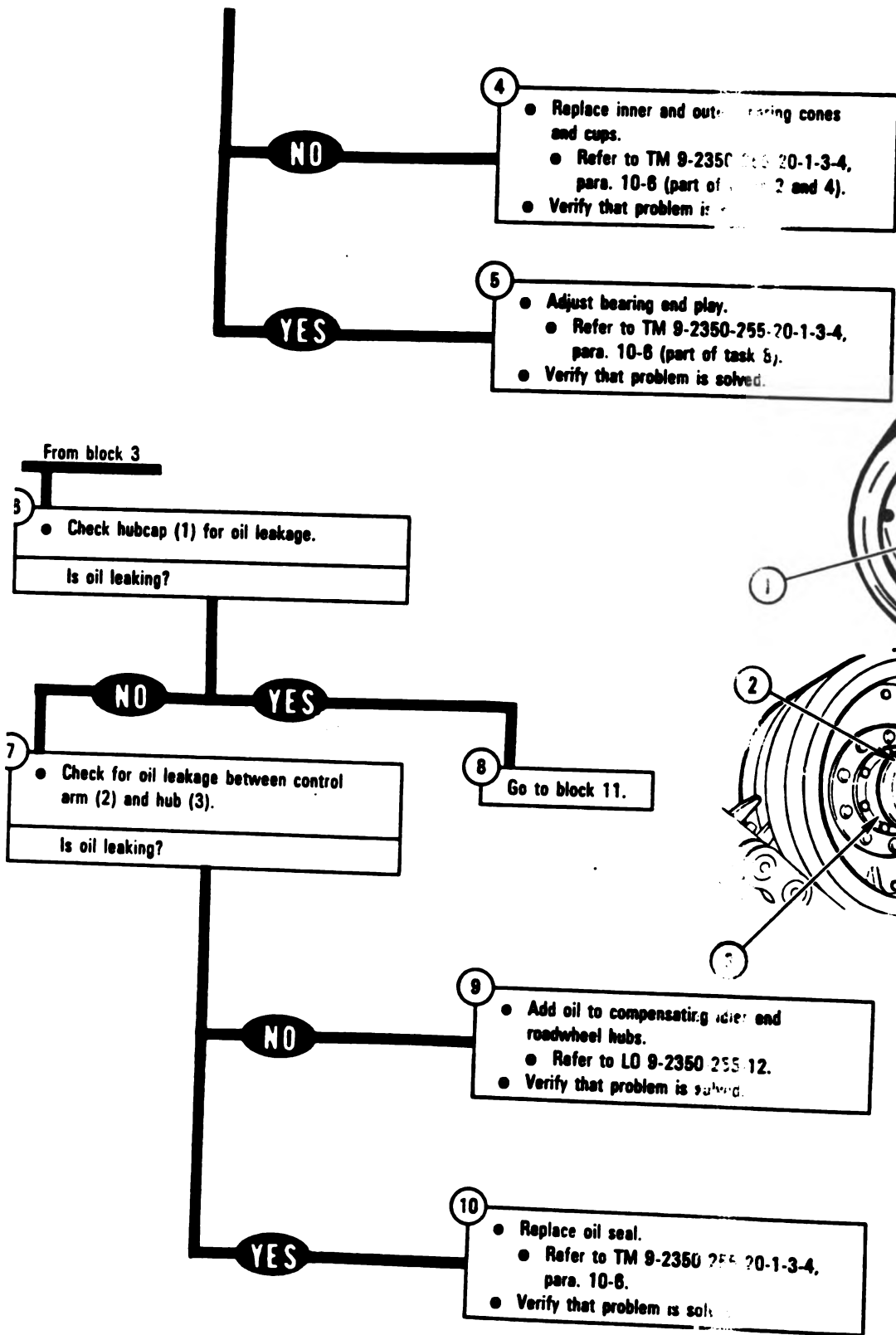
- Check bearing end play adjustment.
- Refer to TM 9-2350-255-20-1-3-4, para. 10-6 (part of task 8).

Was bearing end play out of adjustment?

3

Go to block 6.

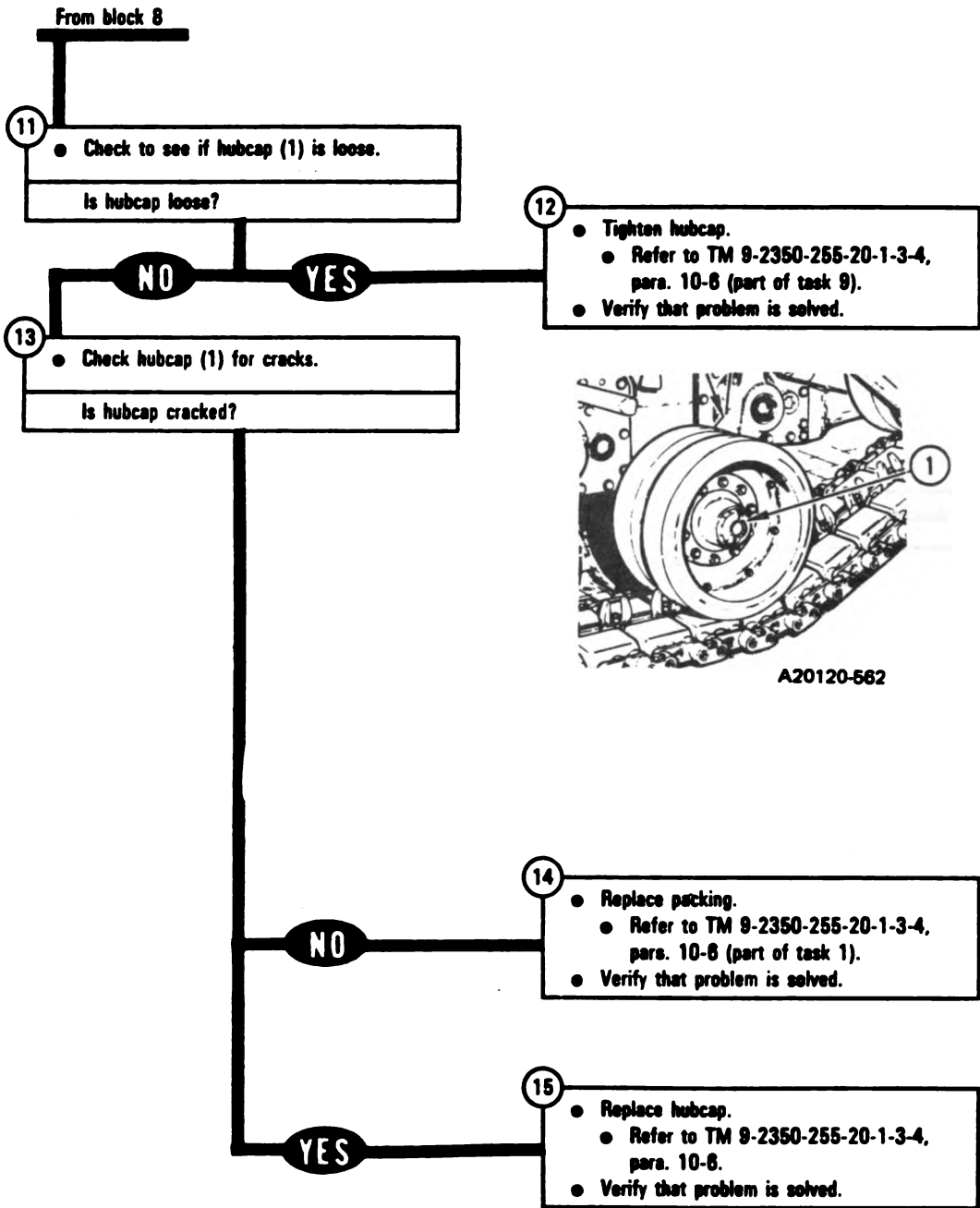
*Figure 8-1 (Sheet 1 of 3)  
Volume II  
Para. 8-2*



A20120-561R1

Figure 8-1 (Sheet 2 of 3)  
Volume II  
Para. 8-2

**TM 9-2350-255-20-1-2-1**  
**SUSPENSION SYSTEM TROUBLESHOOTING**



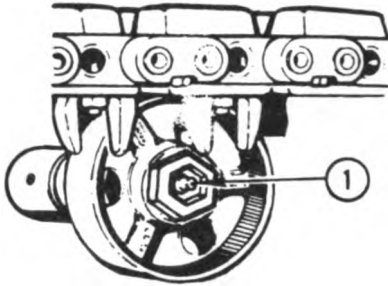
*Figure 8-1 (Sheet 3 of 3)*  
**Volume II**  
**Para. 8-2**

**SYMPTOM SSS-2**

**SUPPORT ROLLER HUB IS TOO HOT**

- Equipment Condition:**
- Tank parked.
  - Parking brake set.
  - Engine shut down.
  - Vehicle master power off.

- WARNING**
- Do not touch hub with bare hands. Hub may be hot and cause severe burns. Use heat protective mittens or wait for hub to cool.
  - Do not open two skirts at the same time if they have the same hinge line. Skirt could break off and fall on you.



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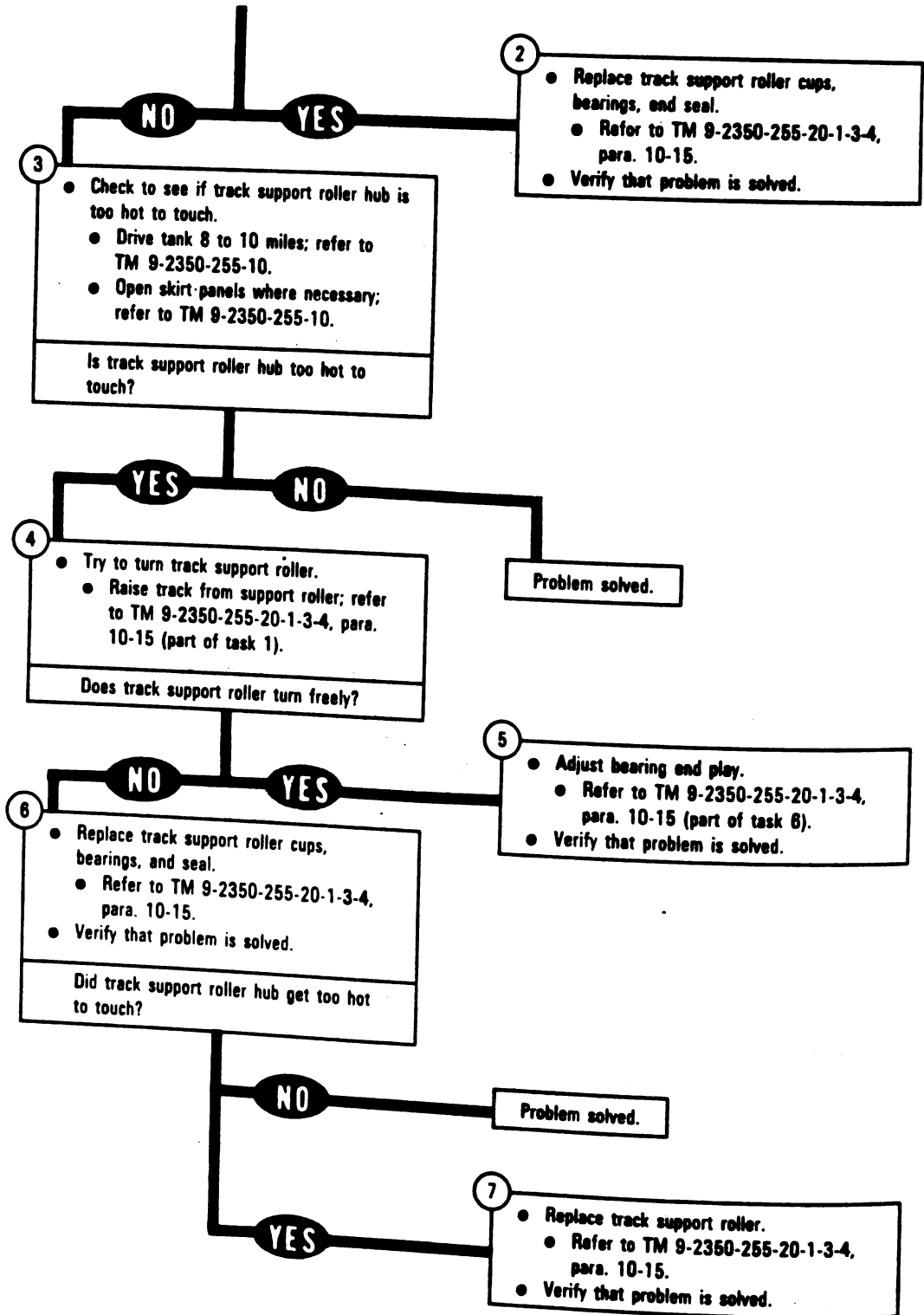
**NOTE**  
Read para. 8-1 before doing any work.

- ①
- Open skirt panels where necessary.
    - Refer to TM 9-2350-255-10.
  - Lubricate track support roller hub.
    - Refer to LO 9-2350-255-12.
  - Check purged grease from hub (1) for metal particles.

Does purged grease contain metal particles?

Figure 8-2 (Sheet 1 of 2)  
Volume II  
Para. 8-2

**TM 9-2350-255-20-1-2-1  
SUSPENSION SYSTEM TROUBLESHOOTING**



*Figure 8-2 (Sheet 2 of 2)*  
Volume II  
Para. 8-2

**SYMPTOM SSS-3**

**UNUSUAL TRACK NOISE**

**Equipment Condition:**

- Tank parked.
- Parking brake set.
- Engine shut down.
- Vehicle master power off.

**WARNING**

Do not open two skirts at the same time if they have the same hinge line. Skirt could break off and fall on you.

**NOTE**

Read para. 8-1 before doing any work.

- Open skirt panels where necessary.
- Refer to TM 9-2350-255-10.
- Check each track shoe assembly (1) for breaks.

Are any shoe assemblies broken?

**NO**

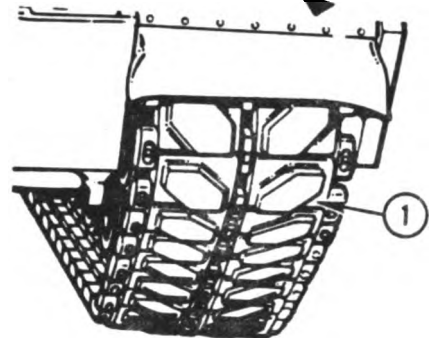
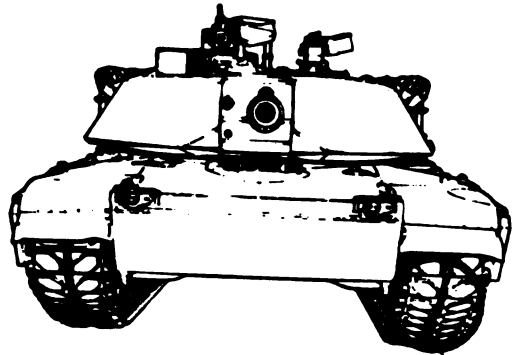
**YES**

- Inspect track adjusting link for damage.
- Refer to TM 9-2350-255-10.

Is track adjusting link damaged?

**2**

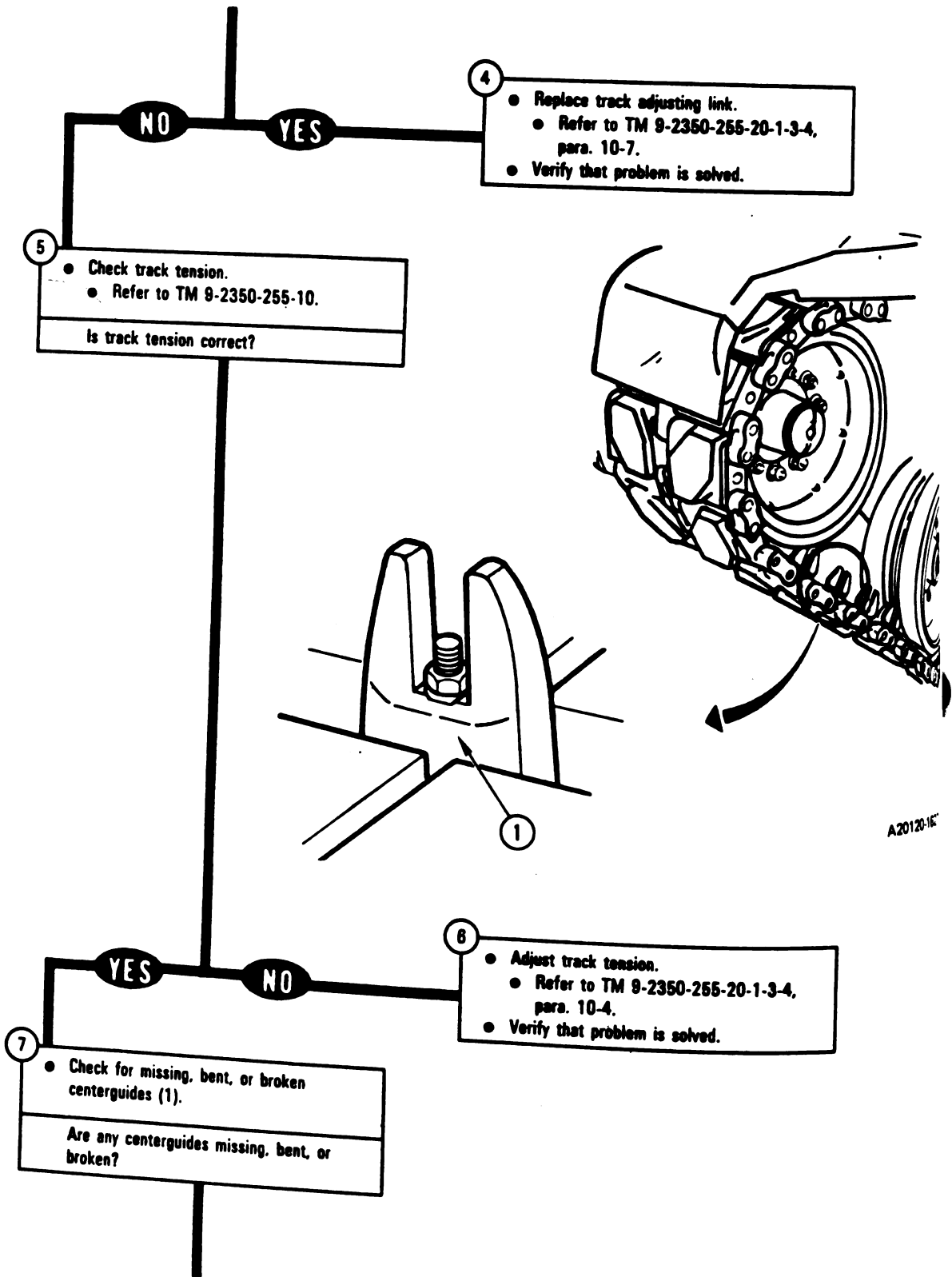
- Replace broken track shoe assembly.
- Refer to TM 9-2350-255-20-1-3-4, para. 10-4.
- Verify that problem is solved.



A20120-565

Figure 8-3 (Sheet 1 of 9)  
Volume II  
Para. 8-2

**TM 9-2350-255-20-1-2-1  
SUSPENSION SYSTEM TROUBLESHOOTING**



*Figure 8-3 (Sheet 2 of 9)  
Volume II  
Para. 8-2*

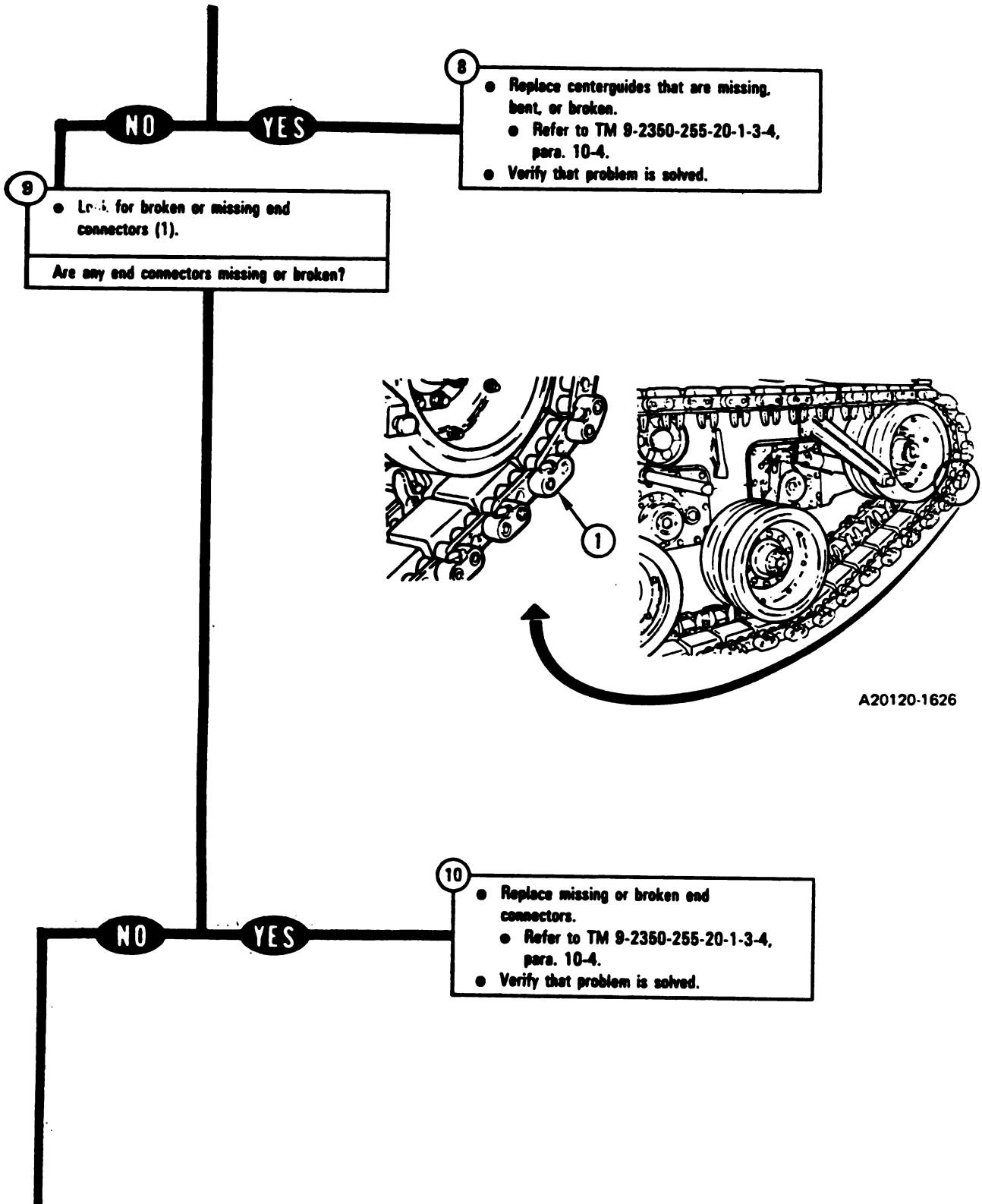


Figure 8-3 (Sheet 3 of 9)  
Volume II  
Para. 8-2

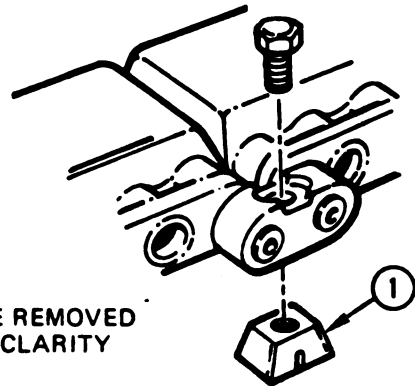
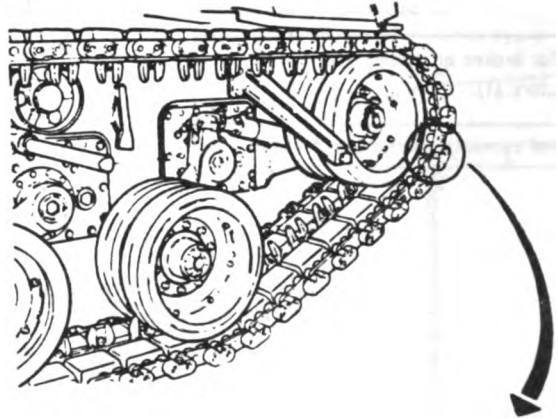


**TM 9-2350-255-20-1-2-1  
SUSPENSION SYSTEM TROUBLESHOOTING**

11

- Look for loose or missing wedges (1).

Are any wedges loose or missing?



WEDGE REMOVED  
FOR CLARITY

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NO YES

12

- Replace missing or tighten loose wedges.
- Refer to TM 9-2350-255-20-1-3-4, para. 10-4.
- Verify that problem is solved.

*Figure 8-3 (Sheet 4 of 9)  
Volume II  
Para. 8-2*

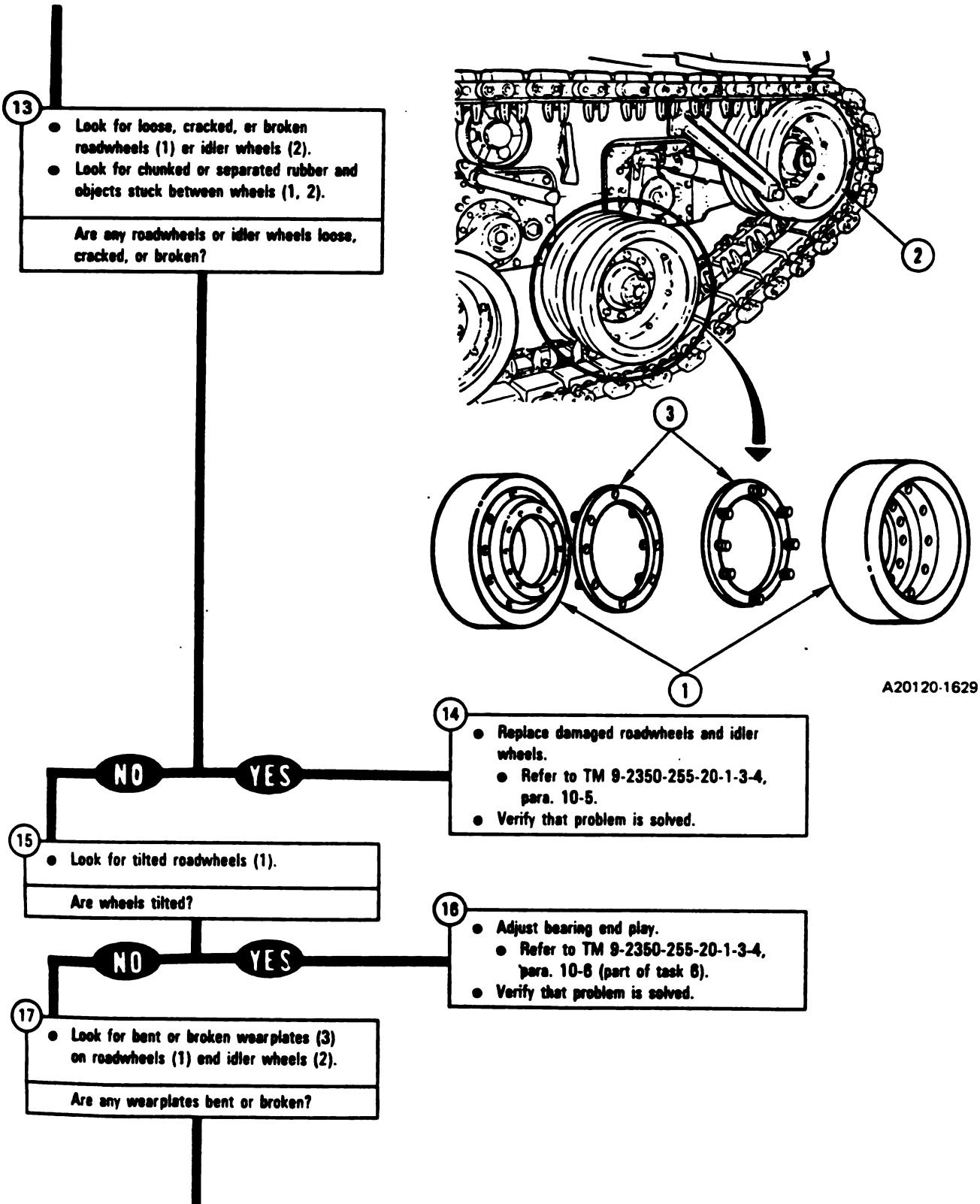
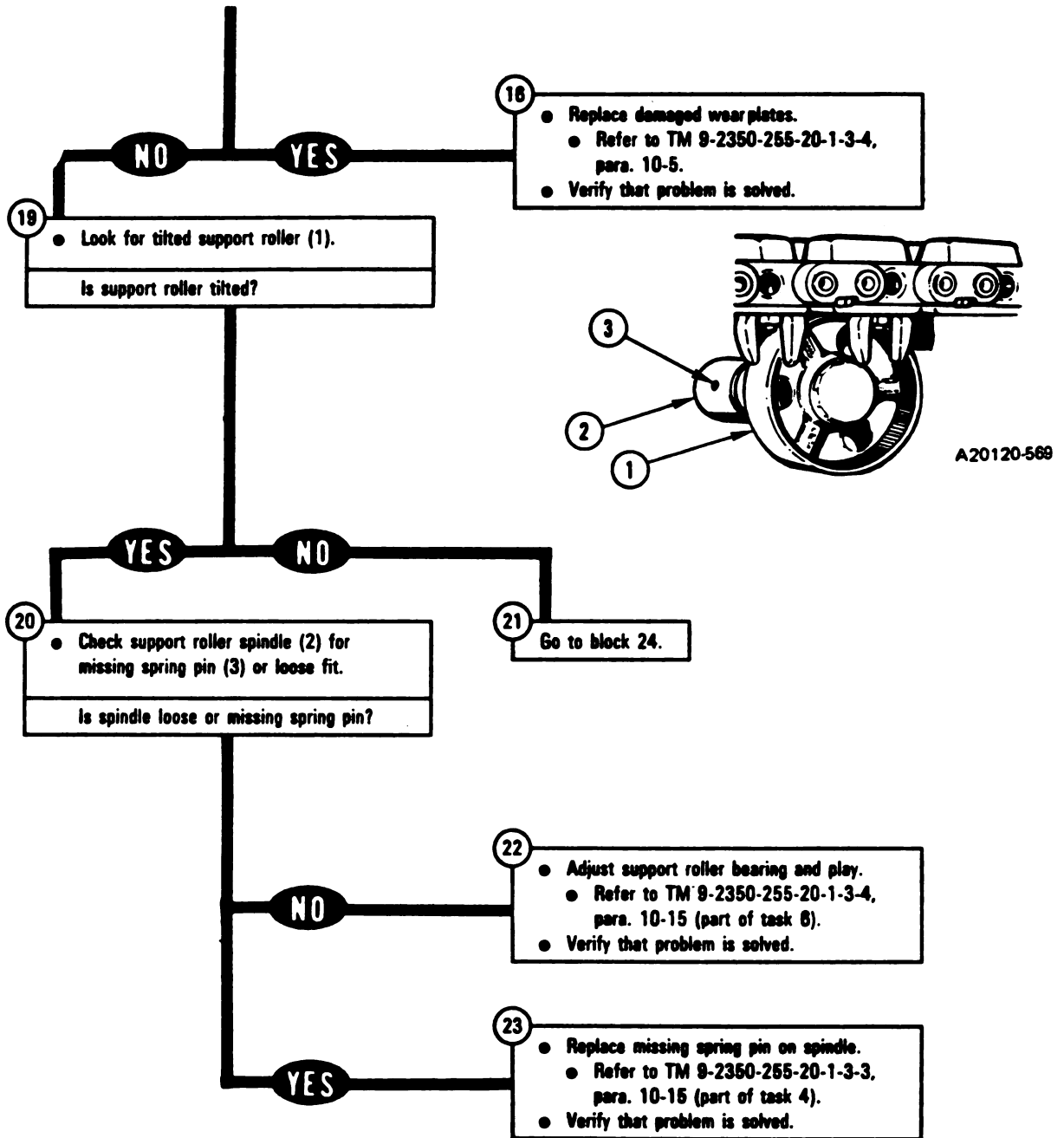


Figure 8-3 (Sheet 5 of 9)  
Volume II  
Para. 8-2

**TM 9-2350-255-20-1-2-1  
SUSPENSION SYSTEM TROUBLESHOOTING**



*Figure 8-3 (Sheet 6 of 9)*  
**Volume II  
Para. 8-2**

m block 21

Check sprockets (1, 2) for loose or missing screws (3).

Are any screws loose or missing?

NO

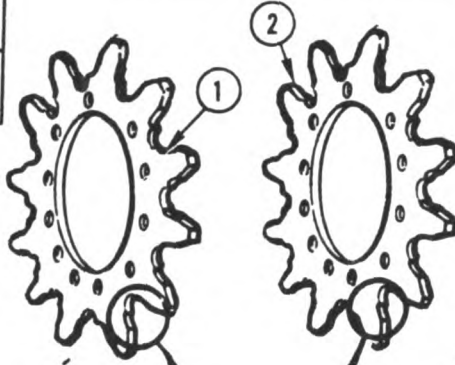
YES

25

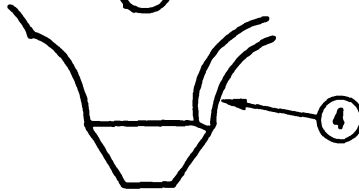
- Replace loose or missing screws on sprocket.
- Refer to TM 9-2350-255-20-1-3-4, para. 10-13 (part of task 8).
- Verify that problem is solved.

Check sprockets (1, 2) for cracked or broken teeth.

Are any teeth on sprockets cracked or broken?



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27

- Replace inner and outer sprockets.
- Refer to TM 9-2350-255-20-1-3-4, para. 10-13.
- Verify that problem is solved.

NO

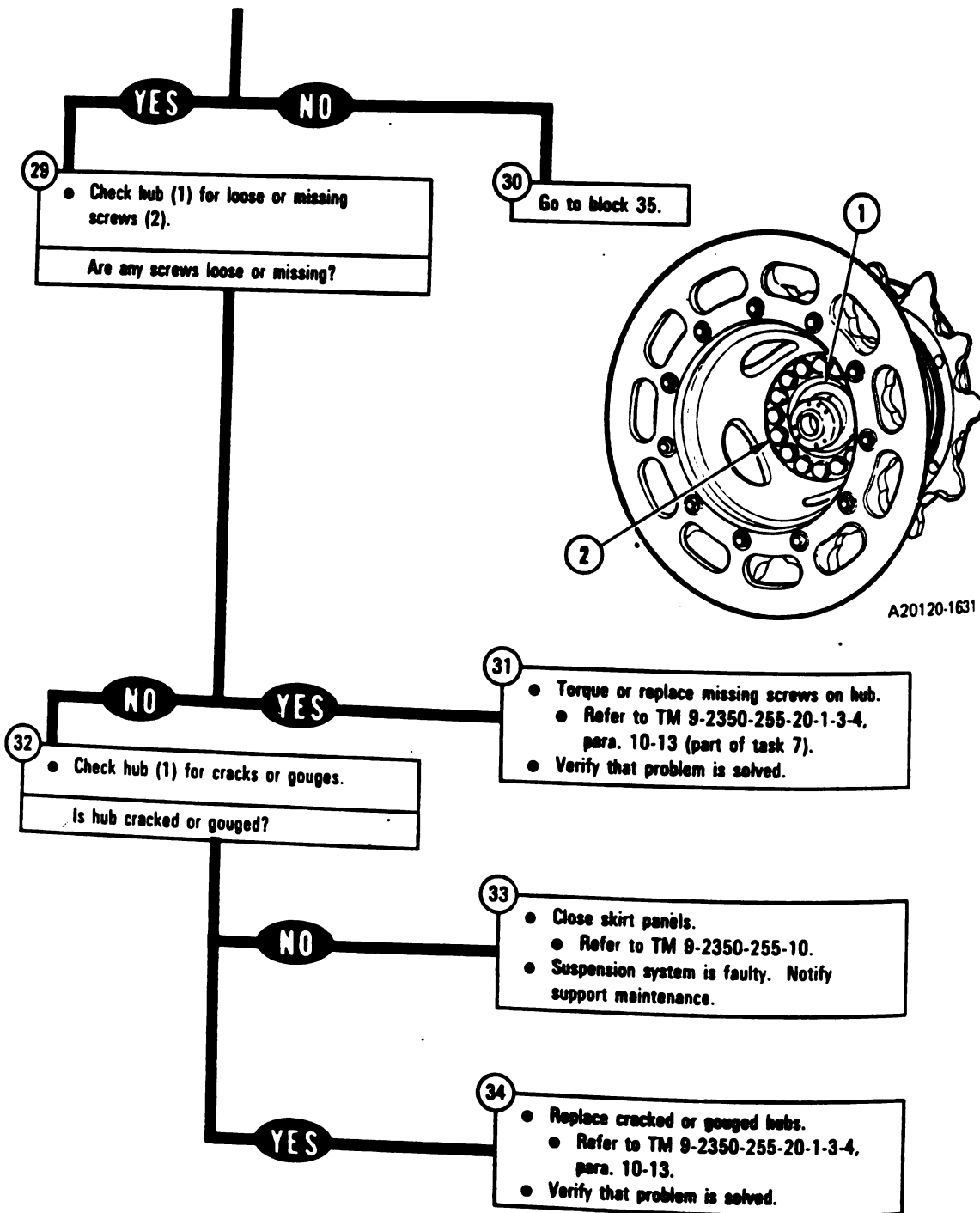
YES

- Check wear marks (4) on sprockets (1, 2).

Can both wear marks be seen?

Figure 8-3 (Sheet 7 of 9)  
Volume II  
Para. 8-2

**TM 9-2350-255-20-1-2-1  
SUSPENSION SYSTEM TROUBLESHOOTING**

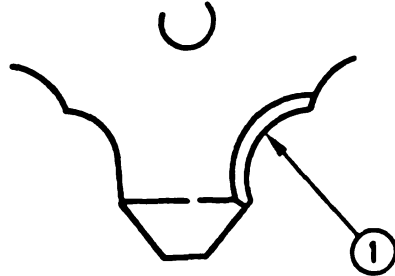


*Figure 8-3 (Sheet 8 of 9)  
Volume II  
Para. 8-2*

From block 30

- Check to see if one wear mark (1) can be seen.

Can one wear mark be seen?



A20120-1632

NO

36

- Replace sprocket and hub assembly.
- Refer to TM 9-2350-255-20-1-3-4, para. 10-13.
- Verify that problem is solved.

YES

37

- Reverse sprocket and hub assemblies.
- Refer to TM 9-2350-255-20-1-3-4, para. 10-13.
- Verify that problem is solved.

**SYMPTOM SSS-4**

**DEGRADED SUSPENSION (UNUSUALLY  
ROUGH RIDE)**

**Equipment Condition:**

- Tank parked.
- Parking brake set.
- Engine shut down.
- Vehicle master power off.

**WARNING**

Do not open two skirts at the same time if they have the same hinge line. Skirt could break off and fall on you.

**NOTE**

Read para. 8-1 before doing any work.

1

- Check shock absorber sight gages, on both sides of tank, for proper oil level.
- Refer to TM 9-2350-255-10.

Is oil level low?

**NO**

**YES**

2

- Check for broken torsion bars, on both sides of tank, at roadwheel positions 2, 3, 4, 5, and 6.
- Refer to TM 9-2350-255-10.

Are any torsion bars broken?

3

Go to block 12.

Figure 8-4 (Sheet 1 of 6)  
Volume II  
Para. 8-2

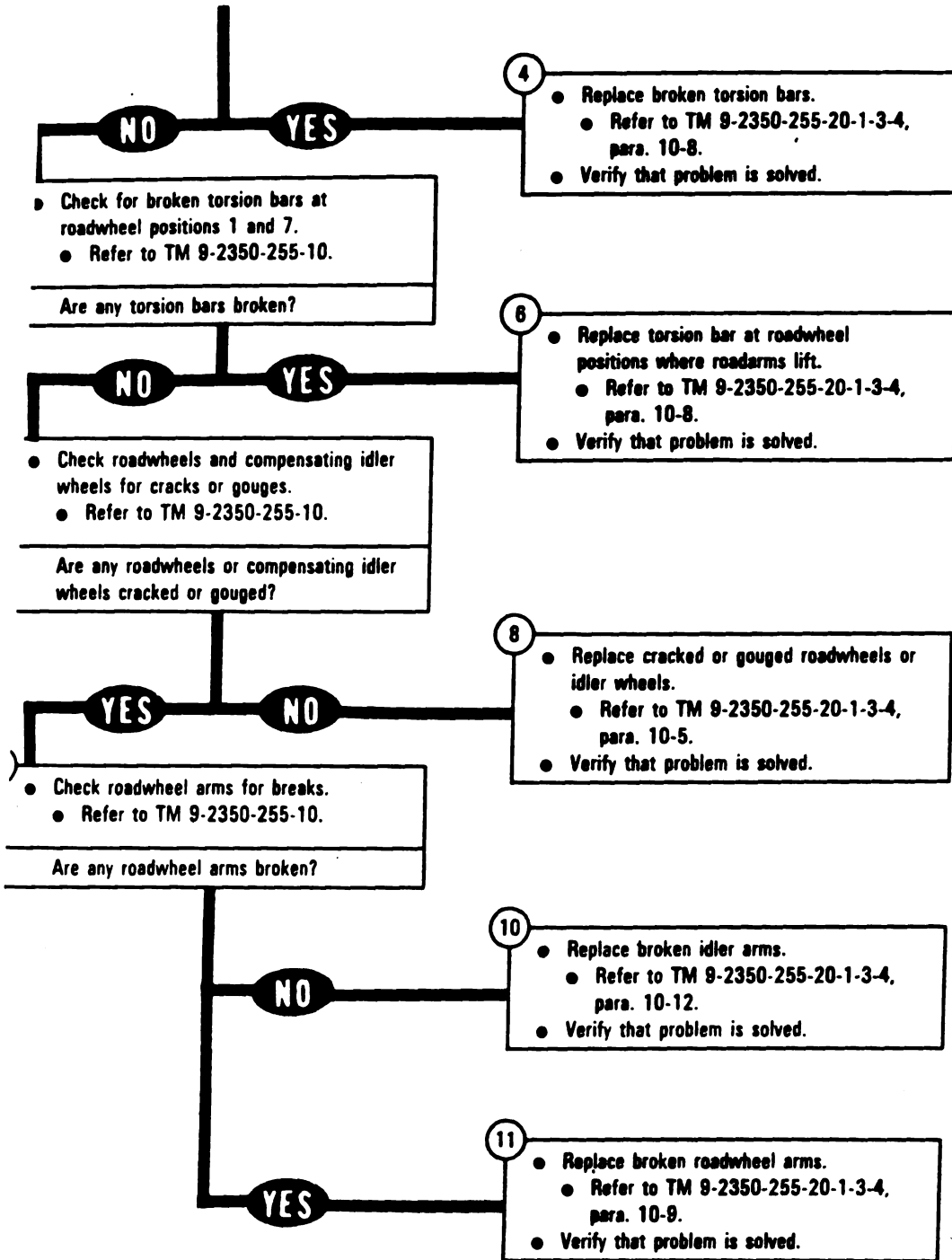
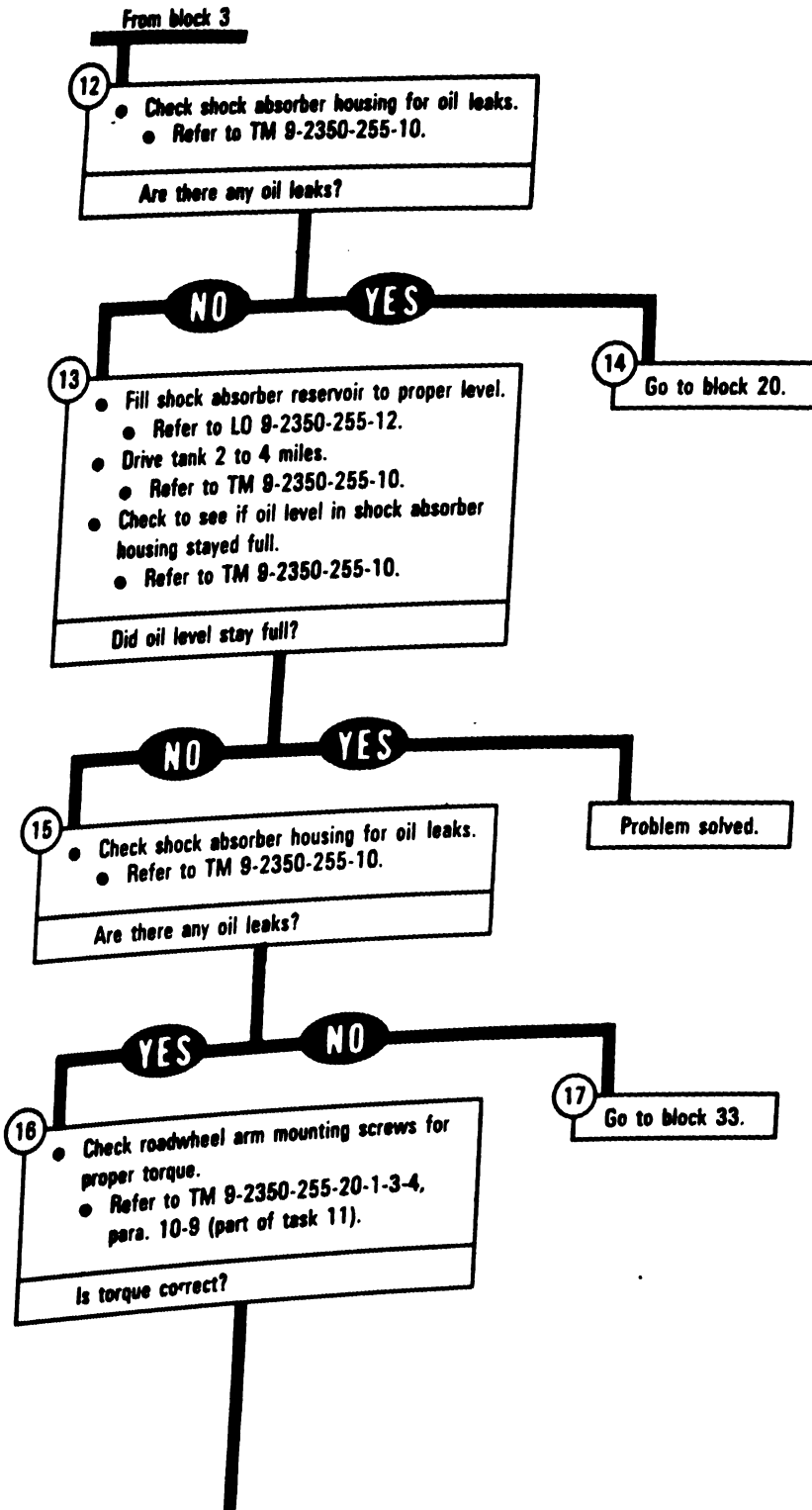


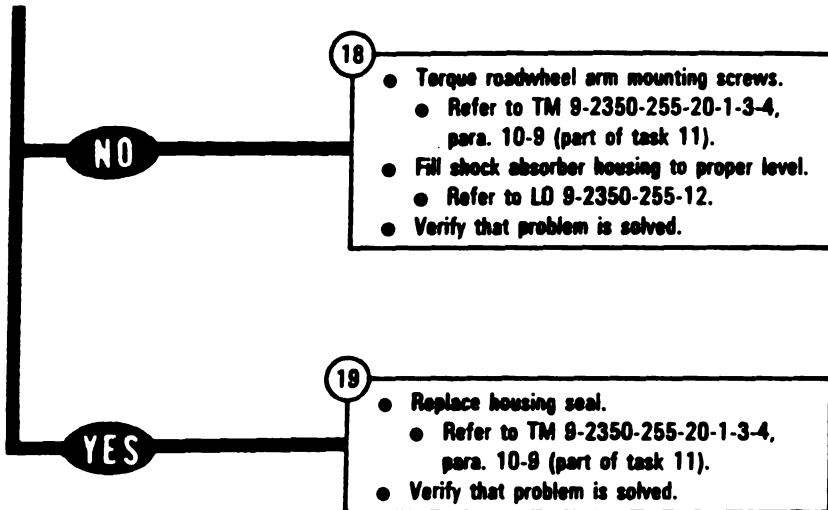
Figure 8-4 (Sheet 2 of 6)  
Volume II  
Para. 8-2



**TM 9-2350-255-20-1-2-1  
SUSPENSION SYSTEM TROUBLESHOOTING**



*Figure 8-4 (Sheet 3 of 6)  
Volume II  
Para. 8-2*



From block 14

- Remove and inspect roadwheel arm seals for cracks, chunking, or scratches.
- Refer to TM 9-2350-255-20-1-3-4, para. 10-9 (part of task 1).

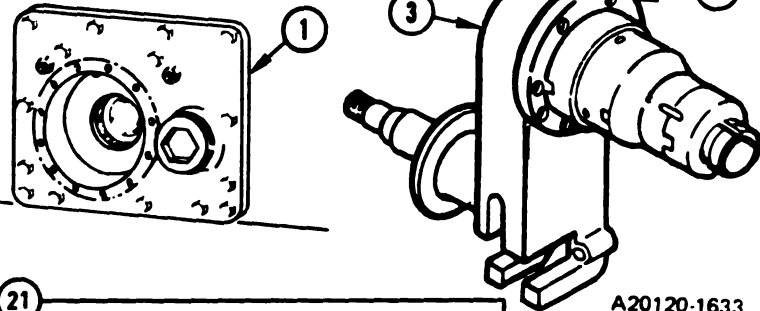
Are seals cracked, chunked, or scratched?

- NO** / **YES**
- Check oil in shock absorber housing (1) for metal particles.

Does oil contain metal particles?

- NO** / **YES**
- Try to turn upper spindle retainer (2) on roadwheel arm (3).

Does spindle turn freely?



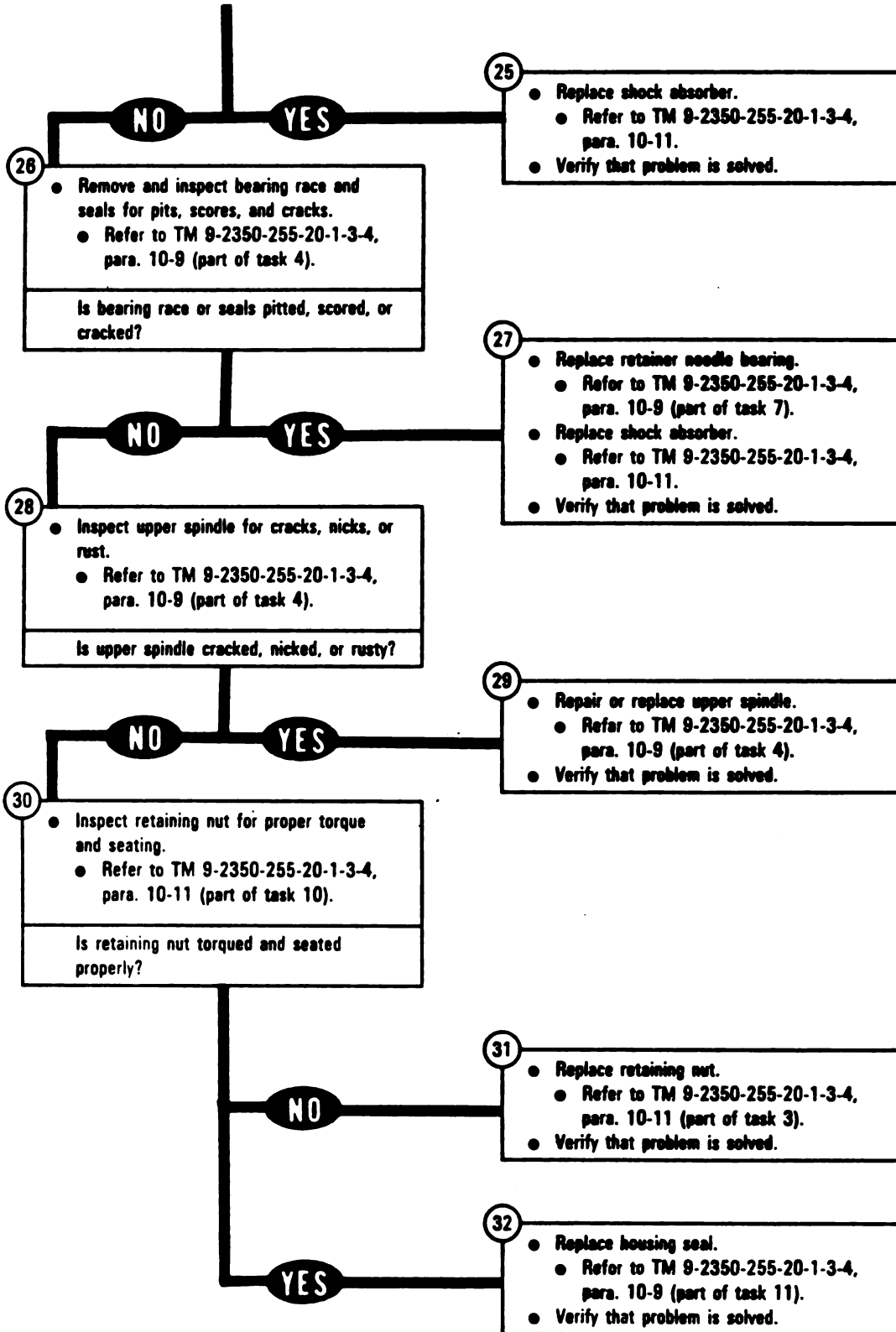
A20120-1633

- 21
- Replace roadwheel arm seals.
  - Refer to TM 9-2350-255-20-1-3-4, para. 10-9 (part of task 1).
  - Verify that problem is solved.

- 23
- Replace shock absorber.
  - Refer to TM 9-2350-255-20-1-3-4, para. 10-11.
  - Replace oil seal.
  - Refer to TM 9-2350-255-20-1-3-4, para. 10-9.
  - Replace housing needle bearing.
  - Refer to TM 9-2350-255-20-1-3-4, para. 10-11.
  - Replace retainer needle bearing.
  - Refer to TM 9-2350-255-20-1-3-4, para. 10-9 (part of task 7).
  - Verify that problem is solved.

Figure 8-4 (Sheet 4 of 6)  
Volume II  
Para. 8-2

**TM 9-2350-255-20-1-2-1  
SUSPENSION SYSTEM TROUBLESHOOTING**



*Figure 8-4 (Sheet 5 of 6)  
Volume II  
Para. 8-2*

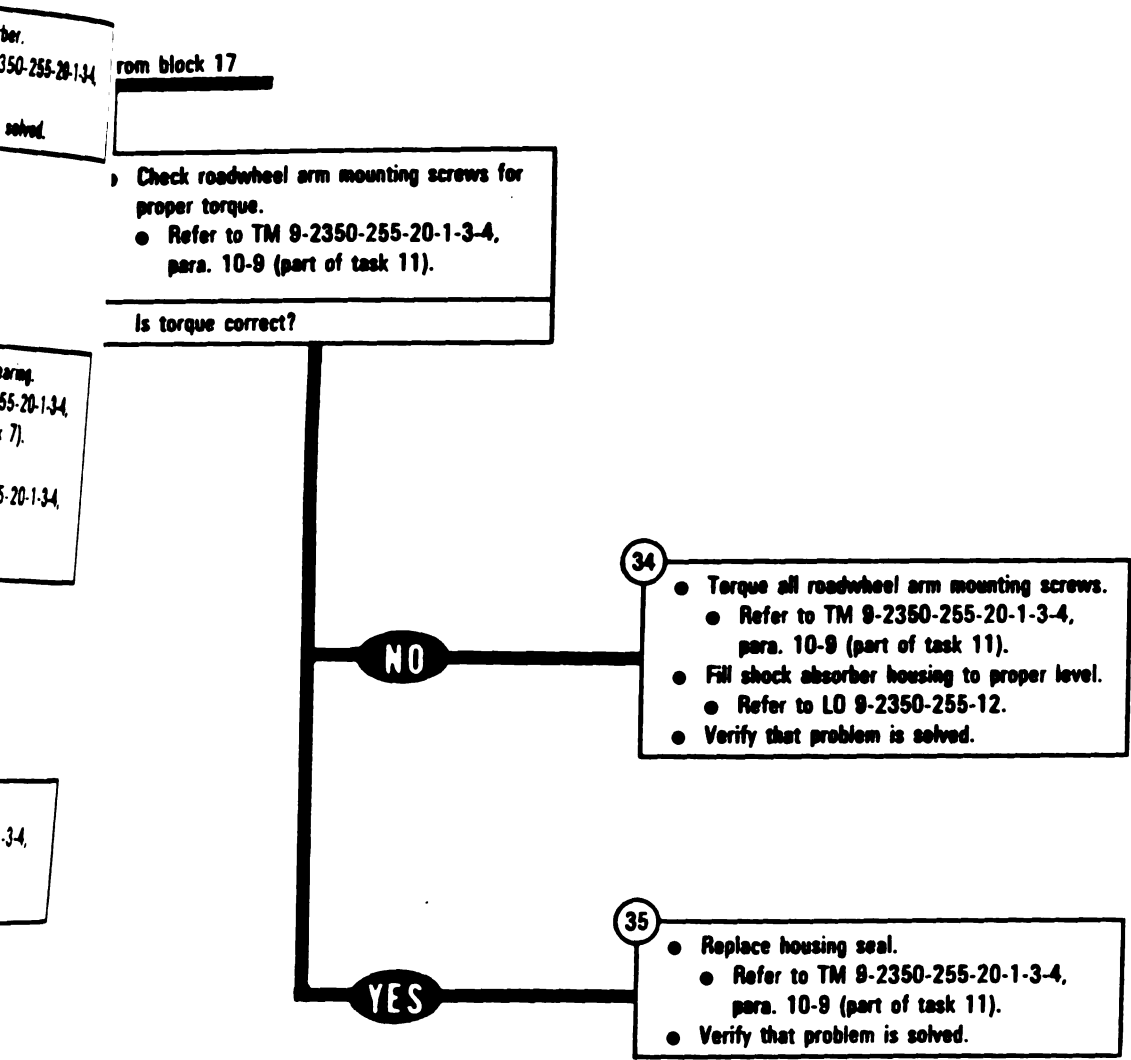


Figure 8-4 (Sheet 6 of 6)  
Volume II  
Para. 8-2

**TM 9-2350-255-20-1-2-1  
SUSPENSION SYSTEM TROUBLESHOOTING**

**SYMPTOM SSS-5**

**TRACK TENSION WILL NOT ADJUST**

**Equipment Condition:**

- Tank parked.
- Parking brake set.
- Engine shut down.
- Vehicle master power off.

**WARNING**

Do not open two skirts at the same time if they have the same hinge line. Skirt could break off and fall on you.

**NOTE**

Read para. 8-1 before doing any work.

1

- Open skirt panels where necessary.
  - Refer to TM 9-2350-255-10.
- Repair adjusting link.
  - Refer to TM 9-2350-255-20-1-3-4, para. 10-7.

Can track tension be adjusted?

**NO**

2

- Replace adjusting link.
  - Refer to TM 9-2350-255-20-1-3-4, para. 10-7.
- Verify that problem is solved.

**YES**

Problem solved.

*Figure 8-5*  
**Volume II**  
**Para. 8-2**

**SYMPTOM SSS-6**

**TANK DOES NOT SIT LEVEL ON LEVEL GROUND**

**Equipment Condition:**

- Tank parked.
- Parking brake set.
- Engine shut down.
- Vehicle master power off.

**WARNING**

Do not open two skirts at the same time if they have the same hinge line. Skirt could break off and fall on you.

**NOTE**

Read para. 8-1 before doing any work.

1

- Open skirt panels where necessary.
  - Refer to TM 9-2350-255-10.
- Check for broken torsion bars.
  - Refer to TM 9-2350-255-10.

Are any torsion bars broken?

**NO**

2

- Check opposite side of tank for an obstruction between roadwheel and track.
  - Refer to TM 9-2350-255-10.
- Verify that problem is solved.

**YES**

3

- Replace broken torsion bar.
  - Refer to TM 9-2350-255-20-1-3-4, para. 10-8.
- Verify that problem is solved.

*Figure 8-6*  
Volume II  
Para. 8-2

**SYMPTOM SSS-7**

**SHOCK ABSORBER OIL IS MILKY**

**Equipment Condition:**

- Tank parked.
- Parking brake set.
- Engine shut down.
- Vehicle master power off.

**WARNING**

Do not open two skirts at the same time if they have the same hinge line. Skirt could break off and fall on you.

**NOTE**

Read para. 8-1 before doing any work.

1

- Open skirt panels where necessary.
- Refer to TM 9-2350-255-10.
- Check shock absorber housing for oil leaks.
- Refer to TM 9-2350-255-10.

Are there any leaks?

**NO**

**YES**

2

- Torque all roadwheel arm mounting screws.
- Refer to TM 9-2350-255-20-1-3-4, para. 10-9.
- Verify that problem is solved.

3

- Check for oil leaks at shock absorber sight gages.
- Refer to TM 9-2350-255-10.

Are sight gages leaking?

Figure 8-7 (Sheet 1 of 2)  
Volume II  
Para. 8-2

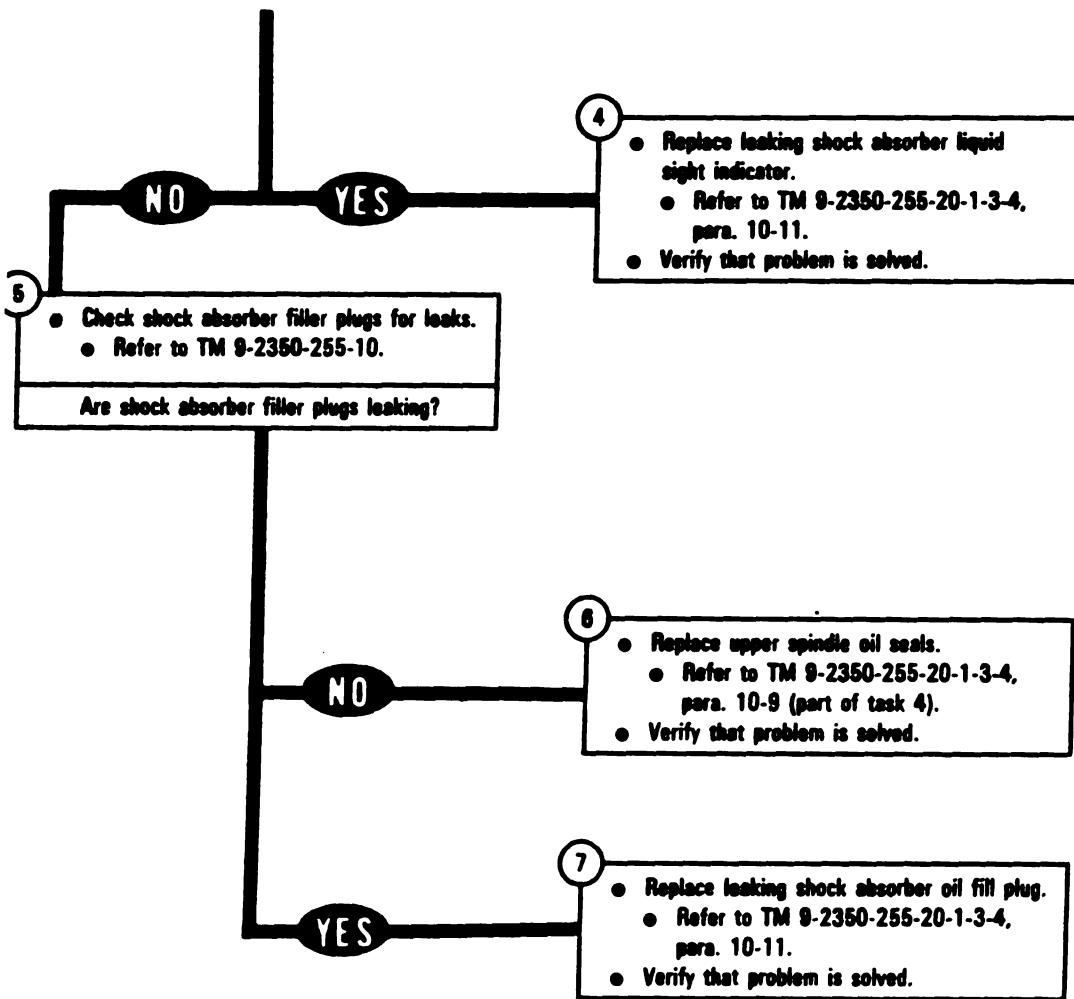


Figure 8-7 (Sheet 2 of 2)  
Volume II  
Para. 8-2



SYMPTOM SSS-8

ROADWHEEL AND COMPENSATING  
IDLER HUB OIL IS MILKY

Equipment Condition:

- Tank parked.
- Parking brake set.
- Engine shut down.
- Vehicle master power off.

WARNING

Do not open two skirts at the same time if they have the same hinge line. Skirt could break off and fall on you.

NOTE

Read para. 8-1 before doing any work.

1

- Open skirt panels where necessary.
  - Refer to TM 9-2350-255-10.
- Check the hubcaps on roadwheels and compensating idler wheels for oil leakage.
  - Refer to TM 9-2350-255-10.

Are any hubcaps leaking?

YES

NO

3

- Check to see if leaking hubcap is loose.
  - Refer to TM 9-2350-255-20-1-3-4, para. 10-6 (part of task 9).

Is hubcap loose?

YES

NO

4

- Tighten hubcap.
  - Refer to TM 9-2350-255-20-1-3-4, para. 10-6 (part of task 9).
- Verify that problem is solved.

5

- Replace hubcap.
  - Refer to TM 9-2350-255-20-1-3-4, para. 10-6.
- Verify that problem is solved.

2

- Replace oil seal on roadwheel or compensating idler wheel that was milky.
  - Refer to TM 9-2350-255-20-1-3-4, para. 10-6.
- Verify that problem is solved.

## CHAPTER 9 ENGINE SYSTEM TROUBLESHOOTING

---

**9-1. General.** This chapter tells you how to troubleshoot the engine system.

The STE/M1 test set is used to troubleshoot the engine system whenever test equipment is required. For a detailed description of the STE/M1 test set, refer to TM 9-2350-255-20-1-2-2, para. 18-4.

A fault symptom index is located at the beginning of the troubleshooting procedures; refer to para. 9-2. The index identifies the primary or alternate procedure used to troubleshoot a known symptom. The primary procedure is included within para. 9-2. When the STE/M1 test set is not available, use the alternate procedure located in TM 9-2350-255-20-1-2-3, chapter 20.

One of four types of messages will be displayed on the STE/M1 test set communicator (SETCOM): a general instruction, a cable instruction, a fault, or a special instruction message. General instruction messages are self-explanatory. For a cable instruction or a fault message, the action is listed in the cable instruction index or fault message index in each primary procedure. The primary procedure may also have a special instruction message index. A full explanation of the messages, with examples, is in TM 9-2350-255-20-1-2-2, para. 18-4. STE/M1 test set hookup diagrams show how the test set is connected to the tank for each troubleshooting action. These diagrams are located at the end of the primary procedures.

Follow these general troubleshooting instructions in each procedure unless the procedure directs otherwise.

Make sure the troubleshooting instructions in TM 9-2350-255-10 have been completed before starting this troubleshooting action. Make sure all test connections are correct. An incorrect test connection can lead to the replacement of a good tank component.

If the same symptom exists after replacing a tank component, repeat the troubleshooting procedure.

Look for obvious damage to harnesses and all surrounding components while checking for loose electrical connectors.

Use slip joint conduit style pliers with plastic jaw inserts to loosen connectors that cannot be loosened by hand.

Connect all cables and harnesses that were disconnected in order to get at the connector being checked.

Use care when hooking up all connectors to avoid bending or breaking pins.

Cap all electrical connectors that were taken off during troubleshooting.

Be sure to close grille doors and access panels before traversing the turret.

Be sure tank is parked where it is safe to traverse the turret.

Be sure vehicle master power is OFF before connecting or disconnecting any electrical cable or harness.

**TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING**

**9-2. Engine System Troubleshooting Procedures.**

**Table 9-1. Engine System (ESS) Fault Symptom Index**

<b>Fault Symptom No.</b>	<b>Fault Symptom</b>	<b>Primary Trouble-Shooting Procedure (PTP)</b>	<b>Test No.</b>	<b>Alternate Trouble-Shooting Procedure (ATP)</b>
ESS-1	Engine Smokes	Figure 9-1	—	—
ESS-2	Engine Does Not Crank - ELECTRICAL SYSTEM Meter Shows Over 12 Volts During Start Attempt And ABORT Light Comes On 7.5 Seconds After Start Attempt	Figure 9-2	1501	Figure 20-1
ESS-3	Engine Does Not Crank - ELECTRICAL SYSTEM Meter Shows Over 12 Volts During Start Attempt And ABORT Light Does Not Come On After Start Attempt	Figure 9-2	1501	Figure 20-2
ESS-4	Engine Does Not Crank When STARTER ONLY Switch Is Held In ENGAGED Position - OK In Normal Start Mode	Figure 9-3	—	—
ESS-5	Engine Has Low Cranking Speed When Starting	Figure 9-4	1502	—
ESS-6	Engine Aborts Start	Figure 9-5	1503	—
ESS-7	Engine Aborts, Engine ABORT Light Stays Off	Figure 9-5	1130	Figure 20-3
ESS-8	Engine Aborts Or Shuts Down Automatically After ENGINE OIL PRESSURE LOW Light Comes On	Figure 9-7	—	—
ESS-9	Engine Starts, ENGINE STARTED Light Does Not Come On	Figure 9-6	1130	Figure 20-4
ESS-10	Engine Starts And ENGINE STARTED Light Comes On Prior To Start Then Goes Off 10 Seconds After Start	Figure 9-6	1130	—
ESS-11	Engine Starts And ENGINE STARTED LIGHT Comes On Prior To Start And Stays On	Figure 9-6	1130	Figure 20-5

Volume II  
Para. 9-2

9-2 Change 3

Table 9-1. Engine System (ESS) Fault Symptom Index (Continued)

Fault Symptom No.	Fault Symptom	Primary Trouble-Shooting Procedure (PTP)	Test No.	Alternate Trouble-Shooting Procedure (ATP)
ESS-12	Engine Running Normally And FUEL CONTROL FAULTY Light Comes On	Figure 9-6	1508	-
ESS-13	Engine Running And ENGINE OIL LOW Light Comes On, But Engine Oil Level OK	Figure 9-9	-	-
ESS-14	Engine Running And ENGINE OIL TEMP HIGH Light Comes On	Figure 9-10	-	-
ESS-15	Engine Running And Engine ABORT Light On	Figure 9-6	1130	Figure 20-6
ESS-16	Engine Idle Speed Does Not Increase When TACTICAL IDLE Switch Is Set To On Or With Transmission Shift Control Set To PVT	Figure 9-11	1103	Figure 20-7
ESS-17	Engine Idle Speed Not At Tactical Idle With Transmission Shift Control Set To PVT, But Engine Speed Increases To Tactical Idle When TACTICAL IDLE Switch Is Set To On	Figure 9-11	1103	Figure 20-8
ESS-18	Engine Idle Speed Not At Tactical Idle With TACTICAL IDLE Switch Set To On, But Engine Speed Increases To Tactical Idle When Transmission Shift Control Is Set To PVT	Figure 9-11	1103	Figure 20-9
ESS-19	Engine Idle Speed At Tactical Idle With Transmission Shift Control Set To N And TACTICAL IDLE Switch Set To OFF	Figure 9-11	1103	Figure 20-9.1
ESS-20	Engine Speed Not Controllable While Underway	Figure 9-12	1505	--
ESS-21	Engine Loses Power - FUEL CONTROL FAULTY Light Comes On	Figure 9-12	1505	-

**TM 9-2360-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING**

**Table 9-1. Engine System (ESS) Fault Symptom Index (Continued)**

Fault Symptom No.	Fault Symptom	Primary Trouble-Shooting Procedure (PTP)	Test No.	Alternate Trouble-Shooting Procedure (ATP)
ESS-22	Engine Loses Power - FUEL CONTROL FAULTY Light Stays Off	Figure 9-13	1506	-
ESS-23	Engine Continues To Run When ENGINE SHUTOFF Switch Is Set To SHUTOFF	Figure 9-14	1507	-
ESS-24	Engine Shuts Down In Less Than 30 Seconds After ENGINE SHUTOFF Switch Is Set to SHUTOFF	Figure 9-4	1502	-
ESS-25	Oil Consumption Is More Than 1 Quart Per 2.5 Hours	Figure 9-15	--	-

**SYMPTOM ESS-1**

**ENGINE SMOKES**

**Test Equipment/Special Tools:**

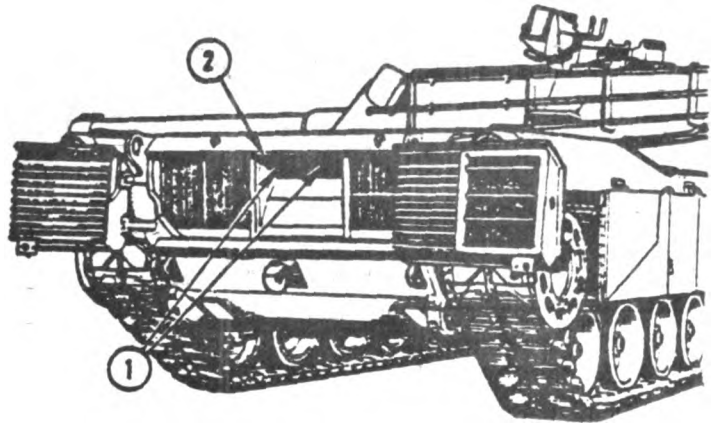
- Dispensing Pump, MSN 4830-00-287-8293

**Equipment Condition:**

- Tank parked.
- Parking brake set.
- Engine shut down.
- Vehicle master power off.
- SMOKE GENERATOR switch set to OFF.

**NOTE**

Spilled oil or fuel, or starts that were aborted will normally cause smoking at engine startup. This smoke should disappear within 3 minutes and not occur again. Repeated smoking at startups or during engine operation indicates a problem.



A20120-638R1

- 1
- Check engine lube oil level to make sure that lube oil tank is not overfilled.
  - Refer to LO 9-2350-255-12.

Is oil level OK?

**YES**

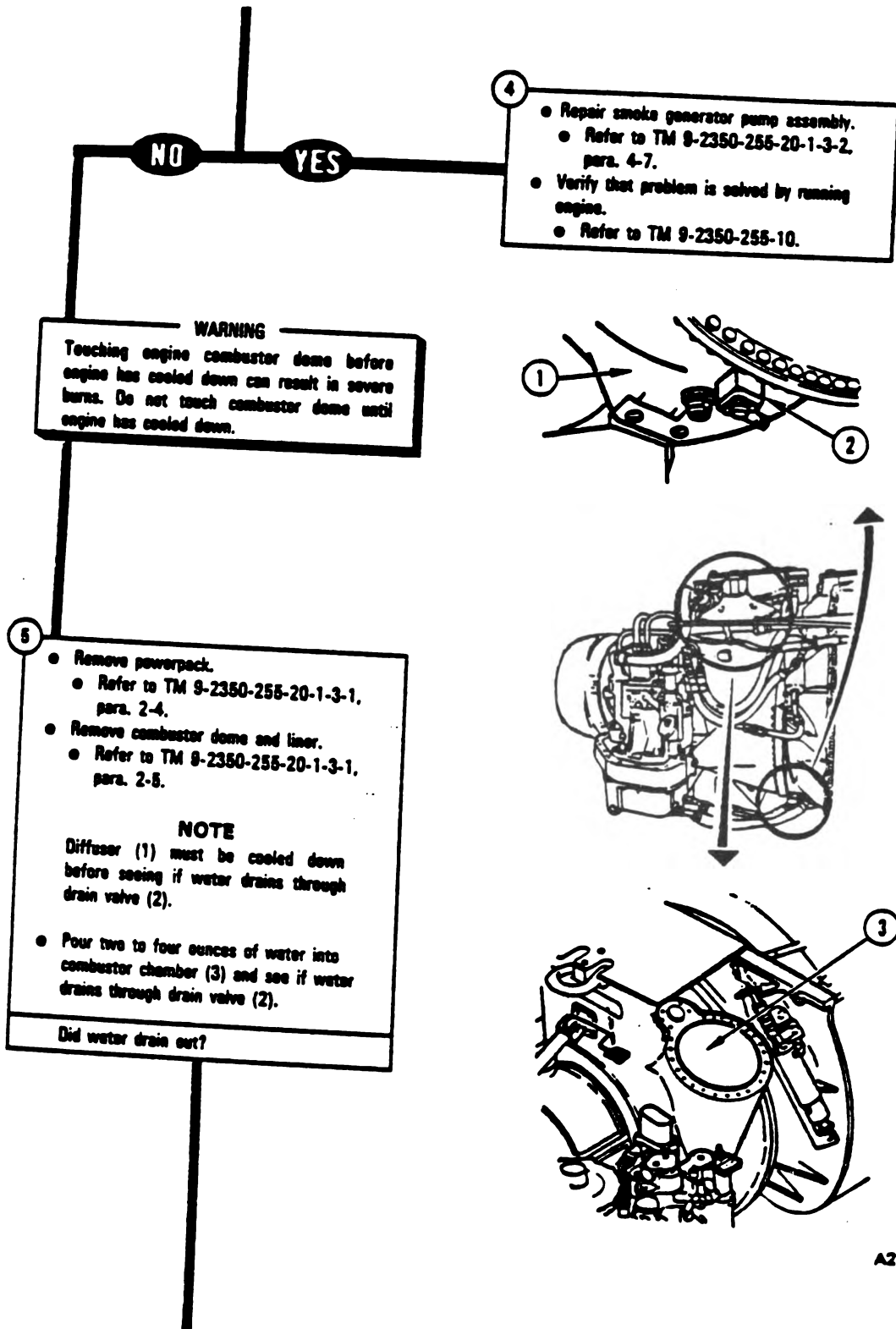
**NO**

- 2
- Remove oil float switch.
  - Refer to TM 9-2350-255-20-1-3-4, para. 12-8.
  - Remove excess oil with dispensing pump.
  - Install oil float switch.
  - Refer to TM 9-2350-255-20-1-3-4, para. 12-8.
  - Verify that problem is solved by running engine.
  - Refer to TM 9-2350-255-10.

- 3
- Open rear grille doors.
  - Refer to TM 9-2350-255-20-1-3-2, para. 7-5.
  - Check for leaks in smoke generator nozzles (1).
  - Run engine for a few minutes and shut down.
  - Refer to TM 9-2350-255-10.
  - Look at nozzles (1) inside exhaust duct (2).

Is either nozzle leaking fuel?

Figure 9-1 (Sheet 1 of 3)  
Volume II  
Para. 9-2



A20120-1078

Figure 9-1 (Sheet 2 of 3)  
Volume II  
Para. 9-2

9-6 Change 3

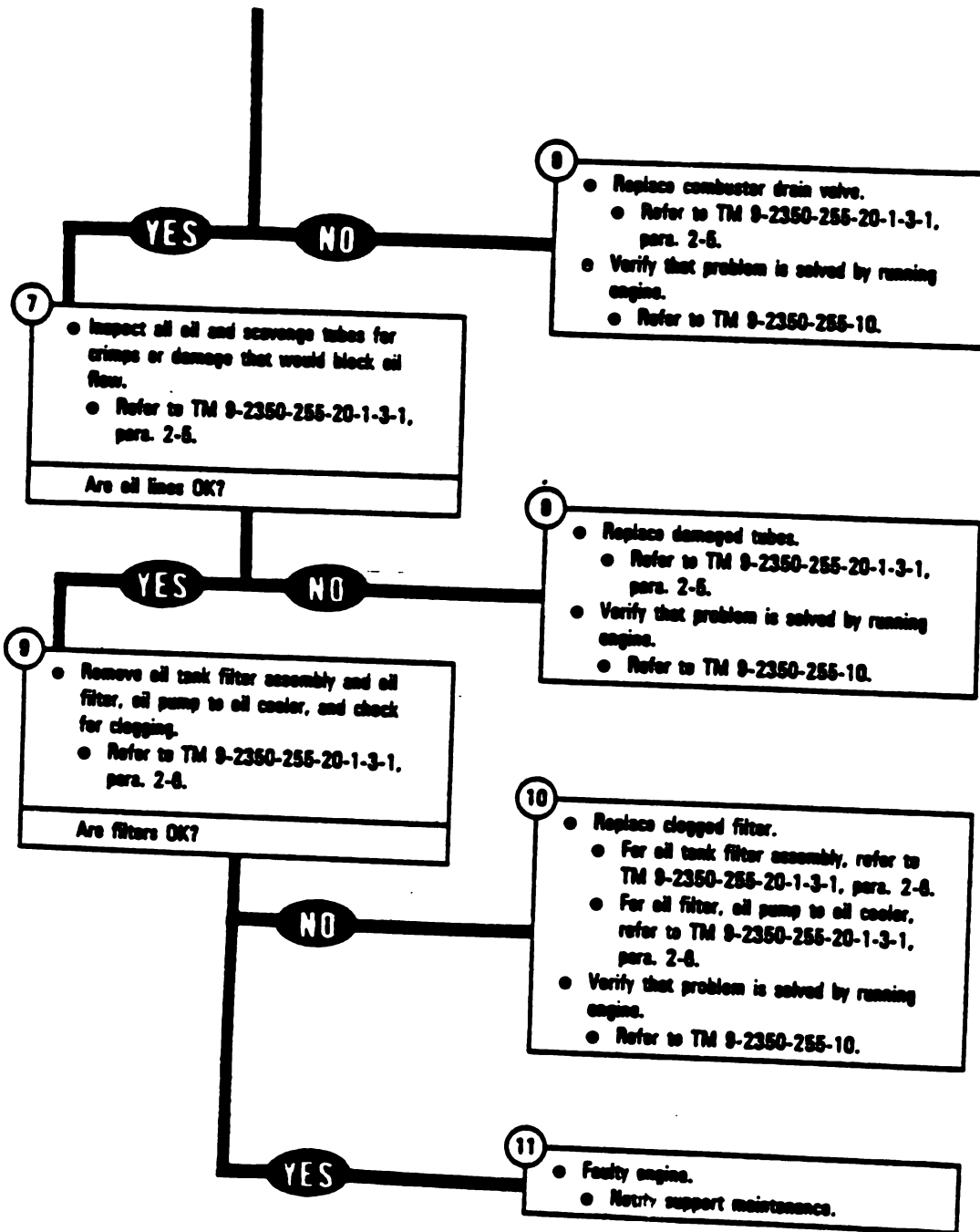


Figure 9-1 (Sheet 3 of 3)  
Volume II  
Para. 9-2



SYMPTOM ESS-2 AND ESS-3

ENGINE DOES NOT CRANK - ELECTRICAL SYSTEM METER SHOWS OVER 12 VOLTS DURING START ATTEMPT AND ABORT LIGHT COMES ON 7.5 SECONDS AFTER START ATTEMPT.

OR

ENGINE DOES NOT CRANK - ELECTRICAL SYSTEM METER SHOWS OVER 12 VOLTS DURING START ATTEMPT AND ABORT LIGHT DOES NOT COME ON AFTER START ATTEMPT.

**Common Tools:**

- Extension, socket wrench, 1/2 inch square drive, 5 inch
- Handle, socket wrench, ratchet, 1/2 inch square drive
- Knife, pocket
- Socket, socket wrench, 1/2 inch square drive, 3/4 inch
- Wrench, combination, 5/16 inch
- Wrench, combination, 3/8 inch
- Wrench, combination, 3/4 inch

**Supplies:**

- Adhesive, sealant, Type 1, 3-ounce tube: (81349) MIL-A-48108, NSN 8040-00-877-9872.

**NOTE**

Read para. 9-1 before doing any work.

**Test Equipment/Special Tools:**

- Pliers, slip joint, conduit style with plastic jaw inserts, NSN 5120-00-824-8085

**NOTE**

Do not get the following equipment until told to further on in this procedure.

- STE/M1 Test Set, 12303600

**Equipment Condition:**

- Tank parked.
- Parking brake set.
- Vehicle master power off.

Figure 9-2 (Sheet 1 of 12)  
Volume II  
Para. 9-2

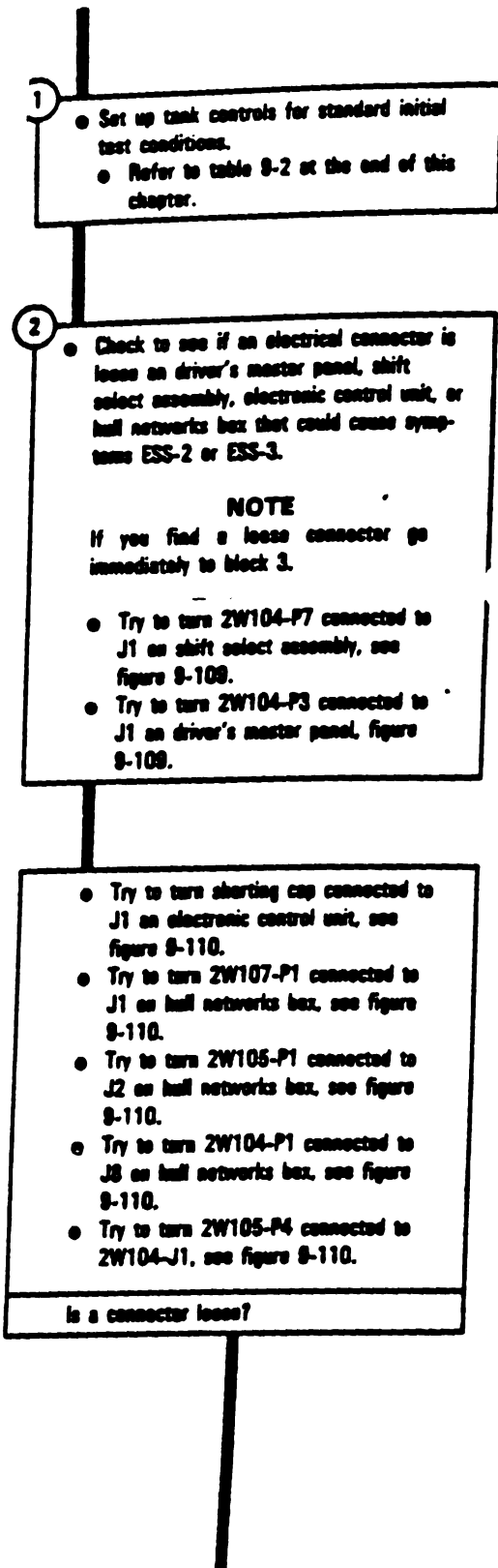
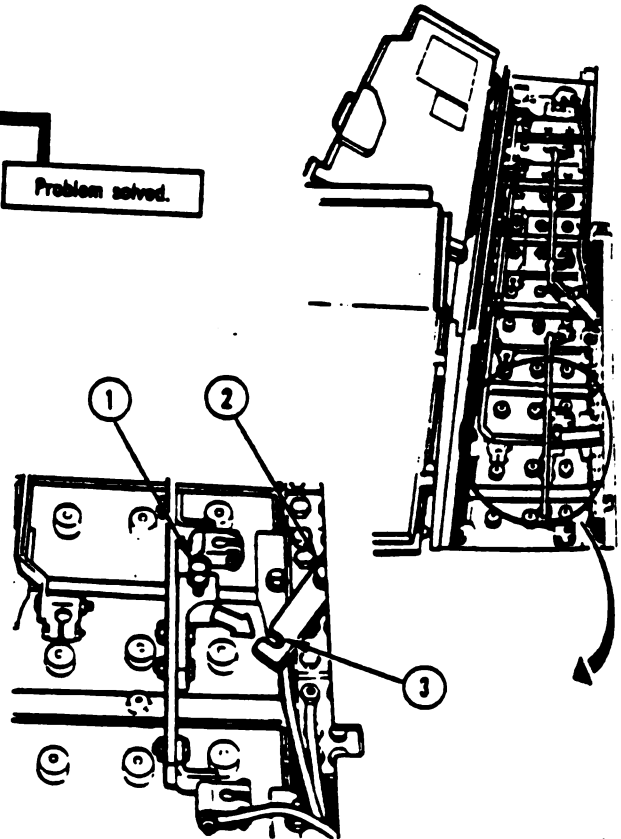
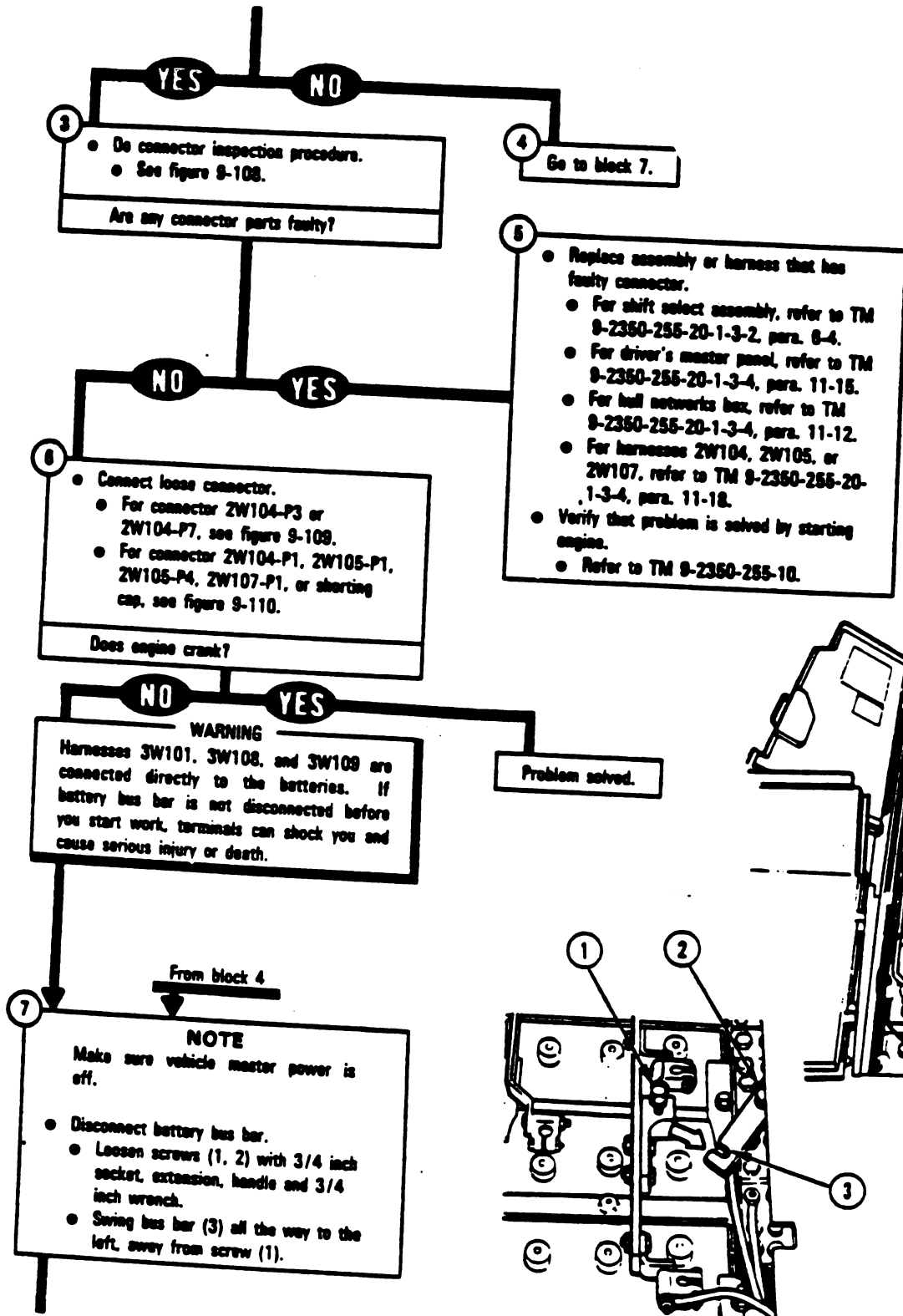


Figure 9-2 (Sheet 2 of 12).  
Volume-11  
Para. 9-2

**TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING**



A20120-1074

Figure 9-2 (Sheet 3 of 12)  
Volume II  
Para. 9-2

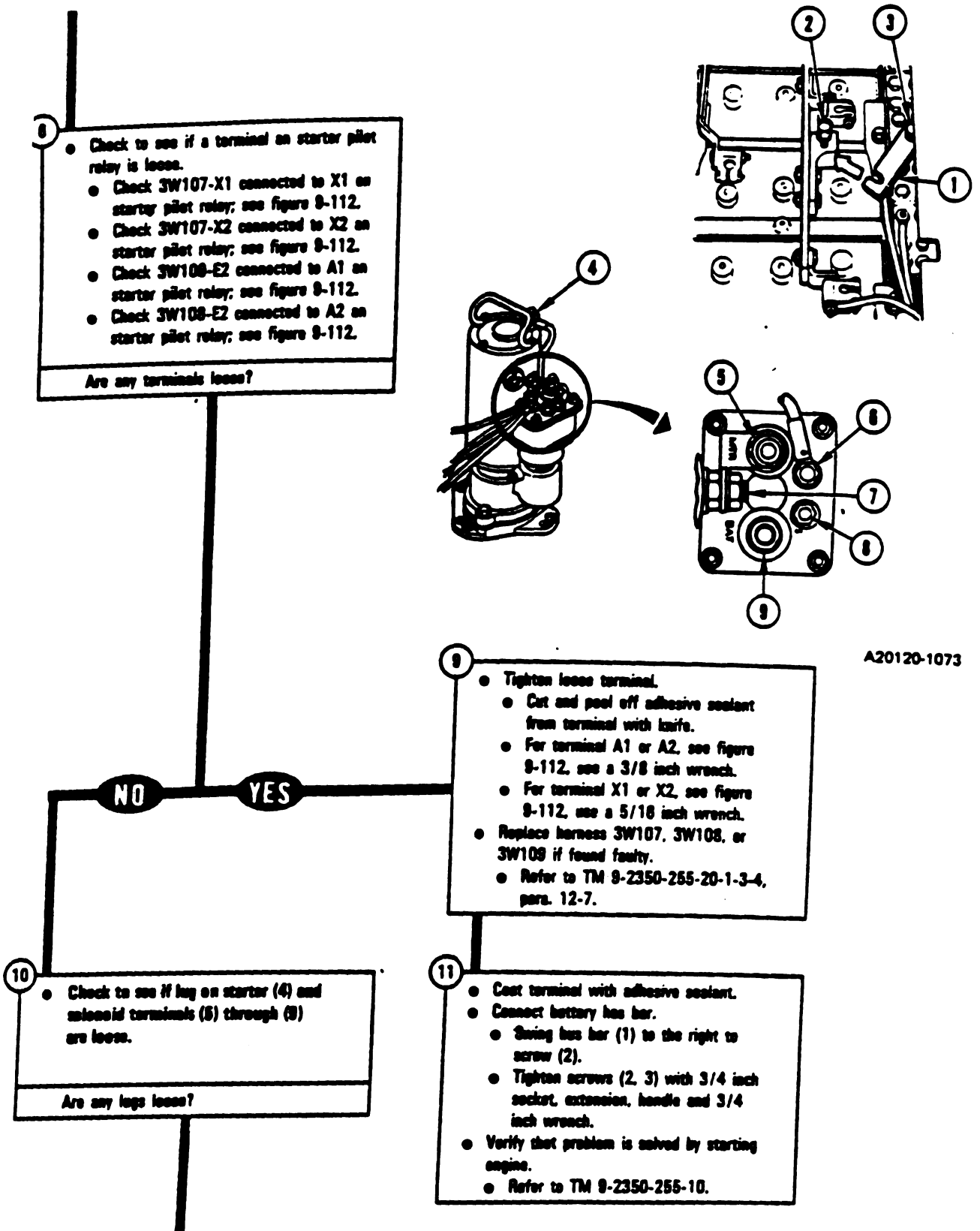


Figure 9-2 (Sheet 4 of 12)  
Volume II  
Para. 9-2

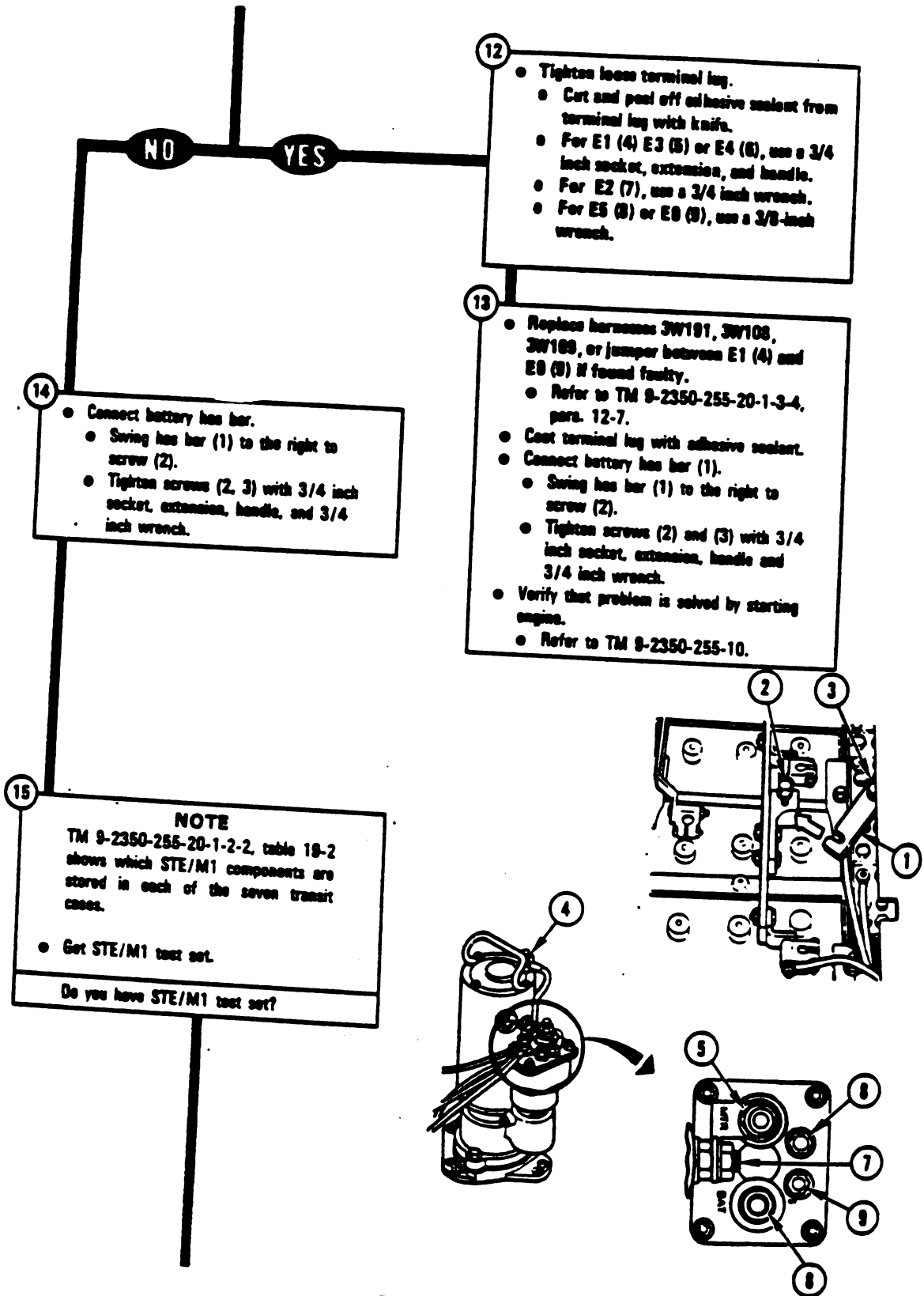
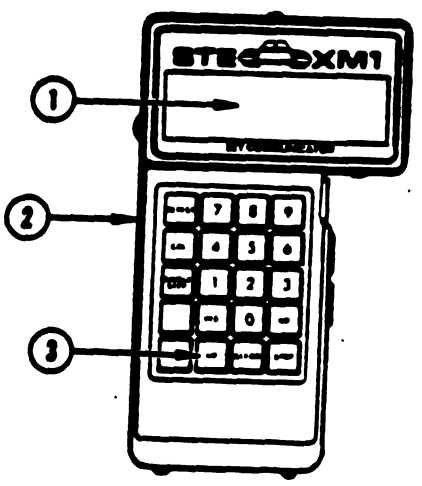
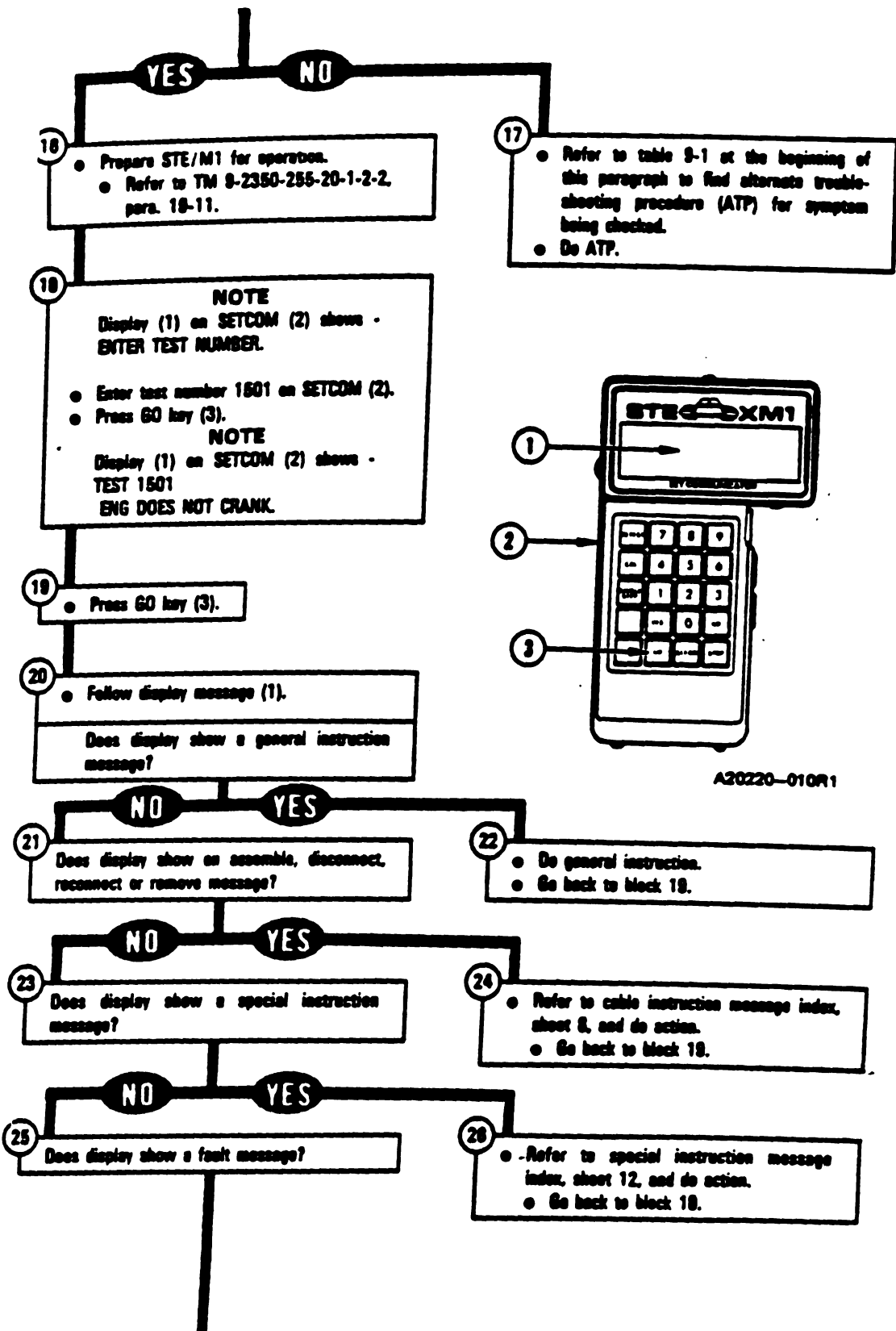


Figure 9-2 (Sheet 5 of 12)  
Volume II  
Para. 9-2

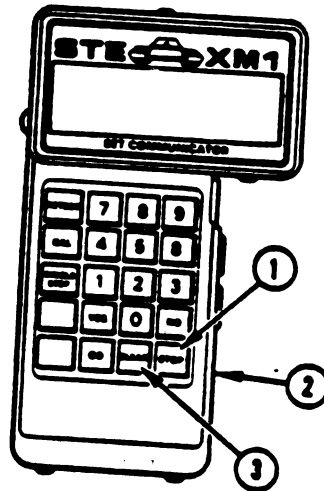
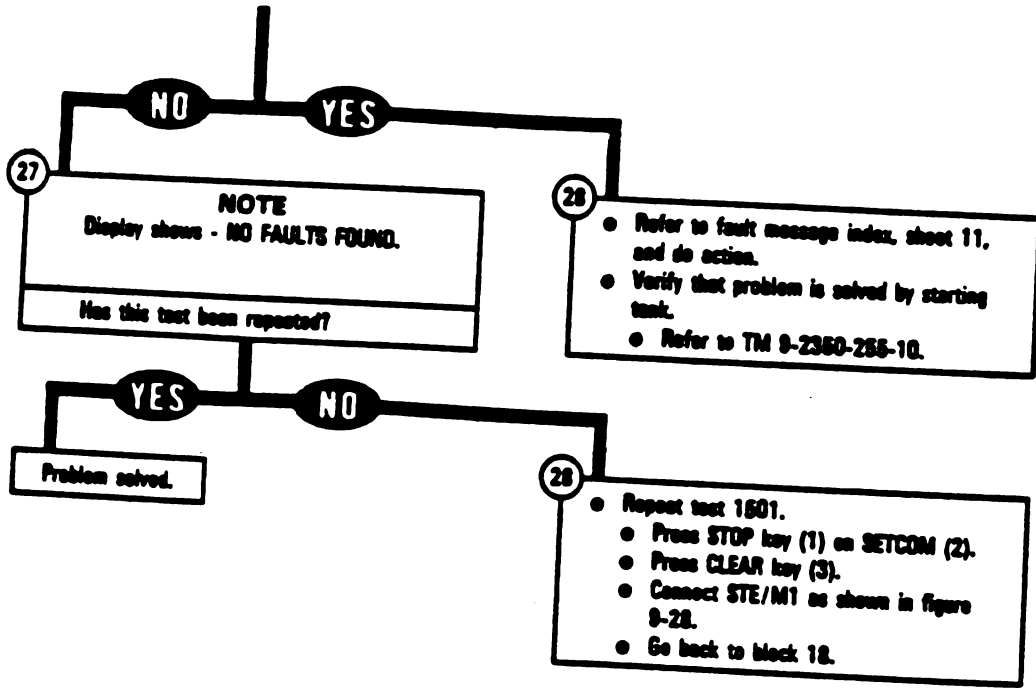
A20120-1075



A20220-010R1

Figure 9-2 (Sheet 6 of 12)  
Volume II  
Para. 9-2

**TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING**



A20220-011R1

*Figure 9-2 (Sheet 7 of 12)  
Volume II  
Para. 9-2*

9-14 Change 3

Engine System Cable Instruction Message Index for Test 1501

Cable Instruction Message	Action
EMBLE CX304, CA417/18	<ul style="list-style-type: none"> <li>● Connect P1 on CIB cable CX304 to P3 on DBA CX206.</li> <li>● Connect P2 on adapter CA417 to P1 on DBA CX206.</li> <li>● Connect P2 on adapter CA418 to P2 on DBA CX206.</li> <li>● See figure 9-18.</li> </ul>
EMBLE CX304, CA421/22	<ul style="list-style-type: none"> <li>● Connect P1 on CIB cable CX304 to P3 on DBA CX206.</li> <li>● Connect P2 on adapter CA421 to P1 on DBA CX206.</li> <li>● Connect P2 on adapter CA422 to P2 on DBA CX206.</li> <li>● See figure 9-19.</li> </ul>
EMBLE CX305, CA421/22	<ul style="list-style-type: none"> <li>● Connect P1 on CIB cable CX305 to P3 on DBA CX206.</li> <li>● Connect P2 on adapter CA421 to P1 on DBA CX206.</li> <li>● Connect P2 on adapter CA422 to P2 on DBA CX206.</li> <li>● See figure 9-20.</li> </ul>
EMBLE CX304, CA535/36	<ul style="list-style-type: none"> <li>● Connect P1 on CIB cable CX304 to P3 on DBA CX207.</li> <li>● Connect P2 on adapter CA535 to P1 on DBA CX207.</li> <li>● Connect P2 on adapter CA536 to P2 on DBA CX207.</li> <li>● See figure 9-21.</li> </ul>
CONNECT CX305 P2 TO J1	<ul style="list-style-type: none"> <li>● Connect P2 on CIB cable CX305 to J1 on CIB.</li> <li>● See figure 9-20.</li> </ul>
CONNECT CX304 P2 TO J2	<ul style="list-style-type: none"> <li>● Connect P2 on CIB cable CX304 to J2 on CIB.</li> <li>● See figure 9-22.</li> </ul>
CONNECT CIB J1 (CX305) TO 2W105P5 (CA205)	<ul style="list-style-type: none"> <li>● Disconnect P1 on CIB cable CX305 from P2 on adapter CA301.</li> <li>● See figure 9-50.</li> <li>● Disconnect P1 on adapter CA301 from TJ1 on driver's master panel.</li> <li>● See figure 9-50.</li> <li>● Connect P1 on adapter CA205 to 2W105-P5.</li> <li>● See figure 9-25.</li> <li>● Connect P1 on CIB cable CX305 to P2 on adapter CA205.</li> <li>● See figure 9-25.</li> </ul>

Figure 9-2 (Sheet 8 of 12)  
Volume II  
Para. 9-2

Change 6 9-15



**TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING**

**Engine System Cable Instruction Message Index for Test 1501 (Continued)**

Cable Instruction Message	Action
CONNECT CIB J1 (CX305) To DMP TJ1 (CA301)	<ul style="list-style-type: none"> <li>● Connect P1 on adapter CA301 to TJ1 on driver's master panel.</li> <li>● Connect P1 on CIB cable CX305 to P2 on adapter CA301.</li> <li>● Connect P2 on CIB cable CX305 to J1 on CIB.</li> <li>● See figure 9-50.</li> </ul>
CONNECT CIB J1 (CX305) To HNB TJ1 (CA301)	<ul style="list-style-type: none"> <li>● Connect P1 on adapter CA301 to TJ1 on hull networks box.</li> <li>● Connect P1 on CIB cable CX305 to P2 on adapter CA301.</li> <li>● Connect P2 on CIB cable CX305 to J1 on CIB.</li> <li>● See figure 9-26.</li> </ul>
CONNECT CIB J2 (CX304) To DMP TJ1 (CA301)	<ul style="list-style-type: none"> <li>● Connect P1 on adapter CA301 to TJ1 on driver's master panel.</li> <li>● See figure 9-31.</li> </ul>
CONNECT CIB J2 (CX304) To ECU J1 (CA201)	<ul style="list-style-type: none"> <li>● Connect P2 on adapter CA201 to J1 on electronic control unit.</li> <li>● Connect P1 on CIB cable CX304 to P1 on adapter CA201.</li> <li>● Connect P2 on CIB cable CX304 to J2 on CIB.</li> <li>● See figure 9-28.</li> </ul>
CONNECT CIB J2 (CX304) To HNB TJ2 (CA301)	<ul style="list-style-type: none"> <li>● Connect P1 on adapter CA301 to TJ2 on hull networks box.</li> <li>● Connect P1 on CIB cable CX304 to P2 on adapter CA301.</li> <li>● See figure 9-29.</li> </ul>
CONNECT DBA BETWEEN 2W104P7 ← → SHIFT	<ul style="list-style-type: none"> <li>● Connect P1 on adapter CA536 to J1 on shift control assembly.</li> <li>● Connect P1 on adapter CA535 to 2W104-P7.</li> <li>● See figure 9-21.</li> </ul>
CONNECT DBA BETWEEN 2W104 ← → DMP J1	<ul style="list-style-type: none"> <li>● Connect P1 on adapter CA418 to J1 on driver's master panel.</li> <li>● Connect P1 on adapter CA417 to 2W104-P3.</li> <li>● See figure 9-18.</li> </ul>
CONNECT DBA BETWEEN 2W105P5 ← → ECU J3	<ul style="list-style-type: none"> <li>● Connect P1 on adapter CA422 to J3 on electronic control unit.</li> <li>● Connect P1 on adapter CA421 to 2W105-P5.</li> <li>● See figure 9-19 if DBA is connected to CX304.</li> <li>● See figure 9-20 if DBA is connected to CX305.</li> </ul>

*Figure 9-2 (Sheet 9 of 12)  
Volume II  
Para. 9-2*

350-255-1-2-1  
E SYSTEM TROUBLESHOOTING

Engine System Cable Instruction Message Index for Test 1501 (Continued)

1 (Continued)

Cable Instruction Message	Action
Disconnect Driver's master panel 2W104 <--> DMP J1	<ul style="list-style-type: none"> <li>● Disconnect 2W104-P3 from J1 on driver's master panel.</li> <li>● See figure 9-109.</li> </ul>
Disconnect CIB cable 2W104P7 <--> SHIFT	<ul style="list-style-type: none"> <li>● Disconnect 2W104-P7 from J1 on shift control assembly.</li> <li>● See figure 9-109.</li> </ul>
Disconnect Hull network 2W105P5 <--> ECU J3	<ul style="list-style-type: none"> <li>● Disconnect 2W105-P5 from J3 on electronic control unit.</li> <li>● See figure 9-110.</li> </ul>
Disconnect CIB cable CX304 AND Adapter CA301 AT DMP TJ1	<ul style="list-style-type: none"> <li>● Disconnect P1 on CIB cable CX304 from P2 on adapter CA301.</li> <li>● Disconnect P1 on adapter CA301 from TJ1 on driver's master panel.</li> <li>● See figure 9-31.</li> </ul>
Disconnect Driver's master panel CX304 AND Adapter CA201 AT ECU J1	<ul style="list-style-type: none"> <li>● Disconnect P1 on CIB cable CX304 from P1 on adapter CA201.</li> <li>● Disconnect P2 on adapter CA201 from J1 on electronic control unit.</li> <li>● See figure 9-28.</li> </ul>
Disconnect CIB cable CX304 AND Adapter CA301 AT HNB TJ2	<ul style="list-style-type: none"> <li>● Disconnect P1 on adapter CA301 from TJ2 on hull networks box.</li> <li>● See figure 9-29.</li> </ul>
Disconnect Hull network CX305 AND Adapter CA301 AT DMP TJ1	<ul style="list-style-type: none"> <li>● Disconnect P1 on adapter CA301 from TJ1 on driver's master panel.</li> <li>● See figure 9-50.</li> </ul>

Figure 9-2 (Sheet 10 of 12)  
Volume-1  
Para. 9-2

Change 6 9-17

Engine System Fault Message Index for Test 1501

Fault Message	Action
FAULTY BATTERY START CHARGING SYS 150122	<ul style="list-style-type: none"> <li>Do follow-on procedure.</li> <li>See figure 9-70.</li> </ul>
FAULTY CABLE GROUP OR ECU 150108	<ul style="list-style-type: none"> <li>Do follow-on procedure.</li> <li>See figure 9-68.</li> </ul>
FAULTY DMP 150120 150133 150142	<ul style="list-style-type: none"> <li>Replace driver's master panel.</li> <li>Refer to TM 9-2350-255-20-1-3-4, para. 11-15.</li> </ul>
FAULTY DMP OR 2W104 150130	<ul style="list-style-type: none"> <li>Do follow-on procedure.</li> <li>See figure 9-71.</li> </ul>
FAULTY DMP, 2W104 2W105 150117	<ul style="list-style-type: none"> <li>Do follow-on procedure.</li> <li>See figure 9-69.</li> </ul>
FAULTY ECU 150128 150139 150145 150146	<ul style="list-style-type: none"> <li>Replace electronic control unit.</li> <li>Refer to TM 9-2350-255-20-1-3-4, para. 11-13.</li> </ul>
FAULTY HNB 150113	<ul style="list-style-type: none"> <li>Replace hull networks box.</li> <li>Refer to TM 9-2350-255-20-1-3-4, para. 11-12.</li> </ul>
FAULTY HNB OR 2W104 150143	<ul style="list-style-type: none"> <li>Do follow-on procedure.</li> <li>See figure 9-74.</li> </ul>
FAULTY HNB OR 2W105 150137 150138	<ul style="list-style-type: none"> <li>Do follow-on procedure.</li> <li>See figure 9-73.</li> </ul>
FAULTY HNB, 2W104, OR 2W105 150132	<ul style="list-style-type: none"> <li>Do follow-on procedure.</li> <li>See figure 9-72.</li> </ul>
FAULTY HULL POWER SYSTEM 150114 150118	<ul style="list-style-type: none"> <li>Run power distribution test number 1000.</li> <li>Refer to TM 9-2350-255-20-1-2-2, figure 16-1.</li> </ul>
FAULTY PTRLY, 3W107 2W107, 2W105 154102 154103	<ul style="list-style-type: none"> <li>Do follow-on procedure.</li> <li>See figure 9-106.</li> </ul>
FAULTY STARTING SYSTEM 150105	<ul style="list-style-type: none"> <li>Do follow-on procedure.</li> <li>See figure 9-67.</li> </ul>

Figure 9-2 (Sheet 11 of 12)  
Volume II  
Para. 9-2

**Engine System Fault Message Index for Test 1501 (Continued)**

Fault Message	Action
TY ST PILOT RELAY                      150109	<ul style="list-style-type: none"> <li>● Replace starter pilot relay.</li> <li>● Refer to TM 9-2350-255-20-1-3-4, para. 12-5.</li> </ul>
TY SHIFT CONTROL ASSEMBLY                      150131	<ul style="list-style-type: none"> <li>● Replace shift control assembly.</li> <li>● Refer to TM 9-2350-255-20-1-3-2, para. 6-4.</li> </ul>

**Special Instructions Message Index for Test 1501**

Special Instruction Message	Action
-20 MANUAL                      150123	<ul style="list-style-type: none"> <li>● Run engine test number 1503 (abort on start)</li> <li>● See figure 9-5.</li> </ul>

*Figure 9-2 (Sheet 12 of 12)*  
**Volume 41**  
**Para. 9-2**

**SYMPTOM ESS-4**

**ENGINE DOES NOT CRANK WHEN STARTER ONLY SWITCH IS HELD IN EN-GAGED POSITION - OK IN NORMAL START MODE**

**NOTE**

- Read para. 9-1 before doing any work.
- When jumpers are used, remove them after completing last instruction in that block.

**Test Equipment/Special Tools:**

- Breakout Box Test Kit, 12311066
- Multimeter
- Pliers, slip joint, conduit style with plastic jaw inserts, NSN 5120-00-824-8085
- STE/M1 Continuity Test Probe Assembly TA1, 12303622, in Transit Case, 12303610.

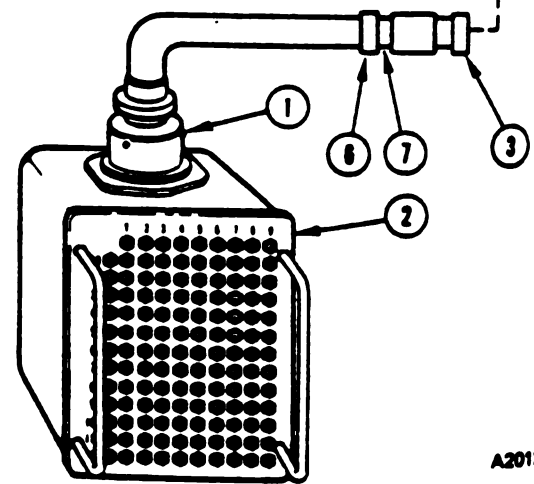
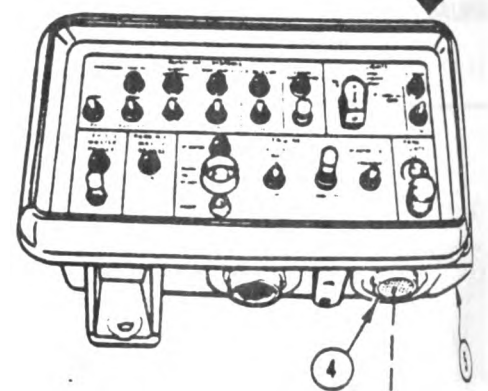
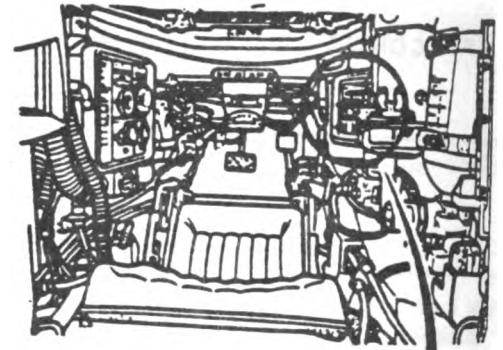
**Equipment Condition:**

- Tank ported.
- Parking brake set.
- Engine shutdown.
- Vehicle master power off.

- 1
- Set up tank controls for standard initial test conditions.
  - Refer to table 9-2 at the end of this chapter.

- 2
- Connect breakout box to TJ1 on driver's master panel.
  - Connect CABLE NO. 1-P1 (1) to breakout box (2).
  - Connect ADAPTER NO. 2-P1 (3) to TJ1 (4) on driver's master panel (5).
  - Connect CABLE NO. 1-P2 (6) to ADAPTER NO. 2-J1 (7).

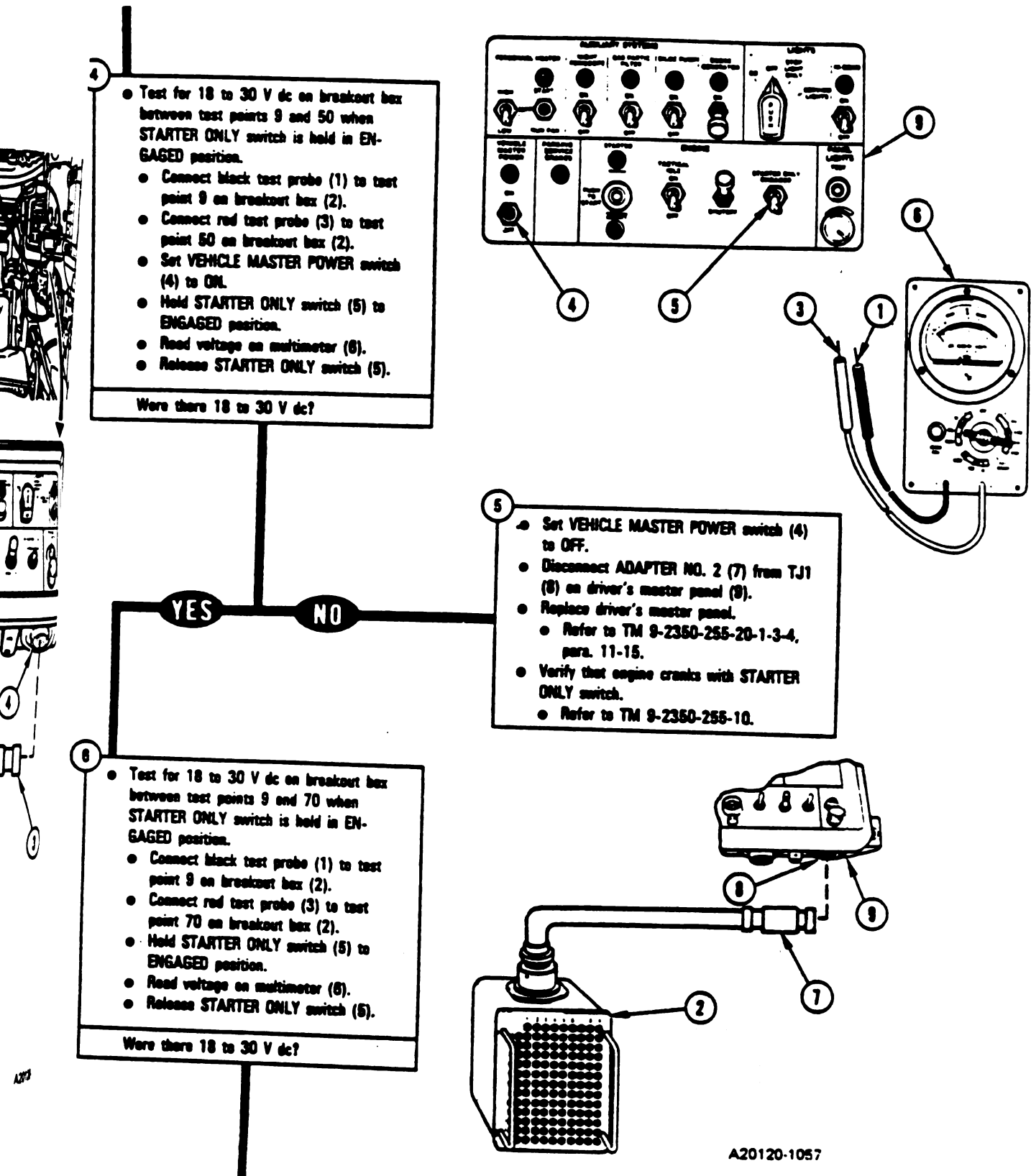
- 3
- Prepare multimeter for DC VOLTAGE TEST.
  - Refer to TM 9-2350-255-20-1-2-2, figure 18-3.



A20120-1046

Figure 9-3 (Sheet 1 of 5)  
Volume II  
Para. 9-2

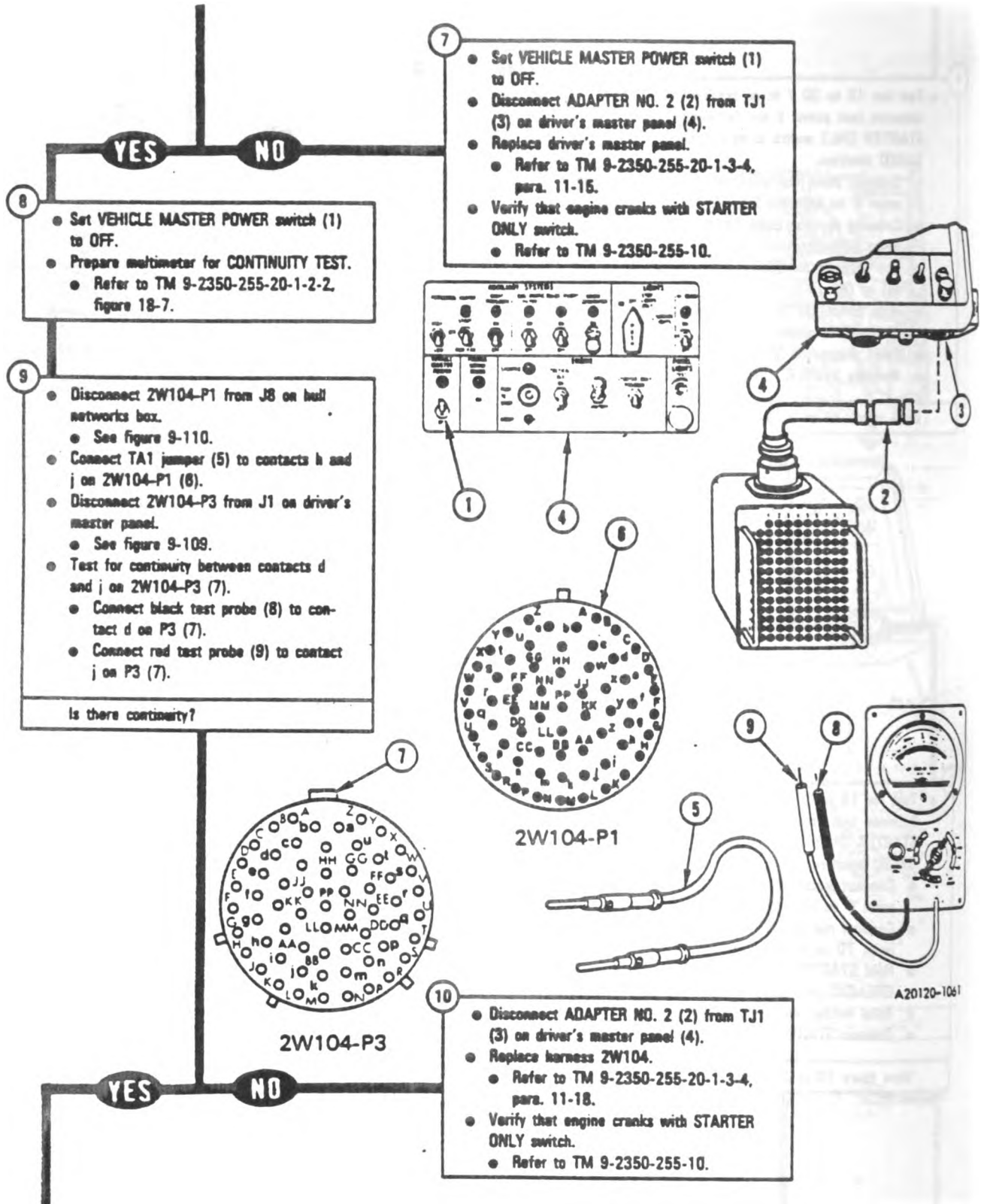
9-20 Change 3



A20120-1057

Figure 9-3 (Sheet 2 of 5)  
Volume 11  
Para. 9-2.

**TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING**



**Figure 9-3 (Sheet 3 of 5)  
Volume II  
Para. 9-2**

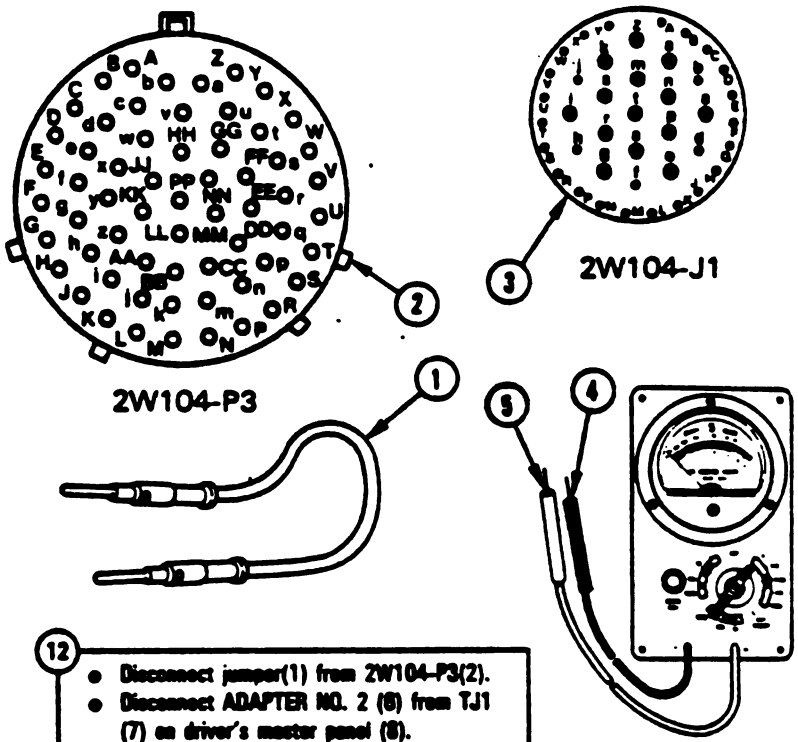
11

- Connect ZW104-P1 to J8 on hull networks box.
  - See figure 9-110.
- Connect TA1 jumper (1) to contacts s and S on ZW104-P3 (2).

**NOTE**  
Leave jumper connected for next block.

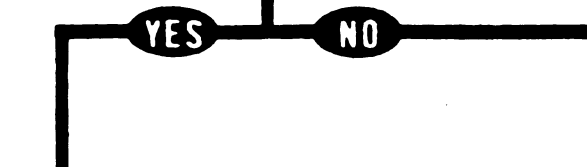
- Disconnect ZW106-P4 from ZW104-J1.
  - See figure 9-110.
- Test for continuity between contacts G and L on ZW104-J1 (3).
  - Connect black test probe (4) to contact G on J1 (3).
  - Connect red test probe (5) to contact L on J1 (3).

Is there continuity?



12

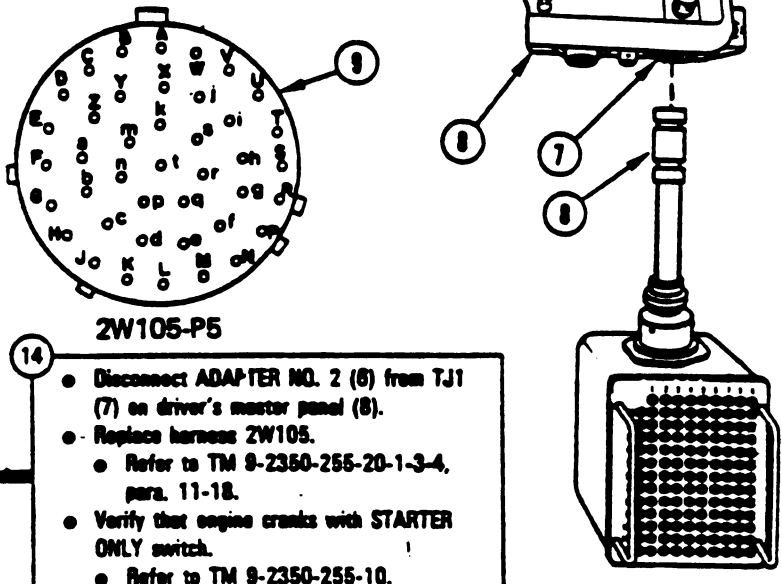
- Disconnect jumper(1) from ZW104-P3(2).
- Disconnect ADAPTER NO. 2 (6) from TJ1 (7) on driver's master panel (8).
- Replace harness ZW104.
  - Refer to TM 9-2350-255-20-1-3-4, para. 11-18.
- Verify that engine cranks with STARTER ONLY switch.
  - Refer to TM 9-2350-255-10.



13

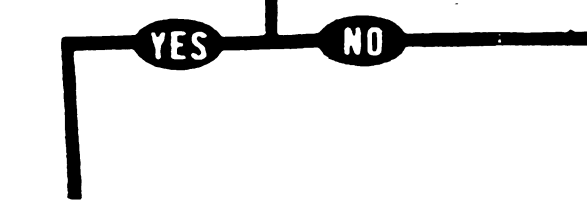
- Connect ZW105-P4 to ZW104-J1.
  - See figure 9-110.
- Disconnect ZW106-P5 from J3 on electronic control unit.
  - See figure 9-110.
- Test for continuity between contacts G and U on ZW105-P5 (9).
  - Connect black test probe (4) to contact G on P5 (9).
  - Connect red test probe (5) to contact U on P5 (9).

Is there continuity?



14

- Disconnect ADAPTER NO. 2 (6) from TJ1 (7) on driver's master panel (8).
- Replace harness ZW105.
  - Refer to TM 9-2350-255-20-1-3-4, para. 11-18.
- Verify that engine cranks with STARTER ONLY switch.
  - Refer to TM 9-2350-255-10.



A20120-1058

Figure 9-3 (Sheet 4 of 5)  
Volums II  
Para. 9-2.



**TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING**

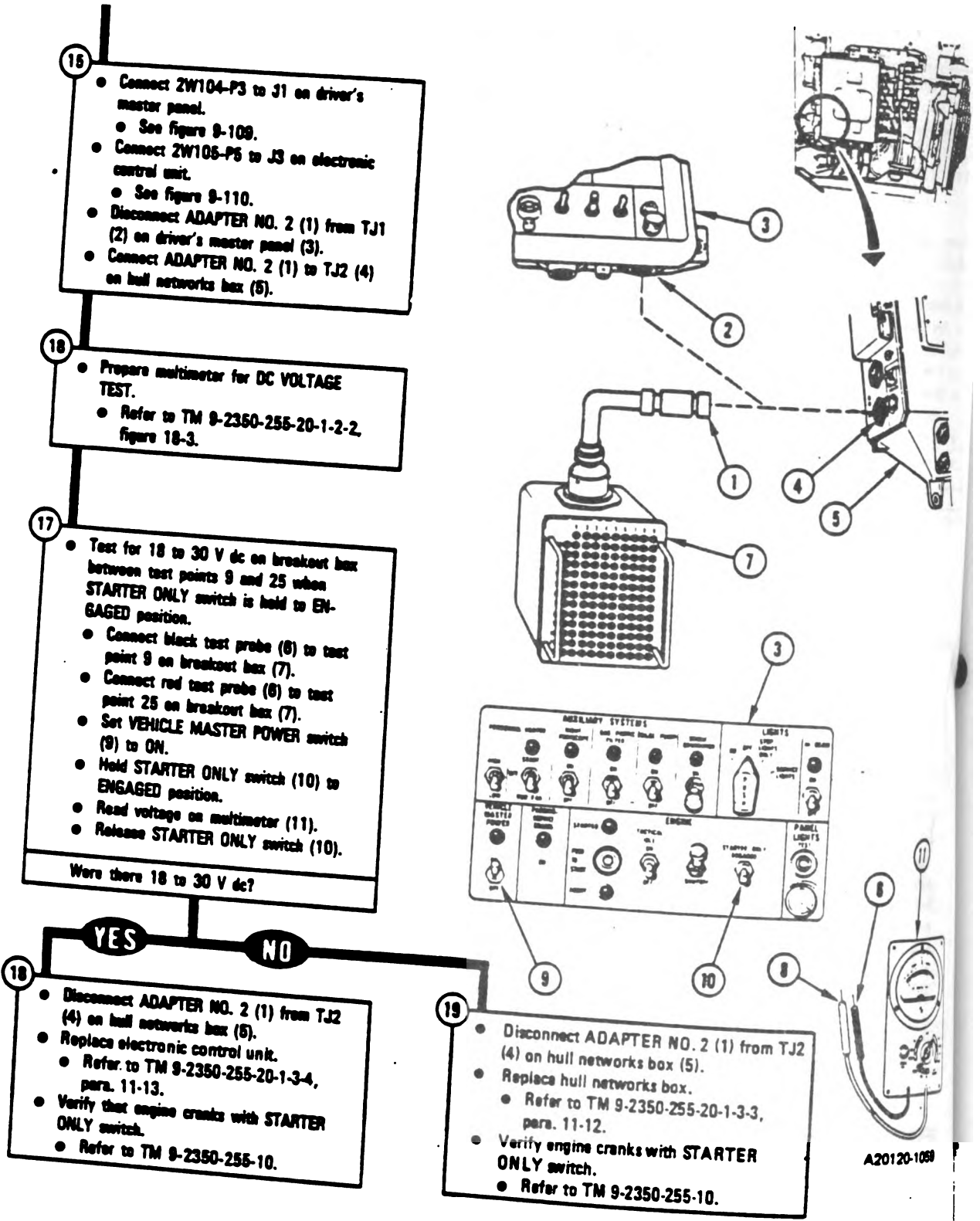


Figure 9-3 (Sheet 5 of 5)  
Volume II  
Para. 9-2

9-24 Change 3

**SYMPTOM ESS-5 AND ESS-24**

**ENGINE HAS LOW CRANKING SPEED  
WHEN STARTING**

OR

**ENGINE SHUTS DOWN IN LESS THAN 30  
SECONDS AFTER ENGINE SHUT OFF  
SWITCH IS SET TO SHUT OFF**

**Common Tools:**

- Extension, socket wrench, 1/2 inch square drive, 5-inch
- Handle, socket wrench, ratchet, 1/2 inch square drive
- Socket, socket wrench, 1/2 inch square drive, 3/4 inch
- Wrench, combination, 3/4 inch

**NOTE**

- Read para. 9-1 before doing any work.

**Test Equipment/Special Tools:**

- Pliers, slip joint, conduit style with plastic jaw inserts, NSN 5120-00-624-8085

**NOTE**

Do not get the following equipment until told to further on in this procedure.

- STE/M1 Test Set, 12303600

**Equipment Condition:**

- Tank parked.
- Parking brake set.
- Engine shutdown.
- Vehicle master power off.

- Set up tank controls for standard initial test conditions.
- Refer to table 9-2 at the end of this chapter.

*Figure 9-4 (Sheet 1 of 8)*  
**Volume II**  
**Para. 9-2**

**Change 3 9-25**

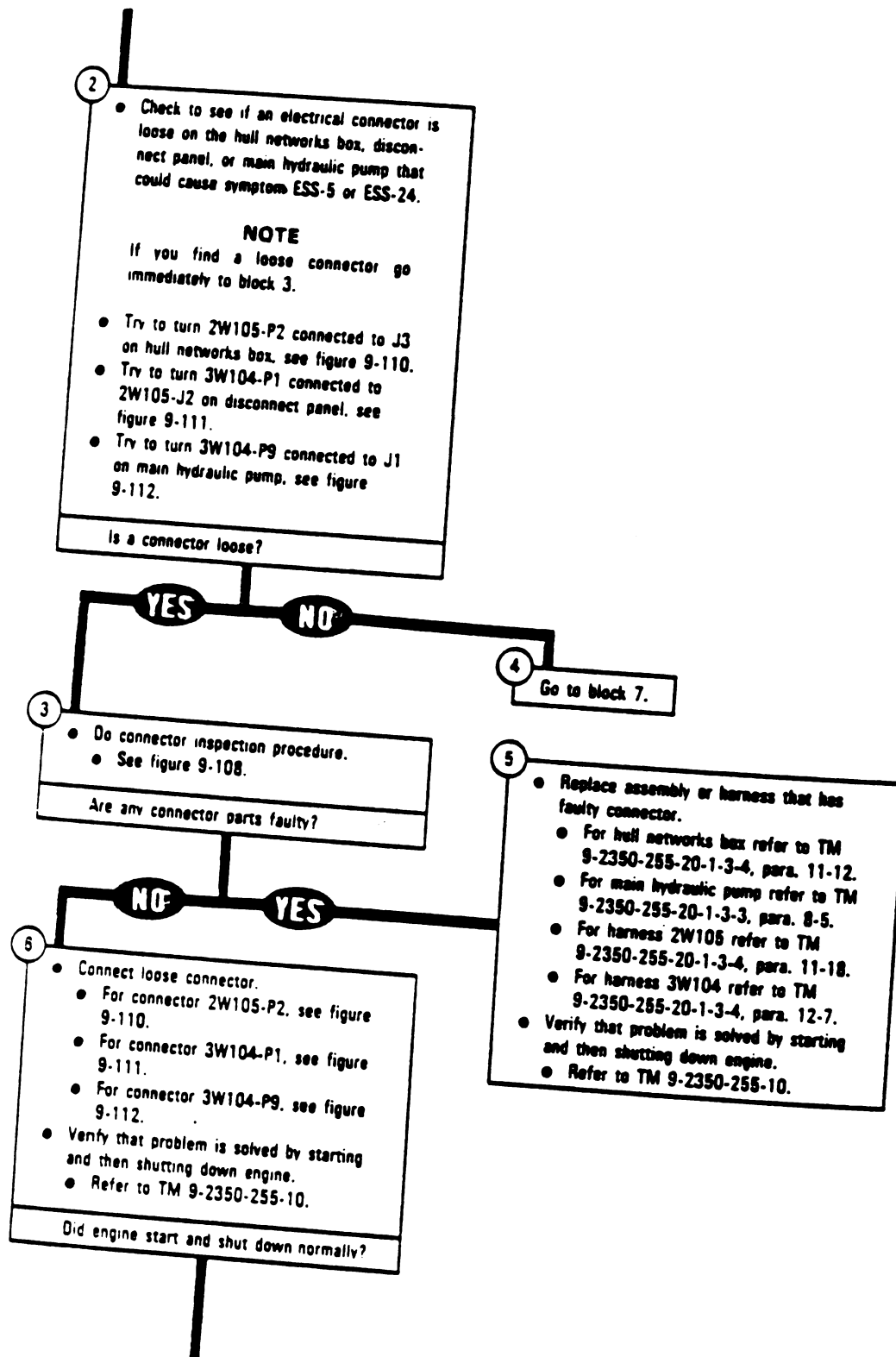


Figure 9-4 (Sheet 2 of 8)  
Volume II  
Para. 9-2

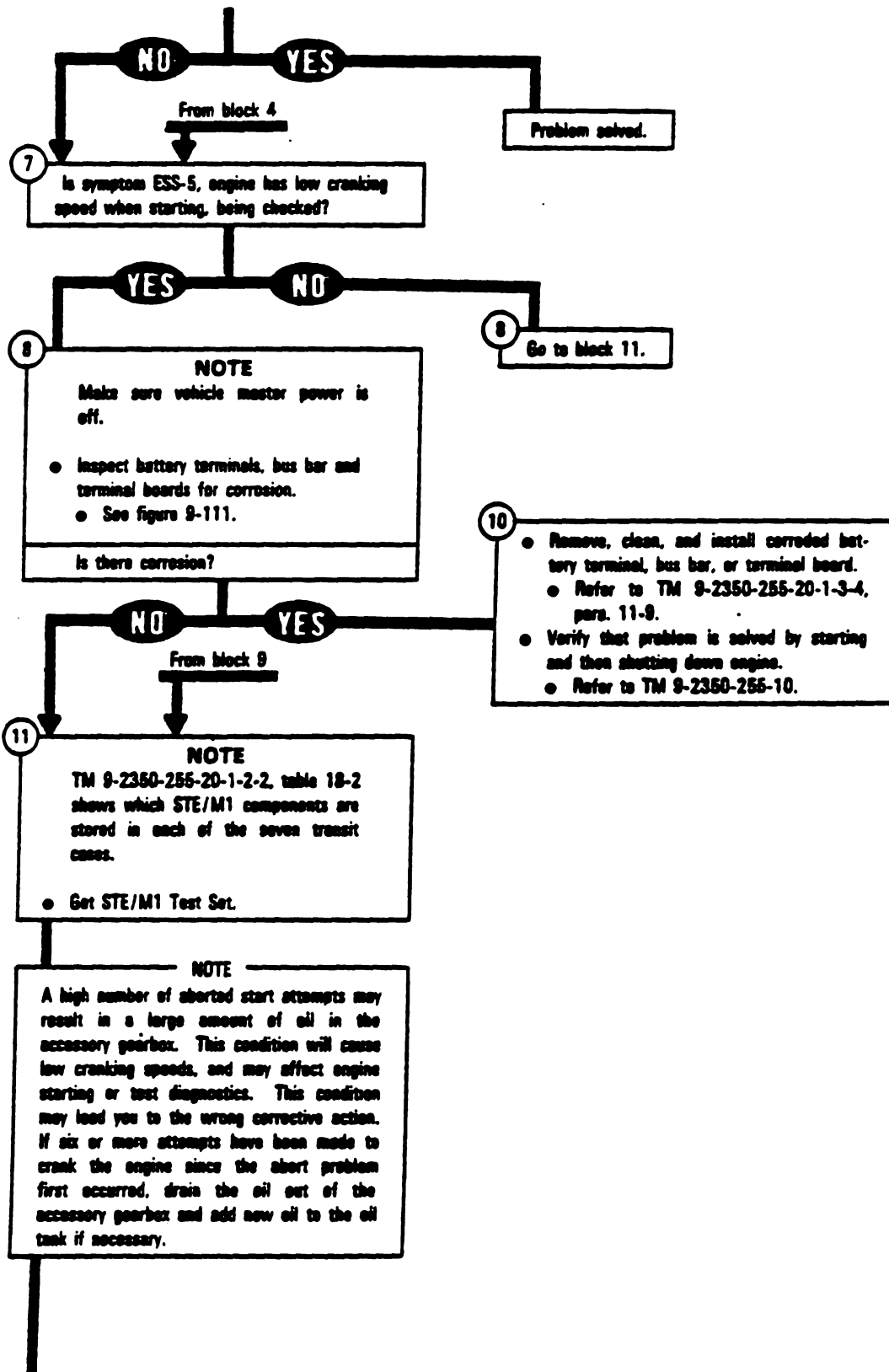
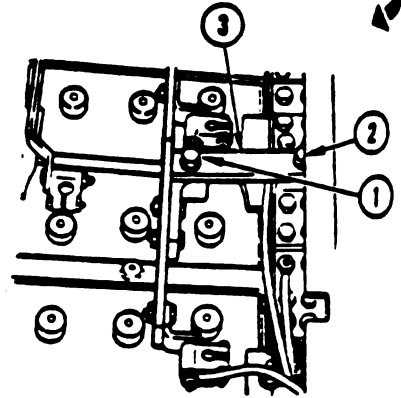
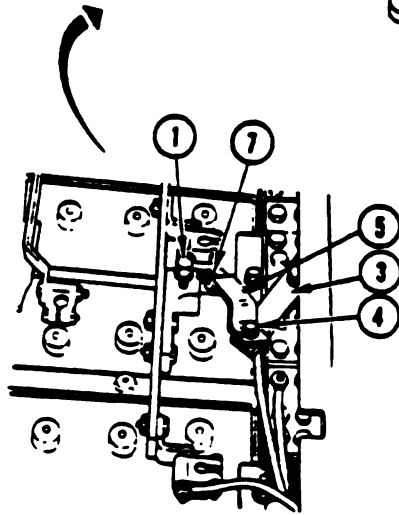
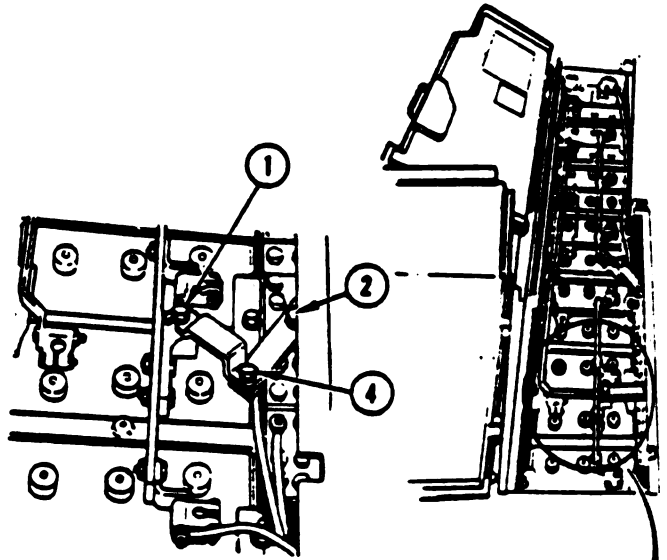
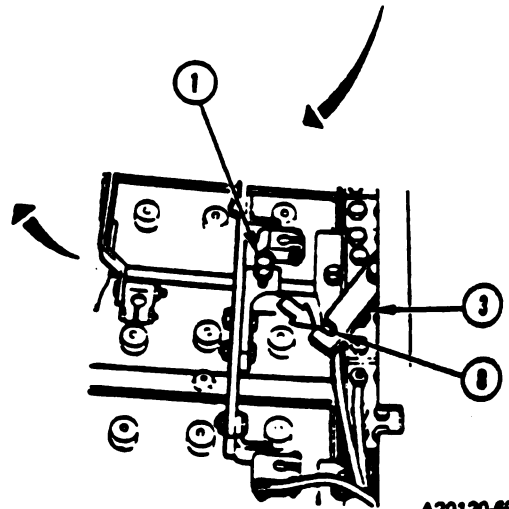


Figure 9-4 (Sheet 3 of 8)  
Volume II  
Para. 9-2

- 12
- Connect adaptor TA303.
    - Loosen two screws (1, 2) on battery ground bus bar (3) with 3/4 inch socket, extension, handle, and 3/4 inch wrench.
    - Swing bus bar(3) away from screw(1).
    - Slide bolt (4) attached to adaptor TA303 (5) into slot (6) on battery ground bus bar (3).



- Swing TA303 (5) so that screw (1) is in slot (7).
- Tighten bolt (4) with 3/4 inch socket, extension, handle, and 3/4 inch wrench.
- Tighten two screws (1, 2) with 3/4 inch socket, extension, handle, and 3/4 inch wrench.



A20120-891 R1

Figure 9-4 (Sheet 4 of 8)  
Volume II  
Para. 9-2

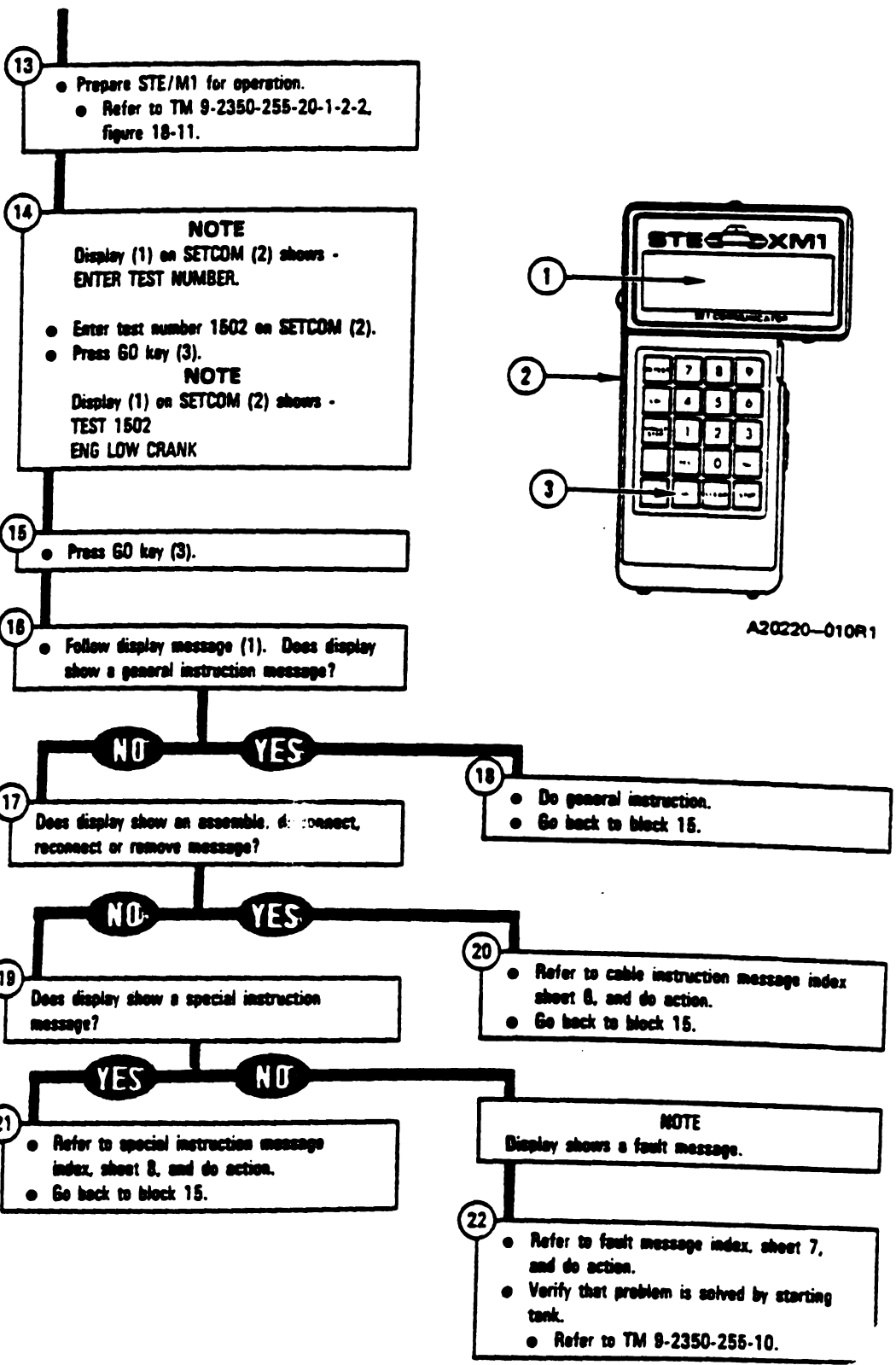


Figure 9-4 (Sheet 5 of 8)  
Volume II  
Para. 9-2

Engine System Cable Instruction Message Index for Test 1502

Cable Instruction Message	Action
ASSEMBLE TWO W4 CABLES <-> ADAPTER	<ul style="list-style-type: none"> <li>● Connect P2 on test cable W4 to end of adapter MS311E14-19 containing pins.</li> <li>● Connect P1 on other test cable W4 to end of adapter MS3119E14-19 containing sockets.</li> <li>● See figure 9-49.</li> </ul>
CONNECT CIB J1 TO DIP TJ1 (CA307)	<ul style="list-style-type: none"> <li>● Connect P1 on adapter CA307 to TJ1 on driver's instrument panel.</li> <li>● Connect P1 on CIB cable CX305 to P2 on adapter CA307.</li> <li>● Connect P2 on CIB cable CX305 to J1 on CIB.</li> <li>● See figure 9-53</li> </ul>
CONNECT CIB J1 TO HNB TJ1 (CA301)	<ul style="list-style-type: none"> <li>● Connect P1 on adapter CA301 to TJ1 on hull networks box.</li> <li>● Connect P1 on CIB cable CX305 to P2 on adapter CA301.</li> <li>● Connect P2 on CIB cable CX305 to J1 on CIB.</li> <li>● See figure 9-26.</li> </ul>
CONNECT CIB J2 TO ECU J1 (CA201)	<ul style="list-style-type: none"> <li>● Connect P2 on adapter CA201 to J1 on electronic control unit.</li> <li>● Connect P1 on CIB cable CX304 to P1 on adapter CA201.</li> <li>● Connect P2 on CIB cable CX304 to J2 on CIB.</li> <li>● See figure 9-28.</li> </ul>
CONNECT CURR PROBE <-> BATT (TA303)	<ul style="list-style-type: none"> <li>● Press handles of current probe to open probe jaws.</li> <li>● Place opened jaws of current probe on adapter link TA303 making sure that arrow on probe handle points toward negative terminal of battery.</li> <li>● See figure 9-49.</li> </ul>
CONNECT W4 <-> VTM J3	<ul style="list-style-type: none"> <li>● Connect P1 of test cable W4 to J3 on VTM.</li> <li>● See figure 9-49.</li> </ul>
CONNECT W4 CABLE TO CURRENT PROBE	<ul style="list-style-type: none"> <li>● Connect P2 of test cable W4 to J1 on current probe.</li> <li>● See figure 9-49.</li> </ul>

Figure 9-4 (Sheet 6 of 8)  
Volume II  
Para. 9-2

Engine System Fault Message Index for Test 1502

Fault Message	Action
<b>FAULTY BATTERY, BUS BARS</b> 150209	<ul style="list-style-type: none"> <li>● Do follow-on procedure.</li> <li>● See figure 9-76.</li> </ul>
<b>FAULTY BATTERY CHARGING SYS</b> 152403	<ul style="list-style-type: none"> <li>● Charge batteries.</li> <li>● Refer to TM 9-2350-255-10</li> <li>● Go back to block 14.</li> </ul>
<b>FAULTY ENGINE</b> 151405	<ul style="list-style-type: none"> <li>● Notify support maintenance that engine is faulty.</li> </ul>
<b>FAULTY HNB</b> 150206	<ul style="list-style-type: none"> <li>● Replace hull networks box.</li> <li>● Refer to TM 9-2350-255-20-1-3-4, para. 11-12.</li> </ul>
<b>FAULTY HULL POWER SYSTEM</b> 152404	<ul style="list-style-type: none"> <li>● Run hull power distribution number 1000.</li> <li>● Refer to TM 9-2350-255-20-1-2-2, figure 16-1.</li> </ul>
<b>FAULTY HYDR PUMP</b> 151404	<ul style="list-style-type: none"> <li>● Replace main hydraulic pump.</li> <li>● Refer to TM 9-2350-255-20-1-3-3, para. 8-5.</li> </ul>
<b>FAULTY HYD PUMP, 3W104, 2W105</b> 150213	<ul style="list-style-type: none"> <li>● Do follow-on procedure.</li> <li>● See figure 9-77.</li> </ul>
<b>FAULTY STARTER</b> 150210	<ul style="list-style-type: none"> <li>● Replace starter.</li> <li>● Refer to TM 9-2350-255-20-1-3-4, para. 12-5.</li> </ul>

Figure 9-4 (Sheet 7 of 8)  
Volume II  
Para. 9-2



Special Instruction Message Index for Test 1502

Special Instruction Message	Action
<p>DUMP HYDR PRESSURE</p> <p>SEE -20 MANUAL</p> <p>150211</p>	<ul style="list-style-type: none"> <li>● Operate bilge pump until hydraulic pressure gage shows zero.</li> <li>● Refer to TM 9-2350-255-10.</li> <li>● Press GO key on SETCOM.</li> <li>● Drain accessory gearbox and fill oil tank, if necessary.</li> <li>● Refer to LO 9-2350-255-12.</li> <li>● Repeat test 1502.</li> <li>● Go back to block 14.</li> </ul> <p><b>NOTE</b> If this message is seen again, do the following steps.</p> <ul style="list-style-type: none"> <li>● Remove main hydraulic pump.</li> <li>● Refer to TM 9-2350-255-20-1-3-3, para. 8-5.</li> <li>● Install cover from groundhop kit on accessory gearbox.</li> <li>● Refer to TM 9-2350-255-20-1-3-1, para. 2-4.</li> <li>● Press STOP key and CLEAR key on SETCOM.</li> <li>● Enter test number 1514 on SETCOM.</li> </ul>
<p>150215</p>	<p><b>NOTE</b> SETCOM display shows - "TEST 1514 FROM REF 150211".</p> <ul style="list-style-type: none"> <li>● Go back to block 15.</li> </ul> <p><b>NOTE</b> No faults were found.</p>
<p>150216</p>	<ul style="list-style-type: none"> <li>● If this test was run because message - "SEE -20 MANUAL 150449," notify support maintenance that engine is faulty.</li> <li>● Repeat test 1502.</li> <li>● Go back to block 14.</li> </ul> <p><b>NOTE</b> If this message is seen again, check your symptom, engine cranking speed is OK.</p>

Figure 9-4 (Sheet 8 of 8)  
Volume II  
Para. 9-2

**SYMPTOM ESS-8**

**ENGINE ABORTS START**

**Common Tools:**

- Wrench, combination, 9/16-inch
- Wrench, combination, 13/16-inch
- Wrench, combination, 3/4-inch
- Wrench, combination, 7/8-inch
- Wrench, open end, 7/8 inch

**NOTE**

Read para. 9-1 before doing any work.

**Test Equipment/Special Tools:**

- Pliers, slip joint, conduit style with plastic jaw inserts, MSN 5120-00-624-8065

**NOTE**

Do not get the following equipment until told to further on in this procedure.

- Goggles, safety
- Multimeter
- STE/M1 Test Set, 12303600

**Equipment Condition:**

- Tank parked.
- Parking brake set.
- Vehicle master power off.

**NOTE**

This is a two-man job. Soldier A is responsible for completing the job. Soldier B is the assistant and is directed by Soldier A. Soldier B will only be used in blocks 10, 13, 18, 21, and 24.

1

- Set up tank controls for standard initial test conditions.
- Refer to table 9-2 at the end of this chapter.

Figure 9-5 (Sheet 1 of 20)  
Volume II-  
Para. 9-2

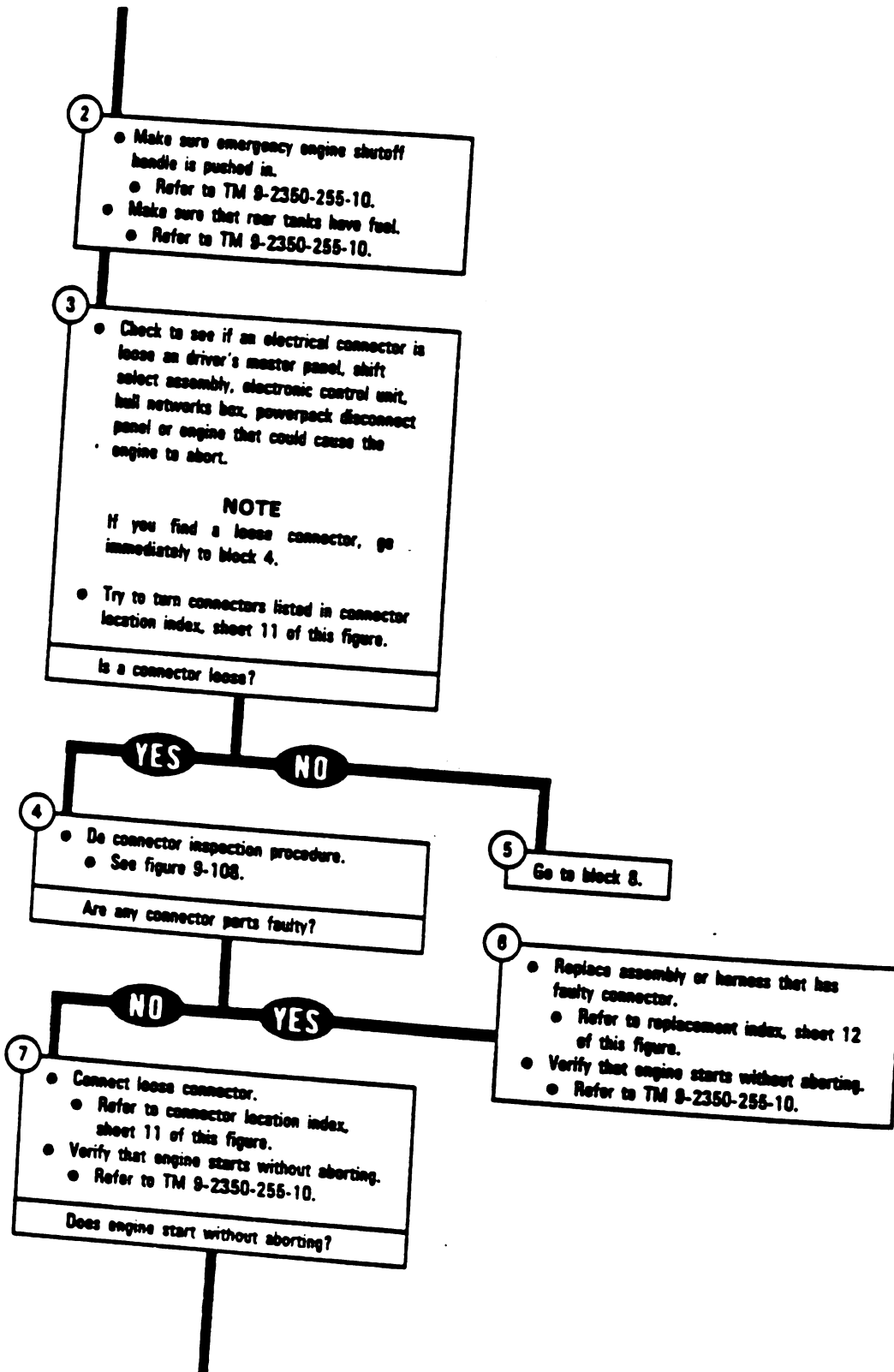


Figure 9-5 (Sheet 2 of 20)  
Volume II  
Para. 9-2

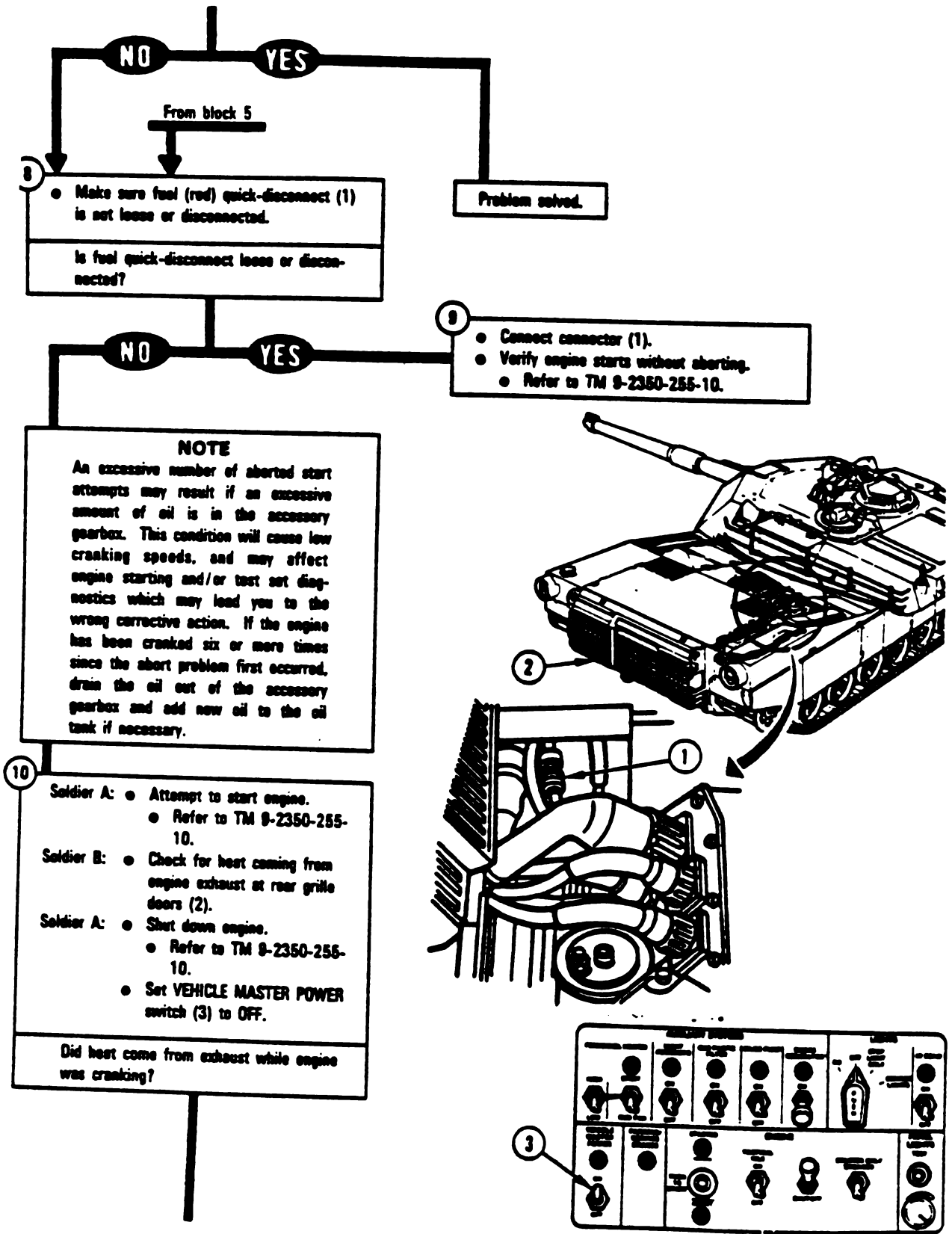
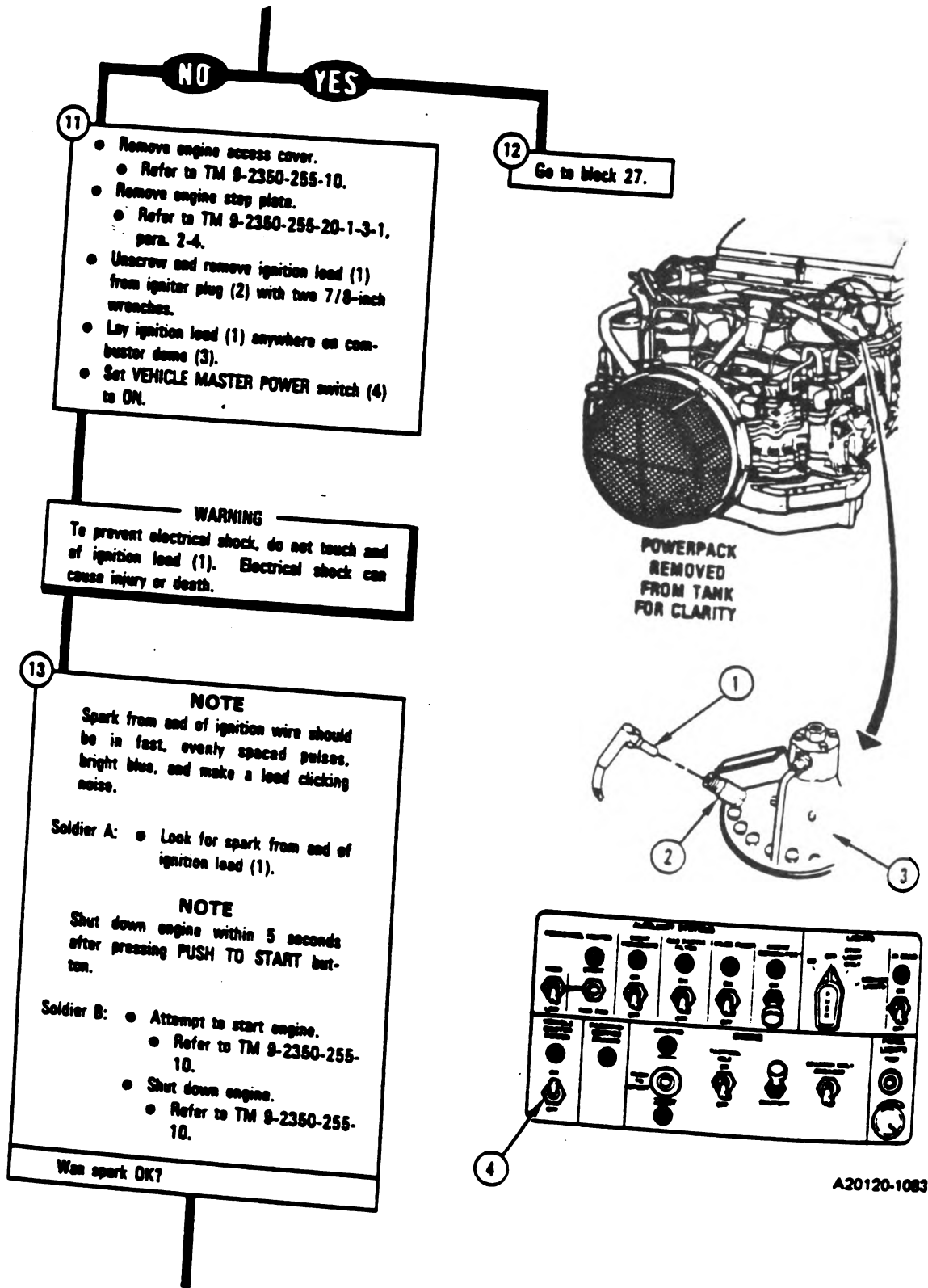


Figure 9-5 (Sheet 3 of 20)  
Volume II  
Para. 9-2

A20120-1077

**TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING**



- 11**
- Remove engine access cover.
  - Refer to TM 9-2350-255-10.
  - Remove engine stop plate.
  - Refer to TM 9-2350-255-20-1-3-1, para. 2-4.
  - Unscrew and remove ignition lead (1) from igniter plug (2) with two 7/8-inch wrenches.
  - Lay ignition lead (1) anywhere on combustor dome (3).
  - Set VEHICLE MASTER POWER switch (4) to ON.

**WARNING**  
To prevent electrical shock, do not touch end of ignition lead (1). Electrical shock can cause injury or death.

**13**

**NOTE**  
Spark from end of ignition wire should be in fast, evenly spaced pulses, bright blue, and make a lead clicking noise.

**Soldier A:**

- Look for spark from end of ignition lead (1).

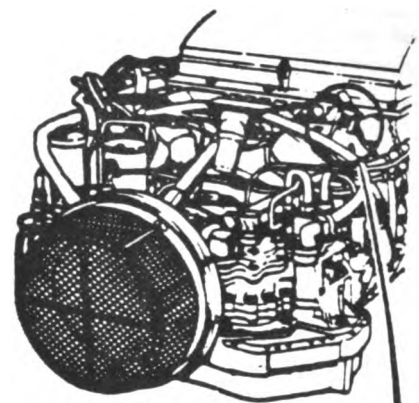
**NOTE**  
Shut down engine within 5 seconds after pressing PUSH TO START button.

**Soldier B:**

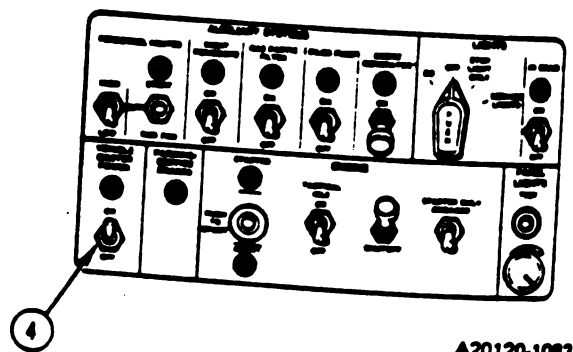
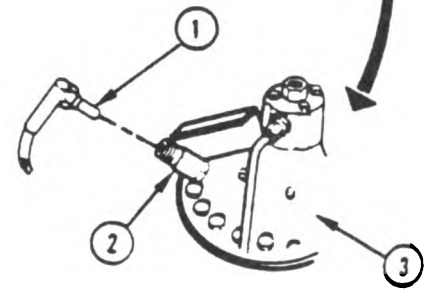
- Attempt to start engine.
- Refer to TM 9-2350-255-10.
- Shut down engine.
- Refer to TM 9-2350-255-10.

Was spark OK?

**12**  
Go to block 27.



POWERPACK REMOVED FROM TANK FOR CLARITY



A20120-1083

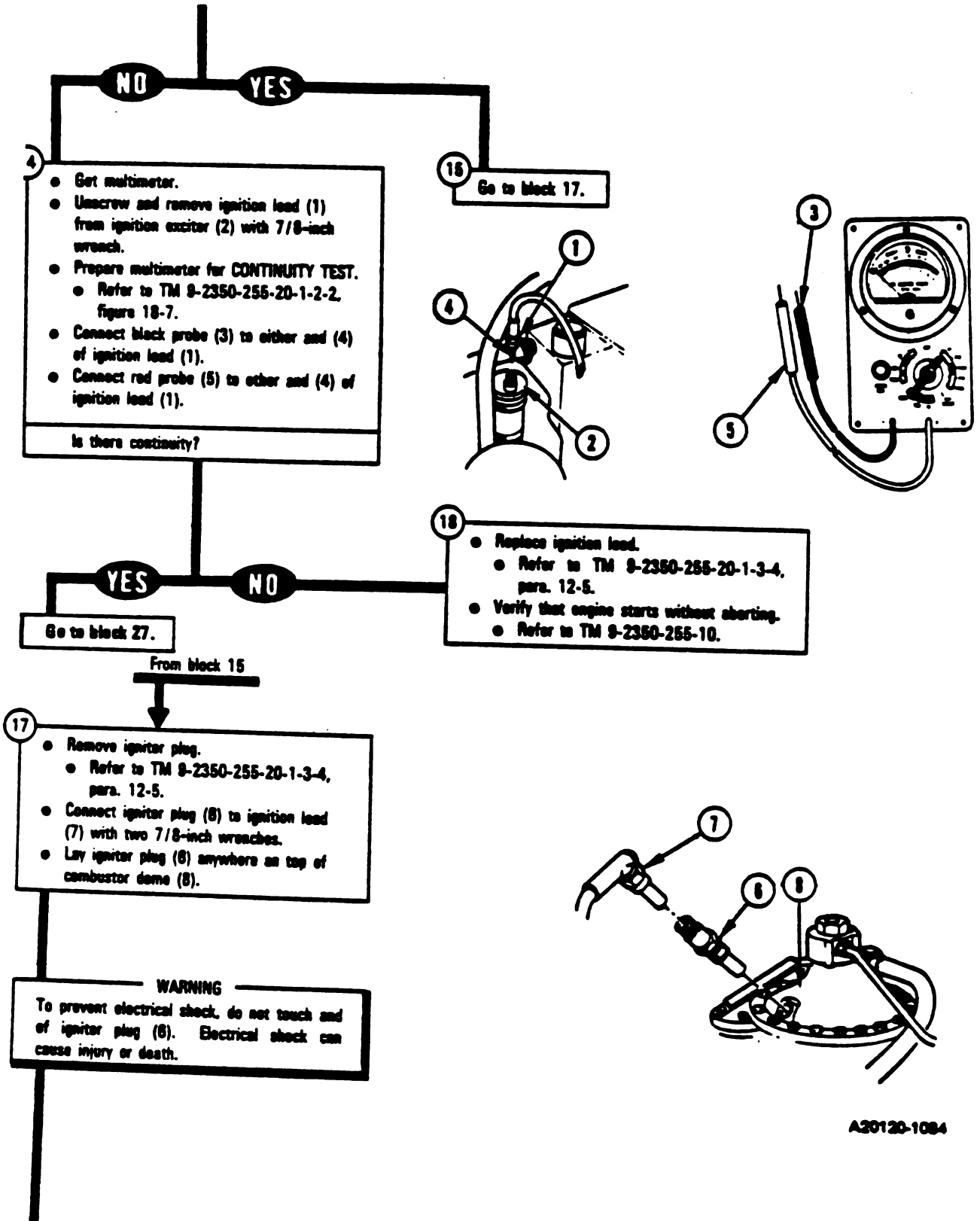


Figure 9-5 (Sheet 5 of 20)  
Volume II  
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18

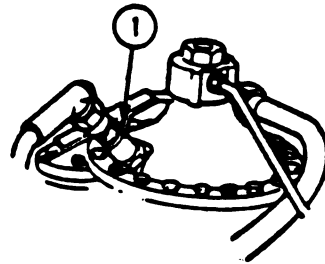
**NOTE**  
Spark from end of igniter plug should be in fast, evenly spaced pulses, bright blue, and make a loud clicking noise.

Soldier A: ● Look for spark from end of igniter plug (1).

**NOTE**  
Shut down engine within 5 seconds after pressing PUSH TO START button.

Soldier B: ● Attempt to start engine.  
● Refer to TM 9-2350-255-10.  
● Shut down engine.  
● Refer to TM 9-2350-255-10.

Was spark OK?



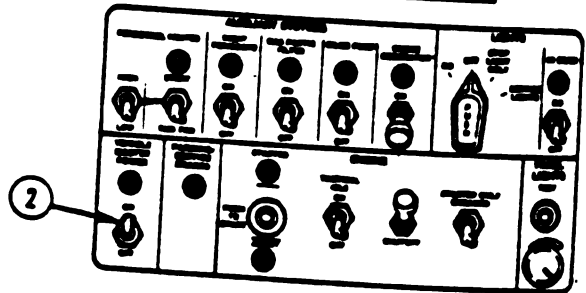
20

**YES** **NO**

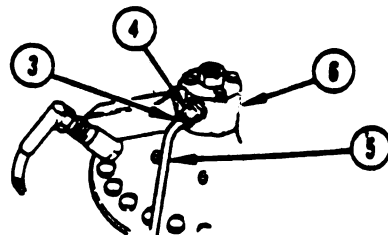
- Set VEHICLE MASTER POWER switch (2) to OFF.
- Install igniter plug and ignition lead.
- Refer to TM 9-2350-255-20-1-3-4, para. 12-5.
- Unscrew and take off tube nut (3) from adapter (4) with 9/16-inch and 3/16-inch wrenches.
- Pull tube (5) away from fuel nozzle (6).
- Place a container under open end of tube (5) to catch fuel.

19

- Replace igniter plug.
- Refer to TM 9-2350-255-20-1-3-4, para. 12-5.
- Verify that engine starts without aborting.
- Refer to TM 9-2350-255-10.



**WARNING**  
A fire extinguisher must be on hand in case of fire.



A20120-1085

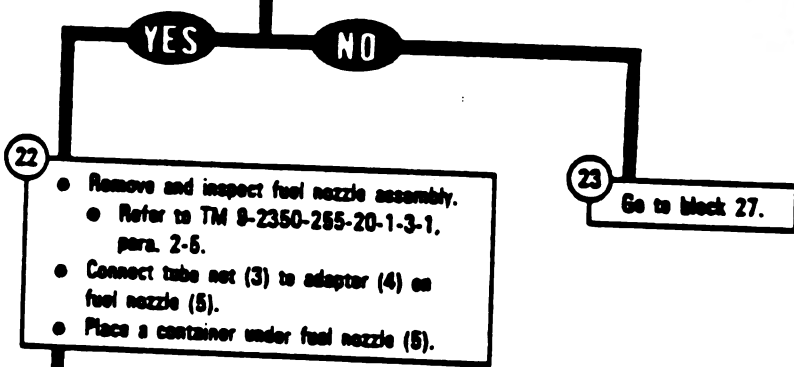
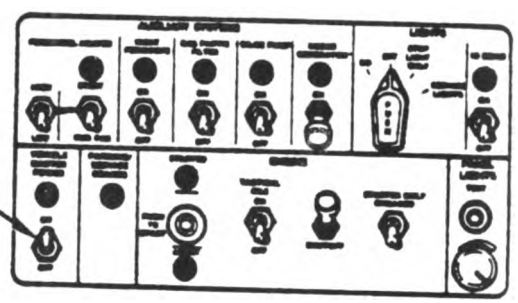
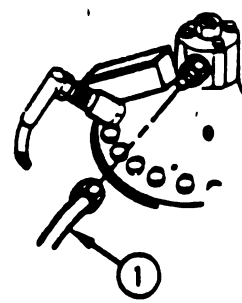
Figure 9-5 (Sheet 6 of 20)  
Volume II  
Para. 9-2

1) Soldier A: ● Look for fuel flow from tube (1).

**NOTE**  
Shut down engine within 5 seconds after pressing PUSH TO START switch.

Soldier B: ● Attempt to start engine.  
● Refer to TM 9-2350-255-10.  
● Shut down engine.  
● Refer to TM 9-2350-255-10.  
● Set VEHICLE MASTER POWER switch (2) to OFF.

Did fuel flow into container?



**WARNING**  
Make sure that you wear safety goggles when doing the steps in the following block. Fuel spray could cause serious eye injury.

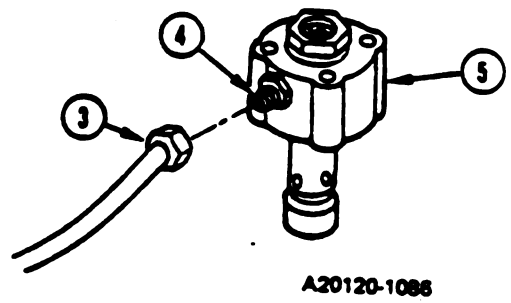
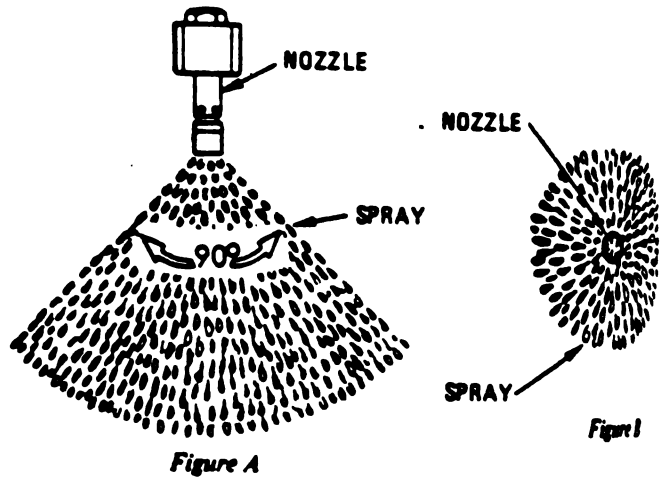


Figure 9-5 (Sheet 7 of 20)  
Volume II  
Para. 9-2



**TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING**

**NOTE**  
Fuel spray pattern from the fuel nozzle should look like a cone with a 90° angle when seen from the side as in figure A, and spray in all directions when seen from the top as in figure B.

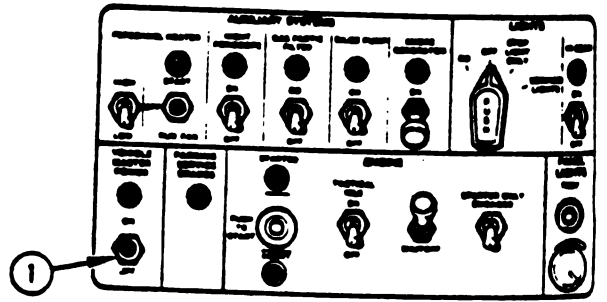


24 Soldier A: ● Look at spray pattern from fuel nozzle.

**NOTE**  
Shut down engine within 5 seconds after pressing PUSH TO START button.

Solder B: ● Attempt to start engine.  
● Refer to TM 9-2350-255-10.  
● Shut down engine.  
● Refer to TM 9-2350-255-10.  
● Set VEHICLE MASTER POWER switch (1) to OFF.

Was spray pattern OK?



A20120-1087

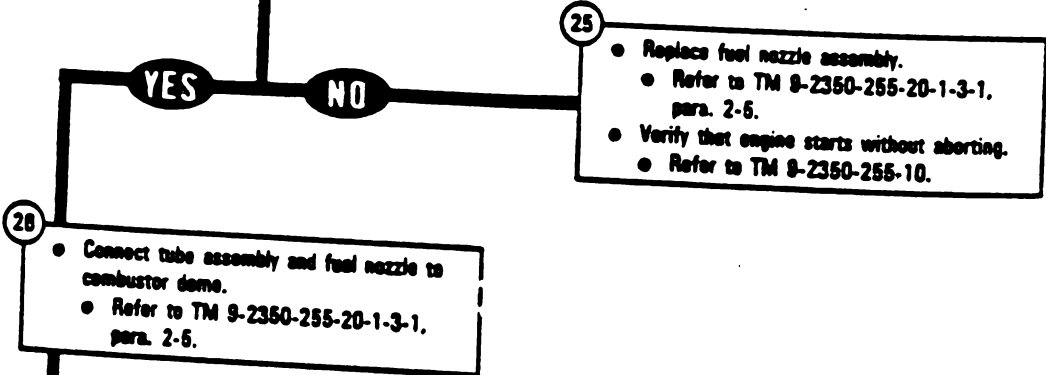


Figure 9-5 (Sheet 8 of 20)  
Volume II  
Para. 9-2

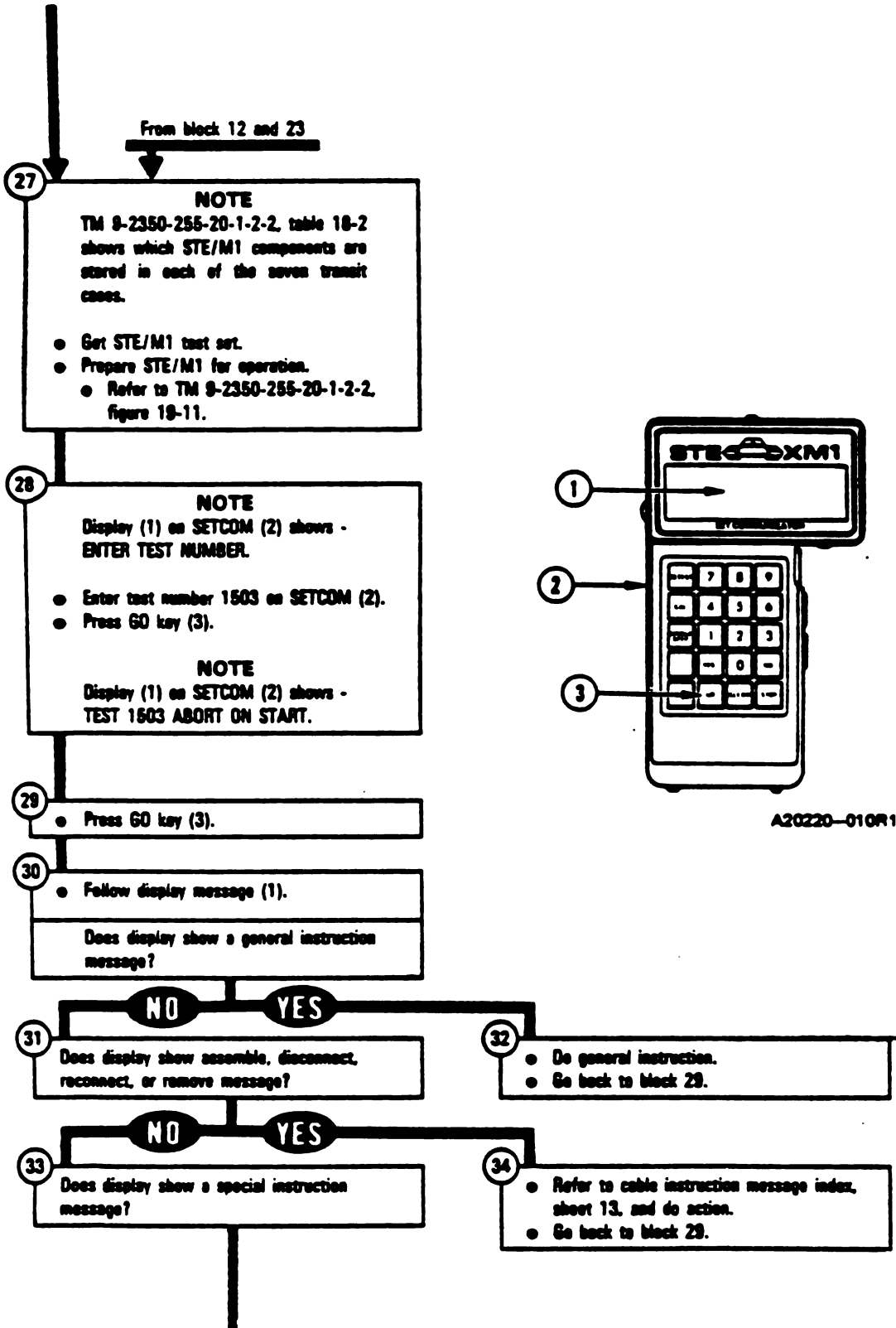
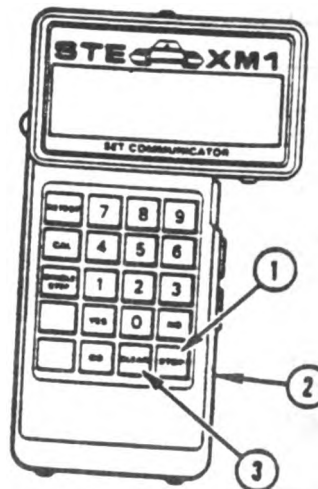
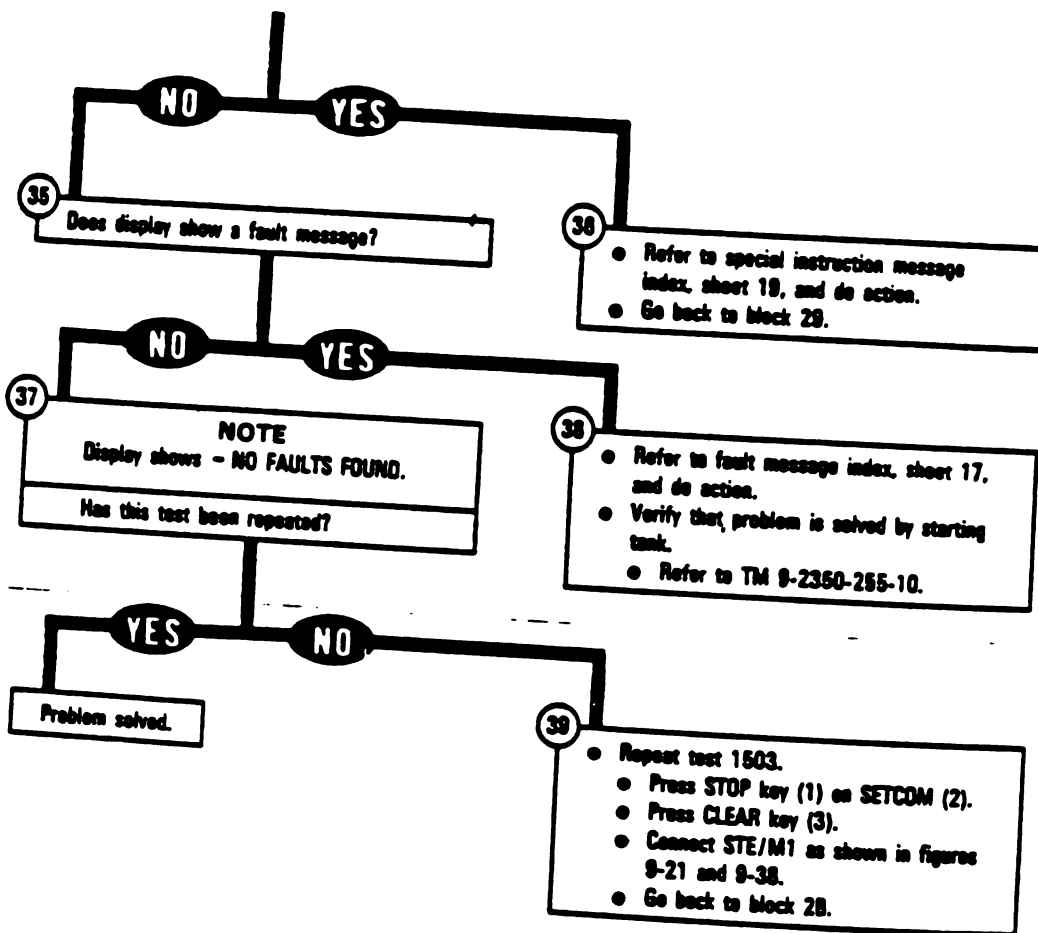


Figure 9-5 (Sheet 9 of 20)  
Volume 11  
Para. 9-2

TM 9-2350-255-20-1-2.1  
ENGINE SYSTEM TROUBLESHOOTING



A20220-011R1

Figure 9-5 (Sheet 10 of 20)  
Volume II  
Para. 9-2

**Connector Location Index**

Harness Connector	Connects To	Figure
2W104-P3	J1 on driver's master	9-109
2W104-P8	J1 on rotary variable differential transformer	9-109
2W105-P5	J3 on electronic control unit	9-110
2W114-P1	J2 on electronic control unit	9-110
2W115-P1	J4 on electronic control unit	9-110
2W105-P4	J1 on harness 2W104	9-110
2W106-P2	J1 on harness 2W107	9-110
2W104-P1	J8 on hull networks box	9-110
2W105-P1	J2 on hull networks box	9-110
2W105-P2	J3 on hull networks box	9-110
2W107-P1	J1 on hull networks box	9-110
3W104-P1	2W105-J2 on powerpack disconnect panel	9-111
3W107-P2	2W107-J2 on powerpack disconnect panel	9-111
3W105-P32	2W114-J1 on powerpack disconnect panel	9-111
3W106-P3	2W115-J1 on powerpack disconnect panel	9-111
3W104-P9	J1 on hydraulic pump	9-112
3W105-P37	J37 on harness 3W105-1	9-112
3W105-P33	J33 on electromechanical fuel unit	9-112
3W108	Thermocouple assembly (3)	9-112
3W107-P16	J16 on ignition exciter	9-112
2W107-P30	J30 on low oil pressure switch	9-112

*Figure 9-5 (Sheet 11 of 20)*  
**Volume 41**  
**Para. 9-2**

**TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING**

**Replacement Index**

Assembly or Harness	TM 9-2350-255-20	Para.	C M
2W104, 2W105, 2W106, 2W107, 2W114 or 2W115	1-3-4	11-18	AS AN
3W104, 3W105, 3W105-1, 3W106 or 3W107	1-3-4	12-7	AS C.
Driver's master panel	1-3-4	11-15	C T
Electromechanical fuel system	1-3-1	2-5	C T
Electronic control unit	1-3-4	11-13	C T
Oil pressure switch	1-3-4	12-6	C T
Hull networks box	1-3-4	11-12	C T
Main hydraulic pump	1-3-3	8-5	C T
Ignition exciter	1-3-4	12-5	C T
Rotary variable differential transformer	1-3-2	6-4	C T
Thermocouple assembly*			

\*Notify support maintenance that the thermocouple assembly is faulty.

*Figure 9-5 (Sheet 12 of 20)  
Volume II  
Para. 9-2*

**9-44 Change 3**

**Engine System Cable Instruction Message Index for Test 1503**

Cable Instruction Message	Action
11. ASSEMBLE CX 305 D CX201	<ul style="list-style-type: none"> <li>● Connect P1 on CIB cable CX305 to P1 on CX201.</li> <li>● See figure 9-43.</li> </ul>
12. ASSEMBLE TWO W4 BLES <- -> ADAPTER	<ul style="list-style-type: none"> <li>● Connect P2 on cable W4 to end of adapter MS3119E14-19 containing pins.</li> <li>● Connect P1 on other cable W4 to end of adapter MS3119E14-19 containing sockets.</li> <li>● See figure 9-23.</li> </ul>
13. CHECK OK, DISCONNECT TA202 <- -> CX201	<ul style="list-style-type: none"> <li>● Disconnect shorting plug TA202 from DBA CX201.</li> <li>● See figure 9-40.</li> </ul>
14. CONNECT BLK PROBE TO J4 CONNECTOR SHELL	<ul style="list-style-type: none"> <li>● Connect TA1 alligator clip on black probe E2 to shell of connector J4 on electronic control unit.</li> <li>● See figure 9-42.</li> </ul>
15. CONNECT BLK PROBE TO W115 P1 PIN A	<ul style="list-style-type: none"> <li>● Connect black probe on cable W2 to TA1 test probe on socket A of 2W115-P1.</li> <li>● See figure 9-41.</li> </ul>
16. CONNECT BLK PROBE TO W115P1 PIN C	<ul style="list-style-type: none"> <li>● Connect black probe with TA1 test probe attached to socket C of 2W115-P1.</li> <li>● See figure 9-41.</li> </ul>
17. CONNECT CX305 P2 TO CIB J1	<ul style="list-style-type: none"> <li>● Connect P2 on CIB cable CX305 to J1 on CIB.</li> <li>● See figure 9-22.</li> </ul>
18. CONNECT CIB J1 TO CX201	<ul style="list-style-type: none"> <li>● Disconnect P1 on CIB cable CX305 from P2 on adapter CX307, if connected.</li> <li>● See figure 9-53.</li> <li>● Connect P2 on CIB cable CX305 to J1 on CIB.</li> <li>● Connect P1 on CIB cable CX305 to P1 on DBA CX201.</li> <li>● See figure 9-40.</li> </ul>
19. CONNECT CIB J1 ( CX305 ) DIP TJ1 (CA307)	<ul style="list-style-type: none"> <li>● Connect P1 on adapter CA307 to TJ1 on driver's instrument panel.</li> <li>● Connect P1 on CIB cable CX305 to P2 on adapter CA307.</li> <li>● Connect P2 on CIB cable CX305 to J1 on CIB.</li> <li>● See figure 9-53.</li> </ul>

*Figure 9-5 (Sheet 13 of 20)*  
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Change 6 9-45

**TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING**

**Engine System Cable Instruction Message Index for Test 1503 (Continued)**

Cable Instruction Message	Action
CONNECT CIB J2 (CX304) To ECU J1 (CA201)	<ul style="list-style-type: none"> <li>● Connect P2 on adapter CA201 to J1 on electronic control unit.</li> <li>● Connect P1 on CIB cable CX304 to P1 on adapter CA201.</li> <li>● Connect P2 on CIB cable CX304 to J2 on CIB.</li> <li>● See figure 9-28.</li> </ul>
CONNECT CX201 ←→ ECU J2	<ul style="list-style-type: none"> <li>● Connect P3 on DBA CX201 to J2 on electronic control unit.</li> <li>● See figure 9-43.</li> </ul>
CONNECT CX201 ←→ 2W114P1	<ul style="list-style-type: none"> <li>● Connect P2 on DBA CX201 to 2W114-P1.</li> <li>● See figure 9-40.</li> </ul>
CONNECT DBA BETWEEN 2W114 ←→ ECU J2	<p>If 2W114-P1 and TA202 are connected to CX201:</p> <ul style="list-style-type: none"> <li>● Take off TA202 from P3 on CX201.</li> <li>● See figure 9-40.</li> <li>● Connect P3 on CX201 to J2 on electronic control unit.</li> <li>● See figure 9-43.</li> </ul> <p>If 2W114-P1 and TA202 are not connected to CX201:</p> <ul style="list-style-type: none"> <li>● Connect 2W114-P1 to P2 on CX201.</li> <li>● Connect P3 on CX201 to J2 on electronic control unit.</li> <li>● See figure 9-43.</li> </ul>
CONNECT FLOW METER INTO FUEL LINE	<ul style="list-style-type: none"> <li>● Take off engine fuel quick-disconnect coupling from fuel-water separator.</li> <li>● Connect TA608 flowmeter between engine fuel quick-disconnect coupling and fuel-water separator.</li> <li>● See figure 9-44.</li> </ul>
CONNECT RED PROBE TO BLACK PROBE	<ul style="list-style-type: none"> <li>● Touch red probe with black probe for several seconds to zero the meter.</li> </ul>
CONNECT RED PROBE TO 2W115P1 PIN B	<ul style="list-style-type: none"> <li>● Connect red probe on cable W2 to TA1 test probe on socket B of 2W115-P1.</li> <li>● See figure 9-41.</li> </ul>
CONNECT RED XDUCER TO VTM W4 CABLE	<ul style="list-style-type: none"> <li>● Connect P2 on VTM cable W4 to 25 psi transducer.</li> <li>● See figure 9-39.</li> </ul>
CONNECT RED XDUCER & TA302 AT FSA INLET	<ul style="list-style-type: none"> <li>● Remove cap. on fuel inlet tee with 7/8 inch wrench.</li> <li>● Connect adapter TA302 to fuel inlet tee with 3/4 inch and 7/8 inch wrenches.</li> <li>● Connect 25 psi transducer (red) to adapter TA302 with 3/4 inch wrench.</li> <li>● See figure 9-39.</li> </ul>
CONNECT TA202 ←→ CX201	<ul style="list-style-type: none"> <li>● Connect shorting plug TA202 to P3 on DBA CX201.</li> <li>● See figure 9-40.</li> </ul>
CONNECT W2 PROBES TO VTM J4	<ul style="list-style-type: none"> <li>● Connect P1 on test probe cable W2 to J4 on VTM.</li> <li>● Connect TA1 test probe to red probe on VTM cable W2.</li> <li>● Connect TA1 test probe to black probe on VTM cable W2.</li> <li>● See figure 9-41.</li> </ul>

*Figure 9-5 (Sheet 14 of 20)*  
Volume II  
Para. 9-2

Engine System Cable Instruction Message Index for Test 1503 (Continued)

Cable Instruction Message	Action
CONNECT W4 CABLE TO FLOWMETER (CX606)	<ul style="list-style-type: none"> <li>● Connect P2 on VTM cable W4 to P1 on CX606.</li> <li>● Connect P2 on CX606 to flowmeter.                             <ul style="list-style-type: none"> <li>● See figure 9-44.</li> </ul> </li> </ul>
CONNECT VTM J3	<ul style="list-style-type: none"> <li>● Connect P1 on VTM cable W4 to J3 on VTM.                             <ul style="list-style-type: none"> <li>● See figure 9-23.</li> </ul> </li> </ul>
CONNECT CIB J2 (CX304) TO W105 P5 (CA205)	<ul style="list-style-type: none"> <li>● Connect P1 on adapter CA205 to 2W105-P5.</li> <li>● Connect P2 on CIB cable CX304 to J2 on CIB.</li> <li>● Connect P1 on CIB cable CX304 to P2 on adapter CA205.                             <ul style="list-style-type: none"> <li>● See figure 9-25.</li> </ul> </li> </ul>
CONNECT W101 <-> ECU J2	<ul style="list-style-type: none"> <li>● Disconnect CX201-P3 from J2 on electronic control unit.                             <ul style="list-style-type: none"> <li>● See figure 9-43.</li> </ul> </li> </ul>
CONNECT PRESSURE TRANSDUCER	<ul style="list-style-type: none"> <li>● Take off 25 psi transducer from adapter TA302 with 3/4 inch wrench.</li> <li>● Take off 25 psi transducer from P2 on VTM cable W4.</li> <li>● Remove adapter TA302 from fuel inlet tee with 3/4 inch and 7/8 inch wrenches.</li> <li>● Reconnect cap on fuel inlet tee with 7/8 inch wrench.                             <ul style="list-style-type: none"> <li>● See figure 9-39.</li> </ul> </li> </ul>
CONNECT W202 <-> CX 201	<ul style="list-style-type: none"> <li>● Disconnect shorting plug TA202 from DBA CX201.                             <ul style="list-style-type: none"> <li>● See figure 9-40.</li> </ul> </li> </ul>
CONNECT W104 <-> TCNTL	<ul style="list-style-type: none"> <li>● Disconnect 2W104-P8 from J1 on rotary variable differential transformer.                             <ul style="list-style-type: none"> <li>● See figure 9-109.</li> </ul> </li> </ul>
CONNECT W105P5 <-> ECU J3	<ul style="list-style-type: none"> <li>● Disconnect 2W105-P5 from J3 on electronic control unit.                             <ul style="list-style-type: none"> <li>● See figure 9-110.</li> </ul> </li> </ul>
CONNECT W2W114 <-> ECU J2	<ul style="list-style-type: none"> <li>● Disconnect 2W114-P1 from J2 on electronic control unit.                             <ul style="list-style-type: none"> <li>● See figure 9-110.</li> </ul> </li> </ul>
CONNECT W115 <-> ECU J4	<ul style="list-style-type: none"> <li>● Disconnect 2W115-P1 from J4 on electronic control unit.                             <ul style="list-style-type: none"> <li>● See figure 9-110.</li> </ul> </li> </ul>
CONNECT W105 <-> EMFS	<ul style="list-style-type: none"> <li>● Disconnect 3W105-P33 from J33 on electromechanical fuel system.                             <ul style="list-style-type: none"> <li>● See figure 9-112, sheet 1.</li> </ul> </li> </ul>

Figure 9-5 (Sheet 15 of 20)  
Volume II  
Para. 9-2



**TM 9-2350-255-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING**

**Engine System Cable Instruction Messages Index for Test 1503 (Continued)**

Cable Instruction Message	Action
DISCONNECT 3W107 P8 FROM OIL LVL SW	<ul style="list-style-type: none"> <li>● Disconnect 3W107-P8 from J8 on oil level switch.</li> <li>● See figure 9-112, sheet 2.</li> </ul>
DISCONNECT 3W107 P30 & ENG OIL PRESS SW	<ul style="list-style-type: none"> <li>● Disconnect 3W107-P30 from J30 on engine low oil pressure switch.</li> <li>● See figure 9-112, sheet 2.</li> </ul>
INSERT 20P PINS IN 2W115 P1 A, B	<ul style="list-style-type: none"> <li>● Put TA1 test probe (20GA) into socket A of 2W115-P1.</li> <li>● Put TA1 test probe (20GA) into socket B of 2W115-P1.</li> <li>● See figure 9-41.</li> </ul>
RECONNECT CX201 TO ECU J2	<ul style="list-style-type: none"> <li>● Take off TA202 from P3 on CX201.</li> <li>● See figure 9-40.</li> <li>● Connect P3 on CX201 to J2 on electronic control unit.</li> <li>● See figure 9-43.</li> </ul>
RECONNECT 2W114 ↔ ECU J2	<ul style="list-style-type: none"> <li>● Connect 2W114-P1 to J2 on electronic control unit.</li> <li>● See figure 9-110.</li> </ul>
RECONNECT 2W115 ↔ ECU J4	<ul style="list-style-type: none"> <li>● Connect 2W115-P1 to J4 on electronic control unit.</li> <li>● See figure 9-110.</li> </ul>
RECONNECT 3W105 ↔ EMFS	<ul style="list-style-type: none"> <li>● Connect 3W105-P33 to J33 on electromechanical fuel system.</li> <li>● See figure 9-112, sheet 1.</li> </ul>
REMOVE CX305 AND ADAPTER AT DIP TJ1	<ul style="list-style-type: none"> <li>● Take off P1 on adapter CA307 from TJ1 on driver's instrument panel.</li> <li>● Take off P1 on CIB cable CX305 from P2 on adapter CA307.</li> <li>● See figure 9-53.</li> </ul>
REMOVE CX304 AND ADAPTER AT ECU J1	<ul style="list-style-type: none"> <li>● Disconnect P1 on CIB cable CX304 from P1 on adapter CA201.</li> <li>● Disconnect P2 on adapter CA201 from J1 on electronic control unit.</li> <li>● See figure 9-28.</li> </ul>

*Figure 9-5 (Sheet 16 of 20)  
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1503 (Continued)

Engine System Fault Message Index for Test 1503

Fault Message		Action	
oil level switch	FAULTY BATTERY/ CHARGING SYS 150308	<ul style="list-style-type: none"> <li>● Charge batteries.</li> <li>● Refer to TM 9-2350-255-10.</li> <li>● Go back to block 39.</li> </ul>	
	150316		
	152403		
engine low	FAULTY DIP OR LAMP GROUP 150421	<ul style="list-style-type: none"> <li>● Do follow-on procedure.</li> <li>● See figure 9-80.</li> <li>● Do follow-on procedure.</li> <li>● See figure 9-82.</li> </ul>	
	150425		
A of 2W113 B of 2W113	FAULTY ECU 150309 150350	<ul style="list-style-type: none"> <li>● Replace electronic control unit.</li> <li>● Refer to TM 9-2350-255-20-1-3-4, para. 11-13.</li> </ul>	
			150310 150351
			150323 150404
			150324 150414
			150325 150416
			150329 150429
			150333 150432
			150340 151303
control unit	150341 151305		
	150344 151306		
control unit	FAULTY ECU, 2W105 2W104 151903	<ul style="list-style-type: none"> <li>● Do follow-on procedure.</li> <li>● See figure 9-96.</li> </ul>	
mechanical	FAULTY ENG OIL LVL 150423	<ul style="list-style-type: none"> <li>● Replace engine oil float switch.</li> <li>● Refer to TM 9-2350-255-20-1-3-4, para. 12-6.</li> </ul>	
driver	FAULTY EXCITER, 3W107, 2W107, 2W105 154202	<ul style="list-style-type: none"> <li>● Do follow-on procedure</li> <li>● See figure 9-87.</li> </ul>	
adapter	FAULTY EMFS 150435 151304 150450 151307 151902	<ul style="list-style-type: none"> <li>● Replace electromechanical fuel system.</li> <li>● Refer to TM 9-2350-255-20-1-3-1, para. 2-5.</li> </ul>	
electrical	FAULTY FUEL SYSTEM 150444	<ul style="list-style-type: none"> <li>● Do follow-on procedure.</li> <li>● See figure 9-84.</li> </ul>	
SYSTEM	FAULTY HULL POWER SYSTEM 152404	<ul style="list-style-type: none"> <li>● Run power distribution test number 1000.</li> <li>● Refer to TM 9-2350-255-20-1-3-3, figure 16-1.</li> </ul>	
CABLES	FAULTY IGN EXCTR OR CABLES 150448	<ul style="list-style-type: none"> <li>● Do follow-on procedure.</li> <li>● See figure 9-86.</li> </ul>	
IGNITER	FAULTY IGNITER 150447	<ul style="list-style-type: none"> <li>● Replace igniter plug.</li> <li>● Refer to TM 9-2350-255-20-1-3-4, para. 12-5.</li> </ul>	

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Engine System Fault Message Index for Test 1503 (Continued)

Fault Message	Action
<b>FAULTY NH1 SENSOR</b> 2W114, 3W105	152602 152603 <ul style="list-style-type: none"> <li>● Do follow-on procedure.</li> <li>● See figure 9-101.</li> </ul>
<b>FAULTY NH2 SENSOR</b> 2W114, 3W105	152802 152803 <ul style="list-style-type: none"> <li>● Do follow-on procedure.</li> <li>● See figure 9-103.</li> </ul>
<b>FAULTY NH1 AND NH2</b> 2W114, 3W105	154504 154505 <ul style="list-style-type: none"> <li>● Do follow-on procedure.</li> <li>● See figure 9-106.1</li> </ul>
<b>FAULTY NOZZLE</b>	150452 <ul style="list-style-type: none"> <li>● Clean fuel nozzle.</li> <li>● Refer to TM 9-2350-255-20-1-3-1, para. 2-5.</li> </ul>
<b>FAULTY THROTTLE CONTROL</b>	150311 150317 <ul style="list-style-type: none"> <li>● Run PLA rigging test number 1523.</li> <li>● See figure 9-17.</li> <li>● Repeat test 1503.</li> <li>● Go back to block 39.</li> </ul>
<b>FAULTY THROTTLE CONTROL RVDT</b>	151907 <ul style="list-style-type: none"> <li>● Replace rotary variable differential transformer.</li> <li>● Refer to TM 9-2350-255-20-1-3-2, para. 6-4.</li> </ul>
<b>FAULTY NHSP PICKUPS OR ENGINE</b>	150337 <ul style="list-style-type: none"> <li>● Check to see if compressor speed pickups #1 and #2 are installed correctly.</li> <li>● Refer to TM 9-2350-255-20-1-3-4, para. 12-6.</li> <li>● If OK, inspect J2 on electronic control unit for damaged pins.</li> <li>● If OK, notify support maintenance that engine is faulty.</li> </ul>
<b>FAULTY STOP/START SYSTEM</b>	151704 <ul style="list-style-type: none"> <li>● Run engine test number 1501.</li> <li>● See figure 9-2.</li> </ul>
<b>FAULTY 2W114 OR 3W105</b>	151905 <ul style="list-style-type: none"> <li>● Do follow-on procedure.</li> <li>● See figure 9-97.</li> </ul>
<b>FAULTY 2W114, 3W105 OR EMFS</b>	150347 <ul style="list-style-type: none"> <li>● Do follow-on procedure.</li> <li>● See figure 9-78.</li> </ul>
153002 153003	153102 153103 <ul style="list-style-type: none"> <li>● Do follow-on procedure.</li> <li>● See figure 9-79.</li> </ul>
<b>FAULTY 2W115, 3W106 OR ENGINE</b>	152503 152504 152506 <ul style="list-style-type: none"> <li>● Do follow-on procedure.</li> <li>● See figure 9-99.</li> </ul>

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Continued

Special Instruction Message Index for Test 1503

Special Instruction Message	Action
CK FOR NOZZLE ING REF 150445	<ul style="list-style-type: none"> <li>● Remove and inspect fuel nozzle.</li> <li>● Refer to TM 9-2350-255-20-1-3-1, para. 2-5.</li> </ul>
ITION IGNITER ...	<ul style="list-style-type: none"> <li>● Press GO key on SETCOM.</li> </ul>
ARK DISPLAY 150408	<ul style="list-style-type: none"> <li>● Remove ignition lead from igniter plug.</li> <li>● Refer to TM 9-2350-255-20-1-3-4, para. 12-5.</li> </ul>
150455	<ul style="list-style-type: none"> <li>● Lay ignition lead anywhere on top of combustor dome.</li> <li>● Remove igniter plug.</li> <li>● Refer to TM 9-2350-255-20-1-3-4, para. 12-5.</li> <li>● Connect ignition lead to igniter plug.</li> <li>● Refer to TM 9-2350-255-20-1-3-4, para. 12-5.</li> <li>● Lay igniter plug on top of combustor dome in a way to assure plug is grounded.</li> </ul>
E-20 MANUAL 150331	<ul style="list-style-type: none"> <li>● Run test number 1522.</li> <li>● See figure 9-16.</li> <li>● Run test number 1523.</li> <li>● See figure 9-17.</li> <li>● Repeat engine test number 1503.</li> <li>● Go back to block 39.</li> </ul>
150335	<ul style="list-style-type: none"> <li>● Run test number 1523.</li> <li>● See figure 9-17.</li> <li>● If no adjustment was required, repeat test number 1503. If you get the same fault messages, replace electronic control unit.</li> <li>● Refer to TM 9-2350-255-20-1-3-4, para. 11-13.</li> </ul>
150354	<ul style="list-style-type: none"> <li>● Run engine test number 1501.</li> <li>● See figure 9-2.</li> </ul>
150411	<ul style="list-style-type: none"> <li>● Repeat igniter and fuel nozzle checks.</li> <li>● Go back to block 11.</li> <li>● If igniter and fuel nozzle checks are OK, replace electronic control unit.</li> <li>● Refer to TM 9-2350-255-20-1-3-4, para. 11-13.</li> </ul>
150412	<ul style="list-style-type: none"> <li>● Repeat igniter and fuel nozzle checks, then run test number 1503.</li> <li>● Go back to block 11.</li> <li>● If test 1503 ends with same fault message, replace electronic control unit.</li> <li>● Refer to TM 9-2350-255-20-1-3-4, para. 11-13.</li> </ul>
150420	<ul style="list-style-type: none"> <li>● Add oil to engine.</li> <li>● Refer to LO 9-2350-255-12, back of card 3.</li> <li>● Repeat engine test number 1503.</li> <li>● Go back to block 39.</li> </ul>
150422	<ul style="list-style-type: none"> <li>● Do follow-on procedure.</li> <li>● See figure 9-81.</li> </ul>
150426	<ul style="list-style-type: none"> <li>● Repeat engine test number 1503.</li> <li>● Go back to block 39.</li> <li>● If test 1503 ends with same fault message, notify support maintenance that engine is faulty.</li> </ul>

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Special Instruction Message Index for Test 1503 (Continued)

Special Instruction Message	Action
SEE -20 MANUAL 150428	<ul style="list-style-type: none"> <li>● Run engine test number 1502.</li> <li>● See figure 9-4.</li> </ul>
150431	<ul style="list-style-type: none"> <li>● Test results indicate there is nothing wrong with the system.</li> </ul>
150451	<ul style="list-style-type: none"> <li>● You may have an intermittent problem. If engine is still not running, repeat engine test number 1503.</li> <li>● Go back to block 39.</li> </ul>
150441	<ul style="list-style-type: none"> <li>● Do follow-on procedure.</li> <li>● See figure 9-83.</li> </ul>
150449	<ul style="list-style-type: none"> <li>● Drain oil from accessory gearbox and fill oil tank if necessary.</li> <li>● Refer to LO 9-2350-255-12, card 3 of 9.</li> <li>● Press STOP key on SETCOM.</li> <li>● Press CLEAR key on SETCOM.</li> </ul>
	<ul style="list-style-type: none"> <li>● If more than 2 quarts of oil were drained, repeat test 1503.</li> <li>● Go back to block 28.</li> <li>● If this fault message is seen again, notify support maintenance that engine is faulty.</li> </ul>
	<ul style="list-style-type: none"> <li>● If less than 2 quarts of oil were drained, run test 1502.</li> <li>● See figure 9-4.</li> <li>● If test 1502 ends with message - "SEE -20 MANUAL 150215," notify support maintenance that engine is faulty.</li> </ul>
152107	<ul style="list-style-type: none"> <li>● Run engine test number 1501.</li> <li>● See figure 9-2.</li> </ul>

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1503 (Continued)

PTOMS ESS-7, ESS-9, ESS-10, ESS-11, AND ESS-15

2.

ENGINE ABORT OR START LIGHT FOUND  
FAULTY DURING TANK OPERATION

nothing wrong with  
problem. If engine  
number 1503.

NOTE

Read para. 9-1 before doing any work.

Test Equipment/Special Tools:

- Pliers, slip joint, conduit style with plastic jaw inserts, NSN 5120-00-024-0085

NOTE

Do not get the following equipment until told to further on in this procedure.

- STE/M1 Test Set, 12303800

x and fill oil tank  
ard 3 of 9.

drained, repeat

in, notify support

ined, run test

"SEE -20 MAN  
ance that engine

Equipment Condition:

- Tank parked.
- Parking brake set.
- Engine shut down.
- Vehicle master power off.

- Set up tank controls for standard initial test conditions.
- Refer to table 9-2 at the end of this chapter.

2

- Check to see if an electrical connector is loose on driver's master panel, electronic control unit, ball networks box, or bracket that could cause symptoms ESS-7, 9 through 11 or ESS-15.

NOTE

If you find a loose connector, go immediately to block 3.

- Try to turn 2W104-P3, connected to J1 on driver's master panel. See figure 9-109.

Figure 9-6 (Sheet 1 of 6)  
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Para. 9-2

TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING

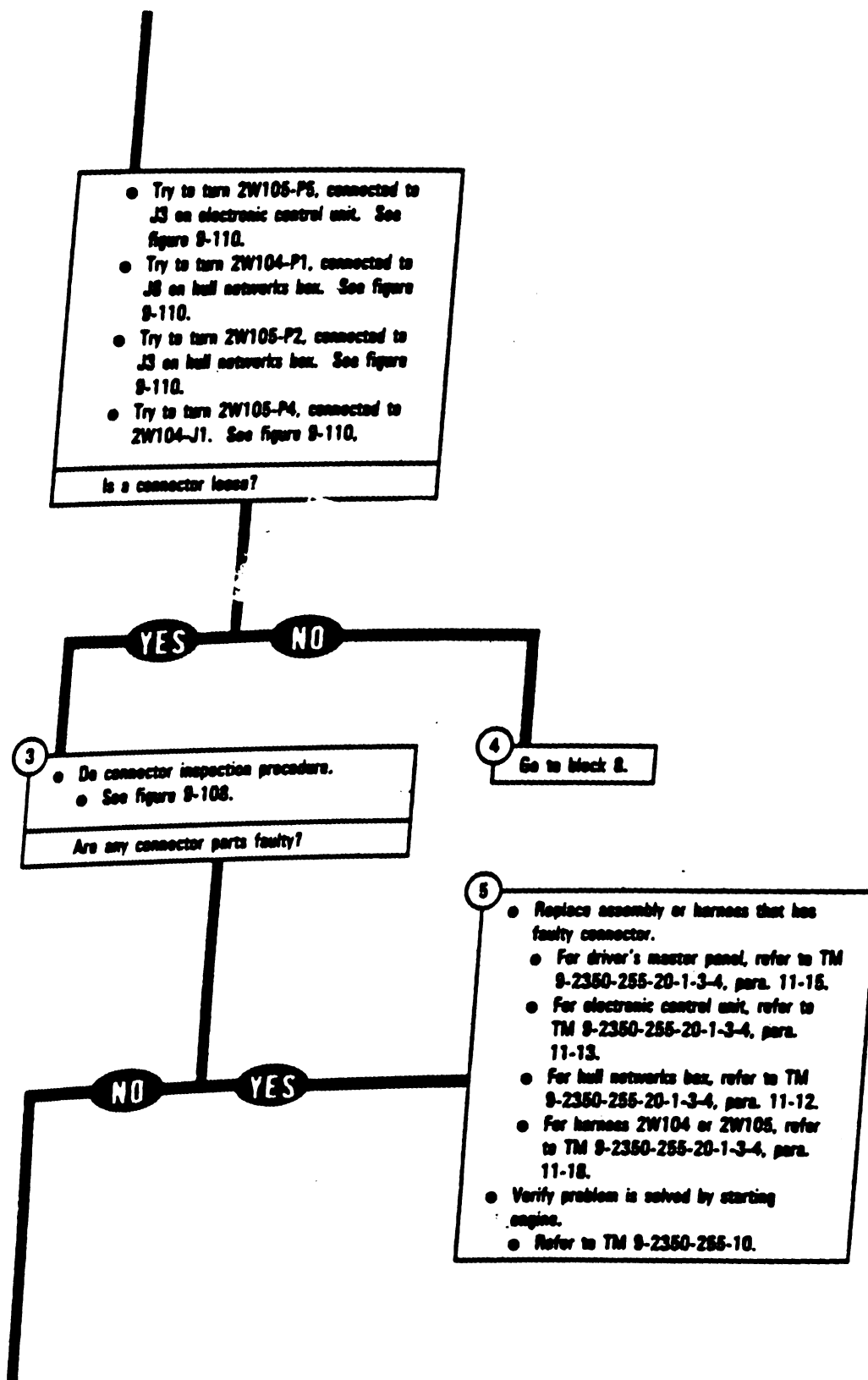


Figure 9-6 (Sheet 2 of 6)  
Volume II  
Para. 9-2

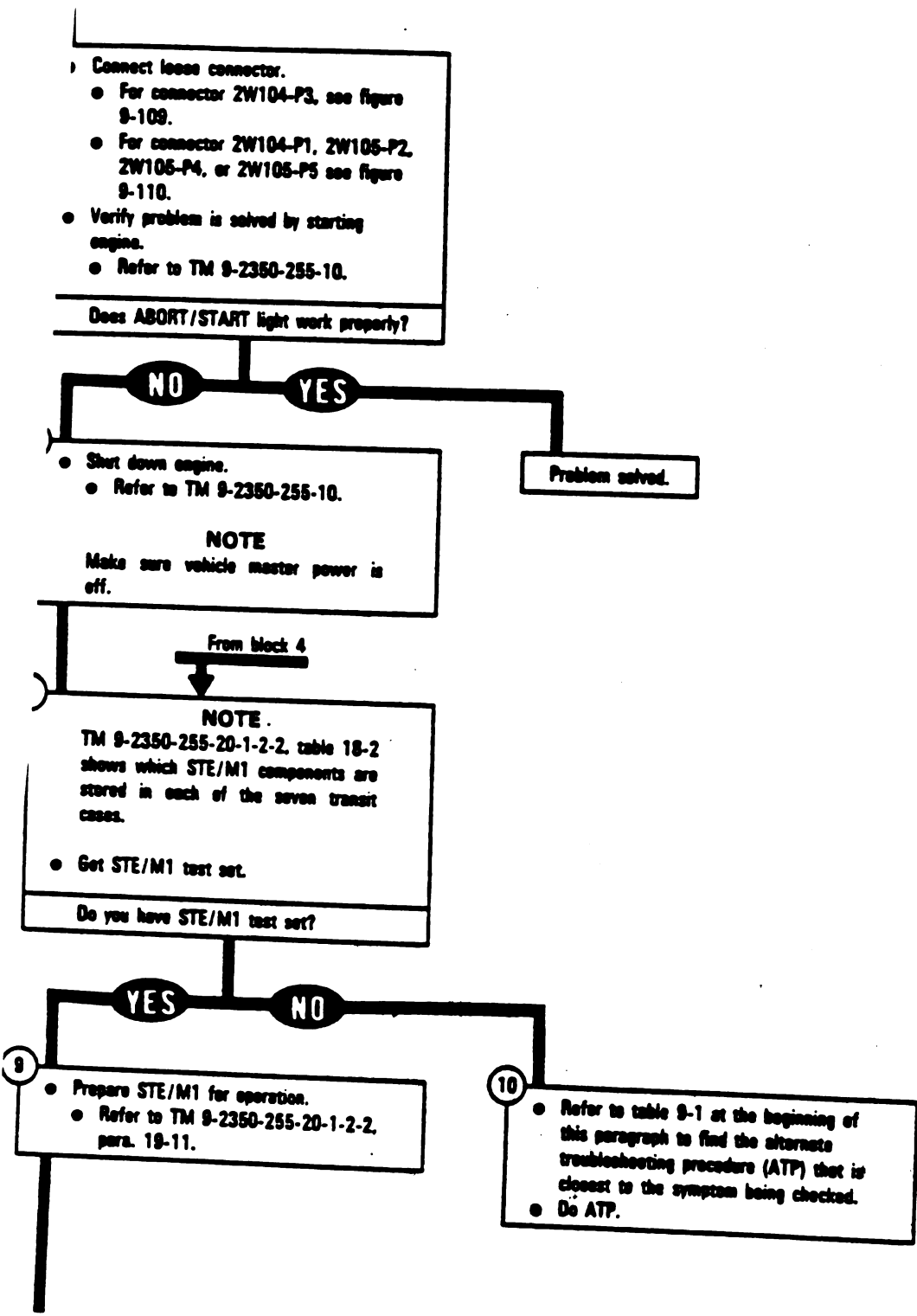
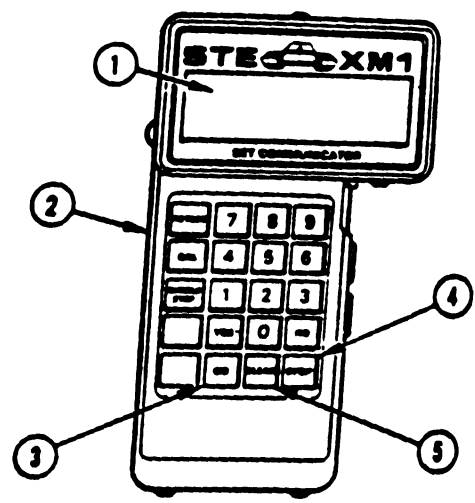
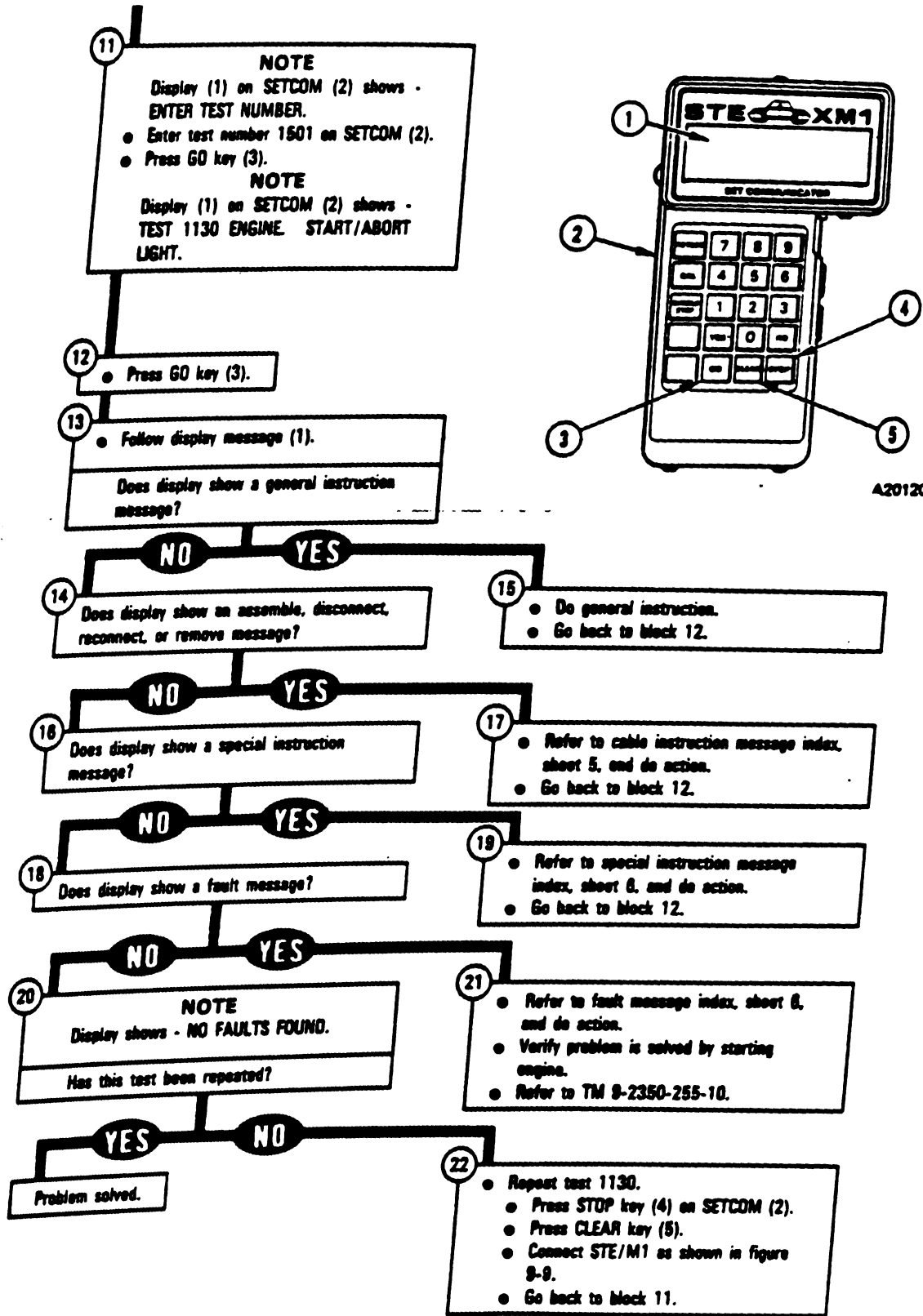


Figure 9-6 (Sheet 3 of 6,  
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9-2350-255-20-1-2-1  
**ENGINE SYSTEM TROUBLESHOOTING**



A20120-606 R1.

Engine System Cable Instruction Message Index for Test 1130

Instruction Message	Action
DISCONNECT CIB J1 (CX305) FROM TJ2 (CA301)	<ul style="list-style-type: none"> <li>● Connect P1 on CIB cable CX304 to P3 on DBA CX206.</li> <li>● Connect P2 on adapter CA417 to P1 on DBA CX206.</li> <li>● Connect P2 on adapter CA418 to P2 on DBA CX206.</li> <li>● See figure 9-18. Val/Ver</li> </ul>
DISCONNECT DBA BETWEEN 2W104 <--> DMP J1	<ul style="list-style-type: none"> <li>● Connect P1 on CIB cable CX304 to P3 on DBA CX206.</li> <li>● Connect P2 on adapter CA417 to P1 on DBA CX206.</li> <li>● See figure 9-54.</li> </ul>
DISCONNECT DBA TO 2W104 P3 ONLY	<ul style="list-style-type: none"> <li>● Connect P2 on CIB cable CX304 to J2 on CIB.</li> <li>● See figure 9-18 if you have assembled adapters CA417 and CA418 to DBA CX206.</li> <li>● See figure 9-54 if you have assembled only adapter CA417 to DBA CX206.</li> </ul>
DISCONNECT DBA BETWEEN 2W104 <--> DMP J1	<ul style="list-style-type: none"> <li>● Connect P1 on adapter CA301 to TJ2 on hull networks box.</li> <li>● Connect P1 on CIB cable CX305 to P2 on adapter CA301.</li> <li>● Connect P2 on CIB cable CX305 to J1 on CIB.</li> <li>● See figure 9-30.</li> </ul>
DISCONNECT DBA BETWEEN 2W104 <--> DMP J1	<ul style="list-style-type: none"> <li>● Connect P1 on adapter CA418 to J1 on driver's master panel.</li> <li>● Connect P1 on adapter CA417 to 2W104-P3.</li> <li>● See figure 9-18.</li> </ul>
DISCONNECT DBA TO 2W104 P3 ONLY	<ul style="list-style-type: none"> <li>● Connect P1 on adapter CA417 to 2W104-P3.</li> <li>● See figure 9-54.</li> </ul>
DISCONNECT DBA BETWEEN 2W104 <--> DMP J1	<ul style="list-style-type: none"> <li>● Disconnect 2W104-P3 from J1 on driver's master panel.</li> <li>● See figure 9-109.</li> </ul>

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Engine System Fault Message Index for Test 1130

Fault Message	Action
FAULTY BATTERY/ CHARGING SYS 113005	<ul style="list-style-type: none"> <li>● Charge batteries.</li> <li>● Refer to TM 9-2350-255-10.</li> <li>● Go back to block 22.</li> </ul>
FAULTY DMP 113015 113023 113026 113029	<ul style="list-style-type: none"> <li>● Replace driver's master panel.</li> <li>● Refer to TM 9-2350-255-20-1-3-4, para. 11-15.</li> </ul>
FAULTY HNB 113013 113017 113020 113024	<ul style="list-style-type: none"> <li>● Replace hull networks box.</li> <li>● Refer to TM 9-2350-255-20-1-3-4, para. 11-12.</li> </ul>
FAULTY HNB OR 2W104 113016 113018 113022 113027	<ul style="list-style-type: none"> <li>● Do follow-on procedure.</li> <li>● See figure 9-64.</li> <li>● See figure 9-65.</li> <li>● See figure 9-66.</li> <li>● See figure 9-65.</li> </ul>
FAULTY HULL POWER SYSTEM 113006	<ul style="list-style-type: none"> <li>● Run hull power distribution test number 1000.</li> <li>● Refer to TM 9-2350-255-20-1-2-2, figure 16-1.</li> </ul>

Special Instruction Message Index for Test 1130

Special Instruction Message	Action
SEE -20 MANUAL 113014 113106	<ul style="list-style-type: none"> <li>● Do follow-on procedure</li> <li>● See figure 9-63.</li> <li>● Run engine test number 1501.</li> <li>● See figure 9-2.</li> </ul>

Figure 9-6 (Sheet 6 of 6)  
 Volume II  
 Para. 9-2

APTOM ESS-8

**ENGINE ABORTS OR SHUTS DOWN  
AUTOMATICALLY AFTER ENGINE OIL  
PRESSURE LOW LIGHT COMES ON**

**NOTE**

Read para. 9-1 before doing any work.

**Test Equipment/Special Tools:**

- Breakout Box Test Kit, 12311066
- Multimeter
- Pliers, slip joint, conduit style with plastic jaw inserts, NSN 5120-00-624-8065
- STE/M1 Continuity Test Probe Assembly TA1, 12303622 in Transit Case, 12303610

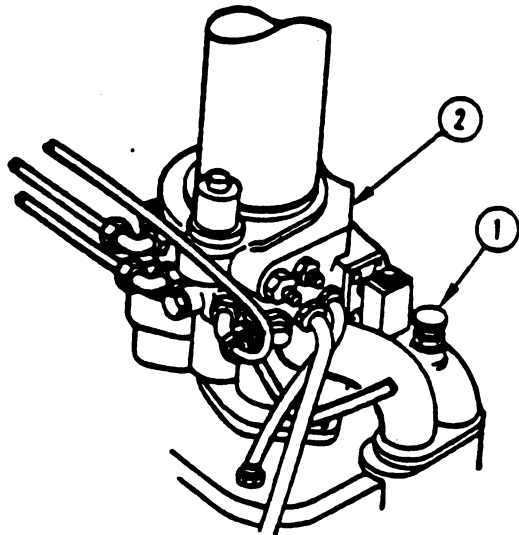
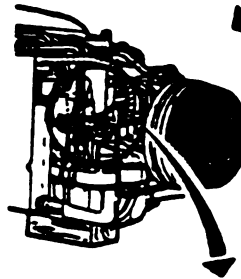
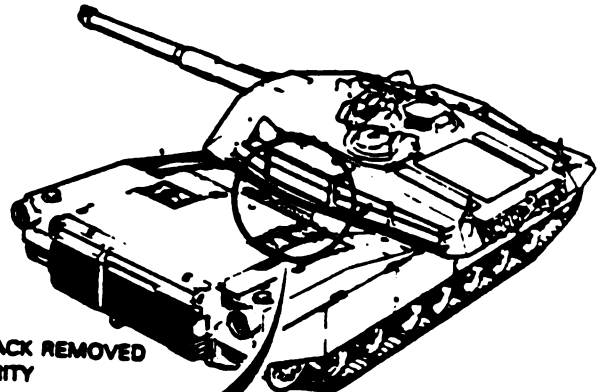
**Equipment Condition:**

- Tank parked.
- Parking brake set.
- Vehicle master power off.

- 1
- Set up tank controls for standard initial test conditions.
  - Refer to table 9-2 at the end of this chapter.

- 2
- Check magnetic plug in oil pump assembly for metal chips.
  - Remove engine access cover, refer to TM 9-2350-255-10.
  - Remove magnetic plug (1) from oil pump assembly (2).
  - Check for metal chips on magnetic plug (1).
  - Install magnetic plug (1).

Was plug over 50% covered?

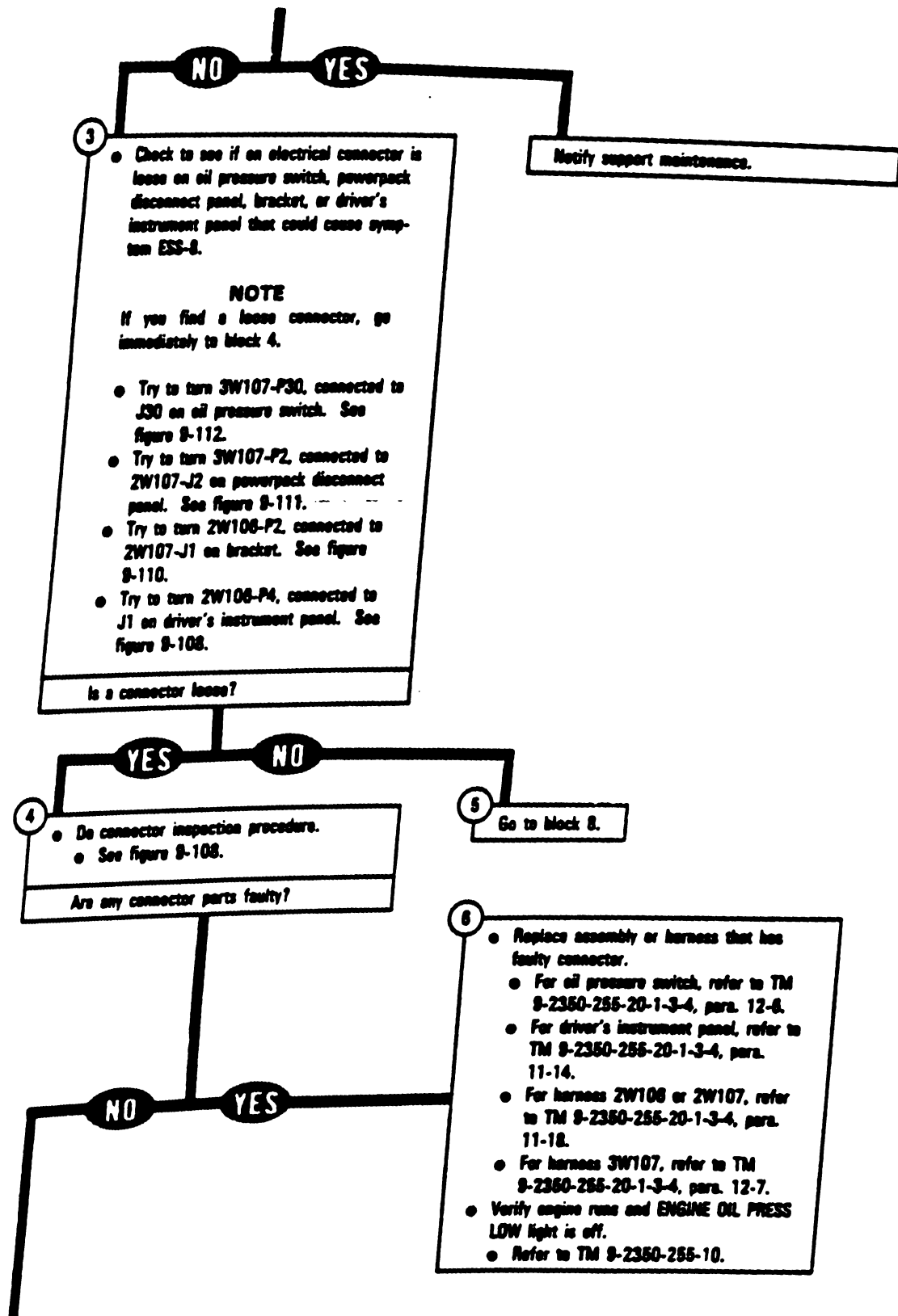


A20120-1066

Figure 9-7 (Sheet 1 of 6)  
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Para. 9-2

Change 3 9-59

**TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING**



*Figure 9-7 (Sheet 2 of 6)  
Volume II  
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- Connect loose connector.
- For connector 3W107-P30, see figure 9-112.
- For connector 3W107-P2, see figure 9-111.
- For connector 2W106-P2, see figure 9-110.
- For connector 2W106-P4, see figure 9-109.
- Verify engine runs and ENGINE OIL PRESS LOW light is off.
- Refer to TM 9-2350-255-10.

Does engine run and does ENGINE OIL PRESS LOW light stay off?

**NO**      **YES**

From block 5

Problem solved.

**NOTE**

Make sure vehicle master power is off.

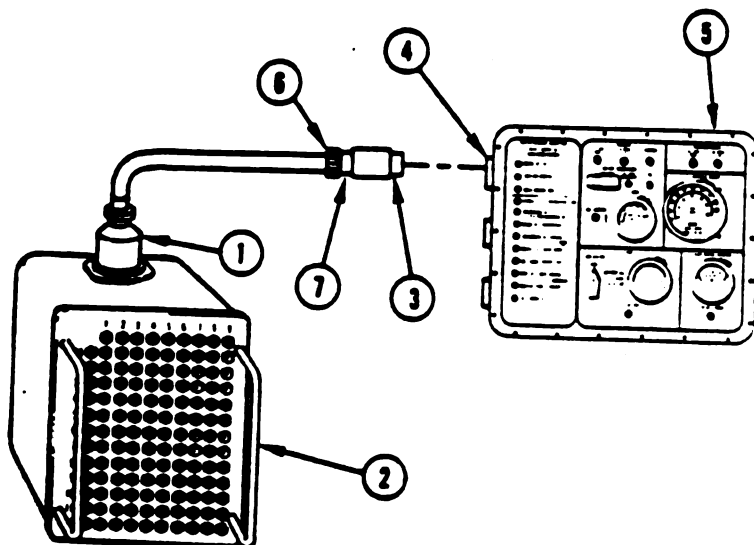
- Disconnect 3W107-P30 from J30 on oil pressure switch.
- See figure 9-112.

● Connect breakout box to TJ1 on driver's instrument panel.

- Connect CABLE NO. 1-P1 (1) to breakout box (2).
- Connect ADAPTER NO. 2-P1 (3) to TJ1 (4) on driver's instrument panel (5).
- Connect CABLE NO. 1-P2 (6) to ADAPTER NO. 2-J1 (7).

● Prepare multimeter for DC VOLTAGE TEST.

- Refer to TM 9-2350-255-20-1-2-2, figure 18-3.



A20120-366R1

Figure 9-7 (Sheet 3 of 6)  
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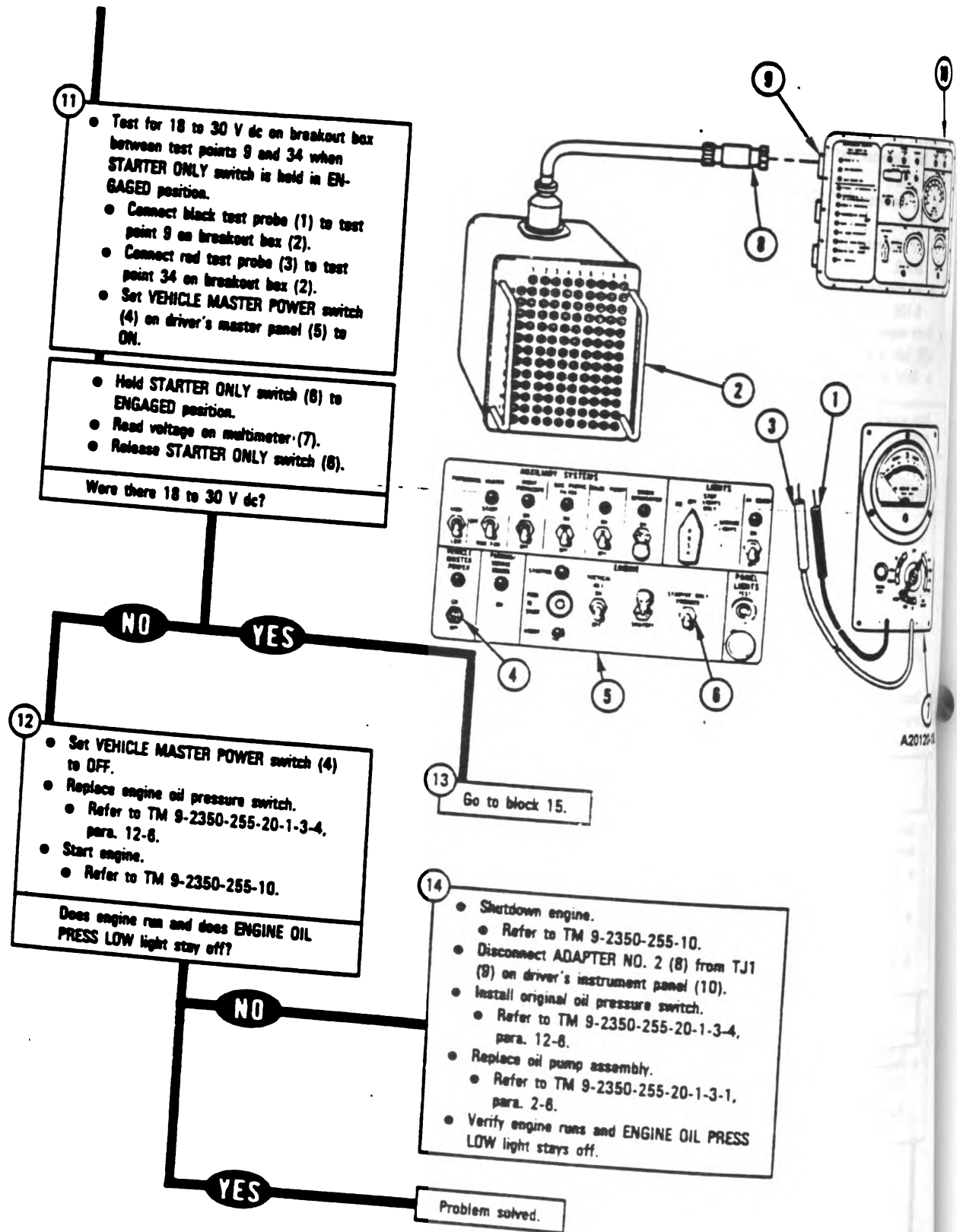


Figure 9-7 (Sheet 4 of 6)  
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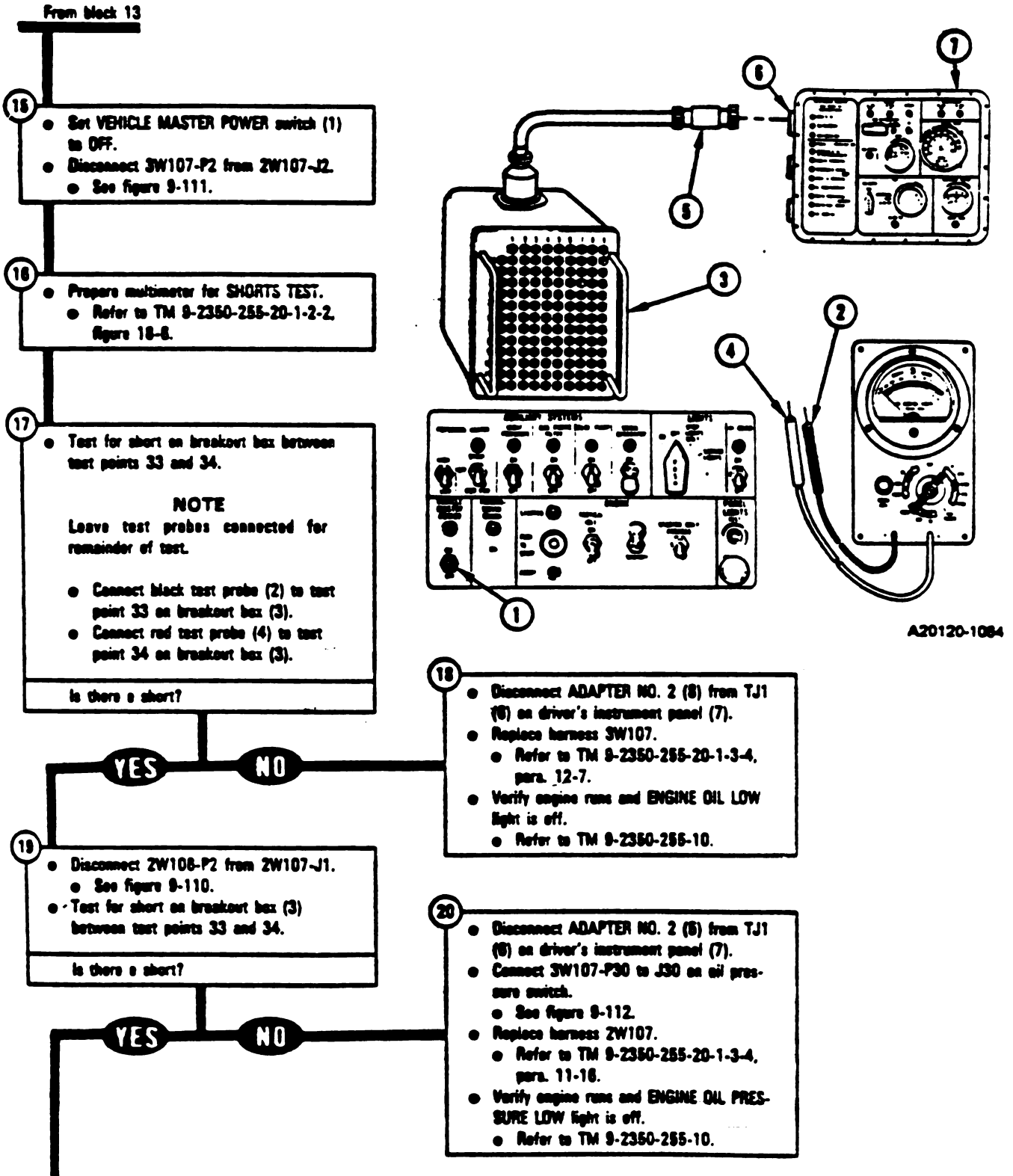


Figure 9-7 (Sheet 5 of 6)  
Volume II  
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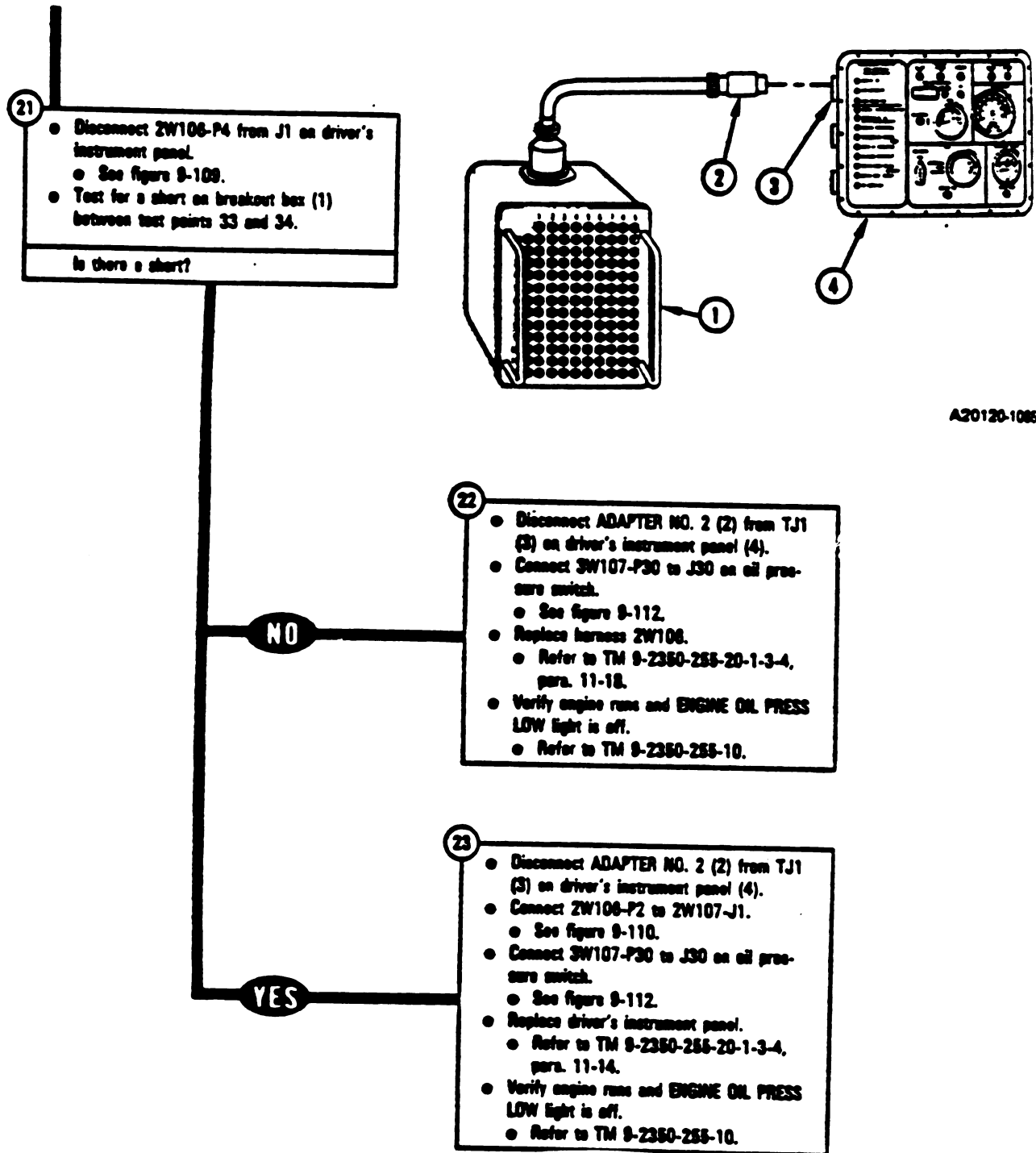


Figure 9-7 (Sheet 6 of 6)  
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**SYMPTOM ESS-12**

**ENGINE RUNNING NORMALLY AND FUEL CONTROL FAULTY LIGHT COMES ON.**

**NOTE**

Read para. 9-1 before doing any work.

**Test Equipment/Special Tools:**

- Flors, slip joint, conduit style with plastic jaw inserts, NSN 5120-00-824-8065

**NOTE**

Do not get the following equipment until told to further on in this procedure.

- STE/M1 Test Set, 12303600

**Equipment Condition:**

- Tank parked.
- Parking brake set.
- Engine shut down.
- Vehicle master power off.

- 1
- Set up tank controls for standard initial test conditions.
  - Refer to table 9-2 at the end of this chapter.

- 2
- Check to see if an electrical connector is loose on the hull network box, electronic control unit, driver's instrument panel, engine, or powerpack disconnect panel that could cause symptom ESS-12.

**NOTE**

If you find a loose connector, go immediately to block 3.

- Try to turn ZW106-P1 connected to J12 on hull network box, see figure 9-110.
- Try to turn ZW107-P1 connected to J1 on hull network box, see figure 9-110.

Figure 9-8 (Sheet 1 of 6)  
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Para. 9-2

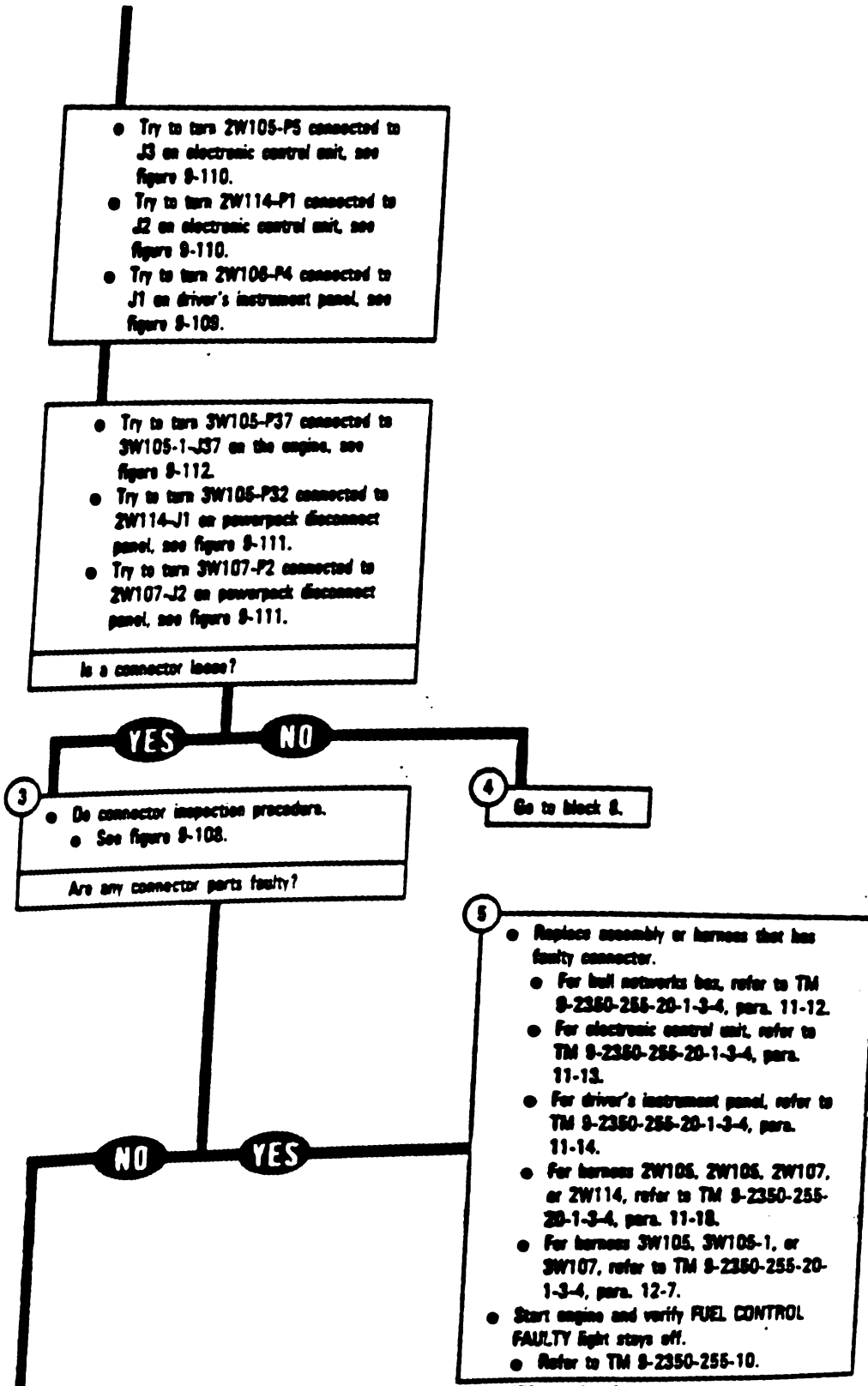


Figure 9-8 (Sheet 2 of 6)  
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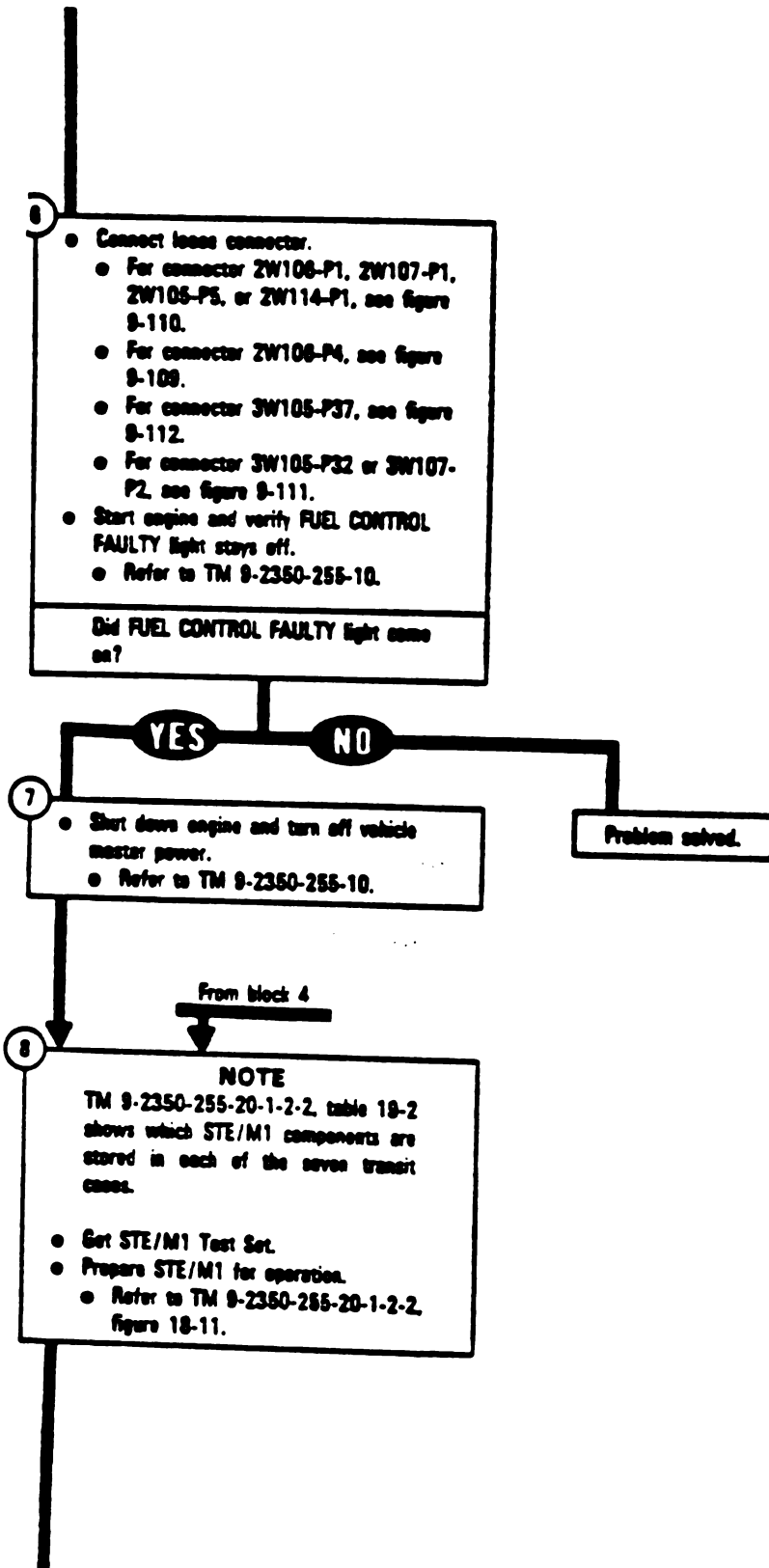


Figure 9-8 (Sheet 3 of 6)  
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TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING

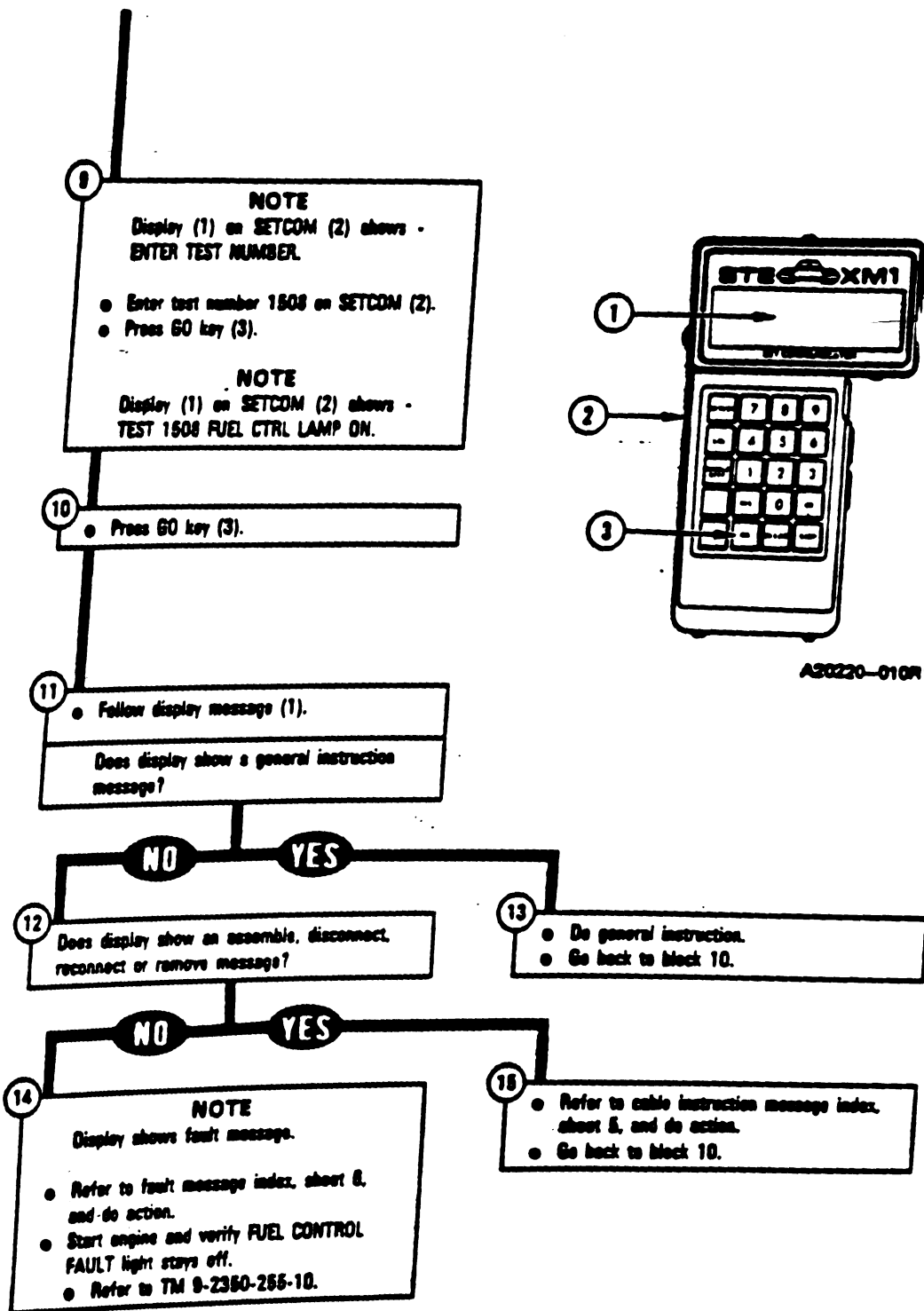


Figure 9-8 (Sheet 4 of 6)  
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Engine System Cable Instruction Message Index for Test 150B

Cable Instruction Message	Action
CONNECT CIB J1 TO CX 201	<ul style="list-style-type: none"> <li>● Connect P2 on CIB cable CX305 to J1 on CIB.</li> <li>● Connect P1 on CIB cable CX305 to P1 on DBA CX201.</li> <li>● See figure 9-48.</li> </ul>
CONNECT CIB J1 TO DIP TJ1 (CA307)	<ul style="list-style-type: none"> <li>● Connect P1 on adapter CA307 to TJ1 on driver's instrument panel.</li> <li>● Connect P1 on CIB cable CX305 to P2 on adapter CA307.</li> <li>● Connect P2 on CIB cable CX305 to J1 on CIB.</li> <li>● See figure 9-53.</li> </ul>
CONNECT CIB J2 TO ECU J1 (CA201)	<ul style="list-style-type: none"> <li>● Connect P2 on adapter CA201 to J1 on electronic control unit.</li> <li>● Connect P1 on CIB cable CX304 to P1 on adapter CA201.</li> <li>● Connect P2 on CIB cable CX304 to J2 on CIB.</li> <li>● See figure 9-28.</li> </ul>
CONNECT CX 201 <--> 2W114 P1	<ul style="list-style-type: none"> <li>● Connect 2W114-P1 to P2 on DBA CX201.</li> <li>● See figure 9-48.</li> </ul>
CONNECT TA 202 <--> CX 201	<ul style="list-style-type: none"> <li>● Connect shorting plug TA202 to P3 on DBA CX201.</li> <li>● See figure 9-48.</li> </ul>
CONNECT 2W114 <--> ECU J2	<ul style="list-style-type: none"> <li>● Connect 2W114-P1 to J2 on electronic control unit.</li> <li>● See figure 9-110.</li> </ul>
DISCONNECT CX 201 <--> 2W114 P1	<ul style="list-style-type: none"> <li>● Disconnect 2W114-P1 from P2 on DBA CX201.</li> <li>● Disconnect P2 on CIB cable CX305 from J1 on CIB.</li> <li>● See figure 9-48.</li> </ul>
DISCONNECT 2W105 P5 <--> ECU J3	<ul style="list-style-type: none"> <li>● Disconnect 2W105-P5 from J3 on electronic control unit.</li> <li>● See figure 9-110.</li> </ul>
DISCONNECT 2W114 <--> ECU J2	<ul style="list-style-type: none"> <li>● Disconnect 2W114-P1 from J2 on electronic control unit.</li> <li>● See figure 9-110.</li> </ul>

Figure 9-8 (Sheet 5 of 6)  
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Para. 9-2

**TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING**

**Engine System Fault Message Index for Test 1508**

<b>Fault Message</b>	<b>Action</b>
<b>FAULTY BATTERY CHARGING SYS</b> 152403	<ul style="list-style-type: none"> <li>● Charge batteries.</li> <li>● Refer to TM 9-2350-255-10.</li> <li>● Press STOP key on SETCOM.</li> <li>● Press CLEAR key on SETCOM.</li> <li>● Go back to block 9.</li> </ul>
<b>FAULTY DIP OR CABLE GROUP</b> 150804	<ul style="list-style-type: none"> <li>● Do follow-on procedure.</li> <li>● See figure 9-93.</li> </ul>
<b>FAULTY ECU OR CABLE GROUP</b> 150806	<ul style="list-style-type: none"> <li>● Do follow-on procedure.</li> <li>● See figure 9-94.</li> </ul>
<b>FAULTY HULL POWER SYSTEM</b> 152404	<ul style="list-style-type: none"> <li>● Run hull power distribution test number 1000.</li> <li>● Refer to TM 9-2350-255-20-1-2-2, figure 16-1.</li> </ul>
<b>FAULTY NH1 SENSOR, 2W114, 3W105</b> 152602 152603	<ul style="list-style-type: none"> <li>● Do follow-on procedure.</li> <li>● See figure 9-100.</li> </ul>
<b>FAULTY NH2 SENSOR, 2W114, 3W105</b> 152802 152803	<ul style="list-style-type: none"> <li>● Do follow-on procedure.</li> <li>● See figure 9-104.</li> </ul>
<b>FAULTY NPT1 SENSOR, 2W114, 3W105</b> 153202 153203	<ul style="list-style-type: none"> <li>● Do follow-on procedure.</li> <li>● See figure 9-105.</li> </ul>
<b>FAULTY NPT2 SENSOR, 2W114, 3W105</b> 153302 153303	<ul style="list-style-type: none"> <li>● Do follow-on procedure.</li> <li>● See figure 9-105.</li> </ul>
<b>FAULTY T1 SENSOR, 2W114, 3W105</b> 153402 153403	<ul style="list-style-type: none"> <li>● Do follow-on procedure.</li> <li>● See figure 9-95.</li> </ul>

**Special Instruction Message Index for Test 1503**

<b>Special Instruction Message</b>	<b>Action</b>
<b>SEE -20 MANUAL</b> 150803 150805 152107	<ul style="list-style-type: none"> <li>● No faults found, FC FAULTY LIGHT is not ON.</li> <li>● Run engine test number 1505.             <ul style="list-style-type: none"> <li>● See figure 9-12.</li> </ul> </li> <li>● Run engine test number 1501.             <ul style="list-style-type: none"> <li>● See figure 9-2.</li> </ul> </li> </ul>

*Figure 9-8 (Sheet 6 of 6)  
Volume II  
Para. 9-2*

SYMPTOM ESS-13

ENGINE RUNNING AND ENGINE OIL LOW LIGHT COMES ON, BUT ENGINE OIL LEVEL IS OK.

NOTE

- Read para. 9-1 before doing any work.
- When jumpers are used, remove them after completing last instruction in this block.

Test Equipment/Special Tools:

- Multimeter
- Pliers, slip joint, conduit style with plastic jaw inserts, NSN 5120-00-824-8085
- STE/M1 Continuity Test Probe Assembly TA1, 12303822 in Transit Case, 12303810

Equipment Condition:

- Tank parked.
- Parking brake set.
- Engine shut down.
- Vehicle master power off.

1

- Set up tank controls for standard initial test conditions.
- Refer to table 9-2 at the end of this chapter.

2

- Check to see if an electrical connector is loose on bracket, driver's instrument panel, oil float switch, or powerpack disconnect panel that could cause symptom ESS-13.

NOTE

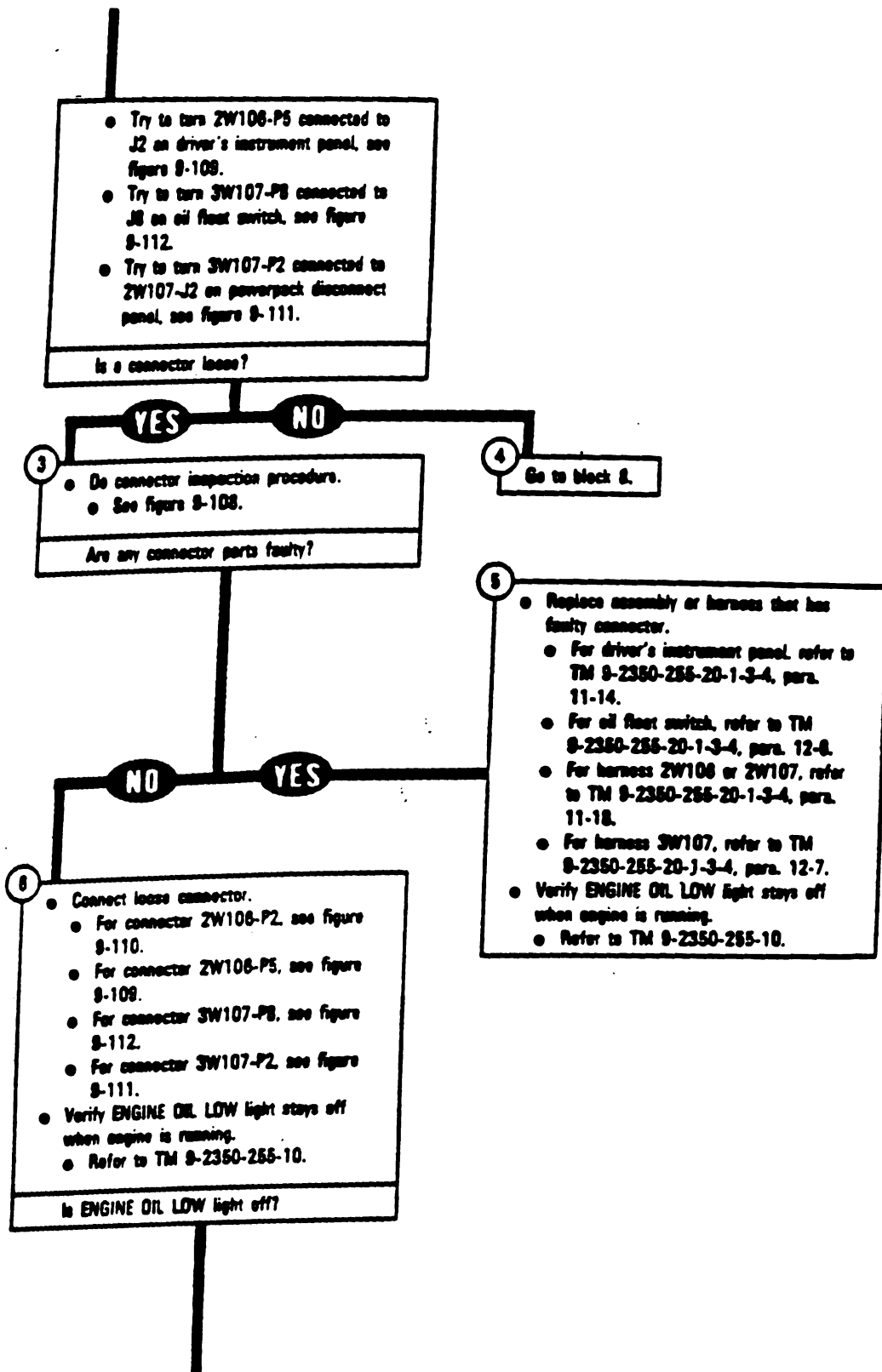
If you find a loose connector, go immediately to block 3.

- Try to turn ZW106-P2 connected to ZW107-J1, see figure 9-110.

Figure 9-9 (Sheet 1 of 6)  
Volume II  
Para. 9-2



**TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING**



*Figure 9-9 (Sheet 2 of 6)  
Volume II  
Para. 9-2*

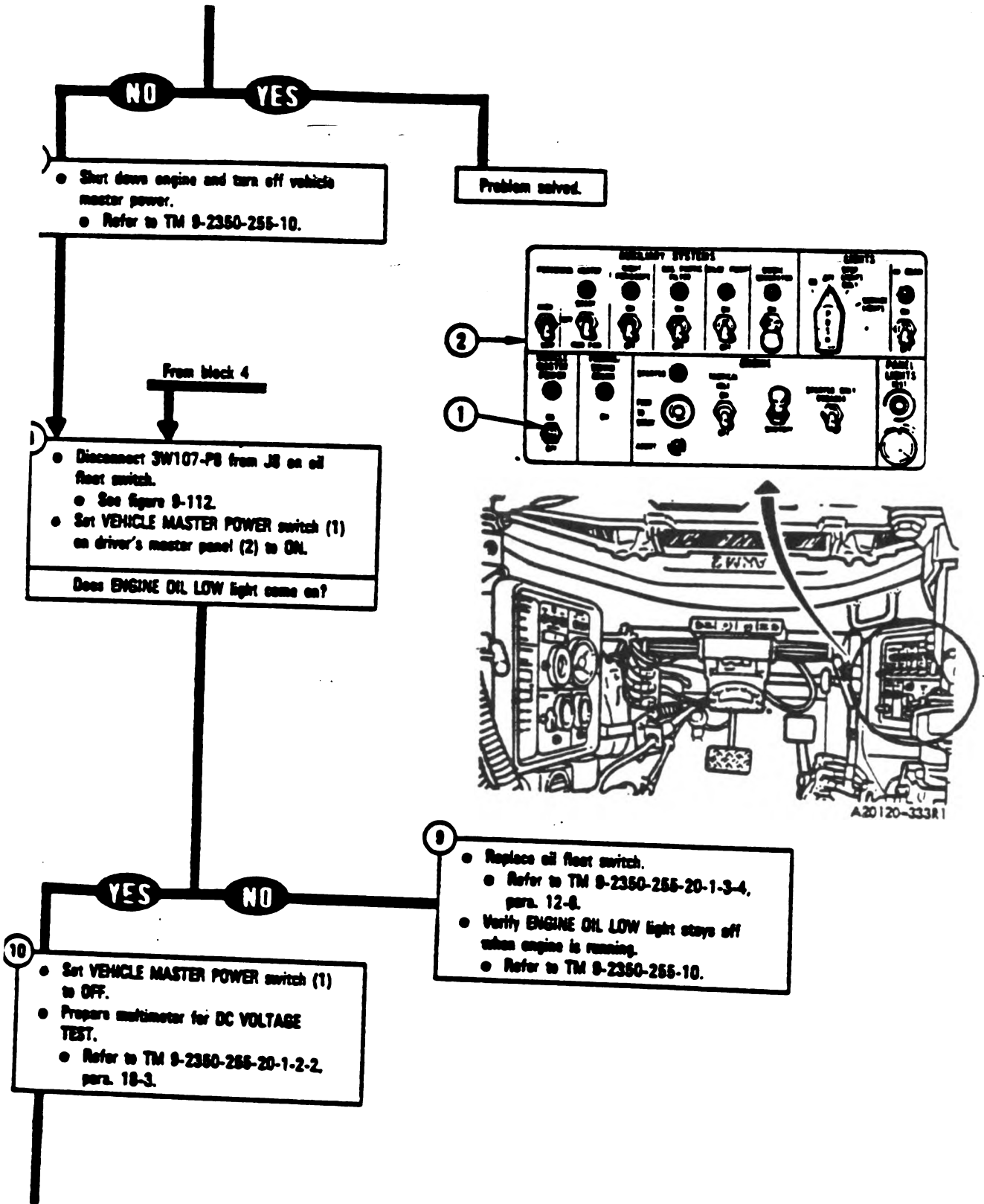
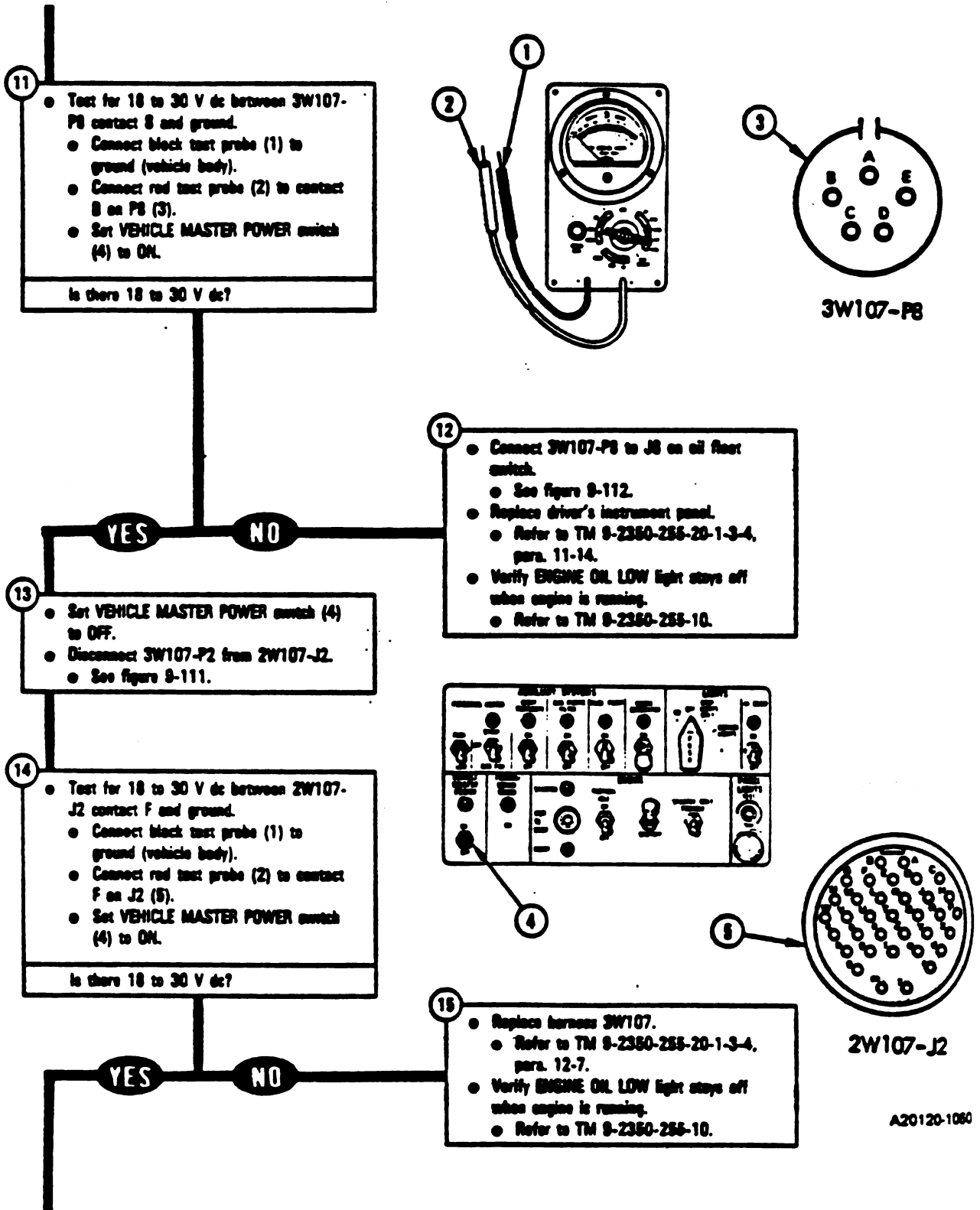


Figure 9-9 (Sheet 3 of 6)  
Volume II  
Para: 9-2

**TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING**



*Figure 9-9 (Sheet 4 of 6)  
Volume II  
Para. 9-2*

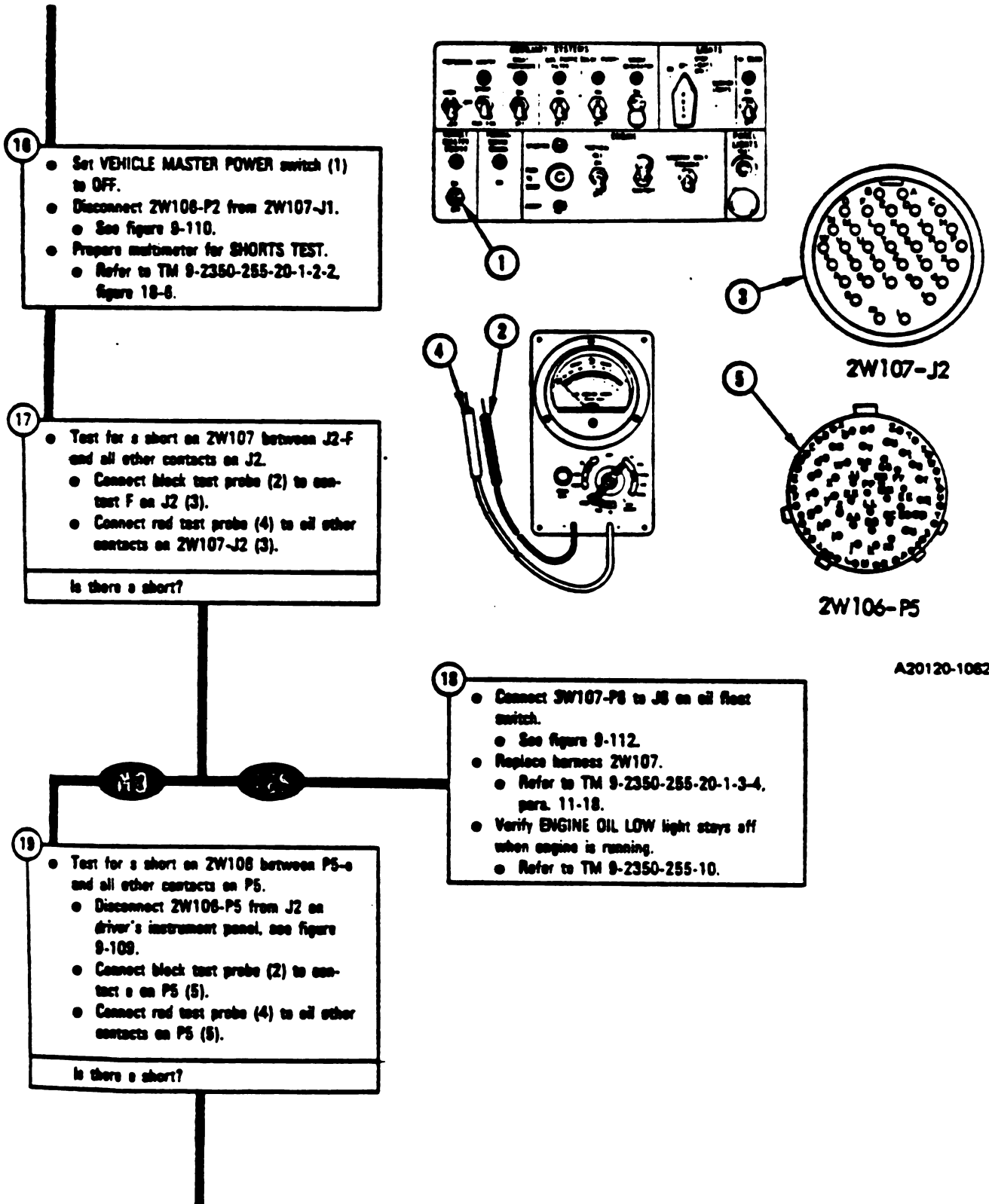
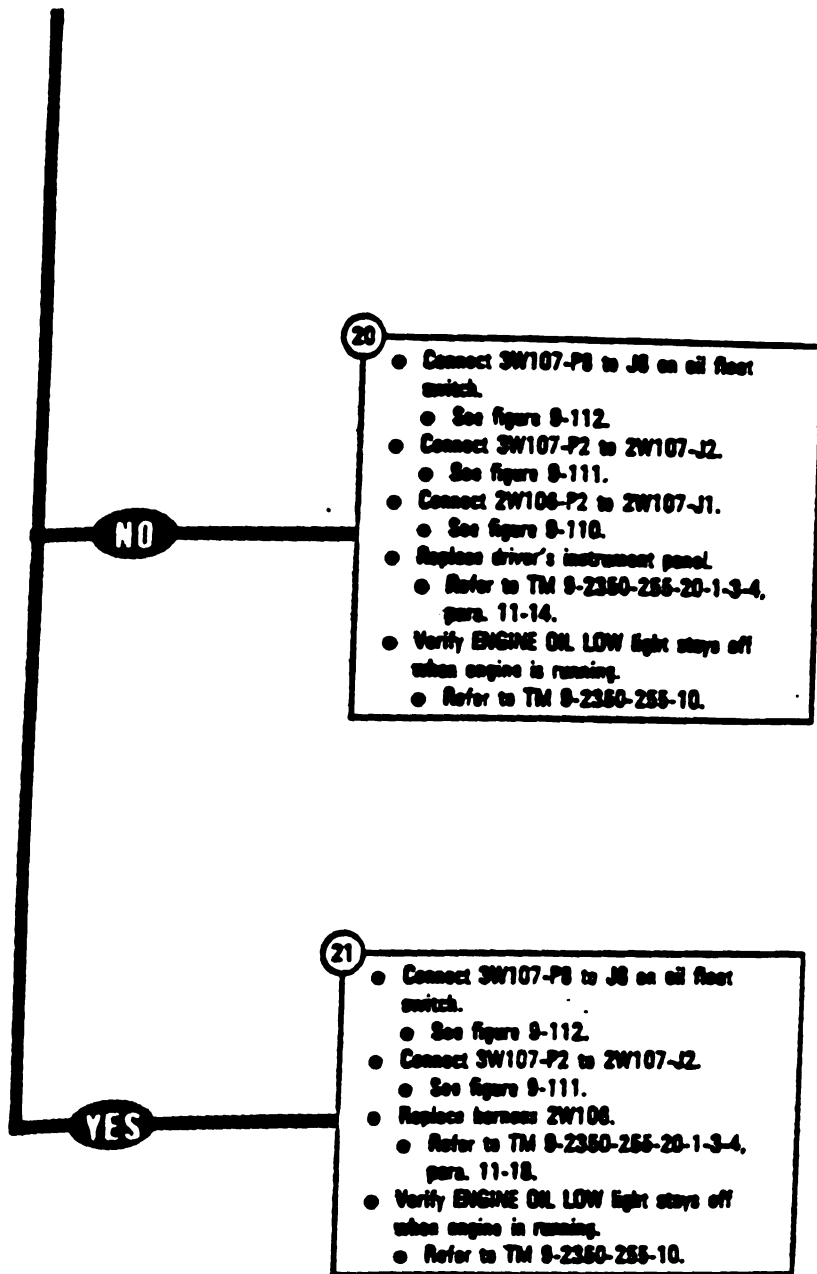


Figure 9-9 (Sheet 5 of 6)  
Volume II  
Para. 9-2.

**TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING**



*Figure 9-9 (Sheet 6 of 6)  
Volume II  
Para. 9-2*

**SYMPTOM ESS-14**

**ENGINE OIL TEMP HIGH LIGHT AND MASTER WARNING LIGHT COME ON**

**Test Equipment/Special Tools:**

- Multimeter
- Flare, slip joint, conduit style with plastic jaw inserts. NSN 5120-00-824-8085
- STE/M1 Continuity Test Probe Assembly TA1, 12303822 in transit case 12303810

**Equipment Condition:**

- Tank parked.
- Parking brake set.
- Engine shut down.
- Vehicle master power off.
- Engine oil level at full mark.

**WARNING**

Exhaust gases and rear grille metal parts will be hot and cause injury. Wear asbestos mittens to prevent injury.

**NOTE**

This is a two man job. Soldier A is responsible for completing the job. Soldier B is the assistant and is directed by Soldier A. Soldier B will only be used in blocks 4, 19 and 28.

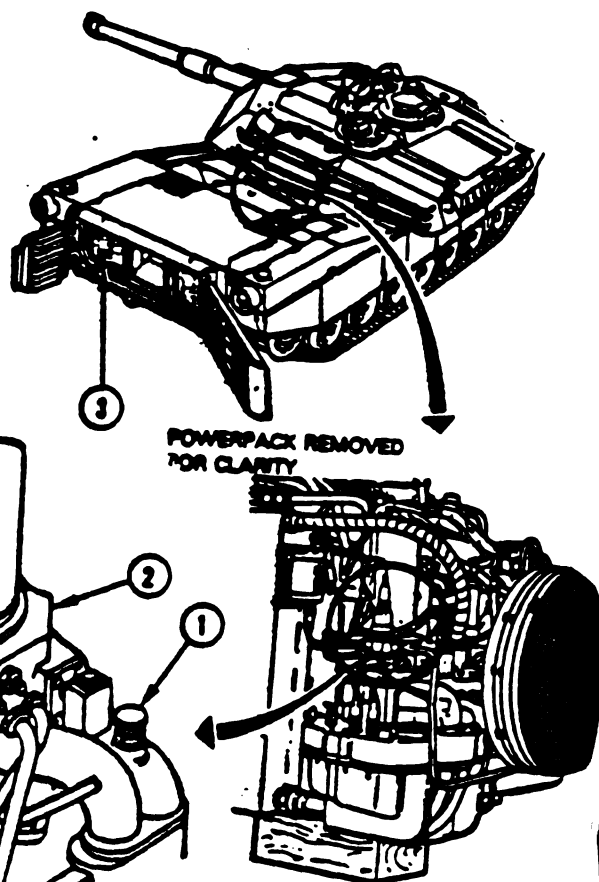
1

- Set up tank controls for standard initial test conditions.
- Refer to table 9-2 at the end of this chapter.

*Figure 9-10 (Sheet 1 of 9)  
Volume II  
Para. 9-2*

TM 9-2350-255-20-1-3-1  
ENGINE SYSTEM TROUBLESHOOTING

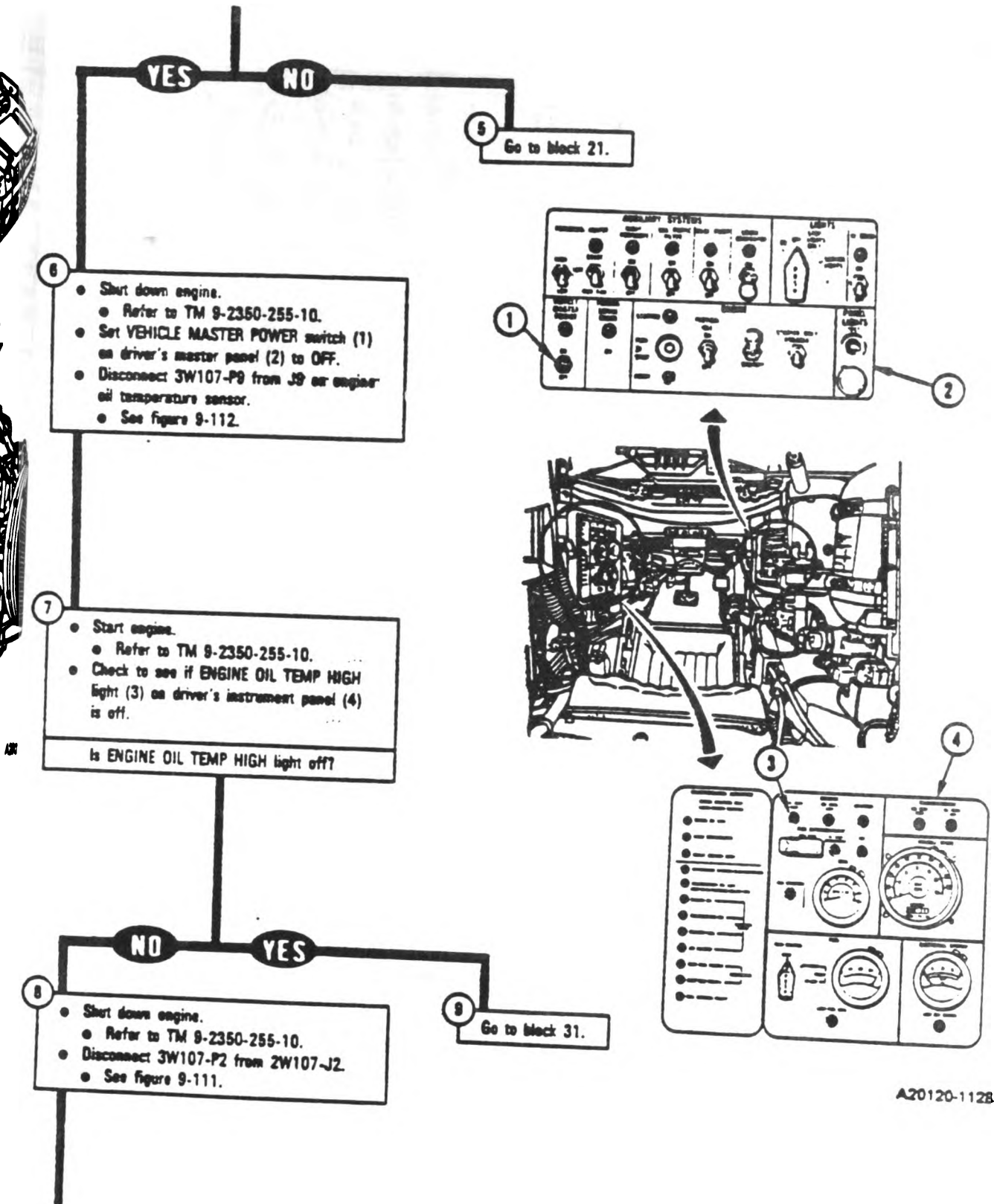
- 2
- Check magnetic plug in oil pump assembly for metal chips.
  - Remove engine access cover, refer to TM 9-2350-255-10.
  - Remove magnetic plug (1) from oil pump assembly (2).
  - Check for metal chips on magnetic plug (1).
  - Install magnetic plug (1).
- Was plug over 50% covered?



A20120-112

- NO YES
- 3
- Rectify support maintenance.
- 4
- Check for air flow from engine oil cooler with engine running.
- Soldier A: ● Open rear grille doors.
- Refer to TM 9-2350-255-20-1-3-2, para. 7-8.
- Soldier B: ● Start engine.
- Refer to TM 9-2350-255-10.
- Soldier A: ● Check for air flow coming from engine oil cooler (3).
- Is air flowing from engine oil cooler?

Figure 9-10 (Sheet 2 of 9)  
Volume II  
Para. 9-2



A20120-112B-

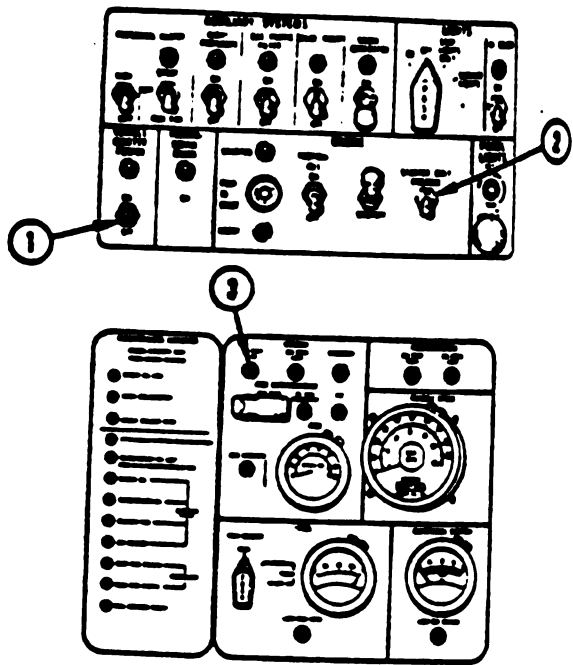
Figure 9-10 (Sheet 3 of 9)  
Volume II  
Para. 9-2



10

- Check to see if ENGINE OIL TEMP HIGH light is off while STARTER ONLY switch is held in ENGAGED position.
- Set VEHICLE MASTER POWER switch (1) to ON.
- Hold STARTER ONLY switch (2) to ENGAGED position.
- Check ENGINE OIL TEMP HIGH light (3).
- Release STARTER ONLY switch (2).

Was ENGINE OIL TEMP HIGH light off?



NO YES

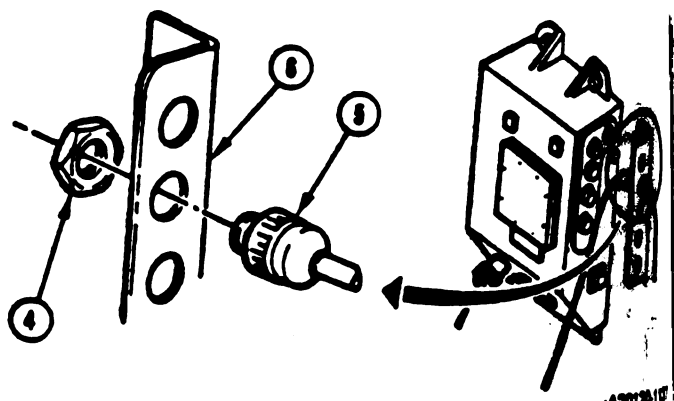
11

- Set VEHICLE MASTER POWER switch (1) to OFF.
- Replace harness SW107.
- Refer to TM 9-2350-255-20-1-3-4, para. 12-7.
- Verify that ENGINE OIL TEMP HIGH light is off when engine is running.
- Refer to TM 9-2350-255-10.

A20120-1128

12

- Set VEHICLE MASTER POWER switch (1) to off.
- Disconnect ZW108-P2 from ZW107-J1.
- See figure 9-110.
- Remove ZW107-J1 from bracket.
- Unscrew and take off jam nut (4) with pliers.
- Remove ZW107-J1 (5) from bracket (6).



A30120-115

Figure 9-10 (Sheet 4 of 9)  
Volume II  
Para. 9-2

9-80 Change 3

13

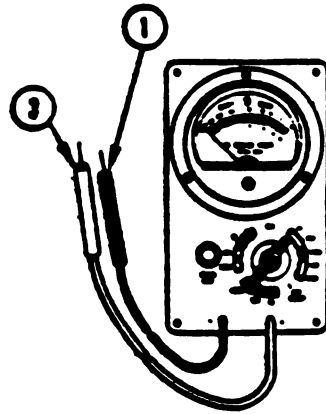
- Prepare multimeter for **SHORT TEST**.
- Refer to TM 9-2350-255-20-1-2-2, figure 18-6.

**NOTE**

If multimeter reads a short between contact DO and any other contact on ZW107-J1, go immediately to block 14.

- Test for a short between contact DO and all other contacts on ZW107-J1.
- Connect black test probe (1) to contact DO on J1 (2).
- Connect red test probe (3) to all other contacts on J1 (2).

Does multimeter show a short?



A20120-1004

14

- Connect SW107-P9 to J9 on engine oil temperature sensor.
- See figure 9-112.
- Replace harness ZW107.
- Refer to TM 9-2350-255-20-1-3-4, para. 11-18.
- Verify that **ENGINE OIL TEMP HIGH** light is off when engine is running.
- Refer to TM 9-2350-255-10.

NO

15

- Disconnect ZW106-P4 from J1 on driver's instrument panel.
- See figure 9-109.
- Disconnect ZW106-P5 from J2 on driver's instrument panel.
- See figure 9-109.

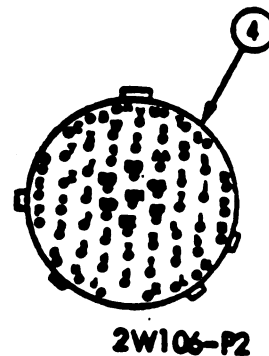
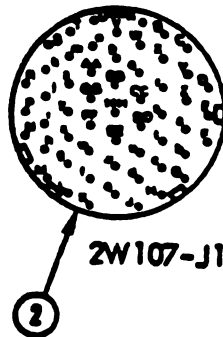
18

**NOTE**

If multimeter reads a short between contact DO and any other contact on ZW106-P2, go immediately to block 17.

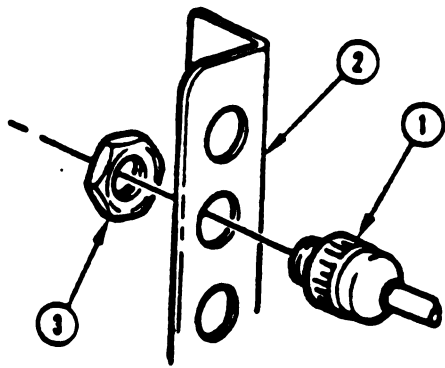
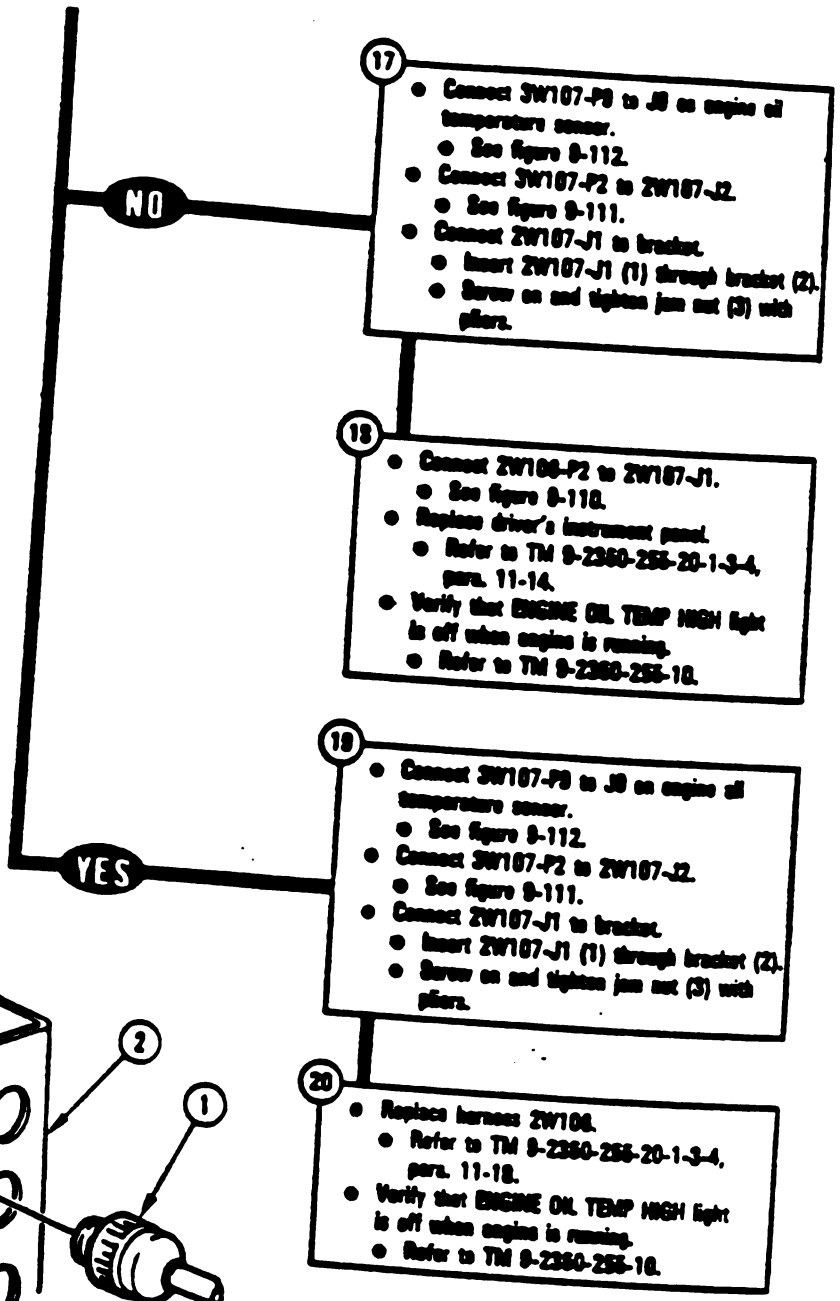
- Test for a short between contact DO and all other contacts on ZW106-P2.
- Connect black test probe (1) to contact DO on P2 (4).
- Connect red test probe (3) to all other contacts on P2 (4).

Does multimeter show a short?



A20120-1130

Figure 9-10 (Sheet 5 of 9)  
Volume II  
Para. 9-2

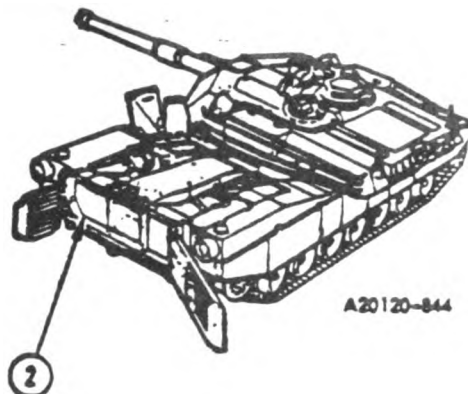
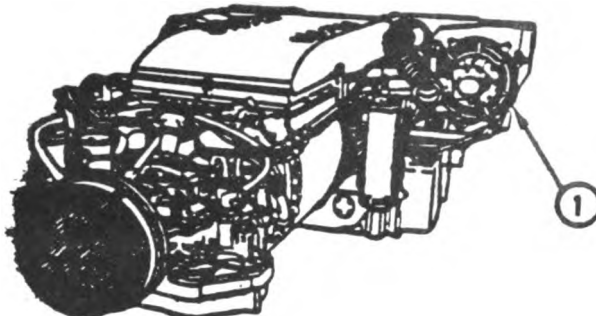


A20120-1138

to engine oil  
17-2  
up bracket (2)  
out (2) with

from block 5

POWERPACK SHOWN  
REMOVED FOR CLARITY



A20120-844

- Soldier B: ● Shut down engine.  
● Refer to TM 9-2350-255-10.
- Soldier A: ● Remove vehicle top deck and grilles.  
● Refer to TM 9-2350-255-20-1-3-3, para. 7-4.
- Soldier B: ● Start engine.  
● Refer to TM 9-2350-255-10.
- Soldier A: ● Check left oil cooling fan while engine is running.  
● Look at left oil cooling fan (1).

is left oil cooling fan turning?

YES

NO

- Shut down engine.
- Refer to TM 9-2350-255-10.
- Check to see if engine oil cooler (2) is clogged or damaged.

23 Go to block 28.

is engine oil cooler clogged or damaged?

NO

- 24
- Clean engine oil cooler.
  - Refer to TM 9-2350-255-20-1-1, para. 2-8.
  - Verify that ENGINE OIL TEMP HIGH light is off when engine is running.
  - Refer to TM 9-2350-255-10.

YES

- 25
- Replace engine oil cooler.
  - Refer to TM 9-2350-255-20-1-3-2, para. 8-8.
  - Verify that ENGINE OIL TEMP HIGH light is off when engine is running.
  - Refer to TM 9-2350-255-10.

Figure 9-10 (Sheet 7 of 9)  
Volume 41  
Para. 9-2

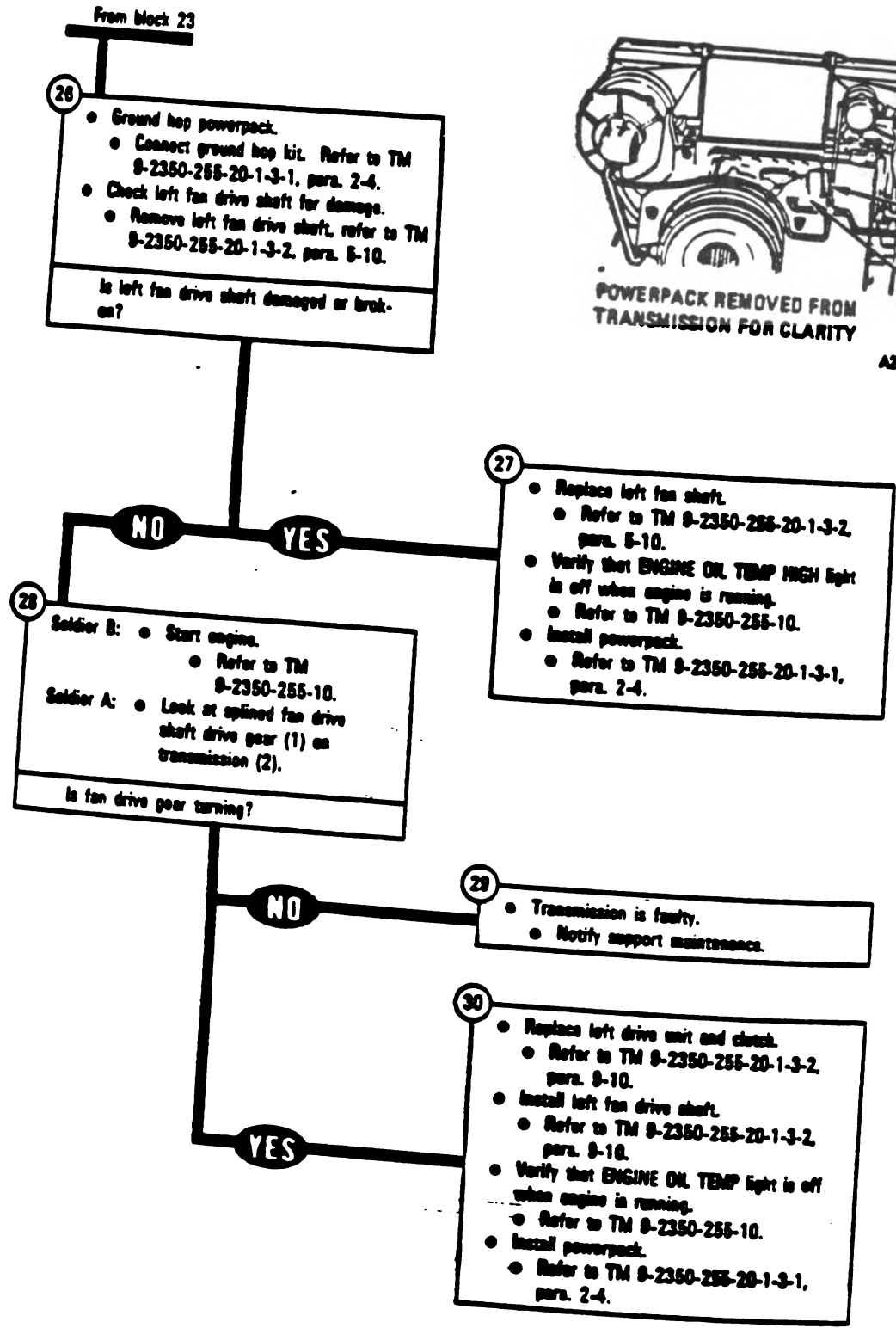


Figure 9-10 (Sheet 8 of 9)  
 Volume II  
 Para. 9-2

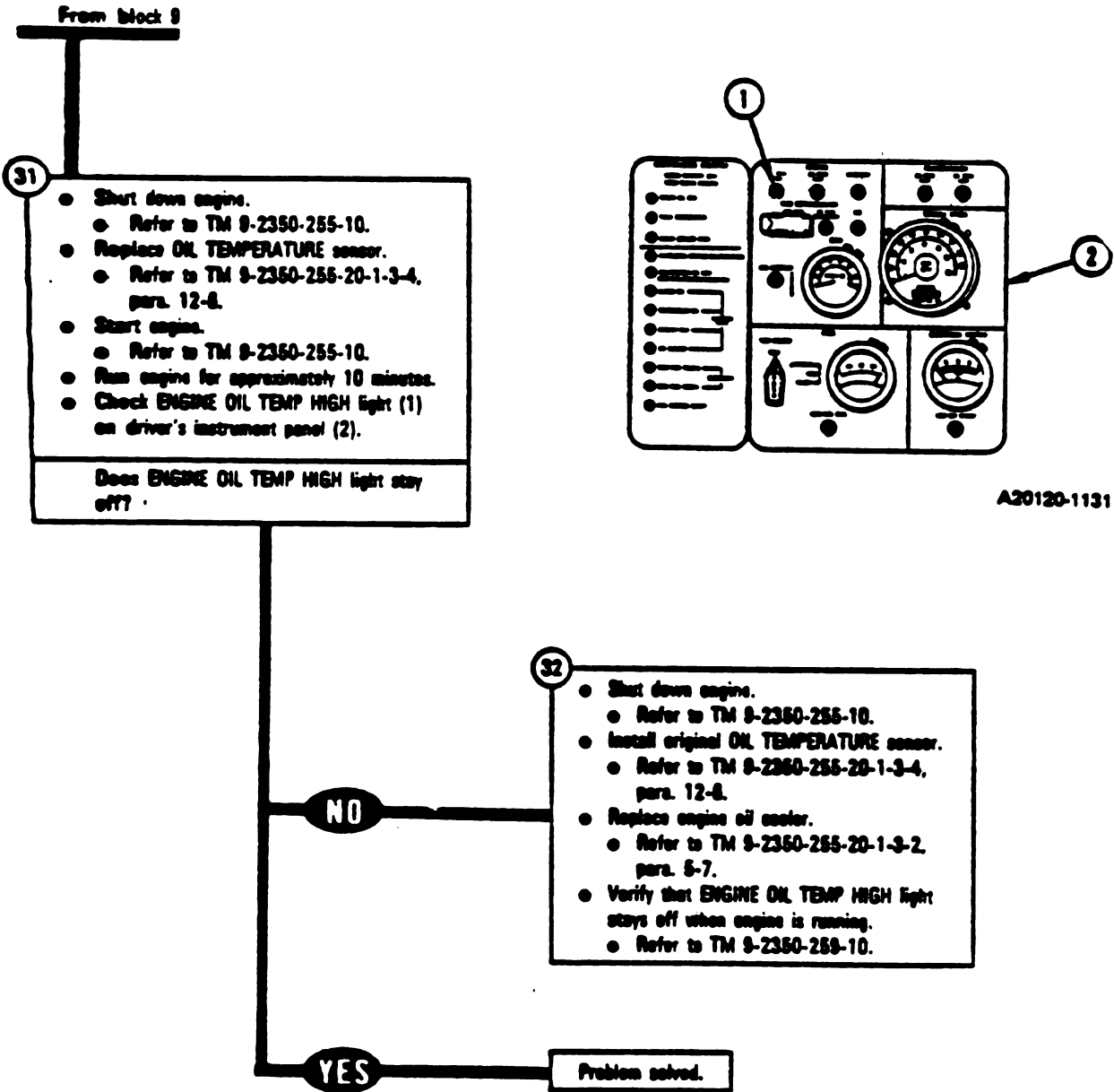


Figure 9-10 (Sheet 9 of 9)  
Volume II.  
Para. 9-2

**SYMPTOMS ESS-16, ESS-17, ESS-18, AND  
ESS-19**

**ENGINE IDLE SPEED DOES NOT INCREASE  
WHEN TACTICAL IDLE SWITCH IS SET TO  
ON OR WITH THE TRANSMISSION SHIFT  
CONTROL SET TO PVT**

OR

**ENGINE IDLE SPEED NOT AT TACTICAL  
IDLE WITH TRANSMISSION SHIFT CON-  
TROL SET TO PVT, BUT ENGINE SPEED  
INCREASES TO TACTICAL IDLE WHEN  
TACTICAL IDLE SWITCH IS SET TO ON**

OR

**ENGINE IDLE SPEED NOT AT TACTICAL  
IDLE WITH TACTICAL IDLE SWITCH SET  
TO ON, BUT ENGINE SPEED INCREASES  
TO TACTICAL IDLE WHEN TRANSMIS-  
SION SHIFT CONTROL IS SET TO PVT**

OR

**ENGINE IDLE SPEED AT TACTICAL IDLE  
WITH TRANSMISSION SHIFT CONTROL  
SET TO N AND TACTICAL IDLE SWITCH  
SET TO OFF**

**NOTE**

Read para. 9-1 before doing any work.

**Test Equipment/Special Tools:**

- Pliers, slip joint, conduit style with plastic jaw inserts, NSN 5120-00-824-8085

**NOTE**

Do not get the following equipment until told to further on in this procedure.

- STE/M1 Test Set, 12303600

**Equipment Condition:**

- Tank parked.
- Parking brake set.
- Engine shut down.
- Vehicle master power off.

1

- Set up tank controls for standard initial test conditions.
- Refer to table 9-2 at the end of this chapter.

Figure 9-11 (Sheet 1 of 9)  
Volume II  
Para. 9-2

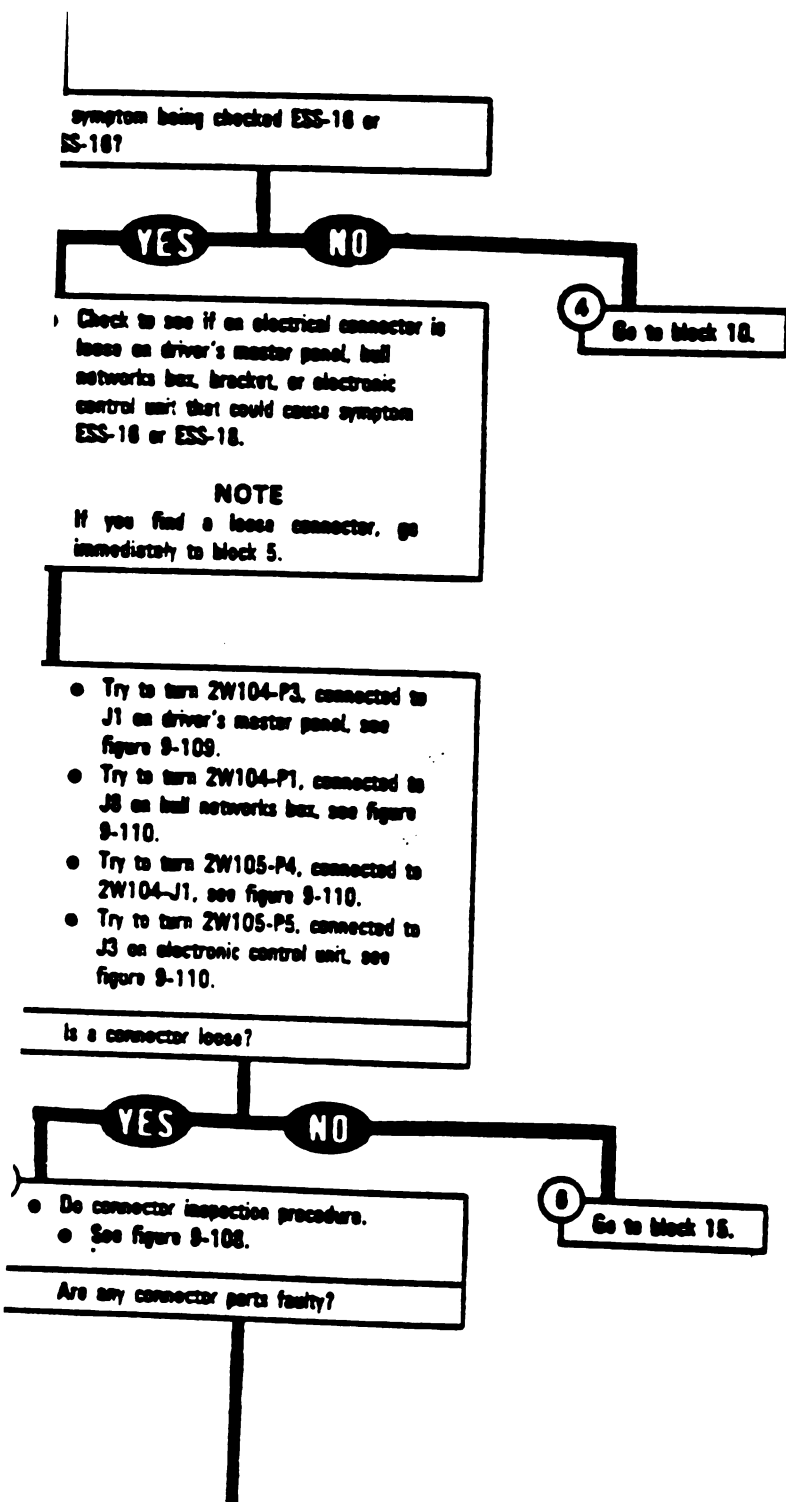


Figure 9-11 (Sheet 2 of 9  
Volume II  
Para. 9-2



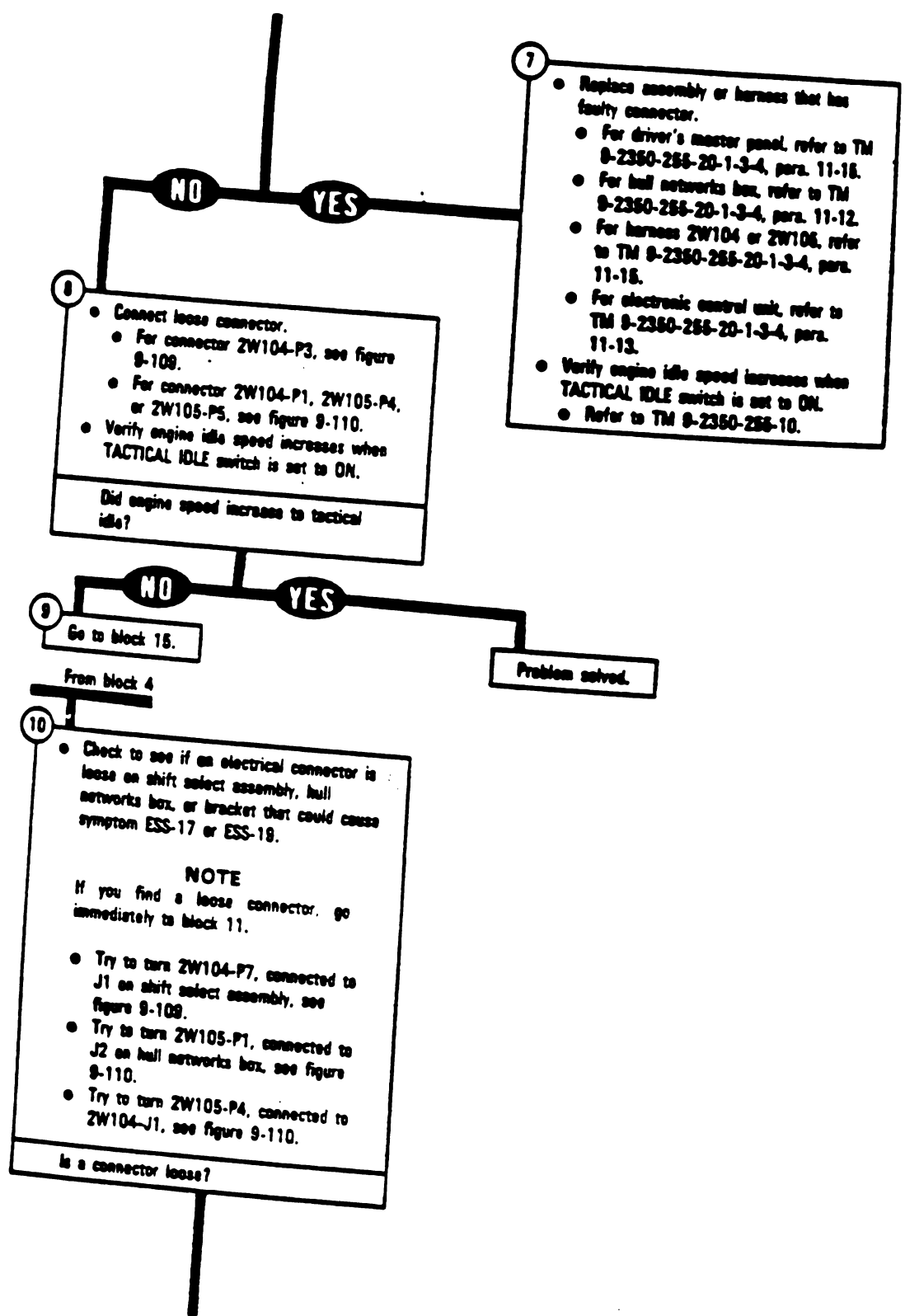


Figure 9-11 (Sheet 3 of 9)  
Volume II  
Para. 9-2

9-88 Change 3

...refer to TM 9-2350-255-20-1-3-4, para. 11-12. ...refer to TM 9-2350-255-20-1-3-4, para. 11-12. ...refer to TM 9-2350-255-20-1-3-4, para. 11-12. ...refer to TM 9-2350-255-20-1-3-4, para. 11-12.

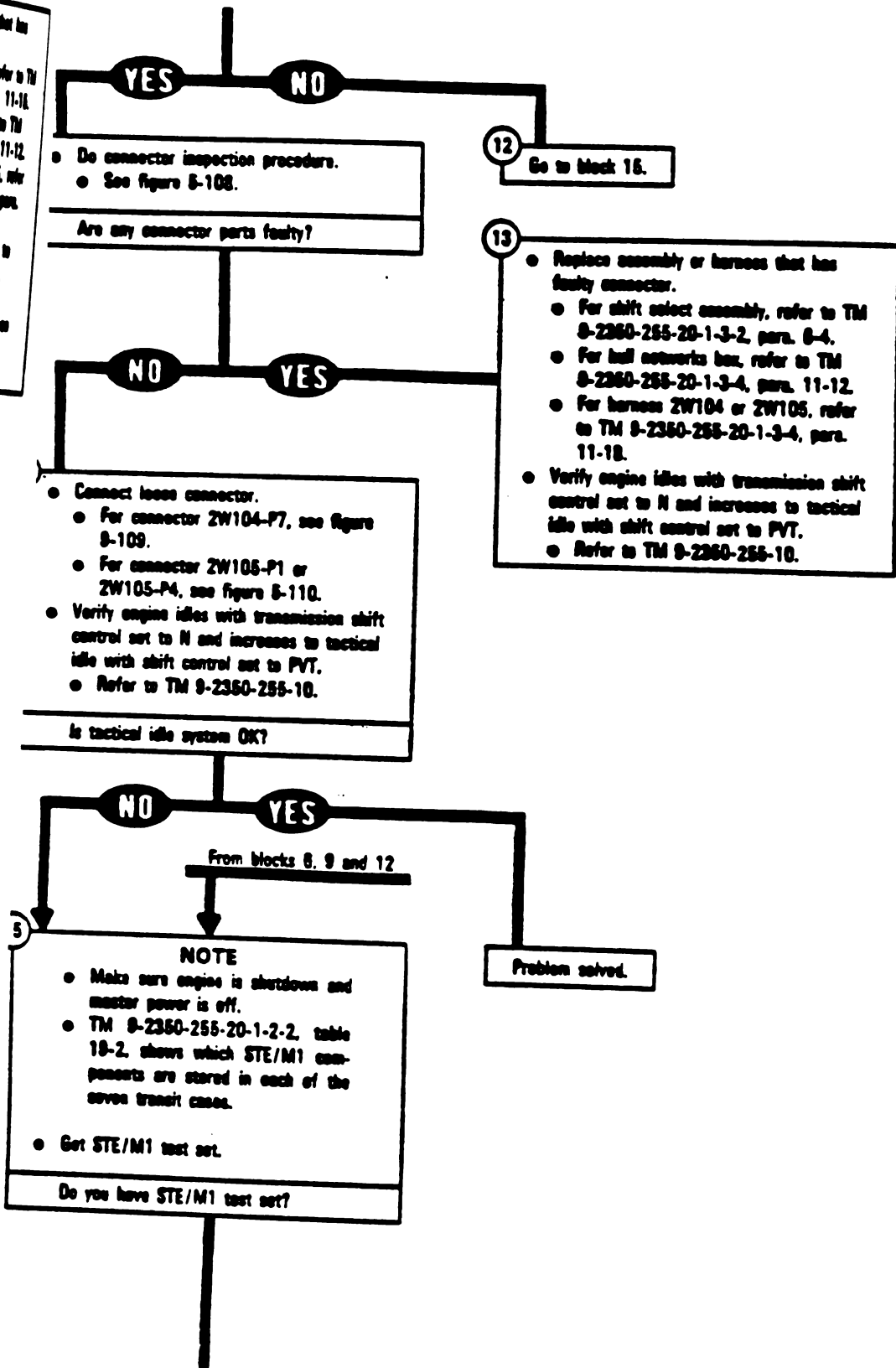
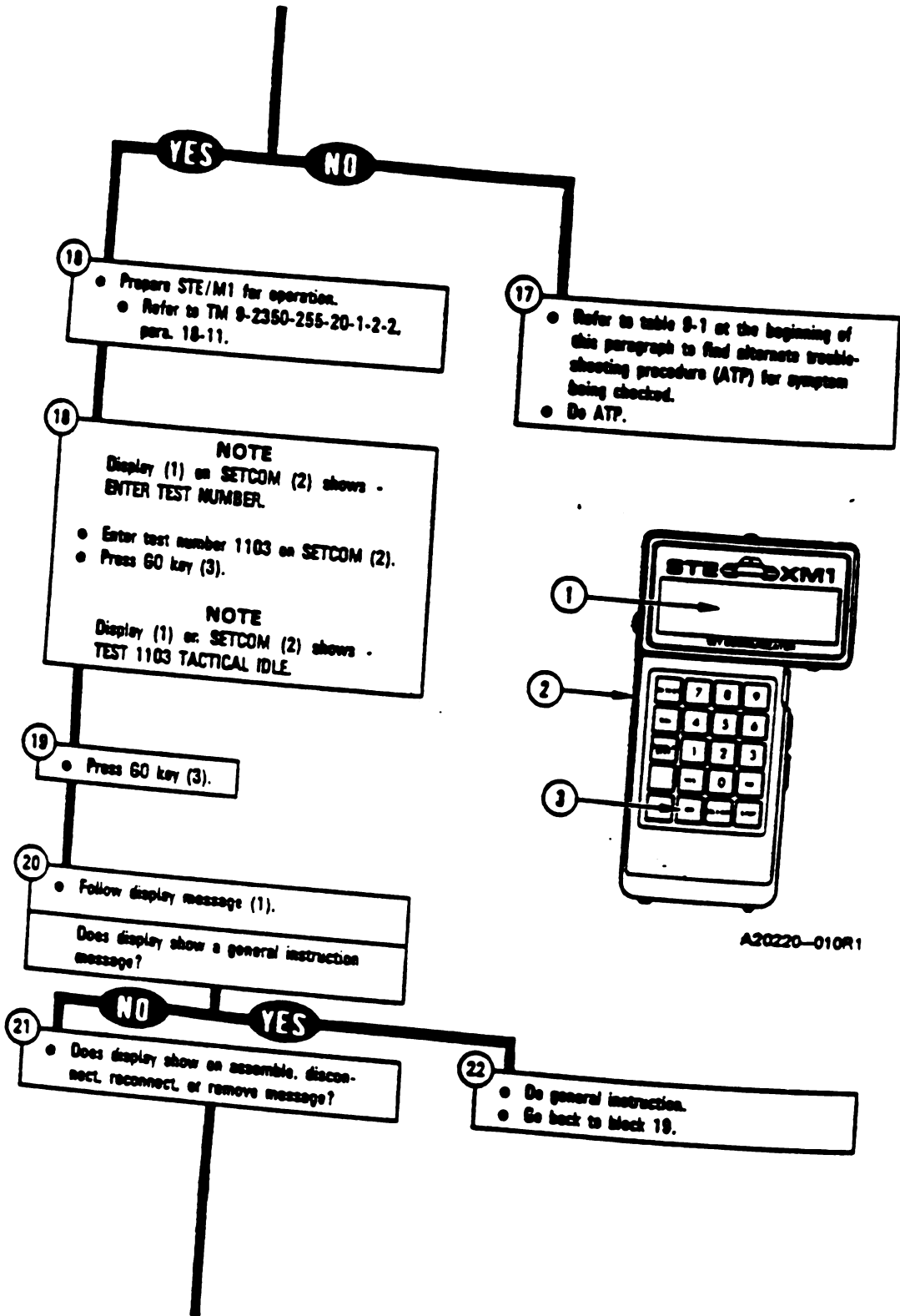


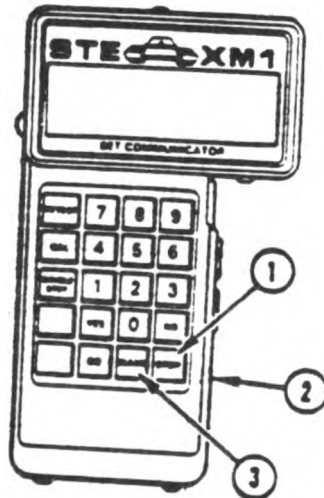
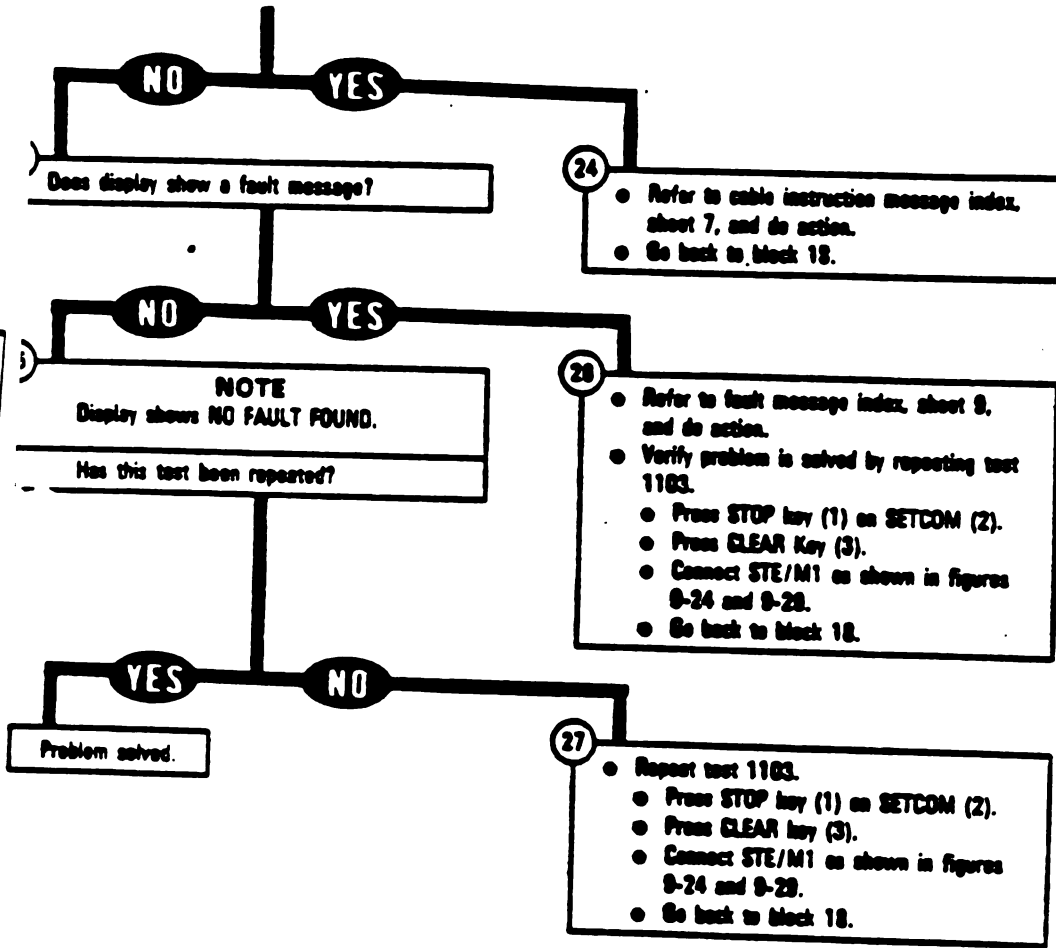
Figure 9-11 (Sheet 4 of 9)  
Volume 4I  
Para. 9-2

TM 9-2350-255-20-1-2.1  
ENGINE SYSTEM TROUBLESHOOTING



9-90 Change 3

Figure 9-11 (Sheet 5 of 9)  
Volume II  
Para. 9-2



A20220-011R1

Figure 9-11 (Sheet 6 of 9)  
Volume II  
Para. 9-2

Engine System Cable Instruction Message Index for Test 1103

Cable Instruction Message	Action
<p>ASSEMBLE CX305, CX206, AND CA418</p>	<ul style="list-style-type: none"> <li>● Connect P1 on CIB cable CX305 to P3 on DBA CX206.</li> <li>● Connect P2 on adapter CA418 to P2 on DBA CX206.</li> <li>● See figure 9-35.</li> </ul>
<p>ASSEMBLE CX304, CX206, AND CA421</p>	<ul style="list-style-type: none"> <li>● Connect P1 on CIB cable CX304 to P3 on DBA CX206.</li> <li>● Connect P2 on adapter CA421 to P1 on DBA CX206.</li> <li>● See figure 9-37.</li> </ul>
<p>ASSEMBLE CX305, CX207, AND CA535/36</p>	<ul style="list-style-type: none"> <li>● Connect P1 on CIB cable CX305 to P3 on DBA CX207.</li> <li>● Connect P2 on adapter CA535 to P1 on DBA CX207.</li> <li>● Connect P2 on adapter CA536 to P2 on DBA CX207.</li> <li>● See figure 9-36.</li> </ul>
<p>CONNECT CX305 P2 TO CIB J1</p>	<ul style="list-style-type: none"> <li>● Connect P2 on CIB cable CX305 to J1 on CIB.</li> <li>● See figure 9-22.</li> </ul>
<p>CONNECT CIB J1 (CX305) TO DMP TJ1 (CA301)</p>	<ul style="list-style-type: none"> <li>● Connect P1 on adapter CA301 to TJ1 on driver's master panel.</li> <li>● Connect P1 on CIB cable CX305 to P2 on adapter CA301.</li> <li>● Connect P2 on CIB cable CX305 to J1 on CIB.</li> <li>● See figure 9-24.</li> </ul>
<p>CONNECT CIB J2 (CX304) TO HNB TJ2 (CA301)</p>	<ul style="list-style-type: none"> <li>● Connect P1 on adapter CA301 to TJ2 on hull networks box.</li> <li>● Connect P1 on CIB cable CX304 to P2 on adapter CA301.</li> <li>● Connect P2 on CIB cable CX304 to J2 on CIB.</li> <li>● See figure 9-29.</li> </ul>
<p>CONNECT DBA BETWEEN 2W104P7 &lt;=&gt; SHIFT J1</p>	<ul style="list-style-type: none"> <li>● Connect P1 on adapter CA536 to J1 on shift control assembly.</li> <li>● Connect P1 on adapter CA535 to 2W104-P7.</li> <li>● See figure 9-36.</li> </ul>
<p>CONNECT CX304 P2 TO CIB J2</p>	<ul style="list-style-type: none"> <li>● Connect P2 on CIB cable CX304 to J2 on CIB.</li> <li>● See figure 9-22.</li> </ul>

Figure 9-11 (Sheet 7 of 9)  
Volume II  
Para. 9-2

Engine System Cable Instruction Message Index for Test 1103 (Continued)

Cable Instruction Message	Action
CONNECT DBA TO P1 on DBA2	<ul style="list-style-type: none"> <li>● Connect P1 on adapter CA418 to J1 on driver's master panel.</li> <li>● See figure 9-35.</li> </ul>
CONNECT DBA TO P1 on DBA2	<ul style="list-style-type: none"> <li>● Connect P1 on adapter CA421 to 2W105-P5.</li> <li>● See figure 9-37.</li> </ul>
CONNECT DBA FROM J1	<ul style="list-style-type: none"> <li>● Disconnect P1 on CIB cable CX305 from P3 on DBA CX206.</li> <li>● Disconnect P1 on adapter CA418 from J1 on driver's master panel.</li> <li>● See figure 9-35.</li> </ul>
CONNECT J1 on DBA2	<ul style="list-style-type: none"> <li>● Disconnect 2W104-P3 from J1 on driver's master panel.</li> <li>● See figure 9-109.</li> </ul>
CONNECT J1 on DBA2	<ul style="list-style-type: none"> <li>● Disconnect 2W104-P7 from J1 on shift control assembly.</li> <li>● See figure 9-109.</li> </ul>
CONNECT J3 on ECU	<ul style="list-style-type: none"> <li>● Disconnect 2W105-P5 from J3 on electronic control unit.</li> <li>● See figure 9-110.</li> </ul>
CONNECT J1 on DBA2	<ul style="list-style-type: none"> <li>● Connect 2W104-P3 to J1 on driver's master panel.</li> <li>● See figure 9-109.</li> </ul>
MOVE CX305 AND ADAPTER AT DMP TJ1	<ul style="list-style-type: none"> <li>● Disconnect P1 on adapter CA301 from TJ1 on driver's master panel.</li> <li>● Disconnect P1 on CIB cable CX305 to P2 on adapter CA301.</li> <li>● See figure 9-24.</li> </ul>
MOVE CX304 AND ADAPTER AT HNB TJ2	<ul style="list-style-type: none"> <li>● Disconnect P1 on adapter CA301 from TJ2 on hull networks box.</li> <li>● Disconnect P2 on adapter CA301 from P1 on CIB cable CX304.</li> <li>● See figure 9-29.</li> </ul>

Figure 9-11 (Sheet 8 of 9)  
Volume II  
Para. 9-2

Change 6 9-93

Engine System Fault Message Index for Test 1103

Fault Message		Action
FAULTY BATTERY/ CHARGING SYS	109910	<ul style="list-style-type: none"> <li>● Charge batteries.</li> <li>● Refer to TM 9-2350-255-10.</li> <li>● Go back to block 27.</li> </ul>
FAULTY DMP	110304 110317 110305 110319 110312 110321 110331	<ul style="list-style-type: none"> <li>● Replace driver's master panel.</li> <li>● Refer to TM 9-2350-255-20-1-3-4, para. 11-15.</li> </ul>
FAULTY ECU	110316 110313	<ul style="list-style-type: none"> <li>● Replace electronic control unit.</li> <li>● Refer to TM 9-2350-255-20-1-3-4, para. 11-13.</li> </ul>
FAULTY ECU OR EMFS	110309	<ul style="list-style-type: none"> <li>● Replace electronic control unit.</li> <li>● Refer to TM 9-2350-255-20-1-3-4, para. 11-13.</li> <li>● If problem is not solved, replace electromechanical system.</li> <li>● Refer to TM 9-2350-255-20-1-3-1, para. 2-5.</li> </ul>
FAULTY ECU, 2W104, OR 2W105	110318	<ul style="list-style-type: none"> <li>● Do follow-on procedure.</li> <li>● See figure 9-59.</li> </ul>
FAULTY HNB OR 2W104	110322 110332	<ul style="list-style-type: none"> <li>● Do follow-on procedure.</li> <li>● See figure 9-60.</li> </ul>
FAULTY HNB, 2W104 OR 2W105	110329 110333	<ul style="list-style-type: none"> <li>● Do follow-on procedure.</li> <li>● See figure 9-61.</li> <li>● See figure 9-62.</li> </ul>
FAULTY HULL POWER SYSTEM	109908 110307	<ul style="list-style-type: none"> <li>● Run hull power distribution test number 1000.</li> <li>● Refer to TM 9-2350-255-20-1-2-2, figure 16-1.</li> </ul>
FAULTY SHIFT ASSEMBLY	110328	<ul style="list-style-type: none"> <li>● Replace shift control assembly.</li> <li>● Refer to TM 9-2350-255-20-1-3-2, para. 6-4.</li> </ul>
HNB FAULTY SHIFT, 2W104 OR 2W105	110310	<ul style="list-style-type: none"> <li>● Do follow-on procedure.</li> <li>● See figure 9-58.</li> </ul>
SYSTEM ERROR	109902 109903	<ul style="list-style-type: none"> <li>● Repeat engine test number 1103.</li> <li>● Press STOP and CLEAR keys on SETCOM.</li> <li>● Go back to block 18.</li> <li>● If same error message appears on SETCOM display, notify support maintenance that test set is faulty.</li> </ul>

Figure 9-11 (Sheet 9 of 9)  
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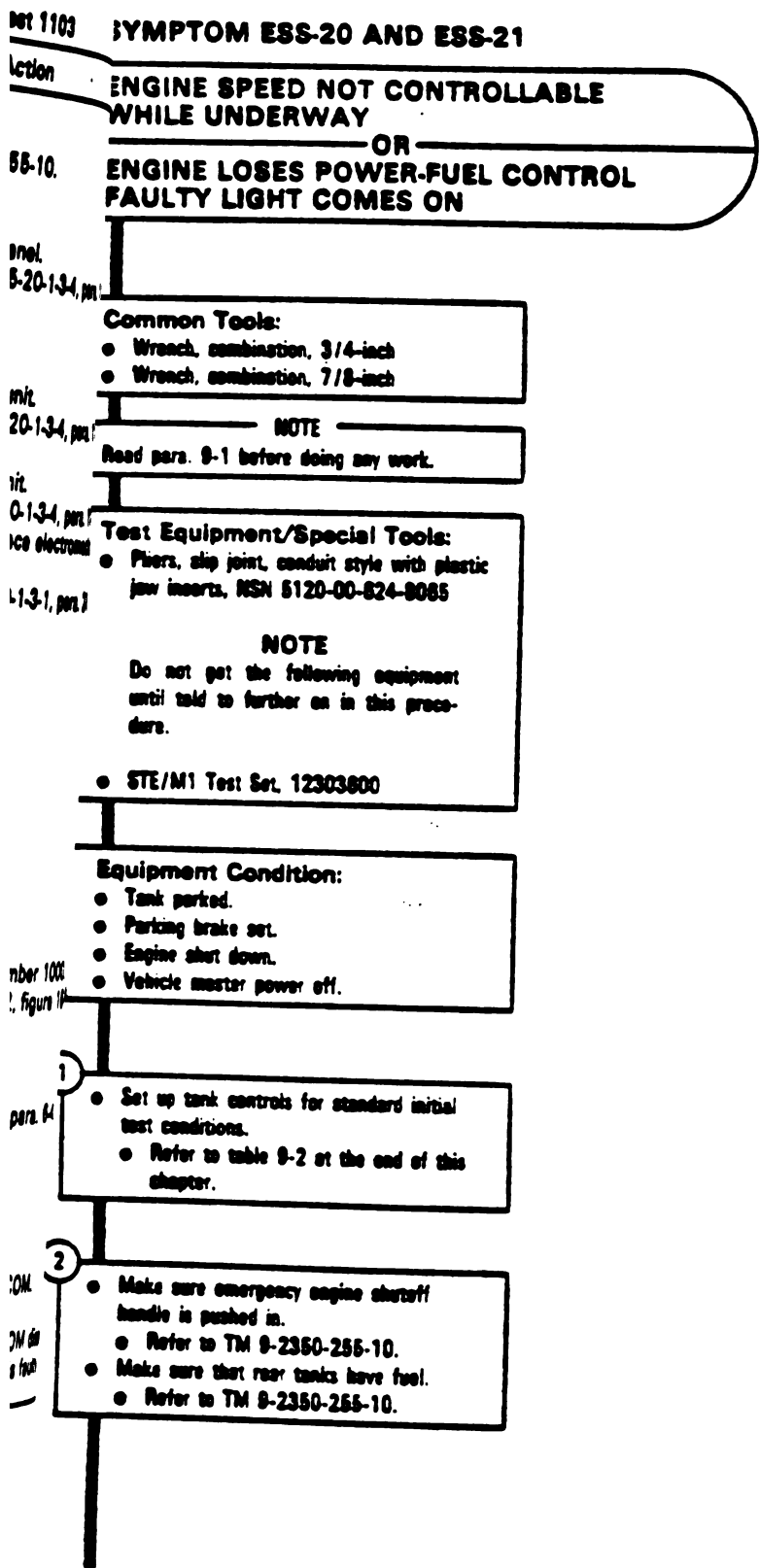


Figure 9-12 (Sheet 1 of 13)  
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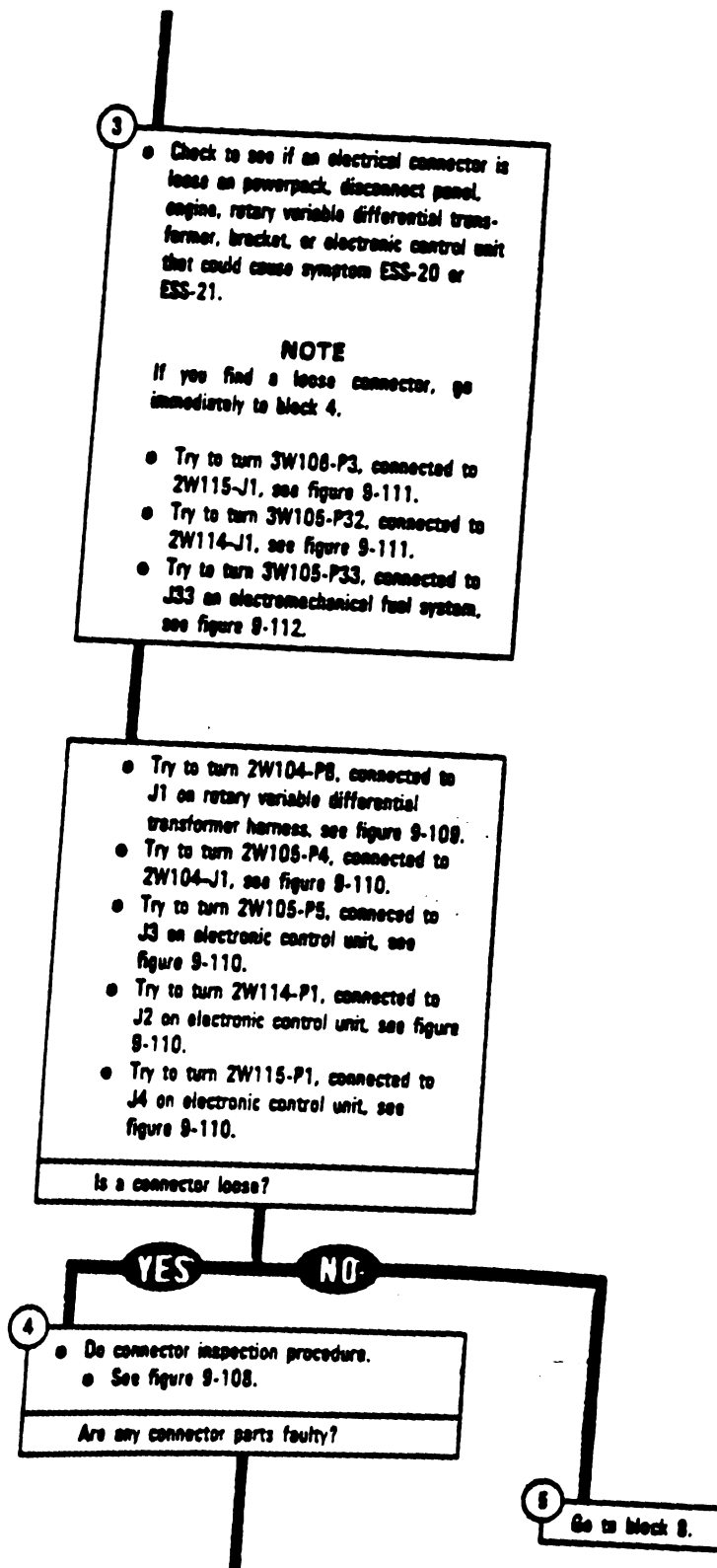


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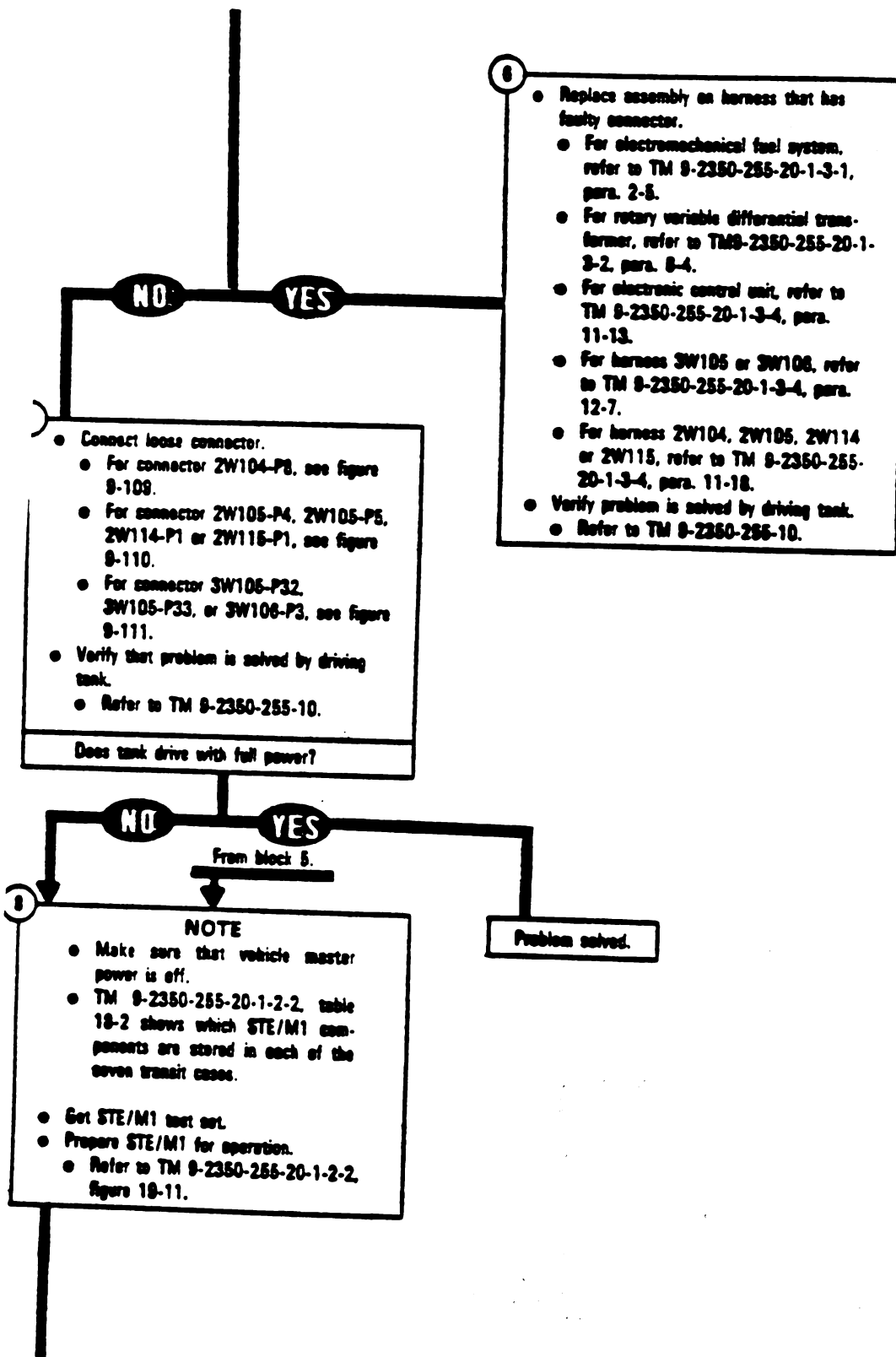


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TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING

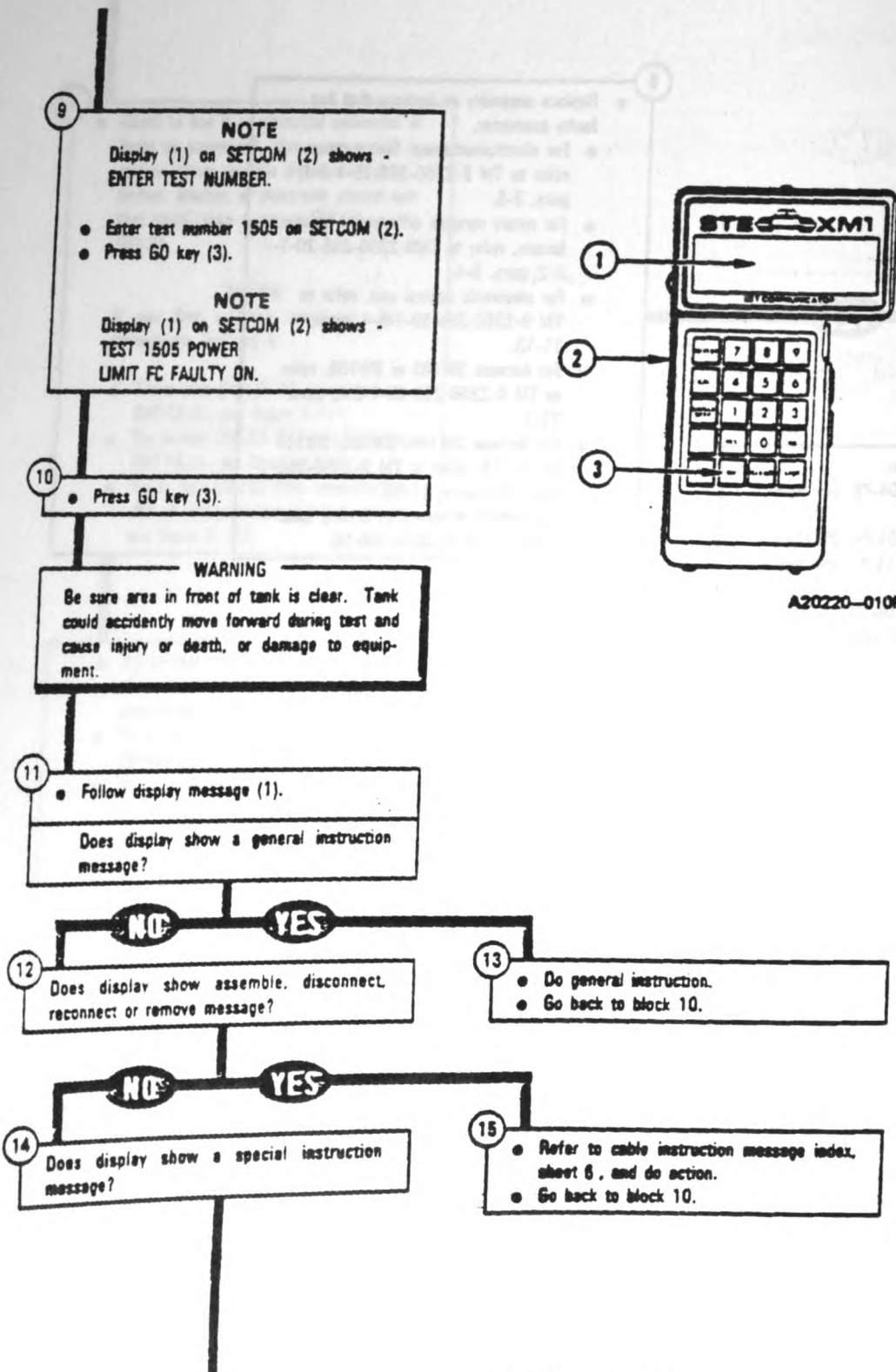
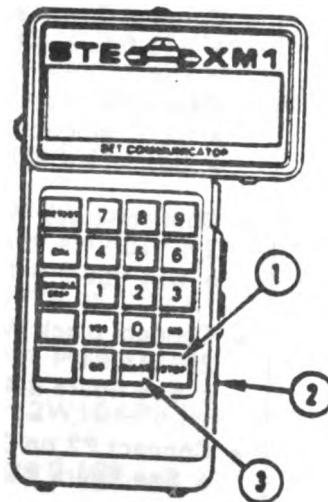
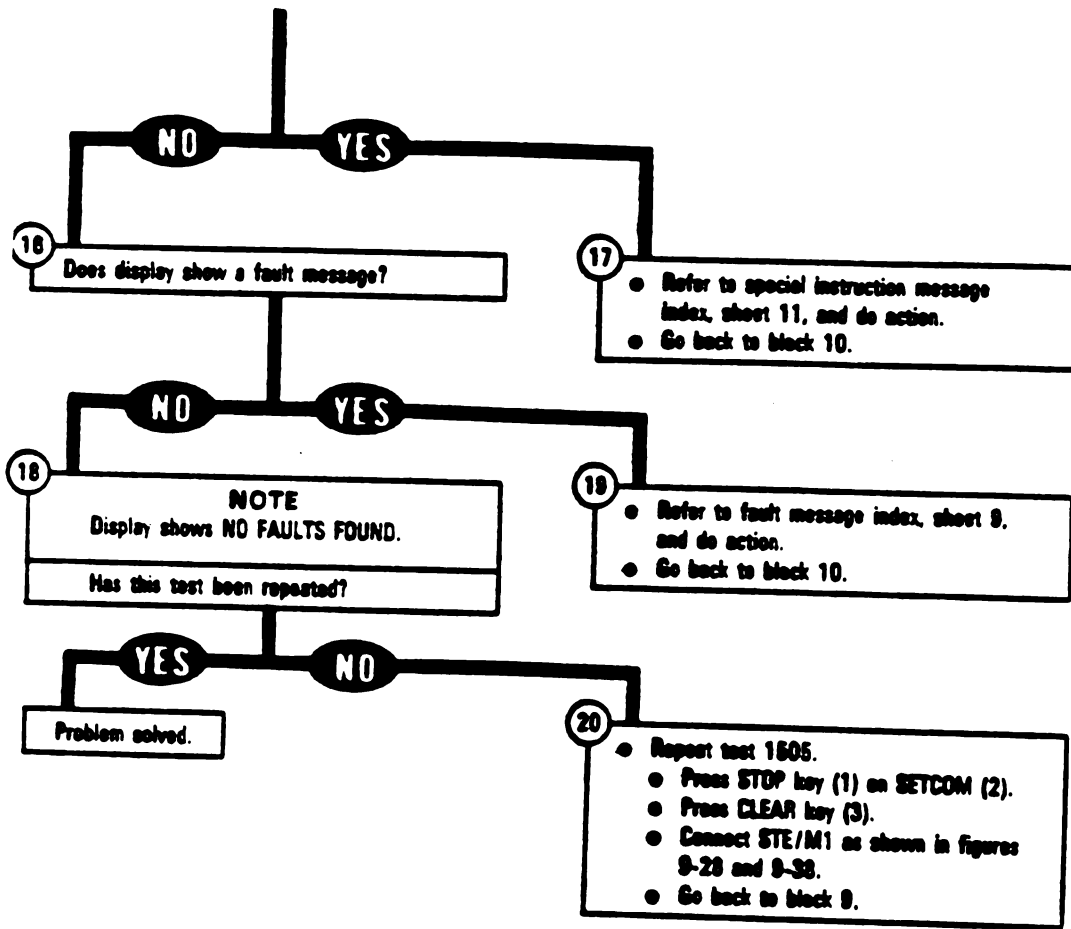


Figure 9-12 (Sheet 4 of 13)  
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A20220-011R1

Figure 9-12 (Sheet 5 of 13)  
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Engine System Cable Instruction Message for Test 1505

Cable Instruction Message	Action
ASSEMBLE CX305 AND CX201	<ul style="list-style-type: none"> <li>● Disconnect P1 on CIB cable CX305 from P2 on adapter CA307 if connected.</li> <li>● See figure 9-53.</li> <li>● Connect P1 on CIB cable CX305 to P1 on DBA CX201.</li> <li>● See figure 9-43.</li> </ul>
ASSEMBLE TWO W4 CABLES <--> ADAPTER	<ul style="list-style-type: none"> <li>● Connect P2 on test cable W4 to end of adapter MS3118E14 containing pins.</li> <li>● Connect P1 on other test cable W4 to end of adapter MS3118E14-19 containing sockets.</li> <li>● See figure 9-23.</li> </ul>
CONNECT CIB J1 (CX305) TO DBA CX201	<ul style="list-style-type: none"> <li>● Connect P2 on CIB cable CX305 to J1 on CIB.</li> <li>● Connect P1 on CIB cable CX305 to P1 on DBA CX201.</li> <li>● See figure 9-40.</li> </ul>
CONNECT CX201 <--> 2W114-P1	<ul style="list-style-type: none"> <li>● Connect 2W114-P1 to P2 on DBA CX201.</li> <li>● See figure 9-40, if TA202 is connected to DBA CX201.</li> <li>● See figure 9-43, if DBA CX201 is connected to J2 on electronic control unit.</li> </ul>
CONNECT TA202 <--> CX201	<ul style="list-style-type: none"> <li>● Connect shorting plug TA202 to P3 on DBA CX201.</li> <li>● See figure 9-40.</li> </ul>
CONNECT W4 <--> VTM J3	<ul style="list-style-type: none"> <li>● Connect P1 on test cable W4 to J3 on VTM.</li> <li>● See figure 9-23.</li> </ul>
CONNECT 2W114 <--> ECU J2	<ul style="list-style-type: none"> <li>● Connect 2W114-P1 to J2 on electronic unit.</li> <li>● See figure 9-110.</li> </ul>
CONNECT BLK PROBE TO ECU CONNECTOR SHELL	<ul style="list-style-type: none"> <li>● Connect alligator clip on black W2 test probe to J4 connector shell on electronic control unit.</li> <li>● See figure 9-42.</li> </ul>
CONNECT BLK PROBE TO 2W115 P1 PIN A	<ul style="list-style-type: none"> <li>● Connect black W2 test probe to TA1 probe in socket A on 2W115-P1.</li> <li>● See figure 9-41.</li> </ul>
CONNECT BLK PROBE TO 2W115 P1 PIN C	<ul style="list-style-type: none"> <li>● Connect black W2 test probe to TA1 probe in socket C on 2W115-P1.</li> <li>● See figure 9-41.</li> </ul>
CONNECT CX305 P2 TO CIB J1	<ul style="list-style-type: none"> <li>● Connect P2 on CIB cable CX305 to J1 on CIB.</li> <li>● See figure 9-22.</li> </ul>
CONNECT CIB J1 (CX305) TO DIP TJ1 (CA307)	<ul style="list-style-type: none"> <li>● Connect P1 on adapter CA307 to TJ1 on driver's instrument panel.</li> <li>● Connect P1 on CIB cable CX305 to P2 on adapter CA307.</li> <li>● Connect P2 on CIB cable CX305 to J1 on CIB.</li> <li>● See figure 9-53.</li> </ul>

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**Engine System Cable Instruction Message Index for Test 1505 (Continued)**

Cable Instruction Message	Action
CONNECT CIB J1 (CX305) TO CX201	<ul style="list-style-type: none"> <li>● Disconnect P1 on CIB cable CX305 from P2 on adapter CA307, if connected.</li> <li>● Connect P1 on CIB cable CX305 to P1 on DBA CX201.               <ul style="list-style-type: none"> <li>● See figure 9-43.</li> </ul> </li> </ul>
CONNECT CIB J2 (CX304) TO CA201	<ul style="list-style-type: none"> <li>● Connect P1 on CIB cable CX304 to P1 on adapter CA201.</li> <li>● Connect P2 on CIB cable CX304 to J2 on CIB.               <ul style="list-style-type: none"> <li>● See figure 9-28.</li> </ul> </li> </ul>
CONNECT CIB J2 (CX304) TO ECU J1 (CA201)	<ul style="list-style-type: none"> <li>● Connect P2 on adapter CA201 to J1 on electronic control unit.</li> <li>● Connect P1 on CIB cable CX304 to P1 on adapter CA201.</li> <li>● Connect P2 on CIB cable CX304 to J2 on CIB.               <ul style="list-style-type: none"> <li>● See figure 9-28.</li> </ul> </li> </ul>
CONNECT DBA BETWEEN 2W114 <--> ECU J2	<ul style="list-style-type: none"> <li>● Connect 2W114-P1 to P2 on DBA CX201.</li> <li>● Connect P3 on DBA CX201 to J2 on electronic control unit.               <ul style="list-style-type: none"> <li>● See figure 9-43.</li> </ul> </li> </ul>
CONNECT RED PROBE TO BLACK PROBE	<ul style="list-style-type: none"> <li>● Touch red W2 test probe to black W2 test probe for several seconds to zero VTM.</li> </ul>
CONNECT RED PROBE TO 2W115 P1 PIN B	<ul style="list-style-type: none"> <li>● Connect red W2 test probe to TA1 probe in socket B on 2W115-P1.               <ul style="list-style-type: none"> <li>● See figure 9-41.</li> </ul> </li> </ul>
CONNECT RED XDUCER TO W4 CABLE	<ul style="list-style-type: none"> <li>● Connect P2 on test cable W4 to 25 psi transducer (red).               <ul style="list-style-type: none"> <li>● See figure 9-39.</li> </ul> </li> </ul>
CONNECT RED XDUCER & TA302 AT EMFS INLET	<ul style="list-style-type: none"> <li>● Remove cap on fuel inlet tee with 7/8 inch wrench.</li> <li>● Connect adapter TA302 to fuel inlet tee with 7/8 inch wrench.</li> <li>● Connect 25 psi transducer (red) to adapter TA302 with 3/4 inch wrench.               <ul style="list-style-type: none"> <li>● See figure 9-39.</li> </ul> </li> </ul>
CONNECT W2 PROBES TO VTM J4	<ul style="list-style-type: none"> <li>● Connect P1 on test cable W2 to J4 on VTM.               <ul style="list-style-type: none"> <li>● See figure 9-41.</li> </ul> </li> </ul>
DISCONNECT CX201 <--> ECU J2	<ul style="list-style-type: none"> <li>● Disconnect P3 on DBA CX201 from J2 on electronic control unit.               <ul style="list-style-type: none"> <li>● See figure 9-43.</li> </ul> </li> </ul>
DISCONNECT 2W104 <--> TCNTL	<ul style="list-style-type: none"> <li>● Disconnect 2W104-P8 from J1 on bracket in driver's compartment.               <ul style="list-style-type: none"> <li>● See figure 9-109.</li> </ul> </li> </ul>
DISCONNECT 2W114 <--> ECU J2	<ul style="list-style-type: none"> <li>● Disconnect 2W114-P1 from J2 on electronic control unit.               <ul style="list-style-type: none"> <li>● See figure 9-110.</li> </ul> </li> </ul>

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TM 9-2350-255-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING

Engine System Cable Instruction Message Index for Test 1505 (Continued)

Cable Instruction Message	Action
DISCONNECT 2W115 ←→ ECU J4	<ul style="list-style-type: none"> <li>● Disconnect 2W115-P1 from J4 on electronic control unit.</li> <li>● See figure 9-112, sheet 1.</li> </ul>
DISCONNECT 3W105 ←→ EMFS	<ul style="list-style-type: none"> <li>● Disconnect 3W105-P33 from J33 on electromechanical fuel system.</li> <li>● See figure 9-154, sheet 1.</li> </ul>
DISCONNECT DBA FROM TA202 AND 2W114	<ul style="list-style-type: none"> <li>● Disconnect shorting plug TA202 from P3 on DBA CX201.</li> <li>● Disconnect 2W114-P1 from P2 on DBA CX201.</li> <li>● See figure 9-40.</li> </ul>
DISCONNECT DBA FROM 2W114 ←→ ECU J2	<ul style="list-style-type: none"> <li>● Disconnect 2W114-P1 from P2 on DBA CX201.</li> <li>● Disconnect P3 on DBA CX201 from J2 on electronic control unit.</li> <li>● See figure 9-43.</li> </ul>
INSERT 20P PINS IN 2W115-P1 A, B	<ul style="list-style-type: none"> <li>● Put TA1 test probe (20GA) into socket A on 2W115-P1.</li> <li>● Put TA1 test probe (20GA) into socket B on 2W115-P1.</li> <li>● See figure 9-41.</li> </ul>
RECONNECT 2W114 ←→ ECU J2	<ul style="list-style-type: none"> <li>● Connect 2W114-P1 to J2 on electronic control unit.</li> <li>● See figure 9-110.</li> </ul>
RECONNECT 2W115 ←→ ECU J4	<ul style="list-style-type: none"> <li>● Connect 2W115-P1 to J4 on electronic control unit.</li> <li>● See figure 9-110.</li> </ul>
RECONNECT 3W105 ←→ EMFS	<ul style="list-style-type: none"> <li>● Connect 3W105-P33 to J33 on electromechanical fuel system.</li> <li>● See figure 9-112, sheet 1.</li> </ul>
RECONNECT SHORTING CAP AT ECU J1 OR REPLACE SHORTING CAP AT ECU J1	<ul style="list-style-type: none"> <li>● Connect shorting cap to J1 on electronic control unit.</li> <li>● See figure 9-110.</li> </ul>
REMOVE CX305 AND ADAPTER AT DIP TJ1	<ul style="list-style-type: none"> <li>● Disconnect P1 on CIB cable CX305 from P2 on adapter CAS.</li> <li>● Disconnect P1 on adapter CA307 from TJ1 on driver's instrument panel.</li> <li>● See figure 9-53.</li> </ul>
REMOVE CX304 AND ADAPTER AT ECU J1	<ul style="list-style-type: none"> <li>● Disconnect P2 on adapter CA201 from J1 on electronic control unit.</li> <li>● See figure 9-28.</li> <li>● Disconnect P3 on DBA CX201 from J2 on electronic control unit.</li> <li>● See figure 9-43.</li> </ul>
RECONNECT CX304, CA201, AND ECU J1	<ul style="list-style-type: none"> <li>● Connect P1 on adapter CA201 to J1 on electronic control unit.</li> <li>● See figure 9-51.</li> </ul>

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Engine System Fault Message Index for Test 1B05

Fault Message	Action
FAULTY BATTERY CHARGING SYS 152403	<ul style="list-style-type: none"> <li>● Charge batteries.</li> <li>● Refer to TM 9-2350-255-10.</li> <li>● Go back to block 20.</li> </ul>
FAULTY ECU 150503 151222 150512 151303 150532 151305 151103 151306 151113 152202 151118 152215 151122 152224 151203 152235 151213 152236 151218 154006	<ul style="list-style-type: none"> <li>● Replace electronic control unit.</li> <li>● Refer to TM 9-2350-255-20-1-3-4, para. 11-13.</li> </ul>
FAULTY ECU, 2W105 R 2W104 151903	<ul style="list-style-type: none"> <li>● Do follow-on procedure.</li> <li>● See figure 9-86.</li> </ul>
FAULTY IGV FEEDBACK CABLE 152211	<ul style="list-style-type: none"> <li>● Replace inlet guide vane feedback cable.</li> <li>● Refer to TM 9-2350-255-20-1-3-1, para. 2-5.</li> </ul>
FAULTY EMPS 151304 151307 151902	<ul style="list-style-type: none"> <li>● Replace electromechanical fuel system.</li> <li>● Refer to TM 9-2350-255-20-1-3-1, para. 2-5.</li> </ul>
FAULTY EMPS, IGV ACT OR ENGINE 150533	<ul style="list-style-type: none"> <li>● Do follow-on procedure.</li> <li>● See figure 9-90.</li> </ul>
FAULTY EMPS OR IGV ACTUATOR 150528	<ul style="list-style-type: none"> <li>● Do follow-on procedure.</li> <li>● See figure 9-89.</li> </ul>
FAULTY EMPS, PTS ACT OR ENGINE 150523	<ul style="list-style-type: none"> <li>● Do follow-on procedure.</li> <li>● See figure 9-88.</li> </ul>
FAULTY FUEL SYSTEM 150531	<ul style="list-style-type: none"> <li>● Do follow-on procedure.</li> <li>● See figure 9-85.</li> </ul>
FAULTY HULL POWER SYSTEM 152404	<ul style="list-style-type: none"> <li>● Run hull power distribution test number 1000.</li> <li>● Refer to TM 9-2350-255-20-1-2-2, figure 16-1.</li> </ul>
FAULTY 2W114 3W105 OR NPT1 & 2 154604 154607	<ul style="list-style-type: none"> <li>● Do follow-on procedure.</li> <li>● See figure 9-107.</li> </ul>

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TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING

Engine System Fault Message Index for Test 1505 (Continued)

Fault Message	Action
<b>FAULTY THROTTLE CONTROL</b> 150502 150505 150508 151004 151008	<ul style="list-style-type: none"> <li>● Run engine test number 1523.</li> <li>● See figure 9-17.</li> </ul>
<b>FAULTY PTS FEEDBACK CABLE</b> 152232	<ul style="list-style-type: none"> <li>● Replace power turbine stator feedback cable.</li> <li>● Refer to TM 9-2350-255-20-1-3-1, para. 2-5.</li> </ul>
<b>FAULTY THROTTLE CONTROL RVDT</b> 151907	<ul style="list-style-type: none"> <li>● Replace rotary variable differential transformer.</li> <li>● Refer to TM 9-2350-255-20-1-3-2, para. 6-4.</li> </ul>
<b>FAULTY STOP/START SYSTEM</b> 151704	<ul style="list-style-type: none"> <li>● Run engine test number 1130.</li> <li>● See figure 9-6.</li> </ul>
<b>FAULTY 2W114 OR 3W105</b> 151905	<ul style="list-style-type: none"> <li>● Do follow-on procedure.</li> <li>● See figure 9-97.</li> </ul>
<b>FAULTY 2W114, 3W105 OR EMFS</b> 151120 154003 151121 154005 151220 154302 151221 154303 153002 154402 153003 154403	<ul style="list-style-type: none"> <li>● Do follow-on procedure.</li> <li>● See figure 9-79.</li> </ul>
152216 152226 152221 152241	<ul style="list-style-type: none"> <li>● See figure 9-78.</li> </ul>
<b>FAULTY 2W115, 3W106 OR ENGINE</b> 152503 152504 152506	<ul style="list-style-type: none"> <li>● Do follow-on procedure.</li> <li>● See figure 9-99.</li> </ul>

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(Continued)

Special Instruction Message Index for Test 1505

Special Instruction Message	Action
EE -20 MANUAL	
150511	<ul style="list-style-type: none"> <li>● Replace electronic control unit.</li> <li>● Refer to TM 9-2350-255-20-1-3-4, para. 11-13.</li> <li>● Repeat test 1505.               <ul style="list-style-type: none"> <li>● Go back to block 20.</li> </ul> </li> <li>● If fault number 150511 appears again, engine is faulty. Install original electronic control unit.               <ul style="list-style-type: none"> <li>● Notify support maintenance.</li> </ul> </li> </ul>
150518	<ul style="list-style-type: none"> <li>● Run engine test number 1508.</li> </ul>
150526	<ul style="list-style-type: none"> <li>● See figure 9-8.</li> <li>● Run engine test number 1503.               <ul style="list-style-type: none"> <li>● See figure 9-5.</li> </ul> </li> </ul>
150534	<ul style="list-style-type: none"> <li>● Run engine test number 1501.</li> </ul>
152107	<ul style="list-style-type: none"> <li>● See figure 9-2.</li> </ul>
151002	<ul style="list-style-type: none"> <li>● Run engine test number 1502.               <ul style="list-style-type: none"> <li>● See figure 9-4.</li> </ul> </li> </ul>
ADJ IGV -1.20/-0.70V XX.XXV	<ul style="list-style-type: none"> <li>● Set VEHICLE MASTER POWER switch to OFF.               <ul style="list-style-type: none"> <li>● Refer to TM 9-2350-255-10.</li> </ul> </li> <li>● Ground hop powerpack.               <ul style="list-style-type: none"> <li>● Connect ground hop kit. Refer to TM 9-2350-255-20-1-3-1, para. 2-4.</li> </ul> </li> <li>● Set VEHICLE MASTER POWER switch to ON.               <ul style="list-style-type: none"> <li>● Refer to TM 9-2350-255-10.</li> </ul> </li> <li>● Press and hold ENGINE SHUTOFF switch.               <ul style="list-style-type: none"> <li>● Refer to TM 9-2350-255-10.</li> </ul> </li> <li>● Go to figure 9-16, block 25, and do procedure until told to press GO.</li> <li>● Go back to block 10.</li> </ul>
ADJ IGV -11.0/-10.2V XX.XV	<ul style="list-style-type: none"> <li>● Set VEHICLE MASTER POWER switch to OFF.               <ul style="list-style-type: none"> <li>● Refer to TM 9-2350-255-10.</li> </ul> </li> <li>● Ground hop powerpack.               <ul style="list-style-type: none"> <li>● Connect ground hop kit. Refer to TM 9-2350-255-20-1-3-1, para. 2-4.</li> </ul> </li> <li>● Set VEHICLE MASTER POWER switch to ON.               <ul style="list-style-type: none"> <li>● Refer to TM 9-2350-255-10.</li> </ul> </li> <li>● Press and hold ENGINE SHUTOFF switch.               <ul style="list-style-type: none"> <li>● Refer to TM 9-2350-255-10.</li> </ul> </li> <li>● Go to figure 9-16, block 23, and do procedure until told to press GO.</li> <li>● Go back to block 10.</li> </ul>
ADJ IGV RVDT TO MAX XX.XXV	<ul style="list-style-type: none"> <li>● Move inlet guide vane RVDT arm located on electromechanical fuel system until the highest possible reading is seen on second line of SETCOM display.               <ul style="list-style-type: none"> <li>● See figure 9-46.</li> </ul> </li> </ul>
ADJ IGV RVDT TO MIN XX.XXV	<ul style="list-style-type: none"> <li>● Move inlet guide vane RVDT arm located on electromechanical fuel system until the lowest possible reading is seen on second line of SETCOM display.               <ul style="list-style-type: none"> <li>● See figure 9-46.</li> </ul> </li> </ul>

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Special Instruction Message Index for Test 1B05 (Continued)

Special Instruction Message	Action
ADJ PTS -6.5/-6.1V XX.XXV	<ul style="list-style-type: none"> <li>● Set VEHICLE MASTER POWER switch to OFF.               <ul style="list-style-type: none"> <li>● Refer to TM 9-2350-255-10.</li> </ul> </li> <li>● Ground hop powerpack.               <ul style="list-style-type: none"> <li>● Connect ground hop kit. Refer to TM 92-350-255-20-1-3-1, para. 2-4.</li> </ul> </li> <li>● Set VEHICLE MASTER POWER switch to ON.               <ul style="list-style-type: none"> <li>● Refer to TM 9-2350-255-10.</li> </ul> </li> <li>● Press and hold ENGINE SHUTOFF switch.               <ul style="list-style-type: none"> <li>● Refer to TM 9-2350-255-10.</li> </ul> </li> <li>● Go to figure 9-16, block 27, and do procedure until told to press GO.</li> <li>● Go back to block 10.</li> </ul>
ADJ PTS RVDT TO MAX XX.XXV	<ul style="list-style-type: none"> <li>● Move power turbine stator arm located on electromechanical fuel system until the highest possible reading is seen on second line of SETCOM display.               <ul style="list-style-type: none"> <li>● See figure 9-45.</li> </ul> </li> </ul>
ADJ PTS RVDT TO MIN XX.XXV	<ul style="list-style-type: none"> <li>● Move power turbine stator arm located on electromechanical fuel system until the lowest possible reading is seen on second line of SETCOM display.               <ul style="list-style-type: none"> <li>● See figure 9-45.</li> </ul> </li> </ul>
MOVE IGV ARM TO FOLLOWING VALUE	<ul style="list-style-type: none"> <li>● Press GO key on SETCOM.               <ul style="list-style-type: none"> <li>● See figure 9-46.</li> </ul> </li> </ul>
MOVE IGV LEVER FULLY REARWARD, PUSH HARD	<ul style="list-style-type: none"> <li>● Move IGV lever towards rear of engine.               <ul style="list-style-type: none"> <li>● See figure 9-55.</li> </ul> </li> </ul>
MOVE IGV LEVER TO FULL FWD POSITION	<ul style="list-style-type: none"> <li>● Move IGV lever towards front of engine.               <ul style="list-style-type: none"> <li>● See figure 9-55.</li> </ul> </li> </ul>
MOVE PTS ACTUATOR TO FULL DOWNWARD STOP	<ul style="list-style-type: none"> <li>● Push down on PTS actuator until bottom of actuator hits stop plate.               <ul style="list-style-type: none"> <li>● See figure 9-56.</li> </ul> </li> </ul>
MOVE PTS ARM TO FOLLOWING VALUE	<ul style="list-style-type: none"> <li>● Press GO key on SETCOM.               <ul style="list-style-type: none"> <li>● See figure 9-45.</li> </ul> </li> </ul>
MOVE TO -1.65/-1.35 X.XX V	<ul style="list-style-type: none"> <li>● Move IGV RVDT arm on electromechanical fuel system until SETCOM display shows between -1.65 and -1.35.               <ul style="list-style-type: none"> <li>● See figure 9-46.</li> </ul> </li> </ul>
MOVE TO -0.45/-0.15 -X.XX V	<ul style="list-style-type: none"> <li>● Move IGV RVDT arm on electromechanical fuel system until SETCOM display shows between -0.45 and -0.15.               <ul style="list-style-type: none"> <li>● See figure 9-46.</li> </ul> </li> </ul>
MOVE TO +0.25/0.55 X.XX V	<ul style="list-style-type: none"> <li>● Move IGV RVDT arm on electromechanical fuel system until SETCOM display shows between +0.25 and +0.55.               <ul style="list-style-type: none"> <li>● See figures 9-46.</li> </ul> </li> </ul>

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Special Instruction Message Index for Test 1505 (Continued)

Special Instruction Message	Action
MOVE TO -7.10/-6.90 X.XX V	<ul style="list-style-type: none"> <li>● Move PTS arm on electromechanical fuel system until SETCOM display shows between -7.10 and -6.90.</li> <li>● See figure 9-45.</li> </ul>
MOVE TO -5.90/-5.70 X.XX V	<ul style="list-style-type: none"> <li>● Move PTS arm on electromechanical fuel system until SETCOM display shows between -5.90 and -5.70.</li> <li>● See figure 9-45.</li> </ul>
MOVE TO -5.10/-4.90 X.XX V	<ul style="list-style-type: none"> <li>● Move PTS arm on electromechanical fuel system until SETCOM display shows between -5.10 and -4.90.</li> <li>● See figure 9-45.</li> </ul>
PULL LINK PIN; REACH IGV-RVDT	<ul style="list-style-type: none"> <li>● Disconnect IGV feedback cable from electromechanical fuel system by removing quick-disconnect pin.</li> <li>● See figure 9-46.</li> </ul>
PULL LINK PIN; REACH PTS-RVDT	<ul style="list-style-type: none"> <li>● Disconnect PTS feedback cable from electromechanical fuel system by removing quick-disconnect pin.</li> <li>● See figure 9-45.</li> </ul>

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**SYMTPOM ESS-22**

**ENGINE LOSES POWER - FUEL CONTROL  
FAULTY LIGHT STAYS OFF**

**Common Tools:**

- Wrench, combination, 3/4 inch
- Wrench, combination, 7/8 inch

**NOTE**

Read para. 9-1 before doing any work.

**Test Equipment/Special Tools:**

- Pliers, slip joint, conduit style with plastic jaw inserts, NSN 5120-00-824-8065.

**NOTE**

Do not get following equipment until told to further on in this procedure.

- STE/M1 Test Set, 12303800

**Equipment Condition:**

- Tank parked.
- Parking brake set.
- Engine shut down.
- Vehicle master power off.

①

- Set up tank controls for standed initial test conditions.
- Refer to table 9-2 at the end of this chapter.

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- Check to see if an electrical connector is loose on rotary variable differential transformer, bracket, electronic control unit, powerpack disconnect panel, or engine that could cause symptom ESS-22.

**NOTE**

If you find a loose connector, go immediately to block 3.

- Try to turn ZW104-P8 connected to J1 on rotary variable differential transformer, see figure 9-108.
- Try to turn ZW105-P4 connected to ZW104-J1, see figure 9-110.

- Try to turn ZW114-P1, connected to J2 on electronic control unit, see figure 9-110.
- Try to turn ZW105-P5, connected to J3 on electronic control unit, see figure 9-110.
- Try to turn 3W105-P32, connected to ZW114-J1, see figure 9-111.
- Try to turn 3W105-P33, connected to J33 on electromechanical fuel system, see figure 9-112.

Is a connector loose?

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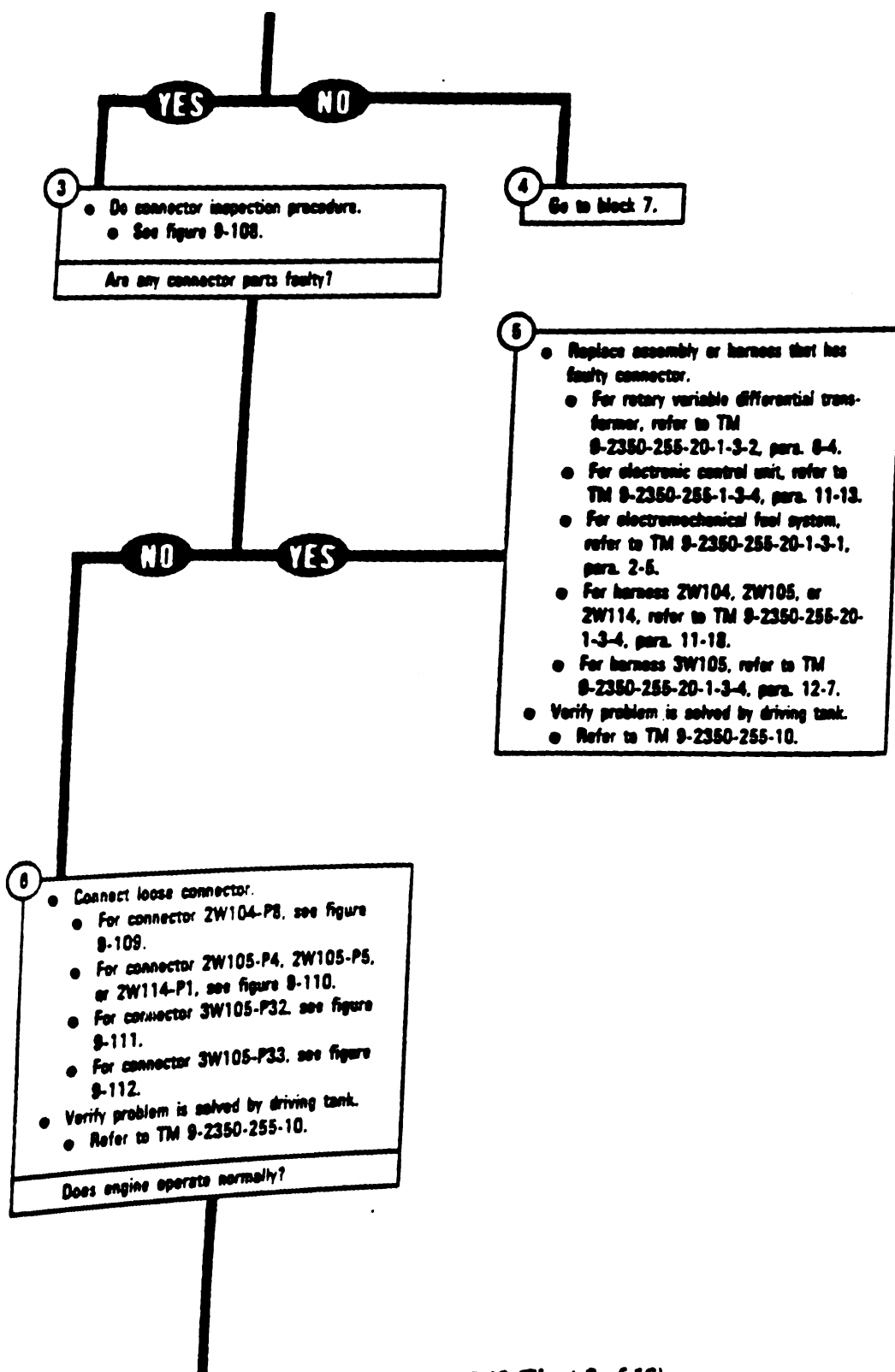


Figure 9-13 (Sheet 3 of 16)  
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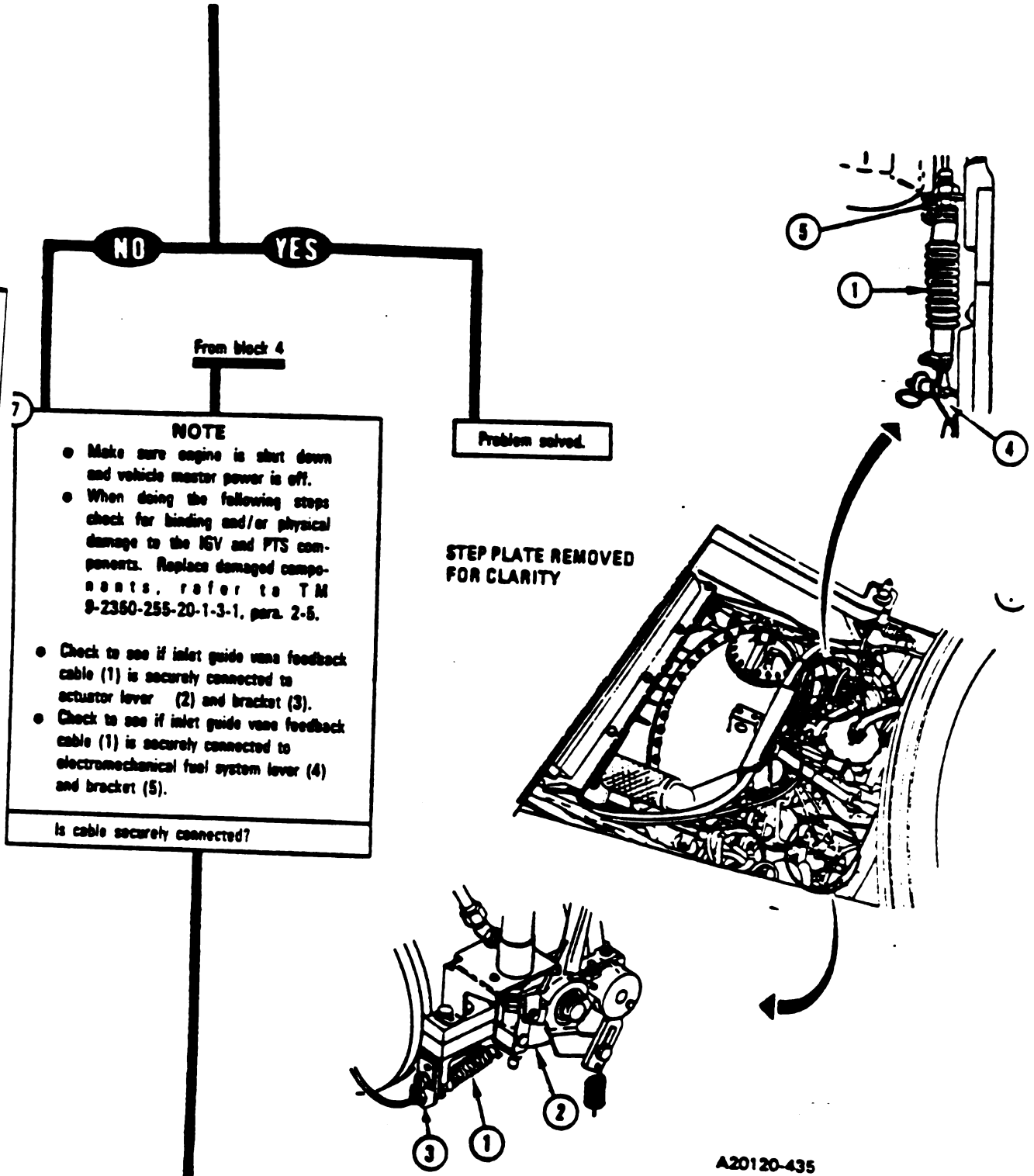


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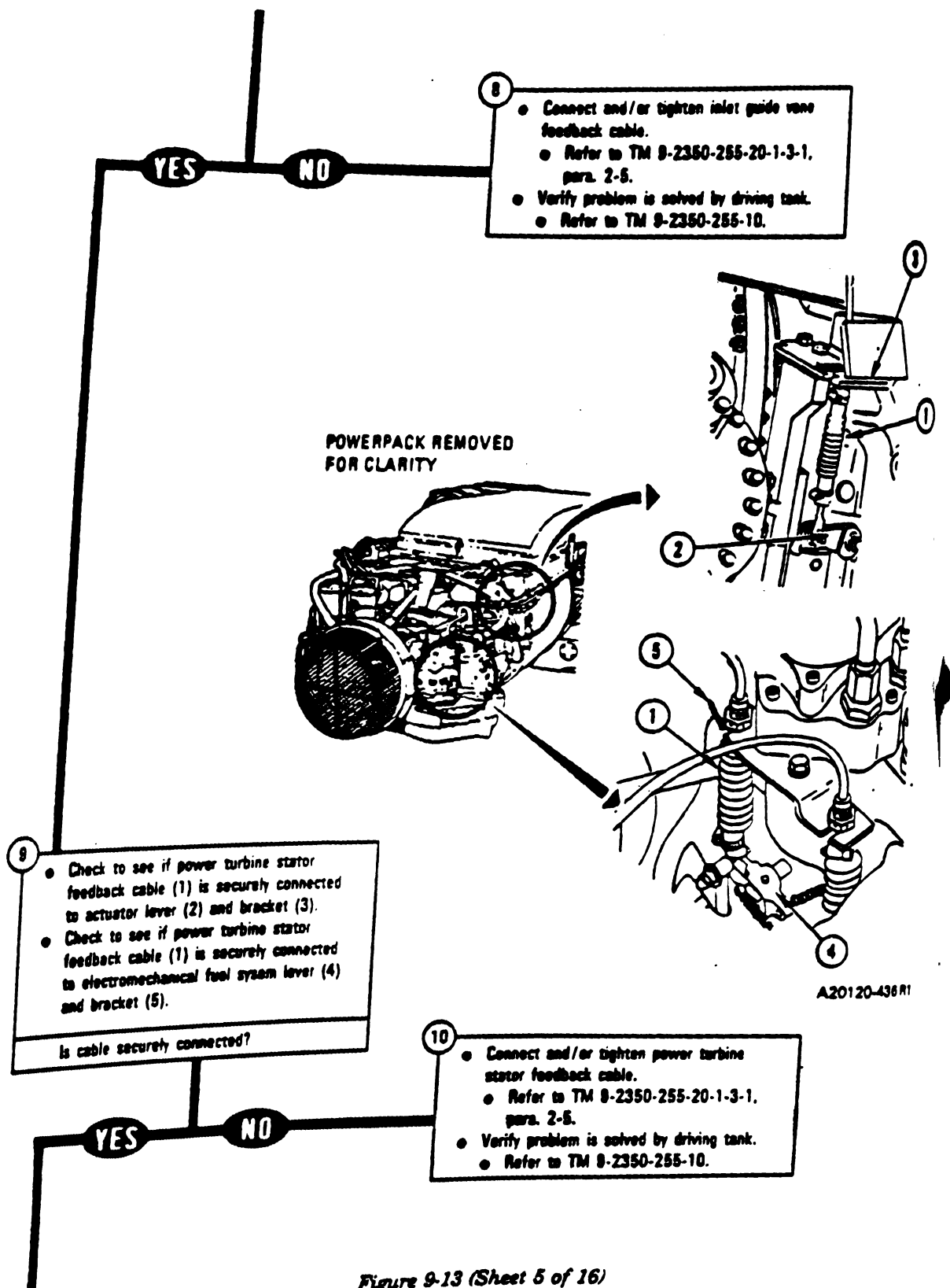


Figure 9-13 (Sheet 5 of 16)  
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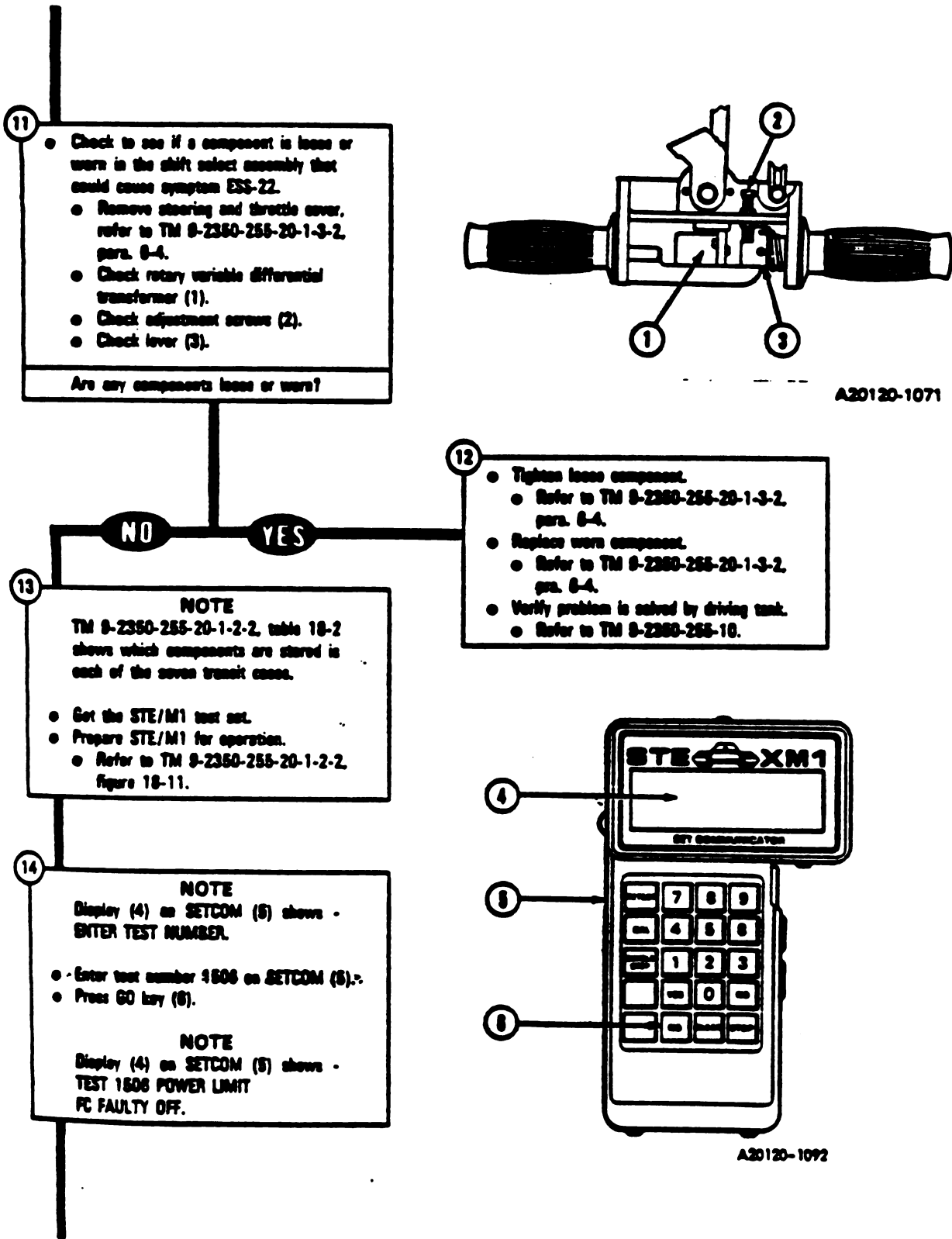
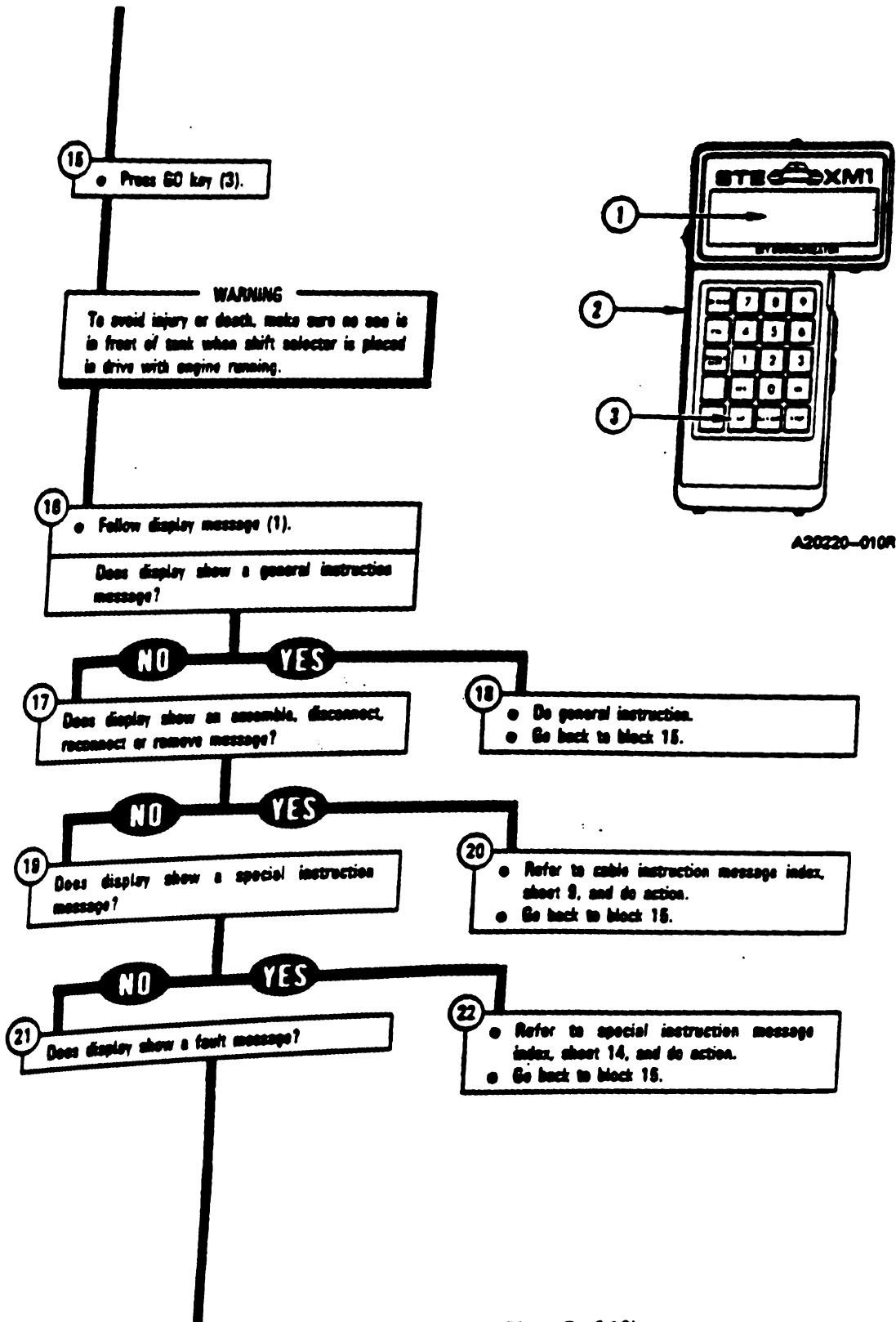


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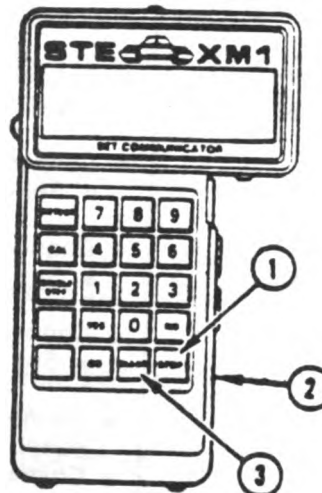
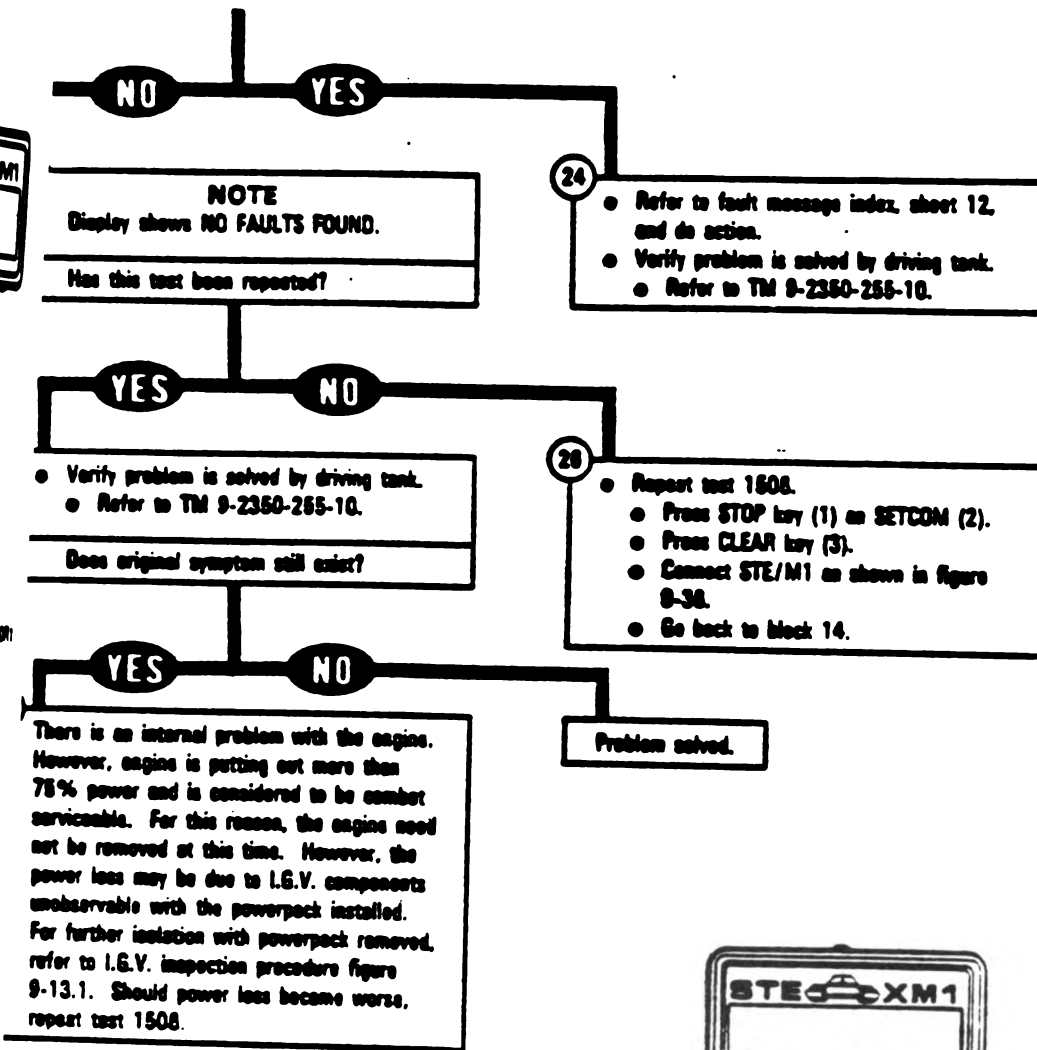
TM 9-2360-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING



A20220-010R1

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9-114 Change 3



A30220-011R1

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Change 5 9-115

Engine System Cable Instruction Message Index for Test 1506

Cable Instruction Message	Action
ASSEMBLE CX305 AND CX201	<ul style="list-style-type: none"> <li>● Disconnect P1 on CIB cable CX305 from P2 on adapter CA307 if connected.</li> <li>● See figure 9-53.</li> <li>● Connect P1 on CIB cable CX305 to P1 on DBA CX201.</li> <li>● See figure 9-43.</li> </ul>
ASSEMBLE TWO W4 CABLES <-> ADAPTER	<ul style="list-style-type: none"> <li>● Connect P2 on test cable W4 to end of adapter MS3119E containing pins.</li> <li>● Connect P1 on other test cable W4 to end of adapter containing sockets.</li> <li>● See figure 9-23.</li> </ul>
CONNECT CIB J1 (CX305) TO DBA CX201	<ul style="list-style-type: none"> <li>● Connect P2 on CIB cable CX305 to J1 on CIB.</li> <li>● Connect P1 on CIB cable CX305 to P1 on DBA CX201.</li> <li>● See figure 9-40.</li> </ul>
CONNECT DBA BETWEEN 2W114 <-> ECU J2	<ul style="list-style-type: none"> <li>● Connect 2W114-P1 to P2 on DBA CX201.</li> <li>● Connect P3 on DBA CX201 to J2 on electronic control unit.</li> <li>● See figure 9-43.</li> </ul>
CONNECT FLOWMETER INTO FUEL LINE	<ul style="list-style-type: none"> <li>● Take off engine fuel quick-disconnect coupling from fuel separator.</li> <li>● Connect TA606 flowmeter between engine fuel quick-disconnect coupling and fuel-water separator.</li> <li>● See figure 9-44.</li> </ul>
CONNECT TA202 <-> CX201	<ul style="list-style-type: none"> <li>● Connect shorting plug TA202 to P3 on DBA CX201.</li> <li>● See figure 9-40.</li> </ul>
CONNECT TA201 <-> W4 CABLE	<ul style="list-style-type: none"> <li>● Connect P2 on test cable W4 to J1 on TA201.</li> <li>● See figure 9-47.</li> </ul>
CONNECT W4 <-> VTM J3	<ul style="list-style-type: none"> <li>● Connect P1 on test cable W4 to J3 on VTM.</li> <li>● See figure 9-23.</li> </ul>
CONNECT 2W114 <-> ECUJ2	<ul style="list-style-type: none"> <li>● Connect 2W114-P1 to J2 on electronic control unit.</li> <li>● See figure 9-110.</li> </ul>
CONNECT CIB J1 (CX305) TO DIP TJ1 (CA307)	<ul style="list-style-type: none"> <li>● Connect P2 on CIB cable CX305 to J1 on CIB.</li> <li>● See figure 9-22.</li> <li>● Connect P1 on adapter CA307 to TJ1 on driver's instrument panel.</li> <li>● Connect P2 on CIB cable CX305 to P2 on adapter CA307.</li> <li>● Connect P2 on CIB cable CX305 to J1 on CIB.</li> <li>● See figure 9-53.</li> </ul>
CONNECT CIB J2 (CX304) TO ECU J1 (CA201)	<ul style="list-style-type: none"> <li>● Connect P2 on adapter CA201 to J1 on electronic control unit.</li> <li>● Connect P1 on CIB cable CX304 to P1 on adapter CA201.</li> <li>● Connect P2 on CIB cable CX304 to J2 on CIB.</li> <li>● See figure 9-28.</li> </ul>

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Engine System Cable Instruction Message Index for Test 1506 (Continued)

Instruction age	Action
305 from P1 to P1 on DB T RED XDUCER & D EMFS INLET	<ul style="list-style-type: none"> <li>Remove cap on fuel inlet tee with 7/8 inch wrench.</li> <li>Connect adapter TA302 to fuel inlet tee with 7/8 inch wrench.</li> <li>Connect 25 psi transducer (red) to adapter TA302 with 3/4 inch wrench.                             <ul style="list-style-type: none"> <li>See figure 9-39.</li> </ul> </li> </ul>
nd of adap to end of T RED XDUCER CABLE	<ul style="list-style-type: none"> <li>Connect P2 on test cable W4 to 25 psi transducer (red).                             <ul style="list-style-type: none"> <li>See figure 9-39.</li> </ul> </li> </ul>
T TA201  150613	<p style="text-align: center;"><b>NOTE</b> Do not turn off test set power.</p>
J1 on C2 P1 on DB  201. Electronic  Coupling line fuel  BA CC  ECT W4 CABLE TO METER (CX606)  ONNECT 1 ←→ ECU J2  ONNECT ←→ VTM J3  ONNECT 04 ←→ TCNTL  ONNECT 14 ←→ ECU J2  ONNECT 05 ←→ EMFS	<ul style="list-style-type: none"> <li>Disconnect P2 on adapter CA201 from J1 on electronic control unit.                             <ul style="list-style-type: none"> <li>See figure 9-28.</li> </ul> </li> <li>Remove air cleaner clog switch.                             <ul style="list-style-type: none"> <li>Refer to TM 9-2350-255-20-1-3-1, ps4ra. 3-8.</li> </ul> </li> <li>Screw male end of adapter 444012 into air cleaner clog switch mounting hole, and hand tighten.</li> <li>Screw male end of 90° elbow 12258879-2 into female end of adapter 444012, and hand tighten.                             <ul style="list-style-type: none"> <li>See figure 9-47.</li> </ul> </li> <li>Disconnect P2 on test cable W4 from 25 psi transducer (red).                             <ul style="list-style-type: none"> <li>See figure 9-39.</li> </ul> </li> <li>Screw threaded end of transducer TA201 into female end of 90° elbow 12258879-2, and hand tighten.                             <ul style="list-style-type: none"> <li>See figure 9-47.</li> </ul> </li> <li>Connect P2 on test cable W4 to P1 on CX606.</li> <li>Connect P2 on CX606 to flowmeter TA606.                             <ul style="list-style-type: none"> <li>See figure 9-44.</li> </ul> </li> <li>Disconnect P3 on DBA CX201 from J2 on electronic control unit.                             <ul style="list-style-type: none"> <li>See figure 9-43.</li> </ul> </li> <li>Disconnect P1 on test cable W4 from J3 on VTM.                             <ul style="list-style-type: none"> <li>See figure 9-23.</li> </ul> </li> <li>Disconnect 2W104-P8 from 2DT101-J1.                             <ul style="list-style-type: none"> <li>See figure 9-109.</li> </ul> </li> <li>Disconnect 2W114-P1 from J2 on electronic control unit.                             <ul style="list-style-type: none"> <li>See figure 9-110.</li> </ul> </li> <li>Disconnect 3W105-P33 from J33 on electromechanical fuel system.                             <ul style="list-style-type: none"> <li>See figure 9-112, sheet 1.</li> </ul> </li> </ul>

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**TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING**

**Engine System Cable Instruction Message Index for Test 1506 (Continued)**

Cable Instruction Message	Action
DISCONNECT DBA FROM 2W114 <-> ECU J2	<ul style="list-style-type: none"> <li>● Disconnect 2W114-P1 from P2 on DBA CX201.</li> <li>● Disconnect P3 on DBA CX201 from J2 on electronic control unit.</li> <li>● See figure 9-43.</li> </ul>
RECONNECT W4 <-> VTM J3	<ul style="list-style-type: none"> <li>● Connect P1 on test cable W4 to J3 on VTM.</li> <li>● See figure 9-23.</li> </ul>
RECONNECT 2W114 <-> ECU J2	<ul style="list-style-type: none"> <li>● Connect 2W114-P1 to J2 on electronic control unit.</li> <li>● See figure 9-110.</li> </ul>
RECONNECT 3W105 <-> EMFS	<ul style="list-style-type: none"> <li>● Connect 3W105-P33 to J33 on electromechanical fuel system.</li> <li>● See figure 9-112, sheet 1.</li> </ul>
RECONNECT CIB J2 <-> ECU J1 (CA201) OR RECONNECT CX304, CA201, AND ECU J1	<ul style="list-style-type: none"> <li>● Connect P2 on adapter CA201 to J1 on electronic control unit</li> <li>● See figure 9-28.</li> </ul>
REMOVE CX304 AND ADAPTER AT ECU J1	<ul style="list-style-type: none"> <li>● Disconnect P2 on adapter CA201 from J1 on electronic control unit.</li> <li>● See figure 9-28.</li> <li>● Disconnect P3 on DBA CX201 from J2 on electronic control unit.</li> <li>● See figure 9-43.</li> </ul>
REMOVE RED XDUCER & TA302; REPLACE CAP	<ul style="list-style-type: none"> <li>● Remove 25 psi transducer (red) from adapter TA302 with 3/4 inch wrench.</li> <li>● Remove adapter TA302 from fuel inlet tee with 7/8-inch wrench.</li> <li>● Screw cap on fuel inlet tee and tighten with 7/8-inch wrench.</li> <li>● See figure 9-39.</li> </ul>
REMOVE TA201 & ADAPTER REPLACE P SW & CABLE	<ul style="list-style-type: none"> <li>● Disconnect P2 on test cable W4 from J1 on transducer TA201.</li> <li>● Unscrew transducer TA201 from 90° elbow.</li> <li>● Unscrew 90° elbow from adapter 444012.</li> <li>● Unscrew adapter 444012 from air cleaner clog switch mounting hole.</li> <li>● See figure 9-47.</li> <li>● Install air cleaner clog switch.</li> <li>● Refer to TM 9-2350-255-20-1-3-1, para. 3-8.</li> </ul>
REMOVE CX305 AND ADAPTER AT DIP TJ1	<ul style="list-style-type: none"> <li>● Disconnect P1 on adapter CA301 from TJ1 on driver's master panel.</li> <li>● See figure 9-50.</li> </ul>
REPLACE SHORTING CAP AT ECU J1	<ul style="list-style-type: none"> <li>● Connect shorting cap to J1 on electronic control unit.</li> <li>● See figure 9-110.</li> </ul>

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**TM 9-2350-255-20-1-2-1**  
**ENGINE SYSTEM TROUBLESHOOTING**

**Engine System Fault Message Index for Test 1508**

Fault Message	Action
AIR CLEANER/ T 150818 150912	<ul style="list-style-type: none"> <li>● Clean precleaner and air cleaner filters.</li> <li>● Refer to TM 9-2350-255-20-1-3-1, para. 3-5 and 3-8.</li> </ul>
BATTERY CHARGING SYS 152403	<ul style="list-style-type: none"> <li>● Charge batteries.</li> <li>● Refer to TM 9-2350-255-10.</li> <li>● Go back to block 25.</li> </ul>
ECU 151113 151611 151118 151618 152202 151122 152215 151603 152224 151604 152235 151605 152236 151608 154006	<ul style="list-style-type: none"> <li>● Replace electronic control unit.</li> <li>● Refer to TM 9-2350-255-20-1-3-4, para. 11-13.</li> </ul>
ECU, 2W105 2W104 151903	<ul style="list-style-type: none"> <li>● Do follow-on procedure.</li> <li>● See figure 9-96.</li> </ul>
ENGINE 151612 151621	<ul style="list-style-type: none"> <li>● Notify support maintenance that engine power is below 60 percent.</li> </ul>
EMFS 151624 151902	<ul style="list-style-type: none"> <li>● Replace electromechanical fuel system.</li> <li>● Refer to TM 9-2350-255-20-1-3-1, para. 2-5.</li> </ul>
EMFS, PTS ACT ENGINE 151606	<ul style="list-style-type: none"> <li>● Do follow-on procedure.</li> <li>● See figure 9-88.</li> </ul>
FUEL SYSTEM 150607 150609 150611	<ul style="list-style-type: none"> <li>● Do follow-on procedure.</li> <li>● See figure 9-84.</li> </ul>
HULL POWER SYSTEM 152404	<ul style="list-style-type: none"> <li>● Run hull power distribution test number 1000.</li> <li>● Refer to TM 9-2350-255-20-1-2-2, figure 16-1.</li> </ul>
IGV FEEDBACK TABLE 152211	<ul style="list-style-type: none"> <li>● Replace inlet guide vane feedback cable.</li> <li>● Refer to TM 9-2350-255-20-1-3-1, para. 2-5.</li> </ul>
THROTTLE CONTROL 150904 151004 150916 151008	<ul style="list-style-type: none"> <li>● Run engine test number 1523, PLA rigging.</li> <li>● See figure 9-17.</li> </ul>
THROTTLE CONTROL RVDT 151907	<ul style="list-style-type: none"> <li>● Replace rotary variable differential transformer.</li> <li>● Refer to TM 9-2350-255-20-1-3-2, para. 6-4.</li> </ul>

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TM 9-2350-255-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING

Engine System Fault Message Index for Test 1506 (Continued)

Cable Instruction Message	Action
FAULTY PTS FEEDBACK CABLE 152232	<ul style="list-style-type: none"> <li>● Replace power turbine stator feedback cable.</li> <li>● Refer to TM 9-2350-255-20-1-3-1, para. 2-5.</li> </ul>
FAULTY RED XDUCER OR W4 CABLES 150603	<ul style="list-style-type: none"> <li>● Disconnect P2 on test cable W4 from 25 psi transducer.</li> <li>● Remove 25 psi transducer from adapter TA302 with 3/4" wrench.</li> <li>● Connect new 25 psi transducer to adapter TA302 with 3/4" wrench.</li> <li>● Connect P2 on test cable W4 to 25 psi transducer.</li> <li>● Refer to figure 9-39.</li> <li>● Repeat engine test number 1506.</li> <li>● Go to block 26.</li> <li>● If same message is displayed on SETCOM again, replace cables and repeat engine test number 1506.</li> <li>● Go back to block 26.</li> </ul>
FAULTY STOP/START SYSTEM 151704	<ul style="list-style-type: none"> <li>● Run engine test number 1130.</li> <li>● See figure 9-6.</li> </ul>
FAULTY TA201 OR W4 CABLES 150614 150615	<ul style="list-style-type: none"> <li>● Disconnect P2 on test cable W4 from J1 on transducer.</li> <li>● Unscrew transducer TA201 from 90° elbow.</li> <li>● Screw new transducer TA201 into 90° elbow and hand-tighten.</li> <li>● Connect P2 on test cable W4 to J1 on transducer TA201.</li> <li>● See figure 9-47.</li> <li>● Repeat engine test number 1506.</li> <li>● Go back to block 26.</li> <li>● If same message is displayed on SETCOM again, replace cables and repeat test number 1506.</li> <li>● Go back to block 26.</li> </ul>
FAULTY T1 SENSOR 150919	<ul style="list-style-type: none"> <li>● Do follow-on procedure.</li> <li>● See figure 9-95.</li> </ul>
FAULTY VTM 150601	<ul style="list-style-type: none"> <li>● Replace VTM and repeat test number 1506.</li> <li>● Go back to block 26.</li> </ul>
FAULTY 2W114 OR 3W105 151905	<ul style="list-style-type: none"> <li>● Do follow-on procedure.</li> <li>● See figure 9-97.</li> </ul>
FAULTY 2W114, 3W105, OR EMFS 151120 152221 151121 152226 152216 152241	<ul style="list-style-type: none"> <li>● Do follow-on procedure.</li> <li>● See figure 9-78.</li> </ul>
154003 154303 154005 154402 154302 154403	<ul style="list-style-type: none"> <li>● See figure 9-79.</li> </ul>

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Special Instruction Message Index for Test 1506

Special Instruction Message	Action
-20 MANUAL 150604 150616 151002 150606	<ul style="list-style-type: none"> <li>● Run engine test number 1503.</li> <li>● See figure 9-5.</li> <li>● Check installation of 25 psi transducer (red) and correct if faulty.                             <ul style="list-style-type: none"> <li>● See figure 9-39.</li> </ul> </li> <li>● If 25 psi transducer installation was faulty, repeat test 1506.                             <ul style="list-style-type: none"> <li>● Go back to block 26.</li> </ul> </li> <li>● If 25 psi transducer installation is OK, replace transducer.</li> <li>● Disconnect P2 on test cable W4 from 25 psi transducer (red).</li> <li>● Remove 25 psi transducer from TA302 with 3/4-inch wrench.</li> <li>● Connect new 25 psi transducer to TA302 with 3/4-inch wrench.</li> <li>● Connect P2 on test cable W4 to 25 psi transducer.                             <ul style="list-style-type: none"> <li>● See figure 9-39.</li> </ul> </li> <li>● Repeat engine test number 1506.                             <ul style="list-style-type: none"> <li>● Go back to block 26.</li> </ul> </li> <li>● If same message is displayed again, replace W4 cables.</li> <li>● Repeat engine test number 1506.                             <ul style="list-style-type: none"> <li>● Go back to block 26.</li> </ul> </li> </ul>
151614 151623	<ul style="list-style-type: none"> <li>● No faults were found in the engine accessories. Engine power output is above 75% and is therefore considered to be combat serviceable.</li> </ul>
150913	<ul style="list-style-type: none"> <li>● Run engine test number 1505.</li> <li>● See figure 9-12.</li> </ul>
151613 151622	<ul style="list-style-type: none"> <li>● No faults were found in the engine accessories, however the engine is putting out between 60 and 75% power. There is an external engine problem, but the engine is considered to be combat serviceable and should not be replaced at this time. If power loss becomes worse, repeat test 1506.</li> </ul>
151625	<p style="text-align: center;"><b>NOTE</b></p> <p>A significant fuel flow fault was corrected when you replaced the fuel nozzle.</p> <ul style="list-style-type: none"> <li>● Test drive tank to see if power loss still exists.                             <ul style="list-style-type: none"> <li>● Refer to TM 9-2350-255-10.</li> </ul> </li> <li>● If problem is not corrected, repeat test 1506.                             <ul style="list-style-type: none"> <li>● Go back to block 26.</li> </ul> </li> </ul>
152107	<ul style="list-style-type: none"> <li>● Run engine test number 1501.</li> <li>● See figure 9-2.</li> </ul>
REFER -20 MANUAL 150914	<ul style="list-style-type: none"> <li>● Press GO key on SETCOM. Test will be repeated. Be sure to go to full throttle in less than three seconds when message on SETCOM display shows "INCREASE THROTTLE QUICKLY".                             <ul style="list-style-type: none"> <li>● If same message is displayed on SETCOM again, run engine test number 1523.</li> </ul> </li> <li>● See figure 9-16.</li> </ul>

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Special Instruction Message Index for Test 1506 (Continued)

Special Instruction Message	Action
ADJ IGV -11.0/-10.2V XX.XV	<ul style="list-style-type: none"> <li>● Set VEHICLE MASTER POWER switch to OFF.               <ul style="list-style-type: none"> <li>● Refer to TM 9-2350-255-10.</li> </ul> </li> <li>● Ground hop powerpack.               <ul style="list-style-type: none"> <li>● Connect ground hop kit. Refer to TM 9-2350-255-20-1-3-1, para. 2-4.</li> </ul> </li> <li>● Set VEHICLE MASTER POWER switch to ON.               <ul style="list-style-type: none"> <li>● Refer to TM 9-2350-255-10.</li> </ul> </li> <li>● Press and hold ENGINE SHUTOFF switch.               <ul style="list-style-type: none"> <li>● Refer to TM 9-2350-255-10.</li> </ul> </li> <li>● Go to figure 9-16, block 23, and do procedure until told to press GO.</li> <li>● Go back to block 15.</li> </ul>
ADJ IGV -1.20/-0.70V XX.XXV	<ul style="list-style-type: none"> <li>● Set VEHICLE MASTER POWER switch to OFF.               <ul style="list-style-type: none"> <li>● Refer to TM 9-2350-255-10.</li> </ul> </li> <li>● Ground hop powerpack.               <ul style="list-style-type: none"> <li>● Connect ground hop kit. Refer to TM 9-2350-255-20-1-3-1, para. 2-4.</li> </ul> </li> <li>● Set VEHICLE MASTER POWER switch to ON.               <ul style="list-style-type: none"> <li>● Refer to TM 9-2350-255-10.</li> </ul> </li> <li>● Press and hold ENGINE SHUTOFF switch.               <ul style="list-style-type: none"> <li>● Refer to TM 9-2350-255-10.</li> </ul> </li> <li>● Go to figure 9-16, block 25, and do procedure until told to press GO.</li> <li>● Go back to block 15.</li> </ul>
ADJ IGV RVDT TO MAX XX.XXV	<ul style="list-style-type: none"> <li>● Move inlet guide vane RVDT arm located on electromechanical fuel system until the highest possible reading is seen on second line of SETCOM display.               <ul style="list-style-type: none"> <li>● See figure 9-46.</li> </ul> </li> </ul>
ADJ IGV RVDT TO MIN XX.XXV	<ul style="list-style-type: none"> <li>● Move inlet guide vane RVDT arm located on electromechanical fuel system until the lowest possible reading is seen on second line of SETCOM display.               <ul style="list-style-type: none"> <li>● See figure 9-46.</li> </ul> </li> </ul>
ADJ PTS -8.5/-8.1V XX.XXV	<ul style="list-style-type: none"> <li>● Set VEHICLE MASTER POWER switch to OFF.               <ul style="list-style-type: none"> <li>● Refer to TM 9-2350-255-10.</li> </ul> </li> <li>● Ground hop powerpack.               <ul style="list-style-type: none"> <li>● Connect ground hop kit. Refer to TM 9-2350-255-20-1-3-1, para. 2-4.</li> </ul> </li> <li>● Set VEHICLE MASTER POWER switch to ON.               <ul style="list-style-type: none"> <li>● Refer to TM 9-2350-255-10.</li> </ul> </li> <li>● Press and hold ENGINE SHUTOFF switch.               <ul style="list-style-type: none"> <li>● Refer to TM 9-2350-255-10.</li> </ul> </li> <li>● Go to figure 9-16, block 27, and do procedure until told to press GO.</li> <li>● Go back to block 15.</li> </ul>

Figure 9-13 (Sheet 15 of 16)  
Volume II  
Para. 9-2

Special Instruction Message Index for Test 1506 (Continued)

Special Instruction Message	Action
<p>J PTS RVDT TO MAX XXV</p>	<ul style="list-style-type: none"> <li>● Move power turbine stator RVDT arm located on electromechanical fuel system until the highest possible reading is seen on second line of SETCOM display.               <ul style="list-style-type: none"> <li>● See figure 9-45.</li> </ul> </li> </ul>
<p>J PTS RVDT TO MIN XXV</p>	<ul style="list-style-type: none"> <li>● Move power turbine stator RVDT arm located on electromechanical fuel system until the lowest possible reading is seen on second line of SETCOM display.               <ul style="list-style-type: none"> <li>● See figure 9-45.</li> </ul> </li> </ul>
<p>ULTY COMPUTATION 150910</p>	<ul style="list-style-type: none"> <li>● Repeat engine test number 1506.               <ul style="list-style-type: none"> <li>● Go back to block 26.</li> </ul> </li> <li>● If same message is displayed on SETCOM again, replace VTM and repeat engine test number 1506.               <ul style="list-style-type: none"> <li>● Go back to block 26.</li> </ul> </li> </ul>
<p>MOVE IGV LEVER FULLY EARWARD, PUSH HARD</p> <p>MOVE IGV LEVER TO ULL FWD POSITION</p>	<ul style="list-style-type: none"> <li>● Move IGV lever towards rear of engine.               <ul style="list-style-type: none"> <li>● See figure 9-55.</li> </ul> </li> <li>● Move IGV lever towards front of engine.               <ul style="list-style-type: none"> <li>● See figure 9-55.</li> </ul> </li> </ul>
<p>MOVE PTS ACTUATOR TO ULL DOWNWARD STOP</p>	<ul style="list-style-type: none"> <li>● Push down on PTS actuator until bottom of actuator hits stop plate.               <ul style="list-style-type: none"> <li>● See figure 9-56.</li> </ul> </li> </ul>
<p>MOVE PTS ARM O FOLLOWING VALUE</p> <p>MOVE TO -7.10/-6.90 XX.XX V</p>	<ul style="list-style-type: none"> <li>● Press GO key on SETCOM.               <ul style="list-style-type: none"> <li>● See figure 9-45.</li> </ul> </li> <li>● Move PTS arm on electromechanical fuel system until SETCOM display shows between -7.10 end -6.90.               <ul style="list-style-type: none"> <li>● See figure 9-45.</li> </ul> </li> </ul>
<p>MOVE TO -5.90/-5.70 XX.XX V</p>	<ul style="list-style-type: none"> <li>● Move PTS arm on electromechanical fuel system until SETCOM display shows between -5.90 and -5.70.               <ul style="list-style-type: none"> <li>● See figure 9-45.</li> </ul> </li> </ul>
<p>MOVE TO -5.10/-4.90 XX.XX V</p>	<ul style="list-style-type: none"> <li>● Move PTS arm on electromechanical fuel system until SETCOM display shows between -5.10 and -4.90.               <ul style="list-style-type: none"> <li>● See figure 9-45.</li> </ul> </li> </ul>
<p>PULL LINK PIN; REACH IGV-RVDT</p>	<ul style="list-style-type: none"> <li>● Disconnect IGV feedback cable from electromechanical fuel system by removing pin.               <ul style="list-style-type: none"> <li>● See figure 9-46.</li> </ul> </li> </ul>
<p>PULL LINK PIN; REACH PTS-RVDT</p>	<ul style="list-style-type: none"> <li>● Disconnect PTS feedback cable from electromechanical fuel system by removing pin.               <ul style="list-style-type: none"> <li>● See figure 9-46.</li> </ul> </li> </ul>

Figure 9-13 (Sheet 16 of 16)  
Volume II  
Para. 9-2

TM 9-2350-255-20-1-2.1  
ENGINE SYSTEM TROUBLESHOOTING

**INSPECTION OF INLET GUIDE VANE  
(IGV)/AIR BLEED VALVE COMPONENTS**

**Common Tools:**

- Flashlight
- Pliers, long round nose

**Supplies:**

- Pin, cutter, MS24865-300

**Equipment Condition:**

- Tank parked.
- Parking bracket set.
- Engine shut down.
- Vehicle master power off.

**NOTE**

Read para. 9-1 before doing any work.

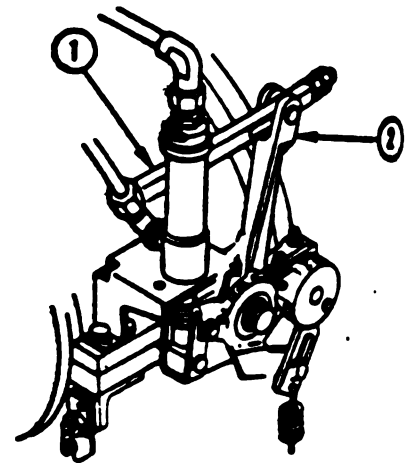
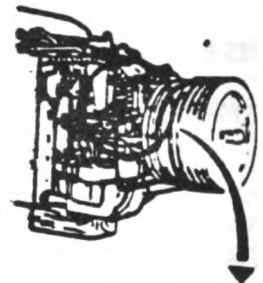
- 1
- Remove powerpack.
  - Refer to TM 9-2350-255-20-1-3-1, para. 2-4.

- 2
- Check to see if air bleed valve rod (1) is bent or broken.
- Is air bleed valve rod bent or broken?

- NO
- YES
- 4
- Check to see if IGV actuator lever (2) is bent or broken.
- Is IGV actuator bent or broken?

- 3
- Replace rod, air bleed valve.
  - Refer to TM 9-2350-255-20-1-3-1, para. 2-7.
  - Go to block 4.

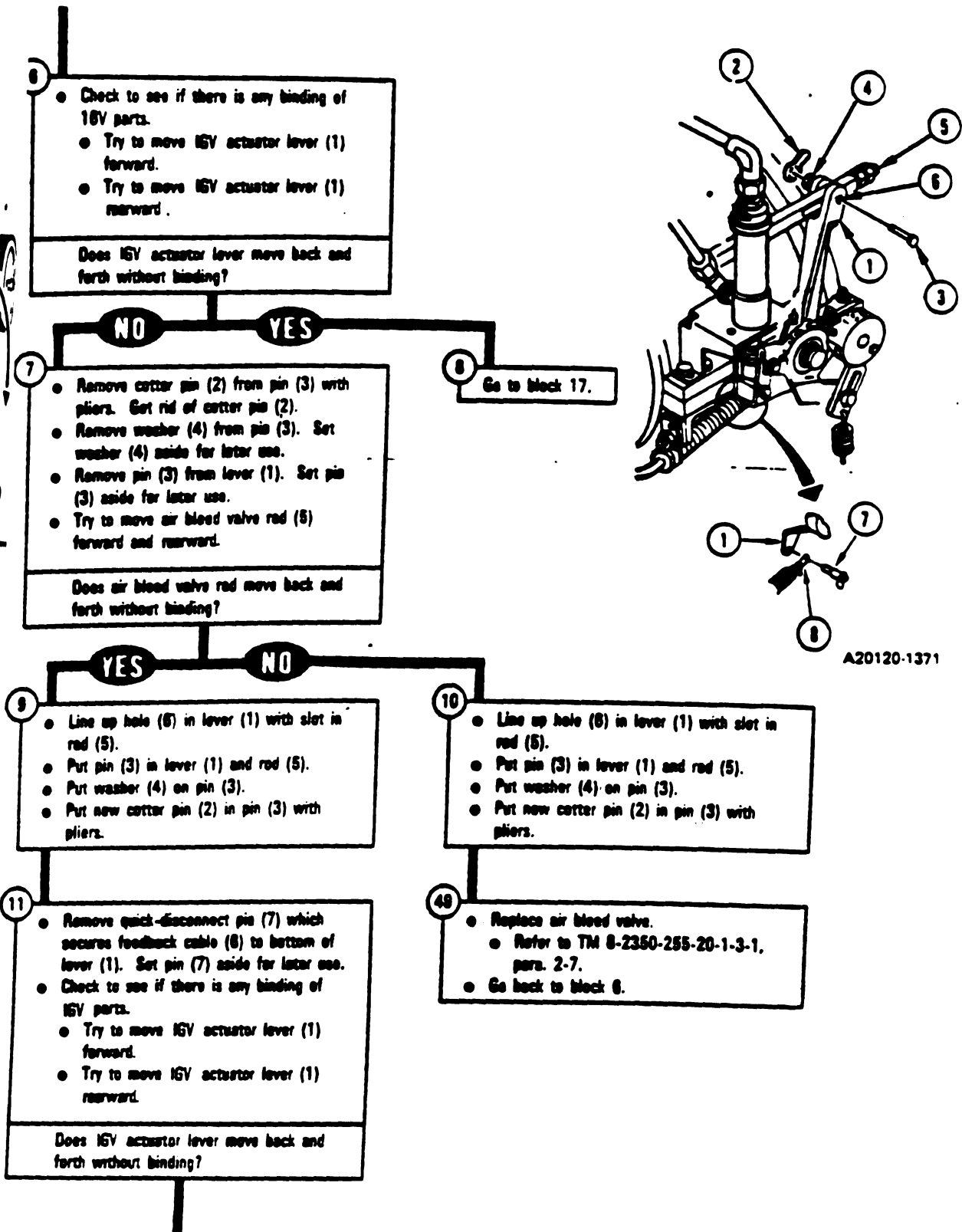
- 5
- Replace IGV actuator lever.
  - Refer to TM 9-2350-255-20-1-3-1, para. 2-8.
  - Go to block 6.



A20120-1370

Figure 9-13.1 (Sheet 1 of 6)  
Volume II  
Para. 9-2

9-123.1 Change 5



A20120-1371

Figure 9-13.1 (Sheet 2 of 6)  
Volume II  
Para. 9-2

Change 5 9-123.2

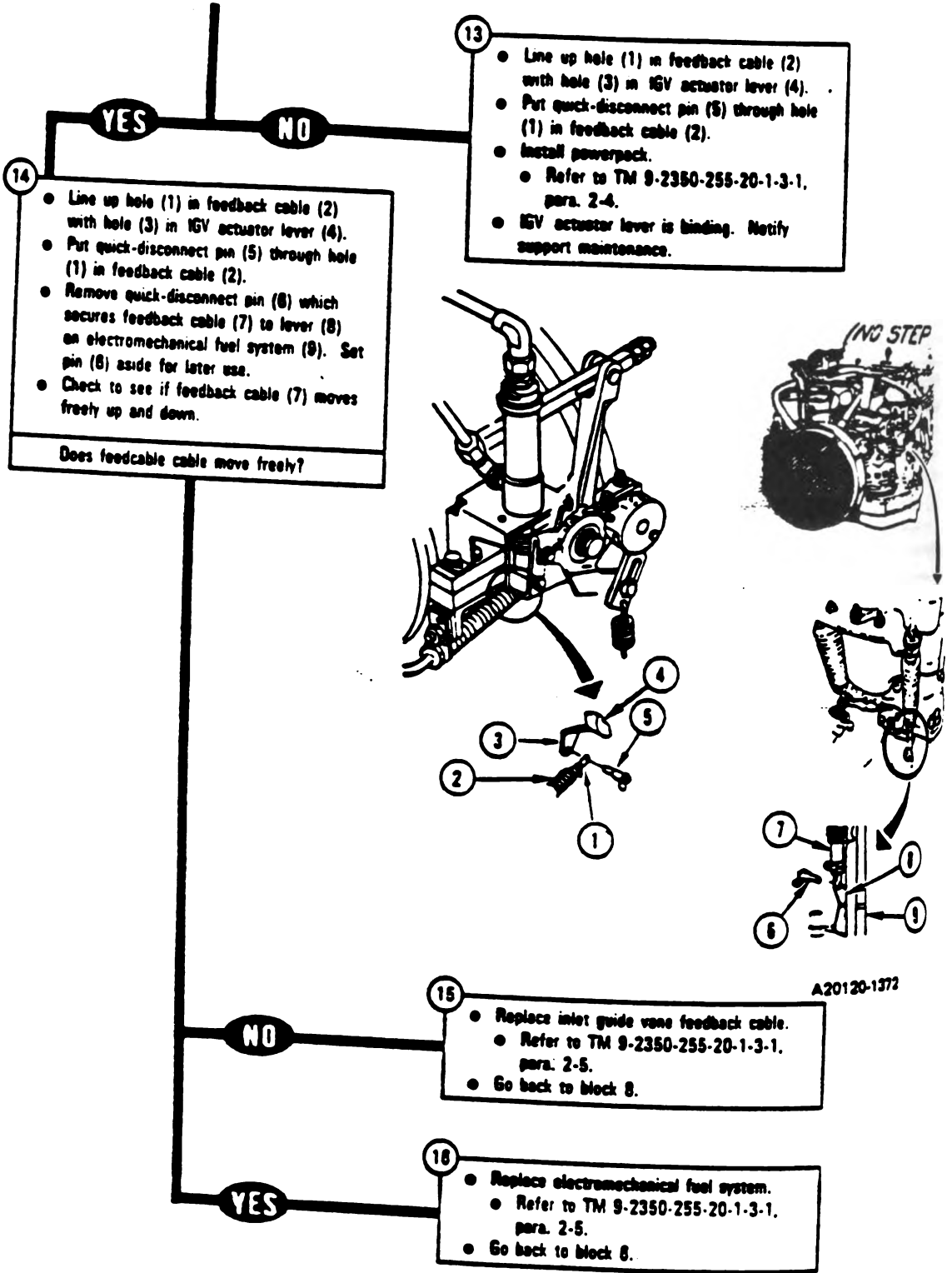


Figure 9-13.1 (Sheet 3 of 6)  
Volume II  
Para. 9-2

9-123.3 Change 5

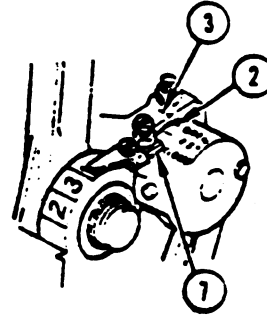
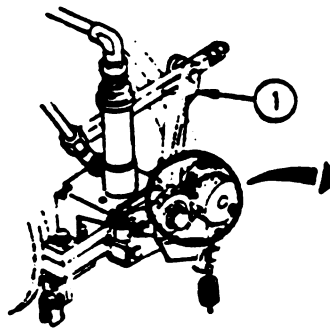
REARWARD

From block 8

17

- Move and hold IGV actuator lever (1) all the way rearward.
- Check to see if OPEN mark (2) lines up with mark (3).

Does OPEN mark line up with mark?



18

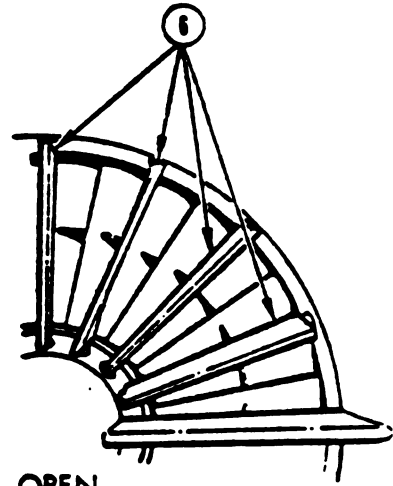
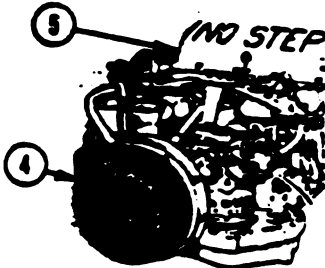
- Do inlet guide vane / power turbine stator (IGV / PTS) adjustment procedures.
- Refer to TM 9-2350-255-20-1-2-2, figure 19-1.
- Go back to block 17.

YES NO

19

- Check to see if vanes are fully open.
- Look into bellmouth (4) of engine (5) at vanes (6) with flashlight.

Are vanes fully open?



A20120-1373

→ PRESS IGV WHILE HOLDING AFT MARK 4 SW DEPRESSED!

20

- Install powerpack.
- Refer to TM 9-2350-255-20-1-3-1, para. 2-4.
- Inlet guide vanes will not open. Notify support maintenance.

YES NO

21

- Move and hold IGV actuator lever (1) all the way forward.
- Check to see if CLOSED mark (7) lines up with mark (3).

Does CLOSED mark line up with mark?

22

- Do inlet guide vane / power turbine stator (IGV / PTS) adjustment procedure.
- Refer to TM 9-2350-255-20-1-2-2, figure 19-1.
- Go back to block 21.

YES NO

Figure 9-13.1 (Sheet 4 of 6)  
Volume II  
Para. 9-2

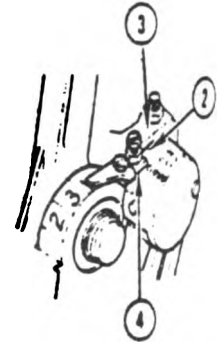
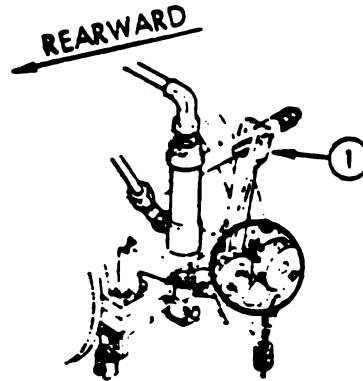
Change 5 9-123.4



23

- Move IGV actuator lever (1) rearward until 12.5 mark (2) lines up with mark (3).
- Move IGV actuator lever (1) forward until CLOSED mark (4) lines up with mark (3).
- Check to see if vanes are fully closed.
  - Look into bellmouth (5) of engine (6) at vanes (7) with flashlight.

Are vanes in closed position?



YES

NO

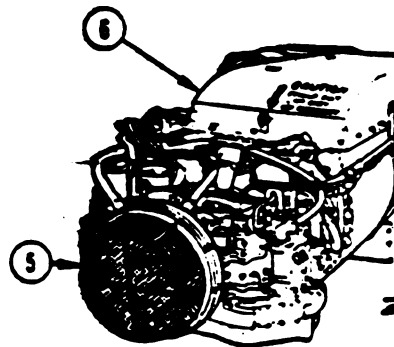
24

- Install powerpack.
- Refer to TM 9-2350-255-20-1-3-1, para. 2-4.
- Inlet guide vanes will not close. Notify support maintenance.

25

- Check to see if vanes will move further closed.
- Move IGV lever (1) all the way forward while looking into bellmouth (5) with flashlight.

Did vanes turn further closed?

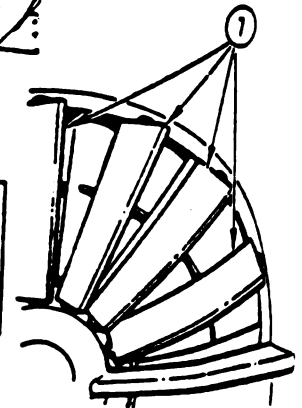


NO

YES

26

- Install powerpack.
- Refer to TM 9-2350-255-20-1-3-1, para. 2-4.
- Inlet guide vanes do not work properly. Notify support maintenance.



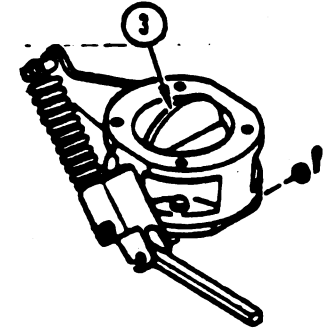
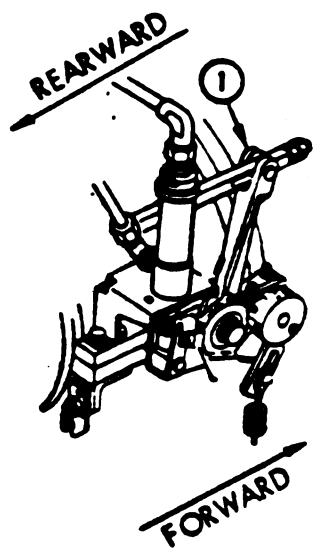
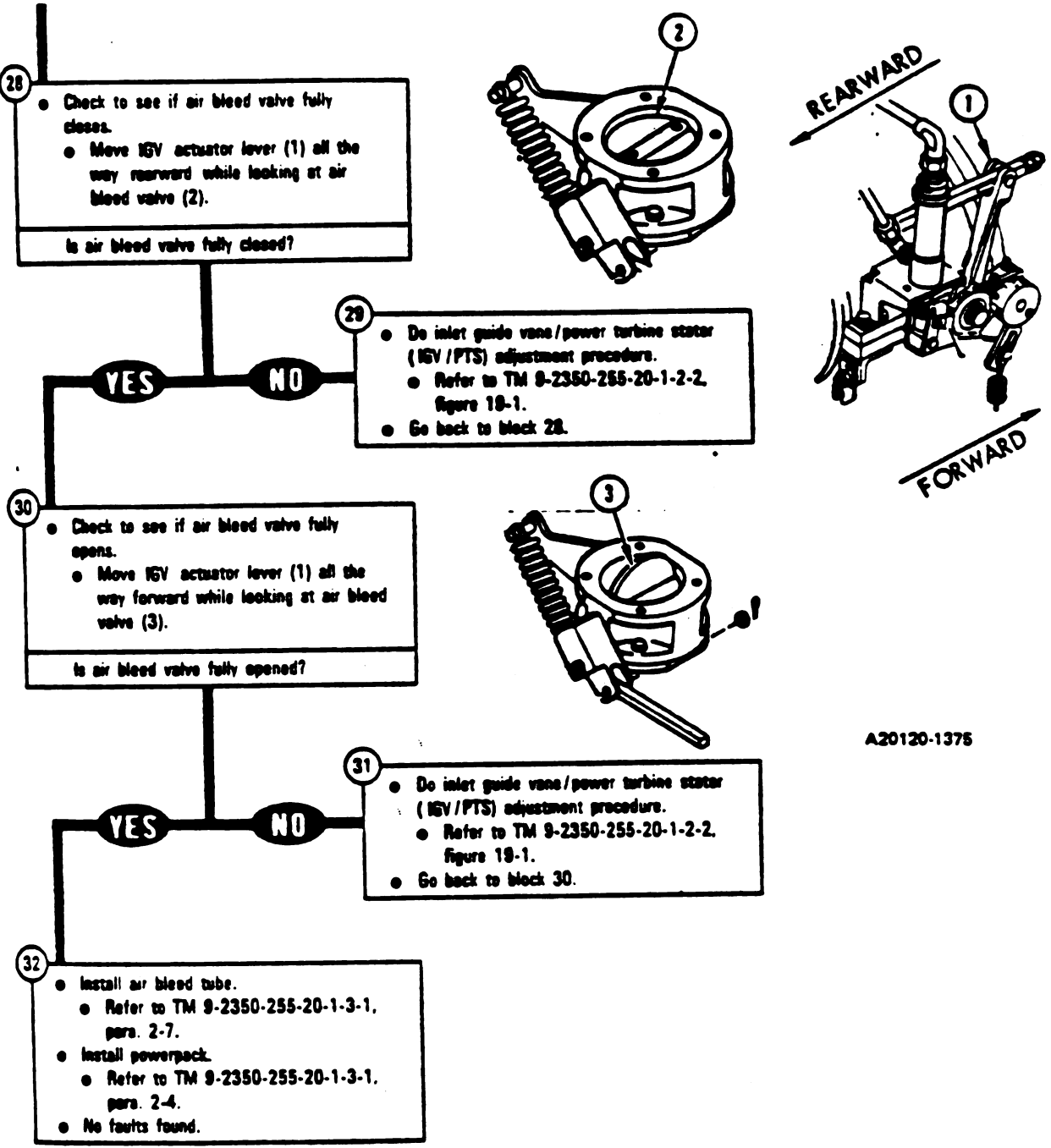
CLOSED

A20120-1374

27

- Remove air bleed tube.
- Refer to TM 9-2350-255-20-1-3-1, para. 2-7.

Figure 9-13.1 (Sheet 5 of 6)  
Volume II  
Para. 9-2



A20120-1375

Figure 9-13.1 (Sheet 6 of 6)  
Volume II  
Para. 9-2

Change 5, 9-123.6

**SYMPTOM ESS-23**

**ENGINE CONTINUES TO RUN WHEN  
ENGINE SHUTOFF SWITCH IS SET TO  
SHUTOFF**

- NOTE**
- Shut down engine by pulling emergency engine shutoff handle.
  - Refer to TM 9-2350-255-10.
  - Read para. 9-1 before doing any work.

- Test Equipment/Special Tools:**
- Pliers, slip joint, conduit style with plastic jaw inserts, NSN 5120-00-824-8085
- NOTE**
- Do not get the following equipment until told to further on in this procedure.
- STE/M1 Test Set, 12303800

- Equipment Condition:**
- Tank parked.
  - Parking brake set.
  - Vehicle master power off.

- 1
- Set up tank controls for standard initial test conditions.
  - Refer to table 9-2 at the end of this chapter.

- 2
- Check to see if an electrical connector is loose on electronic control unit, bracket, driver's master panel, engine, or power-pack disconnect panel that could cause symptom ESS-23.
- NOTE**
- If you find a loose connector, go immediately to block 3.
- Try to turn ZW114-P1, connected to J2 on electronic control unit, see figure 9-110.
  - Try to turn ZW105-P5, connected to J3 on electronic control unit, see figure 9-110.

Figure 9-14 (Sheet 1 of 8)  
Volume II  
Para. 9-2

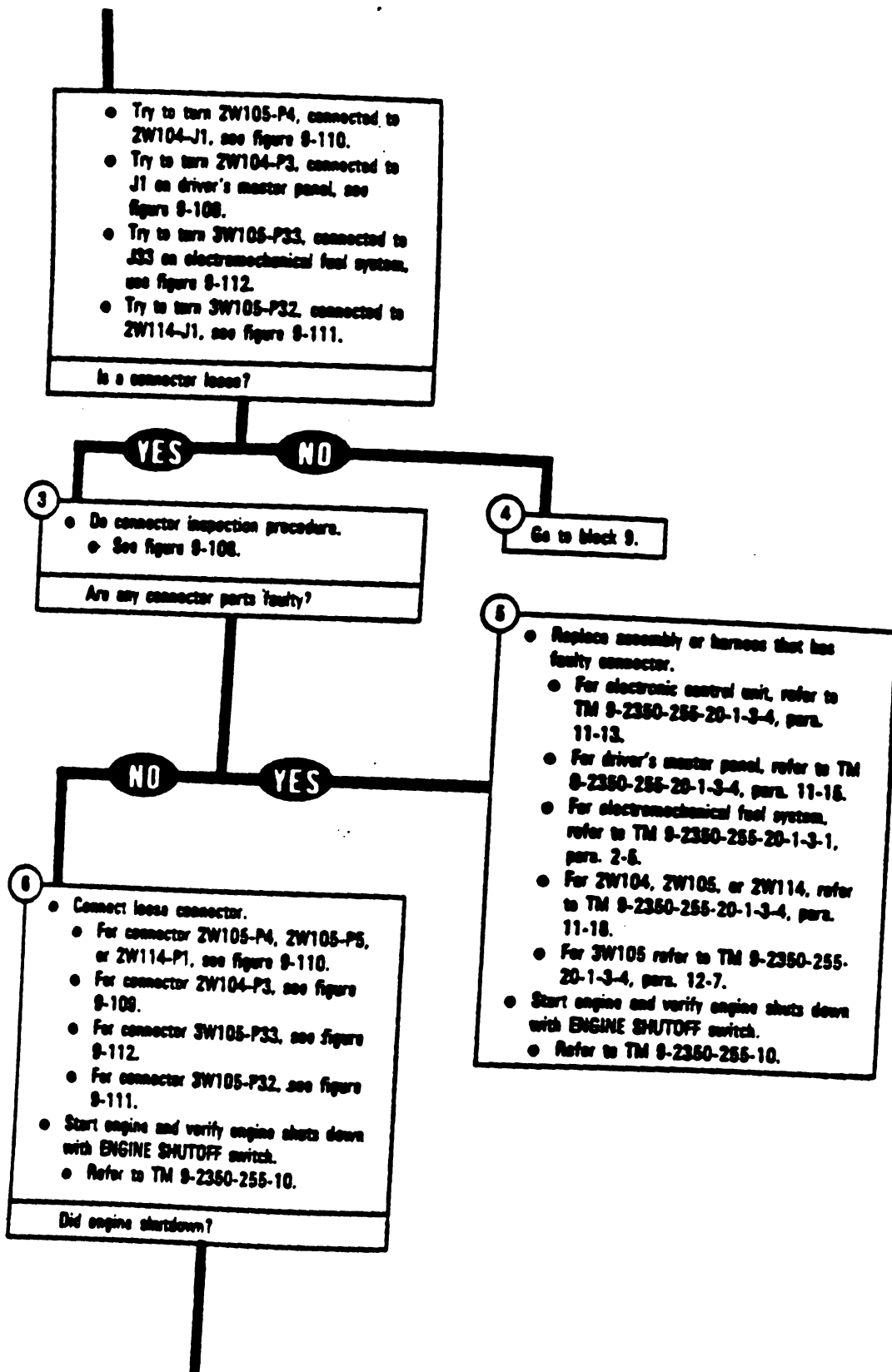
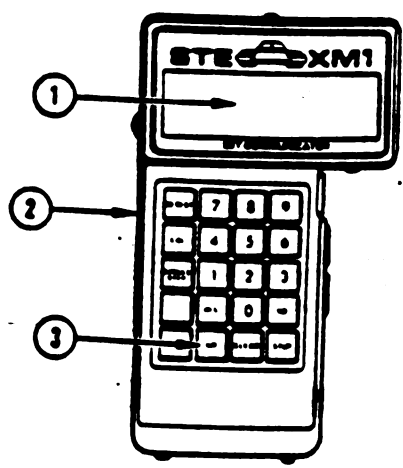
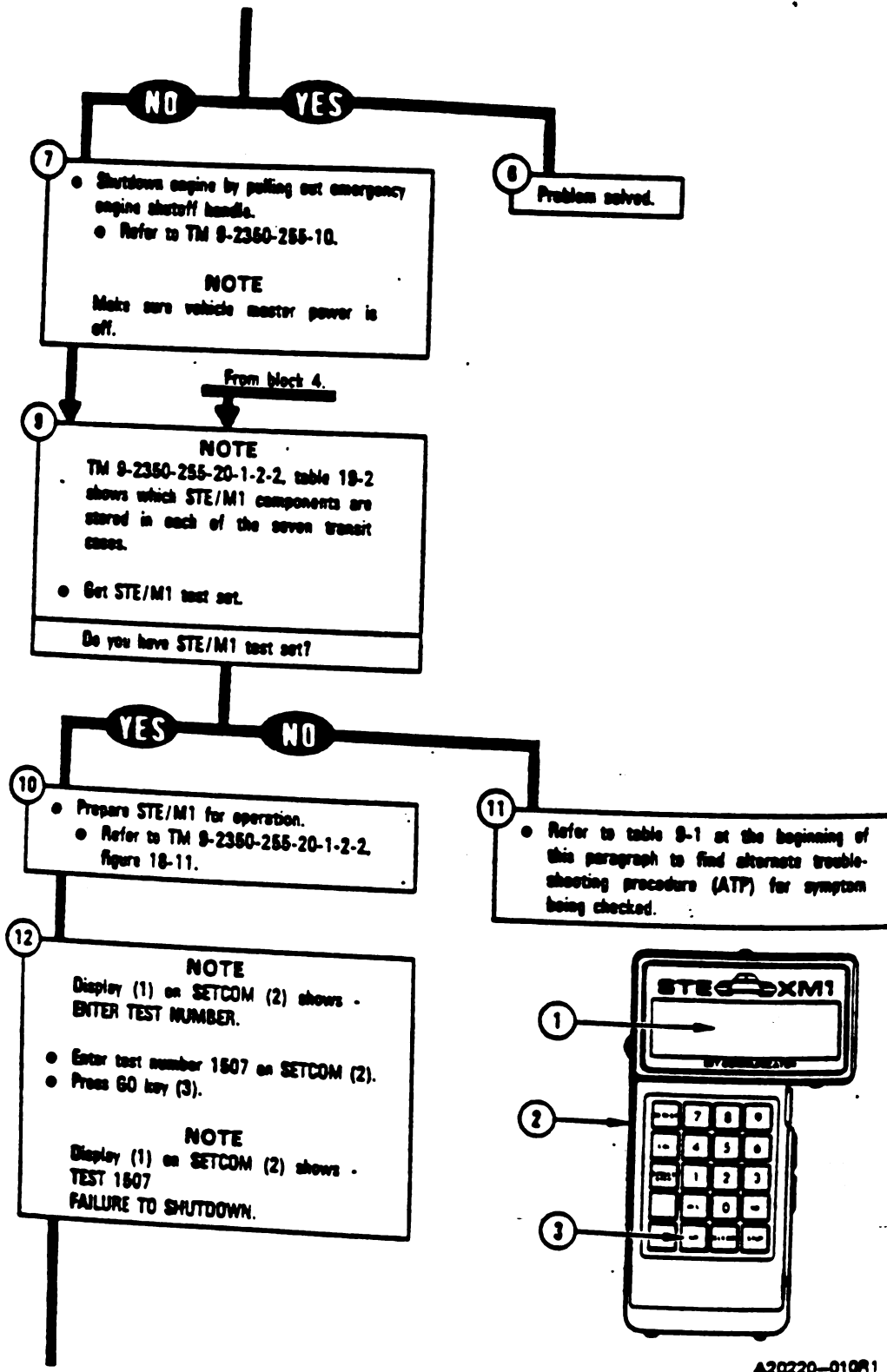


Figure 9-14 (Sheet 2 of 8)  
Volume II  
Para. 9-2

TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING



A20220-010R1

Figure 9-14 (Sheet 3 of 8)  
Volume II  
Para. 9-2

9-128 Change 3

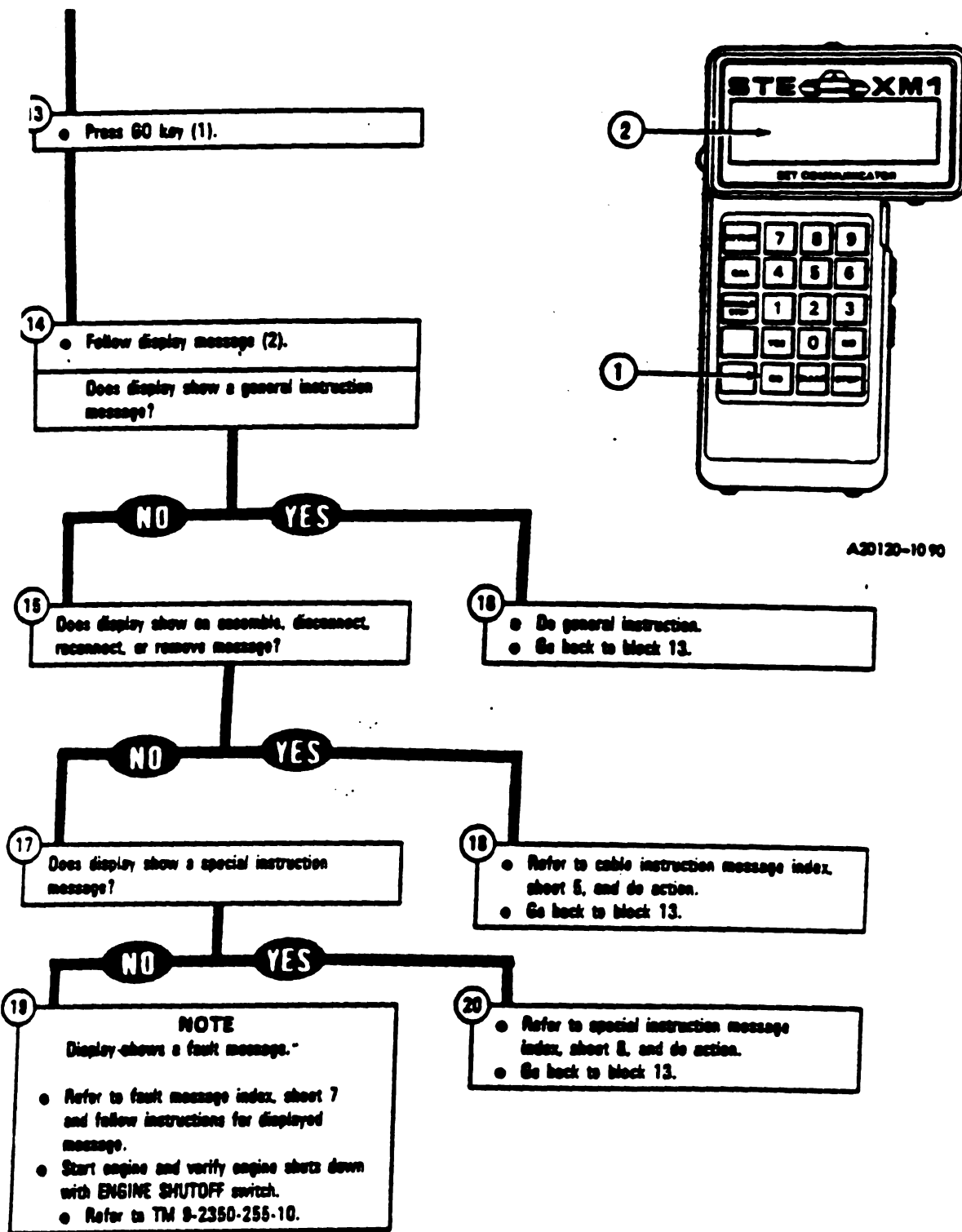


Figure 9-14 (Sheet 4 of 8)  
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Para. 9-2

Change 3 9-127

Engine System Cable Instruction Message Index for Test 1507

Cable Instruction Message	Action	Cable Message
ASSEMBLE CX305, AND CX201	<ul style="list-style-type: none"> <li>● Connect P1 on CIB cable CX305 to P1 on DBA CX201.</li> <li>● See figure 9-43.</li> </ul>	ASC 2W1
ASSEMBLE CX305, CX206 AND CA417/18	<ul style="list-style-type: none"> <li>● Connect P1 on CIB cable CX305 to P3 on DBA CX206.</li> <li>● Connect P2 on adapter CA417 to P1 on DBA CX206.</li> <li>● Connect P2 on adapter CA418 to P2 on DBA CX206.</li> <li>● See figure 9-32.</li> </ul>	DIS CX2
ASSEMBLE CX305, CX206 AND CA421/22	<ul style="list-style-type: none"> <li>● Connect P1 on CIB cable CX305 to P3 on DBA CX206.</li> <li>● Connect P2 on adapter CA421 to P1 on DBA CX206.</li> <li>● Connect P2 on adapter CA422 to P2 on DBA CX206.</li> <li>● See figure 9-20.</li> </ul>	DIS 2W
CONNECT TA202 <--> CX201	<ul style="list-style-type: none"> <li>● Connect adapter TA202 to P3 on DBA CX201.</li> <li>● See figure 9-40.</li> </ul>	DI 2W
CONNECT CIB J1 (CX305) TO HNB TJ1 (CA301)	<ul style="list-style-type: none"> <li>● Connect P1 on adapter CA301 to TJ1 on hull network.</li> <li>● See figure 9-57.</li> </ul>	D 2
CONNECT CIB J1 (CX305) TO HNB TJ2 (CA301)	<ul style="list-style-type: none"> <li>● Connect P1 on adapter CA301 to TJ2 on hull network.</li> <li>● See figure 9-30.</li> </ul>	J 2
CONNECT CIB J1 (CX305) TO DMP TJ1 (CA301)	<ul style="list-style-type: none"> <li>● Connect P1 on adapter CA301 to TJ1 on driver's master panel.</li> <li>● Connect P1 on CIB cable CX305 to P2 on adapter CA301.</li> <li>● Connect P2 on CIB cable CX305 to J1 on CIB.</li> <li>● See figure 9-24.</li> </ul>	R 2
CONNECT CIB J2 (CX304) TO ECU J1 (CA201)	<ul style="list-style-type: none"> <li>● Connect P2 on adapter CA201 to J1 on electronic control unit.</li> <li>● Connect P1 on CIB cable CX304 to P1 on adapter CA201.</li> <li>● Connect P2 on CIB cable CX304 to J2 on CIB.</li> <li>● See figure 9-51.</li> </ul>	R C R A
CONNECT DBA BETWEEN 2W104 <--> DMP J1	<ul style="list-style-type: none"> <li>● Connect P1 on adapter CA418 to J1 on driver's master panel.</li> <li>● Connect 2W104-P3 to P1 on adapter CA417.</li> <li>● See figure 9-32.</li> </ul>	R A
CONNECT DBA BETWEEN 2W105 P5 <--> ECU J3	<ul style="list-style-type: none"> <li>● Connect P1 on adapter CA422 to J3 on electronic control unit.</li> <li>● Connect 2W105-P5 to P1 on adapter CA421.</li> <li>● See figure 9-20.</li> </ul>	RE AC
CONNECT DBA BETWEEN 2W114 <--> ECU J2	<ul style="list-style-type: none"> <li>● Connect P3 on DBA CX201 to J2 on electronic control unit.</li> <li>● Connect 2W114-P1 to P2 on DBA CX201.</li> <li>● See figure 9-43.</li> </ul>	

Figure 9-14 (Sheet 5 of 8)  
Volume II  
Para. 9-2

Engine System Cable Instruction Message Index for Test 1507 (Continued)

Cable Instruction Message	Action
<p>CONNECT DBA FROM 14 &lt;--&gt; ECUJ2</p>	<ul style="list-style-type: none"> <li>● Disconnect P3 on DBA CX201 from J2 on electronic control unit.</li> <li>● Disconnect 2W114-P1 from P2 on DBA CX201. <ul style="list-style-type: none"> <li>● See figure 9-43.</li> </ul> </li> </ul>
<p>CONNECT J1 &lt;--&gt; ECU J2</p>	<ul style="list-style-type: none"> <li>● Disconnect CX201-P3 from J2 on electronic control unit. <ul style="list-style-type: none"> <li>● See figure 9-43.</li> </ul> </li> </ul>
<p>CONNECT O4 &lt;--&gt; DMP J1</p>	<ul style="list-style-type: none"> <li>● Disconnect 2W104-P3 from J1 on driver's master panel. <ul style="list-style-type: none"> <li>● See figure 9-109.</li> </ul> </li> </ul>
<p>CONNECT O5P5 &lt;--&gt; ECU J3</p>	<ul style="list-style-type: none"> <li>● Disconnect 2W105-P5 from J3 on electronic control unit. <ul style="list-style-type: none"> <li>● See figure 9-110.</li> </ul> </li> </ul>
<p>CONNECT 14 &lt;--&gt; ECU J2</p>	<ul style="list-style-type: none"> <li>● Disconnect 2W114-P1 from J2 on electronic control unit. <ul style="list-style-type: none"> <li>● See figure 9-110.</li> </ul> </li> </ul>
<p>PER PINS B &amp; g ON O4P3</p>	<ul style="list-style-type: none"> <li>● Connect TA1 jumper between contacts B and g on 2W104-P3. <ul style="list-style-type: none"> <li>● See figure 9-34.</li> </ul> </li> </ul>
<p>PER PINS D &amp; G ON O5P5</p>	<ul style="list-style-type: none"> <li>● Connect TA1 jumper between contacts D and G on 2W105-P5. <ul style="list-style-type: none"> <li>● See figure 9-34.</li> </ul> </li> </ul>
<p>PER PINS e &amp; G ON O4P3</p>	<ul style="list-style-type: none"> <li>● Connect TA1 jumper between contacts e and G on 2W104-P3. <ul style="list-style-type: none"> <li>● See figure 9-34.</li> </ul> </li> </ul>
<p>CONNECT 14 &lt;--&gt; ECU J2</p>	<ul style="list-style-type: none"> <li>● Connect 2W114-P1 to J2 on electronic control unit. <ul style="list-style-type: none"> <li>● See figure 9-110.</li> </ul> </li> </ul>
<p>CONNECT CX304, J1, AND ECU J1</p>	<ul style="list-style-type: none"> <li>● Connect P1 on adapter CA201 to J1 on electronic control unit. <ul style="list-style-type: none"> <li>● See figure 9-51.</li> </ul> </li> </ul>
<p>CONNECT CX305 AND ADAPTER AT DMP TJ1</p>	<ul style="list-style-type: none"> <li>● Disconnect P1 on adapter CA301 from TJ1 on driver's master panel. <ul style="list-style-type: none"> <li>● See figure 9-24.</li> </ul> </li> </ul>
<p>CONNECT CX304 AND ADAPTER AT ECU J1</p>	<ul style="list-style-type: none"> <li>● Disconnect P2 on adapter CA201 from J1 on electronic control unit. <ul style="list-style-type: none"> <li>● See figure 9-51.</li> </ul> </li> </ul>
<p>CONNECT CX305 AND ADAPTER AT HNB TJ2</p>	<ul style="list-style-type: none"> <li>● Disconnect P1 on CIB cable CX305 from P2 on adapter CA301.</li> <li>● Disconnect P1 on adapter CA301 from TJ2 on hull networks box. <ul style="list-style-type: none"> <li>● See figure 9-30.</li> </ul> </li> </ul>



Engine System Fault Message Index for Test 1507

Fault Message	Action
<b>FAULTY BATTERY/ CHARGING SYSTEM 150703</b>	<ul style="list-style-type: none"> <li>● Charge batteries.</li> <li>● Refer to TM 9-2350-255-10.</li> <li>● Go back to block 12.</li> </ul>
<b>FAULTY DMP</b> 150707 150733 150713 150734 150714 150737	<ul style="list-style-type: none"> <li>● Replace driver's master panel.</li> <li>● Refer to TM 9-2350-255-20-1-3-4, para. 11-15.</li> </ul>
<b>FAULTY DMP, 2W104 2W105</b> 150727 150745	<ul style="list-style-type: none"> <li>● Do follow-on procedure.</li> <li>● See figure 9-89.</li> </ul>
<b>FAULTY ECU</b> 150709 150738 150726 150740	<ul style="list-style-type: none"> <li>● Replace electronic control unit.</li> <li>● Refer to TM 9-2350-255-20-1-3-4, para. 11-13.</li> </ul>
<b>FAULTY ECU, 2W104 2W105</b> 150736	<ul style="list-style-type: none"> <li>● Do follow-on procedure.</li> <li>● See figure 9-92.</li> </ul>
<b>FAULTY HNB</b> 150711 150712 150729	<ul style="list-style-type: none"> <li>● Replace hull networks box.</li> <li>● Refer to TM 9-2350-255-20-1-3-4, para. 11-12.</li> </ul>
<b>FAULTY HNB OR 2W104</b> 150715 150735	<ul style="list-style-type: none"> <li>● Do follow-on procedure.</li> <li>● See figure 9-91.</li> <li>● See figure 9-75.</li> </ul>
<b>FAULTY HULL POWER SYSTEM</b> 150704 150705	<ul style="list-style-type: none"> <li>● Run power distribution test number 1000.</li> <li>● Refer to TM 9-2350-255-20-1-2-2, figure 16-1.</li> </ul>
<b>FAULTY STOP/START SYSTEM</b> 151704	<ul style="list-style-type: none"> <li>● Run engine test number 1501.</li> <li>● See figure 9-2.</li> </ul>
<b>FAULTY 2W114, 3W105 OR EMFS</b> 153502 153503	<ul style="list-style-type: none"> <li>● Do follow-on procedure.</li> <li>● See figure 9-79.</li> </ul>

Figure 9-14 (Sheet 7 of 8)  
Volume II  
Para. 9-2

ort 1507

Special Instruction Message Index for Test 1507

Special Instruction Message	Action
<p>SEE -20 MANUAL</p> <p>150730</p> <p>150739</p> <p>150743</p> <p>SHUTDOWN ENGINE WITH MANUAL VALVE</p> <p>REOPEN MANUAL FUEL VALVE</p> <p>WAIT FOR ECU TO TIME OUT</p>	<p style="text-align: center;"><b>NOTE</b></p> <p>If you were running this test as an operational check and do not have a shutdown problem, no faults have been found.</p> <ul style="list-style-type: none"> <li>● If you have an engine shutdown problem, replace electromechanical fuel system.             <ul style="list-style-type: none"> <li>● Refer to TM 9-2350-255-20-1-3-1, para. 2-5.</li> </ul> </li> <li>● Engine shutdown. Restart engine and attempt shutdown again.</li> <li>● If engine shuts down, problem is solved.</li> <li>● Make sure that emergency engine shutoff handle has been pushed in. If shutoff handle is in correct position, run engine test 1503.             <ul style="list-style-type: none"> <li>● See figure 9-5.</li> </ul> </li> <li>● Pull emergency engine shutoff handle.             <ul style="list-style-type: none"> <li>● Refer to TM 9-2350-255-10.</li> </ul> </li> <li>● Push in on emergency engine shutoff handle.             <ul style="list-style-type: none"> <li>● Refer to TM 9-2350-255-10.</li> </ul> </li> <li>● Red engine lights on driver's instrument panel will go off when electronic control unit has timed out.</li> </ul>

4, para. 11-3

para. 11-3

para. 11-3

16

Figure 9-14 (Sheet 8 of 8)  
Volume II  
Para. 9-2

SYMPTOM ESS-25

OIL CONSUMPTION IS MORE THAN 1 QUART PER 2.5 HOURS.

Equipment Condition:

- Tank parked.
- Parking brake set.
- Engine shut down.
- Vehicle master power off.

NOTE

Spilled oil, fuel, or previous aborted starts will normally cause smoking at engine start up. This smoke should disappear within 3 minutes and not occur again. Repeated smoking at start ups or during engine operation indicates a problem.

- 1
- Inspect all oil tubes and oil filters for leaks.
  - Refer to TM 9-2350-255-20-1-3-1, para. 2-8.

Are there any leaks?

YES

NO

- 2
- Replace leaking oil tubes or oil filters.
  - Refer to TM 9-2350-255-20-1-3-1, para. 2-8.
  - Verify problem is solved by running engine.
  - Refer to TM 9-2350-255-10.

- 3
- Faulty engine.
  - Notify support maintenance.

**NLET GUIDE VANE/POWER TURBINE  
STATOR (IGV/PTS) RIGGING TEST.**

**NOTE**

Read para. 9-1 before doing any work.

**Common Tools:**

- Hammer
- Handle, socket wrench, ratchet, 1/2-inch square drive
- Pliers, diagonal cutting
- Screwdriver, flat tip
- Socket, socket wrench, 1/2-inch square drive, 9/16 inch
- Wrench, combination, 5/16-inch
- Wrench, combination, 3/8-inch
- Wrench, combination, 7/16-inch
- Wrench, combination, 1/2-inch (two required)
- Wrench, combination, 5/8-inch (two required).

**Supplies:**

- Fla. cutter, MS24885-1012

**Test Equipment/Special Tools:**

- Pliers, slip joint, conduit style with plastic jaw inserts, NSN 5120-00-624-9085
- STE/M1 Test Set, 12303600

**Equipment Condition:**

- Tank parked.
- Engine shut down.
- Vehicle master power off.
- Powerpack in groundstop mode.

- 1
- Set up tank controls for standard initial test conditions.
  - Refer to table 9-2 at the end of this chapter.

*Figure 9-16 (Sheet 1 of 17)*  
**Volume 41**  
**Para. 9-2**

**Change 3 9-133**

TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING

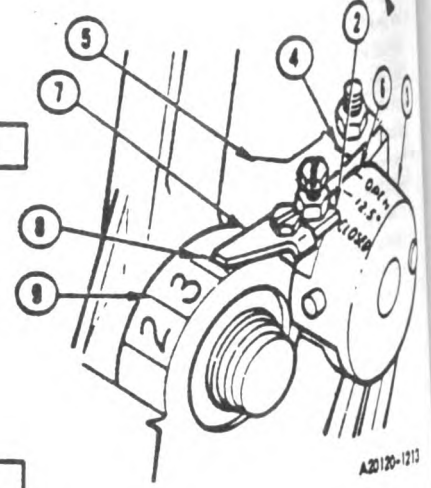
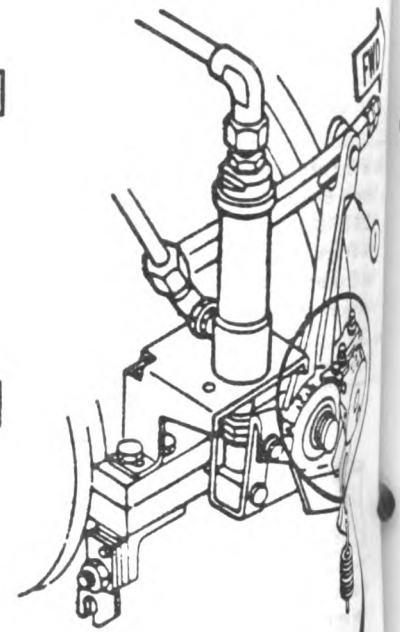
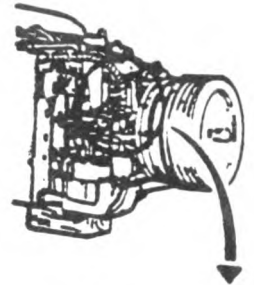
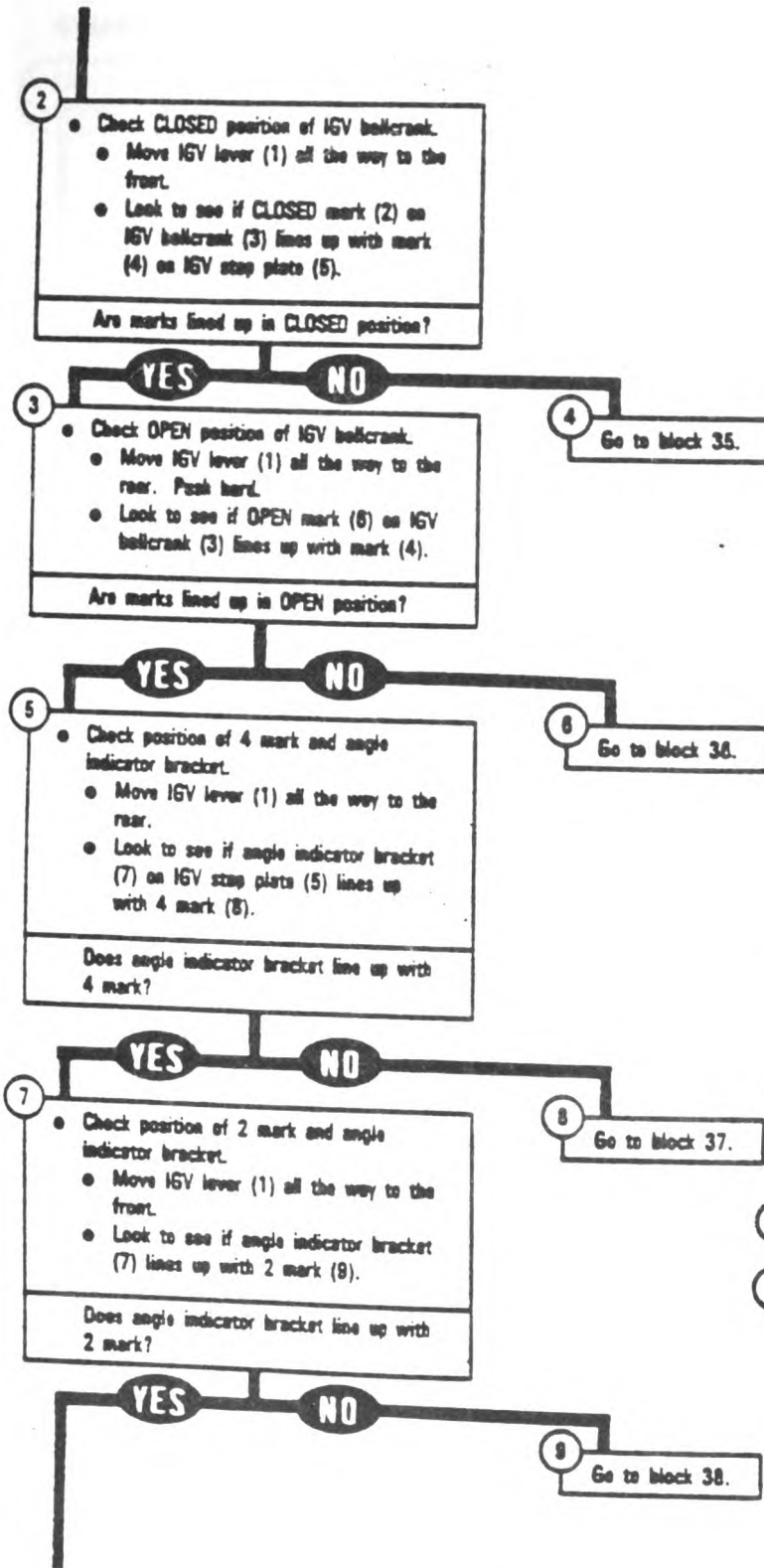


Figure 9-16 (Sheet 2 of 17)  
Volume II  
Para. 9-2

9-134 Change 3

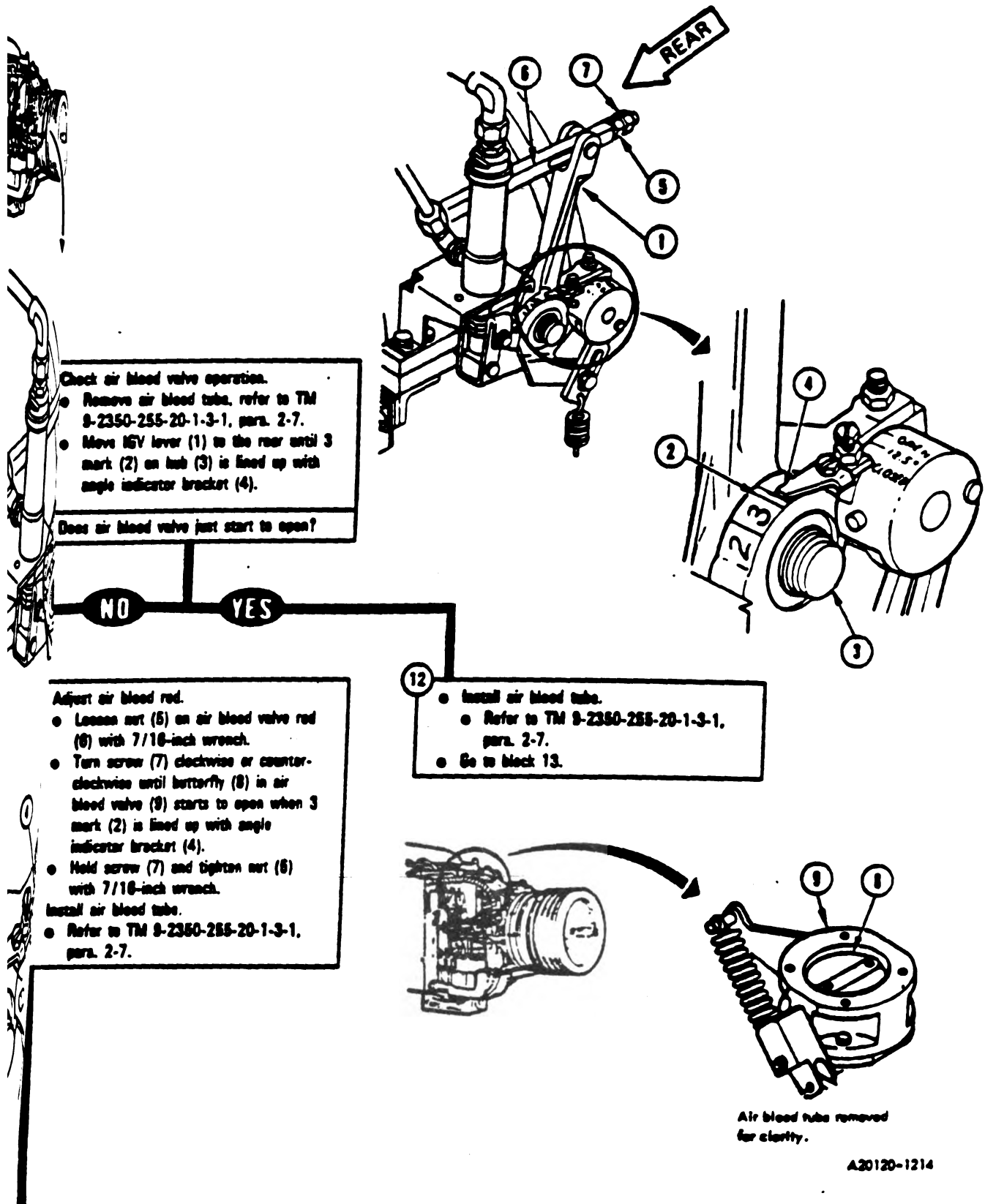


Figure 9-16 (Sheet-3 of 17)  
Volume II  
Para. 8-2

TM 9-2350-255-20-1-2.1  
ENGINE SYSTEM TROUBLESHOOTING

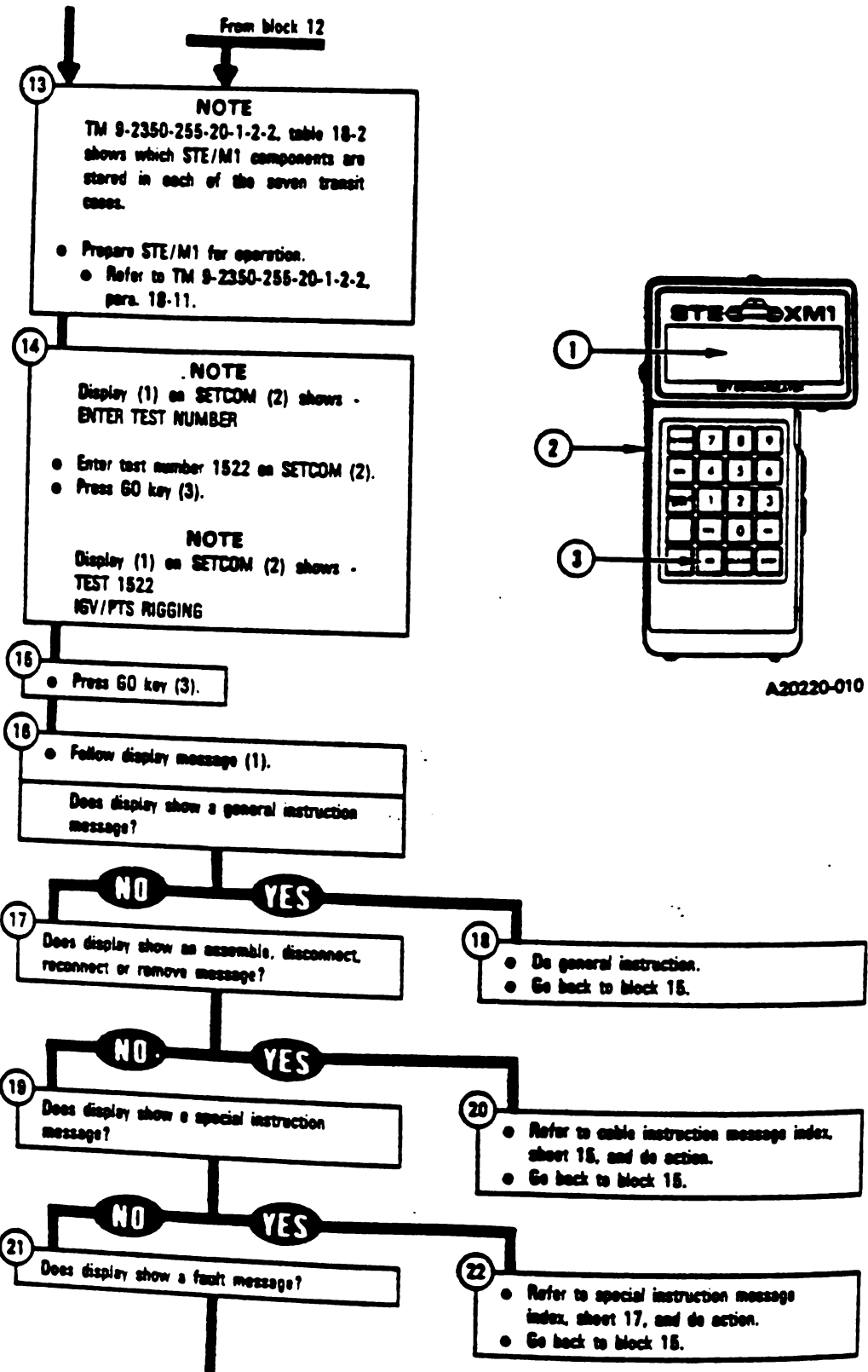


Figure 9-16 (Sheet 4 of 17)  
Volume II  
Para. 9-2

9-136 Change 3

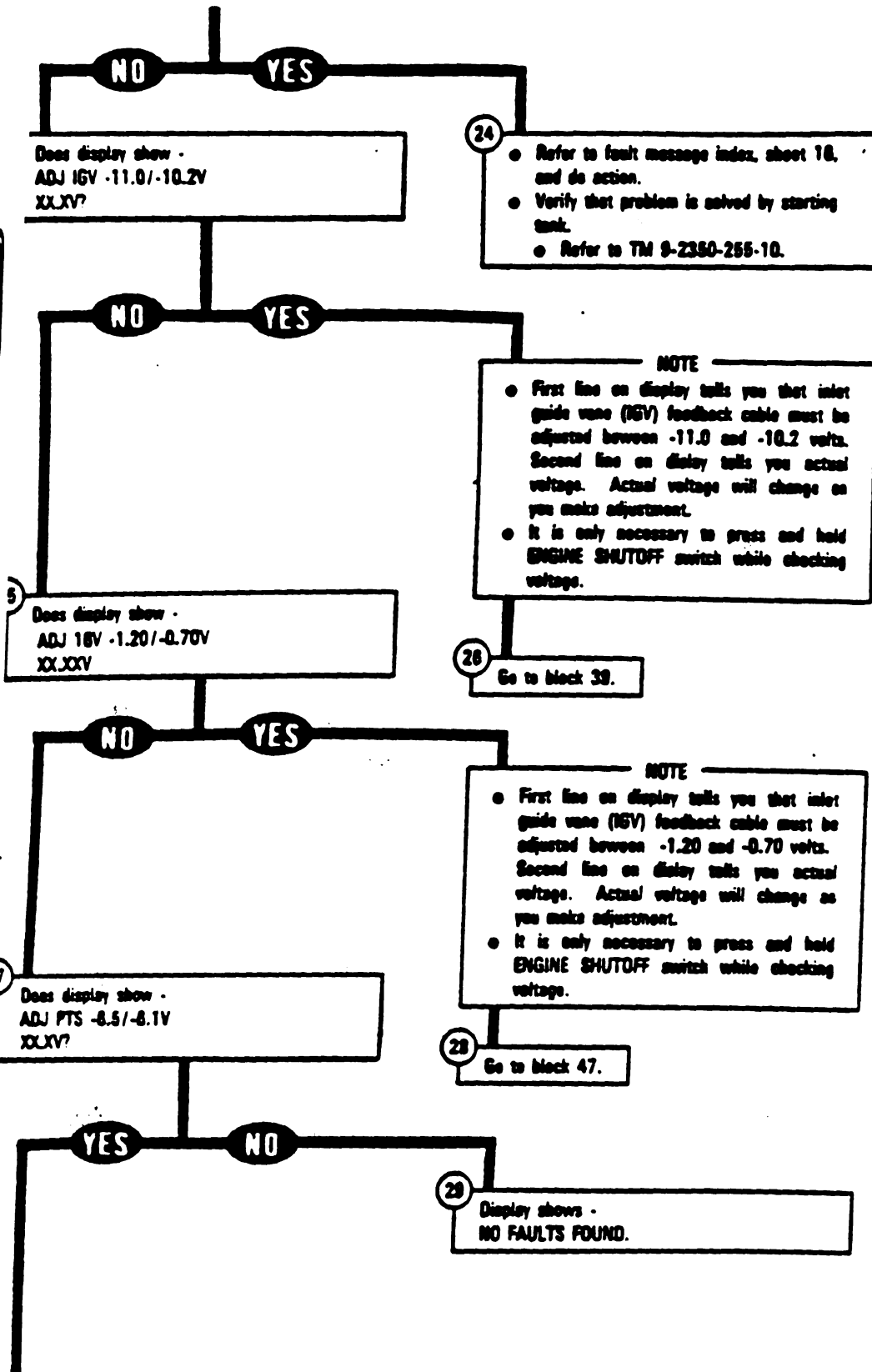
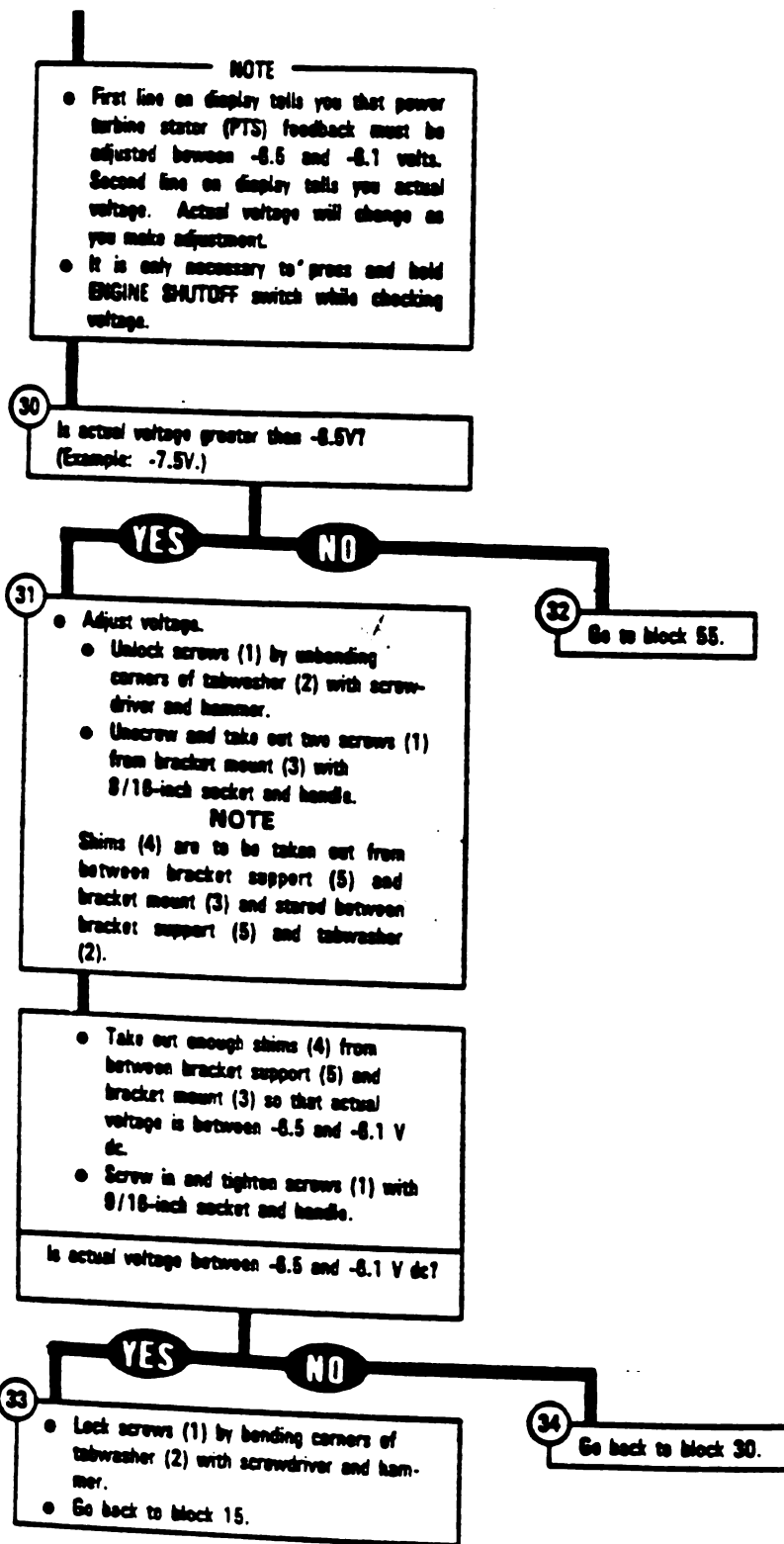


Figure 9-16 (Sheet 5 of 17)  
Volume 11  
Para. 9-2



TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING

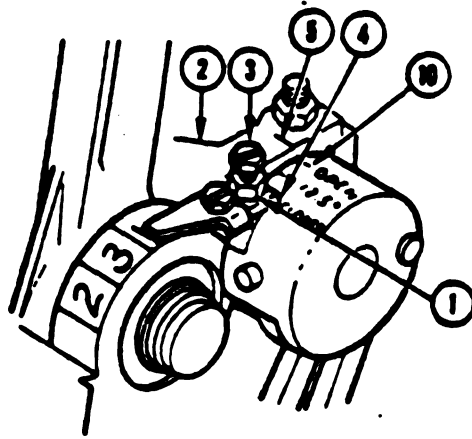


A30120-1215

Figure 9-16 (Sheet 6 of 17)  
Volume II  
Para. 9-2

From block 4

- Adjust CLOSED mark on IGV bellcrank to mark on IGV stop plate.
- Loosen lock nut (1) on IGV stop plate (2) with 3/8-inch wrench.
- Turn screw (3) on IGV stop plate (2) clockwise or counterclockwise with screwdriver until closed mark (4) lines up with mark (5).
- Hold screw (3) with screwdriver and tighten lock nut (1) with 3/8-inch wrench.
- Go back to block 3.



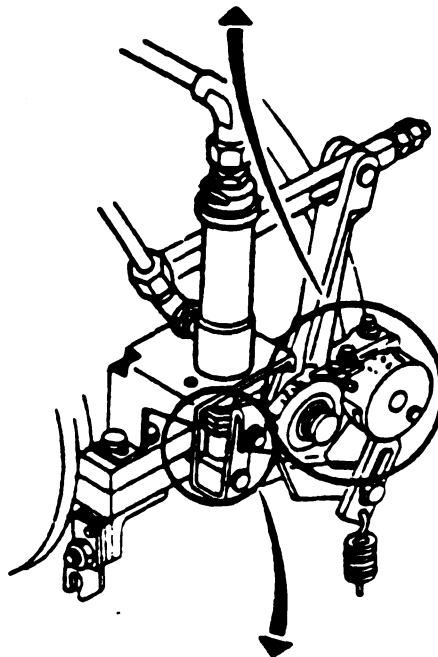
From block 6

- Adjust OPEN mark on IGV bellcrank to mark on IGV stop plate.
- Take out cotter pin (6) from hole (7) in clevis pin (8).
- Get rid of cotter pin (6).
- Take off washer (9) from clevis pin (8).

**NOTE**

The following adjustments must be repeated until OPEN mark (10) lines up with mark (5).

- Take out clevis pin (8) from link (11).



- Move link (11) to the rear.
- Move IGV actuator rod (12) down to stop with screwdriver.
- Hold rod and (13) and loosen lock nut (14) with two 5/8-inch wrenches.

**NOTE**

Rod and (13) will be turned clockwise - if OPEN mark (10) was to the front of mark (5) and counterclockwise if OPEN mark (10) was to the rear of mark (5).

- Hold IGV actuator rod (12) and turn rod and (13).

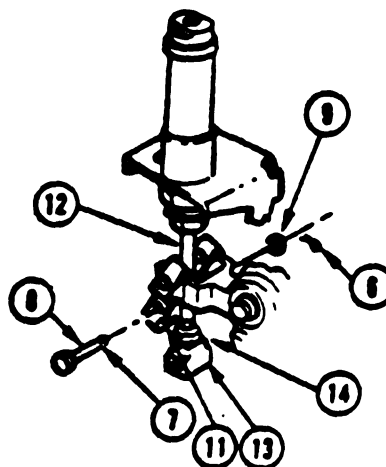


Figure 9-16 (Sheet 7 of 17)  
Volume 41  
Para: 9-2

A 20120-1216

Change 3 9-139

TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING

Continuation of block 36.

- Move IGV actuator rod (1) up and slide link (2) over rod and (3).
- Line up hole (4) in link (2) with hole (5) in rod and (3).
- Put clevis pin (6) through holes (4, 5).
- Move IGV lever (7) all the way to the rear. Push hard.

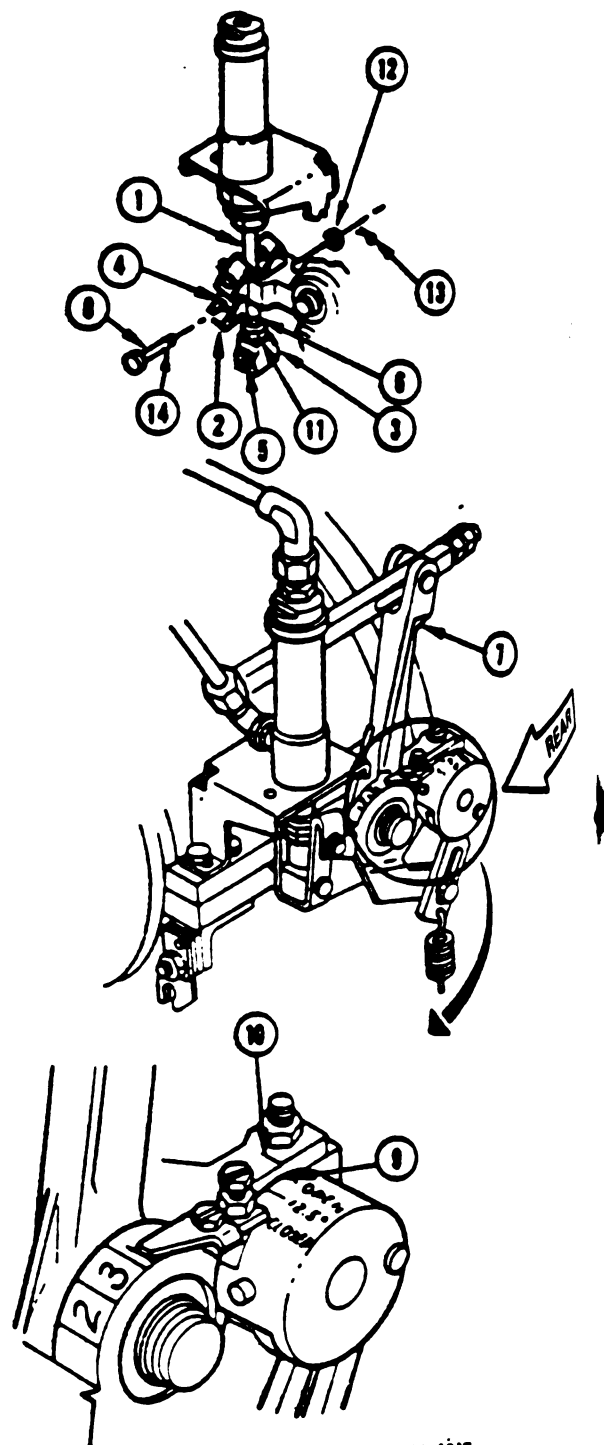
**NOTE**

If a fine adjustment is needed it can be made by turning out (8) on IGV actuator rod (1) with a 5/16-inch wrench.

- Look to see if OPEN mark (9) lines up with mark (10).

- Take out clevis pin (6) from link (2).
- Move link (2) to rear.
- Move IGV actuator rod (1) down for access to lock nut (11).
- Hold rod and (3) and tighten locknut (11) with two 5/8-inch wrenches.
- Move IGV actuator rod (1) up and slide link (2) over rod and (3).

- Line up hole (4) in link (2) with hole (5) in rod and (3).
- Put clevis pin (6) through holes (4, 5).
- Put washer (12) on clevis pin (6).
- Put new cotter pin (13) through hole (14).
- Go back to block 5.



A20120-1217

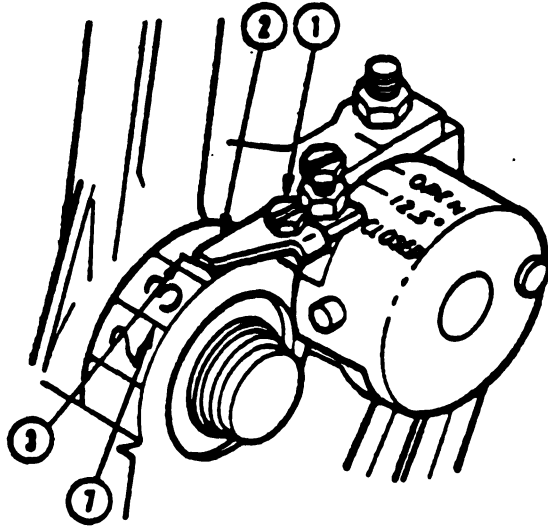
Figure 9-16 (Sheet 8 of 17)  
Volume II  
Para. 8-2

9-140 Change 3

on block 6

Adjust angle indicator bracket to line up with 4 mark.

- Loosen screw (1) on angle indicator bracket (2) with screwdriver.
- Line up angle indicator bracket (2) with 4 mark (3).
- Tighten screw (1) with screwdriver.
- Go back to block 7.



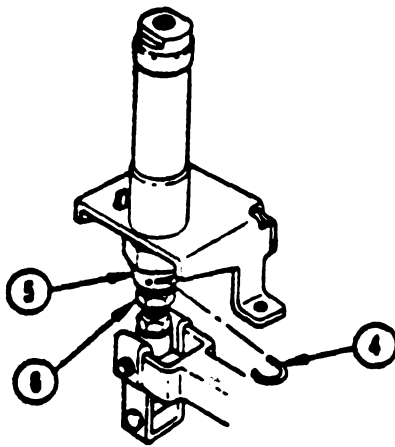
From block 9

- Adjust angle indicator bracket to line up with 2 mark.
- Pull out locking clip (4) from cone seat out (5) with pliers.
- Screw adjusting screw (6) clockwise with 5/8 inch wrench until angle indicator bracket (2) lines up with 2 mark (7).

**NOTE**

Adjusting screw may have to be turned slightly when putting in locking clip.

- Put locking clip (4) in cone seat out (5) with pliers.
- Go back to block 10.



A20120-1218

Figure 9-16 (Sheet 9 of 17)  
Volume:11 -  
Para. 9-2

Change 3 9-141

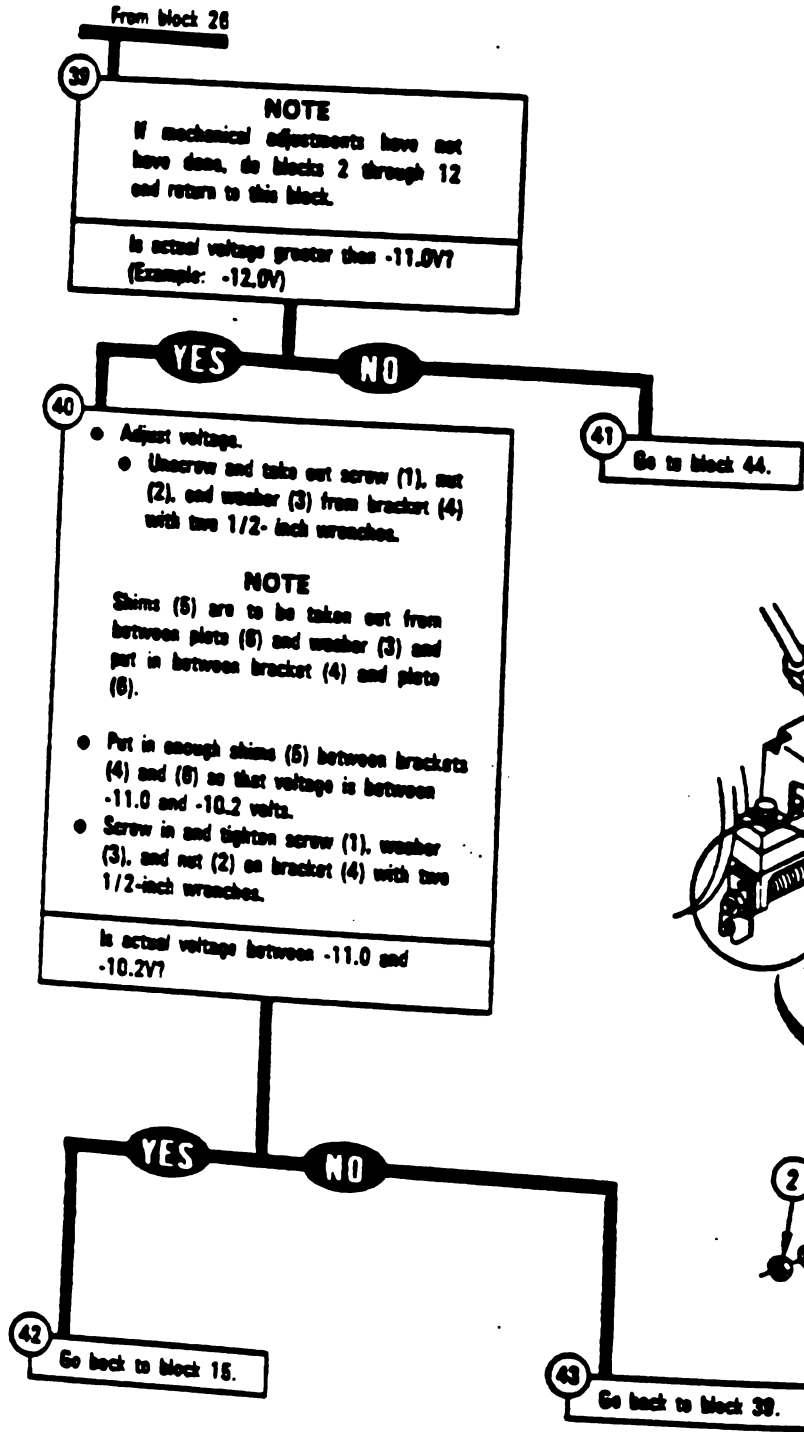


Figure 9-16 (Sheet 10 of 17)  
Volume II  
Para. 9-2

9-142 Change 3

From block 41

44

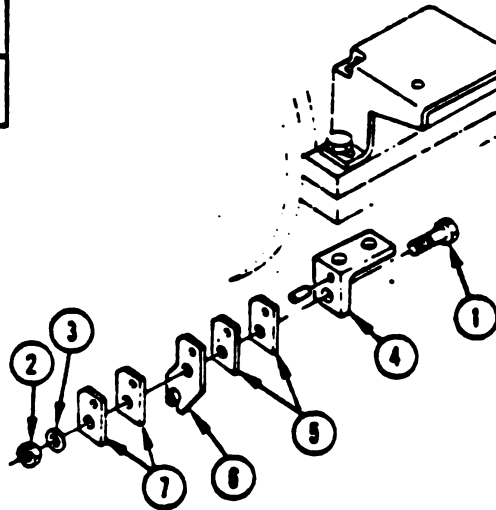
- Adjust voltage.
- Unscrew and take out screw (1), nut (2), and washer (3) from bracket (4) with two 1/2-inch wrenches.

**NOTE**

Shims (5) are to be removed from between plate (6) and bracket (4) and stored between washer (3) and plate (6).

- Remove enough shims (5) from between bracket (4) and plate (6) so that voltage is between -11.0 and -10.2 V.
- Store unused shims (7) between plate (6) and washer (3).
- Screw in and tighten screw (1), washer (3), and nut (2) on bracket (4) with two 1/2-inch wrenches.

Is actual voltage between -11.0 and -10.2V?



A20120-1220

YES

NO

45

Go back to block 15.

46

Go back to block 39.

Figure 9-16 (Sheet 11 of 17)  
Volume 41  
Para. 9-2

TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING

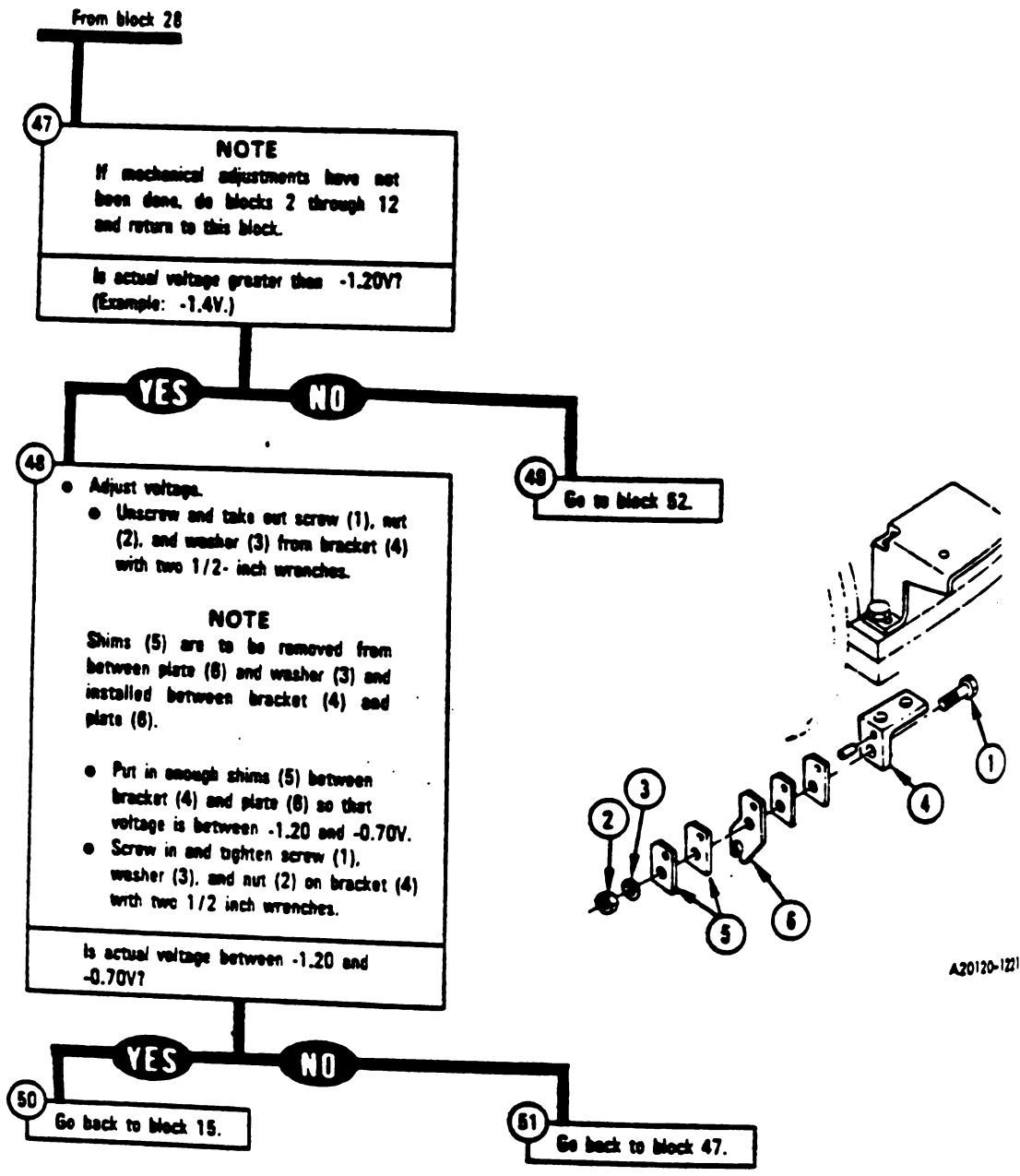


Figure 9-16 (Sheet 12 of 17)  
Volume II  
Para. 9-2

9-144 Change 5

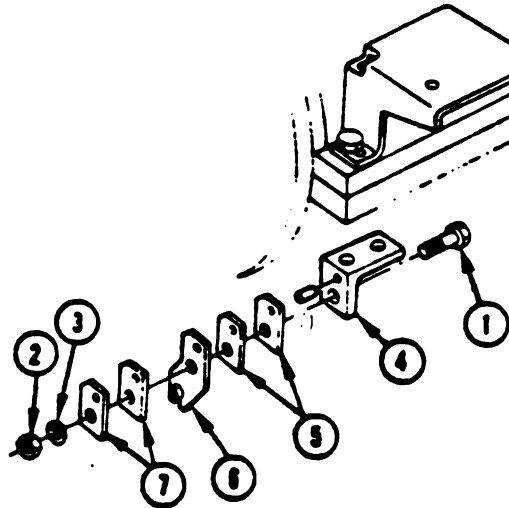
on block 49

- Adjust voltage.
- Unscrew and take nut screw (1), nut (2), and washer (3) from bracket (4) with two 1/2-inch wrenches.

**NOTE**

Shims (5) are to be taken out from between plate (8) and bracket (4) and stored between washers (3) and plate (8).

- Take out enough shims (5) between bracket (4) and plate (8) so that voltage is between -1.20 and -0.70V.
- Store unused shims (7) between plate (8) and washer (3).
- Screw in and tighten screw (1), washer (3), and nut (2) on bracket (4) with two 1/2-inch wrenches.



A20120-1220

Is actual voltage between -1.20 and -0.70V?

YES

NO

● Go back to block 15.

● Go back to block 47.

Figure 9-16 (Sheet 13 of 17)  
Volume II  
Para. 9-2



TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING

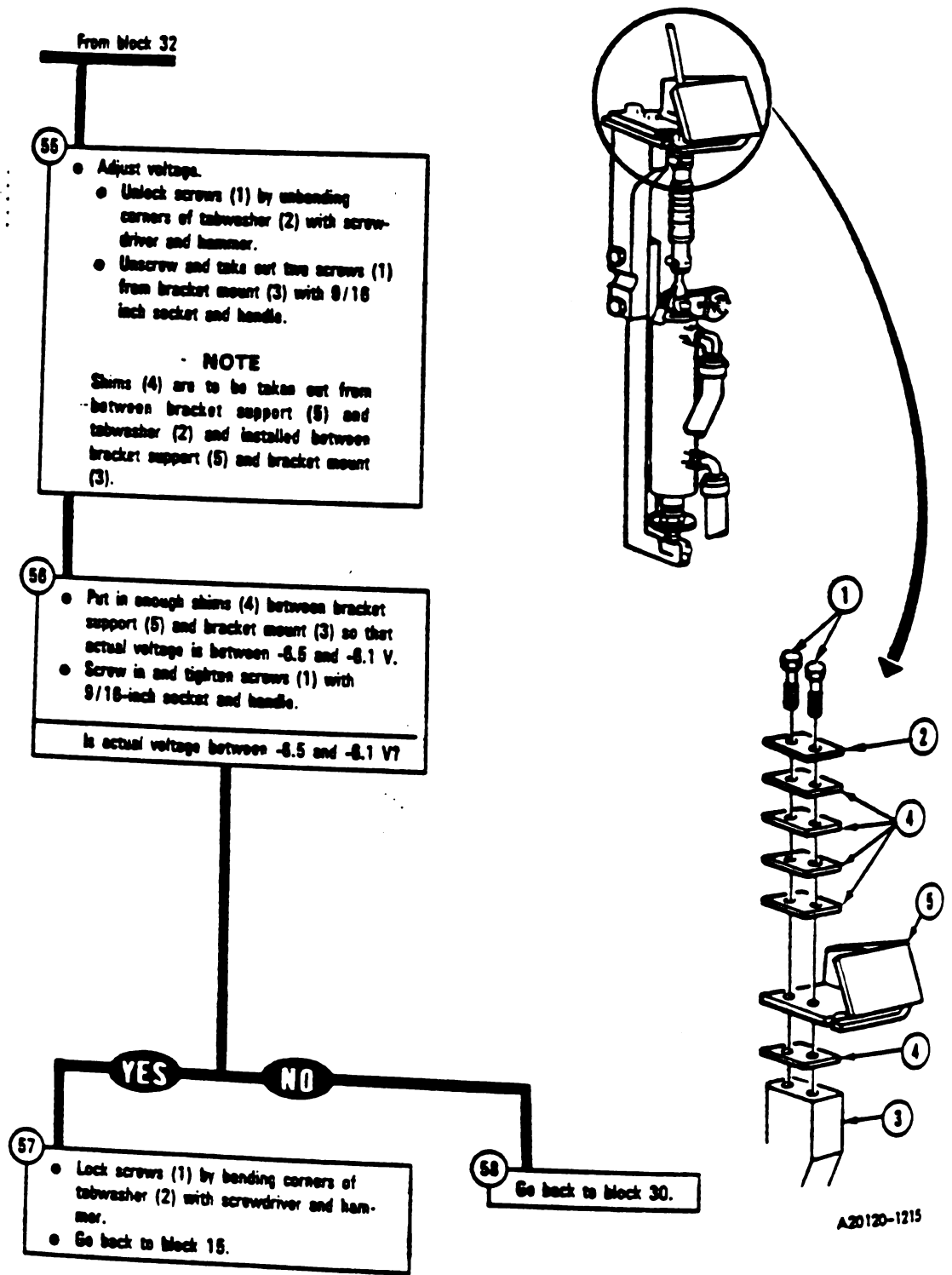


Figure 9-16 (Sheet 14 of 17)  
Volume II  
Para. 9-2

Engine System Cable Instruction Message Index for Test 1522

Cable Instruction Message	Action
ASSEMBLE CIB CABLE AND DBA CX201	<ul style="list-style-type: none"> <li>● Connect P1 on CIB cable CX305 to P1 on DBA CX201.</li> <li>● See figure 9-43.</li> </ul>
CONNECT TA202 <--> CX201	<ul style="list-style-type: none"> <li>● Connect adapter TA202 to P3 on DBA CX201.</li> <li>● See figure 9-40.</li> </ul>
CONNECT CIB CABLE TO CIB J1	<ul style="list-style-type: none"> <li>● Connect P2 on CIB cable CX305 to J1 on CIB.</li> <li>● See figure 9-43.</li> </ul>
CONNECT CIB J2 TO ECU J1 (CA201)	<ul style="list-style-type: none"> <li>● Connect P1 on CIB cable CX304 to P1 on adapter CA201.</li> <li>● Connect P2 on adapter CA201 to J1 on electronic control unit.</li> <li>● Connect P2 on CIB cable CX304 to J2 on CIB.</li> <li>● See figure 9-28.</li> </ul>
CONNECT DBA BETWEEN 2W114 <--> ECU J2	<ul style="list-style-type: none"> <li>● Connect 2W114-P1 to P2 on DBA CX201.</li> <li>● Connect P3 on DBA CX201 to J2 on electronic control unit.</li> <li>● See figure 9-43.</li> </ul>
DISCONNECT CX201 <--> ECU J2	<ul style="list-style-type: none"> <li>● Disconnect P3 on DBA CX201 from J2 on electronic control unit.</li> <li>● See figure 9-43.</li> </ul>
DISCONNECT 2W104 <--> PLA	<ul style="list-style-type: none"> <li>● Disconnect 2W104-P8 from 2DT101-J1.</li> <li>● See figure 9-109.</li> </ul>
DISCONNECT 2W114 <--> ECU J2	<ul style="list-style-type: none"> <li>● Disconnect 2W114-P1 from J2 on electronic control unit.</li> <li>● See figure 9-110.</li> </ul>
DISCONNECT 3W105 <--> FSA	<ul style="list-style-type: none"> <li>● Disconnect 3W105-P33 from J33 on electromechanical fuel system.</li> <li>● See figure 9-112, sheet 1.</li> </ul>
RECONNECT 2W114 <--> ECU J2	<ul style="list-style-type: none"> <li>● Connect 2W114-P1 to J2 on electronic control unit.</li> <li>● See figure 9-110.</li> </ul>
RECONNECT 3W105 <--> FSA	<ul style="list-style-type: none"> <li>● Connect 3W105-P33 to J33 on electromechanical fuel system.</li> <li>● See figure 9-112, sheet 1.</li> </ul>

Figure 9-16 (Sheet 15 of 17)  
Volume II  
Para. 9-2

**TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING**

**Engine System Fault Message Index for Test 1522**

Fault Message	Action
<b>FAULTY ECU</b> 152202 152224 152215 152235 152236	<ul style="list-style-type: none"> <li>● Replace electronic control unit.</li> <li>● Refer to TM 9-2350-255-20-1-3-4, para. 11-13.</li> </ul>
<b>FAULTY ECU, 2W105 OR 2W104</b> 151903	<ul style="list-style-type: none"> <li>● Do follow-on procedure.</li> <li>● See figure 9-96.</li> </ul>
<b>FAULTY FSA</b> 151902	<ul style="list-style-type: none"> <li>● Replace electromechanical fuel system.</li> <li>● Refer to TM 9-2350-255-20-1-3-1, para. 2-5.</li> </ul>
<b>FAULTY IGV FEEDBACK CABLE</b> 152211	<ul style="list-style-type: none"> <li>● Replace inlet guide vane feedback cable.</li> <li>● Refer to TM 9-2350-255-20-1-3-1, para. 2-5.</li> </ul>
<b>FAULTY PLA RVDT</b> 151907	<ul style="list-style-type: none"> <li>● Replace rotary variable differential transformer.</li> <li>● Refer to TM 9-2350-255-20-1-3-2, para. 6-4.</li> </ul>
<b>FAULTY PTS FEEDBACK CABLE</b> 152232	<ul style="list-style-type: none"> <li>● Replace power turbine stator feedback cable.</li> <li>● Refer to TM 9-2350-255-20-1-3-1, para. 2-5.</li> </ul>
<b>FAULTY STOP/START SYSTEM</b> 151704	<ul style="list-style-type: none"> <li>● Run engine test number 1501.</li> <li>● See figure 9-2.</li> </ul>
<b>FAULTY 2W114 OR 3W105</b> 151905	<ul style="list-style-type: none"> <li>● Do follow-on procedure.</li> <li>● See figure 9-97.</li> </ul>
<b>FAULTY 2W114, 3W105 OR FSA</b> 152216 152221 152226 152241	<ul style="list-style-type: none"> <li>● Do follow-on procedure.</li> <li>● See figure 9-78.</li> </ul>
154302 154303 154402 154403	<ul style="list-style-type: none"> <li>● See figure 9-79.</li> </ul>

*Figure 9-16 (Sheet 16 of 17)  
Volume II  
Para. 9-2*

9-148 Change 3

Special Instruction Message Index for Test 1522

Special Instruction Message	Action
ADJ IGV RVDT TO MAX XX.XXV	<ul style="list-style-type: none"> <li>● Move inlet guide vane RVDT arm located on electromechanical fuel system until the highest possible reading is seen on second line of SETCOM display.</li> <li>● See figure 9-46.</li> </ul>
ADJ IGV RVDT TO MIN XX.XXV	<ul style="list-style-type: none"> <li>● Move inlet guide vane RVDT arm located on electromechanical fuel system until the lowest possible reading is seen on second line of SETCOM display.</li> <li>● See figure 9-46.</li> </ul>
ADJ PTS RVDT TO MAX XX.XXV	<ul style="list-style-type: none"> <li>● Move power turbine stator RVDT arm located on electromechanical fuel system until the highest possible reading is seen on second line of SETCOM display.</li> <li>● See figure 9-45.</li> </ul>
ADJ PTS RVDT TO MIN XX.XXV	<ul style="list-style-type: none"> <li>● Move power turbine stator RVDT arm located on electromechanical fuel system until the lowest possible reading is seen on second line of SETCOM display.</li> <li>● See figure 9-45.</li> </ul>
MOVE IGV LEVER FULLY REARWARD	<ul style="list-style-type: none"> <li>● Move IGV lever towards rear of engine.</li> <li>● See figure 9-55.</li> </ul>
MOVE IGV LEVER TO FULL FWD POSITION	<ul style="list-style-type: none"> <li>● Move IGV lever towards front of engine.</li> <li>● See figure 9-55.</li> </ul>
MOVE PTS ACTUATOR TO FULL DOWNWARD STOP	<ul style="list-style-type: none"> <li>● Push down on PTS actuator until bottom of actuator hits stop plate.</li> <li>● See figure 9-56.</li> </ul>
PULL LINK PIN; REACH IGV-RVDT	<ul style="list-style-type: none"> <li>● Disconnect IGV feedback cable from electromechanical fuel system by removing quick-disconnect pin.</li> <li>● See figure 9-46.</li> </ul>
PULL LINK PIN; REACH PTS-RVDT	<ul style="list-style-type: none"> <li>● Disconnect PTS feedback cable from electromechanical fuel system by removing quick-disconnect pin.</li> <li>● See figure 9-45.</li> </ul>

Figure 9-16 (Sheet 17 of 17)  
Volume II  
Para. 9-2

**POWER LEVER ANGLE (PLA)\* RIGGING TEST**

**Common Tools:**

- Wrench, combination, 7/16-inch
- Wrench, open end, 7/16-inch

**NOTE**

Read para. 9-1 before doing any work.

**Test Equipment/Special Tools:**

**NOTE**

TM 9-2350-255-20-1-2-2, table 18-2 shows which STE/M1 components are stored in each of the seven transit cases.

- STE/M1 Test Set, 12303800

**Equipment Condition:**

- Tank parked.
- Parking brake set.
- Engine shut down.
- Vehicle master power off.

- 1
- Set up tank controls for standard initial test conditions.
  - Refer to table 9-2 at the end of this chapter.

- 2
- Prepare STE/M1 for operation.
  - Refer to TM 9-2350-255-20-1-2-2, figure 18-11.

**NOTE**

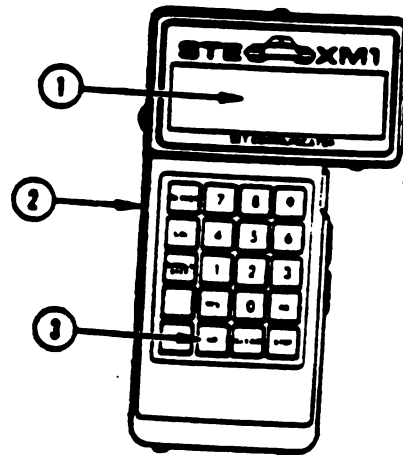
Display (1) on SETCOM (2) shows -  
ENTER TEST NUMBER.

- Enter test number 1523 on SETCOM (2).
- Press GO key (3).

**NOTE**

Display shows -  
TEST 1523  
PLA RIGGING

\*PLA is defined as throttle control.



A20220-010R1

Figure 9-17 (Sheet 1 of 6)  
Volume II  
Para. 9-2

9-150 Change 3

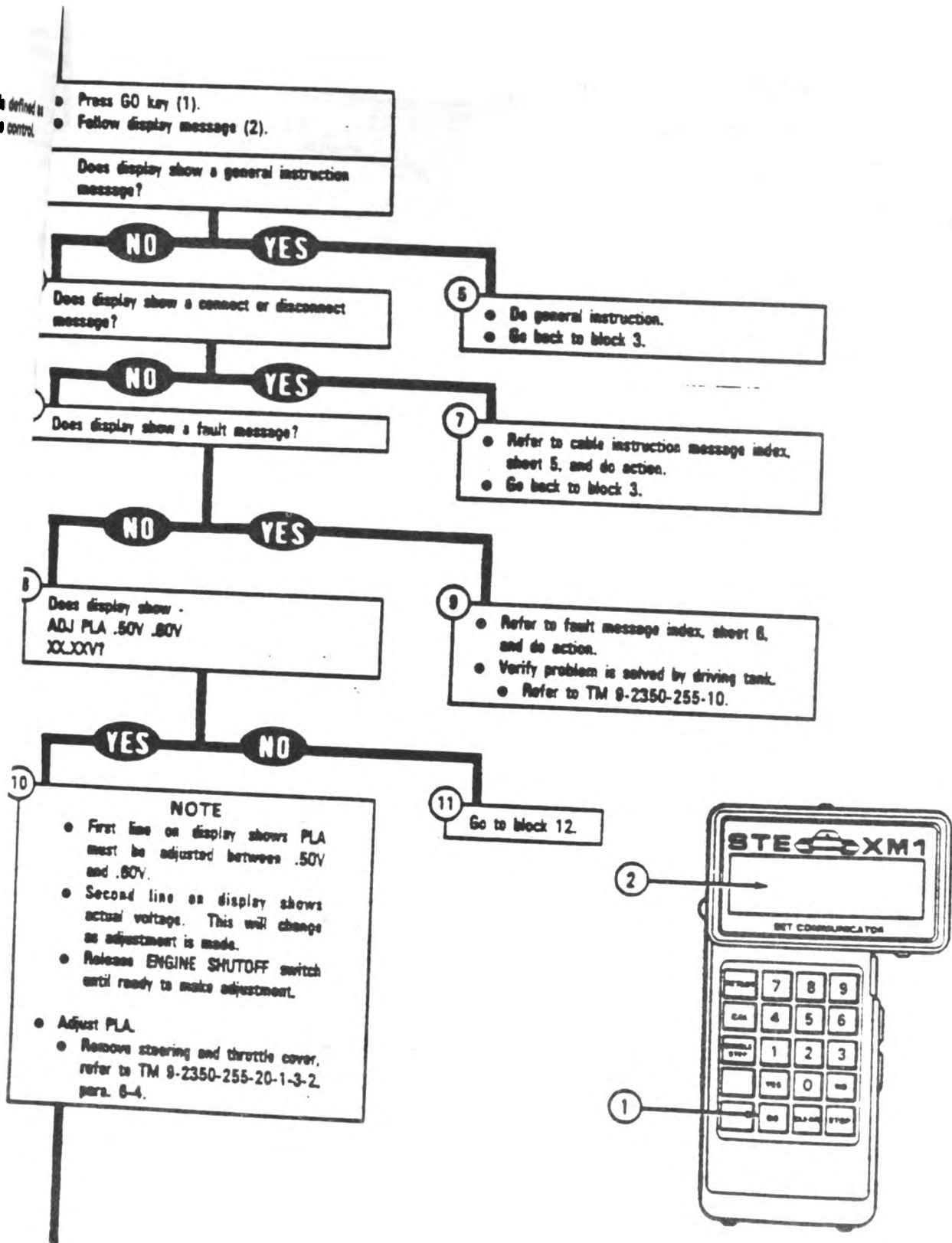
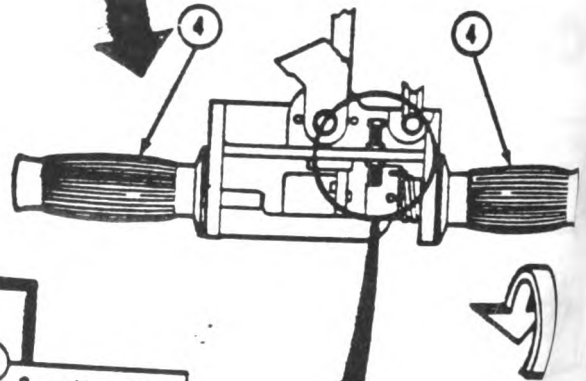
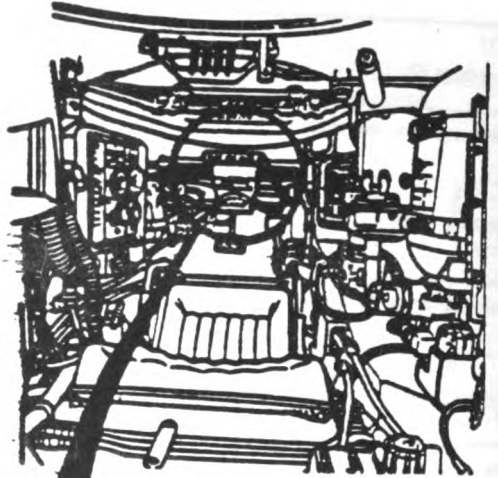


Figure 9-17 (Sheet 2 of 6)  
Volume 11  
Para. 9-2

A20120-10 90

Change 3 9-151

- Loosen locknuts (1, 2) on upper adjustment screw (3) with two 7/16 inch wrenches.
- Make sure throttle control handles (4) are turned forward to lowest throttle position.
- Turn screw (3) with 7/16 inch wrench until second line of display (5) shows between .50V and .80V.
- Hold screw (3) and tighten locknuts (1, 2) with two 7/16 inch wrenches.
- Install steering and throttle cover, refer to TM 9-2360-255-20-1-3-2, para. 6-4.
- Press GO key (6).



From block 11

12 Does display show -  
ADJ PLA 8.50V/8.70V  
XX.XXV?

YES NO

- 13
- NOTE**
- First line on display shows PLA must be adjusted between 8.50V and 8.70V.
  - Second line on display shows actual voltage. This will change as adjustment is made.
  - Release ENGINE SHUTOFF switch until ready to make adjustment.
- Adjust PLA.
    - Remove shift select assembly, refer to TM 9-2350-255-20-1-3-2, para. 6-4.

14 Go to block 15.

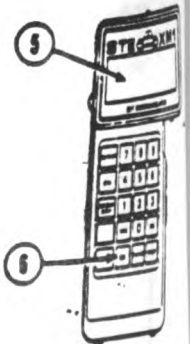
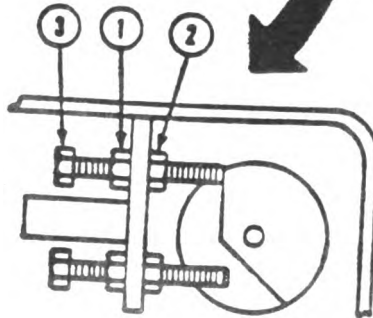
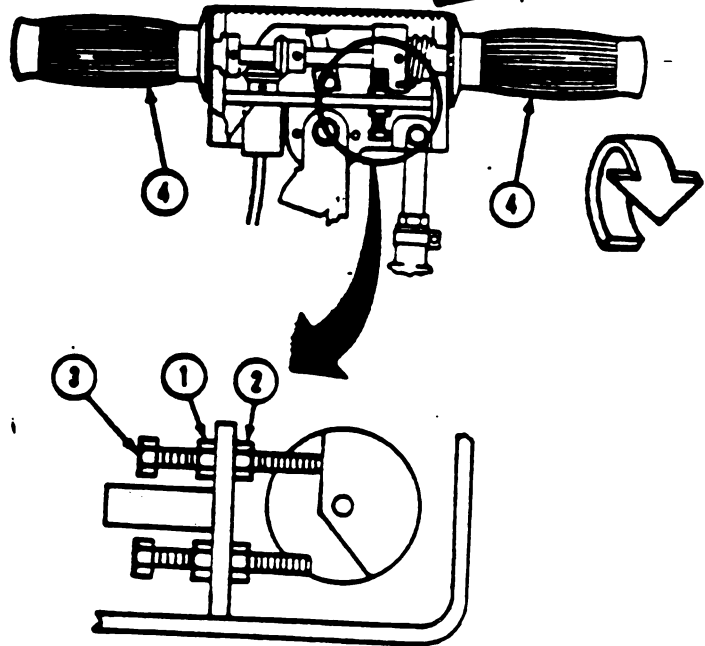
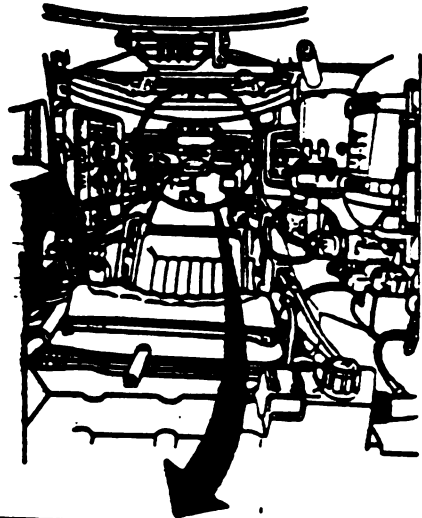


Figure 9-15 (Sheet 3 of 6)  
Volume II  
Para. 9-2

9-152 Change 3

A20120-108

- Loosen locknuts (1, 2) on lower adjustment screw (3) with two 7/16 inch wrenches.
- Make sure throttle control handles (4) are turned all the way back to highest throttle position.
- Turn screw (3) with 7/16 inch wrench until second line of display (5) shows between 6.5V and 7.5V.
- Hold screw (3) and tighten locknuts (1, 2) with two 7/16 inch wrenches.
- Install shift select assembly, refer to TM 9-2350-255-20-1-3-2, para. 8-4.
- Press GO key (6).



From block 14

**NOTE**

Display on SETCOM shows -  
END OF TEST.

- Disconnect CA201-P2 from J1 on electronic control unit.
  - See figure 9-28.
- Connect shorting connector to J1 on electronic control unit.
  - See figure 9-110.
- Verify PLA is adjusted by driving tank.
  - Refer to TM 9-2350-255-10.

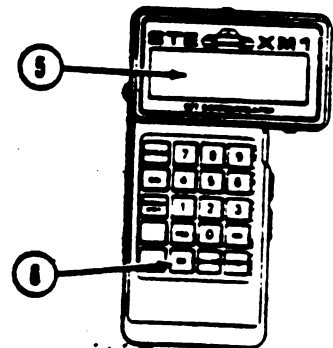


Figure 9-17 (Sheet 4 of 6)  
Volume II  
Para. 9-2

A20120-1089

Change 3 9-153



Engine System Cable Instruction Message Index for Test 1523

Cable Instruction Message	Action
TO CONNECT CIB J1 (CX305) 2W105 P5 (CA205)	<ul style="list-style-type: none"> <li>● Connect P1 on CIB cable CX305 to P2 on adapter CA205.</li> <li>● Connect 2W105-P5 to P1 on adapter CA205.</li> <li>● Connect P2 on CIB cable CX305 to J1 on CIB.</li> <li>● See figure 9-25.</li> </ul>
TO CONNECT CIB J2 (CX304) ECU J1 (CA201)	<ul style="list-style-type: none"> <li>● Connect P1 on CIB cable CX304 to P1 on adapter CA201.</li> <li>● Connect P2 on adapter CA201 to J1 on electronic control unit.</li> <li>● Connect P2 on CIB cable CX304 to J2 on CIB.</li> <li>● See figure 9-28.</li> </ul>
DISCONNECT 2W104 <--> TCNTL	<ul style="list-style-type: none"> <li>● Disconnect 2W104-P8 from 2DT101-J1.</li> <li>● See figure 9-109.</li> </ul>
DISCONNECT 2W105 P5 <--> ECU J3	<ul style="list-style-type: none"> <li>● Disconnect 2W105-P5 from J3 on electronic control unit.</li> <li>● See figure 9-110.</li> </ul>
DISCONNECT 2W114 <--> ECU J2	<ul style="list-style-type: none"> <li>● Disconnect 2W114-P1 from J2 on electronic control unit.</li> <li>● See figure 9-110.</li> </ul>
DISCONNECT 3W105 <--> EMFS	<ul style="list-style-type: none"> <li>● Disconnect 3W105-P33 from J33 on electromechanical fuel system.</li> <li>● See figure 9-112, sheet 1.</li> </ul>
RECONNECT 2W114 <--> ECU J2	<ul style="list-style-type: none"> <li>● Connect 2W114-P1 to J2 on electronic control unit.</li> <li>● See figure 9-110.</li> </ul>
RECONNECT 3W105 <--> EMFS	<ul style="list-style-type: none"> <li>● Connect 3W105-P33 to J33 on electromechanical fuel system.</li> <li>● See figure 9-112, sheet 1.</li> </ul>

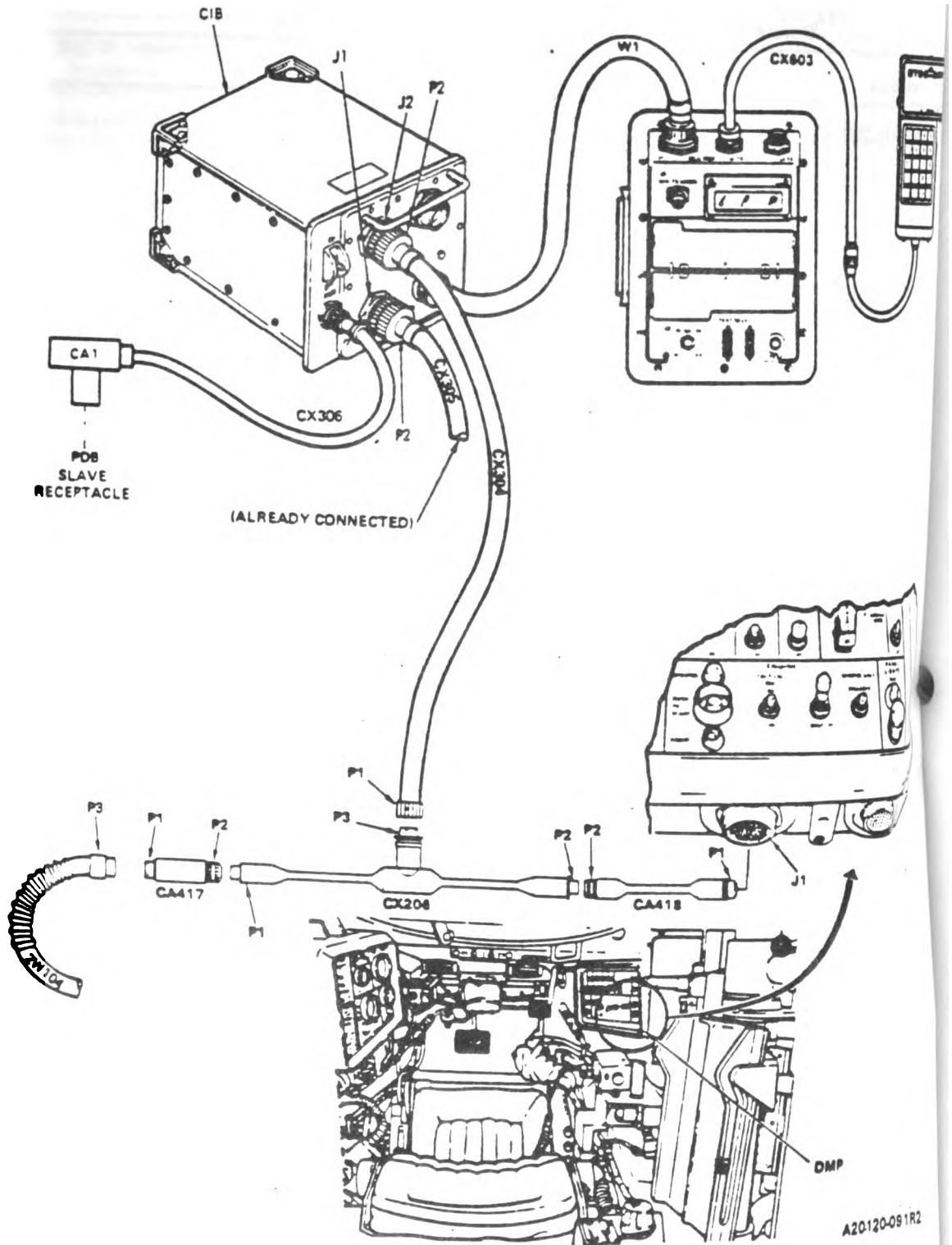
Figure 9-17 (Sheet 5 of 6)  
Volume II  
Para. 9-2

Engine System Fault Message Index for Test 1523

Fault Message	Action
P2 on idle or CA205 J1 on C8 ULTY ADJUSTMENT	<ul style="list-style-type: none"> <li>Do follow-on procedure.</li> <li>See figure 9-98.</li> </ul>
ULTY ECU	<ul style="list-style-type: none"> <li>Replace electronic control unit.</li> <li>Refer to TM 9-2350-255-20-1-3-4, para. 11-13.</li> </ul>
P1 on idle on idles J2 on C8 ULTY ECU, 2W105 R 2W104	<ul style="list-style-type: none"> <li>Do follow-on procedure.</li> <li>See figure 9-98.</li> </ul>
J1 ULTY EMFS	<ul style="list-style-type: none"> <li>Replace electromechanical fuel system.</li> <li>Refer to TM 9-2350-255-20-1-3-1, para. 2-5.</li> </ul>
electronic ULTY THROTTLE CONTROL RVDT	<ul style="list-style-type: none"> <li>Replace rotary variable differential transformer.</li> <li>Refer to TM 9-2350-255-20-1-3-2, para. 6-4.</li> </ul>
electronic ULTY RVDT (CENTL) W104, 2W105	<ul style="list-style-type: none"> <li>Do follow-on procedure.</li> <li>See figure 9-102.</li> </ul>
electronic ULTY STOP/START SYSTEM	<ul style="list-style-type: none"> <li>Run engine test number 1501.</li> <li>See figure 9-2.</li> </ul>
control ULTY 2W114 OR 3W105	<ul style="list-style-type: none"> <li>Do follow-on procedure.</li> <li>See figure 9-97.</li> </ul>

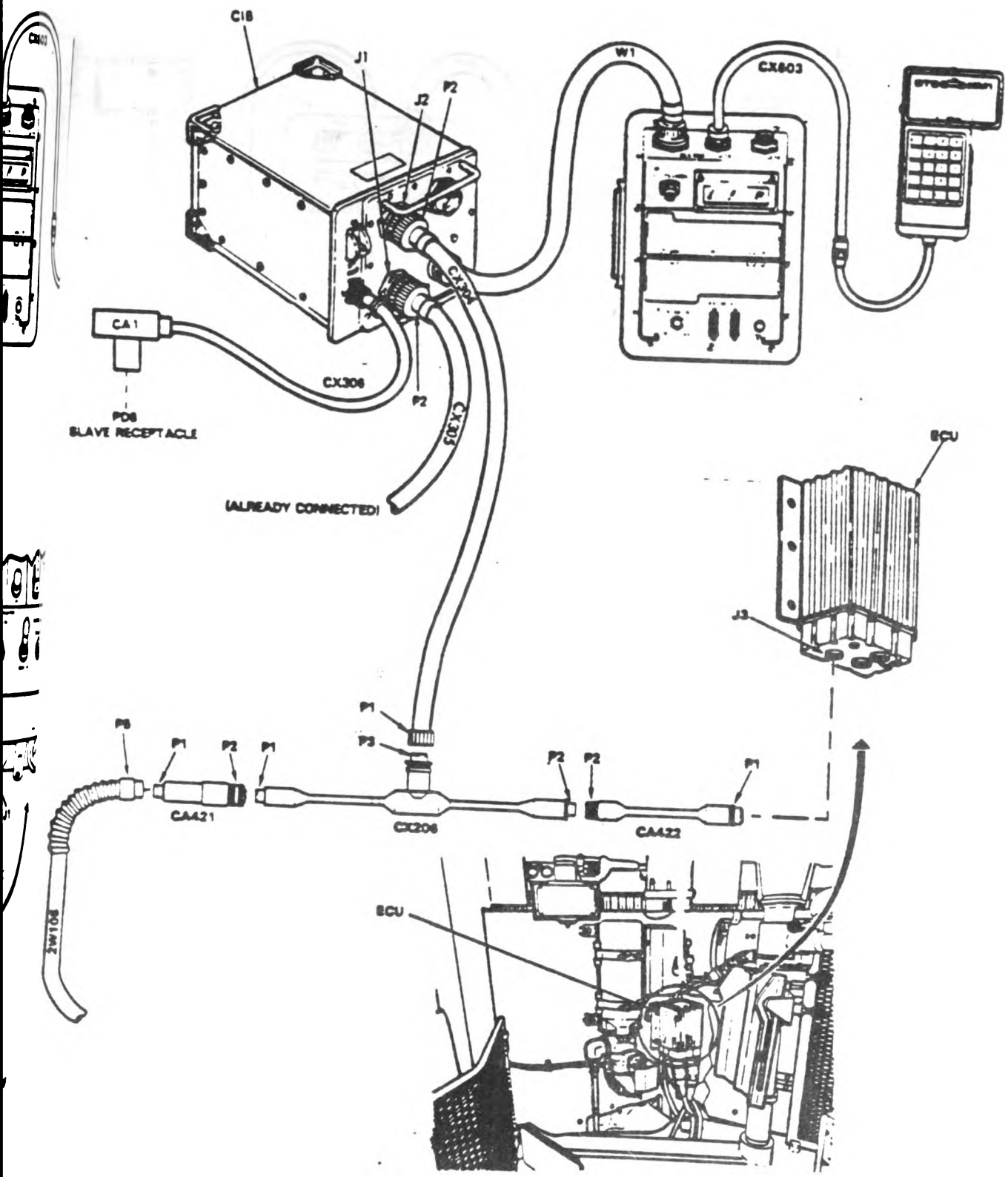
Figure 9-17 (Sheet 6 of 6)  
Volume II  
Para. 9-2

**TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING**



**Figure 9-18. STE/M1 Hull Cable Hookup Between DMP-J1 and 2W104-P3.  
Volume II  
Para. 9-2**

**9-156 Change 3**

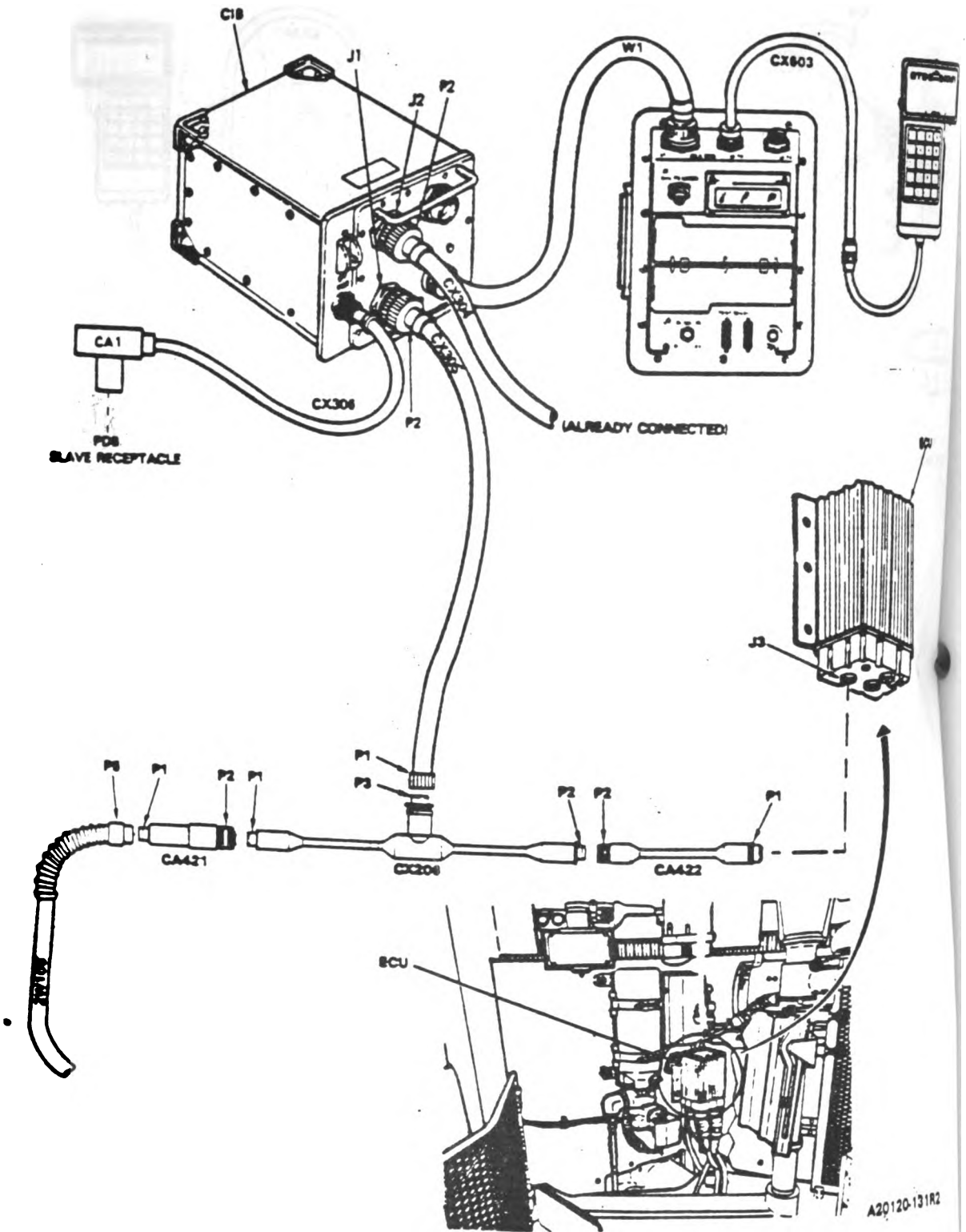


A20120-1082

Figure 9-19. STE/M1 Hull Cable Hookup Between ECU-J3 and 2W105-P6.  
Volume II  
Para. 9-2

Change 3 8-157

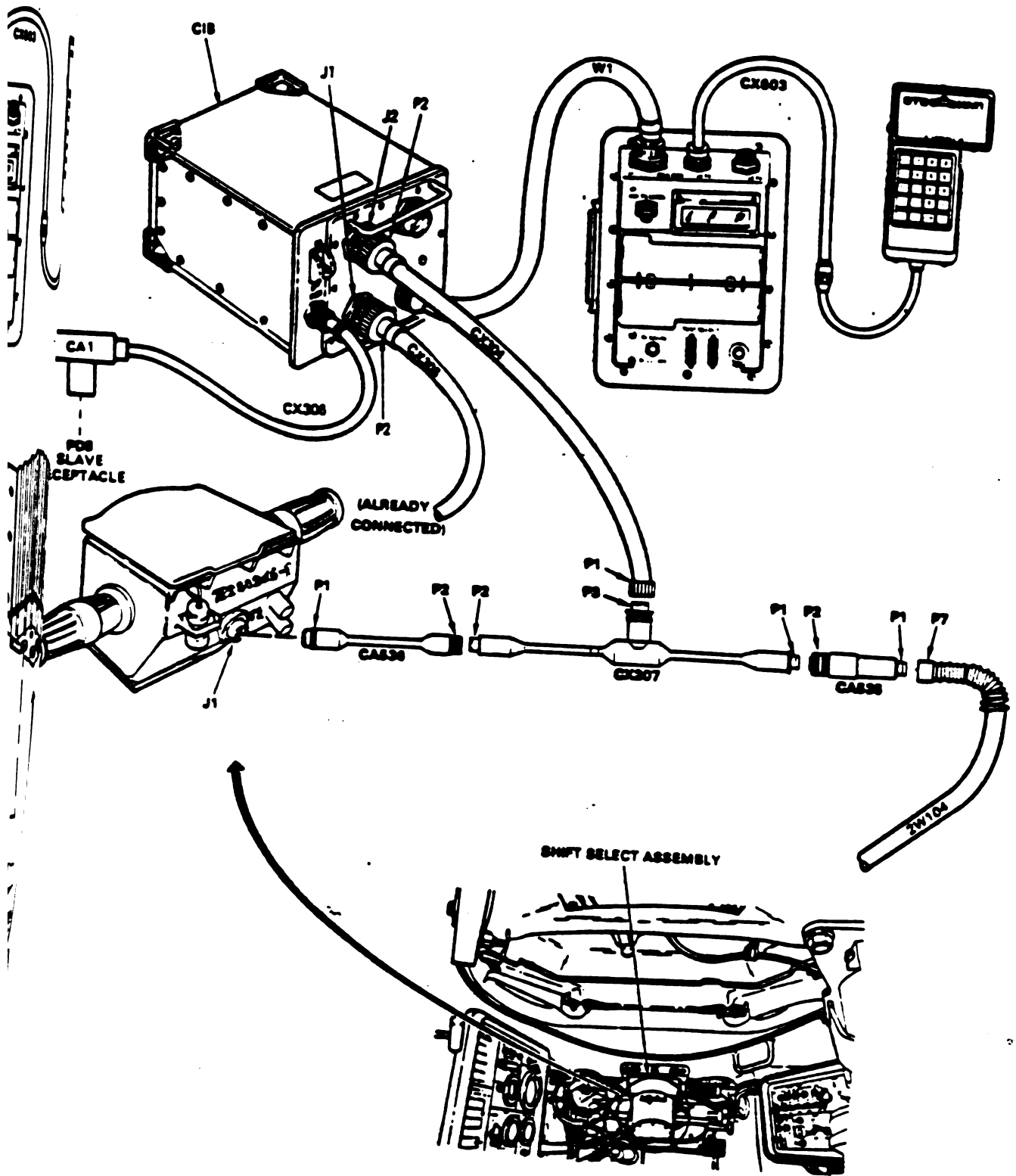
**TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING**



**Figure 9-20. STE/M1 Hull Cable Hookup Between ECU-J3 and 2W105-P5.  
Volume II  
Para. 9-2**

**9-158 Change 3**

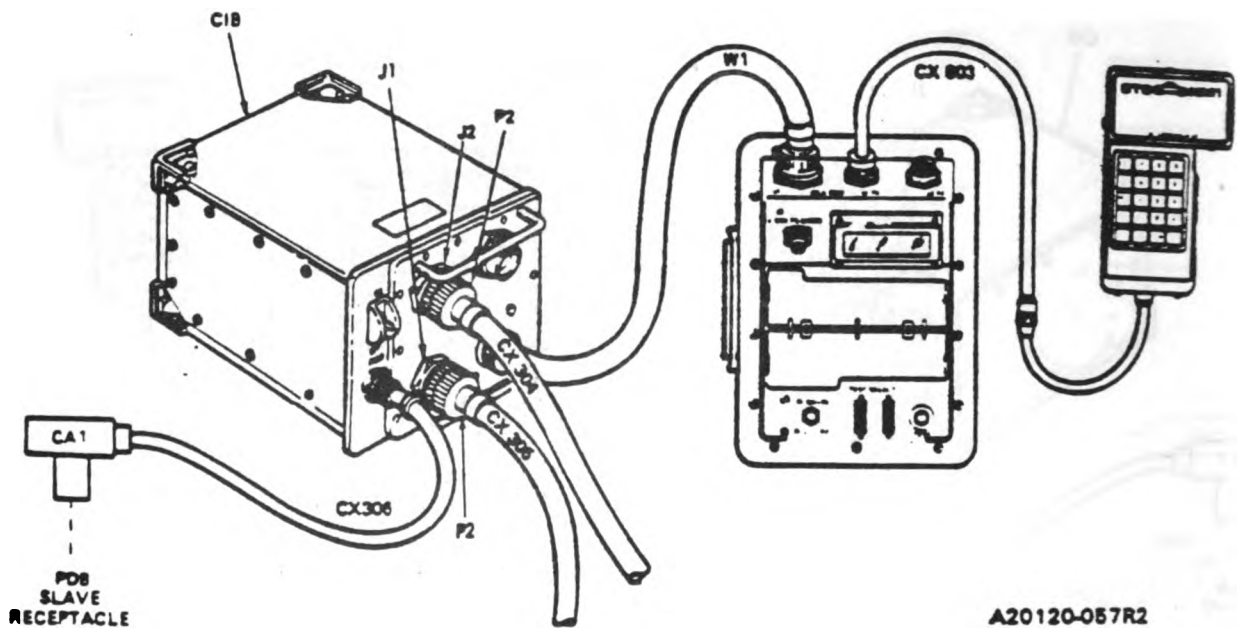
A20120-131R2



A20120-430R2

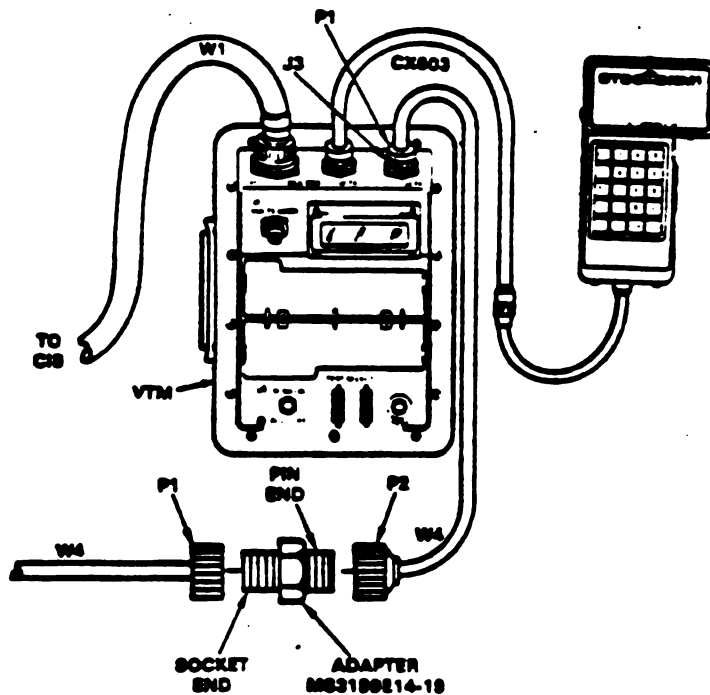
Figure 9-21. STE/M1 Hull Cable Hookup Between J1 on Shift Select Assembly and 2W104-P7.  
Volume-11  
Para. 9-2

Change 3 9-159



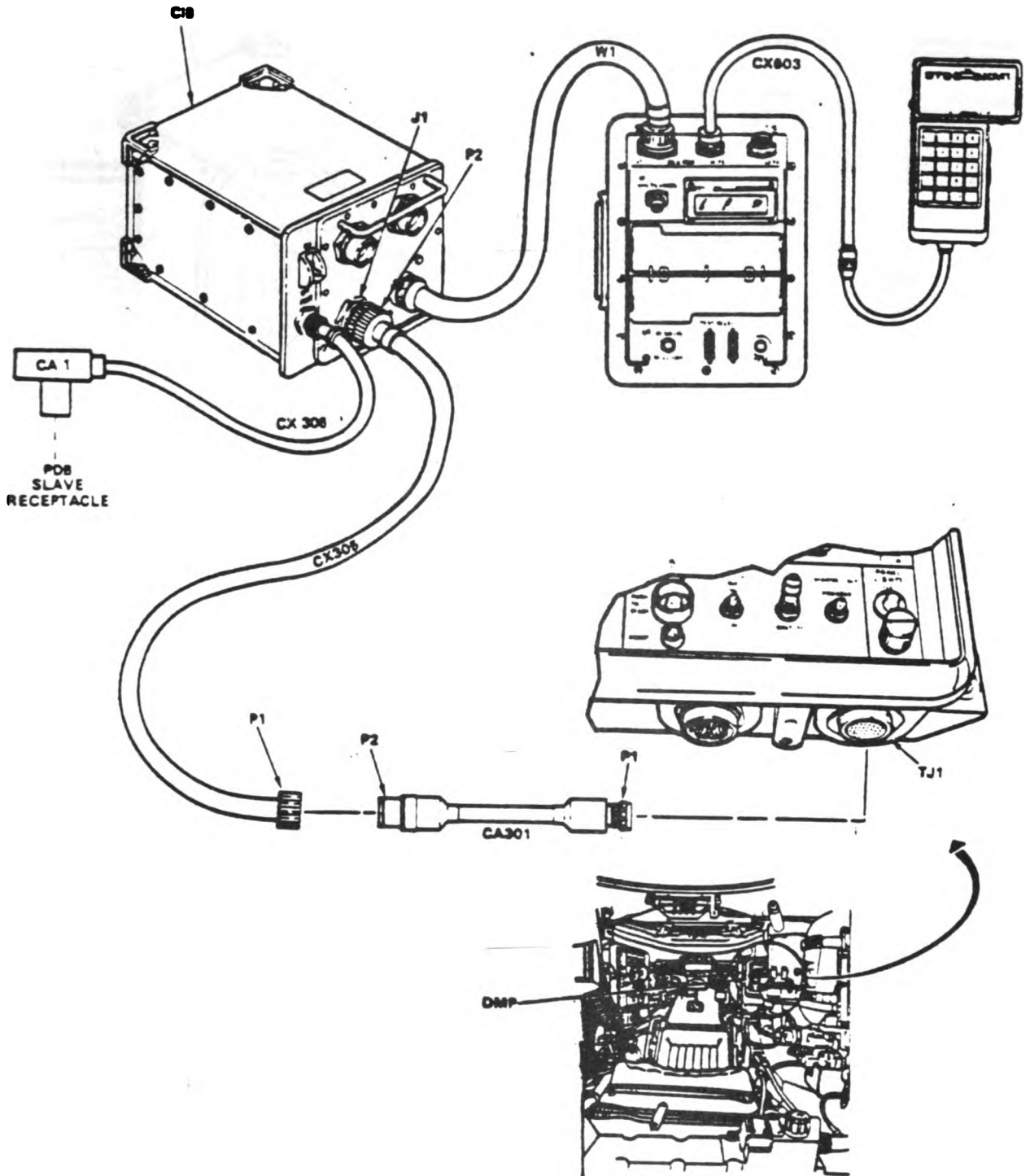
A20120-057R2

Figure 9-22. STE/M1 Hull Cable Hookup to CIB-J2



A20120-1081

Figure 9-23. STE/M1 Hull Cable Hookup for Two W4 Cables.  
Volume II  
Para. 9-2



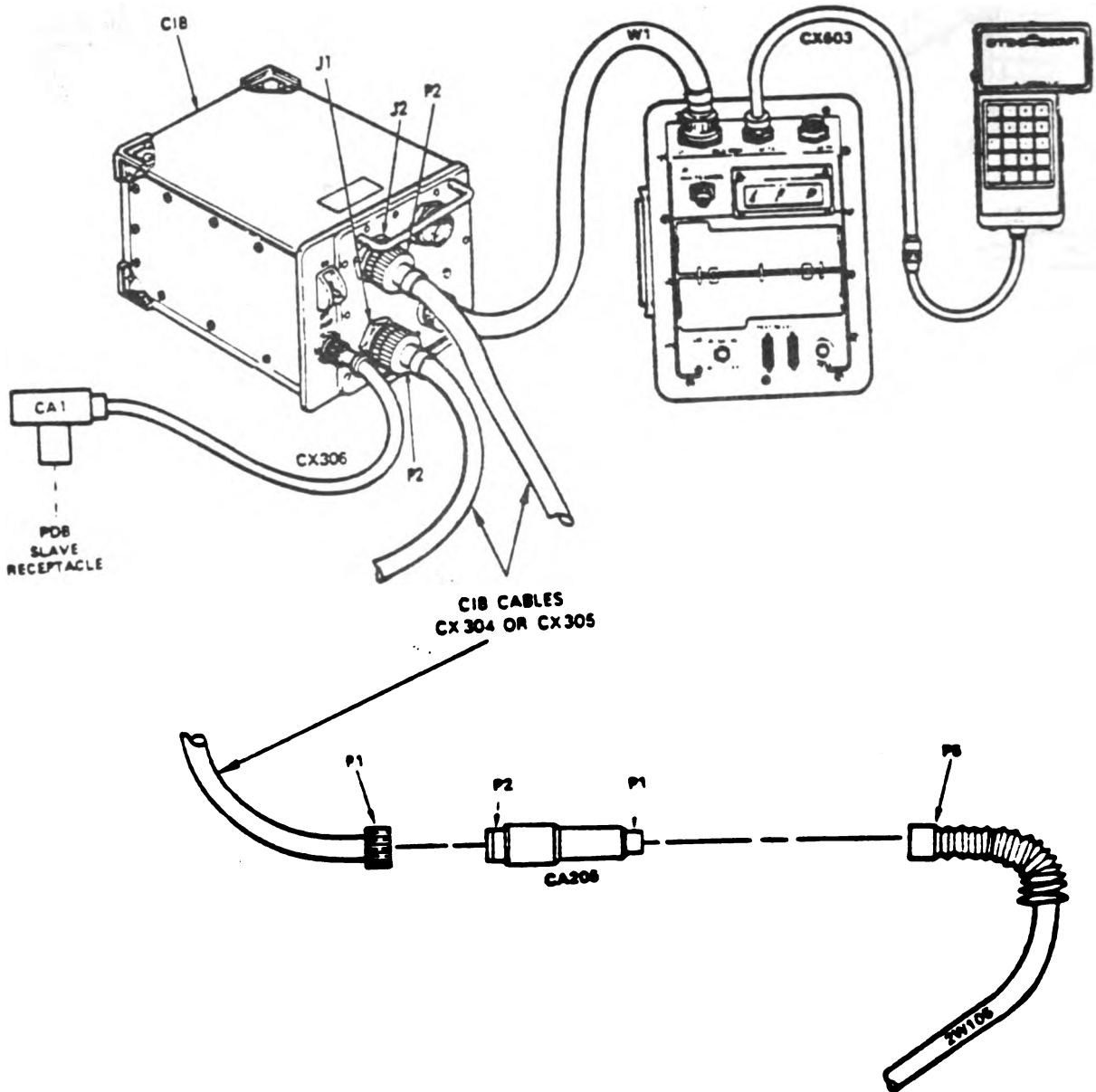
A20120-096R2

Figure 9-24. STE/M1 Hull Cable Hookup to DMP-TJ1  
Volume 41  
Para. 9-2

Change 3 9-161



**TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING**



A20120-072R3

**Figure 9-25. STE/M1 Hull Cable Hookup to 2W105-P5.  
Volume II  
Para. 9-2**

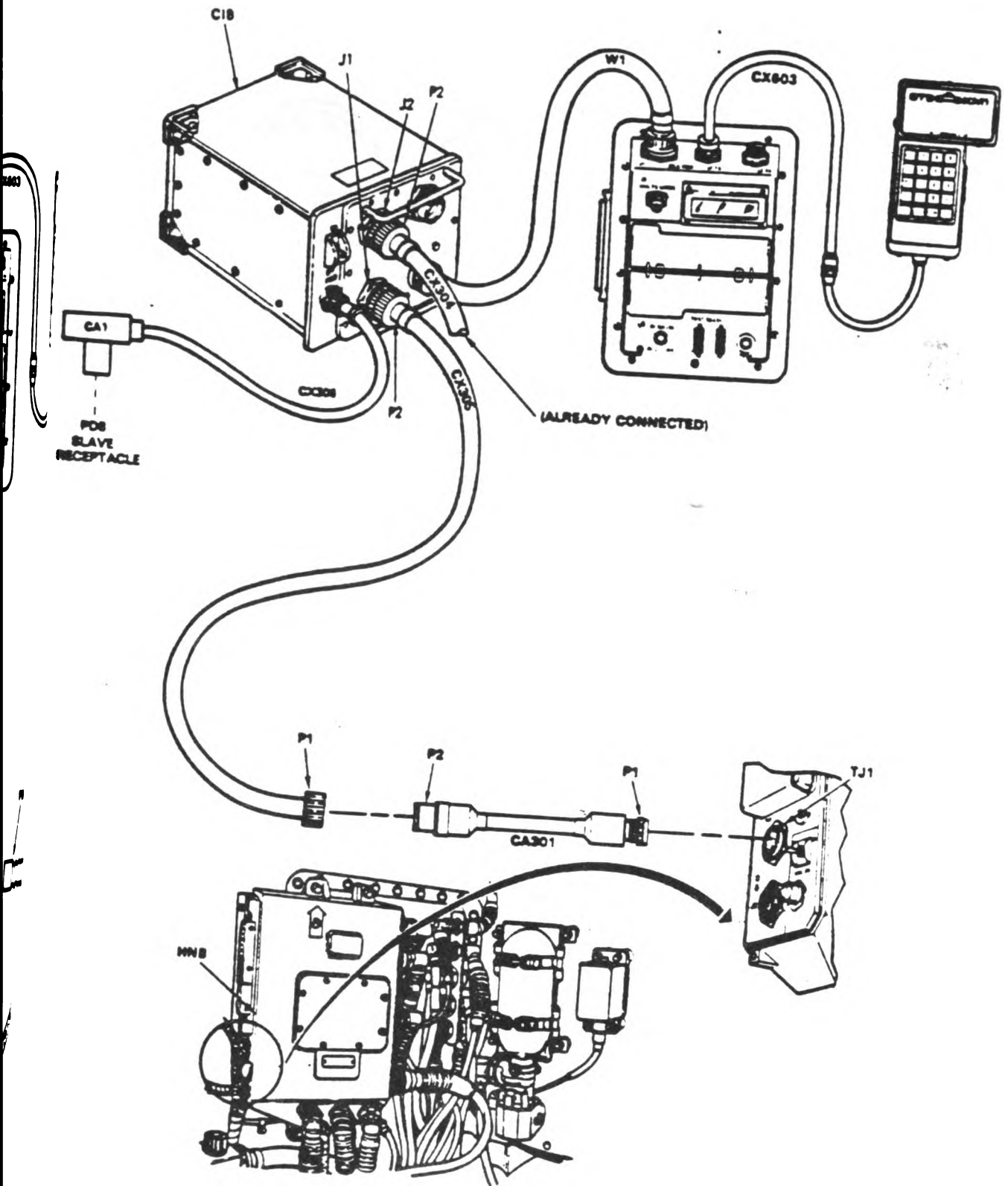
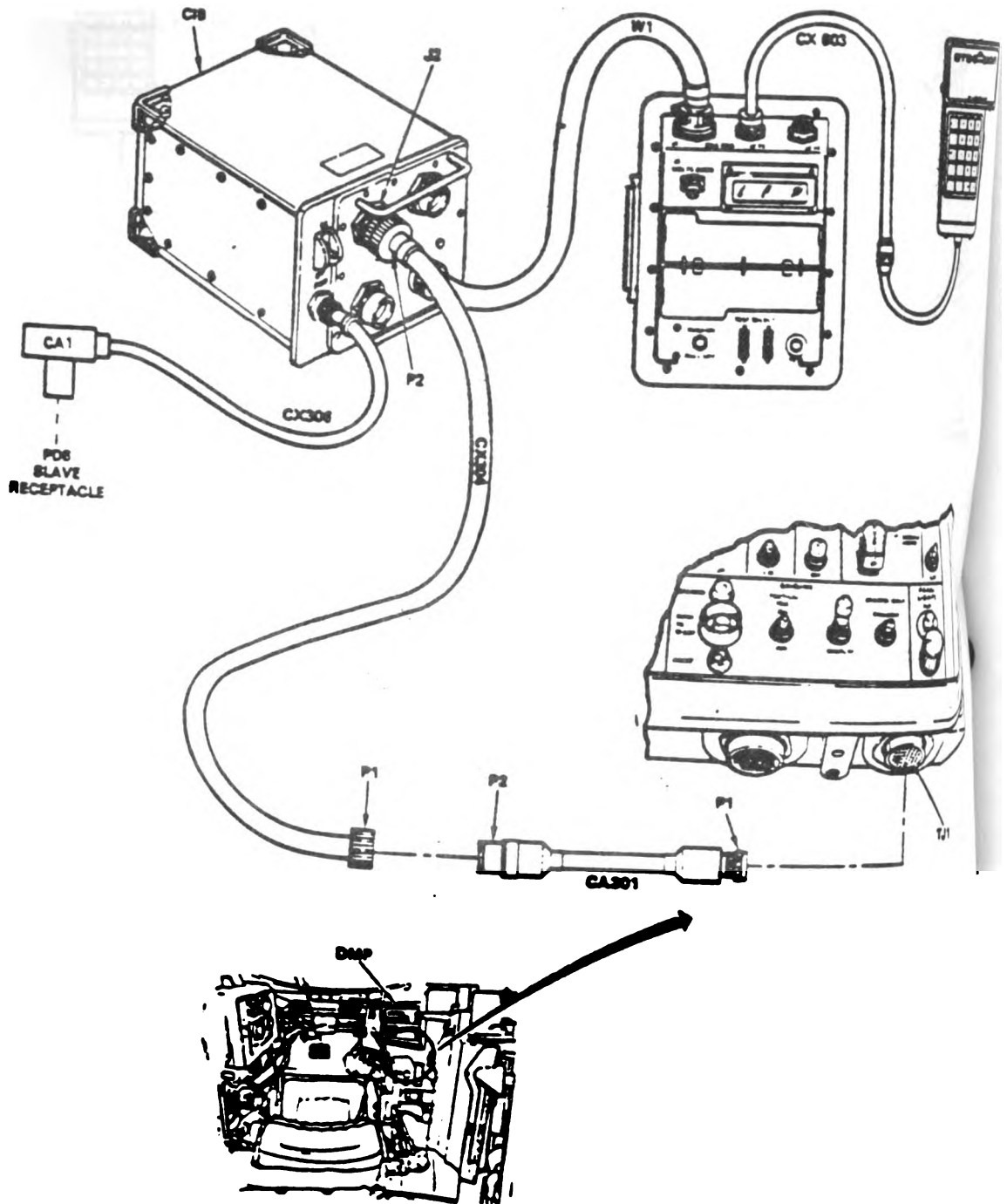


Figure 9-26. STE/M1 Hull Cable Hookup to HNB-TJ1.  
Volume.11  
Para. 9-2

A20120-073R2

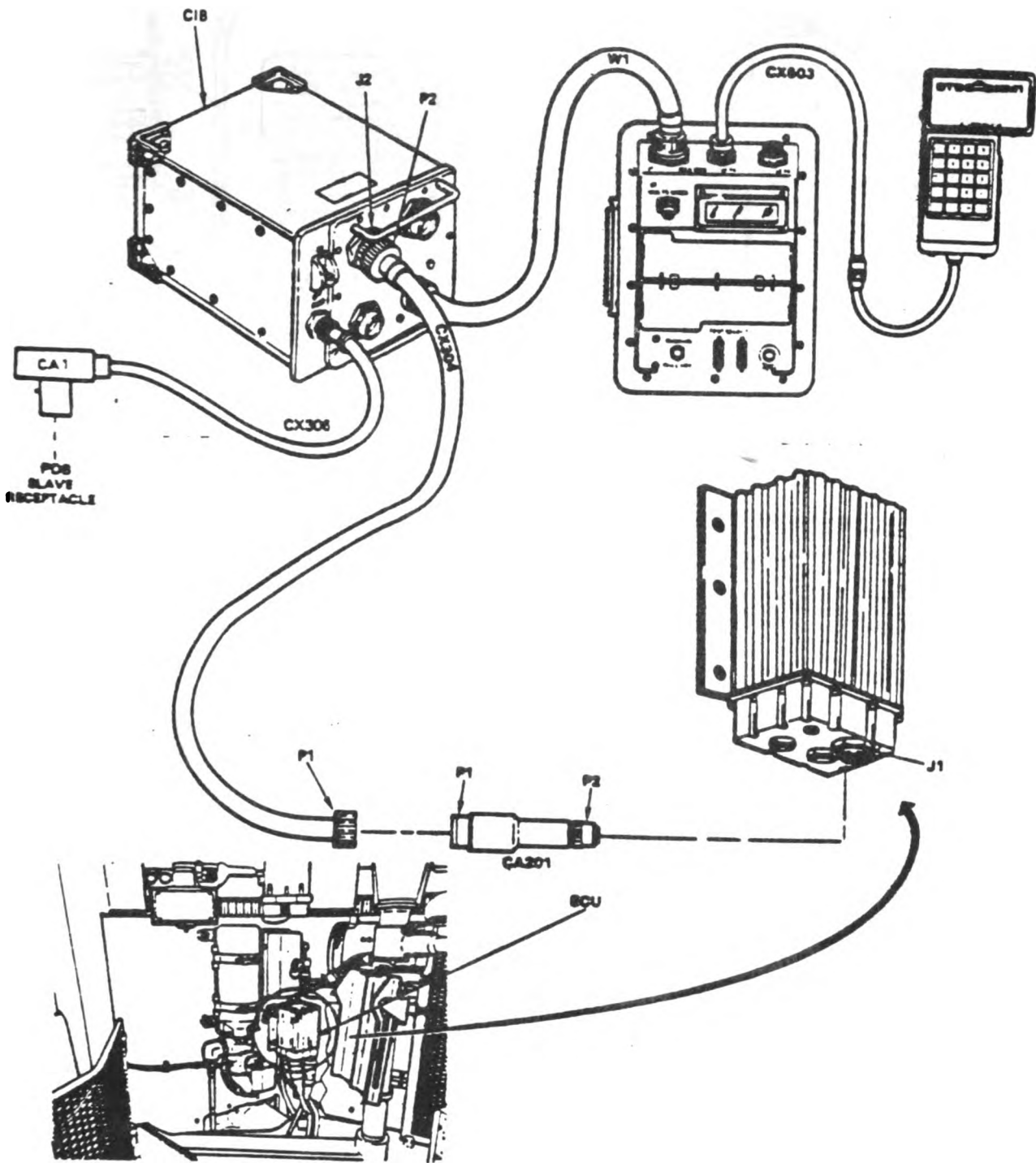
Change 3 9-163



A20126-011R2

Figure 9-27. STE/M1 Hull Cable Hookup to DMP-TJ1.  
 Volume II  
 Para. 9-2

9-164 Change 3

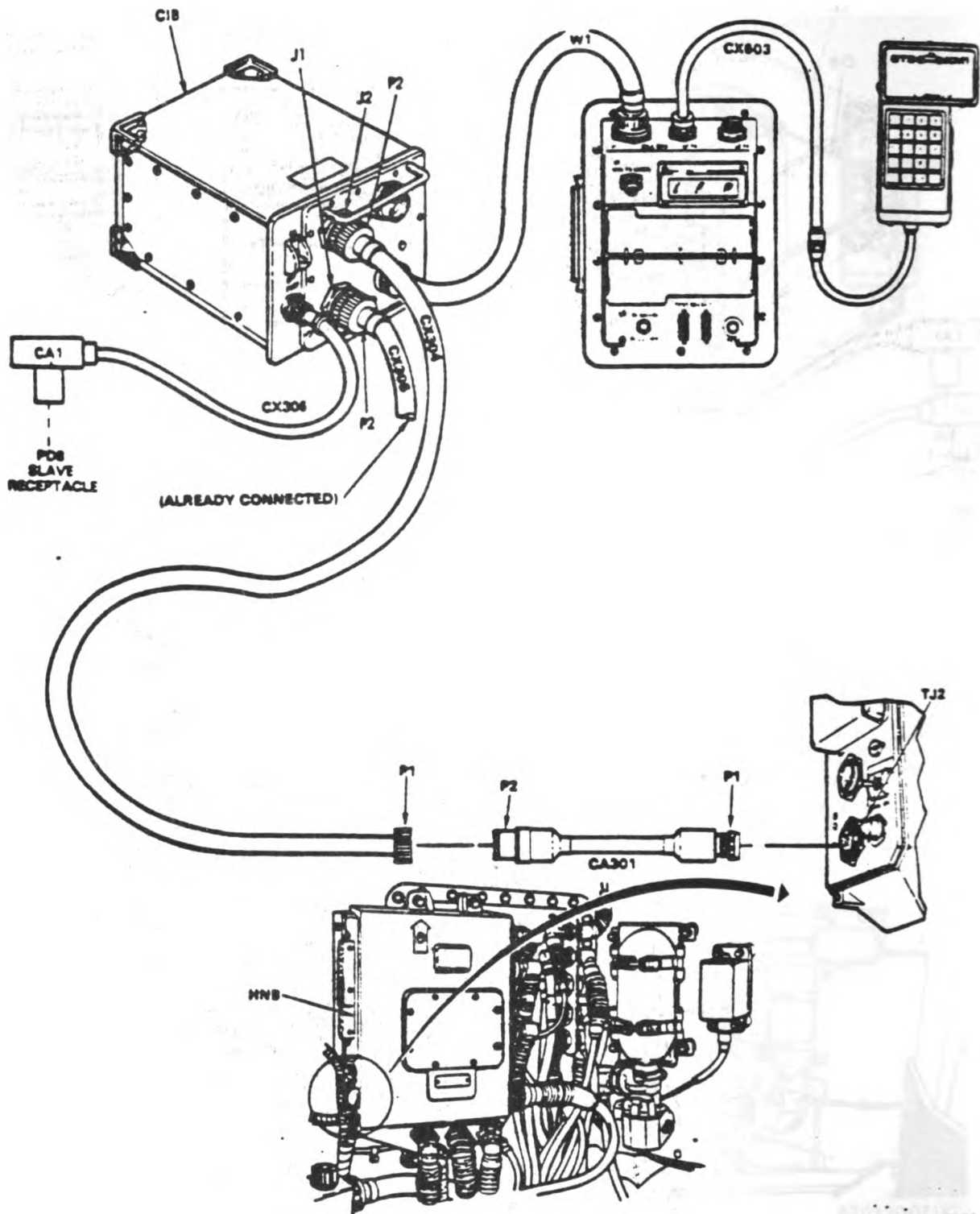


A20120-070R2

Figure 9-28. STE/M1 Hull Cable Hookup to ECU-J1.  
Volume II  
Para. 9-2

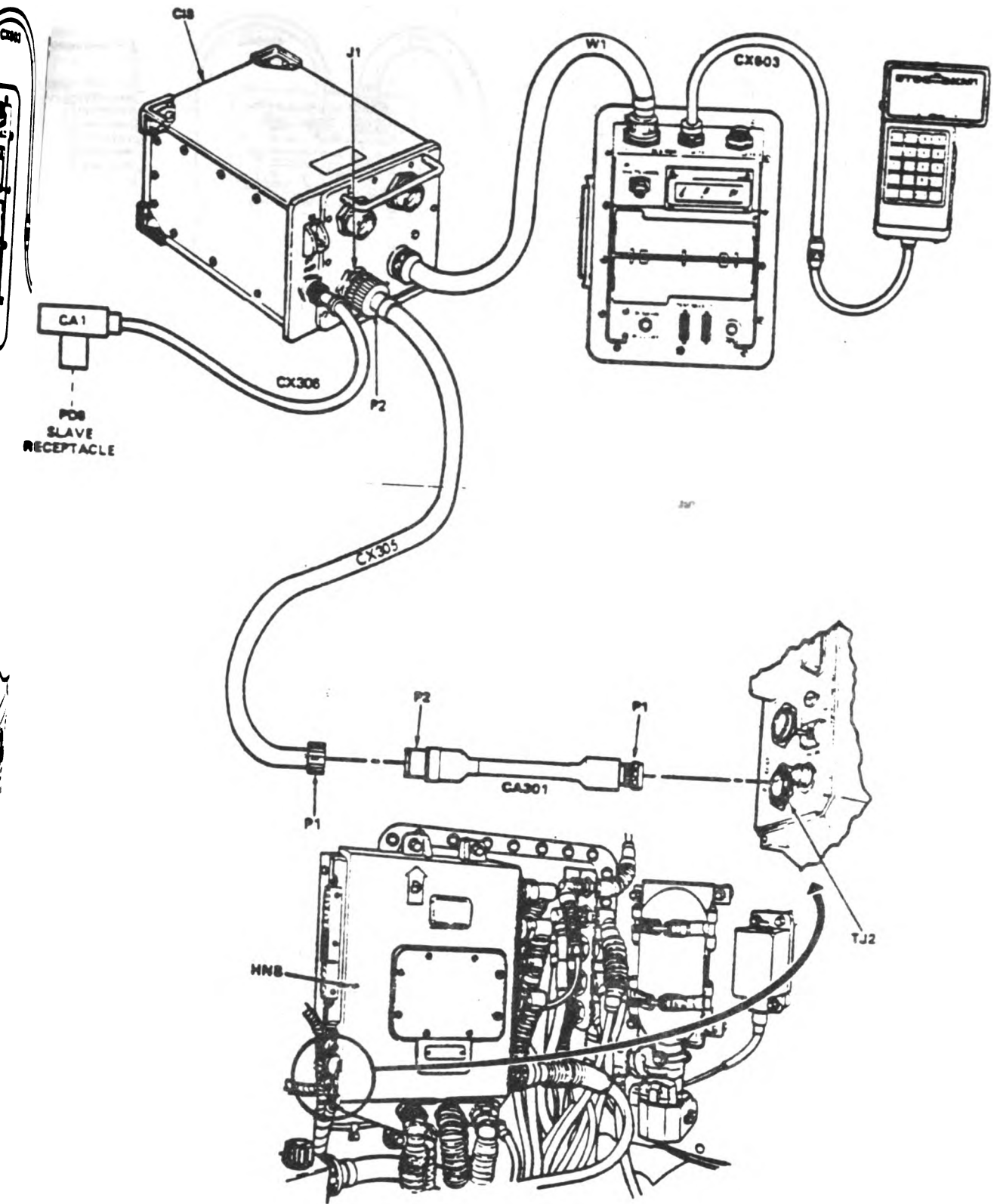
Change 3 9-165

**TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING**



A20120-074R2

**Figure 9-29. STE/M1 Hull Cable Hookup to HNB-TJ2  
Volume II  
Para. 9-2**

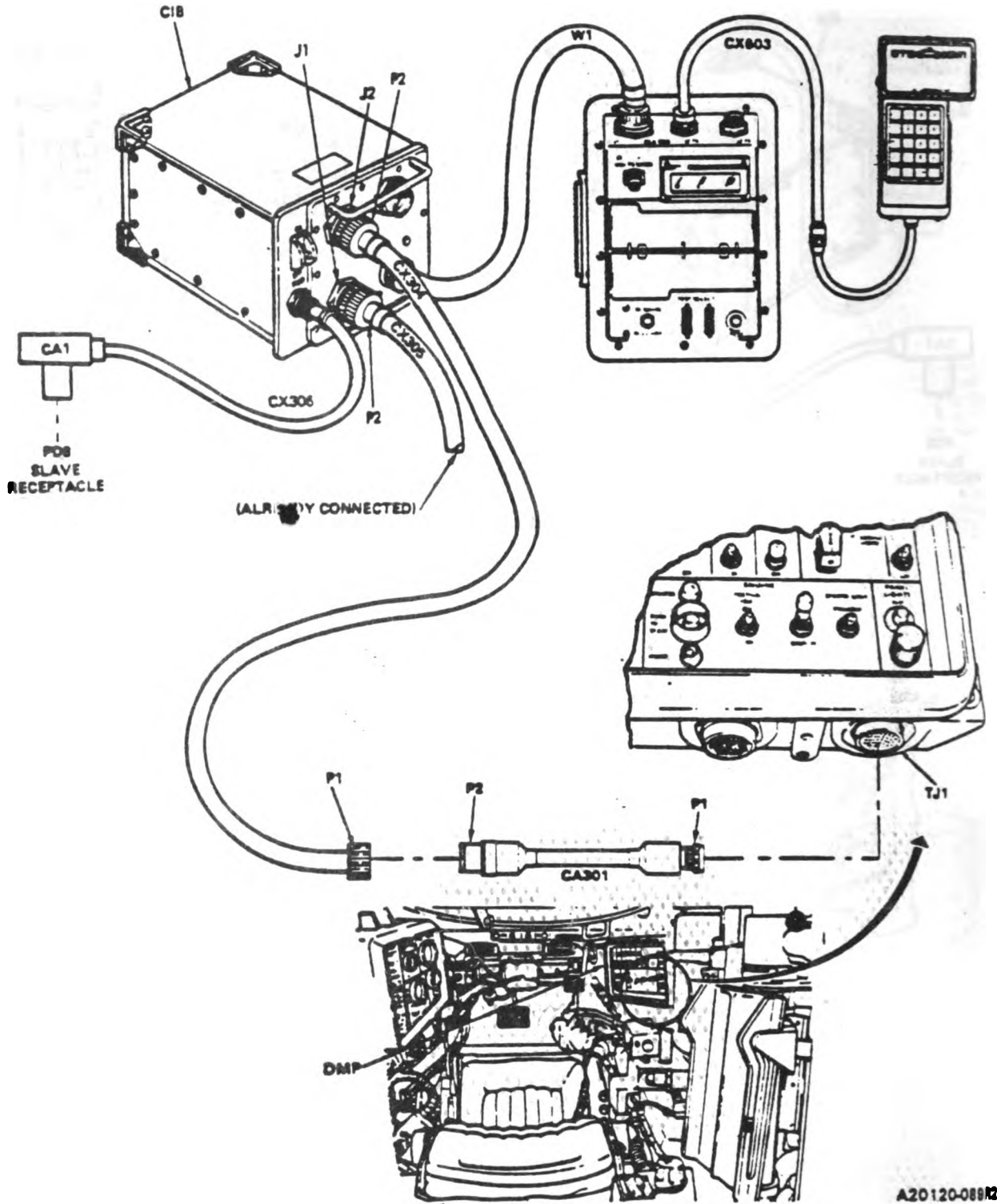


A20120-112R2

Figure 9-30. STE/M1 Hull Cable Hookup to HNB-TJ2  
Volume II  
Para. 9-2

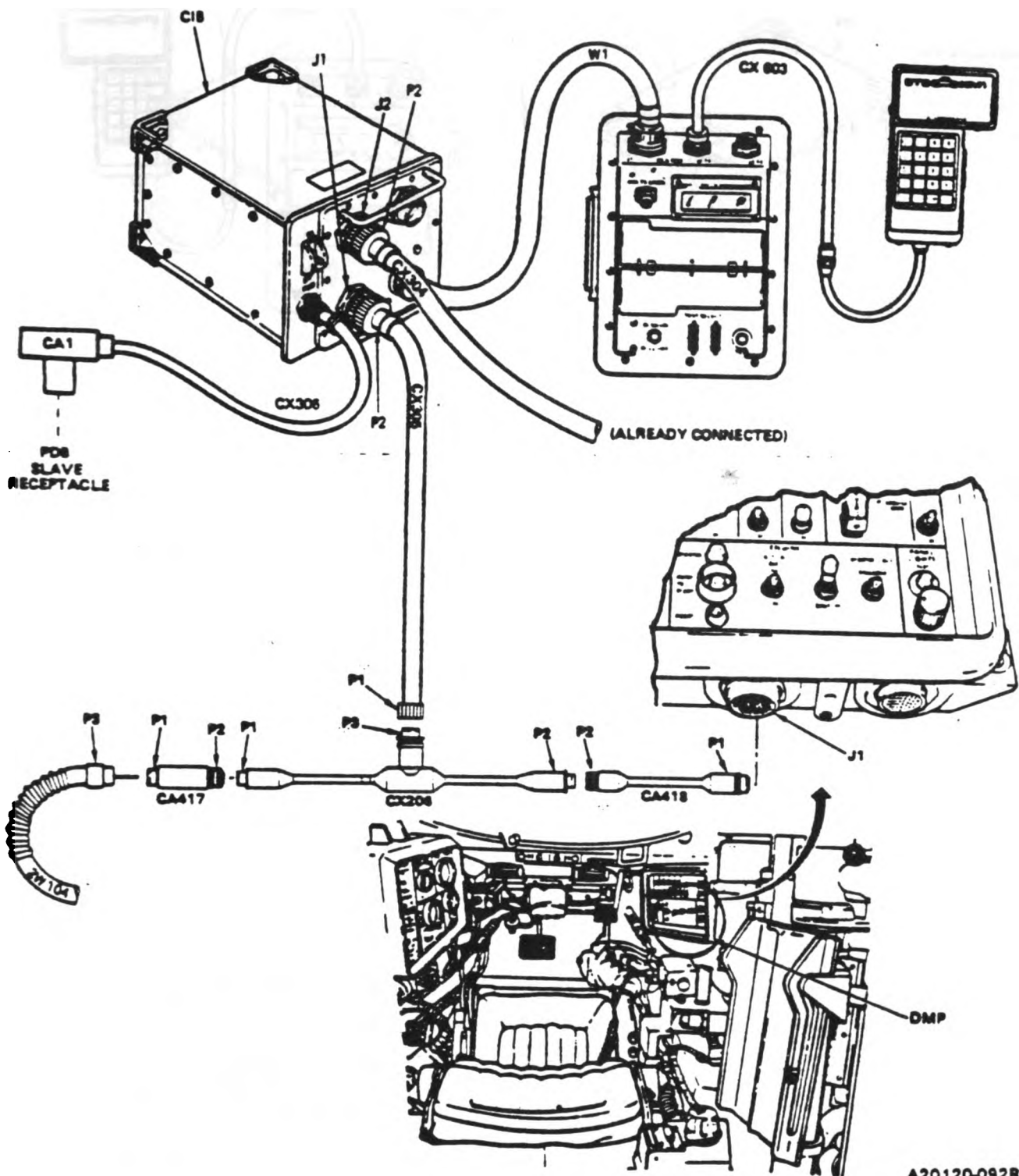
Change 3 9-167

**TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING**



A20120-089R2

**Figure 9-31. STE/M1 Hull Cable Hookup to DMP-TJ1.  
Volume II  
Para. 9-2**



A20120-092R2

Figure 9-32 STE/M1 Hull Cable Hookup Between DMP-J1 and 2W104-P3  
Volume II  
Para. 9-2

Change 3 9-169



TM 9-2350-255-20-1-2-1  
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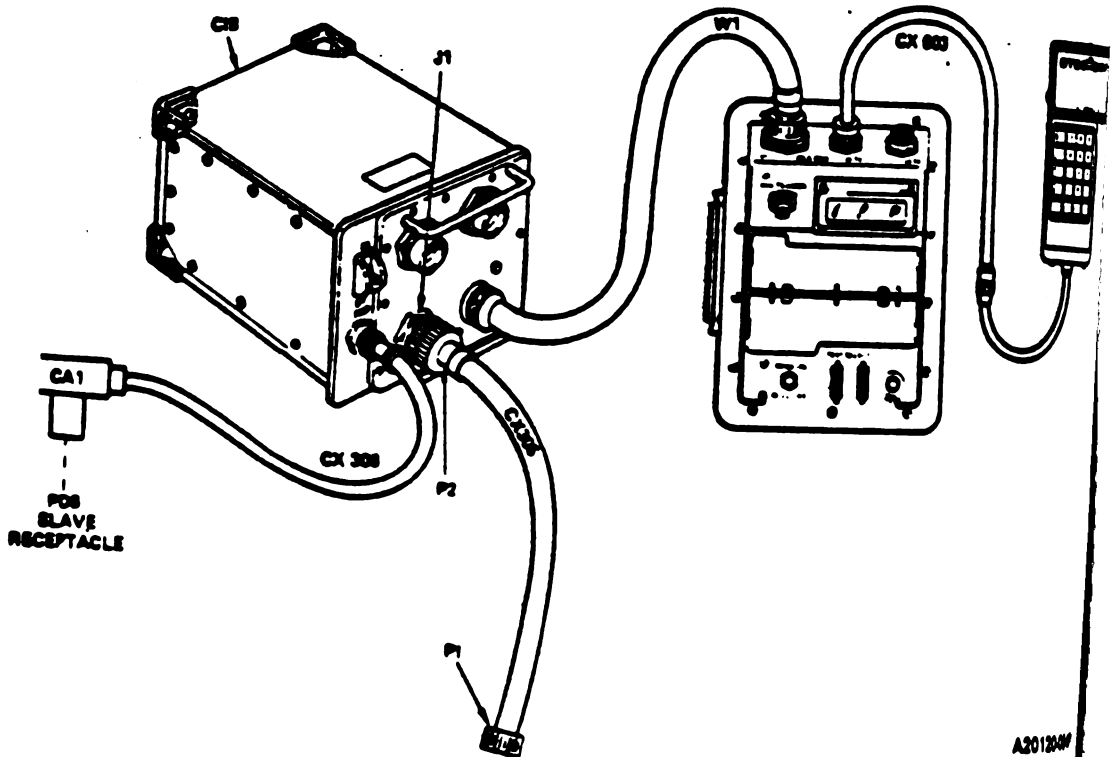


Figure 9-33. STE/M1 Hull Cable Hookup to CIB-J1.

A201204W

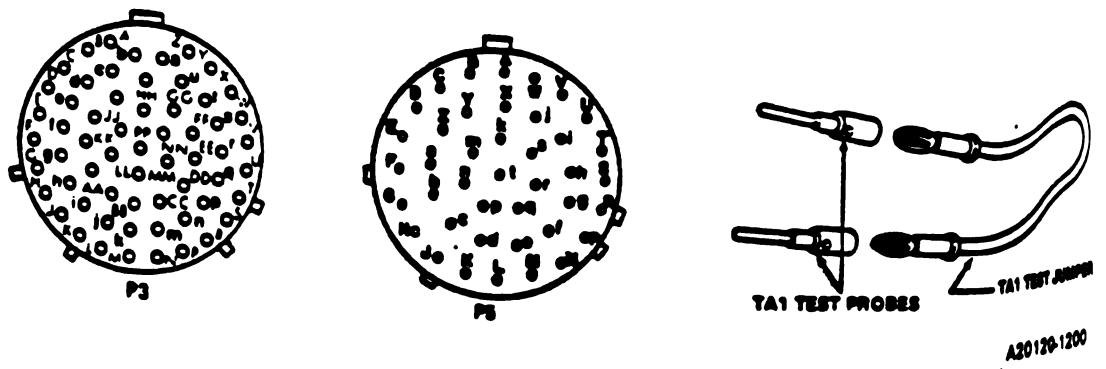
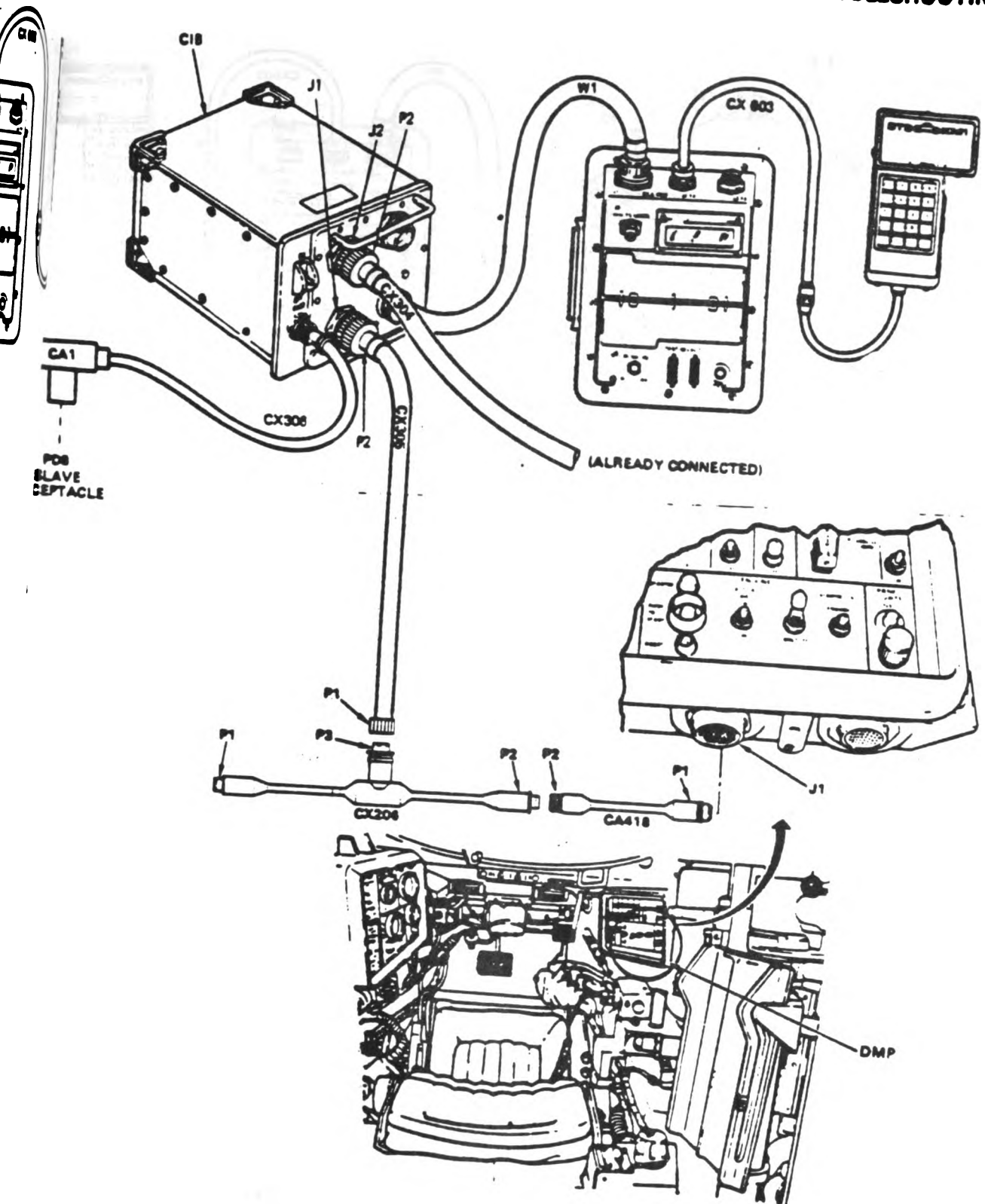


Figure 9-34. STE/M1 Connector Diagram for Connector 2W104-P3 and 2W105-P3.  
Volume II  
Para. 9-2

A20120-1200

9-170 Change 3

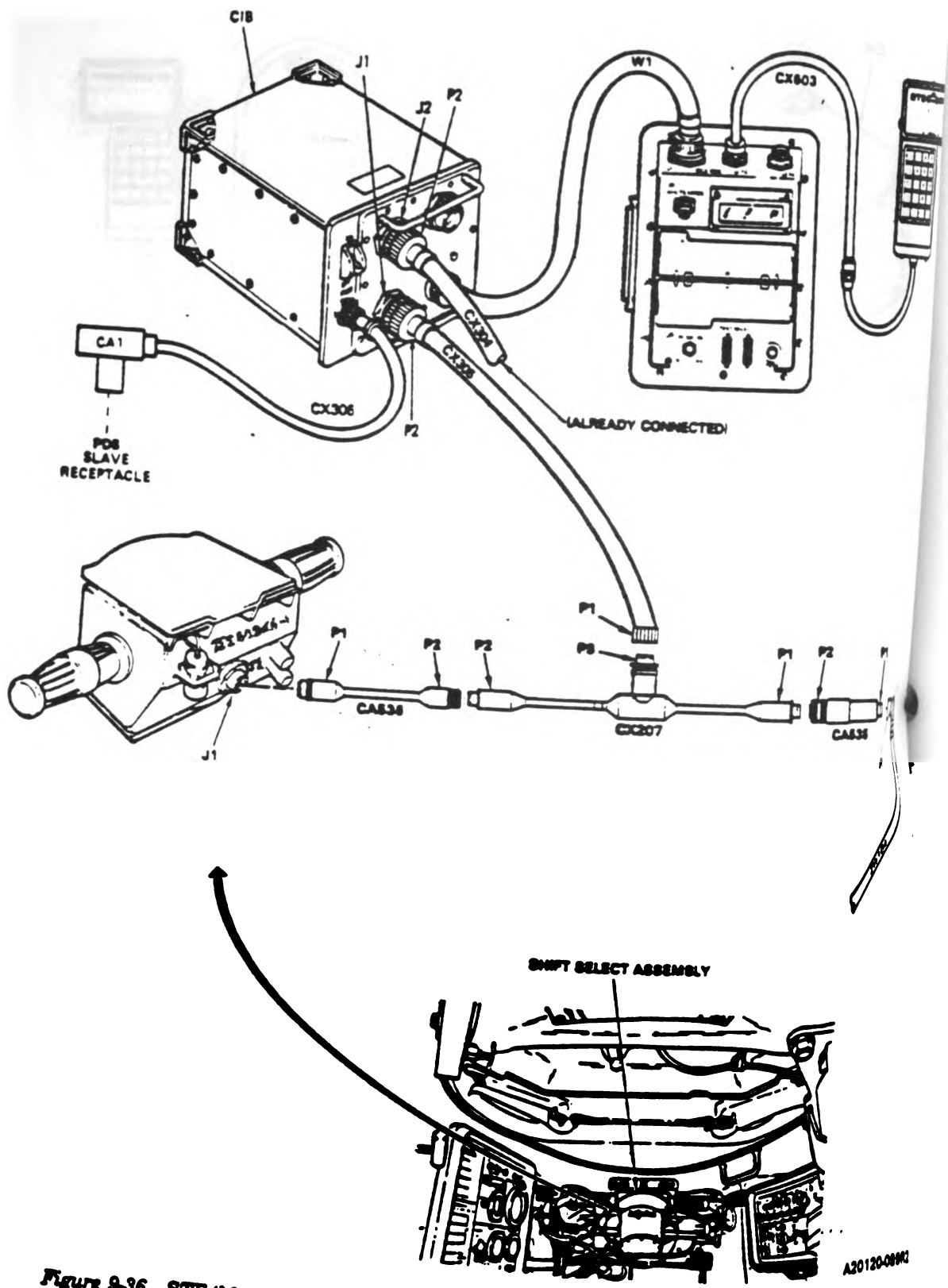


A20120-082R2

Figure 9-35. STE/M1 Hull Cable Hookup to DMP-J1.  
Volume J1  
Para. 9-2

Change 3 9-171

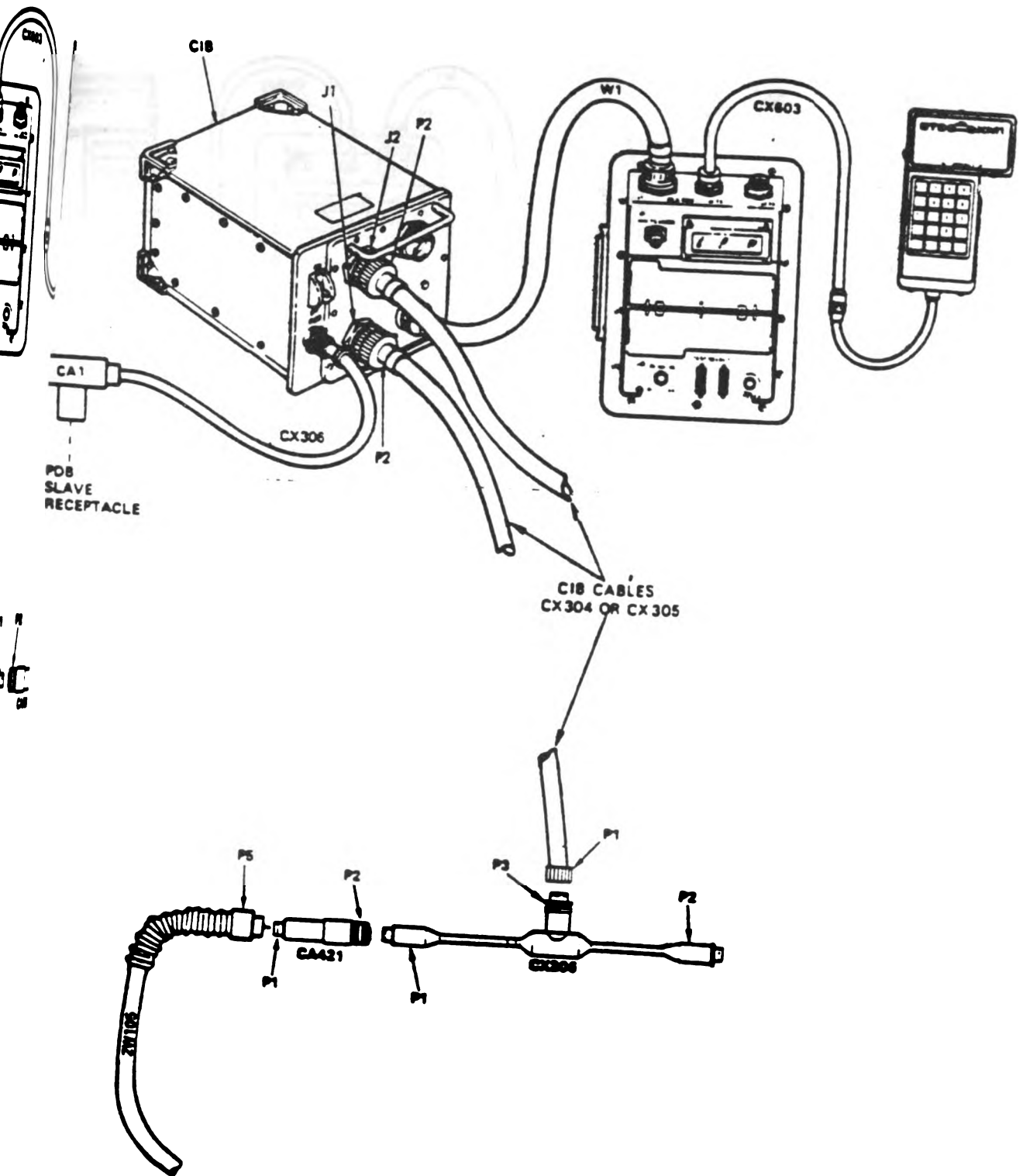
**TM 9-2350-255-20-1-2.1  
ENGINE SYSTEM TROUBLESHOOTING**



**Figure 9-36. STE/M1 Hull Cable Hookup Between J1 on Shift Select Assembly and 2W104-P1.**  
**Volume II**  
**Para. 9-2**

**9-172 Change 3**

A20120-0990



A20120-532A3

Figure 9-37. STE/M1 Hull Cable Hookup to 2W105-P5.  
Volume II  
Para. 9-2

Change 6 9-173

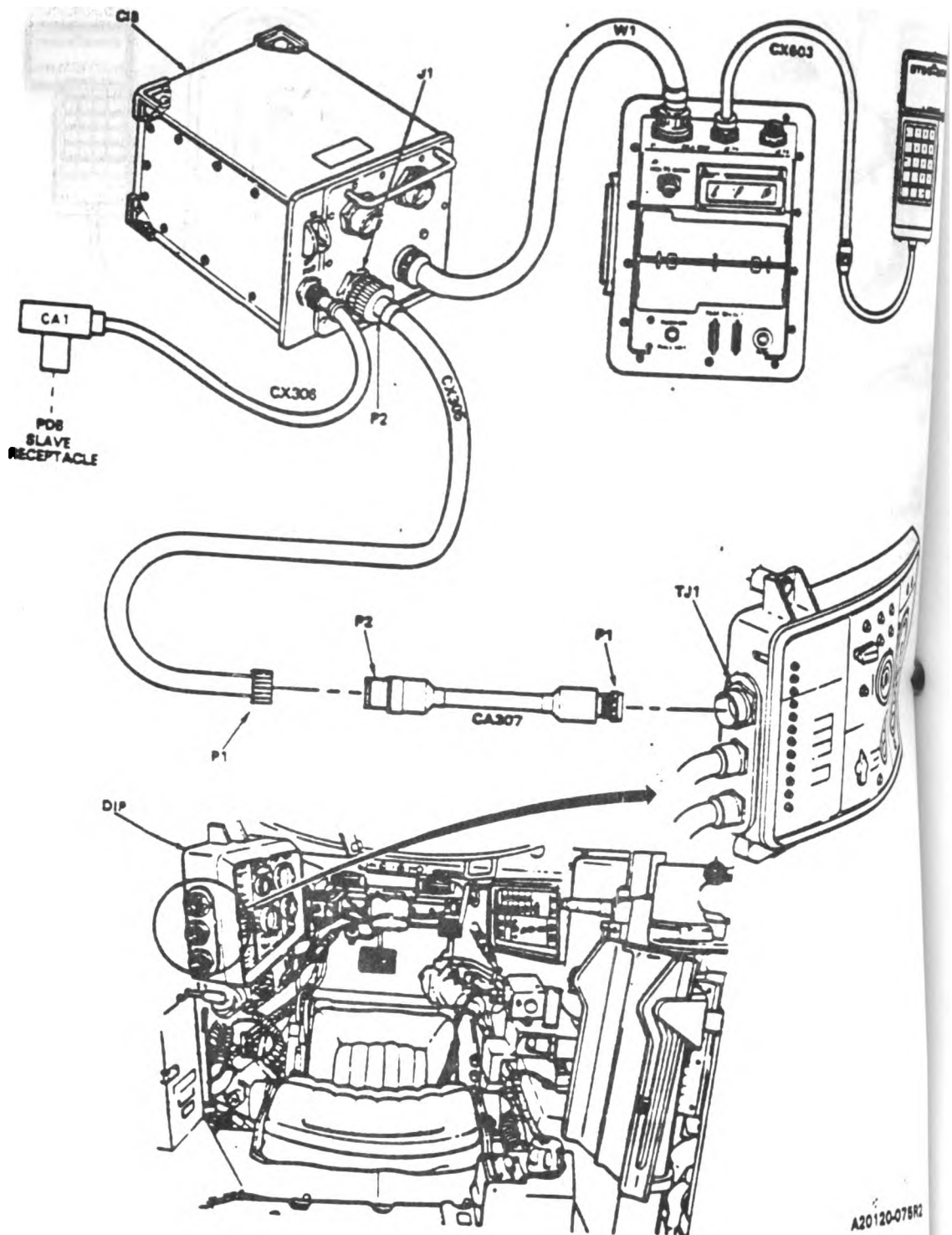
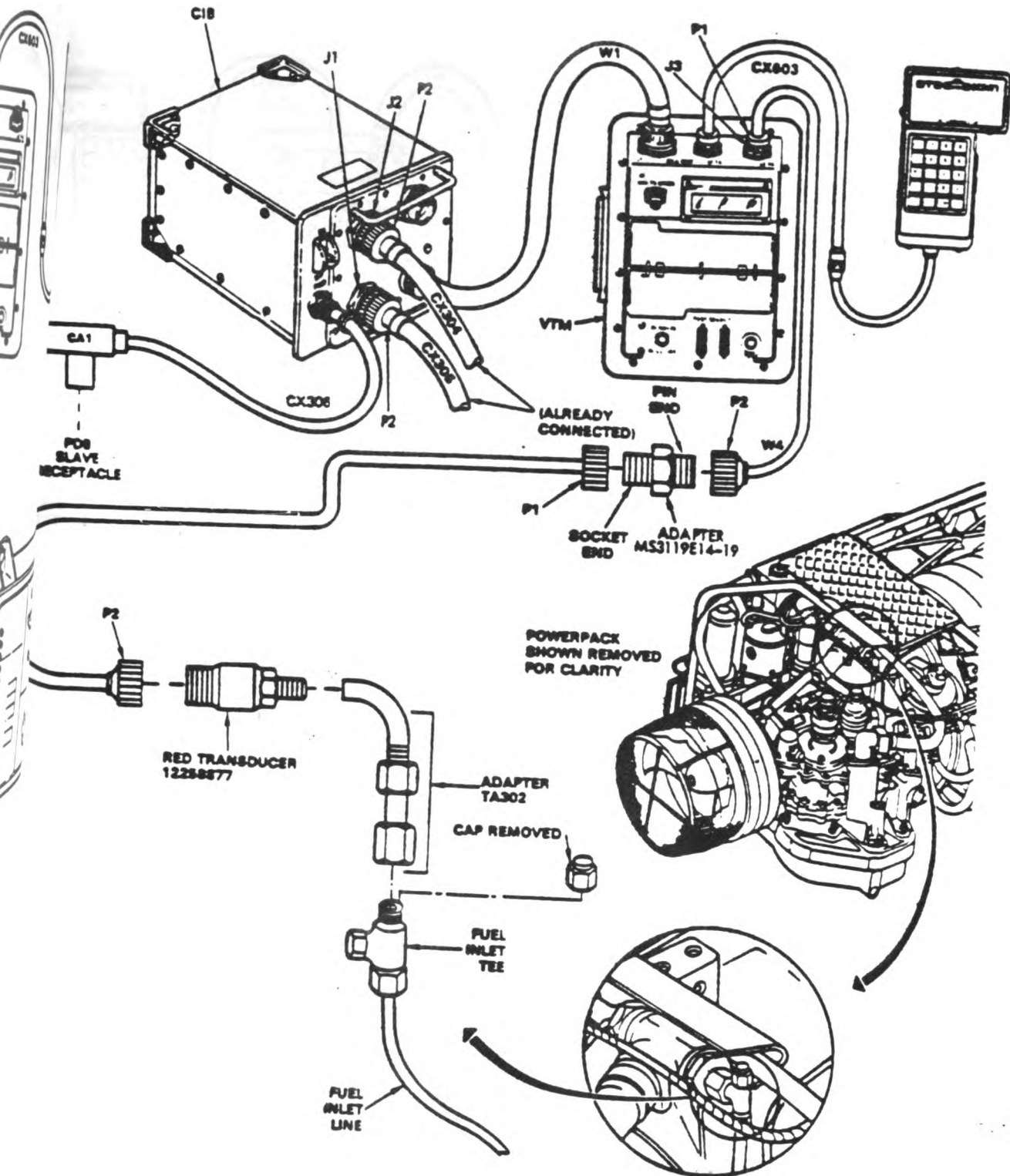


Figure 9-38. STE/M1 Hull Cable Hookup to DIP-TJ1.  
Volume II  
Para. 9-2

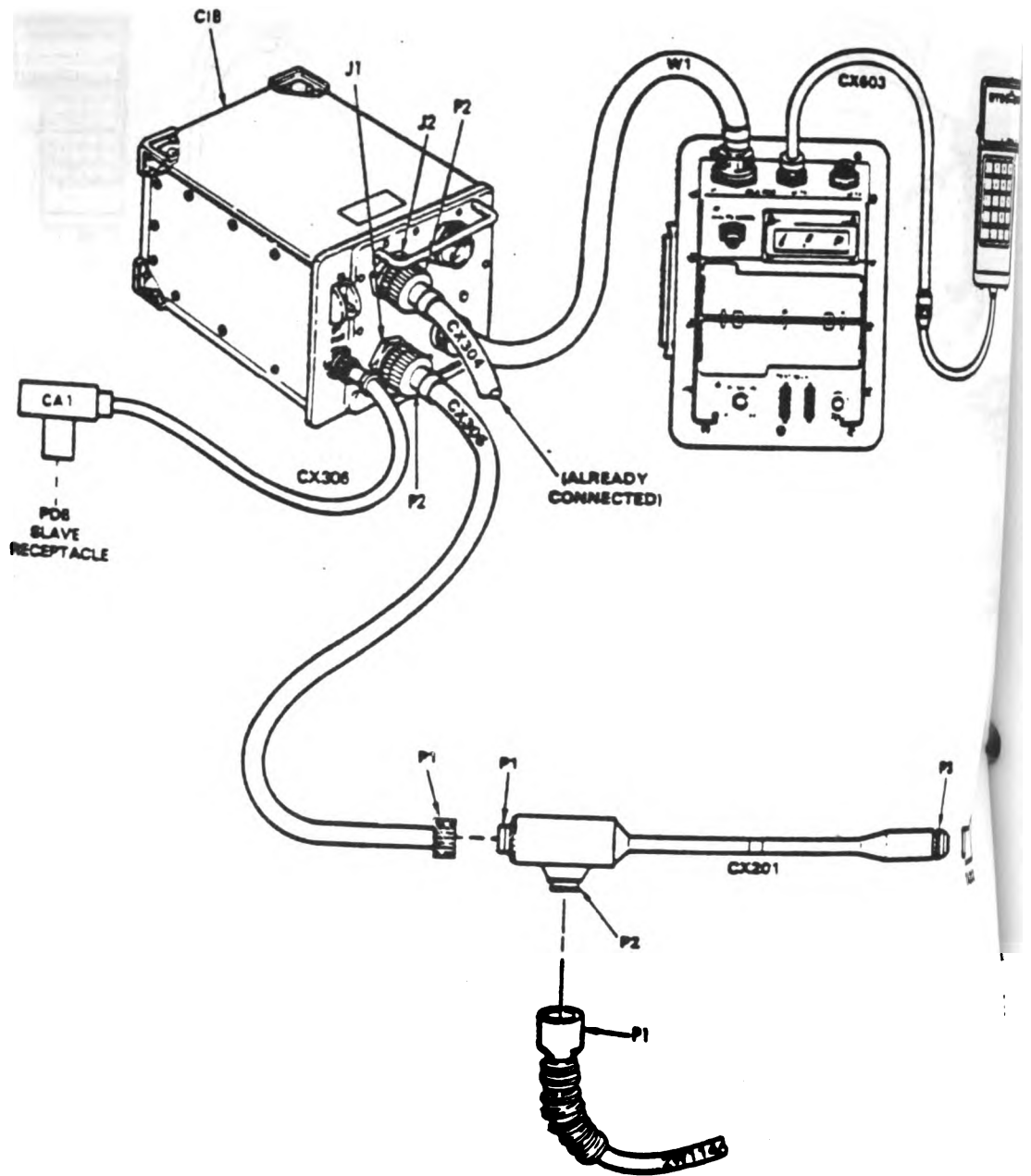
9-174 Change 3

A20120-075R2



A20120-077R2

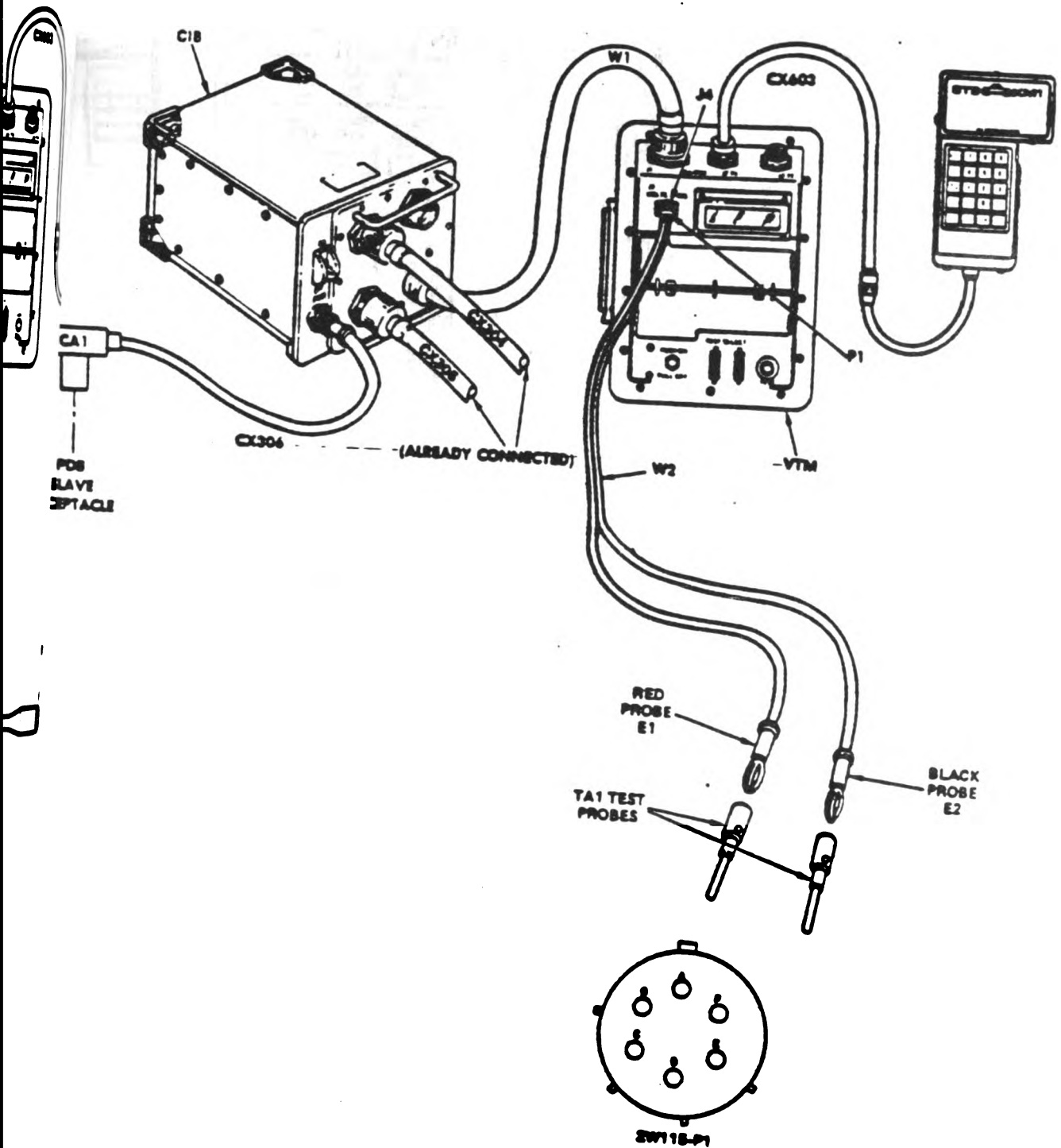
Figure 9-39. STE/M1 Hull Cable Hookup to Electromechanical Assembly Fuel Inlet.  
Volume 11  
Para. 9-2



A20120-079C

Figure 9-40. STE/M1 Hull Cable Hookup to 2W114-P1.  
Volume II  
Para. 9-2

9-176 Change 3



A20120-085R2

Figure 9-41. STE/M1 Hull Cable Hookup to 2W115-P1.  
Volume 11  
Para: 9-2

Change 3 9-177



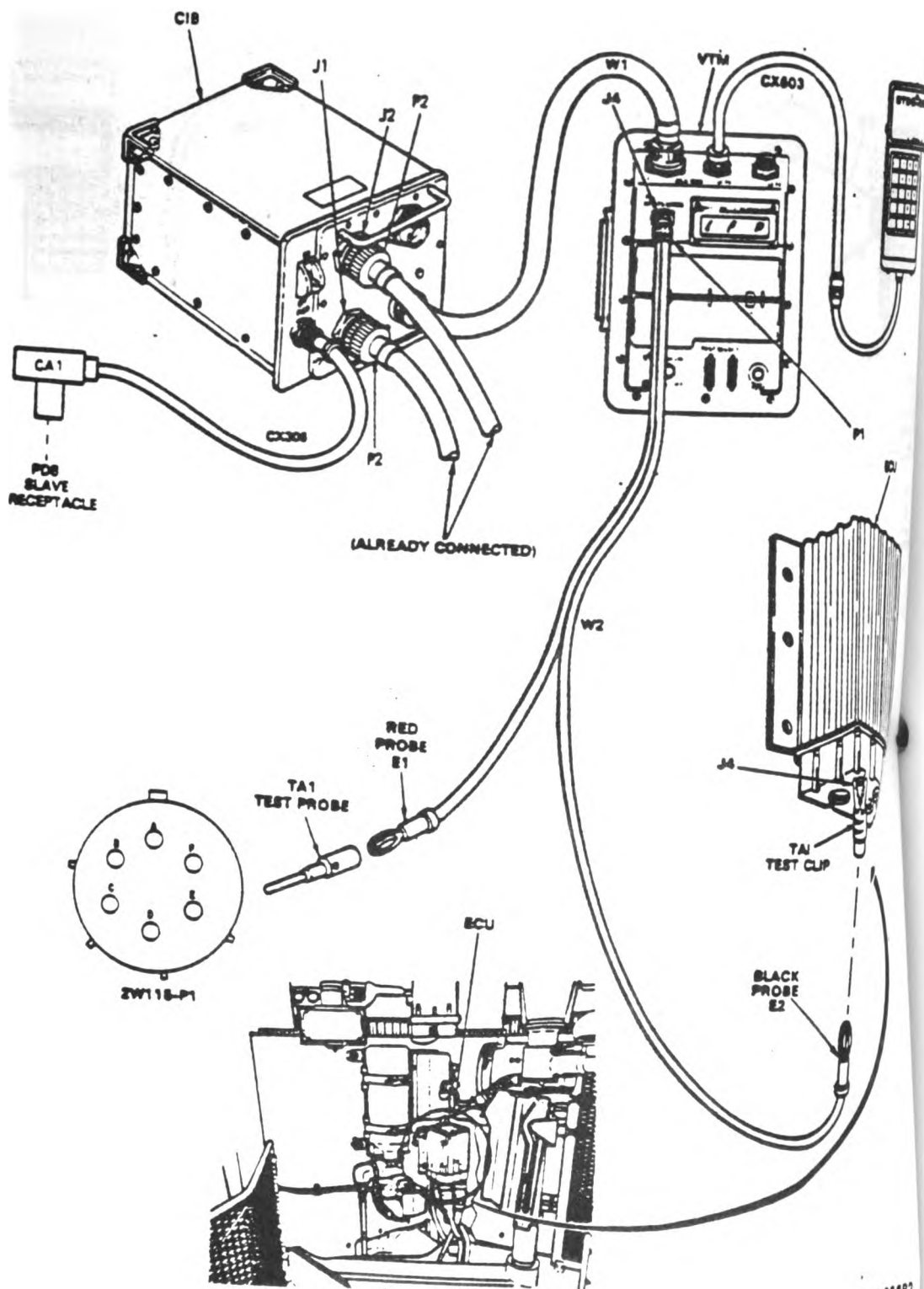
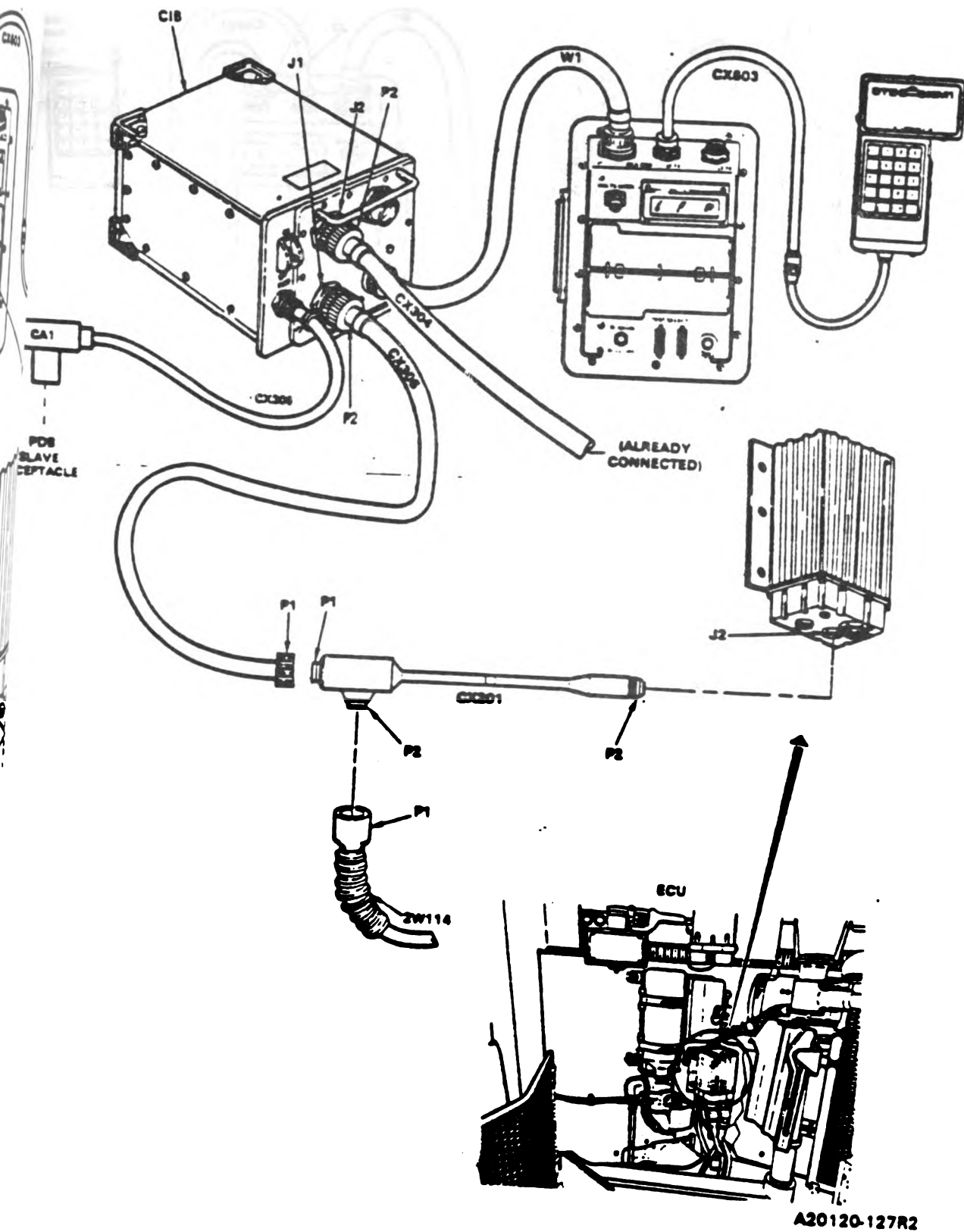


Figure 9-42. STE/M1 Hull Cable Hookup Between ECU-J4 and 2W115-P1.  
 Volume II  
 Para. 9-2

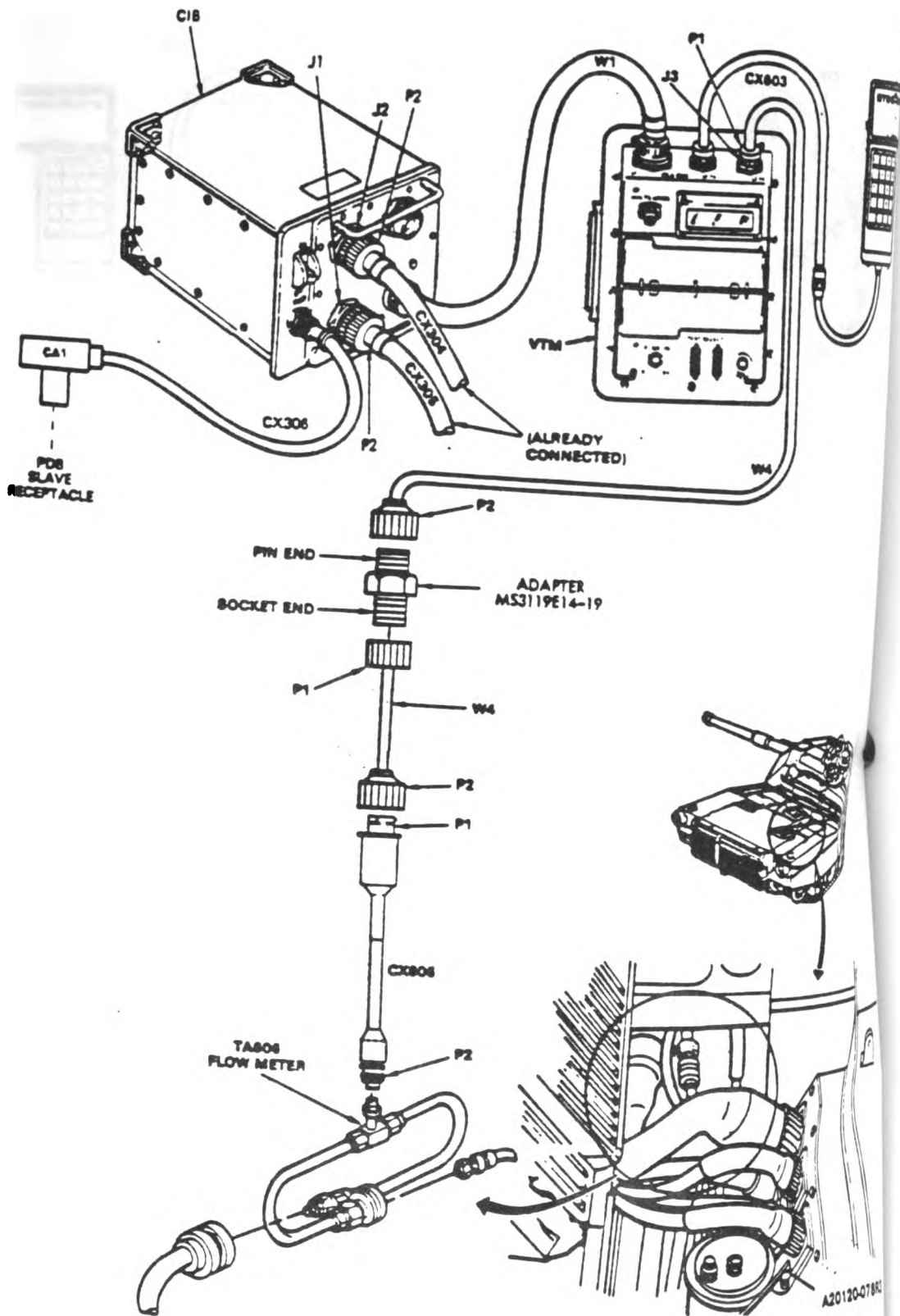
9-178 Change 3



A20120-127R2

Figure 9-43. STE/M1 Hull Cable Hookup Between ECU-J2 and 2W114-P1.  
Volume 41  
Para. 9-2

**TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING**



**Figure 9-44. STE/M1 Hull Cable Hookup - Flowmeter to Fuel Line  
Volume II  
Para. 9-2**

**9-180 Change 3**

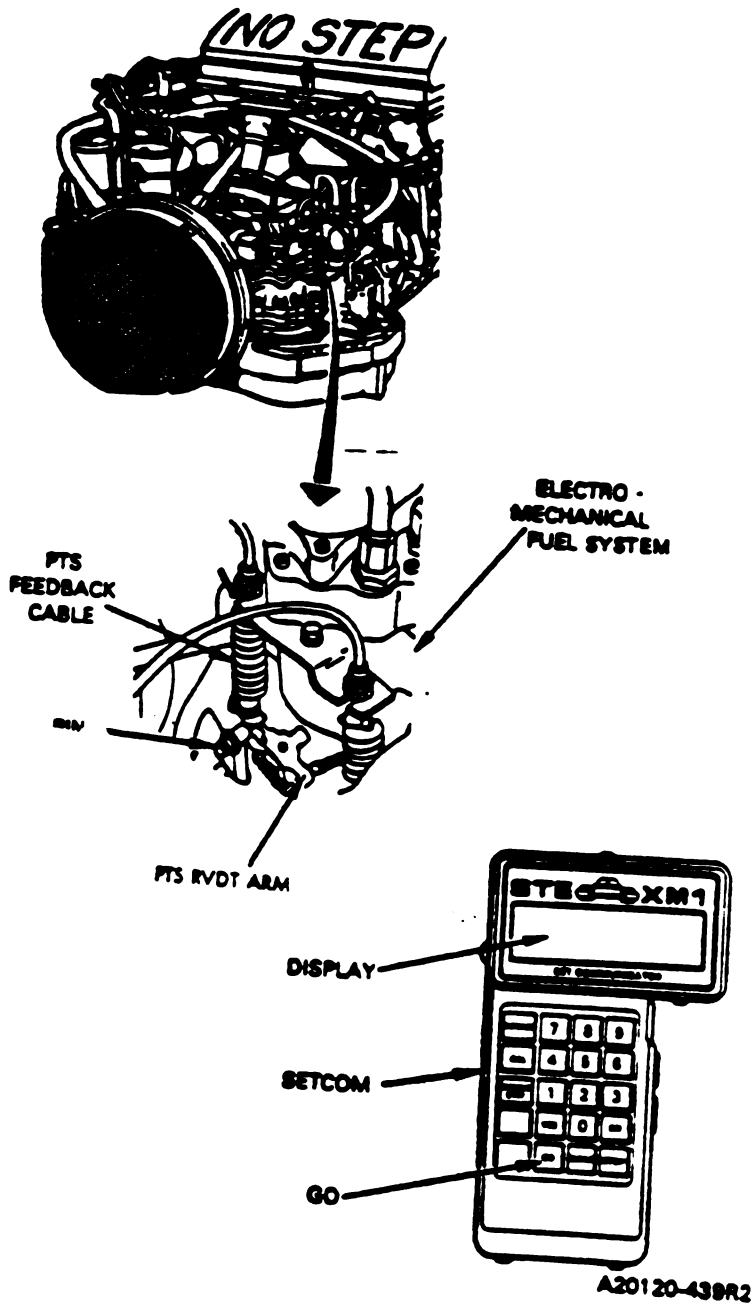
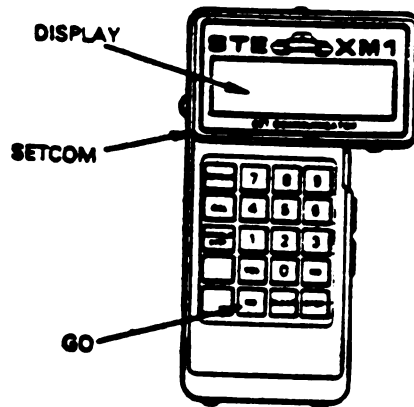
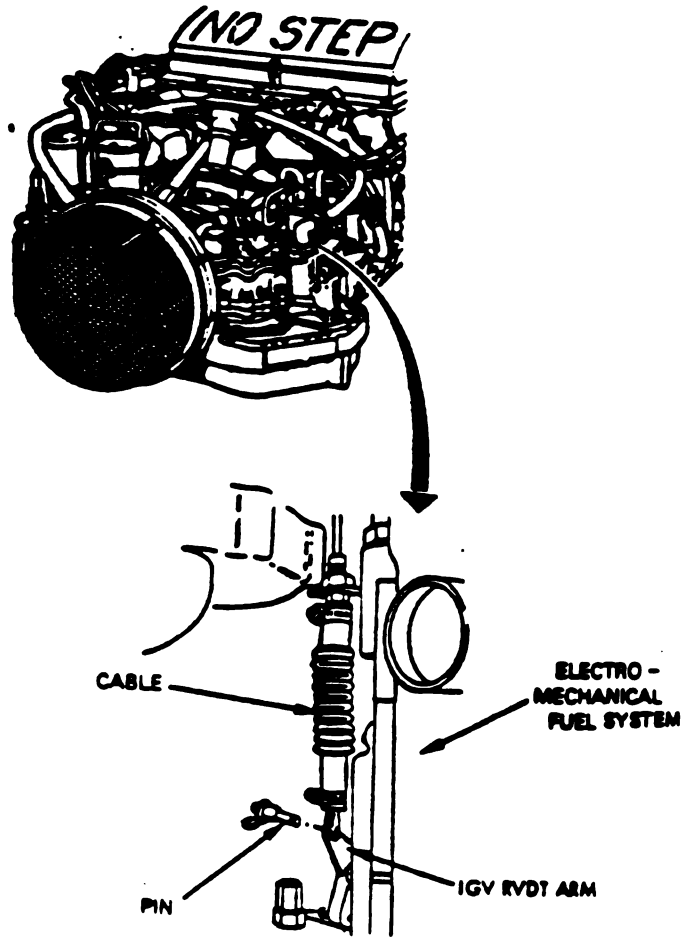


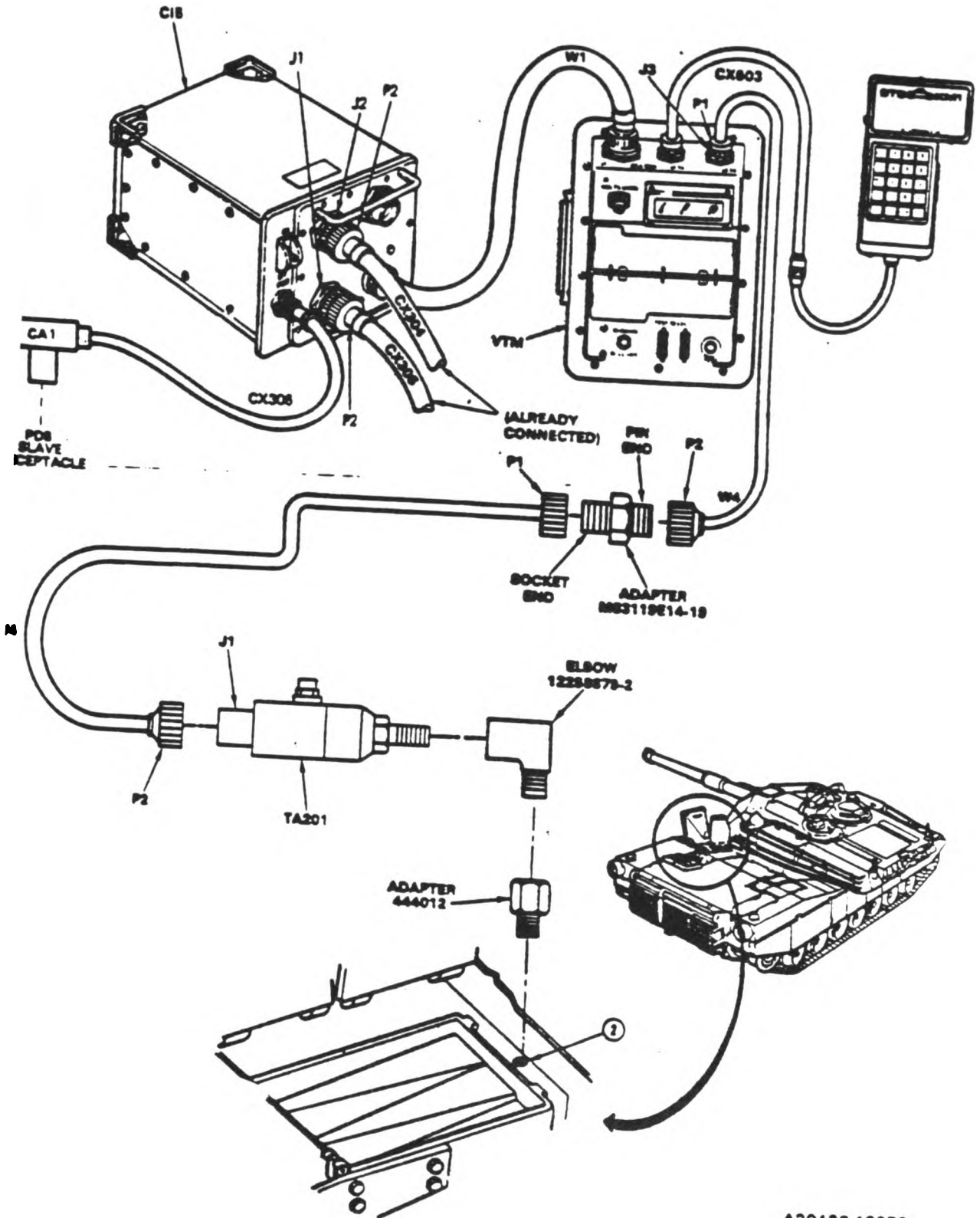
Figure 9-45. Power Turbine Stator Electrical Check.  
Volume 11  
Para. 9-2



A20120-438R2

Figure 9-46. Inlet Guide Vane Electrical Check.  
Volume II  
Para. 9-2

9-182 Change 3

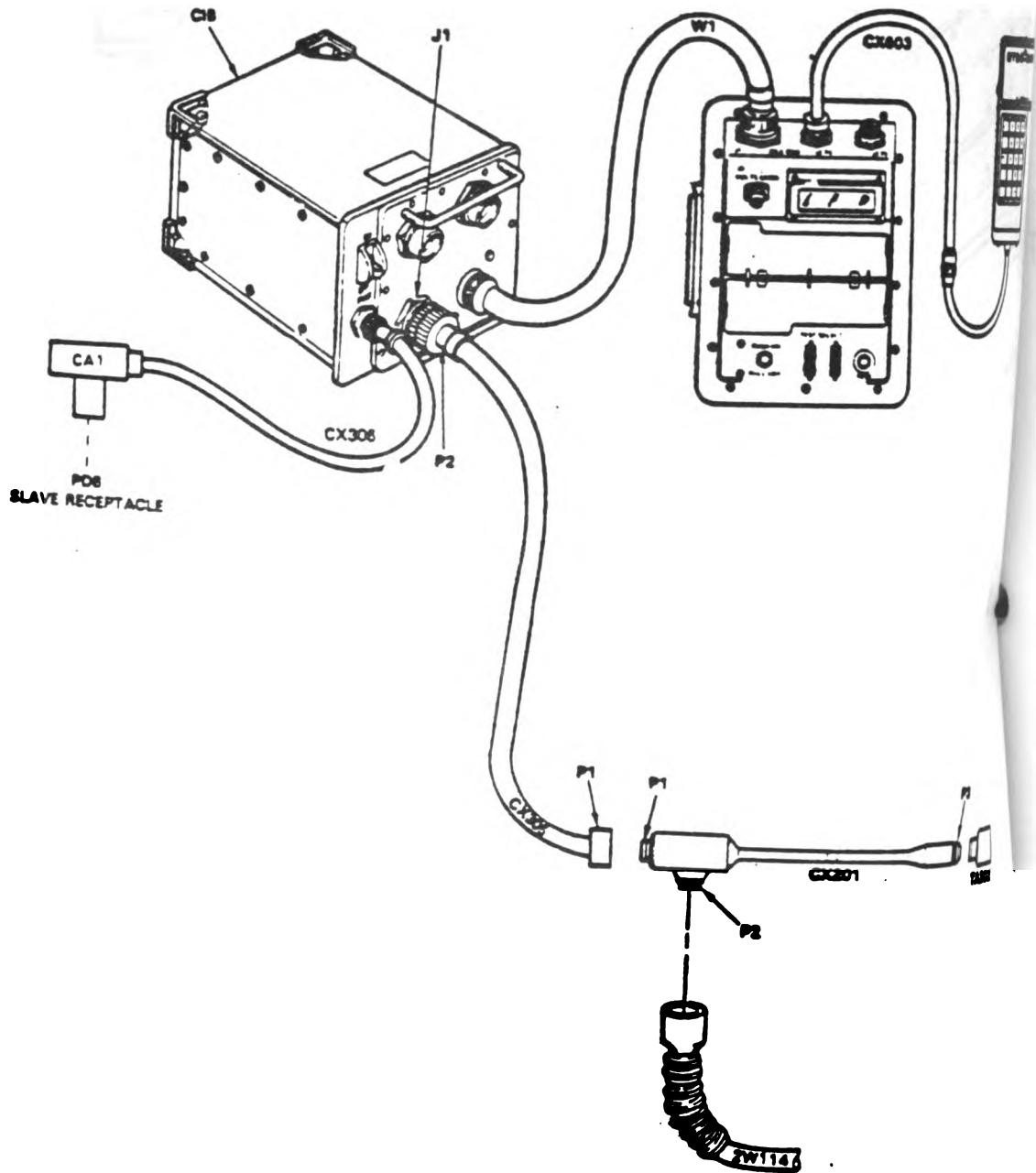


A20120-126R2

Figure 9-47. STE/M1 Hull Cable Hookup to TA201 Transducer.  
Volume 41  
Para. 9-2

Change 3 9-153

TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING



A20120-10002

Figure 9-48. STE/M1 Hull Cable Hookup to 2W114-P1.  
Volume II  
Para. 9-2

9-184 Change 3

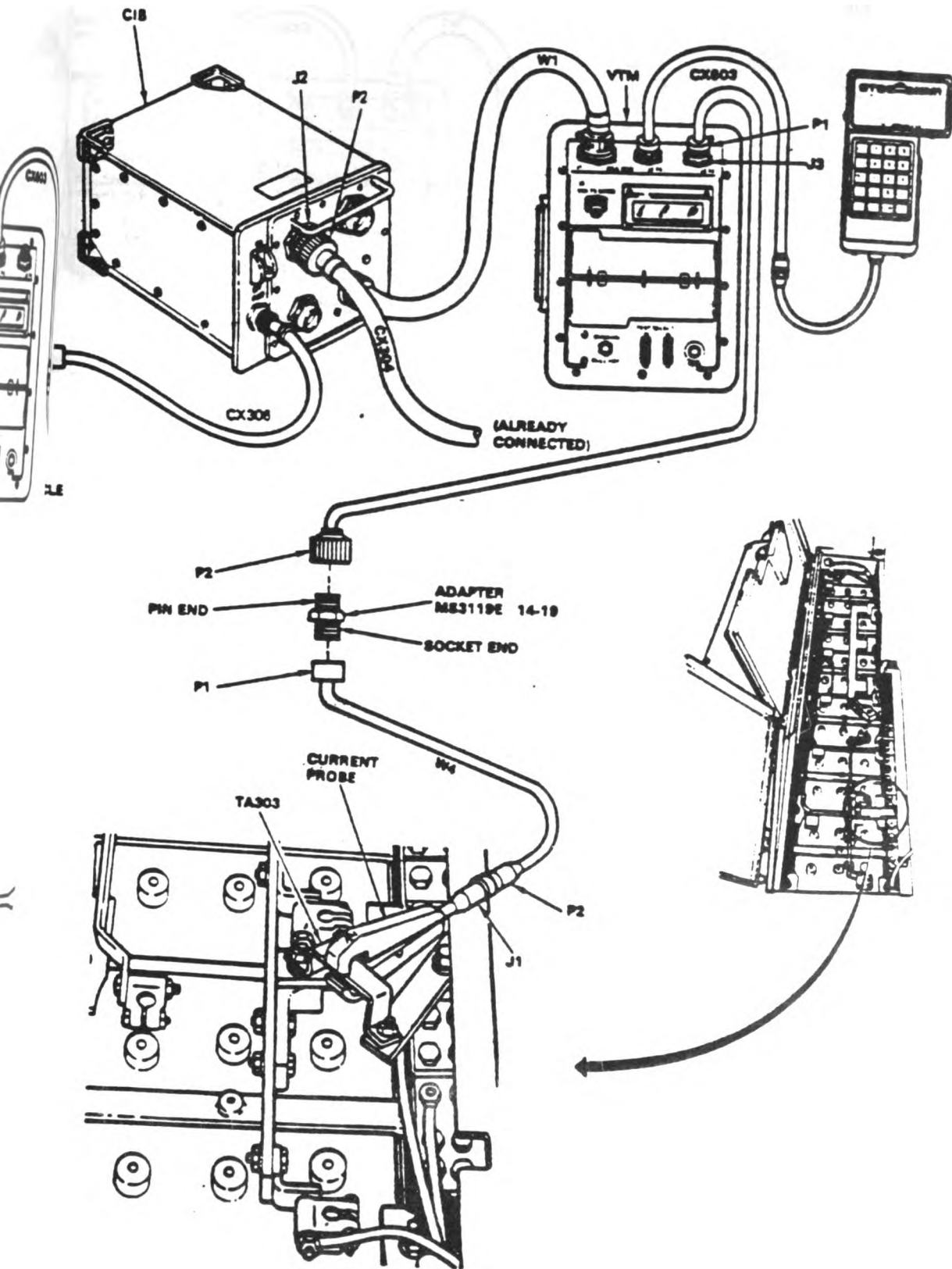


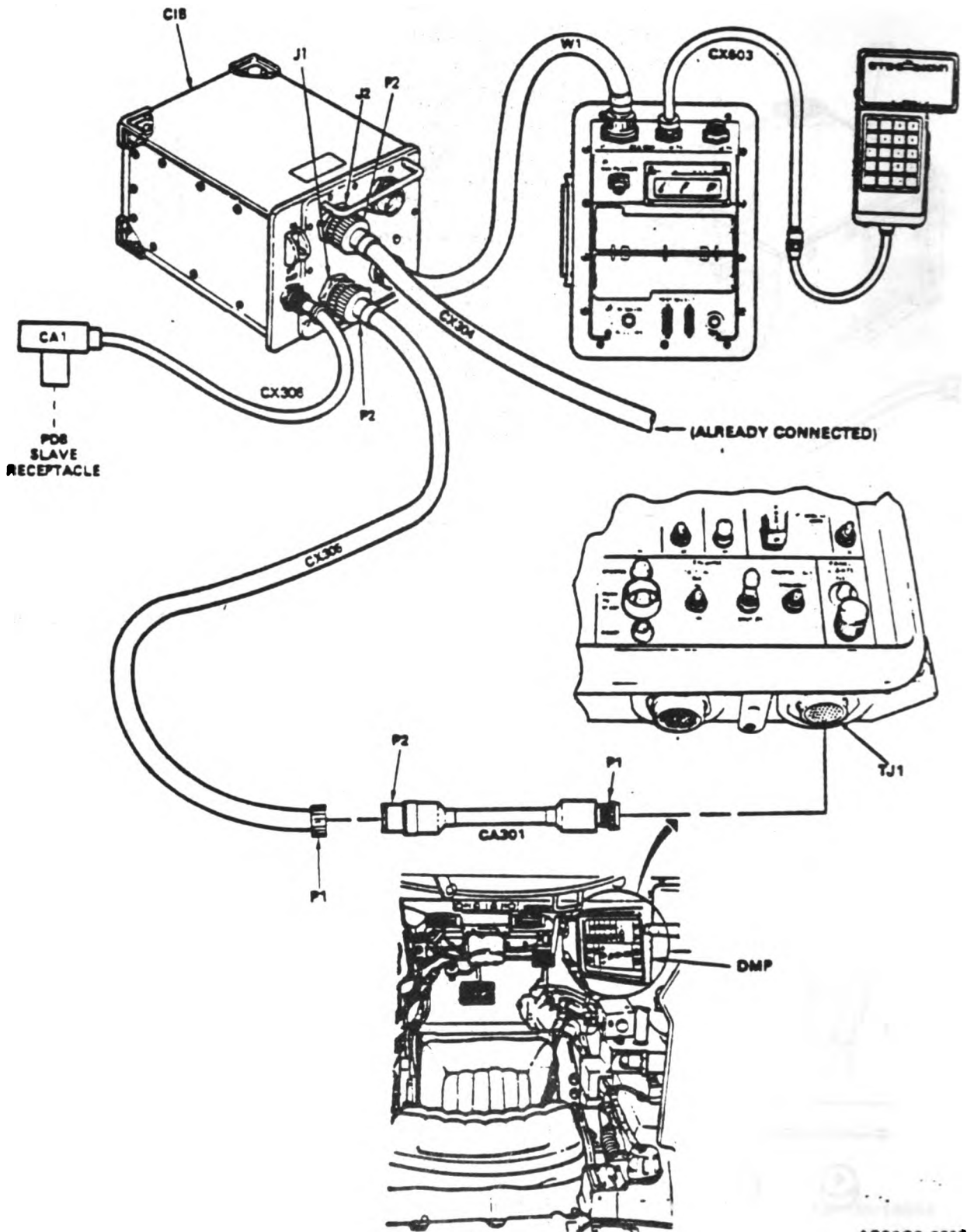
Figure 9-49. STE/M1 Hull Cable Hookup to TA303.  
Volume 41  
Para. 9-2

... A30120-138R1

Change 3 9-185



**TM 9-2350-255-20-1-2-1  
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A20120-030R2

**Figure 9-50. STE/M1 Hull Cable Hookup to DMP-TJ1.  
Volume II  
Para. 9-2**

**9-186 Change 3**

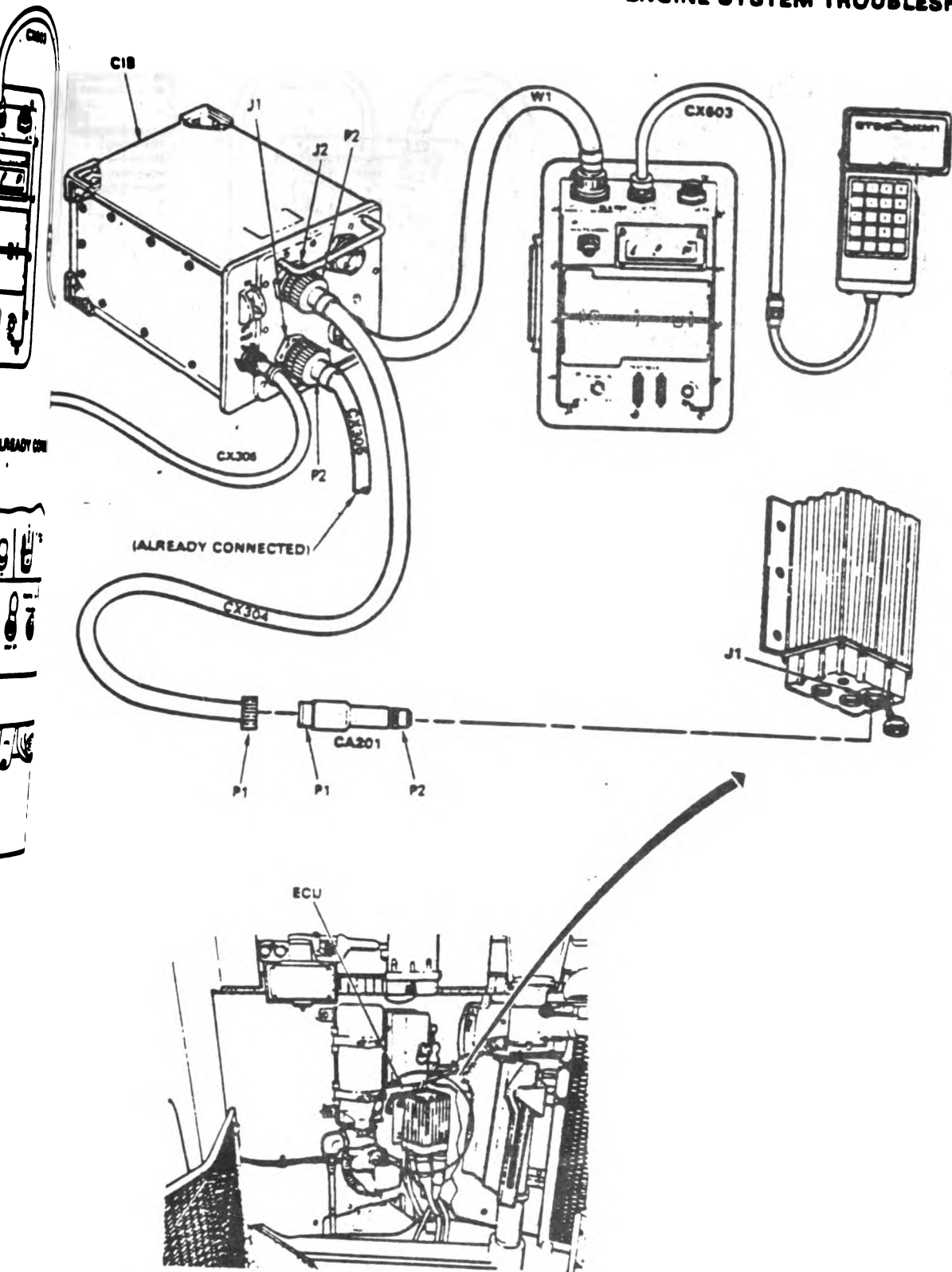


Figure 9-51. STE/M1 Hull Cable Hookup to ECU-J1.  
Volume 41  
Para. 9-2

A2012b-076R2

Change 4 9-187

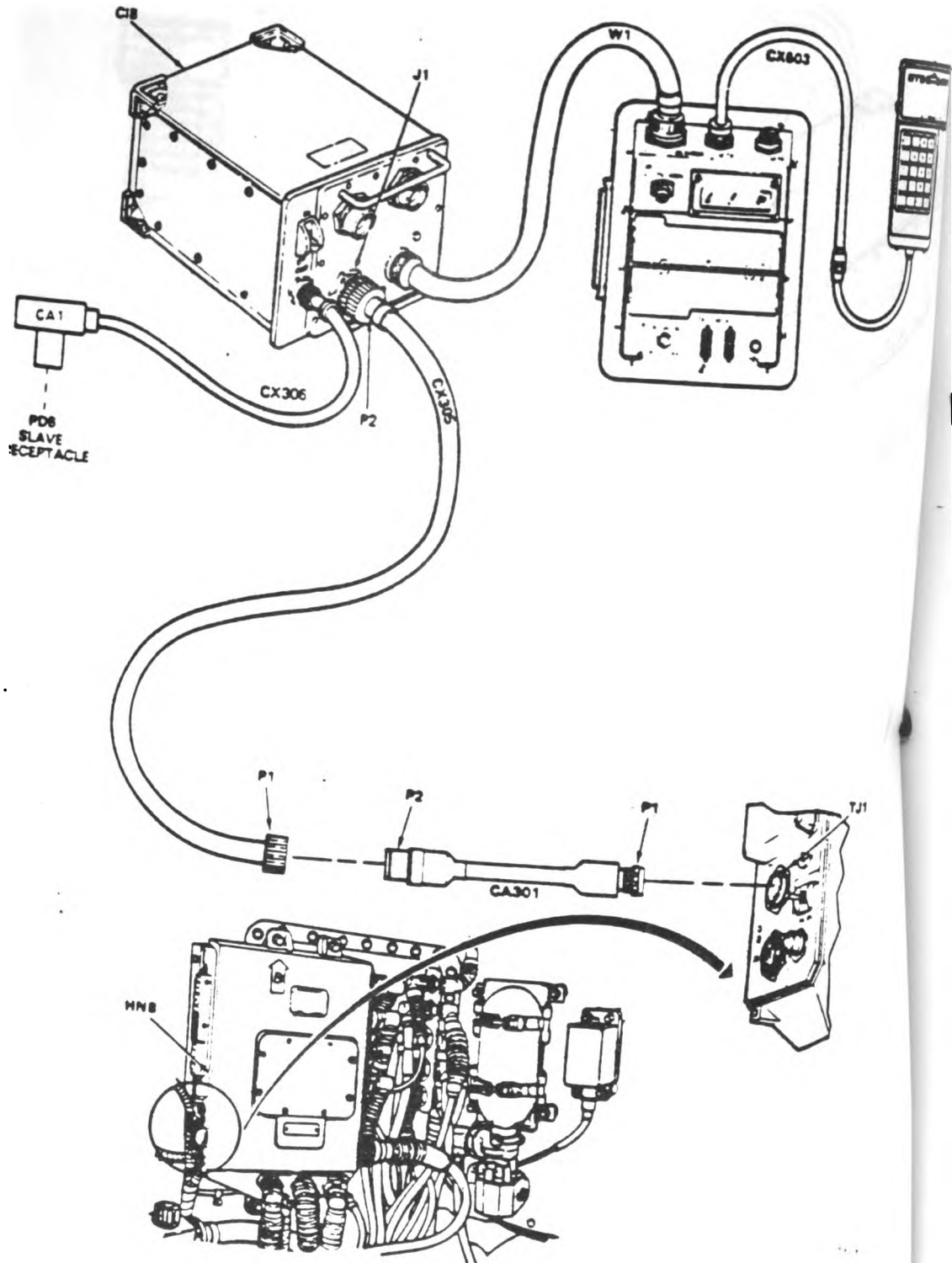
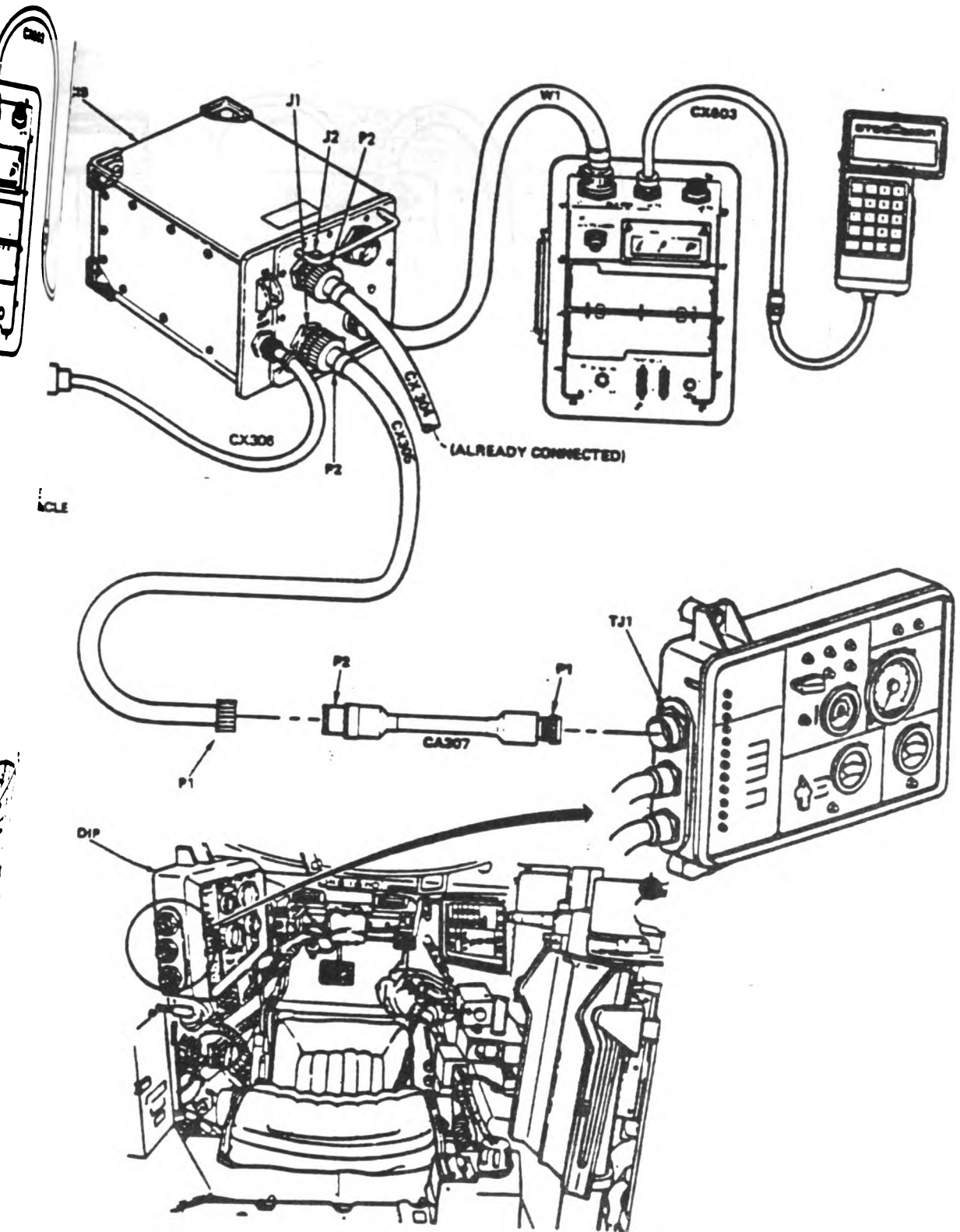


Figure 9-52 STE/M1 Hull Cable Hookup to HNB-TJ1.  
Volume II  
Para. 9-2

9-188 Change 3

A20120-1079

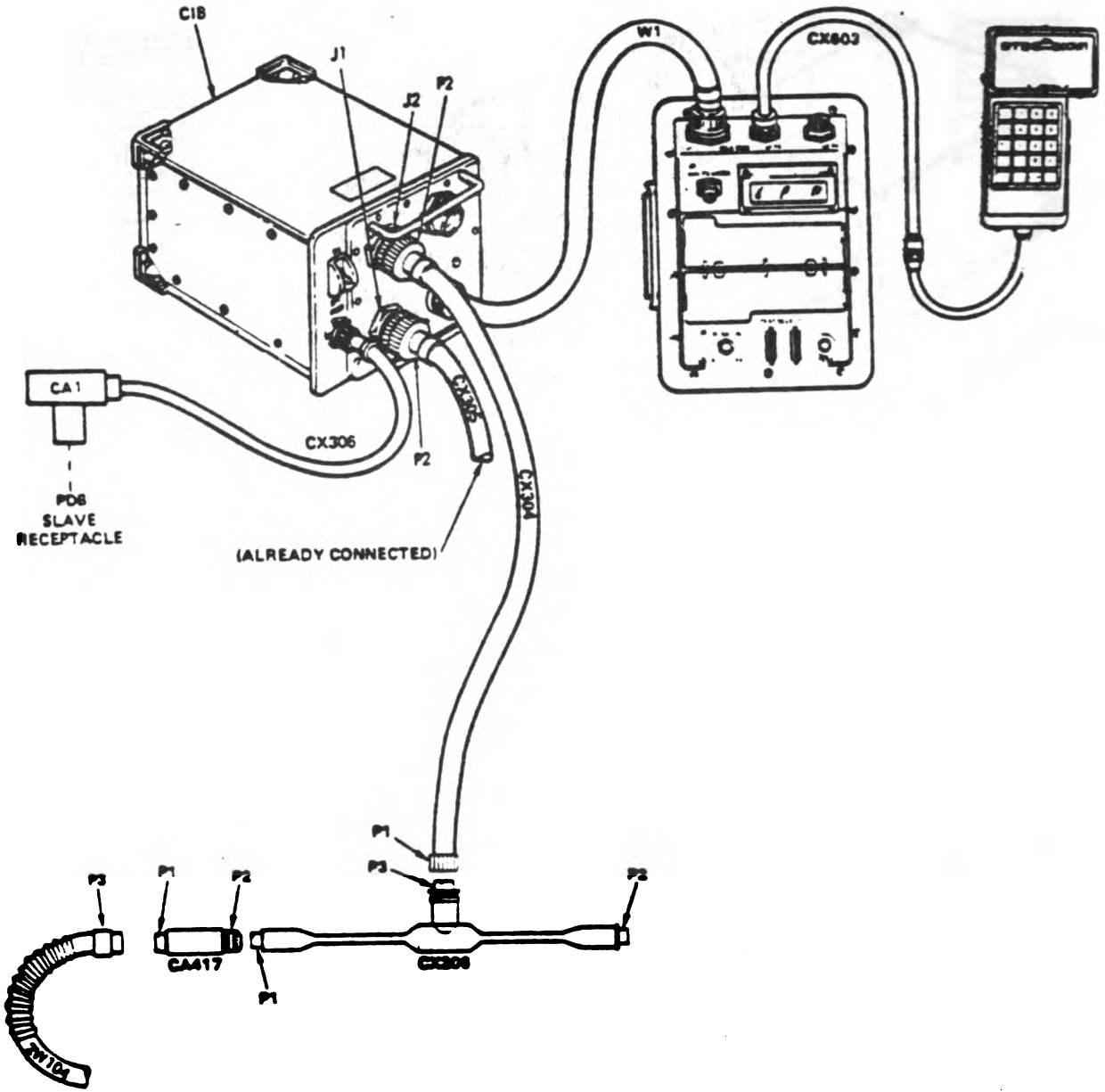


A30120-1000

Figure 9-53. STE/M1 Hull Cable Hookup to DIP-TJ1.  
Volume-II  
Para. 9-2

Change 3 9-188

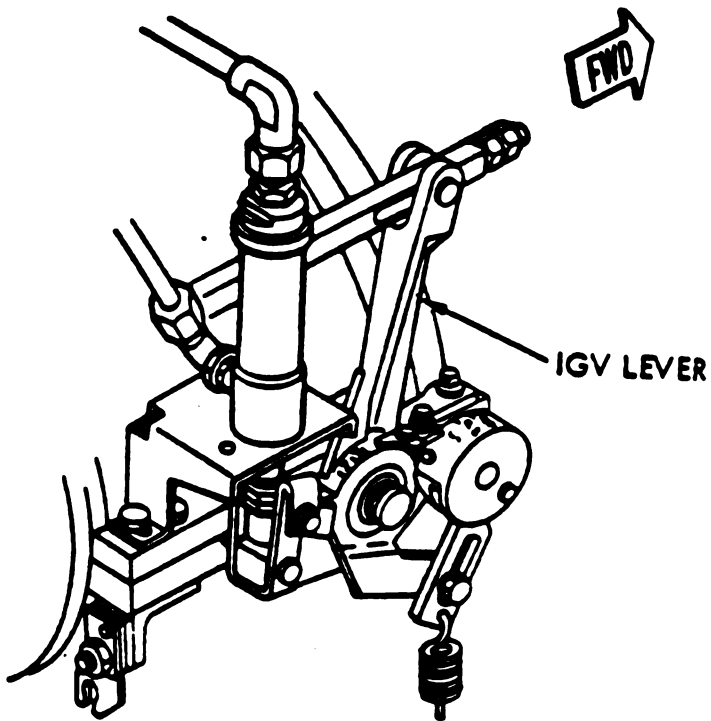
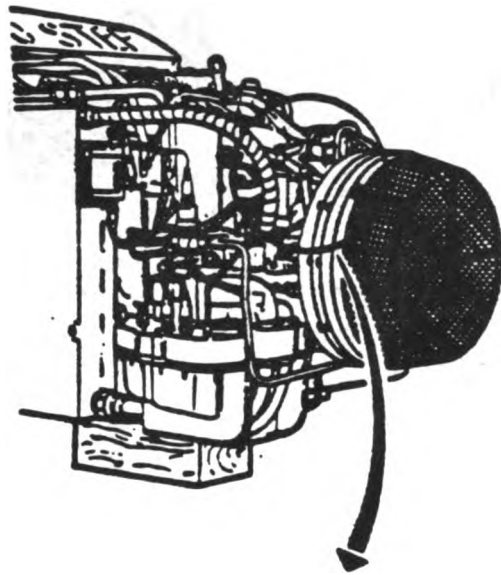
**TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING**



A20120-1081

**Figure 9-54. STE/M1 Hull Cable Hookup to 2W104-P3.  
Volume II  
Para. 9-2**

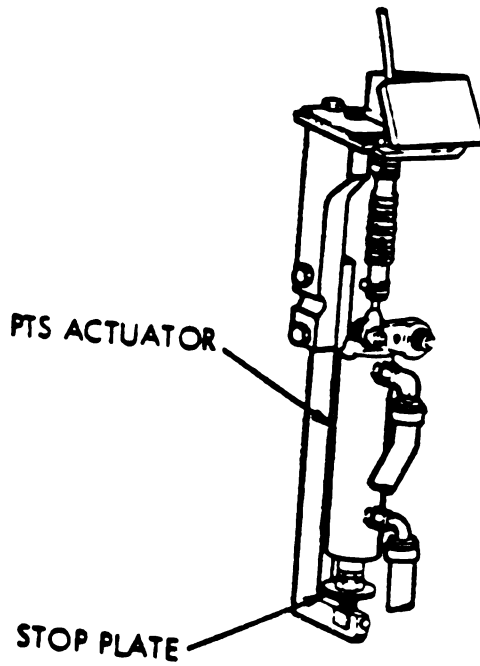
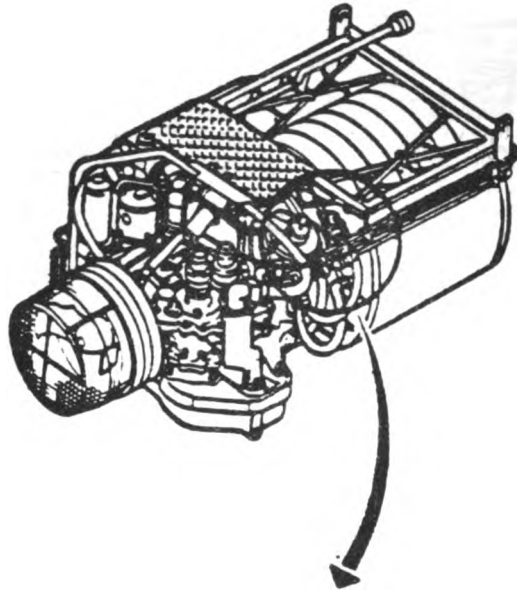
**9-190 Change 3**



A20120-1185

*Figure 9-65. STE/M1 IGV Lever Location Diagram.*  
Volume II  
Para. 9-2

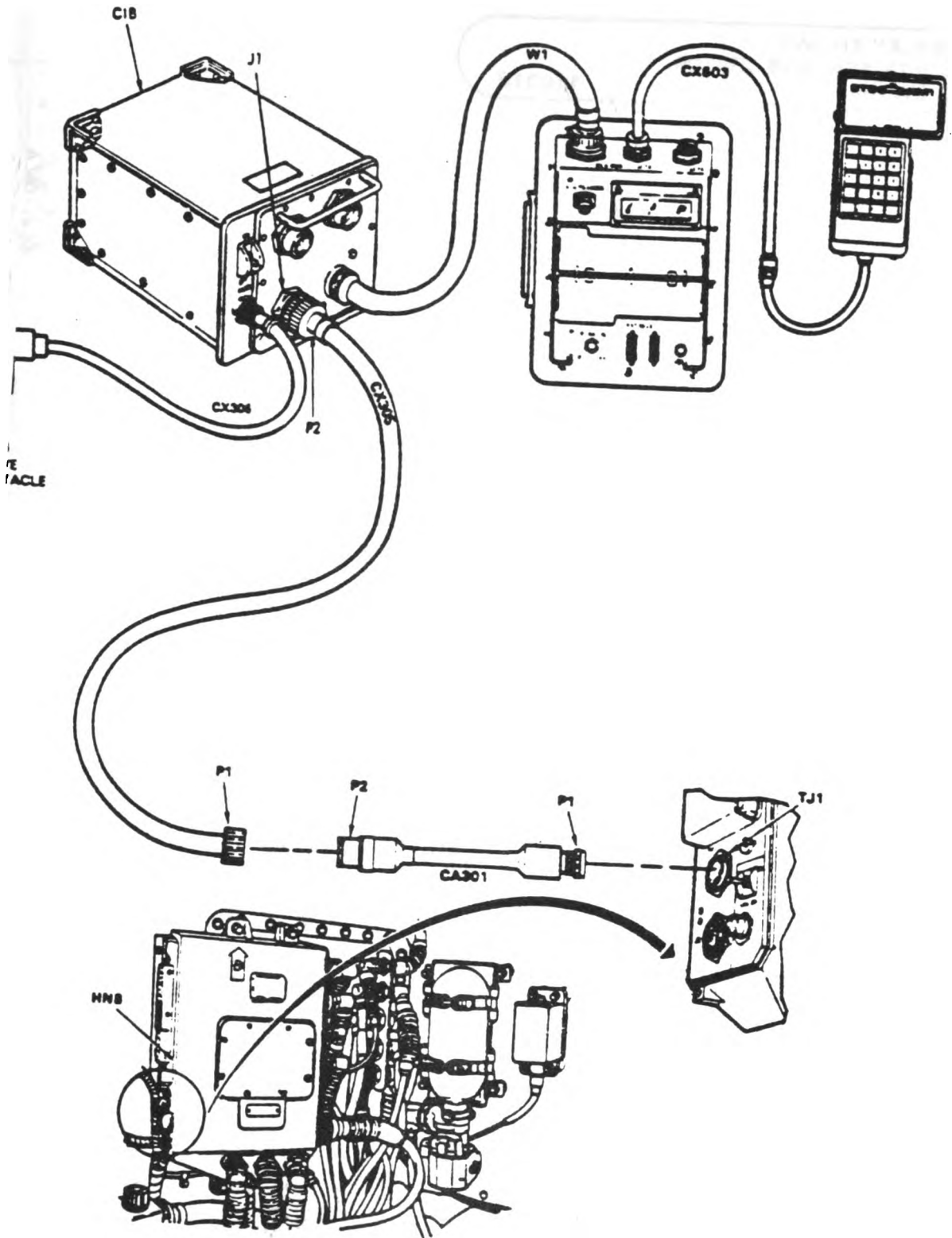
Change 3 9-191



A20120-1186

Figure 9-56. STE/M1 PTS Actuator Location Diagram.  
Volume II  
Para. 9-2

9-192 Change 3



A20120-1209

Figure 9-57. STE/M1 Hull Cable Hookup to HNB-TJ1.  
Volume II  
Para. 9-2

Change 3 9-193



DISPLAY SHOWS .  
FAULTY SSA, HNB, 2W104,  
OR 2W105

110310

**Additional Test  
Equipment/Special Tools:**  
● Breakout Box Test Kit 12311066

**Equipment Condition:**  
● Tank parked.  
● Parking brake set.  
● Engine shut down.  
● Vehicle master power off.

- 1
- Disconnect CX304-P1 from CA301-P2.  
● See figure 9-29.
  - Disconnect CA301-P1 from TJ2 on hull network box.  
● See figure 9-29.
  - Disconnect CX304-P2 from CIB-J2.  
● See figure 9-29.
  - Disconnect 2W104-P7 from J1 on shift select assembly.  
● See figure 9-109.

- 2
- Connect CX304-P2 (1) to breakout box (2).
  - Connect CX304-P1 (3) to CX207-P3 (4).
  - Connect CA536-P1 (5) to J1 (6) on shift select assembly (7).
  - Connect CA536-P2 (8) to CX207-P1 (8).

- 3
- Change control from SETCOM to VTM.
  - Set PWR switch (10) on CIB (11) to OFF to reset VTM (12).
  - Set PWR switch (10) to ON.
  - Prepare VTM for measuring resistance between 0 and 1600 ohms.
  - Refer to TM 9-4910-572-14&P, Volume I, Appendix D.

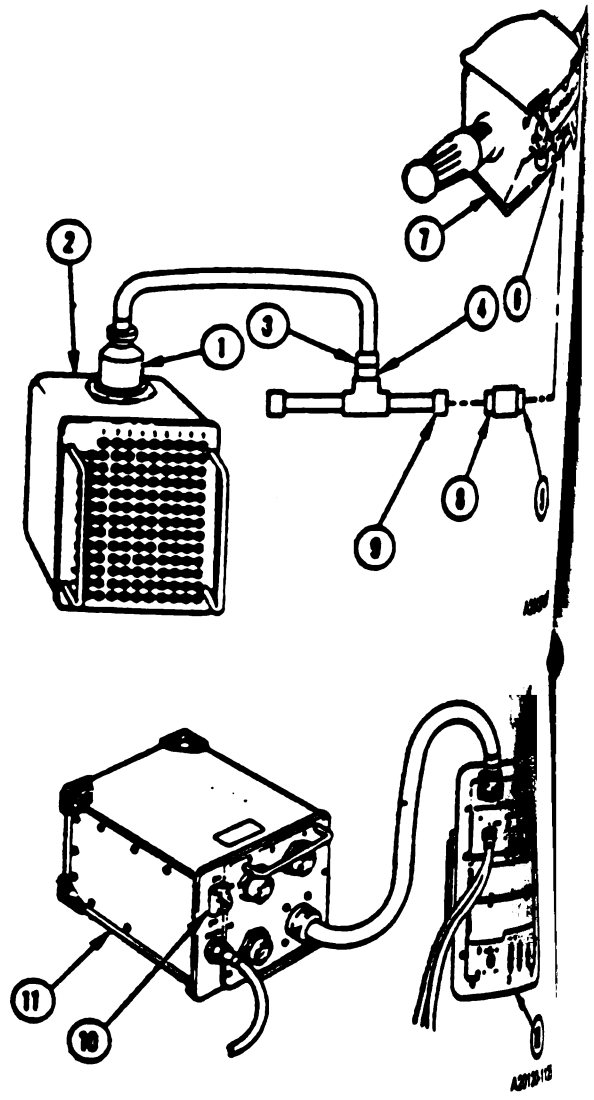


Figure 9-58 (Sheet 1 of 3)  
Volume II  
Para. 9-2

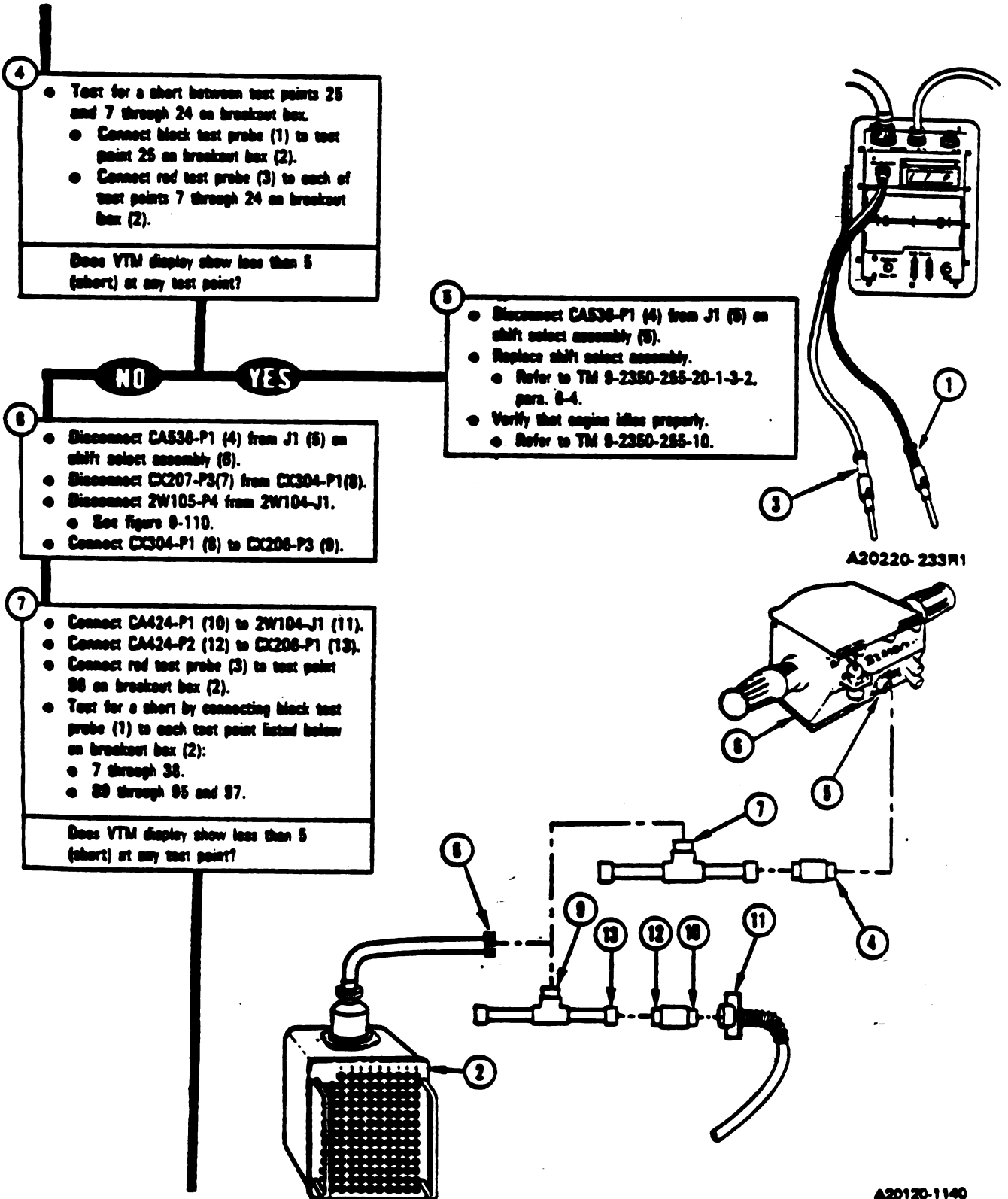
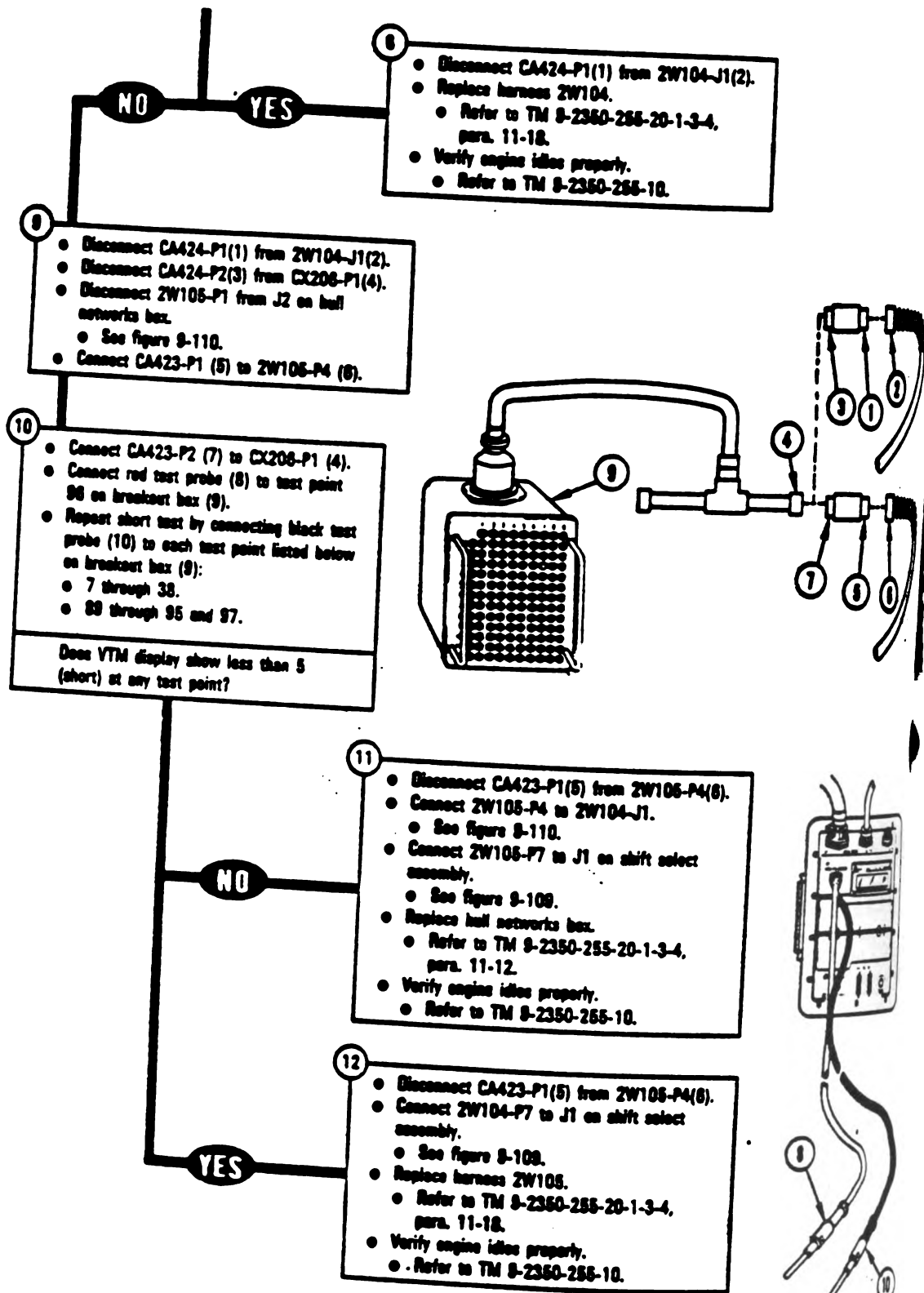


Figure 9-58 (Sheet 2 of 3)  
Volume II  
Para. 9-2

Change 3 9-195

TM 9-2350-255-20-1-2.1  
ENGINE SYSTEM TROUBLESHOOTING



A30120-1141

Figure 9-58 (Sheet 3 of 3)  
Volume II  
Para. 9-2

9-196 Change 3

DISPLAY SHOWS -  
ULTY ECU, 2W104 OR  
/105

11031B

**Equipment Condition:**

- Tank parked.
- Parking brake set.
- Engine shut down.
- Vehicle master power off.

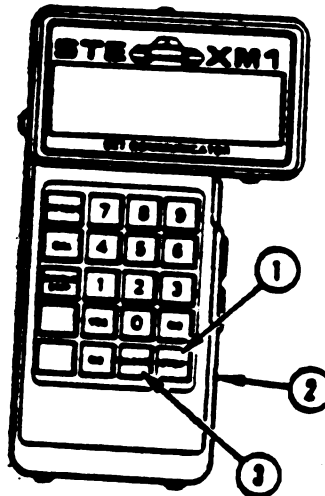
Disconnect CX304-P1 from CA301-P2.

- See figure 9-29.
- Disconnect CA301-P1 from TJ2 on hull network box.
- See figure 9-29.
- Disconnect CA418-P1 from J1 on driver's master panel.
- See figure 9-35.
- Disconnect CA418-P2 from CX208-P2.
- See figure 9-35.

Disconnect ZW105-P4 from ZW104-J1.

- See figure 9-110.
- Prepare STE/M1 to run cable test 1390.
- Press STOP key (1) on SETCOM (2).
- Press CLEAR key (3).
- Enter cable test number 1390 on SETCOM (2).
- Run test on harness ZW104 between J1 and P3.
- Refer to TM 9-2350-255-20-1-2-2, figure 18-13.

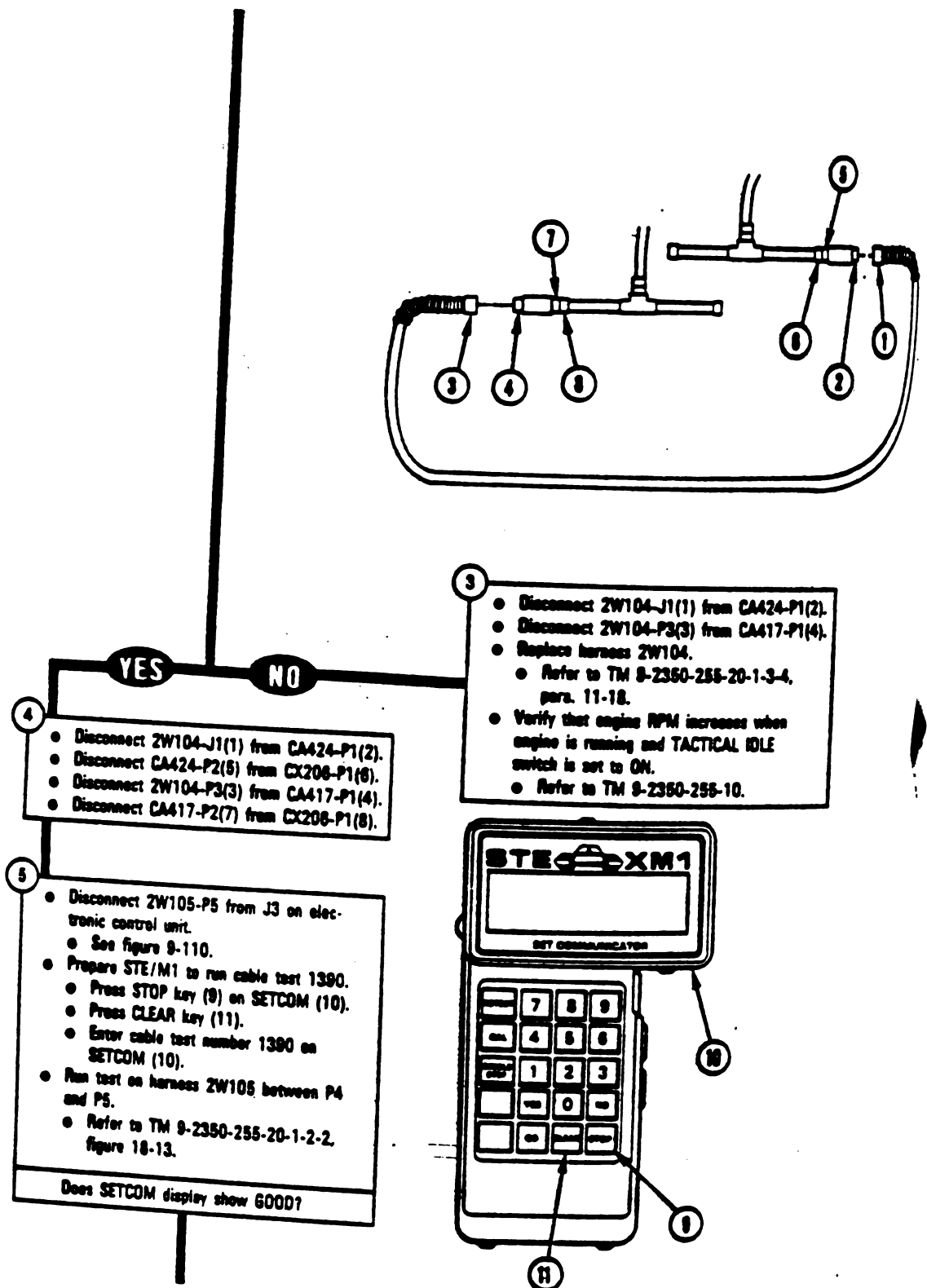
Does SETCOM display show 6000?



A20220-011R1

Figure 9-59 (Sheet 1 of 3)  
Volume II  
Para. 9-2

Change 3 9-197



A30120-114

Figure 9-59 (Sheet 2 of 3)  
Volume II  
Para. 9-2

9-198 Change 3

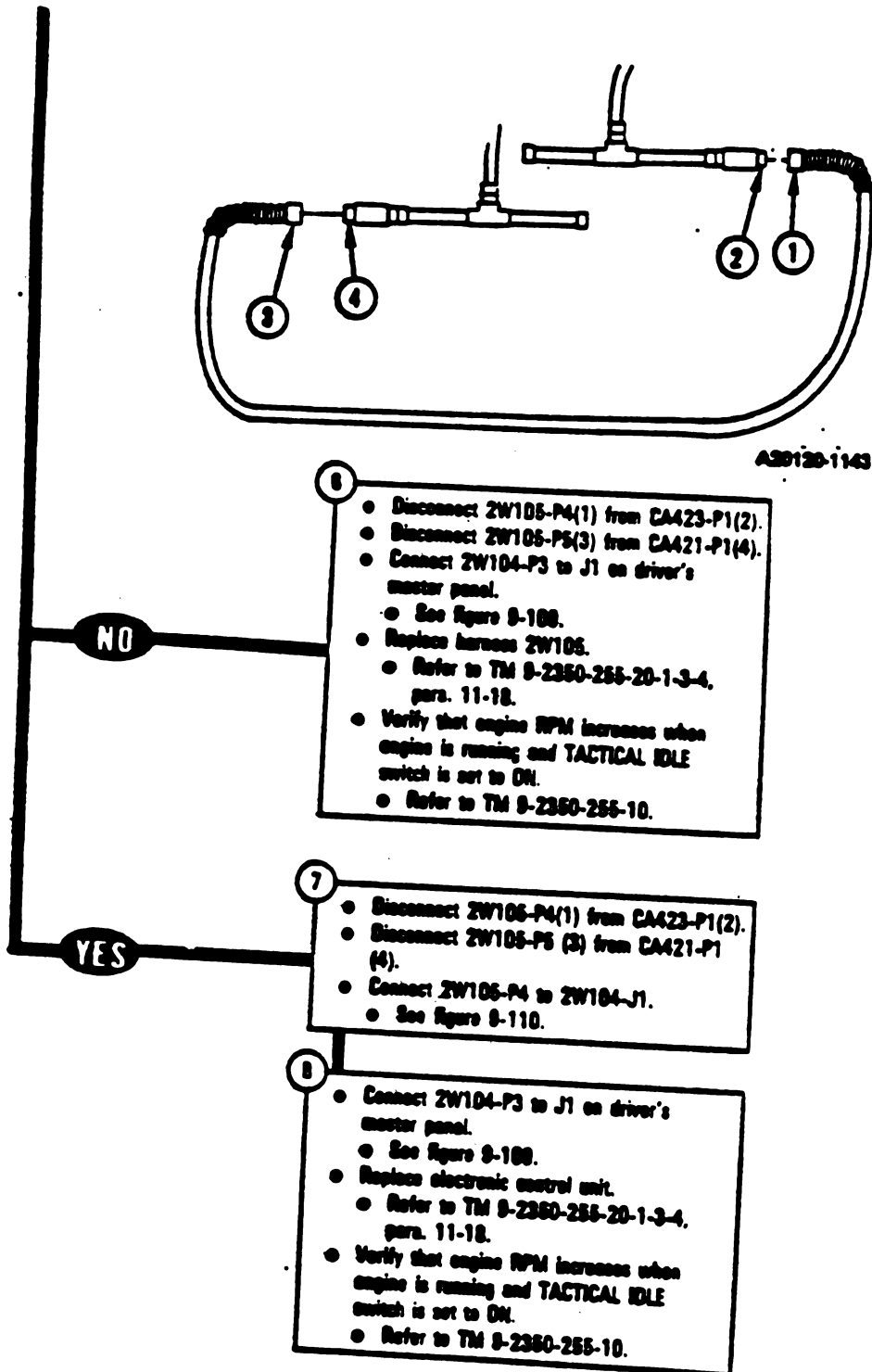


Figure 9-59 (Sheet 3 of 3)  
Volume II  
Para. 9-2

DISPLAY SHOWS  
FAULTY HNB OR  
2W104

**Equipment Condition:**

- Tank parked.
- Parking brake set.
- Engine shut down.
- Vehicle master power off.

• 110322  
110332

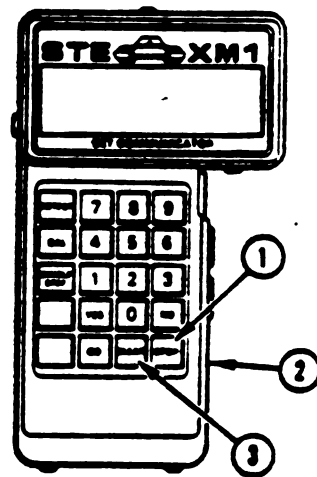
①

- Disconnect CX304-P1 from CA301-P2.
  - See figure 9-29.
- Disconnect CA301-P1 from TJ2 on hull networks box.
  - See figure 8-29.
- Disconnect CA418-P2 from CX208-P2.
  - See figure 9-35.
- Disconnect CA418-P1 from J1 on driver's master panel.
  - See figure 9-35.

②

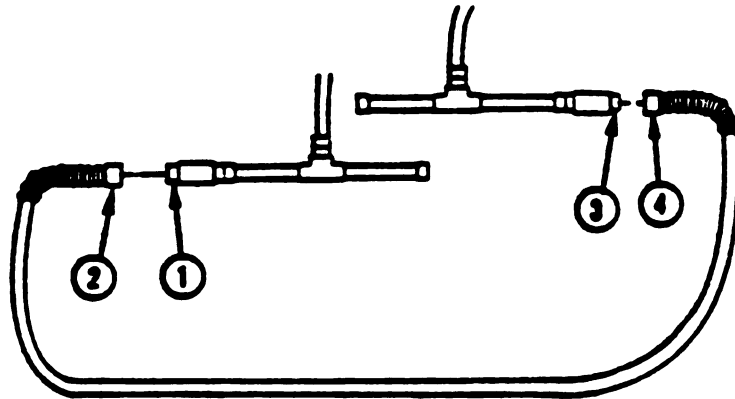
- Disconnect ZW104-P1 from J8 on hull networks box.
  - See figure 9-110.
- Prepare STE/M1 to run cable test 1390.
  - Press STOP key (1) on SETCOM (2).
  - Press CLEAR key (3).
  - Enter cable test number 1390 on SETCOM (2).
- Run test on harness ZW104 between P1 and P3.
  - Refer to TM 9-2350-255-20-1-2-2, figure 18-13.

Does SETCOM display show GOOD?

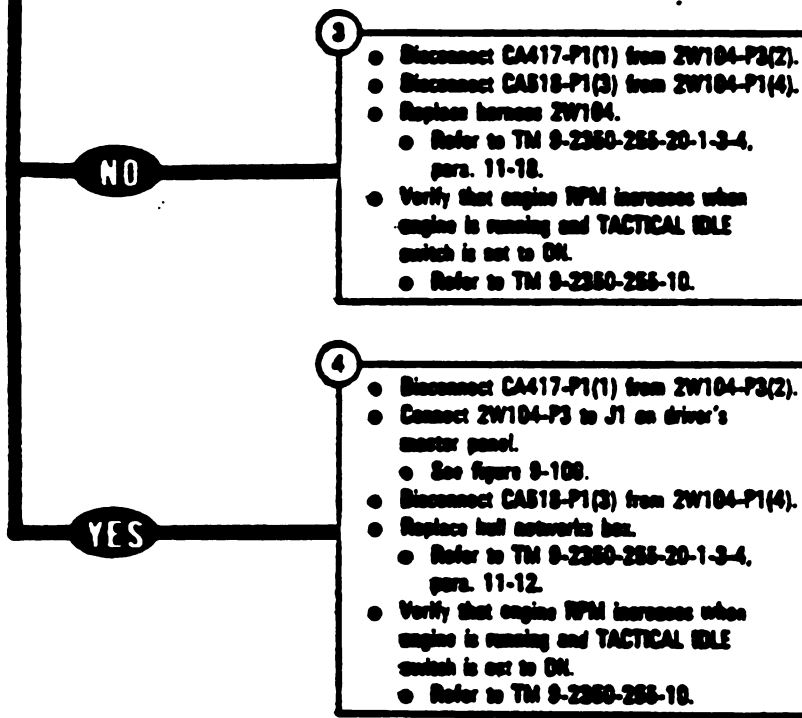


A20220-011R1

Figure 9-60 (Sheet 1 of 2)  
Volume II  
Para. 9-2



A30120-1144



- 3
- Disconnect CA417-P1(1) from ZW104-P3(2).
  - Disconnect CA518-P1(3) from ZW104-P1(4).
  - Replace harness ZW104.
    - Refer to TM 9-2350-255-20-1-3-4, para. 11-18.
  - Verify that engine RPM increases when engine is running and TACTICAL IDLE switch is set to ON.
  - Refer to TM 9-2350-255-10.

- 4
- Disconnect CA417-P1(1) from ZW104-P3(2).
  - Connect ZW104-P3 to J1 on driver's master panel.
    - See figure 9-108.
  - Disconnect CA518-P1(3) from ZW104-P1(4).
  - Replace hull network box.
    - Refer to TM 9-2350-255-20-1-3-4, para. 11-12.
  - Verify that engine RPM increases when engine is running and TACTICAL IDLE switch is set to ON.
  - Refer to TM 9-2350-255-10.

Figure 9-60 (Sheet 2 of 2)  
Volume II  
Para. 9-2

Change 3 9-201



TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING

DISPLAY SHOWS -  
FAULTY HNB, 2W104, OR  
2W105

110329

Equipment Conditions:

- Tank parked.
- Parking brake set.
- Engine shut down.
- Vehicle master power off.

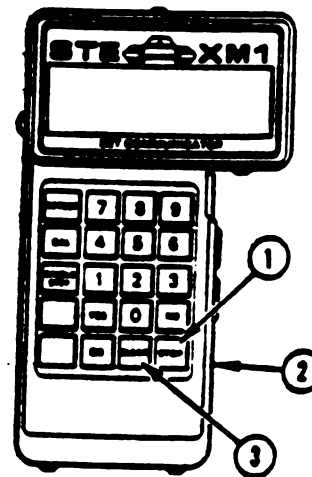
①

- Disconnect CX207-P2 from CA536-P2.
  - See figure 9-38.
- Disconnect CA536-P1 from J1 on shift select assembly.
  - See figure 9-38.
- Disconnect CX304-P1 from CA301-P2.
  - See figure 9-29.
- Disconnect CA301-P1 from TJ2 on hull network box.
  - See figure 9-29.

②

- Disconnect 2W105-P4 from 2W104-J1.
  - See figure 9-110.
- Prepare STE/M1 to run cable test 1390.
  - Press STOP key (1) on SETCOM (2).
  - Press CLEAR key (3).
  - Enter cable test number 1390 on SETCOM (2).
- Run test on harness 2W104 between J1 and P7.
  - Refer to TM 9-2350-255-20-1-2-2, figure 18-13.

Does SETCOM display show GOOD?



A20220-011R1

Figure 9-61 (Sheet 1 of 3)  
Volume II  
Para. 9-2

9-202 Change 3

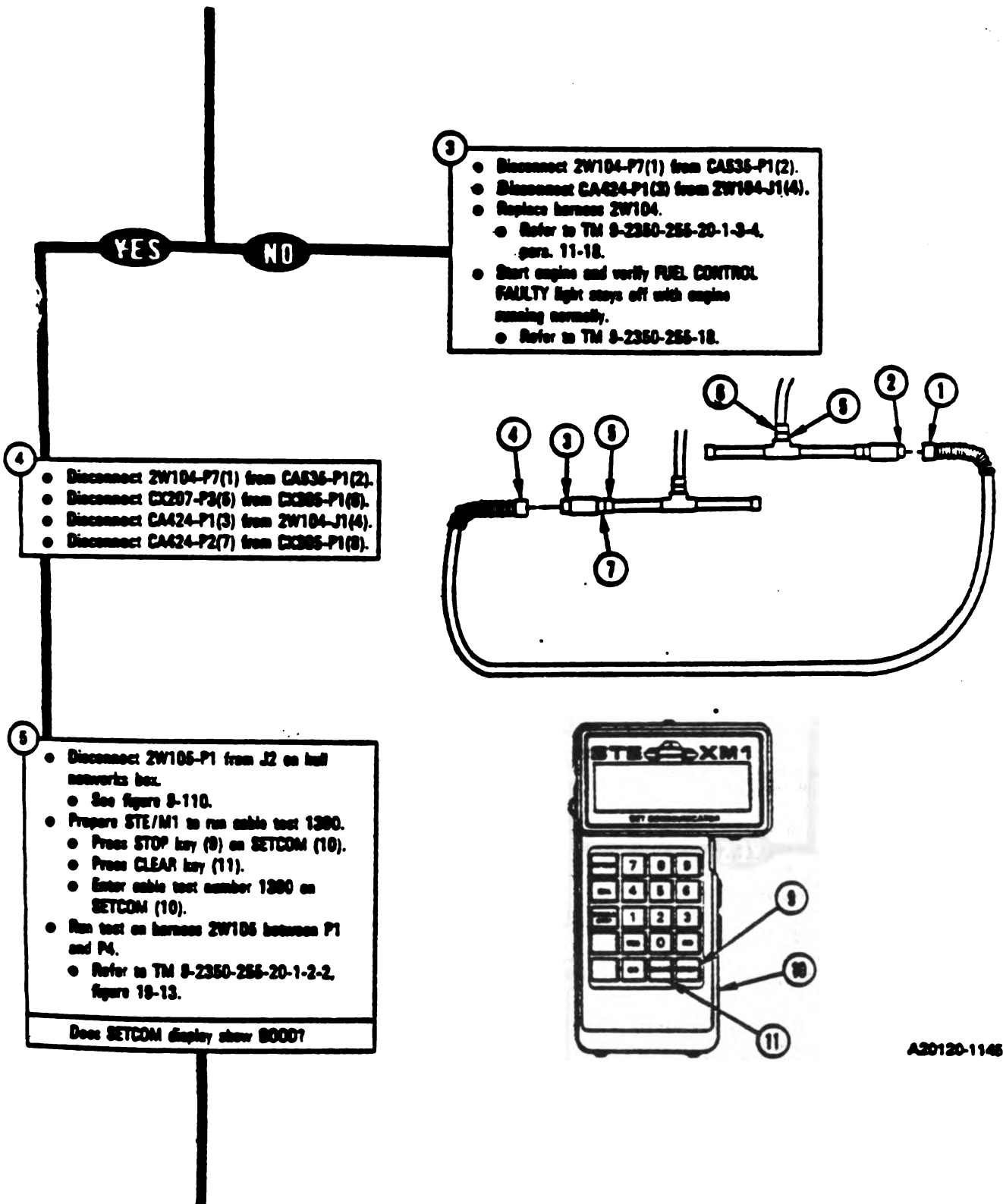
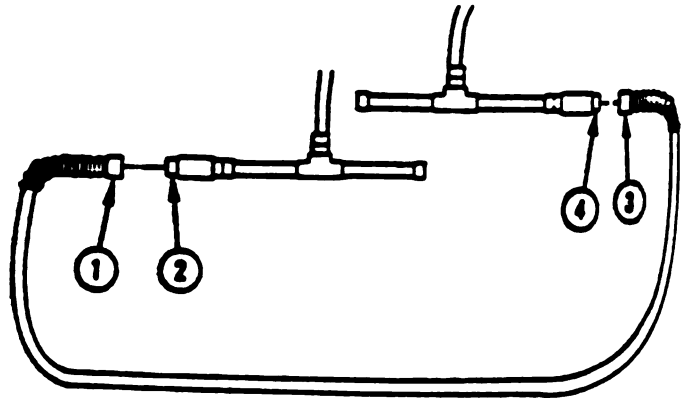
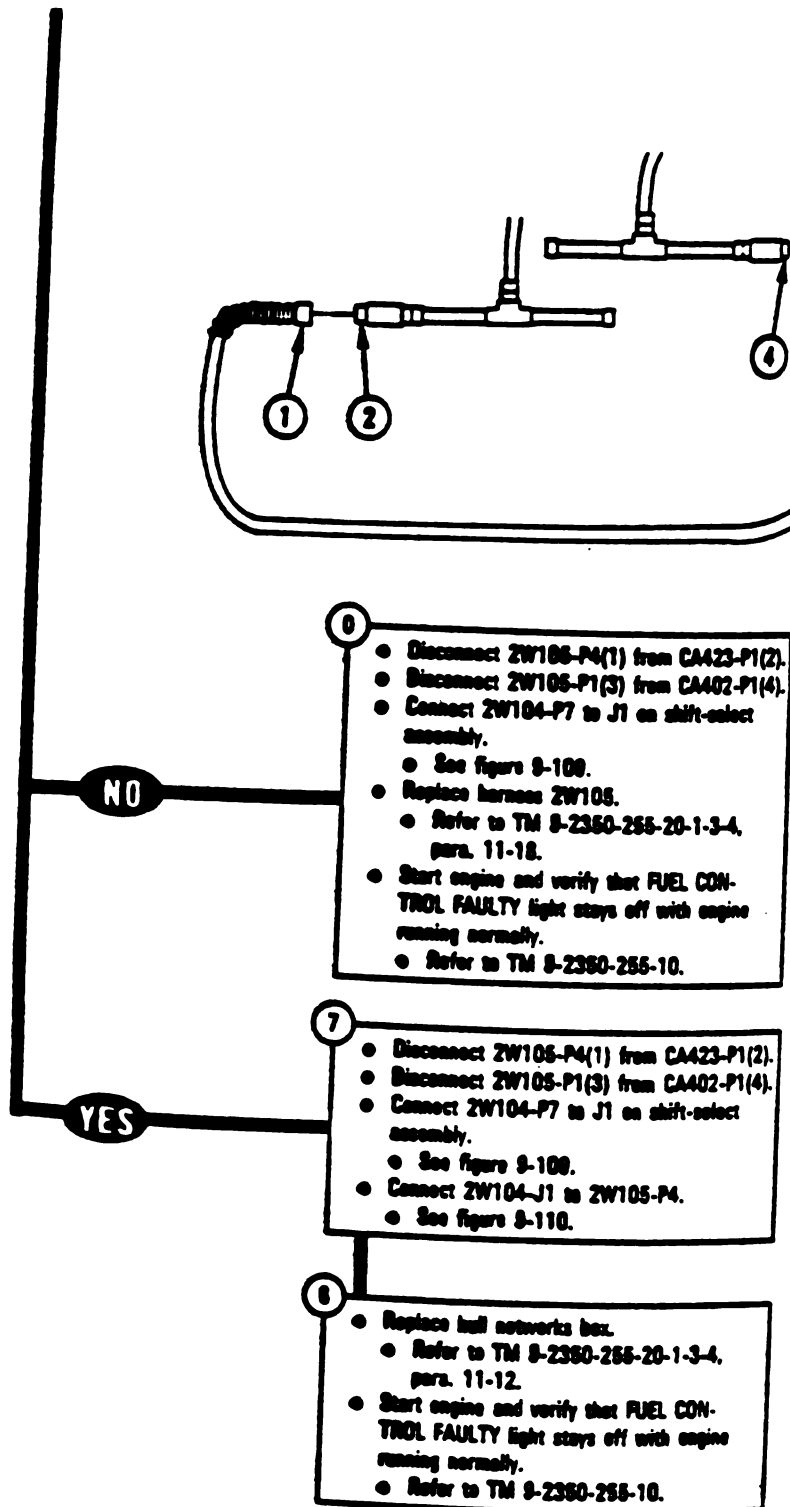


Figure 9-61 (Sheet 2 of 3)  
Volume II  
Para. 9-2

**TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING**



A20120-114



- 0
- Disconnect ZW105-P4(1) from CA423-P1(2).
  - Disconnect ZW105-P1(3) from CA402-P1(4).
  - Connect ZW104-P7 to J1 on shift-select assembly.
    - See figure 9-109.
  - Replace harness ZW105.
    - Refer to TM 9-2350-255-20-1-3-4, para. 11-18.
  - Start engine and verify that FUEL CONTROL FAULTY light stays off with engine running normally.
  - Refer to TM 9-2350-255-10.

- 7
- Disconnect ZW105-P4(1) from CA423-P1(2).
  - Disconnect ZW105-P1(3) from CA402-P1(4).
  - Connect ZW104-P7 to J1 on shift-select assembly.
    - See figure 9-109.
  - Connect ZW104-J1 to ZW105-P4.
  - See figure 9-110.

- 8
- Replace hull networks box.
    - Refer to TM 9-2350-255-20-1-3-4, para. 11-12.
  - Start engine and verify that FUEL CONTROL FAULTY light stays off with engine running normally.
  - Refer to TM 9-2350-255-10.

*Figure 9-61 (Sheet 3 of 3)  
Volume II  
Para. 9-2*

9-204 Change 3

DISPLAY SHOWS .  
FAULTY HNB, 2W104  
OR 2W105

110333

**Additional Test**

**Equipment/Special Tools:**

- Breakout Box Test Kit, 12311806

**Equipment Condition:**

- Tank parked.
- Parking brake set.
- Engine shut down.
- Vehicle master power off.

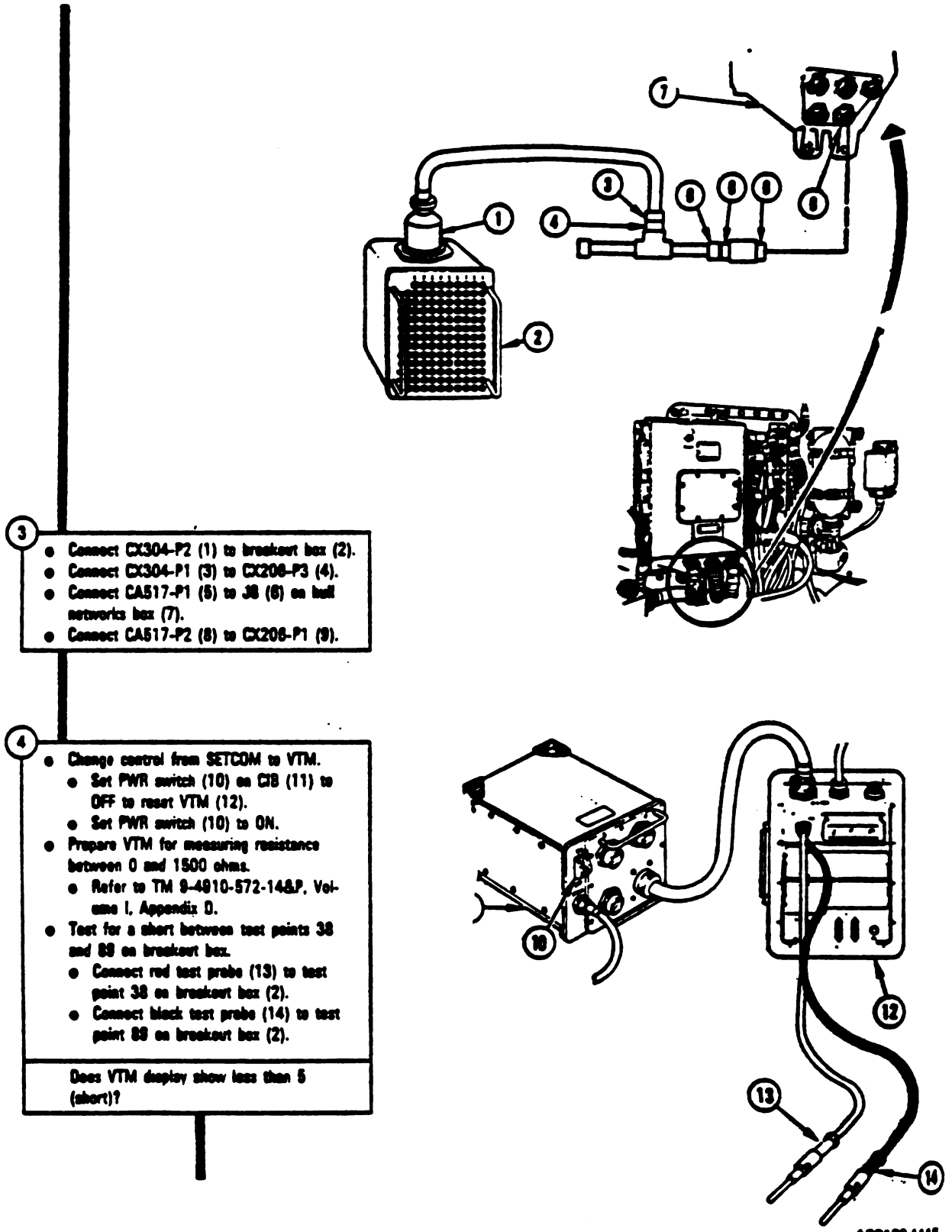
- Disconnect CX304-P1 from CA301-P2.
  - See figure 9-31.
- Disconnect CA301-P1 from TJ1 on driver's master panel.
  - See figure 9-31.
- Disconnect CX304-P2 from J2 on CR.
  - See figure 9-31.
- Disconnect 2W105-P5 from CA421-P1.
  - See figure 9-37.

- Disconnect CA421-P2 from CX206-P1.
  - See figure 9-37.
- Disconnect CX306-P1 from CX206-P2.
  - See figure 9-37.
- Disconnect 2W104-P1 from JB on hull network box.
  - See figure 9-110.

*Figure 9-62 (Sheet 1 of 5)  
Volume II  
Para. 9-2*

Change 3 9-205

**TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING**



- 3
- Connect CX304-P2 (1) to breakout box (2).
  - Connect CX304-P1 (3) to CX206-P3 (4).
  - Connect CA517-P1 (5) to J8 (6) on hull networks box (7).
  - Connect CA517-P2 (8) to CX206-P1 (9).

- 4
- Change control from SETCOM to VTM.
  - Set PWR switch (10) on CIB (11) to OFF to reset VTM (12).
  - Set PWR switch (10) to ON.
  - Prepare VTM for measuring resistance between 0 and 1500 ohms.
  - Refer to TM 9-4910-572-14&P, Volume I, Appendix D.
  - Test for a short between test points 38 and 89 on breakout box.
  - Connect red test probe (13) to test point 38 on breakout box (2).
  - Connect black test probe (14) to test point 89 on breakout box (2).
- Does VTM display show less than 5 (short)?

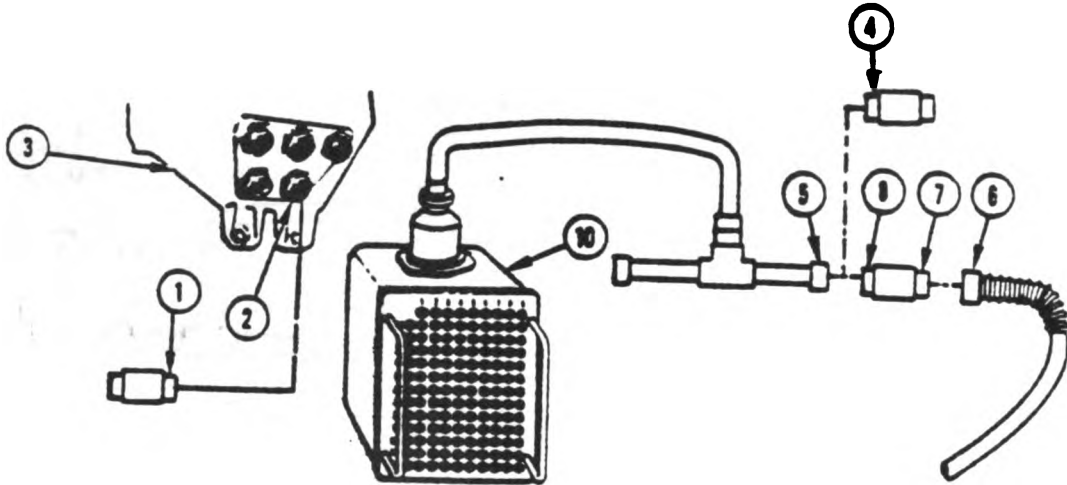
A20120-1115

**Figure 9-62 (Sheet 2 of 5)  
Volume II  
Para. 9-2**

NO YES

- Disconnect CA517-P2(4) from CX206-P1(5).
- Disconnect ZW104-P3 from J1 on driver's master panel.
  - See figure 9-109.
- Connect ZW104-P3 (6) to CA417-P1 (7).
- Connect CA417-P2 (8) to CX206-P1 (5).

- Disconnect CA517-P1 (1) from J8 (2) on hull networks box (3).
- Connect ZW105-P5 to J3 on electronic control unit.
  - Refer to figure 9-110.
- Replace hull networks box.
  - Refer to TM 9-2350-255-20-1-3-4, para. 11-12.
- Verify that engine idles properly.
  - Refer to TM 9-2350-255-10.



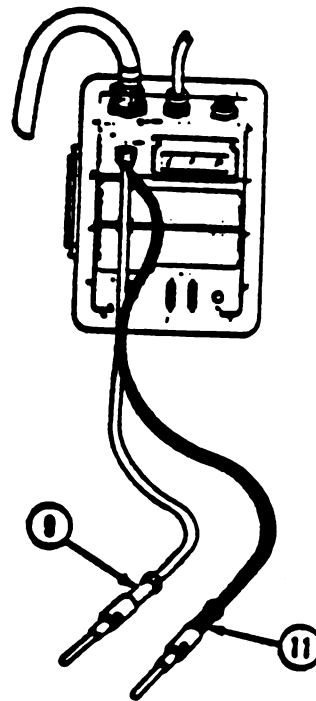
- Connect red test probe (9) to test point 09 on breakout box (10).

**NOTE**

If VTM display shows less than 5 (ohms) between test point 80 and any test point listed below, go immediately to block 8.

- Test for a short by connecting black test probe (11) to each test point listed below on breakout box (10):
  - 7 through 39.
  - 62.
  - 74 and 75.
  - 80 through 113.

Does VTM display show less than 5 (ohms) at any test point?



A30180-1116

Figure 9-62 (Sheet 3 of 5)  
Volume II  
Para. 9-2

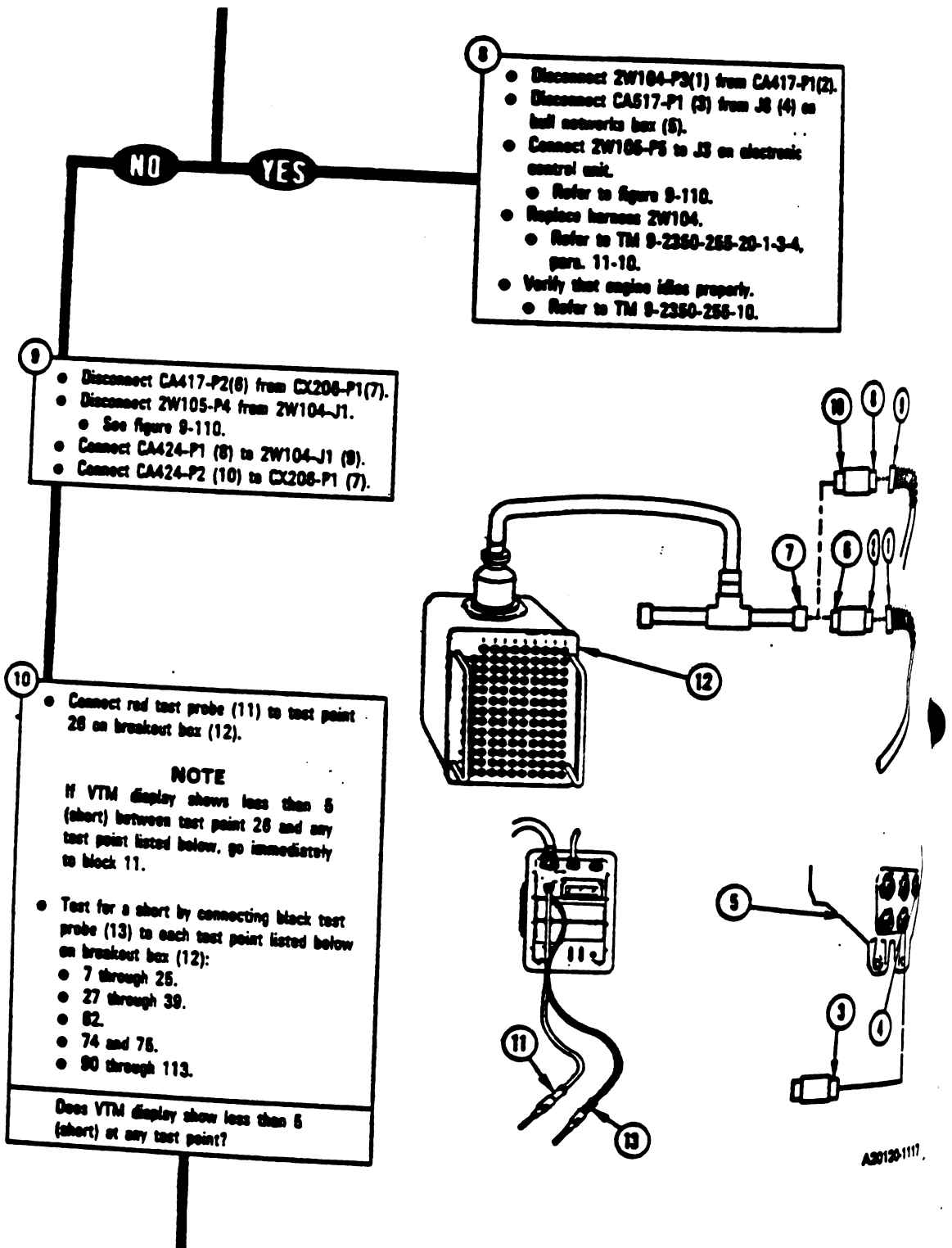


Figure 9-62 (Sheet 4 of 5)  
Volume II  
Para. 9-2

9-208 Change 3

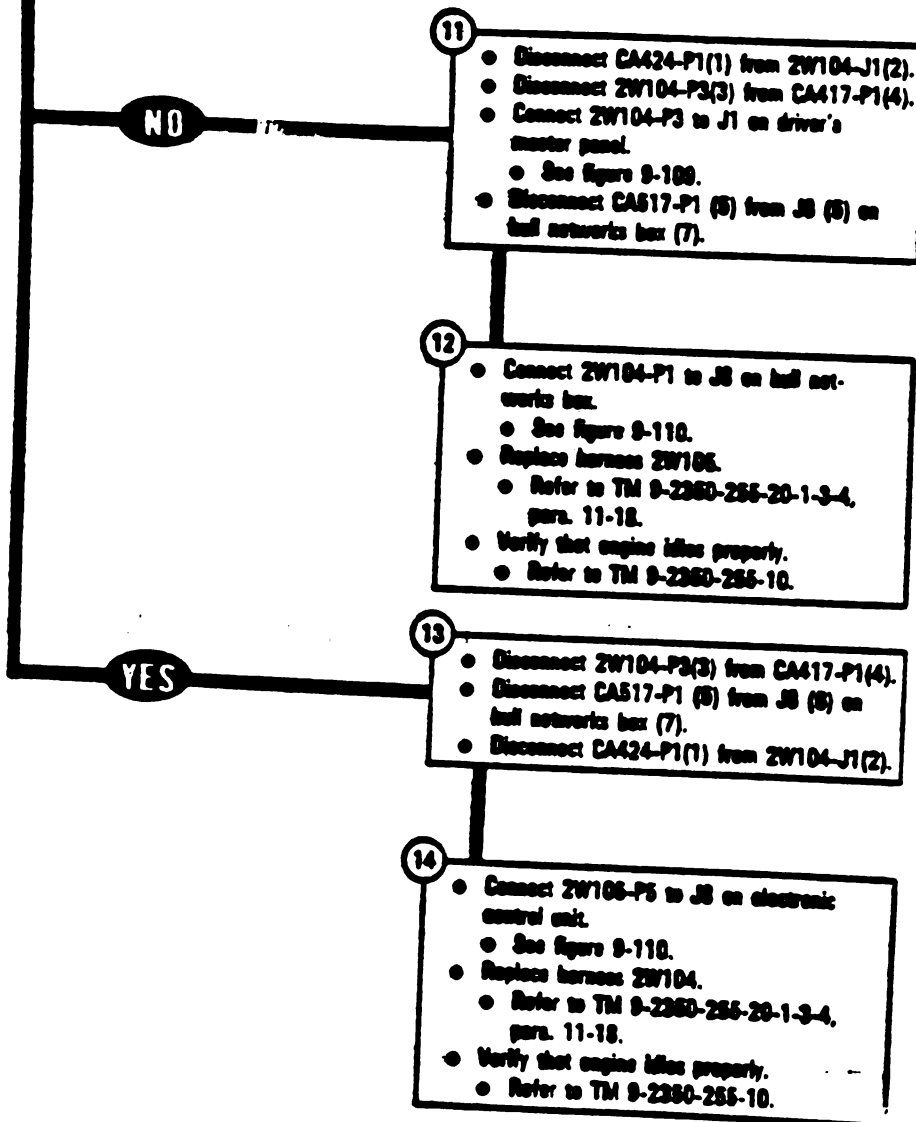
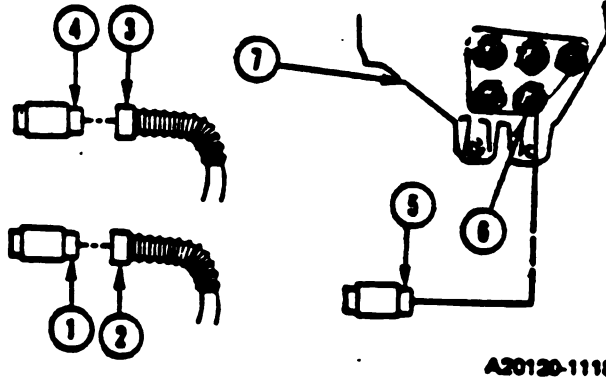


Figure 9-52 (Sheet 5 of 5)  
Volume II  
Para. 9-2



DISPLAY SHOWS  
SEE -20 MANUAL

113014

**Additional Test  
Equipment/Special Tools:**  
● Breakout Box Test Kit, 12311088

**Equipment Condition:**  
● Tank parked.  
● Parking brake set.  
● Engine shut down.  
● Vehicle master power off.

- ①
- Disconnect ZW104-P3 from J1 on driver's master panel.  
○ See figure 9-109.
  - Disconnect ZW104-P1 from J8 on hull network box.  
○ See figure 9-110.
  - Disconnect CA301-P1 from T.J2 on hull network box.  
○ See figure 9-30.
  - Disconnect CX305-P1 from CA301-P2.  
○ See figure 9-30.

- ②
- Connect CX305-P2 (1) to breakout box (2).
  - Connect CX305-P1 (3) to CX206-P3 (4).
  - Connect CA417-P1 (5) to ZW104-P3 (6).
  - Connect CX206-P1 (7) to CA417-P2 (8).

- ③
- Change control from SETCOM to VTM.
  - Set PWR switch (9) on CIB (10) to OFF to reset VTM (11).
  - Set PWR switch (9) to ON.
  - Prepare VTM for measuring resistance between 0 and 1500 ohms.
  - Refer to TM 9-4810-872-14&P, Volume I, Appendix O.

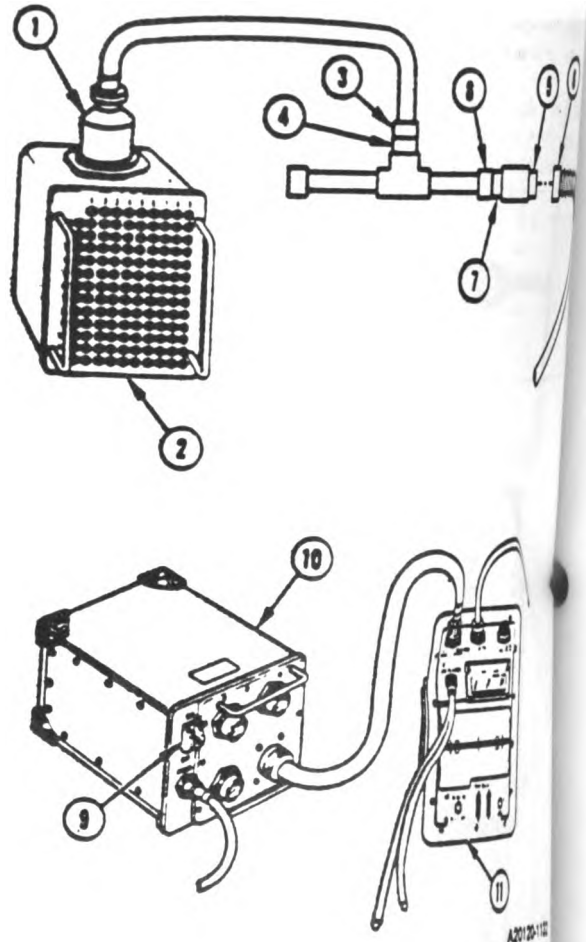


Figure 9-63 (Sheet 1 of 3)  
Volume II  
Para. 9-2

9-210 Change 3

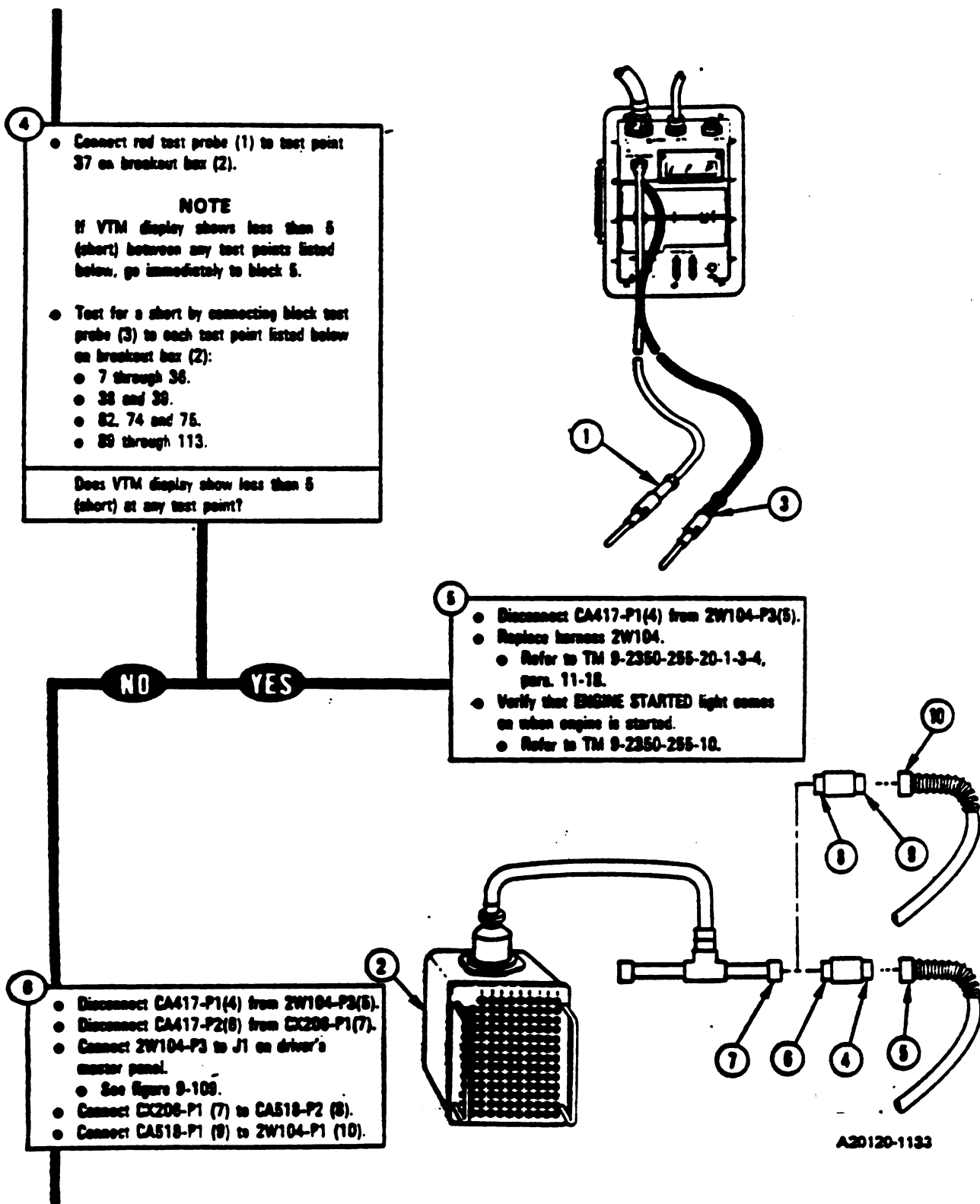


Figure 9-63 (Sheet 2 of 3)  
Volume II  
Para. 9-2

Change 3 9-211

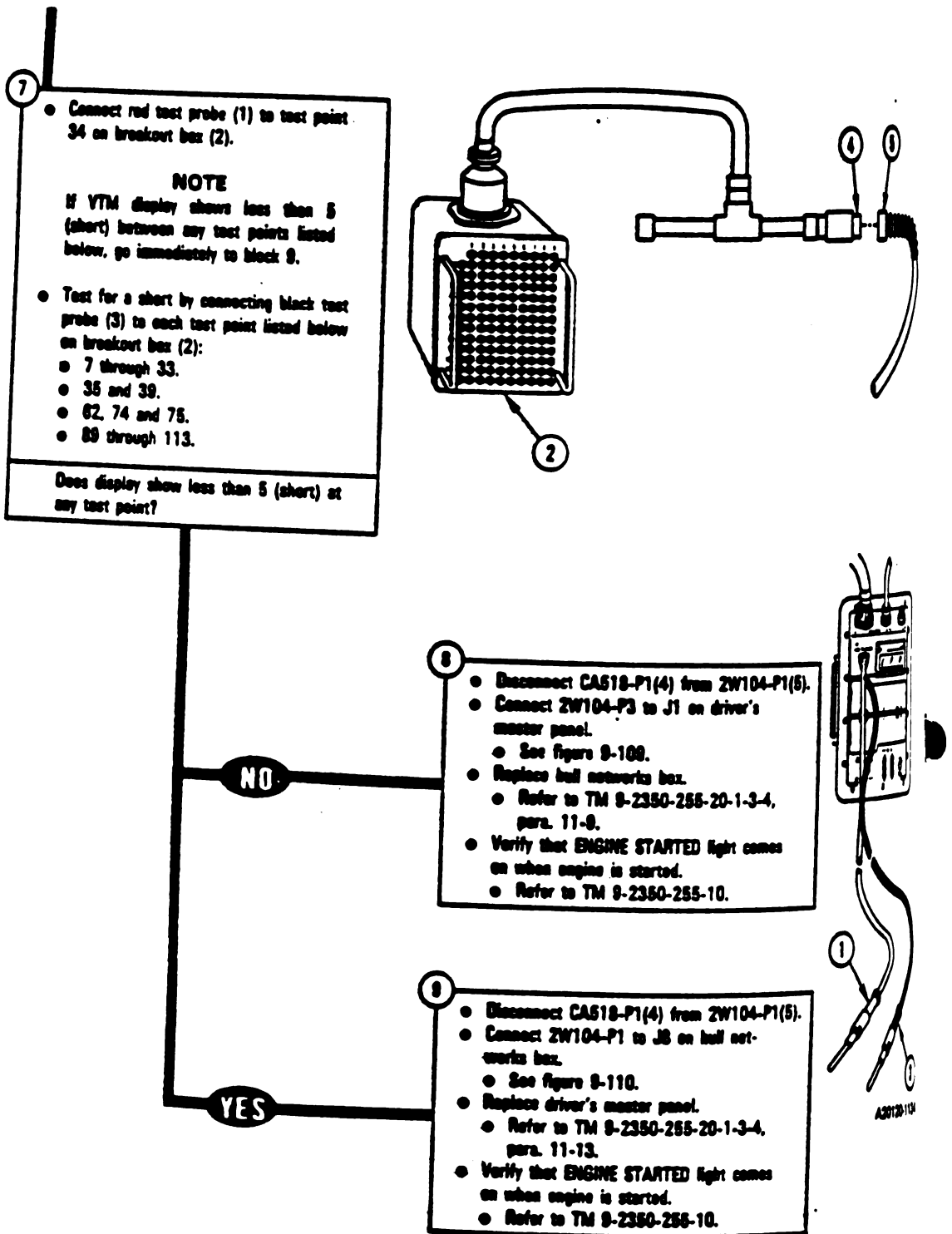


Figure 9-63 (Sheet 3 of 3)  
Volume II  
Para. 9-2

9-212 Change 3

DISPLAY SHOWS -  
FAULTY HNB OR  
2W104

113018

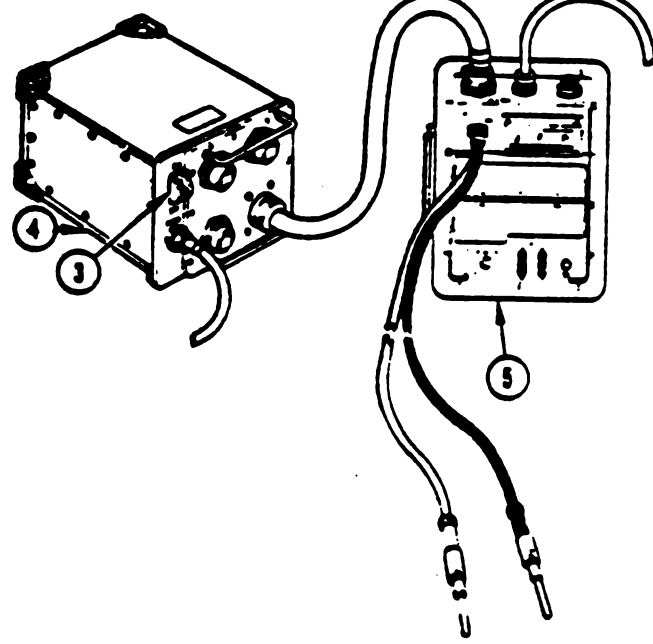
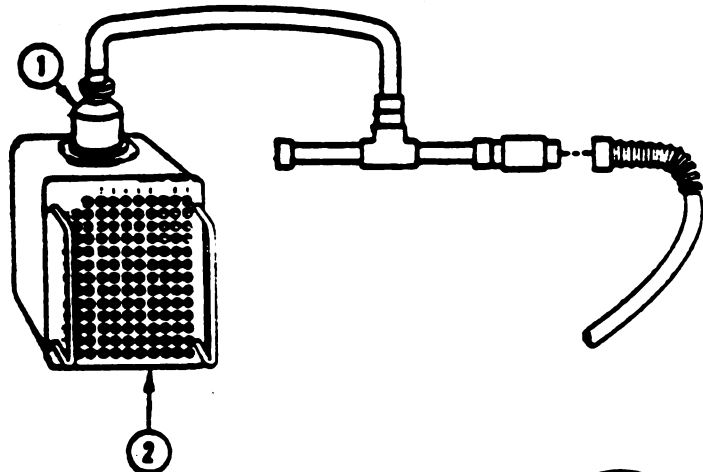
**Additional Test**

**Equipment/Special Tools:**

- Breakout Box Tool Kit 12311088

**Equipment Condition:**

- Tank parked.
- Parking brake set.
- Engine shut down.
- Vehicle master power off.
- Hull networks box circuit breakers on.



- 1
- Disconnect CX305-P1 from CA301-P2.
    - See figure 9-30.
  - Disconnect CA301-P1 from T.J2 on hull networks box.
    - See figure 9-30.
  - Disconnect 2W104-P1 from J8 on hull networks box.
    - See figure 9-110.
  - Disconnect CX304-P2 from J2 on CIB.
    - See figure 9-22.
  - Connect CX304-P2 (1) to breakout box (2).

- 2
- Change control from SETCOM to VTM.
    - Set PWR switch (3) on CIB (4) to OFF to reset VTM (5).
    - Set PWR switch (3) to ON.
  - Prepare VTM for measuring resistance between 0 and 1800 ohms.
  - Refer to TM 9-4910-572-14&P, Volume I, Appendix D.

A20120-1102

Figure 9-64 (Sheet 1 of 2)  
Volume II  
Para. 9-2

Change 3 9-213

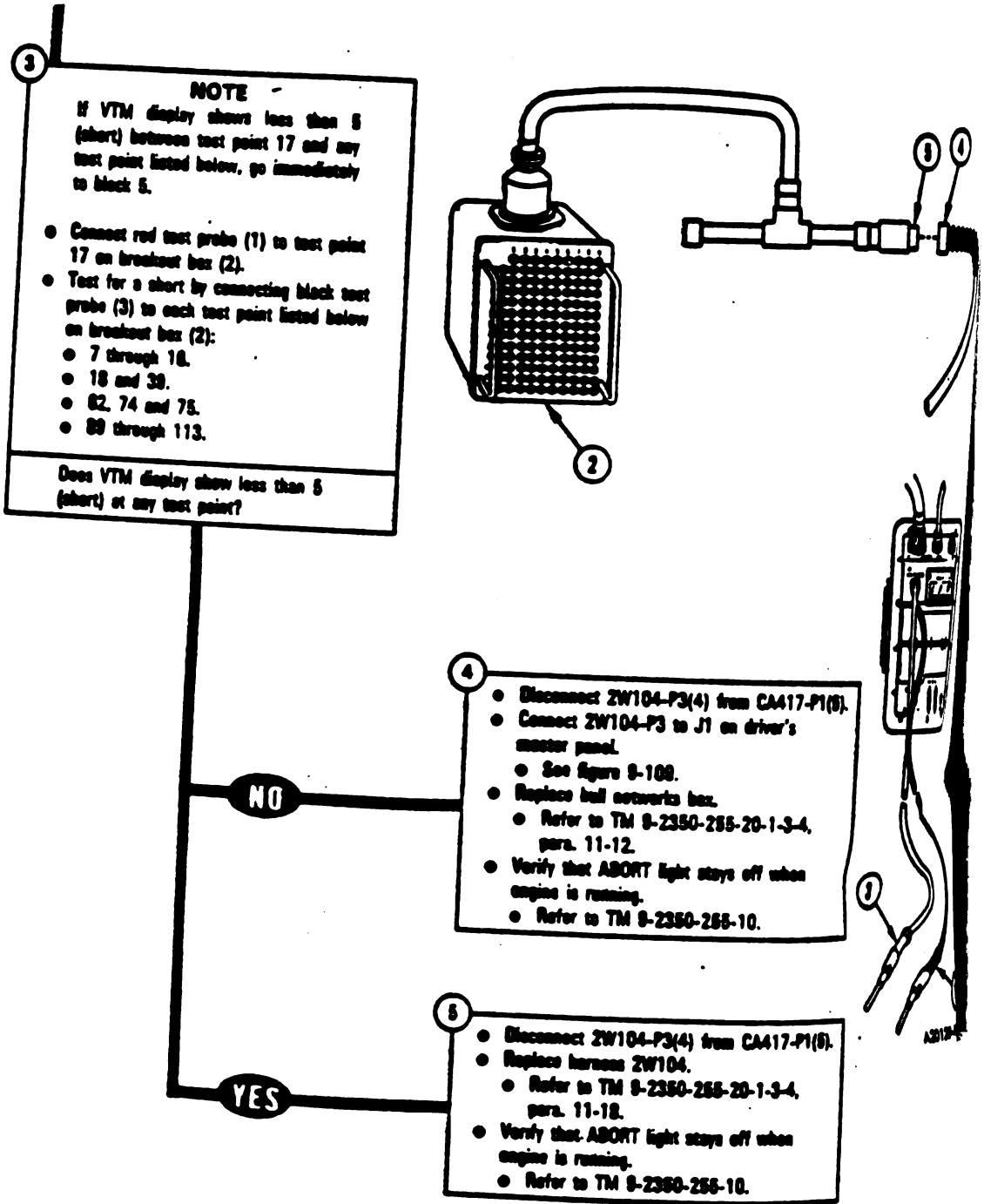


Figure 9-64 (Sheet 2 of 2)  
Volume II  
Para. 9-2

DISPLAY SHOWS  
FAULTY HNB OR  
ZW104

• 113018  
113027

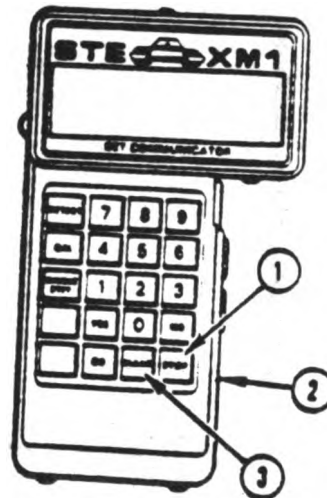
**Equipment Condition:**

- Tank parked.
- Parking brake set.
- Engine shut down.
- Vehicle master power off.

- 1
- Disconnect ZW104-P3 from CA417-P1.
    - See figure 9-18.
  - Disconnect CA418-P2 from CX208-P2.
    - See figure 9-18.
  - Disconnect CA418-P1 from J1 on driver's master panel.
    - See figure 9-18.
  - Disconnect CX305-P1 from CA301-P2.
    - See figure 9-30.

- 2
- Disconnect CA301-P1 from T.J2 on hull networks box.
    - See figure 9-30.
  - Disconnect ZW104-P1 from J8 on hull networks box.
    - See figure 9-110.
  - Prepare STE/M1 to run cable test 1390.
    - Press STOP key (1) on SETCOM (2).
    - Press CLEAR key (3).
    - Enter cable test number 1390 on SETCOM (2).
  - Run test on harness ZW104 between P32 and P37.
    - Refer to TM 9-2350-255-20-1-2-2, figure 19-13.

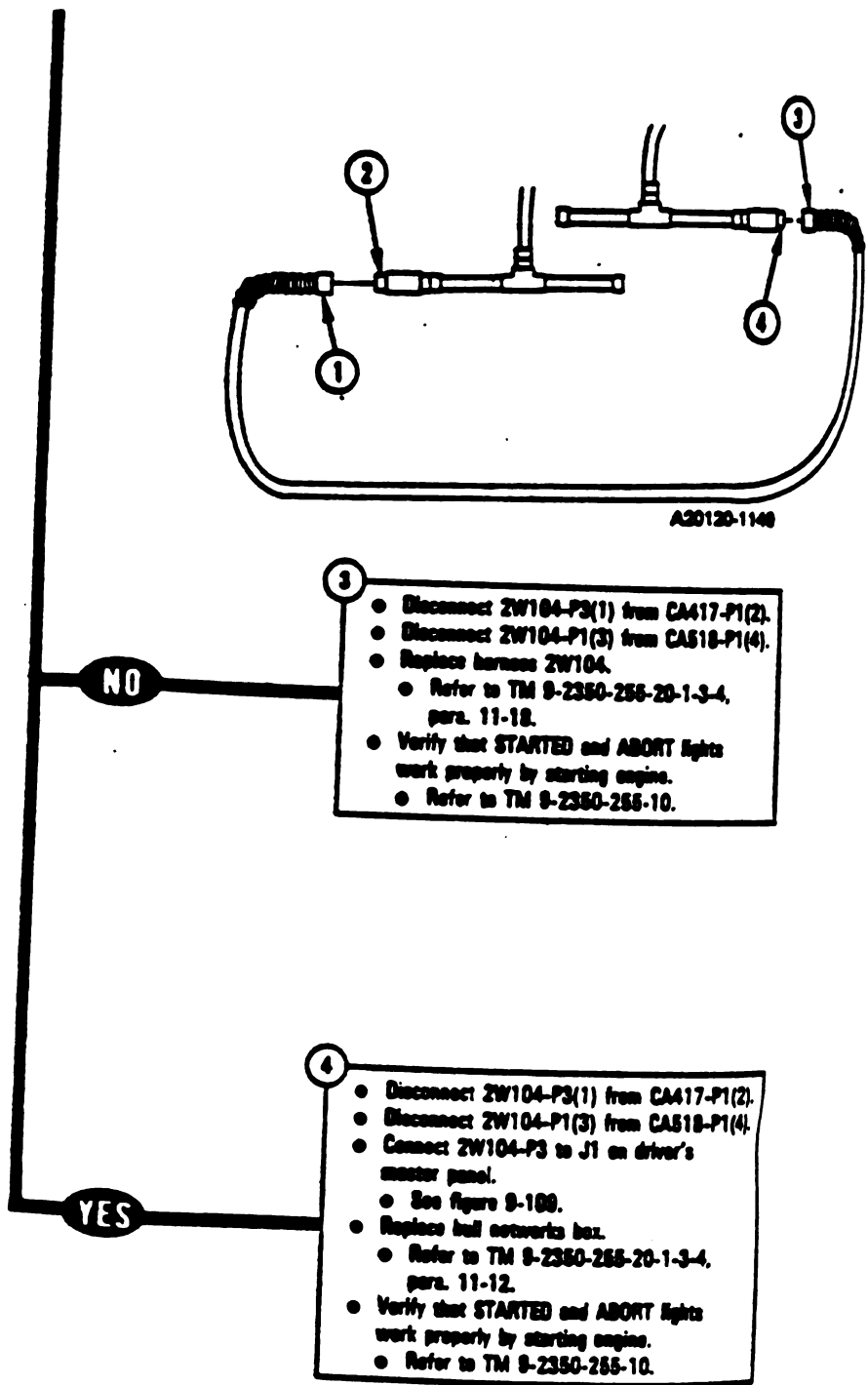
Does SETCOM display show 0000?



A20120-011R1

Figure 9-65 (Sheet 1 of 2)  
Volume II  
Para. 9-2

Change 3 9-215



DISPLAY SHOWS -  
FAULTY HNB OR  
2W104

113022

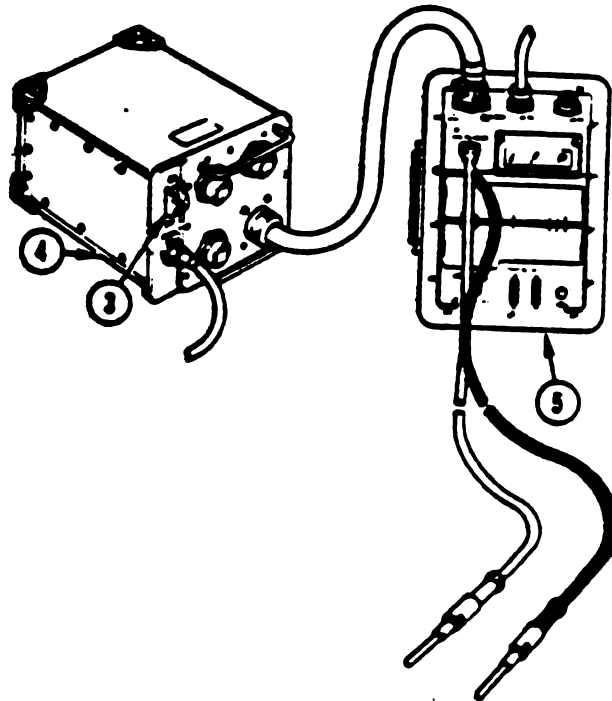
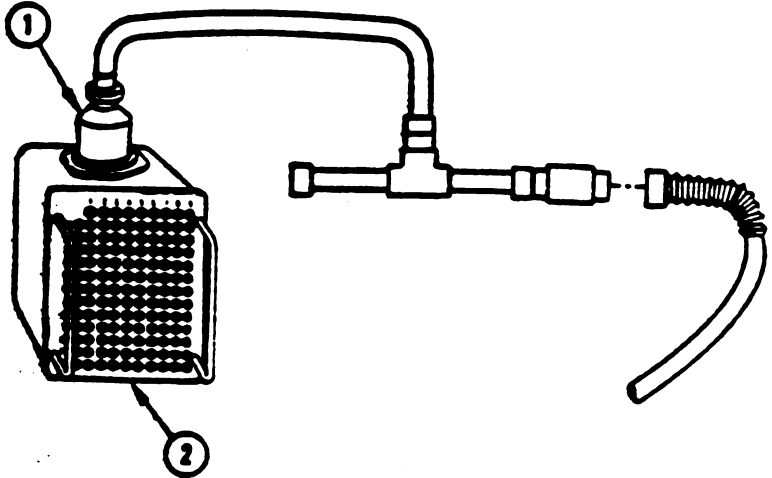
**Additional Test**

**Equipment/Special Tools:**

- Breakout Box Test Kit 12311088

**Equipment Condition:**

- Tank parked.
- Parking brake set.
- Engine shut down.
- Vehicle master power off.



A20120-1107

- 1
- Disconnect CX305-P1 from CA301-P2.

- See figure 9-30.

- Disconnect CA301-P1 from T12 on ball network box.

- See figure 9-30.

- Disconnect CX304-P2 from J2 on CB.

- See figure 9-22.

- Disconnect 2W104-P1 from J3 on ball network box.

- See figure 9-110.

- Connect CX304-P2 (1) to breakout box (2).

- 2
- Change control from SETCOM to VTM.

- Set PWR switch (3) on CB (4) to OFF to reset VTM (5).

- Set PWR switch (3) to ON.

- Prepare VTM for measuring resistance between 0 and 1500 ohms.

- Refer to TM 9-4910-572-14&P, Volume I, Appendix D.

Figure 9-05 (Sheet 1 of 2)  
Volume II  
Para. 9-2

Change 3 9-217



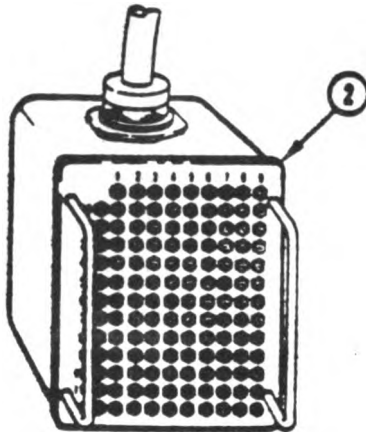
3

- Connect red test probe (1) to test point 38 on breakout box (2).

**NOTE**  
If VTM display shows less than 5 (short) between test point 38 and any test point listed below, go immediately to block 5.

- Test for a short by connecting black test probe (3) to each test point listed below on breakout box (2):
  - 7 through 37.
  - 38, 62, 74 and 75.
  - 89 through 113.

Does VTM display show less than 5 (short) at any test point?



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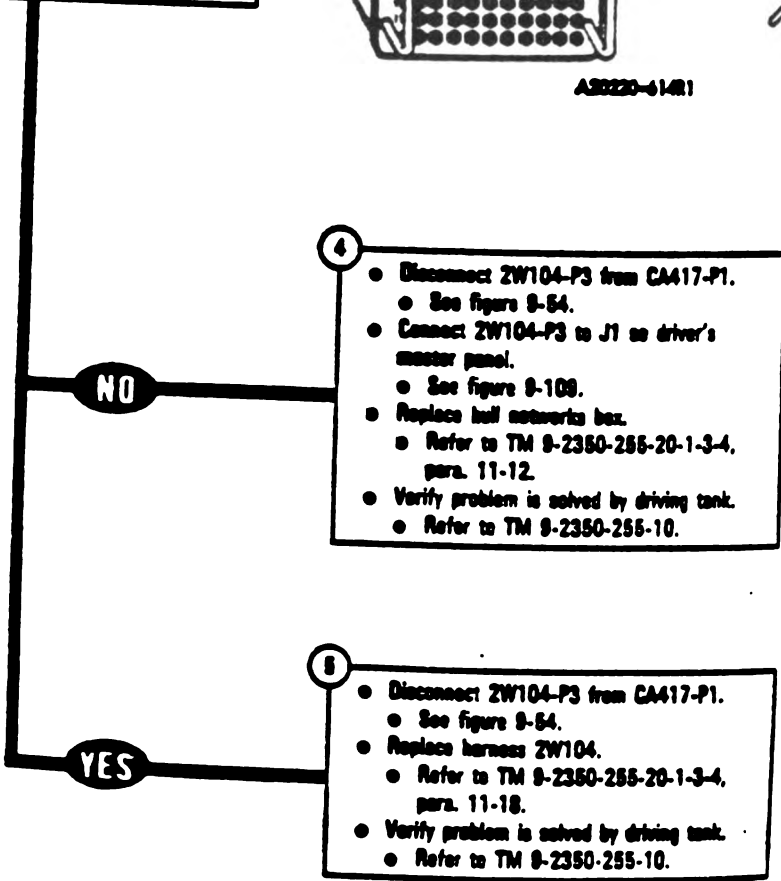


Figure 9-66 (Sheet 2 of 2)  
Volume II  
Para. 9-2

DISPLAY SHOWS -  
FAULTY STARTING  
SYSTEM

150105

Equipment Condition:

- Tank parked.
- Parking brake set.
- Engine shut down.
- Vehicle master power off.

NOTE

- This is a two-man job. Soldier A is responsible for completing the job. Soldier B is the assistant and is directed by Soldier A.
- Soldier B will only be used in block 4.

- Disconnect CX304-P1 from CA201-P2.
  - See figure 9-28.
- Disconnect CA201-P1 from J1 on electronic control unit.
  - See figure 9-28.
- Connect shorting connector to J1 on electronic control unit.
  - See figure 9-110.
- Change control from SETCOM to VTM.
  - Set PWR switch (1) on CIB (2) to OFF to reset VTM (3).
  - Set PWR switch (1) to ON.

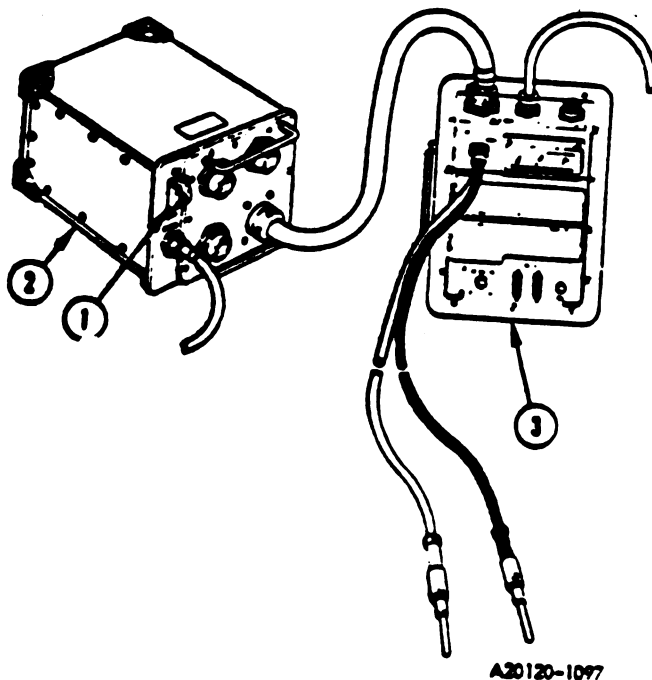
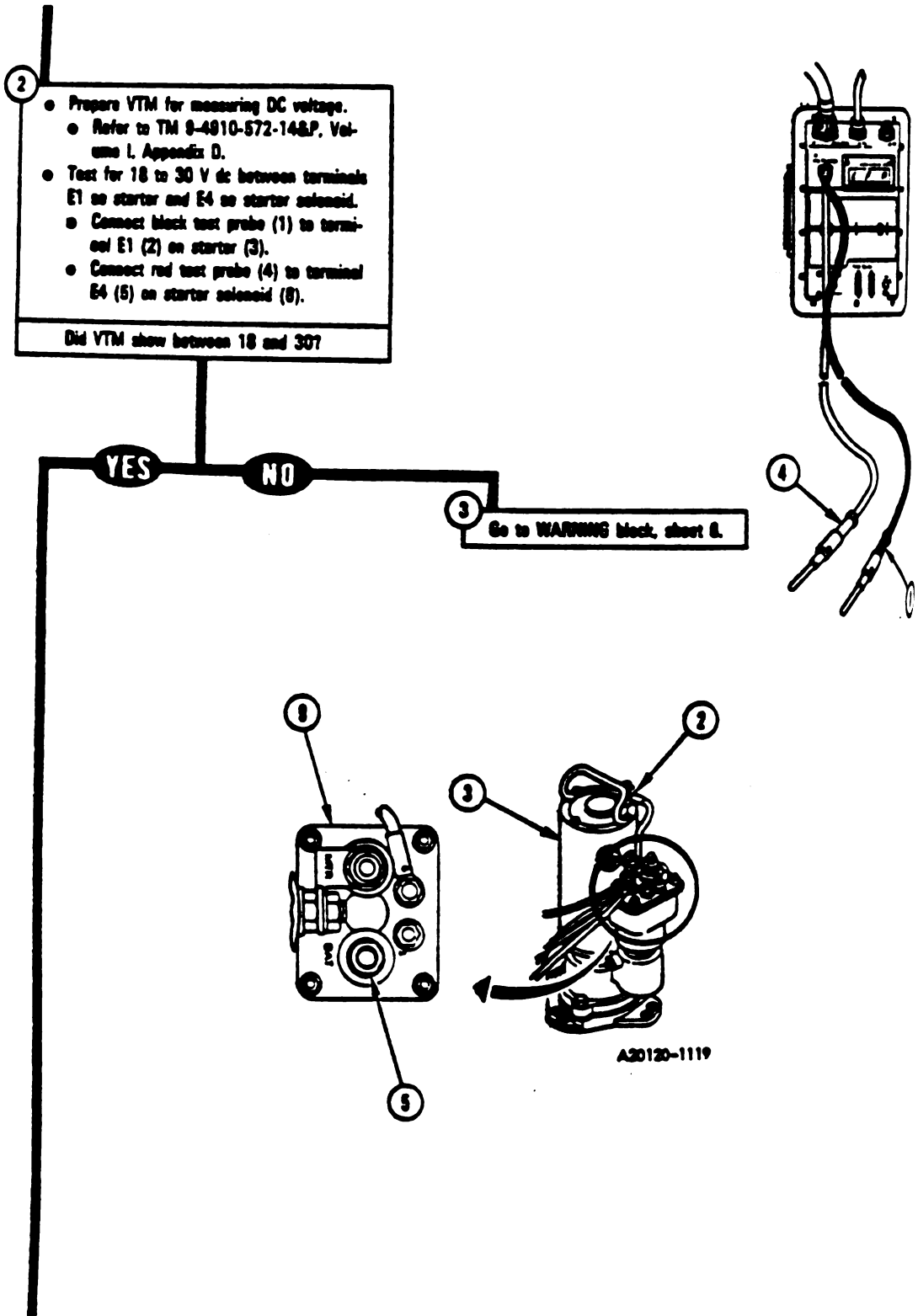


Figure 9-67 (Sheet 1 of 10)  
Volume II  
Para. 9-2

Change 3 9-219

**TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING**



*Figure 9-67 (Sheet 2 of 10)  
Volume II  
Para. 9-2*

9-220 Change 3

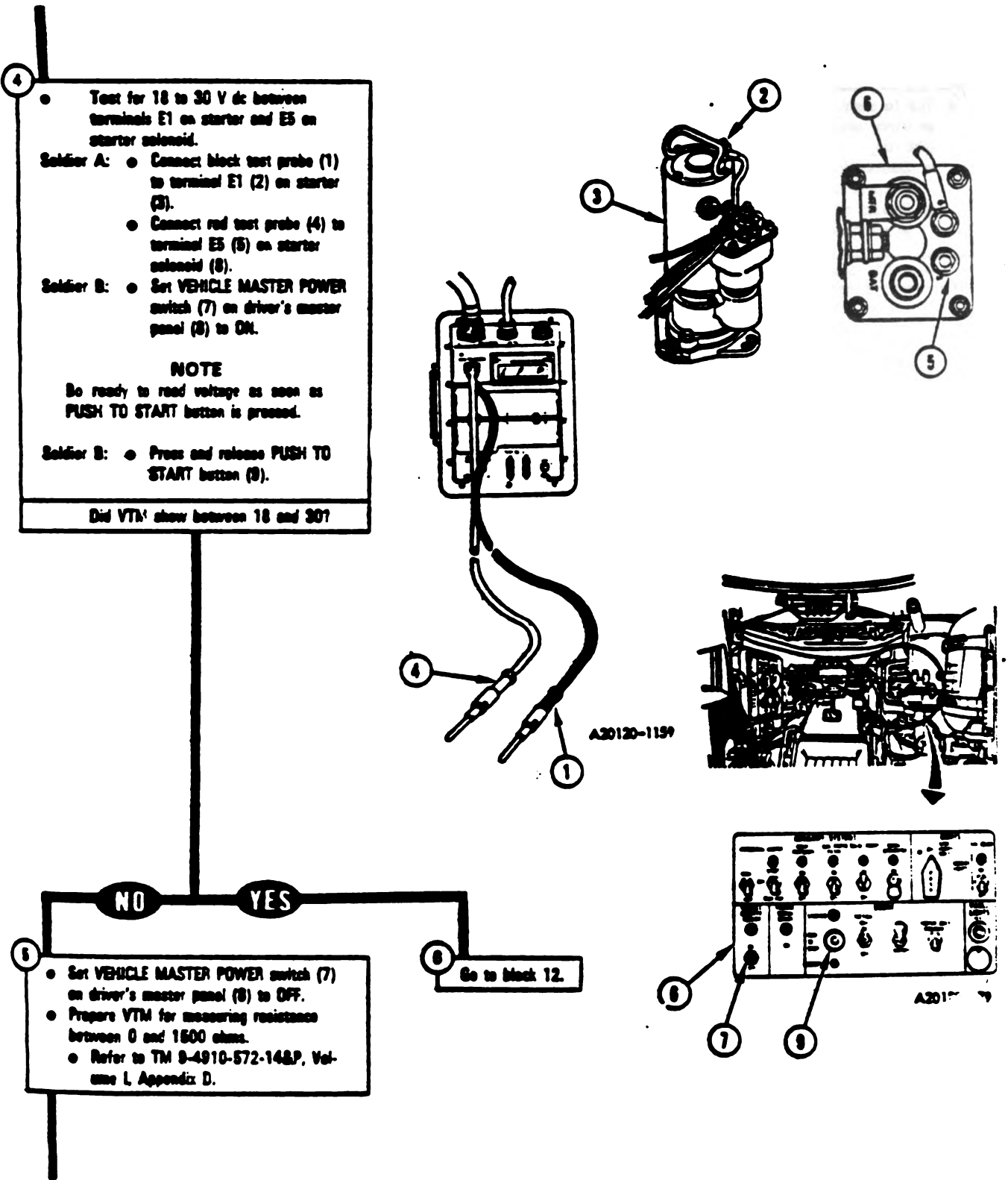


Figure 9-67 (Sheet 3 of 10)  
Volume II  
Para. 9-2

Change 3 9-221

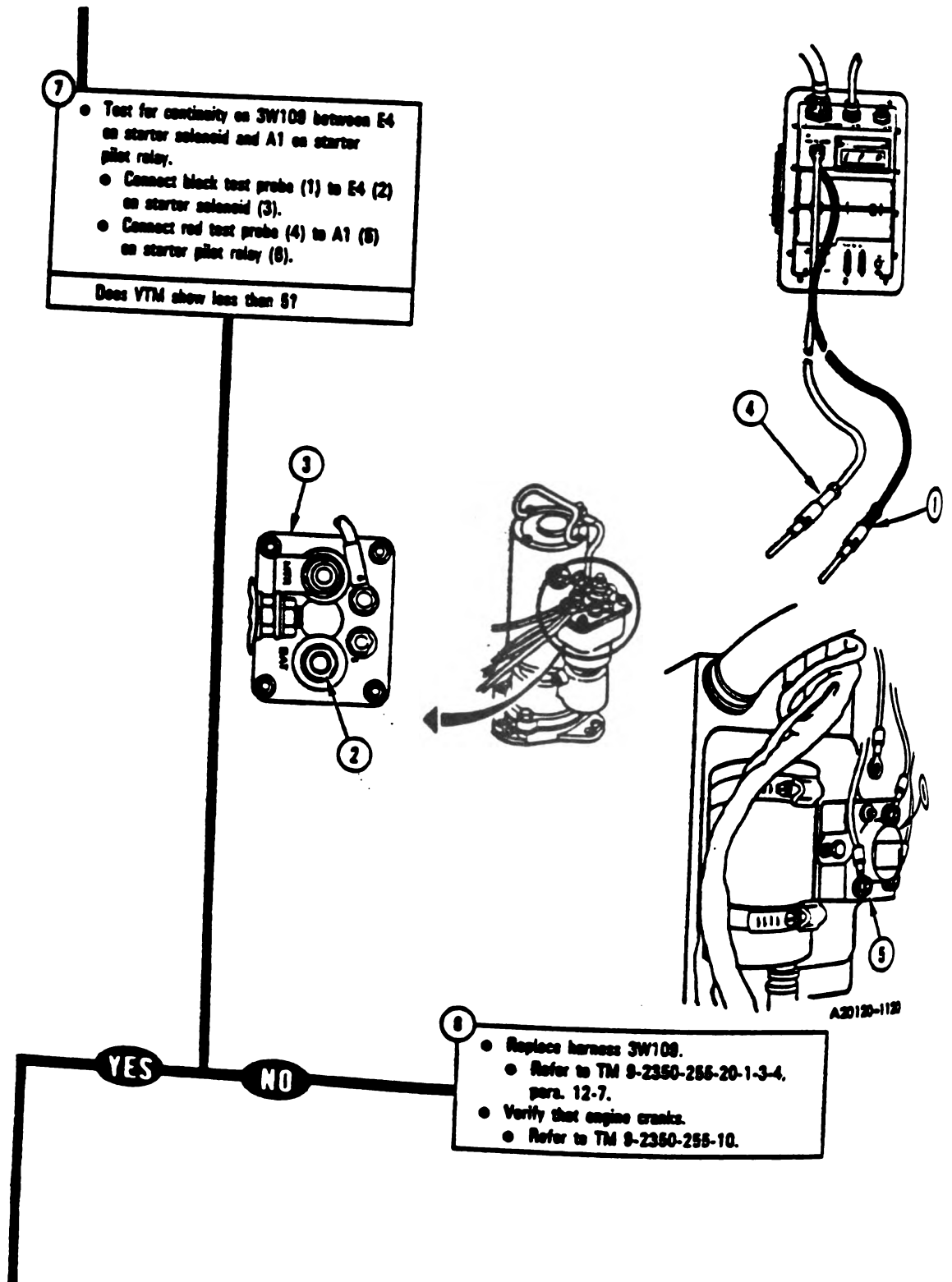


Figure 9-67 (Sheet 4 of 10)  
Volume II  
Para. 9-2

9-222 Change 3

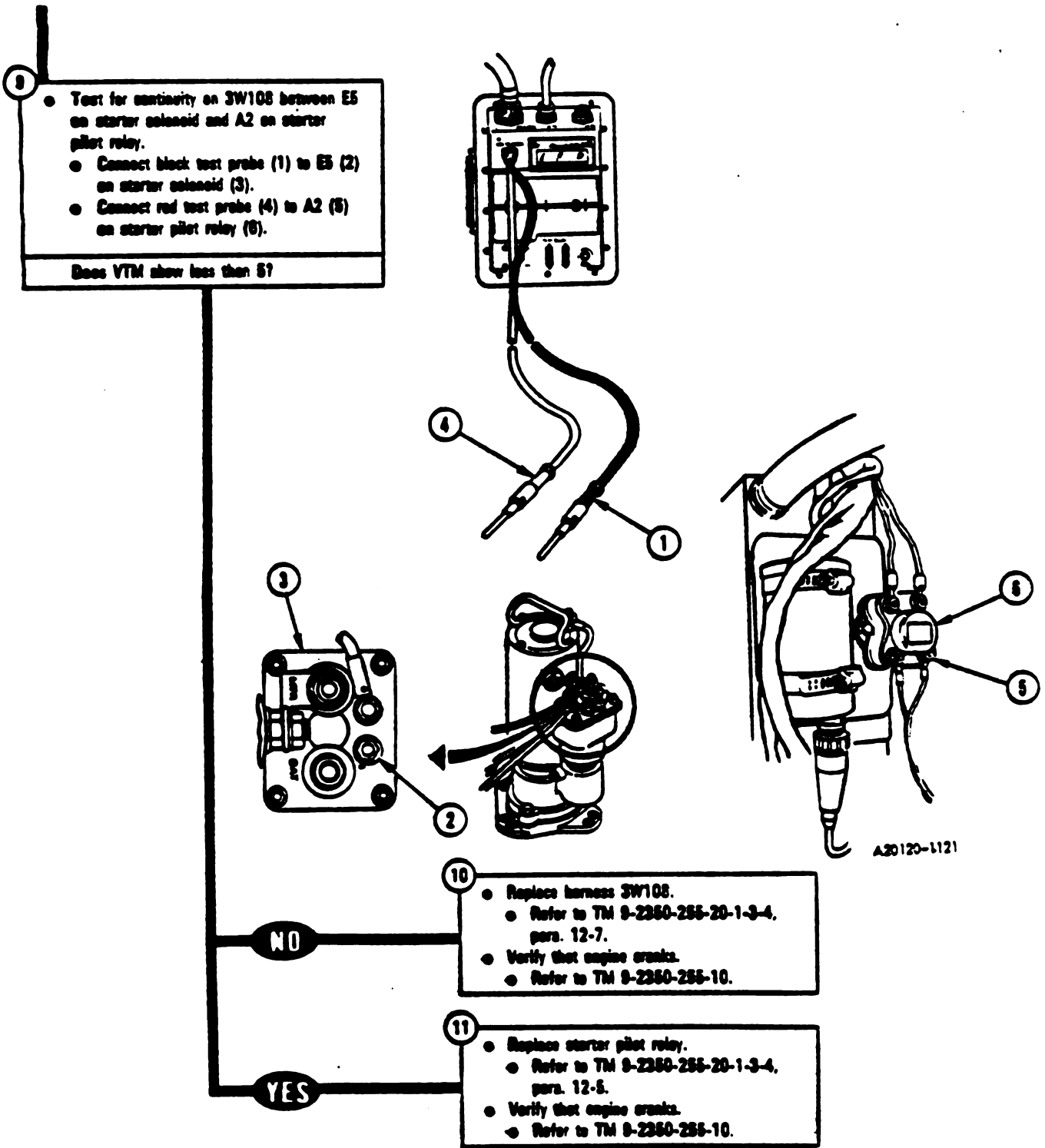
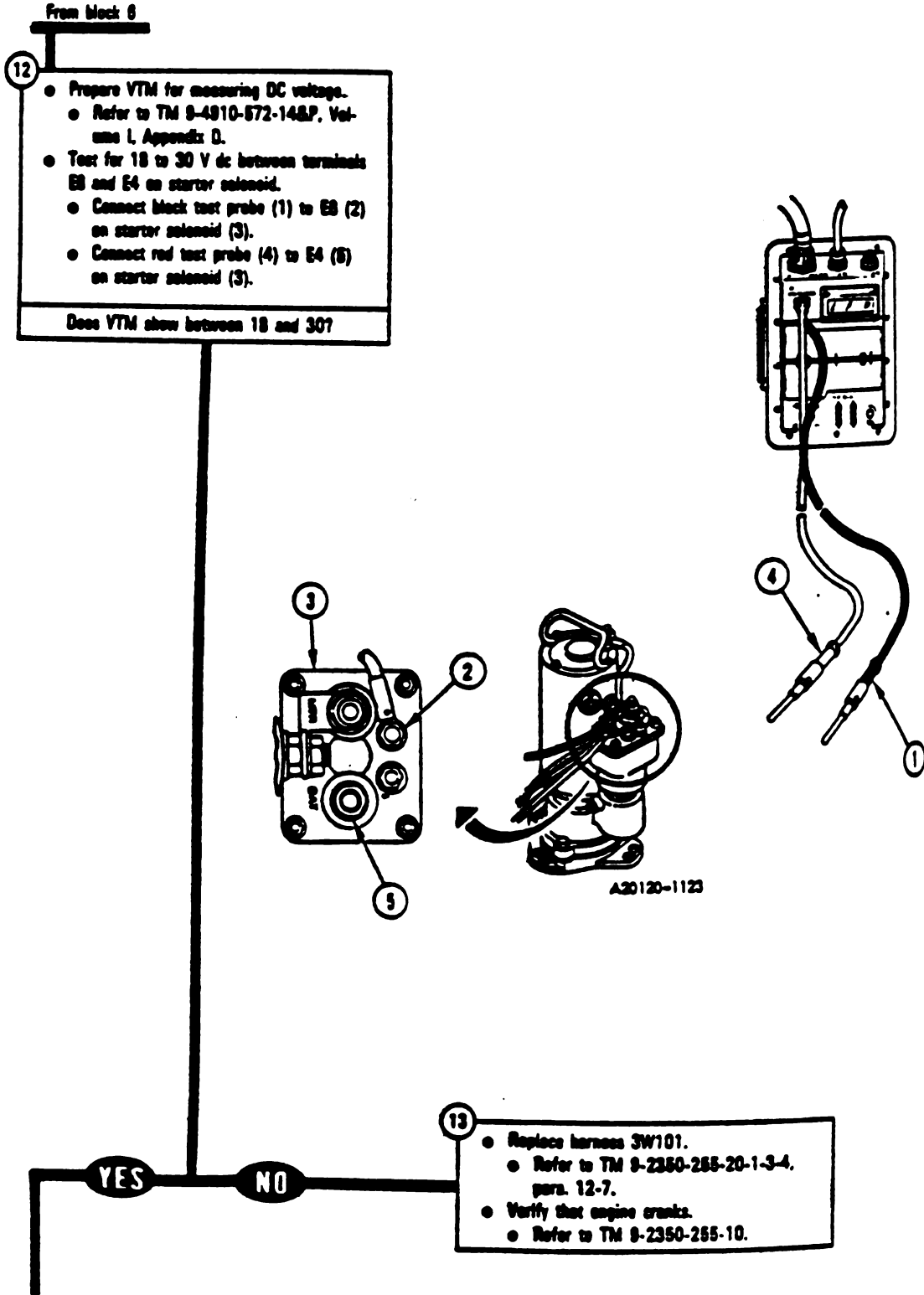


Figure 9-57 (Sheet 5 of 10)  
Volume II  
Para. 9-2

Change 3 9-223

**TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING**



*Figure 9-67 (Sheet 6 of 10)  
Volume II  
Para. 9-2*

9-224 Change 3

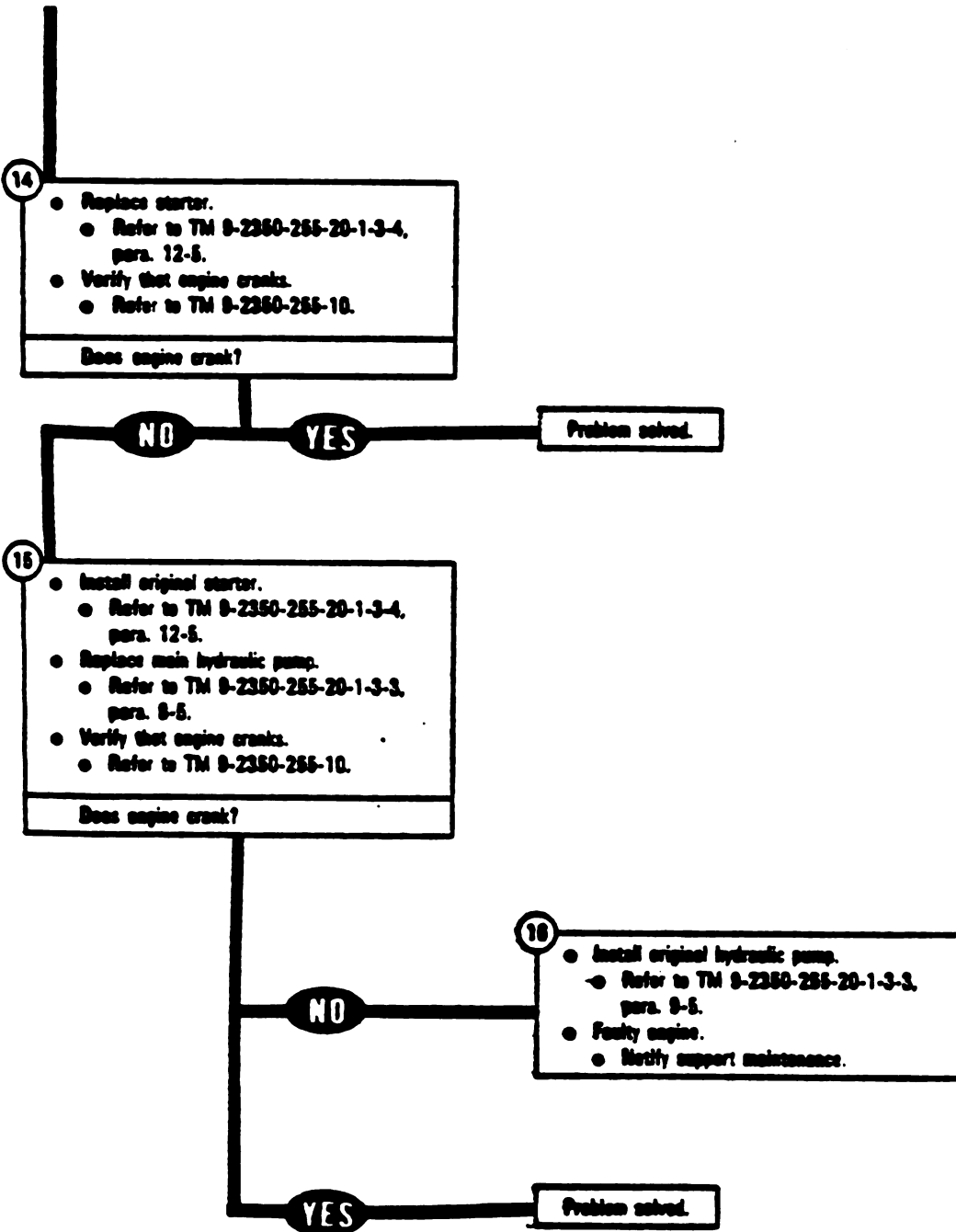


Figure 9-67 (Sheet 7 of 10)  
Volume II  
Para. 9-2



**TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING**

From block 3

**WARNING**

Harness SW101/2 is connected directly to the batteries. Failure to disconnect battery bus bar could cause death or serious injury when touching terminals.

17

**NOTE**

Make sure vehicle master power is off.

- Disconnect battery bus bar.
  - Loosen screws (1, 2) with 3/4 inch socket, extension, handle, and 3/4 inch wrench.
  - Swing bus bar (3) all the way to the left away from screw (2).

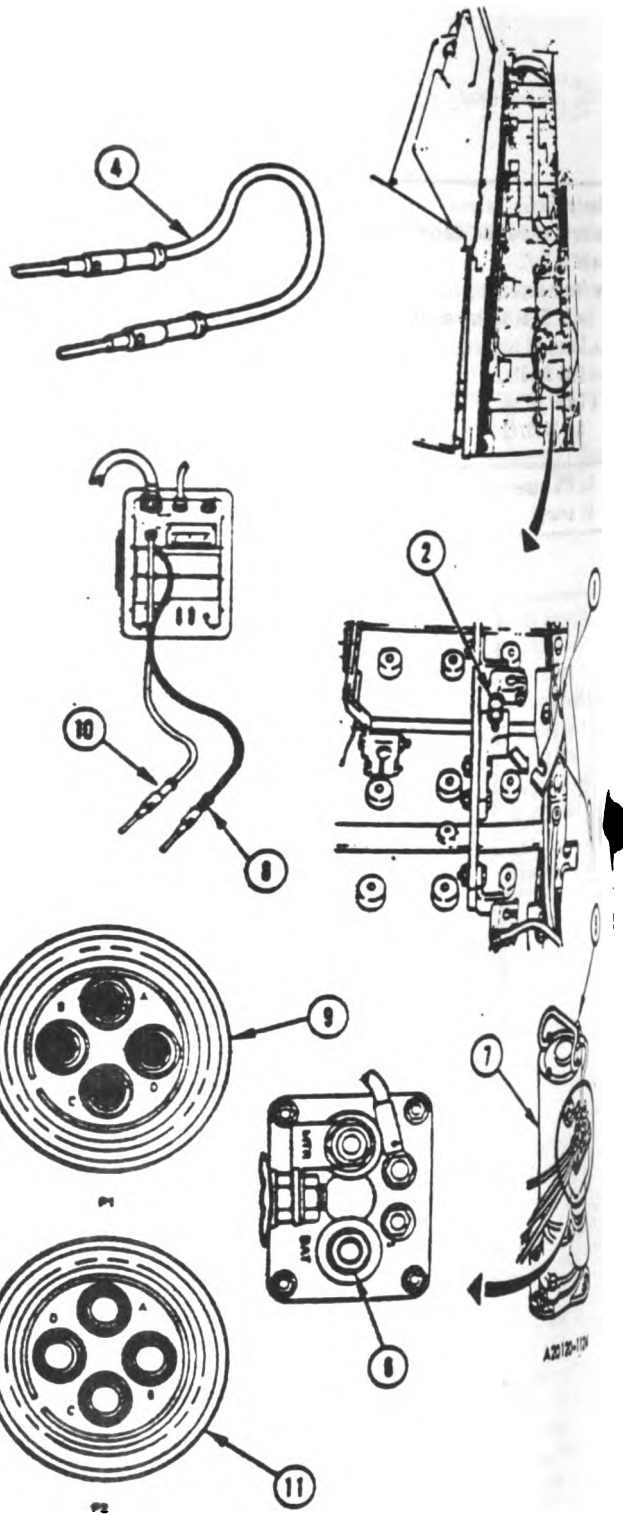
18

- Disconnect SW101/2-P1 from ZW157-J1.
- See figure 9-111.
- Disconnect SW101/2-P2 from ZW158-J1.
- See figure 9-111.
- Connect jumper (4) between terminals E1 (B) and E4 (B) on starter assembly (7).
- Prepare VTM for measuring resistance between 0 and 1800 ohms.
- Refer to TM 9-4810-572-14&P, Volume I, Appendix D.

19

- Test for continuity on SW101/2 between contact P1-C and contacts P2-C and P2-D.
  - Connect black test probe (8) to contact C on P1 (9).
  - Connect red test probe (10) to contacts C and D on P-2 (11).
- Test for continuity on SW101/2 between contact P1-D and contacts on P2-D.
  - Connect black test probe (8) to contact D on P1 (9).
  - Connect red test probe (10) to contacts C and D on P2 (11).
- Disconnect jumper (4) from starter assembly (7).

Does VTM show less than 5 between all contacts?



**Figure 9-67 (Sheet 8 of 10)  
Volume II  
Para. 9-2**

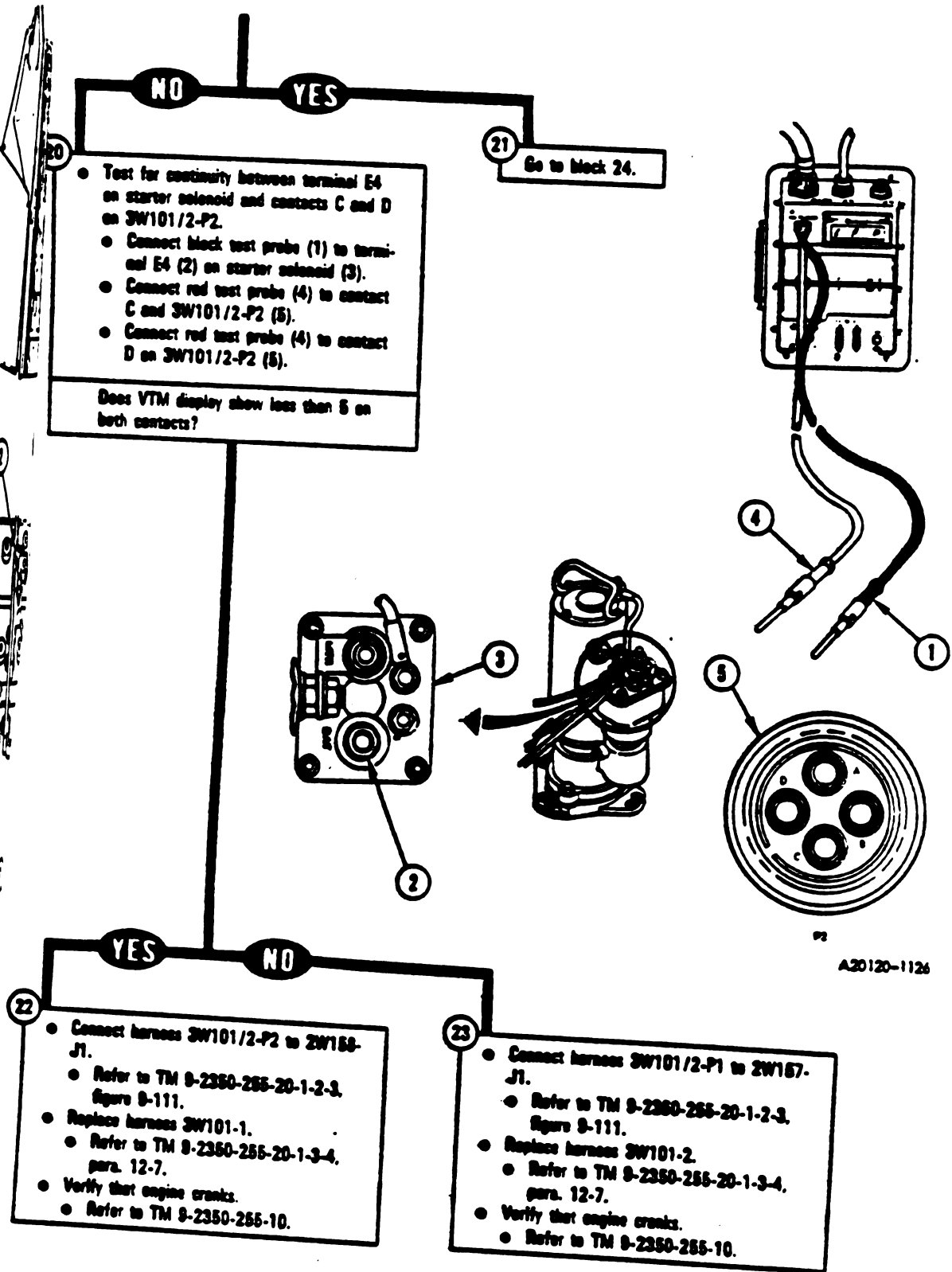
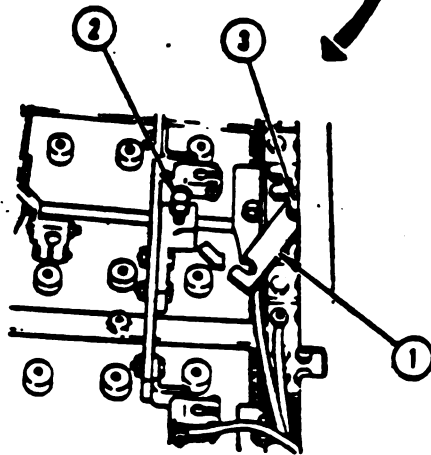
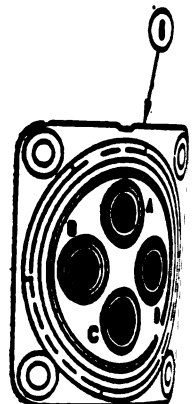
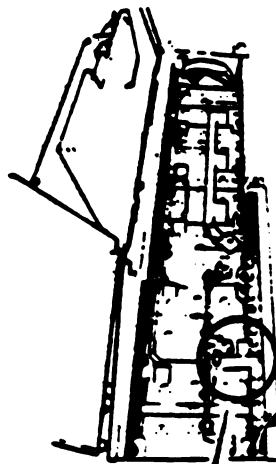


Figure 9-67 (Sheet 9 of 10)  
Volume II  
Para. 9-2

**TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING**

From block 21

- 24**
- Connect battery bus bar.
    - Swing bus bar (1) to the right to screw (2).
    - Tighten screws (2) and (3) with 3/4-inch socket, extension, handle, and 3/4-inch wrench.
  - Prepare VTM for measuring DC voltage.
    - Refer to TM 9-4910-572-14&P, Volume I, Appendix D.
  - Test for 18 to 30 V dc between negative battery bus bar and contacts C and D on ZW158-J1.
    - Connect black test probe (4) to negative bus bar (1).
    - Connect red test probe (5) to contact C and then to D on ZW158-J1 (6).



**YES**      **NO**

- 25**
- Connect 3W101/2-P2 to ZW158-J1.
  - Refer to TM 9-2350-255-20-1-2-3, figure 9-111.
  - Replace harness ZW157.
    - Refer to TM 9-2350-255-20-1-3-4, para. 11-18.
  - Verify that engine cranks.
    - Refer to TM 9-2350-255-10.

- 26**
- Connect 3W101/2-P1 to ZW157-J1.
  - Refer to TM 9-2350-255-20-1-2-3, figure 9-111.
  - Replace harness ZW158.
    - Refer to TM 9-2350-255-20-1-3-4, para. 11-18.
  - Verify that engine cranks.
    - Refer to TM 9-2350-255-10.

*Figure 9-67 (Sheet 10 of 10)  
Volume II  
Para. 9-2*

9-228 Change 3

**DISPLAY SHOWS -  
FAULTY CABLE GROUP  
OR ECU**

150105

**Equipment Condition:**

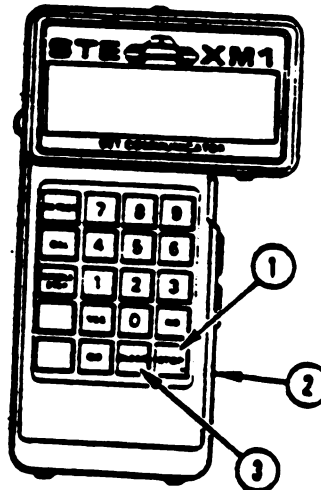
- Tank parked.
- Parking brake set.
- Engine shut down.
- Vehicle master power off.

- Disconnect CX305-P1 from CA301-P2.
  - See figure 8-31.
- Disconnect CA301-P1 from TJ1 on driver's master panel.
  - See figure 8-50.
- Disconnect CX304-P1 from CA201-P1.
  - See figure 8-51.
- Disconnect CA201-P2 from J1 on electronic control unit.
  - See figure 8-51.

- Connect starting connector to J1 on electronic control unit.
  - See figure 8-110.
- Disconnect ZW104-P3 from J1 on driver's master panel.
  - See figure 8-109.
- Disconnect ZW105-P4 from ZW104-J1.
  - See figure 8-110.

- Prepare STE/M1 to run cable test 1390.
  - Press STOP key (1) on SETCOM (2).
  - Press CLEAR key (3).
  - Enter cable test number 1390 on SETCOM (2).
- Run test on harness ZW104 between J1 and P3.
  - Refer to TM 8-2350-255-20-1-2-2, figure 18-13.

Does SETCOM display show GOOD?



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Figure 8-68 (Sheet 1 of 8)  
Volume II  
Para. 8-2

Change 4 8-229

TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING

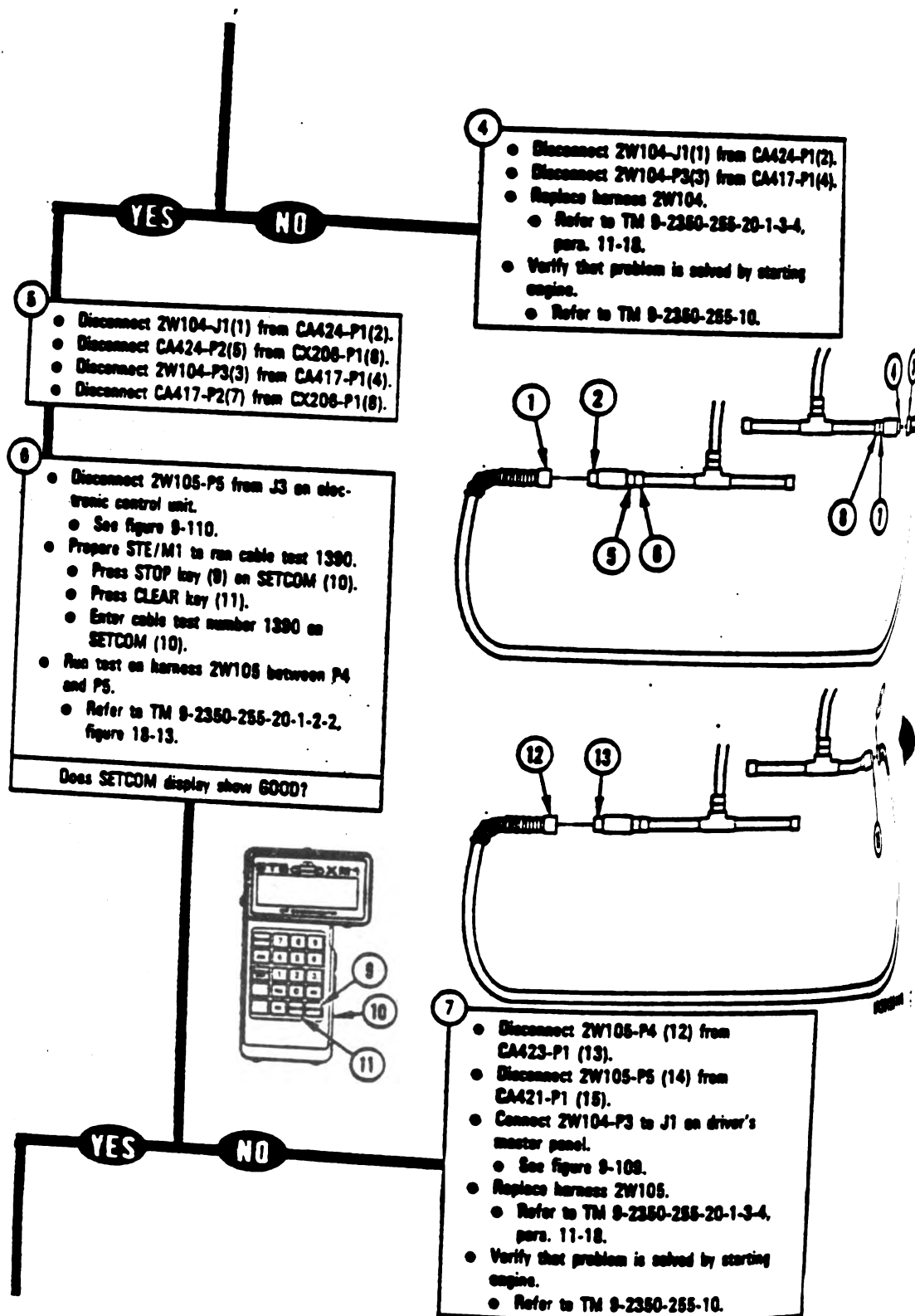
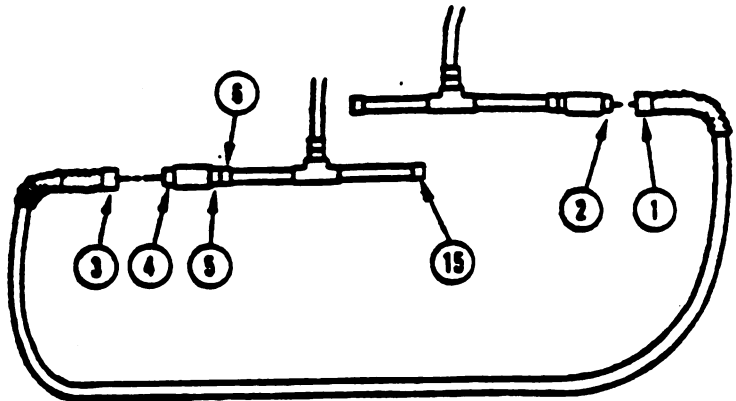


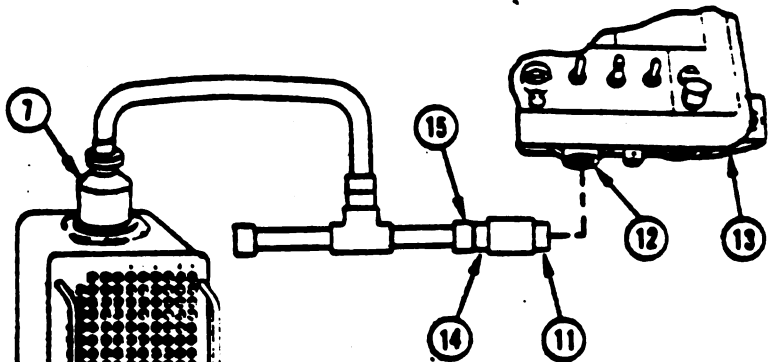
Figure 9-68 (Sheet 2 of 8)  
Volume II  
Para. 9-2

9-230 Change 4

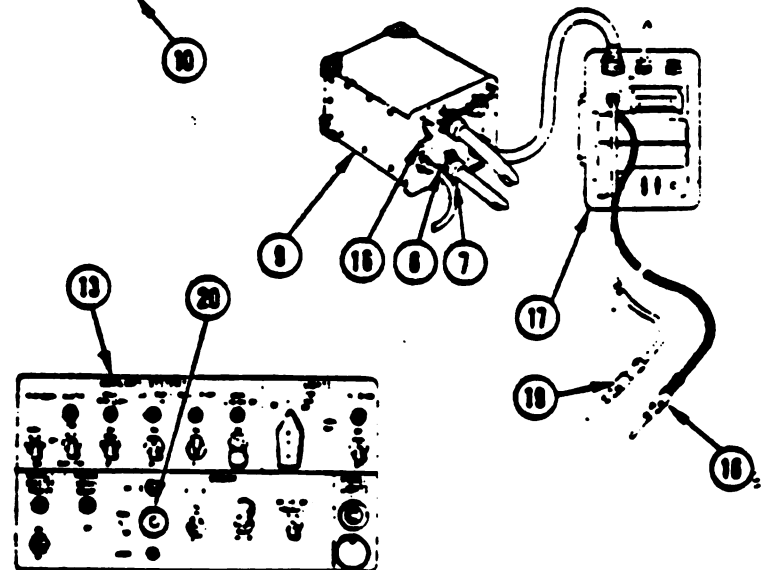
- 8
- Disconnect ZW105-P4 (1) from CA423-P1 (2).
  - Disconnect ZW105-P5 (3) from CA421-P1 (4).
  - Disconnect CA421-P2 (5) from CX206-P1 (6).
  - Disconnect CX305-P2 (7) from J2 (8) on CIB (9).



- 9
- Connect CX305-P2 (7) to breakout box (10).
  - Connect CA418-P1 (11) to J1 (12) on driver's master panel (13).
  - Connect CA418-P2 (14) to CX206-P2 (15).



- 10
- Change control from SETCOM to VTM.
    - Set PWR switch (16) on CIB (9) to OFF to reset VTM (17).
    - Set PWR switch (16) to ON.
  - Prepare VTM for measuring resistance between 0 and 1500 ohms.
    - Refer to TM 8-4910-572-14&P, Volume I, Appendix D.



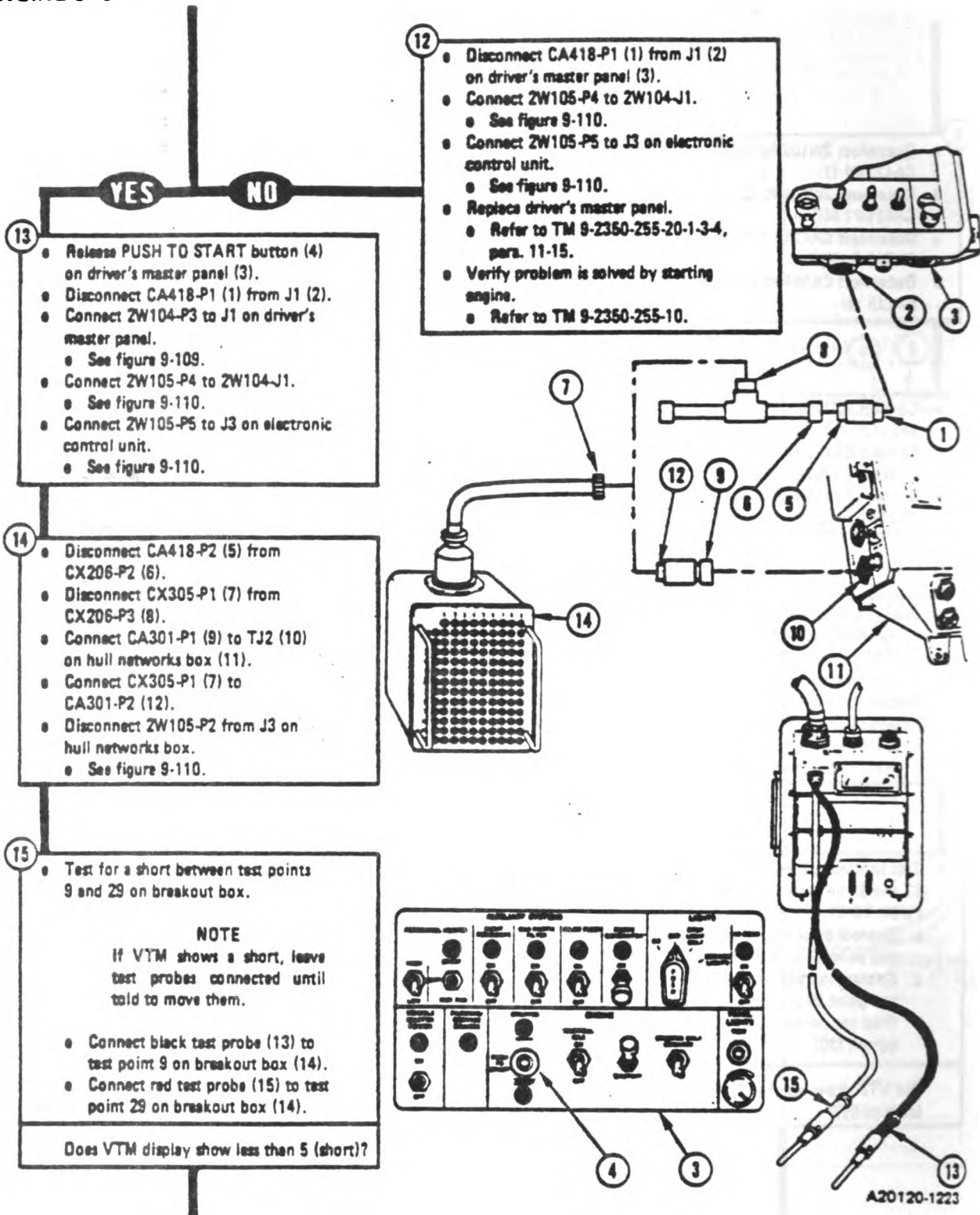
- 11
- Test continuity between test points 27 and 28 on breakout box when PUSH TO START button is held.
    - Connect black test probe (18) to test point 27 on breakout box (10).
    - Connect red test probe (18) to test point 28 on breakout box (10).
    - Press and hold PUSH TO START button (20).

Did VTM show less than 5 (continuity)?

A20120-1220

Figure 9-68 (Sheet 3 of 8)  
Volume II  
Para. 9-2

**TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING**



**Figure 9-68 (Sheet 4 of 8)  
Volume II  
Para. 9-2**

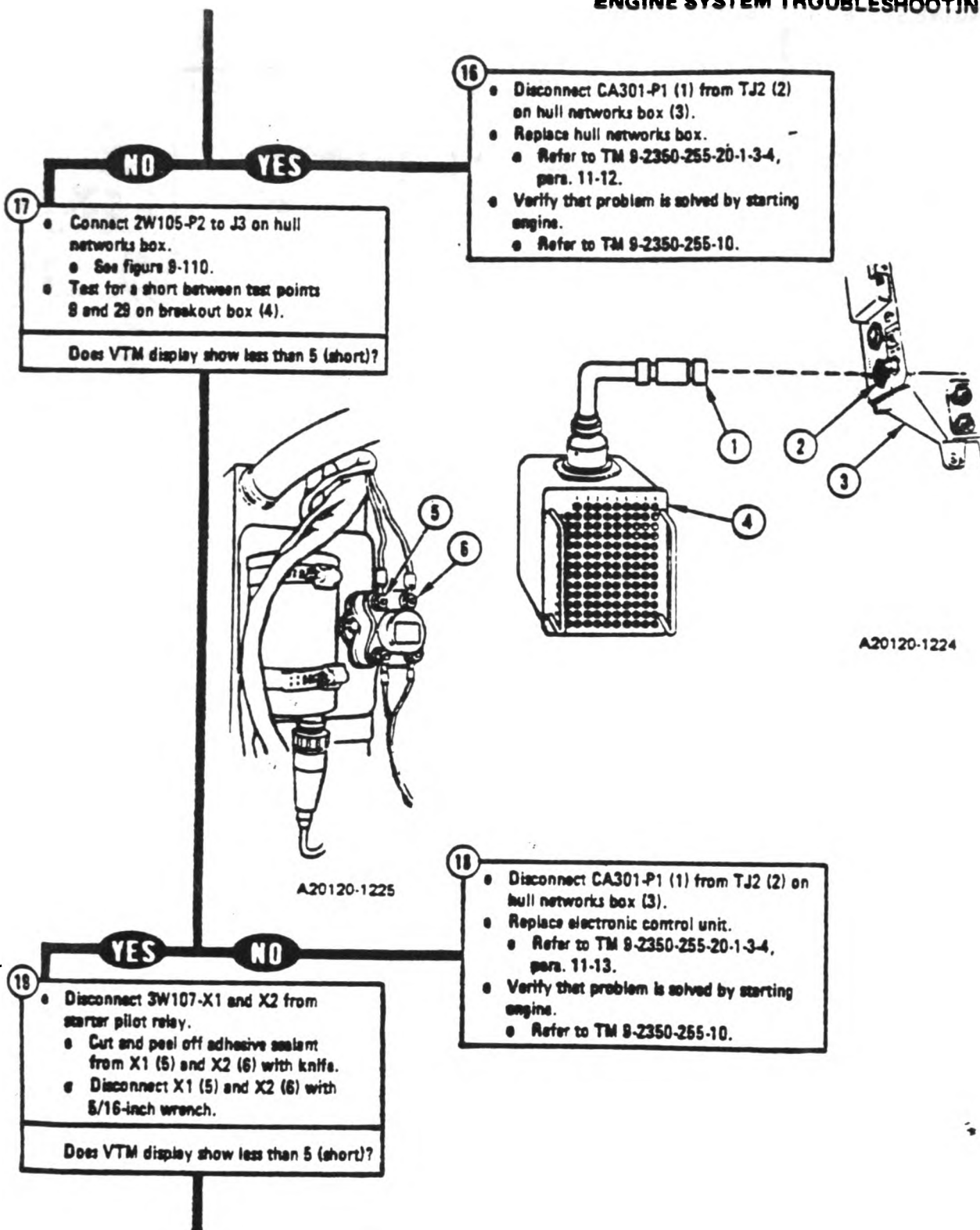


Figure 9-68 (Sheet 5 of 8)  
Volume II  
Para. 9-2



TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING

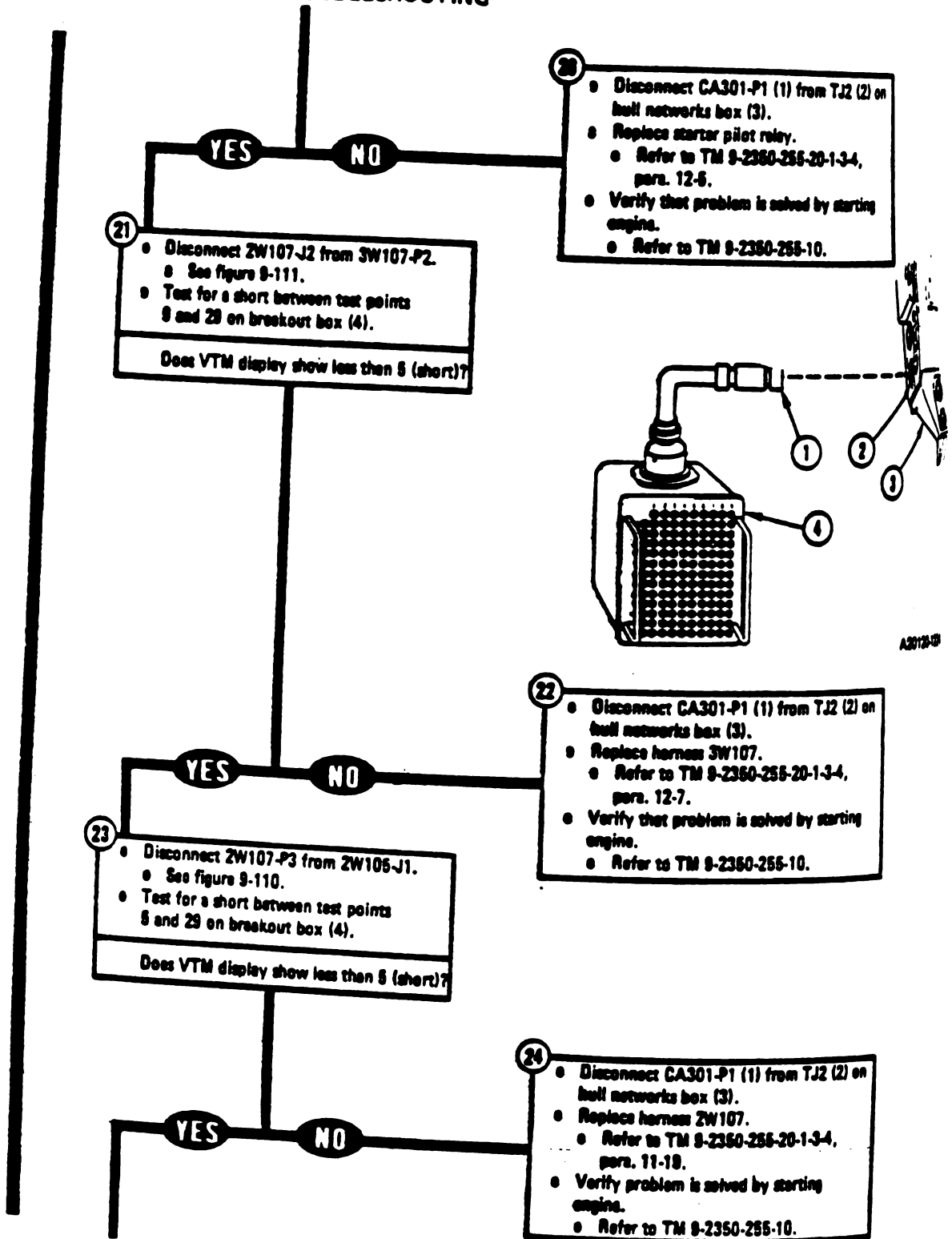
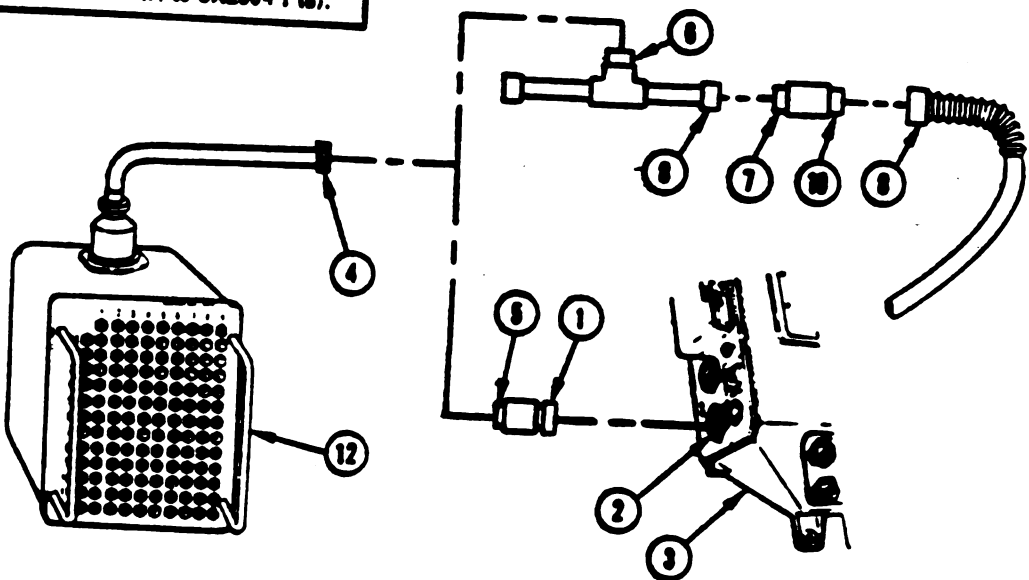


Figure 9-68 (Sheet 6 of 8)  
Volume II  
Para. 9-2

9-234 Change 4

10  
by  
35-34-44  
and by  
15-11

- Disconnect CA301-P1 (1) from TJ2 (2) on hull networks box (3).
- Disconnect CX305-P1 (4) from CA301-P2 (5).
- Connect CX305-P1 (4) to CX206-P3 (6).
- Connect CA421-P2 (7) to CX206-P1 (8).

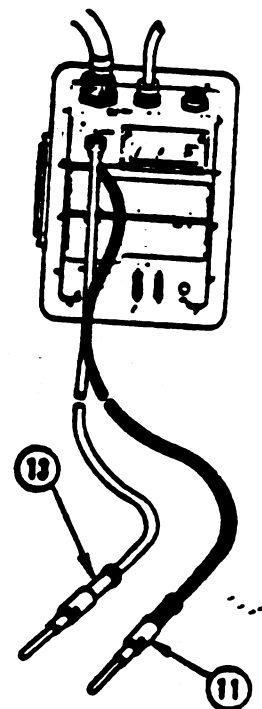


- 26
- Disconnect ZW105-P5 from J3 on electronic control unit.
  - See figure 9-110.
  - Connect ZW105-P5 (9) to CA421-P1 (10).

- 27
- Test for a short between test points listed in Table A on breakout box.
  - Connect black test probe (11) to test points listed in Table A on breakout box (12).
  - Connect red test probe (13) to test points listed in Table A on breakout box (12).
- Does VTM display show less than 5 (ohms) between any test points?

Table A

Black Test Probe Test Point	Red Test Probe Test Point
96	84
21	84
11	21



A30120-1226

Figure 9-68 (Sheet 7 of 8)  
Volume II  
Para. 9-2

Change 4 9-234.1

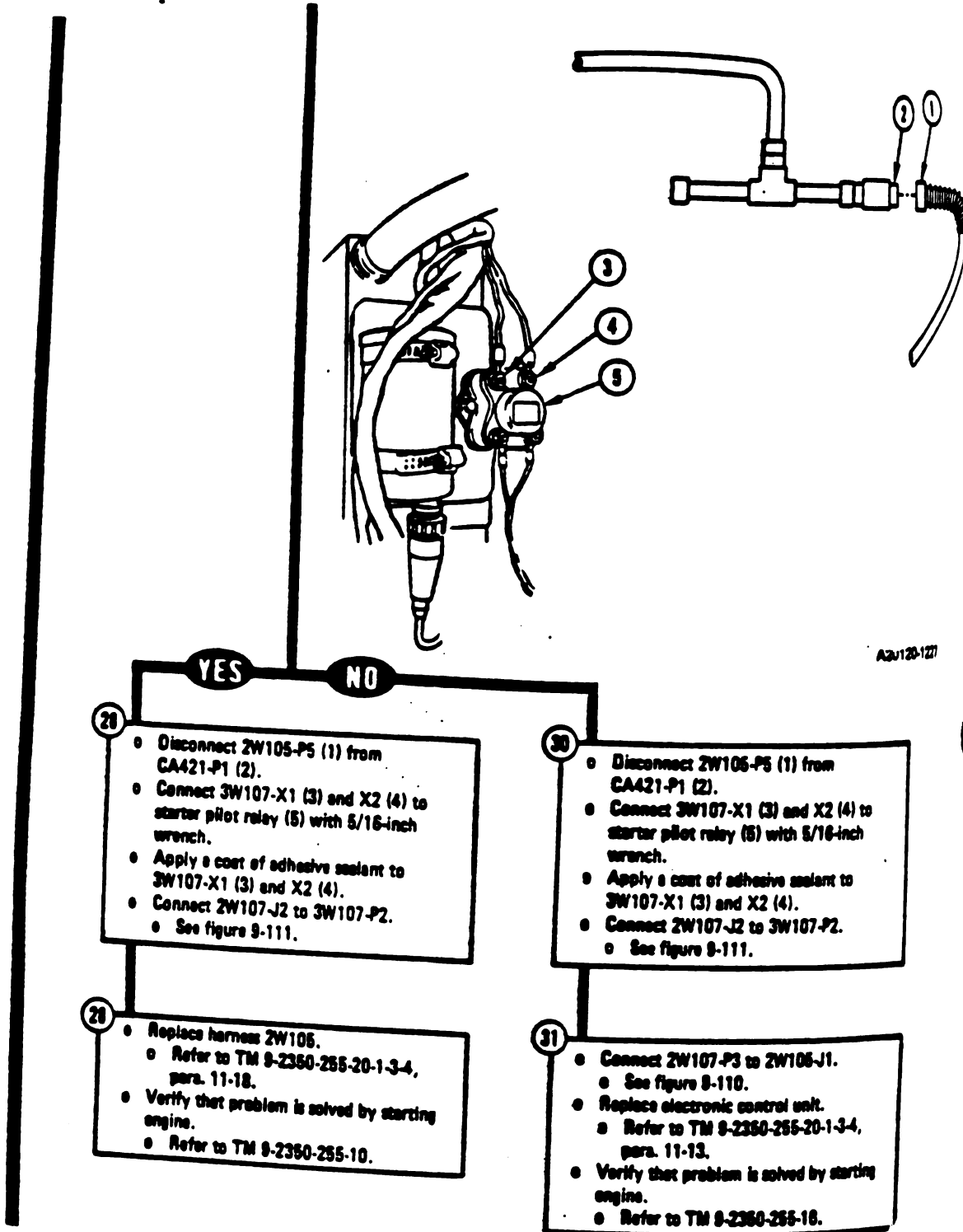


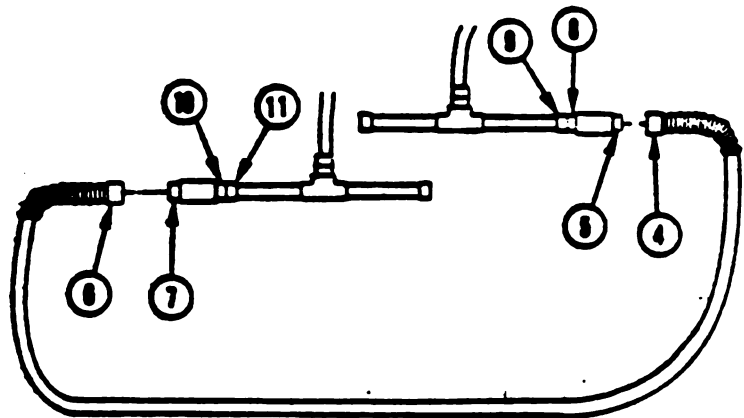
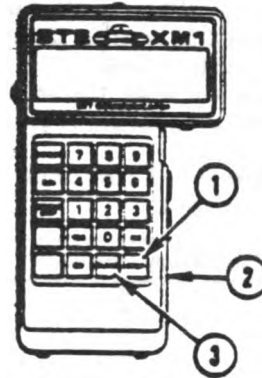
Figure 9-68 (Sheet 8 of 8)  
Volume II  
Para. 9-2

DISPLAY SHOWS .  
FAULTY DMP, 2W104,  
2W105

**Equipment Condition:**

- Tank parked.
- Parking brake set.
- Engine shut down.
- Vehicle master power off.

- 150117
- 150727
- 150745



A20120-1177

- 1
- Disconnect CX304-P1 from CA201-P1.
  - See figure 9-51.
  - Disconnect CA201-P2 from J1 on electronic control unit.
  - See figure 9-110.
  - Disconnect CA422-P2 from CX206-P2.
  - See figure 9-20.
  - Disconnect CA422-P1 from J3 on electronic control unit.
  - See figure 9-20.

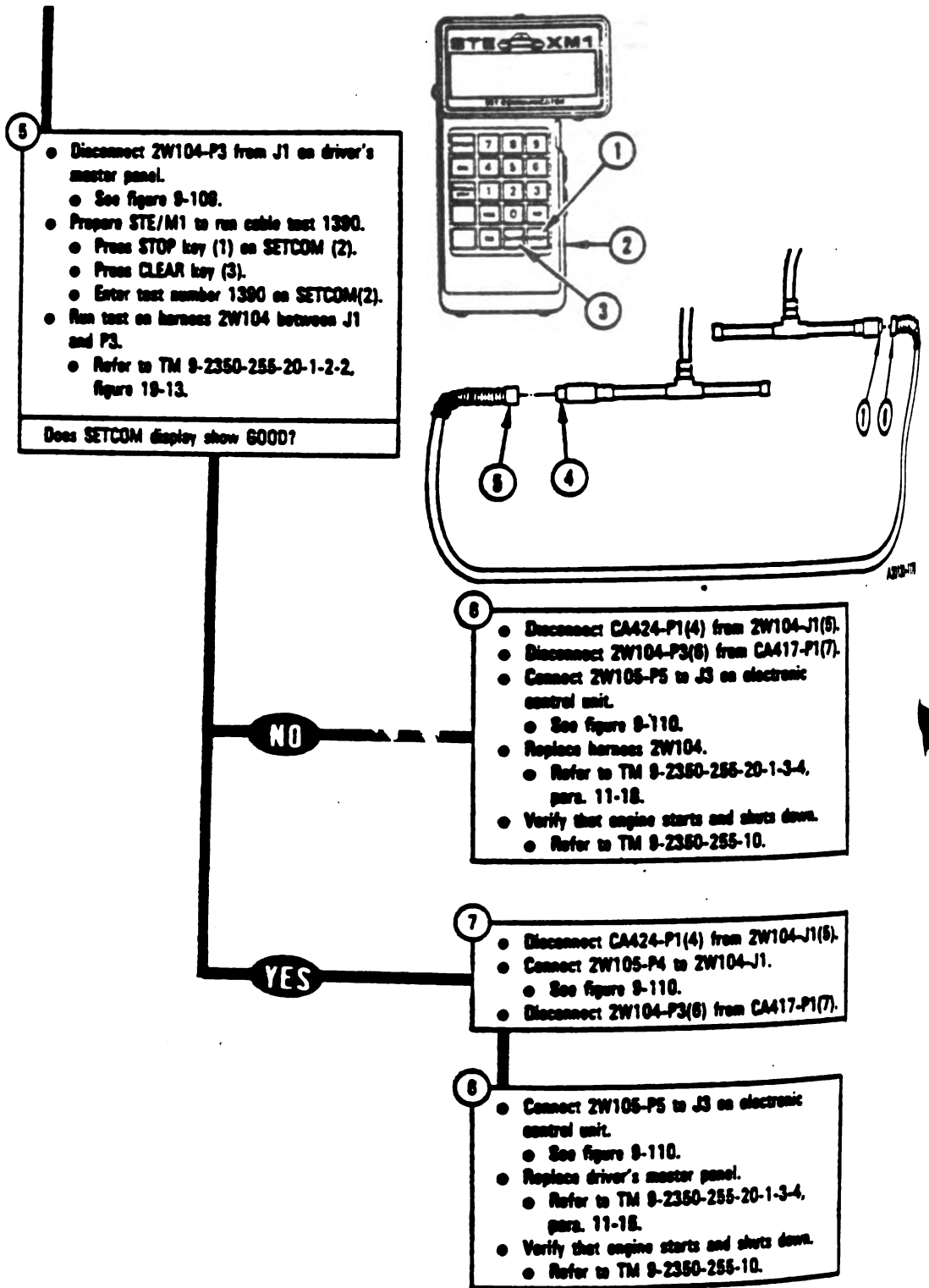
- 2
- Disconnect 2W105-P4 from 2W104-J1.
  - See figure 9-110.
  - Prepare STE/M1 to run cable test 1390.
  - Press STOP key (1) on SETCOM (2).
  - Press CLEAR key (3).
  - Enter test number 1390 on SETCOM(2).
  - Run test on harness 2W105 between P4 and P5.
  - Refer to TM 9-2350-255-20-1-2-2, figure 19-13.
- Does SETCOM display show GOOD?

- 3
- Disconnect 2W105-P5(4) from CA421-P1(5).
  - Disconnect 2W105-P4(6) from CA423-P1(7).
  - Replace harness 2W105.
  - Refer to TM 9-2350-255-20-1-3-4, para. 11-18.
  - Verify that engine starts and shuts down.
  - Refer to TM 9-2350-255-10.

- YES NO
- 4
- Disconnect 2W105-P5(4) from CA421-P1(5).
  - Disconnect CA421-P2(8) from CX206-P1(9).
  - Disconnect 2W105-P4(6) from CA423-P1(7).
  - Disconnect CA423-P2 (10) from CX206-P1 (11).

Figure 9-69 (Sheet 1 of 2)  
Volume II  
Para. 9-2

**TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING**



**Figure 9-69 (Sheet 2 of 2)  
Volume II  
Para. 9-2**

**9-236 Change 3**

DISPLAY SHOWS -  
FAULTY BATTERY, START  
CHARGING SYS

150122

Common Tools:

Wrench, combination, 7/16-inch

Equipment Condition:

Tank parked.  
Parking brake set.  
Engine shut down.  
Vehicle master power off.

Disconnect CX304-P1 from CA201-P1.

● See figure 9-28.

Disconnect CA201-P2 from J1 on elec-  
tronic control unit.

● See figure 9-28.

Connect shorting connector to J1 on  
electronic control unit.

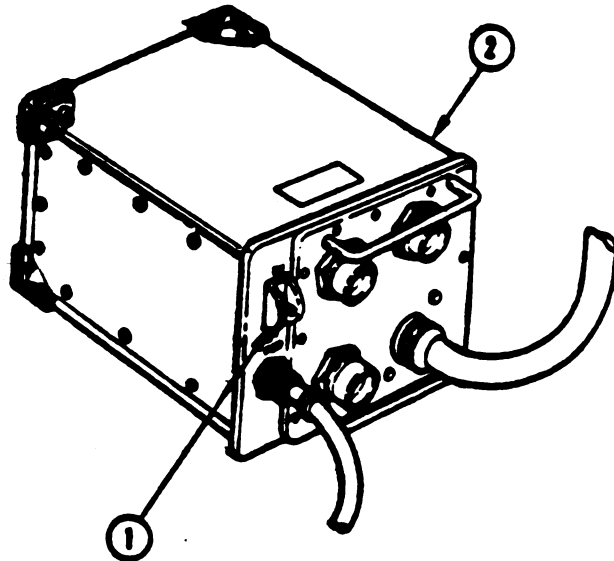
● See figure 9-110.

Set PWR switch (1) on CIB (2) to OFF.

Check all battery condition indicators.

● Refer to TM 9-2350-255-10.

Do any battery condition indicators show  
black?



A30130-480

Figure 9-70 (Sheet 1 of 2)  
Volume II  
Para. 9-2

Change 6 9-237

TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING

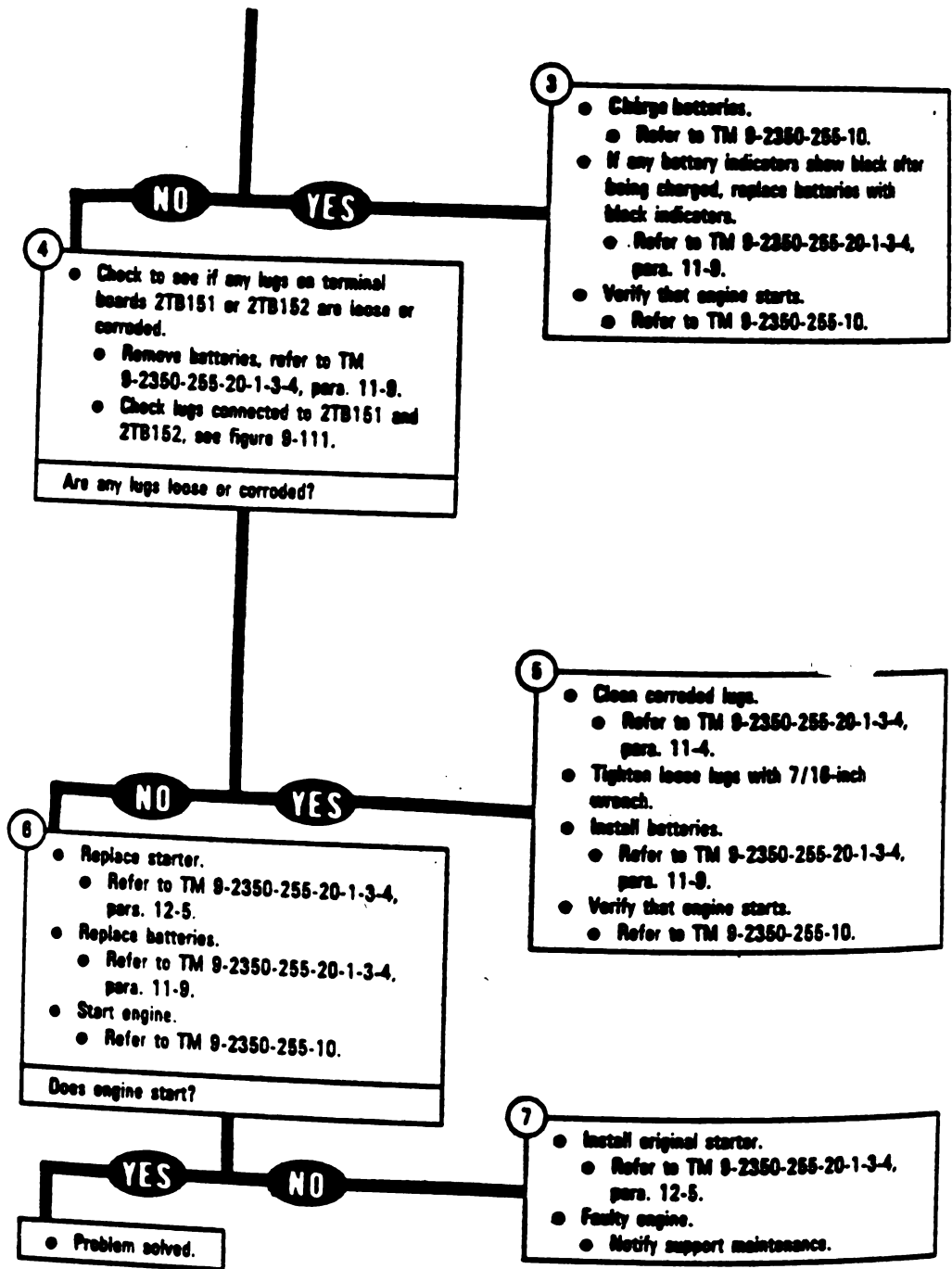


Figure 9-70 (Sheet 2 of 2)  
Volume II  
Para. 9-2

DISPLAY SHOWS -  
FAULTY DMP OR  
2W104

150130

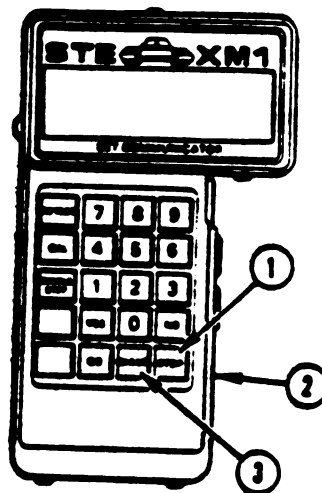
**Equipment Condition:**

- Tank ported.
- Parking brake set.
- Engine shut down.
- Vehicle master power off.

- Disconnect CX305-P1 from CA301-P2.
  - See figure 9-28.
- Disconnect CA301-P1 from TJ1 on hull network box.
  - See figure 9-28.
- Disconnect CA538-P2 from CX207-P2.
  - See figure 9-21.
- Disconnect CA538-P1 from J1 on shift select assembly.
  - See figure 9-21.
- Disconnect 2W104-P3 from J1 on driver's master panel.
  - See figure 9-109.

- Prepare STE/M1 to run cable test 1390.
  - Press STOP key (1) on SETCOM (2).
  - Press CLEAR key (3).
  - Enter cable test number 1390 on SETCOM (2).
- Run test on harness 2W104 between P3 and P7.
- Refer to TM 9-2350-255-20-1-2-2, figure 19-13.

Does VTM display show GOOD?

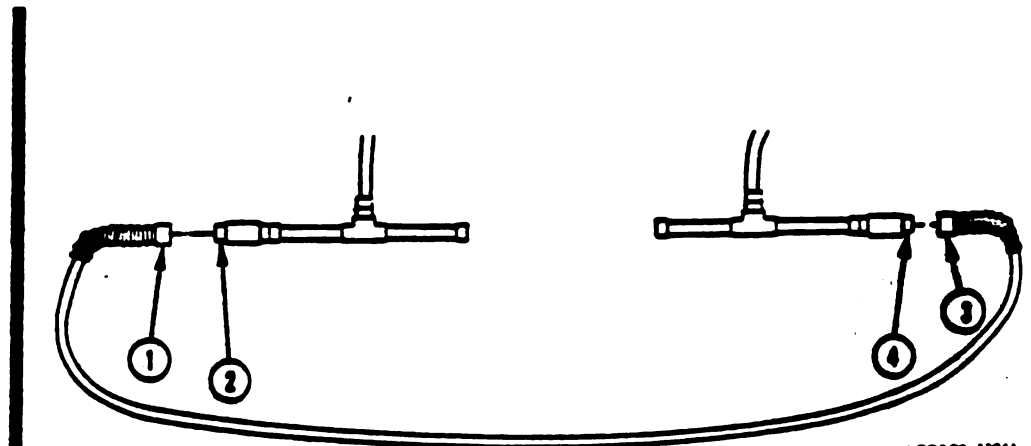


A20220-011R1

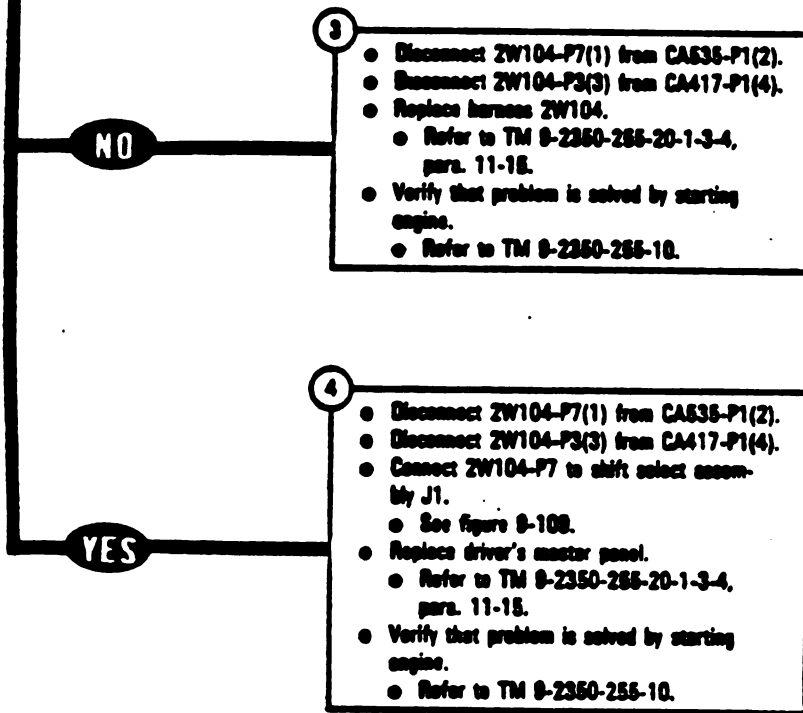
Figure 9-71 (Sheet 1 of 2)  
Volume II  
Para. 9-2

Change 3 9-239





A30120-1104A



3

- Disconnect ZW104-P7(1) from CA635-P1(2).
- Disconnect ZW104-P3(3) from CA417-P1(4).
- Replace harness ZW104.
  - Refer to TM 9-2350-255-20-1-3-4, para. 11-15.
- Verify that problem is solved by starting engine.
- Refer to TM 9-2350-255-10.

4

- Disconnect ZW104-P7(1) from CA635-P1(2).
- Disconnect ZW104-P3(3) from CA417-P1(4).
- Connect ZW104-P7 to shift select assembly J1.
  - See figure 9-108.
- Replace driver's master panel.
  - Refer to TM 9-2350-255-20-1-3-4, para. 11-15.
- Verify that problem is solved by starting engine.
- Refer to TM 9-2350-255-10.

Figure 9-71 (Sheet 2 of 2)  
Volume II  
Para. 9-2

DISPLAY SHOWS -  
FAULTY 2W104, 2W105  
OR HNB

150132

**Equipment Condition:**

- Tank parked.
- Parking brake set.
- Engine shut down.
- Vehicle master power off.

- 1
- Disconnect CX305-P1 from CA201-P2.
    - See figure 9-28.
  - Disconnect CA301-P1 from TJ1 on hull network box.
    - See figure 9-28.
  - Disconnect CA536-P2 from CX207-P2.
    - See figure 9-21.
  - Disconnect CA536-P1 from J1 on shift select assembly.
    - See figure 9-21.

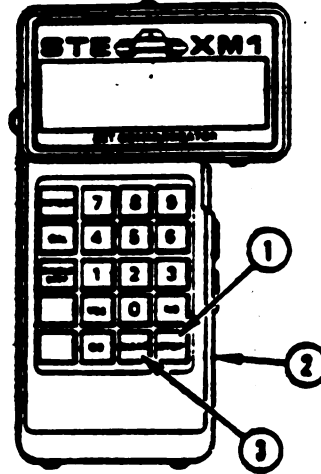
- 2
- Disconnect ZW105-P4 from ZW104-J1.
    - See figure 9-110.
  - Prepare STE/M1 to run cable test 1300.
    - Press STOP key (1) on SETCOM (2).
    - Press CLEAR key (3).
    - Enter cable test number 1300 on SETCOM (2).
  - Run test on harness ZW104 between J1 and P7.
    - Refer to TM 9-2350-255-20-1-2-2, figure 18-13.
- Does SETCOM display show GOOD?

YES

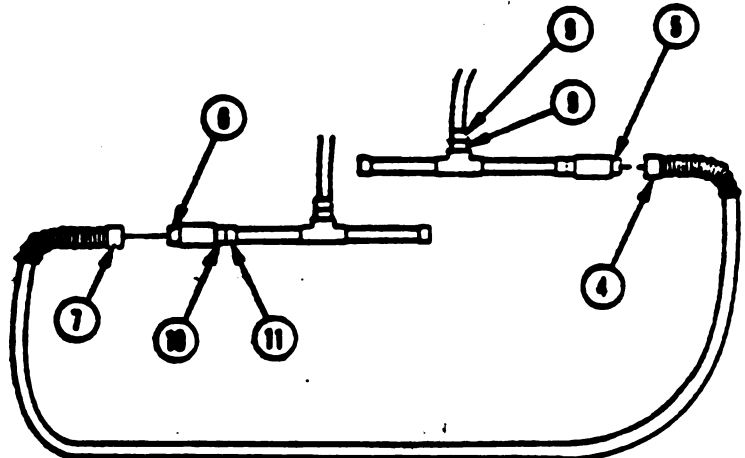
NO

- 4
- Disconnect ZW104-P7(4) from CA536-P1(5).
  - Disconnect CX304-P1(8) from CX207-P3(9).
  - Disconnect CA424-P1(8) from ZW104-J1(7).
  - Disconnect CA424-P2 (10) from CX206-P1 (11).

- 3
- Disconnect ZW104-P7(4) from CA536-P1(5).
  - Disconnect CA424-P1(8) from ZW104-J1(7).
  - Replace harness ZW104.
    - Refer to TM 9-2350-255-20-1-3-4, para. 11-18.
  - Verify that problem is solved by starting engine.
    - Refer to TM 9-2350-255-18.



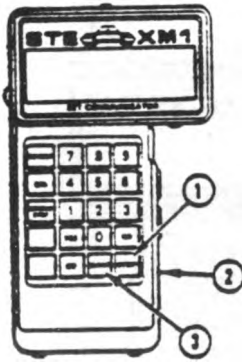
A20220-011R1



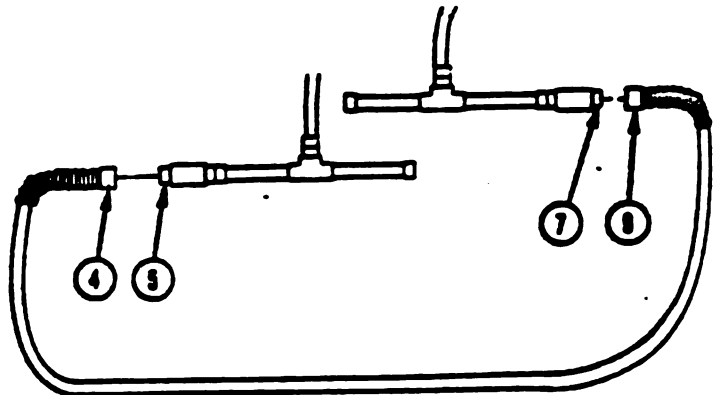
A20120-1150

Figure 9-72 (Sheet 1 of 2)  
Volume II  
Para. 9-2

**TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING**



A30220-011 R1

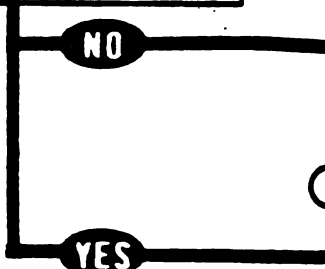


A30120-1161

5

- Disconnect ZW105-P1 from J2 on hull networks box.
  - See figure 9-110.
- Prepare STE/M1 to run cable test 1390.
  - Press STOP key (1) on SETCOM (2).
  - Press CLEAR key (3).
  - Enter cable test number 1390 on SETCOM (2).
- Run test on harness ZW105 between P1 and P4.
- Refer to TM 9-2350-255-20-1-2-2, figure 19-13.

Does SETCOM display show 6000?



6

- Disconnect ZW105-P1(4) from CA402-P1(5).
- Disconnect ZW105-P4(6) from CA423-P1(7).
- Connect ZW104-P7 to J1 on shift select assembly.
  - See figure 9-108.
- Replace harness ZW105.
  - Refer to TM 9-2350-255-20-1-3-4, para. 11-10.
- Verify that problem is solved by starting engine.
  - Refer to TM 9-2350-255-10.

7

- Disconnect ZW105-P1(4) from CA402-P1(5).
- Disconnect ZW105-P4(6) from CA423-P1(7).
- Connect ZW105-P4 to ZW104-J1.
  - See figure 9-110.

8

- Connect ZW104-P7 to J1 on shift select assembly.
  - See figure 9-110.
- Replace hull networks box.
  - Refer to TM 9-2350-255-20-1-3-4, para. 11-12.
- Verify that problem is solved by starting engine.

*Figure 9-72 (Sheet 2 of 2)  
Volume II  
Para. 9-2*

**10-255-20-1-2-1  
SYSTEM TROUBLESHOOTING**

**DISPLAY SHOWS .  
MULTI HNB OR  
105**

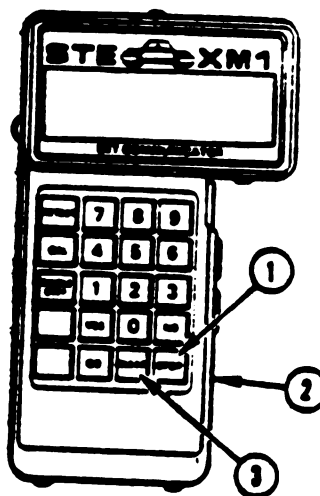
**• 150137  
150138**

**Preparation Condition:**  
 • Tank parked.  
 • Parking brake set.  
 • Engine shut down.  
 • Vehicle master power off.

- Disconnect CA422-P1 from J3 on elec-  
tronic control unit.
- See figure 9-20.
- Disconnect CA422-P2 from CX206-P2.
- See figure 9-20.
- Disconnect CA301-P1 from TJ1 on hull  
networks box.
- See figure 9-26.
- Disconnect CX305-P1 from CA301-P2.
- See figure 9-26.

- Disconnect ZW105-P2 from J3 on hull  
networks box.
- See figure 9-110.
- Prepare STE/M1 to run cable test 1390.
- Press **STDP** key (1) on SETCOM (2).
- Press **CLEAR** key (3).
- Enter cable test number 1390 on  
SETCOM (2).
- Run test on harness ZW105 between P2  
and P5.
- Refer to TM 9-2350-255-20-1-2-2,  
figure 19-13.

**Does SETCOM display show 0000?**



A20220-011R1

**Figure 9-73 (Sheet 1 of 2)  
Volume II  
Para. 9-2**

**Change 3 9-243**

TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING

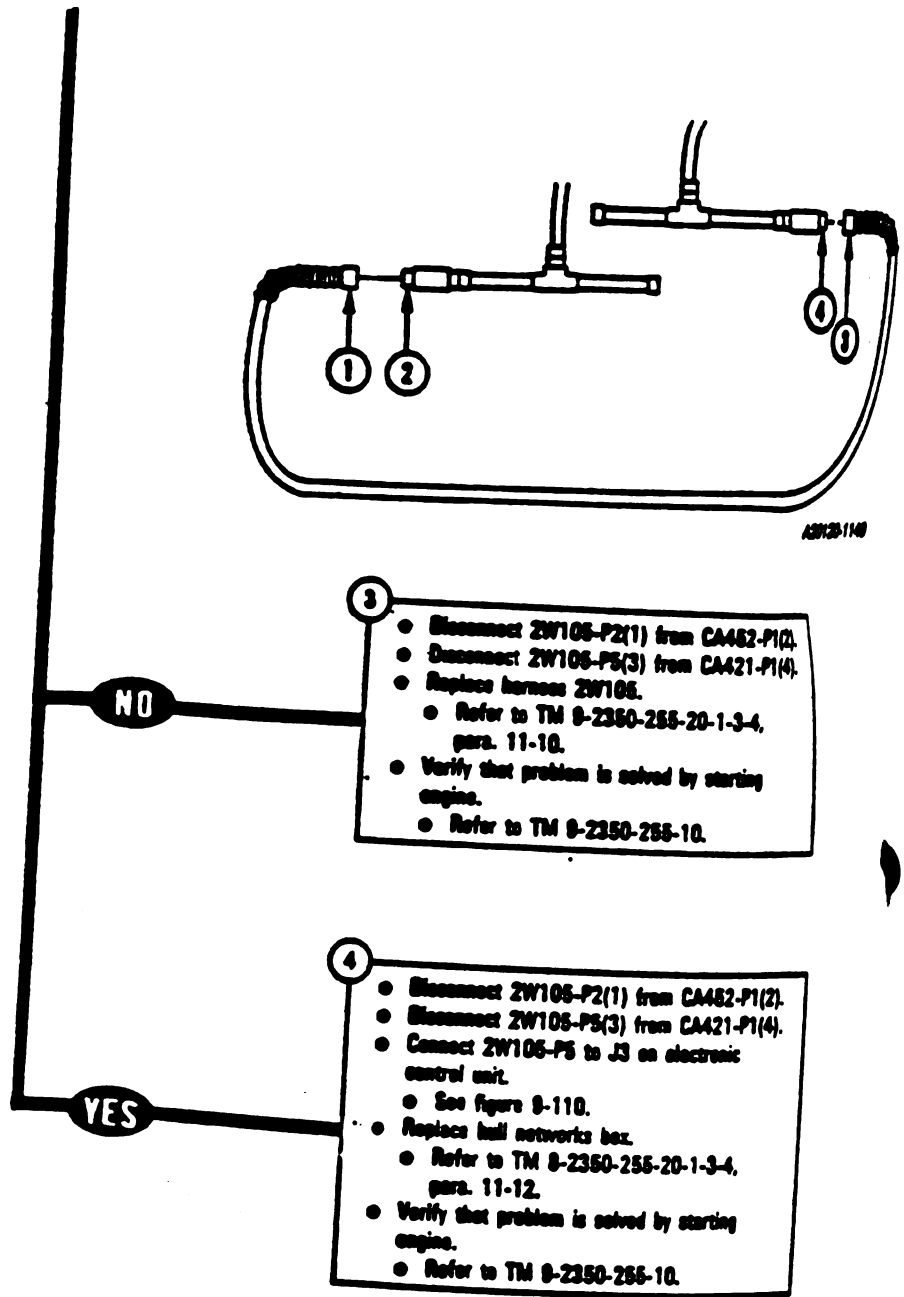


Figure 9-73 (Sheet 2 of 2)  
Volume II  
Para. 9-2

9-244 Change 3

DISPLAY SHOWS -  
MULTI HNB OR  
V104

150143

Equipment Condition:

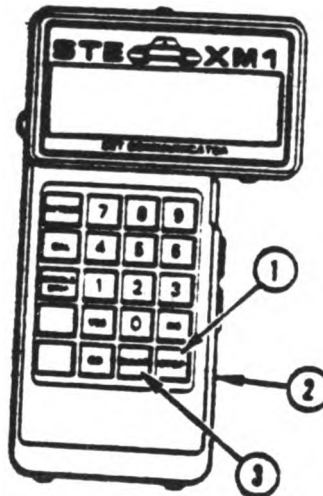
- Tank parked.
- Parking brake set.
- Engine shut down.
- Vehicle master power off.

- Disconnect ZW104-P3 from CA417-P1.
  - See figure 9-18.
- Disconnect CA418-P2 from CX208-P2.
  - See figure 9-18.
- Disconnect CA418-P1 from J1 on driver's master panel.
  - See figure 9-18.

- Disconnect CX305-P1 from CA301-P2.
  - See figure 9-28.
- Disconnect CA301-P1 from T.J1 on hall network box.
  - See figure 9-28.
- Disconnect ZW104-P1 from J8 on hall network box.
  - See figure 9-110.

- Prepare STE/M1 to run cable test 1390.
  - Press STOP key (1) on SETCOM (2).
  - Press CLEAR key (3).
  - Enter cable test number 1390 on SETCOM (2).
- Run test on harness ZW104 between P1 and P2.
- Refer to TM 9-2350-255-20-1-2-2, figure 18-13.

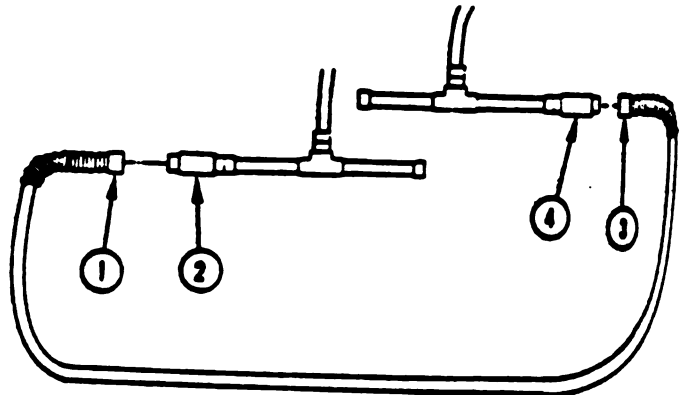
Does SETCOM display show GOOD?



A20220-011R1

Figure 9-74 (Sheet 1 of 2)  
Volume II  
Para. 9-2

Change 3 9-245



A2012-104

NO

- 4
- Disconnect ZW104-P1(1) from CAS18-P1(2).
  - Disconnect ZW104-P3(3) from CA417-P1(4).
  - Replace harness ZW104.
    - Refer to TM 9-2350-255-20-1-3-4, para. 11-18.
  - Verify that engine starts.
  - Refer to TM 9-2350-255-10.

YES

- 5
- Disconnect ZW104-P1(1) from CAS18-P1(2).
  - Disconnect ZW104-P3(3) from CA417-P1(4).
  - Connect ZW104-P3 to J1 on driver's master panel.
    - See figure 9-108.
  - Replace hull networks box.
    - Refer to TM 9-2350-255-20-1-3-4, para. 11-12.
  - Verify that engine starts.
  - Refer to TM 9-2350-255-10.

Figure 9-74 (Sheet 2 of 2)  
Volume II  
Para. 9-2

9-248 Change 3

DISPLAY SHOWS -  
ULTY HNB OR  
V104

150735

**Equipment Condition:**

- Tank ported.
- Parking brake set.
- Engine shut down.
- Vehicle master power off.
- Hull networks box circuit breakers on.

Disconnect ZW104-P3 from CA417-P1.

- See figure 9-32.

Disconnect CA418-P2 from CX206-P2.

- See figure 9-32.

Disconnect CA418-P1 from J1 on driver's master panel.

- See figure 9-32.

Disconnect CX304-P1 from CA201-P1.

- See figure 9-51.

Disconnect CA201-P2 from J1 on electronic control unit.

- See figure 9-51.

Connect shorting connector to J1 on electronic control unit.

- See figure 9-110.

Disconnect ZW104-P1 from J8 on hull networks box.

- See figure 9-110.

Prepare STE/M1 to run cable test 1300.

- Press STOP key (1) on SETCOM (2).

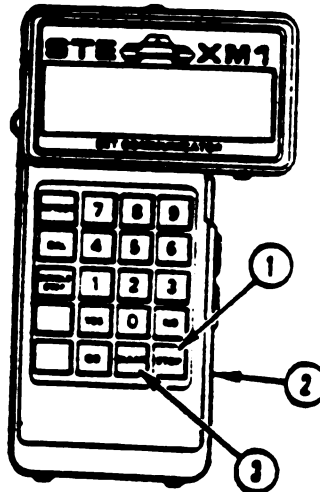
- Press CLEAR key (3).

- Enter cable test number 1300 on SETCOM (2).

Run test on harness ZW104 between P1 and P3.

- Refer to TM 9-2350-255-20-1-2-2, figure 18-13.

Does SETCOM display show GOOD?



A30220-011R1

Figure 9-75 (Sheet 1 of 2)  
Volume II  
Para. 9-2



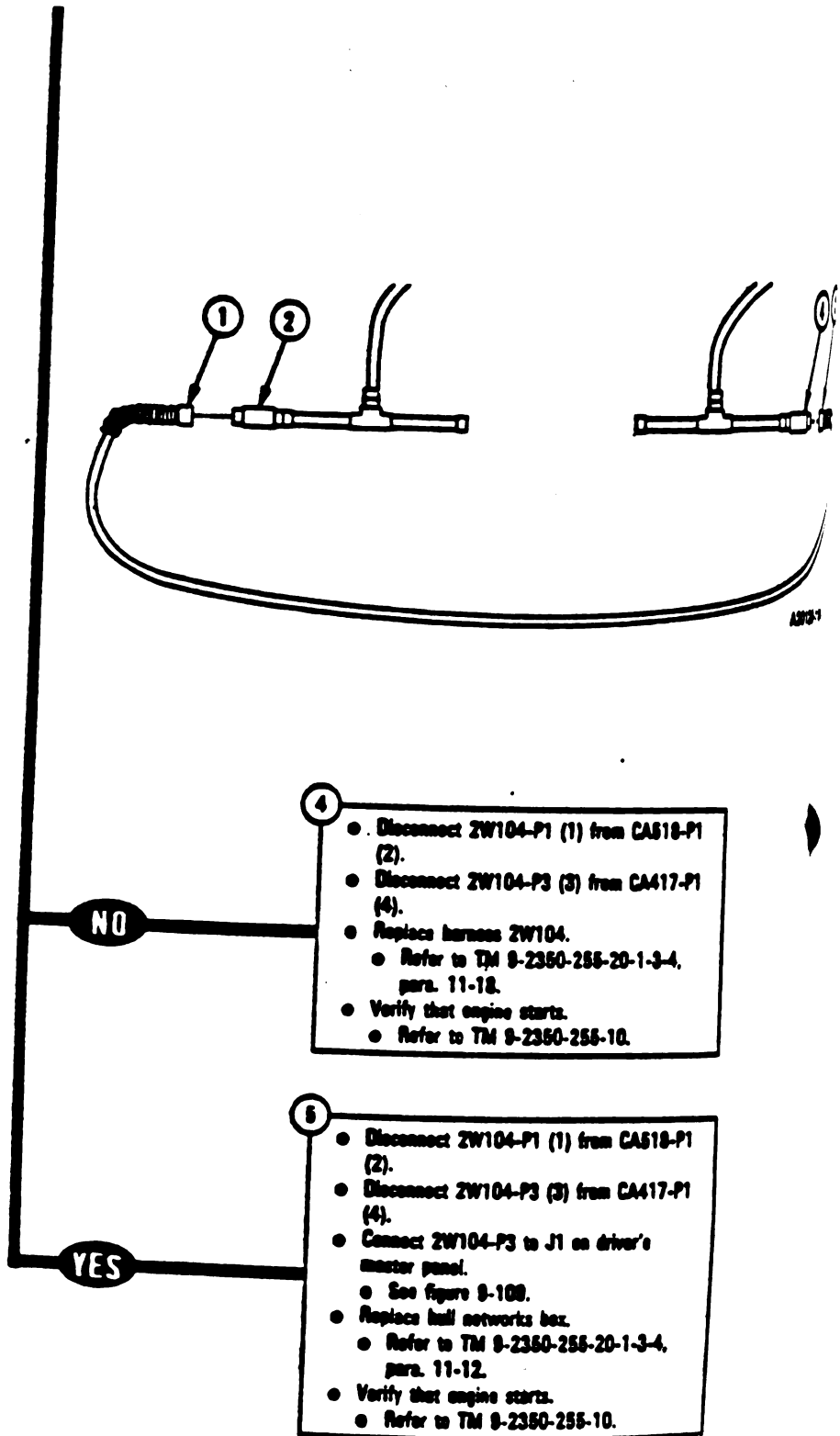
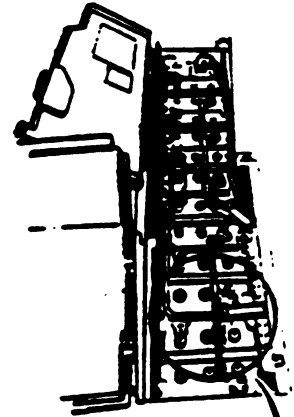


Figure 9-75 (Sheet 2 of 2)  
Volume II  
Para. 9-2

9-248 Change 3

**DISPLAY SHOWS -  
FAULTY BATTERY,  
BUS BAR**

150209

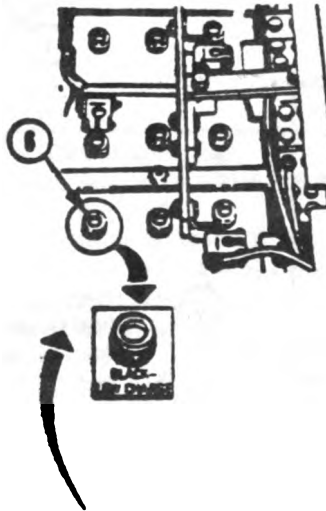


**Equipment Condition:**

- Tank parked.
- Parking brake set.
- Engine shut down.
- Vehicle master power off.

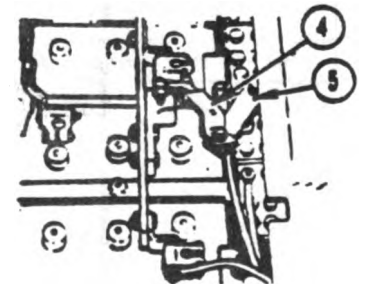
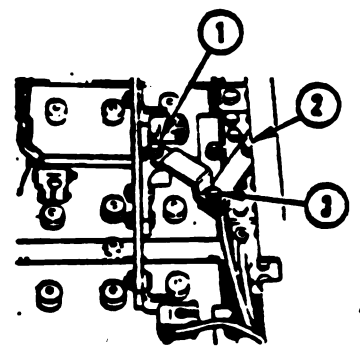
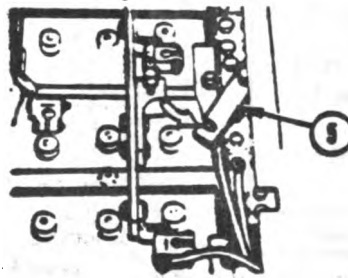
1

- Disconnect CX304-P1 from CA201-P1.
  - See figure 9-51.
- Disconnect CA201-P2 from J1 on electronic control unit.
  - See figure 9-51.
- Connect shorting connector to J1 on electronic control unit.
  - See figure 9-110.
- Disconnect current probe from TA303.
  - See figure 9-49.



2

- Disconnect TA303 from batteries.
  - Loosen screws (1, 2) with 3/4-inch socket, extension, handle, and 3/4-inch wrench.
  - Loosen bolt (3) with 3/4-inch socket, extension, handle, and 3/4-inch wrench.
  - Swing TA303 (4) away from screw (1) and remove TA303 (4).
  - Leave bus bar (5) disconnected for next block.
- Check all battery condition indicators (5).



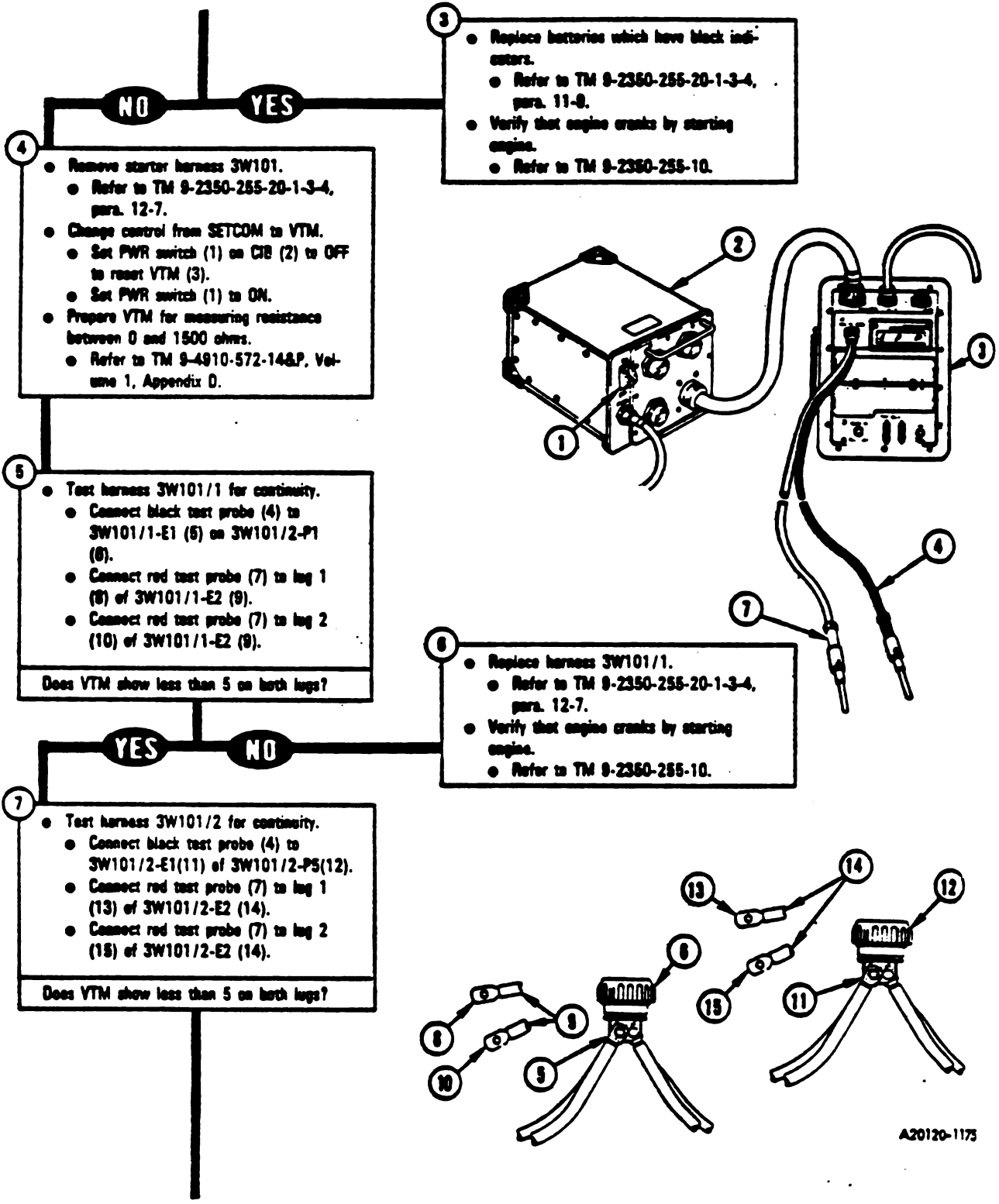
Do any battery condition indicators show black?

A20120-1174

Figure 9-76 (Sheet 1 of 4)  
Volume II  
Para. 9-2

Change 3 9-249

**TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING**



*Figure 9-76 (Sheet 2 of 4)  
Volume II  
Para. 9-2*

which have black insulation.  
9-2350-255-20-1-3-4.  
cranks by starting  
9-2350-255-10.

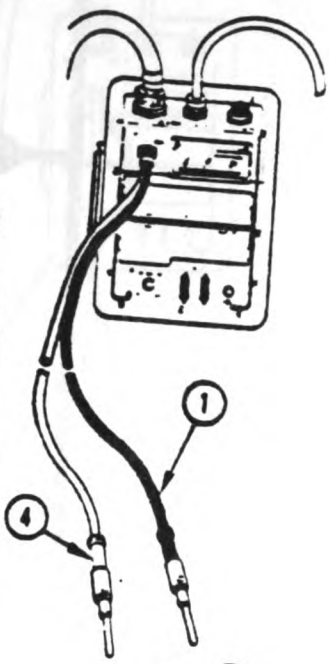
YES NO

- 8
- Replace harness 3W101/2.
  - Refer to TM 9-2350-255-20-1-3-4, para. 12-7.
  - Verify that engine cranks by starting engine.
  - Refer to TM 9-2350-255-10.

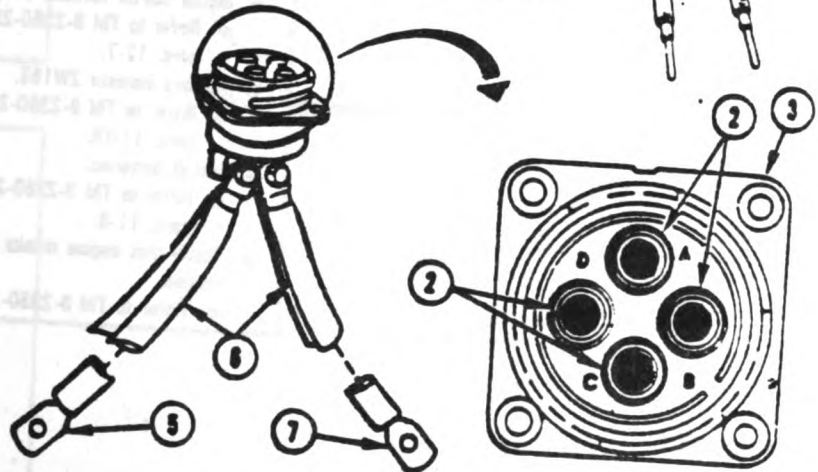
Install batteries.  
Refer to TM 9-2350-255-20-1-3-4, para. 11-9.  
Check to see if the following connections are loose or corroded:  
ZW157-E1 connected to ZTB151-E8, see figure 9-111.  
ZW157-E2 connected to ZTB151-E7, see figure 9-111.  
ZW158-E1 connected to ZTB152-E2, see figure 9-111.  
ZW158-E2 connected to ZTB152-E1, see figure 9-111.  
Are any lugs loose or corroded?

NO YES

- 10
- Clean or tighten lugs.
  - Refer to TM 9-2350-255-20-1-3-4, para. 11-9.
  - Install starter harness 3W101.
  - Refer to TM 9-2350-255-20-1-3-4, para. 12-7.
  - Install batteries.
  - Refer to TM 9-2350-255-20-1-3-4, para. 11-9.
  - Verify that engine cranks by starting engine.
  - Refer to TM 9-2350-255-10.



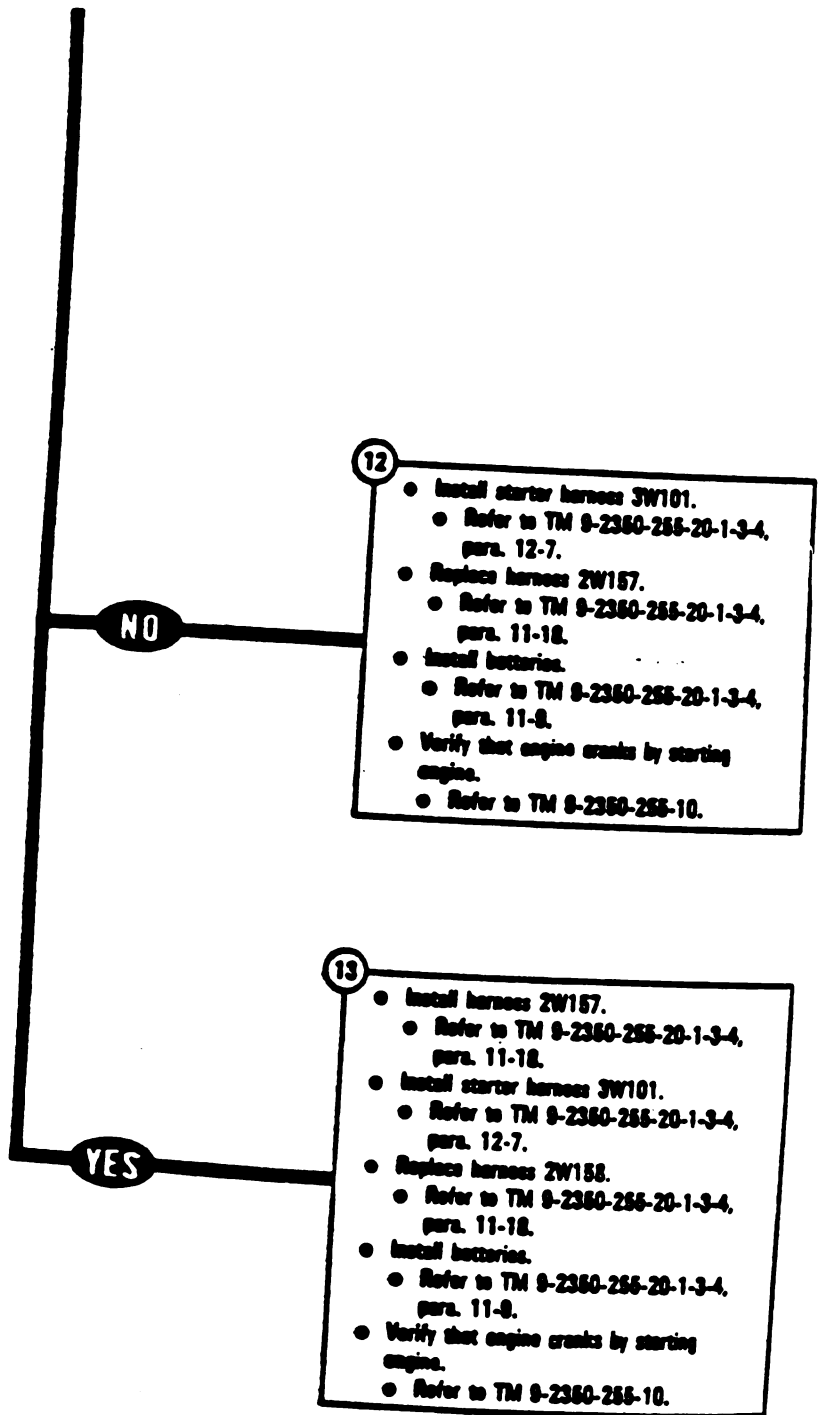
Remove harness 2W157.  
Refer to TM 9-2350-255-20-1-3-4, para. 11-18.  
Test harness 2W157 for continuity.  
Connect black test probe (1) to either contact (2) on 2W157-J1 (3).  
Connect red test probe (4) to contact E1 (5) on 2W157-(8).  
Connect red test probe (4) to contact E2 (7) on 2W157 (8).  
Did VTM show less than 5 ohms on both contacts?



A20120-1176

Figure 9-76 (Sheet 3 of 4)  
Volume II  
Para. 9-2

Change 3 9-251



**DISPLAY SHOWS -  
ULTY HYD PUMP  
V104, 2W105**

150213

**Equipment Condition:**

- Tank parked.
- Parking brake set.
- Engine shut down.
- Vehicle master power off.

Disconnect CX305-P1 from CA301-P2.

- See figure 9-26.

Disconnect CA301-P1 from TJ1 on hull network box.

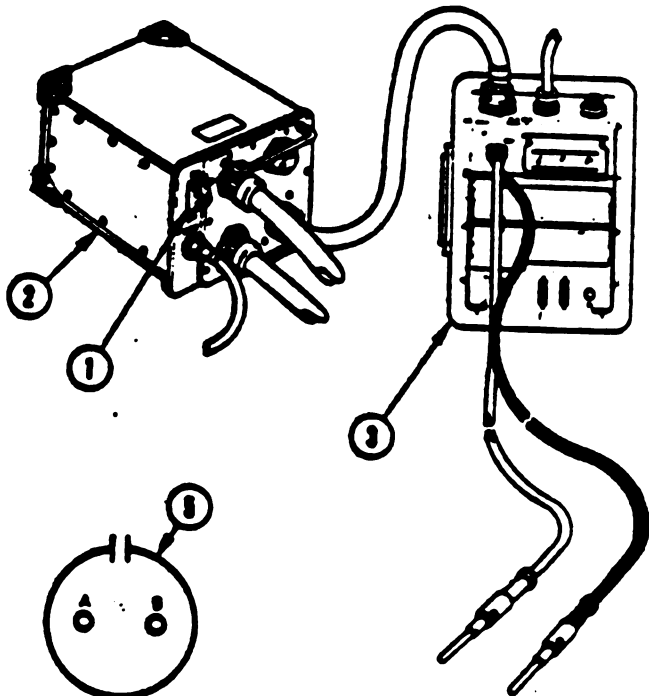
- See figure 9-26.

Disconnect CX304-P1 from CA201-P1.

- See figure 9-51.

Disconnect CA201-P2 from J1 on electronic control unit.

- See figure 9-51.



3W104-P9

A30120-1152

- Connect shunting connector to J1 on electronic control unit.

- See figure 9-110.

- Change control from SETCOM to VTM.

- Set PWR switch (1) on C38 (2) to OFF to reset VTM (3).

- Set PWR switch (1) to ON.

- Prepare VTM for measuring resistance between 0 and 1500 ohms.

- Refer to TM 9-4910-572-14&P, Volume 1, Appendix D.

- Disconnect 2W105-P2 from J3 on hull network box.

- See figure 9-110.

- Disconnect 3W104-P9 from J1 on main hydraulic pump.

- See figure 9-112.

- Connect jumper (4) between contacts A and B on 3W104-P9 (5).

**NOTE**

Leave jumper connected for remainder of test.

Figure 9-77 (Sheet 1 of 2)  
Volume II  
Para. 9-2

Change 3 9-283

TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING

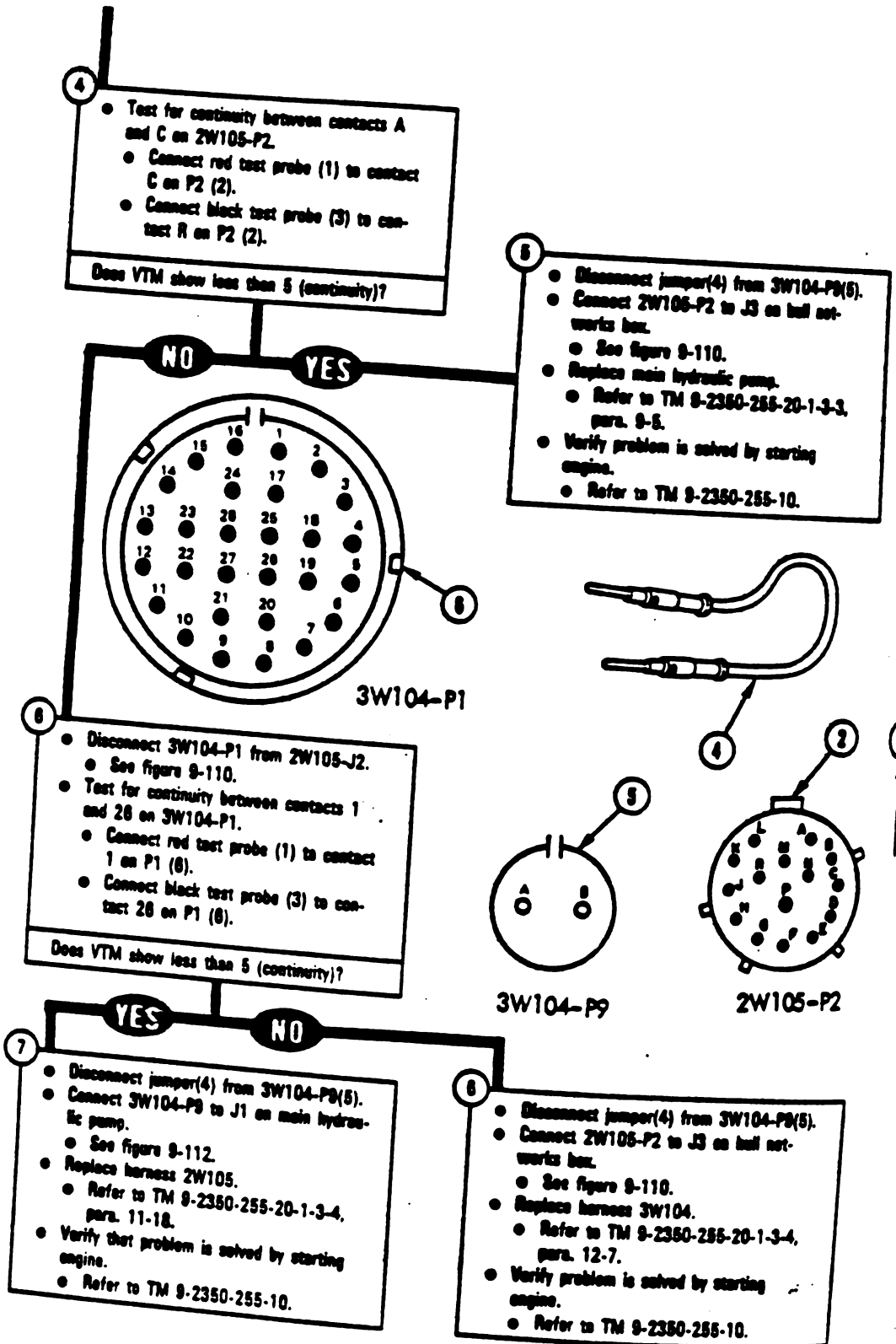


Figure 9-77 (Sheet 2 of 2)  
Volume II  
Para. 9-2

9-254 Change 3

DISPLAY SHOWS -  
FAULTY 2W114, 3W105,  
OR EMFS

**Additional Test**

**Equipment/Special Tools:**

- Breakout box tool kit, 12311066

**Equipment Condition:**

- Tank parked.
- Parking brake set.
- Engine shut down.
- Vehicle master power off.

1

- Disconnect CX201-P3 from J2 on elec-  
tronic control unit.
- See figure 9-43.

2

Go to figure 9-79, block 1.

150347  
152216  
152221  
152226  
152241



**TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING**

**DISPLAY SHOWS -  
FAULTY 2W114, 3W105,  
OR EMFS**

**Additional Test  
Equipment/Special Tools:**  
● Breakout box tool kit, 12311088

**Equipment Condition:**  
● Tank parked.  
● Parking brake set.  
● Engine shut down.  
● Vehicle master power off.

**From Figure 9-78**

① ● Disconnect CX304-P1 from CA201-P1.  
● See figure 9-51.  
● Disconnect CA201-P2 from J1 on elec-  
tronic control panel.  
● See figure 9-51.  
● Connect shorting connector to J1 on  
electronic control *UWIC*.  
● See figure 9-110.  
● Disconnect CX305-P1 from CX201-P1.  
● See figure 9-40.  
● Disconnect 2W114-P1 from CX201-P2.  
● See figure 9-40.

- 151120
- 151121
- 151220
- 151221
- 153002
- 153003
- 153102
- 153103
- 153502
- 153503
- 154003
- 154005
- 154302
- 154303
- 154402
- 154403

*Figure 9-79 (Sheet 1 of 5)  
Volume II  
Para. 9-2*

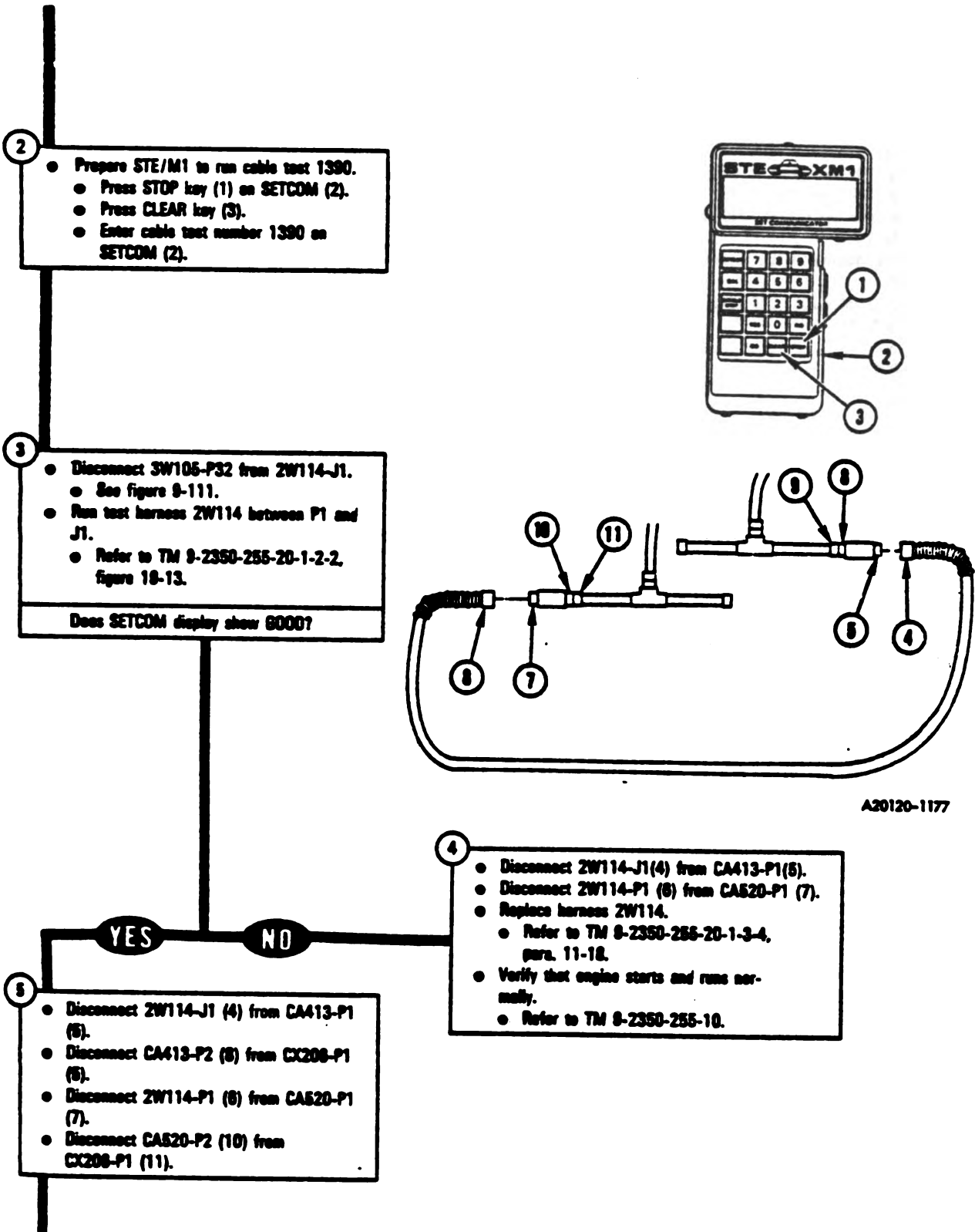
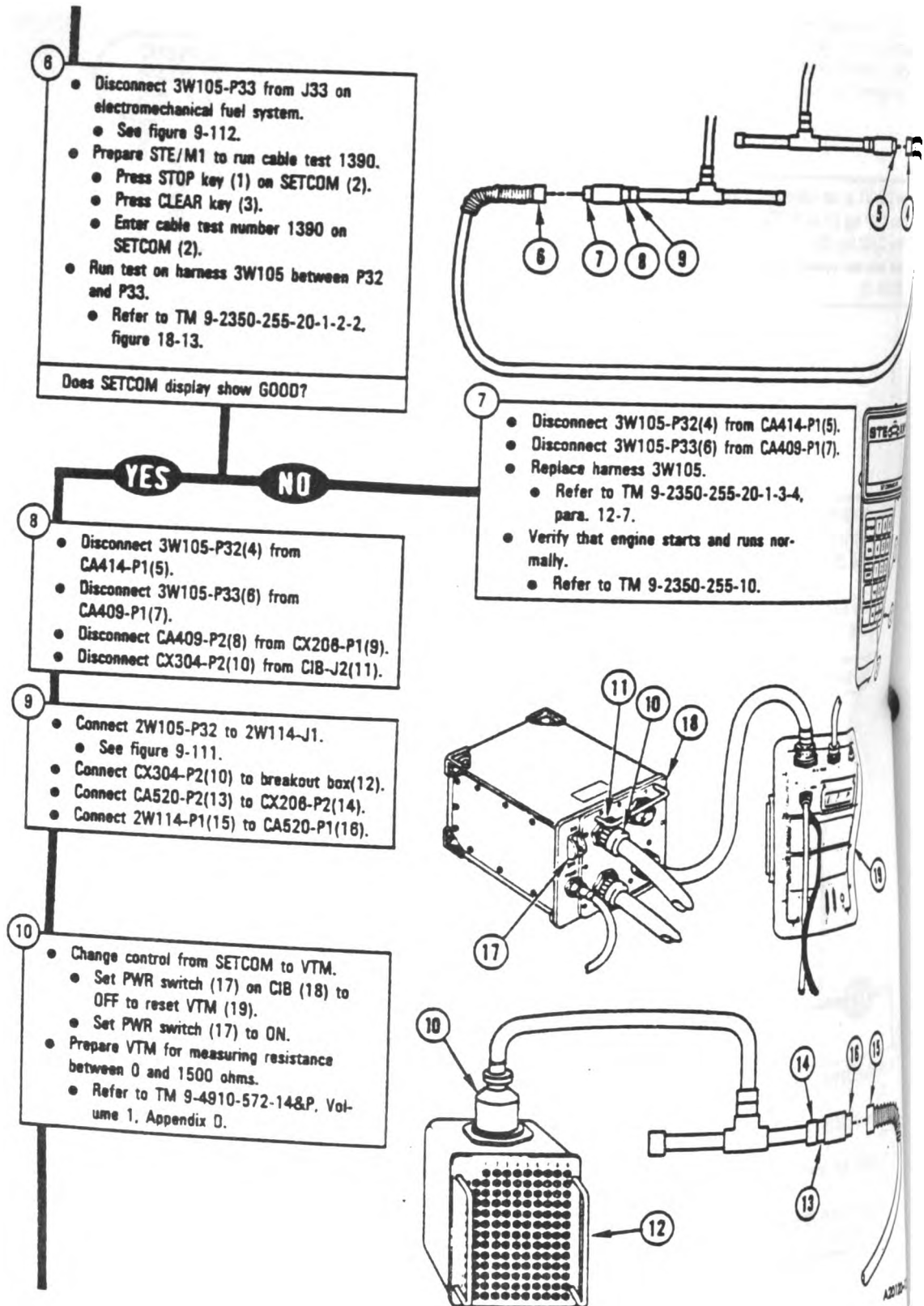


Figure 9-79 (Sheet 2 of 5)  
Volume II  
Para. 9-2

**TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING**



**Figure 9-79 (Sheet 3 of 5)  
Volume II  
Para. 9-2**

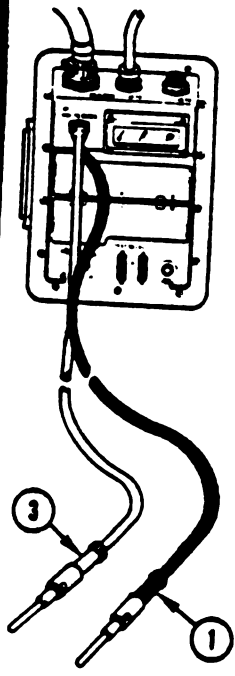
- Test for a short between test points listed in Table A, on breakout box for fault number being checked.

**NOTE**

- There are three tests for each fault number.
- If VTM display shows less than 5 (short), leave test probes connected for remainder of test.

**Table A**

Fault Number	Test 1		Test 2		Test 3	
	Red test probe to breakout box test points	Black test probe to breakout box test points	Red test probe to breakout box test points	Black test probe to breakout box test points	Red test probe to breakout box test points	Black test probe to breakout box test points
150347	24	25	32	25	32	24
151120	104	105	99	105	99	104
151121	104	105	99	105	99	104
151220	106	107	99	107	99	106
151221	106	107	99	107	99	106
152216	35	36	91	36	91	106
152221	89	90	91	90	91	35
152226	89	90	91	90	91	89
152241	35	36	91	36	91	89
153002	108	109	99	109	99	35
153003	108	109	99	109	99	108
153102	102	103	99	103	99	108
153103	102	103	99	103	99	102
153502	100	101	99	103	99	102
153503	100	101	99	101	99	100
154003	104	105	99	101	99	100
154005	104	105	99	105	99	104
154302	33	34	32	105	99	104
154303	33	34	32	34	32	33
154402	37	38	32	34	32	33
154403	37	38	32	38	32	37



- Connect black test probe (1) to test points listed in Table A on breakout box (2).
- Connect red test probe (3) to test points listed in Table A on breakout box (2).

Does VTM display show less than 5 (short)?

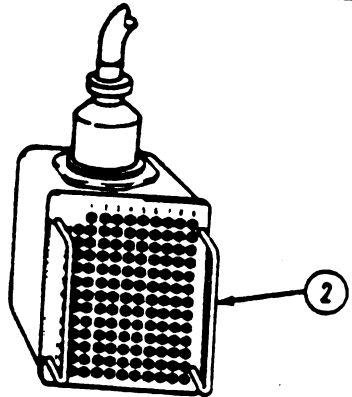
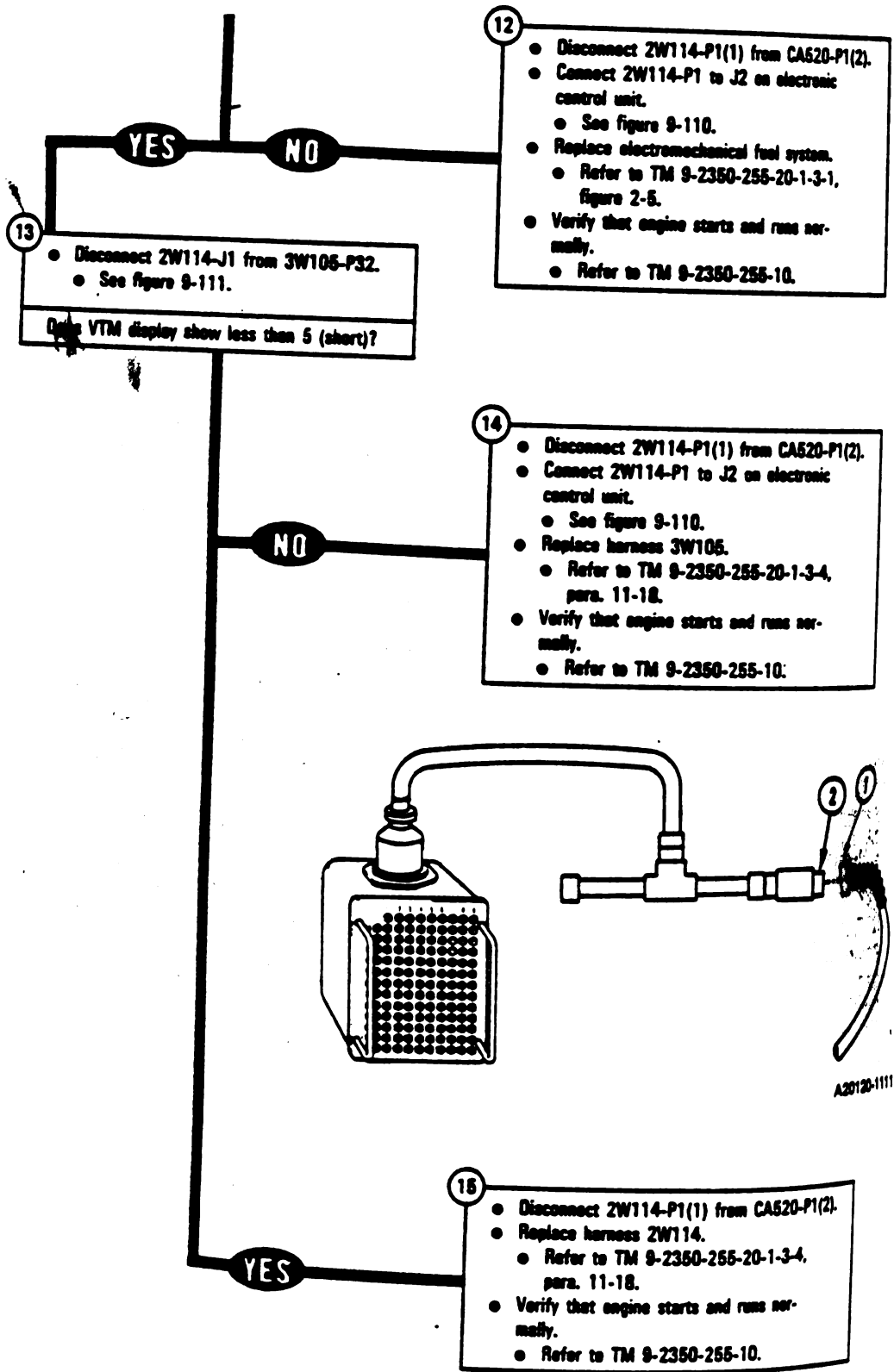


Figure 9-79 (Sheet 4 of 5)  
Volume II  
Para. 9-2

A20220-614

**TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING**



*Figure 9-79 (Sheet 5 of 5)  
Volume II  
Para. 9-2*

9-260 Change 3

**DISPLAY SHOWS -  
FAULTY DIP OR  
SWITCHABLE GROUP**

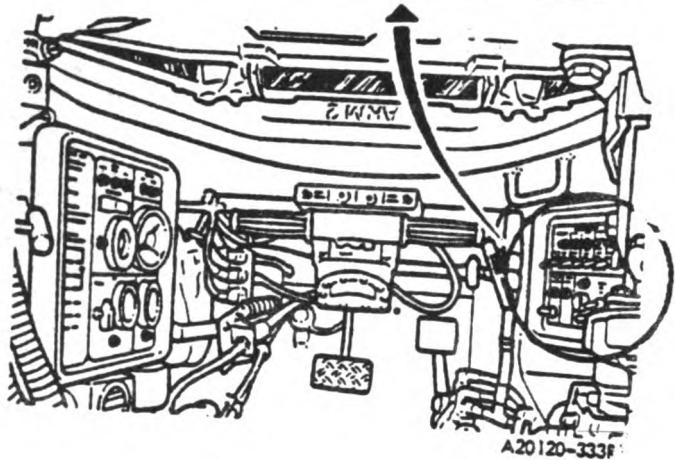
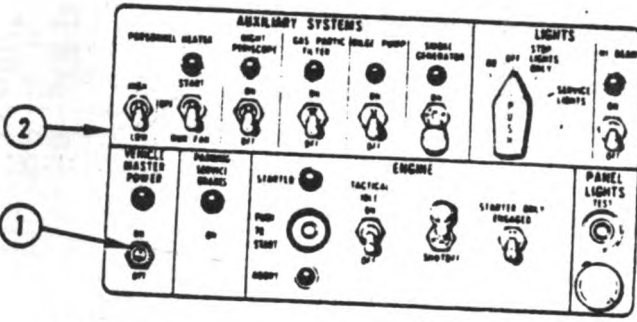
180421

**Additional Test**

**Equipment/Special Tools:**  
Breakout Box Tool Kit, 12311066

**Equipment Condition:**

- Tank parked.
- Parking brake set.
- Engine shut down.
- Vehicle master power off.



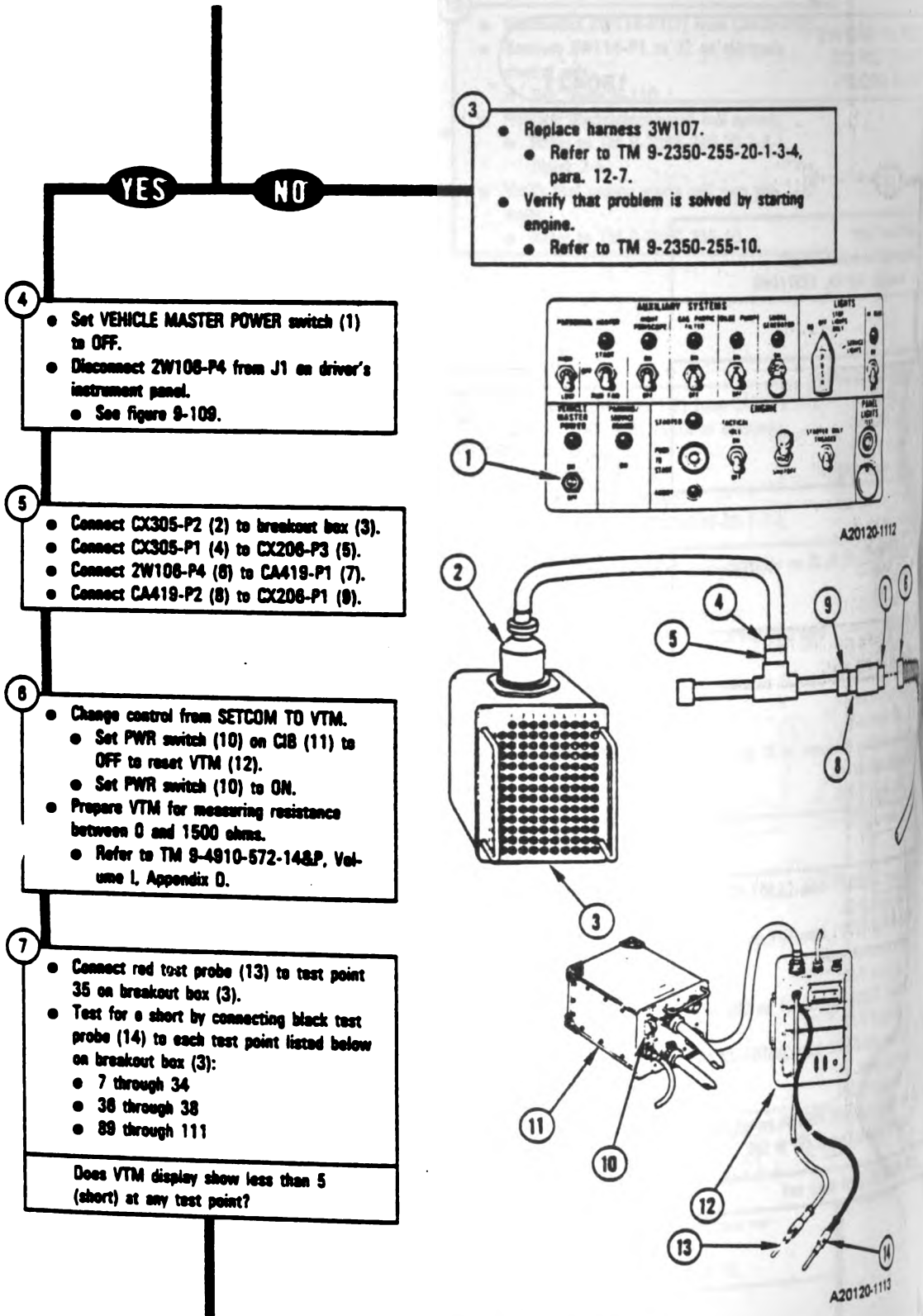
- Connect 3W107-P8 to J8 on oil level switch.
- See figures 9-112.
- Disconnect CX304-P1 from CA201-P1.
- See figures 9-51.
- Disconnect CA201-P2 from J1 on electronic control unit.
- See figures 9-51.
- Connect shorting connector to J1 on electronic control unit.
- See figure 9-110.

- Disconnect CX305-P1 from CA307-P2.
- See figures 9-53.
- Disconnect CA307-P1 from TJ1 on driver's instrument panel.
- See figure 9-53.
- Disconnect CX305-P2 from J1 on CIR.
- See figures 9-53.
- Disconnect 3W107-P2 from ZW107-J2 on disconnect panel.
- See figure 9-111.
- Set VEHICLE MASTER POWER switch (1) on driver's master panel (2) to ON.

Is ENGINE OIL LOW lamp on?

Figure 9-90 (Sheet 1 of 3)  
Volume II  
Para. 9-2

**TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING**



**Figure 9-80 (Sheet 2 of 3)  
Volume II  
Para. 9-2**

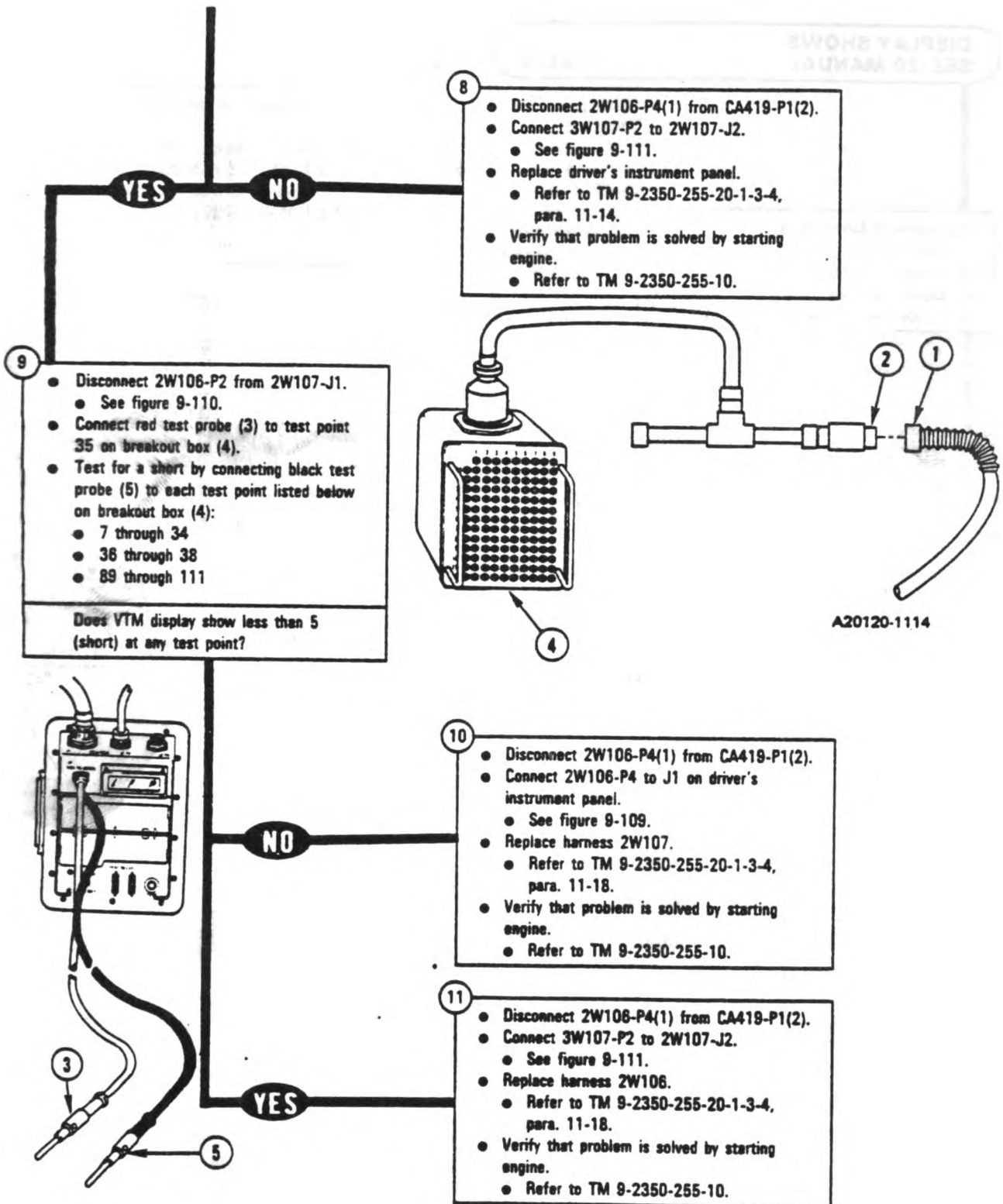


Figure 9-80 (Sheet 3 of 3)  
Volume II  
Para. 9-2



DISPLAY SHOWS -  
SEE -20 MANUAL

150422

**Equipment Condition:**

- Tank parked.
- Parking brake set.
- Engine shut down.
- Vehicle master power off.

①

- Disconnect CX305-P1 from CA307-P2.
  - See figure 9-53.
- Disconnect CA307-P1 from TJ1 on driver's instrument panel.
  - See figure 9-53.
- Disconnect CX304-P1 from CA201-P1.
  - See figure 9-51.
- Disconnect CA201-P2 from J1 on electronic control unit.
  - See figure 9-51.
- Connect shorting connector to J1 on electronic control unit.
  - See figure 9-110.

②

- Replace oil pressure switch.
  - Refer to TM 9-2350-255-20-1-3-4, para. 12-8.
- Verify that problem is solved by starting engine.
  - Refer to TM 9-2350-255-10.

Does engine abort?

YES

NO

Problem solved.

Figure 9-81 (Sheet 1 of 2)  
Volume II  
Para. 9-2

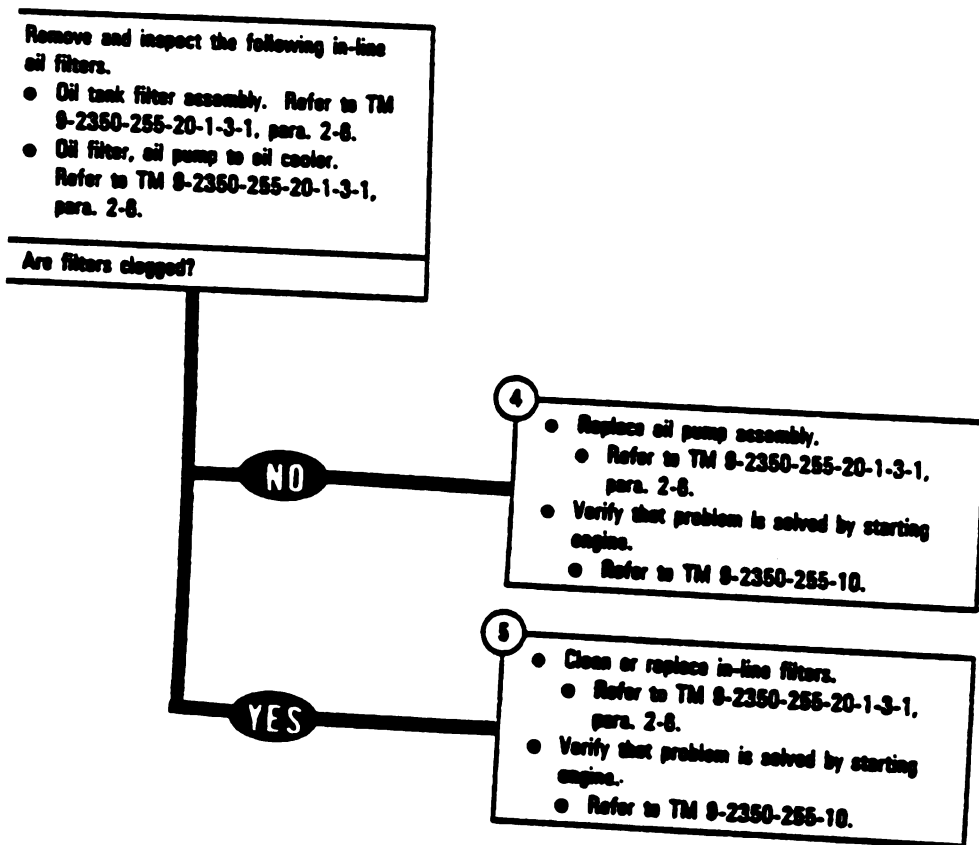


Figure 9-81 (Sheet 2 of 2)  
Volume II  
Para. 9-2

DISPLAY SHOWS -  
FAULTY DIP OR  
CABLE GROUP

150425

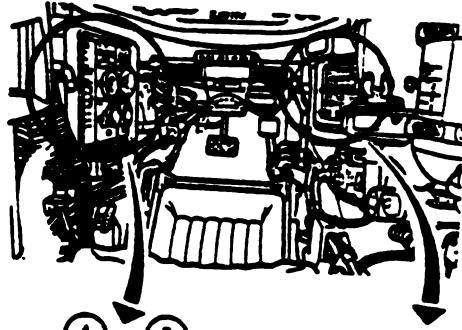
**Additional Test  
Equipment/Special Tools:**  
● Breakout Box Tool Kit, 12311086

**Equipment Condition:**  
● Tank parked.  
● Parking brake set.  
● Engine shut down.  
● Vehicle master power off.

- 1
- Connect 3W107-P30 to J30 on low oil pressure switch.
    - See figure 9-112.
  - Disconnect CX304-P1 from CA201-P1.
    - See figure 9-51.
  - Disconnect CA201-P2 from J1 on electronic control unit.
    - See figure 9-51.
  - Connect shorting connector to J1 on electronic control unit.
    - See figure 9-110.

- 2
- Disconnect CX305-P1 from CA307-P2.
    - See figure 9-53.
  - Disconnect CA307-P1 from TJ1 on driver's instrument panel.
    - See figure 9-53.
  - Disconnect CX305-P2 from J1 on CIB.
    - See figure 9-53.
  - Disconnect 3W107-P2 from 2W107-J2 on powerpack disconnect panel.
    - See figure 9-111.

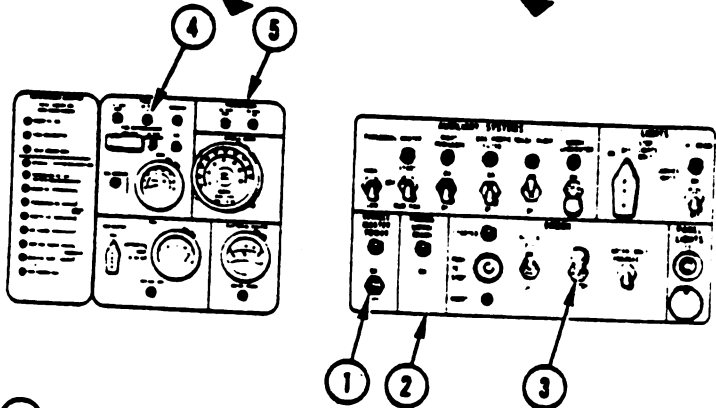
Figure 9-82 (Sheet 1 of 4)  
Volume II  
Para. 9-2



Check to see if ENGINE OIL PRESS LOW lamp comes on with vehicle master power on and ENGINE SHUTOFF switch held in OFF position.

- Set VEHICLE MASTER POWER switch (1) on driver's master panel (2) to ON.
- Hold ENGINE SHUTOFF switch (3) to OFF position.
- Look at ENGINE OIL PRESS LOW lamp (4) on driver's instrument panel (5).
- Release ENGINE SHUTOFF switch (3).
- Set VEHICLE MASTER POWER switch (1) to OFF.

Was ENGINE OIL PRESS LOW lamp on?



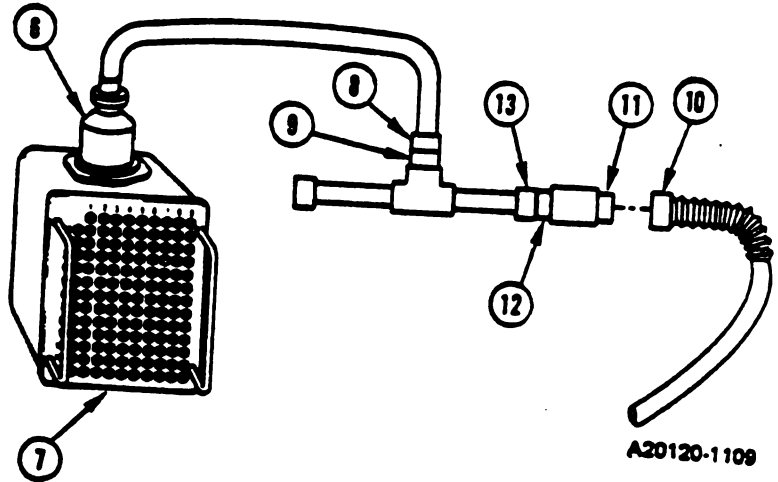
A20120-1108

YES

NO

- 4
- Replace harness 3W107.
  - Refer to TM 9-2350-255-20-1-3-4, para. 12-7.
  - Verify that problem is solved by starting engine.
  - Refer to TM 9-2350-255-10.

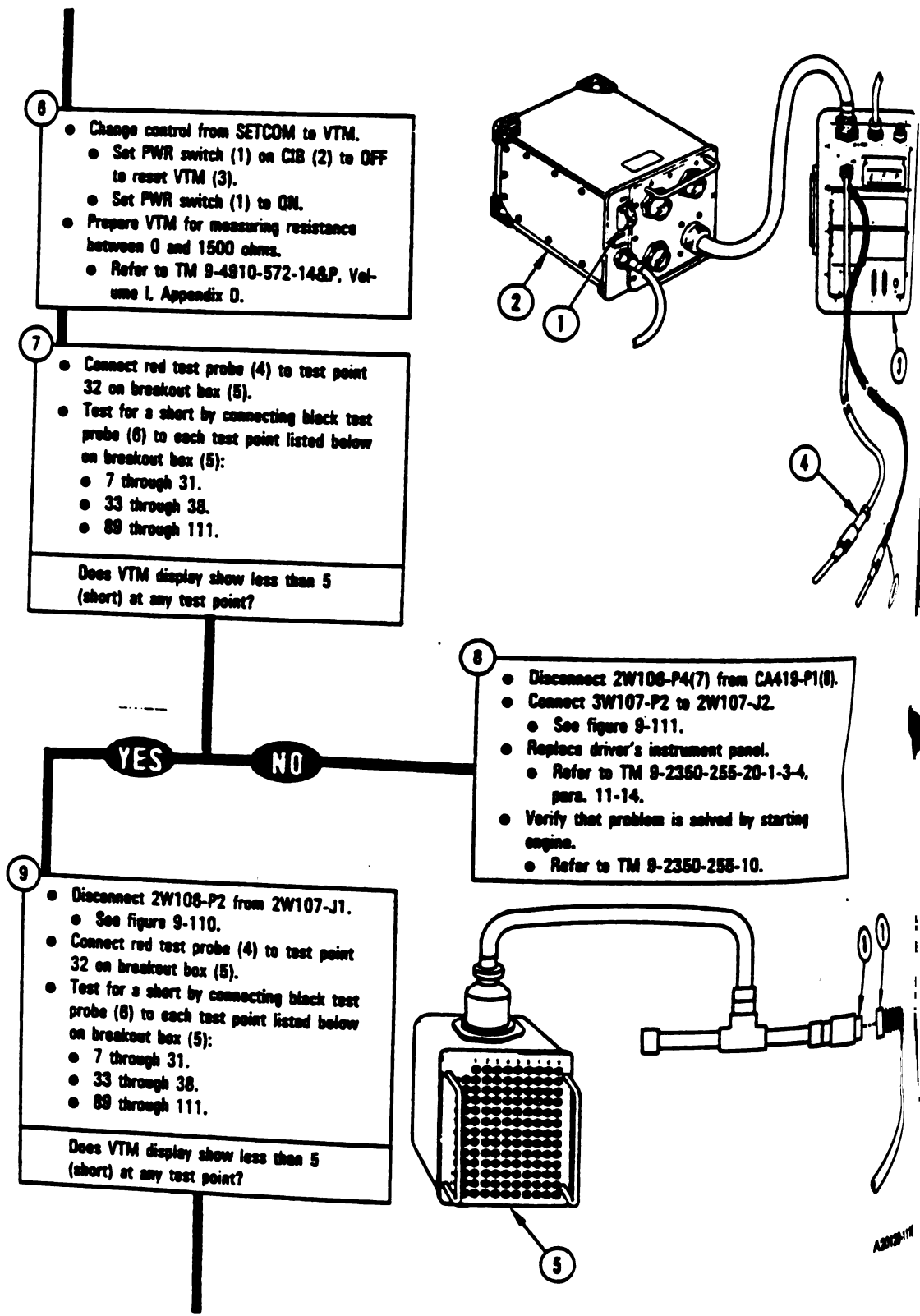
- Disconnect 2W106-P4 from J1 on driver's instrument panel.
- See figure 9-108.
- Connect CX305-P2 (6) to breakout box (7).
- Connect CX305-P1 (8) to CX206-P3 (9).
- Connect 2W106-P4 (10) to CA419-P1 (11).
- Connect CA419-P2 (12) to CX206-P1 (13).



A20120-1108

Figure 9-82 (Sheet 2 of 4)  
Volume II  
Para. 9-2

**TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING**



*Figure 9-82 (Sheet 3 of 4)  
Volume II  
Para. 9-2*

9-288 Change 3

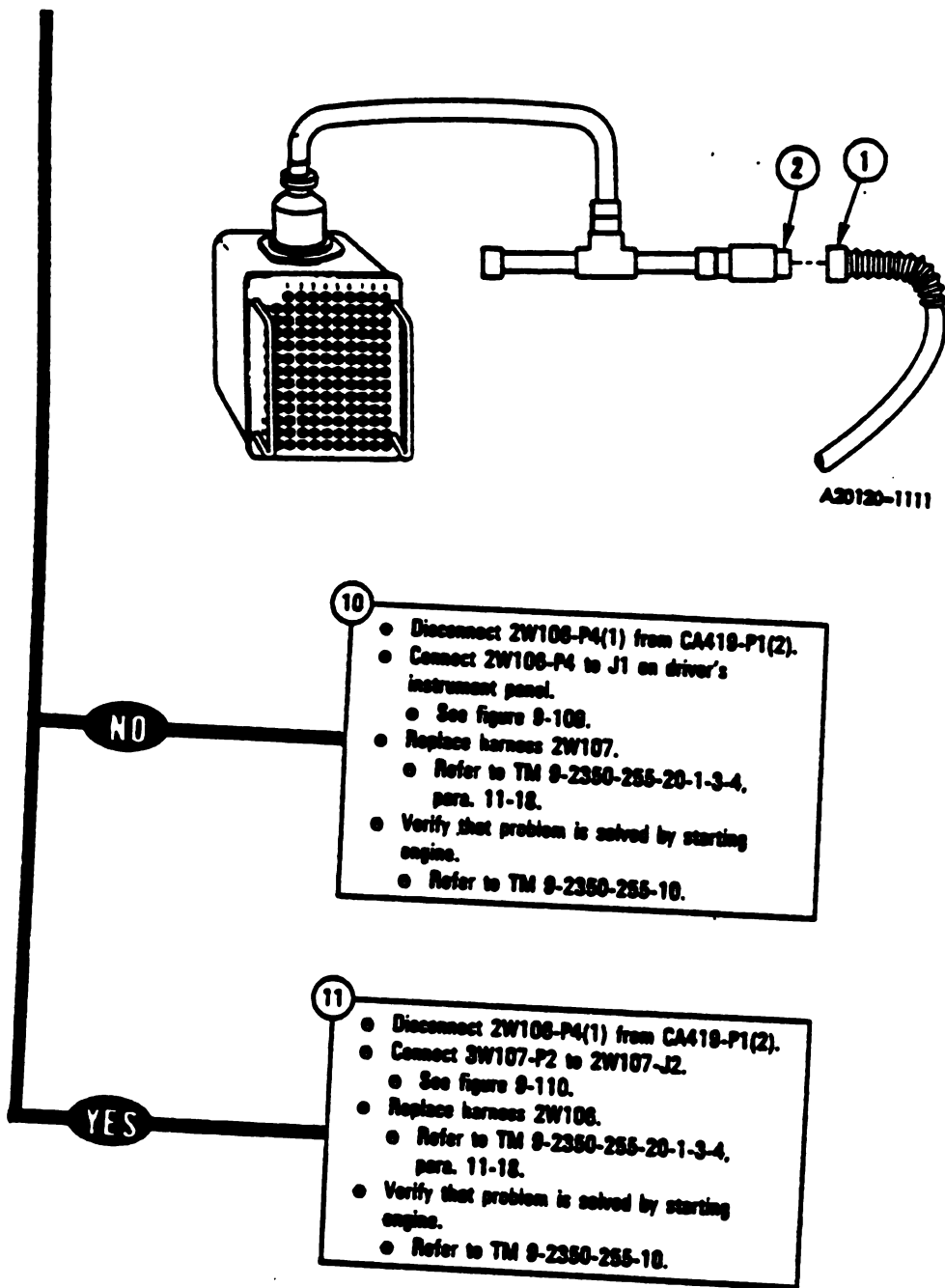


Figure 9-82 (Sheet 4 of 4)  
Volume II  
Para. 9-2

DISPLAY SHOWS -  
SEE -20 MANUAL

150441

**Equipment Condition:**

- Tank parked.
- Parking brake set.
- Engine shut down.
- Vehicle master power off.

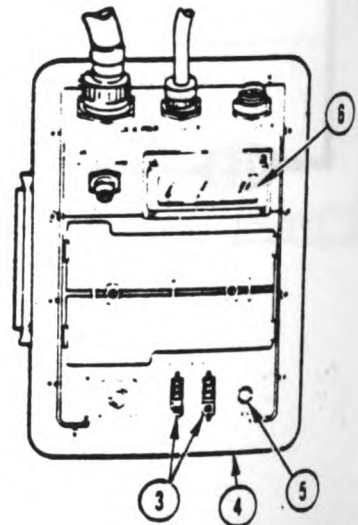
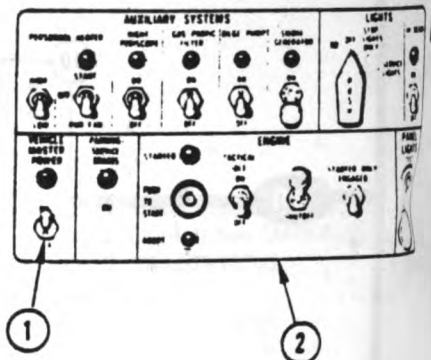
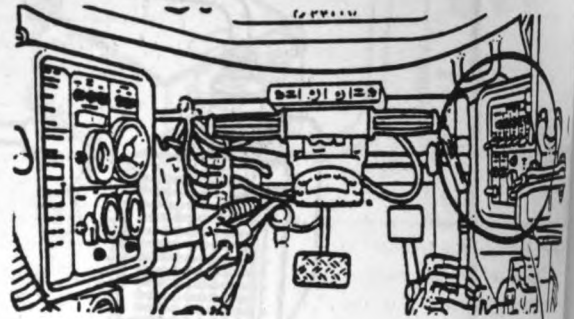
- 1
- Disconnect CX304-P1 from CA201-P1.
    - See figure 9-51.
  - Disconnect CA201-P2 from J1 on electronic control unit.
    - See figure 9-51.
  - Connect shorting connector to J1 on electronic control unit.
    - See figure 9-110.
  - Disconnect CX305-P1 from CA307-P2.
    - See figure 9-53.
  - Disconnect CA307-P1 from TJ1 on driver's instrument panel.
    - See figure 9-53.

- 2
- Prepare VTM to measure 0-25 PSIG.
    - Set VEHICLE MASTER POWER switch (1) on driver's master panel (2) to ON.
    - Set test select switches (3) on VTM (4) to 49.
    - Press and hold test button (5) until display (6) shows - CAL.

- Set test select switches (3) to 03.
- Press and release test button (5).
- Wait until display (6) shows - PASS.
- Set test select switches (3) to 49.
- Press and release test button (5).

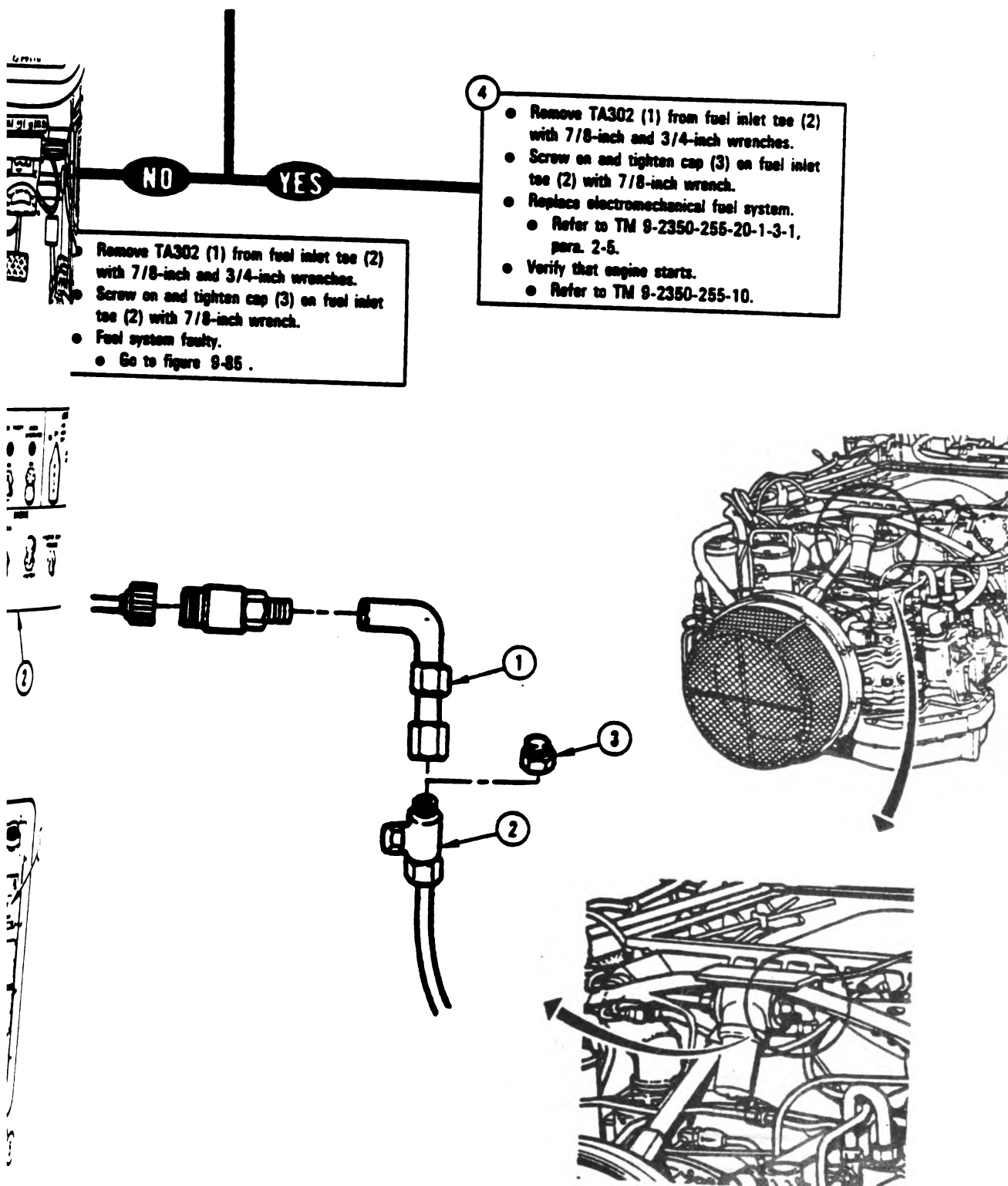
- 3
- Test fuel pump pressure.
    - Start engine, refer to TM 9-2350-255-10.
    - Look at VTM display (6).
    - Shutdown engine, refer to TM 9-2350-255-10.

Did VTM display show 4.0 or more?



A20120-1183

Figure 9-83 (Sheet 1 of 2)  
Volume II  
Para. 9-2



A20120-1184

Figure 9-83 (Sheet 2 of 2)  
Volume II  
Para. 9-2

Change 3 9-271



**DISPLAY SHOWS -  
FAULTY FUEL  
SYSTEM**

• 150444  
150807  
150809  
150811

**Common Tools:**

- Wrench, combination, 7/8-inch
- Measure, liquid, 8 qt. capacity

**Additional Test  
Equipment/Special Tools:**

- Hose, fuel purge
- Stopwatch

**Supplies:**

- Container, fuel, 3 gallon minimum capacity

**Equipment Conditions:**

- Tank parked.
- Parking brake set.
- Engine shut down.
- Vehicle master power off.

**NOTE**

This is a two man job. Soldier A is responsible for completing the job. Soldier B is the assistant and is directed by Soldier A.

1

- Disconnect CX308-P1 from CA307-P2.
  - See figure 9-53.
- Disconnect CA307-P1 from TJ1 on driver's instrument panel.
  - See figure 9-24.

2

Go to figure 9-86, block 1.

18044  
18007  
18000  
18061

**DISPLAY SHOWS -  
FAULTY FUEL  
SYSTEM**

150531

**Common Tools:**

- Wrench, combination, 7/8-inch
- Measure, liquid, 8 qt. capacity

**Additional Test  
Equipment/Special Tools:**

- Hess, fuel purge
- Stopwatch

**Supplies:**

- Container, fuel, 3 gallon minimum capacity

**Equipment Condition:**

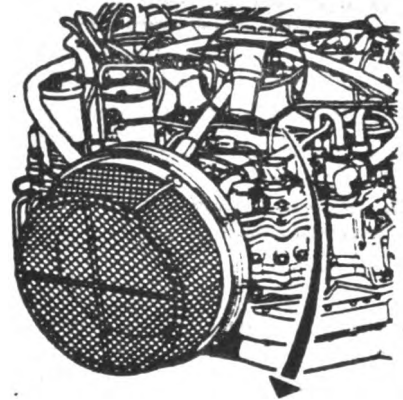
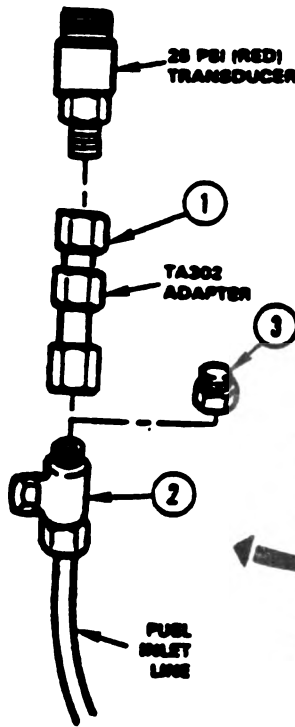
- Tank parked.
- Parking brake set.
- Engine shut down.
- Vehicle master power off.

**NOTE**

This is a two man job. Soldier A is responsible for completing the job. Soldier B is the assistant and is directed by Soldier A. Soldier B will be used only in blocks 2, 4, 8, 10, 11, 17, and 18.

From figure 9-84 (read note above)

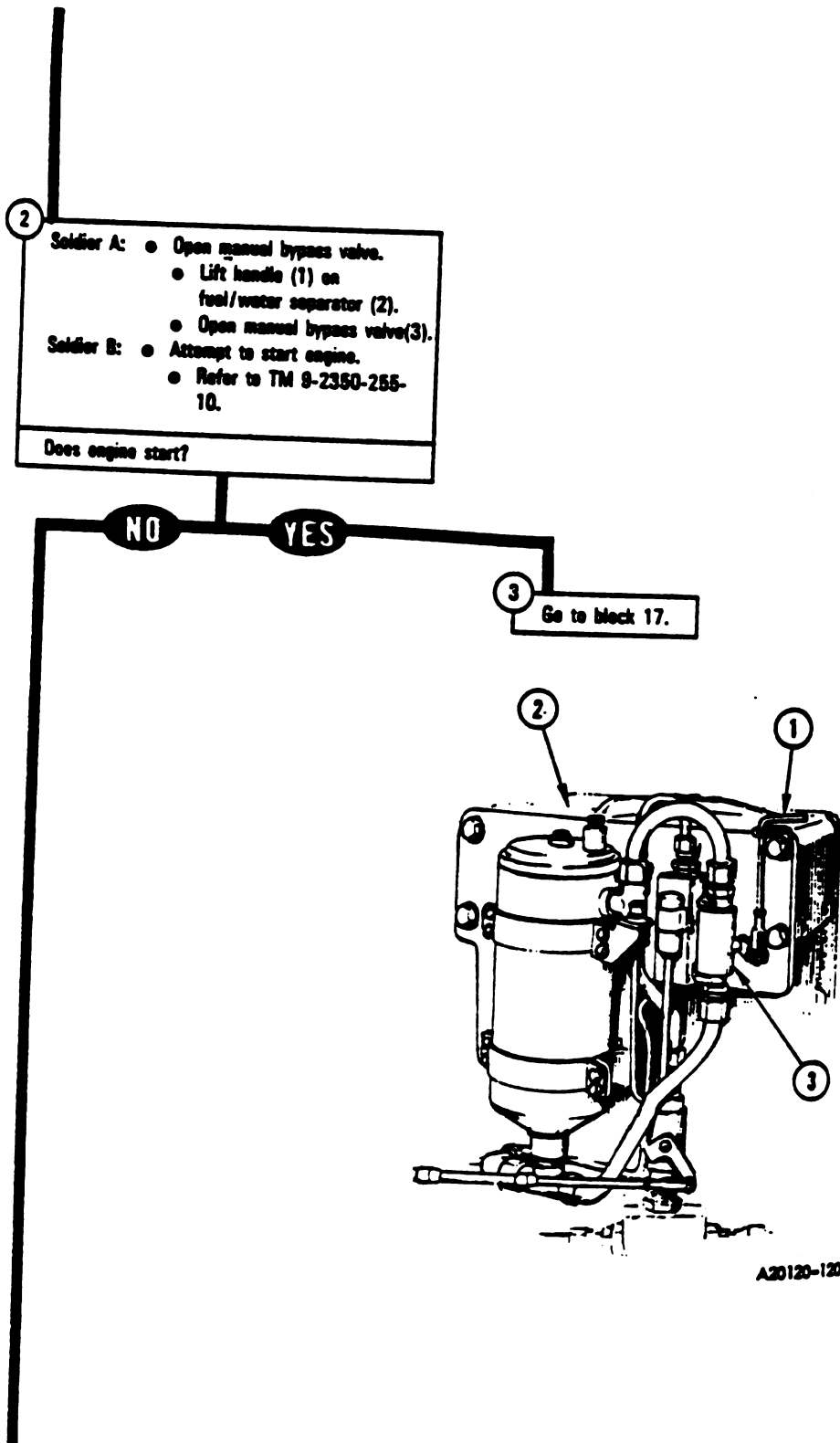
- Remove TA302 (1) from fuel inlet tee (2) with 7/8-inch and 3/4-inch wrenches.
- Screw on and tighten cap (3) on fuel inlet tee (2) with 7/8-inch wrench.
- Disconnect CA201-P2 from J1 on electronic control unit.
  - See figure 9-51.
- Connect shorting connector to J1 on electronic control unit.
  - See figure 9-110.



A20120-1201

Figure 9-85 (Sheet 1 of 8)  
Volume II  
Para. 9-2

**TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING**



*Figure 9-85 (Sheet 2 of 8)  
Volume II  
Para. 9-2*

9-274 Change 3

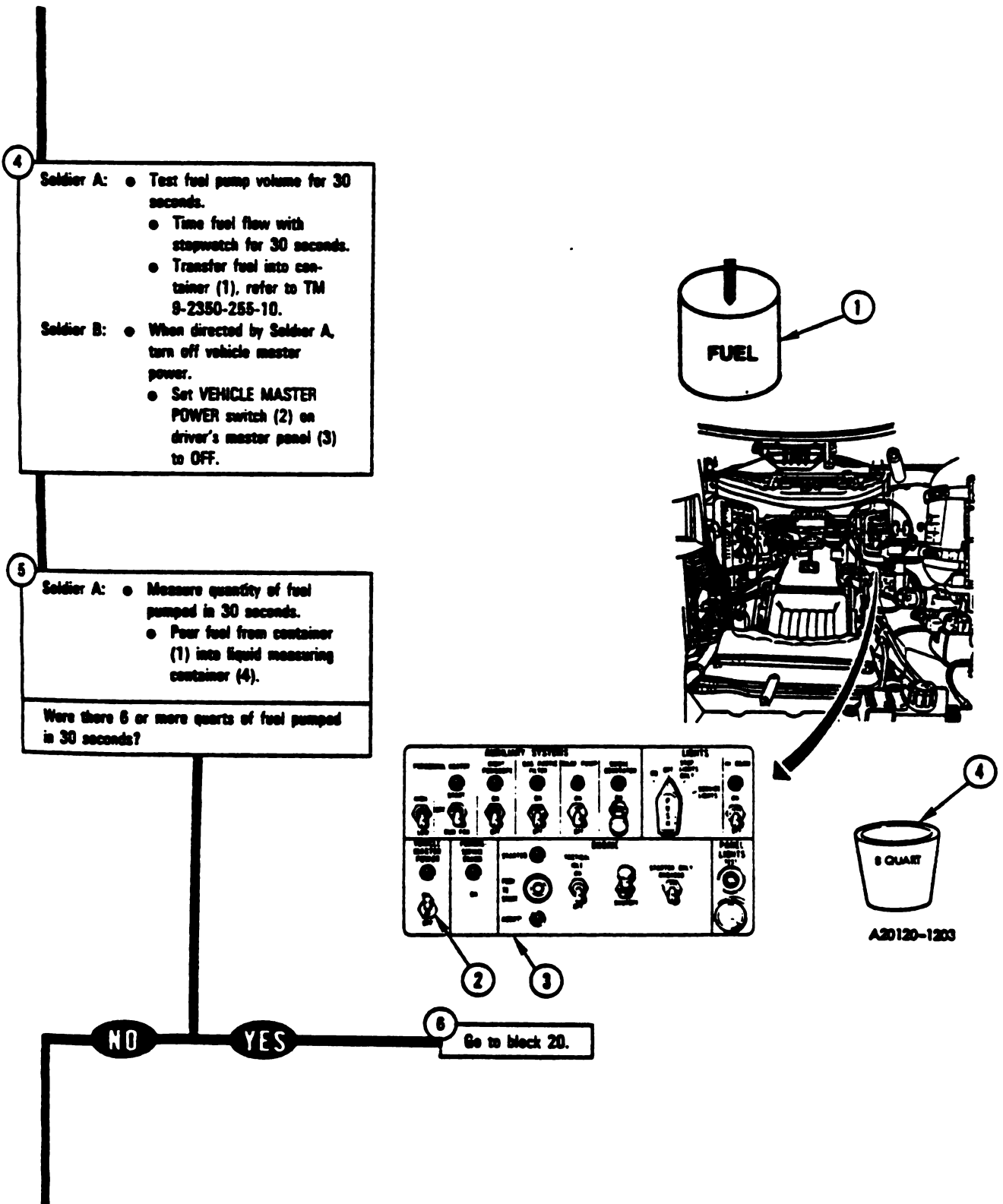
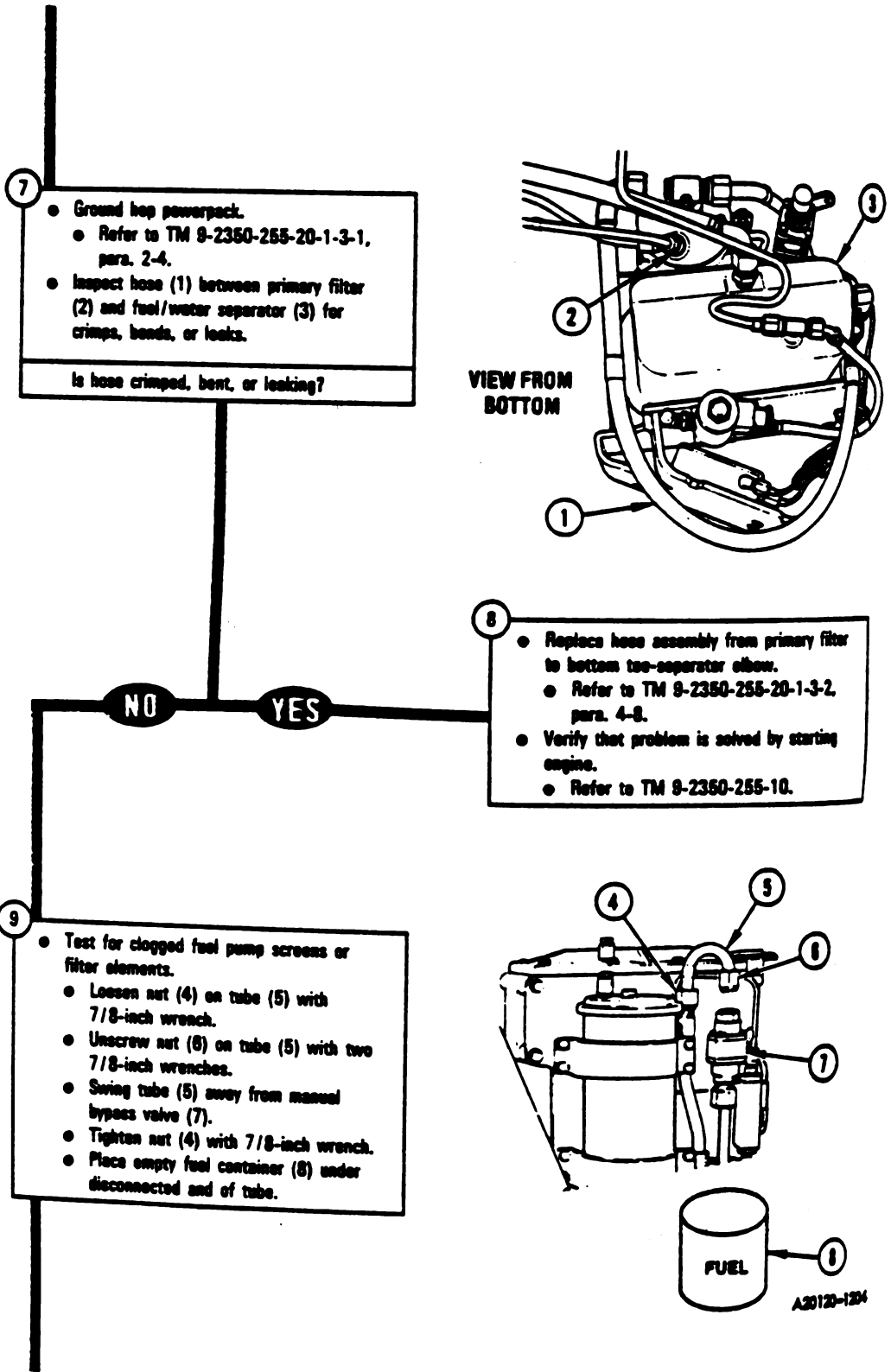


Figure 9-85 (Sheet 3 of 8)  
Volume II  
Para. 9-2

**TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING**



**Figure 9-85 (Sheet 4 of 8)  
Volume II  
Para. 9-2**

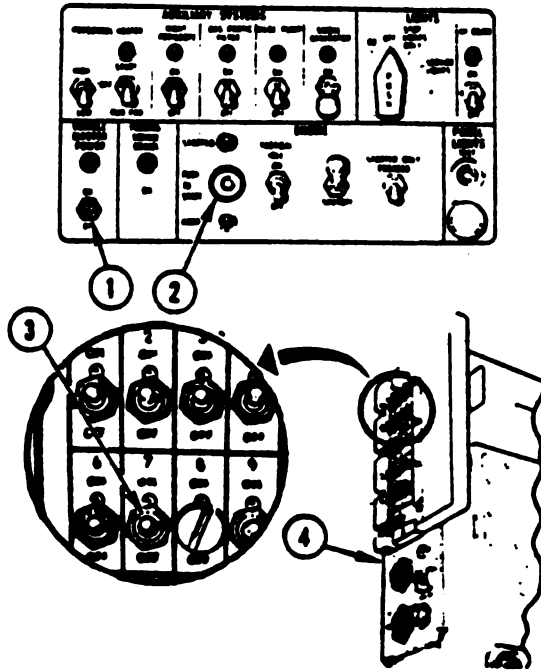
10  
**Soldier B:**

- When directed by Soldier A, turn off vehicle master power.
- Set VEHICLE MASTER POWER switch (1) to OFF.

**NOTE**  
 Set circuit breaker 7, on hull networks box, to OFF as seen as PUSH TO START button is pressed.

**Soldier B:**

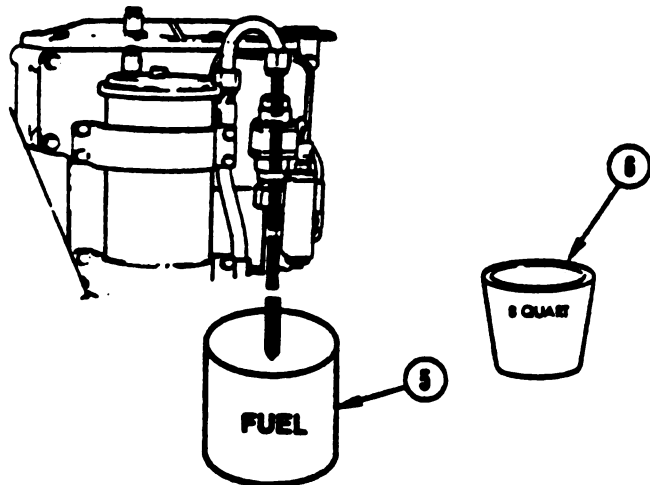
- When directed by Soldier A, press and release PUSH TO START button and set circuit breaker 7 to OFF.
- Push and release PUSH TO START button (2).
- Set circuit breaker 7 (3) on hull networks box (4) to OFF.



11  
**Soldier A:**

- Test fuel pump volume for 30 seconds.
- Time fuel flow with stopwatch for 30 seconds.
- Transfer fuel into container (5), refer to TM 9-2350-255-10.
- Measure quantity of fuel pumped in 30 seconds.
- Pour fuel from container (5) into liquid measuring container (6).

Were there 6 or more quarts of fuel pumped in 30 seconds?



A20120-1205

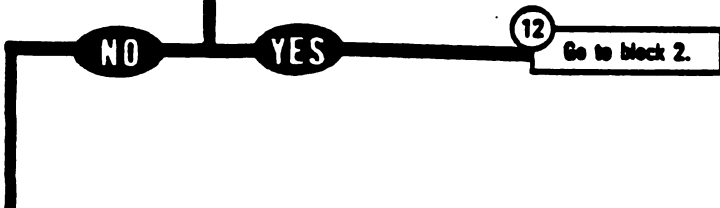
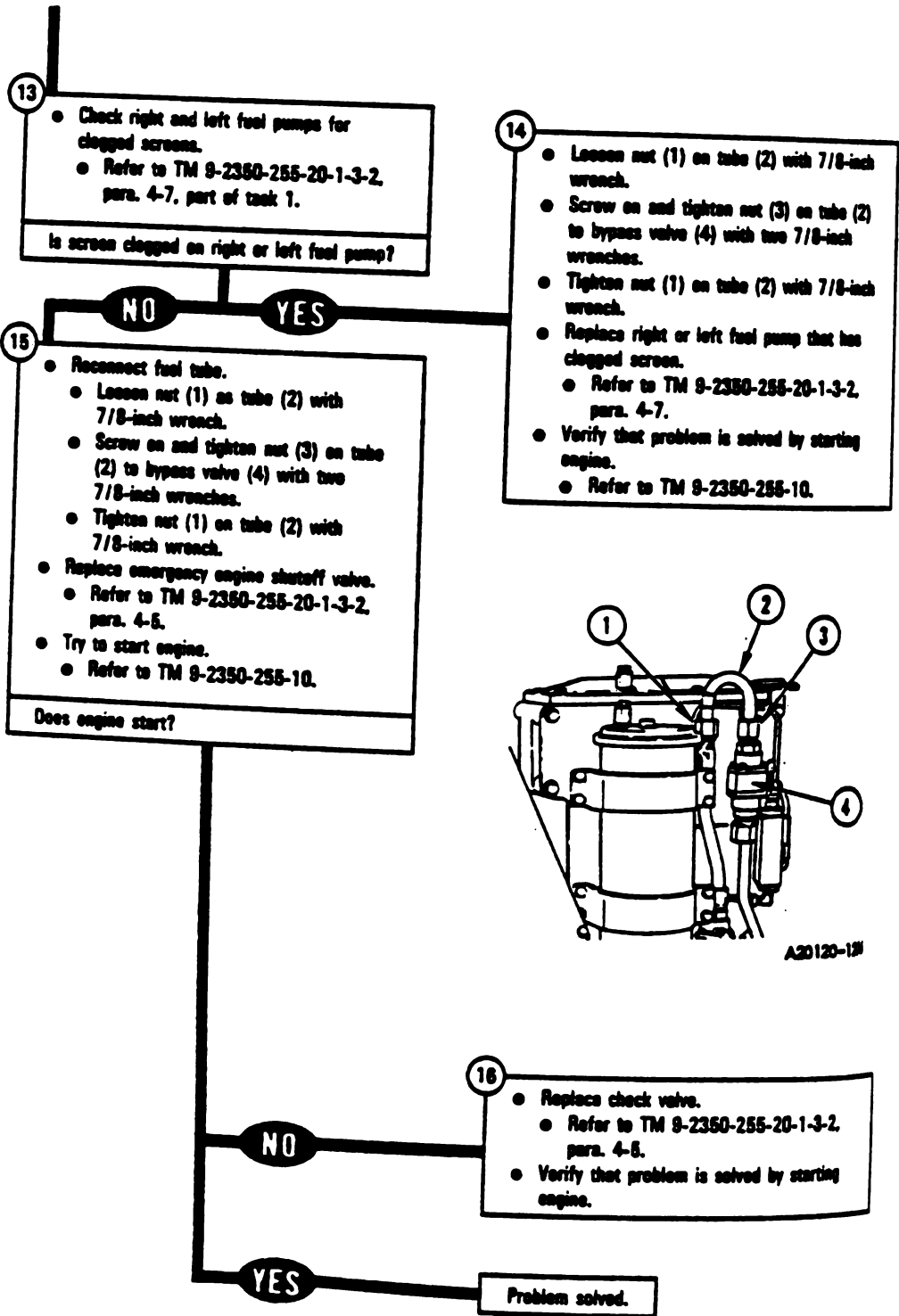


Figure 9-85 (Sheet 5 of 8)  
 Volume II  
 Para. 9-2

**TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING**



*Figure 9-85 (Sheet 6 of 8)  
Volume II  
Para. 9-2*

From block 3

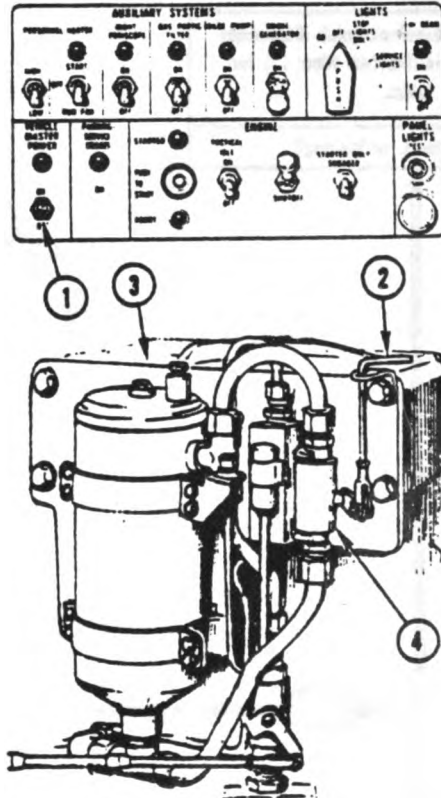
17

**Soldier B:**

- Shut down engine.
- Refer to TM 9-2350-255-10.
- Set VEHICLE MASTER POWER switch (1) to OFF.

**Soldier A:**

- Drain fuel/water separator and primary fuel filter.
- Refer to TM 9-2350-255-20-1-3-2, para. 4-8.
- Purge fuel system.
- Refer to TM 9-2350-255-20-1-3-2, para. 4-8.



A20120-1207

18

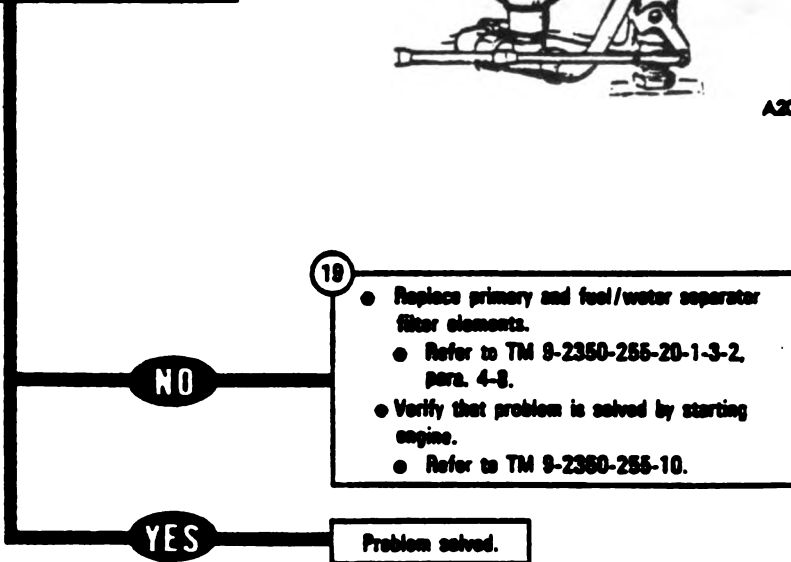
**Soldier A:**

- Push down handle (2) on fuel/water separator (3) to close manual bypass valve (4).

**Soldier B:**

- Start engine.
- Refer to TM 9-2350-255-10.

Does engine start?



19

- Replace primary and fuel/water separator filter elements.
- Refer to TM 9-2350-255-20-1-3-2, para. 4-8.
- Verify that problem is solved by starting engine.
- Refer to TM 9-2350-255-10.

Problem solved.

Figure 9-85 (Sheet 7 of 8)  
Volume II  
Para. 9-2



TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING

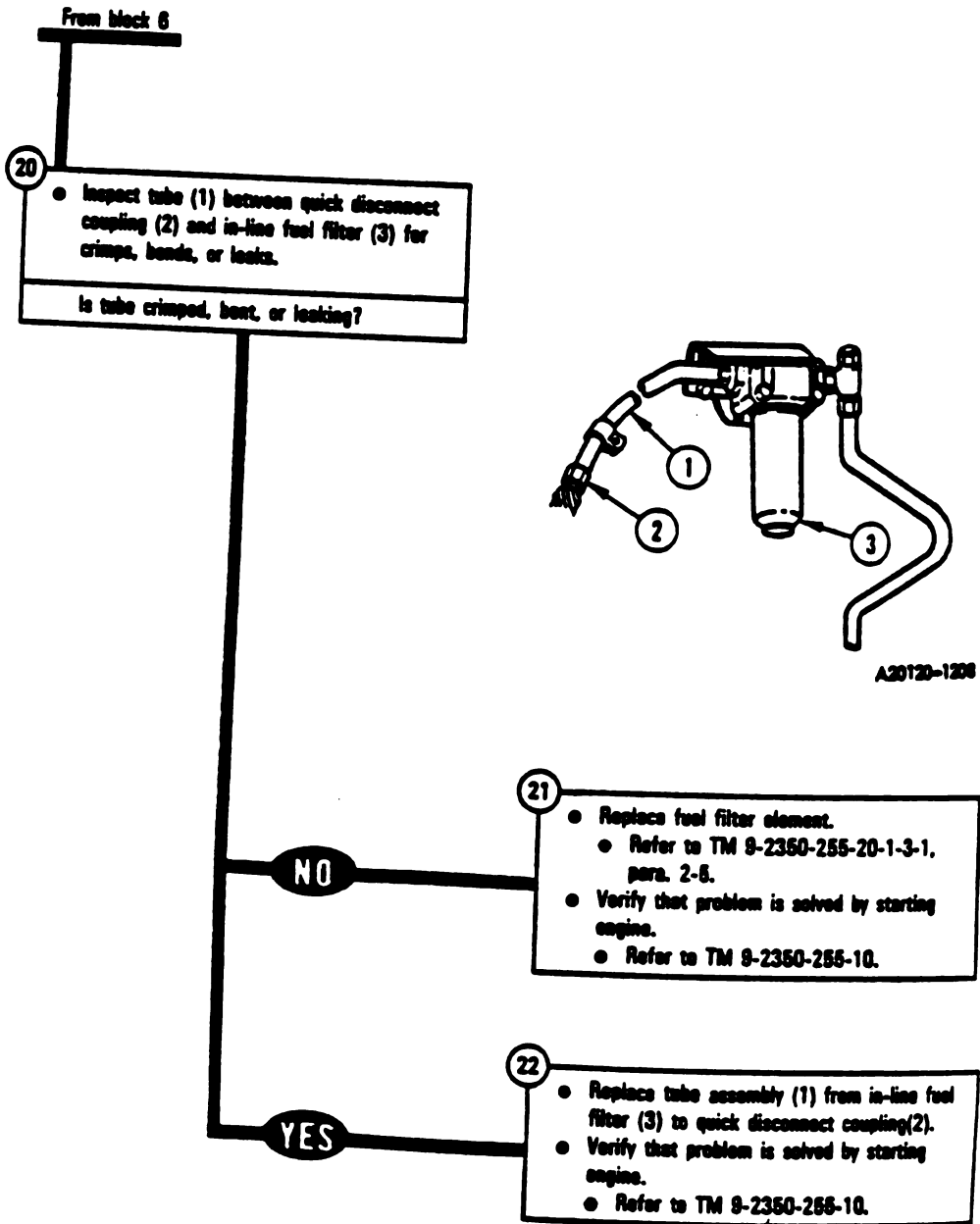


Figure 9-85 (Sheet 8 of 8)  
Volume II  
Para. 9-2

9-280 Change 3

**DISPLAY SHOWS -  
FAULTY IGN EXCTR OR  
CABLES**

**150448**

**Equipment Condition:**

- Tank perked.
- Parking brake set.
- Engine shut down.
- Vehicle master power off.

- Disconnect CX305-P1 from CA307-P2.
  - See figure 9-53.
- Disconnect CA307-P1 from TJ1 on driver's instrument panel.
  - See figure 9-53.

- Go to figure 9-87, block 2.

*Figure 9-86*  
**Volume II**  
**Para. 9-2**

**Change 3 9-281**

TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING

DISPLAY SHOWS -  
FAULTY EXCITER, 3W107,  
2W107, 2W105

154202

Equipment Condition:

- Tank parked.
- Parking brake set.
- Engine shut down.
- Vehicle master power off.

1

- Disconnect CX305-P1 from CA205-P2.
  - See figure 9-25.
- Disconnect 2W105-P5 from CA205-P1.
  - See figure 9-25.

From figure 9-86

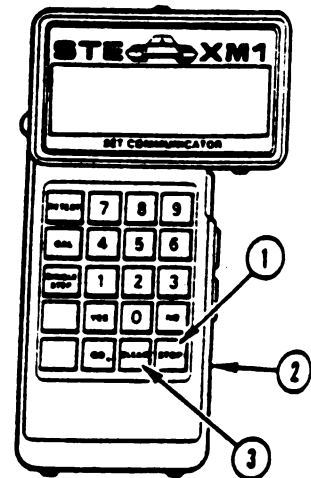
2

- Disconnect CX304-P1 from CA201-P1.
  - See figure 9-51.
- Disconnect CA201-P2 from J1 on electronic control unit.
  - See figure 9-51.
- Disconnect 3W107-P18 from J18 on ignition exciter.
  - See figure 9-112.
- Disconnect 3W107-P2 from 2W107-J2.
  - See figure 9-111.

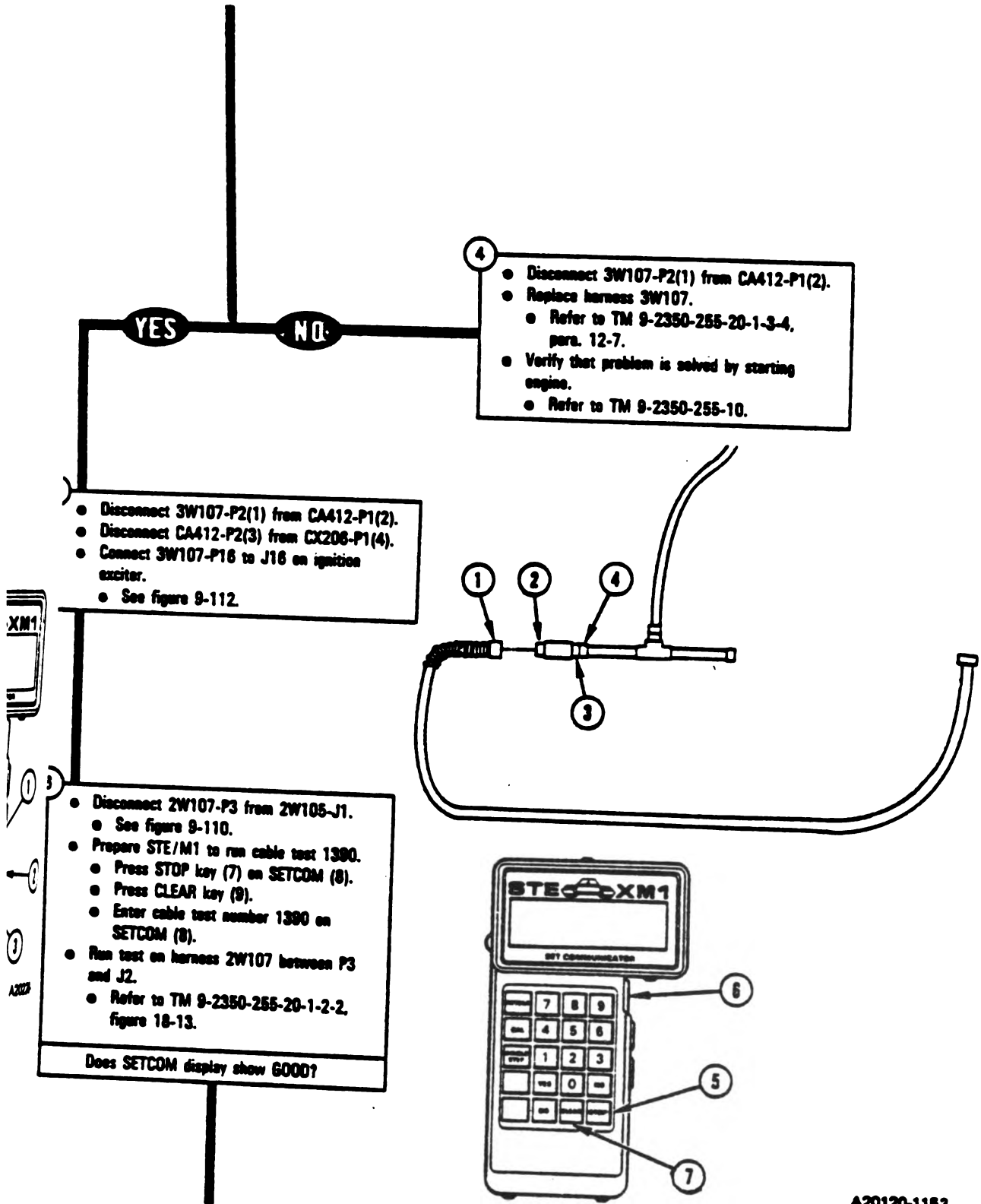
3

- Prepare STE/M1 to run cable test 1390.
- Press STOP key (1) on SETCOM (2).
- Press CLEAR key (3).
- Enter cable test number 1390 on SETCOM (2).
- Run test on harness 2W107 between P2 and P18.
- Refer to TM 9-2350-255-20-1-2-2, figure 18-13.

Does SETCOM display show GOOD?



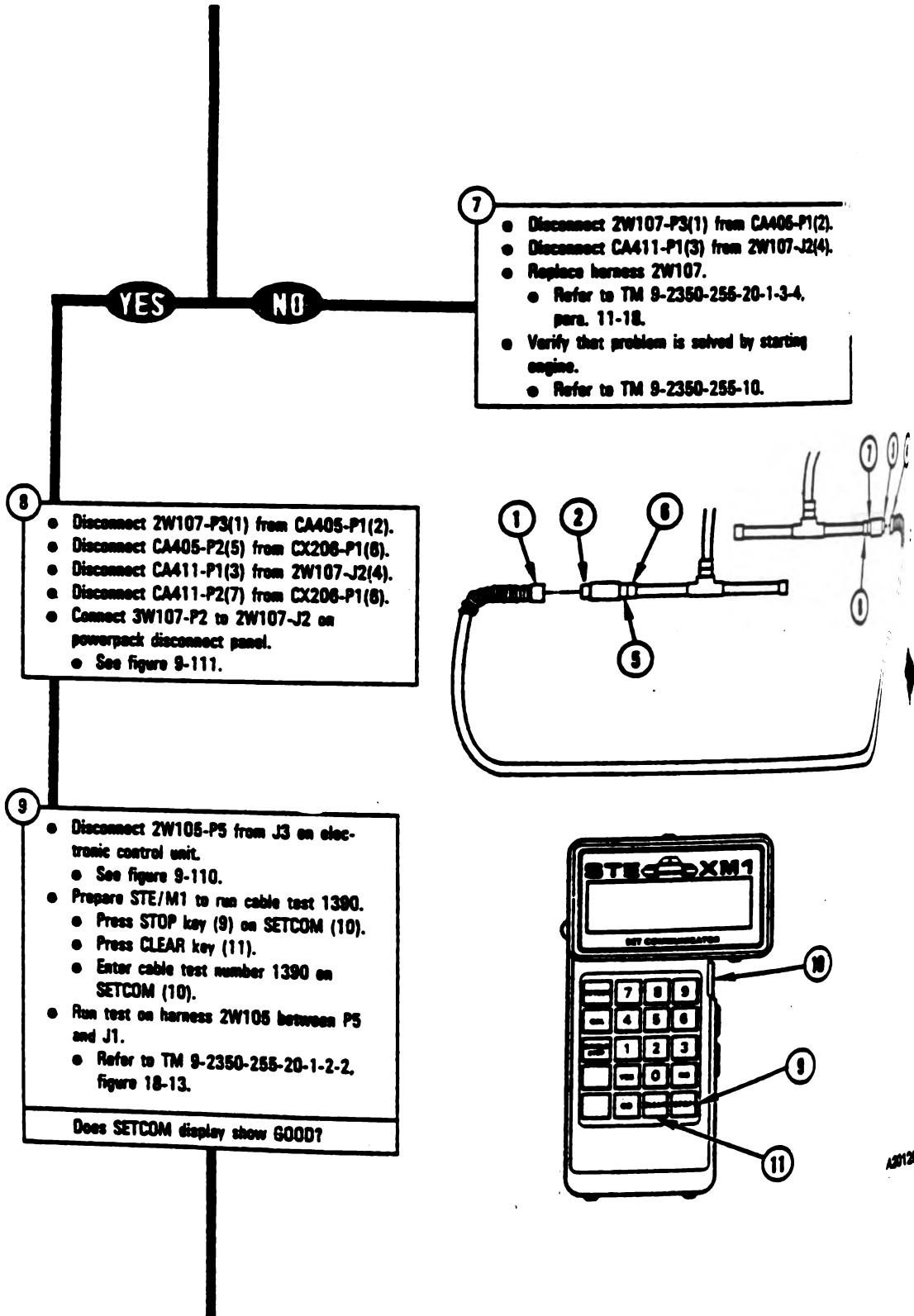
A20220-011R1



A20120-1183

Figure 9-87 (Sheet 2 of 4)  
Volume II  
Para. 9-2

**TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING**



*Figure 9-87 (Sheet 3 of 4)  
Volume II  
Para. 9-2*

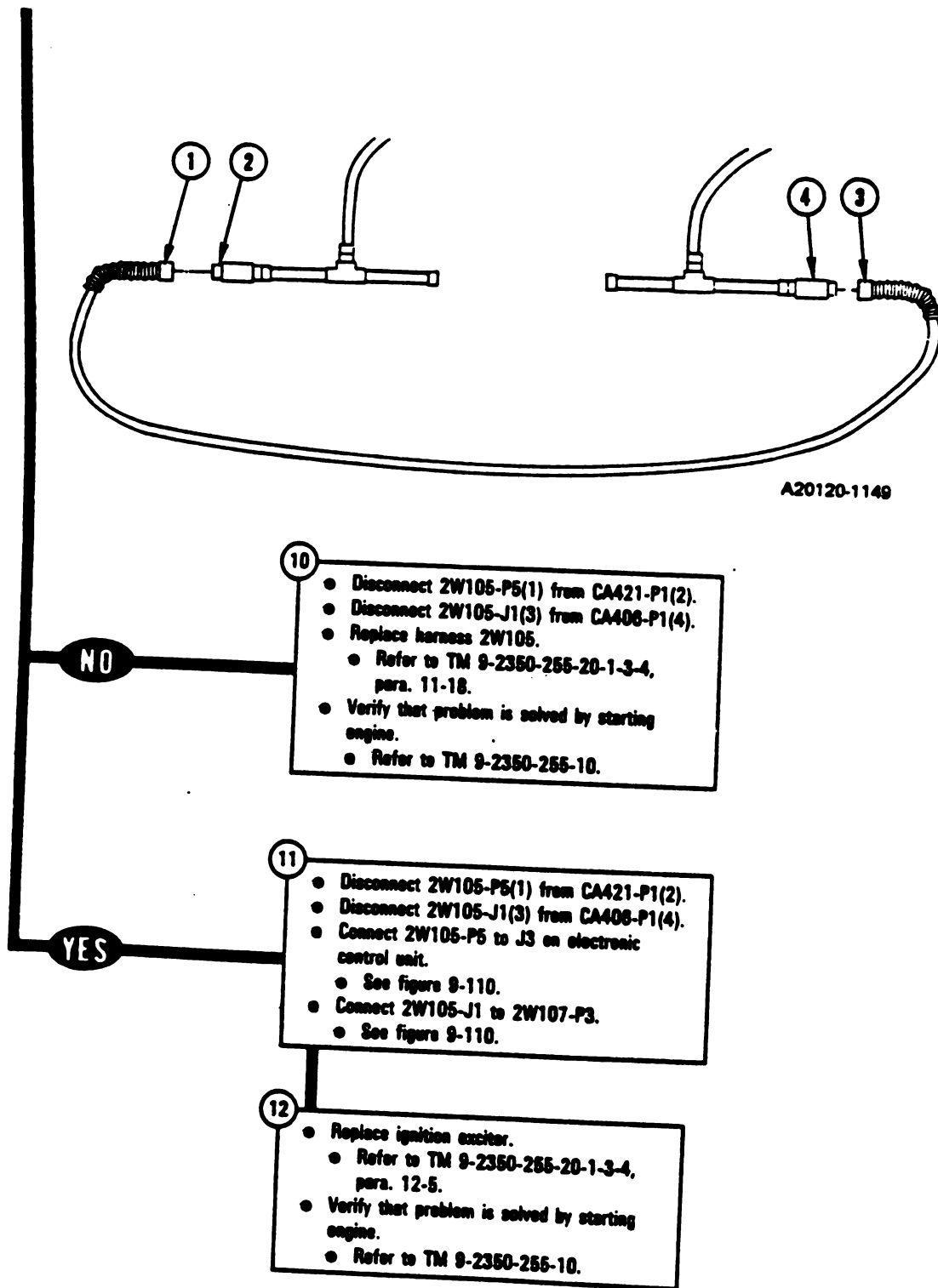


Figure 9-87 (Sheet 4 of 4)  
Volume II  
Para. 9-2

**TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING**

**DISPLAY SHOWS -  
FAULTY *EHFs*, *PTS* ACT  
OR ENGINE**

**Common Tools:**

- Wrench, combination, 9/16-inch
- Wrench, combination, 11/16-inch

**Supplies:**

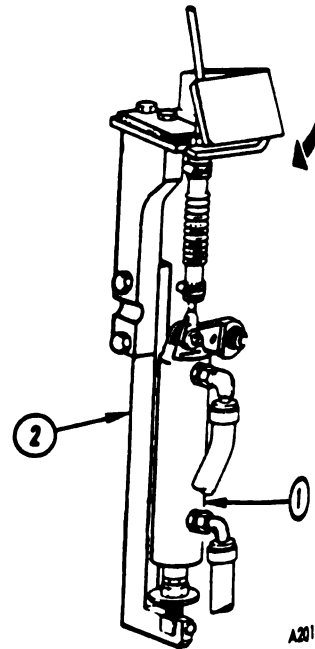
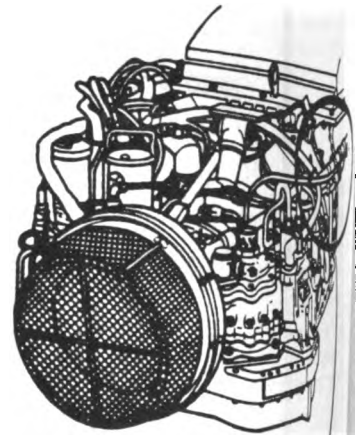
- Cap, tube, 37° flared, *MS-51532853*
- Cap, tube, 37° flared, *MS-51532863*
- Pencil marking
- Protective plug PD60 (two required)
- Rags, wiping

**Equipment Condition:**

- Tank parked in *GROUND* Hop Mode.
- Parking brake set.
- Engine shut down.
- Vehicle master power off.

- ①
- Check power turbine stator (*PTS*) actuator for movement caused by leaky seals.
  - Push *PTS* actuator (1) up as far as possible and mark the stopping point on mounting bracket (2) with pencil.
  - Push *PTS* actuator (1) down as far as possible and mark the stopping point on mounting bracket (2) with pencil.
  - Put *PTS* actuator (1) midway between the two stopping points marked on mounting bracket (2).

● 150523  
151606



A20120-11/6

*Figure 9-88 (Sheet 1 of 4)*  
**Volume II  
Para. 9-2**

Continuation of block 1.

**NOTE**

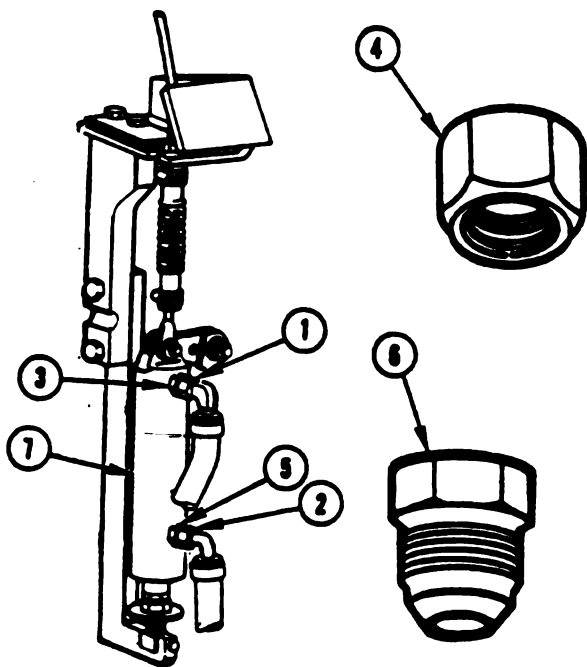
Place rags below assembly to catch any fuel leaking when fitting nuts (1 and 2) are loosened.

Unscrew and take off fuel tube fitting nut (1) from actuator fitting (3) with 9/16-inch and 11/16-inch wrenches.

Screw cap (4) on fitting (3) and tighten with 11/16-inch wrench.

Unscrew and take off fuel tube fitting nut (2) from actuator fitting (5) with 9/16-inch and 11/16-inch wrenches.

Screw other cap (4) on fitting (5) and tighten with 11/16-inch wrench.



A20120-1197

Screw protective plugs (6) on fuel tube fitting nuts (1 and 2) and tighten by hand.

**NOTE**

If PTS actuator can be moved so that it reaches either of the pencil marks made earlier, then seals are leaking.

- Try pushing up on PTS actuator (7) to see if it will reach the upper mark.
- Try pushing down on PTS actuator (7) to see if it will reach the lower mark.

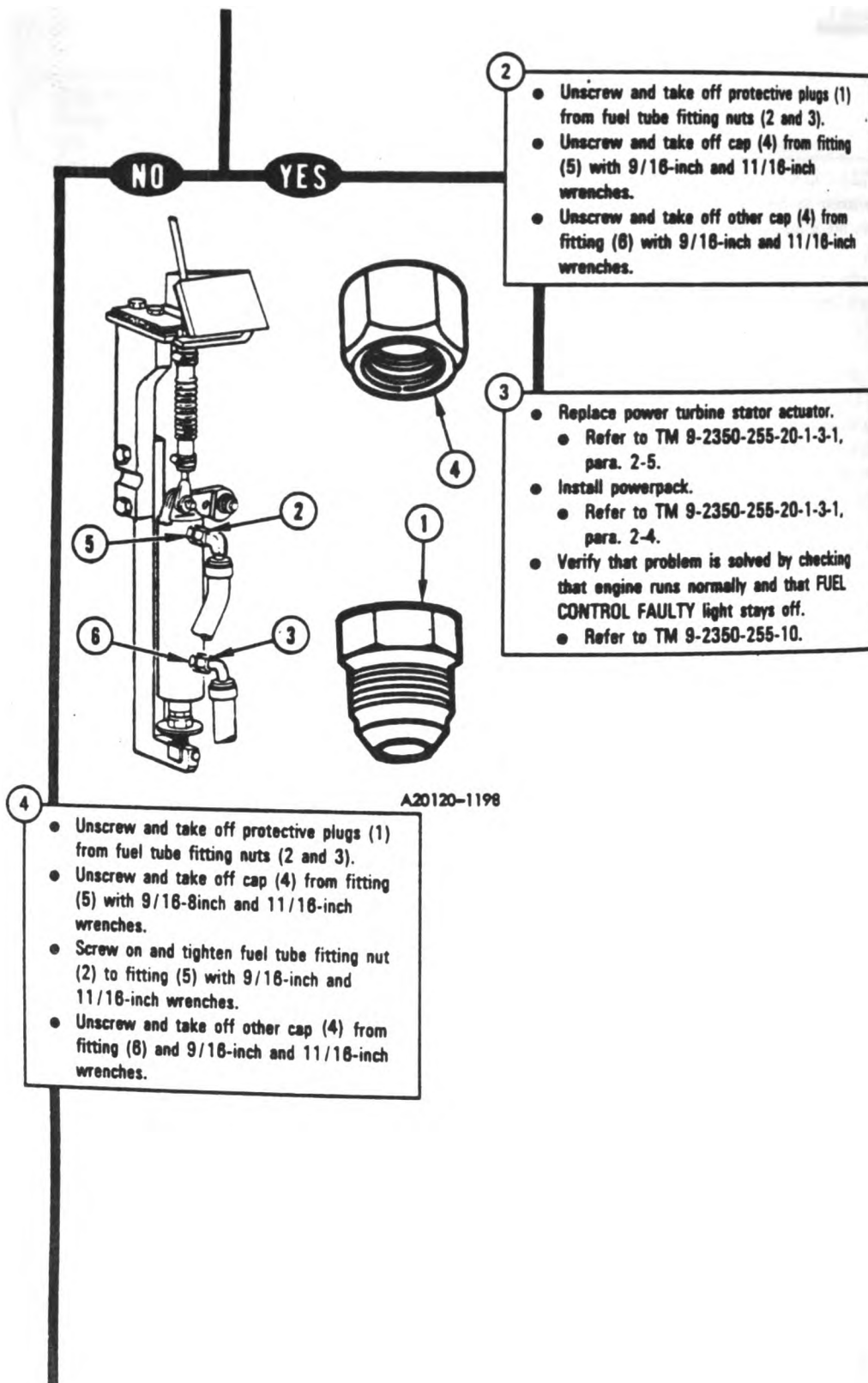
PTS actuator reach either mark?

Figure 9-88 (Sheet 2 of 4)  
Volume II  
Para. 9-2

Change 3 9-287



**TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING**



**4**

- Unscrew and take off protective plugs (1) from fuel tube fitting nuts (2 and 3).
- Unscrew and take off cap (4) from fitting (5) with 9/16-inch and 11/16-inch wrenches.
- Screw on and tighten fuel tube fitting nut (2) to fitting (5) with 9/16-inch and 11/16-inch wrenches.
- Unscrew and take off other cap (4) from fitting (6) and 9/16-inch and 11/16-inch wrenches.

**2**

- Unscrew and take off protective plugs (1) from fuel tube fitting nuts (2 and 3).
- Unscrew and take off cap (4) from fitting (5) with 9/16-inch and 11/16-inch wrenches.
- Unscrew and take off other cap (4) from fitting (6) with 9/16-inch and 11/16-inch wrenches.

**3**

- Replace power turbine stator actuator.
  - Refer to TM 9-2350-255-20-1-3-1, para. 2-5.
- Install powerpack.
  - Refer to TM 9-2350-255-20-1-3-1, para. 2-4.
- Verify that problem is solved by checking that engine runs normally and that FUEL CONTROL FAULTY light stays off.
  - Refer to TM 9-2350-255-10.

**Figure 9-88 (Sheet 3 of 4)  
Volume II  
Para. 9-2**

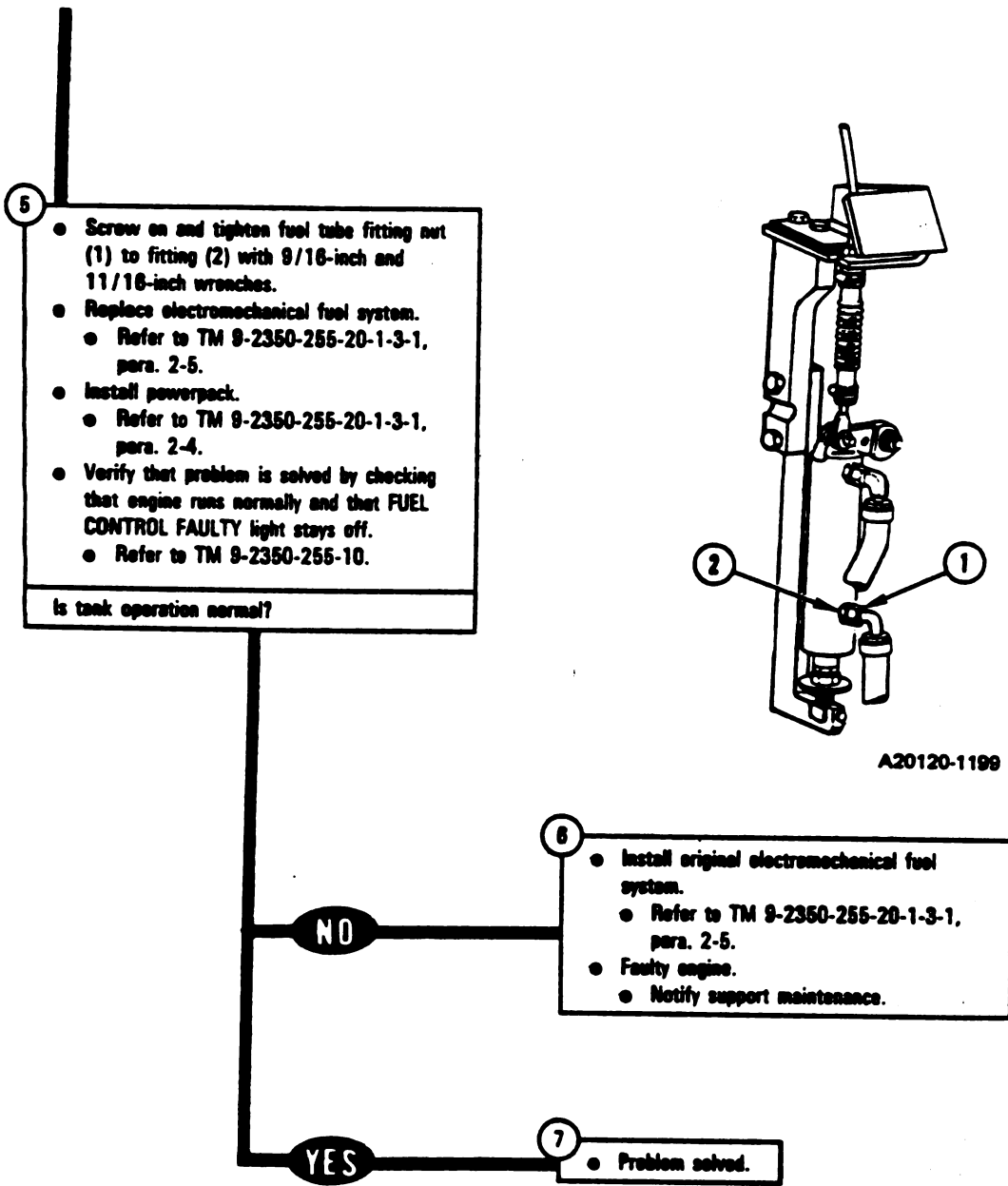


Figure 9-88 (Sheet 4 of 4)  
Volume II  
Para. 9-2

DISPLAY SHOWS -  
FAULTY *EMIS*, OR IGV  
ACTUATOR

150528

**Common Tools:**

- Screwdriver, flat-tip.
- Wrench, combination, 9/16-inch.
- Wrench, combination, 5/8-inch.
- Wrench, combination, 11/16-inch.

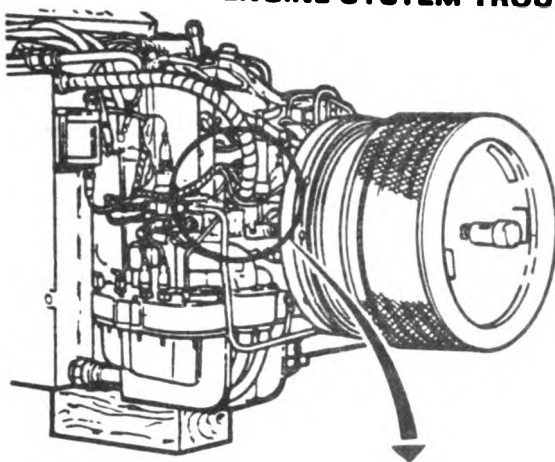
**Supplies:**

- Cap. tube, 37° flared, MS51532B6 (two required).
- Protective plug PD60 (two required).
- Rags, wiping.

**Equipment Condition:**

- Tank parked.
- Parking in ground hop mode.
- Engine shut down.
- Vehicle master power off.

*Figure 9-89 (Sheet 1 of 3)*  
Volume II  
Para. 9-2



Check inlet guide vane (IGV) actuator for movement caused by leaky seals.

- Pull forward or push backward on IGV actuator lever (1) so that 12.5 mark (2) lines up with mark (3) on plate (4).
- Place screwdriver through slot (5) on air bleed valve rod (6) to keep IGV actuator lever (1) from moving forward.

**NOTE**

Place rags below assembly to catch any fuel leaking when fitting nuts (7 and 8) are loosened.

- Unscrew and take off fuel tube fitting nut (7) from fitting (9) with 11/16-inch and 5/8-inch wrenches.

- Screw cap (10) on fitting (9) and tighten with 11/16-inch wrench.
- Unscrew and take off fuel tube fitting nut (8) from fitting (11) with 11/16-inch and 9/16-inch wrenches.
- Screw other cap (10) on fitting (11) and tighten with 11/16-inch wrench.
- Screw protective plugs (12) on fuel tube fitting nuts (7 and 8) and tighten by hand.

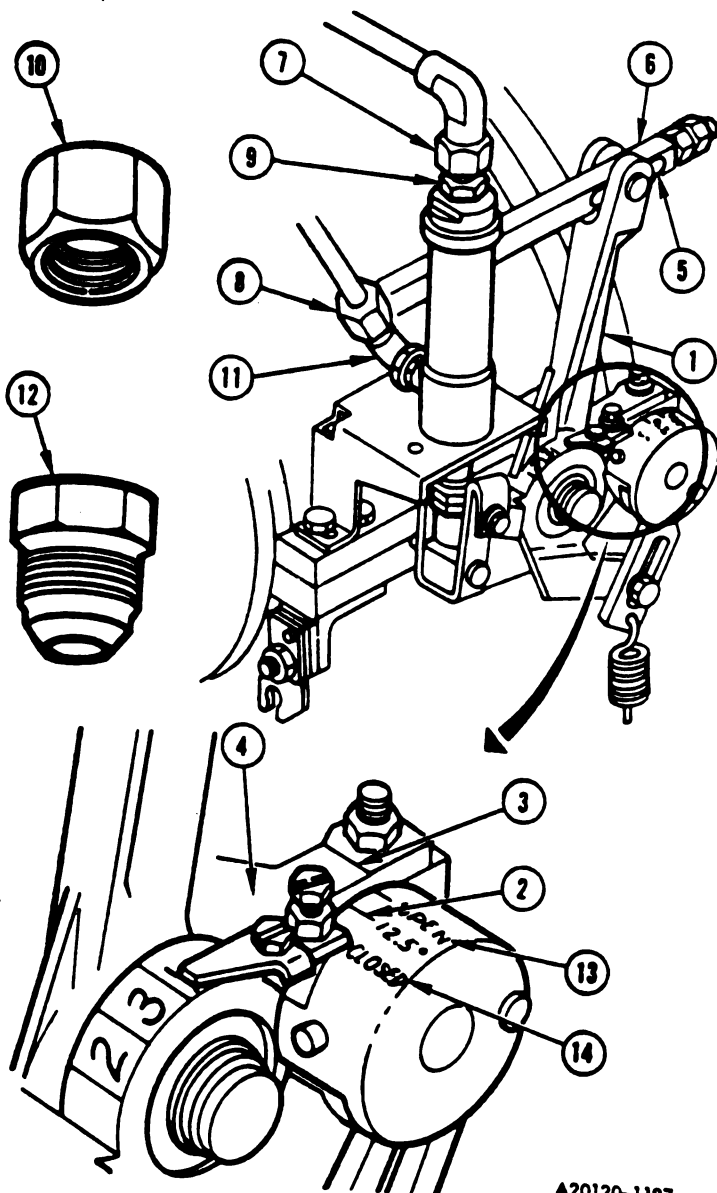
- Remove screwdriver from slot (5) on air bleed valve rod (6).

**NOTE**

If IGV actuator lever (1) can be moved so that OPEN (13) or CLOSED (14) reaches mark (3) on plate (4), then seals are leaking.

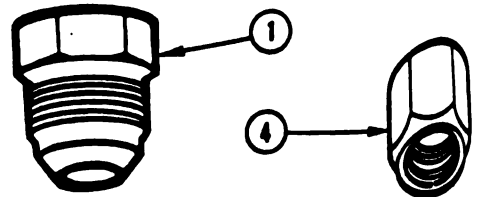
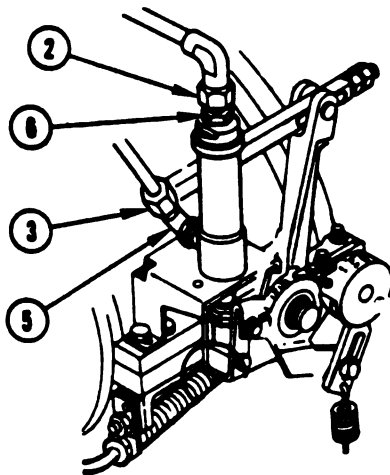
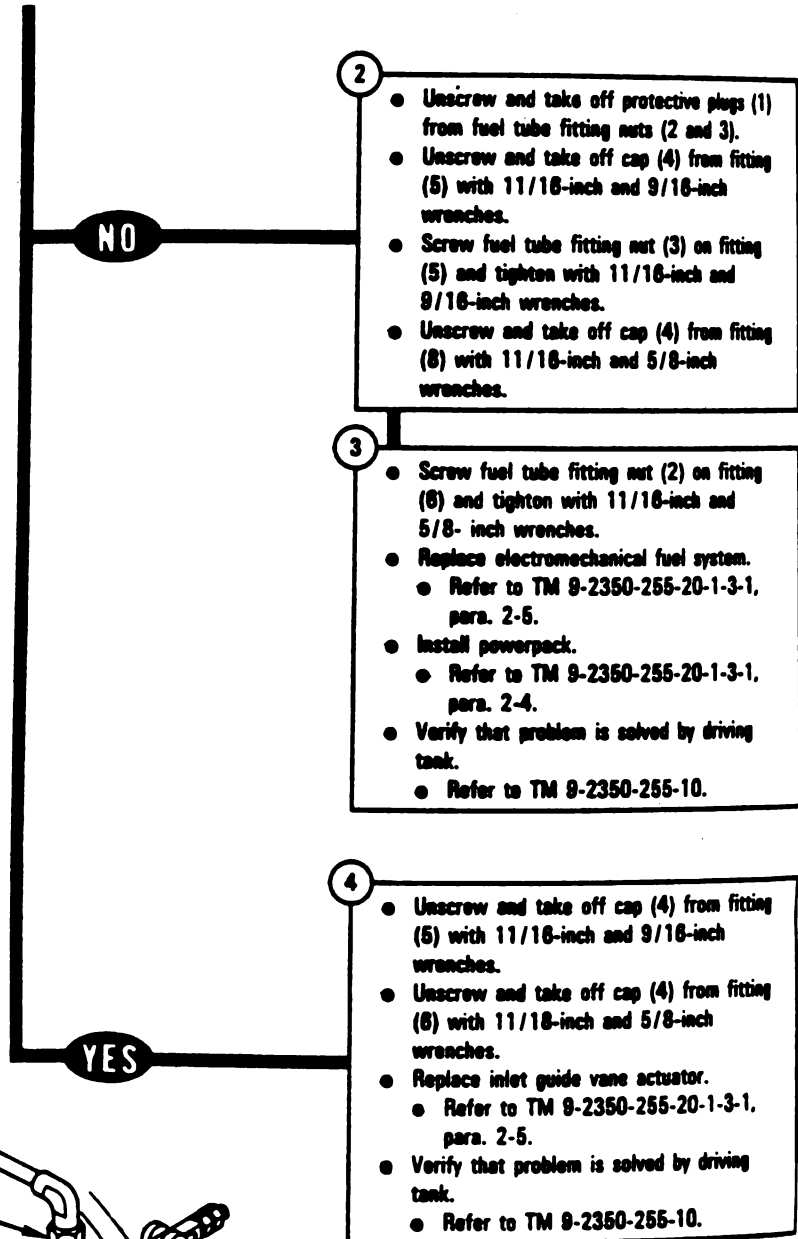
- Try pulling forward on IGV actuator lever (1) to see if CLOSED (14) reaches mark (3) on plate (4).
- Try pushing backward on IGV actuator lever (1) to see if OPEN (13) reaches mark (3) on plate (4).

Did IGV actuator lever move to either mark?



A20120-1187

Figure 9-89 (Sheet 2 of 3)  
Volume II  
Para. 9-2



A20120-1190

Figure 9-89 (Sheet 3 of 3)  
Volume II  
Para. 9-2

**DISPLAY SHOWS -  
FAULTY *EMPS*, IGV ACT,  
OR ENGINE**

**150533**

**Common Tools:**

- Screwdriver, flat-tip.
- Wrench, combination, 9/16-inch.
- Wrench, combination, 5/8-inch.
- Wrench, combination, 11/16-inch.

**Supplies:**

- Cap. tube, 37° flared, MS5153286 *6* (two required).
- Protective plug PD60 (two required).
- Rags, wiping.

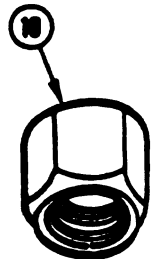
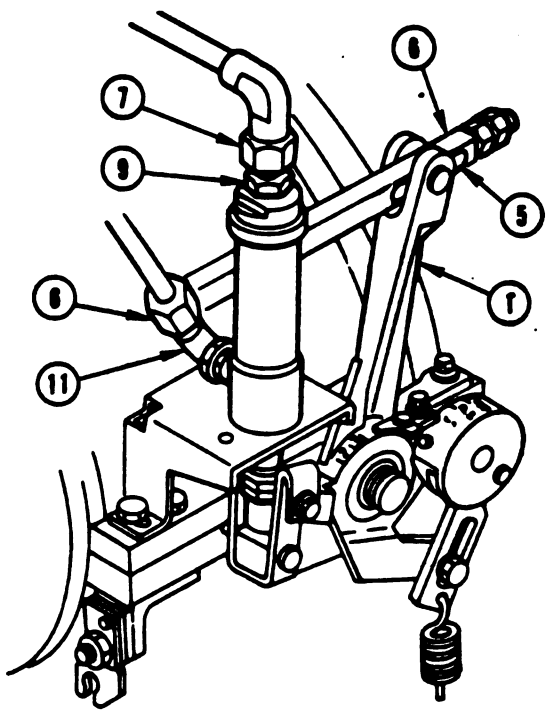
**Equipment Condition:**

- Tank parked.
- Parking in ground hop mode.
- Engine shut down.
- Vehicle master power off.

*Figure 9-90 (Sheet 1 of 4)*  
**Volume II**  
**Para. 9-2**

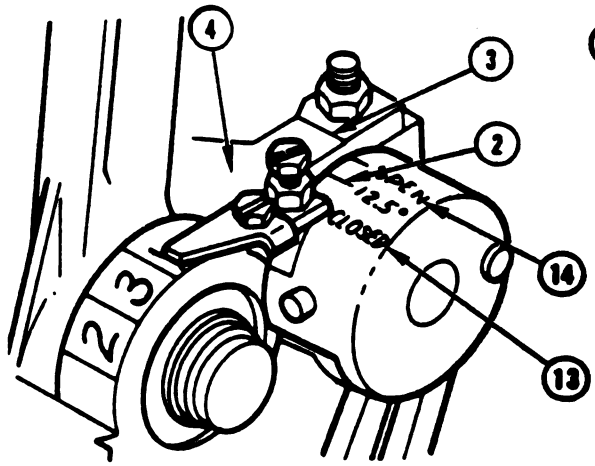
**Change 6 9-293**

- 1
- Check inlet guide vane (IGV) actuator for movement caused by leaky seals.
    - Pull forward or push backward on IGV actuator lever (1) so that 12.5 mark (2) lines up with mark (3) on plate (4).
    - Place screwdriver through slot (5) on air bleed valve rod (6) to keep IGV actuator lever (1) from moving forward.
- NOTE**  
Place rags below assembly to catch any fuel leaking when fitting nuts (7 and 8) are loosened.
- Unscrew and take off fuel tube fitting nut (7) from fitting (9) with 11/16-inch and 5/8-inch wrenches.



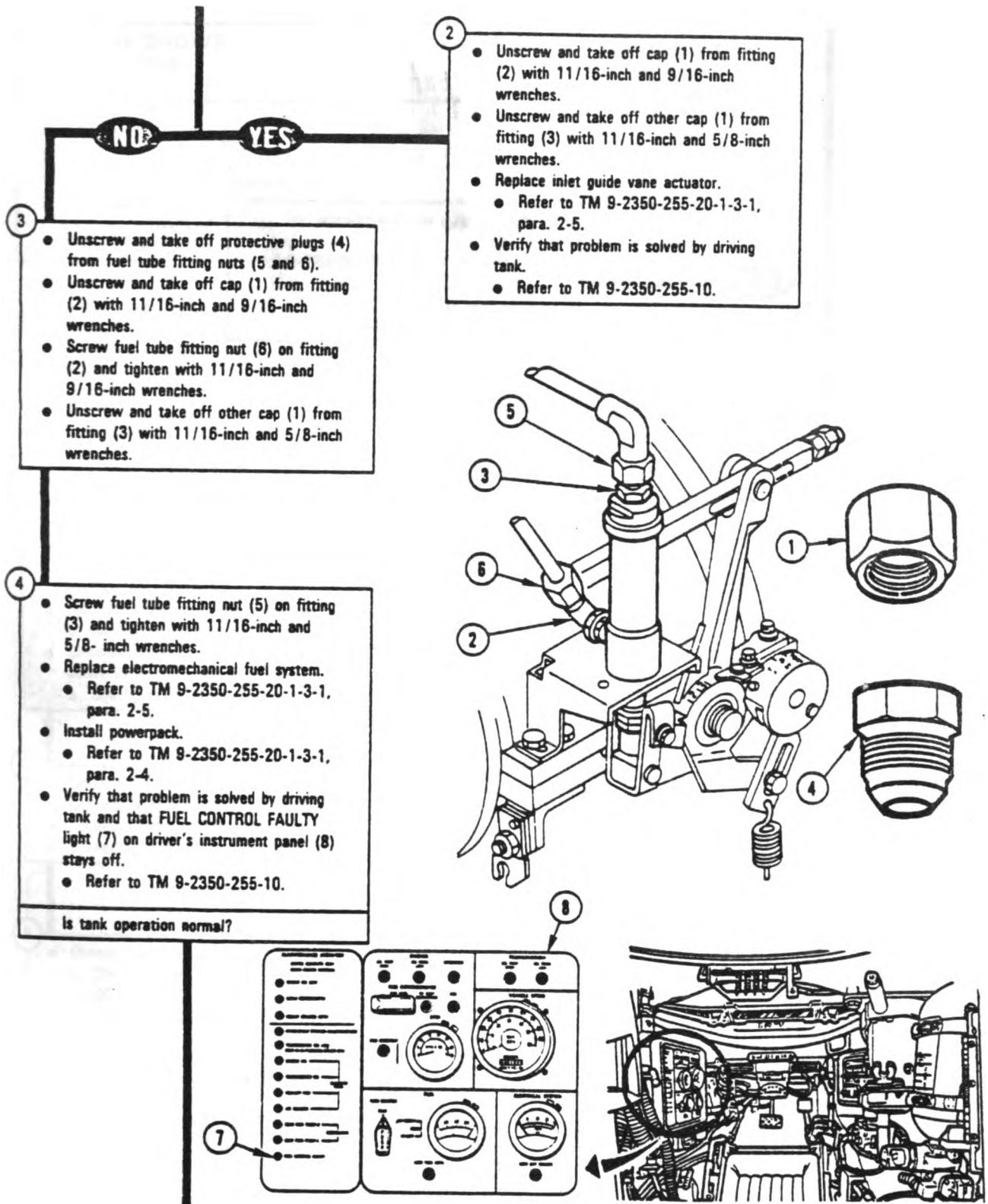
- Screw cap (10) on fitting (9) and tighten with 11/16-inch wrench.
- Unscrew and take off fuel tube fitting nut (8) from fitting (11) with 11/16-inch and 9/16-inch wrenches.
- Screw other cap (10) on fitting (11) and tighten with 11/16-inch wrench.
- Screw protective plugs (12) on fuel tube fitting nuts (7 and 8) and tighten by hand.

- Remove screwdriver from slot (5) on air bleed valve rod (6).
- NOTE**  
If IGV actuator lever can be moved so that CLOSED or OPEN reaches mark on plate, then seals are leaking.
- Try pulling forward on IGV actuator lever (1) to see if CLOSED (13) reaches mark (3) on plate (4).
  - Try pushing backward on IGV actuator lever (1) to see if OPEN (14) reaches mark (3) on plate (4).
- Did IGV actuator lever move to either mark?



A20126-1187A

Figure 9-90 (Sheet 2 of 4)  
Volume II  
Para. 9-2



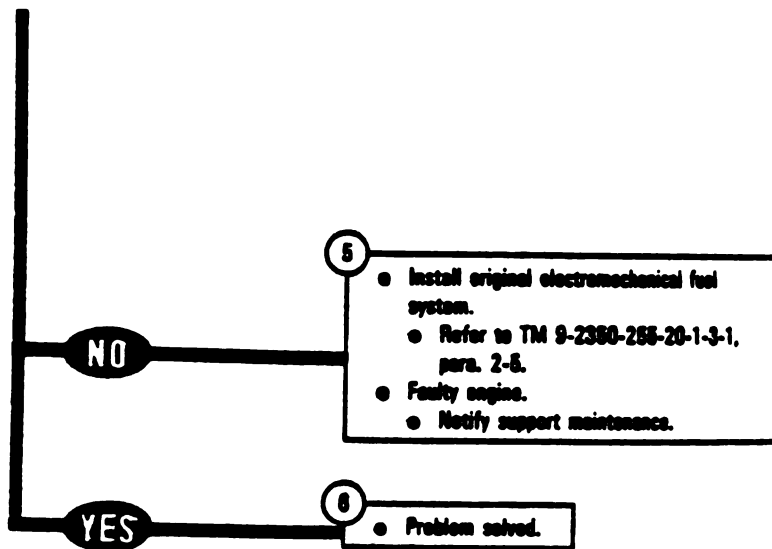
**Figure 9-90 (Sheet 3 of 4)  
Volume II  
Para. 9-2**

A20120-1192

**Change 3 9-295**



**TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING**



*Figure 9-90 (Sheet 4 of 4)*  
**Volume II**  
**Para. 9-2**

**9-296 Change 3**

RAY SHOWS -  
CY HNB,

14

150715

Additional Test  
Equipment/Special Tools:  
Breakout Box Tool Kit, 12311088

Pre-Test Condition:  
Aircraft parked.  
Engine brake set.  
Engine shut down.  
Aircraft master power off.

Connect CX305-P1 from CA301-P2.  
See figure 9-52.  
Connect CA301-P1 from TJ1 on bulk  
power distribution box.  
See figure 9-52.  
Connect CX305-P2 from J1 on CIB.  
See figure 9-52.  
Connect ZW104-P1 from J8 on bulk  
power distribution box.  
See figure 9-110.

Connect CX305-P2 (1) to breakout box (2).  
Connect CX305-P1 (3) to CX206-P3 (4).  
Connect CA518-P1 (5) to ZW104-P1 (6).  
Connect CA518-P2 (7) to CX206-P2 (8).

Change control from SETCOM to VTM.  
Set PWR switch (9) on CIB (10) to  
OFF to reset VTM (11).  
Set PWR switch (9) to ON.  
Configure VTM for measuring resistance  
between 0 and 1500 ohms.  
Refer to TM 9-4910-572-14&P, Vol-  
ume I, Appendix D.

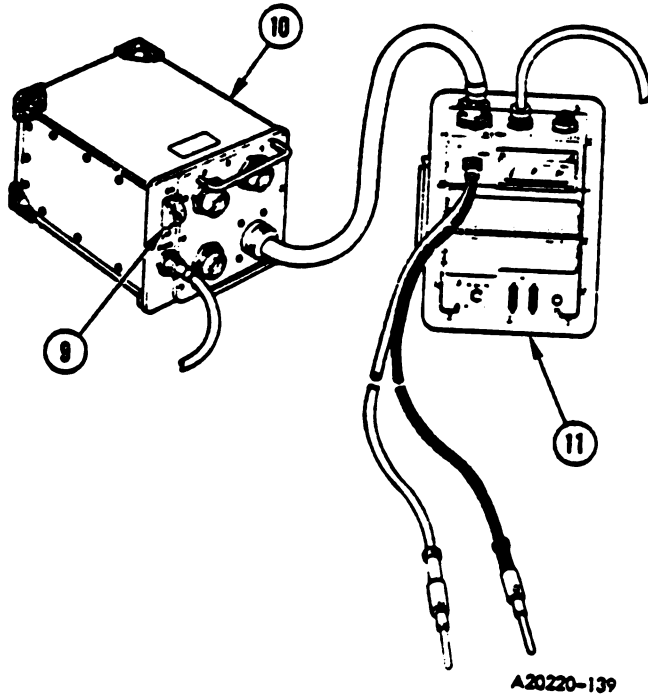
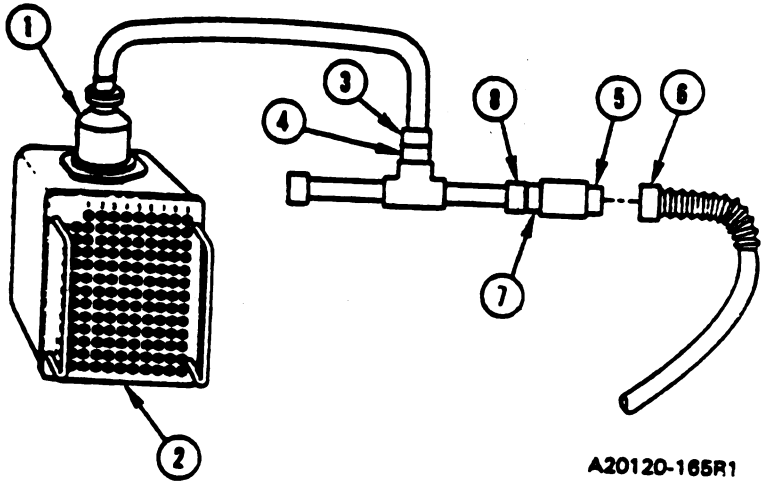
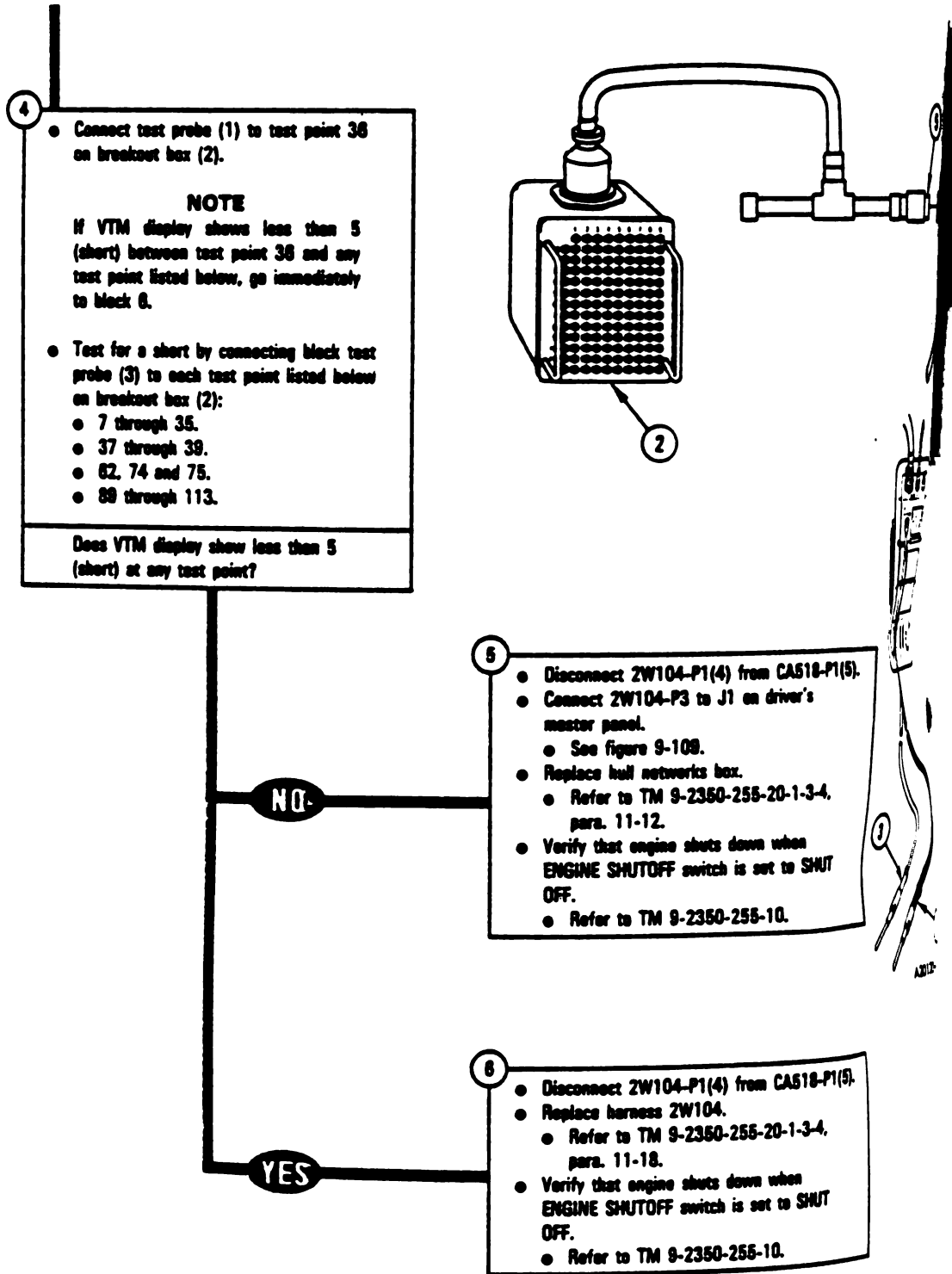


Figure 9-91 (Sheet 1 of 2)  
Volume II  
Para. 9-2

Change 3 9-297

**TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING**



*Figure 9-91 (Sheet 2 of 2)  
Volume II  
Para. 9-2*

**PLAY SHOWS -  
JLTY ECU, 2W104  
105**

150736

**Additional Test**

**Equipment/Special Tools:**  
Breakout Box Tool Kit, 12311066

**Equipment Condition:**

Tank parked.  
Parking brake set.  
Engine shut down.  
Vehicle master power off.

Disconnect CX305-P1 from CA301-P2.

● See figures 9-52.

Disconnect CA301-P2 from TJ1 on hull networks box.

● See figures 9-52.

Disconnect jumper from 2W104-P3.

● See figure 9-34.

Disconnect 2W105-P5 from J3 on electronic control unit.

● See figure 9-110.

Connect CX305-P2 (1) to breakout box(2).

Connect CX305-P1 (3) to CX206-P3 (4).

Connect 2W105-P4 (5) to CA423-P1 (6).

Connect CA423-P2 (7) to CX206-P1 (8).

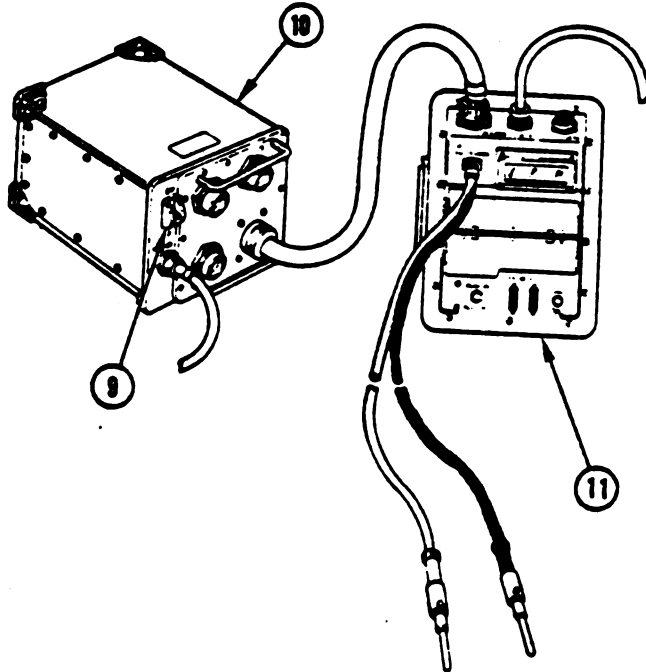
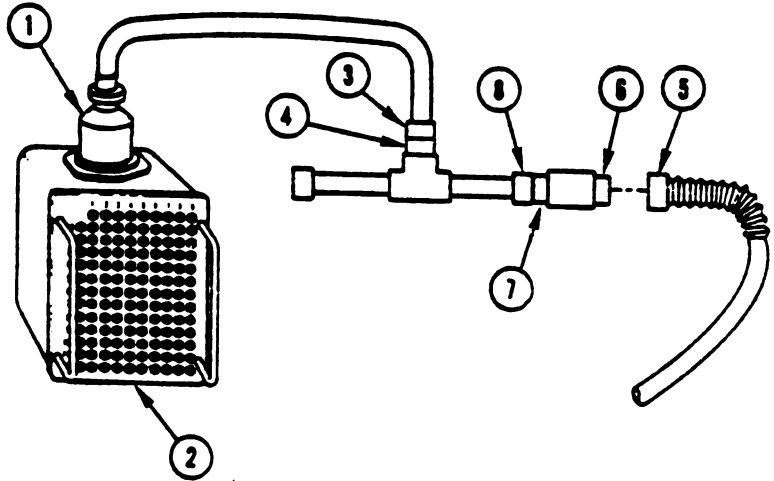
Change control from SETCOM to VTM.

● Set PWR switch (9) on CIB (10) to OFF to reset VTM (11).

● Set PWR switch (9) to ON.

Prepare VTM for measuring resistance between 0 and 1500 ohms.

● Refer to TM 9-4910-571-14&P, Volume 1, Appendix D.

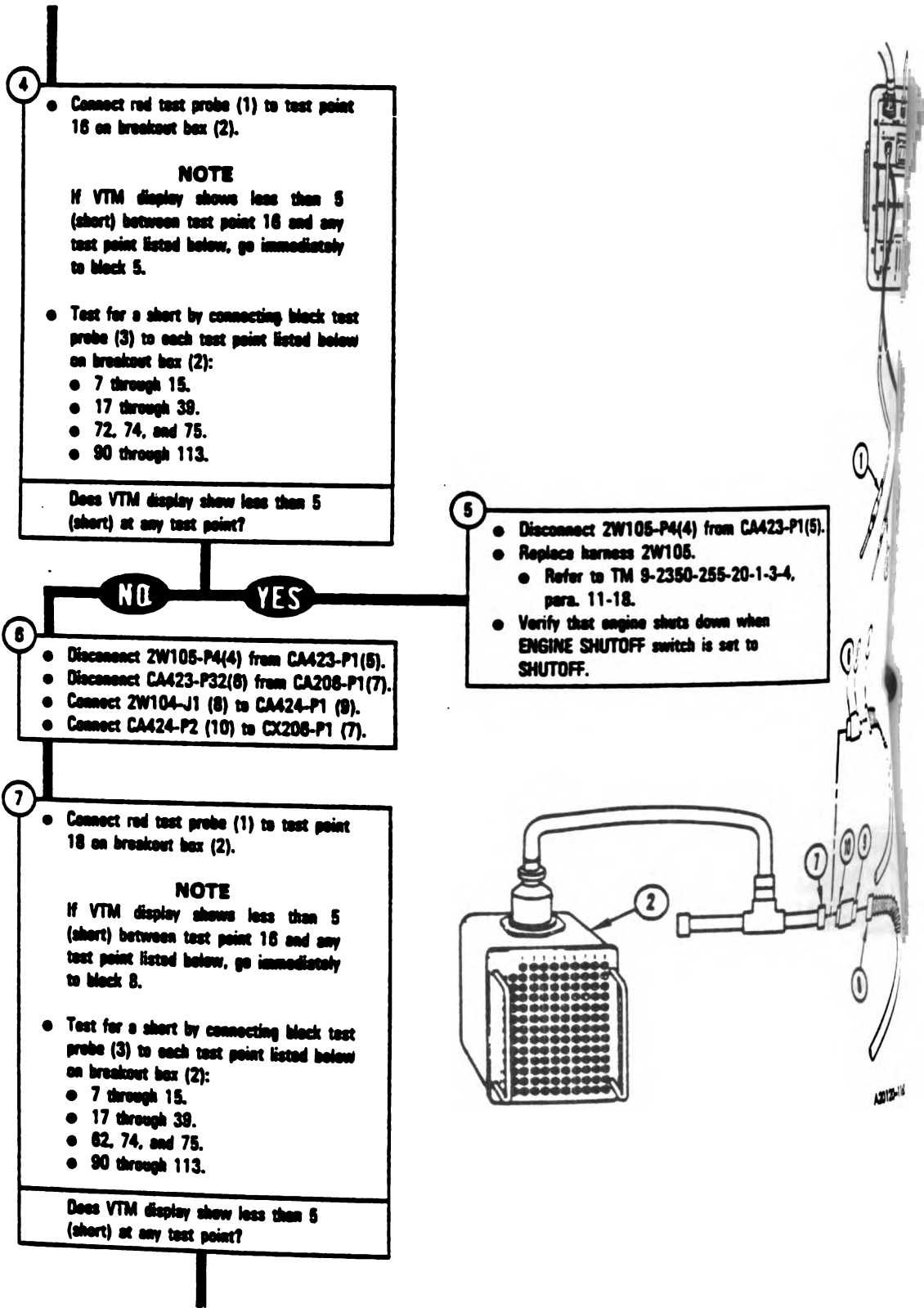


A20120-1158

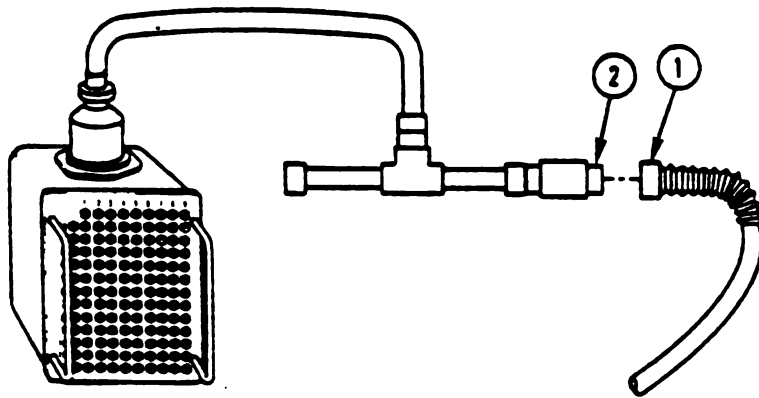
Figure 9-92 (Sheet 1 of 3)  
Volume II  
Para. 9-2

Change 3 9-299

**TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING**



*Figure 9-92 (Sheet 2 of 3)  
Volume II  
Para. 9-2*



A20120-1111

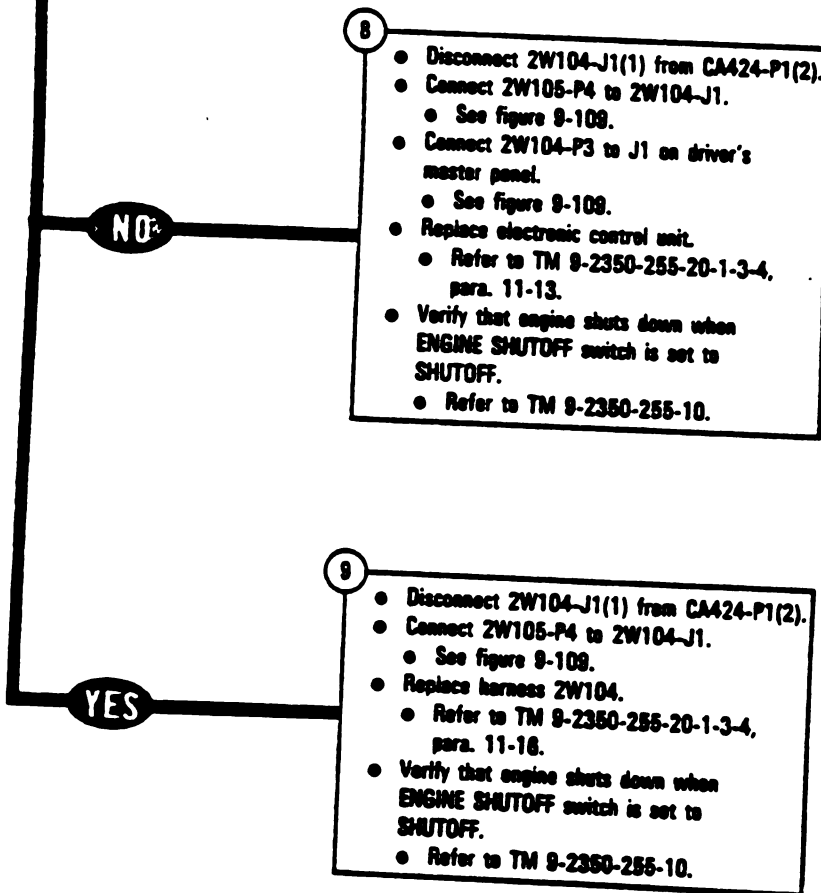


Figure 9-92 (Sheet 3 of 3)  
Volume II  
Para. 9-2

**TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING**

**DISPLAY SHOWS -  
FAULTY DIP OR  
CABLE GROUP** 150804

**Additional Test  
Equipment/Special Tools:**  
● Breakout Box Tool Kit, 12311066

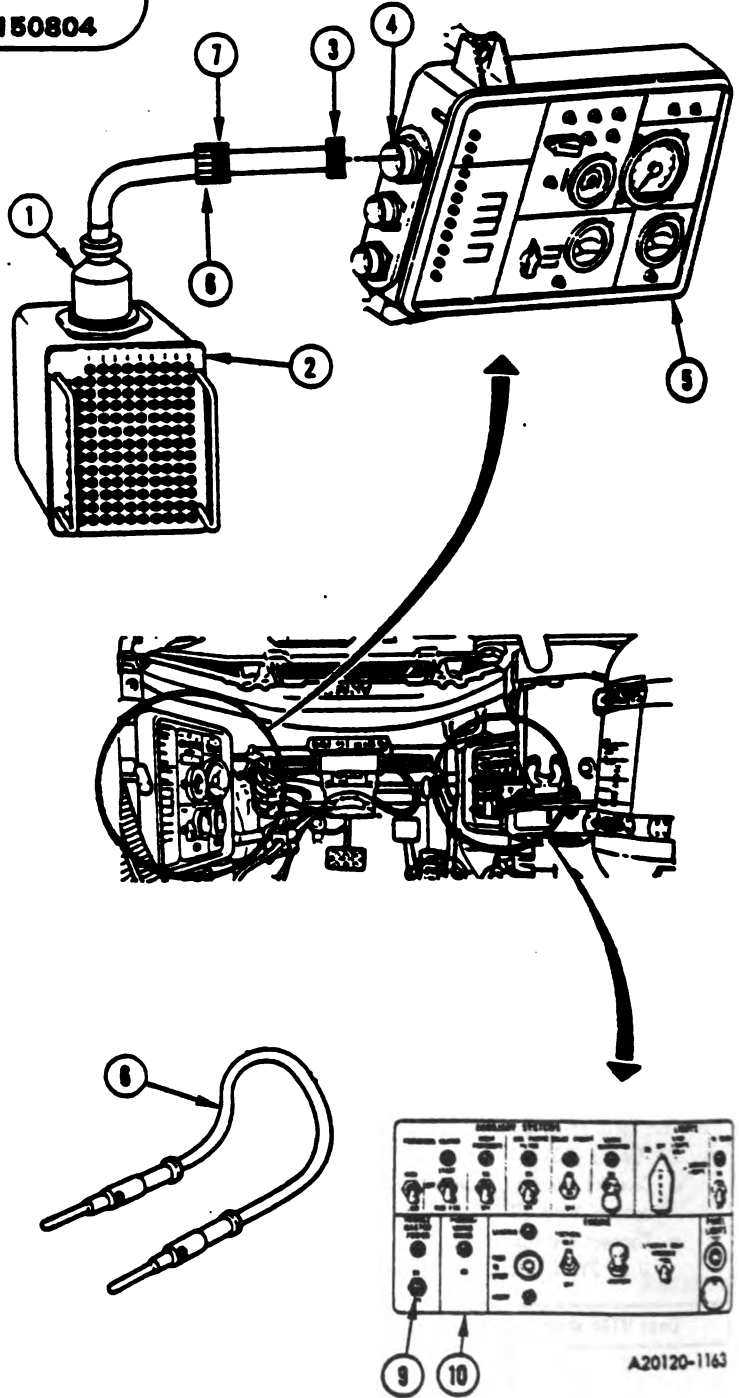
**Equipment Condition:**  
● Tank parked.  
● Parking brake set.  
● Engine shut down.  
● Vehicle master power off.

- 1
- Disconnect CX304-P1 from CA201-P1.  
● See figure 9-51.
  - Disconnect CA201-P2 from J1 on electronic control unit.  
● See figure 9-51.
  - Connect shorting connector to J1 on electronic control unit.  
● See figure 9-110.
  - Disconnect CX305-P1 from CA307-P2.  
● See figure 9-53.
  - Disconnect CA307-P1 from TJ1 on driver's instrument panel.  
● See figure 9-53.

- 2
- Disconnect CX305-P2 from J1 on C18.  
● See figure 9-53.
  - Connect CX305-P2 (1) to breakout box (2).
  - Connect CA301-P1 (3) to TJ1 (4) on driver's instrument panel (5).
  - Connect CX305-P1 (6) to CA301-P2 (7).

- 3
- Connect TA1 jumper wire (8) between test points 8 and 14 on breakout box (2).
  - Disconnect ZW107-P3 from ZW105-J1.  
● See figure 9-110.
  - Power up electronic control unit.  
● Set VEHICLE MASTER POWER switch (9) on driver's master panel (10) to ON.

Is FUEL CONTROL FAULTY lamp ON?



*Figure 9-93 (Sheet 1 of 3)  
Volume II  
Para. 9-2*

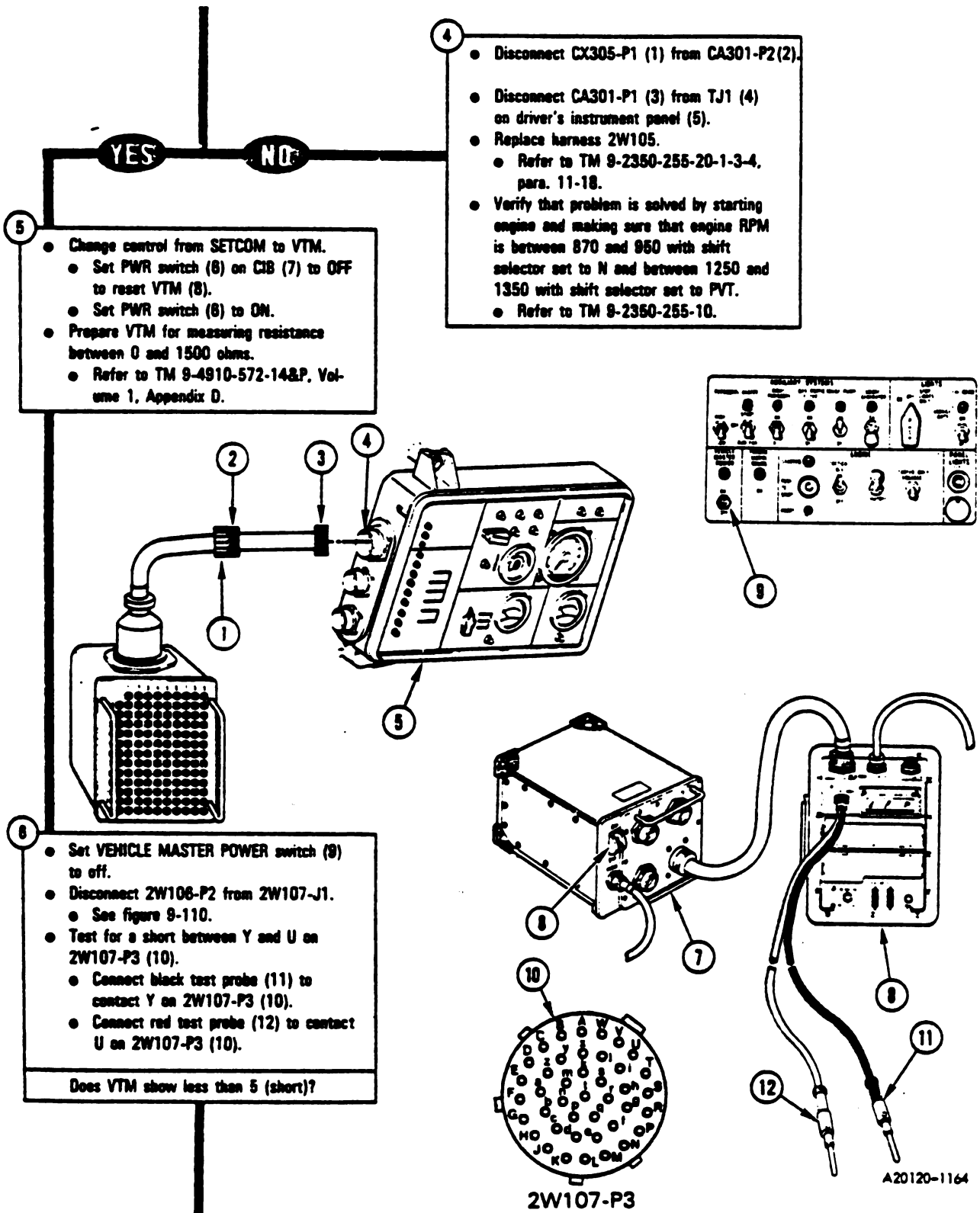
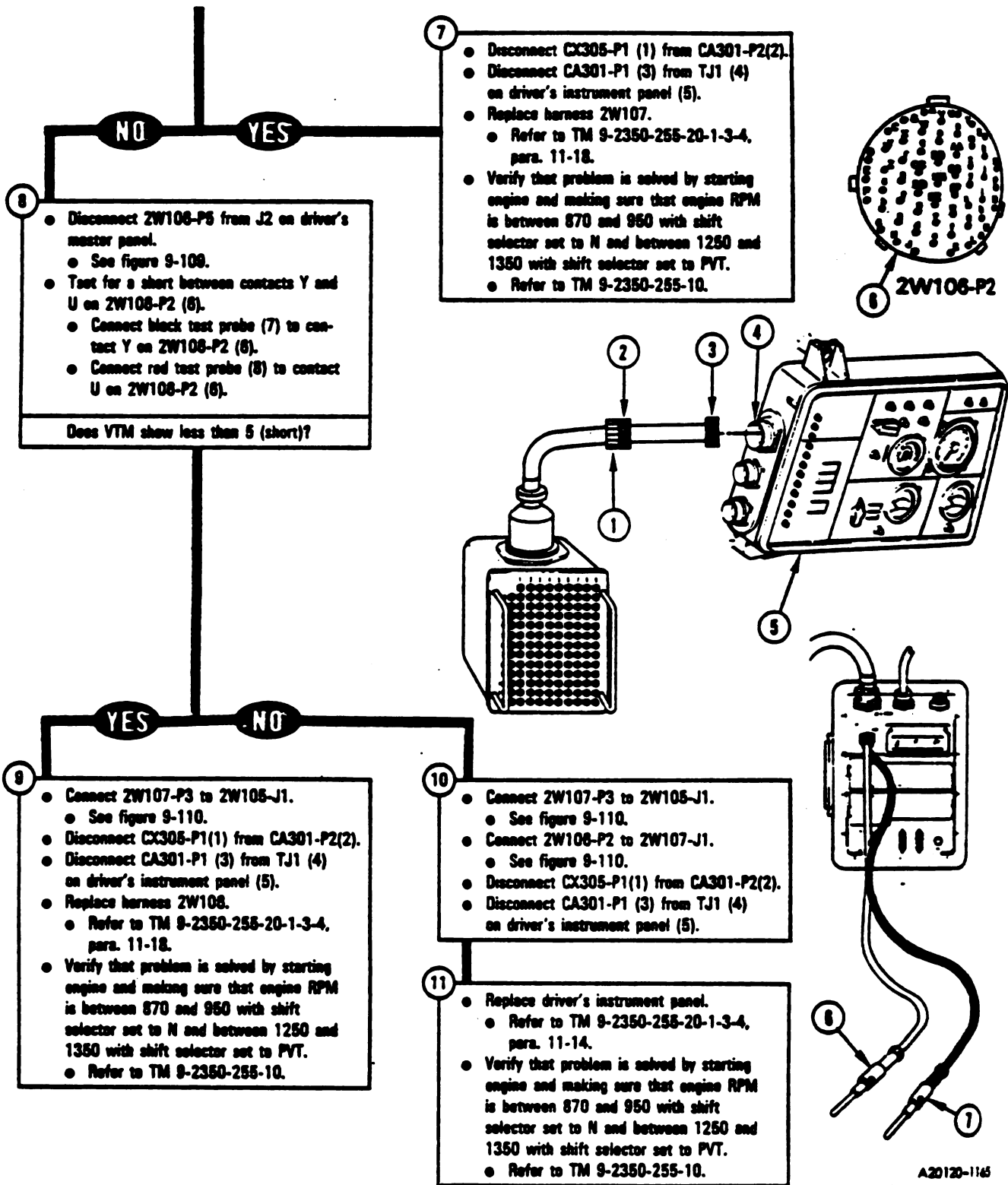


Figure 9-93 (Sheet 2 of 3)  
Volume II  
Para. 9-2



**TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING**



*Figure 9-93 (Sheet 3 of 3)  
Volume II  
Para. 9-2*

**DISPLAY SHOWS -  
FAULTY ECU OR  
WIRE HARNESS GROUP**

150806

**Equipment Condition:**

- Tank parked.
- Parking brake set.
- Engine shut down.
- Vehicle master power off.

Disconnect CX305-P1 from CA307-P2.

- See figure 9-53.
- Disconnect CA307-P1 from TJ1 on driver's instrument panel.
- See figure 9-53.
- Disconnect CX304-P1 from CA201-P1.
- See figure 9-51.
- Disconnect CA201-P2 from J1 on electronic control unit.
- See figure 9-51.

Connect shorting connector to J1 on electronic control unit.

- See figure 9-110.
- Change control from SETCOM to VTM.
- Set PWR switch (1) on CIB (2) to OFF to reset VTM (3).
- Set PWR switch (1) to ON.
- Prepare VTM for measuring resistance between 0 and 1500 ohms.
- Refer to TM 9-4910-572-14&P, Volume 1, Appendix D.

**NOTE**

If VTM display shows less than 5 (short) between pins M and T, leave test probes connected for remainder of test.

- Test for a short between contacts M and T on ZW105-P5.
- Connect red test probe (4) to contact M on ZW105-P5 (5).
- Connect black test probe (6) to contact T on ZW105-P5 (5).

Does VTM display show less than 5 (short)?

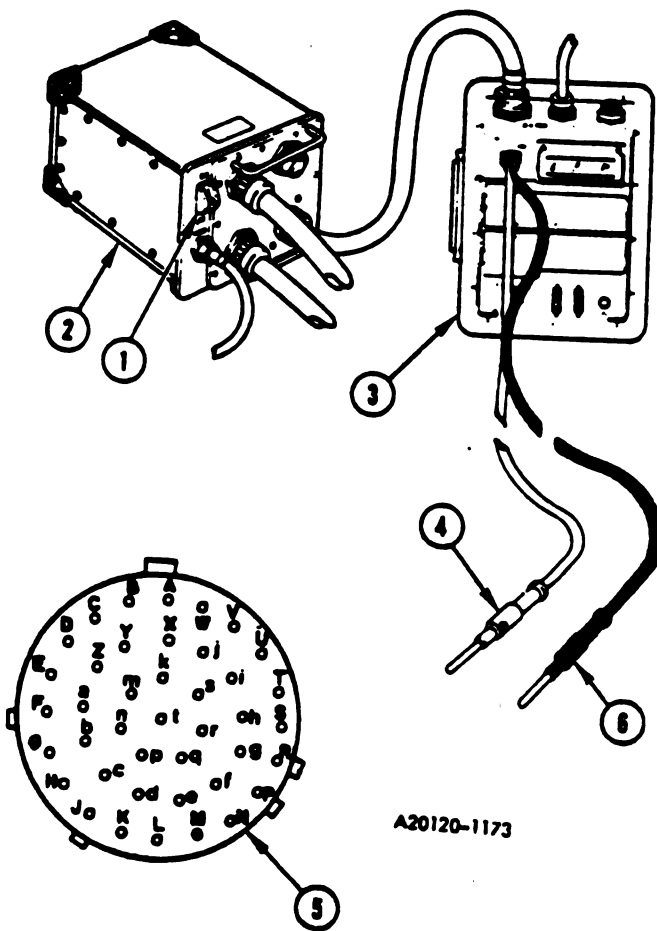
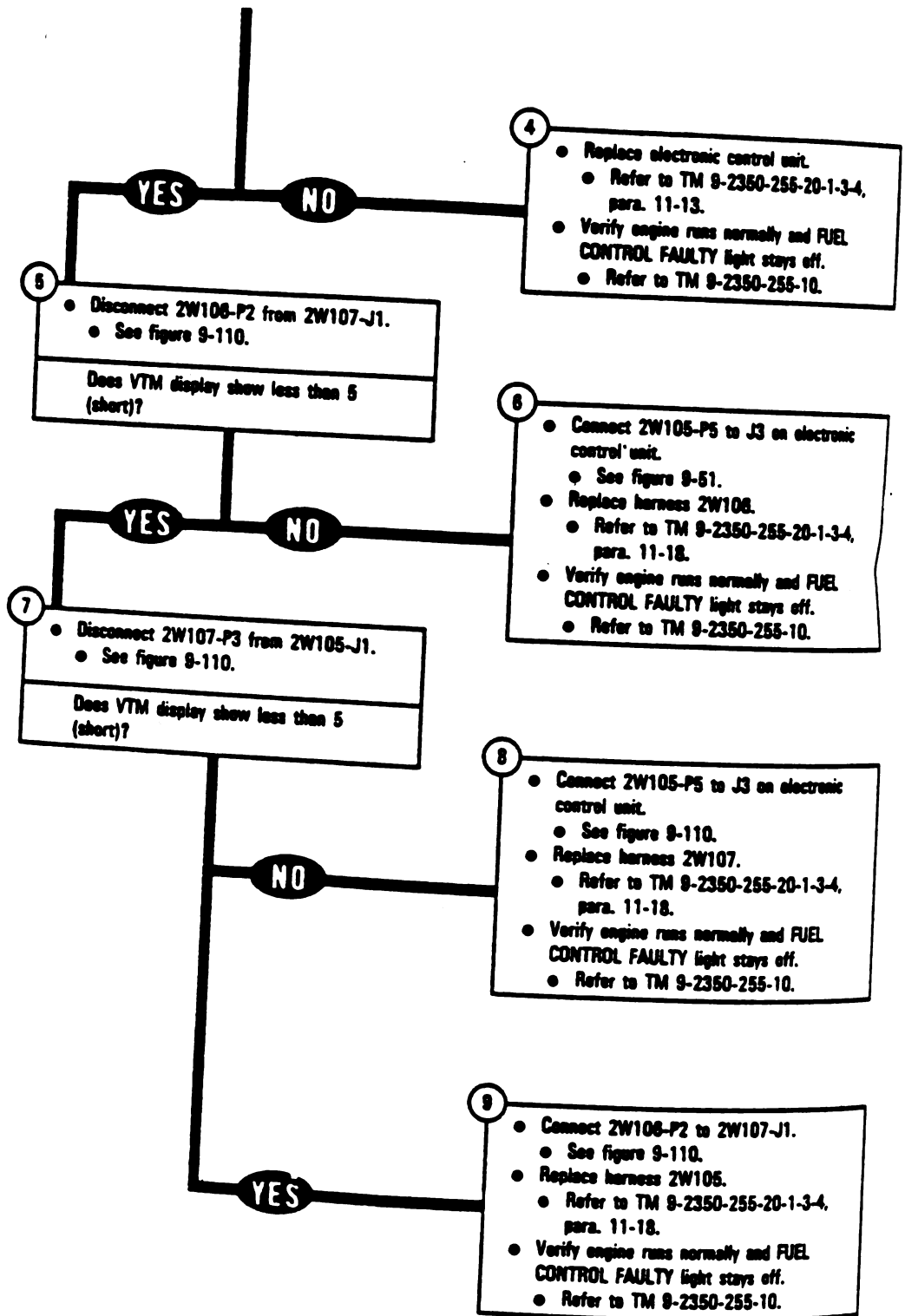


Figure 9-94 (Sheet 1 of 2)  
Volume II  
Para. 9-2

**TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING**



*Figure 9-94 (Sheet 2 of 2)  
Volume II  
Para. 9-2*

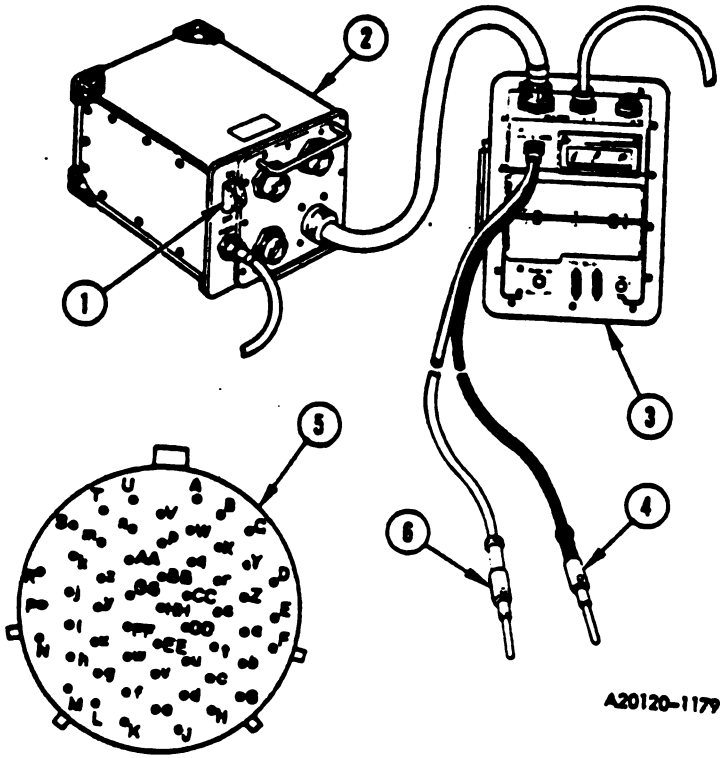
9-306 Change 3

PLAY SHOWS -  
ILITY T1 SENSOR,  
114, 3W105

• 150919  
153402  
153403

**Equipment Condition:**  
Tank parked.  
Parking brake set.  
Engine shut down.  
Vehicle master power off.

Disconnect 2W114-P1 from CX201-P2.  
• See figure 9-48.  
Disconnect CX305-P1 from CX201-P1.  
• See figure 9-48.  
Change control from SETCOM to VTM.  
• Set PWR switch (1) on CIB (2) to OFF to reset VTM (3).  
• Set PWR switch (1) to ON.  
Prepare VTM for measuring resistance between 0 and 1800 ohms.  
• Refer to TM 9-4910-572-14&P, Volume I, Appendix D.



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Test for a short between contacts listed in table A on 2W114-P1.  
• Connect black test probe (4) to contacts listed in table A on 2W114-P1 (5).  
• Connect red test probe 6 to contacts listed in table A on 2W114-P1 (5).  
Does VTM show less than 87 (short) at any test point?

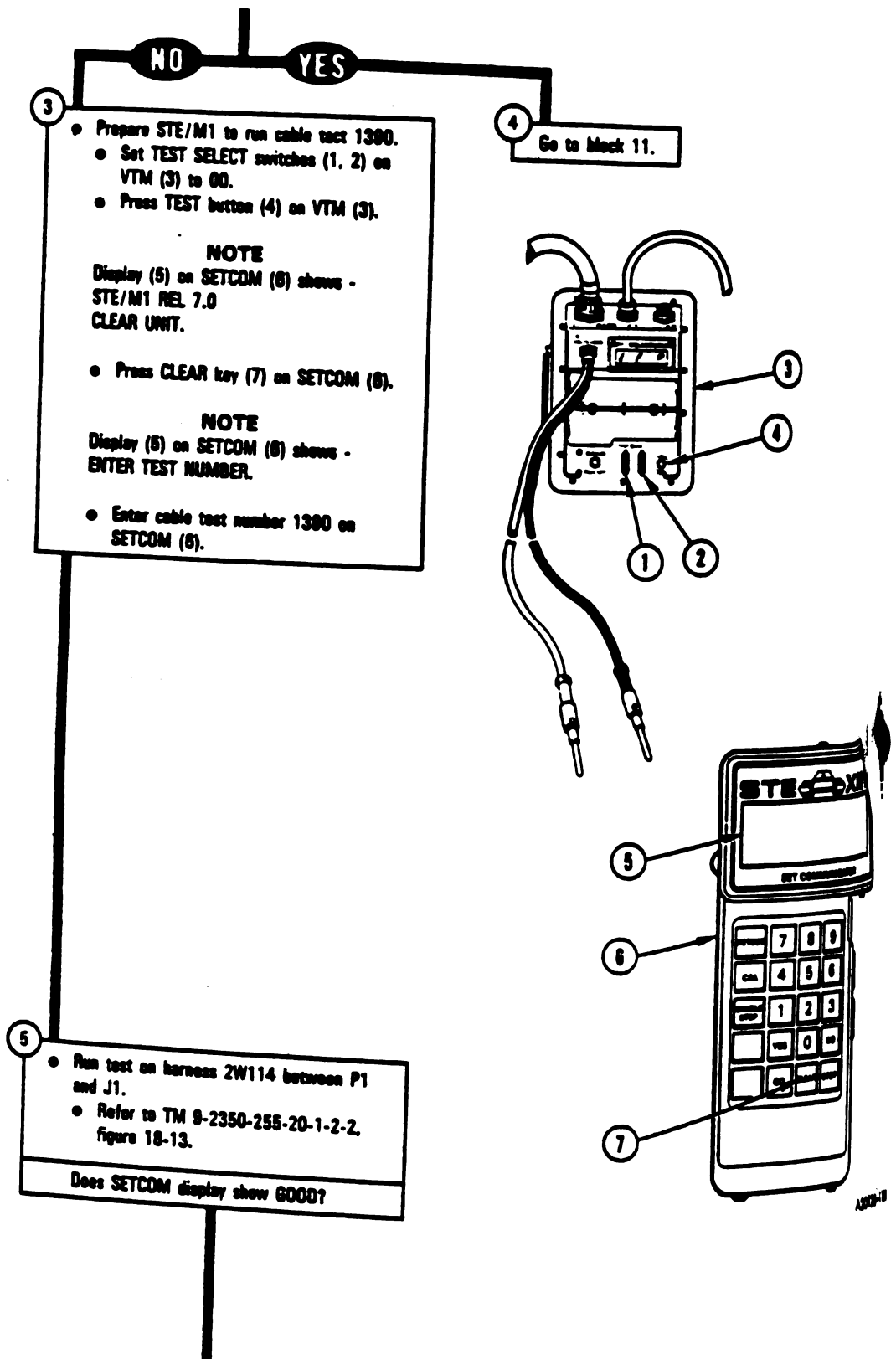
Table A

Black Test Probe	Red Test Probe
2W114-P1 Contact	2W114-P1 Contact
n	p
n	r
p	r

Figure 9-95 (Sheet 1 of 6)  
Volume II  
Para. 9-2

Change 3 9-307

**TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING**



*Figure 9-95 (Sheet 2 of 6)  
Volume II  
Para. 9-2*

9-308 Change 3

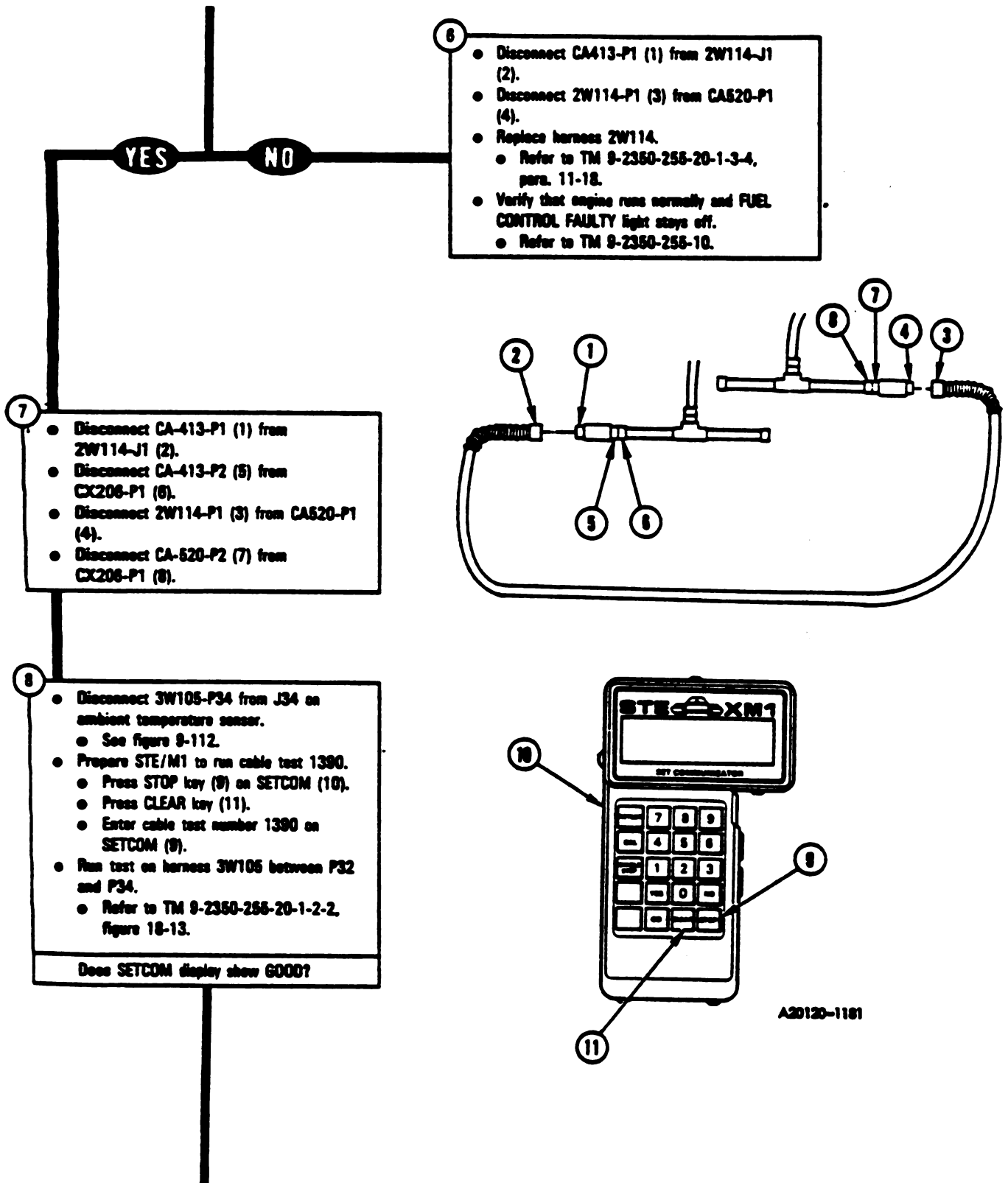
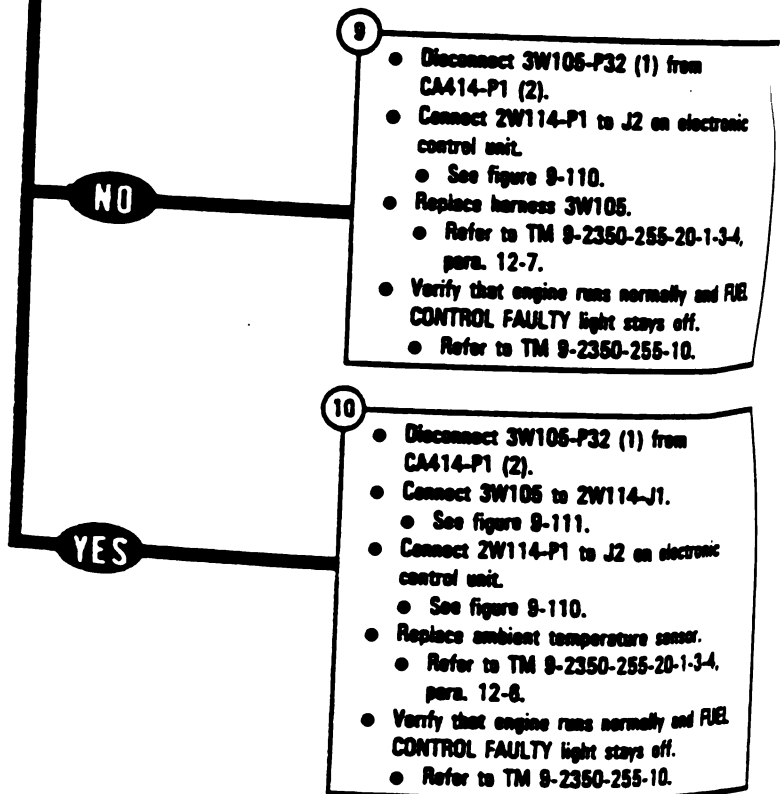
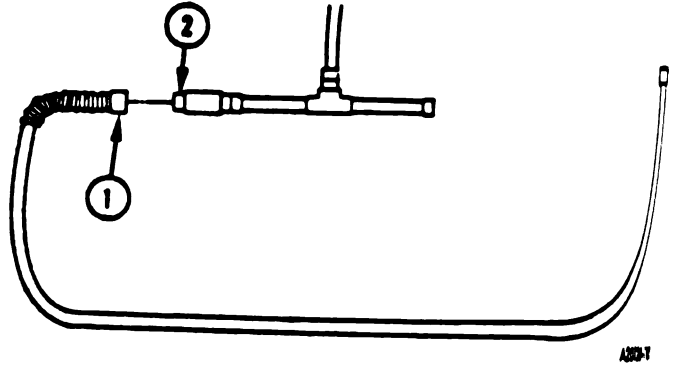


Figure 9-95 (Sheet 3 of 6)  
Volume 41  
Para. 9-2

**TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING**



- 9**
- Disconnect 3W105-P32 (1) from CA414-P1 (2).
  - Connect 2W114-P1 to J2 on electronic control unit.
    - See figure 9-110.
  - Replace harness 3W105.
    - Refer to TM 9-2350-255-20-1-3-4, para. 12-7.
  - Verify that engine runs normally and FUEL CONTROL FAULTY light stays off.
    - Refer to TM 9-2350-255-10.

- 10**
- Disconnect 3W105-P32 (1) from CA414-P1 (2).
  - Connect 3W105 to 2W114-J1.
    - See figure 9-111.
  - Connect 2W114-P1 to J2 on electronic control unit.
    - See figure 9-110.
  - Replace ambient temperature sensor.
    - Refer to TM 9-2350-255-20-1-3-4, para. 12-8.
  - Verify that engine runs normally and FUEL CONTROL FAULTY light stays off.
    - Refer to TM 9-2350-255-10.

*Figure 9-95 (Sheet 4 of 6)  
Volume II  
Para. 9-2*

9-310 Change 3

From block 4

11

- Disconnect 3W105-P32 from 2W114-J1.
- See figure 9-111.
- Test for a short between contacts listed in table A on 2W114-P1.
- Connect black test probe (1) to contacts listed in table A on 2W114-P1 (2).
- Connect red test probe (3) to contacts listed in table A on 2W114-P1 (2).

Does VTM show less than 87 (short) at any test point?

Table A

Black Test Probe	Red Test Probe
2W114-P1 Contact	2W114-P1 Contact
n	p
n	r
p	r

12

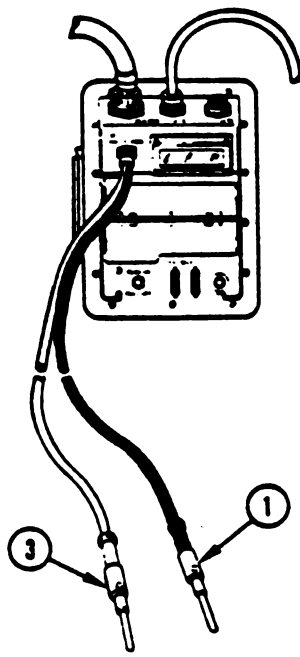
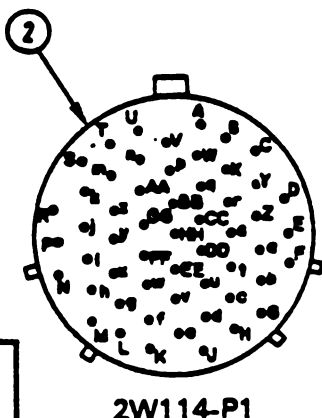
- Replace harness 2W114.
- Refer to TM 9-2350-255-20-1-3-4, para. 11-18.
- Verify that engine runs normally and FUEL CONTROL FAULTY light stays off.
- Refer to TM 9-2350-255-10.

NO YES

13

- Disconnect 3W105-P34 from J34 on ambient temperature sensor.
- See figures 9-112.
- Connect 3W105-P32 to 2W114-J1.
- See figure 9-111.
- Test for a short between contacts listed in table A on 2W114-P1.
- Connect black test probe (1) to contacts listed in table A on 2W114-P1 (2).
- Connect red test probe (3) to contacts listed in table A on 2W114-P1 (2).

Does VTM show less than 87 (short) at any test point?

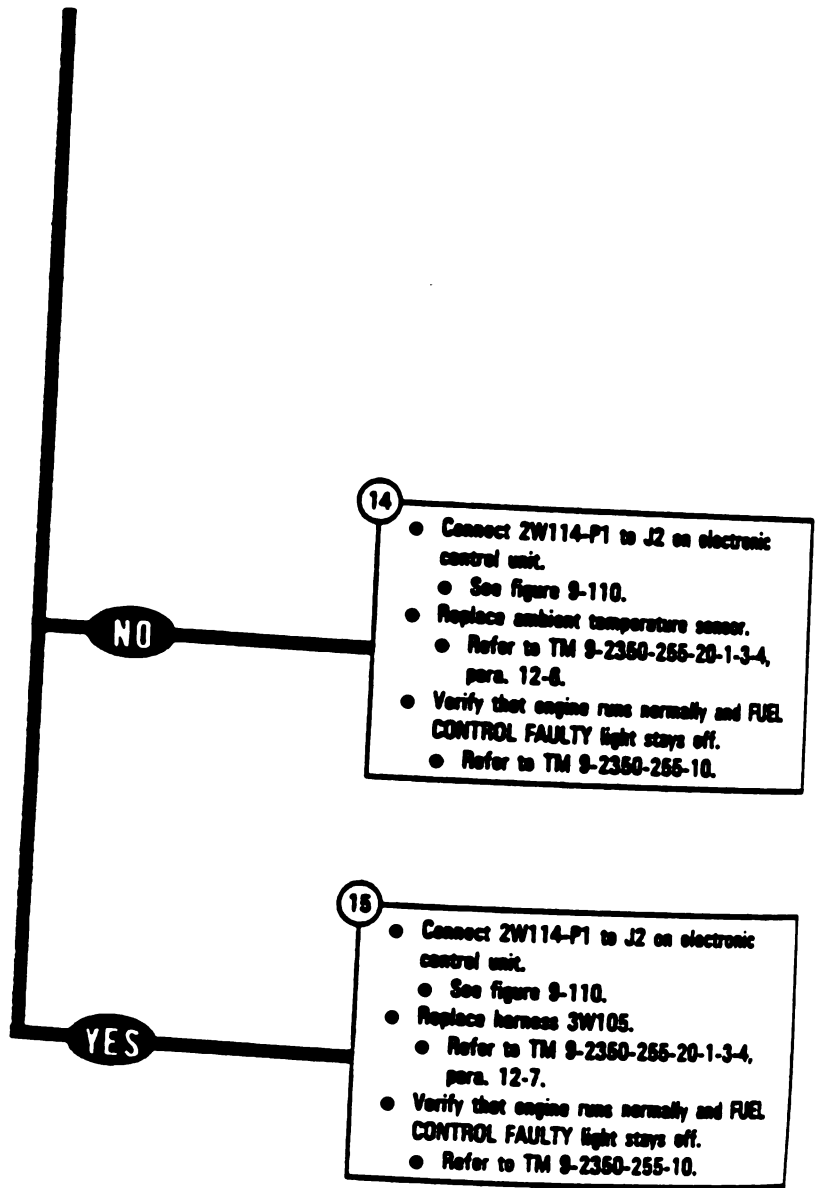


A20120-1182

Figure 9-95 (Sheet 5 of 6)  
Volume II  
Para. 9-2



**TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING**



9-312 Change 3

Figure 9-95 (Sheet 6 of 6)  
Volume II  
Para. 9-2

LAY SHOWS -  
TY ECU, 2W105  
W104

151903

ditional Test  
pment/Special Tools:  
estock Box Tool Kit, 12311068

ipment Condition:  
ank parked.  
arking brake set.  
Engine shut down.  
Vehicle master power off.

Disconnect CA307-P1 from TJ1 on  
driver's instrument panel.  
● See figure 9-53.  
Disconnect CA201-P2 from J1 on elec-  
tronic control unit.  
● See figure 9-51.  
Connect shunting connector to J1 on  
electronic control unit.  
● See figure 9-110.  
Disconnect CX304-P1 from CA201-P1.  
● See figure 9-51.

● Disconnect CX304-P2 from J2 on CIB.  
● See figure 9-51.  
● Disconnect ZW105-P5 from J3 on elec-  
tronic control unit.  
● See figure 9-110.  
● Disconnect ZW105-P4 from ZW104-J1.  
● See figure 9-110.

Figure 9-96 (Sheet 1 of 3)  
Volume II  
Para. 9-2

Change 3 9-313

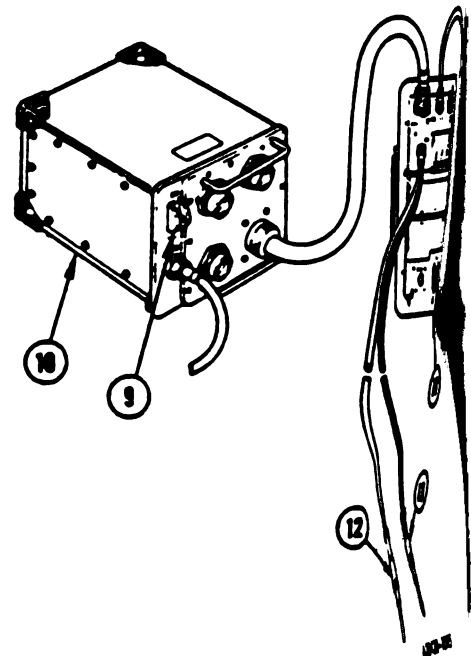
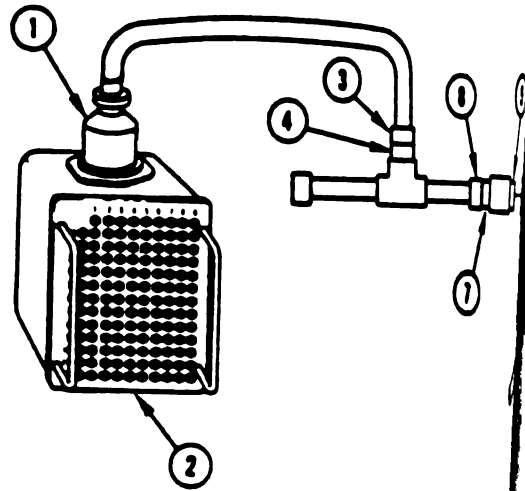
**TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING**

- 3
- Connect CX304-P2 (1) to breakout box (2).
  - Connect CX304-P1 (3) to CX206-P3 (4).
  - Connect CA423-P1 (5) to ZW105-P4 (6).
  - Connect CA423-P2 (7) to CX206-P1 (8).

- 4
- Change control from SETCOM to VTM.
    - Set PWR switch (9) on CIB (10) to OFF to reset VTM (11).
    - Set PWR switch (9) to ON.
  - Prepare VTM for measuring resistance between 0 and 1500 ohms.
    - Refer to TM 9-4910-572-14&P, Volume I, Appendix D.

- 5
- Connect test probe (12) to test point 21 on breakout box (2).
- NOTE**
- If VTM display shows less than 5 (short) between test point 21 and any test point listed below, go immediately to block 6.
- Test for a short by connecting black test probe (13) to each test point listed below on breakout box (2):
    - 7 through 39.
    - 62, 74 and 75.
    - 90 through 113.
- Does VTM display show less than 5 (short) at any test point?

**NO**      **YES**



- 6
- Disconnect ZW105-P4(6) from CA423-P1(5).
  - Connect ZW104-P8 to 20T101-J1.
    - See figure 9-108.
  - Replace harness ZW105.
    - Refer to TM 9-2350-255-20-1-3-4, para. 11-18.
  - Verify that engine starts.
    - Refer to TM 9-2350-255-10.

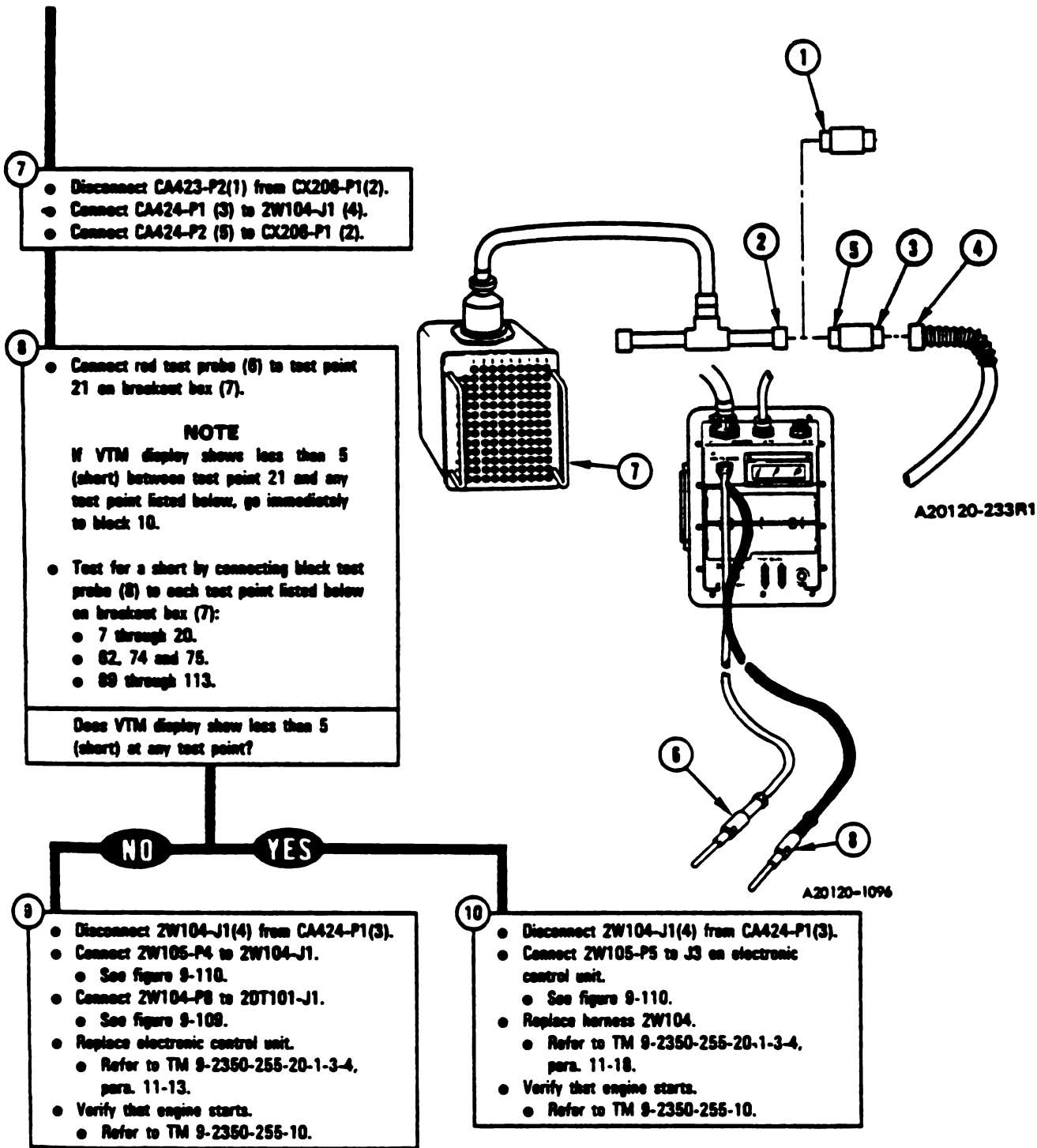


Figure 9-96 (Sheet 3 of 3)  
Volume II  
Para: 9-2

DISPLAY SHOWS -  
FAULTY 2W114  
OR 3W105

151905

**Additional Test**

**Equipment/Special Tools:**

- Breakout Box Test Kit, 12311066

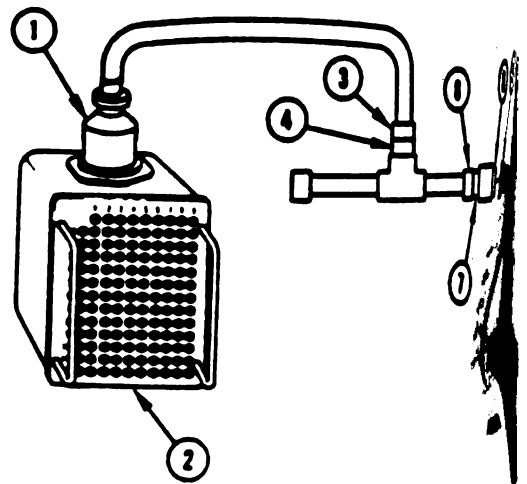
**Equipment Condition:**

- Tank parked.
- Parking brake set.
- Engine shut down.
- Vehicle master power off.

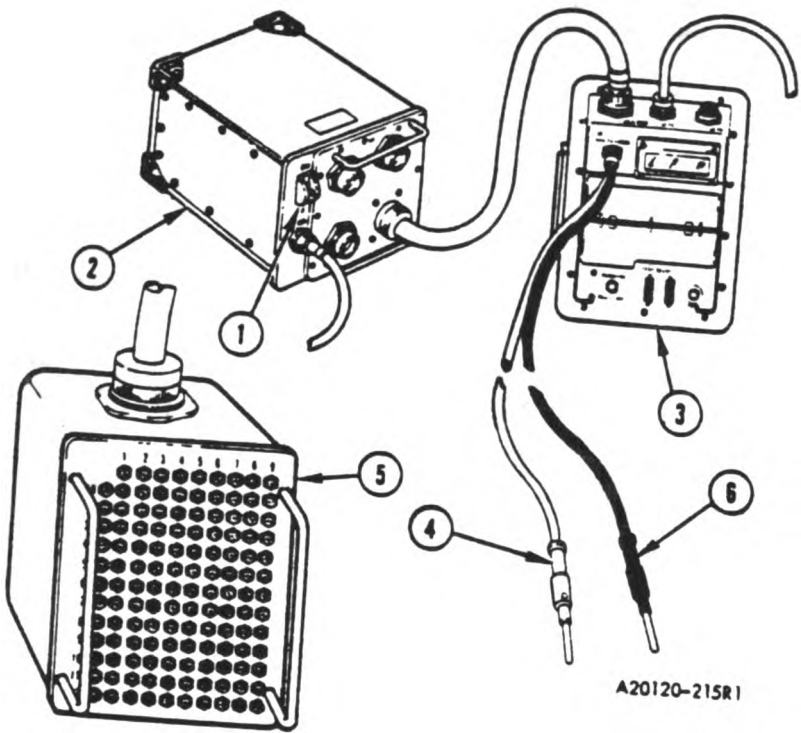
- ①
- Disconnect CX304-P1 from CA201-P1.
    - See figure 9-51.
  - Disconnect CA201-P2 from J1 on electronic control unit.
    - See figure 9-51.
  - Connect shorting connector to J1 on electronic control unit.
    - See figure 9-110.

- ②
- Disconnect CX305-P1 from CA307-P2.
    - See figure 9-53.
  - Disconnect CA307-P1 from TJ1 on driver's instrument panel.
    - See figure 9-53.
  - Disconnect CX304-P2 from C18 J2.
    - See figure 9-51.
  - Disconnect 3W105-P32 from 2W114-J1.
    - See figure 9-111.

- ③
- Connect CX304-P2 (1) to breakout box (2).
  - Connect CX304-P1 (3) to CX206-P3 (4).
  - Connect 2W114-P1 (5) to CA520-P1 (6).
  - Connect CA520-P2 (7) to CX206-P1 (8).



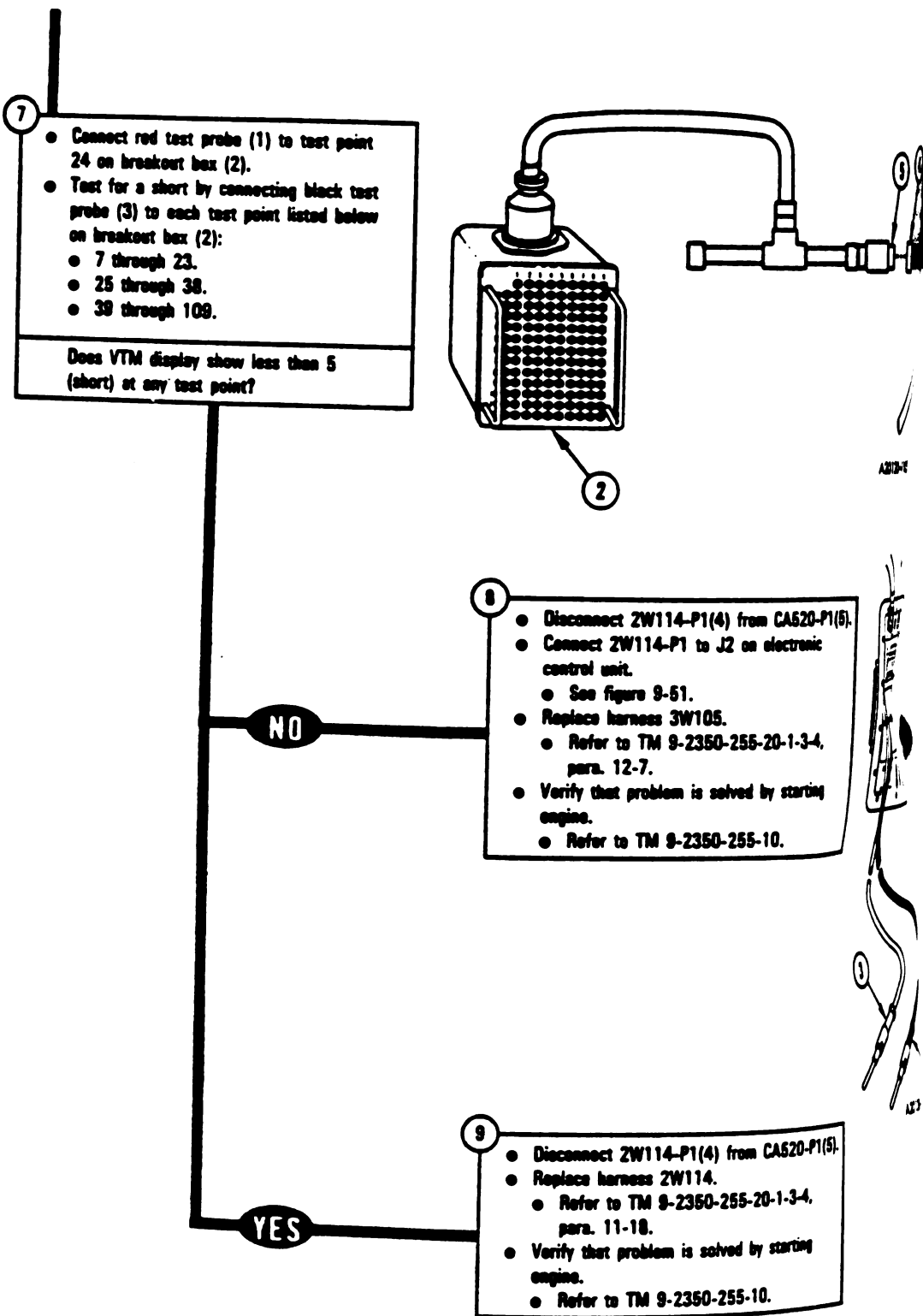
**TM 9-3350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING**



**Figure 9-97 (Sheet 2 of 3)  
Volume II  
Para. 9-2**

**Change 3 9-317**

**TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING**



*Figure 9-97 (Sheet 3 of 3)  
Volume II  
Para. 9-2*

9-318 Change 3

**LAY SHOWS -  
ADJUSTMENT**

152319

**Common Tools:**  
each, combination, 7/16-inch  
each, open end, 7/16-inch

**Prerequisite Condition:**  
truck parked.  
parking brake set.  
engine shut down.  
vehicle master power off.

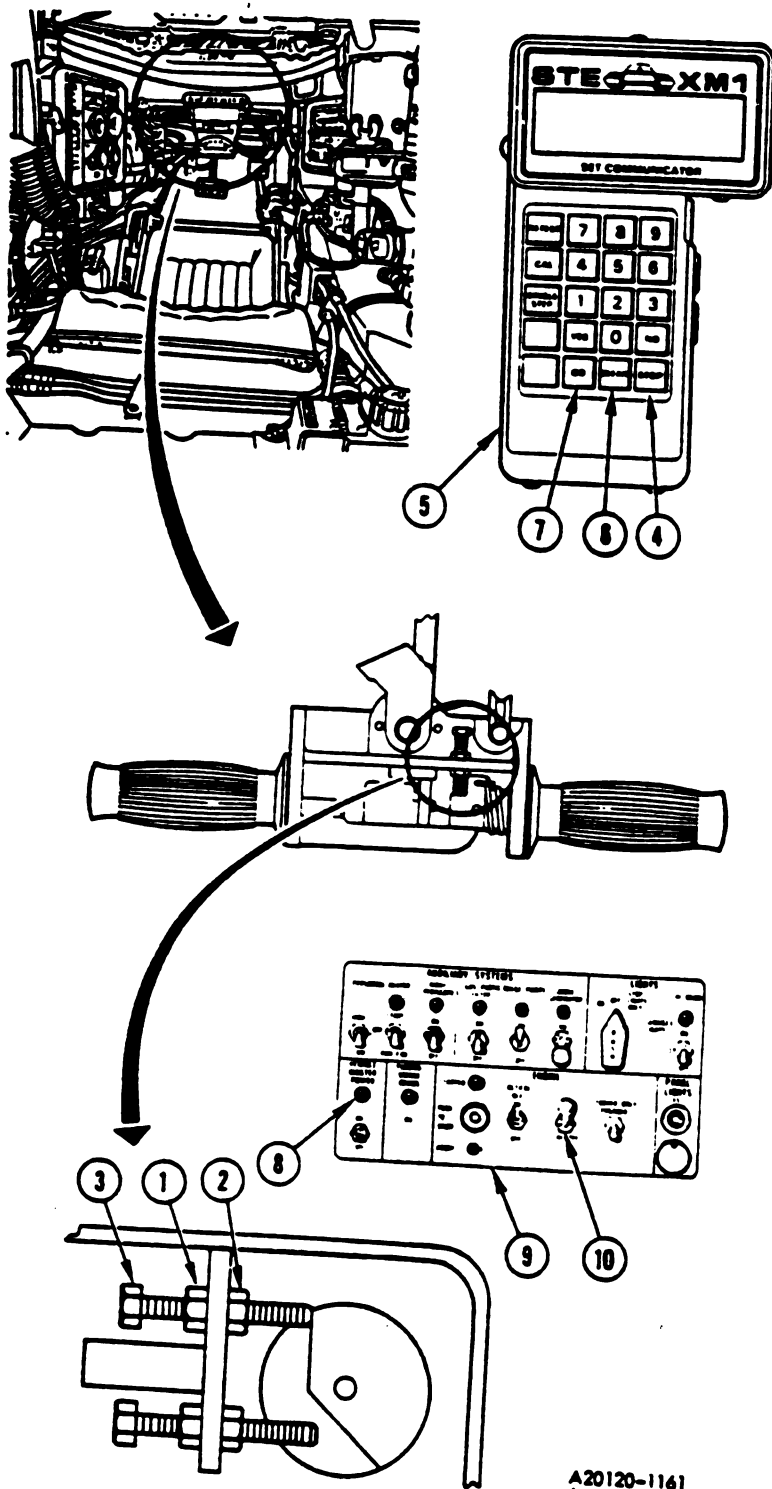
Remove steering and throttle cover.  
Refer to TM 9-2350-255-20-1-3-2,  
para. 6-4.  
Loosen locknuts (1, 2) on upper adjust-  
ment screw (3) with two 7/16-inch  
wrenches.

Prepare STE/M1 to run test 152306.  
Press STOP key (4) on SETCOM (5).  
Press CLEAR key (6).  
Enter numbers 152306 on SETCOM(5).  
Press GO key (7).

Adjust PLA.  
Set VEHICLE MASTER POWER switch  
(9) on driver's master panel(9) to ON.  
Press and release ENGINE SHUTOFF  
switch (10).

**NOTE**

SETCOM display shows between  
0.50V and 0.60V.  
Look at SETCOM display while  
making adjustment.  
If SETCOM display goes suddenly  
to 0.00V during the adjustment,  
press and release ENGINE SHUT-  
OFF switch again.



A20120-1161

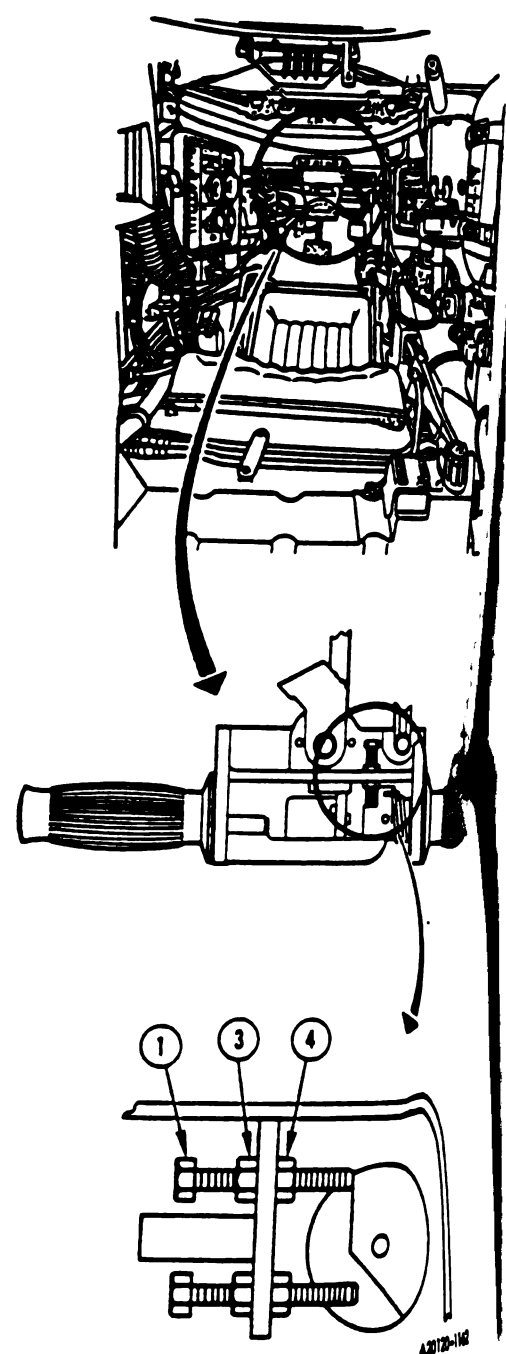
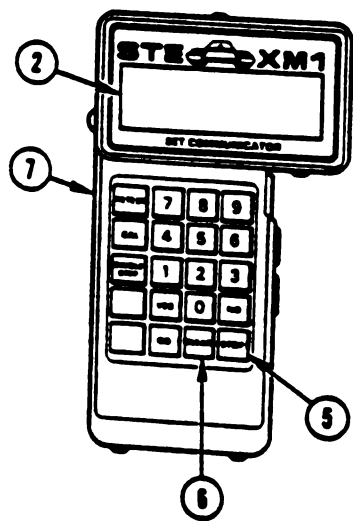
Figure 9-98 (Sheet 1 of 2)  
Volume II  
Para. 9-2

Change 3 9-319



**TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING**

- Turn top adjustment screw (1) clockwise with 7/16-inch wrench until SETCOM display (2) decreases to 0.00V.
  - Continue to turn screw (1) clockwise until display (2) shows between 0.50V and 0.00V.
  - Hold screw (1) and tighten locknuts (3, 4) with 7/16-inch wrenches.
- ④
- Repeat test 1523, figure 9-17.
  - Press STOP key (5).
  - Press CLEAR key (6).
  - Enter test number 1523 on SETCOM(7).
  - Go to figure 9-17, block 3.



9-320 Change 3

Figure 9-98 (Sheet 2 of 2)  
Volume II  
Para. 9-2

AY SHOWS  
TY 2W115,  
16, OR ENGINE

- 152503
- 152504
- 152506

**Pre-Test Condition:**

- Vehicle parked.
- Parking brake set.
- Engine shut down.
- Vehicle master power off.

- Connect CX304-P1 from CA201-P1. See figure 9-51.
- Connect CA201-P2 from J1 on electronic control unit. See figure 9-51.
- Connect shunting connector to J1 on electronic control unit. See figure 9-110.
- Connect CX305-P1 from CA307-P2. See figure 9-53.

- Connect CA307-P1 from TJ1 on driver's instrument panel. See figure 9-53.

- Connect thermocouple assembly #108. See figure 9-112.
- Connect ZW115-P1 from J4 on electronic control unit. See figure 9-110.

- Change control from SETCOM to VTM. Set PWR switch (1) on CIB (2) to OFF to reset VTM (3).
- Set PWR switch (1) to ON.
- Operate VTM for measuring resistance between 0 and 1500 ohms.
- Refer to TM 9-4910-572-14&P, Volume I, Appendix D.

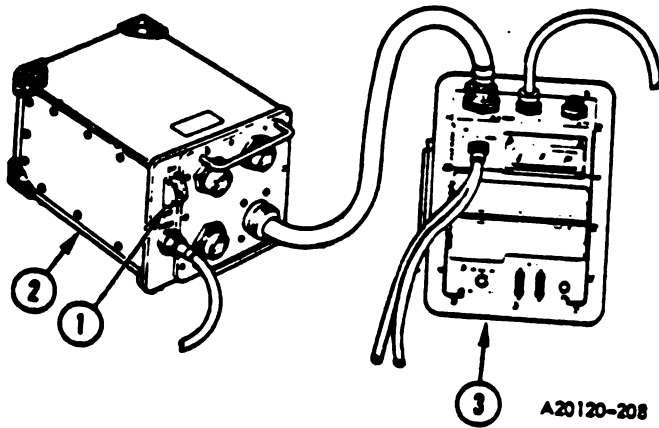
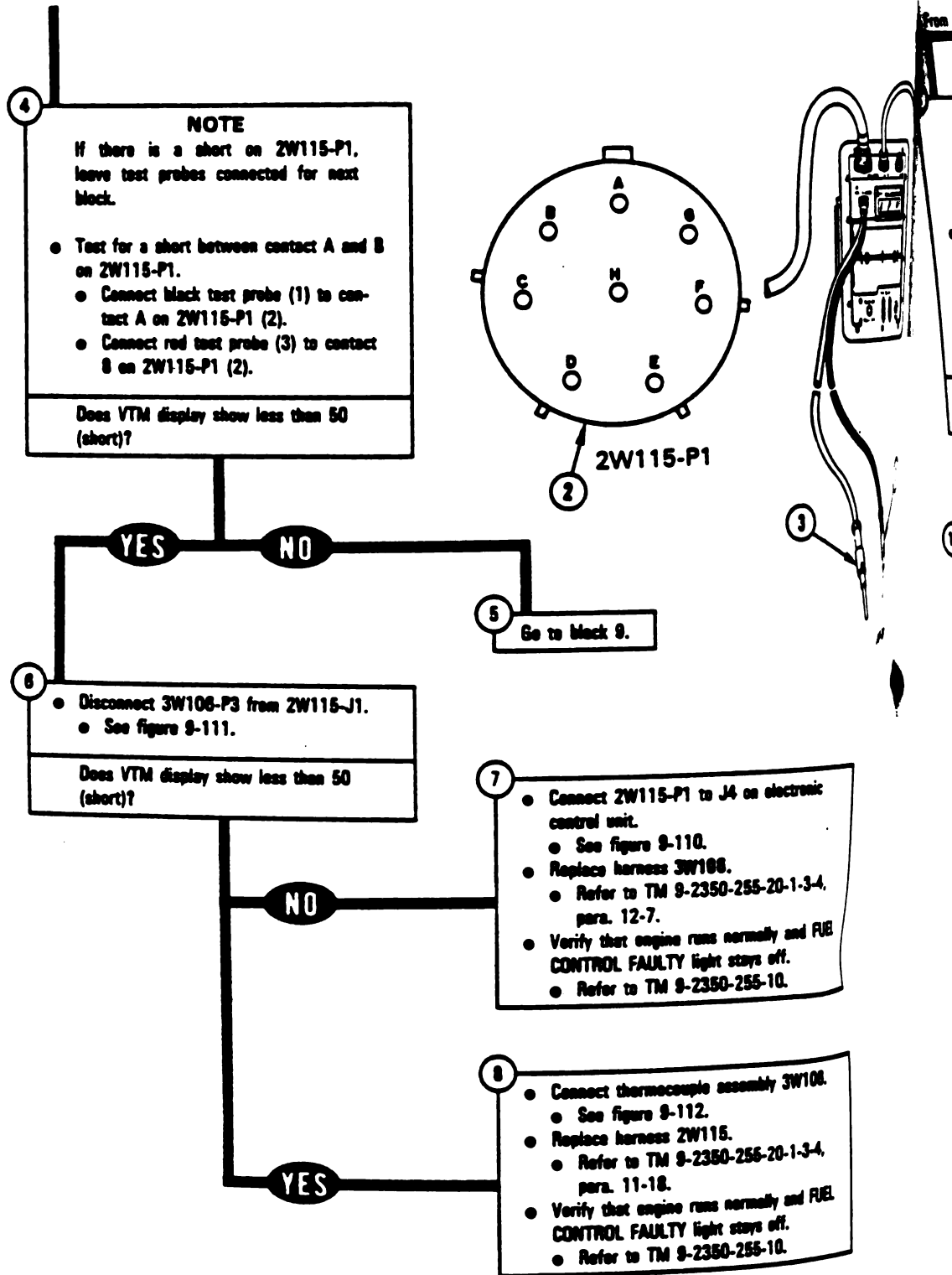


Figure 9-99 (Sheet 1 of 6)  
Volume-II  
Para. 9-2

**TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING**



*Figure 9-99 (Sheet 2 of 6)  
Volume II  
Para. 9-2*

Block 5

**NOTE**

There is a short on ZW115-P1, use test probes connected for next block.

Test for a short between contacts B and C on ZW115-P1.

Connect black test probe (1) to contact C on ZW115-P1 (2).

Connect red test probe (3) to contact B on ZW115-P1 (2).

Does VTM display show less than 50 (short)?

**YES**

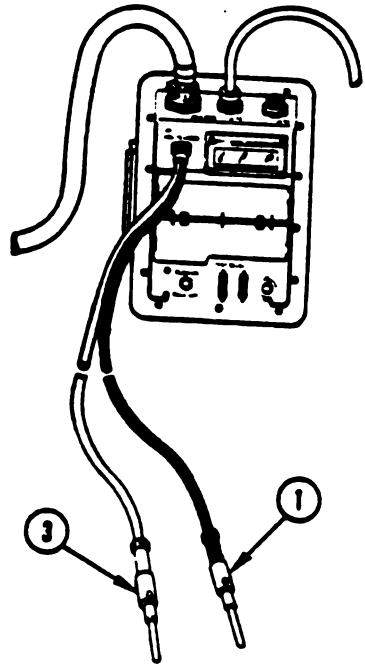
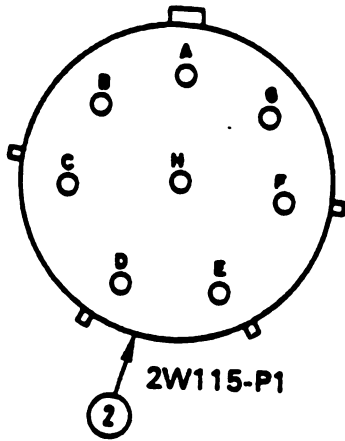
**NO**

Disconnect 3W106-P3 from ZW115-J1. See figure 9-111.

Does VTM display show less than 50 (short)?

**NO**

**YES**



A20120-1188

11 Go to block 14.

12

- Connect ZW115-P1 to J4 on electronic control unit.
- See figure 9-110.
- Replace harness 3W106.
- Refer to TM 9-2350-255-20-1-3-4, para. 12-7.
- Verify that engine runs normally and FUEL CONTROL FAULTY light stays off.
- Refer to TM 9-2350-255-10.

13

- Connect thermocouple assembly 3W106.
- See figure 9-112.
- Replace harness ZW115.
- Refer to TM 9-2350-255-20-1-3-4, para. 11-18.
- Verify that engine runs normally and FUEL CONTROL FAULTY light stays off.
- Refer to TM 9-2350-255-10.

Figure 9-99 (Sheet 3 of 6)  
Volume II  
Para. 9-2

**TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING**

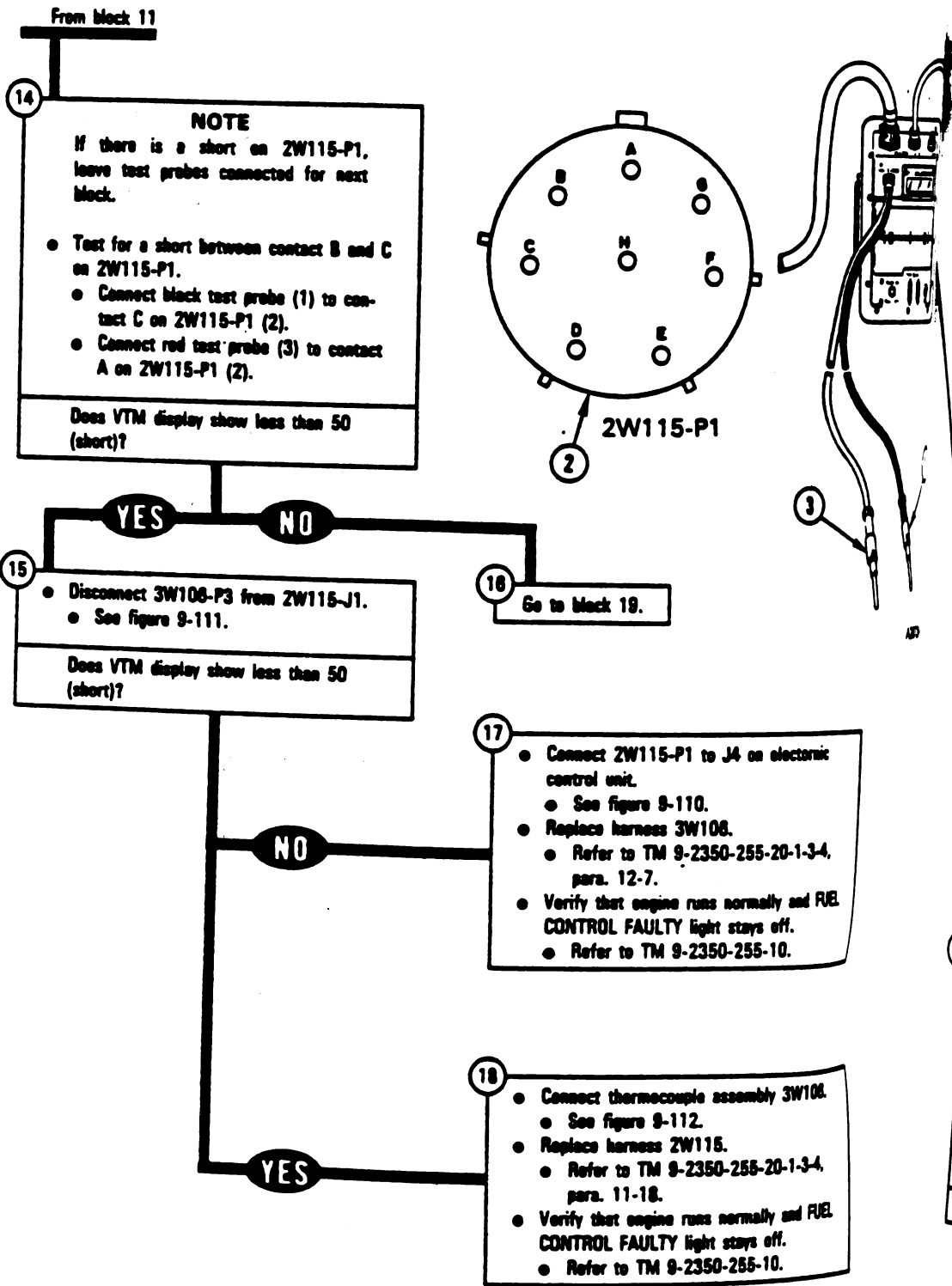


Figure 9-99 (Sheet 4 of 6)  
Volume II  
Para. 9-2

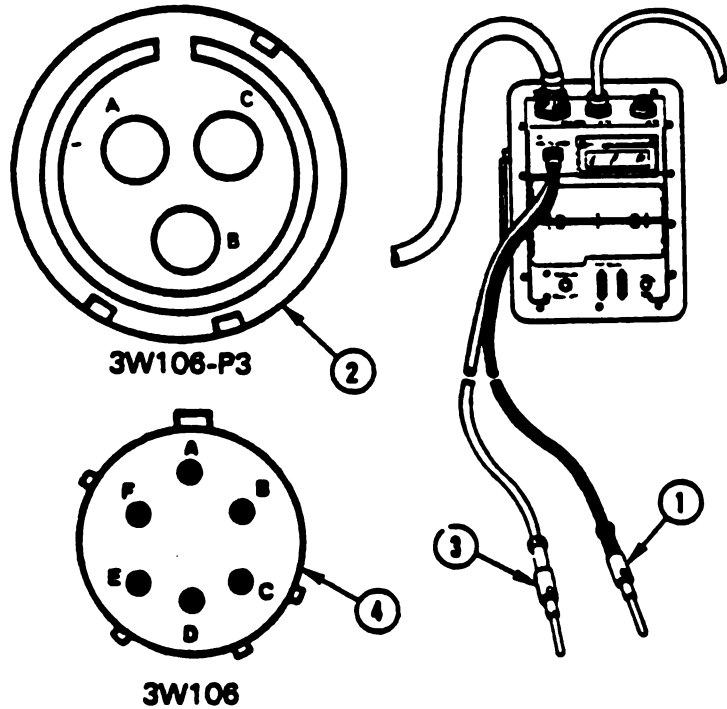
From block 18

19

- Disconnect 3W106-P3 from 2W115-J1.
- See figure 9-111.

**NOTE**  
If VTM display shows more than 20 between any contacts, go immediately to block 20.

- Test for continuity on thermocouple assembly 3W106.
- Connect black test probe (1) to contact A on 3W106-P3 (2).
- Connect red test probe (3) to contacts B, C, B, and E on each of the three unmarked 3W106 connectors (4).



- Connect black test probe (1) to contact B on 3W106-P3 (2).
- Connect red test probe (3) to contact A on each of the three unmarked 3W106 connectors (4).

Did VTM display show less than 20 (continuity) on all contacts?

YES NO

21

- Prepare STE/M1 to run test 1390.
- Press STOP key (5) on SETCOM (6).
- Press CLEAR key (7).
- Enter cable test number 1390 on SETCOM (6).
- Run test on harness 2W115 between J1 and P1.
- Refer to TM 9-2350-20-1-2-2, figure 18-13.

Does SETCOM display show GOOD?

20

- Connect 2W115-P1 to J4 on electronic control unit.
- See figure 9-110.
- Replace harness 3W106.
- Refer to TM 9-2350-255-20-1-3-4, para. 12-7.
- Verify that engine runs normally and FUEL CONTROL FAULTY light stays off.
- Refer to TM 9-2350-255-10.

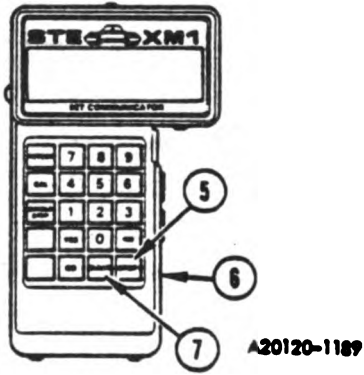


Figure 9-99 (Sheet 5 of 6)  
Volume II  
Para. 9-2

TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING

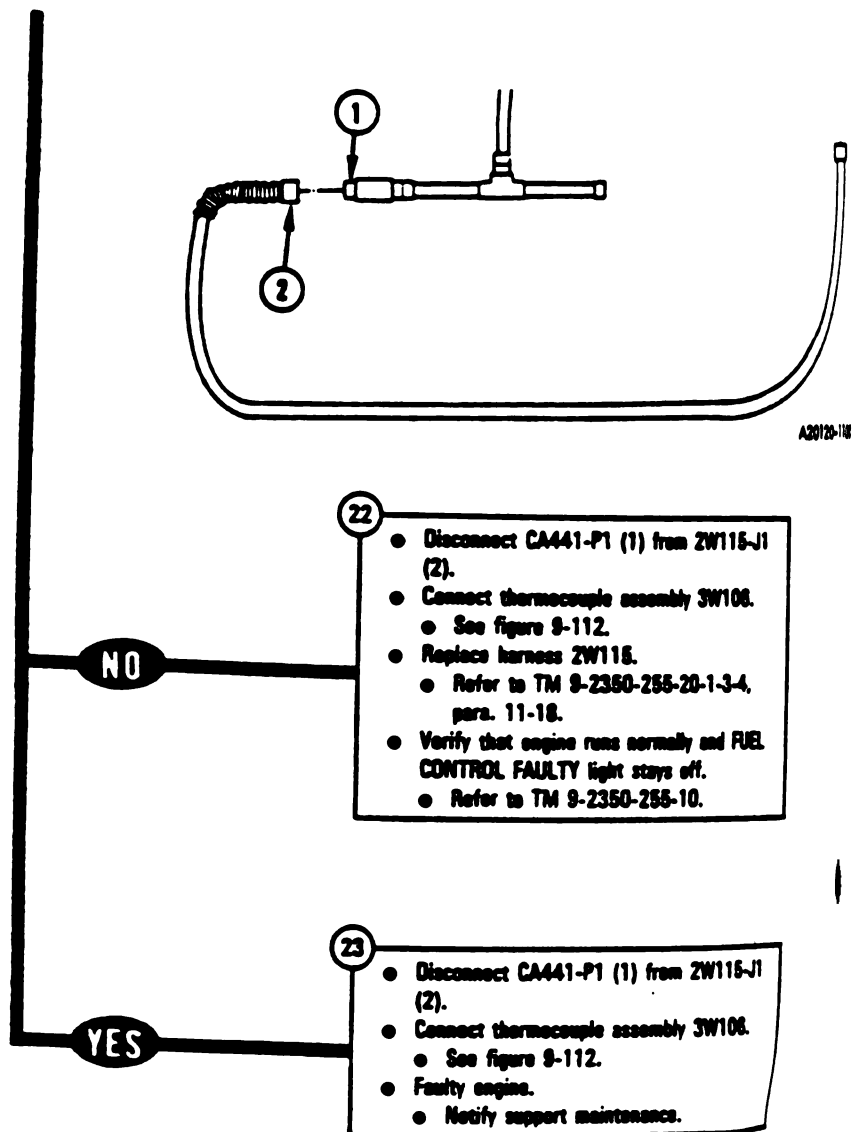


Figure 9-99 (Sheet 6 of 6)  
Volume II  
Para. 9-2

9-326 Change 3

PLAY SHOWS -  
LTY NH1 SENSOR  
114, 3W105

152602  
152603

**Equipment Condition:**

- Tank ported.
- Parking brake set.
- Engine shut down.
- Vehicle master power off.

Disconnect CX305-P1 from CX201-P1.

• See figure 9-48.

Disconnect ZW114-P1 from CX201-P2.

• See figure 9-48.

to figure 9-101.

check 2.

Figure 9-100  
Volume-41  
Para-9-2.

Change 3 9-327



• 152602  
152603

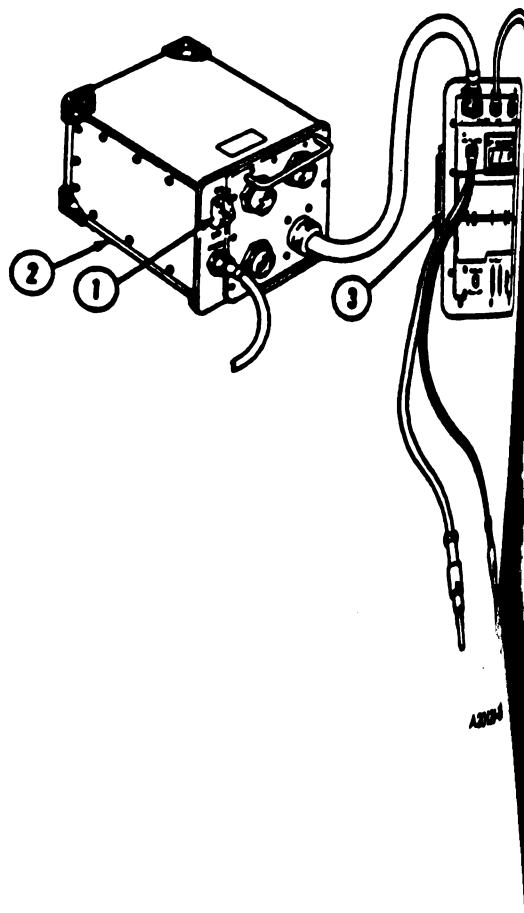
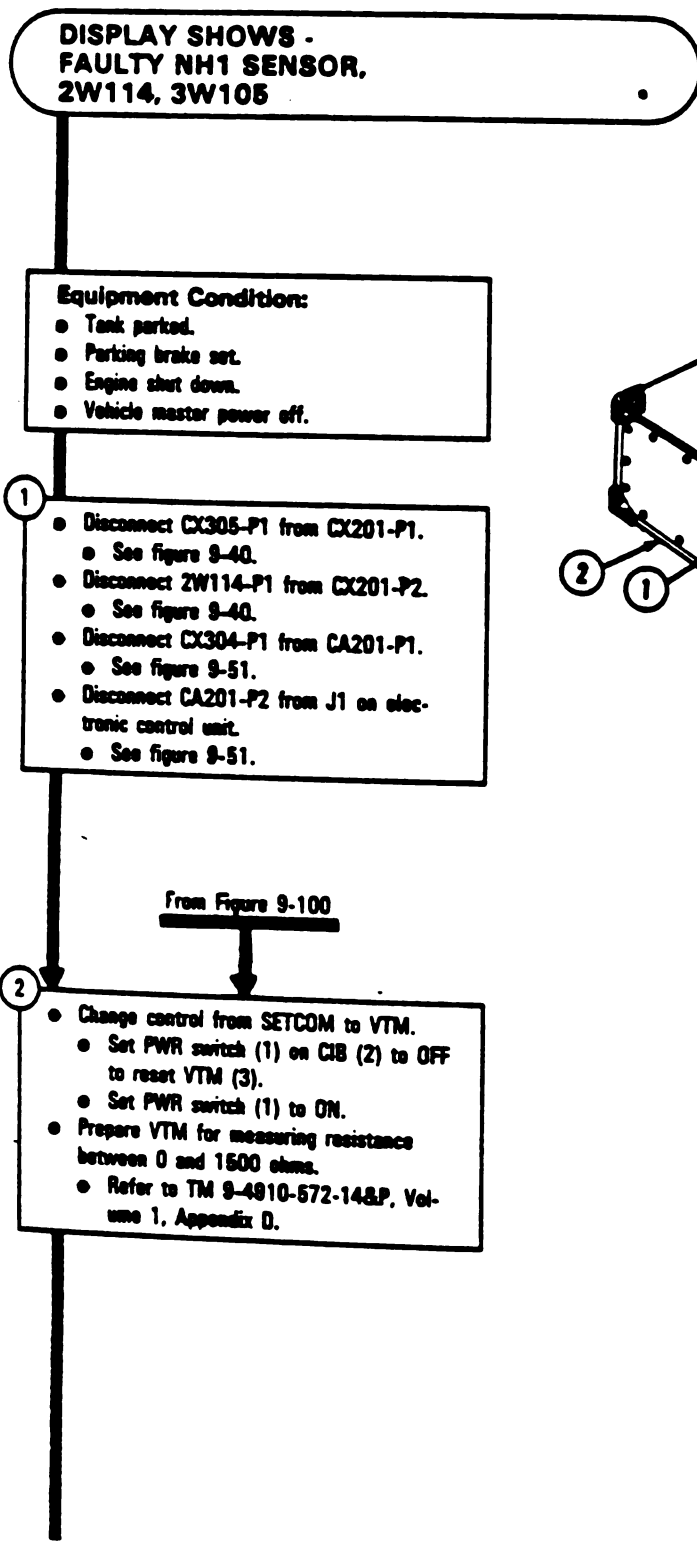


Figure 9-101 (Sheet 1 of 5)  
Volume II  
Para. 9-2

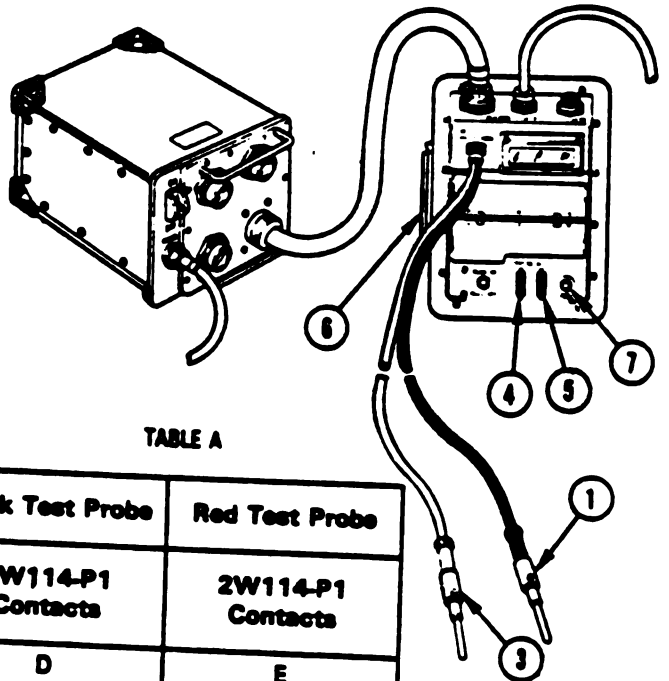
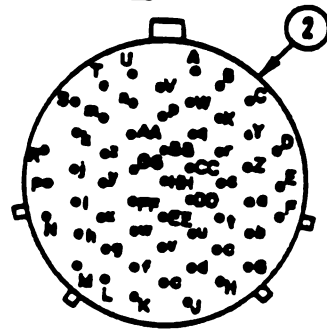


TABLE A

Black Test Probe	Red Test Probe
2W114-P1 Contacts	2W114-P1 Contacts
D D E	E F F



2W114-P1

**NOTE**

VTM display shows less than 80 between any contacts, leave test probes connected for remainder of test.

Check for less than 80 ohms between contacts listed in table A on 2W114-P1.

- Connect black test probe (1) to contacts listed in table A on 2W114-P1 (2).
- Connect red test probe (3) to contacts listed in table A on 2W114-P1 (2).

Does VTM display show less than 80?

**NO**      **YES**

Prepare STE/M1 to run cable test 1390.

- Set TEST SELECT switches (4, 5) on VTM (8) to 00.
- Press TEST button (7) on VTM (8).

**NOTE**

Display (8) on SETCOM (9) shows - STE/M1 REL 7.0 CLEAR UNIT

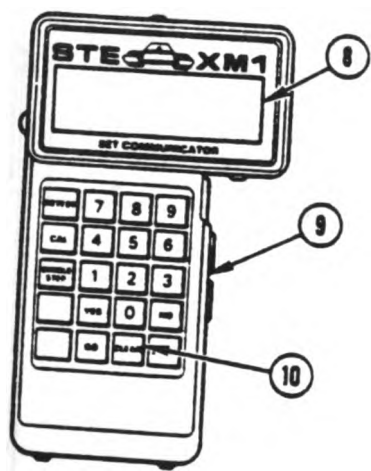
Press CLEAR key (10) on SETCOM (9).

**NOTE**

Display (8) on SETCOM (9) shows - ENTER TEST NUMBER.

Enter cable test number 1390 on SETCOM (9).

5 Go to block 12.

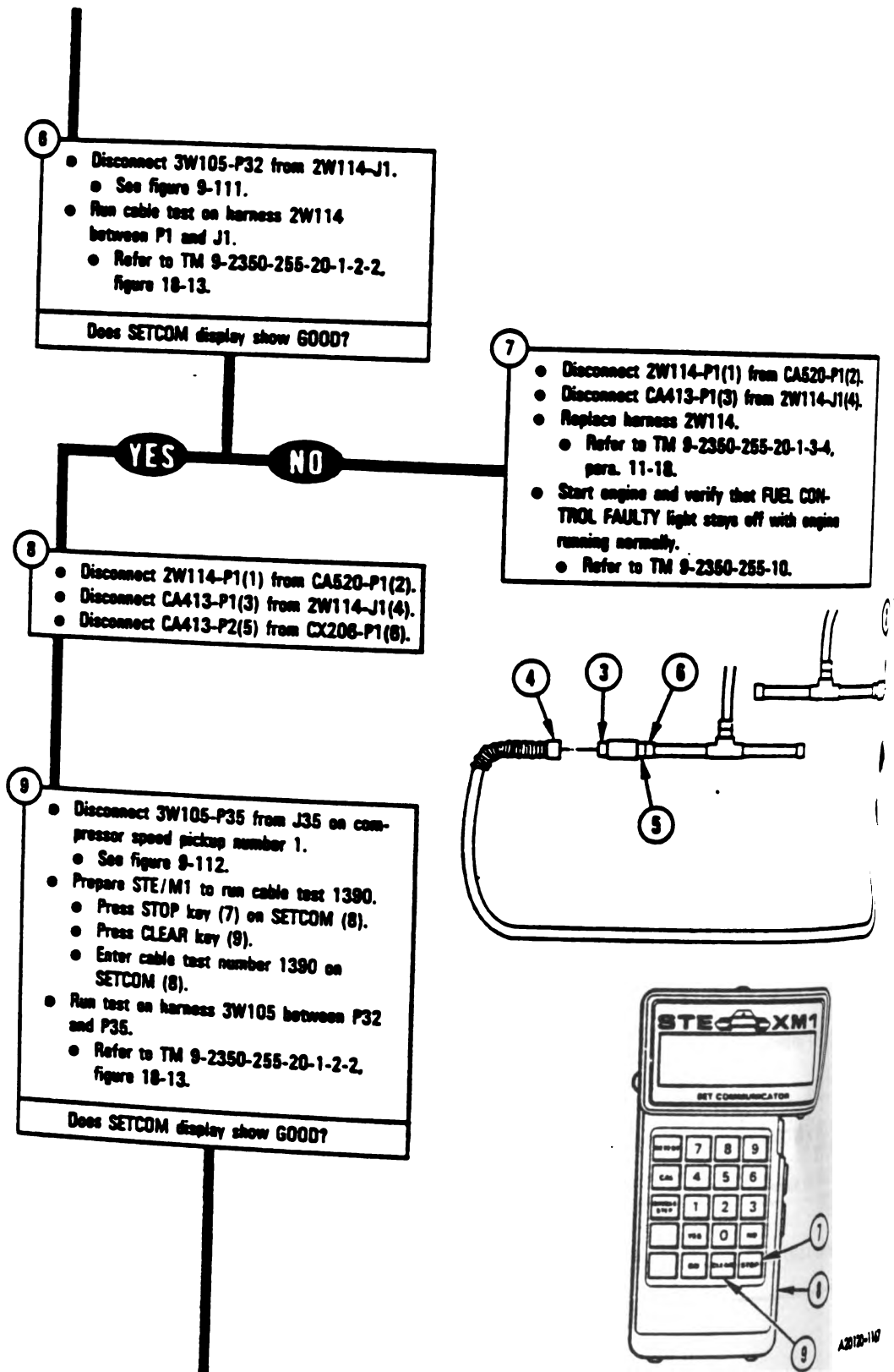


A20120-1166

Figure 9-101 (Sheet 2 of 5)  
Volume II  
Para. 9-2.

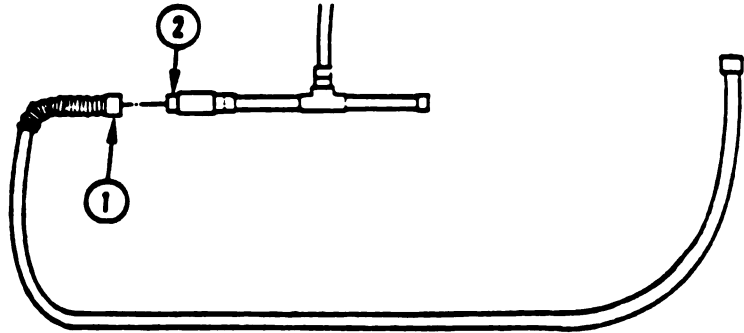
Change 3 9-329

**TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING**

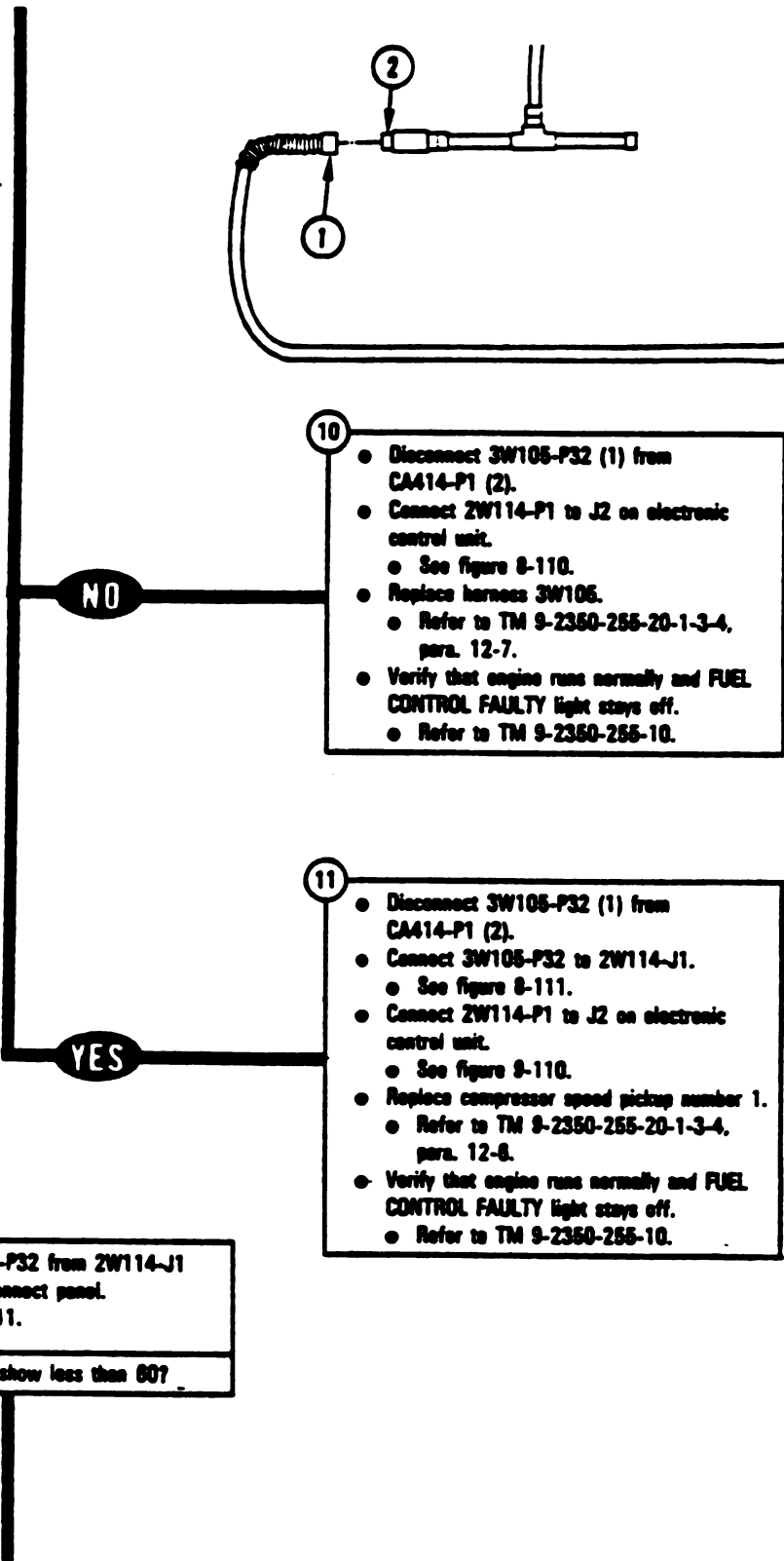


*Figure 9-101 (Sheet 3 of 5)  
Volume II  
Para. 9-2*

9-330 Change 3



A20120-1100



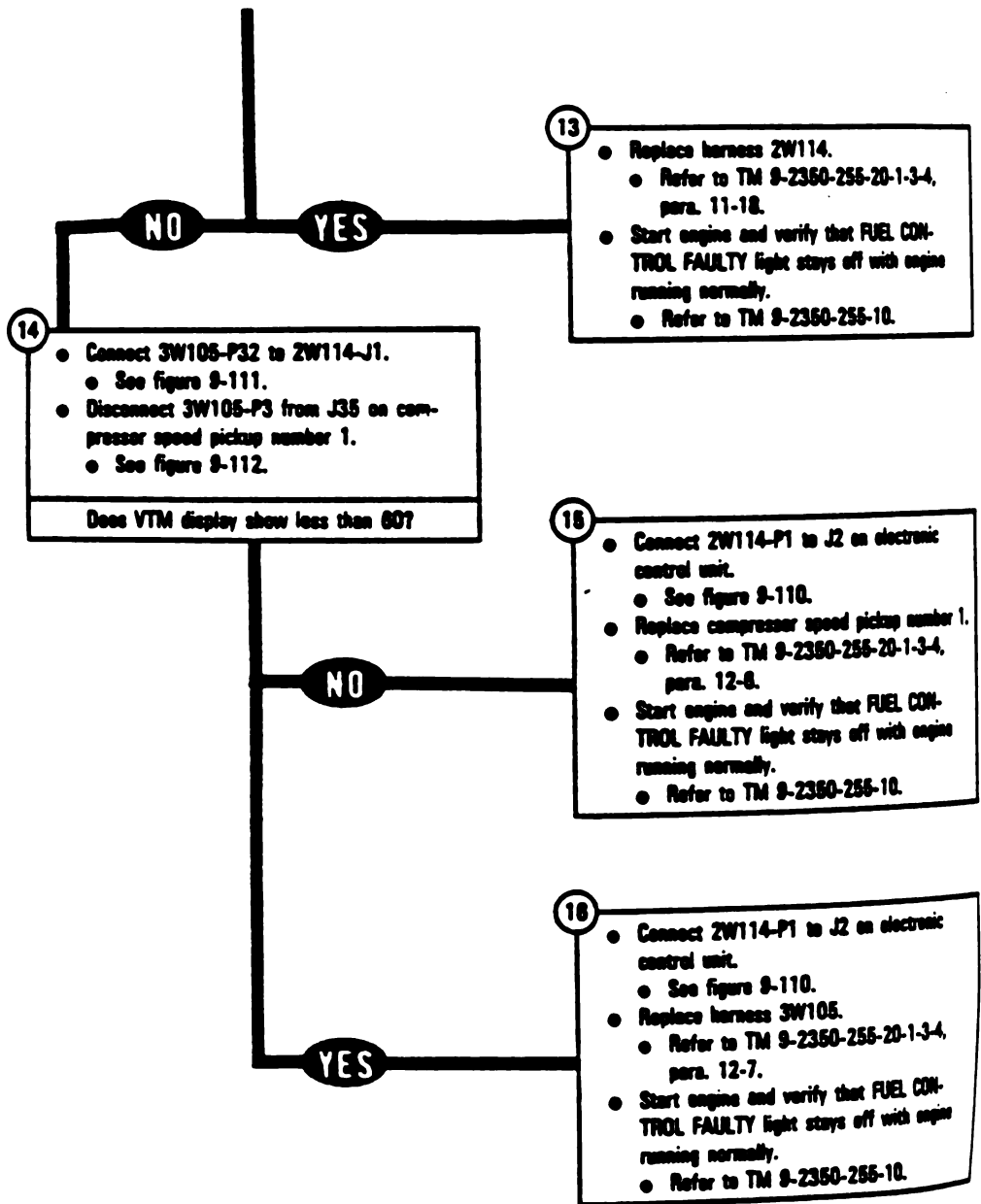
- 10
- Disconnect 3W105-P32 (1) from CA414-P1 (2).
  - Connect 2W114-P1 to J2 on electronic control unit.
    - See figure 8-110.
  - Replace harness 3W105.
    - Refer to TM 9-2350-255-20-1-3-4, para. 12-7.
  - Verify that engine runs normally and FUEL CONTROL FAULTY light stays off.
    - Refer to TM 9-2350-255-10.

- 11
- Disconnect 3W105-P32 (1) from CA414-P1 (2).
  - Connect 3W105-P32 to 2W114-J1.
    - See figure 8-111.
  - Connect 2W114-P1 to J2 on electronic control unit.
    - See figure 8-110.
  - Replace compressor speed pickup number 1.
    - Refer to TM 9-2350-255-20-1-3-4, para. 12-8.
  - Verify that engine runs normally and FUEL CONTROL FAULTY light stays off.
    - Refer to TM 9-2350-255-10.

- from block 5
- 12
- Disconnect 3W105-P32 from 2W114-J1 at powerpack disconnect panel.
  - See figure 9-111.
- Does VTM display show less than 60?

Figure 9-101 (Sheet 4 of 5)  
Volume-J1.  
Para. 9-2

**TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING**



*Figure 9-101 (Sheet 5 of 5)  
Volume II  
Para. 9-2*

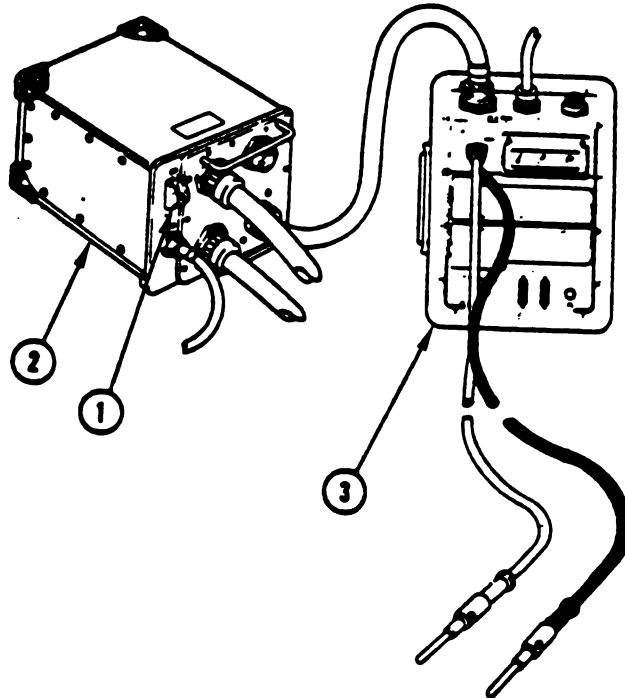
9-332 Change 3

RY SHOWS -  
RY RVDT (TENTL)  
4. 2W105

- 152702
- 152703
- 152902
- 152903

Table A

Fault Number	Red Test Probe to ZW105-P5 Contact	Black Test Probe to ZW105-P5 Contact	VTM Display (Ohms)
152702 OR 152703	j c c	k k j.	28 5 5
152902 OR 152903	m c c	n n m	33 5 5



A20120-240

Figure 9-102 (Sheet 1 of 4)  
Volume II  
Para. 9-2

Change 6 9-333

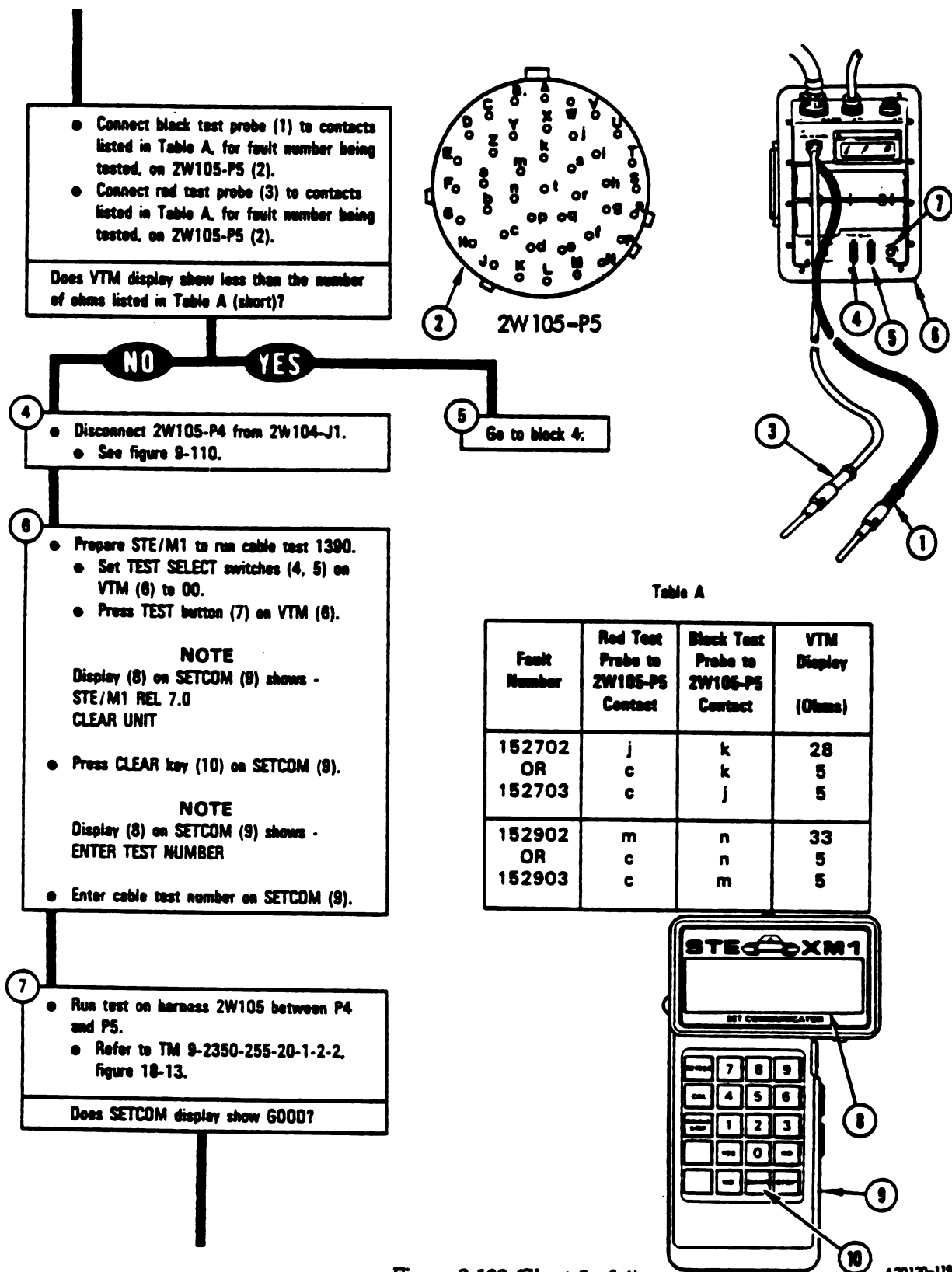
ent Condition:  
parked.  
ing brake set.  
e shut down.  
to master power off.

connect CX304-P1 from CA201-P1.  
see figure 9-51.  
connect CA201-P2 from J1 on elec-  
c control unit.  
see figure 9-51.  
connect shunting connector to J1 on  
ronic control unit.  
see figure 9-110.  
connect ZW105-P5 from CA205-P1.  
see figure 9-25.

go control from SETCOM to VTM.  
et PWR switch (1) on C18 (2) to OFF  
o reset VTM (3).  
et PWR switch (1) to ON.  
are VTM for measuring resistance  
een 0 and 1500 ohms.  
efer to TM 9-4910-572-14&P, Vol-  
ume 1, Appendix D.

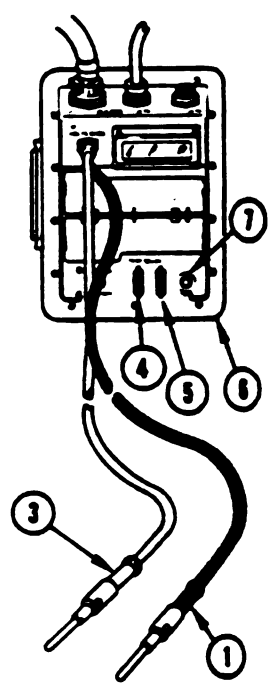
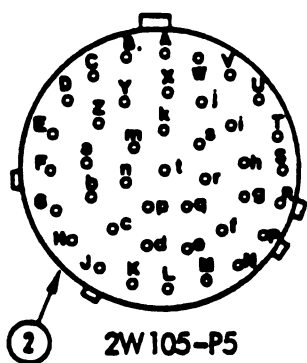
NOTE  
VTM display shows less than the  
nber listed in Table A for your fault  
nber, leave test probes connected  
remainder of test.

**TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING**



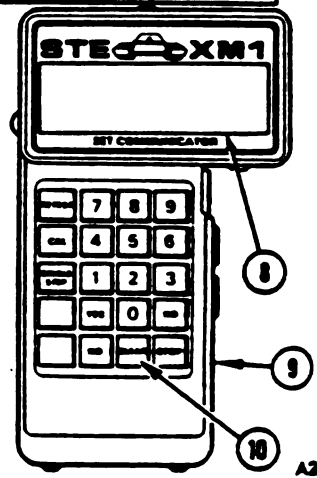
● Connect black test probe (1) to contacts listed in Table A, for fault number being tested, on ZW105-P5 (2).  
 ● Connect red test probe (3) to contacts listed in Table A, for fault number being tested, on ZW105-P5 (2).

Does VTM display show less than the number of ohms listed in Table A (short)?



**Table A**

Fault Number	Red Test Probe to ZW105-P5 Contact	Black Test Probe to ZW105-P5 Contact	VTM Display (Ohms)
152702 OR 152703	j c	k k j	28 5 5
152902 OR 152903	m c c	n n m	33 5 5



*Figure 9-102 (Sheet 2 of 4)  
Volume II  
Para. 9-2*

A20120-1194

**TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING**

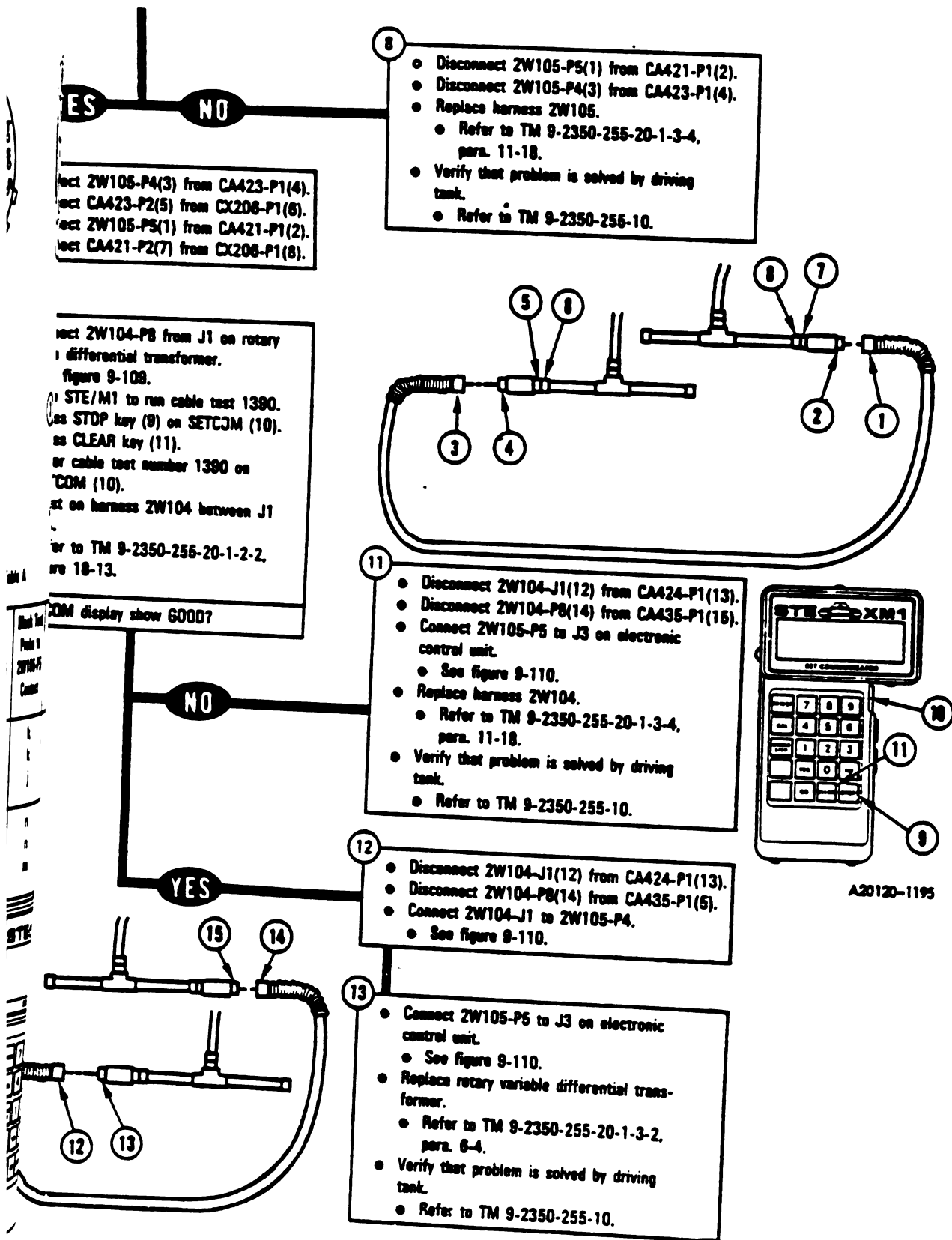
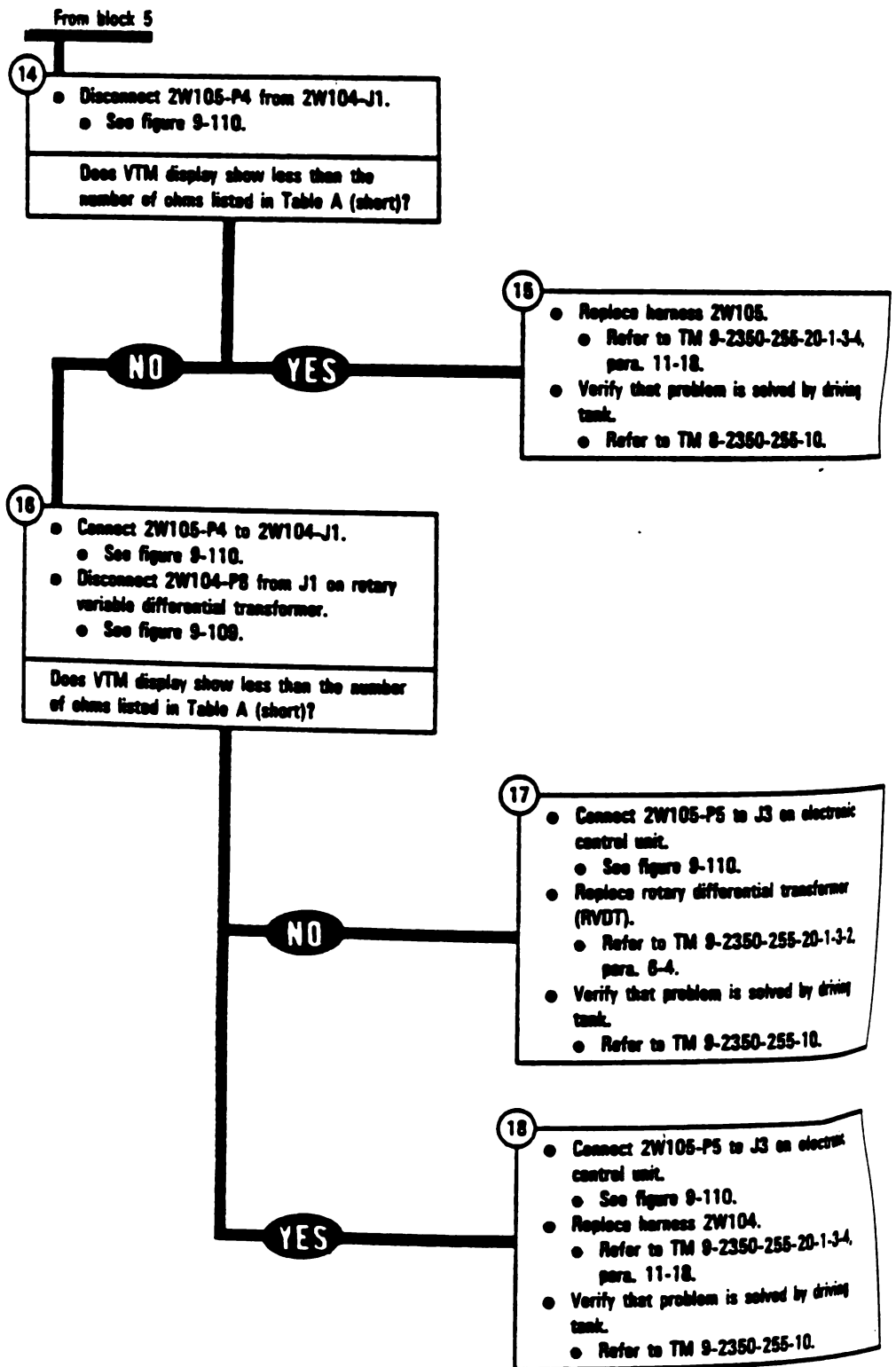


Figure 9-102 (Sheet 3 of 4)  
Volume II  
Para. 9-2



**TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING**



*Figure 9-102 (Sheet 4 of 4)  
Volume II  
Para. 9-2*

9-336 Change 3

AY SHOWS .  
Y NH2 SENSOR  
4, 3W105

• 152802  
152803

ment Condition:  
parked.  
ing brake set.  
shut down.  
cle master power off.

connect CX305-P1 from CX201-P1.  
See figure 9-40.  
connect ZW114-P1 from CX201-P2.  
See figure 9-40.  
connect CX304-P1 from CA201-P1.  
See figure 9-28.  
connect CA201-P2 from J1 on elec-  
tric control unit.  
See figure 9-28.  
connect shunting connector to J1 on  
electronic control unit.  
See figure 9-110.

figure 9-104, block 2.

Figure 9-103  
Volume 41  
Para. 9-2

Change 3 9-337

TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING

DISPLAY SHOWS -  
FAULTY NH2 SENSOR  
2W114, 3W105

• 152802  
152803

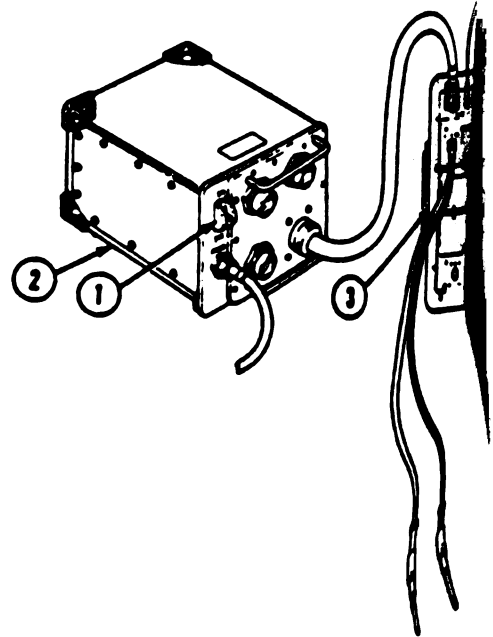
**Equipment Condition:**

- Tank parked.
- Parking brake set.
- Engine shut down.
- Vehicle master power off.

- ①
- Disconnect CX305-P1 from CX201-P1.
    - See figure 9-40.
  - Disconnect 2W114-P1 from CX201-P2.
    - See figure 9-40.

From figure 9-103

- ②
- Change control from SETCOM to VTM.
    - Set PWR switch (1) on CIB (2) to OFF to reset VTM (3).
    - Set PWR switch (1) to ON.
  - Prepare VTM for measuring resistance between 0 and 1500 ohms.
    - Refer to TM 9-4910-572-14&P, Volume I, Appendix D.



A20120-107

Figure 9-104 (Sheet 1 of 5)  
Volume II  
Para. 9-2

9-338 Change 3

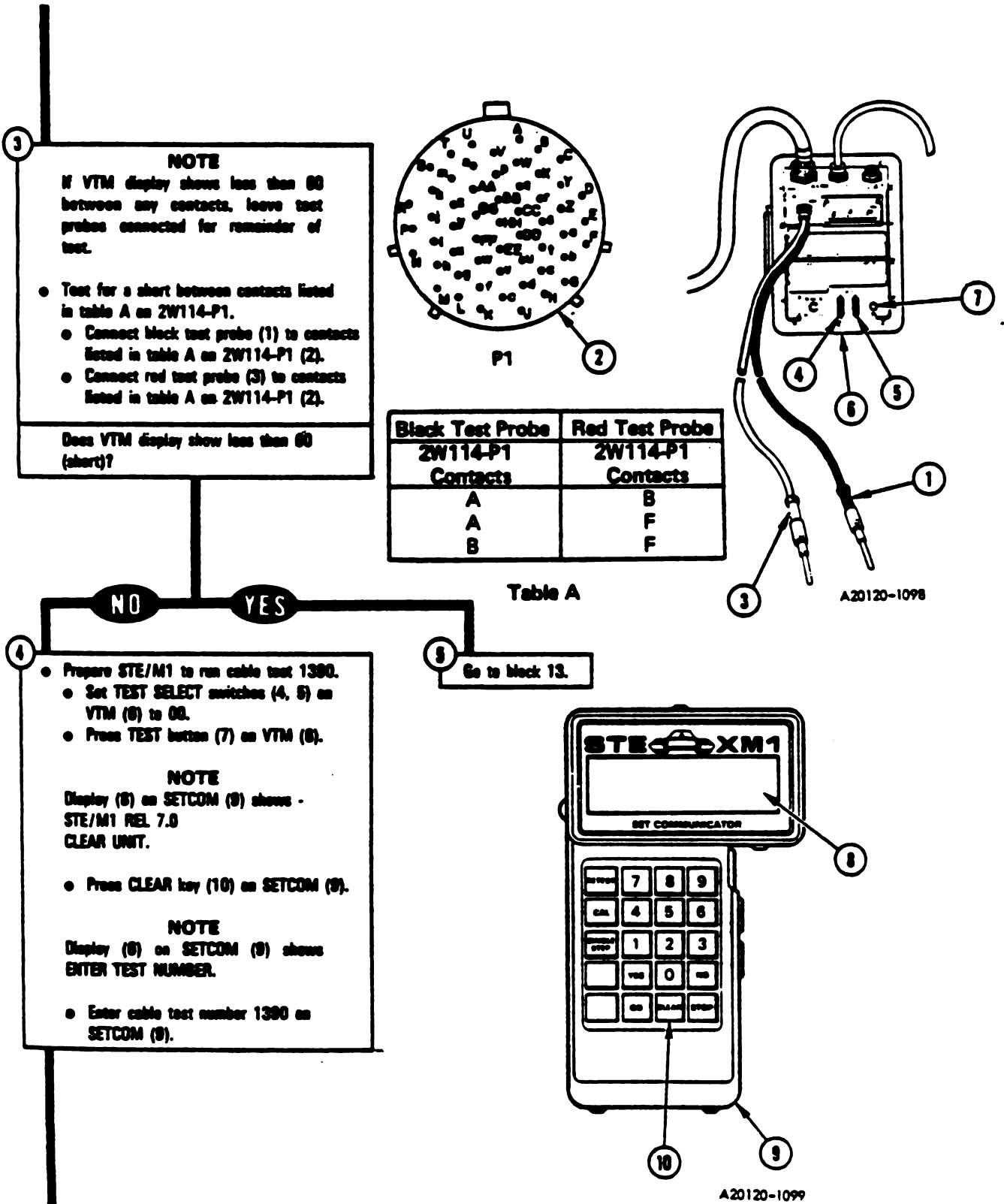
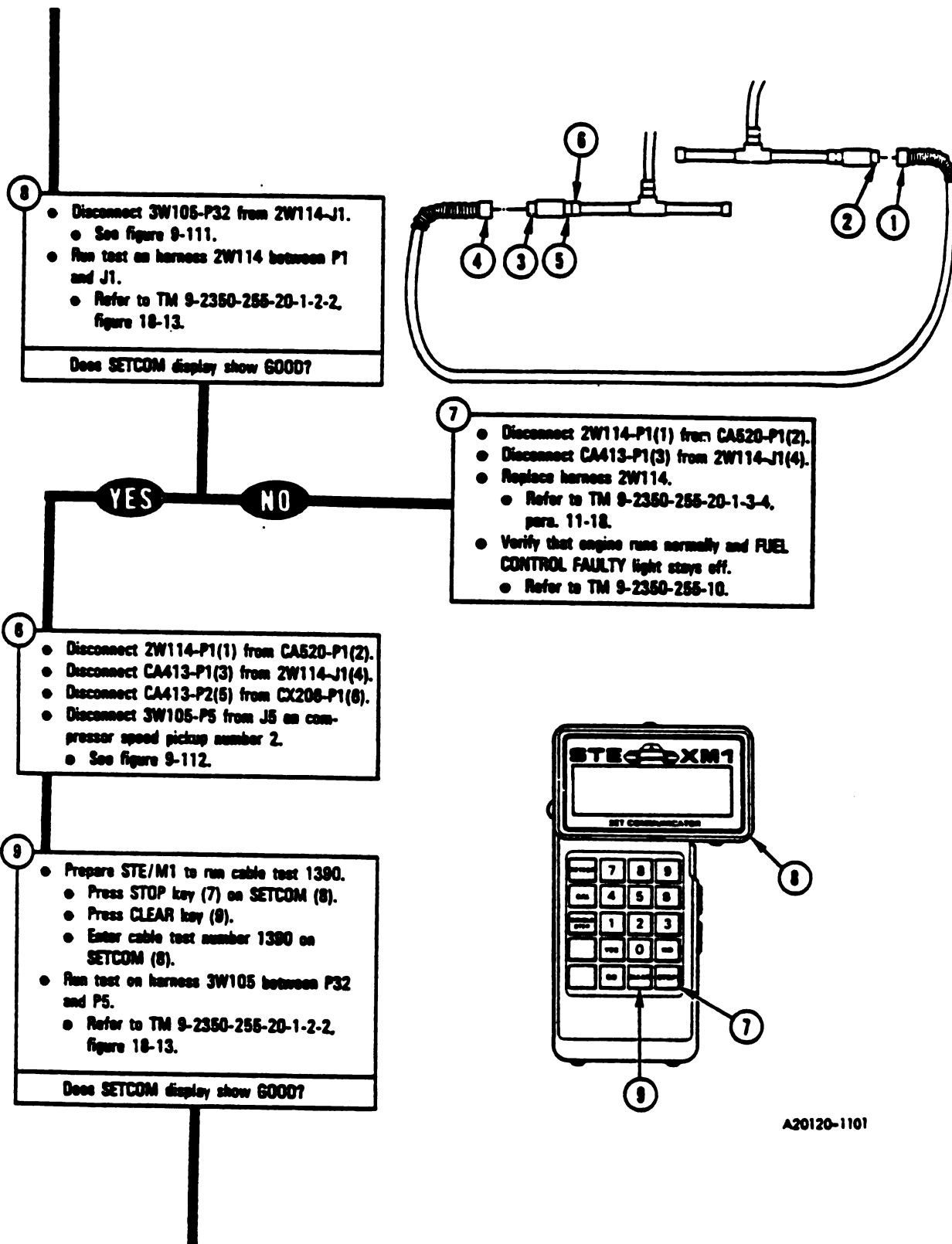
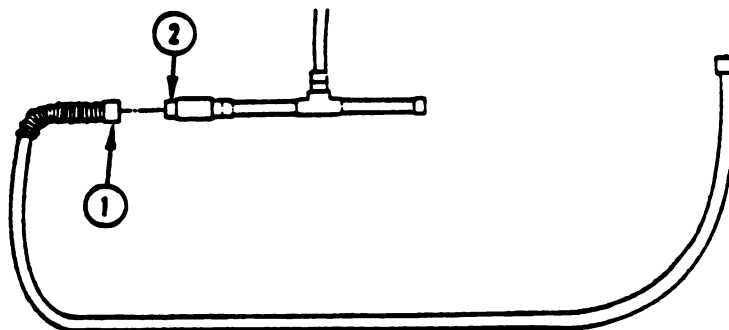


Figure 9-104 (Sheet 2 of 5)  
Volume II  
Para. 9-2.

**TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING**



A20120-1101



A20120-1100

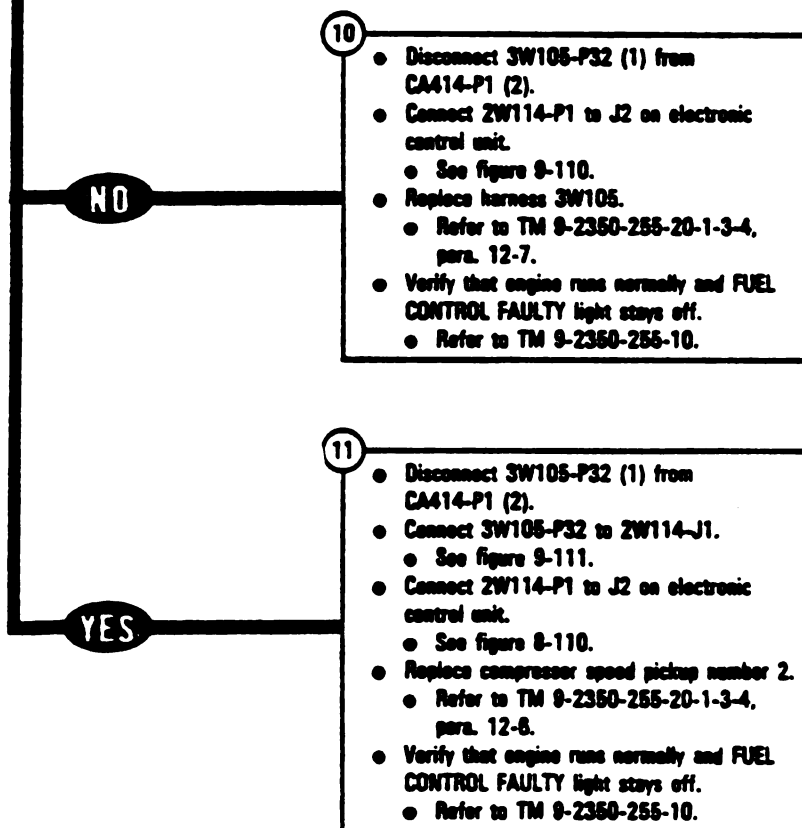


Figure 9-104 (Sheet 4 of 5)  
Volume II  
Para. 9-2

Change 3 9-341

TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING

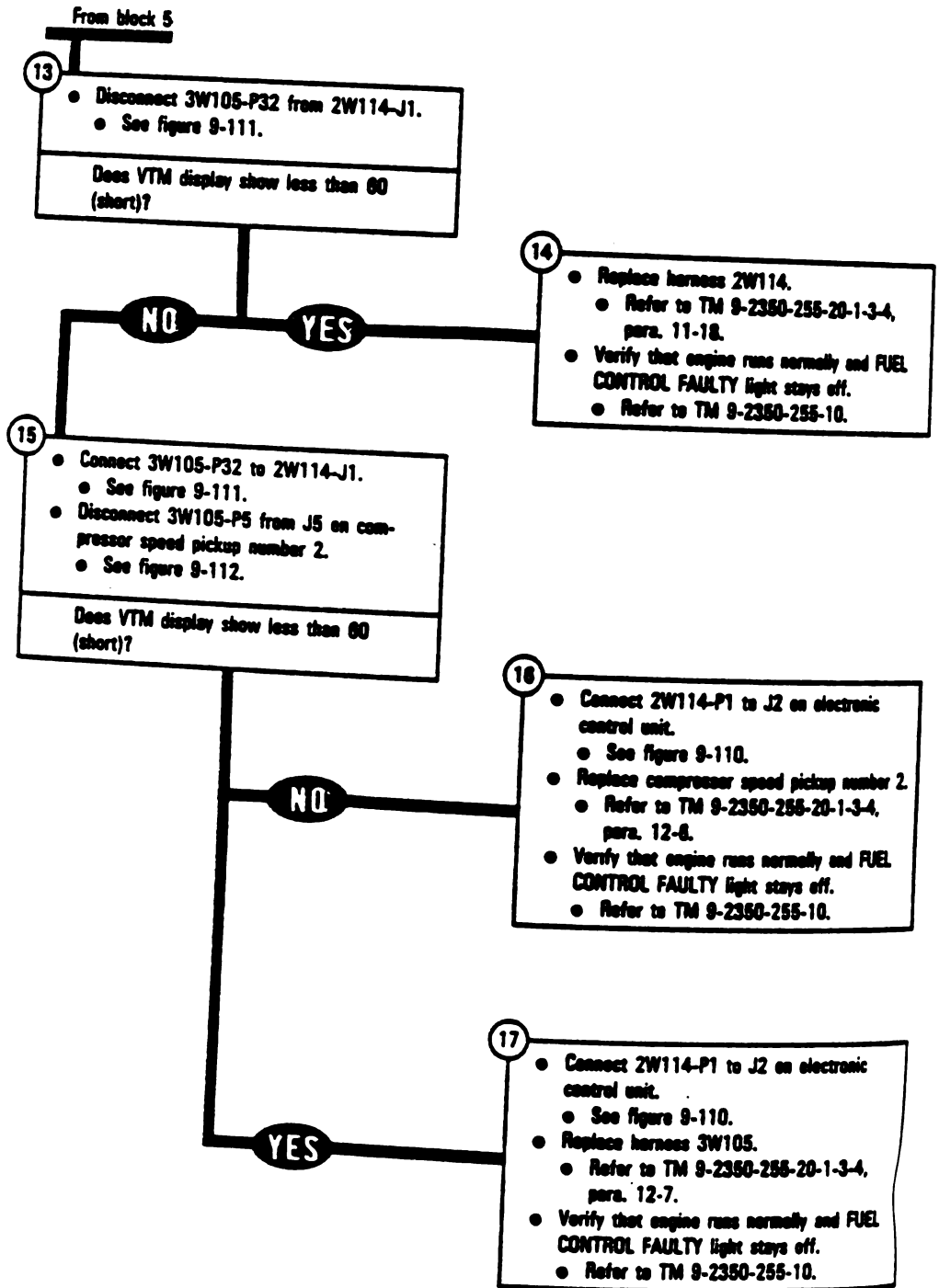


Figure 9-104 (Sheet 5 of 5)  
Volume II  
Para. 9-2

9-342 Change 3

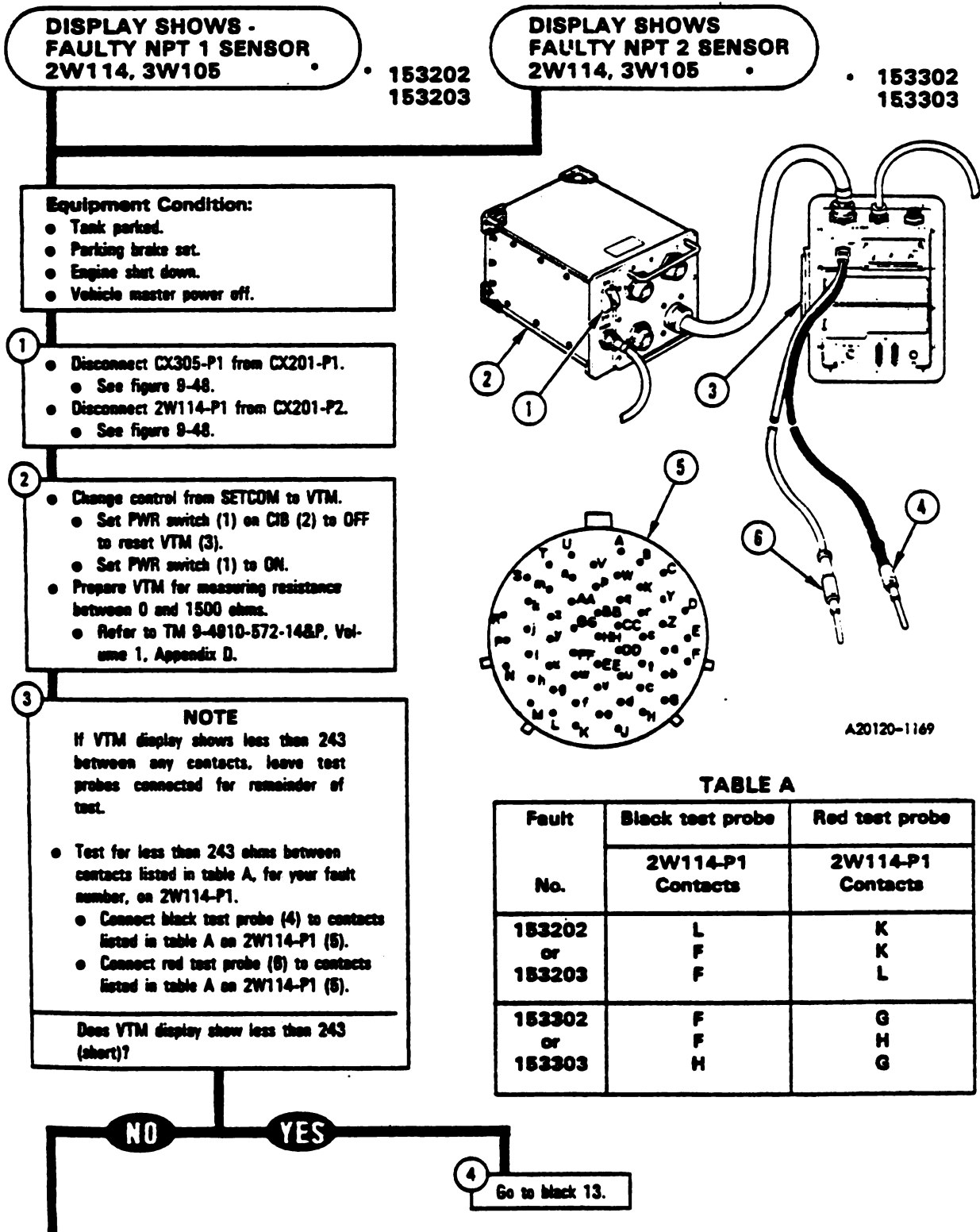


Figure 9-105 (Sheet 1 of 4)  
Volume II  
Para. 9-2



**TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING**

**5**

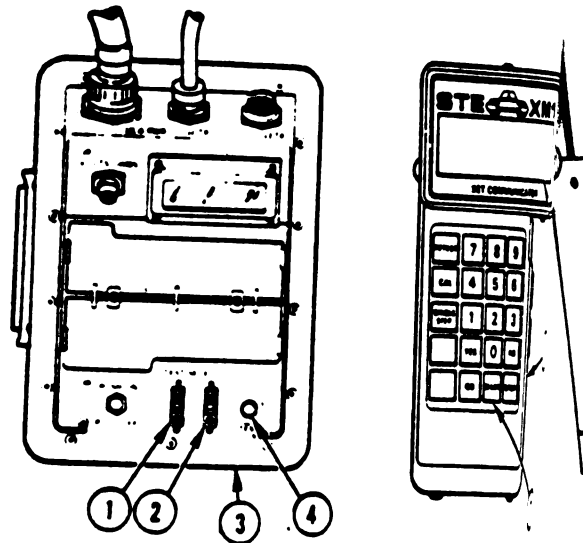
- Prepare STE/M1 to run cable test 1390.
- Set TEST SELECT switches (1, 2) on VTM (3) to 00.
- Press TEST button (4) on VTM (3).

**NOTE**  
Display (5) on SETCOM (6) shows -  
STE/M1 REL 7.0  
CLEAR UNIT.

- Press CLEAR key (7) on SETCOM (6).

**NOTE**  
Display (5) on SETCOM (6) shows -  
ENTER TEST NUMBER.

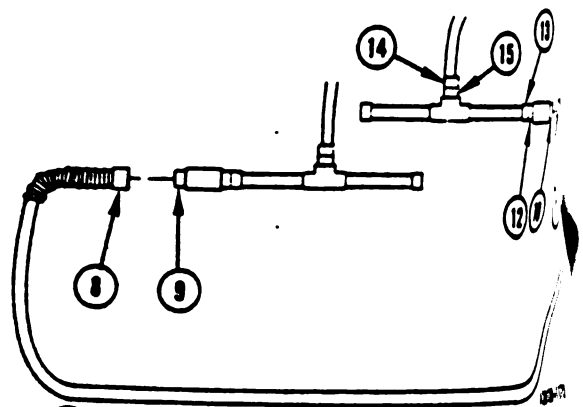
- Enter cable test number 1390 on SETCOM (6)



**6**

- Disconnect 3W105-P32 from 2W114-J1.
- See figure 9-111.
- Run test on harness 2W114 between P1 and J1.
- Refer to TM 9-2350-255-20-1-2-2, figure 18-13.

Does SETCOM display show GOOD?



**YES**      **NO**

**8**

- Disconnect CA413-P1 (10) from 2W114-J1 (11).
- Disconnect CA413-P2 (12) from CX208-P1 (13).
- Disconnect 2W114-P1 (8) from CA520-P1 (9).
- Disconnect CX305-P1 (14) from CX208-P3 (15).
- Disconnect 3W105-P37 from 3W105-1 J37.
- See figure 9-112.

**7**

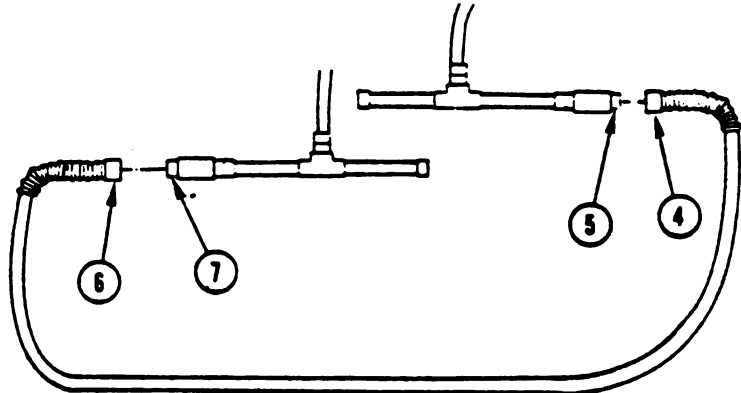
- Disconnect 2W114-P1 (8) from CA520-P1 (9).
- Disconnect CA413-P1 (10) from 2W114-J1 (11).
- Replace harness 2W114.
- Refer to TM 9-2350-255-20-1-3-4, para. 11-18.
- Verify that problem is solved by starting engine and making sure that engine RPM is between 870 and 950 with shift selector set to N and between 1250 and 1350 with shift selector set to PVT.
- Refer to TM 9-2350-255-10.

*Figure 9-105 (Sheet 2 of 4)  
Volume II  
Para. 9-2*

9

- Prepare STE/M1 to run cable test 1390.
- Press STOP key (1) on SETCOM (2).
- Press CLEAR key (3).
- Enter cable test number 1390 on SETCOM (2).
- Run test on harness 3W105 between P32 and P37.
- Refer to TM 9-2350-255-20-1-2-2, figure 18-13.

Does SETCOM display show GOOD?



A20120-1170

NO

10

- Disconnect 3W105-P32 (4) from CA414-P1 (5).
- Disconnect 3W105-P37 (6) from CA439-P1 (7).
- Connect 2W114-P1 to J2 on electronic control unit.
  - See figure 9-110.
- Replace harness 3W105.
  - Refer to TM 9-2350-255-20-1-3-4, para. 12-7.
- Verify that problem is solved by starting engine and making sure that engine RPM is between 870 and 950 with shift selector set to N and between 1250 and 1350 with shift selector set to PVT.
  - Refer to TM 9-2350-255-10.

YES

11

- Disconnect 3W105-P32 (4) from CA414-P1 (5).
- Connect 3W105-P32 to 2W114-J1.
  - See figure 9-111.
- Disconnect 3W105-P37 (6) from CA439-P1 (7).
- Connect 3W105-P37 to 3W105-1-J37.
  - See figure 9-112.

12

- Connect 2W114-P1 to J2 on electronic control unit.
  - See figure 9-110.
- Faulty engine.
  - Notify support maintenance.

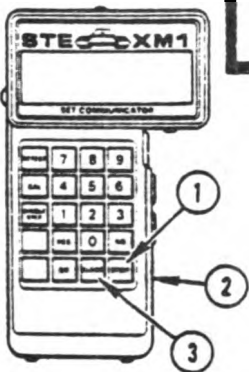


Figure 9-105 (Sheet 3 of 4)  
Volume II  
Para. 9-2

TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING

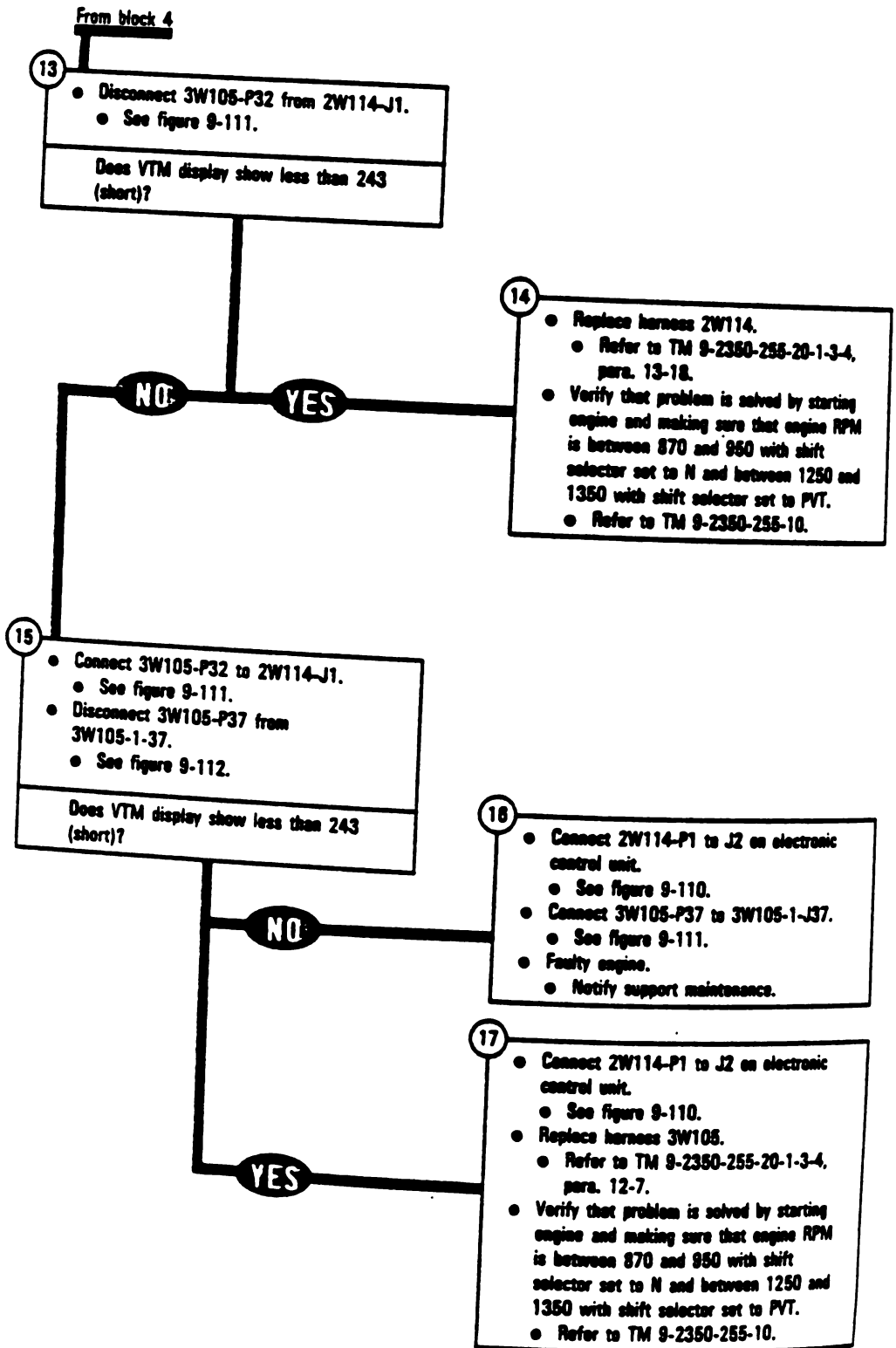


Figure 9-105 (Sheet 4 of 4)  
Volume II  
Para. 9-2

9-348 Change 3

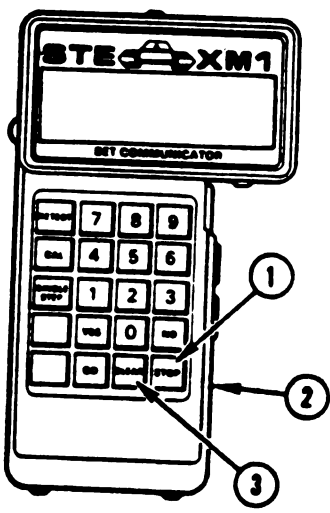
Y SHOWS  
PTRLY , 3W107,  
, 2W105

• 154102  
154103

ient Condition:  
parked.  
g brake set.  
s shut down.  
le master power off.

connect CX304-P1 from CA201-P1.  
see figure 9-51.  
connect CA201-P2 from J1 on elec-  
ic control unit.  
see figure 9-51.  
connect CX305-P1 from CA205-P2.  
See figure 9-25.  
connect CA205-P1 from 2W105-P5.  
See figure 9-25.

connect 2W107-P3 from 2W105-J1.  
See figure 9-110.  
pare STE/M1 to run cable test 1390.  
Press STOP key (1) on SETCOM (2).  
Press CLEAR key (3).  
Enter cable test number 1390 on  
SETCOM (2).  
a test on harness 2W105 between P5  
d J1.  
Refer to TM 9-2350-255-20-1-2-2,  
figure 18-13.  
es SETCOM display show GOOD?

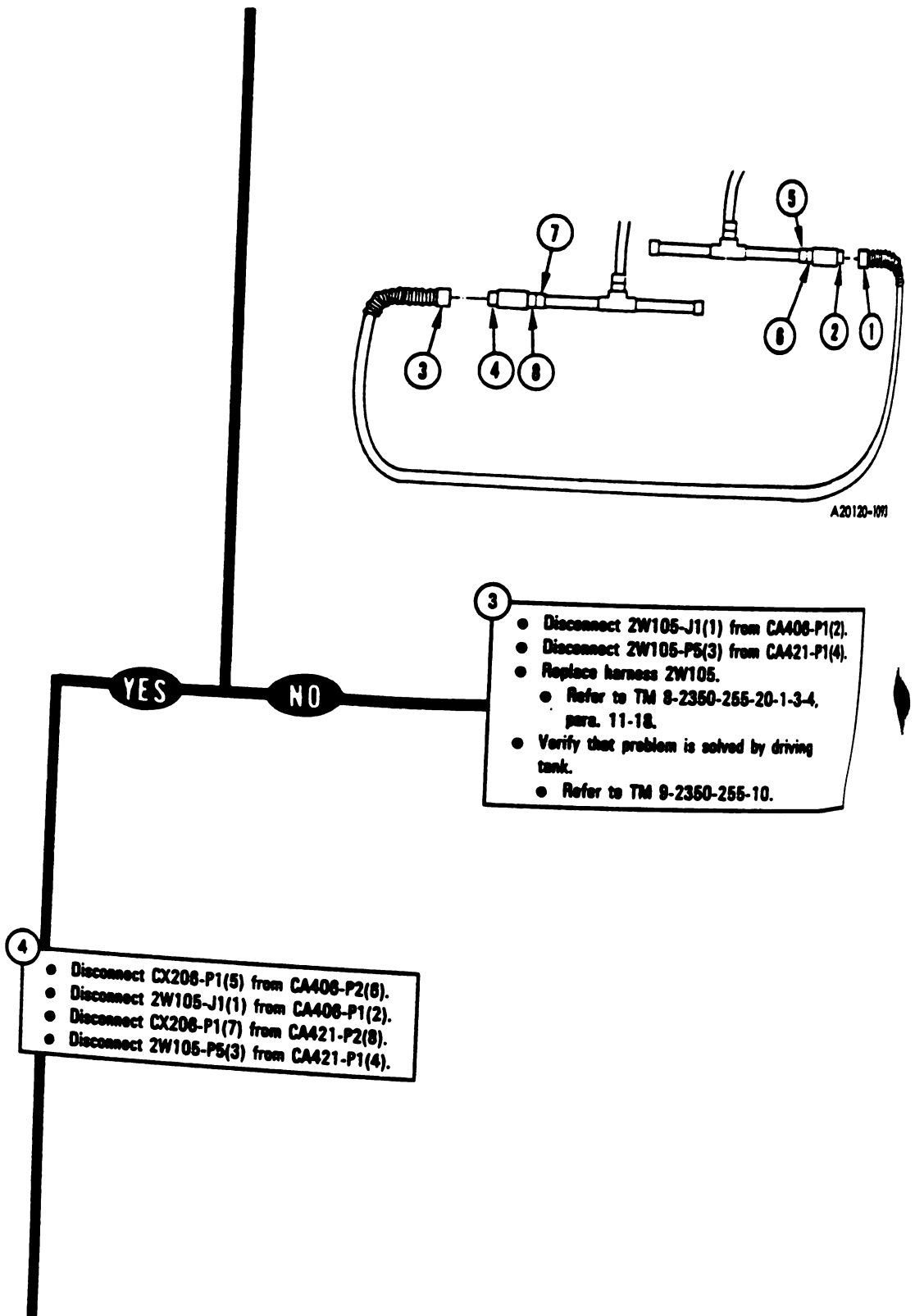


A20220-011R1

Figure 9-106 (Sheet 1 of 4)  
Volume II  
Para. 9-2

Change 6 9-347

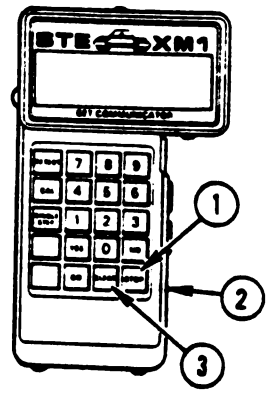
**TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING**



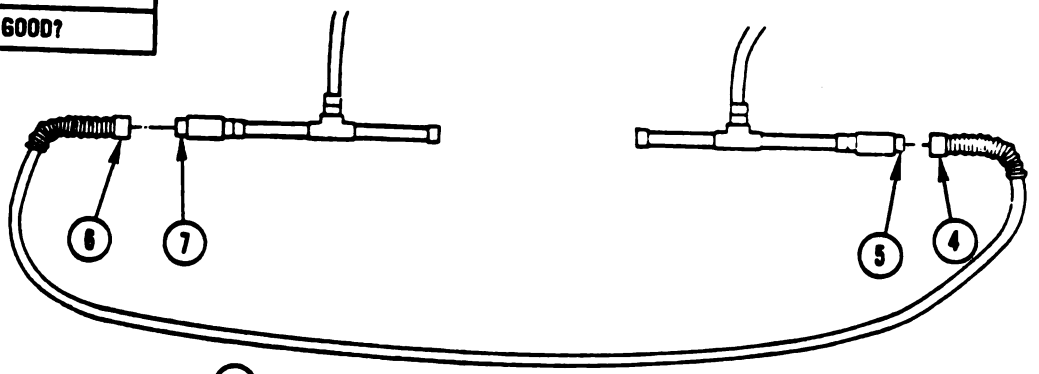
*Figure 9-106 (Sheet 2 of 4)*  
**Volume II  
Para. 9-2**

**9-348 Change 3**

Disconnect 3W107-P2 from 2W107-J2.  
Refer to figure 9-111.  
Press STE/M1 to run cable test 1390.  
Press STOP key (1) on SETCOM (2).  
Press CLEAR key (3).  
Enter cable test number 1390 on  
SETCOM (2).  
Perform test on harness 2W107 between J2  
and J3.  
Refer to TM 9-2350-255-20-1-2-2,  
para. 18-13.



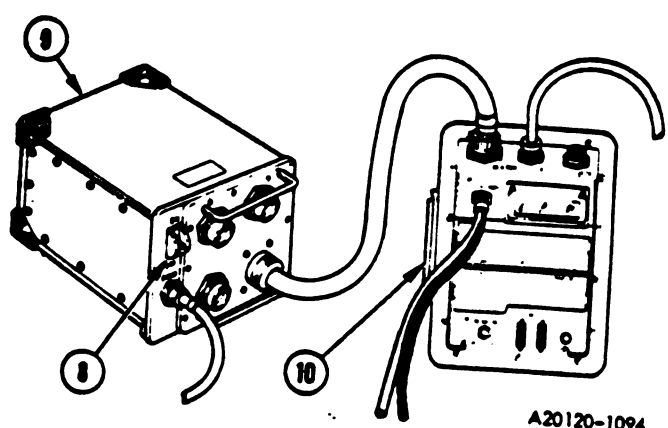
SETCOM display show GOOD?



- 8
- Disconnect 2W107-P3(4) from CA405-P1(5).
  - Disconnect 2W107-J2(8) from CA411-P1(7).
  - Connect 2W105-P5 to J3 on electronic control unit.
  - See figure 9-110.
  - Replace harness 2W107.
  - Refer to TM 9-2350-255-20-1-3-4, para. 11-18.
  - Verify that problem is solved by driving tank.
  - Refer to TM 9-2350-255-10.

YES NO

Disconnect 2W107-P3(4) from CA405-P1(5).  
Disconnect 2W107-J2(8) from CA411-P1(7).  
Remove engine control from SETCOM to VTM.  
Set PWR switch (8) on CIB (9) to OFF  
to reset VTM (10).  
Set PWR switch (8) to ON.  
Operate VTM for measuring resistance  
between 0 and 1500 ohms.  
Refer to TM 9-4910-572-14&P, Vol-  
ume I, Appendix D.



A20120-1094

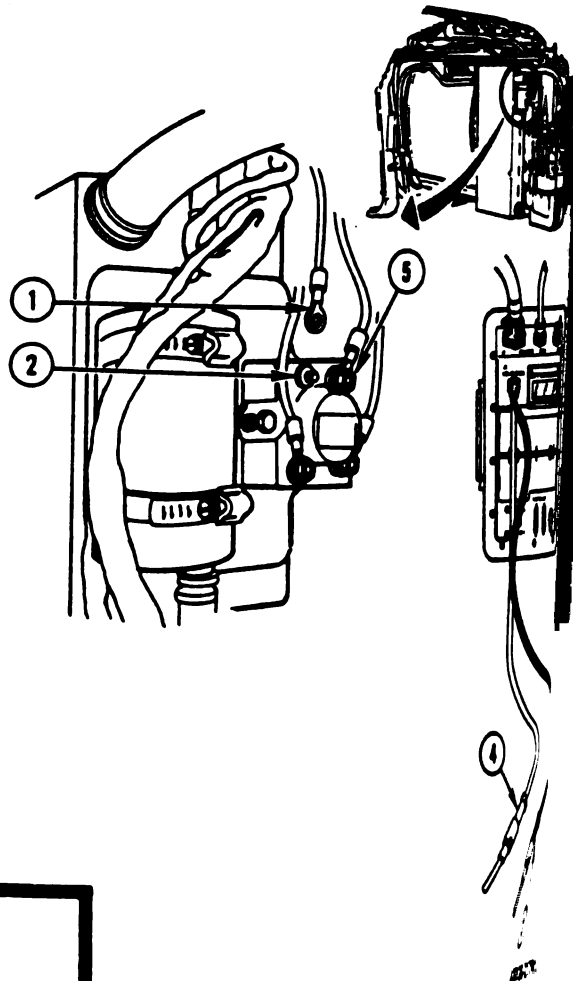
Figure 9-106 (Sheet 3 of 4)  
Volume II  
Para. 9-2

**TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING**

8

- Disconnect 3W107-X1 (1) from starter pilot relay-X1 (2) using 5/16 inch wrench.
- Test for continuity between X1 and X2 on starter pilot relay.
  - Connect black test probe (3) to relay-X1 (2).
  - Connect red test probe (4) to relay-X2(5).

Done VTM display show 9.9.9.97



YES

9

- Connect 2W105-P5 to J3 on electronic control unit.
  - See figure 9-110.
- Connect 2W107-P3 to 2W105-J1.
  - See figure 9-110.
- Connect 3W107-P2 to 2W107-J2.
  - See figure 9-111.
- Replace starter pilot relay.
  - Refer to TM 9-2350-255-20-1-3-4, para. 12-5.
- Verify that problem is solved by driving tank.
  - Refer to TM 9-2350-255-10.

NO

10

- Connect 2W105-P5 to J3 on electronic control unit.
  - See figure 9-110.
- Connect 2W107-P3 to 2W105-J1.
  - See figure 9-110.
- Replace harness 3W107.
  - Refer to TM 9-2350-255-20-1-3-4, para. 12-7.
- Verify that problem is solved by driving tank.
  - Refer to TM 9-2350-255-10.

*Figure 9-106 (Sheet 4 of 4)  
Volume II  
Para. 9-2*

9-350 Change 3

**PLAY SHOWS -  
MULTI NH1 AND NH2 SENSOR  
114, 3W105**

\* 154 504  
154 505

**Additional Test**

**Equipment/Special Tools:**  
Breakout Box Tool Kit, 12311086

**Equipment Condition:**

- Tank parked.
- Parking brake set.
- Engine shut down.
- Vehicle master power off.

Disconnect CA201-P2 from J1 on electronic control unit.

- See figure 9-28.

Connect shorting connector to J1 on electronic control unit.

- See figure 9-110.

Disconnect 2W114-P1 from CX201-P2.

- See figure 9-40.

Disconnect CX305-P1 from CX201-P1.

- See figure 9-40.

Disconnect CX305-P2 from CIB-J1.

- See figure 9-40.

Disconnect 3W105-P32 from 2W114-J1.

- See figure 9-111.

Connect CX305-P2 (1) to breakout box (2).

Connect CX305-P1 (3) to CX206-P3 (4).

Connect CA413-P1 (5) to 2W114-J1 (6).

Connect CA413-P2 (7) to CX206-P1 (8).

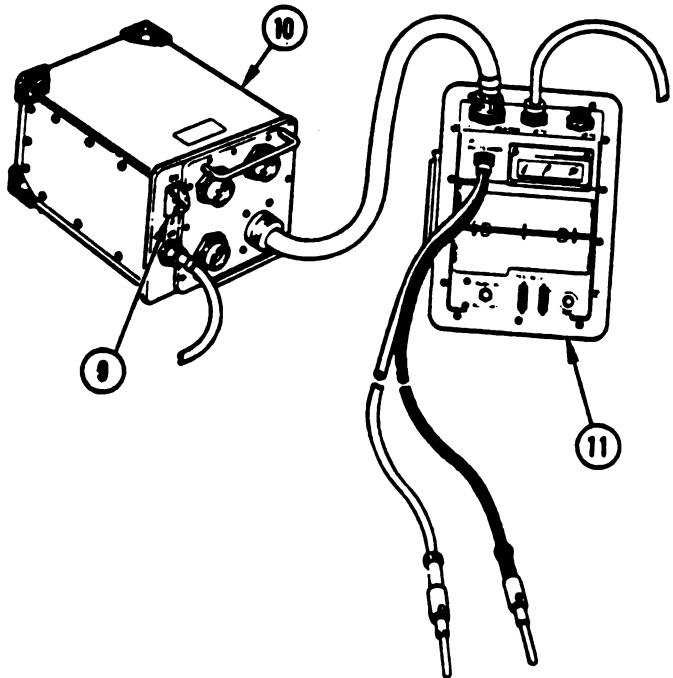
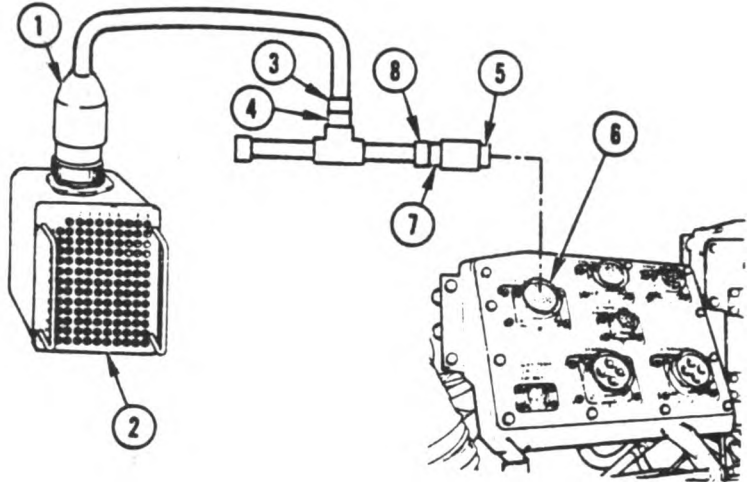
Change control from SETCOM to VTM.

- Set PWR switch (9) on CIB (10) to OFF to reset VTM (11).

- Set PWR switch (9) to ON.

Prepare VTM for measuring resistance between 0 and 1600 ohms.

- Refer to TM 9-4910-572-14&P, Volume 1, Appendix D.



A20120-1716

Figure 9-106.1 (Sheet 1 of 12)  
Volume II  
Para. 9-2

Change 6 9-350.1



TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING

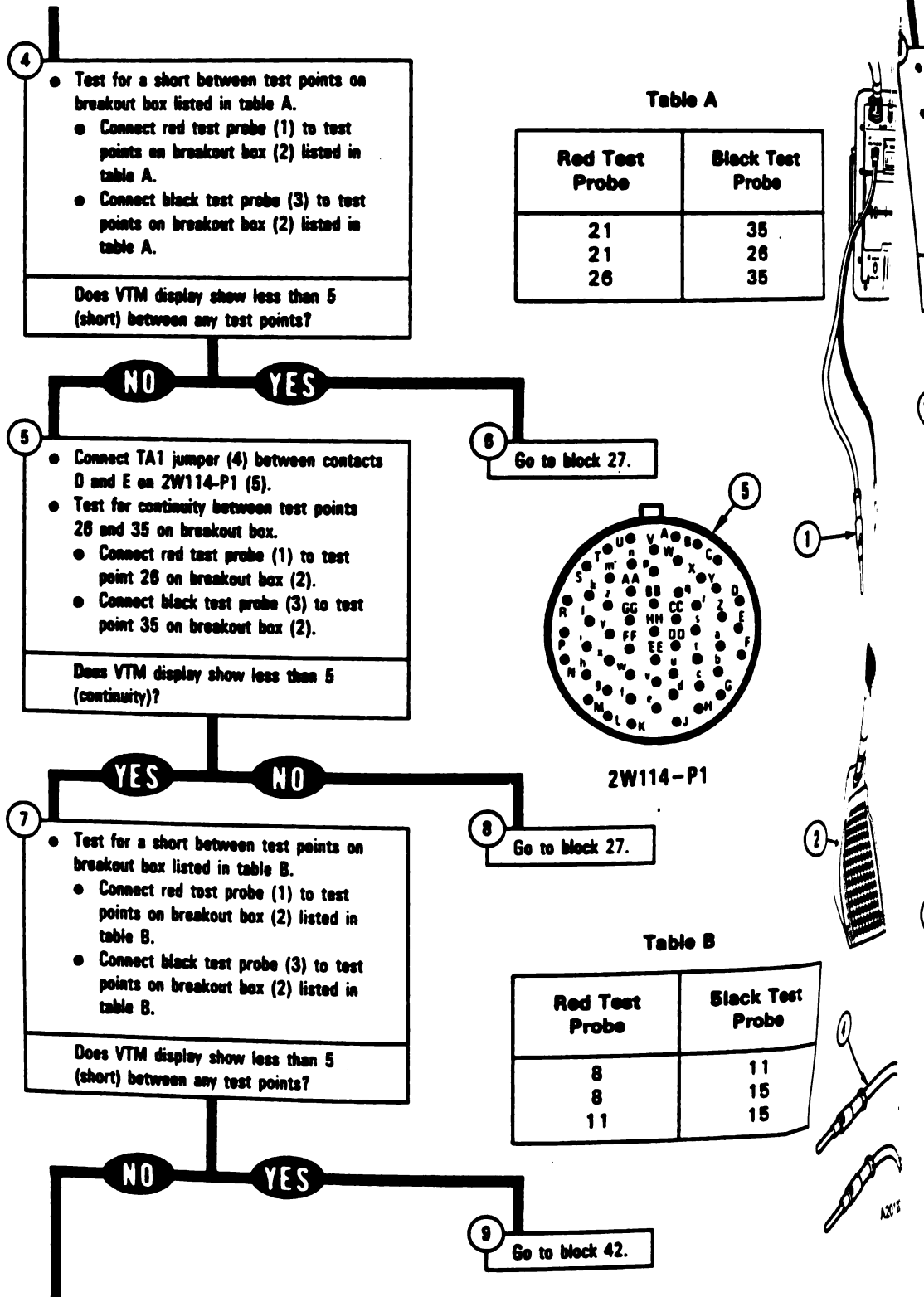


Figure 9-106.1 (Sheet 2 of 12)  
Volume II  
Para. 9-2

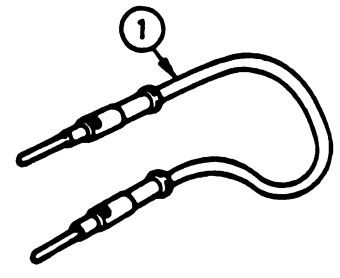
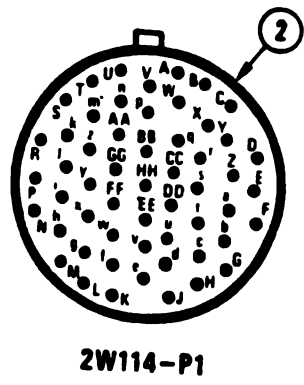
Connect TA1 jumper (1) between contacts A and B on 2W114-P1 (2).

Test for continuity between test points 8 and 11 on breakout box.

Connect red test probe (3) to test point 8 on breakout box (4).

Connect black test probe (5) to test point 11 on breakout box (4).

Does VTM display show less than 5 (continuity)?



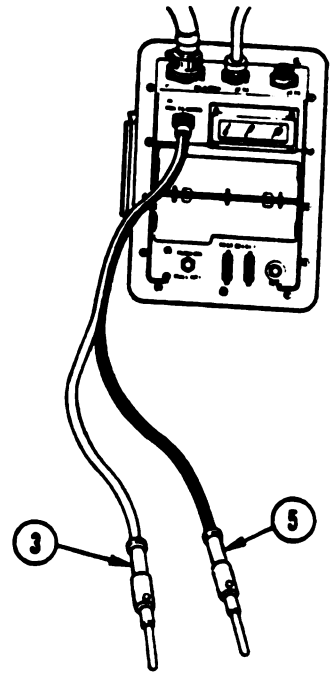
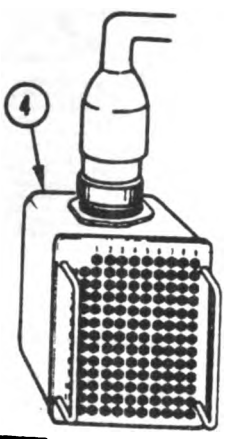
**YES**      **NO**

Check to see if an electrical connector is loose on compressor speed pickup No. 1 or compressor speed pickup No. 2 that could cause symptom ESS-8.

12 Go to block 42.

**NOTE**

- If you find a loose connector, go immediately to block 13.
- Try to turn SW105-P5 connected to J5 on compressor speed pickup No. 2, see figure 9-112.
  - Try to turn SW105-P35 connected to J35 on compressor speed pickup No. 1, see figure 9-112.



Is a connector loose?

**YES**      **NO**

Do connector inspection procedure.

- See figure 9-108.

14 Go to block 17.

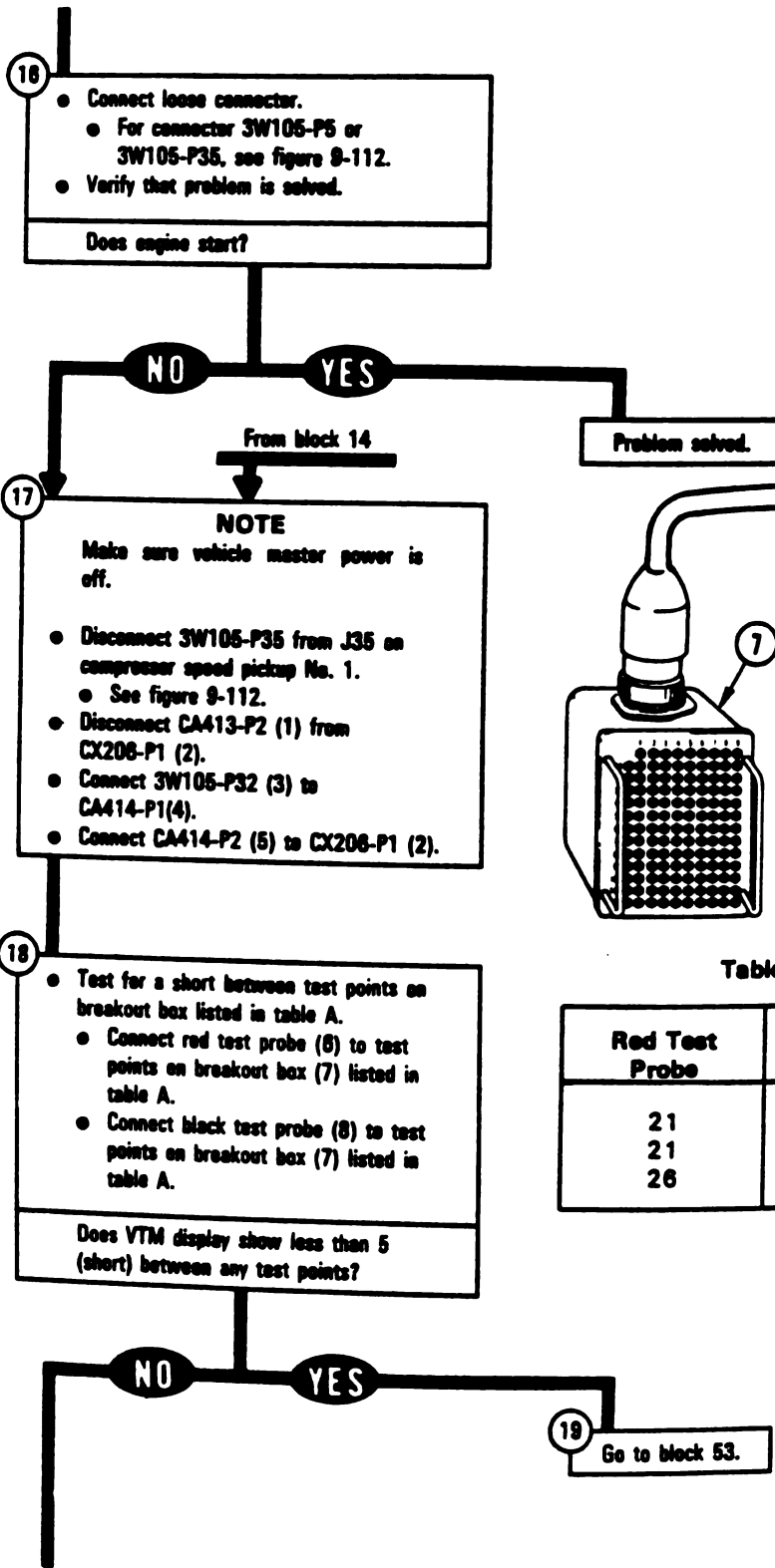
Are any connector parts faulty?

**NO**      **YES**

- 15
- Replace assembly or harness that has a faulty connector.
  - For compressor speed pickup No. 1 or No. 2, refer to TM 9-2350-255-20-1-3-4, para. 12-8.
  - For harness SW105, refer to TM 9-2350-255-20-1-3-4, para. 12-7.
  - Verify that problem is solved.

Figure 9-106.1 (Sheet 3 of 12)  
Volume II  
Para. 9-2

**TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING**



*Figure 9-106.1 (Sheet 4 of 12)  
Volume II  
Para. 9-2*

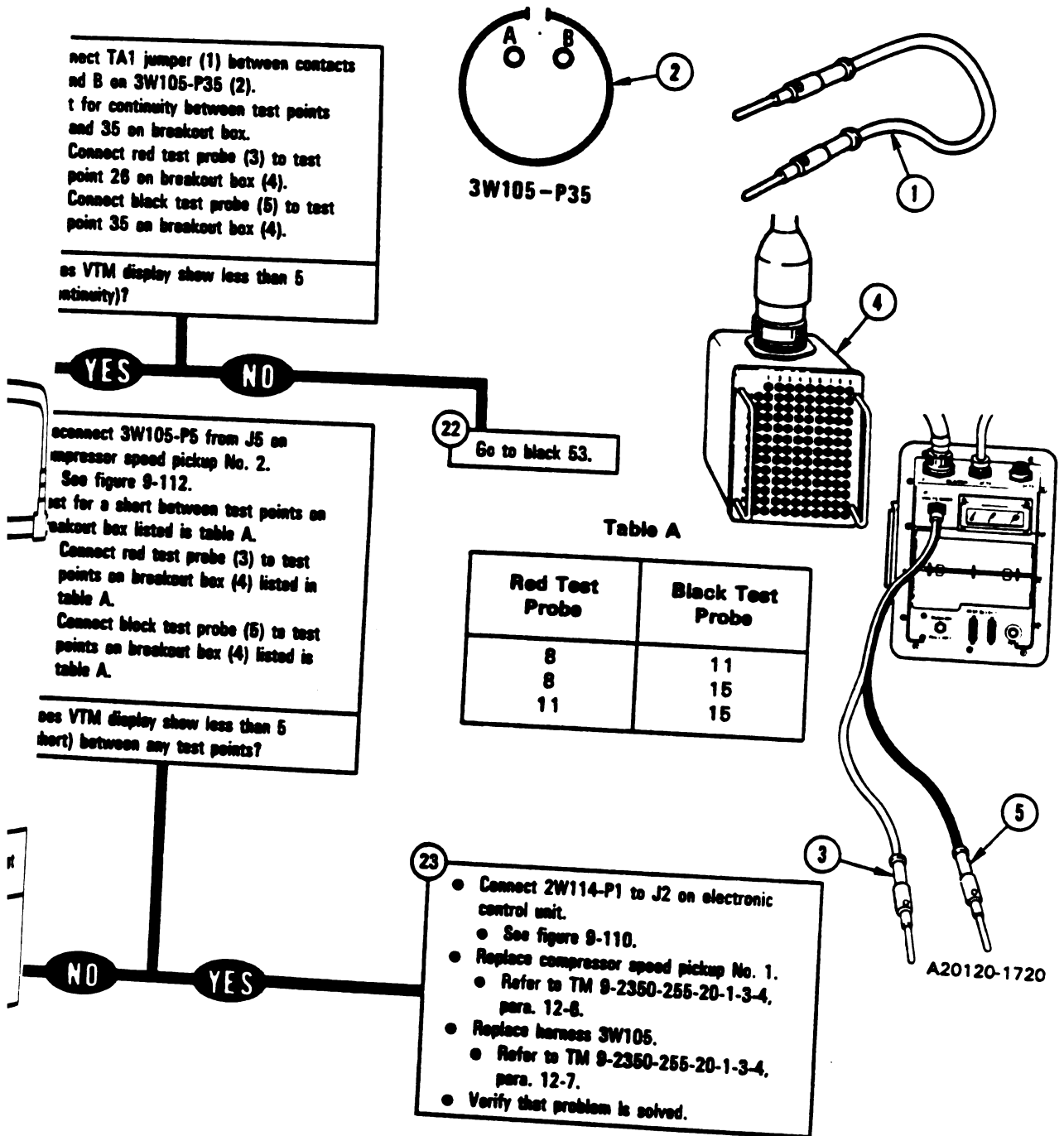
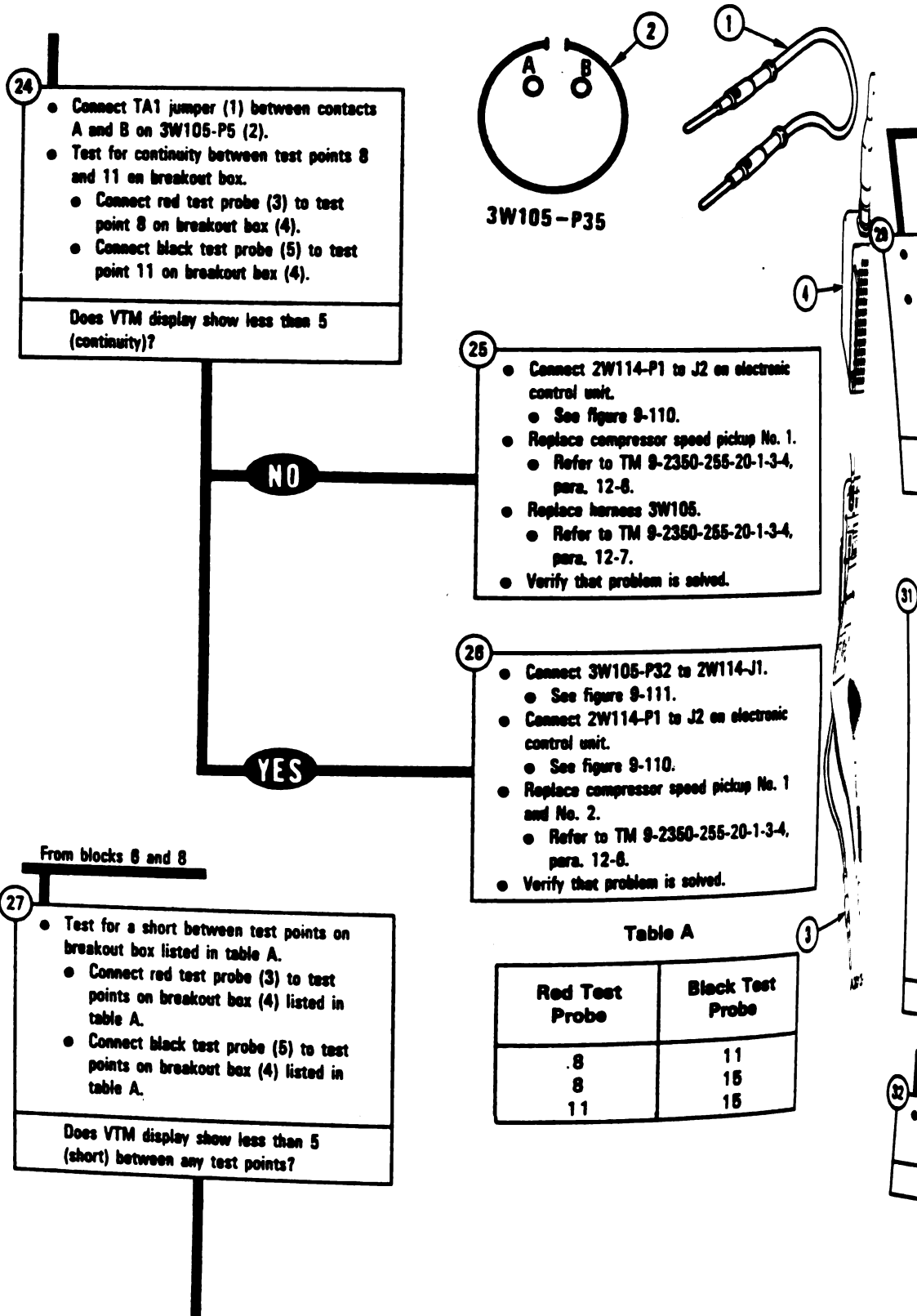


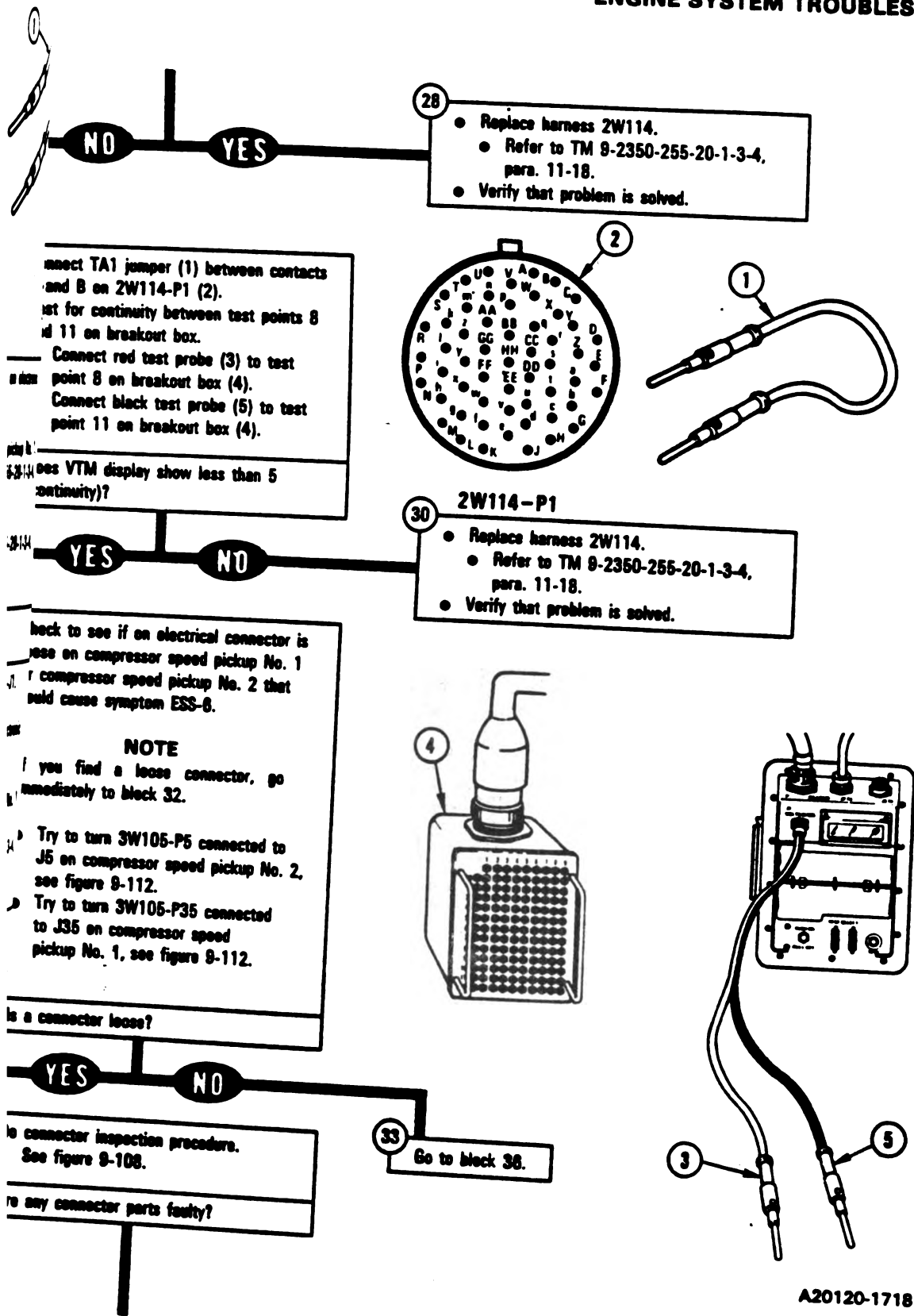
Figure 9-106.1 (Sheet 5 of 12)  
Volume II  
Para. 9-2

**TM 9-2350-255-20-1-2-1.  
ENGINE SYSTEM TROUBLESHOOTING**



*Figure 9-106.1 (Sheet 6 of 12)  
Volume II  
Para. 9-2*

9-350.6 Change 6

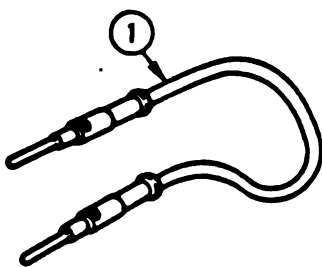
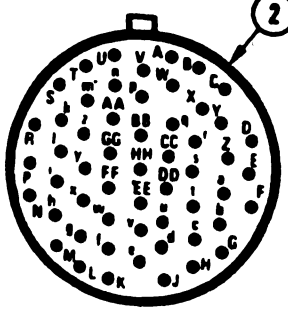


28

- Replace harness 2W114.
- Refer to TM 9-2350-255-20-1-3-4, para. 11-18.
- Verify that problem is solved.

Connect TA1 jumper (1) between contacts A and B on 2W114-P1 (2).  
Test for continuity between test points 8 and 11 on breakout box.  
Connect red test probe (3) to test point 8 on breakout box (4).  
Connect black test probe (5) to test point 11 on breakout box (4).

Does VTM display show less than 5 (continuity)?



30

2W114-P1

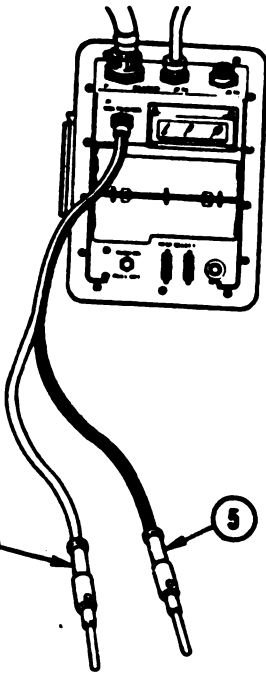
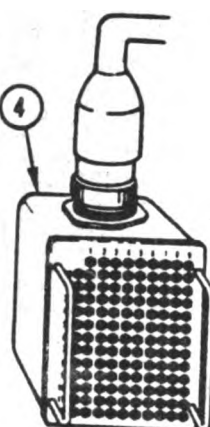
- Replace harness 2W114.
- Refer to TM 9-2350-255-20-1-3-4, para. 11-18.
- Verify that problem is solved.

Check to see if an electrical connector is loose on compressor speed pickup No. 1 or compressor speed pickup No. 2 that could cause symptom ESS-8.

**NOTE**  
If you find a loose connector, go immediately to block 32.

Try to turn 3W105-P5 connected to J5 on compressor speed pickup No. 2, see figure 9-112.  
Try to turn 3W106-P35 connected to J35 on compressor speed pickup No. 1, see figure 9-112.

Is a connector loose?



YES

NO

Go to connector inspection procedure. See figure 9-108.

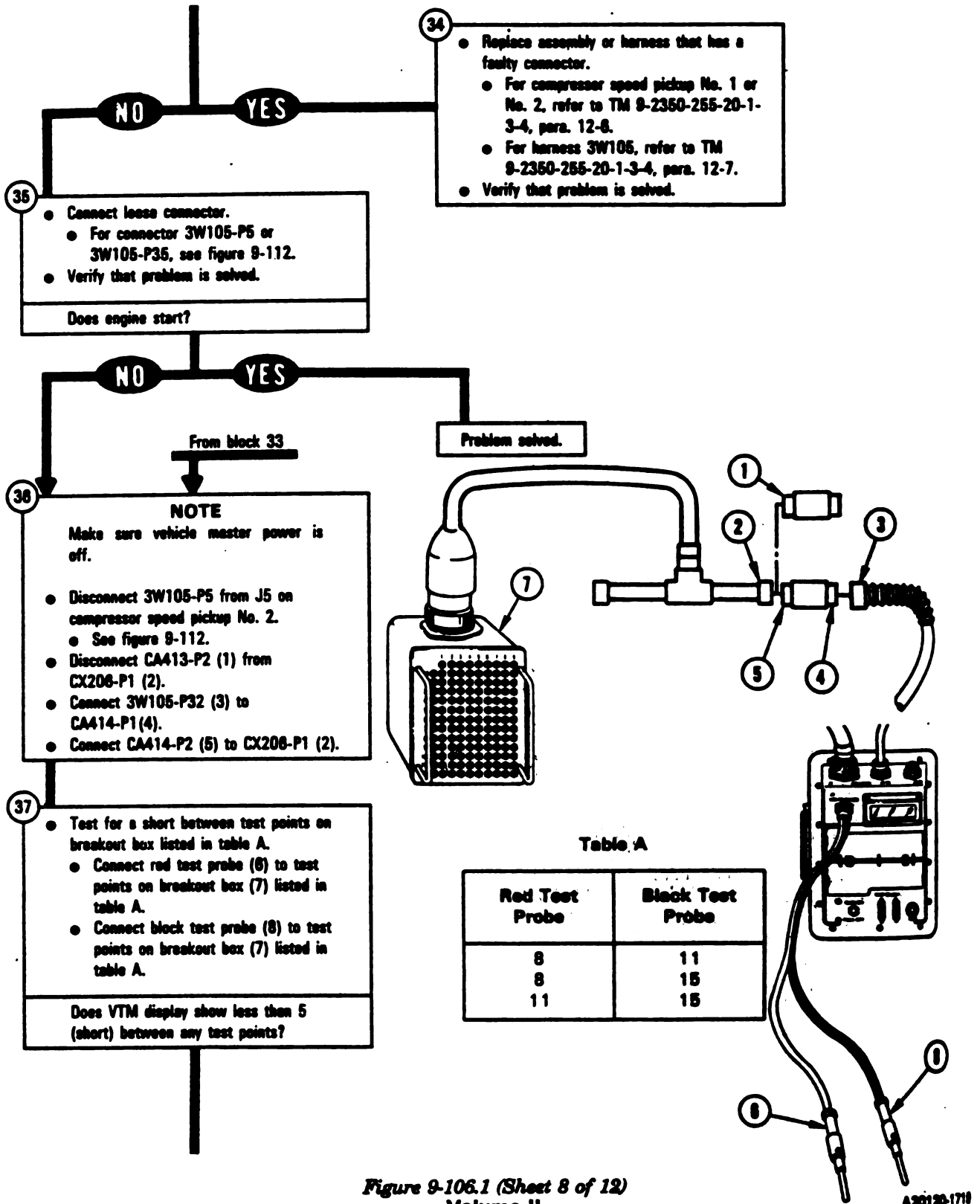
Are any connector parts faulty?

33

Go to block 38.

A20120-1718

Figure 9-106.1 (Sheet 7 of 12)  
Volume II  
Para. 9-2



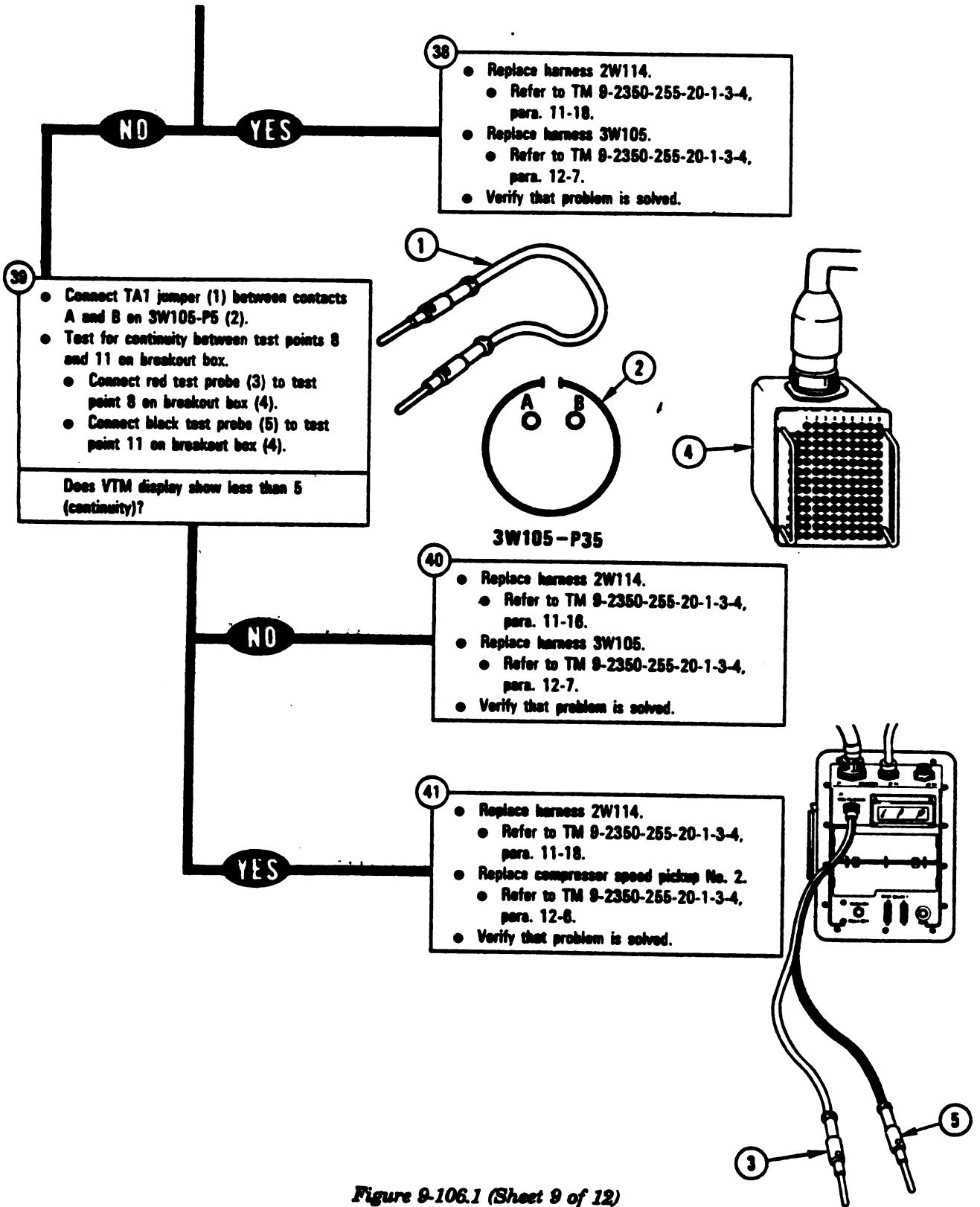


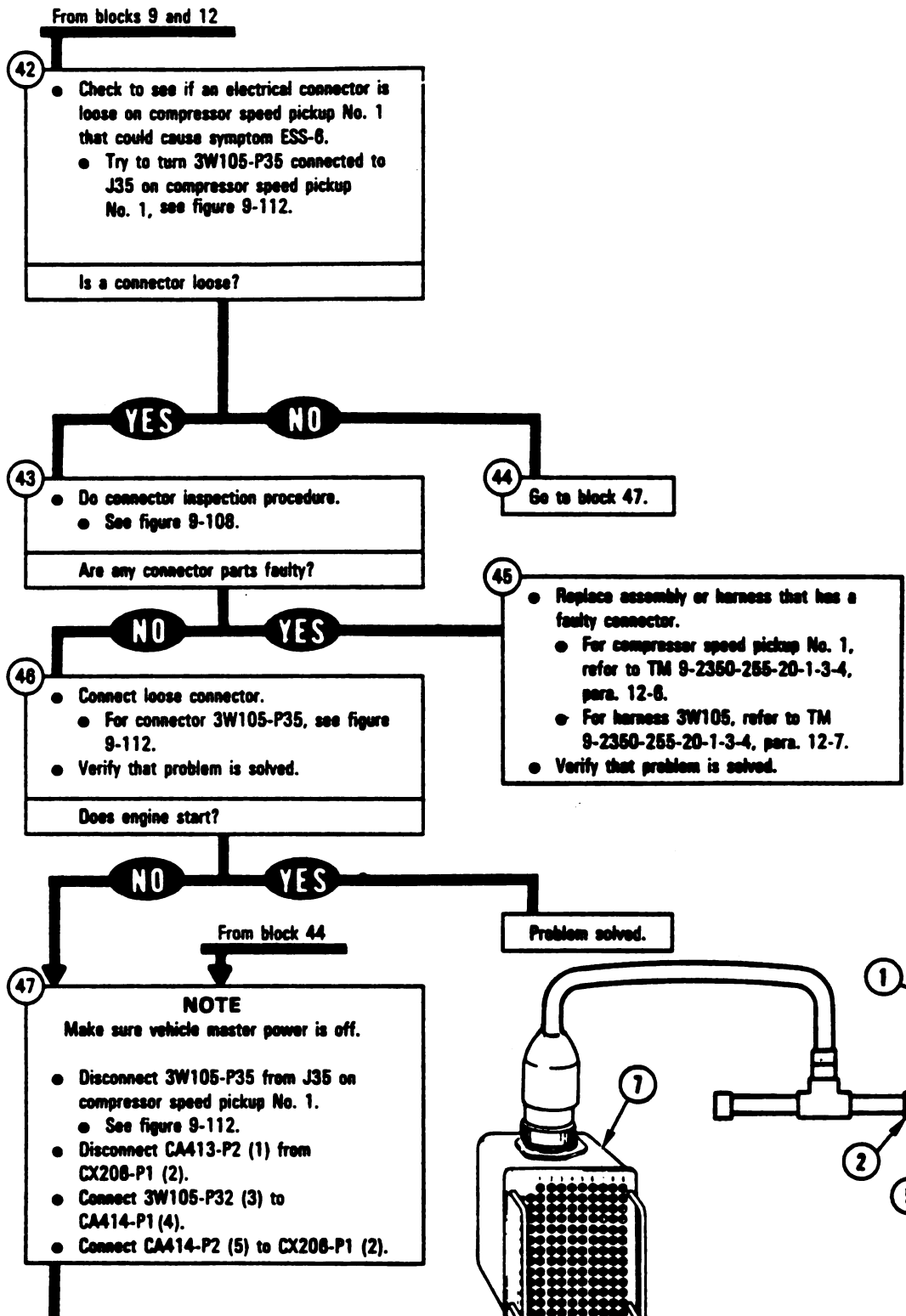
Figure 9-106.1 (Sheet 9 of 12)  
Volume II  
Para. 9-2

A20120-1721

Change 6 9-350.9



**TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING**



A20120-1722

Figure 9-106.1 (Sheet 10 of 12)  
Volume II  
Para. 9-2

Test for a short between test points on breakout box listed in table A.  
Connect red test probe (1) to test points on breakout box (2) listed in table A.  
Connect black test probe (3) to test points on breakout box (2) listed in table A.

Table A

Red Test Probe	Black Test Probe
21	26
21	35
26	35

Does VTM display show less than 5 (short) between any test points?

**NO**      **YES**

- 49
- Replace harness 2W114.
  - Refer to TM 9-2350-255-20-1-3-4, para. 11-18.
  - Replace harness 3W105.
  - Refer to TM 9-2350-255-20-1-3-4, para. 12-7.
  - Verify that problem is solved.

Connect TA1 jumper (4) between contacts A and B on 3W105-P35 (5).  
Test for continuity between test points 28 and 35 on breakout box.  
● Connect red test probe (1) to test point 28 on breakout box (2).  
● Connect black test probe (3) to test point 35 on breakout box (2).

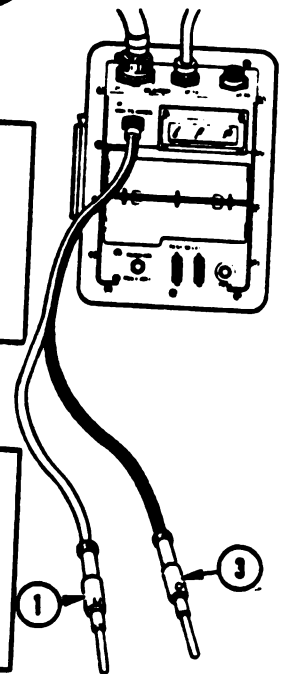
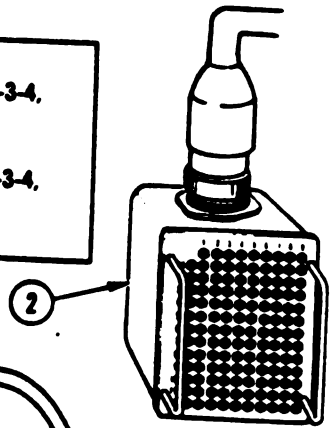
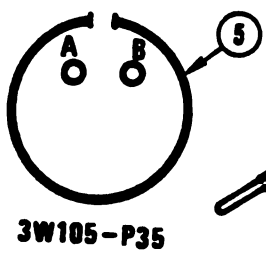
Does VTM display show less than 5 (continuity)?

**NO**

**YES**

- 51
- Replace harness 2W114.
  - Refer to TM 9-2350-255-20-1-3-4, para. 11-18.
  - Replace harness 3W105.
  - Refer to TM 9-2350-255-20-1-3-4, para. 12-7.
  - Verify that problem is solved.

- 52
- Replace harness 2W114.
  - Refer to TM 9-2350-255-20-1-3-4, para. 11-18.
  - Replace compressor speed pickup No. 1.
  - Refer to TM 9-2350-255-20-1-3-4, para. 12-8.
  - Verify that problem is solved.



A20120-1723

Figure 9-106.1 (Sheet 11 of 12)  
Volume II  
Para. 9-2

Change 6 9-350.11

**TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING**

From blocks 19 and 22

**53**

- Disconnect 3W105-P5 from J5 on compressor speed pickup No. 2.
  - See figure 9-112.
- Test for a short between test points on breakout box listed in table A.
  - Connect red test probe (1) to test points on breakout box (2) listed in table A.
  - Connect black test probe (3) to test points on breakout box (2) listed in table A.

Does VTM display show less than 5 (short) between any test points?

**Table A**

Red Test Probe	Black Test Probe
8	11
8	15
11	15

**54**

- Connect 2W114-P1 to J2 on electronic control unit.
  - See figure 9-110.
- Replace harness 3W105.
  - Refer to TM 9-2350-255-20-1-3-4, para. 12-7.
- Verify that problem is solved.

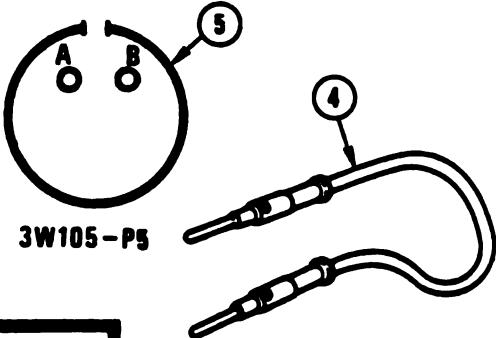


**NO** **YES**

**55**

- Connect TA1 jumper (4) between contacts A and B on 3W105-P5 (5).
- Test for continuity between test points 8 and 11 on breakout box.
  - Connect red test probe (1) to test point 8 on breakout box (2).
  - Connect black test probe (3) to test point 11 on breakout box (2).

Does VTM display show less than 5 (continuity)?



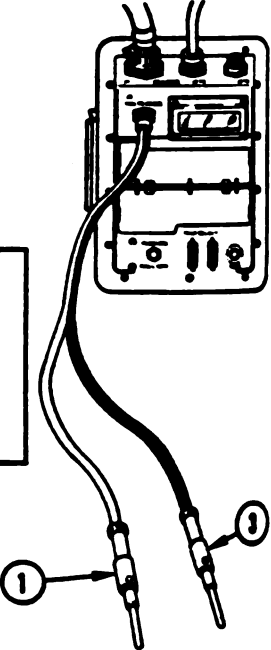
**YES** **NO**

**58**

- Connect 2W114-P1 to J2 on electronic control unit.
  - See figure 9-110.
- Replace compressor speed pickup No. 2.
  - Refer to TM 9-2350-255-20-1-3-4, para. 12-6.
- Replace harness 3W105.
  - Refer to TM 9-2350-255-20-1-3-4, para. 12-7.
- Verify that problem is solved.

**57**

- Connect 2W114-P1 to J2 on electronic control unit.
  - See figure 9-110.
- Replace harness 3W105.
  - Refer to TM 9-2350-255-20-1-3-4, para. 12-7.
- Verify that problem is solved.



A20120-1724

*Figure 9-106.1 (Sheet 12 of 12)  
Volume II  
Para. 9-2*

AY SHOWS -  
Y 2W114, 3W105  
PT 1 & 2

• 154804  
154807

to A  
Black Test  
Probe  
11  
15  
16

2 n dms  
nent Condition:  
parked.  
ing brake set.  
is shut down.  
is master power off.

Connect CX305-P1 from CX201-P1.  
see figure 9-40.  
Connect 2W114-P1 from CX201-P2.  
see figure 9-40.  
Connect CX304-P1 from CA201-P1.  
see figure 9-51.  
Connect CA201-P2 from J1 on elec-  
tric control unit.  
see figure 9-51.  
Connect shorting connector to J1 on  
tronic control unit.  
see figure 9-110.

Change control from SETCOM to VTM.  
Set PWR switch (1) on CIB (2) to OFF  
to reset VTM (3).  
Set PWR switch (1) to ON.  
Use VTM for measuring resistance  
between 9 and 1600 ohms.  
Refer to TM 9-4910-572-14&P, Vol-  
ume I, Appendix D.

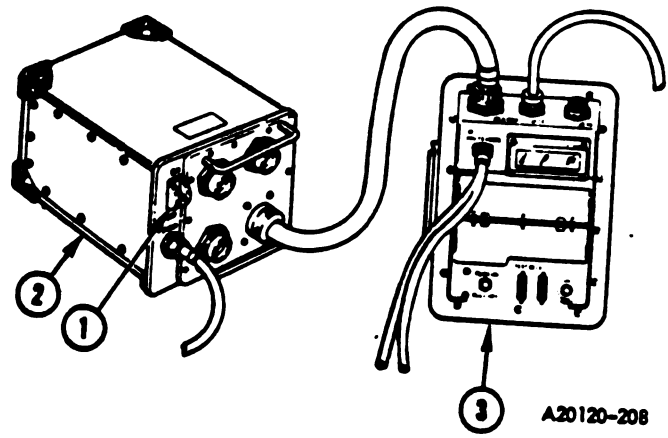


Figure 9-107 (Sheet 1 of 5)  
Volume II  
Para. 9-2

Change 6 9-351

**TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING**

**3**

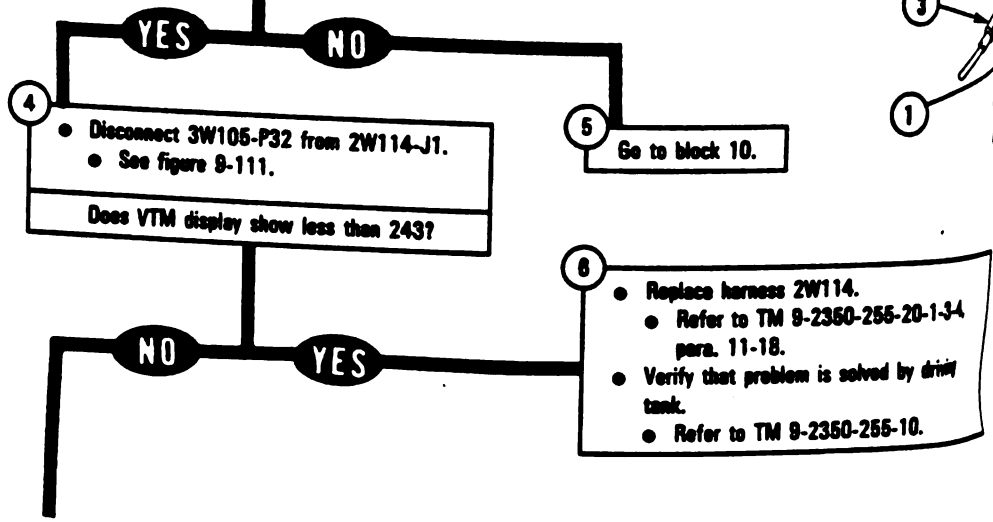
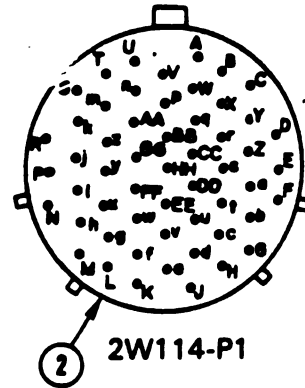
**NOTE**  
If VTM display shows less than 243 ohms between any contacts, leave test probes connected for remainder of test.

- Test for less than 243 ohms between contacts listed in table A on ZW114-P1.
- Connect black test probe (1) to contacts listed in Table A on ZW114-P1 (2).
- Connect red test probe (3) to contacts listed in Table A on ZW114-P1 (2).

Does VTM display show less than 243?

**Table A**

Black Test Probe	Red Test Probe
ZW114-P1 Contacts	ZW114-P1 Contacts
L	K
F	K
F	L
F	H
F	G
H	G



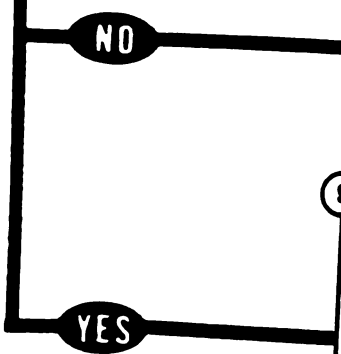
*Figure 9-107 (Sheet 2 of 5)  
Volume II  
Para. 9-2*

9-352 Change 3

Connect 3W105-P32 to 2W114-J1.  
See figure 9-111.

Connect 3W105-P37 from 105-1-J37.  
See figure 9-112.

Do the VTM display show less than 2437



- 8
- Connect 3W105-P37 to 3W105-1-J37.
  - See figure 9-112.
  - Connect 2W114-P1 to J1 on electronic control unit.
  - See figure 9-110.
  - Faulty engine.
  - Notify support maintenance.

- 9
- Connect 2W114-P1 to J2 on electronic control unit.
  - See figure 9-110.
  - Replace harness 3W105.
  - Refer to TM 9-2350-255-20-1-3-4, para. 12-7.
  - Verify that problem is solved by driving tank.
  - Refer to TM 9-2350-255-10.

block 5

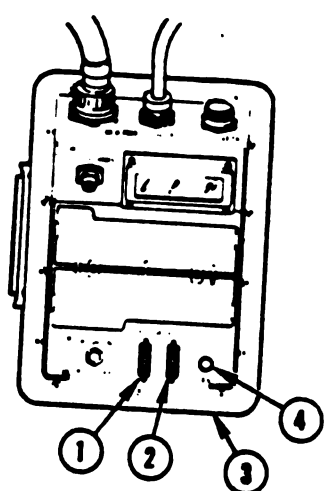
- Prepare STE/M1 to run cable test 1390.
- Set TEST SELECT switches (1, 2) on VTM (3) to 00.
- Press TEST button (4) on VTM (3).

**NOTE**  
Display (5) on SETCOM (6) shows - STE/M1 REL 7.0 CLEAR UNIT.

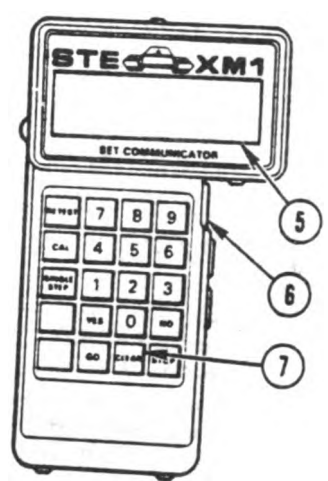
- Press CLEAR key (7) on SETCOM (6).

**NOTE**  
Display (5) on SETCOM (6) shows - ENTER TEST NUMBER.

- Enter cable test number 1390 on SETCOM (6).



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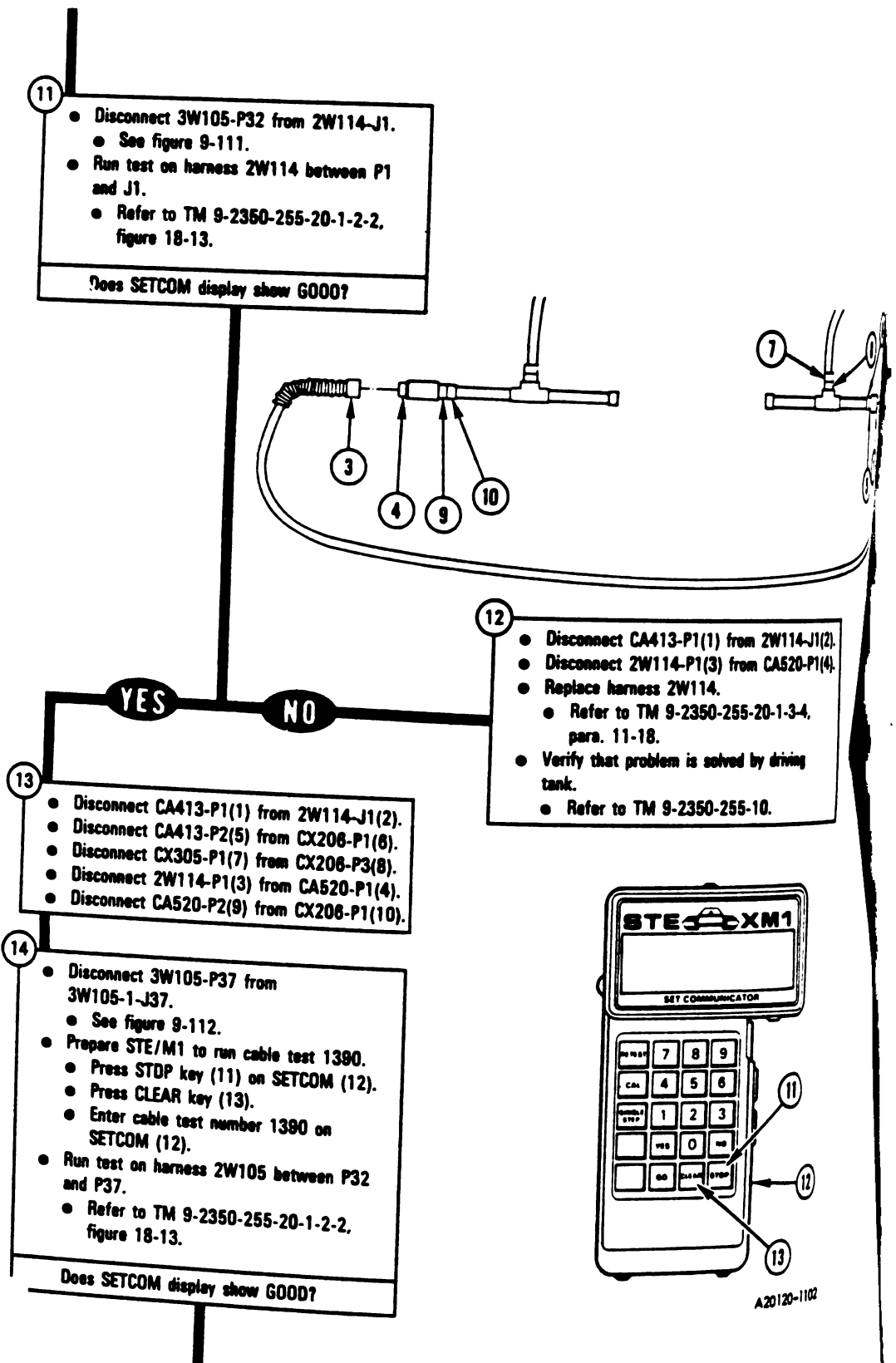


A20120-748

Figure 9-107 (Sheet 3 of 5)  
Volume II  
Para. 9-2

Change 3 9-353

**TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING**



*Figure 9-107 (Sheet 4 of 5)  
Volume II  
Para. 9-2*

9-354 Change 3

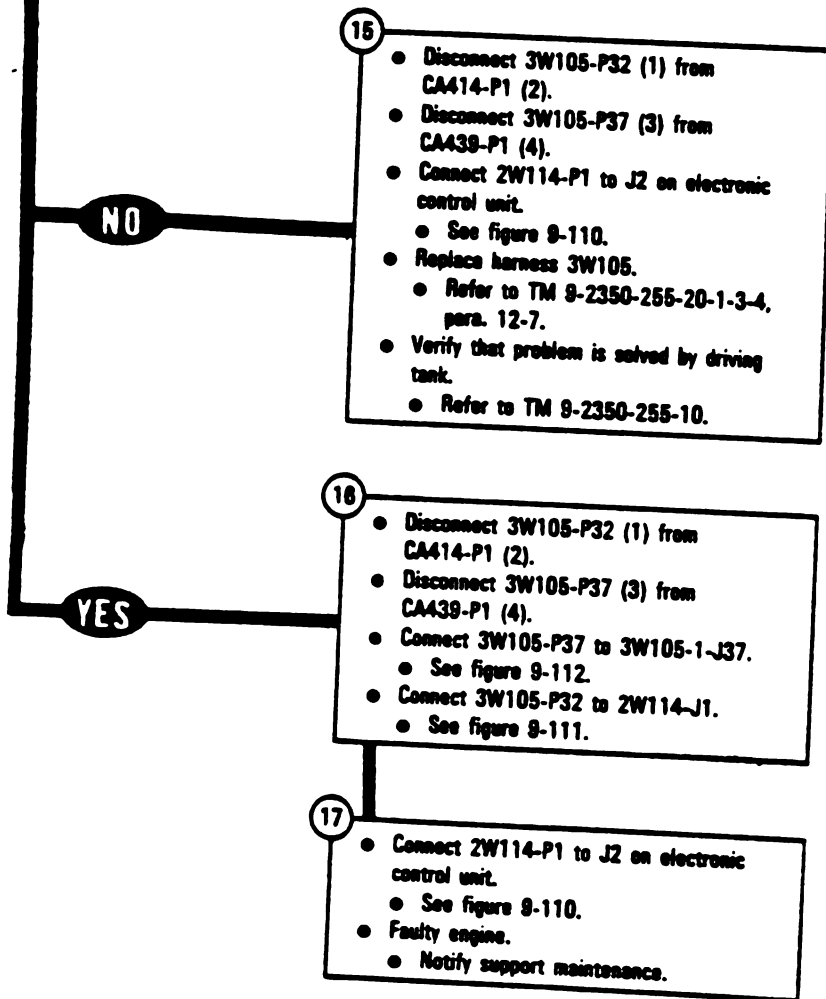
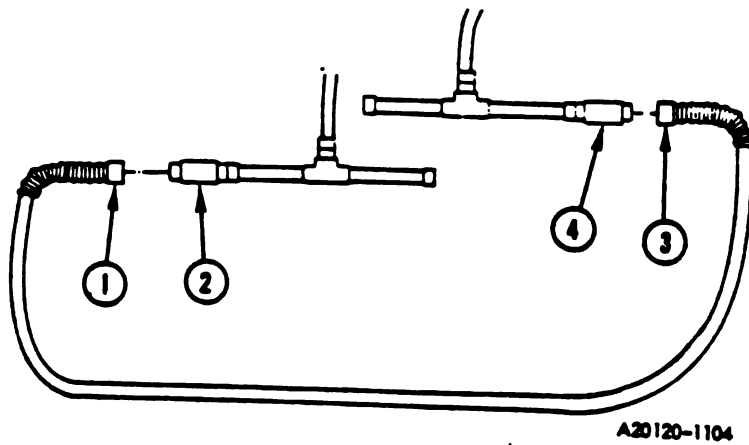


Figure 9-107 (Sheet 5 of 5)  
Volume II  
Para. 9-2



9-3. Engine System Connector Inspection Procedure.

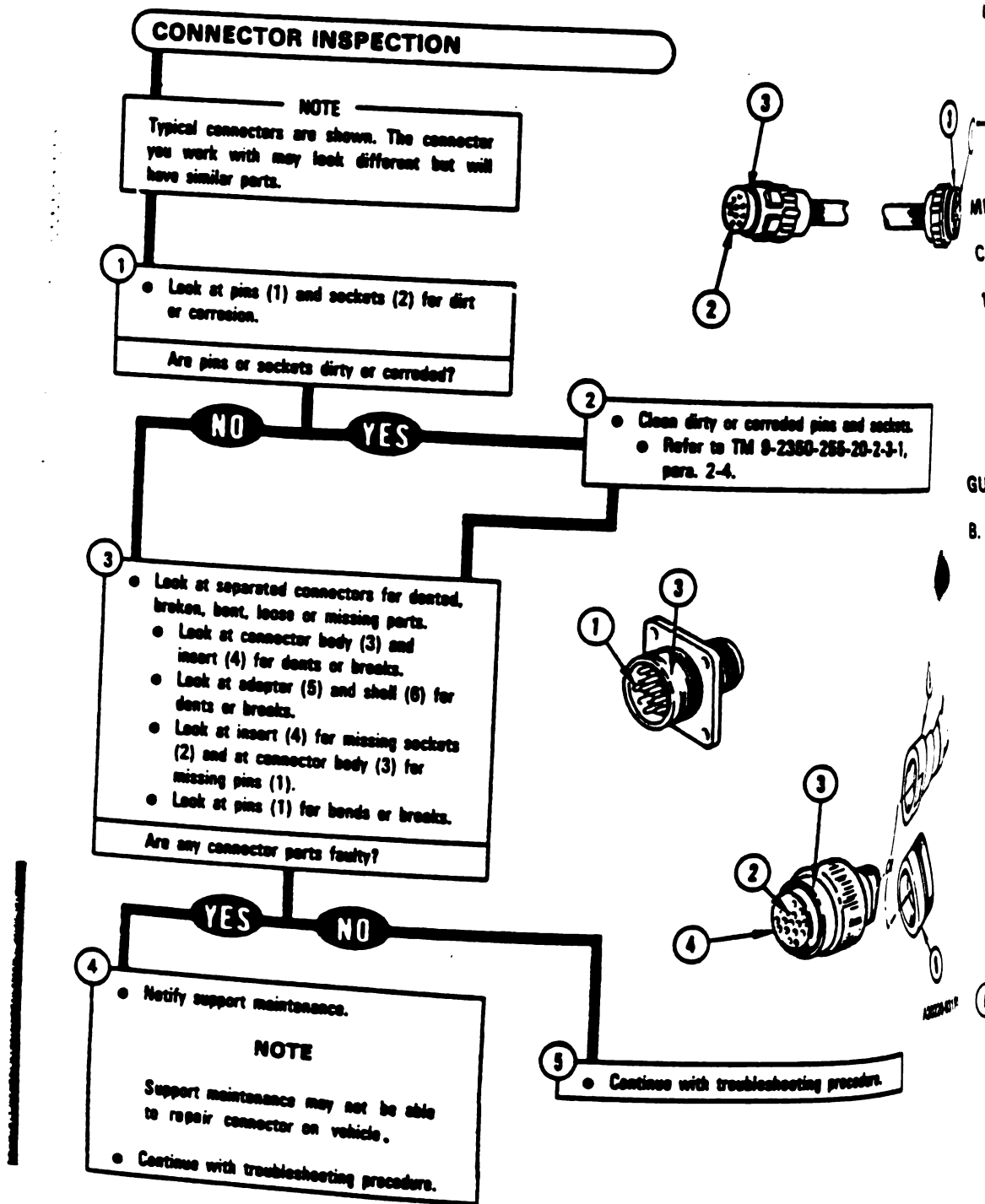


Figure 9-108  
Volume II  
Para. 9-3

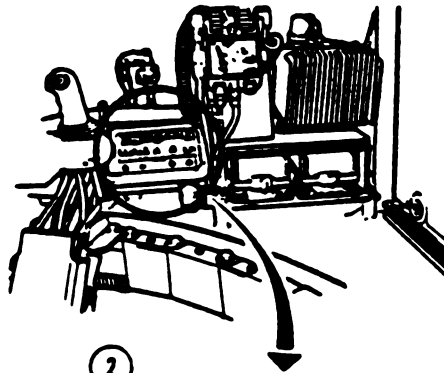
**9-4. Engine System Standard Initial Test Conditions.** This paragraph tells you what the test conditions of the tank should be before you begin troubleshooting. The conditions are listed in table 9-2. These conditions are referenced in each primary troubleshooting procedure where the STE/M1 test set is used. Initial test conditions are included for the gunner's, loader's, and driver's stations.

**Table 9-2. Engine System Standard Initial Test Conditions**

**COMMANDER'S STATION**

**A. Commander's Control Panel (1)**

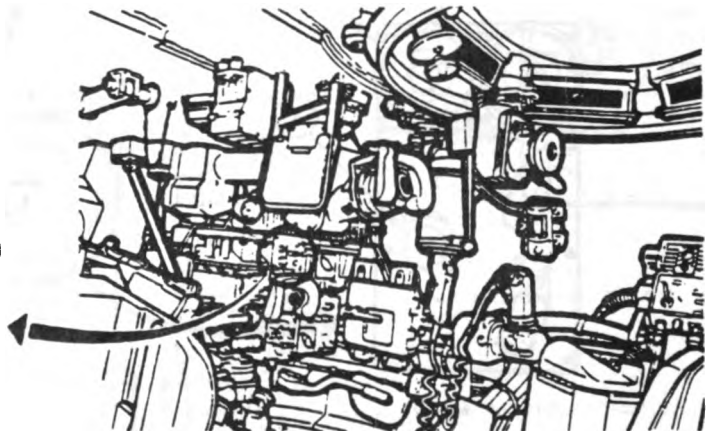
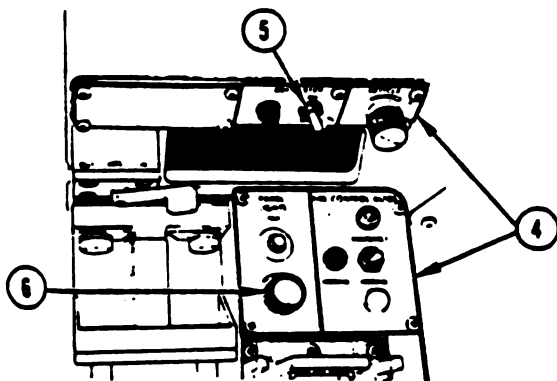
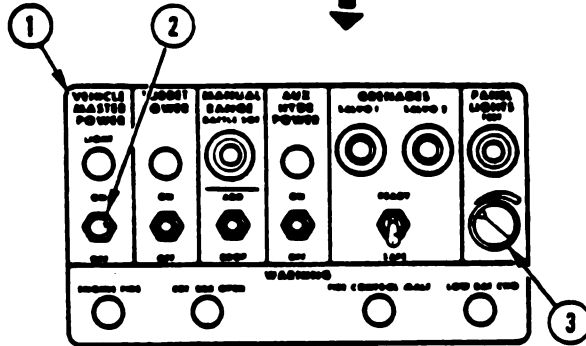
1. Set **VEHICLE MASTER POWER** switch (2) to OFF.
2. Set **PANEL LIGHTS** control (3) to maximum clockwise position.



**GUNNER'S STATION**

**B. Gunner's Primary Sight Control Panel (4)**

1. Set **DEFROSTER** switch (5) to OFF.
2. Set **PANEL LIGHTS** control (6) to maximum clockwise position.



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Table 9-2. Engine System Standard Initial Test Conditions (Continued)

**GUNNER'S STATION (Continued)**

C. Gunner's Image Control Unit (1)  
Set THERMAL MODE switch (2) to OFF.

D. Gunner's Auxiliary Sight Panel (3)  
Set RETICLE control (4) to maximum counterclockwise position.

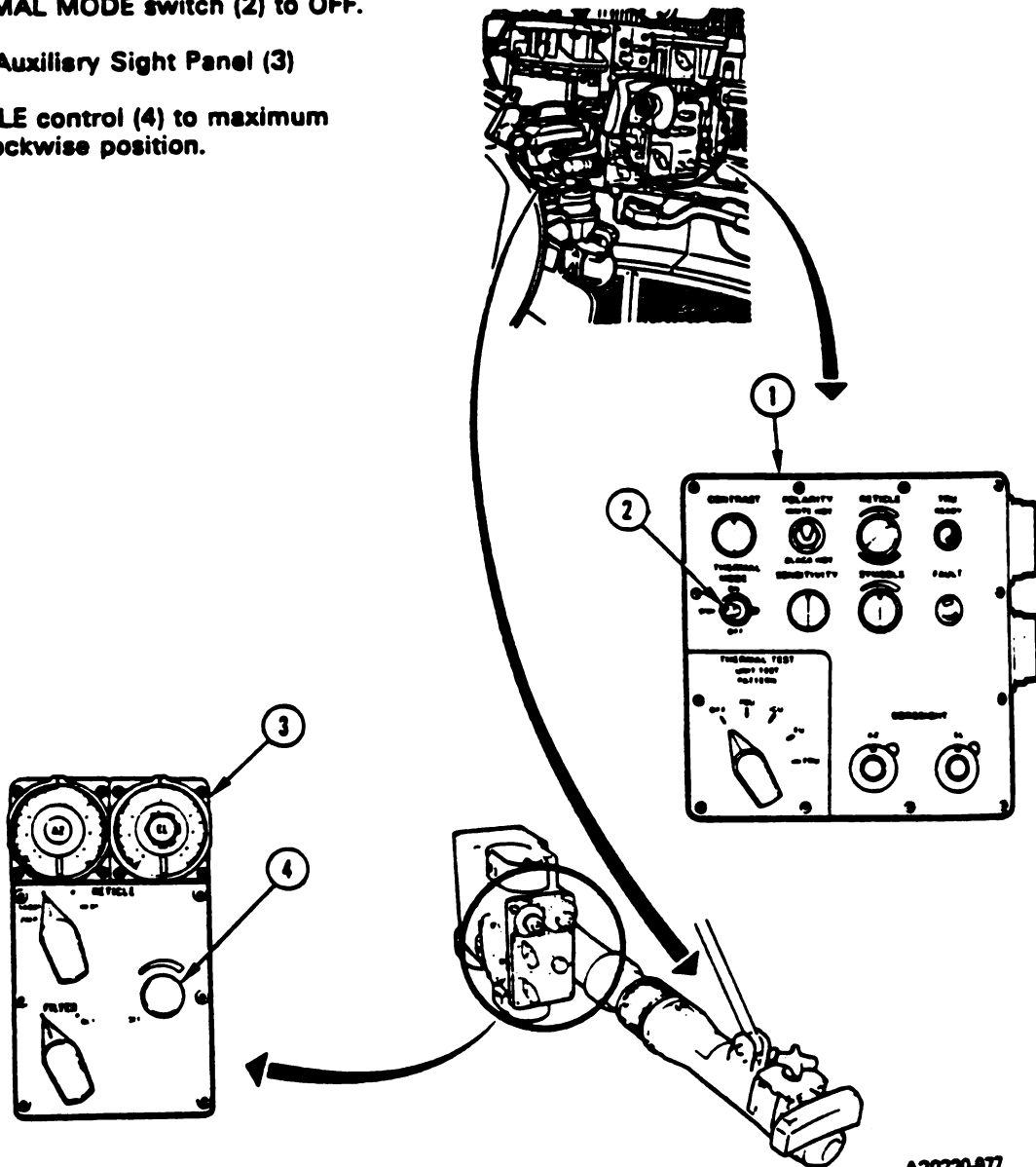


Table 9-2. Engine System Standard Initial Test Conditions (Continued)

OPS STATION (Continued)

Operator Control Panel (1)

AWR switch (2) to OFF.

Range Finder (3)

Laser rangefinder switch (4) to SAFE.

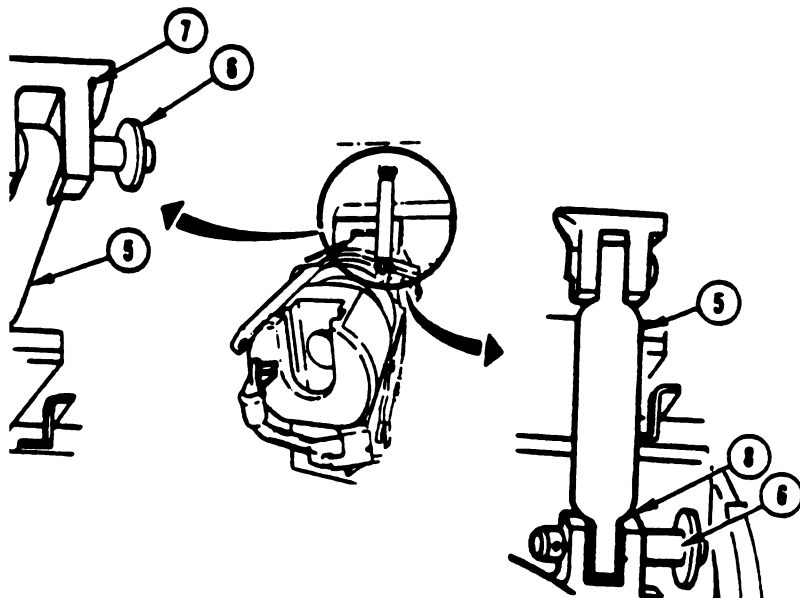
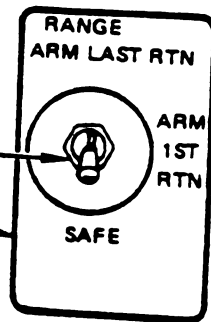
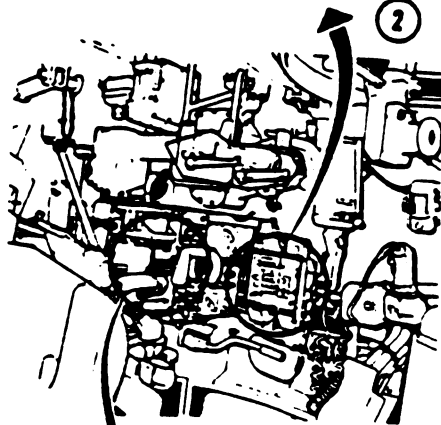
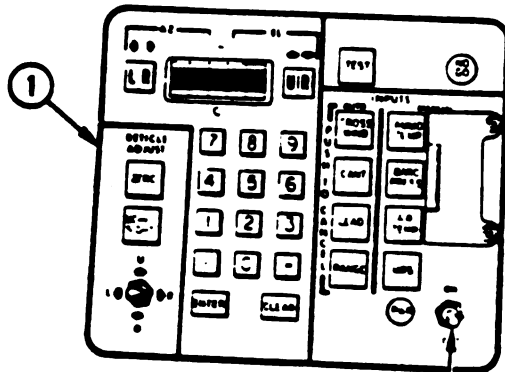
Gun Elevation Travel Lock (5)

Release lock pin (6) from roof strut (7).

Swing main gun elevation travel lock (5) down into main gun strut (8) and engage lock pin (6).

NOTE

Gun may have to be raised or lowered to engage lock pin.



A20220-627R3

Table 9-2. Engine System Standard Initial Test Conditions (Continued)

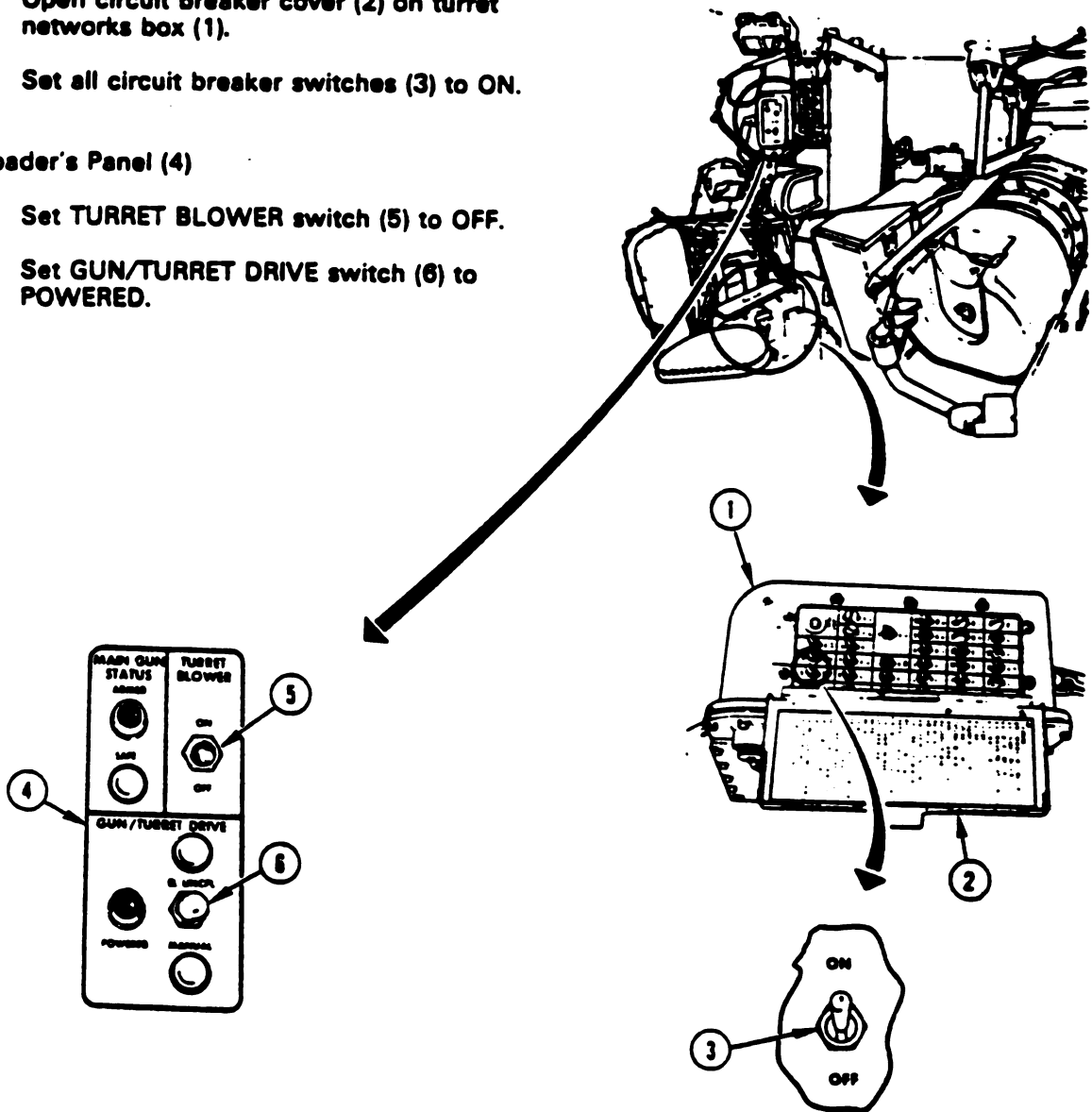
**LOADER'S STATION**

**H. Turret Networks Box (1)**

1. Open circuit breaker cover (2) on turret networks box (1).
2. Set all circuit breaker switches (3) to ON.

**I. Loader's Panel (4)**

1. Set TURRET BLOWER switch (5) to OFF.
2. Set GUN/TURRET DRIVE switch (6) to POWERED.



A20220-628R1

Table 9-2. Engine System Standard Initial Test Conditions (Continued)

STATION (Continued)

Reverse Lock (1)

Retract traverse lock handle (2) and set to LOCKED position.

NOTE

Turret may have to be traversed slightly left or right for handle (2) to drop into detent position.

STATION

Close Master Panel (3)

Set PERSONNEL HEATER switch (4) to LOW and switch (5) to OFF.

Set NIGHT PERISCOPE switch (6) to OFF.

Set GAS PARTIC FILTER switch (7) to OFF.

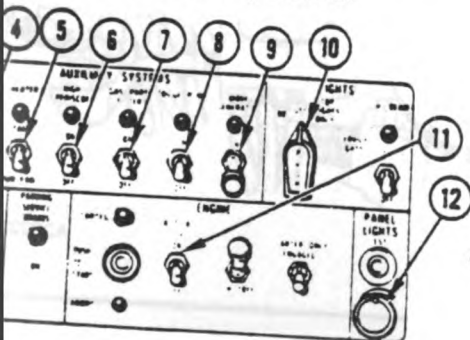
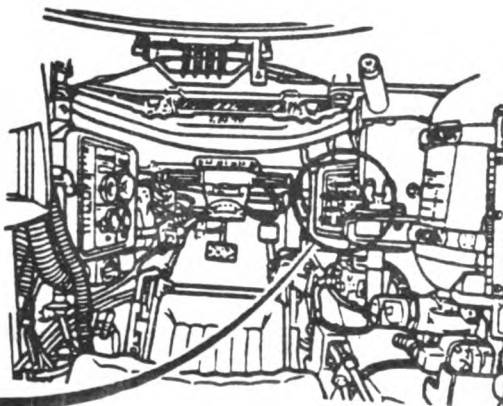
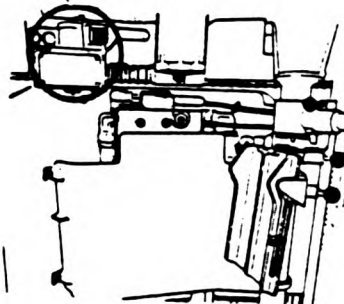
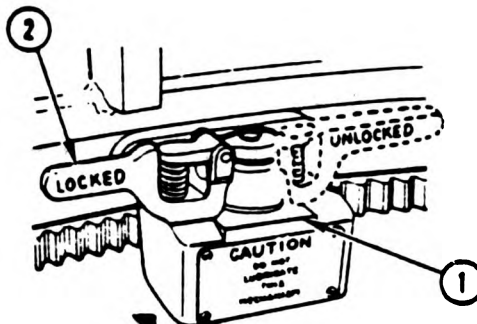
Set BILGE PUMP switch (8) to OFF.

Set SMOKE GENERATOR switch (9) to OFF.

Set LIGHTS switch (10) to OFF.

Set ENGINE TACTICAL IDLE switch (11) to OFF.

Set PANEL LIGHTS control (12) to maximum clockwise position.



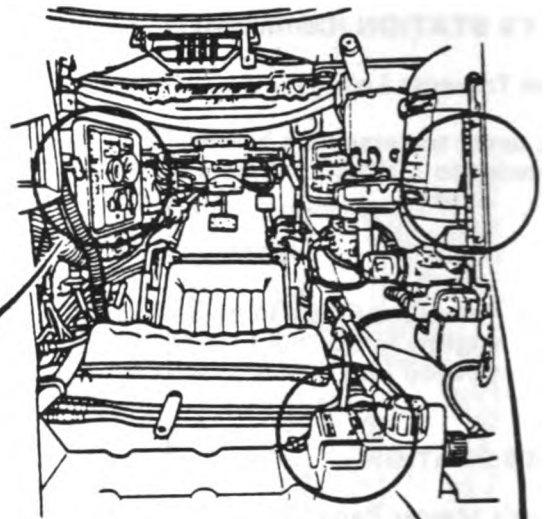
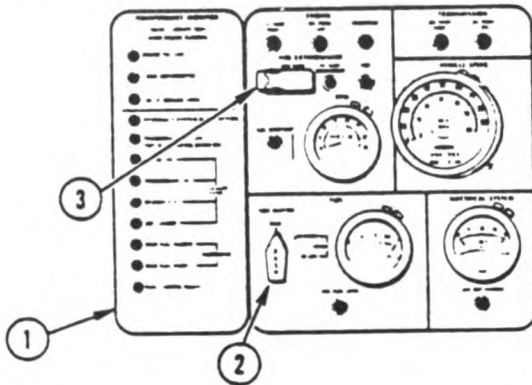
A20220-629R2

**Table 9-2. Engine System Standard Initial Test Conditions (Continued)**

**DRIVER'S STATION (Continued)**

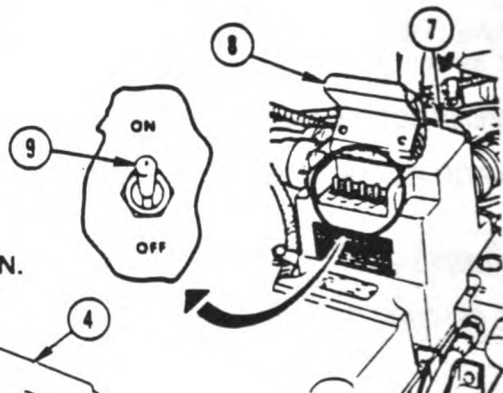
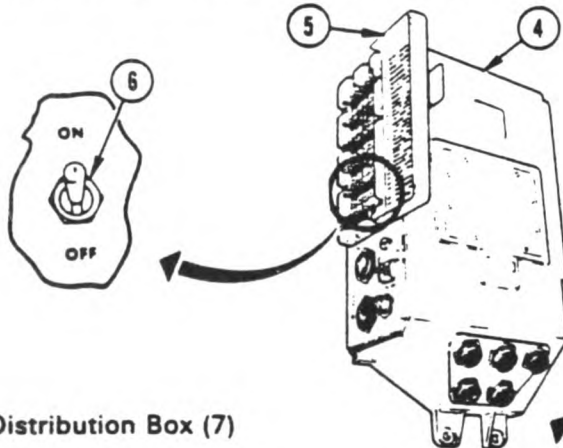
**L. Driver's Instrument Panel (1)**

1. Set TANK SELECTOR switch (2) to REAR.
2. Make sure 2ND SHOT guard (3) is closed.



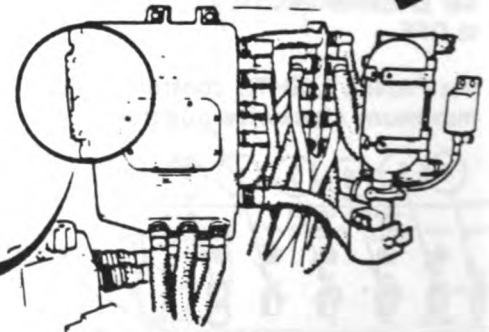
**M. Hull Networks Box (4)**

1. Open circuit breaker cover (5) on hull networks box (4).
2. Set all circuit breaker switches (6) to ON.



**N. Power Distribution Box (7)**

1. Open circuit breaker cover (8) on power distribution box (7).
2. Set all circuit breaker switches (9) to ON.



A20220-630R2

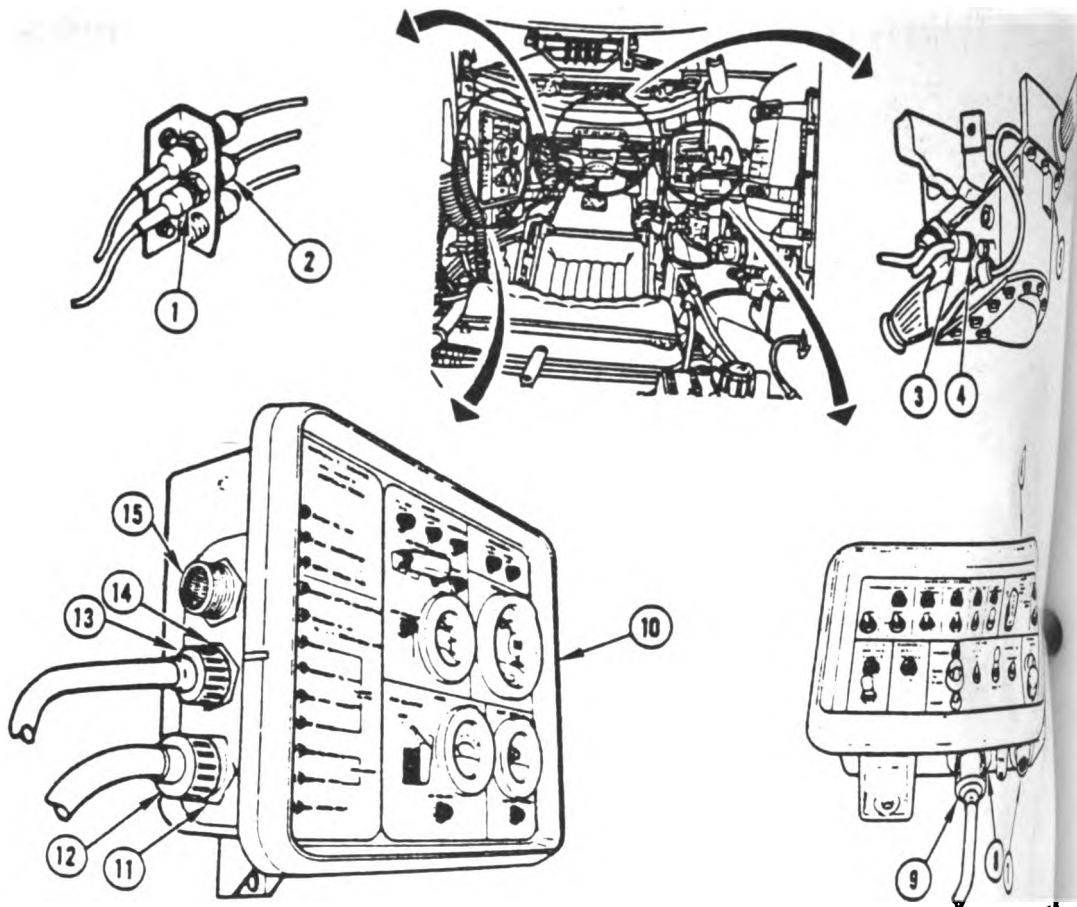
Conten

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**TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING**

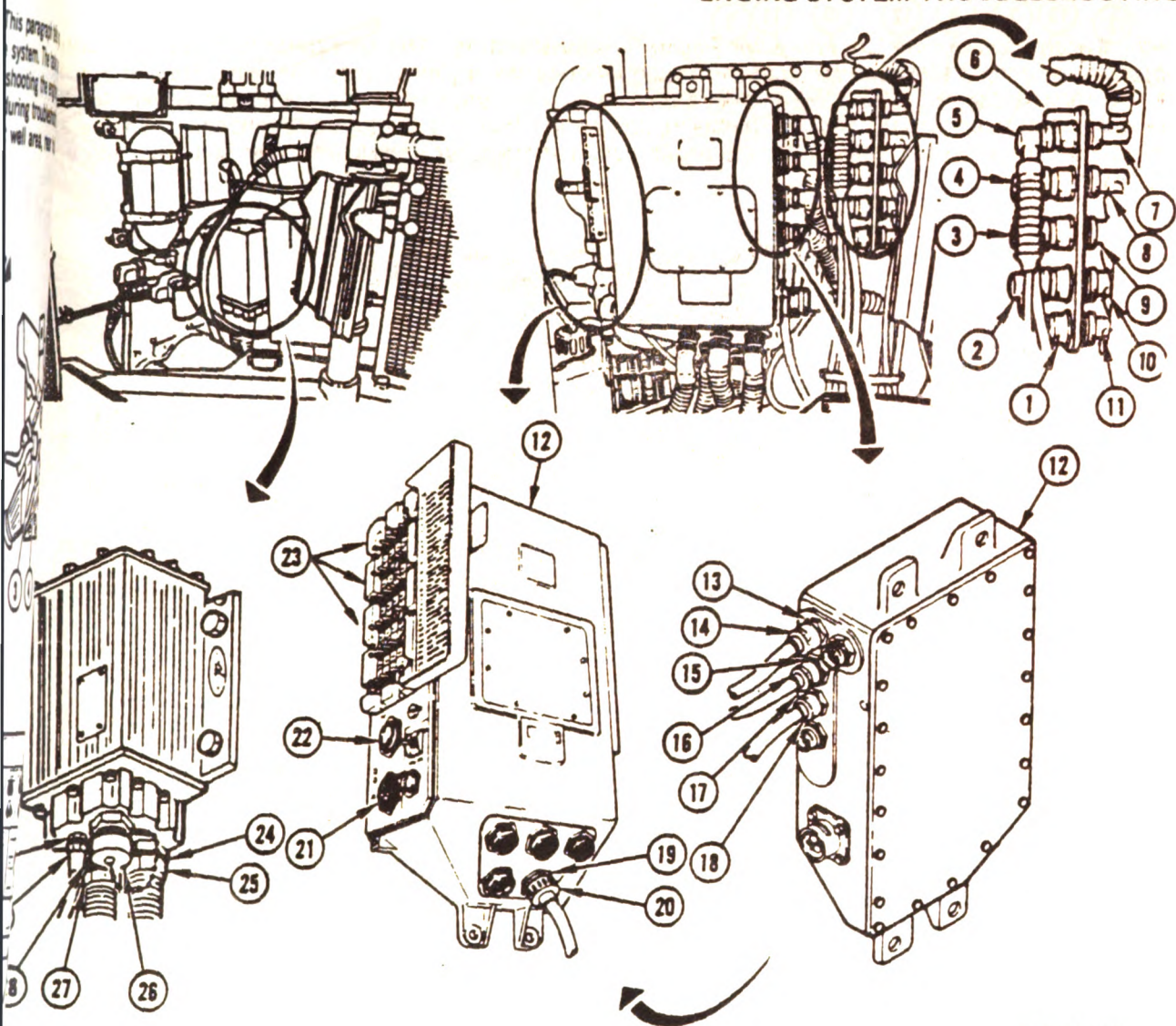
**9-5. System Component Locations for Engine Troubleshooting.** This paragraph tells you what component location and access tasks are required for troubleshooting the engine system. The tasks are listed in figures 9-109 through figure 9-112. These tasks are required when troubleshooting the engine system for vehicle harness connections and for identifying component locations during troubleshooting. Engine component locations are included for the driver's compartment, turret well area, rear hull area, and engine compartment.



<b>DRIVER'S MASTER PANEL (DMP)</b>			
J1	6	<b>SHIFT SELECT ASSEMBLY/ STEER THROTTLE CONTROL</b>	
TJ1	8	J1	
2W104-P3	7	2DT101-J1	
	9	2W104-P7	
<b>DRIVER'S INSTRUMENT PANEL (DIP)</b>		2W104-P8	
J1	10		
J2	14		
TJ1	11		
2W106-P4	15		
2W106-P5	13		
	12		

*Figure 9-109 Driver's Compartment, Engine System Component Locations*  
Volume II  
Para. 9-5

9-360 Change 3



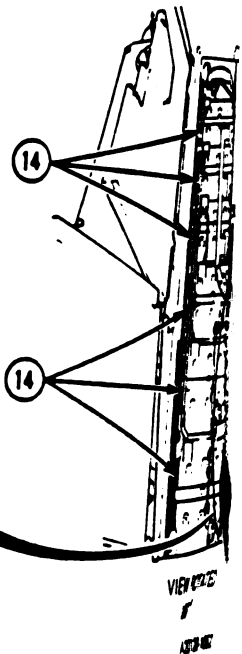
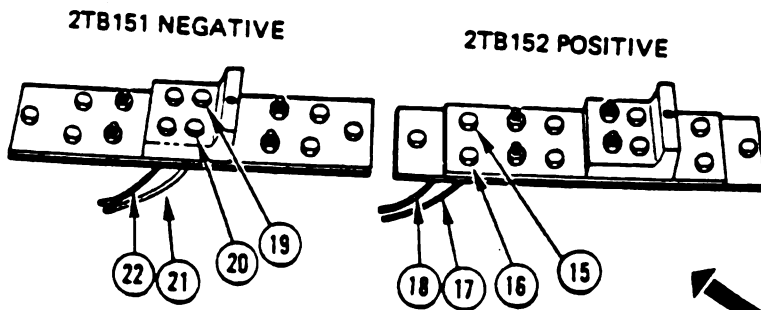
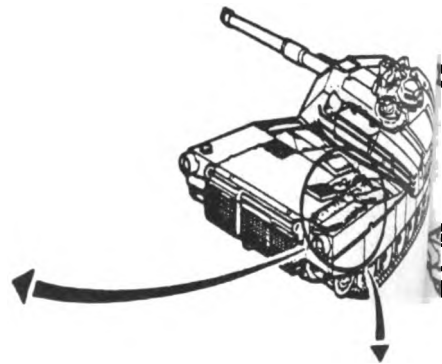
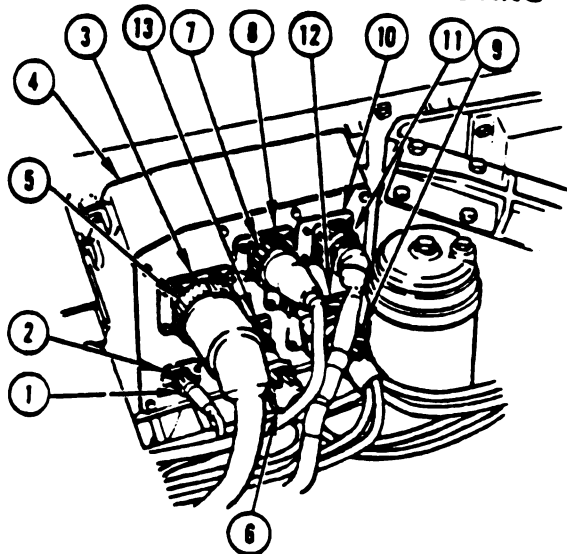
A20120-1051

ABLE JUNCTION BRACKET	6	HULL NETWORKS BOX (HNB)	12
2W104-J1	9	Circuit Breakers	23
2W105-J1	10	J1	13
2W105-P4	3	J2	15
2W106-P2	4	J3	17
2W107-J1	8	J8	19
2W107-P3	2	TJ1	22
LECTRONIC CONTROL UNIT (ECU)	31	TJ2	21
J1	26	2W104-P1	20
J2	24	2W105-P1	16
J3	28	2W105-P2	18
J4	30	2W107-P1	14
2W105-P5	27	2W105-P6	5
2W114-P1	25	2W105-2-J1	7
2W115-P1	29	2W109-J1	11
		2W110-P1	1

tain access to these components, traverse turret until basket opening is in line with component, then lock turret; refer to TM 9-2350-255-10.

Figure 9-110 Turret Well, Engine System Component Locations.  
Volume II  
Para. 9-5

**TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING**



**BATTERY COMPARTMENT**

Batteries (6)	14
2TB 151-E7	20
2TB 151-E8	19
2TB 152-E1	16
2TB 152-E2	15
2W 157-E1	22
2W 157-E2	21
2W 158-E1	18
2W 158-E2	17

**DISCONNECT PANEL**

4	10
2W 105-J2	8
2W 107-J2	3
2W 114-J1	2
2W 115-J1	13
2W 157-J1	12
2W 158-J1	6
3W 101/2-P1	9
3W 101/2-P2	

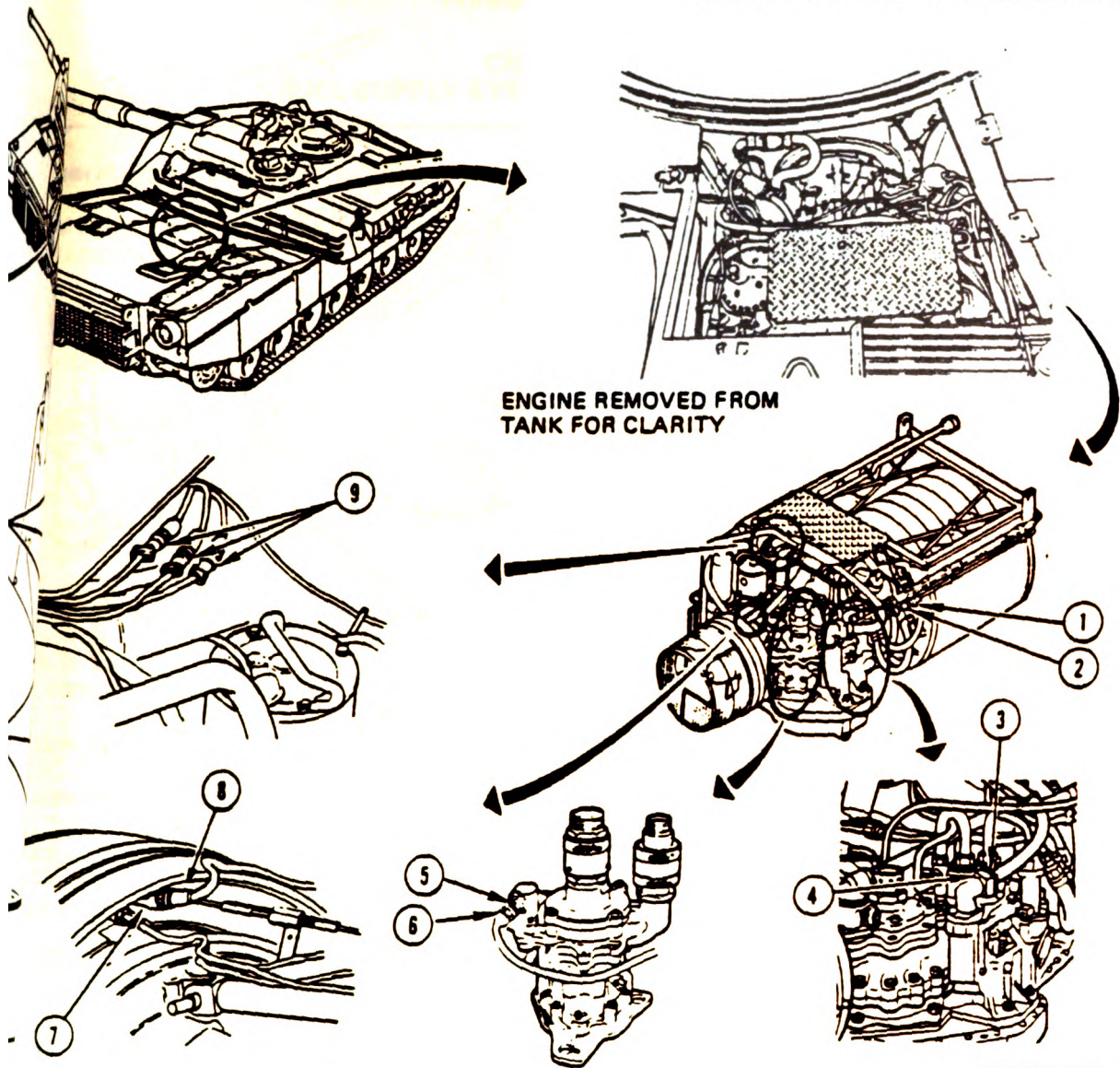
- 3W 104P1
- 3W 106P32
- 3W 106P3
- 3W 107P2

- To gain access to batteries and terminal boards:
1. Traverse turret until main gun is over left side of tank, and then lock turret; refer to TM 9-2350-255-10.
  2. Open both battery covers; refer to TM 9-2350-255-10.
- To gain access to disconnect panel, do steps 1 and 2 above, and then open top deck right grille doors; refer to TM 9-2350-255-10.

Close all doors and covers when troubleshooting is complete.

*Figure 9-111 Rear Hull, Engine System Component Locations.*  
Volume II  
Para. 9-5

**TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING**



A20120-1053

ENGINE TEMPERATURE OR 34	7	ELECTROMECHANICAL FUEL SYSTEM J33	4	MAIN HYDRAULIC PUMP J1	5
3W105-P34	8	3W105-P33	3	3W104-P9	6
3W105-P37	2			THERMOCOUPLE HARNESS 3W106 Connectors	9
3W105-1-J37	1				

For access to these components:

1. Reverse turret until main gun is over left side of tank, and then lock turret; refer to TM 9-2350-255-10.

2. Remove engine access cover; refer to TM 9-2350-255-10.

3. For access to thermocouple harness, do steps 1 and 2 above, and then open top deck right grille; refer to TM 9-2350-255-10.

4. Close all covers and doors, and install engine access cover when troubleshooting is complete.

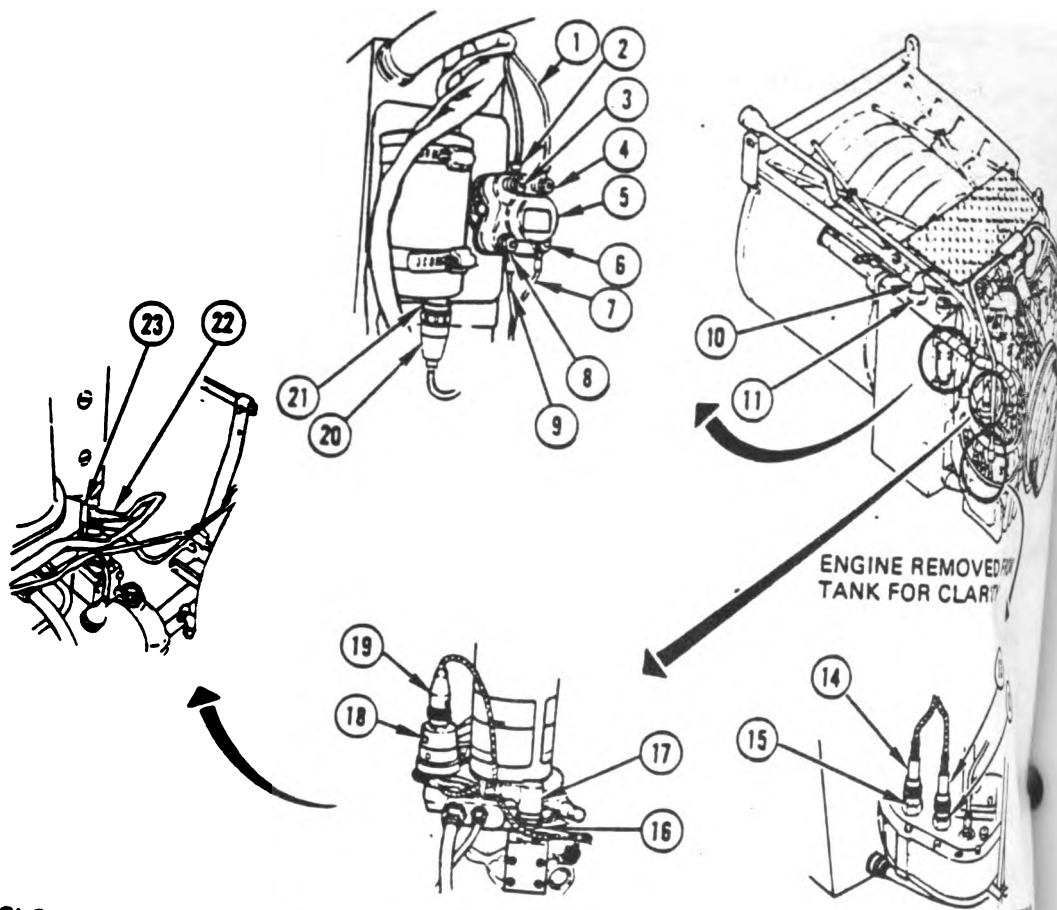
*Figure 9-112. Engine-Compartment, Engine System-Component Locations (Sheet 1 of 2).*

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Para. 9-5**

**Change 5 9-363**

ENGINE REMOVED FROM TANK FOR CLARITY

TM 9-2350-255-20-1-2-1  
ENGINE SYSTEM TROUBLESHOOTING



- |  |          |   |
|--|----------|---|
| CLOGGED OIL FILTER SWITCH<br>J7<br>3W107-P7          | 16       | OIL PRESSURE SWITCH<br>J30<br>3W107-P30   |
| COMPRESSOR SPEED PICKUP<br>NO. 1<br>J35<br>3W105-P35 | 17       | OIL TEMPERATURE SENSOR<br>J9<br>3W107-P9  |
| NO. 2<br>J5<br>3W105-P5                              | 15       | STARTER PILOT RELAY<br>A1<br>A2<br>X1<br>X2<br>3W107-X1<br>3W107-X2<br>3W108-E2<br>3W109-E2 |
| IGNITION EXCITER<br>J16<br>3W107-P16                 | 14       |   |
| OIL FLOAT SWITCH<br>J8<br>3W107-P8                   | 12<br>13 |   |
|  | 21<br>20 |   |
|  | 11<br>10 |   |

For access instructions, see sheet 1 except for components 12, 13, 14, and 15. For them the powerpack must be pulled; refer to TM 9-2350-255-20-1-3-1, para. 2-4.

Close all covers and doors and install engine access cover, when troubleshooting is complete.

Figure 9-112. Engine Compartment, Engine System Component Locations (Sheet 2 of 2)

9-364 Change 6

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Para. 9-5

## CHAPTER 10 FUEL SUPPLY SYSTEM TROUBLESHOOTING

---

**10-1. General.** This chapter tells you how to troubleshoot the fuel supply system.

The STE/M1 test set is no longer programmed to troubleshoot the fuel supply system. STE/M1 test 1120 has been temporarily deleted.

A fault symptom index is located at the beginning of the troubleshooting procedures (paragraph 10-2). The index identifies the primary procedure used to troubleshoot a known symptom. The primary procedure is included within paragraph 10-2.

Follow these general troubleshooting and maintenance instructions in each procedure unless the procedure directs otherwise:

- a. Make sure the troubleshooting instructions in TM 9-2350-255-10 have been completed before starting this troubleshooting action. Make sure all test connections are correct. An incorrect test connection can lead to the replacement of a good tank component.
- b. If the same symptom exists after replacing a tank component, repeat the troubleshooting procedure.
- c. Look for obvious damage to harnesses and all surrounding components while checking for loose electrical connectors.
- d. Be sure tank is parked where it is safe to traverse the turret.
- e. Be sure to close grille doors and access panels before traversing the turret.
- f. Be sure vehicle master power is OFF before connecting or disconnecting any electrical cable or harness.
- g. When taking apart or joining receptacles or connectors, look for missing, broken, and pushed in pins.
- h. If connectors, plugs, or receptacles cannot be removed by hand, use slip joint conduit style pliers with plastic jaw inserts to remove them.
- i. Use care when hooking up all connectors to avoid bending or breaking pins. Make sure that pins and keyways line up. Tighten twist-snap type connectors, plugs, or receptacles until a click is heard and tighten the screw-on type until the ratchet noise is heard to indicate that connectors, plugs, or receptacles are tight.
- j. Connect all cables and harnesses that were disconnected in order to get at the connector being checked.
- k. Dirt or contamination in fuel can ruin the fuel system. Clean off all fuel connections with a clean rag before loosening any connection or fitting.

**10-1. General (Continued).**

**WARNING**

Wipe up spilled fuel immediately with rags. You can slip and fall on spilled fuel.

**l. Put a rag under all connections to catch spilled fuel before removing.**

**m. When a step tells you to loosen connections with two wrenches, use one to loosen the connection and the other to hold the fitting and keep the line from twisting.**

**n. Cap or plug all open fuel tubes, lines, fittings, receptacles, and connectors as soon as they are disconnected.**

**o. Take protective caps or plugs off all fuel tubes, lines, fittings, receptacles, and connectors before they are installed.**

**p. Make sure connection points and insides of all tubes, lines, and fittings are clean before installing them.**

**q. Put antiseizing tape, MIL-T-27730, on pipe (tapered) threads. Do not put tape on first two threads.**

**r. Screw on fuel connections by hand. Finger tighten connections to be sure they are not cross-threaded.**

**s. When a step tells you to tighten connections with two wrenches, use one to tighten the connection and the other to keep the fitting or line from twisting. Tighten 1/6 to 1/3 turn.**

**t. Clean all connections, fittings, and joints that were loosened in the fuel system before you check for leaks.**

**u. Start and run the engine or transfer some fuel from front to rear tanks to check the fuel system for leaks at all connections that were loosened. If a connection leaks, unscrew a full turn, then tighten. If it is still leaking, replace leaking parts.**

**10-2. Fuel Supply System Troubleshooting Procedures.**

**Table 10-1. Fuel Supply System (FSS) Fault Symptom Index**

<b>Fault Symptom No.</b>	<b>Fault Symptom</b>	<b>Primary Troubleshooting Procedure (PTP)</b>
FSS-1	Fuel Cannot Be Transferred From Left Front Fuel Tank	Figure 10-1
FSS-2	Fuel Cannot Be Transferred Or Transfers At A Slow Rate From Right Front Fuel Tank	Figure 10-2
FSS-3	REAR FUEL PUMP - R Light Comes On After Engine Starts	Figure 10-3
FSS-4	REAR FUEL PUMP - L Light Comes On After Engine Starts	Figure 10-4
FSS-5	FUEL Gage Shows Zero In Any FUEL TANK SELECTOR Switch Position	Figure 10-5
FSS-6	Left Front Fuel Tank Shows Zero On FUEL Gage At All Times - Other Fuel Tanks OK	Figure 10-6
FSS-7	Right Front Fuel Tank Shows Zero On FUEL Gage At All Times - Other Fuel Tanks OK	Figure 10-7
FSS-8	Rear Fuel Tank Shows 1/2 Full On FUEL Gage After Filling Rear Fuel Tank	Figure 10-8
FSS-9	Rear Fuel Tank Overfills	Figure 10-9
FSS-10	LOW FUEL LEVEL Light Does Not Go Off - Fuel Transfer Is Normal	Figure 10-10
FSS-11	LOW FUEL LEVEL Light Does Not Come On When Rear Fuel Tank Shows Below 1/4 Full On FUEL Gage - Cannot Transfer Fuel	Figure 10-11
FSS-12	Fuel Transfers From Left Front Fuel Tank When Right Or Left Front Fuel Tank Is Selected	Figure 10-12
FSS-13	Fuel Cannot Be Transferred From Right And Left Front Fuel Tanks - LOW FUEL LEVEL Light Is On, Rear Fuel Tank Shows Below 1/4 Full On Fuel Gage	Figure 10-13
FSS-14	Fuel/Water Separator Does Not Automatically Discharge Collected Water	Figure 10-14
FSS-15	FUEL Gage Does Not Show Correct Fuel Levels - All Fuel Tanks Full	Figure 10-15
FSS-16	Right Front Fuel Tank Shows More Than Full On FUEL Gage At All Times - Other Fuel Tanks OK	Figure 10-16



**TM 9-2350-255-20-1-2-1  
FUEL SUPPLY SYSTEM TROUBLESHOOTING**

**Table 10-1. Fuel Supply System (FSS) Fault Symptom Index (Continued)**

<b>Fault Symptom No.</b>	<b>Fault Symptom</b>	<b>Primary Troubleshooting Procedure (PTP)</b>
FSS-17	Left Front Fuel Tank Shows More Than Full On FUEL Gage At All Times - Other Fuel Tanks OK	Figure 10-17
FSS-18	Rear Fuel Tank Shows More Than Full On FUEL Gage At All Times - Other Fuel Tanks OK	Figure 10-18

**SYMPTOM FSS-1**

**FUEL CANNOT BE TRANSFERRED FROM  
LEFT FRONT FUEL TANK**

**Supplies:**

- Connector Pin/Socket Adapters
- Electrical Jumpers

**Test Equipment/Special Tools:**

- Breakout Box Tool Kit, 12311066
- Multimeter
- Pliers, slip joint, conduit style with plastic jaw inserts, NSN 5120-00-624-8065

**Equipment Condition:**

- Tank parked.
- Parking brake set.
- Engine shut down.
- Vehicle master power off.
- Rear fuel tanks must be less than 1/4 full.

**NOTE**

- Read para. 10-1 before doing any work.
- When jumpers are used, remove them after completing last instruction in that block.

1

- Set up tank controls for standard initial test conditions.
- Refer to table 10-2, para. 10-5.

*Figure 10-1 (Sheet 1 of 8)*  
**Volume II**  
**Para. 10-2**

**Change 6 10-5**

TM 9-2350-255-20-1-2-1  
FUEL SUPPLY SYSTEM TROUBLESHOOTING

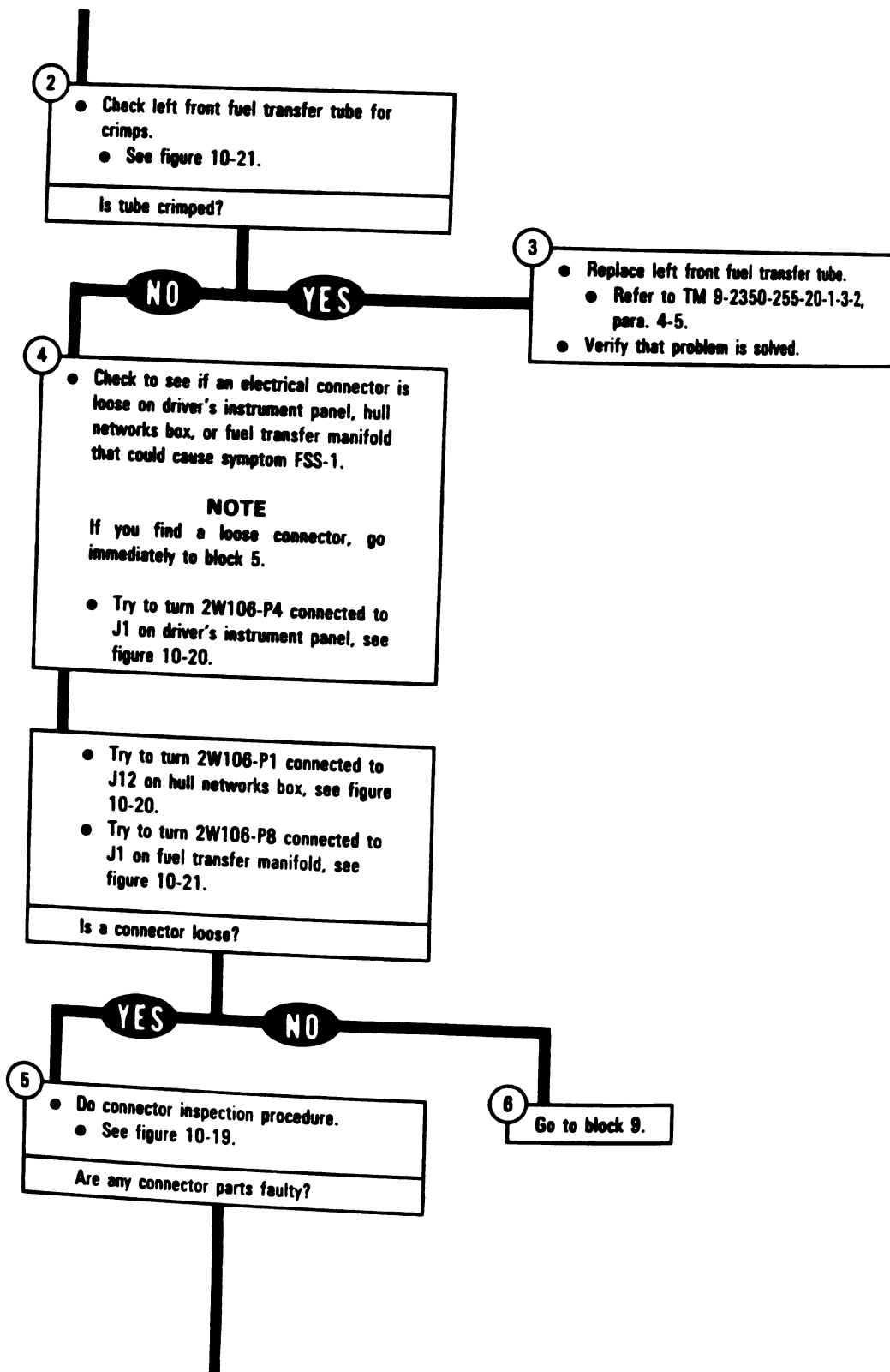


Figure 10-1 (Sheet 2 of 8)  
Volume II  
Para. 10-2

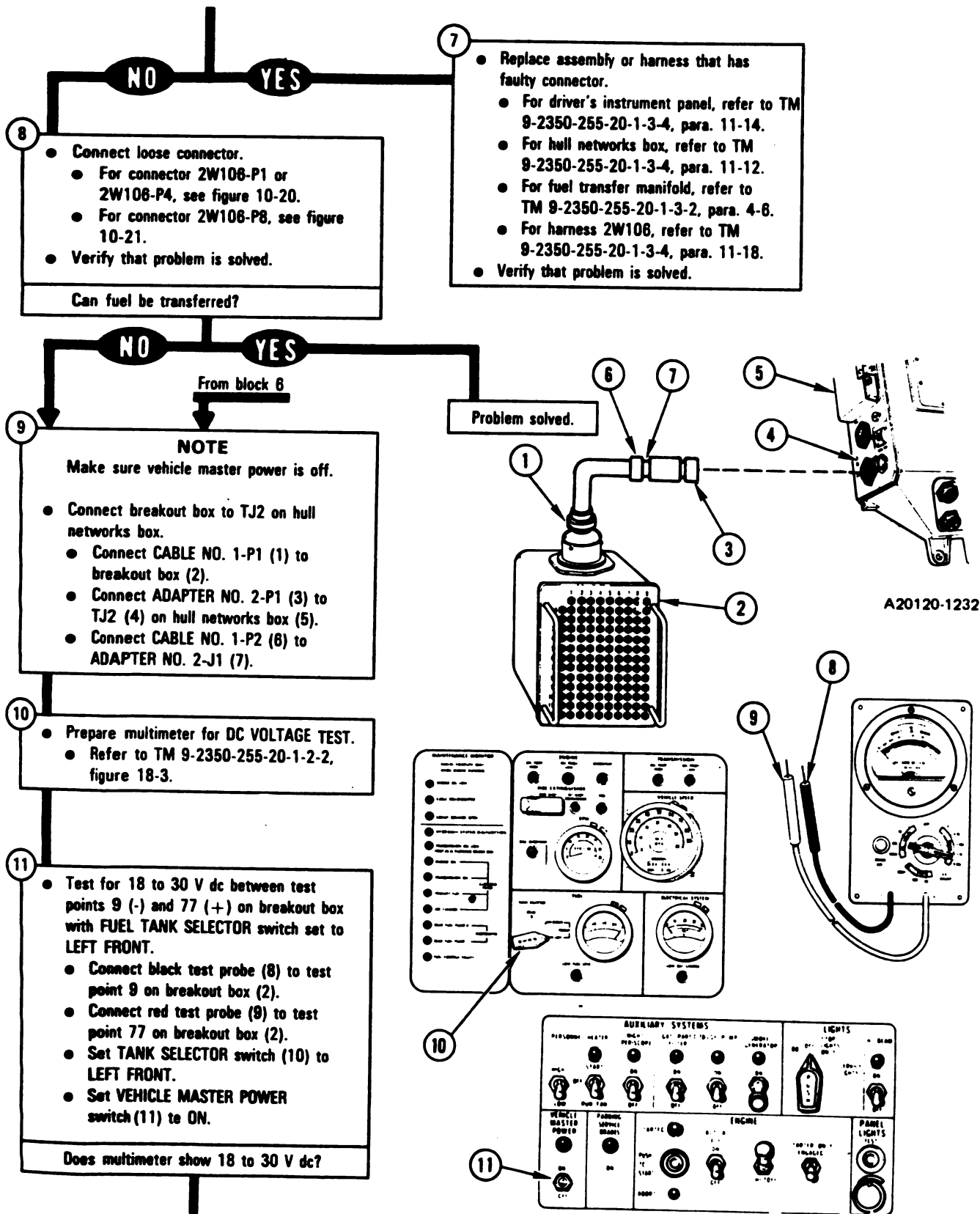
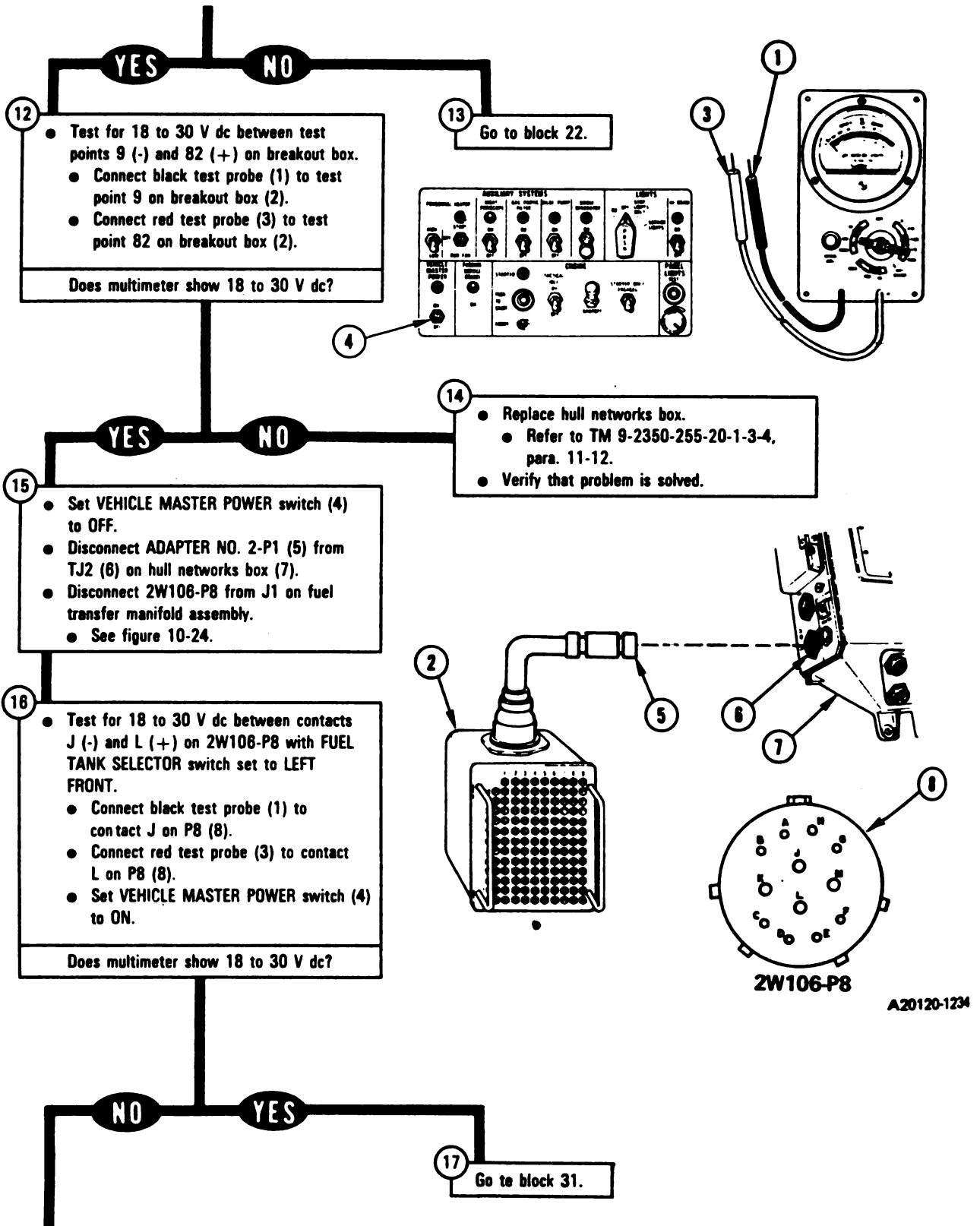


Figure 10-1 (Sheet 3 of 8)  
Volume II  
Para. 10-2

A20120-1233

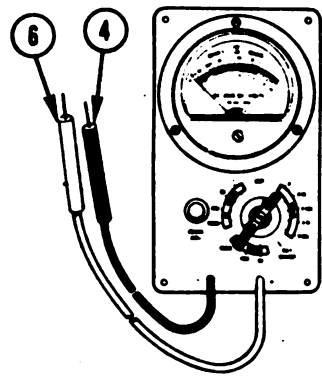
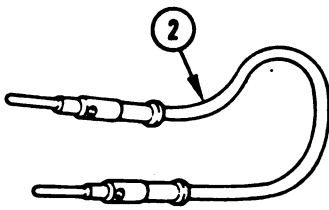
**TM 9-2350-255-20-1-2-1  
FUEL SUPPLY SYSTEM TROUBLESHOOTING**



*Figure 10-1 (Sheet 4 of 8)  
Volume II  
Para. 10-2*

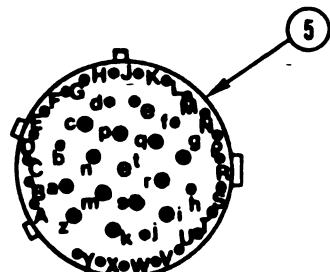
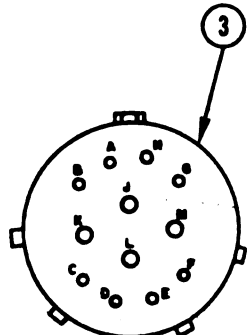
**18**

- Set VEHICLE MASTER POWER switch (1) to OFF.
- Prepare multimeter for CONTINUITY TEST.
  - Refer to TM 9-2350-255-20-1-2-2, figure 18-7.



**19**

- Disconnect 2W106-P1 from J12 on hull networks box.
  - See figure 10-23.
- Connect jumper (2) between contacts J and L on 2W106-P8 (3).
- Test for continuity between contacts e and q on 2W106-P1.
  - Connect black test probe (4) to contact e on P1 (5).
  - Connect red test probe (6) to contact q on P1 (5).



2W106-P8

2W106-P1

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Does multimeter show continuity?

**NO**

**20**

- Replace harness 2W106.
- Refer to TM 9-2350-255-20-1-3-4, para. 11-18.
- Verify that problem is solved.

**YES**

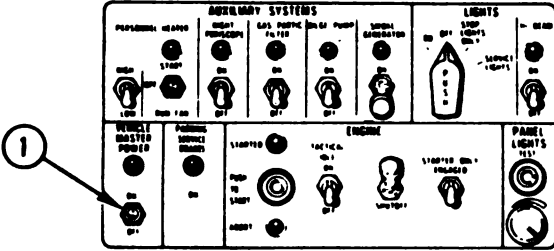
**21**

- Connect 2W106-P8 to J1 on fuel transfer manifold assembly.
  - See figure 10-21.
- Replace hull networks box.
  - Refer to TM 9-2350-255-20-1-3-4, para. 11-12.
- Verify that problem is solved.

From block 13

**22**

- Set VEHICLE MASTER POWER switch (1) to OFF.

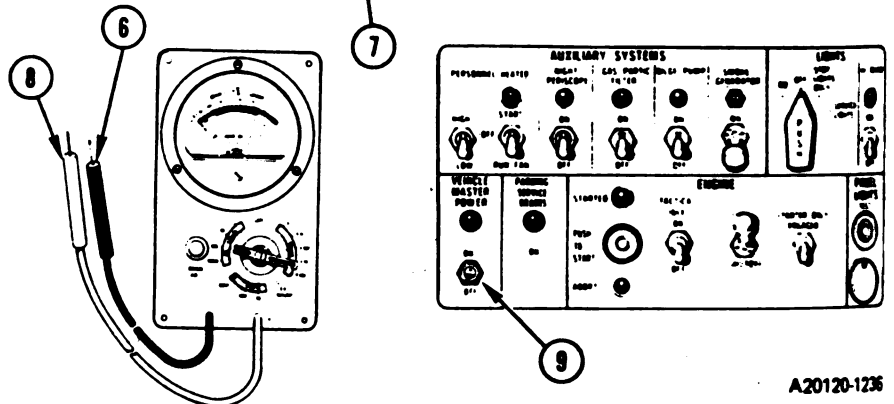
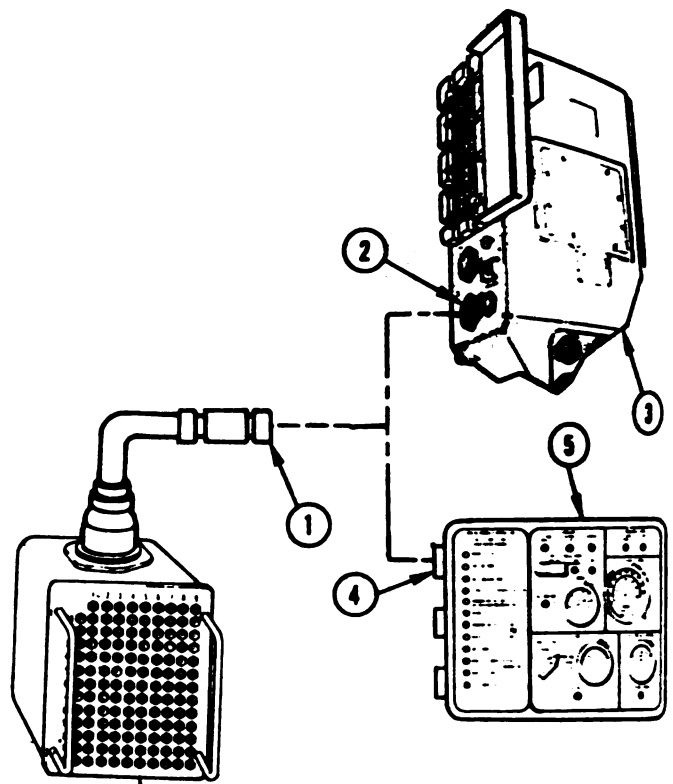


A20120-1112

Figure 10-1 (Sheet 5 of 8)  
 Volume II  
 Para. 10-2

**TM 9-2350-255-20-1-2-1  
FUEL SUPPLY SYSTEM TROUBLESHOOTING**

- 23
- Connect breakout box to TJ1 on driver's instrument panel.
  - Disconnect ADAPTER NO. 2-P1 (1) from TJ2 (2) on hull networks box (3).
  - Connect ADAPTER NO. 2-P1 (1) to TJ1(4) on driver's instrument panel (5).
  - Test for 18 to 30 V dc between test points 9 (-) and 77 (+) on breakout box.
  - Connect black test probe (8) to test point 9 on breakout box (7).
  - Connect red test probe (8) to test point 77 on breakout box (7).
  - Set VEHICLE MASTER POWER switch (9) to ON.
- Does multimeter show 18 to 30 V dc?



- YES NO
- 25
- Set VEHICLE MASTER POWER switch (9) to OFF.
  - Prepare multimeter for CONTINUITY TEST.
  - Refer to TM 9-2350-255-20-1-2-2, figure 18-7.

- 24
- Replace driver's instrument panel.
  - Refer to TM 9-2350-255-20-1-3-4, para. 11-14.
  - Verify that problem is solved.

A20120-1236

*Figure 10-1 (Sheet 6 of 8)  
Volume II  
Para. 10-2*

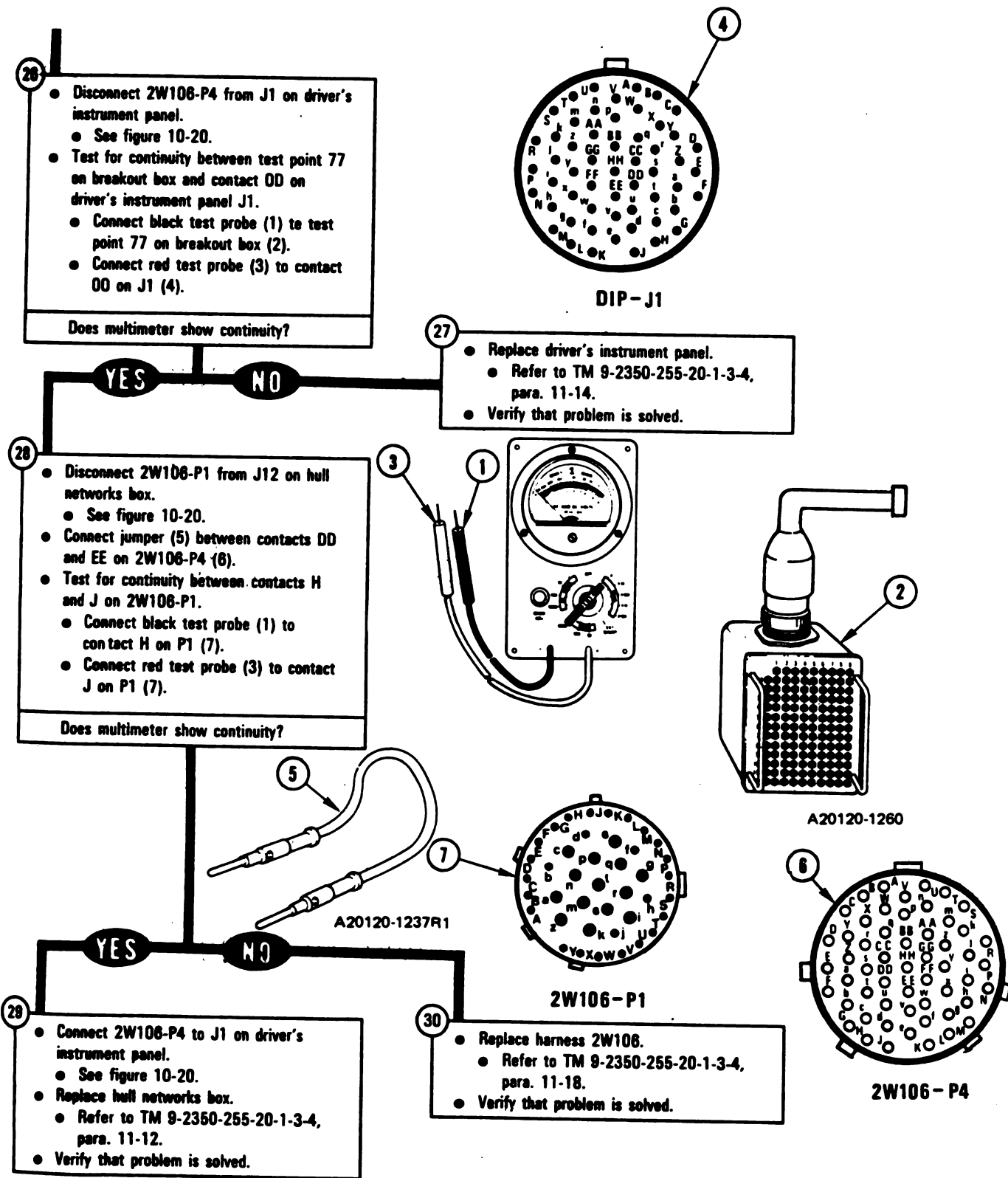


Figure 10-1 (Sheet 7 of 8)  
Volume II  
Para. 10-2



TM 9-2350-255-20-1-2-1  
FUEL SUPPLY SYSTEM TROUBLESHOOTING

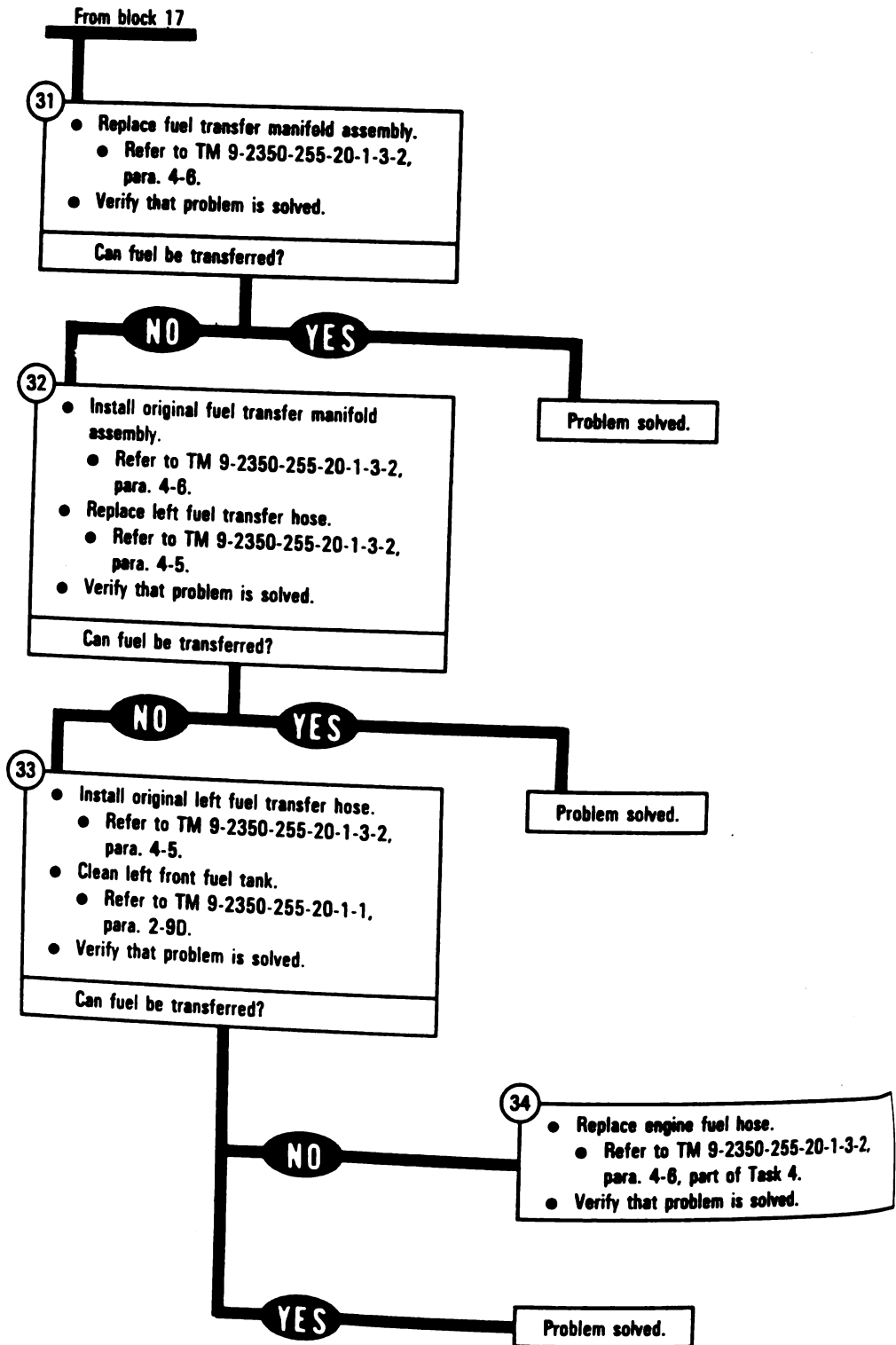


Figure 10-1 (Sheet 8 of 8)  
Volume II  
Para. 10-2

**PTOM FSS-2**

**. CANNOT BE TRANSFERRED OR  
NSFERS AT A SLOW RATE FROM  
IT FRONT FUEL TANK**

**Wires:**  
Connector Pin/Socket Adapters  
Electrical Jumpers

**Equipment/Special Tools:**  
Breakout Box Tool Kit, 12311086  
Multimeter  
Wires, slip joint, conduit style with plastic  
W inserts, NSN 5120-00-624-8065

**Equipment Condition:**  
Aircraft parked.  
Parking brake set.  
Engine shut down.  
Vehicle master power off.  
Near fuel tanks must be less than 1/4  
full.

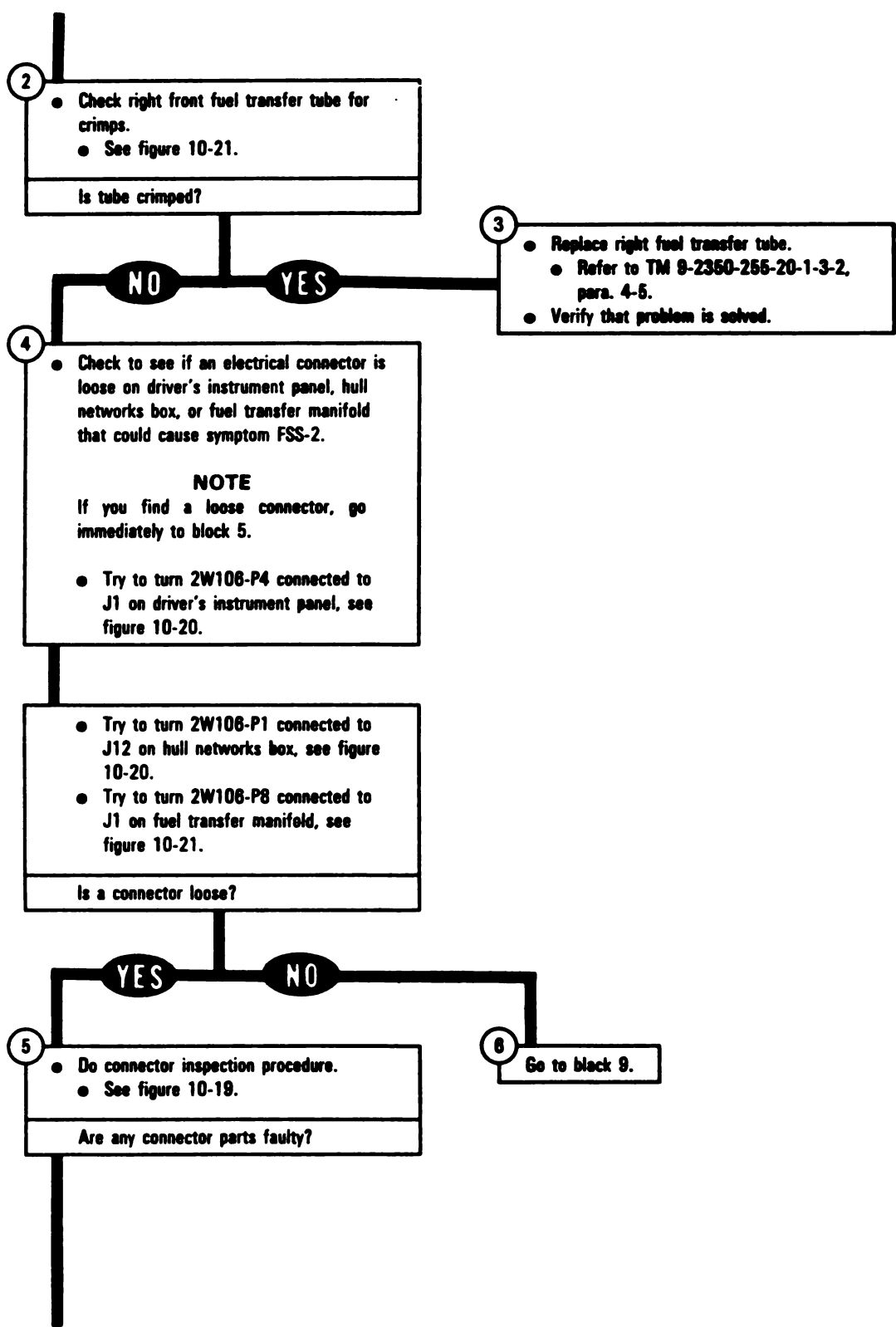
**NOTE**

Read para. 10-1 before doing any work.  
When jumpers are used, remove them  
after completing last instruction in that  
block.

Setup tank controls for standard initial  
conditions.  
Refer to table 10-2, para. 10-5.

*Figure 10-2 (Sheet 1 of 10)*  
**Volume II**  
**Para. 10-2**

**TM 9-2350-255-20-1-2-1  
FUEL SUPPLY SYSTEM TROUBLESHOOTING**



**Figure 10-2 (Sheet 2 of 10)  
Volume II  
Para. 10-2**

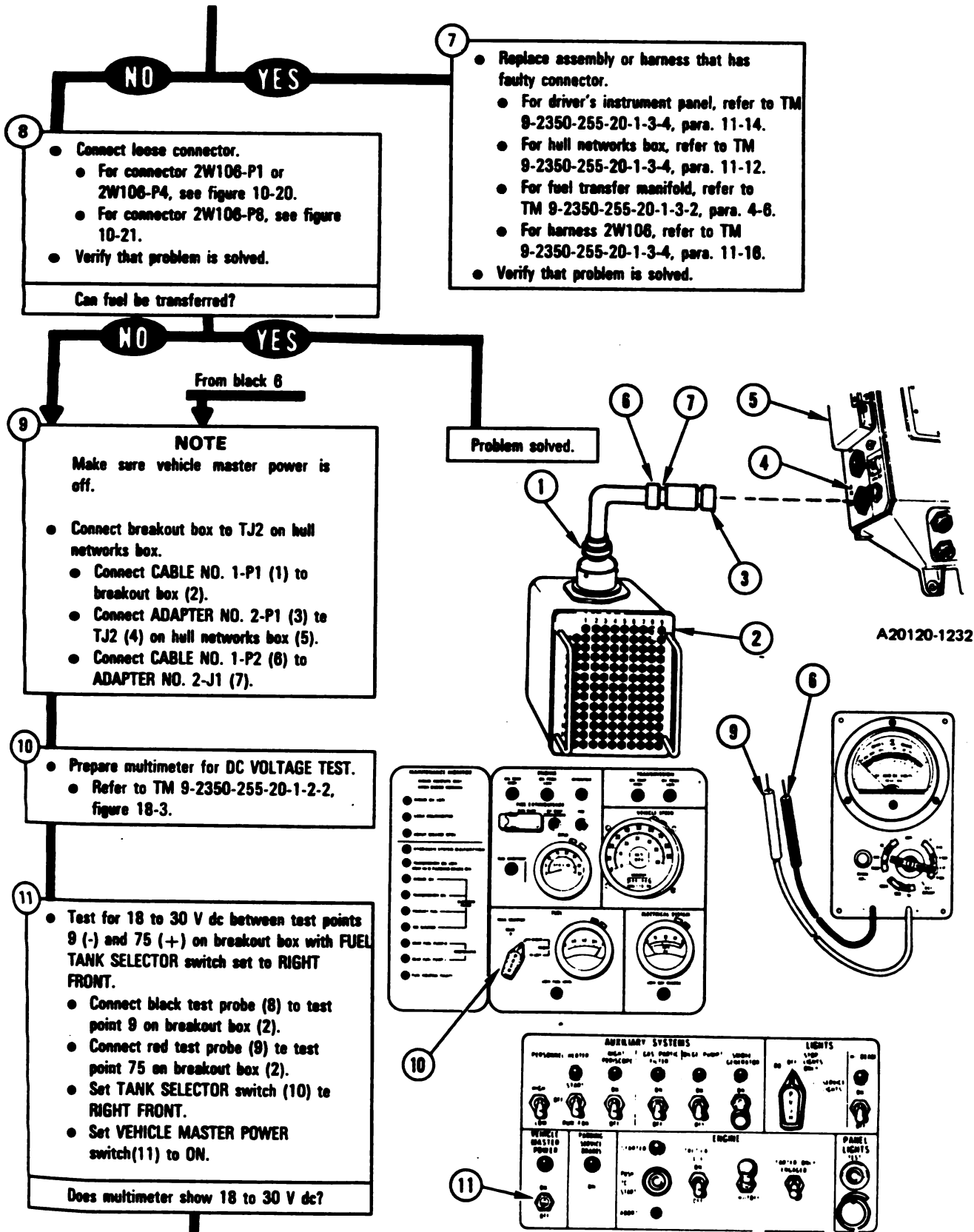
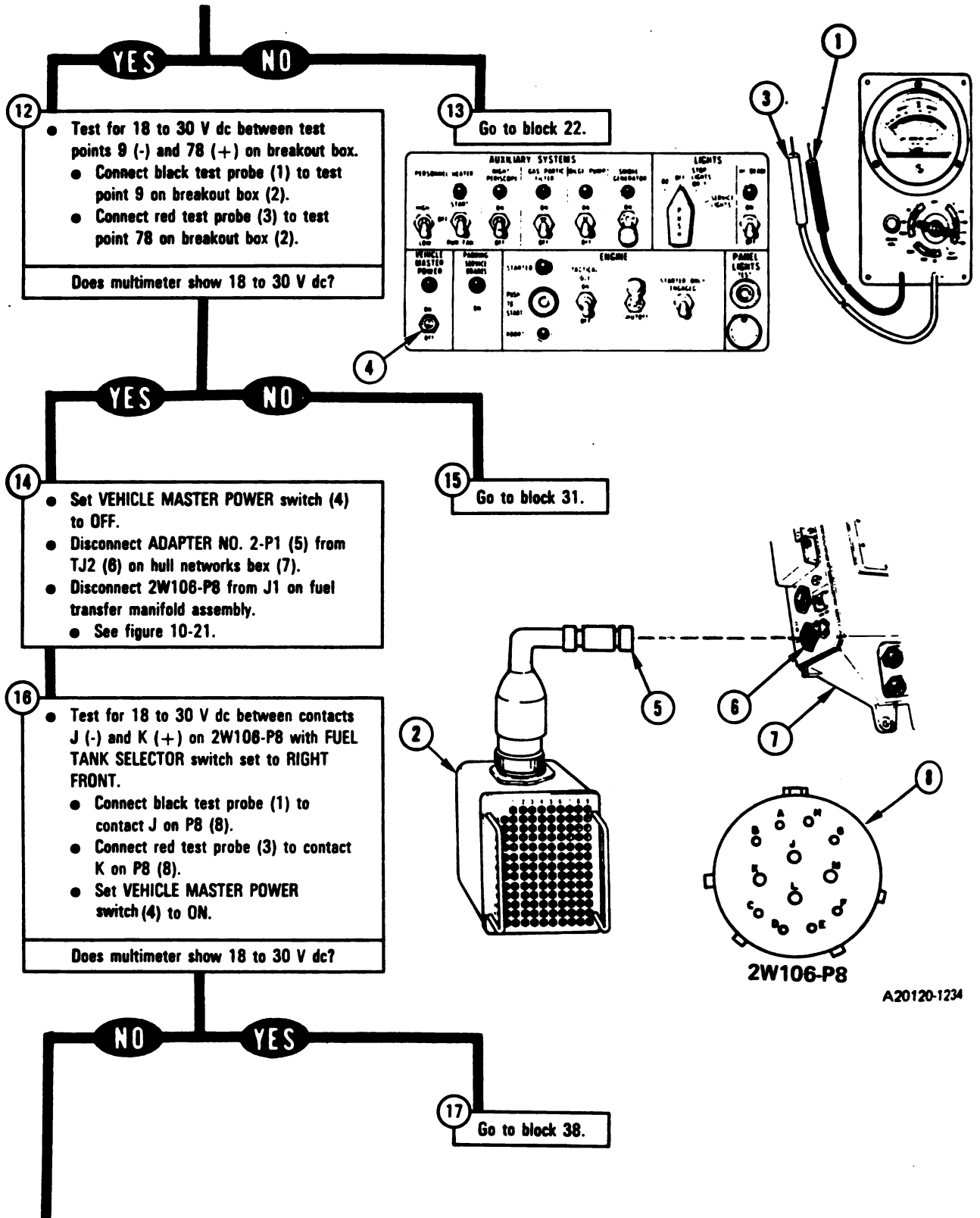


Figure 10-2 (Sheet 3 of 10)  
Volume II  
Para. 10-2

A20120-1233

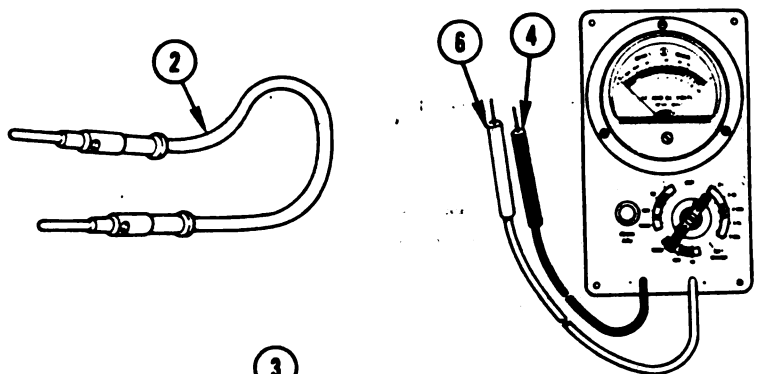
**TM 9-2350-255-20-1-2-1  
FUEL SUPPLY SYSTEM TROUBLESHOOTING**



**Figure 10-2 (Sheet 4 of 10)  
Volume II  
Para. 10-2**

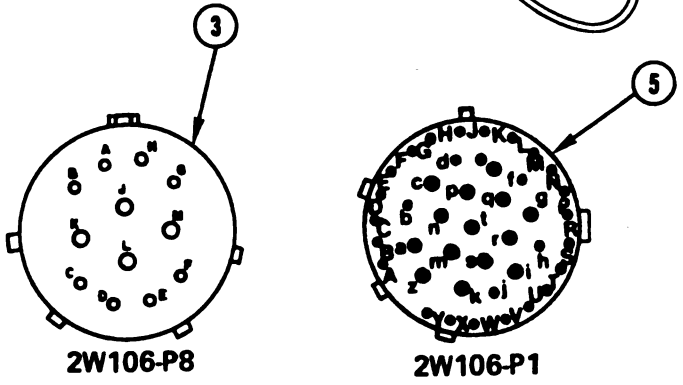
18

- Set VEHICLE MASTER POWER switch (1) to OFF.
- Prepare multimeter for CONTINUITY TEST.
  - Refer to TM 9-2350-255-20-1-2-2, figure 18-7.



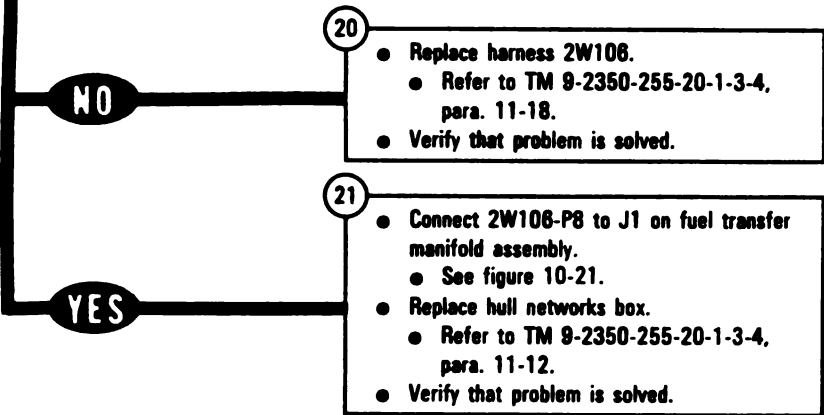
19

- Disconnect 2W106-P1 from J12 on hull networks box.
  - See figure 10-20.
- Connect jumper (2) between contacts J and K on 2W106-P8 (3).
- Test for continuity between contacts e and g on 2W106-P1.
  - Connect black test probe (4) to contact e on P1 (5).
  - Connect red test probe (6) to contact g on P1 (5).



Does multimeter show continuity?

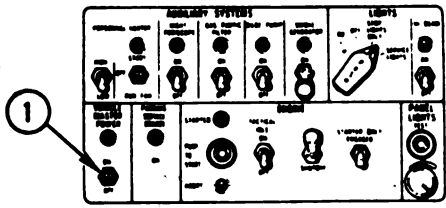
A20120-1235



From block 13

22

- Set VEHICLE MASTER POWER switch (1) to OFF.

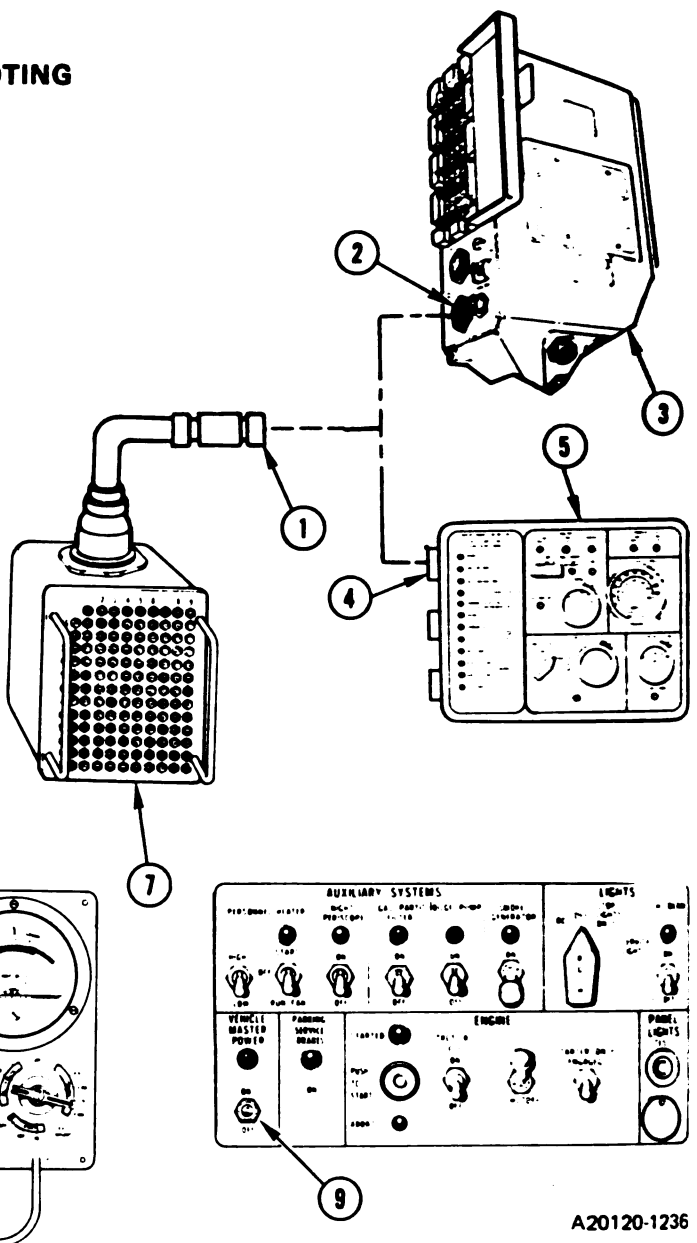


A20120-1112

Figure 10-2 (Sheet 5 of 10)  
Volume II  
Para. 10-2

**TM 9-2350-255-20-1-2-1  
FUEL SUPPLY SYSTEM TROUBLESHOOTING**

- 23
- Connect breakout box to TJ1 on driver's instrument panel.
  - Disconnect ADAPTER NO. 2-P1 (1) from TJ2 (2) on hull networks box (3).
  - Connect ADAPTER NO. 2-P1 (1) to TJ1 (4) on driver's instrument panel (5).
  - Test for 18 to 30 V dc between test points 9 (-) and 75 (+) on breakout box.
  - Connect black test probe (6) to test point 9 on breakout box (7).
  - Connect red test probe (8) to test point 75 on breakout box (7).
  - Set VEHICLE MASTER POWER switch (9) to ON.
- Does multimeter show 18 to 30 V dc?



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**YES**      **NO**

- 24
- Replace driver's instrument panel.
  - Refer to TM 9-2350-255-20-1-3-4, para. 11-14.
  - Verify that problem is solved.

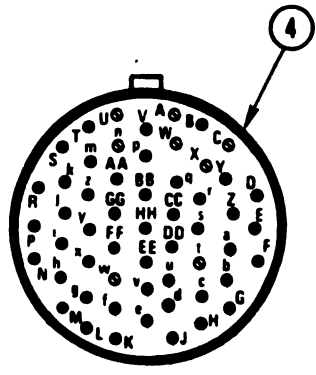
- 25
- Set VEHICLE MASTER POWER switch (9) to OFF.
  - Prepare multimeter for CONTINUITY TEST.
  - Refer to TM 9-2350-255-20-1-2-2, figure 18-7.

*Figure 10-2 (Sheet 6 of 10)  
Volume II  
Para. 10-2*

26

- Disconnect 2W106-P4 from J1 on driver's instrument panel.
- See figure 10-20.
- Test for continuity between test point 75 on breakout box and contact EE on driver's instrument panel J1.
- Connect black test probe (1) to test point 75 on breakout box (2).
- Connect red test probe (3) to contact EE on J1 (4).

Does multimeter show continuity?



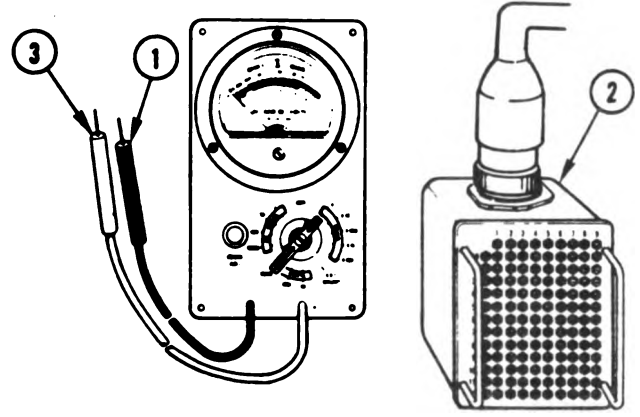
27

- Replace driver's instrument panel.
- Refer to TM 9-2350-255-20-1-3-4, para. 11-14.
- Verify that problem is solved.

28

- Disconnect 2W106-P1 from J12 on hull networks box.
- See figure 10-20.
- Connect jumper (5) between contacts DD and EE on 2W106-P4 (6).
- Test for continuity between contacts H and J on 2W106-P1.
- Connect black test probe (1) to contact H on P1 (7).
- Connect red test probe (3) to contact J on P1 (7).

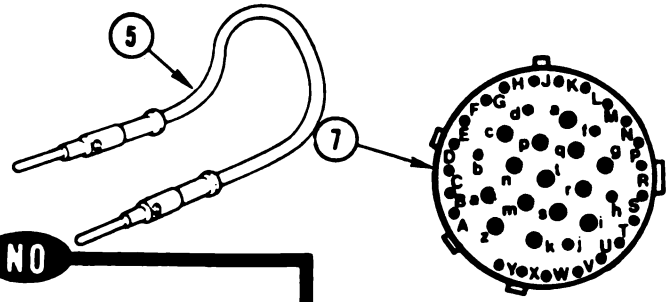
Does multimeter show continuity?



YES NO

29

- Connect 2W106-P4 to J1 on driver's instrument panel.
- See figure 10-20.
- Replace hull networks box.
- Refer to TM 9-2350-255-20-1-3-4, para. 11-12.
- Verify that problem is solved.



30

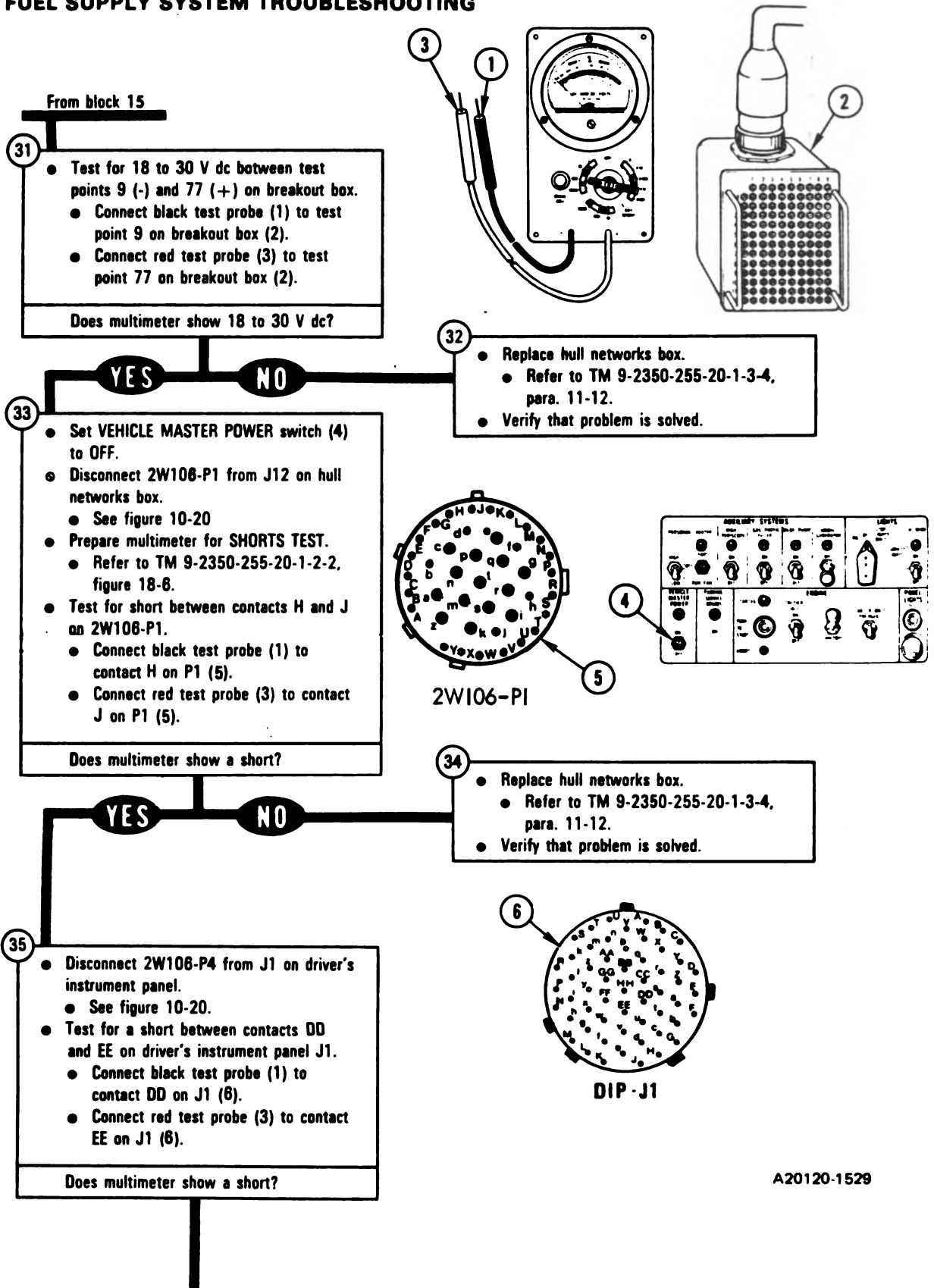
- Replace harness 2W106.
- Refer to TM 9-2350-255-20-1-3-4, para. 11-18.
- Verify that problem is solved.

A20120-1237R1

Figure 10-2 (Sheet 7 of 10)  
Volume II  
Para. 10-2



**TM 9-2350-255-20-1-2-1  
FUEL SUPPLY SYSTEM TROUBLESHOOTING**



*Figure 10-2 (Sheet 8 of 10)  
Volume II  
Para. 10-2*

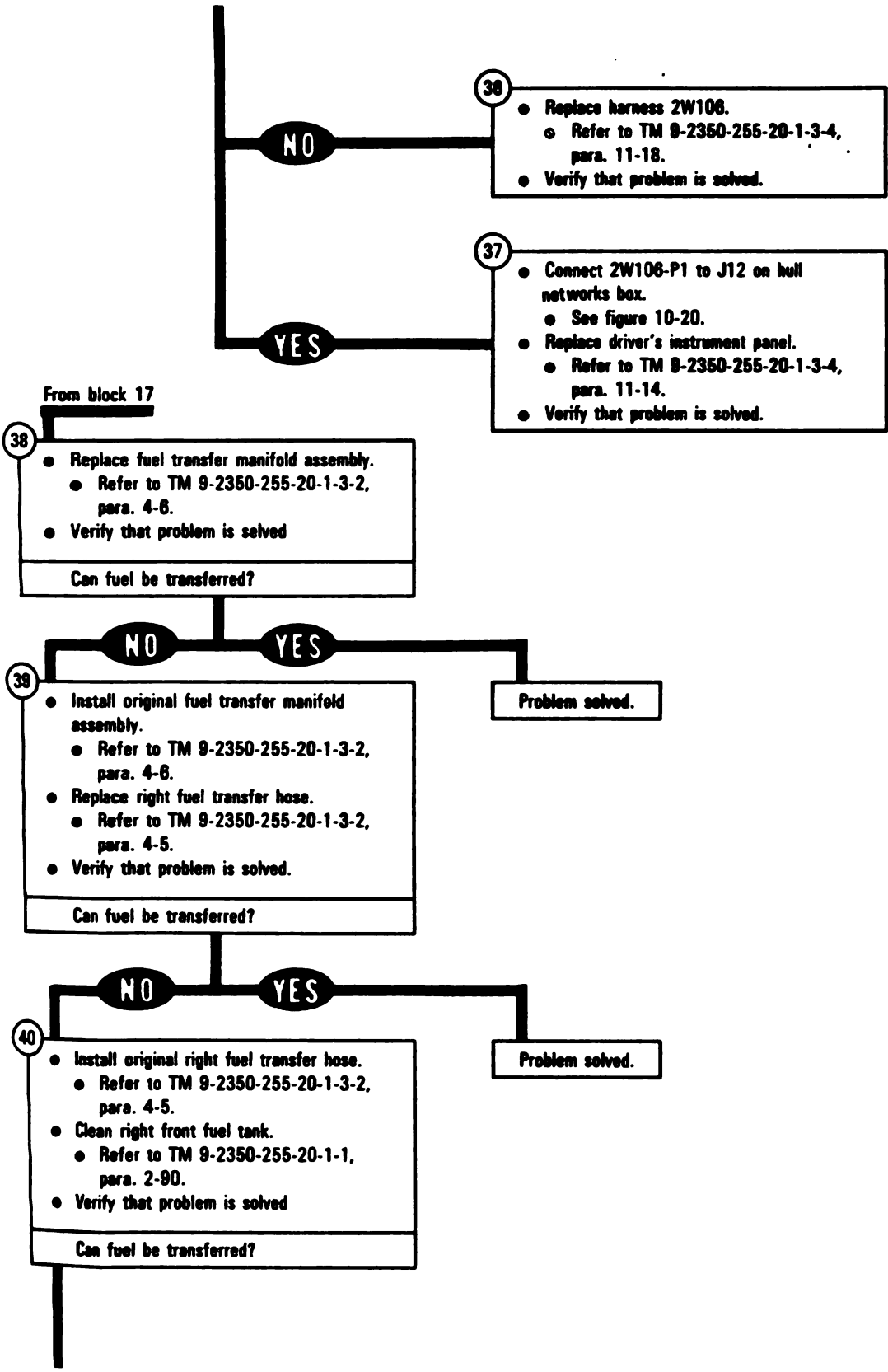
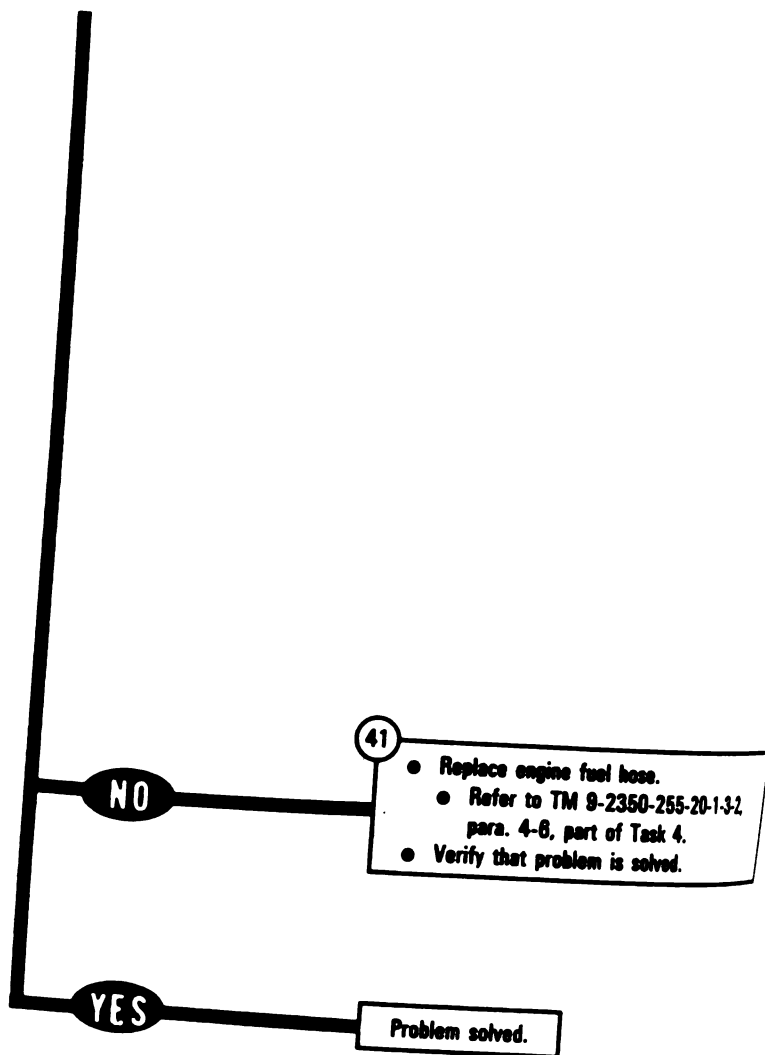


Figure 10-2 (Sheet 9 of 10)  
 Volume II  
 Para. 10-2



10-22 Change 6

Figure 10-2 (Sheet 10 of 10)  
Volume II  
Para. 10-2

**SYMPTOM FSS-3**

**REAR FUEL PUMP - R LIGHT COMES ON  
AFTER ENGINE STARTS**

**Supplies:**

- Connector Pin/Socket Adapters
- Electrical Jumpers

**Test Equipment/Special Tools:**

- Breakout Box Tool Kit, 12311068
- Multimeter
- Pliers, slip joint, conduit style with plastic jaw inserts, NSN 5120-00-824-8085

**Equipment Condition:**

- Tank parked.
- Parking brake set.
- Engine shut down.
- Vehicle master power off.

**NOTE**

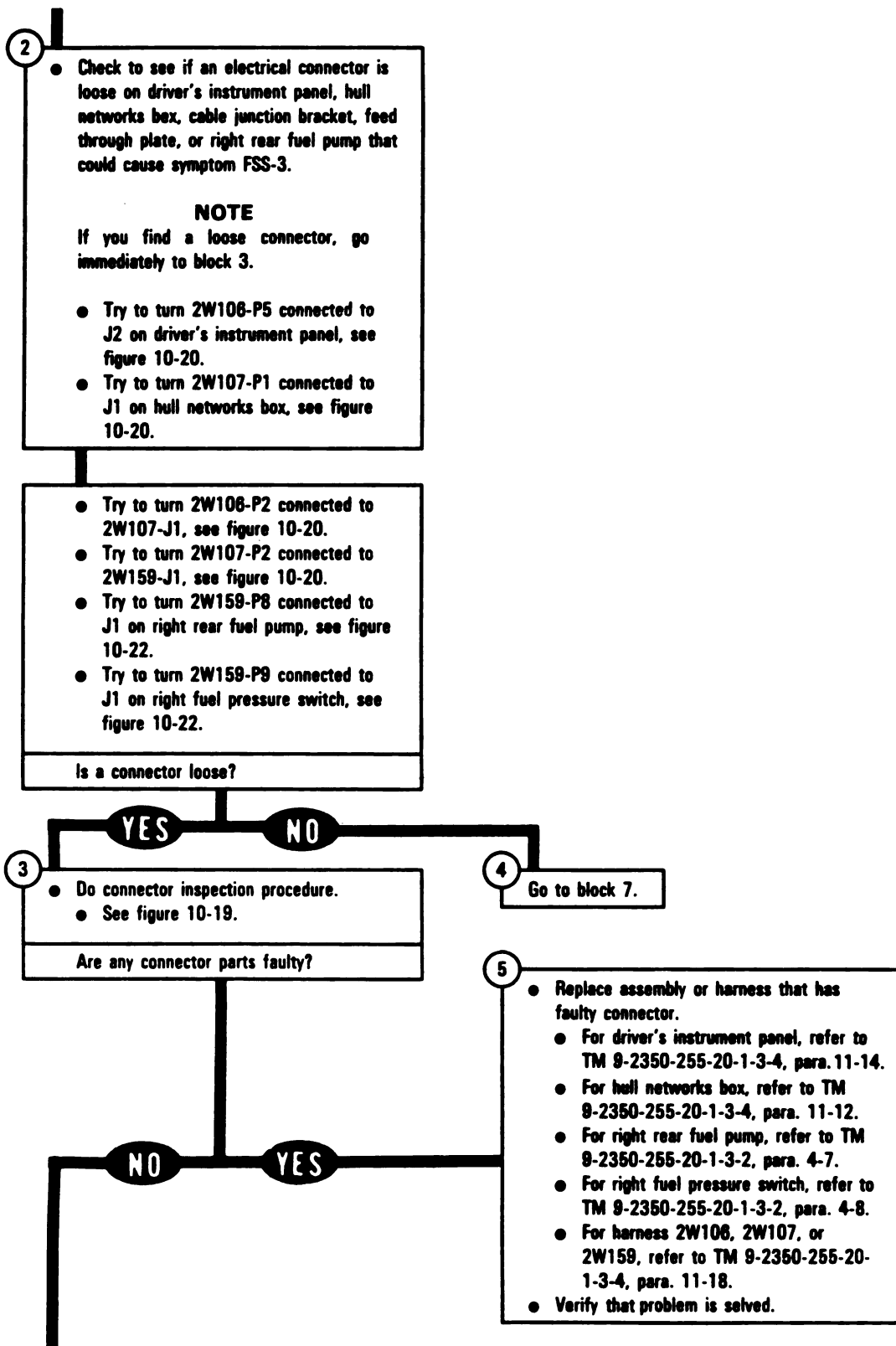
- Read para. 10-1 before doing any work.
- When jumpers are used, remove them after completing last instruction in that block.
- This is a two-man job. Soldier A is responsible for completing the job. Soldier B is the assistant and is directed by Soldier A. Soldier B will be used only in block 21.

1

- Set up tank controls for standard initial test conditions.
- Refer to table 10-2, para. 10-5.

*Figure 10-3 (Sheet 1 of 7)*  
**Volume II**  
**Para. 10-2**

**TM 9-2350-255-20-1-2-1  
FUEL SUPPLY SYSTEM TROUBLESHOOTING**



*Figure 10-3 (Sheet 2 of 7)*  
**Volume II  
Para. 10-2**

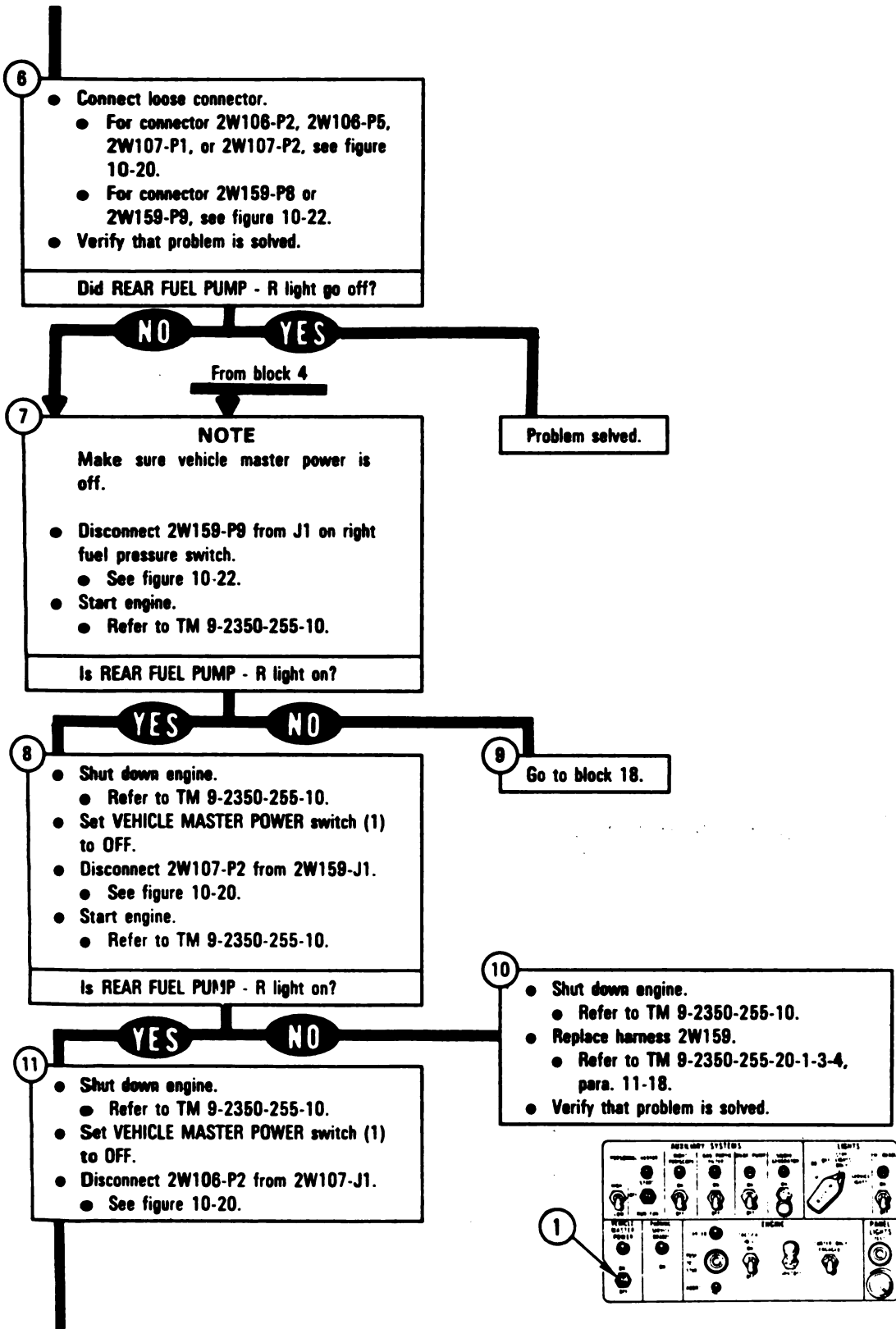


Figure 10-3 (Sheet 3 of 7)  
 Volume II  
 Para. 10-2

A20120-1112

**TM 9-2350-255-20-1-2-1  
FUEL SUPPLY SYSTEM TROUBLESHOOTING**

- 12
- Prepare multimeter for SHORTS TEST.
  - Refer to TM 9-2350-255-20-1-2-2, figure 18-8.

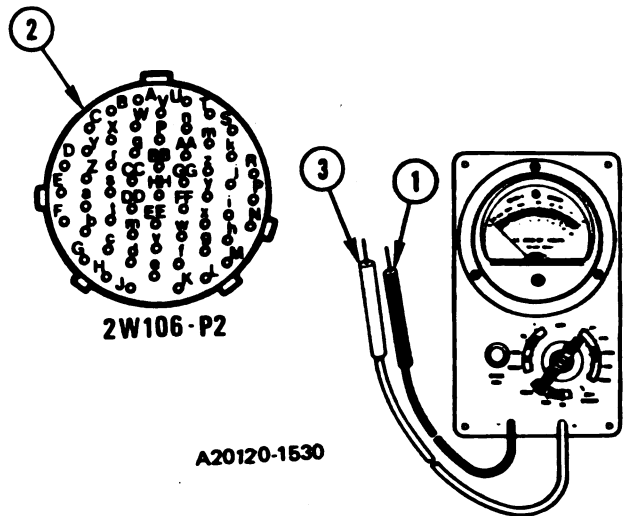
13

**NOTE**

If multimeter shows a short, go immediately to block 15.

- Test for a short between contact M and all other contacts and connector body on 2W106-P2.
- Connect black test probe (1) to contact M on P2 (2).
- Connect red test probe (3) to all other contacts and connector body on P2 (2).

Does multimeter show a short between any contacts or connector body?



- 14
- Connect 2W159-P9 to J1 on right fuel pressure switch.
  - See figure 10-22.
  - Replace harness 2W107.
  - Refer to TM 9-2350-255-20-1-3-4, para. 11-18.
  - Verify that problem is solved.

YES NO

15

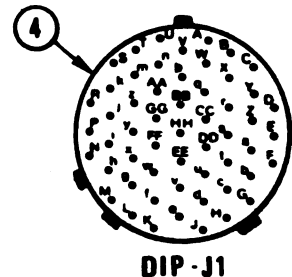
- Disconnect 2W106-P5 from J2 on driver's instrument panel.
- See figure 10-20.

**NOTE**

If multimeter shows a short, go immediately to block 17.

- Test for a short between contact s and all other contacts and connector body on driver's instrument panel J1.
- Connect black test probe (1) to contact s on J1 (4).
- Connect red test probe (3) to all other contacts and connector body on J1 (4).

Does multimeter show a short between any contacts or connector body?



*Figure 10-3 (Sheet 4 of 7)  
Volume II  
Para. 10-2*

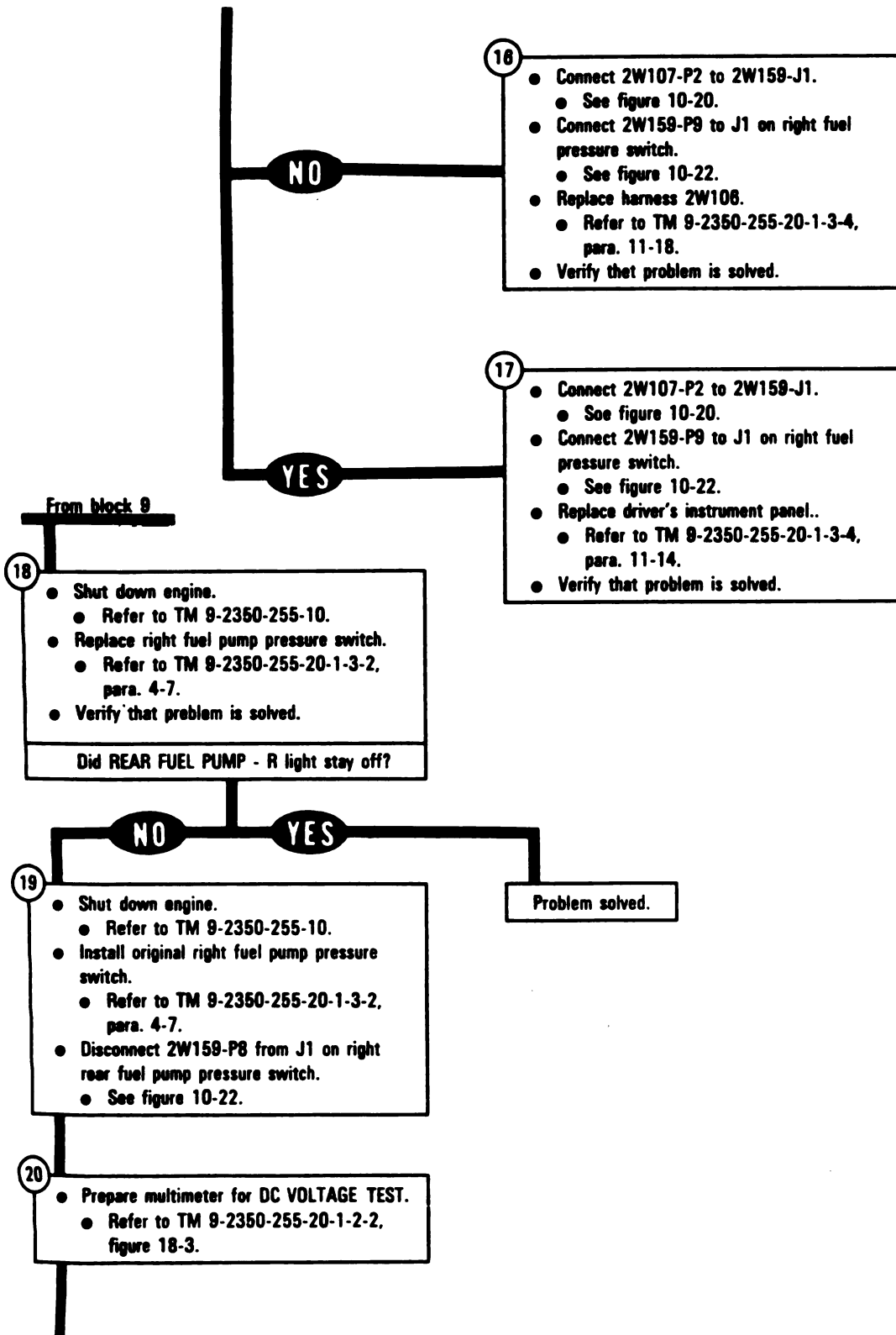


Figure 10-3 (Sheet 5 of 7)  
 Volume II  
 Para. 10-2



**TM 9-2350-255-20-1-2-1  
FUEL SUPPLY SYSTEM TROUBLESHOOTING**

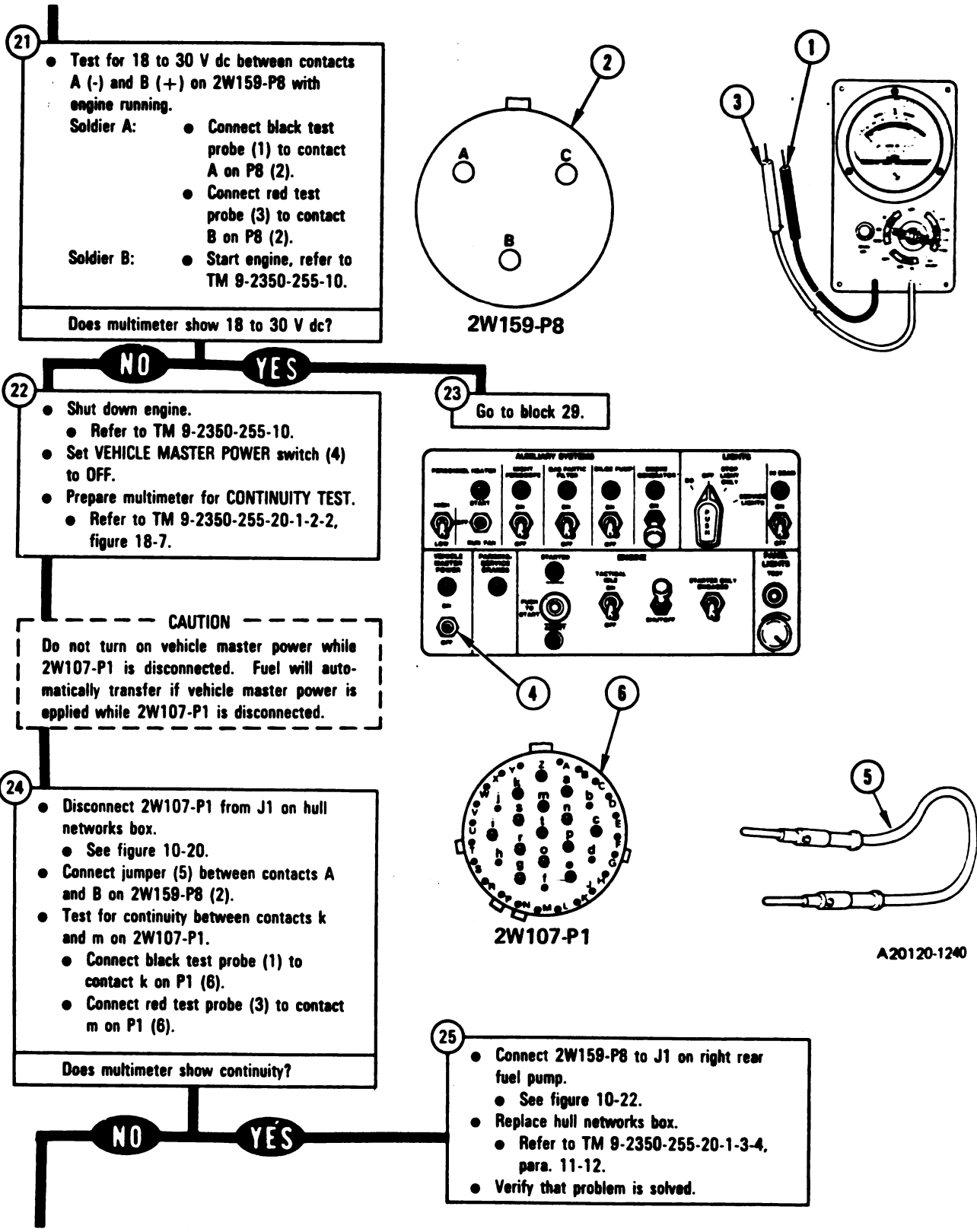


Figure 10-3 (Sheet 6 of 7)  
Volume II  
Para. 10-2

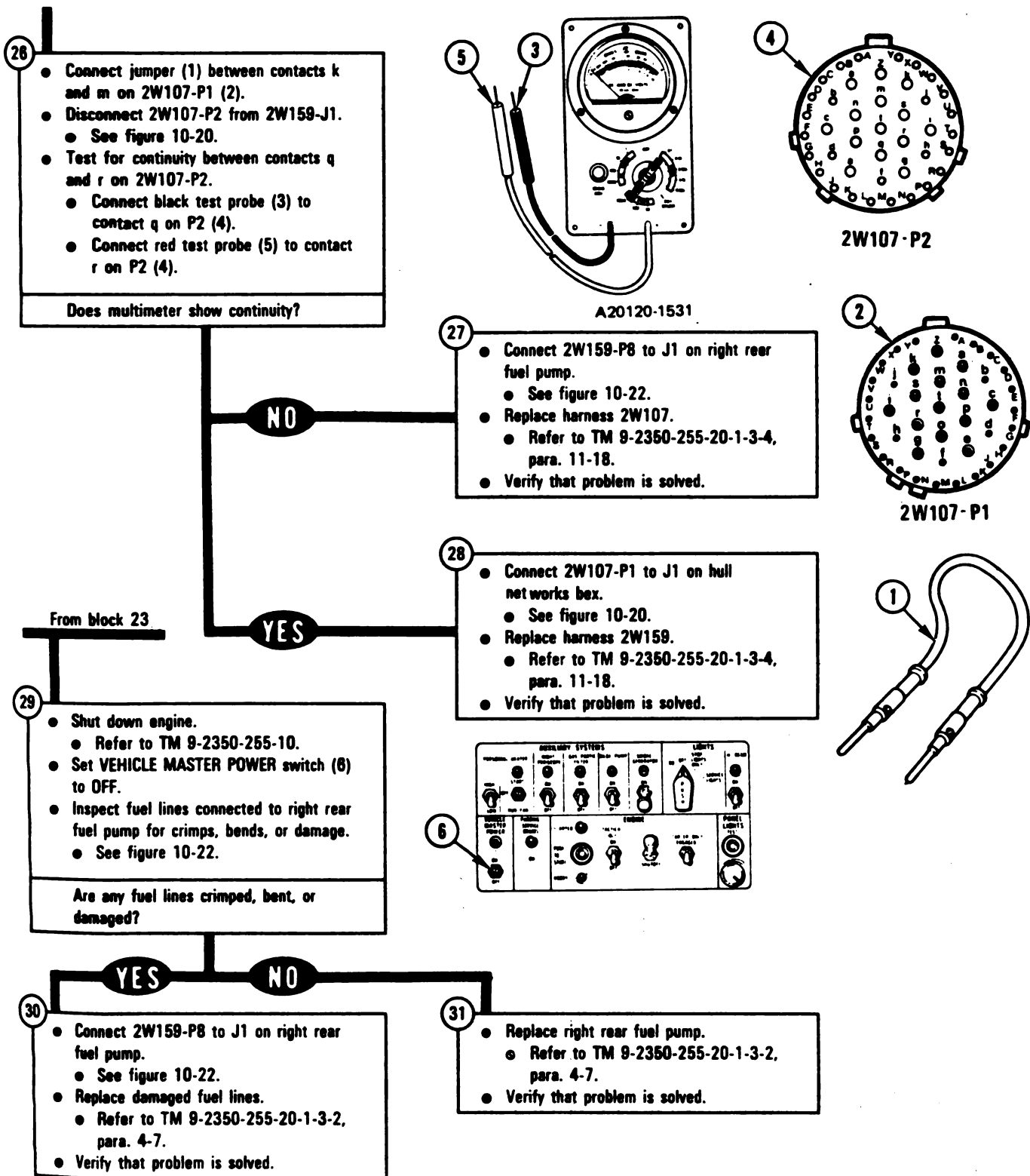


Figure 10-3 (Sheet 7 of 7)  
 Volume II  
 Para. 10-2

**SYMPTOM FSS-4**

**REAR FUEL PUMP - L LIGHT COMES ON  
AFTER ENGINE STARTS**

**Supplies:**

- Connector Pin/Socket Adapters
- Electrical Jumpers

**Test Equipment/Special Tools:**

- Breakout Box Tool Kit, 12311066
- Multimeter
- Pliers, slip joint, conduit style with plastic jaw inserts, NSN 5120-00-624-8065

**Equipment Condition:**

- Tank parked.
- Parking brake set.
- Engine shut down.
- Vehicle master power off.

**NOTE**

- Read para. 10-1 before doing any work.
- When jumpers are used, remove them after completing last instruction in that block.
- This is a two-man job. Soldier A is responsible for completing the job. Soldier B is the assistant and is directed by Soldier A. Soldier B will be used only in block 21.

1

- Set up tank controls for standard initial test conditions.
- Refer to table 10-2, para. 10-5.

*Figure 10-4 (Sheet 1 of 7)*  
**Volume II**  
**Para. 10-2**

to see if an electrical connector is on driver's instrument panel, hull networks box, cable junction bracket, feed plate, or left rear fuel pump that cause symptom FSS-4.

**NOTE**

If you find a loose connector, go immediately to block 3.

Try to turn 2W106-P5 connected to J2 on driver's instrument panel, see figure 10-20.

Try to turn 2W107-P1 connected to J1 on hull networks box, see figure 10-20.

Try to turn 2W106-P2 connected to 2W107-J1, see figure 10-20.

Try to turn 2W107-P2 connected to 2W159-J1, see figure 10-20.

Try to turn 2W159-P4 connected to J1 on left rear fuel pump, see figure 10-23.

Try to turn 2W159-P5 connected to J1 on left fuel pressure switch, see figure 10-23.

Is a connector loose?

**YES**

**NO**

Go to connector inspection procedure. See figure 10-19.

4

Go to block 7.

Are any connector parts faulty?

**NO**

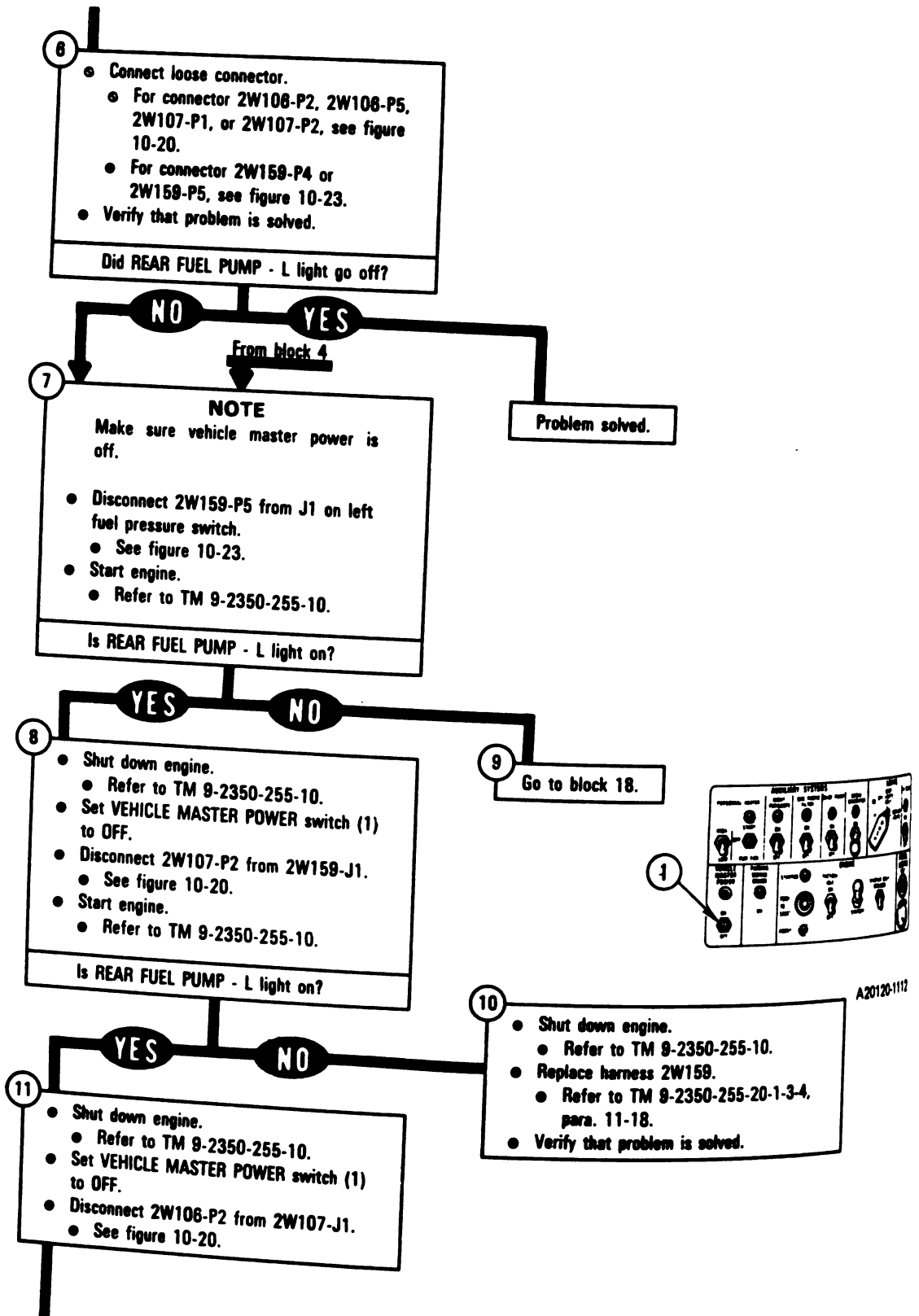
**YES**

5

- Replace assembly or harness that has faulty connector.
- For driver's instrument panel, refer to TM 9-2350-255-20-1-3-4, para. 11-14.
- For hull networks box, refer to TM 9-2350-255-20-1-3-4, para. 11-12.
- For left rear fuel pump, refer to TM 9-2350-255-20-1-3-2, para. 4-7.
- For left fuel pressure switch, refer to TM 9-2350-255-20-1-3-2, para. 4-8.
- For harness 2W106, 2W107, or 2W159, refer to TM 9-2350-255-20-1-3-4, para. 11-18.
- Verify that problem is solved.

Figure 10-4 (Sheet 2 of 7)  
 Volume II  
 Para. 10-2

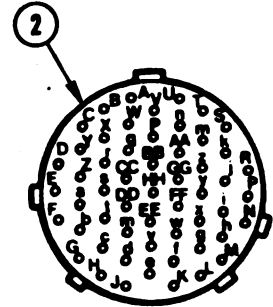
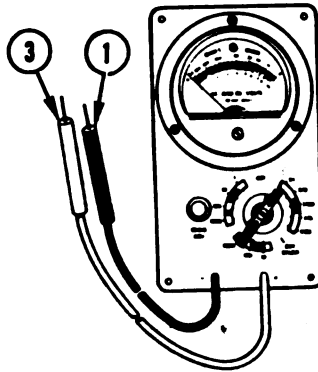
**TM 9-2350-255-20-1-2-1  
FUEL SUPPLY SYSTEM TROUBLESHOOTING**



*Figure 10-4 (Sheet 3 of 7)  
Volume II  
Para. 10-2*

12

- Prepare multimeter for SHORTS TEST.
- Refer to TM 9-2350-255-20-1-2-2, figure 18-6.



2W106-P2

13

**NOTE**

If multimeter shows a short, go immediately to block 15.

- Test for a short between contact P and connector body and all other contacts on 2W106-P2.
- Connect black test probe (1) to contact P on P2 (2).
- Connect red test probe (3) to all other contacts and connector body on P2 (2).

Does multimeter show a short between any contacts or connector body?

YES NO

14

- Connect 2W159-P9 to J1 on left fuel pressure switch.
- See figure 10-23.
- Replace harness 2W107.
- Refer to TM 9-2350-255-20-1-3-4, para. 11-18.
- Verify that problem is solved.

15

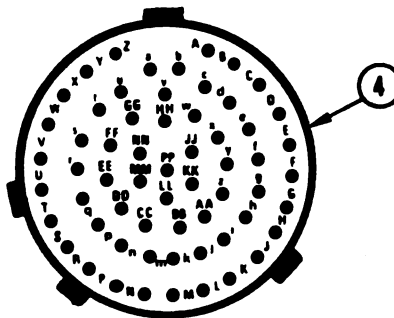
- Disconnect 2W106-P5 from J2 on driver's instrument panel.
- See figure 10-20.

**NOTE**

If multimeter shows a short, go immediately to block 17.

- Test for a short between contact q and all other contacts and connector body on driver's instrument panel J2.
- Connect black test probe (1) to contact q on J2 (4).
- Connect red test probe (3) to all other contacts and connector body on J2 (4).

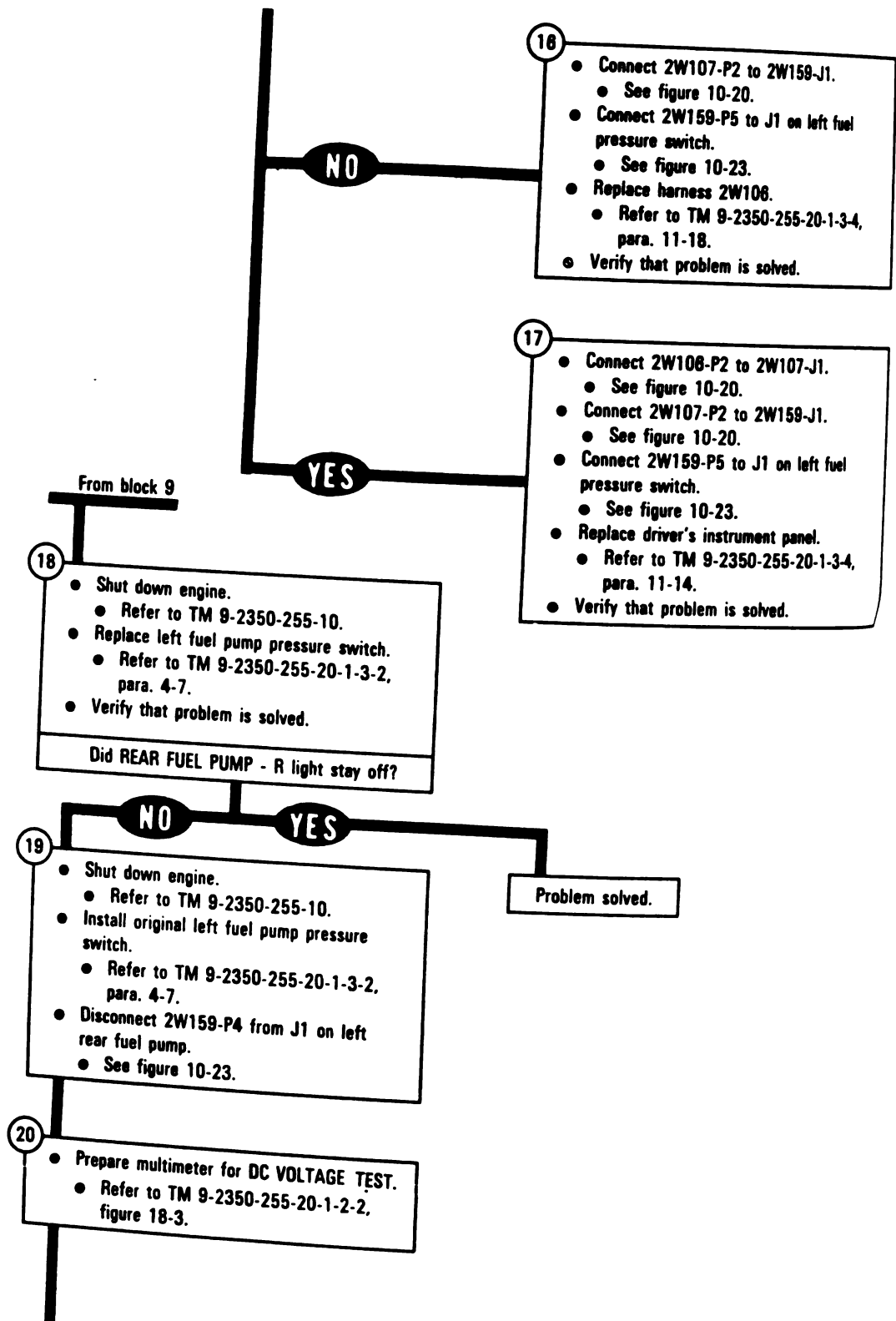
Does multimeter show a short between any contacts or connector body?



DIP-J2

Figure 10-4 (Sheet 4 of 7)  
Volume II  
Para. 10-2

**TM 9-2350-255-20-1-2-1  
FUEL SUPPLY SYSTEM TROUBLESHOOTING**



*Figure 10-4 (Sheet 5 of 7)  
Volume II  
Para. 10-2*

**21**

- Test for 18 to 30 V dc between contacts A (-) and B (+) on 2W159-P4 with engine running.

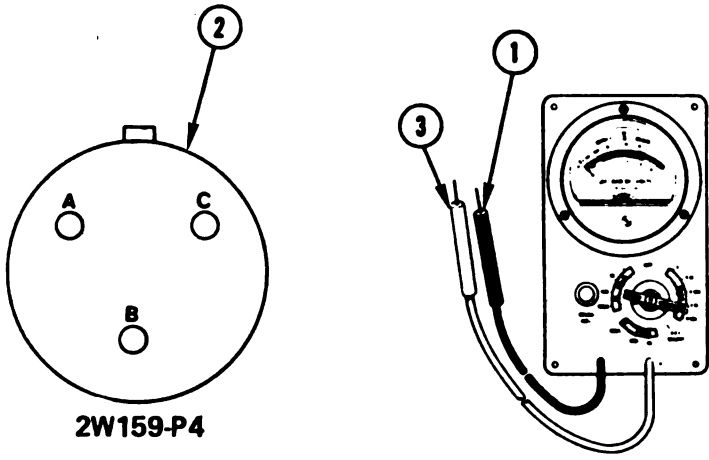
**Soldier A:**

- Connect black test probe (1) to contact A on P4 (2).
- Connect red test probe (3) to contact B on P4 (2).

**Soldier B:**

- Start engine, refer to TM 9-2350-255-10.

Does multimeter show 18 to 30 V dc?



**NO** **YES**

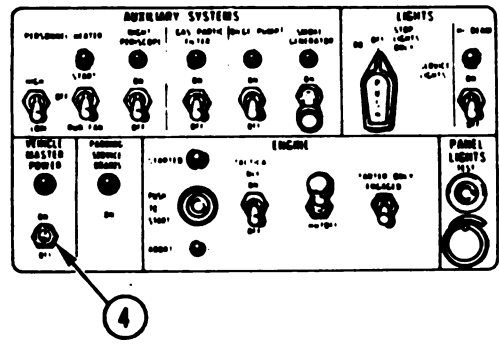
**22**

- Shut down engine.
- Refer to TM 9-2350-255-10.
- Set VEHICLE MASTER POWER switch (4) to OFF.
- Prepare multimeter for CONTINUITY TEST.
- Refer to TM 9-2350-255-20-1-2-2, figure 18-7.

**23** Go to block 29.

**CAUTION**

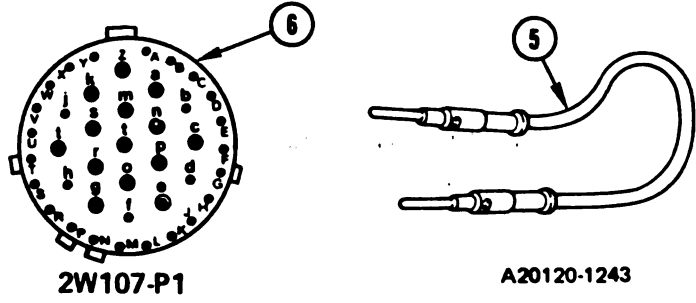
Do not turn on vehicle master power while 2W107-P1 is disconnected. Fuel will automatically transfer if vehicle master power is applied while 2W107-P1 is disconnected.



**24**

- Disconnect 2W107-P1 from J1 on hull networks box.
- See figure 10-20.
- Connect jumper (5) between contacts A and B on 2W159-P4 (2).
- Test for continuity between contacts n and p on 2W107-P1.
- Connect black test probe (1) to contact n on P1 (6).
- Connect red test probe (3) to contact p on P1 (6).

Does multimeter show continuity?



**NO** **YES**

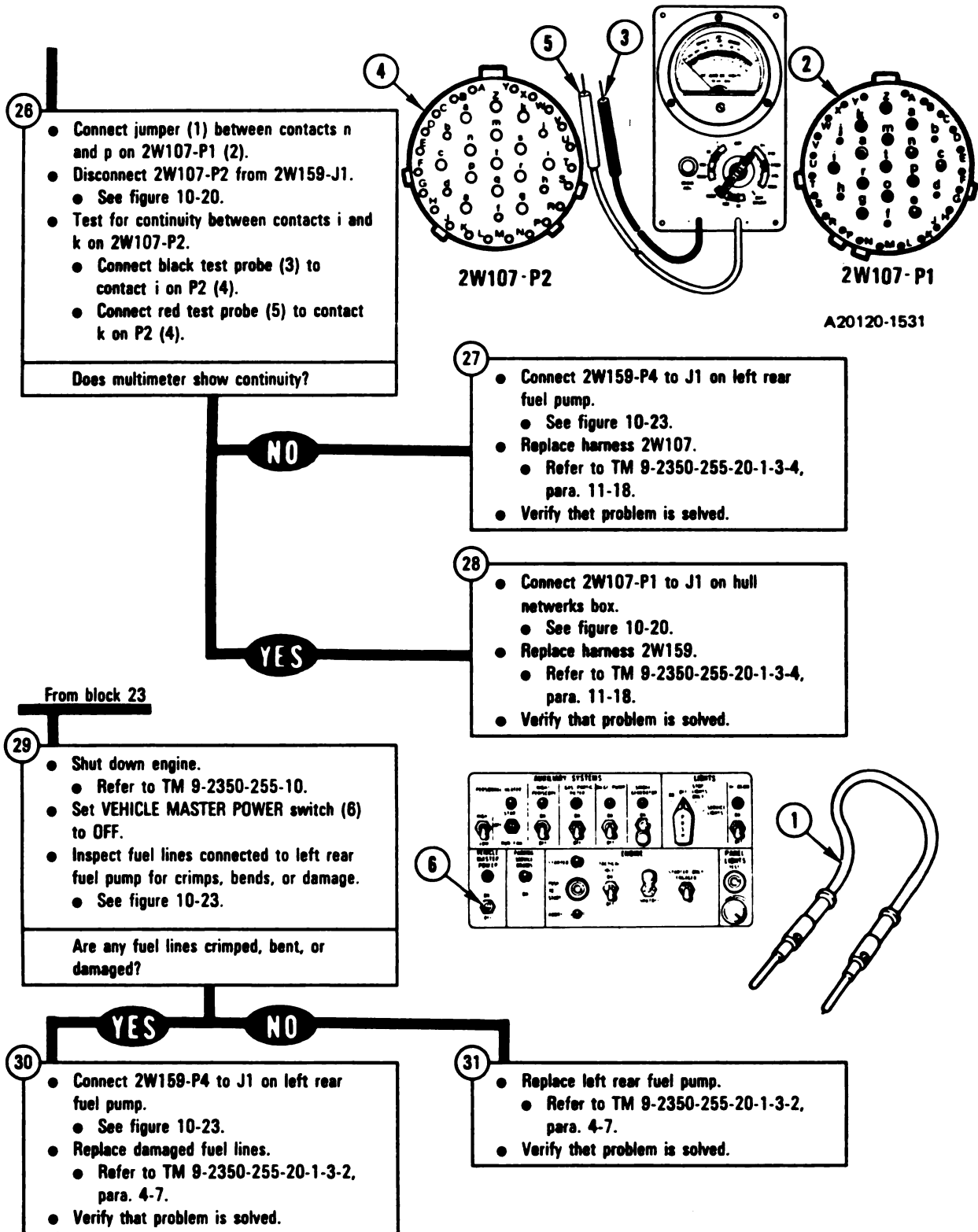
**25**

- Connect 2W159-P4 to J1 on left rear fuel pump.
- See figure 10-23.
- Replace hull networks box.
- Refer to TM 9-2350-255-20-1-3-4, para. 11-12.
- Verify that problem is solved.

Figure 10-4 (Sheet 6 of 7)  
Volume II  
Para. 10-2



**TM 9-2350-255-20-1-2-1  
FUEL SUPPLY SYSTEM TROUBLESHOOTING**



*Figure 10-4 (Sheet 7 of 7)  
Volume II  
Para. 10-2*

**SYMPTOM F8S-5**

**FUEL GAGE SHOWS ZERO IN ANY FUEL  
TANK SELECTOR SWITCH POSITION**

**Supplies:**

- Connector Pin/Socket Adapters
- Electrical Jumpers

**Test Equipment/Special Tools:**

- Breakout Box Tool Kit, 12311066
- Multimeter
- Pliers, slip joint, conduit style with plastic jaw inserts, NSN 5120-00-624-8065

**Equipment Condition:**

- Tank parked.
- Parking brake set.
- Engine shut down.
- Vehicle master power off.
- All fuel tanks full.

**NOTE**

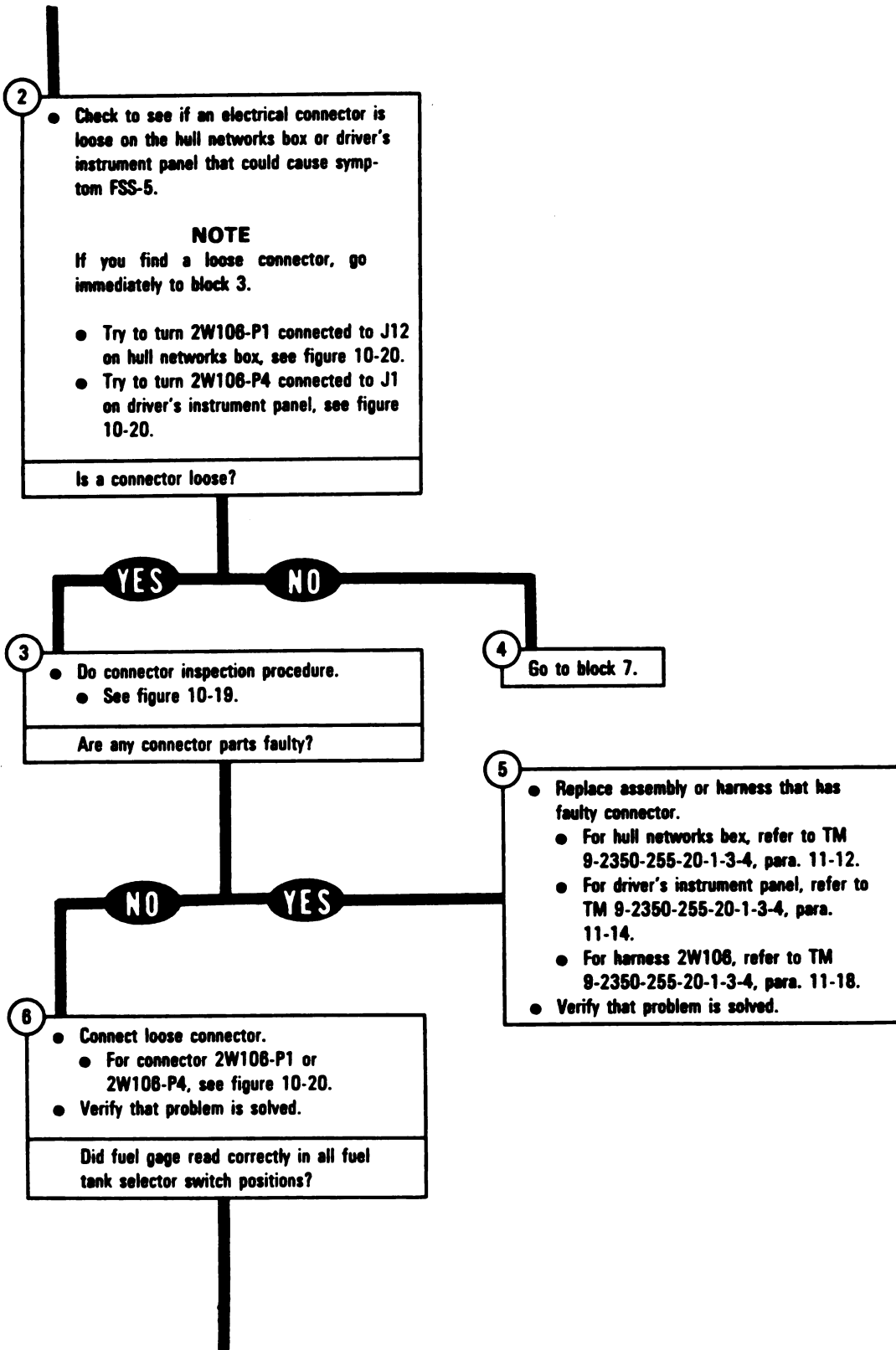
- Read para. 10-1 before doing any work.
- When jumpers are used, remove them after completing last instruction in that block.

1

- Set up tank controls for standard initial test conditions.
- Refer to table 10-2, para. 10-5.

*Figure 10-5 (Sheet 1 of 5)*  
**Volume II**  
**Para. 10-2**

**TM 9-2350-255-20-1-2-1  
FUEL SUPPLY SYSTEM TROUBLESHOOTING**



*Figure 10-5 (Sheet 2 of 5)  
Volume II  
Para. 10-2*

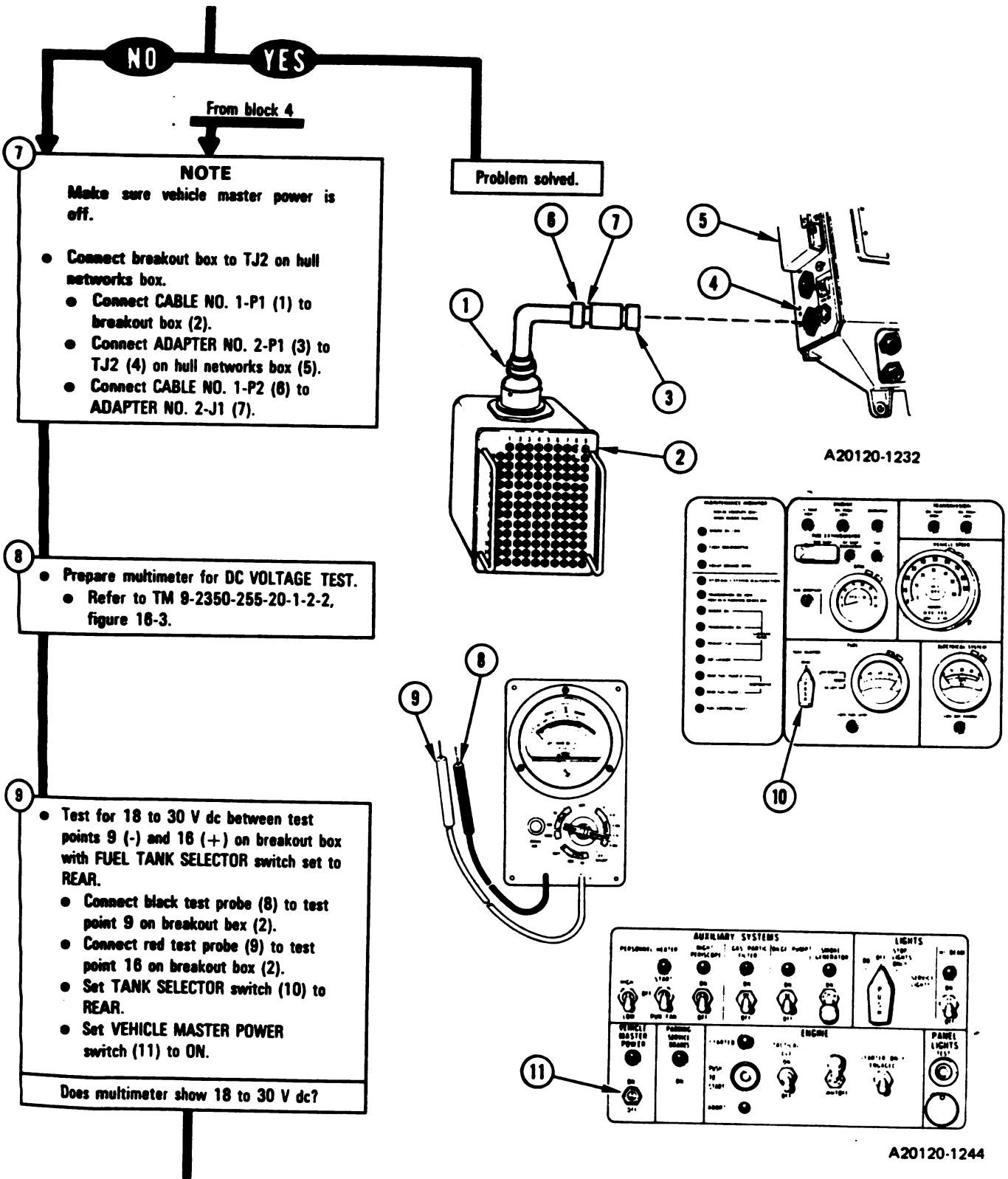
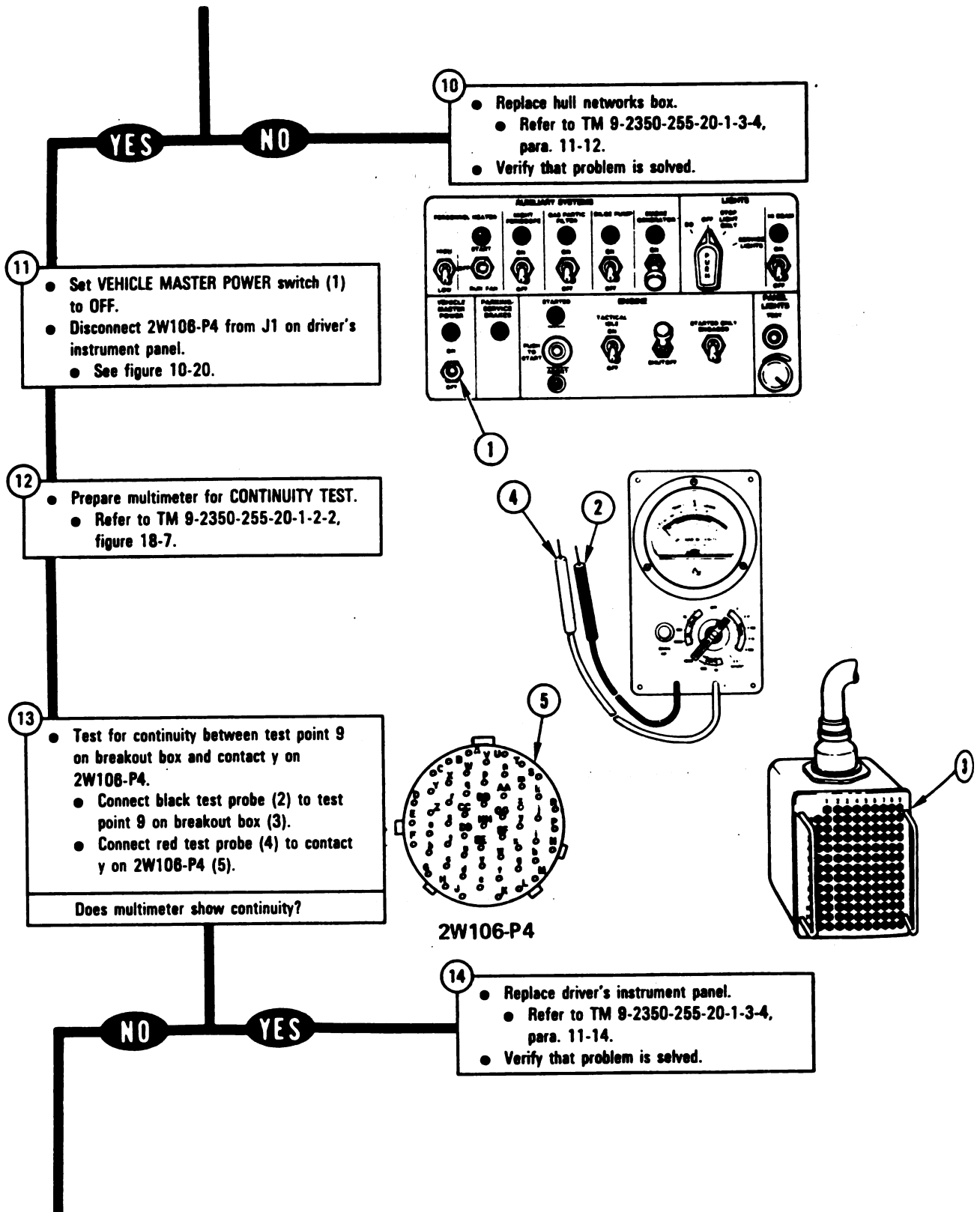


Figure 10-5 (Sheet 3 of 5)  
 Volume II  
 Para. 10-2

**TM 9-2350-255-20-1-2-1  
FUEL SUPPLY SYSTEM TROUBLESHOOTING**



*Figure 10-5 (Sheet 4 of 5)  
Volume II  
Para. 10-2*

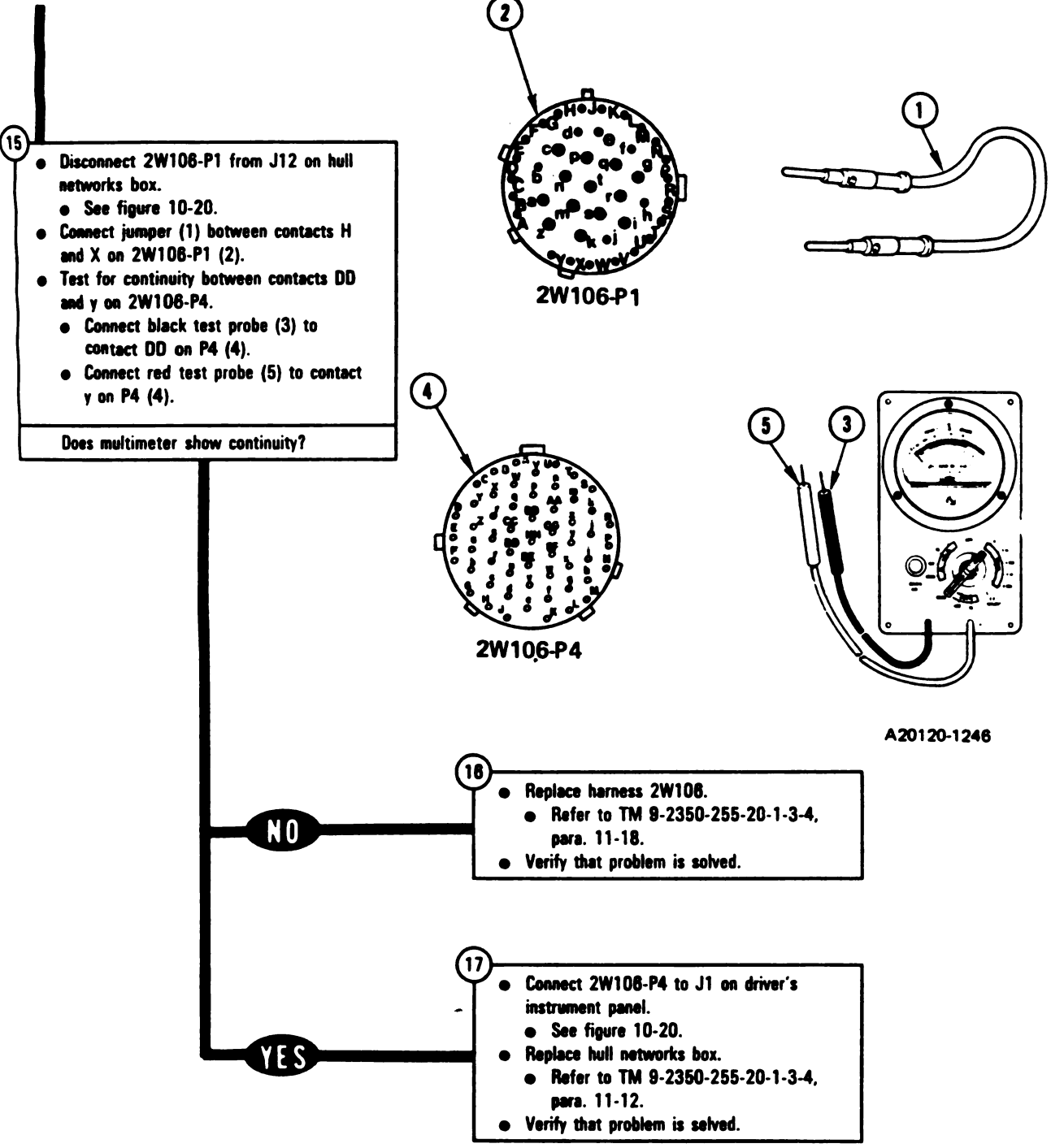


Figure 10-5 (Sheet 5 of 5)  
 Volume II  
 Para. 10-2

**SYMPTOM FSS-6**

**LEFT FRONT FUEL TANK SHOWS ZERO  
ON FUEL GAGE AT ALL TIMES - OTHER  
FUEL TANKS OK**

**Supplies:**

- Connector Pin/Socket Adapters
- Electrical Jumpers

**Test Equipment/Special Tools:**

- Breakout Box Tool Kit, 12311086
- Multimeter
- Pliers, slip joint, conduit style with plastic jaw inserts, NSN 5120-00-624-8065

**Equipment Condition:**

- Tank parked.
- Parking brake set.
- Engine shut down.
- Vehicle master power off.
- FUEL TANK SELECTOR switch set to RIGHT FRONT.
- All fuel tanks full.

**NOTE**

- Read para. 10-1 before doing any work.
- When jumpers are used, remove them after completing last instruction in that block.

1

- Set up tank controls for standard initial test conditions.
- Refer to table 10-2, para. 10-5.

*Figure 10-6 (Sheet 1 of 10)*  
**Volume II**  
**Para. 10-2**

to see if an electrical connector is on driver's instrument panel, hull networks box, or left front fuel tank cover that could cause symptom

**NOTE**

If you find a loose connector, go directly to block 3.

Try to turn 2W108-P4 connected to J12 on hull networks box, see figure 10-20.

Try to turn 2W108-P1 connected to J12 on hull networks box, see figure 10-20.  
 Try to turn 2W108-P7 connected to W108-1-J1, see figure 10-24.

connector loose?

YES

NO

connector inspection procedure. See figure 10-19.

Are any connector parts faulty?

NO

YES

4

Go to block 7.

5

- Replace assembly or harness that has faulty connector.
- For driver's instrument panel, refer to TM 9-2350-255-20-1-3-4, para. 11-14.
- For hull networks box, refer to TM 9-2350-255-20-1-3-4, para. 11-12.
- For harness 2W108, refer to TM 9-2350-255-20-1-3-4, para. 11-18.
- Verify that problem is solved.

Figure 10-6 (Sheet 2 of 10)  
 Volume II  
 Para. 10-2

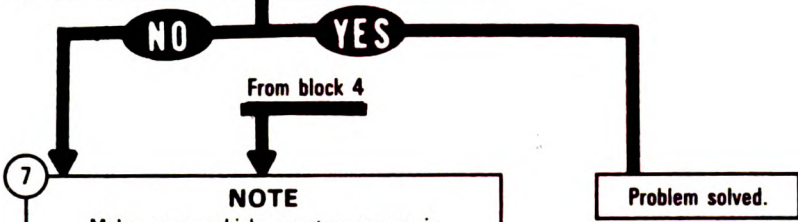


**TM 9-2350-255-20-1-2-1  
FUEL SUPPLY SYSTEM TROUBLESHOOTING**

**6**

- Connect loose connector.
  - For connector 2W106-P1 or 2W106-P4, see figure 10-20.
  - For connector 2W106-P7, see figure 10-24.
- Verify that problem is solved.

Did fuel gage show full?



**7**

**NOTE**

Make sure vehicle master power is off.

- Disconnect 2W105-P1 from J2 on hull networks box.
- See figure 10-20.
- Connect breakout box to TJ1 on driver's instrument panel.
- Connect CABLE NO. 1-P1 (1) to breakout box (2).
- Connect ADAPTER NO. 2-P1 (3) to TJ1 (4) on driver's instrument panel (5).
- Connect CABLE NO. 1-P2 (6) to ADAPTER NO. 2-J1 (7).

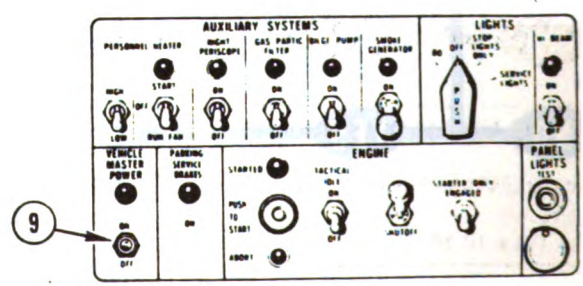
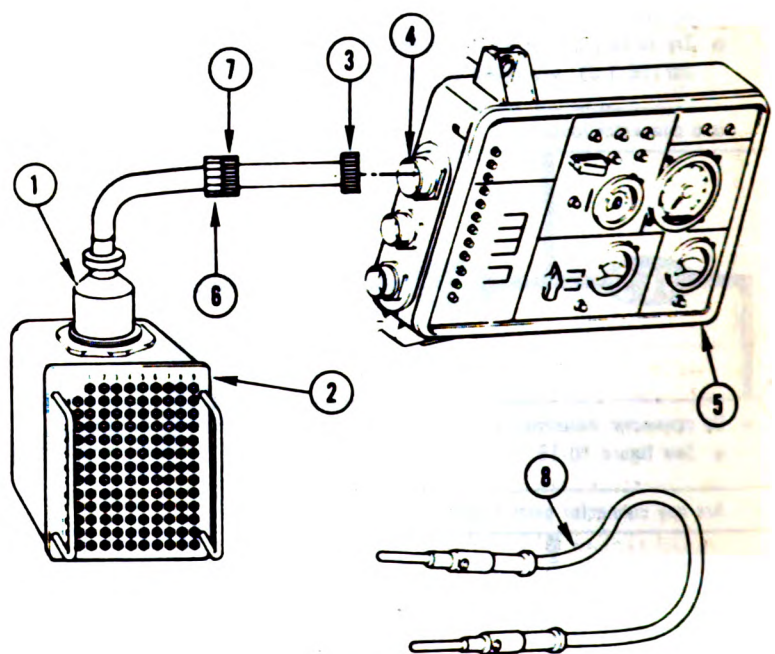
**CAUTION**

Make sure FUEL TANK SELECTOR switch is set to RIGHT FRONT. Failure to do so could cause damage to fuel gage.

**8**

- Connect jumper (8) between test points 20 and 21 on breakout box (2).
- Set VEHICLE MASTER POWER switch (9) to ON.

Does fuel gage show full?



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*Figure 10-6 (Sheet 3 of 10)  
Volume II  
Para. 10-2*

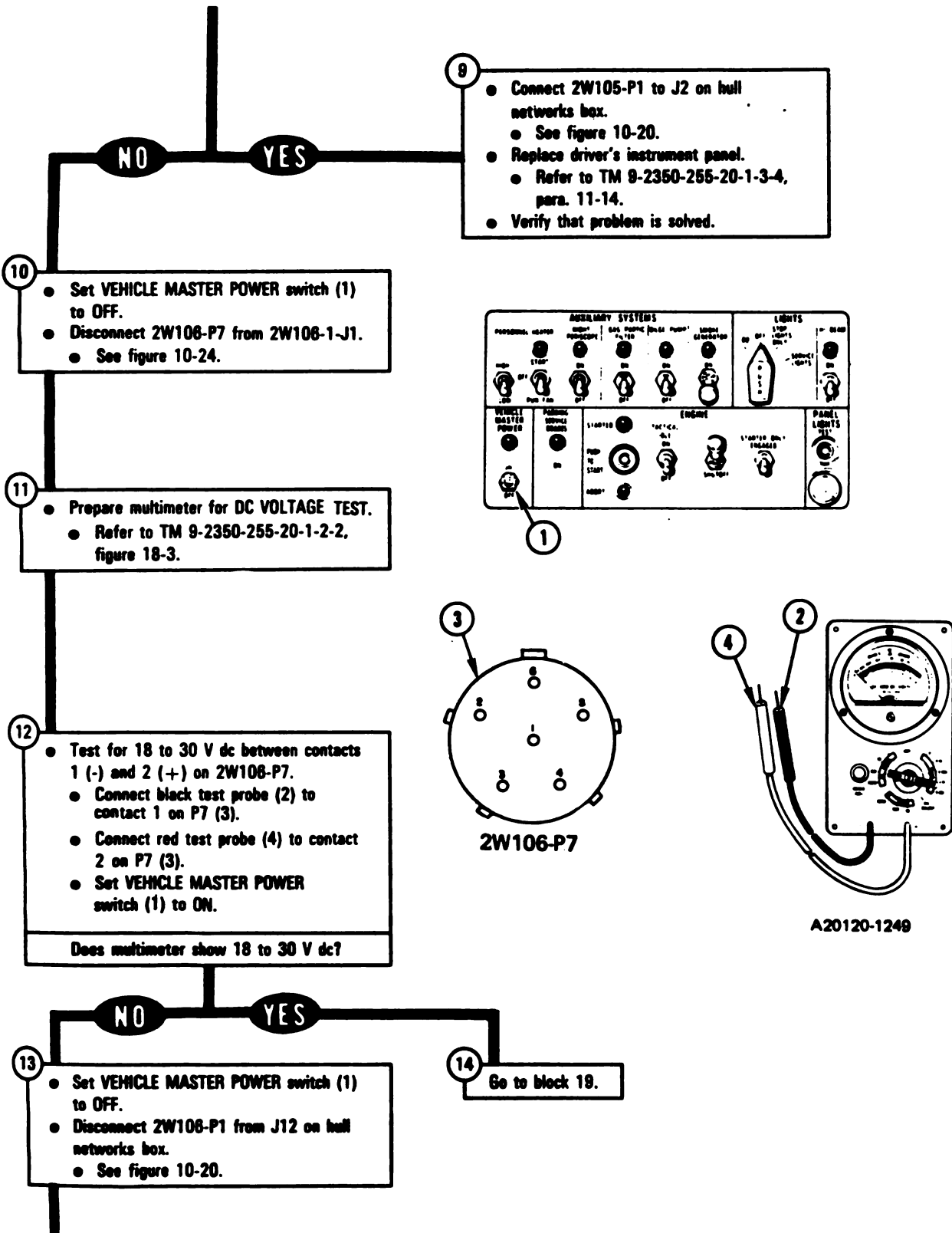
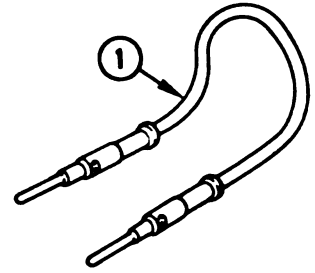
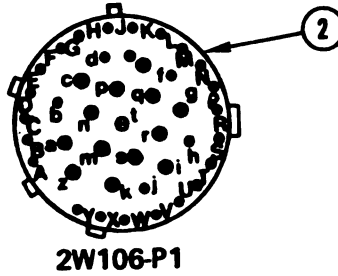


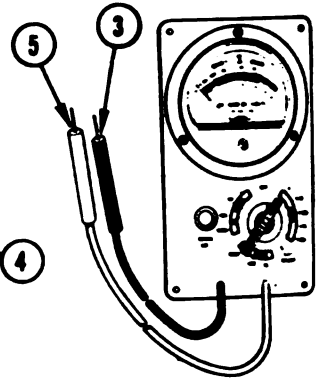
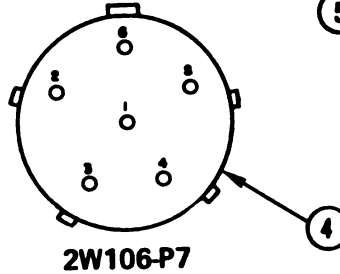
Figure 10-6 (Sheet 4 of 10)  
Volume II  
Para. 10-2

**TM 9-2350-255-20-1-2-1  
FUEL SUPPLY SYSTEM TROUBLESHOOTING**

15 ● Prepare multimeter for CONTINUITY TEST.  
● Refer to TM 9-2350-255-20-1-2-2, figure 18-7.



16 ● Connect jumper (1) between contacts U and V on 2W106-P1 (2).  
● Test for continuity between contacts 1 and 2 on 2W106-P7.  
● Connect black test probe (3) to contact 1 on P7 (4).  
● Connect red test probe (5) to contact 2 on P7 (4).



Does multimeter show continuity?

**NO**

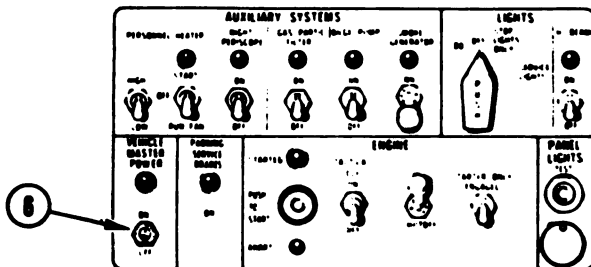
17 ● Connect 2W105-P1 to J2 on hull networks box.  
● See figure 10-20.  
● Replace harness 2W108.  
● Refer to TM 9-2350-255-20-1-3-4, para. 11-18.  
● Verify that problem is solved.

**YES**

18 ● Connect 2W106-P7 to 2W108-1-J1.  
● See figure 10-24.  
● Replace hull networks box.  
● Refer to TM 9-2350-255-20-1-3-4, para. 11-12.  
● Verify that problem is solved.

From block 14

19 ● Set VEHICLE MASTER POWER switch (8) to OFF.  
● Prepare multimeter for CONTINUITY TEST.  
● Refer to TM 9-2350-255-20-1-2-2, figure 18-7.



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Figure 10-6 (Sheet 5 of 10)  
Volume II  
Para. 10-2

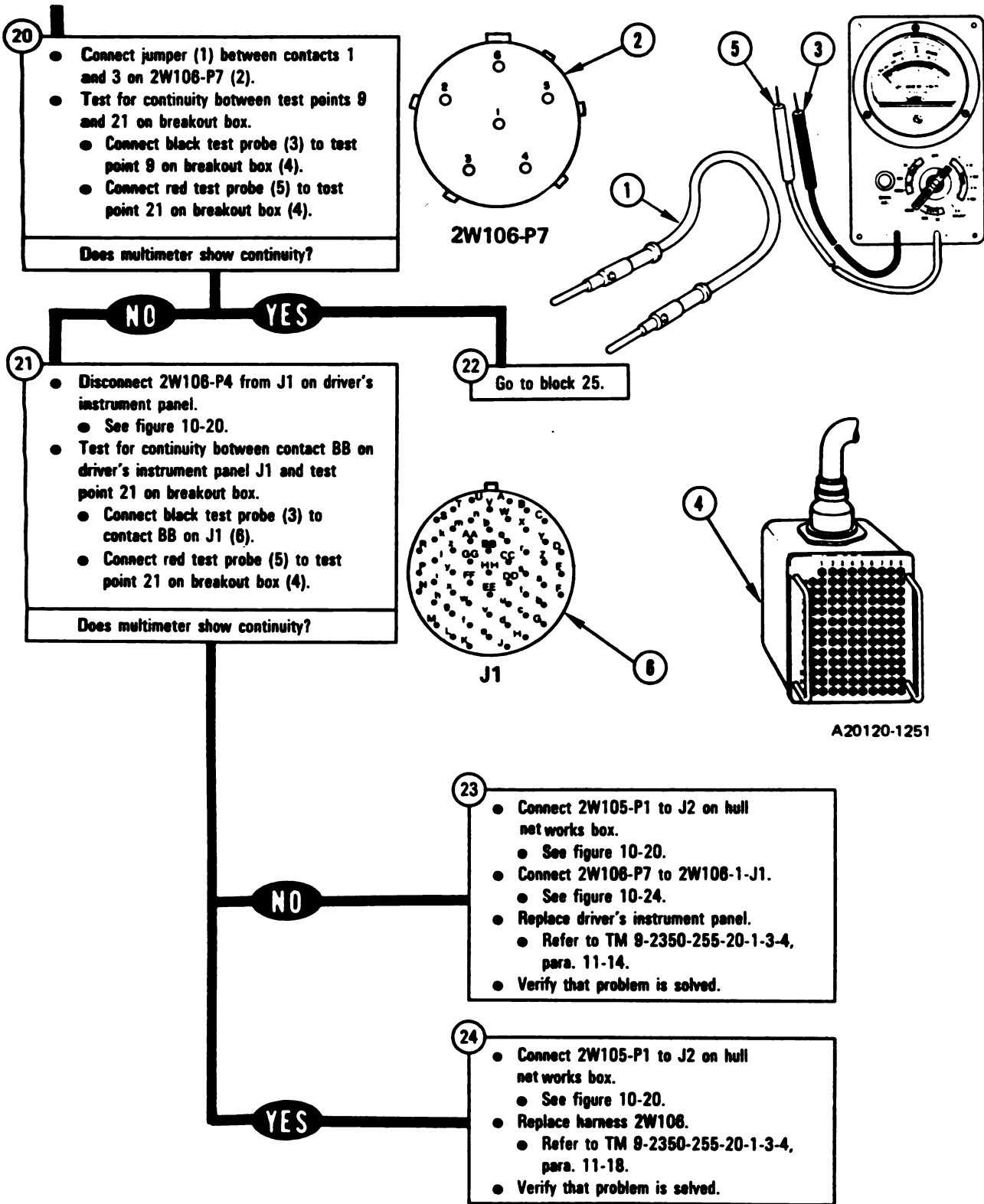
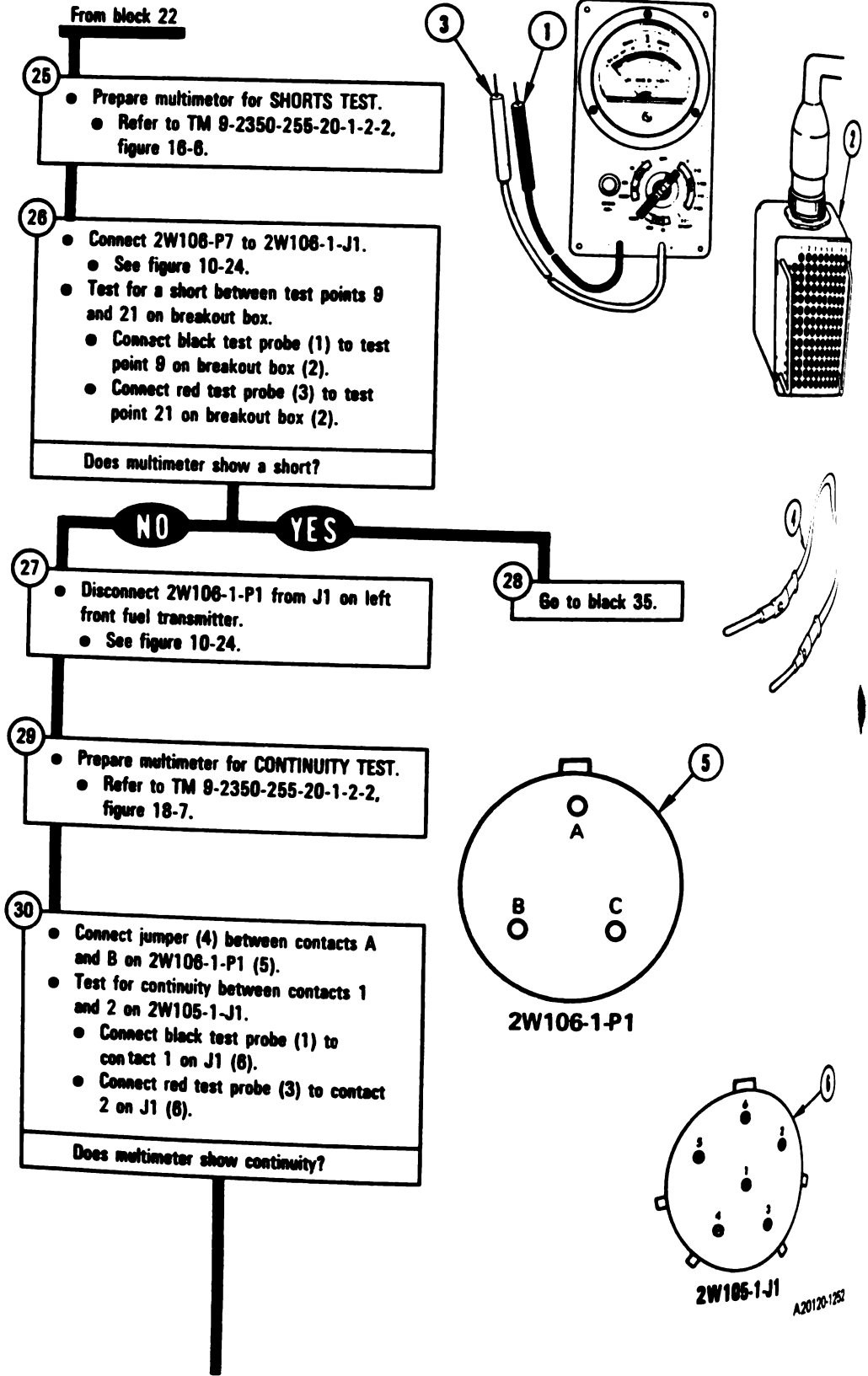


Figure 10-6 (Sheet 6 of 10)  
 Volume II  
 Para. 10-2

**TM 9-2350-255-20-1-2-1  
FUEL SUPPLY SYSTEM TROUBLESHOOTING**



*Figure 10-6 (Sheet 7 of 10)  
Volume II  
Para. 10-2*

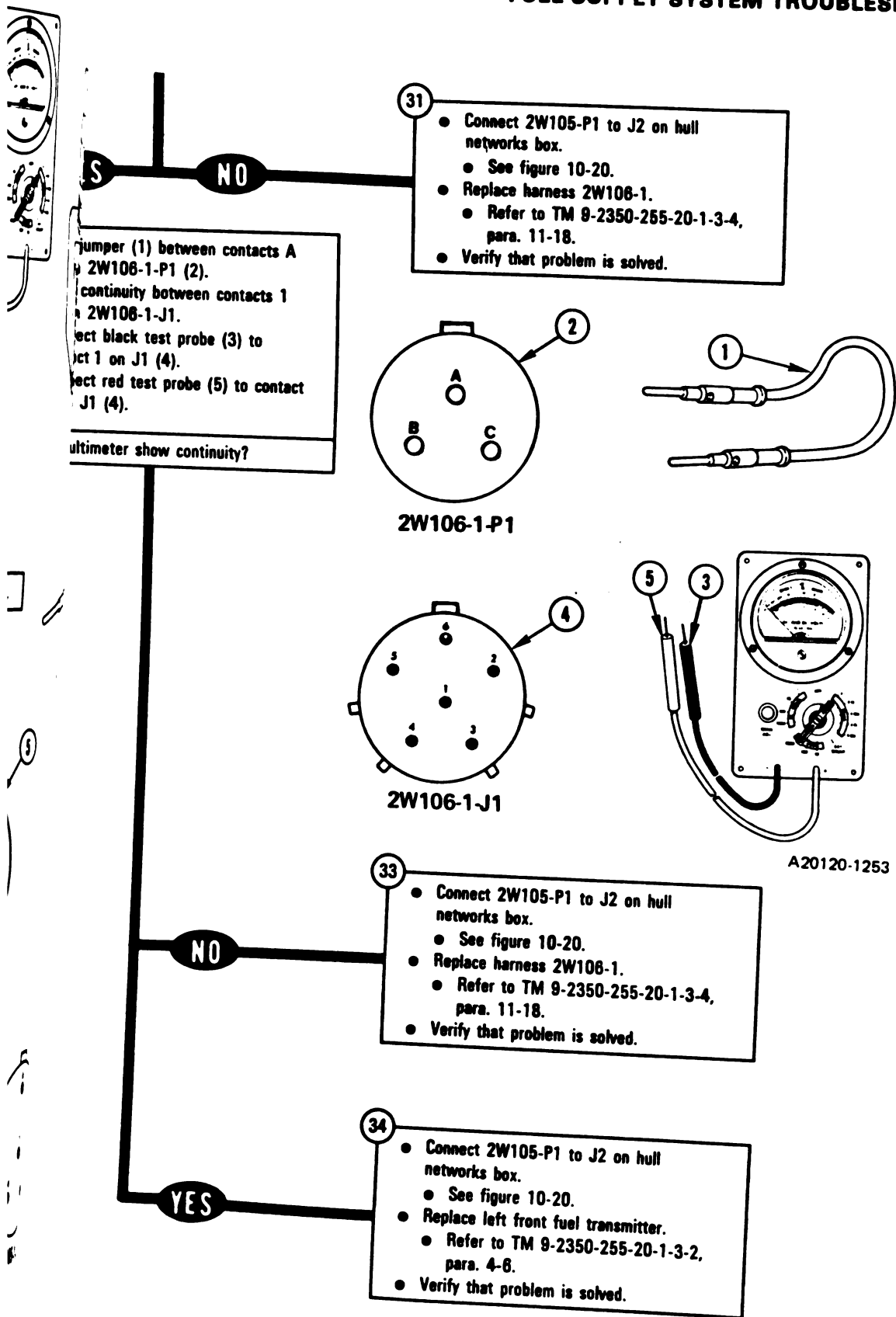


Figure 10-6 (Sheet 8 of 10)  
 Volume II  
 Para. 10-2

TM 9-2350-255-20-1-2-1  
**FUEL SUPPLY SYSTEM TROUBLESHOOTING**

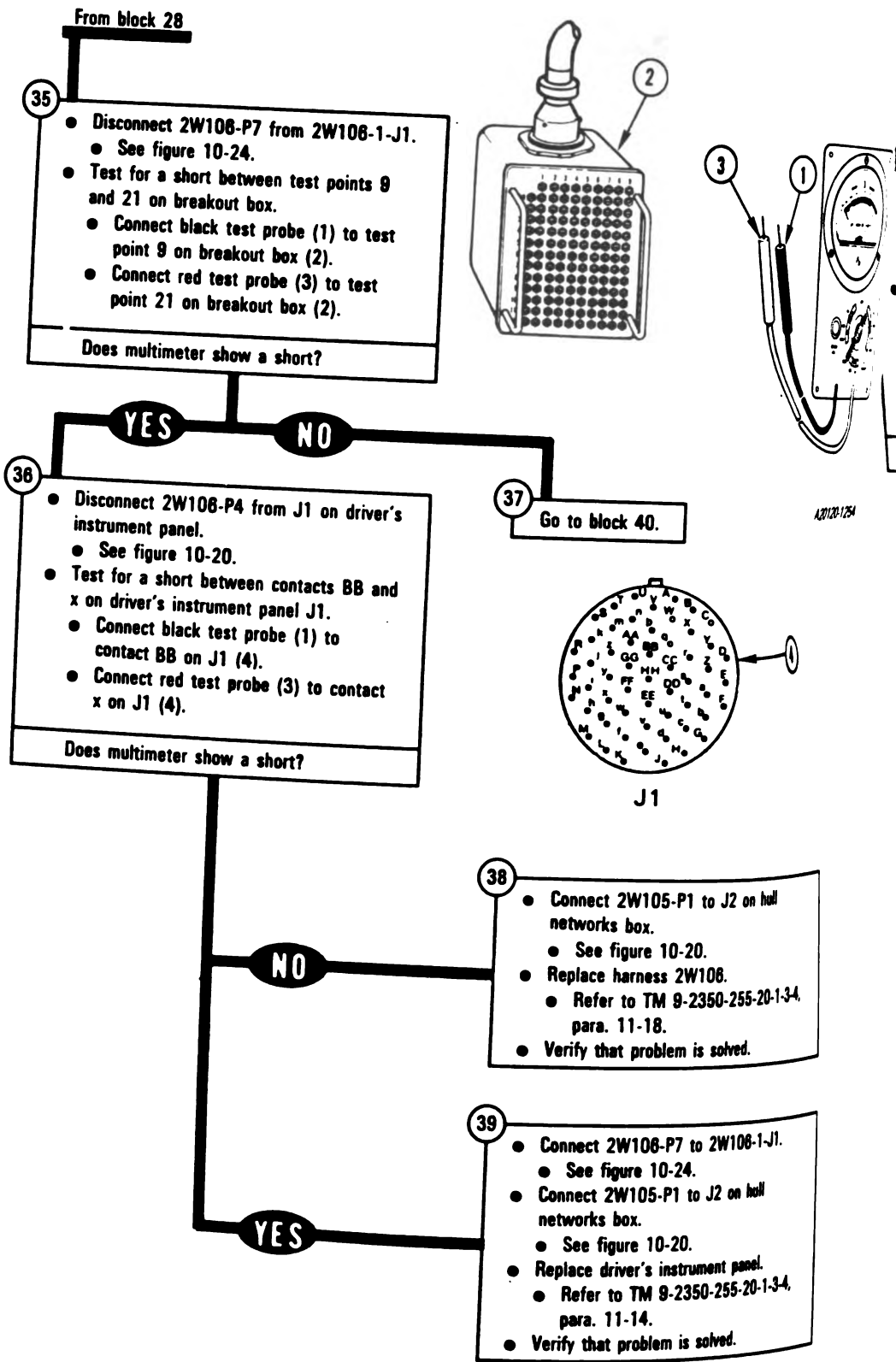


Figure 10-6 (Sheet 9 of 10)  
 Volume II  
 Para. 10-2

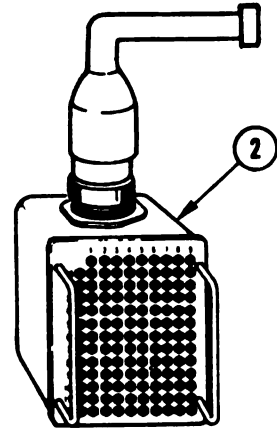
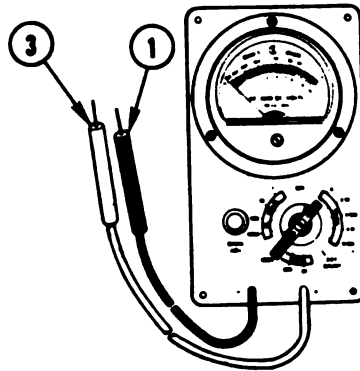
10-50 Change 6

From block 37

40

- Connect 2W106-P7 to 2W106-1-J1.
  - See figure 10-24.
- Disconnect 2W106-1-P1 from J1 on left front fuel level transmitter.
  - See figure 10-24.
- Test for a short between test points 9 and 21 on breakout box.
  - Connect black test probe (1) to test point 9 on breakout box (2).
  - Connect red test probe (3) to test point 21 on breakout box (2).

Does multimeter show a short?



A20120-1260

NO

41

- Connect 2W105-P1 to J2 on hull networks box.
  - See figure 10-20.
- Replace left front fuel level transmitter.
  - Refer to TM 9-2350-255-20-1-3-2, para. 4-6.
- Verify that problem is solved.

YES

42

- Connect 2W105-P1 to J2 on hull networks box.
  - See figure 10-20.
- Replace harness 2W106-1.
  - Refer to TM 9-2350-255-20-1-3-4, para. 11-18.
- Verify that problem is solved.

Figure 10-6 (Sheet 10 of 10)  
 Volume II  
 Para. 10-2



**SYMPTOM FSS-7**

**RIGHT FRONT FUEL TANK SHOWS ZERO  
ON FUEL GAGE AT ALL TIMES - OTHER  
FUEL TANKS OK**

**Supplies:**

- Connector Pin/Socket Adapters
- Electrical Jumpers

**Test Equipment/Special Tools:**

- Breakout Box Tool Kit, 12311066
- Multimeter
- Pliers, slip joint, conduit style with plastic jaw inserts, NSN 5120-00-624-8085

**Equipment Condition:**

- Tank parked.
- Parking brake set.
- Engine shut down.
- Vehicle master power off.
- FUEL TANK SELECTOR switch set to LEFT FRONT.
- All fuel tanks full.

**NOTE**

- Read para. 10-1 before doing any work.
- When jumpers are used, remove them after completing last instruction in that block.

1

- Set up tank controls for standard initial test conditions.
- Refer to table 10-2, para. 10-5.

*Figure 10-7 (Sheet 1 of 13)*  
**Volume II**  
**Para. 10-2**

See if an electrical connector is loose at driver's instrument panel, hull networks box, or right front fuel tank. Verify that connector is not loose.

**NOTE**

If you find a loose connector, go directly to block 3.

Do not turn 2W106-P4 connected to driver's instrument panel, see figure 10-20.

Do not turn 2W106-P1 connected to hull networks box, see figure 10-20.  
 Do not turn 2W105-P1 connected to hull networks box, see figure 10-20.  
 Do not turn 2W105-P3 connected to 05-1-J1, see figure 10-24.

Connector loose?

**YES** **NO**

Follow connector inspection procedure, figure 10-19.

Connector parts faulty?

**NO** **YES**

4 Go to block 7.

- 5
- Replace assembly or harness that has faulty connector.
  - For driver's instrument panel, refer to TM 9-2350-255-20-1-3-4, para. 11-14.
  - For hull networks box, refer to TM 9-2350-255-20-1-3-4, para. 11-12.
  - For harness 2W105, 2W106, or 2W105-1, refer to TM 9-2350-255-20-1-3-4, para. 11-18.
  - Verify that problem is solved.

Figure 10-7 (Sheet 2 of 13)  
 Volume II  
 Para. 10-2

**TM 9-2350-255-20-1-2-1  
FUEL SUPPLY SYSTEM TROUBLESHOOTING**

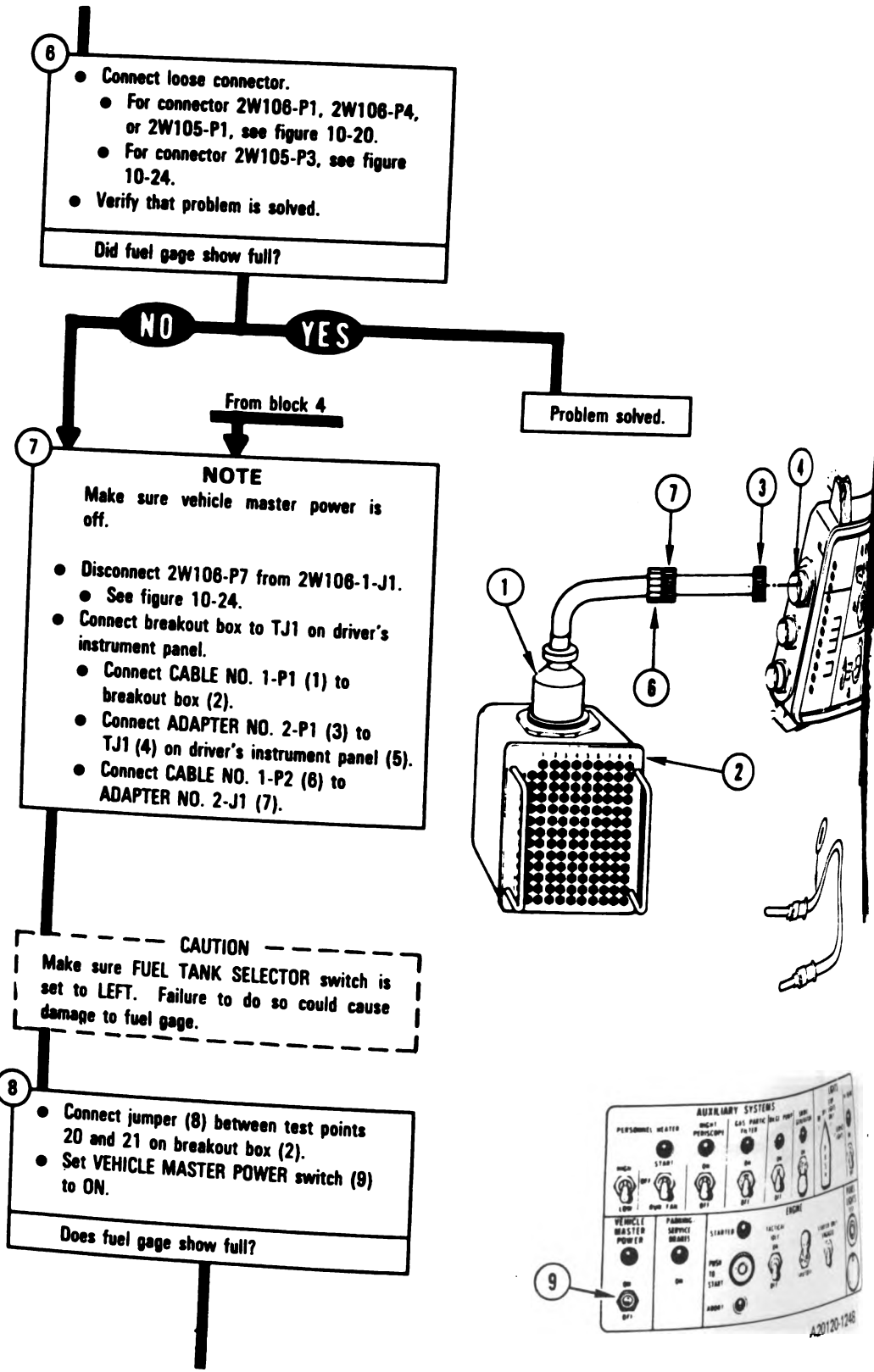
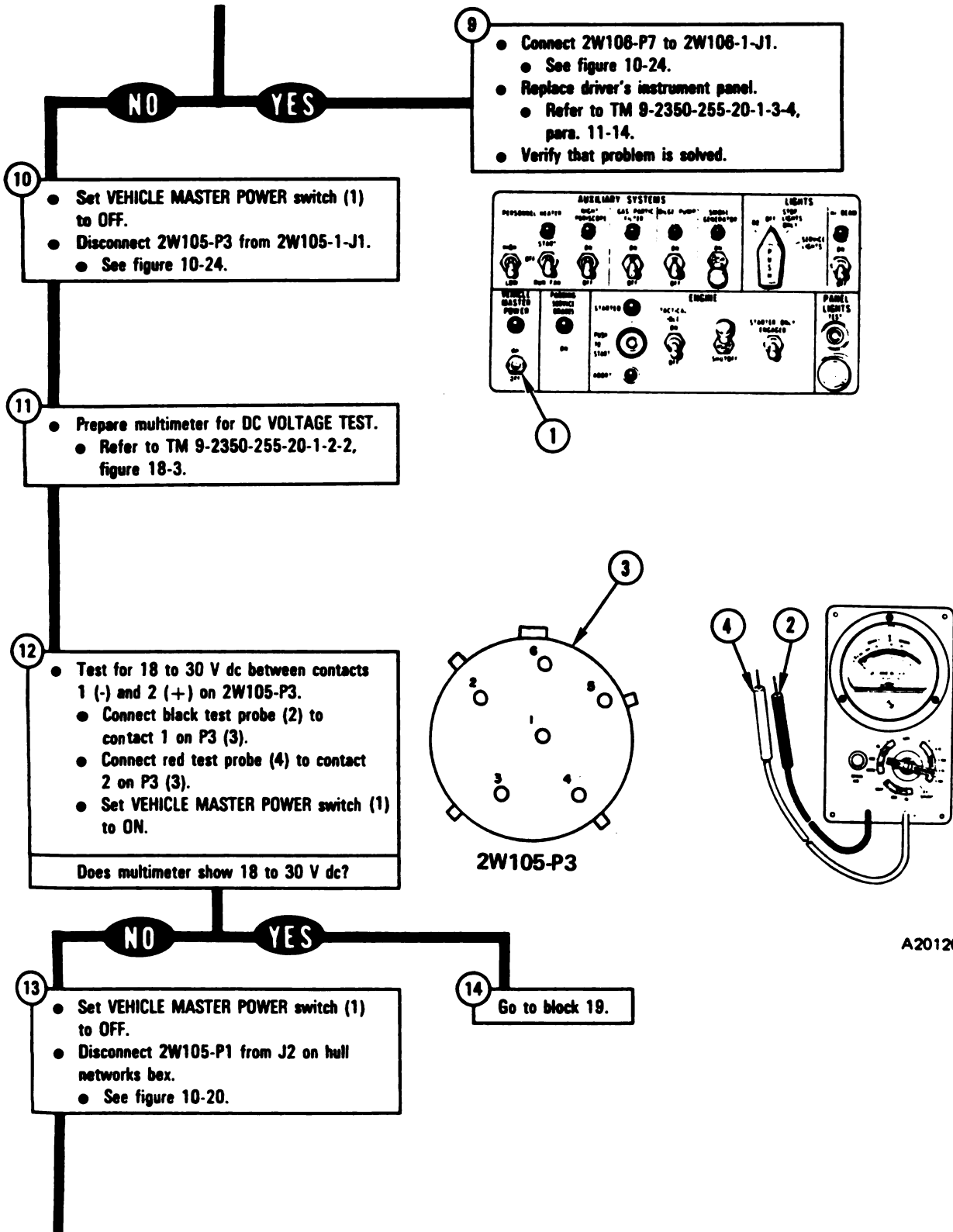


Figure 10-7 (Sheet 3 of 13)  
Volume II  
Para. 10-2



A20120-1256

Figure 10-7 (Sheet 4 of 13)  
 Volume II  
 Para. 10-2

**TM 9-2350-255-20-1-2-1  
FUEL SUPPLY SYSTEM TROUBLESHOOTING**

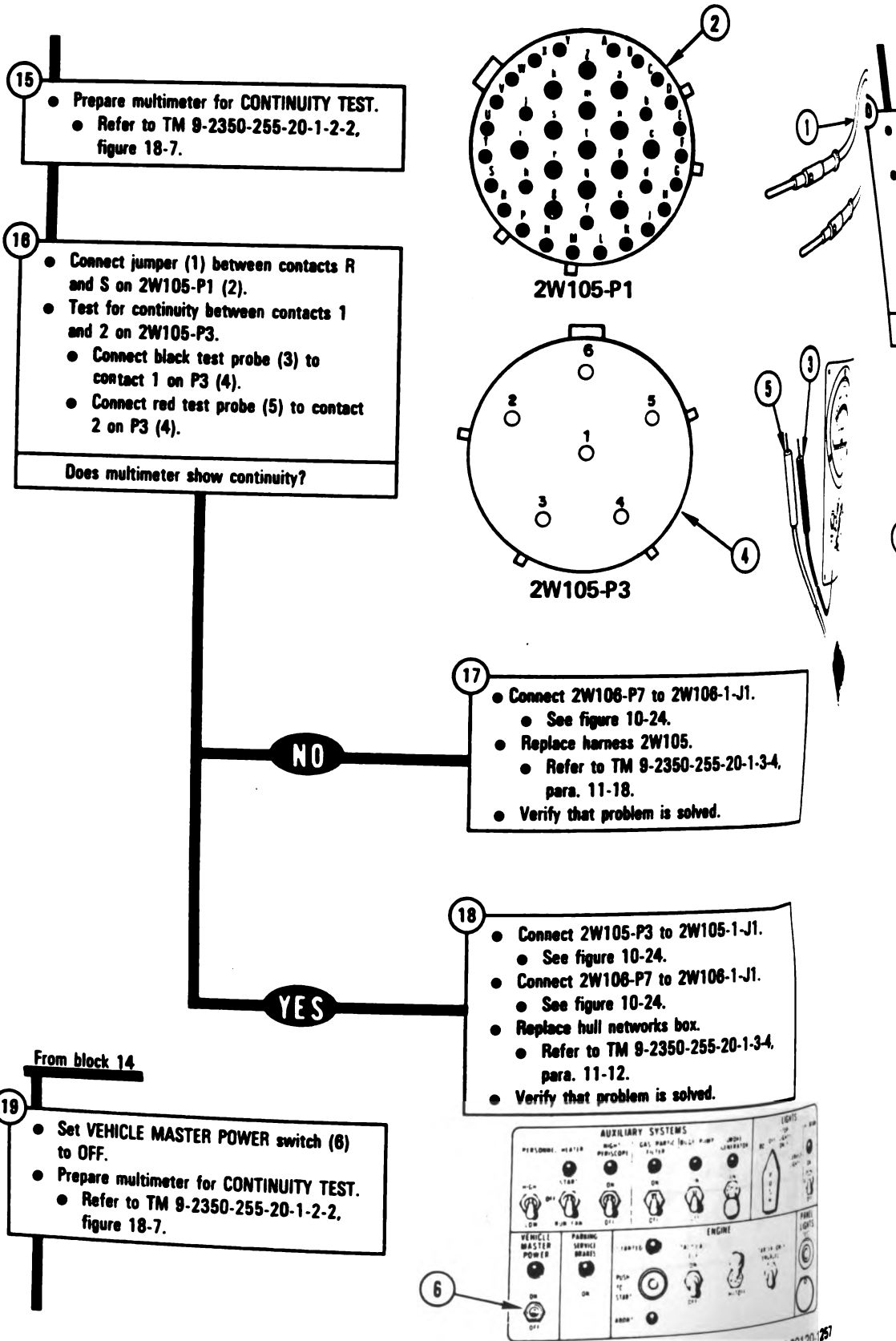


Figure 10-7 (Sheet 5 of 13)

**Volume II  
Para. 10-2**

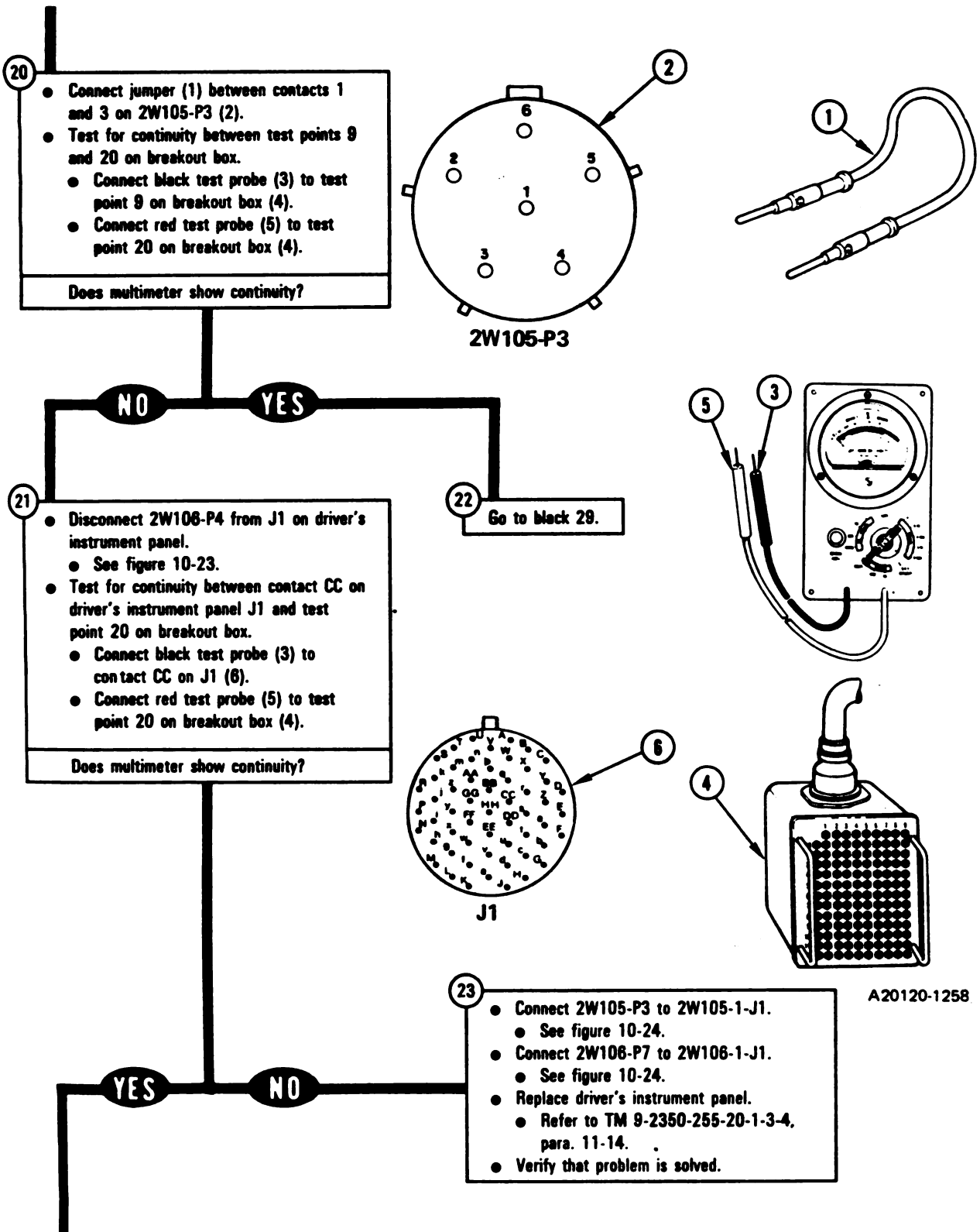
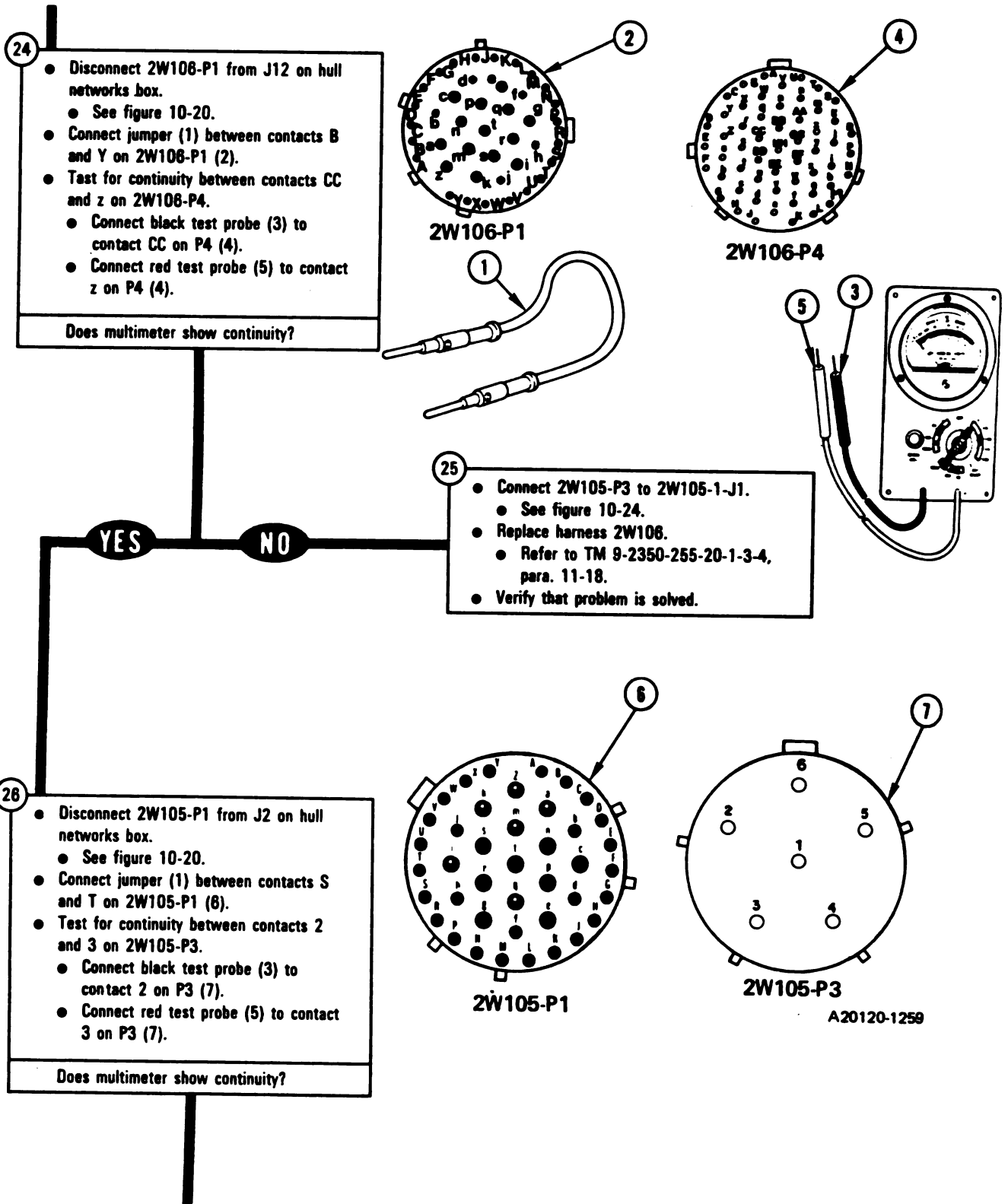
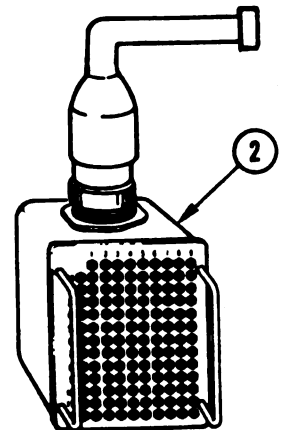
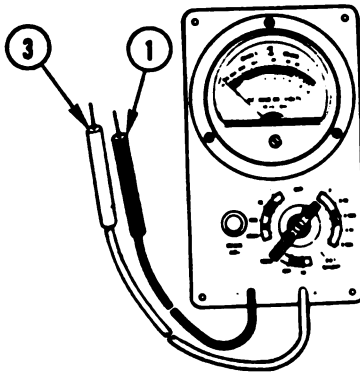
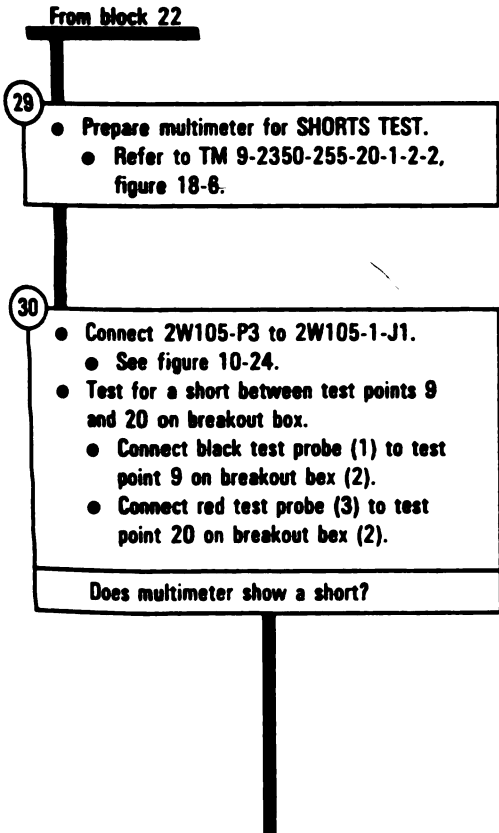
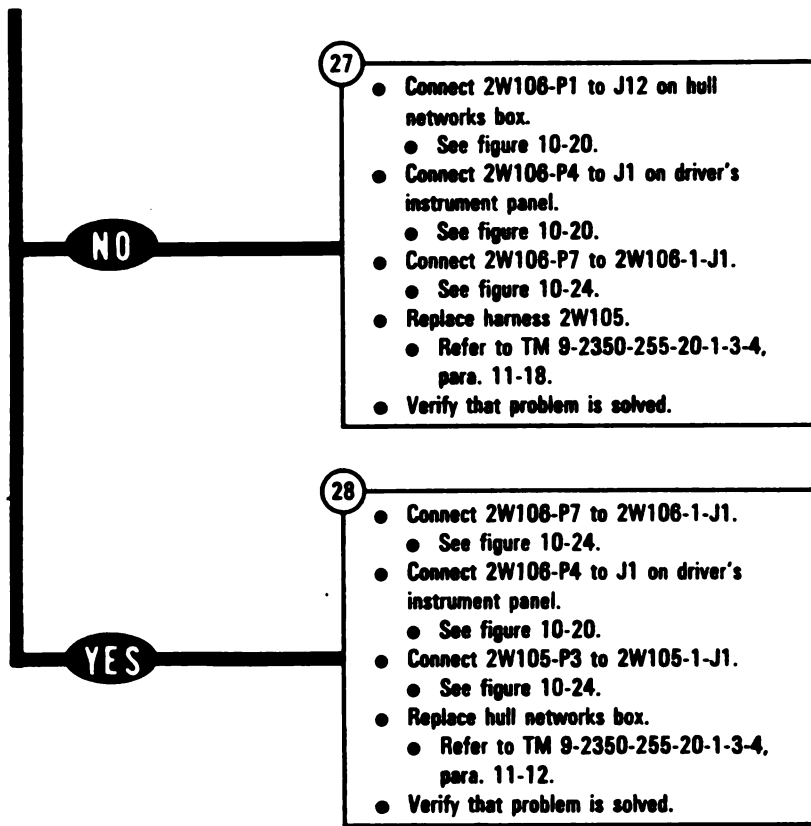


Figure 10-7 (Sheet 6 of 13)  
 Volume II  
 Para. 10-2

**TM 9-2350-255-20-1-2-1  
FUEL SUPPLY SYSTEM TROUBLESHOOTING**



*Figure 10-7 (Sheet 7 of 13)  
Volume II  
Para. 10-2*

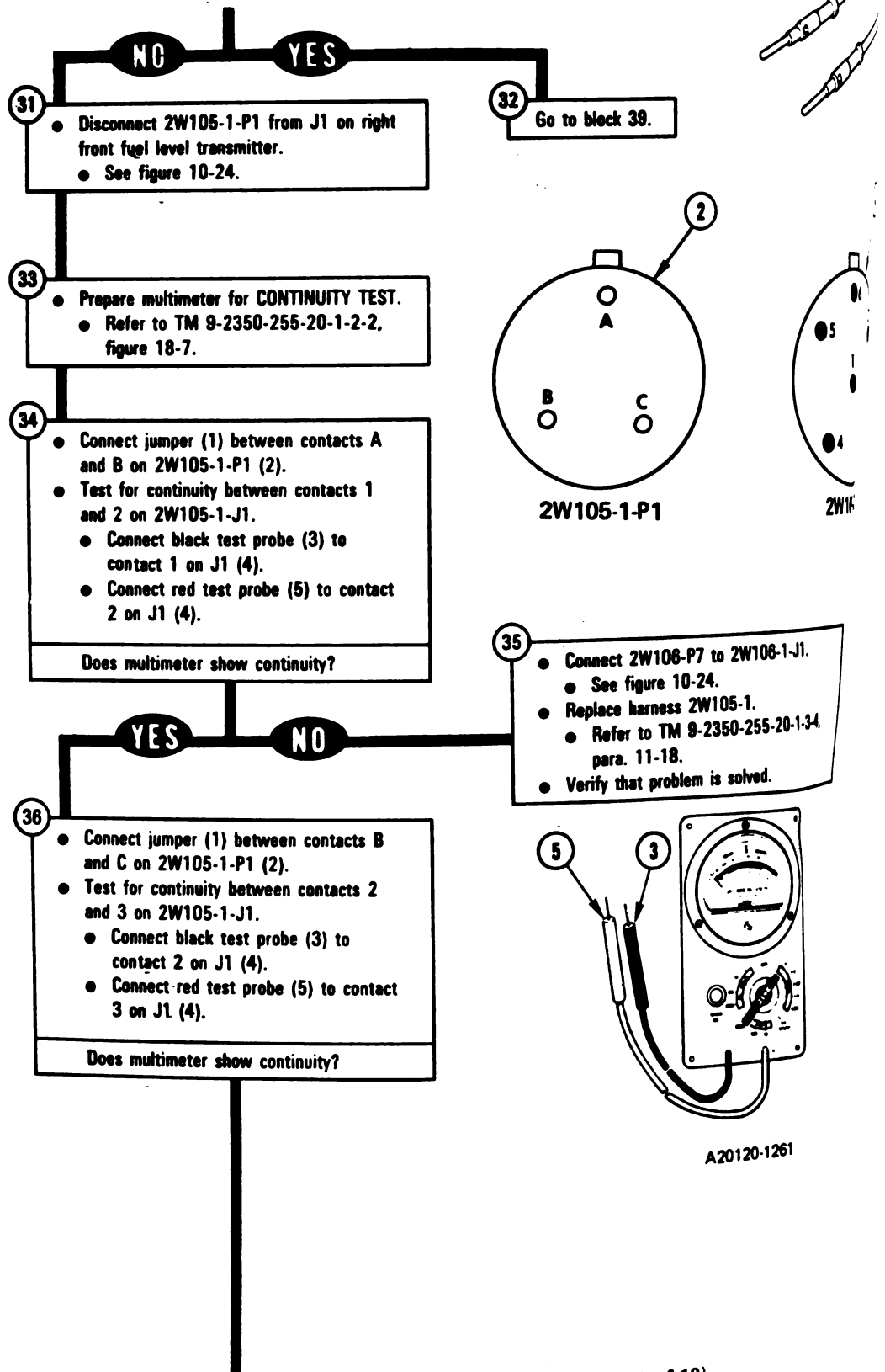


A20120-1260

Figure 10-7 (Sheet 8 of 13)  
Volume II  
Para. 10-2



**TM 9-2350-255-20-1-2-1  
FUEL SUPPLY SYSTEM TROUBLESHOOTING**



*Figure 10-7 (Sheet 9 of 13)  
Volume II  
Para. 10-2*

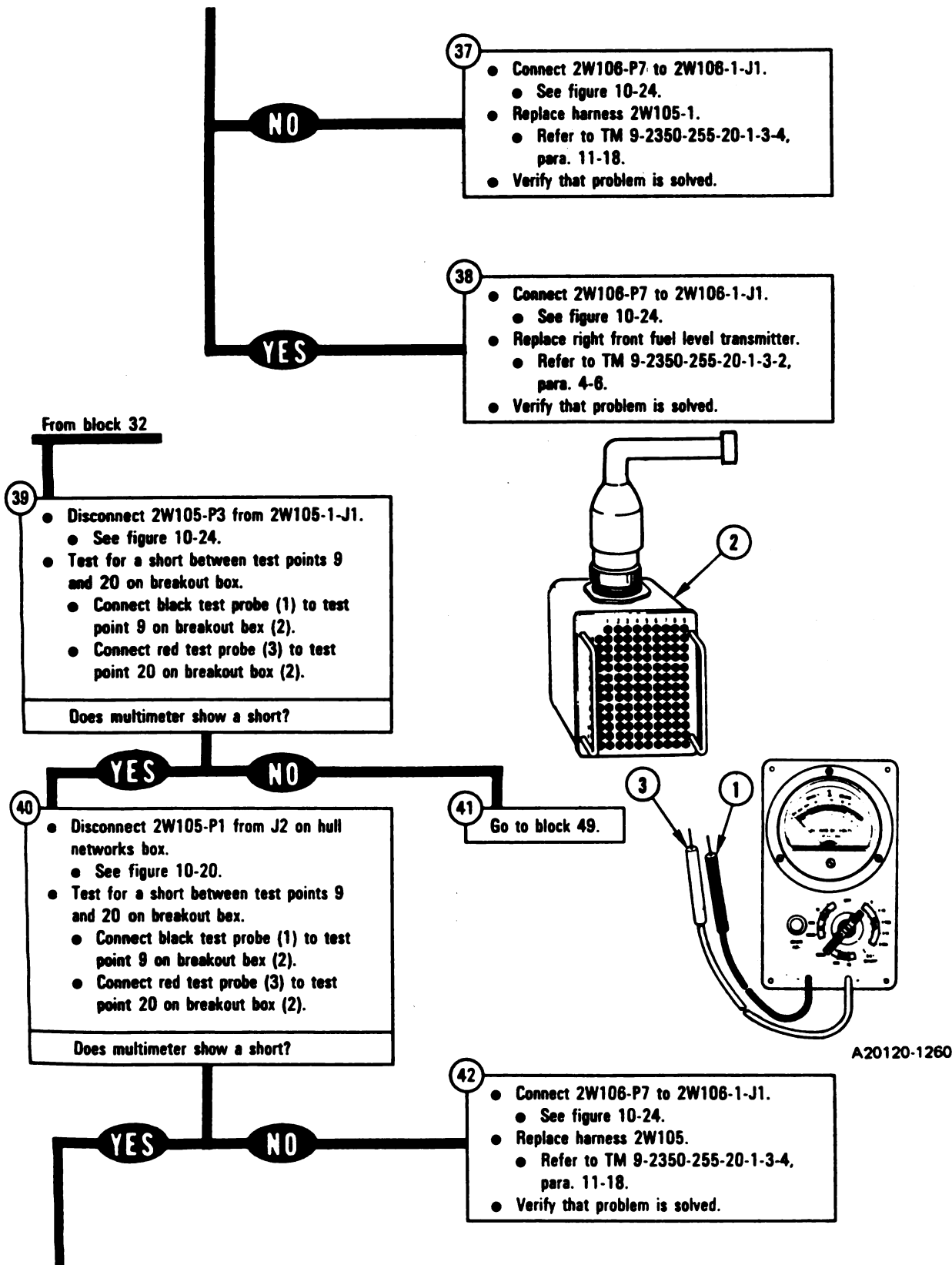
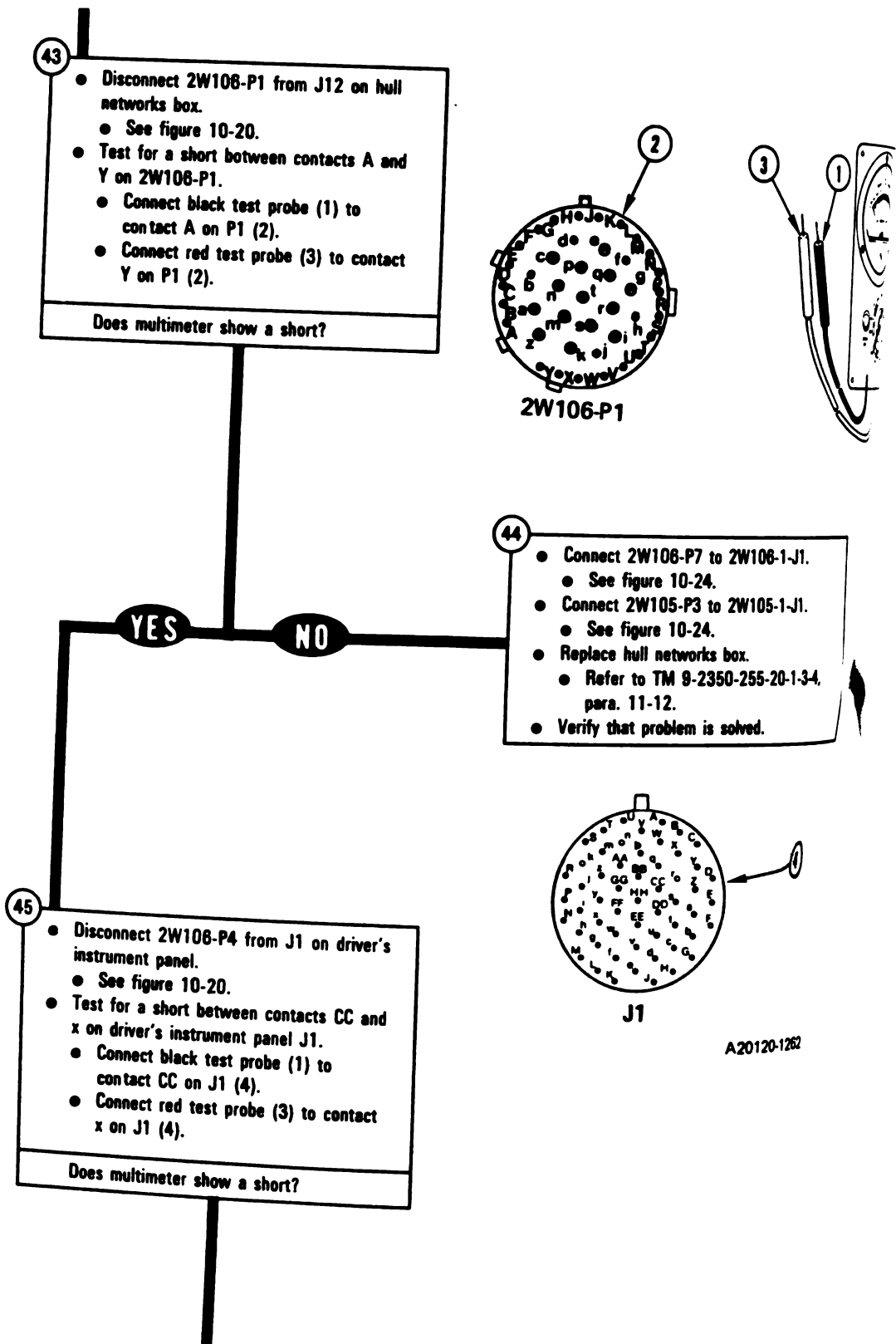


Figure 10-7 (Sheet 10 of 13)  
 Volume II  
 Para. 10-2

**TM 9-2350-255-20-1-2-1  
FUEL SUPPLY SYSTEM TROUBLESHOOTING**



*Figure 10-7 (Sheet 11 of 13)  
Volume II  
Para. 10-2*

10-62 Change 6

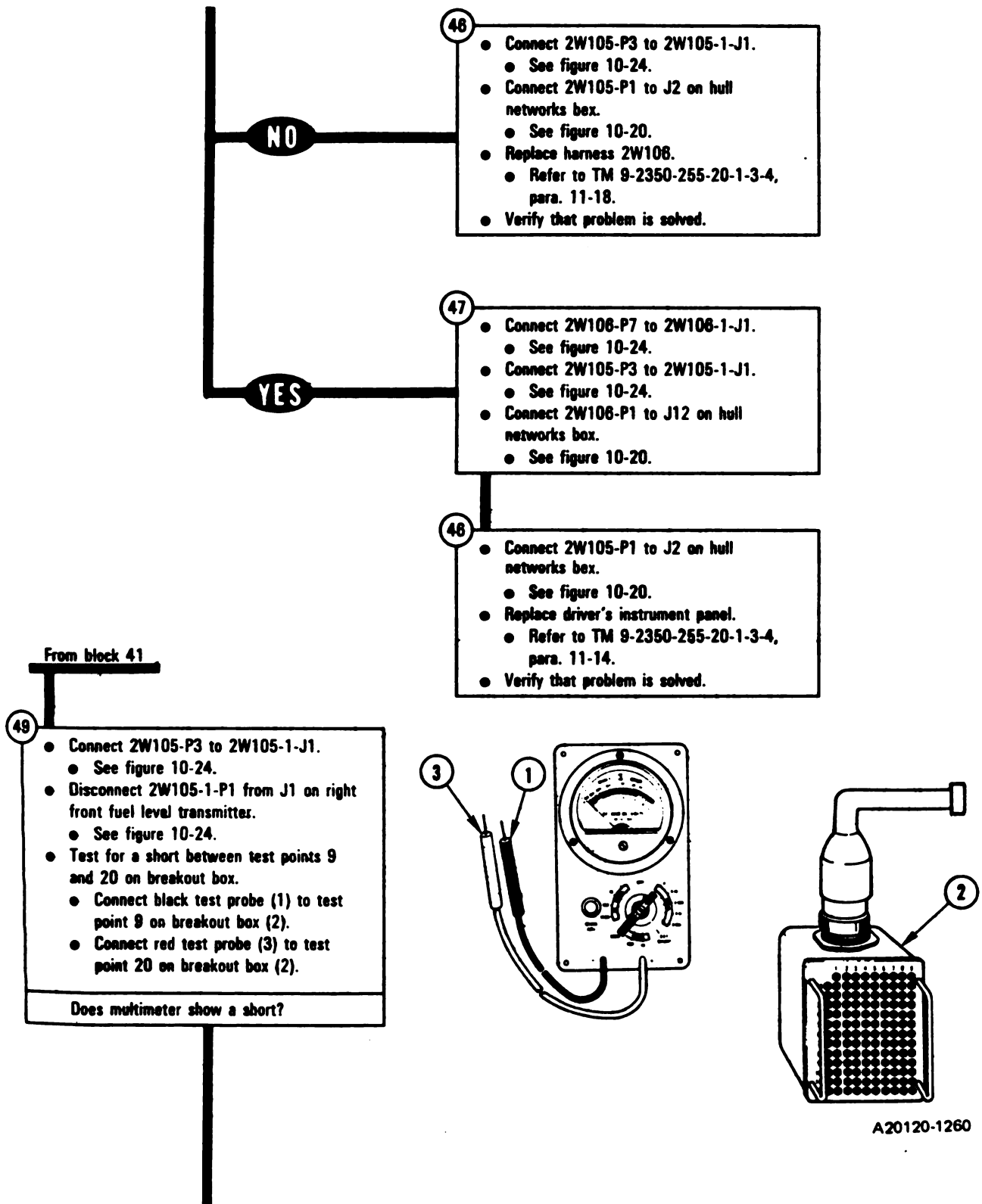
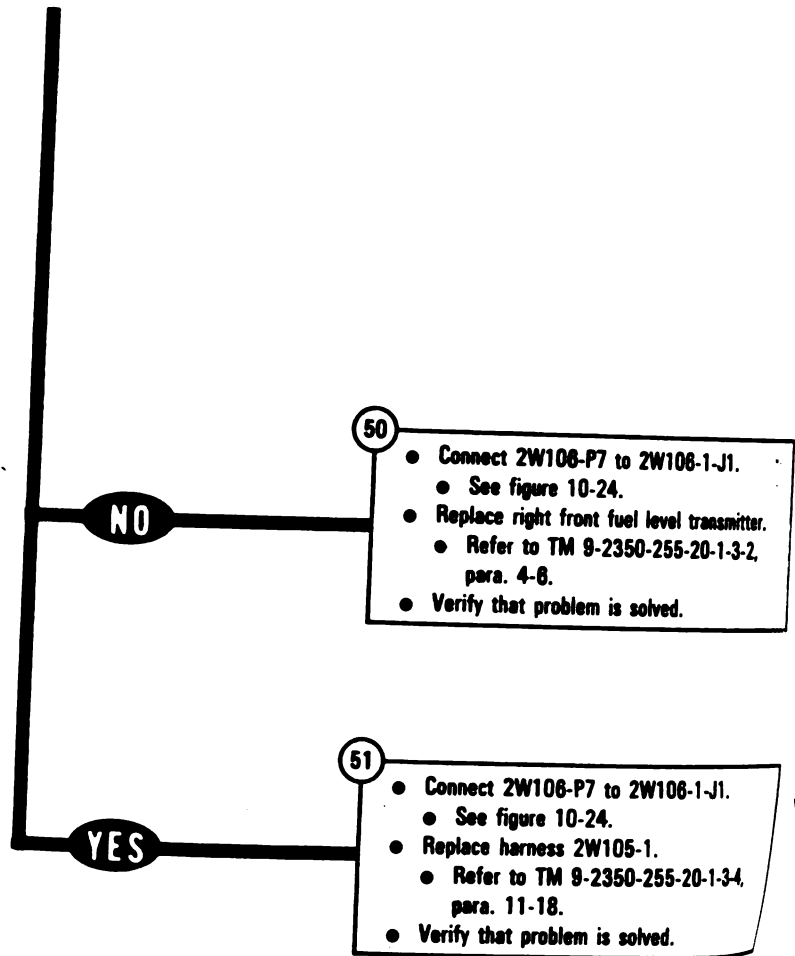


Figure 10-7 (Sheet 12 of 13)  
Volume II  
Para. 10-2

**TM 9-2350-255-20-1-2-1  
FUEL SUPPLY SYSTEM TROUBLESHOOTING**



*Figure 10-7 (Sheet 13 of 13)*  
**Volume II  
Para. 10-2**

**10-64 Change 6**

**SYMPTOM FSS-8**

**REAR FUEL TANK SHOWS 1/2 FULL ON FUEL GAGE AFTER FILLING REAR FUEL TANK**

**Supplies:**

- Connector Pin/Socket Adapters
- Electrical Jumpers

**Test Equipment/Special Tools:**

- Breakout Box Tool Kit, 12311066
- Multimeter
- Pliers, slip joint, conduit style with plastic jaw inserts, NSN 5120-00-824-8065

**Equipment Condition:**

- Tank parked.
- Parking brake set.
- Engine shut down.
- Vehicle master power off.
- FUEL TANK SELECTOR switch set to REAR.
- Rear fuel tanks full.

**NOTE**

- Read para. 10-1 before doing any work.
- When jumpers are used, remove them after completing last instruction in that block.

1

- Set up tank controls for standard initial test conditions.
- Refer to table 10-2, para. 10-5.

*Figure 10-8 (Sheet 1 of 14)*  
**Volume II**  
**Para. 10-2**

TM 9-2350-255-20-1-2-1  
FUEL SUPPLY SYSTEM TROUBLESHOOTING

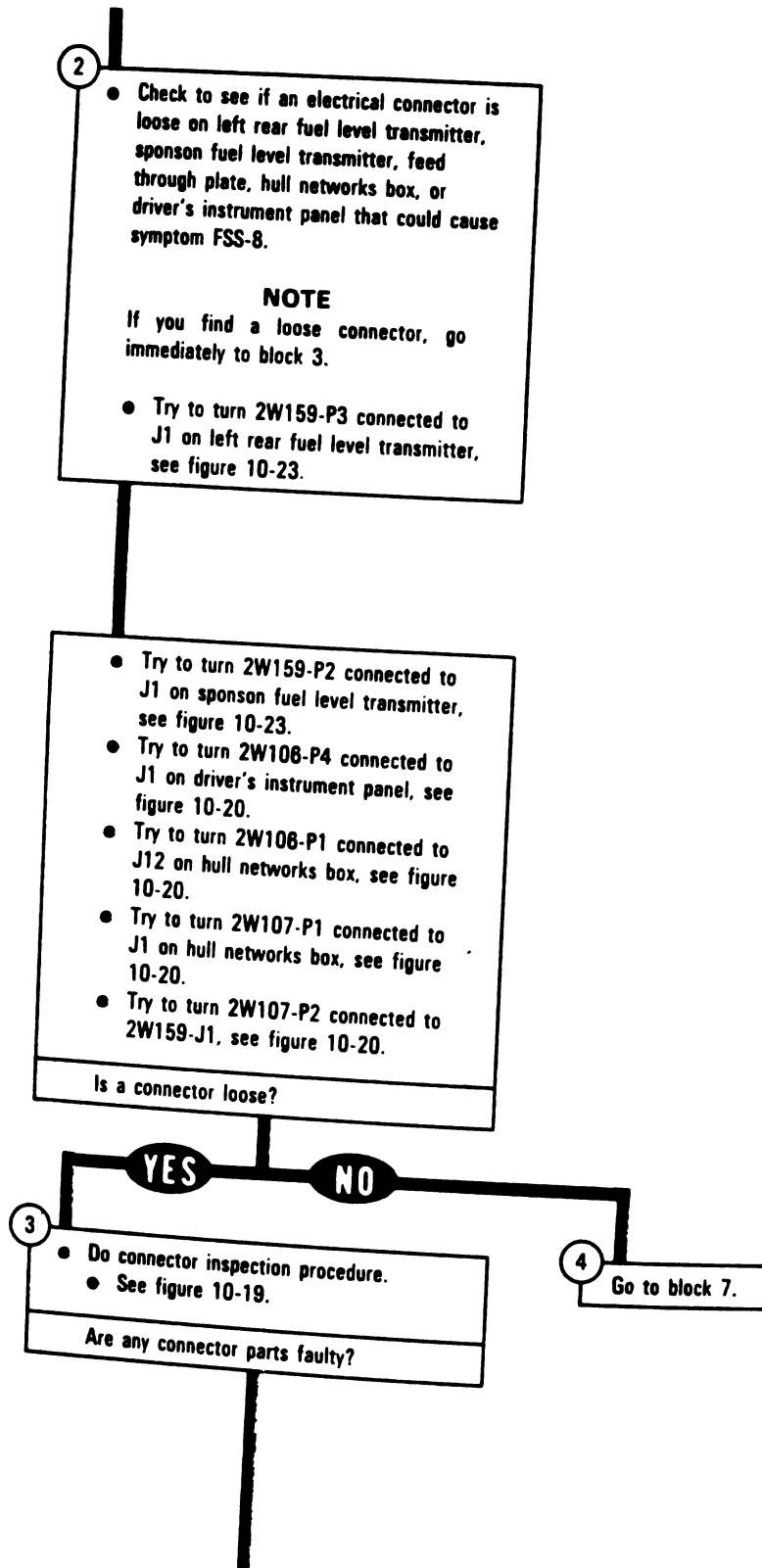


Figure 10-8 (Sheet 2 of 14)  
Volume II  
Para. 10-2

10-66 Change 6

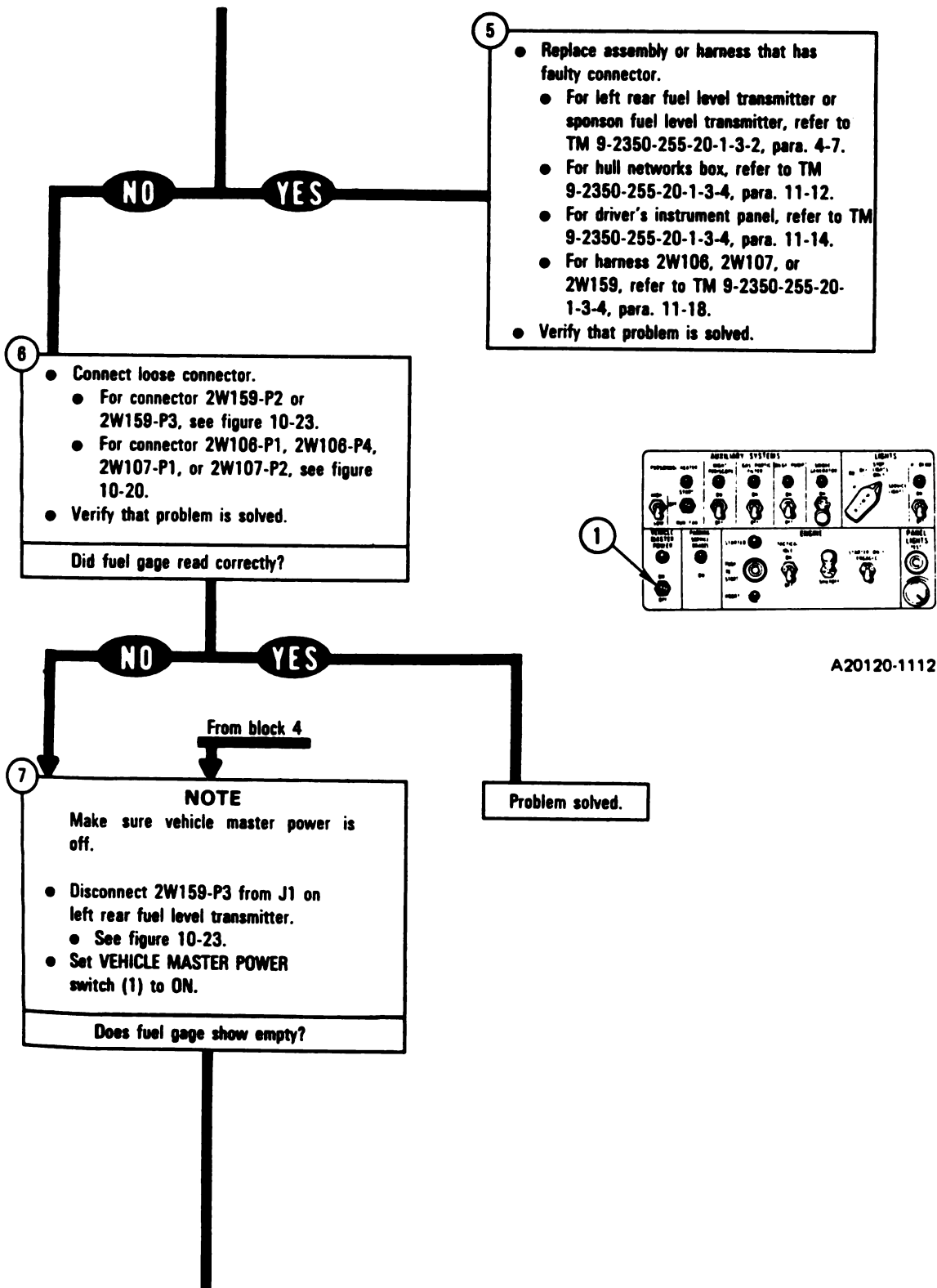
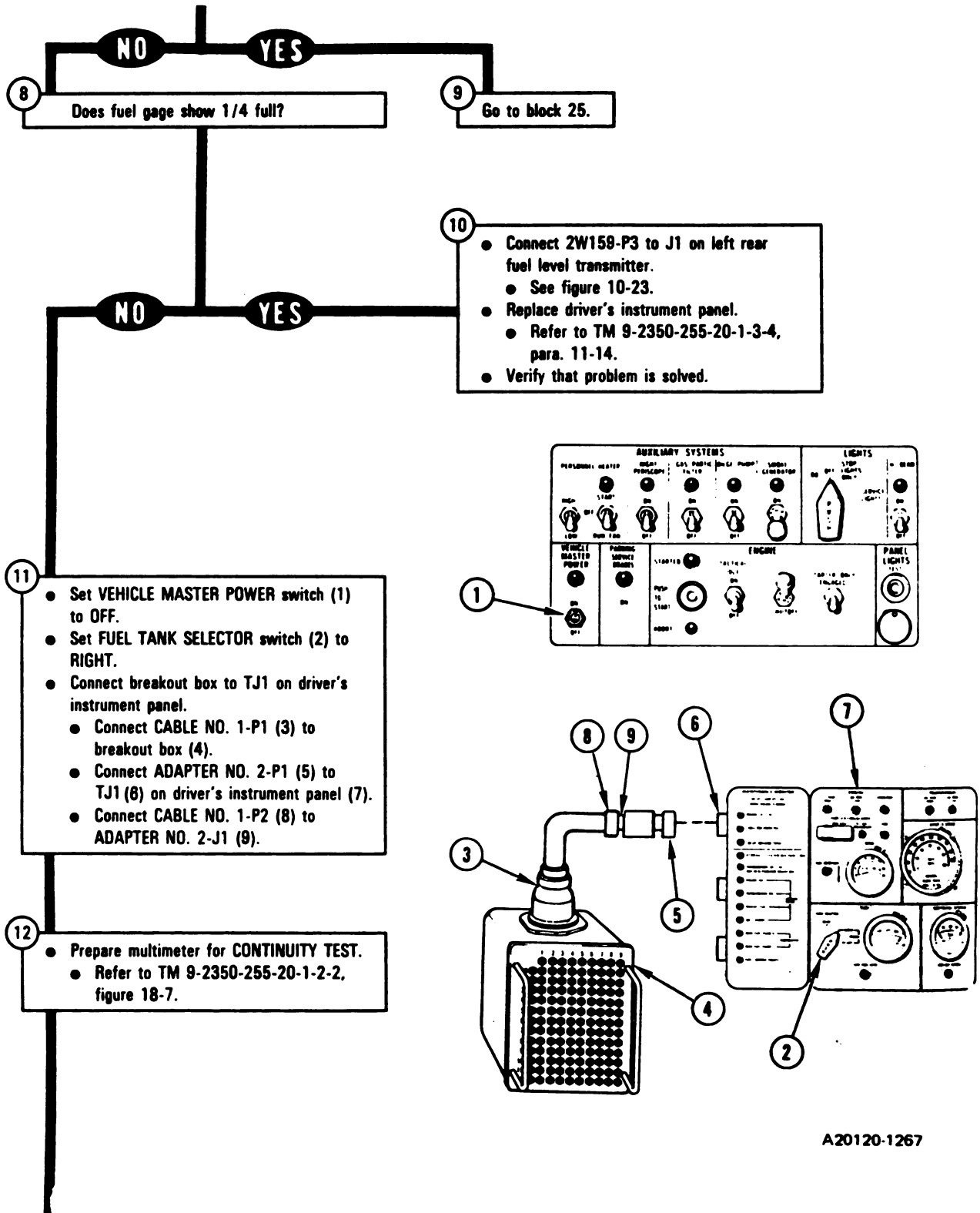


Figure 10-8 (Sheet 3 of 14)  
 Volume II  
 Para. 10-2



**TM 9-2350-255-20-1-2-1  
FUEL SUPPLY SYSTEM TROUBLESHOOTING**



A20120-1267

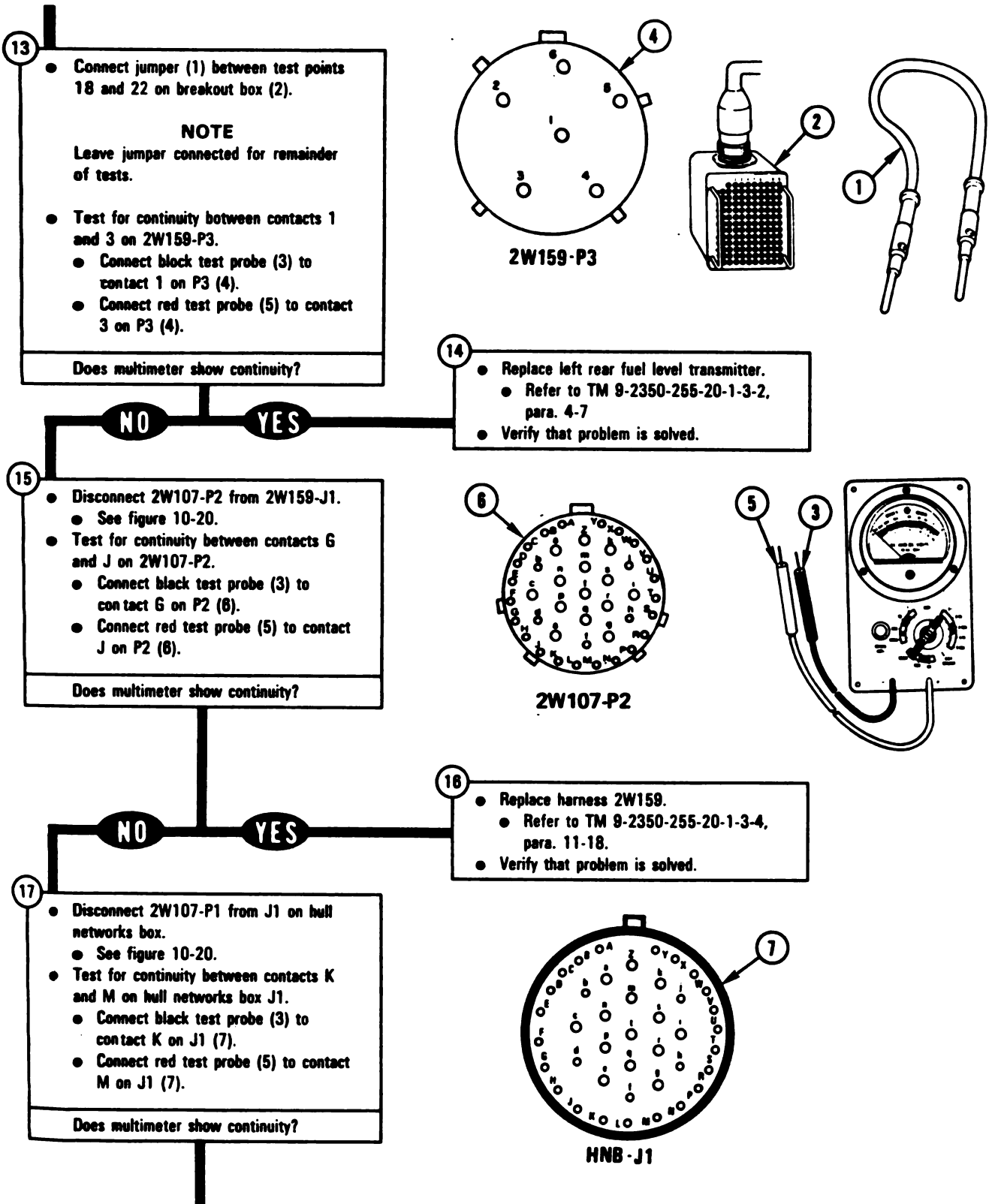
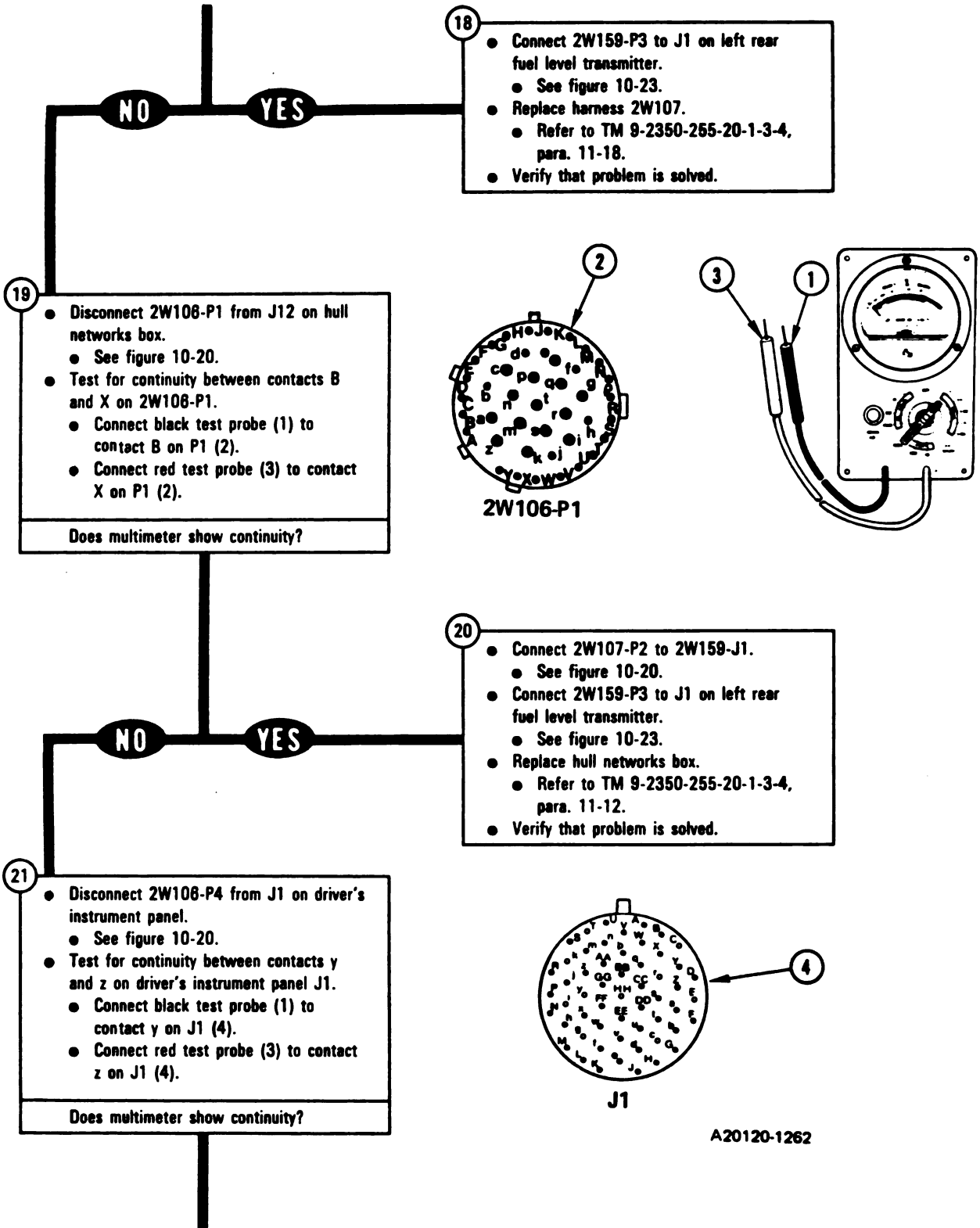
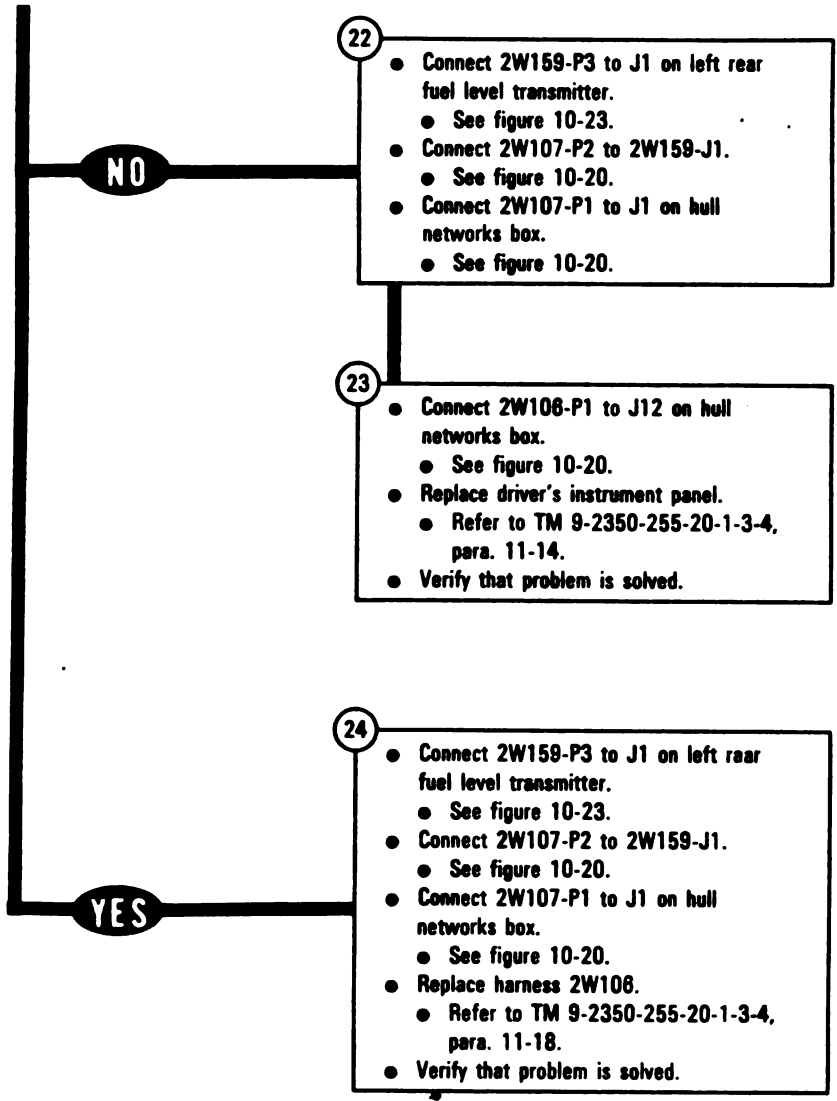


Figure 10-8 (Sheet 5 of 14)  
 Volume II  
 Para. 10-2

**TM 9-2350-255-20-1-2-1**  
**FUEL SUPPLY SYSTEM TROUBLESHOOTING**



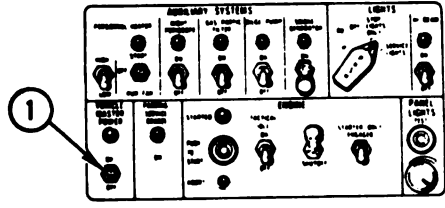
*Figure 10-8 (Sheet 6 of 14)*  
**Volume II**  
**Para. 10-2**



**From block 9**

**25**

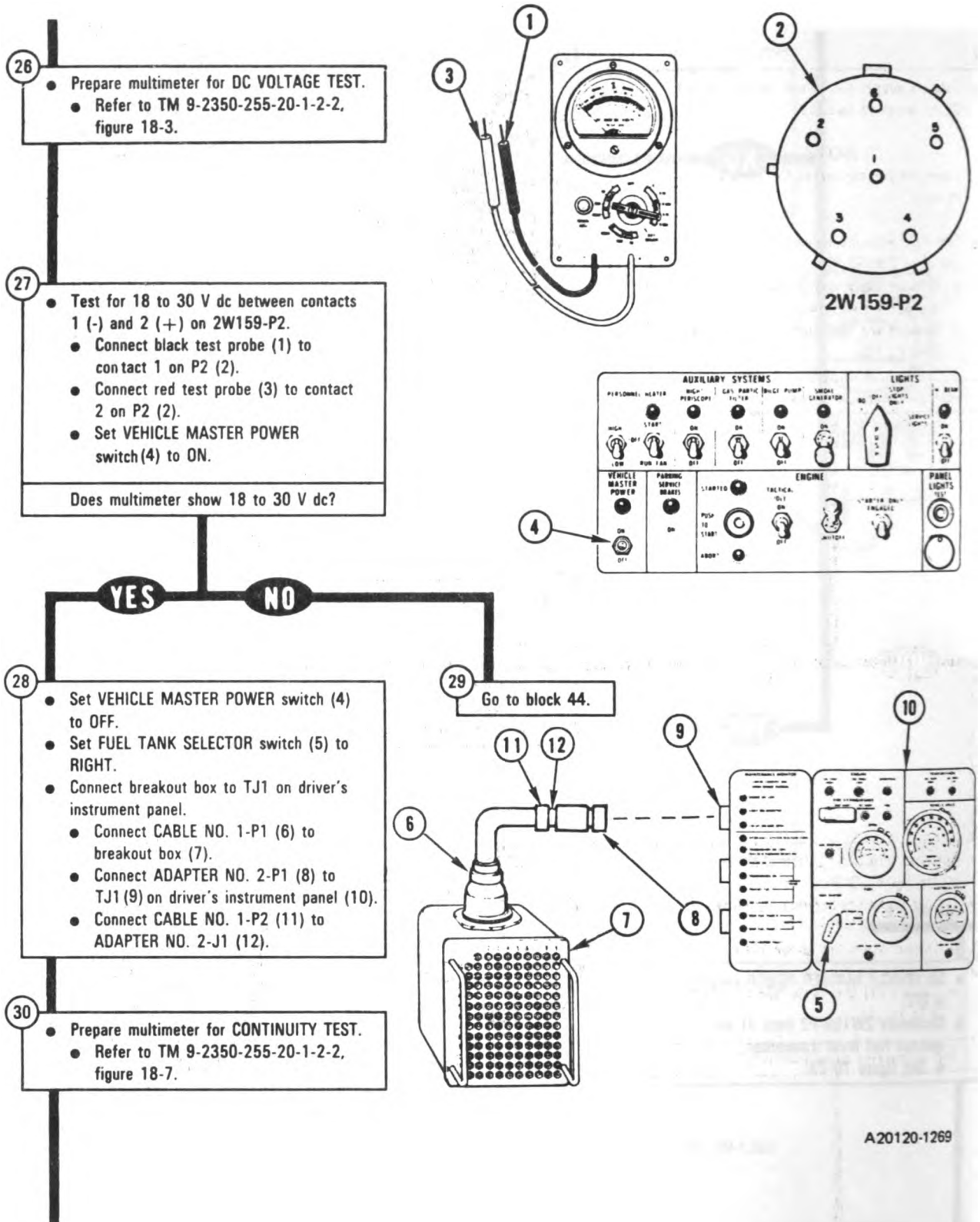
- Set VEHICLE MASTER POWER switch (1) to OFF.
- Disconnect 2W159-P2 from J1 on sponson fuel level transmitter.
- See figure 10-23.



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*Figure 10-8 (Sheet 7 of 14)  
Volume II  
Para. 10-2*

**TM 9-2350-255-20-1-2-1  
FUEL SUPPLY SYSTEM TROUBLESHOOTING**



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**Figure 10-8 (Sheet 8 of 14)  
Volume II  
Para. 10-2**

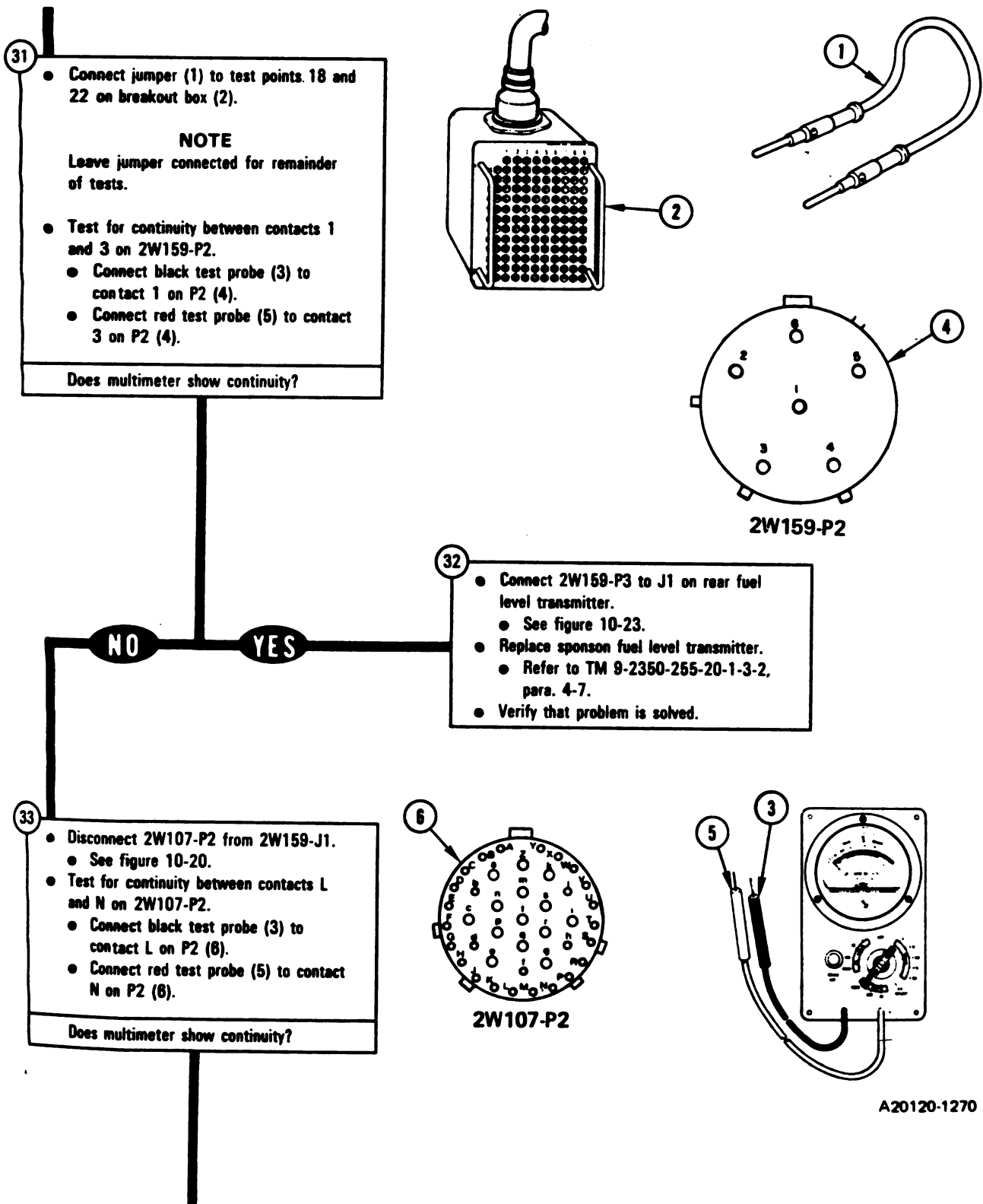
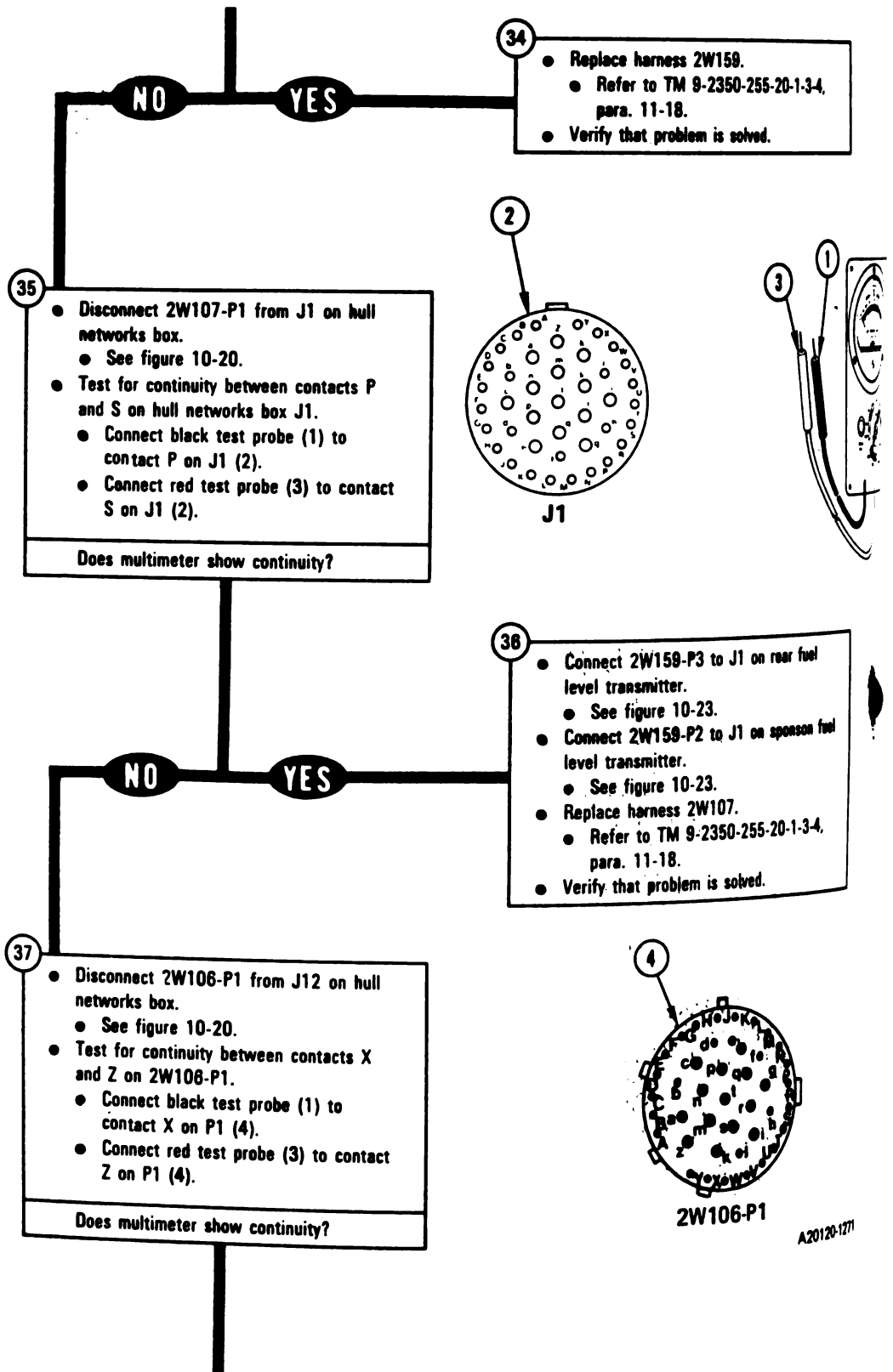


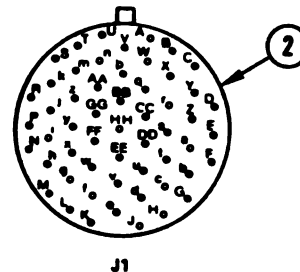
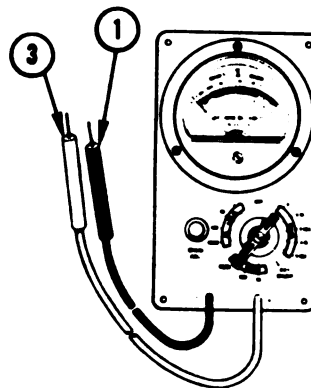
Figure 10-8 (Sheet 9 of 14)  
 Volume II  
 Para. 10-2

**TM 9-2350-255-20-1-2-1  
FUEL SUPPLY SYSTEM TROUBLESHOOTING**



*Figure 10-8 (Sheet 10 of 14)  
Volume II  
Para. 10-2*

- 38
- Connect 2W159-P3 to J1 on rear fuel level transmitter.
    - See figure 10-23.
  - Connect 2W159-P2 to J1 on sponson fuel level transmitter.
    - See figure 10-23.
  - Connect 2W107-P2 to 2W159-J1.
    - See figure 10-20.
  - Replace hull networks box.
    - Refer to TM 9-2350-255-20-1-3-4, para. 11-12.
  - Verify that problem is solved.



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- 39
- Disconnect 2W106-P4 from J1 on driver's instrument panel.
    - See figure 10-20.
  - Test for continuity between contacts AA and y on driver's instrument panel J1.
    - Connect black test probe (1) to contact AA on J1 (2).
    - Connect red test probe (3) to contact y on J1 (2).
- Does multimeter show continuity?

Figure 10-8 (Sheet 11 of 14)  
 Volume II  
 Para. 10-2



TM 9-2350-255-20-1-2-1  
FUEL SUPPLY SYSTEM TROUBLESHOOTING

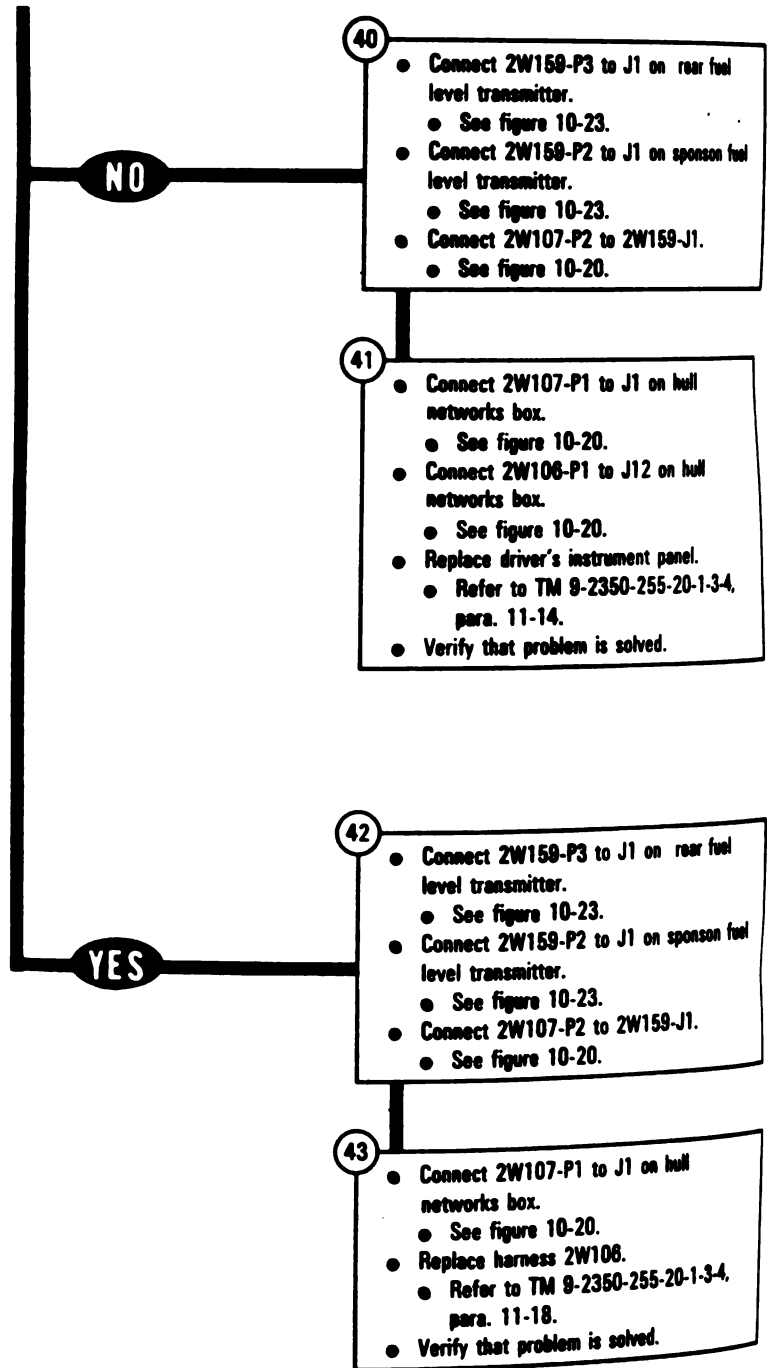
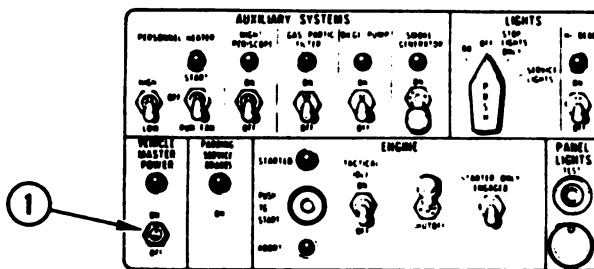


Figure 10-8 (Sheet 12 of 14)  
Volume II  
Para. 10-2

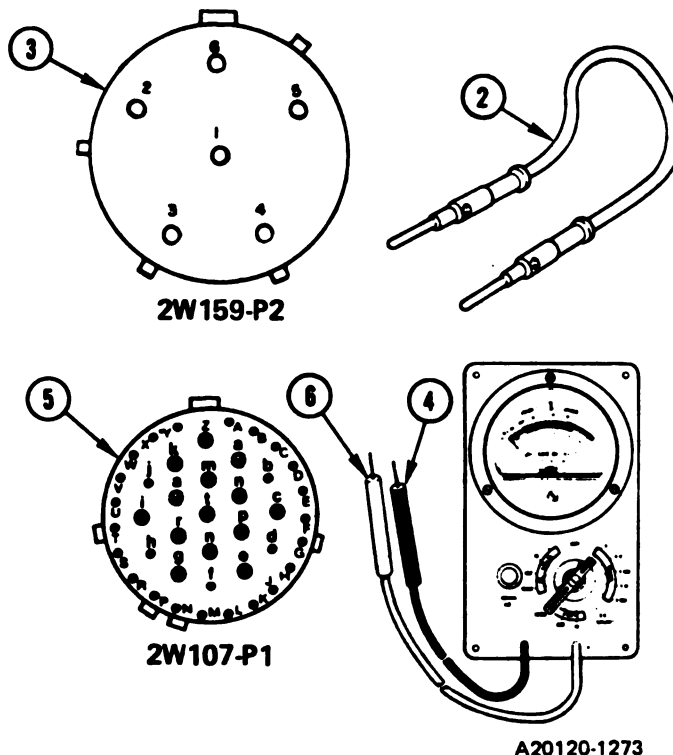
10-76 Change 6

From block 29

- 44
- Set VEHICLE MASTER POWER switch (1) to OFF.
  - Prepare multimeter for CONTINUITY TEST.
    - Refer to TM 9-2350-255-20-1-2-2, figure 18-7.
  - Disconnect 2W107-P1 from J1 on hull networks box.
    - See figure 10-20.



- 45
- Connect jumper (2) between contacts 1 and 2 on 2W159-P2 (3).
  - Test for continuity between contacts P and R on 2W107-P1.
    - Connect black test probe (4) to contact P on P1 (5).
    - Connect red test probe (8) to contact R on P1 (5).
- Does multimeter show continuity?



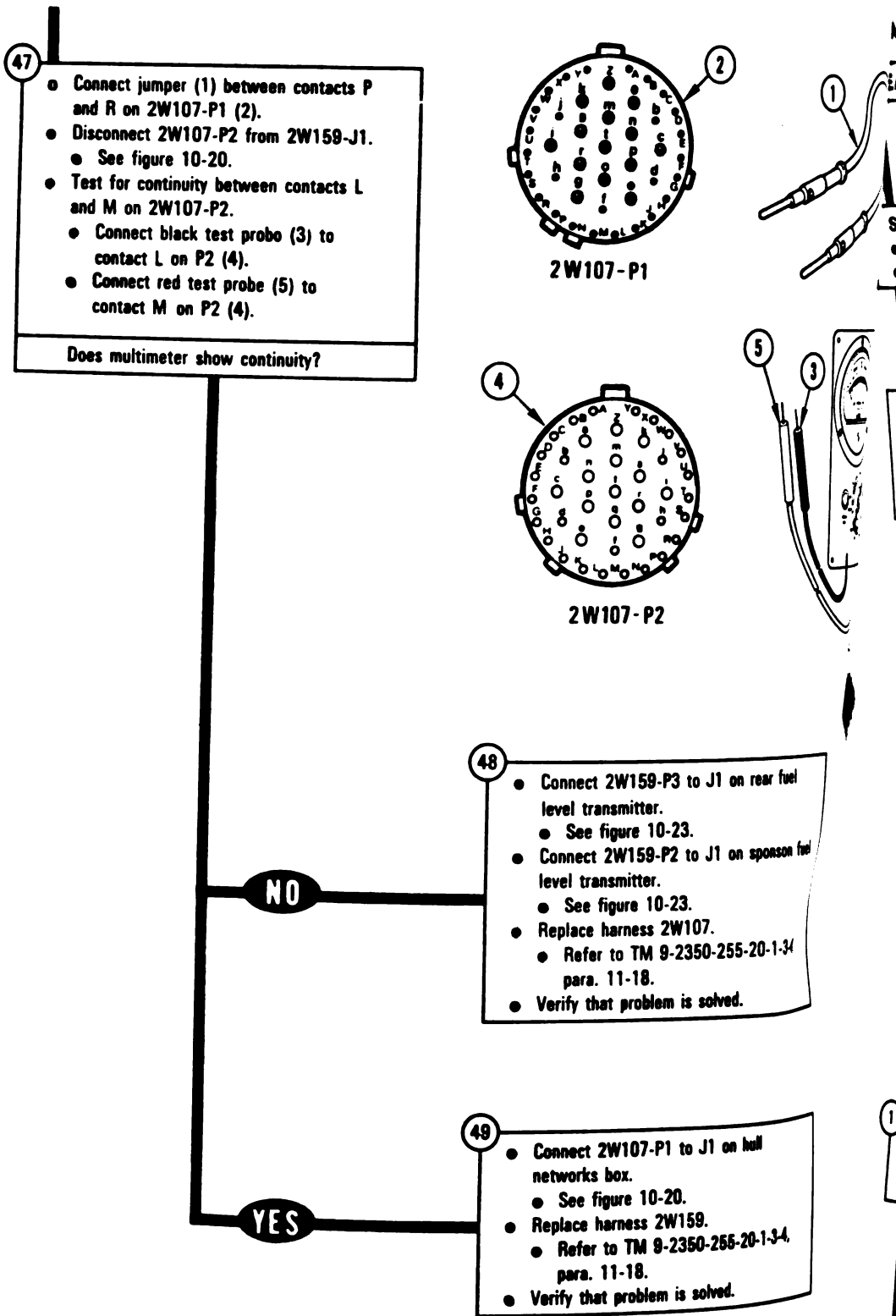
NO

YES

- 48
- Connect 2W159-P3 to J1 on rear fuel level transmitter.
    - See figure 10-23.
  - Connect 2W159-P2 to J1 on sponson fuel level transmitter.
    - See figure 10-23.
  - Replace hull networks box.
    - Refer to TM 9-2350-255-20-1-3-4, para. 11-12.
  - Verify that problem is solved.

Figure 10-8 (Sheet 13 of 14)  
Volume II  
Para. 10-2

**TM 9-2350-255-20-1-2-1  
FUEL SUPPLY SYSTEM TROUBLESHOOTING**



*Figure 10-8 (Sheet 14 of 14)  
Volume II  
Para. 10-2*

**SYMPTOM FSS-9**

**REAR FUEL TANK OVERFILLS**

**Supplies:**

- Connector Pin/Socket Adapters
- Electrical Jumpers

**Test Equipment/Special Tools:**

- Breakout Box Tool Kit, 12311066
- Multimeter
- Pliers, slip joint, conduit style with plastic jaw inserts, NSN 5120-00-624-8065

**Equipment Condition:**

- Tank parked.
- Parking brake set.
- Engine shut down.
- Vehicle master power off.
- Rear fuel tank 7/8 full.

**NOTE**

- Read para. 10-1 before doing any work.
- When jumpers are used, remove them after completing last instruction in that block.

1

- Set up tank controls for standard initial test conditions.
- Refer to table 10-2, para. 10-5.

*Figure 10-9 (Sheet 1 of 12)*  
**Volume II**  
**Para. 10-2**

**Change 6 10-79**

TM 9-2350-255-20-1-2-1  
FUEL SUPPLY SYSTEM TROUBLESHOOTING

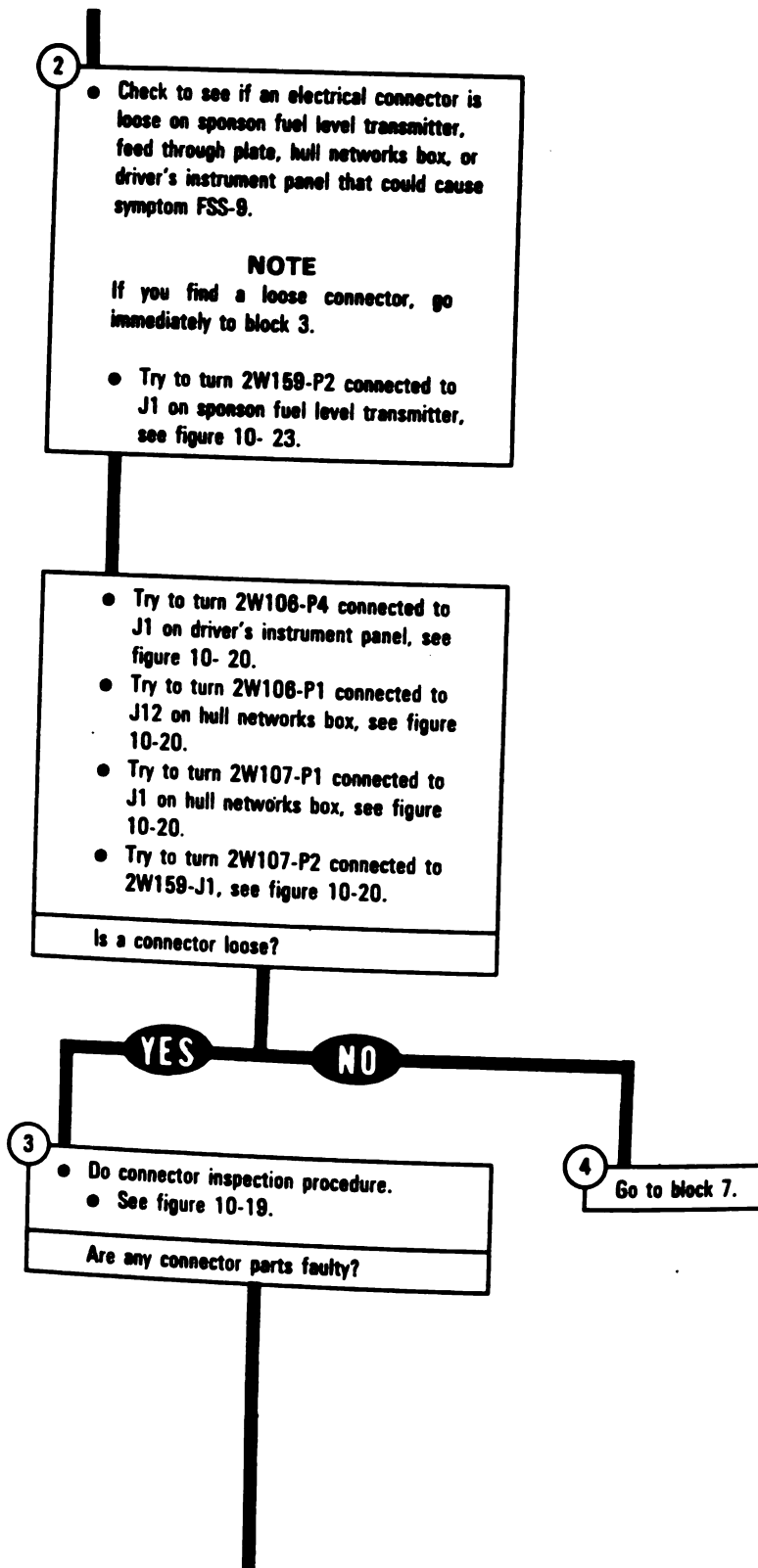
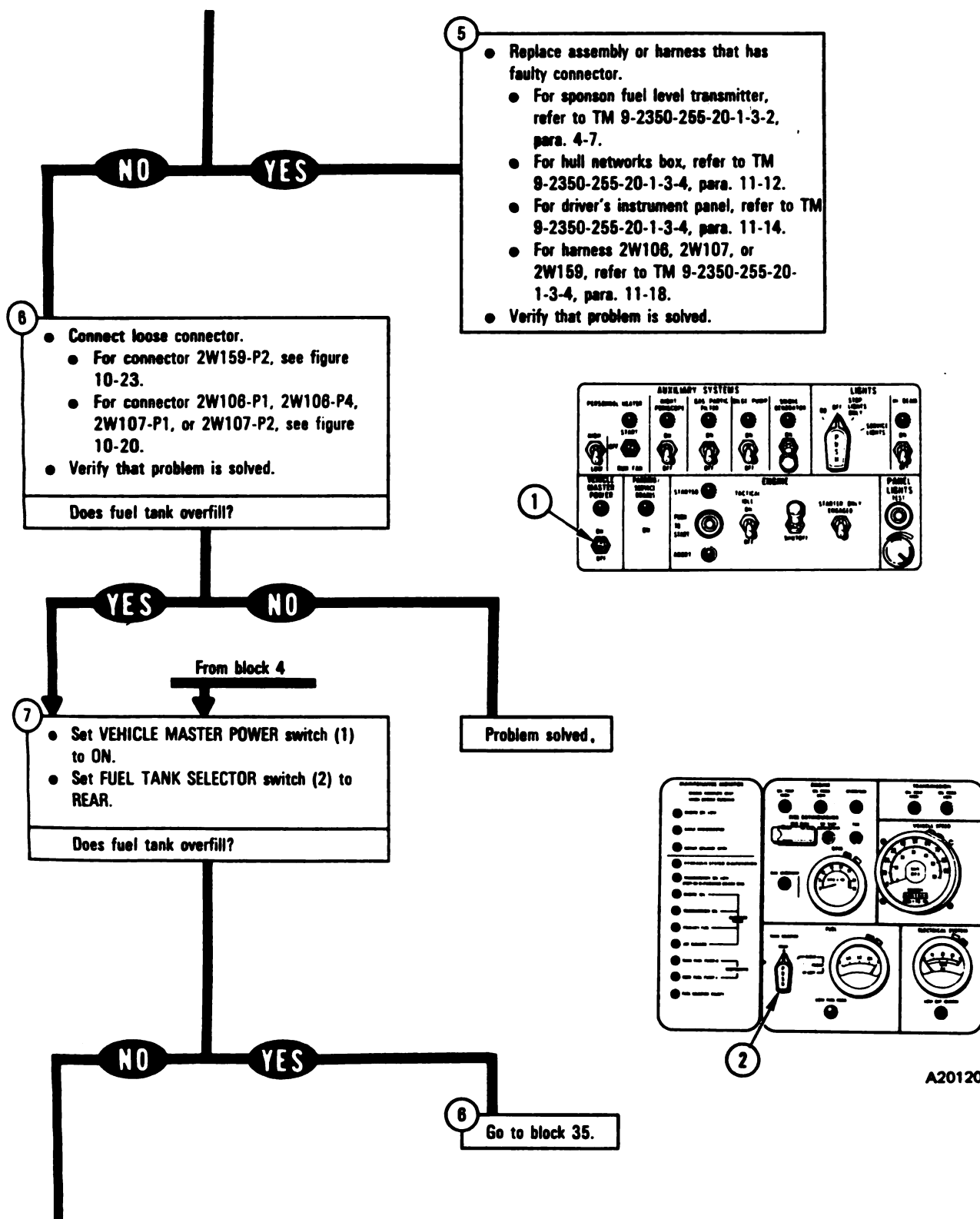


Figure 10-9 (Sheet 2 of 12)  
Volume II  
Para. 10-2

10-80 Change 6

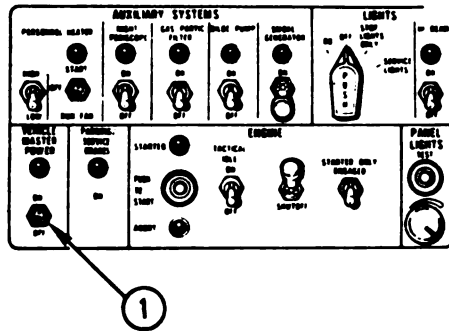
**TM 9-2350-255-20-1-2-1  
FUEL SUPPLY SYSTEM TROUBLESHOOTING**



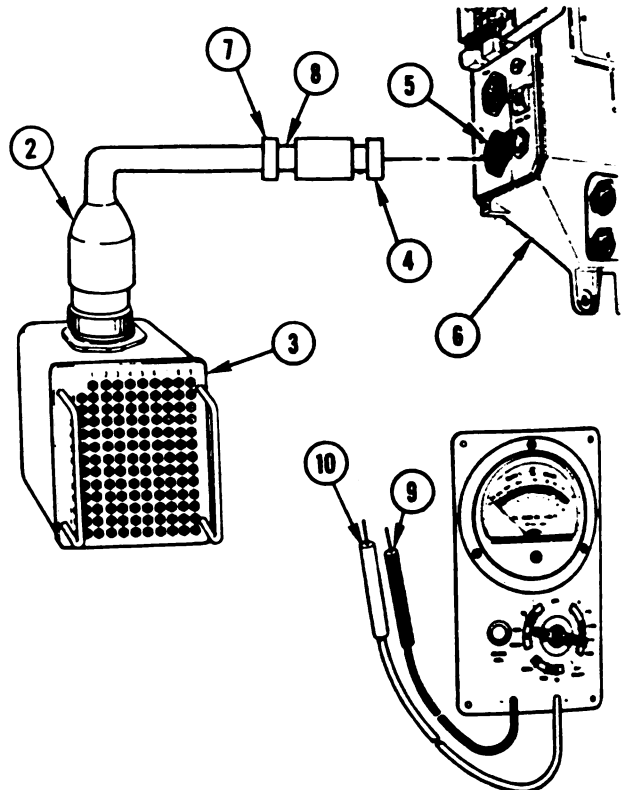
*Figure 10-9 (Sheet 3 of 12)  
Volume II  
Para. 10-2*

**TM 9-2350-255-20-1-2-1  
FUEL SUPPLY SYSTEM TROUBLESHOOTING**

- 9
- Set **VEHICLE MASTER POWER** switch (1) to OFF.
  - Connect breakout box to TJ2 on hull networks box.
    - Connect **CABLE NO. 1-P1** (2) to breakout box (3).
    - Connect **ADAPTER NO. 2-P1** (4) to TJ2 (5) on hull networks box (6).
    - Connect **CABLE NO. 1-P2** (7) to **ADAPTER NO. 2-J1** (8).



- 10
- Prepare multimeter for **DC VOLTAGE TEST**.
    - Refer to TM 9-2350-255-20-1-2-2, figure 18-3.



- 11
- Test for less than 1 V dc between test points 9 (-) and 17 (+) on breakout box.
    - Connect black test probe (9) to test point 9 on breakout box (3).
    - Connect red test probe (10) to test point 17 on breakout box (3).
    - Set **VEHICLE MASTER POWER** switch (1) to ON.
- Does multimeter show less than 1 V dc?

- YES
- 12
- Set **VEHICLE MASTER POWER** switch (1) to OFF.
  - Prepare multimeter for **CONTINUITY TEST**.
    - Refer to TM 9-2350-255-20-1-2-2, figure 18-7.

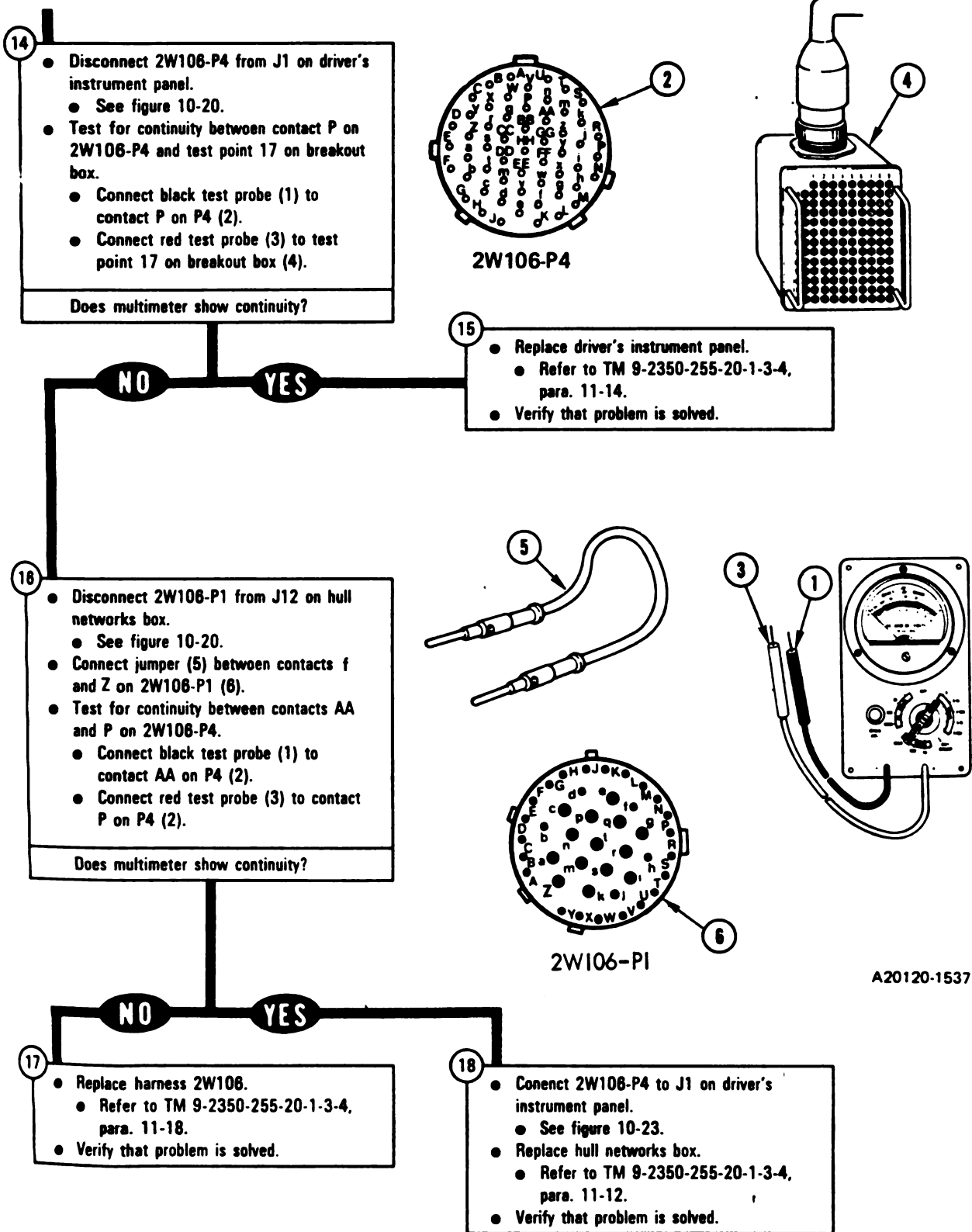
NO

13

Go to block 19.

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*Figure 10-9 (Sheet 4 of 12)  
Volume II  
Para. 10-2*



A20120-1537

Figure 10-9 (Sheet 5 of 12)  
 Volume II  
 Para. 10-2



**TM 9-2350-255-20-1-2-1  
FUEL SUPPLY SYSTEM TROUBLESHOOTING**

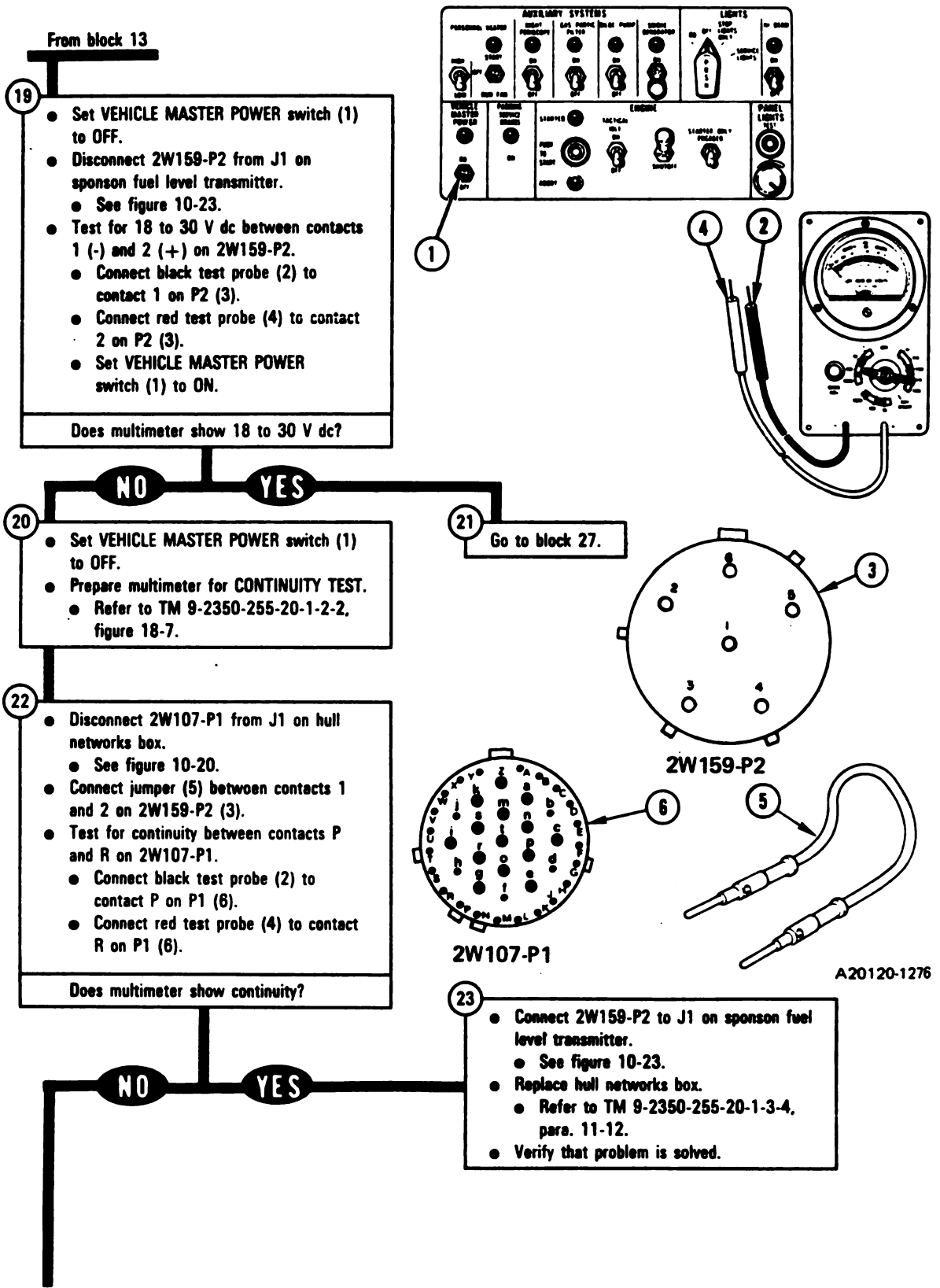
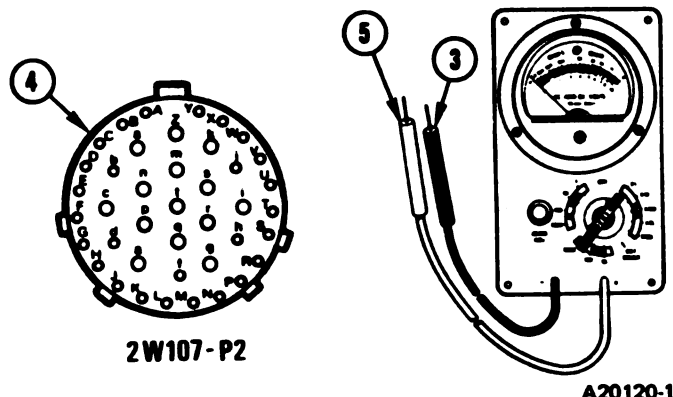
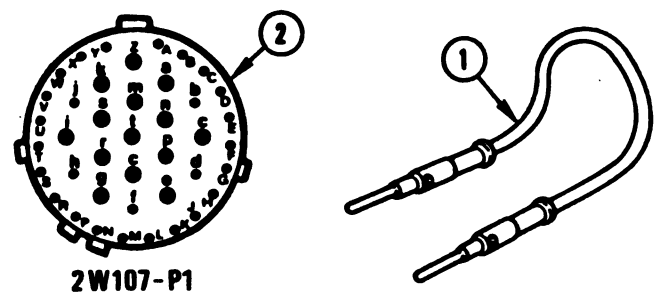


Figure 10-9 (Sheet 6 of 12)  
Volume II  
Para. 10-2

24

- Connect jumper (1) between contacts P and R on 2W107-P1 (2).
- Disconnect 2W107-P2 from 2W159-J1.
  - See figure 10-20.
- Test for continuity between contacts L and M on 2W107-P2.
  - Connect black test probe (3) to contact L on P2 (4).
  - Connect red test probe (5) to contact M on P2 (4).

Does multimeter show continuity?



25

- Connect 2W159-P2 to J1 on sponson fuel level transmitter.
  - See figure 10-23.
- Replace harness 2W107.
  - Refer to TM 9-2350-255-20-1-3-4, para. 11-18.
- Verify that problem is solved.

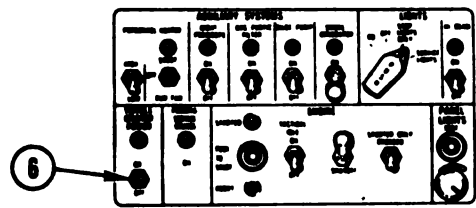
26

- Connect 2W107-P1 to J1 on hull networks box.
  - See figure 10-20.
- Replace harness 2W159.
  - Refer to TM 9-2350-255-20-1-3-4, para. 11-18.
- Verify that problem is solved.

From block 21

27

- Set VEHICLE MASTER POWER switch (6) to OFF.
- Prepare multimeter for CONTINUITY TEST.
  - Refer to TM 9-2350-255-20-1-2-2, figure 18-7.



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Figure 10-9 (Sheet 7 of 12)  
Volume II  
Para. 10-2

**TM 9-2350-255-20-1-2-1  
FUEL SUPPLY SYSTEM TROUBLESHOOTING**

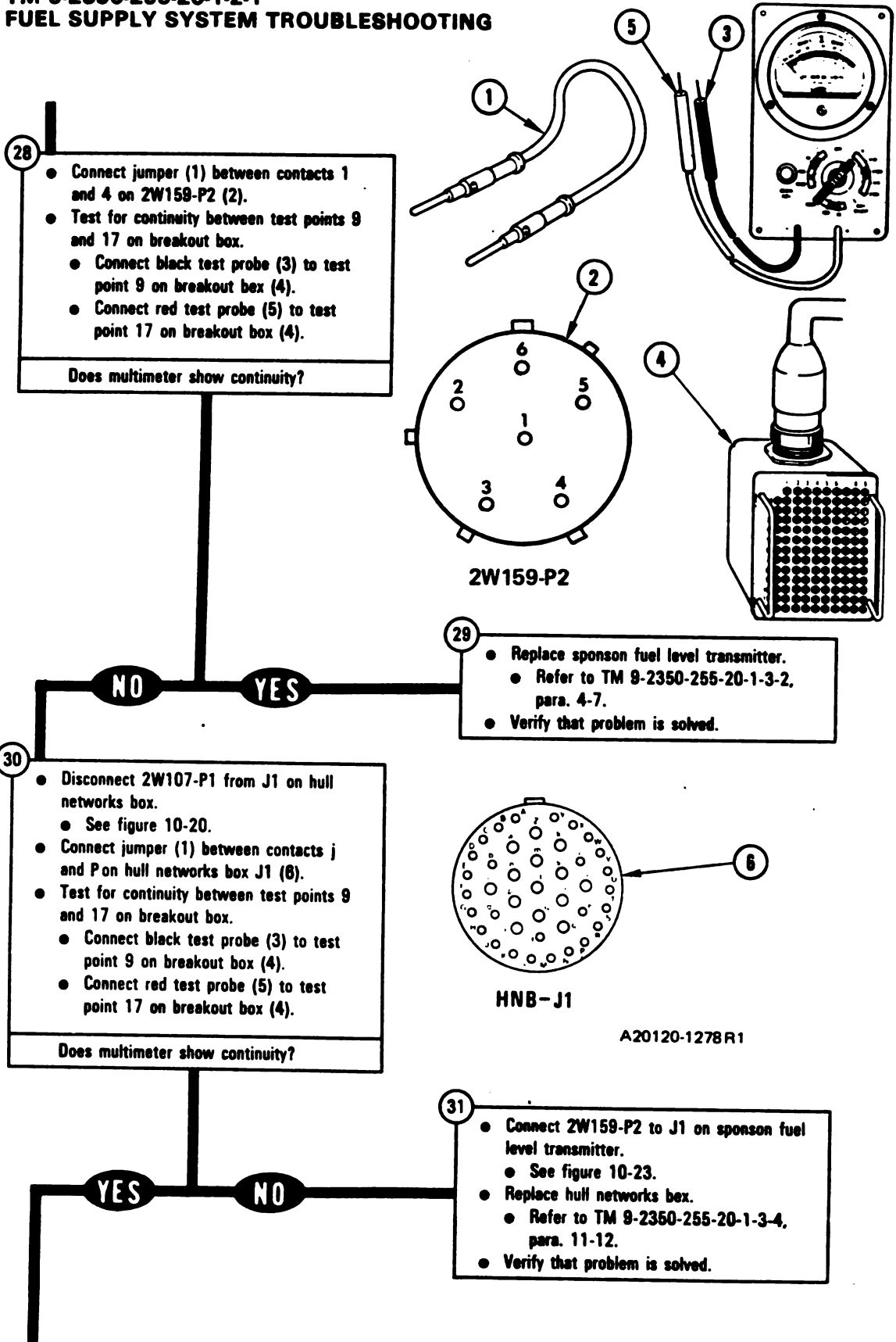


Figure 10-9 (Sheet 8 of 12)  
Volume II  
Para. 10-2

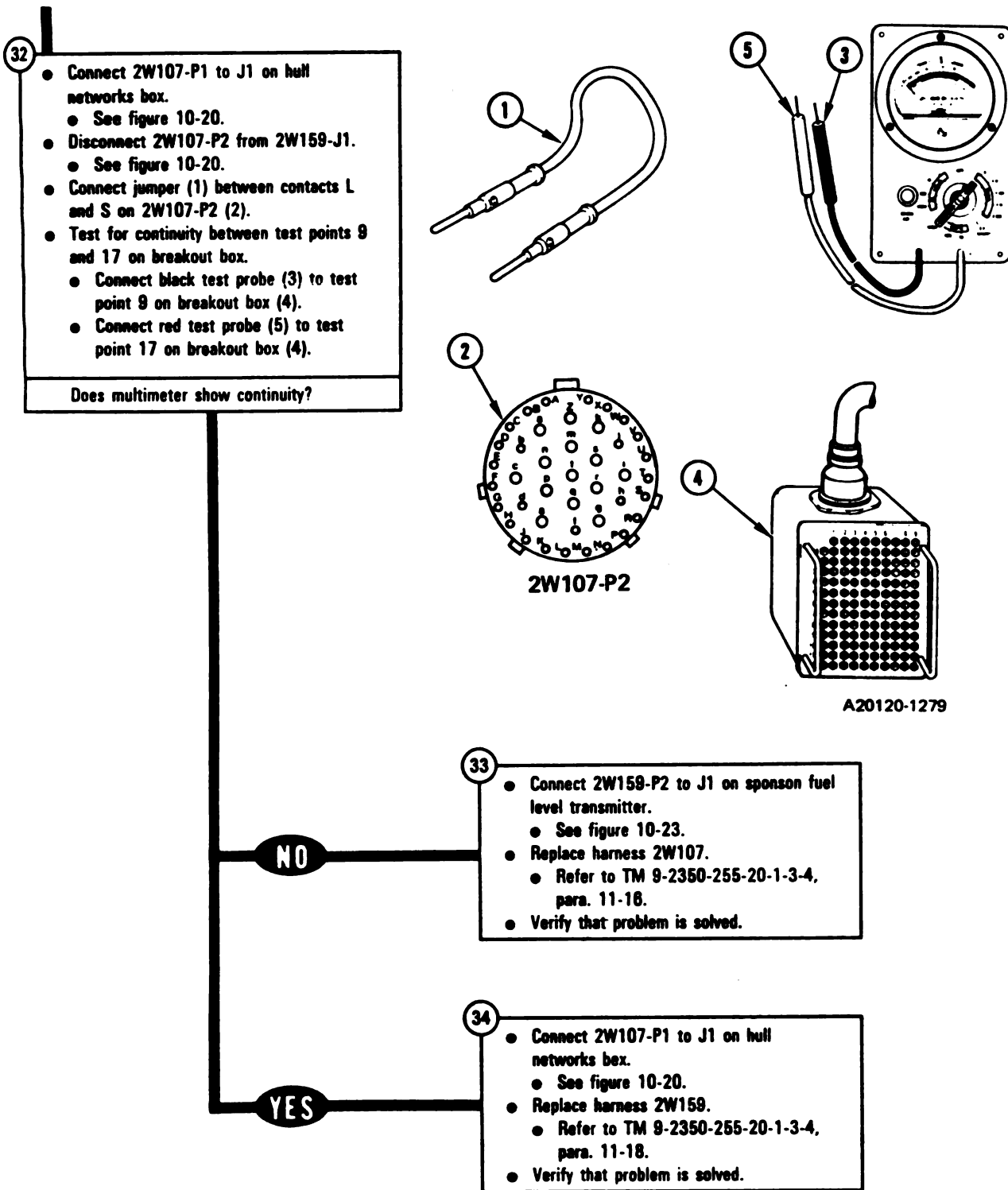


Figure 10-9 (Sheet 9 of 12)  
 Volume II  
 Para. 10-2

**TM 9-2350-255-20-1-2-1  
FUEL SUPPLY SYSTEM TROUBLESHOOTING**

From block 8

- 35
- Set VEHICLE MASTER POWER switch (1) to OFF.
  - Connect breakout box to TJ2 on hull networks box.
    - Connect CABLE NO. 1-P1 (2) to breakout box (3).
    - Connect ADAPTER NO. 2-P1 (4) to TJ2 (5) on hull networks box (6).
    - Connect CABLE NO. 1-P2 (7) to ADAPTER NO. 2-J1 (8).

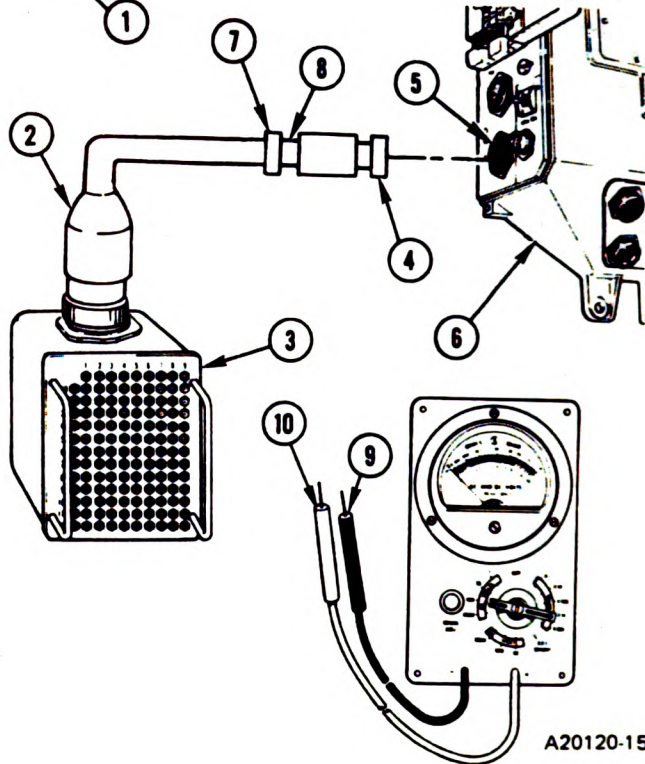
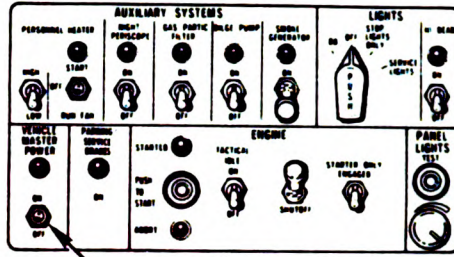
- 36
- Prepare multimeter for DC VOLTAGE TEST.
    - Refer to TM 9-2350-255-20-1-2-2, figure 18-3.

- 37
- NOTE**
- Leave test probes connected for block 39.
- Test for 18 to 30 V dc between test points 9 (-) and 75 (+) on breakout box.
  - Connect black test probe (9) to test point 9 on breakout box (3).
  - Connect red test probe (10) to test point 75 on breakout box (3).
  - Set VEHICLE MASTER POWER switch (1) to ON.
- Does multimeter show 18 to 30 V dc?

**YES**

**NO**

- 39
- Set VEHICLE MASTER POWER switch (1) to OFF.
  - Disconnect 2W108-P1 from J12 on hull networks box.
    - See figure 10-20.
  - Set VEHICLE MASTER POWER switch (1) to ON.
  - Test for 18 to 30 V dc between test points 9 and 75 on breakout box (3).
- Does multimeter show 18 to 30 V dc?



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- 38
- Replace hull networks box.
    - Refer to TM 9-2350-255-20-1-3-4, para. 11-12.
  - Verify that problem is solved.

*Figure 10-9 (Sheet 10 of 12)  
Volume II  
Para. 10-2*

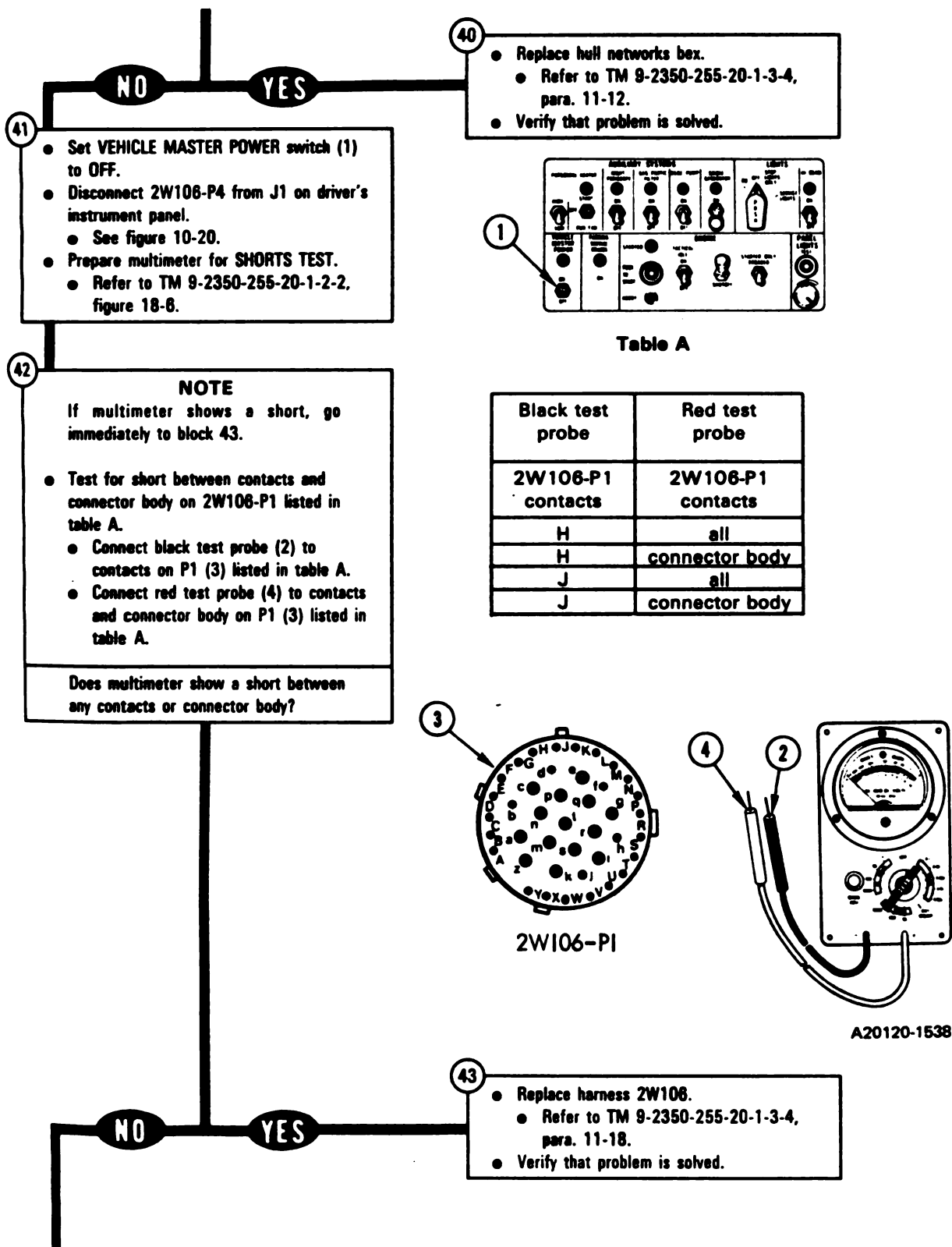


Figure 10-9 (Sheet 11 of 12)  
Volume II  
Para. 10-2

**TM 9-2350-255-20-1-2-1  
FUEL SUPPLY SYSTEM TROUBLESHOOTING**

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**NOTE**

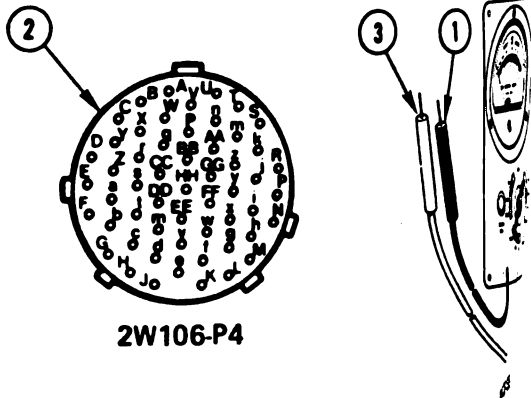
If multimeter shows a short, go immediately to block 45.

- Test for a short between contacts and connector body on 2W106-P4 listed in table B.
- Connect black test probe (1) to contacts on P4 (2) listed in table B.
- Connect red test probe (3) to contacts and connector body on P4 (2) listed in table B.

Does multimeter show a short between any contacts or connector body?

**Table B**

Black test probe	Red test probe
2W106-P4 contacts	2W106-P4 contacts
DD	all
DD	connector body
EE	all
EE	connector body



**2W106-P4**

**NO**

45

- Connect 2W106-P1 to J12 on hull networks box.
- See figure 10-20.
- Replace driver's instrument panel.
- Refer to TM 9-2350-255-20-1-3-4, para. 11-14.
- Verify that problem is solved.

**YES**

46

- Replace harness 2W106.
- Refer to TM 9-2350-255-20-1-3-4, para. 11-18.
- Verify that problem is solved.

*Figure 10-9 (Sheet 12 of 12)  
Volume II  
Para. 10-2*

**SYMPTOM FSS-10**

**LOW FUEL LEVEL LIGHT DOES NOT GO OFF - FUEL TRANSFER IS NORMAL**

**Supplies:**

- Connector Pin/Socket Adapters

**Test Equipment/Special Tools:**

- Breakout Box Tool Kit, 12311066
- Multimeter
- Pliers, slip joint, conduit style with plastic jaw inserts, NSN 5120-00-624-8065

**Equipment Condition:**

- Tank parked.
- Parking brake set.
- Engine shut down.
- Vehicle master power off.
- Rear fuel tanks 3/4 full or more.

**NOTE**

Read para. 10-1 before doing any work.

1

- Set up tank controls for standard initial test conditions.
- Refer to table 10-2, para. 10-5.

*Figure 10-10 (Sheet 1 of 5)*  
Volume II  
Para. 10-2



TM 9-2350-255-20-1-2-1  
FUEL SUPPLY SYSTEM TROUBLESHOOTING

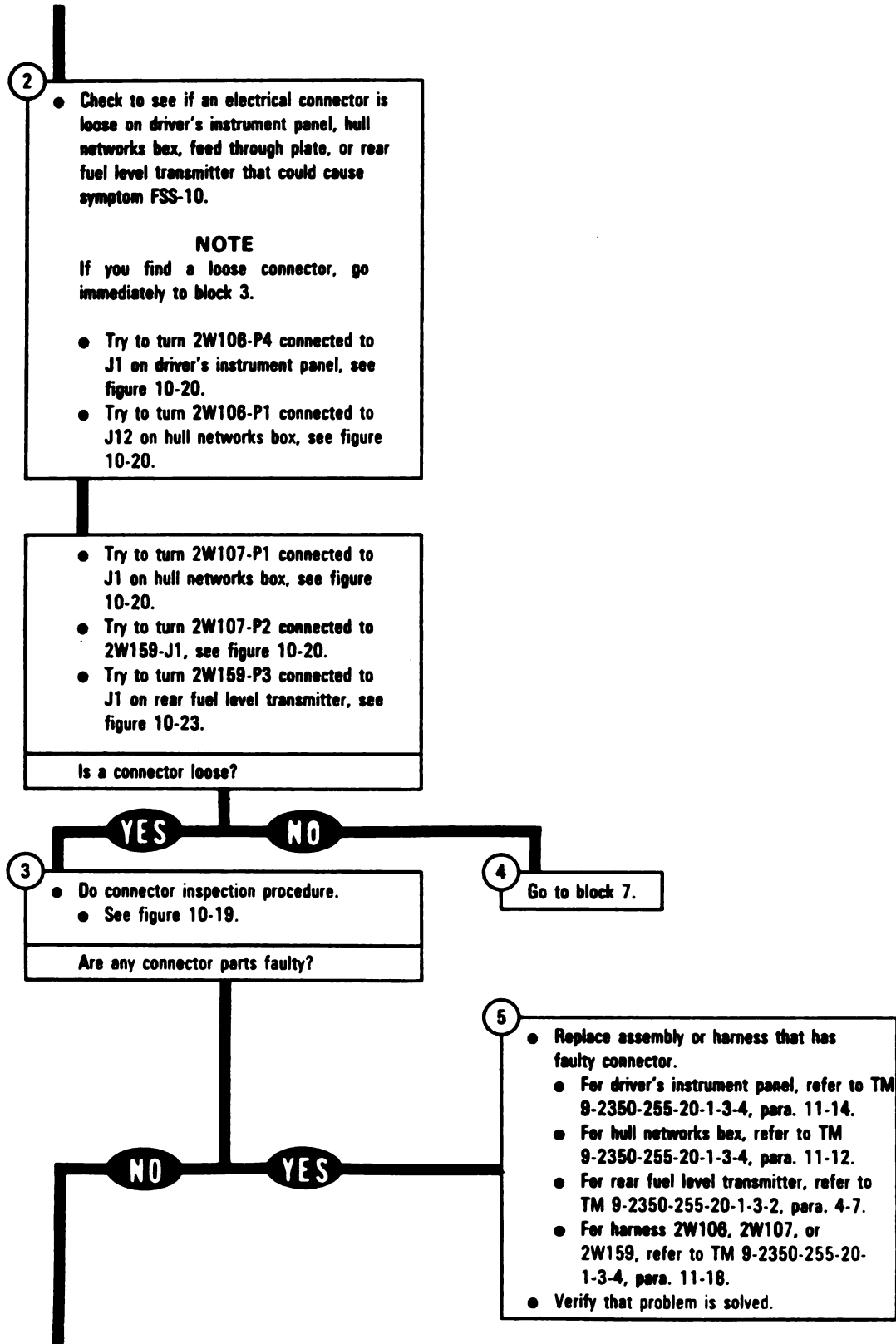
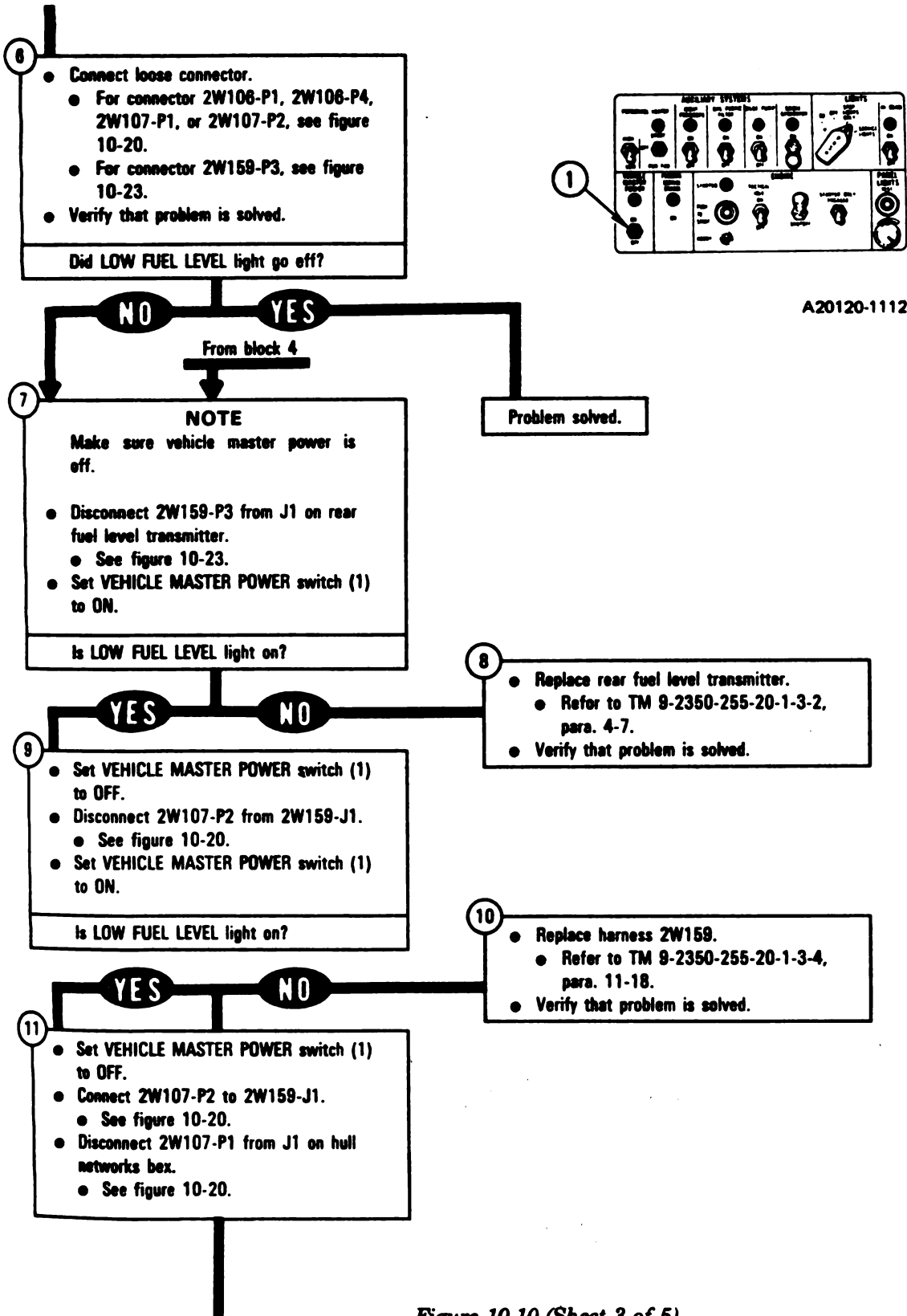


Figure 10-10 (Sheet 2 of 5)  
Volume II  
Para. 10-2



A20120-1112

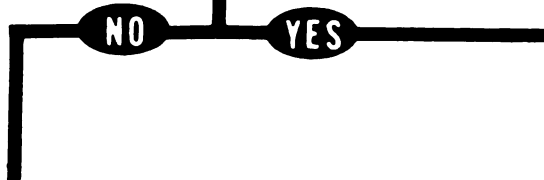
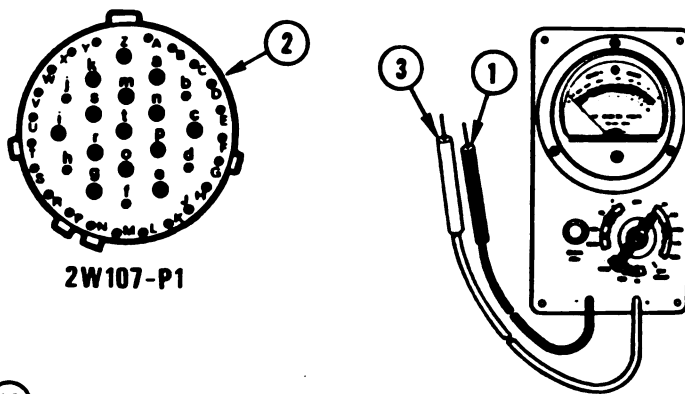
Figure 10-10 (Sheet 3 of 5)  
 Volume II  
 Para. 10-2

**TM 9-2350-255-20-1-2-1  
FUEL SUPPLY SYSTEM TROUBLESHOOTING**

12

- Prepare multimeter for SHORTS TEST.
  - Refer to TM 9-2350-255-20-1-2-2, figure 18-6.
- Test for a short between contacts J and N on 2W107-P1.
  - Connect black test probe (1) to contact J on P1 (2).
  - Connect red test probe (3) to contact N on P1 (2).

Does multimeter show a short?

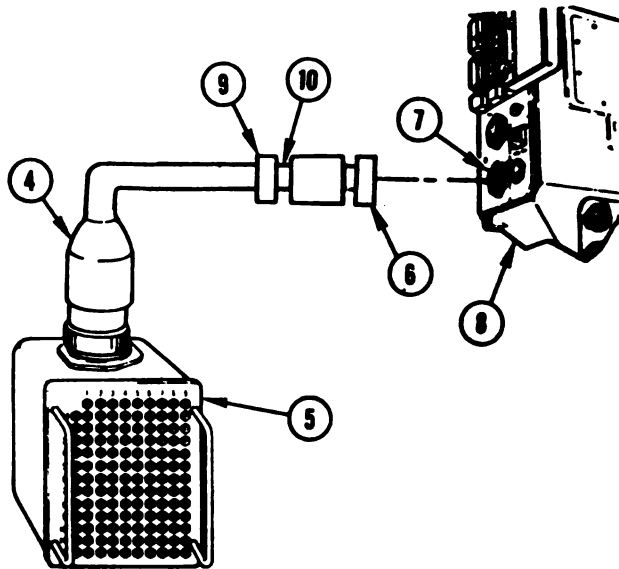


13

- Connect 2W159-P3 to J1 on rear fuel level transmitter.
  - See figure 10-23.
- Replace harness 2W107.
  - Refer to TM 9-2350-255-20-1-3-4, para. 11-18.
- Verify that problem is solved.

14

- Disconnect 2W106-P1 from J12 on hull networks box.
  - See figure 10-20.
- Connect breakout box to TJ2 on hull networks box.
  - Connect CABLE NO. 1-P1 (4) to breakout box (5).
  - Connect ADAPTER NO. 2-P1 (6) to TJ2 (7) on hull networks box (8).
  - Connect CABLE NO. 1-P2 (9) to ADAPTER NO. 2-J1 (10).



15

- Test for a short between test points 9 and 63 on breakout box.
  - Connect black test probe (1) to test point 9 on breakout box (5).
  - Connect red test probe (3) to test point 63 on breakout box (5).

Does multimeter show a short?

A20120-1540

*Figure 10-10 (Sheet 4 of 5)  
Volume II  
Para. 10-2*

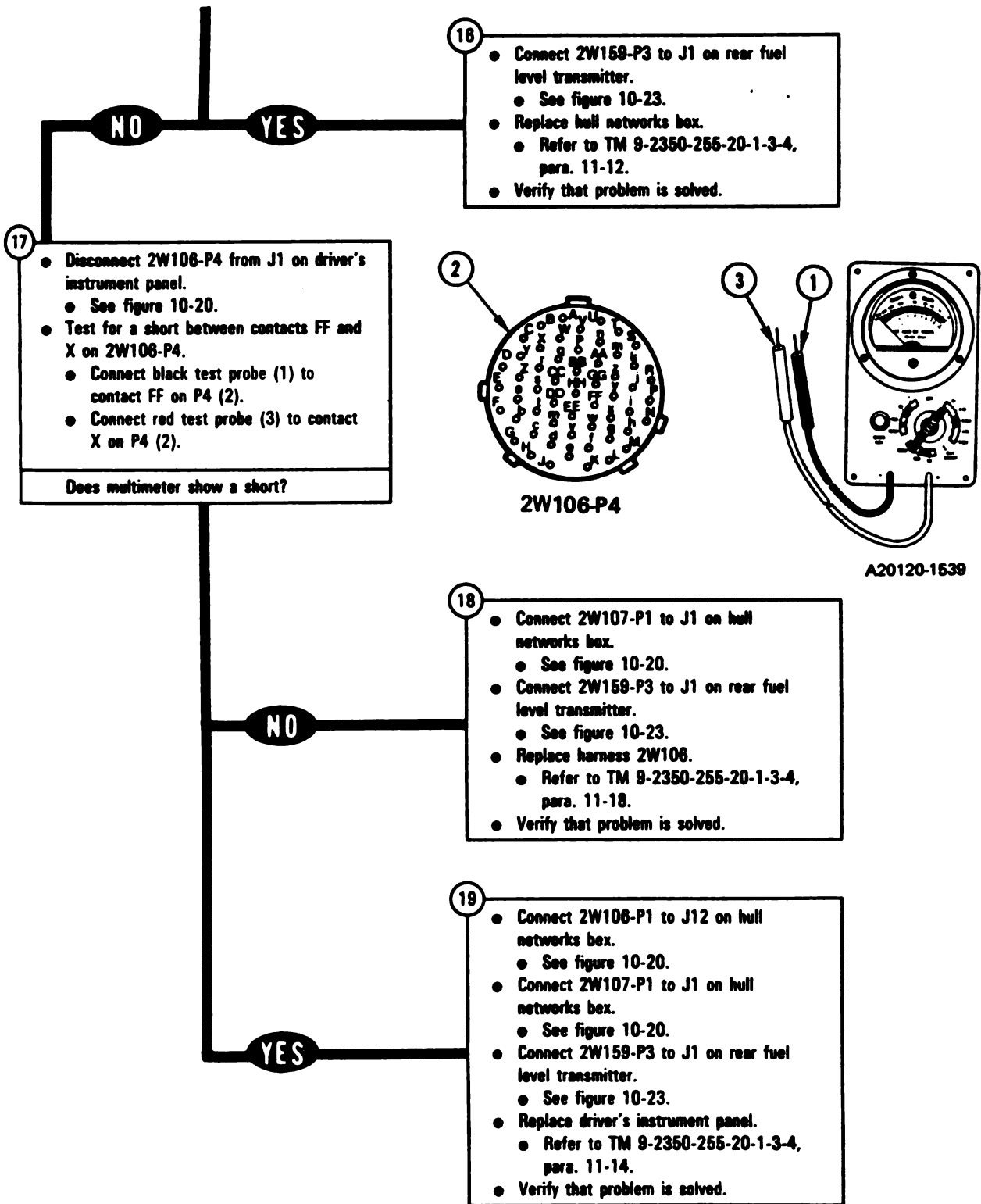


Figure 10-10 (Sheet 5 of 5)  
**Volume II**  
**Para. 10-2**

**SYMPTOM FSS-11**

**LOW FUEL LEVEL LIGHT DOES NOT COME ON  
WHEN REAR FUEL TANK SHOWS BELOW 1/4  
FULL ON FUEL GAGE - CANNOT TRANSFER  
FUEL**

**Supplies:**

- Connector Pin/Socket Adapters
- Electrical Jumpers

**Test Equipment/Special Tools:**

- Breakout Box Tool Kit, 12311088
- Multimeter
- Pliers, slip joint, conduit style with plastic jaw inserts, NSN 5120-00-824-8065

**Equipment Condition:**

- Tank parked.
- Parking brake set.
- Engine shut down.
- Vehicle master power off.
- Rear fuel tanks must be less than 1/4 full.
- Left and right front fuel tanks full.

**NOTE**

- Read para. 10-1 before doing any work.
- When jumpers are used, remove them after completing last instruction in that block.

1

- Set up tank controls for standard initial test conditions.
- Refer to table 10-2, para. 10-5.

*Figure 10-11 (Sheet 1 of 14)*  
**Volume II**  
**Para. 10-2**

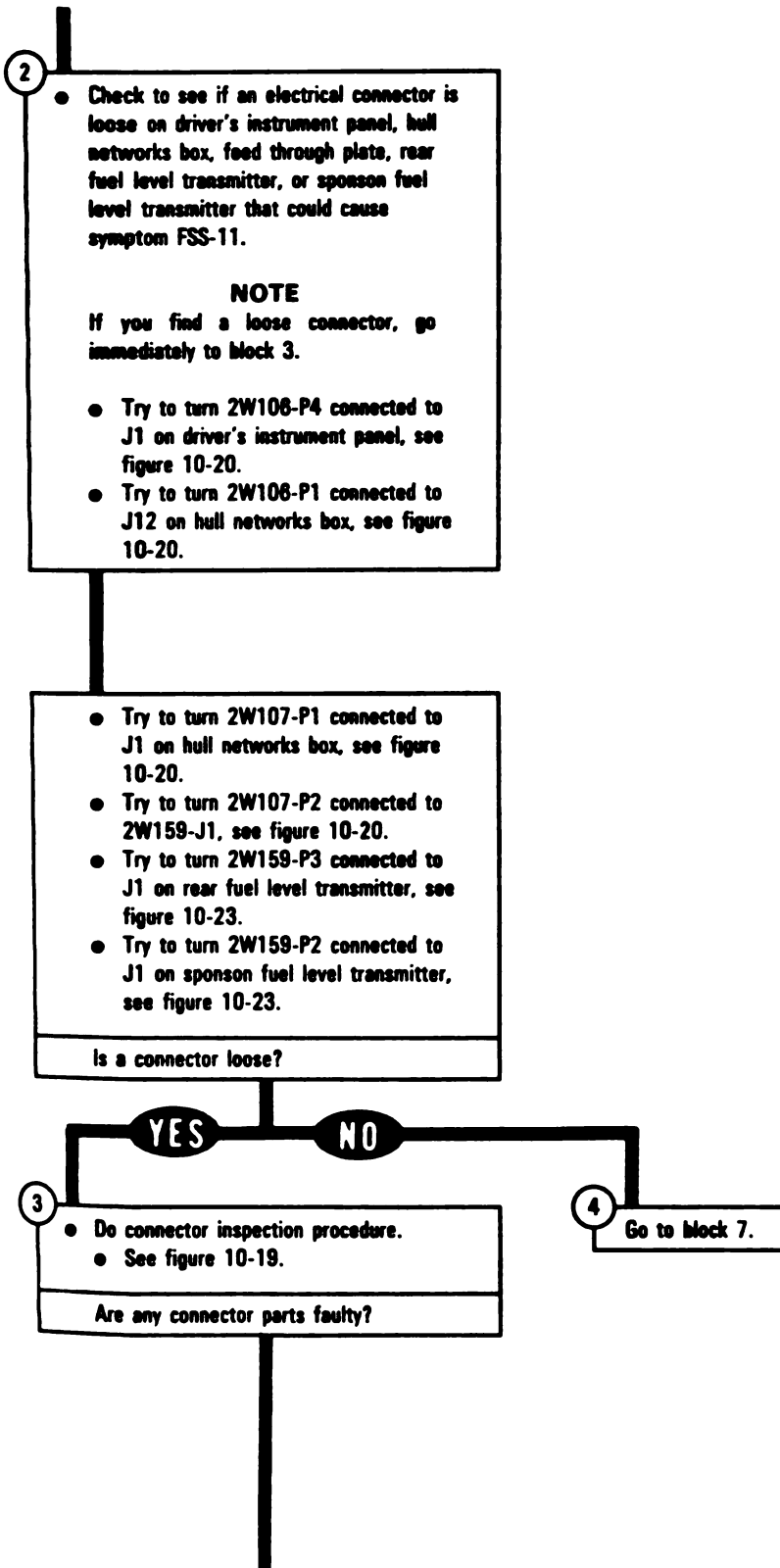
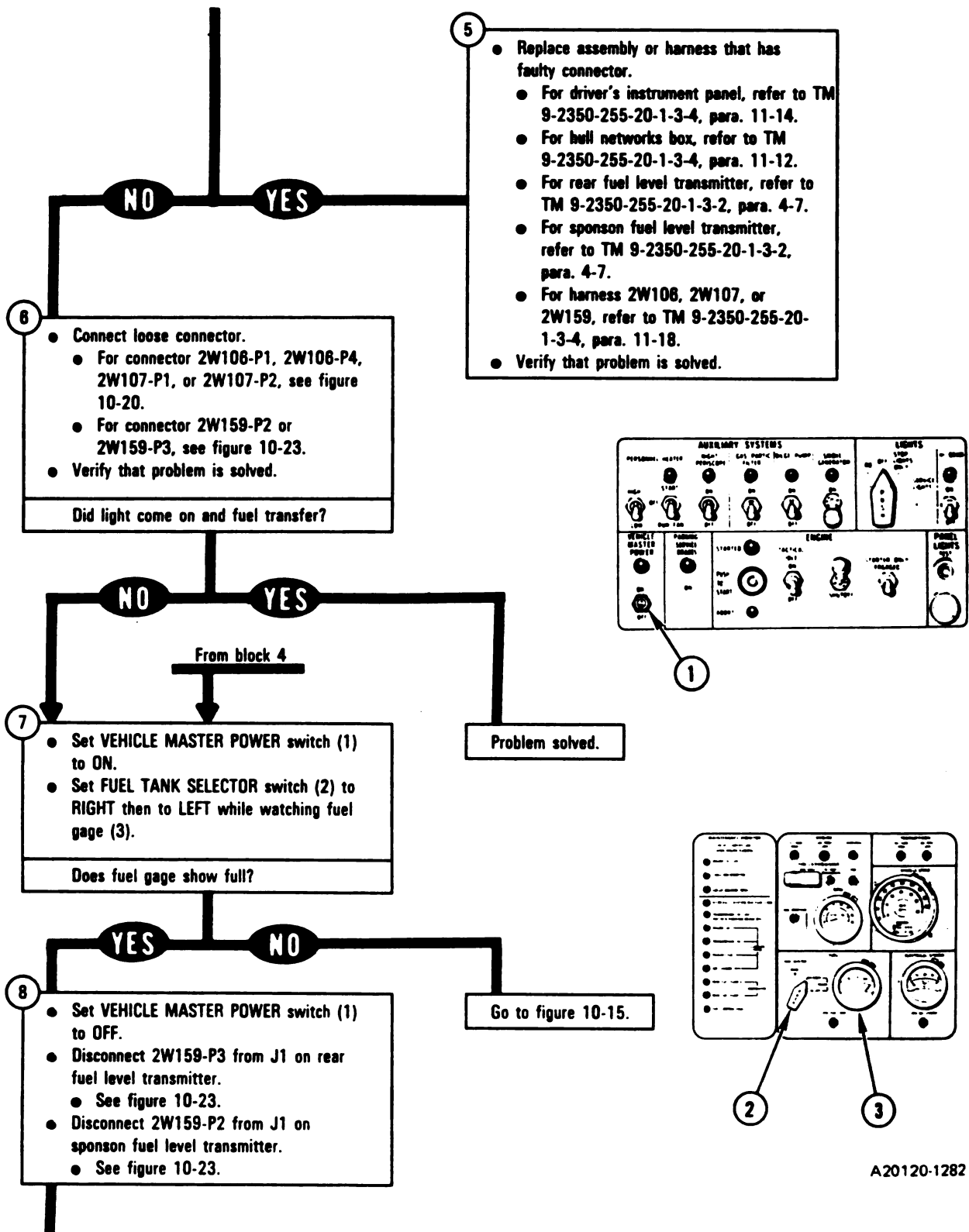


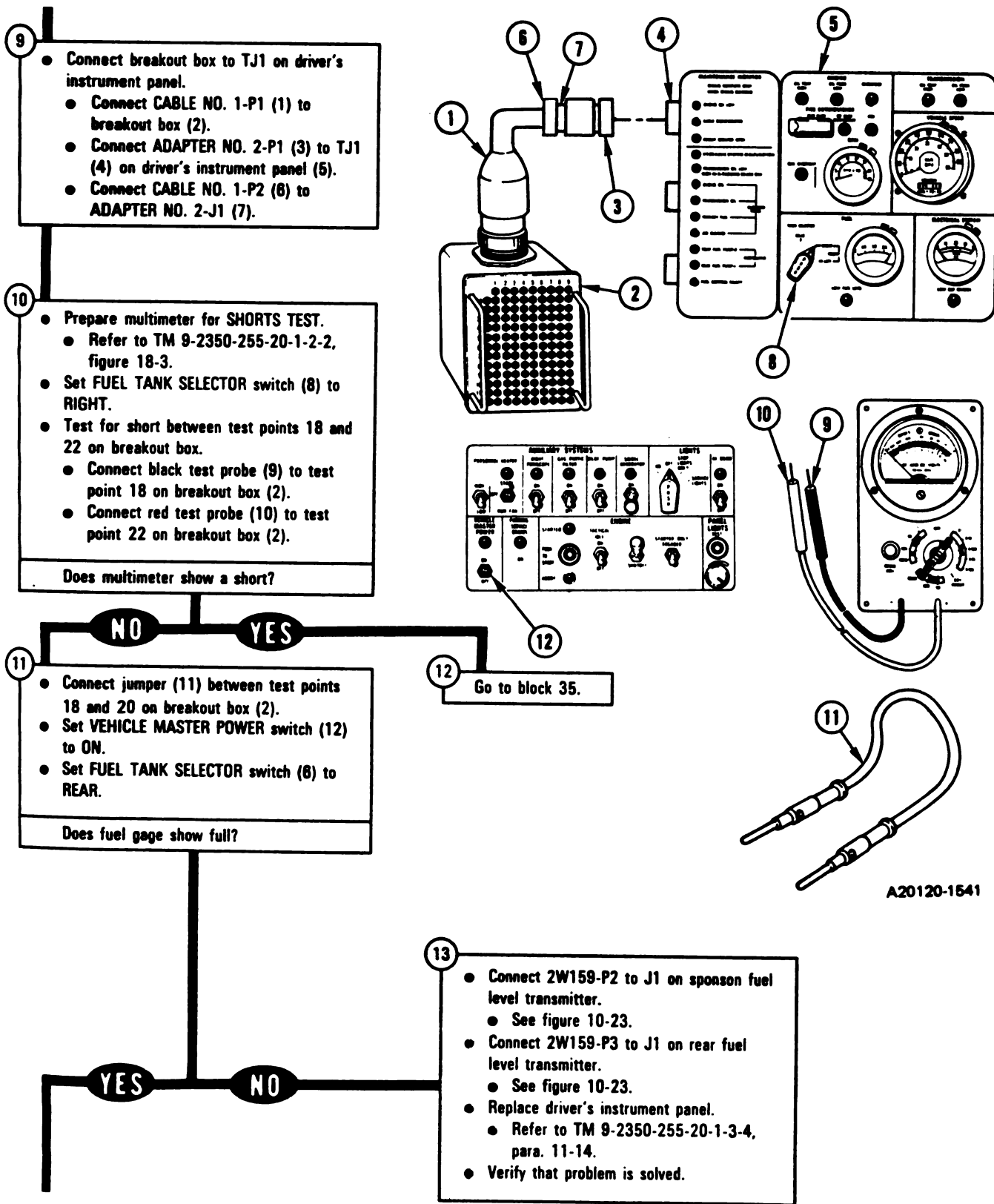
Figure 10-11 (Sheet 2 of 14)  
Volume II  
Para. 10-2

**TM 9-2350-255-20-1-2-1  
FUEL SUPPLY SYSTEM TROUBLESHOOTING**



A20120-1282

*Figure 10-11 (Sheet 3 of 14)  
Volume II  
Para. 10-2*

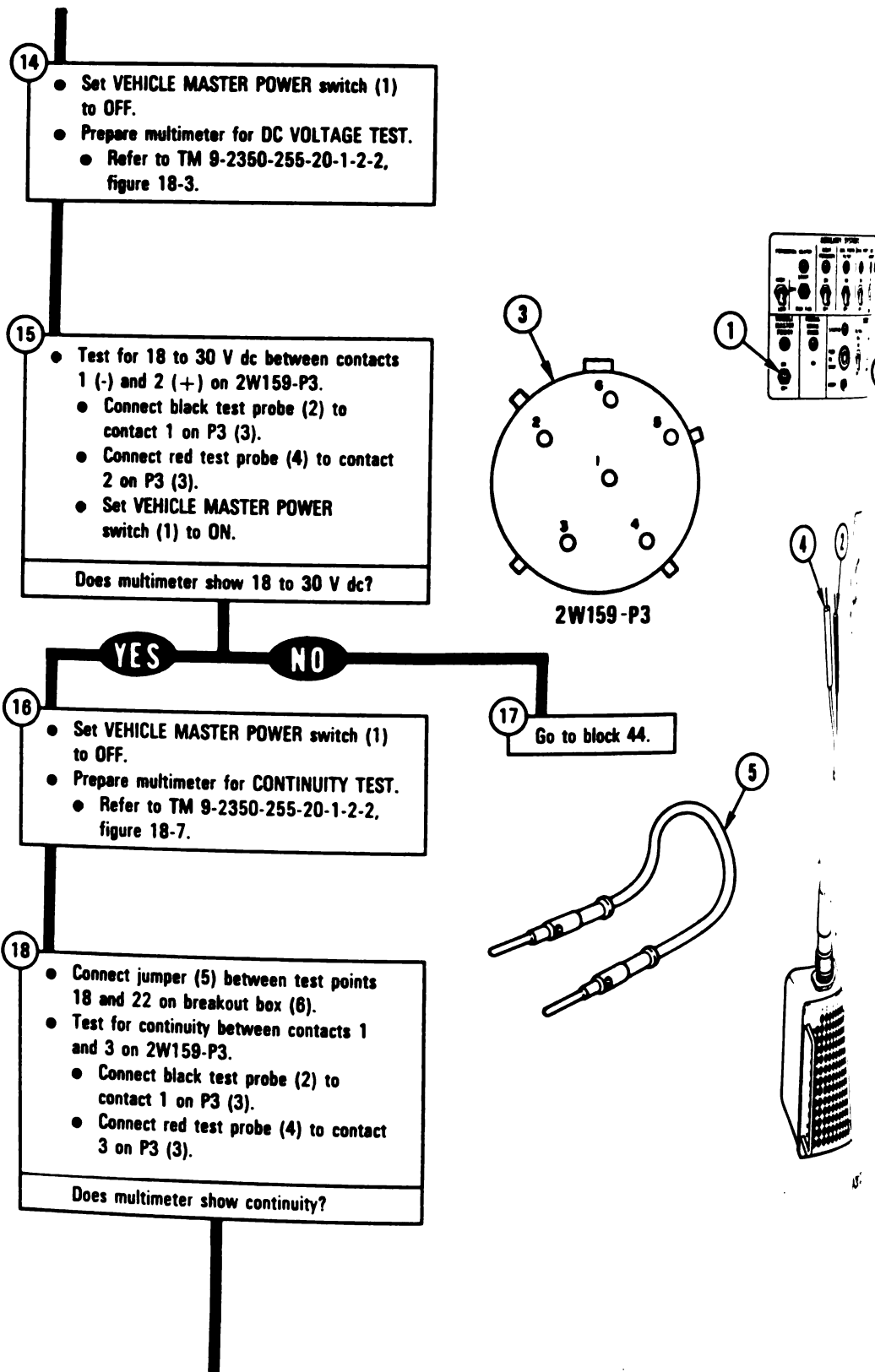


A20120-1541

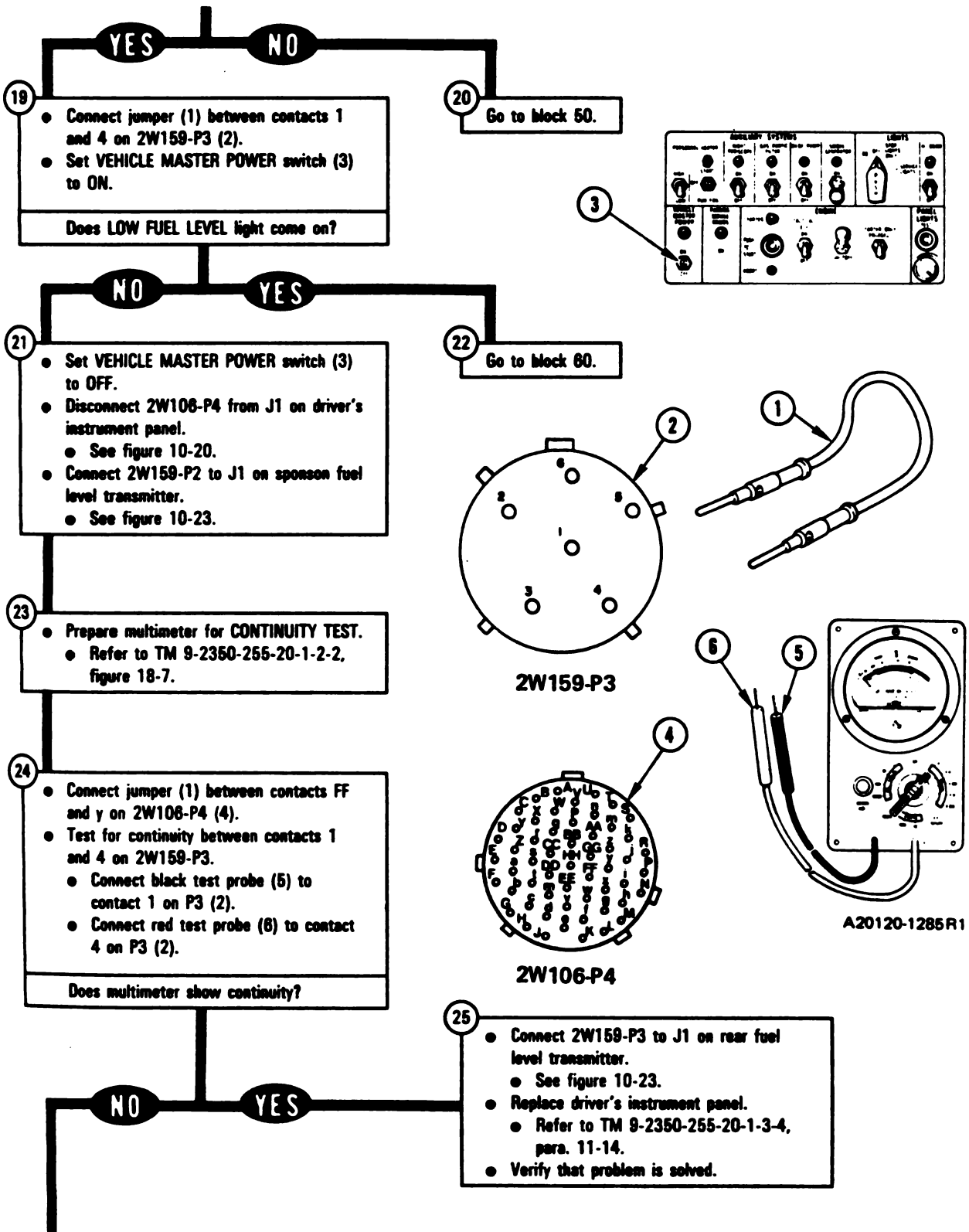
Figure 10-11 (Sheet 4 of 14)  
Volume II  
Para. 10-2



**TM 9-2350-255-20-1-2-1  
FUEL SUPPLY SYSTEM TROUBLESHOOTING**

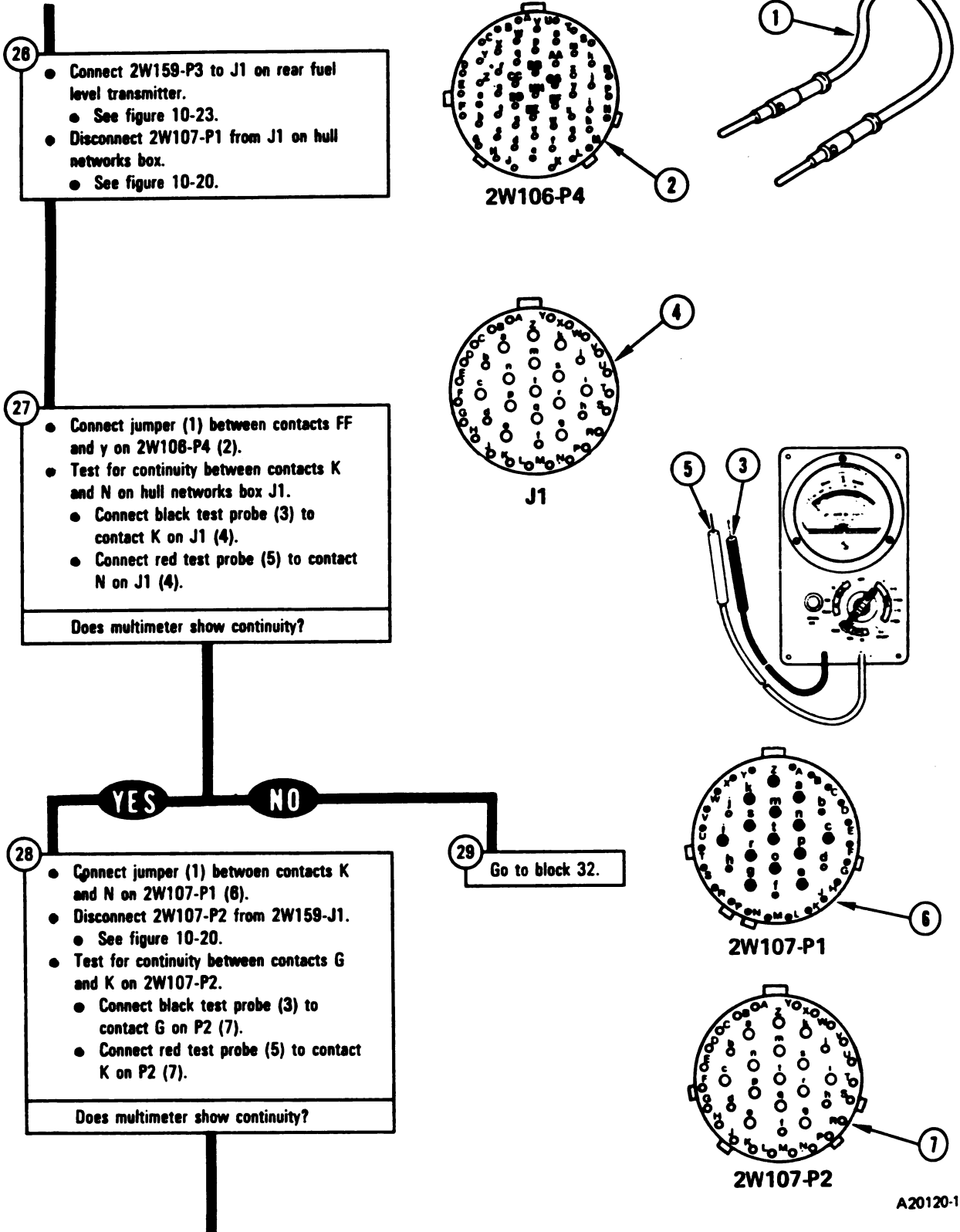


*Figure 10-11 (Sheet 5 of 14)  
Volume II  
Para. 10-2*



*Figure 10-11 (Sheet 6 of 14)*  
**Volume II**  
**Para. 10-2**

**TM 9-2350-255-20-1-2-1  
FUEL SUPPLY SYSTEM TROUBLESHOOTING**



A20120-1286

Figure 10-11 (Sheet 7 of 14)  
Volume II  
Para. 10-2

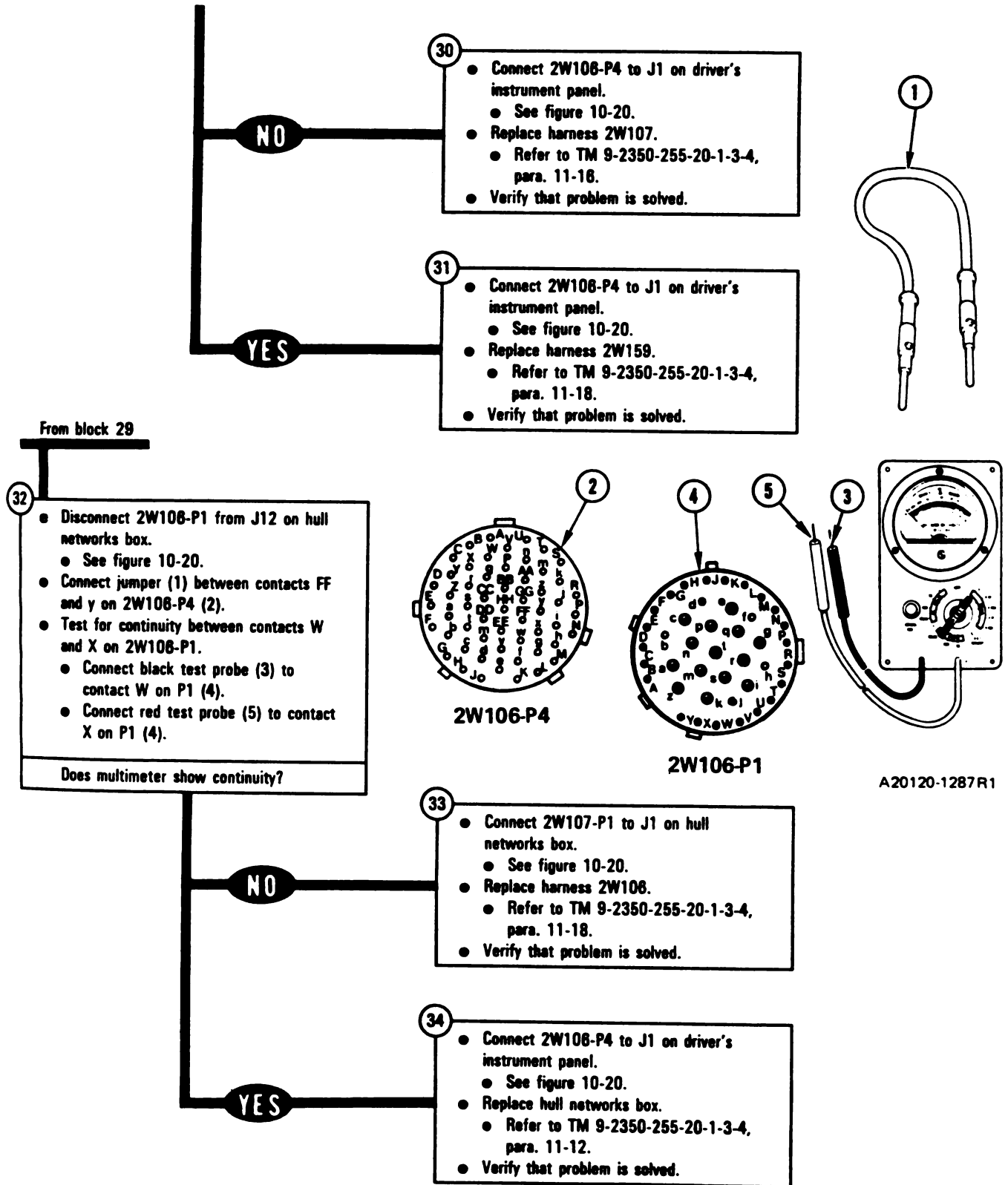
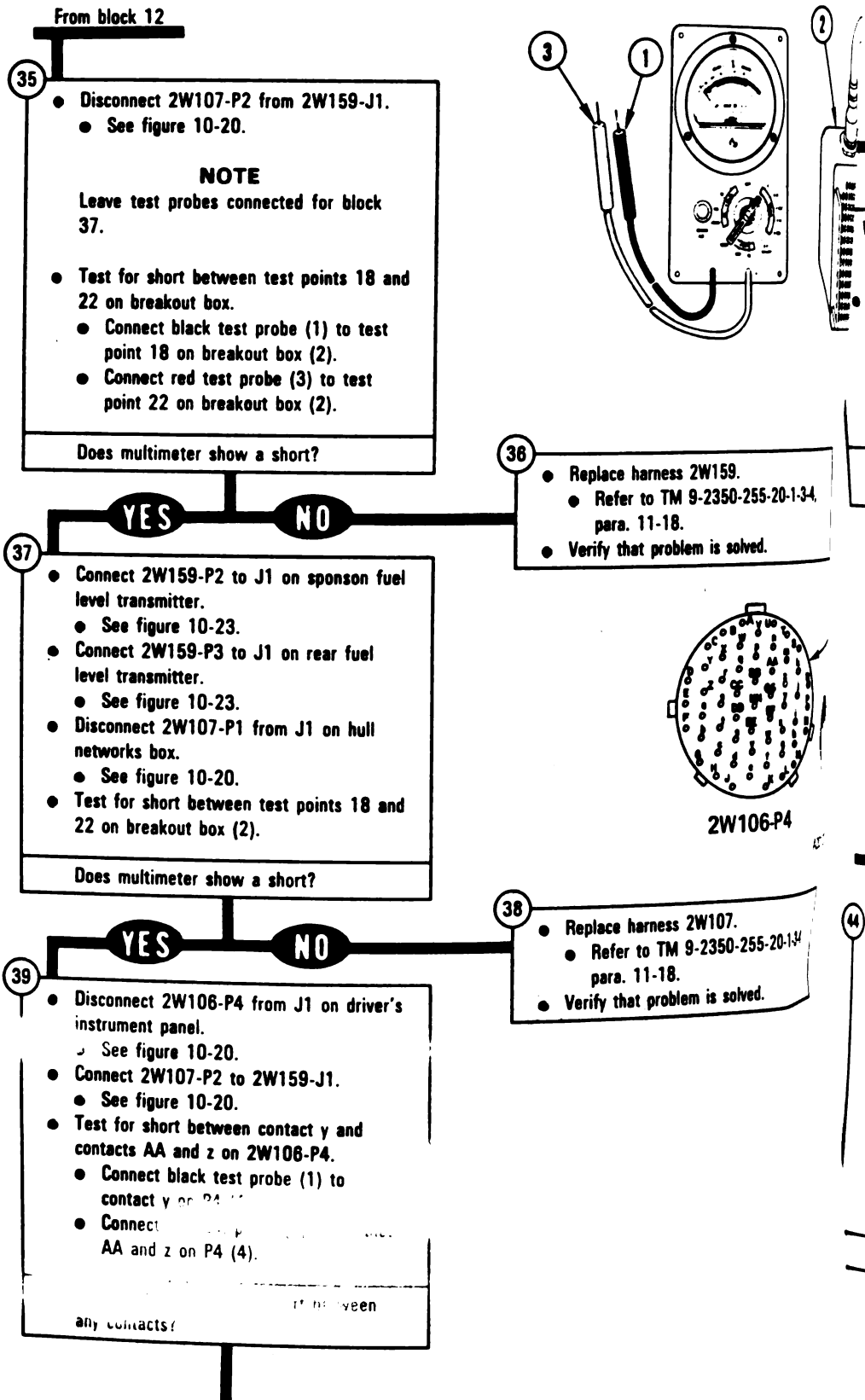


Figure 10-11 (Sheet 8 of 14)  
Volume II  
Para. 10-2

**TM 9-2350-255-20-1-2-1  
FUEL SUPPLY SYSTEM TROUBLESHOOTING**



*Figure 10-11 (Sheet 9 of 14)  
Volume II  
Para. 10-2*

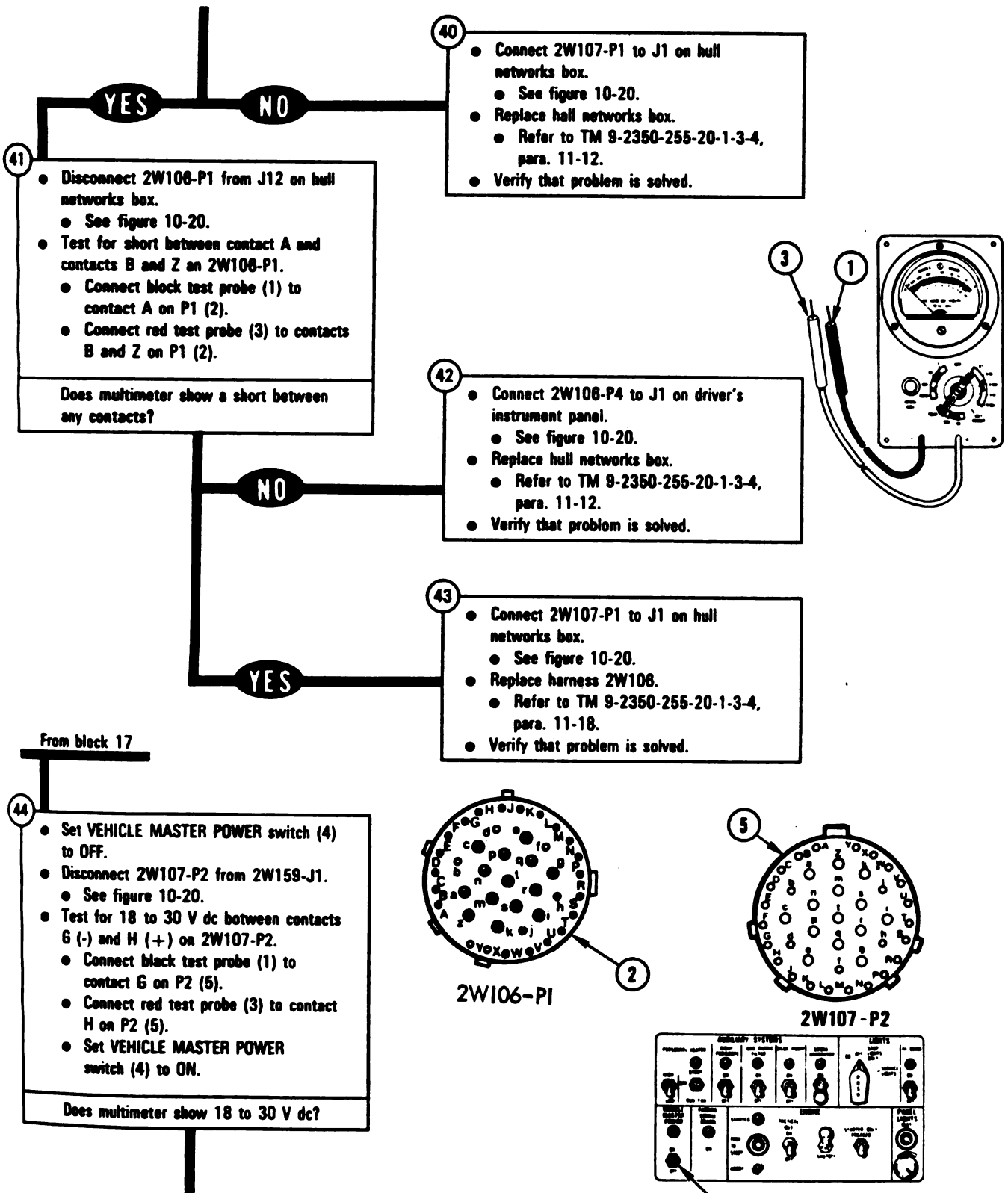
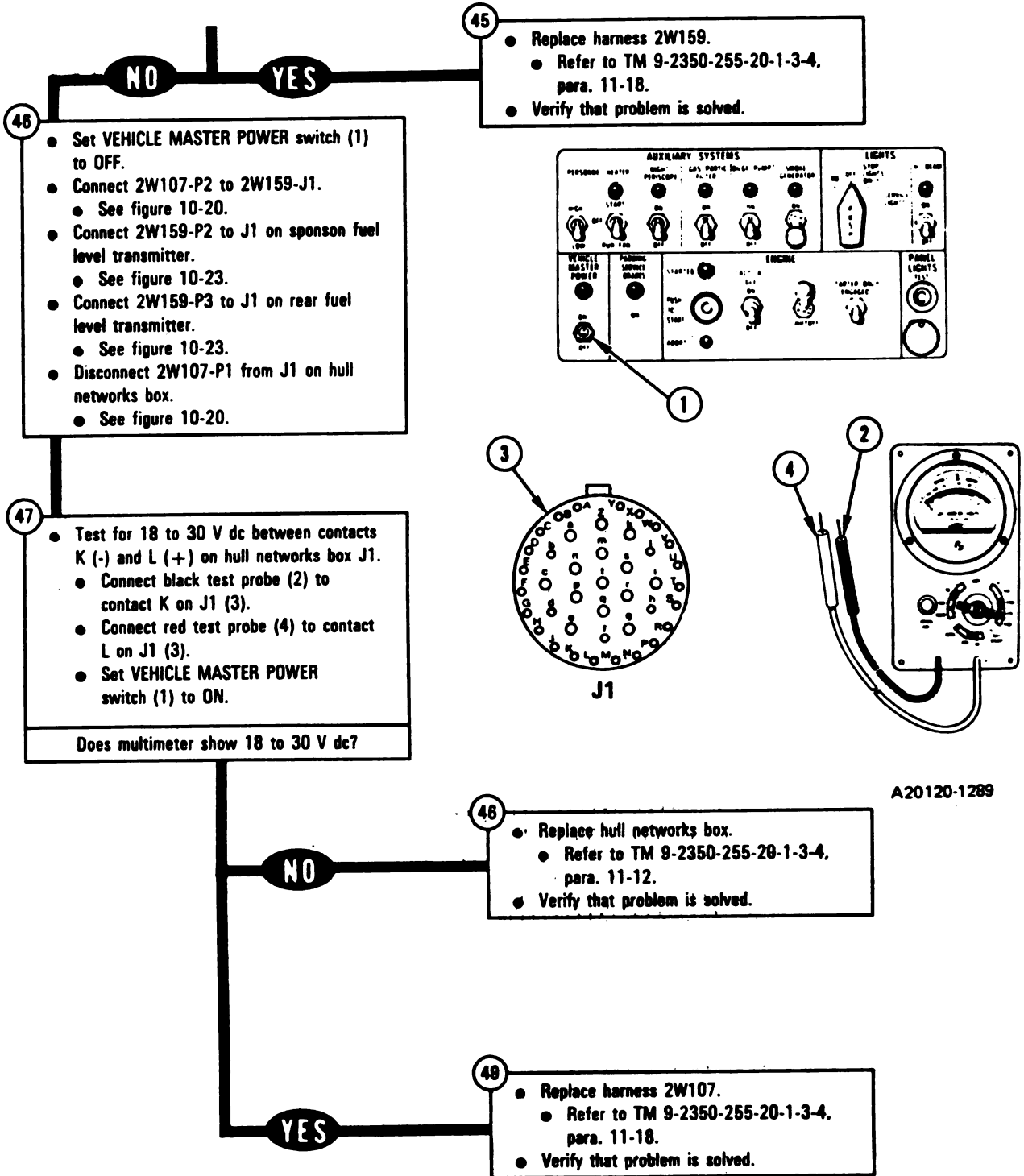


Figure 10-11 (Sheet 10 of 14)  
Volume II  
Para. 10-2

**TM 9-2350-255-20-1-2-1  
FUEL SUPPLY SYSTEM TROUBLESHOOTING**



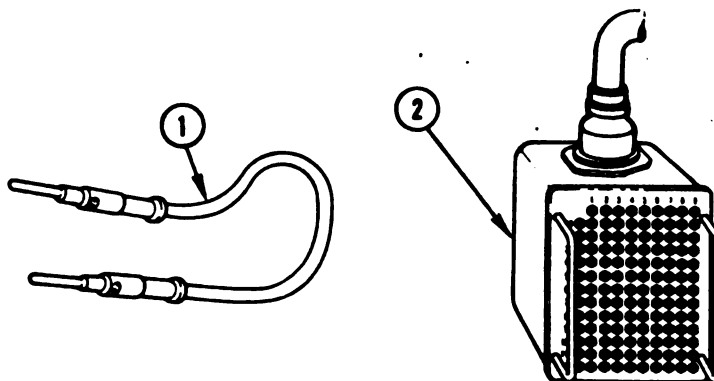
From block 20

**50**

**NOTE**  
Leave jumper (1) connected for remainder of tests.

- Connect jumper (1) between test points 18 and 22 on breakout box (2).
- Disconnect 2W107-P2 from 2W159-J1.
  - See figure 10-20.
- Test for continuity between contacts G and J on 2W107-P2.
  - Connect black test probe (3) to contact G on P2 (4).
  - Connect red test probe (5) to contact J on P2 (4).

Does multimeter show continuity?

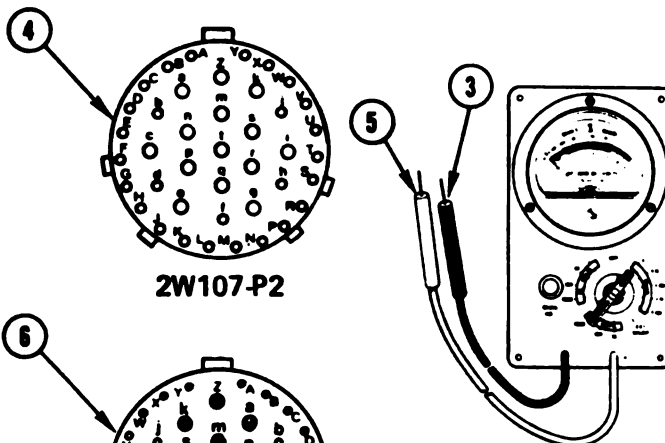


**51**

- Replace harness 2W159.
- Refer to TM 9-2350-255-20-1-3-4, para. 11-18.
- Verify that problem is solved.

**52**

- Connect 2W159-P2 to J1 on sponson fuel level transmitter.
  - See figure 10-23.
- Connect 2W159-P3 to J1 on rear fuel level transmitter.
  - See figure 10-23.
- Disconnect 2W107-P1 from J1 on hull networks box.
  - See figure 10-20.



**53**

- Test for continuity between contacts K and M on 2W107-P1.
  - Connect black test probe (3) to contact K on P1 (6).
  - Connect red test probe (5) to contact M on P1 (6).

Does multimeter show continuity?

**54**

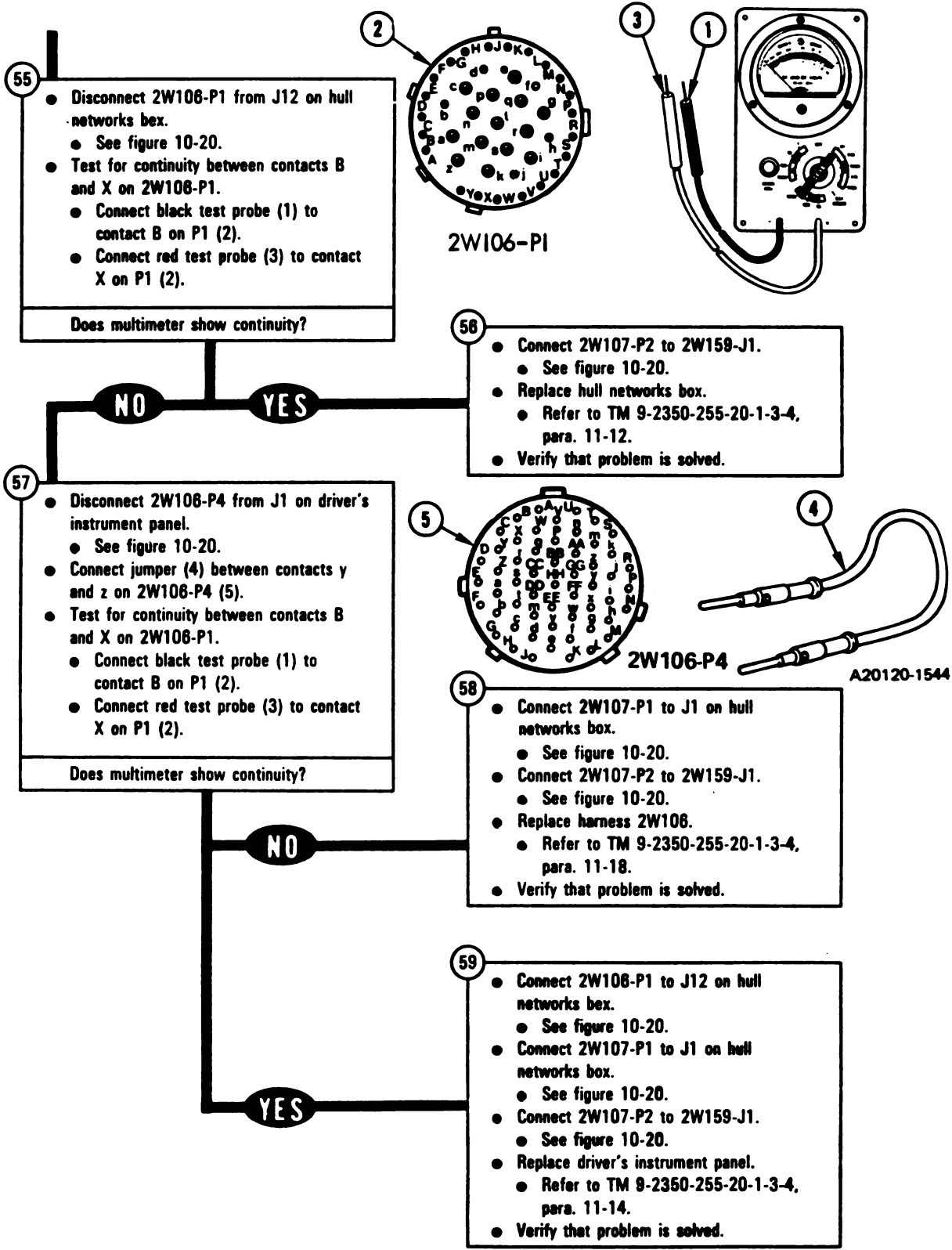
- Replace harness 2W107.
- Refer to TM 9-2350-255-20-1-3-4, para. 11-18.
- Verify that problem is solved.

A20120-1290

Figure 10-11 (Sheet 12 of 14)  
Volume II  
Para. 10-2



**TM 9-2350-255-20-1-2-1  
FUEL SUPPLY SYSTEM TROUBLESHOOTING**



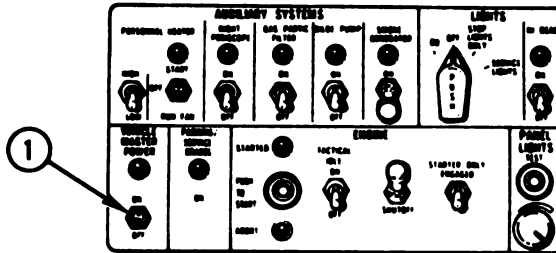
*Figure 10-11 (Sheet 13 of 14)  
Volume II  
Para. 10-2*

From block 22

80

- Set VEHICLE MASTER POWER switch (1) to OFF.
- Connect 2W159-P2 to sponson fuel level transmitter.
  - See figure 10-23.
- Replace rear fuel level transmitter.
  - Refer to TM 9-2350-255-20-1-3-2, para. 4-7.
- Verify that problem is solved.

Did LOW FUEL LEVEL light come on eed fuel transfer?



A20120-1112

81

- Install original rear fuel level transmitter.
  - Refer to TM 9-2350-255-20-1-3-2, para. 4-7.
- Replace sponson fuel level transmitter.
  - Refer to TM 9-2350-255-20-1-3-2, para. 4-7.
- Verify that problem is solved.

YES

NO

Problem solved.

Figure 10-11 (Sheet 14 of 14)  
 Volume II  
 Para. 10-2

Change 6 10-109

**SYMPTOM FSS-12**

**FUEL TRANSFERS FROM LEFT FRONT  
FUEL TANK WHEN RIGHT OR LEFT FRONT  
FUEL TANK IS SELECTED**

**Supplies:**

- Connector Pin/Socket Adapters

**Test Equipment/Special Tools:**

- Multimeter
- Pliers, slip joint, conduit style with plastic jaw inserts, NSN 5120-00-824-8085

**Equipment Condition:**

- Tank perked.
- Parking brake set.
- Engine shut down.
- Vehicle master power off.

**NOTE**

Read para. 10-1 before doing any work.

1

- Set up tank controls for standard initial test conditions.
  - Refer to table 10-2, para. 10-5.

*Figure 10-12 (Sheet 1 of 3)  
Volume II  
Para. 10-2*

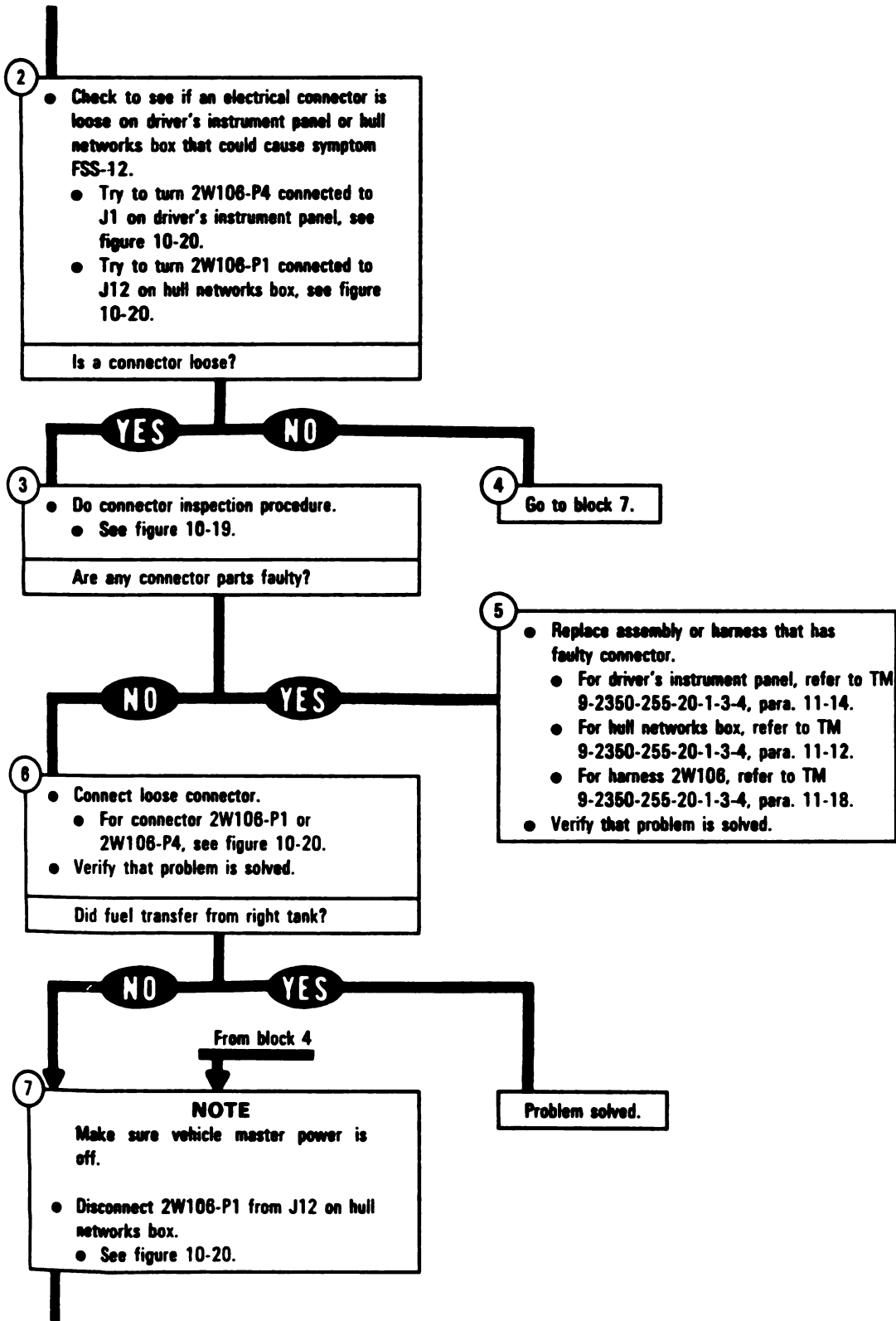
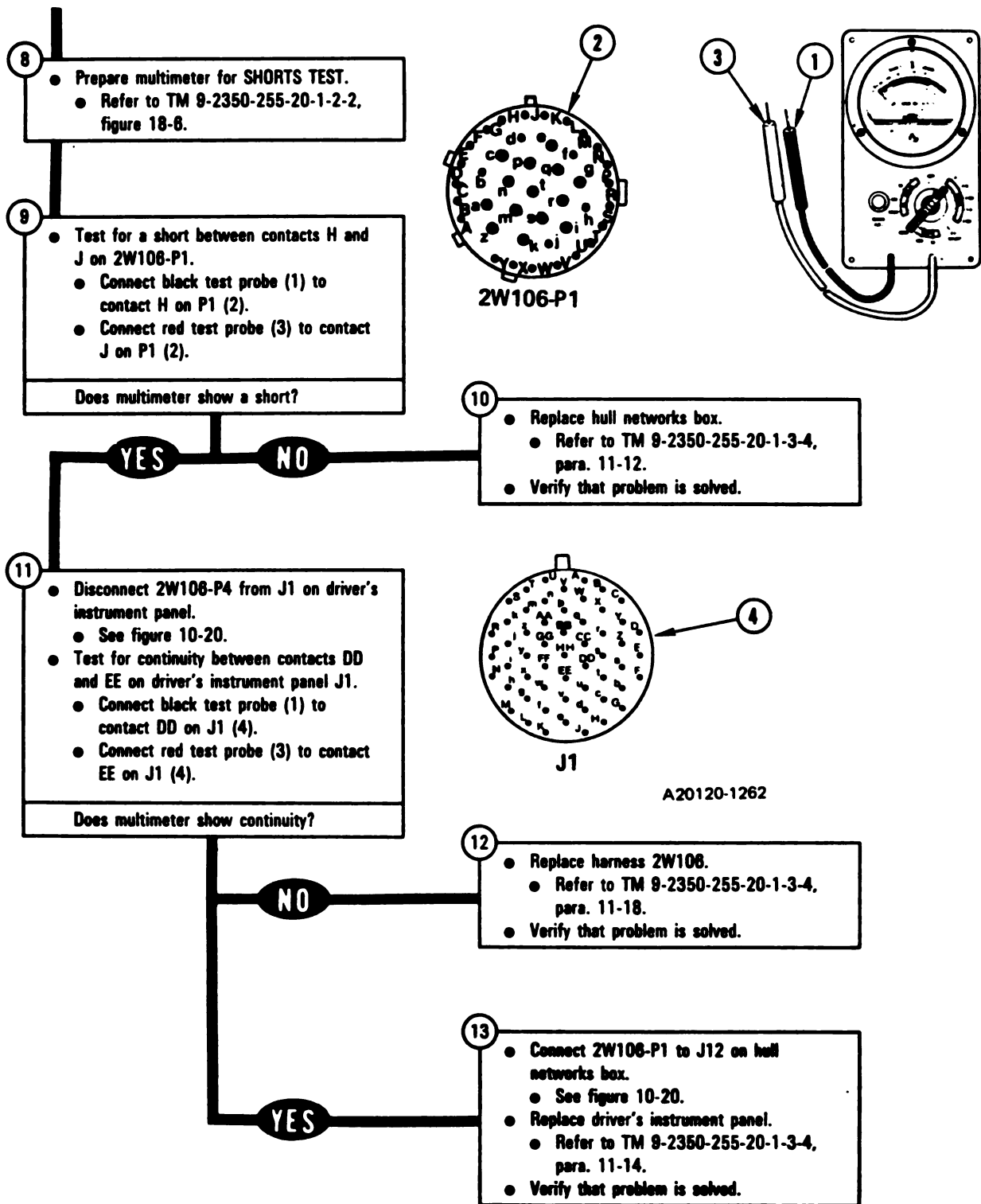
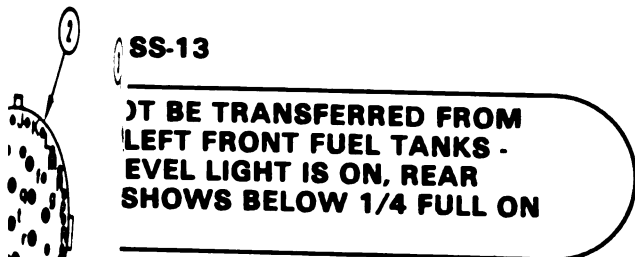


Figure 10-12 (Sheet 2 of 3)  
 Volume II  
 Para. 10-2

**TM 9-2350-255-20-1-2-1  
FUEL SUPPLY SYSTEM TROUBLESHOOTING**



*Figure 10-12 (Sheet 3 of 3)  
Volume II  
Para. 10-2*



**SS-13**

**NOT BE TRANSFERRED FROM LEFT FRONT FUEL TANKS - LEVEL LIGHT IS ON, REAR SHOWS BELOW 1/4 FULL ON**

SP1  
**Socket Adapters**  
 ers

Place fuel network in  
 Refer to TM 9-2350-255-  
 Para. 11-12.  
 that problem is solved.  
**Equipment/Special Tools:**  
 Tool Kit, 12311066  
 nt, conduit style with plastic  
 ISN 5120-00-624-8065

**Condition:**  
 set.  
 down.  
 or power off.  
 ks must be less than 1/4

ess 270106  
 TM 9-2350-255-  
**NOTE**  
 O-1 before doing any work.  
 When sockets are used, remove them  
 after the last instruction in that  
 two-man job. Soldier A is  
 for completing the job. Sol-  
 the assistant and is directed by  
 Soldier B will be used only in  
 and 33.  
 fuel to the rear tanks; the  
 LEVEL light must be on before  
 e transferred.

*Figure 10-13 (Sheet 1 of 17)*  
**Volume II**  
**Para. 10-2**

TM 9-2350-255-20-1-2-1  
FUEL SUPPLY SYSTEM TROUBLESHOOTING

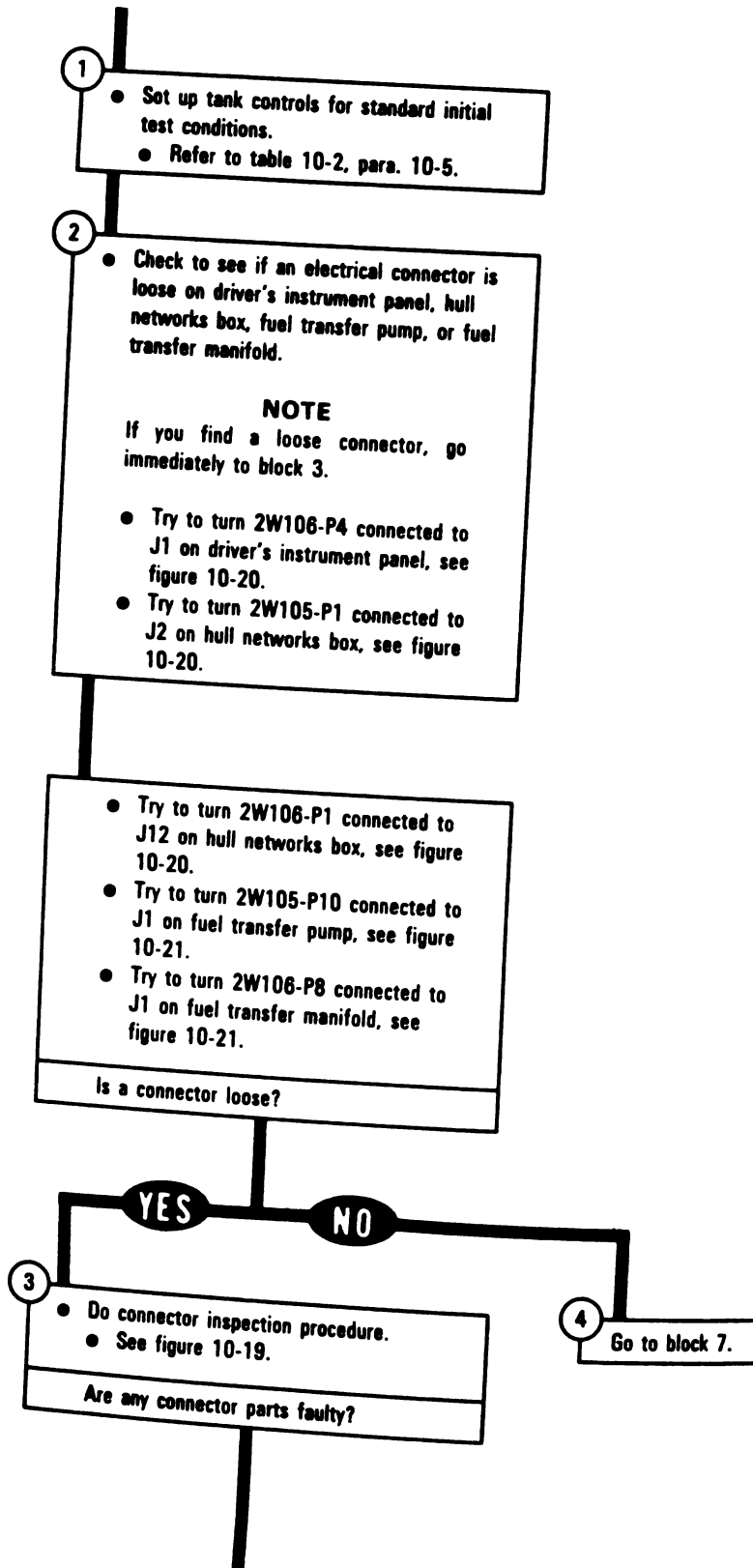


Figure 10-13 (Sheet 2 of 17)  
Volume II  
Para. 10-2

10-114 Change 6

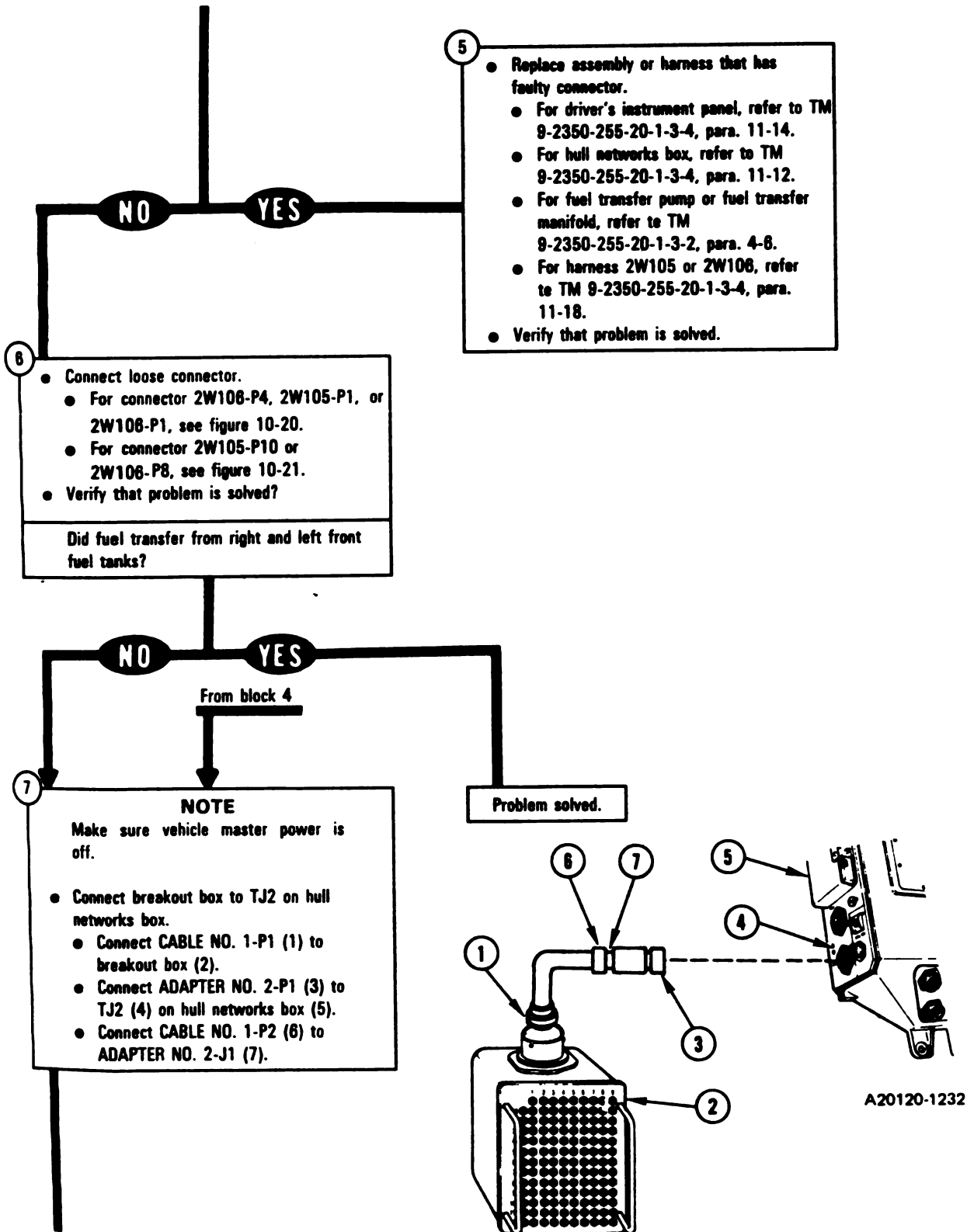


Figure 10-13 (Sheet 3 of 17)  
 Volume II  
 Para. 10-2



**TM 9-2350-255-20-1-2-1  
FUEL SUPPLY SYSTEM TROUBLESHOOTING**

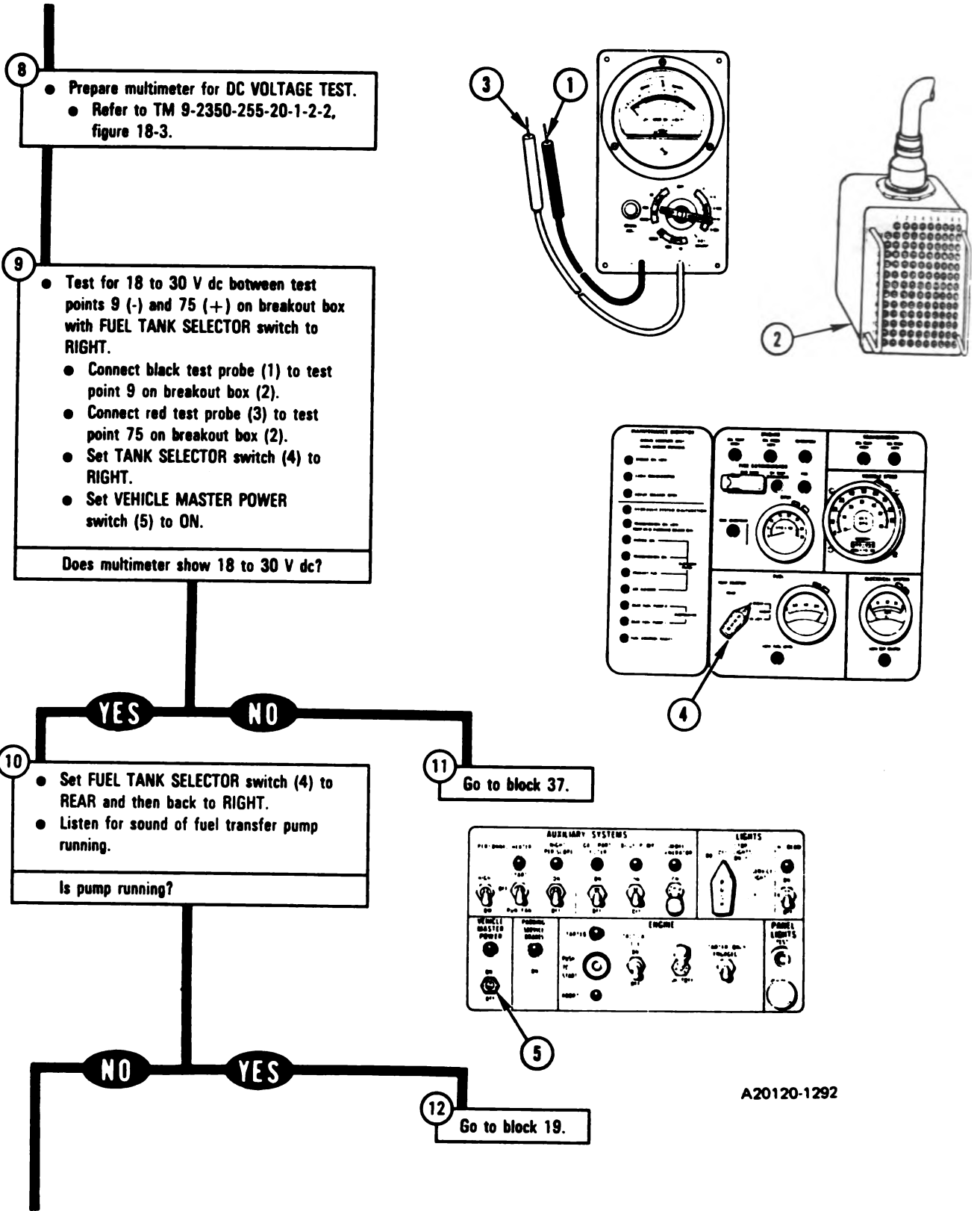
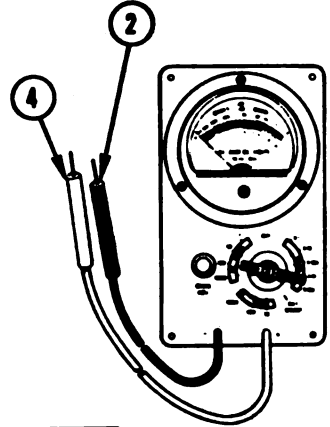
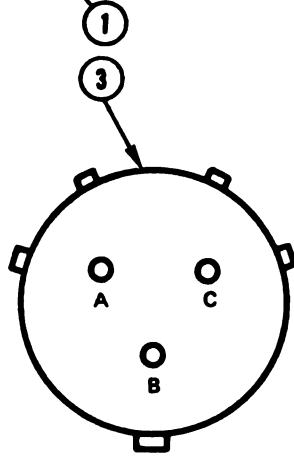
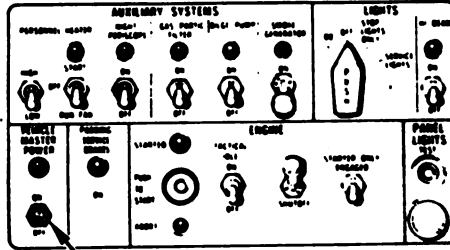


Figure 10-13 (Sheet 4 of 17)  
Volume II  
Para. 10-2

13

- Set **VEHICLE MASTER POWER** switch (1) to OFF.
- Disconnect 2W105-P10 from J1 on fuel transfer pump.
  - See figure 10-21.
- Test for 18 to 30 V dc between contacts A (-) and B (+) on 2W105-P10.
  - Connect black test probe (2) to contact A on P10 (3).
  - Connect red test probe (4) to contact B on P10 (3).
- Set **VEHICLE MASTER POWER** switch (1) to ON.

Does multimeter show 18 to 30 V dc?



14

- Replace fuel transfer pump.
  - Refer to TM 9-2350-255-20-1-3-2, para. 4-6.
- Verify that problem is solved.

NO

YES

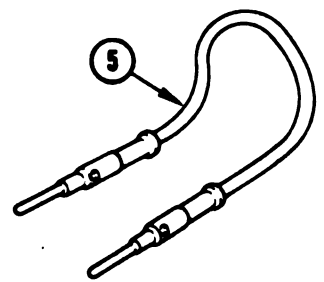
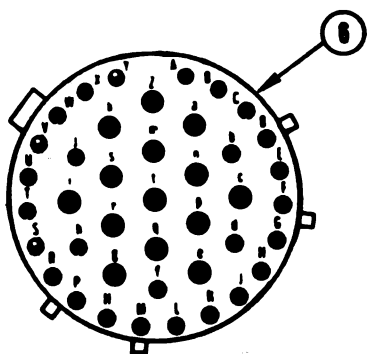
15

- Set **VEHICLE MASTER POWER** switch (1) to OFF.
- Disconnect 2W105-P1 from J2 on hull networks box.
  - See figure 10-20.
- Prepare multimeter for **CONTINUITY TEST**.
  - Refer to TM 9-2350-255-20-1-2-2, figure 18-7.

16

- Connect jumper (5) between contacts A and B on 2W105-P10.
- Test for continuity between contacts g and i on 2W105-P1.
  - Connect black test probe (2) to contact g on P1 (8).
  - Connect red test probe (4) to contact i on P1 (8).

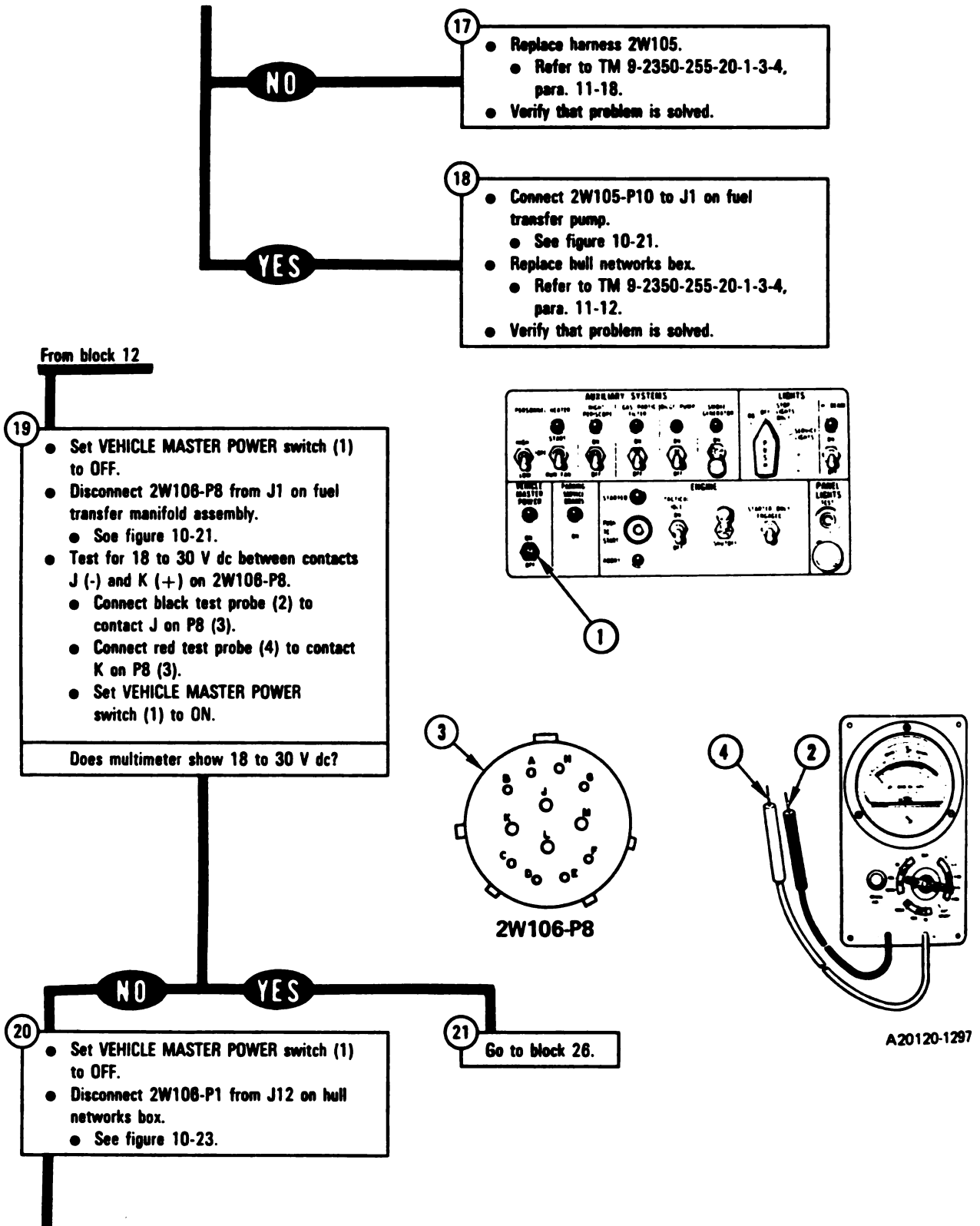
Does multimeter show continuity?



A20120-1293

Figure 10-13 (Sheet 5 of 17)  
 Volume II  
 Para. 10-2

**TM 9-2350-255-20-1-2-1  
FUEL SUPPLY SYSTEM TROUBLESHOOTING**



*Figure 10-13 (Sheet 6 of 17)  
Volume II  
Para. 10-2*

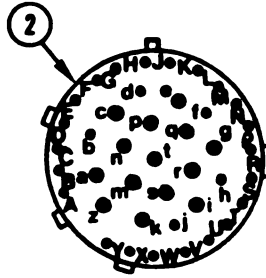
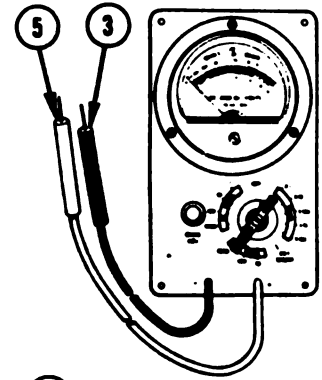
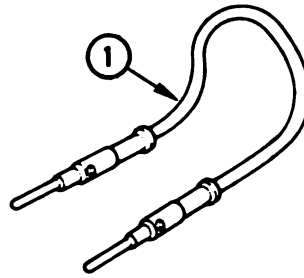
22

- Prepare multimeter for CONTINUITY TEST.
- Refer to TM 9-2350-255-20-1-2-2, figure 18-7.

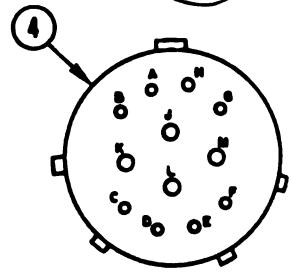
23

- Connect jumper (1) between contacts e and g on 2W106-P1 (2).
- Test for continuity between contacts J and K on 2W106-P8.
- Connect black test probe (3) to contact J on P8 (4).
- Connect red test probe (5) to contact K on P8 (4).

Does multimeter show continuity?



2W106-P1



2W106-P8

NO

24

- Replace harness 2W106.
- Refer to TM 9-2350-255-20-1-3-4, para. 11-18.
- Verify that problem is solved.

YES

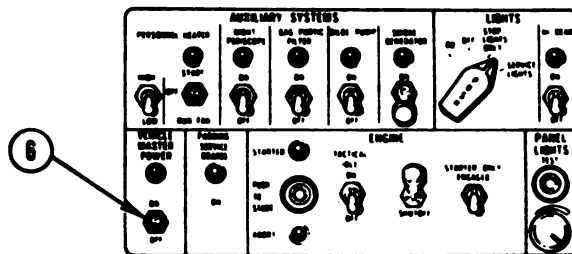
25

- Connect 2W106-P8 to J1 on fuel transfer manifold assembly.
- See figure 10-21.
- Replace bull networks box.
- Refer to TM 9-2350-255-20-1-3-4, para. 11-12.
- Verify that problem is solved.

From block 21

26

- Set VEHICLE MASTER POWER SWITCH (8) to OFF.
- Connect 2W106-P8 to J1 on fuel transfer manifold assembly.
- See figure 10-21.
- Disconnect fuel transfer hose from fuel transfer tube.
- Refer to TM 9-2350-255-20-1-3-2, para. 4-5 (Remove fuel transfer hose).



A20120-1298

Figure 10-13 (Sheet 7 of 17)  
Volume II  
Para. 10-2

**TM 9-2350-255-20-1-2-1  
FUEL SUPPLY SYSTEM TROUBLESHOOTING**

**WARNING**

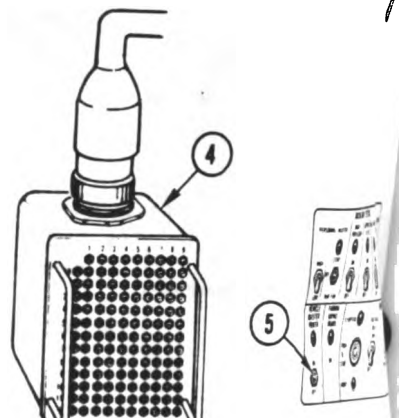
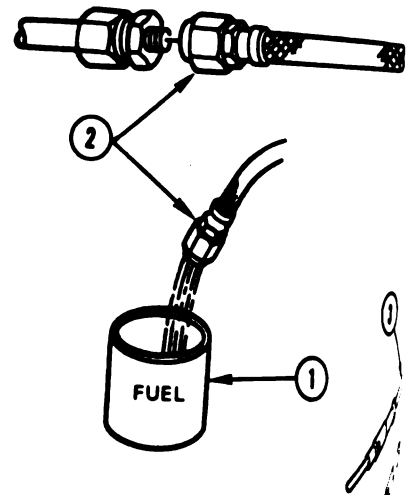
- A fire extinguisher must be on hand in case of fire.
- Make sure you wear safety goggles when doing the following steps. Fuel spray could cause serious eye injury.

**27**

- **Soldier A:**
  - Place container (1) under open end of hose (2) to catch fuel.
- **Soldier B:**
  - Connect jumper (3) between test points 82 and 82 on breakout box (4).
  - Set **VEHICLE MASTER POWER** switch (5) to **ON**.

**NOTE**  
As soon as fuel starts flowing steadily, tell Soldier B to shut off vehicle master power.

Did fuel flow steadily?



**28**

**NO**      **YES**

- Set **VEHICLE MASTER POWER** switch (5) to **OFF**.
- Remove fuel transfer hose.
  - Refer to TM 9-2350-255-20-1-3-2, para. 4-5.
- Inspect inside of hose (2) for blockage.

Is hose passage blocked?

**29** Go to block 32.

**NO**

**30**

- Replace fuel transfer pump and manifold assembly.
- Refer to TM 9-2350-255-20-1-3-2, para. 4-6.
- Verify that problem is solved.

**YES**

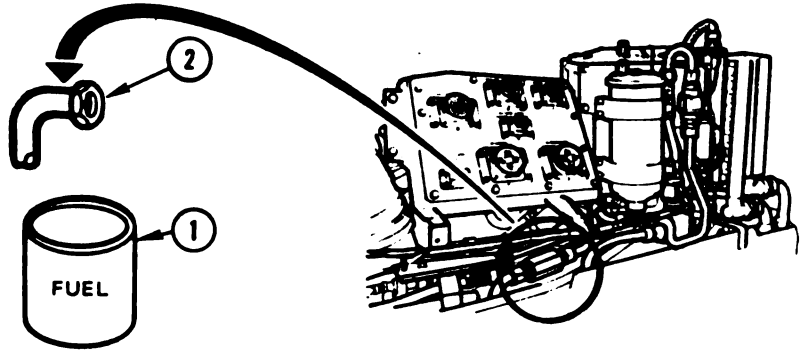
**31**

- If blockage cannot be cleared, replace fuel transfer hose.
- Refer to TM 9-2350-255-20-1-3-2, para. 4-5.
- Verify that problem is solved.

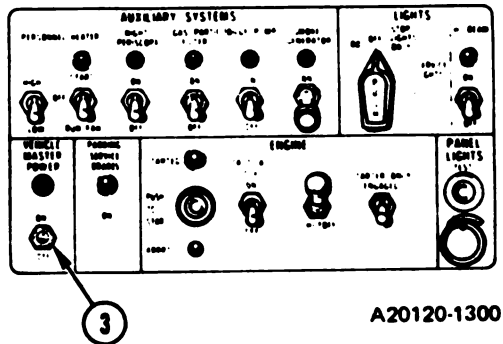
*Figure 10-13 (Sheet 8 of 17)  
Volume II  
Para. 10-2*

From block 29

- 32
- Connect fuel transfer hose.
    - Refer to TM 9-2350-255-20-1-3-2, para. 4-5.
  - Disconnect engine compartment fuel transfer tube from forward adapter.
    - Refer to TM 9-2350-255-20-1-3-2, para. 4-5.



- 33
- Soldier A:
- Place container (1) under open end of tube (2) to catch fuel.
  - Look for fuel flow from tube (2).
- NOTE**  
 As soon as fuel starts flowing, tell Soldier B to shut off vehicle master power.
- Soldier B:
- Set VEHICLE MASTER POWER switch (3) to ON.
- Did fuel flow?



- 34
- Connect engine compartment fuel transfer tube to forward adapter.
    - Refer to TM 9-2350-255-20-1-3-2, para. 4-5.
- NOTE**  
 Fuel transfer tubes are either blocked or crimped.
- If blockage cannot be cleared, or if tube is crimped, notify support maintenance.

YES NO

Figure 10-13 (Sheet 9 of 17)  
 Volume II  
 Para. 10-2

**TM 9-2350-255-20-1-2-1  
FUEL SUPPLY SYSTEM TROUBLESHOOTING**

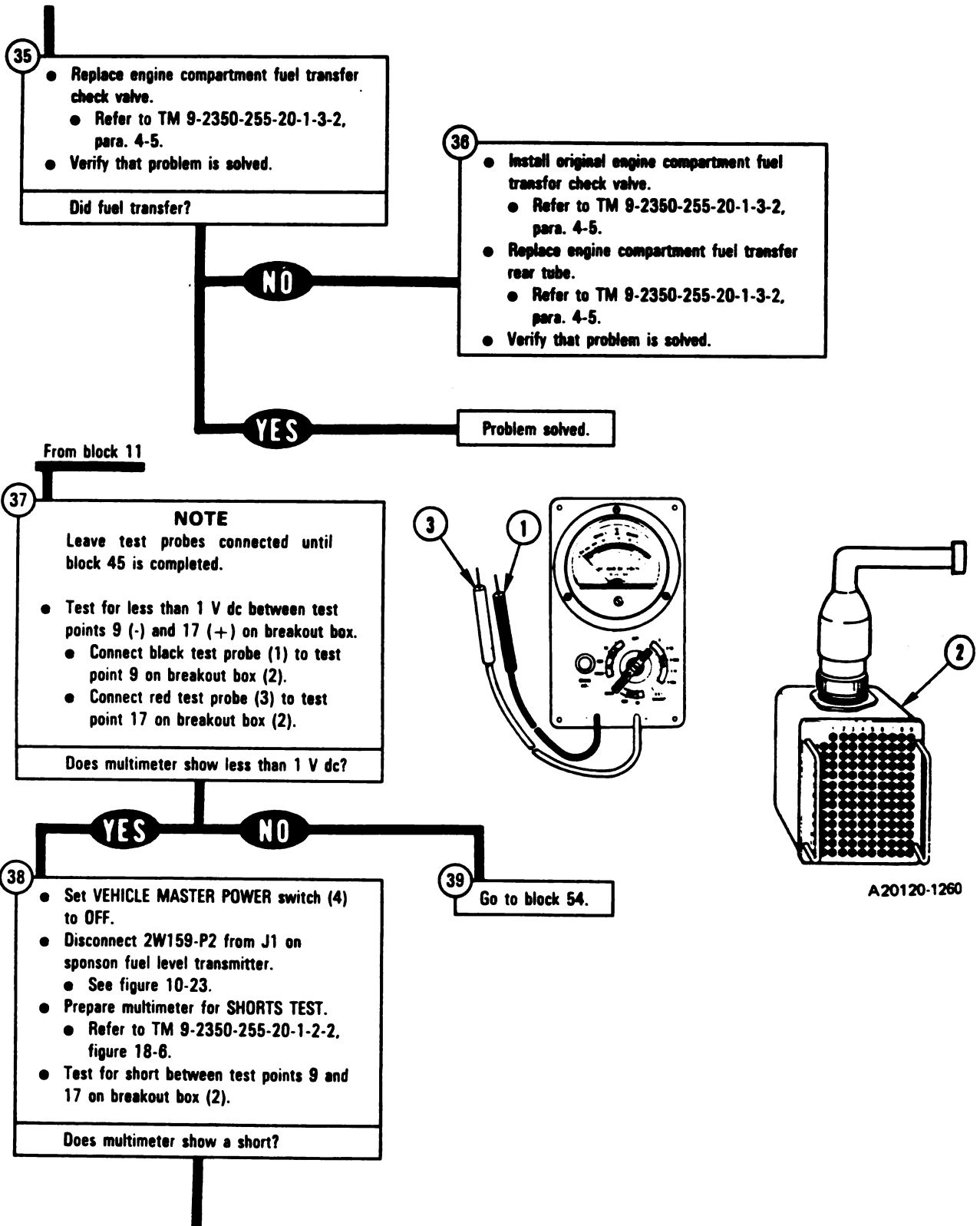
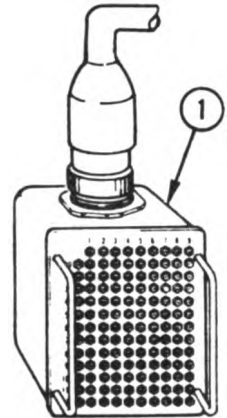
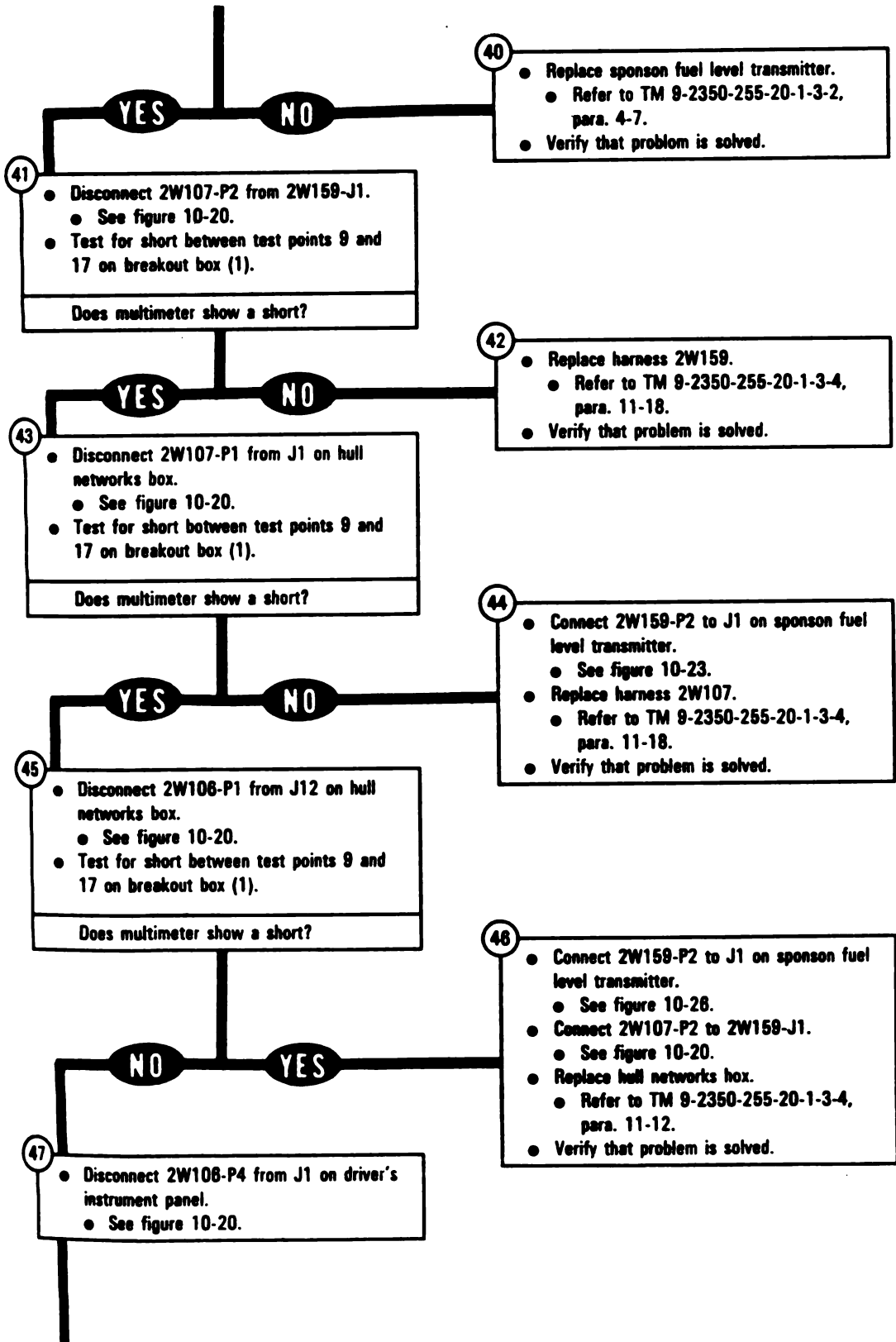


Figure 10-13 (Sheet 10 of 17)  
Volume II  
Para. 10-2



A20120-1305

Figure 10-13 (Sheet 11 of 17)  
Volume II  
Para. 10-2



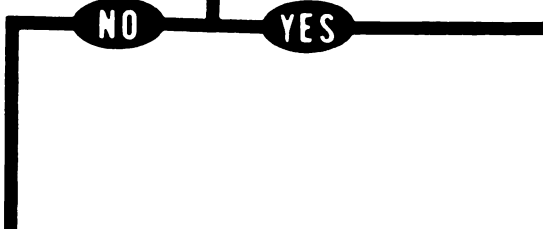
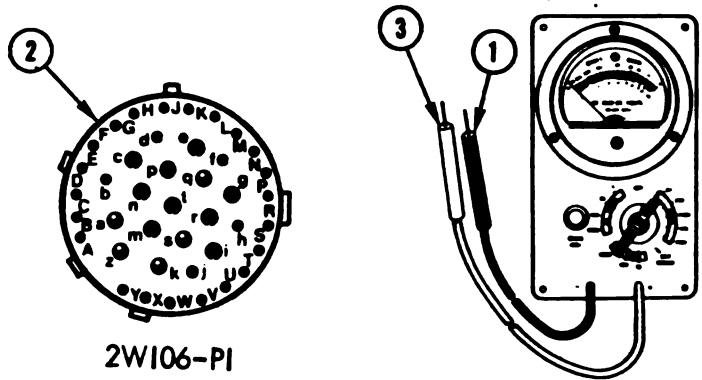
**TM 9-2350-255-20-1-2-1  
FUEL SUPPLY SYSTEM TROUBLESHOOTING**

**46**

**NOTE**  
If multimeter shows a short, go immediately to block 49.

- Test for short between contact f and all other contacts and connector body on 2W106-P1.
- Connect black test probe (1) to contact f on P1 (2).
- Connect red test probe (3) to all other contacts and connector body on P1 (2).

Does multimeter show a short between any contacts or connector body?



**49**

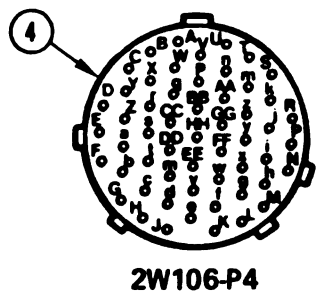
- Connect 2W159-P2 to J1 on sponson fuel level transmitter.
  - See figure 10-23.
- Connect 2W107-P2 to 2W159-J1.
  - See figure 10-20.
- Connect 2W107-P1 to J1 on hull networks box.
  - See figure 10-20.
- Replace harness 2W106.
  - Refer to TM 9-2350-255-20-1-3-4, para. 11-18.
- Verify that problem is solved.

**50**

**NOTE**  
If multimeter shows a short, go immediately to block 53.

- Test for short between contact P and all other contacts on 2W106-P4.
- Connect black test probe (1) to contact P on P4 (4).
- Connect red test probe (3) to all other contacts on P4 (4).

Does multimeter show a short between any contacts?



A20120-1546

Figure 10-13 (Sheet 12 of 17)  
Volume II  
Para. 10-2

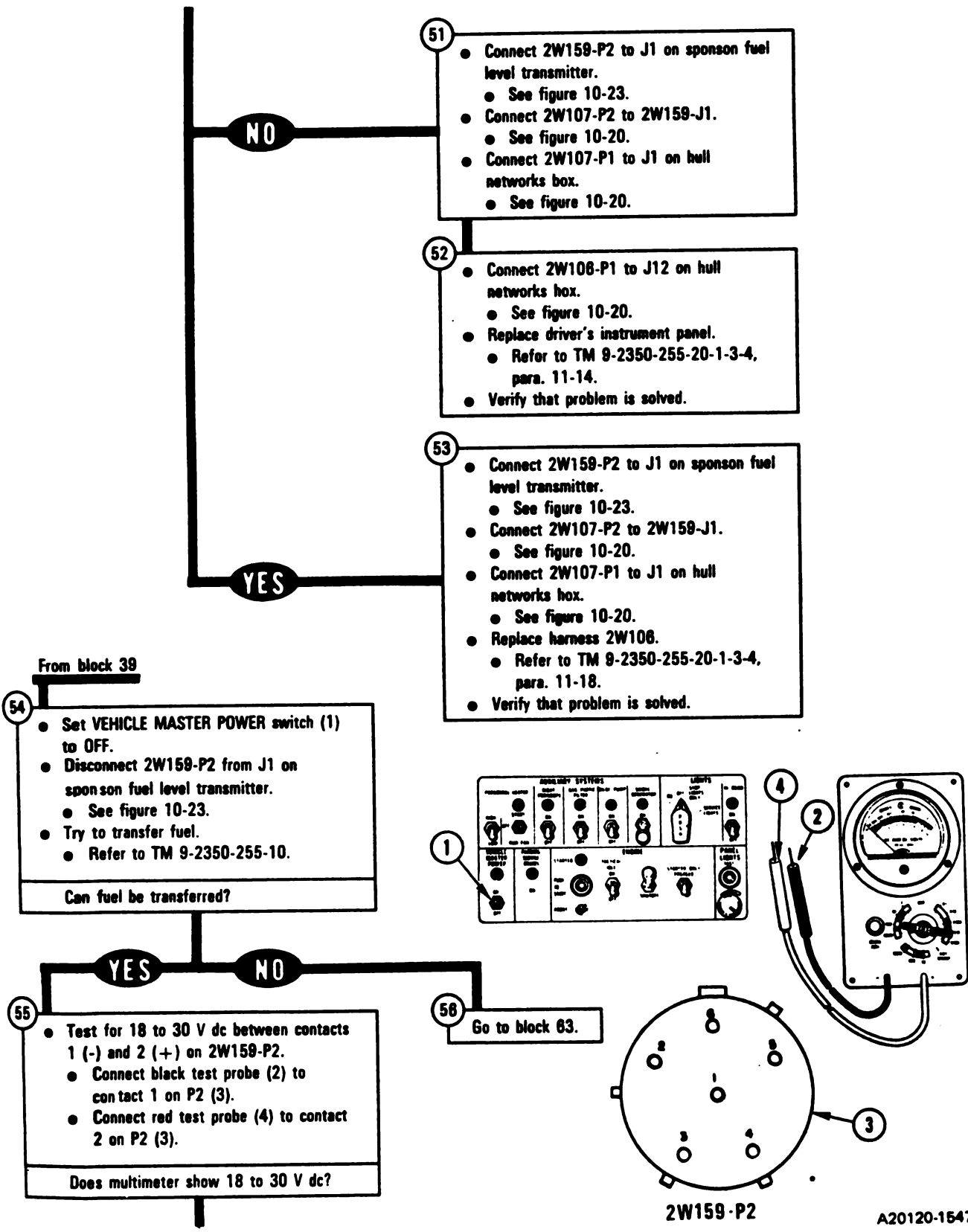
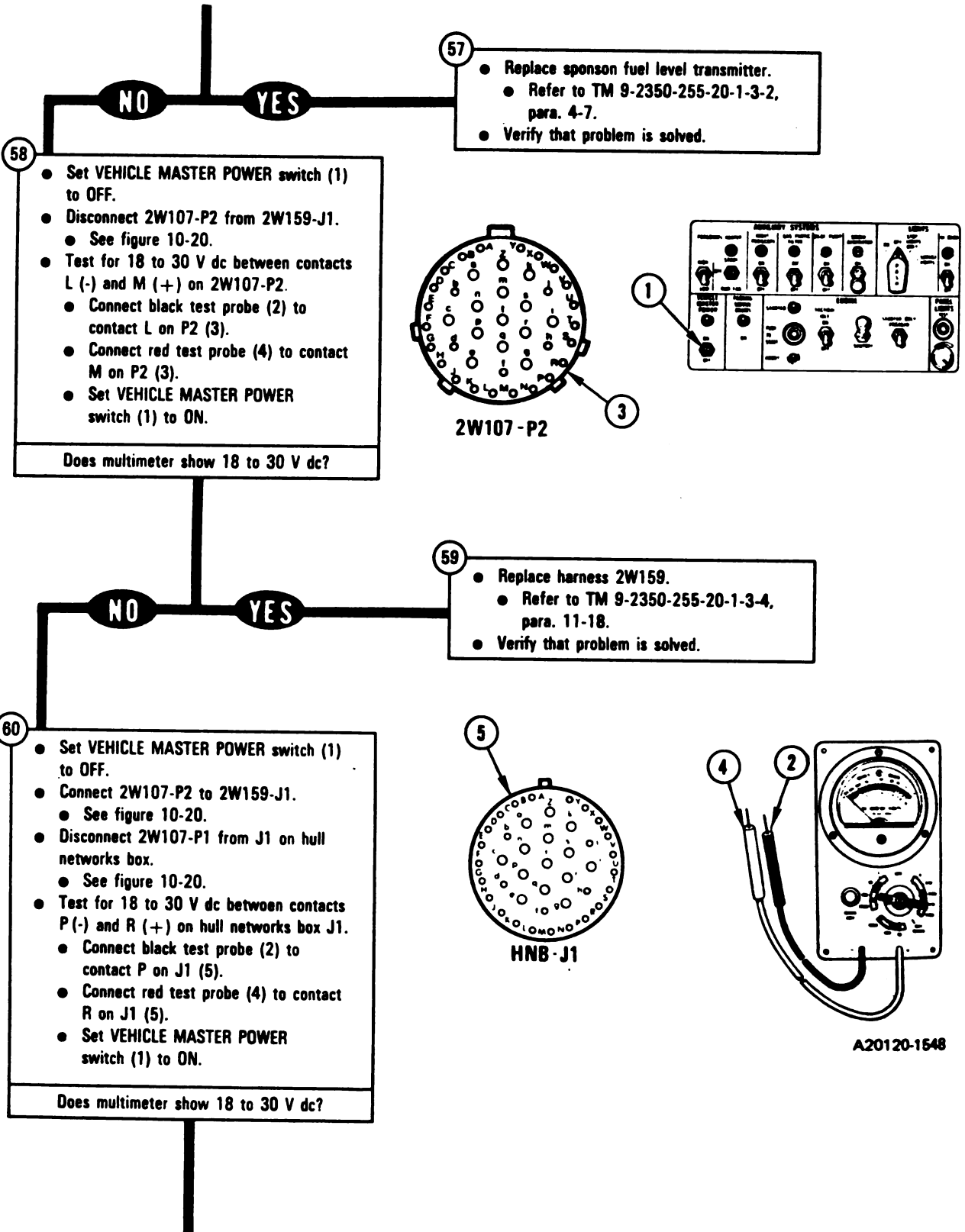


Figure 10-13 (Sheet 13 of 17)  
Volume II  
Para. 10-2

**TM 9-2350-255-20-1-2-1  
FUEL SUPPLY SYSTEM TROUBLESHOOTING**



*Figure 10-13 (Sheet 14 of 17)  
Volume II  
Para. 10-2*

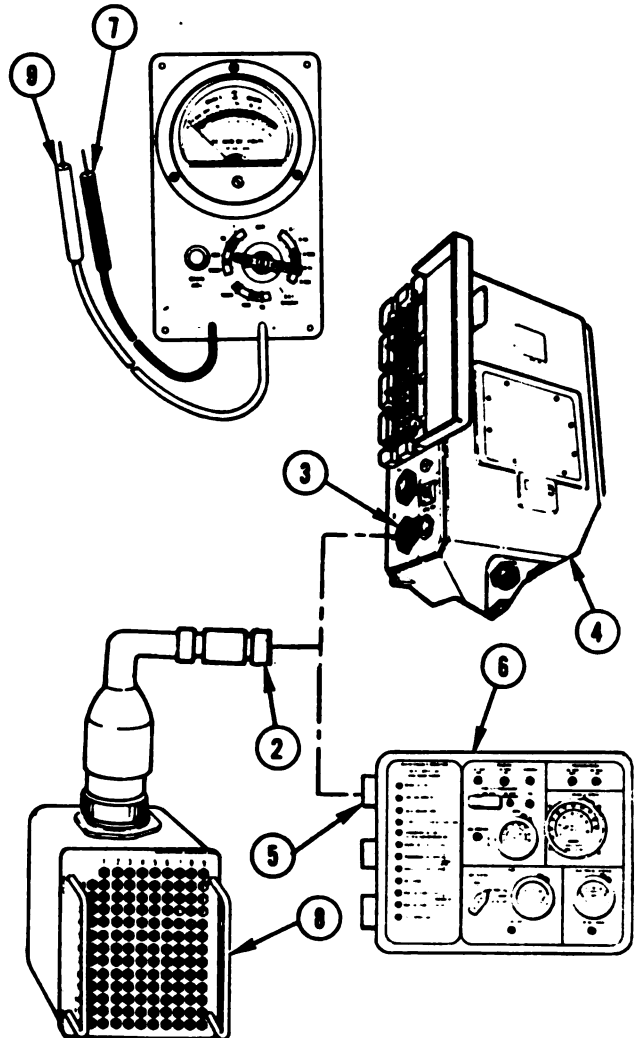
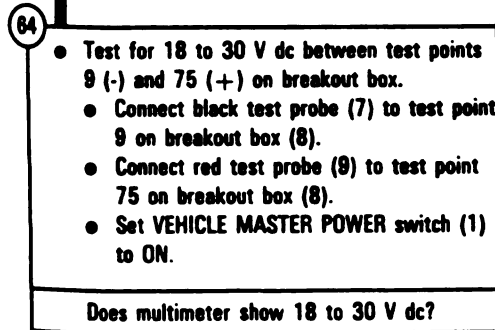
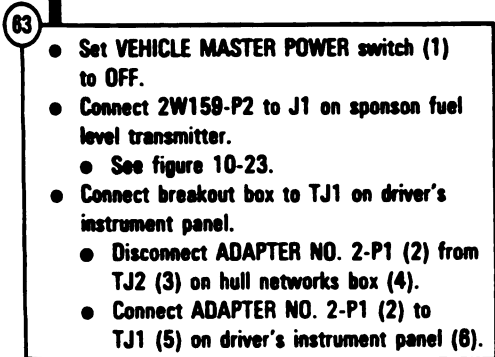
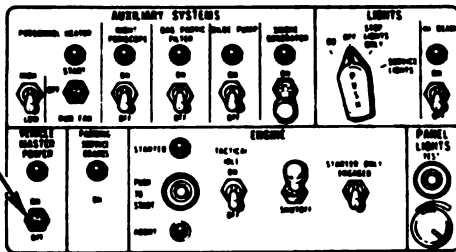
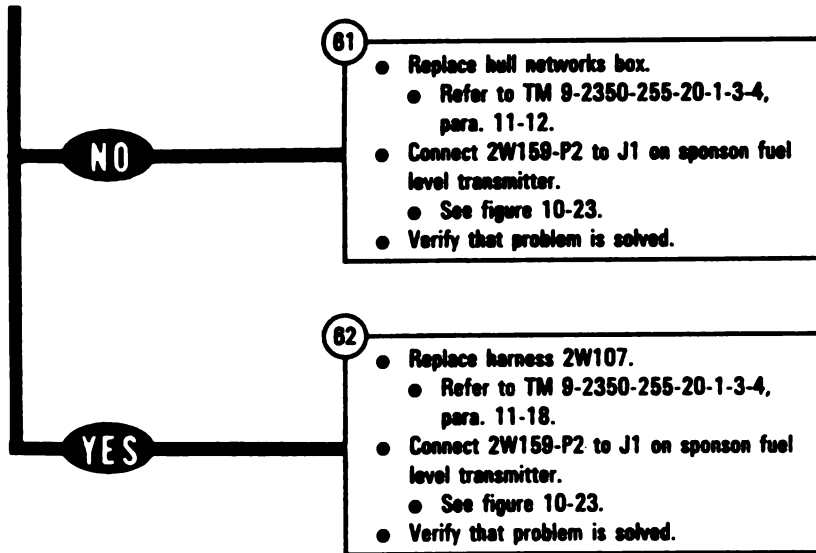


Figure 10-13 (Sheet 15 of 17)  
Volume II  
Para. 10-2

A20120-1294

Change 6 10-127

**TM 9-2350-255-20-1-2-1  
FUEL SUPPLY SYSTEM TROUBLESHOOTING**

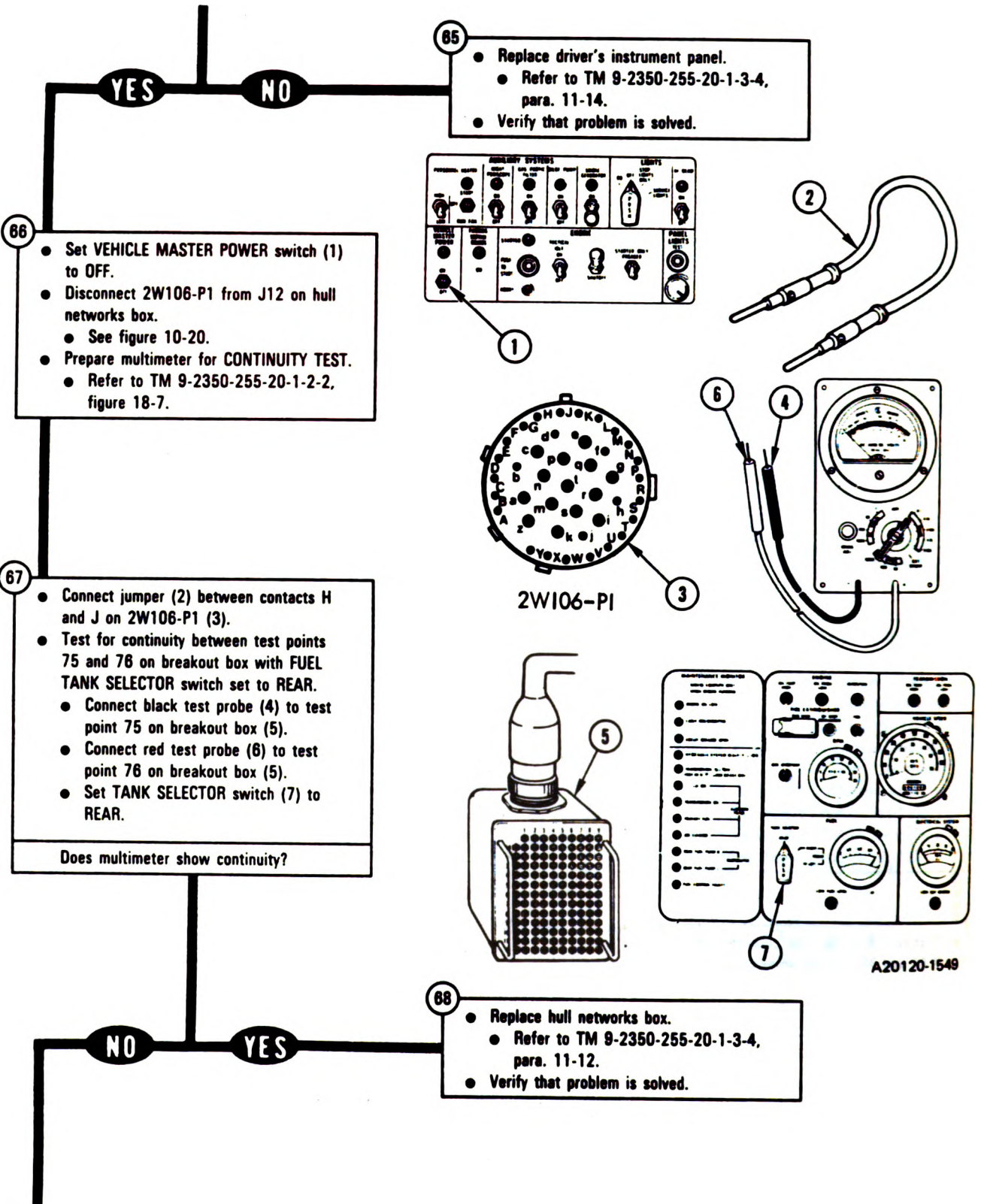


Figure 10-13 (Sheet 16 of 17)  
Volume II  
Para. 10-2

- 89
- Disconnect 2W106-P4 from J1 on driver's instrument panel.
    - See figure 10-20.
  - Connect jumper (1) between contacts DD and EE on driver's instrument panel J1 (2).
  - Test for continuity between test points 75 and 77 on breakout box.
    - Connect black test probe (3) to test point 75 on breakout box (4).
    - Connect red test probe (5) to test point 77 on breakout box (4).
- Does multimeter show continuity?

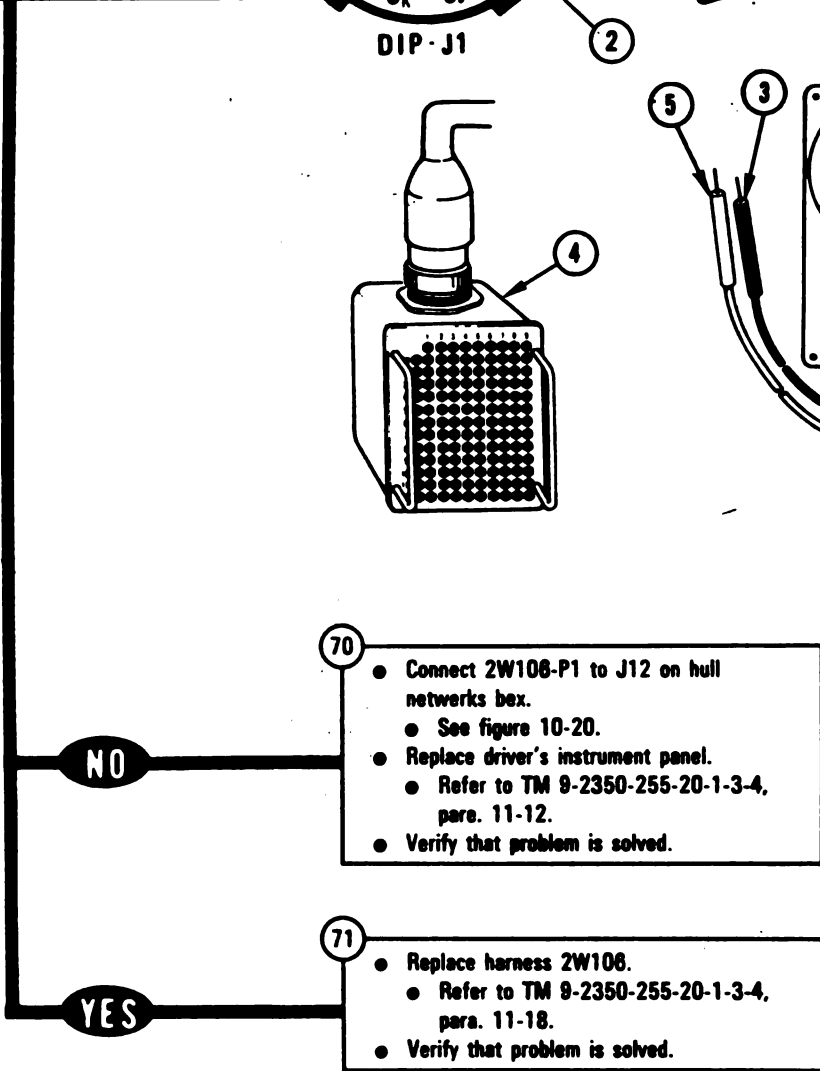
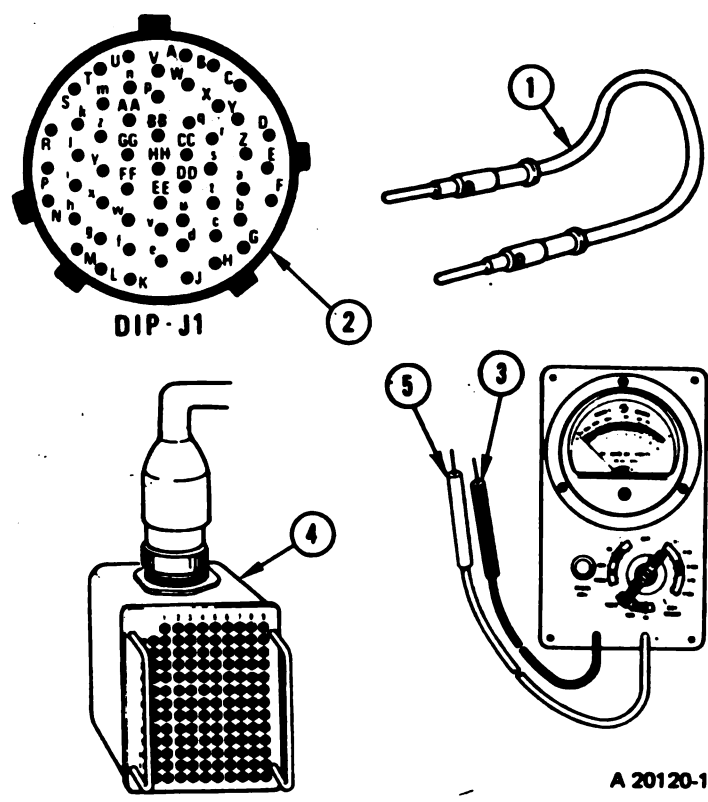


Figure 10-13 (Sheet 17 of 17)  
 Volume II  
 Para. 10-2

**SYMPTOM FSS-14**

**FUEL/WATER SEPARATOR DOES NOT  
AUTOMATICALLY DISCHARGE  
COLLECTED WATER**

**Supplies:**

- Connector Pin/Socket Adapters
- Electrical Jumpers

**Test Equipment/Special Tools:**

- Breakout Box Tool Kit, 12311086
- Multimeter
- Pliers, slip joint, conduit style with plastic jaw inserts, NSN 5120-00-624-8065

**Equipment Condition:**

- Tank parked.
- Parking brake set.
- Engine shut down.
- Vehicle master power off.
- Transmission shift control set to N.

**NOTE**

- Read para. 10-1 before doing any work.
- When jumpers are used, remove them after completing last instruction in that block.

1

- Set up tank controls for standard initial test conditions.
- Refer to table 10-2, para. 10-5.

*Figure 10-14 (Sheet 1 of 4)*  
**Volume II**  
**Para. 10-2**

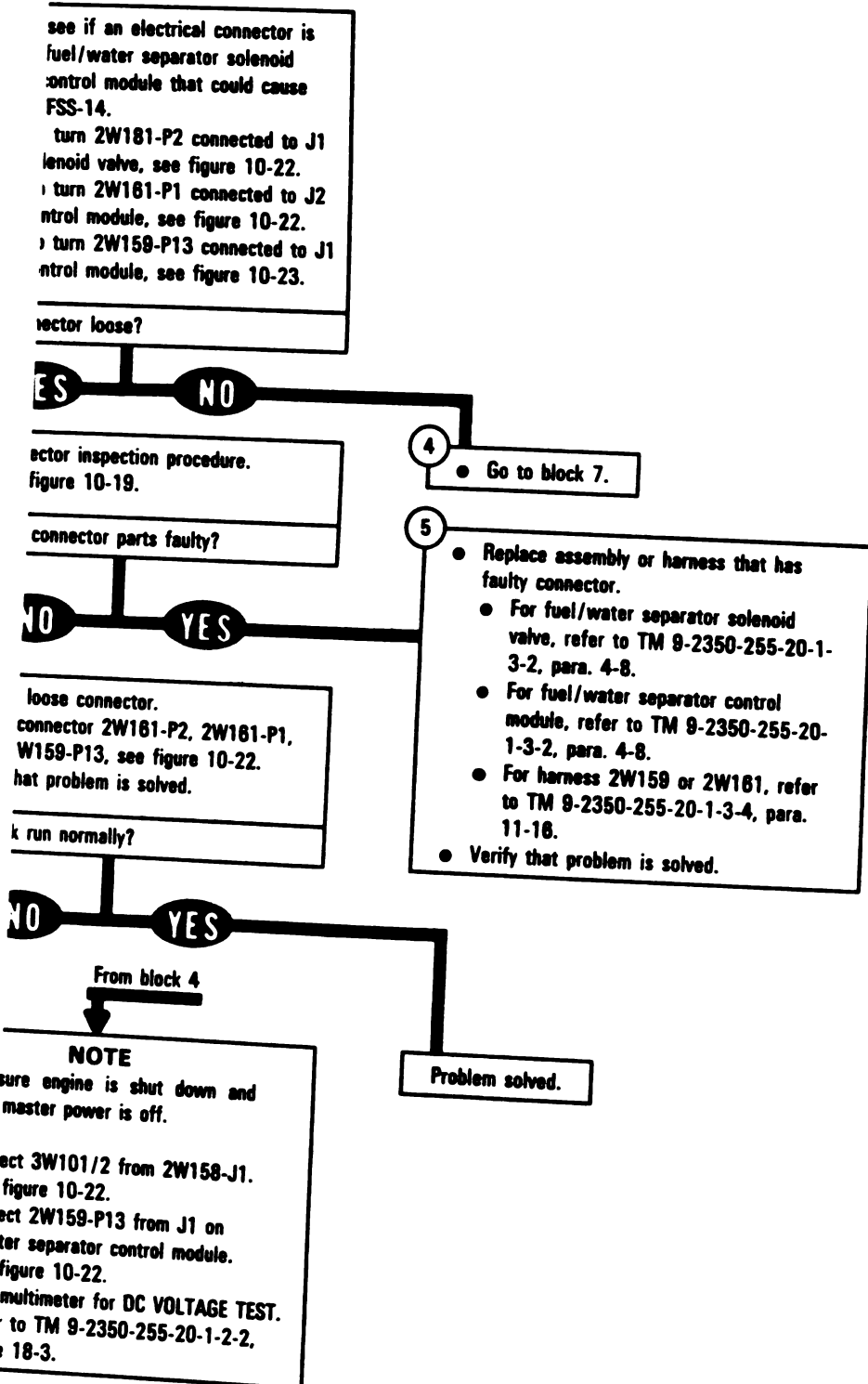
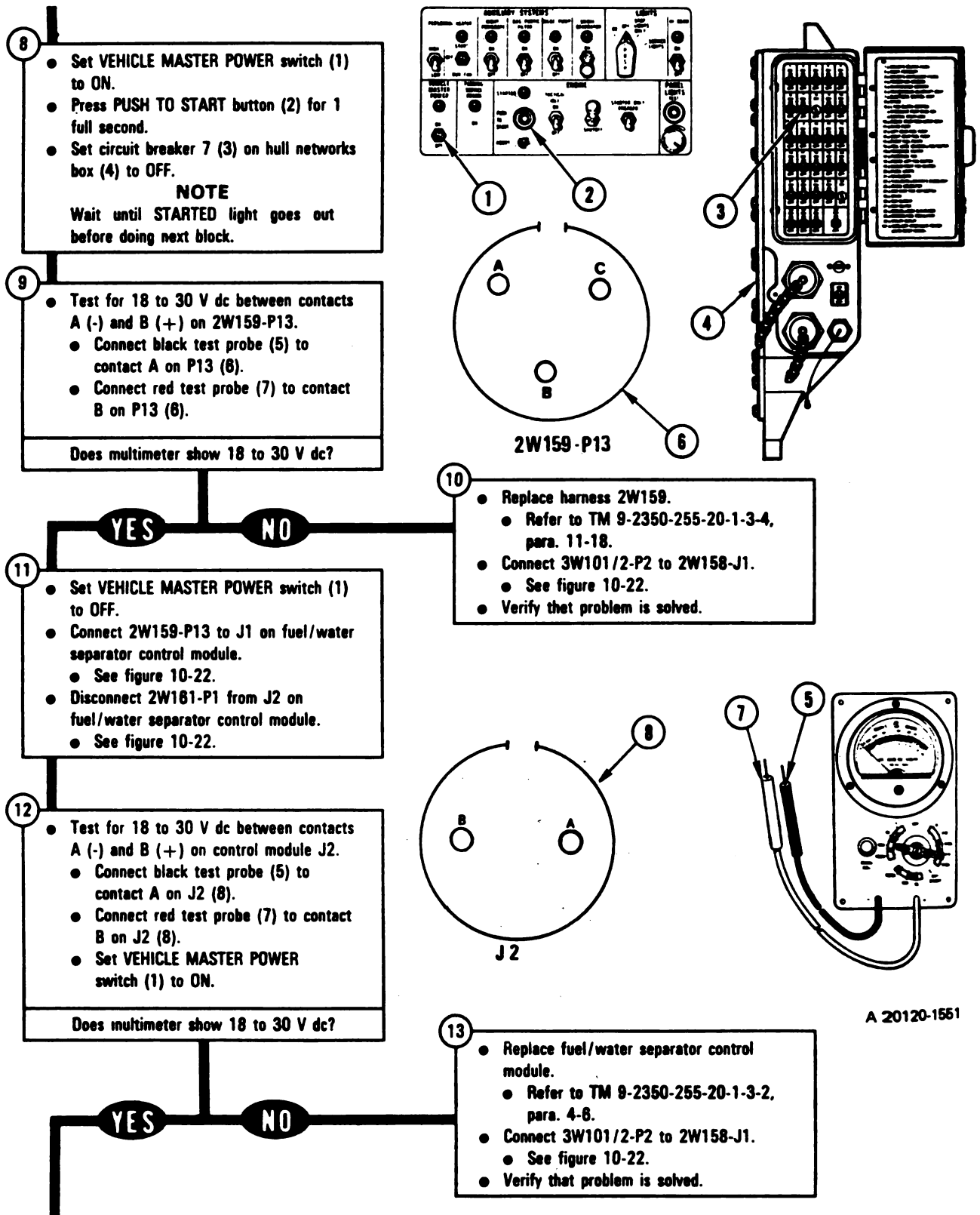


Figure 10-14 (Sheet 2 of 4)  
 Volume II  
 Para. 10-2



**TM 9-2350-255-20-1-2-1  
FUEL SUPPLY SYSTEM TROUBLESHOOTING**



*Figure 10-14 (Sheet 3 of 4)  
Volume II  
Para. 10-2*

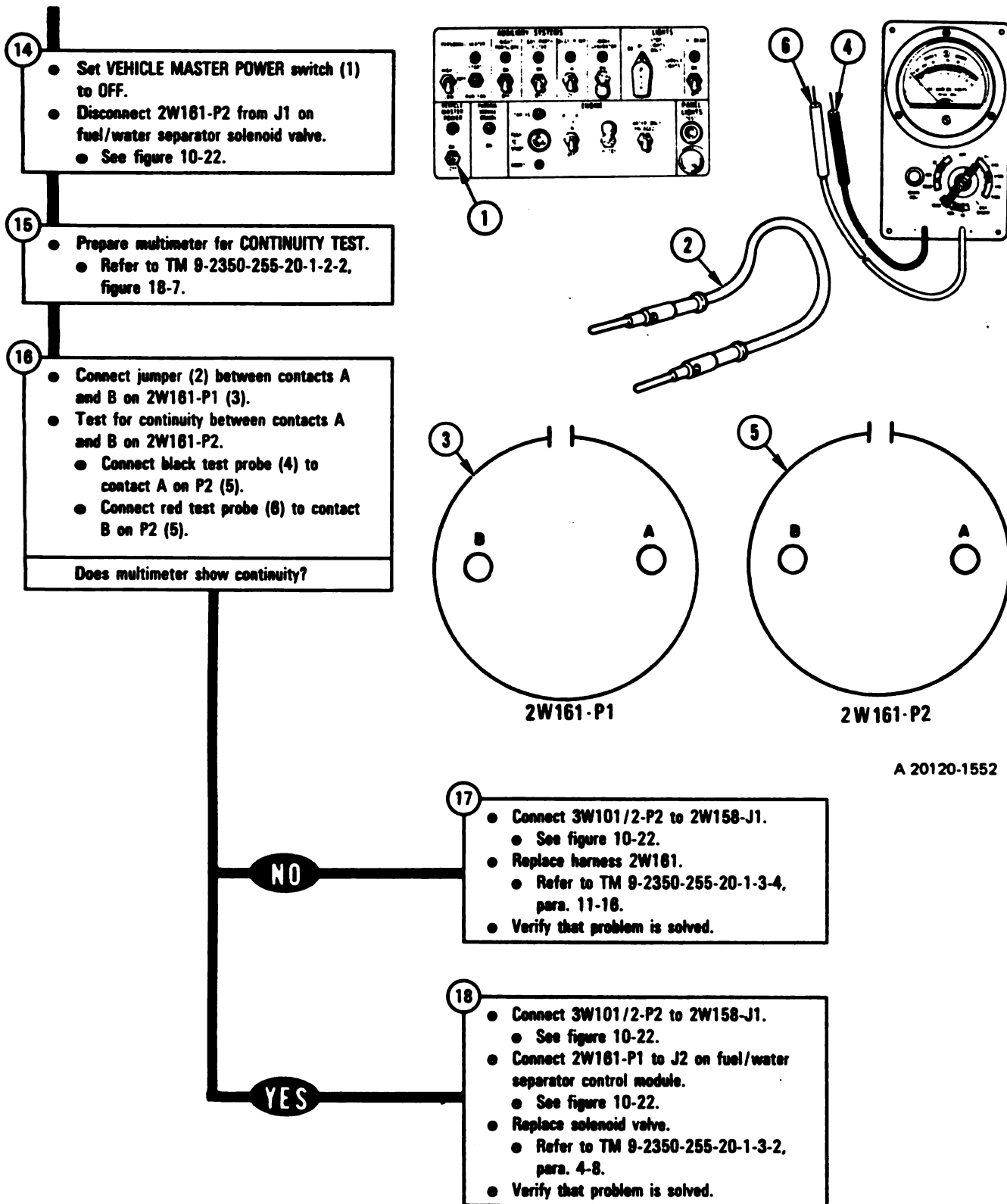


Figure 10-14 (Sheet 4 of 4)  
 Volume II  
 Para. 10-2

**SYMPTOM FSS-15**

**FUEL GAGE DOES NOT SHOW CORRECT FUEL LEVELS - ALL FUEL TANKS FULL**

**Supplies:**

- Connector Pin/Socket Adapters
- Electrical Jumpers

**Test Equipment/Special Tools:**

- Breakout Box Tool Kit, 12311068
- Multimeter
- Pliers, slip joint, conduit style with plastic jaw inserts, NSN 5120-00-824-8085

**Equipment Condition:**

- Tank parked.
- Parking brake set.
- Engine shut down.
- Vehicle master power off.

**NOTE**

Read para. 10-1 before doing any work.

1

- Set up tank controls for standard initial test conditions.
- Refer to table 10-2, para. 10-5.

2

- Check to see if an electrical connector is loose on driver's instrument panel or hull networks box that could cause symptom FSS-15.
  - Try to turn 2W106-P4 connected to J1 on driver's instrument panel, see figure 10-20.
  - Try to turn 2W106-P1 connected to J12 on hull networks box, see figure 10-20.

Is a connector loose?

Figure 10-15 (Sheet 1 of 4)  
Volume II  
Para. 10-2

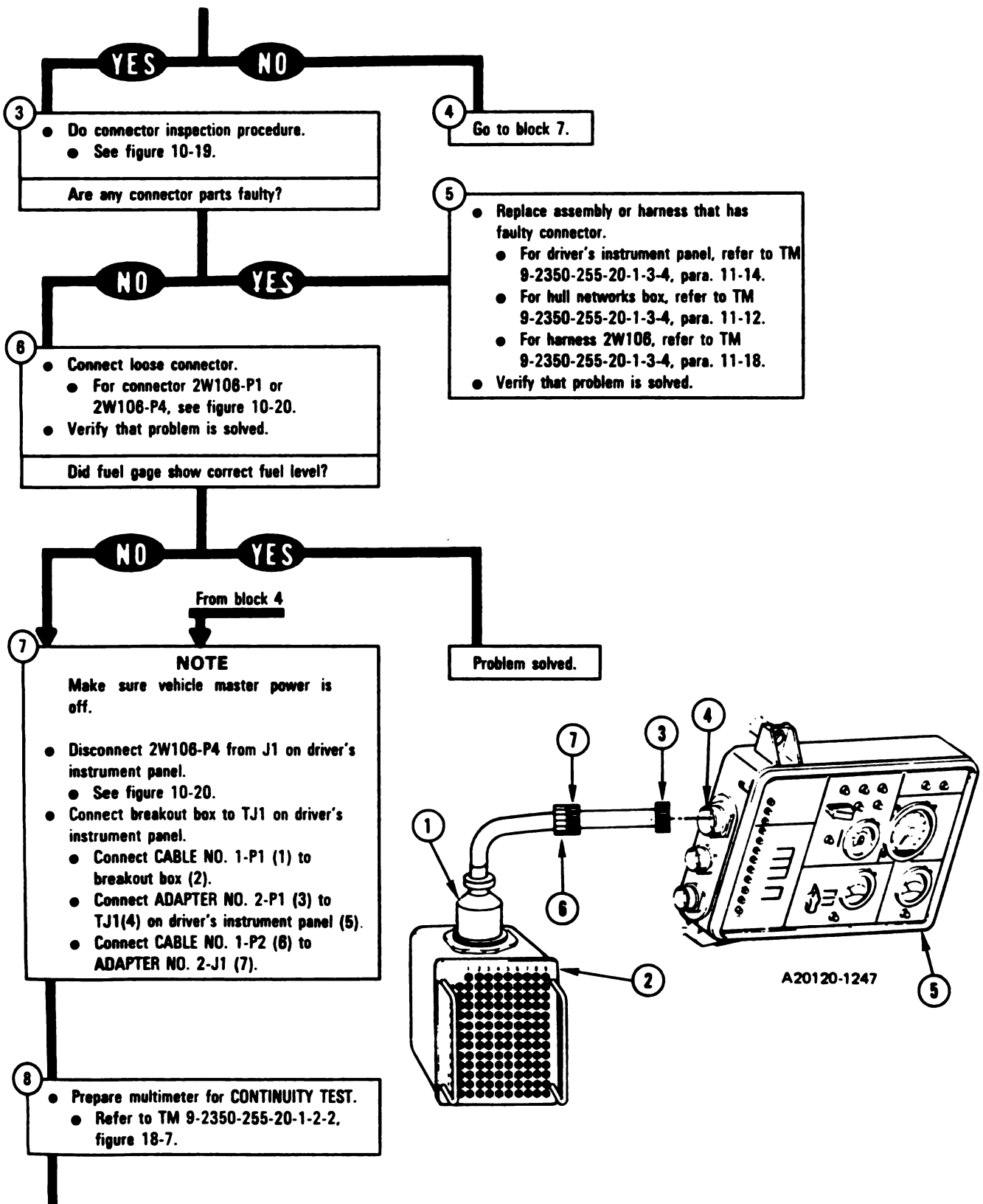


Figure 10-15 (Sheet 2 of 4)  
 Volume II  
 Para. 10-2

**TM 9-2350-255-20-1-2-1  
FUEL SUPPLY SYSTEM TROUBLESHOOTING**

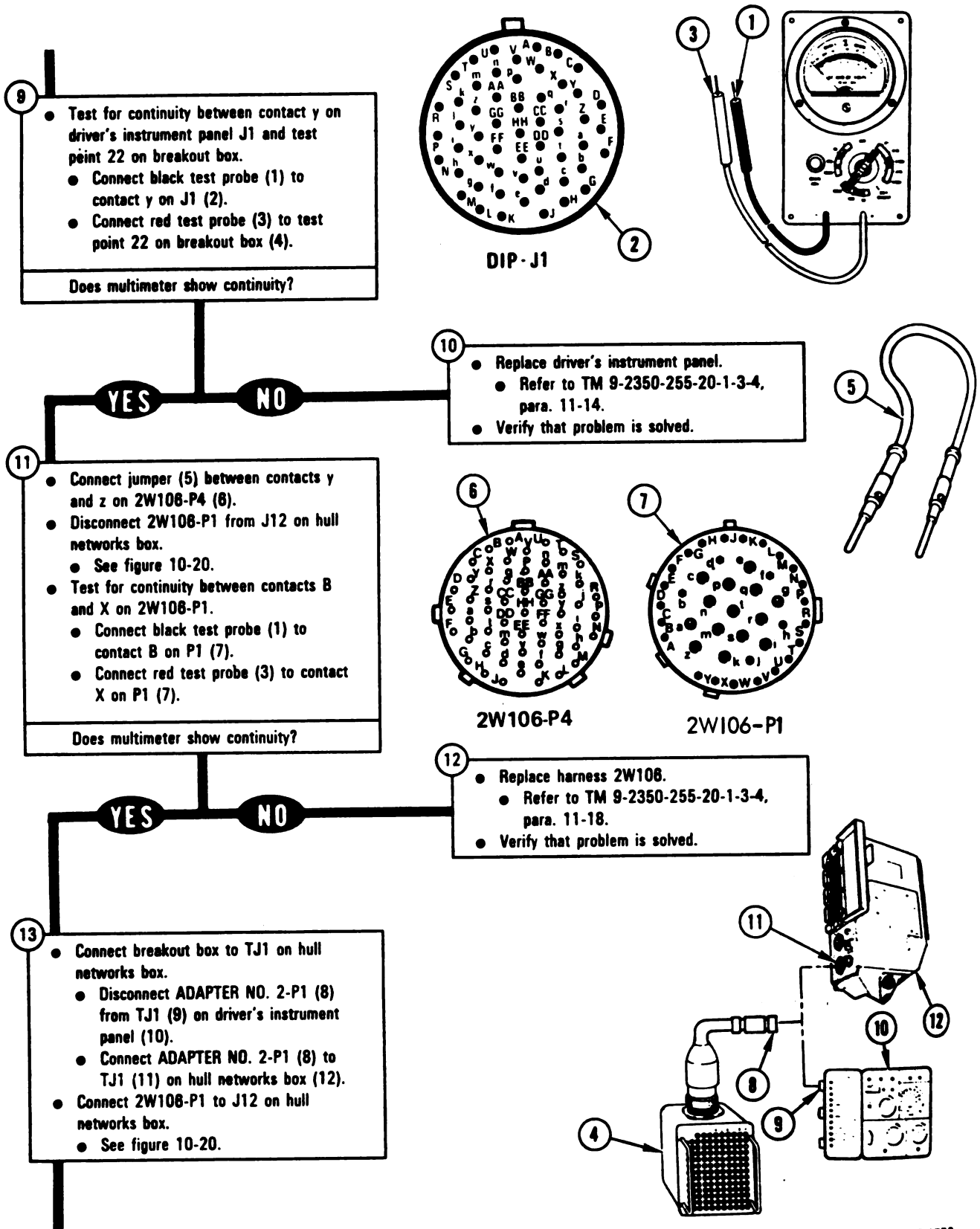


Figure 10-15 (Sheet 3 of 4)  
Volume II  
Para. 10-2

A 20120-1553

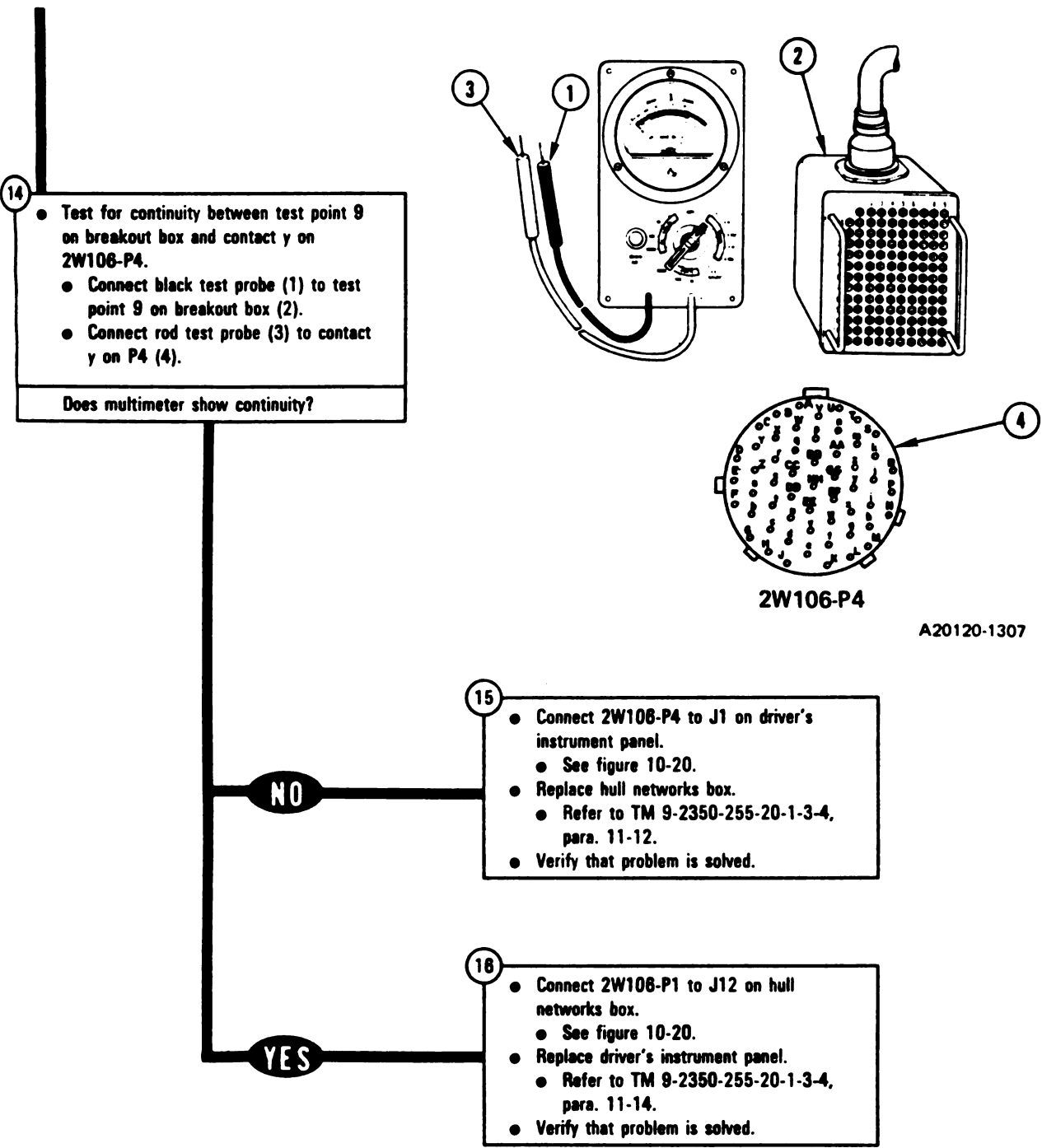


Figure 10-15 (Sheet 4 of 4)  
 Volume II  
 Para. 10-2

**SYMPTOM FSS-16**

**RIGHT FRONT FUEL TANK SHOWS MORE THAN FULL ON FUEL GAGE AT ALL TIMES - OTHER FUEL TANKS OK**

**Supplies:**

- Connector Pin/Socket Adapters
- Electrical Jumpers

**Test Equipment/Special Tools:**

- Multimeter
- Pliers, slip joint, conduit style with plastic jaw inserts, NSN 5120-00-824-8085

**Equipment Condition:**

- Tank parked.
- Parking brake set.
- Engine shut down.
- Vehicle master power off.
- FUEL TANK SELECTOR switch set to RIGHT FRONT.

**NOTE**

- Read para. 10-1 before doing any work.
- When jumpers are used, remove them after completing last instruction in that block.

1

- Set up tank controls for standard initial test conditions.
- Refer to table 10-2, para. 10-5.

*Figure 10-16 (Sheet 1 of 5)*  
Volume II  
Para. 10-2

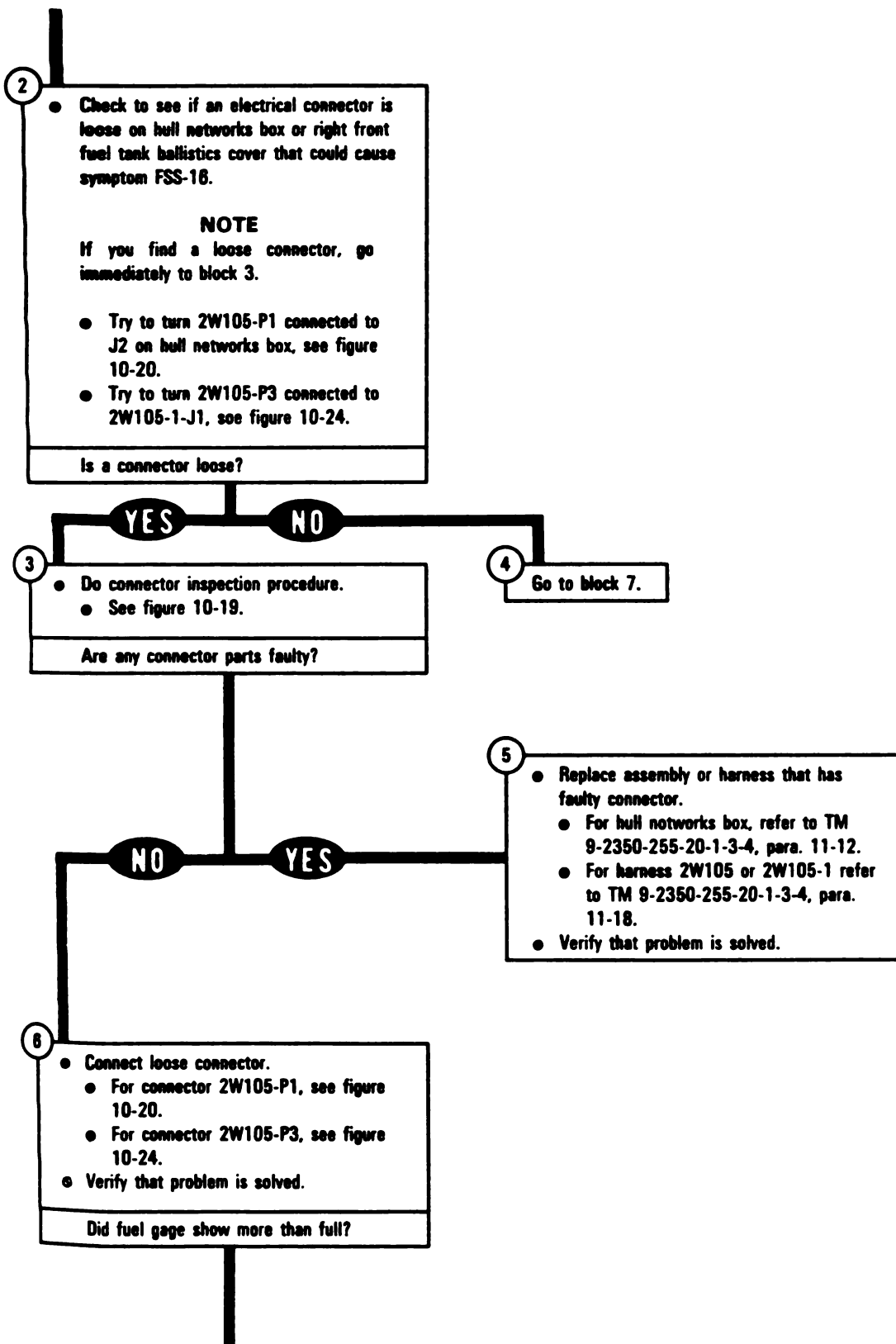
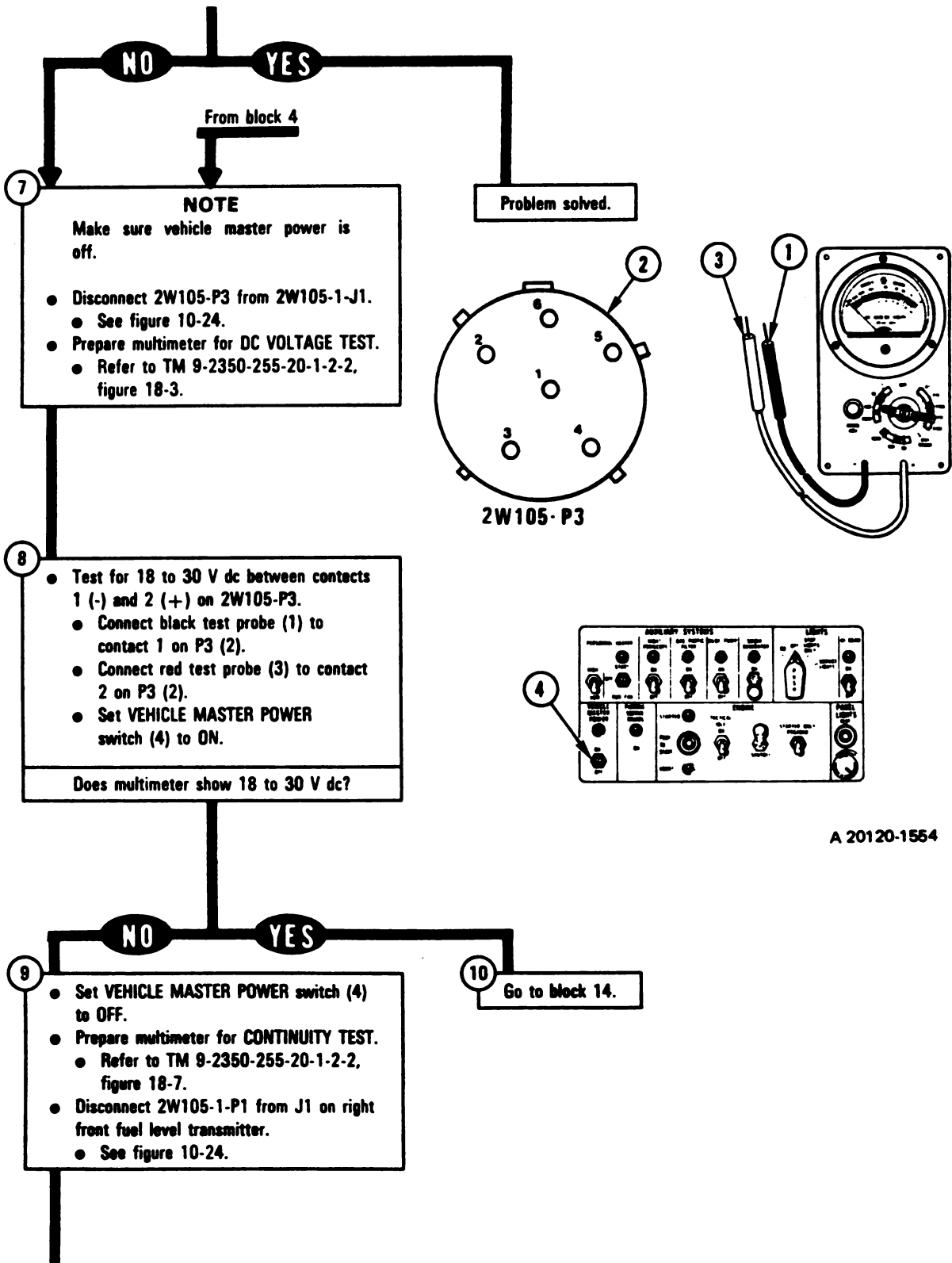


Figure 10-16 (Sheet 2 of 5)  
 Volume II  
 Para. 10-2



**TM 9-2350-255-20-1-2-1  
FUEL SUPPLY SYSTEM TROUBLESHOOTING**

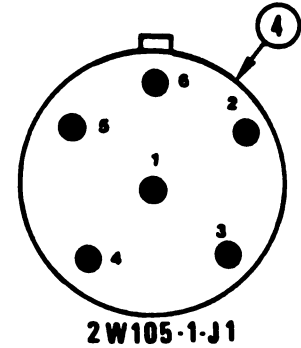
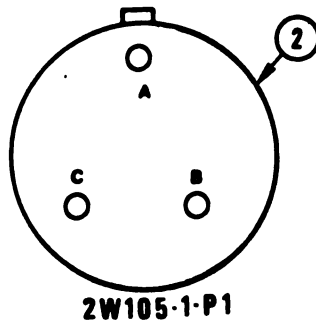


*Figure 10-16 (Sheet 3 of 5)  
Volume II  
Para. 10-2*

11

- Connect jumper (1) between contacts A and B on 2W105-1-P1 (2).
- Test for continuity between contacts 1 and 2 on 2W105-1-J1.
- Connect block test probe (3) to contact 1 on J1 (4).
- Connect red test probe (5) to contact 2 on J1 (4).

Does multimeter show continuity?



NO

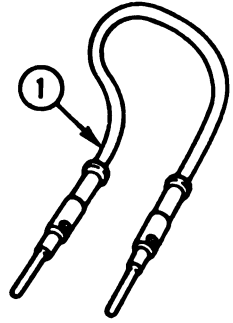
12

- Replace harness 2W105-1.
- Refer to TM 9-2350-255-20-1-3-4, para. 11-18.
- Verify that problem is solved.

YES

13

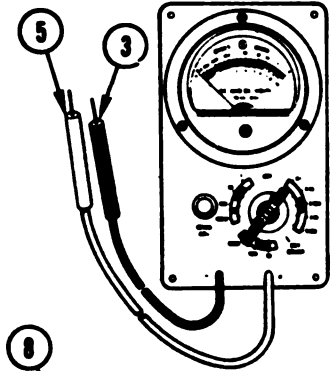
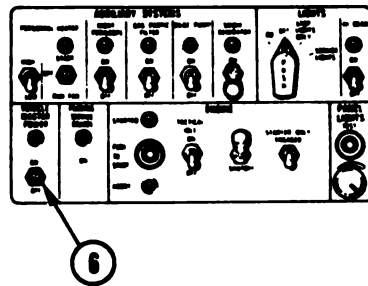
- Replace right front fuel level transmitter.
- Refer to TM 9-2350-255-20-1-3-2, para. 4-6.
- Verify that problem is solved.



From block 10

14

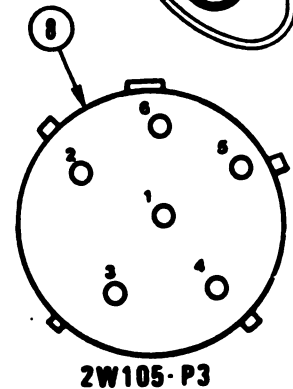
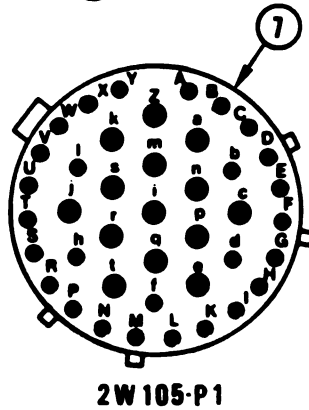
- Set VEHICLE MASTER POWER switch (6) to OFF.
- Prepare multimeter for CONTINUITY TEST.
- Refer to TM 9-2350-255-20-1-2-2, figure 18-7.
- Disconnect 2W105-P1 from J2 on hull networks box.
- See figure 10-20.



15

- Connect jumper (1) between contacts R and S on 2W105-P1 (7).
- Test for continuity between contacts 1 and 2 on 2W105-P3.
- Connect black test probe (3) to contact 1 on P3 (8).
- Connect red test probe (5) to contact 2 on P3 (8).

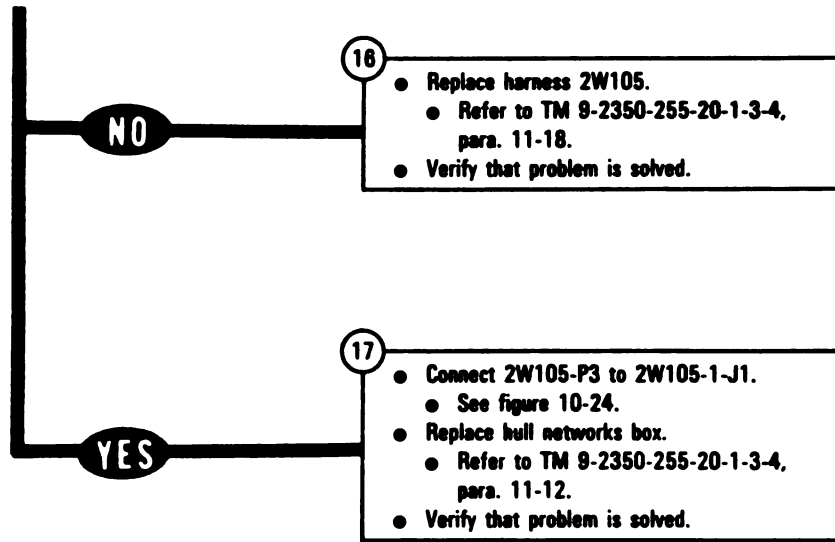
Does multimeter show continuity?



A 20120-1555

Figure 10-16 (Sheet 4 of 5)  
Volume II  
Para. 10-2

**TM 9-2350-255-20-1-2-1  
FUEL SUPPLY SYSTEM TROUBLESHOOTING**



*Figure 10-16 (Sheet 5 of 5)*  
**Volume II  
Para. 10-2**

**SYMPTOM FSS-17**

**LEFT FRONT FUEL TANK SHOWS MORE THAN FULL ON FUEL GAGE AT ALL TIMES - OTHER FUEL TANKS OK**

**Supplies:**

- Connector Pin/Socket Adapters
- Electrical Jumpers

**Test Equipment/Special Tools:**

- Multimeter
- Pliers, slip joint, conduit style with plastic jaw inserts, NSN 5120-00-824-8065

**Equipment Condition:**

- Tank parked.
- Parking brake set.
- Engine shut down.
- Vehicle master power off.
- FUEL TANK SELECTOR switch set to LEFT FRONT.

**NOTE**

- Read para. 10-1 before doing any work.
- When jumpers are used, remove them after completing last instruction in that block.

1

- Set up tank controls for standard initial test conditions.
- Refer to table 10-2, para. 10-5.

*Figure 10-17 (Sheet 1 of 5)*  
**Volume II**  
**Para. 10-2**

TM 9-2350-255-20-1-2-1  
FUEL SUPPLY SYSTEM TROUBLESHOOTING

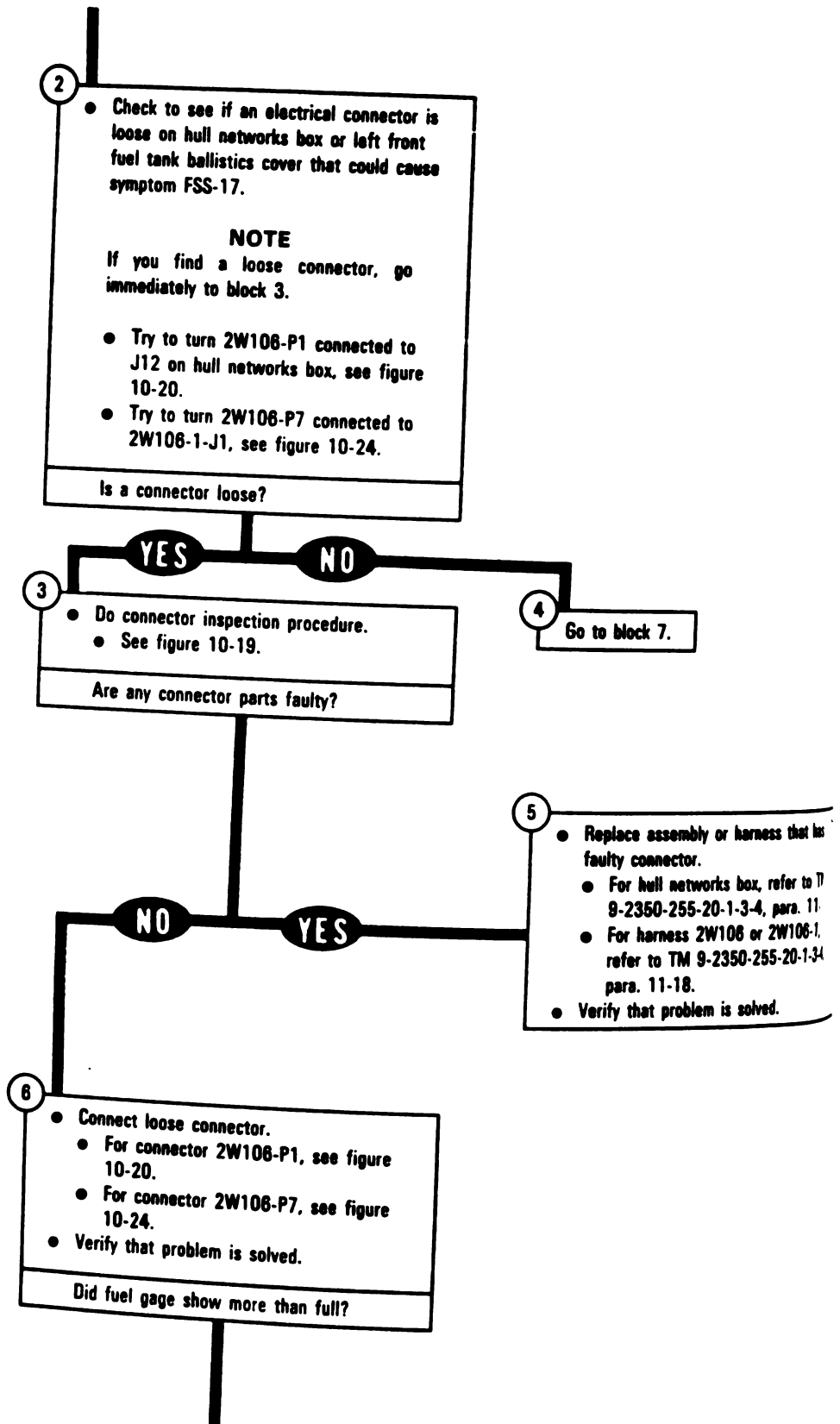


Figure 10-17 (Sheet 2 of 5)  
Volume II  
Para. 10-2

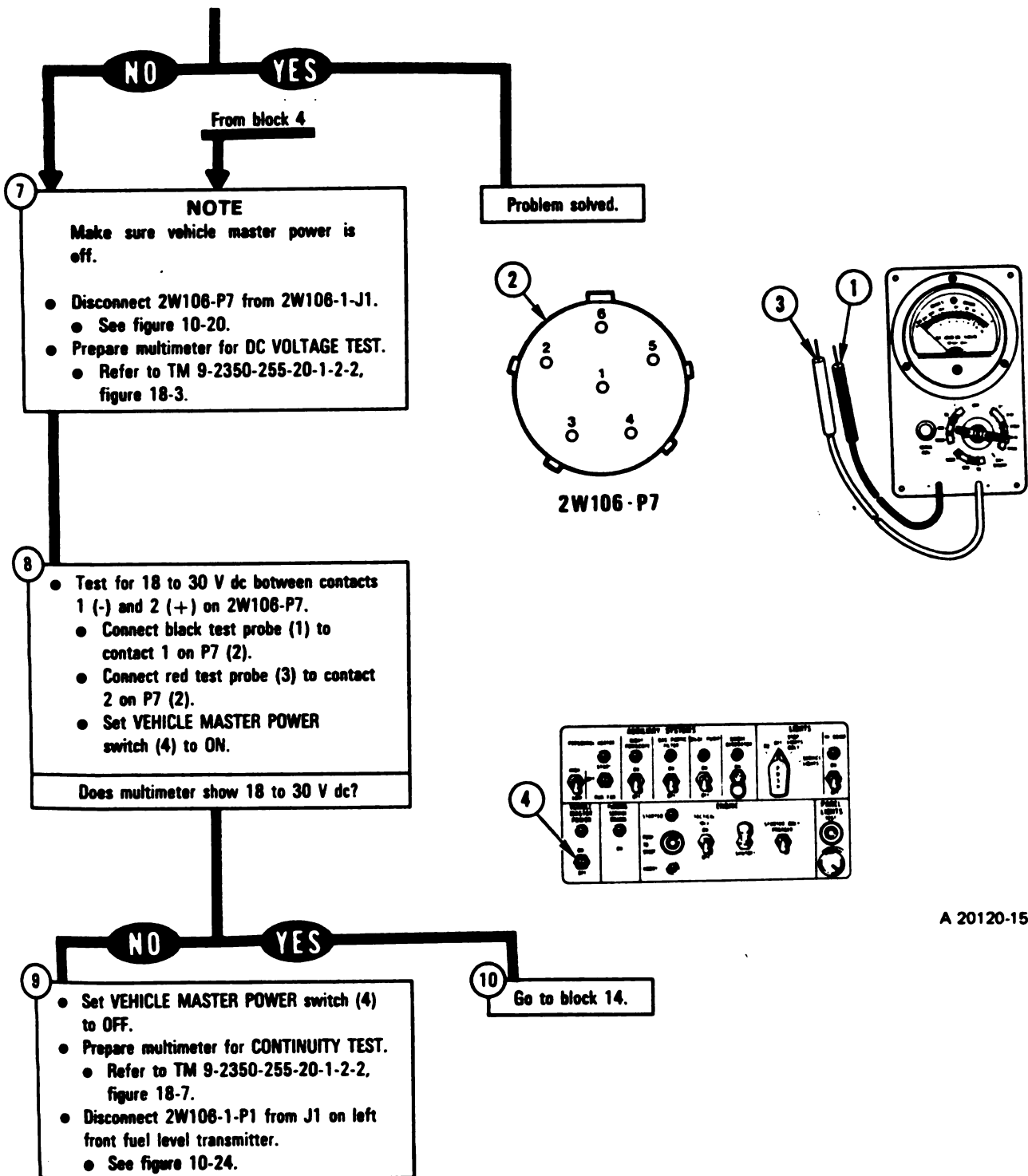
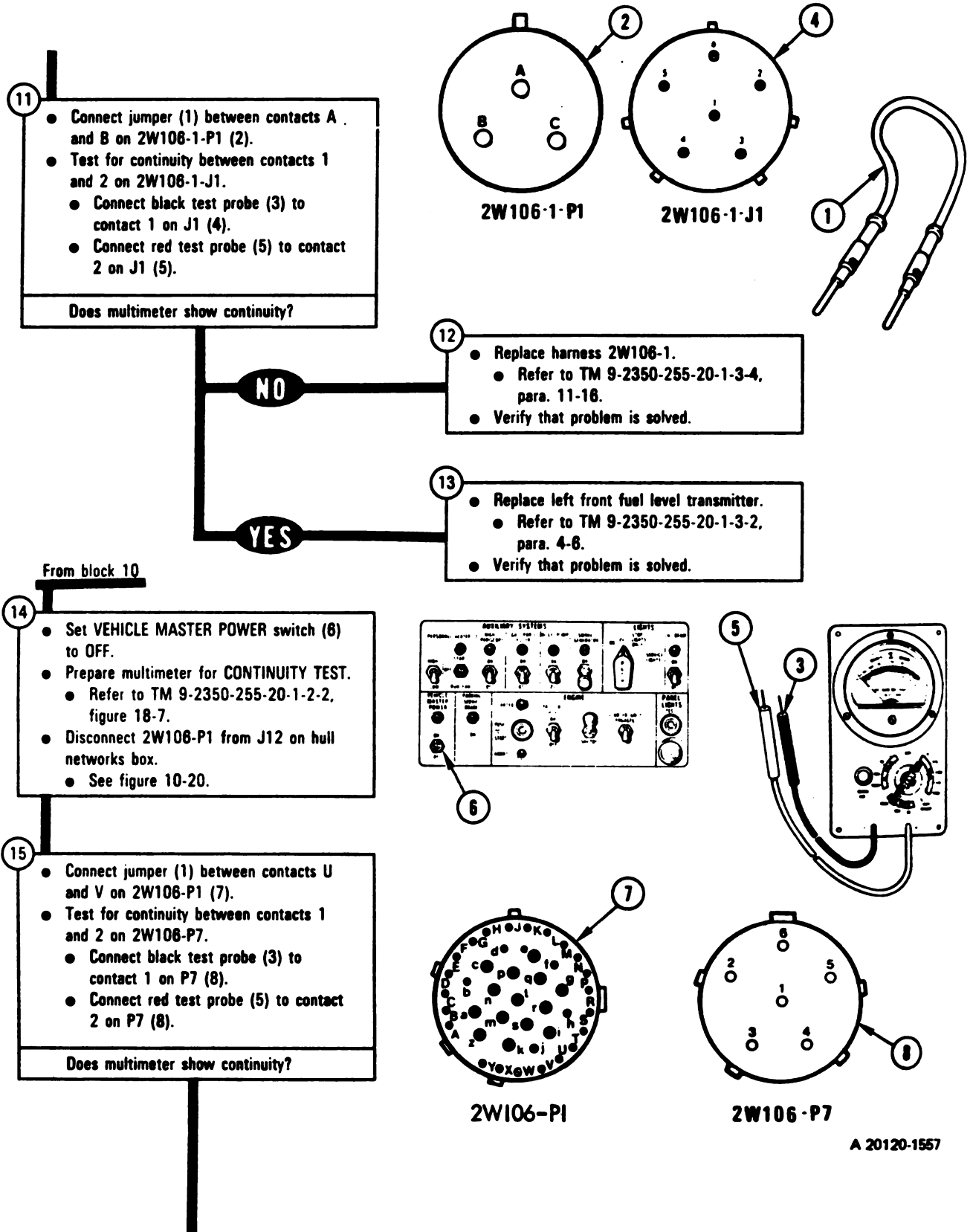


Figure 10-17 (Sheet 3 of 5)  
 Volume II  
 Para. 10-2

**TM 9-2350-255-20-1-2-1  
FUEL SUPPLY SYSTEM TROUBLESHOOTING**



*Figure 10-17 (Sheet 4 of 5)  
Volume II  
Para. 10-2*

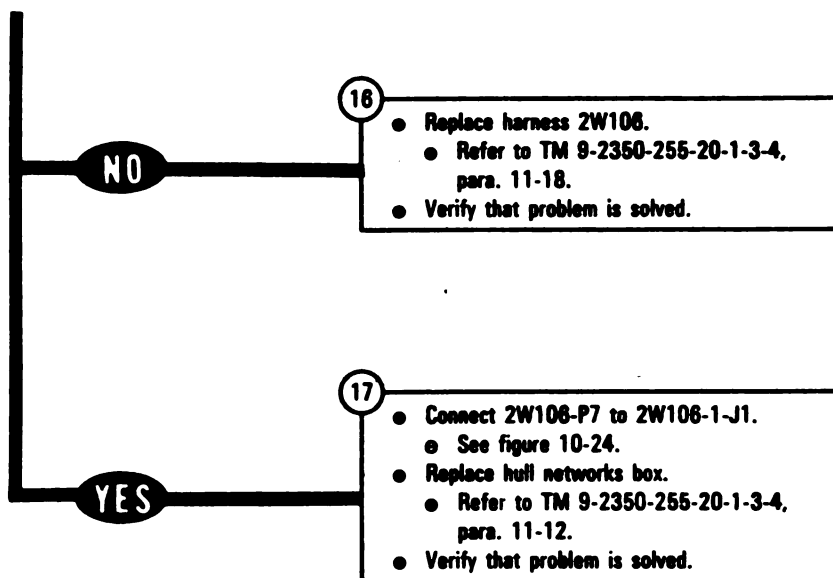


Figure 10-17 (Sheet 5 of 5)  
Volume II  
Para. 10-2



**SYMPTOM FSS-18**

**REAR FUEL TANK SHOWS MORE THAN FULL ON FUEL GAGE AT ALL TIMES - OTHER FUEL TANKS OK**

**Supplies:**

- Connector Pin/Socket Adapters
- Electrical Jumpers

**Test Equipment/Special Tools:**

- Multimeter
- Pliers, slip joint, conduit style with plastic jaw inserts, NSN 5120-00-624-8065

**Equipment Condition:**

- Tank parked.
- Parking brake set.
- Engine shut down.
- Vehicle master power off.
- FUEL TANK SELECTOR switch set to REAR.

**NOTE**

- Read para. 10-1 before doing any work.
- When jumpers are used, remove them after completing last instruction in that block.

1

- Set up tank controls for standard initial test conditions.
- Refer to table 10-2, para. 10-5.

*Figure 10-18 (Sheet 1 of 6)*  
**Volume II**  
**Para. 10-2**

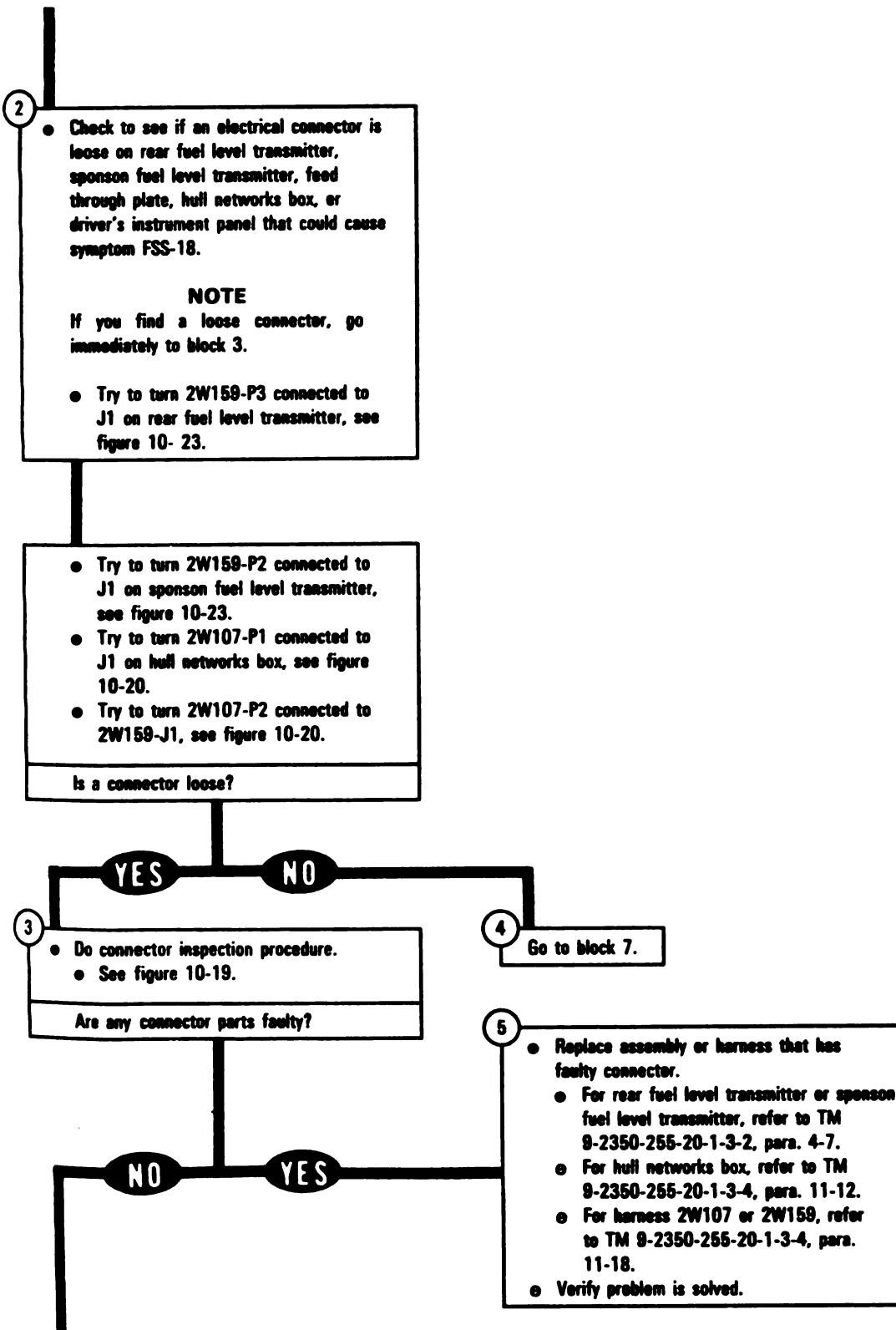


Figure 10-18 (Sheet 2 of 6)  
 Volume II  
 Para. 10-2

**TM 9-2350-255-20-1-2-1  
FUEL SUPPLY SYSTEM TROUBLESHOOTING**

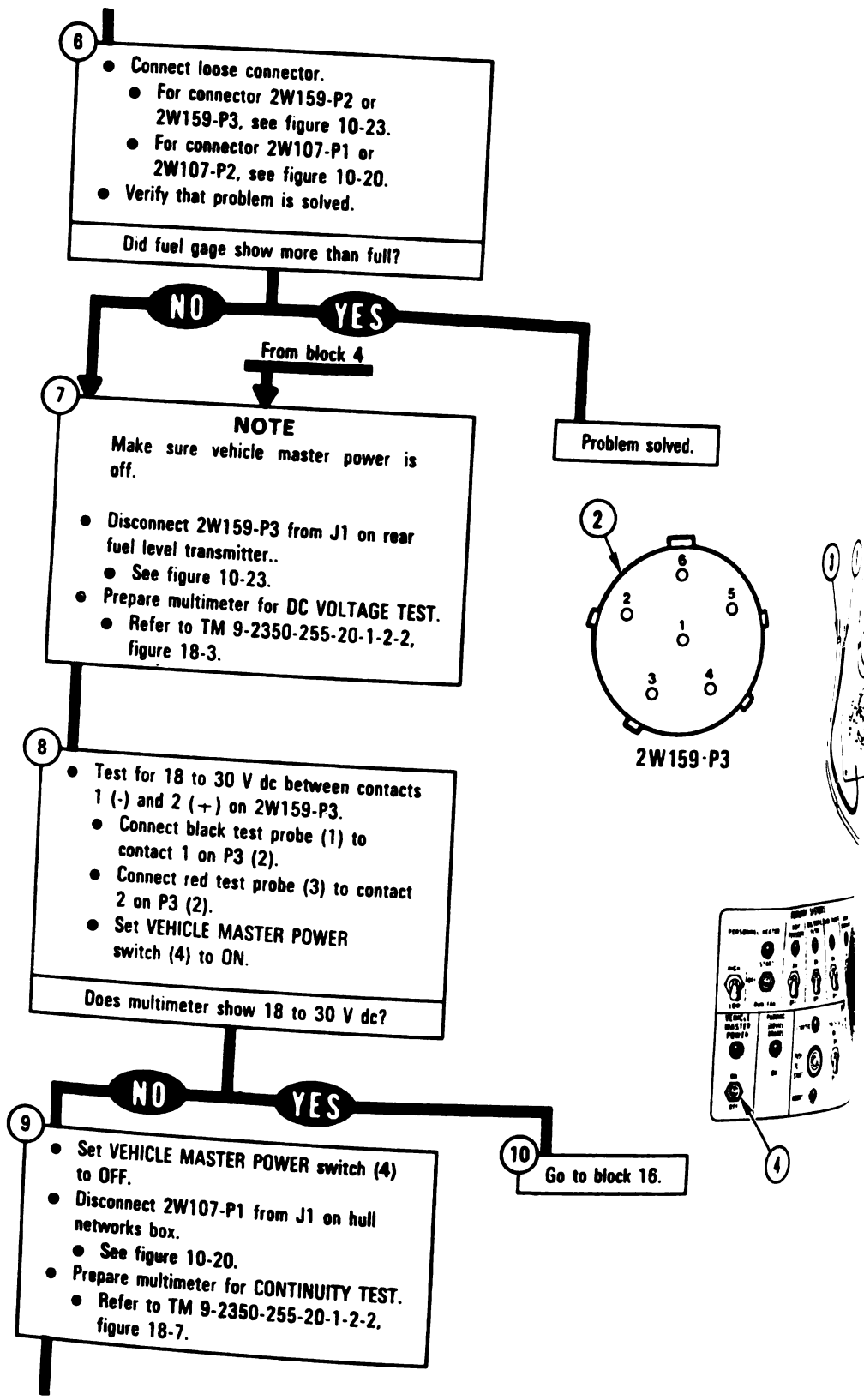


Figure 10-18 (Sheet 3 of 6)  
Volume II  
Para. 10-2

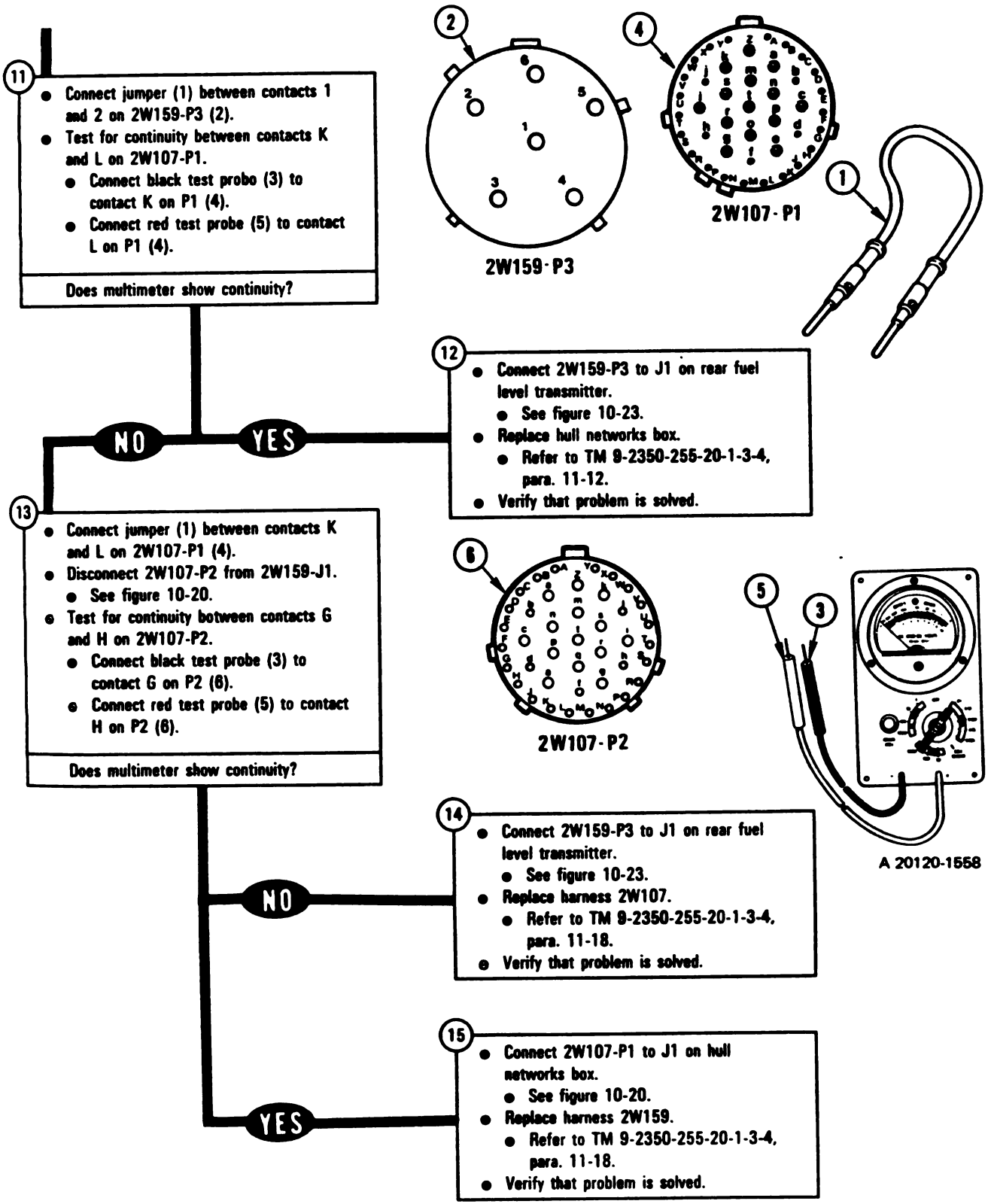


Figure 10-18 (Sheet 4 of 6)  
 Volume II  
 Para. 10-2

**TM 9-2350-255-20-1-2-1  
FUEL SUPPLY SYSTEM TROUBLESHOOTING**

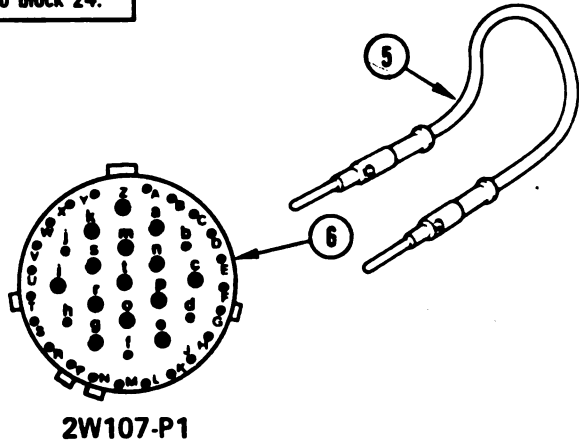
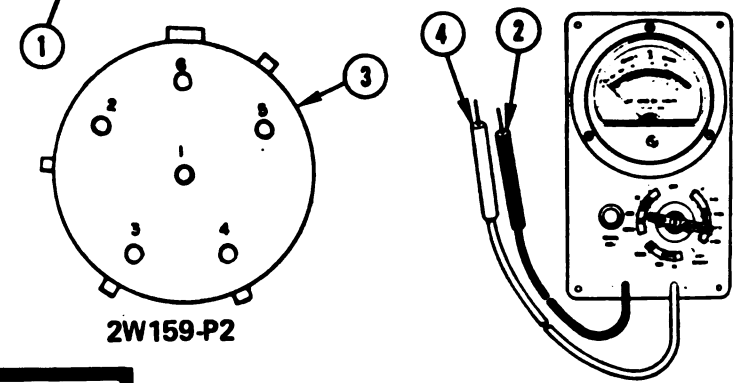
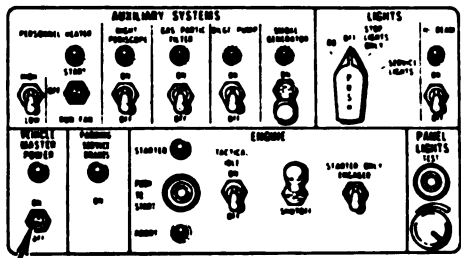
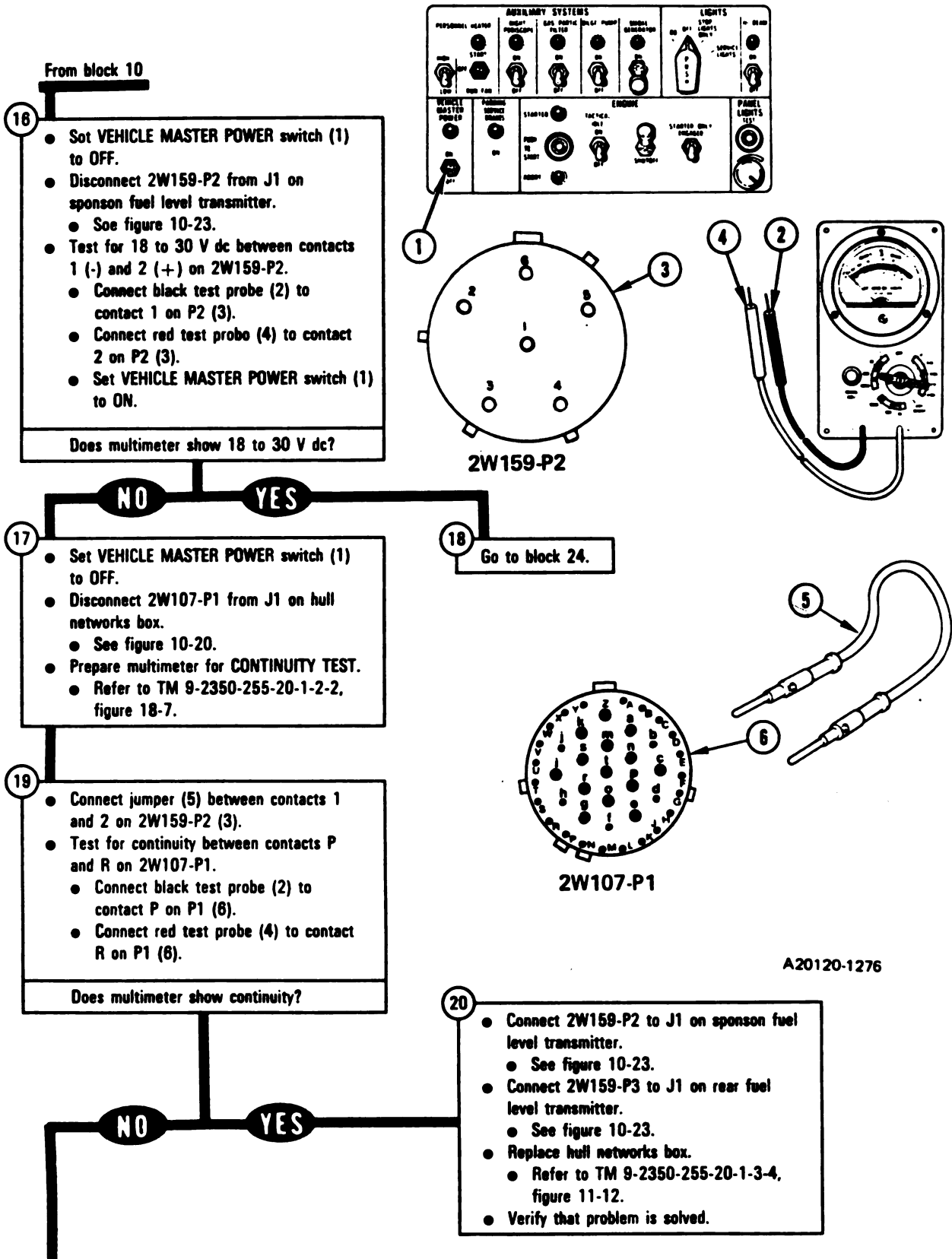


Figure 10-18 (Sheet 5 of 6)  
Volume II  
Para. 10-2

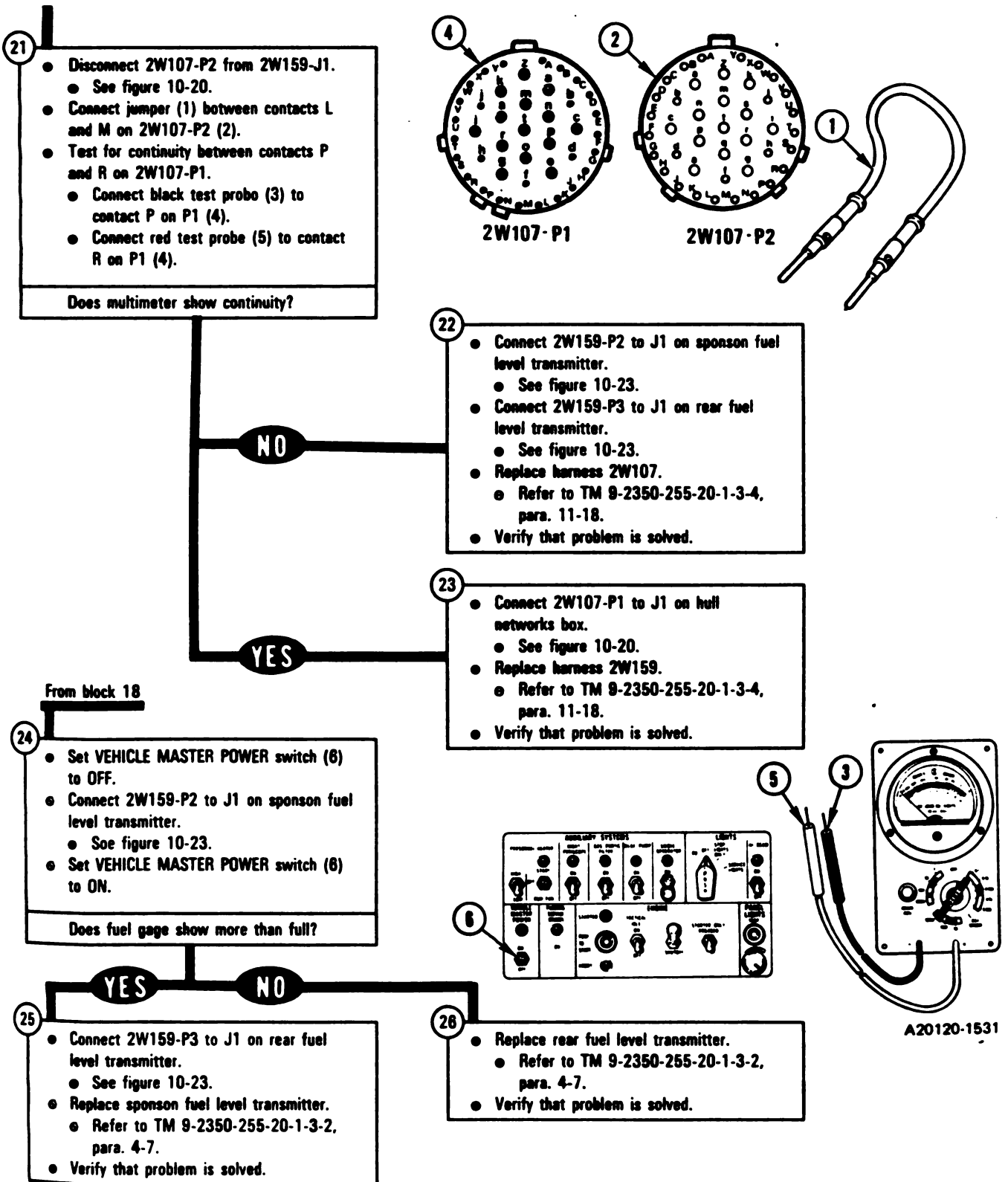
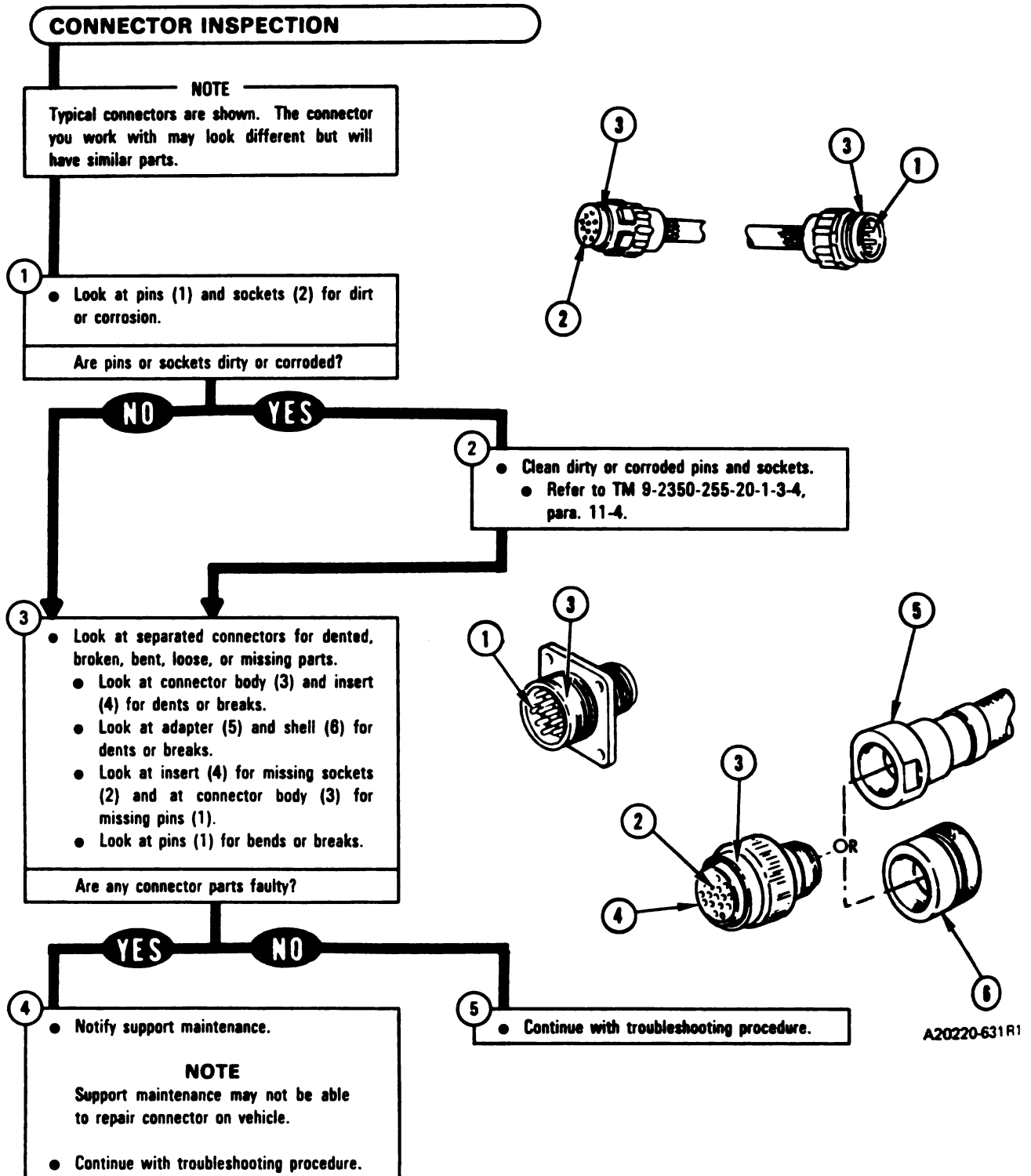


Figure 10-18 (Sheet 6 of 6)  
 Volume II  
 Para. 10-2

**10-3. Fuel Supply System Connector Inspection Procedure.**

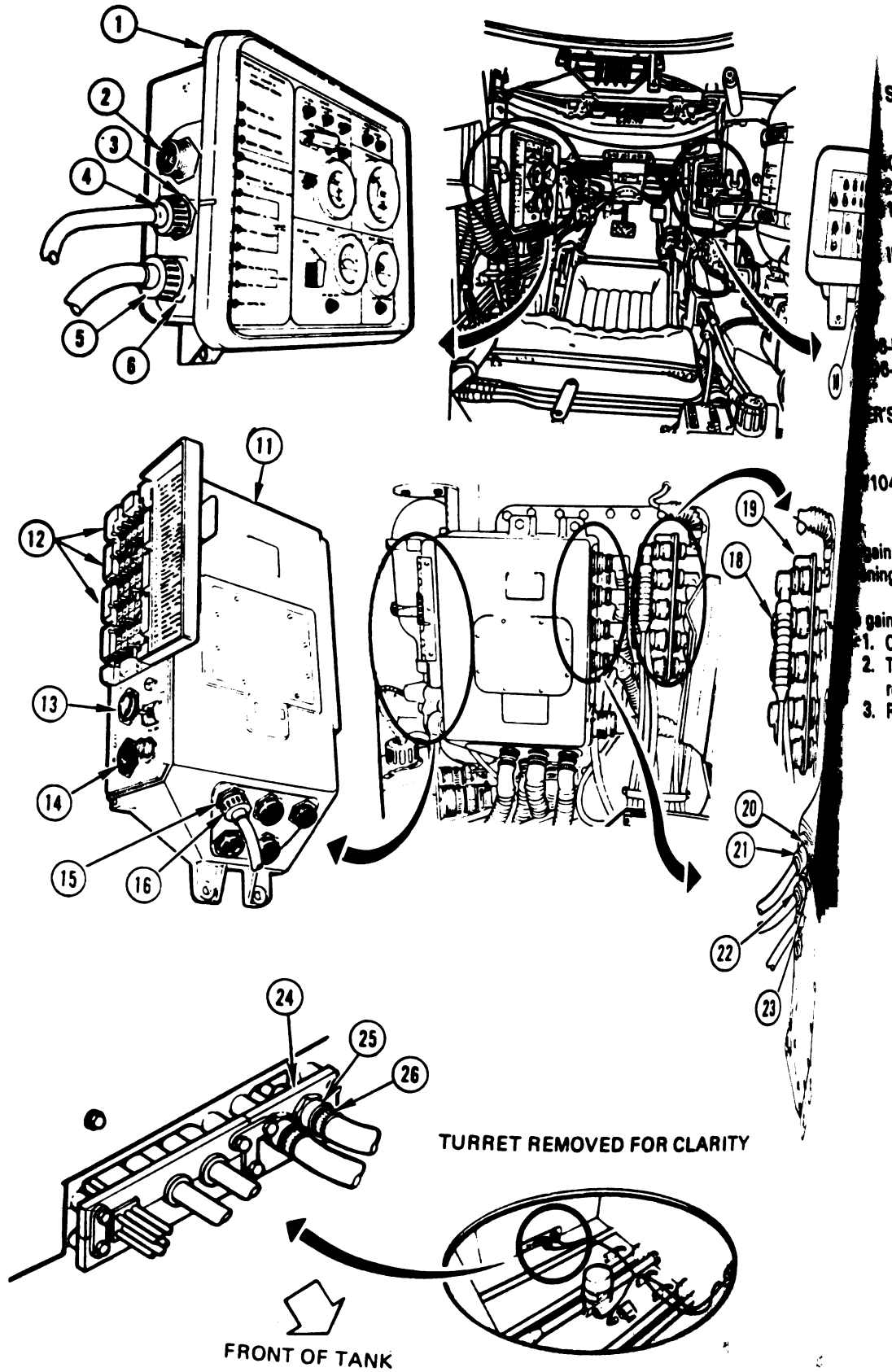


*Figure 10-19*  
**Volume II**  
**Para. 10-3**

**10-4. System Component Location for Fuel Supply System Troubleshooting.** This paragraph tells you what component location and access tasks are required for troubleshooting the fuel supply system. The access tasks are required when checking the fuel supply system for loose vehicle harness connections and damage and for identifying component location for troubleshooting. Fuel supply system component locations are included for the driver's compartment, turret, hull floor, left rear and right rear engine compartment, and left and right front ballistic cover.



TM 9-2350-255-20-1-2-1  
**FUEL SUPPLY SYSTEM TROUBLESHOOTING**



*Figure 10-20. Fuel Supply System Component Location, Driver's Compartment and Turret (Sheet 1 of 2).*

**Volume II  
 Para. 10-4**

**10-156 Change 6**

**Fuel Supply System Component Location, Driver's Compartment and Turret.**

<b>CABLE JUNCTION BRACKET</b>	<b>19</b>	<b>FEED THROUGH PLATE</b>	<b>24</b>
2W106-P2	18	2W107-P2	26
2W107-J1	17	2W159-J1	25
<b>DRIVER'S INSTRUMENT PANEL</b>	<b>1</b>	<b>HULL NETWORKS BOX</b>	<b>11</b>
J1	3	CIRCUIT BREAKERS	12
J2	6	J1	20
TJ1	2	J2	23
2W106-P4	4	J12	15
2W106-P5	5	TJ1	13
<b>DRIVER'S MASTER PANEL</b>	<b>7</b>	TJ2	14
J1	9	2W105-P1	22
TJ1	8	2W106-P1	16
2W104-P3	10	2W107-P1	21

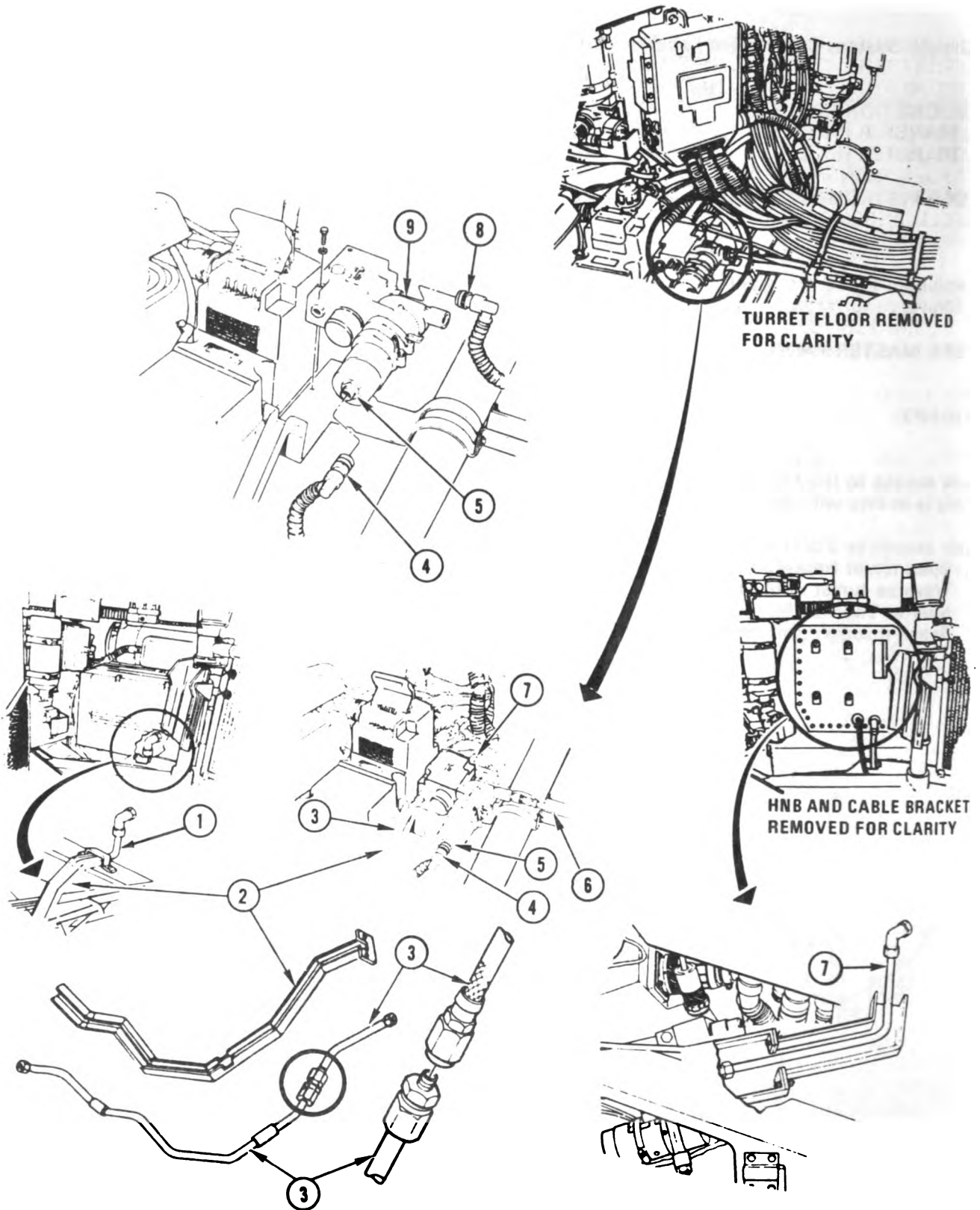
To gain access to the hull networks box and cable junction bracket, traverse turret until basket opening is in line with component and then lock turret; refer to TM 9-2350-255-10.

To gain access to 2W107-P2 and 2W159-J1 connected at the feed through plate:

1. Open turret basket access door; refer to TM 9-2350-255-10.
2. Traverse turret until basket floor opening is centered over harness 2W107 and then lock turret; refer to TM 9-2350-255-10.
3. Reach through floor opening to get at 2W107-P2 connected to 2W159-J1.

*Figure 10-20. Fuel Supply System Component Location,  
 Driver's Compartment and Turret (Sheet 2 of 2).*

**TM 9-2350-255-20-1-2-1**  
**FUEL SUPPLY SYSTEM TROUBLESHOOTING**



A20120-1229 R1

**Figure 10-21. Fuel Supply System Component Location, Hull Floor (Sheet 1 of 2).**  
**Volume II**  
**Para. 10-4**

**TM 9-2350-255-20-1-2-1  
FUEL SUPPLY SYSTEM TROUBLESHOOTING**



FUEL TRANSFER TUBE	1
FUEL TRANSFER SHIELD	2
FUEL TRANSFER HOSE	3
	4
FUEL PUMP J1	5
FUEL HOSE	6
FUEL TRANSFER TUBE	7
	8
FUEL ASSEMBLY J1	9

Refer to items 1 and 2:

Rotate turret until main gun is over right rear sponson and then lock turret; refer to TM 9-2350-255-10.

Open Bil storage box; refer to TM 9-2350-255-20-1-3-3, para. 7-12.

Refer to item 3:

Check driver's seat, between driver's compartment and under turret basket.

Refer to items 4, 5, 6, 8, and 9:

Open turret basket access door; refer to TM 9-2350-255-10.

Rotate turret until basket floor opening is over the fuel transfer pump and then lock turret; refer to TM 9-2350-255-10.

Refer to item 7:

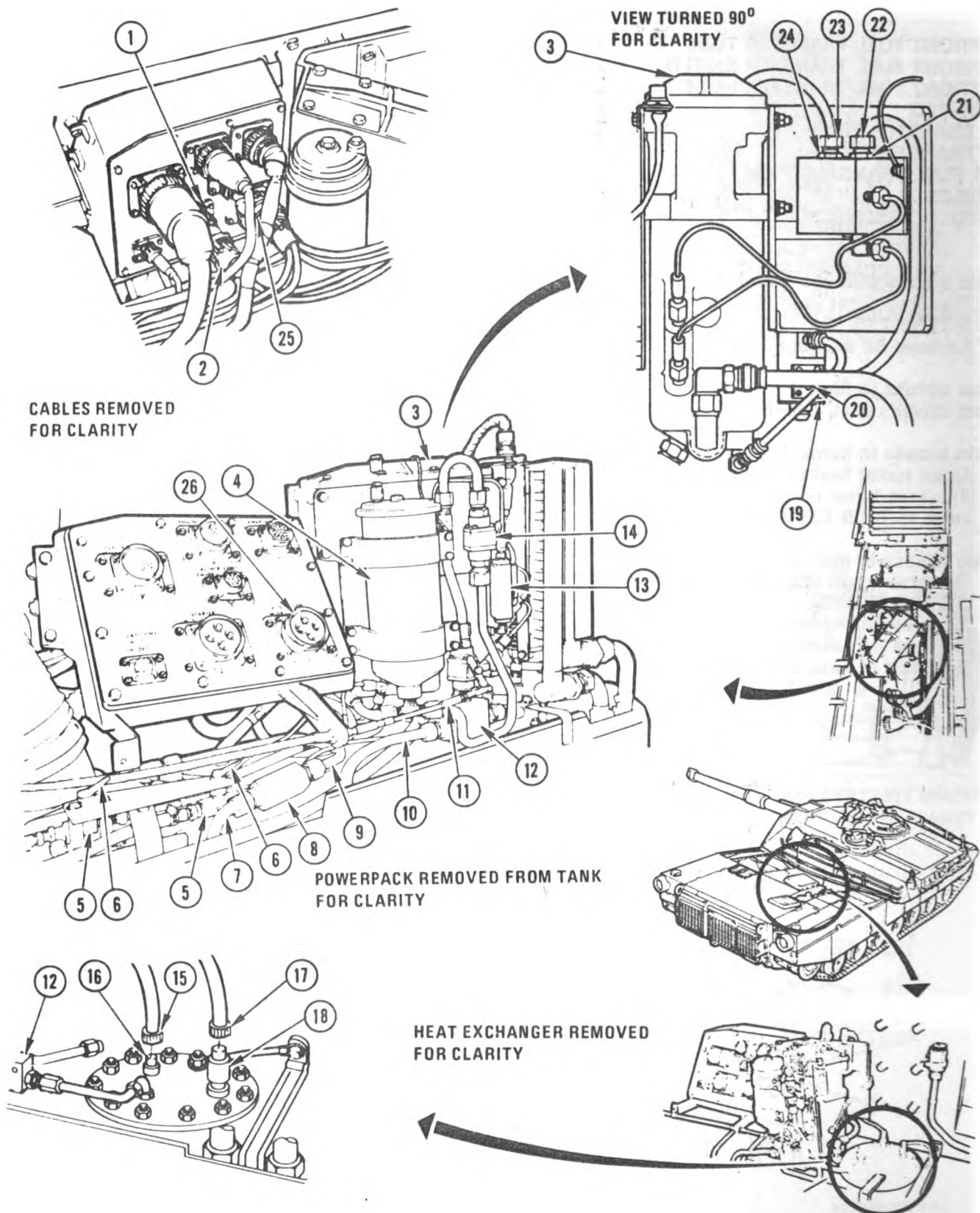
Rotate turret until main gun is over left rear fuel cap and then lock turret; refer to TM 9-2350-255-10.

Check hull networks box; refer to TM 9-2350-255-20-1-3-4, para. 11-12.

Check harnesses connected to cable junction bracket; refer to TM 9-2350-255-20-1-3-2, para. 11-12 of Task 5).

**Figure 10-21. Fuel Supply System Component Location, Hull Floor (Sheet 2 of 2).  
Volume II  
Para. 10-4**

**TM 9-2350-255-20-1-2-1**  
**FUEL SUPPLY SYSTEM TROUBLESHOOTING**



A20120 1230R1

*Figure 10-22. Fuel Supply System Component Location (Right Rear) (Sheet 1 of 2).*  
**Volume II**  
**Para. 10-4**

**Fuel Supply System Components (Right Rear)**

2W157-J1	1
3W101/2-P1	2
FUEL/WATER SEPARATOR	3
PRIMARY FUEL FILTER	4
DUMP VALVES	5
DUMP VALVE HANDLES	6
FORWARD ENGINE COMPARTMENT	7
FUEL TRANSFER TUBE	
CHECK VALVE	8
REAR ENGINE COMPARTMENT	9
FUEL TRANSFER TUBE	
RIGHT REAR FUEL	10
CROSSOVER TUBE	
MANUAL SHUTOFF VALVE CABLE	11
DUAL CHECK VALVE	12
PRESSURE DIFFERENTIAL SWITCH	13
MANUAL BYPASS VALVE	14
2W159-P8	15
RIGHT REAR FUEL PUMP J1	16
2W159-P9	17
RIGHT FUEL PUMP	18
PRESSURE SWITCH J1	
SOLENOID VALVE	19
2W161-P2	20
FUEL/WATER SEPARATOR	21
CONTROL MODULE J2	
2W161-P1	22
2W159-P13	23
FUEL/WATER SEPARATOR	24
CONTROL MODULE J1	
3W101/2-P2	25
2W158-J1	26

To gain access to the components listed above:

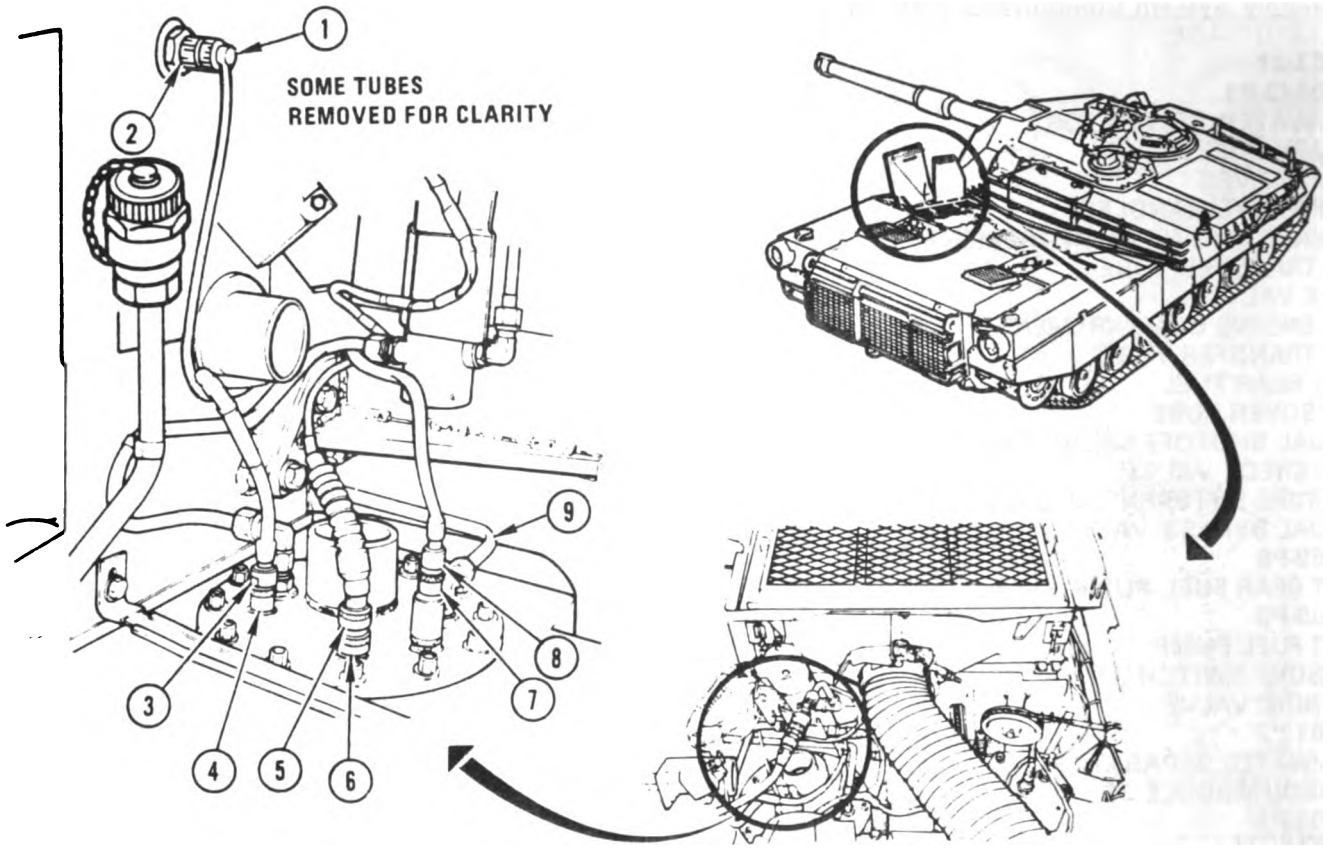
1. Traverse turret until main gun is over left side of tank and then lock turret; refer to TM 9-2350-255-10.
2. Open both battery covers; refer to TM 9-2350-255-10.
3. Open top deck right grille doors; refer to TM 9-2350-255-10.

*Figure 10-22. Fuel Supply System Component Location (Right Rear) (Sheet 2 of 2).*

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**Para. 10-4**

**Change 6 10-161**

**TM 9-2350-255-20-1-2-1  
FUEL SUPPLY SYSTEM TROUBLESHOOTING**



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**Fuel Supply System Components (Left Rear)**

2W159-P2	1	LEFT REAR FUEL PUMP J1	6
SPONSON FUEL LEVEL TRANSMITTER J1	2	LEFT FUEL PUMP PRESSURE	
2W159-P3	3	SWITCH J1	7
REAR FUEL LEVEL TRANSMITTER J1	4	2W159-P5	8
2W159-P4	5	LEFT REAR FUEL CROSSOVER TUBE	9

To gain access to the components listed above:

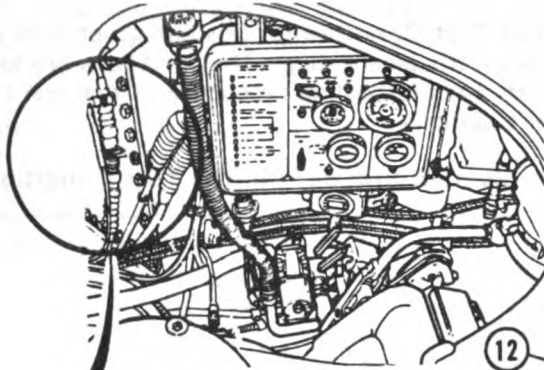
1. Traverse turret until main gun is over left side of tank and then lock turret; refer to TM 9-2350-255-10.
2. Open both precleaner doors; refer to TM 9-2350-255-10.
3. Open top deck left grille doors; refer to TM 9-2350-255-10.

*Figure 10-23. Fuel Supply System Component Location (Left Rear).*

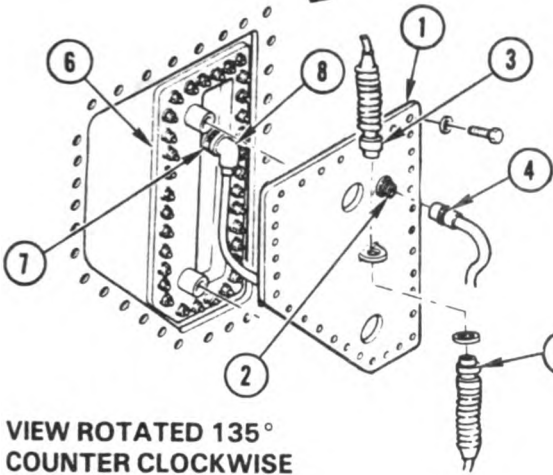
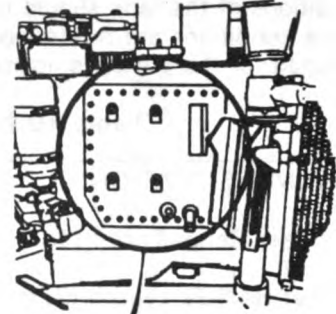
**Volume II  
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**VIEW FROM DRIVER'S COMPARTMENT**

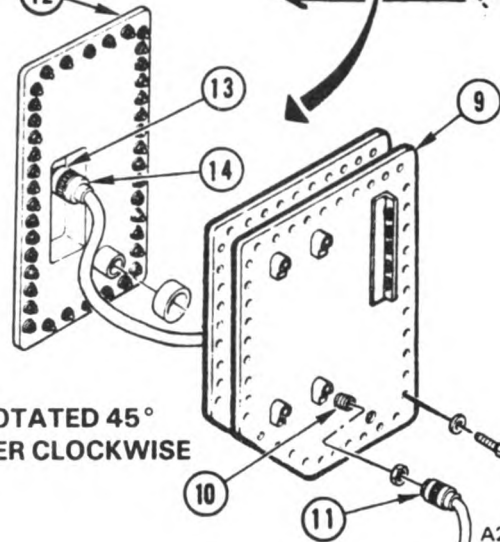
B-11 STOWAGE  
 BOX AND  
 PERSONNEL  
 HEATER SHOWN  
 REMOVED  
 FOR CLARITY



**HNB AND BRACKET SHOWN  
 REMOVED FOR CLARITY**



VIEW ROTATED 135°  
 COUNTER CLOCKWISE



VIEW ROTATED 45°  
 COUNTER CLOCKWISE

A20120-1501

- LEFT FRONT FUEL TANK BALLISTIC COVER**
- 1 2W106-1-J1
  - 2 2W111-2-J1
  - 3 2W106-P7
  - 4 2W111-P2

- RIGHT FRONT FUEL TANK BALLISTIC COVER**
- 9 2W105-1-J1
  - 10 2W105-P3
  - 11

- LEFT FRONT FUEL TANK COVER**
- 6 J1
  - 7 2W106-1-P1
  - 8

- RIGHT FRONT FUEL TANK COVER**
- 12 J1
  - 13 2W105-1-P1
  - 14

To gain access to items 1, 2, 3, 4, and 5, sit in driver's compartment.

To gain access to items 6, 7, and 8, remove left front fuel tank ballistic cover; refer to TM 9-2350-255-20-1-3-2, para. 4-6.

To gain access to items 9, 10, and 11, traverse turret until main gun is over left rear fuel cap and then lock turret; refer to TM 9-2350-255-10.

To gain access to items 12, 13, and 14:

1. Remove harnesses from cable junction bracket; refer to TM 9-2350-255-20-1-3-2, para. 4-6 (part of Task 5).
2. Remove right front ballistic cover; refer to TM 9-2350-255-20-1-3-2, para. 4-6.

*Figure 10-24. Fuel Supply System Component Location,  
 Left and Right Ballistics Covers.*

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**Change 6 10-163**



**TM 9-2350-255-20-1-2-1  
FUEL SUPPLY SYSTEM TROUBLESHOOTING**

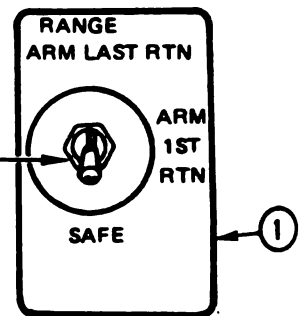
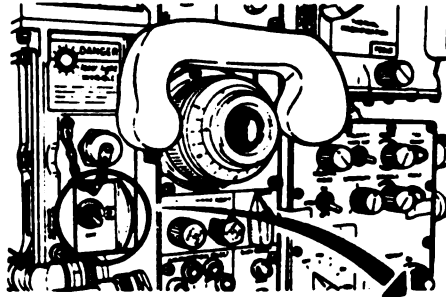
**10-5. Fuel Supply System Standard Initial Test Conditions.** This paragraph tells you what the test conditions of the tank should be before you begin troubleshooting. The conditions are listed in table 10-2. These conditions are referenced in each primary troubleshooting procedure. Initial test conditions are included for the gunner's, loader's, and driver's stations.

**Table 10-2. Fuel Supply System Standard Initial Test Conditions**

**GUNNER'S STATION**

**A. Laser Rangefinder (1)**

Set RANGE switch (2) to SAFE.



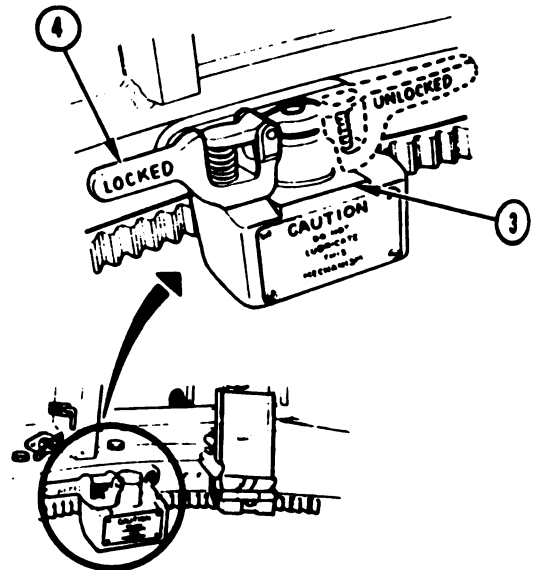
**LOADER'S STATION**

**B. Turret Traverse Lock (3)**

Turn turret traverse lock handle (4) clockwise to LOCKED position.

**NOTE**

Turret may have to be traversed slightly left or right for handle (4) to drop into LOCKED position.



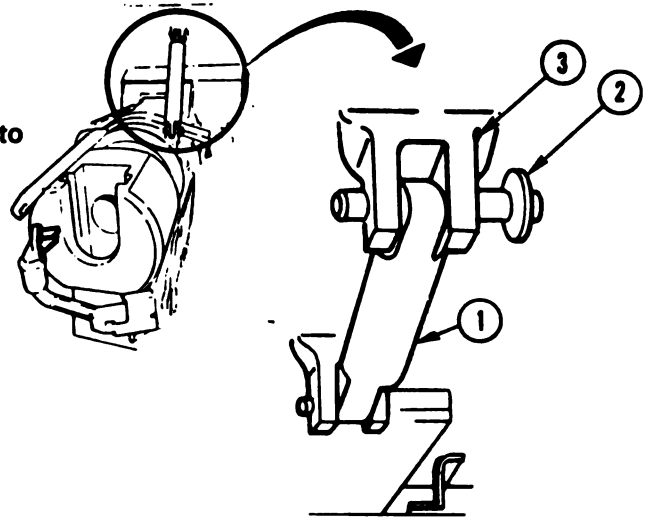
A20120-543R1

**Table 10-2. Fuel Supply System Standard Initial Test Conditions (Continued)**

**LOADER'S STATION (Continued)**

**C. Main Gun Elevation Travel Lock (1)**

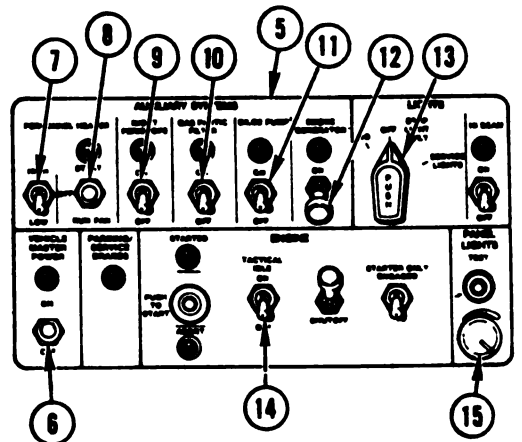
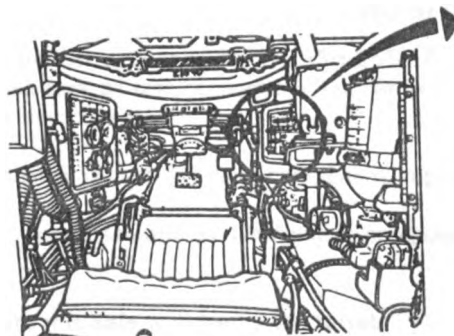
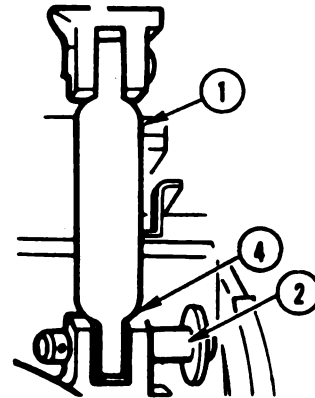
1. Release lock pin (2) from roof strut (3).
2. Swing main gun elevation travel lock (1) down into main gun strut (4) and engage lock pin (2).



**DRIVER'S STATION**

**D. Driver's Master Panel (5)**

1. Set VEHICLE MASTER POWER switch (6) to OFF.
2. Set PERSONNEL HEATER switch (7) to LOW and switch (8) to OFF.
3. Set NIGHT PERISCOPE switch (9) to OFF.
4. Set GAS PARTIC FILTER switch (10) to OFF.
5. Set BILGE PUMP switch (11) to OFF.
6. Set SMOKE GENERATOR switch (12) to OFF.
7. Set LIGHTS switch (13) to OFF.
8. Set ENGINE TACTICAL IDLE switch (14) to OFF.
9. Set PANEL LIGHTS control (15) to maximum clockwise position.



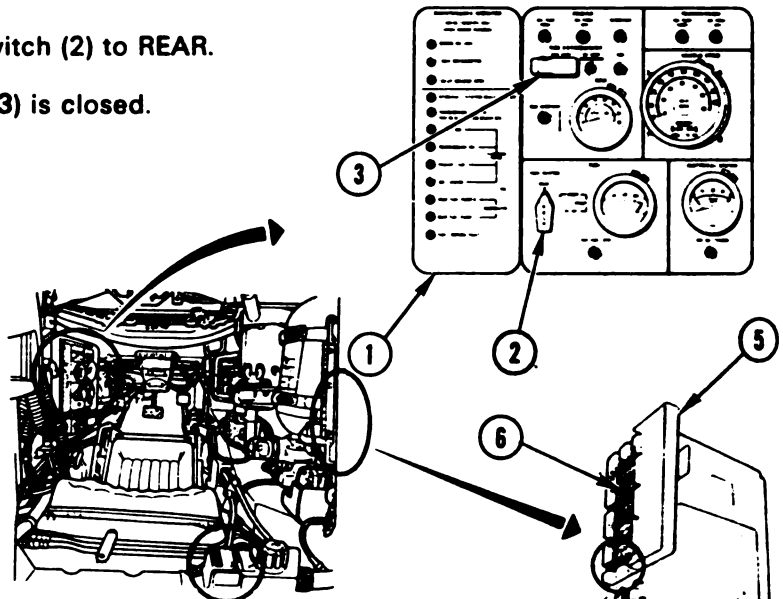
A20120-544R1

Table 10-2. Fuel Supply System Standard Initial Test Conditions (Continued)

DRIVER'S STATION (Continued)

E. Driver's Instrument Panel (1)

1. Set FUEL TANK SELECTOR switch (2) to REAR.
2. Make sure 2ND SHOT guard (3) is closed.

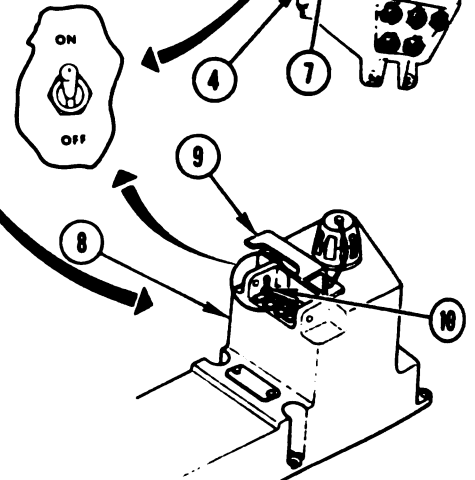


F. Hull Networks Box (4)

1. Open circuit breaker cover (5) on hull networks box (4).
2. Set all circuit breaker switches (6) to ON.
3. Set circuit breaker switch CB30 (7) to ON.

G. Power Distribution Box (8)

1. Open circuit breaker cover (9) on power distribution box (8).
2. Set all circuit breaker switches (10) to ON.



A20120-545R1

**CHAPTER 11**

**TRANSMISSION AND FINAL DRIVE SYSTEM TROUBLESHOOTING**

**11-1. General.** This chapter tells you how to troubleshoot the transmission and final drive system and its major subsystems. The system/subsystems are listed in table 11-1 with paragraph and page numbers.

**Table 11-1. Transmission and Final Drive System/Subsystems**

System/Subsystem	Use STE/M1	Para.	Page
Transmission And Final Drive System	No	11-2	11-3
Transmission Shift Subsystem	Yes	11-3	11-5
Transmission Oil Cooler Subsystem	No	11-4	11-159

The STE/M1 test set is used to troubleshoot the transmission shift system. For a detailed description of the STE/M1 test set, refer to TM 9-2350-255-20-1-2-2, paragraph 18-4. STE/M1 tests 1160, 1161, 1162, and 1163 for transmission oil cooler subsystem have been temporarily deleted.

A system/subsystem fault symptom index is located at the beginning of each system/subsystem paragraph. The index identifies the primary and alternate procedure used to troubleshoot a known symptom. The primary procedure is included within the paragraph. The alternate procedure, located in TM 9-2350-255-20-1-2-3, chapter 20, is used when the STE/M1 test set is not available.

Do not start any alternate troubleshooting procedures until you have completed the pre-test steps in the primary procedures. The pre-test steps include inspection of vehicle harness/component connectors and inspection/test of mechanical components in the faulty subsystem. The pre-test are those steps which are to be performed before being directed to do the specified ATP.

One of four types of messages will be displayed on the STE/M1 test set communicator (SETCOM): a general instruction, a cable instruction, a fault, or a special instruction message. General instruction messages are self-explanatory. For a cable instruction or a fault message, the action is listed in the cable instruction index or fault message index in each primary procedure. The primary procedure may also have a special instruction message index. A full explanation of the messages, with examples, is in TM 9-2350-255-20-1-2-2, para. 18-4. STE/M1 test set hookup diagrams show how the test set is connected to the tank for each troubleshooting action. These diagrams are located at the end of the primary procedures.

Follow these general troubleshooting and maintenance instructions in each procedure unless the procedure directs otherwise:

- a. Make sure the troubleshooting instructions in TM 9-2350-255-10 have been completed before starting this troubleshooting action. Make sure all test connections are correct. An incorrect test connection can lead to the replacement of a good tank component.
- b. If the same symptom exists after replacing a tank component, repeat the troubleshooting procedure.
- c. Look for obvious damage to harnesses and all surrounding components while checking for loose electrical connectors.
- d. Be sure tank is parked where it is safe to traverse the turret.
- e. Be sure to close grille doors and access panels before traversing the turret.

**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**

**11-1. General (Continued)**

- f. Be sure vehicle master power is OFF before connecting or disconnecting any electrical cable.
- g. When taking apart or joining receptacles or connectors, look for missing, broken, and pushed-out pins.
- h. If connectors, plugs, or receptacles cannot be removed by hand, use slip joint conduit style removal inserts to remove them. When installing receptacles on larger harnesses, another soldier will be needed to help align the mating ends. Be sure that pins and keyways line up. Tighten twist-snap-type connectors, plugs, or receptacles and tighten the screw-on-type until the ratchet noise is heard to indicate that connectors, plugs, and receptacles are tight.
- i. Use care when hooking up all connectors to avoid bending or breaking pins.
- j. Connect all cables and harnesses that were disconnected in order to get at the connector before disconnecting.
- k. Dirt or contamination can ruin the transmission system. Clean off all connections with a clean rag before any connection or fitting.

**WARNING**

Wipe up spilled oil immediately with rags. You can slip and fall on spilled oil.

- l. Put a rag under all connections to catch spilled oil before removing.
- m. When a step tells you to loosen connections with two wrenches, use one to loosen the connection and the other to hold the fitting and keep the line from twisting.
- n. Cap or plug all open tubes, lines, fittings, receptacles, and connectors as soon as they are disconnected.
- o. Take protective caps or plugs off all tubes, lines, fittings, receptacles, and connectors before connecting.
- p. Make sure connection points and insides of all tubes, lines, and fittings are clean before connecting.
- q. Screw on connections by hand. Finger tighten connections to be sure they are not cross-threaded.
- r. When a step tells you to tighten connections with two wrenches, use one to tighten the connection and the other to hold the fitting or line from twisting. Tighten 1/6 to 1/3 turn.
- s. Clean all connections, fittings, and joints that were loosened before you check for leaks.

**Volume II  
Para. 11-1**

**11-2 Change 5**

**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**

**on and Final Drive System Troubleshooting Procedures.**

**11-2. Transmission and Final Drive (TFD) System Fault Symptom Index**

Fault Symptom	Primary Troubleshooting Procedure (PTP)	Test No.	Alternate Troubleshooting Procedure (ATP)
Transmission Leaks Oil.	Figure 11-1	-	
Final Drive Leaks Oil.	Figure 11-1.1	-	

**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**

**11-1. General (Continued)**

- f. Be sure vehicle master power is OFF before connecting or disconnecting any electrical cable or harness.
- g. When taking apart or joining receptacles or connectors, look for missing, broken, and pushed in pins.
- h. If connectors, plugs, or receptacles cannot be removed by hand, use slip joint conduit style pliers with plastic jaw inserts to remove them. When installing connectors, plugs, or receptacles on larger harnesses, another soldier will be needed to help align the mating ends of the cable. Make sure that pins and keyways line up. Tighten twist-snap-type connectors, plugs, or receptacles until a click is heard and tighten the screw-on-type until the ratchet noise is heard to indicate that connectors, plugs, or receptacles are tight.
- i. Use care when hooking up all connectors to avoid bending or breaking pins.
- j. Connect all cables and harnesses that were disconnected in order to get at the connector being checked.
- k. Dirt or contamination can ruin the transmission system. Clean off all connections with a clean rag before loosening any connection or fitting.

**WARNING**

Wipe up spilled oil immediately with rags. You can slip and fall on spilled oil.

- l. Put a rag under all connections to catch spilled oil before removing.
- m. When a step tells you to loosen connections with two wrenches, use one to loosen the connection, and the other to hold the fitting and keep the line from twisting.
- n. Cap or plug all open tubes, lines, fittings, receptacles, and connectors as soon as they are disconnected.
- o. Take protective caps or plugs off all tubes, lines, fittings, receptacles, and connectors before they are installed.
- p. Make sure connection points and insides of all tubes, lines, and fittings are clean before installing them.
- q. Screw on connections by hand. Finger tighten connections to be sure they are not cross-threaded.
- r. When a step tells you to tighten connections with two wrenches, use one to tighten the connection and the other to keep the fitting or line from twisting. Tighten 1/6 to 1/3 turn.
- s. Clean all connections, fittings, and joints that were loosened before you check for leaks.

**Volume II  
Para. 11-1**

**11-2 Change 5**

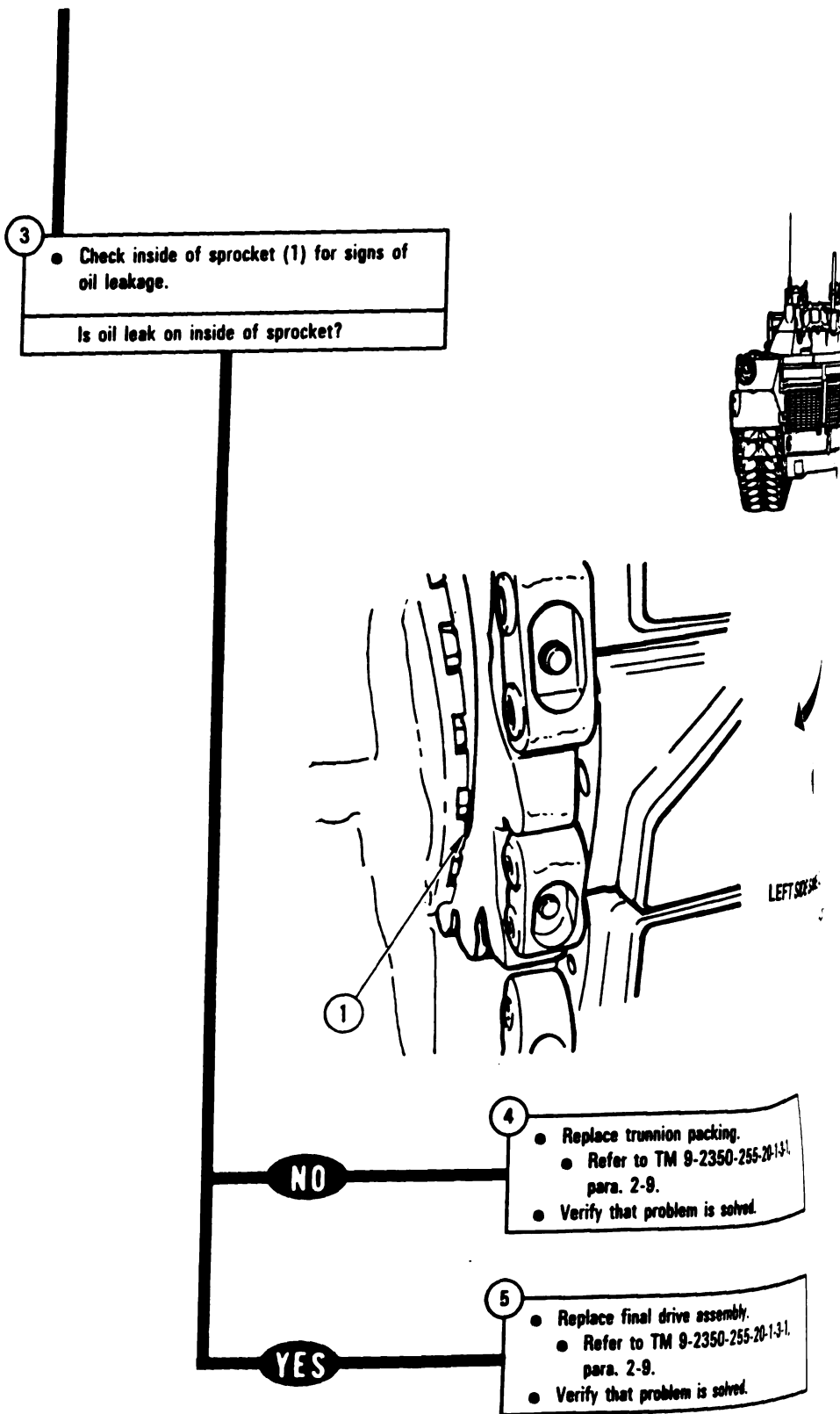
**11-2. Transmission and Final Drive System Troubleshooting Procedures.**

**Table 11-2. Transmission and Final Drive (TFD) System Fault Symptom Index**

<b>Fault Symptom No.</b>	<b>Fault Symptom</b>	<b>Primary Troubleshooting Procedure (PTP)</b>	<b>Test No.</b>	<b>Alternate Troubleshooting Procedure (ATP)</b>
TFD-1	Transmission Leaks Oil.	Figure 11-1	-	
TFD-2	Final Drive Leaks Oil.	Figure 11-1.1	-	



**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**



*Figure 11-1.1 (Sheet 2 of 2)*  
**Volume II  
Para. 11-2**

**SYMPTOM TFD-2**

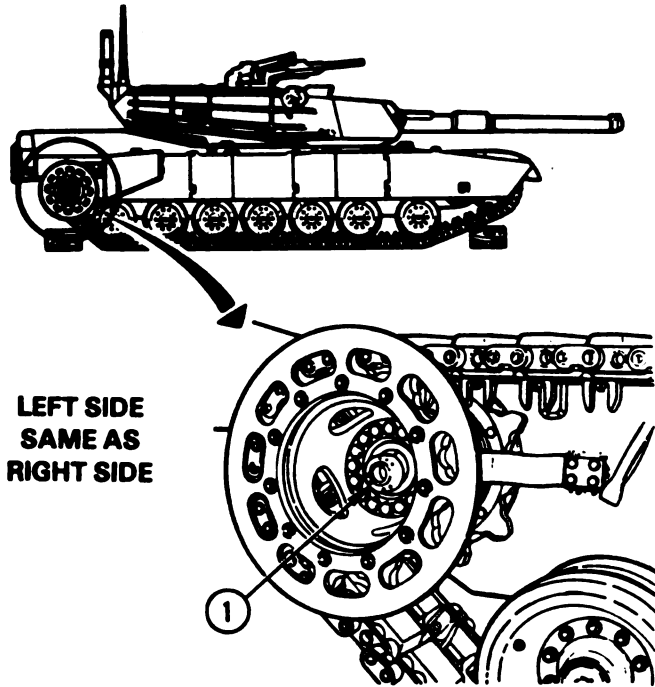
**FINAL DRIVE LEAKS OIL.**

**Equipment Conditions:**

- Tank parked.
- Parking brake set.
- Engine shut down.
- Vehicle master power off.

**NOTE**

- Read para. 11-1 before doing any work.
- Set up tank controls for standard initial test conditions.
- Refer to table 11-5, para. 11-7.



A20120-1708

①

- Open mudguard on side of tank that final drive is leaking.
- Refer to TM 9-2350-255-10.
- Check outside of sprocket (1) for signs of oil leakage.

Is oil leak on outside of sprocket?

**NO**

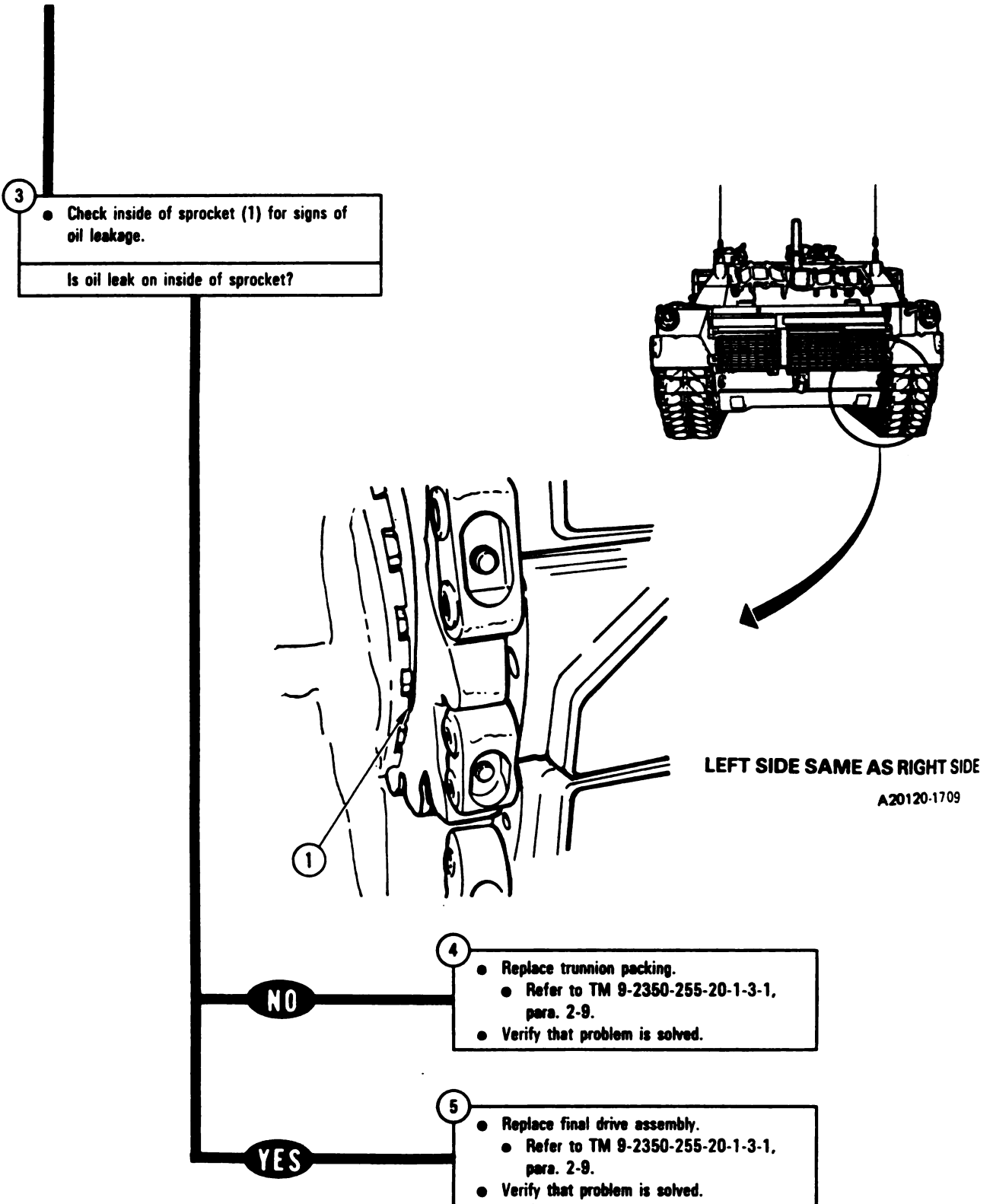
**YES**

②

- Replace packings on final drive disconnect adapter.
- Refer to TM 9-2350-255-20-1-3-1, para. 2-9, (part of task 6).
- Verify that problem is solved.

*Figure 11-1.1 (Sheet 1 of 2)*  
**Volume II  
 Para. 11-2**

**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**



*Figure 11-1.1 (Sheet 2 of 2)*  
**Volume II  
Para. 11-2**

**11-3. Transmission Shift Subsystem Troubleshooting Procedures.**

**Table 11-3. Transmission Shift Subsystem (TSS) Fault Symptom Index**

Fault Symptom No.	Fault Symptom	Primary Troubleshooting Procedure (PTP)	Test No.	Alternate Troubleshooting Procedure (ATP)
TSS-1	Tank Will Not Move In Forward Or Reverse Ranges.	Figure 11-2	1100	Figure 20-29
TSS-2	Transmission Does Not Shift To Low Range.	Figure 11-2	1100	Figure 20-30
TSS-3	Transmission Does Not Shift To Pivot.	Figure 11-2	1100	-
TSS-4	Transmission Does Not Downshift At Full Steer.	Figure 11-2	1100	Figure 20-31
TSS-5	Transmission Does Not Downshift.	Figure 11-2	1100	-
TSS-6	Transmission Does Not Upshift.	Figure 11-2	1100	-
TSS-7	Transmission Does Not Shift To Reverse Range - OK In Other Ranges.	Figure 11-2	1100	Figure 20-32
TSS-8	Transmission Does Not Shift To Drive Range - OK In Other Ranges.	Figure 11-2	1100	Figure 20-32.1
TSS-9	Transmission Shifts At Wrong Time.	Figure 11-2	1100	-
TSS-10	Transmission Does Not Shift To Low And Drive Ranges.	Figure 11-2	1100	-
TSS-11	Transmission Starts Out In Low Range With Shift Selector In Drive.	Figure 11-2	1100	Figure 20-32.2

TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING

SYMPTOMS TSS-1 THROUGH TSS-11

TRANSMISSION SHIFT SUBSYSTEM  
FOUND FAULTY DURING TANK OPERAT-  
ION

**Common Tools:**

- Extension, socket wrench, 1/2-inch square drive, 2-inch
- Extension, socket wrench, 1/2-inch square drive, 10-inch
- Handle, socket wrench, ratchet, 1/2-inch square drive
- Key, socket head screw, 3/16-inch
- Key, socket head screw, 3/8-inch
- Socket, socket wrench, 1/2-inch square drive, 7/16-inch
- Socket, socket wrench, 1/2-inch square drive, 7/8-inch
- Socket, socket wrench, 1/2-inch square drive, 11/16-inch
- Wrench, combination, 7/16-inch
- Wrench, combination, 1/2-inch
- Wrench, combination, 9/16-inch
- Wrench, combination, 5/8-inch
- Wrench, combination, 11/16-inch
- Wrench, combination, 3/4-inch
- Wrench, combination, 7/8-inch

**Supplies:**

- Detergent, general purpose, Type 1, NSN 7930-00-559-9816
- Measure, liquid, 1 quart capacity, NSN 7240-00-233-6013

**Test Equipment/Special Tools:**

- 15 Millimeter Socket (from tool bag in right sponson), 12285489
- Pliers, slip joint, conduit style with plastic jaw inserts, NSN 5120-00-624-8065

**NOTE**

Do not get following equipment until told to further on in this procedure.

- STE/M1 Test Set, 12303600

Figure 11-2 (Sheet 1 of 53)  
Volume II  
Para. 11-3

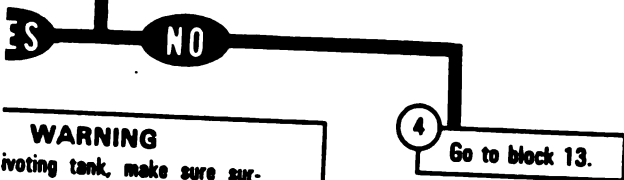
**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**

**Condition:**  
id.  
ake set.  
it down.  
ister power off.

**NOTE**  
1-1 before doing any work.

controls for standard initial test  
i.  
to table 11-5, para. 11-7.

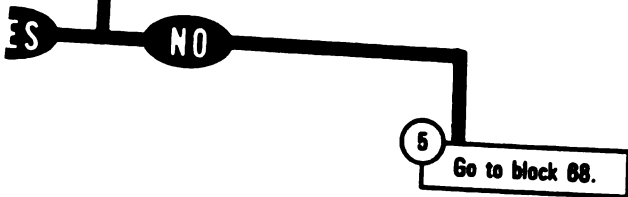
TSS-1 or TSS-3 being checked?



**WARNING**  
rotating tank, make sure sur-  
area is clear to prevent injury  
nel or damage to equipment.

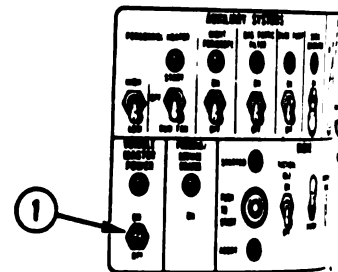
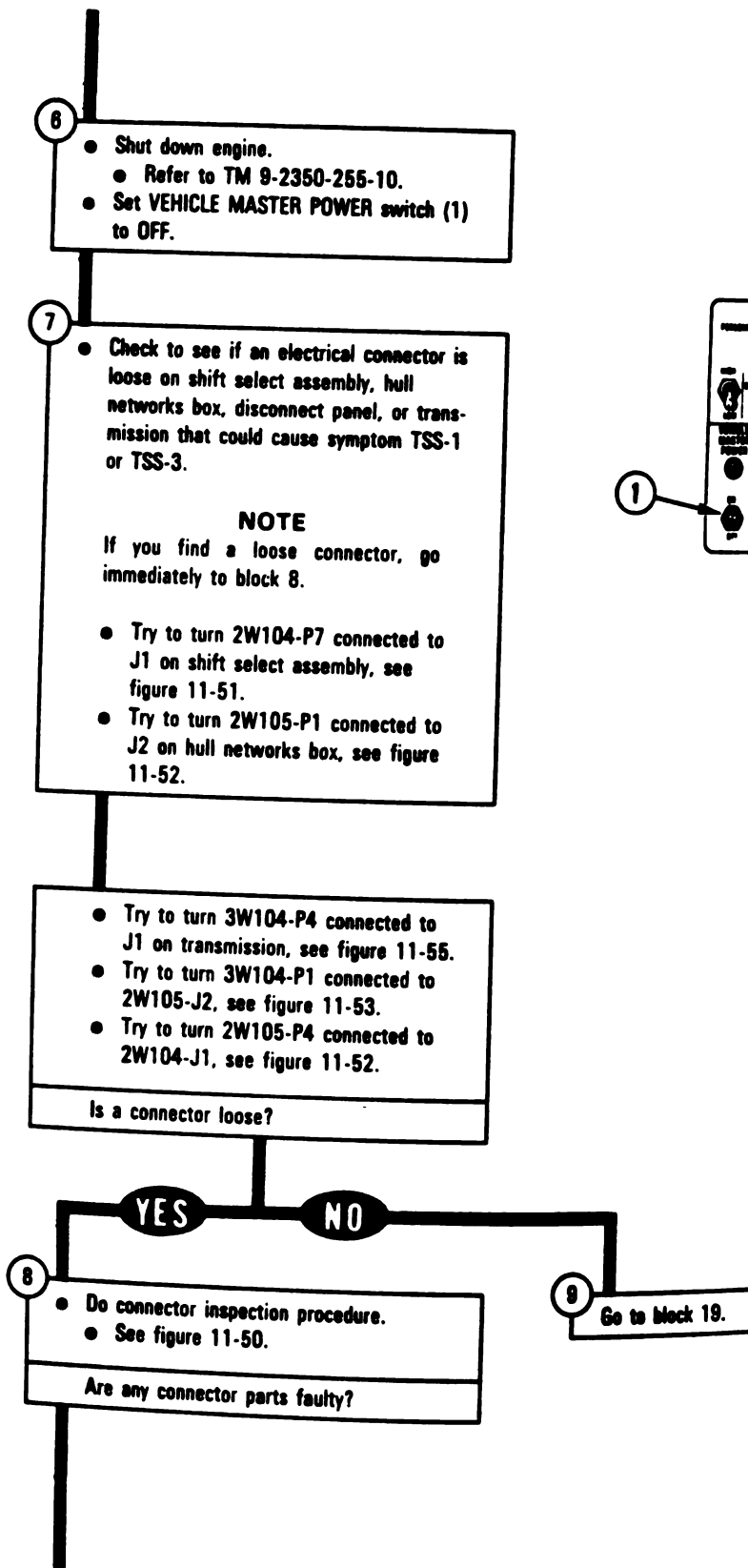
ine.  
to TM 9-2350-255-10.  
see if tank will pivot.  
to TM 9-2350-255-10.

k pivot?



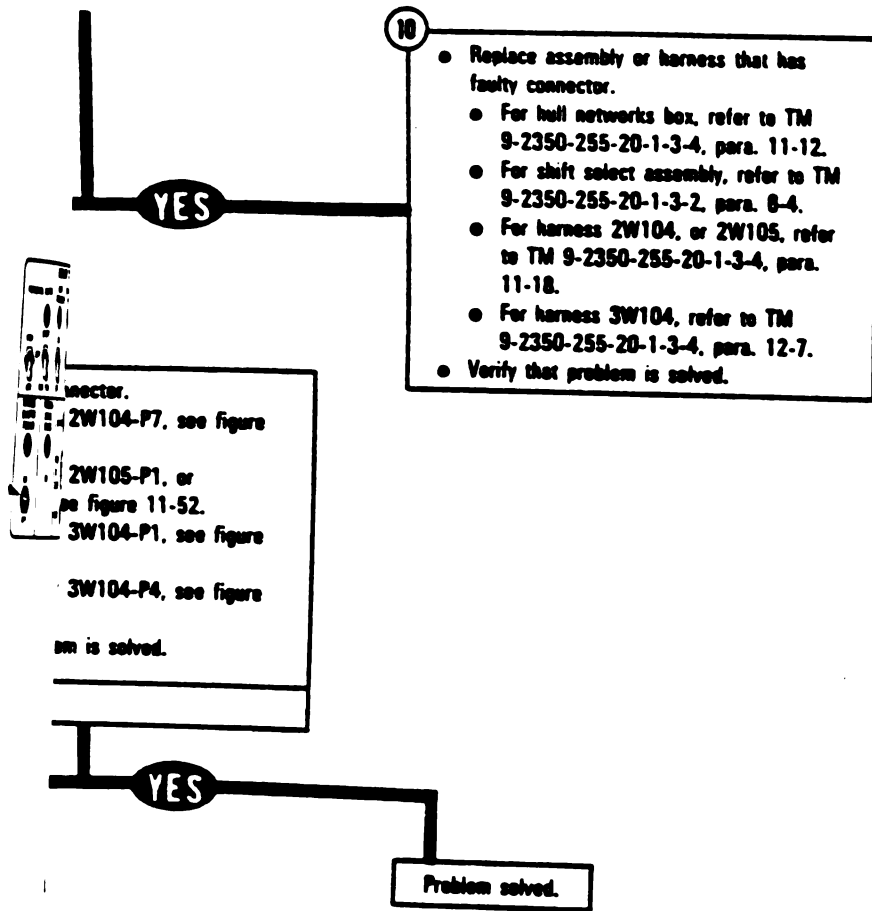
*Figure 11-2 (Sheet 2 of 53)  
Volume II  
Para. 11-3*

**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**



*Figure 11-2 (Sheet 3 of 53)  
Volume II  
Para. 11-3*

**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**



an electrical connector is  
select assembly, hull  
or transmission that could  
TSS-2, TSS-4, TSS-5,  
TSS-8, TSS-8, TSS-10, or

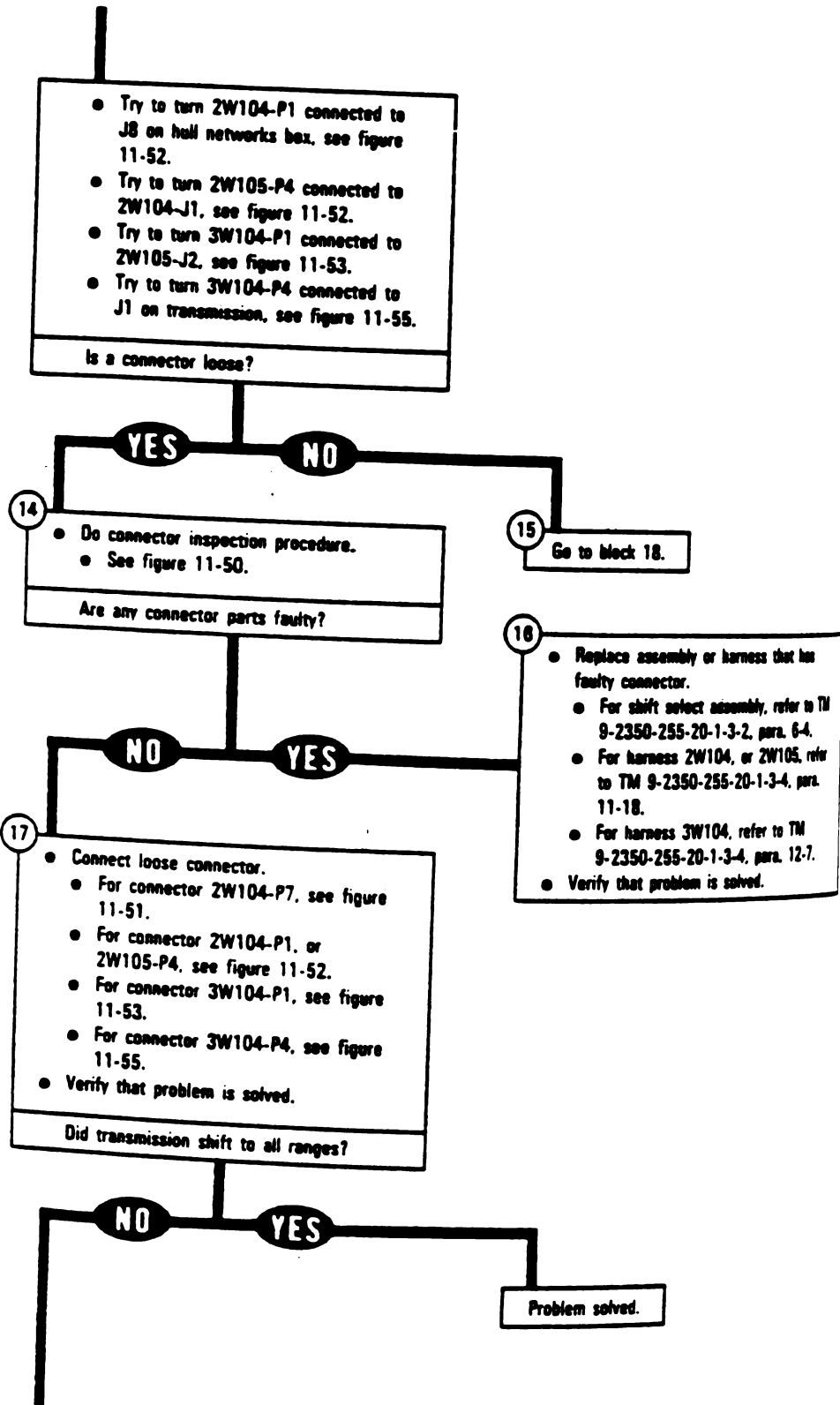
**NOTE**  
a loose connector, go  
a block 14.

a ZW104-P7 connected to  
ft select assembly, see  
51.

*Figure 11-2 (Sheet 4 of 53)  
Volume II  
Para. 11-3*



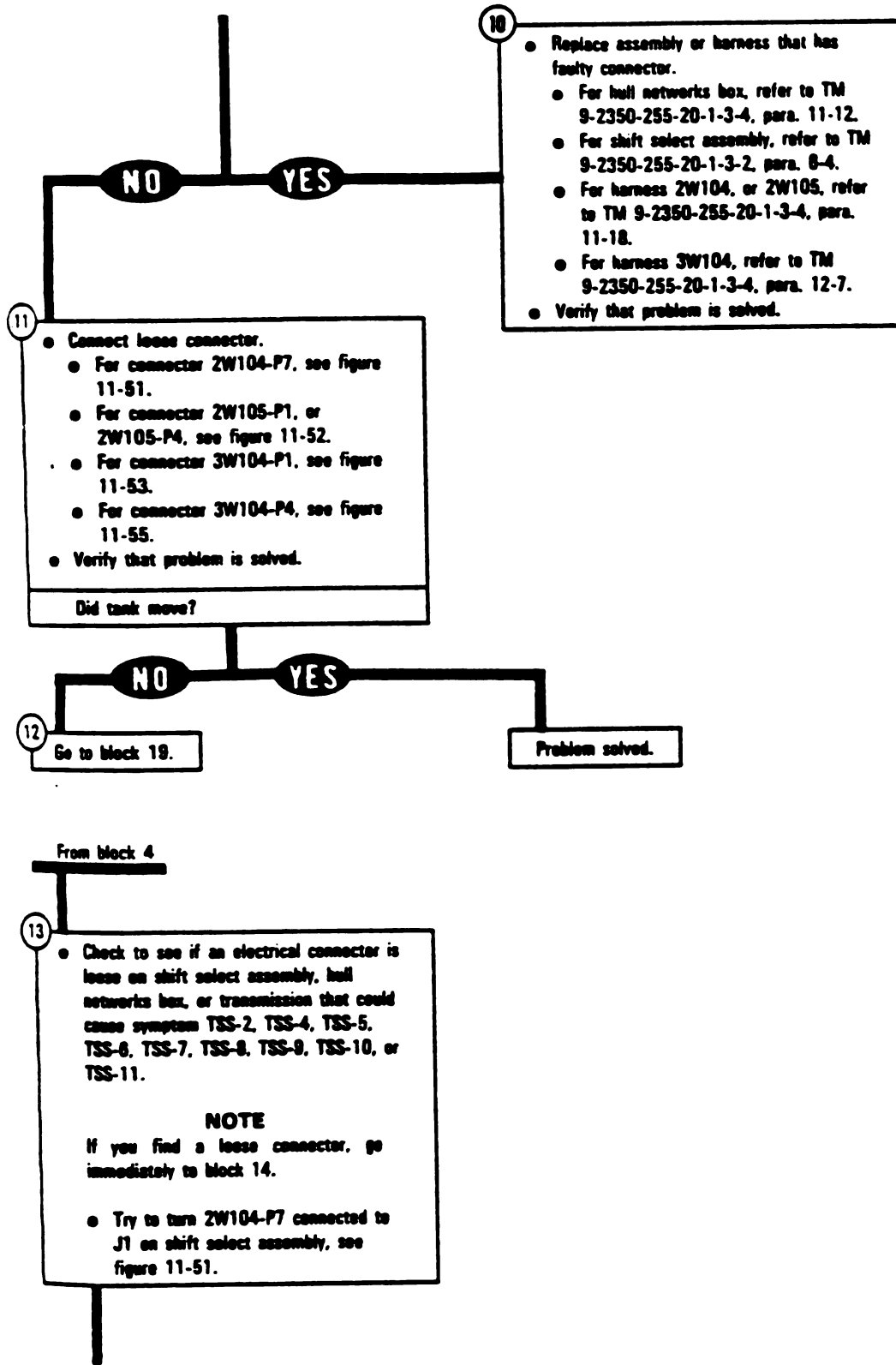
**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**



*Figure 11-2 (Sheet 5 of 53)  
Volume II  
Para. 11-3*

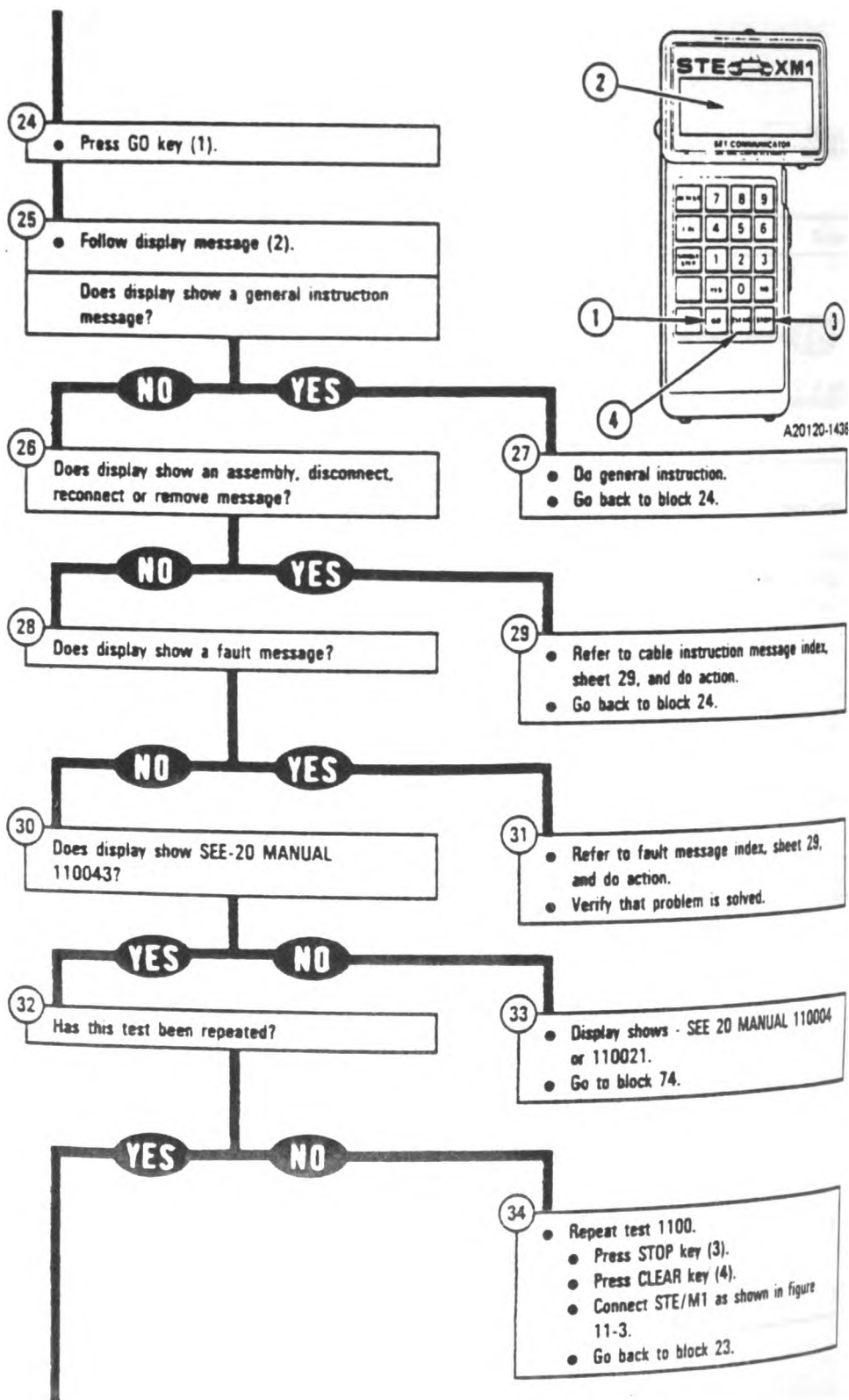
11-10 Change 5

**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**



*Figure 11-2 (Sheet 4 of 53)  
Volume I  
Para. 11-3*

**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**



**Figure 11-2 (Sheet 7 of 53)  
Volume II  
Para. 11-3**

**11-12 Change 5**

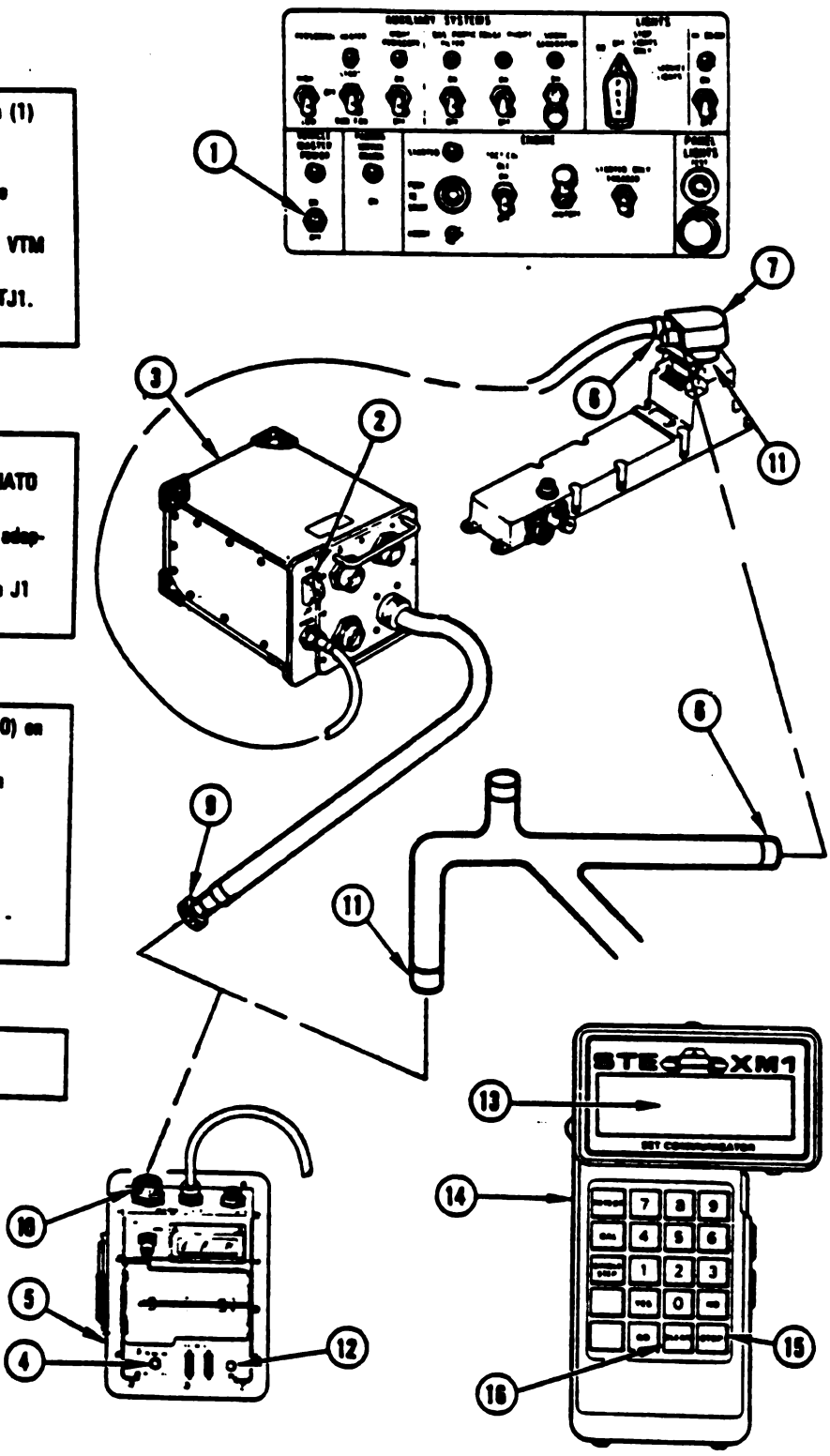
TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING

MASTER POWER switch (1)  
E/M1.  
switch (2) on CIB (3) to  
circuit breaker switch (4) on VTM  
F.  
A407-P1 from 3W104-TJ1.  
11-3.

E/M1 for operation.  
set CX308-P1 (6) from NATO  
CA1 (7).  
CX202-P4 (8) to NATO adap-  
(7).  
set cable W1-P1 (9) from J1  
VTM (5).

CX202-P1 (11) to J1 (10) on  
5).  
circuit breaker switch (4) on  
5) to ON.  
TEST button (12).  
**NOTE**  
3) as SETCOM (14) shows -  
EPLY.

MP key (15).  
EAR key (16).

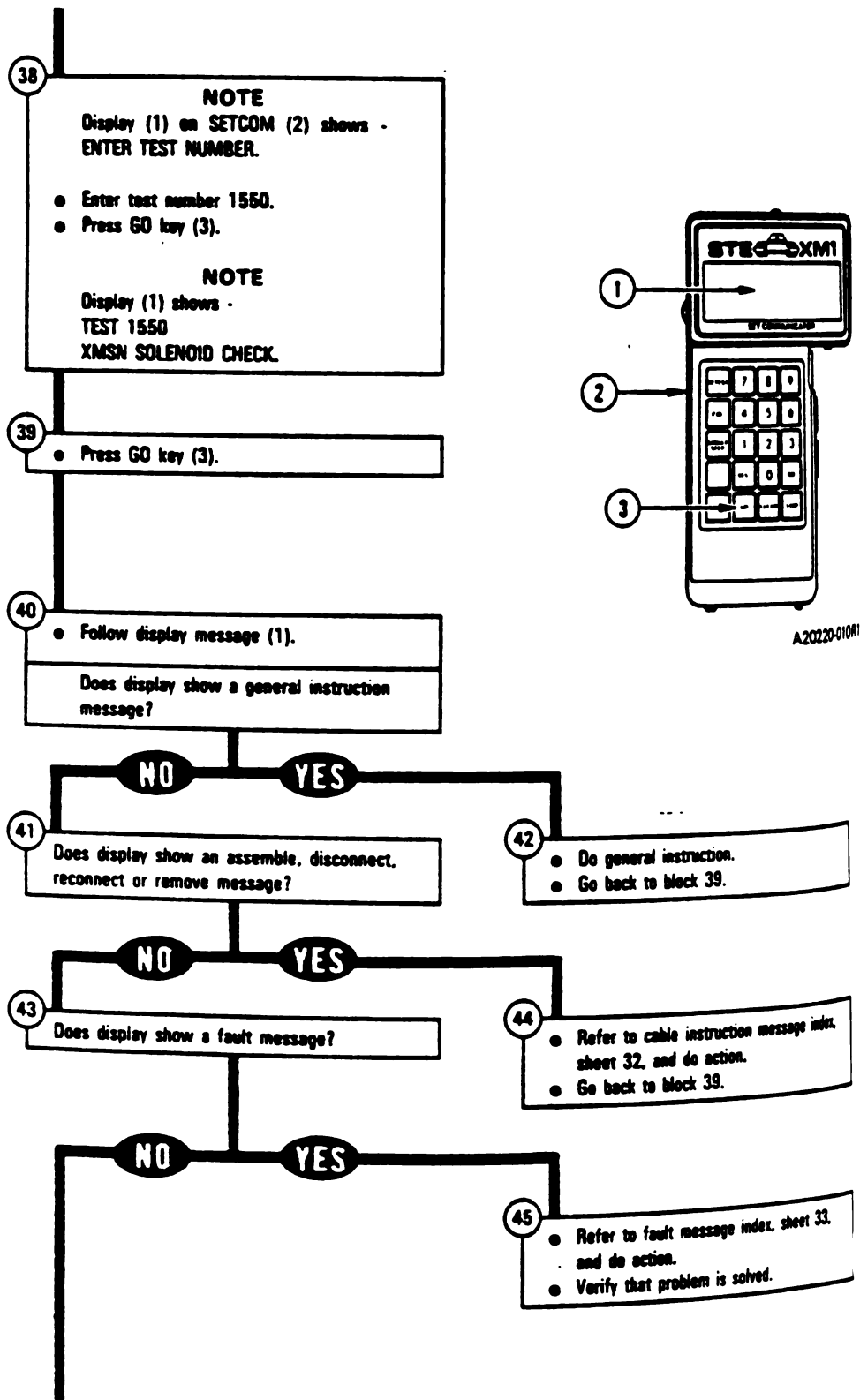


A20120-1437

Figure 11-2 (Sheet 8 of 53)  
Volume II  
Para. 11-3

Change 5 11-13

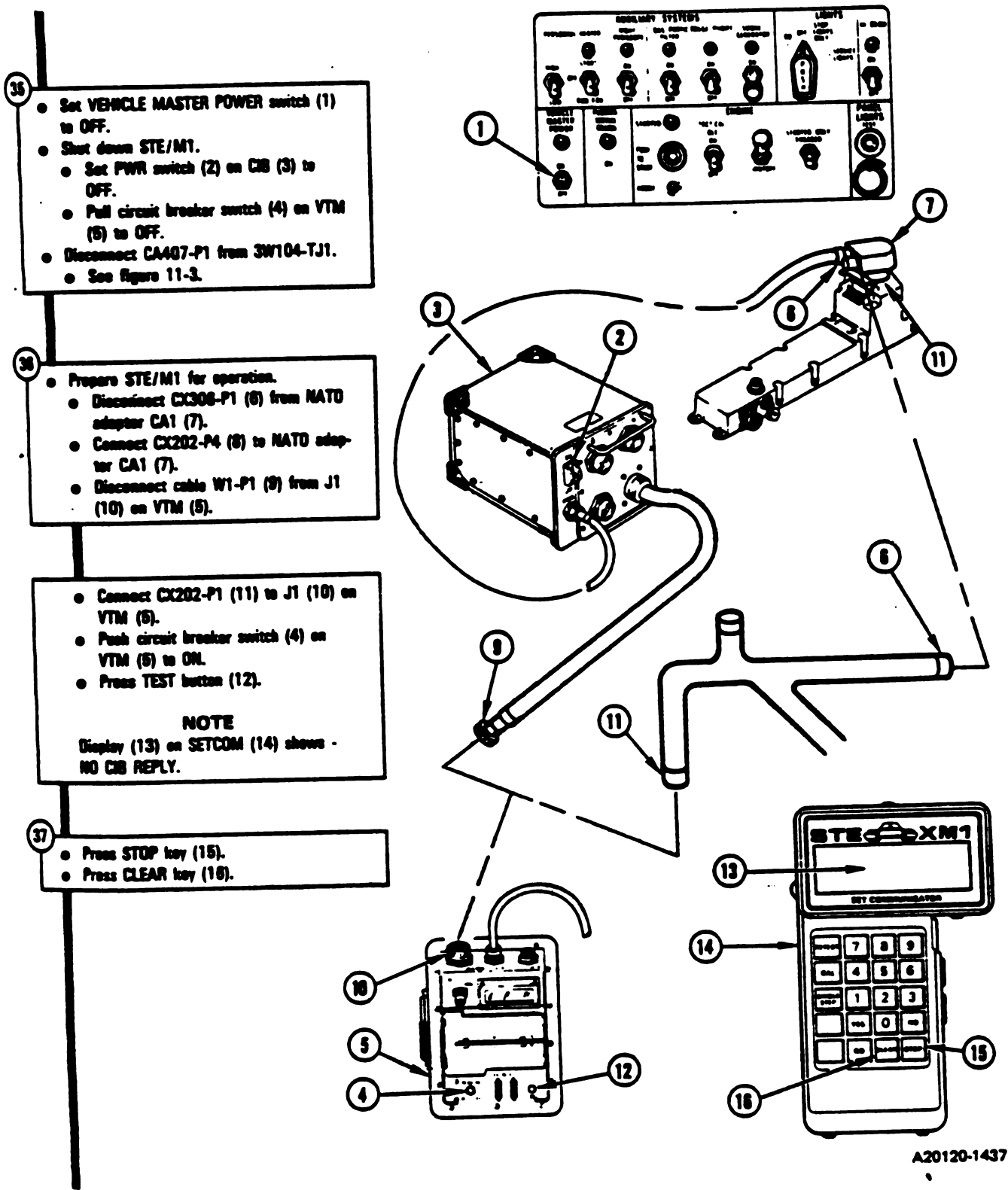
**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**



*Figure 11-2 (Sheet 9 of 53)  
Volume II  
Para. 11-3*

11-14 Change 5

**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**

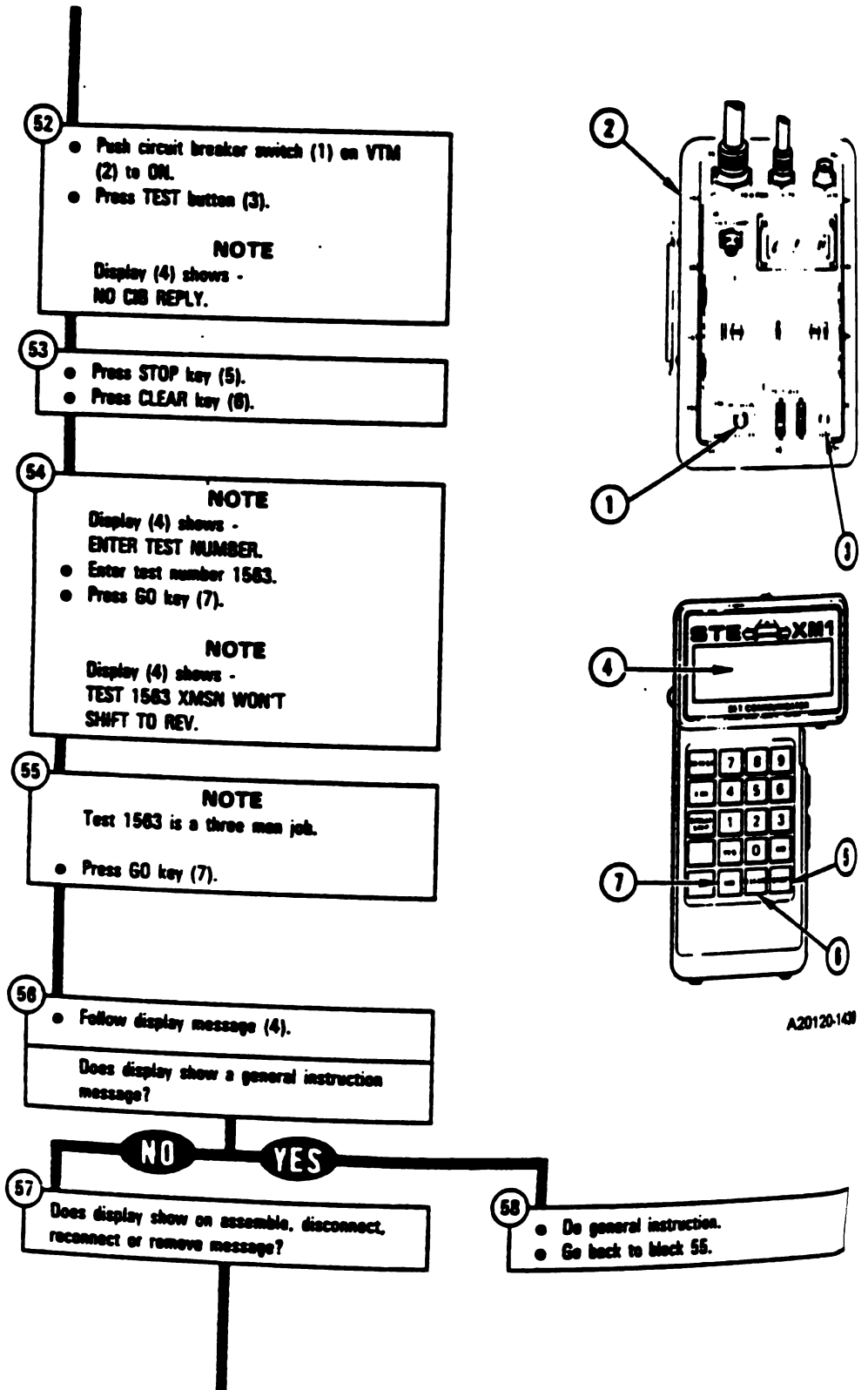


A20120-1437

Figure 11-2 (Sheet 8 of 53)  
Volume II  
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Change 5 11-13

**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**



*Figure 11-2 (Sheet 11 of 53)  
Volume II  
Para. 11-3*

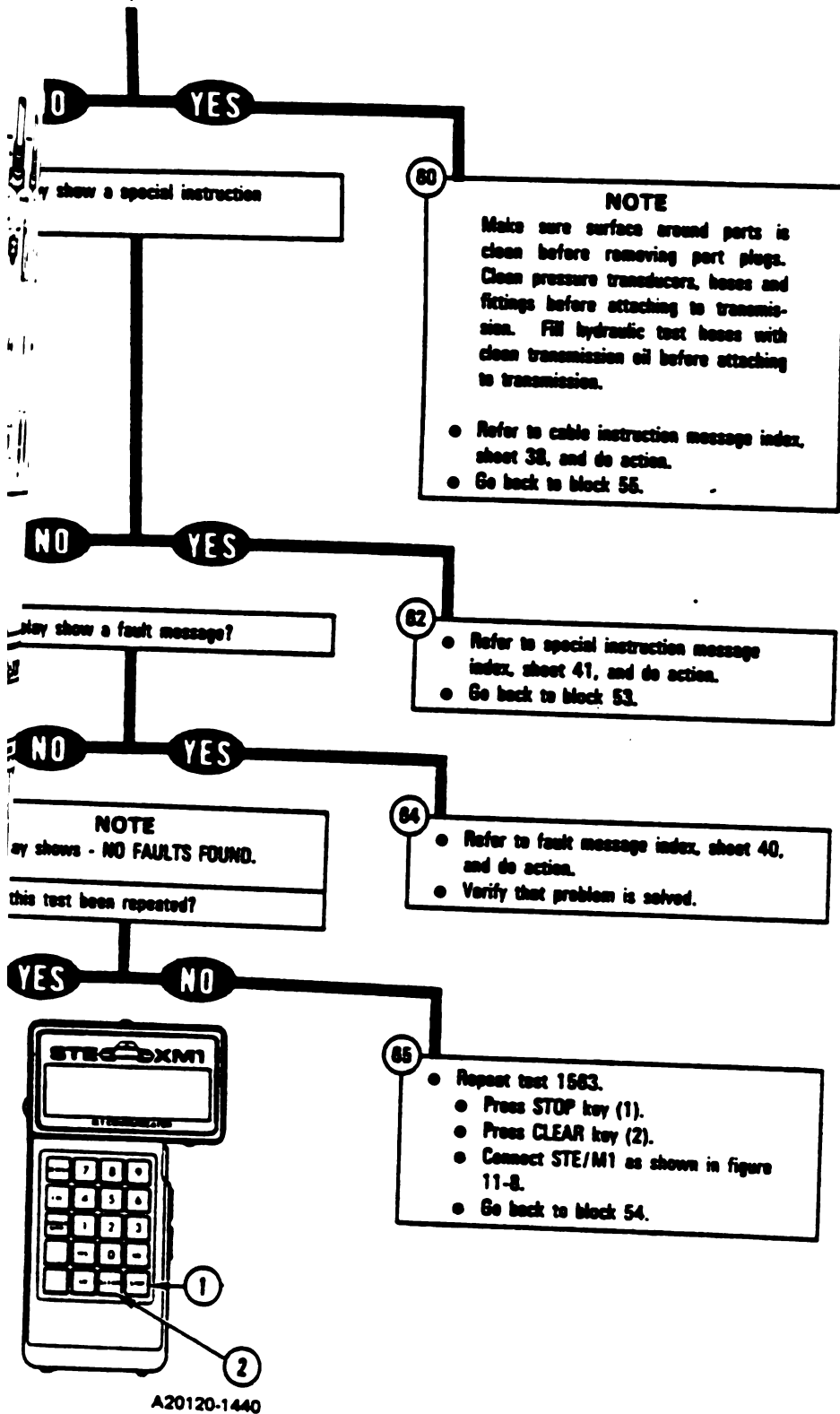
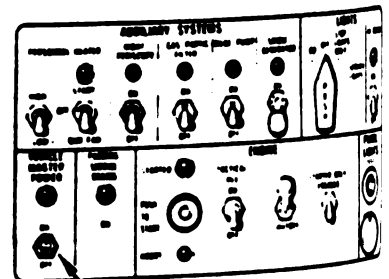
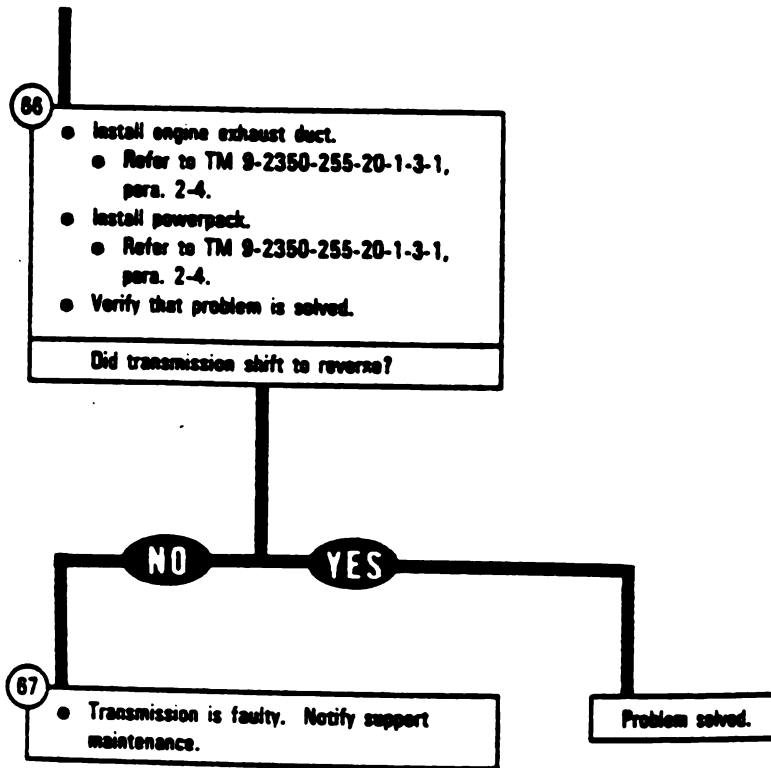


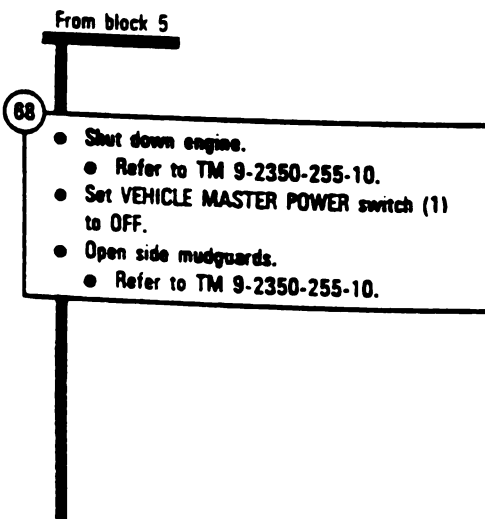
Figure 11-2 (Sheet 12 of 53)  
 Volume II  
 Para. 11-3



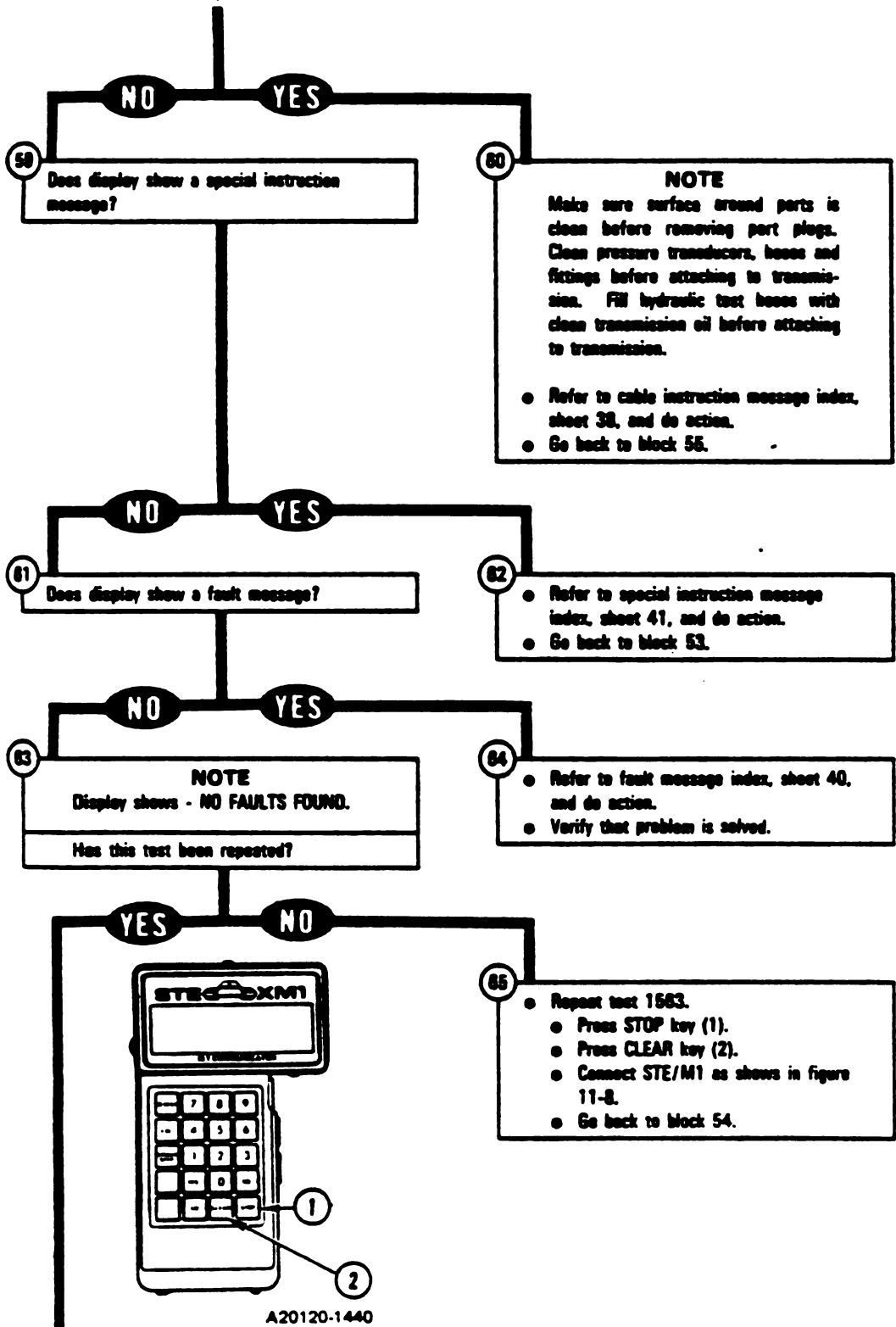
**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**



A20120-1112



*Figure 11-2 (Sheet 13 of 53)  
Volume II  
Para. 11-3*

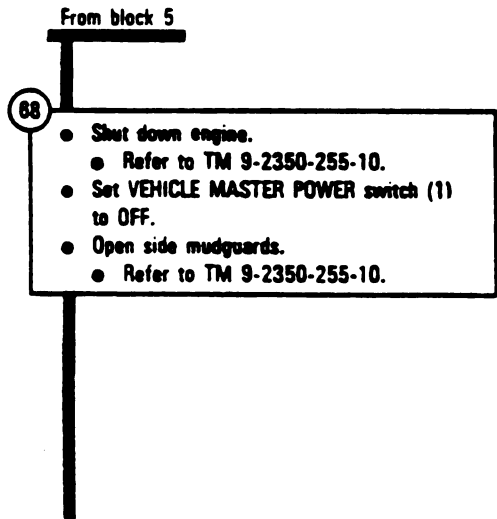
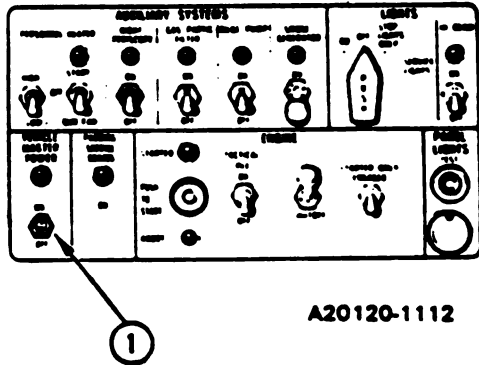
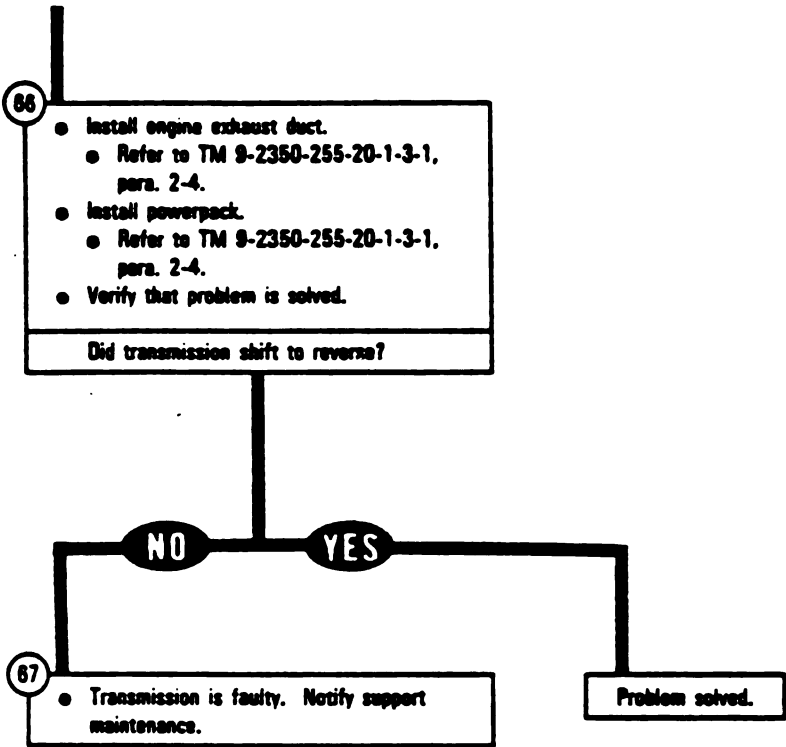


A20120-1440

Figure 11-2 (Sheet 12 of 53)  
 Volume II  
 Para. 11-3

Change 5 11-17

**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**

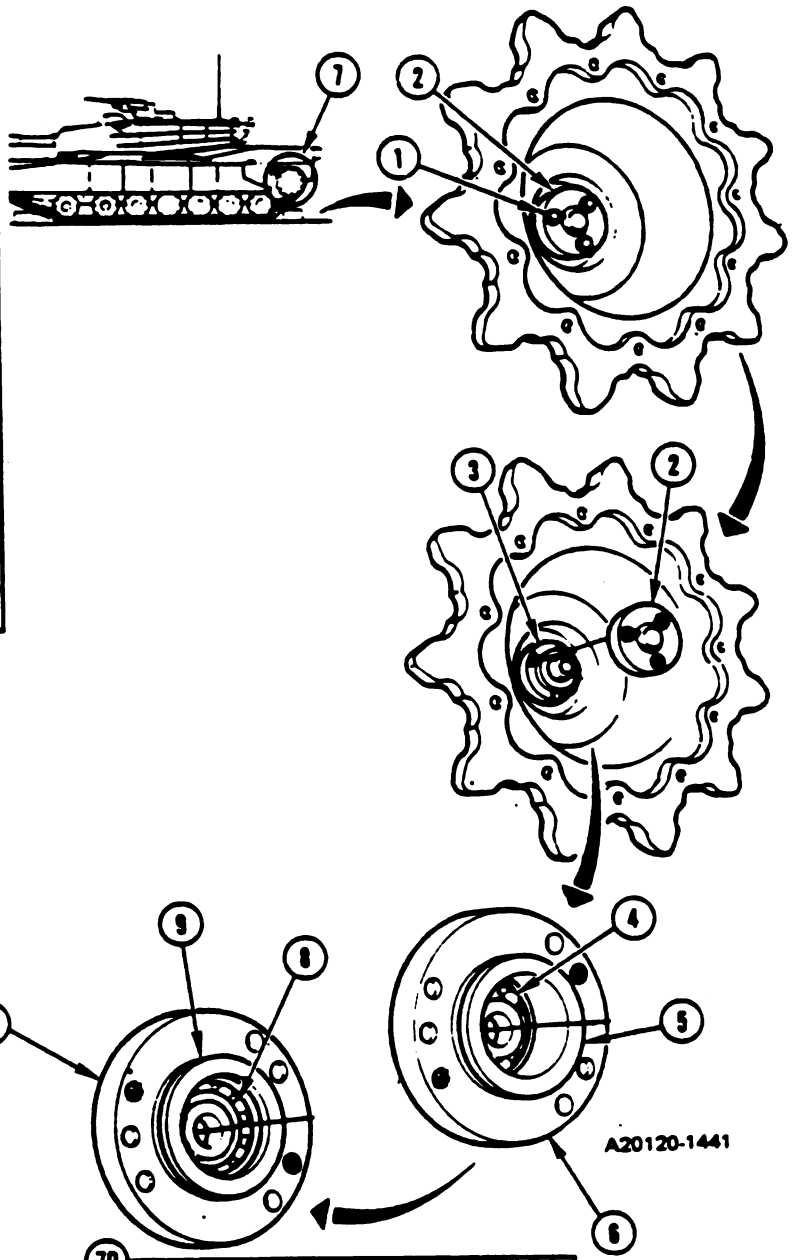


*Figure 11-2 (Sheet 13 of 53)  
Volume II  
Para. 11-3*

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- Check to see if left and right final drives are connected.
- NOTE**  
 Do the following steps for left and right sides.
- Unscrew and take off three screws (1) from cover (2) with 15 millimeter socket, 10-inch extension and socket.
  - Pull cover (2) off adapter (3).
  - If bearing and (4) is even with surface (5) on adapter (6), final drive (7) is not connected.
  - If bearing and (8) is below surface (9) on adapter (10), final drive (7) is connected.

Are final drives connected?



A20120-1441

**NO**

- 70
- Connect final drives.
  - Refer to TM 9-2350-255-20-1-3-1, para. 2-9.
  - Verify that problem is solved.

**YES**

- 71
- Transmission is faulty. Notify support maintenance.

Figure 11-2 (Sheet 14 of 53)  
 Volume 41  
 Para. 11-3

Change 5 11-19



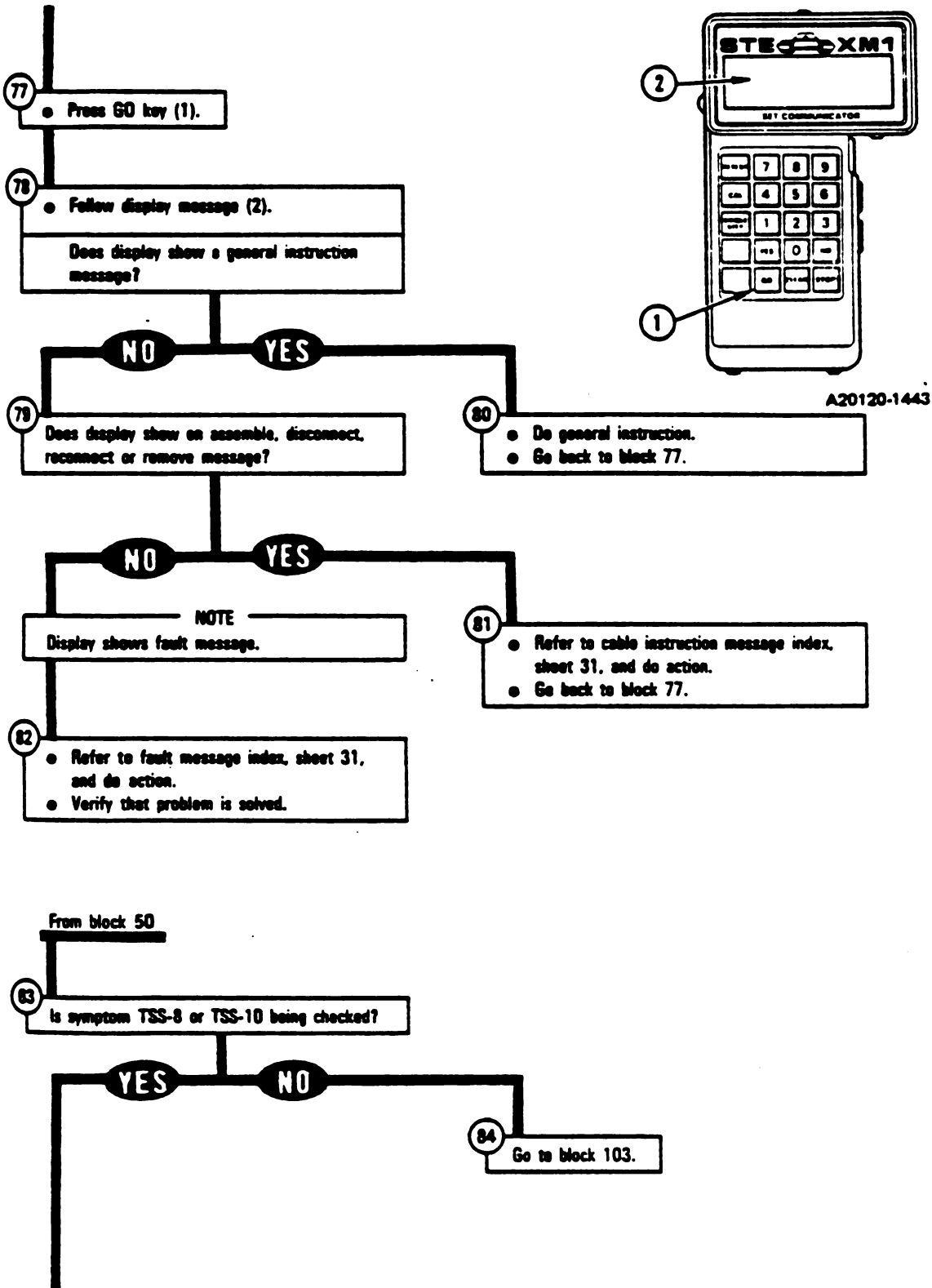
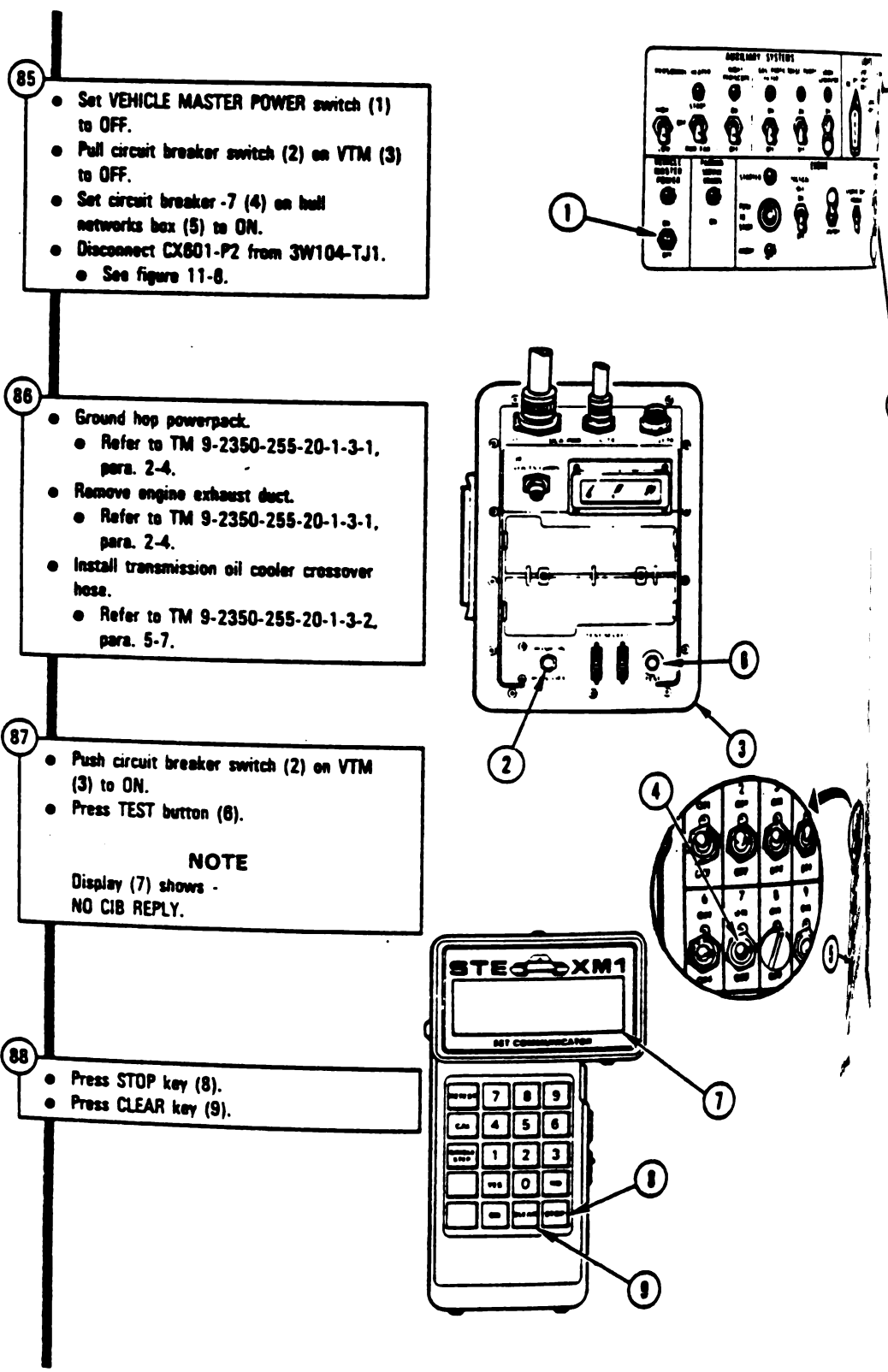


Figure 11-2 (Sheet 16 of 53)  
 Volume II  
 Para. 11-3

**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**



*Figure 11-2 (Sheet 17 of 53)  
Volume II  
Para. 11-3*

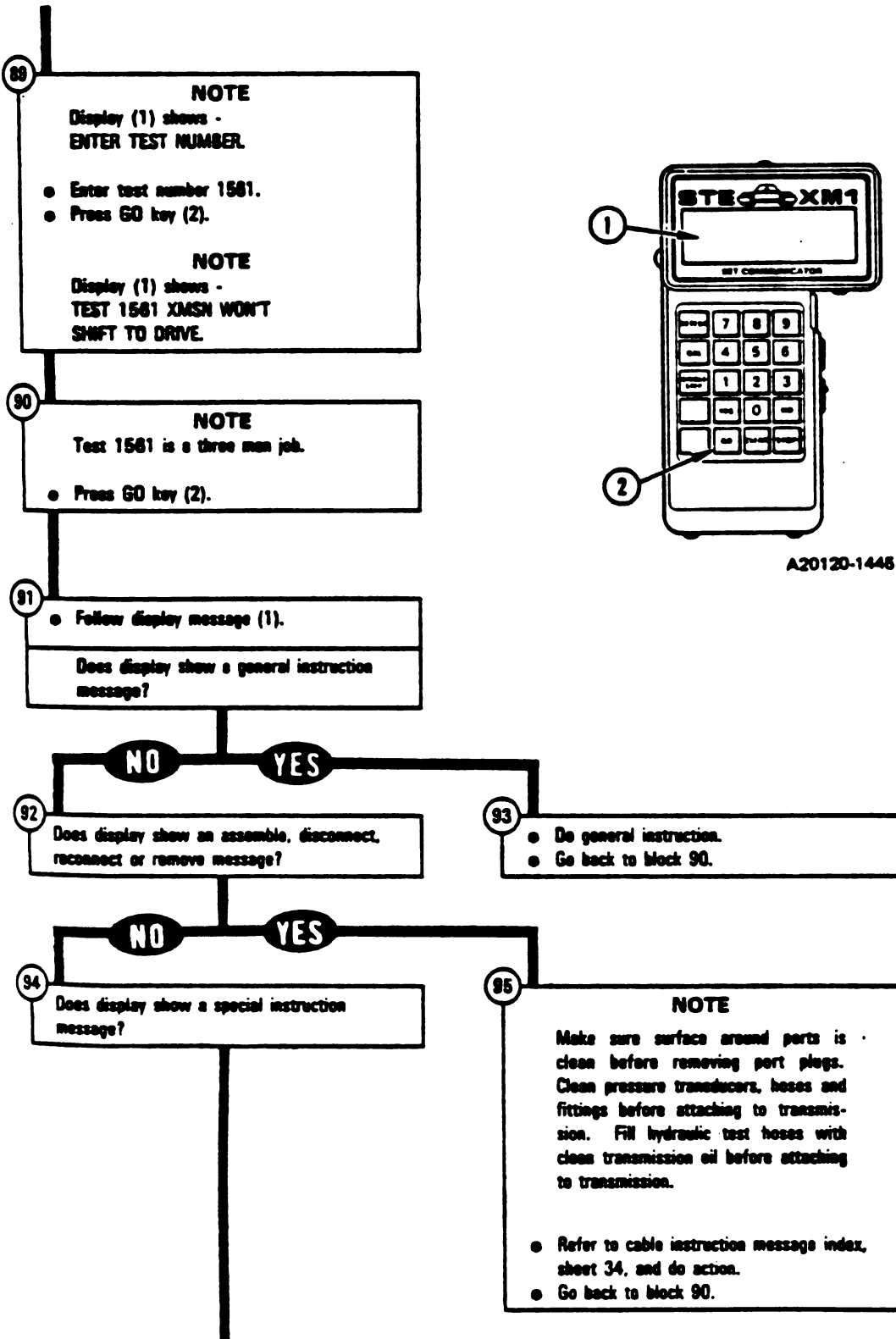
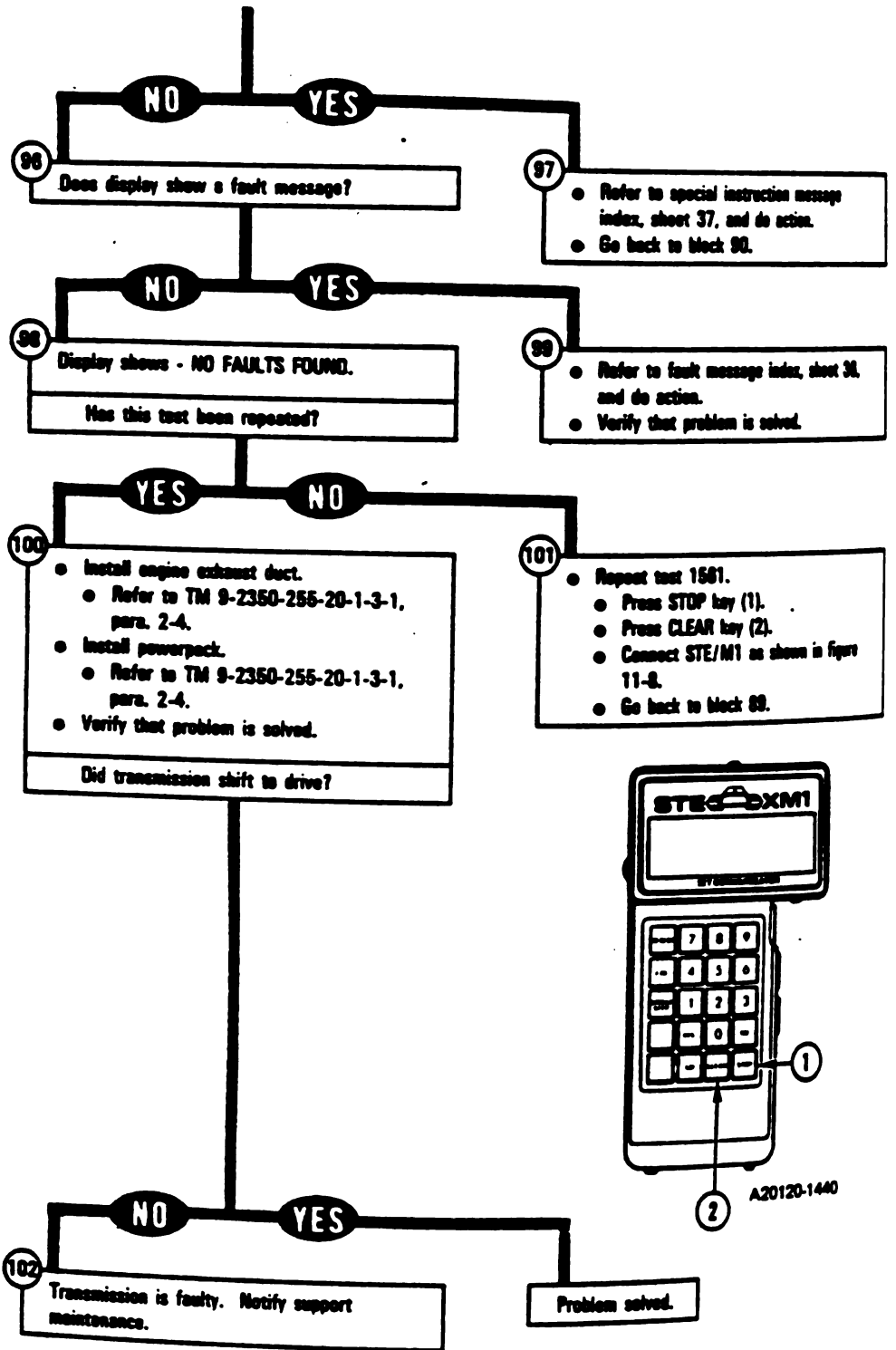


Figure-11-2 (Sheet 18 of 53)  
Volume-11  
Para. 11-3



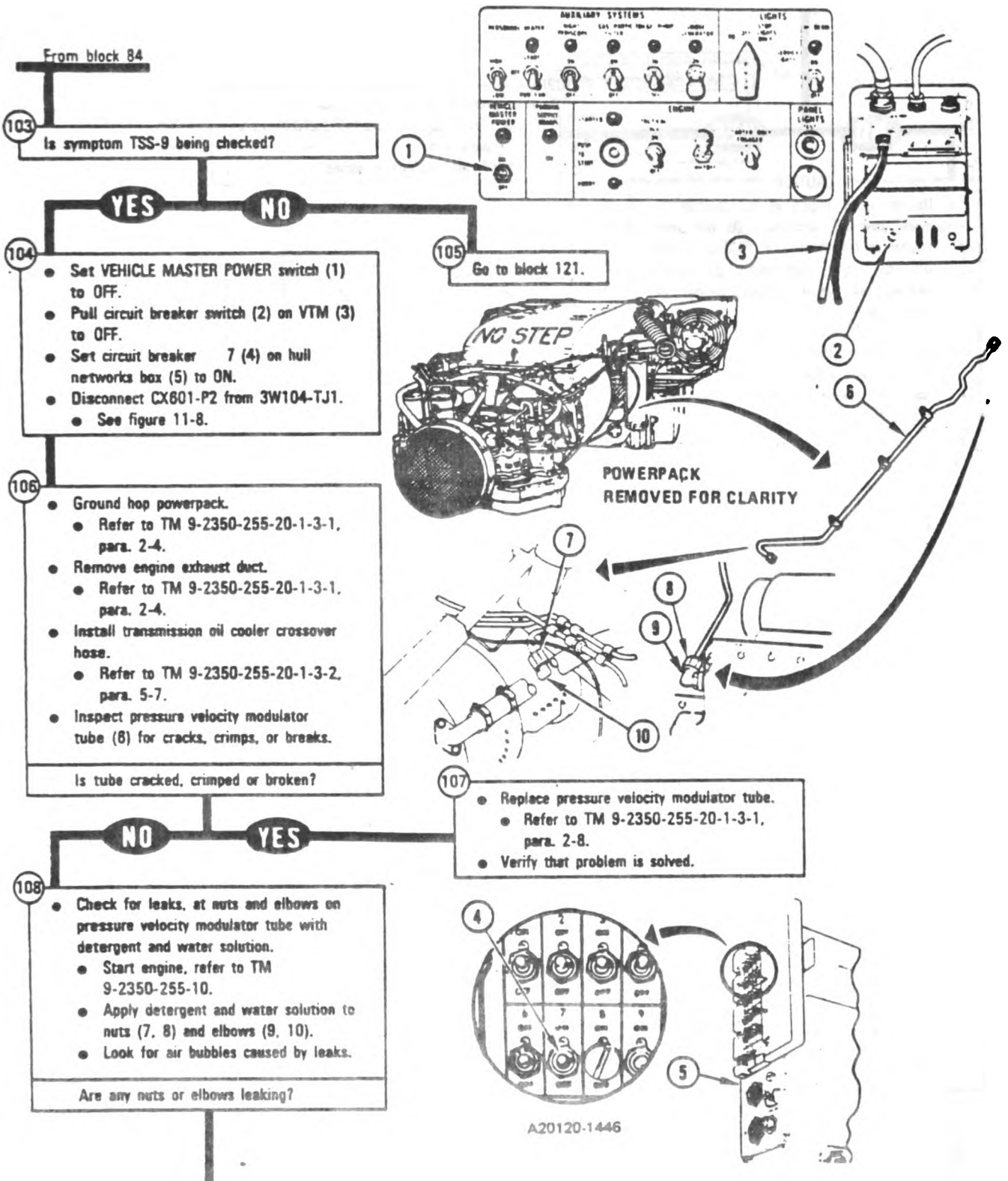
**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**



*Figure 11-2 (Sheet 19 of 53)  
Volume II  
Para. 11-3*

11-24 Change 5

**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**



*Figure 11-2 (Sheet 20 of 53)  
Volume 11  
Para. 11-3*

**Change 5 11-25**

**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**

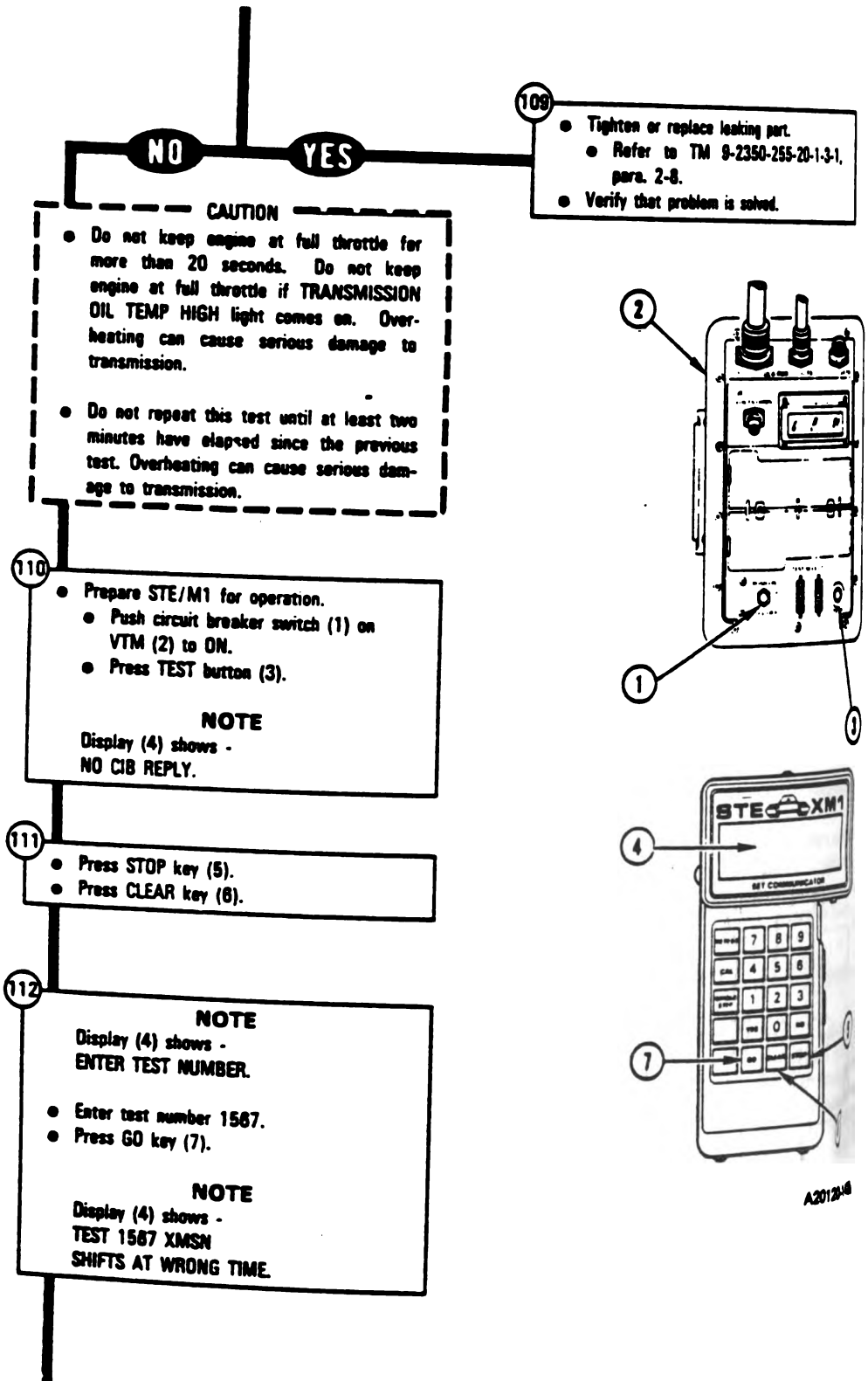


Figure 11-2 (Sheet 21 of 53)  
Volume II  
Para. 11-3

TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING

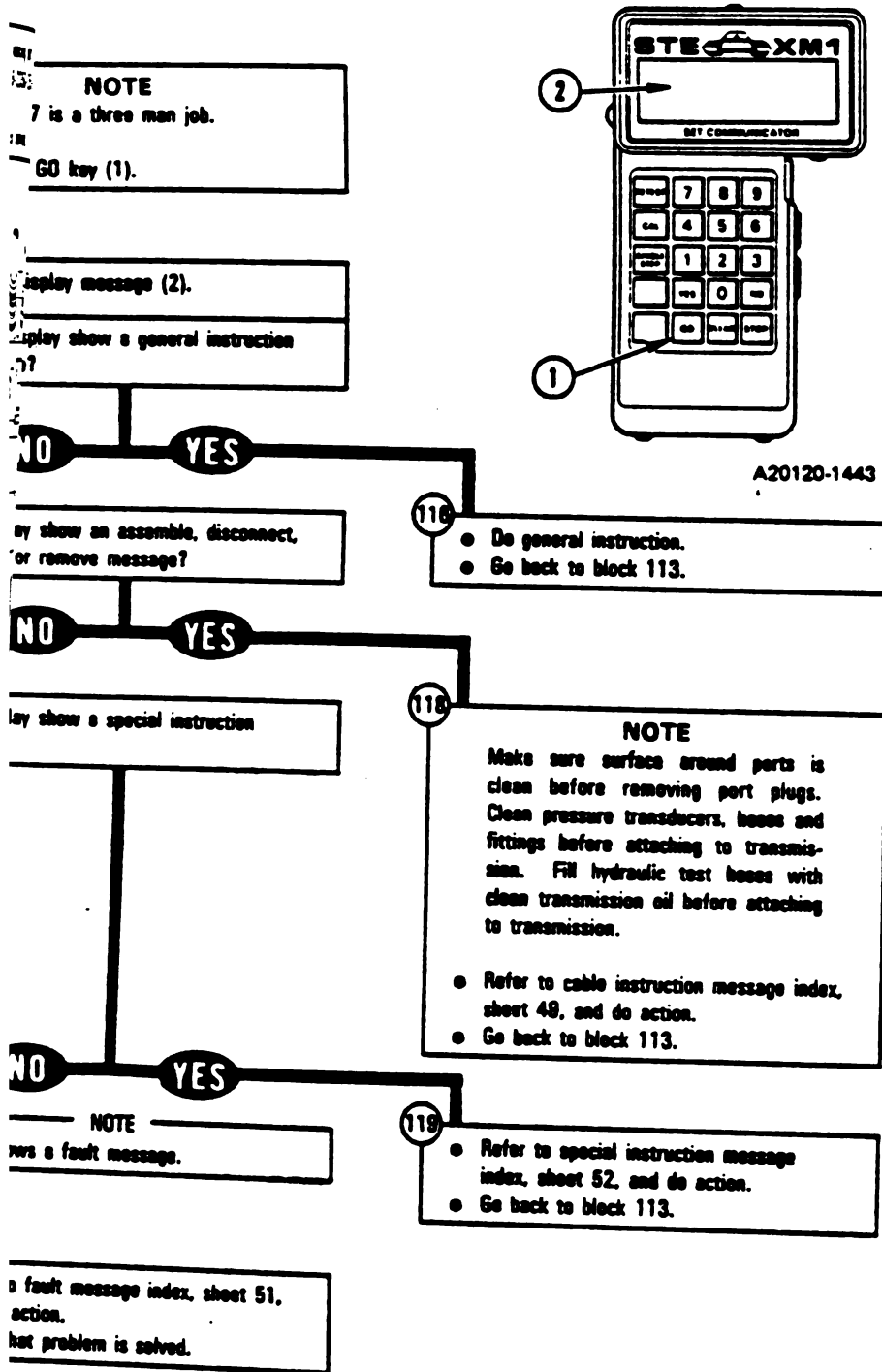
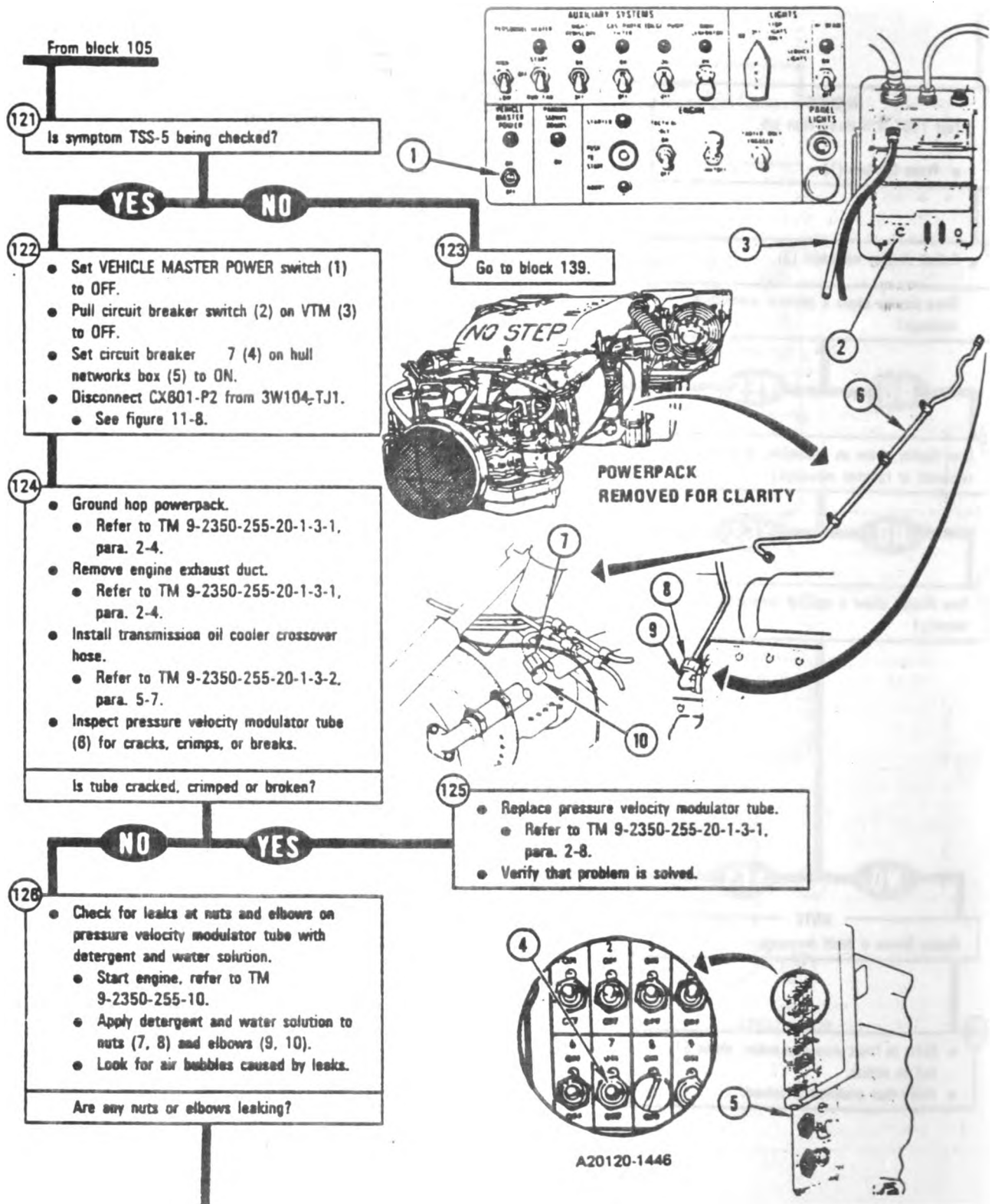


Figure 11-2 (Sheet 22 of 53)  
Volume-41  
Para. 11-3

**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**



**Figure 11-2 (Sheet 23 of 53)  
Volume II  
Para. 11-3**

TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING

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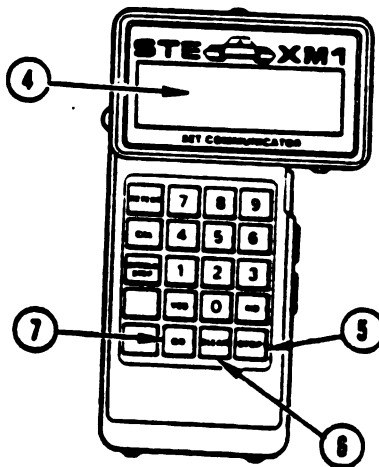
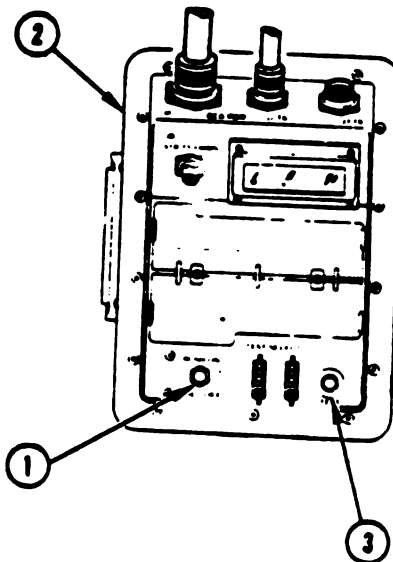
- Tighten or replace leaking part.
- Refer to TM 9-2350-255-20-1-3-1, para. 2-8.
- Verify that problem is solved.

NO YES

**CAUTION**

Do not keep engine at full throttle for more than 20 seconds. Do not keep engine at full throttle if TRANSMISSION TEMP HIGH light comes on. Overheating can cause serious damage to transmission.

Do not repeat this test until at least two minutes have elapsed since the previous test. Overheating can cause serious damage to transmission.



A20120-1439

Refer to para STE/M1 for operation.  
Push circuit breaker switch (1) and VTM (2) to ON.  
Press TEST button (3).

**NOTE**

Display (4) shows -  
CIB REPLY.

Press STOP key (5).  
Press CLEAR key (6).

**NOTE**

Display (4) shows -  
TEST NUMBER.

Enter test number 1588.  
Press GO key (7).

**NOTE**

Display (4) shows -  
1588 XMSN  
DOWNSHIFT.

Figure 11-2 (Sheet 24 of 53)  
Volume II  
Para. 11-3

Change 5 11-29

**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**

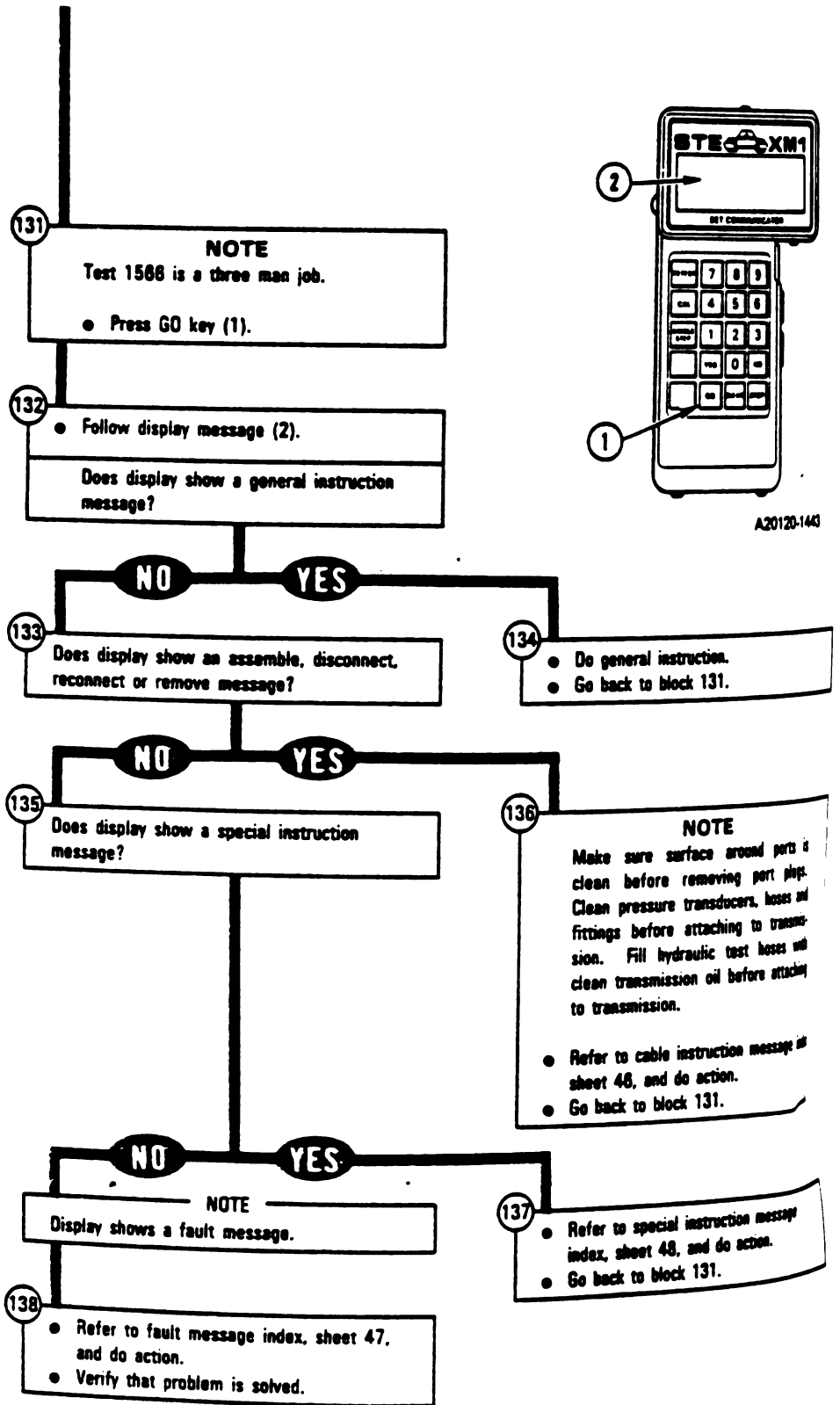
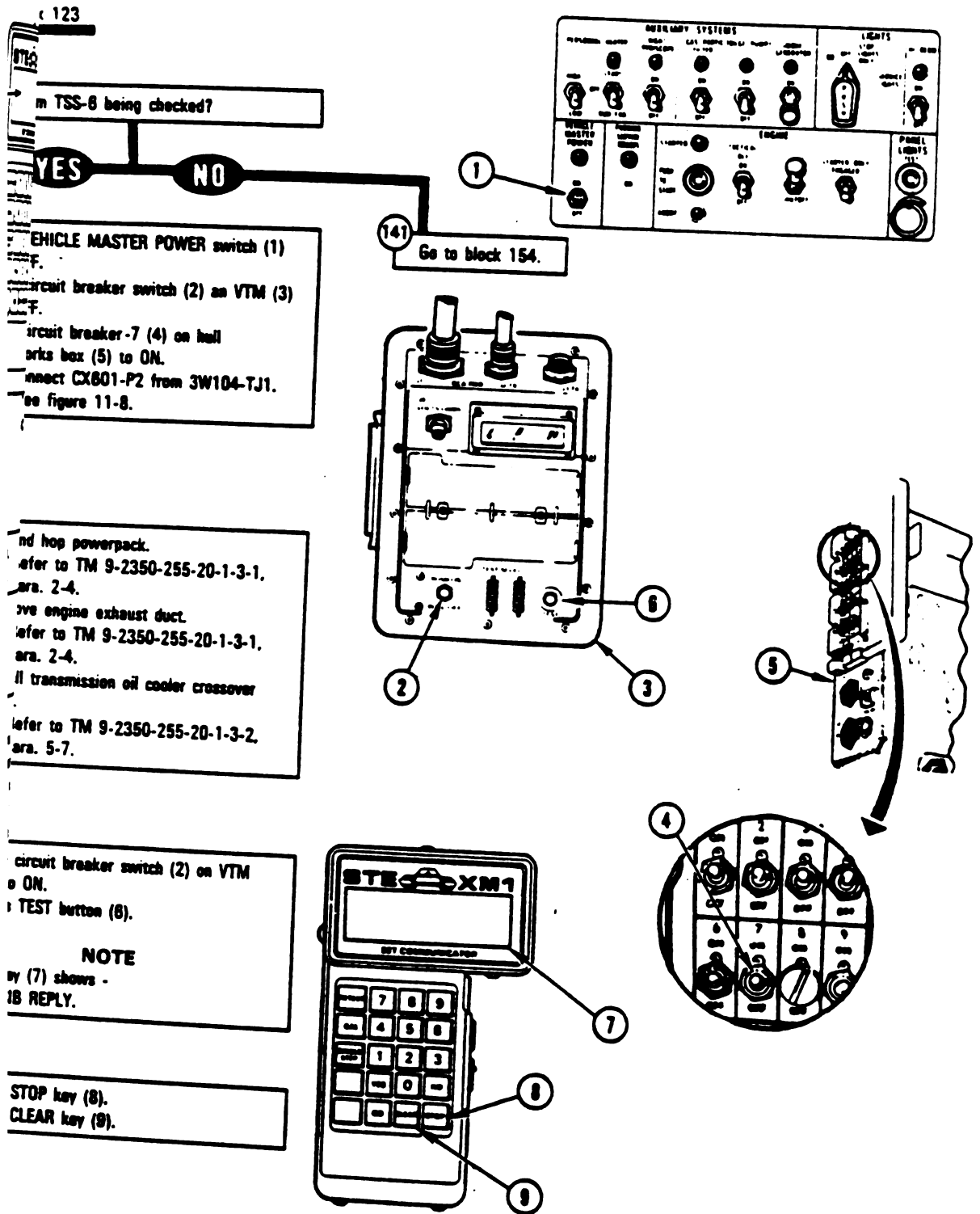


Figure 11-2 (Sheet 25 of 53)  
Volume II  
Para. 11-3

TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING



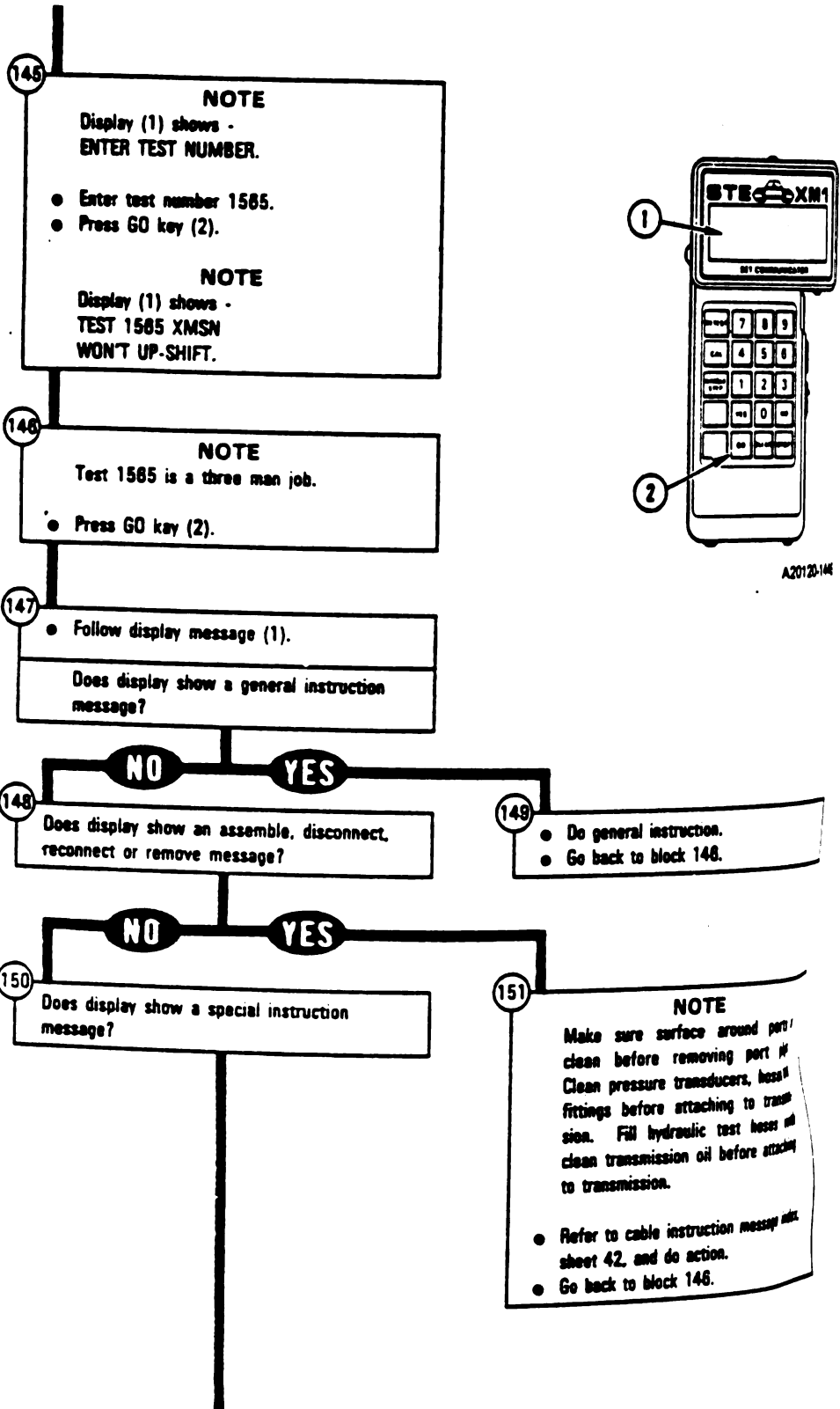
A20120-1444

Figure 11-2 (Sheet 26 of 53)  
Volume II  
Para. 11-3

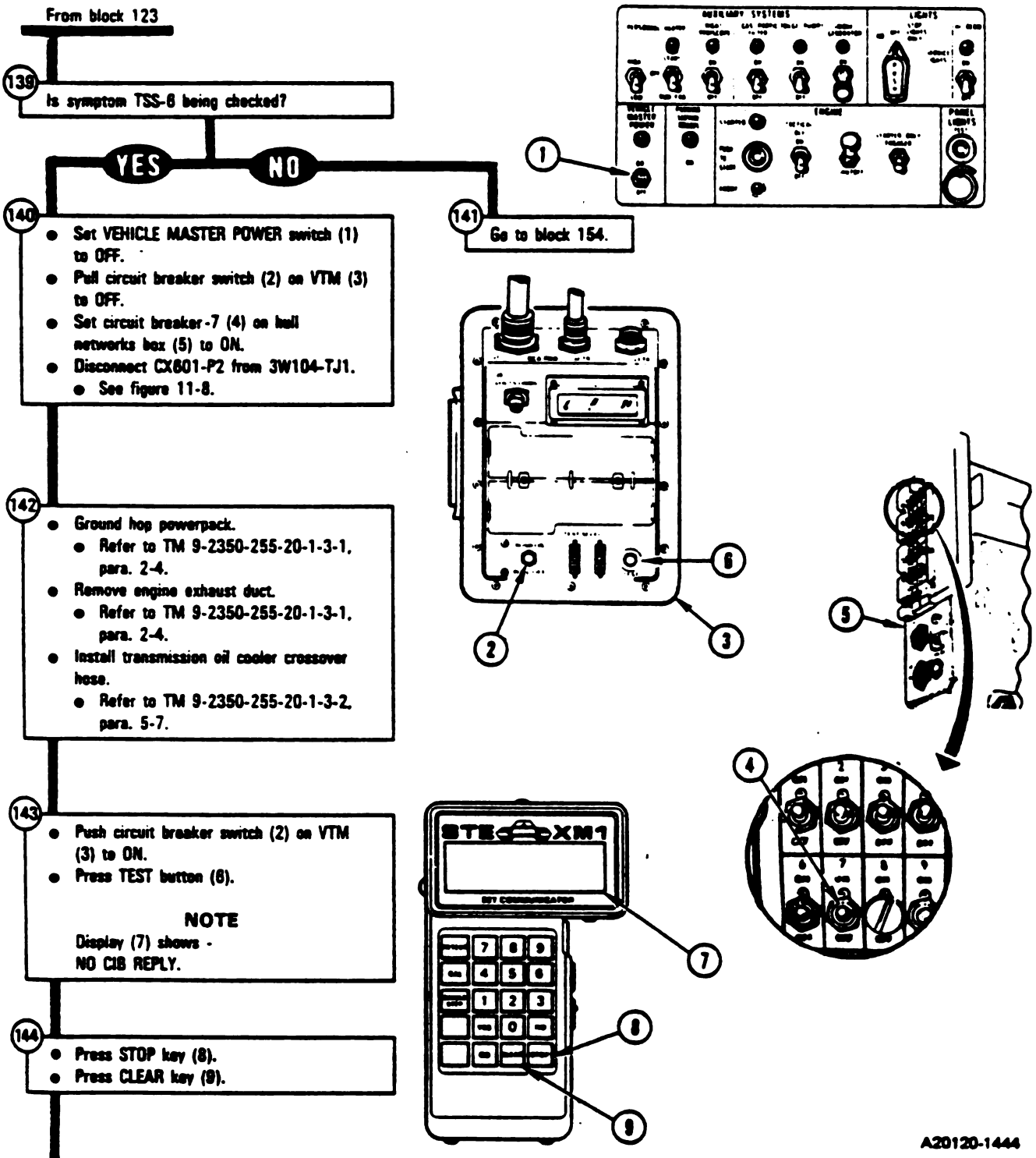
Change 5 11-31



**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**



*Figure 11-2 (Sheet 27 of 53)  
Volume II  
Para. 11-3*



A20120-1444

Figure 11-2 (Sheet 26 of 53)  
Volume II  
Para. 11-3

Change 5 11-31

**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**

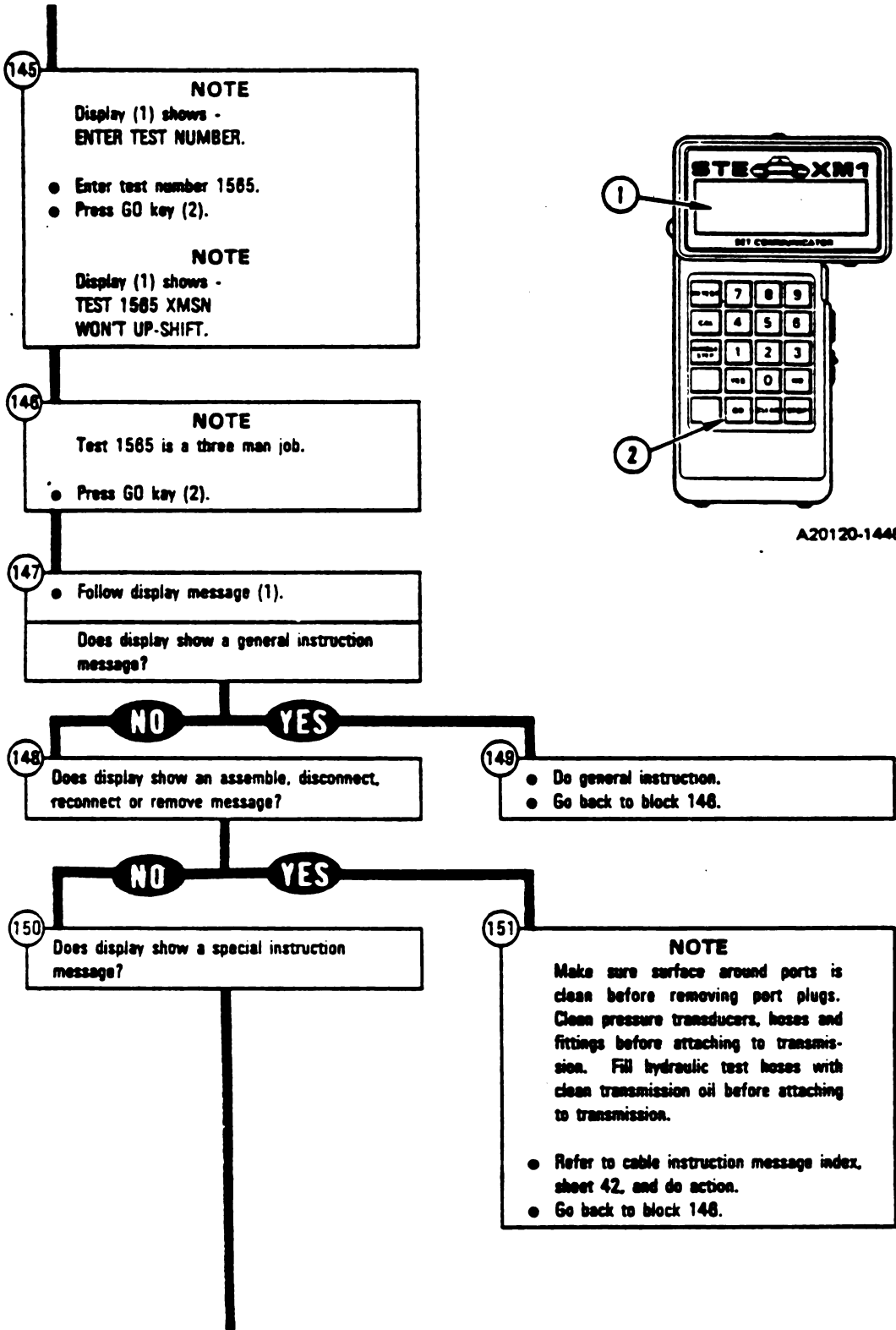


Figure 11-2 (Sheet 27 of 53)  
Volume II  
Para. 11-3

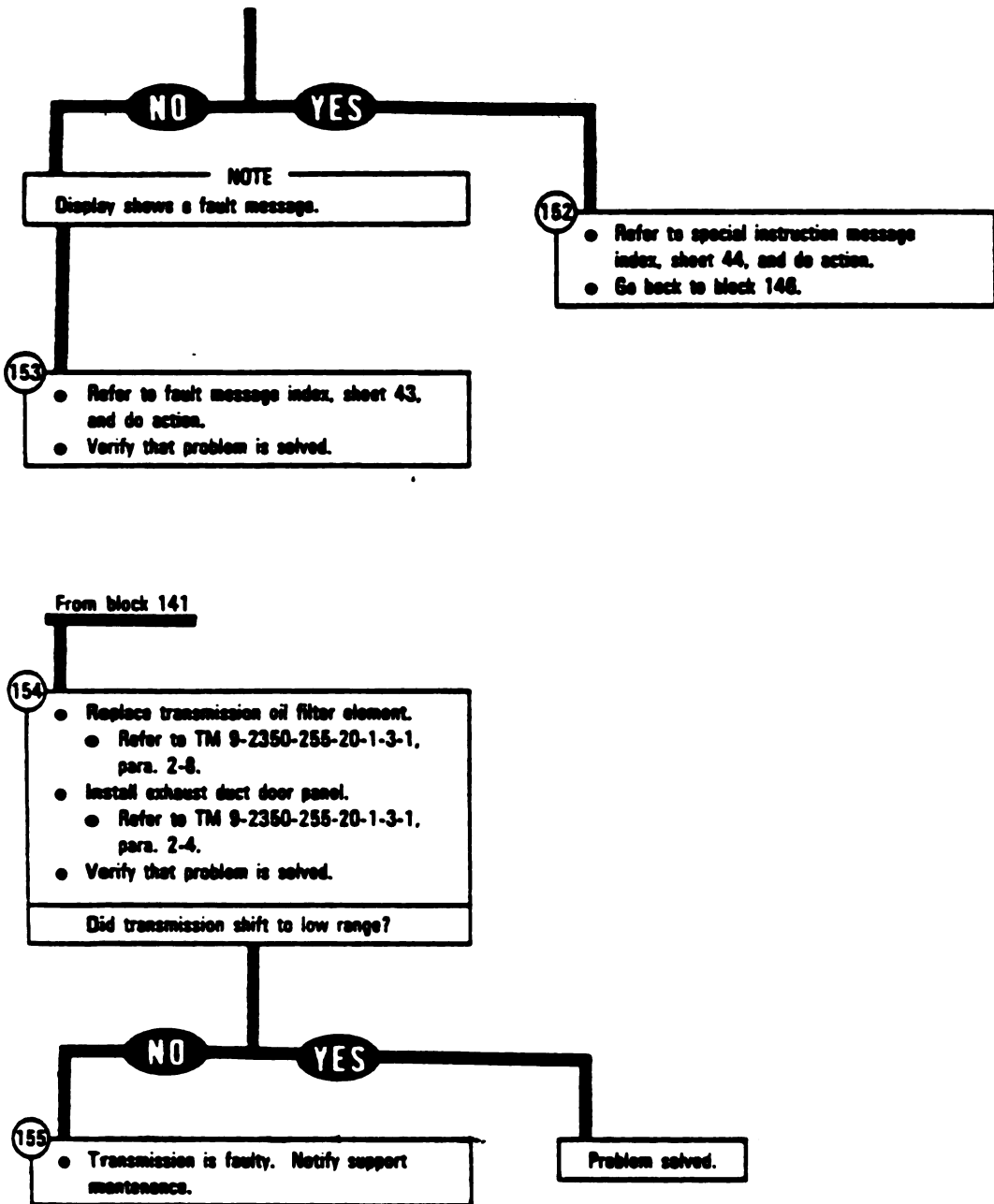


Figure 11-2 (Sheet 28 of 53)  
Volume II  
Para. 11-3



**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**

**Transmission Shift Subsystem Fault Message Index for Test 1101 (Continued)**

Action	Action
POWER 109908	<ul style="list-style-type: none"> <li>● Run hull power distribution test number 1000.</li> <li>● Refer to TM 9-2350-255-20-1-2-2, figure 16-1.</li> </ul>
CONTROL 110109 110113 110117	<ul style="list-style-type: none"> <li>● Replace shift control assembly.</li> <li>● Refer to TM 9-2350-255-20-1-2-2, para. 6-4.</li> </ul>
109902 109903	<ul style="list-style-type: none"> <li>● Run STE/M1 self-test number 666.</li> <li>● Refer to TM 9-2350-255-20-1-2-2, figure 18-11, block 21.</li> <li>● Repeat transmission shift test number 1101.</li> <li>● Press stop and clear keys on SETCOM.</li> <li>● Go back to block 76.</li> <li>● If same error message appears on SETCOM display notify support maintenance that test set is faulty.</li> </ul>

**Transmission Shift Subsystem Special Instruction Message Index for Test 1101**

Instruction	Action
110118	<ul style="list-style-type: none"> <li>● Run engine test number 1501.</li> <li>● See figure 9-2.</li> </ul>

**Transmission Shift Subsystem Cable Instruction Message Index for Test 1550**

Action	Action
TJ1	<ul style="list-style-type: none"> <li>● Connect P3 on cable CX202 to TJ1 on driver's instrument panel.</li> <li>● See figure 11-8.</li> </ul>
CX602	<ul style="list-style-type: none"> <li>● Connect P1 on cable CX601 to P1 on cable CX602.</li> <li>● See figure 11-8.</li> </ul>
MSN TJ1	<ul style="list-style-type: none"> <li>● Connect P2 on cable CX601 to TJ1 on transmission.</li> <li>● See figure 11-8.</li> </ul>
CX202	<ul style="list-style-type: none"> <li>● Connect P2 on cable CX602 to P2 on cable CX202.</li> <li>● See figure 11-8.</li> </ul>

*Figure-11-2 (Sheet 32 of 53)  
Volume II  
Para. 11-3*

**Change 6 11-37**

**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**

**Transmission Shift Subsystem Cable Instruction Message Index for Test 1101**

Cable Instruction Message	Action
ASSEMBLE CX304 CX207 AND CA535/36	<ul style="list-style-type: none"> <li>● Connect P1 on CIB cable CX304 to P3 on DBA CX207.</li> <li>● Connect P2 on adapter CA535 to P1 on DBA CX207.</li> <li>● Connect P2 on adapter CA536 to P2 on DBA CX207.</li> <li>● See figure 11-6.</li> </ul>
CONNECT CX304 P2 TO CIB J1	<ul style="list-style-type: none"> <li>● Connect P2 on CIB cable CX304 to J1 on CIB.</li> <li>● See figure 11-6.</li> </ul>
CONNECT CIB J1 (CX304) HNB TJ2 (CA301)	<ul style="list-style-type: none"> <li>● Connect P1 on adapter CA301 to TJ2 on hull networks box.</li> <li>● Connect P1 on CIB cable CX304 to P2 on adapter CA301.</li> <li>● Connect P2 on CIB cable CX304 to J1 on CIB.</li> <li>● See figure 11-5.</li> </ul>
CONNECT CIB J2 (CX305) HNB TJ1 (CA301)	<ul style="list-style-type: none"> <li>● Connect P1 on adapter CA301 to TJ1 on hull networks box.</li> <li>● Connect P1 on CIB cable CX305 to P2 on adapter CA301.</li> <li>● Connect P2 on CIB cable CX305 to J2 on CIB.</li> <li>● See figure 11-4.</li> </ul>
CONNECT DBA BETWEEN 2W104P7 ↔ SHIFT J1	<ul style="list-style-type: none"> <li>● Connect P1 on adapter CA536 to J1 on shift control assembly.</li> <li>● Connect P1 on adapter CA535 to 2W104-P7.</li> <li>● See figure 11-6.</li> </ul>
DISCONNECT 2W104P7 ↔ SHIFT J1	<ul style="list-style-type: none"> <li>● Disconnect 2W104-P7 from J1 on shift control assembly.</li> <li>● See figure 11-6.</li> </ul>

**Transmission Shift Subsystem Fault Message Index for Test 1101**

Fault Message	Action
FAULTY BATTERY/ CHARGING SYS      109912	<ul style="list-style-type: none"> <li>● Charge batteries.</li> <li>● Refer to TM 9-2350-255-10.</li> <li>● Go back to block 75.</li> </ul>
FAULTY CABLE GROUP      110116	<ul style="list-style-type: none"> <li>● Do follow-on procedure.</li> <li>● See figure 11-34.</li> </ul>
FAULTY HNB      110105 110111 110114	<ul style="list-style-type: none"> <li>● Replace hull networks box.</li> <li>● Refer to TM 9-2305-255-20-1-3-4, para. 11-12.</li> </ul>
FAULTY HNB OR 2W104      110110 110112	<ul style="list-style-type: none"> <li>● Do follow-on procedure.</li> <li>● See figure 11-33.</li> </ul>
FAULTY HNB, 2W104, OR 2W105      110106	<ul style="list-style-type: none"> <li>● Do follow-on procedure.</li> <li>● See figure 11-32.</li> </ul>

*Figure 11-2 (Sheet 31 of 53)*  
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**TM 9-2350-255-20-1-2-1**  
**TRANSMISSION AND FINAL DRIVE**  
**SYSTEM TROUBLESHOOTING**

Message Index for Shift Subsystem Cable Instruction Message Index for Test 1561

	Action
<p>all networks for TM 9-2350-255- n procedure 11-35 procedure 11-40 procedure 11-37 procedure 11-38 procedure 11-39 procedure 11-42 procedure 11-37 procedure 11-38 procedure 11-39 procedure 11-42 procedure 11-37 procedure 11-38 procedure 11-39 procedure 11-42</p>	<p style="text-align: center;"><b>Action</b></p> <ul style="list-style-type: none"> <li>● Connect P3 on cable CX202 to TJ1 on driver's instrument panel.               <ul style="list-style-type: none"> <li>● See figure 11-8.</li> </ul> </li> <li>● Connect P1 on cable CX601 to P1 on cable CX602.               <ul style="list-style-type: none"> <li>● See figure 11-8.</li> </ul> </li> <li>● Connect P2 on cable CX601 to TJ1 on transmission.               <ul style="list-style-type: none"> <li>● See figure 11-8.</li> </ul> </li> <li>● Connect P3 on cable CX601 to transducer TA601.               <ul style="list-style-type: none"> <li>● See figure 11-12.</li> </ul> </li> <li>● Connect P4 on cable CX601 to transducer TA601.               <ul style="list-style-type: none"> <li>● See figure 11-10.</li> </ul> </li> <li>● Connect P5 on cable CX601 to transducer TA601.               <ul style="list-style-type: none"> <li>● See figure 11-9.</li> </ul> </li> <li>● Connect P6 on cable CX601 to transducer TA602.               <ul style="list-style-type: none"> <li>● See figure 11-11.</li> </ul> </li> <li>● Connect P2 on cable CX602 to P2 on cable CX202.               <ul style="list-style-type: none"> <li>● See figure 11-8.</li> </ul> </li> <li>● Do the following steps for 10-port transmission (see figure 11-10):               <ul style="list-style-type: none"> <li>● Remove plug from C4 port with 9/16-inch wrench.</li> <li>● Screw elbow TA609 into C4 port and tighten with 5/8-inch wrench.</li> <li>● Screw transducer TA601 onto elbow TA609 and tighten with 9/16-inch wrench.</li> </ul> </li> <li>● Do the following steps for 11-port transmission (see figure 11-10):               <ul style="list-style-type: none"> <li>● Remove plug from C4 port with 7/8-inch wrench.</li> <li>● Screw adapter TA613 into C4 port and tighten with 7/8-inch wrench.</li> <li>● Screw transducer TA601 onto adapter TA613 and tighten with 9/16-inch wrench.</li> </ul> </li> <li>● Do the following steps for 10-port transmission (see figure 11-12):               <ul style="list-style-type: none"> <li>● Disconnect 3W104-P4 from J1 on transmission.</li> <li>● Remove plug from C1 (forward clutch) port with 7/16-inch socket, 2-inch extension, and handle.</li> <li>● Screw adapter TA612 into C1 port and tighten with 5/8-inch wrench.</li> <li>● Screw transducer TA601 onto adapter TA612 and tighten with 9/16-inch wrench.</li> <li>● Connect 3W104-P4 to J1 on transmission.</li> </ul> </li> </ul>

(continued on next page)

*Figure 11-2 (Sheet 34 of 53)*  
 Volume II  
 Para. 11-3

Change 6 11-39



**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**

**Transmission Shift Subsystem Fault Message Index for Test 1550**

<b>Fault Message</b>	<b>Action</b>
<b>FAULTY HNB</b>  <b>155002</b>	<ul style="list-style-type: none"> <li>● Replace hull networks box.</li> <li>● Refer to TM 9-2350-255-20-1-3-4, para. 11-12.</li> </ul>
<b>FAULTY XMSN SOL A OR 3W104</b>  <b>155004</b>	<ul style="list-style-type: none"> <li>● Do follow-on procedure.</li> <li>● See figure 11-35.</li> </ul>
<b>FAULTY XMSN SOL B OR 3W104</b>  <b>155012</b>	<ul style="list-style-type: none"> <li>● Do follow-on procedure.</li> <li>● See figure 11-40.</li> </ul>
<b>FAULTY XMSN SOL C OR 3W104</b>  <b>155009</b>	<ul style="list-style-type: none"> <li>● Do follow-on procedure.</li> <li>● See figure 11-37.</li> </ul>
<b>FAULTY XMSN SOL D OR 3W104</b>  <b>155005</b>	<ul style="list-style-type: none"> <li>● Do follow-on procedure.</li> <li>● See figure 11-36.</li> </ul>
<b>FAULTY XMSN SOL E OR 3W104</b>  <b>155011</b>	<ul style="list-style-type: none"> <li>● Do follow-on procedure.</li> <li>● See figure 11-39.</li> </ul>
<b>FAULTY XMSN SOL H OR 3W104</b>  <b>155017</b>	<ul style="list-style-type: none"> <li>● Do follow-on procedure.</li> <li>● See figure 11-42.</li> </ul>
<b>FAULTY XMSN SOL J OR 3W104</b>  <b>155010</b>	<ul style="list-style-type: none"> <li>● Do follow-on procedure.</li> <li>● See figure 11-38.</li> </ul>
<b>FAULTY XMSN SOL K</b>  <b>155006</b> <b>155015</b>	<ul style="list-style-type: none"> <li>● Replace 24 volt solenoid (K).</li> <li>● Refer to TM 9-2350-255-20-1-3-1, para. 2-8.</li> </ul>
<b>FAULTY XMSN SOL X OR 3W104</b>  <b>155013</b>	<ul style="list-style-type: none"> <li>● Do follow-on procedure.</li> <li>● See figure 11-41.</li> </ul>

**Transmission Shift Subsystem Special Instruction Message Index for Test 1550**

<b>Special Instruction Message</b>	<b>Action</b>
<b>BE SURE CIB NOT USED (REF-20 MANUAL)</b>  <b>SEE -20 MANUAL</b>  <b>155018</b>	<ul style="list-style-type: none"> <li>● CIB was disconnected in block 36. Press GO key on SETCOM.</li> <li>● No faults were found by this test.</li> <li>● Go back to block 46.</li> </ul>

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**Transmission Shift Subsystem Cable Instruction Message Index for Test 1563**

Cable Instruction Message	Action
CONNECT CX202 ↔ DIP TJ1	<ul style="list-style-type: none"> <li>● Connect P3 on cable CX202 to TJ1 on driver's instrument panel.</li> <li>● See figure 11-8.</li> </ul>
CONNECT CX601 ↔ CX602	<ul style="list-style-type: none"> <li>● Connect P1 on cable CX601 to P1 on cable CX602.</li> <li>● See figure 11-8.</li> </ul>
CONNECT CX601 ↔ XMSN TJ1	<ul style="list-style-type: none"> <li>● Connect P2 on cable CX601 to TJ1 on transmission.</li> <li>● See figure 11-8.</li> </ul>
CONNECT CX601 P3 ↔ TA601	<ul style="list-style-type: none"> <li>● Connect P3 on cable CX601 to transducer TA601.</li> <li>● See figure 11-14.</li> </ul>
CONNECT CX601 P4 ↔ TA601	<ul style="list-style-type: none"> <li>● Connect P4 on cable CX601 to transducer TA601.</li> <li>● See figure 11-15.</li> </ul>
CONNECT CX601 P5 ↔ TA601	<ul style="list-style-type: none"> <li>● Connect P5 on cable CX601 to transducer TA601.</li> <li>● See figure 11-9.</li> </ul>
CONNECT CX601 P6 ↔ TA602	<ul style="list-style-type: none"> <li>● Connect P6 on cable CX601 to transducer TA602.</li> <li>● See figure 11-11.</li> </ul>
CONNECT CX602 ↔ CX202	<ul style="list-style-type: none"> <li>● Connect P2 on cable CX602 to P2 on cable CX202.</li> <li>● See figure 11-8.</li> </ul>
TA601 ↔ C2 PORT (TA607 OR TA613)	<ul style="list-style-type: none"> <li>● Count the number of test ports on the transmission.</li> <li>● See figure 11-7.</li> <li>● Do the following steps for 10-port transmission (see figure 11-15): <ul style="list-style-type: none"> <li>● Remove plug from C2 port with 7/16-inch wrench.</li> <li>● Screw adapter TA607 into C2 port and tighten with 7/16-inch wrench.</li> <li>● Screw transducer TA601 onto adapter TA607 and tighten with 9/16-inch wrench.</li> </ul> </li> <li>● Do the following steps for 11-port transmission (see figure 11-9): <ul style="list-style-type: none"> <li>● Remove plug from C2 port with 7/8-inch wrench.</li> <li>● Screw adapter TA613 into C2 port and tighten with 7/8-inch wrench.</li> <li>● Screw transducer TA601 onto adapter TA613 and tighten with 9/16-inch wrench.</li> </ul> </li> </ul>
TA601 ↔ C5 PORT (TA610 OR TA613)	<ul style="list-style-type: none"> <li>● Do the following steps for 10-port transmission (see figure 11-14): <ul style="list-style-type: none"> <li>● Remove plug from C5 port with 11/16-inch wrench.</li> <li>● Screw elbow TA610 into C5 port and tighten with 3/4-inch wrench.</li> <li>● Screw transducer TA601 onto elbow TA610 and tighten with 9/16-inch wrench.</li> </ul> </li> </ul>

(continued on next page)

**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**

**Transmission Shift Subsystem Cable Instruction Message Index for Test 1563 (Continued)**

<b>Cable Instruction Message</b>	<b>Action</b>
<p><b>TA601 ↔ C5 PORT (TA610 OR TA613) (Continued)</b></p>	<ul style="list-style-type: none"> <li>● Do the following steps for 11-port transmission (see figure 11-14):               <ul style="list-style-type: none"> <li>● Remove plug from C5 port with 7/8-inch wrench.</li> <li>● Screw adapter TA613 into C5 port and tighten with 7/8-inch wrench.</li> <li>● Screw transducer TA601 onto adapter TA613 and tighten with 9/16-inch wrench.</li> </ul> </li> </ul>
<p><b>TA601 ↔ SM PORT (TA608 OR TA613)</b></p>	<ul style="list-style-type: none"> <li>● Count the number of test ports on the transmission.               <ul style="list-style-type: none"> <li>● See figure 11-7.</li> </ul> </li> <li>● Do the following steps for 10-port transmission (see figure 11-9):               <ul style="list-style-type: none"> <li>● Remove plug from signal main port with 3/16-inch socket head screw key.</li> <li>● Screw elbow TA608 into signal main port and tighten with 9/16-inch wrench.</li> <li>● Screw transducer TA601 onto elbow TA608 and tighten with 9/16-inch wrench.</li> </ul> </li> <li>● Do the following steps for 11-port transmission (see figure 11-9):               <ul style="list-style-type: none"> <li>● Remove plug from signal main port with 7/8-inch wrench.</li> <li>● Screw adapter TA613 into signal main port and tighten with 7/8-inch wrench.</li> <li>● Screw transducer TA601 onto adapter TA613 and tighten with 9/16-inch wrench.</li> </ul> </li> </ul>
<p><b>TA602 ↔ MAIN PORT (TA611 OR TA613)</b></p>	<ul style="list-style-type: none"> <li>● Do the following steps for 10-port transmission (see figure 11-11):               <ul style="list-style-type: none"> <li>● Remove plug from main port with 11/16-inch socket, 2-inch extension, and handle.</li> <li>● Screw adapter TA611 into main port and tighten with 11/16-inch socket, 2-inch extension, and handle.</li> <li>● Screw transducer TA602 onto adapter TA611 and tighten with 9/16-inch wrench.</li> </ul> </li> <li>● Do the following steps for 11-port transmission (see figure 11-11):               <ul style="list-style-type: none"> <li>● Remove plug from main port with 7/8-inch socket, 2-inch extension, and handle.</li> <li>● Screw adapter TA613 into main port and tighten with 7/8-inch, socket, 2-inch extension, and handle.</li> <li>● Screw transducer TA602 onto adapter TA613 and tighten with 9/16-inch wrench.</li> </ul> </li> </ul>

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**TM 9-2350-255-20-1-2-1  
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**Transmission Shift Subsystem Fault Message Index for Test 1561**

		Action
	156113	<ul style="list-style-type: none"> <li>● Replace forward/reverse valve.</li> <li>● Refer to TM 9-2350-255-20-1-3-1, para. 2-8.</li> </ul>
	156010	<ul style="list-style-type: none"> <li>● Disconnect test set from tank.</li> <li>● Do power lever angle (PLA) adjustment procedure.                             <ul style="list-style-type: none"> <li>● Refer to TM 9-2350-255-20-1-2-2, figure 19-3.</li> <li>● Do not install powerpack to verify adjustment.</li> </ul> </li> <li>● Reconnect test set to tank.                             <ul style="list-style-type: none"> <li>● Do blocks 35, 36, and 37.</li> </ul> </li> <li>● Repeat transmission test number 1561.                             <ul style="list-style-type: none"> <li>● Go back to block 89.</li> </ul> </li> </ul>
CONTROL	156114	<ul style="list-style-type: none"> <li>● Replace main control valve.                             <ul style="list-style-type: none"> <li>● Refer to TM 9-2350-255-20-1-3-1, para. 2-8.</li> </ul> </li> </ul>
MODULATOR	156112	<ul style="list-style-type: none"> <li>● Replace modulator valve.                             <ul style="list-style-type: none"> <li>● Refer to TM 9-2350-255-20-1-3-1, para. 2-8.</li> </ul> </li> </ul>
POWERPACK	156115	<ul style="list-style-type: none"> <li>● Verify that transmission won't shift to drive.</li> <li>● If symptom still exists faulty C2 clutch in transmission.                             <ul style="list-style-type: none"> <li>● Notify support maintenance.</li> </ul> </li> <li>● If symptom is not present problem solved.</li> </ul>
CONTROL ON P3	156005	<ul style="list-style-type: none"> <li>● Notify support maintenance.</li> </ul>
CONTROL ON P4	156004	<ul style="list-style-type: none"> <li>● Notify support maintenance.</li> </ul>
CONTROL ON P5	156003	<ul style="list-style-type: none"> <li>● Notify support maintenance.</li> </ul>
CONTROL ON P6	156002	<ul style="list-style-type: none"> <li>● Notify support maintenance.</li> </ul>
REGULATOR VALVE/FILTER	156111	<ul style="list-style-type: none"> <li>● Replace transmission oil filter element.                             <ul style="list-style-type: none"> <li>● Refer to TM 9-2350-255-20-1-3-1, para. 2-8.</li> </ul> </li> <li>● Repeat transmission test number 1561.                             <ul style="list-style-type: none"> <li>● Go back to block 88.</li> </ul> </li> <li>● If you get this fault message again, replace main regulator valve.                             <ul style="list-style-type: none"> <li>● Refer to TM 9-2350-255-20-1-3-1, para. 2-8.</li> </ul> </li> </ul>

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**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**

**Transmission Shift Subsystem Special Instruction Message Index for Test 1563**

<b>Special Instruction Message</b>	<b>Action</b>
BE SURE CIB NOT USED (REF -20 MAN)	<ul style="list-style-type: none"> <li>● CIB was disconnected in block 38. Press GO key on SETCOM.</li> </ul>
BE SURE ENG IS GND HOPPED. SEE -20 MAN.	<ul style="list-style-type: none"> <li>● If powerpack is in ground hop mode, press GO key on SETCOM.</li> <li>● If powerpack is not in ground hop mode:               <ul style="list-style-type: none"> <li>● Press STOP and CLEAR keys on SETCOM.</li> <li>● Go back to block 51.</li> </ul> </li> </ul>
CYCLE TRANSMISSION (REF 156000)	<ul style="list-style-type: none"> <li>● Increase engine speed to 1500 rpm for 30 seconds.</li> <li>● Return engine to idle speed.</li> <li>● Set transmission control to D.</li> <li>● Increase engine speed to 1500 rpm for 30 seconds.</li> <li>● Return engine to idle speed.</li> <li>● Set transmission control to L.</li> <li>● Increase engine speed to 1500 rpm for 30 seconds.</li> <li>● Return engine to idle speed.</li> <li>● Set transmission control to R.</li> <li>● Increase engine speed to 1500 rpm for 30 seconds.</li> <li>● Return engine to idle speed.</li> <li>● Set transmission control to N.               <ul style="list-style-type: none"> <li>● Refer to TM 9-2350-255-10.</li> </ul> </li> <li>● Press GO key on SETCOM.</li> </ul>
ENGAGE POWERPACK SERVICE BRAKE	<ul style="list-style-type: none"> <li>● Remove quick-disconnect pin with chain from engine compartment.</li> <li>● Install quick-disconnect pin in clevis on service brake cable.</li> <li>● Tie rope to clevis.</li> <li>● Pull on rope to stop output shafts from turning.               <ul style="list-style-type: none"> <li>● See figure 11-13.</li> </ul> </li> </ul>
NEXT STEP CONNECT	<ul style="list-style-type: none"> <li>● Press GO key on SETCOM.</li> </ul>
SEE -20 MANUAL 156318	<ul style="list-style-type: none"> <li>● No faults were found by this test.</li> <li>● If fault still exists, notify support maintenance.</li> </ul>
SHUT OFF ENGINE RESTART TEST 156301	<ul style="list-style-type: none"> <li>● Place ENGINE SHUTOFF switch on driver's master panel to SHUTOFF.</li> <li>● Set VEHICLE MASTER POWER switch on driver's master panel to OFF.               <ul style="list-style-type: none"> <li>● Refer to TM 9-2350-255-10.</li> </ul> </li> <li>● Go back to block 53.</li> </ul>
WAIT FOR ENGINE TO SETTLE	<ul style="list-style-type: none"> <li>● Let engine run at idle speed until RPM gage on driver's instrument panel shows a steady speed.</li> <li>● Press GO key on SETCOM.</li> </ul>

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Transmission Shift Subsystem Cable Instruction Message Index for Test 1563

Action	Action
DIP TJ1	<ul style="list-style-type: none"> <li>● Connect P3 on cable CX202 to TJ1 on driver's instrument panel.</li> <li>● See figure 11-8.</li> </ul>
CX602	<ul style="list-style-type: none"> <li>● Connect P1 on cable CX601 to P1 on cable CX602.</li> <li>● See figure 11-8.</li> </ul>
XMSN TJ1	<ul style="list-style-type: none"> <li>● Connect P2 on cable CX601 to TJ1 on transmission.</li> <li>● See figure 11-8.</li> </ul>
→ TA601	<ul style="list-style-type: none"> <li>● Connect P3 on cable CX601 to transducer TA601.</li> <li>● See figure 11-14.</li> </ul>
→ TA601	<ul style="list-style-type: none"> <li>● Connect P4 on cable CX601 to transducer TA601.</li> <li>● See figure 11-15.</li> </ul>
→ TA601	<ul style="list-style-type: none"> <li>● Connect P5 on cable CX601 to transducer TA601.</li> <li>● See figure 11-9.</li> </ul>
→ TA602	<ul style="list-style-type: none"> <li>● Connect P6 on cable CX601 to transducer TA602.</li> <li>● See figure 11-11.</li> </ul>
CX202	<ul style="list-style-type: none"> <li>● Connect P2 on cable CX602 to P2 on cable CX202.</li> <li>● See figure 11-8.</li> </ul>
C2 PORT TA613)	<ul style="list-style-type: none"> <li>● Count the number of test ports on the transmission.</li> <li>● See figure 11-7.</li> </ul>
	<ul style="list-style-type: none"> <li>● Do the following steps for 10-port transmission (see figure 11-15):</li> </ul>
	<ul style="list-style-type: none"> <li>● Remove plug from C2 port with 7/16-inch wrench.</li> </ul>
	<ul style="list-style-type: none"> <li>● Screw adapter TA607 into C2 port and tighten with 7/16-inch wrench.</li> </ul>
	<ul style="list-style-type: none"> <li>● Screw transducer TA601 onto adapter TA607 and tighten with 9/16-inch wrench.</li> </ul>
	<ul style="list-style-type: none"> <li>● Do the following steps for 11-port transmission (see figure 11-9):</li> </ul>
	<ul style="list-style-type: none"> <li>● Remove plug from C2 port with 7/8-inch wrench.</li> </ul>
	<ul style="list-style-type: none"> <li>● Screw adapter TA613 into C2 port and tighten with 7/8-inch wrench.</li> </ul>
	<ul style="list-style-type: none"> <li>● Screw transducer TA601 onto adapter TA613 and tighten with 9/16-inch wrench.</li> </ul>
	<ul style="list-style-type: none"> <li>● Do the following steps for 10-port transmission (see figure 11-14):</li> </ul>
	<ul style="list-style-type: none"> <li>● Remove plug from C5 port with 11/16-inch wrench.</li> </ul>
	<ul style="list-style-type: none"> <li>● Screw elbow TA610 into C5 port and tighten with 3/4-inch wrench.</li> </ul>
	<ul style="list-style-type: none"> <li>● Screw transducer TA601 onto elbow TA610 and tighten with 9/16-inch wrench.</li> </ul>

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**TRANSMISSION AND FINAL DRIVE  
 SYSTEM TROUBLESHOOTING**

**Transmission Shift Subsystem Cable Instruction Message Index for Test 18**

Cable Instruction Message	Action
<p>TA601 ↔ C5 PORT            (TA610 OR TA613)            (Continued)</p>	<ul style="list-style-type: none"> <li>Do the following steps for 11-port transmission 11-14):               <ul style="list-style-type: none"> <li>Remove plug from C5 port with 7/8-inch wrench.</li> <li>Screw adapter TA613 into C5 port and tighten with 9/16-inch wrench.</li> <li>Screw transducer TA601 onto adapter TA613 with 9/16-inch wrench.</li> </ul> </li> </ul>
<p>TA601 ↔ SM PORT            (TA608 OR TA613)</p>	<ul style="list-style-type: none"> <li>Count the number of test ports on the transmission.               <ul style="list-style-type: none"> <li>See figure 11-7.</li> </ul> </li> <li>Do the following steps for 10-port transmission:               <ul style="list-style-type: none"> <li>Remove plug from signal main port with 3/16-inch head screw key.</li> <li>Screw elbow TA608 into signal main port with 9/16-inch wrench.</li> <li>Screw transducer TA601 onto elbow TA608 with 9/16-inch wrench.</li> </ul> </li> </ul>
<p>TA602 ↔ MAIN PORT            (TA611 OR TA613)</p>	<ul style="list-style-type: none"> <li>Do the following steps for 11-port transmission:               <ul style="list-style-type: none"> <li>Remove plug from signal main port with 7/8-inch wrench.</li> <li>Screw adapter TA613 into signal main port with 7/8-inch wrench.</li> <li>Screw transducer TA601 onto adapter TA613 with 9/16-inch wrench.</li> </ul> </li> </ul>
	<ul style="list-style-type: none"> <li>Do the following steps for 10-port transmission (11-11):               <ul style="list-style-type: none"> <li>Remove plug from main port with 11/16-inch extension, and handle.</li> <li>Screw adapter TA611 into main port and tighten with 11/16-inch socket, 2-inch extension, and handle.</li> <li>Screw transducer TA602 onto adapter TA611 with 9/16-inch wrench.</li> </ul> </li> <li>Do the following steps for 11-port transmission (11-11):               <ul style="list-style-type: none"> <li>Remove plug from main port with 7/8-inch extension, and handle.</li> <li>Screw adapter TA613 into main port and tighten with 7/8-inch, socket, 2-inch extension, and handle.</li> <li>Screw transducer TA602 onto adapter TA613 with 9/16-inch wrench.</li> </ul> </li> </ul>

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**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**

Instruction Message Index  
Action  
Following steps for 11-para  
... from CS port into CS  
... TAB13 into CS  
... duces TAB01 into CS  
... ch wrench  
... er of test para 2-8  
... 7.  
... steps for 10-para  
... om signal near  
... 1308 into CS  
... TAB01 into CS  
... R  
... ce for 11-para  
... signal near  
... 13 into CS  
... K  
... 1301 into CS  
... ch  
... P3  
... for 10-para  
... P4  
... P5  
... P6  
... TER/  
... TER/  
... TER/  
... TER/

**Transmission Shift Subsystem Fault Message Index for Test 1563**

	Action
156314	<ul style="list-style-type: none"> <li>● Replace forward/reverse valve.</li> <li>● Refer to TM 9-2350-255-20-1-3-1, para. 2-8.</li> </ul>
156010	<ul style="list-style-type: none"> <li>● Disconnect test set from tank.</li> <li>● Do power lever angle (PLA) adjustment procedure.</li> <li>● Refer to TM 9-2350-255-20-1-2-2, figure 19-3.</li> <li>● Do not install powerpack to verify adjustment.</li> <li>● Reconnect test set to tank.</li> <li>● Do blocks 35, 36, and 37.</li> <li>● Repeat transmission test number 1563.</li> <li>● Go back to block 54.</li> </ul>
156313	<ul style="list-style-type: none"> <li>● Replace main control valve.</li> <li>● Refer to TM 9-2350-255-20-1-3-1, para. 2-8.</li> </ul>
156312	<ul style="list-style-type: none"> <li>● Replace modulator valve.</li> <li>● Refer to TM 9-2350-255-20-1-3-1, para. 2-8.</li> </ul>
156315	<ul style="list-style-type: none"> <li>● Verify that transmission won't shift to reverse.</li> <li>● If symptom still exists faulty C1 clutch in transmission.</li> <li>● Notify support maintenance.</li> <li>● If symptom is not present problem solved.</li> </ul>
156005	<ul style="list-style-type: none"> <li>● Notify support maintenance.</li> </ul>
156004	<ul style="list-style-type: none"> <li>● Notify support maintenance.</li> </ul>
156003	<ul style="list-style-type: none"> <li>● Notify support maintenance.</li> </ul>
156002	<ul style="list-style-type: none"> <li>● Notify support maintenance.</li> </ul>
156311	<ul style="list-style-type: none"> <li>● Replace transmission oil filter element.</li> <li>● Refer to TM 9-2350-255-20-1-3-1, para. 2-8.</li> <li>● Repeat transmission test number 1563.</li> <li>● Go back to block 53.</li> <li>● If you get this fault message again, replace main regulator valve.</li> <li>● Refer to TM 9-2350-255-20-1-3-1, para. 2-8.</li> </ul>

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**Change 6 11-45**



**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**

Special Instruction Messages	Transmission Shift Subsystem Special Instruction Message Index for	Action
BE SURE CIB NOT USED (REF -20 MAN)		<ul style="list-style-type: none"> <li>● CIB was disconnected in block 36. Press GO key on SETCOM.</li> </ul>
BE SURE ENG IS GND HOPPED. SEE -20 MAN.		<ul style="list-style-type: none"> <li>● If powerpack is in ground hop mode, press GO key on SETCOM.</li> <li>● If powerpack is not in ground hop mode:               <ul style="list-style-type: none"> <li>● Press STOP and CLEAR keys on SETCOM.</li> <li>● Go back to block 51.</li> </ul> </li> </ul>
CYCLE TRANSMISSION (REF 156000)		<ul style="list-style-type: none"> <li>● Increase engine speed to 1500 rpm for 30 sec.</li> <li>● Return engine to idle speed.</li> <li>● Set transmission control to D.</li> <li>● Increase engine speed to 1500 rpm for 30 sec.</li> <li>● Return engine to idle speed.</li> <li>● Set transmission control to L.</li> <li>● Increase engine speed to 1500 rpm for 30 sec.</li> <li>● Return engine to idle speed.</li> <li>● Set transmission control to R.</li> <li>● Increase engine speed to 1500 rpm for 30 sec.</li> <li>● Return engine to idle speed.</li> <li>● Set transmission control to N.</li> <li>● Refer to TM 9-2350-255-10.</li> <li>● Press GO key on SETCOM.</li> </ul>
ENGAGE POWERPACK SERVICE BRAKE		<ul style="list-style-type: none"> <li>● Remove quick-disconnect pin with chain from compartment.</li> <li>● Install quick-disconnect pin in clevis on service brake.</li> <li>● Tie rope to clevis.</li> <li>● Pull on rope to stop output shafts from turning.</li> <li>● See figure 11-13.</li> </ul>
NEXT STEP CONNECT		<ul style="list-style-type: none"> <li>● Press GO key on SETCOM.</li> </ul>
SEE -20 MANUAL	156318	<ul style="list-style-type: none"> <li>● No faults were found by this test.</li> <li>● If fault still exists, notify support maintenance.</li> </ul>
SHUT OFF ENGINE RESTART TEST	156301	<ul style="list-style-type: none"> <li>● Place ENGINE SHUTOFF switch on driver's master battery disconnect switch.</li> <li>● Set VEHICLE MASTER POWER switch on driver's master battery disconnect switch to OFF.</li> <li>● Refer to TM 9-2350-255-10.</li> <li>● Go back to block 53.</li> </ul>
WAIT FOR ENGINE TO SETTLE		<ul style="list-style-type: none"> <li>● Let engine run at idle speed until RPM gauge on instrument panel shows a steady speed.</li> <li>● Press GO key on SETCOM.</li> </ul>

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**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**

**Transmission Shift Subsystem Cable Instruction Message Index for Test 1565**

Action	Action
P TJ1	<ul style="list-style-type: none"> <li>● Connect P3 on cable CX202 to TJ1 on driver's instrument panel.</li> <li>● See figure 11-8.</li> </ul>
K602	<ul style="list-style-type: none"> <li>● Connect P1 on cable CX602 to P1 on cable CX601.</li> <li>● See figure 11-8.</li> </ul>
MSN TJ1	<ul style="list-style-type: none"> <li>● Connect P2 on cable CX601 to TJ1 on transmission.</li> <li>● See figure 11-8.</li> </ul>
> TA601	<ul style="list-style-type: none"> <li>● Connect P3 on cable CX601 to transducer TA601.</li> <li>● See figure 11-17.</li> </ul>
> TA601	<ul style="list-style-type: none"> <li>● Connect P4 on cable CX601 to transducer TA601.</li> <li>● See figure 11-18.</li> </ul>
⇒ TA601	<ul style="list-style-type: none"> <li>● Connect P5 on cable CX601 to transducer TA601.</li> <li>● See figure 11-16.</li> </ul>
⇒ TA602	<ul style="list-style-type: none"> <li>● Connect P6 on cable CX601 to transducer TA602.</li> <li>● See figure 11-18.</li> </ul>
CX202	<ul style="list-style-type: none"> <li>● Connect P2 on cable CX602 to P2 on cable CX202.</li> <li>● See figure 11-8.</li> </ul>
601 ↔ (308)	<ul style="list-style-type: none"> <li>● Remove plug from G1 port on transmission with 3/16-inch socket head screw key.</li> </ul>
601 ↔ (612)	<ul style="list-style-type: none"> <li>● Screw adapter TA608 into G1 port and tighten with 9/16-inch wrench.</li> <li>● See figure 11-16.</li> </ul>
CONNECT XMSN	<ul style="list-style-type: none"> <li>● Remove plug from G2 port on transmission with 7/16-inch wrench.</li> <li>● Screw adapter TA612 into G2 port and tighten with 5/8-inch wrench.</li> <li>● Screw transducer TA601 onto adapter TA612 and tighten with 9/16-inch wrench.</li> <li>● See figure 11-18.</li> </ul>
	<p align="center"><b>NOTE</b></p> <p>Transducer TA602 is being used to terminate an open line during this test. Do not connect to transmission.</p>
	<ul style="list-style-type: none"> <li>● Push GO key on SETCOM.</li> </ul>

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TRANSMISSION AND FINAL DRIVE  
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Transmission Shift Subsystem Cable Instruction Message Index for Test 1566	
Cable Instruction Message	Action
TA601 ↔ LOCKUP PORT (TA607 OR TA613)	<ul style="list-style-type: none"> <li>Count the number of test ports on the transmitter. See figure 11-7.</li> <li>Do the following steps for 10-port transmission (11-17):               <ul style="list-style-type: none"> <li>Remove plug from lockup port with 7/16-inch wrench.</li> <li>Screw adapter TA607 into lockup port with 1/2-inch wrench.</li> <li>Screw transducer TA601 onto adapter TA607 with 9/16-inch wrench.</li> </ul> </li> <li>Do the following steps for 11-port transmission (11-17):               <ul style="list-style-type: none"> <li>Remove plug from lockup port with 7/8-inch wrench.</li> <li>Screw adapter TA613 into lockup port with 7/8-inch wrench.</li> <li>Screw transducer TA601 onto adapter TA613 with 9/16-inch wrench.</li> </ul> </li> </ul>

Transmission Shift Subsystem Fault Message Index for Test 1566	
Fault Message	Action
FAULTY G2 OR MAIN CONTROL VALVE 156518 156519 156521	<ul style="list-style-type: none"> <li>Replace governor. Refer to TM 9-2350-255-20-1-3-1, para. 14.</li> <li>Verify that problem is solved by driving tank. Refer to TM 9-2350-255-10.</li> <li>If fault still exists after driving tank, replace valve. Refer to TM 9-2350-255-20-1-3-1, para. 14.</li> </ul>
FAULTY IDLE SPEED 156010	<ul style="list-style-type: none"> <li>Disconnect test set from tank.</li> <li>Do power lever angle (PLA) adjustment. Refer to TM 9-2350-255-20-1-3-1, para. 14.</li> <li>Do not install powerpack to verify power.</li> <li>Reconnect test set to tank.</li> <li>Do blocks 35, 36, and 37.</li> <li>Repeat transmission test number 1566.</li> <li>Go back to block 145.</li> </ul>
FAULTY MAIN CTRL OR FWD/REV VALVE 156517	<ul style="list-style-type: none"> <li>Replace forward/reverse valve. Refer to TM 9-2350-255-20-1-3-1, para. 14.</li> <li>Install powerpack. Refer to TM 9-2350-255-20-1-3-1, para. 14.</li> <li>Verify that problem is solved by driving tank. Refer to TM 9-2350-255-10.</li> <li>If fault still exists after driving tank, replace valve. Refer to TM 9-2350-255-20-1-3-1, para. 14.</li> </ul>

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SYSTEM TROUBLESHOOTING**

**Transmission Shift Subsystem Fault Message Index for Test 1565 (Continued)**

		<b>Action</b>
ACK	156514 156515 156516	<ul style="list-style-type: none"> <li>● Notify support maintenance that transmission is faulty.</li> </ul>
ON P3	156005	<ul style="list-style-type: none"> <li>● Notify support maintenance.</li> </ul>
ON P4	156004	<ul style="list-style-type: none"> <li>● Notify support maintenance.</li> </ul>
ON P5	156003	<ul style="list-style-type: none"> <li>● Notify support maintenance.</li> </ul>
ON P6	156002	<ul style="list-style-type: none"> <li>● Notify support maintenance.</li> </ul>

**Transmission Shift Subsystem Special Instruction Message Index for Test 1565**

	<b>Action</b>
NOT USED (AL)  S GND 20 MAN  MISSION	<ul style="list-style-type: none"> <li>● CIB was disconnected in block 36. Press GO key on SETCOM.</li> <li>● If powerpack is in ground hop mode, press GO key on SETCOM.</li> <li>● If powerpack is not in ground hop mode, press STOP and CLEAR keys on SETCOM.               <ul style="list-style-type: none"> <li>● Go back to block 142.</li> </ul> </li> <li>● Increase engine speed to 1500 rpm for 30 seconds.</li> <li>● Return engine to idle speed.</li> <li>● Set transmission control to D.</li> <li>● Increase engine speed to 1500 rpm for 30 seconds.</li> <li>● Return engine to idle speed.</li> <li>● Set transmission control L.</li> <li>● Increase engine speed to 1500 rpm for 30 seconds.</li> <li>● Return engine to idle speed.</li> <li>● Set transmission control to R.</li> <li>● Increase engine speed to 1500 rpm for 30 seconds.</li> <li>● Return engine to idle speed.</li> <li>● Set transmission control to N.               <ul style="list-style-type: none"> <li>● Refer to TM 9-2350-255-10.</li> </ul> </li> <li>● Press GO key on SETCOM.</li> </ul>

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**TM 9-2350-255-20-1-2-1  
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SYSTEM TROUBLESHOOTING**

Transmission Shift Subsystem Special Instruction Message Index for Test 168			Tr
Special Instruction Message		Action	Cable Ins Message
ENGAGE POWERPACK SERVICE BRAKE		<ul style="list-style-type: none"> <li>● Remove quick-disconnect pin with chain from top compartment.</li> <li>● Install quick-disconnect pin in clevis on service brake.</li> <li>● Tie rope to clevis.</li> <li>● Pull on rope to stop output shafts from turning.</li> <li>● See figure 11-13.</li> </ul>	CONNECT CX202 < > CONNECT CX801 <
NEXT STEP CONNECT . . .		<ul style="list-style-type: none"> <li>● Press GO key on SETCOM.</li> </ul>	CONNECT CX801 <
SEE -20 MANUAL	156513	<ul style="list-style-type: none"> <li>● Do follow-on procedure.</li> <li>● See figure 11-43.</li> </ul>	CONNECT CX801 P
	156520	<ul style="list-style-type: none"> <li>● Repeat transmission test number 1685.</li> <li>● Go back to block 144.</li> <li>● If same, SEE -20 MANUAL message appearing control valve.</li> <li>● Refer to TM 9-2350-255-20-1-3-1, para. 11.</li> </ul>	CONNECT CX801 P
	156523	<ul style="list-style-type: none"> <li>● Repeat transmission test number 1685.</li> <li>● Go back to block 144.</li> <li>● If same, SEE -20 MANUAL message appearing number 1103.</li> <li>● See figure 9-11.</li> <li>● If test 1103 results in NO FAULTS FOUND.</li> <li>● Notify support maintenance of a faulty test.</li> </ul>	CONNECT CX801 P
SHUT OFF ENGINE RESTART TEST	156501	<ul style="list-style-type: none"> <li>● Set ENGINE SHUTOFF switch on driver's seat SHUTOFF.</li> <li>● Set VEHICLE MASTER POWER switch on driver's seat OFF.</li> <li>● Refer to TM 9-2350-25-10.</li> <li>● Go back to block 144.</li> </ul>	DO NOT TAG01
WAIT FOR ENGINE TO SETTLE		<ul style="list-style-type: none"> <li>● Run engine at idle speed until RPM gauge on instrument panel shows a steady speed.</li> <li>● Refer to TM 9-2350-255-10.</li> <li>● Press GO key on SETCOM.</li> </ul>	DO NOT TAG02

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**Transmission Shift Subsystem Cable Instruction Message Index for Test 1566**

Instruction	Action
→ DIP TJ1	<ul style="list-style-type: none"> <li>● Connect P3 on cable CX202 to TJ1 on driver's instrument panel.</li> <li>● See figure 11-8.</li> </ul>
→ CX602	<ul style="list-style-type: none"> <li>● Connect P1 on cable CX601 to P1 on cable CX602.</li> <li>● See figure 11-8.</li> </ul>
→ XMSN TJ1	<ul style="list-style-type: none"> <li>● Connect P2 on cable CX601 to TJ1 on transmission.</li> <li>● See figure 11-8.</li> </ul>
↔ TA601	<ul style="list-style-type: none"> <li>● Connect P3 on cable CX601 to transducer TA601.</li> <li>● See figure 11-19.</li> </ul>
↔ TA601	<ul style="list-style-type: none"> <li>● Connect P4 on cable CX601 to transducer TA601.</li> <li>● See figure 11-20.</li> </ul>
↔ TA601	<ul style="list-style-type: none"> <li>● Connect P5 on cable CX601 to transducer TA601.</li> <li>● See figure 11-20.</li> </ul>
↔ TA602	<ul style="list-style-type: none"> <li>● Connect P6 on cable CX601 to transducer TA602.</li> <li>● See figure 11-20.</li> </ul>
→ CX202	<ul style="list-style-type: none"> <li>● Connect P2 on cable CX602 to P2 on cable CX202.</li> <li>● See figure 11-8.</li> </ul>
↔ TA601 ↔ (TA612)	<ul style="list-style-type: none"> <li>● Remove plug from G2 port on transmission with 7/16-inch wrench.</li> <li>● Screw adapter TA612 into G2 port and tighten with 5/8-inch wrench.</li> <li>● Screw transducer TA601 onto adapter TA612 and tighten with 9/16-inch wrench.</li> <li>● See figure 11-20.</li> </ul>
CONNECT → XMSN	<p style="text-align: center;"><b>NOTE</b></p> <p>Transducer TA601 is being used to terminate an open line during this test. Do not connect to transmission.</p> <ul style="list-style-type: none"> <li>● Press GO key on SETCOM.</li> </ul>
CONNECT → XMSN	<p style="text-align: center;"><b>NOTE</b></p> <p>Transducer TA602 is being used to terminate an open line during this test. Do not connect to transmission.</p> <ul style="list-style-type: none"> <li>● Press GO key on SETCOM.</li> </ul>

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TRANSMISSION AND FINAL DRIVE  
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**Transmission Shift Subsystem Cable Instruction Message Index for Test 1566 (Continued)**

Cable Instruction Message	Action
TA601 <=> MOD PORT (TA607 OR TA613)	<ul style="list-style-type: none"> <li>● Count the number of test ports on the transmission.               <ul style="list-style-type: none"> <li>● See figure 11-7.</li> </ul> </li> <li>● Do the following steps for 10-port transmission (see figure 11-19):               <ul style="list-style-type: none"> <li>● Remove plug from mod port with 7/16-inch wrench.</li> <li>● Screw adapter TA607 into mod port and tighten with 1/2-inch wrench.</li> <li>● Screw transducer TA601 onto adapter TA607 and tighten with 9/16-inch wrench.</li> </ul> </li> <li>● Do the following steps for 11-port transmission (see figure 11-19):               <ul style="list-style-type: none"> <li>● Remove plug from mod port with 7/8-inch wrench.</li> <li>● Screw adapter TA613 into mod port with 7/8-inch wrench.</li> <li>● Screw transducer TA601 onto adapter TA613 and tighten with 9/16-inch wrench.</li> </ul> </li> </ul>

**Transmission Shift Subsystem Fault Message Index for Test 1566**

Fault Message	Action
FAULTY CDP ACTUATOR OR MOD VALVE 156614 156615	<ul style="list-style-type: none"> <li>● Replace compressor discharge pressure actuator.               <ul style="list-style-type: none"> <li>● Refer to TM 9-2350-255-20-1-3-1, para. 2-8.</li> </ul> </li> <li>● Verify that problem is solved by driving tank.               <ul style="list-style-type: none"> <li>● Refer to TM 9-2350-255-10.</li> </ul> </li> <li>● If fault still exists after driving tank, replace modulator valve.               <ul style="list-style-type: none"> <li>● Refer to TM 9-2350-255-20-1-3-1, para. 2-8.</li> </ul> </li> </ul>
FAULTY G2 OR MAIN CONTROL VALVE 156611 156612 156613	<ul style="list-style-type: none"> <li>● Replace governor.               <ul style="list-style-type: none"> <li>● Refer to TM 9-2350-255-20-1-3-1, para. 2-8.</li> </ul> </li> <li>● Verify that problem is solved by driving tank.               <ul style="list-style-type: none"> <li>● Refer to TM 9-2350-255-10.</li> </ul> </li> <li>● If fault still exists after driving tank, replace main control valve.               <ul style="list-style-type: none"> <li>● Refer to TM 9-2350-255-20-1-3-1, para. 2-8.</li> </ul> </li> </ul>
FAULTY IDLE SPEED 156010	<ul style="list-style-type: none"> <li>● Disconnect test set from tank.</li> <li>● Do power lever angle (PLA) adjustment procedure.               <ul style="list-style-type: none"> <li>● Refer to TM 9-2350-255-20-1-2-2, figure 19-3.</li> <li>● Do not install powerpack to verify adjustment.</li> </ul> </li> <li>● Reconnect test set to tank.               <ul style="list-style-type: none"> <li>● Do blocks 35, 36, and 37.</li> </ul> </li> <li>● Repeat transmission test number 1566.               <ul style="list-style-type: none"> <li>● Go back to block 130.</li> </ul> </li> </ul>
FAULTY TA601 ON P3 OR CABLES 156005	<ul style="list-style-type: none"> <li>● Notify support maintenance.</li> </ul>

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**Transmission Shift Subsystem Fault Message Index for Test 1566 (Continued)**

Fault Message	Action
<b>FAULTY TA601 ON P4 OR CABLES</b>	<ul style="list-style-type: none"> <li>● Notify support maintenance.</li> </ul>
156004	
<b>FAULTY TA601 ON P5 OR CABLES</b>	<ul style="list-style-type: none"> <li>● Notify support maintenance.</li> </ul>
156003	
<b>FAULTY TA602 ON P6 OR CABLES</b>	<ul style="list-style-type: none"> <li>● Notify support maintenance.</li> </ul>
156002	

**Transmission Shift Subsystem Special Instruction Message Index for Test 1566**

Special Instruction Message	Action
<b>BE SURE CIB NOT USED (REF -20 MAN)</b>	<ul style="list-style-type: none"> <li>● CIB was disconnected in block 36. Press GO key on SETCOM.</li> </ul>
<b>BE SURE ENG IS GND HOPPED. SEE -20 MAN</b>	<ul style="list-style-type: none"> <li>● If powerpack is in ground hop mode, press GO key on SETCOM.</li> <li>● If powerpack is not in ground hop mode:               <ul style="list-style-type: none"> <li>● Press STOP and CLEAR keys on SETCOM.</li> <li>● Go back to block 124.</li> </ul> </li> </ul>
<b>CYCLE TRANSMISSION (REF 156000)</b>	<ul style="list-style-type: none"> <li>● Increase engine speed to 1500 rpm for 30 seconds.</li> <li>● Return engine to idle speed.</li> <li>● Set transmission control to D.</li> <li>● Increase engine speed to 1500 rpm for 30 seconds.</li> <li>● Return engine to idle speed.</li> <li>● Set transmission control L.</li> <li>● Increase engine speed to 1500 rpm for 30 seconds.</li> <li>● Return engine to idle speed.</li> <li>● Set transmission control to R.</li> <li>● Increase engine speed to 1500 rpm for 30 seconds.</li> <li>● Return engine to idle speed.</li> <li>● Set transmission control to N.               <ul style="list-style-type: none"> <li>● Refer to TM 9-2350-255-10.</li> </ul> </li> <li>● Press GO key on SETCOM.</li> </ul>
<b>ENGAGE POWERPACK SERVICE BRAKE</b>	<ul style="list-style-type: none"> <li>● Remove quick-disconnect pin with chain from engine compartment.</li> <li>● Install quick-disconnect pin in clevis on service brake cable.</li> <li>● Tie rope to clevis.</li> <li>● Pull on rope to stop output shafts from turning.               <ul style="list-style-type: none"> <li>● See figure 11-13.</li> </ul> </li> </ul>
<b>NEXT STEP CONNECT . . .</b>	<ul style="list-style-type: none"> <li>● Press Go key on SETCOM.</li> </ul>

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**Transmission Shift Subsystem Special Instruction Message Index for Test 1566 (Continued)**

Special Instruction Message	Action
<p>SEE -20 MANUAL</p> <p>156605 156610</p> <p>156616</p>	<ul style="list-style-type: none"> <li>● Do follow-on procedure.               <ul style="list-style-type: none"> <li>● See figure 11-44.</li> <li>● See figure 11-45.</li> </ul> </li> <li>● Repeat transmission test number 1566.               <ul style="list-style-type: none"> <li>● Go back to block 129.</li> </ul> </li> <li>● If same SEE -20 MANUAL message is displayed again, replace main control valve.               <ul style="list-style-type: none"> <li>● Refer to TM 9-2350-255-20-1-3-1, para. 2-8.</li> </ul> </li> </ul>
<p>SHUT OFF ENGINE RESTART TEST</p> <p>156601</p>	<ul style="list-style-type: none"> <li>● Set ENGINE SHUTOFF switch on driver's master panel to SHUTOFF.</li> <li>● Set VEHICLE MASTER POWER switch on driver's master panel to OFF.               <ul style="list-style-type: none"> <li>● Refer to TM 9-2350-255-10.</li> </ul> </li> <li>● Go back to block 129.</li> </ul>
<p>WAIT FOR ENGINE TO SETTLE</p>	<ul style="list-style-type: none"> <li>● Run engine at idle speed until RPM gage on driver's instrument panel shows a steady speed.               <ul style="list-style-type: none"> <li>● Refer to TM 9-2350-255-10.</li> </ul> </li> <li>● Press GO key on SETCOM.</li> </ul>

**Transmission Shift Subsystem Cable Instruction Message Index for Test 1567**

Cable Instruction Message	Action
<p>CONNECT CX202 ↔ DIP TJ1</p>	<ul style="list-style-type: none"> <li>● Connect P3 on cable CX202 to TJ1 on driver's instrument panel.               <ul style="list-style-type: none"> <li>● See figure 11-8.</li> </ul> </li> </ul>
<p>CONNECT CX601 ↔ CX602</p>	<ul style="list-style-type: none"> <li>● Connect P1 on cable CX601 to P1 on cable CX602.               <ul style="list-style-type: none"> <li>● See figure 11-8.</li> </ul> </li> </ul>
<p>CONNECT CX601 ↔ XMSN TJ1</p>	<ul style="list-style-type: none"> <li>● Connect P2 on cable CX601 to TJ1 on transmission.               <ul style="list-style-type: none"> <li>● See figure 11-8.</li> </ul> </li> </ul>
<p>CONNECT CX601 P3 ↔ TA601</p>	<ul style="list-style-type: none"> <li>● Connect P3 on cable CX601 to transducer TA601.               <ul style="list-style-type: none"> <li>● See figure 11-21.</li> </ul> </li> </ul>
<p>CONNECT CX601 P4 ↔ TA601</p>	<ul style="list-style-type: none"> <li>● Connect P4 on cable CX601 to transducer TA601.               <ul style="list-style-type: none"> <li>● See figure 11-18.</li> </ul> </li> </ul>
<p>CONNECT CX601 P5 ↔ TA601</p>	<ul style="list-style-type: none"> <li>● Connect P5 on cable CX601 to transducer TA601.               <ul style="list-style-type: none"> <li>● See figure 11-16.</li> </ul> </li> </ul>

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**Transmission Shift Subsystem Cable Instruction Message Index for Test 1567 (Continued)**

Instruction Message	Action
T P6 ↔ TA602	<ul style="list-style-type: none"> <li>● Connect P6 on cable CX601 to transducer TA602.</li> <li>● See figure 11-18.</li> </ul>
T ↔ CX202	<ul style="list-style-type: none"> <li>● Connect P2 on cable CX602 to P2 on cable CX202.</li> <li>● See figure 11-8.</li> </ul>
T TA601 (TA608)	<ul style="list-style-type: none"> <li>● Remove plug from G1 port on transmission with 3/16-inch socket head screw key.</li> <li>● Screw adapter TA608 into G1 port and tighten with 9/16-inch wrench.</li> <li>● Screw transducer TA601 onto adapter TA608 and tighten with 9/16-inch wrench.</li> <li>● See figure 11-16.</li> </ul>
T TA601 ↔ (TA612)	<ul style="list-style-type: none"> <li>● Remove plug from G2 port on transmission with 7/16-inch wrench.</li> <li>● Screw adapter TA612 into G2 port and tighten with 5/8-inch wrench.</li> <li>● Screw transducer TA601 onto adapter TA612 and tighten with 9/16-inch wrench.</li> <li>● See figure 11-18.</li> </ul>
CONNECT ↔ XMSN	<p style="text-align: center;"><b>NOTE</b></p> <p>Transducer TA602 is being used to terminate an open line during this test. Do not connect to transmission.</p>
↔ MOD PORT (R TA613)	<ul style="list-style-type: none"> <li>● Press GO key on SETCOM.</li> <li>● Count the number of test ports on transmission. <ul style="list-style-type: none"> <li>● See figure 11-7.</li> </ul> </li> <li>● Do the following steps for 10-port transmission (see figure 11-21): <ul style="list-style-type: none"> <li>● Remove plug from mod port with 7/16-inch wrench.</li> <li>● Screw adapter TA607 into mod port and tighten with 1/2-inch wrench.</li> <li>● Screw transducer TA601 onto adapter TA607 and tighten with 9/16-inch wrench.</li> </ul> </li> <li>● Do the following steps for 11-port transmission (see figure 11-21): <ul style="list-style-type: none"> <li>● Remove plug from mod port with 7/8-inch wrench.</li> <li>● Screw adapter TA613 into mod port with 7/8-inch wrench.</li> <li>● Screw transducer TA601 onto adapter TA613 and tighten with 9/16-inch wrench.</li> </ul> </li> </ul>

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**Transmission Shift Subsystem Fault Message Index for Test 1567**

Fault Message	Action
<b>FAULTY CDP ACTUATOR OR MOD VALVE</b> 156723 156725	<ul style="list-style-type: none"> <li>● Replace compressor discharge pressure actuator.</li> <li>● Refer to TM 9-2350-255-20-1-3-1, para. 2-8.</li> <li>● Verify that problem is solved by driving tank.</li> <li>● Refer to TM 9-2350-255-10.</li> <li>● If fault still exists after driving tank, replace modulator valve.</li> <li>● Refer to TM 9-2350-25-1-3-1, para. 2-8.</li> </ul>
<b>FAULTY G2 OR MAIN CONTROL VALVE</b> 156720 156721 156722	<ul style="list-style-type: none"> <li>● Replace governor.</li> <li>● Refer to TM 9-2350-255-20-1-3-1, para. 2-8.</li> <li>● Verify that problem is solved by driving tank.</li> <li>● Refer to TM 9-2350-255-10.</li> <li>● If fault still exists after driving tank, replace main control valve.</li> <li>● Refer to TM 9-2350-255-20-1-3-1, para. 2-8.</li> </ul>
<b>FAULTY IDLE SPEED</b> 156010	<ul style="list-style-type: none"> <li>● Disconnect test set from tank.</li> <li>● Do power lever angle (PLA) adjustment procedure.</li> <li>● Refer to TM 9-2350-255-20-1-2-2, figure 19-3.</li> <li>● Do not install powerpack to verify adjustment.</li> <li>● Reconnect test set to tank.</li> <li>● Do blocks 35, 36, and 37.</li> <li>● Repeat transmission test number 1567.</li> <li>● Go back to block 112.</li> </ul>
<b>FAULTY POWERPACK</b> 156717 156718	<ul style="list-style-type: none"> <li>● Notify support maintenance that transmission is faulty.</li> </ul>
<b>FAULTY TA601 ON P3 OR CABLES</b> 156005	<ul style="list-style-type: none"> <li>● Notify support maintenance.</li> </ul>
<b>FAULTY TA601 ON P4 OR CABLES</b> 156004	<ul style="list-style-type: none"> <li>● Notify support maintenance.</li> </ul>
<b>FAULTY TA601 ON P5 OR CALBES</b> 156003	<ul style="list-style-type: none"> <li>● Notify support maintenance.</li> </ul>
<b>FAULTY TA602 ON P6 OR CABLES</b> 156002	<ul style="list-style-type: none"> <li>● Notify support maintenance.</li> </ul>

*Figure 11-2 (Sheet 51 of 53)  
Volume II  
Para. 11-3*

**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**

**Transmission Shift Subsystem Special Instruction Message Index for Test 1567**

Special Instruction Message	Action
<p><b>SURE ENG IS GND PPED. SEE -20 MAN</b></p>	<ul style="list-style-type: none"> <li>● If powerpack is in ground hop mode, press GO key on SETCOM.</li> <li>● If powerpack is not in ground hop mode:               <ul style="list-style-type: none"> <li>● Press STOP and CLEAR keys on SETCOM.</li> <li>● Go back to block 106.</li> </ul> </li> </ul>
<p><b>CLE TRANSMISSION (REF 156000)</b></p>	<ul style="list-style-type: none"> <li>● Increase engine speed to 1500 rpm for 30 seconds.</li> <li>● Return engine to idle speed.</li> <li>● Set transmission control to D.</li> <li>● Increase engine speed to 1500 rpm for 30 seconds.</li> <li>● Return engine to idle speed.</li> <li>● Set transmission control to L.</li> <li>● Increase engine speed to 1500 rpm for 30 seconds.</li> <li>● Return engine to idle speed.</li> <li>● Set transmission control to R.</li> <li>● Increase engine speed to 1500 rpm for 30 seconds.</li> <li>● Return engine to idle speed.</li> <li>● Set transmission control to N.               <ul style="list-style-type: none"> <li>● Refer to TM 9-2350-255-10.</li> </ul> </li> <li>● Press GO key on SETCOM.</li> </ul>
<p><b>ENGAGE POWERPACK SERVICE BRAKE</b></p>	<ul style="list-style-type: none"> <li>● Remove quick-disconnect pin with chain from engine compartment.</li> <li>● Install quick-disconnect pin in clevis on service brake cable.</li> <li>● Tie rope to clevis.</li> <li>● Pull on rope to stop output shafts from turning.               <ul style="list-style-type: none"> <li>● See figure 11-13.</li> </ul> </li> </ul>
<p><b>SEE -20 MANUAL</b></p>	<ul style="list-style-type: none"> <li>● Do follow-on procedure.               <ul style="list-style-type: none"> <li>● See figure 11-46.</li> <li>● See figure 11-47.</li> </ul> </li> </ul>
<p>156711 156716</p>	<ul style="list-style-type: none"> <li>● Repeat transmission test number 1567.               <ul style="list-style-type: none"> <li>● Go back to block 111.</li> </ul> </li> </ul>
<p>156724</p>	<ul style="list-style-type: none"> <li>● If same SEE -20 MANUAL message is displayed again, replace main control valve.               <ul style="list-style-type: none"> <li>● Refer to TM 9-2350-255-20-1-3-1, para. 2-8.</li> </ul> </li> </ul>

*Figure 11-2 (Sheet 52 of 53).*  
Volume II  
Para. 11-3

**Change 5 11-57**

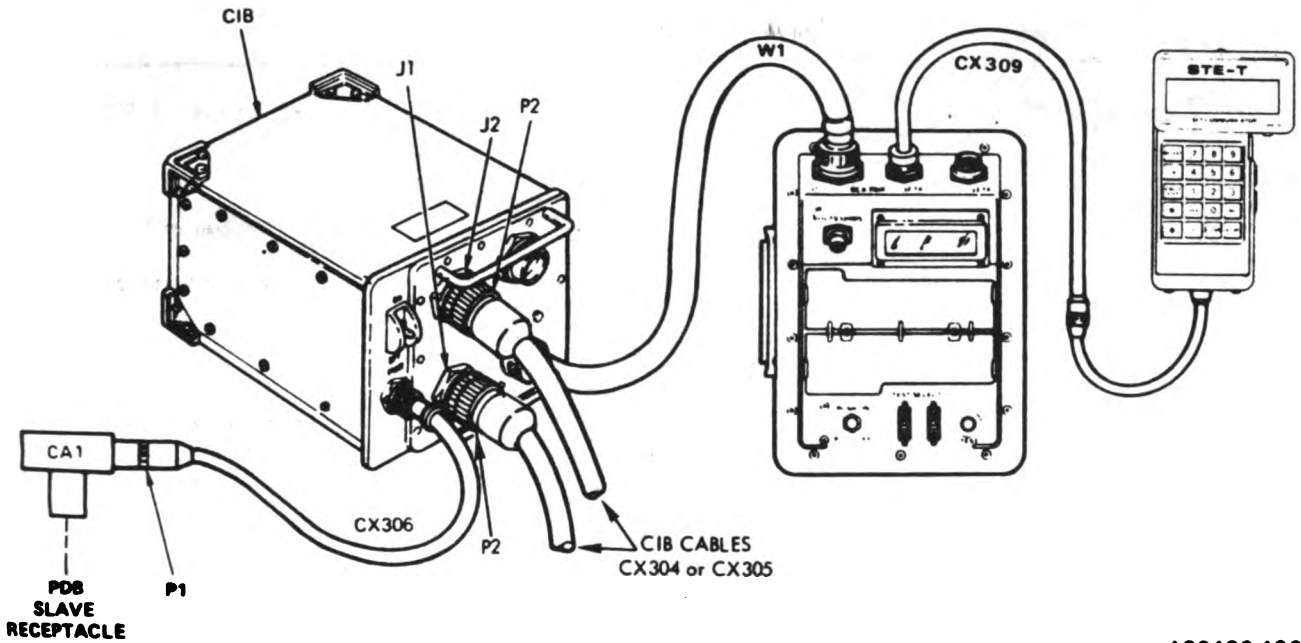
**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**

**Transmission Shift Subsystem Special Instruction Message Index for Test 1567 (Continued)**

<b>Special Instruction Message</b>	<b>Action</b>
<b>BE SURE CIB NOT USED (REF -20 MANUAL)</b>	<ul style="list-style-type: none"> <li>● CIB was disconnected in block 36. Press GO key on SETCOM.</li> </ul>
<b>SHUT OFF ENGINE RESTART TEST</b> <b>156701</b>	<ul style="list-style-type: none"> <li>● Set ENGINE SHUTOFF switch on driver's master panel to SHUTOFF.</li> <li>● Set VEHICLE MASTER POWER switch on driver's master panel to OFF.               <ul style="list-style-type: none"> <li>● Refer to TM 9-2350-255-10.</li> </ul> </li> <li>● Go back to block 111.</li> </ul>
<b>WAIT FOR ENGINE TO SETTLE</b>	<ul style="list-style-type: none"> <li>● Run engine at idle speed until RPM gage on driver's instrument panel shows a steady speed.               <ul style="list-style-type: none"> <li>● Refer to TM 9-2350-255-10.</li> </ul> </li> <li>● Press GO key on SETCOM.</li> </ul>

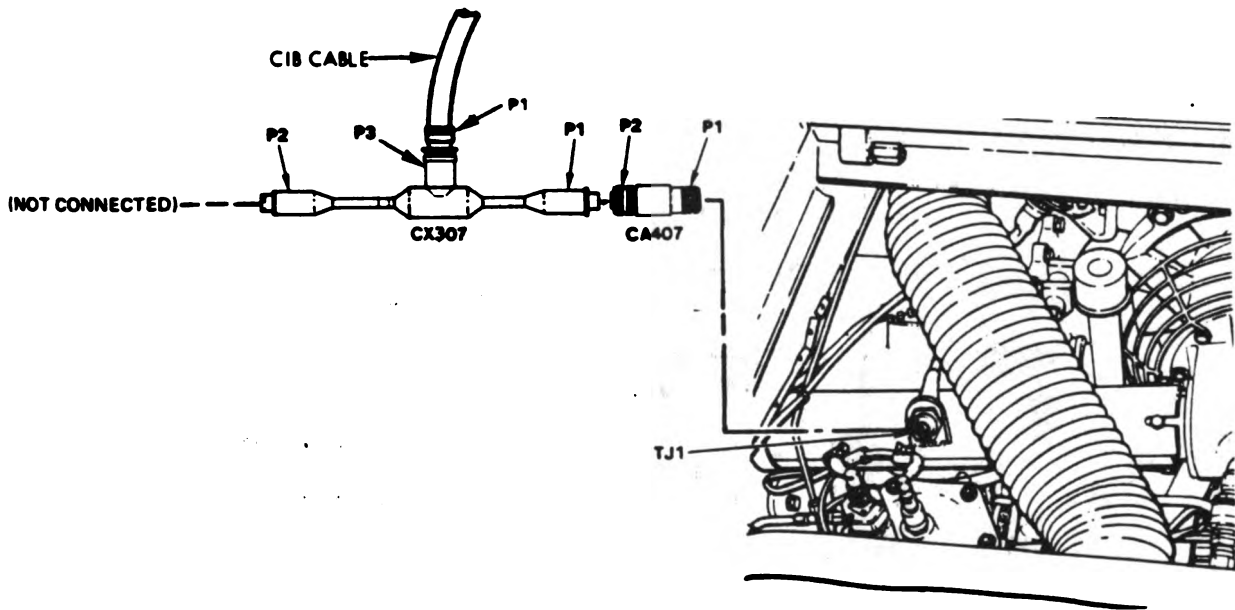
*Figure 11-2 (Sheet 53 of 53)  
Volume II  
Para. 11-3*

**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**



A20120-1865

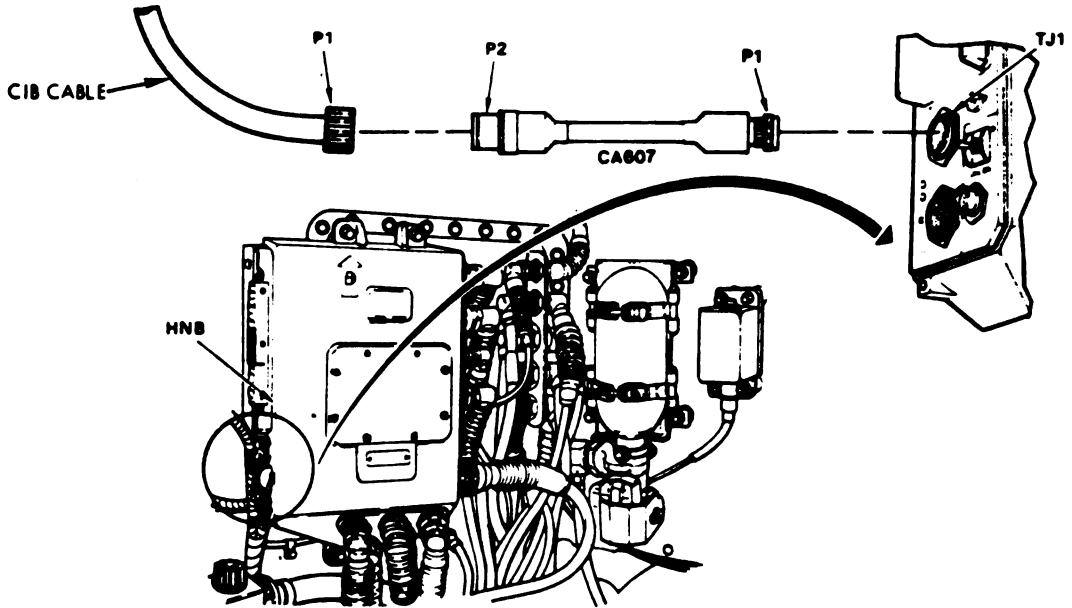
*Figure 11-2.1. STE/M1 Hull Cable Hookup to CIB*



A20120-1866

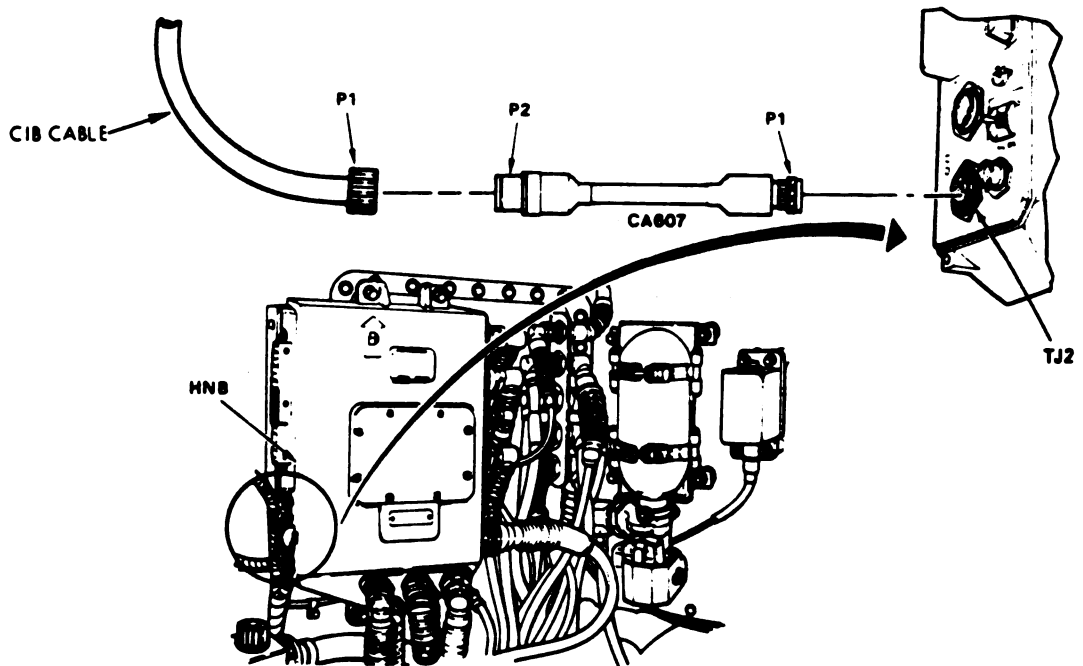
*Figure 11-3. STE/M1 Hull Cable Hookup to Transmission - TJ1*  
**Volume II  
Para. 11-3**

**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**



A20120-1867

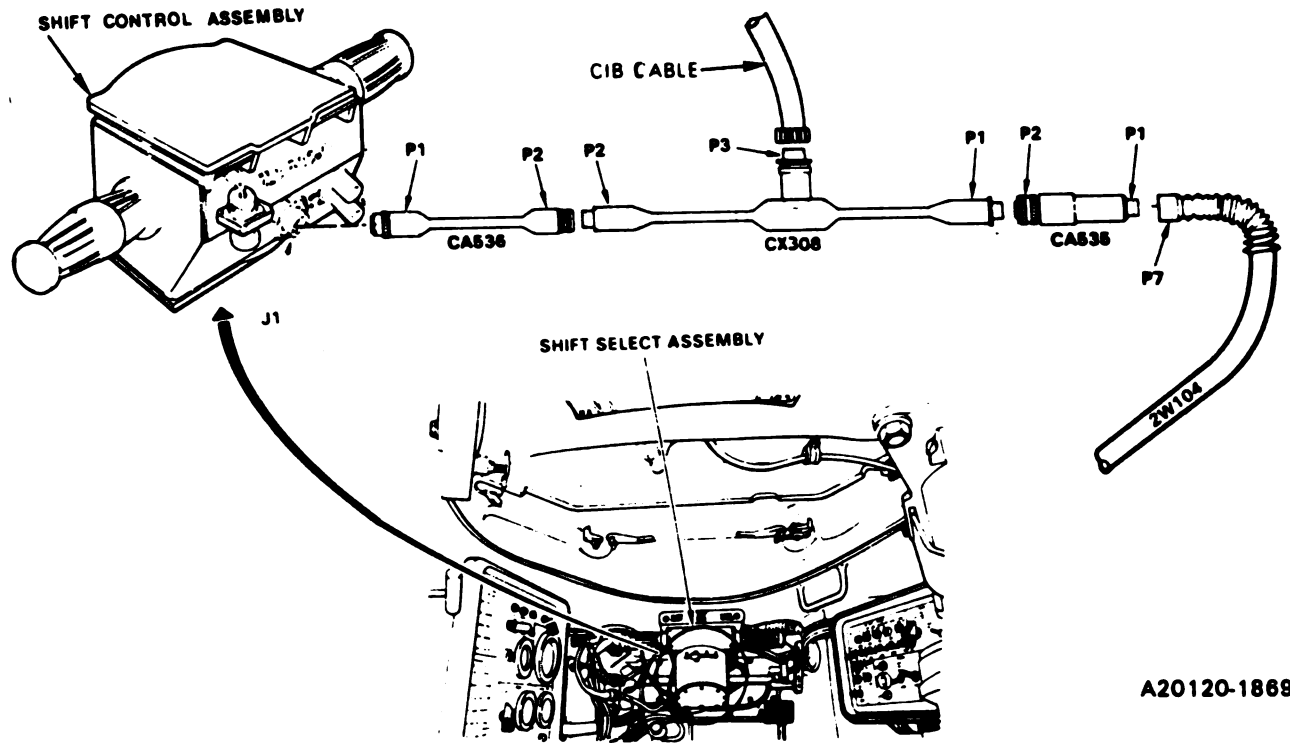
*Figure 11-4. STE/M1 Hull Cable Hookup to HNB - TJ1*



A20120-1868

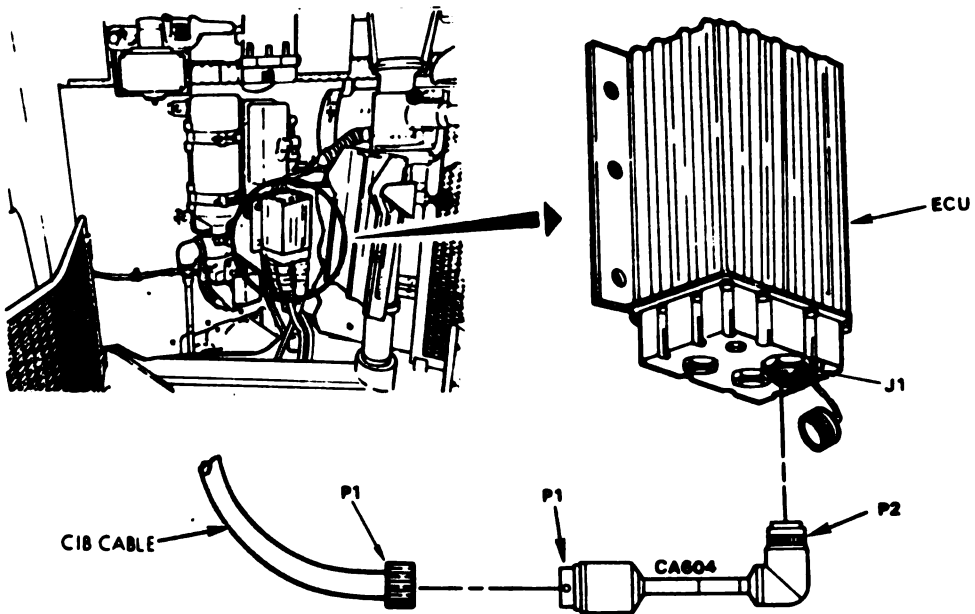
*Figure 11-5. STE/M1 Hull Cable Hookup to HNB - TJ2*  
Volume II  
Para. 11-3

**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**



A20120-1869

*Figure 11-6. STE/M1 Hull Cable Hookup Between J1 on Shift Select Assembly and 2W104-P7*



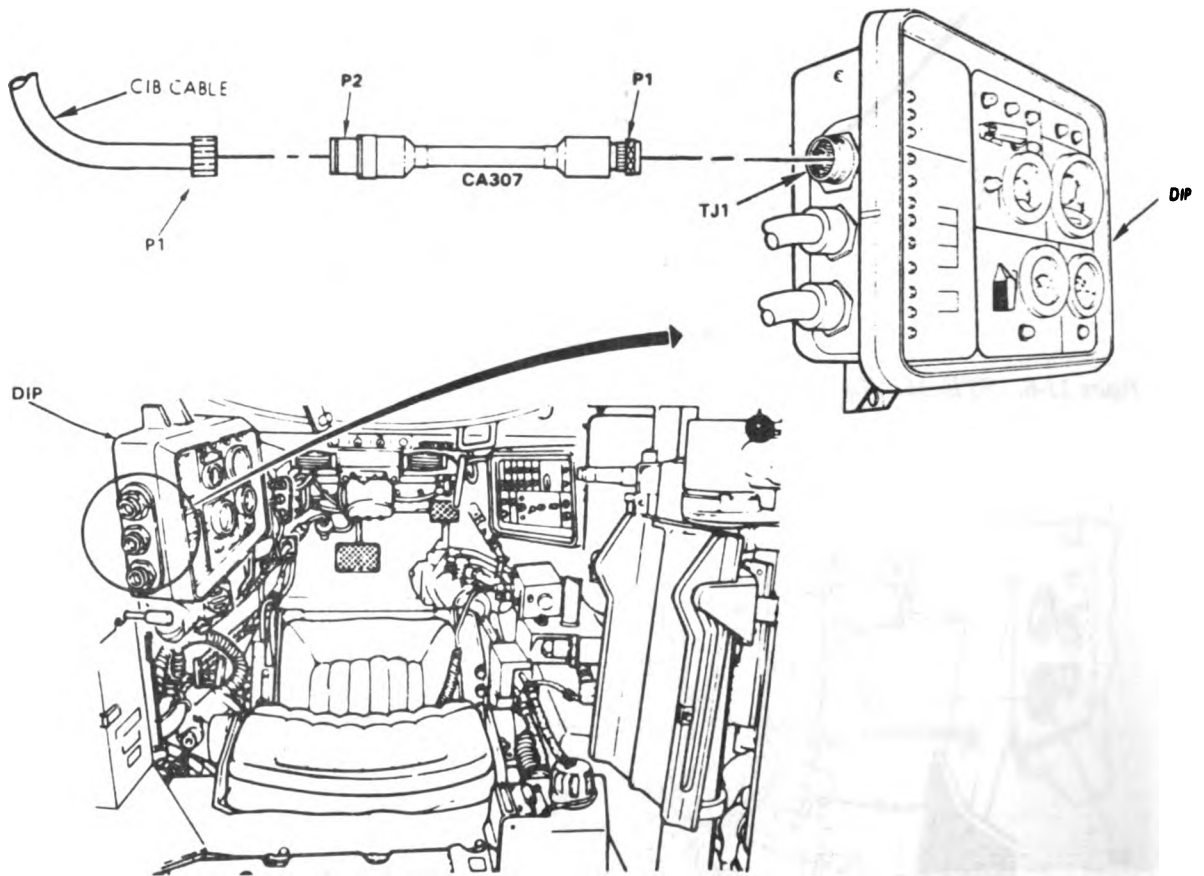
A20120-1870

*Figure 11-6.1. STE/M1 Hull Cable Hookup to ECU-J1  
Volume II  
Para. 11-3*

**Change 8 11-61**



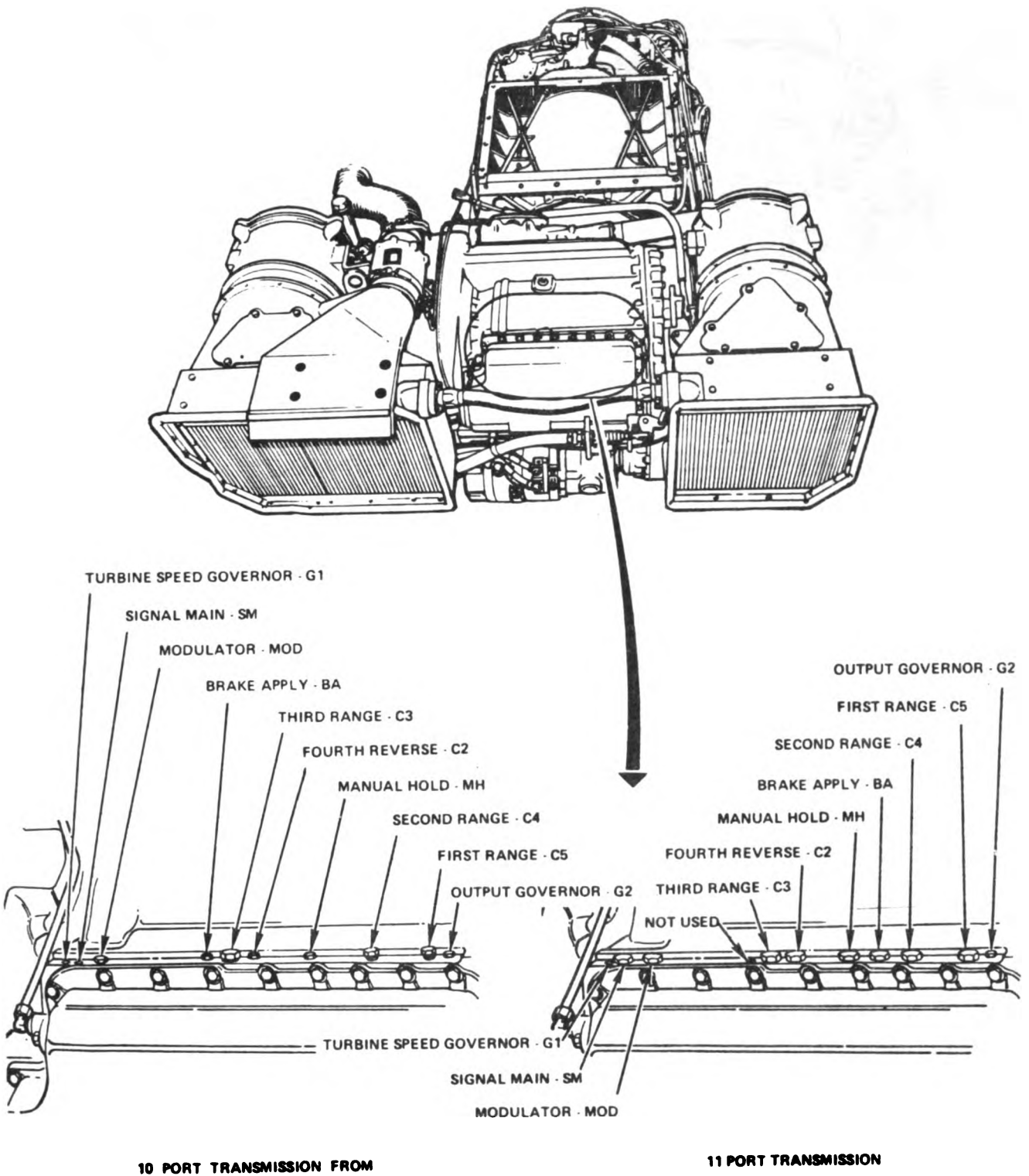
**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**



A20120-1871

*Figure 11-6.2. STE/M1 Hull Cable Hookup to DIP-TJ1*  
**Volume II**  
**Para. 11-3**

**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**



**10 PORT TRANSMISSION FROM**

**11 PORT TRANSMISSION**

A20120-1448

**Figure 11-7. 10 and 11 Port Transmission Description and Port Location.  
Volume II  
Para. 11-3**

**Cnange 5 11-63**

**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**

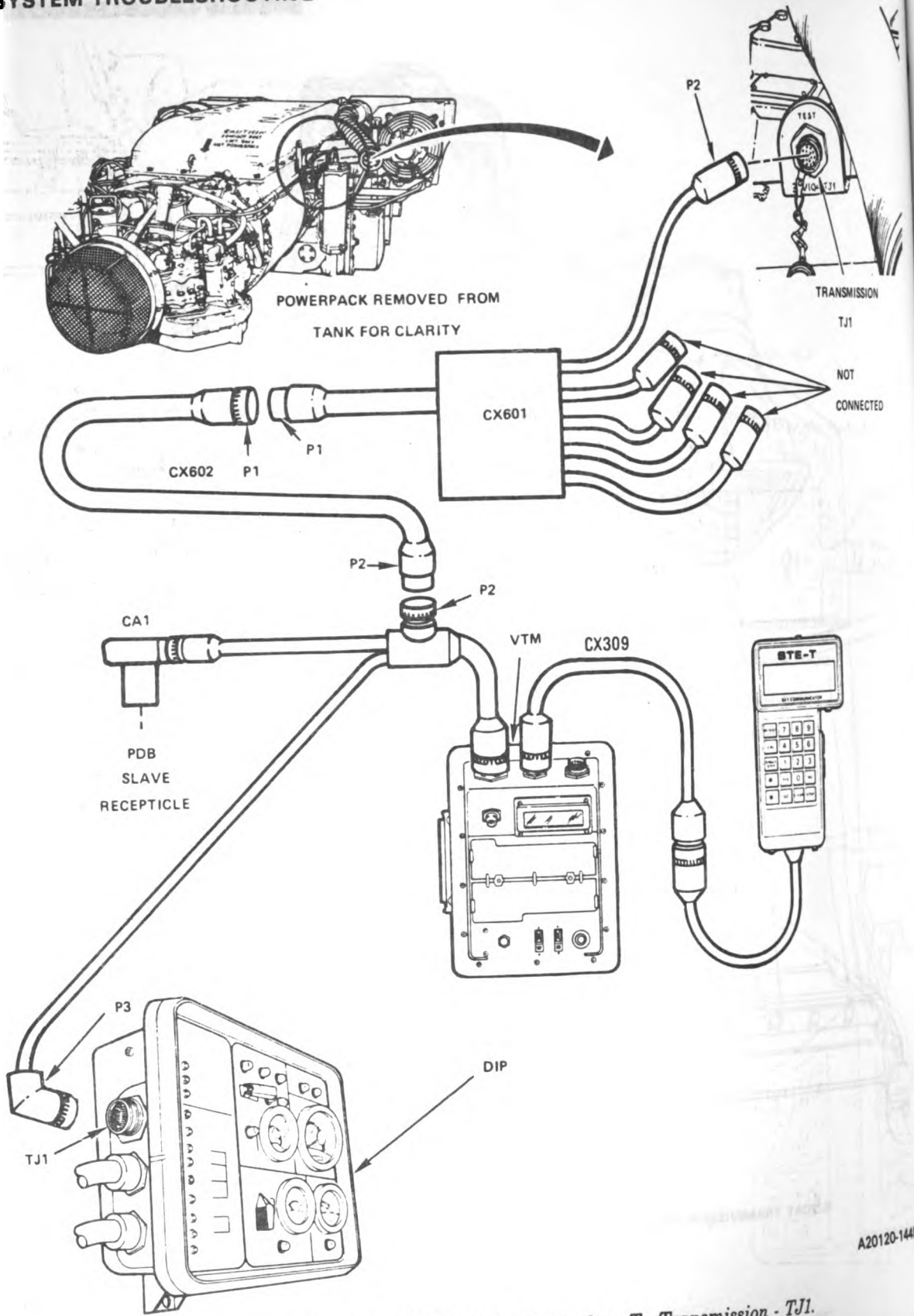
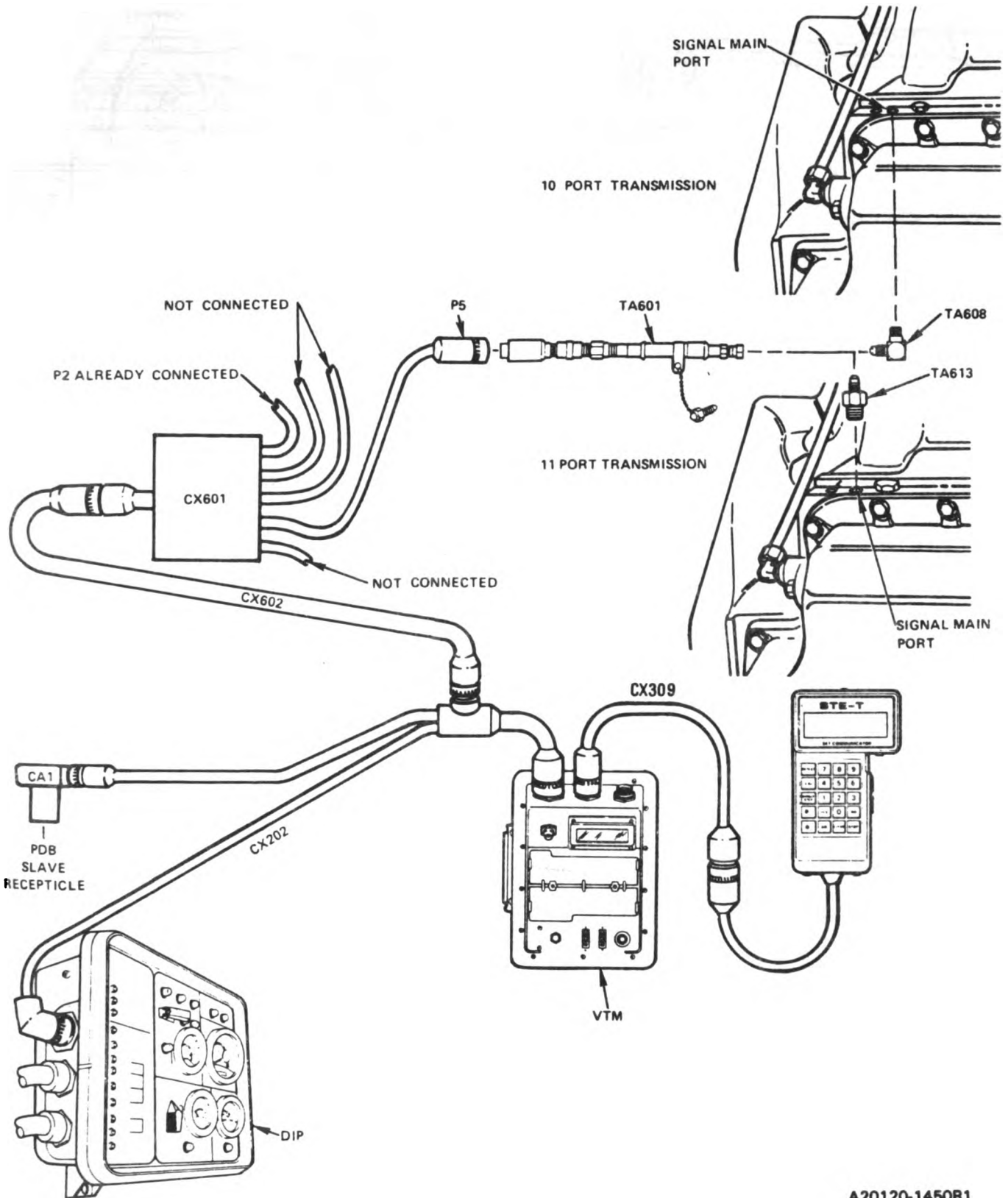


Figure 11-8. STE/M1 Hull Cable Hookup To Transmission - TJ1.

**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**

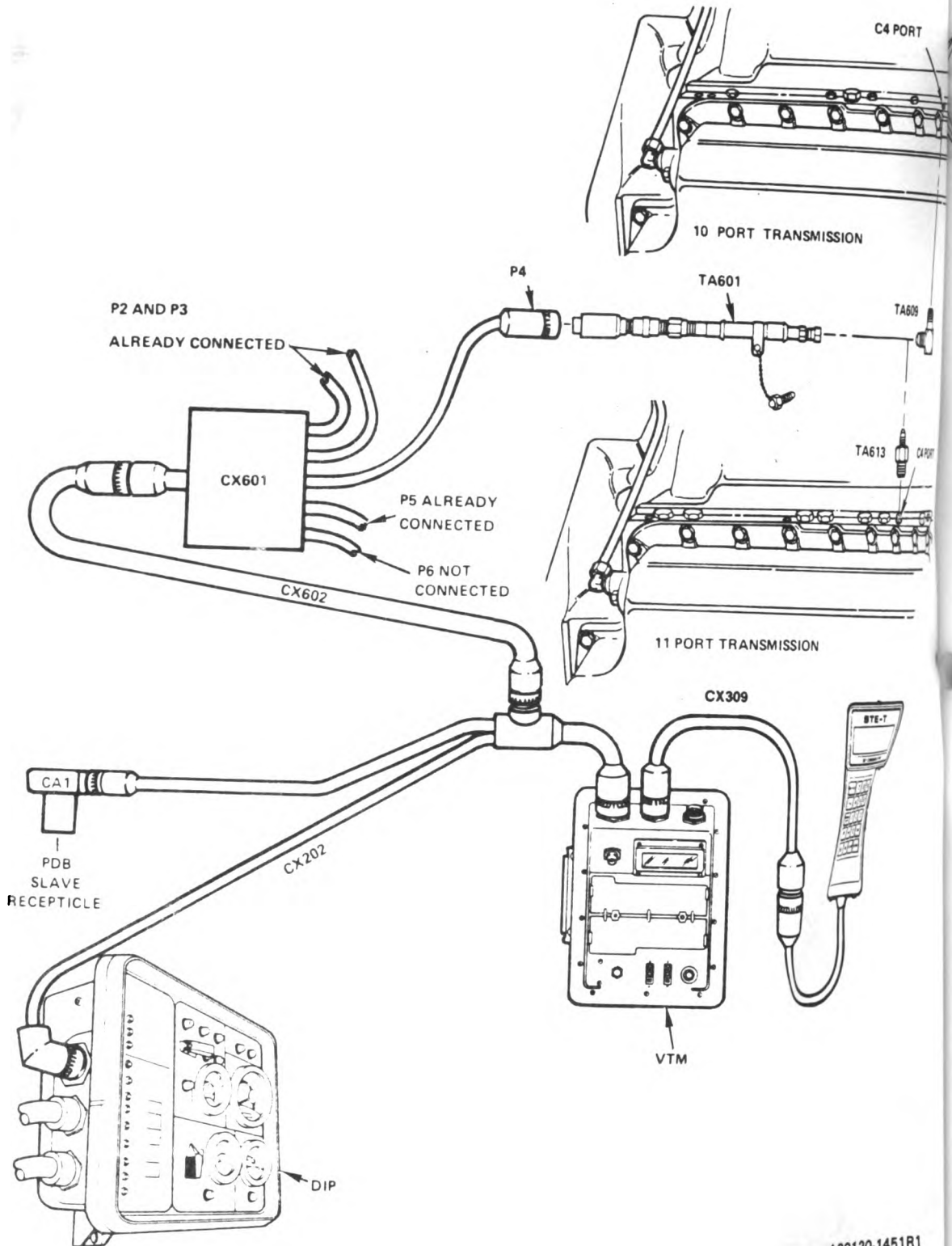


A20120-1450R1

**Figure 11-9. STE/M1 Hull Cable Hookup To Signal Main Port.  
Volume II  
Para. 11-3**

**Change 5 11-65**

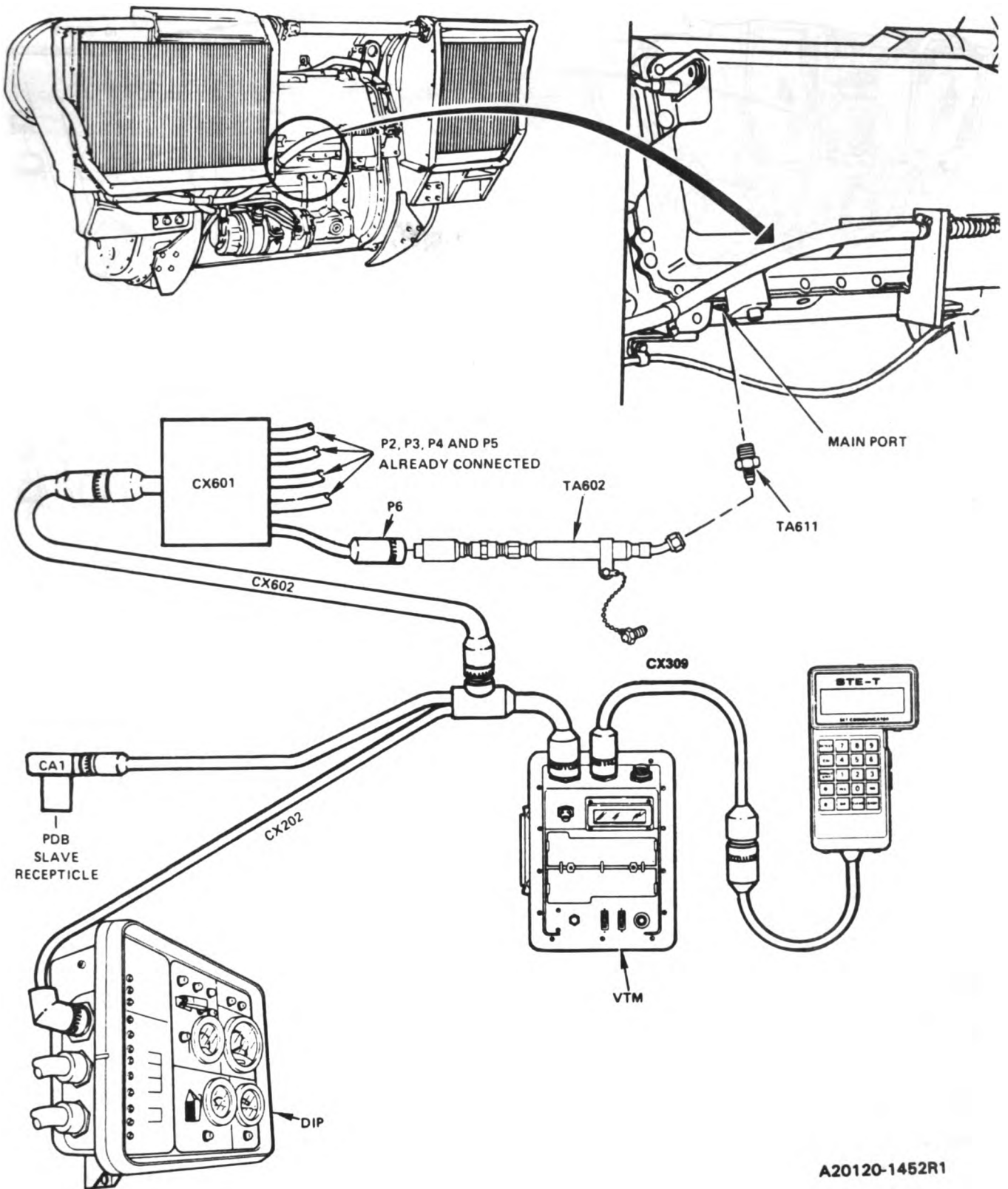
**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**



A20120-1451R1

Figure 11-10. STE/M1 Hull Cable Hookup To C4 Port.

**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**

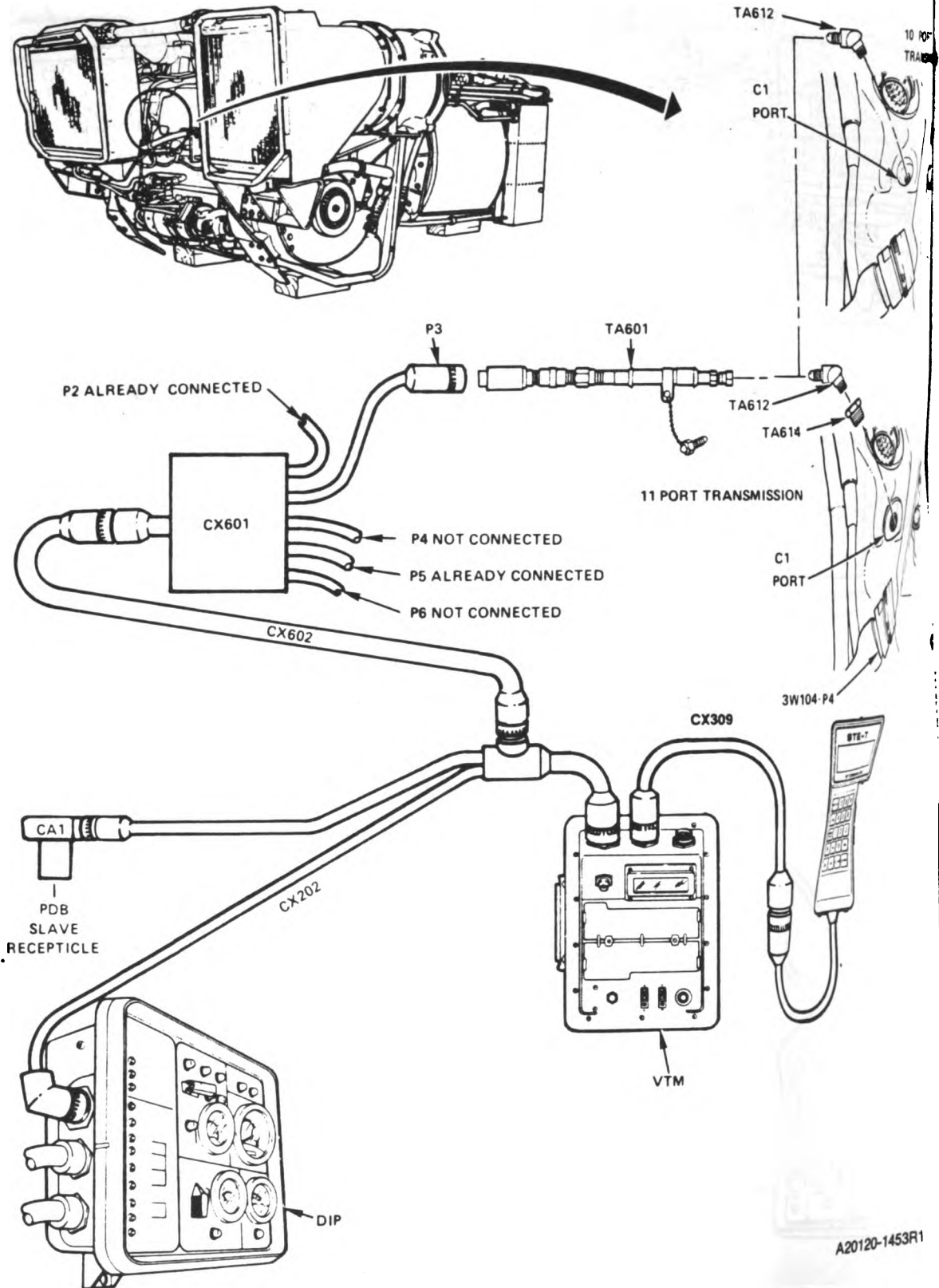


A20120-1452R1

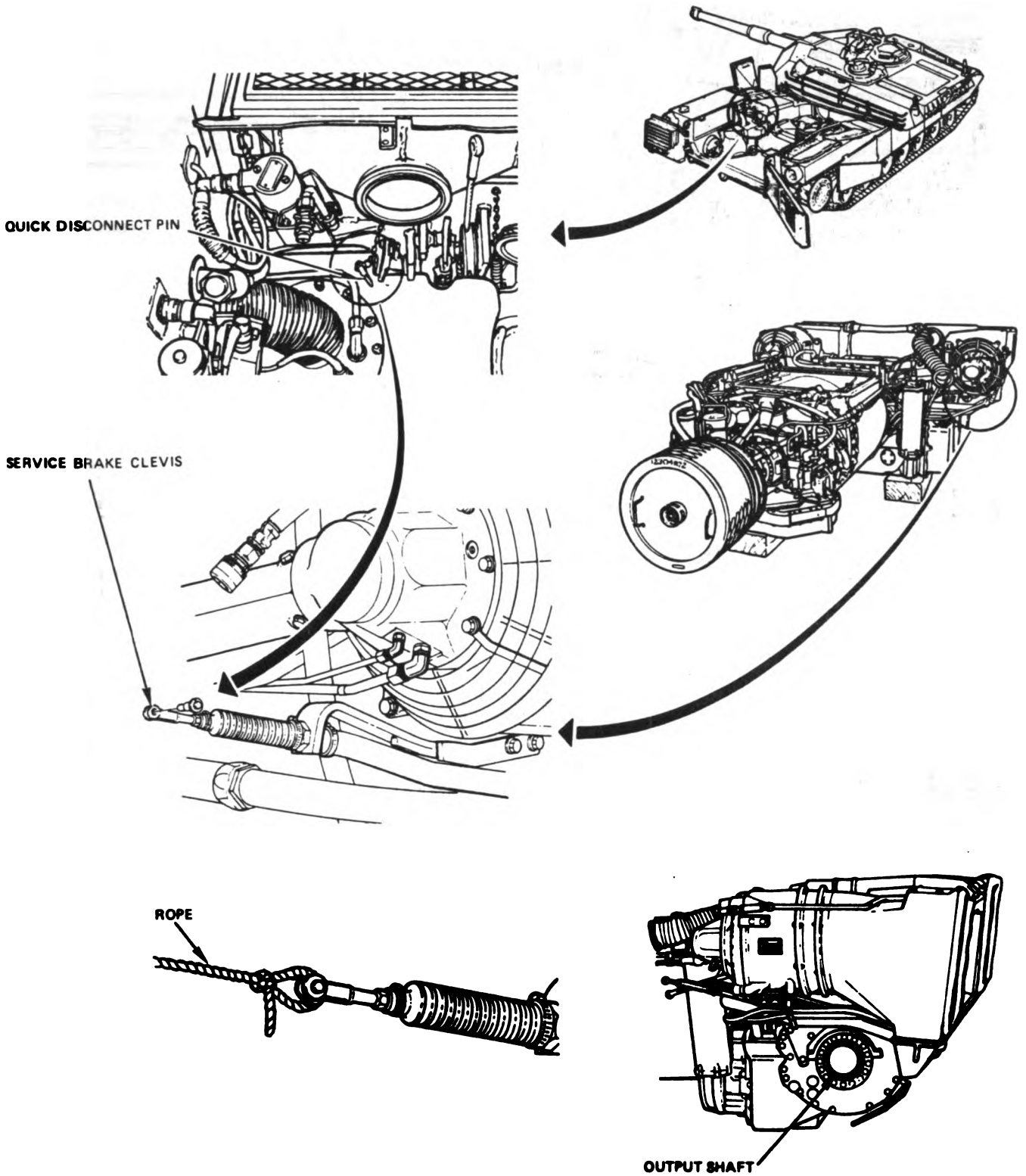
**Figure 11-11. STE/M1 Hull Cable Hookup To Main Port.  
Volume II  
Para. 11-3**

**Change 8 11-67**

**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**



**Figure 11-12. STE/M1 Hull Cable Hookup To C1 (Forward Clutch) Port.**



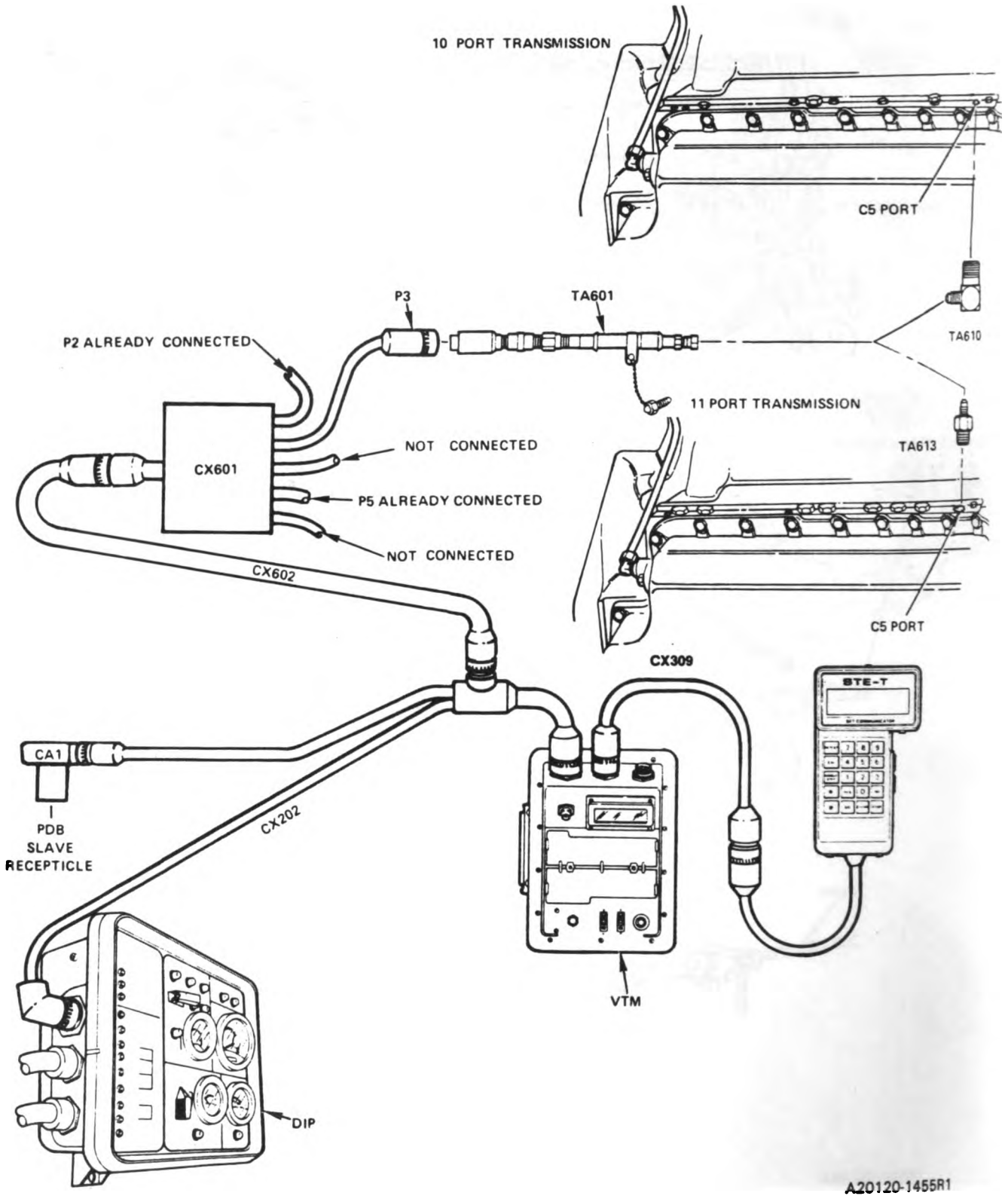
A20120-1454

Figure 11-13. Powerpack Service Brake.  
Volume II  
Para. 11-3

Change 5 11-69



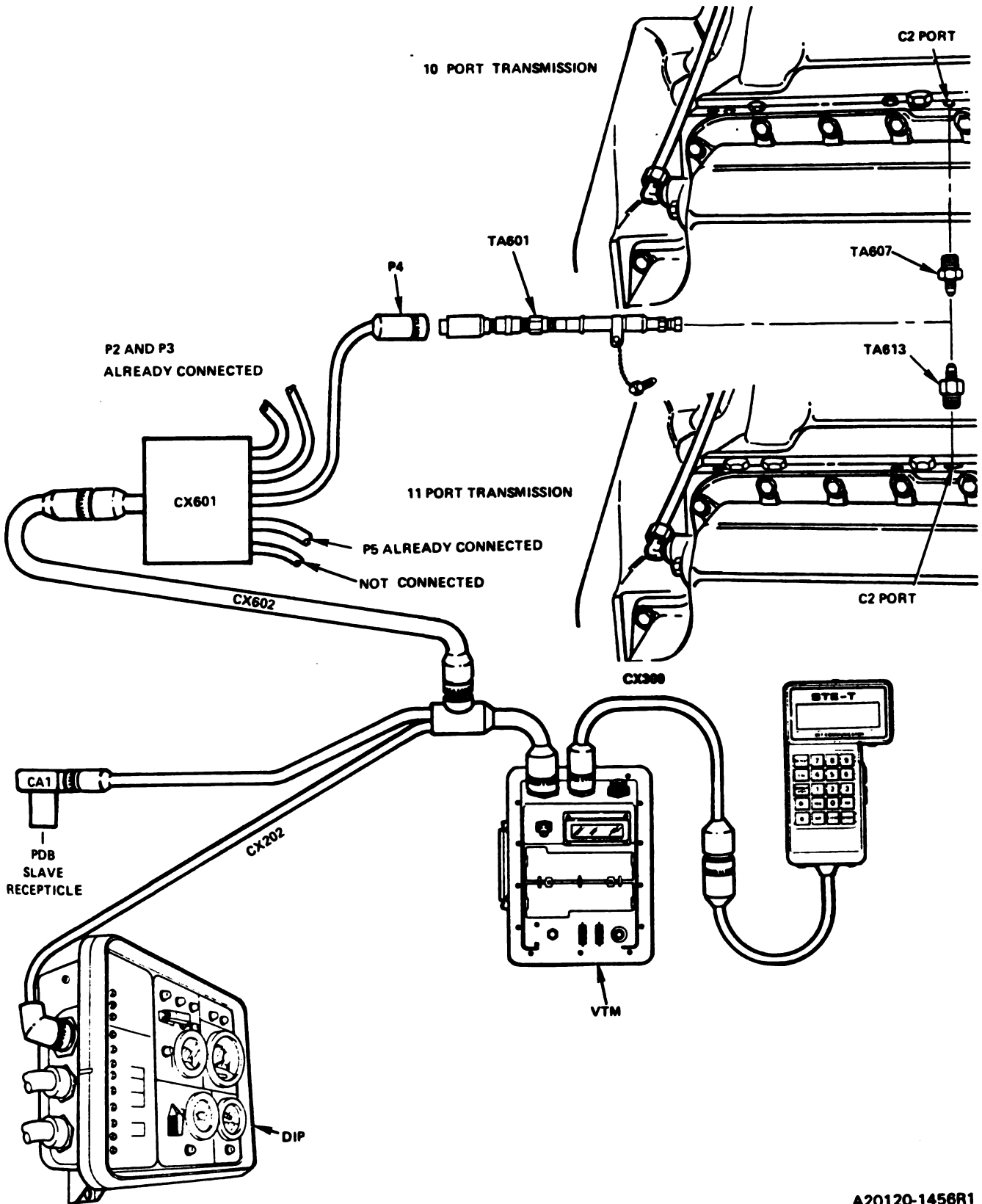
**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**



A20120-1455R1

**Figure 11-14. STE/M1 Hull Cable Hookup To C5 Port.**

**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**

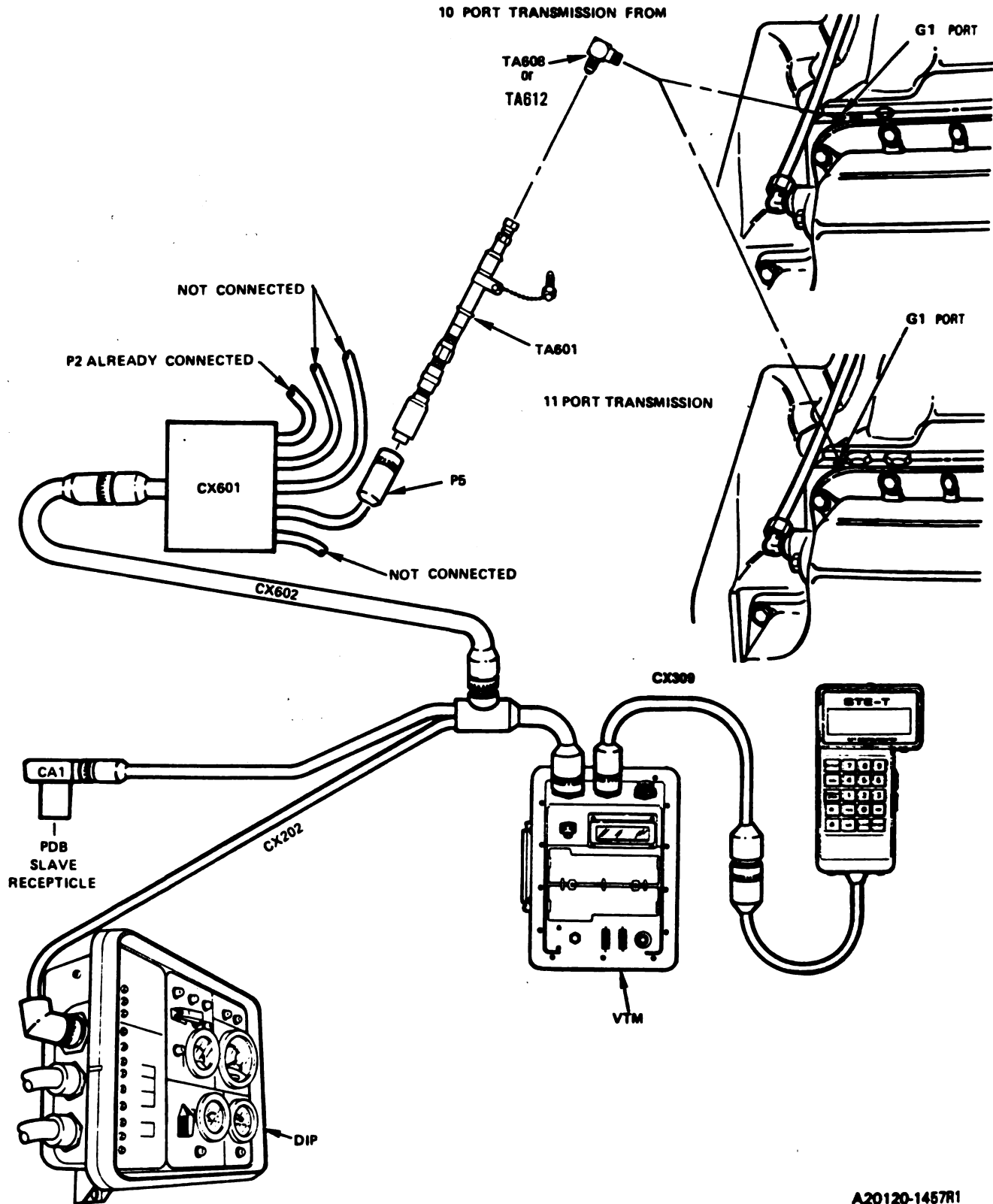


A20120-1456R1

*Figure 11-15. STE/M1 Hull Cable Hookup To C2 Port.*  
**Volume II  
Para. 11-3**

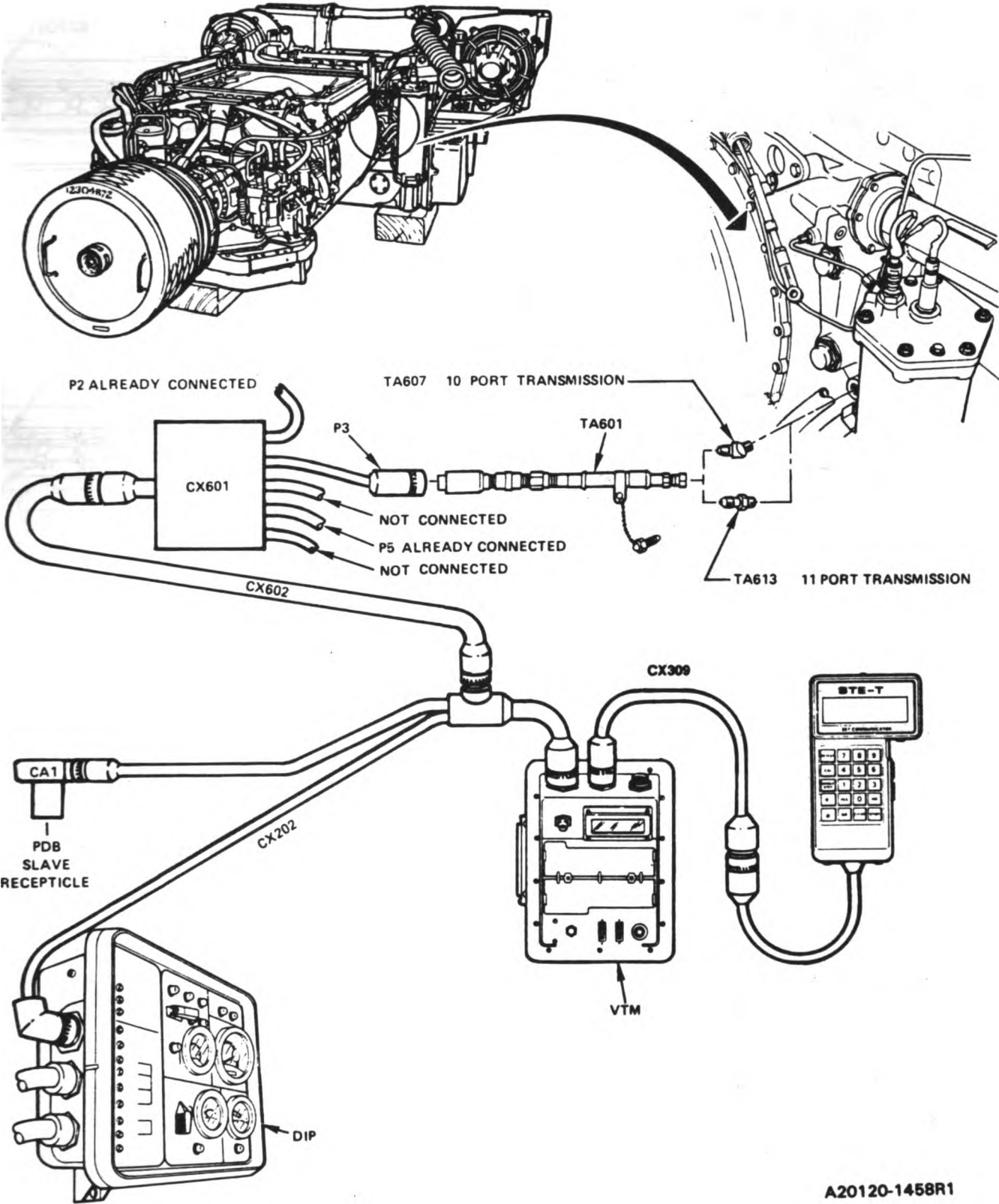
**Change 8 11-71**

**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**



**Figure 11-16. STE/M1 Hull Cable Hookup To G1 Port.**

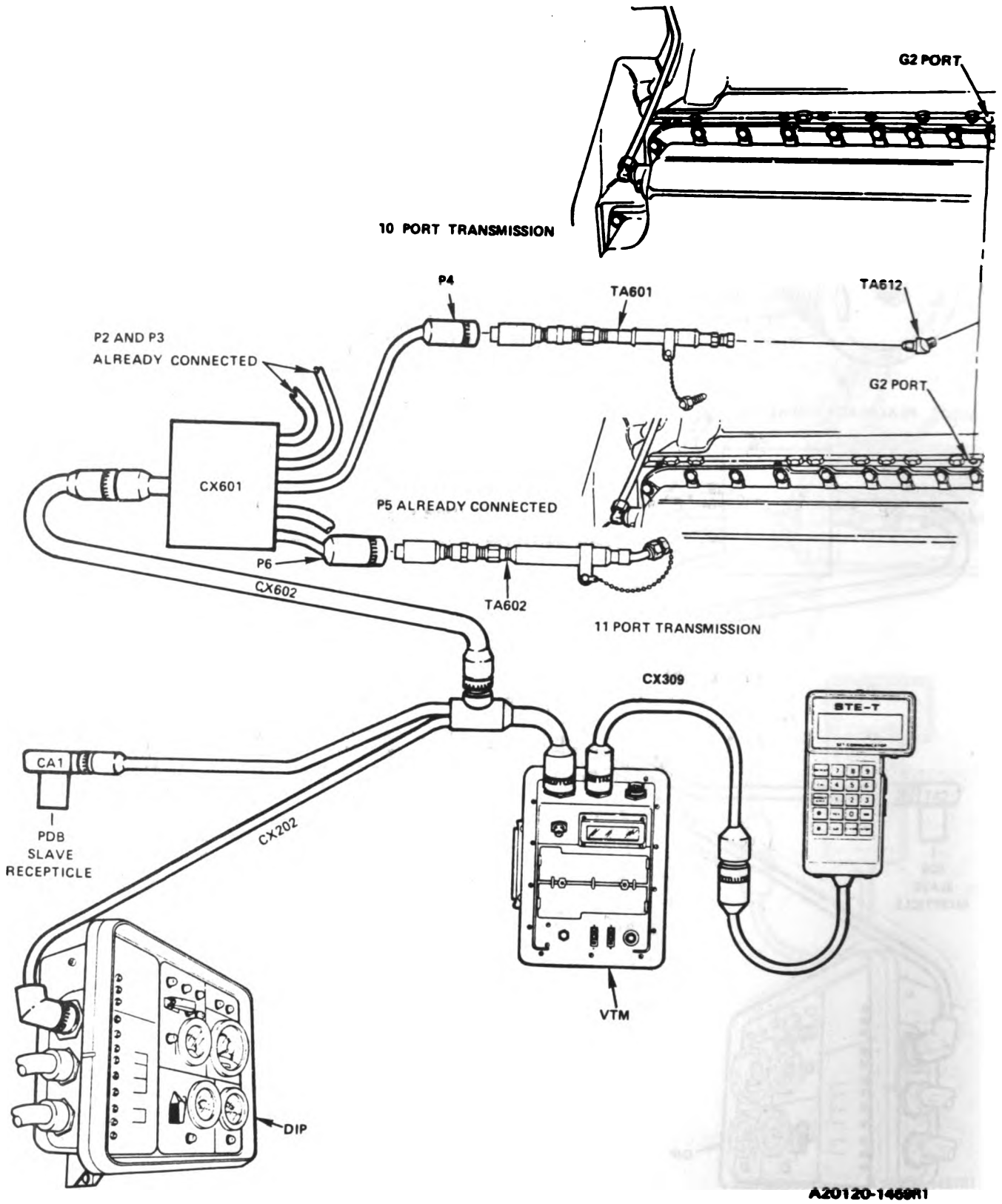
**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**



**Figure 11-17. STE/M1 Hull Cable Hookup To Lockup Port.  
Volume II  
Para. 11-3**

A20120-1458R1

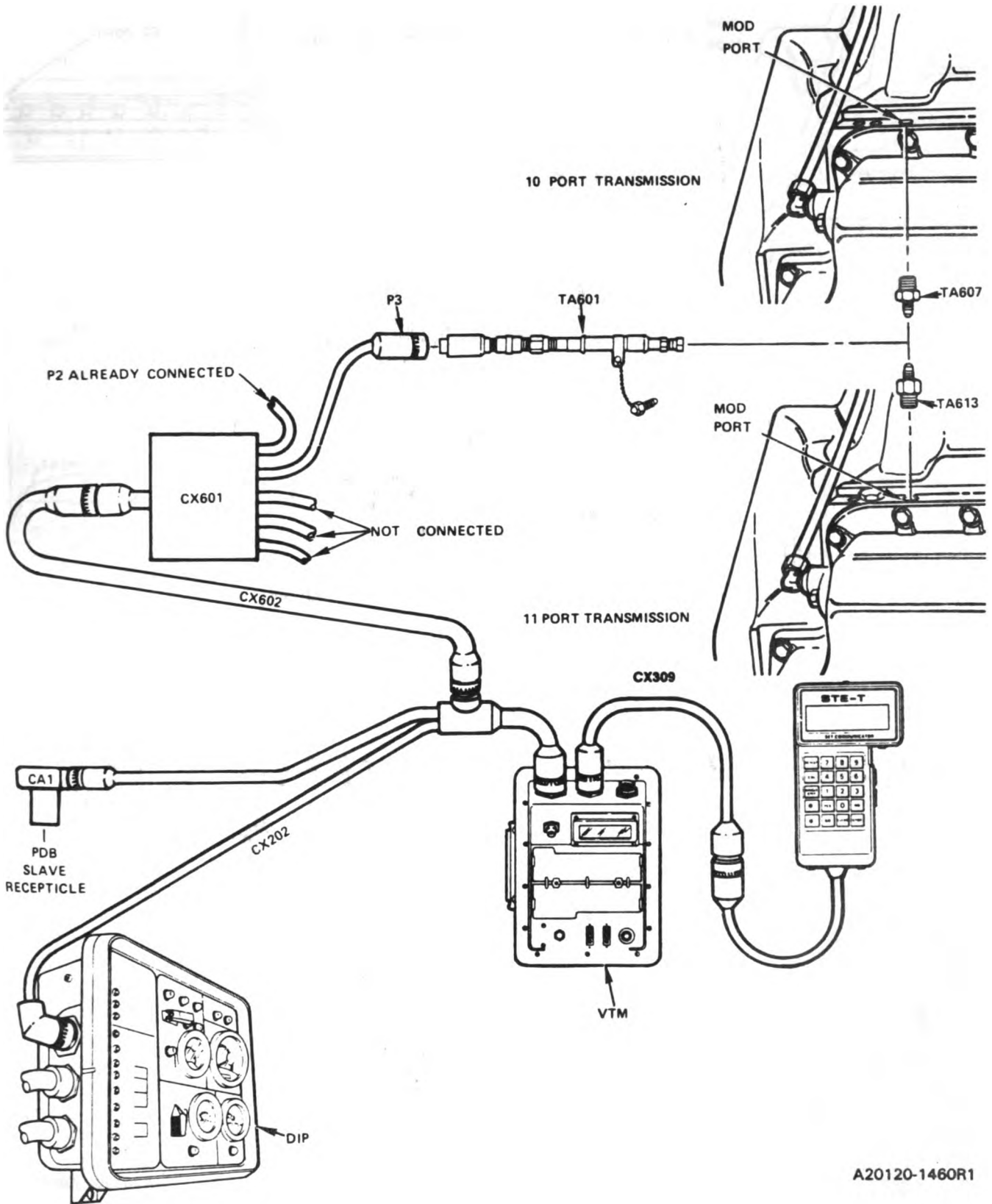
**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**



A20120-1468R1

**Figure 11-18. STE/M1 Hull Cable Hookup To G2 Port.**

**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**

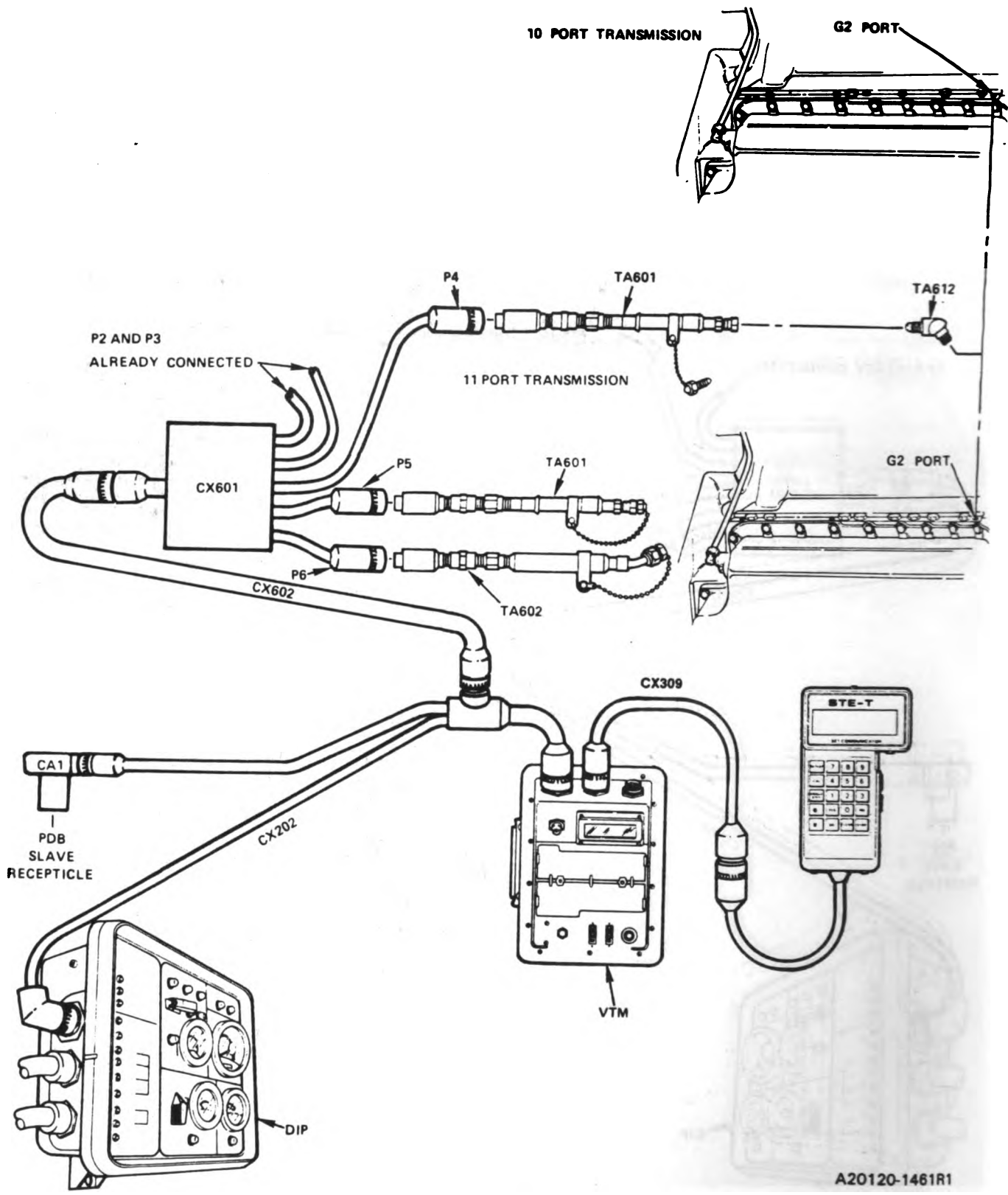


A20120-1460R1

**Figure 11-19. STE/M1 Hull Cable Hookup To MOD Port.  
Volume II  
Para. 11-3**

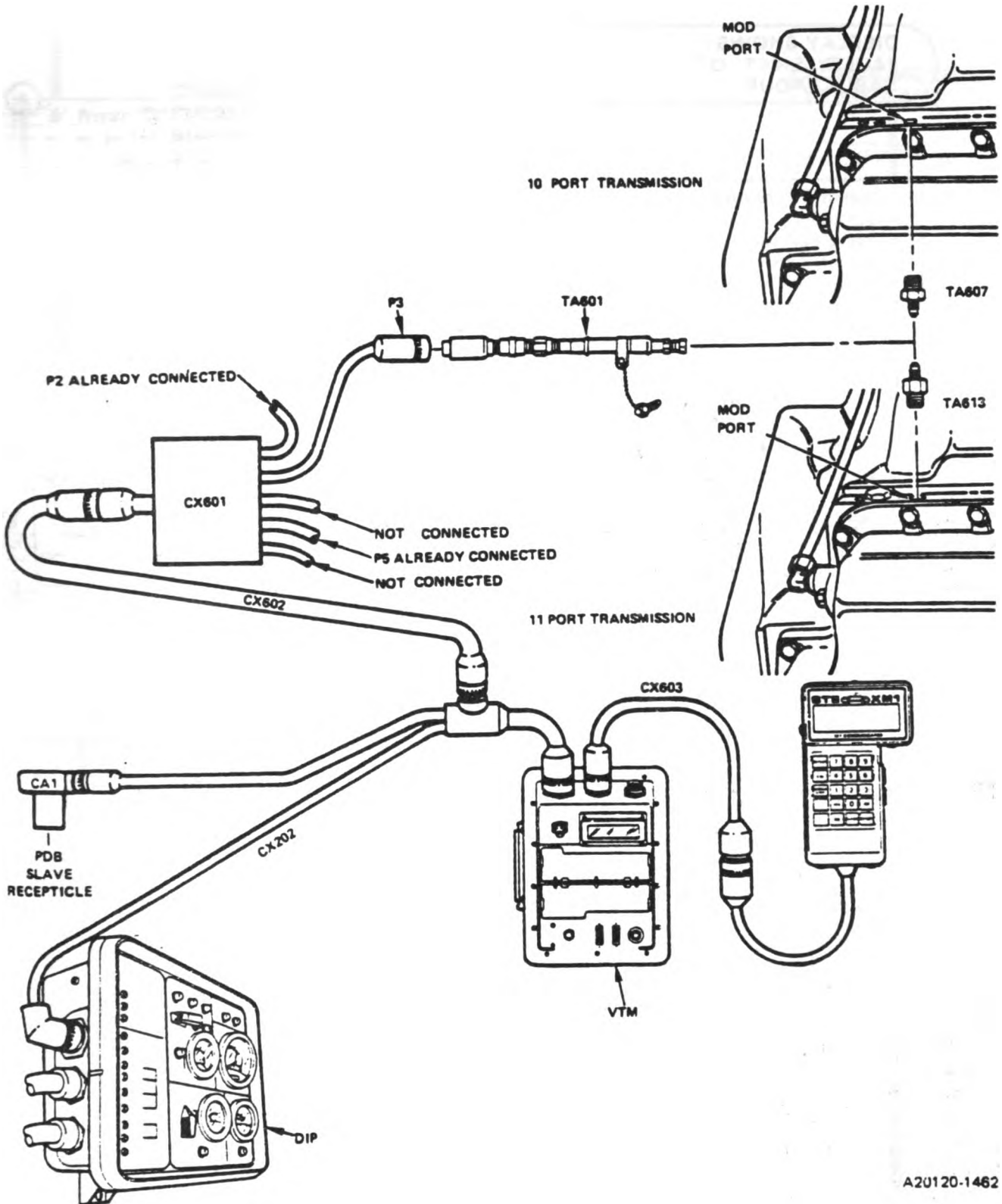
**Change 8 11-75**

**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**



*Figure 11-20. STE/M1 Hull Cable Hookup To G2 Port.*

**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**



A20120-1462

**Figure 11-21. STE/M1 Hull Cable Hookup To MOD Port.  
Volume II  
Para. 11-3**

**Change 5 11-77**



**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**

**DISPLAY SHOWS -  
FAULTY SHIFT OR  
CABLE GROUP**

**Equipment Condition:**

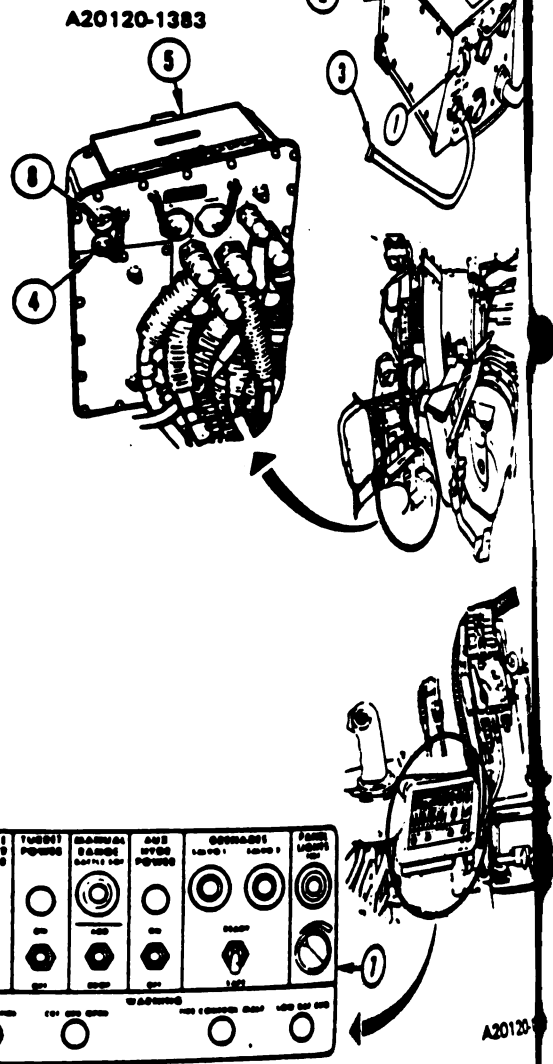
- Tank parked.
- Parking brake set.
- Engine shut down.
- Vehicle master power off.
- Hull networks box circuit breakers on.

110002  
110003  
110005  
110006  
110012  
110013  
110018  
110019  
110020  
110027  
110035

- 1
- Set PWR switch (1) on CIB (2) to OFF.
  - Disconnect CX308-P1 from CA-1.
    - See figure 11-3.
  - Connect CX308-P1 (3) to utility outlet (4) on turret networks box (5).

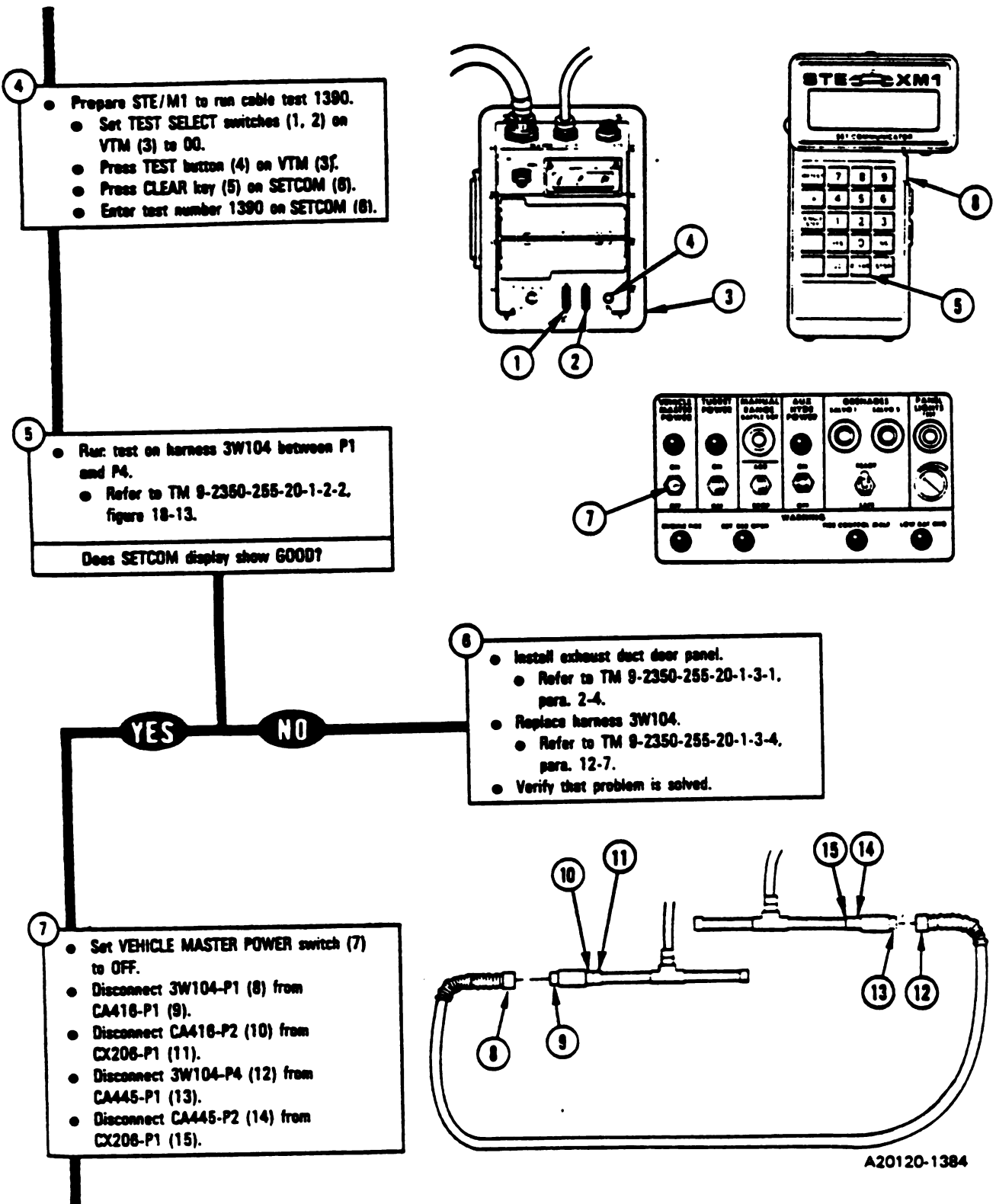
- 2
- Disconnect CA407-P1 from 3W104-TJ1.
    - See figure 11-3.
  - Disconnect CA407-P2 from CX208-P1.
    - See figure 11-3.
  - Disconnect 3W104-P4 from J1 on transmission.
    - See figure 11-55.
  - Disconnect 3W104-P1 from 2W105-J2.
    - See figure 11-53.

- 3
- Set VEHICLE MASTER POWER switch (6) on commander's control panel (7) to ON.
  - Set utility outlet switch (8) to ON.
  - Set PWR switch (1) on CIB (2) to ON.



*Figure 11-22 (Sheet 1 of 4)  
Volume II  
Para. 11-3*

**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**

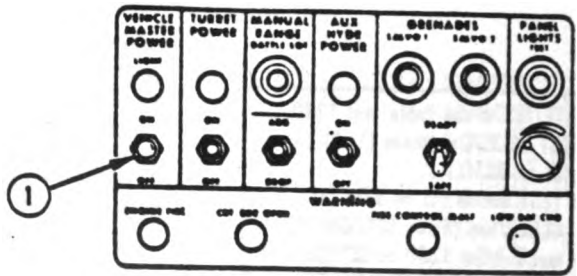


*Figure 11-22 (Sheet 2 of 4)  
Volume II  
Para. 11-3*

**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**

8

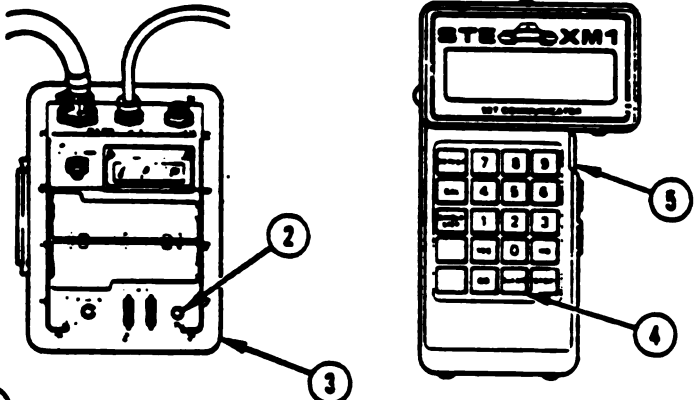
- Disconnect ZW105-P4 from ZW104-J1.
- See figure 11-52.
- Set VEHICLE MASTER POWER switch (1) to ON.
- Prepare STE/M1 to run cable test 1390.
  - Press TEST button (2) on VTM (3).
  - Press CLEAR key (4) on SETCOM (5).
  - Enter test number 1390 on SETCOM (5).



9

- Run test on harness ZW105 between J2 and P4.
- Refer to TM 9-2350-255-20-1-2-2, figure 19-13.

Does SETCOM display show GOOD?



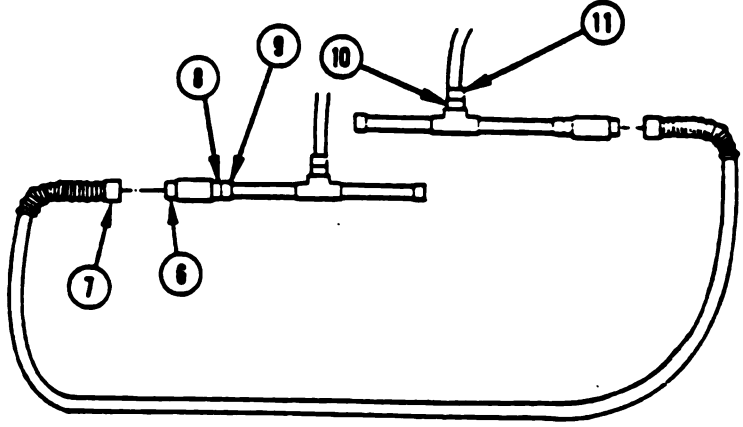
YES NO

10

- Connect 3W104-P4 to J1 on transmission.
- See figure 11-15.
- Install exhaust duct door panel.
- Refer to TM 9-2350-255-20-1-3-1, para. 2-4.
- Replace harness ZW105.
- Refer to TM 9-2350-255-20-1-3-4, para. 11-18.
- Verify that problem is solved.

11

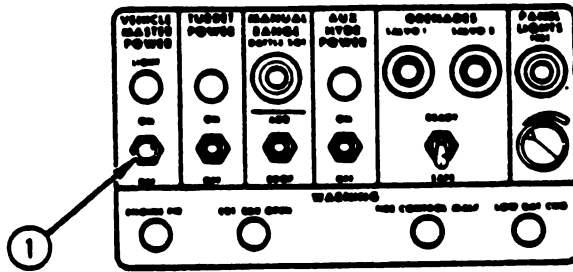
- Set VEHICLE MASTER POWER switch (1) to OFF.
- Disconnect CA415-P1 (8) from ZW105-J2 (7).
- Disconnect CA415-P2 (8) from CX206-P1 (9).
- Disconnect CX206-P3 (10) from CX305-P1 (11).



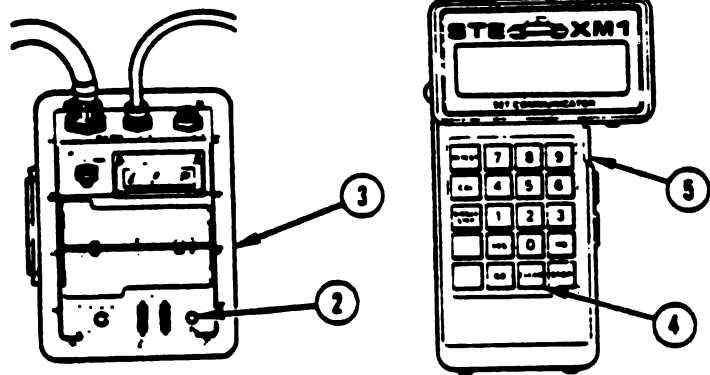
A20120-1385

*Figure 11-22 (Sheet 3 of 4)  
Volume II  
Para. 11-3*

- 12
- Disconnect ZW104-P7 from J1 on shift select assembly.
    - See figure 11-51.
  - Set VEHICLE MASTER POWER switch (1) to ON.
  - Prepare STE/M1 to run cable test 1390.
    - Press TEST button (2) on VTM (3).
    - Press CLEAR key (4) on SETCOM (5).
    - Enter test number 1390 on SETCOM (5).



- 13
- Run test on harness ZW104 between P7 and J1.
    - Refer to TM 9-2350-255-20-1-2-2, figure 18-13.
- Does SETCOM display show GOOD?



A20120-1386

- YES
- 14
- Connect ZW105-P4 to ZW104-J1.
    - See figure 11-52.
  - Connect ZW104-P4 to J1 on transmission.
    - See figure 11-55.
  - Install exhaust duct door panel.
    - Refer to TM 9-2350-255-20-1-3-1, para. 2-4.
  - Replace shift select assembly.
    - Refer to TM 9-2350-255-20-1-3-2, para. 6-4.
  - Verify that problem is solved.

- NO
- 15
- Connect 3W104-P4 to J1 on transmission.
    - See figure 11-55.
  - Install exhaust duct door panel.
    - Refer to TM 9-2350-255-20-1-3-1, para. 2-4.
  - Replace harness ZW104.
    - Refer to TM 9-2350-255-20-1-3-4, para. 11-18.
  - Verify that problem is solved.

Figure 11-22 (Sheet 4 of 4)  
Volume II  
Para. 11-3

**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**

**DISPLAY SHOWS -  
FAULTY SHIFT OR  
CABLE GROUP**

**Additional  
Test Equipment/Special Tools:**

- Breakout Box Test Kit, 12311088

**Equipment Conditions:**

- Tank parked.
- Parking brake set.
- Engine shut down.
- Vehicle master power off.
- Hull network box circuit breakers on.

**1**

- Disconnect CX304-P2 from CIB-J1.
  - See figure 11-3.
- Connect CX304-P2 (1) to breakout box (2).
- Disconnect CX304-P1 from CX208-P3.
  - See figure 11-3.
- Connect CX304-P1 (3) to CX207-P3 (4).

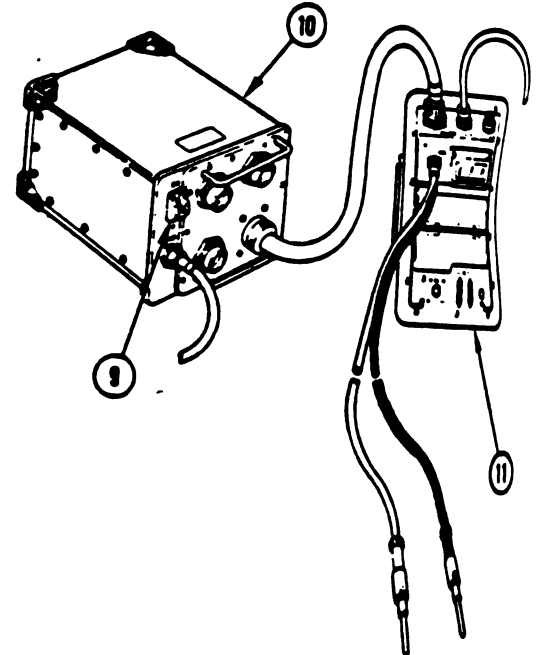
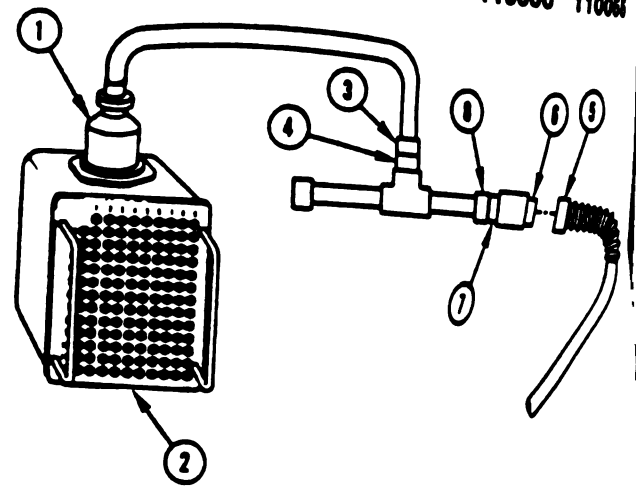
**2**

- Disconnect ZW104-P7 from J1 on shift select assembly.
  - See figure 11-51.
- Connect ZW104-P7 (5) to CA535-P1 (8).
- Connect CA535-P2 (7) to CX207-P1 (8).

**3**

- Change control from SETCOM to VTM.
  - Set PWR switch (9) on CIB (10) to OFF to reset VTM (11).
  - Set PWR switch (9) to ON.
- Prepare VTM for measuring resistance between 0 and 1500 ohms.
- Refer to TM 9-4910-572-14&P, Volume 1, Appendix D.

110048 110061  
110047 110062  
110048 110062  
110048 110064  
110050 110066



A20120-1414

*Figure 11-23 (Sheet 1 of 4)  
Volume II  
Para. 11-3*

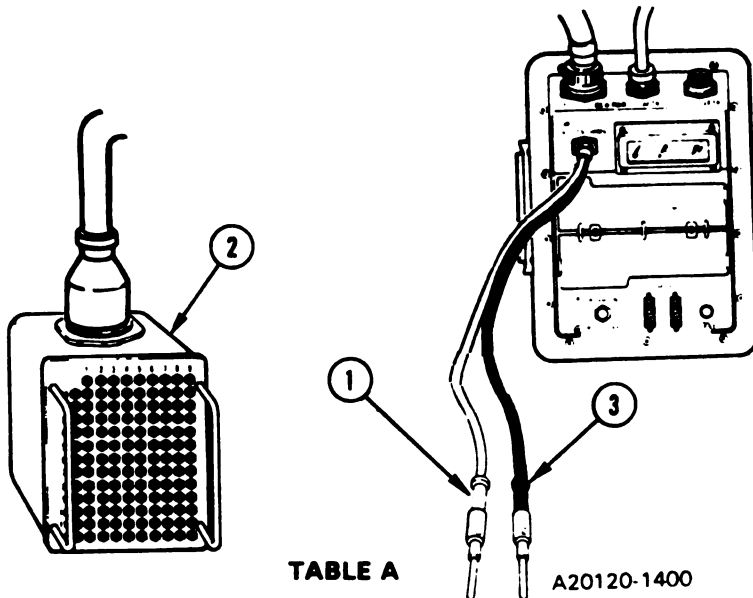
**4**

**NOTE**

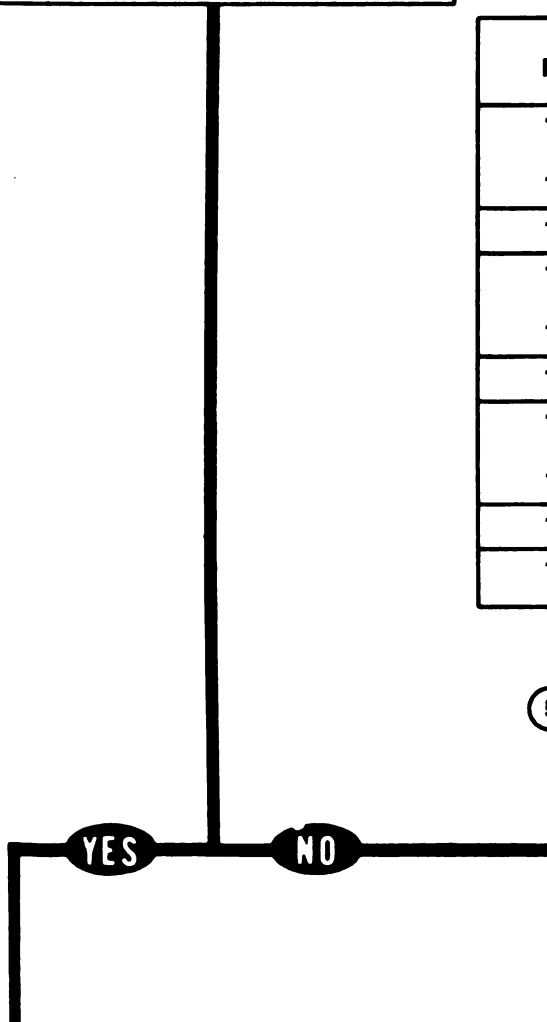
If VTM display shows less than 5 (short), leave test probes connected and go immediately to block 6.

- Test for a short between test points on breakout box listed in table A for fault number being tested.
- Connect red test probe (1) to test point on breakout box (2) listed in table A.
- Connect black test probe (3) to test point on breakout box (2) listed in table A.

Does VTM display show less than 5 (short) at any test point?



Fault Number	Red Test Probe	Black Test Probe
110046 OR 110052	8	7, 9 through 24
110047	9	7, 8, 10 through 24
110048 OR 110051	15	7 through 14, 16 through 24
110049	7	8 through 24
110050 OR 110053	10	7 through 9, 11 through 24
110054	11	7 through 10, 12 through 24
110055	14	7 through 13, 15 through 24

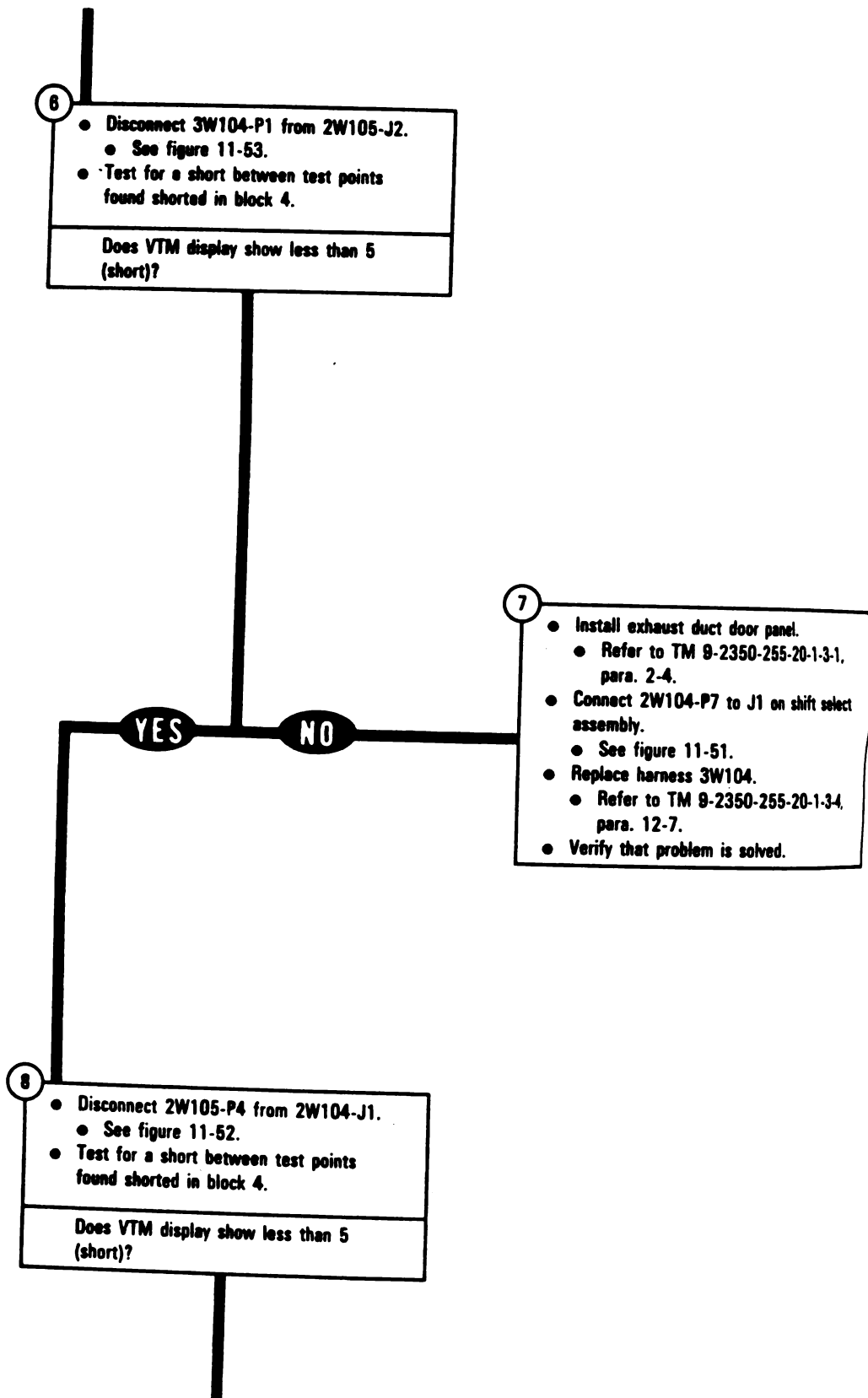


**5**

- Connect 3W104-P4 to J1 on transmission.
  - See figure 11-55.
- Install exhaust duct door panel.
  - Refer to TM 9-2350-255-20-1-3-1, para. 2-4.
- Replace shift select assembly.
  - Refer to TM 9-2350-255-20-1-3-2, para. 8-4.
- Verify that problem is solved.

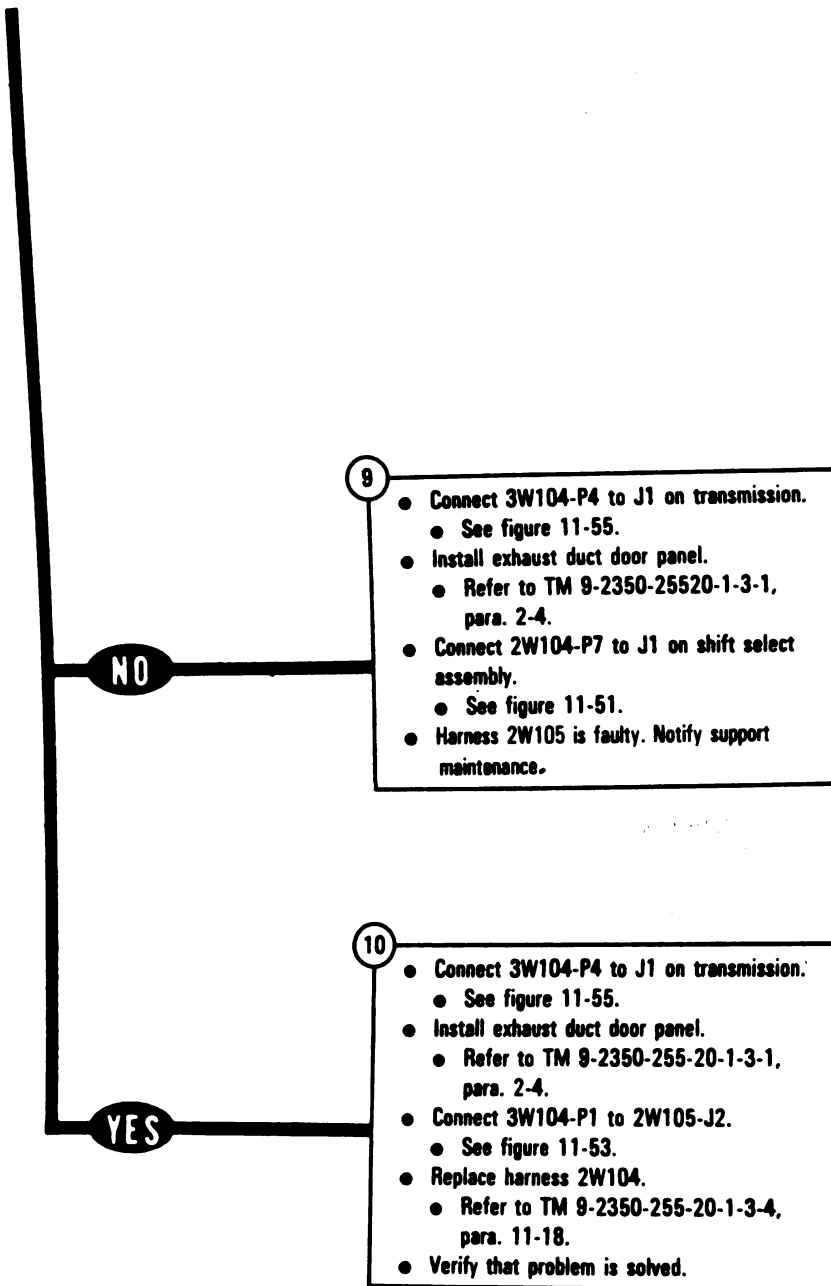
*Figure 11-23 (Sheet 2 of 4)*  
**Volume II**  
**Para. 11-3**

**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**



*Figure 11-23 (Sheet 3 of 4)*  
**Volume II**  
**Para. 11-3**

**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**



*Figure 11-23 (Sheet 4 of 4)*  
**Volume II  
Para. 11-3**

**Change 8 11-85**



**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**

**DISPLAY SHOWS -  
FAULTY TRANSMISSION  
OR 3W104**

• 110011  
110034

**Additional  
Test Equipment/Special Tools:**

- Breakout Box Tool Kit, 12311086

**Equipment Condition:**

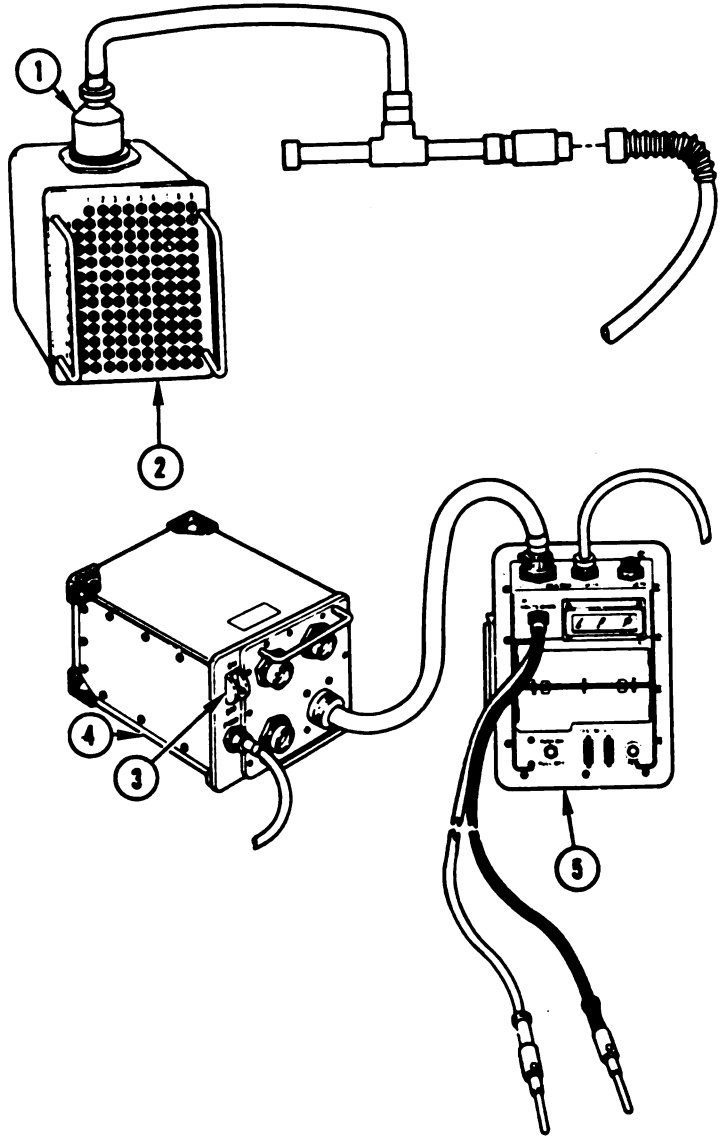
- Tank parked.
- Parking brake set.
- Engine shut down.
- Vehicle master power off.
- Transmission shift control set to N.
- Hull networks box circuit breakers on.

1

- Disconnect CX304-P2 from CIB-J1.
- See figure 11-3.
- Connect CX304-P2 (1) to breakout box (2).
- Disconnect 3W104-P4 from J1 on transmission.
- See figure 11-55.

2

- Change control from SETCOM to VTM.
- Set PWR switch (3) on CIB (4) to OFF to reset VTM (5).
- Set PWR switch (3) to ON.
- Prepare VTM for measuring resistance between 0 and 1500 ohms.
- Refer to TM 9-4910-572-14&P, Volume 1, Appendix D.



A20120-1107

*Figure 11-24 (Sheet 1 of 2)  
Volume II  
Para. 11-3*

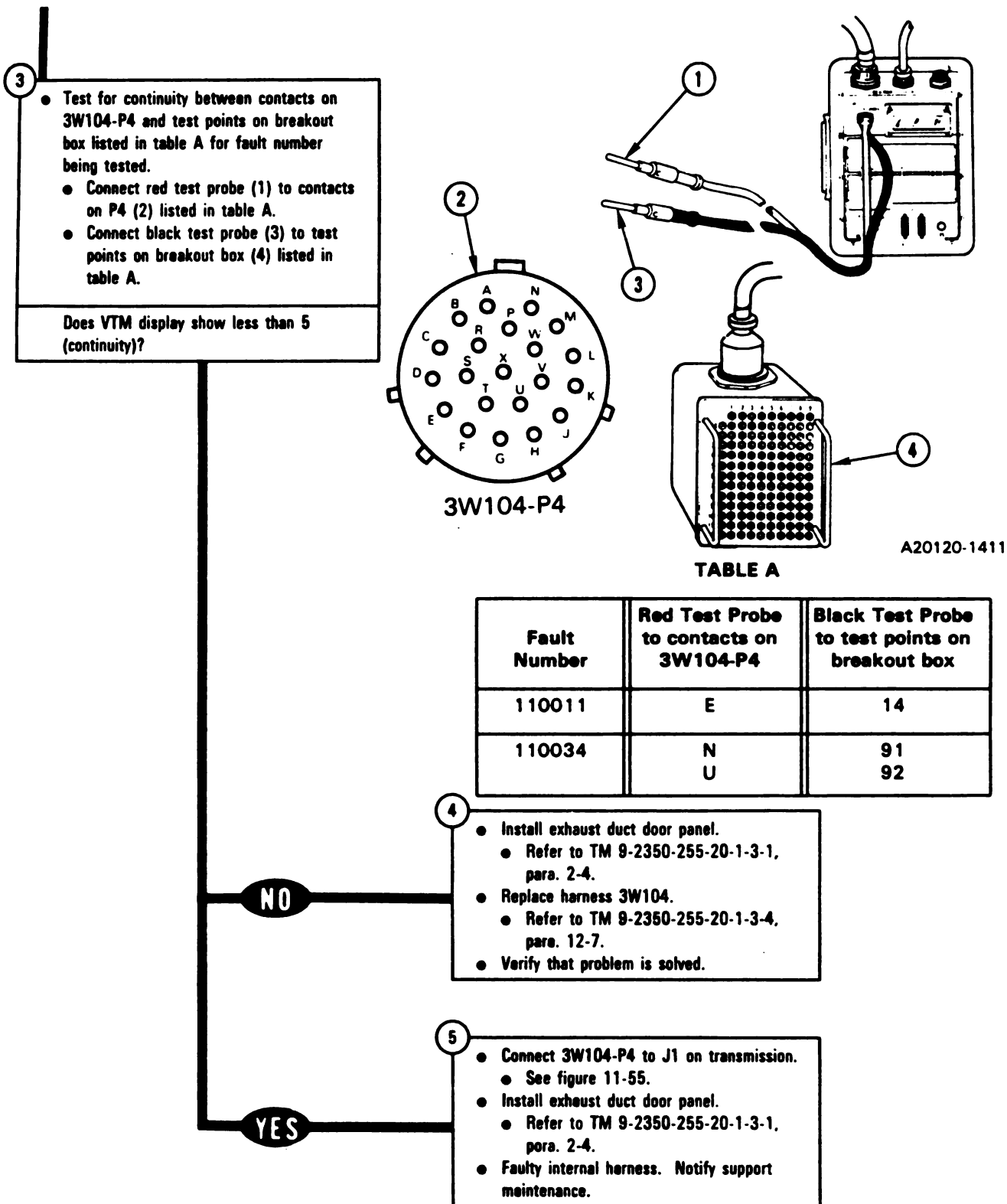


Figure 11-24 (Sheet 2 of 2)  
Volume II  
Para. 11-3

DIS  
FA  
CA

**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**

**HOWS -  
LIFT OR  
DUP**

• 110031  
110032  
110033

**ent/Special Tools:**  
Tool Kit, 12311066

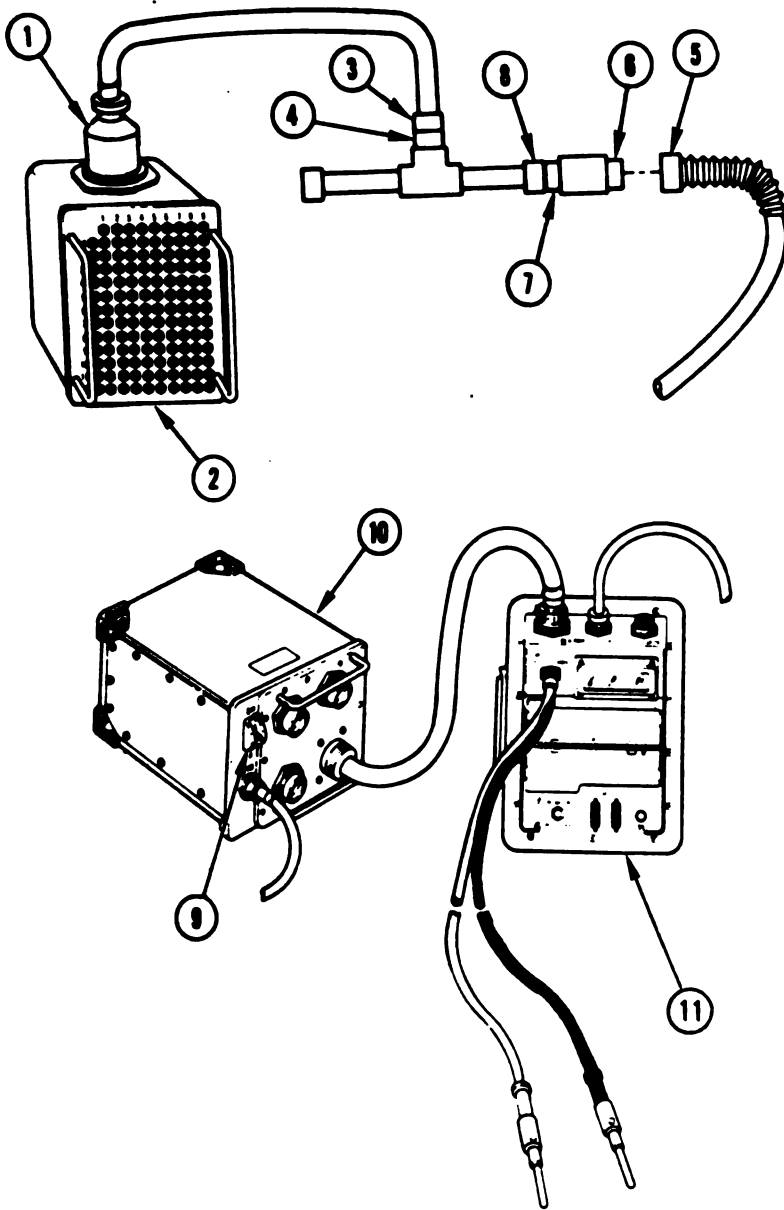
**Condition:**

ake set.  
down.  
ster power off.  
on shift control set to N.  
ks box circuit breakers on.

CX304-P2 from CIB-J1.  
ure 11-3.  
CX304-P2 (1) to breakout box (2).  
CX304-P1 from CX307-P3.  
ure 11-3.  
CX304-P1 (3) to CX308-P3 (4).

2W104-P7 from J1 on shift  
embly.  
ure 11-51.  
W104-P7 (5) to CA535-P1 (8).  
A535-P2 (7) to CX308-P1 (8).

ontrol from SETCOM to VTM.  
R switch (9) on CIB (10) to  
reset VTM (11).  
R switch (9) to ON.  
M for measuring resistance  
and 1500 ohms.  
o TM 9-4910-572-14&P,  
1, Appendix D.

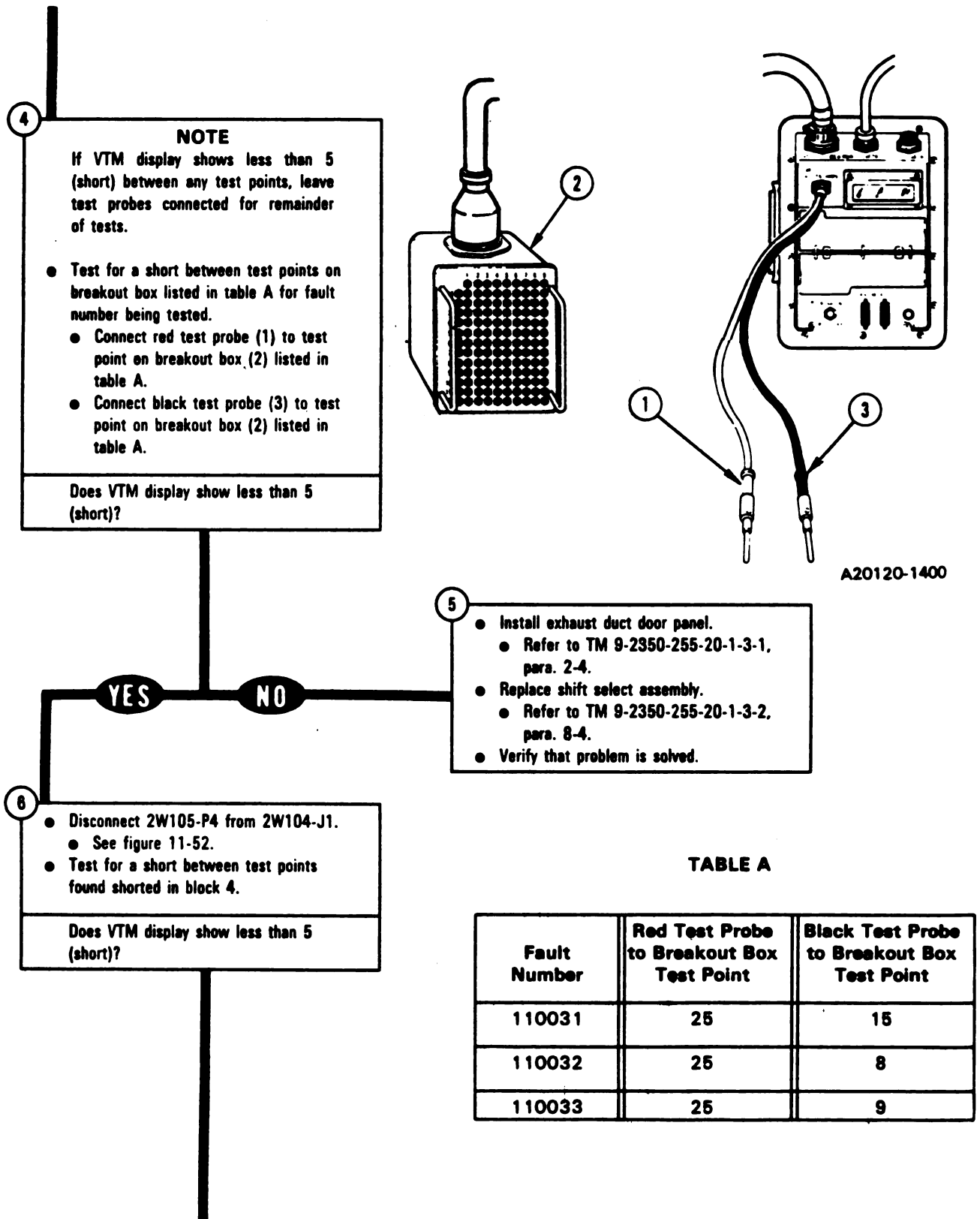


A20120-1414

**Figure 11-27 (Sheet 1 of 3)  
Volume II  
Para. 11-3**

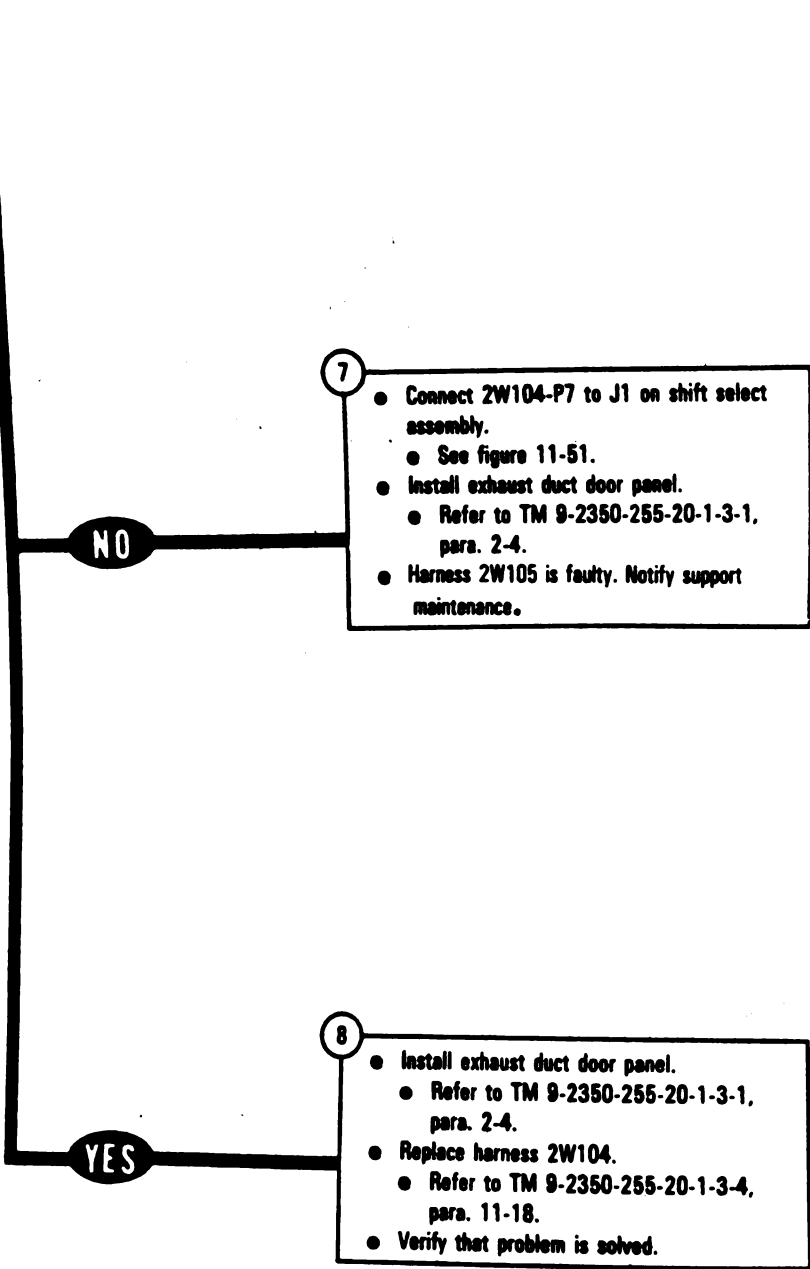
**Change 8 11-95**

**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**



*Figure 11-27 (Sheet 2 of 3)*  
**Volume II  
Para. 11-3**

**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**



*Figure 11-27 (Sheet 3 of 3)*  
**Volume II  
Para. 11-3**

**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**

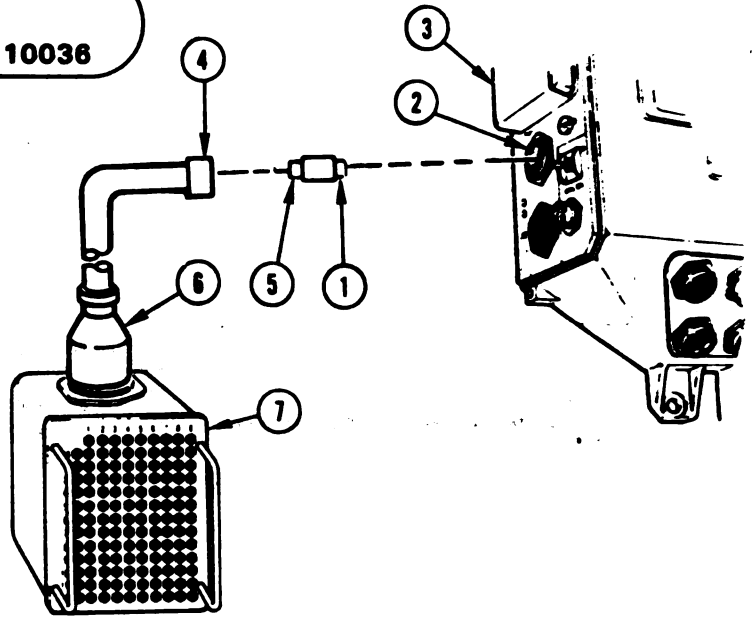
**DISPLAY SHOWS -  
FAULTY SHIFT, HNB OR  
CABLE GROUP** 110036

**Additional  
Test Equipment/Special Tools:**

- Breakout Box Tool Kit, 12311086

**Equipment Condition:**

- Tank parked.
- Parking brake set.
- Engine shut down.
- Vehicle master power off.
- Hull networks box circuit breakers on.

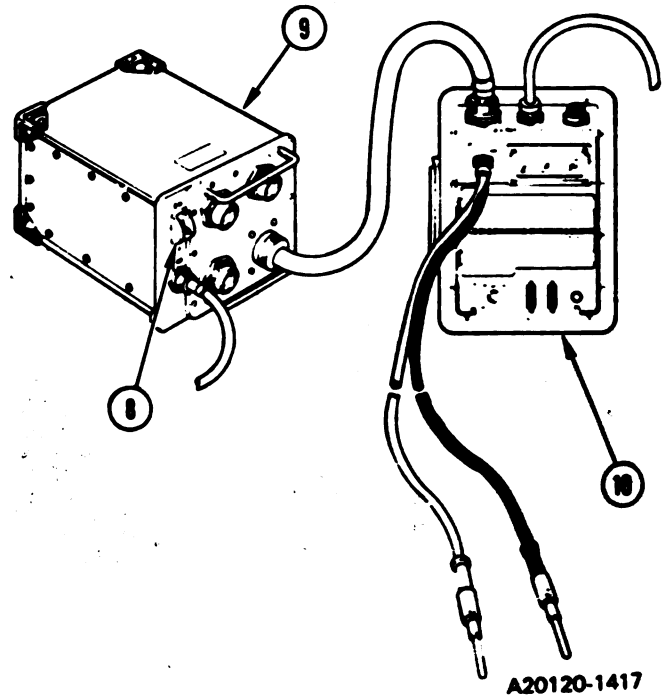


**1**

- Disconnect 2W105-P1 from J2 on hull networks box.
  - See figure 11-52.
- Connect CA807-P2 (1) to TJ1 (2) on hull networks box (3).
- Connect CX305-P1 (4) to CA807-P1 (5).
- Connect CX305-P2 (6) to breakout box (7).
- Install exhaust duct door panel.
  - Refer to TM 9-2350-255-20-1-3-1, para. 2-4.

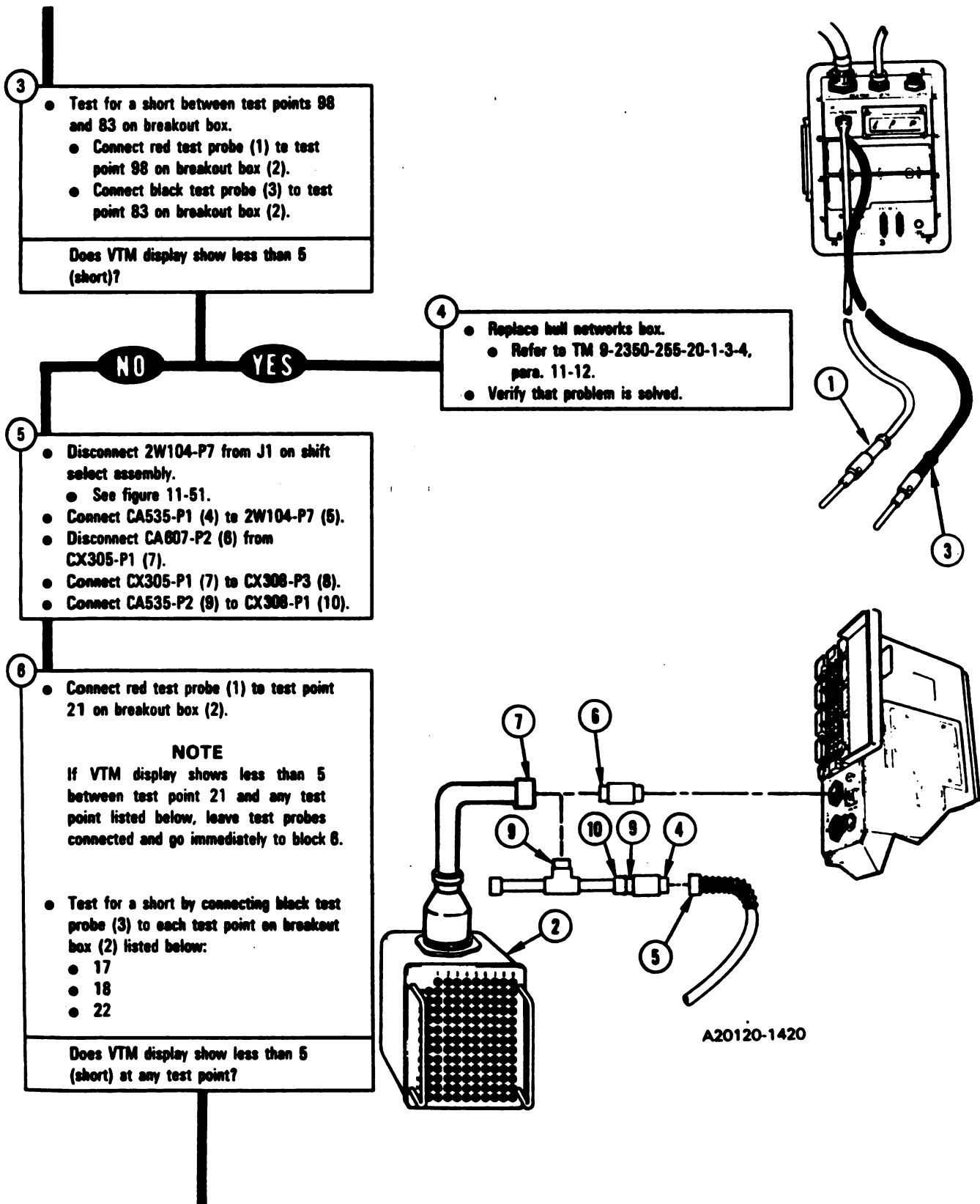
**2**

- Change control from SETCOM to VTM.
  - Set PWR switch (8) on CIB (9) to OFF to reset VTM (10).
  - Set PWR switch (8) to ON.
- Prepare VTM for measuring resistance between 0 and 1500 ohms.
  - Refer to TM 9-4910-572-14&P, Volume 1, Appendix D.



A20120-1417

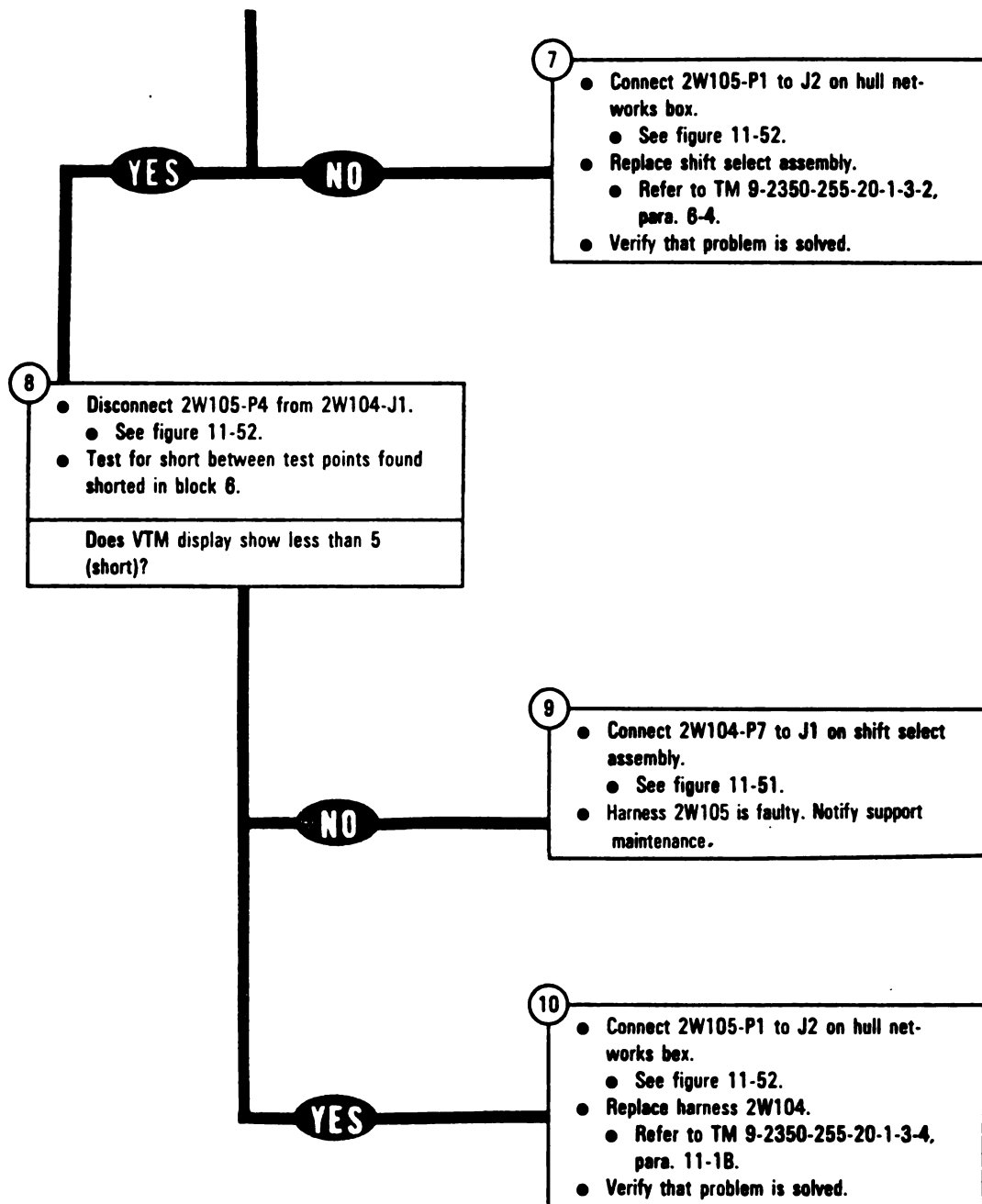
*Figure 11-28 (Sheet 1 of 3)  
Volume II  
Para. 11-3*



*Figure 11-28 (Sheet 2 of 3)  
Volume II  
Para. 11-3*



**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**



*Figure 11-28 (Sheet 3 of 3)*  
**Volume II  
Para. 11-3**

**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**

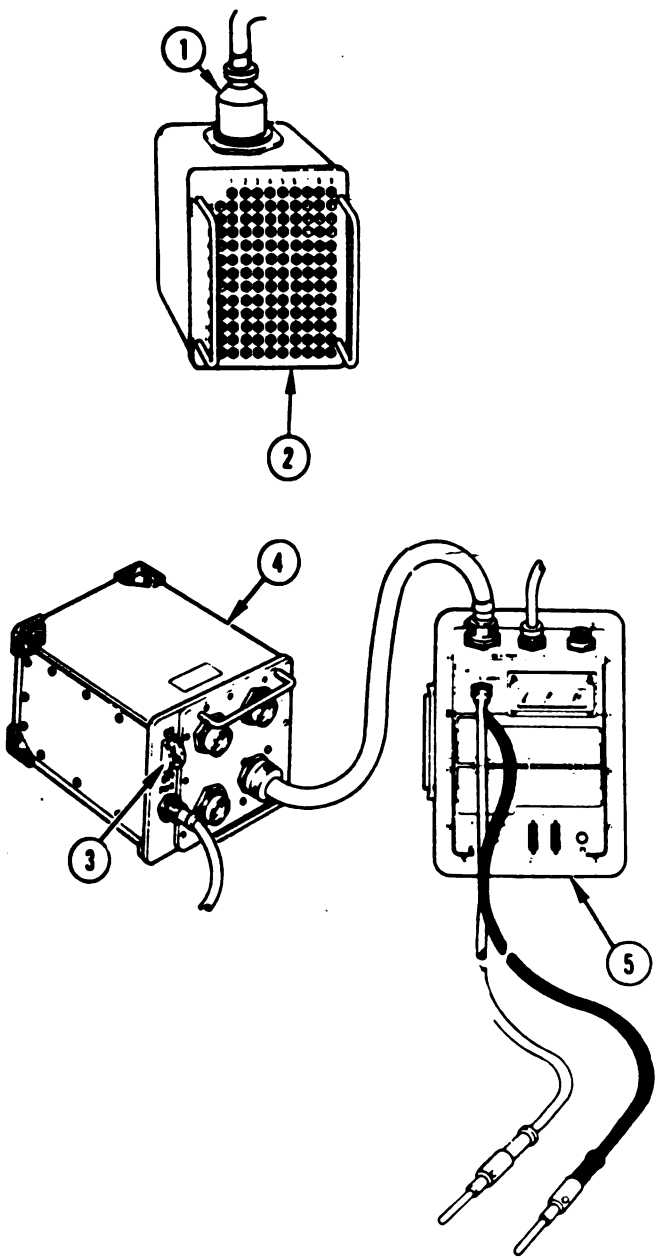
**WS -  
4, 3S105** **110057**

**Special Tools:  
Kit, 12311088**

**Condition:**  
power off.  
box circuit breakers on.

**04-P2 from CIB-J1.  
11-3.  
P2 (1) to breakout box (2).**

**from SETCOM to VTM.  
Switch (3) on CIB (4) to OFF  
(5).  
Switch (3) to ON.  
measuring resistance  
1500 ohms.  
9-4910-572-14&P,  
Appendix D.**

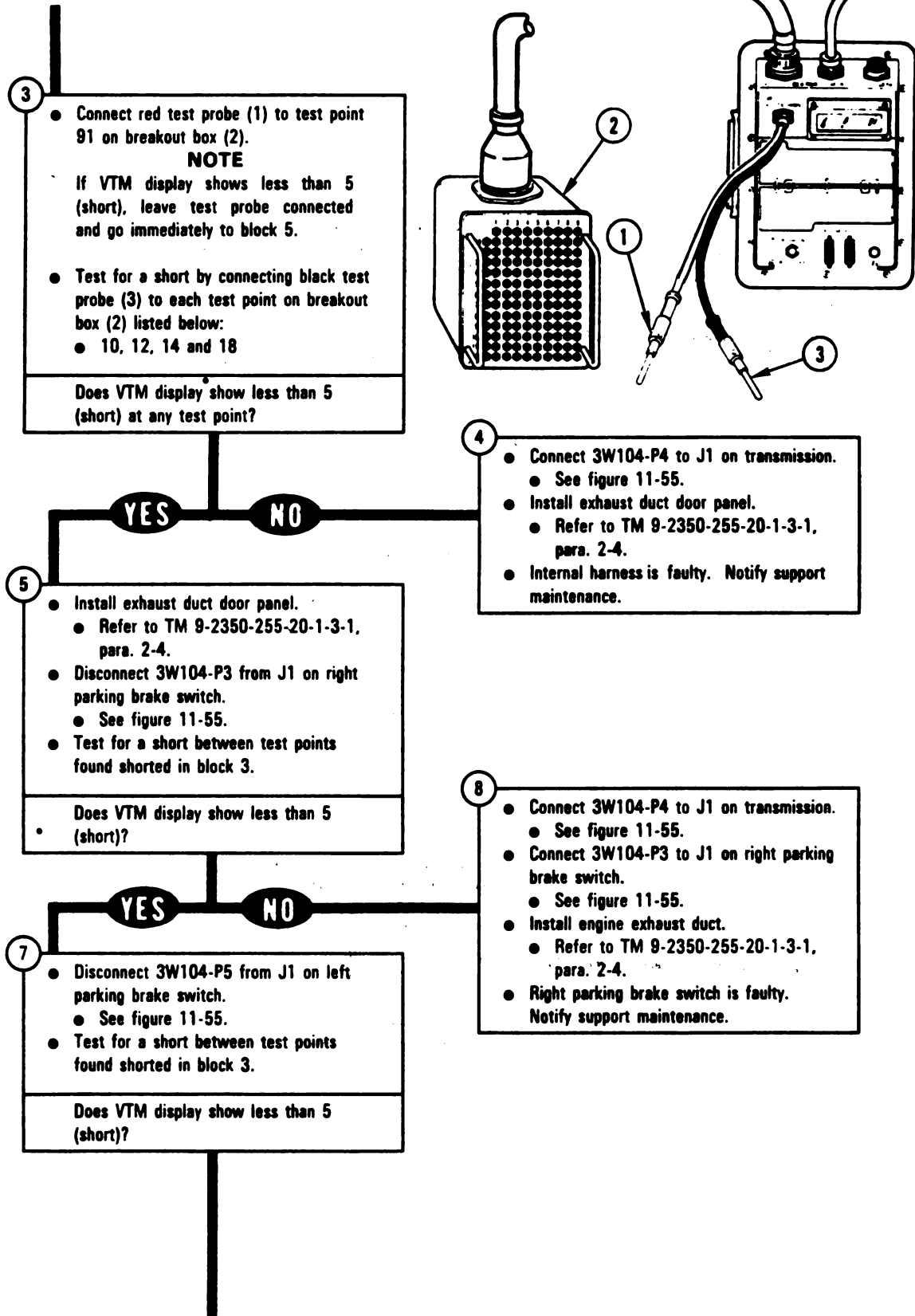


A20120-1427

**Figure 11-29 (Sheet 1 of 3)  
Volume II  
Para. 11-3**

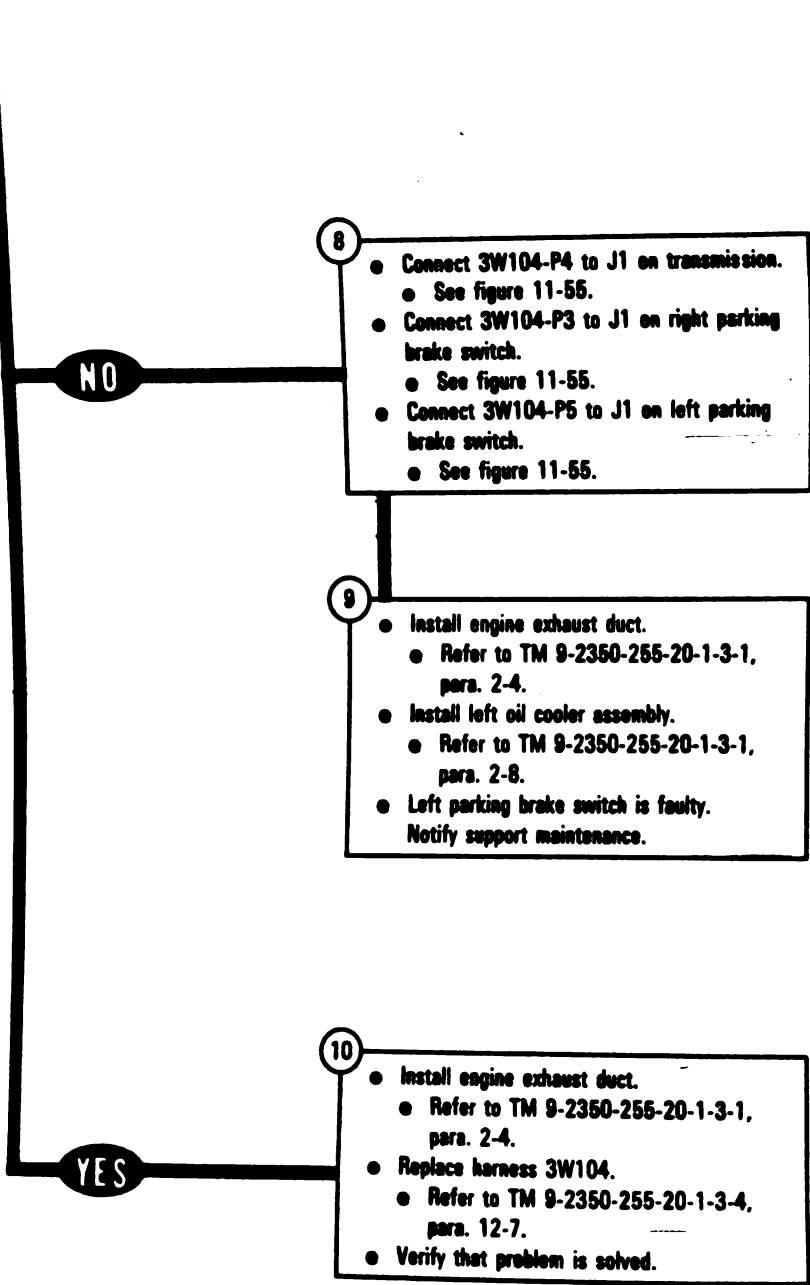
**Change 6 11-101**

**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**



*Figure 11-29 (Sheet 2 of 3)  
Volume II  
Para. 11-3*

**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**



*Figure 11-29 (Sheet 3 of 3)*  
**Volume II**  
**Para. 11-3**

**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**

**DISPLAY SHOWS -  
FAULTY SHIFT, HNB OR  
CABLE GROUP**

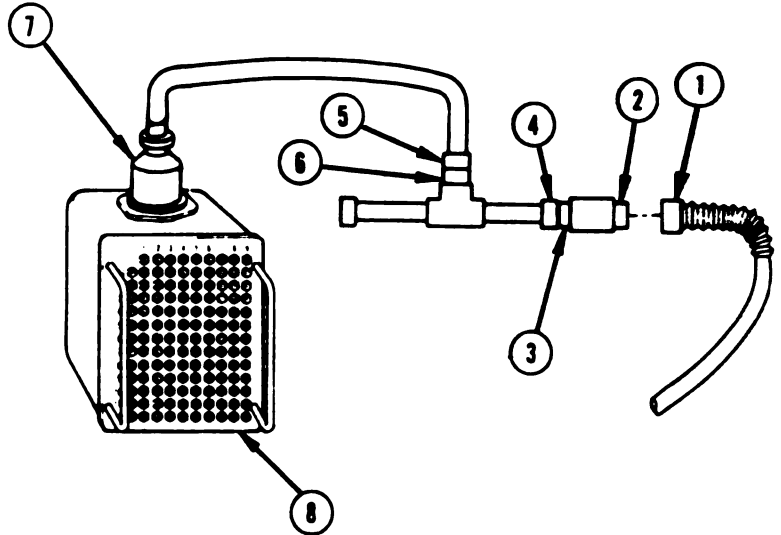
**110042**

**Additional  
Test Equipment/Special Tools:**

- Breakout Box Tool Kit, 12311086

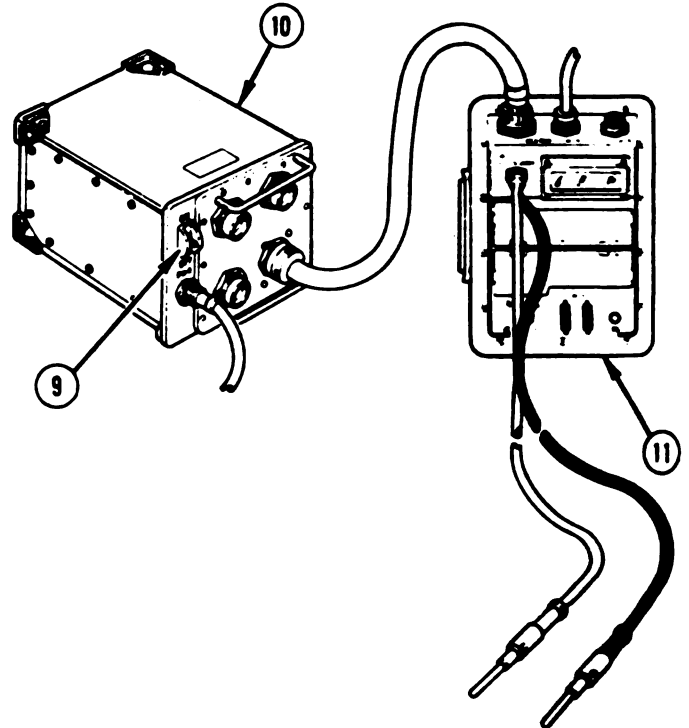
**Equipment Condition:**

- Tank parked.
- Parking brake set.
- Engine shut down.
- Vehicle master power off.
- Transmission shift control set to N.
- Hull networks box circuit breakers on.



- 1
- Disconnect 2W104-P7 from J1 on shift select assembly.
    - See figure 11-51.
  - Connect 2W104-P7 (1) to CA535-P1 (2).
  - Connect CA535-P2 (3) to CX308-P1 (4).

- 2
- Disconnect CX304-P1 from CX307-P3.
    - See figure 11-3.
  - Connect CX304-P1 (5) to CX308-P3 (6).
  - Disconnect CX304-P2 from CIB-J1.
    - See figure 11-3.
  - Connect CX304-P2 (7) to breakout box (8).
  - Install exhaust duct door panel.
    - Refe: to TM 9-2350-255-20-1-3-1, para. 2-4.

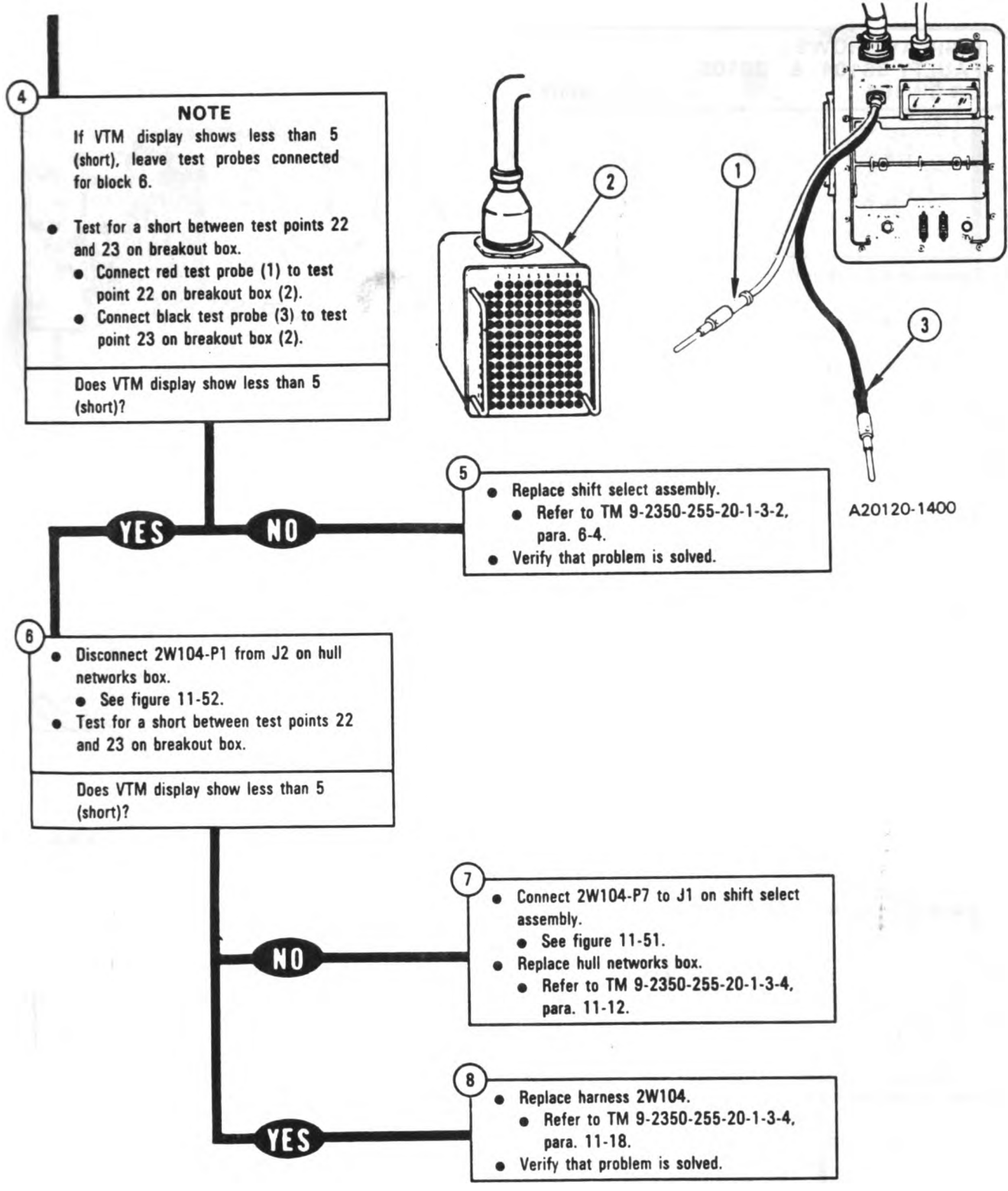


- 3
- Change control from SETCOM to VTM.
    - Set PWR switch (9) on CIB (10) to OFF to reset VTM (11).
    - Set PWR switch (9) to ON.
  - Prepare VTM for measuring resistance between 0 and 1500 ohms.
    - Refer to TM 9-4910-572-14&P, Volume 1, Appendix D.

**A20120-1422**

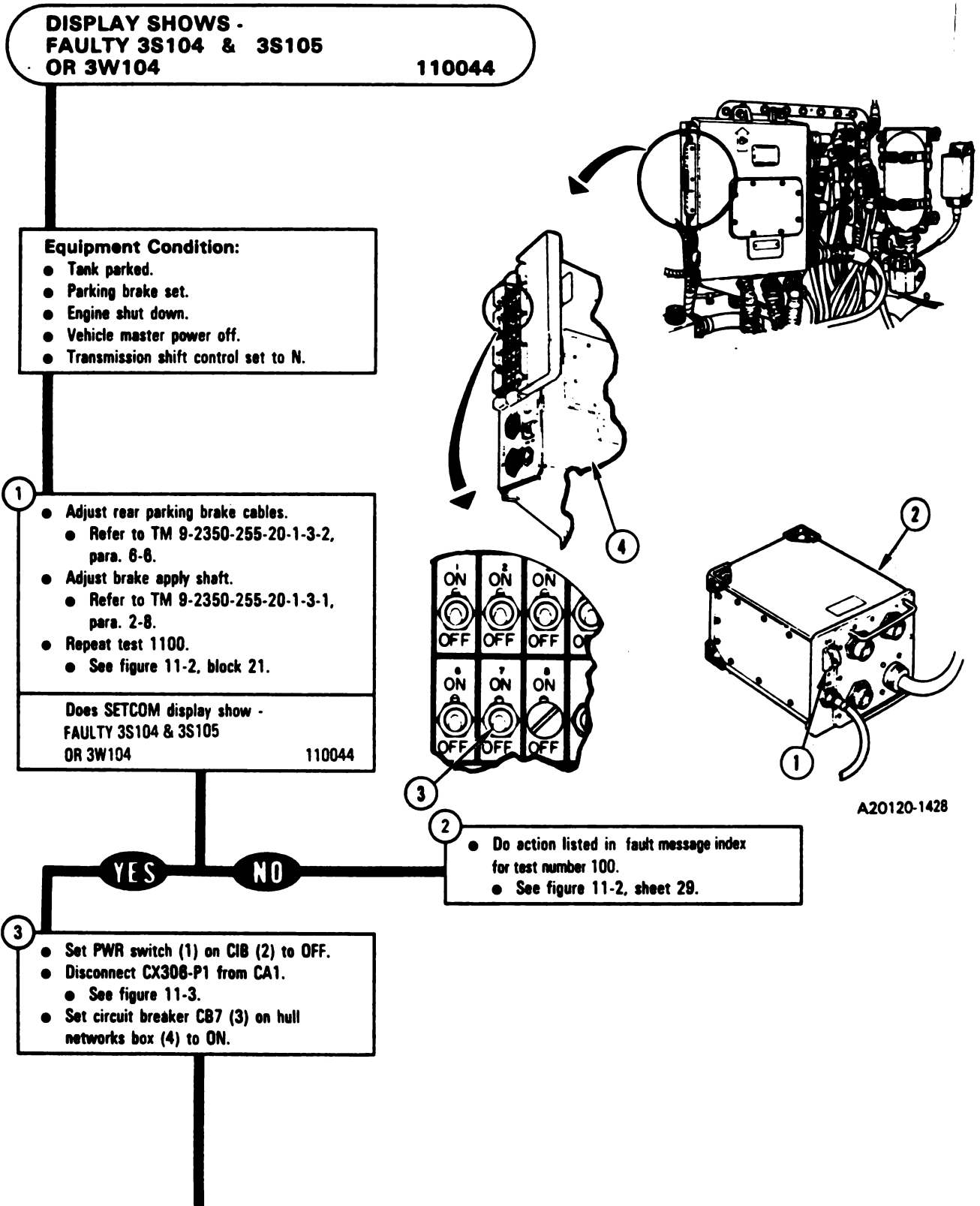
*Figure 11-30 (Sheet 1 of 2)  
Volume II  
Para. 11-3*

**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**



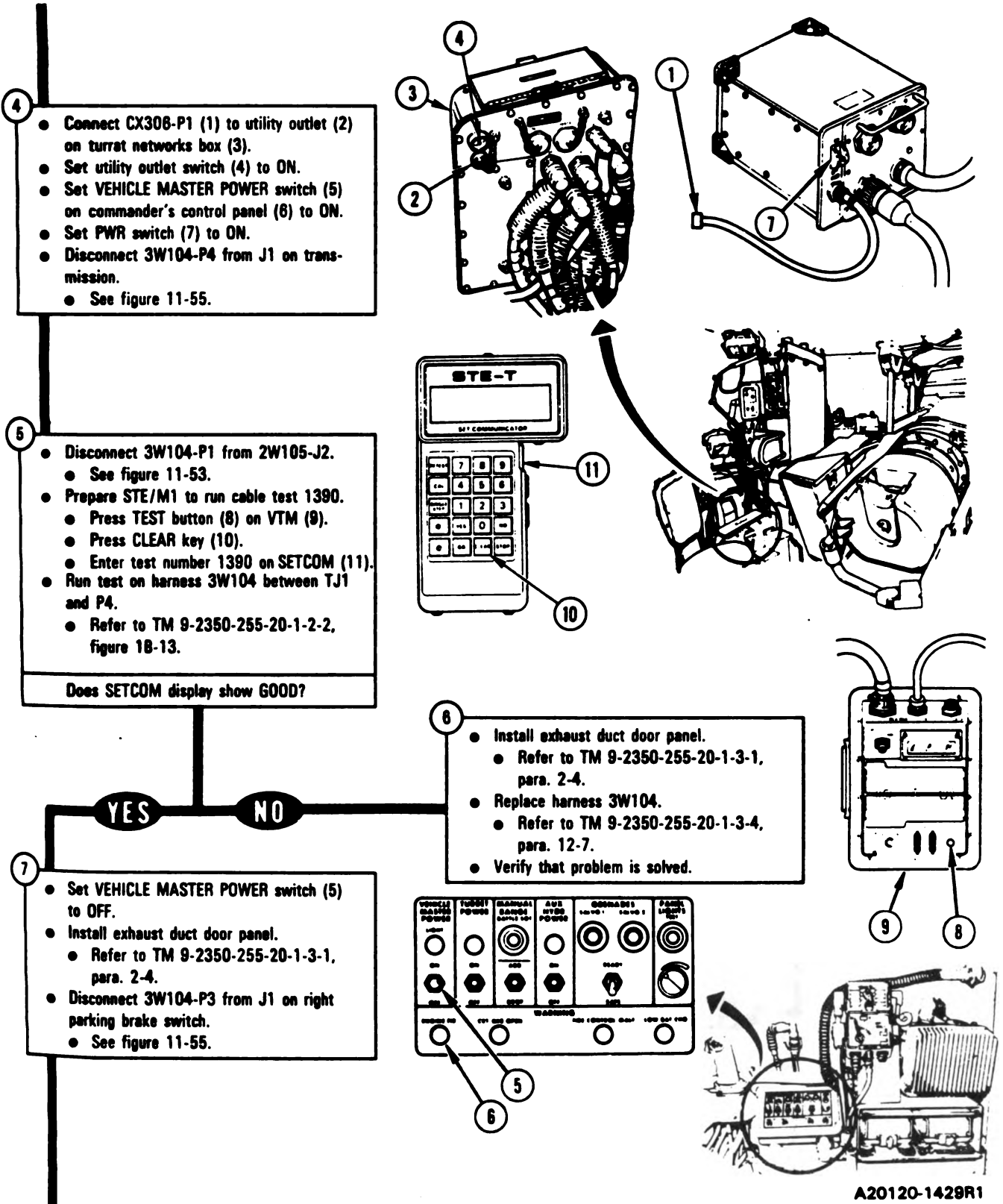
**Figure 11-30 (Sheet 2 of 2)  
Volume II  
Para. 11-3**

**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**



*Figure 11-31 (Sheet 1 of 3)  
Volume II  
Para. 11-3*

**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**

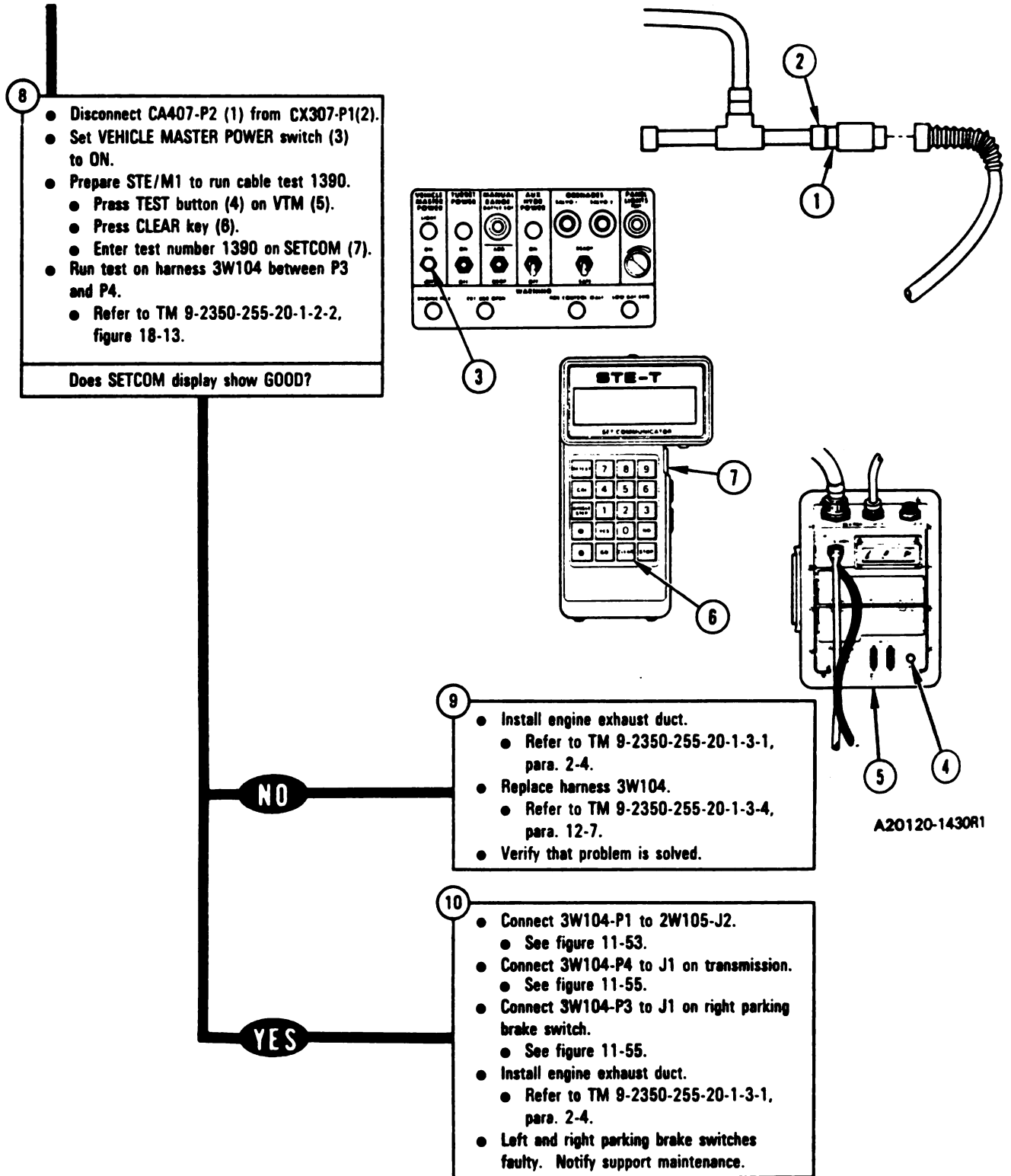


*Figure 11-31 (Sheet 2 of 3)  
Volume II  
Para. 11-3*

A20120-1429R1



**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**



*Figure 11-31 (Sheet 3 of 3)  
Volume II  
Para. 11-3*

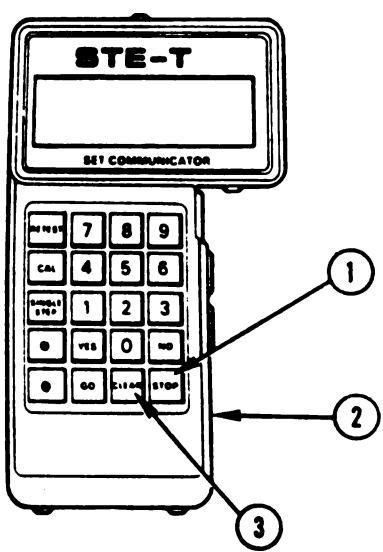
**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**

2W104, 110108

Condition:  
power off.  
circuit breakers on.

duct door panel.  
9-2350-255-20-1-3-1,  
04-P1 from CA807-P2,  
1-4.  
36-P1 from J1 on shift  
11-6.  
36-P2 from CX308-P2.  
11-6.

05-P4 from 2W104-J1.  
1-52.  
to run cable test 1390.  
key (1) on SETCOM (2).  
key (3).  
number 1390 on SETCOM (2).  
less 2W104 between J1  
9-2350-255-20-1-2-2,  
display show GOOD?



A20220-011R2

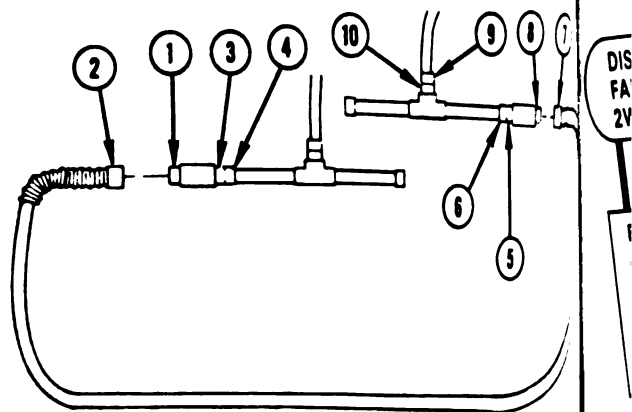
- 3
- Replace harness 2W104.
  - Refer to TM 9-2350-255-20-1-3-4, para. 11-18.
  - Verify that problem is solved.

NO

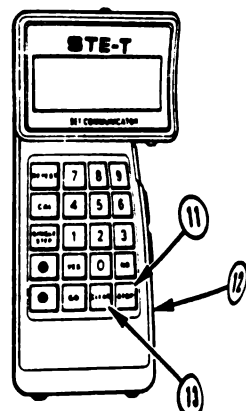
*Figure 11-32 (Sheet 1 of 2)  
Volume II  
Para. 11-3*

**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**

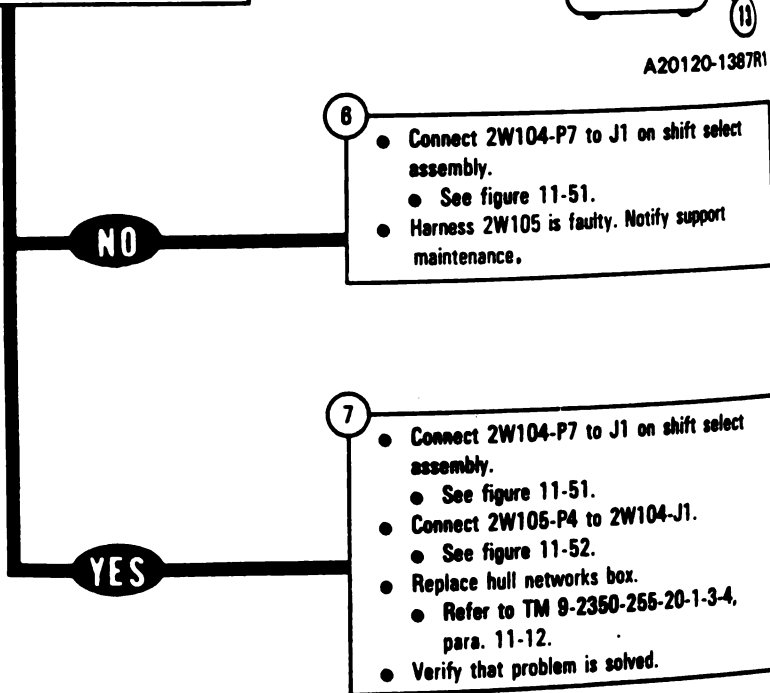
- 4
- Disconnect CA424-P1 (1) from 2W104-J1 (2).
  - Disconnect CA424-P2 (3) from CX307-P1 (4).
  - Disconnect CA535-P2 (5) from CX308-P1 (8).
  - Disconnect 2W104-P7 (7) from CA535-P1 (8).
  - Disconnect CX304-P1 (9) from CX308-P3 (10).



- 5
- Disconnect 2W105-P1 from J2 on hull networks box.
    - See figure 11-52.
  - Prepare STE/M1 to run cable test 1390.
    - Press STOP key (11) on SETCOM (12).
    - Press CLEAR key (13).
    - Enter test number 1390 on SETCOM (12).
  - Run test on harness 2W105 between P1 and P4.
    - Refer to TM 9-2350-255-20-1-2-2, figure 18-13.
- Does SETCOM display show GOOD?



A20120-1387R1



*Figure 11-32 (Sheet 2 of 2)*  
**Volume II  
Para. 11-3**

**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**

**OWS -  
3 OR**

**•110110  
110112**

**Condition:**  
set.  
own.  
power off.  
box circuit breakers on.

t duct door panel.  
TM 9-2350-255-20-1-3-1,  
CX304-P1 from CA607-P2.  
e 11-4.  
A536-P1 from J1 on shift  
bly.  
e 11-8.  
A536-P2 from CX308-P2.  
e 11-8.  
W104-P1 from J8 on hull  
x.  
e 11-52.

/M1 to run cable test 1390.  
OP key (1) on SETCOM (2).  
EAR key (3).  
t number 1390 on SETCOM (2).  
harness 2W104 between P1

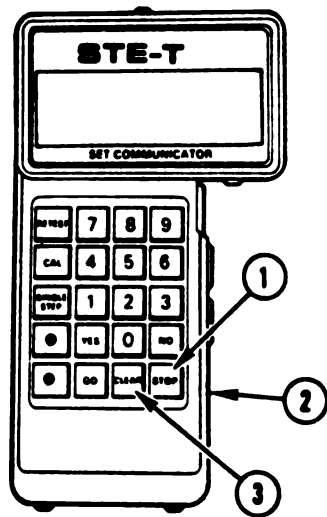
TM 9-2350-255-20-1-2-2,  
-13.

M display show GOOD?

**NO**

04-P7 to J1 on shift select  
11-51.  
networks box.  
TM 9-2350-255-20-1-3-4,  
2.  
blem is solved.

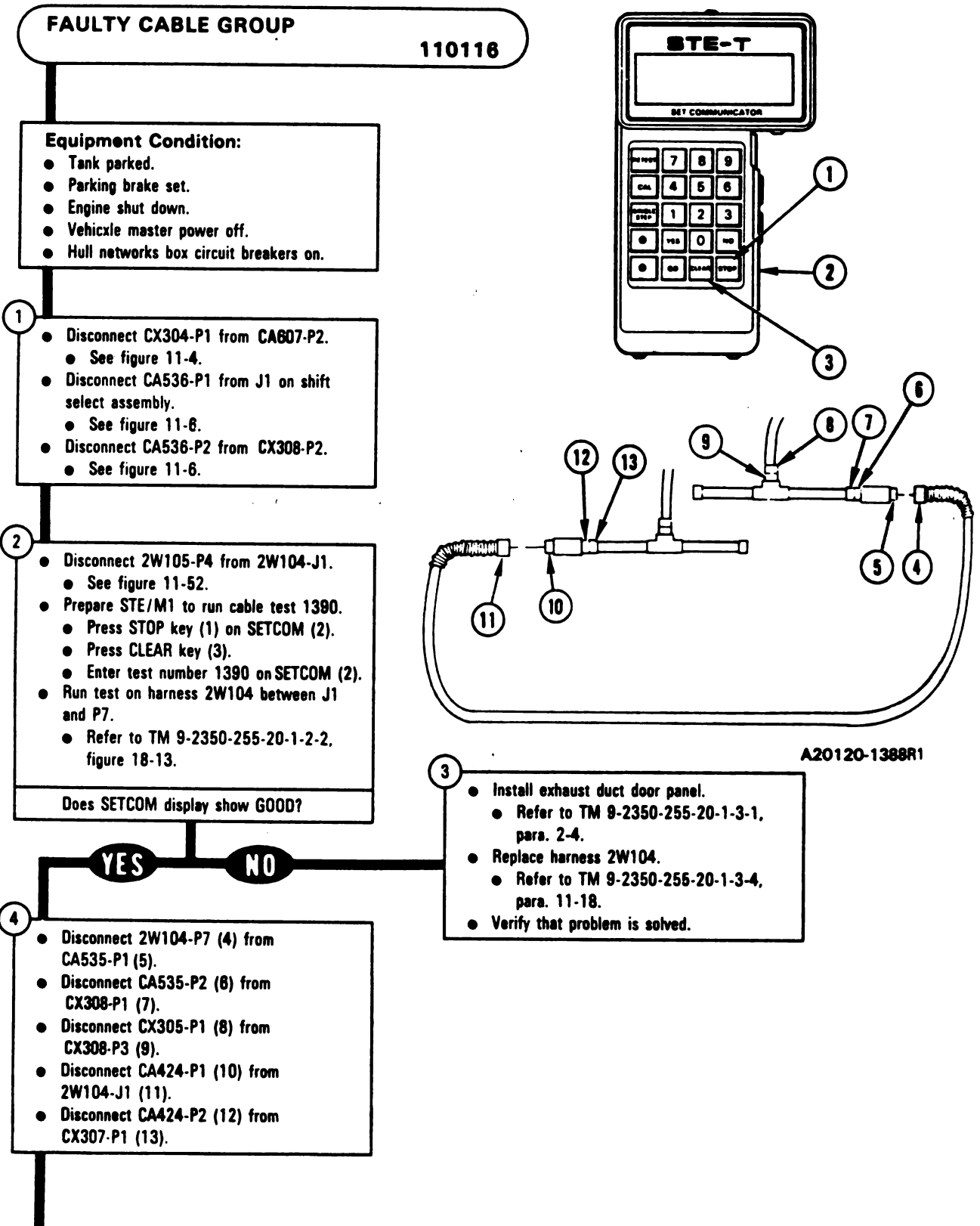
- 4**
- Replace harness 2W104.
  - Refer to TM 9-2350-255-20-1-3-1, para. 11-18.
  - Verify that problem is solved.



**A20220-011R2**

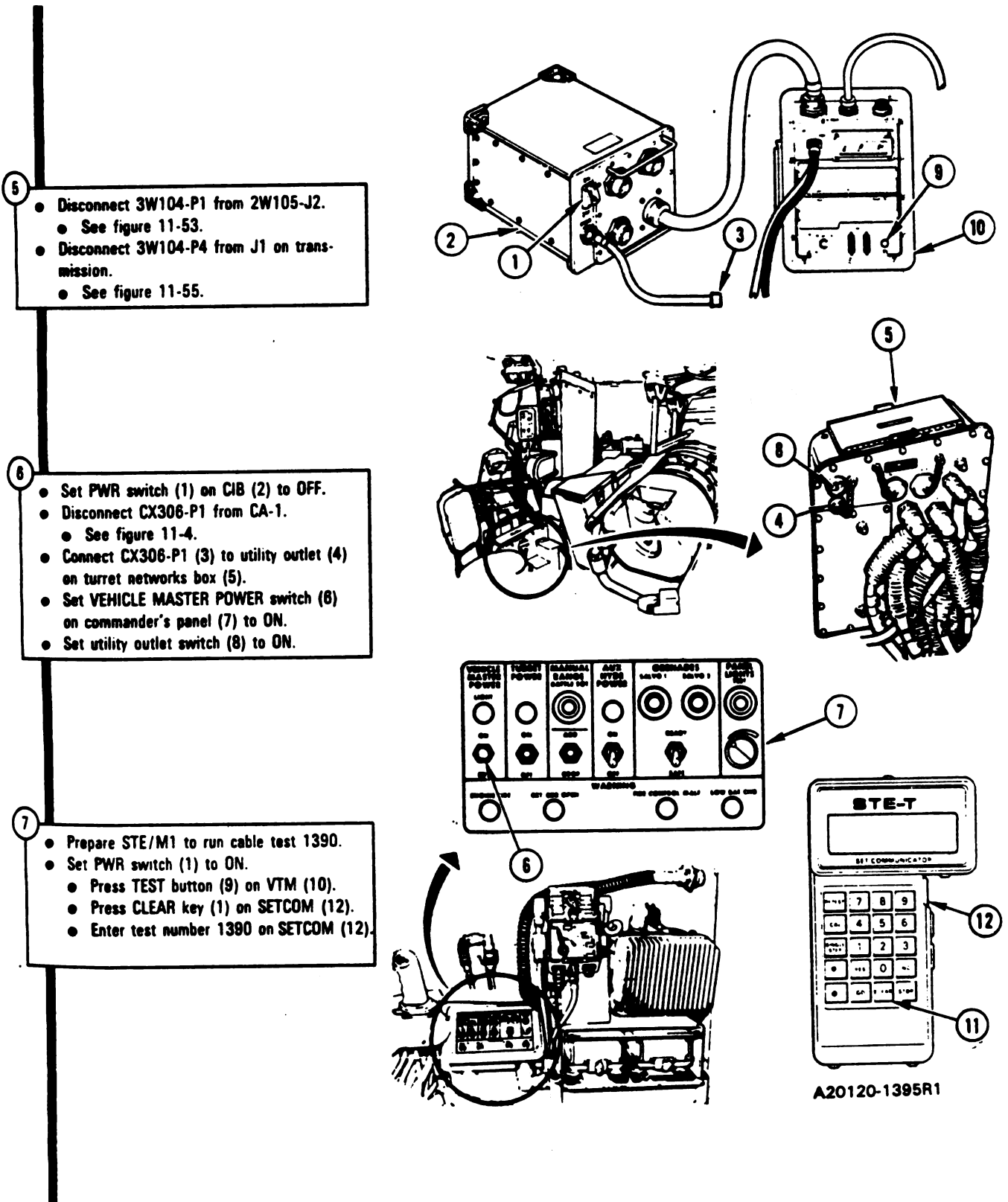
**Figure 11-33  
Volume II  
Para. 11-3**

**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**



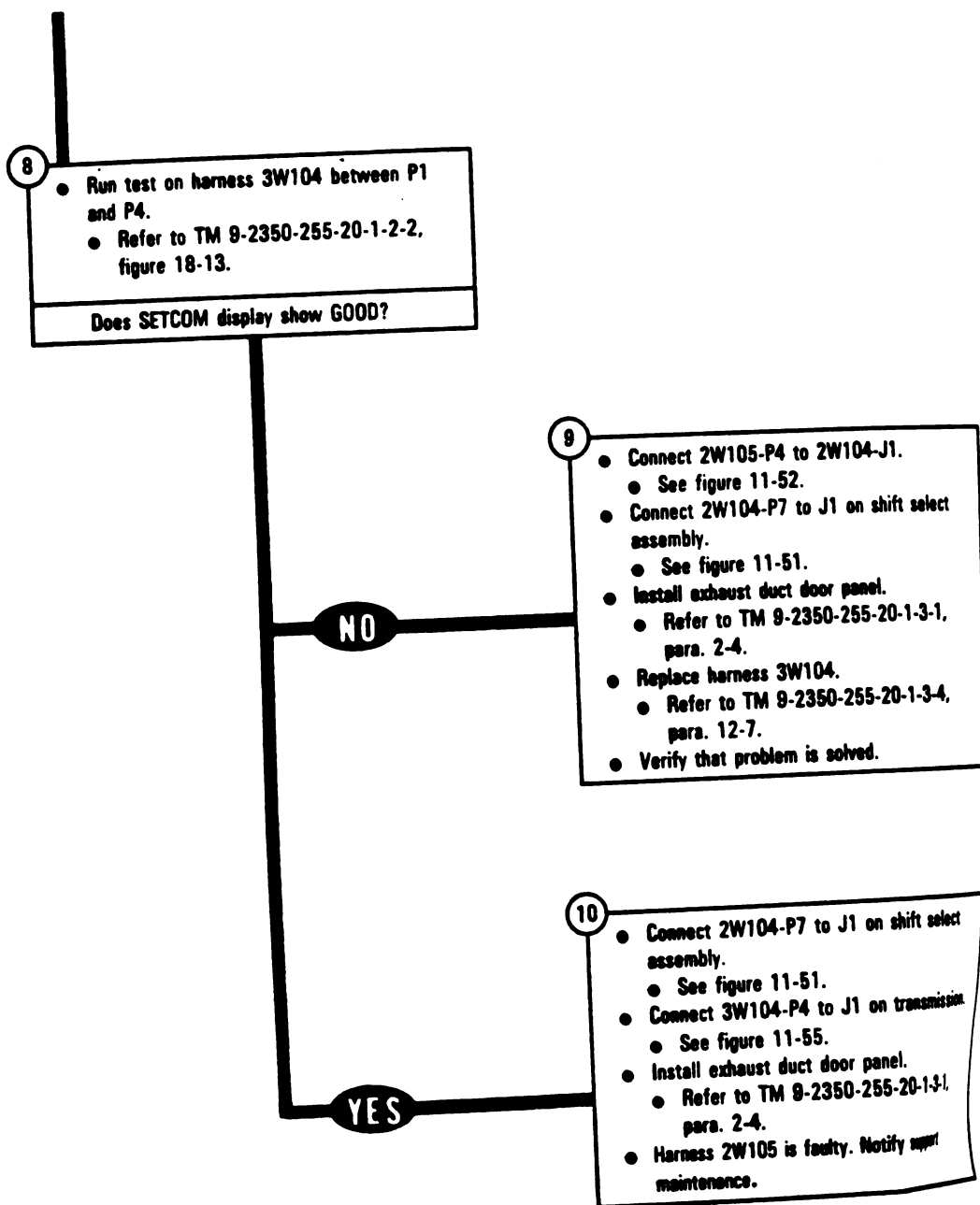
*Figure 11-34 (Sheet 1 of 3)  
Volume II  
Para. 11-3*

**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**



*Figure 11-34 (Sheet 2 of 3)  
Volume II  
Para. 11-3*

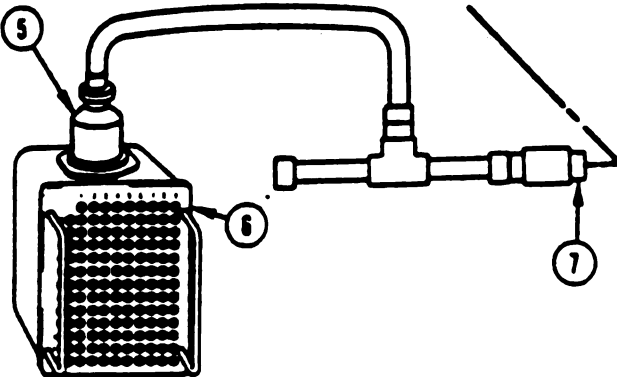
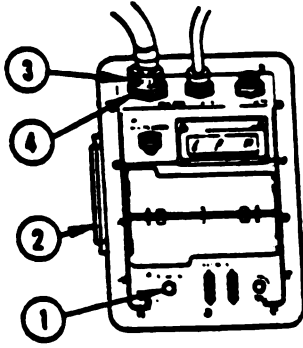
**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**



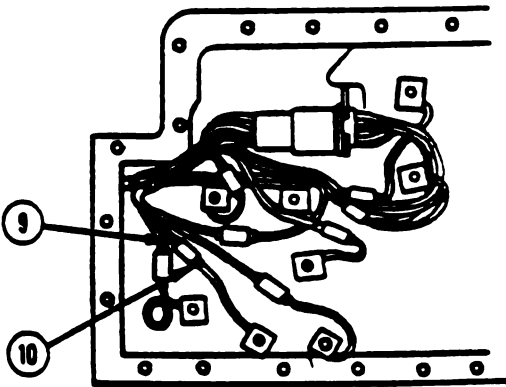
*Figure 11-34 (Sheet 3 of 3)  
Volume II  
Para. 11-3*

TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING

155004



A20120-1397



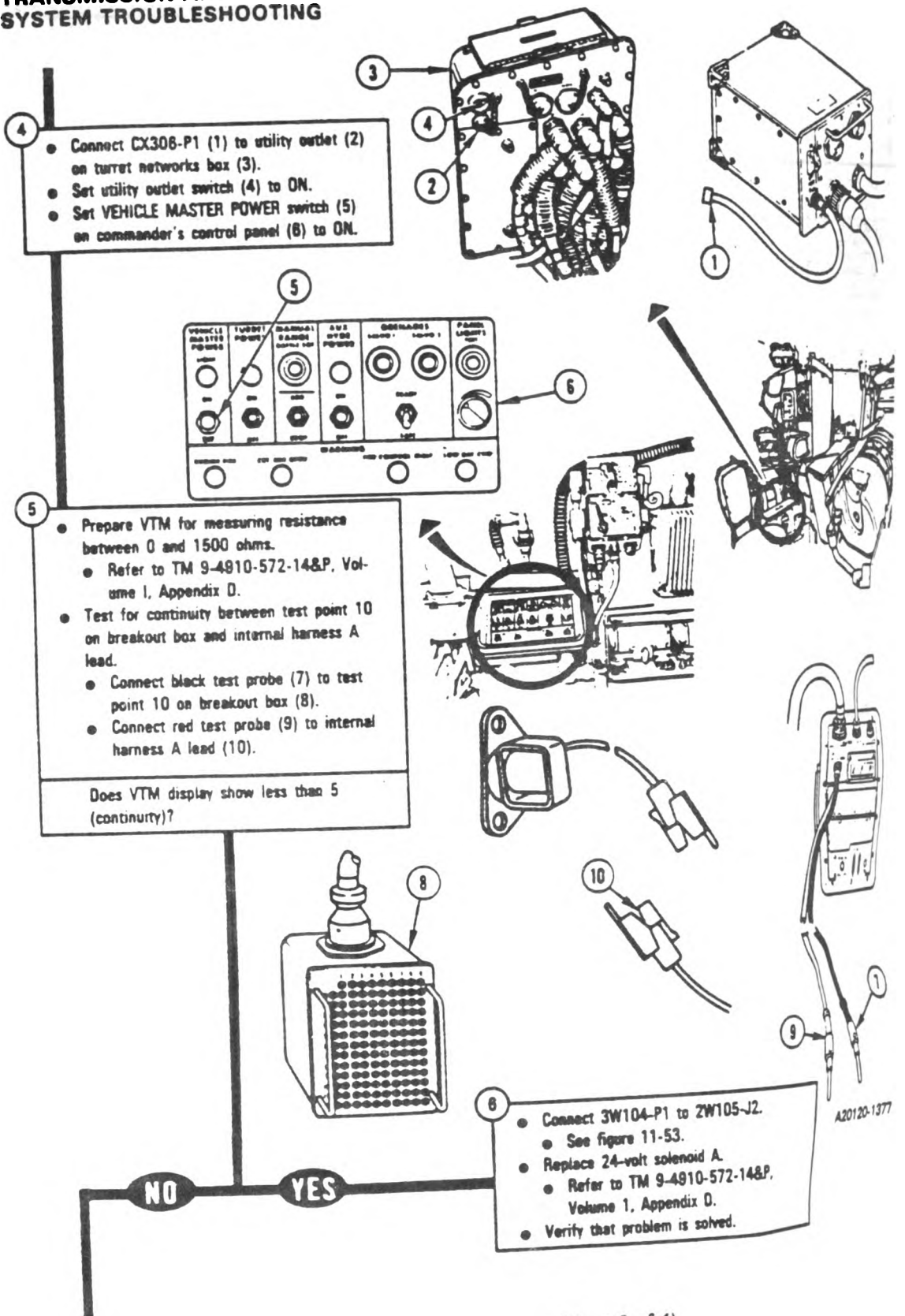
A20120-1398

Figure 11-35 (Sheet 1 of 4).  
Volume II  
Para. 11-3

Change 5 11-115

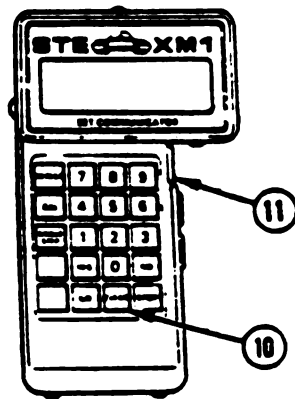
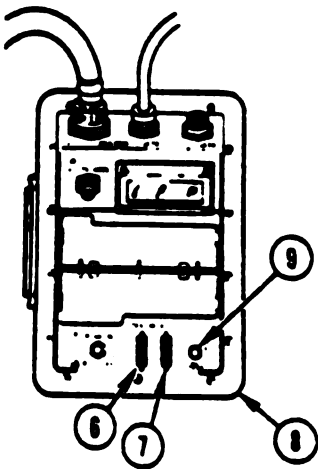
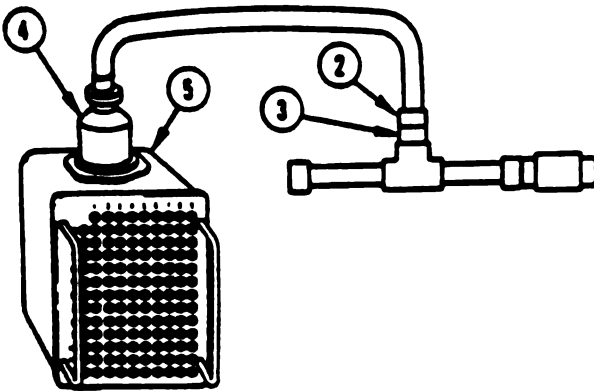
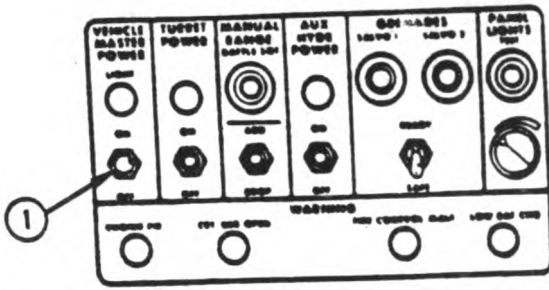


**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**



**Figure 11-35 (Sheet 2 of 4)  
Volume II  
Para. 11-3**

**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**

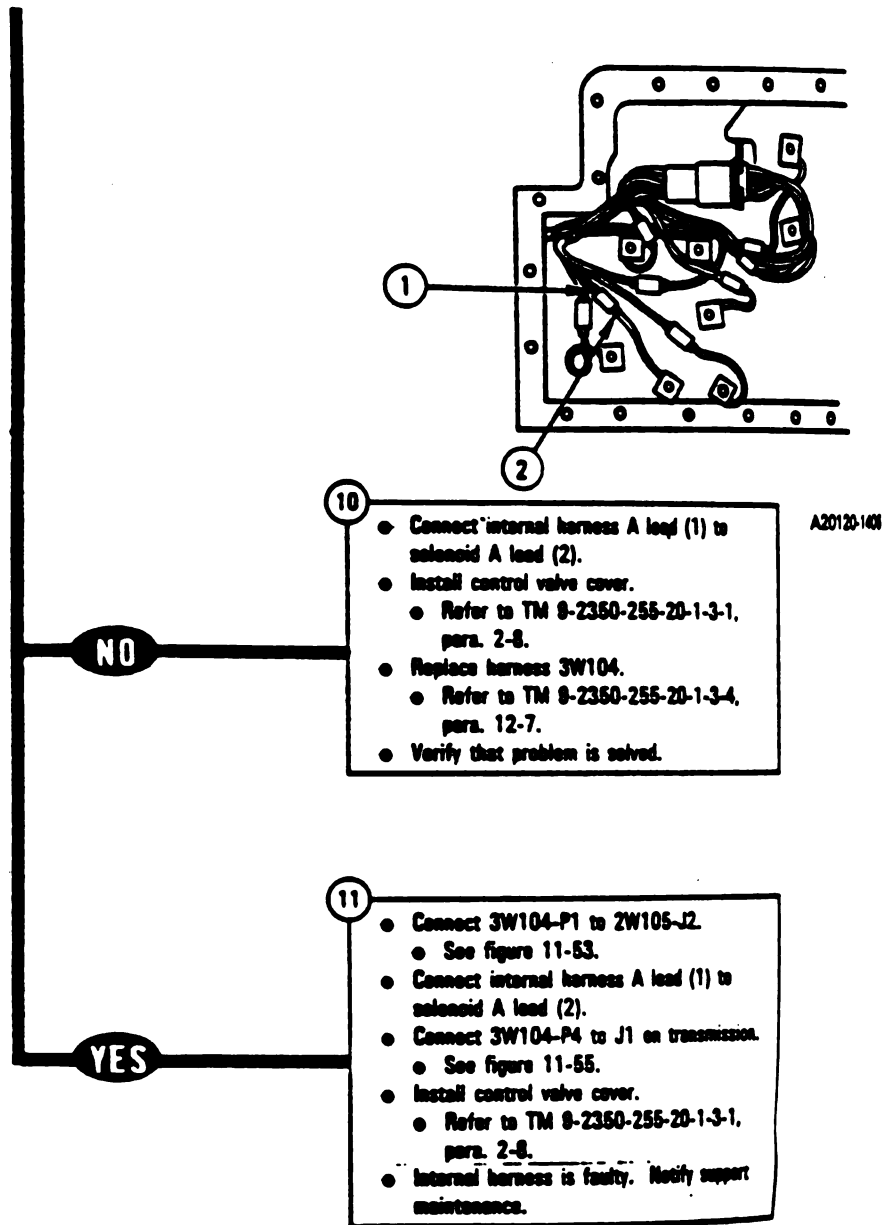


A20120-1378

**Figure 11-35 (Sheet 3 of 4)  
Volume 11  
Para. 11-3**

**Change 5 11-117**

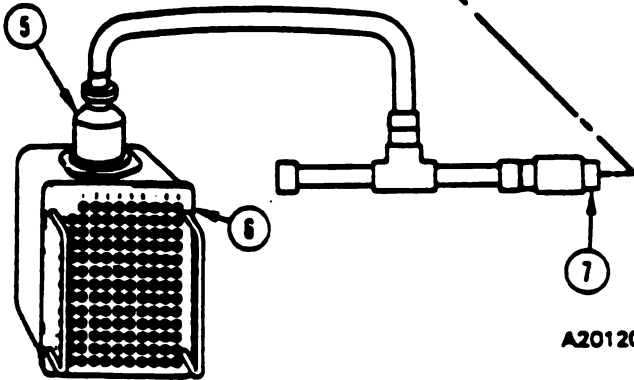
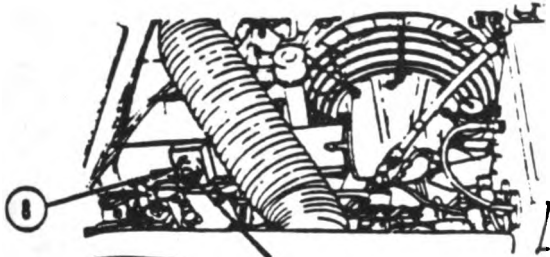
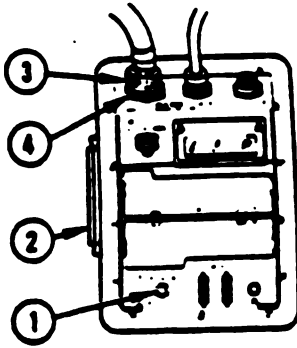
**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**



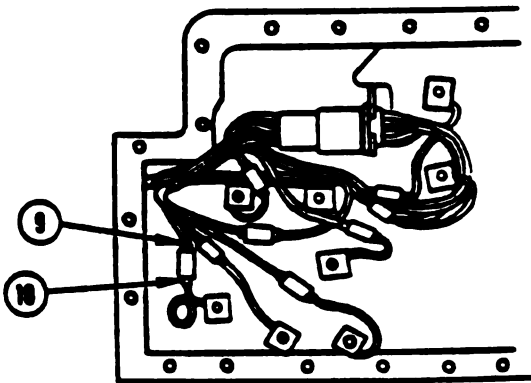
*Figure 11-35 (Sheet 4 of 4)  
Volume II  
Para. 11-3*

**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**

155005



A20120-1397

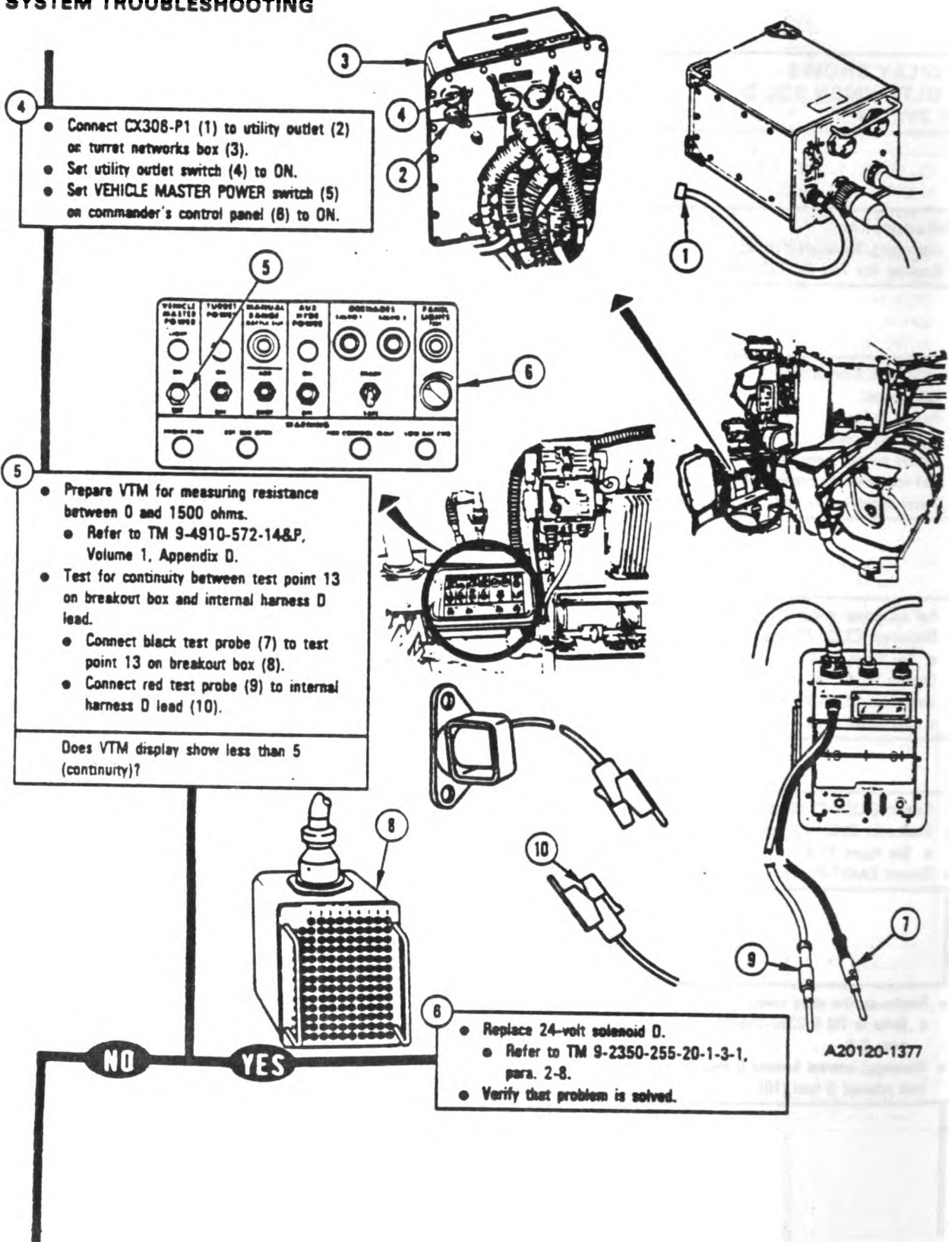


A20120-1419

**Figure 11-36 (Sheet 1 of 4)  
Volume II  
Para. 11-3**

**Change 5 11-119**

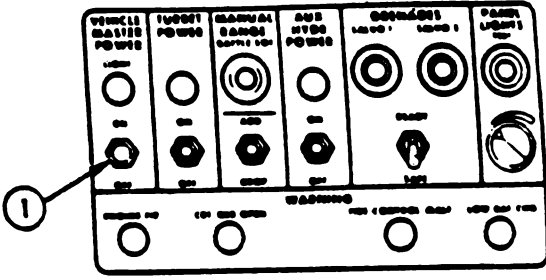
**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**



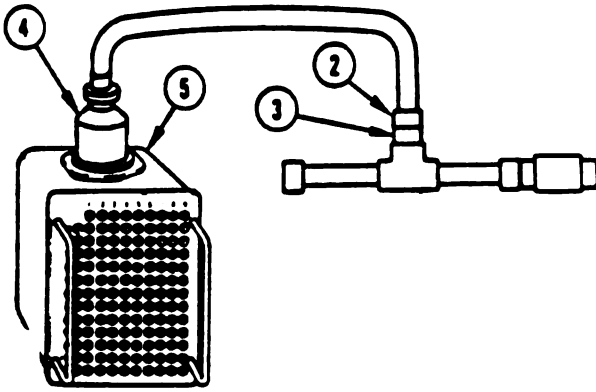
*Figure 11-36 (Sheet 2 of 4)  
Volume II  
Para. 11-3*

**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**

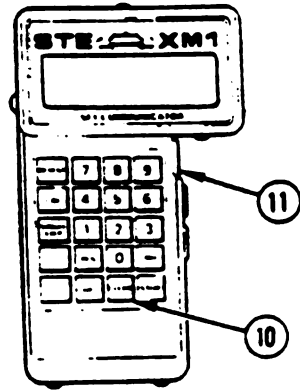
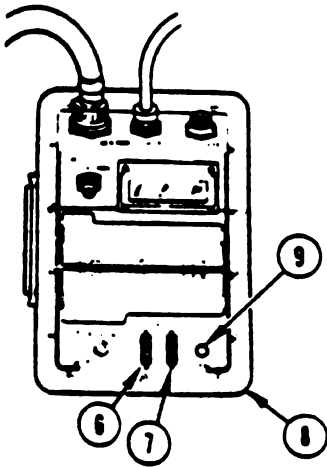
switch (1)  
breakout  
on trans-  
switch (1)



test 1390.  
s (6, 7) on  
VTM (8).  
SETCOM (11).  
SETCOM (11).



W105-J2.  
between TJ1  
20-1-2-2.  
0007

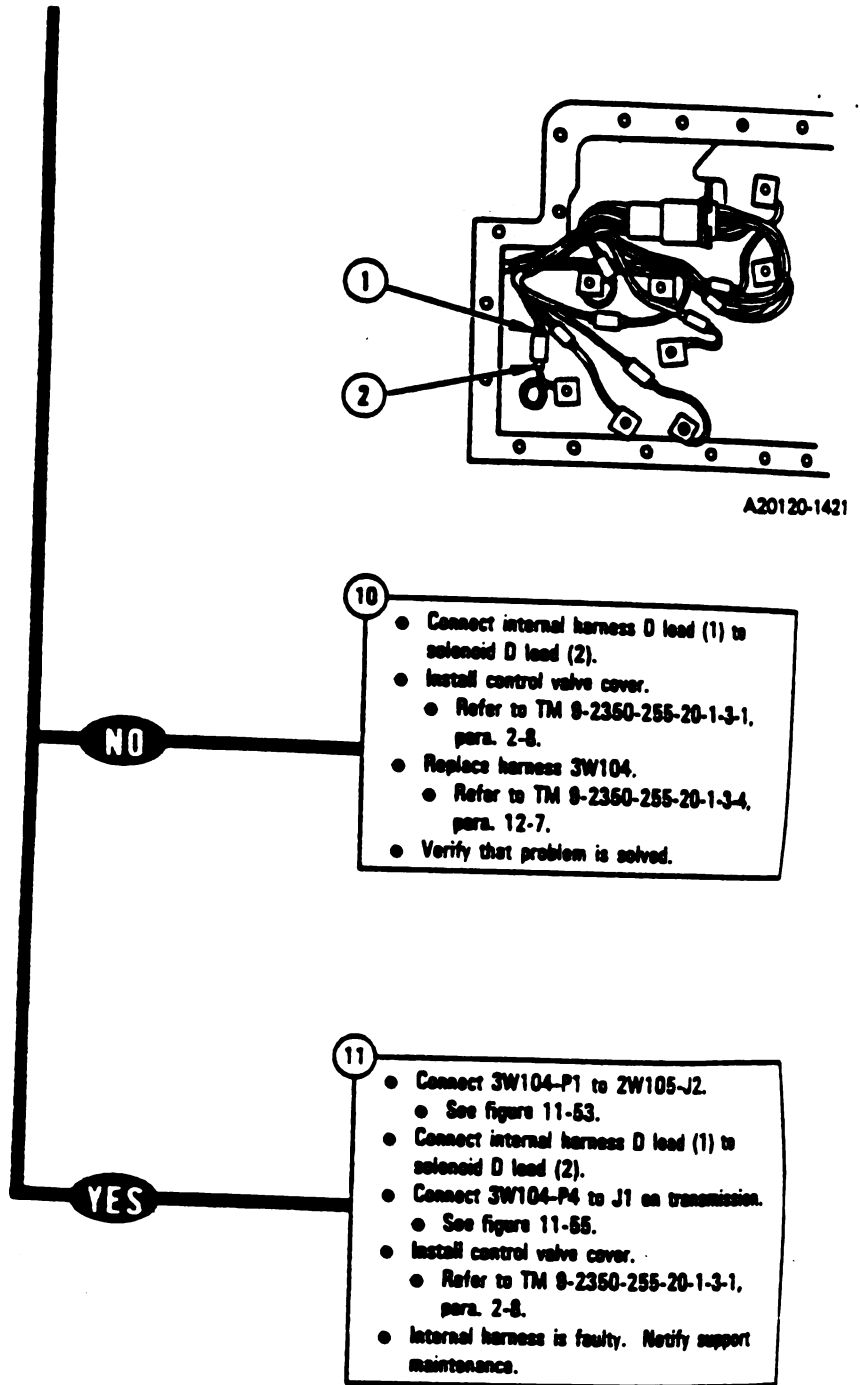


A20120-1378

**Figure 11-36 (Sheet 3 of 4)  
Volume II  
Para. 11-3**

**Change 5 11-121**

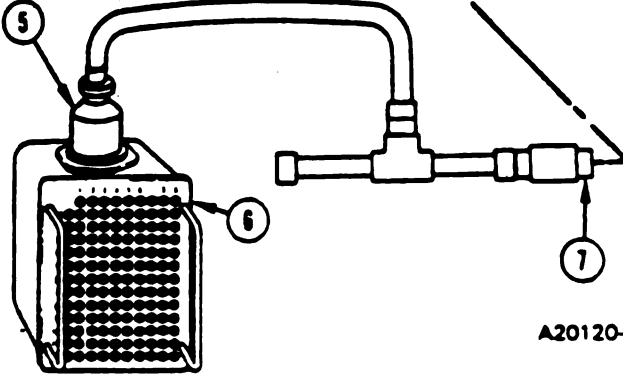
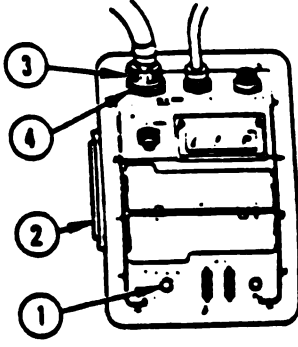
**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**



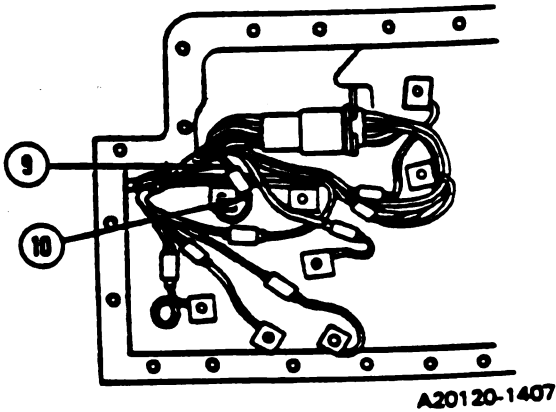
*Figure 11-36 (Sheet 4 of 4)  
Volume II  
Para. 11-3*

TM 9-2350-255-20-1-2-1  
**TRANSMISSION AND FINAL DRIVE  
 SYSTEM TROUBLESHOOTING**

155009



A20120-1397



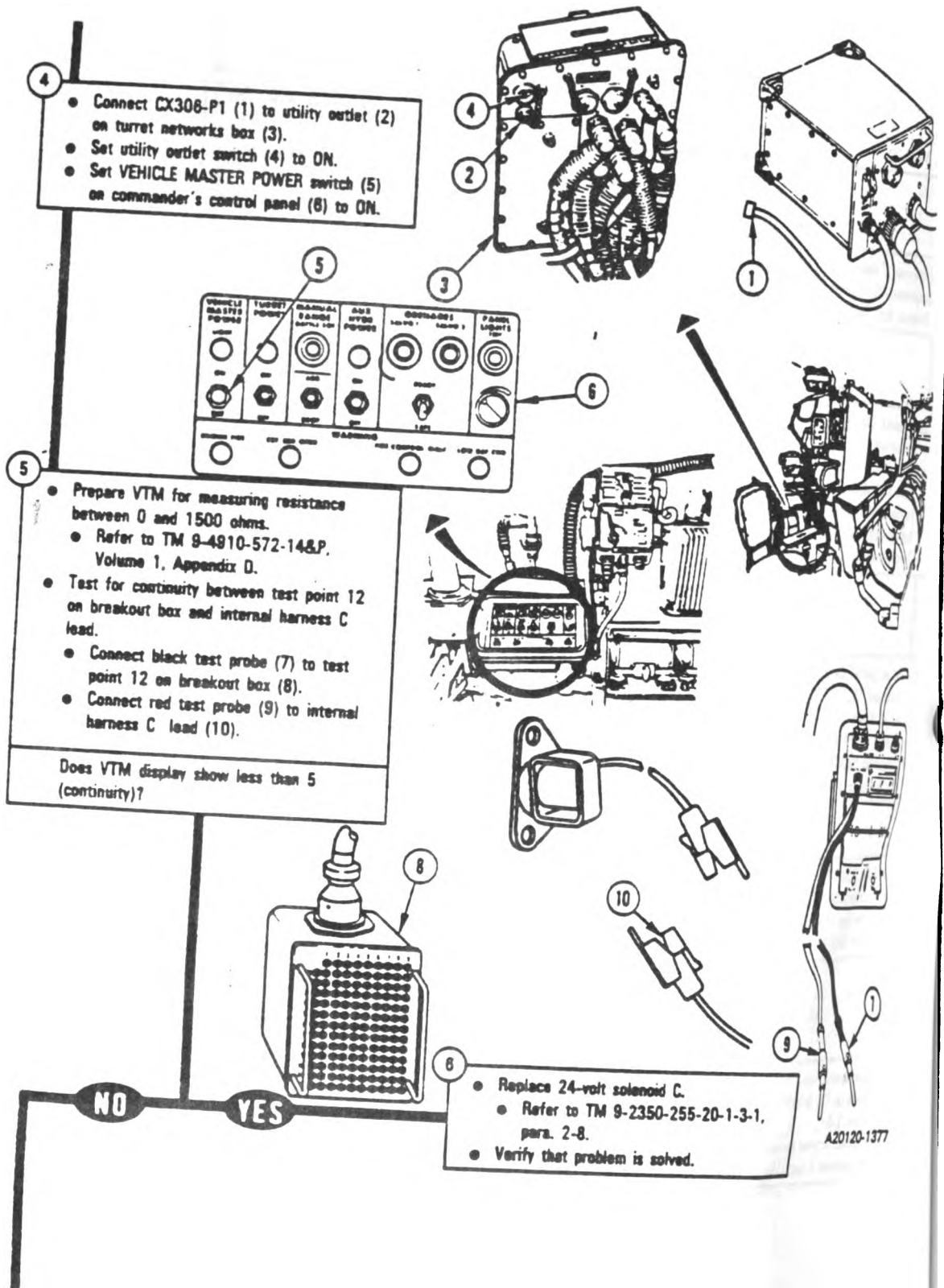
A20120-1407

Figure 11-37 (Sheet 1 of 4)  
 Volume II  
 Para. 11-3

Change 5 11-123



**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**

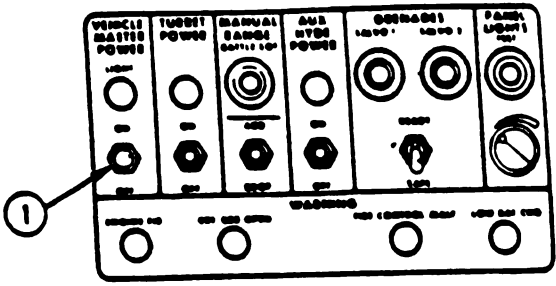


**Figure 11-37 (Sheet 2 of 4)  
Volume II  
Para. 11-3**

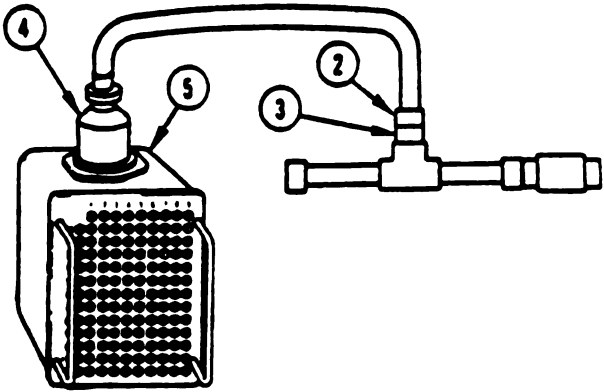
11-124 Change 5

# TM 9-2350-255-20-1-2-1 TRANSMISSION AND FINAL DRIVE SYSTEM TROUBLESHOOTING

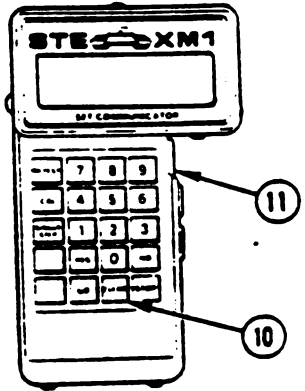
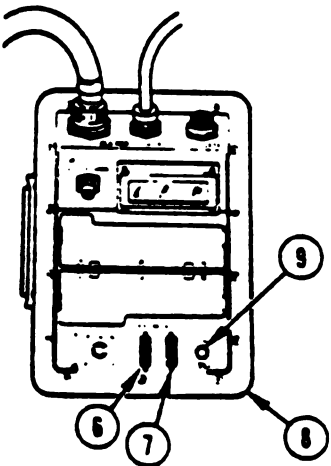
switch (1)  
breakout  
J1 on trans-  
R switch (1)



test 1390.  
tes (6, 7) on  
on VTM (8).  
on SETCOM (11).  
on SETCOM (11).



ZW105-J2.  
between TJ1  
5-20-1-2-2.  
GOOD?

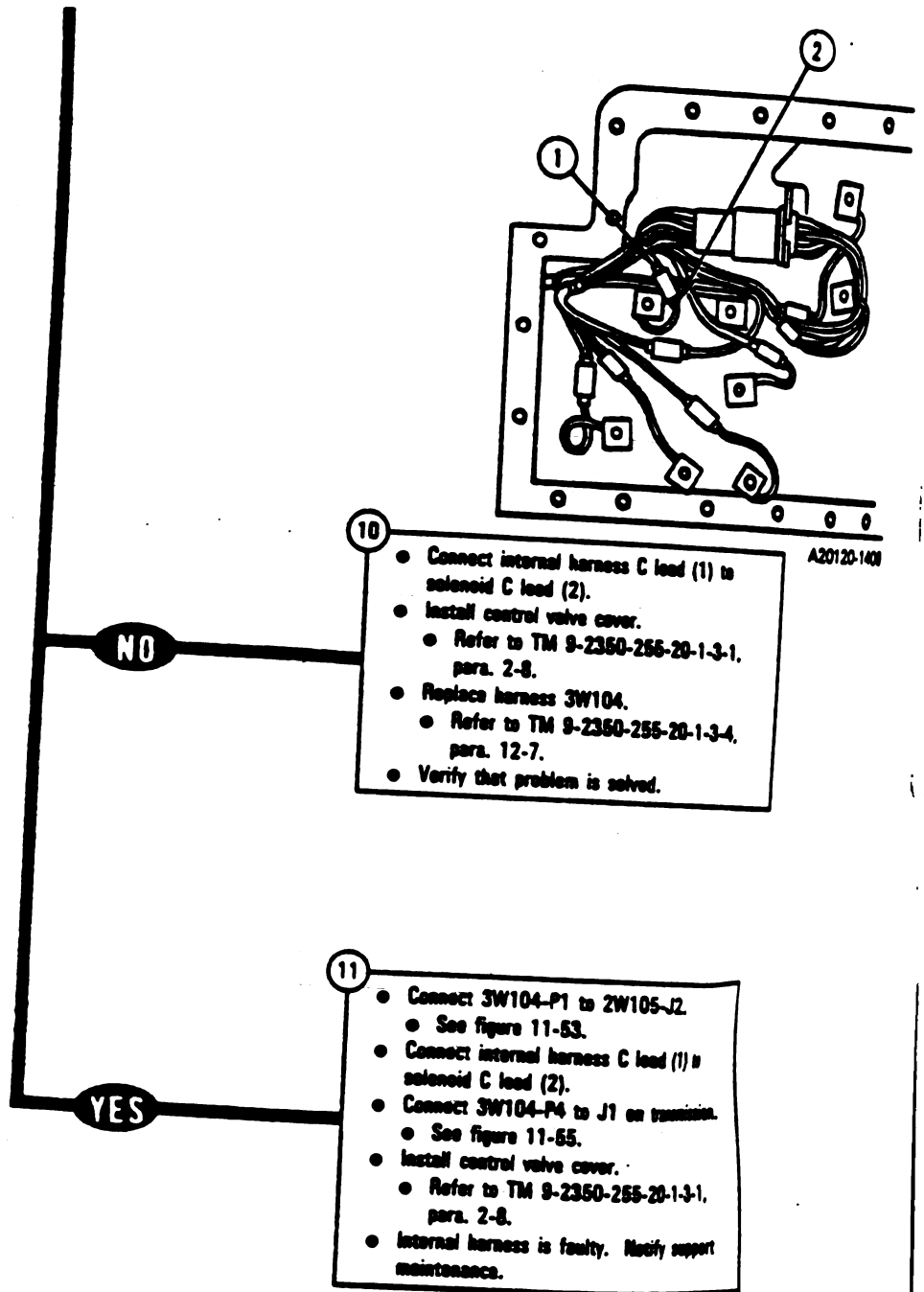


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Figure 11-37 (Sheet 3 of 4)  
Volume II  
Para. 11-3

Change 5 11-125

**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**

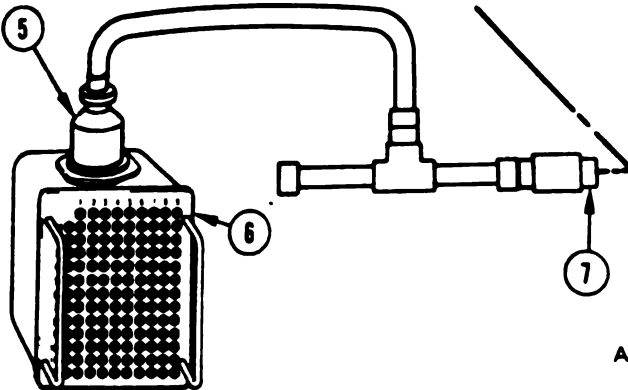
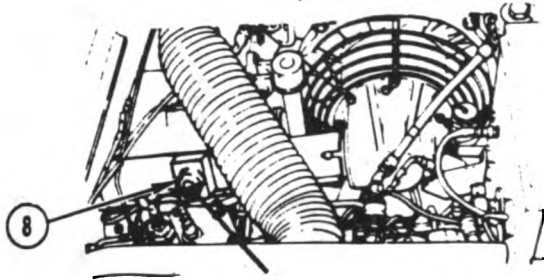
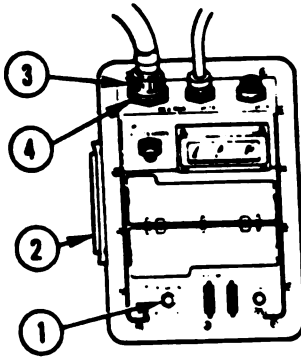


*Figure 11-37 (Sheet 4 of 4)  
Volume II  
Para. 11-3*

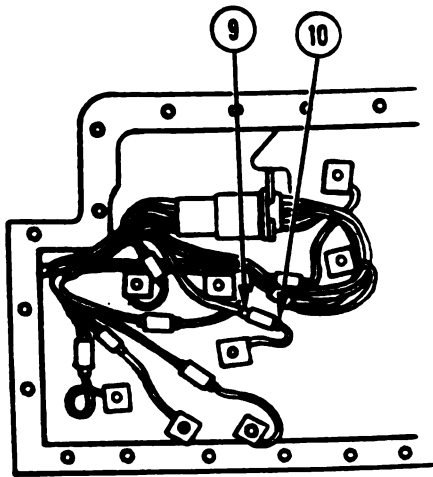
11-126 Change 5

**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**

155010



A20120-1397

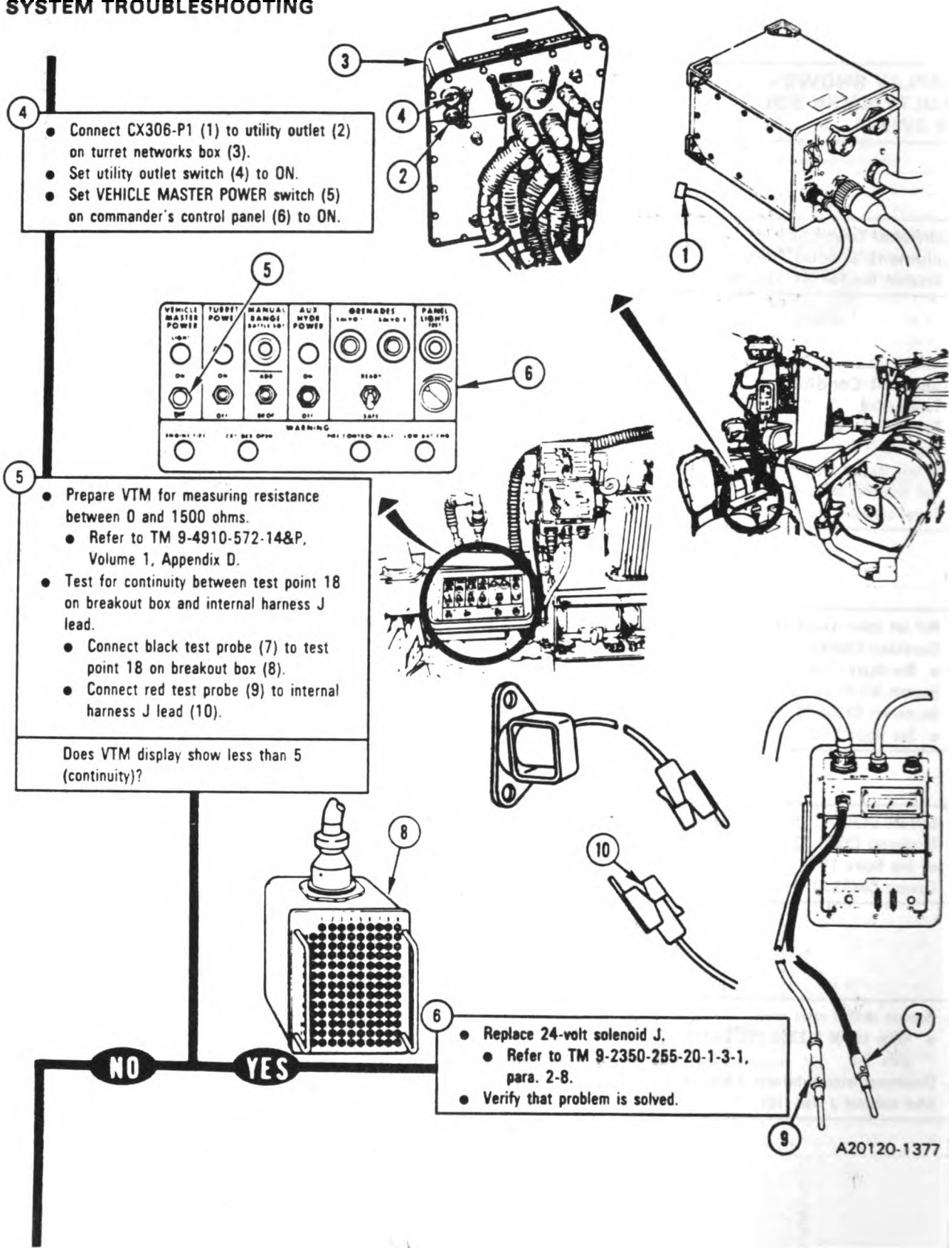


A20120-1410

**Figure 11-38 (Sheet 1 of 4)  
Volume II  
Para. 11-3**

**Change 8 11-127**

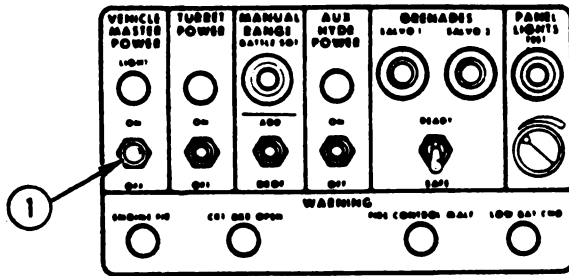
**TM 9-2350-255-20-1-2-1**  
**TRANSMISSION AND FINAL DRIVE**  
**SYSTEM TROUBLESHOOTING**



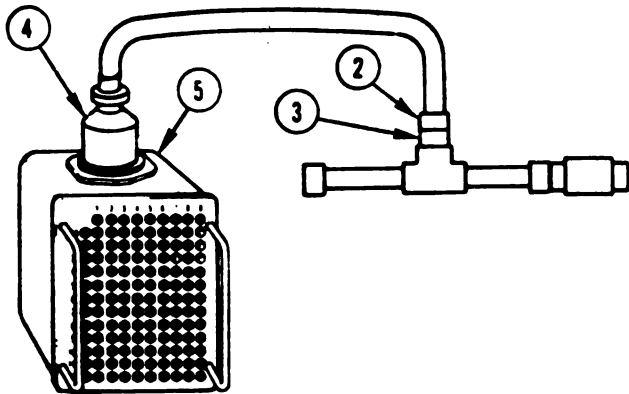
**Figure 11-38 (Sheet 2 of 4)**  
**Volume II**  
**Para. 11-3**

**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**

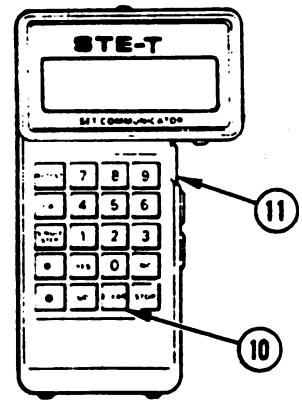
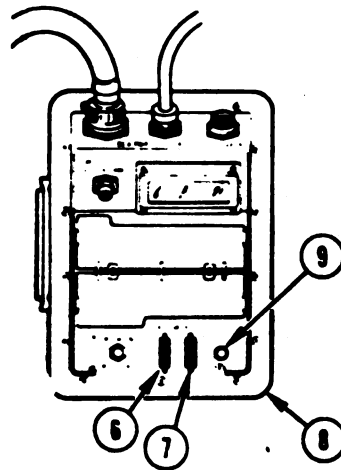
- 7**
- Set VEHICLE MASTER POWER switch (1) to OFF.
  - Disconnect CX304-P1 (2) from CX307-P3 (3).
  - Disconnect CX304-P2 (4) from breakout box (5).
  - Disconnect 3W104-P4 from J1 on transmission.
    - See figure 11-55.
  - Set VEHICLE MASTER POWER switch (1) to ON.



- 8**
- Prepare STE/M1 to run cable test 1390.
    - Set TEST SELECT switches (8, 7) on VTM (8) to 00.
    - Press TEST button (9) on VTM (8).
    - Press CLEAR key (10) on SETCOM (11).
    - Enter test number 1390 on SETCOM (11)



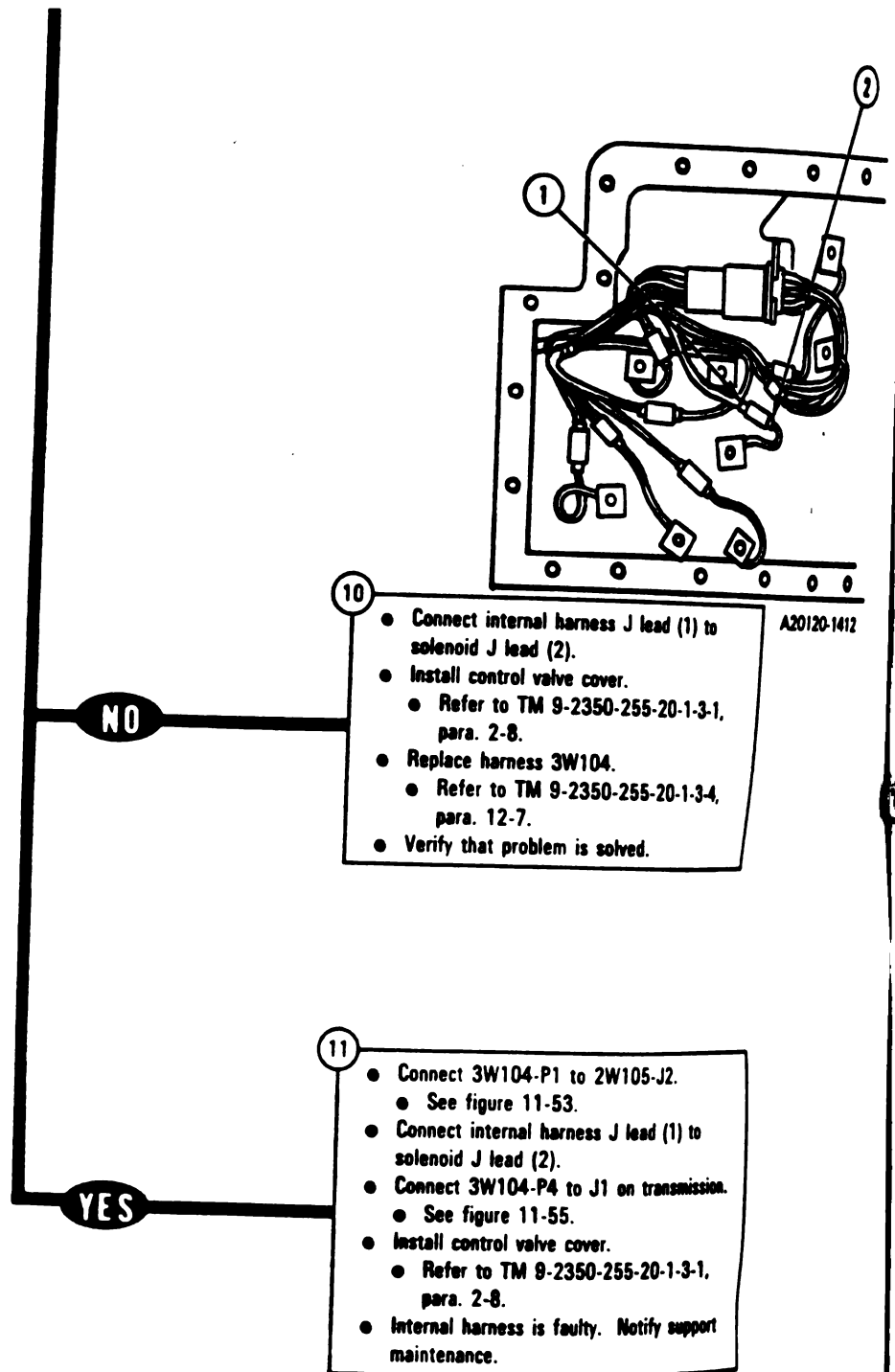
- 9**
- Disconnect 3W104-P1 from 2W105-J2.
    - See figure 11-53.
  - Run test on harness 3W104 between TJ1 and P4.
    - Refer to TM 9-2350-255-20-1-2-2, figure 18-13.
- Does SETCOM display show GOOD?**



A20120-1378R1

*Figure 11-38 (Sheet 3 of 4)  
Volume II  
Para. 11-3*

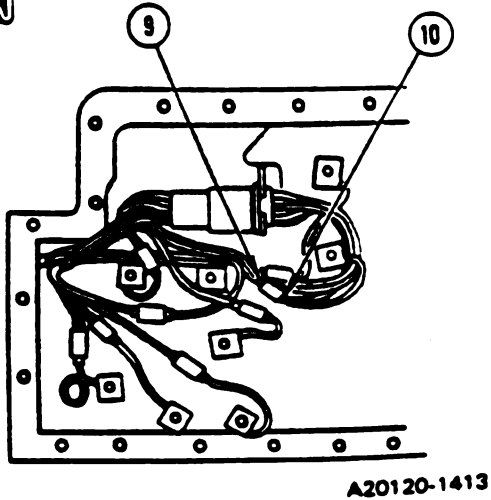
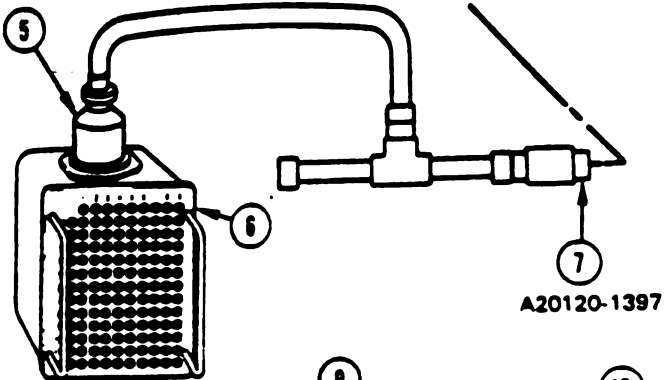
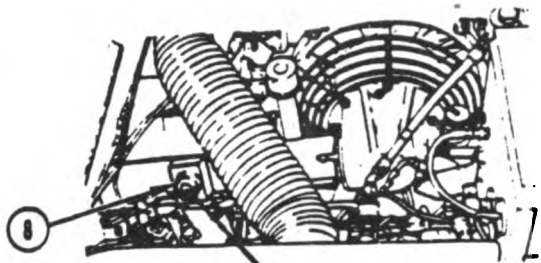
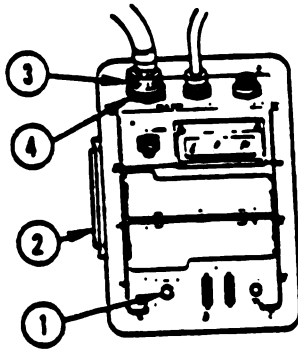
**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**



*Figure 11-38 (Sheet 4 of 4)*  
**Volume II**  
**Para. 11-3**

**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**

155011



**Figure 11-39 (Sheet 1 of 4)  
Volume II  
Para. 11-3**

**Change 5 11-131**



**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**

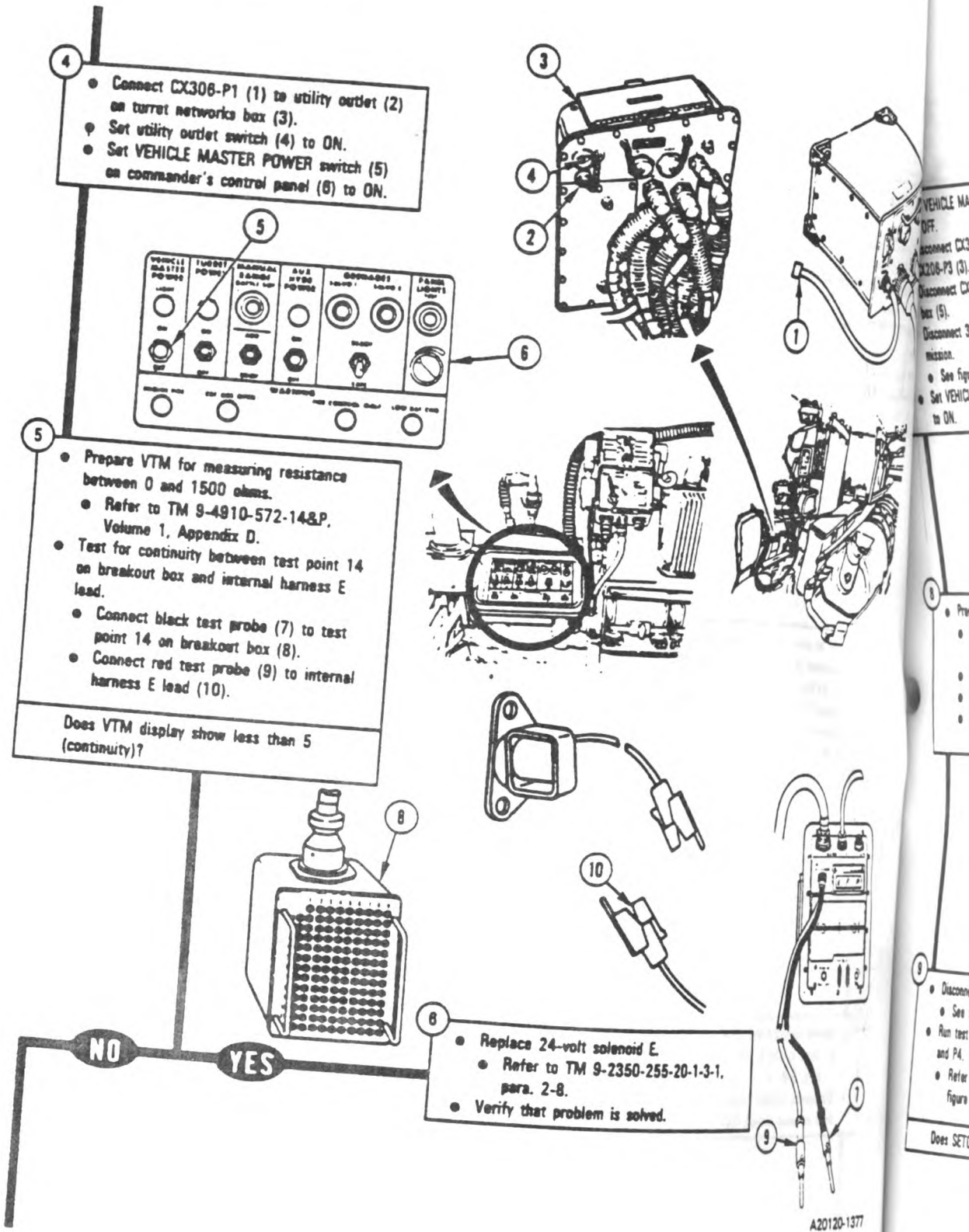
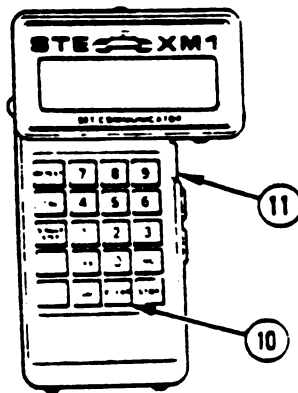
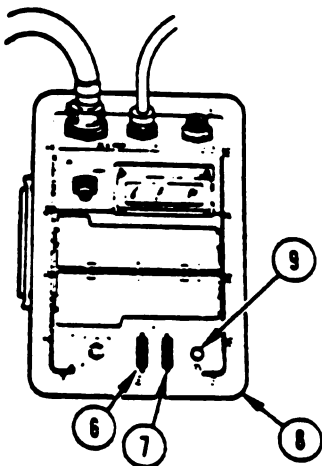
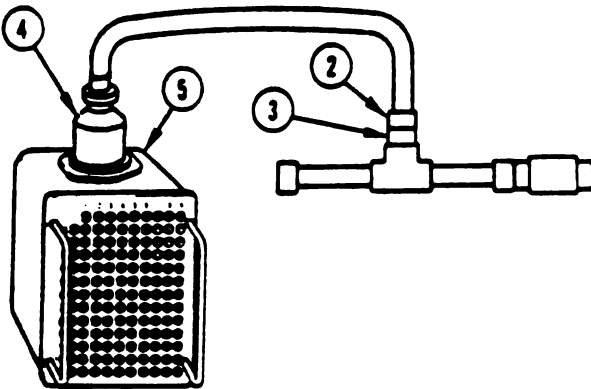
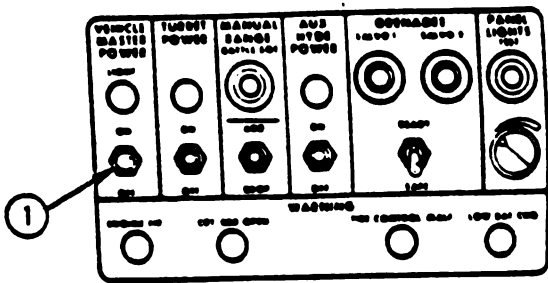


Figure 11-39 (Sheet 2 of 4)  
Volume II  
Para. 11-3

11-132 Change 5

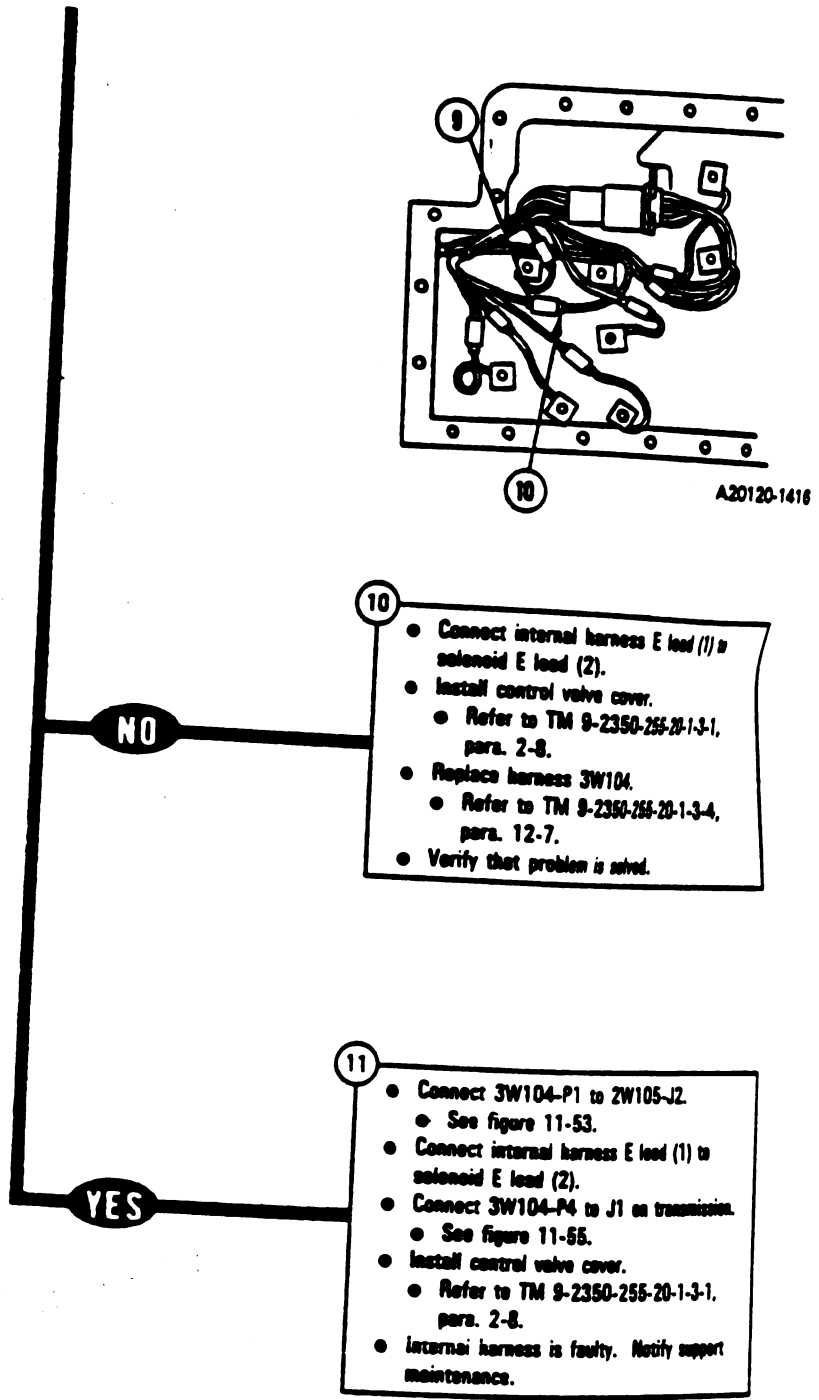
**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**



A20120-1378

Figure 11-39 (Sheet 3 of 4)  
Volume II  
Para. 11-3

Change 5 11-133



*Figure 11-39 (Sheet 4 of 4)  
Volume II  
Para. 11-3*

**11-134 Change 5**

TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING

DISPLAY SHOWS -  
FAULTY XMSN SOL B  
OR 3W104 155012

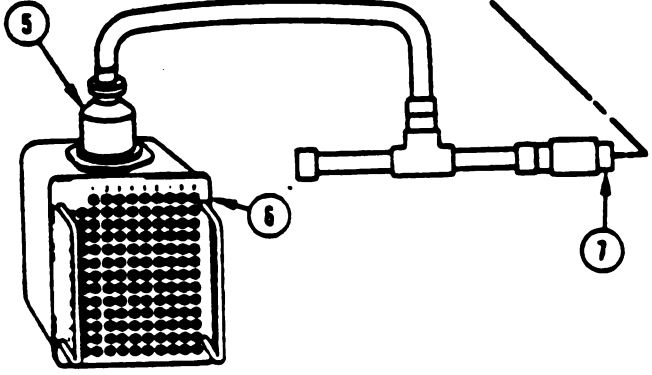
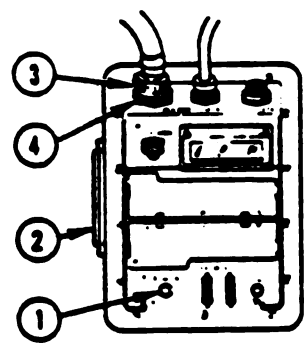
**Additional Test Equipment/Special Tools:**  
● Breakout Box Tool Kit, 12311066

**Equipment Condition:**  
● Tank ported.  
● Parking brake set.  
● Engine shut down.  
● Vehicle master power off.  
● Hull networks box circuit breakers on.  
● Turret networks box circuit breakers on.

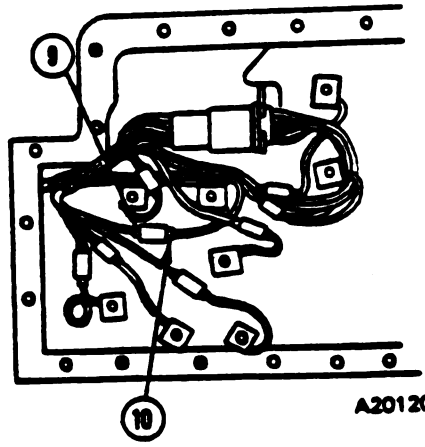
1 ● Pull out power switch (1) on VTM (2).  
● Disconnect CX202-P1 from J1 on VTM.  
● See figure 11-8.  
● Connect W1-P1 (3) to J1 (4) on VTM (2).  
● Disconnect CX304-P2 from CIB-J1  
● See figure 11-3.

2 ● Connect CX304-P2 (5) to breakout box (6).  
● Disconnect CX601-P2 from 3W104-TJ1.  
● See figure 11-8.  
● Connect CA407-P1 (7) to 3W104-TJ1 (8).

3 ● Remove control valve cover.  
● Refer to TM 9-2350-255-20-1-3-1,  
para. 2-8.  
● Disconnect internal harness B lead (9)  
from solenoid B lead (10).



A20120-1397



A20120-1418

Figure 11-40 (Sheet 1 of 4)  
Volume-II  
Para. 11-3

**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**

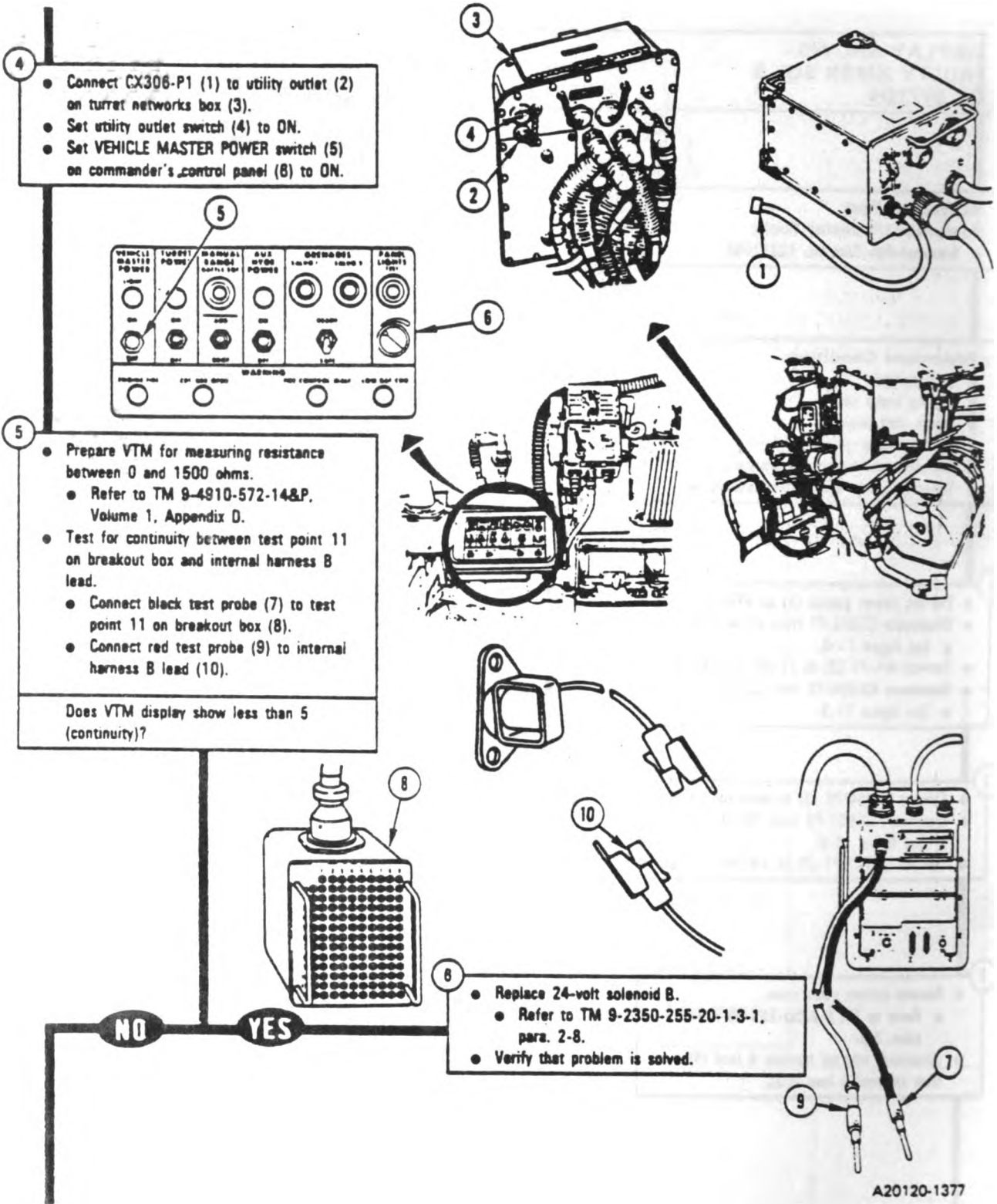
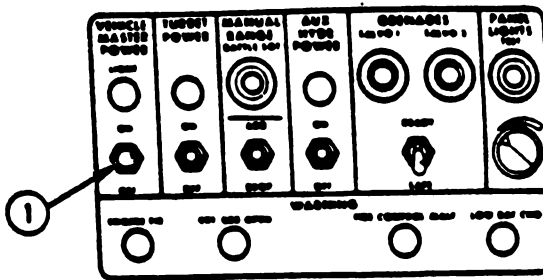


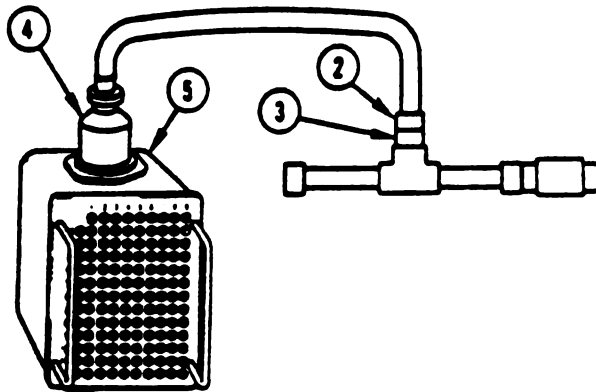
Figure 11-40 (Sheet 2 of 4)  
Volume II  
Para. 11-3

**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**

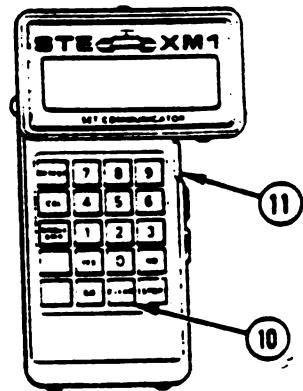
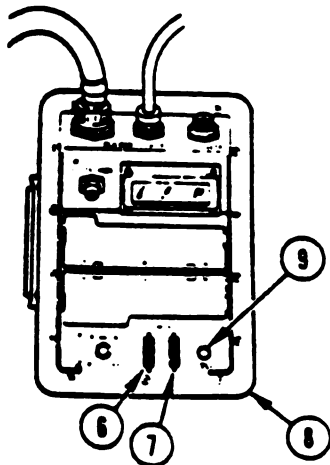
- Set VEHICLE MASTER POWER switch (1) to OFF.
- Disconnect CX304-P1 (2) from CX208-P3 (3).
- Disconnect CX304-P2 (4) from breakout box (5).
- Disconnect JW104-P4 from J1 on transmission.
- See figure 11-55.
- Set VEHICLE MASTER POWER switch (1) to ON.



- Prepare STE/M1 to run cable test 1390.
- Set TEST SELECT switches (6, 7) on VTM (8) to 00.
- Press TEST button (9) on VTM (8).
- Press CLEAR key (10) on SETCOM (11).
- Enter test number 1390 on SETCOM (11).



- Disconnect JW104-P1 from ZW106-J2.
  - See figure 11-53.
  - Run test on harness JW104 between TJ1 and P4.
  - Refer to TM 9-2350-255-20-1-2-2, figure 18-13.
- Does SETCOM display show GOOD?

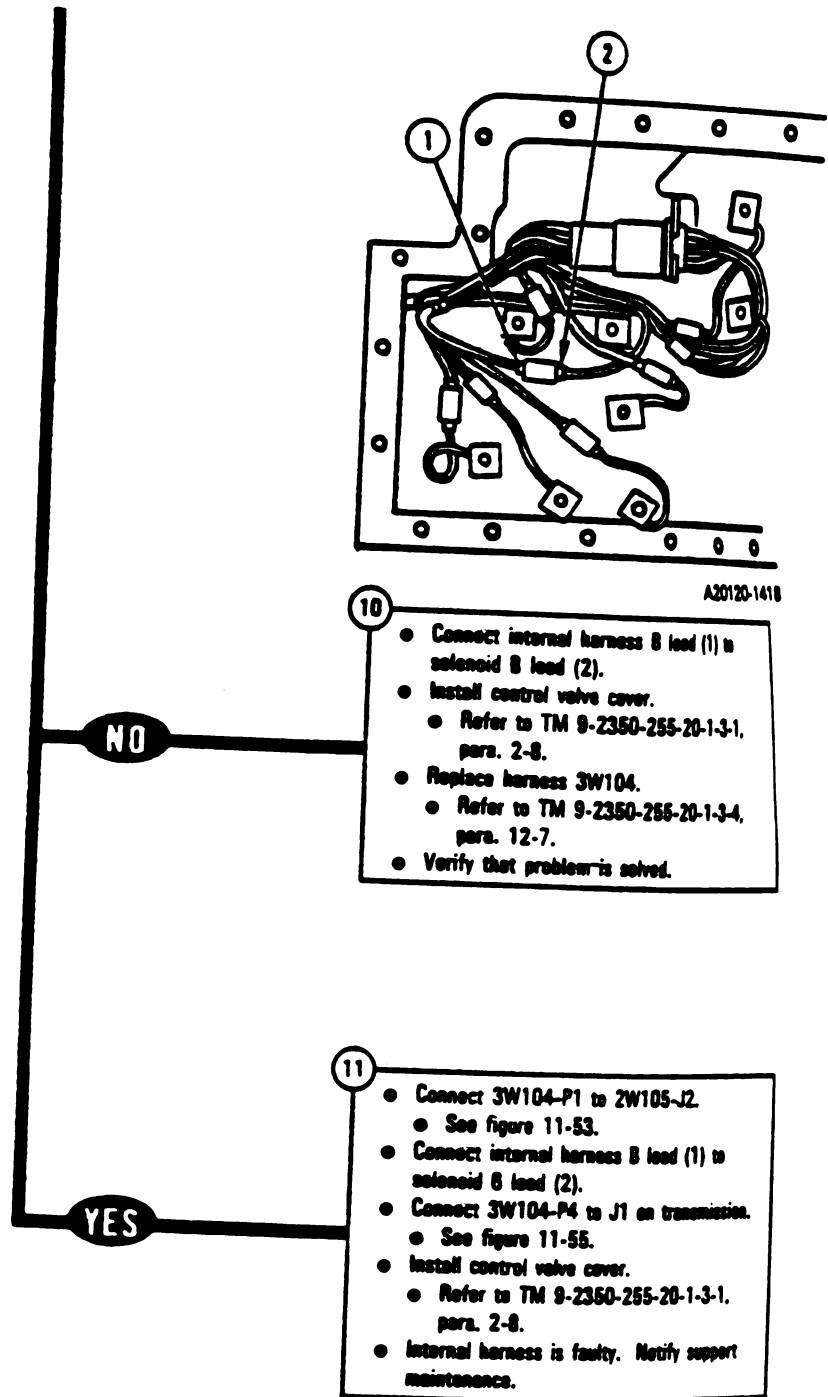


A20120-1378

**Figure 11-40 (Sheet 3 of 4)  
Volume II  
Para. 11-3**

**Change 5 11-137**

**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**



*Figure 11-40 (Sheet 4 of 4)  
Volume II  
Para. 11-3*

**DISPLAY SHOWS -  
 FAULTY XMSN SOL X  
 OR 3W104**

155013

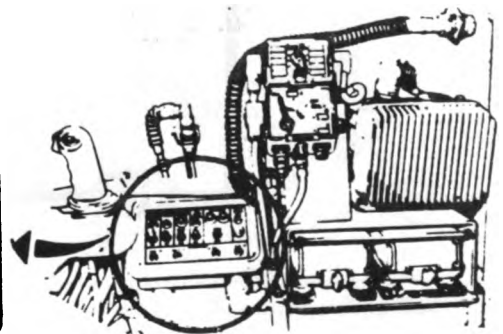
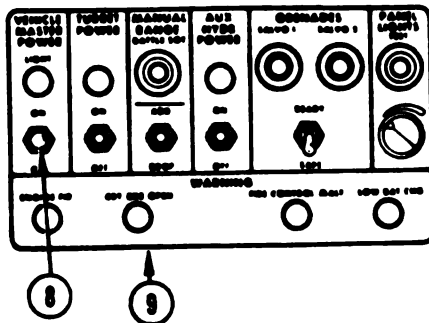
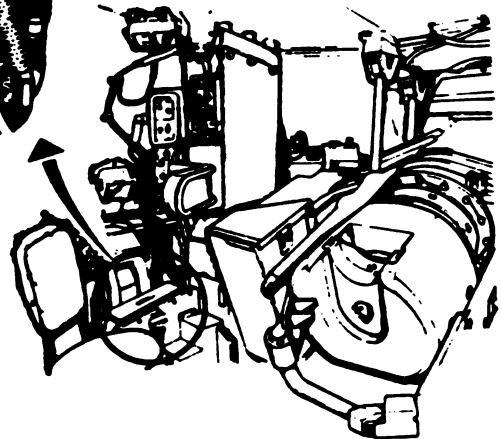
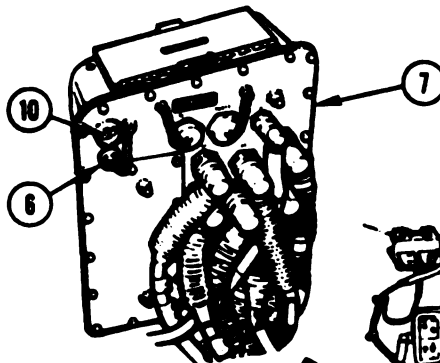
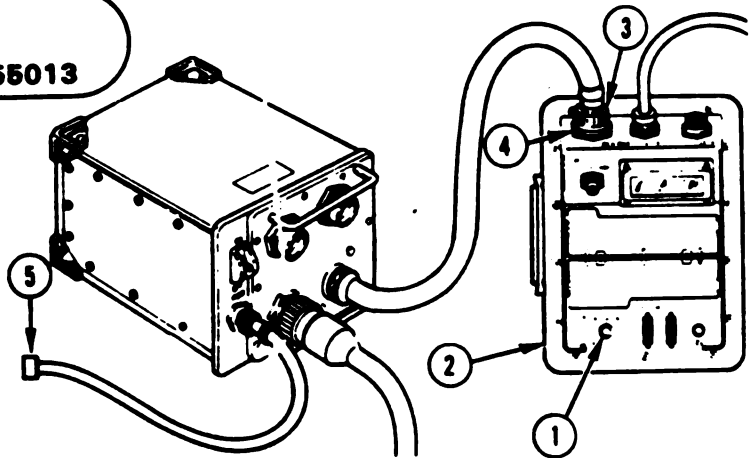
**Equipment Condition:**

- Tank parked.
- Parking brake set.
- Engine shut down.
- Vehicle master power off.
- Hull networks box circuit breakers on.

- 1
- Pull out power switch (1) on VTM (2).
  - Disconnect CX004-P1 from J1 on VTM.
    - See figure 11-8.
  - Connect W1-P1 (3) to J1 (4) on VTM (2).
  - Disconnect CX304-P2 from CIB-J1.
    - See figure 11-3.

- 2
- Disconnect CX801-P2 from 3W104-TJ1.
    - See figure 11-8.
  - Disconnect 3W104-P4 from J1 on transmission.
    - See figure 11-55.
  - Connect CX308-P1 (5) to utility outlet (6) on turret networks box (7).

- 3
- Set VEHICLE MASTER POWER switch (8) on commander's control panel (9) to ON.
  - Set utility outlet switch (10) to ON.
  - Push on power switch (1) on VTM (2).



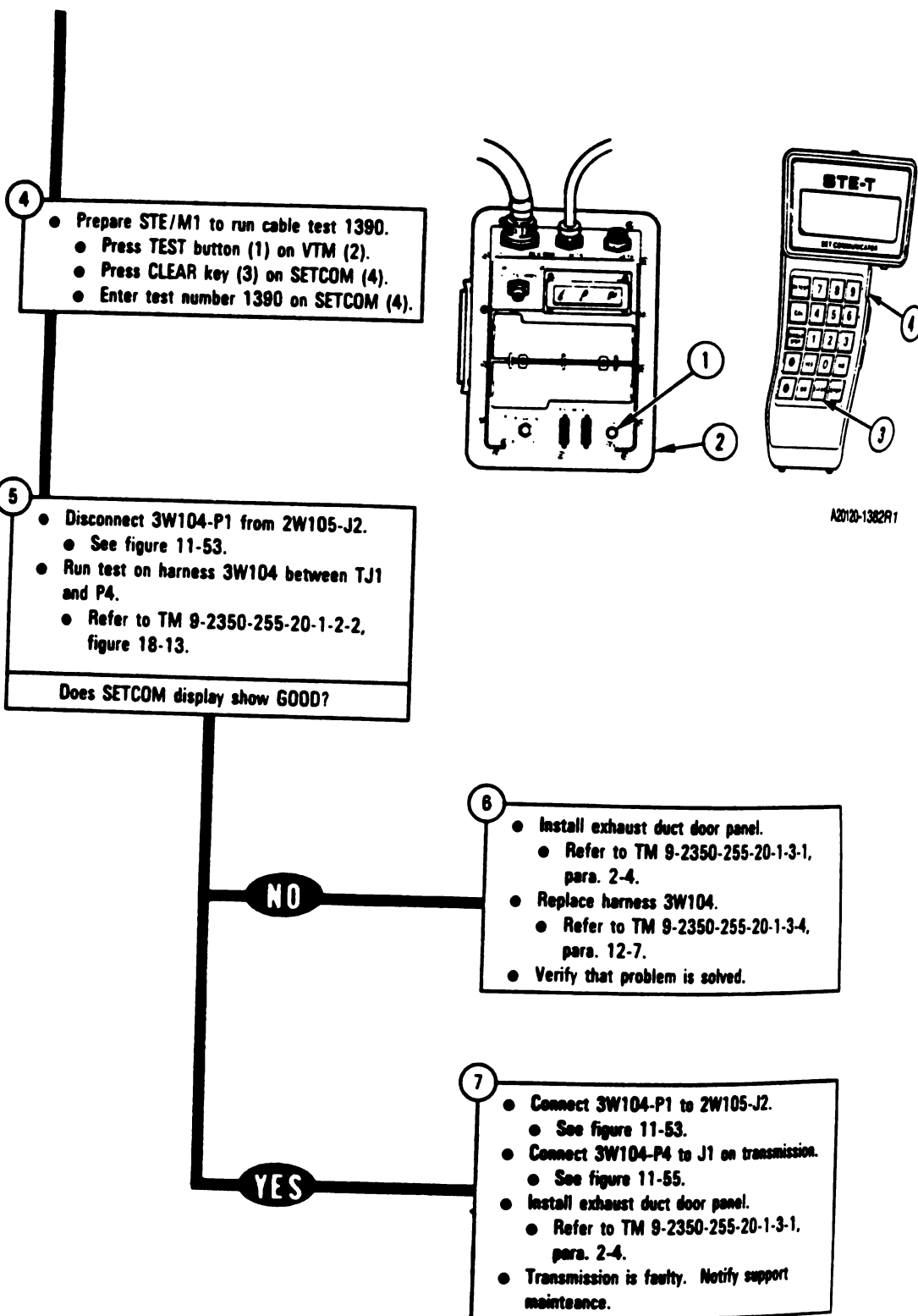
A20120-1381

Figure 11-41 (Sheet 1 of 2)  
 Volume II  
 Para. 11-3

Change 8 11-139



**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**

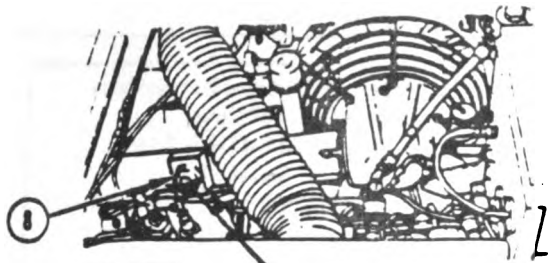
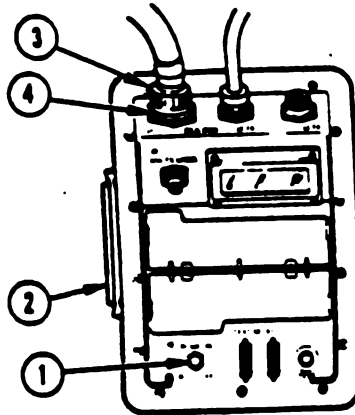


*Figure 11-41 (Sheet 2 of 2)  
Volume II  
Para. 11-3*

TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING

DISPLAY SHOWS  
MULTI XMSN SOL H  
R 3W104

155017



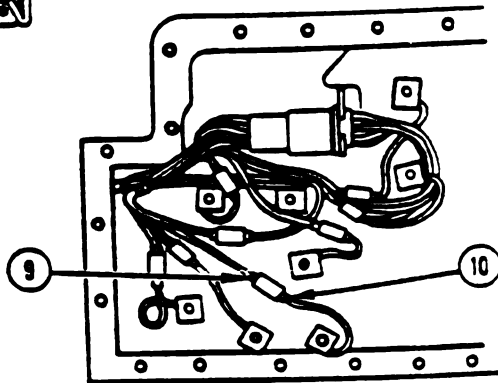
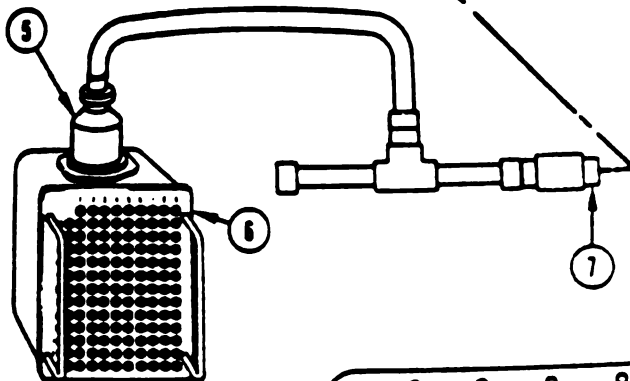
**Additional Test Equipment/Special Tools:**  
● Breakout Box Tool Kit, 12311088

**Equipment Condition:**  
● Tank parked.  
● Parking brake set.  
● Engine shut down.  
● Vehicle master power off.  
● Hull networks box circuit breakers on.  
● Turret networks box circuit breakers on.

**1**  
● Pull out power switch (1) on VTM (2).  
● Disconnect CX202-P1 from J1 on VTM.  
● See figure 11-8.  
● Connect W1-P1 (3) to J1 (4) on VTM (2).  
● Disconnect CX304-P2 from CIB-J1  
● See figure 11-3.

**2**  
● Connect CX304-P2 (5) to breakout box (6).  
● Disconnect CX801-P2 from 3W104-TJ1.  
● See figure 11-8.  
● Connect CA407-P1 (7) to 3W104-TJ1 (8).

**3**  
● Remove control valve cover.  
● Refer to TM 9-2350-255-20-1-3-1, para. 2-8.  
● Disconnect internal harness H lead (9) from solenoid H lead (10).

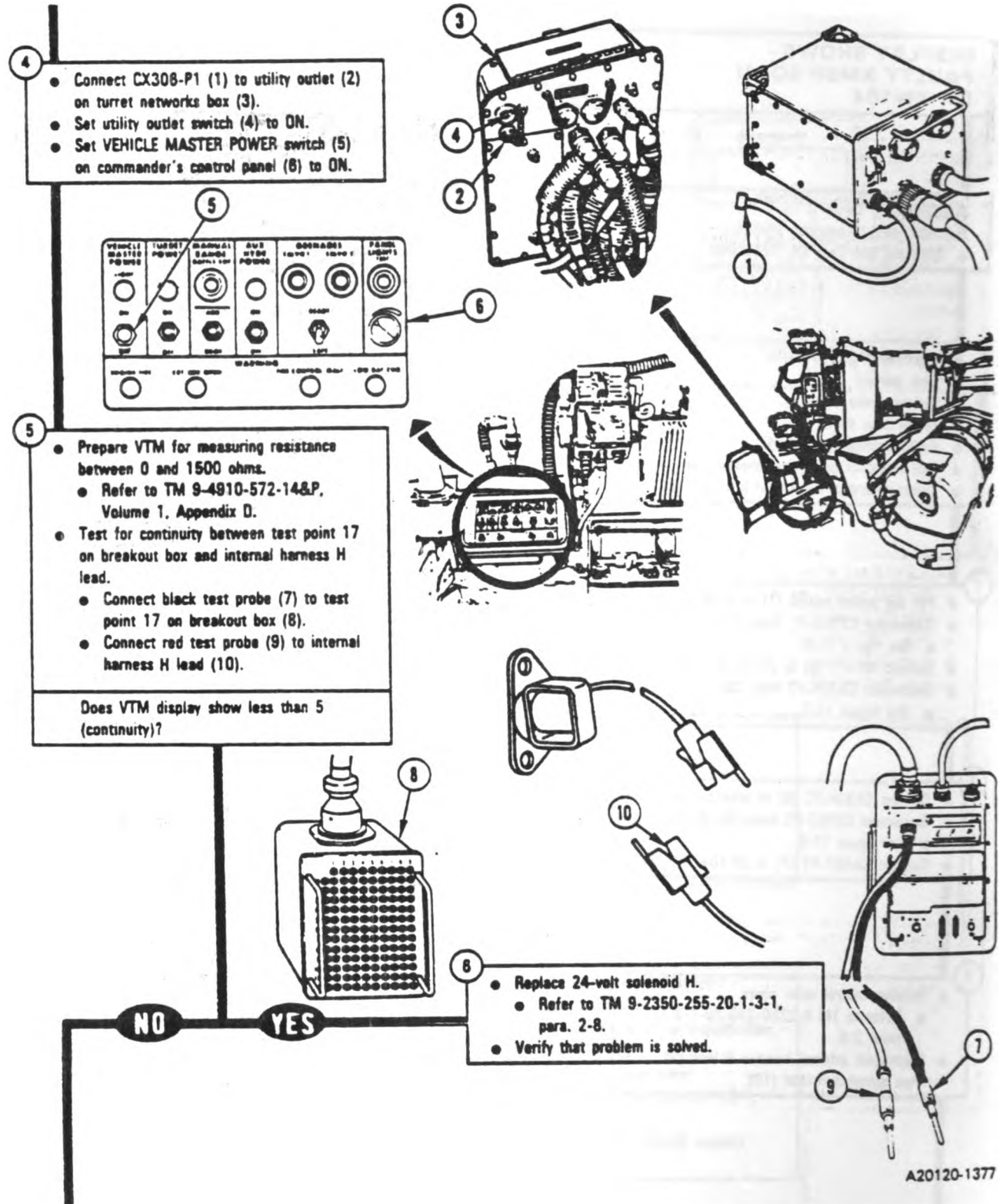


A20120-1376

Figure 11-42 (Sheet 1 of 4)  
Volume-II  
Para. 11-3

Change 5 11-141

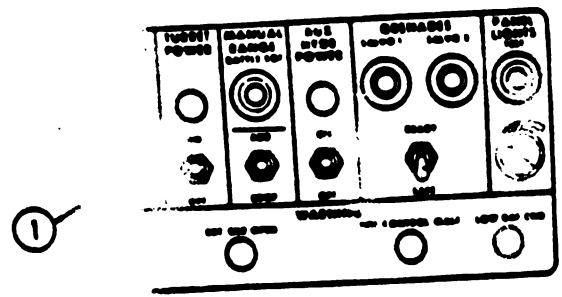
**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**



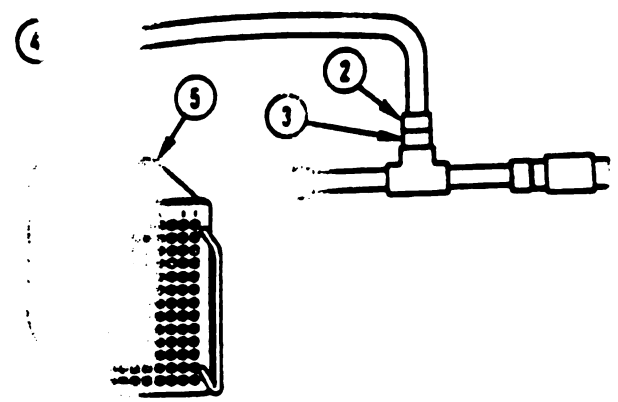
**Figure 11-42 (Sheet 2 of 4)  
Volume II  
Para. 11-3**

# TM 9-2350-255-20-1-2 TRANSMISSION AND FINAL DRIVE SYSTEM TROUBLESHOOTING

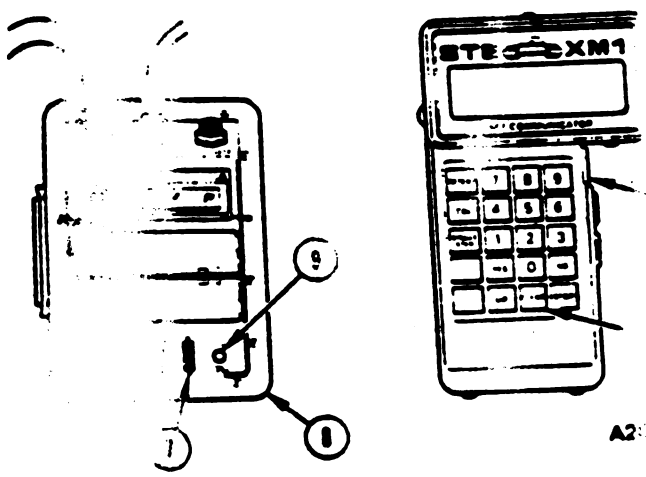
Set VEHICLE MASTER POWER switch (1) to OFF.  
 Disconnect CX304-P1 (2) from CX208-P3 (3).  
 Disconnect CX304-P2 (4) from breakout box (5).  
 Disconnect 3W104-P4 from J1 on transmission.  
 • See figure 11-55.  
 Set VEHICLE MASTER POWER switch (1) to ON.



• Prepare STE/M1 to run cable test 1390.  
 • Set TEST SELECT switches (6, 7) on VTM (8) to 00.  
 • Press TEST button (9) on VTM (8).  
 • Press CLEAR key (10) on SETCOM (11).  
 • Enter test number 1390 on SETCOM (11)



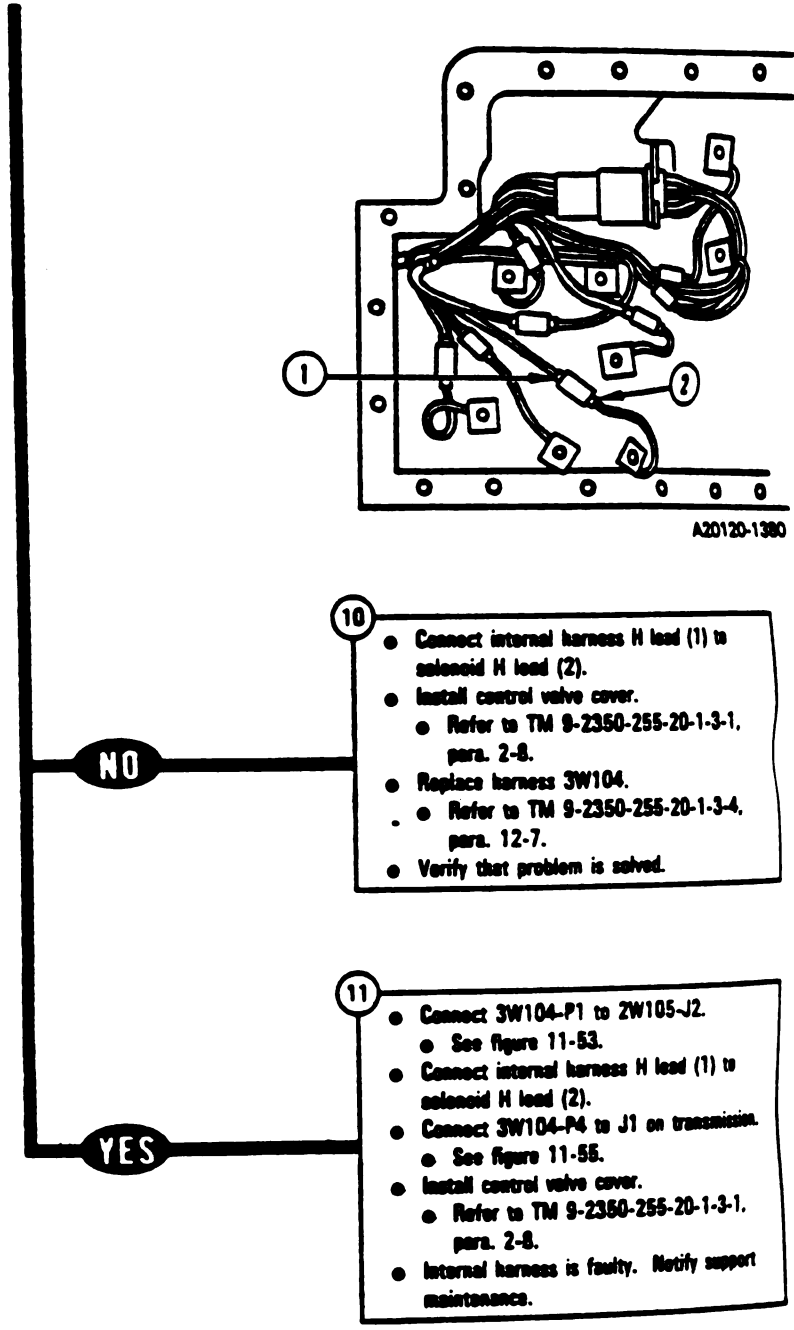
• Disconnect 3W104-P1 from ZW105-J2.  
 • See figure 11-53.  
 • Run test on harness 3W104 between TJ1 and P4.  
 • Refer to TM 9-2350-255-20-1-2-2, figure 18-13.



Does SETCOM display show GOOD?

Figure 11-55 (set 3 of 4)  
 Version 11  
 Part 1-3

**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**



*Figure 11-42 (Sheet 4 of 4)  
Volume II  
Para. 11-3*

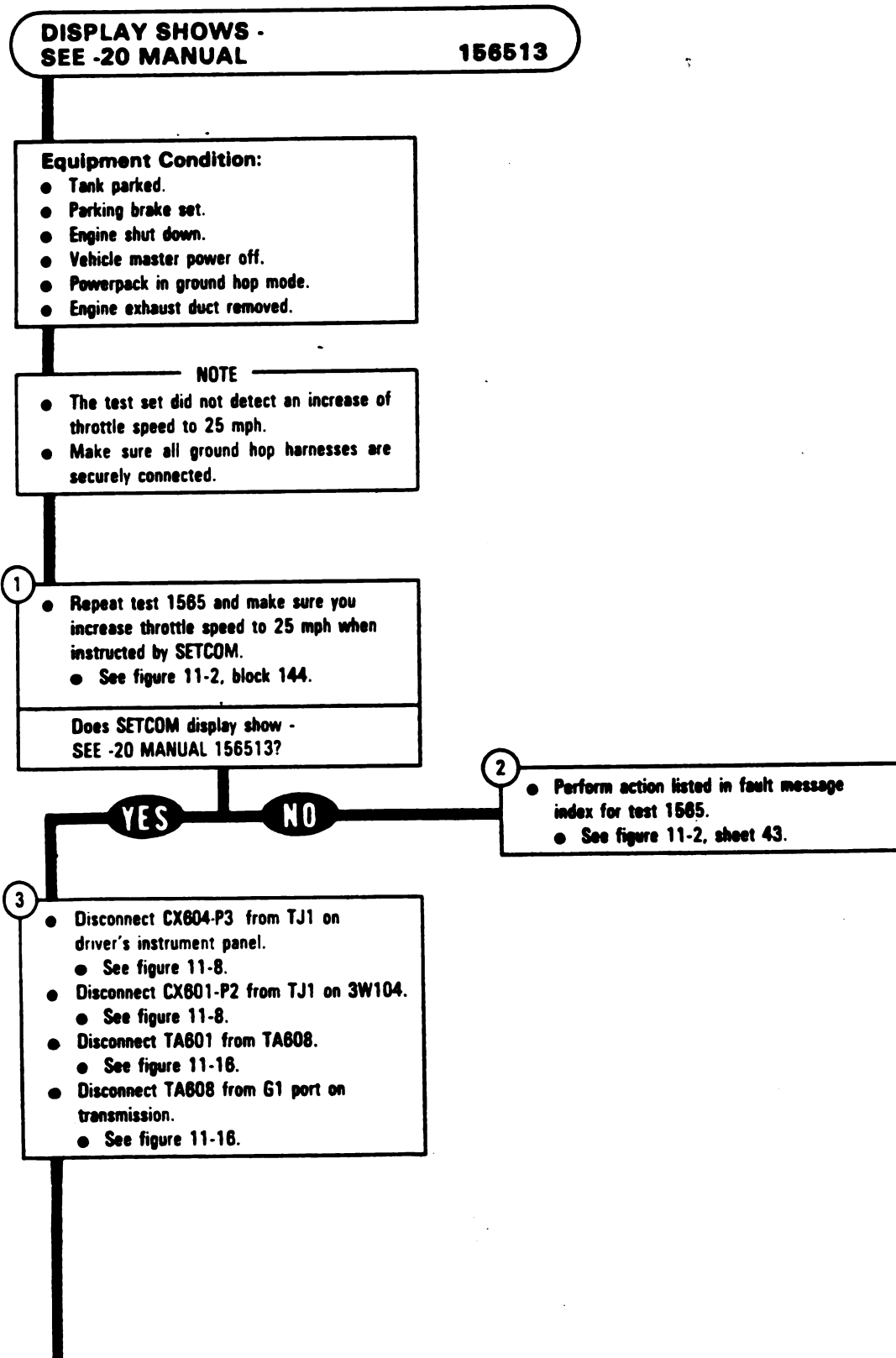
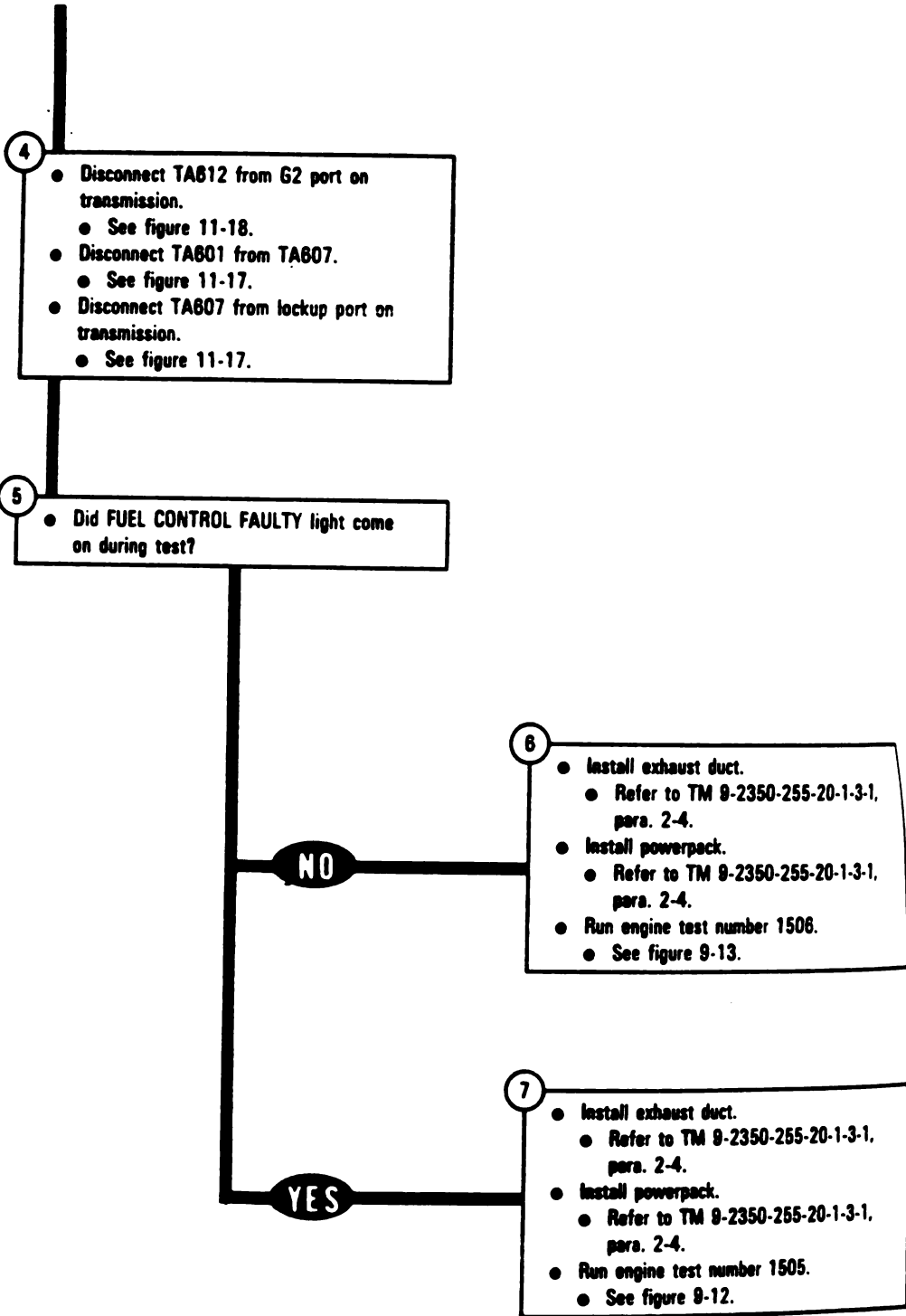


Figure 11-43 (Sheet 1 of 2)  
Volume II  
Para. 11-3

**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**



*Figure 11-43 (Sheet 2 of 2)*  
**Volume II  
Para. 11-3**

**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**

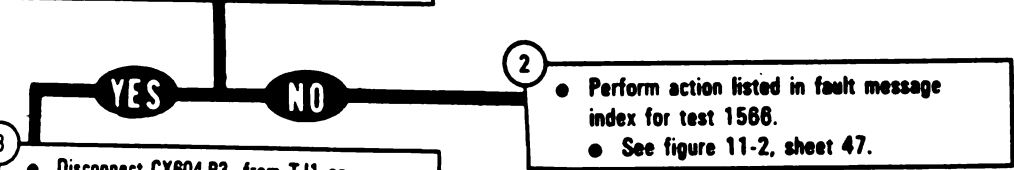
**ISPLAY SHOWS -  
EE -20 MANUAL 156605**

- Equipment Condition:**
- Tank parked.
  - Parking brake set.
  - Engine shut down.
  - Vehicle master power off.
  - Powerpack in ground hop mode.
  - Engine exhaust duct removed.

- NOTE**
- The test set did not detect an increase of throttle speed to 25 mph.
  - Make sure all ground hop harnesses are securely connected.

- Repeat test 1566 and make sure you go to full throttle when instructed by SETCOM.
- See figure 11-2, block 129.

Does SETCOM display show -  
SEE -20 MANUAL 156605?



- Disconnect CX604-P3 from TJ1 on driver's instrument panel.
- See figure 11-8.
- Disconnect CX601-P2 from 3W104-TJ1.
- See figure 11-8.
- Disconnect TA801 from TA812.
- See figure 11-18.
- Disconnect TA812 from G2 port on transmission.
- See figure 11-18.

- NOTE**
- Determine if you have a 10 port, or 11 port transmission by counting the ports above valve cover on transmission. For 10 port go to block 4, for 11 port go to block 5.

*Figure 11-44 (Sheet 1 of 3)  
Volume II  
Para. 11-3*



**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**

**4**

**NOTE**  
This block is for 10 port transmission.

- Disconnect TA601 from TA607.
  - See figure 11-21.
- Disconnect TA607 from MOD port on transmission.
  - See figure 11-21.
- Install plug (1) in G2 port (2) on transmission (3) with 7/16-inch wrench.
- Install plug (4) in MOD port (5) on transmission (3) with 7/16-inch wrench.

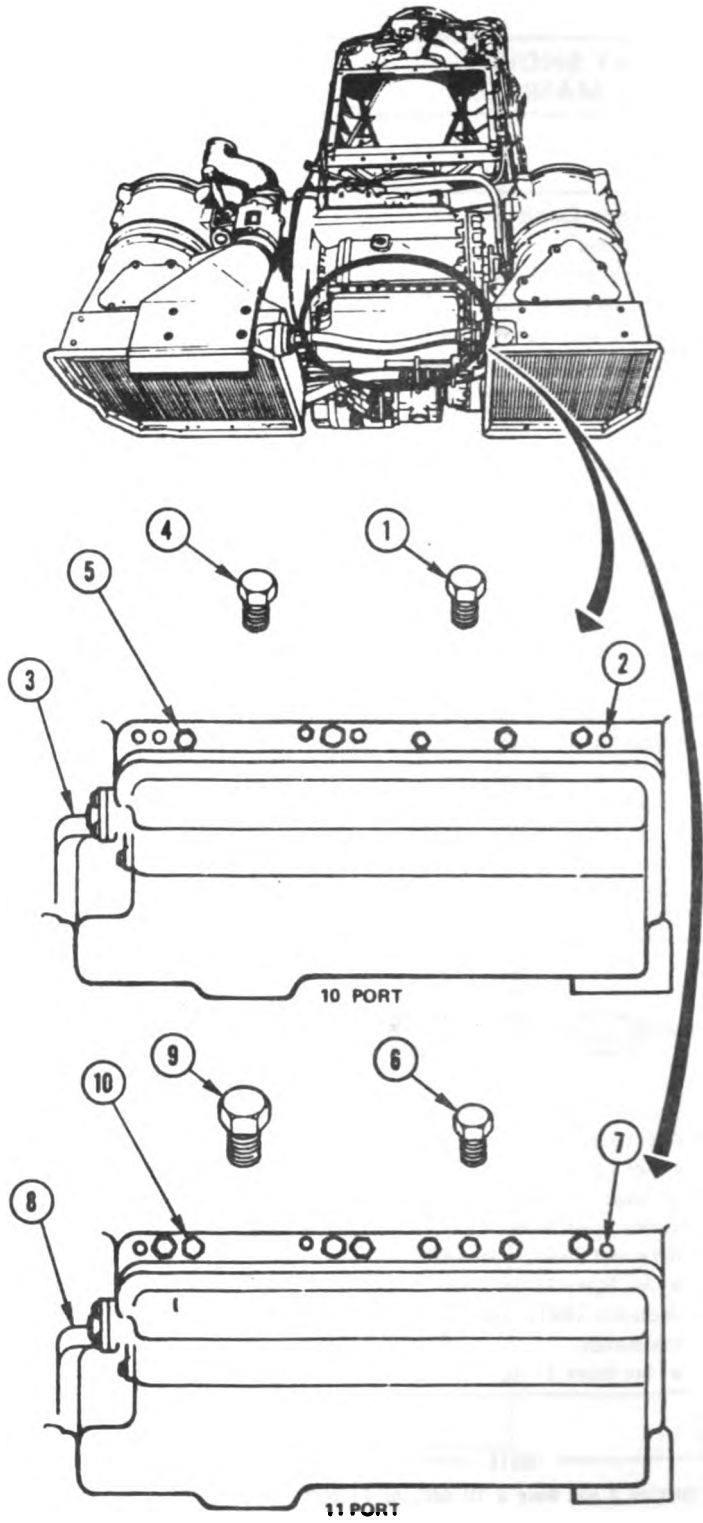
**5**

**NOTE**  
This block is for 11 port transmission.

- Disconnect TA601 from TA613.
  - See figure 11-21.
- Disconnect TA613 from MOD port on transmission.
  - See figure 11-21.
- Install plug (6) in G2 port (7) on transmission (8) with 7/16-inch wrench.
- Install plug (9) in MOD port (10) on transmission (8) with 7/8-inch wrench.

**6**

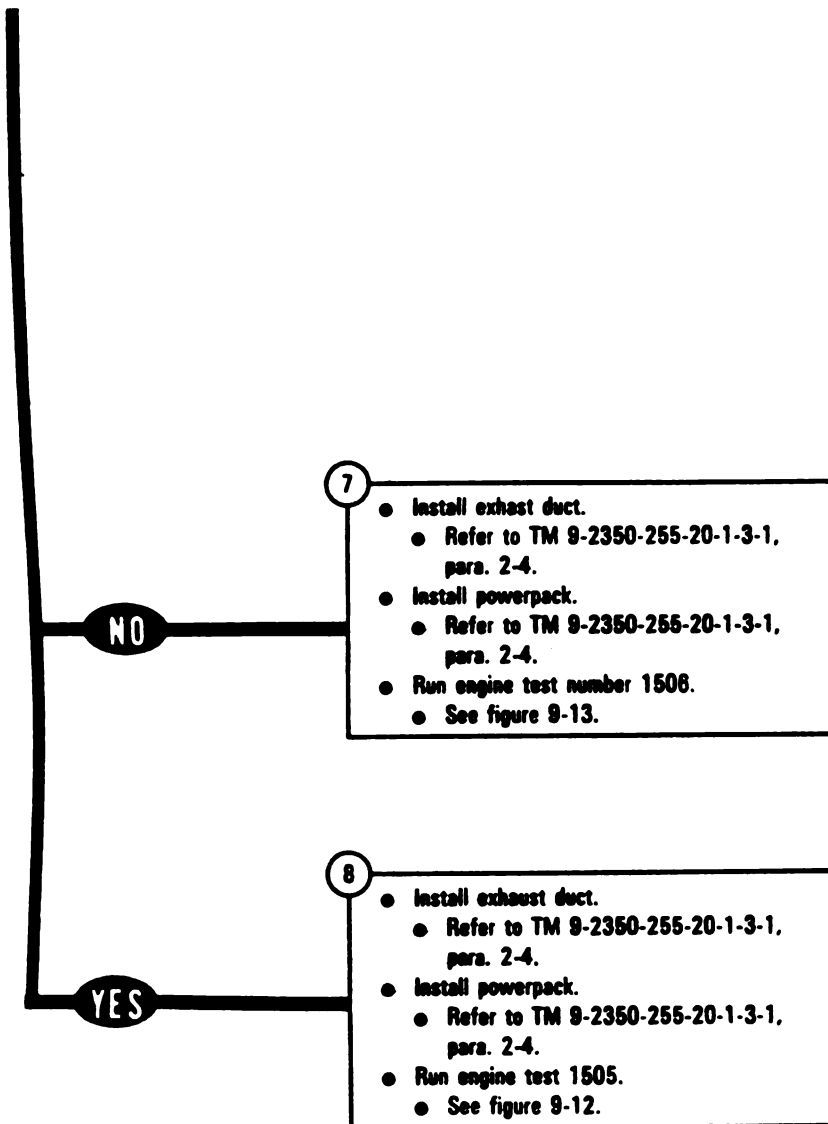
Did FUEL CONTROL FAULTY light come on during test?



A 20120-1434

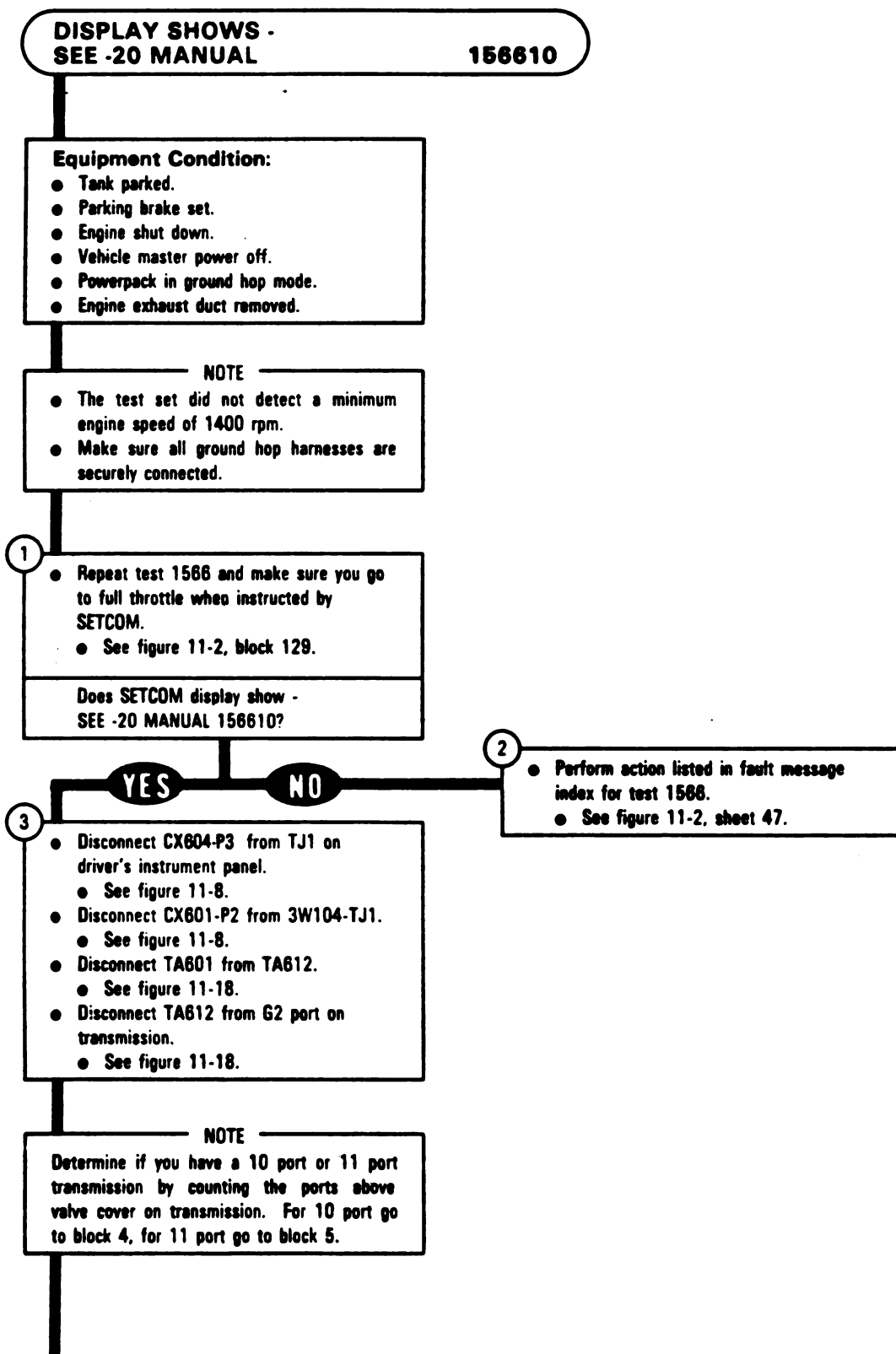
**Figure 11-44 (Sheet 2 of 3)  
Volume II  
Para. 11-3**

**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**



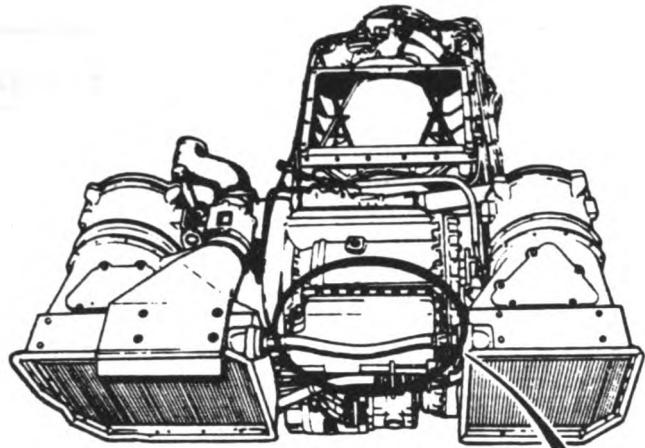
*Figure 11-44 (Sheet 3 of 3)*  
**Volume II  
Para. 11-3**

**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**



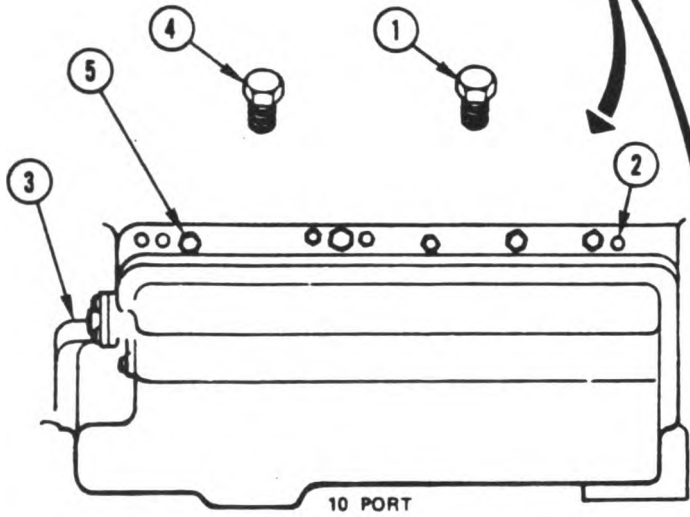
*Figure 11-45 (Sheet 1 of 3)  
Volume II  
Para. 11-3*

**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**



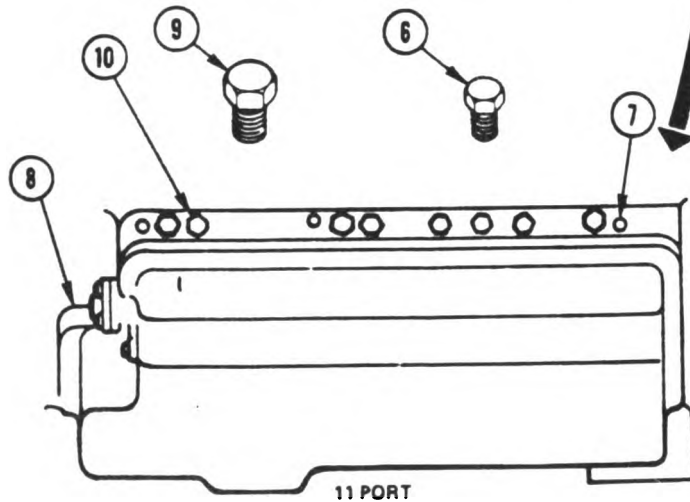
**NOTE**  
This block is for 10 port transmission.

- Disconnect TA801 from TA807.
- See figure 11-21.
- Disconnect TA807 from MOD port on transmission.
- See figure 11-21.
- Install plug (1) in G2 port (2) on transmission (3) with 7/16-inch wrench.
- Install plug (4) in MOD port (5) on transmission (3) with 7/16-inch wrench.



**NOTE**  
This block is for 11 port transmission.

- Disconnect TA801 from TA813.
- See figure 11-21.
- Disconnect TA813 from MOD port on transmission.
- See figure 11-21.
- Install plug (6) in G2 port (7) on transmission (8) with 7/16-inch wrench.
- Install plug (9) in MOD port (10) on transmission (8) with 7/8-inch wrench.



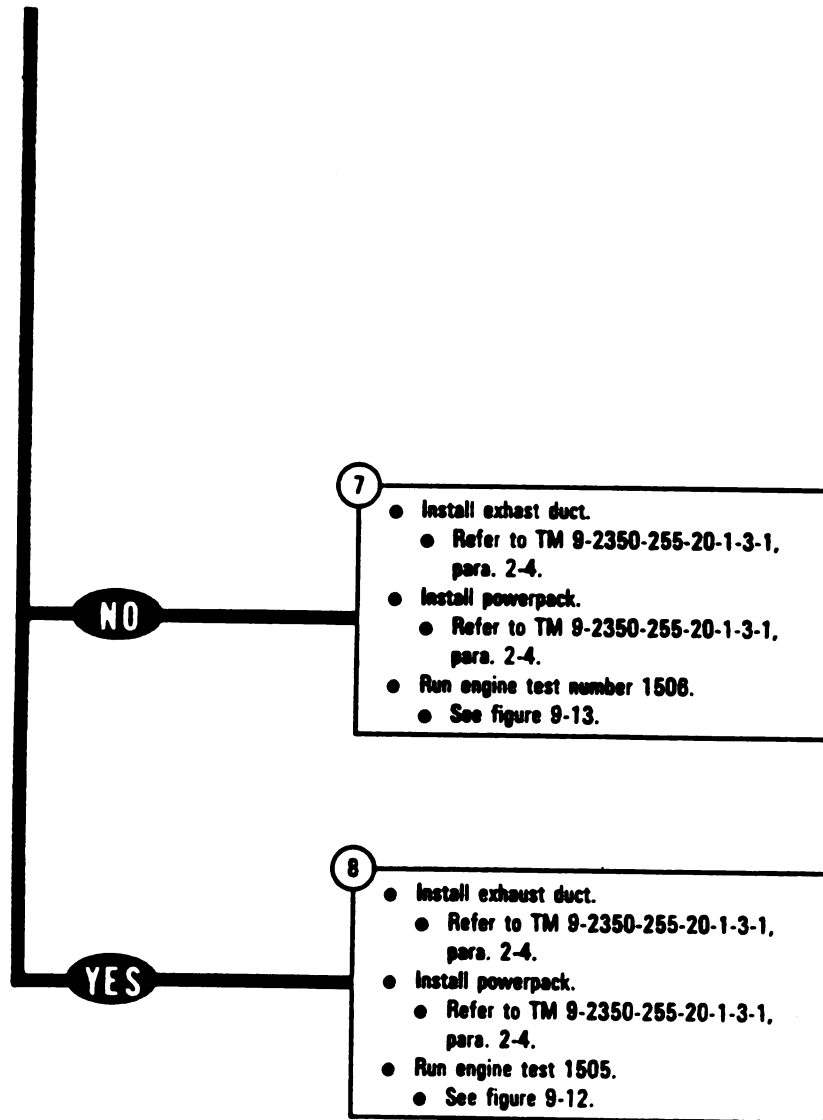
**6**  
Did FUEL CONTROL FAULTY light come on during test?

A20120-1434

Figure 11-45 (Sheet 2 of 3)  
Volume II  
Para. 11-3

Change 5 11-151

**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**



*Figure 11-45 (Sheet 3 of 3)*  
**Volume II  
Para. 11-3**

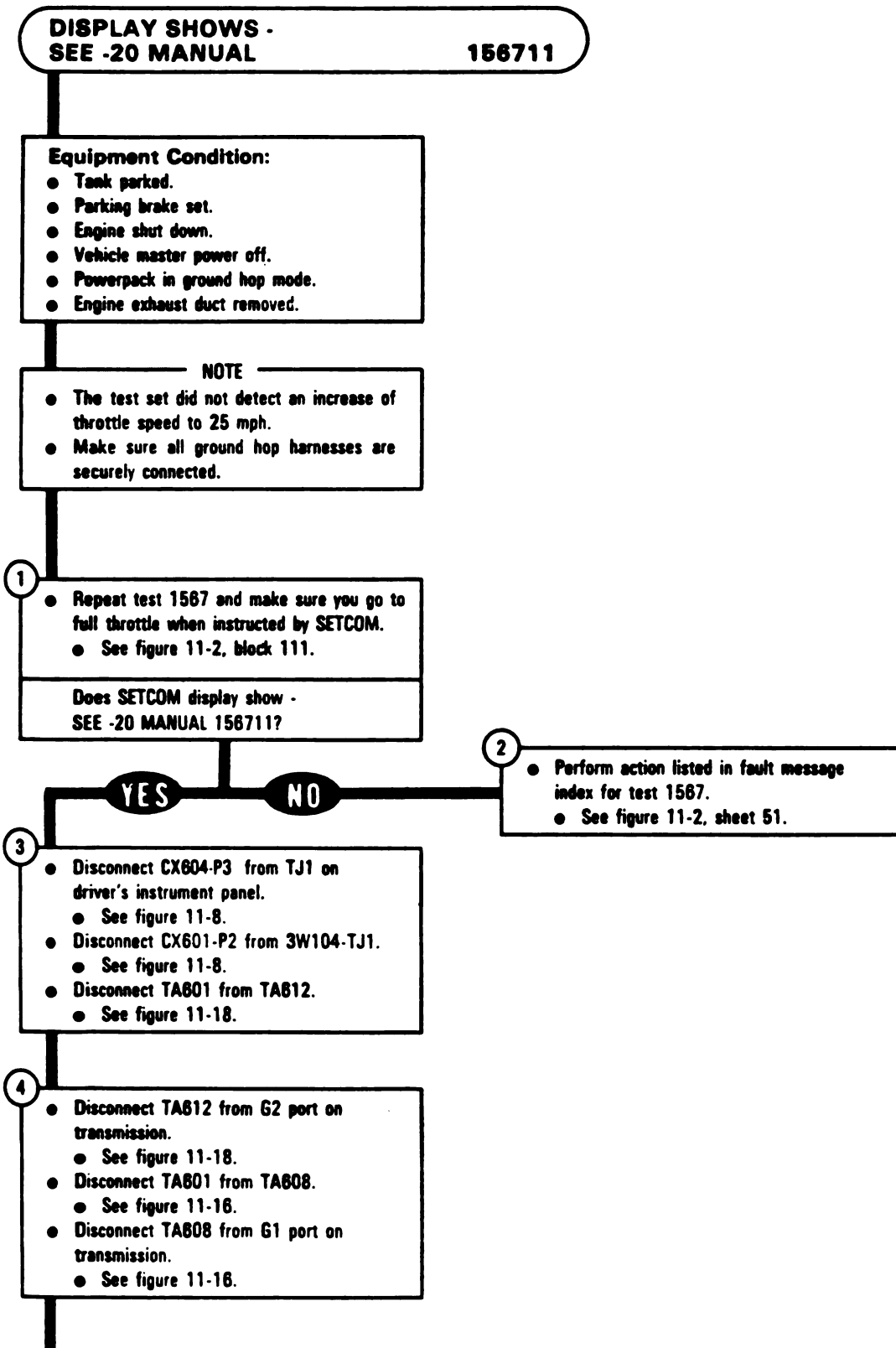


Figure 11-46 (Sheet 1 of 3)  
Volume II  
Para. 11-3

**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**

**NOTE**

Determine if you have a 10 port, or 11 port transmission by counting the ports above valve cover on transmission. For 10 port go to block 5, for 11 port go to block 6.

5

**NOTE**

This block is for 10 port transmission.

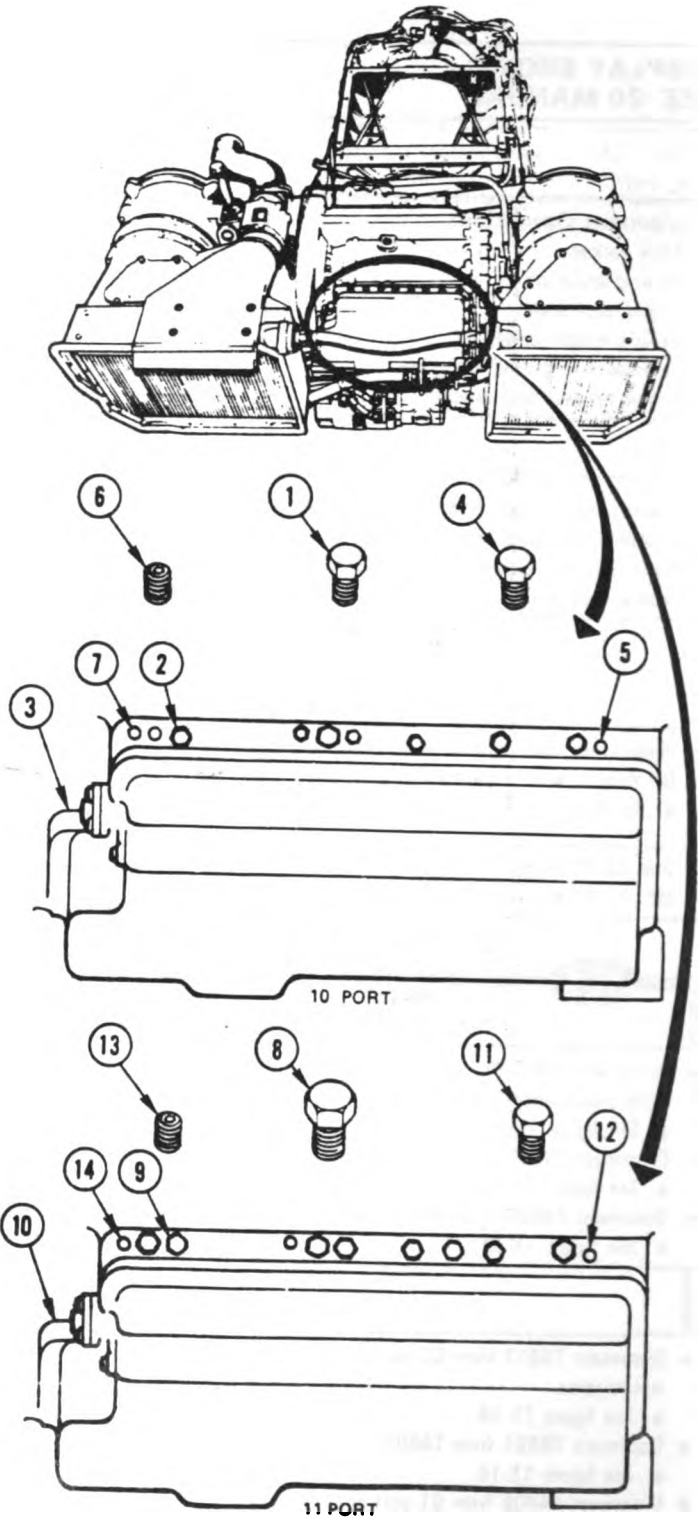
- Disconnect TA601 from TA607.
  - See figure 11-21.
- Disconnect TA607 from MOD port on transmission.
  - See figure 11-21.
- Install plug (1) in MOD port (2) on transmission (3) with 7/16-inch wrench.
- Install plug (4) in G2 port (5) on transmission (3) with 7/16-inch wrench.
- Install plug (6) in G1 port (7) on transmission (3) with 3/16-inch key.

6

**NOTE**

This block is for 11 port transmission.

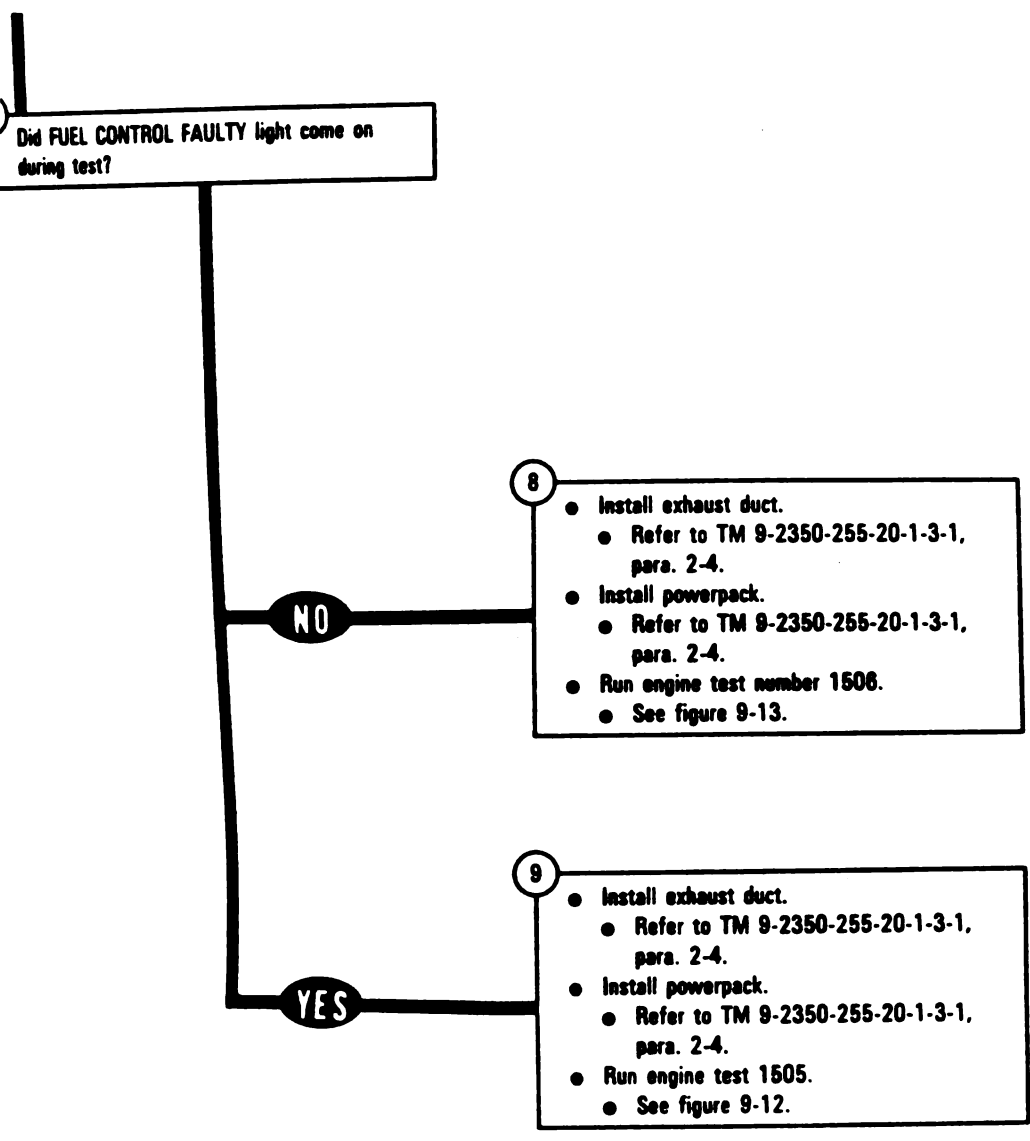
- Disconnect TA601 from TA613.
  - See figure 11-21.
- Disconnect TA613 from MOD port on transmission.
  - See figure 11-21.
- Install plug (8) in MOD port (9) on transmission (10) with 7/8-inch wrench.
- Install plug (11) in G2 port (12) on transmission (10) with 7/16-inch wrench.
- Install plug (13) in G1 port (14) on transmission (10) with 3/16-inch key.



A20120-1435

**Figure 11-46 (Sheet 2 of 3)  
Volume II  
Para. 11-3**

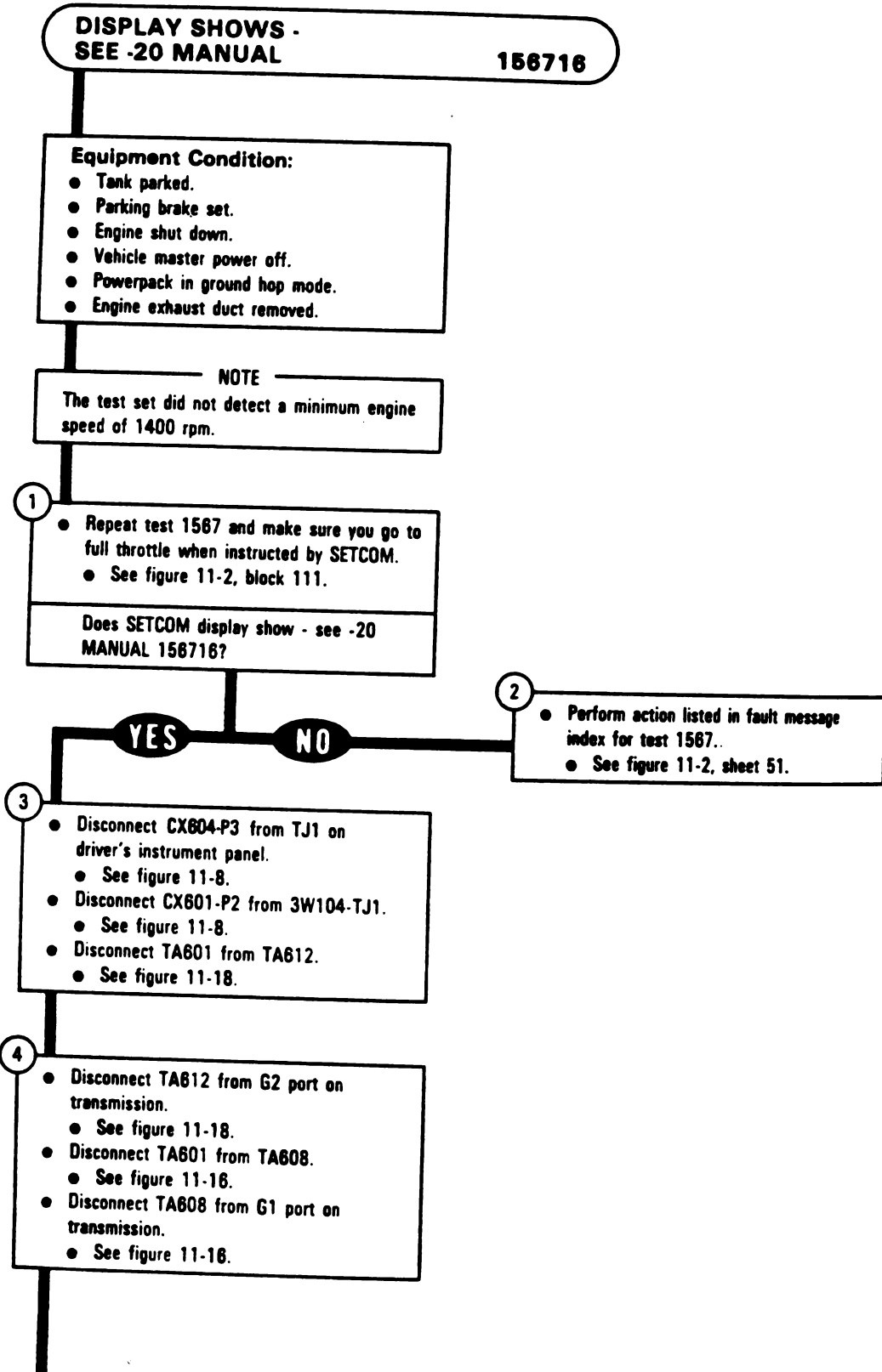
**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**



*Figure 11-46 (Sheet 3 of 3)*  
**Volume II**  
**Para. 11-3**



**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**



*Figure 11-47 (Sheet 1 of 3)  
Volume II  
Para. 11-3*

**NOTE**

Determine if you have a 10 port, or 11 port transmission by counting the ports above valve cover on transmission. For 10 port go to block 5, for 11 port go to block 6.

5

**NOTE**

This block is for 10 port transmission.

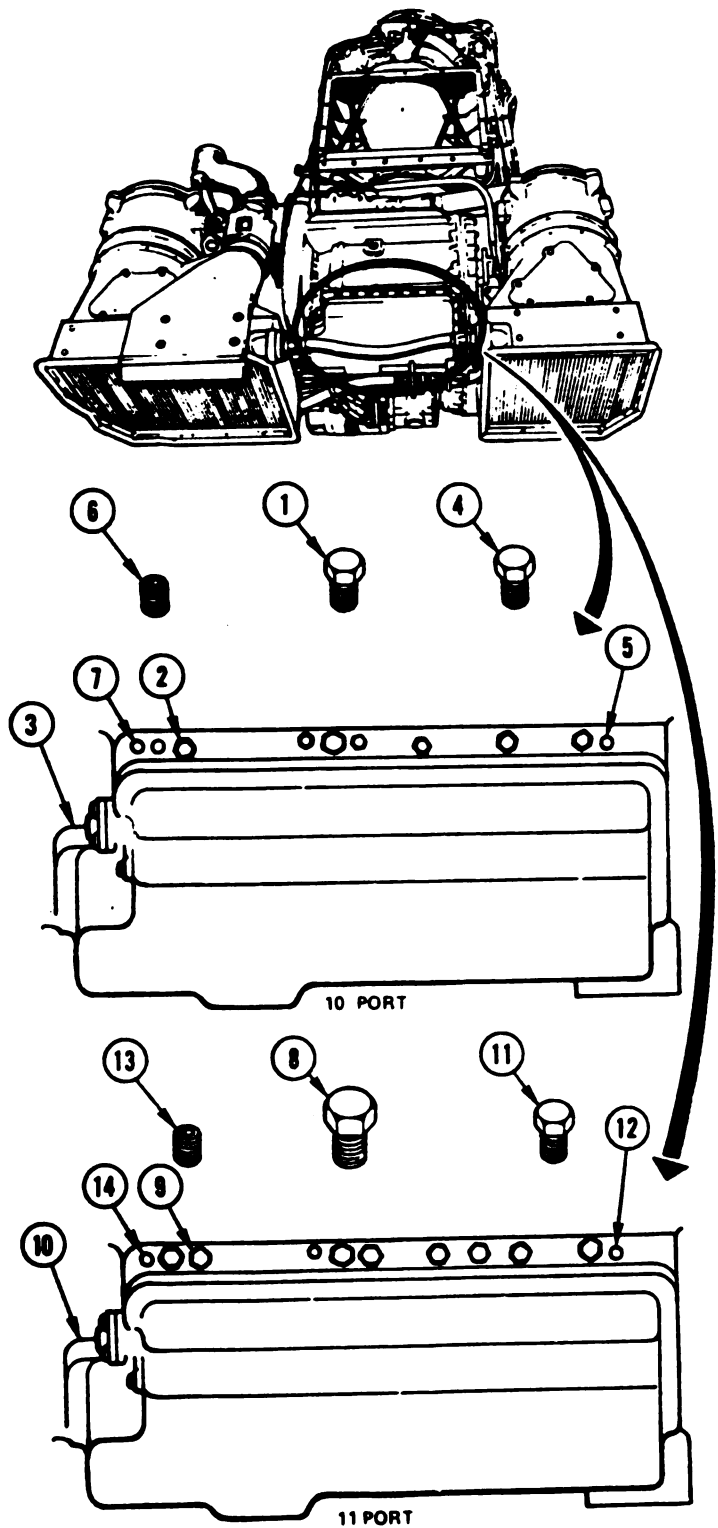
- Disconnect TA601 from TA607.
  - See figure 11-21.
- Disconnect TA607 from MOD port on transmission.
  - See figure 11-21.
- Install plug (1) in MOD port (2) on transmission (3) with 7/16-inch wrench.
- Install plug (4) in G2 port (5) on transmission (3) with 7/16-inch wrench.
- Install plug (6) in G1 port (7) on transmission (3) with 3/16-inch key.

6

**NOTE**

This block is for 11 port transmission.

- Disconnect TA601 from TA613.
  - See figure 11-21.
- Disconnect TA613 from MOD port on transmission.
  - See figure 11-21.
- Install plug (8) in MOD port (9) on transmission (10) with 7/8-inch wrench.
- Install plug (11) in G2 port (12) on transmission (10) with 7/16-inch wrench.
- Install plug (13) in G1 port (14) on transmission (10) with 3/16-inch key.

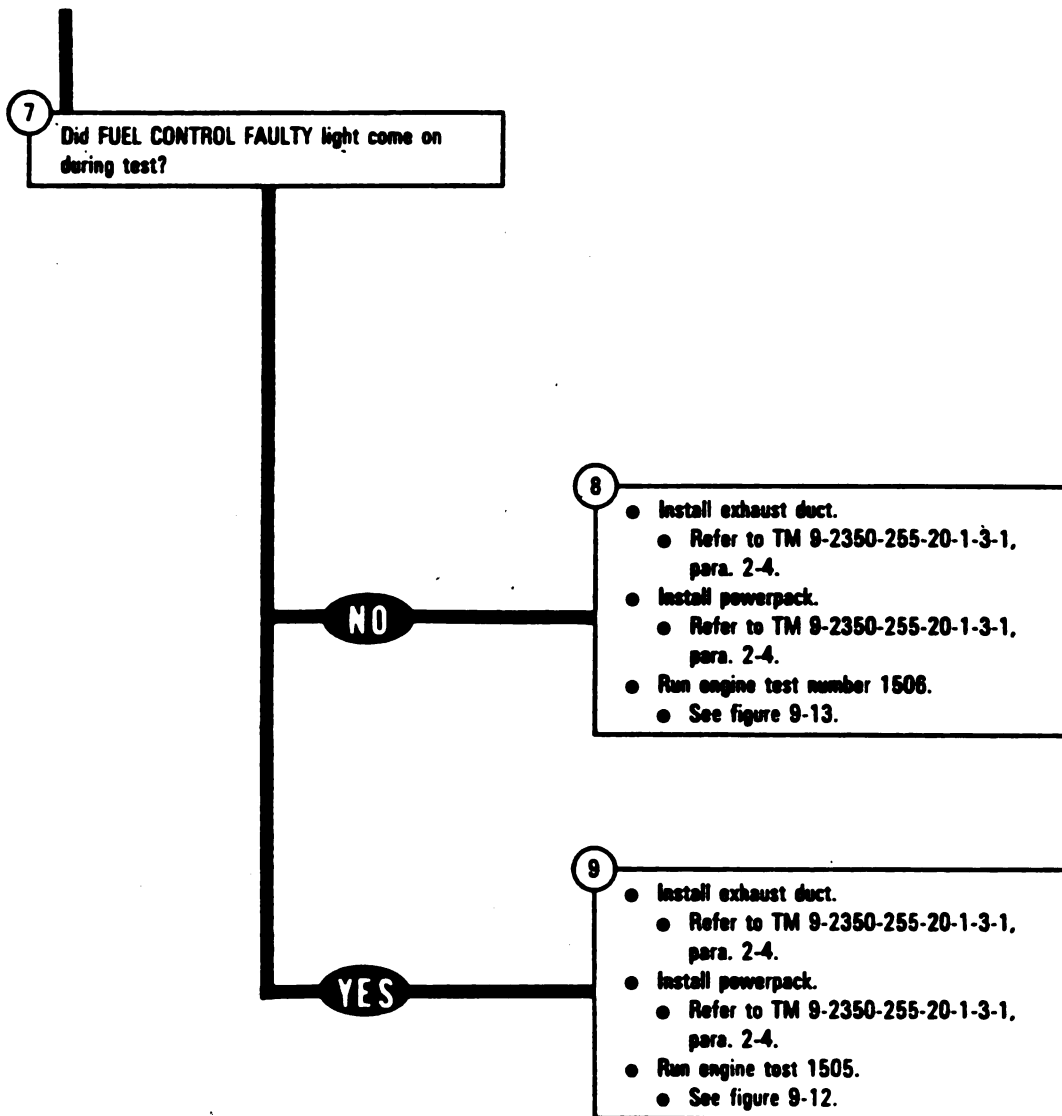


A20120-1435

Figure 11-47 (Sheet 2 of 3)  
 Volume II  
 Para. 11-3

Change 5 11-157

**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**



*Figure 11-47 (Sheet 3 of 3)*  
**Volume II**  
**Para. 11-3**

**DISPLAY SHOWS -  
 FAULTY 3S105 OR  
 3W104**

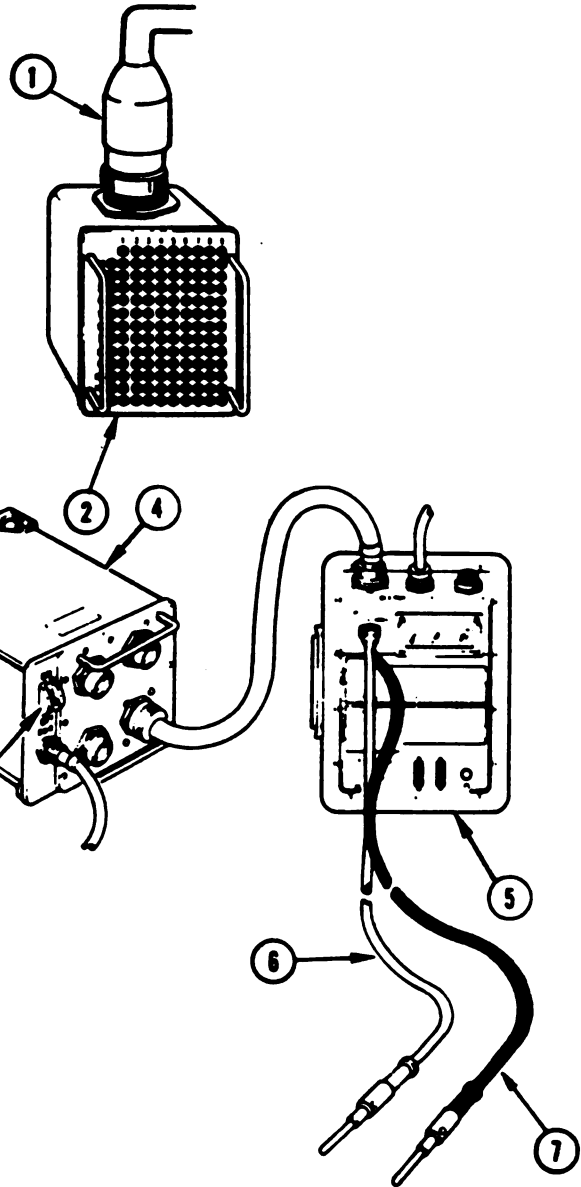
**110058**

**Additional Test  
 Equipment/Special Tools:**

- Breakout Bo; Tool Kit, 12311066

**Equipment Condition:**

- Tank parked.
- Parking brake set.
- Engine shut down.
- Vehicle master power off.
- Hull networks box circuit breakers on.



A20120-1872

- 1
- Disconnect 3W104-P3 from J1 on right parking brake switch.
    - See figure 11-55.
  - Disconnect CX304-P2 from CIB-J1.
    - See figure 11-3.
  - Connect CX304-P2 (1) to breakout box (2).
  - Change control from SETCOM to VTM.
    - Set PWR switch (3) on CIB (4) to OFF to reset VTM (5).
  - Prepare VTM for measuring resistance between 0 and 1500 ohms.
    - Refer to TM 9-4910-572-14&P, Volume I, Appendix D.

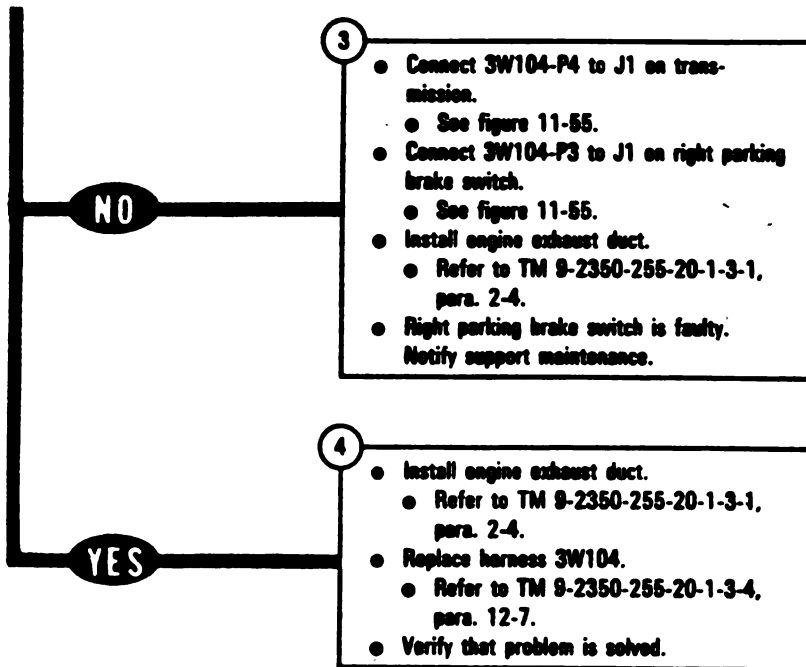
- 2
- Connect red test probe (6) to test point 91 on breakout box (2).
  - Connect black test probe (7) to test point 92 on breakout box (2).

Does VTM display show less than 5 (short)?

Figure 11-47.1 (Sheet 1 of 2)  
 Volume II  
 Para. 11-3

Change 8 11-158.1

**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**



*Figure 11-47.1 (Sheet 2 of 2)*  
**Volume II  
Para. 11-3**

PLAY SHOWS -  
ULTY 3S104 OR  
/104

110059

Additional Test  
Equipment/Special Tools:  
Breakout Box Tool Kit, 12311088

Equipment Condition:

- Tank parked.
- Parking brake set.
- Engine shut down.
- Vehicle master power off.
- Hull networks box circuit breakers on.

- Disconnect 3W104-P5 from J1 on left parking brake switch.
  - See figure 11-55.
- Disconnect CX304-P2 from CIB-J1.
  - See figure 11-3.
- Connect CX304-P2 (1) to breakout box (2).
- Change control from SETCOM to VTM.
  - Set PWR switch (3) on CIB (4) to OFF to reset VTM (5).
  - Set PWR switch (3) to ON.
- Prepare VTM for measuring resistance between 0 and 1500 ohms.
  - Refer to TM 9-4910-572-14&P, Volume I, Appendix D.

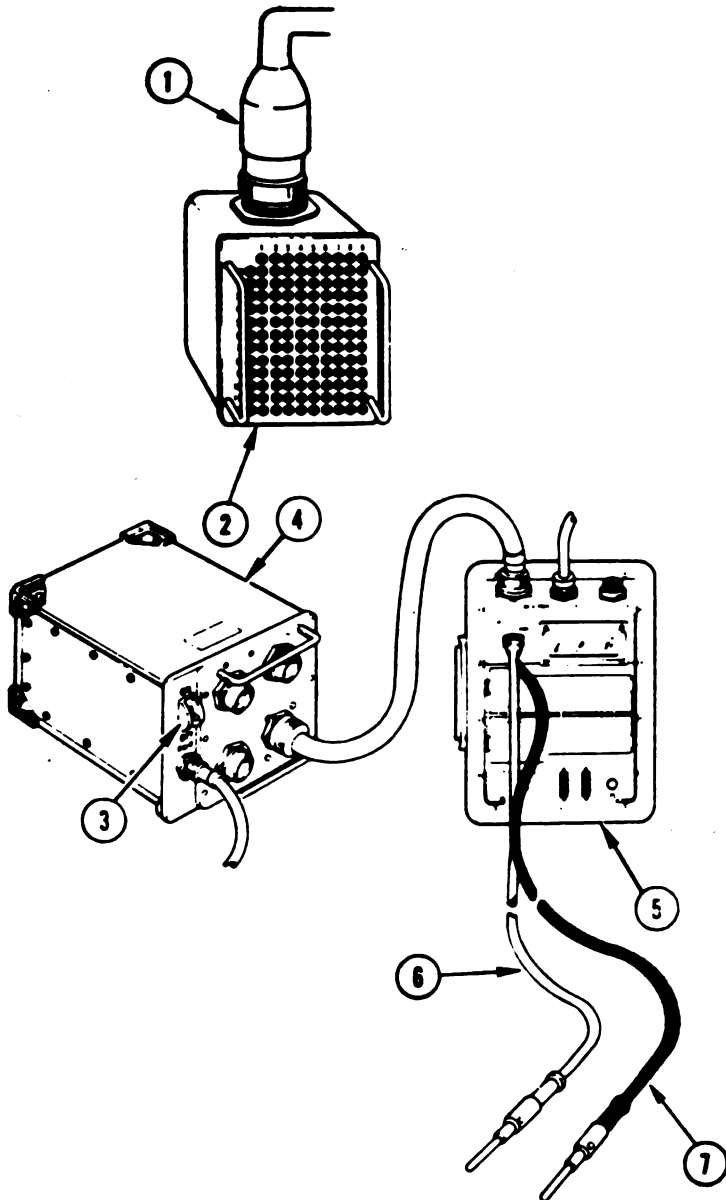
- Connect red test probe (6) to test point 90 on breakout box (2).

NOTE

If VTM display shows less than 5 (short), leave test probes connected and go immediately to block 4.

- Test for a short by connecting black test probe (7) to each test point on breakout box (2) listed below:
  - 89, 92

Does VTM display show less than 5 (short) at any test point?

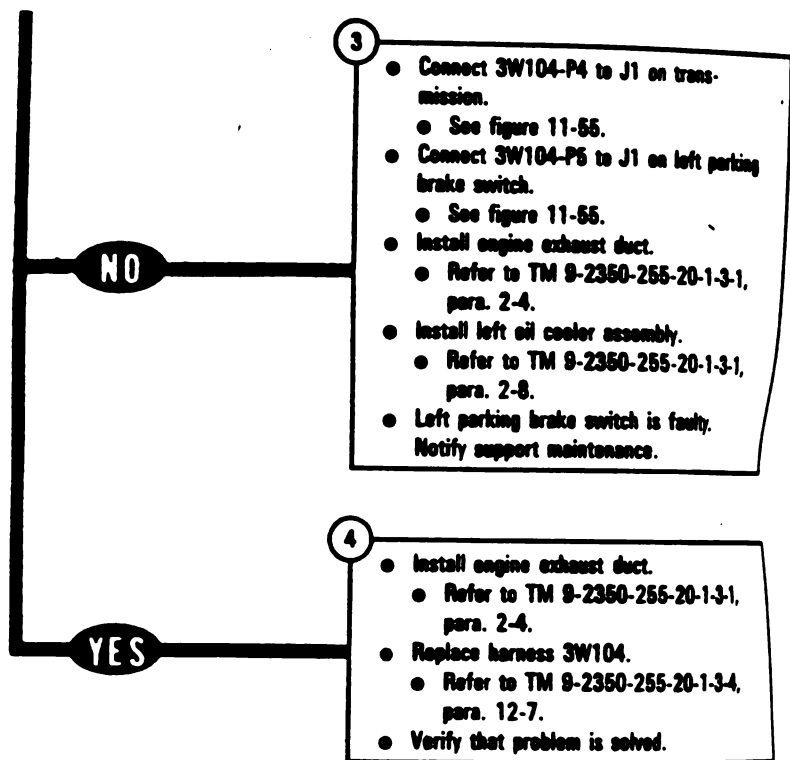


A20120-1872

Figure 11-47.2 (Sheet 1 of 2)  
Volume II  
Para. 11-3

Change 8 11-158.3

**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**



*Figure 11-47.2 (Sheet 2 of 2)*  
**Volume II  
Para. 11-3**

**11-158.4 Change 8**

11-4. Transmission Oil Cooler Subsystem Troubleshooting Procedures

Table 11-4. Transmission Oil Cooler (TOC) Subsystem Fault Symptom Index

Fault Symptom No.	Fault Symptom	Primary Trouble-Shooting Procedure (PTP)
TOC-1	TRANSMISSION OIL TEMP HIGH Light And MASTER WARNING Light Come On - Oil Temperature Is Hot	Figure 11-48
TOC-2	TRANSMISSION OIL TEMP HIGH Light And Master WARNING Light Come On But Oil Temperature OK	Figure 11-49



**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**

**SYMPTOM TOC 1**

**TRANSMISSION OIL TEMP HIGH LIGHT  
AND MASTER WARNING LIGHT COME ON  
- OIL TEMPERATURE IS HOT.**

**Common Tools:**

- Wrench, 9/16-inch

**Test Equipment/Special Tools:**

- Breakout Box Test Kit, 12311066
- Multimeter
- Pliers, slip joint, conduit style with plastic jaw inserts, NSN 5120-00-624-8085

**Equipment Condition:**

- Tank parked.
- Parking brake set.
- Engine shut down.
- Vehicle master power off.

**NOTE**

- Read para. 11-1 before doing any work.
- This is a two-man job. Soldier A is responsible for completing the job. Soldier B is the assistant and is directed by Soldier A. Soldier B will only be used in block 12.

**1**

- Set up tank controls for standard initial test conditions.
- Refer to table 11-5 para. 11-7.

*Figure 11-48 (Sheet 1 of 7)  
Volume II  
Para. 11-4*

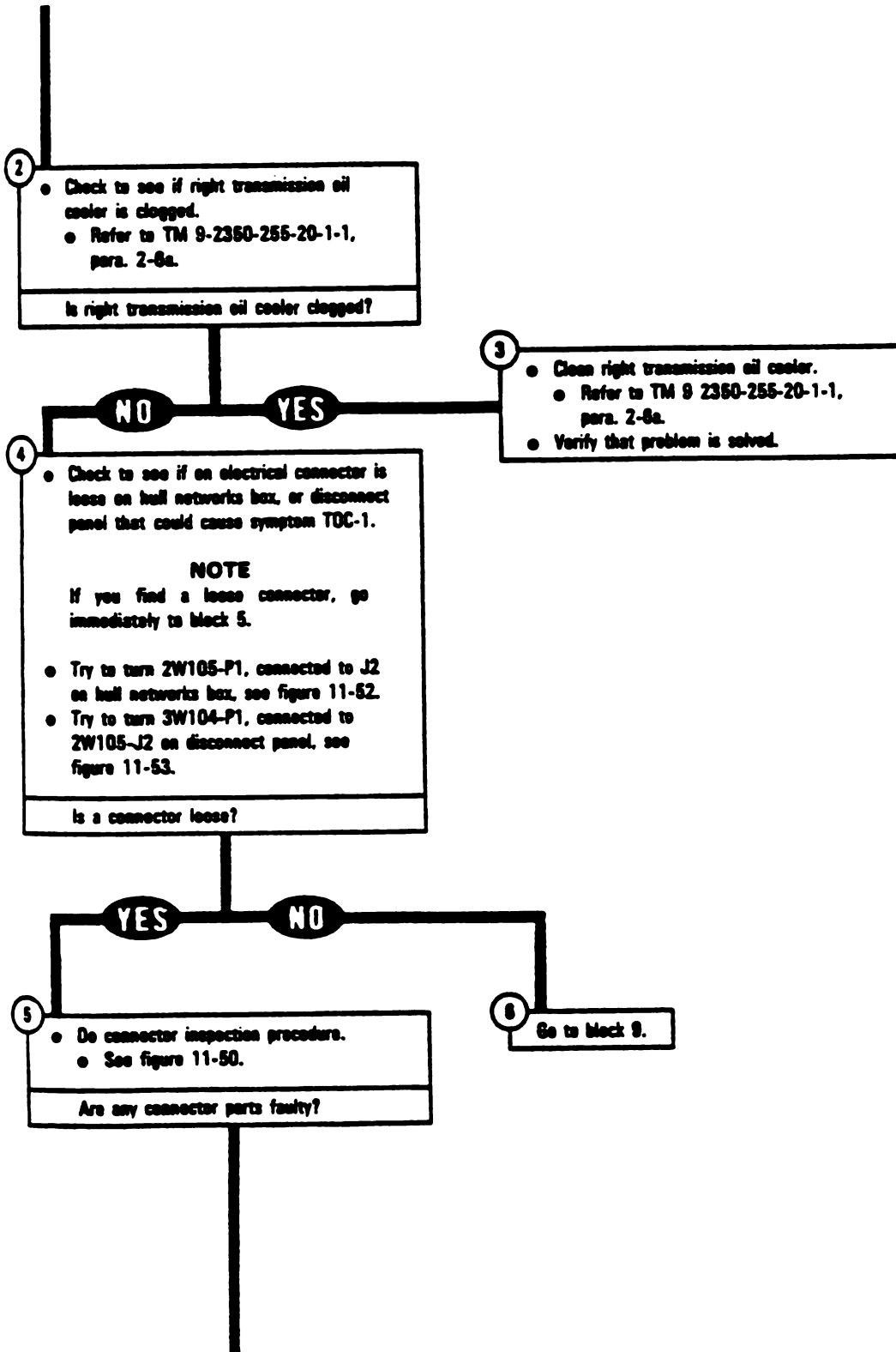


Figure 11-48 (Sheet 2 of 7)  
 Volume II  
 Para. 11-4

**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**

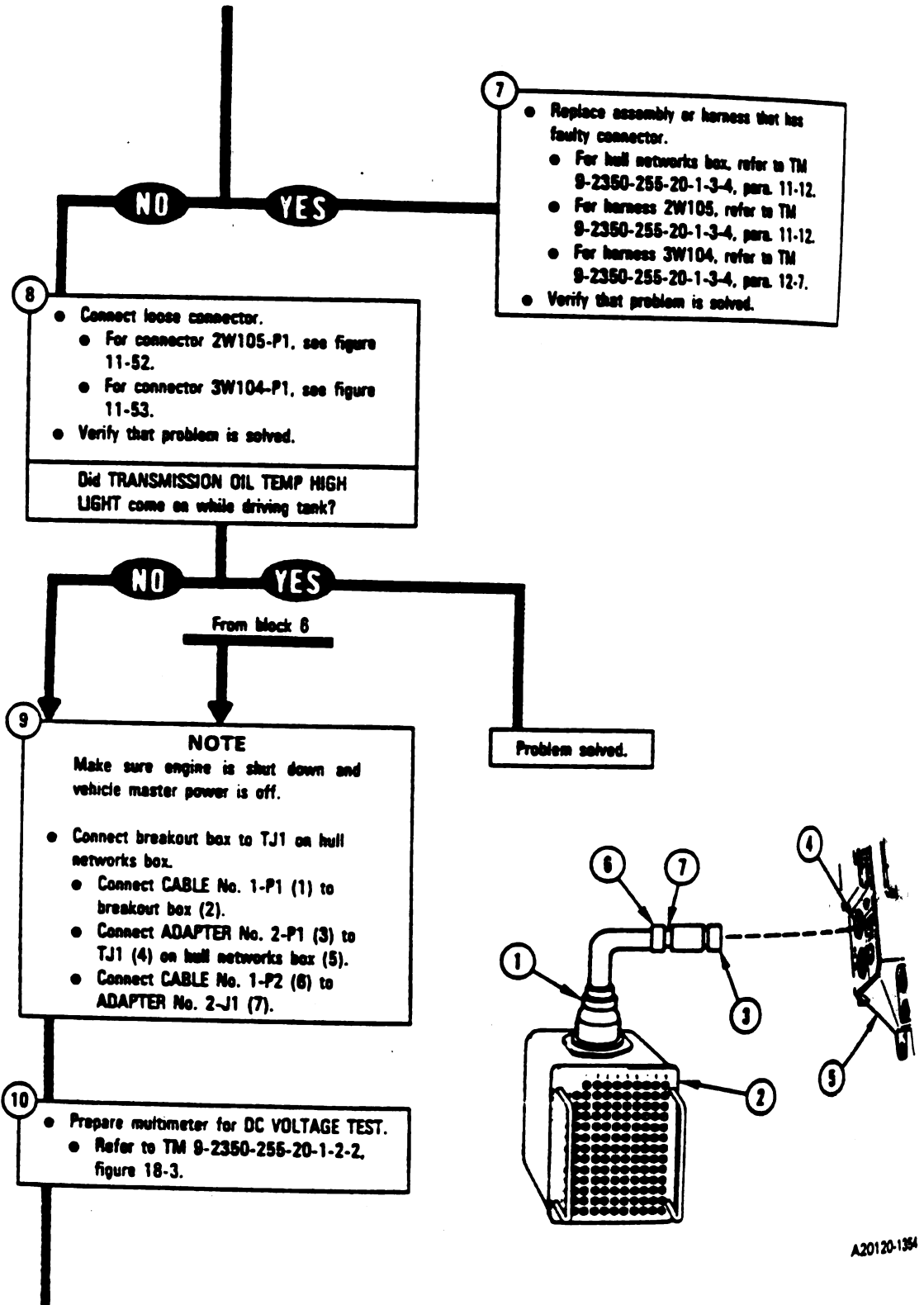


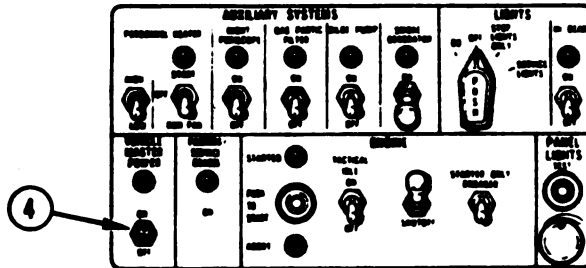
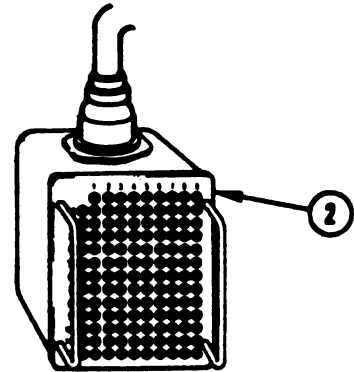
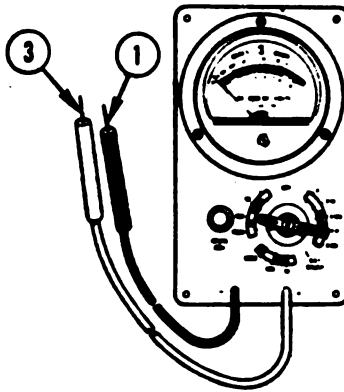
Figure 11-48 (Sheet 3 of 7)  
Volume II  
Para. 11-4

11

**NOTE**  
 If multimeter shows 18 to 30 V dc leave test probes connected for remainder of tests.

- Test for 18 to 30 V dc between test point 9 (-) and 35 (+) on breakout box.
- Connect black test probe (1) to test point 9 on breakout box (2).
- Connect red test probe (3) to test point 35 on breakout box (2).
- Set VEHICLE MASTER POWER switch (4) to ON.

Does multimeter show 18 to 30 V dc?



A20120-1401

12

**NO**      **YES**

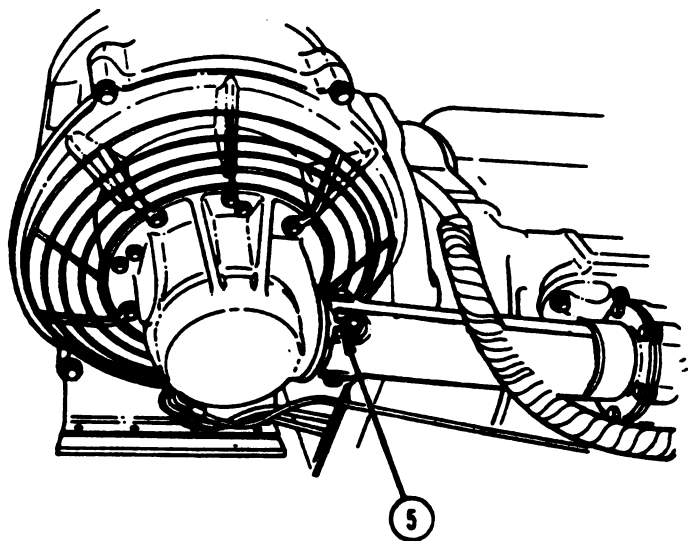
Soldier A: ● Open top deck right grille door. Refer to TM 9-2350-255-10.

Soldier B: ● Start engine. Refer to TM 9-2350-255-10.

Soldier A: ● Look through right drive shaft cover slot (5).

Is right drive shaft turning?

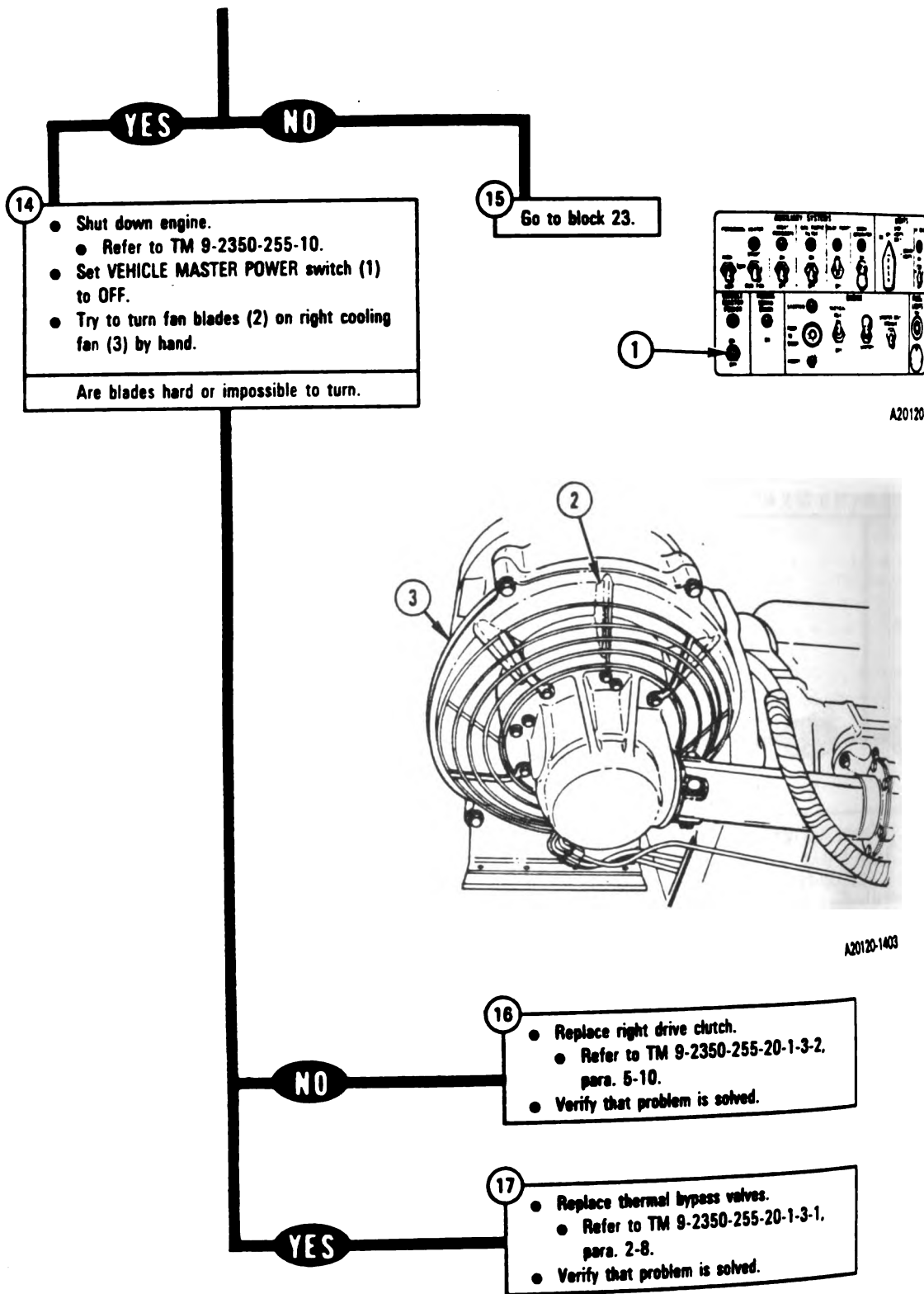
13 Go to block 18.



A20120-1402

Figure 11-48 (Sheet 4 of 7)  
 Volume II  
 Para. 11-4

**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**



*Figure 11-48 (Sheet 5 of 7)  
Volume II  
Para. 11-4*

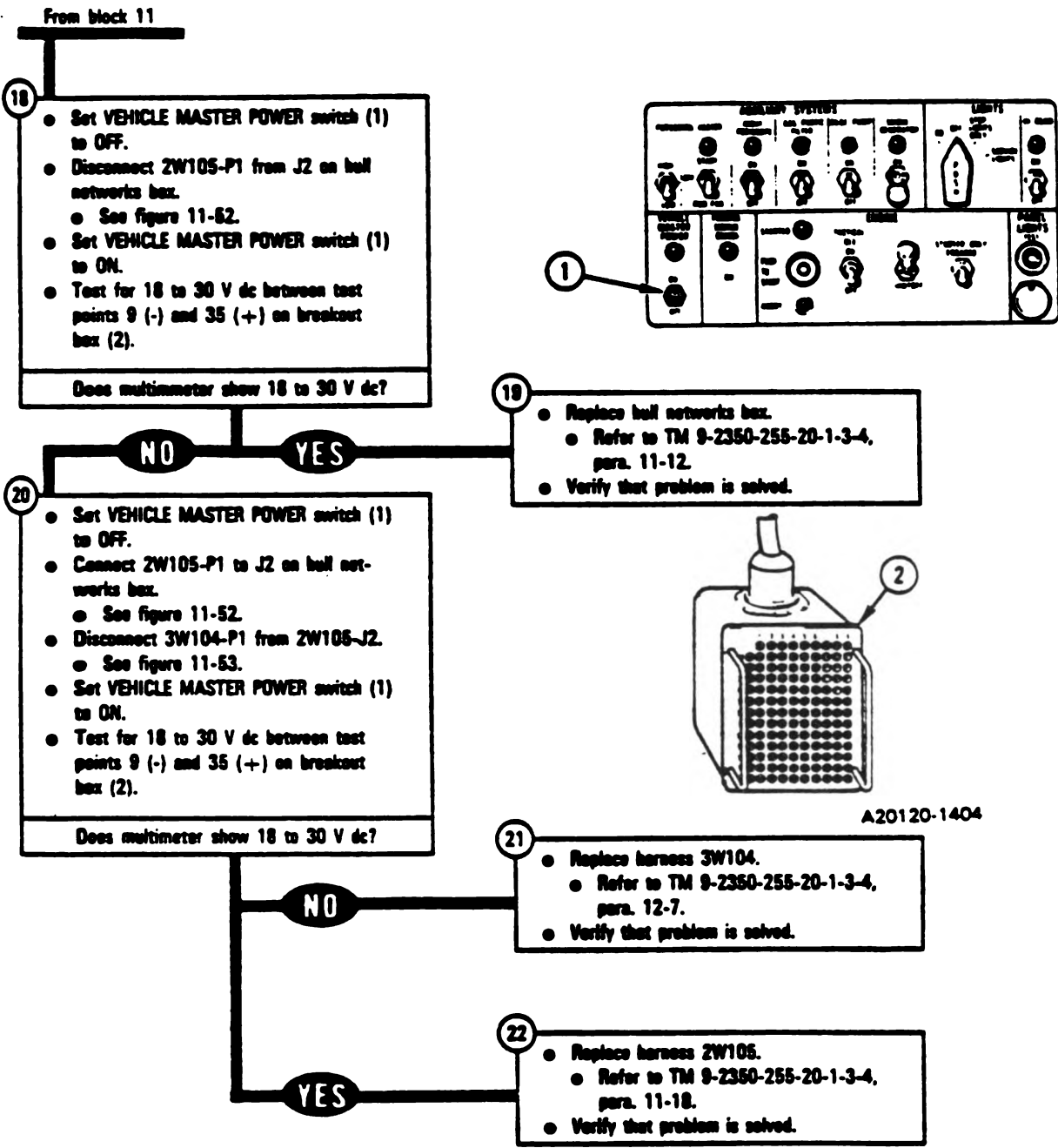
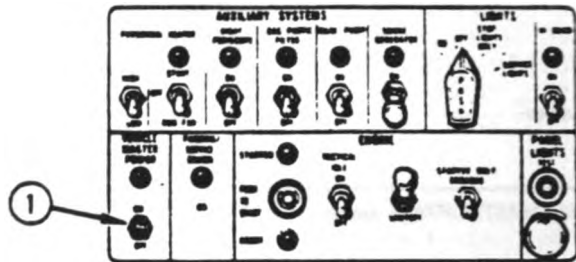


Figure 11-48 (Sheet 6 of 7)  
 Volume II  
 Para. 11-4

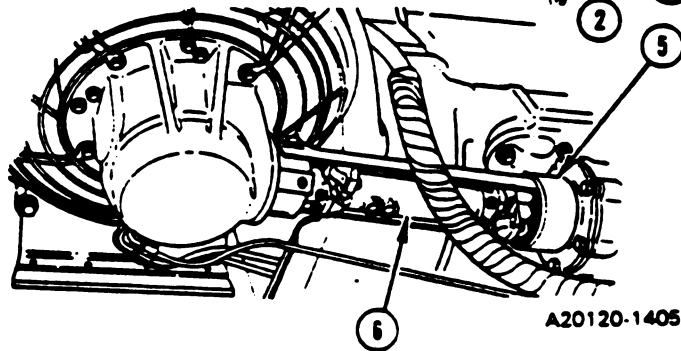
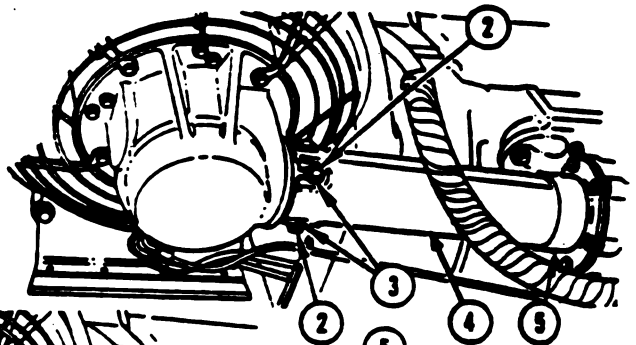
**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**

From block 15

- 23**
- Shut down engine.
  - Refer to TM 9-2350-255-10.
  - Set VEHICLE MASTER POWER switch (1) to OFF.
  - Take off shaft cover from right drive shaft.
  - Unscrew and take off two screws (2) and washers (3) from shaft cover (4) with 9/16-inch wrench.
  - Slide cover (4) away from transmission (5) and off drive shaft (6).
  - Check to see if drive shaft (8) is broken.
- Is drive shaft broken?



A20120-1112



A20120-1405

**YES**

**NO**

- 24**
- Replace right fan drive shaft.
  - Refer to TM 9-2350-255-20-1-3-2, para. 5-10.
  - Verify that problem is solved.

- 25**
- Put back shaft cover on right drive shaft.
  - Put cover (4) over shaft (6) and slide in transmission (5).
  - Screw in and tighten two screws (2) and washers (3) with 9/16-inch wrench.
  - Replace powerpack.
  - Refer to TM 9-2350-255-20-1-3-1, para. 2-4.
  - Verify that problem is solved.

*Figure 11-48 (Sheet 7 of 7)  
Volume II  
Para. 11-4*

SYMPTOM TOC 2

TRANSMISSION OIL TEMP HIGH LIGHT  
AND MASTER WARNING LIGHT COMES  
ON BUT OIL TEMPERATURE OK.

Test Equipment/Special Tools:

- Breakout Box Tool Kit, 12311088
- Multimeter
- Pliers, slip joint, conduit style with plastic jaw inserts, NSN 5120-00-824-8085

Equipment Condition:

- Tank parked.
- Parking brake set.
- Engine shut down.
- Vehicle master power off.
- Engine cool.

NOTE

Read para. 11-1 before doing any work.

- 1
- Set up tank controls for standard initial test conditions.
  - Refer to table 11-5 para. 11-7.

- 2
- Disconnect 3W104-P2 from J1 on transmission thermal switch.
  - See figure 11-54.
  - Connect breakout box to TJ1 on driver's instrument panel.
  - Connect CABLE No. 1-P1 (1) to breakout box (2).
  - Connect ADAPTER No. 2-P1 (3) to TJ1 (4) on driver's instrument panel (5).
  - Connect CABLE No. 1-P2 (6) to ADAPTER No. 2-J1 (7).

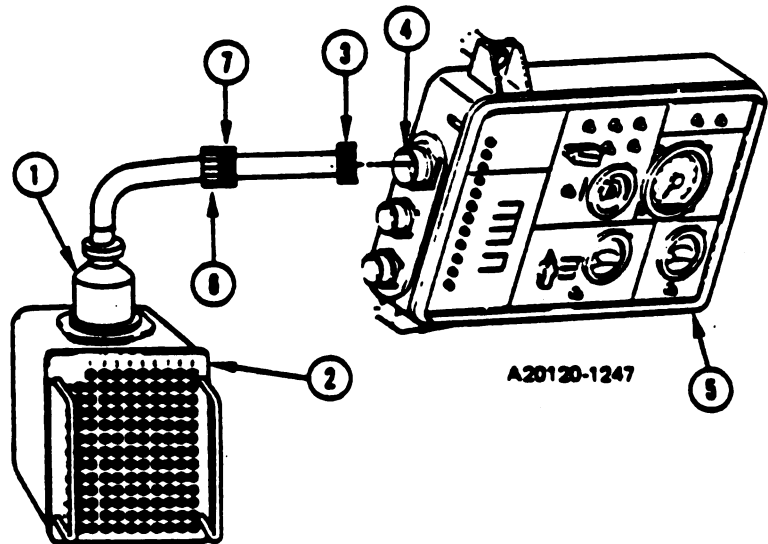
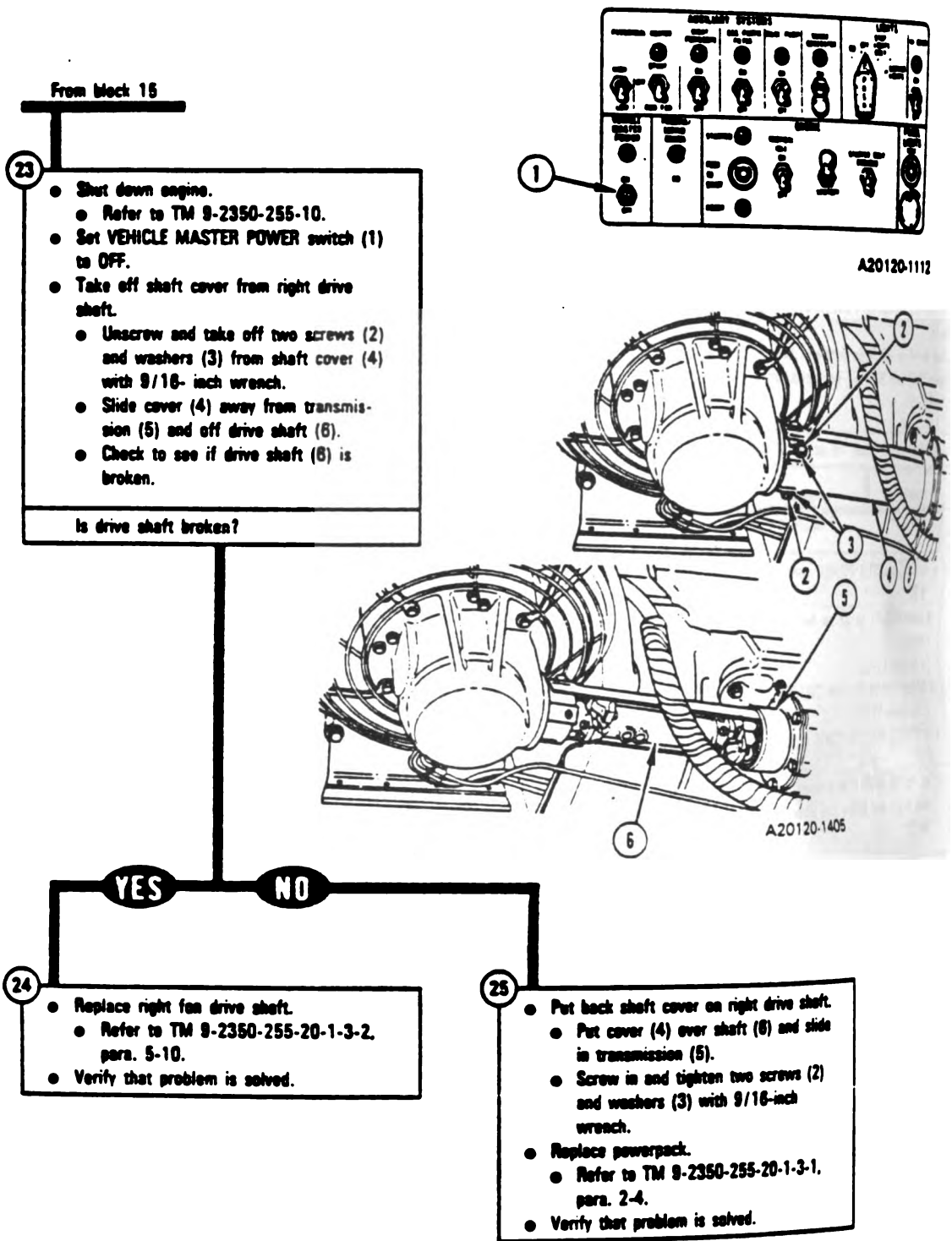


Figure 11-49 (Sheet 1 of 4)  
Volume II  
Para. 11-4

Change 5 11-167



**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**



*Figure 11-48 (Sheet 7 of 7)  
Volume II  
Para. 11-4*

**SYMPTOM TOC 2**

**TRANSMISSION OIL TEMP HIGH LIGHT  
 AND MASTER WARNING LIGHT COMES  
 ON BUT OIL TEMPERATURE OK.**

**Test Equipment/Special Tools:**

- Breakout Box Tool Kit, 12311068
- Multimeter
- Pliers, slip joint, conduit style with plastic jaw inserts, NSN 5120-00-824-8085

**Equipment Condition:**

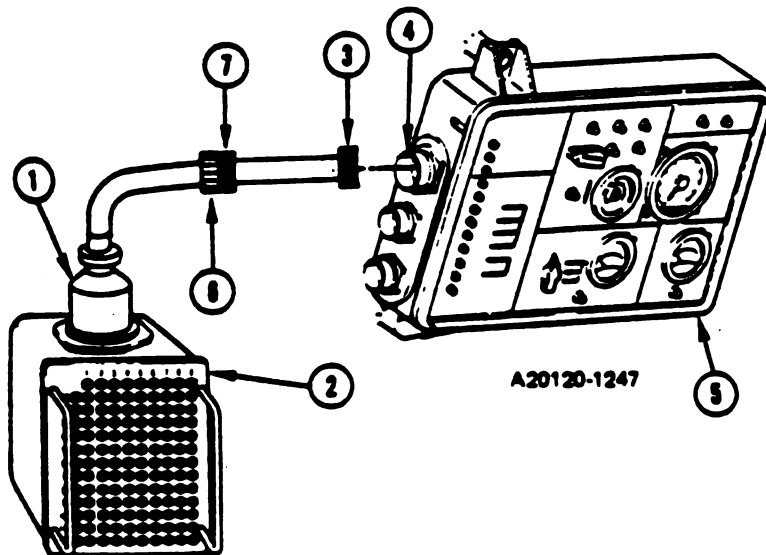
- Tank parked.
- Parking brake set.
- Engine shut down.
- Vehicle master power off.
- Engine cool.

**NOTE**

Read para. 11-1 before doing any work.

- 1
- Set up tank controls for standard initial test conditions.
  - Refer to table 11-5 para. 11-7.

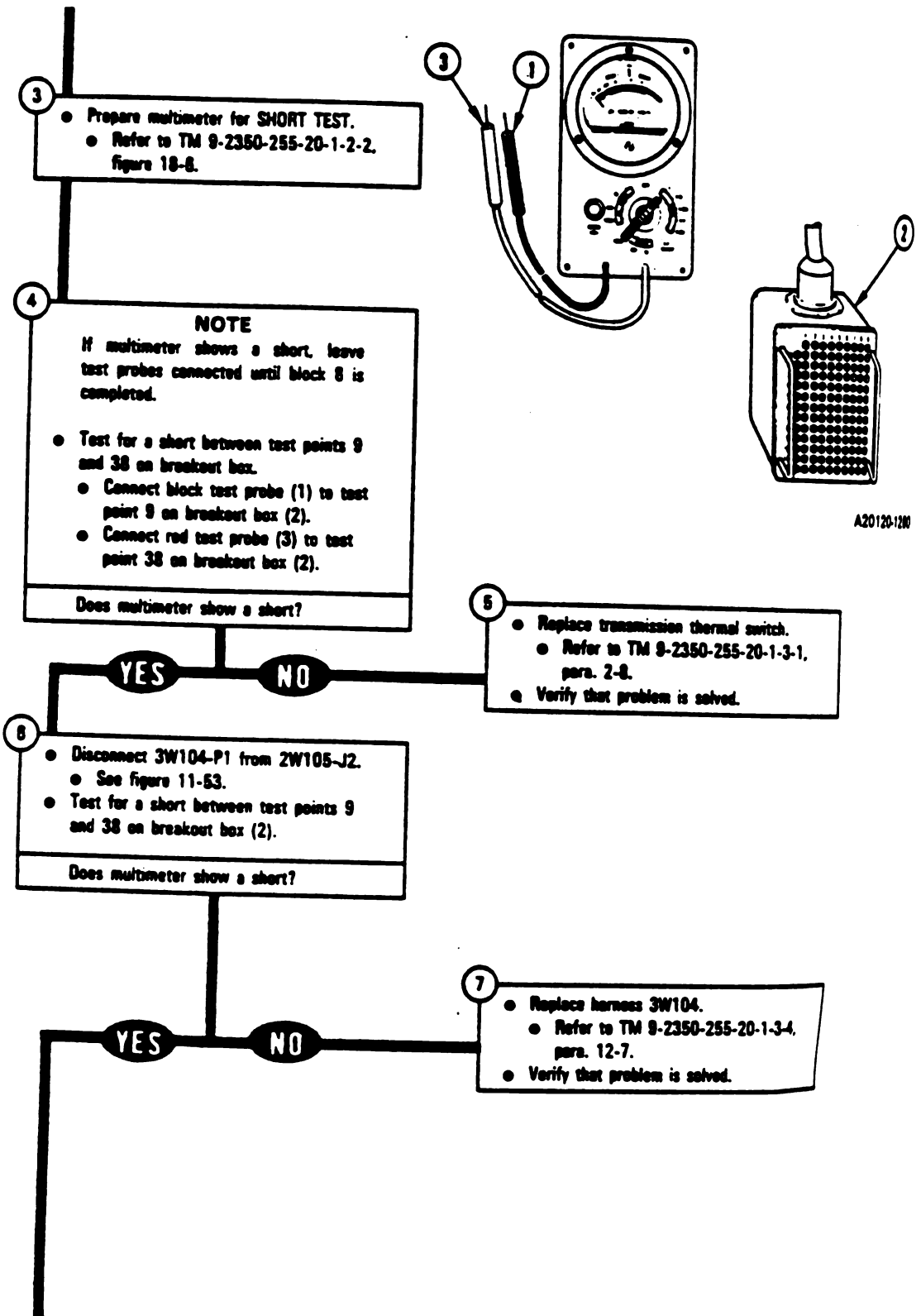
- 2
- Disconnect 3W104-P2 from J1 on transmission thermal switch.
  - See figure 11-54.
  - Connect breakout box to TJ1 on driver's instrument panel.
  - Connect CABLE No. 1-P1 (1) to breakout box (2).
  - Connect ADAPTER No. 2-P1 (3) to TJ1 (4) on driver's instrument panel (5).
  - Connect CABLE No. 1-P2 (6) to ADAPTER No. 2-J1 (7).



*Figure 11-49 (Sheet 1 of 4)*  
**Volume-II  
 Para. 11-4**

**Change 5 11-167**

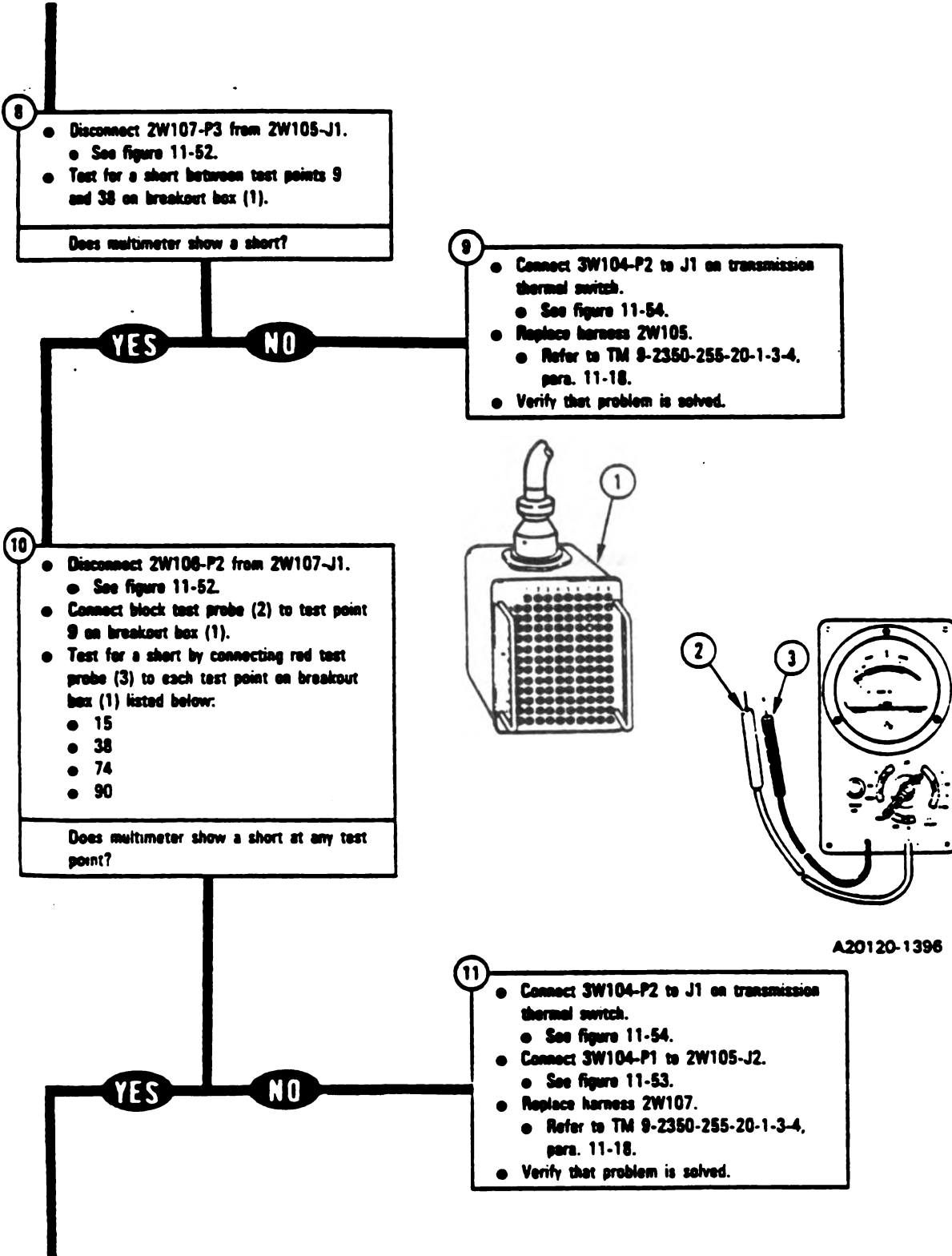
**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**



*Figure 11-49 (Sheet 2 of 4)  
Volume II  
Para. 11-4*

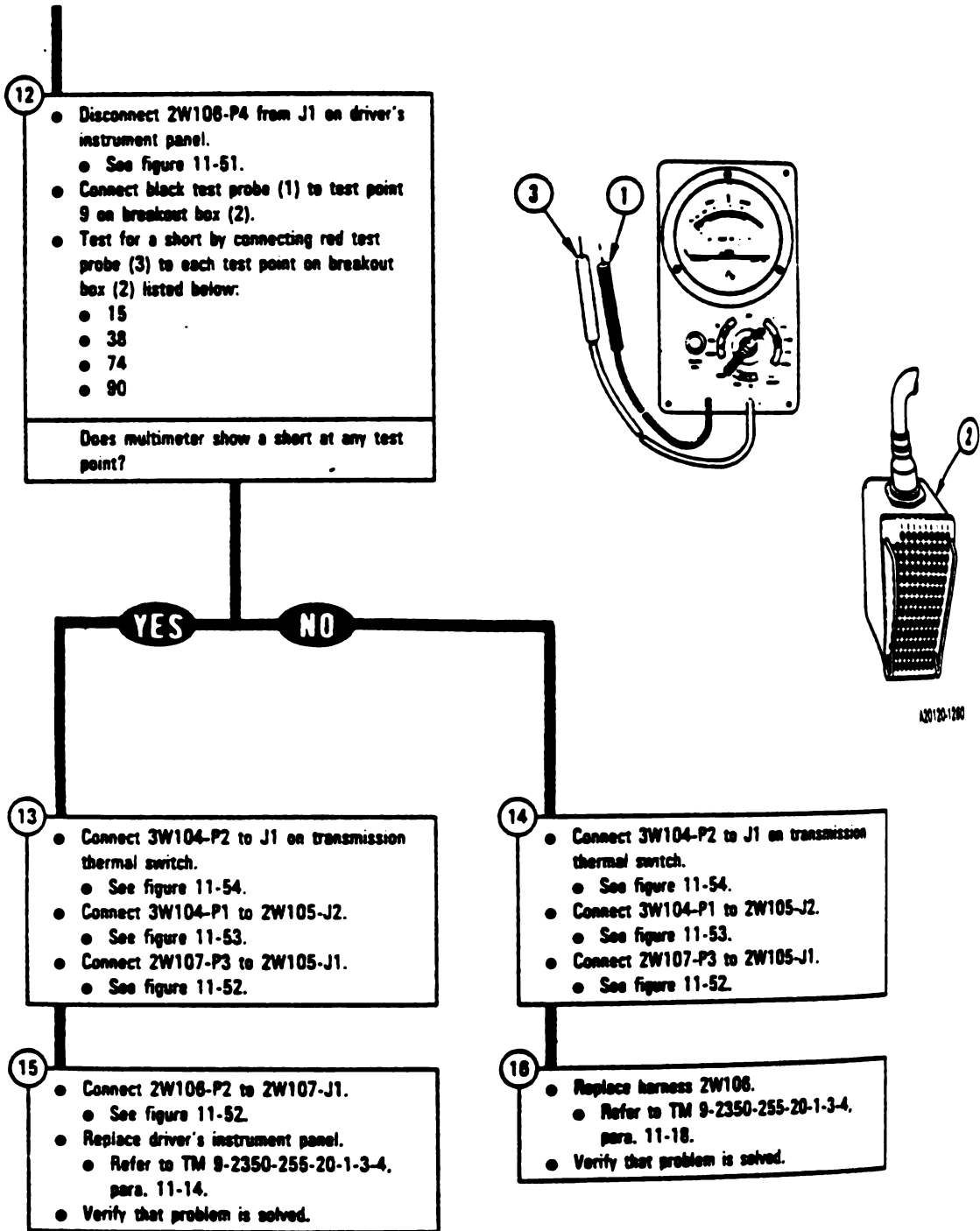
11-168 Change 5

**TM 9-2350-255-20-1-2-1**  
**TRANSMISSION AND FINAL DRIVE**  
**SYSTEM TROUBLESHOOTING**



*Figure 11-49 (Sheet 3 of 4)*  
**Volume II**  
**Para. 11-4**

**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**



*Figure 11-49 (Sheet 4 of 4)  
Volume II  
Para. 11-4*

11-170 Change 5

**Transmission and Final Drive System Connector Inspection Procedure.**

**CONNECTOR INSPECTION**

**NOTE**  
 Connectors are shown. The connector  
 look with may look different but will  
 similar parts.

Look at pins (1) and sockets (2) for dirt  
 corrosion.

Are pins or sockets dirty or corroded?

**NO**      **YES**

2  
 • Clean dirty or corroded pins and sockets.  
 • Refer to TM 9-2350-255-20-2-3-1,  
 para. 2-4.

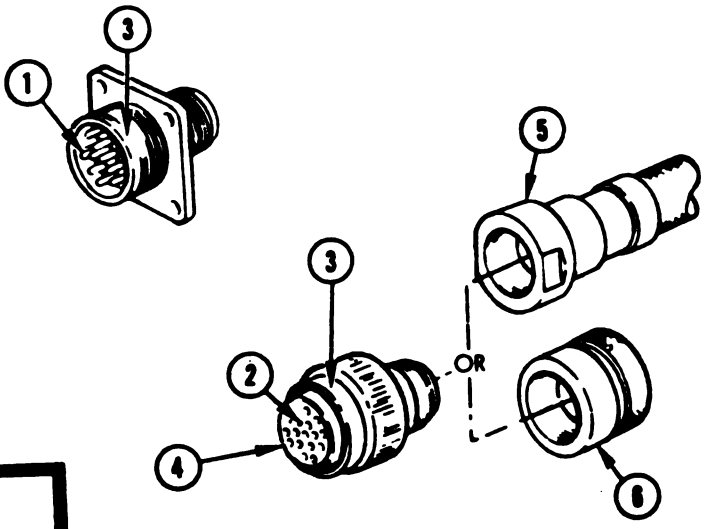
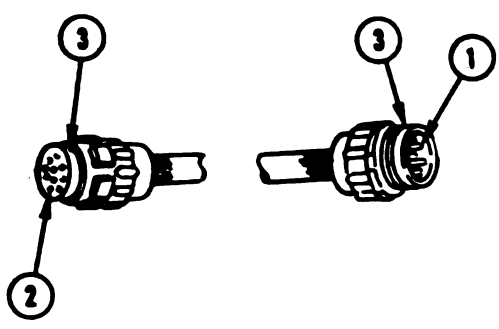
Look at separated connectors for dented,  
 bent, loose or missing parts.  
 Look at connector body (3) and  
 insert (4) for dents or breaks.  
 Look at adapter (5) and shell (6) for  
 dents or breaks.  
 Look at insert (4) for missing sockets  
 (2) and at connector body (3) for  
 missing pins (1).  
 Look at pins (1) for bends or breaks.

Are any connector parts faulty?

**YES**      **NO**

Refer to support maintenance.  
**NOTE**  
 Support maintenance may not be able  
 repair connector on vehicle.  
 Continue with troubleshooting procedure.

5  
 • Continue with troubleshooting procedure.

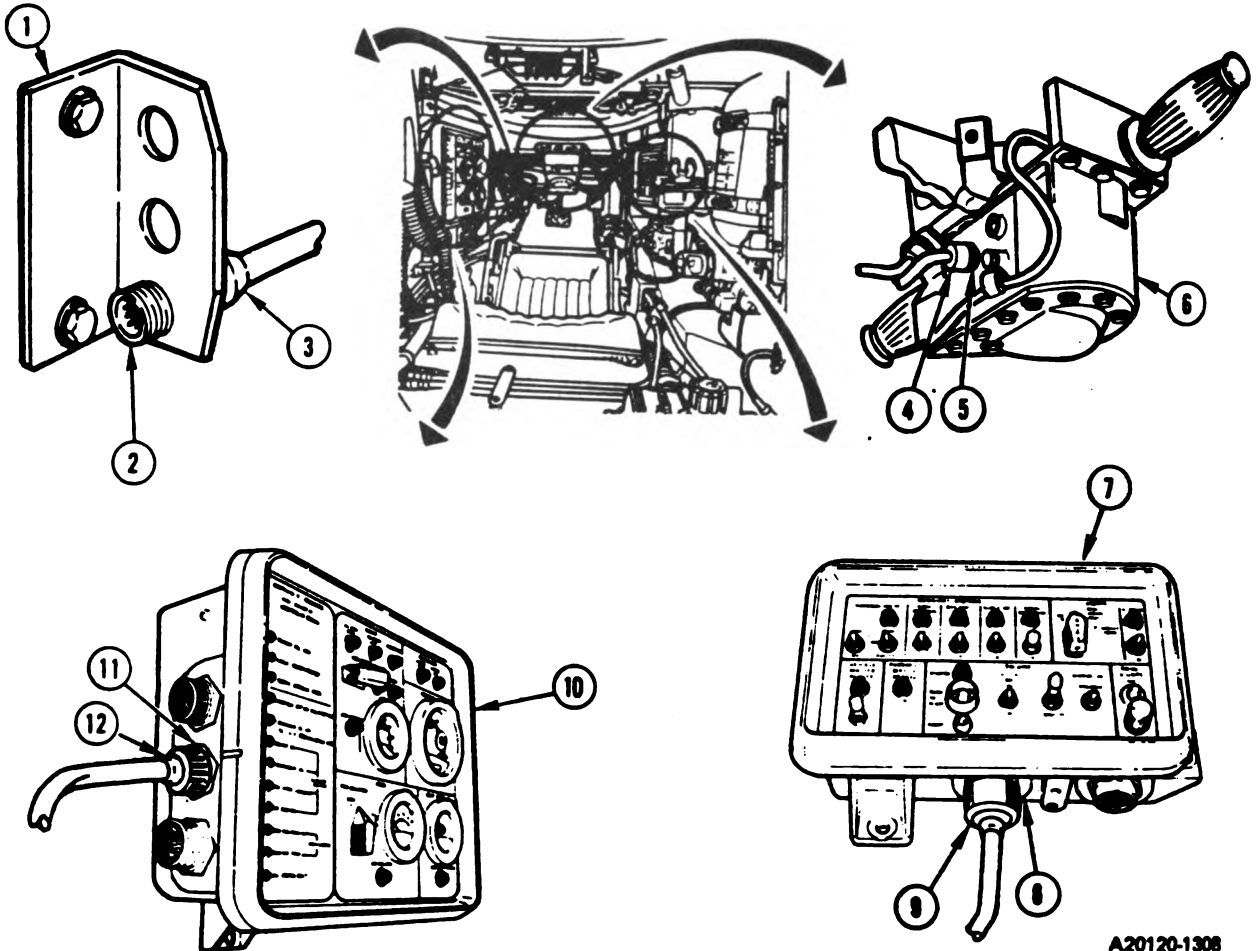


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Figure 11-50  
 Volume II  
 Para. 11-5

**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**

**11-6. System Component Location for Transmission and Final Drive System Troubleshooting.** This paragraph tells you what component location and access tasks are required for troubleshooting the transmission and final drive system. The access tasks are required when checking the transmission and final drive system for loose vehicle harness connections and damage, and for identifying component location for troubleshooting. Transmission and final drive system component locations are included for the driver's compartment, turret well, engine compartment, and transmission area.



A20120-1308

**CABLE JUNCTION BRACKET**  
Adapter 2L104-J1  
2W104-P9

1  
2  
3

**DRIVER'S MASTER PANEL**  
J1  
2W104-P3

7  
8  
9

**DRIVER'S INSTRUMENT PANEL**  
J1  
W2106-P4

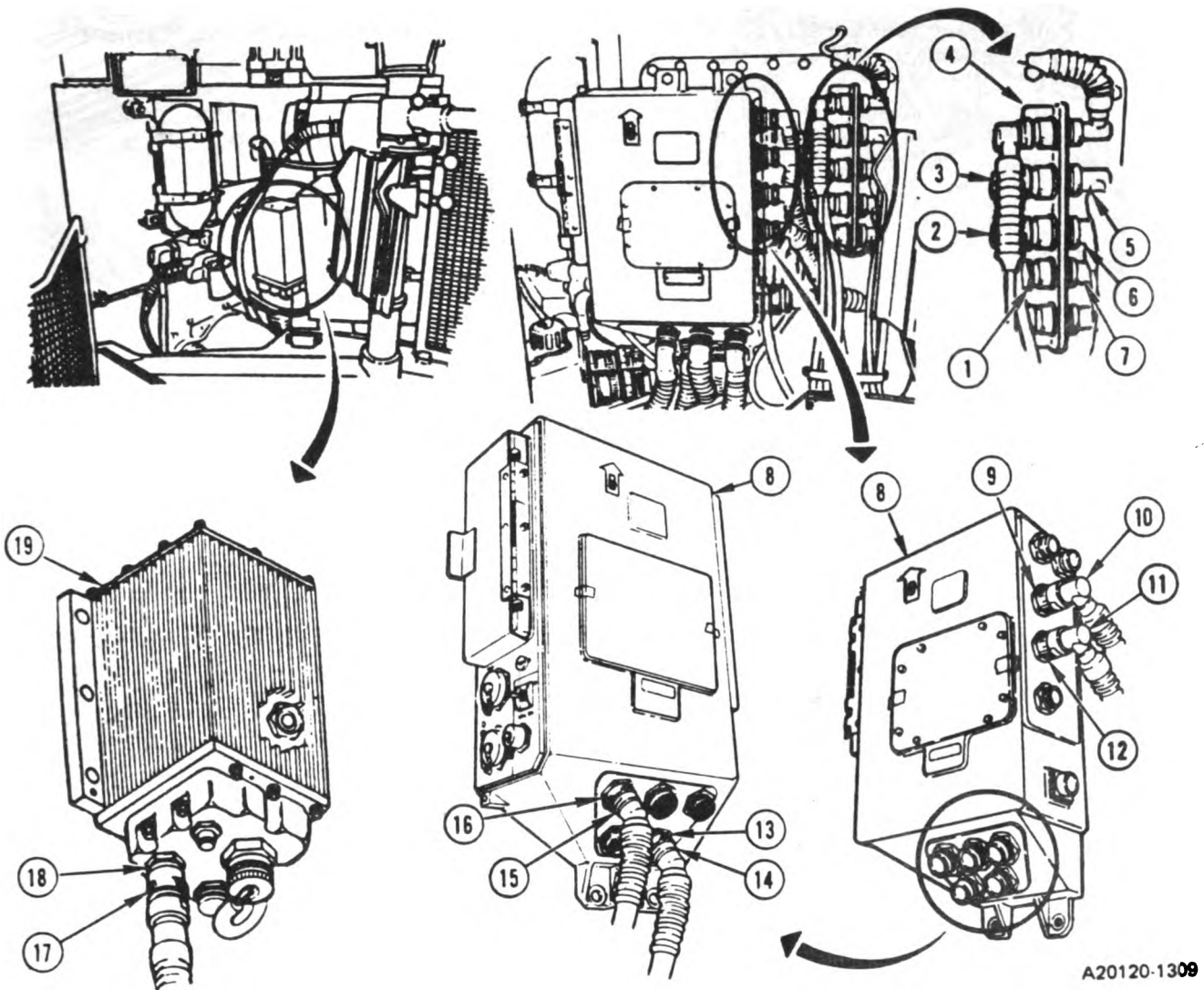
10  
11  
12

**SHIFT SELECT ASSEMBLY/  
STEER THROTTLE CONTROL**  
J1  
2W104-P7

6  
5  
4

*Figure 11-51. Driver's Compartment, Transmission and Final Drive System Component Location  
Volume II  
Para. 11-6*

**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**



A20120-1309

<b>CABLE JUNCTION BRACKET</b>	<b>4</b>	<b>HULL NETWORKS BOX</b>	<b>8</b>
2W104-J1	6	J2	9
2W105-J1	7	J3	12
2W107-J1	5	J8	13
2W105-P4	2	J12	16
2W106-P2	3	2W104-P1	14
2W107-P3	1	2W105-P1	10
		2W105-P2	11
<b>ELECTRONIC CONTROL UNIT</b>	<b>19</b>	2W106-P1	15
J3	18		
2W105-P5	17		

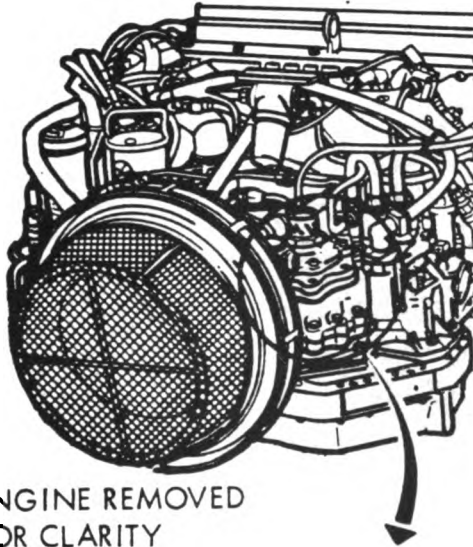
To gain access to these components, traverse turret until basket opening is in line with component, and then lock turret; refer to TM 9-2350-255-10.

*Figure 11-52. Turret Well, Transmission and Final Drive System Component Location*  
**Volume II**  
**Para. 11-6**

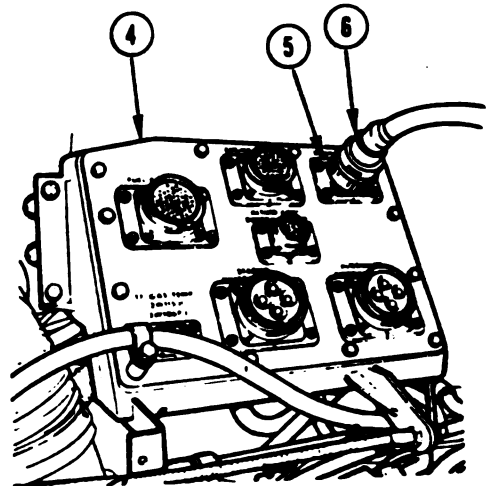
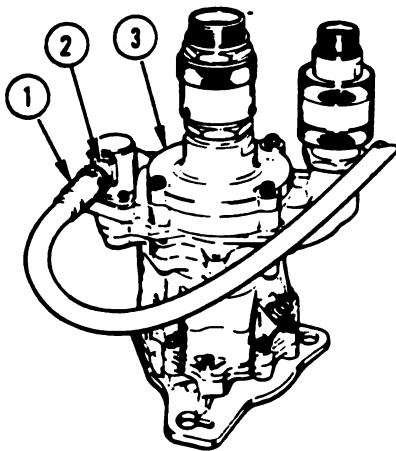
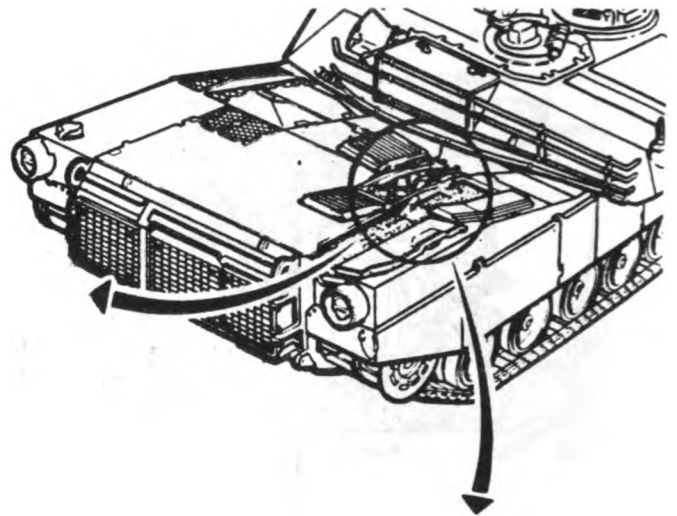
**Change 5 11-173**



**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**



ENGINE REMOVED  
FOR CLARITY



A20120-1310

**DISCONNECT PANEL**  
2W105-J2  
3W104-P1

4  
5  
6

**MAIN HYDRAULIC PUMP**  
J1  
3W104-P9

3  
2  
1

To gain access to disconnect panel:

1. Traverse turret until main gun is over left side of tank, and then lock turret; refer to TM 9-2350-255-10.
2. Open both battery covers; refer to TM 9-2350-255-10.
3. Open top deck right grille doors; refer to TM 9-2350-255-10.

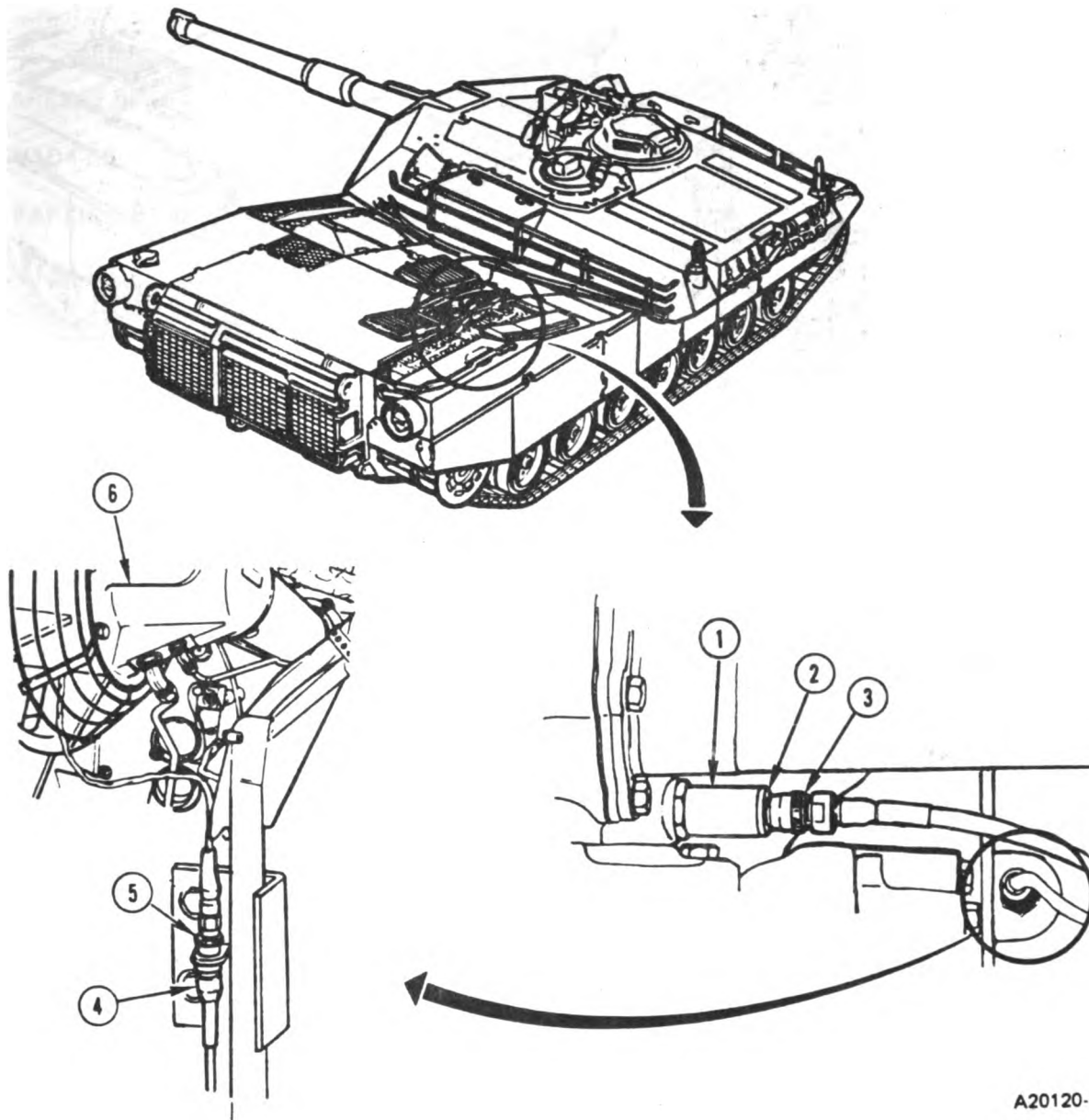
To gain access to main hydraulic pump, do step 1 above, and then remove engine access cover; refer to TM 9-2350-255-10.

Close all doors and covers/replace engine access cover when troubleshooting is complete.

*Figure 11-53. Engine Compartment, Transmission and Final Drive System Component Location*  
**Volume II**  
**Para. 11-6**

11-174 Change 5

**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**



A20120-1311

**RIGHT FAN DRIVE**  
3L104-P1  
3W104-J1

<b>6</b>	<b>TRANSMISSION</b>
<b>5</b>	J1
<b>4</b>	3W104-P2

**1**  
**2**  
**3**

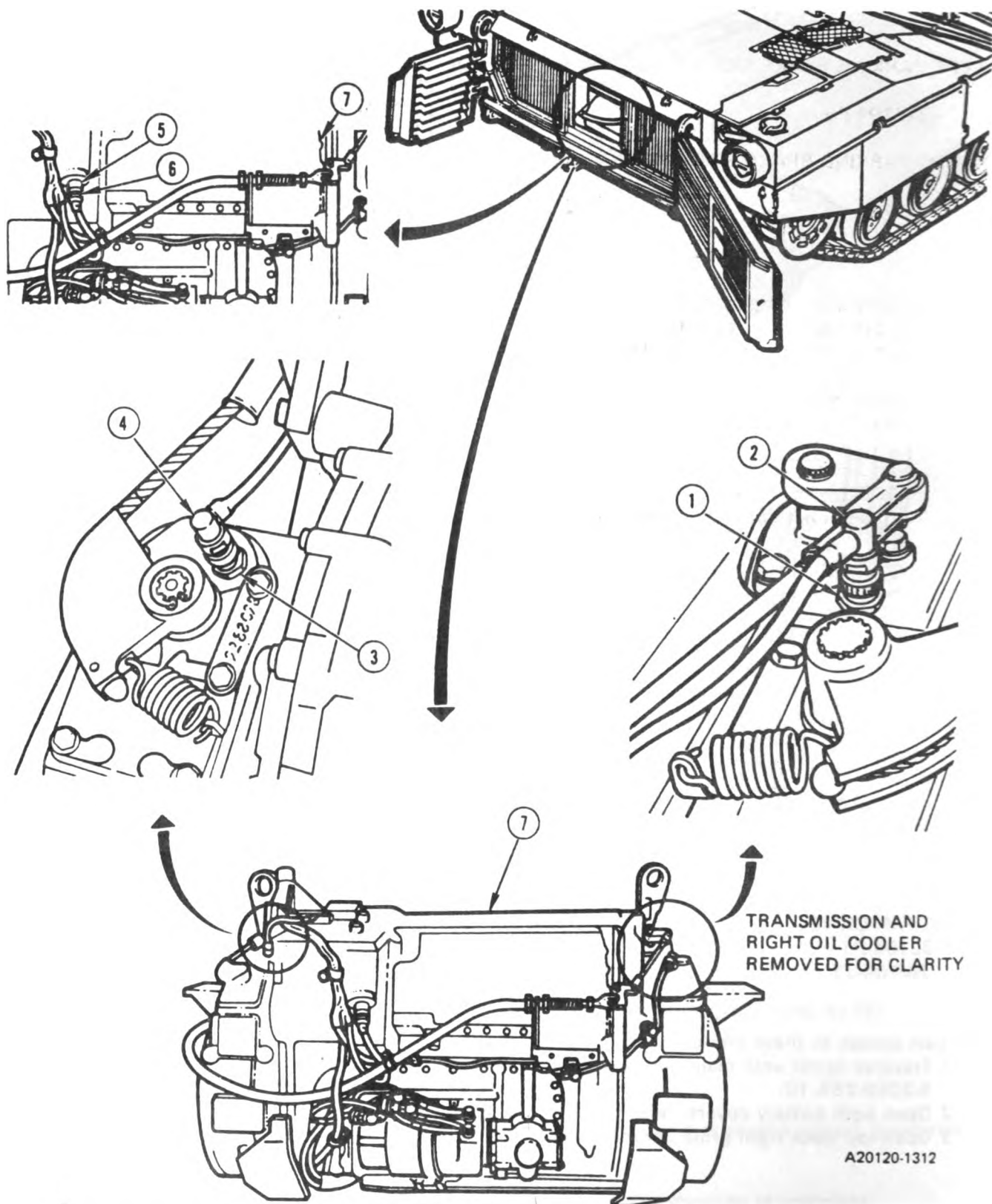
To gain access to these components:

1. Traverse turret until main gun is over left side of tank, and then lock turret; refer to TM 9-2350-255-10.
2. Open both battery covers; refer to TM 9-2350-255-10.
3. Open top deck right grille doors; refer to TM 9-2350-255-10.

*Figure 11-54. Engine Compartment, Transmission and Final Drive System Component Location*  
**Volume II**  
**Para. 11-6**

**Change 5 11-175**

**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**



**Figure 11-55. Transmission Area, Transmission and Final Drive System Component Location  
(Sheet 1 of 2)  
Volume II  
Para. 11-6**

**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**

<b>LEFT PARKING BRAKE SWITCH</b>	<b>3</b>	<b>TRANSMISSION</b>	<b>7</b>
<b>J1</b>	<b>3</b>	<b>J1</b>	<b>5</b>
<b>3W104-P5</b>	<b>4</b>	<b>3W104-P4</b>	<b>6</b>
<b>RIGHT PARKING BRAKE SWITCH</b>	<b>1</b>		
<b>J1</b>	<b>1</b>		
<b>3W104-P3</b>	<b>2</b>		

To gain access to left parking brake switch:

1. Remove engine exhaust duct; refer to TM 9-2350-255-20-1-3-1, para. 2-4.
2. Remove left oil cooler assembly; refer to TM 9-2350-255-20-1-3-1, para. 2-8.

To gain access to right parking brake switch remove engine exhaust duct; refer to TM 9-2350-255-20-1-3-1, para. 2-4.

To gain access to transmission J1 remove engine exhaust duct door panel; refer to TM 9-2350-255-20-1-3-1, para. 2-4.

Install exhaust duct door panel when troubleshooting is complete.

**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**

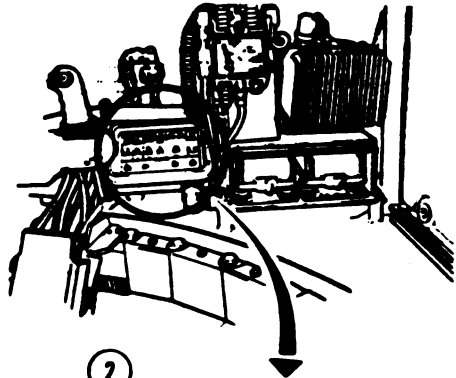
**11-7. Transmission and Final Drive System Standard Initial Test Conditions.** This paragraph tells you what the test conditions of the tank should be before you begin troubleshooting. The conditions are listed in table 11-5. These conditions are referenced in each primary troubleshooting procedure. Initial test conditions are included for the gunner's, loader's, and driver's stations.

**Table 11-5. Transmission and Final Drive System Standard Initial Test Conditions**

**COMMANDER'S STATION**

**A. Commander's Control Panel (1)**

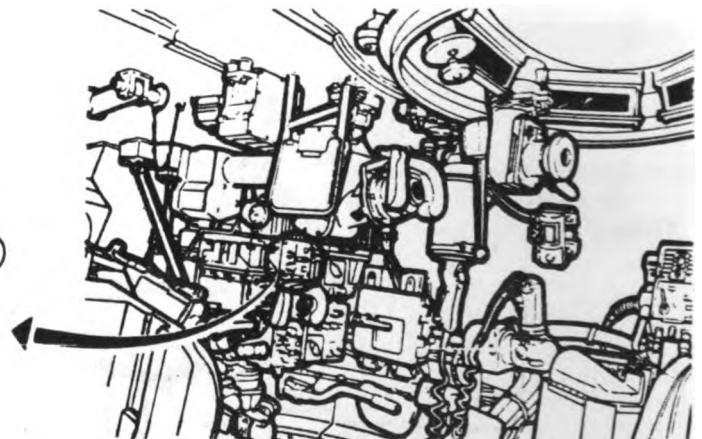
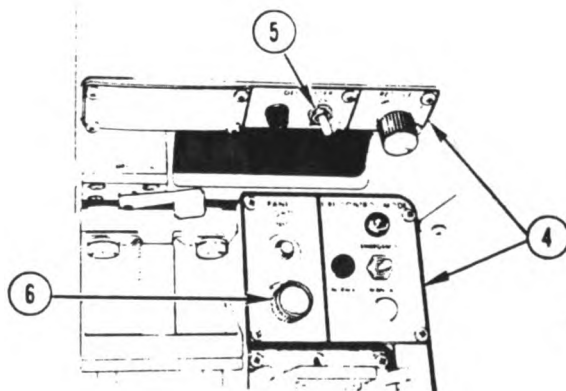
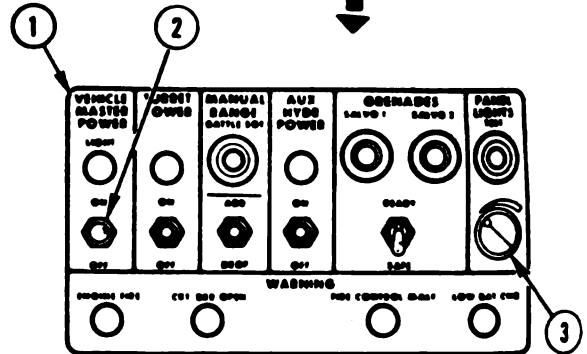
1. Set **VEHICLE MASTER POWER** switch (2) to OFF.
2. Set **PANEL LIGHTS** control (3) to maximum clockwise position.



**GUNNER'S STATION**

**B. Gunner's Primary Sight Control Panel (4)**

1. Set **DEFROSTER** switch (5) to OFF.
2. Set **PANEL LIGHTS** control (6) to maximum clockwise position.



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**Table 1 1-5. Transmission and Final Drive System Standard Initial Test Conditions (Continued)**

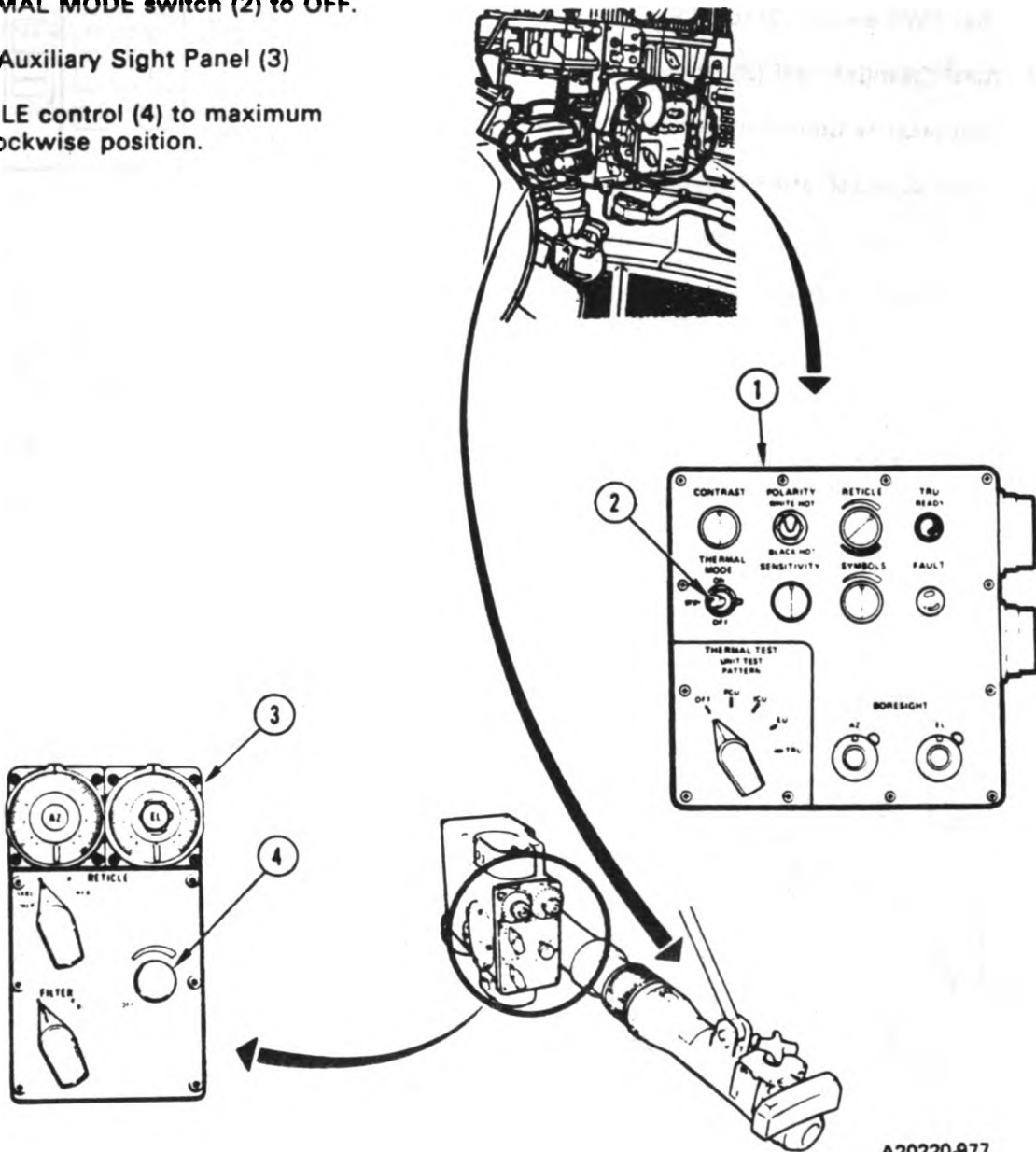
**GUNNER'S STATION (Continued)**

**C. Gunner's Image Control Unit (1)**

Set **THERMAL MODE** switch (2) to OFF.

**D. Gunner's Auxiliary Sight Panel (3)**

Set **RETICLE** control (4) to maximum counterclockwise position.



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**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**

**Table 11-5. Transmission and Final Drive System Standard Initial Test Conditions (Cont)**

**GUNNER'S STATION (Continued)**

**E. Computer Control Panel (1)**

Set PWR switch (2) to OFF.

**F. Laser Rangefinder (3)**

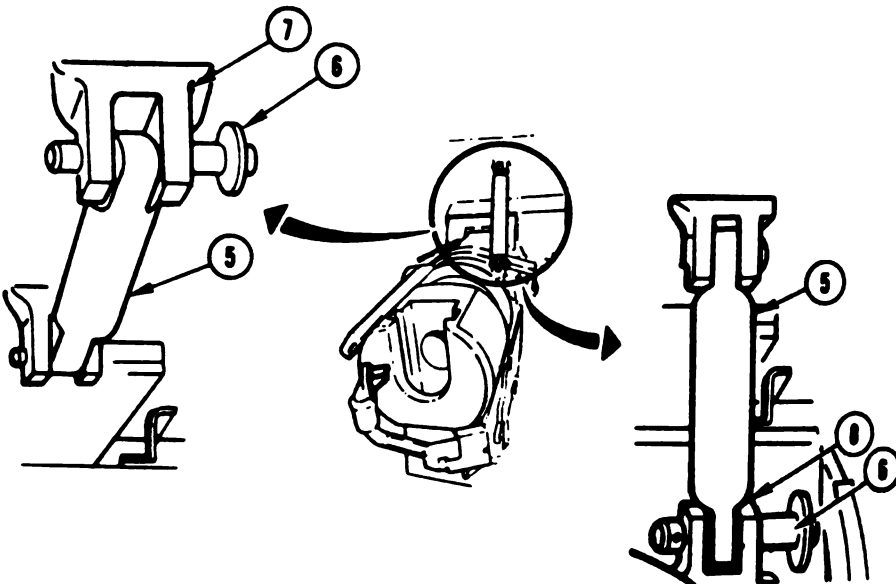
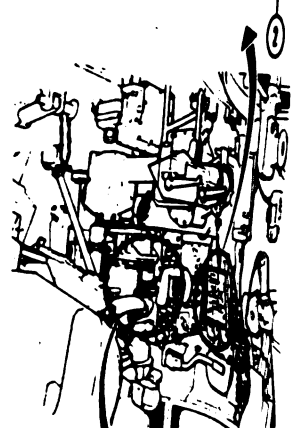
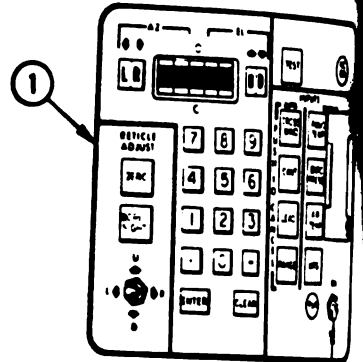
Set laser rangefinder switch (4) to SAFE.

**G. Main Gun Elevation Travel Lock (5)**

1. Release lock pin (6) from roof strut (7).
2. Swing main gun elevation travel lock (5) down into main gun strut (8) and engage lock pin (6).

**NOTE**

Gun may have to be raised or lowered to engage lock pin.



A20220-00

**Table 11-5. Transmission and Final Drive System Standard Initial Test Conditions (Continued)**

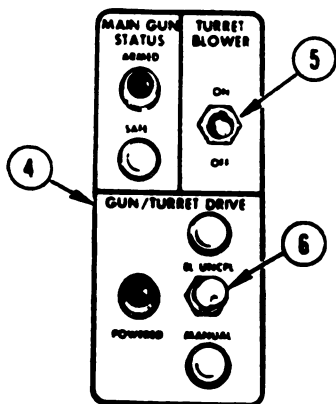
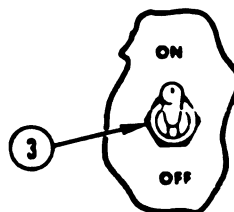
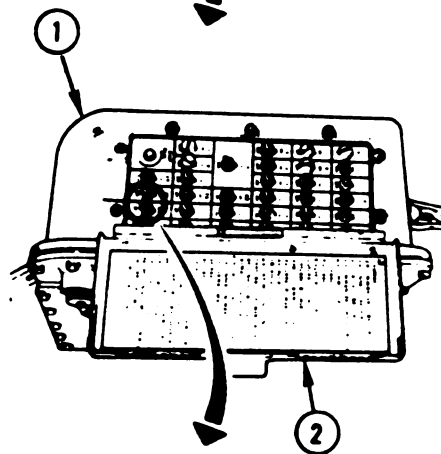
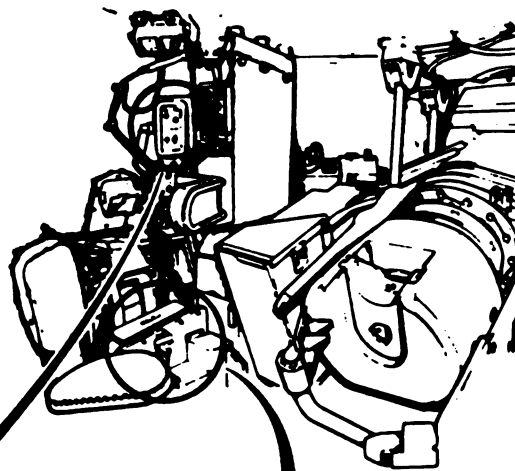
**LOADER'S STATION**

**H. Turret Networks Box (1)**

1. **Open circuit breaker cover (2) on turret networks box (1).**
2. **Set all circuit breaker switches (3) to ON.**

**I. Loader's Panel (4)**

1. **Set TURRET BLOWER switch (5) to OFF.**
2. **Set GUN/TURRET DRIVE switch (6) to POWERED.**



A20220-628R1



**TM 9-2350-255-20-1-2-1  
TRANSMISSION AND FINAL DRIVE  
SYSTEM TROUBLESHOOTING**

**Table 11-5. Transmission and Final Drive System Standard Initial Test Conditions (Continued)**

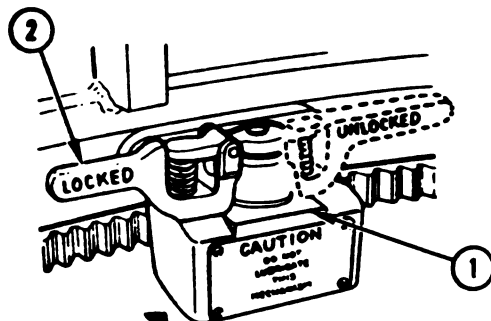
**LOADER'S STATION (Continued)**

**J. Turret Traverse Lock (1)**

Turn turret traverse lock handle (2) clockwise to LOCKED position.

**NOTE**

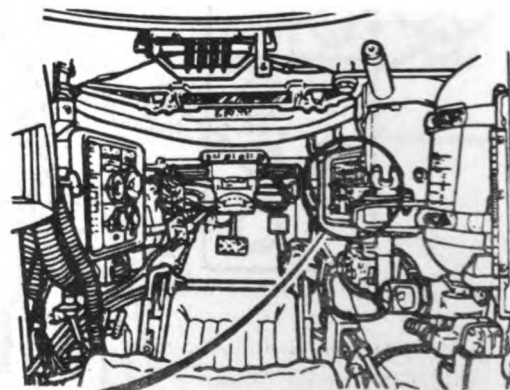
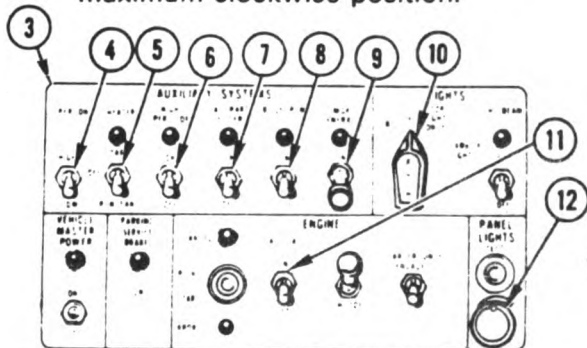
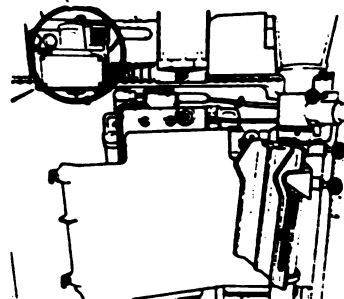
Turret may have to be traversed slightly left or right for handle (2) to drop into detent position.



**DRIVER'S STATION**

**K. Driver's Master Panel (3)**

1. Set PERSONNEL HEATER switch (4) to LOW and switch (5) to OFF.
2. Set NIGHT PERISCOPE switch (6) to OFF.
3. Set GAS PARTIC FILTER switch (7) to OFF.
4. Set BILGE PUMP switch (8) to OFF.
5. Set SMOKE GENERATOR switch (9) to OFF.
6. Set LIGHTS switch (10) to OFF.
7. Set ENGINE TACTICAL IDLE switch (11) to OFF.
8. Set PANEL LIGHTS control (12) to maximum clockwise position.



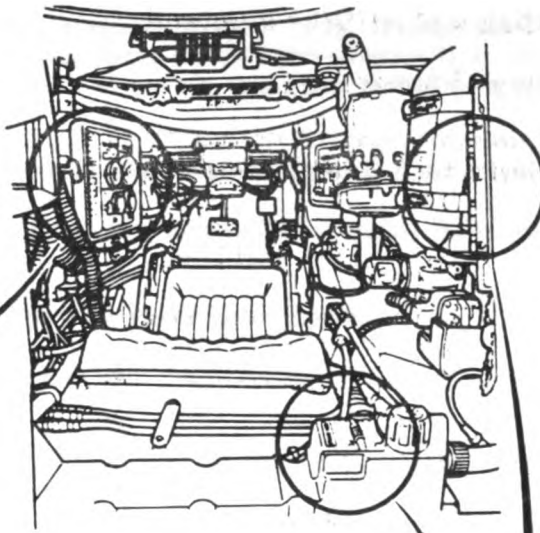
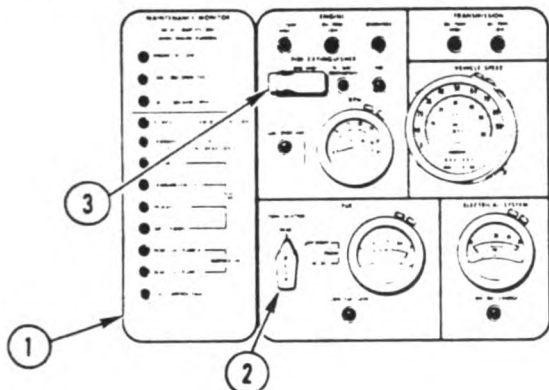
A20220-629R2

**Table 11-5. Transmission and Final Drive System Standard Initial Test Conditions (Continued)**

**DRIVER'S STATION (Continued)**

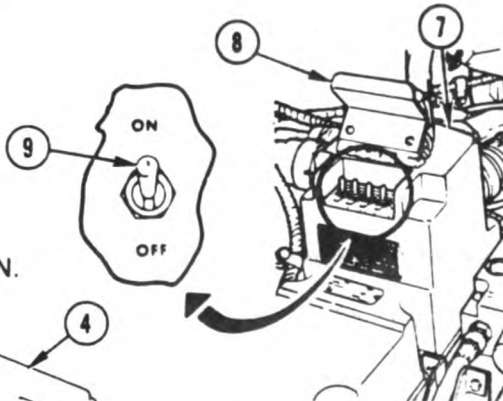
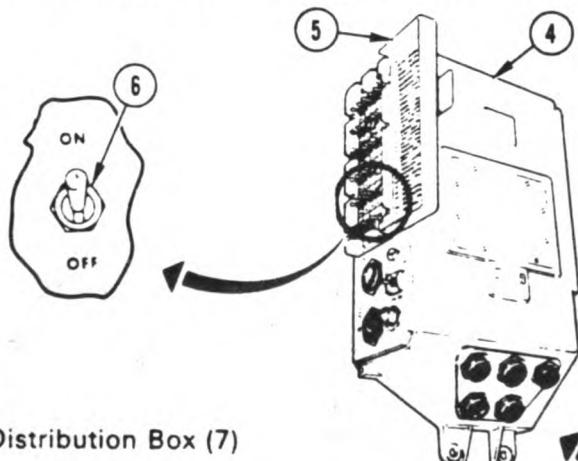
**L. Driver's Instrument Panel (1)**

1. Set TANK SELECTOR switch (2) to REAR.
2. Make sure 2ND SHOT guard (3) is closed.



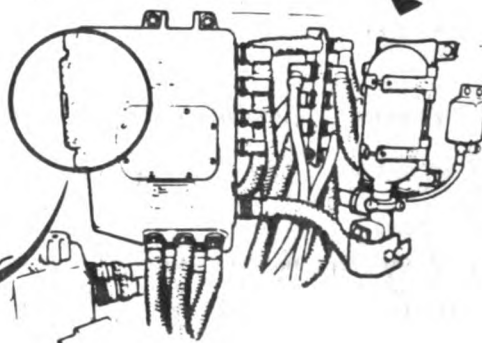
**M. Hull Networks Box (4)**

1. Open circuit breaker cover (5) on hull networks box (4).
2. Set all circuit breaker switches (6) to ON.



**N. Power Distribution Box (7)**

1. Open circuit breaker cover (8) on power distribution box (7).
2. Set all circuit breaker switches (9) to ON.



A20220-630R2

12.1. C

A. Fair

grace

trac-

res:

Feb

**CHAPTER 12**  
**STEERING SYSTEM TROUBLESHOOTING**

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**12-1. General.** This chapter tells you how to troubleshoot the steering system.

A fault symptom index is located at the beginning of the troubleshooting procedures (paragraph 12-2). The index identifies the primary procedure used to troubleshoot a known symptom. The primary procedure is included within paragraph 12-2. Since troubleshooting of the steering system does not require the use of the STE/M1 test set, no alternate troubleshooting procedures are required.

Follow these general troubleshooting and maintenance instructions in each procedure unless the procedure directs otherwise:

- a. Make sure the troubleshooting instructions in TM 9-2350-255-10 have been completed before starting this troubleshooting action.
- b. If the same symptom exists after replacing a tank component, repeat the troubleshooting procedure.
- c. Look for obvious damage to harnesses and all surrounding components while troubleshooting.
- d. Be sure tank is parked where it is safe to traverse the turret.
- e. Be sure to close grille doors and access panels before traversing the turret.

**12-2. Steering System Troubleshooting Procedures.**

**Table 12-1. Steering System (SS) Fault Symptom Index**

Fault Symptom No.	Fault Symptom	Primary Troubleshooting Procedure (PTP)
SS-1	No Steering Control	Figure 12-1
SS-2	Tank Leads To One Side With Steer Bar In Center Position	Figure 12-2
SS-3	Tank Steers Well In One Direction Only	Figure 12-2
SS-4	No Full Steer In Either Direction	Figure 12-2

**SYMPTOM SS-1**

**NO STEERING CONTROL**

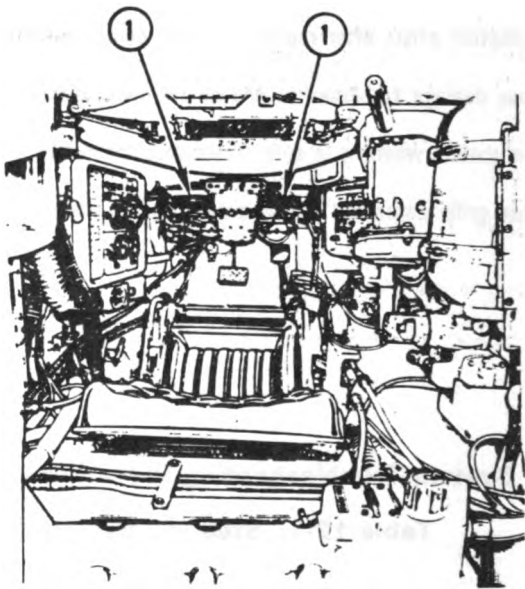
- Common Tools:**
- Extension, socket wrench, 1/2-inch square drive, 10 inch
  - Handle, socket wrench, 1/2-inch square drive
  - Pliers, long round nose

- Supplies:**
- Pin, cotter

- Test Equipment/Special Tools:**
- Pliers, retaining ring external
  - 15 millimeter socket, 12285499

- Equipment Condition:**
- Tank parked.
  - Parking brake set.
  - Engine shut down.
  - Vehicle master power off.

- NOTE**
- Read para. 12-1 before doing any work.
  - This is a two-man job. Soldier A is responsible for completing the job. Soldier B is the assistant and is directed by Soldier A. Soldier B will only be used in block 3.



A20120-603

- ①
- Try to move steering and throttle assembly handles (1) to right and then left.
- Do handles move?

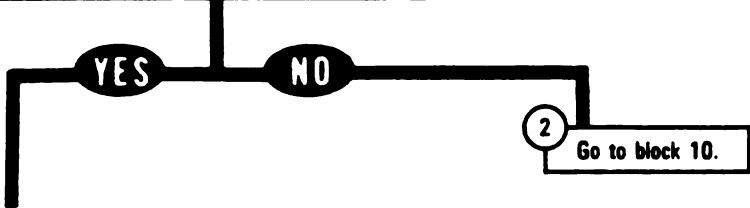
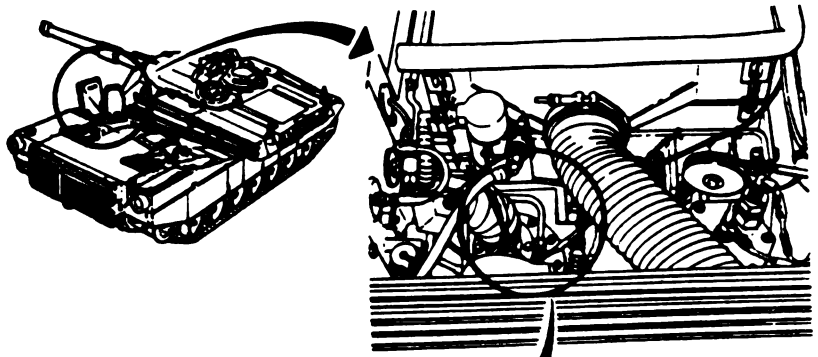


Figure 12-1 (Sheet 1 of 8)  
 Volume II  
 Para. 12-2



3

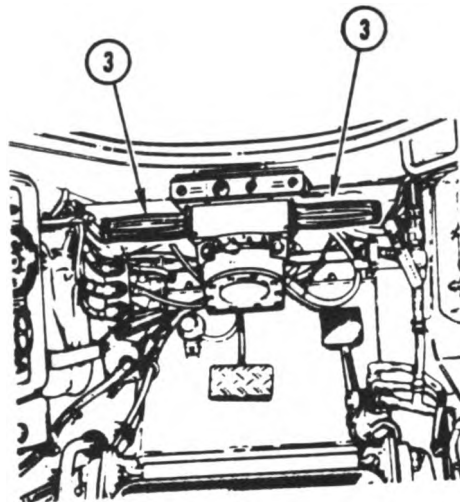
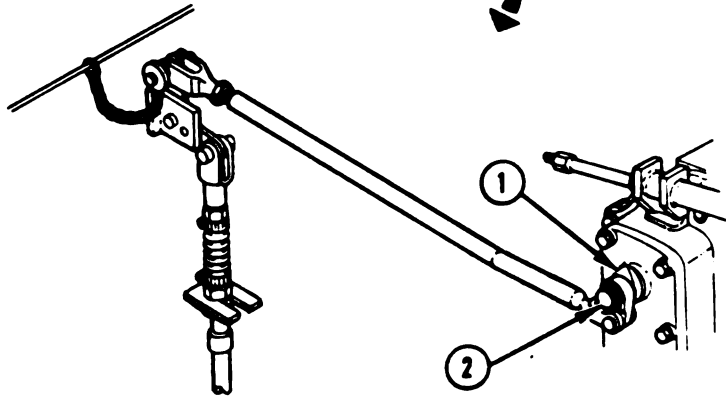
**Soldier A:**

- Open top deck left side grille doors.
- Refer to TM 9-2350-255-10.
- Check to see if lever (1) moves and shaft (2) rotates when steering handles (3) are turned.

**Soldier B:**

- Turn steering and throttle assembly handles (3) to right and then left when told by Soldier A.

Does lever move back and forth and shaft rotate?



A20120-1614

YES

NO

4

Go to block 20.

Figure 12-1 (Sheet 2 of 8)  
Volume II  
Para. 12-2

**TM 9-2350-255-20-1-2-1  
STEERING SYSTEM TROUBLESHOOTING**

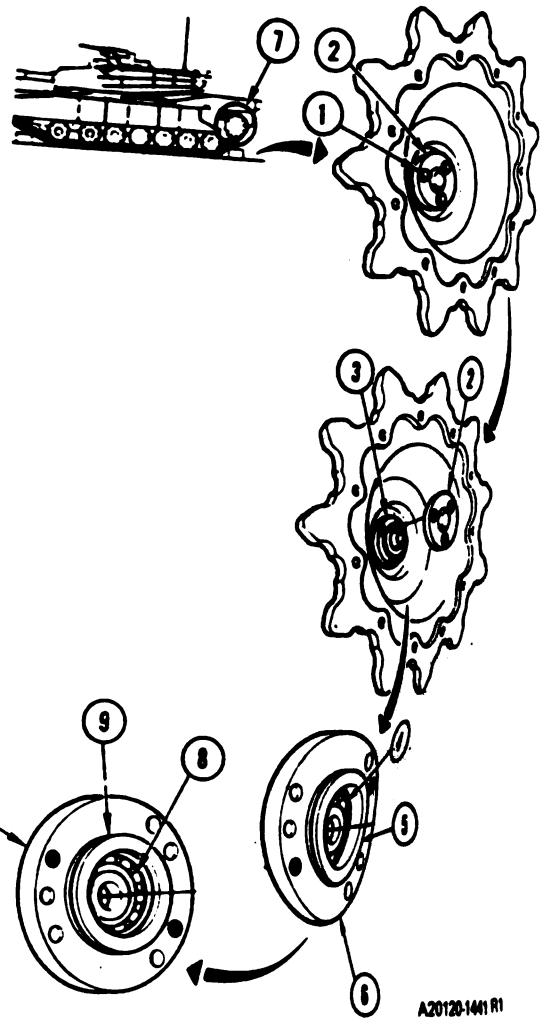
5

- Check to see if left and right final drives are connected.

**NOTE**  
Do the following steps for left and right sides.

- Unscrew and take off three screws (1) from cover (2) with 15 millimeter socket, 10-inch extension, and handle.
- Pull cover (2) off adapter (3).
- If bearing end (4) is even with surface (5) on adapter (6), final drive (7) is not connected.
- If bearing end (8) is below surface (9) on adapter (10), final drive (7) is connected.

Are final drives connected?



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YES NO

7

- Check torque on left and right final drives.
- Refer to TM 9-2350-255-20-1-3-1, para. 2-9.

Is torque more than 100 inch-pounds (11 Newton meters)?

6

- Connect final drives.
- Refer to TM 9-2350-255-20-1-3-1, para. 2-9.
- Verify that problem is solved.

Figure 12-1 (Sheet 3 of 8)  
Volume II  
Para. 12-2

**TM 9-2350-255-20-1-2-1**  
**STEERING SYSTEM TROUBLESHOOTING**

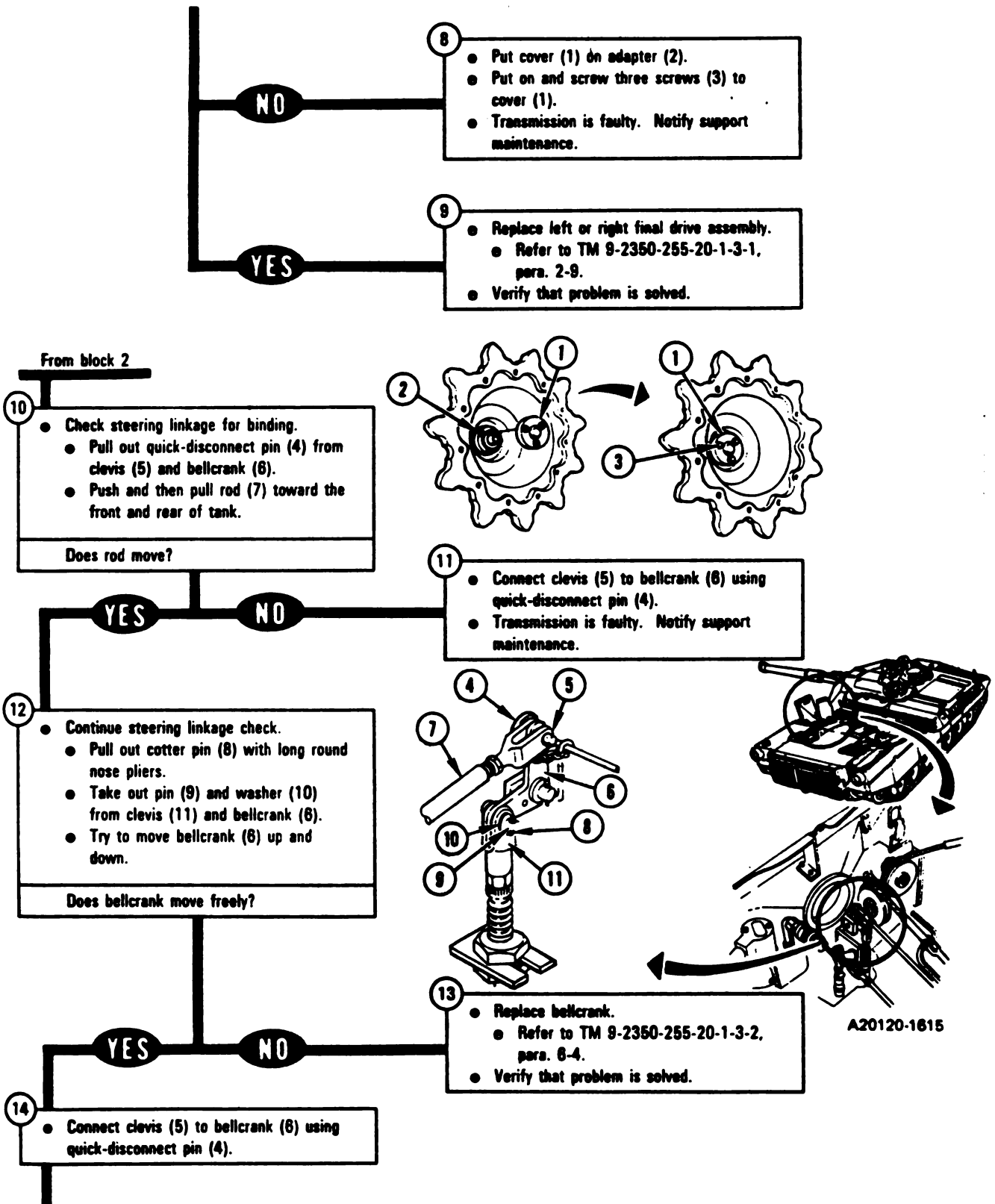
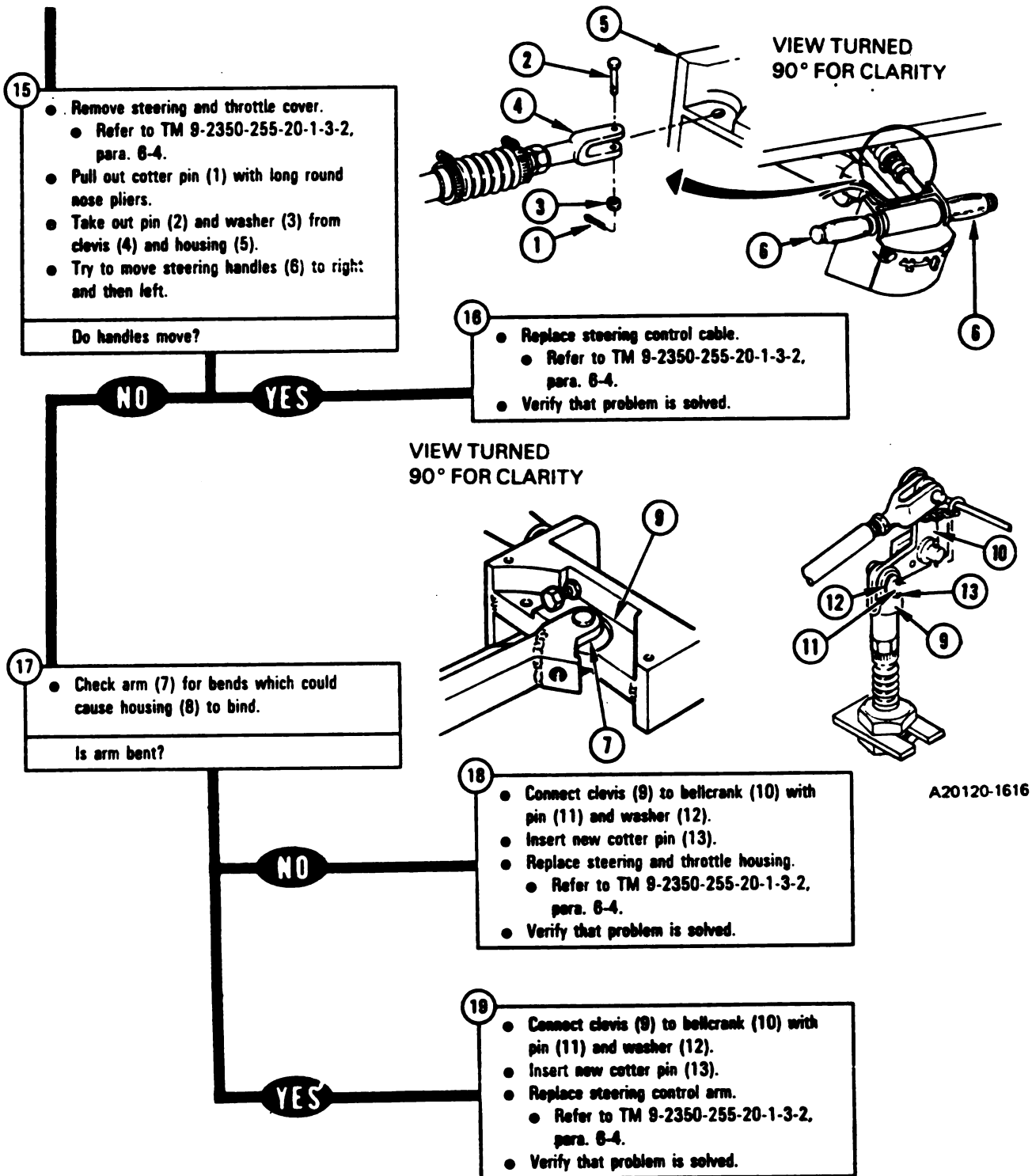


Figure 12-1 (Sheet 4 of 8)  
Volume II  
Para. 12-2



**TM 9-2350-255-20-1-2-1**  
**STEERING SYSTEM TROUBLESHOOTING**



*Figure 12-1 (Sheet 5 of 8)*  
**Volume II**  
**Para. 12-2**

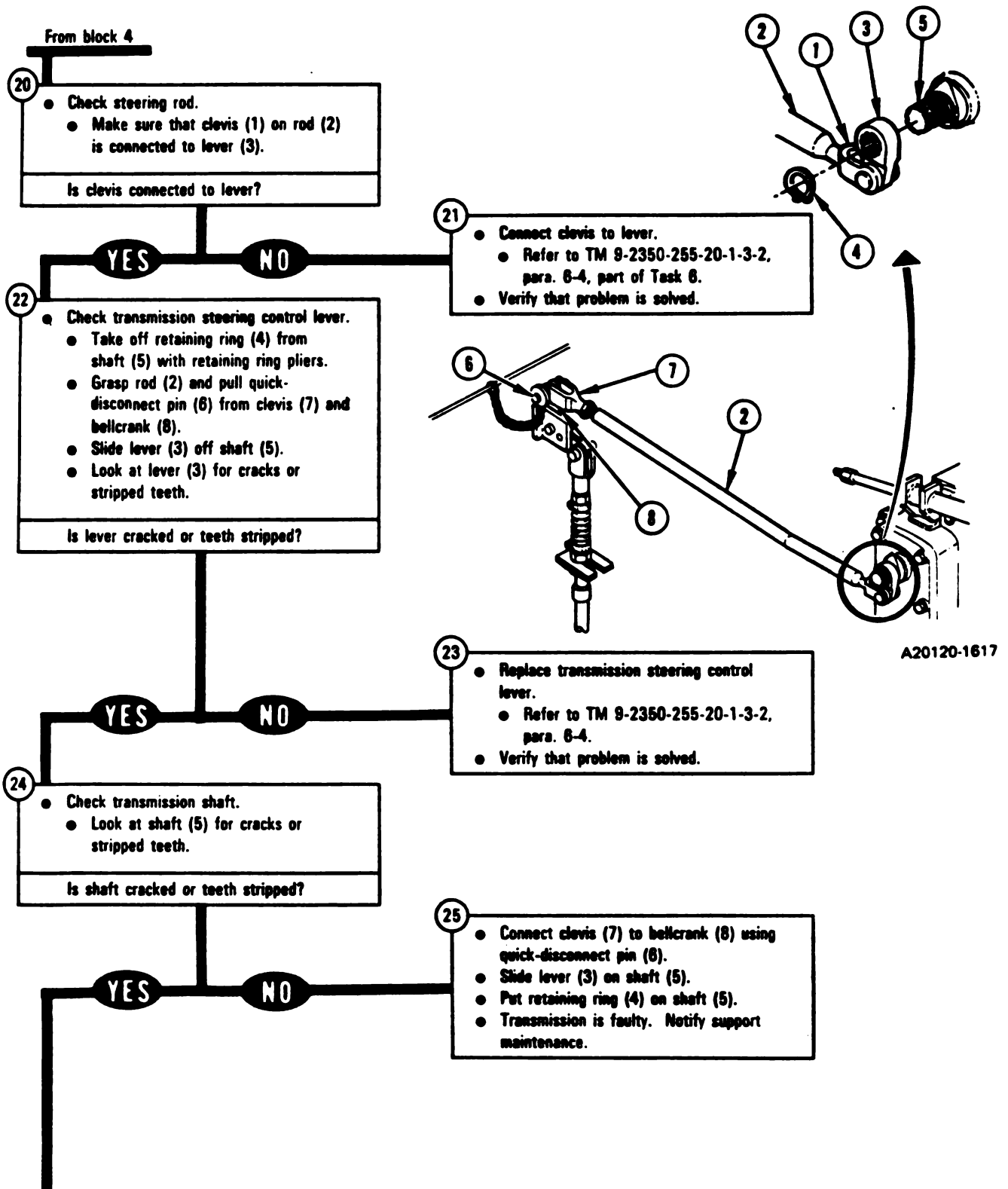
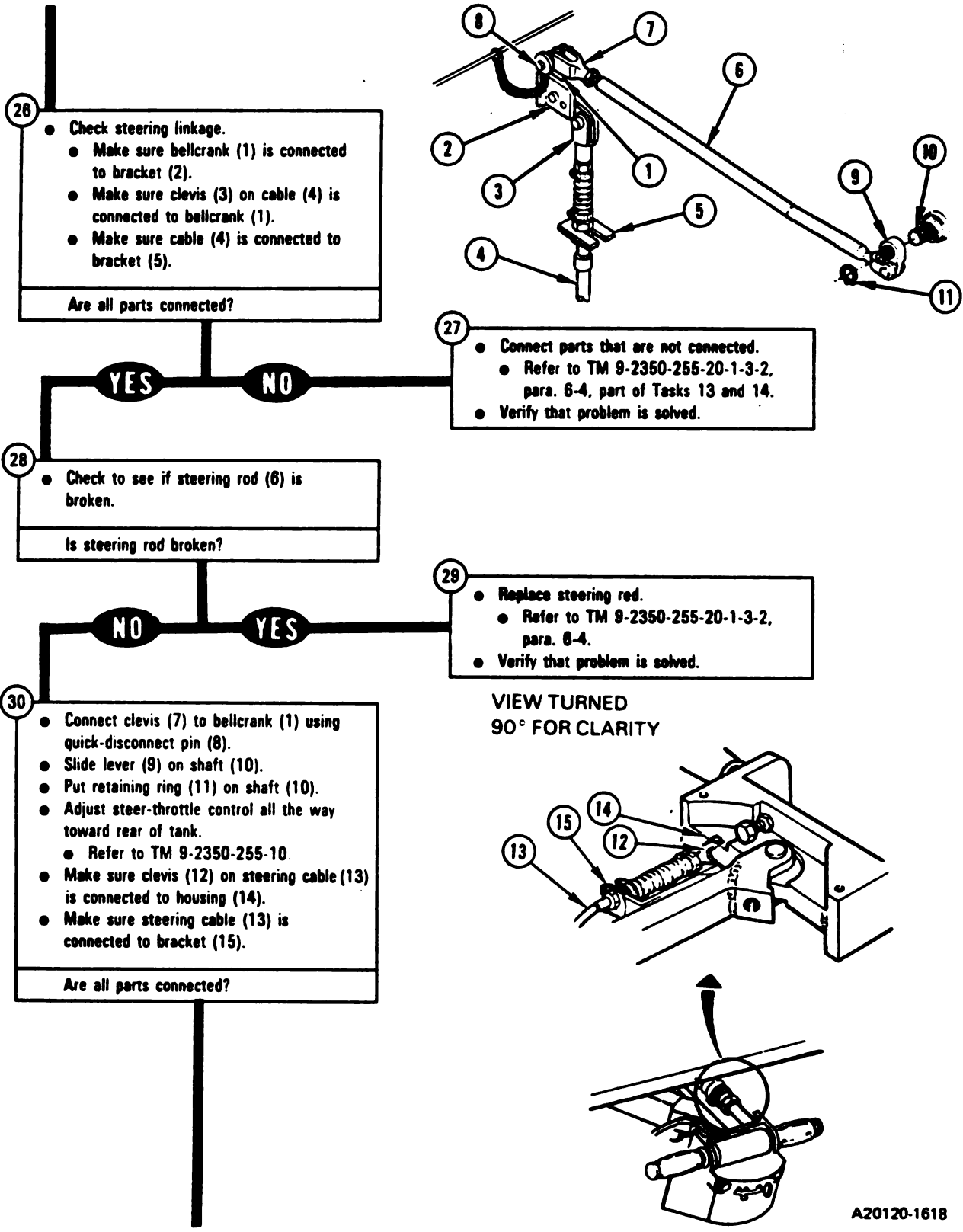


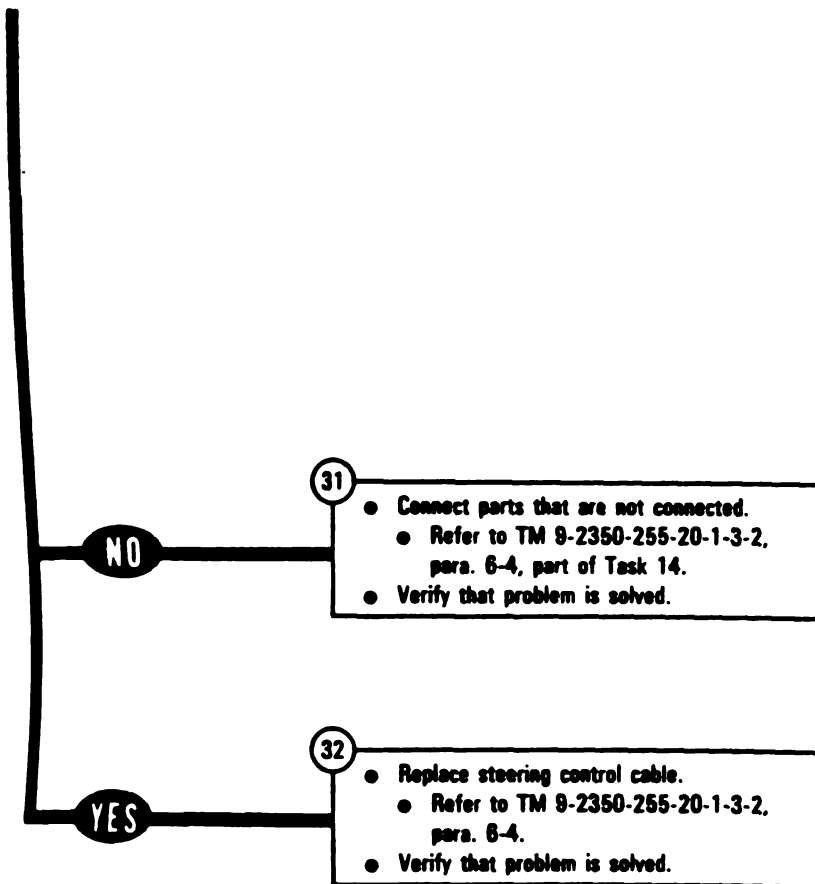
Figure 12-1 (Sheet 6 of 8)  
Volume II  
Para. 12-2

**TM 9-2350-255-20-1-2-1**  
**STEERING SYSTEM TROUBLESHOOTING**



A20120-1618

*Figure 12-1 (Sheet 7 of 8)*  
**Volume II**  
**Para. 12-2**



*Figure 12-1 (Sheet 8 of 8)*  
**Volume II**  
**Para. 12-2**

**TM 9-2350-255-20-1-2-1  
STEERING SYSTEM TROUBLESHOOTING**

**SYMPTOMS SS-2, SS-3, AND SS-4**

**TANK LEADS TO ONE SIDE WITH STEER BAR IN CENTER POSITION**

**OR**

**TANK STEERS WELL IN ONE DIRECTION ONLY**

**OR**

**NO FULL STEER IN EITHER DIRECTION**

**Equipment Condition:**

- Tank parked.
- Parking brake set.
- Engine shut down.
- Vehicle master power off.

**NOTE**

Read para. 12-1 before doing any work.

1

- Perform track tension adjustment procedure.
  - Refer to TM 9-2350-255-10.
- Adjust steering linkages.
  - Refer to TM 9-2350-255-20-1-3-2, para. 6-4.
- Verify that problem is solved.

Is steering normal?

**NO**

**YES**

2

- Perform transmission steering centering adjustment.
  - Refer to TM 9-2350-255-20-1-3-1, para. 2-8.
- Verify that problem is solved.

Is steering normal?

**YES**

**NO**

Problem solved.

3

- Transmission is faulty. Notify support maintenance.

**Figure 12-2  
Volume II  
Para. 12-2**

**CHAPTER 13  
BRAKE SYSTEM TROUBLESHOOTING**

**13-1. General.** This chapter tells you how to troubleshoot the subsystems of the brake system. The subsystems are listed in table 13-1 with paragraph and page numbers.

**Table 13-1. Brake Subsystems**

Subsystem	Use STE/M1	Para.	Page
Service Brake	No	13-2	13-2
Parking Brake	No	13-3	13-10

A fault symptom index is located at the beginning of each subsystem paragraph. The index identifies the primary and alternate procedure used to troubleshoot a known symptom. The primary procedure is included within the paragraph. The alternate procedure is located in TM 9-2350-255-20-1-2-3, chapter 20. STE/M1 test 1110 for parking brake has been deleted temporarily.

Do not start any alternate troubleshooting procedures until you have completed the pre-test steps in the primary procedures. The pre-test steps include inspection of vehicle harness/component connectors and inspection/test of mechanical components in the faulty subsystem. The pre-test are those steps which are to be performed before being directed to do the specified ATP.

Follow these general troubleshooting and maintenance instructions in each procedure unless the procedure directs otherwise:

- a. Make sure the troubleshooting instructions in TM 9-2350-255-10 have been completed before starting this troubleshooting action. Make sure all test connections are correct. An incorrect test connection can lead to the replacement of a good tank component.
- b. If the same symptom exists after replacing a tank component, repeat the troubleshooting procedure.
- c. Look for obvious damage to harnesses and all surrounding components while checking for loose electrical connectors.
- d. Be sure tank is parked where it is safe to traverse the turret.
- e. Be sure to close grille doors and access panels before traversing the turret.
- f. Be sure vehicle master power is OFF before connecting or disconnecting any electrical cable or harness.
- g. When taking apart or joining receptacles or connectors, look for missing, broken, and pushed in pins.
- h. If connectors, plugs, or receptacles cannot be removed by hand, use slip joint conduit style pliers with plastic jaw inserts to remove them. When installing connectors, plugs, or receptacles on larger harnesses, another soldier will be needed to help align the mating ends of the cable. Make sure that pins and keyways line up. Tighten twist-snap-type connectors, plugs, or receptacles until a click is heard and tighten the screw-on-type until the ratchet noise is heard to indicate that connectors, plugs, or receptacles are tight.

**13-1. General (Continued)**

- i. Use care when hooking up all connectors to avoid bending or breaking pins.
- j. Connect all cables and harnesses that were disconnected in order to get at the connector being checked.
- k. Dirt or contamination can ruin the transmission system. Clean off all connections with a clean rag before loosening any connection or fitting.

**WARNING**

Wipe up spilled oil immediately with rags. You can slip and fall on spilled oil.

- l. Put a rag under all connections to catch spilled oil before removing.
- m. When a step tells you to loosen connections with two wrenches, use one to loosen the connection, and the other to hold the fitting and keep the line from twisting.
- n. Cap or plug all open tubes, lines, fittings, receptacles, and connectors as soon as they are disconnected.
- o. Take protective caps or plugs off all tubes, lines, fittings, receptacles, and connectors before they are installed.
- p. Make sure connection points and insides of all tubes, lines, and fittings are clean before installing them.
- q. Screw on connections by hand. Finger tighten connections to be sure they are not cross-threaded.
- r. When a step tells you to tighten connections with two wrenches, use one to tighten the connection and the other to keep the fitting or line from twisting. Tighten 1/6 to 1/3 turn.
- s. Clean all connections, fittings, and joints that were loosened before you check for leaks.

**13-2. Service Brake Subsystem Troubleshooting Procedures**

Table 13-2. Service Brake Subsystem (SBS) Fault Symptom Index

Fault Symptom No.	Fault Symptom	Alternate Troubleshooting Procedure (ATP)
SBS-1	Service Brakes Do Not Stop Or Hold Tank.	Figure 13-1
SBS-2	Service Brakes Lock Or Drag When Attempting To Drive Tank.	Figure 13-2

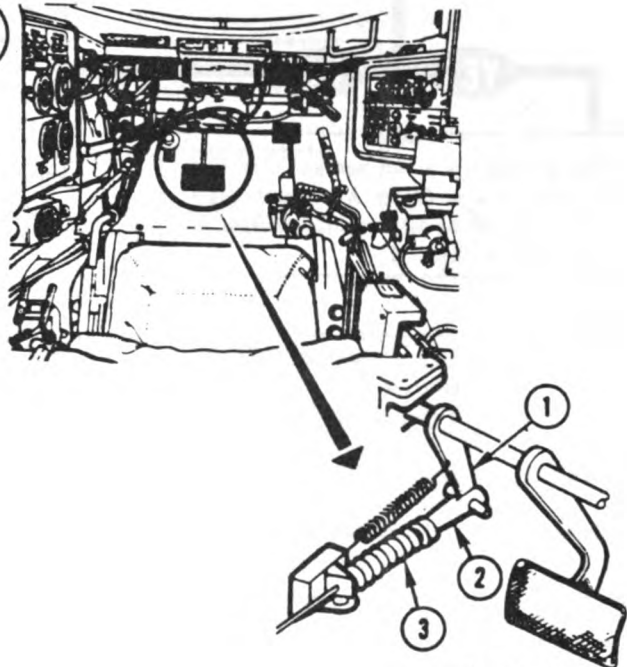
**SYMPTOM SBS-1**

**SERVICE BRAKES DO NOT STOP OR HOLD TANK**

**Test Equipment/Special Tools:**  
 None

**Equipment Condition:**

- Tank parked.
- Parking brake set.
- VEHICLE MASTER POWER switch set to OFF.
- Transmission shift control set to N.



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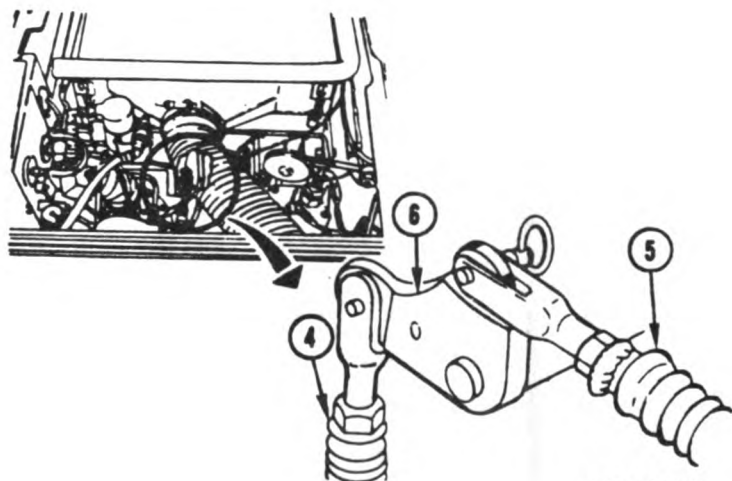
- 1
- Look at connection between lever (1) and clevis (2) on brake cable (3).
- Is clevis pinned to lever?

**YES**

**NO**

- 2
- Connect lever (1) to clevis (2).
  - Refer to TM 9-2350-255-20-1-3-2, para. 6-5.
  - Verify that problem is solved by testing service brakes.
  - Refer to TM 9-2350-255-10.

- 3
- Open top left grille door.
  - Refer to TM 9-2350-255-10.
  - Check that forward cable (4) and rear cable (5) are pinned to bellcrank (6).
- Are cables connected?

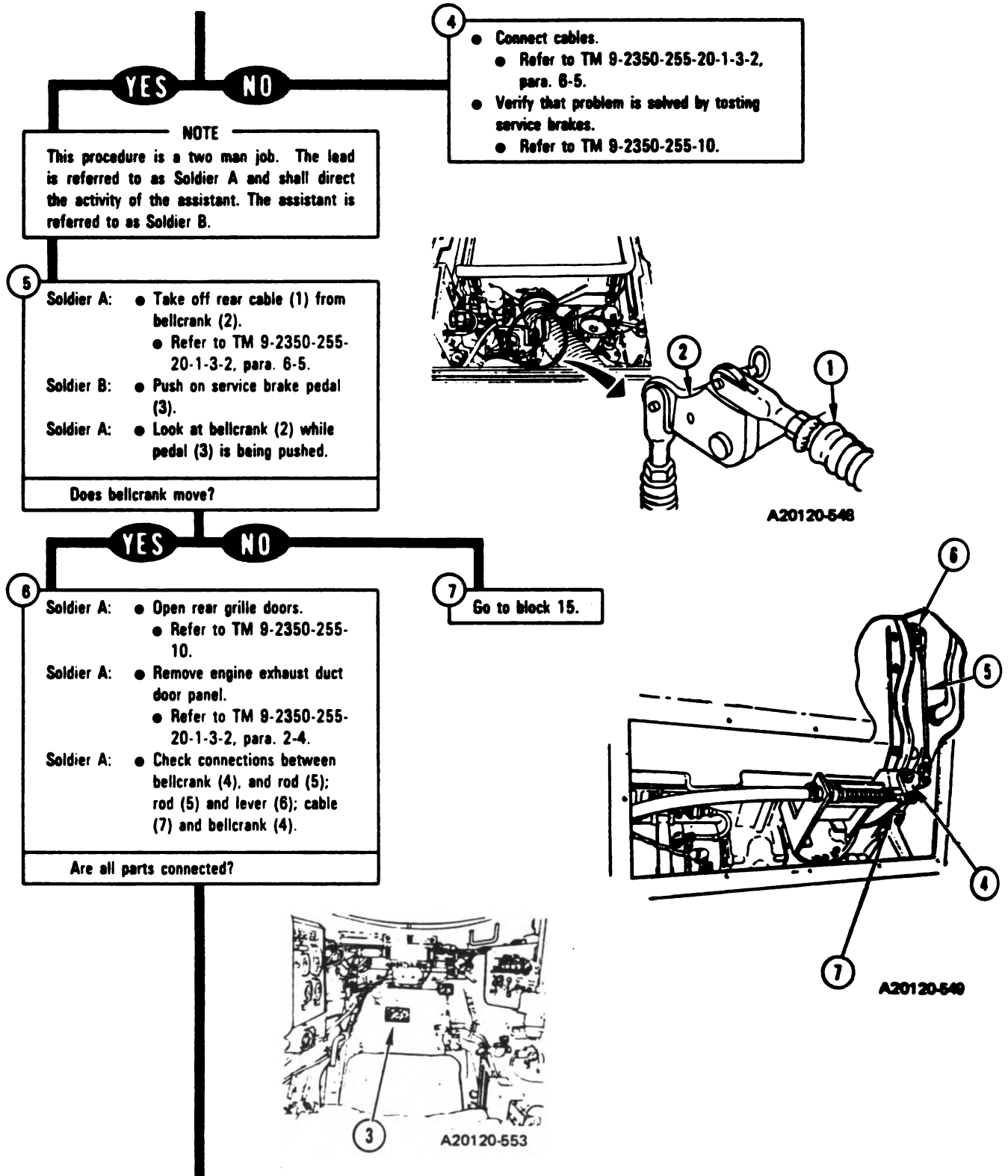


A20120-547

**Figure 13-1 (Sheet 1 of 4)**  
**Volume II**  
**Para. 13-2**

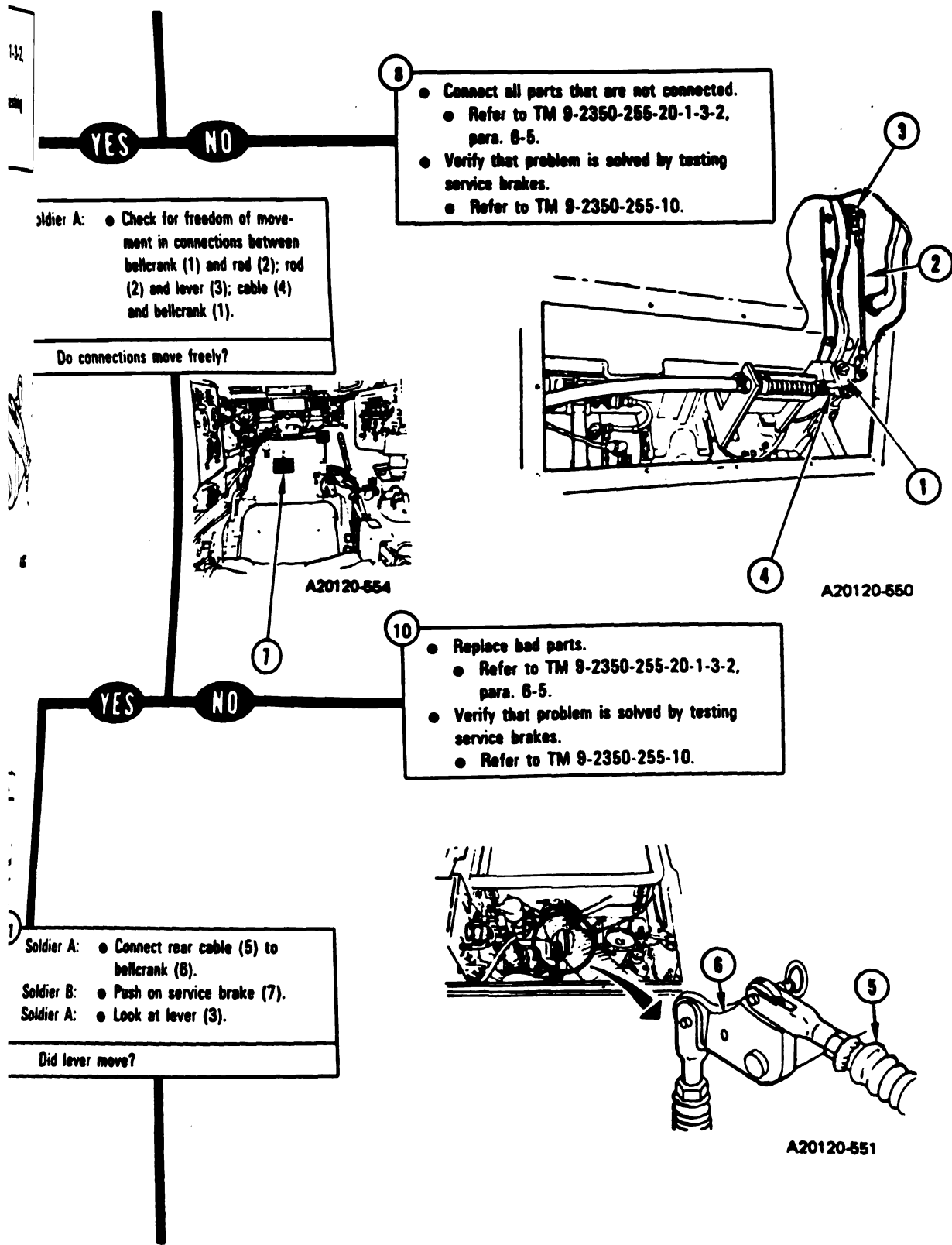


**TM 9-2350-255-20-1-2-1  
BRAKE SYSTEM TROUBLESHOOTING**

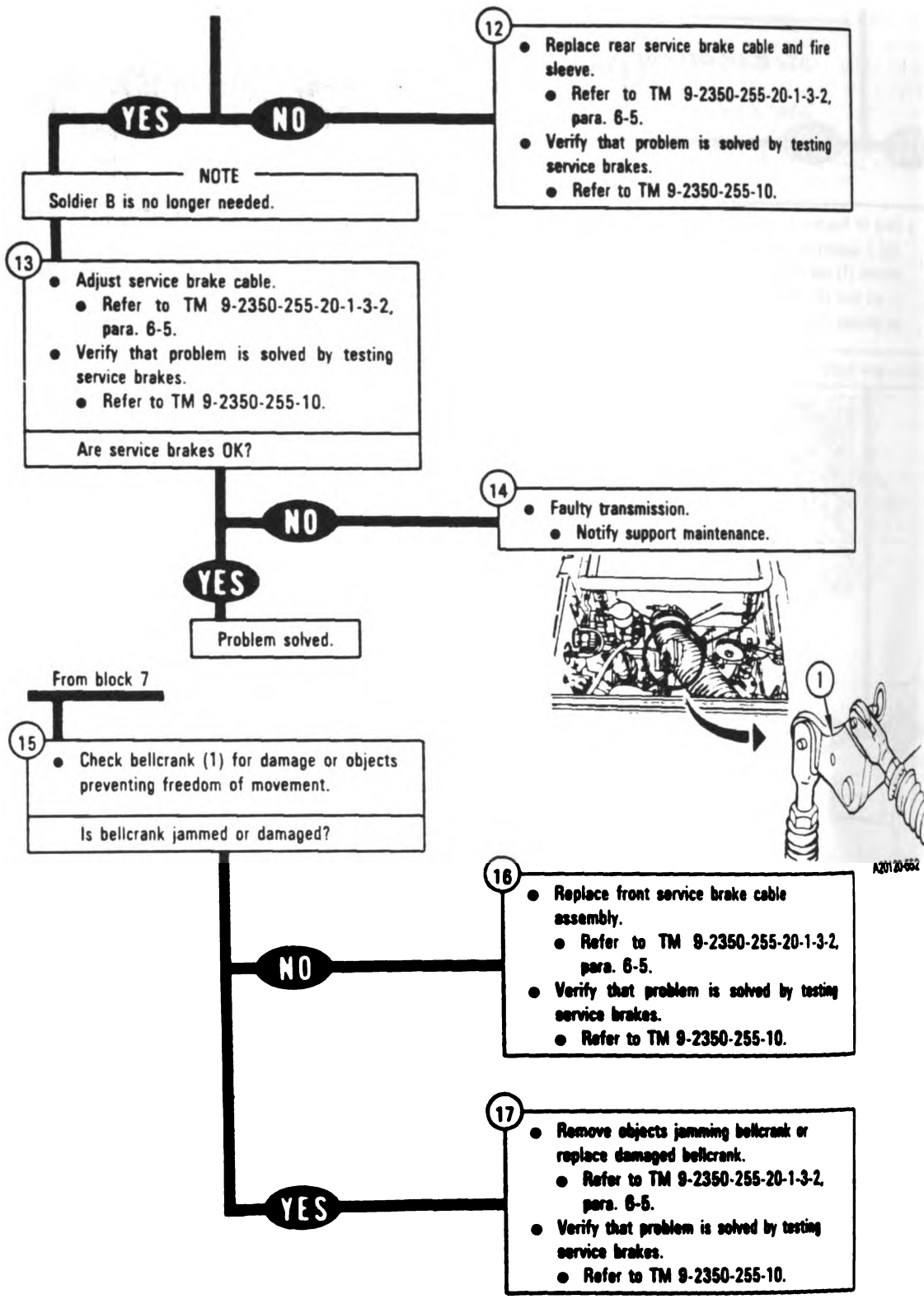


*Figure 13-1 (Sheet 2 of 4)  
Volume II  
Para. 13-2*

# TM 9-2350-255-20-1-2-1 BRAKE SYSTEM TROUBLESHOOTING



**TM 9-2350-255-20-1-2-1  
BRAKE SYSTEM TROUBLESHOOTING**



*Figure 13-1 (Sheet 4 of 4)  
Volume II  
Para. 13-2*

**SYMPTOM SBS-2**

**SERVICE BRAKES LOCK OR DRAG WHEN ATTEMPTING TO DRIVE TANK**

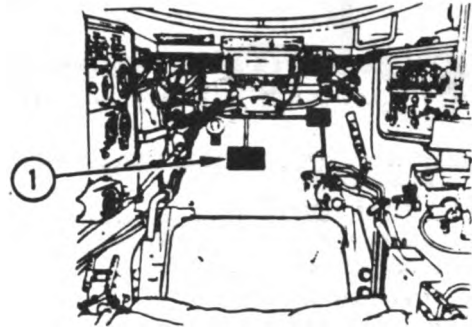
**Test Equipment/Special Tools:**  
None

**Equipment Condition:**

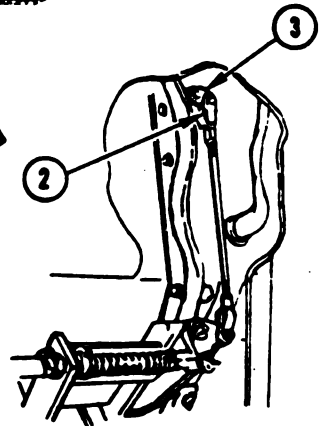
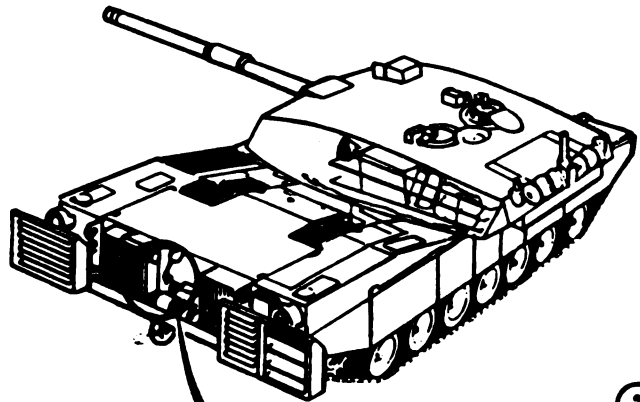
- Tank parked.
- Parking brake set.
- VEHICLE MASTER POWER switch set to OFF.
- Transmission shift control set to N.

**NOTE**

This procedure is a two man job. The lead is called Soldier A and shall direct the activity of the assistant. The assistant is called Soldier B.



A20120-555



A20120-555

1 Soldier A: ● Look at service brake pedal (1) and nearby linkage.

Is anything keeping parts from moving freely?

**NO**

**YES**

- 2
- Remove objects blocking movement.
  - Verify that problem is solved by testing service brakes.
  - Refer to TM 9-2350-255-10.

3 Soldier B: ● Take off clevis (2) from lever (3) on transmission.

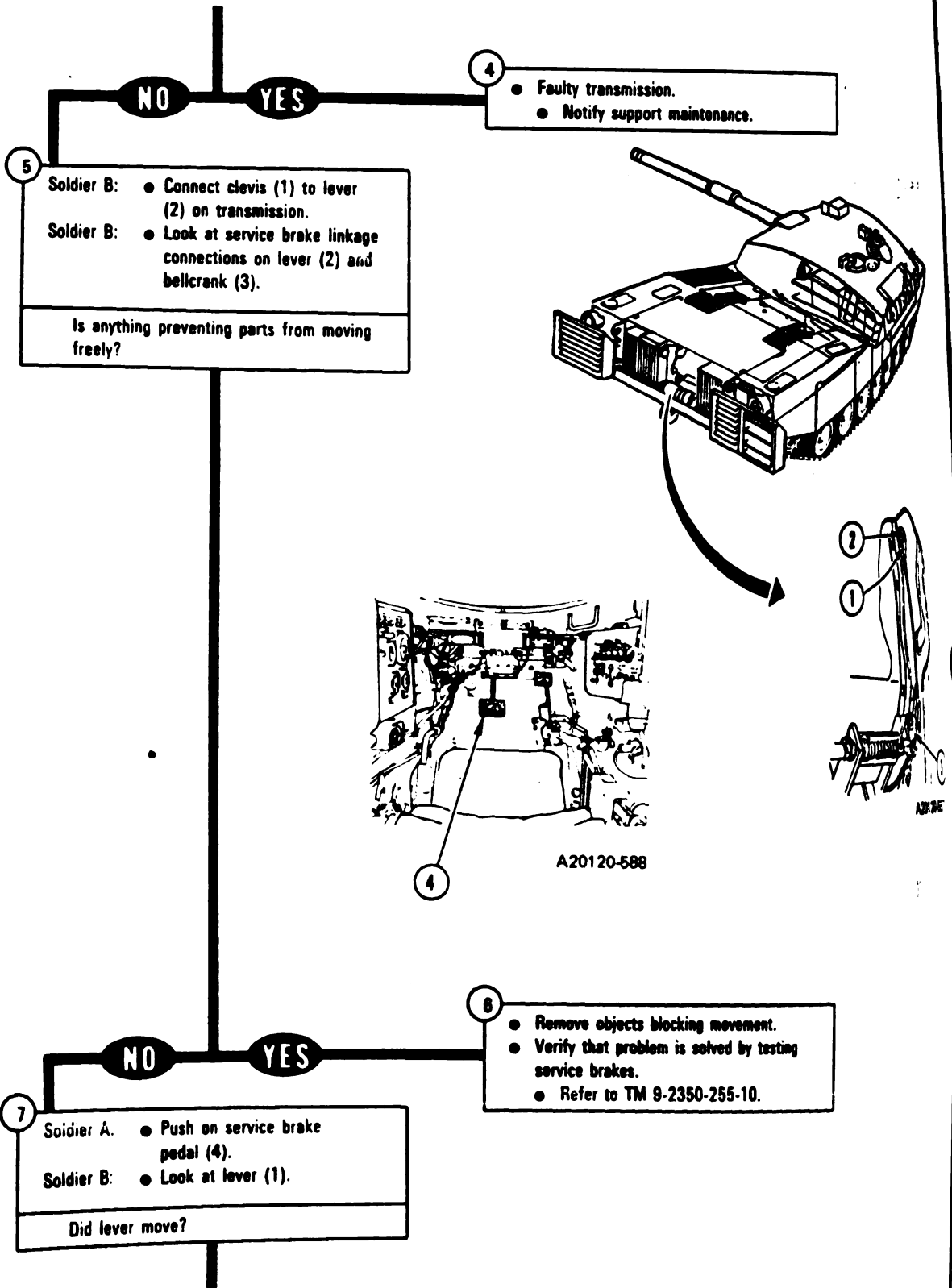
Soldier A: ● Start engine.

- Refer to TM 9-2350-255-10.

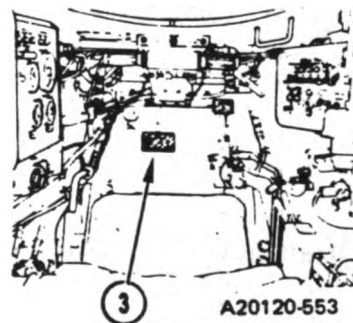
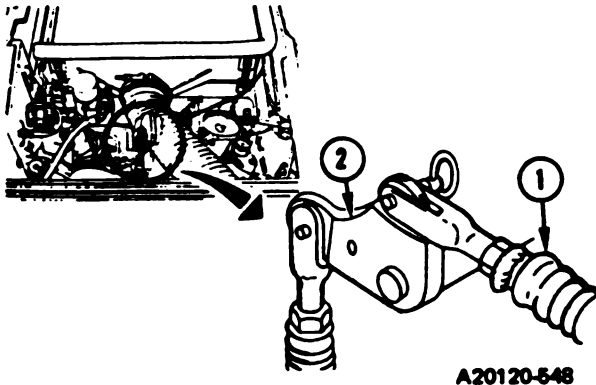
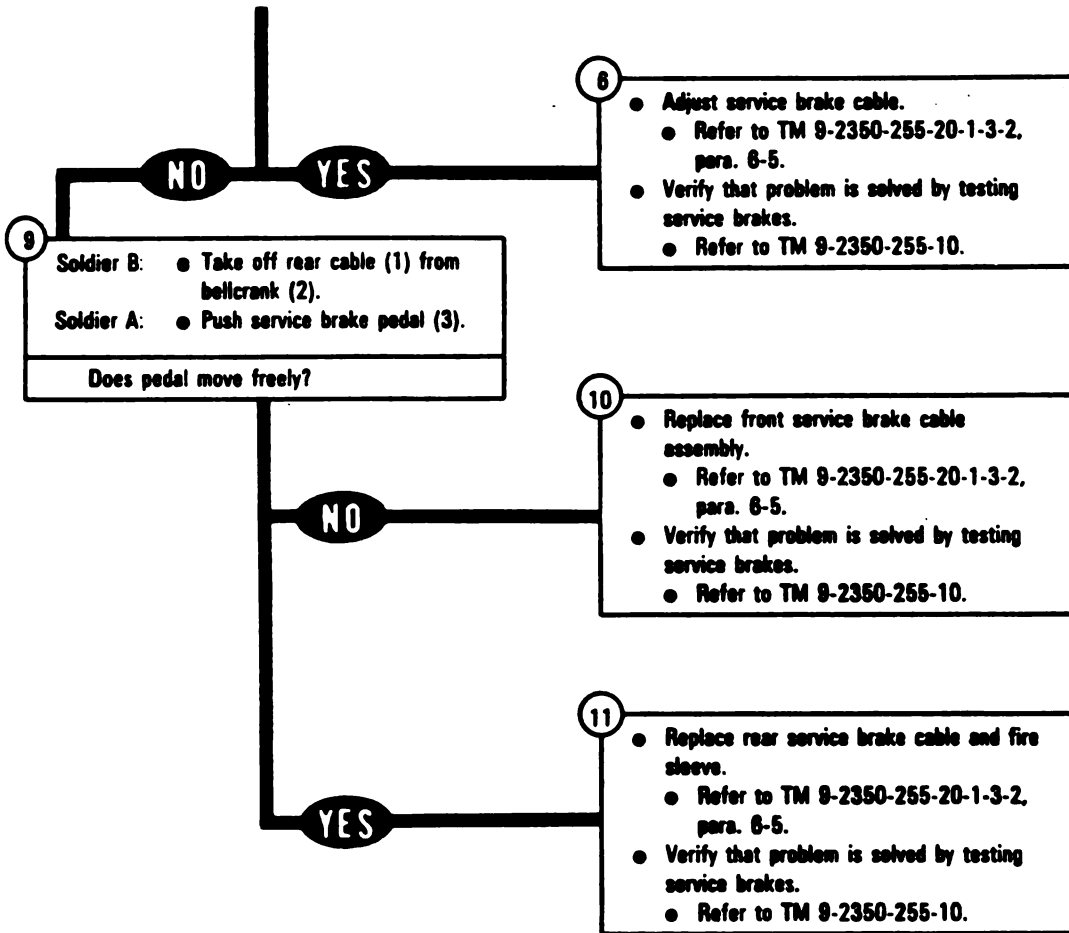
Does parking/service brakes light come on after two minutes?

Figure 13-2 (Sheet 1 of 3)  
Volume II  
Para. 13-2

**TM 9-2350-255-20-1-2-1  
BRAKE SYSTEM TROUBLESHOOTING**



*Figure 13-2 (Sheet 2 of 3)  
Volume II  
Para. 13-2*



*Figure 13-2 (Sheet 3 of 3)*  
**Volume II**  
**Para. 13-2**

**13-3. Parking Brake Subsystem Troubleshooting Procedures**

**Table 13-3. Parking Brake Subsystem (PBS) Fault Symptom Index**

<b>Fault Symptom No.</b>	<b>Fault Symptom</b>	<b>Primary Troubleshooting Procedure (PTP)</b>	<b>Test No.</b>	<b>Alternate Troubleshooting Procedure (ATP) TM 9-2350-255-20-2-2-3</b>
PBS-1	PARKING/SERVICE BRAKES Light Is On When All Brakes Are Released.	Figure 13-3	-	Figure 20-35
PBS-2	PARKING/SERVICE BRAKES Light Does Not Come On When Parking Brake Is Pressed.	Figure 13-3	-	Figure 20-36
PBS-3	PARKING/SERVICE BRAKES Light Does Not Come On When Service Brake Is Pressed For Two Minutes Or More.	Figure 13-3	-	Figure 20-37
PBS-4	Parking Brakes Do Not Hold Tank.	Figure 13-17	-	-
PBS-5	Parking Brakes Do Not Release.	Figure 13-18	-	-
PBS-6	MASTER WARNING Light Does Not Come On When Parking Brake Is Pressed.	Figure 13-3	-	Figure 20-38

TOMS PBS-1 through PBS-3 and PBS-6.

**PARKING BRAKE SUBSYSTEM FOUND  
FAULTY DURING TANK OPERATION**

**NOTE**

Before going on with this procedure, make sure brakes are mechanically disengaged, refer to TM 9-2350-255-10. If PARKING/SERVICE BRAKES light is ON and parking brakes are not mechanically disengaged, do troubleshooting procedure, figure 13-18.

**Test Equipment/Special Tools:**  
• None

**Equipment Condition:**

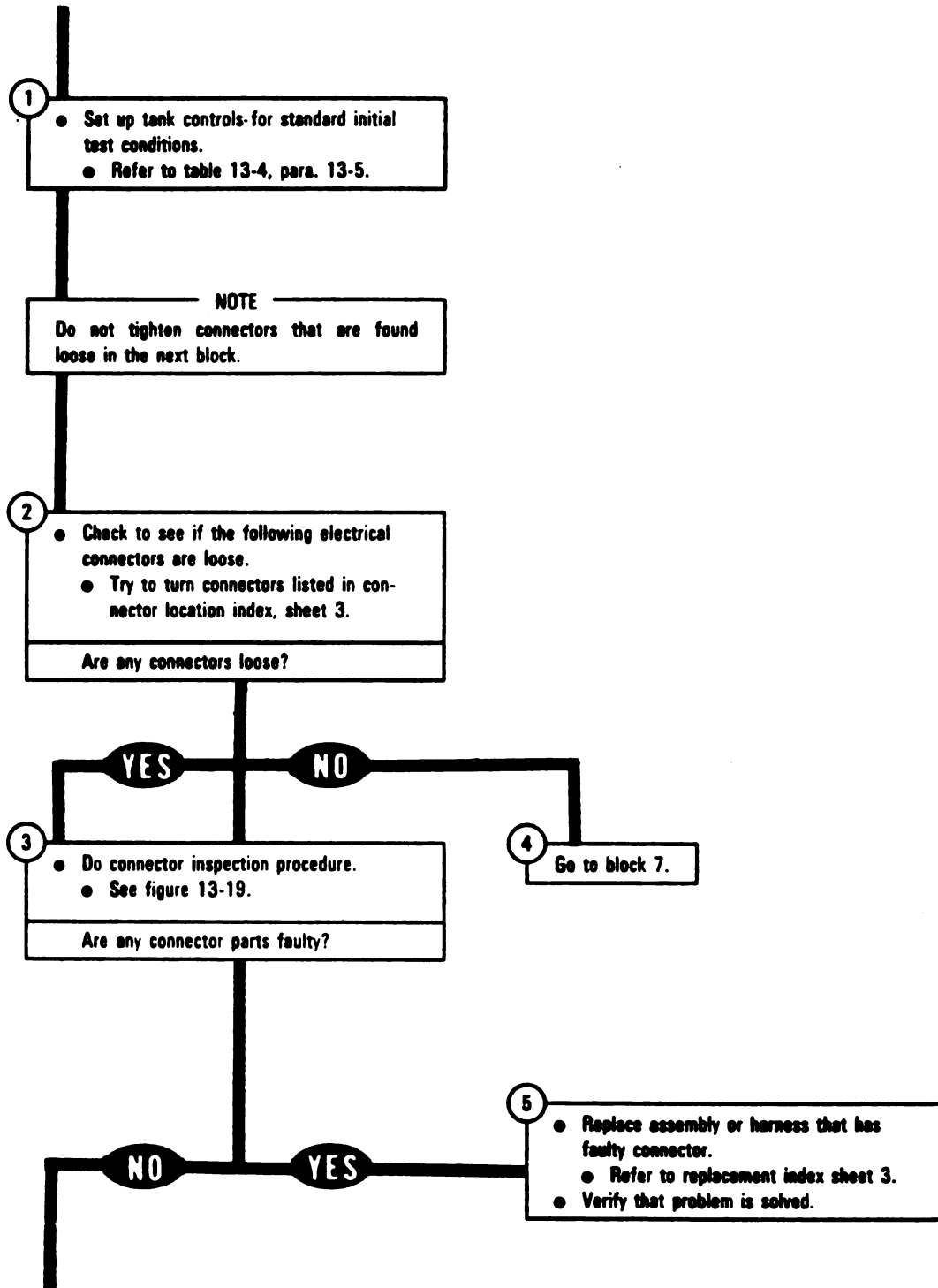
- Tank parked.
- Parking brake set.
- Engine shut down.
- Vehicle master power off.

*Figure 13-3 (Sheet 1 of 9)*  
**Volume II**  
**Para. 13-3**

**Change 5 13-11**



**TM 9-2350-255-20-1-2-1  
BRAKE SYSTEM TROUBLESHOOTING**



*Figure 13-3 (Sheet 2 of 9)*  
**Volume II  
Para. 13-3**

**TM 9-2350-255-20-1-2-1  
BRAKE SYSTEM TROUBLESHOOTING**

**Connector Location Index**

<b>Harness Connector</b>	<b>Connects To</b>	<b>TM 9-2350-255-20-1-2-3, Figure</b>
2W104-P1	J8 on hull networks box	20-138
2W104-P3	J1 on driver's master panel	20-138
2W105-P1	J2 on hull networks box	20-139
2W105-P4	J1 on 2W104	20-139
2W106-P1	J12 on hull networks box	20-142
2W106-P2	J1 on 2W107	20-142
2W106-P4	J1 on driver's instrument panel	20-142
2W106-P5	J2 on driver's instrument panel	20-142
2W106-P6	J1 on driver's alert panel	20-143
2W107-P1	J1 on hull networks box	20-159
3W104-P1	2W105-J2 on disconnect panel	20-159
3W104-P3	J1 on right parking brake switch	20-159
3W104-P4	J1 on transmission	20-159
3W104-P5	J1 on left parking brake switch	20-159

**Replacement Index**

<b>Harness or Assembly</b>	<b>TM 9-2350-255-20-</b>	<b>Para.</b>
2W104, 2W105, 2W106, or 2W107	1-3-4	11-18
2W104	1-3-4	12-7
Driver's alert panel	1-3-4	11-16
Driver's instrument panel	1-3-4	11-14
Driver's master panel	1-3-4	11-15
Hull networks box	1-3-4	11-12
Left parking brake switch	Notify support maintenance	-
Right parking brake switch	Notify support maintenance	-
Transmission	Notify support maintenance	-

*Figure 13-3 (Sheet 3 of 9)*  
**Volume II  
Para. 13-3**

TM 9-2350-255-20-1-2-1  
BRAKE SYSTEM TROUBLESHOOTING

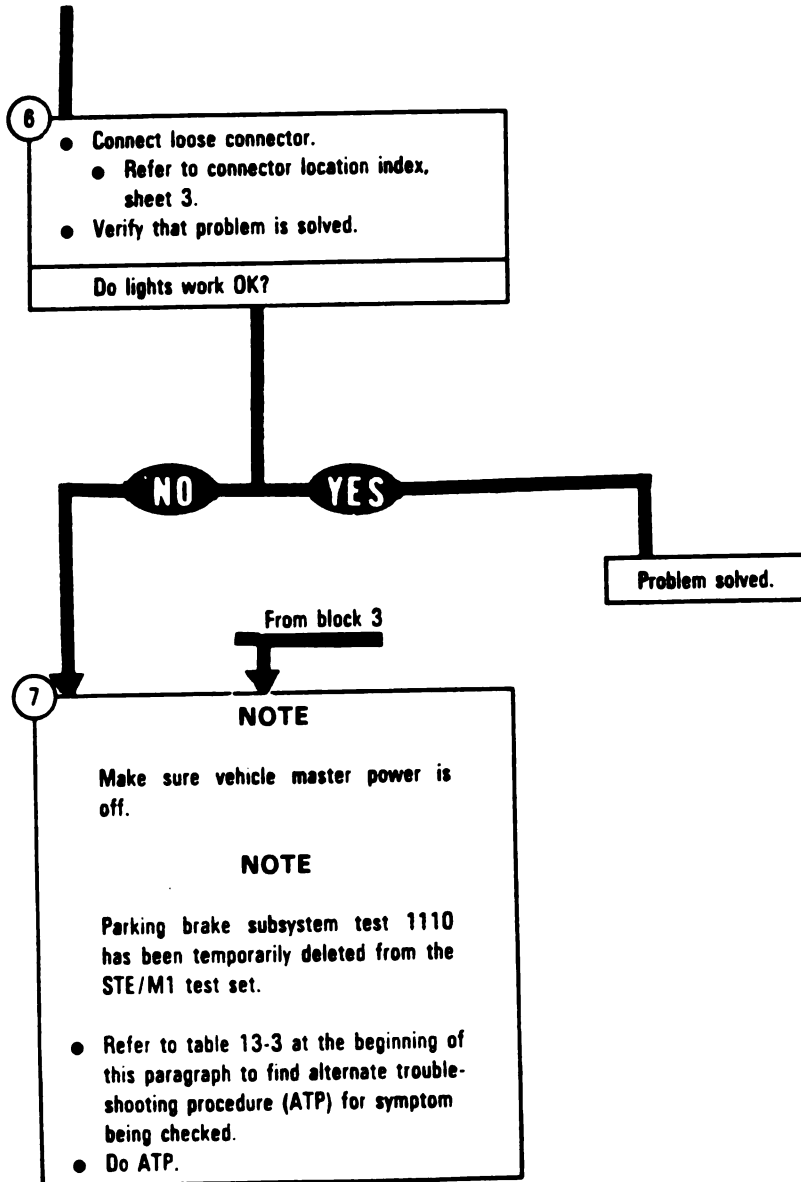


Figure 13-3 (Sheet 4 of 9)  
Volume II  
Para. 13-3

13-14 Change 5

All data on pages 13-15 through 13-39 has been deleted including sheets 5 through 9 of figure 13-3 and figures 13-4 through 13-16



**TM 9-2350-255-20-1-2-1  
BRAKE SYSTEM TROUBLESHOOTING**

**SYMPTOM PBS-4**

**PARKING BRAKES DO NOT HOLD TANK**

**Test Equipment/Special Tools:**  
None

**Equipment Condition:**

- Tank parked.
- Parking brake released.
- VEHICLE MASTER POWER switch set to OFF.
- Transmission shift control set to N.

**NOTE**

- This procedure is a two man job. The lead is referred to as Soldier A and shall direct the activity of the assistant. The assistant is referred to as Soldier B.
- If auxiliary hydraulic powerpack does not stop cycling in 60 seconds, refer to symptom index TM 9-2350-255-20-2-2-1, para. 9-6.

**1**

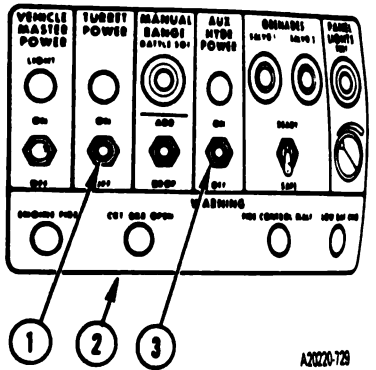
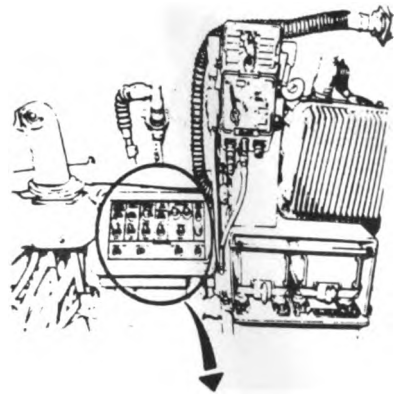
**Soldier A:**

- Set TURRET POWER switch (1) on commander's panel (2) to ON.
- Set AUX HYDR POWER switch (3) to ON.
- After auxiliary hydraulic powerpack stops, set AUX HYDR POWER switch (3) to OFF.
- Set TURRET POWER switch (1) to OFF.
- Reduce main hydraulic pressure to zero.
  - Refer to TM 9-2350-255-10.

**Soldier B:**

- Push on parking brake pedal (4) and watch pressure gage (5).

Did pressure go to zero psi?



A2020-729



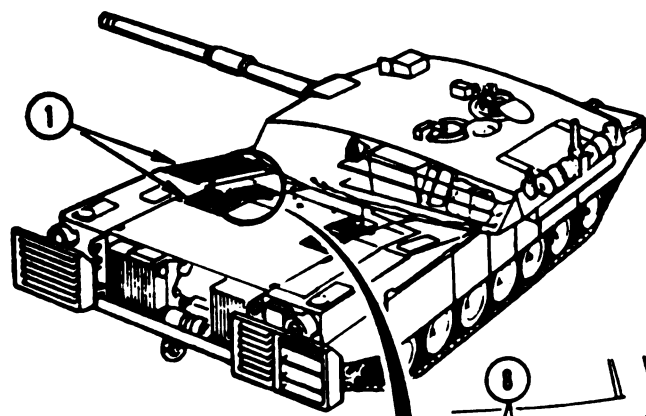
A20120-558

**Figure 13-17 (Sheet 1 of 8)  
Volume II  
Para. 13-3**

**TM 9-2350-255-20-1-2-1  
BRAKE SYSTEM TROUBLESHOOTING**

**2**

- Replace parking brake hydraulic accumulator.
- Refer to TM 9-2350-255-20-1-3-3, para. 8-13.
- Verify that problem is solved by setting parking brake.
- Refer to TM 9-2350-255-10.

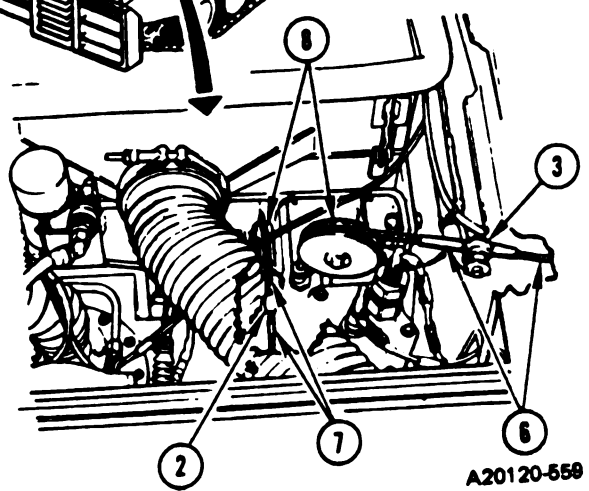


**3**

Soldier A: ● Open top deck left grille doors (1).

Soldier A: ● Look at left and right quick disconnect pins (2, 3).

Are pins in place?



**4**

- Connect brake cable (6) with pin (3).
- Connect brake cable (7) with pin (2).
- Verify that problem is solved by setting parking brake.
- Refer to TM 9-2350-255-10.

**5**

Soldier B: ● Pull parking brake release handle (4).

Soldier B: ● Push on parking brake pedal (5).

Soldier A: ● Look at brake cables (6) and (7) as they move toward pulleys (8).

Did cables move toward pulleys and stop?

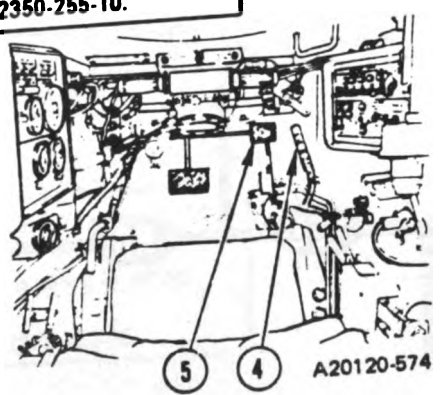


Figure 13-17 (Sheet 2 of 8)  
Volume II  
Para. 13-3

TM 9-2350-255-20-1-2-1  
BRAKE SYSTEM TROUBLESHOOTING

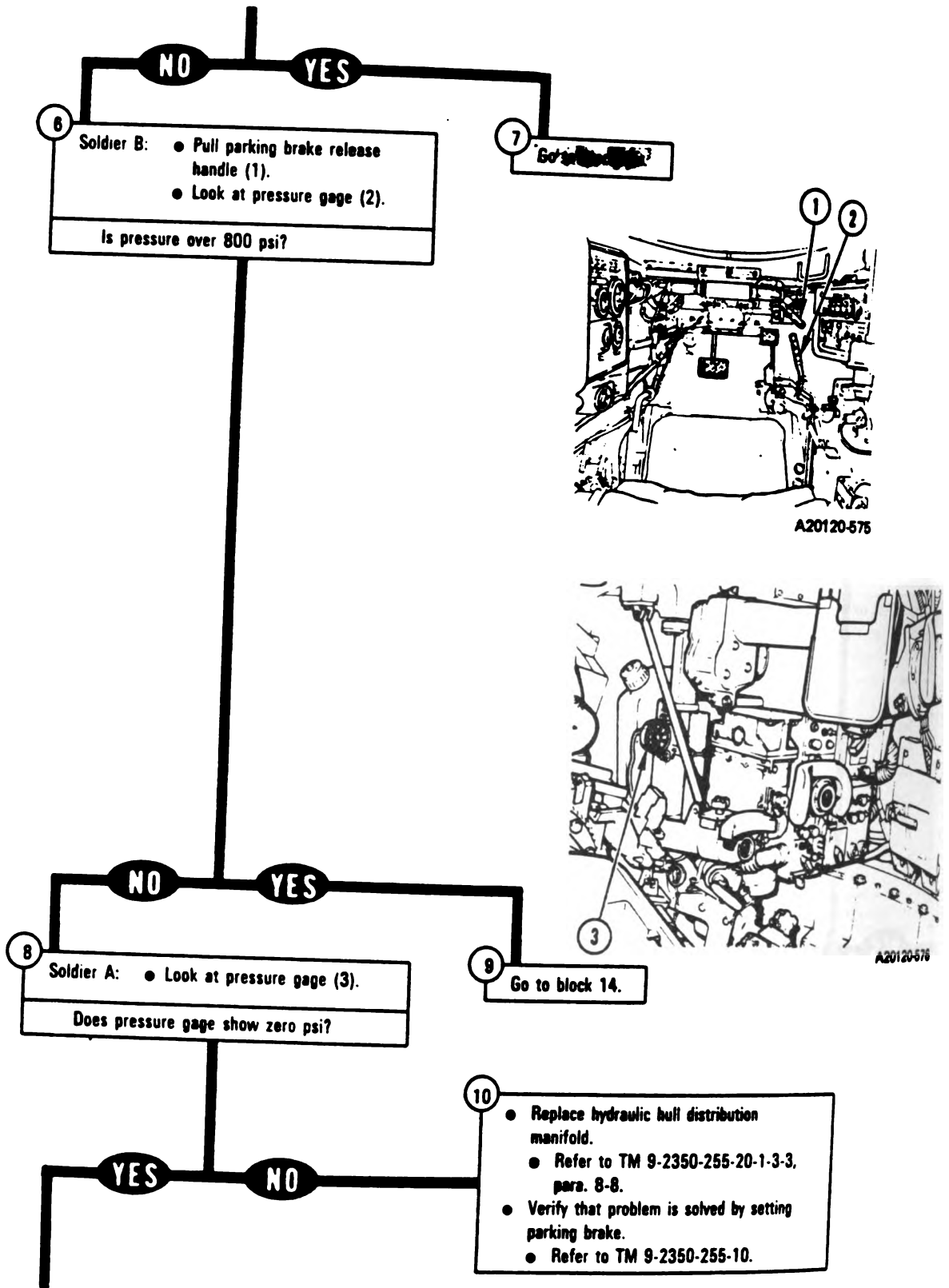
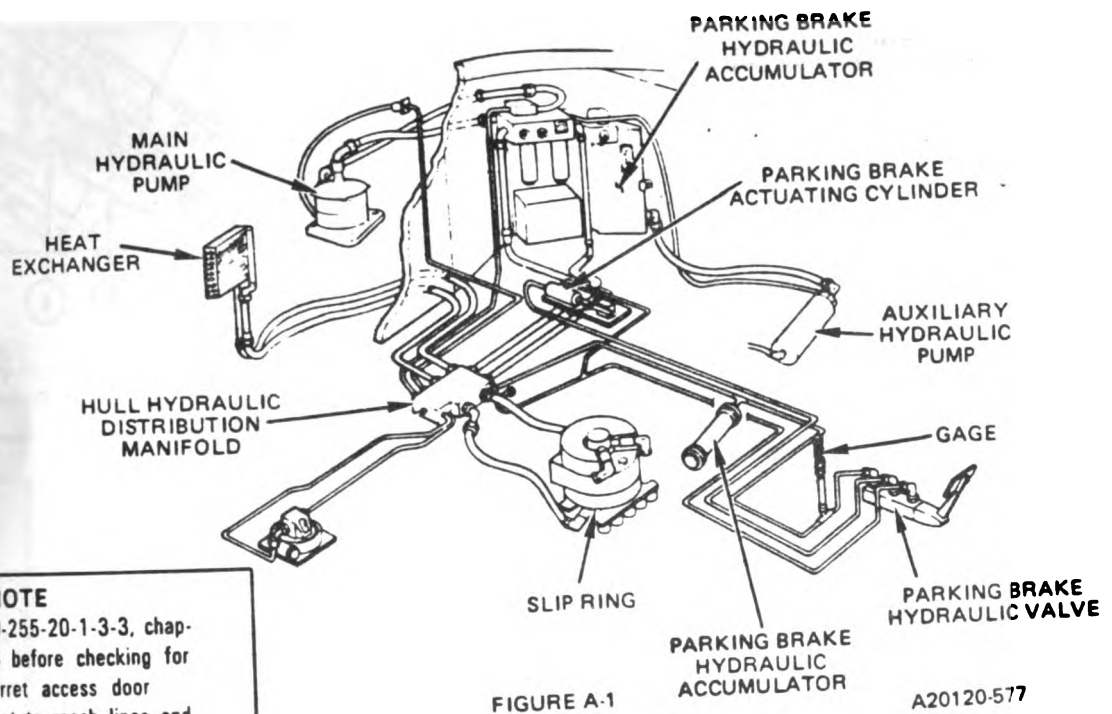


Figure 13-17 (Sheet 3 of 8)  
Volume II  
Para. 13-3

# TM 9-2350-255-20-1-2-1 BRAKE SYSTEM TROUBLESHOOTING



**NOTE**

Read TM 9-2350-255-20-1-3-3, chapter 8, para. 8-4 before checking for leaks. Open turret access door and traverse turret to reach lines and fittings. Lock turret.

- Check lines and fittings for leaks, dents, or loose connections.
- Look at lines and fittings between hydraulic hull distribution manifold, parking brake hydraulic accumulator, gage, and parking brake hydraulic valve. See figure A-1.
- Look at lines and fittings between parking brake hydraulic valve and parking brake actuating cylinder. See figure A-1.

Are hydraulic lines and fittings OK?

**NO**

12

- Faulty parking brake line or fitting.
- Notify support maintenance.

**YES**

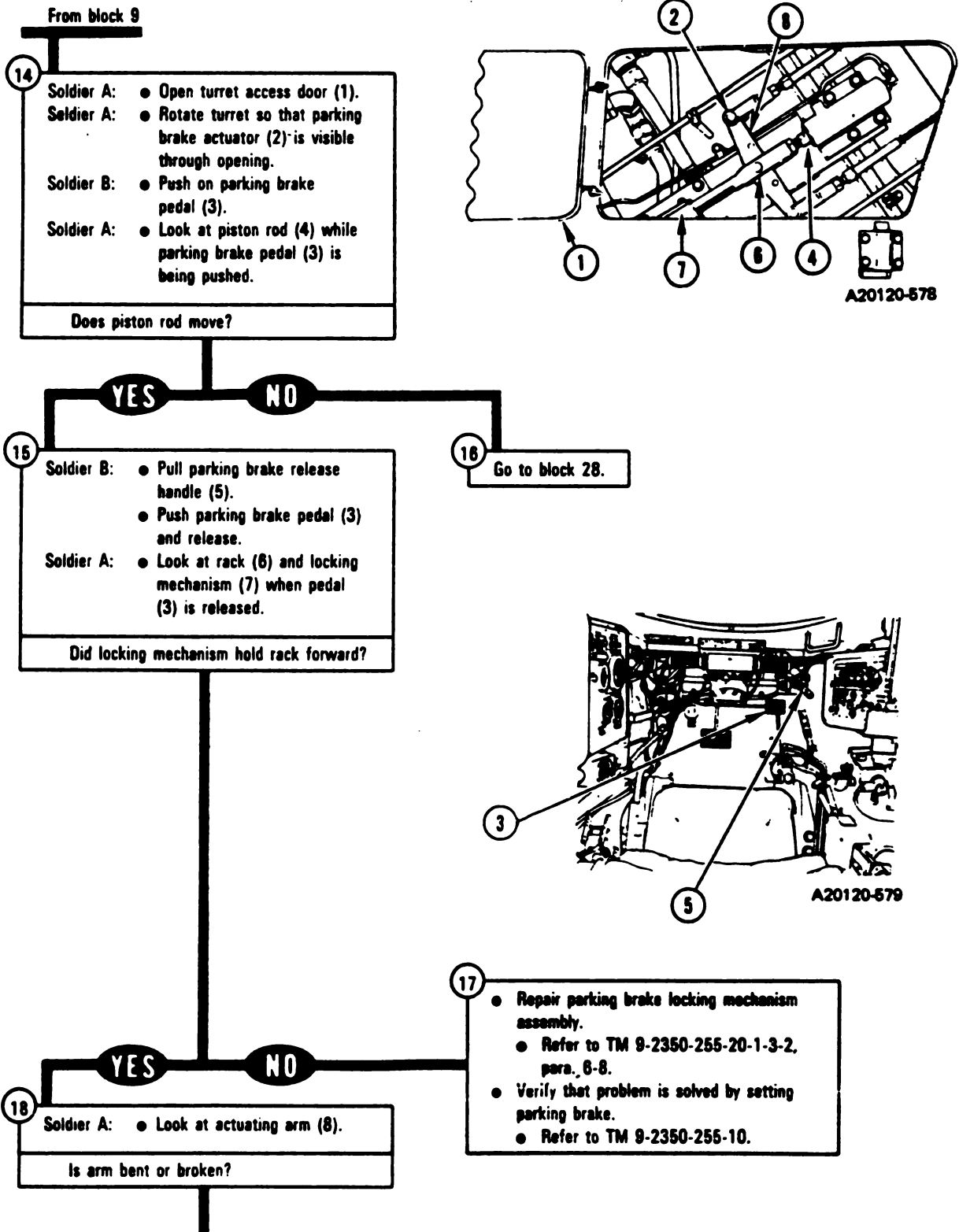
13

- Replace parking brake hydraulic valve.
- Refer to TM 9-2350-255-20-1-3-2, para. 6-6.
- Verify that problem is solved by setting parking brake.
- Refer to TM 9-2350-255-10.

**Figure 13-17 (Sheet 4 of 8)  
Volume II  
Para. 13-3**



**TM 9-2350-255-20-1-2-1  
BRAKE SYSTEM TROUBLESHOOTING**



*Figure 13-17 (Sheet 5 of 8)  
Volume II  
Para. 13-3*

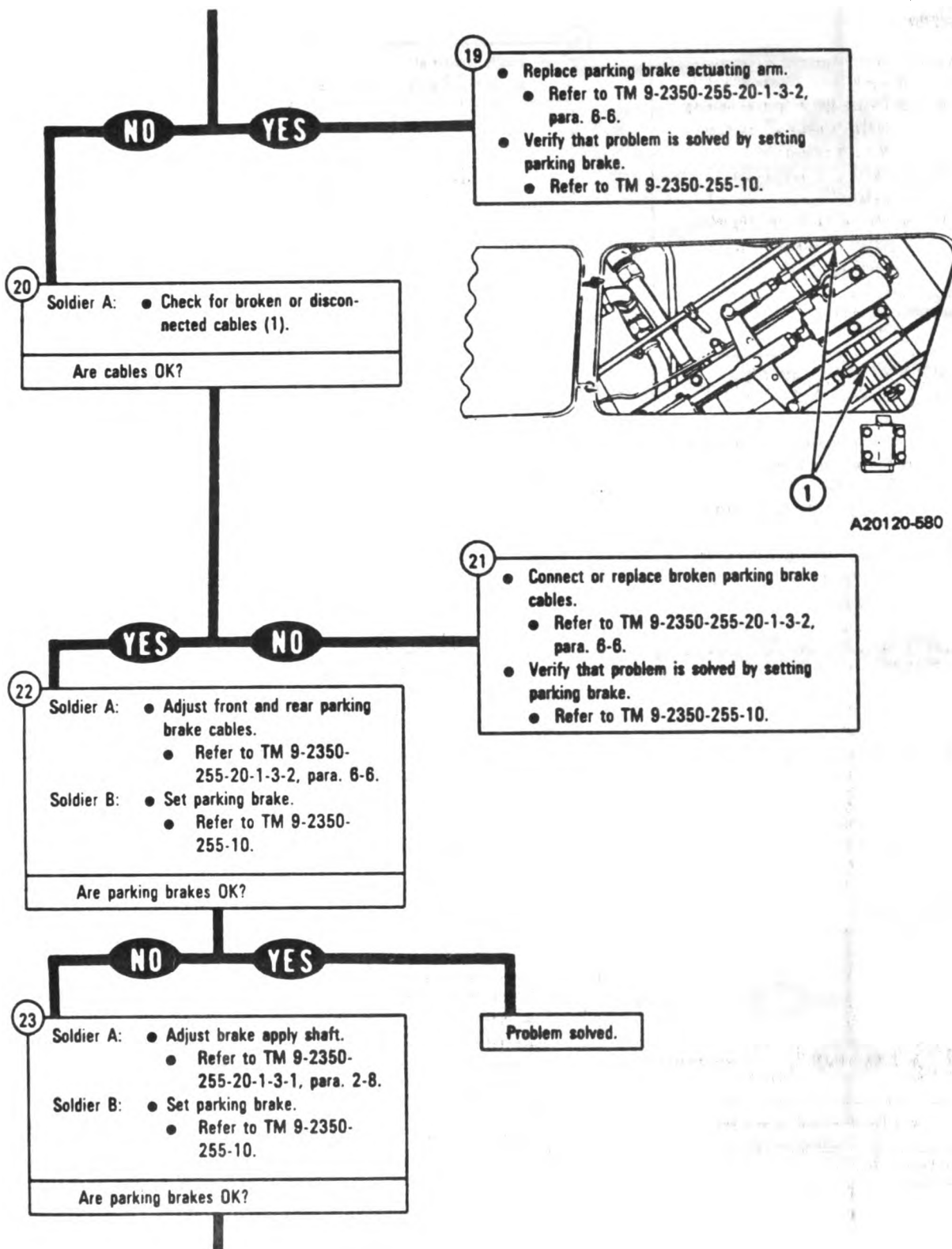
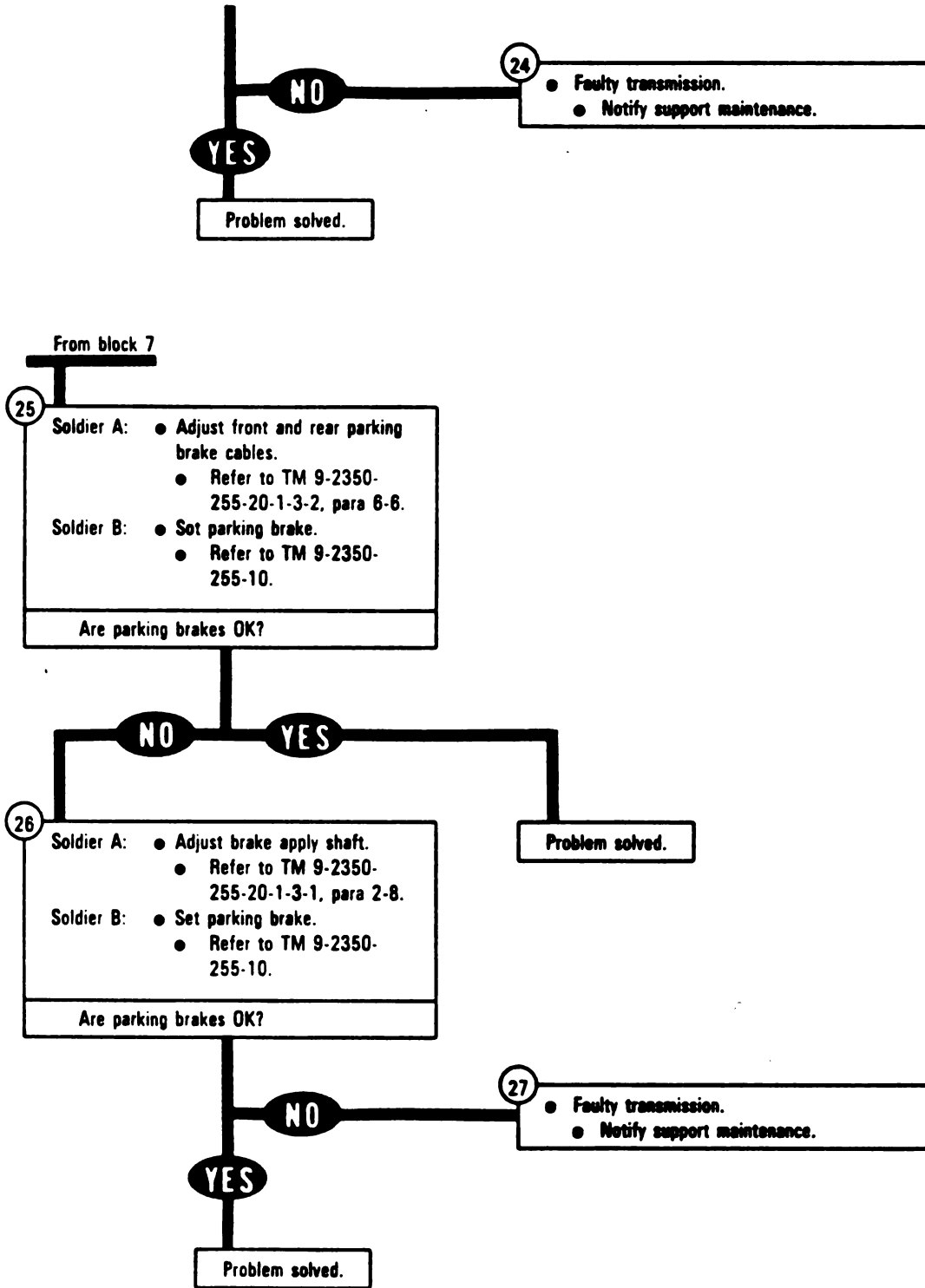


Figure 13-17 (Sheet 6 of 8)  
Volume II  
Para. 13-3

**TM 9-2350-255-20-1-2-1  
BRAKE SYSTEM TROUBLESHOOTING**



*Figure 13-17 (Sheet 7 of 8)  
Volume II  
Para. 13-3*

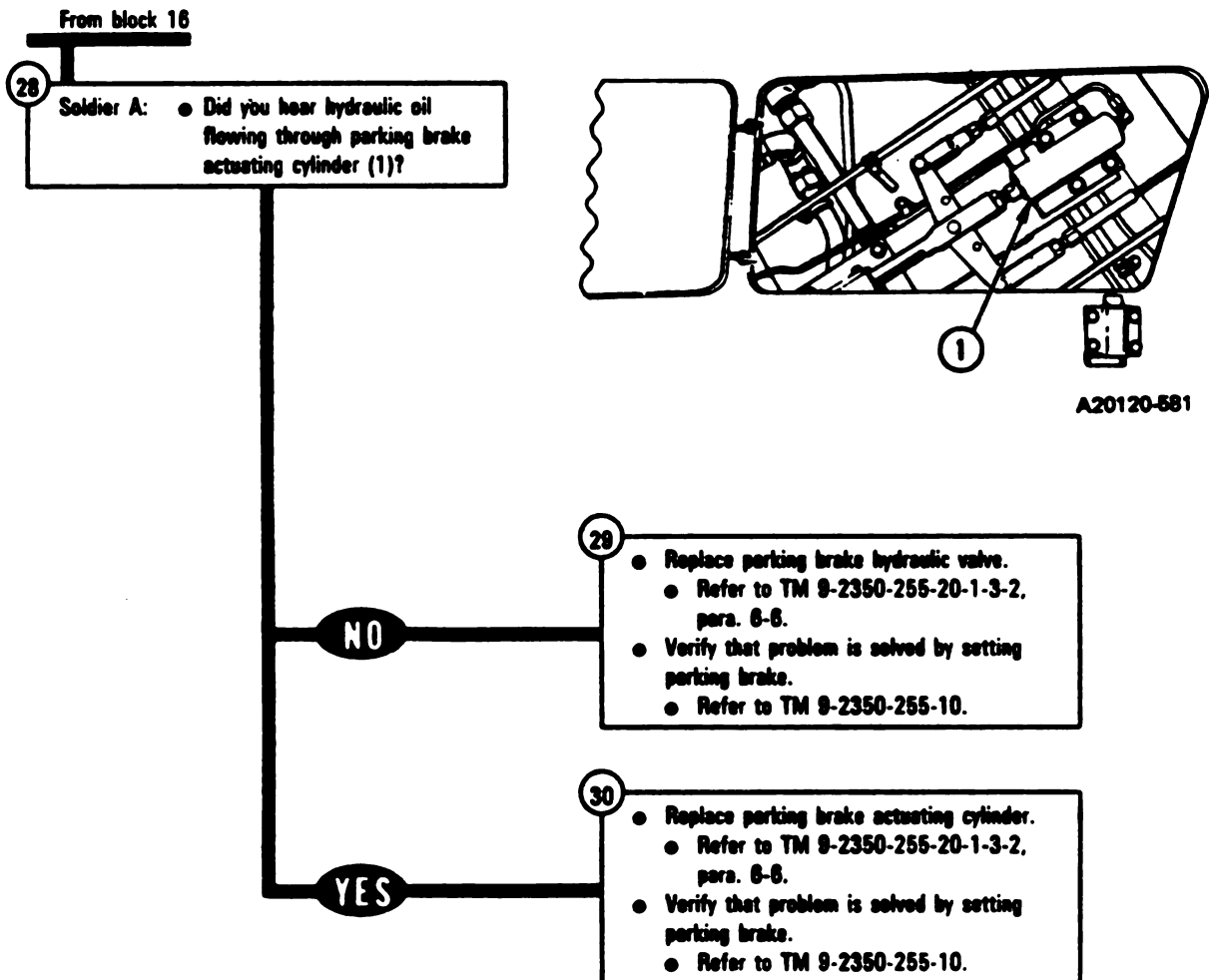


Figure 13-17 (Sheet 8 of 8)  
Volume II  
Para. 13-3

**SYMPTOM PBS-5**

**PARKING BRAKES DO NOT RELEASE**

**Common Tools:**

- Pliers, slip joint

**Test Equipment/Special Tools:**

None

**Equipment Condition:**

- Tank parked.
- Parking brake set.
- VEHICLE MASTER POWER switch set to OFF.
- Transmission shift control set to N.

**NOTE**

Frost may prevent cables from moving during extremely cold weather. Before doing the following troubleshooting procedures, wiggle all brake cables to make sure they are not stuck.

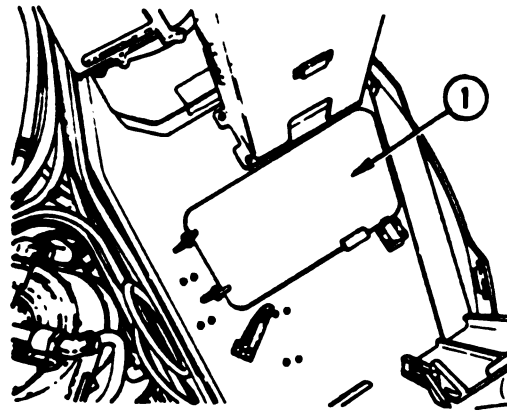
**NOTE**

This procedure is a two man job. The lead is referred to as SOLDIER A and shall direct the activity of the assistant. The assistant is referred to as SOLDIER B.

*Figure 13-18 (Sheet 1 of 4)  
Volume II  
Para. 13-3*

**TM 9-2350-255-20-1-2-1  
BRAKE SYSTEM TROUBLESHOOTING**

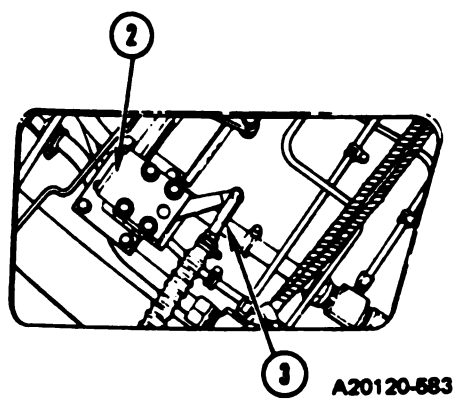
- Soldier A:**
- Open turret access door (1).
  - Rotate turret so that parking brake locking mechanism (2) is visible through opening.
  - Check parking brake release cable (3).



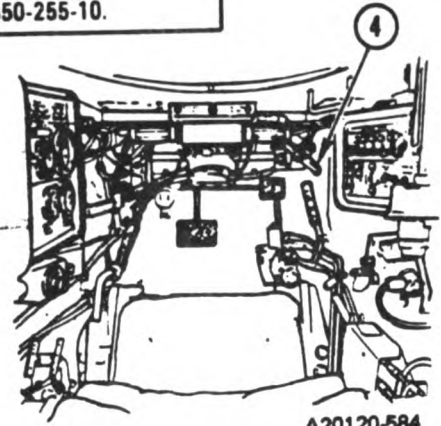
A20120-582

Is parking brake release cable broken?

- 2**
- Replace parking brake release cable assembly.
  - Refer to TM 9-2350-255-20-1-3-2, para. 6-8.
  - Verify that problem is solved by setting and releasing parking brake.
  - Refer to TM 9-2350-255-10.



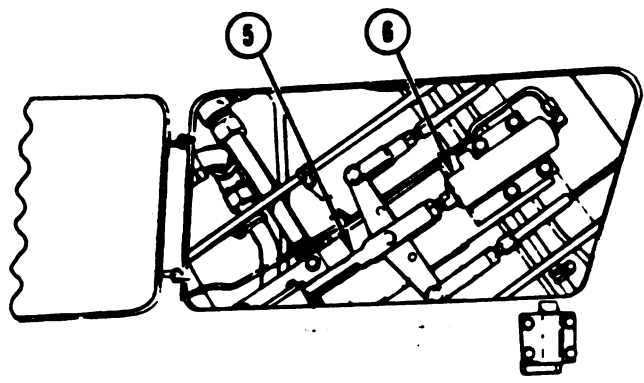
A20120-583



A20120-584

- 3**
- Soldier B:**
- Pull parking brake release handle (4).
- Soldier A:**
- Look at rack (5) move toward cylinder (6) while release handle (4) is being pulled.

Does pack move toward cylinder?



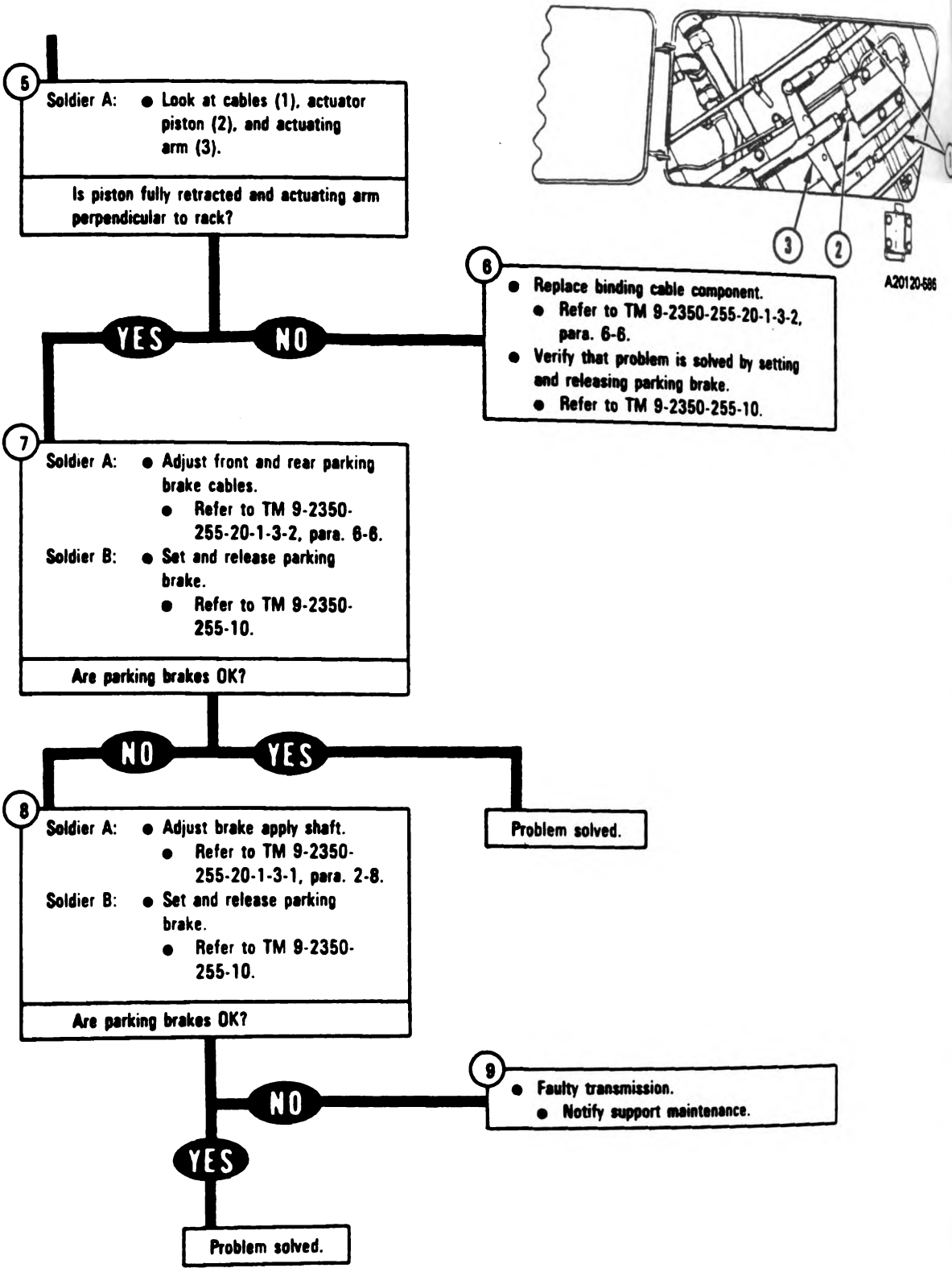
A20120-585

**YES**      **NO**

**4** Go to block 10.

*Figure 13-18 (Sheet 2 of 4)  
Volume II  
Para. 13-3*

**TM 9-2350-255-20-1-2-1  
BRAKE SYSTEM TROUBLESHOOTING**



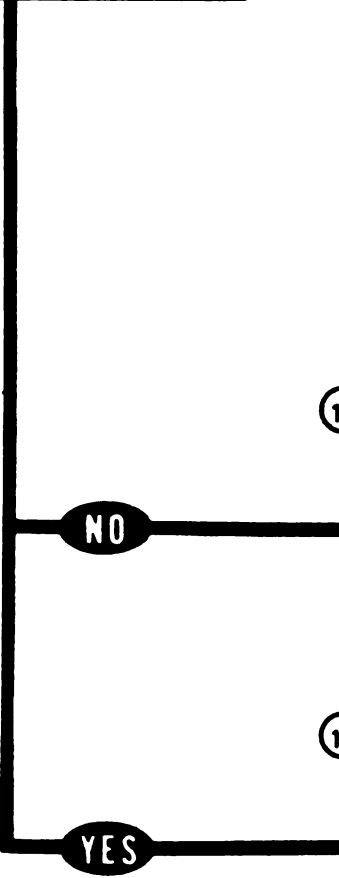
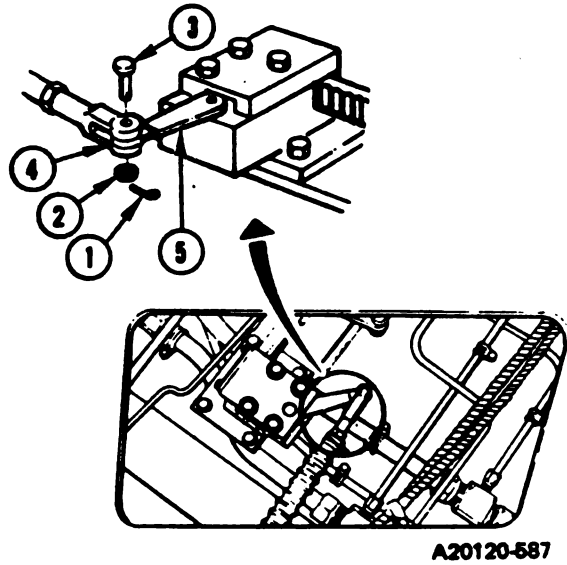
*Figure 13-18 (Sheet 3 of 4)  
Volume II  
Para. 13-3*

From block 4

10  
Soldier A:

- Remove cotter pin (1) with pliers.
- Remove washer (2) and pin (3) from clevis (4).
- Take off clevis (4) from arm (5).
- Move arm (5) toward front of tank.

Did rack move toward cylinder?



NO

11

- Repair parking brake locking mechanism assembly.
- Refer to TM 9-2350-255-20-1-3-2, para. 6-6.
- Verify that problem is solved by setting and releasing parking brake.
- Refer to TM 9-2350-255-10.

YES

12

- Replace parking brake release cable assembly.
- Refer to TM 9-2350-255-20-1-3-2, para. 6-6.
- Verify that problem is solved by setting and releasing parking brake.
- Refer to TM 9-2350-255-10.

Figure 13-18 (Sheet 4 of 4)  
Volume II  
Para. 13-3



13-4. Brake System Connector Inspection Procedure.

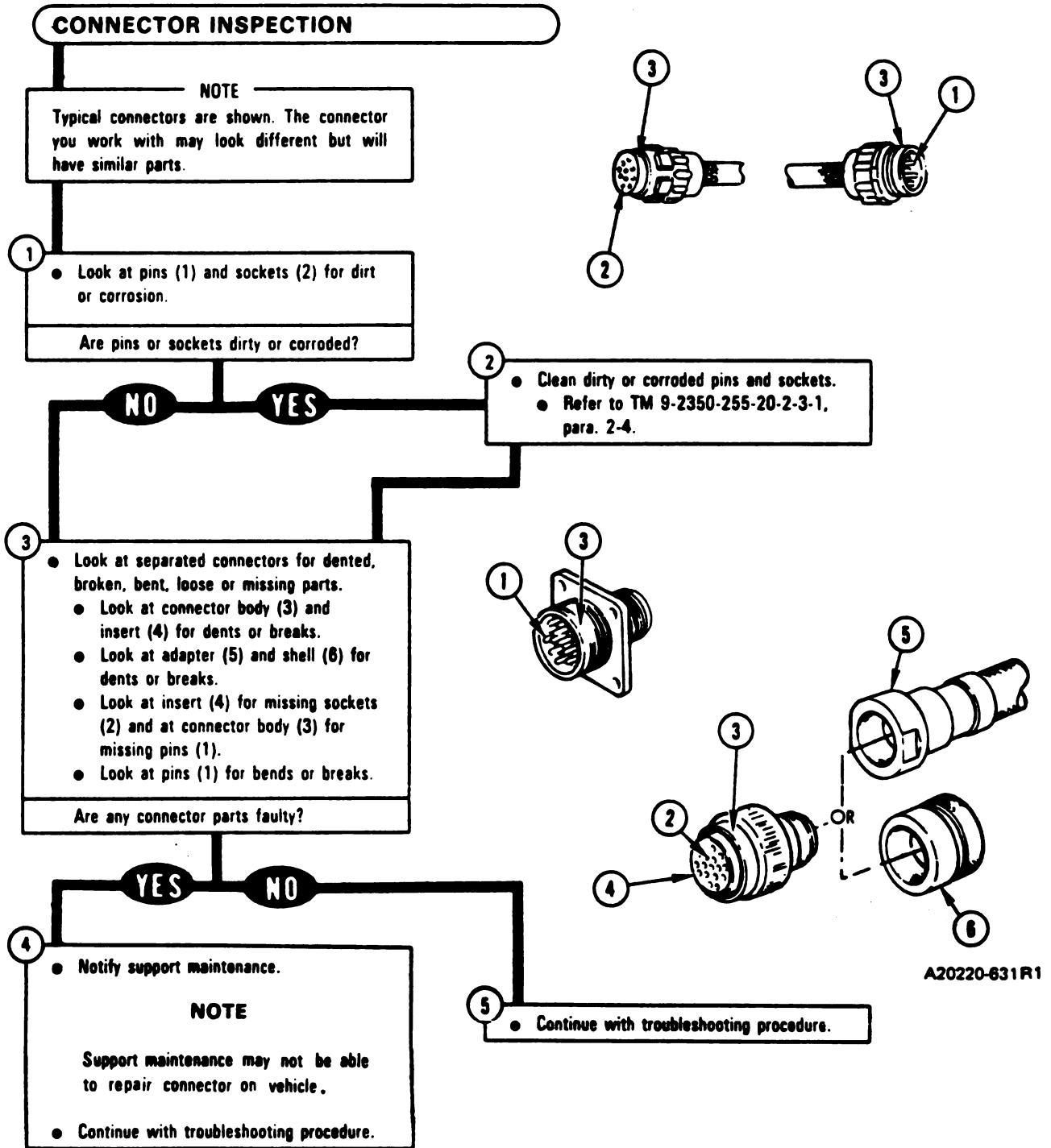


Figure 13-19  
Volume II  
Para. 13-4

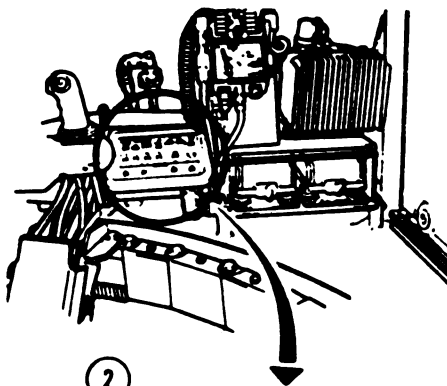
13-5. **Brake System Standard Initial Test Conditions.** This paragraph tells you what the test conditions of the tank should be before you begin troubleshooting. The conditions are listed in table 13-4. These conditions are referenced in each primary troubleshooting procedure where the STE/M1 test set is used. Initial test conditions are included for the gunner's, loader's, and driver's stations.

**Table 13-4. Brake System Standard Initial Test Conditions**

**COMMANDER'S STATION**

**Commander's Control Panel (1)**

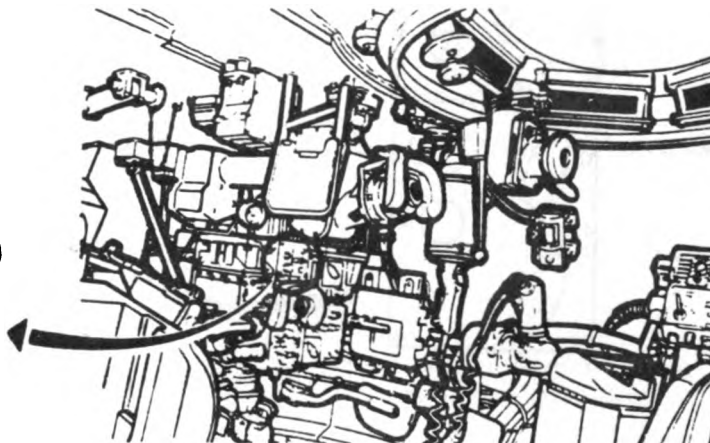
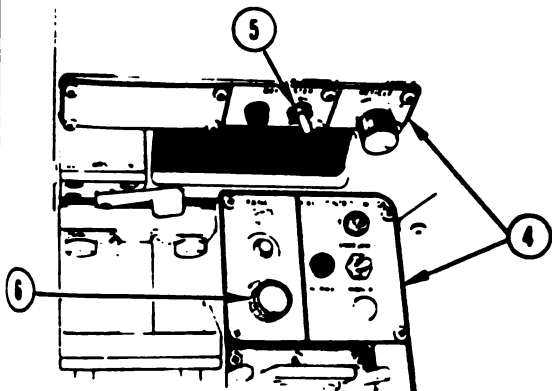
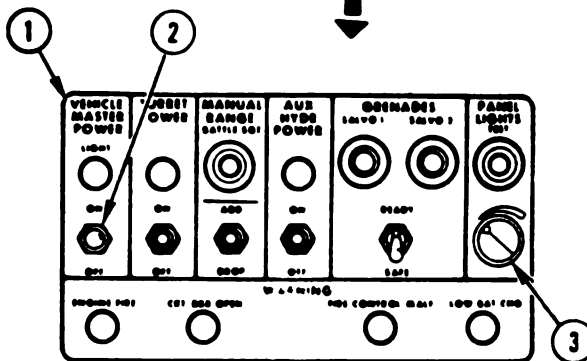
1. Set **VEHICLE MASTER POWER** switch (2) to OFF.
2. Set **PANEL LIGHTS** control (3) to maximum clockwise position.



**GUNNER'S STATION**

**Gunner's Primary Sight Control Panel (4)**

1. Set **DEFROSTER** switch (5) to OFF.
2. Set **PANEL LIGHTS** control (6) to maximum clockwise position.



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Table 13-4. Brake System Standard Initial Test Conditions (Continued)

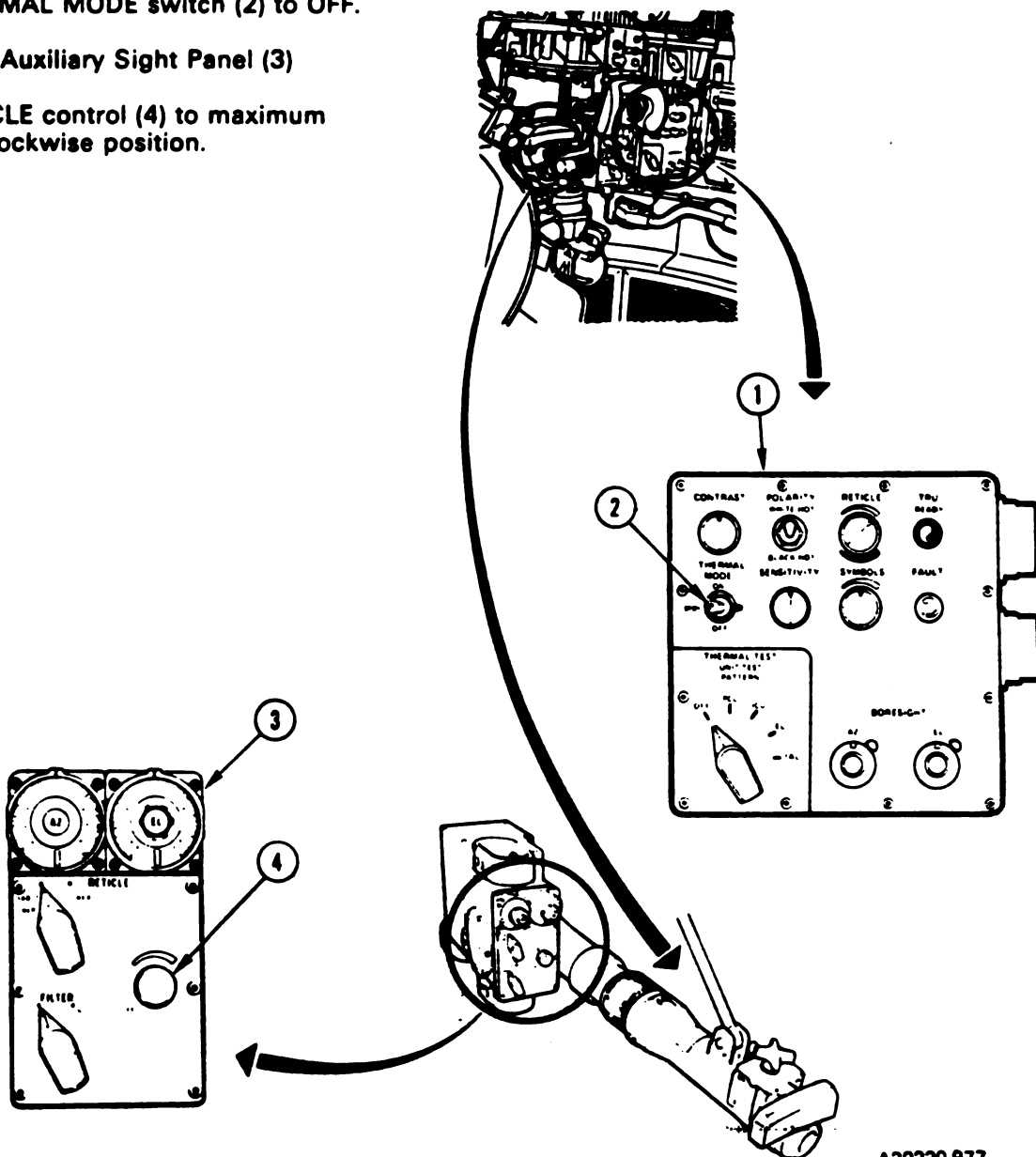
**GUNNER'S STATION (Continued)**

**C. Gunner's Image Control Unit (1)**

Set THERMAL MODE switch (2) to OFF.

**D. Gunner's Auxiliary Sight Panel (3)**

Set RETICLE control (4) to maximum counterclockwise position.



A20220-977

Table 13-4. Brake System Standard Initial Test Conditions (Continued)

OPERATOR'S STATION (Continued)

Computer Control Panel (1)

Power switch (2) to OFF.

Range Finder (3)

Range finder switch (4) to SAFE.

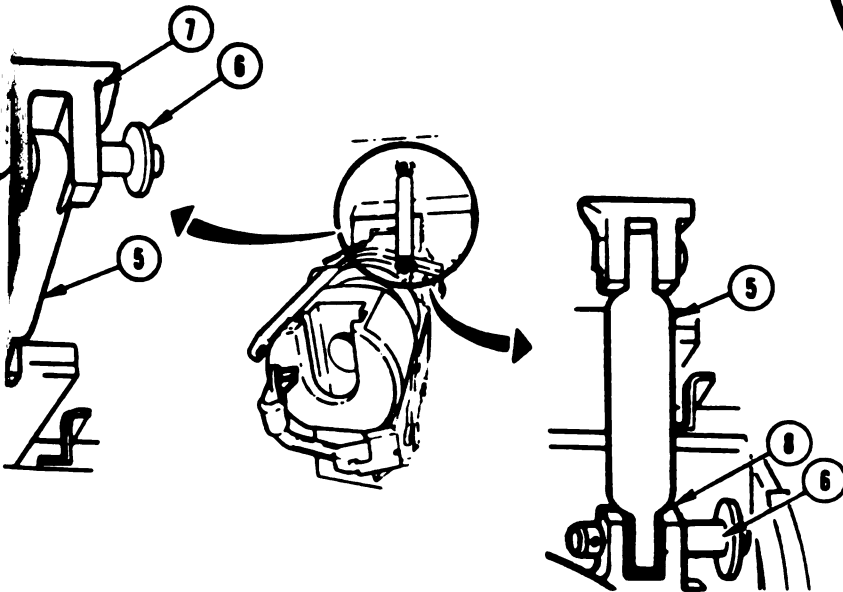
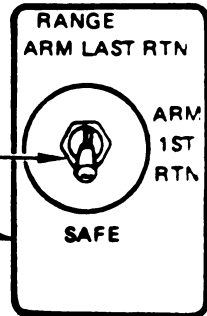
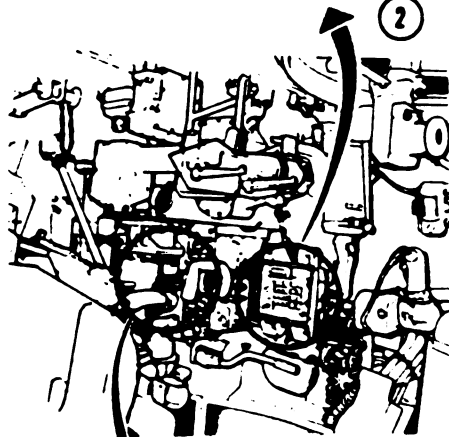
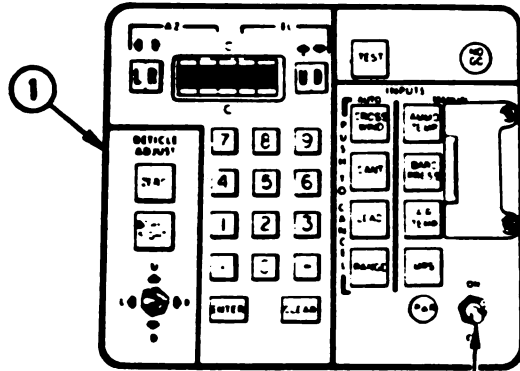
Engage Gun Elevation Travel Lock (5)

Release lock pin (6) from roof strut (7).

Swing main gun elevation travel lock (5) down into main gun strut (8) and engage lock pin (6).

NOTE

Gun may have to be raised or lowered to engage lock pin.



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Table 13-4. Brake System Standard Initial Test Conditions (Continued)

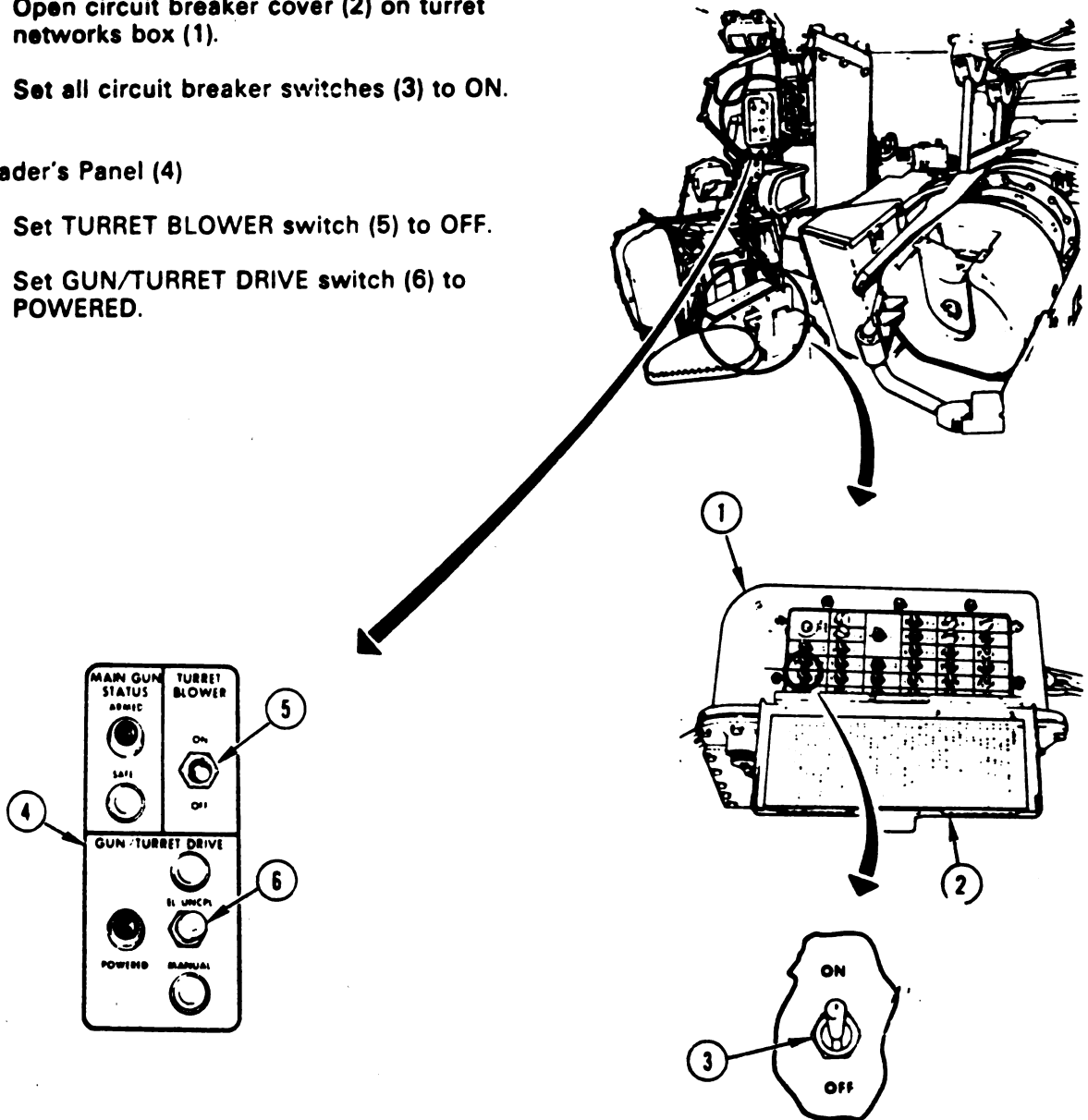
**LOADER'S STATION**

**H. Turret Networks Box (1)**

1. Open circuit breaker cover (2) on turret networks box (1).
2. Set all circuit breaker switches (3) to ON.

**I. Loader's Panel (4)**

1. Set TURRET BLOWER switch (5) to OFF.
2. Set GUN/TURRET DRIVE switch (6) to POWERED.



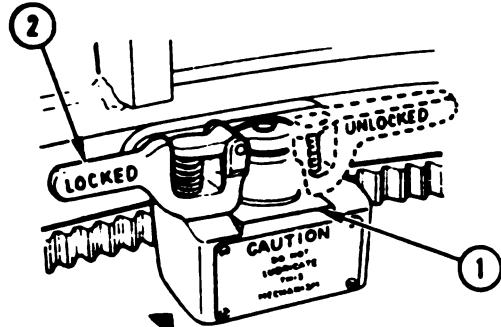
A20220-628R1

Table 13-4. Brake System Standard Initial Test Conditions (Continued)

DRIVER'S STATION (Continued)

Turret Traverse Lock (1)

Turn turret traverse lock handle (2) clockwise to LOCKED position.



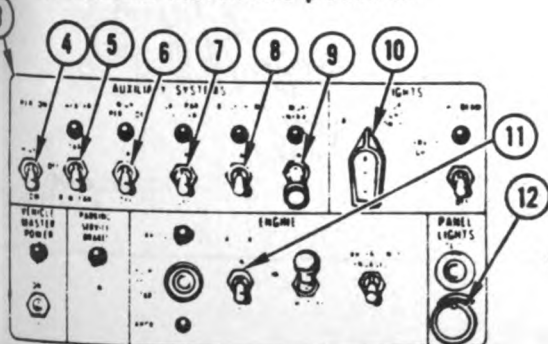
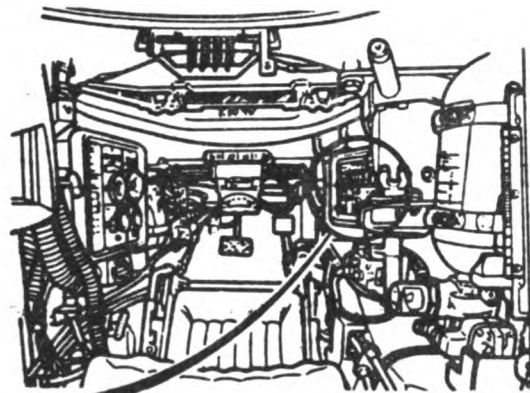
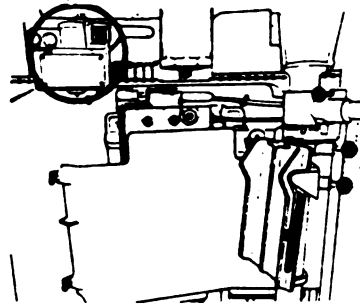
NOTE

Turret may have to be traversed slightly left or right for handle (2) to drop into detent position.

DRIVER'S STATION

Driver's Master Panel (3)

1. Set PERSONNEL HEATER switch (4) to LOW and switch (5) to OFF.
2. Set NIGHT PERISCOPE switch (6) to OFF.
3. Set GAS PARTIC FILTER switch (7) to OFF.
4. Set BILGE PUMP switch (8) to OFF.
5. Set SMOKE GENERATOR switch (9) to OFF.
6. Set LIGHTS switch (10) to OFF.
7. Set ENGINE TACTICAL IDLE switch (11) to OFF.
8. Set PANEL LIGHTS control (12) to maximum clockwise position.



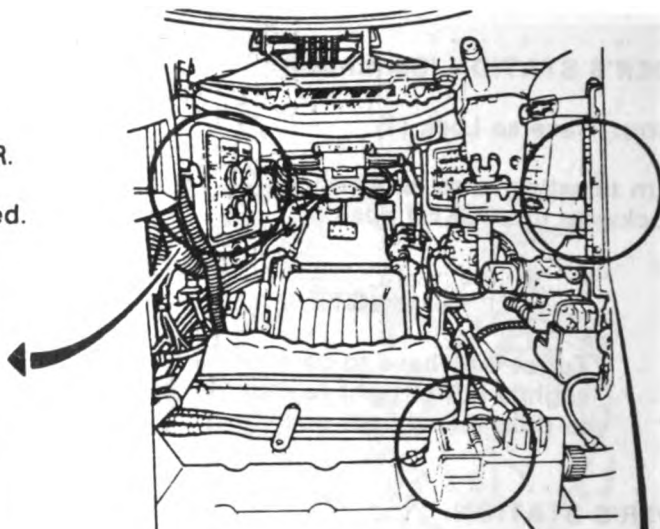
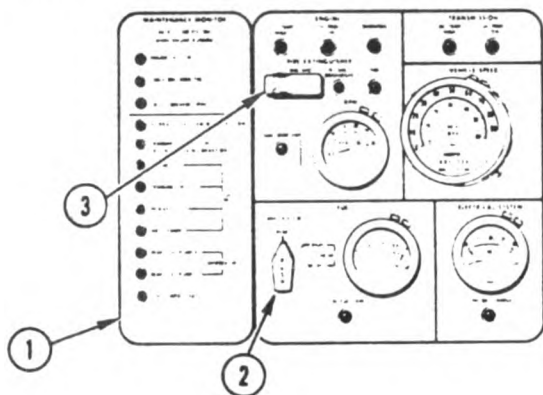
A20220-629R2

**Table 13-4. Brake System Standard Initial Test Conditions (Continued)**

**DRIVER'S STATION (Continued)**

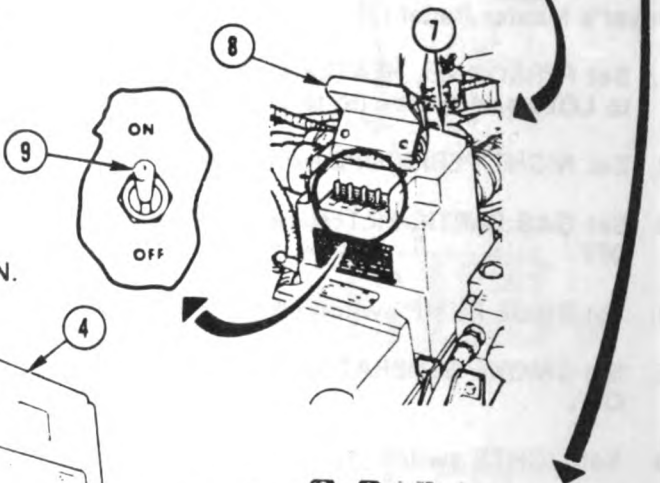
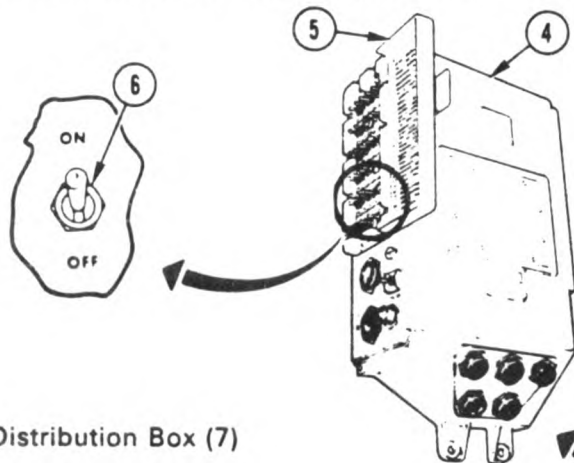
**L. Driver's Instrument Panel (1)**

1. Set TANK SELECTOR switch (2) to REAR.
2. Make sure 2ND SHOT guard (3) is closed.



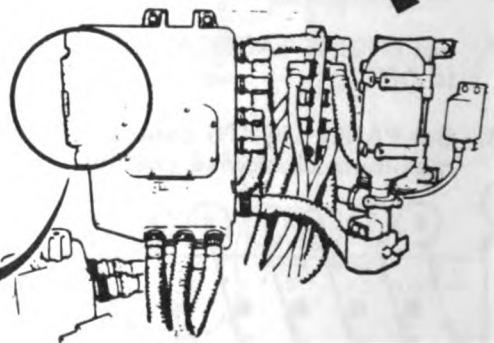
**M. Hull Networks Box (4)**

1. Open circuit breaker cover (5) on hull networks box (4).
2. Set all circuit breaker switches (6) to ON.



**N. Power Distribution Box (7)**

1. Open circuit breaker cover (8) on power distribution box (7).
2. Set all circuit breaker switches (9) to ON.



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Handwritten musical notation on a staff, including notes and clefs, visible along the left edge of the page.



