

Collating List of Pages

This reference drawing contains the collating sequence, page side, and EC level of pages for *IBM 3480 Magnetic Tape Subsystem Maintenance Information Manual (MI) Volume A03, SY32-5050-12*.

The part number of the divider tab list is 8673745.

This reference drawing is to be placed at the front of the manual.

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3480	PN 8673720	EC A57721	EC A57723	EC A57724		
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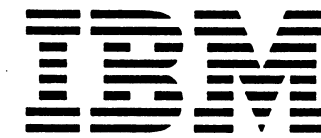
PUBLICATIONS REFERENCE DRAWING

MACHINE TYPE/MODEL NO. 3480

MACHINE NAME - Magnetic Tape Subsystem

FORM NO.	E C NO.	DESCRIPTION / COMMENTS
SY32-5050-0	991552	VOL. A03 - Maintenance Information
	336326	TNL SN32-0309 IEC 0011225741 (REA 12-25743) IEC 0021225741 (REA 12-25493)
SY32-5050-1	336389	Second Edition IEC 0011225996
SY32-5050-2	336390	Third Edition IEC 0011225997 IEC 0011215157
SY32-5050-3	336391	Fourth Edition REA 77-11223 IEC 0011215158 REA 12-11922 REA 12-15151 IEC 0011215159 IEC 0011225842 IEC 0011225843
SY32-5050-4	336392	Fifth Edition IEC 0011225998 IEC 0011228481
	336393	TNL SN32-5036
SY32-5050-5	336394	Sixth Edition
SY32-5050-6	336395	Seventh Edition IEC 0011225844
SY32-5050-7	336396	Eighth Edition IEC 0011222985
SY32-5050-8	A47957C	Ninth Edition
SY32-5050-9	A57693	Tenth Edition
SY32-5050-10	A57721	Eleventh Edition
SY32-5050-11	A57723	Twelfth Edition
SY32-5050-12	A57724	Thirteenth Edition

IBM				DATE	CHANGE NO	DATE	CHANGE NO	8673863 B
NAME	PUB REF DWG (PRD)			REL	See EC History			
				7/24/89	A57723			
DESIGN			SHT OF	5/11/90	A57724			
DETAIL								
CHECK			CLASSIFICATION	MUST CONFORM TO ENG SPEC		DEVELOPMENT NO		LOGIC PG NO
APPRO						RD003		



Maintenance Information

3480 S/N- MI Maintenance Information	3480 S/N- MI Maintenance Information	3480 S/N- MI Maintenance Information	3480 S/N- MI Maintenance Information	3480 S/N- MI Maintenance Information
GLOSS PLAN INTRO *START* CART PNEU MSG INST INSP INDEX	PWR SENSE PANEL MD LOC CARR-CU	CARR-DR	LGND SPROC SDISK DIAG DF OPER	FSI EAD
Vol A01	Vol A02	Vol A03	Vol A04	Vol A05

Maintenance Library
Maintenance Information
Logic Diagrams

Vols. A01 to A05
Vols. C01 and D01

3480 Magnetic Tape Subsystem

This manual contains maintenance information about the IBM 3480 Magnetic Tape Subsystem and is intended for customer engineers responsible for servicing the 3480 tape subsystem. This publication is designed to be used with the IBM Maintenance Device (MD). Therefore, CEs using this manual should be familiar with that tool.

Prerequisite Knowledge

It is assumed that you have a background in data processing concepts and that you are familiar with the hexadecimal numbering system, stored program concepts, and have a basic understanding of tape subsystems and their relationship to a processor I/O channel.

Related Publications

IBM System/360 and System/370 I/O Interface Channel to Control Unit Original Equipment Manufacturers' Information, GA22-6974.

IBM 3480 Magnetic Tape Subsystem Description, GA32-0042.

How to Update the Maintenance Information

This manual is form number controlled. The 3480 manuals will be updated by Technical Newsletters (TNLs). The TNL cover letter will indicate the new EC level. The entire manual will be updated by major revision. All updates are processed through normal MLC control. The Publications Reference Drawing (PRD) in the front of each volume contains the EC history.

How to Order This Manual

This manual or pages can be ordered from one of the following:

- United States
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Use the wiring Diagram/Logic Page Request form, Z150-0130. Be sure to include the form number of the manual when ordering the new manual or pages. Please write your telephone number on the form in case there are any questions regarding your order.

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1640
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GLOSS Glossary
PLAN Maintenance Plan
INTRO 3480 Introduction
START Start Maintenance
CART Cartridge Analysis
PNEU Pneumatic Analysis
MSG Console Messages and EREP
INST Installation/Removal
INSP Safety Check Procedures
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PWR Power Maps
SENSE Sense/Status
PANEL Panel
MD Maintenance Device
LOC Locations
CARR-CU Control Unit
Checks/Adjustments/Removal/Replacement

Volume A03

CARR-DR Drive Checks/Adjustments/Removal/Replacement

Volume A04

LGND Legend
SPROC Support Procedures
SDISK Support Diskette Procedures
DIAG Support Diagnostic Descriptions
DF Data Fields and Registers
OPER Theory of Operation

Volume A05

FSI Fault Symptom Index
EAD Error Analysis Diagrams



This directory lists all field-replaceable units (FRUs) for the 3480 Tape Subsystem, and includes all control unit and drive assembly FRUs.

To locate a specific FRU removal or replacement procedure, use the FRU number displayed on the maintenance device (MD) and perform the following:

1. Locate the FRU number in the FRU NUMBER column.
2. The VOLUME column indicates where the information for the FRU is located. Volume A02 contains the information for the control unit. Volume A03 contains the information for the drive. The name of the FRU is listed in the FRU NAME column.
3. Go to the page listed in the REMOVE column to perform the removal procedure.
4. Go to the page listed in the REPLACE column to perform the replacement procedure.

Control Unit cover removals and replacements are described on CARR-CU 2-1 through 2-4.

Drive cover removals and replacements are described on CARR-DR 2-1 through 2-6.

Plenum supply hose clamping procedures are described on CARR-DR 3-1.

Tape lifter solenoid response time checking procedures are described on CARR-DR 3-2.

Device interconnections checks are described on CARR-DR 3-3.

FRU NUMBER	VOLUME	FRU NAME	CU WITH BM6460460 DRIVE WITH BM 6460006		CU WITHOUT BM6460460 DRIVE WITHOUT BM6460006	
			REMOVE PAGE	REPLACE PAGE	REMOVE PAGE	REPLACE PAGE
FRU001	A03	Threader Assembly	10	10	10	10
FRU002	A03	Latch Solenoid	20	20	20	20
FRU003	A03	File Reel Motor	30	30	30	30
FRU004	A03	Machine Reel Motor and Hub Mount	40	40	40	40
FRU005	A03	Lower Flange	50	50	50	50
FRU006	A03	Tape Path Sensor A	60	60	60	60
FRU007	A03	Tape Path Sensor B	70	70	70	70
FRU008	A03	Cartridge Latch Assembly	80	80	80	80
FRU009	A03	File Protect Switch	90	90	90	90
FRU010	A03	Cartridge Present Sensor	100	100	100	100
FRU011	A03	Cartridge Latched Sensor	110	110	110	110
FRU012	A03	Decoupler Assembly	120	120	120	120
FRU013	A03	Head and Guide Assembly	130	130	130	130
FRU014	A03	Tension Transducer	140	140	140	140
FRU015	A02	A1V5-A2V3 Cable	150	150	150	150
FRU016	A03	Latch Spring	160	160	160	160
FRU017	A03	Plunger Spring	170	170	170	170
FRU018	A03	Compression Spring	180	180	180	180
FRU019	A03	Interlock Spring	190	190	190	190
FRU020	A03	Blower Assembly	200	200	205	205
FRU022	A02	Read Bus Cable - Local	150	150	150	150
FRU024 *	A02	Read Bus Cable - Remote	150	150	150	150
FRU025 *	A02	Read Bus Cable - Remote	150	150	150	150
FRU026 *	A02	Device Data Bus Cable - Remote	150	150	150	150
FRU027	A02	Device Data Bus Cable - Remote	150	150	150	150
FRU029	A02	Device Data Bus Cable - Local	150	150	150	150
FRU030	A03	Pump Motor	300	300	305	305
FRU031	A03	Regulator (60 Hz)	310	310	315	315
	A03	Regulator (50 Hz)	310	310	318	318
FRU032	A03	Output Filter (60 Hz)	320	320	325	325
	A03	Output Filter (50 Hz)	320	320	328	328
FRU033	A03	Inlet Filter	330	330	335	335
FRU034	A03	Pressure Hose Assembly (60 Hz)	340	340	345	345
	A03	Pressure Hose Assembly (50 Hz)	340	340	348	348
FRU035	A03	Vacuum Hose Assembly (60 Hz)	350	350	355	355
	A03	Vacuum Hose Assembly (50 Hz)	350	350	358	358
FRU036	A03	-5V dc Resistor Panel (60 Hz)	360	360	365	365
	A03	-5V dc Resistor Panel (50 Hz)	360	360	368	368
FRU037	A03	Manifold-In Pressure Hose (60 Hz)			370	370

FRU NUMBER	VOLUME	FRU NAME	CU WITH BM6460460 DRIVE WITH BM 6460006		CU WITHOUT BM6460460 DRIVE WITHOUT BM6460006	
			REMOVE PAGE	REPLACE PAGE	REMOVE PAGE	REPLACE PAGE
	A03	Manifold-In Pressure Hose (50 Hz)			378	378
FRU038	A03	Manifold-In Vacuum Hose (60 Hz)			380	380
	A03	Manifold-In Vacuum Hose (50 Hz)			388	388
FRU039	A03	Plenum Supply Hose	390	390	390	390
FRU040	A03	Pressure Sensor	400	400	400	400
FRU041	A03	Plenum Assembly, includes Pressure Sensor	410	410	410	410
FRU042	A03	Decoupler Pressure Hose	420	420	420	420
FRU043	A03	Decoupler Vacuum Hose	430	430	430	430
FRU044	A03	Right Guide Bearing Hose	440	440	440	440
FRU045	A03	Left Guide Bearing Hose	450	450	450	450
FRU046	A03	Tension Transducer Hose	460	460	460	460
FRU047	A03	Cleaner Supply Hose	470	470	470	470
FRU048	A02	Power Bus Cable	150	150	150	150
FRU049	A03	Logic Board to Power Amplifier J2 Cable	490	490	490	490
FRU054	A03	Upper Flange	540	540	540	540
FRU056 *	A02	Status Store Communication Cable - Dual CU	150	150	150	150
FRU058	A03	Logic Board (02A-A1)	580	580	580	580
FRU059	A03	Power Amplifier Board	590	590	590	590

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Remove/Replace Procedures by FRU Number

This directory lists all field-replaceable units (FRUs) for the 3480 Tape Subsystem, and includes all control unit and drive assembly FRUs.

To locate a specific FRU removal or replacement procedure, use the FRU number displayed on the maintenance device (MD) and perform the following:

1. Locate the FRU number in the FRU NUMBER column.
2. The VOLUME column indicates where the information for the FRU is located. Volume A02 contains the information for the control unit. Volume A03 contains the information for the drive. The name of the FRU is listed in the FRU NAME column.
3. Go to the page listed in the REMOVE column to perform the removal procedure.
4. Go to the page listed in the REPLACE column to perform the replacement procedure.

Control Unit cover removals and replacements are described on CARR-CU 2-1 through 2-4.

Drive cover removals and replacements are described on CARR-DR 2-1 through 2-6.

Plenum supply hose clamping procedures are described on CARR-DR 3-1.

Tape lifter solenoid response time checking procedures are described on CARR-DR 3-2.

Device interconnections checks are described on CARR-DR 3-3.

FRU NUMBER	VOLUME	FRU NAME	CU WITH BM6460460 DRIVE WITH BM 6460006		CU WITHOUT BM6460460 DRIVE WITHOUT BM6460006	
			REMOVE PAGE	REPLACE PAGE	REMOVE PAGE	REPLACE PAGE
FRU001	A03	Threader Assembly	10	10	10	10
FRU002	A03	Latch Solenoid	20	20	20	20
FRU003	A03	File Reel Motor	30	30	30	30
FRU004	A03	Machine Reel Motor and Hub Mount	40	40	40	40
FRU005	A03	Lower Flange	50	50	50	50
FRU006	A03	Tape Path Sensor A	60	60	60	60
FRU007	A03	Tape Path Sensor B	70	70	70	70
FRU008	A03	Cartridge Latch Assembly	80	80	80	80
FRU009	A03	File Protect Switch	90	90	90	90
FRU010	A03	Cartridge Present Sensor	100	100	100	100
FRU011	A03	Cartridge Latched Sensor	110	110	110	110
FRU012	A03	Decoupler Assembly	120	120	120	120
FRU013	A03	Head and Guide Assembly	130	130	130	130
FRU014	A03	Tension Transducer	140	140	140	140
FRU015	A02	A1V5-A2V3 Cable	150	150	150	150
FRU016	A03	Latch Spring	160	160	160	160
FRU017	A03	Plunger Spring	170	170	170	170
FRU018	A03	Compression Spring	180	180	180	180
FRU019	A03	Interlock Spring	190	190	190	190
FRU020	A03	Blower Assembly	200	200	205	205
FRU021	A03	Message Display LEDs (LEDs 1 through 8)	210	210	210	210
FRU022	A02	Read Bus Cable - Local	150	150	150	150
FRU024 *	A02	Read Bus Cable - Remote	150	150	150	150
FRU025 *	A02	Read Bus Cable - Remote	150	150	150	150

Remove/Replace Procedures by FRU Number CARR-DR 1-1

FRU NUMBER	VOLUME	FRU NAME	CU WITH BM6460460 DRIVE WITH BM 6460006		CU WITHOUT BM6460460 DRIVE WITHOUT BM6460006	
			REMOVE PAGE	REPLACE PAGE	REMOVE PAGE	REPLACE PAGE
FRU026 *	A02	Device Data Bus Cable - Remote	150	150	150	150
FRU027	A02	Device Data Bus Cable - Remote	150	150	150	150
FRU029	A02	Device Data Bus Cable - Local	150	150	150	150
FRU030	A03	Pump Motor	300	300	305	305
FRU031	A03	Regulator (60 Hz)	310	310	315	315
	A03	Regulator (50 Hz)	310	310	318	318
FRU032	A03	Output Filter (60 Hz)	320	320	325	325
	A03	Output Filter (50 Hz)	320	320	328	328
FRU033	A03	Inlet Filter	330	330	335	335
FRU034	A03	Pressure Hose Assembly (60 Hz)	340	340	345	345
	A03	Pressure Hose Assembly (50 Hz)	340	340	348	348
FRU035	A03	Vacuum Hose Assembly (60 Hz)	350	350	355	355
	A03	Vacuum Hose Assembly (50 Hz)	350	350	358	358
FRU036	A03	-5V dc Resistor Panel (60 Hz)	360	360	365	365
	A03	-5V dc Resistor Panel (50 Hz)	360	360	368	368
FRU037	A03	Manifold-In Pressure Hose (60 Hz)			370	370
	A03	Manifold-In Pressure Hose (50 Hz)			378	378
FRU038	A03	Manifold-In Vacuum Hose (60 Hz)			380	380
	A03	Manifold-In Vacuum Hose (50 Hz)			388	388
FRU039	A03	Plenum Supply Hose	390	390	390	390
FRU040	A03	Pressure Sensor	400	400	400	400
FRU041	A03	Plenum Assembly, includes Pressure Sensor	410	410	410	410
FRU042	A03	Decoupler Pressure Hose	420	420	420	420
FRU043	A03	Decoupler Vacuum Hose	430	430	430	430
FRU044	A03	Right Guide Bearing Hose	440	440	440	440
FRU045	A03	Left Guide Bearing Hose	450	450	450	450
FRU046	A03	Tension Transducer Hose	460	460	460	460
FRU047	A03	Cleaner Supply Hose	470	470	470	470
FRU048	A02	Power Bus Cable	150	150	150	150
FRU049	A03	Logic Board to Power Amplifier J2 Cable	490	490	490	490
FRU054	A03	Upper Flange	540	540	540	540
FRU056 *	A02	Status Store Communication Cable - Dual CU	150	150	150	150
FRU058	A03	Logic Board (02A-A1)	580	580	580	580
FRU059	A03	Power Amplifier Board	590	590	590	590

Remove/Replace Procedures by FRU Number

FRU NUMBER	VOLUME	FRU NAME	CU WITH BM6460460 DRIVE WITH BM 6460006		CU WITHOUT BM6460460 DRIVE WITHOUT BM6460006	
			REMOVE PAGE	REPLACE PAGE	REMOVE PAGE	REPLACE PAGE
FRU060	A03	Message Display Board	600	600	600	600
FRU061	A03	Machine Reel Hub	610	610	610	610
FRU062	A03	EC Sensitive (See CARR-DR 4)				
FRU063	A03	EC Sensitive (See CARR-DR 4)				
FRU064	A03	EC Sensitive (See CARR-DR 4)				
FRU065	A03	Pump to Output Filter Hose	650	650	655	655
FRU066	A03	Top Card Connector B2X			660	660
FRU067	A03	Top Card Connector C2X			660	660
FRU068	A03	Top Card Connector WBC			660	660
FRU069	A03	Top Card Connector YBCD			660	660
FRU070	A03	Top Card Connector ZBCD			660	660
FRU071	A03	Power Supply Blower (60 Hz)			710	710
	A03	Power Supply Blower (50 Hz)			718	718
FRU072	A03	AC CB to Power Supply Blower Cable	490	490	490	490
FRU073	A03	Logic Board to Power Amplifier J1 Cable	490	490	490	490
FRU074	A03	Tape Unit AC Power CB Cable	490	490	490	490
FRU075	A03	AC Power Supply Cable			750	750
FRU076	A03	AC Distribution Cable			765	765
FRU077	A03	Blower Assembly AC Power Cable (Tape Unit to both Drives)	490	490	490	490
FRU078	A03	Blower Assembly AC Power Cable	490	490	490	490
FRU079	A03	EC Sensitive (See CARR-DR 4)	790	790		
	A03	DC Power Distribution Cable (Drive External)			796	796
FRU080	A03	DC Power Distribution Cable	800	800		
FRU081	A03	Tachometer Sensor Cable	810	810	815	815
FRU082	A03	Thermal Switch	820	820	823	823
FRU083	A03	Thermal Switch Cable	830	830	833	833
FRU084	A02	Local/Remote Power Panel	840	840	840	840
FRU085	A03	EC Sensitive (See CARR-DR 4)				
FRU086	A02	IML Diskette Drive	860	860	860	860
FRU087	A03	Read Data Local Cable (02A-A1G2 to TU-D0/1-P1RA1) Internal	490	490	490	490
FRU088	A03	Read Bus Local Adapter Cable to TU-D1-P2A1	880	880	490	490
FRU089	A03	Read Adapter Local Cable from Tee to P1RA1	490	490	490	490
FRU090	A03	Message Display DC Power Cable	900	900	905	905
FRU091	A02	Power Bus Cable	150	150	150	150
FRU092	A03	Read Bus Remote Adapter to TU-D1-P2B1 Cable	880	880	490	490
FRU093	A03	Read Adapter Remote Cable from Tee to P1RB1	490	490	490	490

Remove/Replace Procedures by FRU Number CARR-DR 1-2

FRU NUMBER	VOLUME	FRU NAME	CU WITH BM6460460 DRIVE WITH BM 6460006		CU WITHOUT BM6460460 DRIVE WITHOUT BM6460006	
			REMOVE PAGE	REPLACE PAGE	REMOVE PAGE	REPLACE PAGE
FRU094	A03	Read Data Remote Cable (02A-A1G2 to TU-D0/1-P1B1)	490	490	490	490
FRU095	A03	DC Power Supply	950	950	955	955
FRU096	A03	Fuse F1 + 24V Drive 0 Fuse F2 + 24V Drive 1	960	960	960	960
FRU097	A02	Power Bus Cable	150	150	150	150
FRU098	A03	Fuse F3 + 15V Drive 0 Fuse F4 + 15V Drive 1	960	960	960	960
FRU099	A03	Fuse F5 -15V Drive 0 Fuse F6 -15V Drive 1	960	960	960	960
FRU100	A03	Fuse F7 + 8.5V Drive 0 Fuse F8 + 8.5V Drive 1	960	960	960	960
FRU101	A03	Fuse F9 -5V Drive 0 Fuse F10 -5V Drive 1	960	960	960	960
FRU102	A03	Fuse F11 + 5V Drive 0 Fuse F12 + 5V Drive 1	960	960	960	960
FRU103	A02	Power Bus Cable	150	150	150	150
FRU104	A03	Drive Power Switch	1040	1040	1045	1045
FRU105	A03	Online/Offline Switch (Drive)	1040	1040	1045	1045
FRU106	A03	Address Switch Cable to J4 (rear of deck)	490	490	490	490
FRU107	A03	Reset Switch	1040	1040	1045	1045
FRU108	A03	Drive Address Switch	1040	1040	1045	1045
FRU109	A03	Operator Panel Switch Board (contains Rewind Switch Unload Switch, and Ready/Not Ready Switch)	1090	1090	1090	1090
FRU110	A03	EC Sensitive (See CARR-DR 4)				
FRU111	A02	Read ECC/CORR Card 01A-A1R2	1110	1110	1110	1110
FRU112	A02	Buffer Storage Card 01A-A1N2	1110	1110	1110	1110
FRU113	A02	Buffer Storage Card 01A-A1M2	1110	1110	1110	1110
FRU114	A02	Buffer Control Card 01A-A1L2	1110	1110	1110	1110
FRU115	A02	Maintenance Adapter Card 01A-A1E2	1110	1110	1110	1110
FRU116	A02	Write Data Flow Card 01A-A1P2	1110	1110	1110	1110
FRU117	A02	Microprocessor Card 01A-A1D2	1110	1110	1110	1110
FRU118	A02	Drive Adapter Card 01A-A1Q2	1180	1180	1180	1180
FRU119	A02	Read Clock and Format Card 01A-A1S2	1110	1110	1110	1110
FRU120	A02	Buffer Adapter Card 01A-A1K2	1200	1200	1200	1200
FRU121	A02	Status Store Basic Card 01A-A1G2	1110	1110	1110	1110

Remove/Replace Procedures by FRU Number

FRU NUMBER	VOLUME	FRU NAME	CU WITH BM6460460 DRIVE WITH BM 6460006		CU WITHOUT BM6460460 DRIVE WITHOUT BM6460006	
			REMOVE PAGE	REPLACE PAGE	REMOVE PAGE	REPLACE PAGE
FRU122 *	A02	Status Store Communication Card 01A-A1F2	1110	1110	1110	1110
FRU123	A02	Read Skew Buffer Card 1 01A-A2K2	1110	1110	1110	1110
FRU124	A02	Read Skew Buffer Card 2 01A-A2L2	1110	1110	1110	1110
FRU125	A02	Read Skew Buffer Card 3 01A-A2M2	1110	1110	1110	1110
FRU126	A02	Power/POR Card 01A-A2H4	1260	1260	1260	1260
FRU127	A03	Latch Interlock	1270	1270	1270	1270
FRU128	A03	EC Sensitive (See CARR-DR 4)	640	640		
FRU129	A03	Physical Address Switch	1290	1290	1295	1295
FRU130	A02	EC Sensitive (See CARR-CU 4)	***	***	***	***
FRU131	A02	EC Sensitive (See CARR-CU 4)	***	***	***	***
FRU132	A02	EC Sensitive (See CARR-CU 4)	***	***	***	***
FRU133	A02	Channel Adapter Card (Channel A) 01A-A2C2	1110	1110	1110	1110
FRU134	A02	Control Store Card 01A-A1C2	1110	1110	1110	1110
FRU135	A02	Control Storage Array Card 01A-A1B2	1110	1110	1110	1110
FRU136	A02	Bus Shoe Card (Channel A) 01A-T1A1	1360	1360	1360	1360
FRU137	A02	Tag Shoe Card (Channel A) 01A-T1A3	1360	1360	1360	1360
FRU138	A02	V Regulator Card 01A-A1T2	1260	1260	1260	1260
FRU139	A02	Logic Board A1	1390	1390	1390	1390
FRU140	A02	Logic Board A2	1400	1400	1400	1400
FRU141	A02	Control Unit Switch Panel Card (includes Offline Indicator, IML Switch, Normal/Test Switch, CU0/CU1 Switch, Control Unit Online/Offline Switch) Enable/Disable Switch (A, B, C, D)	1410	1410	1410	1410
FRU142	A02	Control Unit Operator Panel Printed Circuit Board (includes Power On/Off Switch, and Power Indicator)	1420	1420	1420	1420
FRU143	A02	Thermal Switch (CU Gate) Lower	1430	1430	1430	1430
FRU144	A02	AC Power Supply	1440	1440	1440	1440
FRU145	A02	DC Power Supply	1450	1450	1450	1450
FRU146	A02	AC Fuse F1 + 24V	1460	1460	1460	1460
FRU147	A02	DC Fuse F1 + 8.5V	1470	1470	1470	1470
FRU148	A02	DC Fuse F2 + 24V	1470	1470	1470	1470
FRU149	A02	AC Line Cord	1490	1490	1490	1490
FRU150	A02	Blower Assembly 1	1500	1500	1500	1500
FRU151	A02	Blower Assembly 2	1500	1500	1500	1500
FRU152	A02	Channel Adapter Card (Channel B) 01A-A2D2	1110	1110	1110	1110

Remove/Replace Procedures by FRU Number CARR-DR 1-3

FRU NUMBER	VOLUME	FRU NAME	CU WITH BM6460460 DRIVE WITH BM 6460006		CU WITHOUT BM6460460 DRIVE WITHOUT BM6460006	
			REMOVE PAGE	REPLACE PAGE	REMOVE PAGE	REPLACE PAGE
FRU153	A02	Channel C, D Address Feature Cable	150	150	150	150
FRU154 **	A02	Channel Timeout Card 01A-A2G2	1110	1110	1110	1110
FRU155	A02	Thermal Switch Cable	150	150	150	150
FRU156	A02	Power Bus Cable	150	150	150	150
FRU157	A02	Top Card Connector WKL	1570	1570	1570	1570
FRU158	A02	Top Card Connector XKL	1570	1570	1570	1570
FRU159	A02	Top Card Connector YKL	1570	1570	1570	1570
FRU160	A02	DC Power Supply to Gate TB Cable	1600	1600	1600	1600
FRU161	A03	Cleaner Block	1610	1610	1610	1610
FRU162	A02	Service Switch	1620	1620	1620	1620
FRU163	A02	I/O Card DC Cable (Channel A)	150	150	150	150
FRU164	A02	GTE DC Distribution Cable Assembly	150	150	150	150
FRU165	A02	Gate Fan Cable	1650	1650	1650	1650
FRU166	A02	AC Power Supply to DC Power Supply Cable	150	150	150	150
FRU167	A02	Power Bus Cable	150	150	150	150
FRU168	A02	Control Unit Switch Panel to Gate Cable	150	150	150	150
FRU169	A02	A1Y1 to MD Connector Cable	150	150	150	150
FRU170	A02	I/O Tag Cable (Channel A)	150	150	150	150
FRU171	A02	I/O Bus Cable (Channel A)	150	150	150	150
FRU172	A02	I/O Tag/Bus Jumper Cable (Channel A)	150	150	150	150
FRU173	A02	Channel A, B Address Cable	150	150	150	150
FRU175	A02	Read Bus Cable - Single CU	150	150	150	150
FRU176	A02	CU AC Control Switch Panel Cable	150	150	150	150
FRU177	A02	AC Power to Gate Cable	1770	1770	1770	1770
FRU178	A02	A1S2W to A2V2 Cable	150	150	150	150
FRU179	A02	Power Bus Cable	150	150	150	150
FRU180	A02	Top Card Connector ZCD	1570	1570	1570	1570
FRU181	A02	Top Card Connector P2Y	1570	1570	1570	1570
FRU182	A02	Top Card Connector WE	1570	1570	1570	1570
FRU183	A02	Top Card Connector WCD	1570	1570	1570	1570
FRU184	A02	Top Card Connector ZPQ	1570	1570	1570	1570
FRU185	A02	Top Card Connector XRS	1570	1570	1570	1570
FRU186	A02	Top Card Connector YRS	1570	1570	1570	1570

Remove/Replace Procedures by FRU Number

FRU NUMBER	VOLUME	FRU NAME	CU WITH BM6460460 DRIVE WITH BM 6460006		CU WITHOUT BM6460460 DRIVE WITHOUT BM6460006	
			REMOVE PAGE	REPLACE PAGE	REMOVE PAGE	REPLACE PAGE
FRU187	A02	Top Card Connector ZFG	1570	1570	1570	1570
FRU188	A02	Top Card Connector ZKL	1570	1570	1570	1570
FRU189	A02	Top Card Connector WFG	1570	1570	1570	1570
FRU190	A02	Top Card Connector XFG	1570	1570	1570	1570
FRU191	A02	Top Card Connector YFG	1570	1570	1570	1570
FRU192	A02	Top Card Connector XCDE	1570	1570	1570	1570
FRU193	A02	Top Card Connector YCDE	1570	1570	1570	1570
FRU194	A02	IML Diskette Drive Cable (Drive to 01A-A1A3)	150	150	150	150
FRU195	A02	Channel Adapter Card (Channel C) 01A-A2E2	1110	1110	1110	1110
FRU196	A02	Channel Adapter Card (Channel D) 01A-A2F2	1110	1110	1110	1110
FRU197	A02	Channel Address Switch (Channel A, Channel B, Channel C, or Channel D)	1970	1970	1970	1970
FRU198	A02	UEPO Switch	1980	1980	1980	1980
FRU199	A02	Write Bus Terminator CU0 (Local)	1995	1995	1990	1990
FRU200	A03	Write Adapter B Cable (CU to Drive 0 P1WB1)	490	490	490	490
FRU201	A03	Write Adapter B Cable (Drive 0 P1WB2 to Drive 1 P1WB1)	490	490	490	490
FRU202	A03	Write Adapter B Cable (TU-D1-P1WB2 to TU-D1-P2B2)	490	490	490	490
FRU203	A03	Write Adapter B Cable (A1A4 to P1WB1)	490	490	490	490
FRU204	A03	Write Adapter B Cable (A1A5 to P1WB2)	490	490	490	490
FRU205	A03	Write Adapter A Cable (CU to Drive 0 P1WA1)	490	490	490	490
FRU206	A03	Write Adapter A Cable (Drive 0 P1WA2 to Drive 1 P1WA1)	490	490	490	490
FRU207	A03	Write Adapter A Cable (TU-D1-P1WA2 to TU-D1-P2A2)	490	490	490	490
FRU208	A03	Write Adapter A Cable (A1A2 to P1WA1)	490	490	490	490
FRU209	A03	Write Adapter A Cable (A1A3 to P1WA2)	490	490	490	490
FRU210	A03	Message Display Cable	490	490	490	490
FRU211	A03	Message Display Cable	2110	2110	2115	2115
FRU212	A03	Vacuum Supply Hose	2120	2120	2120	2120
FRU213	A03	Message Display Board to Message Display Switch Board Cable	2130	2130	2130	2130
FRU214	A02	I/O Tag Cable (Channel B)	150	150	150	150
FRU215	A03	Tape Lifter Solenoid Input Hose	2150	2150	2150	2150
FRU216	A03	Tape Lifter Solenoid	2160	2160	2160	2160
FRU217	A02	A2Z2 to Gate TB2 Cable	150	150	150	150
FRU218	A03	AC Power Circuit Breaker	2180	2180	2185	2185

Remove/Replace Procedures by FRU Number CARR-DR 1-4

FRU NUMBER	VOLUME	FRU NAME	CU WITH BM6460460 DRIVE WITH BM 6460006		CU WITHOUT BM6460460 DRIVE WITHOUT BM6460006	
			REMOVE PAGE	REPLACE PAGE	REMOVE PAGE	REPLACE PAGE
FRU219	A03	Vacuum Distribution Tee	2190	2190	2190	2190
FRU220	A02	I/O Tag Cable (Channel C)	150	150	150	150
FRU221	A02	I/O Tag Cable (Channel D)	150	150	150	150
FRU223	A03	Convuluted Bellows	2230	2230		
FRU224	A02	Thermal Switch (CU Gate) Upper	2240	2240	2240	2240
FRU225	A03	Machine Reel Tach Sensor A	2250	2250	2250	2250
FRU226	A03	Machine Reel Tach Sensor B	2260	2260	2260	2260
FRU227	A03	Machine Reel Tape Guide	2270	2270	2270	2270
FRU228	A03	Head Tape Guide (Left)	2280	2280	2280	2280
FRU229	A03	Head Tape Guide (Right)	2290	2290	2290	2290
FRU230	A03	Tension Transducer Tape Guide	2300	2300	2300	2300
FRU231	A03	Center Tape Guide	2310	2310	2310	2310
FRU232	A03	Cartridge	2320	2320	2320	2320
FRU233	A02	Bus Shoe Card (Channel B) 01A-T1B1	1360	1360	1360	1360
FRU234	A02	Tag Shoe Card (Channel B) 01A-T1B3	1360	1360	1360	1360
FRU235	A02	Bus Shoe Card (Channel C) 01A-T1C1	1360	1360	1360	1360
FRU236	A02	Tag Shoe Card (Channel C) 01A-T1C3	1360	1360	1360	1360
FRU237	A02	Bus Shoe Card (Channel D) 01A-T1D1	1360	1360	1360	1360
FRU238	A02	Tag Shoe Card (Channel D) 01A-T1D3	1360	1360	1360	1365
FRU239	A02	I/O Card DC Cable (Channel B)	150	150	150	150
FRU240	A02	I/O Card DC Cable (Channel C)	150	150	150	150
FRU241	A02	I/O Card DC Cable (Channel D)	150	150	150	150
FRU242	A02	I/O Bus Cable (Channel B)	150	150	150	150
FRU243	A02	I/O Tag Bus Jumper Cable (Channel B)	150	150	150	150
FRU244	A02	I/O Bus Cable (Channel C)	150	150	150	150
FRU245	A02	I/O Tag Bus Jumper Cable (Channel C)	150	150	150	150
FRU246	A02	I/O Bus Cable (Channel D)	150	150	150	150
FRU247	A02	I/O Tag Bus Jumper Cable (Channel D)	150	150	150	150
FRU248	A02	Write Bus Terminator CU0 (Remote)	1990	1990	1990	1990
FRU249	A02	A1Z1-A2Y1 Cable	150	150	150	150

Remove/Replace Procedures by FRU Number

FRU NUMBER	VOLUME	FRU NAME	DRIVE WITH BM 6460006		DRIVE WITHOUT BM 6460006	
			REMOVE PAGE	REPLACE PAGE	REMOVE PAGE	REPLACE PAGE
FRU258	A02	IML Diskette	2580	2580	2580	2580
FRU260	A02	CU to CU Read Cable - Remote	150	150	150	150
FRU261	A02	CU to CU Write Cable - Remote	150	150	150	150
FRU262	A03	Air Pressure Test Port Hose Assembly	2620	2620		
FRU263	A03	Vacuum Test Port Hose Assembly	2630	2630		
FRU264	A02	Write Bus Terminator CU1 (Local)	1990	1990	1990	1990
FRU265	A02	Write Bus Terminator CU1 (Remote)	1990	1990	1990	1990
FRU267	A03	Top Card Connector B2X	660	660		
FRU268	A03	Top Card Connector B2Y	660	660		
FRU270	A03	Interposer Signal Cable 02A-A1Y3 to P1-J2	490	490	490	490
FRU271	A02	I/O Bus Tag Interposer Cable	150	150	150	150
FRU277	A03	Head Compliant Guide	2770	2770	2770	2770
FRU280	A03	Fuse 13 +5 V DC Drive 0, Fuse 14 +5 V DC Drive 1	960	960		
FRU281	A03	Loader Control Card	2810	2810	2810	2810
FRU282	A03	Load Assembly	2820	2820	2820	2820
FRU283	A03	Load Motor	2830	2830	2830	2830
FRU284	A03	Load Motor Complete Sensor	2840	2840	2840	2840
FRU285	A03	Loader Mechanical Assembly	2850	2850	2850	2850
FRU286	A03	Loader Signal Cable	2860	2860	2860	2860
FRU287	A03	Loader Power Cable	2860	2860	2860	2860
FRU288	A03	Loader Fuse +24 V DC	2880	2880	2880	2880
FRU289	A03	Stack Low Position Sensor	2890	2890	2890	2890
FRU290	A03	Input Stack Assembly	2900	2900	2900	2900
FRU291	A03	Cartridge In Stack Sensor	2910	2910	2910	2910
FRU292	A03	Cartridge Staged Sensor	2920	2920	2920	2920
FRU293	A03	Left Input Rail Assembly	2930	2930	2930	2930
FRU294	A03	Right Input Rail Assembly	2940	2940	2940	2940
FRU295	A03	Feed Assembly	2950	2950	2950	2950
FRU296	A03	Stack Up Position Sensor	2960	2960	2960	2960
FRU297	A03	Output Stack Assembly	2970	2970	2970	2970
FRU298	A03	Loader Operator Panel	2980	2980	2980	2980
FRU299	A03	Loader Fuse +5 V DC	2880	2880	2880	2880
FRU300	A03	Feed Assembly Motor	3000	3000	3000	3000

FRU Listing by Alphabetical Sequence

FRU Name	FRU No.	Page
AC		
Circuit Breaker	218	2180
Distribution Cable	76	765
Power Supply Cable	75	750
Air Pressure Test Port Assembly	262	2620
Blower - Tape Unit	020	200
Blower - Power Supply (60 Hz)	071	710
Blower - Power Supply (50 Hz)	071	718
BOARD		
Drive Op Panel Switch	109	1090
Drive Logic	058	580
Message Display	060	600
Power Amplifier	059	590
CABLE		
AC Distribution	076	765
AC Power Circuit Breaker	074	490
AC Power to Blower Asm	077	490
AC Power Supply	075	750
Address Switch	106	490
Blower Assembly AC Power	078	490
DC Distribution (Drive, External)	079	790
DC Distribution (Drive, Internal) (EC Sensitive)	079	4
DC Power Distribution	080	490
Interposer Cable and Connector (EC Sensitive)	269	4
Interposer Signal Cable 02A-A1Y3 to P1-J2	270	490
Loader Signal	286	2860
Loader Power	287	2860
Logic Board to Pwr Amp J1 Connector	073	490
Logic Board to Pwr Amp J2 Connector	049	490
Message Display	210	490
Message Display	211	2110
Message Display Power	090	900
Msg Display Bd to Msg Sw Bd	213	2130
Read Adapter A	089	490
Read Adapter B	093	490
Read Bus A Adapter	088	490
Read Bus B Adapter	092	490
Read Data A (Internal)	087	490
Read Data B (Internal)	094	490
Tachometer Sensor	081	810
Thermal Switch - Tape Unit	083	830
Write Adapter A	207	490
Write Adapter A	208	490
Write Adapter A	209	490
Write Adapter A (CU to DR 0)	205	490
Write Adapter A (DR 0 to DR1)	206	490
Write Adapter B	202	490
Write Adapter B	203	490
Write Adapter A	204	490
Write Adapter A (CU to DR 0)	200	490
Write Adapter A (DR 0 to DR 1)	201	490
CARD		
Drive Control (EC Sensitive)	085	4
Drive Power Preload (EC Sensitive)	128	4
Drive Pre-Amp (EC Sensitive)	062	4
Loader Control	281	2810
Write Driver (EC Sensitive)	063	4
Write Power (A1G2)	064	640
CARTRIDGE		
Cartridge	232	2320
Latch Assembly	008	80
Latch Sensor	011	110
Latch Solenoid	002	20
Latch Spring	016	160
Present Sensor	010	100
Convoluted Bellows	223	2230
Circuit Breaker - AC	218	2180
Cleaner Block Assembly	161	1610
Cleaner Vacuum Hose	047	470

FRU Name	FRU No.	Page
DC		
Power Supply	095	950
Dist Cable (Drive External)	079	790
Distribution Cable (Drive Internal)	079	790
Fuses, Power Supply	096	960
Power Distribution Cable	080	490
DECOUPLER		
Assembly	012	120
Pressure Hose	042	420
Vacuum Hose	043	430
DRIVE		
DC Power Supply	095	950
Fuse F1 and F2 + 24V dc	096	960
Fuse F3 and F4 + 15V dc	098	960
Fuse F5 and F6 -15V dc	099	960
Fuse F7 and F8 + 8.5V dc	100	960
Fuse F9 and F10 -5V dc	101	960
Fuse F11 and F12 + 5V dc	102	960
Loader Fuse + 24V dc	288	2880
Power On/Off Switch	104	1040
Thermal Switch (EC Sensitive)	110	4
External Load Resistor Panel	036	360
Feed Assembly	295	2950
Feed Assembly Motor	300	3000
File Protect Switch	009	90
File Reel Motor	003	30
Filter, Drive Inlet	033	330
Filter, Drive Outlet	032	320
Flange, Machine Reel - Lower	005	50
Flange, Machine Reel - Upper	054	540
FUSE		
Loader Fuse + 24V dc	288	2880
Loader Fuse + 5V dc	299	2880
F1 and F2 + 24 V dc - Tape Unit	096	960
F3 and F4 + 15 V dc - Tape Unit	098	960
F5 and F6 -15 V dc - Tape Unit	099	960
F7 and F8 + 8.5 V dc - Tape Unit	100	960
F9 and F10 -5 V dc - Tape Unit	101	960
F11 and F12 + 5 V dc - Tape Unit	102	960
F13 and F14 + 5V dc - Tape Unit	280	960
HEAD		
Compliant Guide	277	2770
Guide Assembly	013	130
Tape Guide - Left	228	2280
Tape Guide - Right	229	2290
HOSE		
Air Pressure Test Port Assembly	262	2620
Cleaner Vacuum	047	470
Decoupler Pressure	042	420
Decoupler Vacuum	043	430
Head Guide Left Bearing	045	450
Head Guide Right Bearing	044	440
Manifold-In Pressure	037	370
Manifold-In Vacuum	038	380
Plenum Supply	039	390
Pressure Assembly	034	340
Pump to Outlet Filter	065	650
Tension Transducer	046	460
Vacuum Assembly	035	350
Vacuum Test Port Assembly	263	2630
Vacuum Supply	212	2120
Tape Lifter Solenoid Input	215	2150
Hub - Machine Reel	061	610
Inlet Filter - Tape Unit	033	330
Input Rail Assembly, Left	293	2930
Input Rail Assembly, Right	294	2940
Input Stack Assembly	290	2900

FRU Listing by Alphabetical Sequence CARR-DR 1-7

FRU Name	FRU No.	Page
LATCH		
Assembly - Cartridge	008	80
Interlock	127	1270
Interlock Spring	019	190
Plunger Spring	017	170
Sensor - Cartridge	011	110
Solenoid - Cartridge	002	20
Spring - Cartridge	016	160
Load Assembly	282	2820
Load Motor Complete Sensor	284	2840
Loader Mechanical Assembly	285	2850
Cartridge Staged Sensor	292	2920
Loader Operator Panel	298	2980
Logic Board - Drive	058	580
Lower Flange - Machine Reel	005	50
MACHINE REEL		
Flange, Lower	005	50
Flange, Upper	054	540
Hub	061	610
Motor and Hub Mount	004	40
Tachometer Sensor A	225	2250
Tachometer Sensor B	226	2260
Tape Guide	227	2270
Manifold-In Pressure Hose	037	370
Manifold-In Vacuum Hose	038	380
Message Display Board	060	600
MOTOR		
Load	283	2830
File Reel	003	30
Machine Reel and Hub Mount	004	40
Tape Unit Pump	030	300
Operator Panel Switch Board - Drive	109	1090
Output Stack Assembly	297	2970
Outlet Filter - Tape Unit	032	320
Plenum Assembly	041	410
POWER		
Amplifier Board	059	590
Supply Blower - Tape Unit	071	710
Supply - DC - Tape Unit	095	950
Pressure Sensor	040	400
Pressure Manifold-In Hose	038	380
Regulator - Tape Unit	031	310
Resistor Panel, External Load	036	360
SENSOR		
Cartridge In Stack	291	2910
Cartridge Latch	011	110
Cartridge Present	010	100
Cartridge Staged	292	2920
Load Motor Complete	284	2840
Pressure	040	400
A - Machine Reel Tachometer	225	2250
A - Tape Path	006	60
B - Machine Reel Tachometer	226	2260
B - Tape Path	007	70
Stack Low Position	289	2890
Stack Up Position	296	2960
Solenoid Assembly - Tape Lifter	216	2160
SPRING		
Cartridge Latch	016	160
Compression	018	180
Latch Interlock	019	190
Latch Plunger	017	170
SWITCH		
Drive Address	108	1040
Drive Online/Offline	105	1040
Drive Reset	107	1040
Drive Thermal (EC Sensitive)	110	4
File Protect	009	90
Physical Address	129	1290
Power ON/OFF - Drive	104	1040
Thermal - Tape Unit	082	820
TAPE		
Guide - Center	231	2310
Guide - Head Left	228	2280

FRU Name	FRU No.	Page
Guide - Head Right	229	2290
Guide - Machine Reel	227	2270
Guide - Tension Transducer	230	2300
Lifter Solenoid Assembly	216	2160
Path - Sensor A	006	60
Path - Sensor B	007	70
Tape Unit		
Blower Assembly	020	200
DC Power Supply	095	950
Inlet Filter	033	330
Outlet Filter	032	320
Power Supply Blower	071	710
Pump Motor Assembly	030	300
Regulator	031	310
Thermal Switch	082	820
Tension Transducer	014	140
Tension Transducer - Tape Guide	230	2300
Thermal Switch - Drive (EC Sensitive)	110	4
Thermal Switch - Tape Unit	082	820
Threader Assembly	001	10

FRU Listing by Alphabetical Sequence

FRU Name	FRU No.	Page
TOP CARD		
Connector B2X (EC Sensitive)	267	4
Connector B2Y (EC Sensitive)	268	4
Connector WBC (EC Sensitive)	068	4
Connector B2X(EC Sensitive)	066	4
Connector C2X (EC Sensitive)	067	4
Connector YBCD (EC Sensitive)	069	4
Connector ZBCD (EC Sensitive)	070	4
Upper Flange - Machine Reel	054	540
Vacuum Distribution Tee	219	2190
Vacuum Hose - Manifold-In	038	380
Vacuum Test Port Hose Assembly	263	2630

This section contains the removal and replacement procedures for all Field Replaceable Units (FRUs) in the 3480 tape subsystem. Checks and adjustment procedures are also included.

Carr Layout

CARR-DR pages 1-1 through 1-5 (in volume A03) contain a complete FRU list for the control unit and tape unit. An error code or FRU number that is displayed on the Maintenance Device (MD) operator panel will make reference to this FRU list. The corresponding procedure should be performed. The FRU removal procedure is given first and the FRU replacement procedure immediately follows for the same FRU. All procedures are shown in a step by step method with keyed reference to views.

Common Procedures

Procedures for cover removal and replacement, are given on CARR-DR 2-1 through CARR-DR 2-6. You will be sent to these common procedures by the FRU removal and replacement procedures.

Read through the complete procedure before performing it and give attention to caution and danger notes.

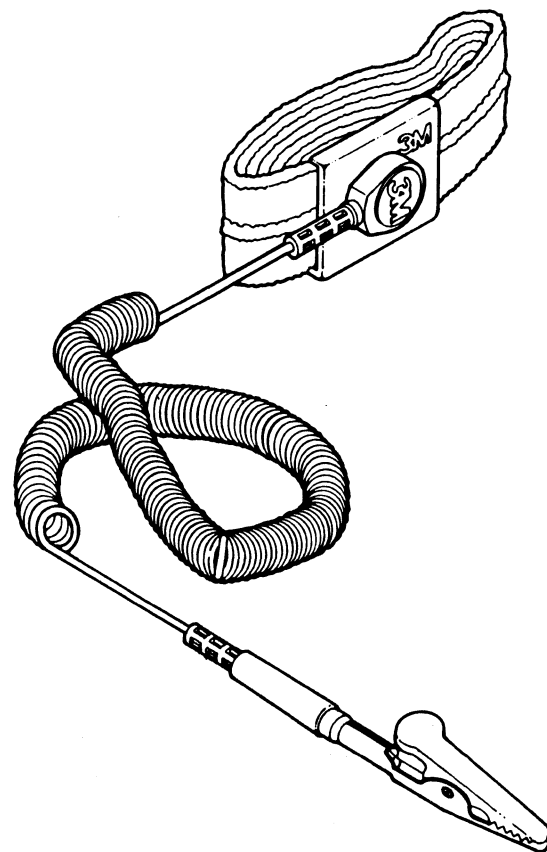


Figure 1. ESD Grounding Wrist Strap

Instructions for Working With ESD-Sensitive Parts

To prevent damage when you work with electrostatic discharge (ESD) sensitive parts, observe the following instructions. These instructions are in addition to all the usual precautions.

- ESD-sensitive parts that are shipped in a special ESD bag should be left in this bag until you are ready to immediately install them into the machine.
- Before touching the ESD-sensitive part, put on the ESD Grounding Wrist Strap on either wrist. This strap has a high resistance (1 megohm) resistor in series with the grounding clip, so there is no danger to you. It discharges the static electricity from your body. Connect the clip to the flex ground strap of the gate to the frame. Keep the strap on while you are inserting or removing a logic card or handling any ESD-sensitive part.
- Do not place the ESD-sensitive part on the machine cover or on a metal table. If you need to put down the ESD-sensitive part for any reason, first put it into its special bag. (Large metal objects can be discharge paths without being grounded.)
- Prevent ESD-sensitive parts from being touched by other personnel, such as service representatives or customers. Reinstall all covers when you are not working on the machine.
- If possible, keep all ESD-sensitive parts in a grounded metal cabinet (case).
- Be extra careful in working with ESD-sensitive parts when cold-weather heating is used. Heating of cold air lowers the relative humidity which increases the static electricity.

CAUTION

When wearing the ESD grounding wrist strap, ensure that the flex ground strap remains connected. Failure to do this creates a safety exposure in the same manner as wearing jewelry while working on live exposed electrical circuits.

Use the most current IBM part number available for the ESD Grounding Wrist Strap.

- The following is a list of the ESD-sensitive parts in the 3480 subsystem:
 - All of the logic cards in the control unit and the drives
 - Message display card in the drives
 - Transducer FRU in the drives.

This section contains the removal and replacement procedures for all Field Replaceable Units (FRUs) in the 3480 Tape Subsystem. Checks and adjustment procedures are also included.

Carr Layout

CARR-DR pages 1-1 through 1-5 (in volume A03) contain a complete FRU list for the control unit and tape unit. An error code or FRU number that is displayed on the Maintenance Device (MD) operator panel will make reference to this FRU list. The corresponding procedure should be performed. The FRU removal procedure is given first and the FRU replacement procedure immediately follows for the same FRU. All procedures are shown in a step by step method with keyed reference to views.

Common Procedures

Procedures for cover removal and replacement, are given on CARR-DR 2-1 through CARR-DR 2-6. You will be sent to these common procedures by the FRU removal and replacement procedures.

Read through the complete procedure before performing it and give attention to caution and danger notes.

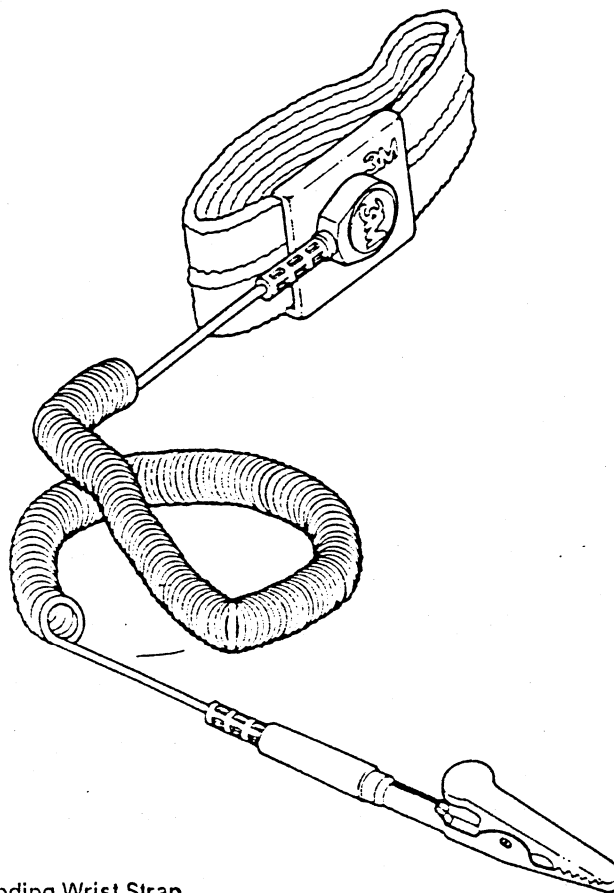


Figure 1. ESD Grounding Wrist Strap

Instructions for Working With ESD -Sensitive Parts

To prevent damage when you work with electrostatic discharge (ESD) sensitive parts, observe the following instructions. These instructions are in addition to all the usual precautions.

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- Do not place the ESD-sensitive part on the machine cover or on a metal table. If you need to put down the ESD-sensitive part, for any reason, first put it into its special bag. (Large metal objects can be discharge paths without being grounded.)
- Prevent ESD-sensitive parts from being touched by other personnel, such as service representatives or customers. Reinstall all covers when you are not working on the machine.
- If possible, keep all ESD-sensitive parts in a grounded metal cabinet (case).
- Be extra careful in working with ESD-sensitive parts when cold-weather heating is used. Heating of cold air lowers the relative humidity which increases the static electricity.

CAUTION:

When wearing the ESD grounding wrist strap, ensure that the flex ground strap remains connected. Failure to do this creates a safety exposure in the same manner as wearing jewelry while working on live exposed electrical circuits.

Use the most current IBM part number available for the ESD Grounding Wrist Strap.

- The following is a list of the ESD-sensitive parts in the 3480 subsystem:
 - All of the logic cards in the control unit and the drives
 - Message display card in the drives
 - Transducer FRU in the drives.
 - Loader Control Card
 - Loader Mechanical Assembly
 - Load Assembly

0 0 0 0 0 0 0 0 0 0 0

Tape Unit Cover Removal Procedure

Tape Unit With BM 6460006 (see CARR-DR 9)

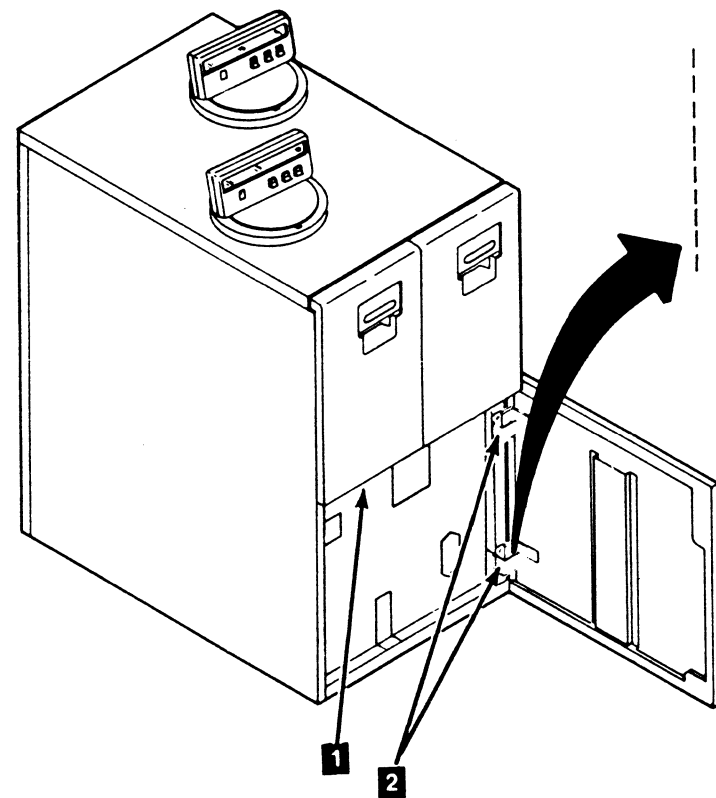
This page contains the steps needed to remove any of the tape unit covers. The drive drawer safety cover is not included on this page, but can be found on CARR-DR 2-5.

Tape Unit Front and Rear Cover Removal

The tape unit front and rear covers are held on by two hinges. The front cover hinges are on the right side, the rear cover hinges are on the left. Latches hold both covers closed.

To open the front cover, push on the left center to release the latch. To open the rear cover, insert a small screw driver into the slot in the right center of the cover and push to the left to release the latch.

1. Pull the cover open until the hinge pins **2** are accessible.
2. Remove the ground strap from the cover, if present.
3. While holding the cover, remove the hinge pins and then remove the cover.
4. Return to the procedure that sent you here.



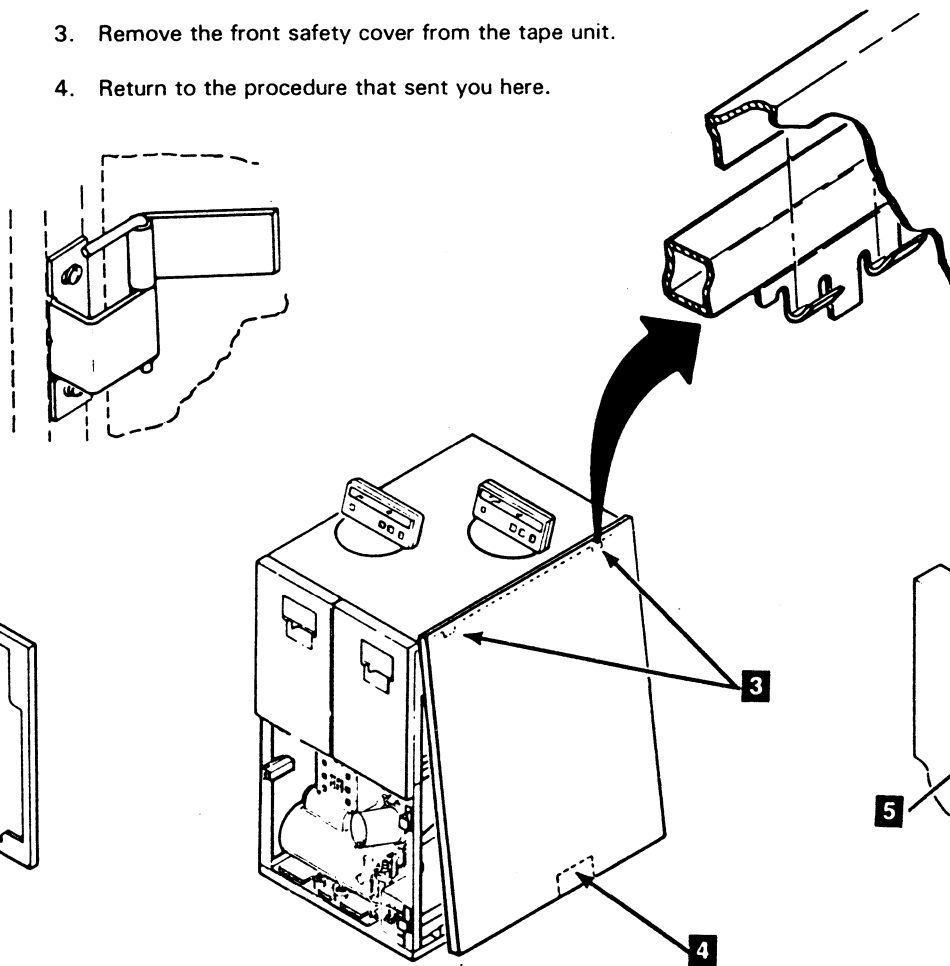
Tape Unit Side Cover Removal

The last tape unit in a string of drives will have a cover on the right side. The other tape units do not have side covers. The tape unit side cover is held at the top by two cradle-like brackets **3** attached to the tape unit frame. The bottom of the cover is held in place by a latch assembly **4**.

1. To open the side cover, insert a small screw driver into the slot in the bottom center of the cover and push upward to release the latch.
2. Pull the bottom of the cover away from the tape unit, then lift the cover straight up and out of the brackets attached to the tape unit frame.
3. Return to the procedure that sent you here.

Tape Unit Front Safety Cover Removal

1. Loosen the three cover mounting screws **7** (one on each side and one on the bottom of the safety cover).
2. Remove the grounding strap, if present.
3. Remove the front safety cover from the tape unit.
4. Return to the procedure that sent you here.

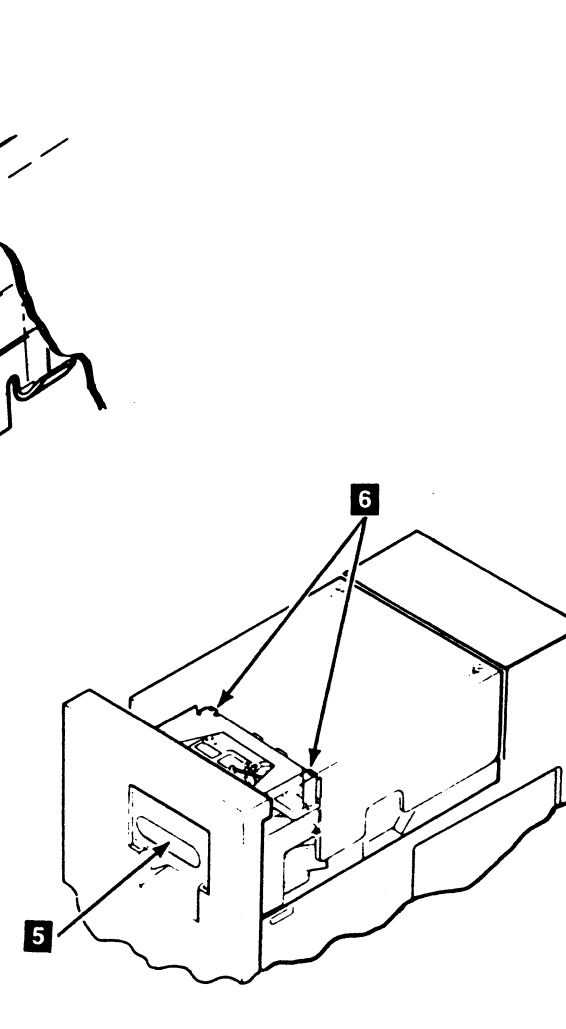


Drive Drawer Cover Removal

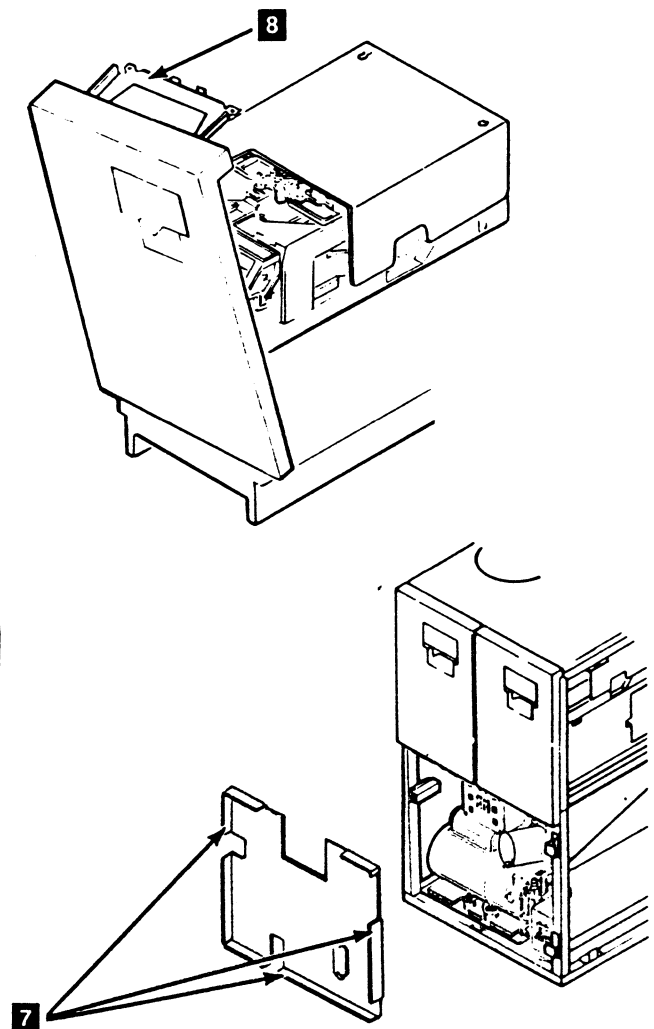
Warning: The drive O safety cover may contact the left side vertical member of the frame when being opened or closed. When opening drive O, pull the drawer slowly to prevent damage to the safety cover.

The drawer is held at the top by two screws **6** which are near the cartridge latch assembly. Do not remove the cover support bracket **8** from the top cover.

The bottom of the drive drawer can be held by either two screws, or by two pins. If held by the pins it will not be necessary to remove the pins.



1. Open the front cover. The drive drawer has a latch located in the center-bottom of the drive drawer **1**. Push up on the latch and at the same time pull out on the drawer until you can access the two cover screws.
2. Check the bottom of the drawer cover. If you have two screws holding the bottom of the cover, remove them at this time.
3. Ensure that the cartridge latch door **5** is closed. Remove the two drawer cover bracket screws **6** from the cartridge latch assembly. Do not remove the bracket **8** from the cover.
4. Lift up on the cover and at the same time lift the cover away from the drive.
5. Return to the procedure that sent you here.



Tape Unit Cover Replacement Procedure

Tape Unit With BM 6460006 (see CARR-DR 9)

This page contains the steps needed to replace any of the tape unit covers. The drive drawer safety cover is not included on this page, but can be found on CARR-DR 2-5.

Tape Unit Front and Rear Cover Replacement

1. Move the cover into position on the tape unit until the cover hinges and the tape unit hinges are aligned. Insert the hinge pins into the top and bottom hinges.
2. Reconnect the ground connector to the cover, if present.
3. Close each cover until it is held by the latch assembly.
4. Return to the procedure that sent you here.

Tape Unit Front Cover Adjustment

Note: The tape unit front cover must be adjusted so that it does not open to the casual or incidental touch. The cover should only open by the use of an intentional force in the proper area.

When the tape unit front cover is adjusted correctly, the upper right corner should be in alignment (approximately) with the bottom of the drive 0 front cover (check the alignment with your six-inch straight edge).

1. As a starting point, loosen the two latch assembly holding screws and position the front of the latch assembly **7** to extend approximately 2 mm (5/64 inch) beyond the front of the side-frame.
2. Partially close the front cover and ensure that the catch mechanism **8** aligns with the latch assembly.
3. Close the front cover to ensure that it will stay closed with the latch assembly in this position (2 mm beyond the front side-frame).
4. Continue the adjustment by changing the 2 mm adjustment (distance from the front side-frame to the latch assembly) until the upper right corner of the front cover is in alignment (approximately) with the bottom of the drive 0 front cover (check the alignment with your six-inch straight edge).
5. Tighten the two latch assembly holding screws.
6. Return to the procedure that sent you here.

Tape Unit Side Cover Replacement

The last tape unit in a string of drives will have a cover on the right side. The other tape units do not have side covers. The tape unit side cover is held at the top by two cradle-like brackets attached to the tape unit frame. The bottom of the cover is held by a latch assembly.

1. Lower the cover onto the tape unit until the top of the cover moves into the two brackets attached to the tape unit frame **1**.
2. Reconnect the ground connector to the cover, if present.
3. Move the bottom of the cover toward the tape unit until it is held by the latch assembly **2**.
4. Return to the procedure that sent you here.

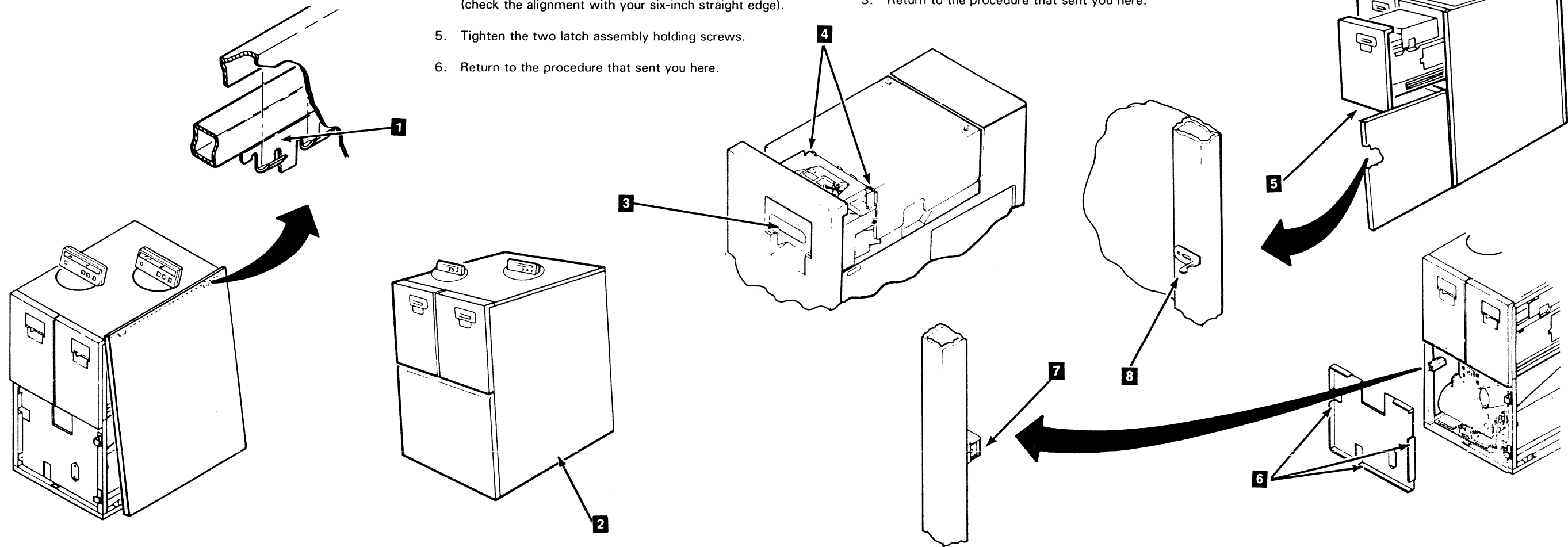
Tape Unit Front Safety Cover Replacement

1. Position the safety cover in the tape unit and tighten the three mounting screws **6** (one on each side and one at the bottom of the safety cover).
2. Connect the grounding strap to the cover, if present.
3. Return to the procedure that sent you here.

Drive Drawer Cover Replacement

The bottom of the drawer cover can be held by either two screws, or by two pins.

1. Close the cartridge latch door **3** and lift the cover onto the drive drawer. If your cover has pins, guide the pins into the holes of the cover at the same time you lift the cover onto the drive drawer.
2. Install the two cover bracket screws **4** at the top of the cover.
3. If your cover has two screws at the bottom, install the two screws **5**.
4. Return to the procedure that sent you here.



Tape Unit Cover Removal Procedure

Tape Unit Without BM 6460006 (see CARR-DR 9)

This page contains the steps needed to remove any of the tape unit covers. The drive drawer safety cover is not included on this page, but can be found on CARR-DR 2-5.

Tape Unit Front and Rear Cover Removal

The tape unit front and rear covers are held on by two hinges. The front cover hinges are on the right side, the rear cover hinges are on the left side. Latches hold both covers closed.

1. Pull the cover open until the hinge pins **2** are accessible.
2. Remove the grounding strap from the cover, if present.
3. While holding the cover, remove the hinge pins and then the cover.
4. Return to the procedure that sent you here.

Tape Unit Side Cover Removal

The tape unit side covers are held at the top by two tabs **3** which fit into slots in the tape unit frame. The bottom is held in place by a latch assembly.

1. Press in on the bottom center of the cover to release the latch, then lift the cover straight up to lift the two tabs out of the tape unit frame.
2. Remove the grounding strap from the cover, if present.
3. Return to the procedure that sent you here.

Tape Unit Front Safety Cover Removal

1. Loosen the two side bracket bolts **7** and the top bracket bolt **6**. Slide the brackets in.
2. Remove the grounding strap from the cover, if present.
3. Lift the safety cover up and out of the tape unit.
4. Return to the procedure that sent you here.

Tape Unit Rear Safety Cover Removal

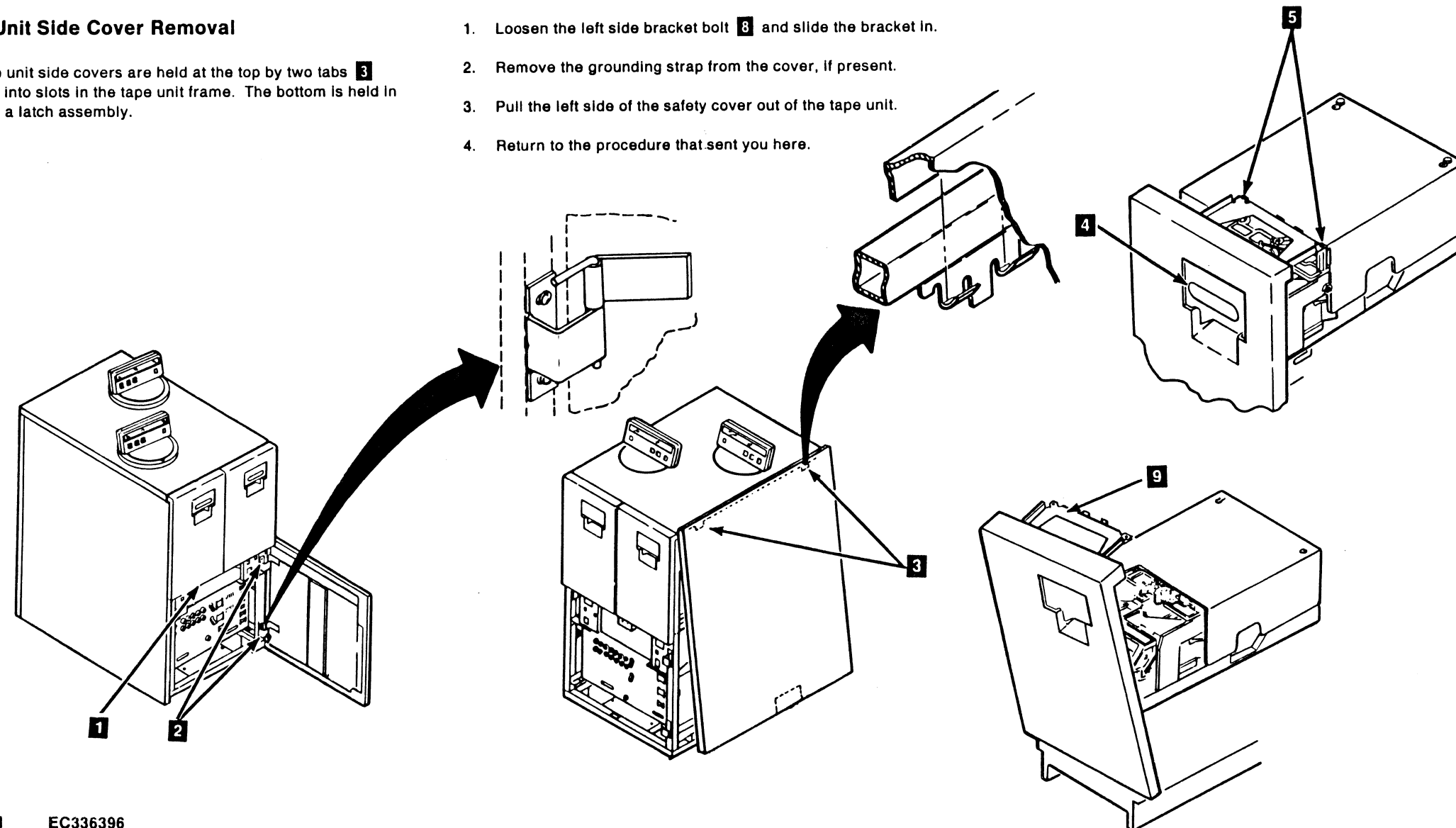
1. Loosen the left side bracket bolt **8** and slide the bracket in.
2. Remove the grounding strap from the cover, if present.
3. Pull the left side of the safety cover out of the tape unit.
4. Return to the procedure that sent you here.

Drive Drawer Cover Removal

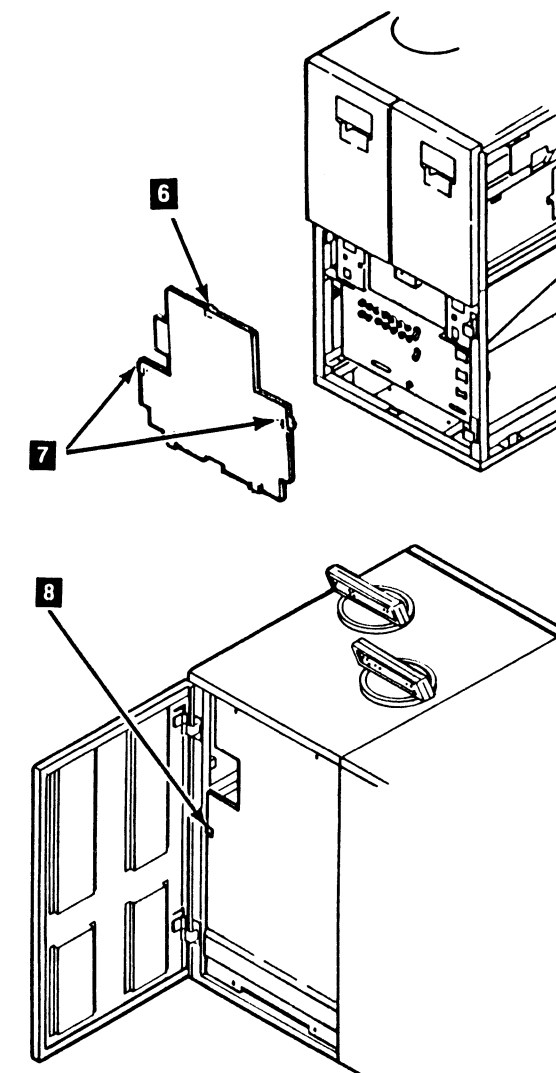
Warning: The drive 0 safety cover may contact the left side vertical member of the frame when being opened or closed. When opening drive 0, pull the drawer slowly to prevent damage to the safety cover.

The drawer cover is held at the top by two screws **5** which are near the cartridge latch assembly. Do not remove the cover support brackets **9** from the top of the cover.

The bottom of the drive drawer can be held by either two screws, or by two pins. If held by the pins, it will not be necessary to remove the pins.



1. Open the front cover. The drive drawer has a latch located in the center of the drive drawer **1**. Push up on the latch and at the same time pull out on the drawer until you can get to the two cover screws.
2. Check the bottom of the drawer cover. If you have two screws holding the bottom of the cover, remove them at this time.
3. Ensure that the cartridge latch door **4** is closed. Remove the two drawer cover bracket screws **5** from the cartridge latch assembly. Do not remove the brackets **9** from the cover.
4. Lift up on the cover and at the same time lift the cover away from the drive.
5. Return to the procedure that sent you here.



Tape Unit Cover Replacement Procedure

Tape Unit Without BM 6460006 (see CARR-DR 9)

This page contains the steps needed to replace any of the tape unit covers. The drive drawer safety cover is not included on this page, but can be found on CARR-DR 2-5.

Tape Unit Front or Rear Cover Replacement

1. Move the cover into position on the tape unit until the cover hinges and the tape unit hinges are aligned. Then insert the hinge pins into the top and bottom hinges.
2. Reconnect the grounding strap to the cover, if present.
3. Close the cover until it is held by the latch assembly.
4. Return to the procedure that sent you here.

Tape Unit Front Cover Adjustment

Note: The tape unit front cover must be adjusted so that it does not open to the casual or incidental touch. The cover should only open by the use of an intentional force in the proper area.

When the tape unit front cover is adjusted correctly, the upper right corner should be in alignment (approximately) with the bottom of the drive 0 front cover (check the alignment with your six-inch straight edge).

1. As a starting point, loosen the two latch assembly holding screws and position the front of the latch assembly **7** to extend approximately 2 mm (5/64 inch) beyond the front of the side-frame.
2. Partially close the front cover and ensure that the catch mechanism **8** aligns with the latch assembly.
3. Close the front cover to ensure that it will stay closed with the latch assembly in this position (2 mm beyond the front side-frame).
4. Continue the adjustment by changing the 2 mm adjustment (distance from the front side-frame to the latch assembly) until the upper right corner of the front cover is in alignment (approximately) with the bottom of the drive 0 front cover (check the alignment with your six-inch straight edge).
5. Tighten the two latch assembly holding screws.
6. Return to the procedure that sent you here.

Tape Unit Side Cover Replacement

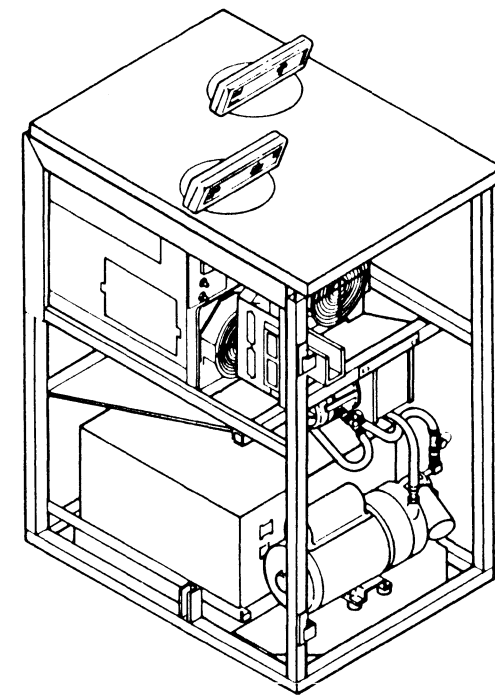
The last tape unit in a string will have a cover on the right side. The other tape units do not have side covers. The last tape unit cover is held at the top by two tabs which fit into slots in the tape unit frame. The bottom is held by a latch assembly.

1. Lower the cover onto the tape unit until the two tabs **1** move into the slots near the top of the tape unit.
2. Reconnect the grounding strap to the cover, if present.
3. Continue to lower the cover as far as you can. Move the bottom of the cover toward the tape unit until it is held by the latch assembly **2**.
4. Return to the procedure that sent you here.

Tape Unit Front Safety Cover Replacement

It will be easier to replace the front safety cover if the bottom brackets are extended.

1. Check that the bottom brackets are fully extended. If not, loosen the bracket bolts **7** and slide the brackets out as far as you can; then tighten the bolts.
2. Reconnect the grounding strap to the cover, if present.
3. Lift the safety cover into the tape unit, inserting the two brackets into the holes in the tape unit frame.

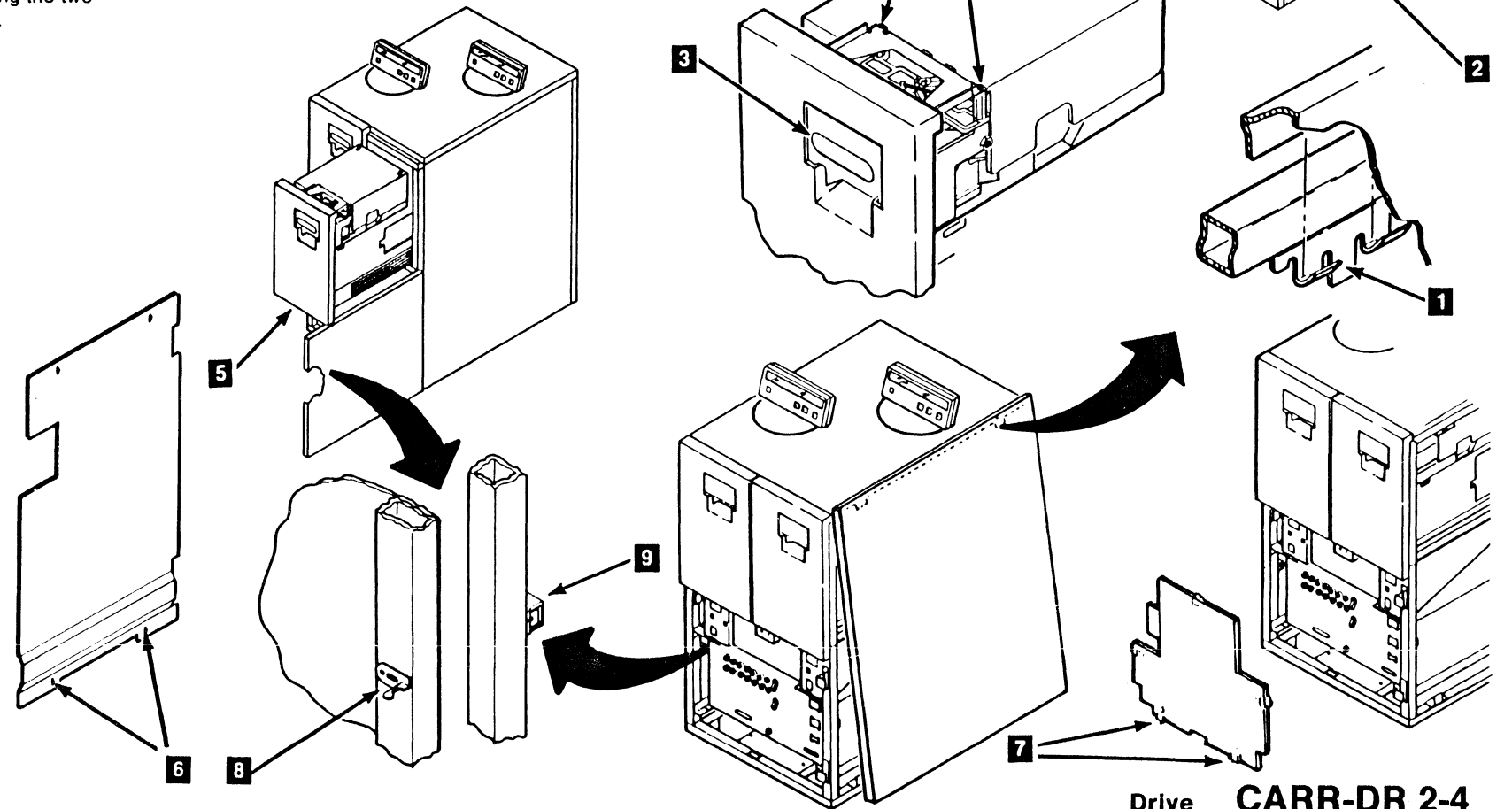


4. Continue to push the cover into the tape unit until the right, left and top brackets are aligned with the holes in the tape unit frame.
5. Loosen the bracket bolts and slide the brackets out until they are in the tape unit frame holes; then tighten the bolts.
6. Return to the procedure that sent you here.

Tape Unit Rear Safety Cover Replacement

It will be easier to replace the rear safety cover if the right brackets are extended.

1. Check if the right brackets are fully extended. If not, loosen the bracket bolts **6** and slide the brackets out as far as you can; then tighten the bolts.
2. Reconnect the grounding strap to the cover, if present.
3. Lift the safety cover into the tape unit, inserting the two brackets into the holes in the tape unit frame.
4. Continue to push the cover into the tape unit until the left bracket is aligned with the hole in the tape unit frame.
5. Loosen the bracket bolt and slide the bracket out until it is in the tape unit frame hole; then tighten the bolt.
6. Return to the procedure that sent you here.



Drive Drawer Cover Replacement

The bottom of the drawer cover can be held by either two screws, or by two pins.

1. Close the cartridge latch door **3** and lift the cover onto the drive drawer. If your cover has pins, guide the pins into the holes of the cover at the same time you lift the cover onto the drive drawer.
2. Install the two cover bracket screws **4** at the top of the cover.
3. If your cover has the two screws at the bottom, install the two screws **5**.

Drive Drawer Safety Cover Removal or Replacement Procedure

This page contains the steps needed to remove or replace the drive drawer safety cover.

Drive Drawer Safety Cover Removal

Warning: The drive 0 safety cover may contact the left side vertical member of the frame when being opened or closed. When opening drive 0, pull the drawer slowly to prevent damage to the safety cover.

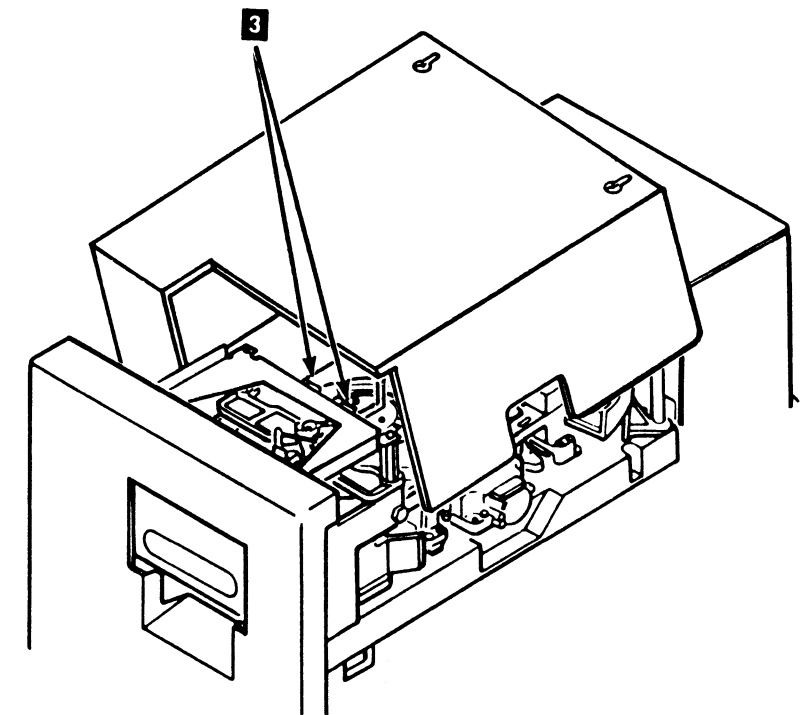
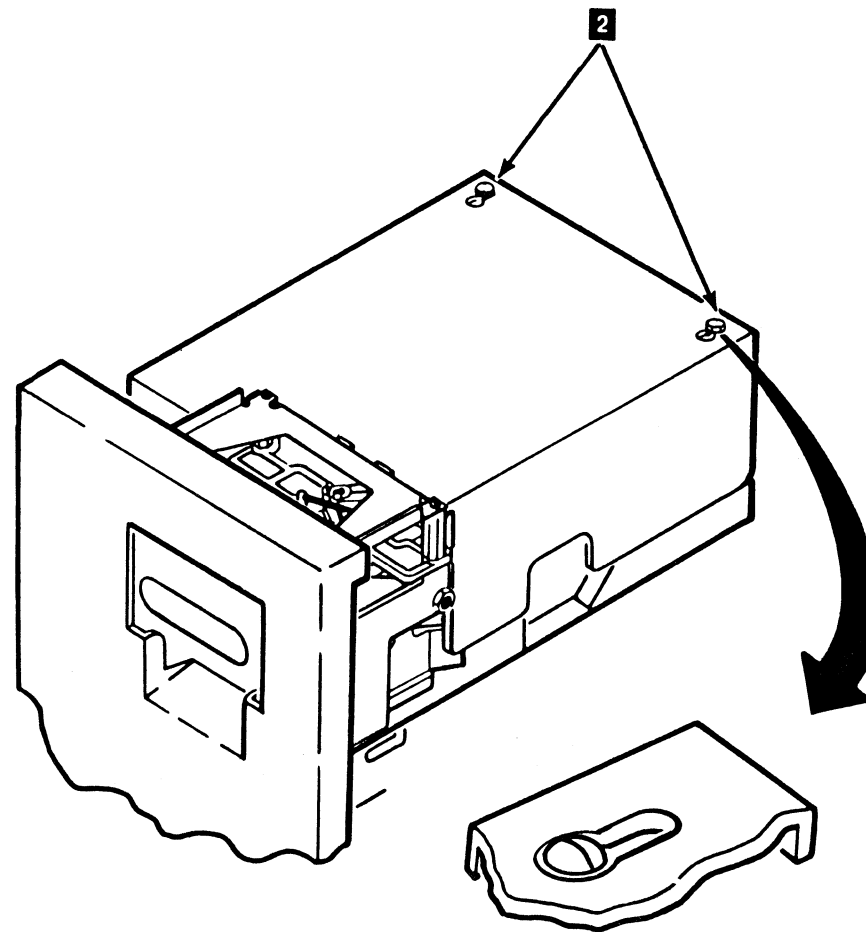
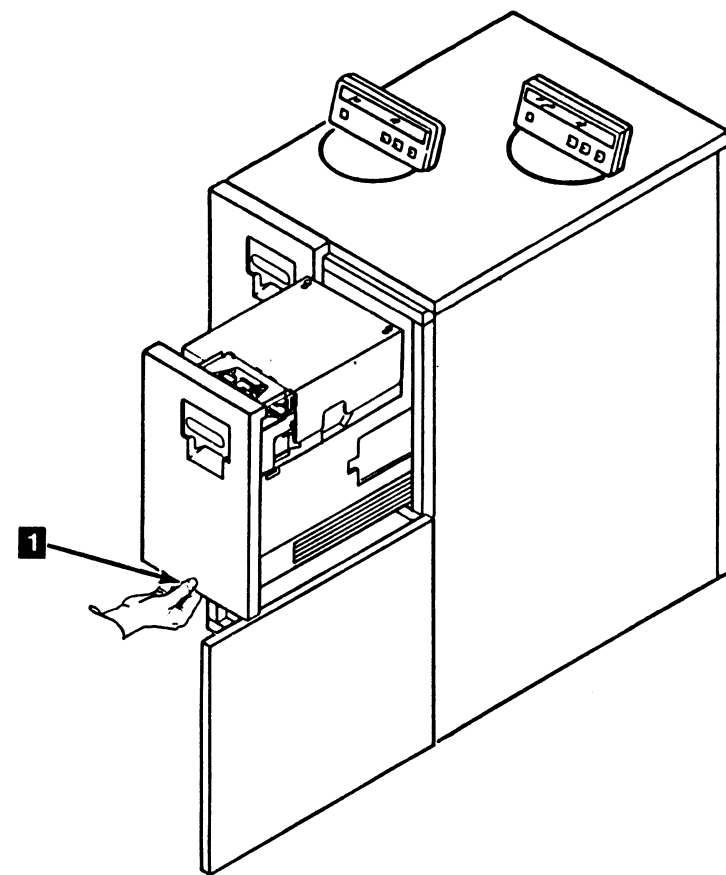
Warning: Do not slide the drawer into the latched position with the cover screws **2** loosened. The screws may contact the bottom of the message display pan.

1. Open the front cover. The drive drawer has a latch located in the center of the drive drawer **1**. Push up on the latch and at the same time pull out on the drawer until you can get to the two cover screws.
2. The safety cover is held by two screws **2**. Loosen the two screws.

3. Slide the safety cover toward the rear of the drive drawer until the screws will pass through the opening in the cover.
4. Lift the end of the cover near the rear panel up and away from the drive drawer until it is free of the drawer.
5. Set the cover to the side.
6. Return to the procedure that sent you here.

Drive Drawer Safety Cover Replacement

1. Lower the drawer safety cover onto the drive drawer, guiding the forward end into the front cover brackets **3**. At the same time, guide the cover so the two mounting screws **2** enter the slotted openings on the rear of the cover.
2. Tighten the screws.
3. Return to the procedure that sent you here.



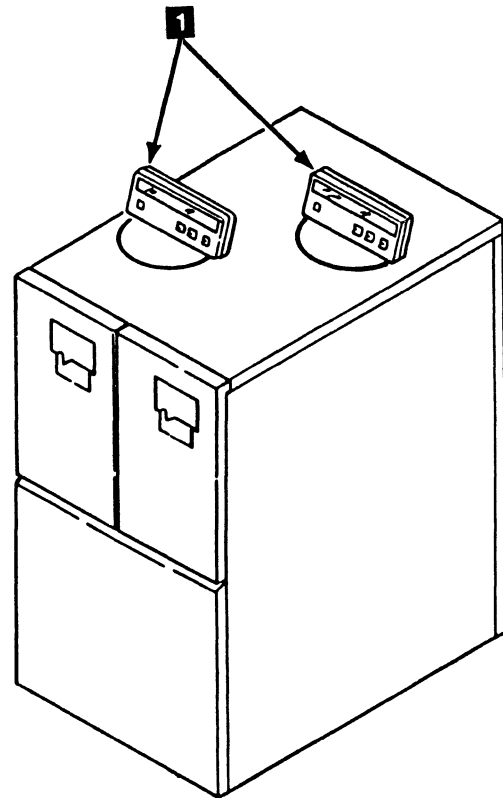
Drive Operator Panel Removal and Replacement Procedure

This page contains the steps needed to remove or replace the drive operator panel **1**.

Drive Operator Panel Removal

1. There are two tabs **1** on the base of the drive operator panel. These two tabs insert into slots in the top cover opening.

Turn the operator panel **2** to the position shown (clockwise to its stop).

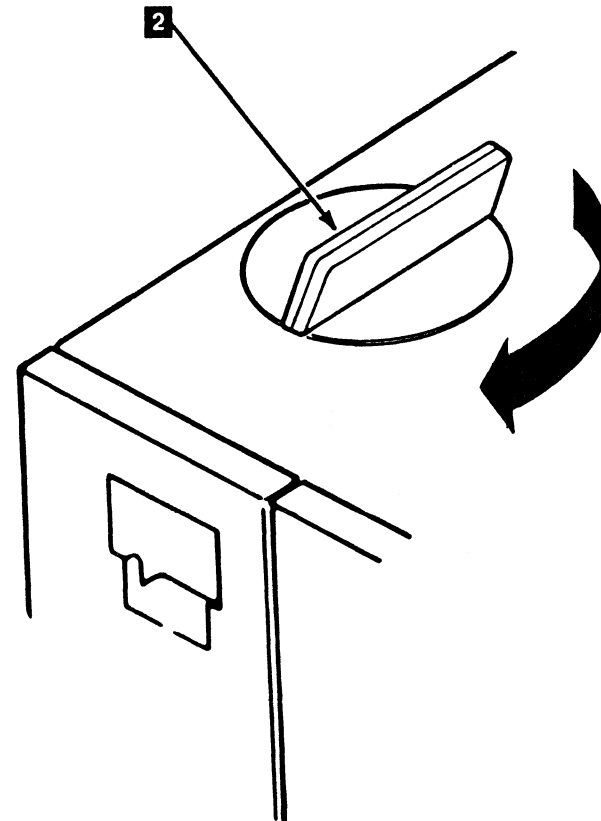


2. There are "ball bearing" type retainers in the top cover opening that hold the operator panel, and provide detents.

Remove the operator panel by lifting straight up and out of the top cover opening.

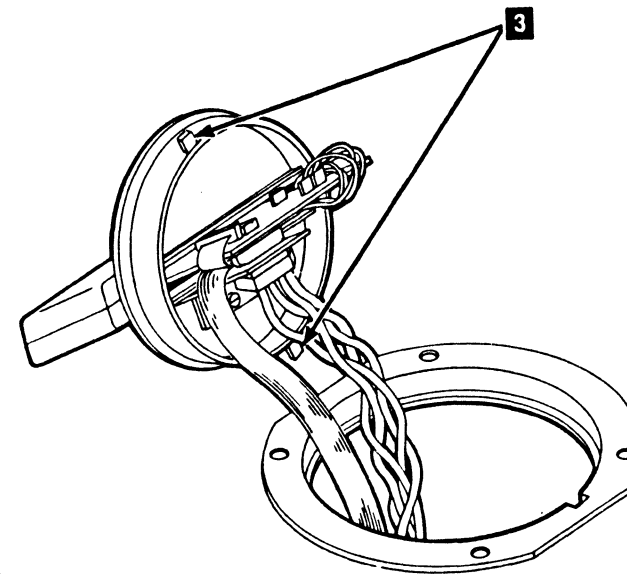
Note: It may be necessary to turn the operator panel a few degrees right or left to free the assembly from the top cover.

3. If it is necessary to disconnect the cables from the display panel, see CARR-DR 600 "Message Display Board Removal and Replacement Procedure."
4. Return to the procedure that sent you here.

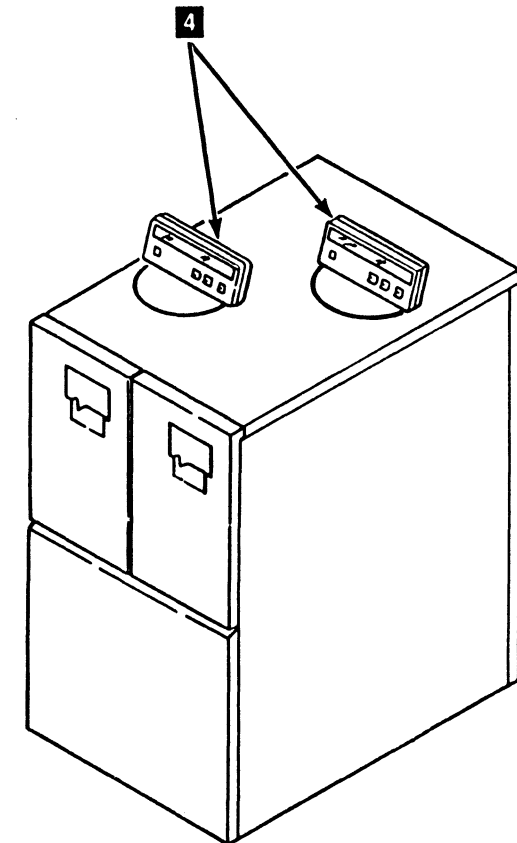


Drive Operator Panel Replacement

1. If the cables from the display panel have been removed, see see CARR-DR 600 "Message Display Board Removal and Replacement Procedure."
2. Place the operator panel in position over the top cover opening.
3. Align the tabs **3** on the operator panel with the slots in the top cover opening.
4. Push the operator panel into the opening until it seats.



5. Turn the operator panel in a counterclockwise direction. This ensures seating of the operator panel.
6. Position the operator panel **4** so it may easily be read by the operator.
7. Return to the procedure that sent you here.



Tape Unit Top Cover Removal and Replacement Procedure

Tape Unit With BM 6460006 (see CARR-DR 9)

This page contains the steps needed to remove and replace the top cover assembly **1** from the tape unit. Since both operator display panels will be disconnected, it will be necessary to have both drives available for service.

Note: This FRU can be removed and replaced without affecting the other tape units by removing power from the failing tape unit with the tape unit ac power circuit breaker.

Removing the Top Drive Cover

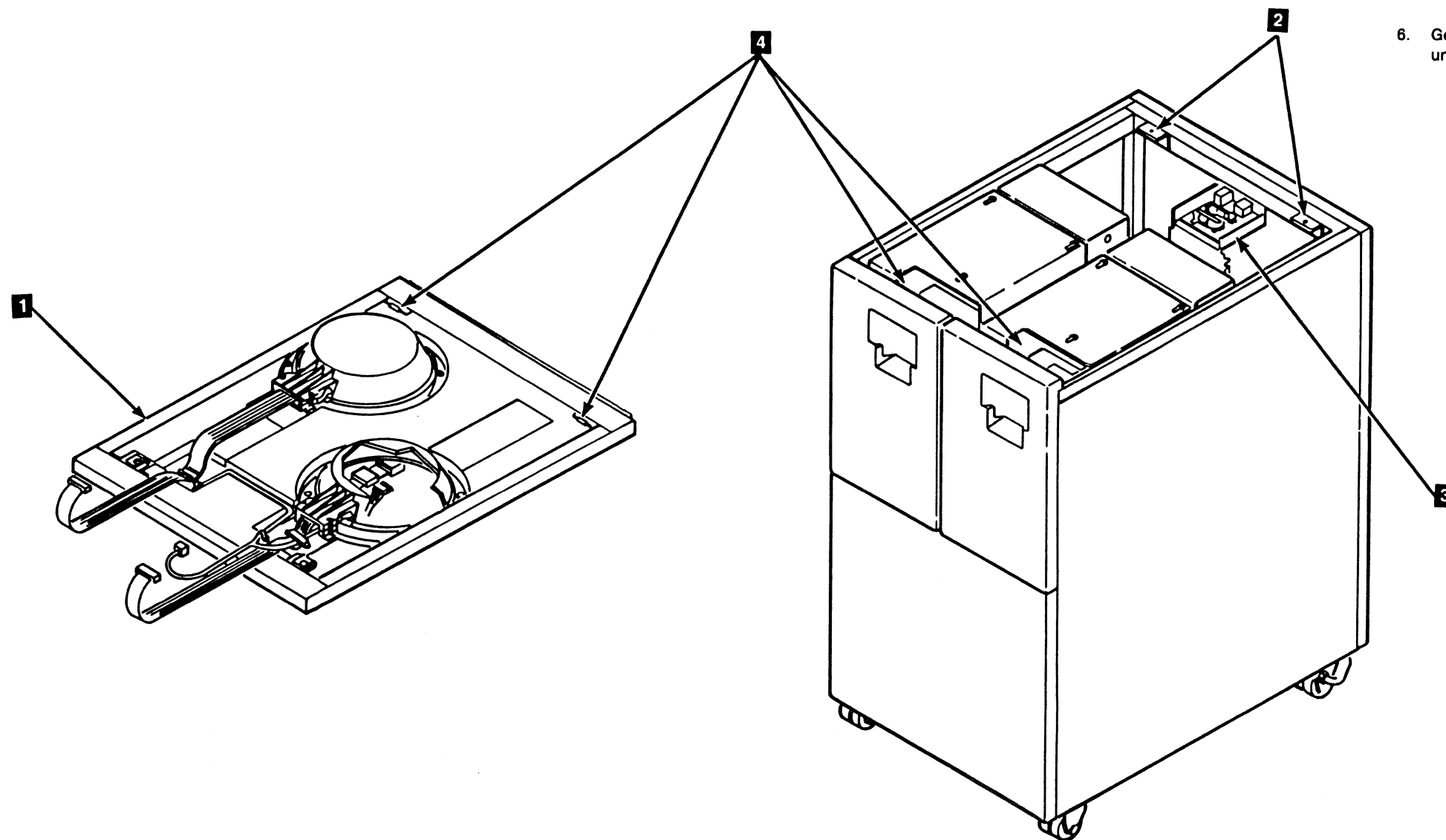
1. Go to CARR-DR 8 for the procedure to **power off** the tape unit.
2. Open the rear drive cover (see CARR-DR 2-1).
3. Release the two rear latch screws **2**. (These are captive screws.)
4. Remove cable plug P11 from connector J11 located on the bottom of the external load resistor panel **3** (cable support bracket, if tape unit has power supply part number 6177166 or 1677167).
5. Unplug the two SLT cables from the operator display panels to the SLT connector panel which is attached to the bottom of the external load resistor panel, and remove the cable support bracket, if tape unit has power supply part number 6177166 or 1677167.

6. Open both drive drawers. (This will make space for the operator panel when the top cover is turned upside down.)
7. Pivot the top cover on its front locating tabs and brackets **4** by lifting from the rear of the tape unit.
8. Lift the top cover off the front locating tabs and brackets **4**.
9. Place the top cover upside down on top of the tape drive for easy access to the message display cables, ferrites, and RFI pans.

Drive **CARR-DR 2-8**

Replacing the Top Drive Cover

1. Replace the top cover **1** by inserting the front locating tabs into the brackets **4**.
2. Pivot the rear of the cover down and latch the two rear captive screws **2**.
3. Install cable plug P11 into connector J11 located on the bottom of the external load resistor panel **3** (cable support bracket, if tape unit has power supply part number 6177166 or 1677167).
4. Plug the two SLT cables from the operator display panels to the SLT connector panel which is attached to the bottom of the external load resistor panel, and remove cable support bracket, if tape unit has power supply part number 6177166 or 1677167.
5. Close both drive drawers.
6. Go to CARR-DR 8 for the procedure to **power on** the tape unit.



Decorative Cover Removal When Drive is Not in Use

1. Set the automatic cartridge loader mode switch **1** to MANUAL. This prevents the tray from lowering when cartridges are unloaded.
2. Check to see if there are any cartridges in the loader or drive. If there are, remove the cartridges.
3. Make sure the cartridge loader output tray is in the up position. The decorative cover cannot be removed if the tray is not in the up position.
 - a. If the tray is in the up position, go to step 4.
 - b. If the tray is not in the up position, place a cartridge into the top position of the input station. Press the automatic cartridge loader START switch and remove the cartridge from the input station, even if the cartridge is moving downward. The tray will move to the up position.

The tray is now in the up position.

4. Remove the lower decorative cover **3** by pushing in on the sides and pulling the cover straight out. The cover is held by tabs **2**.

The automatic cartridge loader must be operated in the manual mode until the decorative cover is placed back on the cartridge loader.

Decorative Cover Removal When Drive is in Use

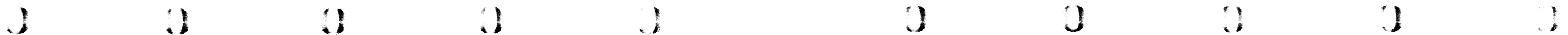
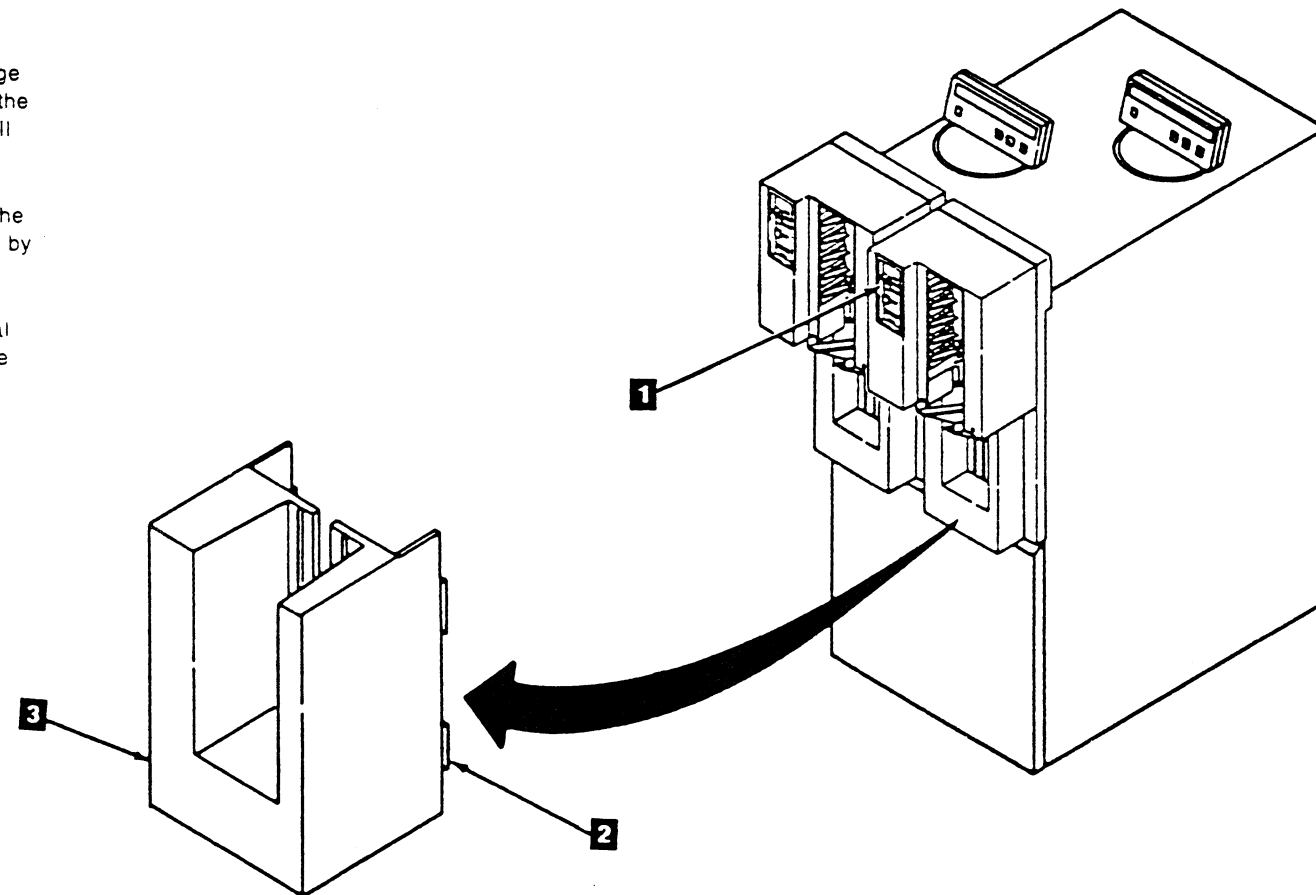
The following procedure can be used to remove the lower decorative cover from an automatic cartridge loader on a drive that is being used by a customer.

1. Note the setting of the automatic cartridge loader mode switch for use when the cover is installed.
2. Set the automatic cartridge mode loader switch **1** to MANUAL. This prevents the tray from lowering when cartridges are unloaded.
3. Check to see if there are any cartridges in the loader. If there are, remove the cartridges.
4. Make sure the cartridge loader output tray is in the up position. The decorative cover cannot be removed if the tray is not in the up position.
 - a. If the tray is in the up position, go to step 4.
 - b. If the tray is not in the up position, wait for the cartridge that is loaded to be unloaded by either the system or the operator. When the cartridge is unloaded, the tray will rise.
5. Remove the lower decorative cover **3** by pushing in on the sides and pulling the cover straight out. The cover is held by tabs **2**.

The automatic cartridge loader must be operated in the manual mode until the decorative cover is placed back on the cartridge loader.

Decorative Cover Replacement

1. Align the tabs **2** of the decorative cover with the slots in the automatic cartridge loader cover.
2. Press in on the decorative cover **3** until the cover snaps into place.
3. Set the automatic cartridge loader mode switch **1** to either the previous setting or the required setting.



Plenum Supply Hose Clamping Procedure

Several Remove/Replace procedures require clamping the plenum supply hose to prevent air pressure loss in the adjacent drive (in the same tape unit) during concurrent maintenance. Clamping this hose also aids in field replacement unit (FRU) isolation when both drives within a tape unit are having an air pressure loss problem.

Getting Started

1. Open the front cover.
2. Open the drive drawer.
 - a. Push up on the latch located in the center of the drive drawer **1**.
 - b. While pushing up on the latch, pull out on the drive drawer.
 - c. Pull the drive drawer out far enough to get access to the safety cover screws.

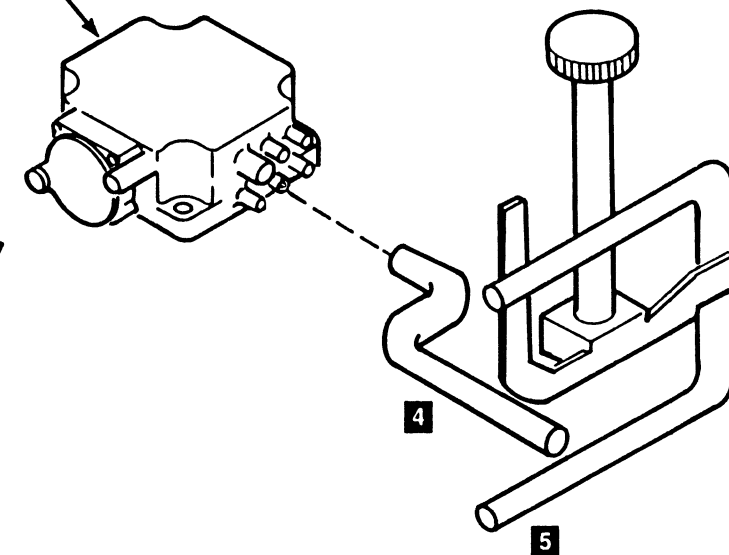
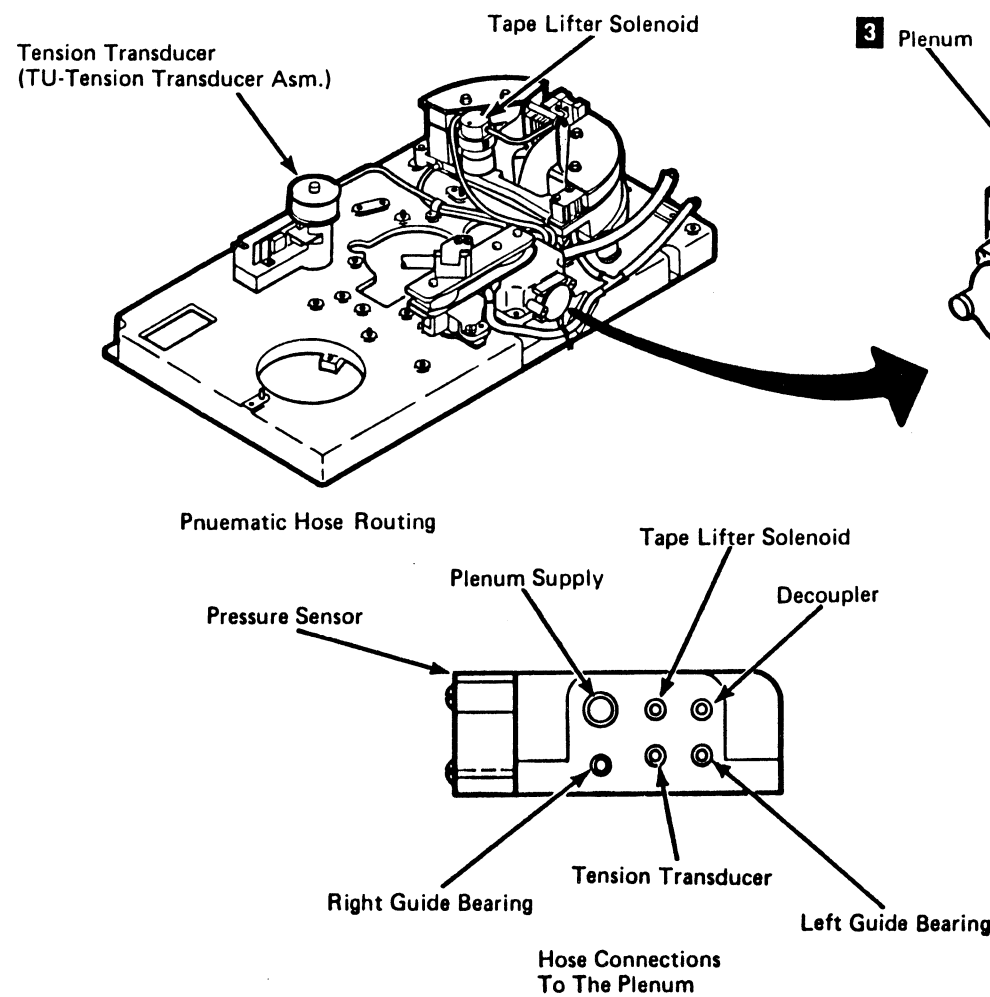
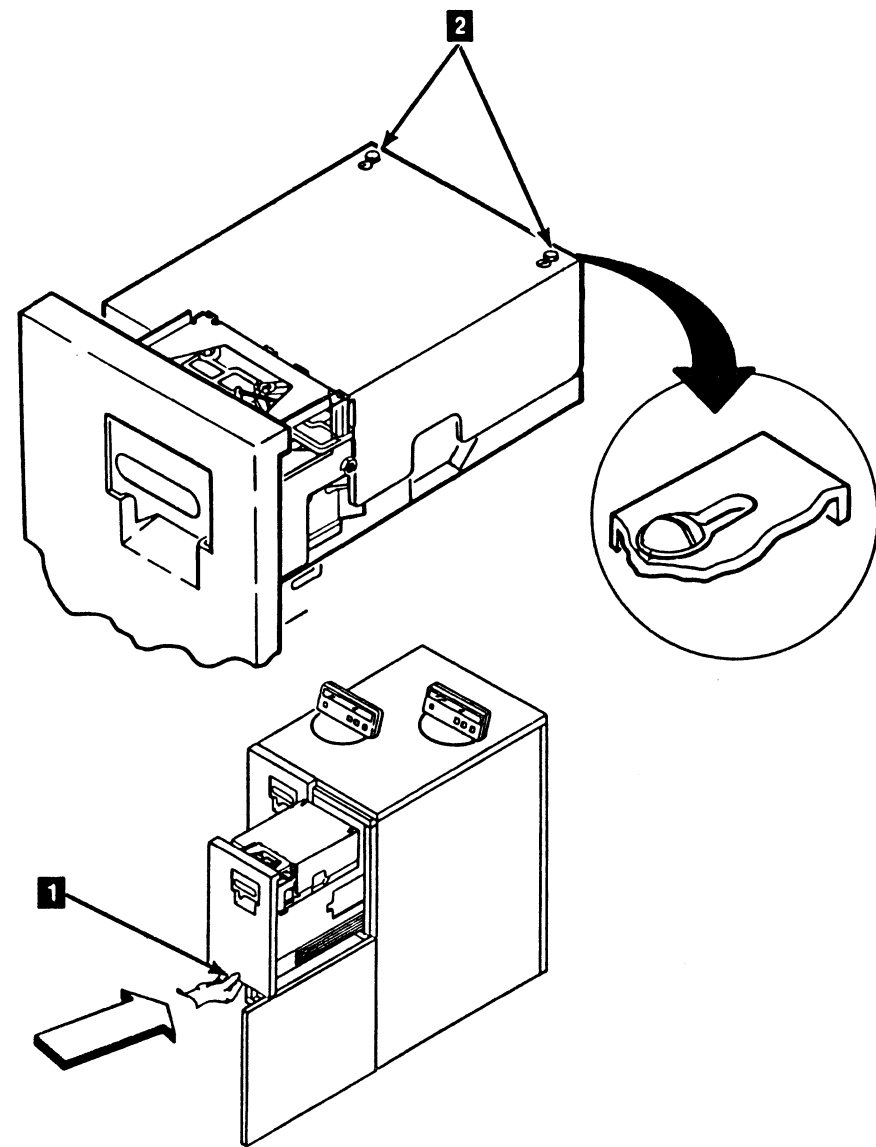
3. The drive drawer safety cover is held by two screws **2**. Loosen the two screws.
4. Slide the safety cover toward the rear of the drive drawer until the mounting screws pass through the openings in the safety cover.
5. Lift the rear of the safety cover up and away from the drive drawer.
6. Set the safety cover to the side.

Clamping the Plenum Supply Hose

1. Locate the plenum **3** and identify the plenum supply hose. The plenum supply hose **4** is the hose with the largest diameter connected to the plenum (top hose, closest to the pressure sensor).
2. Using the hose clamp tool (part 2496268) **5**, clamp the hose as it leaves the plenum. Ensure that the plenum supply hose does not separate from the plenum before it is clamped.

Warning: Remove the clamp from the plenum supply hose slowly so you do not affect the air pressure in the adjacent drive in the tape unit. Rapidly removing the plenum supply hose clamp can cause pressure to drop in the adjacent drive, causing a 'Check 46' error.

3. Return to the procedure that sent you here.



Tape Lifter Solenoid Response Checking Procedure

You have been directed to this page by the maintenance device (MD) to check the response time of the tape lifter solenoid. A dual trace oscilloscope is needed for this checking procedure.

The dropout response time of the tape lifter solenoid is measured from the time the tape lifter solenoid is electrically turned off (the dropping of '+ lifter on'), until the start of read signal. This dropout response time must be longer than 2.5 milliseconds but not longer than 14 milliseconds.

When directed by the MD, proceed as follows:

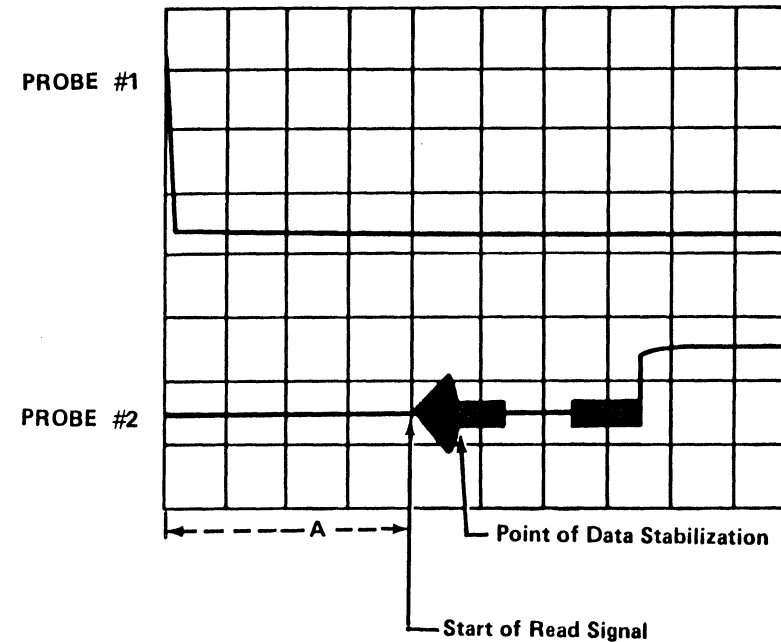
1. Oscilloscope setup:
 - chop
 - sync minus (-) on probe #1
 - 2 msec/div
 - trigger minus (-)
2. Place probe #1 on logic board 02A-A1C1E11 ('+ lifter on' signal). Sync the oscilloscope minus on this signal.
3. Check logic card position 02A-A1D2 of the drive you are testing for the presence of a logic card.
4. Place probe #2 on the logic board pin you select from the charts on this page.
5. Observe the time (labeled 'A' in the scope figure on this page) from the start of the trace ('+ lifter on' signal going minus), until the start of read signal on the read bus.

This time must be longer than 2.5 milliseconds but not longer than 14 milliseconds.

6. If the time (A) is longer than 14 milliseconds, the solenoid is dropping too slowly (suspect a defective solenoid).
7. If the time (A) is shorter than 2.5 milliseconds, the solenoid is dropping too rapidly (suspect loss of air to the lifter or a defective solenoid).
8. Correct operation of this check can be verified by pinching the air hose between the solenoid and lifter while observing the oscilloscope trace. (This will shorten the time required for the read signal to stabilize on the read bus.)
9. Observe that the read signal amplitude does not vary after the point of data stabilization. The time between start of read signal and the point of data stabilization may vary from drive to drive.

A1D2 LOGIC CARD PRESENT			
MD Connected to CU0		MD Connected to CU1	
Drive Addr 0-7	Drive Addr 8-F	Drive Addr 0-7	Drive Addr 8-F
Probe #2 on J2D07	Probe #2 on J2B07	Probe #2 on J2B07	Probe #2 on J2D07

A1D2 LOGIC CARD NOT PRESENT			
MD Connected to CU0		MD Connected to CU1	
Drive Addr 0-7	Drive Addr 8-F	Drive Addr 0-7	Drive Addr 8-F
Probe #2 on H2D07	Probe #2 on H2B07	Probe #2 on H2B07	Probe #2 on H2D07



NOTES

CE panel

NOTES

CARR-DR 3-2

0 0 0 0 0 0 0 0 0 0 0

Device Interconnection Checks

Error Description

An error was detected on the device interconnection bus.

Error Condition Theory

A malfunction at any drive or at the control unit may appear as a single drive or multiple drive problem. (Check code 82 is a prime example of this symptom.) In this instance the maintenance device (MD) code and functional microcode cannot perform stand-alone problem determination and require assistance from the service representative.

Problem Determination

When routed to the MAP for problem determination by an error code pointing to device data bus problems, the MD will attempt to communicate with each drive attached to the control unit. The results of this test are entered in a status table and an error code table which are displayed to the service representative on the MD keyboard display.

Display Examples

DRIVE	01234567	STATUS DISPLAY
STATUS	BGGFBFFG	

ERRORS ON THIS PASS	ERROR DISPLAY
8007 123	
800C 4	
8005 56	

Problem determination is accomplished by the process of elimination. The service representative should analyze the display on the MD keyboard/display to determine the error and what drives are presenting the error. For instance, an error code of 8007 implies that the drive will not communicate with the MD. If the display shows that drives 0 through 3 are not in the 8007 error code list but that drives 4 through 7 are; this indicates a break between drives 3 and 4. The service representative should concentrate his efforts on locating the break (loose cable or broken wire).

If the error code is other than 8007, there may be hot bits or an open on the bus. By breaking the bus apart, that error code will go away when the faulty drive is disconnected. However, note that the drives beyond the break will assume an error code of 8007.

The MD isolation routine is designed to be interactive so new displays may be obtained after each disconnect/reconnect action.

Bus identification is as follows:

- If the MD is connected to control unit 0, drives 0-7 are on the local bus and drives 8-F are on the remote bus.
- If the MD is connected to control unit 1, drives 0-7 are on the remote bus and drives 8-F are on the local bus.

At the end of each pass, the MD will display a suggested FRU list to the service representative on demand.

Supplemental Data

DEVICE INTERCONNECTION BUS FUNCTIONS

- a) Send and receive device addresses
- b) Receive alerts from devices
- c) Send and receive device tags
- d) Receive device status
- e) Send write data to the devices

The bus is divided into two categories:

- A) Device Tags
 - 1) Select Out
 - 2) Status In
 - 3) Address In
 - 4) Address Out
 - 5) Gap In/Out (Bi-directional)
 - 6) Clock A Out
 - 7) Clock B In/Out (Bi-directional)
 - 8) Command Out
 - 9) Repositioning In
- B) Device Data (Bi-directional)
 - 1) Status data
 - 2) Write data
 - 3) Address data

Tape Unit and Drive FRUs That Are EC Sensitive

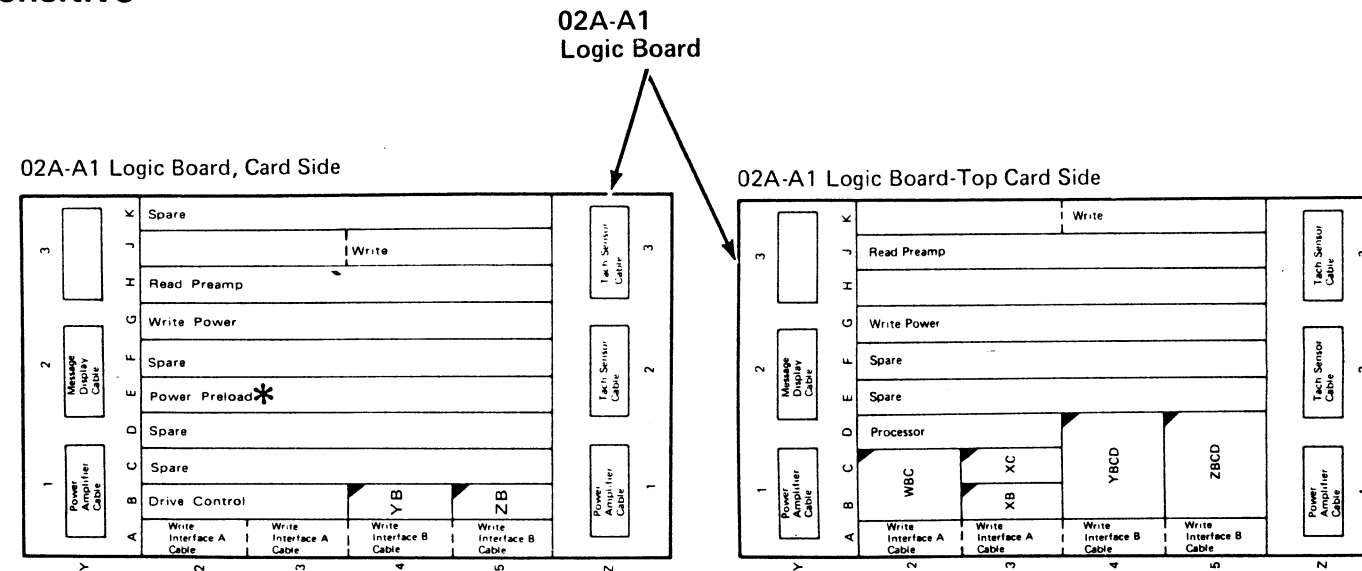
This page contains a listing of the FRUs that are engineering change (EC) sensitive.

Due to changes in manufacturing and in the level of the diskettes used in the maintenance device (MD), invalid FRUs may be selected by the maintenance package. With the procedures on this page you will be able to select the correct FRU to be exchanged in your drive.

FRU Selection Procedure

1. Open the drive drawer (see CARR-DR 2-5) and remove the the card side cover mounting screws and remove the card side cover (see CARR-DR 640).
2. Compare the arrangement of the logic cards and TCCs in your drive with the figures on this page.
3. Use the charts under figure selected to choose the correct FRU to be exchanged on your drive.

Note: There may be tape units at different EC levels in the subsystem. Ensure the logics you are using have the same serial number as the tape unit you are working on.



Engineering Change (EC) 333293 Installed

- **FRU062**
Exchange logic card 02A-A1H2 (see CARR-DR 640).
- **FRU063**
Exchange logic card 02A-A1J4 (see CARR-DR 640).
- **FRU064**
Exchange logic card 02A-A1G2 (see CARR-DR 640).

Note: The multicolor read bus cables plug into the 02A-A1G2 card.

- **FRU079**
Exchange 'DC Power Distribution Cable (Drive Internal)' (see CARR-DR 790).
- **FRU085**
Exchange logic card 02A-A1B2 (see CARR-DR 850).
- **FRU110**
Exchange the drive thermal switch with new style thermal switch (see CARR-DR 1100 or 1105).
- **FRU128**
Exchange logic card 02A-A1E2 (see CARR-DR 640).
- **FRU267, 268**
These FRUs are top card connectors (TCC) used on drive logic cards with EC 333293 installed (see CARR-DR 660).
- **FRU269**
This FRU is not required at this EC level.

- Power, preload card not used in machines containing power supply part number 6177166 or 6177167.

Engineering Change (EC) 333293 Not Installed

- **FRU062**
Exchange logic cards 02A-A1H2 and 02A-A1J2 (see CARR-DR 640).
- **FRU063**
Exchange logic card 02A-A1K4 (see CARR-DR 640).
- **FRU064**
Exchange logic card 02A-A1G2 (see CARR-DR 640).

Note: The multicolor read bus cables plug into the 02A-A1H2 card.

- **FRU066, 067, 068, 069, 070**
These FRUs are top card connectors (TCC) used on drive logic cards without EC 333293 installed (see CARR-DR 660).
- **FRU079**
Exchange 'DC Power Distribution Cable (Drive Internal)' (see CARR-DR 790).
- **FRU085**
Use the 'Fix ID Table' (see CARR-DR 5) to determine the correct FRU to be exchanged.
- **FRU110**
Exchange the drive thermal switch with the old style thermal switch (see CARR-DR 1100).
- **FRU128**
This FRU (02A-A1E2) does not exist in the drive at this EC level.
- **FRU269**
This FRU may be required when exchanging FRU079 on tape units without EC 333293 installed (see CARR-DR 2690).

Tape Unit and Drive Power Off and Power On Procedures

This page contains the steps needed to remove and replace power for the tape unit and drive of the 3480 Tape Subsystem.

To power Off: first complete the "Power Off Procedure" on this page, then go to the desired section:

- Tape Unit Power Off
- Drive Power Off

To power On: go to the desired section:

- Tape Unit Power On
- Drive Power On

With an automatic cartridge loader installed and a cartridge at the feed station, the cartridge is loaded into the feed station and the Attention bar LEDs on the automatic cartridge loader blink when the drive is powered on.

To clear the cartridge press the Start button. The cartridge is returned to the feed station and the Attention LEDs will stop blinking.

Power Off Procedure

1. Verify that all paths to the failing tape unit or drive are offline to the operating systems through the local control unit.
2. Verify that all paths to the failing tape unit or drive are offline to the operating systems through the remote control unit.

Tape Unit Power Off

1. Open the tape unit front cover (see CARR-DR 2-1 or 2-3).
2. Set both drive Online/Offline switches to Offline (see LOC 1).
3. If there is a cartridge in any drive, remove it using the following three steps:
 - a. Set the drive Ready/Not Ready switch to Not Ready (see LOC 1).
 - b. Press the drive Unload switch (see LOC 1).
 - c. If you were sent here by CART, go to step 4.
 - d. Remove the cartridge from the drive. If the cartridge cannot be removed, go to "Cartridge Removal By Hand" on CART 10; return here after the cartridge has been removed.

DANGER
Electric shock. Hazardous voltages are present on the AC Power circuit breaker and on the AC Power cord.

Tape Unit Without BM 6460006 (see CARR-DR 9)

4. Remove the front safety cover and ground connector (see CARR-DR 2-3).

Tape Unit With BM 6460006 (see CARR-DR 9).

5. Loosen the screws in the circuit breaker access cover and pivot the cover clockwise to get access to the circuit breaker (see CARR-DR 2-2).
6. Set the tape unit ac power circuit breaker to Off (see LOC 1).
7. Return to the procedure that sent you here.

Drive Power Off

1. Open the tape unit front cover (see CARR-DR 2-1 or 2-3).
2. Set the drive Online/Offline switch to Offline (see LOC 1).
3. If there is a cartridge in the drive, remove it using the following three steps:
 - a. Set the drive Ready/Not Ready switch to Not Ready (see LOC 1).
 - b. Press the drive Unload switch (see LOC 1).
 - c. If you were sent here by CART, go to step 4.
 - d. Remove the cartridge from the drive. If the cartridge cannot be removed, go to "Cartridge Removal By Hand" on CART 10; return here after the cartridge has been removed.

DANGER
Electric shock. The Drive Power switch removes dc voltages (both ac and dc voltages on tape units without BM 6460006 (see CARR-DR 9)) to that drive only and does not affect the other drive in the tape unit.

4. Set the Drive Power switch to Off (see LOC 1).
5. Return to the procedure that sent you here.

Tape Unit Power On

1. Set the tape unit ac power circuit breaker to On (see LOC 1).

Tape Unit Without BM 6460006 (see CARR-DR 9)

2. Replace the front safety cover and ground connector (see CARR-DR 2-4).

Tape Unit With BM 6460006 (see CARR-DR 9).

3. Pivot the circuit breaker access cover counterclockwise to close the cover and tighten the access cover screw (see CARR-DR 2-2).
4. Return to the procedure that sent you here.
5. Set each Drive Power switch to On (see LOC 1).
6. Set each drive Online/Offline switch to Online (see LOC 1).
7. Close the tape unit front cover (see CARR-DR 2-2 or 2-4).
8. Continue by selecting one of the following:
 - If you were sent to this procedure by the maintenance device (MD), return to the MD and press the ENTER key.
 - If you were sent to this procedure by the Maintenance Information, return to the MAP or procedure that sent you here.

Drive Power On

1. Set the Drive Power switch to On (see LOC 1).
2. Set the drive Online/Offline switch to Online (see LOC 1).
3. Close the tape unit front cover (see CARR-DR 2-2 or 2-4).
4. Continue by selecting one of the following:
 - If you were sent to this procedure by the maintenance device (MD), return to the MD and press the ENTER key.
 - If you were sent to this procedure by the Maintenance Information, return to the MAP or procedure that sent you here.

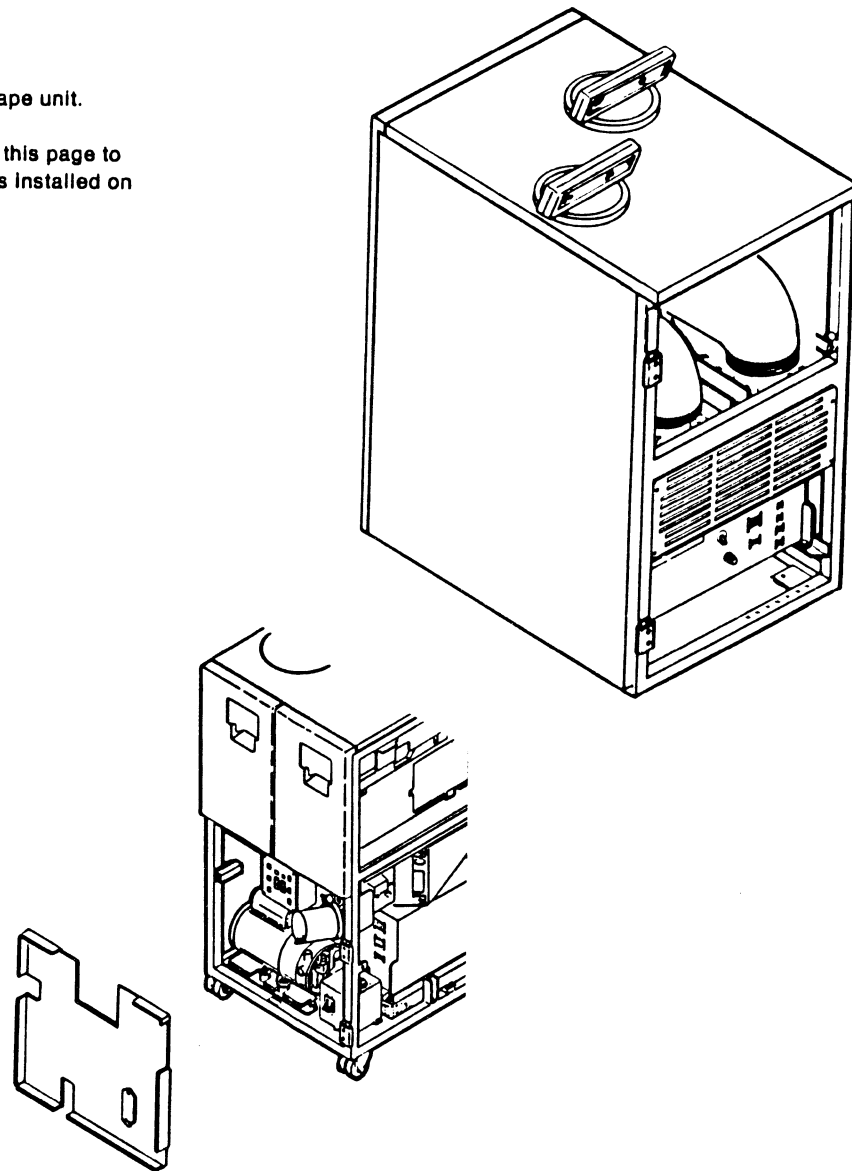
Procedure for Determining If BM 6460006 Is Installed On Tape Unit

Due to changes in manufacturing there may be more than one style of tape units installed on a subsystem.

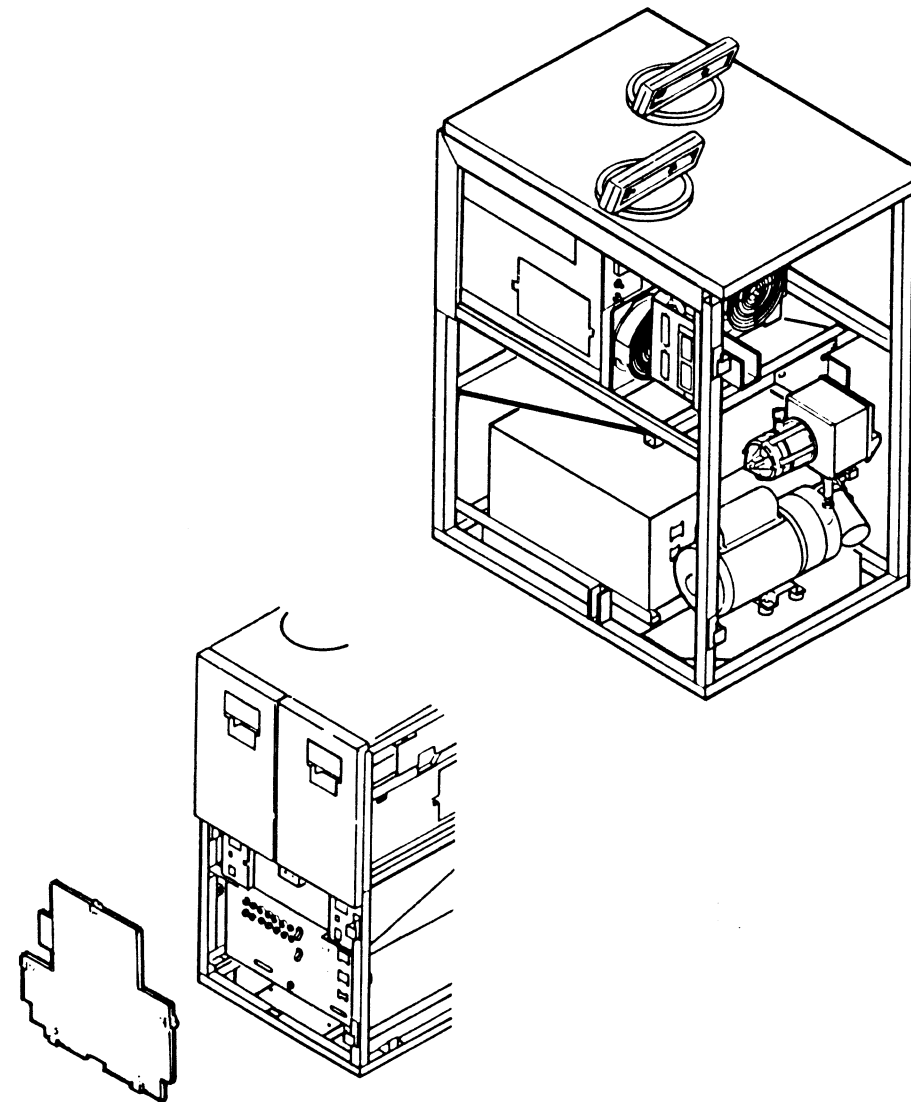
With the procedures on this page you will be able to determine if BM 6460006 is installed on your tape unit.

Determining If BM Is Installed

1. Open the front and/or rear cover(s) of the tape unit.
2. Compare your tape unit with the figures on this page to determine if Bill of Material (BM) 6460006 is installed on your tape unit.
3. Return to the procedure that sent you here.



Bill of Material (BM) 6460006 Installed



Bill of Material (BM) 6460006 Not Installed

Drive CARR-DR 9

FRU001 Threader Assembly Removal and Replacement Procedure

This page contains the steps needed to remove and replace the threader assembly **15** in the drive. It is necessary to remove some of the parts in the machine reel area.

Note: This FRU can be removed and replaced without affecting the other drive by removing power from the failing drive with the Drive Power On/Off switch.

Removing the Threader Assembly.

1. Go to CARR-DR 8 for the procedure to **power off** the drive.
2. Open the drive drawer and remove the drive drawer safety cover (see CARR-DR 2-5).
3. So that we do not affect the other drive, you must clamp the plenum supply hose of the drive requiring maintenance.

Clamp the plenum supply hose (see CARR-DR 3-1).

4. Close the cartridge latch **19**. On drives with automatic cartridge loaders turn the knurled knob **1**, on the load assembly, clockwise until it stops. This releases the threader pin **4** from the interlock. Turn the threader arm **2** until it is in the position shown (at the 12 o'clock position). This moves the arm out of the way to prevent the arm from being broken.

5. Disconnect the two threader motor wires **9**.

Note: Label the wires to aid in their replacement. Later production drives have a red dot marking the terminal for connecting the white wire.

6. Tape path sensor B **10** is located on the threader assembly and needs to be removed. Loosen the two screws holding the sensor in position, then slide the cable and sensor away from the threader assembly, toward the front of the drive.
7. Remove the cable connector from the sensor and set the sensor to the side. Push the cable back through the sensor B mounting bracket.
8. Because the tension transducer hose **7** and the left bearing guide hose pass through the threader, they must be removed. Disconnect the hoses from the tension transducer and the left bearing guide. Push the hoses through the threader assembly and disconnect their other ends from the plenum **18**.

9. Remove the two machine reel tape guide mounting screws **13**, then release the machine reel tape guide pin from the center tape guide by pulling it straight up. Slide the machine reel tape guide **6** out of the drive.
10. The tape lifter solenoid **5** is installed on the threader assembly. Disconnect the two hoses from the solenoid and move them out of the way. Remove the single screw holding the solenoid to the threader and move the solenoid out of the way.

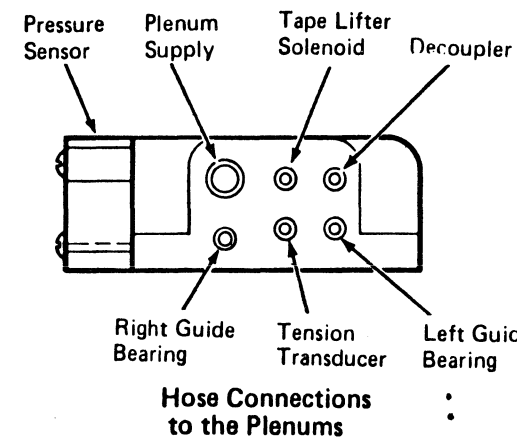
11. The threader is fastened to the base plate with three screws **11**. All three screws are partially out of view and must be accessed at an angle. Ensure that the screwdriver does not slip and cause personal injury or damage the screw. The first screw to be removed is near the plenum. It is easier to remove the screw if you first remove the hoses that cover it. Remove the hoses from the plenum and move them out of the way. Remove the screw and set it to the side.

The other two screws can be seen by turning the machine reel. Turn the reel and remove the two screws. Do not remove the threader assembly at this time; it is necessary to remove the machine reel first.

The lower flange **14** must be removed to remove the threader. The machine reel is between the cartridge latch assembly and the threader assembly.

Note: To remove the machine reel, the threader assembly must be lifted off the base plate approximately one inch. Loosen the threader from the locating pins and lift the threader and remove the machine reel.

12. The lower flange **14** is held on by the machine reel hub **16** and upper flange **17**, which in turn, is held by two screws. Remove the two screws and upper flange. The machine reel hub and machine reel can be easily damaged, do not use any tools to remove the hub. Use your thumbs and use pressure as shown and at the same time lift the hub off the hub mount.
13. Lift the threader assembly **15** off the baseplate.



Replacing the Threader Assembly.

1. Prepare the replacement threader assembly **15** for installation by turning the threader arm **2** to the position shown (to the 12 o'clock position).

To turn the arm, hold the base of the threader assembly in one hand and turn the arm with the other.

2. Temporarily place the threader assembly on the base plate. Do not attach the screws at this time.
3. To install the machine reel flange (lower) on the machine reel hub, lift the edge of the threader assembly nearest the machine reel.

Place the machine reel flange (lower) **14**, the machine reel hub **16** and the machine reel flange (upper) **17** on the mounting hub and install but do not tighten the two screws. Be careful not to scratch the hub or reel.

Inspect the alignment of the hub opening to the flange openings **12** and if necessary, adjust the flanges so that the hub opening is centered over the flange openings **12**. Tighten the two screws holding the upper machine reel flange and the machine reel hub.

Warning: The installation of the machine reel tape guide (FRU227) and the tape center guide (FRU 231) is sequence sensitive, and they must be installed in the correct order for correct adjustment.

4. Go to CARR-DR 2270 and do the procedure for installing the machine reel tape guide **6** and the mounting screws **13**; return here when finished.
5. Install the three threader mounting screws **11**, turning the machine reel as needed to get to the screws. Use caution when installing the screws to avoid cross-threading. Also use care when tightening to ensure that the screwdriver does not slip, causing personal injury or damage to the screws.
6. Place the tape lifter solenoid **5** on the threader assembly (with the 'out' port of the solenoid toward the rear of the drive) and install the mounting screw. (If the threader assembly has two holes, use the one on the left side.)

7. Connect the two hoses to the tape lifter solenoid.
8. Connect the tension transducer hose **7** to the tension transducer **8** and the left bearing guide hose to the left bearing guide. Insert the hoses through the threader assembly base toward the plenum, then reconnect the hoses to the plenum **18**.
9. If any other hoses were removed for access to the threader mounting screw near the plenum, move them back to their original places and reconnect them to the plenum.
10. Install tape path sensor B **10** onto the threader assembly.

Note: Ensure that the polarity markings on the cable connector and the sensor match.

Push the cable through the threader assembly sensor B mounting bracket toward the front of the drive. Plug the sensor onto the cable connector and slide the sensor and cable connector into the sensor B mounting bracket. Align the edges so the edges of the sensor are flush with the threader assembly, then tighten the screws to hold the sensor in place.

11. Connect the two wires to the threader assembly motor **9**. The white wire goes to the terminal labeled '1', and the black wire goes to the terminal labeled '2'.
12. Move the interlock and receiver into the position shown **3**.
13. Turn the threader arm clockwise to move the threader pin **4** into the receiver.

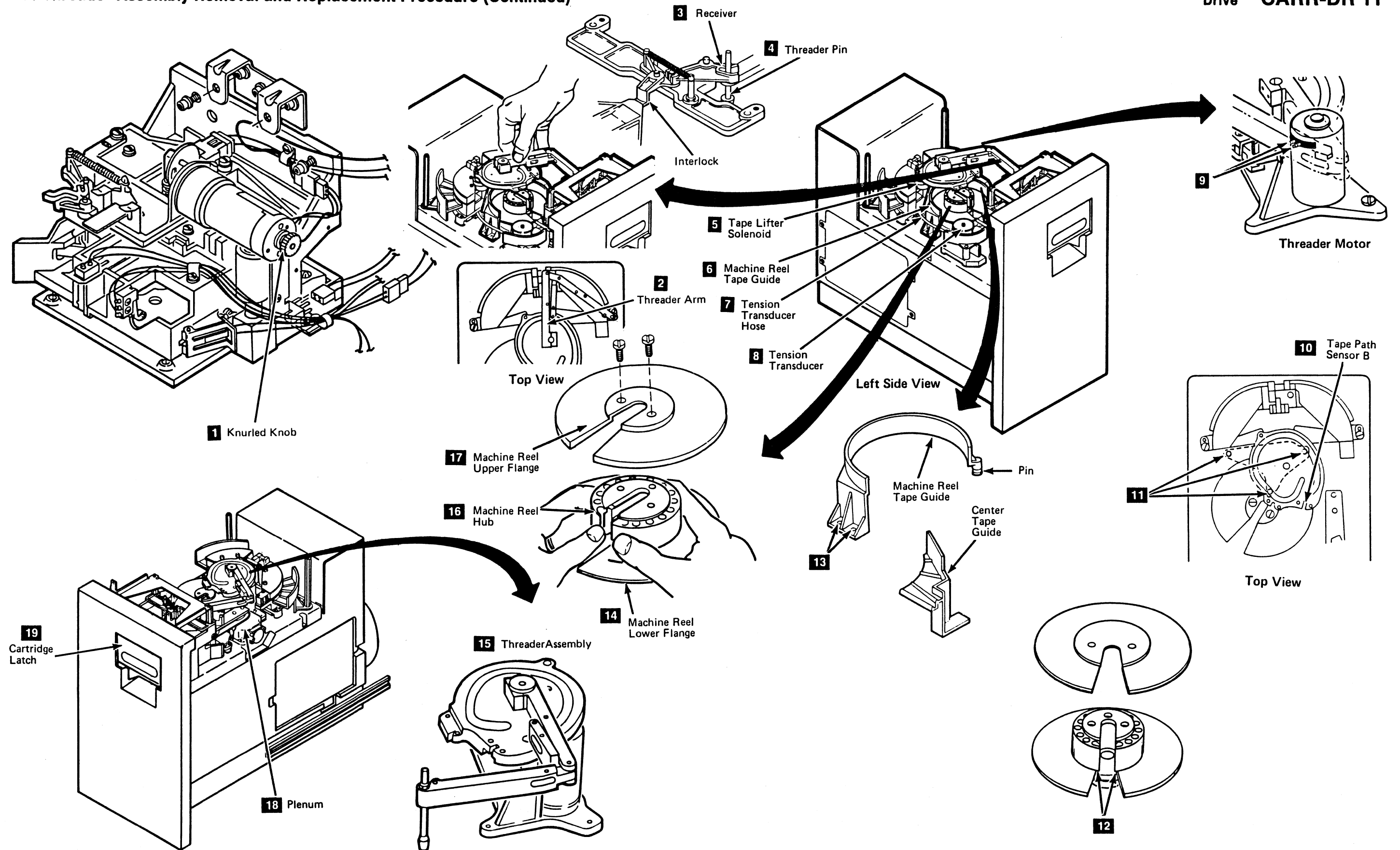
On drives with the automatic cartridge loaders turn the knurled knob **18**, on the load assembly, counterclockwise until the knob stops. This opens the cartridge latch and interlocks the threader pin **3**.

On drives without the automatic cartridge loaders check by opening and closing the cartridge latch **19**. The latch can be opened only if the threader pin has released the interlock and is in the correct location.

14. Remove the clamp from the plenum supply hose.
15. Install the drive safety cover and close the drive drawer (see CARR-DR 2-5).
16. Go to CARR-DR 8 for the procedure to **power on** the drive.

FRU001 Threader Assembly Removal and Replacement Procedure (Continued)

Drive CARR-DR 11



FRU002 Cartridge Latch Solenoid Removal and Replacement Procedure

This page contains the steps needed to remove and replace the cartridge latch solenoid **4** (TU-D0/1-DK-Tray Solenoid) from the cartridge latch assembly.

Note: This FRU can be removed and replaced without affecting the other drive by removing power from the failing drive with the Drive Power On/Off switch.

Removing the Cartridge Latch Solenoid

1. Go to CARR-DR 8 for the procedure to **power off** the drive.
2. Open the drive drawer and remove the drive drawer safety cover (see CARR-DR 2-5).

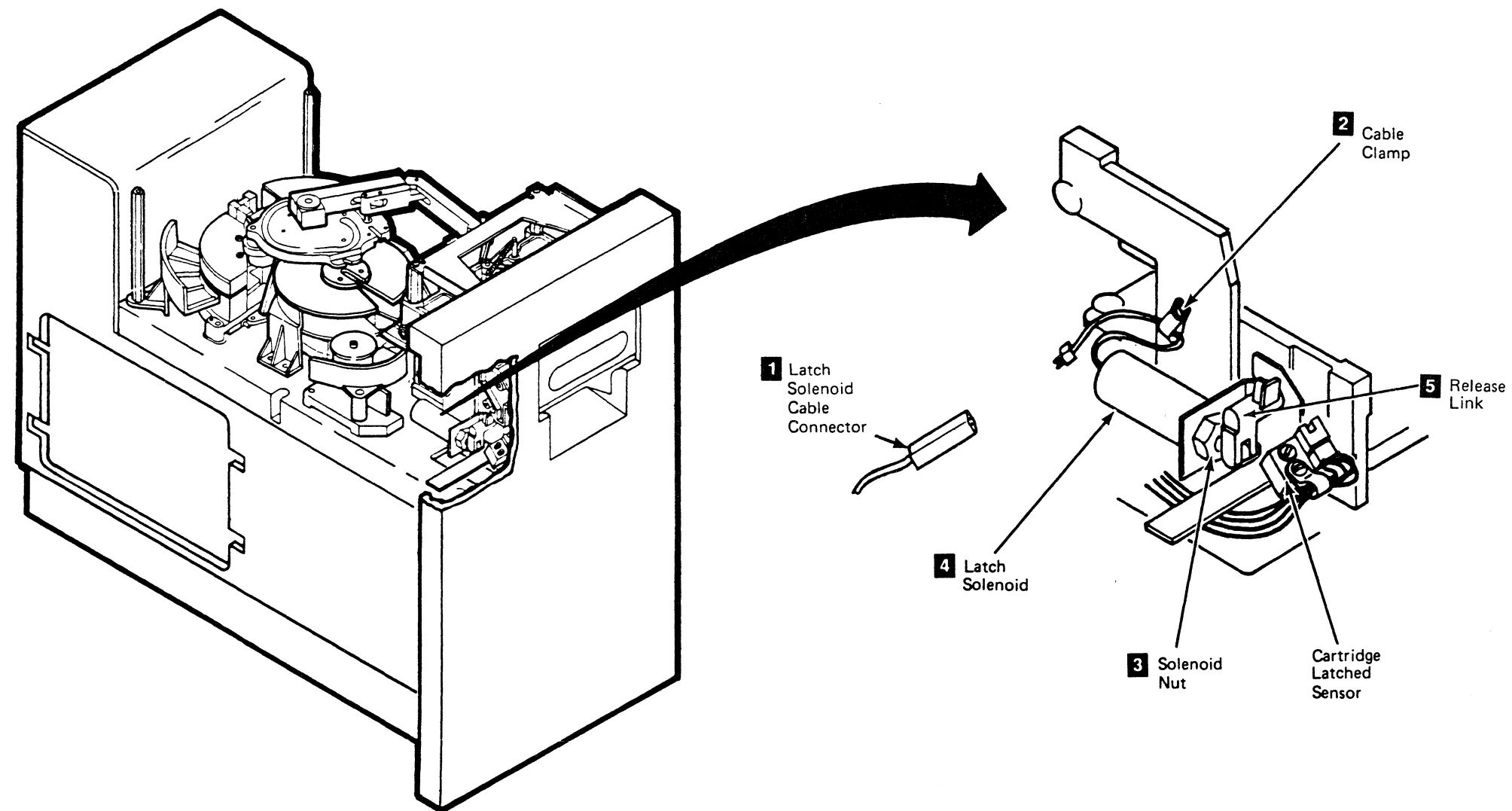
The latch solenoid is found at the left side of the cartridge latch assembly. It is not necessary to remove the drive drawer cover to change the solenoid.

3. Remove the screw from the cable clamp **2**, remove the wires from the clamp and set the clamp and screw to the side.
4. Disconnect the latch solenoid cable connector **1**.
5. Loosen the solenoid nut **3**, then remove the cartridge latch solenoid **4** and the lockwasher from the mounting bracket.
6. Move the solenoid plunger forward and remove the solenoid plunger from the release link **5**. Be careful that the solenoid nut does not fall into the drive.
7. Remove the solenoid nut from the plunger.

Replacing the Cartridge Latch Solenoid

1. Place the solenoid nut **3** in position on the bracket.
2. Slide the solenoid plunger through the bracket and nut and onto the release link **5**. The slot in the spring pin should be facing down.
3. Slide the cartridge latch solenoid **4** and lockwasher onto the latch assembly rod.
4. Attach the solenoid to the bracket using the solenoid nut **3**. Tighten the solenoid nut.

5. Insert the cable into the cable clamp **2**.
6. Place the cable clamp and retaining screw in position and tighten the screw.
7. Connect the cartridge latch solenoid cable connector **1**.
8. Install the drive drawer safety cover (see CARR-DR 2-5) and close the drive drawer.
9. Go to CARR-DR 8 for the procedure to **power on** the drive.



FRU003 File Reel Motor Removal and Replacement Procedure

Drive CARR-DR 30

This page contains the steps needed to remove and replace the file reel motor **1** (TU-File Reel Motor). The motor will be removed through the front of the drive drawer.

Note: This FRU can be removed and replaced without affecting the other drive by removing power from the failing drive with the Drive Power On/Off switch.

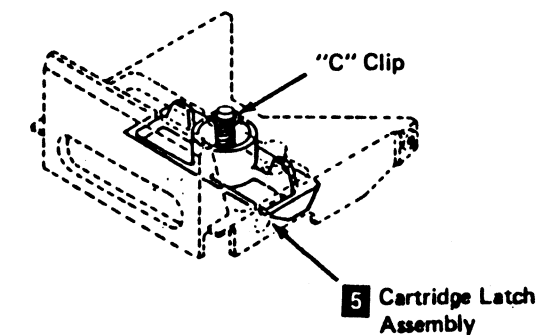
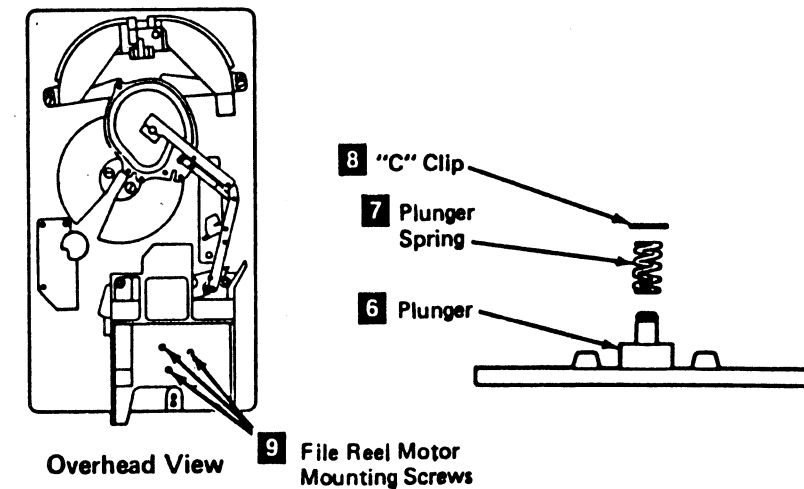
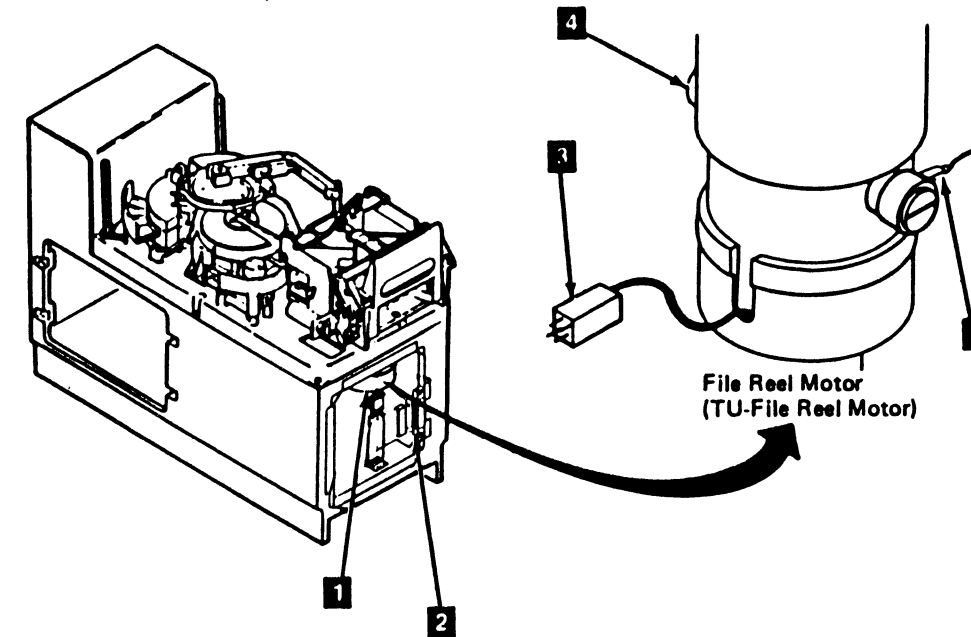
Removing the File Reel Motor

1. Go to CARR-DR 8 for the procedure to **power off** the drive.
 2. Open the drive drawer and remove the drive drawer safety cover (see CARR-DR 2-5).
 3. On drives with automatic cartridge loaders go to CARR-DR 2850 and perform the load mechanical assembly Removal procedure, then go to CARR-DR 2820 and perform the load assembly Removal procedure. When complete return to this page, step 10.
 4. On drives without the automatic cartridge loader, remove drive drawer cover (see CARR-DR 2-1 or 2-3).
 5. Open the cartridge latch, push up on the plunger **6** and remove the "C" clip retainer **8** from the plunger shaft.
 6. Slowly lower the plunger and remove it from the cartridge latch assembly **5**.
 7. Make sure you do not lose the plunger spring **7**.
 8. Close the cartridge latch to gain access to the three file reel motor screws **9**.
 9. Disconnect the black and white wires **4** from the file reel motor.
- Note:** The white wire is removed from the terminal with the red marking. You cannot see the red mark until the motor is removed from the drive; therefore on replacement remember which terminal has the red mark.
10. Disconnect the tachometer sensor cable from the file reel motor at the connector **3**.
 11. Hold the file reel motor with one hand and at the same time loosen and remove the three file reel motor screws **9**.
 12. Remove the file reel motor by turning it counterclockwise approximately 1/4 of a turn and at the same time lowering and tilting the motor to remove it through the front of the drawer **2**.

Replacing the File Reel Motor

1. On drives without the automatic cartridge loaders verify that the cartridge latch is closed. If the latch is open, the mounting screw holes will not be visible.
 2. Pass the file reel motor through the opening in the front of the drive drawer **2**.
 3. Hold the file reel motor **1** against the base plate and at the same time turn the file reel motor clockwise until the motor mounting holes are aligned with those in the base plate.
 4. Install the three mounting screws **9**.
 5. Reconnect the tachometer sensor cable to the file reel motor at the connector **3**.
 6. Reconnect the white and black wires **4** to the file reel motor. The white wire is installed on the terminal with the red marking.
- Note:** The white goes to the terminal marked with the red dot. If there is a white shrink wrap on one of the two wires, that is the white wire; otherwise the white colored wire is the white wire.
7. On drives with the automatic cartridge loaders go to CARR-DR 2820 and perform the load assembly Replacement procedure. When complete go to CARR-DR 2850 and perform the load mechanical assembly Replacement procedure. Go to step 12.
 8. On drives without the automatic cartridge loaders install the plunger spring **7** on the plunger.
 9. Open the cartridge latch and insert the plunger **6** into the cartridge latch assembly **5**.
 10. Push up on the plunger to extend the shaft above the latch tray and install the "C" clip retainer **8**.
 11. Install the drive drawer cover (see CARR-DR 2-2 or 2-4).
 12. Install the drive drawer safety cover (see CARR-DR 2-5) and close the drive drawer.
 13. Go to CARR-DR 8 for the procedure to **power on** the drive.

Note: Drive safety cover is not shown.



This page contains the steps needed to remove and replace the machine reel motor 5 (TU-Machine Reel Motor). The threader assembly needs to be removed to permit the machine reel motor to be removed.

Note: This FRU can be removed and replaced without affecting the other drive by removing power from the failing drive with the Drive Power On/Off switch.

Removing the Machine Reel Motor

1. Go to CARR-DR 8 for the procedure to power off the drive.
2. Open the drive drawer and remove the drive drawer safety cover (see CARR-DR 5).
3. Clamp the plenum supply hose (see CARR-DR 3-1).
4. Close the cartridge latch 24. On drives with the automatic cartridge loaders turn the knurled knob 21, on the load assembly motor, clockwise until it stops. This releases the threader pin 19 from the interlock.
5. Turn the threader arm 1 until it is in the 12 o'clock position 13. This moves the arm out of the way and prevents the arm from being broken.
6. Disconnect the two threader motor wires 3.

Note: Label the wires to aid in their replacement. Later production drives have a red dot marking the terminal for connecting the white wire.

7. Tape path sensor B 2 is located on the threader assembly. Loosen the two screws holding the sensor in position, then slide the cable and sensor away from the threader assembly, toward the front of the drive.
8. Remove the cable connector from the sensor and set the sensor to the side. Push the cable back through the sensor B mounting bracket.
9. Since tension transducer hose 10 and the left bearing guide hose pass through the threader, they must be removed. Remove the hoses from the tension transducer and the left bearing guide. Push the hoses through the threader assembly and disconnect their other ends from the plenum 23.
10. Remove the machine reel tape guide 11 by removing the two mounting screws, then release the center tape guide pin from the center tape guide 8 by pulling it straight up. Slide the machine reel tape guide out of the drive and set it to the side.
11. The tape lifter solenoid 12 is located on the threader assembly near the read/write head. Disconnect the two hoses from the solenoid and move them out of the way. Remove the single screw holding the solenoid to the threader and move the solenoid out of the way.
12. The threader is fastened to the base plate with three screws 4; all are partially out of view and must be accessed at an angle. Ensure that the screwdriver does not slip and cause personal injury or damage the screw. The first screw to remove is near the plenum. It will be easier to remove the screw if you first remove the hoses that cover it. Remove the hoses from the plenum and move them out of the way; then remove the screw. The other two screws can be seen by turning the machine reel. Turn the reel and remove the two screws. Do not remove the threader assembly at this time; it is necessary to remove the machine reel first.
13. Next, remove the machine reel lower flange so the threader can be removed. The machine reel area is between the cartridge latch assembly and the threader assembly.
14. The machine reel lower flange is held on by the machine reel hub, and upper flange which, in turn, is held by two

screws. Remove the two screws 7. The machine reel hub and the machine reel flange can be easily damaged; do not use any tools to remove the hub. Use your thumbs and use pressure as shown. At the same time lift the hub off the hub mount.

15. To remove the machine reel lower flange, the threader assembly must be lifted off the base plate approximately one inch. Lift the threader and remove the flange.
16. Lift the threader assembly off the base plate and set it to the side.
17. Remove the tension transducer tape guide 9 (see CARR-DR 2300), or the tension transducer (see CARR-DR 140).
18. Remove the center tape guide 8. It is also fastened to the base plate with one screw.

CAUTION
The machine reel motor may be hot.

19. There are three screws holding the machine reel mounting bracket to the base plate. Remove these three screws.
20. The tach sensors 6 should be removed next. There are two screws holding each sensor. Remove the screws holding the sensors.
21. Lift the sensors off the machine reel mounting bracket and disconnect the cable connectors from the sensors. If the cables are not labeled, mark them at this time.
22. Lift the machine reel motor off the base plate far enough to push the sensor cables through the bracket. After the cables are free of the bracket, lay them on the base plate.
23. Lift the machine reel motor off the base plate far enough to remove the two motor wires. The machine reel motor can now be removed from the drive.

Replacing the Machine Reel Motor

1. Move the machine reel motor 5 into position, but do not lower it to the base plate at this time.
2. Find the black and white wires that attach to the machine reel motor. Lift and attach them to the terminals on the machine reel motor.

Note: The white wire goes to the terminal marked with the red dot. If there is white shrink wrap on one of the two wires, that is the white wire; otherwise the white colored wire is the white wire.

3. Before lowering the motor to the base plate, push the tach sensor cables up through the openings in the machine reel motor mounting bracket.
4. Lower the machine reel motor to the base plate and install the three mounting screws.

5. Connect the tach sensors to the cable connectors and lower the sensors to the machine reel motor mounting bracket 6.

Note: Ensure that the polarity markings on the cable connector and the sensor match.

6. Install the four screws to hold the two sensors but do not tighten them at this time. They need to be adjusted to permit the machine reel to turn.
7. Temporarily install the machine reel lower flange 14 on the machine reel mounting hub. Do not install the machine reel hub or upper flange or the two screws at this time.
8. Adjust tach sensors A and B so the machine reel lower flange will turn and not touch the sensor 15 as it turns. Tighten the sensor mounting screws when you have the sensors adjusted correctly.
9. Remove the machine reel lower flange from the mounting hub.
10. Install the tension transducer tape guide or tension transducer 9.
11. Install the center tape guide 8. It is fastened with one screw.
12. Temporarily place the threader assembly 22 on the base plate. Do not attach the screws at this time.
13. Place the machine reel lower flange 14, the machine reel hub 16, and upper flange on the mounting hub and install, but do not tighten, the two screws 18. Be careful not to scratch the hub or reel.

Inspect the alignment of the hub opening to the flange opening 17 and if necessary, adjust the flange so that the hub opening is centered over the flange opening 17. Tighten the two screws 18 on the machine reel upper flange.

Warning: The installation of the machine reel tape guide (FRU227) and the tape center guide (FRU231) is sequence sensitive and they must be installed in the correct order for correct adjustment.

14. Go to CARR-DR 2270 and do the procedure for installing the machine reel tape guide 11 and mounting screws, return here when finished.

15. Install the three threader mounting screws 4, turning the machine reel as needed to get access to the screws.

16. Place the tape lifter solenoid 12 on the threader assembly (with the 'out' port of the solenoid toward the rear of the drive) and install the mounting screw. (If the threader assembly has two holes, use the one on the left side.) Reconnect the two hoses removed in step 11.

17. Connect the tension transducer hose 10 to the tension transducer 9 and the left bearing guide hose to the left bearing guide. Pass the other end of the hoses through the threader assembly toward the plenum, then connect the hoses to the plenum 23.

18. If any hoses were removed to get access to the threader mounting screw, move them back and reconnect them to the plenum.

19. Install tape path sensor B 2 to the threader assembly 22.

Note: Ensure that the polarity markings on the cable connector and the sensor match.

Push the cable through the threader assembly sensor B mounting bracket toward the front of the drive. Plug the sensor onto the connector and slide the sensor and cable connector into the sensor B mounting bracket. Align the edges of the sensor with the threader assembly, then tighten the screws to hold the sensor in place.

20. Connect the two wires to the threader motor 3. The white wire goes to the terminal labeled '1' and the black wire goes to the terminal labeled '2'.

21. Move the interlock and receiver 20 into the position shown.

22. Turn the threader arm clockwise to move the threader pin 19 into the receiver 20.

On drives with the automatic cartridge loaders turn the knurled knob 21, on the load assembly motor, counterclockwise until it stops. This opens the cartridge latch and interlocks the threader pin 19.

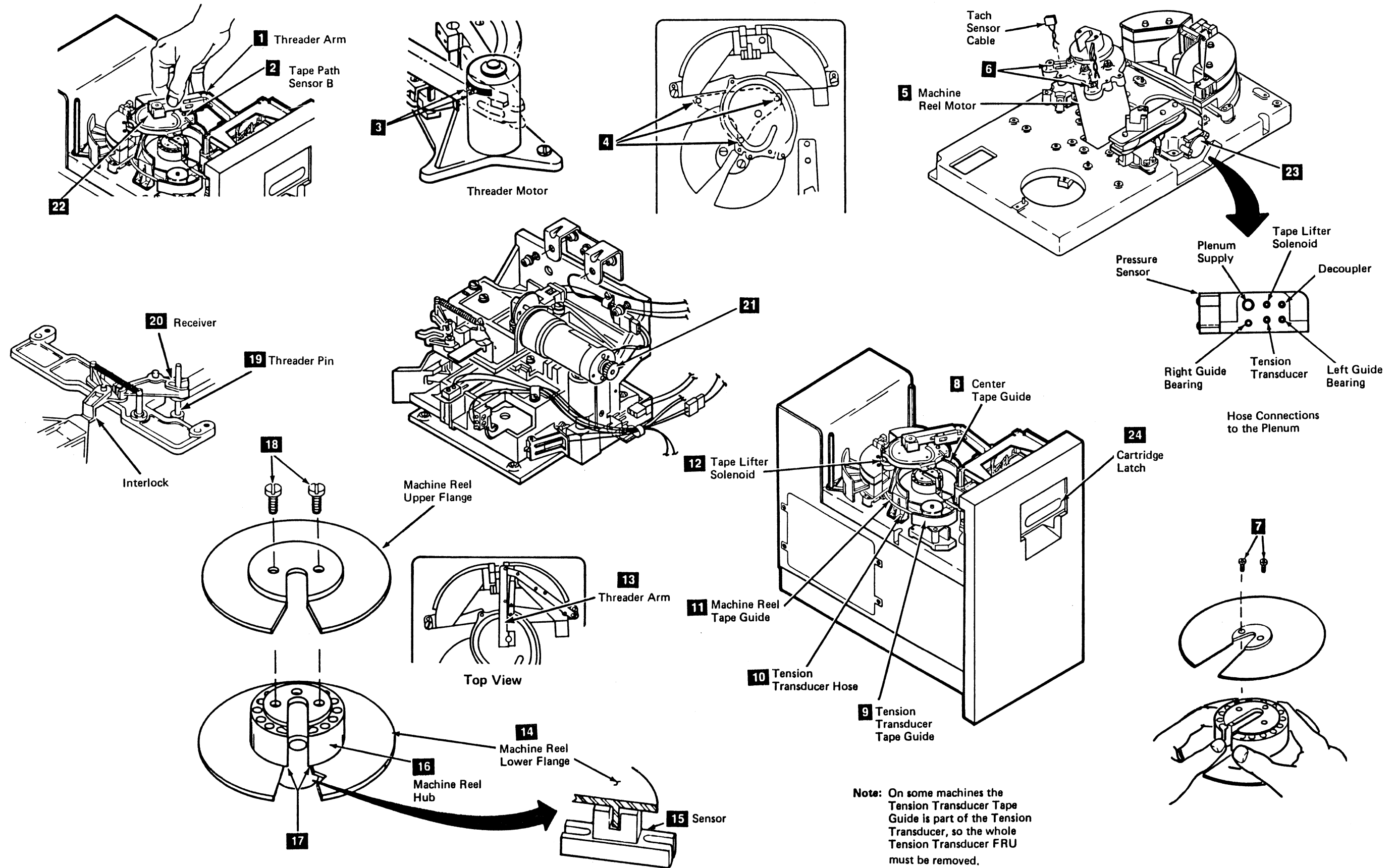
On drives without the automatic cartridge loaders check by opening and closing the cartridge latch 24. The latch can be opened only if the threader pin has released the interlock and is in the correct location.

23. Remove the clamp from the plenum supply hose.

24. Install the drive drawer safety cover (see CARR-DR 2-5) and close the drive drawer.

25. Go to CARR-DR 8 for the procedure to power on the drive.

26. Insert a scratch cartridge and observe the loading process. If any load failures occur, check the hoses and wiring.



FRU005 Machine Reel Lower Flange Removal and Replacement Procedure

This page contains the steps needed to remove and replace the machine reel lower flange **10**. To get the flange off the hub it is also necessary to loosen, but not remove, the threader assembly.

Note: This FRU can be removed and replaced without affecting the other drive by removing power from the failing drive with the Drive Power On/Off switch.

Removing the Machine Reel Flange

- Go to CARR-DR 8 for the procedure to **power off** the drive.
- Open the drive drawer and remove the drive drawer safety cover (see CARR-DR 2-5).
- Clamp the plenum supply hose (see CARR-DR 3-1).
- On drives without the automatic cartridge loaders close the cartridge latch **14**.

On drives with the automatic cartridge loaders turn the knurled knob **2** clockwise until it stops. This releases the threader pin from the interlock.
- Turn the threader arm **6** until it is in the position shown (the 12 o'clock position). This moves the arm out of the way and may prevent the arm from being broken.
- Disconnect the tension transducer hose **5** from the tension transducer. The tension transducer hose goes through the threader assembly and the threader assembly will be moved in a later step.
- Remove the two machine reel tape guide mounting screws, then release the center tape guide pin from the center tape guide by pulling it straight up. Slide the machine reel tape guide **4** out of the drive and set it to the side.

- The threader is fastened to the base plate with three screws **11**. All three screws are partially out of view and must be accessed at an angle. Ensure that the screwdriver does not slip and cause personal injury or damage the screw. The first screw to be removed is near the plenum **12**. It will be easier to remove the screw if you first remove the hoses that cover it. Remove the hoses from the plenum and move them out of the way. Remove the screw and set it to the side.

The other two screws can be seen by turning the machine reel. Turn the reel and remove the two screws.

- To remove the machine reel lower flange, the threader assembly must be lifted off the base plate approximately one inch. Lift the threader and remove the machine reel.

- The machine reel lower flange **10** is held by the machine reel hub **9** and upper flange **8**, which is held by two screws **7**. Remove the two screws and set them aside. The machine reel hub **9** and the machine reel can be easily damaged; do not use any tools to remove the hub. Use your thumbs and use pressure as shown and at the same time lift the hub off the hub mount.

Replacing the Machine Reel Flange

- Lift the threader assembly off the base plate far enough to permit the machine reel flange to be placed on the mounting hub.
- Place the machine reel lower flange **10**, machine reel hub **9** and machine reel upper flange **8** on the mounting hub and install, but do not tighten, the two screws **7**. Be careful not to scratch the hub or reel.

Inspect the alignment of the hub opening to the flange opening **13** and if necessary, adjust the flange so that the hub opening is centered over the flange opening **13**. Tighten the two screws **7** on the machine reel upper flange **8**.

Warning: The installation of the machine reel tape guide (FRU227) and the tape center guide (FRU 231) is sequence sensitive; they must be installed in the correct order for correct adjustment.

- Go to CARR-DR 2270 and do the procedure for installing the machine reel tape guide **4** and mounting screws, return here when finished.
- Install the three threader mounting screws **11**, turning the machine reel as needed to get to the screws.
- Connect the tension transducer hose **5** to the tension transducer bracket.

- If any hoses were removed to get access to the threader mounting screw, move them back to their original places and connect them to the plenum **12**.
- On drives without the automatic cartridge loaders move the interlock and receiver **1** into the position shown.

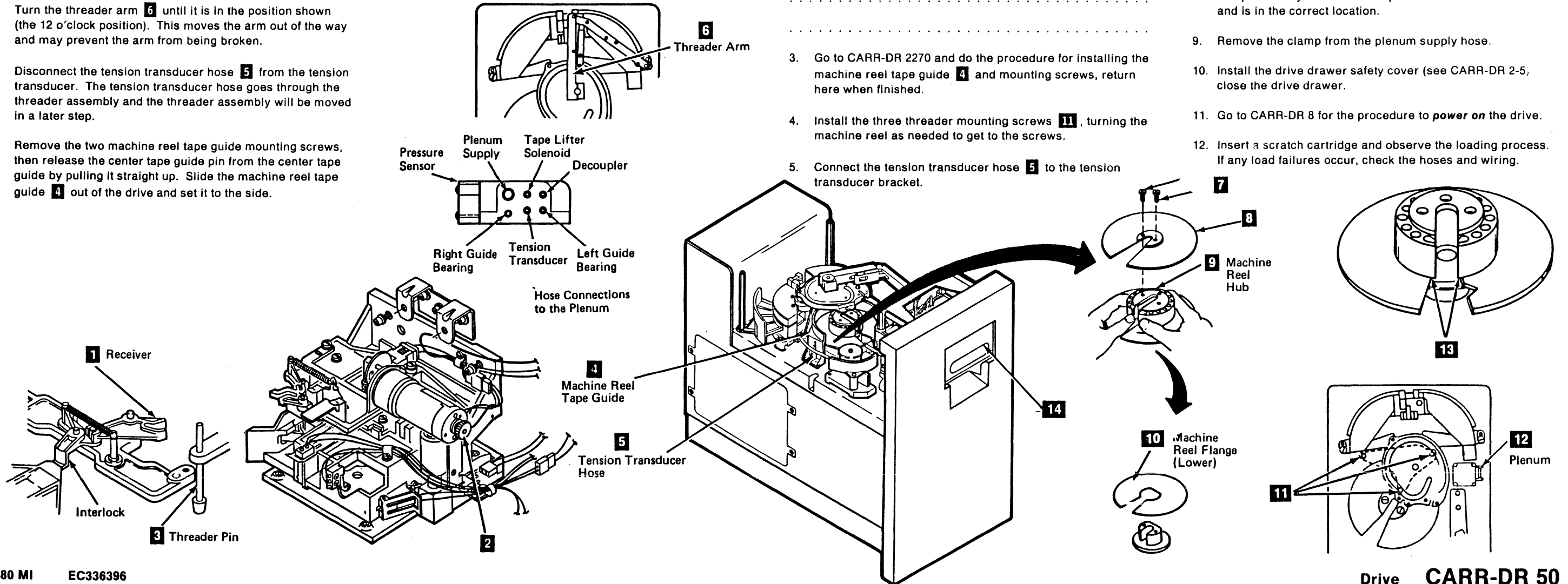
On drives with the automatic cartridge loaders make sure that the load assembly is at the lowest point by turning the knurled knob **2** clockwise until the knob stops turning freely. This permits the threader arm to engage the interlock and receiver.

- Turn the threader arm clockwise to move the threader pin **3** into the receiver **1**.

On drives with the automatic cartridge loaders turn the knurled knob **2** counterclockwise until the knob stops turning freely. This opens the cartridge latch and interlocks the threader pin **3**.

On drives without the automatic cartridge loaders check by opening and closing the cartridge latch **14**. The latch can be opened only if the threader pin has released the interlock and is in the correct location.

- Remove the clamp from the plenum supply hose.
- Install the drive drawer safety cover (see CARR-DR 2-5, close the drive drawer.
- Go to CARR-DR 8 for the procedure to **power on** the drive.
- Insert a scratch cartridge and observe the loading process. If any load failures occur, check the hoses and wiring.



FRU006 Tape Path Sensor A Removal and Replacement Procedure

Drive **CARR-DR 60**

This page contains the steps needed to remove and replace the tape path sensor A **2** (TU-DK-Tape Path Sensor A).

Note: This FRU can be removed and replaced without affecting the other drive by removing power from the failing drive with the Drive Power On/Off switch.

Removing Tape Path Sensor A

1. Go to CARR-DR 8 for the procedure to **power off** the drive.
2. Open the drive drawer and remove the drive safety cover (see CARR-DR 2-5).
3. On drives without the automatic cartridge loaders close the cartridge latch **9**.

On drives with the automatic cartridge loaders turn the knurled knob **1**, on the load assembly motor, clockwise until it stops. This releases the threader pin **4** from the receiver **3**.

4. Turn the threader arm **6** until it is in the position shown (the 12 o'clock position). This moves the arm out of the way and may prevent the arm from being broken.

Tape path sensor A **2** is located on the decoupler **8**.

5. Loosen the two mounting screws and slide the sensor out of the mounting bracket **7**.
6. Disconnect the sensor from the cable connector **5**.

Replacing Tape Path Sensor A

1. Tape path sensor A **2** is located on the decoupler **8**. Find the cable and plug the sensor into the cable connector **5**. Ensure the polarity markings match.
2. Slide the sensor into the mounting bracket **7**.
3. Align the sensor with the edge of the mounting bracket **8** and tighten the screws.

4. On drives without the automatic cartridge loaders ensure that the cartridge latch is closed.

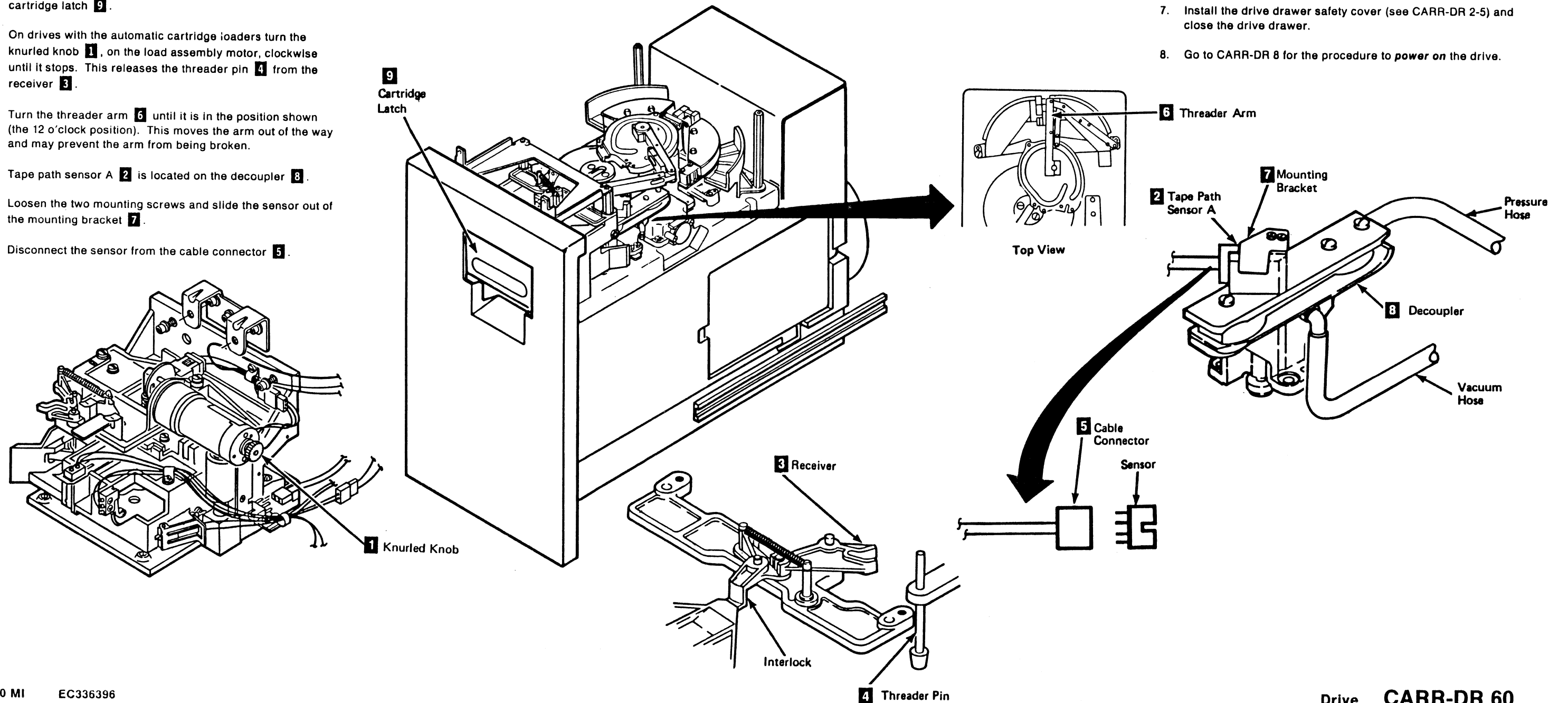
On drives with the automatic cartridge loaders turn the knurled knob **1**, on the load assembly motor, clockwise until it stops.

5. Move the interlock and receiver **3** into the position shown.
6. Turn the threader arm **6** clockwise to move the threader pin **4** into the receiver **3**.

On drives with the automatic cartridge loaders turn the knurled knob **1**, on the load assembly motor, counterclockwise until the knob stops. This opens the cartridge latch and interlocks the threader pin **4**.

On drives without the automatic cartridge loaders check by opening and closing the cartridge latch **9**. The latch can be opened only if the threader pin has released the interlock and is in the correct location.

7. Install the drive drawer safety cover (see CARR-DR 2-5) and close the drive drawer.
8. Go to CARR-DR 8 for the procedure to **power on** the drive.



FRU007 Tape Path Sensor B Removal and Replacement Procedure

Drive **CARR-DR 70**

This page contains the steps needed to remove and replace the tape path sensor B **4** (TU-DK-Tape Path Sensor B).

Note: This FRU can be removed and replaced without affecting the other drive by removing power from the failing drive with the Drive Power On/Off switch.

Removing Tape Path Sensor B

1. Go to CARR-DR 8 for the procedure to **power off** the drive.
2. Open the drive drawer and remove the drive safety cover (see CARR-DR 2-5).
3. On drives without the automatic cartridge loaders close the cartridge latch **8**.

On drives with the automatic cartridge loaders turn the knurled knob **7**, on the load assembly motor, clockwise until it stops. This releases the threader pin **6** from the receiver **5**.

4. Turn the threader arm **1** to the position shown (the 12 o'clock position). This moves the arm out of the way and may prevent the arm from getting broken.
5. Loosen the two sensor bracket mounting screws **2**.
6. Push the sensor and cable through the bracket and away from the threader assembly.
7. Disconnect tape path sensor B **4** from from the cable connector **3**.

Replacing Tape Path Sensor B

1. Connect the tape path sensor B **4** the cable connector **3**. Ensure that the polarity markings match.
2. Push the sensor and cable back into the mounting bracket on the threader assembly.
3. Align the edge of the sensor with the edge of the threader assembly and tighten the two mounting screws **2**.

4. On drives without the automatic cartridge loaders move the interlock and receiver **5** into the position shown.

On drives with the automatic cartridge loaders ensure that the load assembly is at its lowest point by turning the knurled knob clockwise until it stops turning freely. This permits the threader arm to engage the interlock and receiver.

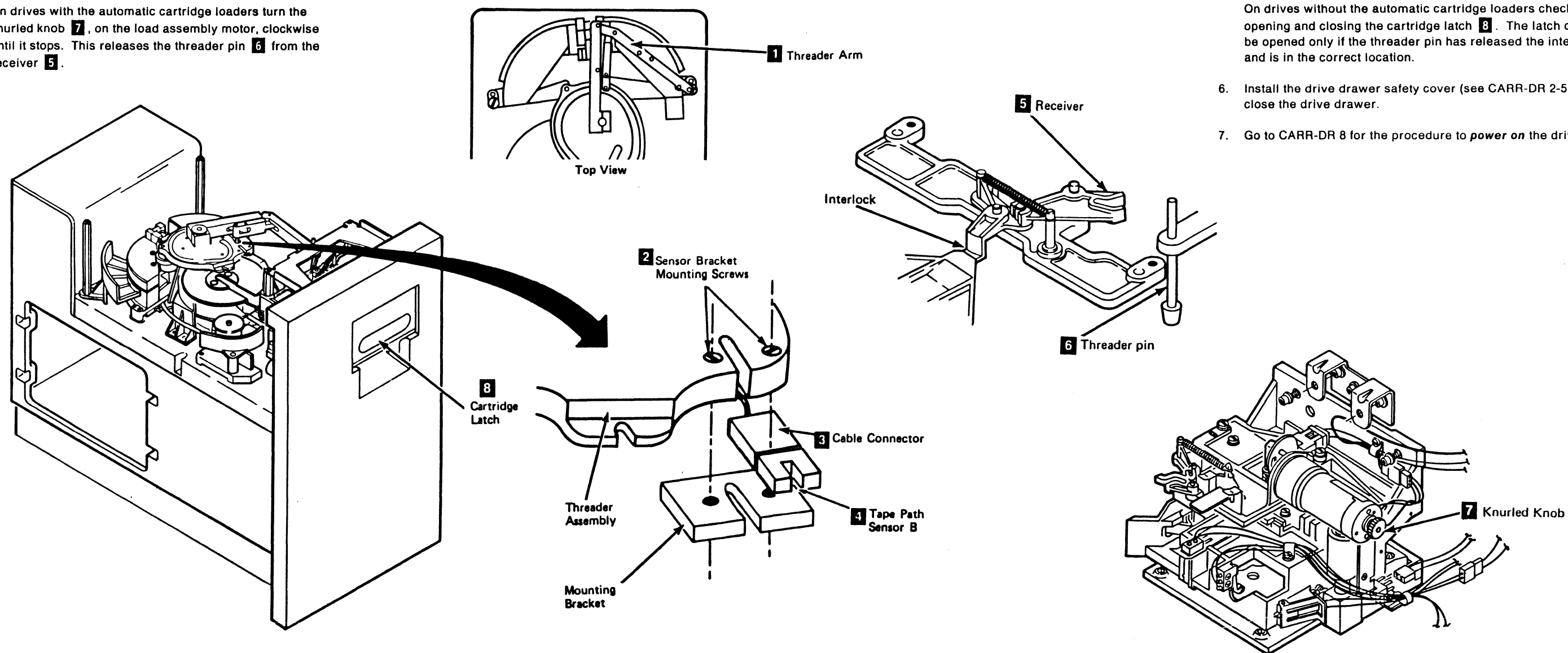
5. Turn the threader arm **1** clockwise to move the threader pin **6** into the receiver **5**.

On drives with the automatic cartridge loaders turn the knurled knob **7**, on the load assembly motor, counterclockwise until it stops. This opens the cartridge latch and interlocks the the threader pin **6**.

On drives without the automatic cartridge loaders check by opening and closing the cartridge latch **8**. The latch can be opened only if the threader pin has released the interlock and is in the correct location.

6. Install the drive drawer safety cover (see CARR-DR 2-5) and close the drive drawer.

7. Go to CARR-DR 8 for the procedure to **power on** the drive.



FRU008 Cartridge Latch Assembly Removal and Replacement Procedure

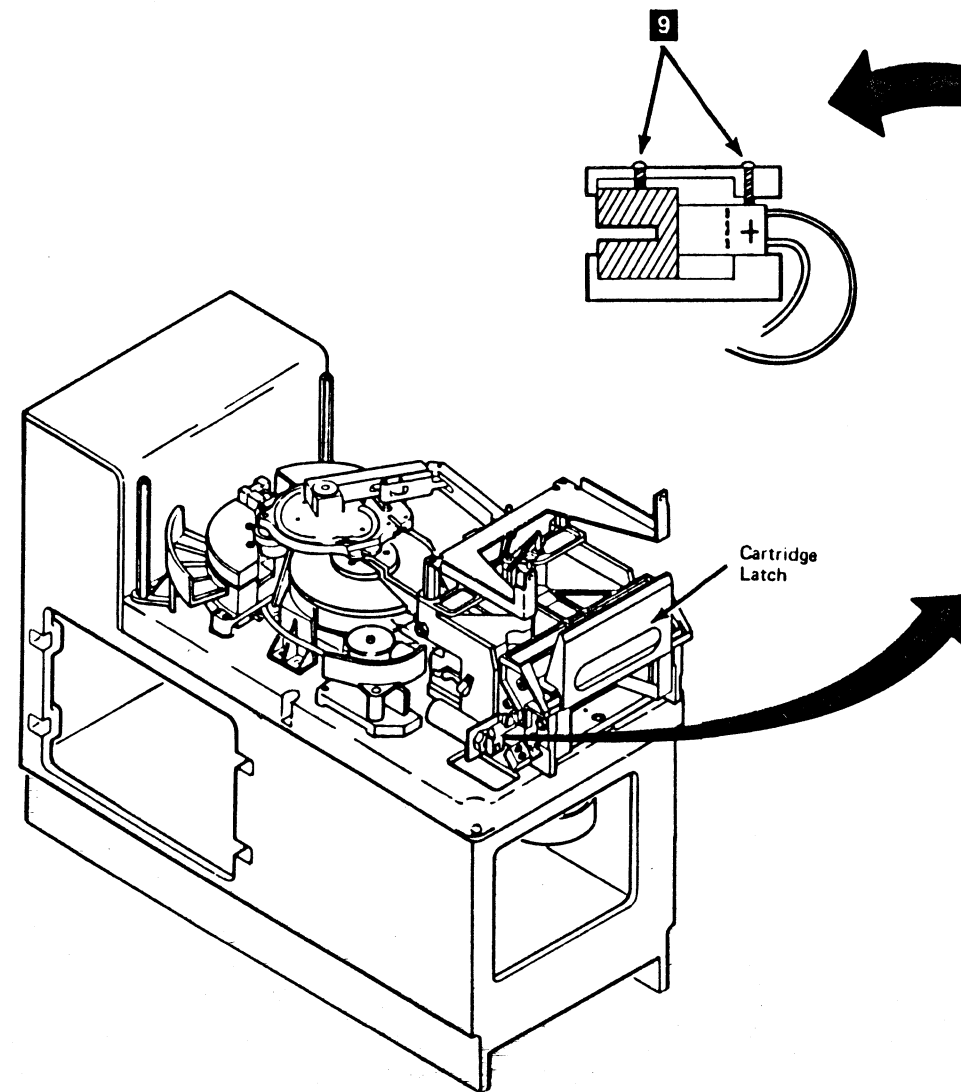
This page contains the steps needed to remove and replace the cartridge latch assembly.

Note: This FRU can be removed and replaced without affecting the other drive by removing power from the failing drive with the Drive Power On/Off switch.

Removing the Cartridge Latch Assembly

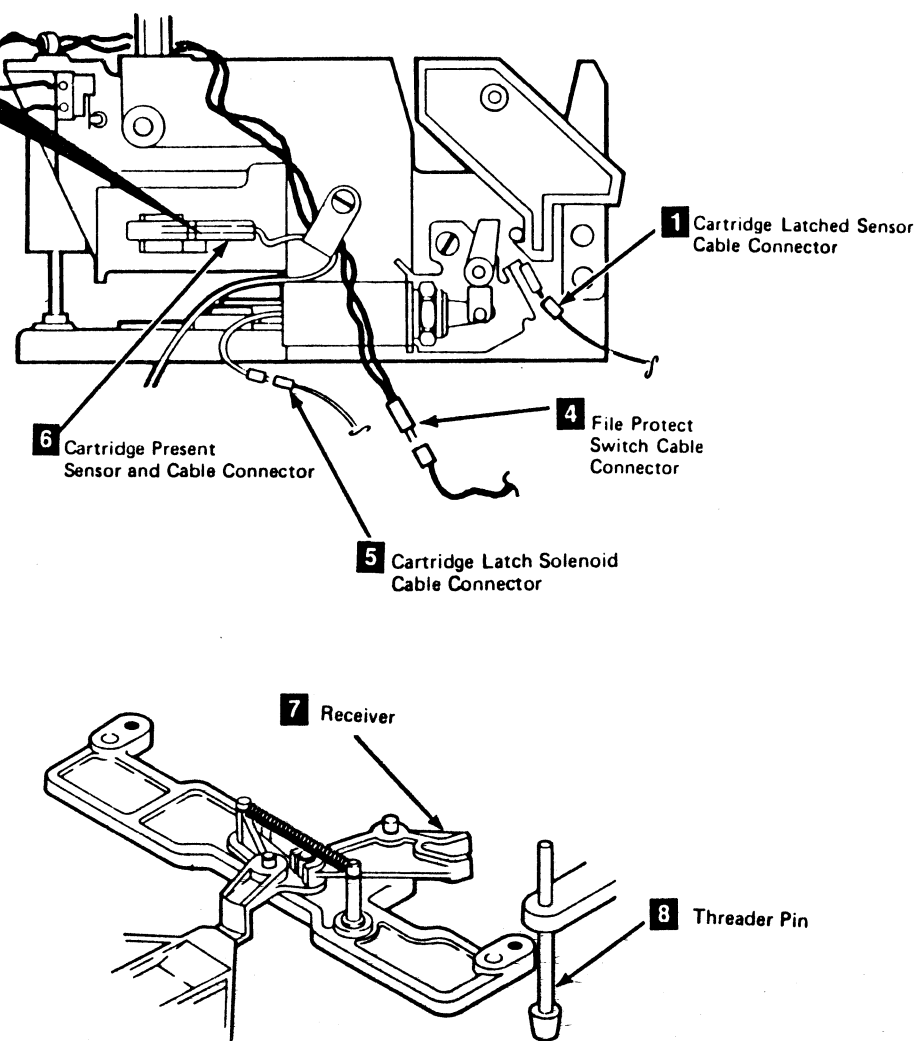
1. Go to CARR-DR 8 for the procedure to **power off** the drive.
2. Open the drive drawer and remove the drive drawer safety cover (see CARR-DR 2-5).
3. Disconnect the file protect switch cable connector **4**.

4. Loosen the two set screws **9** holding the cartridge present sensor and cable connector **6**. Remove the sensor and connector assembly from the cartridge latch assembly.
5. Disconnect the cartridge latched sensor cable connector **1** by removing the screw and cable clamp.
6. Disconnect the cartridge latch solenoid cable connector **5**.
7. Close the cartridge latch.
8. Turn the threader arm counter clockwise to move the threader arm **2** to the position shown (the 12 o'clock position). This moves the arm out of the way and may prevent the arm from being broken.
9. Remove the three cartridge latch assembly mounting screws **3** and lift the latch assembly off the baseplate.



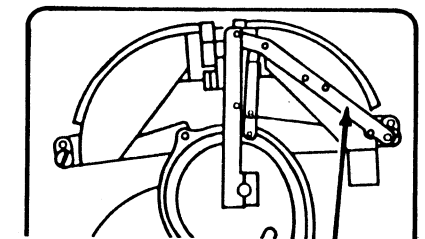
Replacing the Cartridge Latch Assembly

1. Place the cartridge latch assembly in position on the baseplate.
2. Install the three mounting screws **3** to mount the cartridge latch assembly to the baseplate.
3. Connect the cartridge latch solenoid cable connector (J5) **5** by replacing the screw and cable clamp.
4. Replace the cartridge present sensor and cable **4** into the cartridge latch assembly. **The '+' label on the connector must be visible.** Tighten the two set screws **9** to hold the sensor and cable connector **4** in position.
5. Connect the cartridge latched sensor cable connector **1**. **The '+' label on the connector must be visible.**



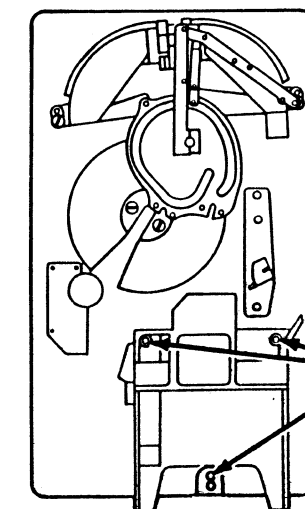
Drive **CARR-DR 80**

6. Replace the cartridge latched sensor cable clamp.
 7. Connect the file protect switch cable connector (J3) **4**.
 8. Move the interlock and receiver **8** into the position shown.
 9. Turn the threader arm **2** clockwise to move the threader pin **7** into the receiver **8**.
- Check by opening and closing the cartridge latch. The latch can be opened only if the threader pin has released the interlock and is in the correct location.
10. Replace the drive drawer safety cover (see CARR-DR 2-5) and close the drive drawer.
 11. Go to CARR-DR 8 for the procedure to **power on** the drive.



Top View

2 Threader Arm



Top View

3 Cartridge Latch Assembly Mounting Screws

FRU009 File Protect Switch Removal and Replacement Procedure

This page contains the steps needed to remove and replace the file protect switch.

It may be difficult to install the early style file protect switch on the cartridge latch assembly with the assembly attached to the base plate. For removal of the cartridge latch assembly see FRU008 Cartridge Latch Assembly Removal and Replacement procedure found in the CARR pages.

Note: This FRU can be removed and replaced without affecting the other drive by removing power from the failing drive with the Drive Power On/Off switch.

Removing the File Protect Switch

1. Go to CARR-DR 8 for the procedure to **power off** the drive.
2. Open the drive drawer and remove the drive safety cover (see CARR-DR 2-5).
3. Disconnect the file protect switch cable connector J3 **3**.
4. Remove the cable clamps holding the file protect switch cable.
5. Before removing the file protect switch, check the illustration **4** to determine if your drive has the old or new style file protect switch mounting.

Note: The file protect switch **7** is installed on the cartridge latch assembly with two screws **9**, four lockwashers **6** (two are used as spacers between the switch and the latch assembly), and a mounting plate **5**.

6. **If the old style mounting:**
 - a. Remove the two screws **9**, four lockwashers **6**, the mounting plate **5**, and the file protect switch **7**.
 - b. Be careful not to lose the two lockwashers **6**, used as spacers when you remove the two screws.

7. **If the new style mounting:**

Loosen the two mounting screws **9** and remove the file protect switch **7** and the mounting hardware from the drive.

Replacing the File Protect Switch

1. Ensure that the new switch is good by checking it with an ohmmeter before replacing.
2. Before installing the file protect switch, check the illustration **4** to determine if your drive has the old or new style file protect switch mounting.

3. **If the old style mounting:**

Ensure that the parts are installed as shown. There are four lockwashers **6**, two screws **9**, a mounting plate **5**, and the file protect switch **7**. Use a lockwasher under the head of each screw, and another on each screw between the file protect switch and the cartridge latch assembly. The lockwasher is used as a spacer to permit the file protect switch to operator freely.

Do not tighten the two screws **9** at this time.

Go to step 5 on this page.

4. **If the new style mounting:**

Assemble the parts as shown in the illustration **4**. There are four lockwashers **6**, two screws **9**, a mounting plate **5**, and the file protect switch **7**. Use a lockwasher under the head of each screw and another on each screw between the file protect switch and the cartridge latch assembly. The lockwasher is used as a spacer to permit the file protect switch to operator freely.

Loosely fasten the file protect switch **7** and the mounting hardware to the cartridge latch assembly.

5. Install the cable clamps holding the file protect cable.
6. This procedure contains the steps needed to replace and adjust the file protect switch using the File Protect Gauge (part 6178974).
 - a. Attach a meter to the pins of the file protect cable **3** (to check continuity while adjusting the switch).

- b. On drives without automatic cartridge loaders open the latch and insert the file protect gauge **2** so that the arrow closest to the words **switch closed** on the gauge points to the file protect switch. Close the latch.

Ensure that the gauge is resting on the locating pins **1**. If there is play between the locating pins and the gauge, push the gauge toward the file protect switch.

On drives with automatic cartridge loaders insert the file protect gauge **2** so that the arrow closest to the words **switch closed** on the gauge points to the file protect switch.

Turn the knurled knob **11** clockwise until the knob stops turning.

Note: While turning the knurled knob ensure that the cartridge present switch actuator arm **12** does not come in contact with the file protect gauge **2** while lowering the load assembly.

It may be necessary to hold the actuator arm away from the gauge while turning the knurled knob.

Ensure that the gauge is resting on the locating pins **1**. If there is play between the locating pins and the gauge, push the gauge toward the file protect switch.

- c. With the switch roller touching the gauge, slowly pivot the file protect switch back and forth to find the position where the switch closes (meter indicates continuity). While holding the switch at this position, tighten the bottom screw first and then the top screw.
- d. On drives without automatic cartridge loaders open the latch. Remove the gauge and reinsert the gauge so that the arrow closest to the words **switch open** on the gauge points to the file protect switch. Ensure that the gauge is resting on the locating pins **1** as you close the latch.

On drives with automatic loaders turn the knurled knob **11** counterclockwise until the knob stops turning. Remove the gauge and reinsert the gauge so that the arrow closest to the words **switch open** on the gauge points to the file protect switch. Turn the knurled knob clockwise until the knob stops turning.

Note: While turning the knurled knob ensure that the cartridge present switch actuator arm **12** does not come in contact with the file protect gauge **2** while lowering the load assembly.

It may be necessary to hold the actuator arm away from the gauge while turning the knurled knob.

Ensure that the gauge is resting on the locating pins **1**. If there is play between the locating pins and the gauge, push the gauge toward the locating pins.

- e. Check the meter for continuity to determine if the switch is open or closed.

If continuity is indicated the switch is closed and the switch is not correctly adjusted. Return to step b of this procedure.

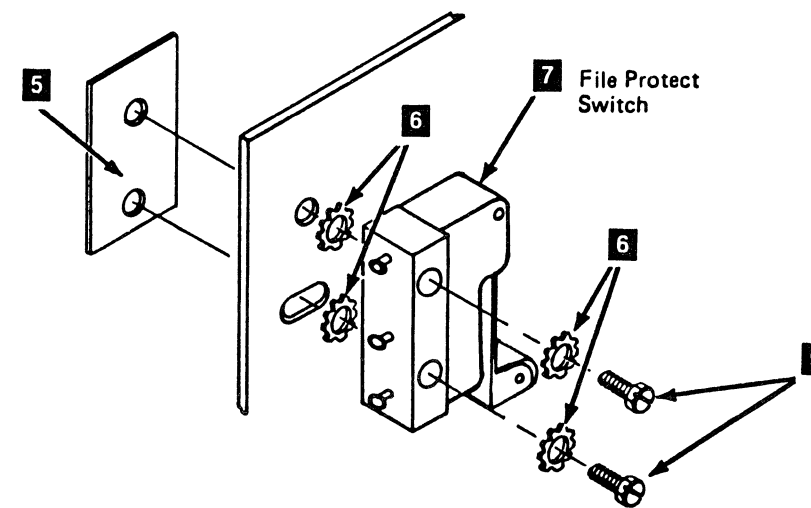
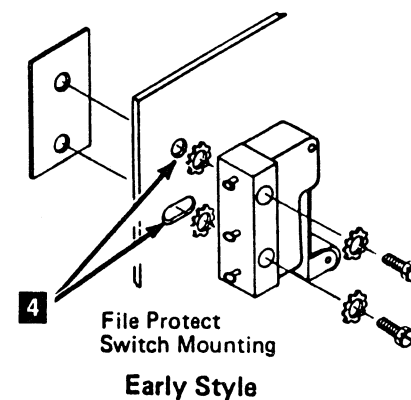
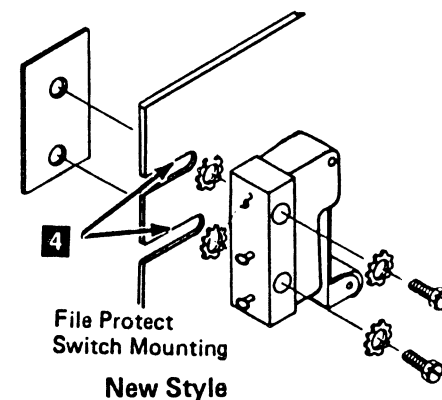
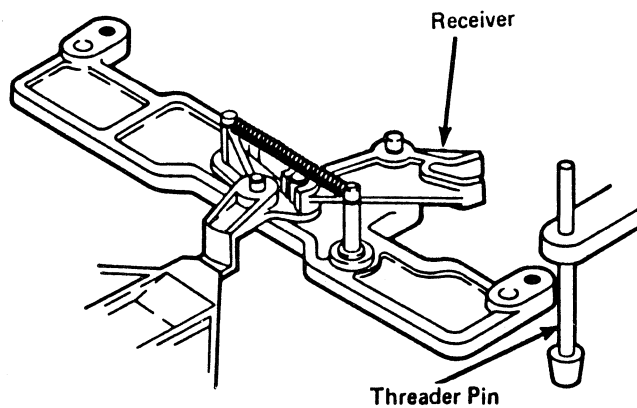
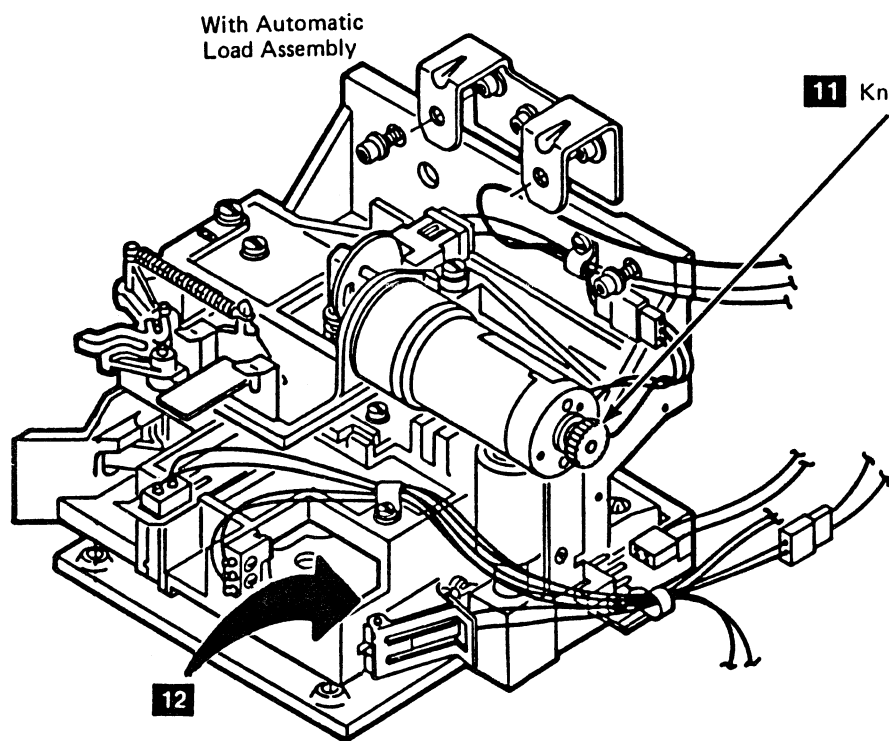
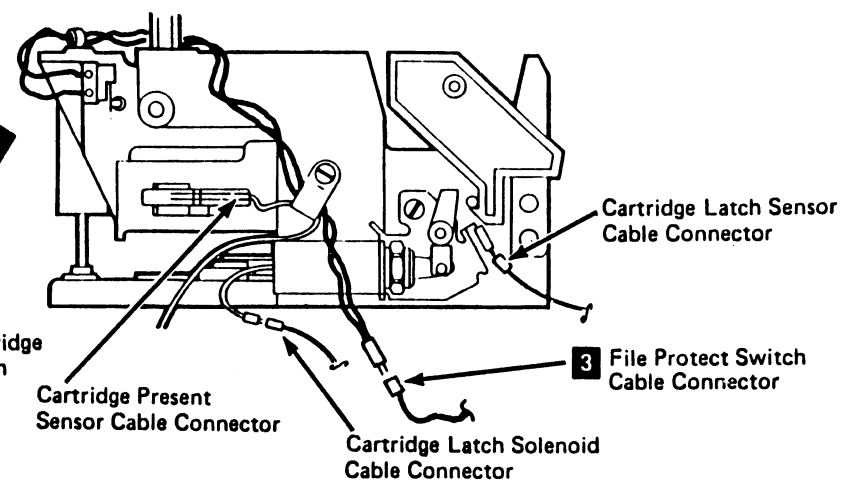
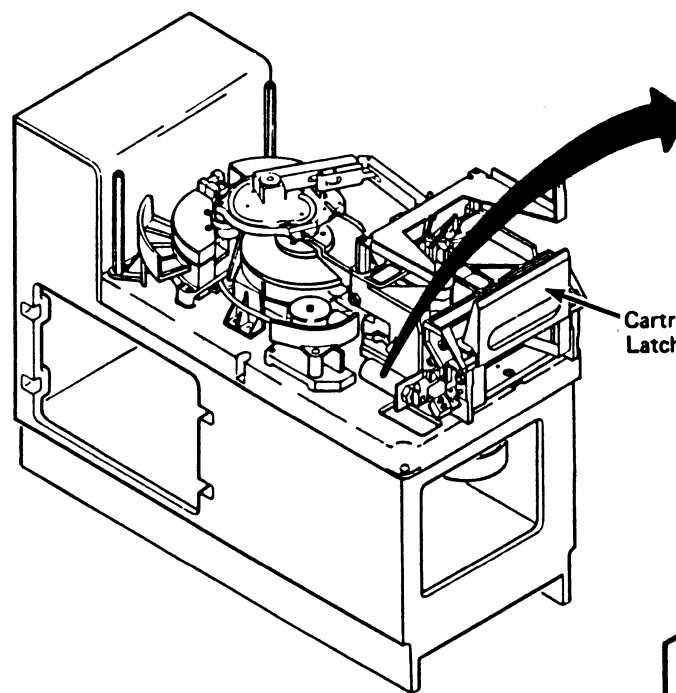
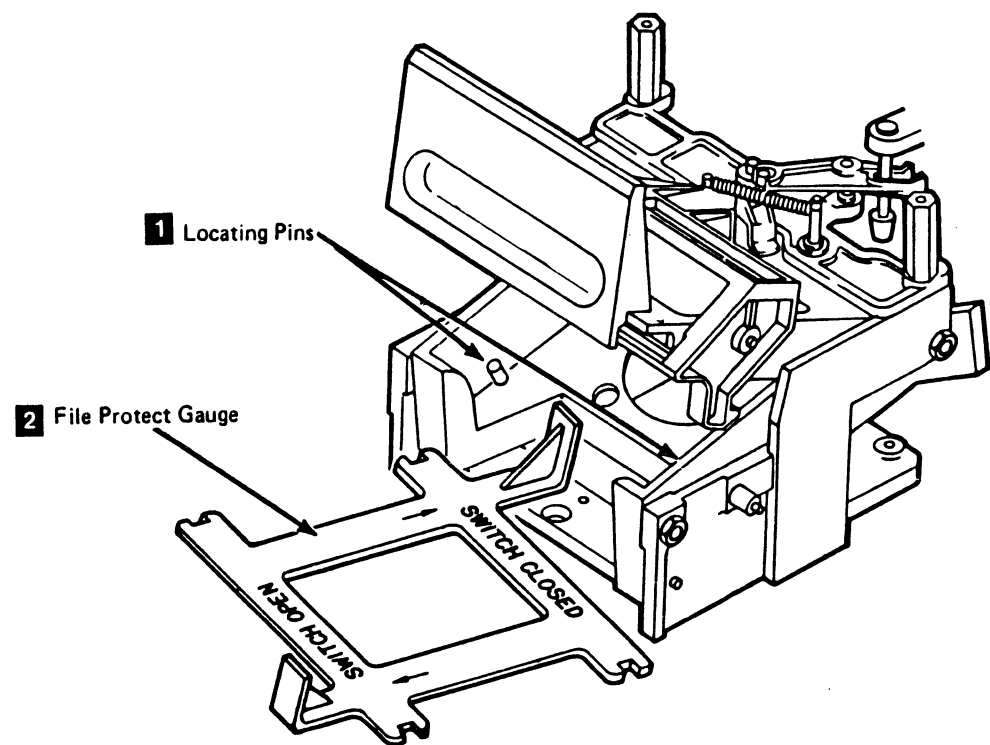
If continuity is not indicated the switch is open and the switch is correctly adjusted.

- f. On drives without automatic loaders open the latch. Remove the file protect gauge.

On drives with automatic loaders turn the knurled knob **11** counterclockwise until the knob stops turning. Remove the gauge.

- g. Remove the meter from the file protect switch cable connector.

7. Connect the file protect switch cable connector J3 **3**.
8. Install the drive drawer safety cover and close the drive drawer (see CARR-DR 2-5).
9. Go to CARR-DR 8 for the procedure to **power on** the drive.



This page contains the steps needed to remove and replace the cartridge present sensor **5** (TU-DK-Cartridge Present Sensor).

Note: This FRU can be removed and replaced without affecting the other drive by removing power from the failing drive with the Drive Power On/Off switch.

Removing the Cartridge Present Sensor

1. Go to CARR-DR 8 for the procedure to **power off** the drive.
2. Open the drive drawer and remove the drive drawer safety cover (see CARR-DR 2-5).
3. The cartridge present sensor is installed on the left side of the cartridge latch assembly, or on the left side of the load assembly (for machines with the automatic cartridge loader feature installed). If this drive has a loader installed, go to step 8.

Note: If it is necessary to remove the tension transducer in the next step, be aware that the tension transducer FRU is an ESD-sensitive part. See CARR-DR 1-5 for "Instructions for Working With ESD-Sensitive Parts."

4. Remove the tension transducer tape guide **7** mounting screw (or entire tension transducer if the tape guide is part of the tension transducer) and lift the tape guide off the baseplate.
5. There are two small setscrews **5** holding the cartridge present sensor assembly. One holds the sensor, the other holds the connector. Close the cartridge latch **8**.

Loosen the setscrews enough to remove the sensor and connector from the cartridge latch assembly.

6. Disconnect the cartridge present sensor cable connector **6**.
7. Open the cartridge latch **8**.

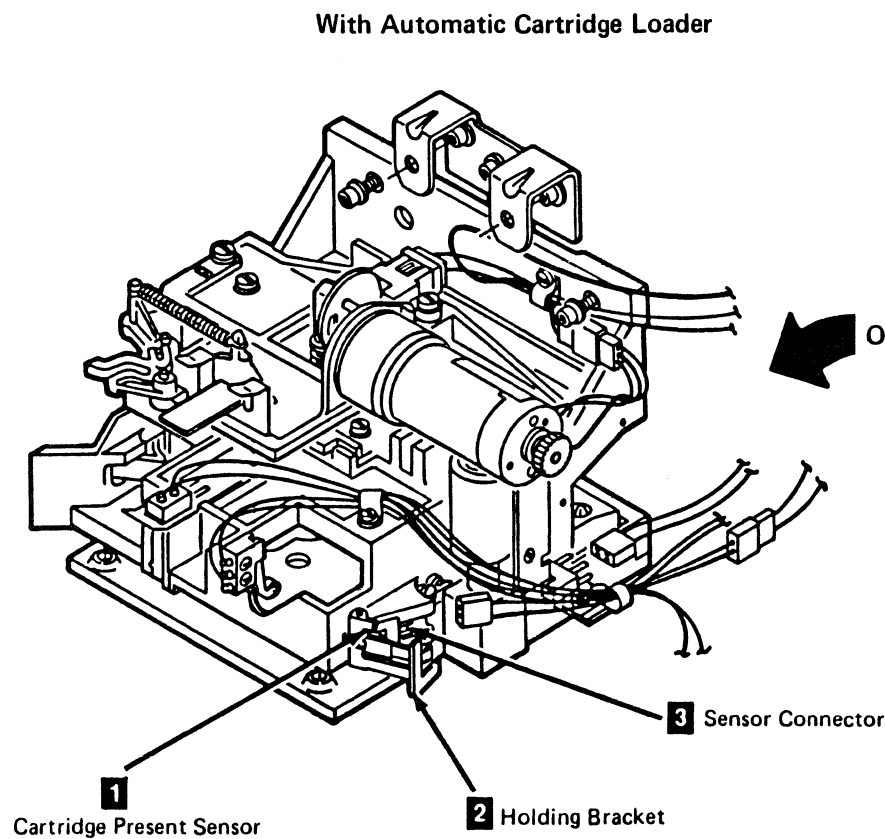
End of the removal procedure for drives without the automatic cartridge loader.

8. Unlatch the sensor holding bracket **2** and remove the cartridge present sensor **1** and its cable connector **3**.
9. Disconnect the cartridge present sensor cable connector **3**.

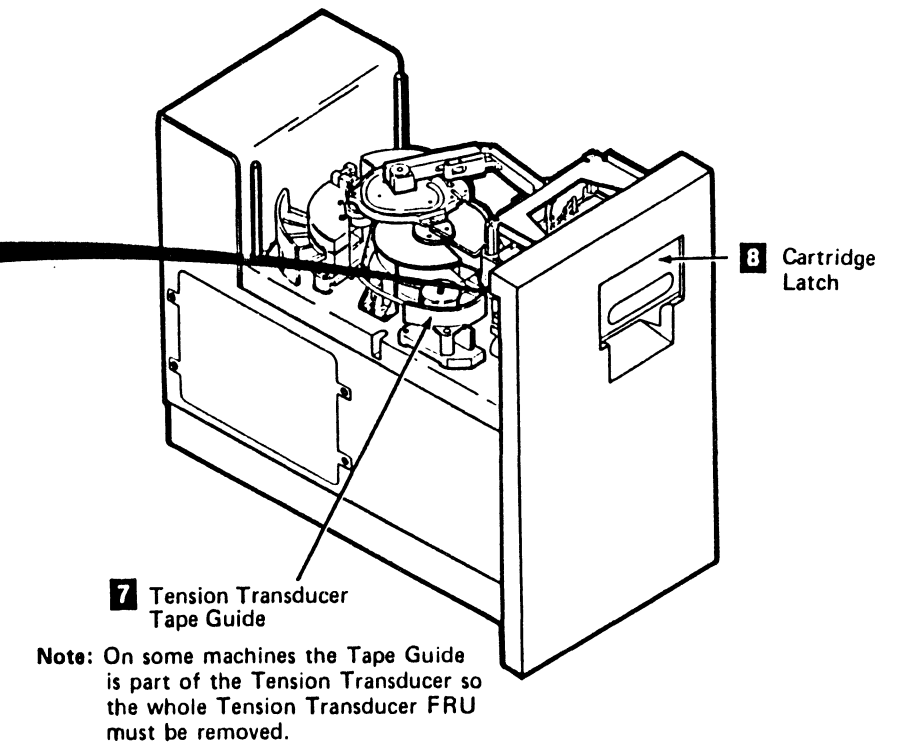
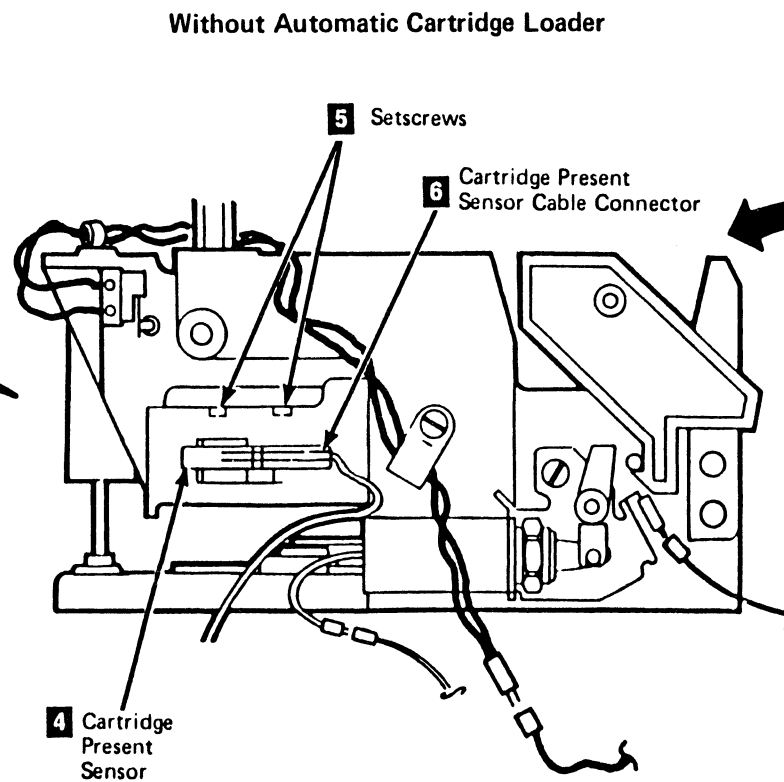
Replacing the Cartridge Present Sensor

1. Reconnect the cartridge present sensor cable connector or **6**, observing the polarity markings.
2. If this drive has the automatic cartridge loader feature installed, go to step 6.
3. Insert the cartridge present sensor **4** and connector into the cartridge latch assembly. Close the cartridge latch **8** and tighten the setscrews **5**.
4. Place the tension transducer tape guide **7** or tension transducer in position on the baseplate and install the mounting screw(s).

5. Go to step 8.
6. Place the cartridge present sensor **1** and its connector **3** in the cavity of the load assembly, with the sensor slot facing in.
7. Latch the sensor holding bracket **2**.
8. Install the drive drawer safety cover (see CARR-DR 2-5) and close the drive drawer.
9. Go to CARR-DR 8 for the procedure to **power on** the drive.



OR



FRU011 Cartridge Latched Sensor Removal and Replacement Procedure

Drive **CARR-DR 110**

This page contains the steps needed to remove the cartridge latched sensor **4** (TU-DK-Cartridge Latched Sensor) from the side of the cartridge latch assembly or load assembly.

Note: This FRU can be removed and replaced without affecting the other drive by removing power from the failing drive with the Drive Power On/Off switch.

Removing the Cartridge Latched Sensor

1. Go to CARR-DR 8 for the procedure to **power off** the drive.
2. Open the drive drawer and remove the drive drawer safety cover (see CARR-DR 2-5).
3. On drives without the automatic cartridge loader feature, remove the drive drawer cover (see CARR-DR 2-1 or 2-3).
4. Open the cartridge latch **1** or raise the cartridge latch sensor flag **2** on drives with the automatic cartridge loader feature (if it is not in the up position) by turning the knurled knob **7** on the load motor clockwise.

5. The cartridge latched sensor **4** is located on the left side of the cartridge latch assembly (held in position by two mounting screws **3**).
- Remove the mounting screw holding the cable clamp **5**.
6. Disconnect the cartridge latched sensor cable from the sensor **4**.
7. Remove the other cartridge latched sensor mounting screws **3** and remove the sensor from the drive.

Replacing the Cartridge Latched Sensor

1. Place the cartridge latched sensor **4** in position on the mounting bracket **6** and install the last mounting screw **3** removed earlier, but **do not** tighten the mounting screw at this time.
2. Reconnect the cartridge latched sensor cable to the sensor and install the cable clamp **5** and the other mounting screw **3**. Ensure that the polarity marking is correct.
3. It is necessary to adjust the cartridge latched sensor to permit the flag **2** to move through the sensor without touching.

Slowly close the cartridge latch **1**, or for drives with the automatic cartridge loader feature turn the knurled knob **7** clockwise until the flag is in the sensor opening. If the flag hits the sensor, move the sensor so the cartridge sensor flag can be lowered.

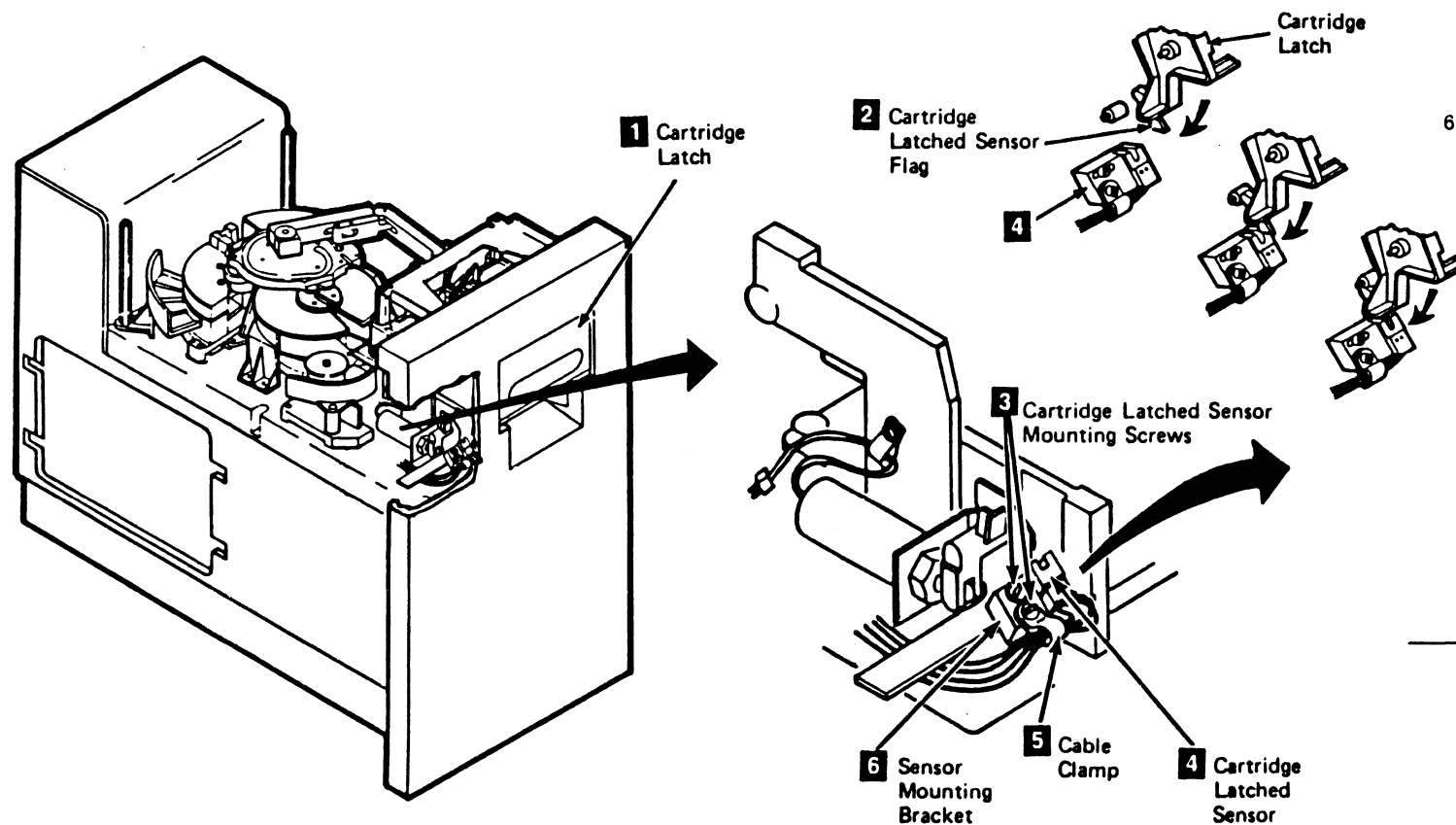
4. Adjust the sensor so the flag is the same distance from both sides of the sensor.
 5. Tighten the sensor mounting screws **3**.
- Check the sensor adjustment by opening and closing the cartridge latch, or by raising and lowering the load assembly with the knurled knob **7**. Leave the load assembly in the up position.
6. On drives without the automatic cartridge loader feature, close the latch and install the drive drawer cover (see CARR-DR 2-1 or 2-3). Leave the latch in the open position. Go to step 8.

7. On drives with the automatic cartridge load feature, if the screws **9** for the cartridge latched sensor were loosened or the sensor up and down position is suspect, go to the Cartridge Latched Sensor Adjustment on this page.
8. Install the drive drawer safety cover (see CARR-DR 2-5) and close the drive drawer.
9. Go to CARR-DR 8 for the procedure to **power on** the drive.

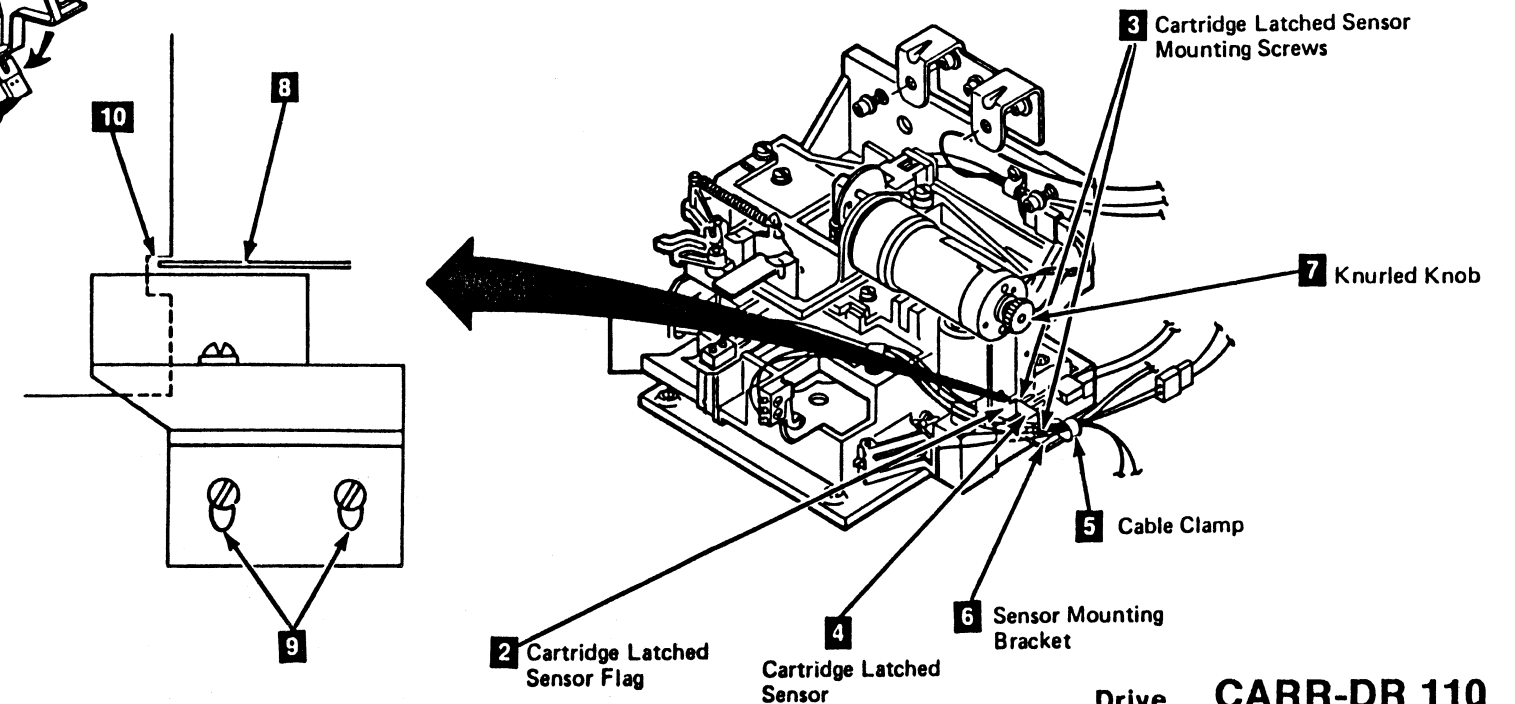
Cartridge Latched Sensor Adjustment

1. Manually insert a cartridge through the feed station until it is all the way into the load assembly.
2. Turn the knurled knob **7** clockwise until the load assembly is at its lowest position or you reach the mechanical stop.
3. Loosen the two cartridge latched sensor bracket holding screws **9**.
4. Place a 0.25MM (0.010 IN) feeler gage **8** on top of the cartridge latched sensor **4** and into the notch in the cartridge latched sensor flag **10**.
5. Position the sensor and bracket up until the feeler gage contacts the upper edge of the cartridge latched sensor flag notch **10** and tighten the two screws **9**.
6. The cartridge can be unloaded after power is restored to the drive by pressing the UNLOAD key and then the START key.
7. Return to the procedure that sent you here.

Without Automatic Cartridge Loader



With Automatic Cartridge Loader



Drive **CARR-DR 110**

FRU012 Decoupler Assembly Removal and Replacement Procedure

This page contains the steps needed to remove and replace the decoupler assembly **5** in the drive. Since tape path sensor A **6** is installed on the decoupler, it will also be removed.

Note: This FRU can be removed and replaced without affecting the other drive by removing power from the failing drive with the Drive Power On/Off switch.

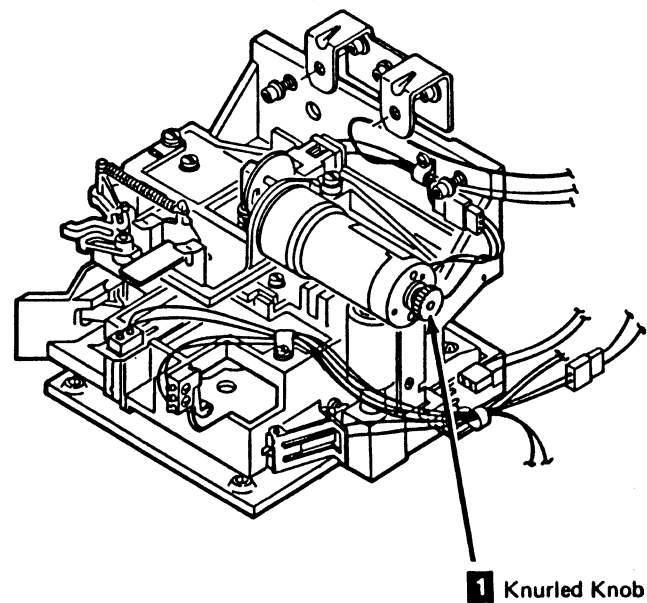
Removing the Decoupler

1. Go to CARR-DR 8 for the procedure to **power off** the drive.
2. Open the drive drawer and remove the drive drawer safety cover (see CARR-DR 2-5).
3. So that we don't affect the other drive, it is necessary to clamp the plenum supply hose of the drive requiring service.

Clamp the plenum supply hose (see CARR-DR 3-1).

4. On drives without the automatic cartridge loaders close the cartridge latch.

On drives with the automatic cartridge loaders turn the knurled knob **1**, on the load assembly motor, clockwise until it stops. This releases the threader pin **4** from the receiver.



1 Knurled Knob

5. Turn the threader arm **2** until it is in the position shown (the 12 o'clock position). This moves the arm out of the way and prevents the arm from being broken.

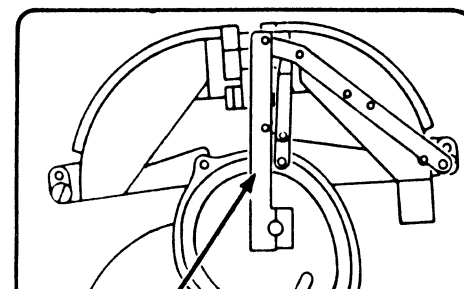
Note: Tape path sensor A **6** is installed on top of the decoupler.

6. Disconnect the tape path sensor A cable connector.
7. Remove the two screws and remove the tape path sensor A from the decoupler.
8. Remove the vacuum hose **8** from the decoupler.
9. Use duckbill pliers to slide back the retention clip on the pressure hose **7** and remove the pressure hose from the decoupler.
10. Remove the three mounting screws **9** and lift the decoupler assembly **5** off the base plate.

Replacing the Decoupler

1. Place the decoupler assembly **5** in position on the base plate and install the three mounting screws **9**.
2. Connect the decoupler vacuum hose **8**.
3. Connect the decoupler pressure hose **7** and use duckbill pliers to slide the retention clip back over the decoupler pressure hose connection.
4. Install the tape path sensor A on the decoupler with the two mounting screws.
5. Connect the tape path sensor A **6** to the cable connector, observing the polarity markings.
6. From the rear of the decoupler, insert the sensor into the mounting bracket.

Align the edge of the sensor with the front edge of the decoupler and tighten the two mounting screws.



2 Threader Arm

Top View

7. On drives without the automatic cartridge loaders move the receiver **3** into the position shown.

On drives with the automatic cartridge loaders ensure that the load assembly is at its lowest point by turning the knurled knob **1** clockwise until it stops turning freely. This permits the threader pin **4** to engage the receiver **3**.

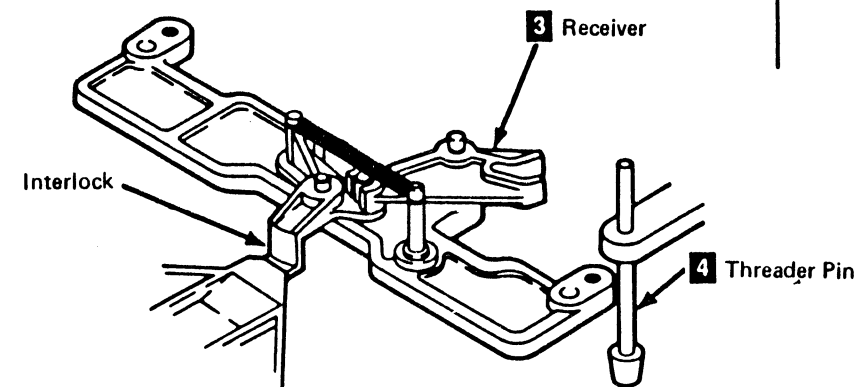
8. Turn the threader arm **2** clockwise to move the threader pin **4** into the receiver **3**.

On drives with the automatic cartridge loaders turn the knurled knob **1**, on the load assembly motor, counterclockwise until it stops turning freely. This opens the cartridge latch and interlocks the threader pin **4**.

On drives without the automatic cartridge loaders check by opening and closing the cartridge latch. The latch can be opened only if the threader pin has released the interlock and is in the correct location.

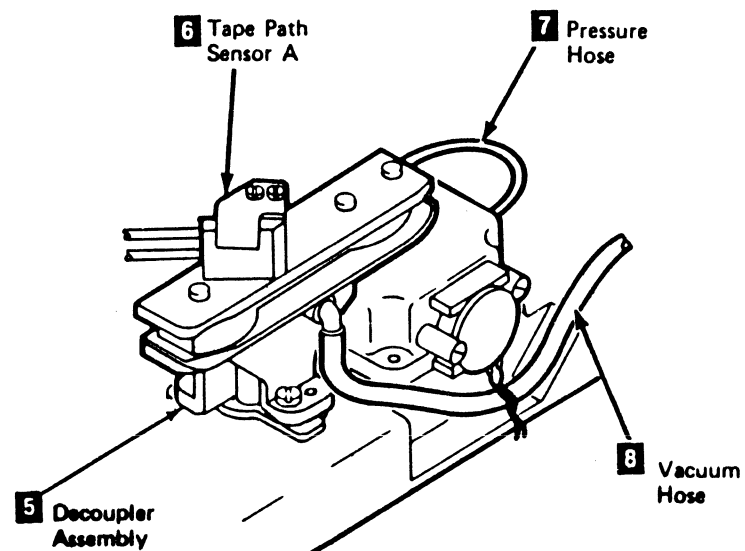
9. Install the drive drawer safety cover (see CARR-DR 2-5) and close the drive drawer.

10. Go to CARR-DR 8 for the procedure to **power on** the drive.



3 Receiver

4 Threader Pin

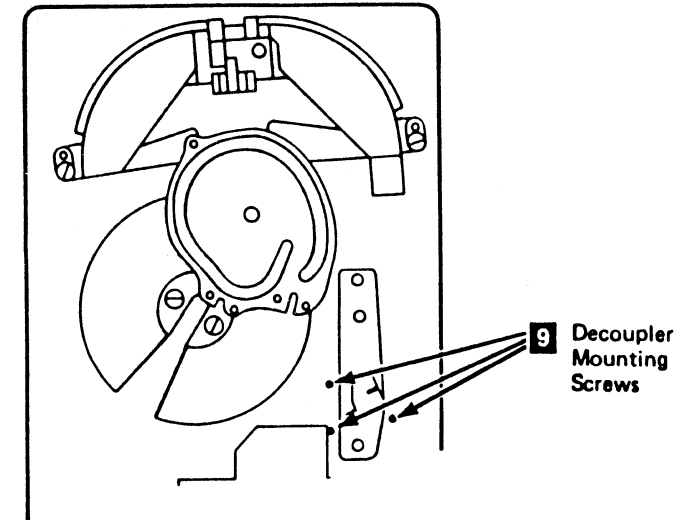


6 Tape Path Sensor A

7 Pressure Hose

8 Vacuum Hose

5 Decoupler Assembly



Top View

9 Decoupler Mounting Screws

C

C

C

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C

C

C

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Notes

Notes CARR-DR 125

FRU013 Head and Guide Assembly Cleaning, Checking, Removal and Replacement Procedure

* These cards are EC sensitive.
See CARR-DR 4 to determine the position of these logic cards for your drive.

This page contains the steps needed to clean and remove the head and guide assembly. The head alignment is critical. Do not attempt to remove the head from the head and guide assembly.

To permit space when removing the head and guide assembly it is necessary to remove the rear panel cover **13**.

Head, Decoupler, and Cleaner Block Cleaning Procedure

Warning: Do not attempt to clean the air bearings. The upper guide could be severely damaged.

If you have cleaned the head as described in this section and are returning from the maintenance device (MD) or the Maintenance Information (MI), go directly to Checking the Head Connectors.

This procedure requires use of cotton swabs and tape cleaner (part 8493001), and lint-free cloth (part 2108930). The cotton swabs and the lint-free cloth are found in the Tape Cleaning Kit (part 352465).

CAUTION:
Only IBM tape cleaner, (part 8493001) or an equivalent tape cleaner should be used as a dampening agent. Prolonged skin contact with cleaner should be avoided.

1. Open the drive drawer and remove the drive safety cover (see CARR-DR 2-5).
2. Inspect the head with a dental mirror and a light for contaminant.
3.
 - a. If contaminant is visible, dampen a clean, lint-free cloth with tape cleaner and wrap it around a cotton swab. Gently scrub the head, repeating as necessary to remove the contaminant. A brush from the cleaning kit, dampened with tape cleaner may be used to remove any stubborn residue. Gently scrub the head. Verify residue is removed by using a light and dental mirror.
 - b. If contaminant is not visible, dampen a clean, lint-free cloth with tape cleaner and wrap it around a cotton swab and gently scrub the head. Wipe dry with a clean cloth.
4. Use a cotton swab and tape cleaner to clean the decoupler, tension transducer and cleaner block. Stubborn residue may be removed with brush (part 2501611) and tape cleaner. Wipe dry with a lint free cloth.

Checking the Head Connectors

If you have checked the head connectors as described in this section and are returning from the maintenance device (MD) or the Maintenance Information (MI), go to "Removing the Head and Guide Assembly" on this page.

A problem may be caused by a head cable that is not fully seated or by bent pins on the connector. The following procedure checks these conditions:

1. To get access to the read and write cables, first remove the card cover **9**.
The read and write cables are found on the H2* and J4* cards.
2. Lift up on the tab **10** to disconnect the read cable **11** and the write cable **12**.
3. Inspect the pins on the head cable connectors and straighten any bent pins.
4. Reconnect the head cables to the H2* and J4* cards. Ensure that the cables are fully seated.
5. Replace the card cover **9** and mounting screws.
6. Go to CARR-DR 8 for the procedure to **power on** the drive.

Removing the Head and Guide Assembly

Notes:

- a. This FRU can be removed and replaced without affecting the other drive by removing power from the failing drive with the Drive Power On/Off switch.
- b. The Head and Guide Assembly should *not* be removed unless it has been cleaned and the connectors checked as described on this page.

1. Go to CARR-DR 8 for the procedure to **power off** the drive.
2. Clamp the plenum supply hose (see CARR-DR 3-1).
3. Remove the mounting screws and the card cover **9**.

Warning: The cables and connectors can be easily damaged. Do not pull on the cables to disconnect them.

The read and write cables are found on the H2* and J4* cards.

4. Lift up on the tab **10** to disconnect the read cable **11**.
5. Lift up on the tab **10** to disconnect the write cable **12**. Remove the write cable from the J4* card.

Note: After the read and write cables have been disconnected, position a protector (such as an IBM card) between the logic cards and the cables. This will protect the cable pins and card components from damage.

Warning: Do not touch the surface of the read/write head when removing or replacing the protective shield.

To prevent damage to the read/write head, the shield that is shipped with the new head should remain on the new head until it has been installed, see the following procedure.

6. Slide the shield **6** on to the head assembly located in the drive using equal downward pressure on each side.
7. Unscrew the right safety cover support **8** and remove the head tape guide (right) **7**.
8. Unscrew the left safety cover support **14** and remove the head tape guide (left) **15**.
9. Remove the two screws and the rear panel cover **13**.
10. Disconnect the tape lifter solenoid output hose **2** from the tape lifter solenoid.
11. Disconnect the right guide bearing hose **3** from the right guide bearing.
12. Disconnect the left guide bearing hose **1** from the left guide bearing.
13. Disconnect the cleaner hose **4** from the tape cleaner block.
14. Remove the three head and guide assembly mounting screws **5**.
15. Slowly lift the assembly off the baseplate. Tilt the head away from the rear panel after clearing locating pins.

Continue lifting the head and guide assembly, permitting the cable connectors to pass through the opening in the baseplate.

16. Set the head and guide assembly to the side taking care not to bend the cables or damage the head.

Note: The cables on the replacement head and guide assembly must be bent using the cables on the old head and guide assembly as an example.

17. Remove the two ferrites **16** and the rubber cable protectors from the head assembly cables. These parts will be installed on the new head FRU assembly.

Replacing the Head and Guide Assembly

1. Remove the replacement head and guide assembly from the shipping container. Ensure that the protective shield **6** is in place on the read/write head **6**.
2. Bend the read and write cables of the replacement head and guide assembly using the old head and guide assembly as an example.
3. Install the two ferrites **16** and rubber cable protectors on the replacement head and guide assembly in the same positions as they were on the old head and guide assembly.

Drive **CARR-DR 130**

Warning: Ensure that the cable connector pins are not damaged during the replacement procedure.

4. Lower the head and guide assembly on to the baseplate. As you lower the head and guide assembly, guide the read and write cables through the opening in the baseplate. Ensure that the head and guide assembly installs correctly on the locating pins and is seated on the baseplate.
5. Install the three mounting screws **5**. Do not over tighten the screws.
6. Reconnect the write cable **12** to the J4* write card connector.
7. Remove the protector that was used to protect the cable pins and card components from damage.
8. Reconnect the read cable **11** to the H2* read card connector.

Note: Ensure that both the read and write cables are seated before continuing.

If either read or write cable is not fully seated, they may have bent pins. Remove the read and/or write card(s) (see CARR-DR 640) and bend the cable connectors up to inspect for bent pins. Straighten any bent pins with the pin straightener (part 453473). Excessively bent pins may be straightened using needle nose pliers before using the pin straightener tool.

9. Install the card cover **9**.
- Note:** As you install the tape guides (in the next two steps), ensure that the guides are against the head guide assembly and do not protrude into the tape path. See CARR-DR 2280 for installing the left guide and CARR-DR 2290 for installing the right guide.
10. Install the head tape guide (left) **15** and the left safety cover support **14**.
11. Install the head tape guide (right) **7** and the right safety cover support **8**.
12. Reconnect the left guide bearing hose **1**.
13. Reconnect the right guide bearing hose **3**.
14. Reconnect the cleaner hose **4**.
15. Reconnect the tape lifter solenoid output hose **2** to the tape lifter solenoid.
16. Install the rear panel cover **13** with the two mounting screws.
17. Remove the protective shield **6** from the read/write head **6**. Place it on the defective head to be returned with the defective head and guide assembly.
18. Remove the clamp from the plenum supply hose (see CARR-DR 3-1).
19. Install the drive drawer safety cover (see CARR-DR 2-5) and close the drive drawer.
20. Go to CARR-DR 8 for the procedure to **power on** the drive.

This page contains the steps needed to clean and remove the head and guide assembly. The head alignment is critical. Do not attempt to remove the head from the head and guide assembly.

The Head and Guide Assembly should **not** be removed unless it has been cleaned and the connectors checked as described on this page.

Head, Decoupler, and Cleaner Block Cleaning Procedure

Warning: Do not attempt to clean the air bearings. The upper guide could be severely damaged.

If you have cleaned the head as described in this section and are returning from the maintenance device (MD) or the Maintenance Information (MI), go directly to Checking the Head Connectors.

This procedure requires use of cotton swabs and tape cleaner (part 8493001), and lint-free cloth (part 2108930). The cotton swabs and the lint-free cloth are found in the Tape Cleaning Kit (part 352465).

CAUTION:

Only IBM tape cleaner, (part 8493001) or an equivalent tape cleaner should be used as a dampening agent. Prolonged skin contact with cleaner should be avoided.

1. Open the drive drawer and remove the drive safety cover (see CARR-DR 2-5).
2. Inspect the head with a dental mirror and a light for contaminant. If contaminants are visible, do step 3, otherwise proceed to step 4.
3. Dampen a clean, lint-free cloth with tape cleaner and wrap it around a cotton swab. Gently scrub the head, repeating as necessary to remove the contaminant. A brush from the cleaning kit, dampened with tape cleaner may be used to remove any stubborn residue. Gently scrub the head until clean. Verify that all residue is removed by using a dental mirror and a light.
4. Dampen a clean, lint-free cloth with tape cleaner and wrap it around a cotton swab, and gently scrub the head. Wipe dry with a clean lint-free cloth.
5. Use a cotton swab and tape cleaner, to clean the tension transducer. Stubborn residue may be removed with brush (P/N 2501611) and tape cleaner. Wipe dry with a clean lint-free cloth.

6. Use a cotton swab, tape cleaner, plastic pot adjusting rod (from the cleaning kit) and a small allen wrench provided in the tool kit to clean the decoupler, cleaner block, and vacuum distribution tee. Remove the decoupler (see CARR-DR 120), remove the vacuum elbow, clean out foreign material using the pointed end of the plastic pot adjusting rod. Replace the tee and decoupler. Remove the two screws holding the cleaner block, and remove the cleaner block. Using the smallest allen wrench from the tool kit, probe through the vacuum port, removing all foreign matter. Replace the cleaner block. Use cotton swabs and tape cleaner to finish cleaning the decoupler and cleaner block. Stubborn residue may be removed with the brush and tape cleaner. Wipe dry with a clean lint-free cloth.

Checking the Head Connectors

If you have checked the head connectors as described in this section and are returning from the maintenance device (MD) or the Maintenance Information (MI), go to "Removing the Head and Guide Assembly" on page. page CARR-DR 131.

A problem may be caused by a head cable that is not fully seated or by bent pins on the connector. The following procedure checks these conditions:

1. Go to CARR-DR 8 for the procedure to *power off* the drive.
2. To get access to the read and write cables, first remove the card cover **9**.
The read and write cables are found on the H2 and J4 cards.
3. Lift up on the tab **10** to disconnect the read cable **11** and the write cable **12**.
4. Inspect the pins on the head cable connectors and straighten any bent pins.
5. Reconnect the head cables to the H2 and J4 cards. Ensure that the cables are fully seated.
6. Replace the card cover **9** and mounting screws.
7. Go to CARR-DR 8 for the procedure to *power on* the drive.

Removing the Head and Guide Assembly

Notes:

- a. This FRU can be removed and replaced with affecting the other drive by removing power from the failing drive with the Drive Power On/Off switch.
- b. The Head and Guide Assembly should **not** be removed unless it has been cleaned and the connectors checked as described on this page.

Continue on to page CARR-DR 131.

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This page contains the steps needed to remove the head and guide assembly. The head alignment is critical. Do not attempt to remove the head from the head and guide assembly.

Removing the Head and Guide Assembly

The Head and Guide Assembly should *not* be removed unless it has been cleaned and the connectors checked as described on page CARR-DR 130.

Notes:

- This FRU can be removed and replaced without affecting the other drive by removing power from the failing drive with the Drive Power On/Off switch.
- To permit space when removing the head and guide assembly it may be necessary to remove the rear panel cover **13**.

- Go to CARR-DR 8 for the procedure to *power off* the drive.
- Clamp the plenum supply hose (see CARR-DR 3-1).
- Remove the mounting screws and the card cover **9**.

Warning: The cables and connectors can be easily damaged. Do not pull on the cables to disconnect them.

The read and write cables are found on the H2 and J4 cards.

- Lift up on the tab **10** to disconnect the read cable **11**.
- Lift up on the tab **10** to disconnect the write cable **12**. Remove the write cable from the J4 card.

Note: After the read and write cables have been disconnected, position a protector (such as an IBM card) between the logic cards and the cables. This will protect the cable pins and card components from damage.

Warning: Do not touch the surface of the read/write head when removing or replacing the protective shield.

To prevent damage to the read/write head, the shield that is shipped with the new head should remain on the new head until it has been installed, see the following procedure.

- Slide the shield **6** on to the head assembly located in the drive using equal downward pressure on each side.
- Unscrew the right safety cover support **8** and remove the head tape guide (right) **7**.
- Unscrew the left safety cover support **14** and remove the head tape guide (left) **15**.
- Remove the two screws and the rear panel cover **13**.
- Disconnect the tape lifter solenoid output hose **2** from the tape lifter solenoid.
- Disconnect the right guide bearing hose **3** from the right guide bearing.

- Disconnect the left guide bearing hose **1** from the left guide bearing.
- Disconnect the cleaner hose **4** from the tape cleaner block.
- Remove the three head and guide assembly mounting screws **5**.
- Slowly lift the assembly off the baseplate. Tilt the head away from the rear panel after clearing locating pins.

Continue lifting the head and guide assembly, permitting the cable connectors to pass through the opening in the baseplate.

- Set the head and guide assembly to the side taking care not to bend the cables or damage the head.

Note: The cables on the replacement head and guide assembly must be bent using the cables on the old head and guide assembly as an example.

- Remove the two ferrites **16** and the rubber cable protectors from the head assembly cables. These parts will be installed on the new head FRU assembly.

Replacing the Head and Guide Assembly

- Remove the replacement head and guide assembly from the shipping container. Ensure that the protective shield **6** is in place on the read/write head **6**.
- Bend the read and write cables of the replacement head and guide assembly using the old head and guide assembly as an example.
- Install the two ferrites **16** and rubber cable protectors on the replacement head and guide assembly in the same positions as they were on the old head and guide assembly.

Warning: Ensure that the cable connector pins are not damaged during the replacement procedure.

- Lower the head and guide assembly on to the baseplate. As you lower the head and guide assembly, guide the read and write cables through the opening in the baseplate. Ensure that the head and guide assembly installs correctly on the locating pins and is seated on the baseplate.
- Install the three mounting screws **5**. Do not over tighten the screws.
- Reconnect the write cable **12** to the J4 write card connector.
- Remove the protector that was used to protect the cable pins and card components from damage.
- Reconnect the read cable **11** to the H2 read card connector.

Note: Ensure that both the read and write cables are seated before continuing.

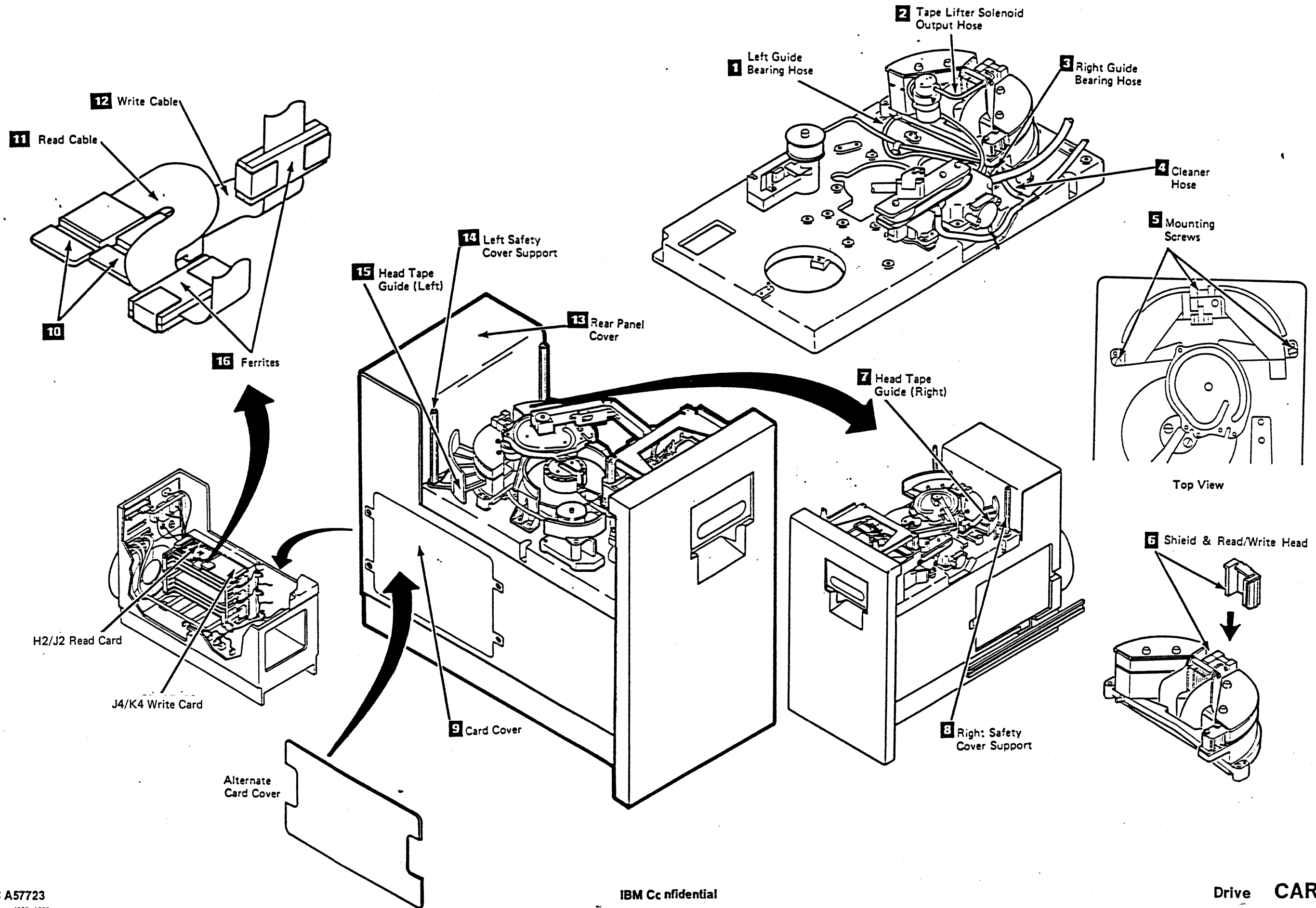
If either read or write cable is not fully seated, they may have bent pins. Remove the read and/or write card(s) (see CARR-DR 640) and bend the cable connectors up to inspect for bent pins. Straighten any bent pins with the pin straightener (part 453473). Excessively bent pins may be straightened using needle nose pliers before using the pin straightener tool.

- Install the card cover **9**.

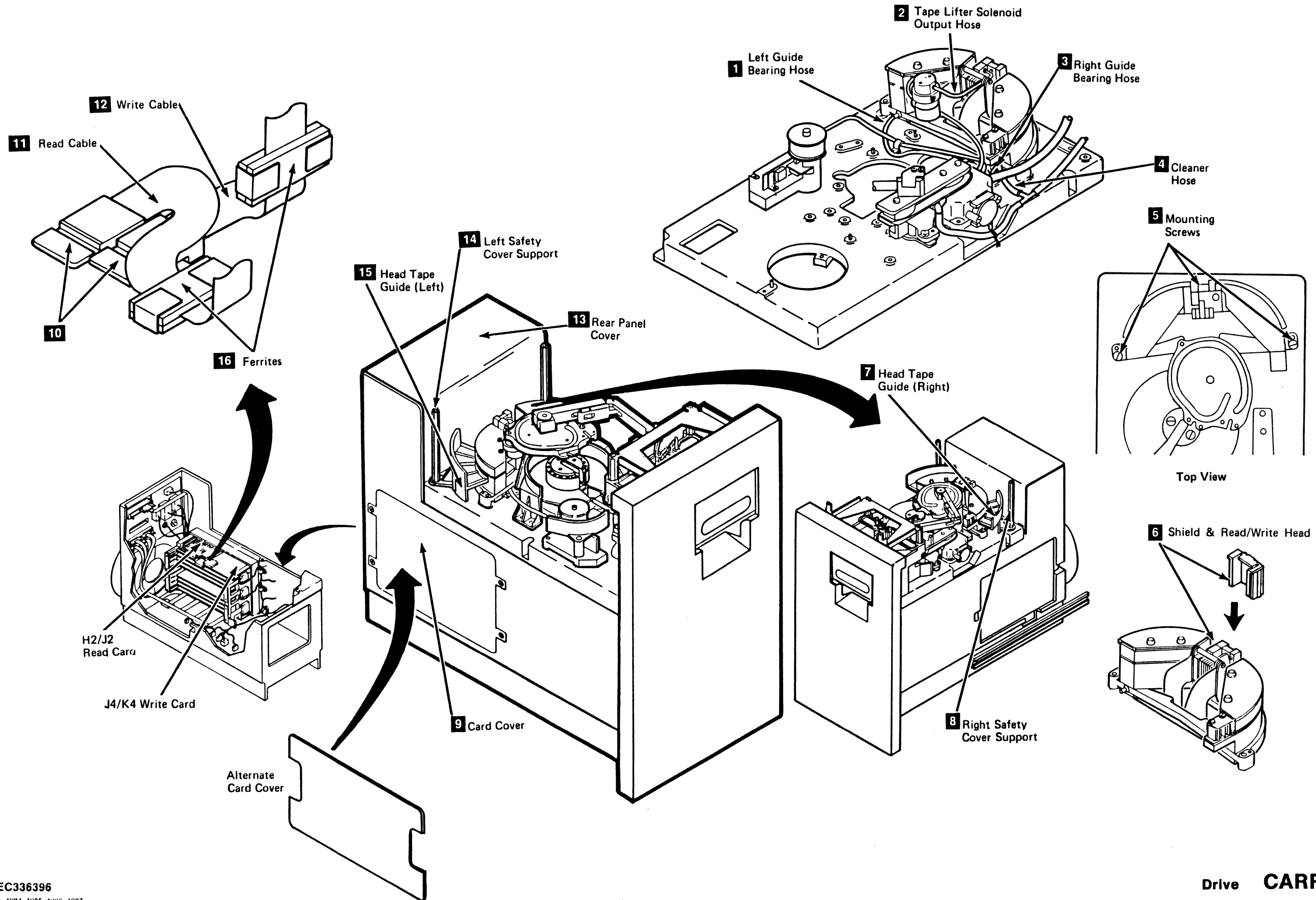
Note: As you install the tape guides (in the next two steps), ensure that the guides are against the head guide assembly and do not protrude into the tape path. See CARR-DR 2280 for installing the left guide and CARR-DR 2290 for installing the right guide.

- Install the head tape guide (left) **15** and the left safety cover support **14**.
- Install the head tape guide (right) **7** and the right safety cover support **8**.
- Reconnect the left guide bearing hose **1**.
- Reconnect the right guide bearing hose **3**.
- Reconnect the cleaner hose **4**.
- Reconnect the tape lifter solenoid output hose **2** to the tape lifter solenoid.
- Install the rear panel cover **13** with the two mounting screws.
- Remove the protective shield **6** from the read/write head **6**. Place it on the defective head to be returned with the defective head and guide assembly.
- Remove the clamp from the plenum supply hose (see CARR-DR 3-1).
- Install the drive drawer safety cover (see CARR-DR 2-5) and close the drive drawer.
- Go to CARR-DR 8 for the procedure to *power on* the drive.

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FRU014 Tension Transducer Removal and Replacement Procedure

Drive CARR-DR 140

This page contains the steps needed to remove and replace the tension transducer assembly (TU-D0/1-DK-Tension Transducer).

Warning: Some parts handled during this procedure are sensitive to electrostatic discharge (ESD), see CARR-DR 1-9 for "Instructions for Working With ESD-Sensitive Parts."

Note: This FRU can be removed and replaced without affecting the other drive by removing power from the failing drive with the Drive Power On/Off switch.

Removing the Tension Transducer Procedure

1. Go to CARR-DR 8 for the procedure to **power off** the drive.
2. Open the drive drawer and remove the drive safety cover (see CARR-DR 2-5).

So that we don't affect the other drive, it is necessary to clamp the plenum supply hose of the drive requiring service.
3. Clamp the plenum supply hose (see CARR-DR 3-1).
4. The tension transducer assembly is located in the area between the cartridge latch assembly and the threader assembly.
5. Disconnect the transducer hose **3** from the tension transducer.

6. Remove the tension transducer mount screws **1**, but do not remove the tension transducer at this time.

Note: The tension transducer tape guide **2** may or may not be a part of the tension transducer assembly. If one of the tension transducer mounting screws **1** is used to secure the tension transducer tape guide, remove the mounting screw and the tension transducer tape guide.

7. Lift the tension transducer off the baseplate far enough to get access to the cable connector on the side of the assembly. Disconnect the cable connector and lay the connector on the baseplate.
8. Lift the tension transducer off the baseplate and remove from the drive.

Replacing Tension Transducer Procedure

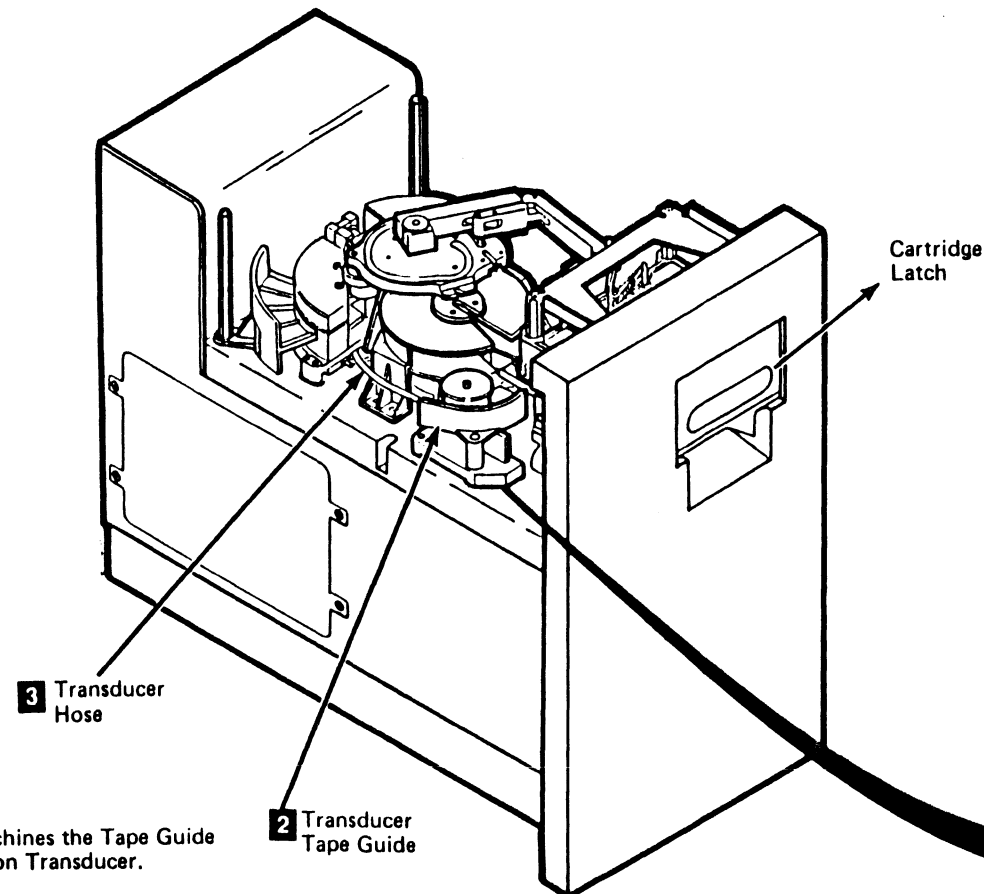
1. Place the tension transducer near its location on the baseplate and connect the cable connector to the side of the tension transducer.

Note: Ensure that the cable to the tape lifter solenoid is routed under the tension transducer.

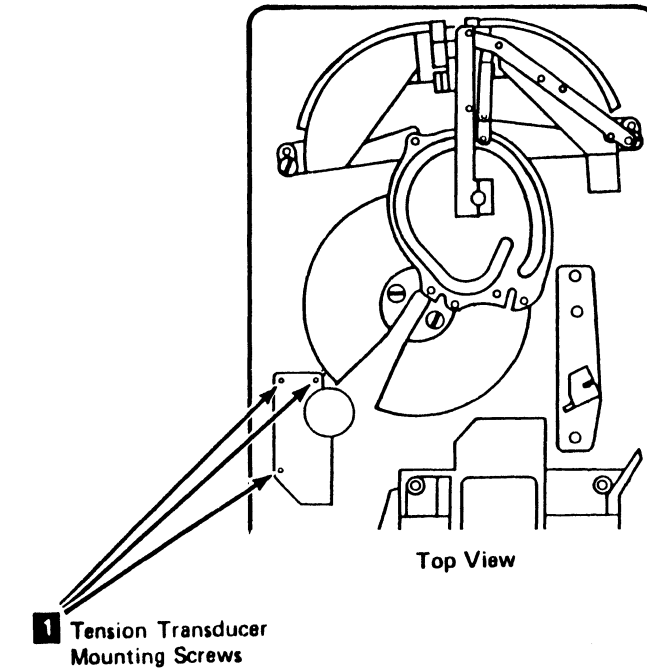
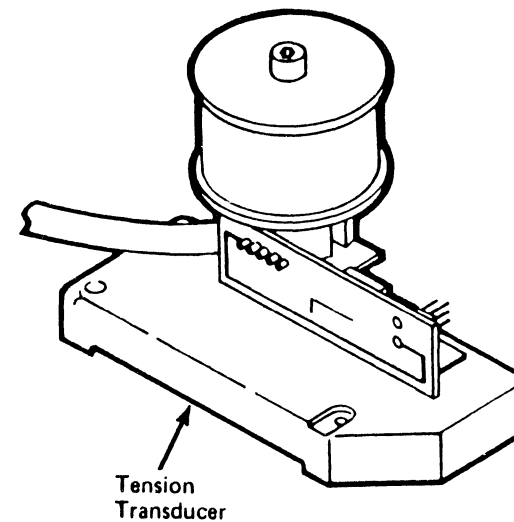
2. Place the tension transducer in position on the baseplate and install the three mounting screws **1**.

Note: The tension transducer tape guide **2** may or may not be a part of the tension transducer assembly. If the tension transducer tape guide is not a part of the tension transducer assembly, place the tension transducer tape guide **2** on the tension transducer and install the mounting screw.

3. Connect the transducer hose **3** to the tension transducer mounting bracket.
4. Remove the clamp from the plenum supply hose.
5. Install the drive drawer safety cover (see CARR-DR 2-5) and close the drive drawer.
6. Go to CARR-DR 8 for the procedure to **power on** the drive.



Note: On some machines the Tape Guide is part of the Tension Transducer.



FRU016 Latch Spring Removal and Replacement Procedure

Drive **CARR-DR 160**

This page contains the steps needed to remove and replace the latch spring **1** from the cartridge latch assembly. The latch spring is located inside the cartridge latch assembly.

Note: This FRU can be removed and replaced without affecting the other drive by removing power from the failing drive with the Drive Power On/Off switch.

Removing the Latch Spring

1. Go to CARR-DR 8 for the procedure to **power off** the drive.
2. Open the drive drawer.
3. Open the cartridge latch and find the latch spring **1**.

The spring is installed on the latch shaft **2** and is located in the center of the latch opening.

4. Remove the "C" clip **3** from the left end of the latch shaft.
5. Pull the right end of the latch shaft **4** out of the latch assembly until the latch spring can be removed.
6. Remove the latch spring from the drive.

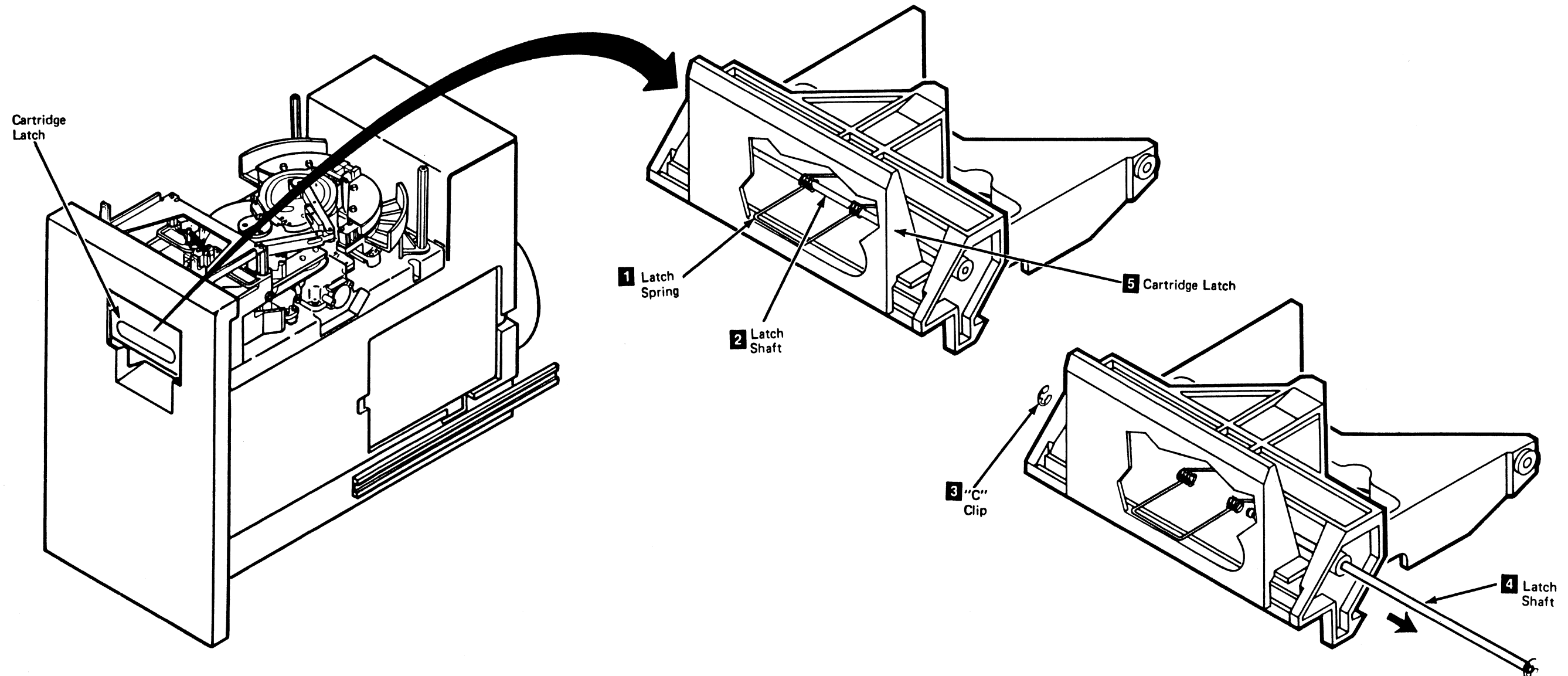
Replacing the Latch Spring

1. Slide the latch spring **1** on to the latch shaft **2**.

The "loop" end of the spring should be toward the front of the drive and the "loop" should be to the bottom of the latch shaft.

2. The "loop" must be on top of the latch **5**.
3. Press down on the latch shaft and slide it to the left, through the opening on the left side of the cartridge latch assembly.

4. Install the "C" clip **3** on the end of the latch shaft.
5. Check the operation of the cartridge latch by opening and closing it.
6. Close the drive drawer.
7. Go to CARR-DR 8 for the procedure to **power on** the drive.



FRU017 Plunger Spring Removal and Replacement Procedure

Drive **CARR-DR 170**

This page contains the steps needed to remove and replace the plunger spring **2** from the cartridge latch assembly. The plunger and plunger spring are installed on the bottom of the loader cover, which is part of the cartridge latch assembly.

Note: This FRU can be removed and replaced without affecting the other drive by removing power from the failing drive with the Drive Power On/Off switch.

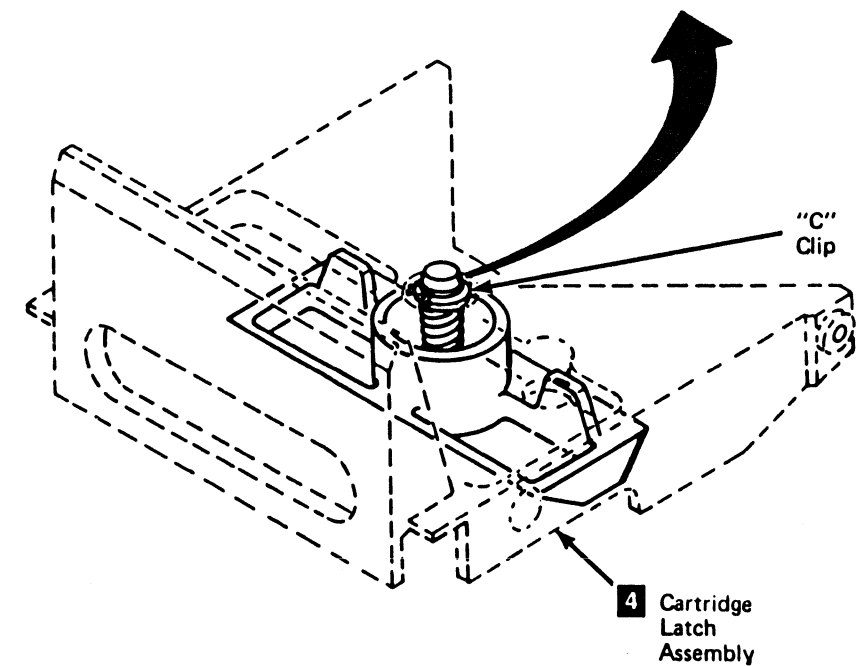
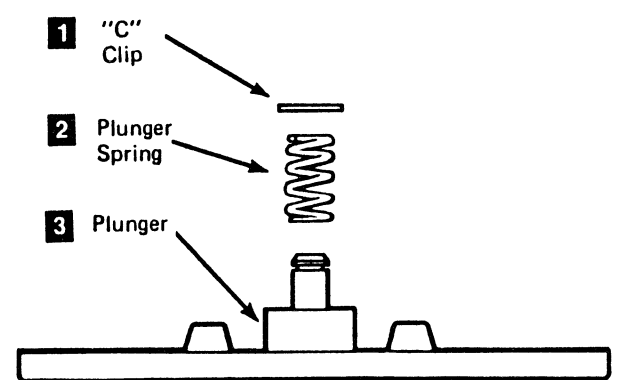
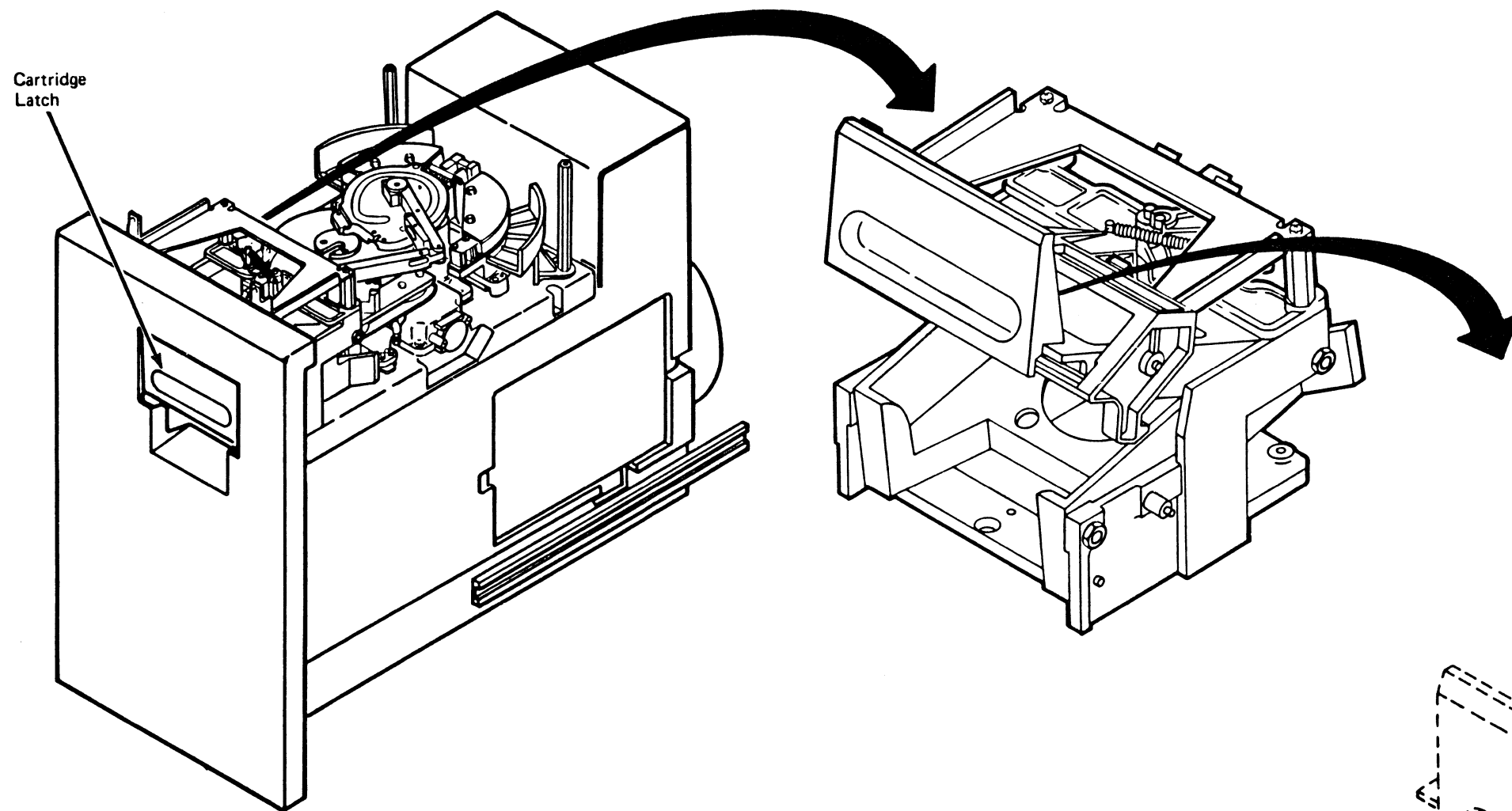
Removing the Plunger Spring

1. Go to CARR-DR 8 for the procedure to **power off** the drive.
2. Open the drive drawer.
3. Open the cartridge latch.

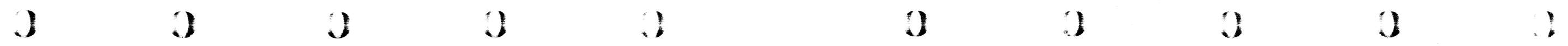
4. Push up on the plunger **3** and at the same time remove the "C" clip retainer **1** from the end of the plunger shaft.
5. Slowly lower the plunger until you can remove it from the cartridge latch assembly **4**.
6. Remove the plunger and spring **2** from the cartridge latch assembly **4**.
7. Remove the spring from the plunger.

Replacing the Plunger Spring

1. Place the plunger spring **2** on the plunger shaft **3**.
2. Insert the plunger and spring into the cartridge latch assembly **4**.
3. Press up on the plunger to extend the shaft above the latch tray, and reinstall the "C" clip retainer **1**.
4. Go to CARR-DR 8 for the procedure to **power on** the drive.



Drive **CARR-DR 170**



FRU018 Compression Spring Removal and Replacement Procedure

Drive **CARR-DR 180**

This page contains the steps needed to remove and replace the compression spring **2** in the cartridge latch assembly.

Note: This FRU can be removed and replaced without affecting the other drive by removing power from the failing drive with the Drive Power On/Off switch.

Removing the Compression Spring

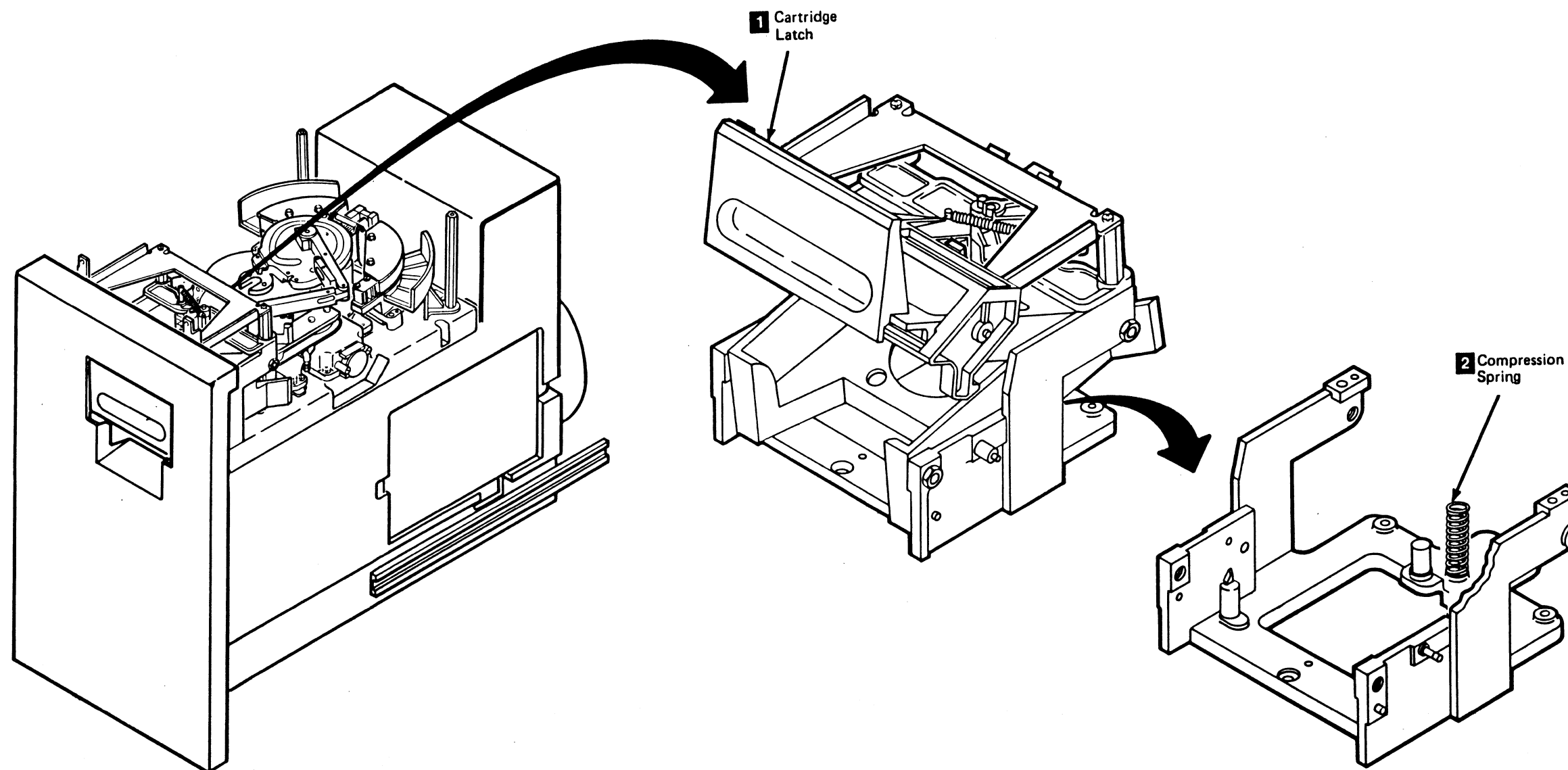
1. Go to CARR-DR 8 for the procedure to **power off** the drive.
2. Open the drive drawer and remove the drive safety cover (see CARR-DR 2-5).
3. Open the cartridge latch **1**.

4. Remove the compression spring **2** from the cartridge latch assembly.

The spring can be removed by holding the top with duckbill pliers, pushing down, and pulling the spring out of the cartridge latch assembly.

Replacing the Compression Spring

1. Using duckbill pliers, insert the compression spring **2** into the cartridge latch assembly.
Ensure that the compression spring is seated correctly.
2. Install the drive drawer safety cover (see CARR-DR 2-5) and close the drive drawer.
3. Go to CARR-DR 8 for the procedure to **power on** the drive.



This page contains the steps needed to remove and replace the interlock spring **2** in the the cartridge latch assembly.

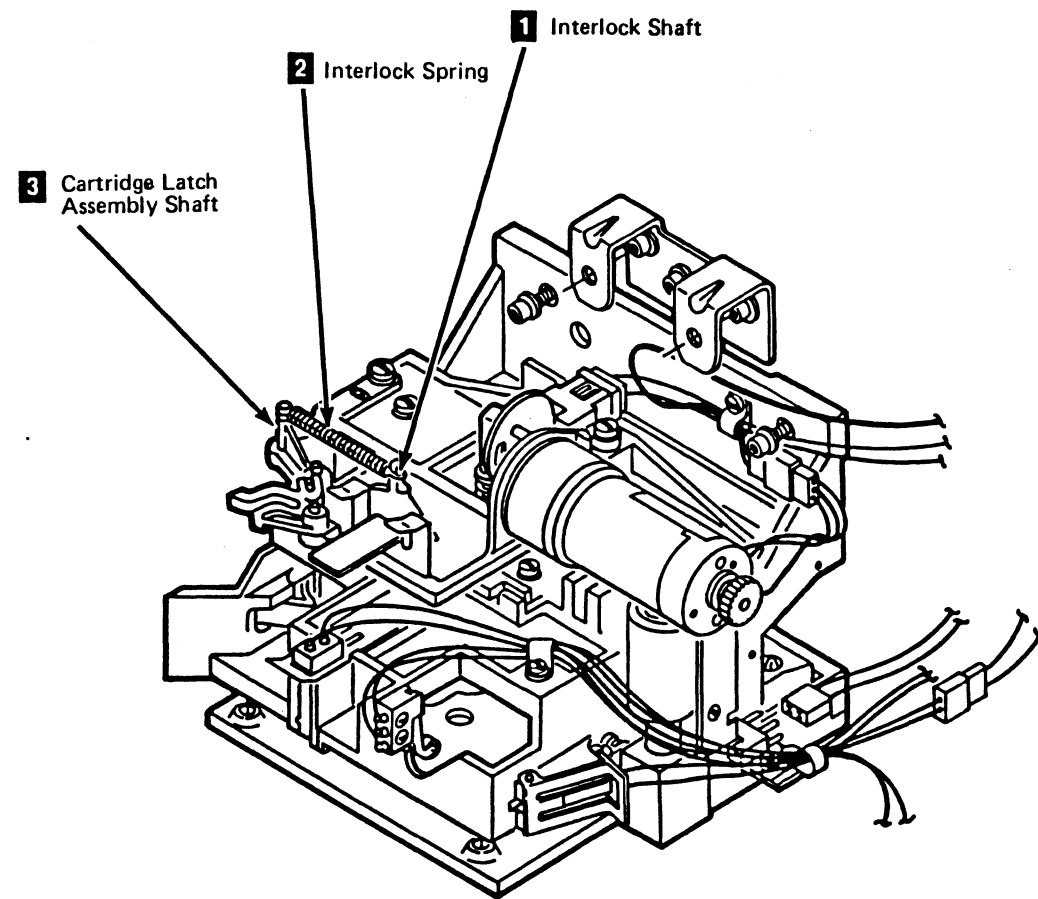
Note: This FRU can be removed and replaced without affecting the other drive by removing power from the failing drive with the Drive Power On/Off switch.

Removing the Interlock Spring

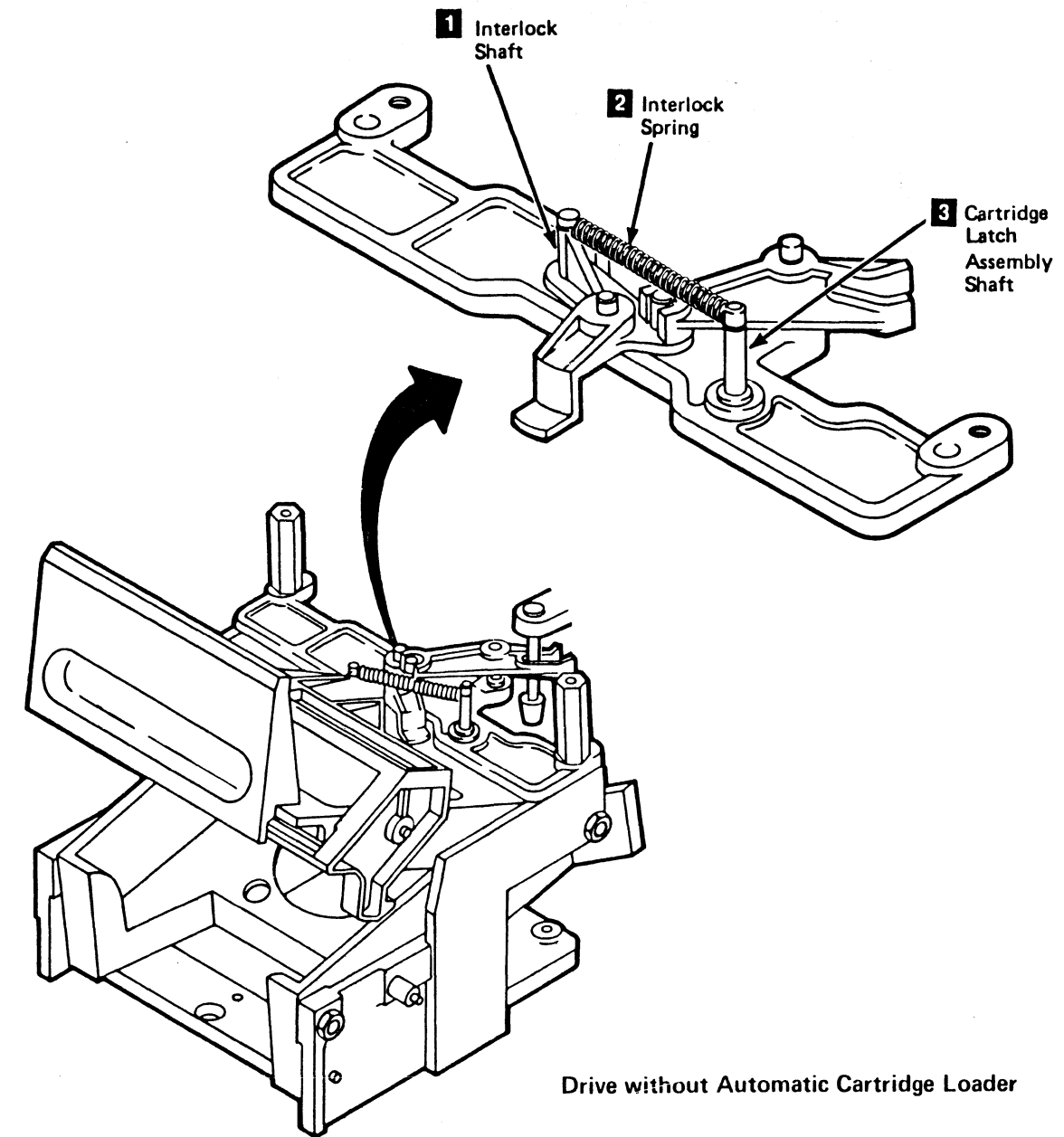
1. Go to CARR-DR 8 for the procedure to **power off** the drive.
2. Open the drive drawer.
3. Remove both ends of the interlock spring **2** and remove the spring from the cartridge latch assembly.

Replacing the Interlock Spring

1. Install one end of the interlock spring **2** on the interlock shaft **1**.
2. Install the other end of the interlock spring on the cartridge latch assembly shaft **3**.
3. Close the drive drawer.
4. Go to CARR-DR 8 for the procedure to **power on** the drive.



Drive with Automatic Cartridge Loader



Drive without Automatic Cartridge Loader



FRU020 Blower Assembly Removal and Replacement Procedure

Drive **CARR-DR 200**

Tape Unit With BM 6460006 (see CARR-DR 9)

This page contains the steps needed to remove and replace the tape unit blower assembly from the tape unit. The removal is from the rear of the tape unit.

Since there is only one blower in a tape unit, it is necessary that both drives be available for service.

Note: This FRU can be removed and replaced without affecting the other tape units by removing power from the failing tape unit with the ac power circuit breaker.

Removing the Blower Assembly

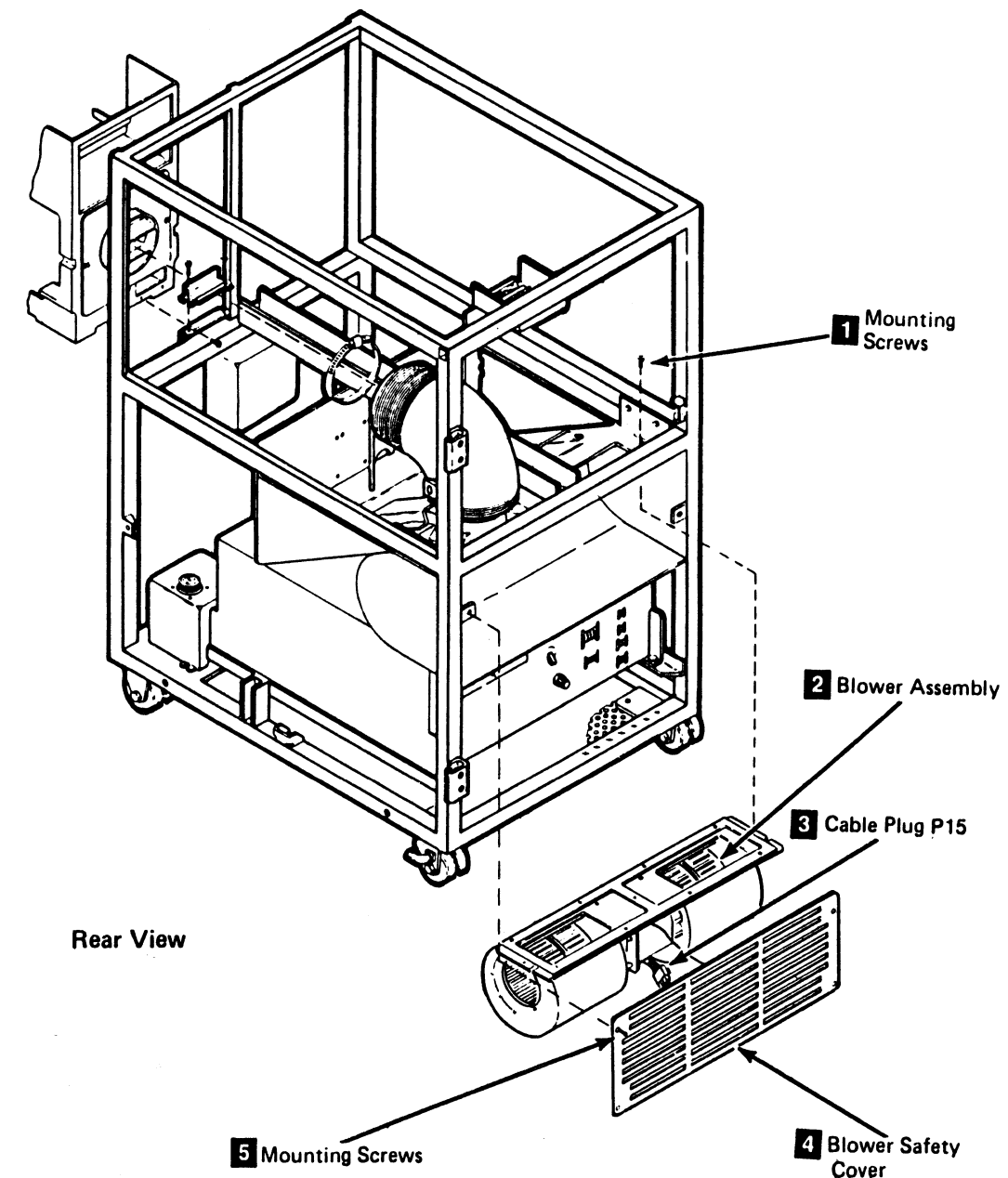
1. Go to CARR-DR 8 for the procedure to **power off** the tape unit.
2. Open the rear cover (see CARR-DR 2-1).
3. Remove the four mounting screws **5**, then remove the blower safety cover **4** from the tape unit.
4. Remove cable plug P15 from connector J15 **3** (located on the rear of the dc power supply).
5. Support the blower and remove the three mounting screws **1**.
6. Remove the blower **2** from the tape unit.
7. Save all mounting screws for the replacement procedure.

Replacing the Blower Assembly

The replacement procedure is from the rear of the tape unit.

1. Position the blower assembly **2** in the tape unit with the blower motor capacitor toward the rear of the tape unit.
2. Support the blower assembly and install the three blower mounting screws **1** saved from the removal procedure.
3. Install cable plug P15 **3** to connector J15 (located on the rear of the dc power supply).

4. Route the cable through the slot in the bottom of the blower mounting assembly.
5. Position the blower safety cover **4**, and then replace the four safety cover mounting screws **5** saved from the removal procedure.
6. Close the rear cover (see CARR-DR 2-2).
7. Go to CARR-DR 8 for the procedure to **power on** the tape unit.



Tape Unit Without BM 6460006 (see CARR-DR 9)

This page contains the steps needed to remove the drive blower assembly from the drive rear panel. The removal and replacement is from the rear of the tape unit.

Warning: This procedure will require all drives on this control unit to be offline. For CU 0 all addresses 0 through 7 must be offline. For CU 1 all addresses 8 through F must be offline.

Removing the Blower Assembly

1. Go to CARR-DR 8 for the procedure to **power off** the drive.
2. Open the rear cover and remove the rear safety cover (see CARR-DR 2-3).
3. Disconnect J1 **2**, J2 **3**, J3 **4**, and the flat cables (above the blower) from the rear of panel P1 **5** (the rear of the drive drawer). This makes it easier to remove the blower assembly **1**.
4. Disconnect the AC power plug **6** from the blower.

5. Remove the ground wire mounting screw **8** from the blower. Remove the ground wires **7** and the lockwasher **9** from the blower.
6. Remove the bottom blower mounting screw **15**.

Note: In the next step, if access to the mounting screw **10** is too difficult, loosen the top cover. Move the top cover toward the rear of the tape unit. The cover will move about 75 mm (approximately 3 inches) without pulling other cables loose. Pull the drive drawer to the front of the tape unit as far as possible. Access to the mounting screw **10** is now possible through the opening created at point **17**.

7. Remove the top blower mounting screw **10** and at the same time hold the blower to keep it from falling.
8. Lift the blower out of the drive.
9. Remove the finger guard mounting screw **13** from the blower assembly. Be careful not to lose the nut **11**, lockwasher **12**, and cable retainer **16**.

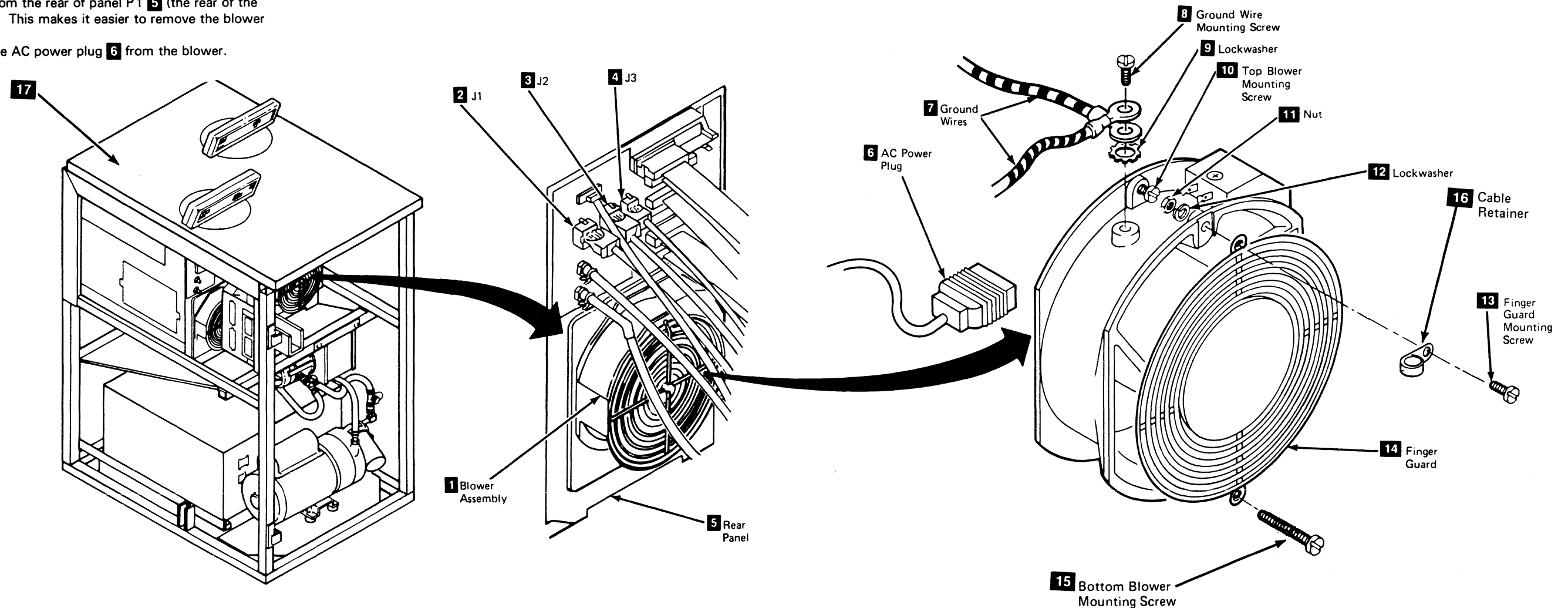
Save the finger guard **14** and hardware for use with the replacement blower assembly.

Replacing the Blower Assembly

1. Place the finger guard **14** on the blower assembly **1** and install the mounting screw **13**, lockwasher **12**, nut **11**, and cable retainer **16**.
2. Place the blower assembly in position against the rear panel **5** and install the top blower mounting screw **10** to hold the blower to the rear panel.
3. Install the bottom blower mounting screw **15**.
4. Install the two ground wires **7**, the lockwasher **9** and the mounting screw **8** to the blower assembly.

5. Connect the blower ac power plug **6** to the blower assembly.

Ensure that the blower plug is seated correctly on the blower.
6. Reconnect the J1 **2**, J2 **3**, J3 **4**, and the flat cables (above the blower) connectors to the rear panel.
7. If the top cover was loosened, put it back in place and tighten the holding screws.
8. Install the rear safety cover and close the rear cover (see CARR-DR 2-4).
9. Go to CARR-DR 8 for the procedure to **power on** the drive.





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FRU021 Message Display LED Removal and Replacement Procedure

Drive **CARR-DR 210**

This page contains the steps needed to remove and replace any of the message display LEDs. There are 8 message display LEDs in each message display panel.

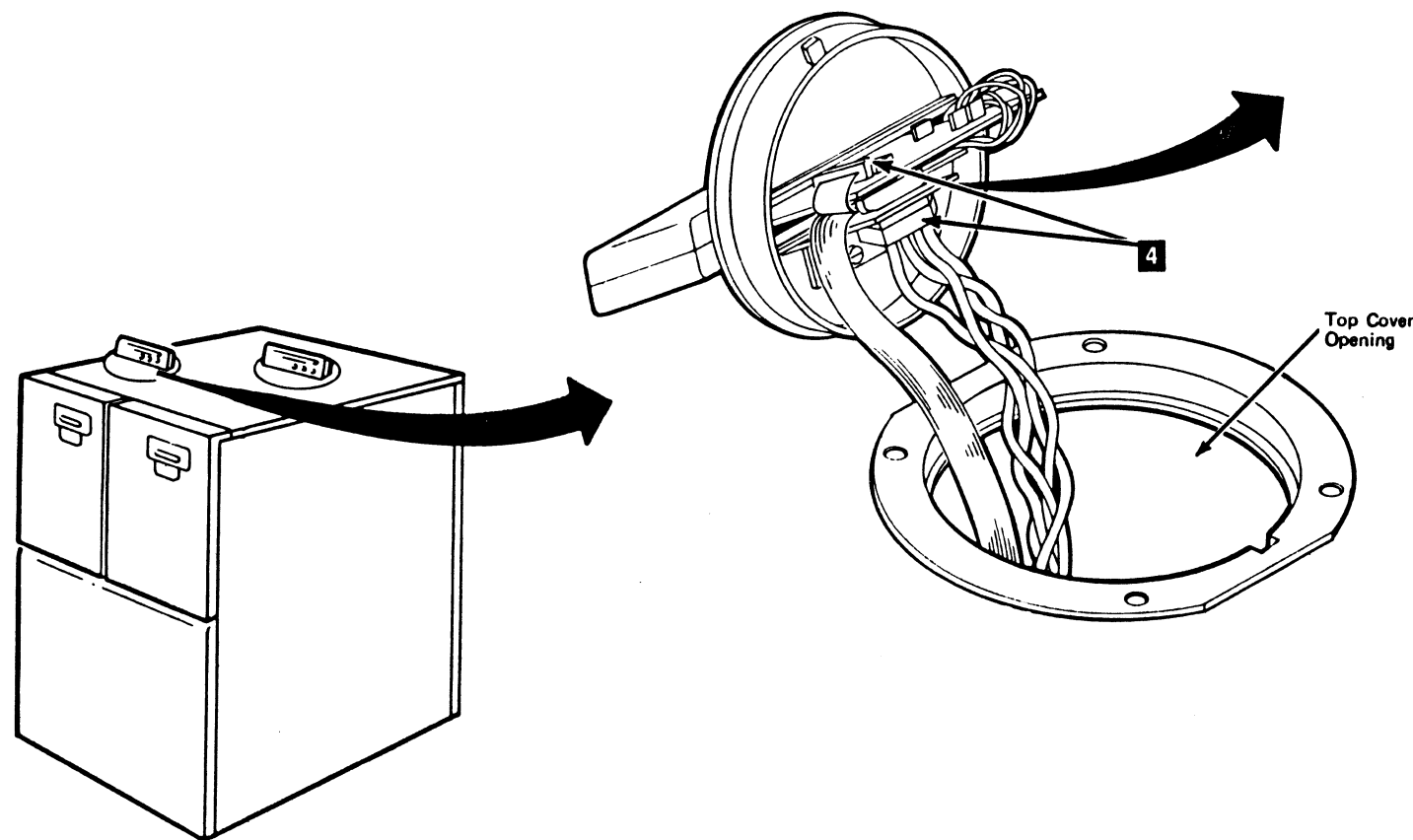
Warning: Some parts handled during this procedure are sensitive to electrostatic discharge (ESD). See CARR-DR 1-9 for "Instructions for Working With ESD-Sensitive Parts."

Note: This FRU can be removed and replaced without affecting the other drive by removing power from the falling drive with the Drive Power On/Off switch.

Removing the Message Display LED

1. Go to CARR-DR 8 for the procedure to **power off** the drive.
2. Remove the operator panel from the drive top cover (see CARR-DR 2-6).
3. Invert the operator panel and place it on the top cover to gain access to the connectors and screws on the bottom.
4. Remove the two screws holding the flat cable clamp to the mounting bracket.
5. Remove any retention hardware as required and remove the two cables from the connectors **4**.
6. Remove the two screws **1**, attaching the rear housing **3** to the base.
7. Remove the housing from the operator panel assembly by pulling it forward and sliding it towards the rear at the same time. Notice the plastic tabs and lip when viewed from the bottom.

When the tabs and lip are free from the base, remove the top housing from the base.



8. Turn the operator panel assembly upright.
9. Pull the bottom of the front housing **2** away from the rear housing and at the same time lift up on the front housing; remove it from the operator panel assembly.

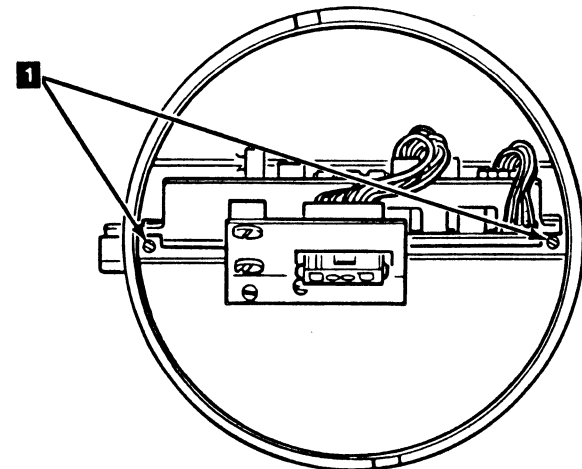
Note: There is a 'U' shaped lip on the top of the front housing.

10. Find the LED to be removed and remove the LED.

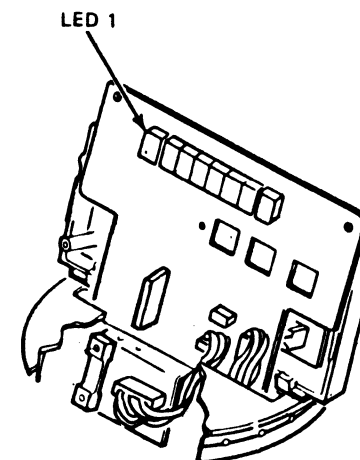
- a. Insert a small screwdriver under the LED.

Warning: The pins on the LED are small and can be easily damaged.

- b. Carefully separate the LED from the display board until it can be removed. Remove the LED.



Bottom View



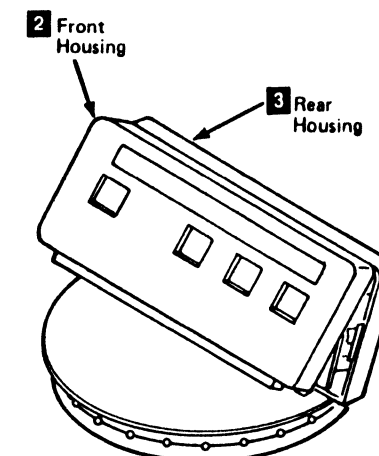
Replacing the Message Display LED

1. There are eight LEDs on the display board.
Determine which LED is to be installed.

Warning: The pins on the LEDs are small and can be easily damaged.

Note: LED Orientation - Double notches are on the top with a missing pin at the lower left.

2. Insert the LED on the display board and push the LED down until it is seated in the socket.
3. Place the top of the front housing in the 'U' shaped slot at the top of the rear housing and pivot the front housing down into position.
4. Work the bottom of the message display board through the opening in the message display base.
5. Insert the bottom of the front housing **2** into the opening in the operator panel assembly base and press the front housing and rear housing **3** together.
6. Turn the panel assembly over and align the two mounting holes in the rear panel housing with the two holes in the base. Install the two screws **1**.
7. Connect the two cables to the connectors **4** on the bottom of the operator panel assembly and replace any retention hardware.
8. Insert the flat cable in the clamp and tighten the two clamp mounting screws.
9. Install the operator panel assembly into the top cover (see CARR-DR 2-6).
10. Go to CARR-DR 8 for the procedure to **power on** the drive.



Drive **CARR-DR 210**

FRU030 Pump Motor Removal and Replacement Procedure

Drive **CARR-DR 300**

Tape Unit With BM 6460006 (see CARR-DR 9)

This page contains the steps needed to remove and replace the pump motor assembly in the tape unit. The pump motor assembly consists of the pump motor, the input filter, and the pump motor mounting plate.

The pump motor assembly is removed from the front of the tape unit.

Since the pump motor assembly supplies air and vacuum for both drives, it will be necessary to have both drives available for service.

Note: This FRU can be removed and replaced without affecting the other tape units by removing power from the failing tape unit with the ac power circuit breaker.

Removing the Pump Motor Assembly

1. Go to CARR-DR 8 for the procedure to **power off** the tape unit.

CAUTION
The pump motor may be hot.

2. Remove the tape unit front safety cover (see CARR-DR 2-1).
3. Disconnect the vacuum supply hose at the pump inlet (at the venturi) **3**.
4. Disconnect the pressure supply hose at the pump outlet **4**.
5. Remove the pump motor cable plug P4 **2** from connector J4 (located on the front of the dc power supply).
6. Remove the mounting screw **5** (located near the ac circuit breaker box) for the pump motor mounting plate.
7. Loosen the mounting screw (located at the left bottom side frame of the tape drive) for the pump motor mounting plate.

Note: There is a grounding star washer between the mounting plate and the machine frame.

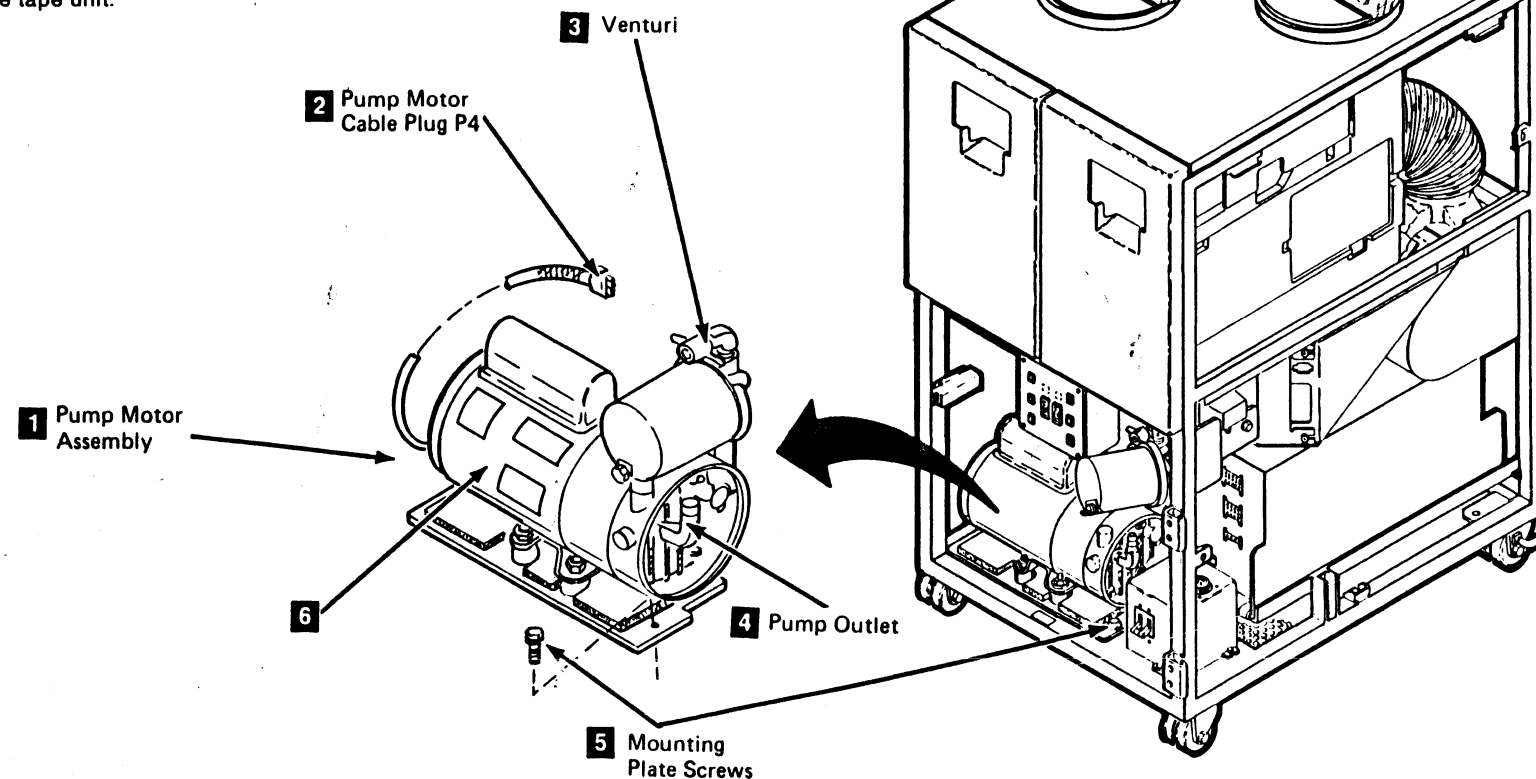
8. Remove the pump motor assembly **1** from the tape unit.

Replacing the Pump Motor Assembly

CAUTION
When placing the pump motor assembly into the tape unit (in the next step), ensure that the ac distribution cable is placed to the rear of the pump motor assembly and is not pinched by the pump motor mounting plate.

1. Install the "Warning" and "Caution" labels **6** on the pump motor according to the instructions that come with the pump motor.
2. Place the pump motor assembly **1** into front of the tape unit.
 - a. When positioning the left end of the pump motor mounting plate (slotted end) on its mounting screw, ensure that the grounding star-washer is between the mounting plate and the machine frame.

- b. Align the right end of the mounting plate with the screw hole near the ac circuit breaker box, then install the mounting screw **5**.
 - c. Tighten both mounting screws for the pump motor mounting plate.
3. Connect the vacuum supply hose to the pump inlet (at the venturi) **3**.
 4. Connect the pressure supply hose to the pump outlet **4**.
 5. Install the pump motor cable plug P4 **2** to connector J4 (located on the front of the dc power supply).
 6. Set the tape unit ac power circuit breaker to On (see LOC 1).
 7. Check all hoses for leaks.
 8. Install the tape unit front safety cover (see CARR-DR 2-2).
 9. Go to CARR-DR 8 for the procedure to **power on** the tape unit.



Drive **CARR-DR 300**

FRU030 Pump Motor Removal and Replacement Procedure

Tape Unit Without BM 6460006 (see CARR-DR 9)

This page contains the steps needed to remove and replace the pump motor assembly **2** from the tape unit. Since the pump supplies air and vacuum for both drives, it will be necessary to have both drives available for service.

The pump motor is removed and replaced from the rear of the tape unit.

Note: This FRU can be removed and replaced without affecting the other tape units by removing power from the failing tape unit with the ac power circuit breaker.

Removing the Pump Assembly

1. Go to CARR-DR 8 for the procedure to power off the tape unit.
2. Open the rear cover and remove the rear safety cover (see CARR-DR 2-3).

CAUTION
The pump motor may be hot.

3. Disconnect the pump motor cable connector P4 **9** from the rear of the power supply outlet (TU-PS01-J4).

4. Disconnect the outlet hose **1** from the pump outlet **8**.

- a. Slide the hose clamp away from the pump assembly outlet.

Note: On some hose clamps it is necessary to loosen the clamp with a screwdriver.

- b. Pull the hose off of the outlet to remove it.

5. Disconnect the inlet hose **3** from the pump assembly inlet filter **4**.

- a. Slide the hose clamp away from the inlet filter.

Note: On some hose clamps it is necessary to loosen the clamp with a screwdriver.

- b. Remove the hose from the inlet filter.

6. Remove the two plate mounting screws **7**.

Note: There is a grounding star washer **6** between the mounting plate and the machine frame.

7. Remove the mounting plate and pump assembly.

Lift the rear edge of the mounting plate **5** and at the same time slide the mounting plate and pump assembly toward the rear of the tape unit.

8. Remove the grounding star washer and save it for the installation procedure.

Replacing the Pump Assembly

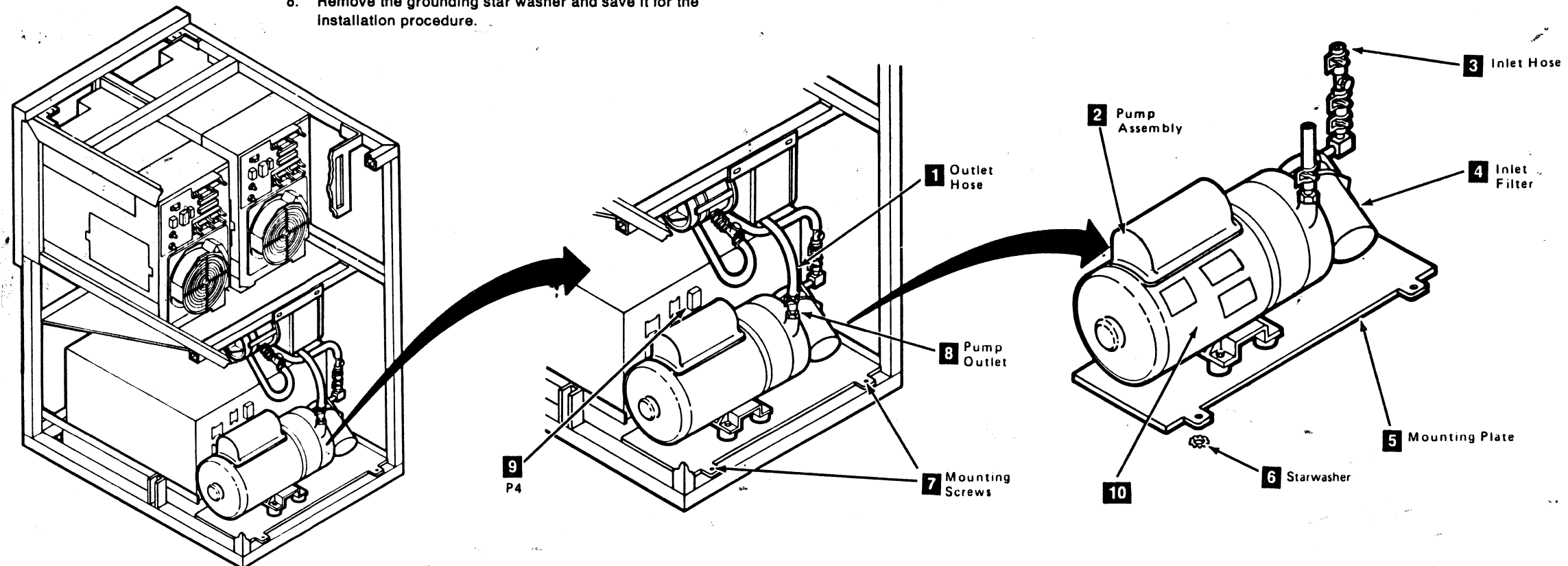
1. Install the "Warning" and "Caution" labels **10** on the pump motor according to the instructions that come with the pump motor.
2. Install the pump assembly **2** into the rear of the tape unit by sliding the mounting plate **5** forward until the mounting screw holes align with the holes in the frame.
3. Install the grounding star washer **6** between the left mounting tab and the machine frame. Ensure that the mounting screw goes through the grounding star washer.
4. Install and tighten the two mounting plate screws **7**.
5. Connect the outlet hose **1** from the output filter to the pump outlet **8**.

Slide the hose clamp into position and tighten the clamp if necessary.

6. Connect the inlet hose **3** to the inlet filter **4**.

Slide the hose clamp into position and tighten the clamp if necessary.

7. Connect the pump motor cable connector P4 **9** to the rear of the power supply (TU-PS01-J4).
8. Install the rear safety cover (see CARR-DR 2-4) and close the rear cover.
9. Go to CARR-DR 8 for the procedure to power on the tape unit.



Tape Unit With BM 6460006 (see CARR-DR 9)

This page contains the steps needed to remove and replace the regulator in the tape unit.

Since the regulator provides air pressure for both drives, it is necessary to have both drives available for service.

The regulator attaches to the output filter and the output filter mounts on a bracket attached to the front side-frame of the tape unit. Remove the entire assembly to access any component.

Note: This FRU can be removed and replaced without affecting the other tape units by removing power from the failing tape unit with the ac power circuit breaker.

Removing the Regulator

1. Go to CARR-DR 8 for the procedure to **power off** the tape unit.

Warning: The threaded fitting on the regulator is the only support for the regulator and can easily be broken. Use care when removing the hose clamp and regulator output port hose.

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2. Remove the tape unit front safety cover (see CARR-DR 2-1).
3. Remove cable plugs P8 and P9 from connectors J8 and J9 (located on the left side of the control box **4**).

4. Loosen the two control box mounting screws and remove the control box (for ease of removal of the regulator/filter assembly).
5. Remove the regulator output port hose **2** from the regulator.
6. Remove the pump to filter hose from the filter inlet port **7**.
7. Loosen the two mounting screws **6** holding the assembly and bracket **5** to the side frame.

Note: Before removing the regulator from the filter, note the position of the regulator output port.

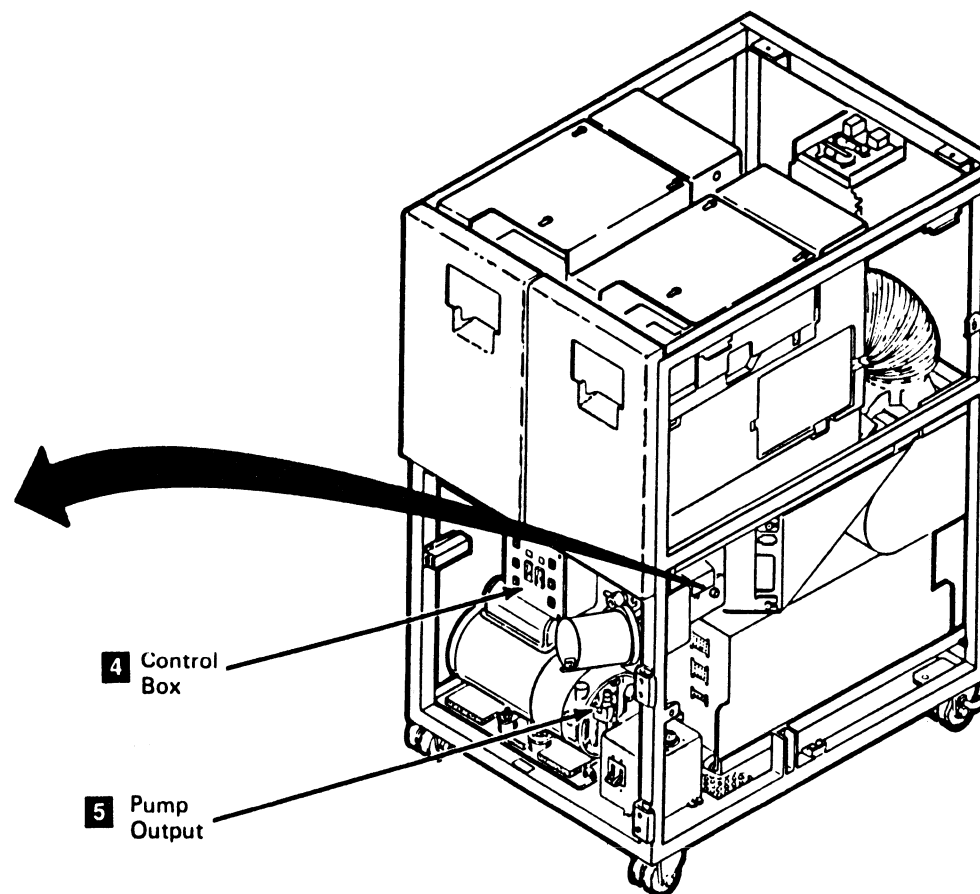
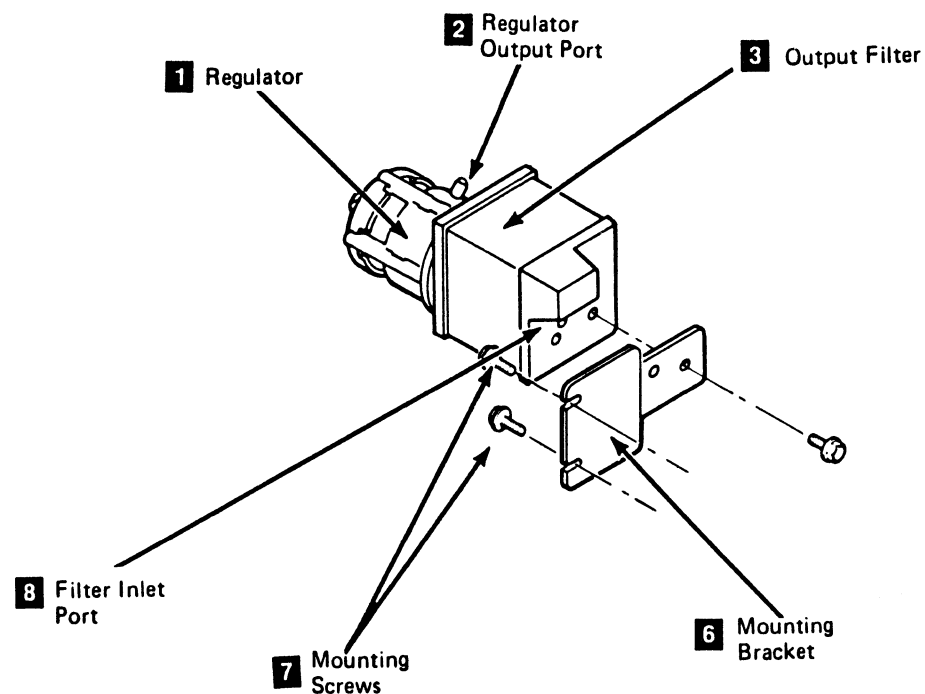
8. Remove the regulator **1** from the output filter **3** by turning the regulator counterclockwise.

Note: Teflon* tape will be required for the replacement procedure.

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Replacing the Regulator

1. Wrap Teflon* tape around the threaded fitting of the regulator.
2. Thread the regulator **1** onto the output filter **3** by turning the regulator clockwise. Hand tighten with caution. Position the regulator output port **2** to the same position noted during the removal procedure.
3. Replace the regulator-filter assembly and bracket **5** on the tape unit frame (using the two mounting screws **6**).
4. Install the hose on the regulator output port **2**.
5. Install the pump to filter hose on the filter inlet port **7**.
6. Replace the control box **4** and tighten the two mounting screws.
7. Install cable plugs P8 and P9 into connectors J8 and J9 (located on the left side of the control box **4**).
8. Go to PNEU 105 and do the procedure for checking and adjusting the pneumatic pressure and vacuum; return here when finished.
9. Replace the tape unit front safety cover (see CARR-DR 2-2).
10. Go to CARR-DR 8 for the procedure to **power on** the tape unit.



Tape Unit Without BM 6460006 (see CARR-DR 9)

If Your Tape Drive is 50 Hz, Go to CARR-DR 318

This page contains the steps needed to remove and replace the regulator from the tape unit. Since this regulator provides air pressure for both drives, it is necessary to have both drives available for service.

The regulator is attached to the output filter and the filter is mounted to a bracket that also contains the external load resistor panel. The entire assembly must be removed to access any component.

Note: This FRU can be removed and replaced without affecting the other tape units by removing power from the failing tape unit with the ac power circuit breaker.

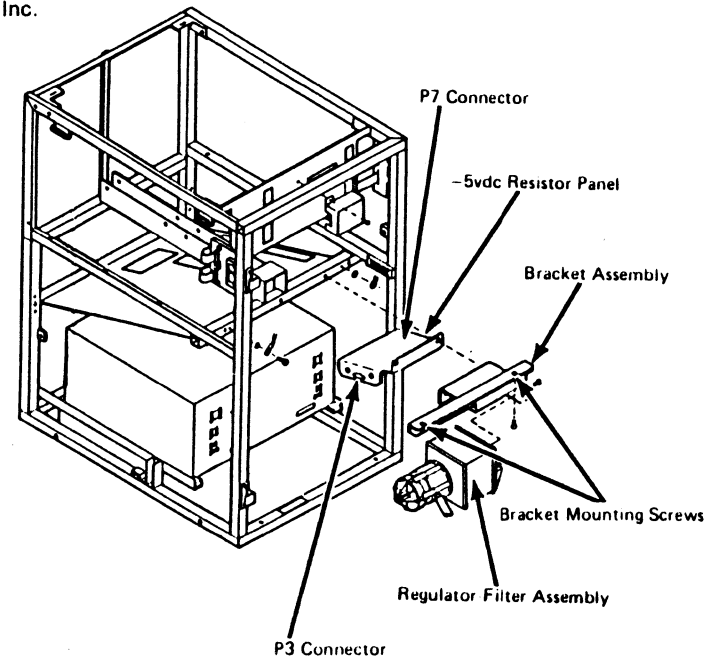
Removing the Regulator

1. Go to CARR-DR 8 for the procedure to **power off** the tape unit.

Warning: The threaded fitting on the regulator is the only support for the regulator and can easily be broken. Use care when removing the hose clamp and air pressure measurement tee.

Note: Teflon[®] tape will be required in the replacement procedure.

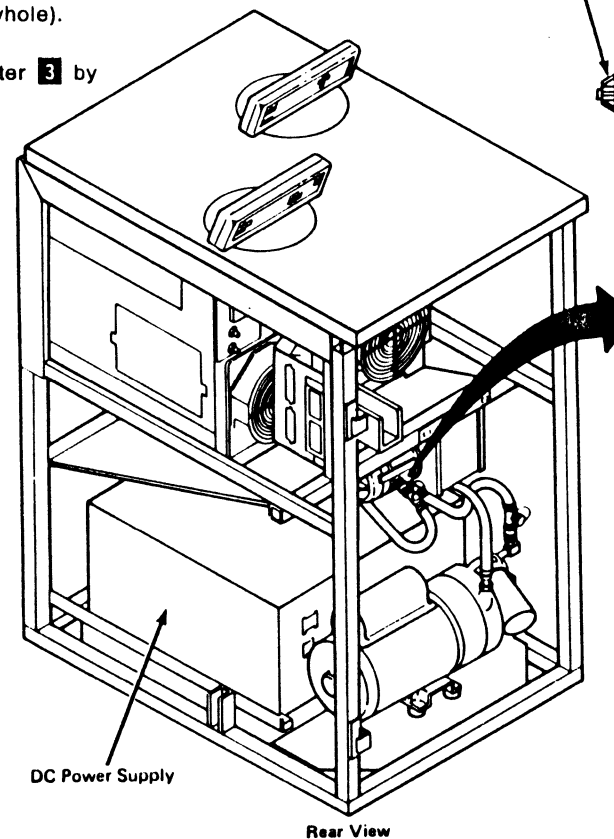
* Trademark of Dupont, Inc.



2. Remove the rear safety cover and ground connector (see CARR-DR 2-3).
3. Disconnect the air output hose from the regulator output port **4**.

CAUTION
Before removing cables P5, P6, and P7 from the power supply, rotate the vacuum tee hardware away from the hand access area.

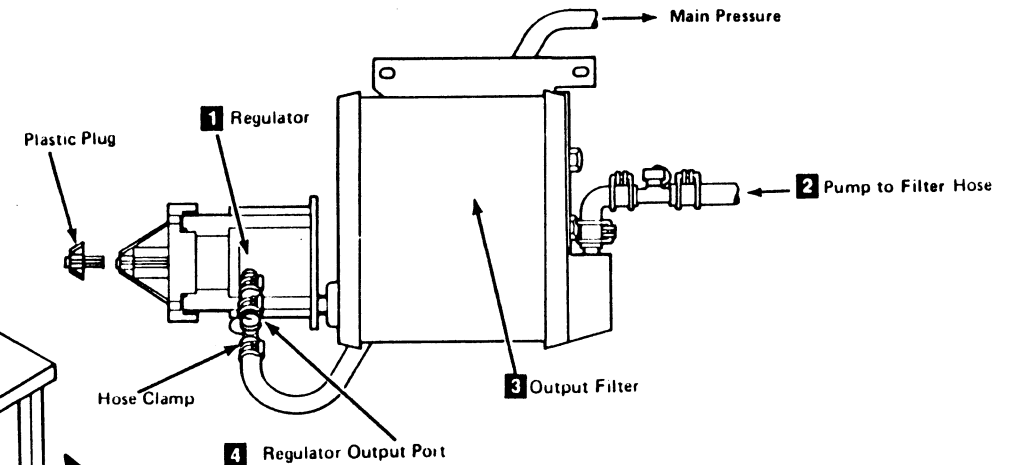
4. Unplug drive cables P5 and P6 and external load resistor panel cables P3 and P7 from the power supply.
5. Position drive cables and power supply fan cables to the right (for easier removal of the bracket assembly).
6. Remove the two bracket mounting screws.
7. Unbolt the bracket assembly and unplug the message display cables P3 and P7 from the external load resistor panel. P3 and P7 connectors from the external load resistor panel.
8. Remove the pump output hose from the filter inlet fitting **2**.
9. Remove the regulator-filter assembly from the bracket by loosening the mounting screws (slot and keyhole).
10. Remove the regulator **1** from the output filter **3** by turning the regulator counterclockwise.



Replacing the Regulator

Warning: The threaded fitting on the regulator can be broken by over tightening. Hand tighten only until tight, stopping with the regulator output port in the position shown. Use care when installing the hose clamp and the hose on the regulator output port.

1. Wind Teflon[®] tape around the threaded fitting of the regulator.
2. Thread the regulator **1** onto the output filter **3** by turning the regulator clockwise. Hand tighten with caution. Position the regulator output port **4** to the position shown.



3. Install the regulator-filter assembly on the bracket while preserving the output port position.
4. Connect message display cables (P3 and P7) to the external load resistor panel.
5. Connect the pump to filter hose **2** to the filter input.
6. Mount the bracket assembly to the frame.
7. Connect the pressure measurement tee hose to the regulator output port **4**.
8. Connect the external load resistor panel cables P3 and P7 to the power supply.
9. Connect drive cables P5 and P6 to the power supply.
10. Go to PNEU 105 and do the procedure for checking and adjusting the pneumatic pressure and vacuum; return here when finished.
11. Replace the rear safety cover and ground connector (see CARR-DR 2-4).
12. Go to CARR-DR 8 for the procedure to **power on** the tape unit.

FRU031 Regulator Removal and Replacement Procedure (50 Hz)

Tape Unit Without BM 6460006 (see CARR-DR 9)

If Your Tape Unit is 60 Hz, Go to CARR-DR 315

This page contains the steps needed to remove and replace the regulator from the rear of the tape unit. Since this regulator provides air pressure for both drives, it is necessary to have both drives available for service.

The regulator is attached to the output filter and the filter is mounted on a bracket that also contains the external load resistor panel and power supply cooling fan.

Note: This FRU can be removed and replaced without affecting the other tape units by removing power from the failing tape unit with the ac power circuit breaker.

Removing the Regulator

1. Go to CARR-DR 8 for the procedure to **power off** the tape unit.

Warning: The threaded fitting on the regulator is the only support for the regulator and can easily be broken. Use care when removing the hose clamp and air pressure measurement tee.

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Note: Teflon* tape will be required in the replacement procedure.

2. Remove the rear safety cover and ground connector (see CARR-DR 2-3).
3. Disconnect the air output hose from the regulator output port **2**.
4. Remove the regulator **3** from the output filter **1** by turning the regulator counterclockwise.

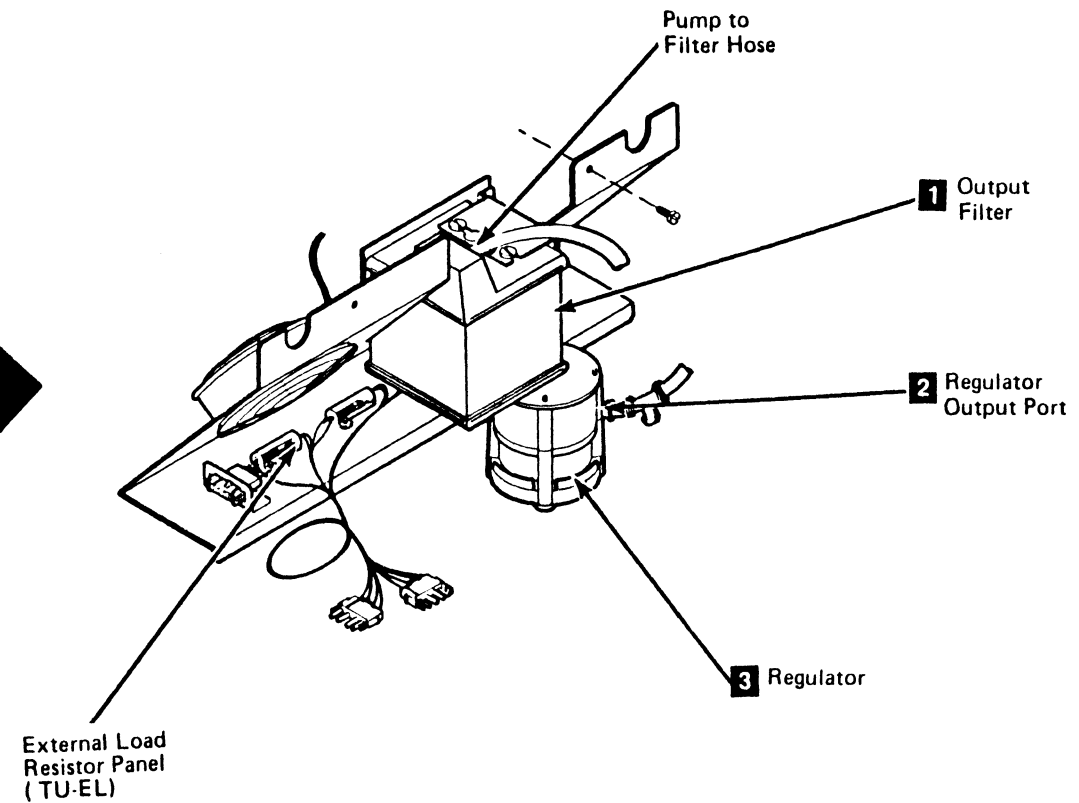
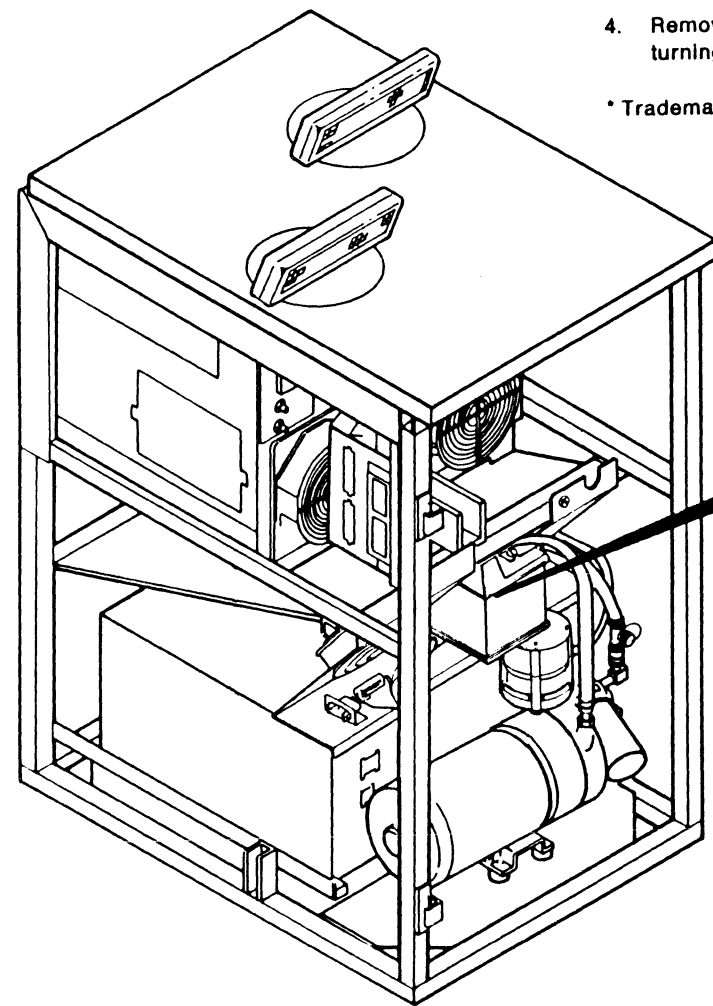
* Trademark of Dupont, Inc.

Replacing the Regulator

Warning: The threaded fitting on the regulator can be broken by over tightening. Hand tighten only until tight, stopping in the position shown. Use care when installing the hose clamp and pressure hose.

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1. Wind Teflon* tape around the threaded fitting of the regulator.
2. Thread the regulator **3** onto the output filter **1** by turning the regulator clockwise. Hand tighten with caution. Position the regulator output port **2** of the new the regulator to the same position as the removed regulator.
3. Connect the air output hose to the regulator output port **2**.
4. Go to PNEU 105 and do the procedure for checking and adjusting the pneumatic pressure and vacuum; return here when finished.
5. Replace the rear safety cover and ground connector (see CARR-DR 2-4).
6. Go to CARR-DR 8 for the procedure to **power on** the tape unit.



FRU032 Output Filter Removal and Replacement Procedure

Tape Unit With BM 6460006 (see CARR-DR 9)

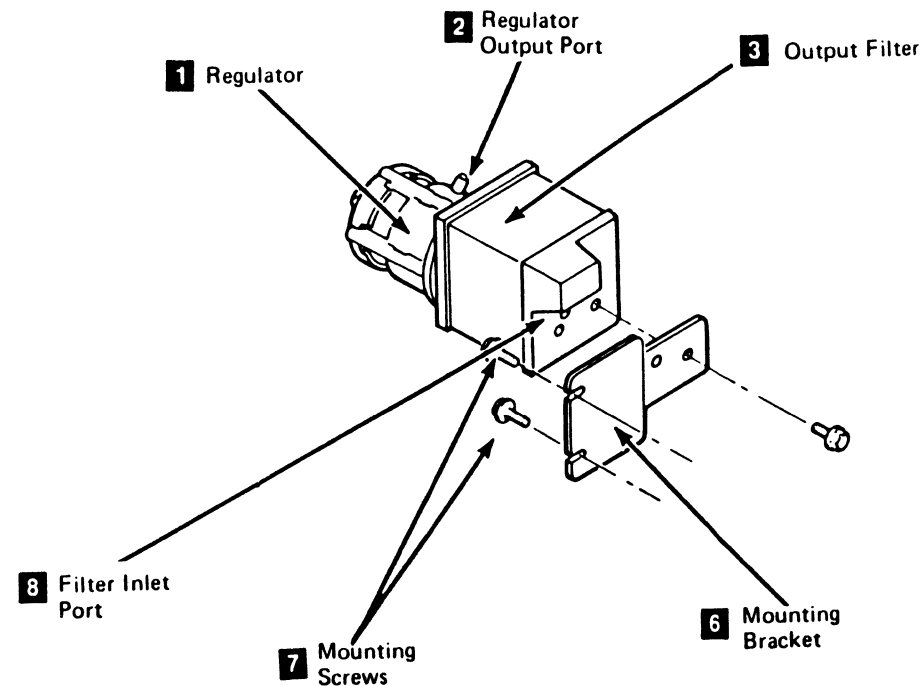
This page contains the steps needed to remove and replace the output filter in the tape unit. Since this output filter provides air pressure for both tape drives, it is necessary to have both tape drives available for service.

The regulator is attached to the output filter and the filter is mounted on a bracket attached to the front side-frame. The entire assembly must be removed to access any component.

Note: This FRU can be removed and replaced without affecting the other tape units by removing power from the failing tape unit with the ac power circuit breaker.

Removing the Output Filter

1. Go to CARR-DR 8 for the procedure to **power off** the tape unit.
2. Remove the tape unit front safety cover (see CARR-DR 2-1).
3. Remove cable plugs P8 and P9 from connectors J8 and J9 (located on the left side of the control box **4**).



4. Loosen the address box mounting screws and remove the tape unit control box (for ease of removal of the filter/regulator assembly).

Warning: The threaded fitting on the regulator is the only support for the regulator and can easily be broken. Use care when removing the hose clamp and regulator output port hose.

5. Disconnect the regulator output port hose **2** from the regulator output port.

6. Remove the pump to filter hose from the filter inlet port **7**.
7. Loosen the two mounting screws **6** and remove the regulator/filter assembly and bracket from the tape unit.

Note: Before removing the regulator from the output filter, note the position of the output port.

8. Remove the regulator **1** from the output filter **3** by turning the regulator counterclockwise. Save the regulator to be used with the replacement output filter.

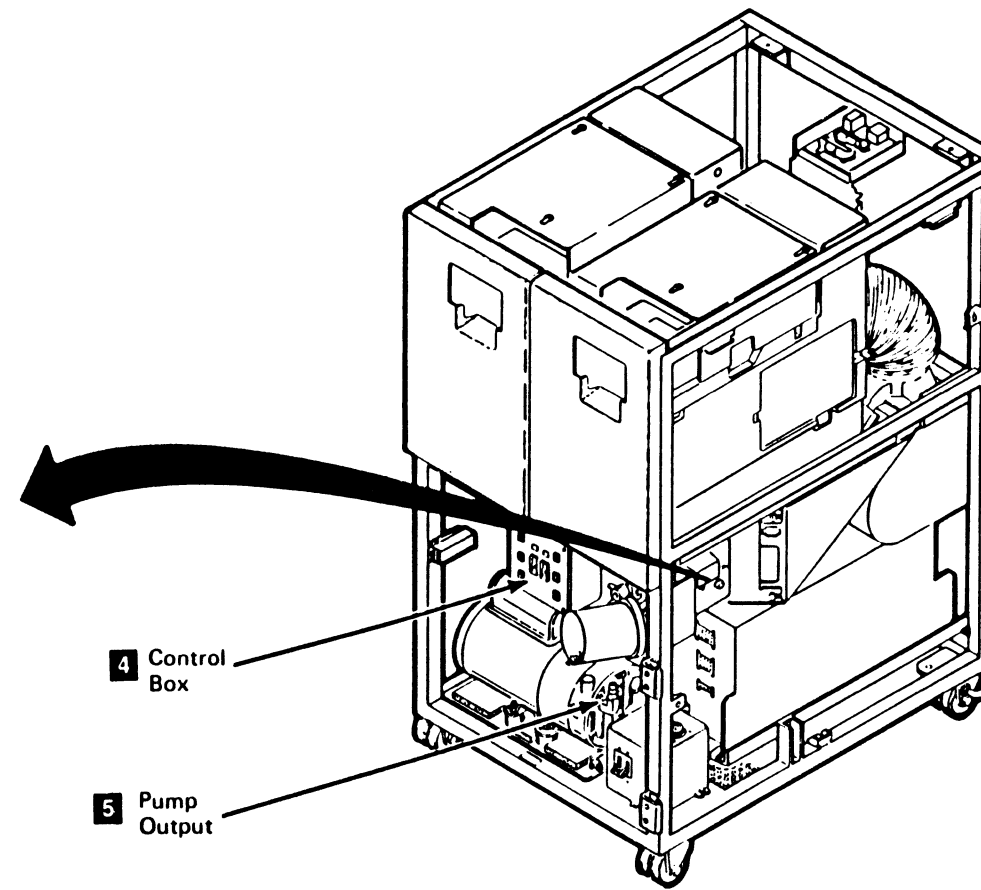
Note: Teflon* tape will be required in the replacement procedure.

9. Remove the mounting bracket **5** from the output filter **3**, save the screws and mounting bracket for the replacement procedure.

* Trademark of Dupont, Inc.

Replacing the Output Filter

1. Wind Teflon* tape around the threaded fitting of the regulator.
2. Thread the regulator **1** onto the output filter **3** by turning the regulator clockwise. Hand tighten with caution. Position the output port **2** of the regulator to the same position noted during the removal procedure.
3. Attach the mounting bracket **5** to the output filter with the screws saved from the removal procedure.
4. Install the regulator-filter assembly and bracket on the machine frame (using the two mounting screws **6**).
5. Replace the pump to filter hose on the filter inlet port **7**.
6. Connect the hose to the regulator output port **2**.
7. Replace the tape unit control box (using the two mounting screws).
8. Connect cables P8 and P9 to the the tape unit control box **4** (located on the left side of the control box).
9. Go to PNEU 105 and do the procedure for checking and adjusting the pneumatic pressure and vacuum; return here when finished.
10. Install the tape unit front safety cover (see CARR-DR 2-2).
11. Go to CARR-DR 8 for the procedure to **power on** the tape unit.



FRU032 Output Filter Removal and Replacement Procedure (60 Hz)

Tape Unit Without BM 6460006 (see CARR-DR 9)

If Your Tape Unit Is 50 Hz, Go to CARR-DR 328

This page contains the steps needed to remove and replace the output filter from the tape unit. Since this output filter provides air pressure for both drives, it is necessary to have both drives available for service.

The filter is mounted on a bracket containing the external load resistor panel. The entire assembly must be removed for access to any component.

Note: This FRU can be removed and replaced without affecting the other tape units by removing power from the failing tape unit with the ac power circuit breaker.

Removing the Output Filter

1. Go to CARR-DR 8 for the procedure to **power off** the tape unit.
2. Open the rear cover and remove the rear safety cover and ground connector (see CARR-DR 2-3).
3. Disconnect the regulator output port hose **4** from the regulator.
4. Disconnect the pump to filter hose **2** from the filter.

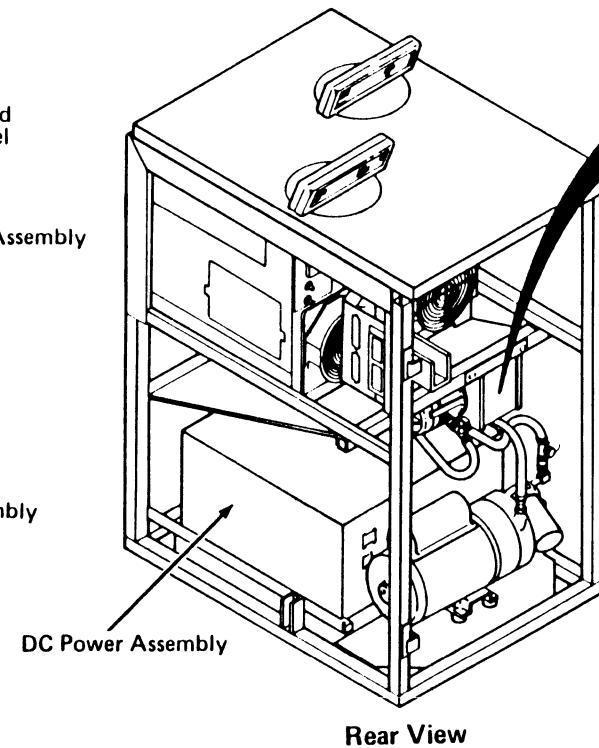
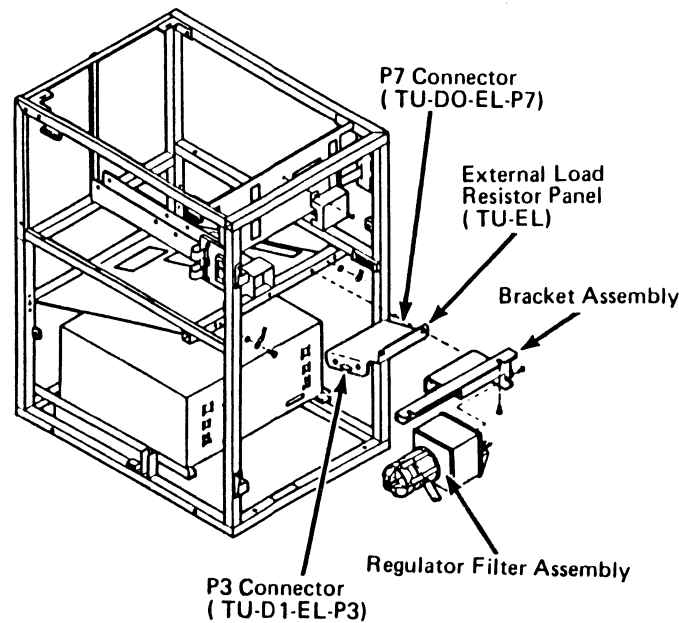
Warning: The threaded fitting on the regulator is the only support for the regulator and can easily be broken. Use care when removing the hose clamp and air pressure measurement tee.

Note: Teflon* tape will be required in the replacement procedure.

* Trademark of Dupont, Inc.

CAUTION
Before removing cables P5, P6, and P7 from the power supply, rotate the vacuum tee hardware away from the hand access area.

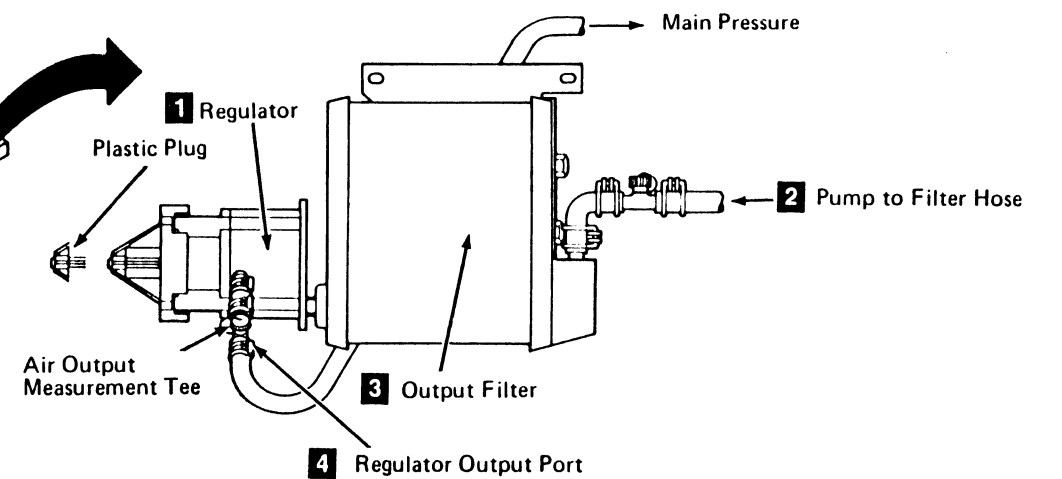
5. Unplug drive cables P5 and P6, and external load resistor panel cables P3 and P7, from the power supply.
6. Position the drive cables and the power supply fan cables to the right of the drive (for easier removal of the bracket assembly).
7. Unbolt the bracket assembly and unplug message display panel cables P3 and P7 from the external load resistor panel.
8. Remove the regulator-filter assembly from the bracket by loosening the mounting screws (slot and keyhole).
9. Remove the regulator **1** from the output filter **3** by turning the regulator counterclockwise. Save the regulator, to be used with the replacement output filter.



Replacing the Output Filter

Warning: The threaded fitting on the regulator can be broken by over tightening. Hand tighten only until tight, stopping with the output port in the position shown. Use care when installing the hose clamps and pressure hose.

1. Wind Teflon* tape around the threaded fitting of the regulator.
2. Thread the regulator **1** onto the output filter **3** by turning the regulator clockwise. Hand tighten with caution. Position the output port **4** of the regulator to the position shown.



3. Install the regulator-filter assembly on the bracket while preserving the output port position.
4. Connect message display cables (P3 and P7) to the external load resistor panel.
5. Connect the pump to filter hose **2** to the output filter **3**.
6. Install the bracket assembly to the frame.
7. Connect the hose to the regulator output port **4**.
8. Connect the external load resistor panel cables P3 and P7 to the power supply.
9. Connect drive cables P5 and P6 to the power supply.
10. Go to PNEU 105 and do the procedure for checking and adjusting the pneumatic pressure and vacuum; return here when finished.
11. Replace the rear safety cover and ground connector (see CARR-DR 2-4) and close the rear cover.
12. Go to CARR-DR 8 for the procedure to **power on** the tape unit.

FRU032 Output Filter Removal and Replacement Procedure (50 Hz)

Tape Unit Without BM 6460006 (see CARR-DR 9)

If Your Tape Unit Is 60 Hz, Go to CARR-DR 325

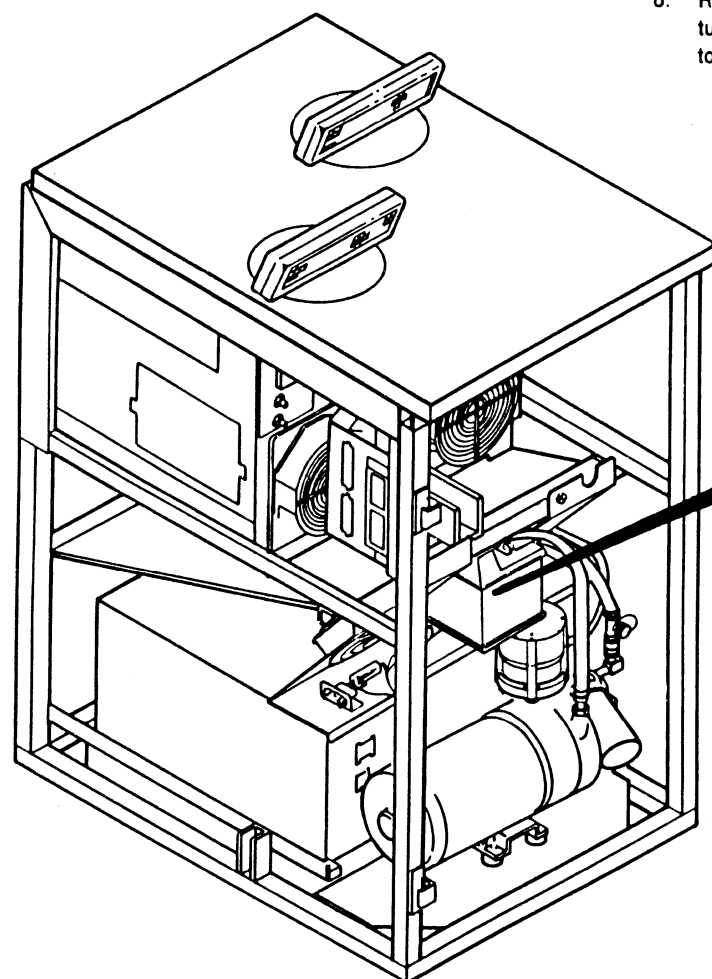
This page contains the steps needed to remove and replace the output filter from the rear of the tape unit. Since this output filter provides air pressure for both drives, it is necessary to have both drives available for service.

The filter is mounted on a bracket containing the external load resistor panel and the power supply cooling fan.

Note: This FRU can be removed and replaced without affecting the other tape units by removing power from the failing tape unit with the ac power circuit breaker.

Removing the Output Filter

1. Go to CARR-DR 8 for the procedure to **power off** the tape unit.
2. Open the rear cover and remove the rear safety cover and ground connector (see CARR-DR 2-3).



3. Disconnect the air output hose from the regulator output port **2**.
4. Disconnect the pump to filter hose **4** from the output filter **1**.

Warning: The threaded fitting on the regulator is the only support for the regulator and can easily be broken. Use care when removing the hose clamp and air pressure measurement tee.

Note: Teflon* tape will be required in the replacement procedure.

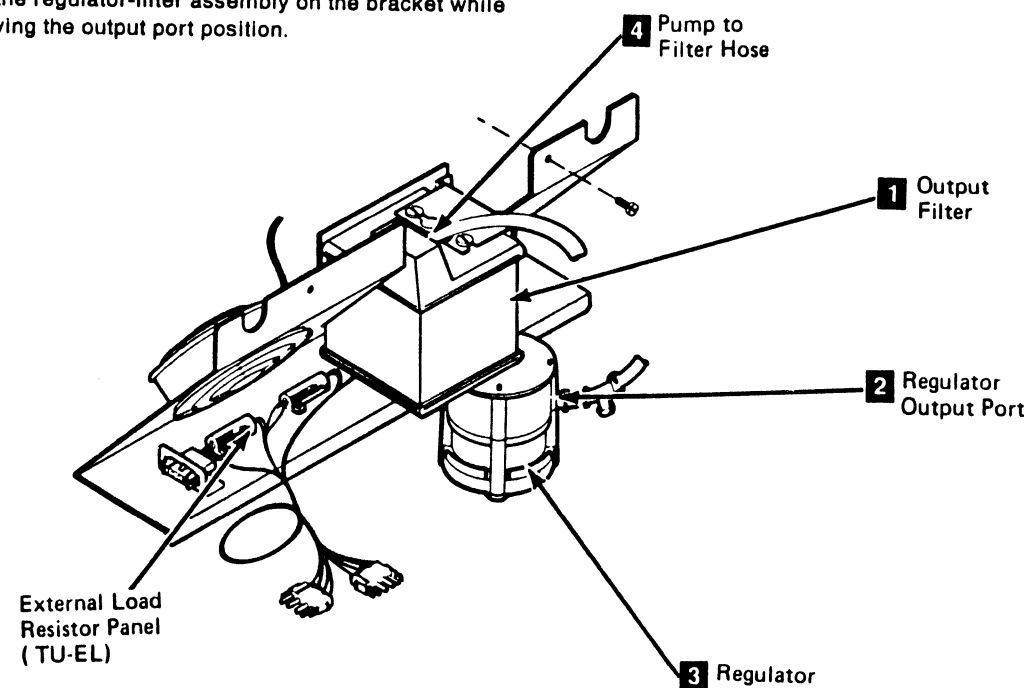
* Trademark of Dupont, Inc.

5. Remove the regulator-filter assembly from the bracket by loosening the mounting screws (slot and keyhole).
6. Remove the regulator **3** from the output filter **1** by turning the regulator counterclockwise. Save the regulator, to be used with the replacement output filter.

Replacing the Output Filter

Warning: The threaded fitting on the regulator can be broken by over tightening. Hand tighten only until tight, stopping in the position shown. Use care when installing the hose clamps and pressure hose.

1. Wind Teflon* tape around the threaded fitting of the regulator.
2. Thread the regulator **3** onto the output filter **1** by turning the regulator clockwise. Hand tighten with caution. Position the output port **2** of the regulator to the same position as on the replaced regulator.
3. Install the regulator-filter assembly on the bracket while preserving the output port position.



Drive **CARR-DR 328**

4. Connect the pressure hose to the regulator output port **2**.
5. Connect the pump to filter hose **4** to the output filter **1**.
6. Go to PNEU 105 and do the procedure for checking and adjusting the pneumatic pressure and vacuum, return here when finished.
7. Replace the rear safety cover and ground connector (CARR-DR 2-4) and close the rear cover.
8. Go to CARR-DR 8 for the procedure to **power on** the tape unit.

Tape Unit With BM 6460006 (see CARR-DR 9)

This page contains the steps needed to remove and replace the inlet filter in the inlet filter assembly. Since this inlet filter provides air pressure for both drives, it is necessary to have both drives available for service.

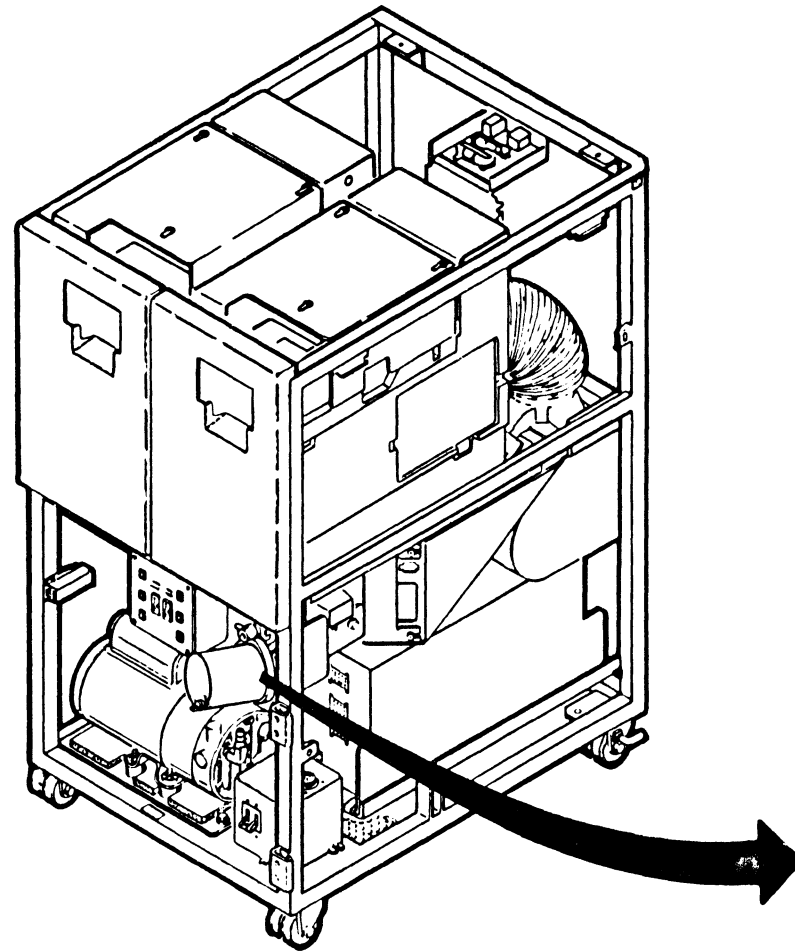
The inlet filter assembly is attached to the pump motor and is removed from the front of the tape unit.

Note: This FRU can be removed and replaced without affecting the other tape units by removing power from the failing tape unit with the ac power circuit breaker.

Removing the Inlet Filter

1. Go to CARR-DR 8 for the procedure to **power off** the tape unit.
2. Remove the tape unit front safety cover (see CARR-DR 2-1).

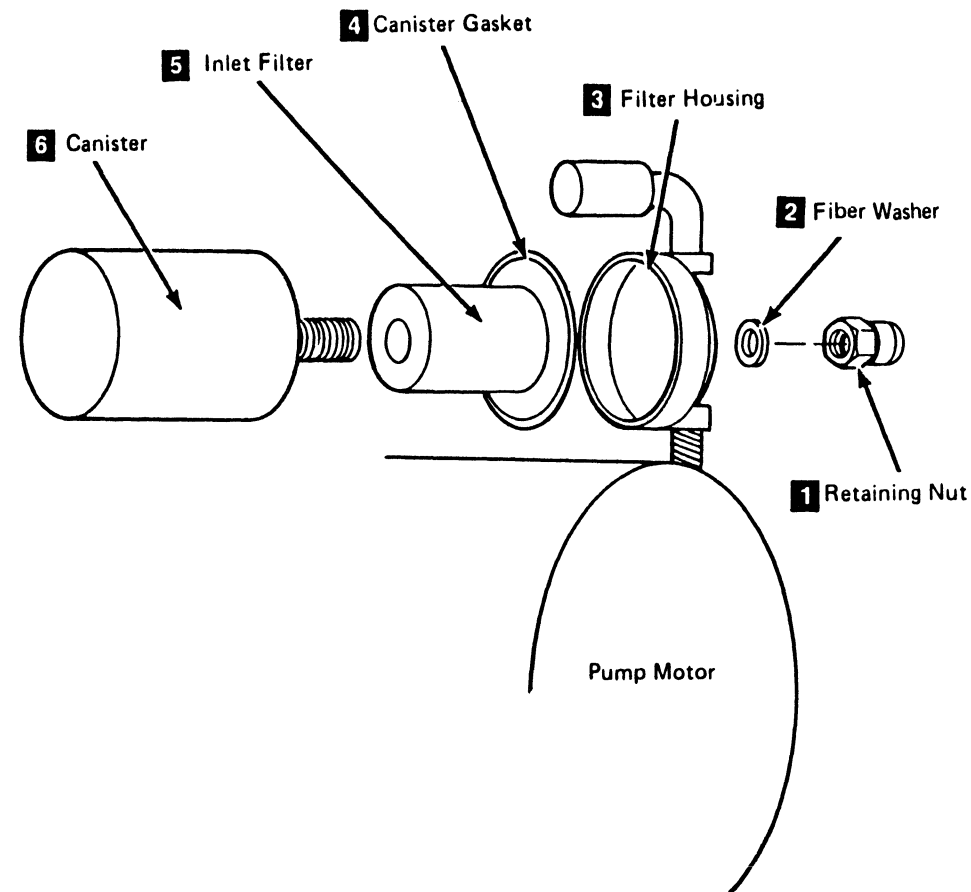
CAUTION
The inlet filter canister and pump motor may be hot.



3. Remove the retaining nut **1** from the top of the inlet filter assembly.
Note: Do not lose the fiber washer **2** on top of the filter assembly as the canister is being removed.
4. Remove the canister **6** by pulling it away from the filter housing **3**.
Note: It may be necessary to turn the canister to free it from the inlet filter assembly.
5. Remove and discard the canister gasket **4** and the inlet filter **5** from the canister.
6. Save the canister for use with the replacement inlet filter.

Replacing the Inlet Filter

1. Remove any dirt from the bottom of the canister **6**.
2. Slide the inlet filter **5** into the canister.
3. Install canister gasket **4** in the filter housing **3**.
4. Slide the canister and the inlet filter into the top of the filter housing **3**.
Note: Do not lose the fiber washer **2** on top of the filter assembly as the canister is being installed.
5. Install and tighten the retaining nut **1**. Do not over tighten.
6. Install the tape unit front safety cover (see CARR-DR 2-2).
7. Go to CARR-DR 8 for the procedure to **power on** the tape unit.



FRU033 Inlet Filter Removal and Replacement Procedure

Tape Unit Without BM 6460006 (see CARR-DR 9)

This page contains the steps needed to remove and replace the inlet filter in the inlet filter assembly. Since this inlet filter provides air pressure for both drives, it is necessary to have both drives available for service.

The inlet filter assembly is attached to the pump motor and is removed from the rear of the tape unit.

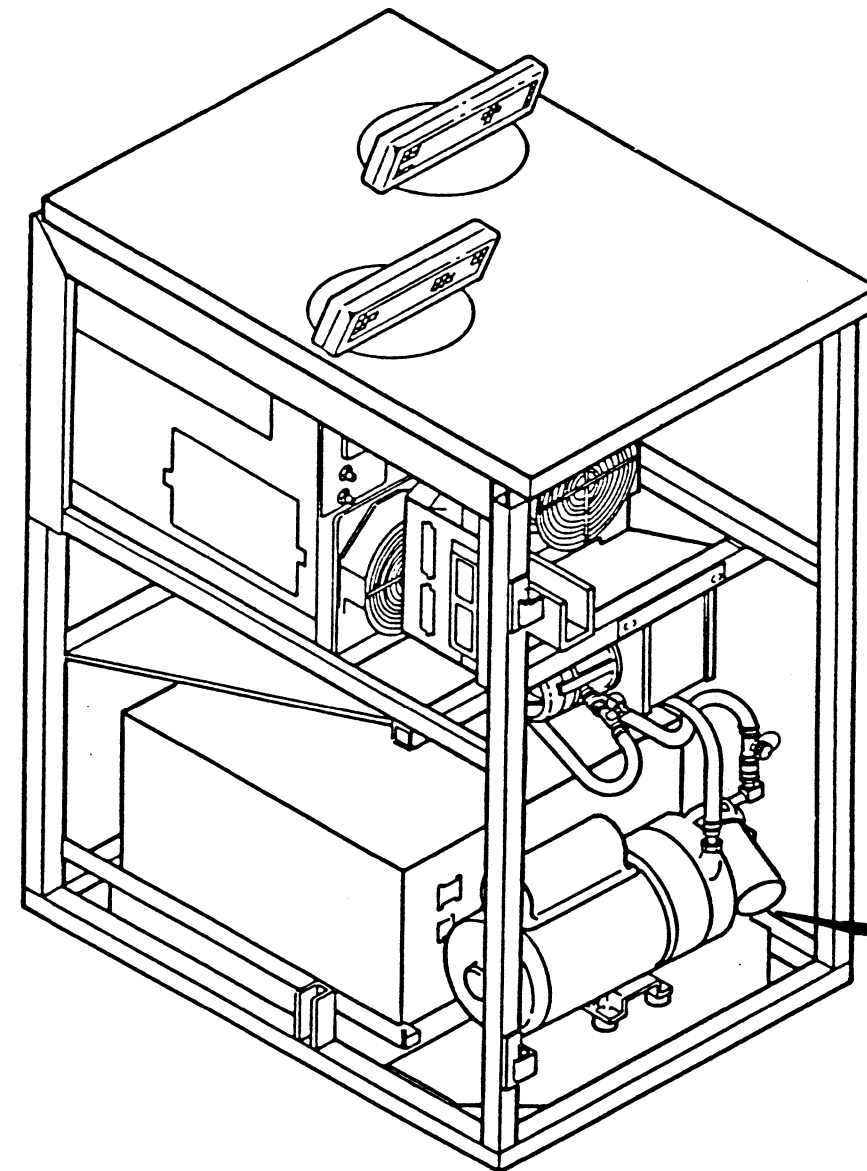
Note: This FRU can be removed and replaced without affecting the other tape units by removing power from the failing tape unit with the ac power circuit breaker.

Removing the Inlet Filter

1. Go to CARR-DR 8 for the procedure to **power off** the tape unit.
2. Open the rear cover and remove the rear safety cover and ground connector (see CARR-DR 2-3).

CAUTION

The inlet filter canister and pump motor may be hot.

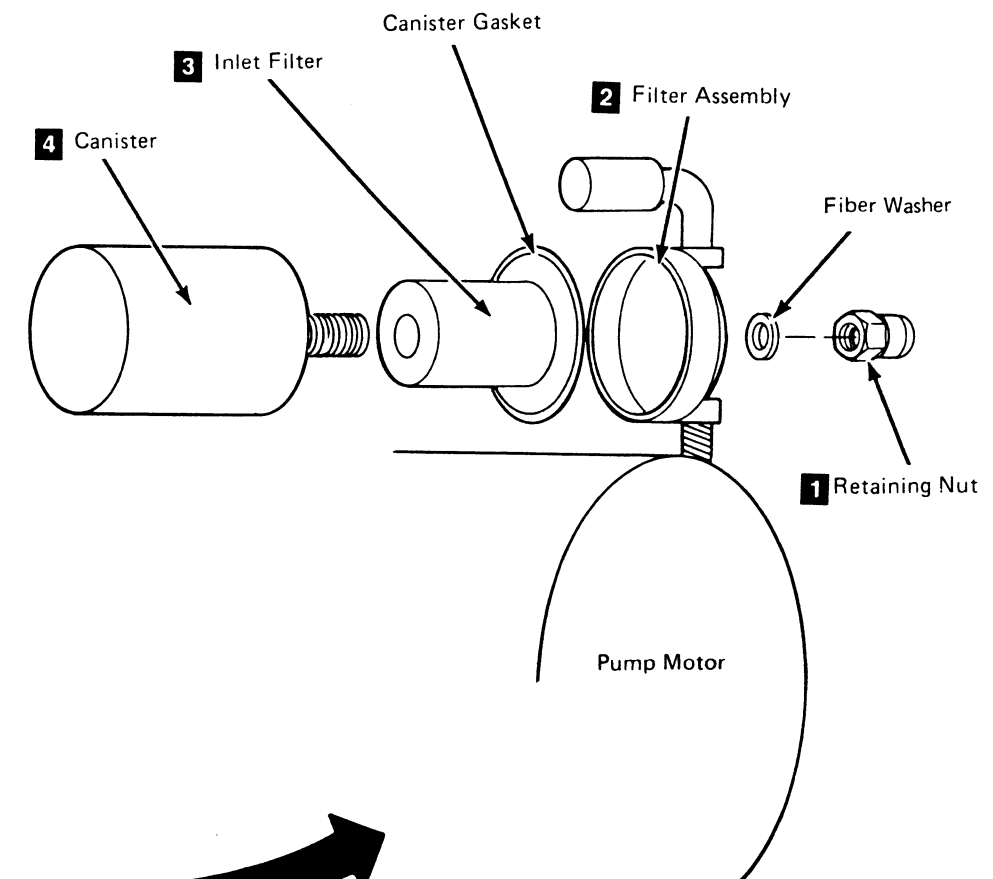


Replacing the Inlet Filter

1. Remove any dirt from the bottom of the canister **4**.
2. Slide the inlet filter **3** into the canister.

Note: Do not lose the fiber washer on top of the filter assembly as the canister is being installed.

- Note:** Do not lose the fiber washer on top of the filter assembly as the canister is being removed.
3. Remove the retaining nut **1** from the top of the inlet filter assembly.
 4. Remove the canister **4** by pulling it away from the filter assembly.
- Note:** It may be necessary to turn the canister to free it from the inlet filter assembly.
5. Remove the inlet filter **3** from the canister by pulling it out.
 6. Save the canister for use with the replacement inlet filter.



Drive **CARR-DR 335**

3. Slide the canister and the inlet filter into the top of the filter assembly **2**.
4. Install and tighten the retaining nut **1**. Do not over tighten.
5. Replace the rear safety cover and ground connector (see CARR-DR 2-4) and close the rear cover.
6. Go to CARR-DR 8 for the procedure to **power on** the tape unit.

FRU034 Air Pressure Hose Assembly Removal and Replacement Procedure

Drive **CARR-DR 340**

Tape Unit With BM 6460006 (see CARR-DR 9)

This page contains the steps needed to remove and replace the air pressure hose assembly from either drive in the tape unit.

The air pressure hose assembly connects from the air pressure regulator output tee to the pressure system in each drive. Since this air pressure regulator output tee provides air pressure for both drives, it is necessary to have both drives available for service.

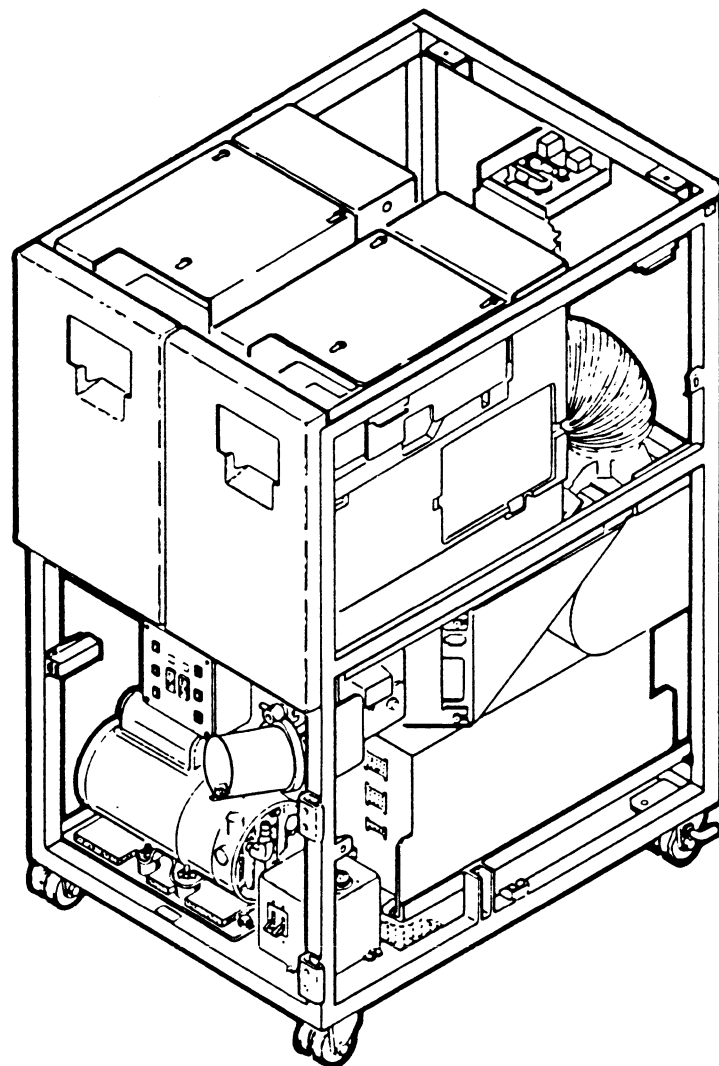
Note: This FRU can be removed and replaced without affecting the other tape units by removing power from the failing tape unit with the ac power circuit breaker.

Removing the Air Pressure Hose Assembly

1. Go to CARR-DR 8 for the procedure to **power off** the tape unit.

From the front of the tape unit:

2. Remove the tape unit front safety cover (see CARR-DR 2-1).
3. Remove the hose clamp holding the air pressure hose assembly **2** to the air pressure regulator output tee **3**.
4. Pull the air pressure hose assembly off the air pressure regulator output tee.
5. Remove the clamp from the hose and save for the replacement procedure.
6. Open both drive drawers (see CARR-DR 2-1).



From the rear of the tape unit:

7. Open and remove the rear tape unit cover (see CARR-DR 2-1).
8. At the rear panel of each drive, loosen the hose clamps of the air pressure hose assembly. (At each drive drawer the assembly is connected to the fitting labeled 'Air'.)
9. Pull the air pressure hose assembly off the pressure fittings **1**.
10. Carefully pull the hose through the access hose in the front of the cable plenum **4**.
11. Unlace the air pressure hose assembly from the cable harness.
12. Remove the hose from the tape unit.

Replacing the Air Pressure Hose Assembly

1. Inspect the replacement hose for contamination or damage.
2. Open both drive drawers (see CARR-DR 2-1).

From the rear of the tape unit:

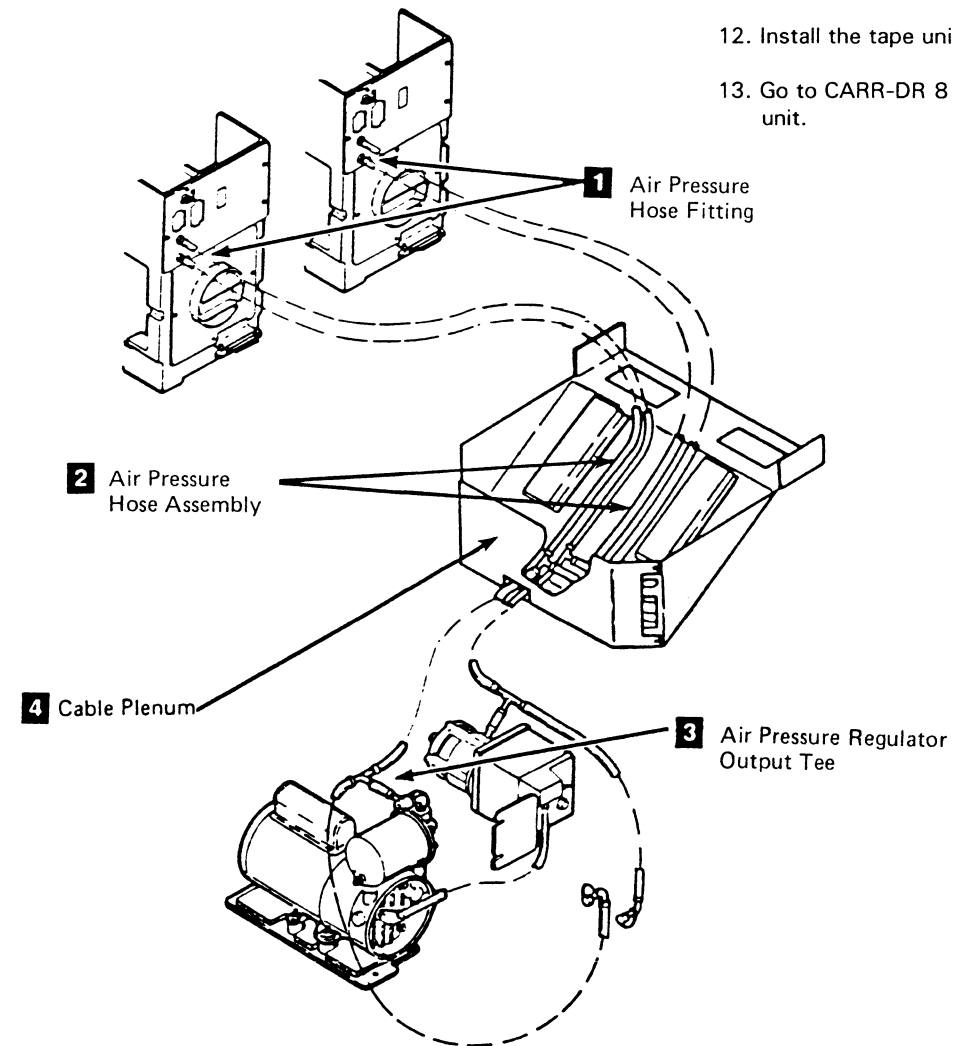
3. Slide the end of the air pressure hose assembly **2** through the access hole in the cable plenum **4** to the front of the tape unit.
4. Route the air pressure hose assembly along same path as the defective assembly to the rear panel of the drive drawers.

5. Install the ends of the air pressure hose assembly **2** onto the fittings labeled 'Air' on the rear panel of the drive drawers **1**, then install the hose clamps.
6. Lace the air pressure hose assembly to the cable harness going to the rear panel of each drive drawer.

7. Install the rear cover and ground connector (see CARR-DR 2-2).

From the front of the tape unit:

8. Close both drive drawers (see CARR-DR 2-5).
9. Install the air pressure hose assembly onto the air pressure regulator tee **3**, then install the hose clamp.
10. Check for air leaks at each end of the replaced air pressure hose assembly.
11. Close both drive drawers.
12. Install the tape unit front safety cover (see CARR-DR 2-2).
13. Go to CARR-DR 8 for the procedure to **power on** the tape unit.



FRU034 Pressure Hose Assembly Removal and Replacement Procedure (60 Hz)

Drive **CARR-DR 345**

Tape Unit Without BM 6460006 (see CARR-DR 9)

If Your Tape Unit is 50 Hz, Go to CARR-DR 348

This page contains the steps needed to remove and replace either pressure hose assembly in the tape unit. One end of each pressure hose is attached to a pressure/vacuum manifold located on the slanted baffle **1** above the power supply. Since this pressure hose provides air pressure for both drives, it is necessary to have both drives available for service.

Note: This FRU can be removed and replaced without affecting the other tape units by removing power from the failing tape unit with the ac power circuit breaker.

Removing Pressure Hose Assembly

1. Go to CARR-DR 8 for the procedure to **power off** the tape unit.
2. Open the rear cover and remove the rear safety cover and ground connector (see CARR-DR 2-3).
3. At the rear panel of the drive, loosen the hose clamp of the pressure hose **3** to be removed (drive 0 or drive 1).
4. Pull the hose off the pressure fitting.

5. Open the drive drawer for the drive being serviced (see CARR-DR 2-5).

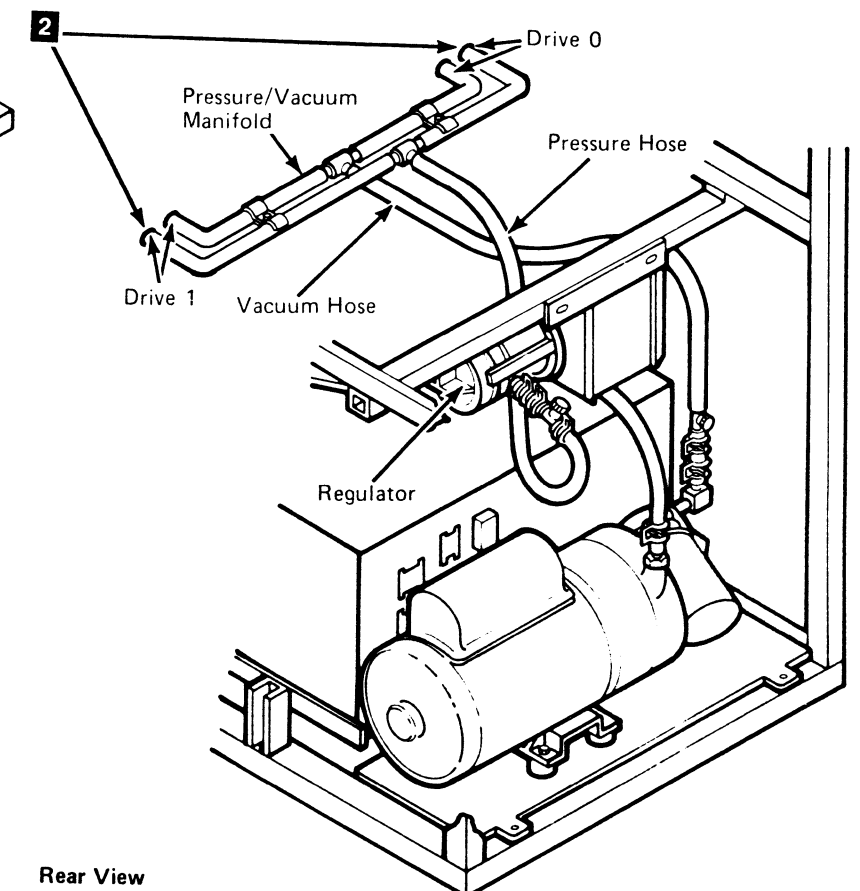
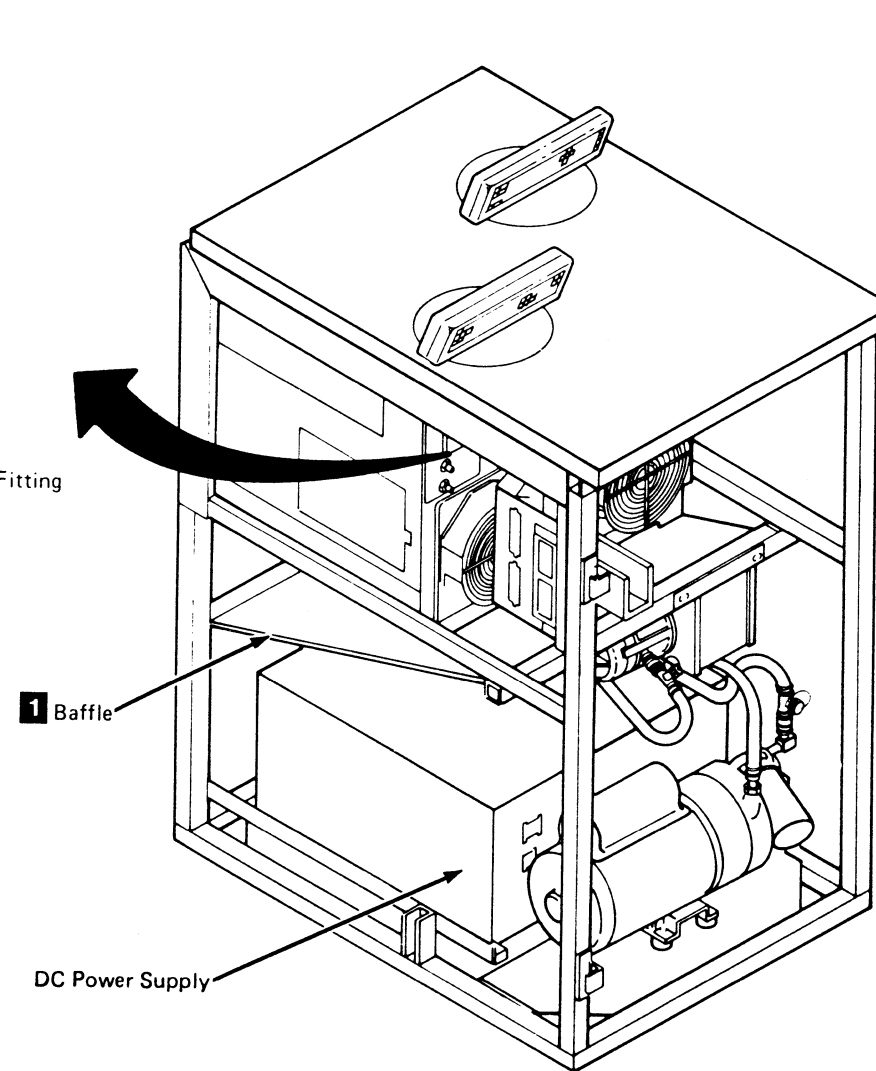
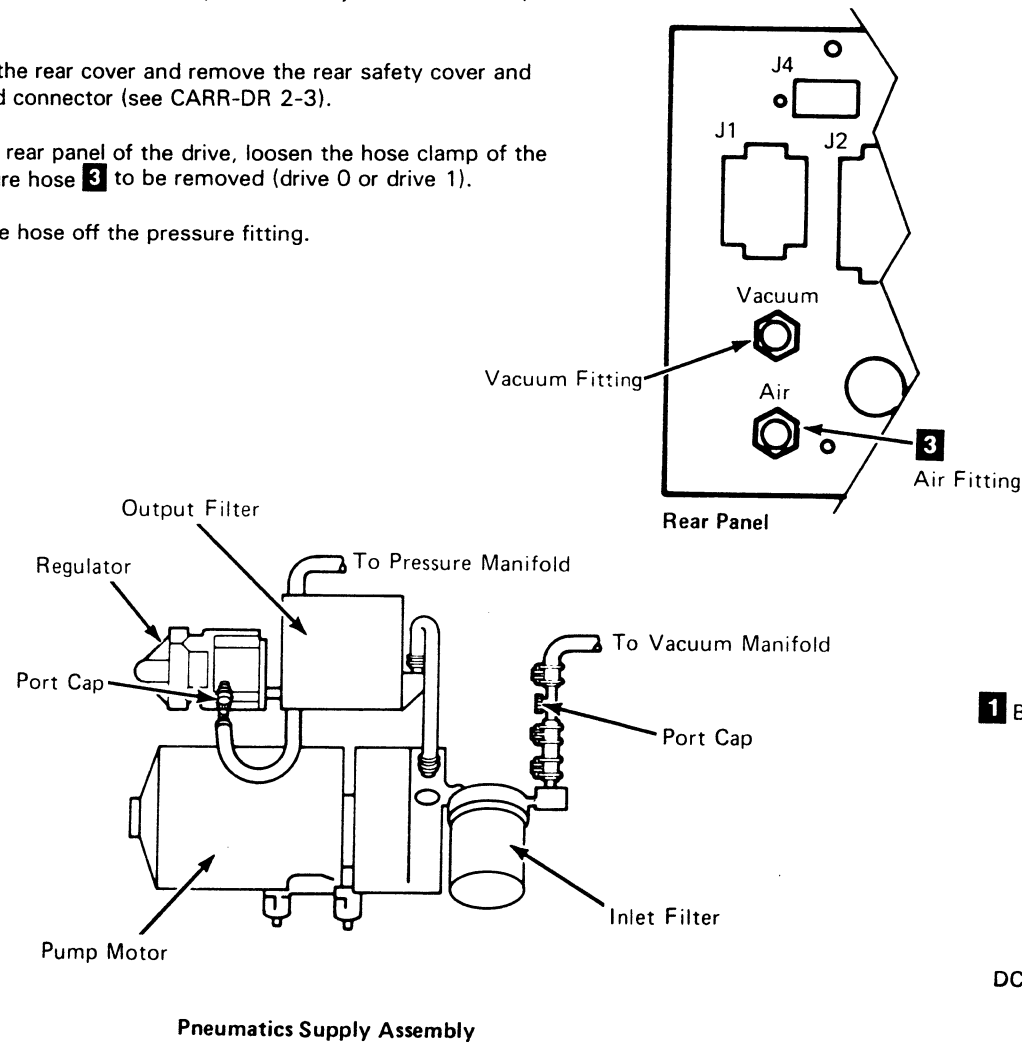
This will permit access to the pressure/vacuum manifold.

6. From the rear of the tape unit, loosen the hose clamp of the hose to be removed (at the pressure/vacuum manifold) **2**.
7. Pull the hose off the pressure/vacuum manifold.
8. Remove the hose from the tape unit.
9. Save the hose clamps to be used on the replacement hose.

Replacing Pressure Hose Assembly

1. Inspect the replacement hose for contamination or damage.
2. Install the hose clamps saved during the removal procedure on each end of the new hose assembly.
 - a. Slide one end of the hose on the pressure/vacuum manifold **2**.
 - b. Slide the hose clamp in place.

3. Close the drive drawer and slide the other end of the hose on the pressure fitting **3**.
4. Slide the hose clamp in place.
5. Replace the rear safety cover and ground connector (see CARR-DR 2-4) and close the rear cover.
6. Go to CARR-DR 8 for the procedure to **power on** the tape unit.



FRU034 Pressure Hose Assembly Removal and Replacement Procedure (50 Hz)

Tape Unit Without BM 6460006 (see CARR-DR 9)

If Your Tape Unit is 60 Hz, Go to CARR-DR 345

This page contains the steps needed to remove and replace either pressure hose assembly in the tape unit. One end of each pressure hose is attached to a pressure/vacuum manifold located on the slanted baffle 1 above the power supply. Since this manifold provides air pressure for both drives, it is necessary to have both drives available for service.

Note: This FRU can be removed and replaced without affecting the other tape units by removing power from the failing tape unit with the ac power circuit breaker.

5. Open the drive drawer for the drive being serviced (see CARR-DR 2-5).
This will permit access to the pressure/vacuum manifold.
6. From the rear of the tape unit, loosen the hose clamp of the hose to be removed (at the pressure/vacuum manifold) 2.
7. Pull the hose off the pressure/vacuum manifold.
8. Remove the hose from the tape unit.
9. Save the hose clamps to be used on the replacement hose.

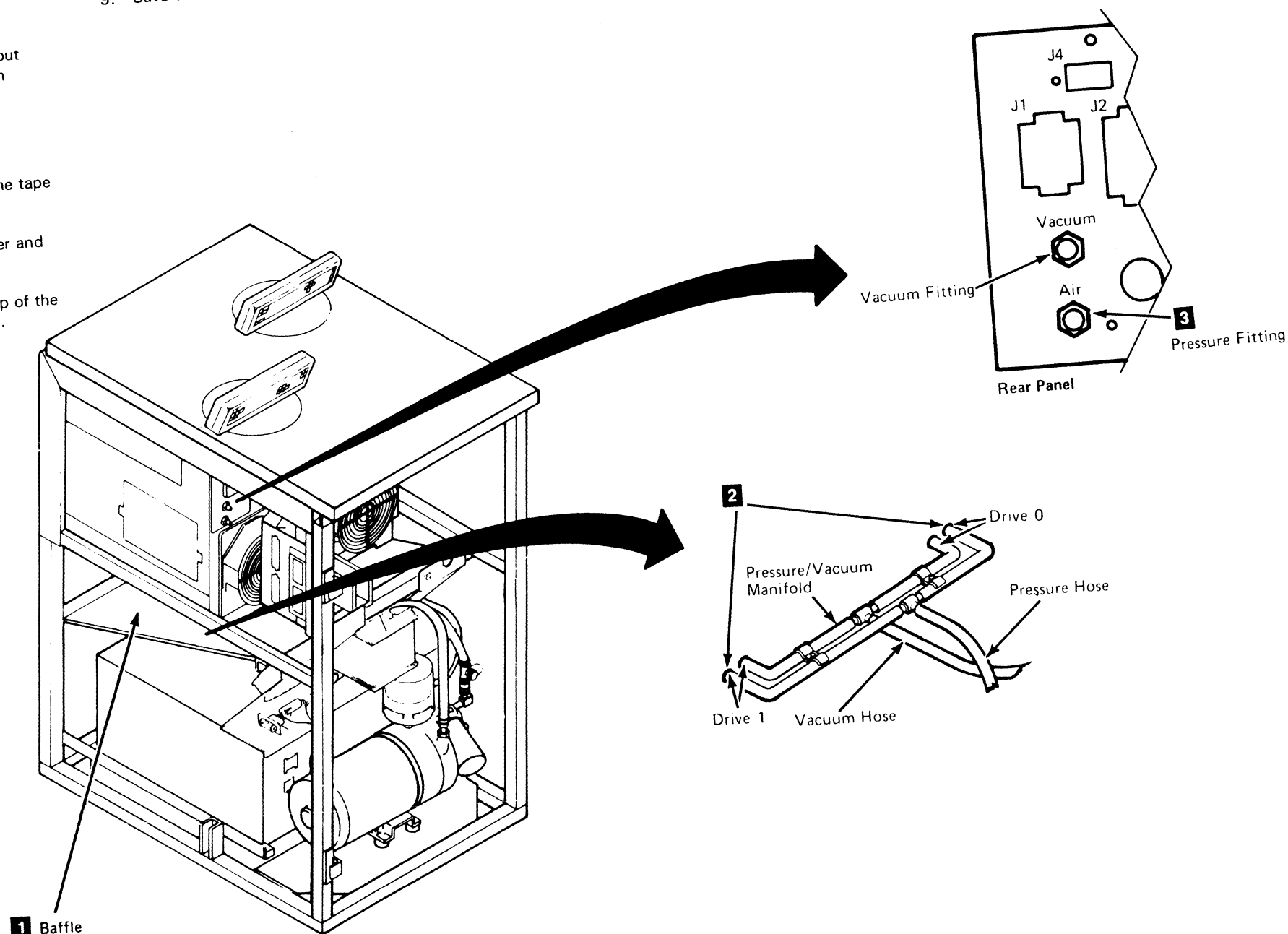
Replacing the Pressure Hose Assembly

1. Inspect the replacement hose for contamination or damage.
2. Install the hose clamps saved during the removal procedure on each end of the new hose assembly.
 - a. Slide one end of the hose on the pressure/vacuum manifold 2.
 - b. Slide the hose clamp in place.

3. Close the drive drawer and slide the other end of the hose on the pressure fitting 3.
4. Slide the hose clamp in place.
5. Replace the rear safety cover and ground connector (see CARR-DR 2-4) and close the rear cover.
6. Go to CARR-DR 8 for the procedure to **power on** the tape unit.

Removing Pressure Hose Assembly

1. Go to CARR-DR 8 for the procedure to **power off** the tape unit.
2. Open the rear cover and remove the rear safety cover and ground connector (see CARR-DR 2-3).
3. At the rear panel of the drive, loosen the hose clamp of the pressure hose 3 to be removed (drive 0 or drive 1).
4. Pull the hose off the pressure fitting.



FRU035 Vacuum Hose Assembly Removal and Replacement Procedure

Tape Unit With BM 6460006 (see CARR-DR 9)

This page contains the steps needed to remove and replace the vacuum hose assembly from the tape unit.

The vacuum hose assembly connects from the input filter tee to the vacuum system in each drive. Since this input filter tee provides vacuum for both drives, it is necessary to have both drives available for service.

Note: This FRU can be removed and replaced without affecting the other tape units by removing power from the failing tape unit with the ac power circuit breaker.

Removing the Vacuum Hose Assembly

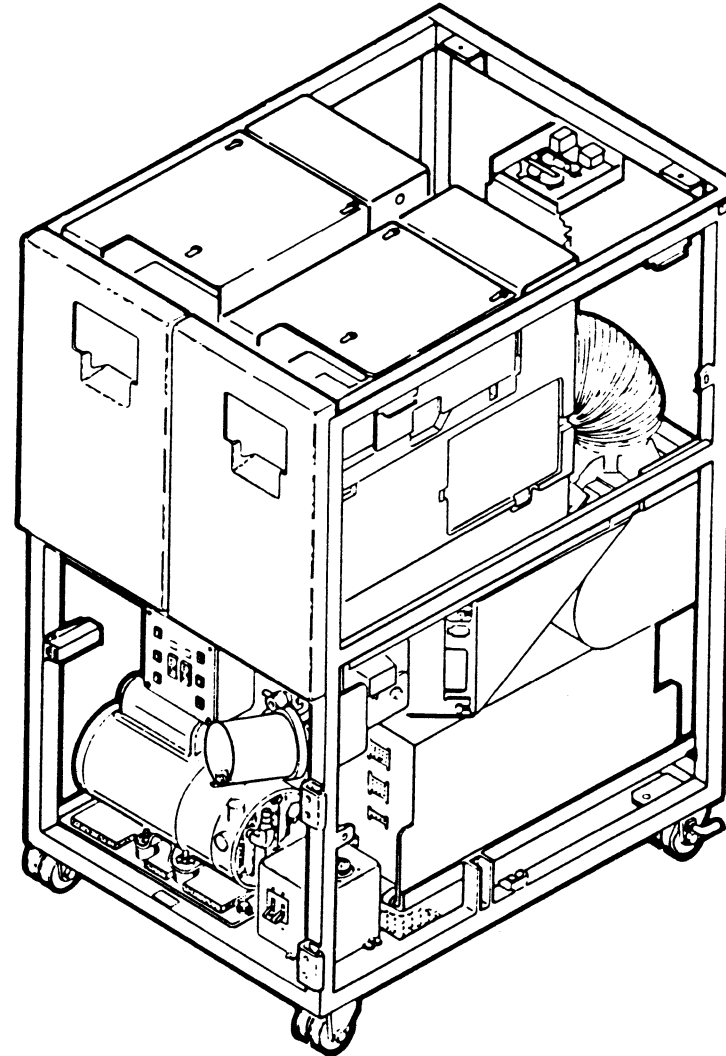
1. Go to CARR-DR 8 for the procedure to **power off** the tape unit.

From the front of the tape unit:

2. Remove the tape unit safety cover (see CARR-DR 2-1).
3. Remove the hose clamp holding the vacuum hose assembly **2** to the input filter tee **3**.
4. Pull the vacuum hose assembly off the input filter tee.
5. Remove the clamp from the hose.

From the rear of the tape unit:

6. Open both drive drawers (see CARR-DR 2-1).
7. Carefully pull the hose through the access hole in the front of the cable plenum **4**.
8. Open and remove the rear tape unit cover (see CARR-DR 2-1).
9. At the rear panel of each drive, loosen the hose clamps of the vacuum hose assembly **2**. (At each drive drawer the assembly is connected to the fitting labeled 'Vacuum'.)
10. Pull the vacuum hose assembly off the vacuum fittings **1**.
11. Unlace the vacuum hose assembly from the cable harness.
12. Remove the vacuum hose assembly from the tape unit.

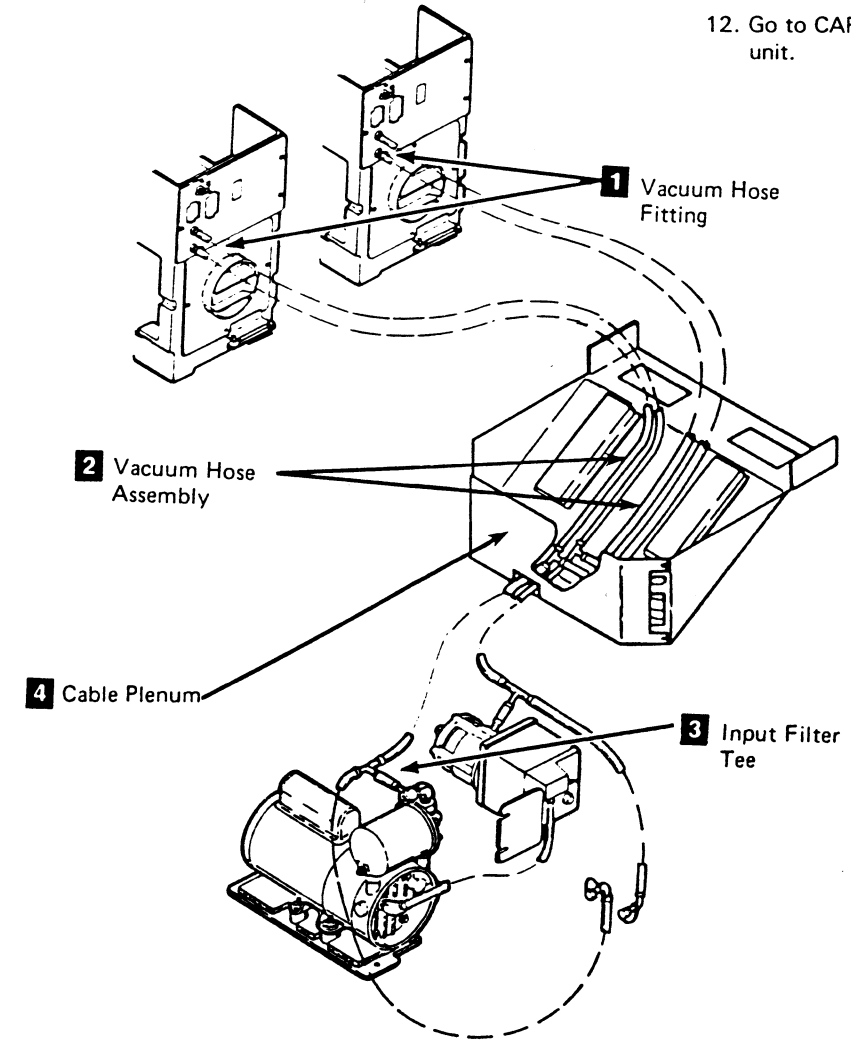


Replacing the Vacuum Hose Assembly

1. Inspect the replacement hose for contamination or damage.
2. Open both drive drawers (see CARR-DR 2-1).

From the rear of the tape unit:

3. Slide the end of the vacuum hose assembly **2** through the access hole in the cable plenum **4** to the front of the tape unit.
4. Route the vacuum hose assembly along the same path as the defective assembly to the rear panel of the drive drawers.



Drive **CARR-DR 350**

5. Install the ends of the vacuum hose assembly **2** onto the fittings labeled 'Vacuum' **1** on the rear panel of the drive drawers; then install the hose clamps.
6. Lace the vacuum hose assembly to the cable harness going to the rear panel of each drive drawer.
7. Replace the rear cover and ground connector (see CARR-DR 2-2).

From the front of the tape unit:

8. Install the vacuum hose assembly onto the input filter tee **3**; then install the hose clamp.
9. Close both drive drawers.
10. Check for air leaks at each end of the replaced vacuum hose assembly.
11. Install the tape unit front safety cover (see CARR-DR 2-2).
12. Go to CARR-DR 8 for the procedure to **power on** the tape unit.

FRU035 Vacuum Hose Assembly Removal and Replacement Procedure (60 Hz)

Drive **CARR-DR 355**

Tape Unit Without BM 6460006 (see CARR-DR 9)

If Your Tape Unit is 50 Hz, Go to CARR-DR 358

This page contains the steps needed to remove and replace either vacuum hose assembly from the tape unit. One end of each vacuum hose is attached to a pressure/vacuum manifold located on the slanted baffle above the power supply. Since this manifold provides vacuum for both drives, it is necessary to have both drives available for service.

Note: This FRU can be removed and replaced without affecting the other tape units by removing power from the failing tape unit with the ac power circuit breaker.

- Open the drive drawer for the drive being serviced (see CARR-DR 2-5).

This permits access to the pressure/vacuum manifold.

- From the rear of the tape unit, loosen the hose clamp of the hose to be removed (at the pressure/vacuum manifold).
- Pull the hose off the pressure/vacuum manifold.
- Remove the hose from the tape unit.
- Save the hose clamps to be used on the replacement hose.

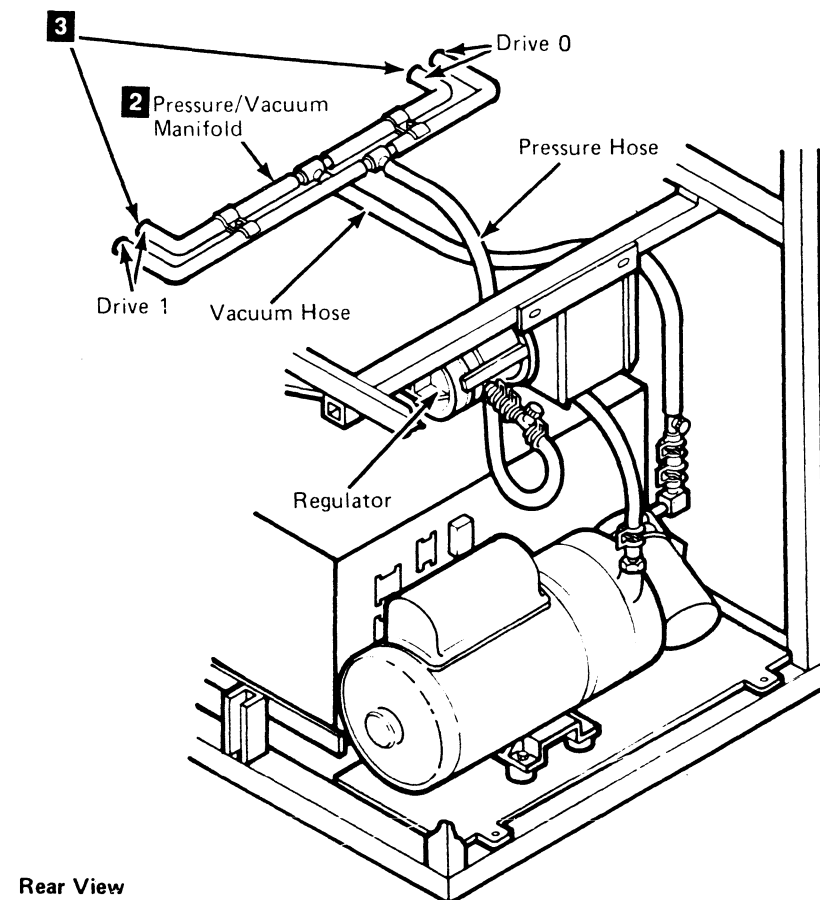
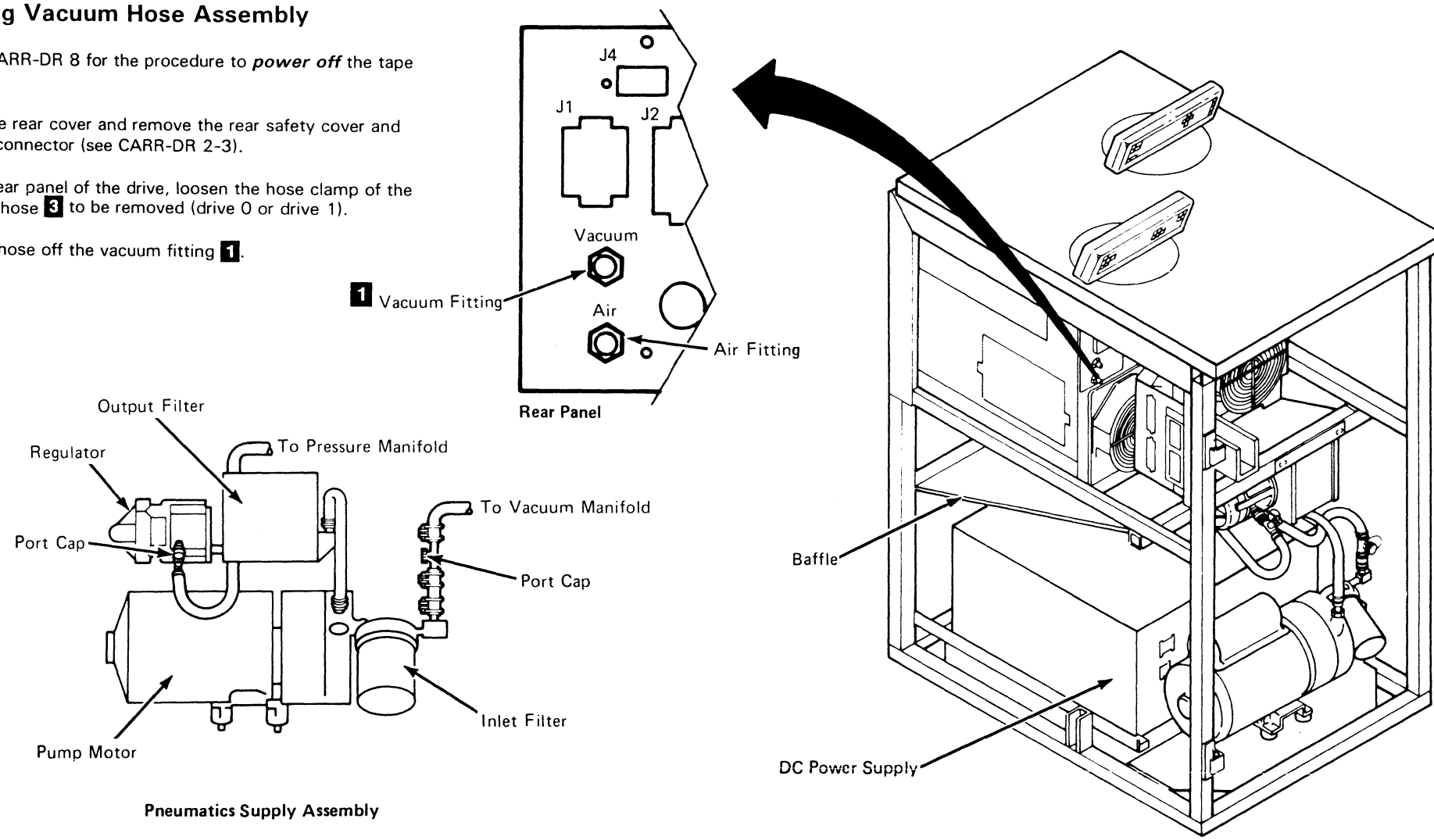
Replacing Vacuum Hose Assembly

- Install the hose clamps saved during the removal procedure on each end of the new hose assembly.
 - Slide one end of the vacuum hose **3** on the pressure/vacuum manifold **2**.
 - Slide the hose clamp in place.

- Close the drive drawer and slide the other end of the hose on the vacuum fitting **1**.
- Slide the hose clamp in place.
- Install the rear safety cover and ground connector (see CARR-DR 2-4) and close the rear cover.
- Go to CARR-DR 8 for the procedure to **power on** the tape unit.

Removing Vacuum Hose Assembly

- Go to CARR-DR 8 for the procedure to **power off** the tape unit.
- Open the rear cover and remove the rear safety cover and ground connector (see CARR-DR 2-3).
- At the rear panel of the drive, loosen the hose clamp of the vacuum hose **3** to be removed (drive 0 or drive 1).
- Pull the hose off the vacuum fitting **1**.



FRU035 Vacuum Hose Assembly Removal and Replacement Procedure (50 Hz)

Drive **CARR-DR 358**

Tape Unit Without BM 6460006 (see CARR-DR 9)

If Your Tape Unit Is 60 Hz, Go to CARR-DR 355

This page contains the steps needed to remove and replace either vacuum hose assembly in the tape unit. One end of each vacuum hose is attached to a pressure/vacuum manifold located on the slanted baffle **1** above the power supply. Since this manifold provides vacuum for both drives, it is necessary to have both drives available for service.

Note: This FRU can be removed and replaced without affecting the other tape units by removing power from the failing tape unit with the ac power circuit breaker.

Removing Vacuum Hose Assembly

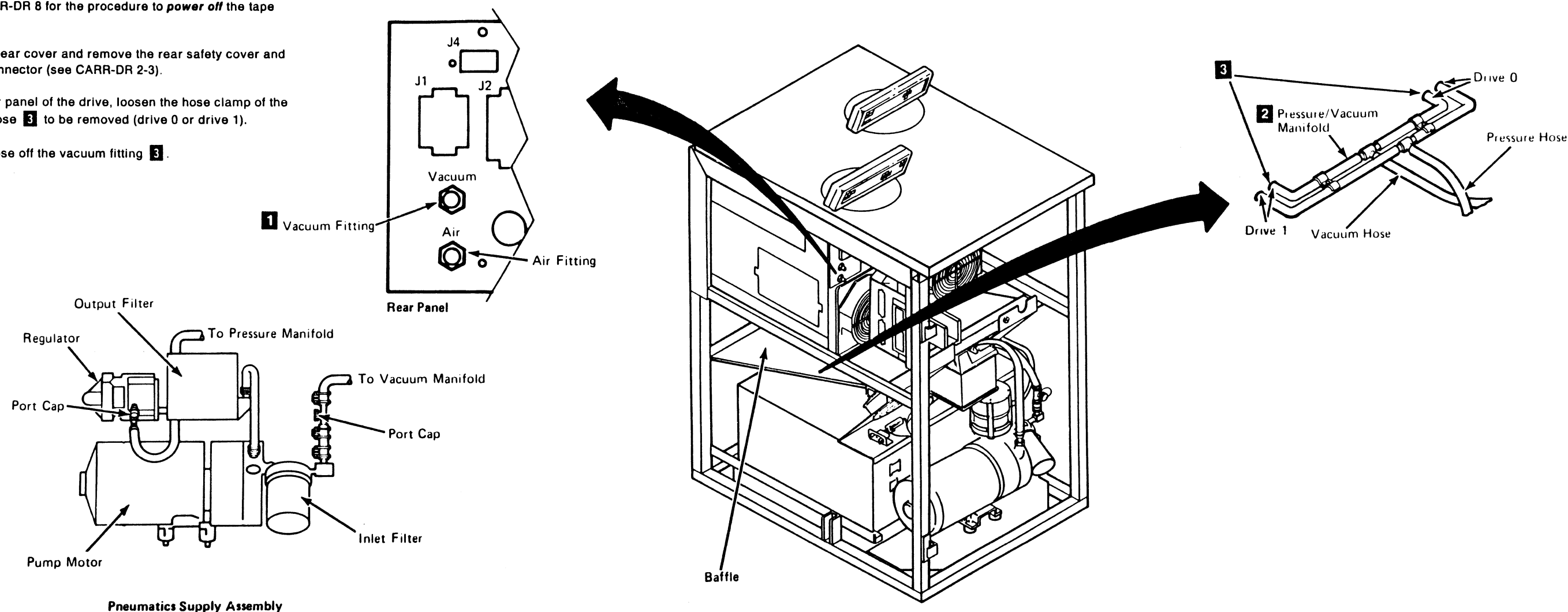
1. Go to CARR-DR 8 for the procedure to **power off** the tape unit.
2. Open the rear cover and remove the rear safety cover and ground connector (see CARR-DR 2-3).
3. At the rear panel of the drive, loosen the hose clamp of the vacuum hose **3** to be removed (drive 0 or drive 1).
4. Pull the hose off the vacuum fitting **3**.

5. Open the drive drawer for the drive being serviced (see CARR-CR 2-5).
This permits access to the pressure/vacuum manifold.
6. From the rear of the tape unit, loosen the hose clamp of the hose to be removed (at the pressure/vacuum manifold).
7. Pull the hose off the pressure/vacuum manifold **2**.
8. Remove the hose from the tape unit.
9. Save the hose clamps to be used on the replacement hose.

Replacing Vacuum Hose Assembly

1. Install the hose clamps saved during the removal procedure on each end of the new hose assembly.
 - a. Slide one end of the vacuum hose on the pressure/vacuum manifold **2**.
 - b. Slide the hose clamp in place.

2. Close the drive drawer and slide the other end of the hose on the vacuum fitting **3**.
3. Slide the hose clamp in place.
4. Replace the rear safety cover and ground connector (see CARR-DR 2-4) and close the rear cover.
5. Go to CARR-DR 8 for the procedure to **power on** the tape unit.



Drive **CARR-DR 358**

FRU036 External Load Resistor Panel Removal and Replacement Procedure

Drive **CARR-DR 360**

Tape Unit With BM 6460006 (see CARR-DR 9)

This page contains the steps needed to remove and replace the external load resistor panel (TU-EL) from the tape unit. The external load resistor panel is attached to the upper rear machine frame. Since this assembly provides voltage for both operator display panels, it is necessary to have both tape drives available for service.

Note: This FRU can be removed and replaced without affecting the other tape units by removing power from the failing tape unit with the ac power circuit breaker.

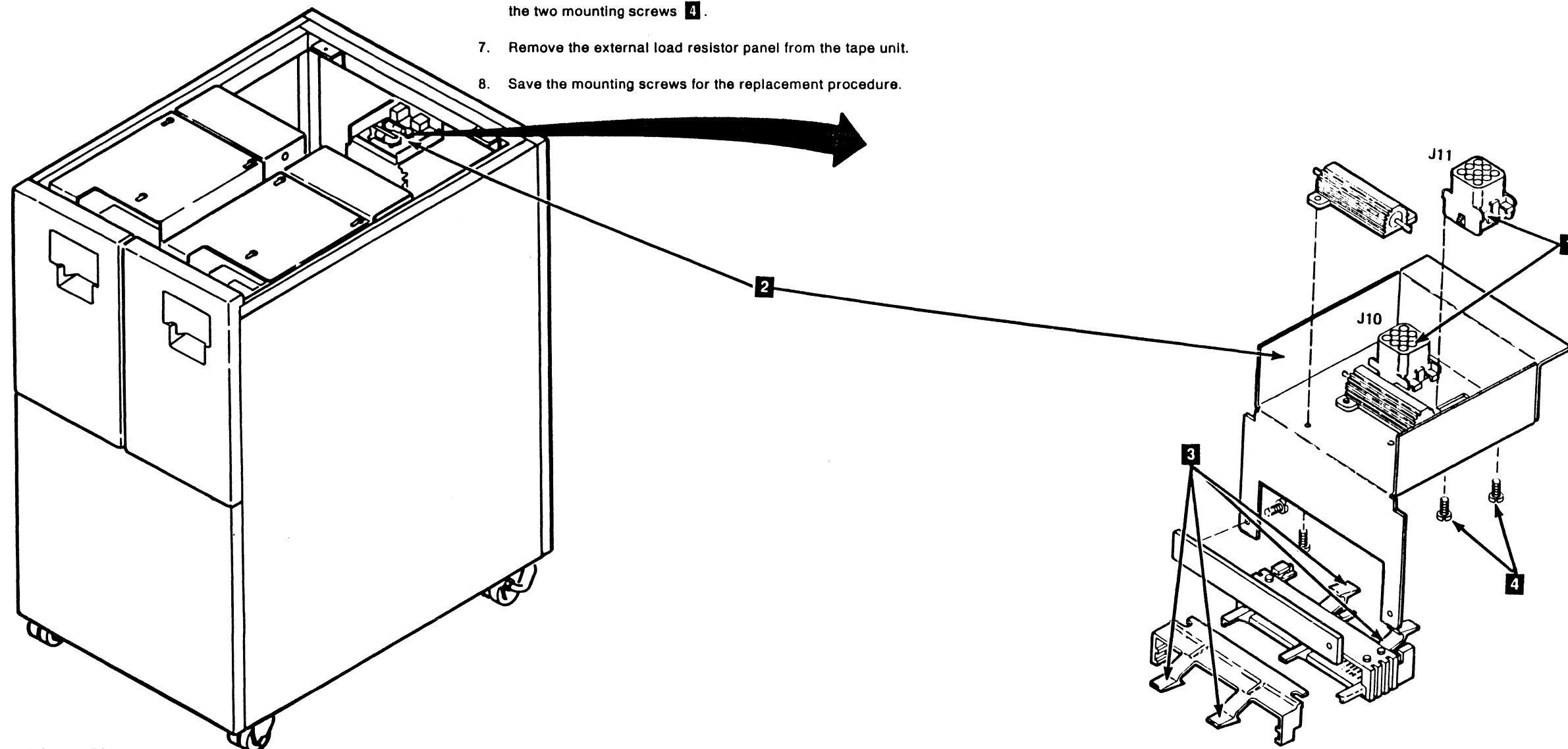
Removing the External Load Resistor Panel

1. Go to CARR-DR 8 for the procedure to **power off** the tape unit.
2. Open the rear cover (see CARR-DR 2-1).
3. Disconnect cable plugs P10 and P11 **1** from connectors J10 and J11 located on the bottom of external load resistor panel **2** (cable support panel, if the tape unit has power supply part number 6177166 or 6177167 installed).
4. Release the SLT cable retaining latch **3** and unplug the two SLT cables from the front of the SLT connector panel. (These cables go to the operator display panels.)
5. Release the SLT cable retaining latch **3** and unplug the two SLT cables from the rear of the SLT connector panel. (These cables go to the drive logic board.)
6. Hold the external load resistor panel assembly and remove the two mounting screws **4**.
7. Remove the external load resistor panel from the tape unit.
8. Save the mounting screws for the replacement procedure.

Replacing the External Load Resistor Panel

1. Install the external load resistor panel assembly **2** (cable support panel, if tape unit has power supply part number 6177166 or 6177167 installed) on the tape drive frame, using the two screws **4** saved from the removal procedure.
2. Connect the two SLT cables from the operator panels to the front of the SLT connector panel and latch into place **3**.

3. Connect the two SLT cables from the logic drive board to the rear of the SLT connector panel and latch into place **3**.
4. Connect cables plugs P10 and P11 **1** to connectors J10 and J11 located on the bottom of external load resistor panel **2** (cable support panel, if the tape unit has power supply part number 6177166 or 6177167 installed).
5. Close the rear cover (see CARR-DR 2-2).
6. Go to CARR-DR 8 for the procedure to **power on** the tape unit.



Drive **CARR-DR 360**

FRU036 External Load Resistor Panel Removal and Replacement Procedure (60 Hz)

Drive **CARR-DR 365**

Tape Unit Without BM 6460006 (see CARR-DR 9)

If Your Tape Unit is 50 Hz, Go to CARR-DR 368

This page contains the steps needed to remove and replace the external load resistor panel (TU-EL) in the tape unit. The regulator-filter assembly must be removed for access to the external load resistor panel. Since this assembly provides air pressure for both drives, it is necessary to have both drives available for service.

Note: This FRU can be removed and replaced without affecting the other tape units by removing power from the failing tape unit with the ac power circuit breaker.

Removing the External Load Resistor Panel

1. Go to CARR-DR 8 for the procedure to **power off** the tape unit.
2. Open the rear cover and remove the rear safety cover and ground connector (see CARR-DR 2-3).
3. Disconnect the air output tee assembly hose from the regulator.

CAUTION

Before removing cables P5, P6, and P7 from the power supply, rotate the vacuum tee hardware away from the hand access area.

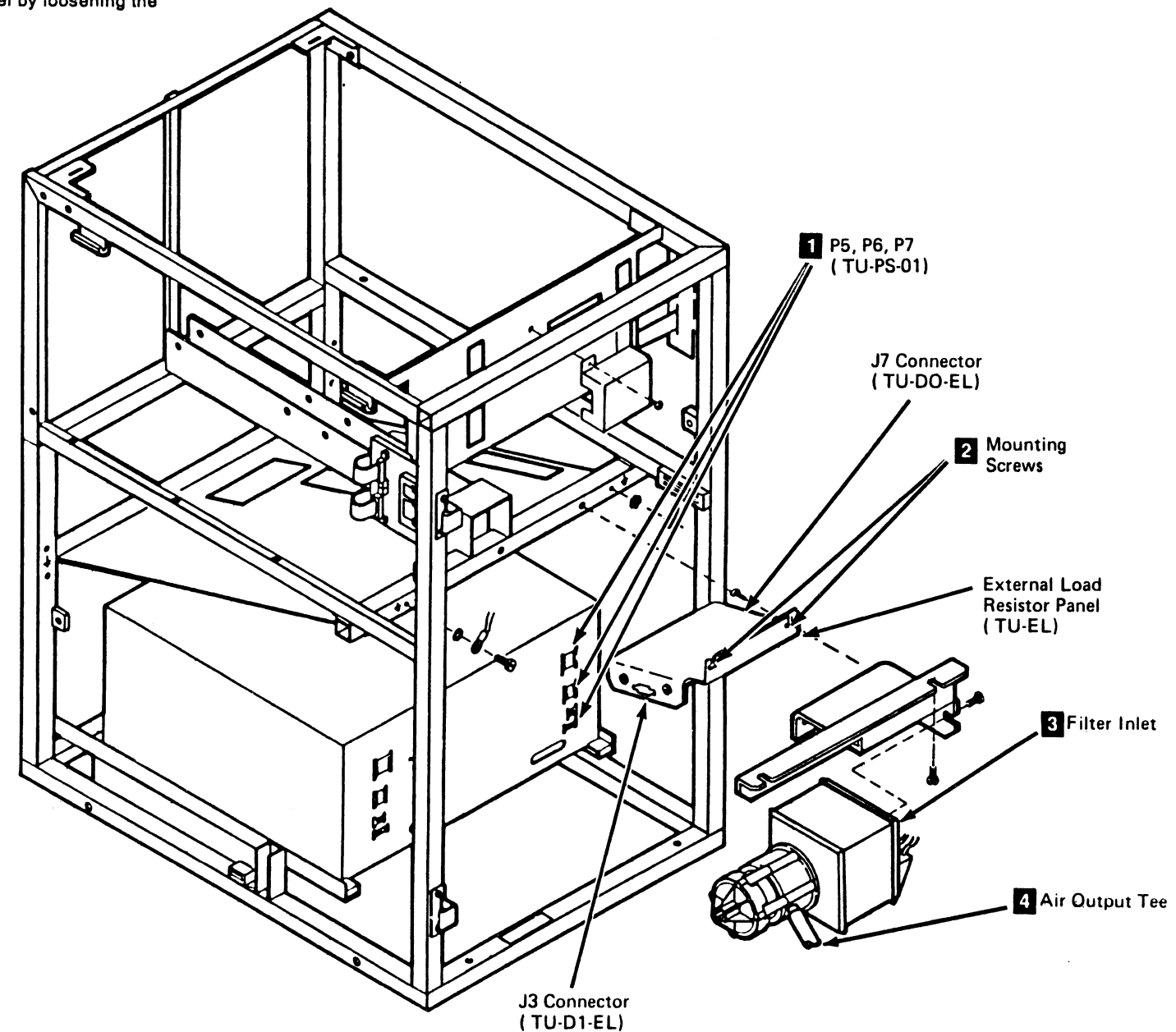
Note: Before removing the regulator bracket, move the drive fan cable assembly to the right (to provide removal space).

4. Disconnect cables P5, P6, and P7 **1** from the rear of the power supply. Place cables P5, P6, and P7 to the right (to provide removal space for the bracket assembly).
5. Unbolt the bracket assembly and unplug the message display cables P3 (TU-D1-EL-P3) and P7 (TU-D0-EL-P7) from the external load resistor panel.
6. Remove the pump outlet hose from the filter inlet **3**.
7. Remove the air output tee hose **4** from the regulator.
8. Remove the external load resistor panel by loosening the two mounting screws **2**.

Replacing the External Load Resistor Panel

1. Install the external load resistor panel on the bracket assembly and tighten the two screws **2**.
2. Connect the pump output hose to the filter inlet **3**.
3. Connect the message display cables P3 (TU-D1-EL-P3) and P7 (TU-D0-EL-P7) to the external load resistor panel.

4. Install the bracket assembly on the tape unit.
5. Reconnect cables P5, P6, and P7 **1** to the rear of the power supply.
6. Reconnect the air output tee hose **4** to the regulator.
7. Reconnect the pump output hose to the filter inlet **3**.
8. Install the rear safety cover and ground connector (see CARR-DR 2-4) and close the rear cover.
9. Go to CARR-DR 8 for the procedure to **power on** the tape unit.



Tape Unit Without BM 6460006 (see CARR-DR 9)

If Your Tape Unit is 60 Hz, Go to CARR-DR 365

This page contains the steps needed to remove and replace the external load (TU-EL) resistor panel from the tape unit. Since this assembly provides the external load for both drives, it is necessary to have both drives available for service.

Note: This FRU can be removed and replaced without affecting the other tape units by removing power from the failing tape unit with the ac power circuit breaker.

Removing the External Load Resistor Panel

1. Go to CARR-DR 8 for the procedure to *power off* the tape unit.
2. Open the rear cover and remove the rear safety cover and ground connector (see CARR-DR 2-3).

The external load resistor assembly **3** for the 50 Hz tape units is located on the fan/filter assembly panel.

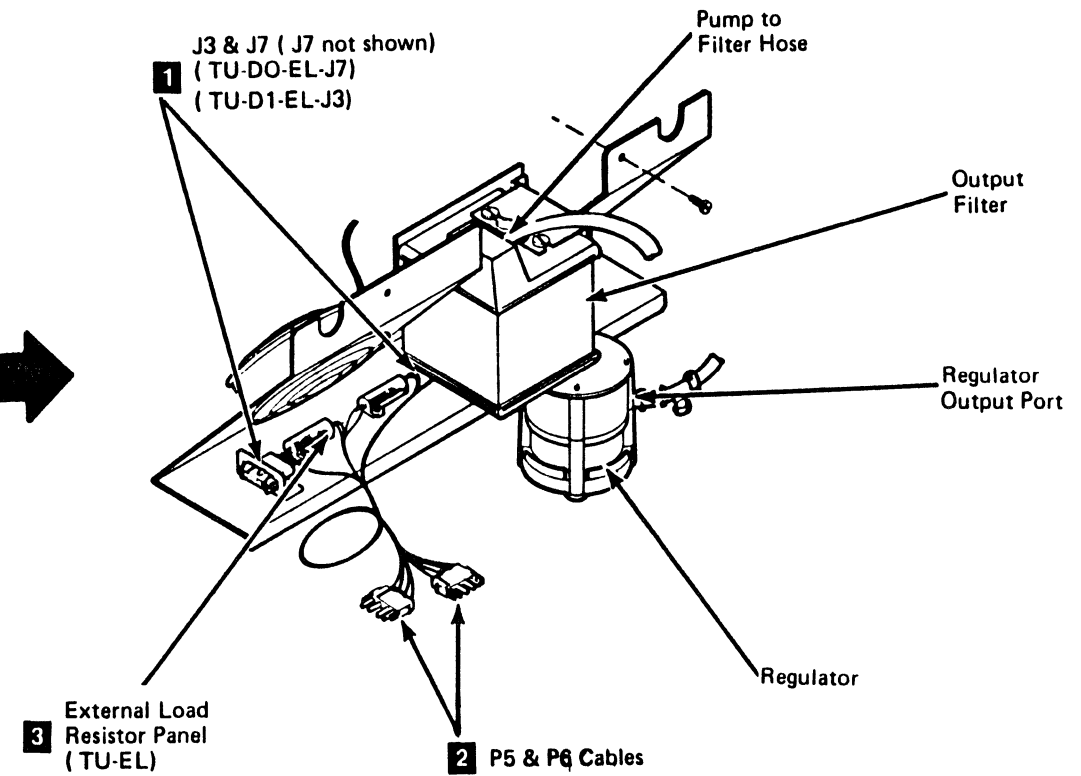
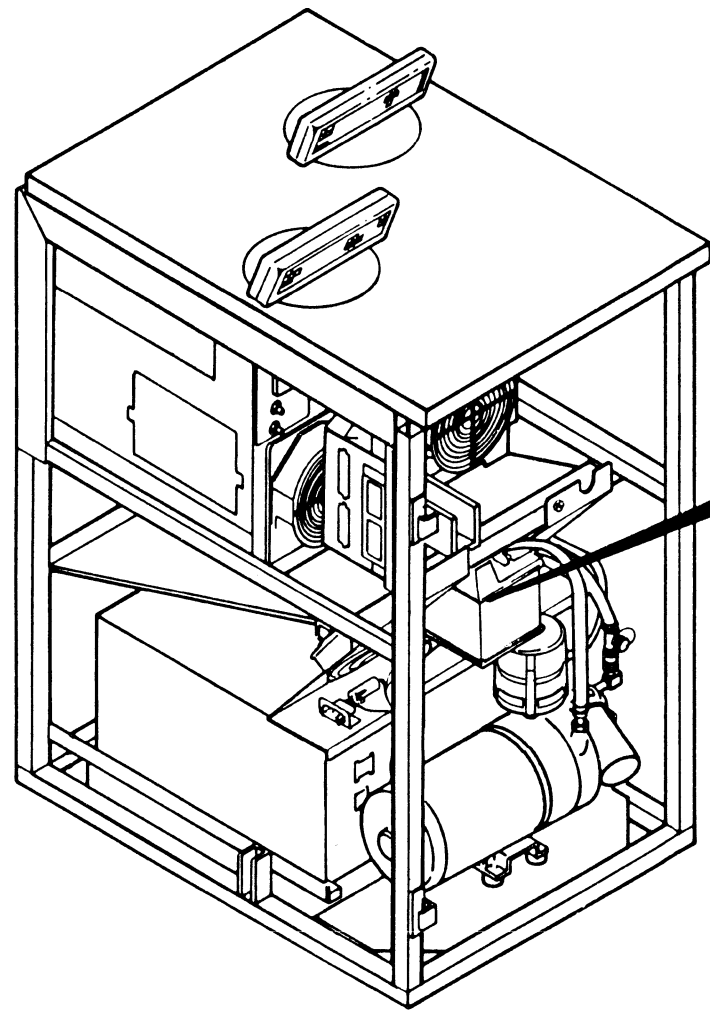
3. Disconnect cables P5 and P6 **2** from the dc power supply.
4. Unplug P3 and P7, then remove plugs J3 (TU-D1-EL-J3) and J7 (TU-D0-EL-J7) **1** from their mounting brackets.
5. Remove the four mounting screws and remove the external load resistor assembly from the tape unit.

Save the four mounting screws for the replacement procedure.

Replacing the External Load Resistor Panel

1. Install the four mounting screws that hold the external load resistor assembly **3** on the fan/filter assembly panel.
2. Replace the J3 (TU-D1-EL-J3) and J7 (TU-D0-EL-J7) **1** plugs into their mounting brackets.
3. Reconnect cables P3 and P7 into connectors J3 and J7.

4. Reconnect cables P5 and P6 **2** into connectors J5 and J6 (to the dc power supply).
5. Replace the rear safety cover and ground connector (see CARR-DR 2-4) and close the rear cover.
6. Go to CARR-DR 8 for the procedure to *power on* the tape unit.



FRU037 Manifold-In Pressure Hose Removal and Replacement Procedure (60 Hz)

Tape Unit Without BM 6460006 (see CARR-DR 9)

If Your Tape Unit is 50 Hz, Go to CARR-DR 378

This page contains the steps needed to remove and replace the manifold-in pressure hose from the tape unit. Since this hose provides air pressure for both drives, it is necessary to have both drives available for service.

The manifold-in pressure hose connects the regulator outlet with a pressure/vacuum manifold which is located on the slanted baffle above the power supply **3**. To gain access to the manifold end of the hose, it is necessary to slide the power supply to the front of the tape unit.

Note: This FRU can be removed and replaced without affecting the other tape units by removing power from the failing tape unit with the ac power circuit breaker.

Moving the Power Supply

1. Go to CARR-DR 8 for the procedure to **power off** the tape unit.
2. Open the rear cover and remove the rear safety cover and ground connector (see CARR-DR 2-3).

CAUTION

Before removing the cables from the rear of the power supply, rotate the vacuum hardware (with cable clamps) away from the hand access area.

3. Remove all the cables from the rear of the power supply.
4. Remove the cables J11, J15, and J16 **7** from the front of the power supply. Do not remove the jumper in J12, J13, or J14.
5. Remove the bolt **2** used to secure the tape unit at the left side (front of the tape unit).
6. Remove the two mounting bolts **1**.
7. Use the two bottom cutouts to move the power supply toward the front of the tape unit.

Warning: Ensure that the cables J11, J15, and J16 are not pinched when the power supply is moved.

Removing the Manifold-In Pressure Hose

1. Loosen the hose clamp and slide it away from the regulator **4**.
2. Pull the hose off the regulator.
3. Loosen the hose clamp and slide it away from the manifold **6**.
4. Pull the hose off the manifold.
5. Remove the pressure hose **5** from the tape unit.
6. Save the hose clamps for the replacement hose.

Replacing the Manifold-In Pressure Hose

1. Install the hose clamps, saved during the removal procedure, on each end of the new pressure hose **5**.
2. Slide one end of the hose on the regulator **4** and the other end on the pressure/vacuum **6**.
3. Slide the two hose clamps in place, clamping the hose to the fittings.

Replacing the Power Supply

Warning: When replacing the power supply, ensure that the upper rear of the supply clears the external load resistor panel.

Drive **CARR-DR 370**

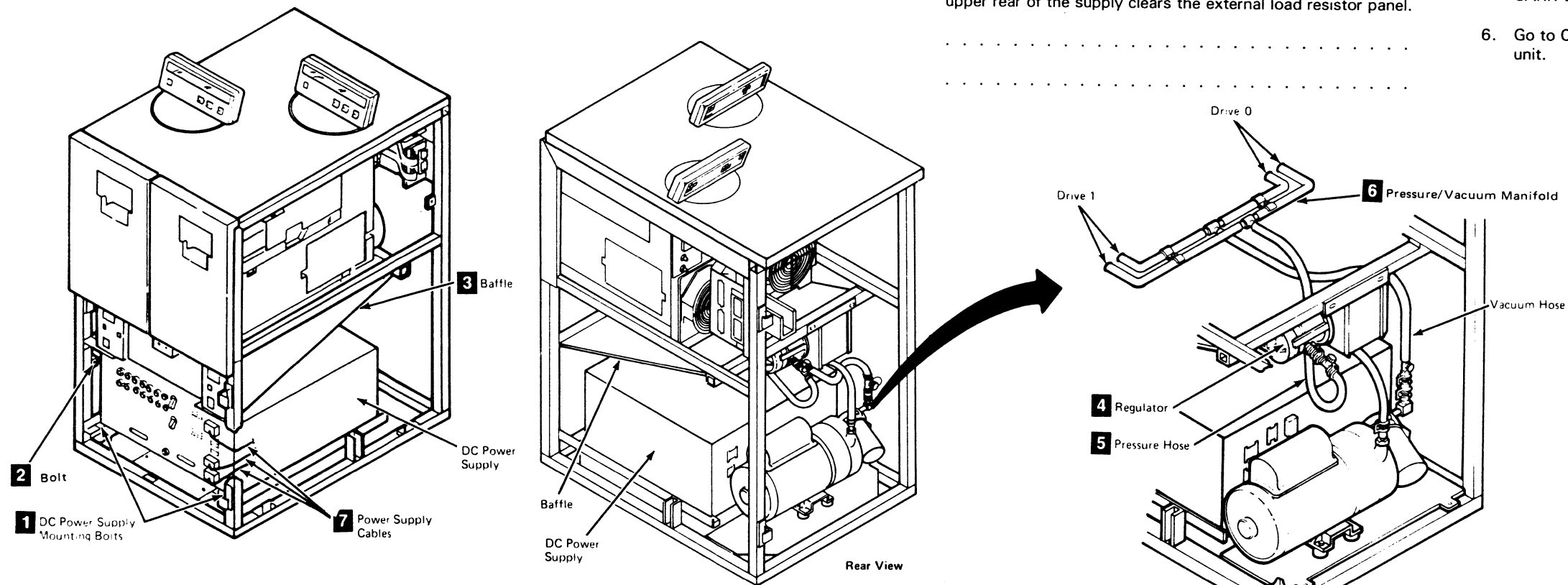
Warning: Ensure that the cables J11, J15, and J16 are not pinched when the power supply is moved.

1. Slide the power supply to the rear of the tape unit and install the two mounting bolts **1**.
2. Replace the bolt **2** used to secure the tape unit at the left side.
3. Replace the cables (J11, J15, and J16) **7** removed from the front of the power supply.

CAUTION

Before replacing the cables at the rear of the power supply, rotate the vacuum hardware (with cable clamps) away from the hand access area.

4. Replace the cables removed from the rear of the power supply.
5. Replace the rear safety cover and ground connector (see CARR-DR 2-4) and close the rear cover.
6. Go to CARR-DR 8 for the procedure to **power on** the tape unit.



FRU037 Manifold-In Pressure Hose Removal and Replacement Procedure (50 Hz)

Drive **CARR-DR 378**

Tape Unit Without BM 6460006 (see CARR-DR 9)

If Your Tape Unit is 60 Hz, Go to CARR-DR 370

This page contains the steps needed to remove the manifold-in pressure hose from the tape unit. Since this hose provides air pressure for both drives, it is necessary to have both drives available for service.

The manifold-in pressure hose connects the regulator outlet with a pressure/vacuum manifold which is located on the slanted baffle above the power supply **3**. To gain access to the manifold end of the hose, it is necessary to slide the power supply to the front of the tape unit.

Note: This FRU can be removed and replaced without affecting the other tape units by removing power from the failing tape unit with the ac power circuit breaker.

Moving the Power Supply

1. Go to CARR-DR 8 for the procedure to **power off** the tape unit.
2. Open the rear cover and remove the rear safety cover and ground connector (see CARR-DR 2-3).

CAUTION

Before removing the cables from the rear of the power supply, rotate the vacuum hardware (with cable clamps) away from the hand access area.

3. Remove all the cables from the rear of the power supply.
4. Remove the cables J11, J15, and J16 **6** from the front of the power supply. Do not remove the jumper in J12, J13, or J14.
5. Remove the bolt **2** used to secure the tape unit at the left side (front of the tape unit).

Warning: Ensure that the cables J11, J15, and J16 are not pinched when the power supply is moved.

6. Remove the two mounting bolts **1**.
7. Use the two bottom cutouts to move the power supply toward the front of the tape unit.

Removing the Manifold-In Pressure Hose

1. Loosen the hose clamp and slide it away from the regulator **5**.
2. Pull the hose off the regulator.
3. Loosen the hose clamp and slide it away from the manifold **6**.
4. Pull the hose off the manifold.
5. Save the hose clamps for the replacement hose.

Replacing the Manifold-In Pressure Hose

1. Install the hose clamps, saved during the removal procedure, on each end of the new hose.
2. Slide one end of the hose on the regulator outlet **5** and the other end on the pressure/vacuum manifold **4**.
3. Slide the two hose clamps in place, clamping the hose to the fittings.

Replacing the Power Supply

Warning: When replacing the power supply, ensure that the upper rear of the supply clears the external load resistor panel.

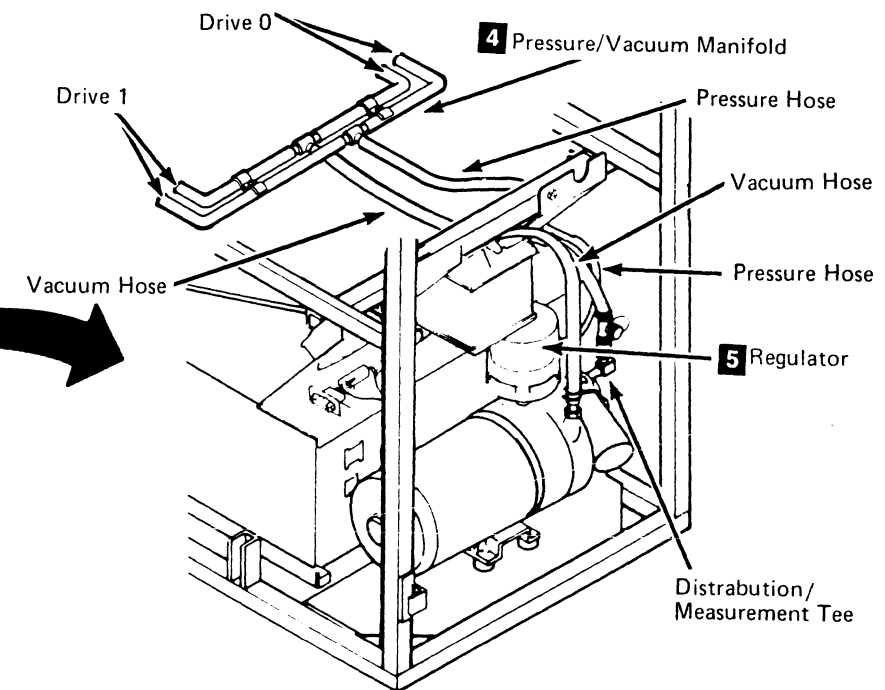
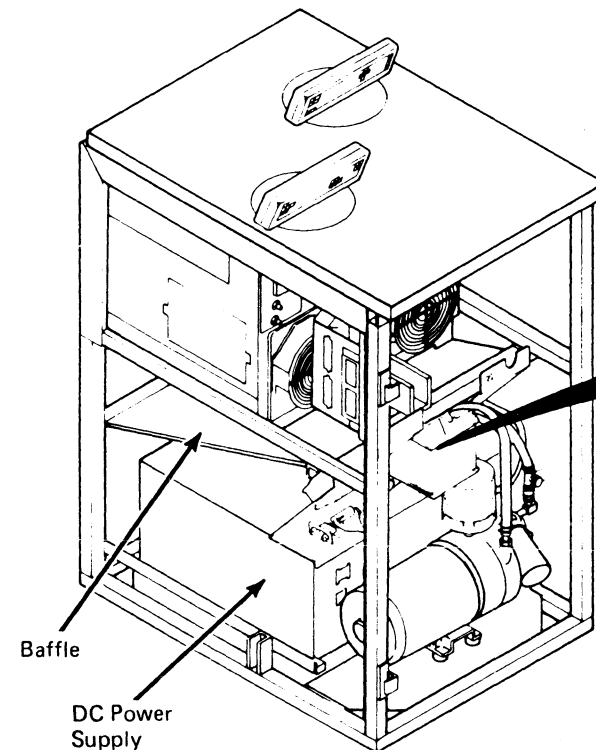
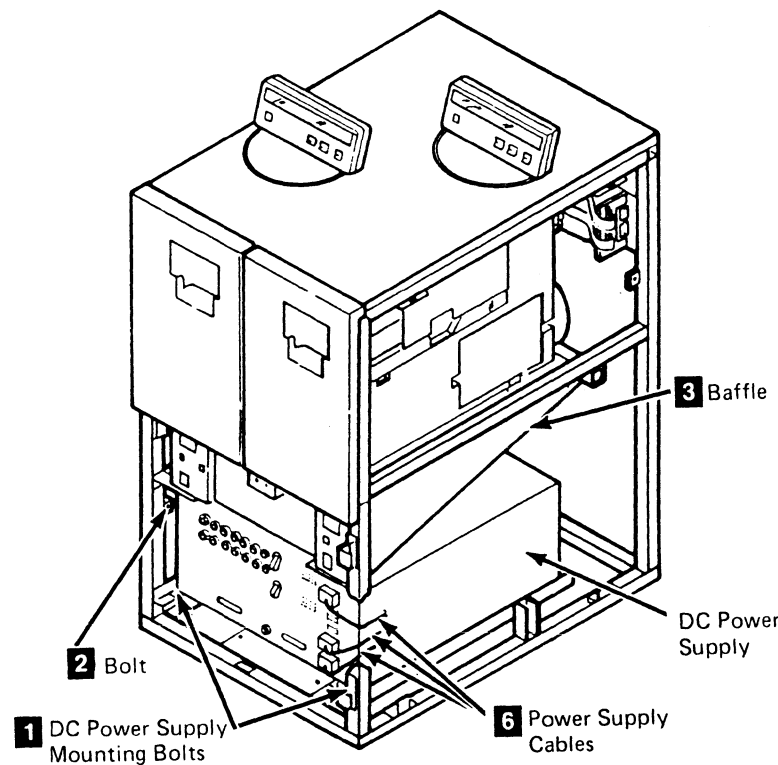
Warning: Ensure that the cables J11, J15, and J16 are not pinched when the power supply is moved.

1. Slide the power supply to the rear of the tape unit and install the two mounting bolts **1**.
2. Replace the bolt **2** used to secure the tape unit at the left side.
3. Replace the cables (J11, J15, and J16) **7** removed from the front of the power supply.

CAUTION

Before replacing the cables at the rear of the power supply, rotate the vacuum hardware (with cable clamps) away from the hand access area.

4. Replace the cables removed from the rear of the power supply.
5. Replace the rear safety cover and ground connector (see CARR-DR 2-4) and close the rear cover.
6. Go to CARR-DR 8 for the procedure to **power on** the tape unit.



FRU038 Manifold-In Vacuum Hose Assembly Removal and Replacement Procedure (60 Hz)

Drive **CARR-DR 380**

Tape Unit Without BM 6460006 (see CARR-DR 9)

If Your Tape Unit is 50 Hz, Go to CARR-DR 388

This page contains the steps needed to remove and replace the manifold-in vacuum hose assembly in the tape unit. Since this procedure requires disabling the dc power supply, it is necessary to have both drives available for service.

The manifold-in vacuum hose connects the input filter with a pressure/vacuum manifold which is mounted on the slanted baffle **2** above the power supply. To gain access to the manifold end of the hose, it is necessary to slide the power supply to the front of the machine.

Note: This FRU can be removed and replaced without affecting the other tape units by removing power from the failing tape unit with the ac power circuit breaker.

Moving the Power Supply

1. Open the rear cover and remove the rear safety cover and ground strap (see CARR-DR 2-3).

CAUTION
Before removing the cables from the rear of the power supply, rotate the vacuum hardware (with cable clamps) away from the hand access area.

2. Remove all the cables from the rear of the power supply.
3. Remove the cables J11, J15, and J16 **5** from the front of the power supply. Do not remove the jumper in J12, J13, or J14.
4. Remove the bolt **1** used to secure the tape unit at the left side (front of machine).

Warning: Ensure that the cables J11, J15, and J16 are not pinched when the power supply is moved.

5. Remove the two mounting bolts **6**.
6. Use the two bottom cutouts to move the power supply toward the front of the machine (7 or 8 inches will be enough).

Removing the Manifold-In Vacuum Hose Assembly

1. Go to CARR-DR 8 for the procedure to **power off** the tape unit.
2. Loosen the hose clamp and slide it away from the distribution/measurement tee **4**.
3. Pull the hose off the distribution/measurement tee.

4. Loosen the hose clamp and slide it away from the pressure/vacuum manifold **3**.
5. Pull the hose off the pressure/vacuum manifold.
6. Save the hose clamps for the replacement hose.

Replacing the Manifold-In Vacuum Hose Assembly

1. Install the hose clamps, saved during the removal procedure, on each end of the new hose assembly.
2. Slide one end of the hose on the distribution/measurement tee **4** and the other end on the pressure/vacuum manifold **3**.
3. Slide the two hose clamps in place (clamping the hose to the fittings).

Replacing the Power Supply

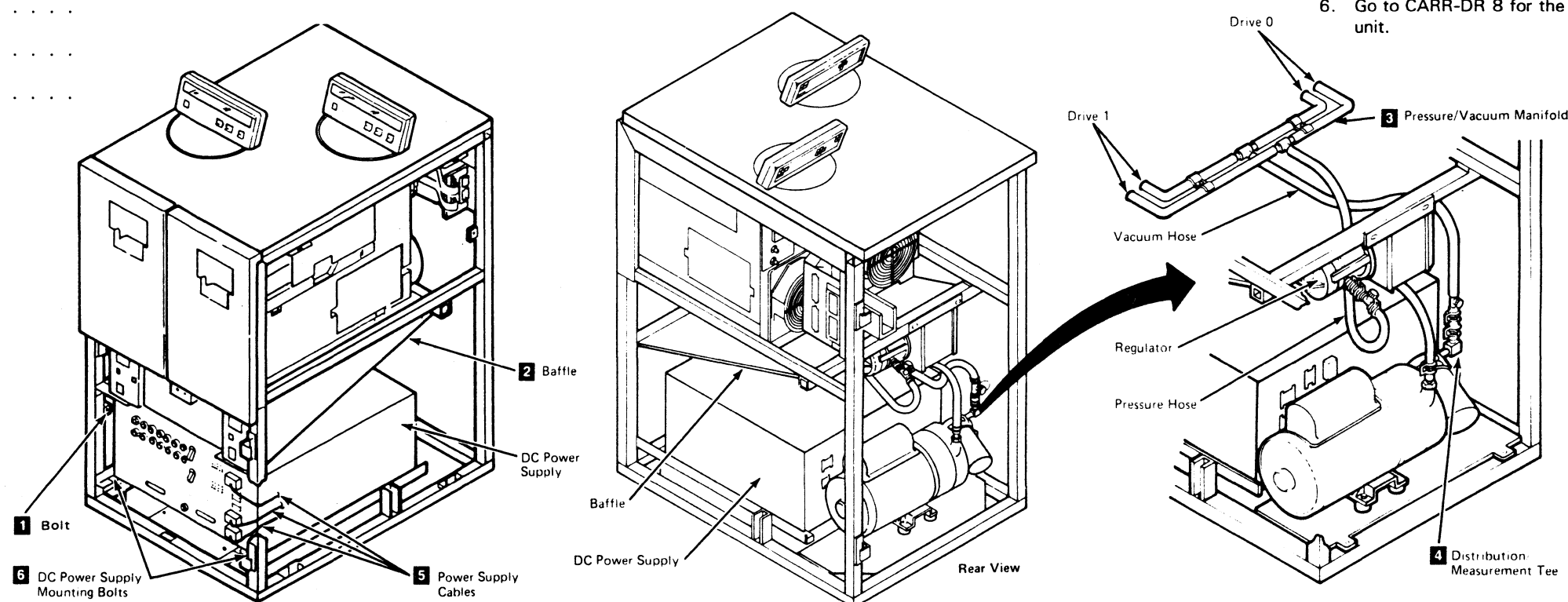
Warning: When replacing the power supply, ensure that the upper rear of the supply clears the external load resistor panel.

Warning: Ensure that the cables J11, J15, and J16 are not pinched when the power supply is moved.

1. Slide the power supply to the rear of the tape unit and install the two mounting bolts **6**.
2. Replace the bolt **1** used to secure the tape unit at the left side.
3. Replace the cables (J11, J15, and J16) **5** removed from the front of the power supply.

CAUTION
Before replacing the cables at the rear of the power supply, rotate the vacuum hardware (with cable clamps) away from the hand access area.

4. Replace the cables removed from the rear of the power supply.
5. Install the rear safety cover and ground connector (see CARR-DR 2-4) and close the rear cover.
6. Go to CARR-DR 8 for the procedure to **power on** the tape unit.



FRU038 Manifold-In Vacuum Hose Assembly Removal and Replacement Procedure (50 Hz)

Drive **CARR-DR 388**

Tape Unit Without BM 6460006 (see CARR-DR 9)

If Your Tape Unit is 60 Hz, Go to CARR-DR 380

This page contains the steps needed to remove and replace the manifold-in vacuum hose assembly from the tape unit. Since this procedure requires disabling the dc power supply, it is necessary to have both drives available for service.

The manifold-in vacuum hose connects the input filter with a pressure/vacuum manifold which is mounted on the slanted baffle **2** above the power supply. To gain access to the manifold end of the hose, it is necessary to slide the power supply to the front of the machine.

Note: This FRU can be removed and replaced without affecting the other tape units by removing power from the failing tape unit with the ac power circuit breaker.

Moving the Power Supply

1. Open the rear cover and remove the rear safety cover and ground strap (see CARR-DR 2-3).

CAUTION
Before removing the cables from the rear of the power supply, rotate the vacuum hardware (with cable clamps) away from the hand access area.

2. Remove all the cables from the rear of the power supply.
 3. Remove the cables J11, J15, and J16 **5** from the front of the power supply. Do not remove the jumper in J12, J13, or J14.
 4. Remove the bolt **1** used to secure the tape unit at the left side (front of machine).
- Warning:** Ensure that the cables J11, J15, and J16 are not pinched when the power supply is moved.
5. Remove the two mounting bolts **6**.
 6. Use the two bottom cutouts to move the power supply toward the front of the machine (7 or 8 inches will be enough).

Removing the Manifold-In Vacuum Hose Assembly

1. Go to CARR-DR 8 for the procedure to **power off** the tape unit.
2. Loosen the hose clamp and slide it away from the distribution/measurement tee **4**.
3. Pull the hose off the distribution/measurement tee.

4. Loosen the hose clamp and slide it away from the pressure/vacuum manifold **3**.
5. Pull the hose off the pressure/vacuum manifold.
6. Save the hose clamps for the replacement hose.

Replacing the Manifold-In Vacuum Hose Assembly

1. Install the hose clamps, saved during the removal procedure, on each end of the new hose assembly.
2. Slide one end of the hose on the distribution/measurement tee **4** and the other end on the pressure/vacuum manifold **3**.
3. Slide the two hose clamps in place (clamping the hose to the fittings).

Replacing the Power Supply

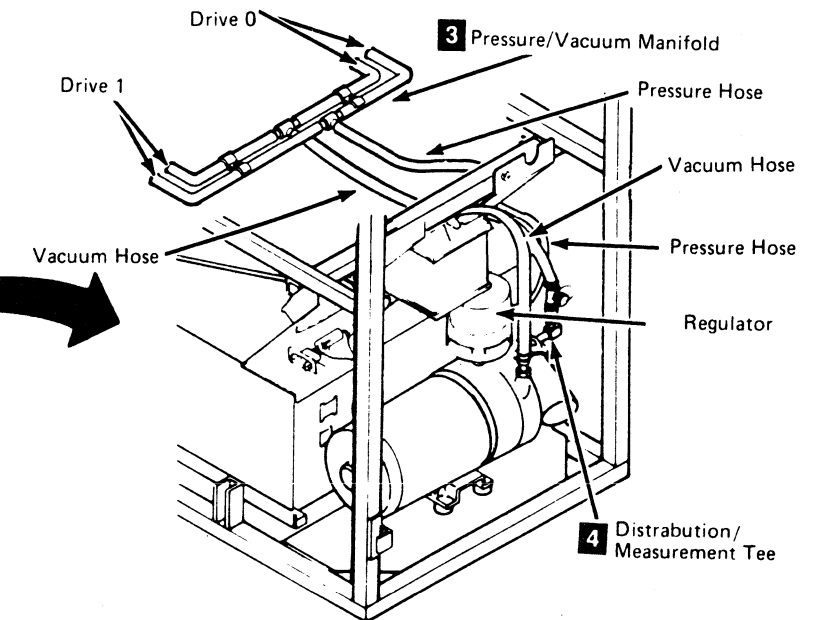
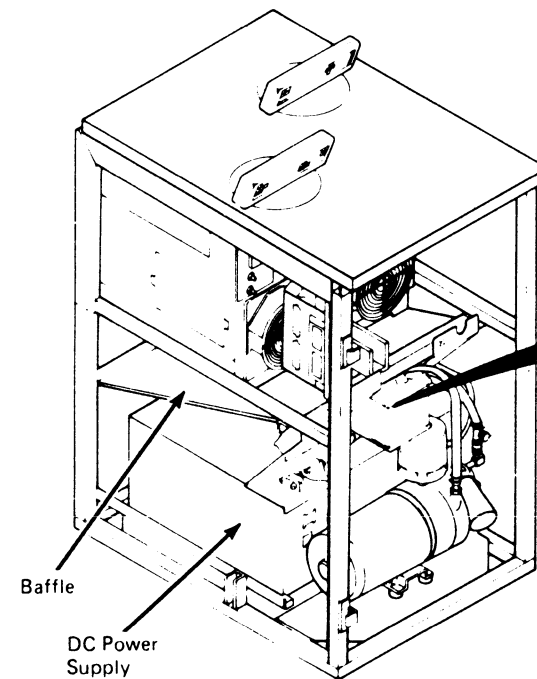
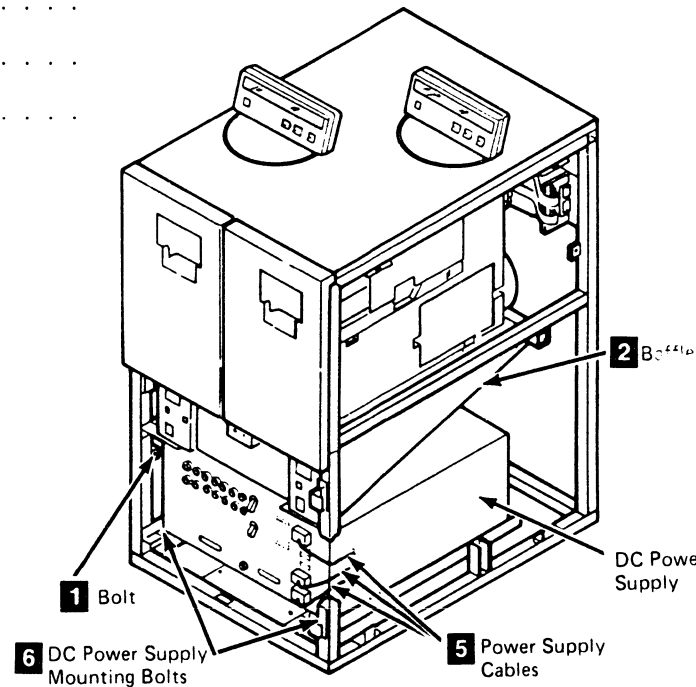
Warning: When replacing the power supply, ensure that the upper rear of the supply clears the external load resistor panel.

Warning: Ensure that the cables J11, J15, and J16 are not pinched when the power supply is moved.

1. Slide the power supply to the rear of the tape unit and install the two mounting bolts **6**.
2. Replace the bolt **1** used to secure the tape unit at the left side.
3. Replace the cables (J11, J15, and J16) **5** removed from the front of the power supply.

CAUTION
Before replacing the cables at the rear of the power supply, rotate the vacuum hardware (with cable clamps) away from the hand access area.

4. Replace the cables removed from the rear of the power supply.
5. Install the rear safety cover and ground connector (see CARR-DR 2-4) and close the rear cover.
6. Go to CARR-DR 8 for the procedure to **power on** the tape unit.



Drive **CARR-DR 388**

FRU039 Plenum Supply Hose Removal and Replacement Procedure

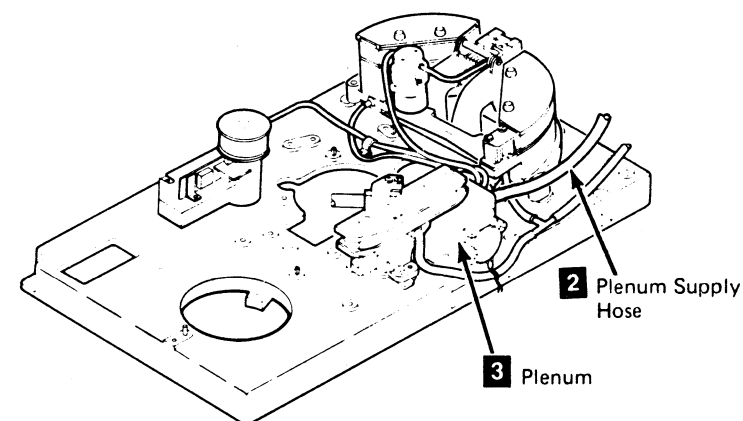
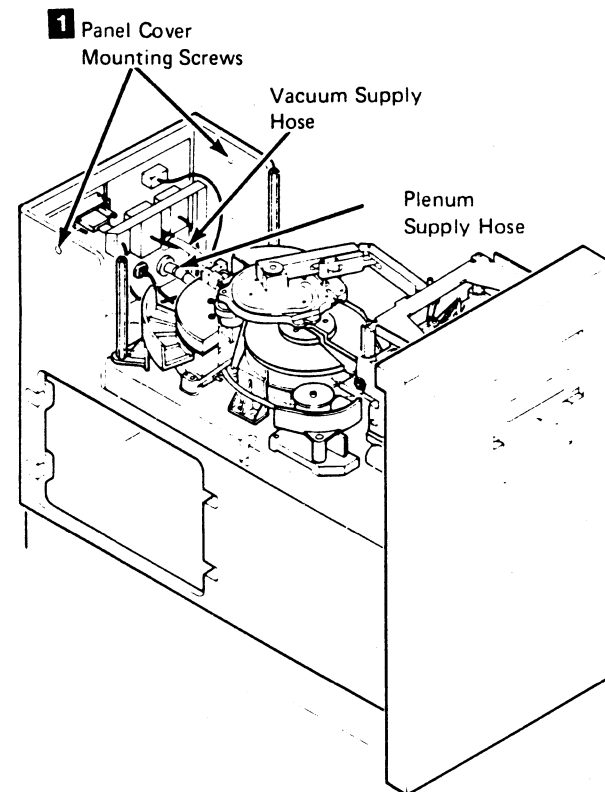
This page contains the steps needed to remove and replace the plenum supply hose **2** from the tape unit. Because the air pressure is used by both drives, it is necessary to clamp off the air supply going to the failing drive.

Note: This FRU can be removed and replaced without affecting the other drive by removing power from the failing drive with the Drive Power On/Off switch.

Removing the Plenum Supply Hose

1. Go to CARR-DR 8 for the procedure to **power off** the drive.
2. Open the rear cover of the drive requiring service (see CARR-DR 2-3).
3. Locate the Air Pressure hose **4** at the point where it attaches to the rear panel of the drive drawer on the drive you are servicing.

4. Using the clamping tool (part 2496268) **5**, clamp off the air going into the failing drive. Ensure that the hose does not separate from the rear panel before it is clamped.
5. Open the drive drawer on the drive requiring service.
6. Remove the drive safety cover (see CARR-DR 2-5).
7. Remove the panel cover mounting screws **1** and the panel cover.
8. Loosen the plenum supply hose clamp and remove the plenum supply hose **2** from the pressure fitting. Save the plenum supply hose clamp to be used on the replacement hose.
9. Disconnect the other end of the plenum supply hose **2** from the plenum **3** and remove the hose from the drive.

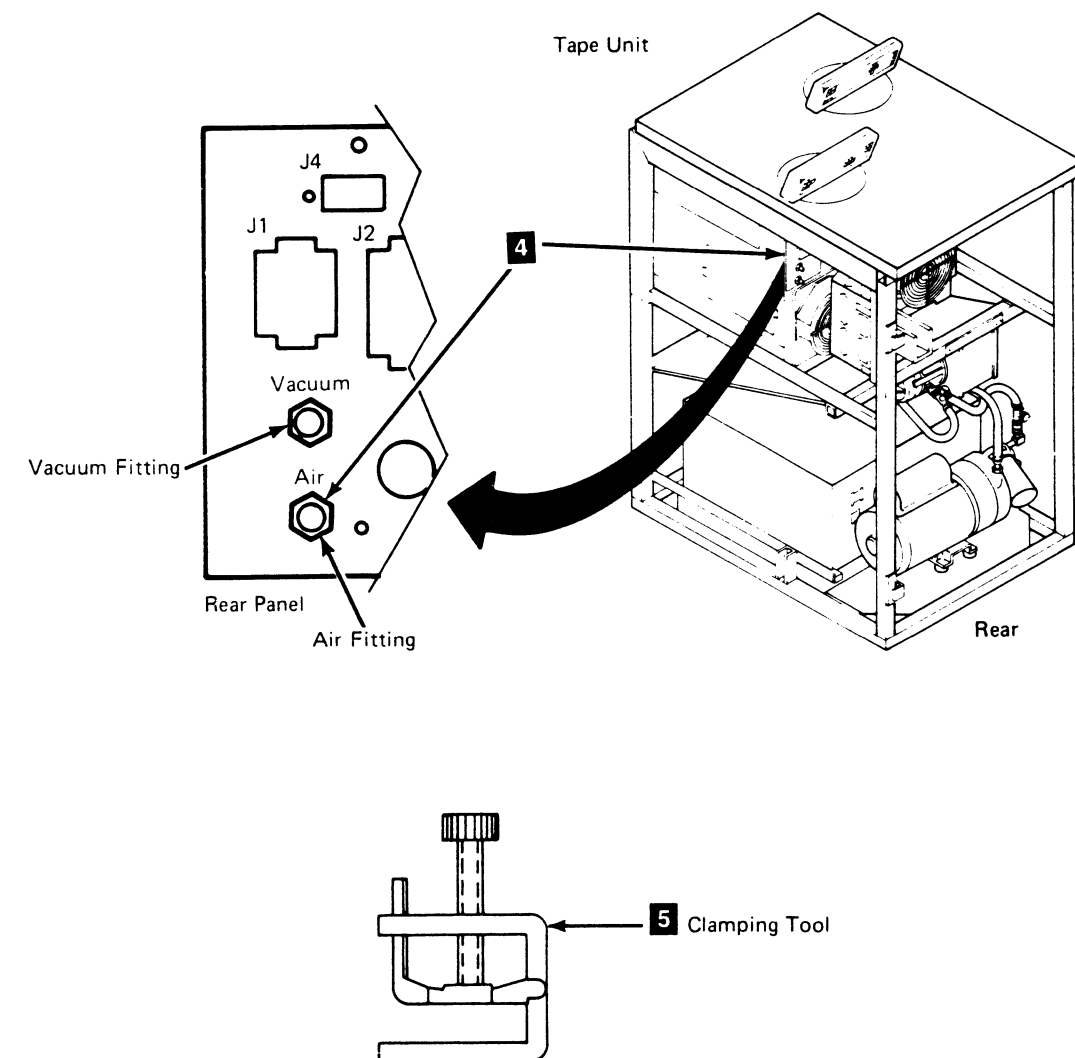


Replacing the Plenum Supply Hose

1. Connect one end of the plenum supply hose **2** to the plenum **3**. Place the hose in position, going to the rear panel.
2. Slide the hose clamp on to the plenum supply hose. Slide the hose on to the pressure fitting **4** and install the hose clamp.

Drive CARR-DR 390

3. Install the panel cover and the two mounting screws **1**.
4. Install the drive safety cover (see CARR-DR 2-5).
5. Ensure that the Air Pressure hose is securely attached to the rear panel of the drive; then remove clamping tool **5**.
6. Close the rear cover of the tape drive (see CARR-DR 2-3).
7. Go to CARR-DR 8 for the procedure to **power on** the drive.



FRU040 Pressure Sensor Removal and Replacement Procedure

This page contains the steps needed to remove and replace the pressure sensor (TU-DK-Pressure Sensor) from the plenum assembly.

Note: This FRU can be removed and replaced without affecting the other drive by removing power from the failing drive with the Drive Power On/Off switch.

Removing the Pressure Sensor Assembly

1. Go to CARR-DR 8 for the procedure to **power off** the drive.
2. Open the drive drawer and remove the drive drawer safety cover (see CARR-DR 2-5).
3. Clamp the plenum supply hose (see CARR-DR 3-1).

The pressure sensor is mounted on the plenum assembly **1**, which is located on the right side of the drive, in the center.

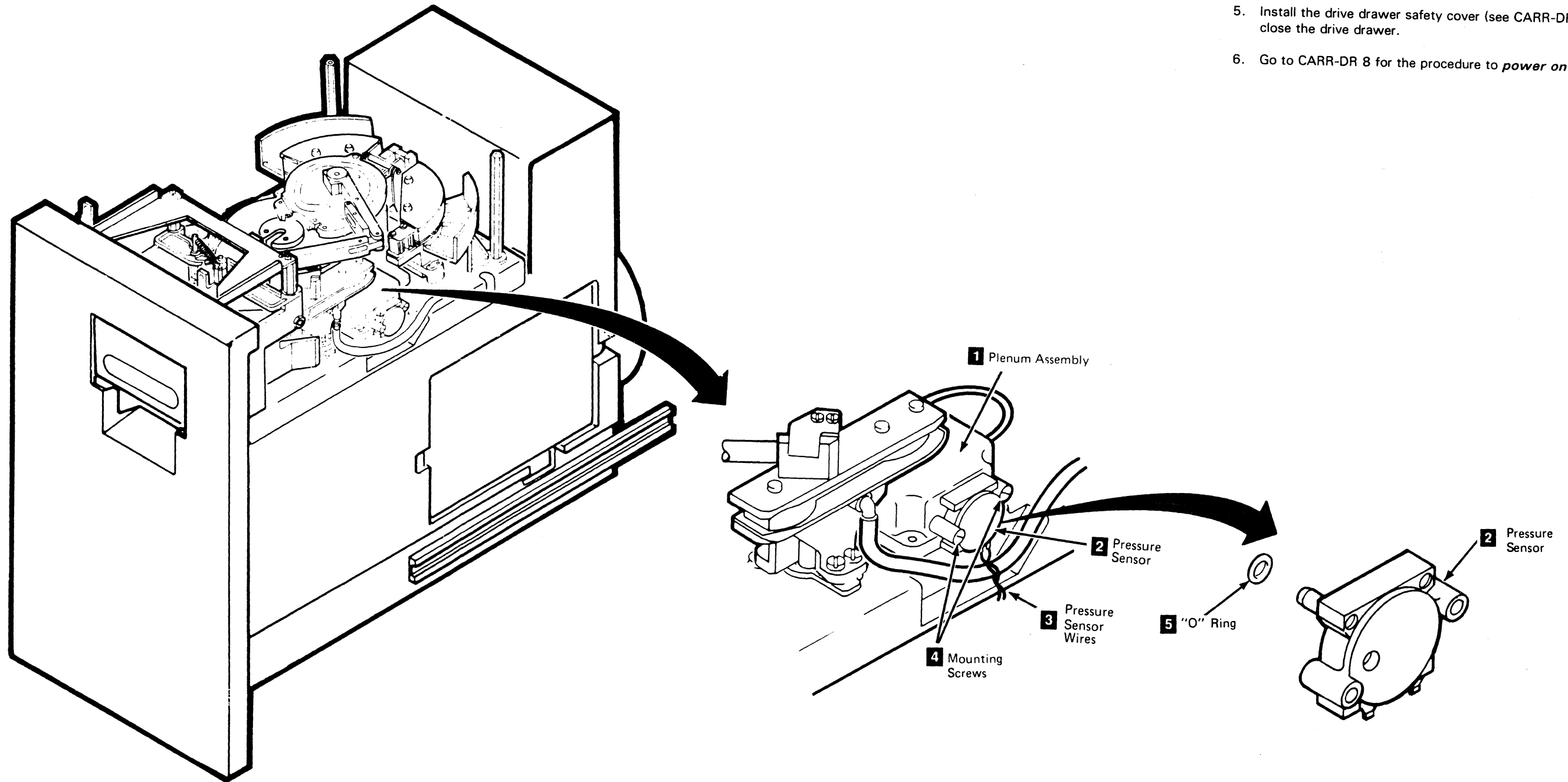
4. Disconnect the two pressure sensor wires **3** from the pressure sensor **2**.

Warning: There is a small "O" ring **5** on the rear of the sensor. Be careful not to lose it.

5. Remove the two mounting screws **4** holding the sensor to the plenum **1** and remove the sensor.

Drive CARR-DR 400 Replacing the Pressure Sensor Assembly

1. Place the "O" ring **5** on the pressure sensor **2**.
2. Place the pressure sensor and "O" ring in position on the plenum assembly **1** and install the two mounting screws **4**.
3. Connect the two sensor wires **3** to the sensor terminals.
4. Remove the clamp from the plenum supply hose.
5. Install the drive drawer safety cover (see CARR-DR 2-5) and close the drive drawer.
6. Go to CARR-DR 8 for the procedure to **power on** the drive.



FRU041 Plenum Assembly Removal and Replacement Procedure

This page contains the steps needed to remove and replace the plenum assembly **7** in the drive. The replacement plenum assembly will have a new pressure sensor mounted on it, so it is not necessary to remove the pressure sensor.

Note: This FRU can be removed and replaced without affecting the other drive by removing power from the failing drive with the Drive Power On/Off switch.

Removing the Plenum Assembly

1. Go to CARR-DR 8 for the procedure to **power off** the drive.
2. Open the drive drawer and remove the drive drawer safety cover (see CARR-DR 2-5).

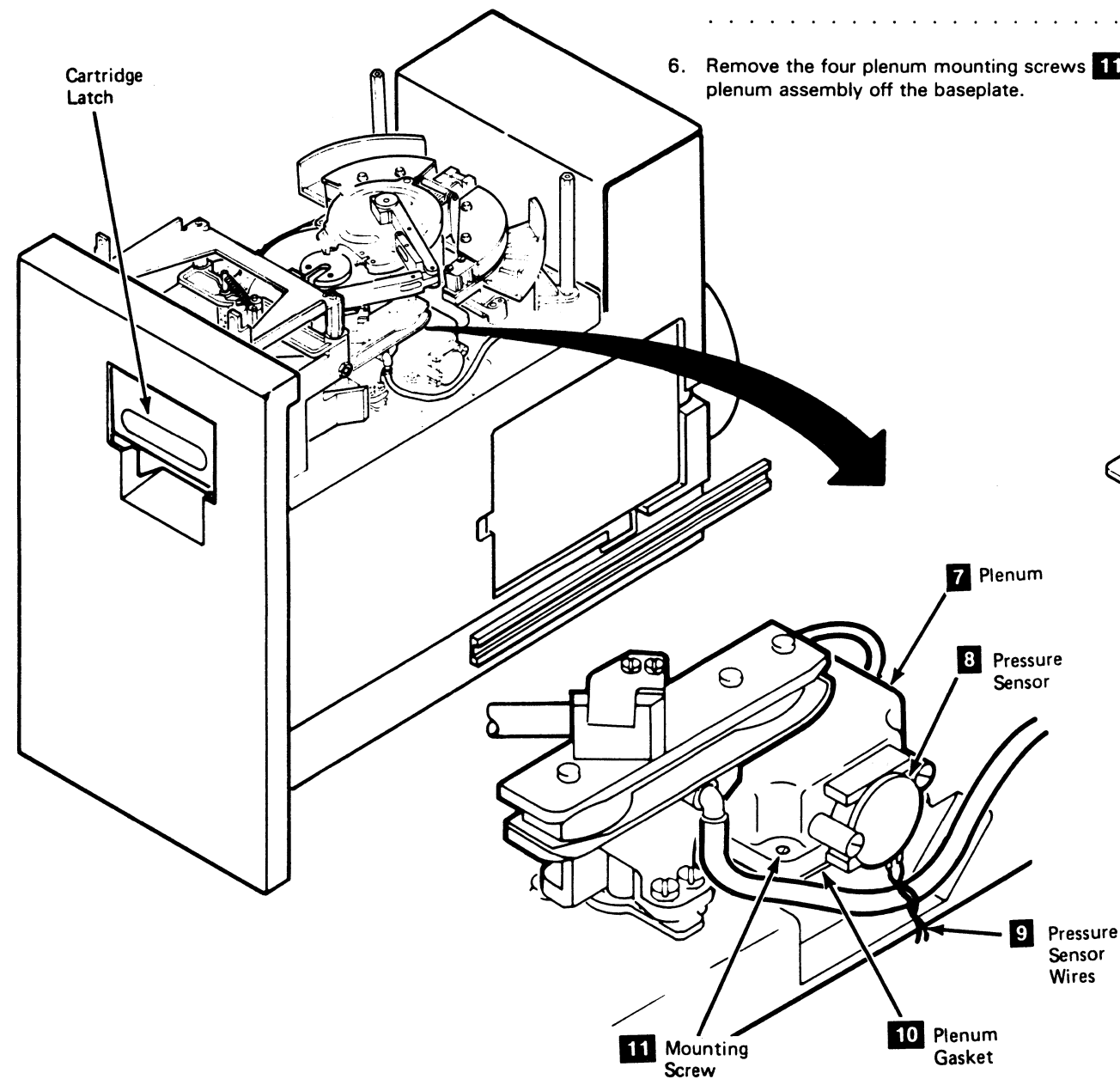
3. Clamp the plenum supply hose (see CARR-DR 3-1).

The plenum assembly **7** is located on the right side of the drive, in the center.

4. Disconnect the two pressure sensor wires **9** from the pressure sensor **8**.
5. Disconnect all of the hoses from the plenum.

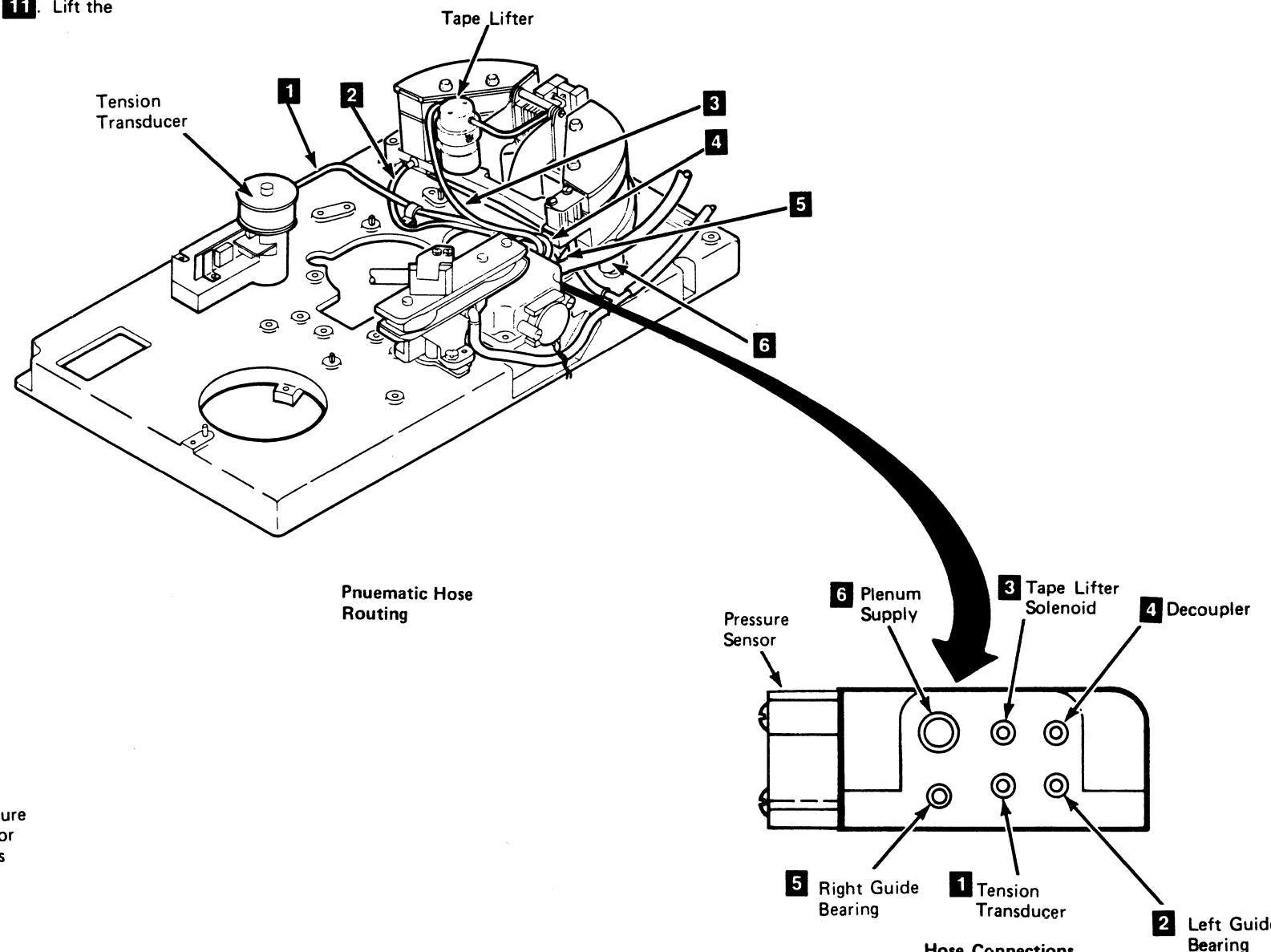
Warning: Be careful not to damage the gasket **10** under the plenum. It is used for reinstallation of the plenum.

6. Remove the four plenum mounting screws **11**. Lift the plenum assembly off the baseplate.



Replacing the Plenum Assembly

1. Place the plenum **7** and gasket **10** in position on the baseplate.
2. Install the four mounting screws **11**.
3. Connect the two pressure sensor wires **9** to the pressure sensor **8**.
4. Connect the hoses to the plenum.
 - a. Connect the left guide bearing hose **2**.
 - b. Connect the tension transducer hose **1**.
 - c. Connect the right guide bearing hose **5**.



Drive **CARR-DR 410**

- d. Connect the decoupler pressure hose **4**.
- e. Connect the tape lifter solenoid input hose **3**.
- f. Connect the plenum supply hose **6**.

Note: Ensure that the two wires to the threader motor have not been loosen or damaged.

5. Remove the clamp from the plenum supply hose.
6. Install the drive drawer safety cover (see CARR-DR 2-5) and close the drive drawer.
7. Go to CARR-DR 8 for the procedure to **power on** the drive.

FRU042 Decoupler Pressure Hose Removal and Replacement Procedure

Drive **CARR-DR 420**

This page contains the steps needed to remove and replace the decoupler pressure hose **2** from the drive.

Note: This FRU can be removed and replaced without affecting the other drive by removing power from the failing drive with the Drive Power On/Off switch.

Removing the Decoupler Pressure Hose

1. Go to CARR-DR 8 for the procedure to *power off* the drive.
2. Open the drive drawer and remove the drive drawer safety cover (see CARR-DR 2-5).
3. Clamp the plenum supply hose (see CARR-DR 3-1).
4. Disconnect the decoupler pressure hose **2** from the plenum **1**.
5. Disconnect the other end of the decoupler pressure hose from the decoupler **3** and remove it from the drive.

Replacing the Decoupler Pressure Hose

1. Connect one end of the decoupler pressure hose **2** to the decoupler **3**.
2. Connect the other end of the decoupler pressure hose to the plenum **1**.

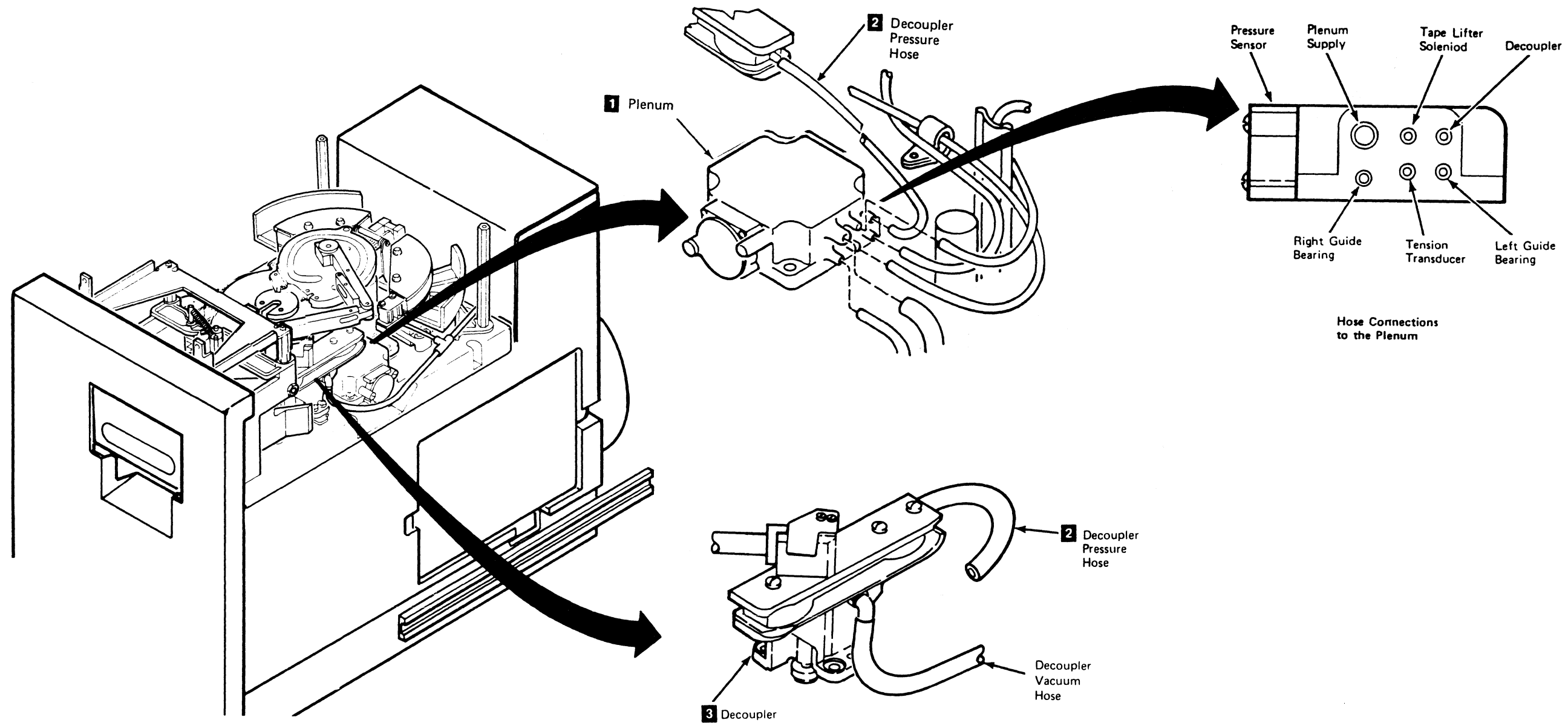
3. Remove the clamp from the plenum supply hose.

Note: Ensure that the two wires to the threader motor have not been loosened or damaged.

4. Install the drive drawer safety cover (see CARR-DR 2-5) and close the drive drawer.

5. Go to CARR-DR 8 for the procedure to *power on* the drive.

Note: Ensure that the two wires to the threader motor have not been loosened or damaged.



FRU043 Decoupler Vacuum Hose Removal and Replacement Procedure

Drive **CARR-DR 430**

This page contains the steps needed to remove and replace the decoupler vacuum hose **3** from the decoupler **4**.

Note: This FRU can be removed and replaced without affecting the other drive by removing power from the failing drive with the Drive Power On/Off switch.

Removing the Decoupler Vacuum Hose

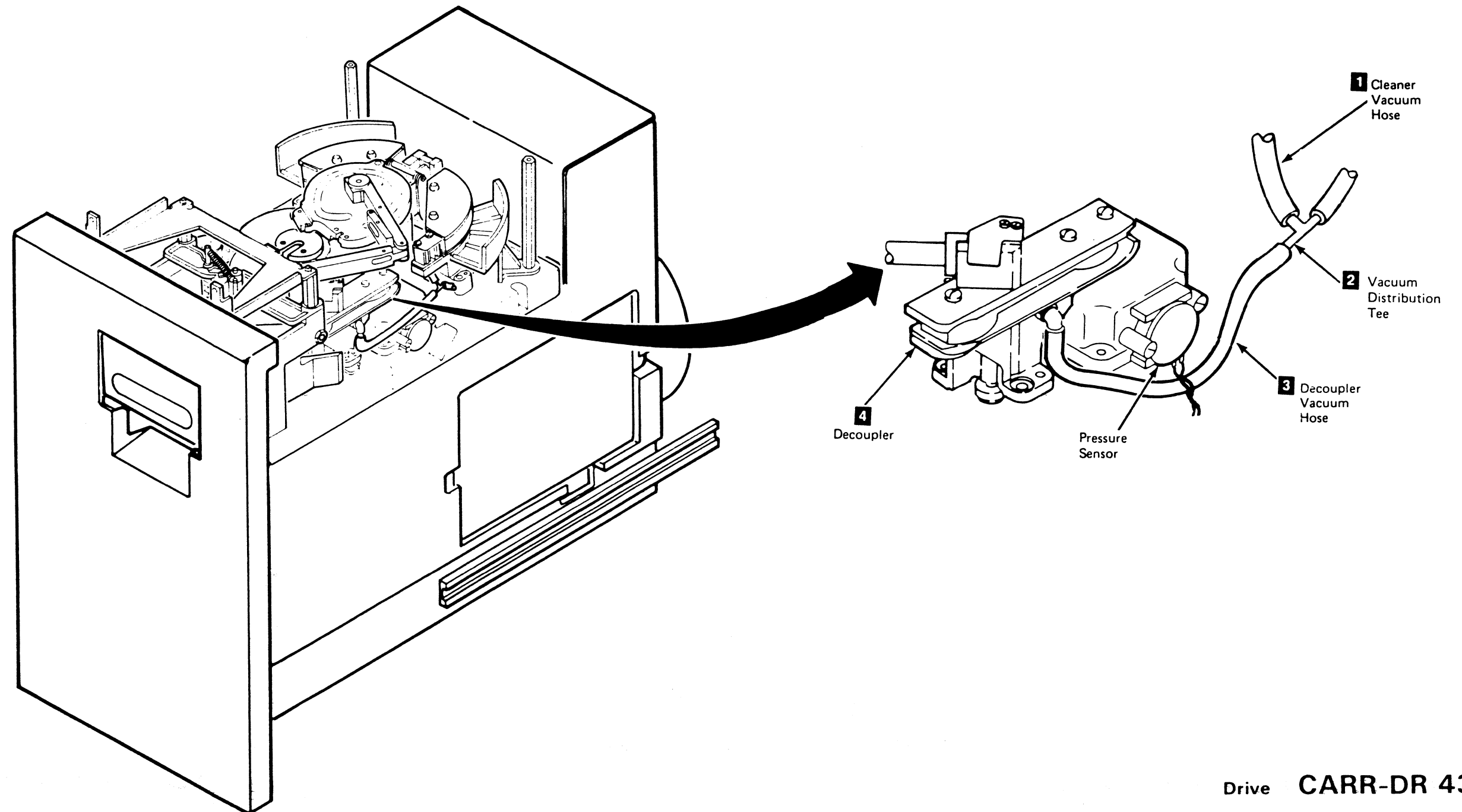
1. Go to CARR-DR 8 for the procedure to **power off** the drive.
2. Open the drive drawer and remove the drive drawer safety cover (see CARR-DR 2-5).
3. Disconnect the decoupler vacuum hose **3** from the vacuum distribution tee **2**.
4. Disconnect the other end of the decoupler vacuum hose from the decoupler **4** and remove it from the drive.

Replacing the Decoupler Vacuum Hose

1. Connect the decoupler vacuum hose **3** to the decoupler **4**.
2. Connect the other end of the decoupler vacuum hose to the vacuum distribution tee **2**.

Ensure that the cleaner vacuum hose **1** is connected to the cleaner assembly.

3. Install the drive drawer safety cover (see CARR-DR 2-5) and close the drive drawer.
4. Go to CARR-DR 8 for the procedure to **power on** the drive.



FRU044 Right Guide Bearing Hose Removal Procedure

This page contains the steps needed to remove the right guide bearing hose **3** from the drive.

Note: This FRU can be removed and replaced without affecting the other drive by removing power from the failing drive with the Drive Power On/Off switch.

Removing the Right Guide Bearing Hose

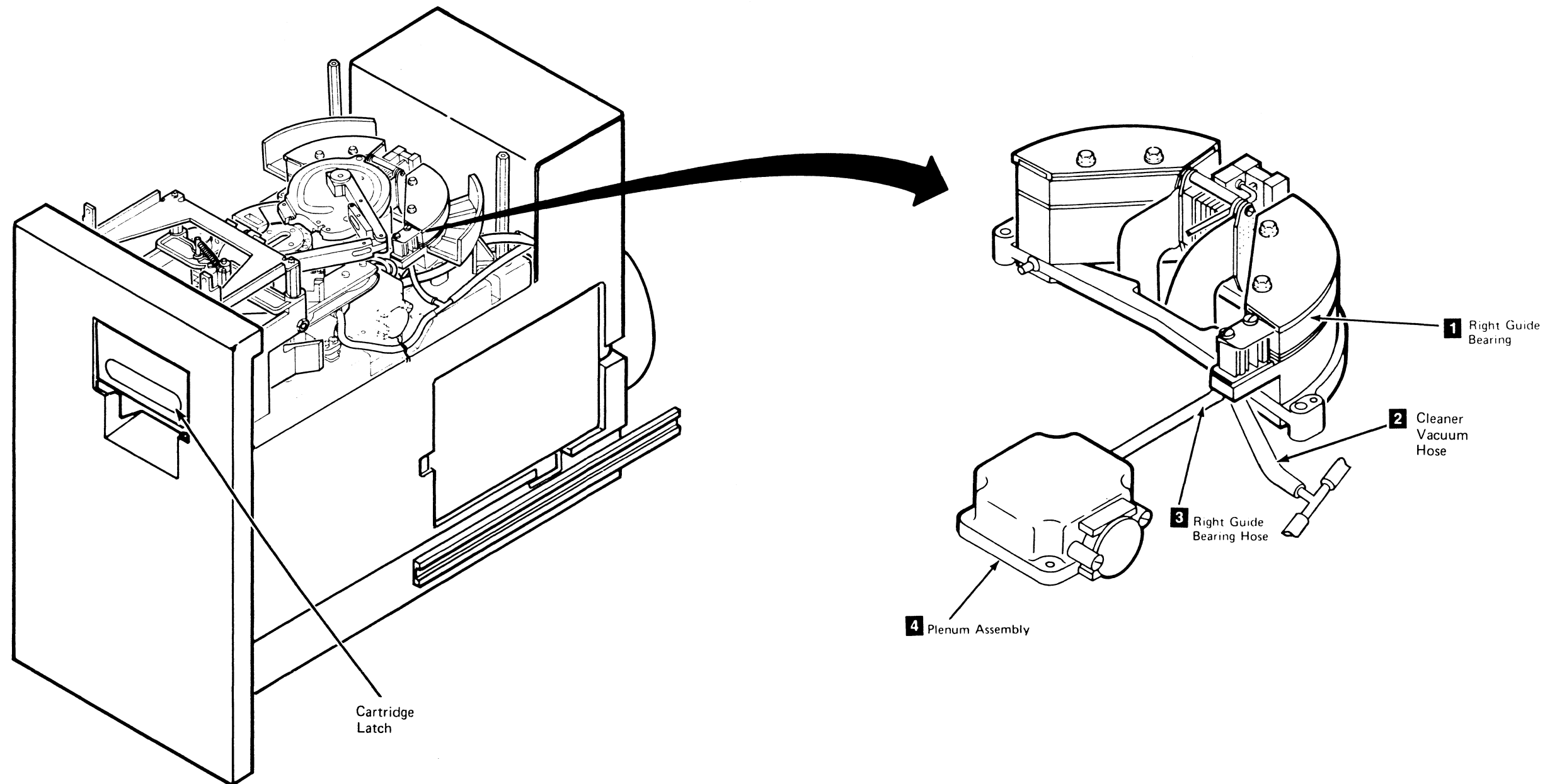
1. Go to CARR-DR 8 for the procedure to **power off** the drive.
2. Open the drive drawer and remove the drive drawer safety cover (see CARR-DR 2-5).
3. Clamp the plenum supply hose (see CARR-DR 3-1).
4. Disconnect the right guide bearing hose **3** from the right guide bearing **1**.
5. Disconnect the other end of the right guide bearing hose from the plenum assembly **4** and remove it from the drive.

Replacing the Right Guide Bearing Hose

1. Connect the right guide bearing hose **3** to the right guide bearing **1**.
2. Connect the other end of the right guide bearing hose to the plenum assembly **4**.

Ensure that the cleaner vacuum hose **2** is connected to the cleaner assembly.

3. Remove the clamp from the plenum supply hose.
4. Install the drive drawer safety cover (see CARR-DR 2-5) and close the drive drawer.
5. Go to CARR-DR 8 for the procedure to **power on** the drive.



FRU045 Left Guide Bearing Hose Removal and Replacement Procedure

Drive **CARR-DR 450**

This page contains the steps needed to remove and replace the left guide bearing hose **1** in the drive.

Note: This FRU can be removed and replaced without affecting the other drive by removing power from the failing drive with the Drive Power On/Off switch.

Removing the Left Guide Bearing Hose

1. Go to CARR-DR 8 for the procedure to **power off** the drive.
2. Open the drive drawer and remove the drive drawer safety cover (see CARR-DR 2-5).
3. Clamp the plenum supply hose (see CARR-DR 3-1).
4. Disconnect the left guide bearing hose **1** from the left guide bearing **2**.
5. Disconnect the other end of the left guide bearing hose **1** from the plenum assembly **3** and remove it from the drive.

Replacing the Left Guide Bearing Hose

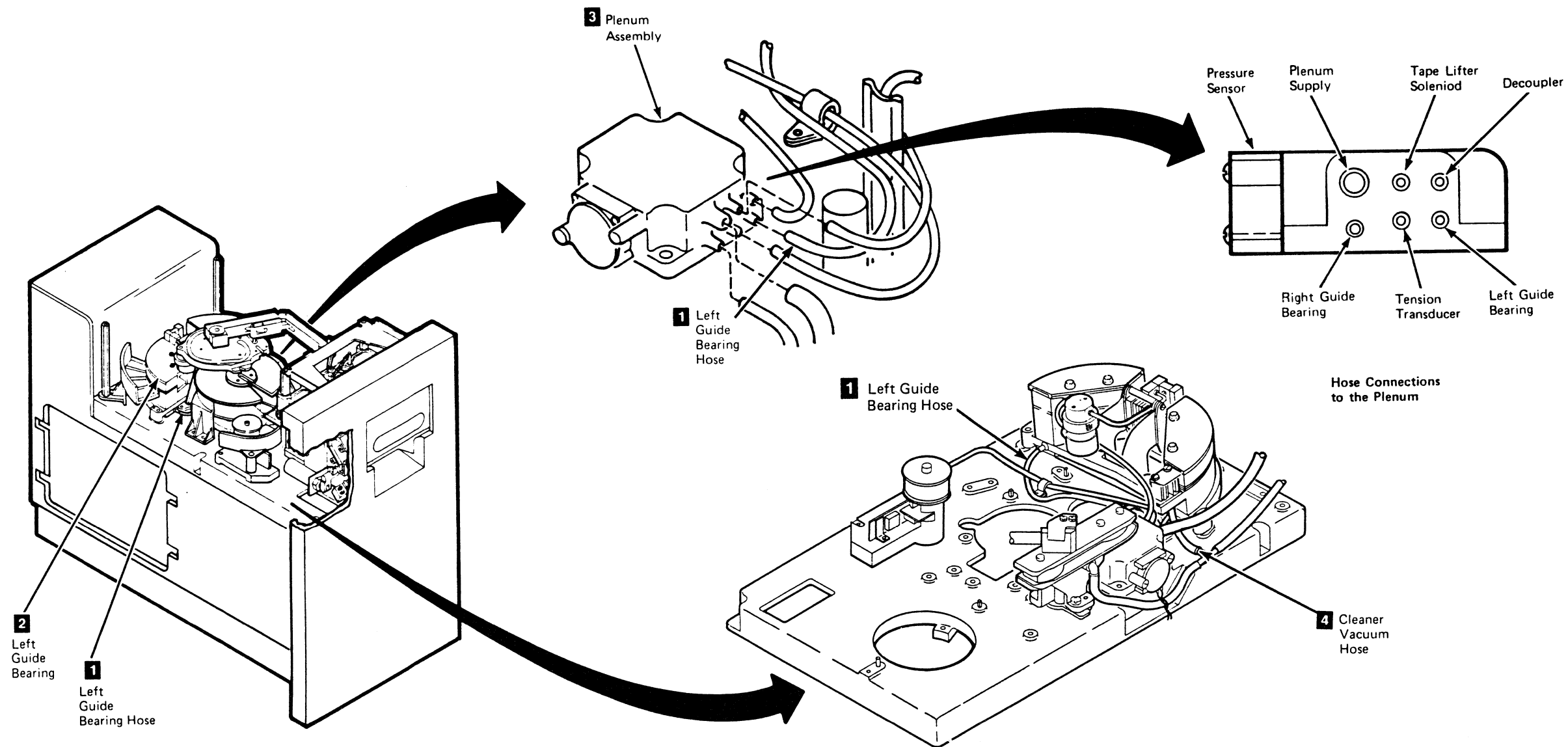
1. Connect the left guide bearing hose **1** to the left guide bearing **2**.

Place the hose through the threader assembly base to the plenum assembly **3**.

2. Connect the other end of the left guide bearing hose **1** to the plenum.

Ensure that the cleaner vacuum hose **4** is connected to the cleaner assembly.

3. Remove the clamp from the plenum supply hose.
4. Install the drive drawer safety cover (see CARR-DR 2-5) and close the drive drawer.
5. Go to CARR-DR 8 for the procedure to **power on** the drive.



FRU046 Tension Transducer Hose Removal and Replacement Procedure

This page contains the steps needed to remove and replace the tension transducer hose **1** in the drive.

Note: This FRU can be removed and replaced without affecting the other drive by removing power from the failing drive with the Drive Power On/Off switch.

Removing the Tension Transducer Hose

1. Go to CARR-DR 8 for the procedure to *power off* the drive.
2. Open the drive drawer and remove the drive drawer safety cover (see CARR-DR 2-5).

3. Clamp the plenum supply hose (see CARR-DR 3-1).
4. Disconnect the tension transducer hose **1** from the tension transducer **4**.
5. Disconnect the other end of the tension transducer hose from the plenum assembly **2** and remove it from the drive.

For ease of removal of the tension transducer hose, you should remove the tape lifter solenoid hose and the decoupler hose.

Note: Notice the routing of the tension transducer hose (through the threader assembly base).

Replacing the Tension Transducer Hose

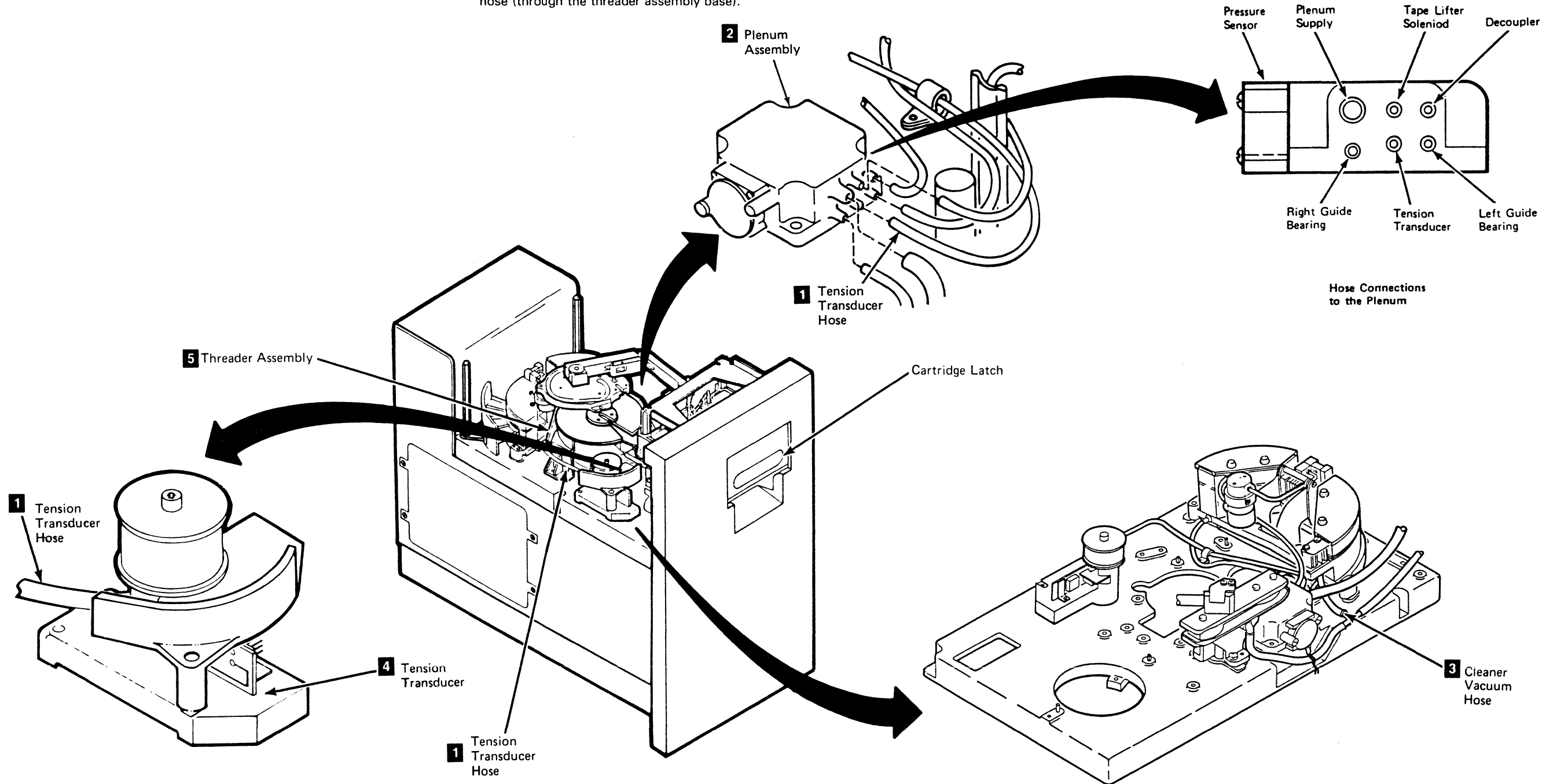
1. Connect the tension transducer hose **1** to the tension transducer **4**.
2. Connect the other end of the tension transducer hose to the plenum assembly **2**.

Place the hose through the threader assembly **5** base, to the plenum assembly **2**.

Replace the tape lifter solenoid hose and the decoupler hose if they were removed during the removal procedure.

Ensure that the cleaner vacuum hose **3** is connected to the cleaner assembly.

3. Remove the clamp from the plenum supply hose.
- Note:** Ensure that the two wires to the threader motor have not been loosened or damaged.
4. Install the drive drawer safety cover (see CARR-DR 2-5) and close the drive drawer.
5. Go to CARR-DR 8 for the procedure to *power on* the drive.



FRU047 Cleaner Vacuum Hose Removal and Replacement Procedure

Drive CARR-DR 470

This page contains the steps needed to remove and replace the cleaner vacuum hose in the drive.

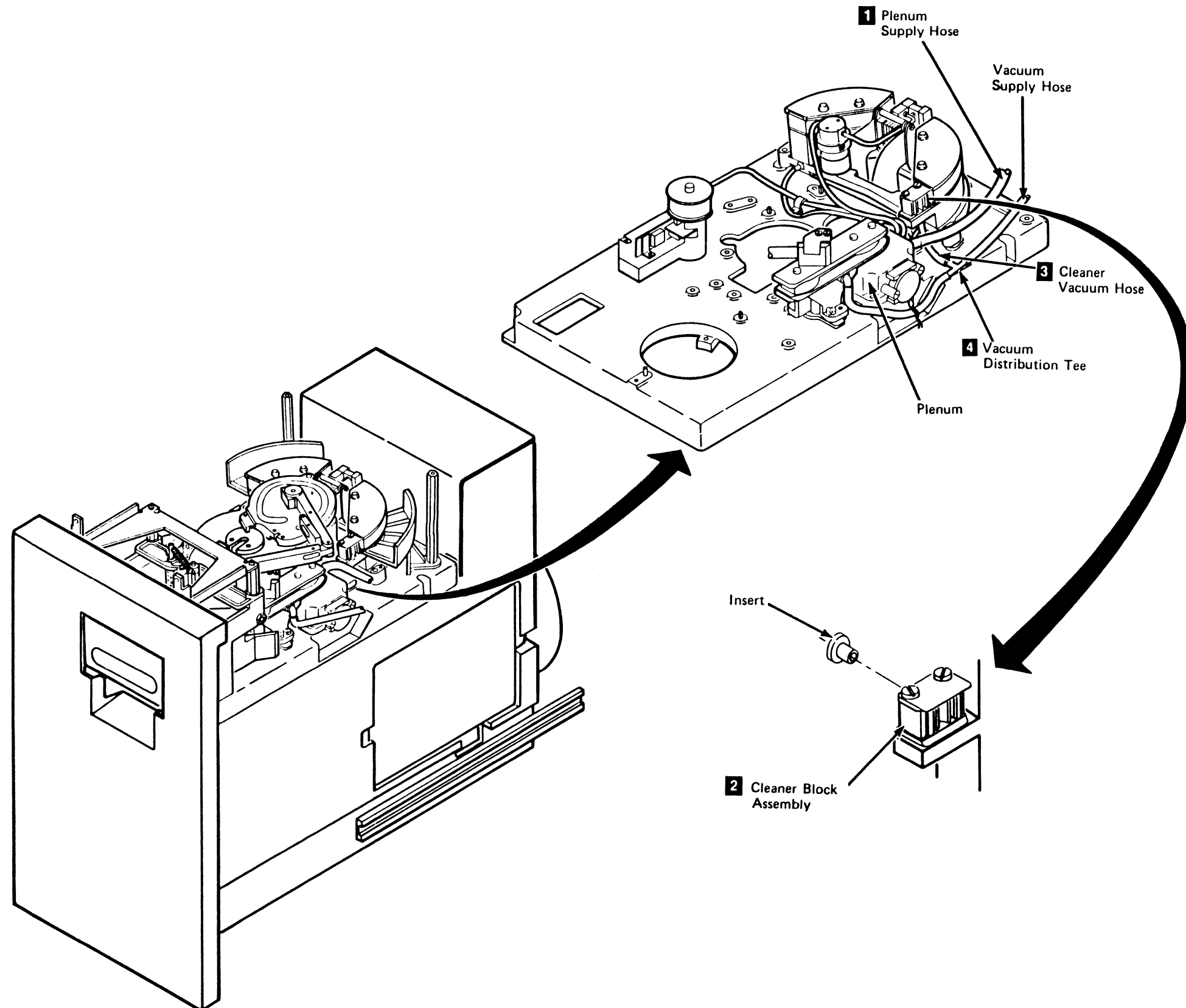
Note: This FRU can be removed and replaced without affecting the other drive by removing power from the failing drive with the Drive Power On/Off switch.

Removing the Cleaner Vacuum Hose

1. Go to CARR-DR 8 for the procedure to **power off** the drive.
2. Open the drive drawer and remove the drive drawer safety cover (see CARR-DR 2-5).
3. Disconnect the cleaner vacuum hose at the vacuum distribution tee **4**.
4. Disconnect the other end of the cleaner vacuum hose at the connector on the bottom of the cleaner block assembly **2**.
5. Remove the cleaner vacuum hose **3** from the drive.

Replacing the Cleaner Vacuum Hose

1. Connect one end of the cleaner vacuum hose **3** to the connector on the bottom of the cleaner block assembly **2**.
2. Route the cleaner vacuum hose under the plenum supply hose **1**.
3. Connect the other end of the cleaner vacuum hose to the vacuum distribution tee **4**.
4. Install the drive drawer safety cover (see CARR-DR 2-5) and close the drive drawer.
5. Go to CARR-DR 8 for the procedure to **power on** the drive.



Drive Cables Removal and Replacement Procedure

This page contains general guidelines for removing and replacing drive cables. Any of the cables listed on CARR-DR 491 can be removed and replaced using these procedures.

Warning: Some parts handled during this procedure are sensitive to electrostatic discharge (ESD), see CARR-CU 1-5 for "Instructions For Working With ESD-Sensitive Parts."

Note: The FRUs marked with an asterisk (*) on CARR-DR 491 require the ac power to be removed from the control unit and all attached tape units with the ac control unit circuit breaker. Removal of those FRUs requires the entire subsystem be available for service. Any FRU not marked with an asterisk (*) can be removed and replaced without affecting the other tape units by removing power from the failing tape unit with that tape unit ac power circuit breaker.

Drive **CARR-DR 490**

Removing Tape Unit Cables

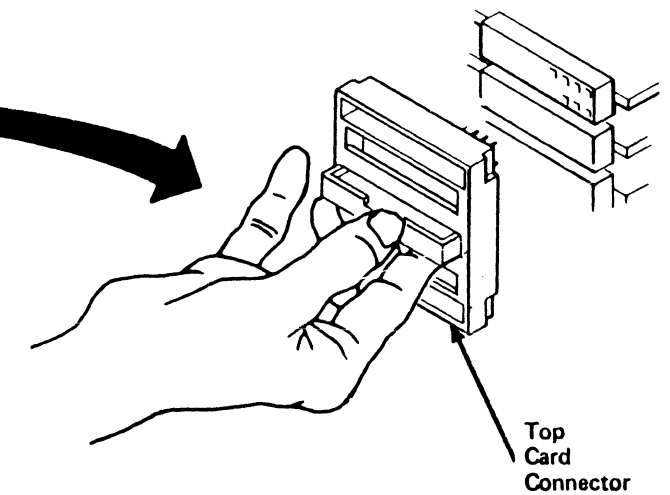
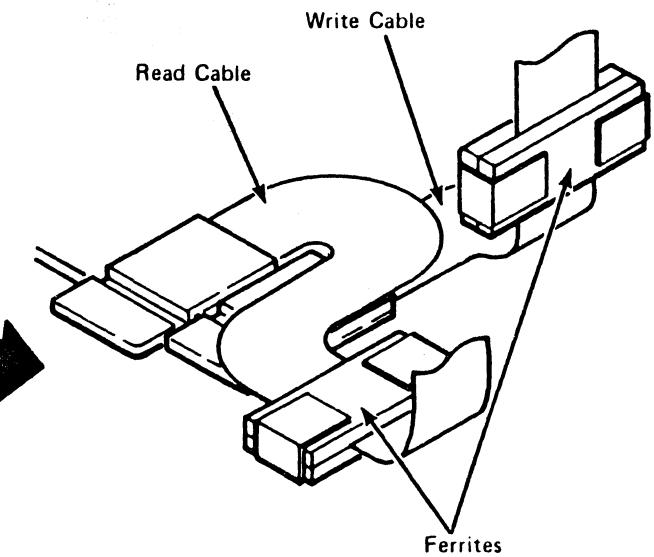
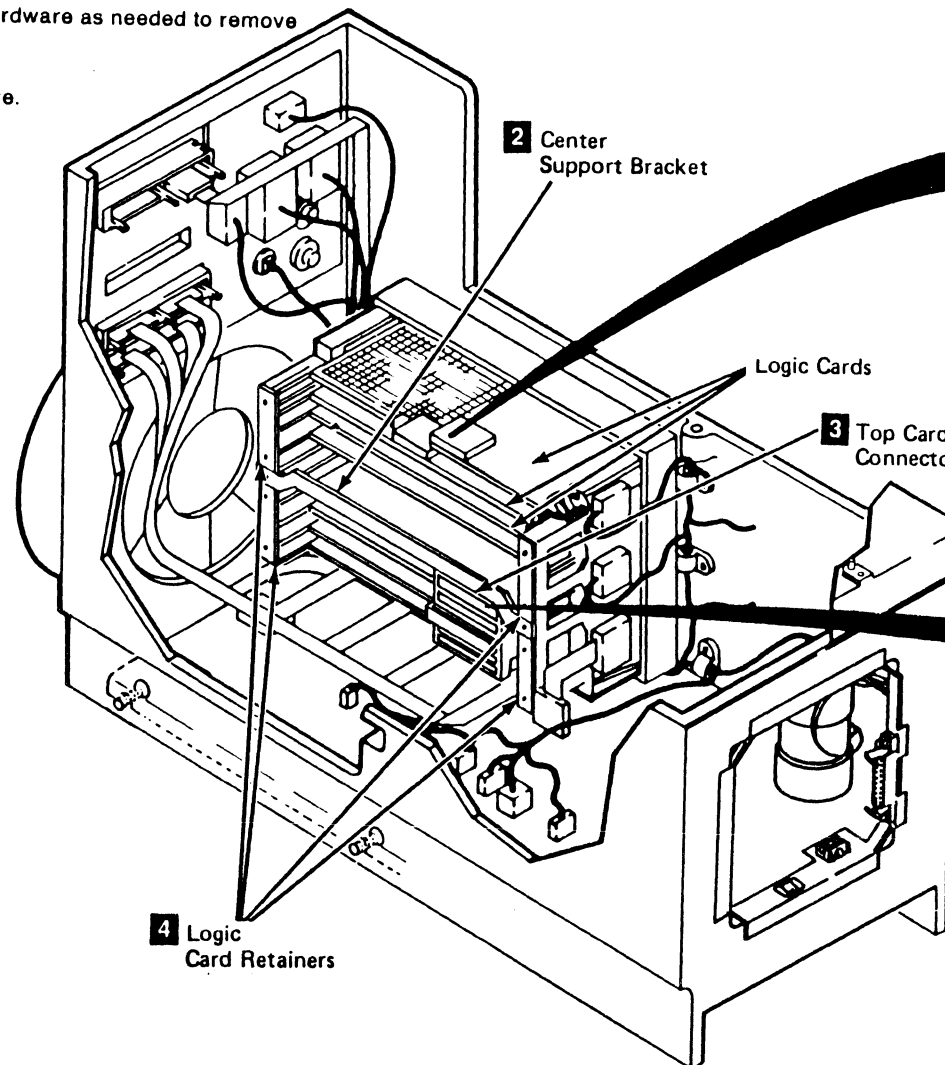
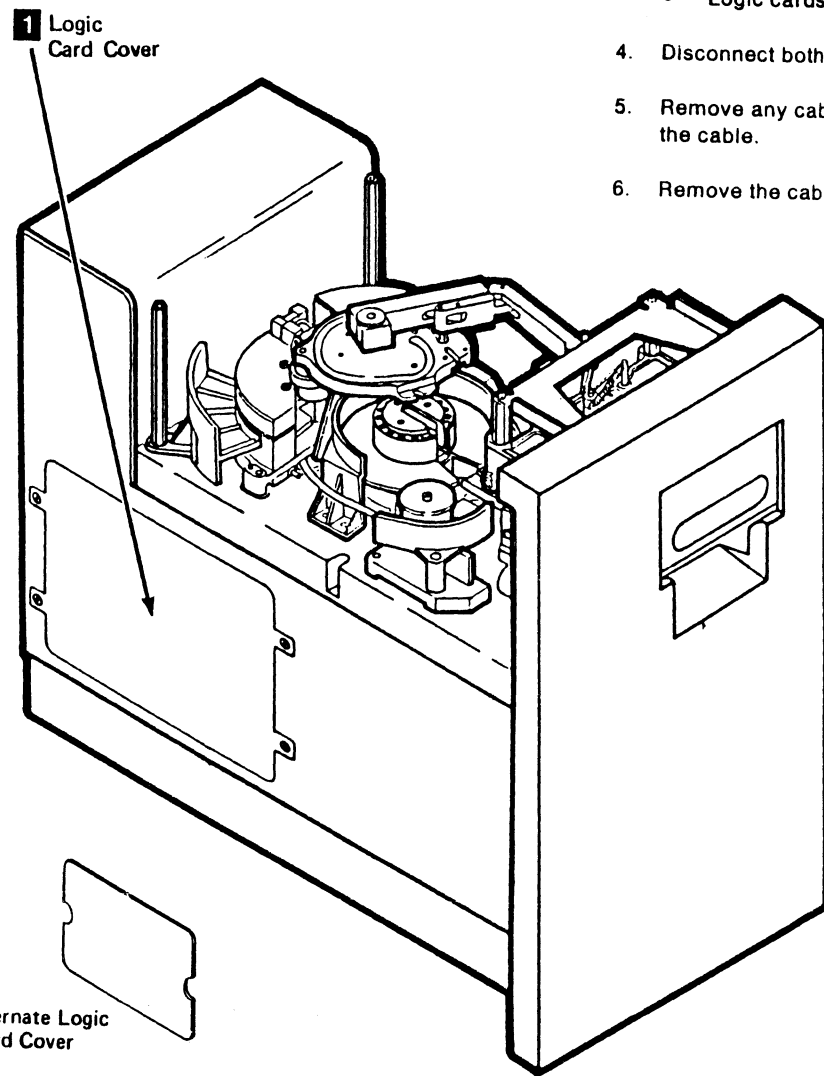
- Go to CARR-DR 8 for the procedure to **power off** the tape unit.
- Find the cable "from" and "to" locations using the table beginning on CARR-DR 491.
- To remove the cables from the tape unit, it may be necessary to remove some, or all of the following:
 - Logic card cover **1**.
 - Logic card retainers **4**.
 - Top card connectors (TCC's) **3**.
 - Top card cable connectors.
 - Center support bracket **2**.
 - Logic cards.
- Disconnect both ends of the cable to be removed.
- Remove any cable retention hardware as needed to remove the cable.
- Remove the cable from the drive.

Replacing Tape Unit Cables

Warning: Some parts handled during this procedure are sensitive to electrostatic discharge (ESD), see CARR-CU 1-5 for "Instructions For Working With ESD-Sensitive Parts."

- Find the cable "from" and "to" locations in the tables on CARR-DR 491.
- Place the cable in the drive following the same path as the previous cable.
- Install the cable retention hardware as you install the cable.
- Connect both ends of the cable.

- Install any of the following items that may have been removed:
 - Logic card cover **1**.
 - Logic card retainers **4**.
 - Top card connectors (TCC's) **3**.
 - Top card cable connectors.
 - Logic cards.
 - Center support bracket **2**.
- Go to CARR-DR 8 for the procedure to **power on** the tape unit.



Drive **CARR-DR 490**

Drive Cables Location Chart

Drive **CARR-DR 491**

This table shows the FROM and TO locations for each drive cable listed for tape units without bill of material (BM) 6460006.

FRU	FRU NAME	FROM	Loc PAGE	TO	Loc PAGE
FRU049	Logic Board to Power Amplifier J2 Cable	02A-A1Z1	130	TU-D0/1-PA-J2	125
FRU072 *	AC CB to Power Supply Blower Cable	Tape Unit AC Power CB1	70	Drive Power Supply Blower	110
FRU073	Logic Board to Power Amplifier J1 Cable	02A-A1Y1	130	TU-D0/1-PA-J1	125
FRU074 *	Tape Unit AC Power CB Cable	Power Supply DR0-P15, DR1-P16	80	TU-D1 Drive Power Switch	70
FRU077 *	Blower Assembly AC Power Cable (Tape Unit to both drives)	TU-D0/1-P1-J3	110	Drive (0/1) Power Switch	70
FRU078 *	Blower Assembly AC Power Cable (Drive)	Blower Assembly	110	TU-D0/1-P1-J3	110
FRU080	DC Power Distribution Cable	Power Supply DR0 P5, P6 DR1 P1, P2	80	TU-D0/1 P1-P1, P2	110
FRU087	Read Data A Cable (02A-A1G2 to Deck Panel) Internal	02A-A1G2 (YZ)	130, 145	TU-D0/1-P1-RA1	110, 145
FRU088	Read Bus A Adapter Cable to TU-D1-P2A1	Previous TU-D1-P2A1 or CU-P1A1	70, 145, 25, 145	Next TU-D1-P2A1	70, 145
FRU089	Read Adapter A Cable from Tee to P1RA1	TU-D0/1-RA (Tee)	70, 145	TU-D0/1-P1-RA1	110, 145
FRU092	Read Bus B Adapter Cable to TU-D1-P2B1	Previous TU-D1-P2B1 or CU-P1B1	25, 145	Next TU-D1-P2B1	70, 145
FRU093	Read Adapter B Cable from Tee to P1RB1	TU-D0/1-RB (Tee)	70, 145	TU-D0/1-P1-RB1	110, 145
FRU094	Read Data B Cable (02A-A1G2 to Rear of Deck)	02A-A1G2 (WX)	130, 145	TU-D0/1-P1-RB1	110, 145
FRU106 *	Address Switch Cable to J4 (Rear of Deck)	Address Switch	70	TU-D0/1-P1-J4	110
FRU200 *	Write Adapter B Cable (CU or Previous TU to Drive 0 P1WB1)	CU-P1B2 or TU-P2WB1	25 70	TU-D0-P1-WB1	110, 150
FRU201 *	Write Adapter B Cable (Drive 0 P1WB2 to Drive 1 P1WB1)	TU-D0-P1-WB2	110, 150	TU-D1-P1WB1	110, 150
FRU202 *	Write Adapter B Cable (Drive 1-P1WB2 to TU-D1-P2B2)	TU-D1-P1-WB2	110, 150	TU-D1-P2WB1	70, 150
FRU203 *	Write Adapter B Cable (P1WB1 to 02A-A1A4)	TU-D0/1-P1-WB1	110, 150	TU-D0/1-02A-A1A4	130, 150
FRU204 *	Write Adapter B Cable (02A-A1A5 to P1WB2)	TU-D0/1-02A-A1A5	130, 150	TU-D0/1-P1-WB2	110, 150
FRU205 *	Write Adapter A Cable (CU or Previous TU to Drive 0 P1WA1)	CU-P1A2 or TU-P2 WA1	25, 150 70, 150	TU-D0-P1-WA1	110, 150
FRU206 *	Write Adapter A Cable (Drive 0 P1WA2 to Drive 1 P1WA1)	TU-D0-P1-WA2	110, 150	TU-D1-P1-WA1	110, 150
FRU207 *	Write Adapter A Cable (Drive 1 P1WA2 to TU-D1-P2A2)	TU-D1-P1-WA2	110, 150	TU-D1-P2-WA1	70, 150
FRU208 *	Write Adapter A Cable (P1WA1 to 02A-A1A2)	TU-D0/1-P1-WA1	110, 150	TU-D0/1-02A-A1A2	130, 150

*See the Note on CARR-DR 490

FRU	FRU NAME	FROM	Loc PAGE	TO	Loc PAGE
FRU209 *	Write Adapter A Cable (02A-A1A3 to P1WA2)	TU-D0/1-02A-A1A3	130, 150	TU-D0/1-P1-WA2	110, 150
FRU210	Message Display Cable (02A-A1Y2 to P1-DISP-P1)	02A-A1Y2	130	TU-D0/1-P1-DISP-P1	70
FRU270	Interposer Signal Cable	02A-A1Y3	130	P1-J2	170

This table shows the FROM and TO locations for each drive cable listed for tape units with bill of material (BM) 6460006.

FRU	FRU NAME	FROM	Loc PAGE	TO	Loc PAGE
FRU023 *	Write Cable Local/Remote CU or Previous TU to Drive 0	P2WA1/WB1 in Previous TU or CU-P1-A/B2	75, 150 30, 150	TU-D0-02A-A2/A4	130, 150
FRU049	Logic Board to Power Amplifier J2 Cable	02A-A1Z1	130	TU-D0/1-PA-J2	125
FRU053 *	Write Adapter Local/Remote Cable Drive 1 to P2 Panel	TU-D1-02A-A1-A3/A5	130, 150	TU-D1-P2WA1/WB1	75, 150
FRU055	Read Adapter Remote Cable from Tee 02A-A1G2 (WX)	TU-D0/1-RA(Tee)	120, 145	TU-D0/1-A1G2 (WX) (Left TCC)	130, 145
FRU057	Read Adapter Local Cable from Tee to 02A-A1G2 (YZ)	TU-D0/1-RB (Tee)	120, 145	TU-D0/1-A1G2 (YZ) (Right TCC)	130, 145
FRU073	Logic Board to Power Amplifier J1 Cable	02A-A1Y1	130	TU-D0/1-PA-J1	125
FRU174 *	Write Adapter Remote Cable (Drive 0 to Drive 1)	TU-D0-02A-A1A5	130, 150	TU-D1-02A-A1A4	130, 150
FRU210	Message Display Cable (02A-A1Y2 to MD 00/01)	02A-A1Y2	130	Drive 0 - MD 00 Drive 1 - MD 01	75
FRU222 *	Write Adapter Local Cable (Drive 0 to Drive 1)	TU-D0-02A-A1A3	130, 150	TU-D1-02A-A1A2	130, 150
FRU270	Interposer Signal Cable	02A-A1Y3	130	P1-J2	170

FRU054 Machine Reel Flange (Upper) Removal and Replacement Procedure

Drive **CARR-DR 540**

This page contains the steps needed to remove and replace the machine reel flange (upper) from the drive.

Note: This FRU can be removed and replaced without affecting the other drive by removing power from the failing drive with the Drive Power On/Off switch.

Removing the Machine Reel Flange (Upper)

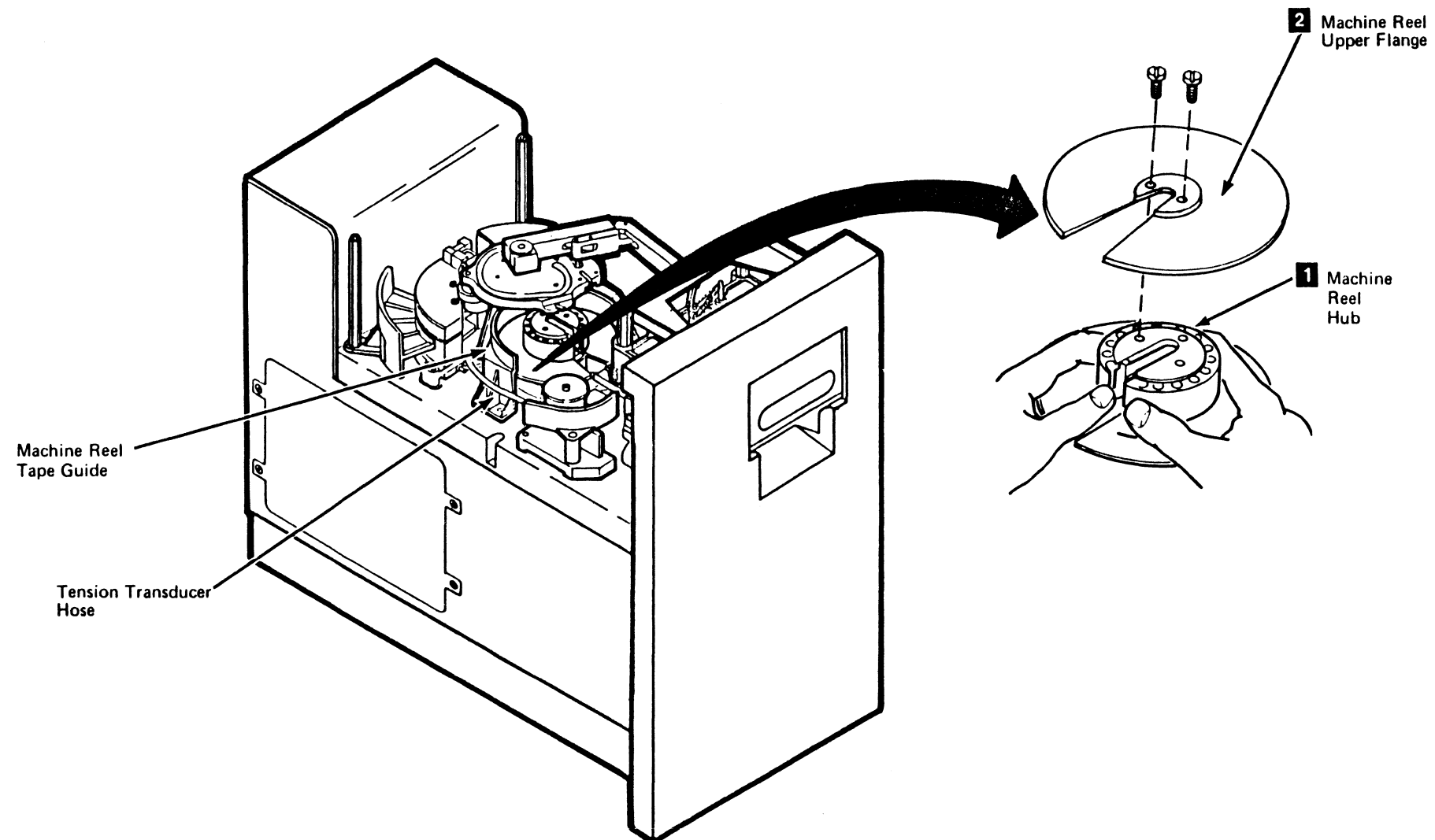
1. Go to CARR-DR 8 for the procedure to **power off** the drive.
2. Open the drive drawer and remove the drive drawer safety cover (see CARR-DR 2-5).
3. Remove the two screws holding the machine reel upper flange **2** to the machine reel hub **1**.
4. Remove the machine reel flange (upper) from the drive.

Replacing the Machine Reel Flange (Upper)

This page contains the steps needed to replace the machine reel upper flange in the drive.

1. Place the machine reel upper flange **2** in position on the machine reel hub **1**.
2. Install the two screws holding the machine reel upper flange to the machine reel hub **1**.

3. Replace the drive drawer safety cover (see CARR-DR 2-5) and close the drive drawer.
4. Go to CARR-DR 8 for the procedure to **power on** the drive.



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Notes

Notes CARR-DR 545

FRU058 Drive Logic Board (02A-A1) Removal and Replacement Procedure

* These cards are EC sensitive.
See CARR-DR 4 to determine the position of these logic cards for your drive.

This page contains the steps needed to remove and replace the logic board from the drive. The logic board is removed and replaced from the card side of the drive.

Warning: Some parts handled during this procedure are electrostatic sensitive (ESD), see CARR-DR 1-9 for "Instructions for Working With ESD-Sensitive Parts."

Removing a drive logic board will require that the entire subsystem be available for service. The termination path of the write circuits is opened when removing a logic board.

Note: This FRU removal and replacement requires the ac power to be removed from the control unit and all attached tape units with the control unit ac power circuit breaker.

Removing the Drive Logic Board

Note: Although the component locations are documented (see LOC 1 for the card and TCC locations), you may want to put temporary labels on the components for your own convenience.

1. Go to CARR-CU 6 for the procedure to remove the ac power from the control unit.
2. Open the drive drawer.
3. Remove the two pin side cover mounting screws **2** and the pin side cover **1**.
4. Disconnect the six voltage connectors **3** from the pin side of the logic board. Also disconnect the connector for J2 P08.

The power amplifier board is lowered in the next steps. This will give you more room to work inside the drive and make it easier to remove the logic board.

5. Support the power amplifier board **12** with one hand, and with the other, remove the two screws **8** holding the power amplifier in position.
6. Lower the power amplifier board slowly.
7. Remove the card side logic card cover **9**.
8. Remove the eight screws holding the four card retainers **10** and remove the card retainers by pulling them straight out.

Note: Some machines do not have Logic Card Retainers.

9. Remove the two screws holding the center support bracket **5** and remove the bracket.
10. Release the retainers and remove the two multi-colored read bus cables from the G2* card.

Warning: Be careful not to bend the pins when removing the cables from the H2* and J4* cards.

11. Release the retainers, then lift up on the tabs and remove the cables **4** from the H2* and J4* cards.
12. Remove all of the top card connectors **7**.
13. Remove all of the logic cards.
14. Remove the two screws holding the bottom support bracket **11** and remove the bracket.
15. Remove all of the cables from the A row of the logic board.
16. Disconnect the cables in the Y and Z rows of the logic board.
17. Remove the four screws holding the card guides **6** and the logic board.
18. Remove the screw holding the cable retaining clamp.
19. Remove the screw holding the thermal to the top of the right card guide.
20. Slide the card guides off the logic board and remove them from the drive.
21. Remove the logic board from the drive.

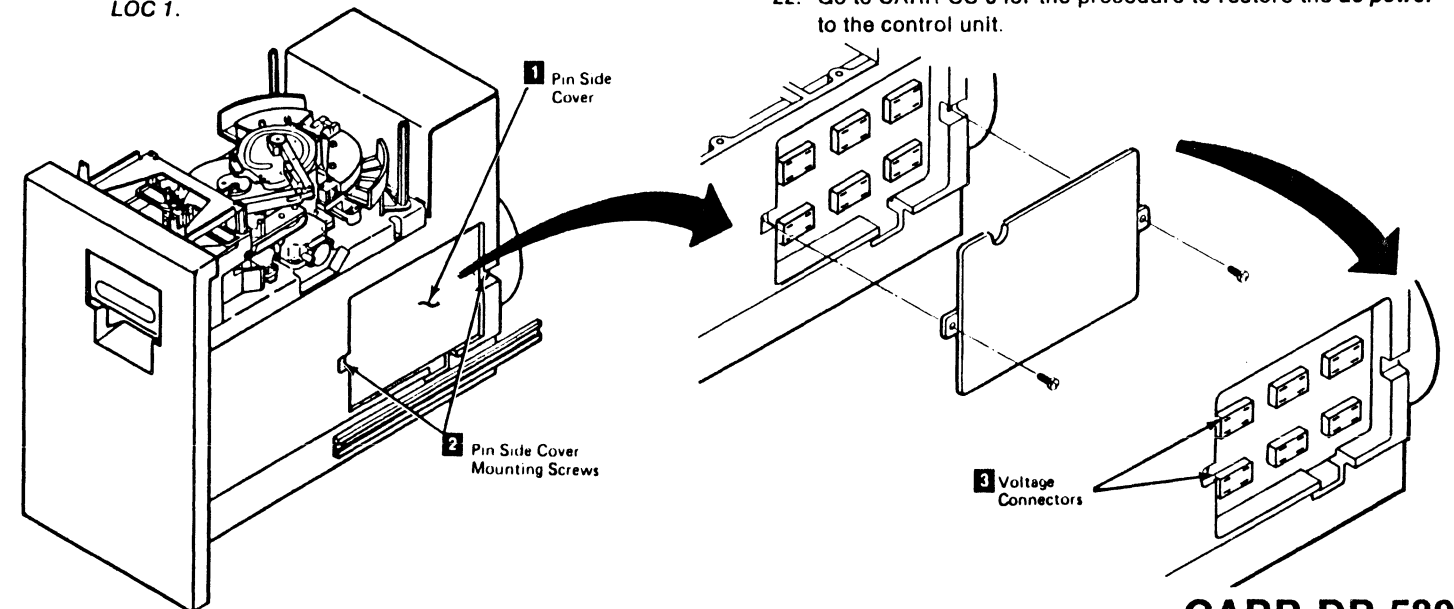
Replacing the Drive Logic Board

The logic board is replaced from the card side of the drive.

Warning: Some parts handled during this procedure are sensitive to electrostatic discharge (ESD), see CARR-DR 1-9 for "Instructions for Working With ESD-Sensitive Parts."

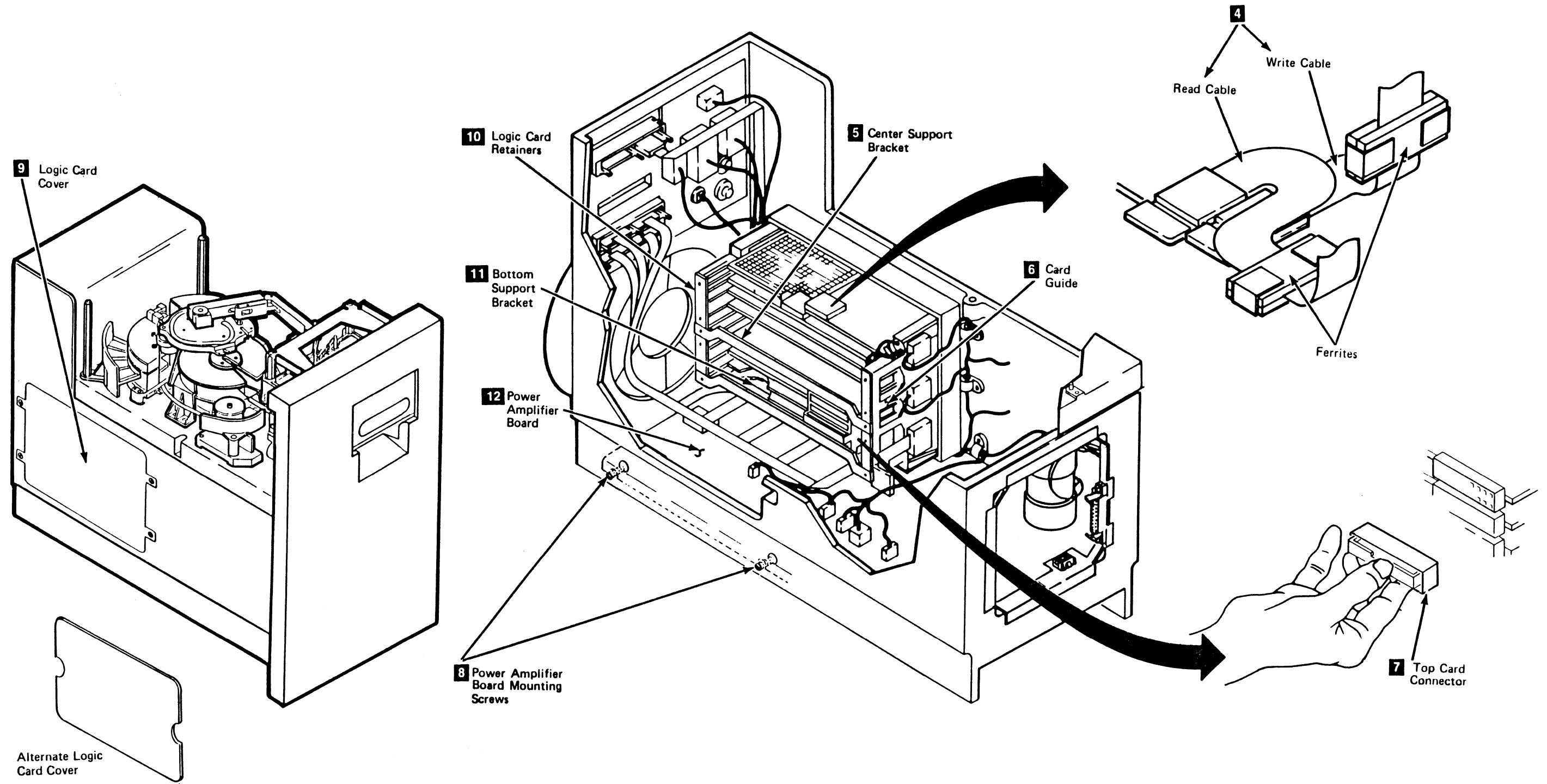
1. Place the logic board in the drive. Ensure that the board is placed with the printing facing the correct way, with the K row toward the top of the drive.
2. Slide the card guides **6** onto the logic board and install the four mounting screws.
3. Replace the screw holding the cable retaining clamp.
4. Replace the thermal and mounting screw in the upper most hole in the right card guide.
5. Connect the cables to the Y row of the logic board.
6. Connect the cables to the Z row of the logic board.
7. Connect the cables to the A row of the logic board.
8. Install the bottom support bracket **11** and the two mounting screws.
9. Install the logic cards, beginning with the J4* card.
10. Install the top card connectors **7**.

Note: For top card connector (TCC) location see LOC 1.



Warning: The pins on the read and write cables are small and can be easily damaged.

11. Install the head write cable to the J4* card **4**.
12. Install the head read cable to the H2* card **4**.
13. Install the multi-colored read bus cables to the G2* card.
14. Install the center support bracket **5** and the two mounting screws.
15. Slide the four card retainers **10** into position and install the eight retaining screws.
16. Place the logic card cover **9** in position and install the four mounting screws if removed previously.
17. Lift the power amplifier board **12** into position and install the two mounting screws **8**.
18. Install the voltage connectors **3** on the pin side of the logic board in positions A2A14, A3A14, A4A14, J2A14, J3A14 and J4A14.
19. Install the connector on J2 P08.
20. It is possible to install the pin side cover **1** with the wrong side out. Ensure that the pin side cover is installed so that it is flush to or recessed to the side of the drive drawer. Place the pin side cover **1** in position and install the two mounting screws **2**.
21. Close the drive drawer.
22. Go to CARR-CU 6 for the procedure to restore the ac power to the control unit.



FRU059 Power Amplifier Board Removal and Replacement Procedure

Drive **CARR-DR 590**

This page contains the steps needed to remove and replace the power amplifier board (TU-PA) **1** in the drive, and on the mounting board.

Note: This FRU can be removed and replaced without affecting the other drive by removing power from the failing drive with the Drive Power On/Off switch.

Removing the Power Amplifier Board

1. Go to CARR-DR 8 for the procedure to **power off** the drive.
2. Open the drive drawer.

3. Support the power amplifier board **1** with one hand, and with the other, remove the two screws **2** holding the power amplifier in position.
4. Lower the power amplifier board slowly.
5. Disconnect the nine connectors from the power amplifier board.

It will be necessary to loosen the retaining hardware for the J1 flat cable.

6. Slide the power amplifier board to the front to remove it from the hinges **3** on the bottom of the drive.
7. Remove the four mounting screws **4** from the component side of the power amplifier board and remove the board from the cover.

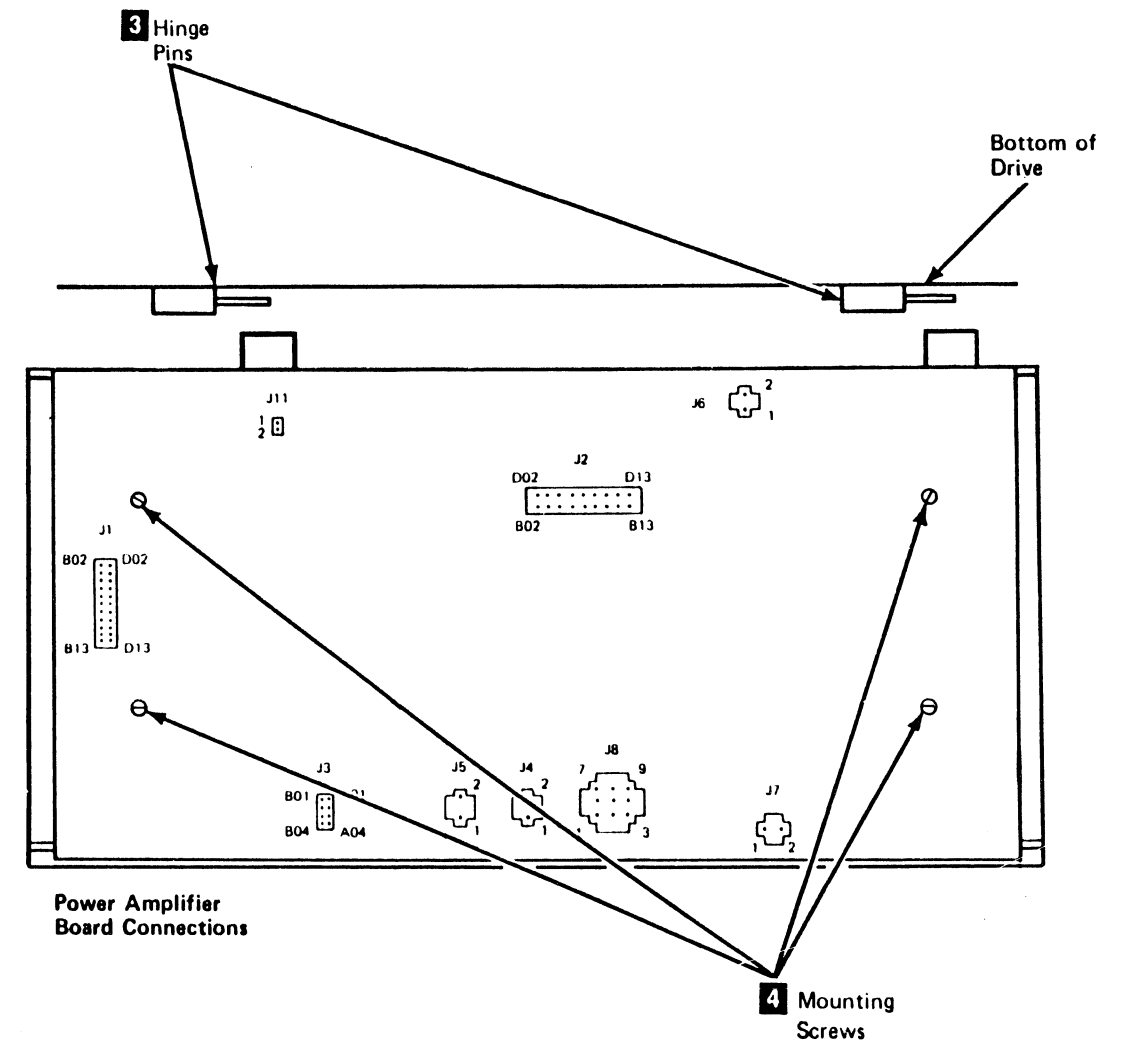
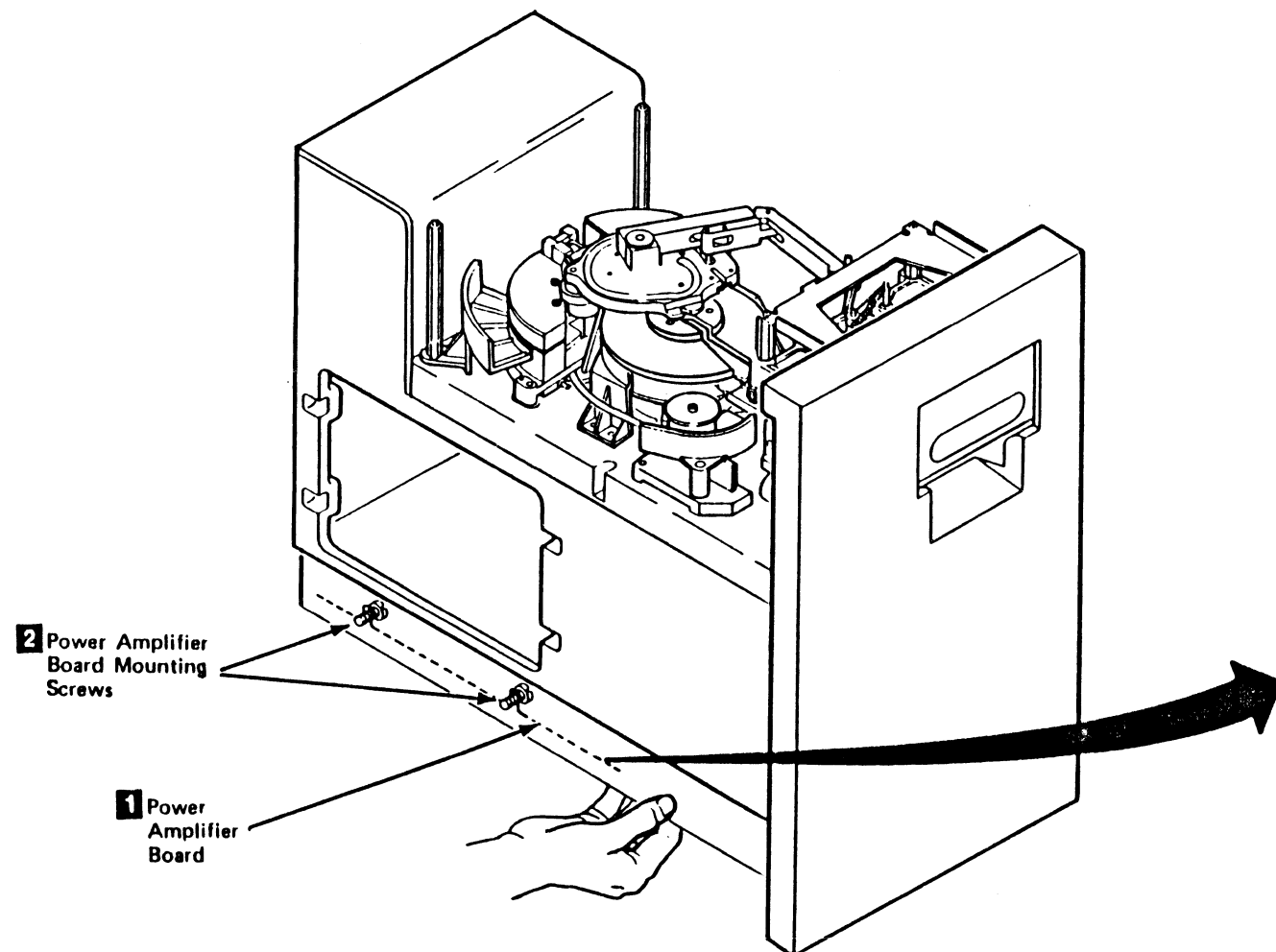
Replacing the Power Amplifier Board

1. Place the power amplifier board on the cover and install the four mounting screws **4**.
2. Place the power amplifier board assembly in position and slide to the rear to mount on the hinge pins **3**.
3. Install the nine connectors on the power amplifier board.

Tighten the retaining hardware for the J1 flat cable.

Note: Replace the J1 cable retainer and tighten the screws. Ensure that the cable is inserted with the D02 pin connection up and away from the board.

4. Lift the power amplifier board **1** into position and install the two screws **2**.
5. Close the drive drawer.
6. Go to CARR-DR 8 for the procedure to **power on** the drive.



FRU060 Message Display Board Removal and Replacement Procedure

Drive **CARR-DR 600**

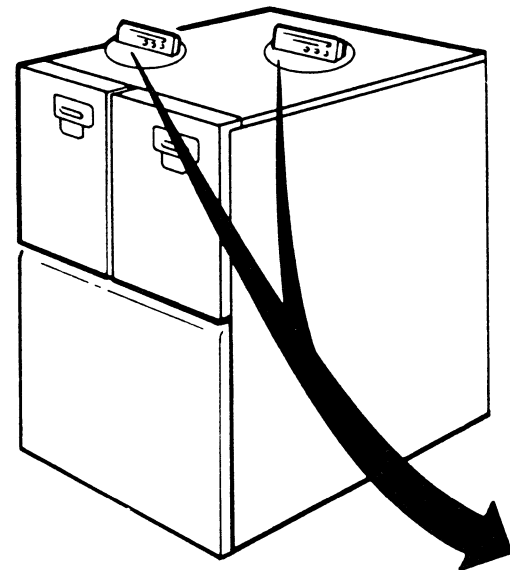
This page contains the steps needed to remove and replace the message display board from the operator panel assembly.

Note: This FRU can be removed and replaced without affecting the other drive by removing power from the failing drive with the Drive Power On/Off switch.

Removing the Message Display Board

1. Go to CARR-DR 8 for the procedure to **power off** the drive.
2. Remove the operator panel from the top cover (see CARR-DR 2-6).
3. Invert the operator panel and place it on the top cover to get access to the connectors and screws on the bottom.
4. Remove the two screws holding the flat cable clamp to the mounting bracket and remove any retention hardware as required.
5. Remove the two cables from the connectors **1**.

Note: The message display assembly should now be disconnected from the drive.



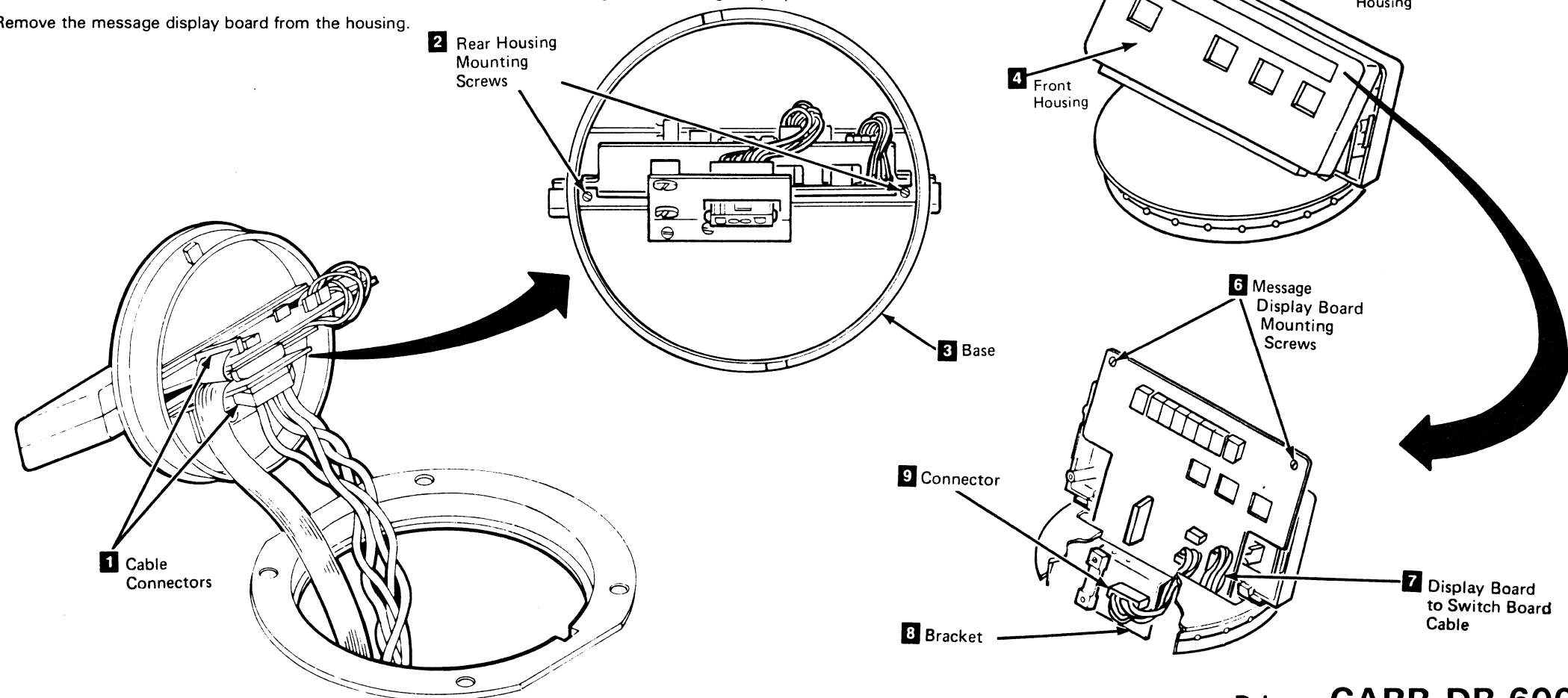
6. Remove the two screws **2** attaching the rear of the operator panel housing to the base **3**.
7. Remove the housing from the operator panel assembly by pulling it forward and sliding it towards the rear at the same time. Notice the plastic tabs and lip when viewed from the bottom.

When the tabs and lip are free from the base, remove the top housing from the base.

8. Turn the operator panel assembly upright.
9. Pull the bottom of the front housing **4** away from the rear housing **5** and at the same time lift up on the bottom of the front housing and remove it from the operator panel assembly.

Note: There is a 'U' shaped lip on the top of the front housing.

10. Disconnect the display board to switch board cable **7** by removing the connector from the edge of the display board.
11. Remove the two mounting screws and mounting stud **6** that hold the message display board to the housing.
12. Remove the connector **9** by squeezing the tabs together and pulling the connector out of the bracket **8**.
13. Remove the message display board from the housing.



Replacing the Message Display Board

Warning: Some parts handled during this procedure are electrostatic sensitive (ESD), see CARR-DR 1-9 for "Instructions for Working With ESD-Sensitive Parts."

1. Mount the message display board on the rear housing with the two mounting screws and the mounting stud **6**.
2. Connect the display board to switch board cable **7** by inserting the connector to the edge of the display board.

Note: There is a 'U' shaped lip on the top of the front housing.

3. Place the top of the front housing **4** in the 'U' shaped slot at the top of the rear housing **5** and pivot the front housing down into position.
4. Insert the connector **9** into the bracket **8**.
5. Work the bottom of the message display board through the opening in the message display base.

6. Insert the bottom of front housing **4** into the opening in message display base and press the front housing and rear housing **5** together.
7. Align the two mounting holes in the rear housing with the holes in the base **3** and install the two mounting screws **2**.
8. Connect the two cable to the connectors **1** on the bottom of the operator panel assembly and replace any retention hardware.
9. Insert the flat cable in the clamp and tighten the two clamp mounting screws.
10. Install the operator panel into the top cover (see CARR-DR 2-6).
11. Go to CARR-DR 8 for the procedure to **power on** the drive.

FRU061 Machine Reel Hub Removal and Replacement Procedure

This page contains the steps needed to remove and replace the machine reel hub **1** from the machine reel motor.

Note: This FRU can be removed and replaced without affecting the other drive by removing power from the failing drive with the Drive Power On/Off switch.

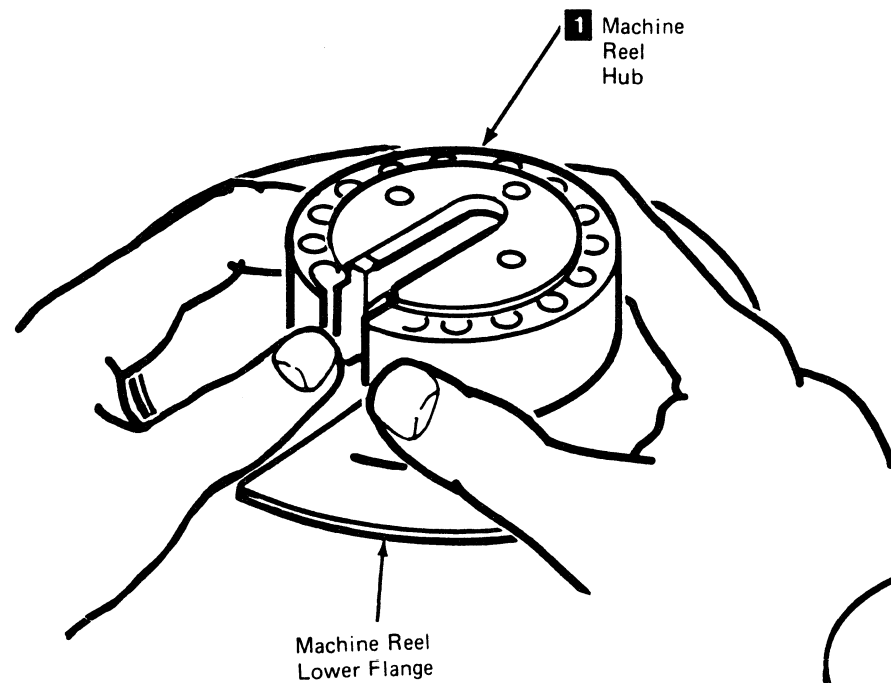
Removing the Machine Reel Hub

1. Go to CARR-DR 8 for the procedure to **power off** the drive.
2. Open the drive drawer and remove the drive drawer safety cover (see CARR-DR 2-5).

Warning: The machine reel hub and the machine reel flange can be easily scratched. Use care with tools in this area.

3. Remove the two machine reel hub and upper flange mounting screws **3**.

Note: The threader assembly must be lifted up so that the machine reel hub can be removed.

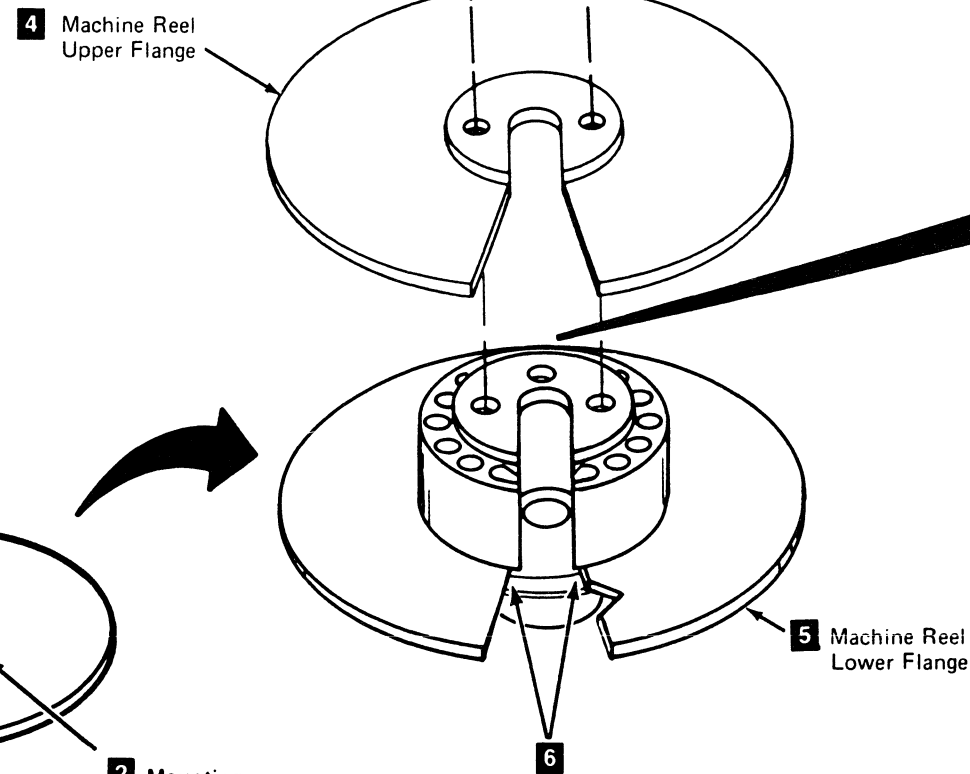
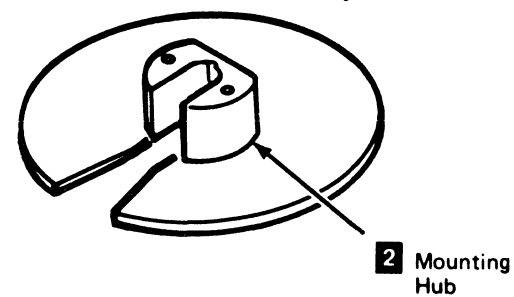


4. The threader is fastened to the baseplate with three screws. All three screws are partially out of view and must be accessed at an angle. Ensure that the screwdriver does not slip and cause personal injury or damage the screw. The first screw to be removed is near the plenum. It is easier to remove the screw if you first remove the hoses that cover it. Remove the hoses from the plenum and move them out of the way. Remove the screw and set it to the side.

The other two screws can be seen by turning the machine reel. Turn the reel and remove the two screws.

Warning: Do not use any tools to remove the machine reel hub.

5. Use your thumbs to apply pressure as shown and at the same time lift the machine reel hub **1** off the hub mount.



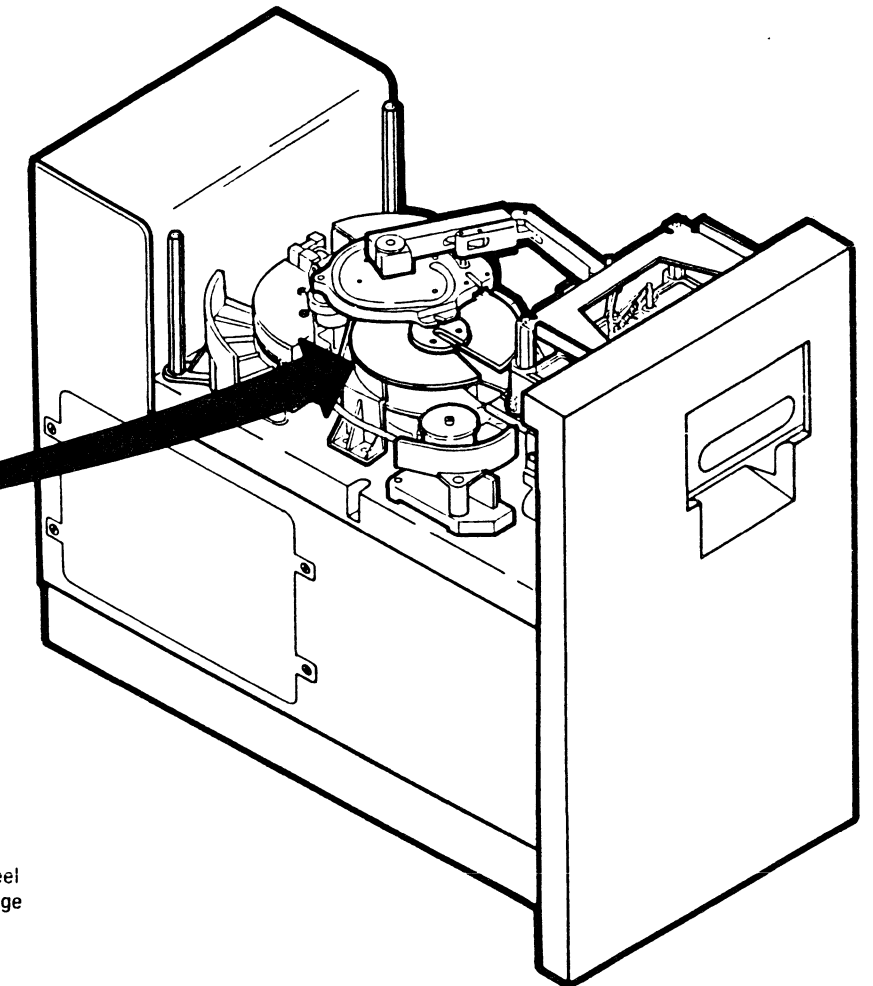
Replacing the Machine Reel Hub

Warning: The machine reel flanges and the machine reel hub can be easily scratched. Use care with tools in this area.

1. Place the machine reel hub **1** and upper flange **4** on the mounting hub **2** and install, but do not tighten the two screws **3**. Be careful not to scratch the hub or reel.

Inspect the alignment of the hub opening to the flange opening **6** and if necessary, adjust the flanges **4** and **5** so that the hub opening is centered over the flange opening **6**. Tighten the two screws on the machine reel hub **3**.

2. Install the three threader mounting screws, turning the machine reel as needed to get to the screw holes. Use caution when installing the screws to avoid cross-threading. Also use care when tightening to ensure that the screwdriver does not slip, causing personal injury or damage to the screws.
3. If any hoses were removed for access to the threader mounting screw near the plenum, move them back to their original places and reconnect them to the plenum.
4. Replace the drive drawer safety cover (see CARR-DR 2-5) and close the drive drawer.
5. Go to CARR-DR 8 for the procedure to **power on** the drive.



FRU062-064, 128 Drive Card Removal and Replacement Procedure

Drive **CARR-DR 640**

This page contains the steps needed to remove and replace a logic card from the drive. The other drive will not be affected when the logic cards are removed. For top card connector (TCC) location see LOC 1.

Warning: Some parts handled during this procedure are sensitive to electrostatic discharge (ESD), see CARR-DR 1-9 for "Instructions for Working With ESD-Sensitive Parts."

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Note: This FRU can be removed and replaced without affecting the other drive by removing power from the failing drive with the Drive Power On/Off switch.

Removing a Drive Logic Card

1. Go to CARR-DR 8 for the procedure to **power off** the drive.
2. Open the drive drawer.
3. Remove the card side cover **1**.

Warning: Cards A1B2, A1C2, A1D2, A1E2, A1G2, A1H2, A1J2, A1J4, and A1K4 are EC (engineering change) sensitive (see CARR-DR 4).

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4. Remove the two center support bracket mounting screws and remove the center support bracket **2** (if necessary).

Note: Some machines do not have the Logic Card Retainers **4**.

5. Remove the two screws for each card retainer **4** and remove the card retainers as needed.
6. Remove any of the top card connectors **3** as needed to remove the logic card.

Notes:

- a. If the card you are removing has a cable plugged directly into it (A1G2 or A1H2), unplug the cable before removing the card.
- b. The following steps should be used when removing the J4 (or K4) logic card to prevent damage to the read/write cables and connectors and logic card components:
 - 1) Disconnect the cables from the H2 (or J2) card and the J4 (or K4) card.
 - 2) Position a protector (such as an IBM card) between the J4 (or K4) card and the read/write cables. This will protect both the cable connectors and the components of the J4 (or K4) card.
 - 3) Remove the J4 (or K4) card.

7. Remove the logic card from the drive by pulling it straight out from the logic board.

Replacing a Drive Logic Card

Warning: Before inserting any logic card, visually inspect the board for any bent or damaged pins.

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Warning: Before inserting any new logic card, ensure that you transferred all jumpers from the old logic card to the new logic card.

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Warning: Cards A1B2, A1C2, A1D2, A1E2, A1G2, A1H2, A1J2, A1J4, and A1K4 are EC sensitive (see CARR-DR 4).

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Note: The following steps should be used when replacing the J4 (or K4) logic card to prevent damage to the read/write cables and connectors and logic card components:

1. Position a protector (such as an IBM card) between the J4 (or K4) card and the read/write cables. This will protect both the cable connectors and the components of the J4 (or K4) card.
2. Insert the J4 (or K4) logic card in the logic board by pushing it straight in until it seats.
3. Remove the protector.
4. Reconnect the cables to the H2 (or J2) and J4 (or K4) logic cards. See note 1.

1. Insert any other logic card in the logic board by pushing it straight in until it seats. See LOC 1 for logic card and TCC locations.

2. If the logic card you are replacing has a cable plugged directly into it (A1G2 or A1H2), replace the cable after replacing the logic card. See note 1.

3. Install any TCCs **3** that may have been removed.

4. Place the card retainers **4** in position and install the two mounting screws in each retainer if removed previously.

5. Place the center support bracket **2** in position and install the two mounting screws (if removed).

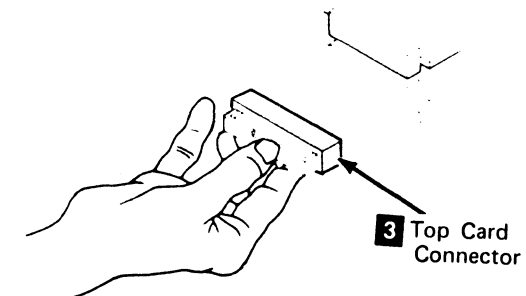
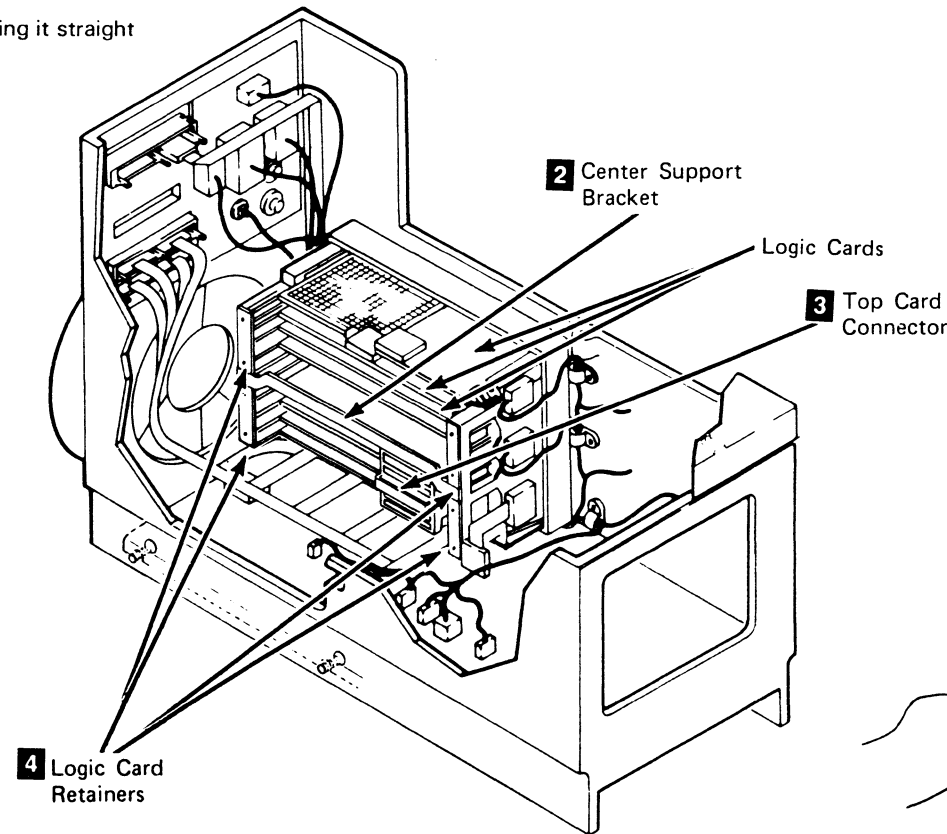
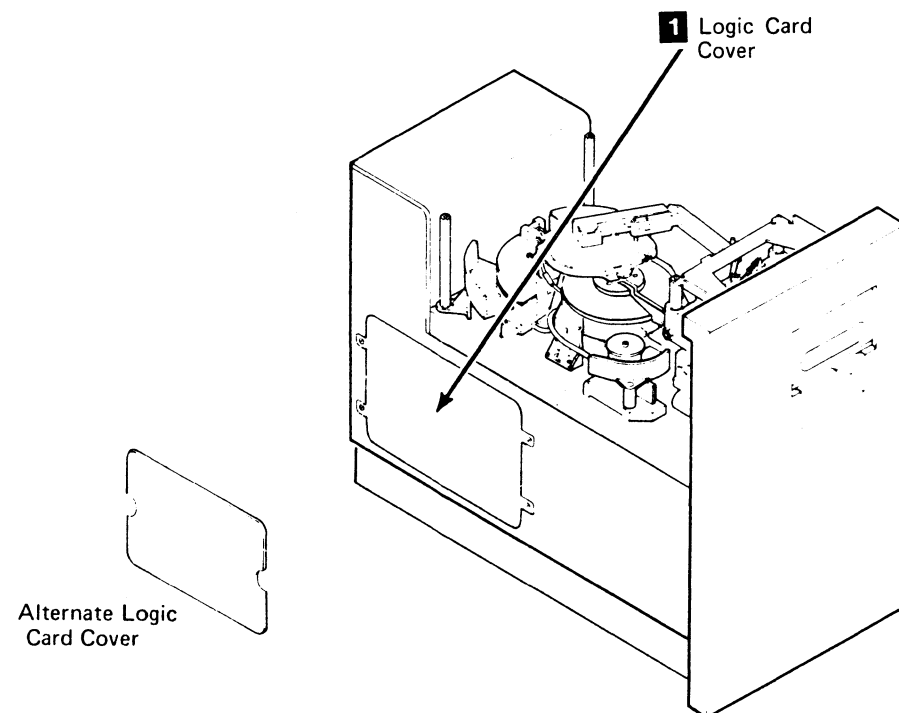
6. Place the card side cover **1** in position.

7. Close the drive drawer.

8. Go to CARR-DR 8 for the procedure to **power on** the drive.

Notes:

1. If either read or write cable is not fully seated, they may have bent pins. Remove the read and/or write card(s) (see CARR-DR 640) and bend the cable connectors up to inspect for bent pins. Straighten any bent pins with the pin straightener (part 453473). Excessively bent pins may be straightened using needle nose pliers before using the pin straightener tool.



FRU065 Pump to Output Filter Hose Removal and Replacement Procedure

Drive **CARR-DR 650**

Tape Unit With BM 6460006 (see CARR-DR 9)

This page contains the steps needed to remove and replace the pump to output filter hose **3** in the tape unit. Since this pump provides air pressure for both drives, it is necessary to have both drives available for service.

Note: This FRU can be removed and replaced without affecting the other tape units by removing power from the failing tape unit with the ac power circuit breaker.

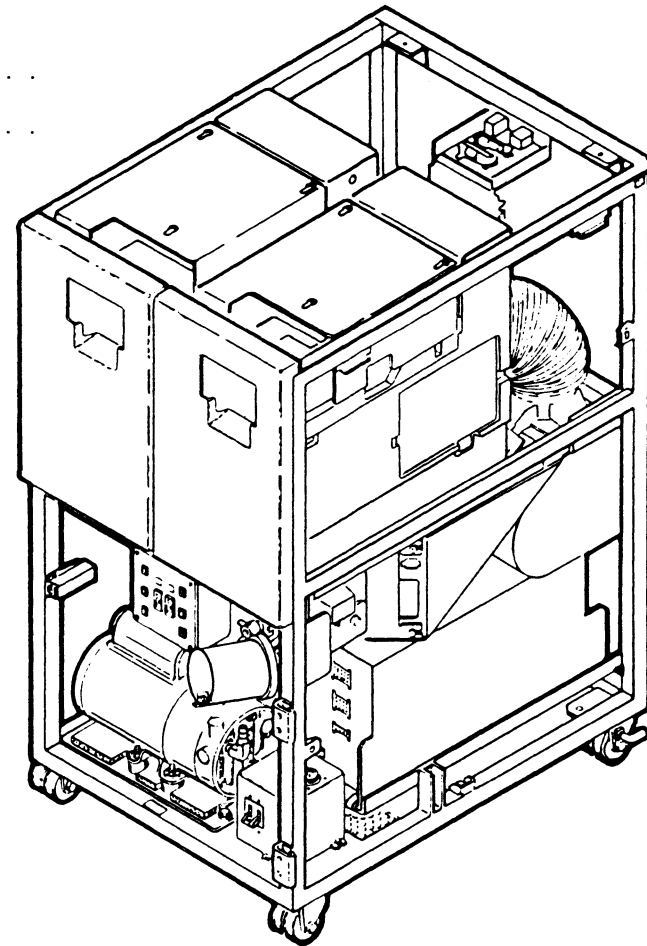
Removing the Pump to Output Filter Hose

1. Go to CARR-DR 8 for the procedure to **power off** the tape unit.
2. Remove the tape unit front safety cover (see CARR-DR 2-1).

CAUTION
The pump motor may be hot.

3. Slide the hose clamp away from the pump assembly outlet **4**.
4. Pull the hose off the outlet to remove it.
5. Slide the hose clamp away from the output filter assembly inlet **1**.

Note: It may be necessary to loosen the output filter mounting bracket **2** screws and move the bracket away from the frame to get better access to the filter inlet **1**.
6. Pull the hose off the inlet to remove it.
7. Save the hose clamps for use with replacement hose.

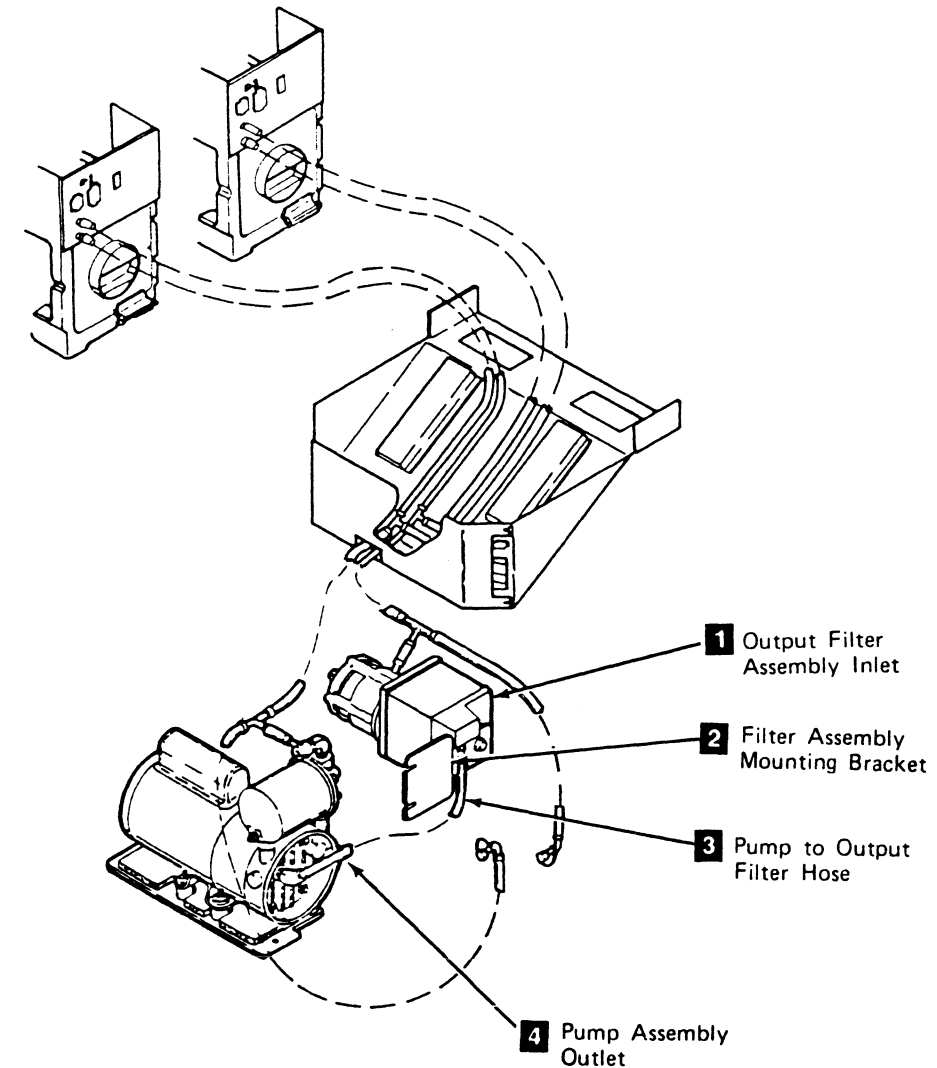


Replacing the Pump to Output Filter Hose

1. Install the hose clamps saved during the removal procedure on each end of the new hose assembly.
2. Connect one end of the pump to output filter hose **3** to the pump assembly outlet **4**.
3. Connect the pump to output filter hose **3** to the output filter assembly inlet **1**.

4. Slide the two hose clamps in place.

Note: If the filter assembly mounting bracket **2** was loosened during the removal procedure, tighten the assembly now.
5. Install the tape unit front safety cover (see CARR-DR 2-2).
6. Go to CARR-DR 8 for the procedure to **power on** the tape unit.



FRU065 Pump to Output Filter Hose Removal and Replacement Procedure (60 Hz)

Drive **CARR-DR 655**

Tape Unit Without BM 6460006 (see CARR-DR 9)

If Your Tape Unit is 50 Hz, Go to CARR-DR 658

This page contains the steps needed to remove and replace the pump to output filter hose **3** in the tape unit. Since this pump provides air pressure for both drives, it is necessary to have both drives available for service.

Note: This FRU can be removed and replaced without affecting the other tape units by removing power from the falling tape unit with the ac power circuit breaker.

Removing the Pump to Output Filter Hose

1. Go to CARR-DR 8 for the procedure to **power off** the tape unit.
2. Open the rear cover and remove the rear safety cover and ground strap (see CARR-DR 2-3).

CAUTION
The pump motor may be hot.

3. Slide the hose clamp away from the pump assembly outlet **1**.

4. Pull the hose off the outlet to remove it.
5. Slide the hose clamp away from the output filter assembly Inlet **2**.
6. Pull the hose off the inlet to remove it.
7. Save the hose clamps for the replacement hose.

Note: Regulator Bracket Assembly - The output filter, regulator, and external load resistor panel are mounted on the regulator bracket assembly. The regulator bracket assembly is attached to the rear cross frame with two screws. To get access to the output filter, regulator, or external load resistor panel, it is necessary to remove the regulator bracket.

Removing the Regulator Bracket Assembly

Before removing the regulator bracket, move the drive fan cable assembly to the right (to provide removal space).

1. Loosen the hose clamp and remove air measurement tee **4** from the filter.
2. Disconnect cables J5, J6, and J7 **5** from the rear of the power supply. Place these cables to the right (to provide removal space for the regulator bracket).
3. Remove the two screws mounting the regulator bracket to the machine frame. Save these two screws for the replacement procedure.
4. Rest the regulator assembly on top of the power supply:
 - Disconnect connectors P3 and P7 from the resistor panel.
 - Loosen the hose clamp and disconnect the input hose to the filter.
5. Remove the regulator bracket from the tape unit.

Replacing the Pump to Output Filter Hose

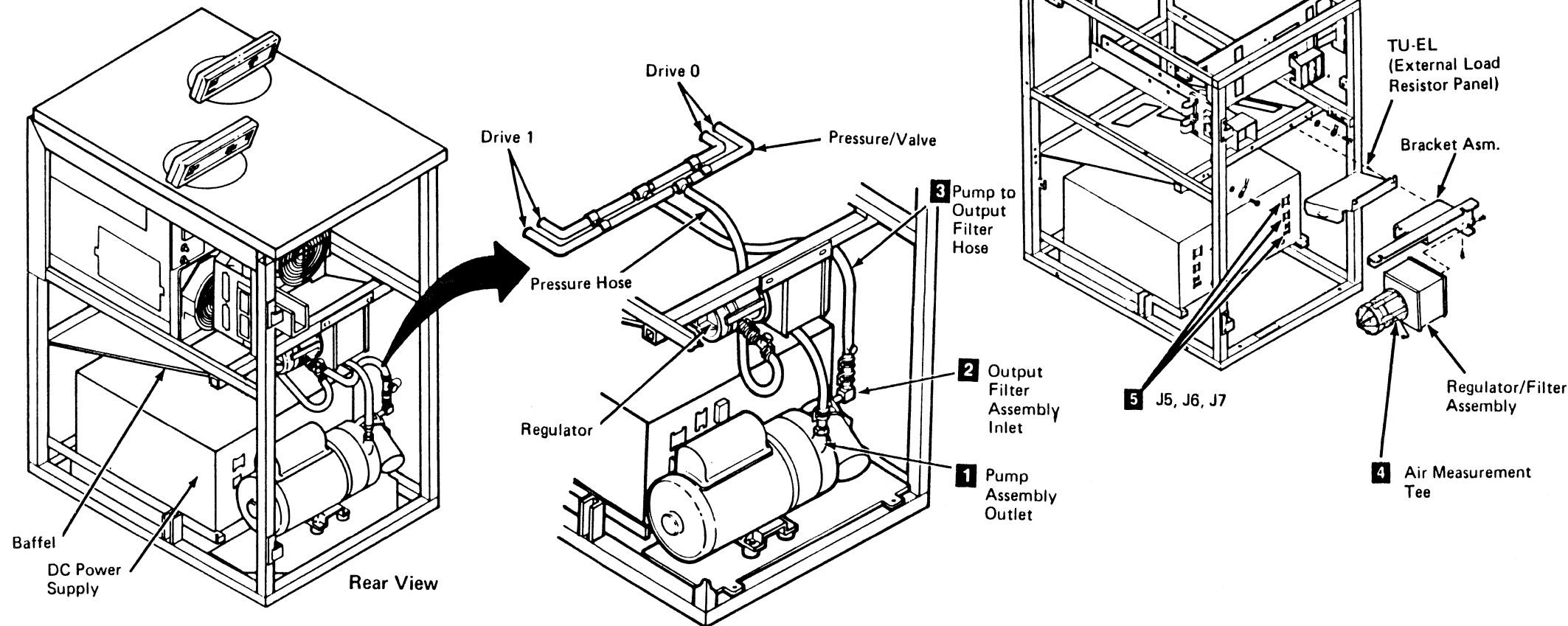
1. Install the hose clamps saved during the removal procedure on each end of the new hose assembly.
2. Connect one end of the pump to output filter hose **3** to the pump assembly outlet **1**.
3. Connect the pump to output filter hose **3** to the output filter assembly Inlet **2**.
4. Slide the two hose clamps in place.

Note: If it was necessary to remove the regulator bracket assembly to get access to the output filter **2** end of the hose, replace the regulator bracket assembly (see "Regulator Bracket Assembly Replacement Procedure" this page).

5. Install the rear safety cover and ground strap (see CARR-DR 2-4).

Replacing the Regulator Bracket Assembly

1. Rest the regulator bracket assembly (with the external load resistor panel, output filter, and regulator already mounted) on the top of the power supply.
 - a. Reconnect the filter input hose to the filter.
 - b. Slide the hose clamp into place, clamping the hose to the fitting.
 - c. Reconnect drive cables P3 and P7 to the resistor panel.
2. Fasten the regulator bracket to the machine frame, using the screws saved from the removal.
3. Reconnect the air measurement **4** tee to the regulator output.
4. Slide the hose clamp into place, clamping the hose to the fitting.
5. Reconnect cables J5, J6, and J7 **5** to the rear of the power supply.
6. Install the rear safety cover and ground connector (see CARR-DR 2-4) and close the rear cover.
7. Go to CARR-DR 8 for the procedure to **power on** the tape unit.



FRU065 Pump to Output Filter Hose Removal and Replacement Procedure (50 Hz)

Drive **CARR-DR 658**

Tape Unit Without BM 6460006 (see CARR-DR 9)

If Your Tape Unit is 60 Hz, Go to CARR-DR 655

This page contains the steps needed to remove and replace the pump to output filter hose **1** in the tape unit. Since this pump provides air pressure for both drives, it is necessary to have both drives available for service.

Note: This FRU can be removed and replaced without affecting the other tape units by removing power from the failing tape unit with the ac power circuit breaker.

Removing the Pump to Output Filter Hose

1. Go to CARR-DR 8 for the procedure to **power off** the tape unit.

2. Open the rear cover and remove the rear safety cover and ground strap (see CARR-DR 2-3).

CAUTION
The pump motor may be hot.

3. Slide the hose clamp away from the pump assembly outlet **2**.
4. Pull the hose off the outlet to remove it.

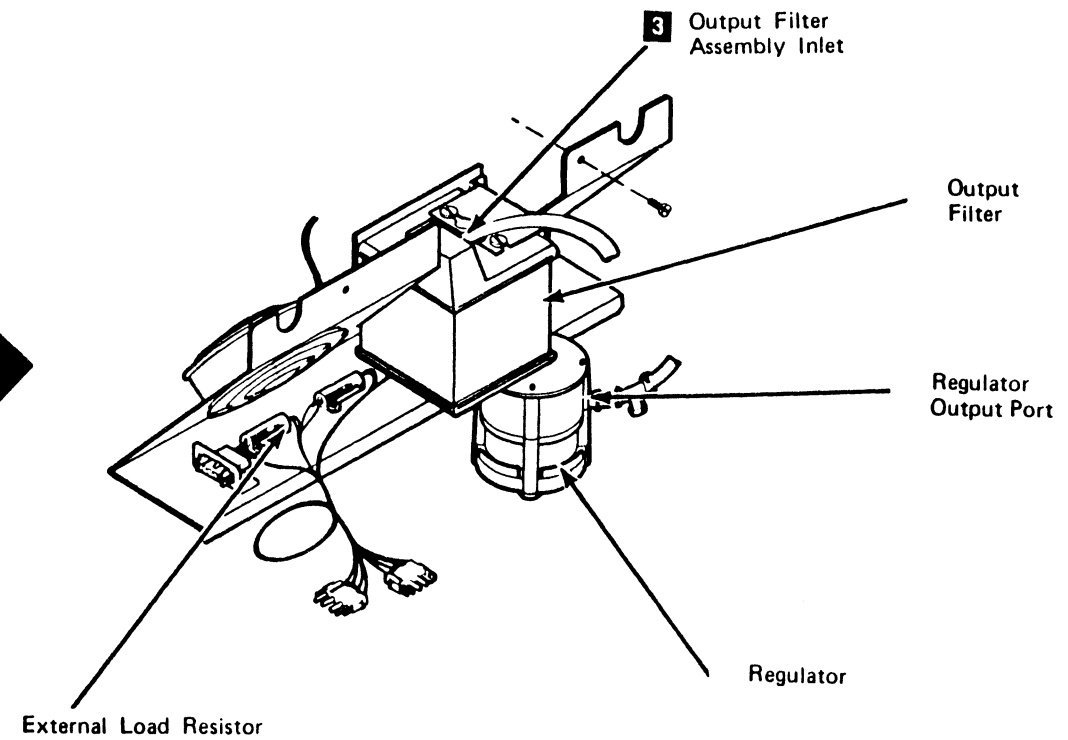
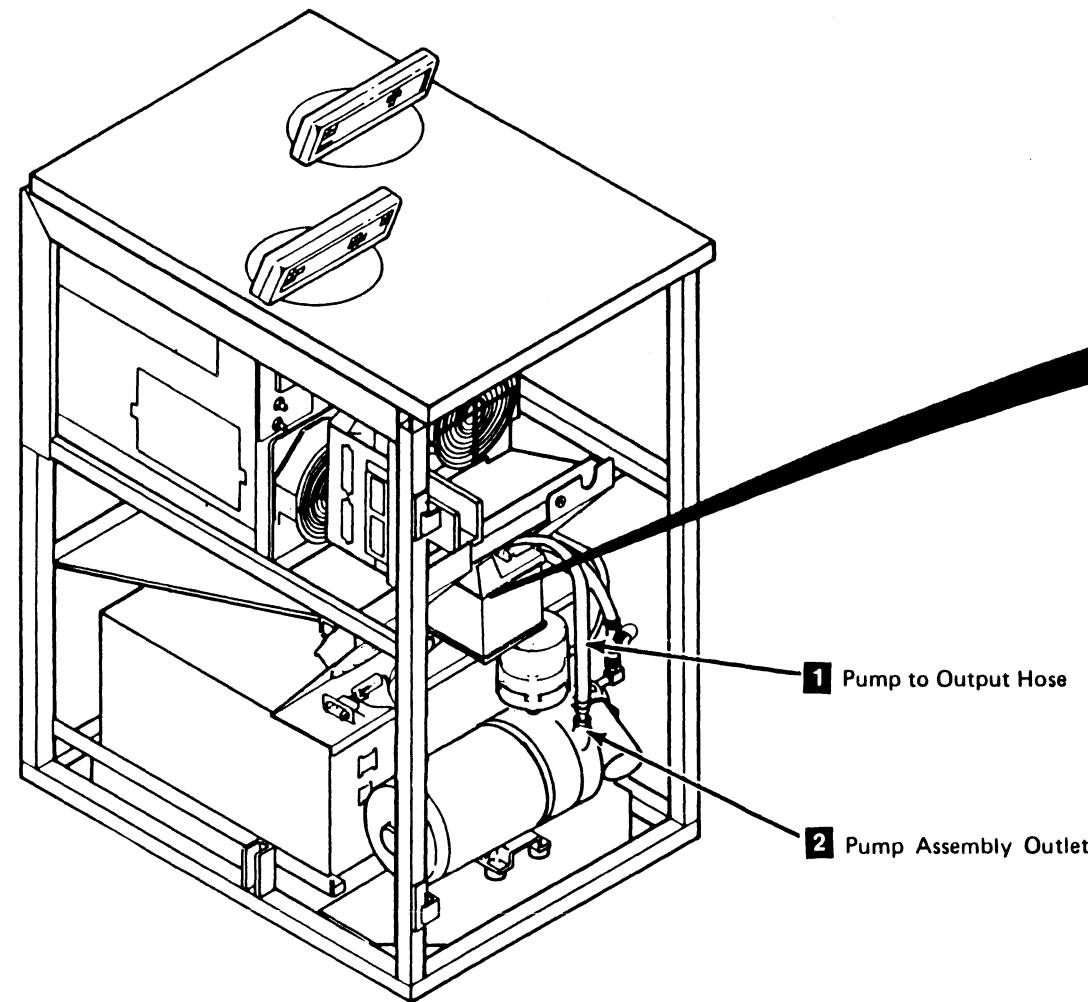
Note: The other end of the hose connects to the outlet filter assembly.

5. Slide the hose clamp away from the output filter assembly inlet **3**.
6. Pull the hose off the inlet to remove it.
7. Save the hose clamps for the replacement hose.

Replacing the Pump to Output Filter Hose

1. Install the hose clamps saved during the removal procedure on each end of the new hose assembly.
2. Connect one end of the pump to output filter hose **1** to the pump assembly outlet **2**.
3. Connect the other end of the pump to output filter hose **1** to the output filter assembly inlet **3**.

4. Slide the two hose clamps in place.
5. Install the rear safety cover and ground strap (see CARR-DR 2-4).
6. Go to CARR-DR 8 for the procedure to **power on** the tape unit.



These FRUs EC Sensitive (see CARR-DR 4)

This page contains the steps needed to remove and replace a top card connector (TCC) in the drive. The other drive will not be affected when any of the TCCs are removed.

Note: See LOC 1 for TCC locations.

Note: This FRU can be removed and replaced without affecting the other drive by removing power from the failing drive with the Drive Power On/Off switch.

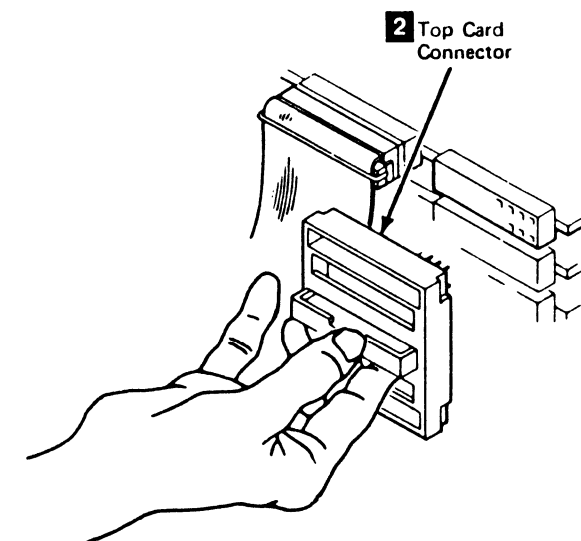
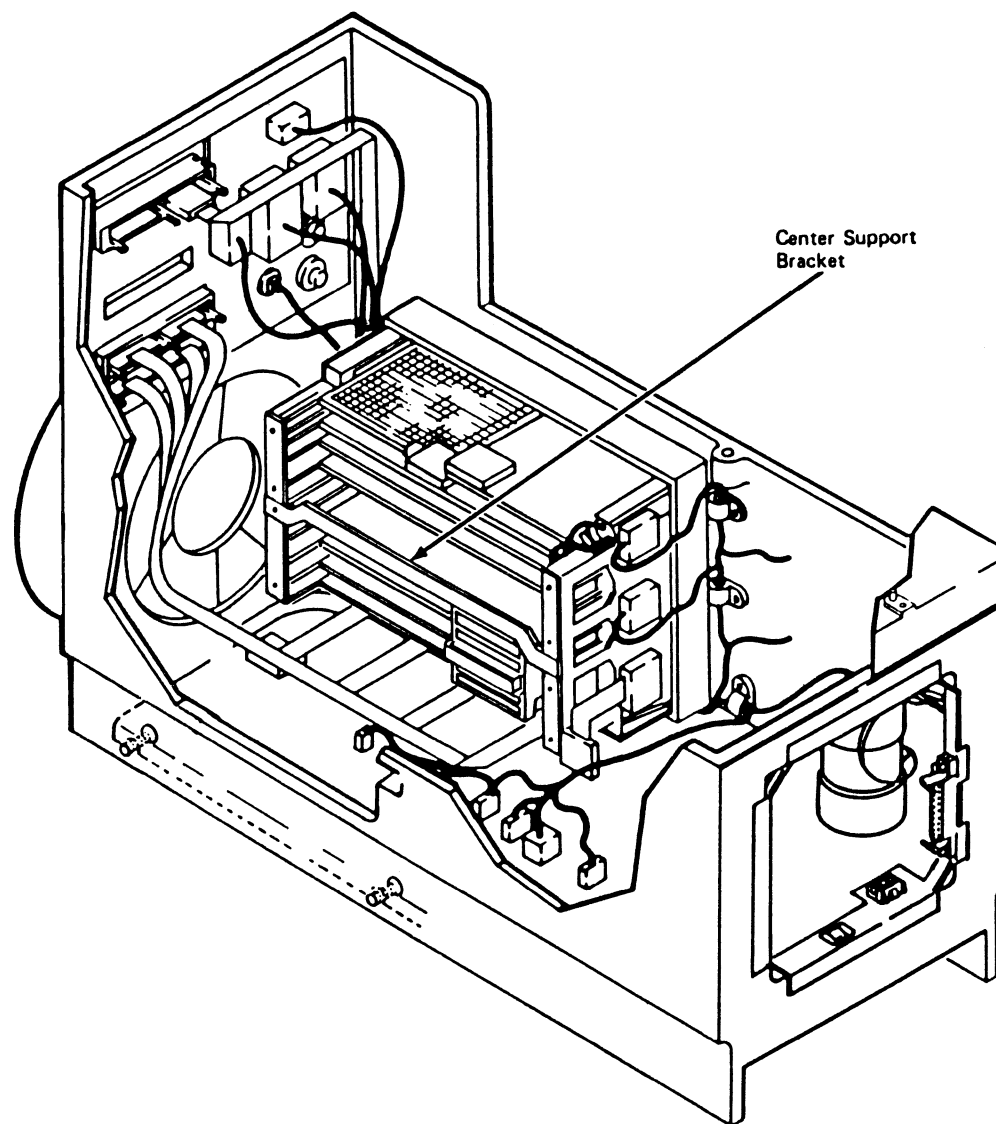
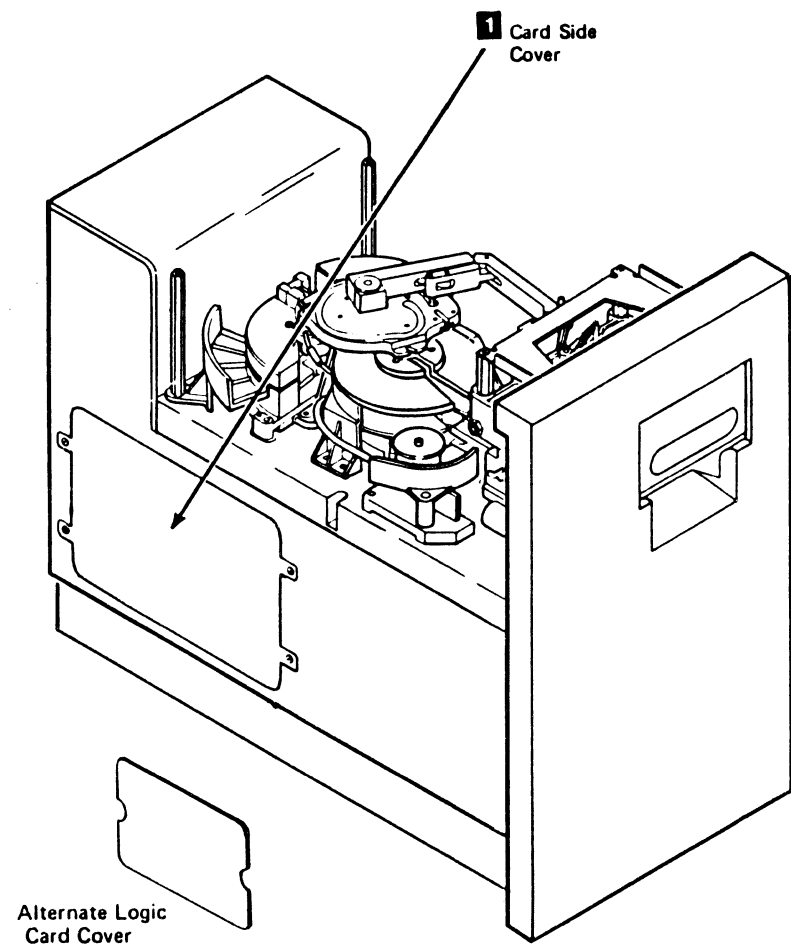
Removing a Top Card Connector

1. Go to CARR-DR 8 for the procedure to **power off** the drive.
2. Open the drive drawer.
3. Remove the card side cover **1**.
4. Remove the desired top card connector **2**.

Replacing a Top Card Connector

1. Install the top card connector (TCC) that was removed **2**.
- Note:** A listing of TCC locations is on LOC 1.
2. Place the card side cover **1** in position.
3. Close the drive drawer.

4. Go to CARR-DR 8 for the procedure to **power on** the drive.



FRU071 Tape Unit Power Supply Blower Removal and Replacement Procedure (60 Hz)

Drive **CARR-DR 710**

Tape Unit Without BM 6460006 (see CARR-DR 9)

If Your Tape Unit is 50 Hz, Go to CARR-DR 718)

This page contains the steps needed to remove the tape unit power supply blower from the tape unit. The blower is located below the dc power supply, on a plate that covers the base of the tape unit. To get access to the power supply blower, the dc power supply must be moved toward the front of the tape unit approximately 177.8 mm (7.5 inch). See "Moving the Power Supply" on CARR-DR 370.

Since the power supply provides dc voltages to both drives, it is necessary to have both drives available for service.

Note: This FRU can be removed and replaced without affecting the other tape units by removing power from the failing tape unit with the ac power circuit breaker.

Removing the Tape Unit Power Supply Blower

1. Go to CARR-DR 8 for the procedure to **power off** the tape unit.

To get access to the power supply blower, the dc power supply must be moved toward the front of the tape drive 177.8 mm (7.5 inch). See "Moving the Power Supply" on CARR-DR 370, then return here when the power supply is moved.

Note: The blower is installed on a plate under the dc power supply with four screws, four lockwashers, and four nuts. The four lockwashers and four nuts are under the machine. There are four plastic spacers used to position the blower above the bottom plate.

2. Remove the four mounting screws **2** from the blower, save the screws, spacers, lockwashers, and nuts for installing the replacement blower.
3. Remove the power supply blower:
 - a. Disconnect the ac power plug **1** from the power supply blower.
 - b. Remove the ground wire mounting screw, lockwasher **4**, and ground wire **3** from the blower. Save the ground wire mounting screw and lockwasher for installing the replacement blower.

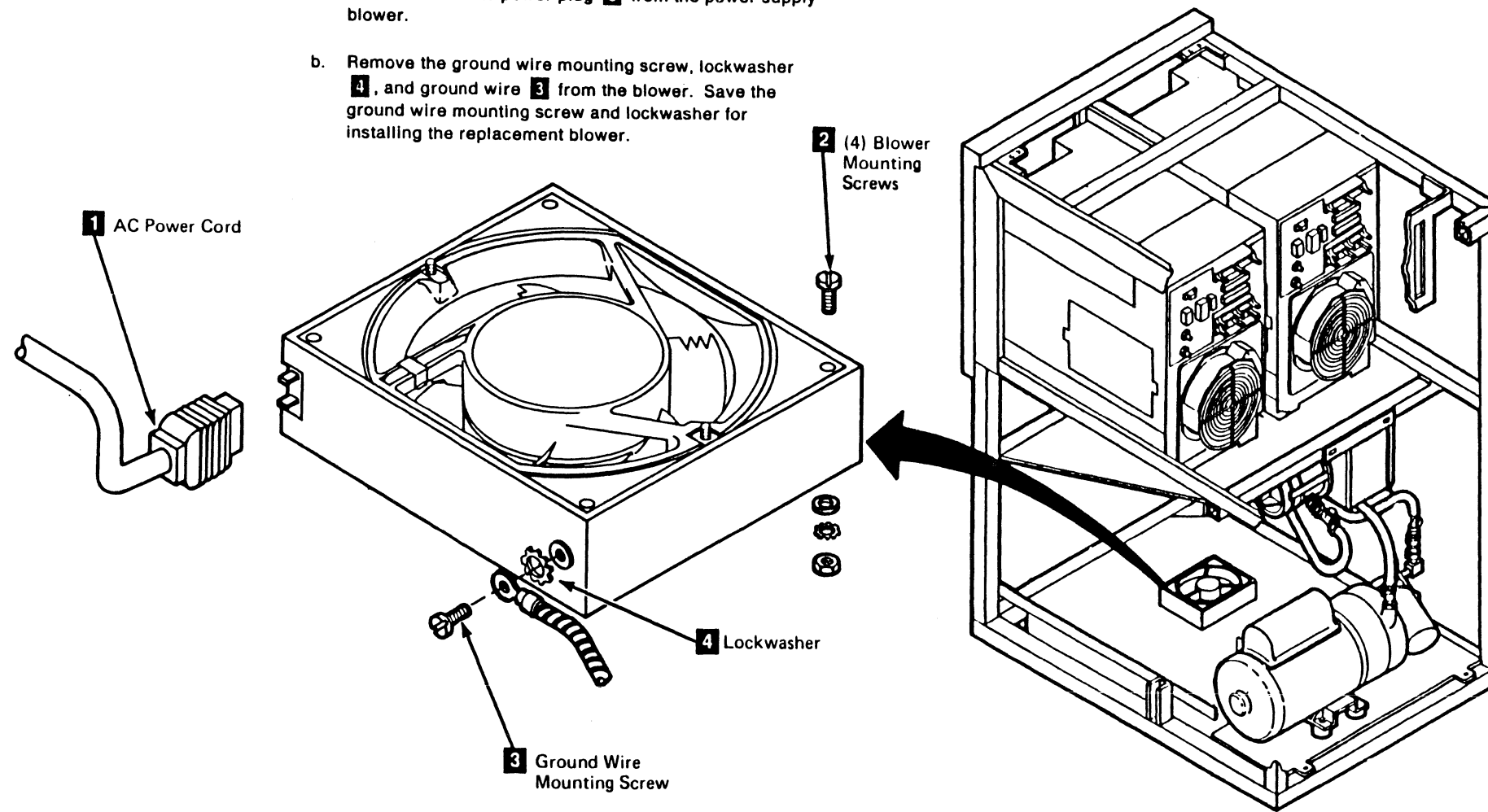
Replacing the Tape Unit Power Supply Blower

To get access to the power supply blower, the dc power supply had to be moved toward the front of the tape unit approximately 177.8 mm (7.5 inch).

1. Install the ground wire **3** with the ground wire mounting screw and lockwasher **4** saved from the blower removal procedure.
2. Connect the ac power plug **1** to the blower.
3. Place the blower assembly in position on the baseplate.

Note: Ensure that the arrow indicating air flow points down.

4. Install the four mounting screws, four spacers, four lockwashers, and four nuts **2** saved from the blower removal procedure.



5. Go to CARR 370 - "FRU037 Manifold-In Pressure Hose Replacement Procedure" for "Replacing the Power Supply," return here when finished.
6. Replace the tape unit front safety cover (see CARR-DR 2-4).
7. Verify that the replaced blower is moving air in the correct direction by feeling for a downward flow of air under the tape unit.
8. Go to CARR-DR 8 for the procedure to **power on** the tape unit.

FRU071 Tape Unit Power Supply Blower Removal and Replacement Procedure (50 Hz)

Tape Unit Without BM 6460006 (see CARR-DR 9)

If Your Tape Unit is 60 Hz, go to CARR-DR 710

This page contains the steps needed to remove and replace the tape unit power supply blower in the tape unit. The blower is located at the rear of the tape unit, installed on a panel that also contains the filter/regulator assembly.

Since the blower cools the dc power supply for both drives, it is necessary to have both drives available for service.

Note: This FRU can be removed and replaced without affecting the other tape units by removing power from the failing tape unit with the ac power circuit breaker.

Removing the Power Supply Blower

1. Go to CARR-DR 8 for the procedure to **power off** the tape unit.
2. Open the tape unit rear cover and remove the rear safety cover and ground connector (see CARR-DR 2-1).

Note: The blower is installed on the same panel as the filter/regulator assembly; this panel must be removed to get access to any of the components.
3. Remove the two screws **4** holding the panel to the machine.
4. Position the panel assembly on top of the compressor assembly.
5. Remove the ground wire **2**, if present and set the screw and washer to the side for installing the replacement blower.

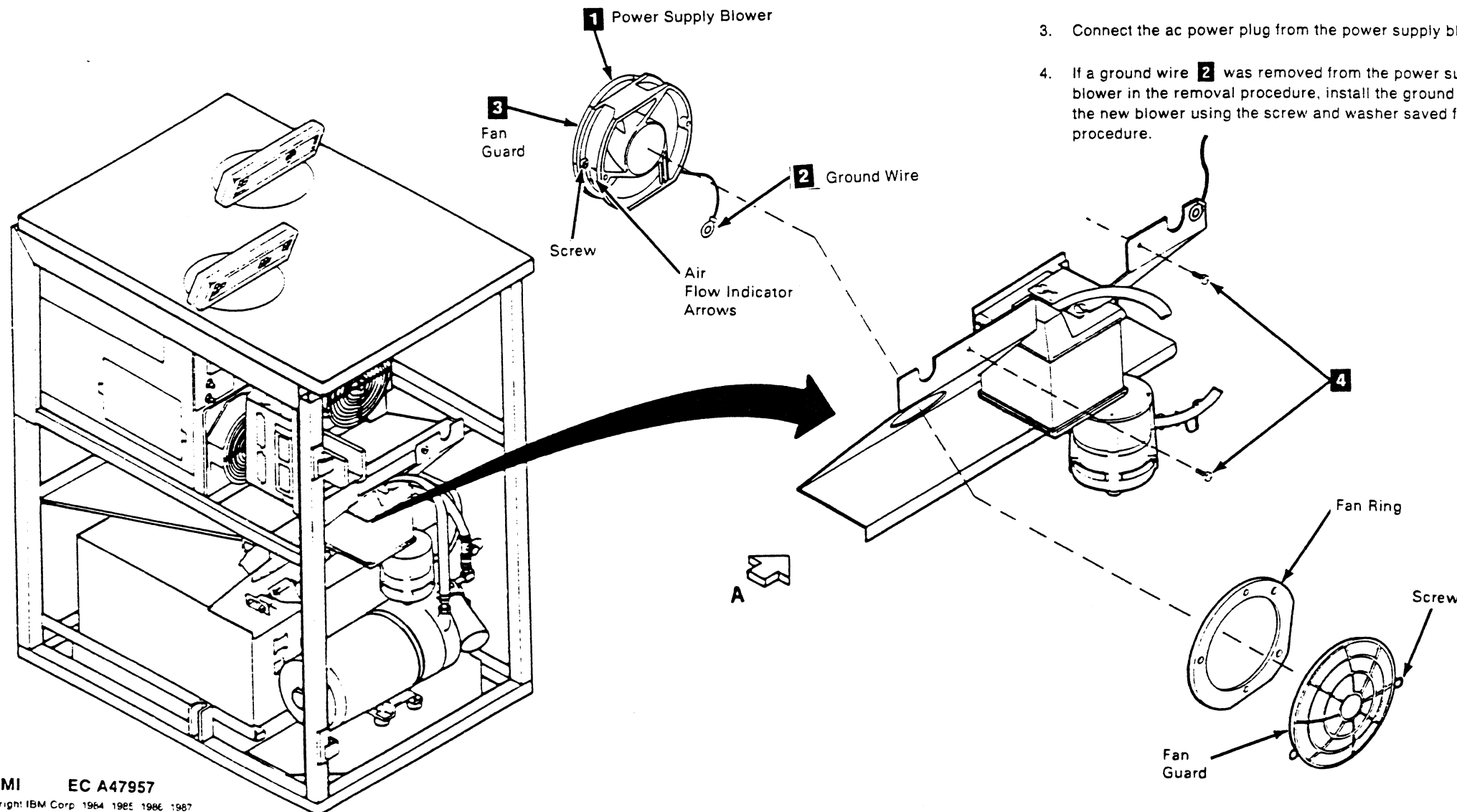
6. Disconnect the ac power plug from the power supply blower.
7. Remove the two screws from the fan guard **3**; save the fan guard, screws, washers, and nuts for installing the replacement blower.
8. Remove the two mounting screws from the blower and the fan ring; save the screws, washers, and nuts for installing the replacement blower.
9. Remove the power supply blower **1**.

Replacing the Power Supply Blower

1. Position the panel assembly on top of the compressor assembly.
2. Install the blower **1** and fan guards on the panel assembly using the mounting hardware saved from the removal procedure.

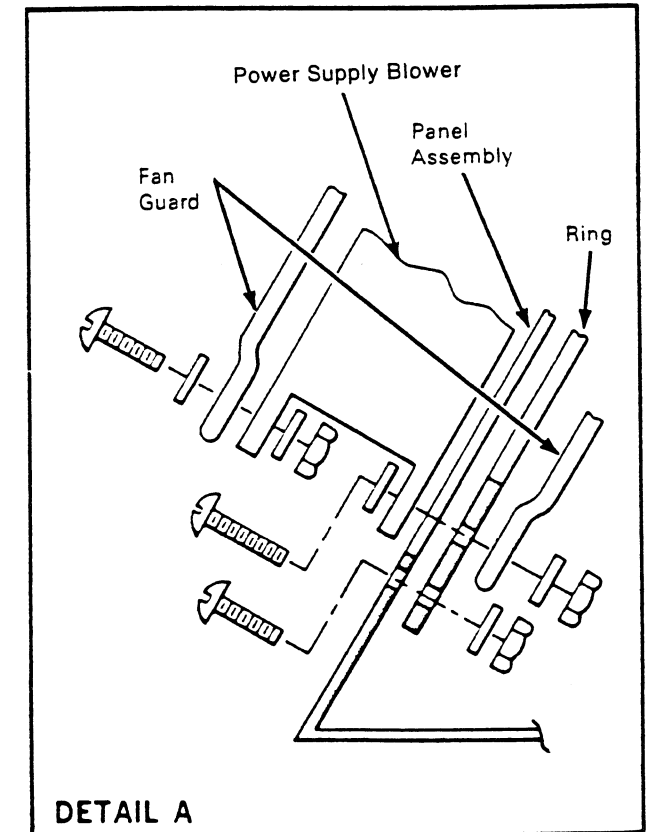
Note: Ensure that the arrow indicating air flow points toward the rear of the machine.

3. Connect the ac power plug from the power supply blower.
4. If a ground wire **2** was removed from the power supply blower in the removal procedure, install the ground wire on the new blower using the screw and washer saved from the procedure.



Drive CARR-DR 718

5. Replace the two screws **4** that hold the panel to the machine.
6. Set the tape unit ac power supply circuit breaker to On (see LOC 1).
7. Replace the tape unit rear safety cover and ground connector (see CARR-DR 2-2) and close the rear cover.
8. Verify that the replaced blower is operating properly by feeling for air flow toward the rear of the tape unit.
9. Go to CARR-DR 8 for the procedure to **power on** the tape unit.



FRU075 Tape Unit AC Power Supply Cable Removal and Replacement Procedure

Tape Unit Without BM 6460006 (see CARR-DR 9)

This page contains the steps needed to remove and replace the tape unit ac power supply cable. Because ac power will be switched off and disconnected at the control unit, all of the tape units attached to the control unit must be available for service.

Note: This FRU removal and replacement requires the ac power to be removed from the control unit and all attached tape units with the control unit ac power circuit breaker.

Removing the Tape Unit AC Power Supply Cable

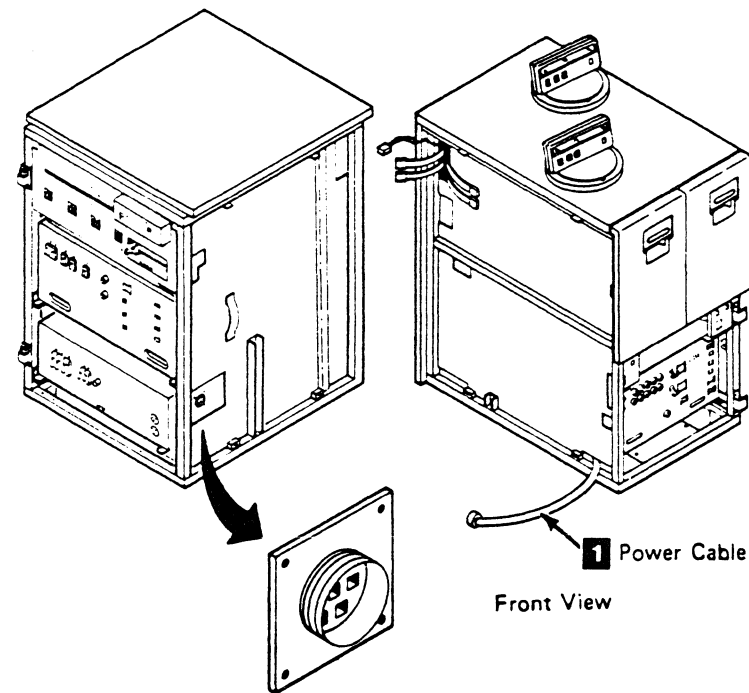
1. Go to CARR-CU 6 for the procedure to remove the ac power from the control unit.

At the control unit:

2. Remove the ac power cable (CU-PS-01-J1) **1** from the control unit by turning the retaining ring counter-clockwise and at the same time pulling the cable connector away from the receptacle.

At the failing tape unit:

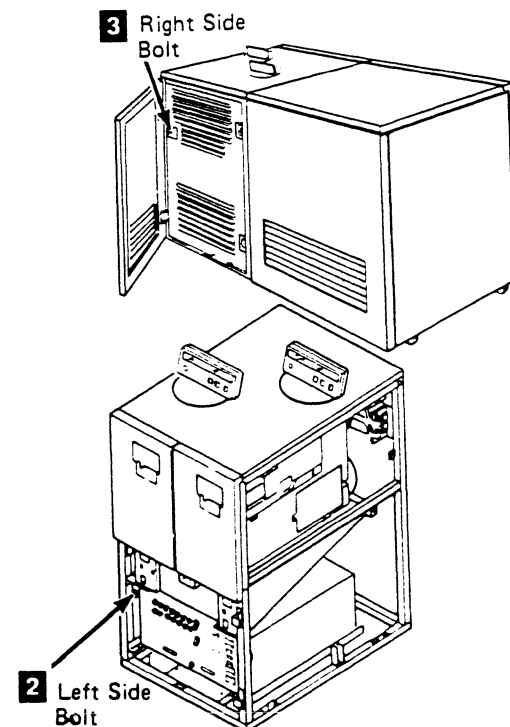
3. Open the tape unit front cover and remove the safety cover and ground connector (see CARR-DR 2-3).
4. Remove the bolts **2** and **3** holding the failing tape unit to the control unit or tape unit to the left.



5. Separate the failing tape unit from the tape unit or the control unit on the left far enough to disconnect the ac power cable connector **4**. (See INST 10 for the procedure to unlock the tape unit castors.)

Remove the ac power cable connector by turning the retaining ring counter-clockwise and at the same time pulling the connector away from the receptacle.

6. Remove the plastic safety shield from TU-TB1 **5**.
7. Trace and remove the leads from ac power cable to TB1 **5**. (You may want to make a chart of the TB1 power connections for your replacement procedure.)
8. Remove the cable clamp.
9. Remove the tape unit ac power cable through the front of the tape unit.
10. Save all cable mounting hardware for the replacement procedure.



Replacing the Tape Unit AC Power Supply Cable

At the failing tape unit:

1. Place the ac power supply cable in position through the front of the tape unit.
2. Connect the ac power supply cable leads to TU-TB1 **5**.
3. Replace the plastic safety shield on TU-TB1 **5**.
4. Replace the ac power supply cable clamp.

5. Connect the ac power supply cable **4** by inserting the connector into the receptacle and at the same time turning the retaining ring clockwise.
6. Move the separated tape units together and install the front **2** and rear **3** connecting bolts. (See INST 10 for the procedure to lock the castors.)

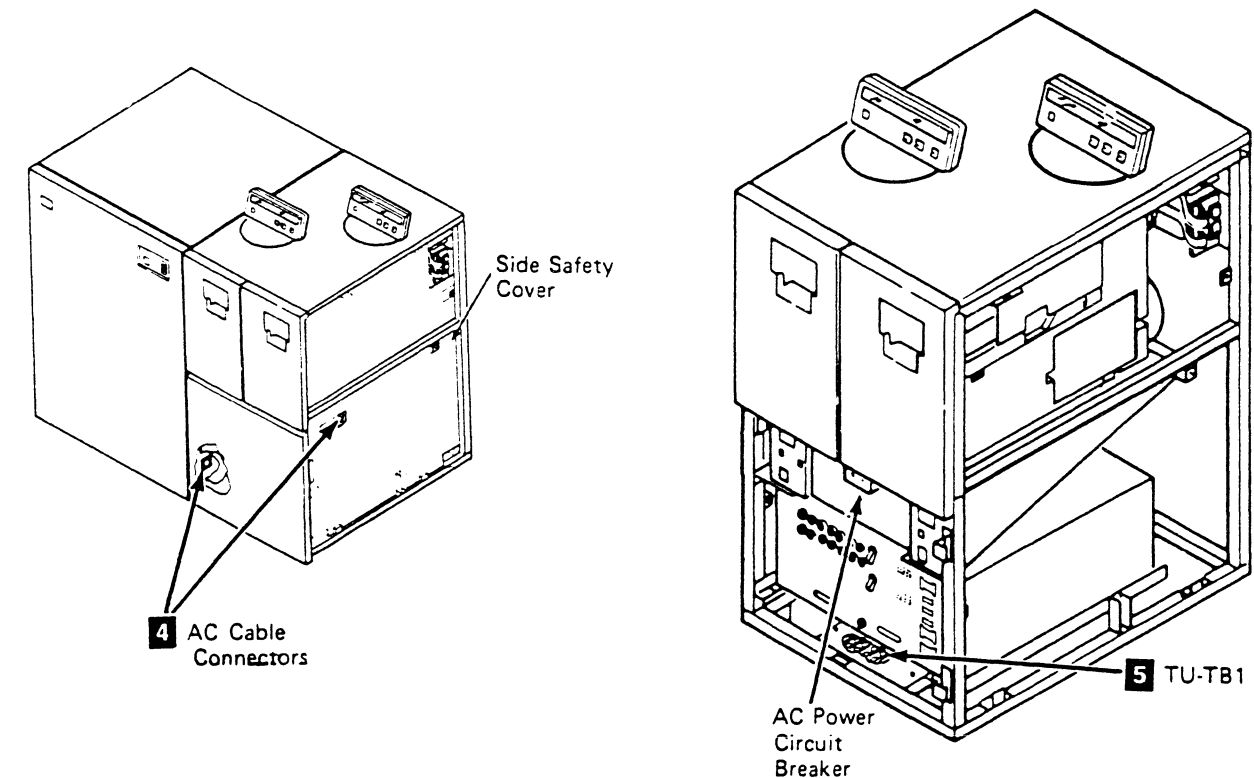
CAUTION

When connecting two B boxes together with the automatic cartridge loader feature installed on any drive, the drive must be opened approximately 5 cm (2 in.) to prevent the conductive seal from being pinched between the tape unit frames.

7. Install the tape unit front safety cover and ground connector (see CARR-DR 2-4) and close the front cover.

At the control unit:

8. Connect the ac power cable **1** to the connector on the right side of the control unit (see LOC 1). Insert the connector into the receptacle and at the same time turn the retaining ring clockwise.
9. Go to CARR-CU 6 for the procedure to restore the ac power to the control unit.



FRU076 Tape Unit AC Power Distribution Cable Removal and Replacement Procedure

Drive **CARR-DR 765**

Tape Unit Without BM 6460006 (see CARR-DR 9)

This page contains the steps needed to remove the tape unit ac power distribution cable. Because ac power will be switched off and disconnected at the control unit, all of the tape units attached to the control unit must be available for service.

Note: This FRU removal and replacement requires the ac power to be removed from the control unit and all attached tape units with the control unit ac power circuit breaker.

Removing the Tape Unit AC Power Distribution Cable

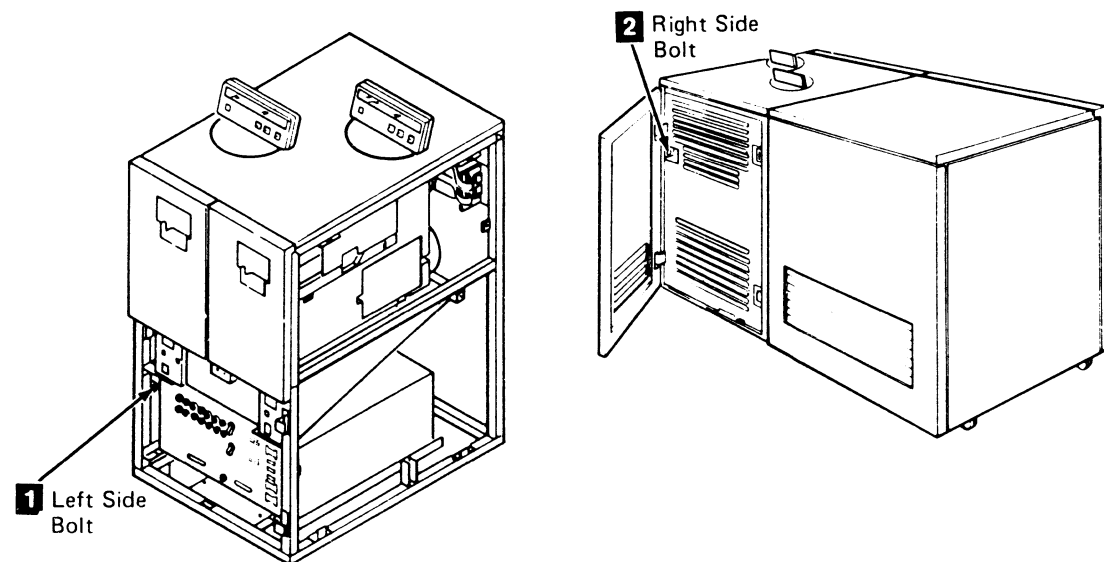
1. Go to CARR-CU 6 for the procedure to remove the **ac power** from the control unit.

At the control unit:

2. Remove the ac power cable **6** from the control unit by turning the retaining ring counter-clockwise and at the same time pulling the cable connector away from the receptacle.

At the failing tape unit:

3. Open the tape unit front cover and remove the safety cover and ground connector (see CARR-DR 2-3).
4. Remove the bolts **1** and **2** holding the failing tape unit to the tape unit on the right (if present).
5. Separate the failing tape unit from the tape unit on the right (if present) far enough to disconnect the ac power cable connector **6**. Remove the ac power cable connector by turning the retaining ring counter-clockwise and at the same time pulling the connector away from the receptacle. (See INST 10 for the procedure to unlock the casters.)

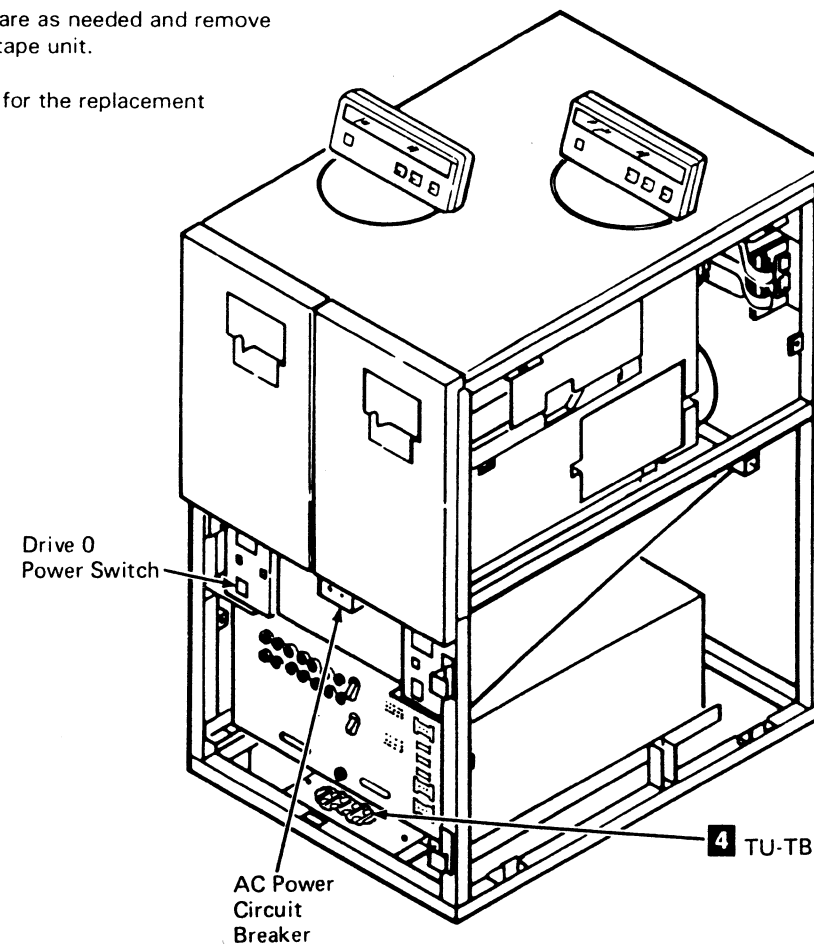


6. Disconnect cable plug P11 from the J11 connector on the dc power supply (see LOC 1).
7. Disconnect cable plug P15 from the J15 connector on the dc power supply (see LOC 1).
8. Disconnect the wires from the ac terminals of the drive 0 power switch (see LOC 1). The ac terminals are the top and bottom terminals.
9. Disconnect the green/yellow ground wire near the drive 0 On/Off switch.
10. Disconnect the wires from TU-TB1 **4**.
11. Disconnect the wires from the ac terminals of the tape unit ac power circuit breaker. The ac terminals are the top and bottom terminals.
12. Remove TU-J1:
 - a. Remove the side safety cover **3** by loosening the retainers as needed to remove the cover from the frame.
 - b. Remove the four mounting screws **5** holding TU-J1.
 - c. Slide TU-J1 out of the bottom of the bracket mounted on the safety cover.
13. Remove the cable retention hardware as needed and remove the ac distribution cable from the tape unit.
14. Save the cable retention hardware for the replacement procedure.

Replacing the Tape Unit AC Power Distribution Cable

At the failing tape unit:

1. Install TU-J1 on the side safety cover **3**.
 - a. Slide TU-J1 into the bottom of the bracket installed on the safety cover.
 - b. Install the four screws **5** holding TU-J1.
 - c. Install the side safety cover **3** and tighten the retainers as needed.
2. Connect the wires to the ac terminals of the tape unit ac power circuit breaker. The ac terminals are the top and bottom terminals.
3. Connect the wires to TU-TB1 **4**.
4. Connect the green/yellow ground wire to the frame near the drive 0 On/Off switch.
5. Connect the wires to the ac terminals of the drive 0 power switch (see LOC 1). The ac terminals are the top and bottom terminals.



6. Connect cable plug P15 to the J15 connector on the dc power supply (see LOC 1).
7. Connect cable plug P11 to the J11 connector on the dc power supply (see LOC 1).
8. Replace the cable retention hardware.
9. Connect the ac power cable to the repaired tape unit from the tape unit on the right (if present). Insert the connector into the receptacle and at the same time turn the retaining ring clockwise.
10. Move the tape units together. (See INST 10 for the procedure to lock the casters.)

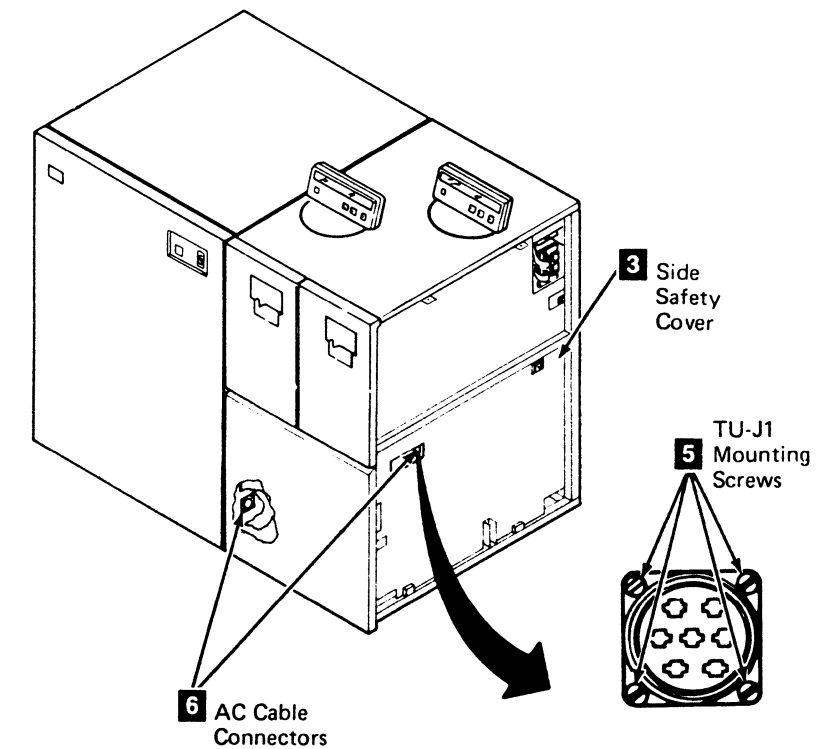
CAUTION

When connecting two B boxes together with the automatic cartridge loader feature installed on any drive, the drive must be opened approximately 5 cm (2 in.) to prevent the conductive seal from being pinched between the tape unit frames.

11. Replace the bolts **1** and **2** holding the tape unit to the tape unit on the right side (if present).
12. Install the tape unit front safety cover and ground connector (see CARR-DR 2-4) and close the front cover.

At the control unit:

13. Connect the ac power cable to the connector **6** on the right side of the control unit (see LOC 1). Insert the connector into the receptacle and at the same time turn the retaining ring clockwise.
14. Go to CARR-CU 6 for the procedure to restore the **ac power** to the control unit.



Tape Unit With BM 6460006 (see CARR-DR 9)

This page contains the steps needed to remove and replace the dc power distribution cable (drive internal). This page will not cover removal of any of the deck assemblies. To find out how to remove a specific assembly, refer to index, or to the "Remove/Replace Procedures By FRU Number" beginning on CARR-DR 1-1.

Note: This FRU can be removed and replaced without affecting the other tape units by removing power from the failing tape unit with the ac power circuit breaker.

Removing the DC Power Distribution Cable (Drive Internal)

Note: Some of the drives will have a single dc power distribution cable assembly in the drive. The rest of the drives will have an interposer cable that connects J8, J9, and J6.

1. Go to CARR-DR 8 for the procedure to **power off** the tape unit.
2. Open the tape unit rear cover.
3. Disconnect the cables from the rear panel connectors P1-J1, P2-J2 **1** and P4-J4 **2**.
4. Open the drive drawer and remove the drive drawer safety cover.
5. Remove the rear panel cover screws **5** and cover.
6. Remove connectors J1 and J2 **3** from inside the rear panel.
7. Remove the power amplifier board (TU-PA) **4** from the drive (see CARR-DR 590).

On drives with an interposer cable, J8 is a double connector that joins the dc power distribution cable and the power amplifier board.

8. On drives without the automatic cartridge loaders remove the drive front cover (see CARR-DR 2-1). On drives with the automatic cartridge loaders go to CARR-DR 2850 and perform the loader mechanical assembly Removal procedure.
9. Open the tape unit front cover (see CARR-DR 2-1).

Note: In the following two steps, notice that the white wire is removed from the terminal identified by the red dot on the motor housing. The leads from the new cable assembly must be connected in the same way (for correct polarity).

10. Disconnect the wires from the machine reel motor **11**. Label the wires to assist in the replacement procedure.
11. Disconnect the wires from the file reel motor **9**. Label the wires to assist in the replacement procedure.
12. Disconnect the cable connector from the threader motor (not shown). Label the wires to assist in the replacement procedure.
13. Disconnect the cable connector J4 (located near the access hole) from the tape lifter solenoid **6**.
14. Disconnect the cable connector J5 (located near the access hole) from the latch solenoid **10**.
15. Disconnect the cable plug P14 from the tension transducer **12**.
16. Remove one on the leads from the file protect switch connector as follows:
 - a. Disconnect the cable connector J3 from the file protect switch.
 - b. Remove the J3 part of the connector from the retainer.
 - c. Locate the lead (that is NOT part of the cable assembly being replaced) going through the access hole for the machine reel motor.
 - d. Remove this lead from the connector block by carefully prying the retaining tab away from the pin. Label the pin (with the number of the connector position) for the replacement procedure.
17. Remove the two mounting screws and the pin side cover **8**.
18. Disconnect the voltage connectors **7** from the O2A-A1 board:
 - B2A14
 - B3A14
 - B4A14
 - J2A14
 - J3A14
 - J4A14
19. Remove the air pressure and vacuum hoses from the inside of the rear panel of the drive drawer.
20. Remove any retention hardware, as needed, and remove the cable from the drive as follows:
 - **From the top of the drive**, carefully work the J1 and J2 end of the cable around the end of the card retainers at the rear of the logic gate and out through the bottom of the drive drawer.

21. The interposer cable can be removed by disconnecting J9 and removing the retention hardware that holds the J6 connector to the front of the drive. Carefully remove the cable from the drive.
22. Save all retention hardware for the replacement procedure.

Replacing the DC Power Distribution Cable (Drive Internal)

1. Install the replacement cable in the drive drawer as follows:
 - **From the bottom of the drive**, carefully work the J1 and J2 end of the cable around the end of the card retainers at the rear of the logic gate and out through the top of the drive drawer.
2. Place the dc distribution cable in position and install the cable retention hardware.

If the interposer cable was removed place it in position; install the cable retention hardware and connect J8-P8 and J9-P9.
3. Connect the air pressure and vacuum hoses to the connectors on the inside rear of the drive drawer.
4. Connect the voltage connectors **7** to the O2A-A1 board:
 - B2A14
 - B3A14
 - B4A14
 - J2A14
 - J3A14
 - J4A14
5. Replace the pin side cover **8** and two mounting screws.

Note: In the next step, transfer your labels from the cable you replaced.

6. Connect the leads to the machine reel motor **11**.

Note: In the next step, transfer your labels from the cable you replaced.

7. Connect the leads to the file reel motor **9**.

Note: In the next step, transfer your labels from the cable you replaced.

8. Connect the leads to the threader motor (not shown).
9. Connect cable connector J4 to the tape lifter solenoid **6**.
10. Connect cable connector J5 to the latch solenoid **10**.
11. Connect cable plug P14 to the tension transducer **12**.

12. Connect the lead coming from the access hole for the machine reel motor (noted and labeled in the removal procedure - step 16) as follows:
 - a. Locate the J3 connector on the end of the new cable assembly.
 - b. Insert the lead from the machine reel motor into the connector position indicated on the label.
 - c. Insert the J3 Plug into the retainer.
 - d. Connect cable connector J3 to the file protect switch.

13. Install the power amplifier board (TU-PA) **4** (see CARR-DR 590).

14. Install connectors J1 and J2 **3** on the rear panel.

15. Install the rear panel cover and mounting screws **5**.

16. Connect the external dc cable plugs P1 and P2 to the rear panel connectors P1-J1 and P2-J2 **1**.

17. Connect the external dc cable plug P4 to the rear panel connectors P4-J4 **2**.

18. On drives without the automatic cartridge loaders install the front drawer cover (see CARR-DR 2-2).

On drives with the automatic cartridge loaders go to CARR-DR 2850 and perform the loader mechanical assembly Replacement procedure.

19. Install the drive drawer safety cover (see CARR-DR 2-5).

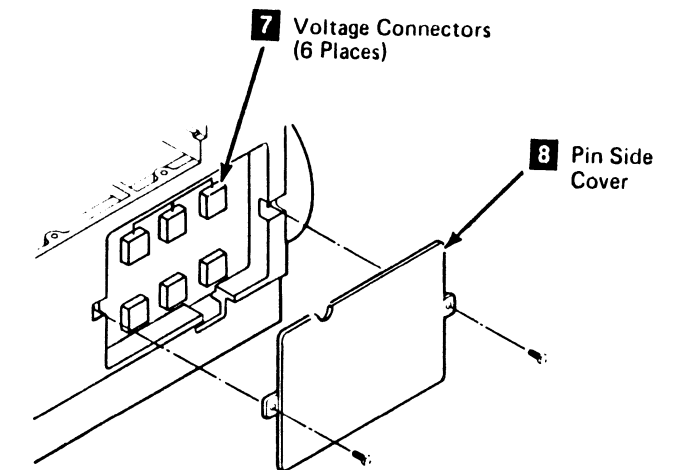
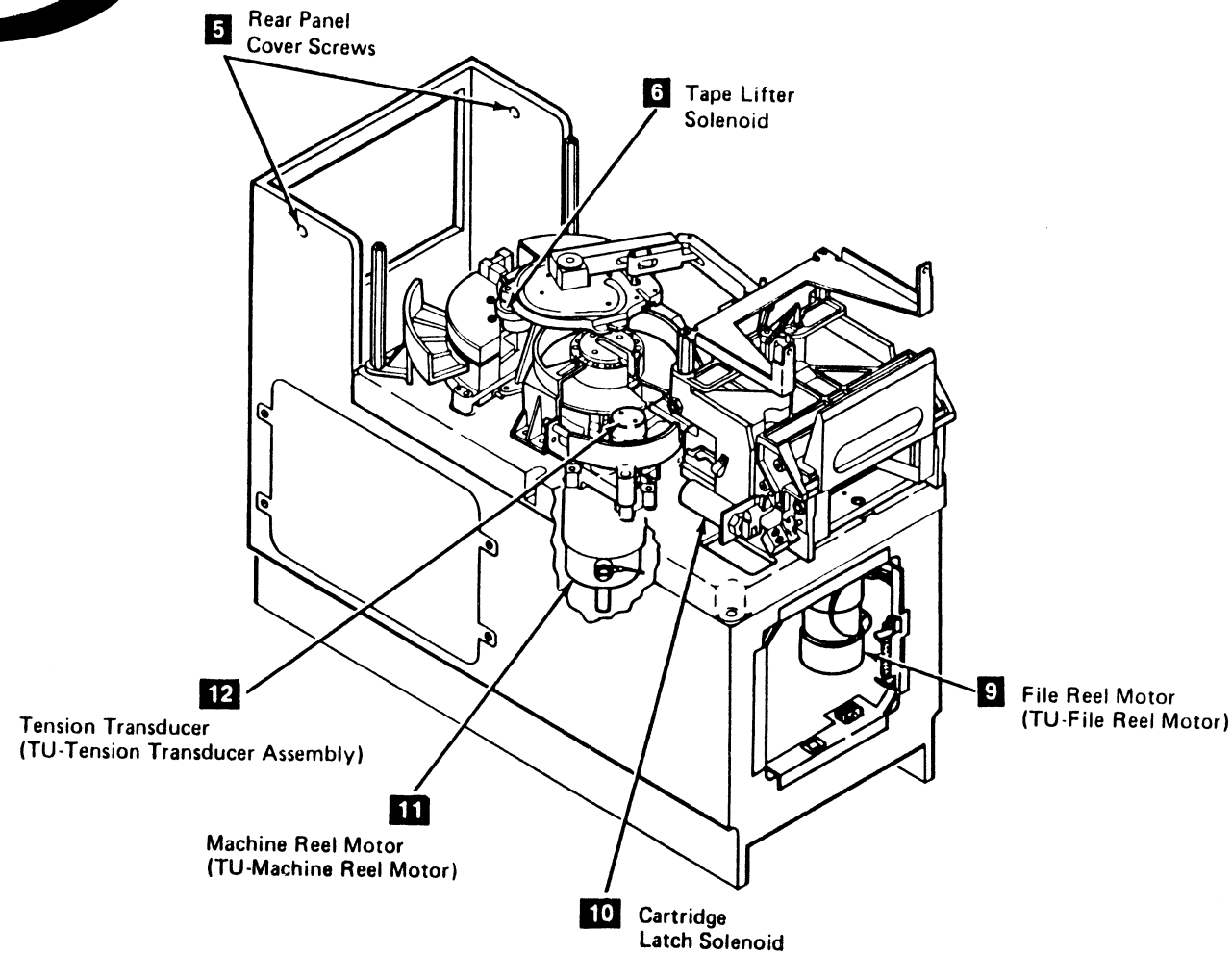
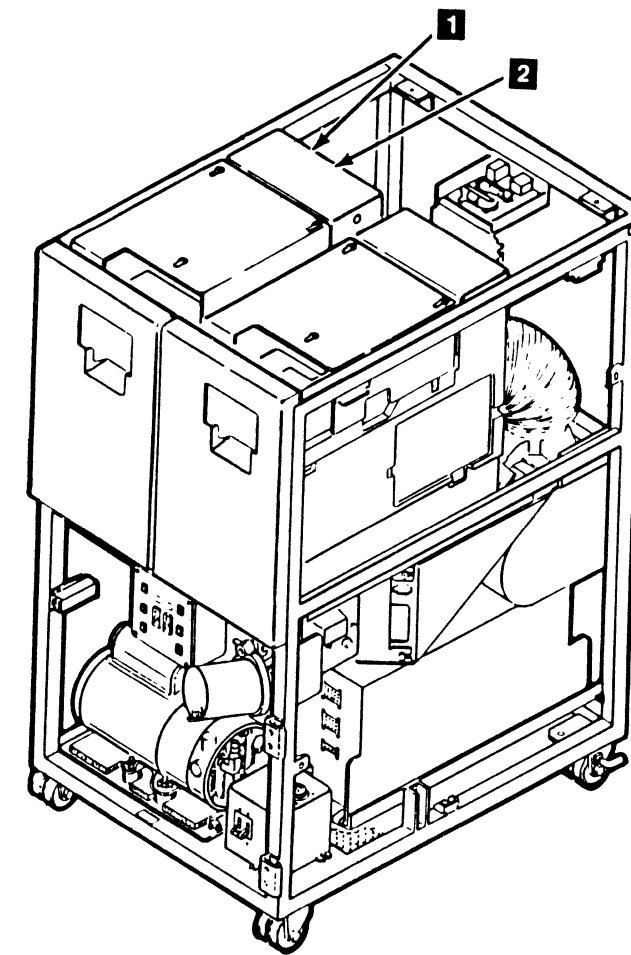
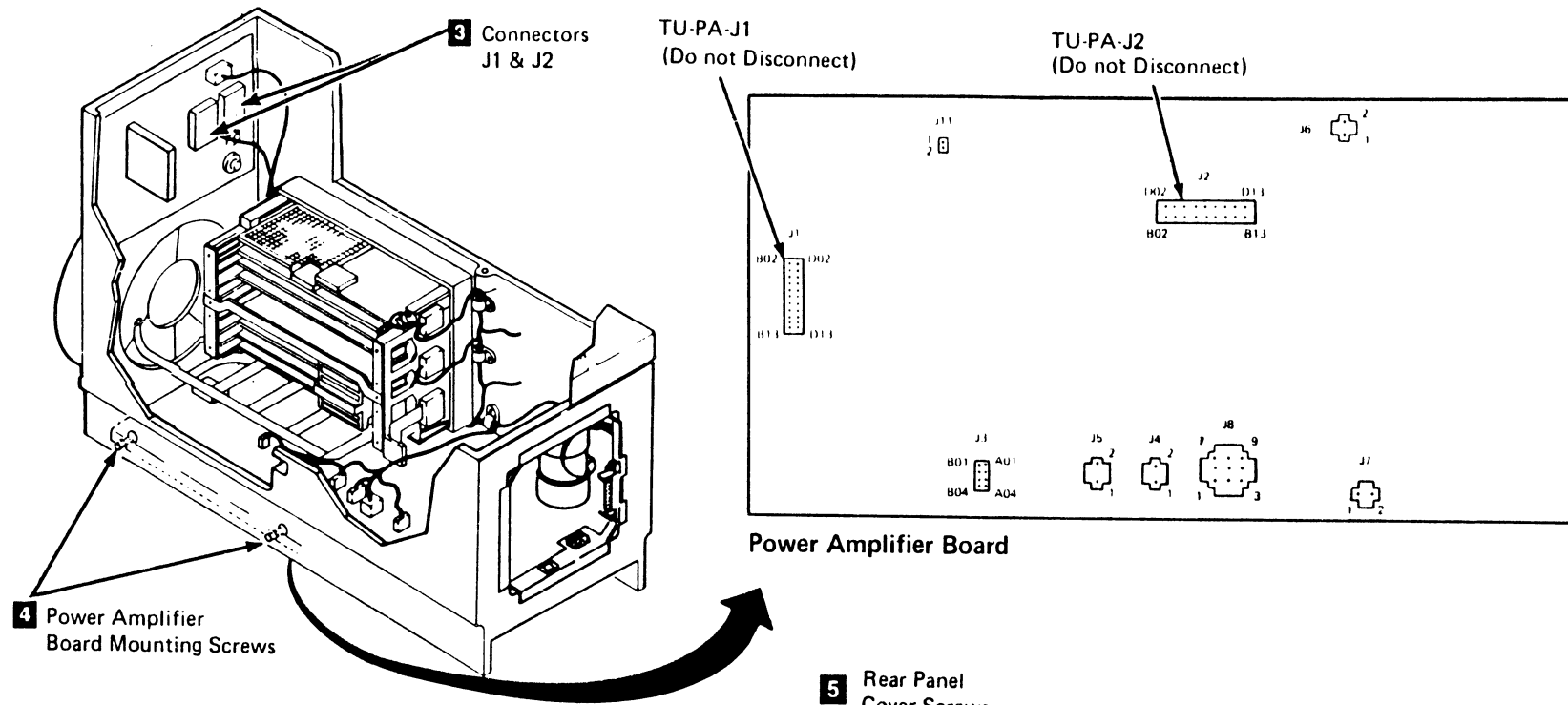
20. Close the drive drawer.

21. Go to CARR-DR 8 for the procedure to **power on** the tape unit.

FRU079 DC Power Distribution Cable (Drive Internal) Removal and Replacement Procedure (Continued)

Drive CARR-DR 791

Tape Unit With BM 6460006 (see CARR-DR 9)



Drive CARR-DR 791

Tape Unit Without BM 6460006 (see CARR-DR 9)

This page contains the steps needed to remove and replace the dc power distribution cable (drive internal). This page will not cover removal of any of the deck assemblies. To find out how to remove a specific assembly, refer to index, or to the "Remove/Replace Procedures By FRU Number" beginning on CARR-DR 1-1.

Since there is only one power distribution cable (drive external), it is necessary to have both drives available for service.

Note: This FRU can be removed and replaced without affecting the other tape units by removing power from the failing tape unit with the ac power circuit breaker.

Removing the DC Power Distribution Cable (Drive Internal)

1. Go to CARR-DR 8 for the procedure to **power off** the tape unit.
2. Open the tape unit rear cover and remove the rear safety cover and ground connector (see (CARR-DR 2-3)).
3. Disconnect the cables from the rear panel connectors P1-J1 **1** and P1-J2 **2**.
4. Open the drive drawer and remove the drive drawer safety cover.
5. Remove the rear panel cover screws **5** and cover.
6. Remove connectors J1 and J2 **3** from inside the rear panel.
7. Remove the two mounting screws **4** and slowly lower the power amplifier board.
8. Disconnect the following cables from the power amplifier board:
 - a. PA-J6
 - b. PA-J11
 - c. PA-J7
 - d. PA-J4
 - e. PA-J5
 - f. PA-J3

Note: Connector PA-J8 (on the power amplifier board) is EC (engineering change) sensitive. Check the level of your drive as follows:

- a. Open the drive drawer (see CARR-DR 2-5), remove the card side cover mounting screws and remove the card side cover (see CARR-DR 640).
 - b. Check to see if your drive has an A1D2 logic card installed.
 - c. If your drive **does** have an A1D2 logic card, go to step 11 of this procedure.
 - d. If your drive **does not** have an A1D2 logic card, proceed with step 9 of this procedure.
9. Check to see if your drive has an interposer cable plugged into connector PA-J8.

- a. If your drive has an interposer cable installed, disconnect the dc power distribution cable (drive internal) from the interposer cable connector.
 - b. If your drive does not have an interposer cable installed, remove the PA-J8 connector from the power amplifier board and remove the connector from inside the front of the drive drawer (at the access hole for the cartridge drive motor).
 - c. On drives without the automatic cartridge loaders remove the drive front cover (see CARR-DR 2-1).
 - d. On drives with the automatic cartridge loaders go to CARR-DR 2850 and perform the loader mechanical assembly Removal procedure.
10. Go to step 12 of this procedure.
 11. If your drive **does** have a logic card in A1D2, remove the PA-J8 connector from the power amplifier board and remove the connector from inside the front of the drive drawer (at the access hole for the cartridge drive motor).
 12. Disconnect the cable connector from the tape lifter solenoid **6**.

Note: In the following two steps, notice that the white wire is removed from the terminal identified by the red dot on the motor housing. The leads from the new cable assembly must be connected in the same way (for correct polarity).
 13. Disconnect the wires from the machine reel motor **11**.
 14. Disconnect the wires from the file reel motor **9**.
 15. Disconnect the cable connector from the latch solenoid **10**.
 16. Remove one of the leads from the file protect switch connector as follows:
 - a. Disconnect the cable connector J3 from the file protect switch.
 - b. Remove the J3 part of the connector from the retainer.
 - c. Locate the lead (that is NOT part of the cable assembly being replaced) going through the access hole for the machine reel motor.
 - d. Remove this lead from the connector block by carefully prying the retaining tab away from the pin. Label the pin (with the number of the connector position) for the replacement procedure.
 17. Disconnect the cable connector from the tension transducer **12**.
 18. Disconnect the cable connector from the threader motor (not shown).
 19. Remove the two mounting screws and the pin side cover **8**.
 20. Disconnect the voltage connectors **7** from the 01A-A1 board:
 - a. B2A14
 - b. B3A14
 - c. B4A14
 - d. J2A14
 - e. J3A14
 - f. J4A14

21. Remove the air pressure and vacuum hoses from the inside of the rear panel of the drive drawer.
22. Remove any retention hardware, as needed, and remove the cable from the drive as follows:
 - **From the top of the drive drawer**, carefully work the J1 and J2 end of the cable around the logic gate card guides toward the rear of the drive drawer.
 - You can now remove the cable from the drive through the bottom of the drive drawer.
23. The interposer cable can be removed by disconnecting J9 and removing the retention hardware that holds the J6 connector to the front of the drive. Carefully remove the cable from the drive.
24. Save all retention hardware for the replacement procedure.

Replacing the DC Power Distribution Cable (Drive Internal)

1. Install the replacement cable in the drive drawer as follows:
 - **From the bottom of the drive drawer**, carefully work the J1 and J2 end of the cable around the end of the logic board card retainers toward the rear of the drive drawer to the top of the drive drawer.
2. Place the dc distribution cable in position and install the cable retention hardware. If the interposer cable was removed earlier place it in position; install the cable retention hardware and connect J8-P8 and J9-P9.
3. Connect the voltage connectors **7** to the 02A-A1 board:
 - a. B2A14
 - b. B3A14
 - c. B4A14
 - d. J2A14
 - e. J3A14
 - f. J4A14
4. Replace the pin side cover **8** and mounting screws. Ensure that the cover is replaced with the notch on the upper left (see the figure on this page).
5. Connect the wires to the threader motor (not shown). The white wire goes to the terminal labeled '1' and the black wire goes to the terminal labeled '2'.
6. Connect the cable connector to the tension transducer **12**.
7. Connect the wires to the threader motor (not shown).
8. Connect the cable connector to the cartridge latch solenoid **10**.

In the following two steps the **white** wire goes to the terminal marked with the red dot. If there is white shrink wrap on one of the two wires, this is the **white** wire. Otherwise, the white colored wire is the **white**.

9. Connect the wires to the file reel motor **9**.
10. Connect the lead coming from the access hole for the machine reel motor (noted and labeled in the removal procedure) as follows:
 - a. Locate the J3 connector on the end of the new cable assembly.
 - b. Insert the lead from the machine reel motor into the connector position indicated on the label.
 - c. Insert the P3 Plug into the retainer.
 - d. Connect cable connector J3 to the file protect switch.

11. Connect the cable connector to the tape lifter solenoid **6**.
12. Connect the following cables to the power amplifier board:
 - a. PA-J6
 - b. PA-J11
 - c. PA-J7
 - d. PA-J4
 - e. PA-J5
 - f. PA-J3

Note: Connector PA-J8 (on the power amplifier board) is EC (engineering change) sensitive. Check the level of your drive as follows:

- a. Check to see if your drive has an A1D2 logic card installed.
 - b. If your drive **does** have an A1D2 logic card, go to step 15 on this page.
 - c. If your drive **does not** have an A1D2 logic card, proceed with step 13 on this page.
13. If your drive **does not** have an A1D2 logic card, check to see if you have an interposer cable plugged into connector PA-J8. If your drive has an interposer cable installed, connect the dc power distribution cable (drive internal) connector P8 to the interposer cable connector.
 14. If your drive **does not** have an interposer cable installed, connect the dc power distribution cable (drive internal) connector P8 to the power amplifier connector PA-J8 and mount the connector inside the front of the drive drawer (at the access hole for the cartridge drive motor).
 15. If your drive **does** have a logic card in A1D2, connect the dc power distribution cable (drive internal) connector P8 to the power amplifier connector PA-J8.
 16. Raise the power amplifier board in position and install the two mounting screws **4**.
 17. Install connectors J1 and J2 **3** on the rear panel.
 18. Install the rear panel cover and mounting screws **5**.
 19. Connect the cables from the rear panel connector P1-J1 **1** and P1-J2 **2**.
 20. On drives without the automatic cartridge loaders install the front drawer cover (see CARR-DR 2-2).

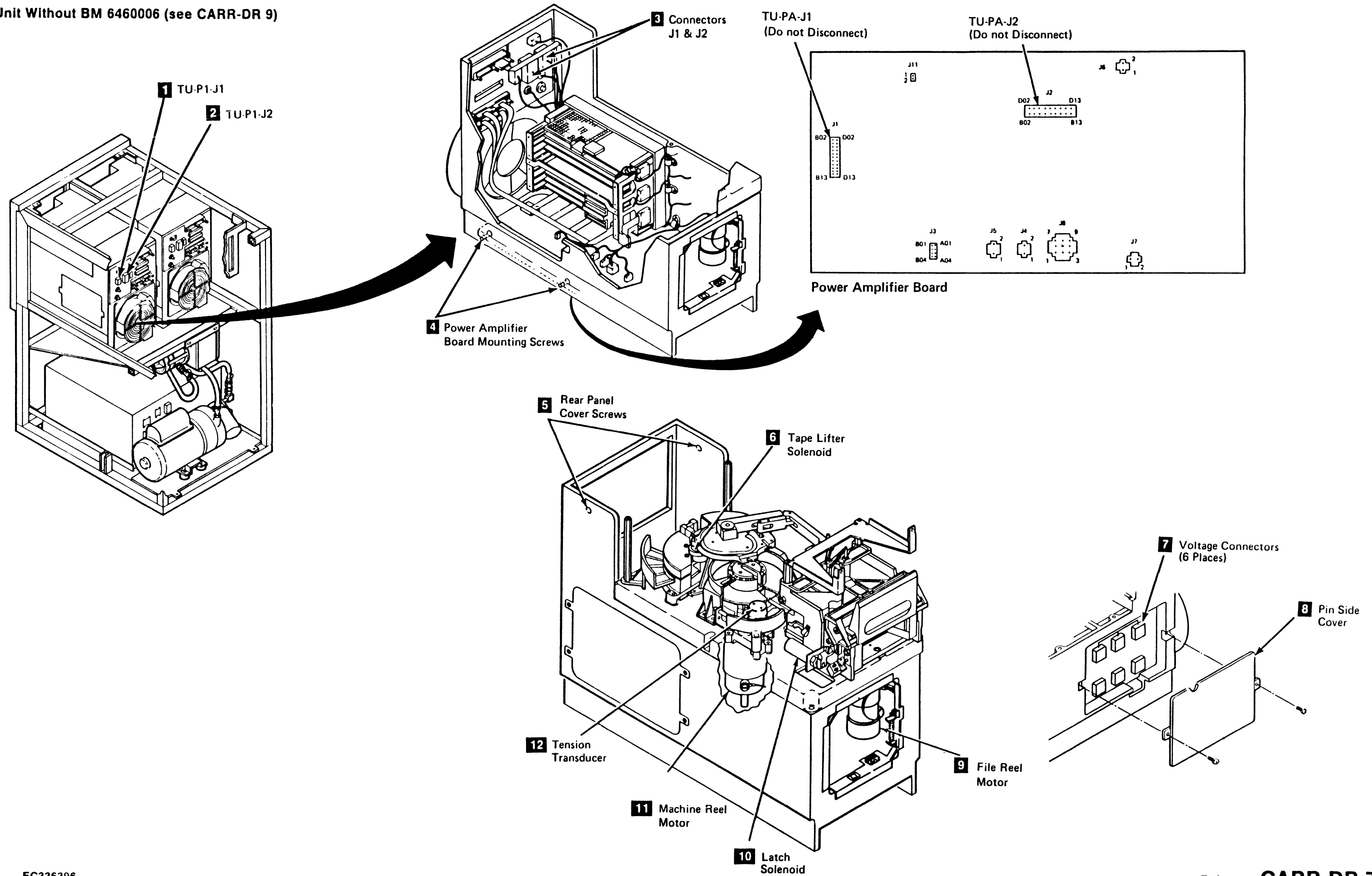
On drive with the automatic cartridge loaders go to CARR-DR 2850 and perform the loader mechanical assembly Replacement procedure.

21. Install the drive drawer safety cover (see CARR-DR 2-5).
22. Close the drive drawer.
23. Go to CARR-DR 8 for the procedure to **power on** the tape unit.

FRU079 DC Power Distribution Cable (Drive Internal) Removal and Replacement Procedure (Continued)

Drive CARR-DR 795

Tape Unit Without BM 6460006 (see CARR-DR 9)



FRU079 DC Power Distribution Cable (Drive External) Removal and Replacement Procedure

Tape Unit With BM 6460006 (see CARR-DR 9)

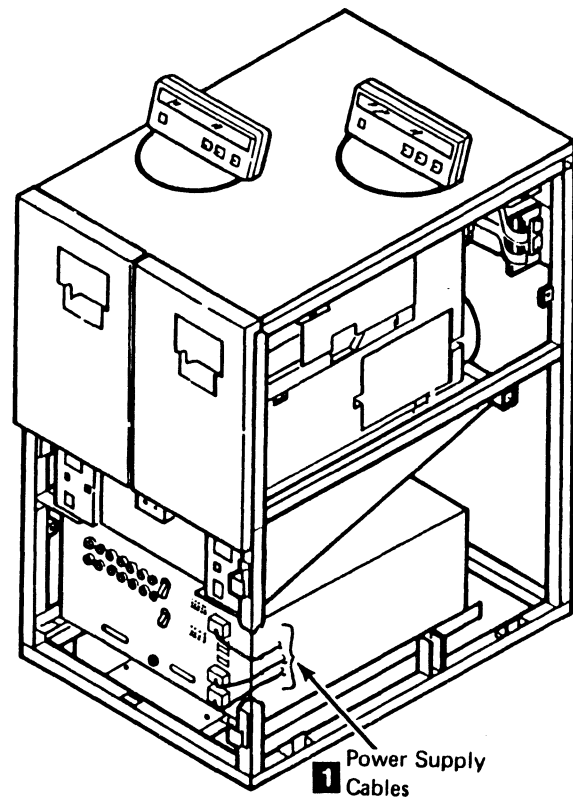
This page contains the steps needed to remove and replace the dc power distribution cable (drive external). All power will be removed from the tape unit except the ac power box which serves as a feedthrough for other tape units attached to the same control unit.

Since there is only one power distribution cable (drive external), it is necessary to have both drives available for service.

Note: This FRU can be removed and replaced without affecting the other tape units by removing power from the failing tape unit with the ac power circuit breaker.

Removing the DC Power Distribution Cable (Drive External)

1. Go to CARR-DR 8 for the procedure to **power off** the tape unit.



From the front of the tape unit:

2. Open the tape unit front cover and remove the safety cover and ground connector (see CARR-DR 2-3).
3. Unplug power supply cables J12, J13, and J14 **1** from the front of the dc power supply (TU-PS-01).
4. Carefully remove cables J12, J13, and J14 by routing them past the right side of the dc power supply and to the rear of the tape unit.

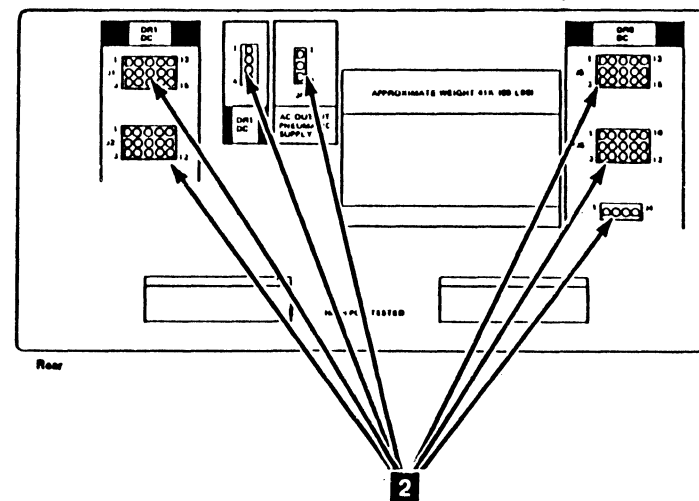
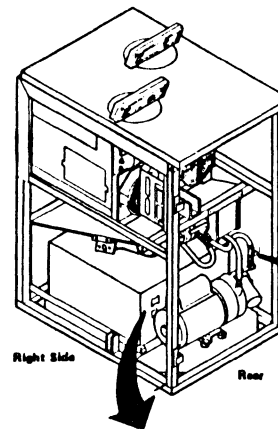
From the rear of the tape unit:

5. Open the rear cover and remove the rear safety cover and ground connector (see CARR-DR 2-3).
6. Unplug cables P1, P2, P3, P5, P6, and P7 **2** from the rear of the dc power supply.
7. Carefully remove the dc cable harness and connectors from between the pump motor assembly and the rear of the dc power supply.
8. Unplug the cables from the rear of the drive panels TU-D0-P1-J1, TU-D0-P2-J2, TU-D1-P1-J1, TU-D1-P2-J2 **3**.
9. Unplug cables J3 and J7 **4** from the external load resistor panel.
10. Remove the dc power distribution cable (drive external) from the tape unit by guiding the cable connectors over the pump motor assembly and out the rear of the tape unit.

Replacing the DC Power Distribution Cable (Drive External)

From the rear of the tape unit:

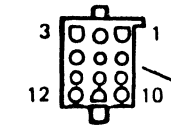
1. Replace the dc power distribution cable (drive external) into the tape unit by guiding the cable connectors over the pump motor assembly and toward the front of the tape unit.
2. Connect cables J3 and J7 **4** into the external load resistor panel.
3. Connect the cables into the rear of the drive panels TU-P1-J1, and TU-P1-J2, TU-P2-J1, and TU-P2-J2 **3**.
4. Carefully route the dc cable harness and connectors between the pump motor assembly and the rear of the dc power supply.
5. Connect cables P1, P2, P3, P5, P6, and P7 **2** into the rear of the dc power supply (TU-PS-01).
6. Install the rear safety cover and ground connector (see CARR-DR 2-4) and close the rear cover.



From the front of the tape unit:

1. Carefully route cables J12, J13, and J14 past the right side of the dc power supply and to the front of the tape unit.
2. Connect power supply cables J12, J13, and J14 **1** to the front of the dc power supply.
3. Install the tape unit front safety cover and ground connector (see CARR-DR 2-4) and close the front cover.
4. Go to CARR-DR 8 for the procedure to **power on** the tape unit.

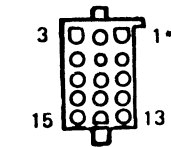
TU-D0/1-P1-J1



Connector positioning may be different than shown.

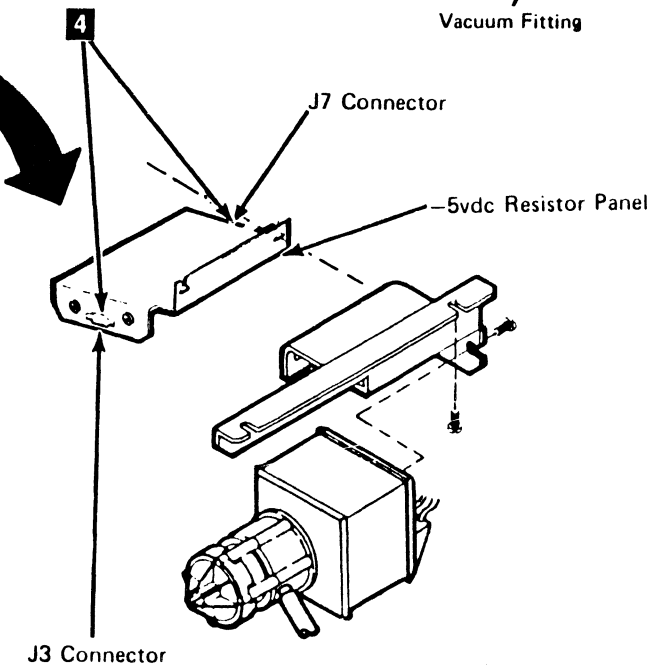
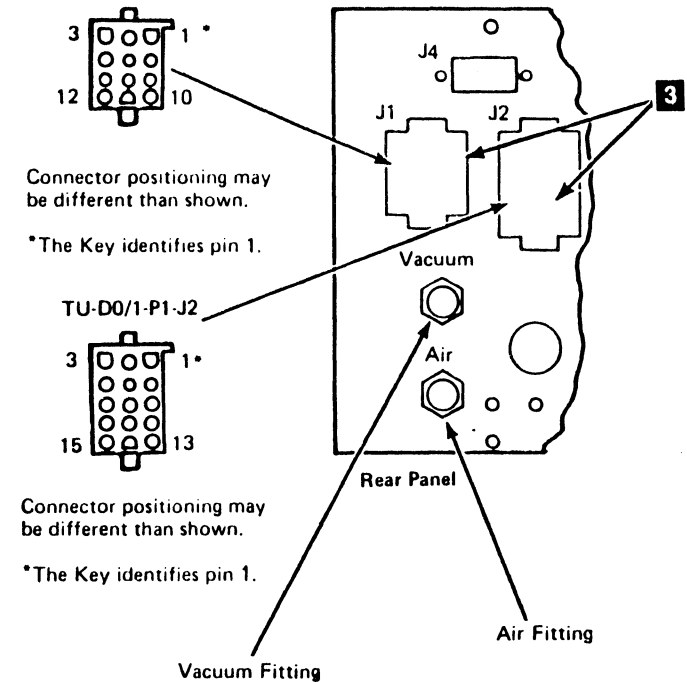
*The Key identifies pin 1.

TU-D0/1-P1-J2



Connector positioning may be different than shown.

*The Key identifies pin 1.



FRU080 Tape Unit DC Power Distribution Cable Removal and Replacement Procedure

Drive **CARR-DR 800**

Tape Unit With BM 6460006 (see CARR-DR 9)

This page contains the steps needed to remove and replace the tape unit dc power distribution cable. All power will be removed from the tape unit except the ac power box which serves as a feedthrough for other tape units attached to the same control unit.

Since there is only one tape unit dc power distribution cable, it is necessary to have both drives available for service.

Note: This FRU can be removed and replaced without affecting the other tape units by removing power from the failing tape unit with the ac power circuit breaker.

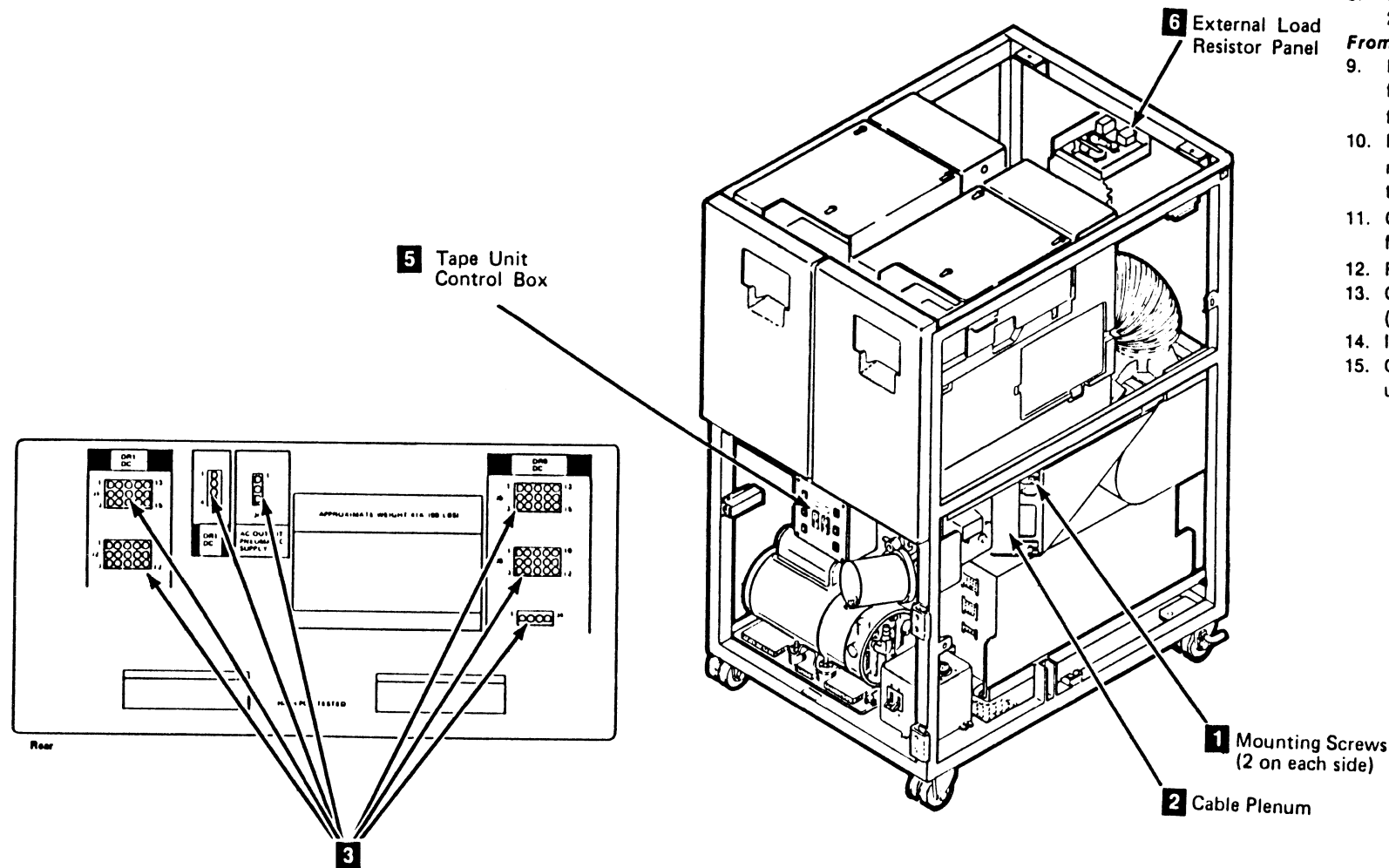
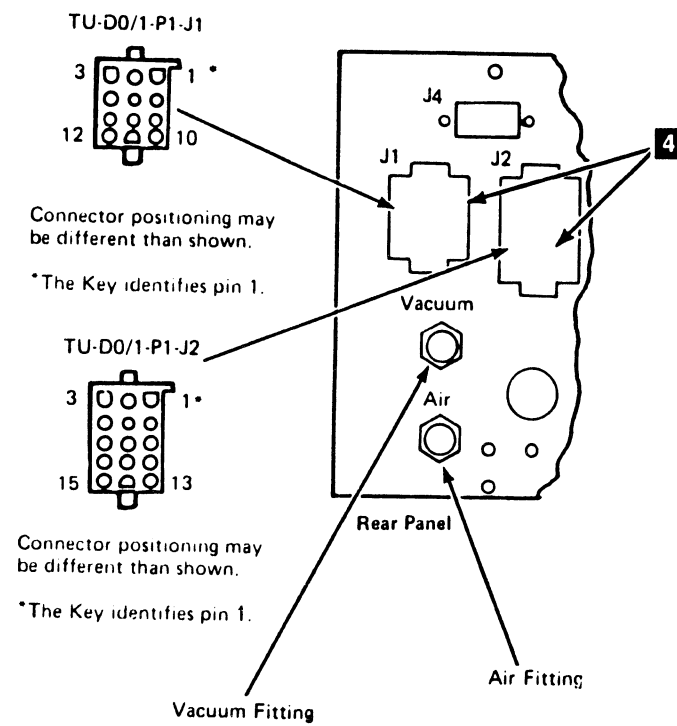
Removing the Tape Unit DC Power Distribution Cable

1. Go to CARR-DR 8 for the procedure to **power off** the tape unit.
2. **From the front of the tape unit:**
3. Remove the tape unit front safety cover (see CARR-DR 2-1).
4. Disconnect cable plugs P8 and P9 from connectors J8 and J9 (located on the left side of the tape unit control box).
5. Loosen the two mounting screws and remove the tape unit control box **5** from the tape unit.
6. Disconnect cable plugs P1, P2, P3, P5, P6, and P7 **3** from the front of the dc power supply (TU-PS-01).
7. Loosen the two screws **1** holding the left front of the cable plenum.
8. Open the left front of the cable plenum **2** and push the cable connectors through toward the rear of the tape unit. Ensure that the R/W cables and the thermal cable (attached to the inside of the cable plenum) are not disconnected or damaged.

- From the rear of the tape unit:**
9. Open and remove the rear cover and ground connector (see CARR-DR 2-1).
 10. Remove the convoluted bellows for drive 0 (see CARR-DR 2230) for easier access to the cable assemblies.
 11. Disconnect cable plug P10 from connector J10 located on the bottom of the external load resistor panel **6** (cable support bracket, if the tape unit has power supply part number 6177166 or 6177167 installed).
 12. Disconnect cable plugs P1, P2, and P4 (located on the rear panels of drive 0 and drive 1 **4**).
 13. Unlace the cables from the pneumatic hoses (to the drives) and remove the cable clamps.
 14. Remove the dc power distribution cable from the tape unit by guiding the front cable connectors over the cable plenum and out the rear of the tape unit.

Replacing the Tape Unit DC Power Distribution Cable

- From the rear of the drive unit:**
1. Place the dc power distribution cable in the tape unit by routing the front cable connectors (cable plugs P1, P2, P3, P5, P6 and P7) over the cable plenum to the front of the power supply (TU-PS-01).
 2. Connect cable plug P10 into connector J10 located on the bottom of the external load resistor panel **6** (cable support bracket, if the tape unit has power supply part number 6177166 or 6177167 installed).
 3. Connect the cable clamps.
 4. Connect the cable plugs 0P1, 0P2 and 0P4 into the rear panel of drive 0 **4**.
 5. Connect the cable plugs 1P1, 1P2, and 1P4 into the rear panel of drive 1 **4**.
 6. Lace the cables to the pneumatic hoses for each drive.
 7. Replace the convoluted bellows in drive 0 (see CARR-DR 2230).
 8. Replace the rear cover and ground connector (see CARR-DR 2-2). Close the rear cover.
- From the front of the tape unit:**
9. Route the front cable connectors around the left end of the front cable plenum. Place the cable in the access hole in the front of the cable plenum **2**.
 10. Replace the front of the cable plenum and tighten the two mounting screws **1**. Ensure that the R/W cables and the thermal cable are correctly positioned.
 11. Connect cable plugs P1, P2, P3, P5, P6, and P7 **3** into the front of the dc power supply.
 12. Replace the tape unit control box **5** in the tape unit.
 13. Connect cable plugs P8 and P9 into connectors J8 and J9 (located on the left side of the tape unit control box).
 14. Install the tape unit front safety cover (see CARR-DR 2-2).
 15. Go to CARR-DR 8 for the procedure to **power on** the tape unit.



FRU080 DC Power Distribution Cable Removal and Replacement Procedure

Tape Unit Without BM 6460006 (see CARR-DR 9)

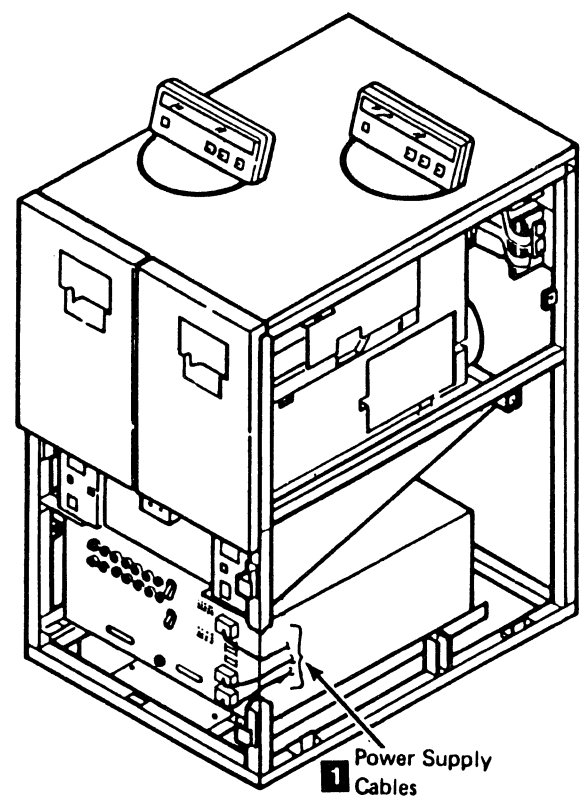
This page contains the steps needed to remove and replace the dc power distribution cable. All power will be removed from the tape unit except the ac power box which serves as a feedthrough for other tape units attached to the same control unit.

Since there is only one power distribution cable, it is necessary to have both drives available for service.

Note: This FRU can be removed and replaced without affecting the other tape units by removing power from the failing tape unit with the ac power circuit breaker.

Removing the DC Power Distribution Cable

1. Go to CARR-DR 8 for the procedure to **power off** the tape unit.



From the front of the tape unit:

2. Open the tape unit front cover and remove the safety cover and ground connector (see CARR-DR 2-3).
3. Unplug power supply cables J12, J13, and J14 **1** from the front of the dc power supply (TU-PS-01).
4. Carefully remove cables J12, J13, and J14 by routing them past the right side of the dc power supply and to the rear of the tape unit.

From the rear of the tape unit:

5. Open the rear cover and remove the rear safety cover and ground connector (see CARR-DR 2-3).
6. Unplug cables P1, P2, P3, P5, P6, and P7 **2** from the rear of the dc power supply.
7. Carefully remove the dc cable harness and connectors from between the pump motor assembly and the rear of the dc power supply.
8. Unplug the cables from the rear of the drive panels TU-D0-P1-J1, TU-D0-P2-J2, TU-D1-P1-J1, TU-D1-P2-J2 **3**.
9. Unplug cables J3 and J7 **4** from the external load resistor panel.
10. Remove the dc power distribution cable from the tape unit by guiding the cable connectors over the pump motor assembly and out the rear of the tape unit.

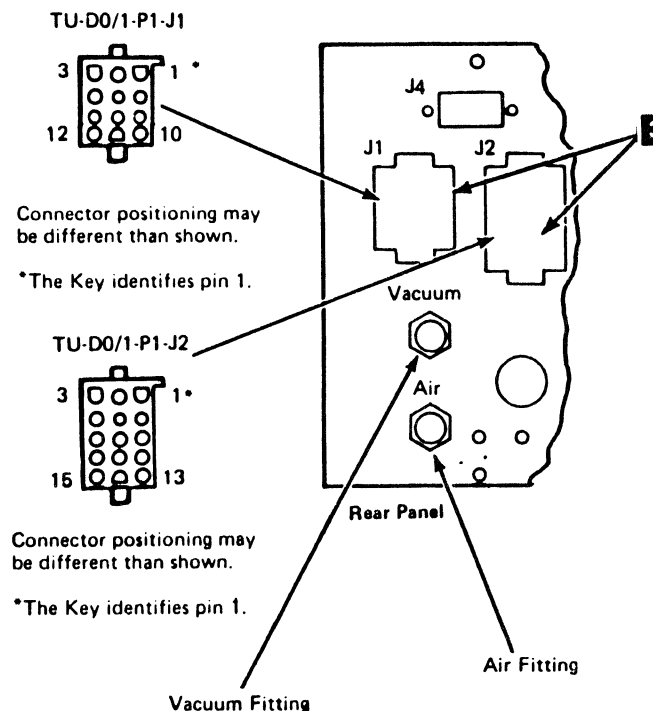
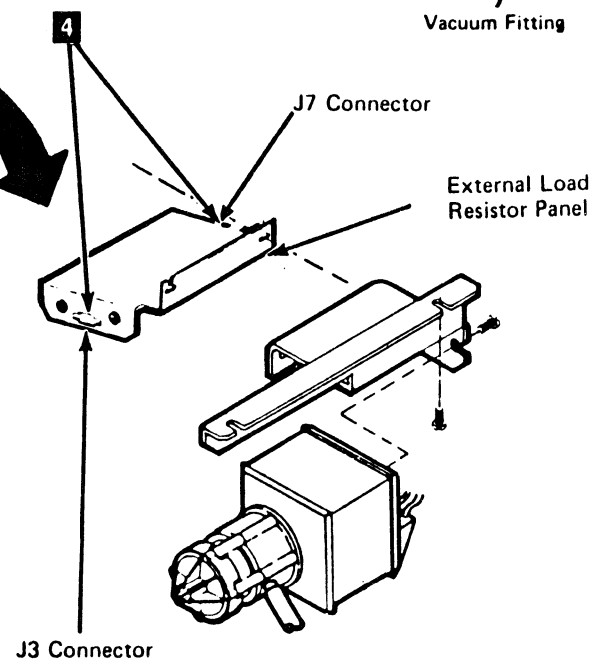
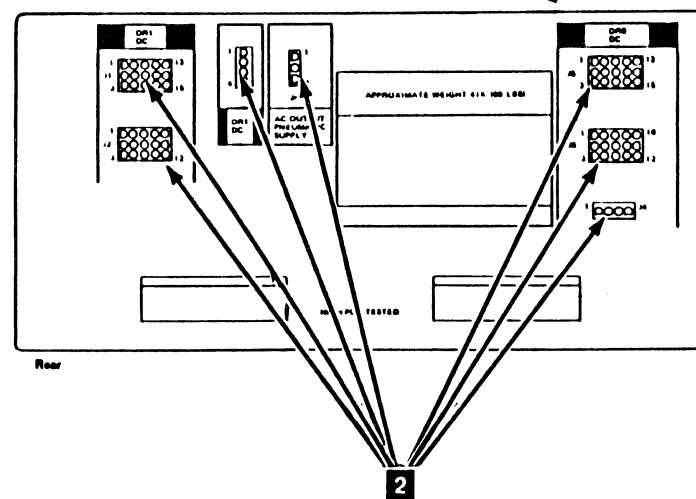
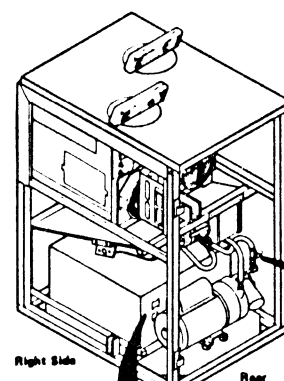
Replacing the DC Power Distribution Cable

From the rear of the tape unit:

1. Replace the dc power distribution cable into the tape unit by guiding the cable connectors over the pump motor assembly and toward the front of the tape unit.
2. Connect cables J3 and J7 **4** into the external load resistor panel.
3. Connect the cables into the rear of the drive panels TU-P1-J1, and TU-P1-J2, TU-P2-J1, and TU-P2-J2 **3**.
4. Carefully route the dc cable harness and connectors between the pump motor assembly and the rear of the dc power supply.
5. Connect cables P1, P2, P3, P5, P6, and P7 **2** into the rear of the dc power supply (TU-PS-01).
6. Install the rear safety cover and ground connector (see CARR-DR 2-4) and close the rear cover.

From the front of the tape unit:

1. Carefully route cables J12, J13, and J14 past the right side of the dc power supply and to the front of the tape unit.
2. Connect power supply cables J12, J13, and J14 **1** to the front of the dc power supply.
3. Install the tape unit front safety cover and ground connector (see CARR-DR 2-4) and close the front cover.
4. Go to CARR-DR 8 for the procedure to **power on** the tape unit.



FRU081 Tachometer Sensor Cable Removal and Replacement Procedure

Tape Unit With EC 333293 (see CARR-DR 4)

This page contains the steps needed to remove the drive tachometer sensor cable from the drive. Refer to LOC 1 for a diagram of the tachometer sensor cable.

This page will not cover removal of any of the deck assembly. To find out how to remove a specific assembly, refer to the index, or to the "Removal/Replacement Procedures by FRU Number" beginning on CARR-DR 1-1.

Note: This FRU can be removed and replaced without affecting the other drive by removing power from the failing drive with the Drive Power On/Off switch.

Removing the Tachometer Sensor Cable

1. Go to CARR-DR 8 for the procedure to **power off** the drive.
2. Open the drive drawer **1** for the drive being serviced.
3. Remove the drive safety cover (see CARR-DR 2-5).
4. Remove the two rear panel screws **2** and the rear panel cover.
5. Remove the drive drawer front cover (see CARR-DR 2-1).
6. Remove cable connector J4 from the inside of the rear panel.
7. Remove the drive physical address switch connector **12** from the inside of the rear panel.
8. Disconnect the wires from the pressure sensor **5** (see CARR-DR 400).

9. Go to CARR-DR 2250 and CARR-DR 2260 and do the procedures to remove the tachometer A and B **3** sensors.
10. Disconnect the cable from the file reel motor tachometer sensor (see CARR-DR 30).
11. Disconnect the cable connector from the file protect switch (see CARR-DR 90) and remove the pin at position 1 of the J3 connector block.

Note: This lead is part of the tachometer sensor cable being replaced. The J3 connector block and other leads are part of the internal dc distribution cable.

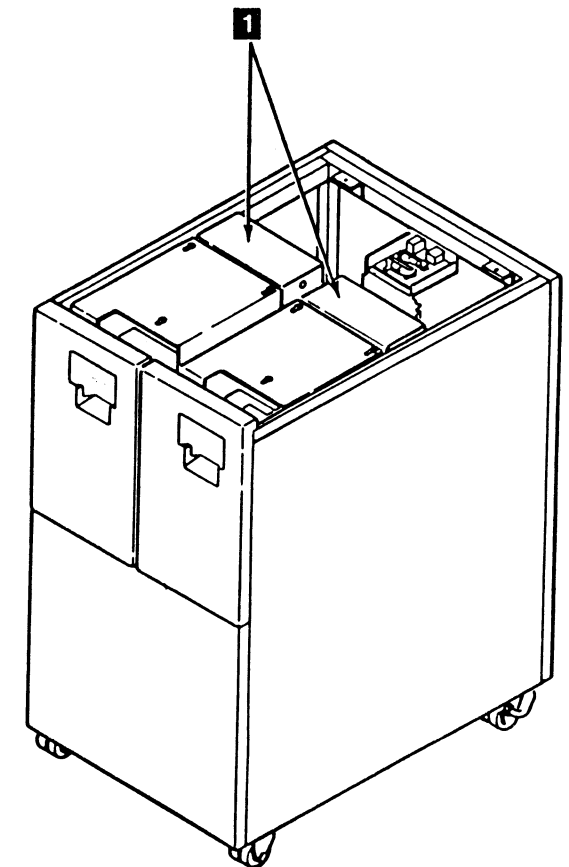
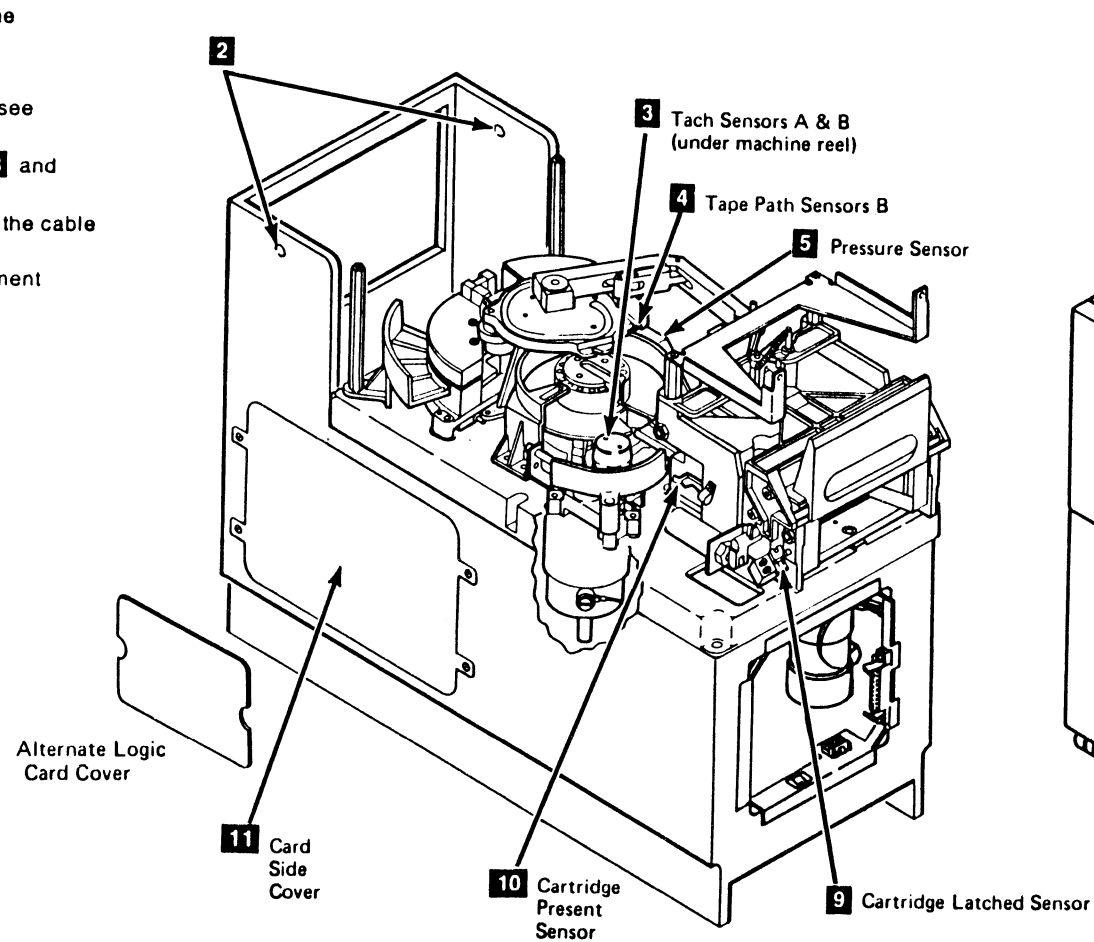
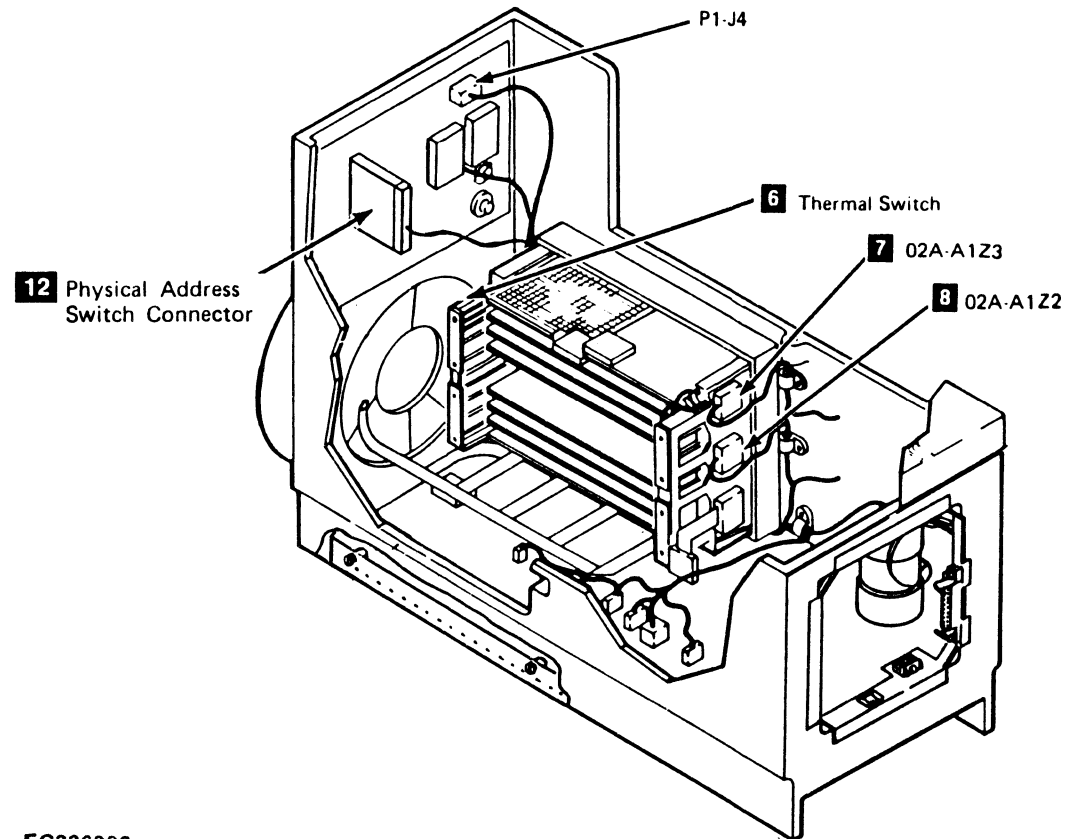
12. Disconnect the cable from tape path sensor A (see CARR-DR 60).
13. Disconnect the cable from tape path sensor B **4** (see CARR-DR 70).
14. Loosen the setscrew holding the connector and disconnect the cable from the cartridge present sensor **10** (see CARR-DR 100).
15. Loosen the screw and disconnect the cable from the cartridge latch sensor **9** (see CARR-DR 110).
16. Remove the card side cover **11**.
17. Disconnect the cable from the thermal switch **6** (see CARR-DR 1100).
18. Remove the flat cables from positions 02A-A1Z2 **8** and 02A-A1Z3 **7**.
19. Remove the cable retention hardware and remove the cable from the drive.
20. Save the cable retention hardware for the replacement procedure.

Replacing the Tachometer Sensor Cable

Refer to LOC 1 for a diagram of the tachometer sensor cable.

1. Replace the cable retention hardware as the cable is installed in the drive.
2. Connect the cable to the thermal switch **6** (see CARR-DR 1100).
3. Install the flat cables in positions 02A-A1Z2 **8** and 02A-A1Z3 **7**.
4. Connect the wires to the pressure sensor **5** (see CARR-DR 400).
5. Connect the cables to tachometer sensor A and B **3** (see CARR-DR 2250 and CARR-DR 2260).
6. Connect the cables to the file reel motor tachometer sensor (see CARR-DR 30).

7. Insert the single lead (with connector pin) into position 1 of the J3 connector block; then connect the file protect plug (see CARR-DR 90).
8. Connect the cable to the tape path sensor A (see CARR-DR 60).
9. Connect the cable to the tape path sensor B **4** (see CARR-DR 70).
10. Connect the cable to the cartridge present sensor **10**.
11. Connect the cable to the cartridge latched sensor **9**.
12. Install the cable connector J4 inside the rear panel.
13. Install the drive physical address switch connector **12**.
14. Install the rear panel cover and mounting screws **2**.
15. Install the card side cover **11**.
16. Install the drive drawer safety cover (see CARR-DR 2-5).
17. Install front drive drawer cover (see CARR-DR 2-2).
18. Close the drive drawer **1**.
19. Go to CARR-DR 8 for the procedure to **power on** the drive.



Drive CARR-DR 810

FRU081 Tachometer Sensor Cable Removal and Replacement Procedure

Tape Unit Without EC333293 (see CARR-DR 4)

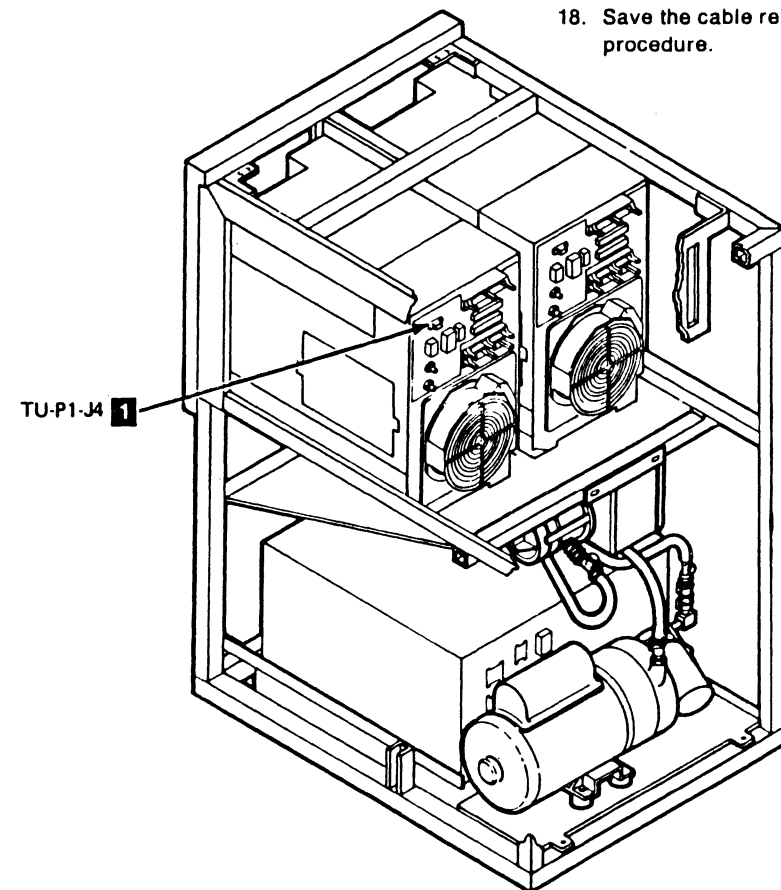
This page contains the steps needed to remove and replace the drive tachometer sensor cable in the drive. Refer to LOC 1 for a diagram of the tachometer sensor cable.

This page will not cover removal of any of the deck assemblies. To find out how to remove a specific assembly, refer to the index, or to the "Removal/Replacement Procedures by FRU Number" beginning on CARR-DR 1-1.

Note: This FRU can be removed and replaced without affecting the other drive by removing power from the failing drive with the Drive Power On/Off switch.

Removing the Tachometer Sensor Cable

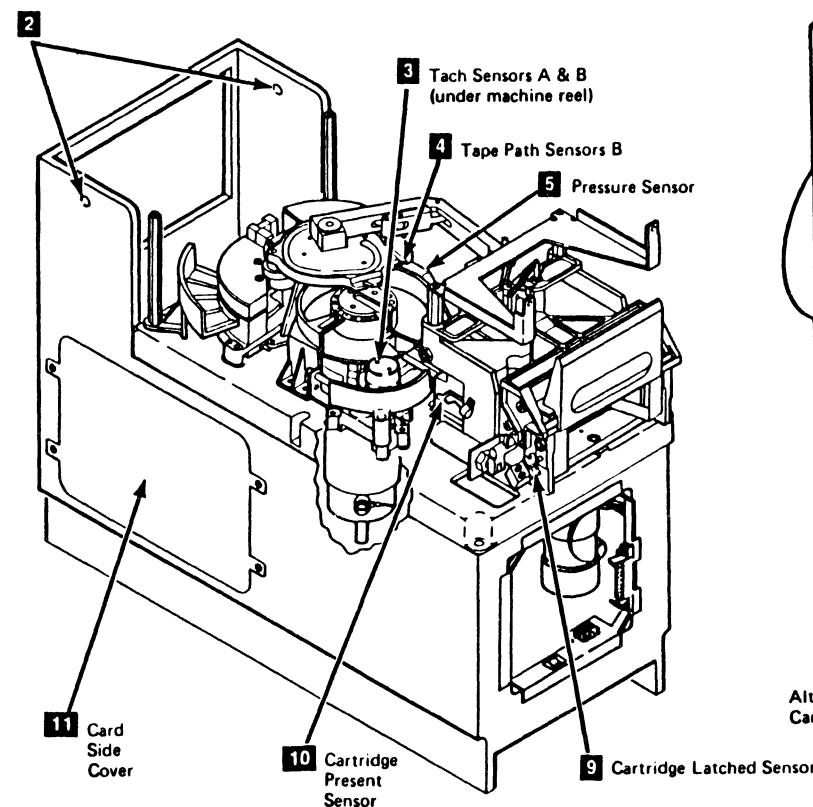
1. Go to CARR-DR 8 for the procedure to **power off** the drive.
2. Disconnect the cable from the rear panel connector P1-J4 **1** on the drive being serviced.
3. Open the drive drawer and remove the drive drawer safety cover (see CARR-DR 2-5).
4. Remove the two rear panel screws **2**. Disconnect the cable from the physical address switch and remove the rear panel cover.
5. Remove cable connector P1-J4 from the inside of the rear panel.



6. Disconnect the wires from the pressure sensor **5** (see CARR-DR 400).
7. Disconnect the cables from tachometer A and B **3** (see CARR-DR 2250 and CARR-DR 2260).
8. Disconnect the cable from the file reel motor tachometer sensor (see CARR-DR 30).
9. Disconnect the cable connector from the file protect switch (see CARR-DR 90) and remove the pin at position 1 of the J3 connector block.

Note: This lead is part of the tachometer sensor cable being replaced. The J3 connector block and other leads are part of the internal dc distribution cable.

10. Disconnect the cable from tape path sensor A (see CARR-DR 60).
11. Disconnect the cable from tape path sensor B **4** (see CARR-DR 70).
12. Disconnect the cable from the cartridge present sensor **10** (see CARR-DR 100).
13. Disconnect the cable from the cartridge latch sensor **9** (see CARR-DR 110).
14. Remove the four screws from the card side cover **11**.
15. Remove the thermal switch **6** from the card guide.
16. Remove the flat cables from positions 02A-A1Z3 **7** and 02A-A1Z2 **8**.
17. Remove the cable retention hardware and remove the cable from the drive.
18. Save the cable retention hardware for the replacement procedure.

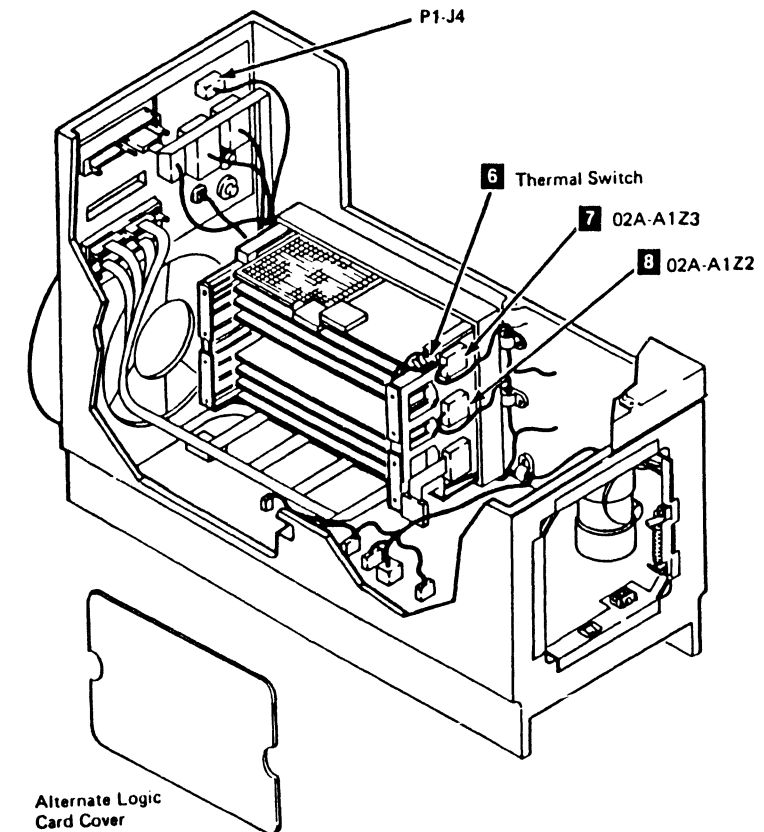


Replacing the Tachometer Sensor Cable

Refer to LOC 1 for a diagram of the tachometer sensor cable.

1. Replace the cable retention hardware as the cable is installed in the drive.
2. Install the thermal switch **6** on the card guide.
3. Install the flat cables in positions 02A-A1Z3 **7** and 02A-A1Z2 **8**.
4. Replace the card side cover **11** and the four mounting screws.
5. Connect the wires to the pressure sensor **5** (see CARR-DR 400).
6. Connect the cables to tachometer sensor A and B **3** (see CARR-DR 2250 and CARR-DR 2260).
7. Connect the cables to the file reel tachometer sensor (see CARR-DR 30).

8. Insert the single lead (with connector pin) into position 1 of the J3 connector block; then connect the file protect plug (see CARR-DR 90).
9. Connect the cable to the tape path sensor A (see CARR-DR 60).
10. Connect the cable to the tape path sensor B **4** (see CARR-DR 70).
11. Connect the cable to the cartridge present sensor **10** (see CARR-DR 100).
12. Connect the cable to the cartridge latched sensor **9** (see CARR-DR 110).
13. Install the cable connector P1-J4 inside the rear panel.
14. Connect the cable to the physical address switch; then replace the rear panel cover and mounting screws **2**.
15. Install the drive drawer safety cover (see CARR-DR 2-5).
16. Connect the cable to the rear panel connector on P1-J4 **1** on the drive being serviced.
17. Install the drive drawer front cover (see CARR-DR 2-2) and close the drive drawer.
18. Go to CARR-DR 8 for the procedure to **power on** the drive.



FRU082 Tape Unit Thermal Switch Removal and Replacement Procedure

Drive **CARR-DR 820**

Tape Unit With BM 6460006 (see CARR-DR 9)

This page contains the steps needed to remove and replace the tape unit thermal switch (TU-Thermal Switch (S-2)). Since this procedure requires the ac voltage to be off, it is necessary to have all drives attached to the control unit, and the control unit, available for service.

Note: This FRU removal and replacement requires the ac power to be removed from the control unit and all attached tape units with the control unit ac power circuit breaker.

Removing the Tape Unit Thermal Switch

1. Go to CARR-CU 6 for the procedure to remove the *ac power* from the control unit.

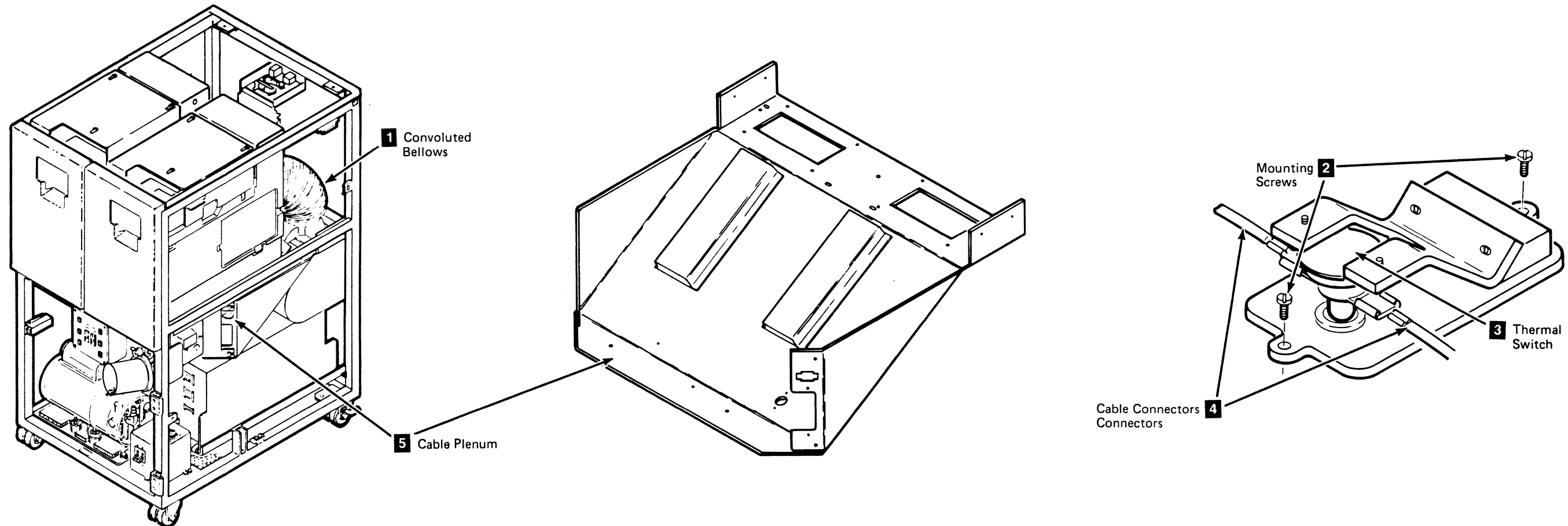
The thermal switch **3** for each tape unit is located on top of the cable plenum **5** under the drive 1 drawer.

2. Open and remove the rear tape unit cover (see CARR-DR 2-1).
3. Remove the convoluted bellows **1** from drive 1 of the affected unit (see CARR-DR 2230).

4. Open drive 1 drawer as far as possible.
5. Unplug the cable connectors **4** from the thermal switch **3**.
6. Remove the two mounting screws **2** and remove the thermal switch **3** from the cable plenum.
7. Save the two thermal switch mounting screws **2** for the replacement procedure.

Replacing the Tape Unit Thermal Switch

1. Install the tape unit thermal switch on the cable plenum **5** using the two screws saved from the removal procedure.
2. Connect the cable to the thermal switch **3** using the two slip on connectors **4**.
3. Close drive 1 drawer.
4. Replace the convoluted bellows **1** (see CARR 2230).
5. Close the tape unit rear cover.
6. Go to CARR-CU 6 for the procedure to restore the *ac power* to the control unit.



FRU082 Tape Unit Thermal Switch Removal and Replacement Procedure (Not End Tape Unit)

Drive **CARR-DR 823**

Tape Unit Without BM 6460006 (see CARR-DR 9)

If This is the End Tape Unit - Go To CARR-DR 825

This page contains the steps needed to remove and replace the thermal switch (TU-Thermal Switch (S-2)) from any tape unit that is not the end tape unit. Since this procedure requires the ac voltage to be switched off, it is necessary to have all drives attached to the control unit available for service.

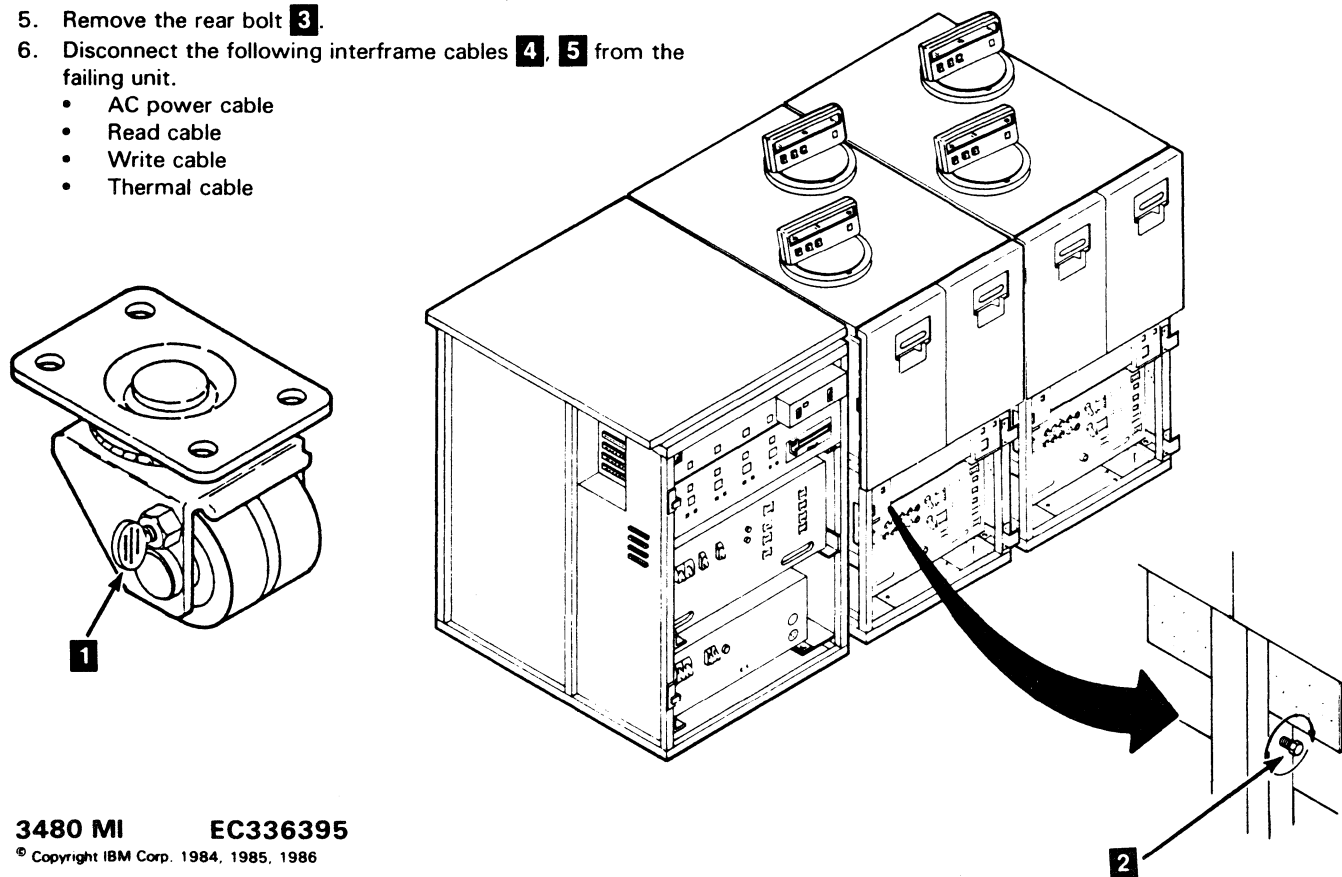
Note: This FRU removal and replacement requires the ac power to be removed from the control unit and all attached tape units with the control unit ac power circuit breaker.

Removing the Tape Unit Thermal Switch (Not End Tape Unit)

This procedure is for any tape unit attached to the control unit except the end tape unit.

After you have determined the failing tape unit, you must disconnect all tape units to the right (viewed from the front) of the failing unit.

1. Go to CARR-CU 6 for the procedure to remove the **ac power** from the control unit.
- On the tape unit to the right of the failing unit:
2. Remove the front cover (see CARR-DR 2-3).
3. Remove the front bolt **2**.
4. Remove the rear cover (see CARR-DR 2-3).
5. Remove the rear bolt **3**.
6. Disconnect the following interframe cables **4, 5** from the failing unit.
 - AC power cable
 - Read cable
 - Write cable
 - Thermal cable



- On all tape units to the right of the failing unit:
7. Unlock the castors **1** on all tape units to be moved (see INST 10).
 8. Move the disconnected units to get working access to the right side of the failing unit; obtain assistance if necessary.

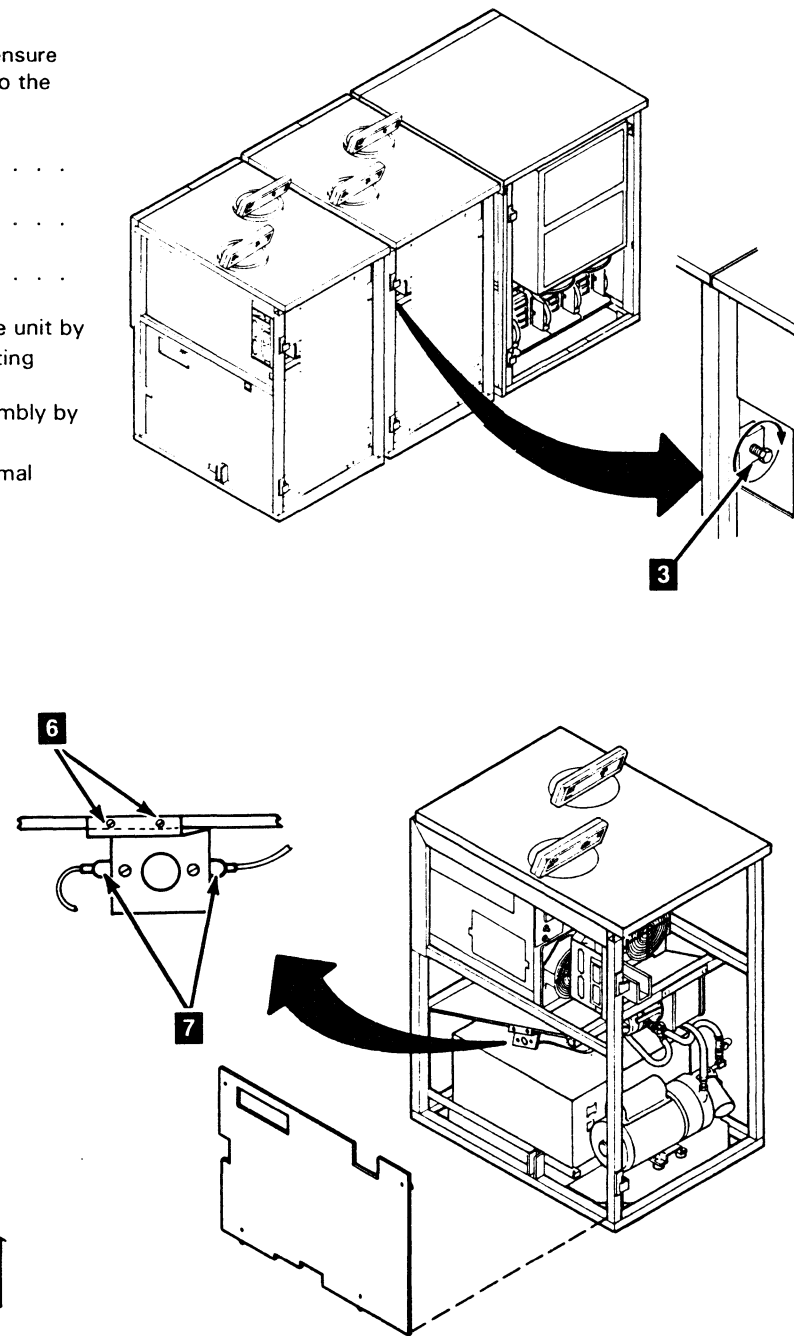
- On the failing tape unit:
9. Remove the front and rear covers (see CARR-DR 2-3).
 10. Remove the lower right-side subframe cover and ground connector.

Do not remove the AC power receptacle from the cover. There is enough slack in the cable to move the cover for work access.

- a. Loosen and slide the top (right and left) brackets toward the center of the cover.
- b. Lift the cover up and out of the tape unit.

Warning: Cover the top of the power supply to ensure that no parts can be dropped through the cover into the power supply.

11. Remove the thermal switch assembly from the tape unit by removing the two screws **6** connecting the mounting bracket to the baffle.
12. Disconnect the thermal switch from the cable assembly by removing the two cable connectors **7**.
13. Save the two screws **6** for installing the new thermal switch assembly.



Replacing the Tape Unit Thermal Switch (Not End Tape Unit)

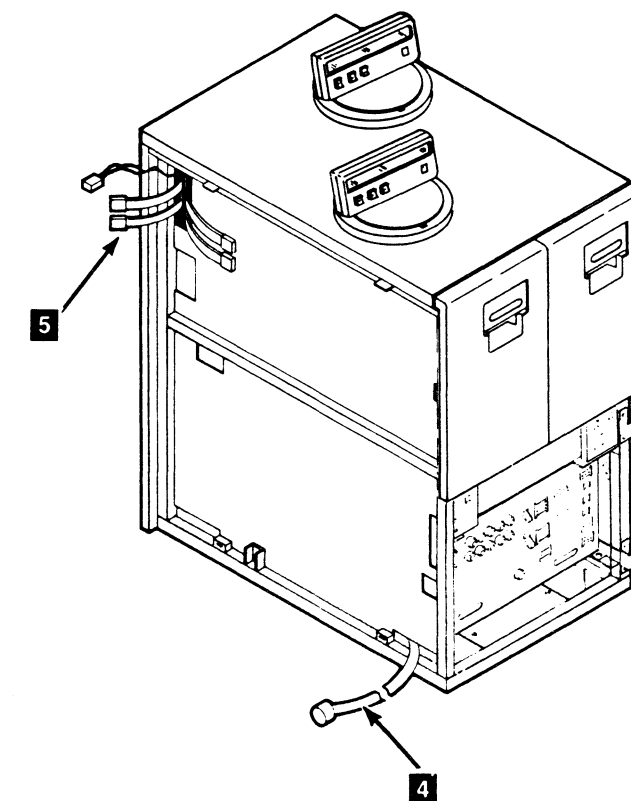
1. Connect the thermal switch to the cable assembly using the two slip on connectors **7**.
2. Install the tape unit thermal switch assembly on the baffle **6** using the two screws saved from the removal procedure.
3. Remove the drop cover from the top of the power supply.
4. Replace the lower right-side cover and ground connector.
 - a. Slide the top (right and left) brackets into the position holes in the machine frame.
 - b. Tighten the brackets.
 - c. Reconnect the ground connector to the cover.

5. Move the disconnected units in position to be reconnected; obtain assistance if necessary.

CAUTION

When connecting two B boxes together with the automatic cartridge loader feature installed on any drive, the drive must be opened approximately 5 cm (2 in.) to prevent the conductive seal from being pinched between the tape unit frames.

6. Connect the following interframe cables: **4, 5**.
 - AC power cable
 - Read cable
 - Write cable
 - Thermal cable
 7. Replace the front bolt **2**.
 8. Replace the front cover and front safety cover (see CARR-DR 2-3).
 9. Replace the rear bolt **3**.
 10. Replace the rear cover and safety cover (see CARR-DR 2-3).
 11. Lock the castors **1** on all tape units that were moved. (see INST 10).
- On the tape unit just repaired:
12. Replace the front and rear covers (see CARR-DR 2-3).
 13. Go to CARR-CU 6 for the procedure to restore the **ac power** to the control unit.



Drive **CARR-DR 823**

FRU082 Tape Unit Thermal Switch Removal and Replacement Procedure (End Tape Unit)

Drive **CARR-DR 825**

Tape Unit Without BM 6460006 (see CARR-DR 9)

If This Is Not the End Tape Unit - Go To CARR-DR 823

This page contains the steps needed to remove the tape unit thermal switch (TU-Thermal Switch (S-2)) from the end tape unit. Since this procedure requires the ac voltage to be off, it is necessary to have all drives attached to the control unit, and the control unit, available for service.

Note: This FRU removal and replacement requires the ac power to be removed from the control unit and all attached tape units with the control unit ac power circuit breaker.

Removing the Tape Unit Thermal Switch (End Tape Unit)

This procedure is only for the end tape unit attached to the control unit.

1. Go to CARR-CU 6 for the procedure to remove the **ac power** from the control unit.

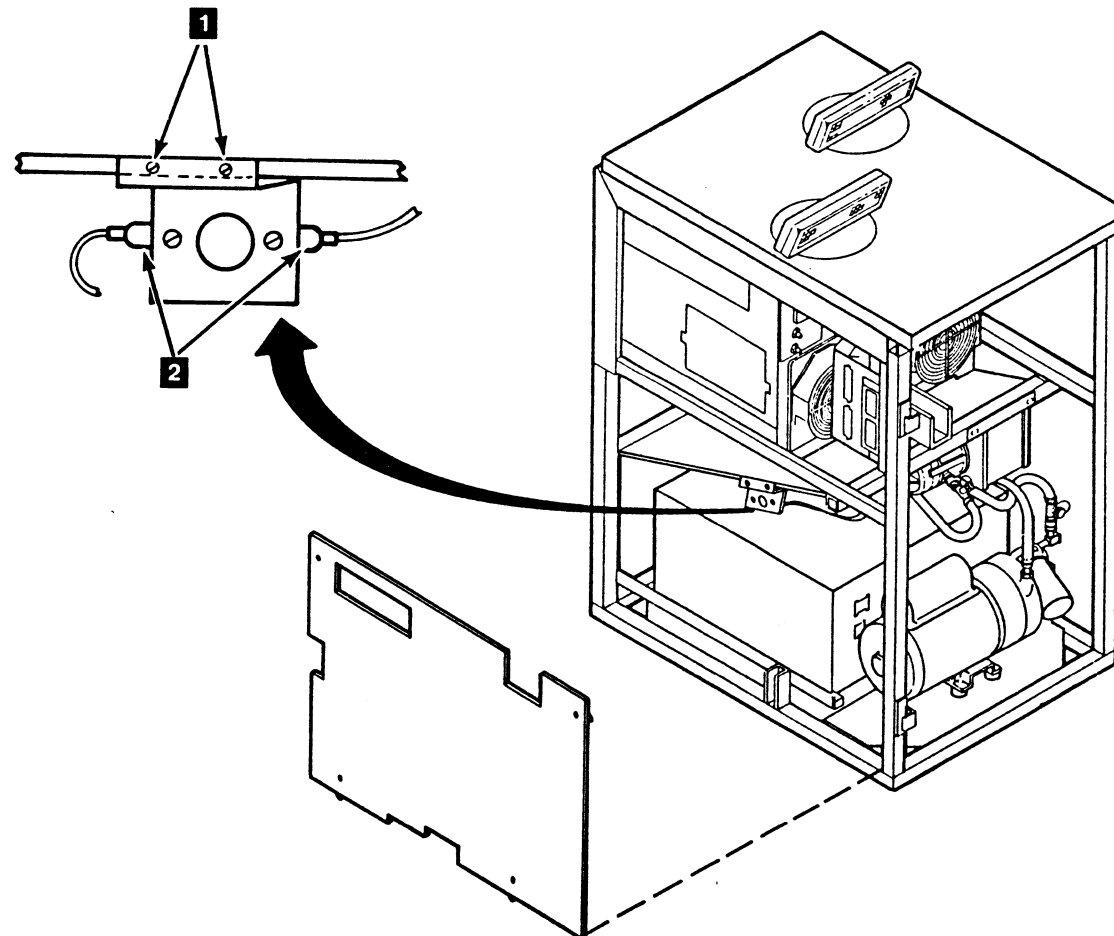
2. Remove the tape unit right side cover (see CARR-DR 2-3).
 3. Remove the tape unit lower right-side cover and ground connector (see CARR-DR 2-3).
Do not remove the AC power receptacle from the cover. There is enough slack in the cable to move the cover for work access.
 - a. Loosen and slide the top (right and left) brackets toward the center of the cover.
 - b. Lift the cover up and out of the tape unit.
- Warning:** Cover the top of the power supply to ensure that no parts are dropped through the cover into the power supply.
-
-
-

4. Remove the thermal switch assembly from the tape unit by removing the two screws **1** connecting the mounting bracket to the baffle.
5. Disconnect the thermal switch from the cable assembly by removing the two cable connectors **2**.
6. Save the two screws to install the new thermal switch assembly.

Replacing the Tape Unit Thermal Switch (End Tape Unit)

1. Connect the switch to the cable assembly using the two slip on connectors **2**.
2. Replace the tape unit thermal switch on the baffle **1** using the two screws saved from the removal procedure.
3. Remove the drop cover from the top of the power supply.

4. Replace the lower right-side cover:
 - a. Position the two bottom cover brackets into the locating holes in the bottom side frame.
 - b. Slide the top (right and left) brackets into the locating holes in the side frames; tighten the brackets.
 - c. Reconnect the ground connector to the cover.
 - d. Go to CARR-CU 6 for the procedure to restore the **ac power** to the control unit.
5. Replace the tape unit right side cover (see CARR-DR 2-3).



Tape Unit With BM 6460006 (see CARR-DR 9)

This page contains the steps needed to remove and replace the thermal switch cable harness in the tape unit.

Since this procedure requires the ac voltage to be switched off, it is necessary to have all tape units attached to the control unit, and the control unit, available for service.

Note: This FRU removal and replacement requires the ac power to be removed from the control unit and all attached tape units with the control unit ac power circuit breaker.

Removing the Tape Unit Thermal Switch Cable Harness

After you have determined the tape unit containing the failing thermal switch cable harness, proceed as follows:

1. Go to CARR-CU 6 for the procedure to remove the *ac power* from the control unit.
2. Remove the tape unit top cover (see CARR-DR 2-8) for easier access to cables and connectors.
3. If this is the end tape unit, remove the right side cover (see CARR-DR 2-1). If this is not the end tape unit, open the front cover and remove the front safety cover (see CARR-DR 2-1) for the tape unit to the right of the failing unit.
4. Remove the convoluted bellows **7** from both drives (see CARR-DR 2230).
5. Position both drive drawers all the way open (see CARR-DR 2-1).

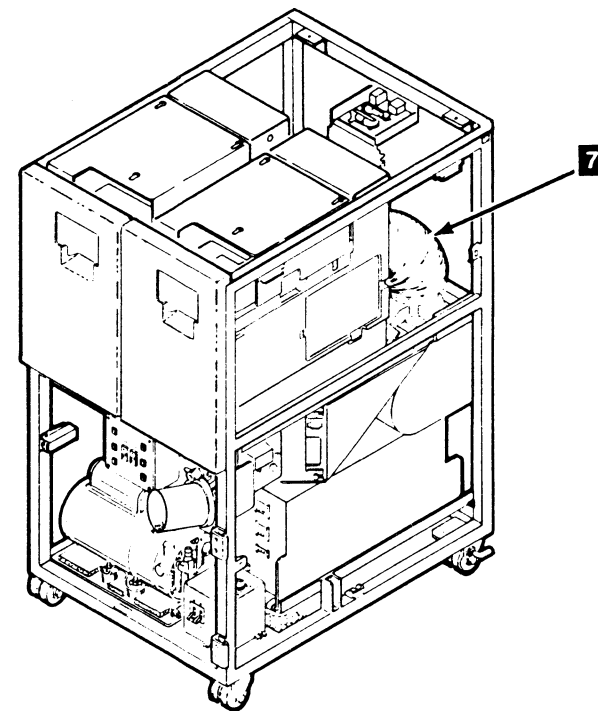
6. Remove the tape unit front cover (see CARR-DR 2-1).
7. Remove the tape unit front safety cover (see CARR-DR 2-1).
8. Disconnect the thermal switch cable plug P1 **6** from the interframe connector panel in the tape unit or control unit to the left (as viewed from the front of the tape unit).
9. Loosen, but do not remove, the two screws **5** on the front of the cable plenum **1**.

This will provide an opening for the removal of the thermal cable connector.

10. Put the thermal cable and connector through the opening in the cable mounting plate and toward the rear of the tape unit.
11. Disconnect the thermal switch cable harness from the tape unit to the right of the failing tape unit (as viewed from the front, if present).

Note: This will be a jumper if the failing tape unit is the end tape unit connected to a control unit. Save the jumper for the replacement procedure.

12. Press the retention fingers and remove the thermal switch cable connector J1 **2** from the interframe connector panel **3**.
13. Remove the two cable connectors from the thermal switch **4**.
14. Remove the thermal switch cable harness from the cable plenum **1** and out the rear of the tape unit.



Replacing the Tape Unit Thermal Switch Cable Harness

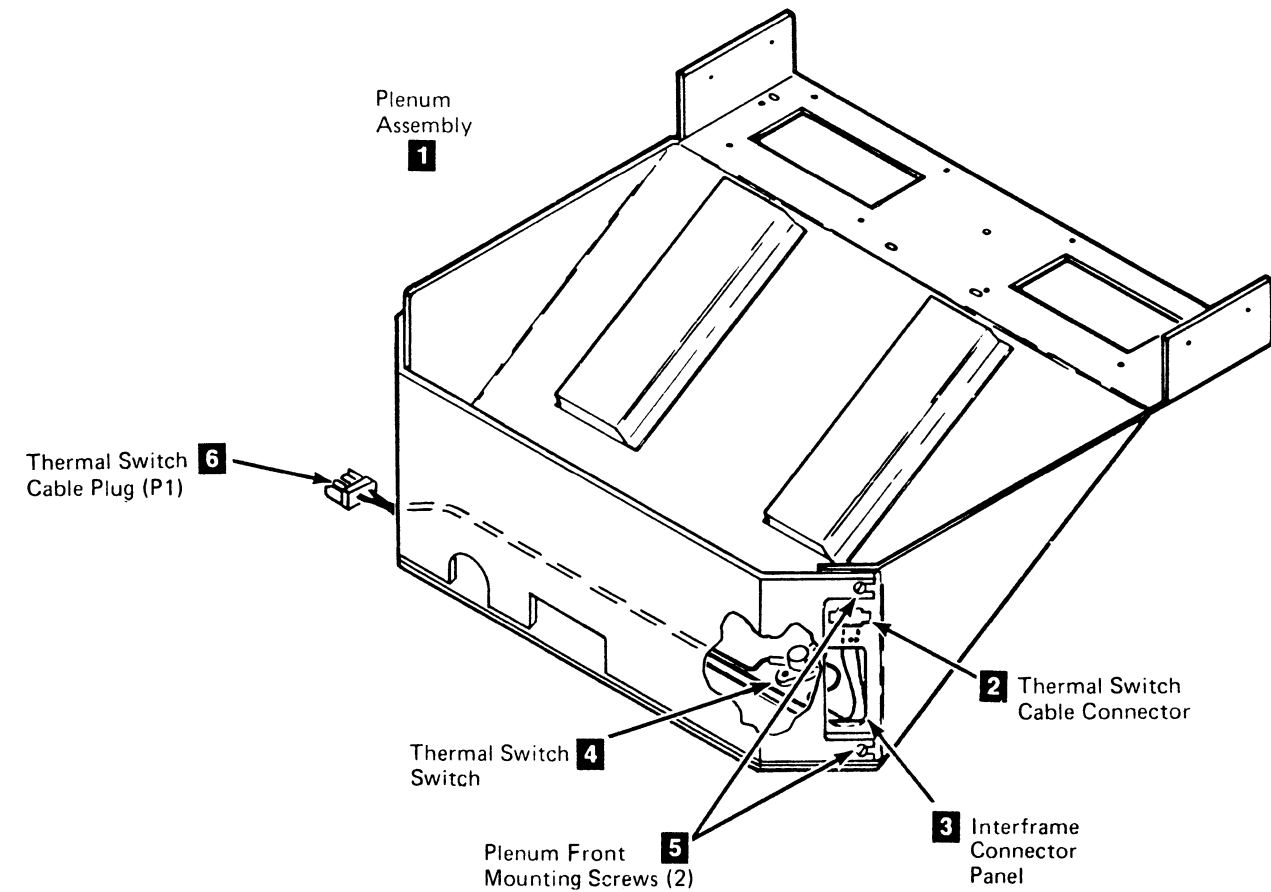
From the rear of the tape unit:

1. Insert the J1 connector of the cable harness into its opening in the interframe connector panel **3**.
2. Connect the two cable harness connectors to the thermal switch **4**.
3. Route the P1 plug **6** end of the cable harness through the opening in the cable plenum at side of the tape toward the control unit.

From the front of the tape unit:

4. Connect the P1 plug **6** of the cable harness into the J1 connector of the adjacent tape unit (on the left) or control unit.
5. Connect the P1 plug **6** of the cable harness from the tape unit to the right (if present) into the J1 connector.

Note: If this is the end tape unit, plug the jumper saved from the removal procedure into the thermal switch cable connector J1 **2**.



6. Tighten the two mounting screws **5** securing the front of the cable plenum assembly **1**.
7. Close both drive drawers and replace the convoluted bellows **7** (see CARR-DR 2230).
8. Install the tape unit front safety cover (see CARR-DR 2-2).
9. Replace the tape unit rear cover (see CARR-DR 2-4).
10. If this is the end tape unit, install the tape unit right side cover (see CARR-DR 2-2). If this is not the end tape unit, install the tape unit front safety cover (see CARR-DR 2-2) for the tape unit to the right.
11. Go to CARR-CU 6 for the procedure to restore the *ac power* to the control unit.

FRU083 Tape Unit Thermal Switch Cable Harness Removal and Replacement Procedure (Not End Tape Unit)

Drive **CARR-DR 833**

Tape Unit Without BM 6460006 (see CARR-DR 9)

If This is the End Tape Unit - Go To CARR-DR 835

This page contains the steps needed to remove the thermal switch cable harness from a tape unit that is not the end tape unit. Since this procedure requires the ac voltage to be switched off, it is necessary to have all drives attached to the control unit available for service.

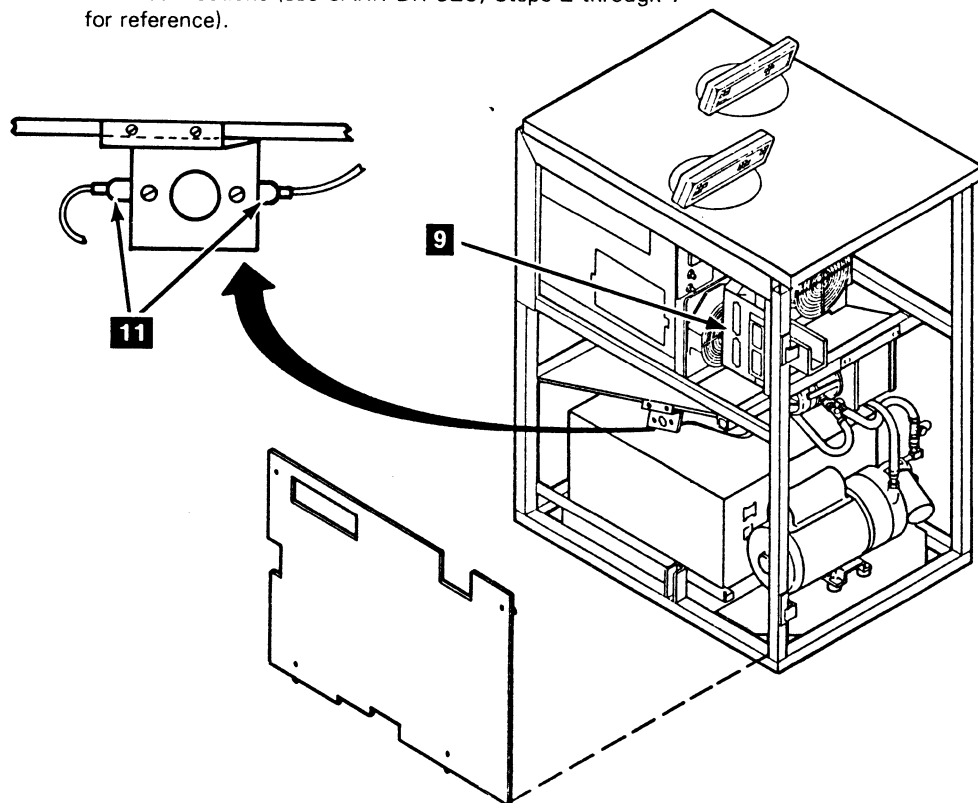
Note: This FRU removal and replacement requires the ac power to be removed from the control unit and all attached tape units with the control unit ac power circuit breaker.

Tape Unit Thermal Switch Cable Harness Removal (Not End Tape Unit)

This procedure is for any tape unit attached to the control unit except the end drive.

After you have determined the failing unit:

1. Go to CARR-CU 6 for the procedure to remove the **ac power** from the control unit.
2. Remove the rear cover (see CARR-DR 2-3).
3. Remove the rear safety cover (see CARR-DR 2-3).
4. Isolate the tape unit for working access to adjacent drive cable connections (see CARR-DR 823, Steps 2 through 7 for reference).



5. Unplug P1 from the left adjacent drive unit. Remove the J1 **10** end of the cable harness from the interframe mounting plate (TU-P2) **9** by pressing the spring retention fingers.
6. Disconnect the cable harness from the thermal switch assembly **11** by removing the two connectors.
7. Unplug P1 from the right adjacent drive unit. Remove the P1 end of the cable harness from the flexible support **8**.
8. Remove the cable from the ferrite assembly **7** as follows:

Note: Read this entire procedure before starting the removal.

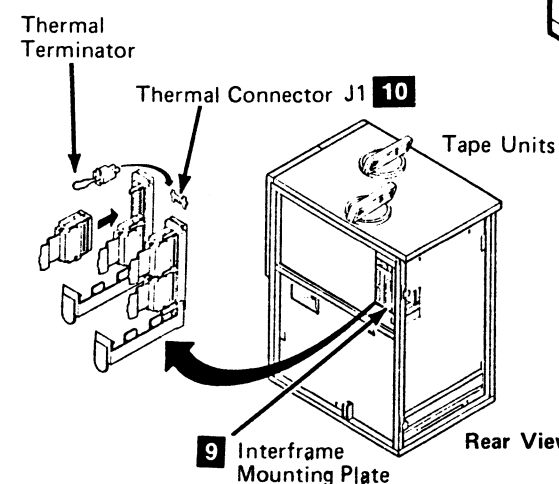
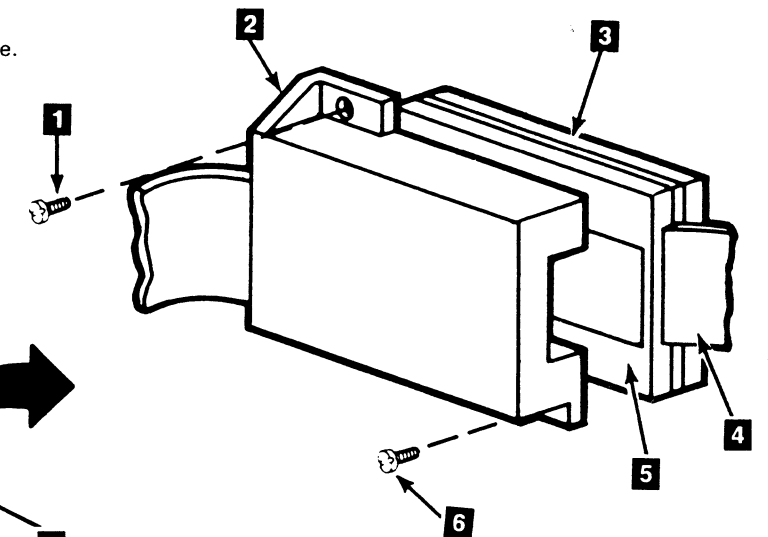
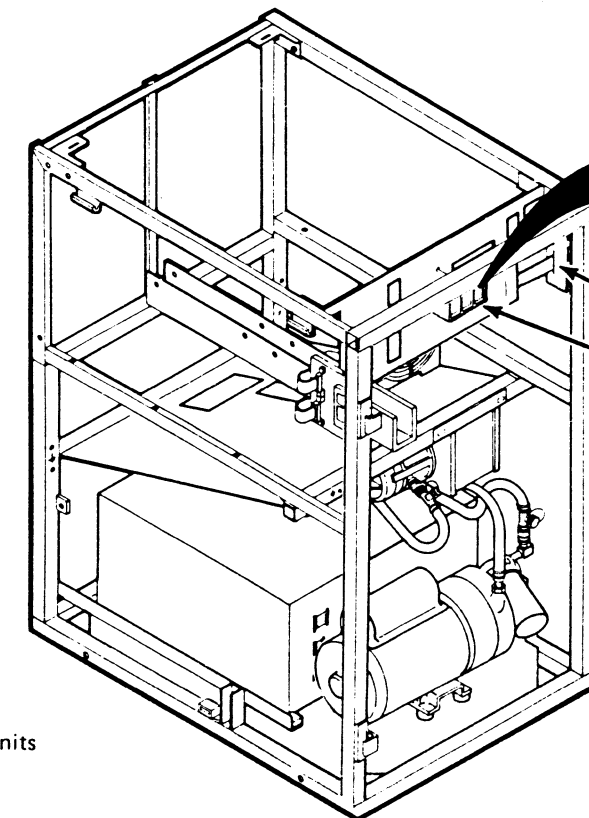
- a. Loosen the bottom mounting screw **6**.
- b. Remove the top mounting screw **1**.
- c. Work the inner ferrite **3** out of the assembly.
- d. Hold the cover **2** and outer ferrite **5** together and remove the bottom mounting screw.

Warning: When the cover is removed the outer ferrite is unsupported, it is fragile and may shatter if dropped.

- e. Remove the cable harness **4** from the ferrite assembly.
- f. Save all the components of the ferrite assembly for the cable replacement procedure.
9. Remove the cable harness from the tape unit.

Tape Unit Thermal Switch Cable Harness Removal (Not End Tape Unit)

1. Route the P1 end of the cable harness through the flexible support **8** at the control unit side of the tape unit near the top rear frame.
2. Insert the P1 connector into the J1 connector (or thermal terminator **10**) of the interframe mounting plate TU-P2 **9** of the adjacent tape unit.
3. Connect the cable harness to the thermal switch **11** with the two connectors.
4. Insert the J1 connector into the interframe mounting plate TU-P2 **9**.
5. Replace the cable harness in the ferrite assembly **7** as follows:
 - a. Assemble the outer ferrite **5** and cover **2**.
 - b. Install the outer ferrite and cover assembly over the cable harness **4** and install the bottom screw **6** loosely.
 - c. Work the inner ferrite **3** between the cables and frame.
 - d. Install the top screw **1**.
 - e. While ensuring the cables are not pinched, tighten the top and bottom screws.



Tape Unit Without BM 6460006 (see CARR-DR 9)

If This Is Not the End Tape Unit - Go To CARR-DR 833

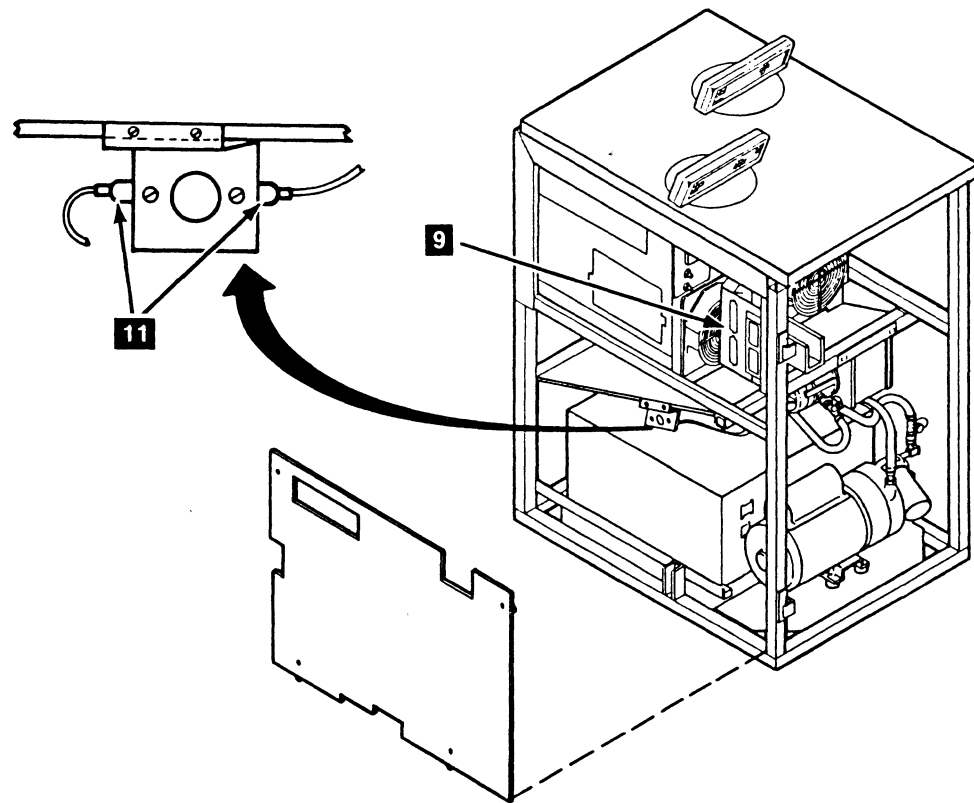
This page contains the steps needed to remove the tape unit thermal switch cable harness from the end tape unit. Since this procedure requires the ac voltage to be switched off, it is necessary to have all drives attached to the control unit, and the control unit, available for service.

Note: This FRU removal and replacement requires the ac power to be removed from the control unit and all attached tape units with the control unit ac power circuit breaker.

Removing the Tape Unit Thermal Switch Cable Harness (End Tape Unit)

This procedure is only for the end tape unit attached to the control unit.

1. Go to CARR-CU 6 for the procedure to remove the **ac power** from the control unit.
2. Remove the tape unit side cover (see CARR-DR 2-3).
3. Remove the jumper from the thermal switch cable **10** at the interframe mounting plate (TU-P2); save this jumper for installation in the new assembly.



4. Remove the rear cover (see CARR-DR 2-3).
5. Remove the rear safety cover (see CARR-DR 2-4).
6. Disconnect the cable harness from the thermal switch assembly **11** by removing the two connectors.
7. Remove the J1 end of the cable harness from the interframe mounting plate **9** by pressing the spring retention fingers.
8. Unplug P1 from the adjacent drive unit.
9. Remove the P1 end of the cable harness from the flexible support **8**.
10. Remove the cable from the ferrite assembly **7** as follows:

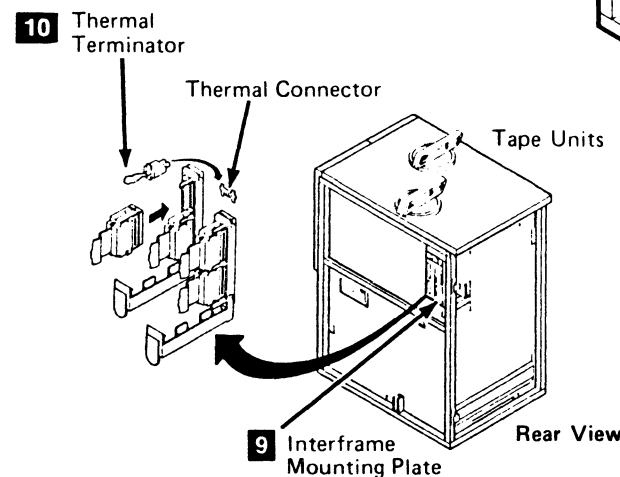
Note: Read this entire procedure before starting the removal.

- a. Loosen the bottom mounting screw **6**.
- b. Remove the top mounting screw **1**.
- c. Work the inner ferrite **3** out of the assembly.
- d. Hold the cover **2** and outer ferrite **5** together and remove the bottom mounting screw.

Warning: When the cover is removed the outer ferrite is unsupported; it is fragile and may shatter if dropped.

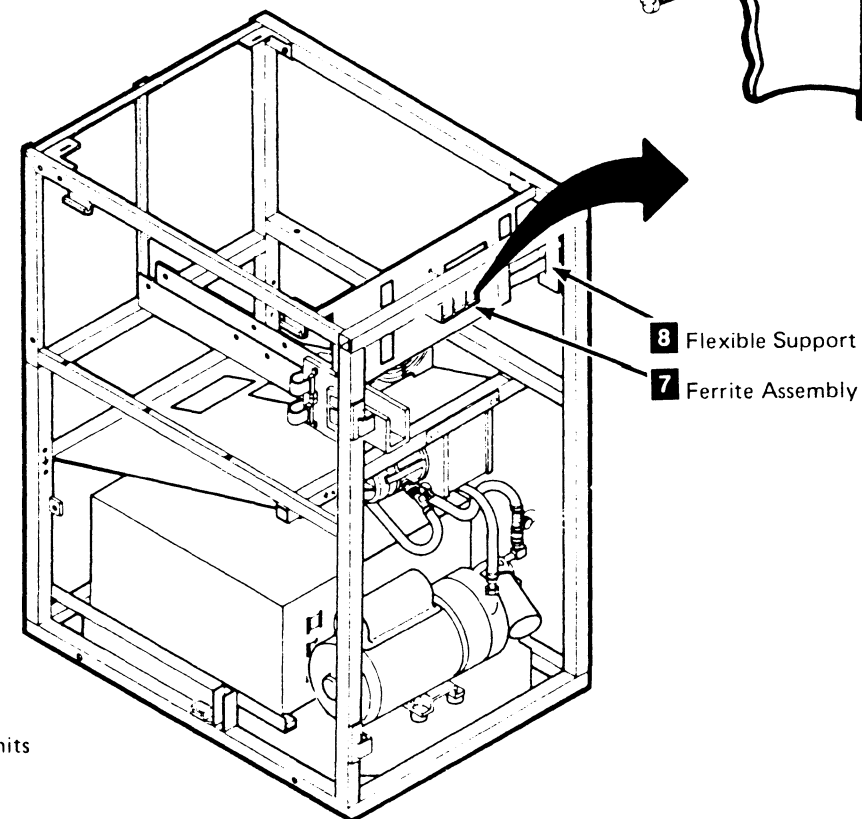
- e. Remove the cable harness **4** from the ferrite assembly.
- f. Save all the parts of the ferrite assembly for the cable replacement procedure.

11. Remove the cable harness from the tape unit.

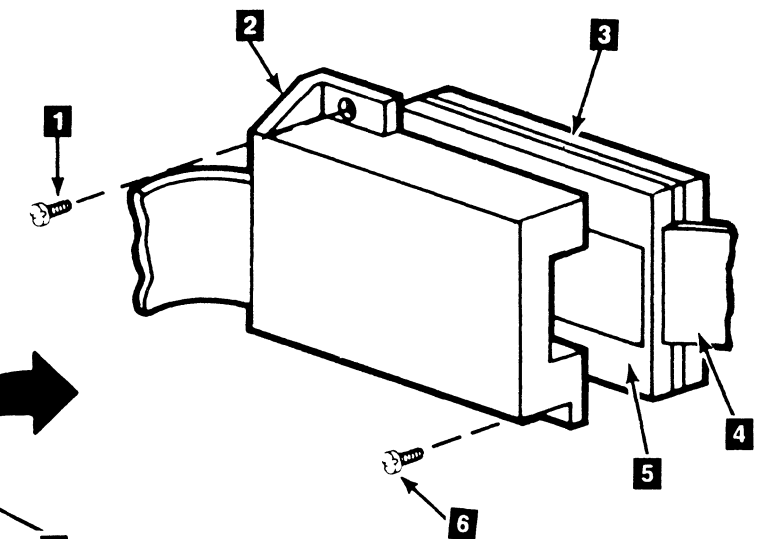


Replacing the Tape Unit Thermal Switch Cable Harness (End Tape Unit)

1. Route the P1 end of the cable harness through the flexible support **8** at the control unit side of the tape unit near the top frame.
2. Insert the P1 connector of the cable harness into the interframe mounting plate **9** at TU-P2 of the adjacent drive.
3. Connect the cable harness to the thermal switch assembly **11** with the two connectors.
4. Insert the J1 connector of the cable harness into the interframe mounting plate at TU-P2 **9** (of the tape unit you are repairing).
5. Install the jumper **10** in the J1 connector at the interframe mounting plate.



6. Replace the cable harness in the ferrite assembly **7** as follows:
 - a. Assemble the outer ferrite **5** and cover **2**.
 - b. Install the outer ferrite and cover assembly over the cable harness **4** and install the bottom screw **6** loosely.
 - c. Work the inner ferrite **3** between the cables and frame.
 - d. Install the top screw **1**.
 - e. While ensuring the cables are not pinched, tighten the top and bottom screws.
7. Replace the tape unit right side cover (see CARR-DR 2-4).
8. Replace the tape unit rear safety cover and rear cover (see CARR-DR 2-4).
9. Go to CARR-CU 6 for the procedure to restore the **ac power** to the control unit.



FRU085 Drive Control Card (02A-A1B2) Removal and Replacement Procedure

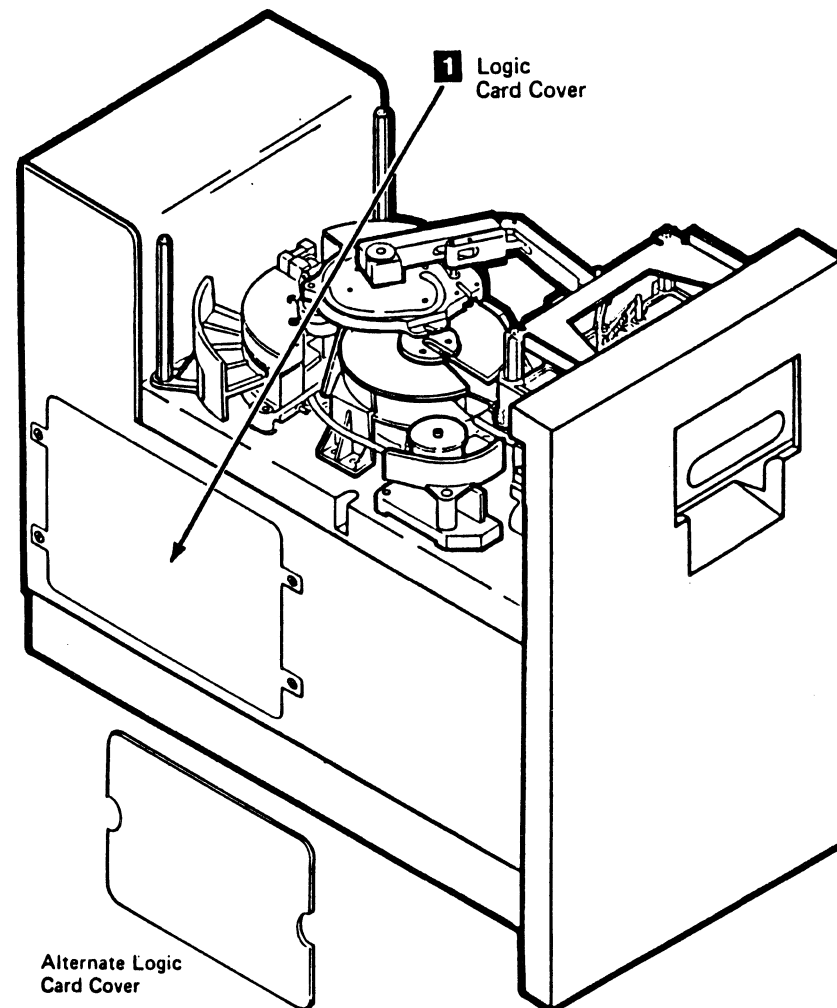
This page contains the steps needed to remove and replace the drive control card 02A-A1B2 from a drive.

Warning: Some parts handled during this procedure are sensitive to electrostatic discharge (ESD). See CARR-DR 1-9 for "Instructions for Working With ESD-Sensitive Parts."

Note: This FRU can be removed and replaced without affecting the other drive by removing power from the failing drive with the Drive Power On/Off switch.

Removing Logic Card A1B2

1. Go to CARR-DR 8 for the procedure to **power off** the drive.
2. Open the drive drawer (see CARR-DR 2-5).



3. Remove the card side cover **1**.
4. Remove the two screws for each card retainer and remove the card retainers **3** if installed.

Note: The A1B2 logic card is the bottom one plugged into the logic board.

5. Remove the TCCs **2** from positions YB and ZB.

Note: The Drive Control card (A1B2) is a special card that plugs into three rows of pins in the logic board (A1B2-B,C,D).

Warning: Ensure that you do not loosen or damage any of the cables in the A1 row of the logic board while removing the A1B2 logic card.

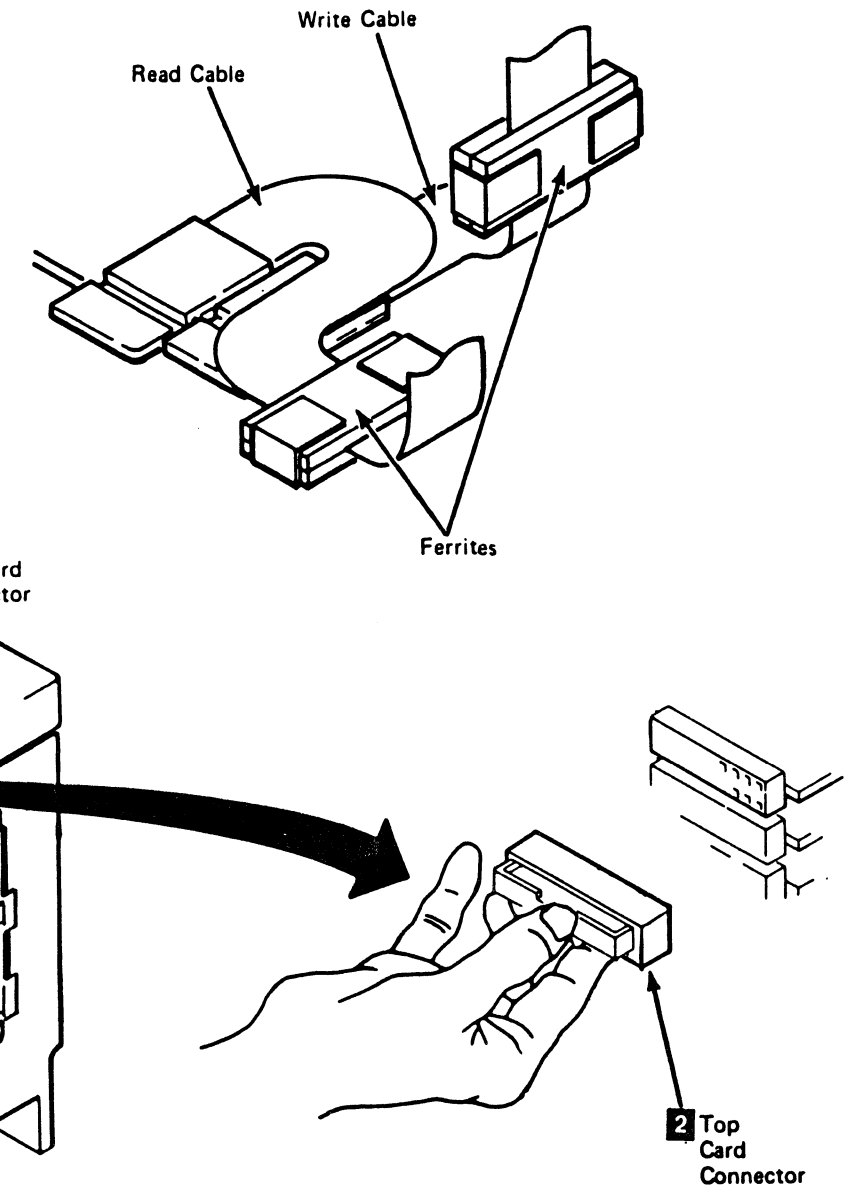
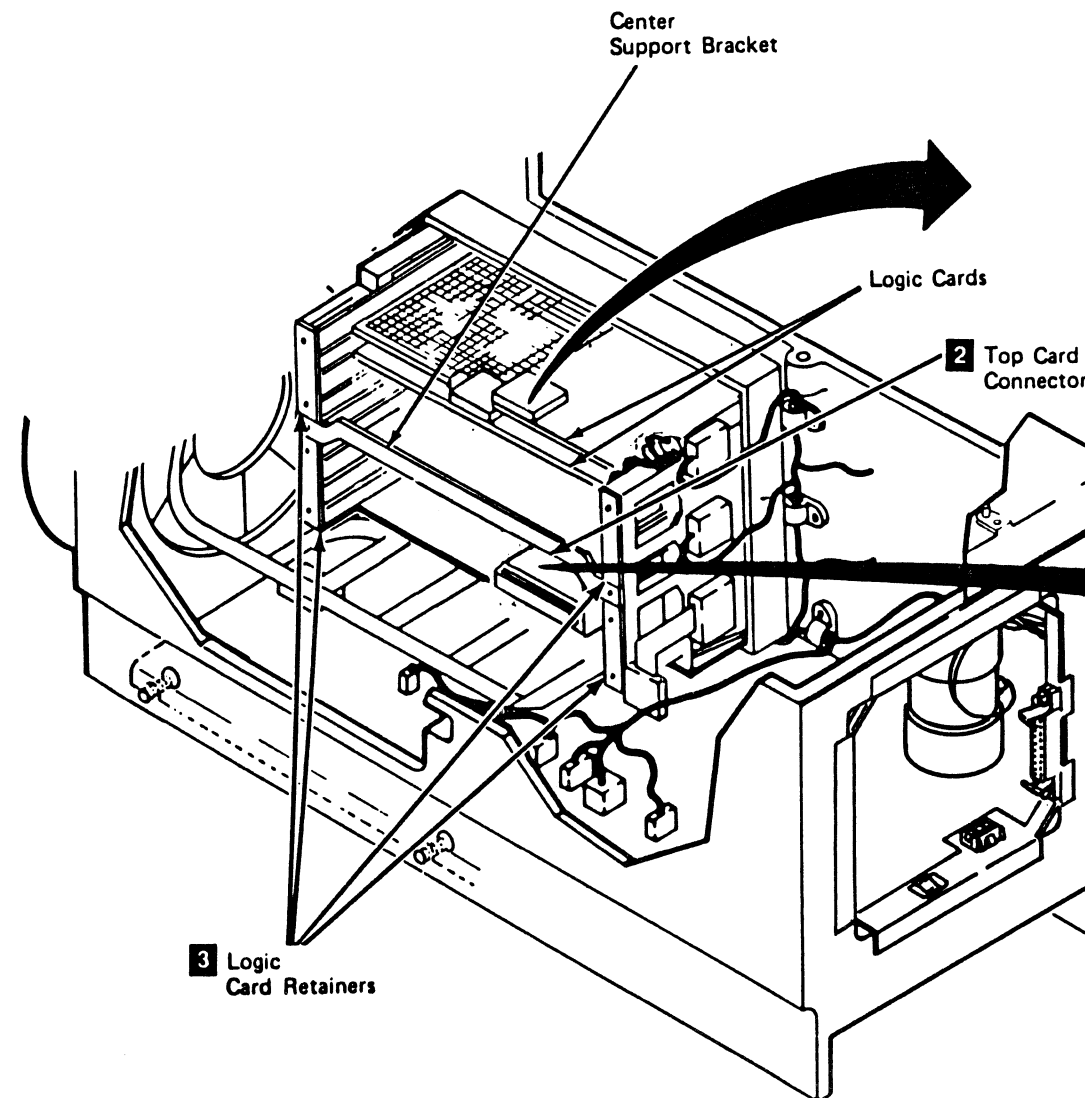
6. Remove the drive control card (02A-A1B2) from the drive by pulling the card straight out from the logic board.

Replacing Logic Card A1B2

Note: Before inserting the drive control card into the logic board, inspect the board for any bent or damaged pins.

Warning: Ensure that you do not loosen any of the cables that plug into the A1 row of the logic board when you are inserting the A1B2 logic card.

Note: The A1B2 logic card is a special card that plugs into all three pins in the B2 row (A1B2-B,C,D).



Drive CARR-DR 850

1. Insert the drive control card (02A-A1B2) into the drive by pushing the card straight into the logic board.
2. Install the card retainers **3** and the two screws to secure each retainer if previously removed.
3. Install the TCCs **2** for A1B2 card at locations YB and ZB.
4. Install the card side cover **1**.
5. Close the drive drawer (see CARR-DR 2-5).
6. Go to CARR-DR 8 for the procedure to **power on** the drive.

Tape Unit With BM 6460006 (see CARR-DR 9)

This page contains the steps needed to remove and replace either of the read bus cables (local or remote) in the tape unit. Since only one read bus will be affected, the customer may continue to use the subsystem through the other read bus if two control units are installed. If only one control unit is installed, the entire subsystem must be available for service.

Note: This FRU can be removed and replaced without affecting the other tape units by removing power from the failing tape unit with the ac power circuit breaker **1**.

Removing the Read Bus Cable

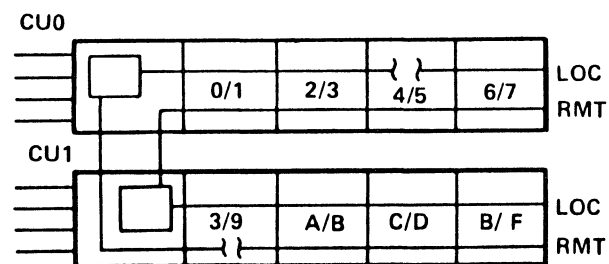
1. Have the customer vary offline both drives in the tape unit with the failing read bus cable.
2. Have the customer vary offline all paths that use the failing read bus cable. (See the examples on this page.)
3. Go to CARR-DR 8 for the procedure to **power off** the tape unit.

From the front of the tape unit:

4. Remove the tape unit front safety cover (see CARR-DR 2-1).
5. If this is the end tape unit, remove the right side cover (see CARR-DR 2-1). If this is not the end tape unit, open the front cover and remove the front safety cover on the tape unit to the right (see CARR-DR 2-1).

Examples

- a. Control Unit 0 - local read bus in drives 4/5 failing:
 - Vary **drives 4 and 5** offline.
 - Vary **paths** through control unit 0 to drives 0-7 offline.
- b. Control Unit 0 - remote read bus in drives 8/9 failing:
 - Vary **drives 8 and 9** offline.
 - Vary **paths** through control unit 0 to drives 8-F offline.



Warning: Check the connector panel and cable labels to ensure that the correct read bus cable is being disconnected.

6. Disconnect the failing read bus cable from the P2 connector panel **2** in the tape unit to the left (or P1 connector panel in the control unit).
7. Disconnect the read bus cable from the P2 connector panel **2** of the failing tape unit to the tape unit to the right (if present, or else remove the terminator from the P2 connector panel in the failing drive).
8. Remove the two screws holding the cable connector to the P2 panel in the failing drive.
9. Loosen the top screw holding the front of the cable plenum **3** on each side.

From the rear of the tape unit:

10. Remove the top cover of the tape unit to get access to the cables (see CARR-DR 2-8).
11. Remove the convoluted bellows **5** from both drives (see CARR-DR 2230).
12. Open both drive drawers, completely (see CARR-DR 2-5).
13. Disconnect the drive read bus cables that plug into the tees **6** of the failing read bus cable (local **4** or remote **4**).

14. Remove the top and loosen the bottom mounting screws holding the tees to the cable plenum.
15. Remove the failing read bus cable from the tape unit.
16. Save the mounting screws for the replacement procedure.

Replacing the Read Bus Cable

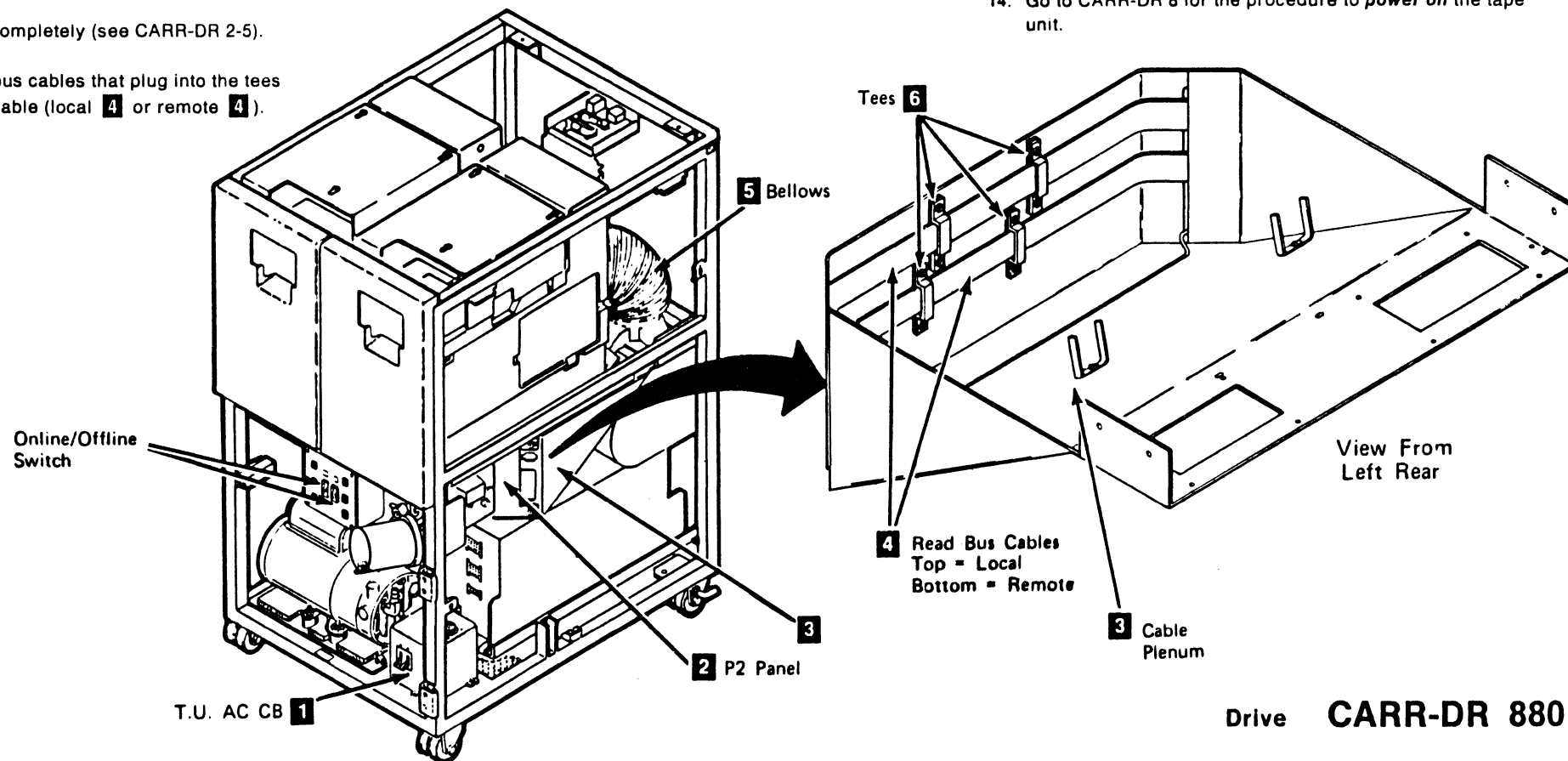
From the rear of the tape unit:

1. Position the read bus cable **4** in the cable plenum with the plug end to the right.
2. Attach the cable tees **6** to the cable plenum with the screws saved from the removal procedure.
3. Plug the drive cables into the read bus cable tees **6**.
4. Route the right end of the read bus cable through the slot in the cable plenum **3**.

5. Route the left end of the read bus cable through the slot at the P2 panel.
6. Close both drive drawers and replace both convoluted bellows **5** (see CARR-DR 2230).
7. Replace the tape unit top cover (see CARR-DR 2-8).

From the front of the tape unit:

8. Attach the connector on the right end of the read bus cable to the P2 panel with the screws saved from the removal procedure.
9. Install the read bus cable from the tape unit on the right (if present, otherwise install the terminator) in the connector just installed on the P2 panel **2**.
10. Tighten the screws holding the front cable plenum **3** in position. Ensure that no cables are pinched.
11. Install the read bus cable from the drive just repaired to the tape unit on the left P2 panel **2** (P1 panel if this is the control unit).
12. Replace the tape unit front safety cover (see CARR-DR 2-2).
13. If this is the end tape unit, replace the right side cover (see CARR-DR 2-2). If this is not the end tape unit, replace the front safety cover and front cover (see CARR-DR 2-2) on the tape unit to the right.
14. Go to CARR-DR 8 for the procedure to **power on** the tape unit.



FRU090 Message Display DC Power Cable Removal and Replacement Procedure

Tape Unit With BM 6460006 (see CARR-DR 9)

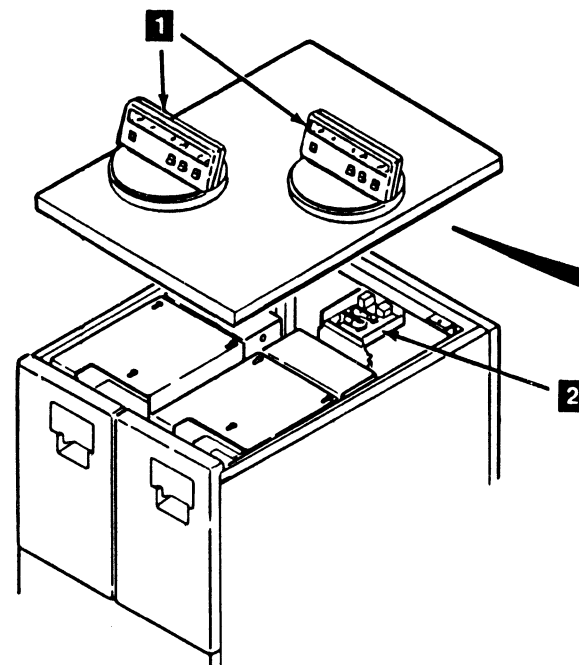
This page contains the steps needed to remove and replace the dc power cable connecting the message display of both drives to the external load resistor panel. Since dc voltage is supplied to both message displays with this cable, it will be necessary to have both drives of the tape unit available for service.

Note: This FRU can be removed and replaced without affecting the other tape units by removing power from the failing tape unit with the ac power circuit breaker.

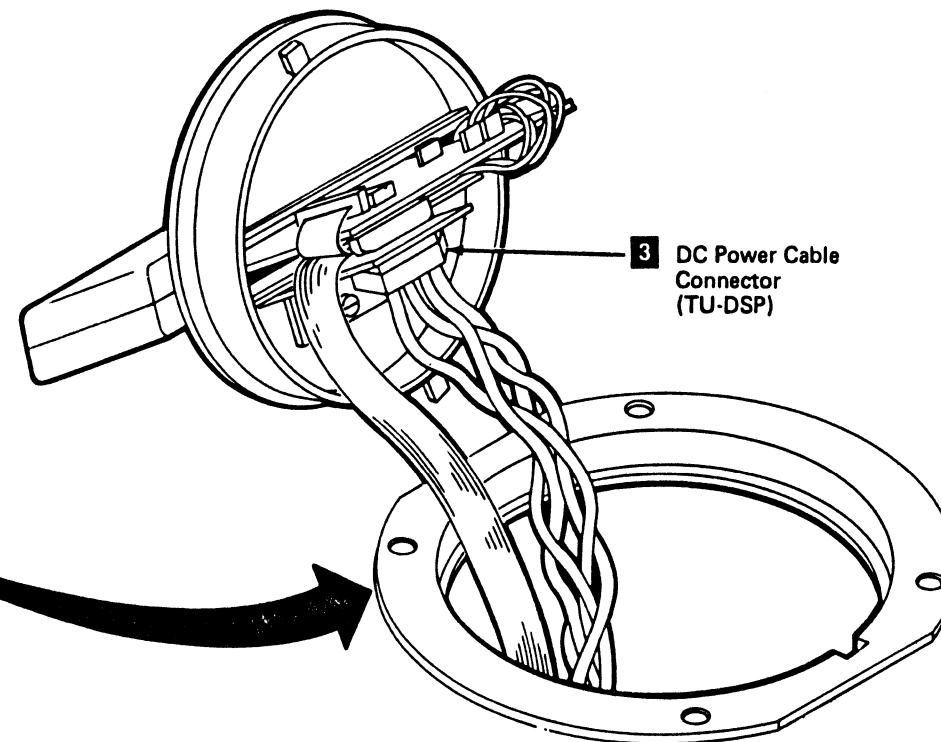
Removing the Message Display DC Power Cable

1. Go to CARR-DR 8 for the procedure to **power off** the tape unit.
2. Remove the tape unit front safety cover (see CARR-DR 2-1).
3. Open both drive drawers (see CARR-DR 2-5).
4. Open the tape unit rear cover (see CARR-DR 2-1).
5. Remove cable plug P11 from connector J11 located on the bottom of the external load resistor panel **2** (cable support bracket, if the tape unit has power supply part number 6177166 or 6177167 installed).

Warning: When removing the ferrites, take care not to drop them as they may shatter on impact.

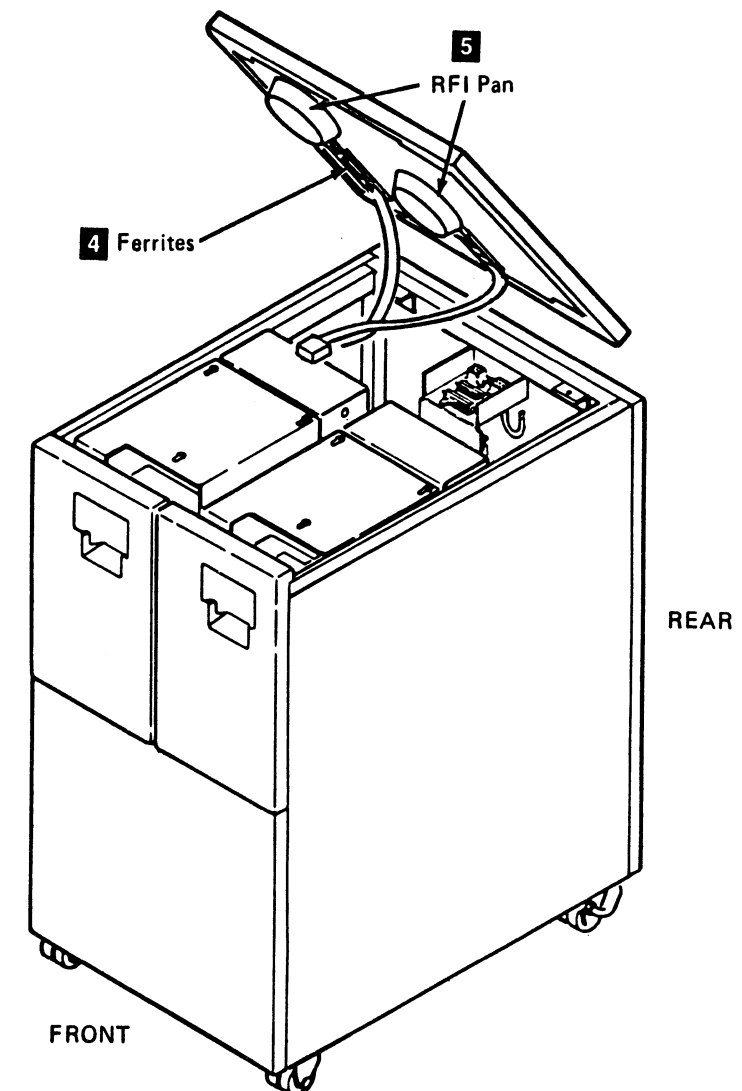


6. Loosen the two screws holding the ferrites **4** to the RFI pans **5** for both message display panels and carefully remove both halves of each ferrite.
7. Remove both message display panels (TU-DSP) **1** from the top cover (see CARR-DR 2-6).
8. Turn both message display panels over and set them on the top of the cover.
9. Remove the four-conductor dc power cable plug P3 **3** from each message display panel.
 - For drive 0 remove cable plug P3 from connector J3.
 - For drive 1 remove cable plug P3 from connector J3.
10. Remove the message display dc cable from the tape unit.
11. Save all the cable retention hardware for the installation procedure.



Replacing the Message Display DC Power Cable

1. Route the P3 **3** end of the cable through the radio frequency interference (RFI) pans and to the message display panels.
 - For drive 0 - connect the cable plug P3 to connector J3.
 - For drive 1 - connect the cable plug P3 to connector J3.
2. Loosely assemble the ferrite retention and mounting plate with the ferrites and cables enclosed in the ferrites **4**.
3. Tighten the ferrite mounting screws, ensuring that the cables are not pinched.



Drive CARR-DR 900

4. Replace the two screws holding the ferrites **4** to the RFI pans **5**.
5. Replace the cable plug P11 in connector J11 located on the bottom of the external load resistor panel **2** (cable support bracket, if the tape unit has power supply part number 6177166 or 6177167 installed).
6. Replace the message display panels **1** (TU-DSP) (see CARR-DR 2-6).
7. Install and close the rear cover if removed (see CARR-DR 2-2).
8. Install the front safety cover and ground connector (see CARR-DR 2-2).
9. Go to CARR-DR 8 for the procedure to **power on** the tape unit.

FRU090 Message Display DC Power Cable Removal and Replacement Procedure

Drive **CARR-DR 905**

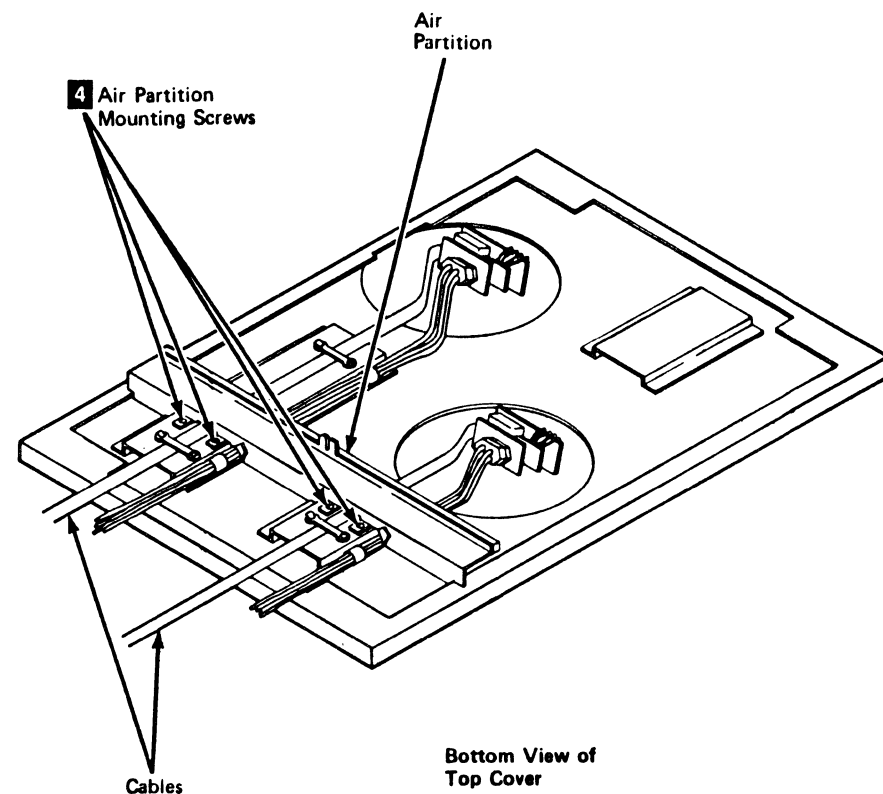
Tape Unit Without BM 6460006 (see CARR-DR 9)

This page contains the steps needed to remove and replace the dc power cable connecting the message display to the tape unit power supply. A second service representative will be needed during the procedure to hold the top cover during the cable removal.

Note: This FRU can be removed and replaced without affecting the other tape units by removing power from the failing tape unit with the ac power circuit breaker.

Removing the Message Display DC Power Cable

1. Go to CARR-DR 8 for the procedure to **power off** the tape unit.
2. Remove the message display panel from the top cover (see CARR-DR 2-6).
3. Turn the message display panel housing over and set it on the top of the cover.
4. Remove the four-conductor dc power cable connector **3** from the receptacle on the message display housing.

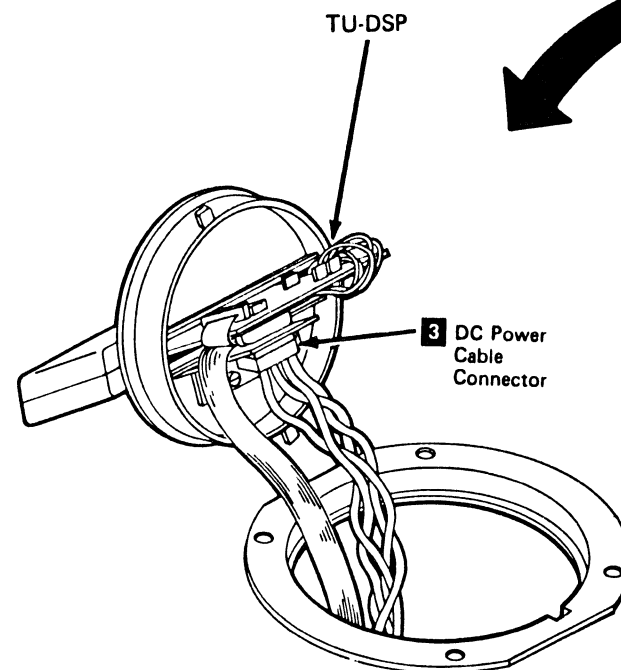


Bottom View of Top Cover

5. Open the rear cover and remove the rear safety cover (see CARR-DR 2-3).
6. Remove the connector from the external load resistor panel (see LOC 1).
 - For drive 0 remove cable plug J7.
 - For drive 1 remove cable plug J3.
7. Remove the rubber retainer and the plastic retainer from the cable plate **2**.

The top cover is retained by two fasteners located on the rear of the cover.

8. Loosen the top cover fasteners **1** by turning each one-fourth turn counterclockwise.
9. Have the second service representative lift the top cover and hold it.
10. Remove the four mounting screws **4** and the air partition from the top cover.
11. Remove the cable retention hardware and remove the cable from the top cover.
12. Save all the cable retention hardware for the installation procedure.

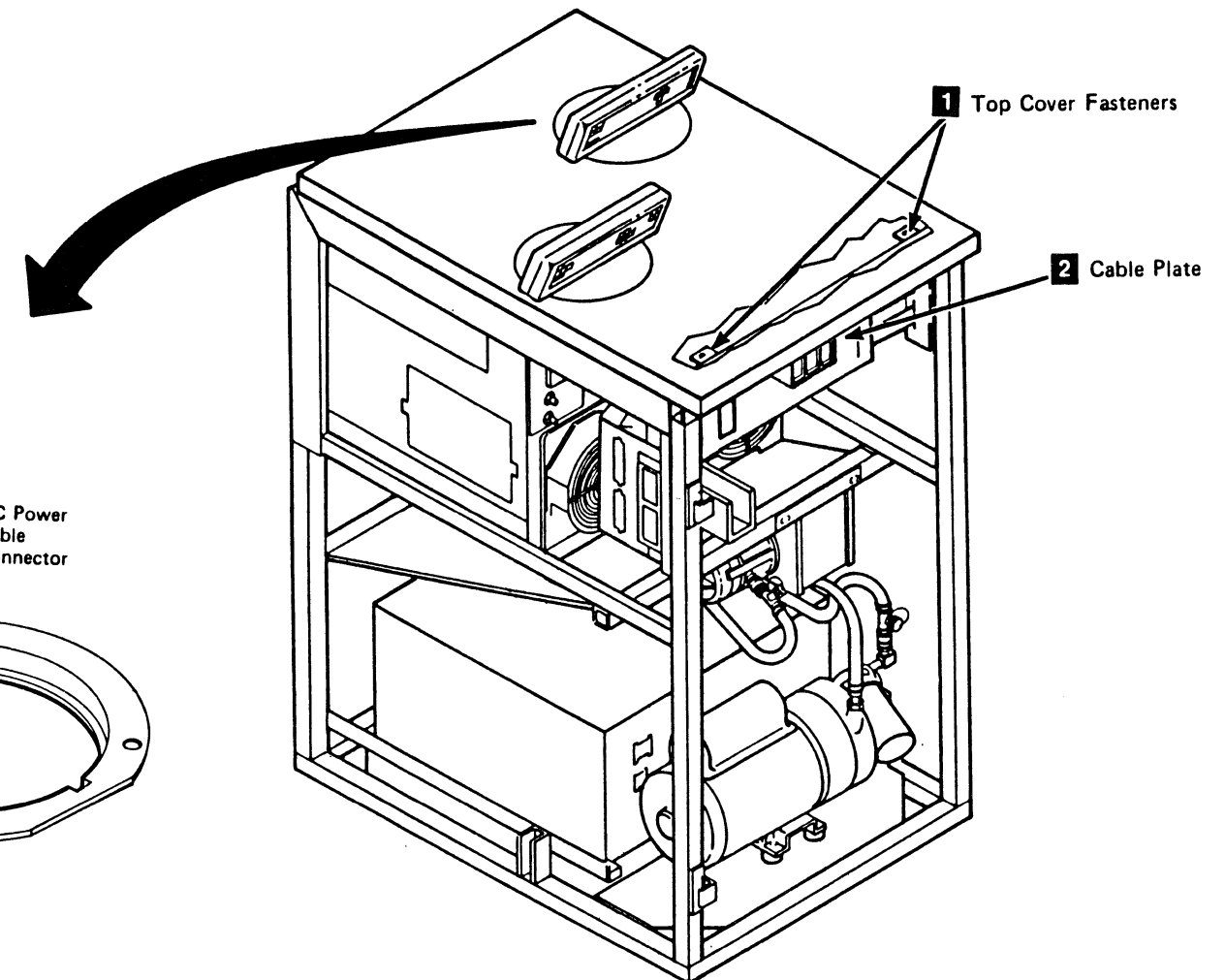


Replacing the Message Display DC Power Cable

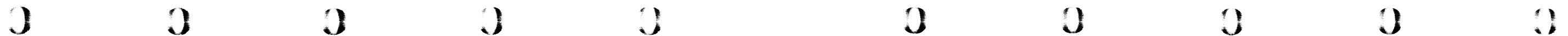
A second service representative will be needed to lift and hold the top cover while the cables are being connected.

1. Connect the cable to the rear of the external load resistor panel (see LOC 1).
 - If drive 0 - connect the cable plug P7 to connector J7.
 - If drive 1 - connect the cable plug P3 to connector J3.
2. Install the cable retention hardware to the cable plate **2**. Be sure to install the plastic clamp and the rubber retainer.
3. Have the second service representative lift and hold the top cover while the message display dc power cable is being replaced.

4. Place the message display dc power cable in position on the top cover and install the cable retention hardware.
5. Install the air partition using the four air partition mounting screws **4**.
6. Lower the top cover into place on the tape unit frame and turn the top cover fasteners **1**.
7. Pull the end of the cable through the top cover opening. Connect the dc power cable connector **3** to the message display panel assembly.
8. Install the message display panel assembly into the top cover (see CARR-DR 2-6).
9. Install the rear safety cover and close the rear cover (see CARR-DR 2-4).
10. Go to CARR-DR 8 for the procedure to **power on** the tape unit.



Drive **CARR-DR 905**



FRU095 Tape Unit DC Power Supply Removal and Replacement Procedure

Drive **CARR-DR 950**

Tape Unit With BM 6460006 (see CARR-DR 9)

This page contains the steps needed to remove and replace the tape unit dc power supply (TU-PS-01). The removal and replacement of the dc power supply is from the rear of the tape unit.

Since there is only one dc power supply in the tape unit, both drives must be available for service.

Note: This FRU can be removed and replaced without affecting the other tape units by removing power from the failing tape unit with the ac power circuit breaker.

Removing the Tape Unit DC Power Supply

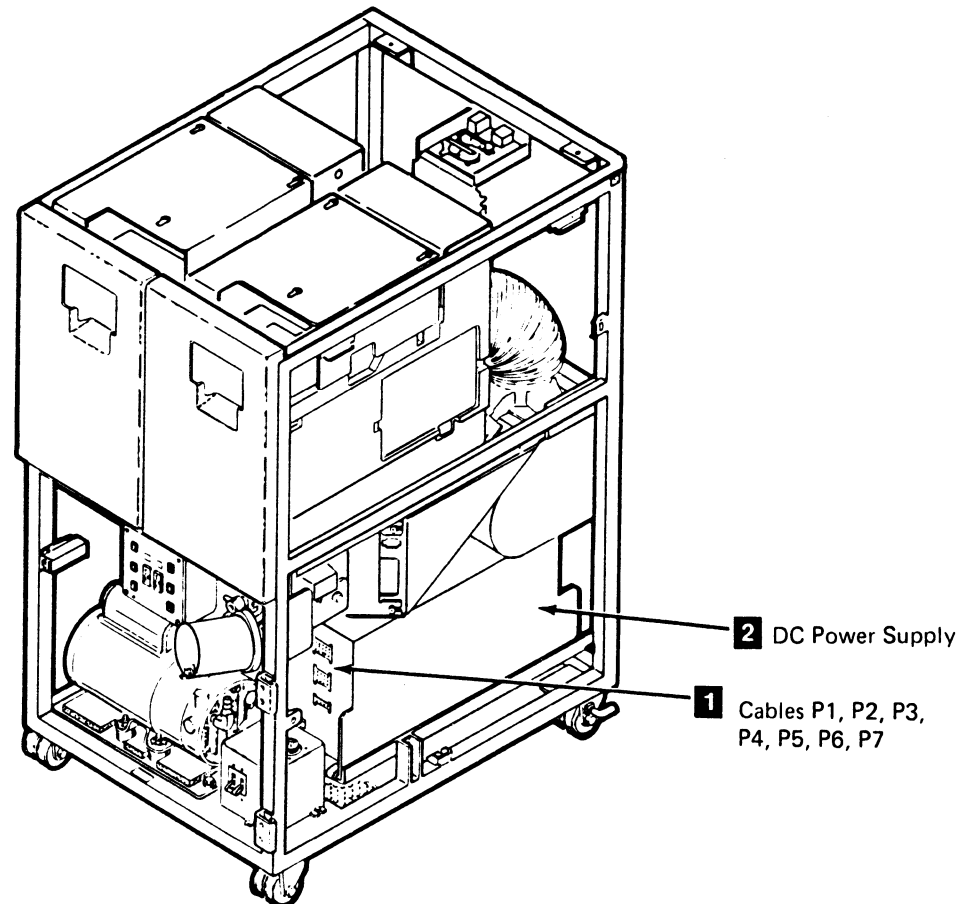
1. Go to CARR-DR 8 for the procedure to *power off* the tape unit.
2. Remove the tape unit rear cover (see CARR-DR 2-1).
3. Open the tape unit front cover (see CARR-DR 2-1).
4. Remove the tape unit front safety cover (see CARR-DR 2-1).
5. Remove cable plugs P11 and P15 (TU-PS-01-P11 and P15) **4** from the rear of the power supply **2** (see LOC 1).

6. Remove cable plugs P1, P2, P3, P4, P5, P6, and P7 (TU-PS-01-P1, P2, P3, P4, P5, and P6) **1** from the front of the power supply.
7. Remove the two mounting bolts **3**.

Warning: Be careful during the next step not to pinch any cables or damage any connectors as you slide the power supply from the tape unit frame.

CAUTION
The drive dc power supply weighs about 41 kilograms (90 pounds). Two service representatives should lift the power supply.

8. Using the handles provided, slide the power supply out the rear of the tape unit.
9. Save the mounting bolts for the replacement procedure.

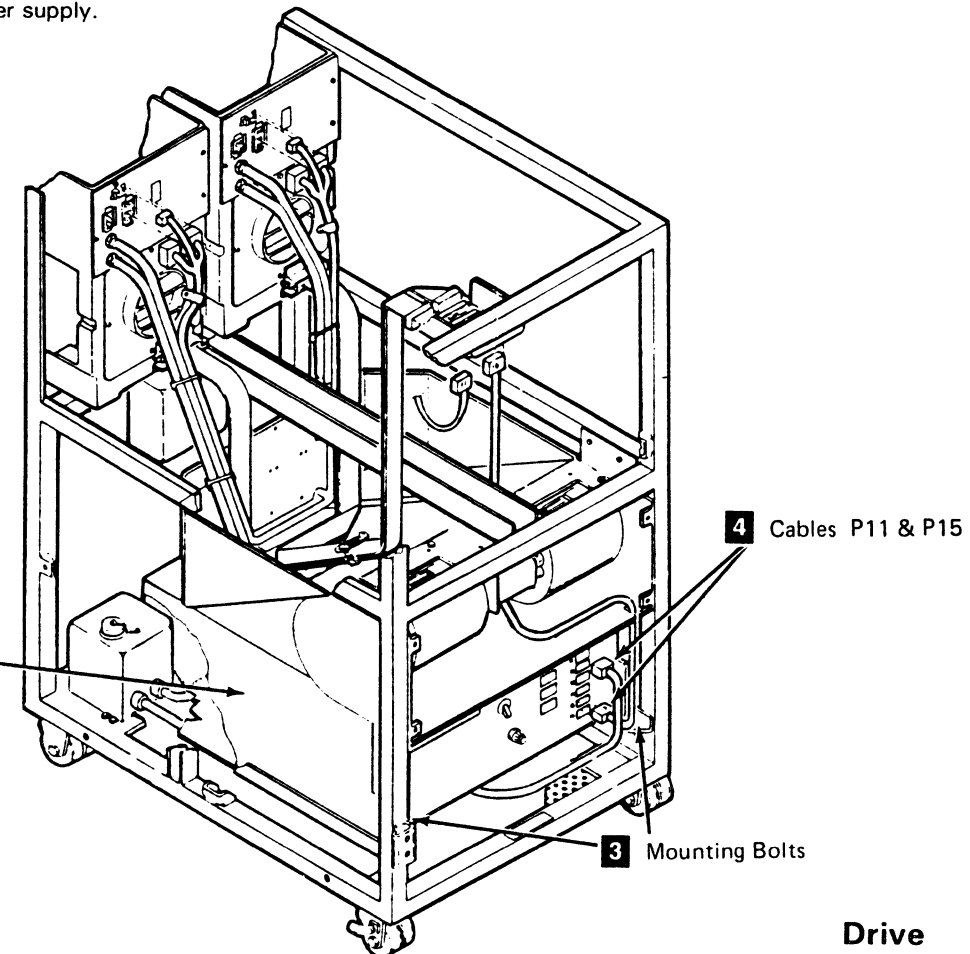


Replacing the Tape Unit DC Power Supply

CAUTION
The drive dc power supply weighs about 41 kilograms (90 pounds). Two service representatives should lift the power supply.

Warning: Be careful during the next step not to pinch any cables or damage any connectors as you slide the power supply into the tape unit frame.

1. Place the power supply **2** on the rails and slide into position.
2. Install the two mounting bolts **3**.
3. Connect the P11 and P15 cables **4** (TU-PS-01-P11 and P15) to the rear of the power supply (see LOC 1).
4. Connect cables P1, P2, P3, P4, P5, P6, and P7 **1** (TU-PS-01-P1, P2, P3, P4, P5, P6, and P7) to the front of the power supply.



5. Ensure that the voltage jumper on the dc power supply is installed in the correct position.

- If the ac supply voltage is 208/220 V ac install the voltage jumper in TU-PS-01-J12.
- If the ac supply voltage is 230 V ac install the voltage jumper in TU-PS-01-J13.
- If the ac supply voltage is 240 V ac install the voltage jumper in TU-PS-01-J14.

Note: Ensure that the setting of the ac voltage jumper is the same as listed on the power supply voltage label (input); if necessary, change the power supply voltage label.

6. Install and close the rear cover (see CARR-DR 2-2).
7. Install the tape unit front safety cover and close the front cover (see CARR-DR 2-2).
8. Go to CARR-DR 8 for the procedure to *power on* the tape unit.

Tape Unit Without BM 6460006 (see CARR-DR 9)

This page contains the steps needed to remove and replace the dc power supply in the tape unit. Since the power supply provides the dc voltages for both drives, it is necessary to have both drives available for service.

Note: This FRU can be removed and replaced without affecting the other tape units by removing power from the failing tape unit with the ac power circuit breaker.

Removing the DC Power Supply

1. Go to CARR-DR 8 for the procedure to *power off* the tape unit.
2. Open the rear cover and remove the rear safety cover and ground connector (see CARR-DR 2-3).

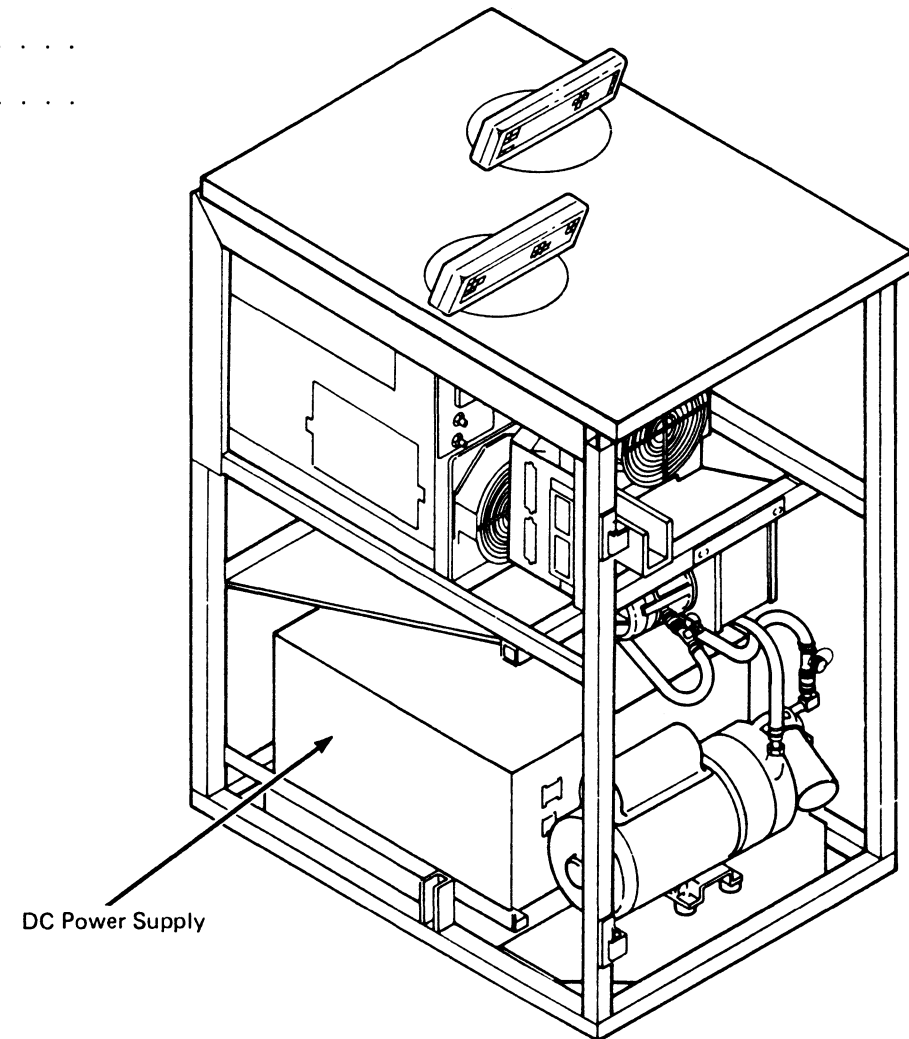
CAUTION
Before removing the cables from the rear of the power supply, rotate the vacuum hardware (with cable clamps) away from the hand access area.

3. Remove cables P1, P2, P3, P4, P5, P6, and P7 from the rear of the dc power supply **2**.
4. Remove cable J11, J15, and J16 from front of the dc power supply (see LOC 1). Note, but do not remove, the jumper in J12, J13, or J14.
5. Remove the bolt **3** used to secure the tape unit at the left side (front of tape unit).

Warning: Ensure that cables J11, J15, and J16 are not pinched when the power supply is moved.

CAUTION
The tape unit dc power supply weights about 41 kilograms (90 pounds). Two service representatives should lift the power supply.

6. Remove the two mounting bolts **1** and remove the dc power supply by sliding it out the front of the tape unit.



Replacing the DC Power Supply

CAUTION
The tape unit dc power supply weighs about 41 kilograms (90 pounds). Two service representatives should lift the dc power supply.

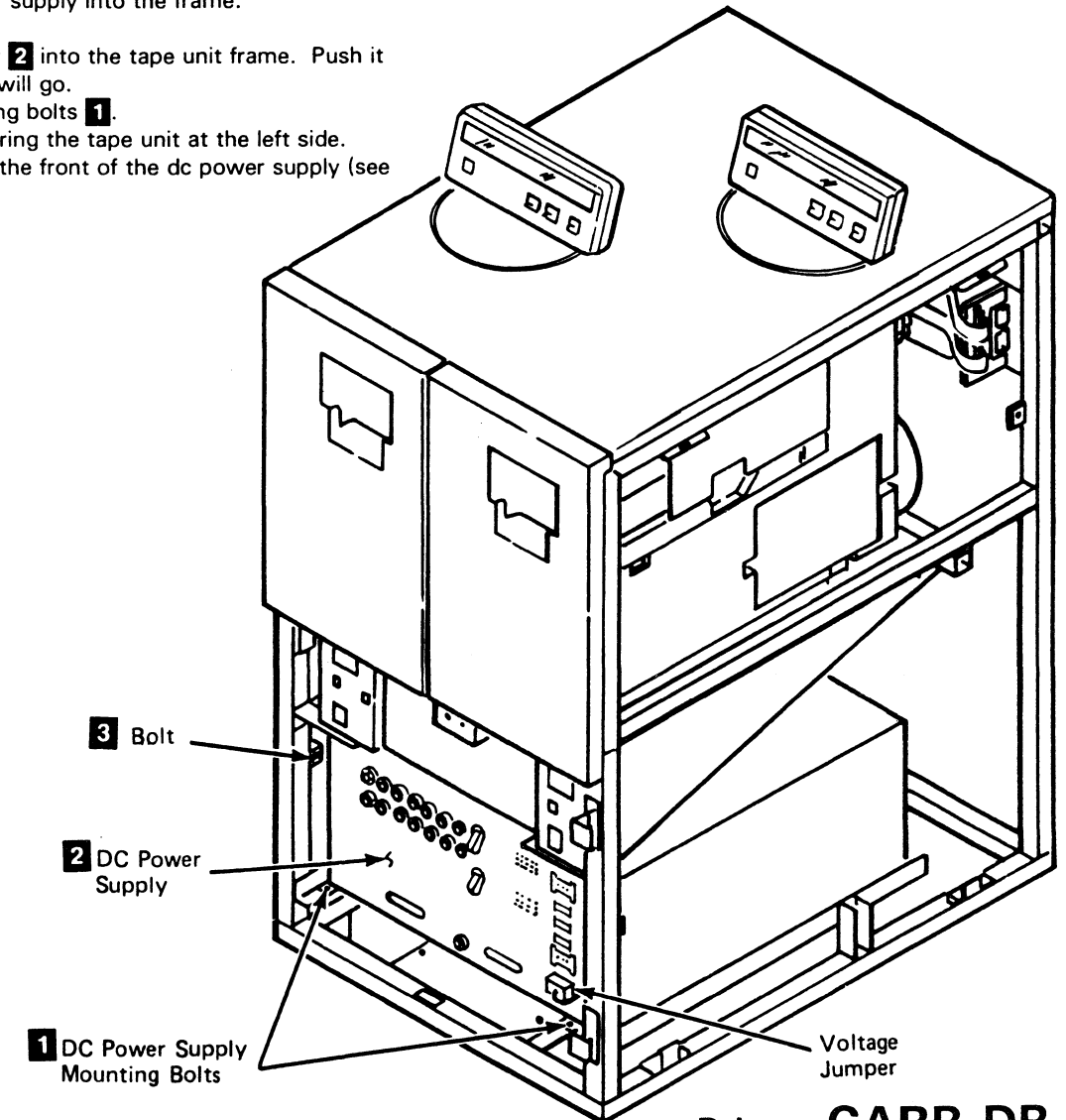
Note: During the next step, ensure that you do not pinch the cables between the tape unit frame and the power supply as you slide the power supply into the tape unit frame. Also take care not to damage the sound retarding material with the rear of the power supply as it slides into position.

Note: For 50 Hz machines it may be necessary to loosen and raise the blower bracket to provide clearance when sliding the power supply into the frame.

1. Slide the power supply **2** into the tape unit frame. Push it to the rear as far as it will go.
2. Install the two mounting bolts **1**.
3. Install the bolt **3** securing the tape unit at the left side.
4. Connect the cables to the front of the dc power supply (see LOC 1).

- TU-PS01-J11
- TU-PS01-J15
- TU-PS01-J16

5. Ensure that the voltage jumper on the dc power supply is installed in the correct position.
 - If the ac supply voltage is 208/220V ac, install the voltage jumper in TU-PA01-J12.
 - If the ac supply voltage is 230V ac, install the voltage jumper in TU-PA01-J13.
 - If the ac supply voltage is 240V ac, install the voltage jumper in TU-PA01-J14.
6. Install the seven cables on the rear of the dc power supply.
7. Write the voltage information on the power label if the power supply has been changed.
8. Install the rear safety cover and close the rear cover (see CARR-DR 2-4).
9. Go to CARR-DR 8 for the procedure to *power on* the tape unit.



FRU096, 98-102 Fuse Removal and Replacement Procedure

Drive **CARR-DR 960**

This page contains the steps needed to remove and replace any of the fuses in the tape unit dc power supply **1** (TU-PS-01). There are separate fuses for each drive.

Note: This FRU can be removed and replaced without affecting the other drive by removing power from the failing drive with the Drive Power On/Off switch.

Tape Unit With BM 6460006 (see CARR-DR 9)

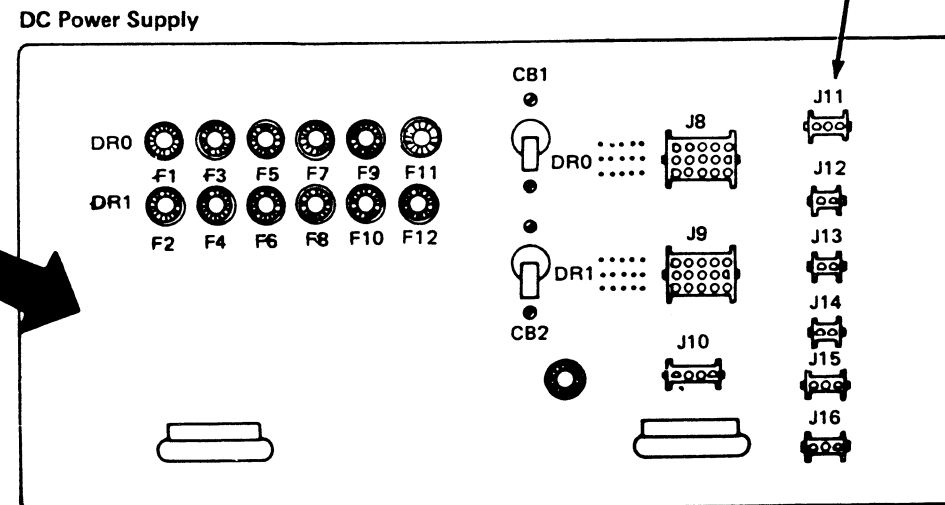
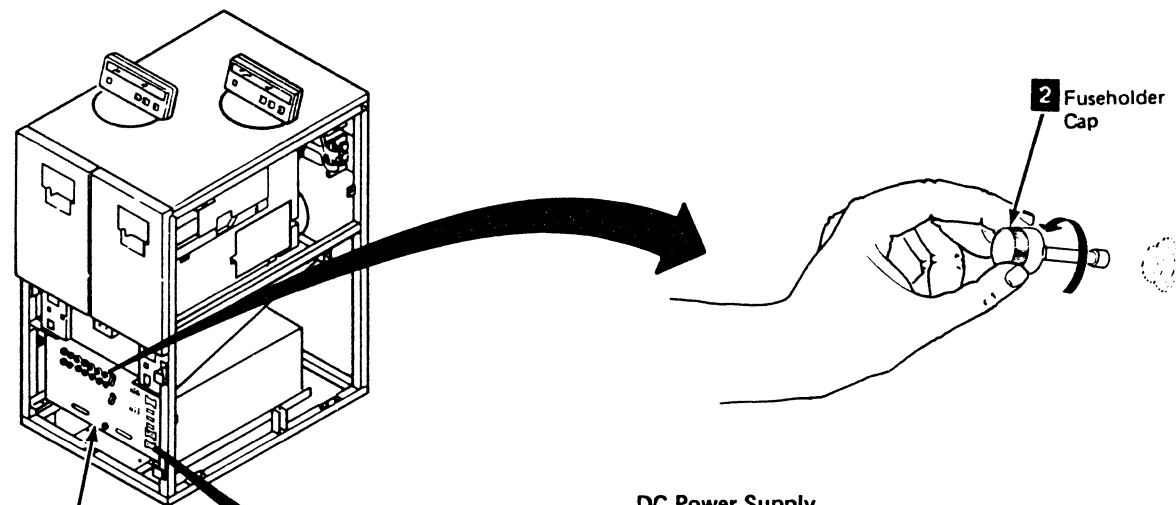
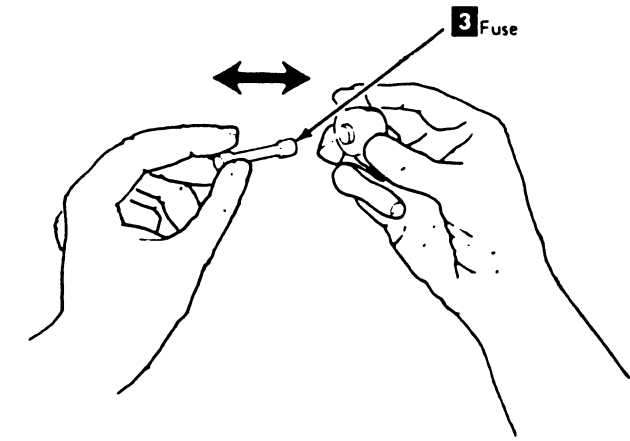
Fuse Removal and Replacement

1. Go to CARR-DR 8 for the procedure to **power off** the drive.
2. Open the drive rear cover (see CARR-DR 2-1).
3. Locate the fuse to be replaced (see table on this page).
4. Turn the fuseholder cap counterclockwise **2** and remove the defective fuse from the power supply.
5. Place a fuse **3** of the correct rating in the fuseholder cap.
6. Replace the fuse in the power supply by turning the fuseholder cap clockwise.
7. Close the drive rear cover (see CARR-DR 2-2).
8. Go to CARR-DR 8 for the procedure to **power on** the drive.

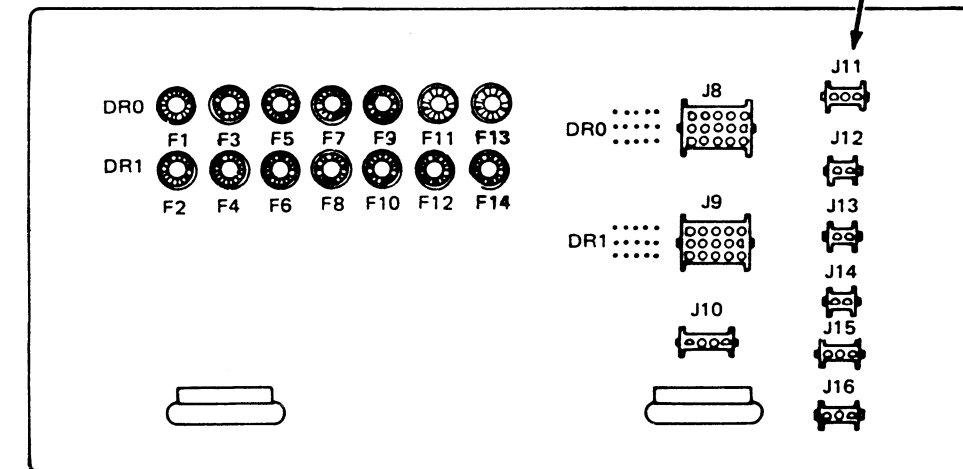
Tape Unit Without BM 6460006 (see CARR-DR 9)

Fuse Removal and Replacement

1. Go to CARR-DR 8 for the procedure to **power off** the drive.
2. Open the tape unit front cover and remove the front safety cover (see CARR-DR 2-3).
3. Locate the fuse to be replaced (see table).
4. Turn the fuseholder cap counterclockwise **2** and remove the fuse from the supply.
5. Place a fuse **3** of the correct rating in the fuseholder cap and insert the fuse and cap into the power supply **1**.
6. Replace the tape unit front safety cover and close the front cover (see CARR-DR 2-4).
7. Go to CARR-DR 8 for the procedure to **power on** the drive.



DC Power Supply



1 DC Power Supply (TU-PS-01)

FRU Number	DR. 0	DR. 1	Fuse Usage
096	F1	F2	+24v.
098	F3	F4	+15v.
099	F5	F6	-15v.
100	F7	F8	+8.5v.
101	F9	F10	-5v.
102	F11	F12	+5v.
280	F13	F14	+5v.

FRU104 Tape Unit Control Box Switch Removal and Replacement Procedure

Tape Unit With BM 6460006 (see CARR-DR 9)

This page contains the steps needed to remove and replace any of the switches from the tape unit control box assembly (TU-OSU).

Note: This FRU can be removed and replaced without affecting the other tape units by removing power from the failing drive with the tape unit ac power circuit breaker.

Note: Due to cable lengths and/or physical size or some connectors, you may not be able to pass the cable connectors through the front of the drive address switch panel 1. In these cases, access the cable connectors by removing the four mounting screws and the front of the drive address switch panel.

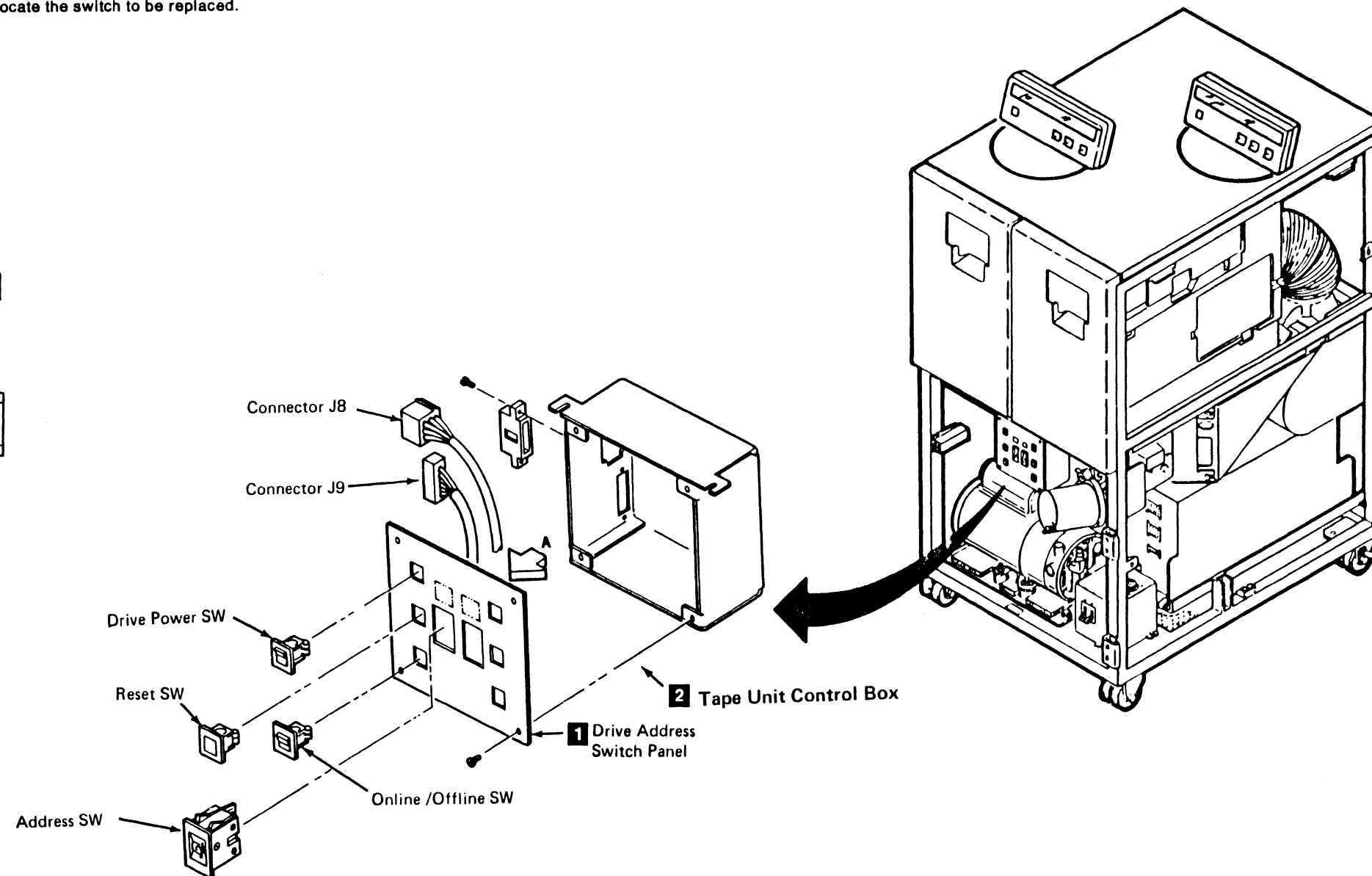
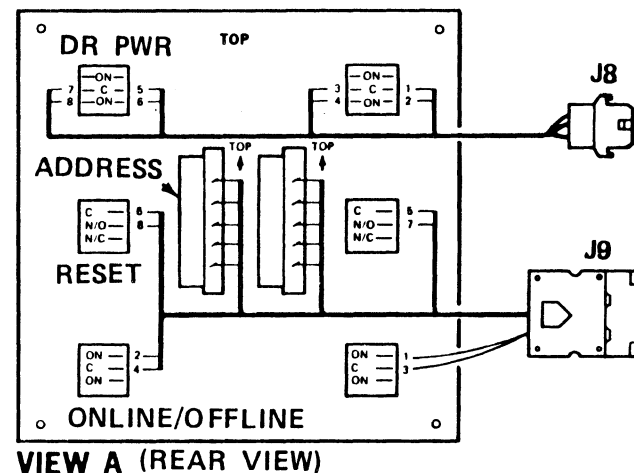
Removing and Replacing the Control Box Switches

1. Go to CARR-DR 8 for the procedure to **power off** the tape unit.
2. Remove the tape unit front safety cover (see CARR-DR 2-1).
3. Remove cable plugs P8 and P9 from connectors J8 and J9 located on the left side of the tape unit control box 2.
4. Loosen the two mounting screws and remove the control box 2 from the tape unit.
5. Locate the switch to be replaced.

6. Using a small screw driver or similar tool, carefully pry the switch out through the opening in the panel front 1.
7. Remove the leads (a connector block on the address switch) one at a time from the old switch and install them on the replacement switch.

Note: If you are uncertain about the lead connections, see the cable diagram on this page to define which lead goes to which switch connection.

8. Guide the replacement switch into the opening in the panel 1 and firmly push to seat the switch into place.
9. Install the control box 2 in the tape unit and tighten the mounting screws.
10. Install cable plugs P8 and P9 into connectors J8 and J9 located on the left side of the control box 2.
11. Install the tape unit safety cover (see CARR-DR 2-2).
12. Go to CARR-DR 8 for the procedure to **power on** the drive.



Drive Switch Panel Switch Removal and Replacement Procedure

Drive CARR-DR 1045

Tape Unit Without BM 6460006 (see CARR-DR 9)

This page contains the steps needed to remove any of the switches from the drive switch panel **1** (TU-OSU). Since 220 V ac is present on the wires to the Drive Power switch, turn off the ac power circuit breaker to remove this hazardous voltage. Since the ac power circuit breaker is turned off, both drives will need to be available for service.

Note: This FRU can be removed and replaced without affecting the other tape units by removing power from the failing tape unit with the ac power circuit breaker.

Removing the Switch Panel Switches

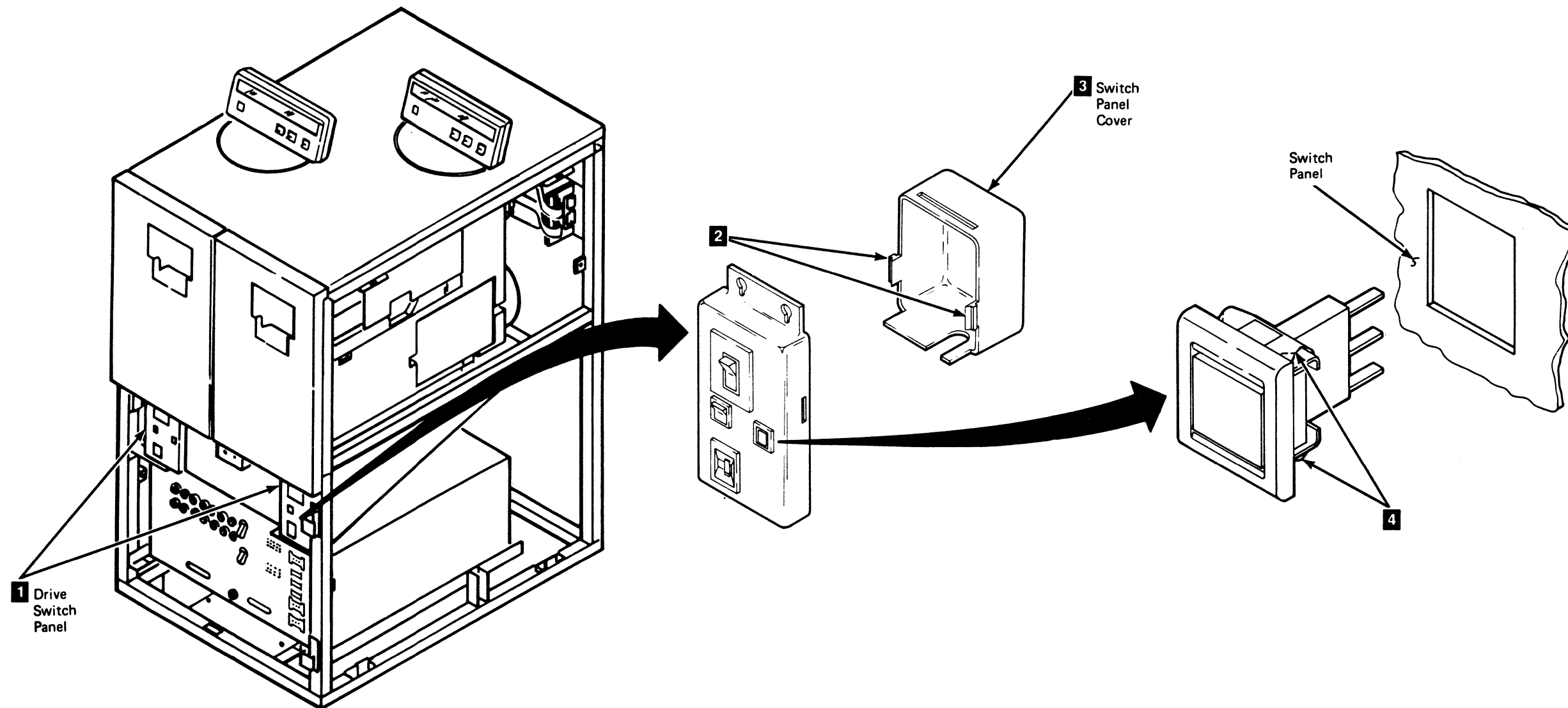
1. Go to CARR-DR 8 for the procedure to **power off** the tape unit.
2. Find the switch panel containing the switch to be replaced.
3. Remove the switch panel cover **3** by pressing in the area shown **2** and pulling the cover away from the switch panel.

The switches can be removed by pressing in on the tabs **4** and at the same time pushing the switch through the front of the switch panel opening.

4. Remove the switch from the switch panel.
5. Disconnect and label the wires to the switch.

Replacing the Switch Panel Switches

1. Pull the wires through the switch panel **1** opening and connect the wires to the switch.
2. Push the switch into the switch panel opening.
3. Install the switch panel cover **3** by pushing toward the switch panel and at the same time pushing in the area shown **2**.
4. Go to CARR-DR 8 for the procedure to **power on** the tape unit.



FRU109 Operator Panel Switch Board Removal and Replacement Procedure

This page contains the steps needed to remove and replace the switch board (TU-DSP) from the operator panel assembly. The switch board is behind the message display board in the operator panel assembly.

Note: This FRU can be removed and replaced without affecting the other drive by removing power from the failing drive with the Drive Power On/Off switch.

Removing the Operator Panel Switch Board

1. Go to CARR-DR 8 for the procedure to **power off** the drive.
2. Remove the operator panel from the drive top cover (see CARR-DR 2-6).
3. Invert the operator panel assembly and place it on the top cover to get access to the connectors and screws on the bottom.
4. Remove the two screws holding the flat cable clamp to the mounting bracket.
5. Remove the two cables from the connectors **1**.

Note: The message display assembly should now be disconnected from the drive.

6. Remove the two operator panel mounting screws **3**.
7. Remove the front and rear housing assembly from the base **2** (of the operator panel assembly) by pulling it forward and sliding it towards the rear at the same time. Notice the plastic tabs and lip when viewed from the bottom.

When the tabs and lip are free from the base, remove the top housing from the base.

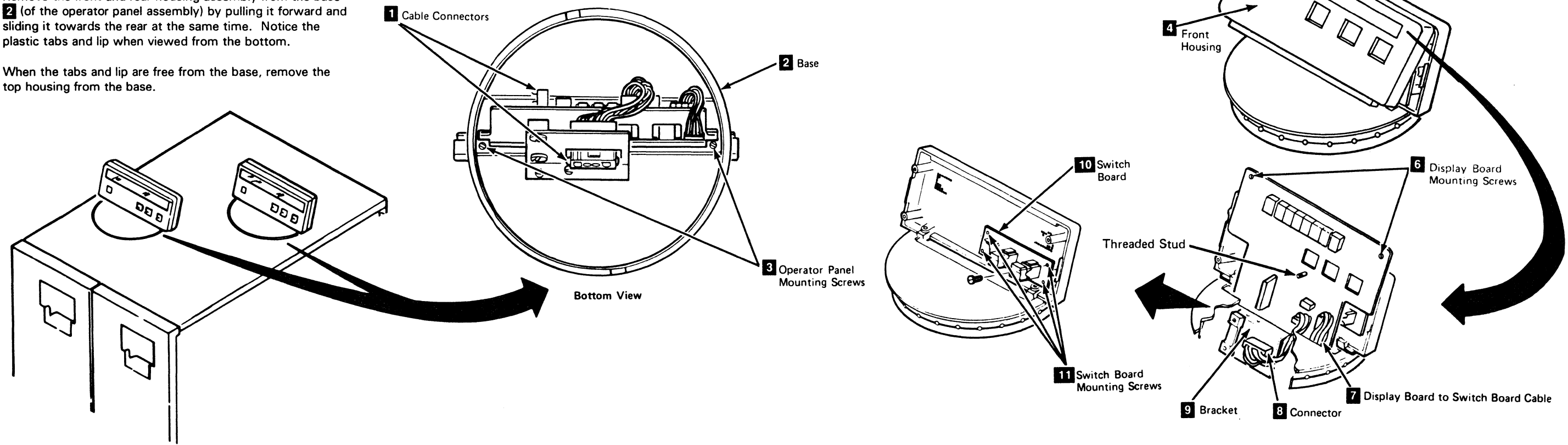
8. Remove the retention hardware as required and disconnect P1 **8** and loosen the J1 mounting bracket **9** (two screws).
9. Turn the operator panel assembly upright.
10. Pull the bottom of the front housing **4** away from the rear housing **5** and at the same time lift up on the bottom of the front housing and remove it from the operator panel assembly.
11. Disconnect the switch board cable **7** from the switch board **10** (located behind the display board, between the Unload and Ready switch connections).
12. Remove the two display board mounting screws **6** (located at the top corners) and the threaded stud (located in the center).
13. Remove the four mounting screws **11** and remove the switch board **10** from the rear housing.
14. Save all the mounting hardware for the replacement procedure.

Replacing the Operator Panel Switch Board

1. Place the switch board **10** on the rear housing (with the connector down) and install the four mounting screws **11**.
 2. Mount the display board on the rear housing **5** with the threaded stud in the center and the two mounting screws **6** in the upper corners.
 3. Connect the switch board cable **7** from the display board to the switch board.
- Note:** There is a 'U' shaped lip in the top of the front housing.
4. Place the top of the front housing **4** in the 'U' shaped slot at the top of the rear housing **5** and pivot the front housing down into position.
 5. Install the cable plug P1 into connector **8** and tighten the two screws for the J1 mounting bracket **9**.

Drive CARR-DR 1090

6. Work the bottom of the message display board through the opening in the operator panel assembly base.
7. Insert the bottom of the front housing **4** into the opening in the operator panel assembly base and press the front housing and the rear housing **5** together.
8. Turn the display panel assembly over and align the two mounting holes in the rear panel housing with the two holes in the base **3**.
9. Install the flat cable and the power cable into the connectors **1**.
10. Insert the folded cable into the clamp and tighten with the two screws. Replace any retention hardware.
11. Install the operator display panel by inserting the panel base **2** into the top cover (see CARR-DR 2-6).
12. Position the operator display panel to the original customer orientation.
13. Go to CARR-DR 8 for the procedure to **power on** the drive.



This page contains the steps needed to remove and replace the thermal switch (TU-Thermal Switch) in the drive.

Note: This FRU can be removed and replaced without affecting the other drive by removing power from the failing drive with the Drive Power On/Off switch.

Warning: This FRU is EC (engineering change) sensitive (see CARR-DR 4).

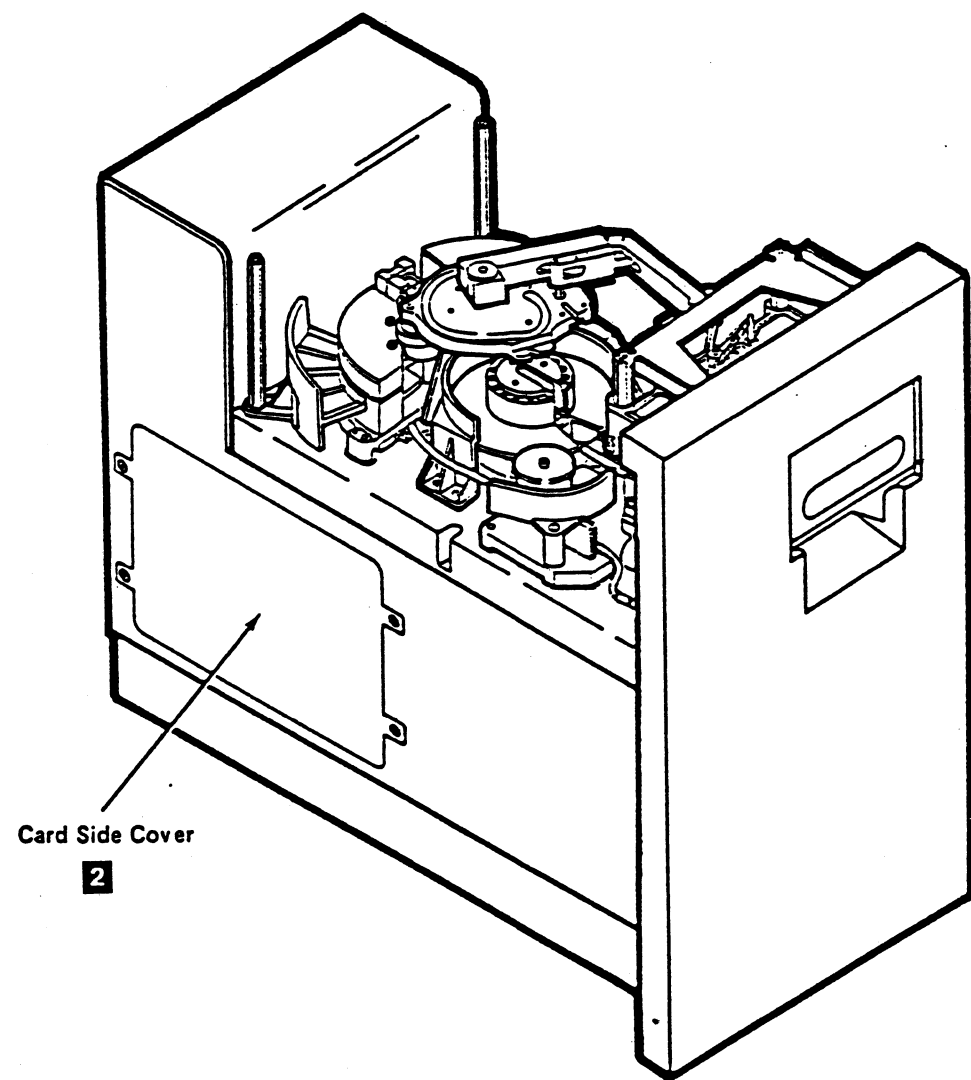
Removing the Drive Thermal Switch

1. Go to CARR-DR 8 for the procedure to **power off** the drive.
2. Open the drive drawer (see CARR-DR 2-5).
3. Remove the card side cover mounting screws and remove the card side cover **2**.

Note: The thermal switch is located in one of three places:

- Mounted on the logic board *right* card guide.
- Mounted on the logic board *left* card guide.
- Mounted on the rear of the cradle assembly.

4. Remove the thermal switch mounting screw **1** and remove the thermal switch.
5. Disconnect the wires from the thermal and remove the thermal from the drive.



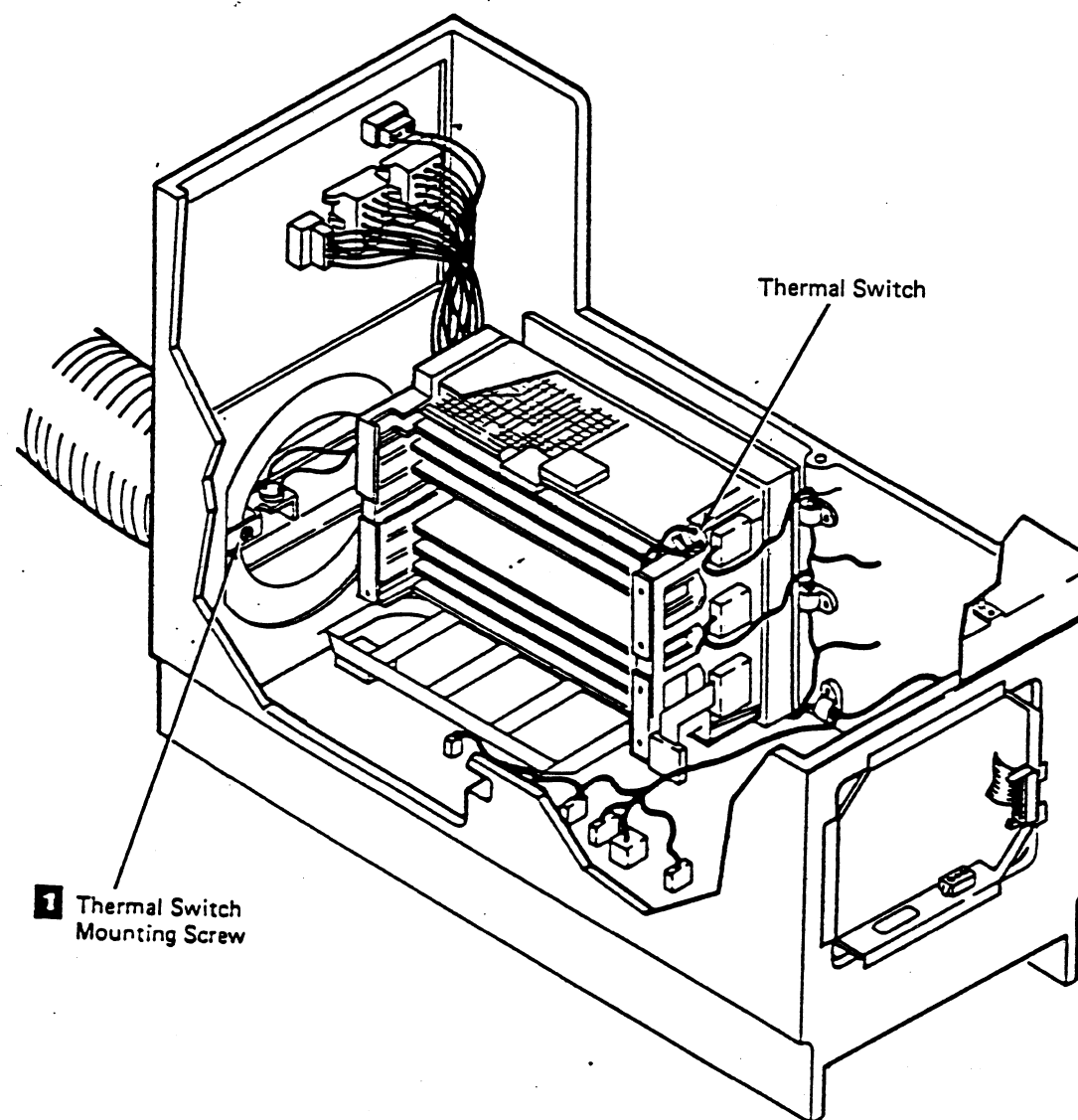
Replacing the Drive Thermal Switch

Warning: This FRU is EC (engineering change) sensitive (see CARR-DR 4).

Note: The thermal switch is installed in one of three places (depending on where the defective switch was installed):

- Mounted on the logic board *right* card guide.
- Mounted on the logic board *left* card guide.
- Mounted on the rear of the cradle assembly.

1. Connect the wires to the thermal switch.
2. Place the thermal switch in position and install the mounting screw **1**.
3. Place the card side cover **2** in position and install the mounting screws.
4. Close the drive drawer (see CARR-DR 2-5).
5. Go to CARR-DR 8 for the procedure to **power on** the drive.



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FRU110 Thermal Switch Removal and Replacement Procedure

Drive **CARR-DR 1100**

This page contains the steps needed to remove and replace the thermal switch (TU-Thermal Switch) in the drive.

Note: This FRU can be removed and replaced without affecting the other drive by removing power from the failing drive with the Drive Power On/Off switch.

Warning: This FRU is EC (engineering change) sensitive (see CARR-DR 4).

Removing the Drive Thermal Switch

1. Go to CARR-DR 8 for the procedure to **power off** the drive.
2. Open the drive drawer (see CARR-DR 2-5).
3. Remove the card side cover mounting screws and remove the card side cover **3**.

Note: The thermal switch is located in one of two places:

- Mounted on the logic board *right* card guide.
 - Mounted on the logic board *left* card guide.
4. Remove the thermal switch mounting screw **1** and remove the thermal switch from the card guide **2**.
 5. Disconnect the wires from the thermal and remove the thermal from the drive.

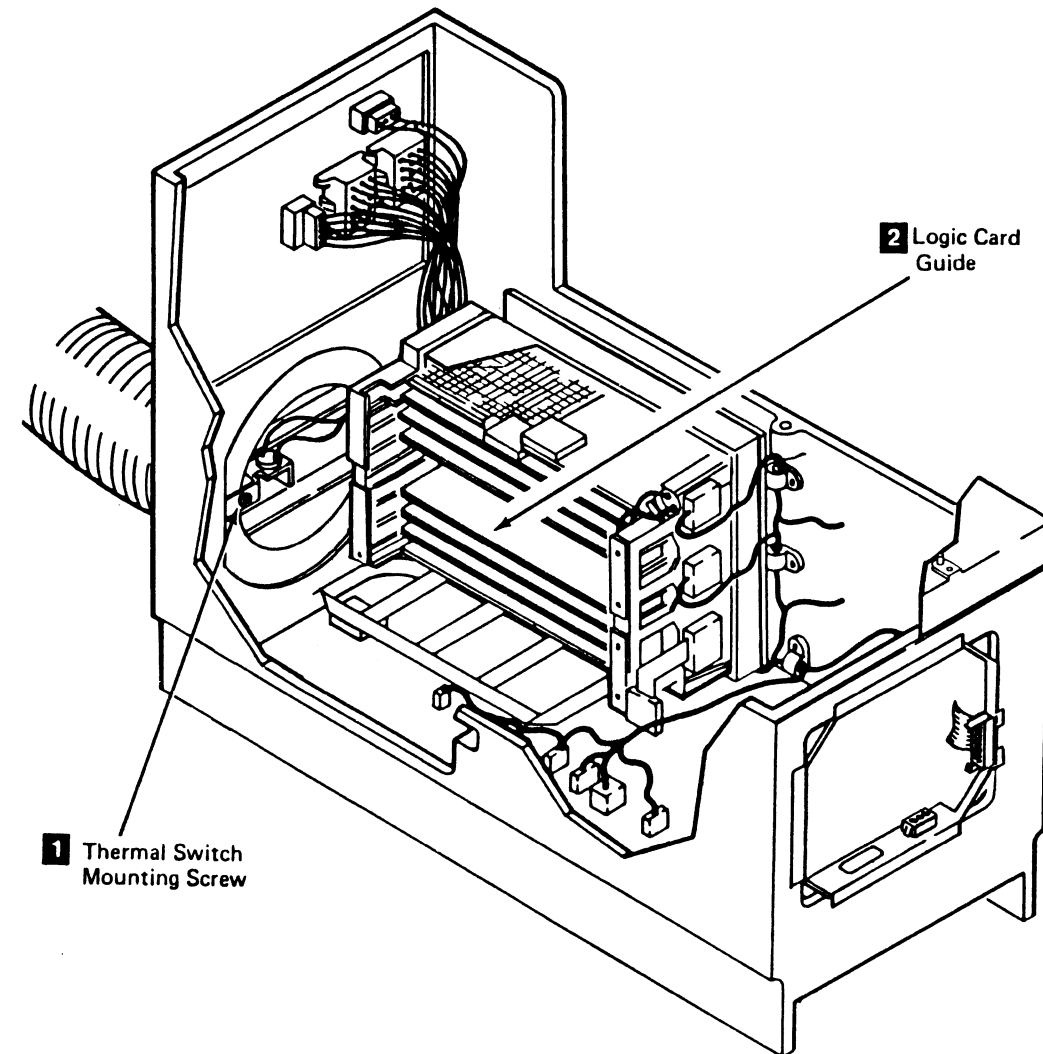
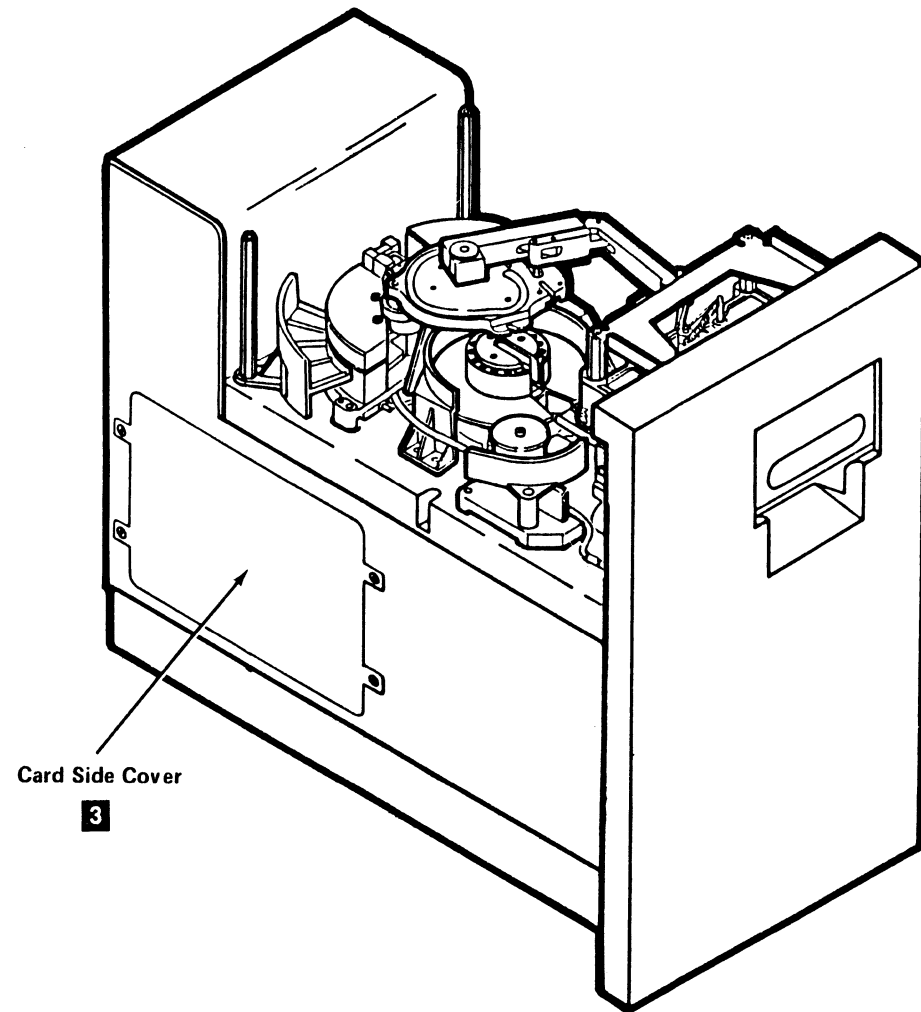
Replacing the Drive Thermal Switch

Warning: This FRU is EC (engineering change) sensitive (see CARR-DR 4).

Note: The thermal switch is installed in one of two places (depending on where the defective switch was installed):

- Mounted on the logic board *right* card guide.
- Mounted on the logic board *left* card guide.

1. Connect the wires to the thermal switch.
2. Place the thermal switch in position on the card guide **2** and install the mounting screw **1**.
3. Place the card side cover **3** in position and install the mounting screws.
4. Close the drive drawer (see CARR-DR 2-5).
5. Go to CARR-DR 8 for the procedure to **power on** the drive.



FRU110 Thermal Switch Removal and Replacement Procedure

Tape Unit Without BM 6460006 (See CARR-DR 9)

This page contains the steps needed to remove and replace the thermal switch (TU-Thermal Switch) in the drive.

Note: This FRU can be removed and replaced without affecting the other drive by removing power from the failing drive with the Drive Power On/Off switch.

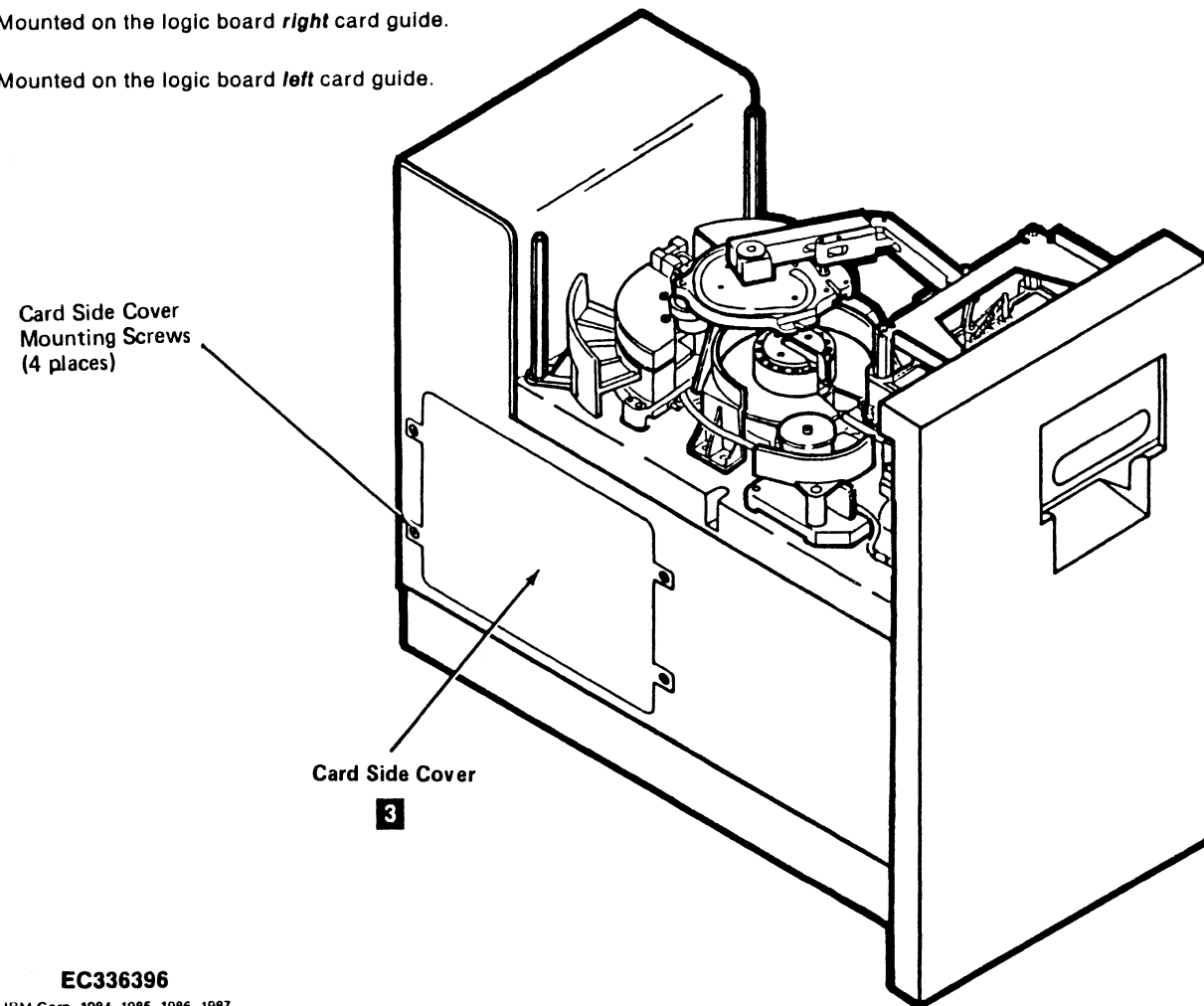
Warning: This FRU is EC (engineering change) sensitive (see CARR-DR 4).

Removing the Drive Thermal Switch

1. Go to CARR-DR 8 for the procedure to **power off** the drive.
2. Open the drive drawer (see CARR-DR 2-5).
3. Remove the card side cover **3**.

Note: The thermal switch is located in one of two places.

- Mounted on the logic board **right** card guide.
- Mounted on the logic board **left** card guide.



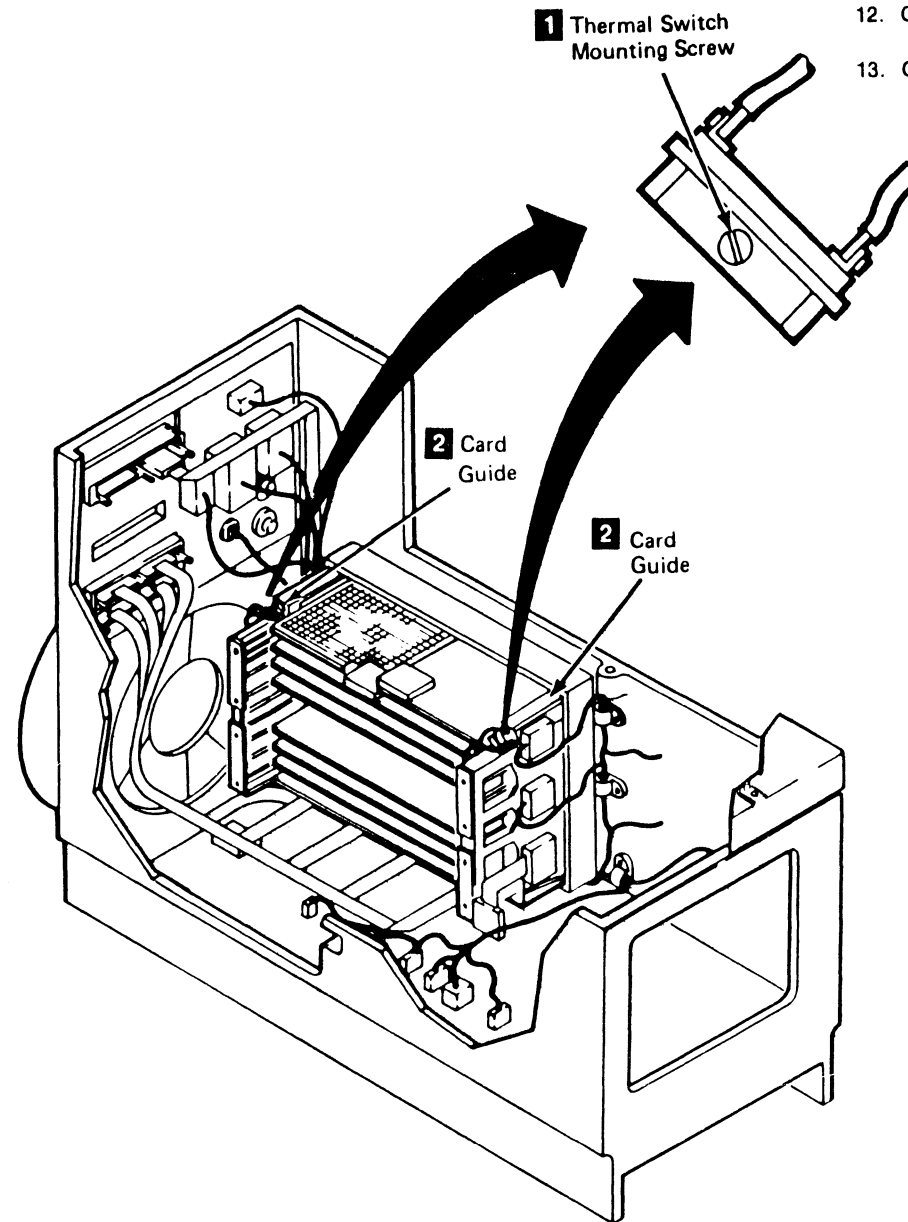
4. Remove the thermal switch mounting screw **1** and remove the thermal switch from the card guide **2**.
5. If the thermal switch is mounted on the **left** card guide, proceed to step 7 of this procedure.
6. If the thermal switch is mounted on the **right** card guide, disconnect the wires from the thermal and remove the thermal switch from the drive.
7. Locate and disconnect the pigtail connector (below the right-hand corner of the logic card cage).
8. Locate and remove the cable clamp (below the center of the logic card cage).
9. Remove the thermal switch and pigtail from the drive (some card removal may be necessary).

Replacing the Drive Thermal Switch

Note: The thermal switch is located in one of two places.

- Mounted on the logic board **right** card guide.
- Mounted on the logic board **left** card guide.

1. If the thermal switch is located on the **right** card guide, connect the wires to the thermal switch.
2. Place the thermal switch in position on the card guide **2** and install the mounting screw **1**.
3. If the thermal switch is located on the **left** card guide, go to step 7 of this procedure.



4. Place the card side cover **3** in position.
5. Close the drive drawer (see CARR-DR 2-5).
6. Go to CARR-DR 8 for the procedure to **power on** the drive.
7. Route the thermal switch pigtail to the lower right-hand corner of the logic card cage and connect to the cable.
8. Install the cable clamp at the lower center of the logic card cage.
9. Install any logic cards you removed in the removal procedure.
10. Go to step 4 of this procedure.
11. Place the card side cover **3** in position.
12. Close the drive drawer (see CARR-DR 2-5).
13. Go to CARR-DR 8 for the procedure to **power on** the drive.

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FRU127 Latch Interlock Removal and Replacement Procedure

This page contains the steps needed to remove and replace the latch interlock in the drive. The other drive will not be affected.

The latch interlock is a part of the cartridge latch assembly or the load assembly.

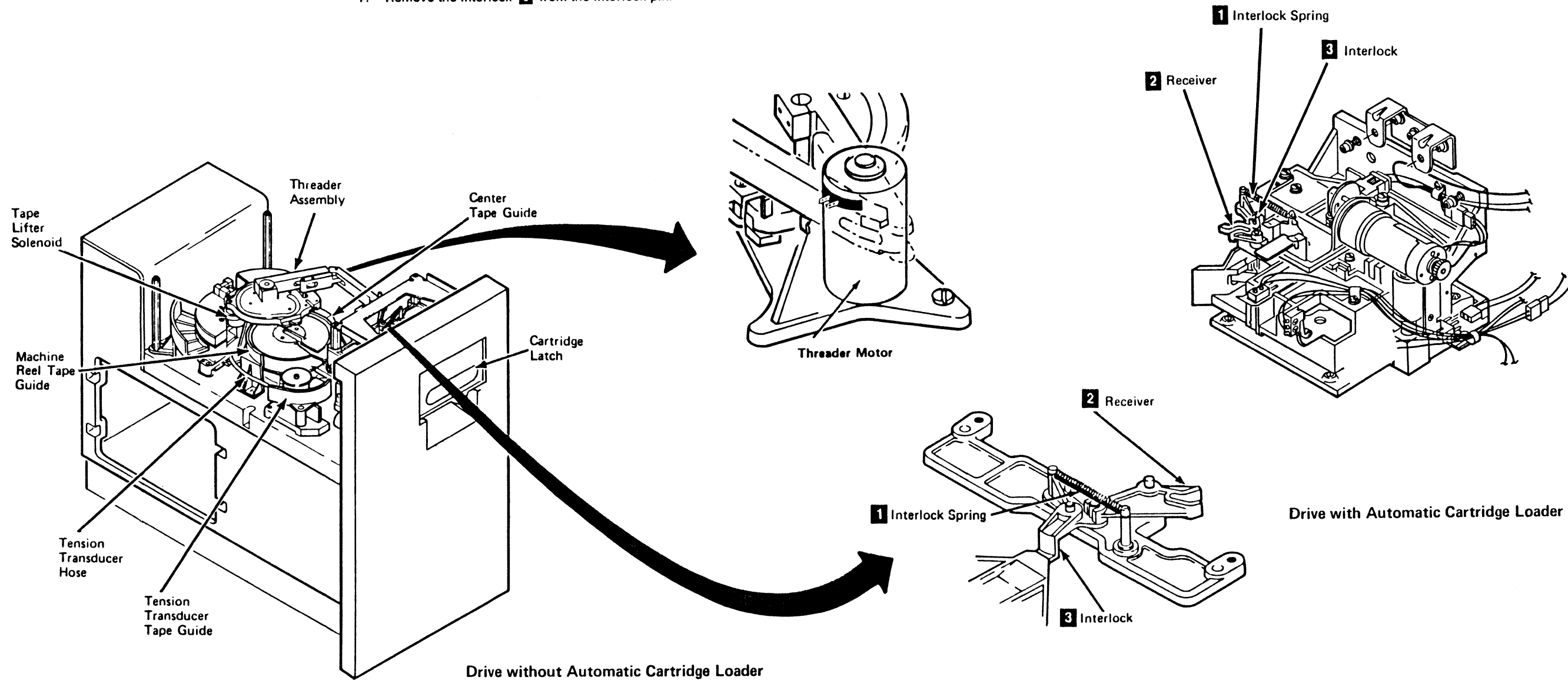
Note: This FRU can be removed and replaced without affecting the other drive by removing power from the failing drive with the Drive Power On/Off switch.

Removing the Latch Interlock

1. Go to CARR-DR 8 for the procedure to **power off** the drive.
2. Open the drive drawer (see CARR-DR 2-5).
3. Remove the drive drawer safety cover (see CARR-DR 2-5).
4. Remove both ends of the interlock spring **1** and remove the spring from the latch assembly.
5. Remove the 'C' clips holding the receiver **2** and the interlock **3**.
6. Lift the receiver **2** so it is not engaged with the interlock.
7. Remove the interlock **3** from the interlock pin.

Replacing the Latch Interlock

1. Place the interlock **3** on the interlock pin.
2. Place the receiver **2** on the receiver pin.
3. Replace the 'C' clips on the interlock and receiver pins.
4. Replace the interlock spring **1**.
5. Replace the drive drawer safety cover (see CARR-DR 2-5).
6. Close the drive drawer (see CARR-DR 2-5).
7. Go to CARR-DR 8 for the procedure to **power on** the drive.



FRU129 Physical Address Switch Removal and Replacement Procedure

Drive **CARR-DR 1290**

Tape Unit With BM 6460006 (see CARR-DR 9)

This page contains the steps needed to remove and replace the physical address switch (TU-PASW) in the drive. The other drive will not be affected.

The physical address switch is located on the rear panel of each drive drawer.

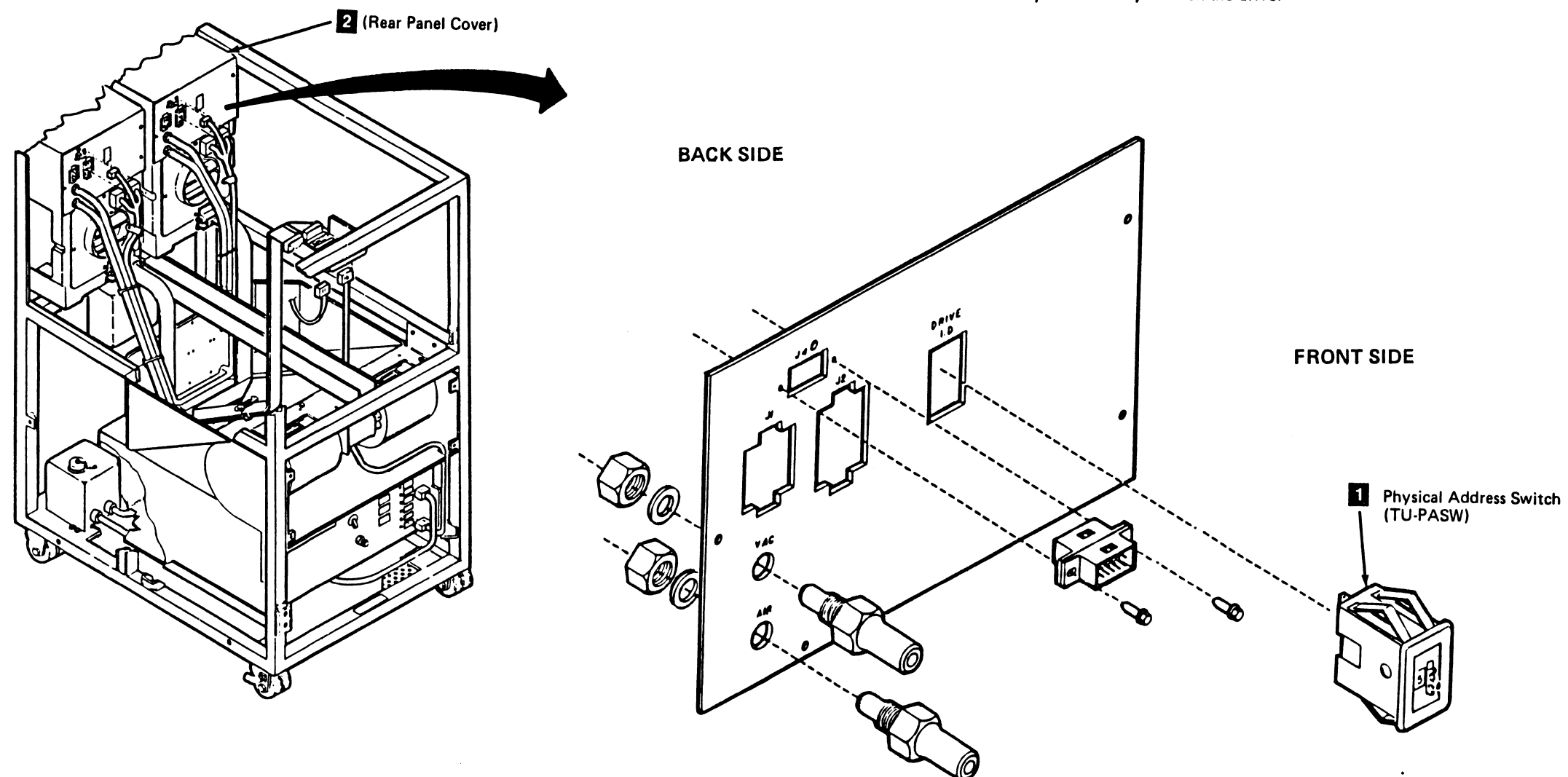
Note: This FRU can be removed and replaced without affecting the other drive by removing power from the failing drive with the Drive Power On/Off switch.

Removing the Physical Address Switch

1. Go to CARR-DR 8 for the procedure to *power off* the drive.
2. Open the drive drawer and remove the drive rear panel cover (see CARR-DR 2-5).
3. Write the address shown on the physical address switch **1** on the rear panel cover **2**. This address will be used in the replacement procedure.
4. Disconnect the cable connector to the physical address switch.
5. Compress the springs on the physical address switch and push the switch out the rear panel of the drive drawer.

Replacing the Physical Address Switch

1. Compress the springs on the physical address switch and push the switch through the rear panel of the drive drawer.
- Ensure that the switch is positioned so that the digits can be read.
2. Connect the cable connector to the physical address switch.
 3. Set the physical address switch **1** to the physical address of the drive. The physical address of the drive should have been written on the rear panel cover during the removal procedure.
 4. Replace the drive rear panel cover **2** (see CARR-DR 2-5).
 5. Close the drive drawer.
 6. Go to CARR-DR 8 for the procedure to *power on* the drive.



Tape Unit Without BM 6460006 (see CARR-DR 9)

This page contains the steps needed to remove and replace the physical address switch (TU-PASW) in the drive. The other drive will not be affected.

The physical address switch is located at the rear of the tape deck on the rear panel cover.

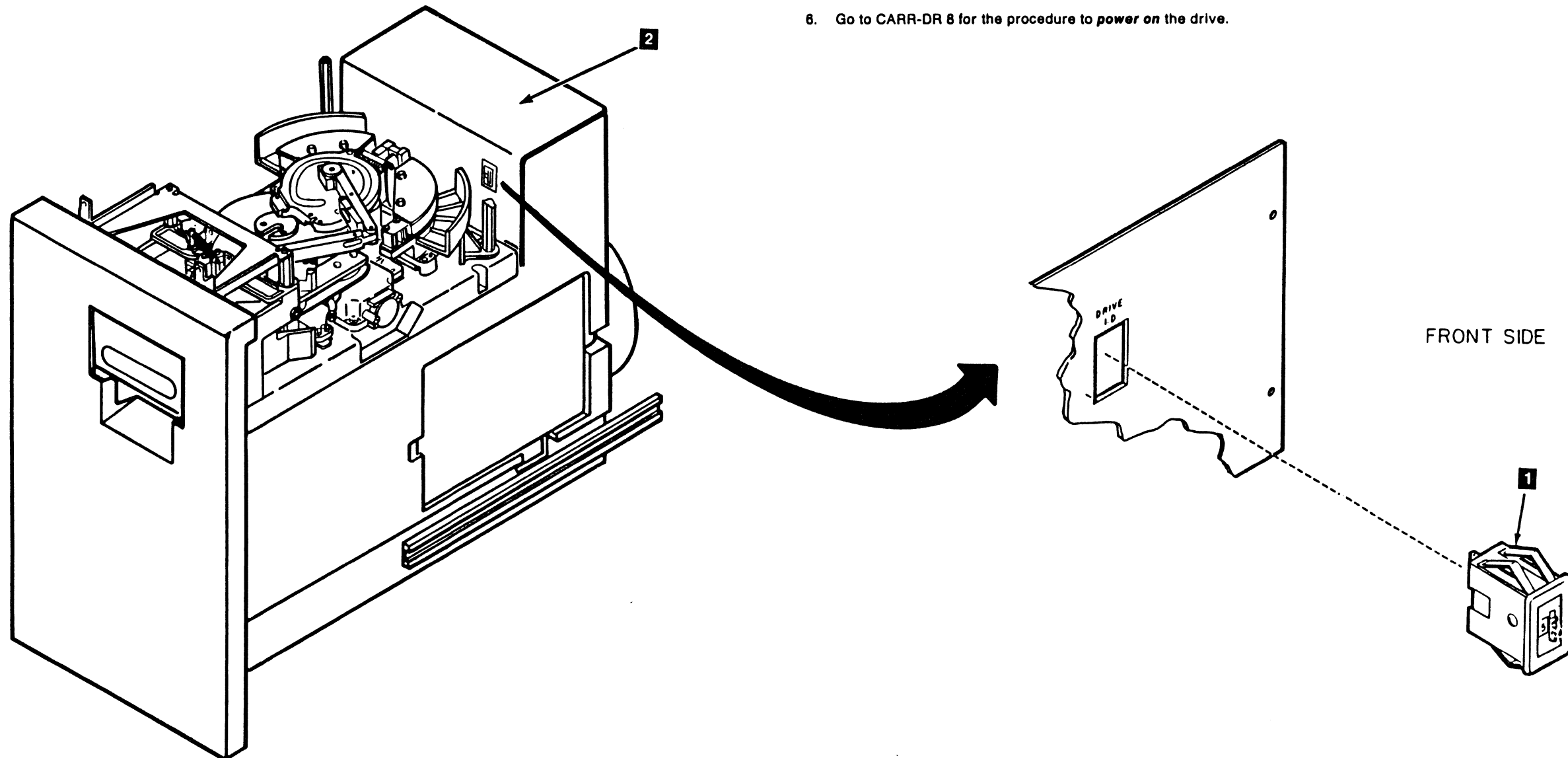
Note: This FRU can be removed and replaced without affecting the other drive by removing power from the failing drive with the Drive Power On/Off switch.

Removing the Physical Address Switch

1. Go to CARR-DR 8 for the procedure to *power off* the drive.
2. Open the drive drawer and remove the drive drawer safety cover (see CARR-DR 2-5).
3. Write the address shown on the physical address switch **1** on the rear panel cover **2**. This address will be used in the replacement procedure.
4. Use a small screwdriver to pry the physical address switch from the rear panel cover.
5. Disconnect and label the wires to the physical address switch.

Replacing the Physical Address Switch

1. Connect the wires to the physical address switch.
 2. Replace the physical address switch **1** in the rear panel cover **2**.
- Ensure that the switch is positioned so that the digits can be read.
3. Set the physical address switch to the physical address of the drive. The physical address of the drive should have been written on the rear panel cover during the removal procedure.
 4. Replace the drive safety cover (see CARR-DR 2-5).
 5. Close the drive drawer.
 6. Go to CARR-DR 8 for the procedure to *power on* the drive.



FRU161 Cleaner Block Assembly Removal and Replacement Procedure

This page contains the steps needed to remove and replace the cleaner block assembly **3** from the drive.

Note: This FRU can be removed and replaced without affecting the other drive by removing power from the failing drive with the Drive Power On/Off switch.

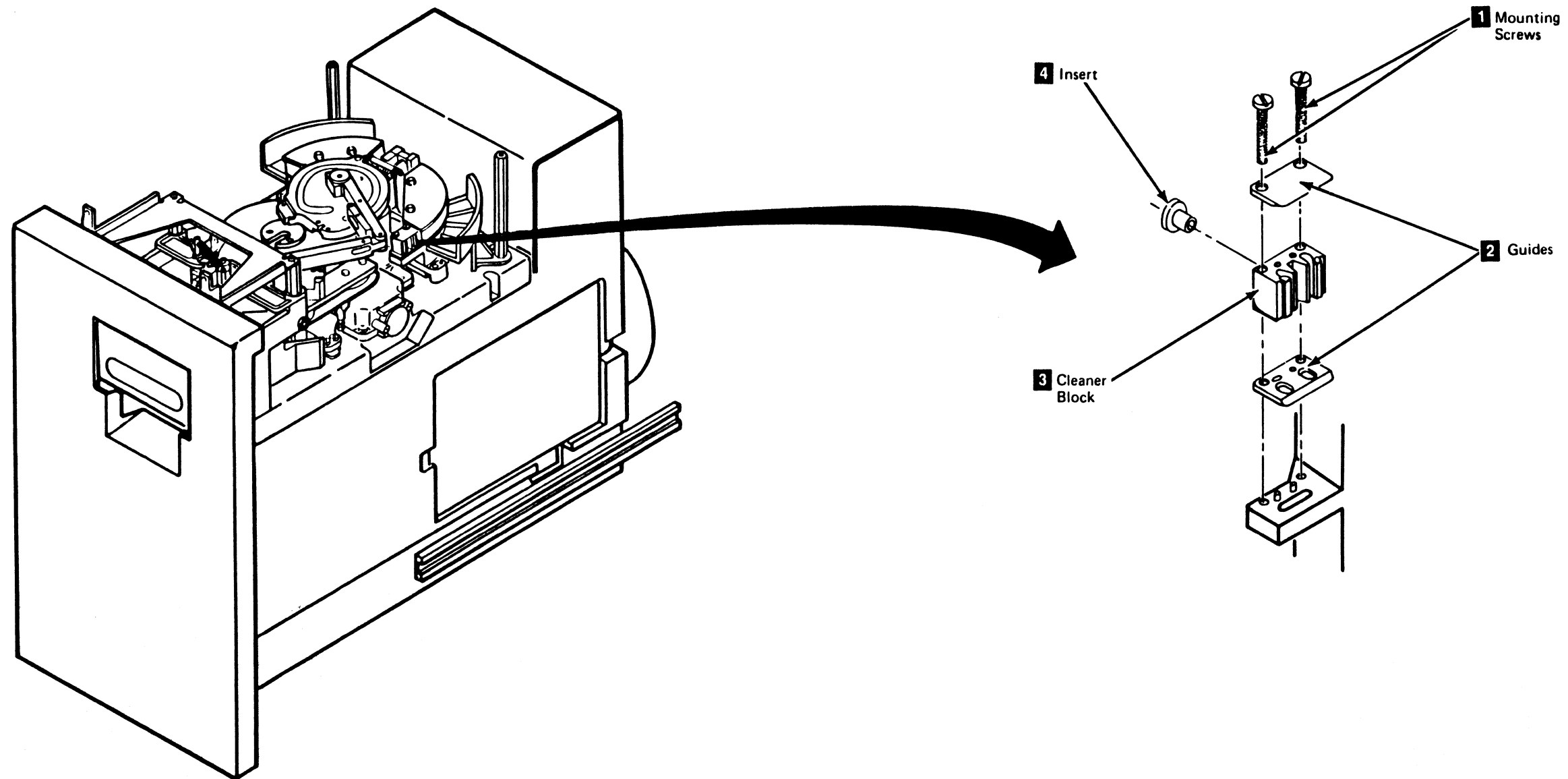
Removing the Cleaner Block Assembly

1. Go to CARR-DR 8 for the procedure to **power off** the drive.
2. Open the drive drawer and remove the drive drawer safety cover (see CARR-DR 2-5).
3. Remove the two cleaner block mounting screws **1** using care not to drop the upper and lower guides **2**.
4. Remove the cleaner block **3** and the two guides.
5. Remove the plastic insert **4**. Save the guides and plastic insert for use on the replacement cleaner block.

Replacing the Cleaner Block Assembly

1. Install the plastic insert **4** on the new cleaner block.
2. Install the cleaner block **3** using the two mounting screws **1** and the upper and lower guides **2** as shown. Do not over tighten the mounting screws.

3. Install the drive drawer safety cover (see CARR 2-5).
4. Go to CARR-DR 8 for the procedure to **power on** the drive.



FRU211 Message Display Cable Removal and Replacement Procedure (Message Display to SLT Panel)

Tape Unit With BM 6460006 (see CARR-DR 9)

This page contains the steps needed to remove and replace the message display flat cable between the message display (TU-DSP) and the tape unit SLT connector panel (located on the bottom of the external load resistor panel - or cable support bracket, if the tape unit has power supply part number 6177166 or 6177167 installed).

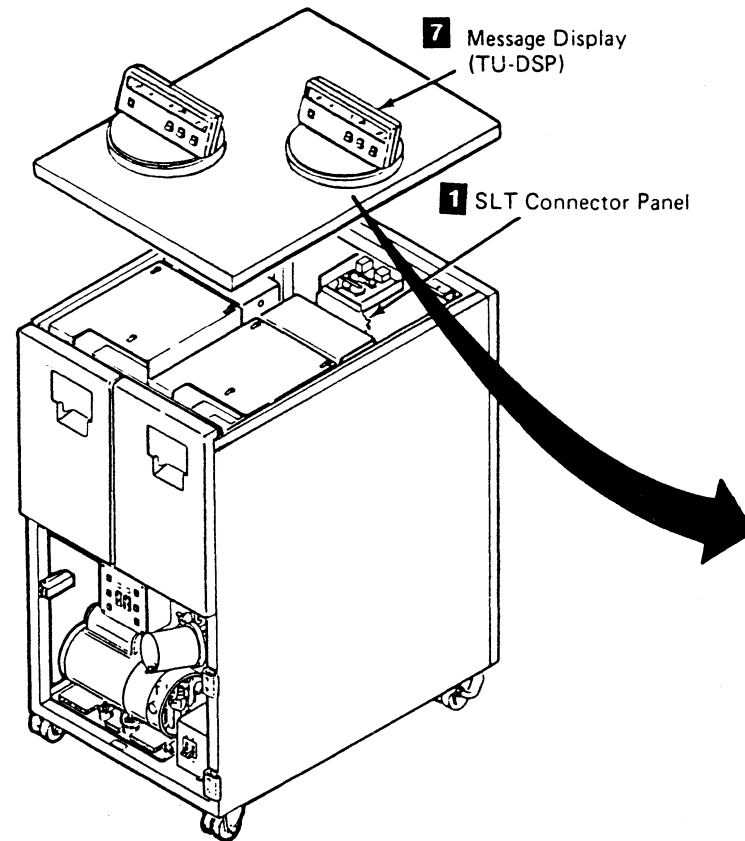
It is not necessary to have both drives available for service.

Note: This FRU can be removed and replaced without affecting the other drive by removing power from the failing drive with the Drive Power On/Off switch.

Removing the Message Display Cable

1. Go to CARR-DR 8 for the procedure to **power off** the drive.
2. Open the tape unit rear cover (see CARR-DR 2-1).
3. Disconnect the SLT cable for the failing drive from the SLT connector panel MD 00/01 **1**, located below the external load resistor panel (cable support bracket if the tape unit has power supply part number 6177166 or 6177167 installed.)

Warning: When removing the ferrites, take care not to drop them as they may shatter on impact.



4. Loosen the two screws holding the ferrites **5** to the radio frequency interference (RFI) pan **6** and carefully remove both of the ferrite parts.

Note: The ferrites **5** are only present in machines without EC A46533 installed.
5. Remove the message display panel (for the failing drive) **7** from the top cover of the tape unit (see CARR-DR 2-6).
6. Place the message display panel on top of the tape unit to get access to the bottom of the panel.
7. Remove the two screws from cable clamp **3**.
8. Remove the message display cable from connector DPS-J1 **2** (TU-D0/1-DSP-J1) on the message display board.
9. Note the position of the ferrite **4** (from the end of the cable) and then carefully remove both of the ferrite parts.

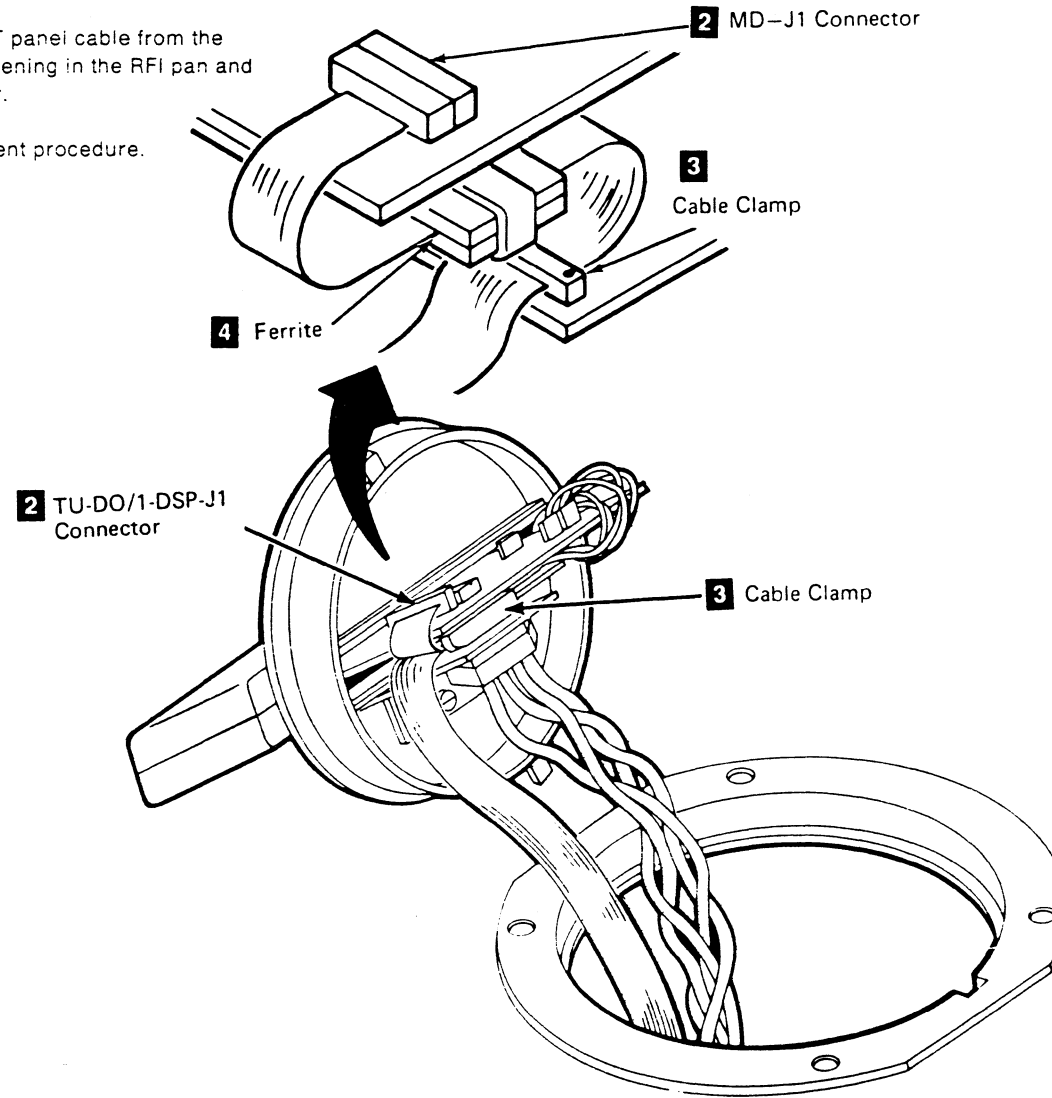
Note: The ferrites **4** are only present in machines without EC A46533 installed.
10. Remove the message display to SLT panel cable from the tape unit by pulling it through the opening in the RFI pan and through the opening in the top cover.
11. Save all hardware for the replacement procedure.

Replacing the Message Display Cable

1. Connect the message display cable for the failing drive to the SLT connector panel MD 00/01 **1**, located below the external load resistor panel (cable support bracket if the tape unit has power supply part number 6177166 or 6177167 installed).
2. Route the DSP-J1 connector end of the message display cable through the hole in the radio frequency interference (RFI) pan **6** to the message display panel **7**.
3. Loosely, assemble the two ferrite parts **5** (surrounding the cables) and attach with the mounting screws to the RFI pan **6**.

Notes:

- a. Ensure that you do not pinch any of the cables when you tighten the mounting screws.
- b. The ferrites **5** are only present in machines without EC A46533 installed.

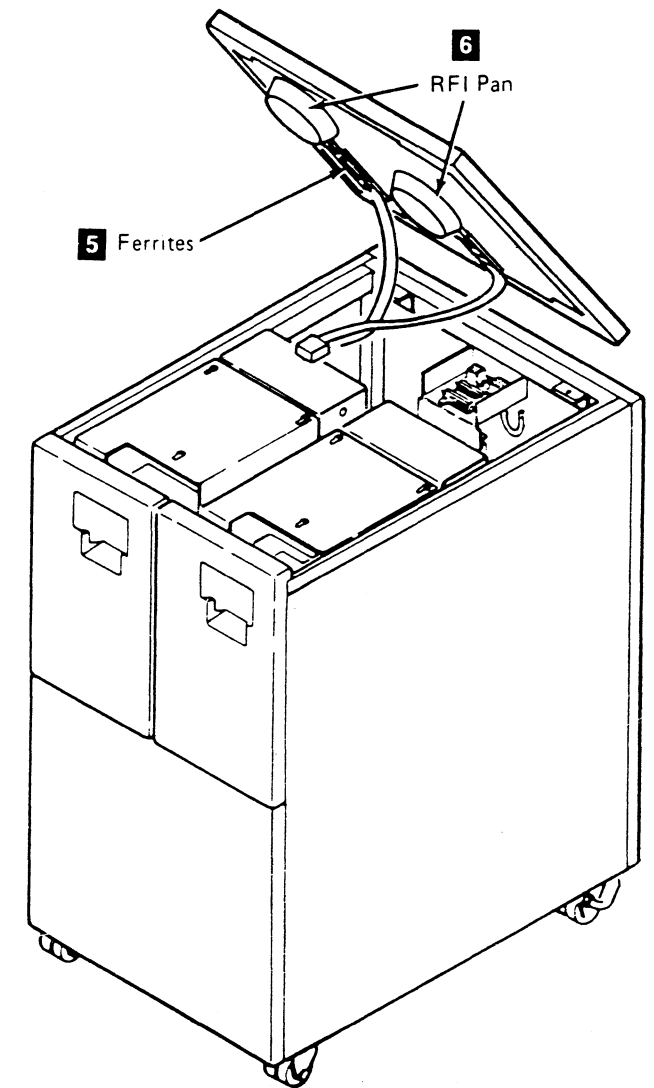


Drive CARR-DR 2110

4. Loosely, assemble the two ferrite parts **4** (surrounding the cables) and place in the position (from the cable end) noted in the removal procedure.

Notes:

- a. Ensure that you do not pinch any of the cables with the ferrites.
 - b. The ferrites **4** are only present in machines without EC A46533 installed.
5. Install the cable clamp **3** with the two mounting screws.
 6. Plug the message display cable into connector DSP-J1 **2** (TU-D0/1-DSP-J1) on the message display panel.
 7. Install the message display panel **7** in the tape unit (see CARR-DR 2-6).
 8. Close the tape unit rear cover (see CARR-DR 2-2).
 9. Go to CARR-DR 8 for the procedure to **power on** the drive.



Drive CARR-DR 2110

FRU211 Message Display Cable Removal and Replacement Procedure (SLT Panel to Logic Board)

Drive **CARR-DR 2113**

Tape Unit With BM 6460006 (see CARR-DR 9)

This page contains the steps needed to remove and replace the message display flat cable between the SLT connector panel (located on the bottom of the external load resistor panel) and the logic board 02A-Y2.

It is necessary to have both drives available for service.

Note: This FRU can be removed and replaced without affecting the other drive by removing power from the failing drive with the Drive Power On/Off switch.

Removing the Message Display Cable

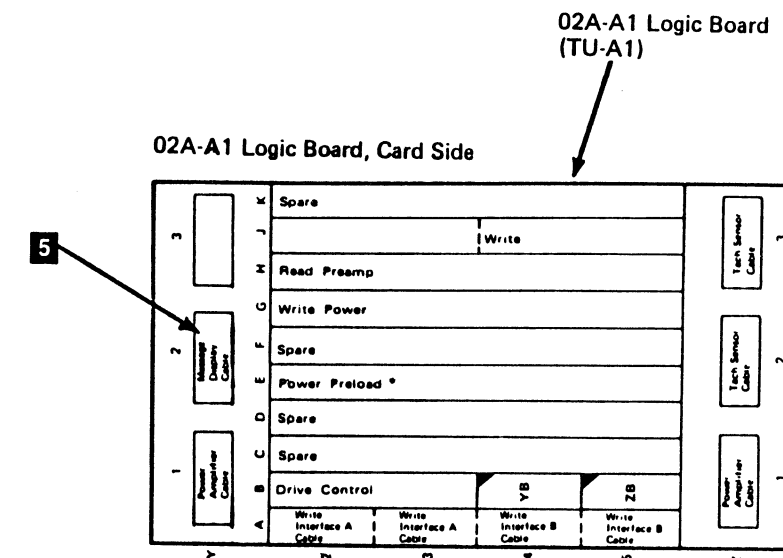
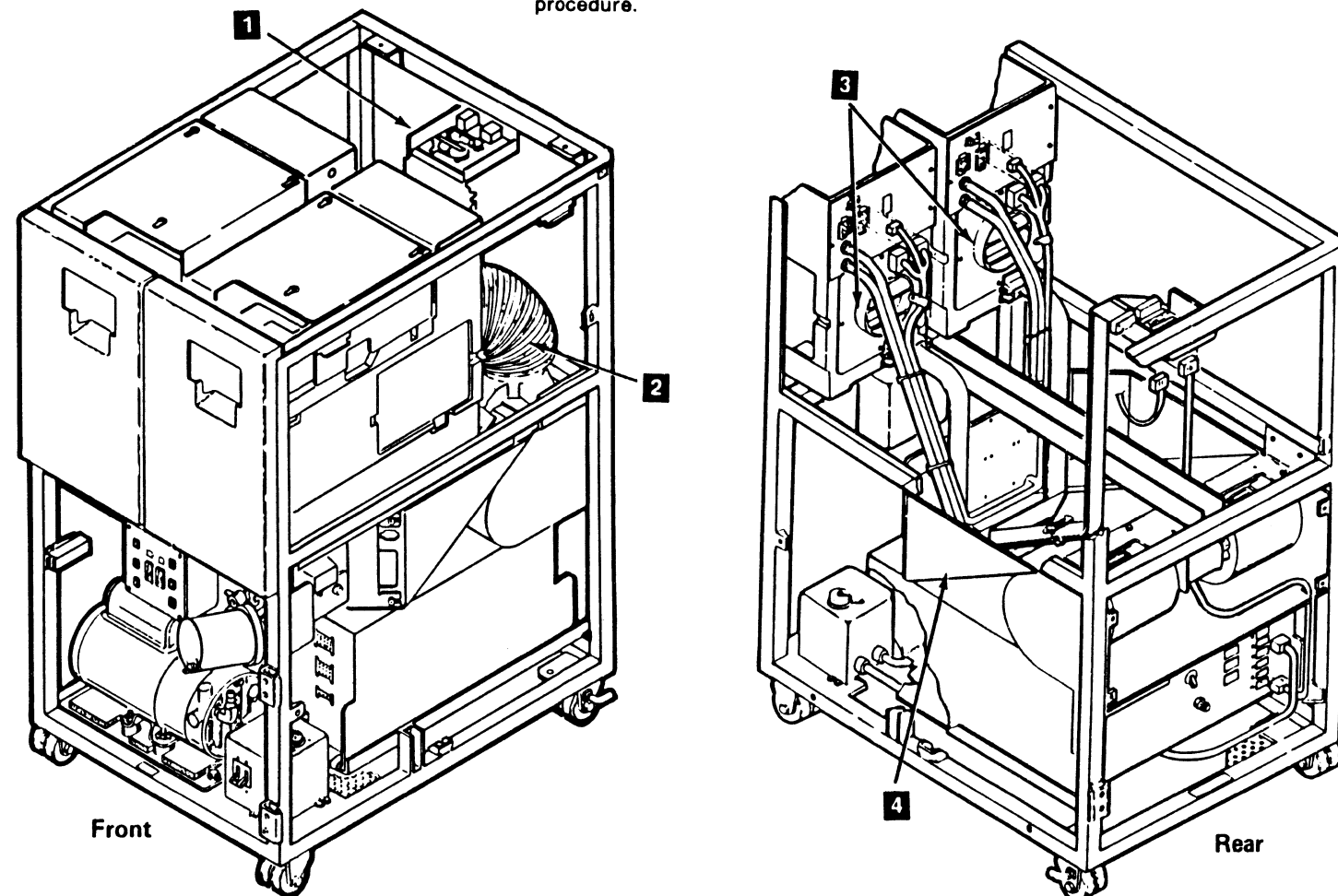
1. Go to CARR-DR 8 for the procedure to **power off** the drive.
2. Open the tape unit rear cover (see CARR-DR 2-1).
3. Remove the convoluted bellows **2** (see CARR-DR 2230) for drive 1 to get better access to the path the cable follows to the logic board.

4. Open both drive drawers (see CARR-DR 2-5).
5. Remove the message display signal cable (for the affected drive) from the SLT connector **1** (located on the bottom of the external load resistor panel - cable support bracket is the tape unit has power supply part number 6177166 or 6177167 installed).
6. Loosen the drive cable retainer clamps and remove the message display signal cable from the cable raceway on top of the cable plenum **4**.
7. Remove the drive bellows housing **3** for the affected drive (held in position by four screws).
8. Reach through the opening in the rear of the drive drawer and unplug the display cable from the logic board (Y2 position) **5**.
9. Loosen the cable clamp located at the rear of the drive drawers.
10. Unlace the message display signal cable from the R/W cables and remove the cable from the tape unit.
11. Save all the mounting hardware for the replacement procedure.

Replacing the Message Display Cable

1. Route the logic board end of the message display signal cable through the cable raceway on top of the cable plenum **4** and to the logic board.
2. Route the cable through the cable clamp at the rear of the drive drawers and replace the cable clamp.
3. Reach through the opening in the rear of the drive drawer and plug the message display signal cable into the correct position in the logic board (Y2 position) **5**.
4. Replace the drive bellows housing **3** for the affected drive (held in position by four screws).

5. Replace the drive cable retaining clamps that hold the drive cables in the cable raceway on top of the cable plenum **4**.
6. Replace the convoluted bellows **2** for drive 1.
7. Plug the message display signal cable into the SLT connector panel **1** (located on the bottom of the external load resistor panel - cable support bracket is the tape unit has power supply part number 6177166 or 6177167 installed).
8. Lace the cable to the R/W cables for the affected drive.
9. Replace the tape unit rear cover (and ground connector, if present) (see CARR-DR 2-2).
10. Close the tape unit rear cover (see CARR-DR 2-2).
11. Go to CARR-DR 8 for the procedure to **power on** the drive.



*Power preload card not used in machines containing power supply part number 6177166 or 6177167

Tape Unit Without BM 646006 (see CARR-DR 9)

This page contains the steps needed to remove and replace the message display cable between the message display 1 (TU-DSP) and the drive rear panel 6. A second service representative will be needed during the procedure to hold the top cover during the cable removal and replacement.

It is necessary to have both drives available for service.

Note: This FRU can be removed and replaced without affecting the other tape units by removing power from the failing tape unit with the ac power circuit breaker.

Removing the Message Display Cable

1. Go to CARR-DR 8 for the procedure to **power off** the tape unit.
2. Remove the operator panel from the top cover (see CARR-DR 2-6).
3. Turn the operator panel housing over and set it on the top cover.

Note: Take care to note the lengths of the cables.

4. Remove retention hardware as required and remove the connector from DSP-J1 2 on the message display and loosen the cable clamp 3.
5. Partially extend the drive drawer (see CARR-DR 2-5).
6. Open the rear cover and remove the rear safety cover and ground connector (see CARR-DR 2-3).
7. Release the cable in the next step by pushing down on the tab 5.

Warning: Control unit errors may occur if the write cable connections are unplugged.

8. Disconnect the cable from P1-P1 7 (TU-D0/1-P1-P1).

Loosen the top cover retaining screws by turning them one-fourth counterclockwise (these are captive screws).

Remove the message display power cable from the cable holders to get extra working length when pivoting the top cover (both drives).

The top cover is retained by two hinge-type fasteners located on the rear of the cover.

9. Have the second service representative lift the top cover by lifting on the front edge.
10. Remove the three mounting screws and washers and the air partition 4 from the top cover.
11. Remove the Radio Frequency Interference (RFI) pan (remove four nuts) to get access to the message display cable connector.
12. Remove the ferrite retention screws and plate and remove the ferrites.
13. Remove the cable retention hardware and remove the cable from the top cover.
14. Remove the cable from the cable plate 8; be sure to save the plastic clamp and rubber retainer for the replacement procedure.
15. Save all hardware for the replacement procedure.

Replacing the Message Display Cable

This page contains the steps needed to replace the message display flat cable between the message display panel 1 and the drive rear panel 6. A second service representative will be needed during the procedure to hold the top cover during the cable replacement.

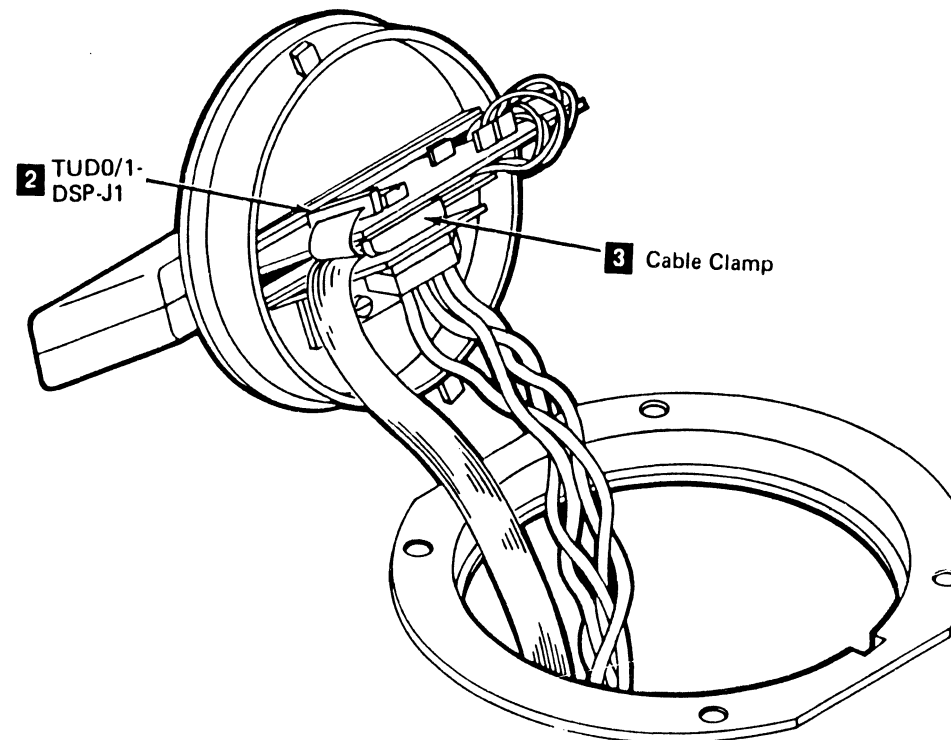
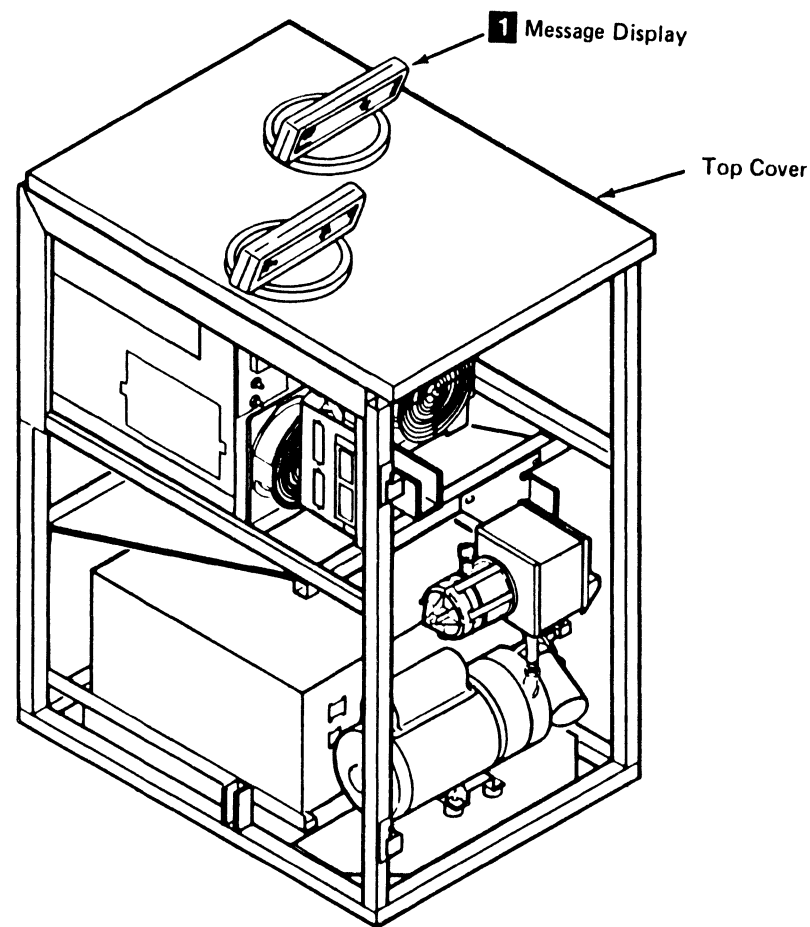
It is necessary to have both drives available for service.

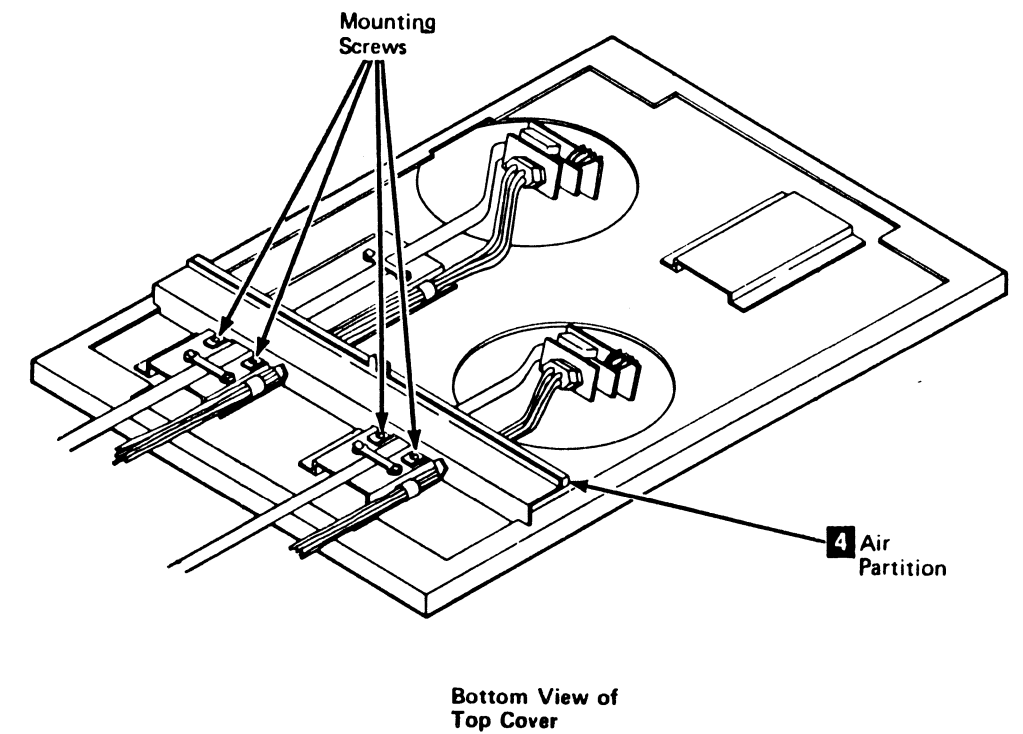
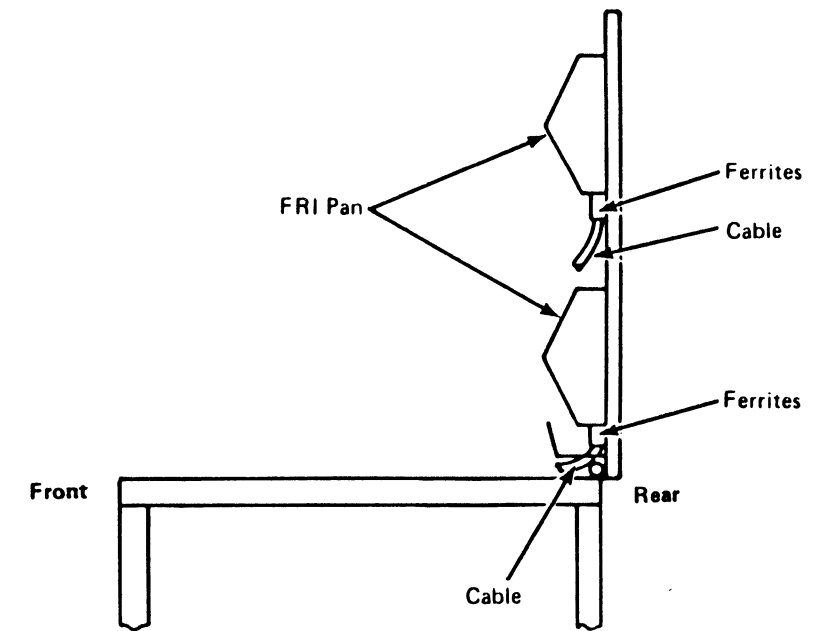
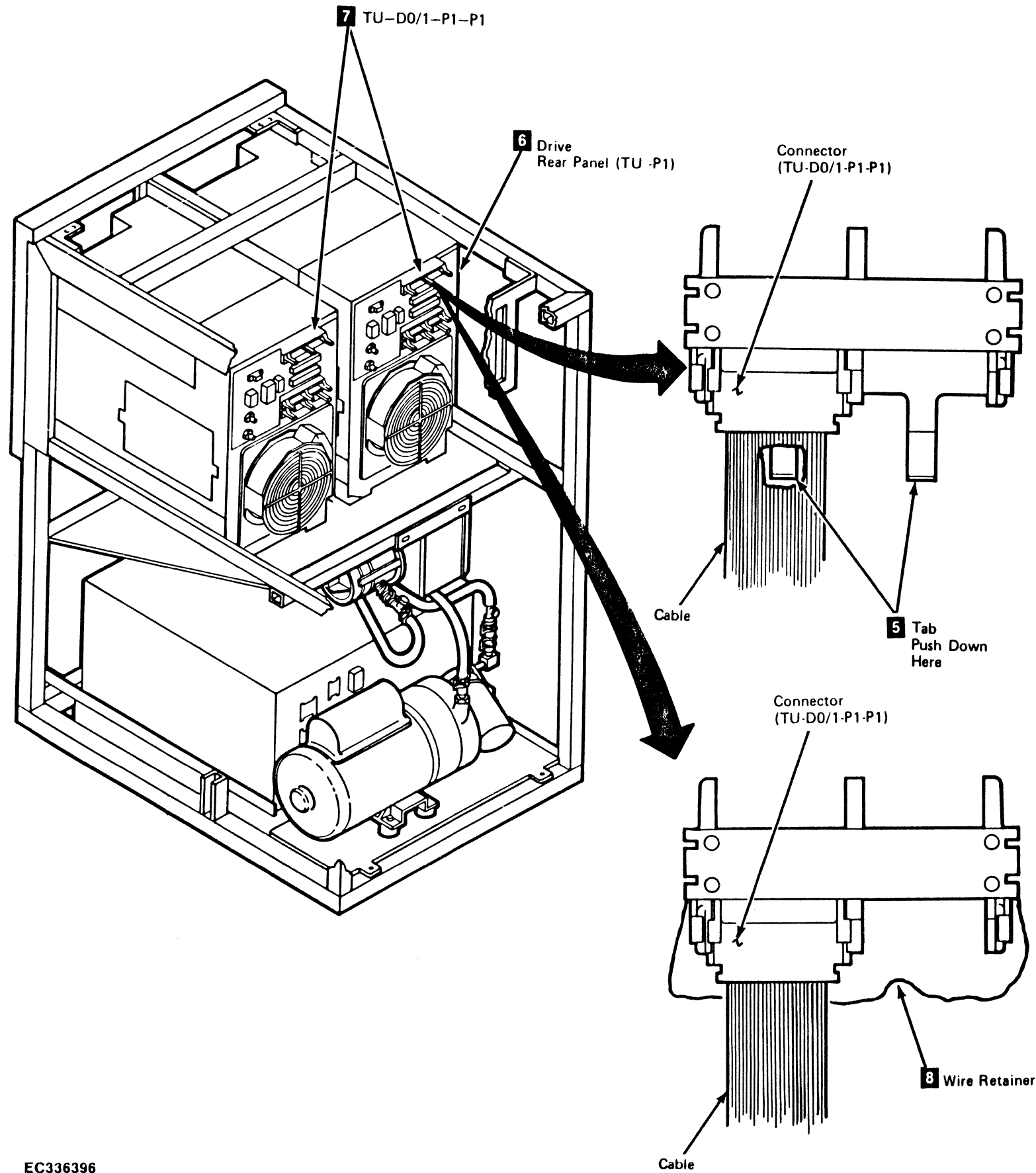
1. Connect the cable into P1-P1 7 (TU-D0/1-P1-P1) on the drive rear panel.
2. Have the second service representative lift up and hold the top cover while the message display cable is being replaced.
3. Route the cable to the rear of the tape unit and through the cable plate 8. Be sure to install the plastic clamp and the rubber retainer.
4. Place the message display cable in position on the top cover and install the cable retention hardware, including the ferrite assembly and the radio frequency interference (RFI) pan.
5. Install the four mounting screws and washers and the air partition 4 on the top cover.

6. Lower the top cover into place on the tape unit frame and turn the top cover fasteners one-fourth clockwise to retain the top cover.
7. Pull the end of the cable through the opening in the top cover.
8. Fold the message display cable approximately 100 mm (4 inches) from the end.
9. Slide the cable under the cable clamp 3 and tighten the screws.
10. Connect the cable to DSP-J1 2 on the message display panel and replace any retention hardware.

Note: Ensure that the D02 position of the cable connector is up or away from the message display board.

11. Install the operator panel into the top cover (see CARR-DR 2-6).
12. Route the message display power cable through the cable holders.
13. Go to CARR-DR 8 for the procedure to **power on** the tape unit.





FRU212 Vacuum Supply Hose Removal and Replacement Procedure

This page contains the steps needed to remove and replace the vacuum supply hose **3**. The other drive will not be affected when the vacuum is disconnected during this procedure.

Note: This FRU can be removed and replaced without affecting the other drive by removing power from the failing drive with the Drive Power On/Off switch.

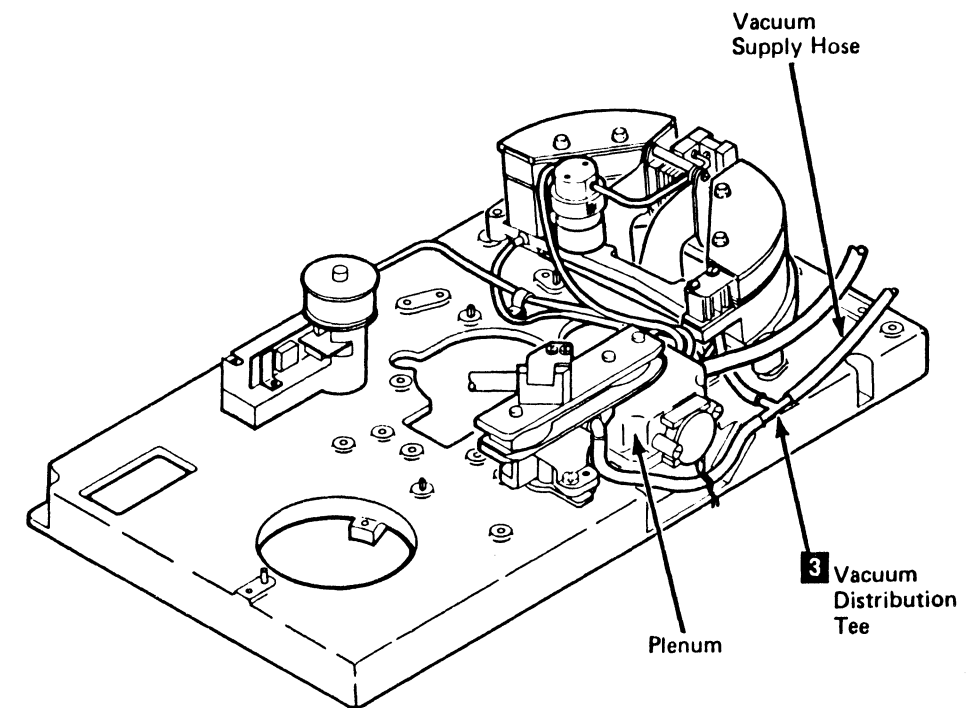
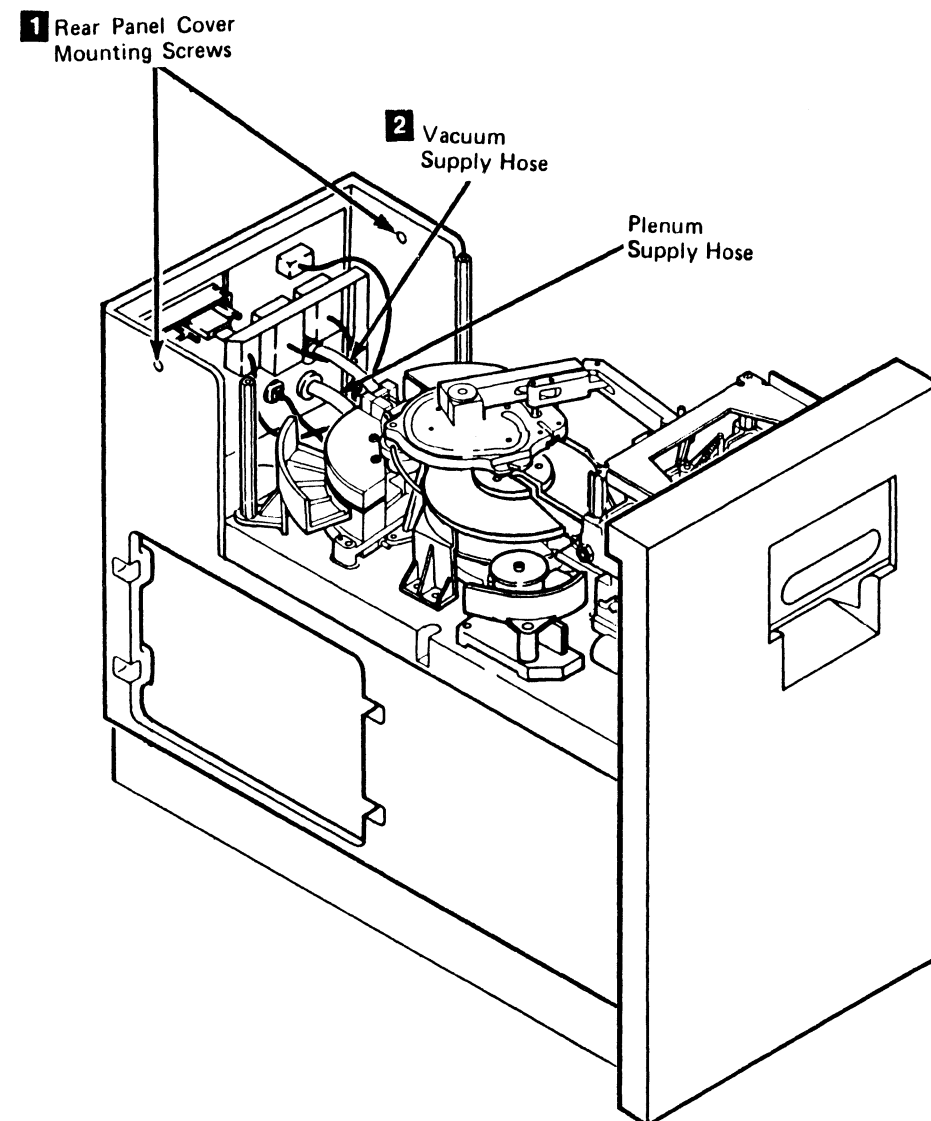
Removing the Vacuum Supply Hose

1. Go to CARR-DR 8 for the procedure to **power off** the drive.
2. Open the drive drawer.
3. Remove the drive drawer safety cover (see CARR-DR 2-5).
4. Remove the two rear panel cover mounting screws **1** and remove the rear panel cover.
5. Loosen the vacuum supply hose clamp and disconnect the vacuum supply hose **2** from the vacuum fitting.
6. Disconnect the other end of the vacuum supply hose from the vacuum distribution tee **3**.
7. Remove the hose from the drive.

Replacing the Vacuum Supply Hose

1. Connect one end of hose to the vacuum distribution tee **3**.
2. Place the hose in position, going to the rear panel.
3. Slide the hose clamp onto the vacuum supply hose **2**. Slide the hose onto the vacuum fitting and tighten the hose clamp.

4. Install the rear panel cover and the two mounting screws **1**.
5. Install the drive safety cover (see CARR-DR 2-5).
6. Close the drive drawer.
7. Go to CARR-DR 8 for the procedure to **power on** the drive.



FRU213 Display Board to Switch Board Cable Removal and Replacement Procedure

This page contains the steps needed to remove and replace the display board (TU-D0/1-DSP) to switch board cable.

Note: This FRU can be removed and replaced without affecting the other drive by removing power from the failing drive with the Drive Power On/Off switch.

Removing the Display Board to Switch Board Cable

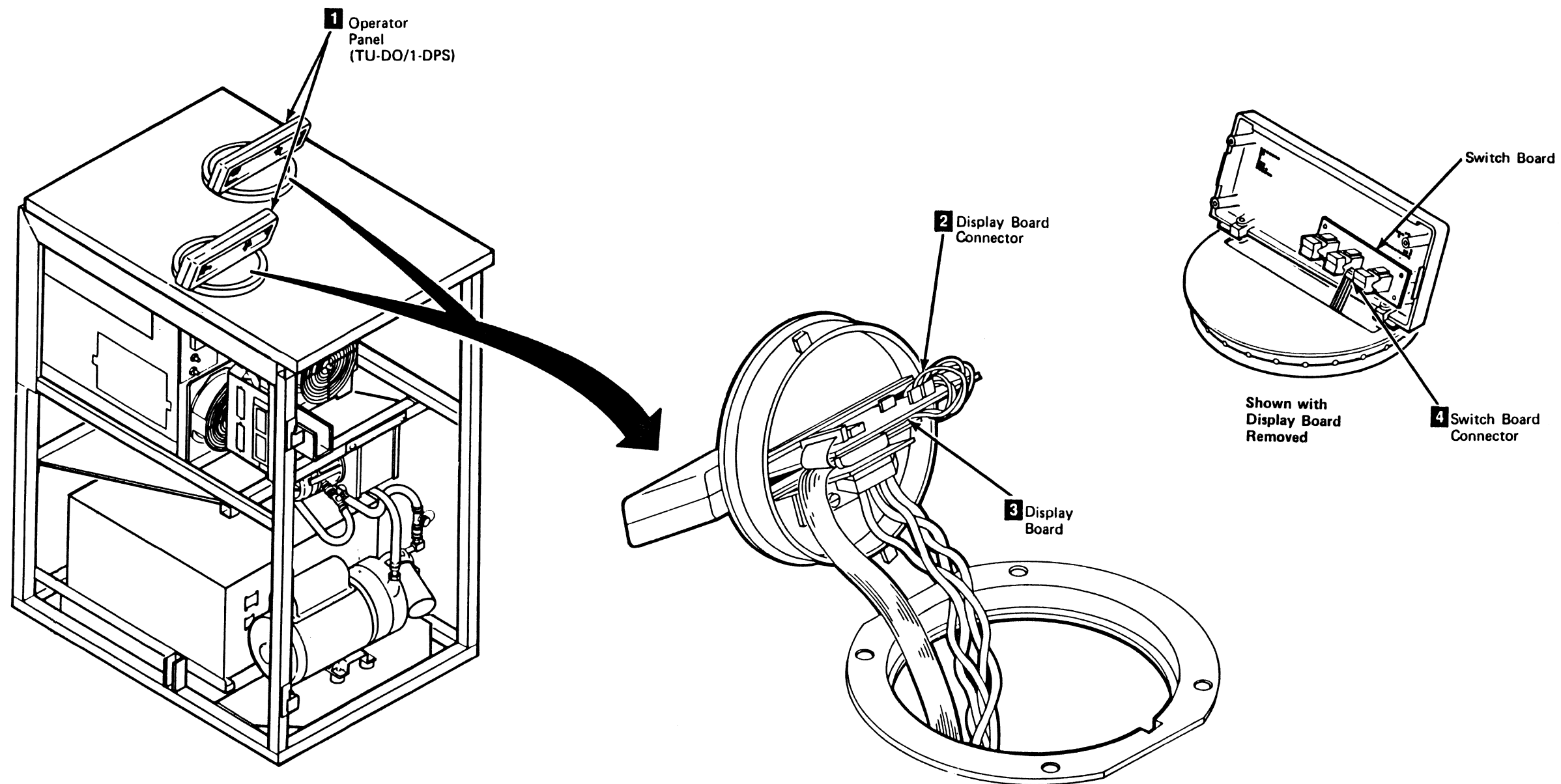
1. Go to CARR-DR 8 for the procedure to **power off** the drive.
2. Remove the operator panel assembly **1** from the top cover (see CARR-DR 2-6).
3. Disconnect the cable from the connector **2** on the edge of the display board **3**.
4. Disconnect the other end of the cable from the connector **4** on the switch board. Remove the cable from the drive.

Replacing the Display Board to Switch Board Cable

1. Connect one end of the cable to the connector **4** on the switch board.
2. Connect the other end of the cable to the connector **2** on the display board **3**.

Drive **CARR-DR 2130**

3. Install the operator panel assembly **1** into the top cover (see CARR-DR 2-6).
4. Go to CARR-DR 8 for the procedure to **power on** the drive.



FRU215 Tape Lifter Solenoid Input Hose Removal and Replacement Procedure

This page contains the steps needed to remove and replace the tape lifter solenoid input hose **1** from the drive.

Note: This FRU can be removed and replaced without affecting the other drive by removing power from the failing drive with the Drive Power On/Off switch.

Note: The tape lifter solenoid **2** may be rectangular in shape, or of a different design.

Removing the Tape Lifter Solenoid Input Hose

1. Go to CARR-DR 8 for the procedure to **power off** the drive.
2. Open the drive drawer and remove the drive safety cover (see CARR-DR 2-5).
3. Clamp the plenum supply hose (see CARR-DR 3-1).
4. Disconnect the tape lifter solenoid input hose **1** from the tape lifter solenoid **2** (TU-Tape Lifter (Head) Solenoid).
5. Disconnect the other end of the tape lifter solenoid input hose from the plenum **4** and remove it from the drive.

Replacing the Tape Lifter Solenoid Input Hose

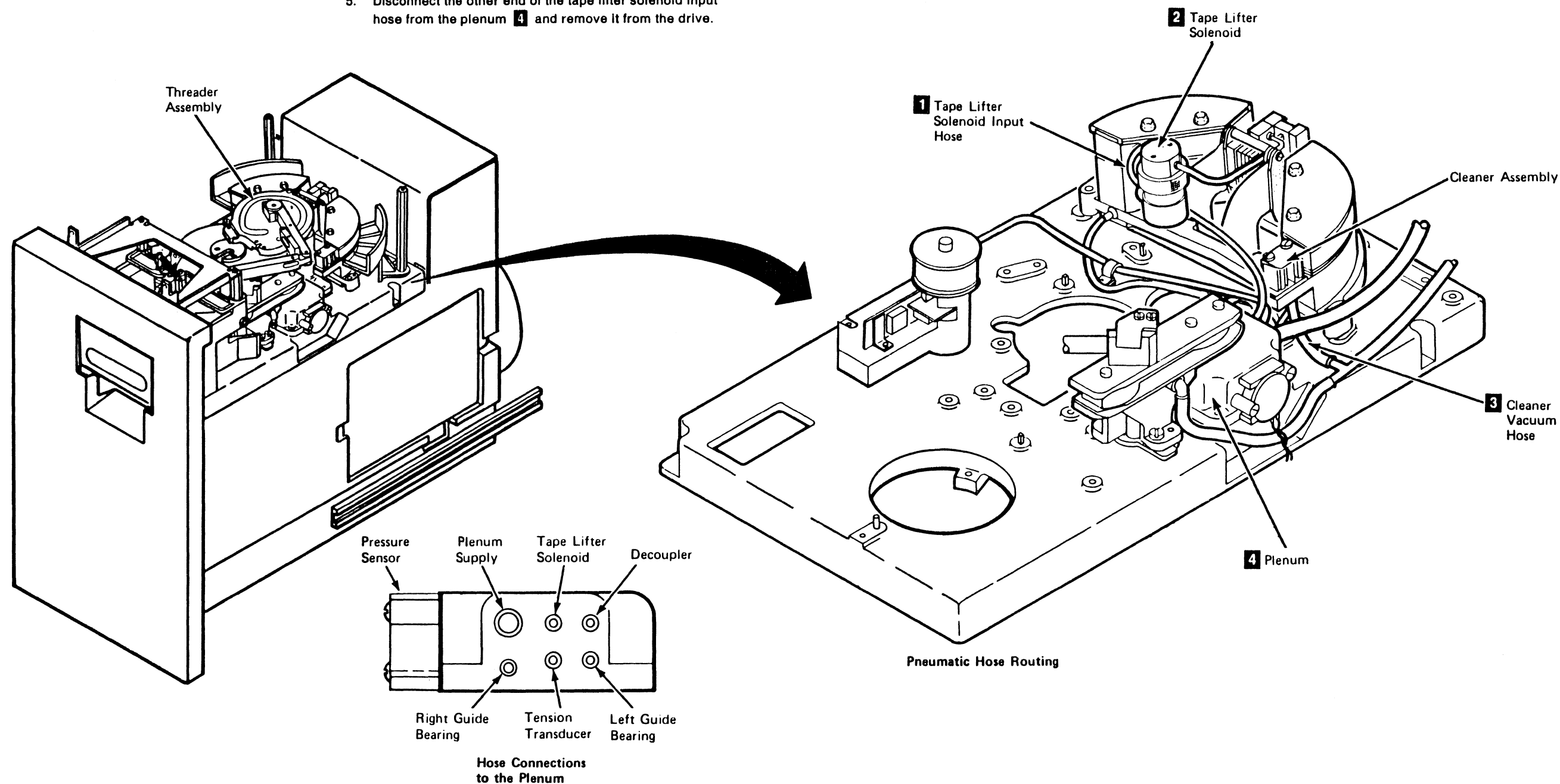
1. Connect the tape lifter solenoid input hose **1** to the tape lifter solenoid **2**.

Place the hose in the path shown, around the threader assembly base, to the plenum **4**.

2. Connect the other end of the tape lifter solenoid input hose to the plenum **4**.

Check that the cleaner vacuum hose **3** is still connected to the cleaner assembly.

3. Remove the clamp from the plenum supply hose.
4. Install the drive safety cover (see CARR-DR 2-5).
5. Go to CARR-DR 8 for the procedure to **power on** the drive.



FRU216 Tape Lifter Solenoid Removal and Replacement Procedure

Drive **CARR-DR 2160**

This page contains the steps needed to remove and replace the tape lifter solenoid **6** from the drive.

Note: This FRU can be removed and replaced without affecting the other drive by removing power from the failing drive with the Drive Power On/Off switch.

Note: The tape lifter solenoid **6** may be rectangular in shape, or of a different design.

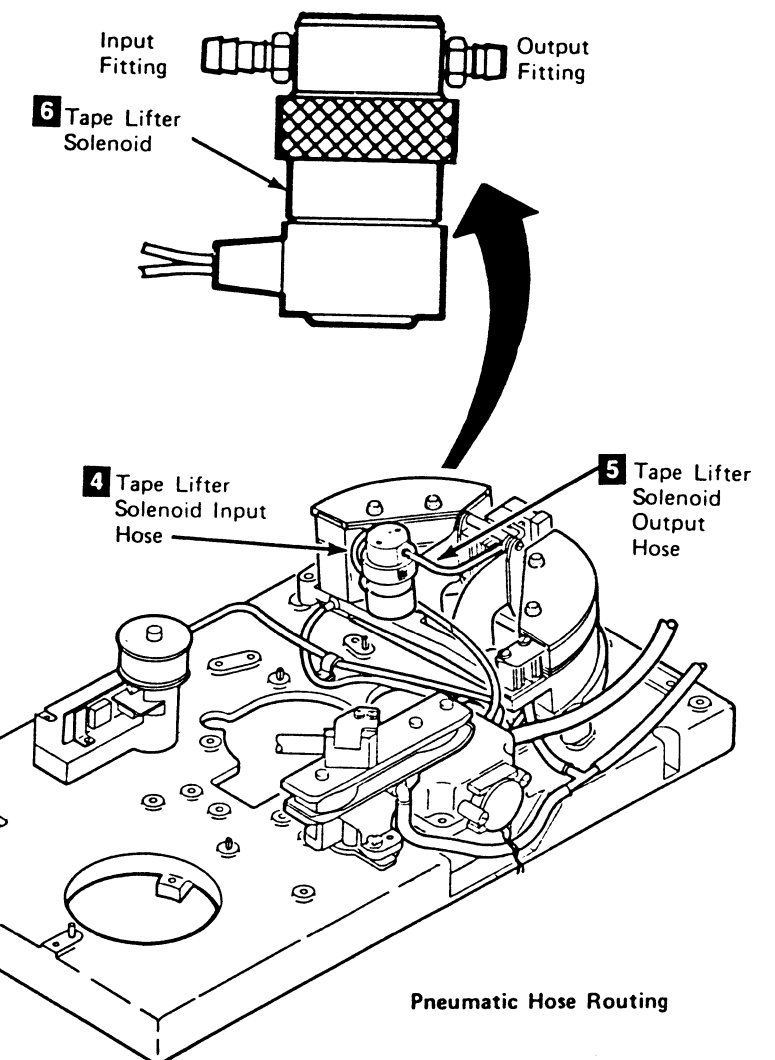
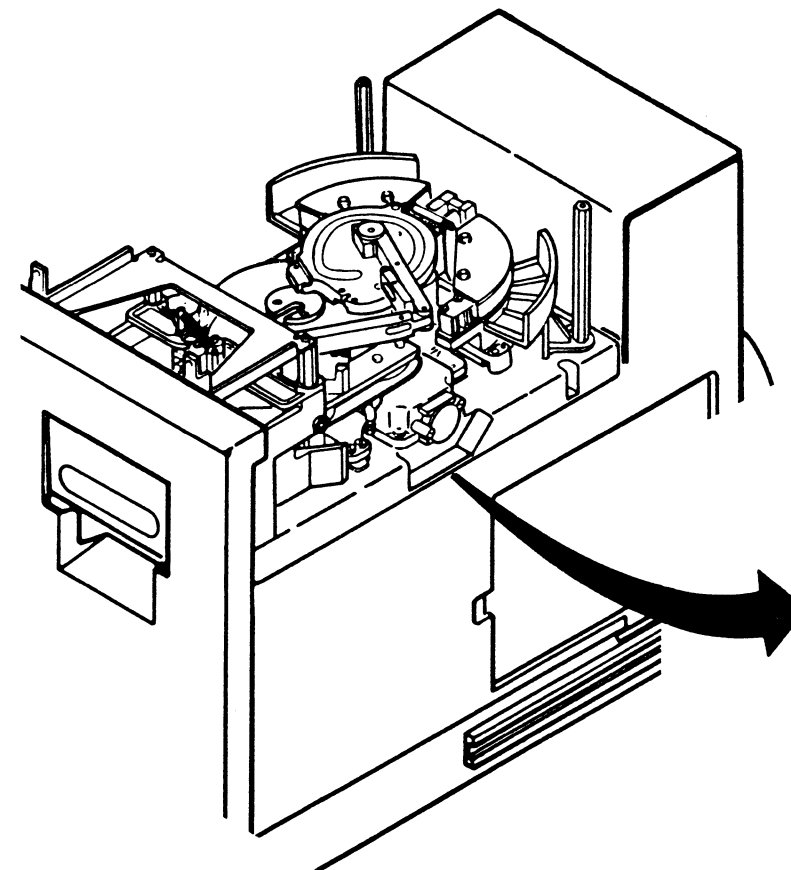
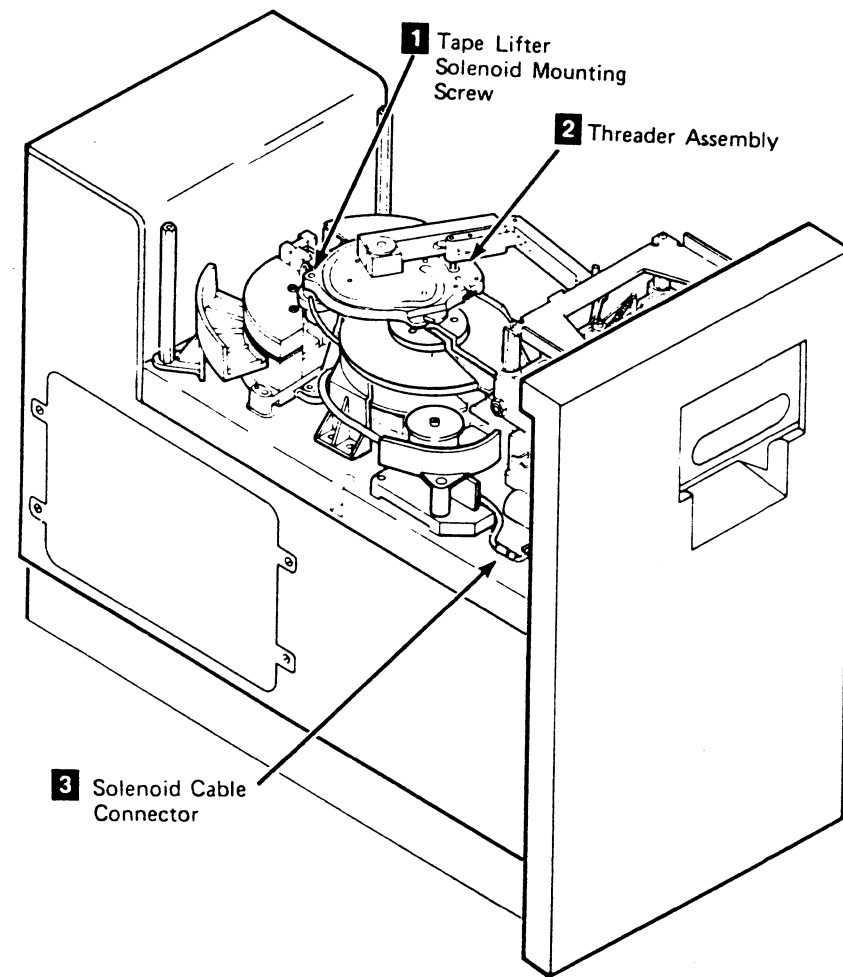
Removing the Tape Lifter Solenoid

1. Go to CARR-DR 8 for the procedure to **power off** the drive.
2. Open the drive drawer and remove the drive safety cover (see CARR-DR 2-5).
3. Clamp the plenum supply hose (see CARR-DR 3-1).
4. Disconnect the tape lifter solenoid input hose **4** from the tape lifter solenoid **6**.
5. Disconnect the tape lifter solenoid output hose **5** from the tape lifter solenoid.
6. Disconnect the solenoid cable connector **3**.
7. Remove the tape lifter solenoid mounting screw **1** and remove the tape lifter solenoid from the threader assembly **2**.

Replacing the Tape Lifter Solenoid

1. Install the tape lifter solenoid **6** and mounting screw **1** on the threader assembly **2**. If your threader assembly has two mounting holes, be sure to use the hole on the left.
2. Route the cable along the bottom of the deck to the solenoid cable connector **3** and reconnect the solenoid cable.
3. Connect the tape lifter solenoid output hose **5** to the tape lifter solenoid **6**.

4. Connect the tape lifter solenoid input hose **4** to the tape lifter solenoid.
5. Remove the clamp from the plenum supply hose.
6. Install the drive drawer safety cover (see CARR-DR 2-5) and close the drive drawer.
7. Go to CARR-DR 8 for the procedure to **power on** the drive.



FRU218 Tape Unit AC Power Circuit-Breaker/Cable Assembly Removal and Replacement Procedure

Tape Unit With BM 6460006 (see CARR-DR 9)

This page contains the steps needed to remove and replace the tape unit ac power circuit-breaker/cable assembly.

Because ac power will be switched off and disconnected at the control unit, all of the tape units attached to the control unit must be available for service.

Note: This FRU removal and replacement requires the ac power to be removed from the control unit and all attached tape units with the control unit ac power circuit breaker.

Removing the Tape Unit AC Power Circuit Breaker Assembly

1. Go to CARR-CU 6 for the procedure to remove the ac power from the control unit.

At the control unit:

2. Remove the ac distribution cable P1 1 from the control unit by turning the retaining ring counter-clockwise and at the same time pulling the cable connector away from the receptacle.

At the failing tape unit:

3. Open the tape unit front cover and remove the front safety cover (see CARR-DR 2-1).
4. Remove the ac distribution cable P1 1 from ac connector J1 4 (TU-PS-01-J1) to the tape unit on the right side (if present) by turning the retaining ring counter-clockwise and at the same time pulling the cable connector away from the receptacle.

Note: In the next step, if the failing tape unit is connected to the control unit, the ac distribution cable has already been removed.

5. Remove the ac distribution cable P1 1 from the ac box in the tape unit on the left side (if present) by turning the retaining ring counter-clockwise and at the same time pulling the cable connector away from the receptacle.
6. Remove the cable clamp 2.
7. Disconnect the cable plug P11 3 (TU-PS-01-P11) from J11 connector (at the rear of the dc power supply) and carefully route the plug to the front of the tape unit.
8. There are two grounding wires from the ac box:

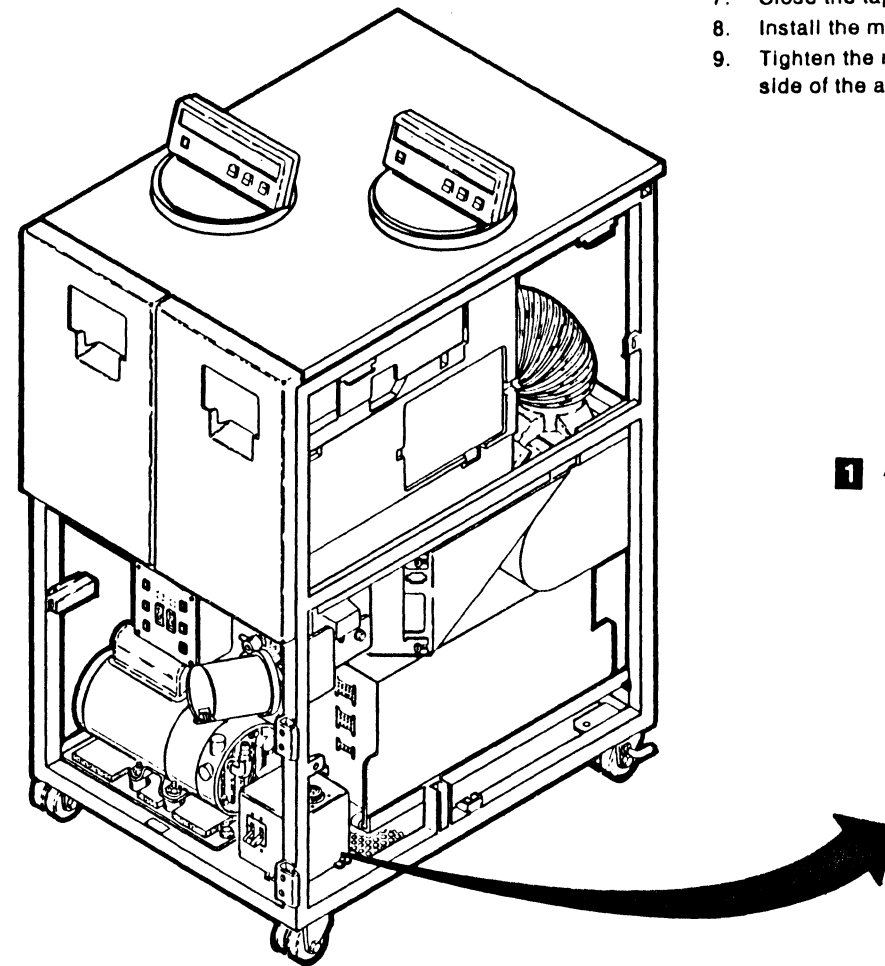
- Remove the mounting screw for the green ground wire 6 and starwasher.
- Remove the mounting screw for the yellow/green ground wire 6 and starwasher.
- Save the ground wire mounting screws and lockwashers for the replacement procedure.

9. Remove the front mounting screw 5 from the ac box.

10. Loosen the mounting screws 7 at the right side and the left side of the ac box.
11. Open the tape unit rear cover (see CARR-DR 2-1).
12. Remove the two mounting bolts in the rails at the rear of the dc power supply.
13. Using the handles provided, move the dc power supply toward the rear of the tape unit far enough to allow the ac cable plug P1 1 to pass between the front of the dc power supply and the rear of the motor pump.

Warning: The ac distribution cable is routed behind the pump motor assembly and in front of the dc power supply. When removing the ac distribution cable, ensure that you do not damage or disconnect any connectors on the front of the dc power supply.

14. Remove the ac box and cables through the front of the tape unit.

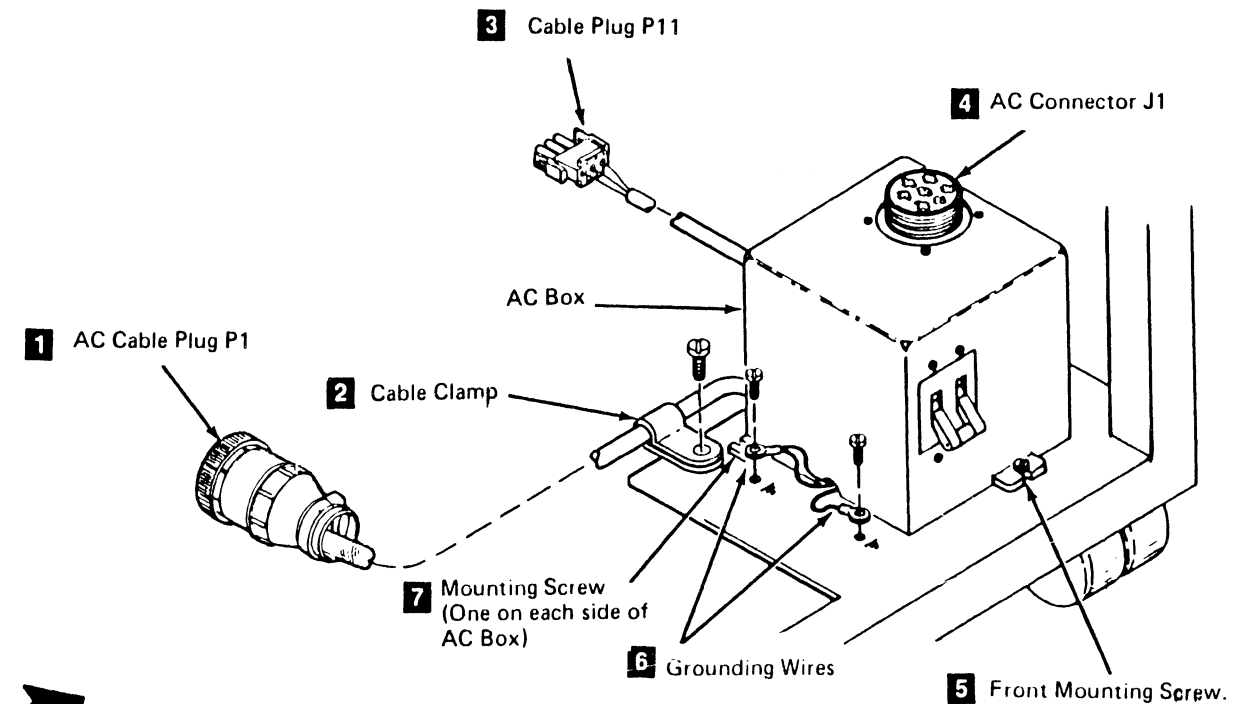


Replacing the Tape Unit AC Power Circuit Breaker Assembly

1. Place the ac box and cables into position through the front of the tape unit.
2. Route cable plug P11 3 (TU-PS-01-P11) along the right side of the dc power supply to the rear of the machine.
3. Connect cable plug P11 to J11 connector on the rear of the dc power supply.

Warning: When replacing the ac distribution cable, ensure that you do not damage or disconnect any connectors on the front of the dc power supply.

4. Route the ac distribution cable plug P1 1 between the rear of the pump motor mounting frame and the front of the dc power supply to the tape unit or control unit on the left.
5. Install the cable clamp 2.
6. Move the dc power supply into position and install the two mounting bolts in the rails.
7. Close the tape unit rear cover (see CARR-DR 2-2).
8. Install the mounting screw 5 at the front of the ac box.
9. Tighten the mounting screws 7 at the left side and right side of the ac box.



There are two grounding wires from the ac distribution box:

- Install the mounting screw and starwasher for the green ground wire 6
- Install the mounting screw and starwasher for the yellow/green ground wire 6.

10. Connect the ac distribution cable 1 from the tape drive on the right (if present) to the ac box by inserting the connector plug into the receptacle and turning the retaining ring clockwise.
11. Connect the ac distribution cable 1 from the ac box to the tape unit (or control unit) on the left by inserting the connector plug into the receptacle and turning the retaining ring clockwise.
12. Replace the tape unit front safety cover and close the front cover (see CARR-DR 2-2).

At the control unit:

13. Connect the ac distribution cable P1 1 from the tape drive on the right of the control unit to the control unit ac box (see LOC 1) (if not already connected) by inserting the connector plug and turning the retaining ring clockwise.
14. Go to CARR-CU 6 for the procedure to restore the ac power to the control unit.
15. Go to CARR-DR 8 for the procedure to power on the tape unit.

FRU218 Tape Unit AC Power Circuit Breaker Removal and Replacement Procedure

Drive **CARR-DR 2185**

Tape Unit Without BM 6460006 (see CARR-DR 9)

This page contains the steps needed to remove and replace the ac power circuit breaker (TU-CB1) in the tape unit. Because ac power will be switched off and disconnected at the control unit, all of the tape units attached to the control unit must be available for service.

Note: This FRU removal and replacement requires the ac power to be removed from the control unit and all attached tape units with the control unit ac power circuit breaker.

Removing the AC Power Circuit Breaker

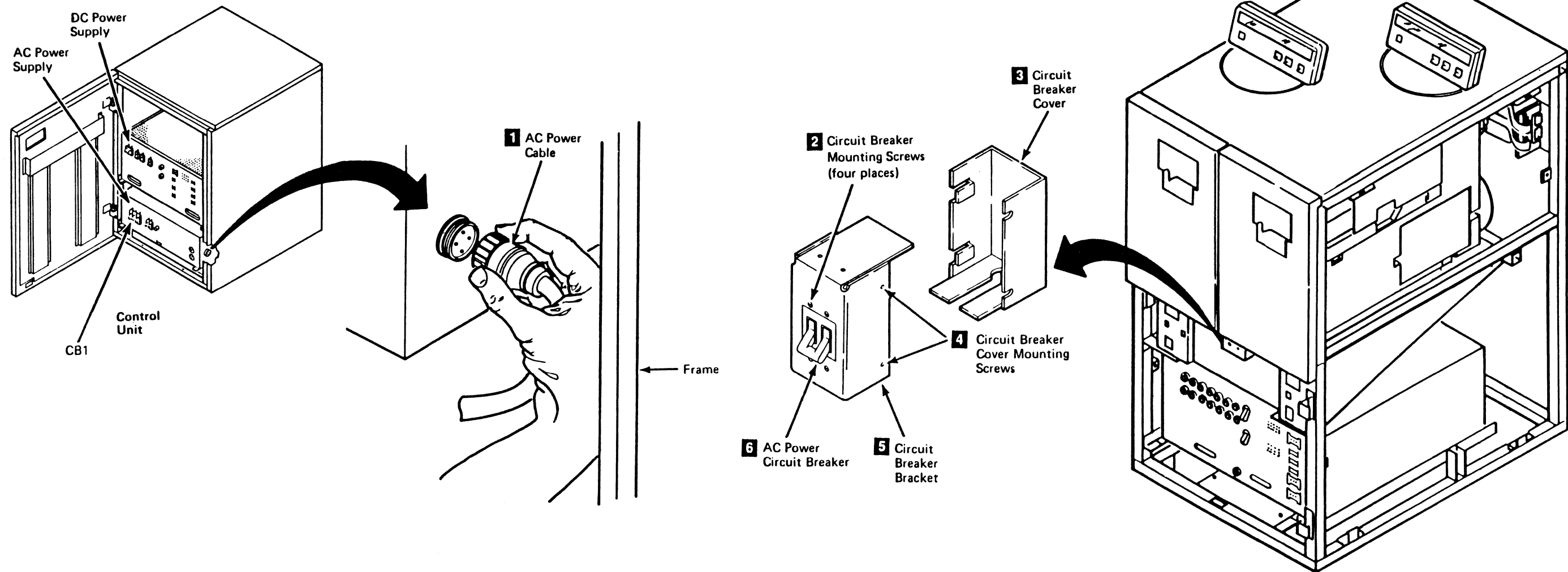
1. Go to CARR-CU 6 for the procedure to remove the ac power from the control unit.
2. Remove the ac power cable P1 **1** from the control unit by turning the retaining ring counter-clockwise and at the same time pulling the cable away from the connector.

3. Open the tape unit front cover and remove the front safety cover (see CARR-DR 2-3).
4. Loosen the two screws **1** holding the circuit breaker cover **3** and slide the cover to the rear to remove it.
5. Remove the four mounting screws **2** from the front of the circuit breaker bracket.
6. Slide the ac power circuit breaker **6** to the rear until it can be removed from the circuit breaker bracket **5**.
7. Disconnect and label the four wires connected to the circuit breaker **6**.
8. Remove the circuit breaker from the tape unit.

Replacing the AC Power Circuit Breaker

1. Reconnect the four wires to the circuit breaker **6** (TU-CB1).
2. Slide the circuit breaker into position in the bracket **5** as shown and install the four mounting screws **2**. Ensure that the "Off" position of the circuit breaker is positioned downward.
3. Slide the circuit breaker cover **3** into position and tighten the two mounting screws **1**.

4. Ensure that the ac power circuit breaker is turned Off.
5. Connect the ac power cable **1** to the connector on the right side of the control unit (see LOC 1).
6. Go to CARR-CU 6 for the procedure to restore the ac power to the control unit.
7. Go to CARR-DR 8 for the procedure to power on the tape unit.
8. Install the tape unit front safety cover and close the front cover (see CARR-DR 2-4).



FRU219 Vacuum Distribution Tee Removal and Replacement Procedure

Drive CARR-DR 2190

This page contains the steps needed to remove and replace the vacuum distribution tee **1** from the drive. The other drive will not be affected when the vacuum is disconnected.

Note: This FRU can be removed and replaced without affecting the other drive by removing power from the failing drive with the Drive Power On/Off switch.

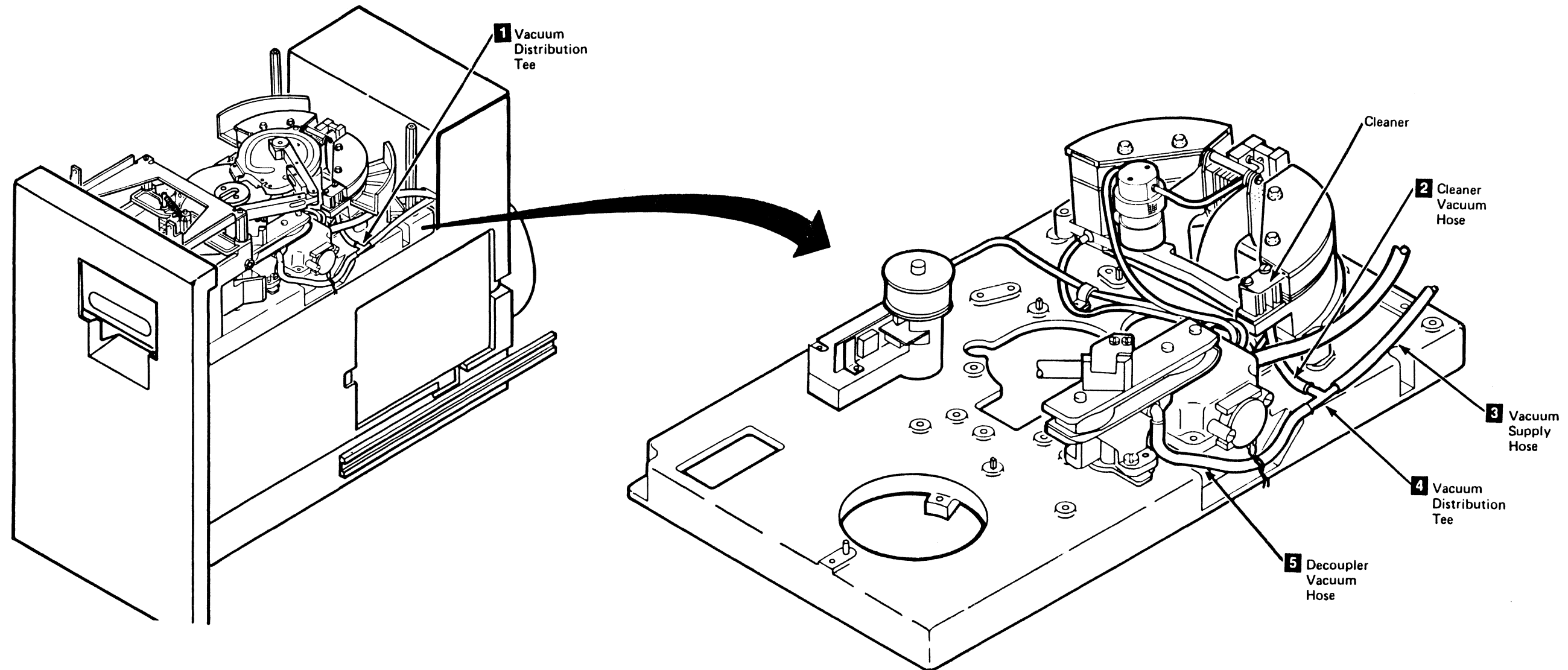
Removing the Vacuum Distribution Tee

1. Go to CARR-DR 8 for the procedure to **power off** the drive.
2. Open the drive drawer and remove the drive safety cover (see CARR-DR 2-5).
3. Disconnect the decoupler vacuum hose **5** from the vacuum distribution tee **1**, **4**.
4. Disconnect the cleaner vacuum hose **2** from the vacuum distribution tee.
5. Remove the vacuum distribution tee from the vacuum supply hose **3**.

Replacing the Vacuum Distribution Tee

1. Insert the large end of the vacuum distribution tee **4** into the vacuum supply hose **3**.
2. Connect the decoupler vacuum hose **5** to the vacuum distribution tee.

3. Connect the cleaner vacuum hose **2** to the vacuum distribution tee **1**, **4**. Make sure the cleaner hose remains connected to the cleaner.
4. Install the drive safety cover and close the drive drawer (see CARR-DR 2-5).
5. Go to CARR-DR 8 for the procedure to **power on** the drive.



FRU223 Convoluted Bellows Removal and Replacement Procedure

Drive **CARR-DR 2230**

Tape Unit With BM 6460006 (see CARR-DR 9)

This page contains the steps needed to remove and replace the convoluted bellows for either drive in the tape unit.

Since there is a convoluted bellows for each drive in the tape unit, it is not necessary to have both drives available for service when performing this procedure.

Note: This FRU can be removed and replaced without affecting the other drive by removing power from the failing drive with the Drive Power On/Off switch.

Removing the Convoluted Bellows

1. Go to CARR-DR 8 for the procedure to **power off** the drive.
2. Open the rear tape unit cover (see CARR-DR 2-1).
3. Loosen the retaining clamp **1** on each end of the convoluted bellows **2** you are replacing.
4. Remove the convoluted bellows from the housing on the rear panel of the drive.

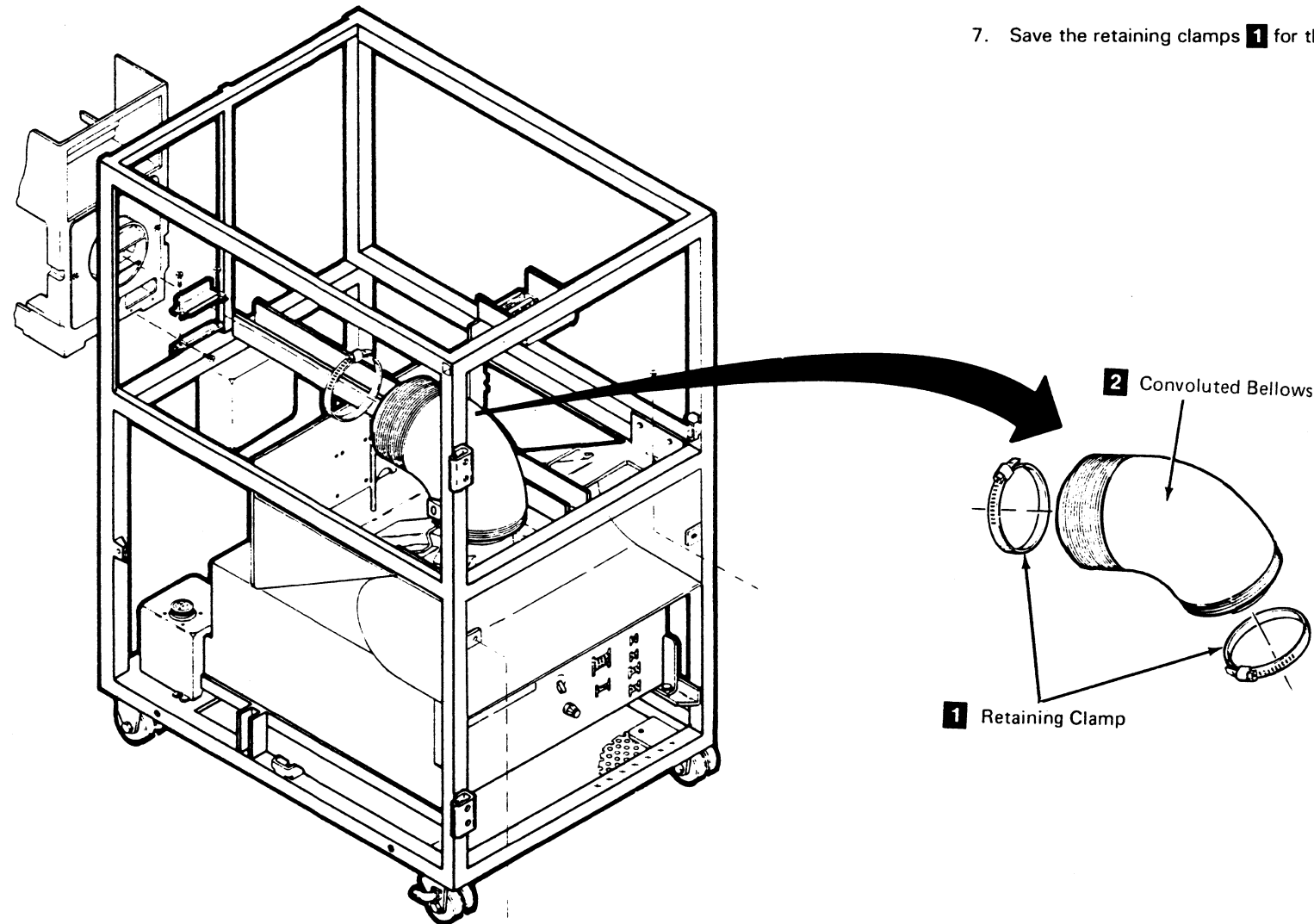
CAUTION

The blower motor has not been turned Off; therefore, the blower fans are still turning. When the convoluted bellows is removed from the blower, the vanes of the blower are exposed. Ensure that all fingers, tools, and parts are kept clear of the blower opening.

-
-
-
-
- 5. Remove the convoluted bellows **2** from the housing on the output of the blower.
- 6. Remove the convoluted bellows from the tape unit.
- 7. Save the retaining clamps **1** for the replacement procedure.

Replacing the Convoluted Bellows

1. Install the retaining clamps on each end of the replacement convoluted bellows **2**.
2. Install the convoluted bellows on the housing on the output of the blower (of the affected drive).
3. Tighten the retaining clamp **1**.
4. Install the convoluted bellows on the housing on the rear panel of the affected drive.
5. Tighten the retaining clamp **1**.
6. Check for air leaks at both ends of the replaced convoluted bellows.
7. Close the tape unit rear cover (see CARR-DR 2-1).
8. Go to CARR-DR 8 for the procedure to **power on** the drive.



FRU225 Machine Reel Tach Sensor A Removal and Replacement Procedure

Drive **CARR-DR 2250**

This page contains the steps needed to remove and replace the machine reel tach sensor A **4** (TU-D0/1-DK-Machine Reel Tach Phase A Sensor). The sensor is located under the machine reel, but it is not necessary to remove the machine reel to remove the tach sensor. This tach sensor will be easier to remove if the tension transducer tape guide is removed.

Note: This FRU can be removed and replaced without affecting the other drive by removing power from the failing drive with the Drive Power On/Off switch.

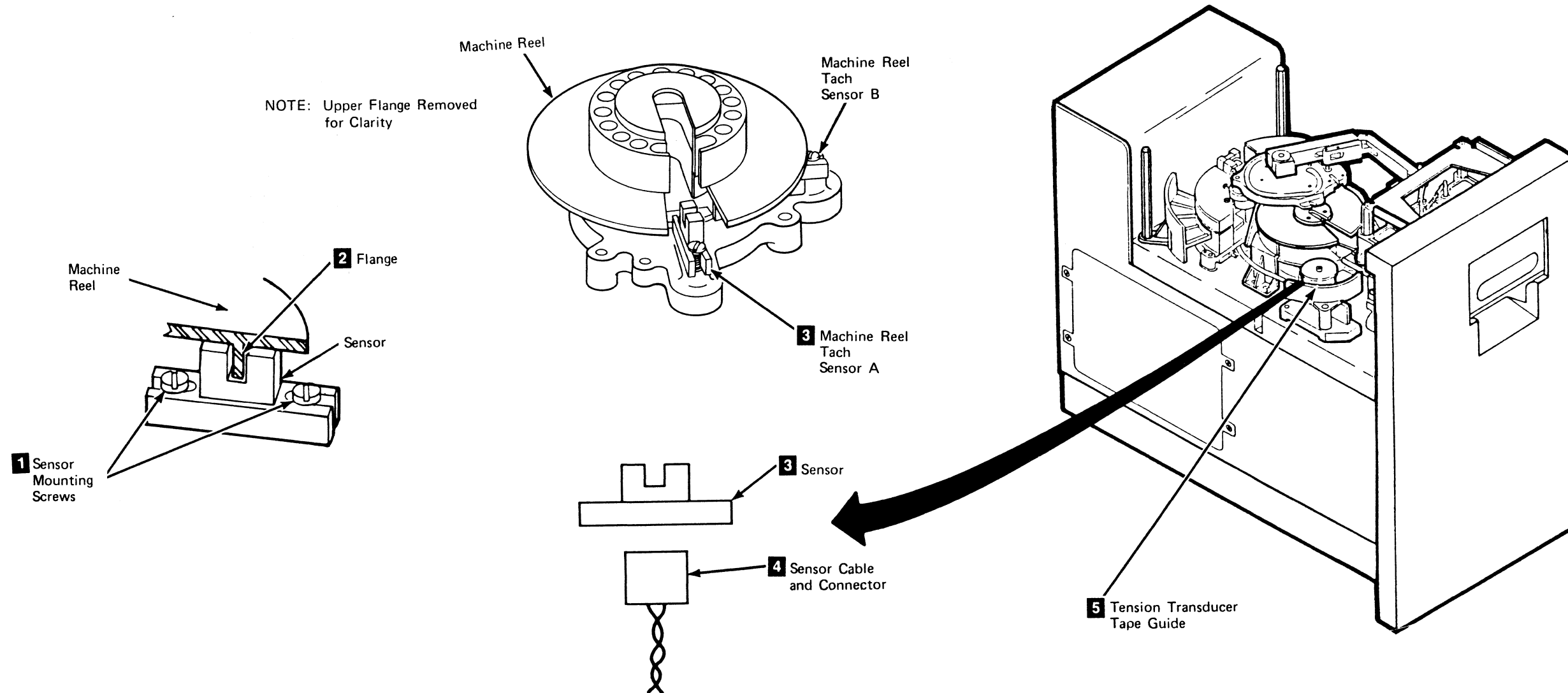
Removing the Machine Reel Tach Sensor A

1. Go to CARR-DR 8 for the procedure to **power off** the drive.
2. Open the drive drawer and remove the drive safety cover (see CARR-DR 2-5).
3. Turn the machine reel to get access to tach sensor A **3**.
4. Remove the two sensor mounting screws **1**.
5. Lift the sensor and cable connector **4** from the baseplate.
6. Disconnect the cable from the sensor **3** and remove the sensor from the drive.

Replacing the Machine Reel Tach Sensor A

1. Connect the machine reel tach sensor **3** to the sensor cable and connector **4**.
2. Lower the sensor and cable into the mounting block and install the two mounting screws **1**. Do not tighten the screws at this time. The sensor must be adjusted to allow the machine reel to turn.

3. Adjust machine reel tach sensor A so the machine reel flange **2** will turn without touching the sensor. Tighten the sensor mounting screws when you have the sensor adjusted correctly.
4. Install the drive safety cover and close the drive drawer (see CARR-DR 2-5).
5. Go to CARR-DR 8 for the procedure to **power on** the drive.



FRU226 Machine Reel Tach Sensor B Removal and Replacement Procedure

Drive **CARR-DR 2260**

This page contains the steps needed to remove and replace the machine reel tach sensor B **3** (TU-D0/1-DK-Machine Reel Tach Reel Phase B Sensor). The sensor is located under the machine reel, but it is not necessary to remove the machine reel to remove the tach sensor.

Note: This FRU can be removed and replaced without affecting the other drive by removing power from the failing drive with the Drive Power On/Off switch.

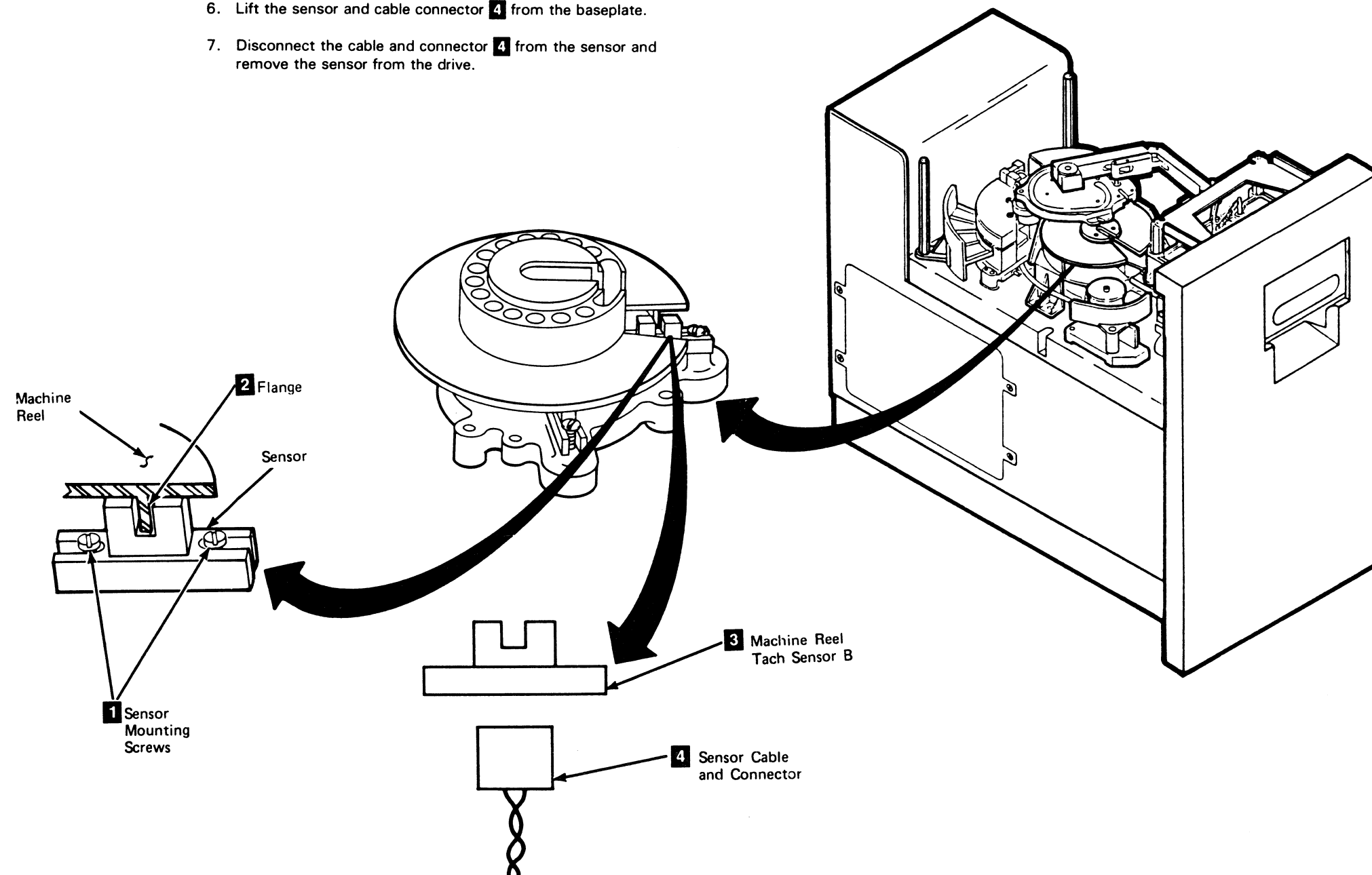
Removing the Machine Reel Tach Sensor B

1. Go to CARR-DR 8 for the procedure to **power off** the drive.
2. Open the drive drawer and remove the drive safety cover (see CARR-DR 2-5).
3. Remove the center tape guide (see CARR-DR 2310) and the tension transducer tape guide (see CARR-DR 2300) to get access to tach sensor B.
4. Turn the machine reel to get access to tach sensor B **3**.
5. Remove the two sensor mounting screws **1**.
6. Lift the sensor and cable connector **4** from the baseplate.
7. Disconnect the cable and connector **4** from the sensor and remove the sensor from the drive.

Replacing the Machine Reel Tach Sensor B

1. Connect the machine reel tach sensor **3** to the sensor cable and connector **4**.
2. Lower the sensor and cable into the mounting block and install the two mounting screws **1**. Do not tighten the screws at this time, the sensor must be adjusted to allow the machine reel to turn.

3. Adjust machine reel tach sensor B so the machine reel flange **2** will turn without touching the sensor. Tighten the sensor mounting screws when you have the sensor adjusted correctly.
4. Replace the center tape guide (see CARR-DR 2310) and the tension transducer tape guide (see CARR-DR 2300).
5. Install the drive safety cover and close the drive drawer (see CARR-DR 2-5).
6. Go to CARR-DR 8 for the procedure to **power on** the drive.



FRU227 Machine Reel Tape Guide Removal and Replacement Procedure

This page contains the steps needed to remove and replace the machine reel tape guide **2** from the drive.

Note: This FRU can be removed and replaced without affecting the other drive by removing power from the failing drive with the Drive Power On/Off switch.

Removing the Machine Reel Tape Guide

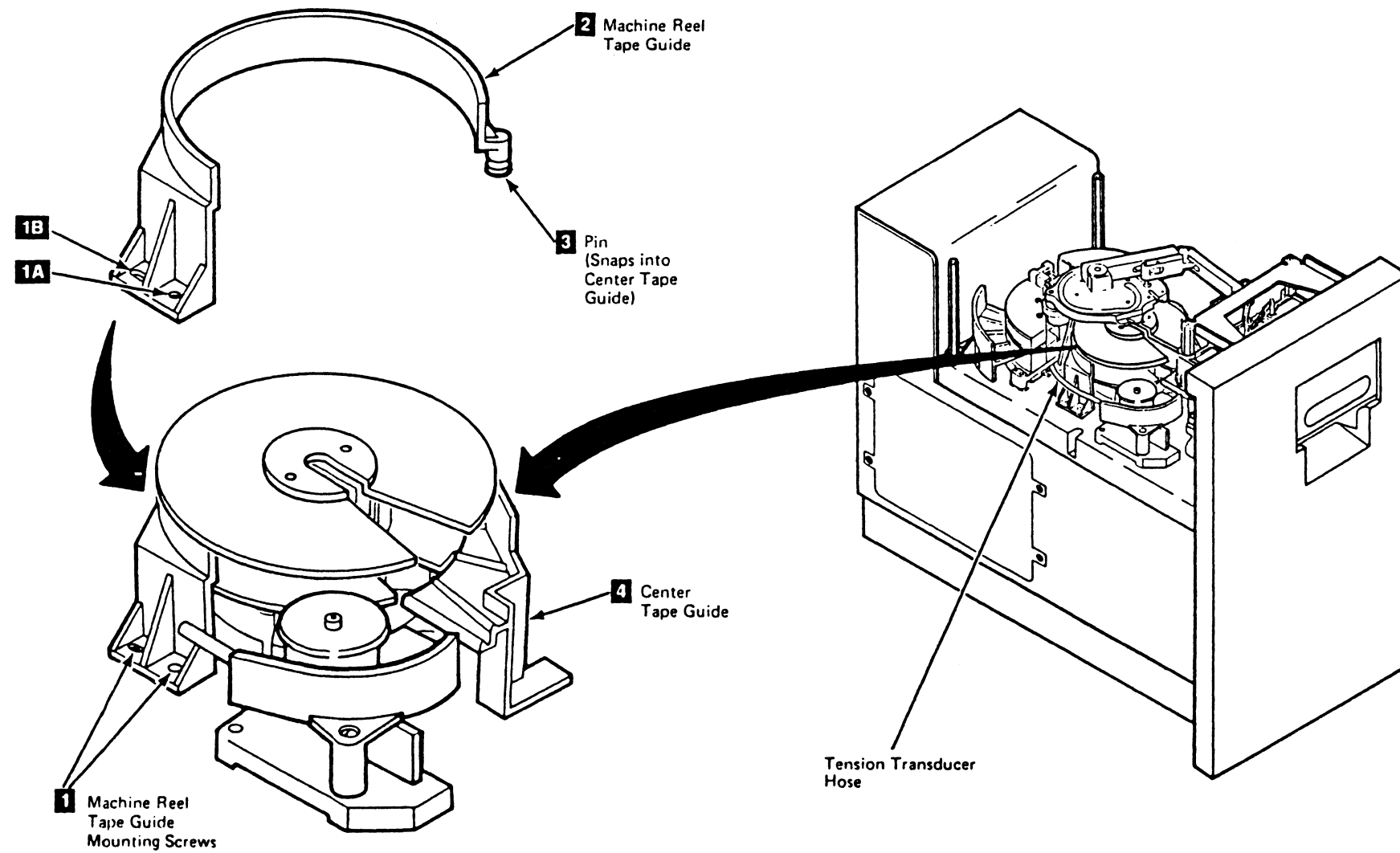
1. Go to CARR-DR 8 for the procedure to *power off* the drive.
2. Open the drive drawer and remove the drive safety cover (see CARR-DR 2-5).
3. Remove the two machine reel guide mounting screws **1**; then unsnap the center tape guide pin **3** from the center tape guide **4** by pulling it straight up.
4. To remove the machine reel tape guide **2**, carefully lift the screw mount base up and over the tape tension transducer in a counterclockwise direction, being careful not to scratch the flange surface with the mounting pin.

Replacing the Machine Reel Tape Guide

Warning: The machine reel tape guide (FRU227) and the tape center guide (FRU231) are sequence sensitive and must be installed in the correct order for correct adjustment.

1. Place the machine reel tape guide **2** in position and install (but do not tighten) the two mounting screws **1**.

2. Press the guide pin **3** on the machine reel tape guide into the slotted hole in the center tape guide **4**.
3. Loosen the center tape guide mounting screw, and then tighten.
4. Tighten the machine reel tape guide mounting screws, first **1A** and then **1B**.
5. Install the drive drawer safety cover (see CARR-DR 2-5).
6. Close the drive drawer.
7. Go to CARR-DR 8 for the procedure to *power on* the drive.



FRU228 Head Tape Guide (Left) Removal and Replacement Procedure

Drive **CARR-DR 2280**

This page contains the steps needed to remove and replace the head tape guide (left) from the drive.

Note: This FRU can be removed and replaced without affecting the other drive by removing power from the failing drive with the Drive Power On/Off switch

Removing the Head Tape Guide (Left)

1. Go to CARR-DR 8 for the procedure to **power off** the drive.
2. Open the drive drawer and remove the drive safety cover (see CARR-DR 2-5).

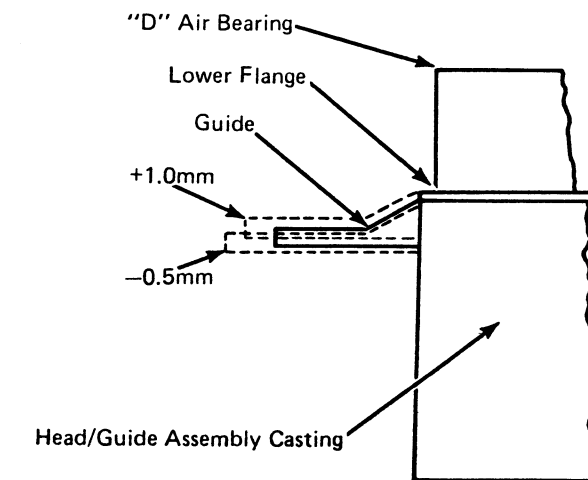
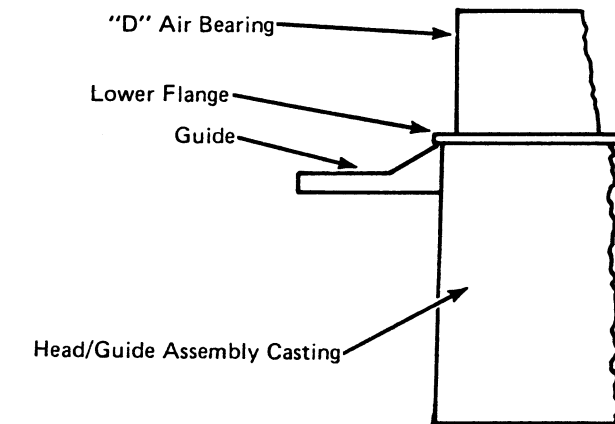
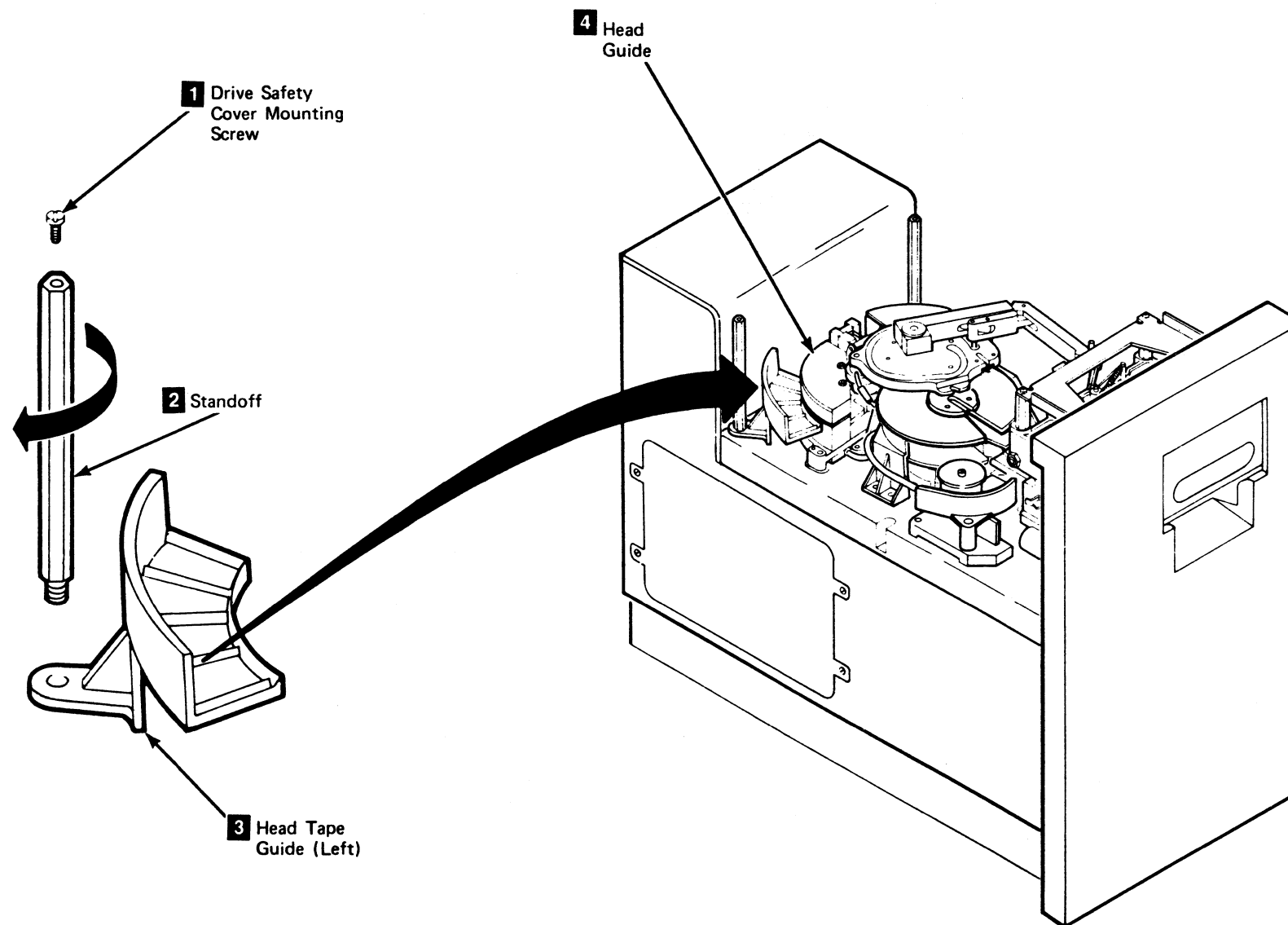
Note: Note the position of the head guide with respect to the lower flange.
3. Remove the drive safety cover mounting screw **1** from the standoff **2**.
4. Unscrew and remove the standoff **2** from the baseplate.
5. Remove the head tape guide (left) **3**.

Replacing the Head Tape Guide (Left)

1. Place the tape guide (left) **3** into position next to the head guide.
2. Install the standoff **2** but do not tighten.
3. Push the tape guide (left) against the casting and tighten the standoff **2**.

4. Replace the drive safety cover mounting screw **1** in the standoff **2**.

Note: The relationship of the tape guide to the flange may vary. See the illustrations for the acceptable positions.
5. Install the drive safety cover using the drive safety cover mounting screw **1** and close the drive drawer (see CARR-DR 2-5).
6. Go to CARR-DR 8 for the procedure to **power on** the drive.



FRU229 Head Tape Guide (Right) Removal and Replacement Procedure

Drive **CARR-DR 2290**

This page contains the steps needed to remove and replace the head tape guide (right) from the drive.

Note: This FRU can be removed and replaced without affecting the other drive by removing power from the failing drive with the Drive Power On/Off switch.

Removing the Head Tape Guide (Right)

1. Go to CARR-DR 8 for the procedure to **power off** the drive.
2. Open the drive drawer and remove the drive safety cover (see CARR-DR 2-5).

Note: Note the position of the head guide with respect to the lower flange.

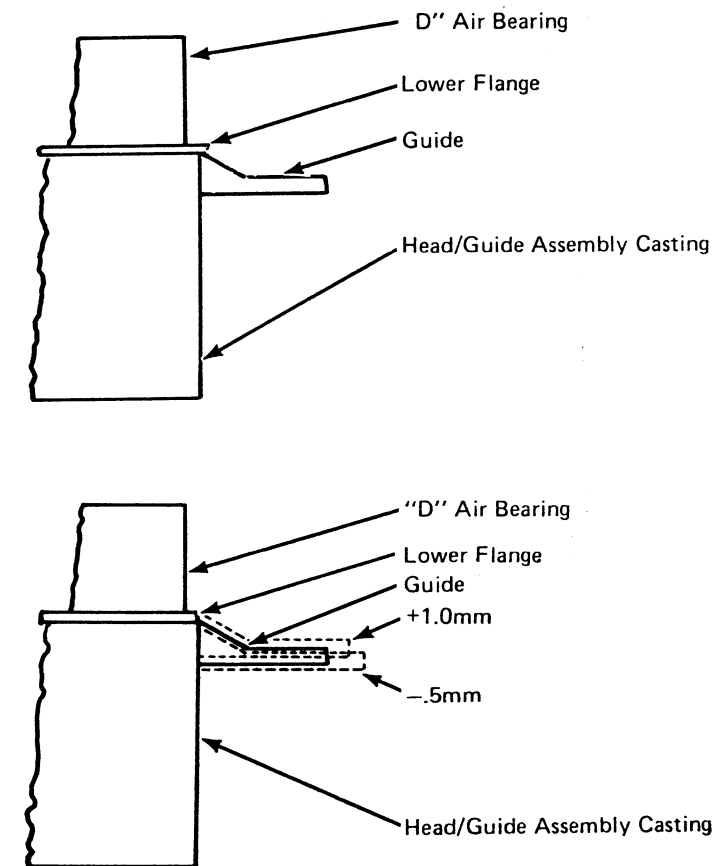
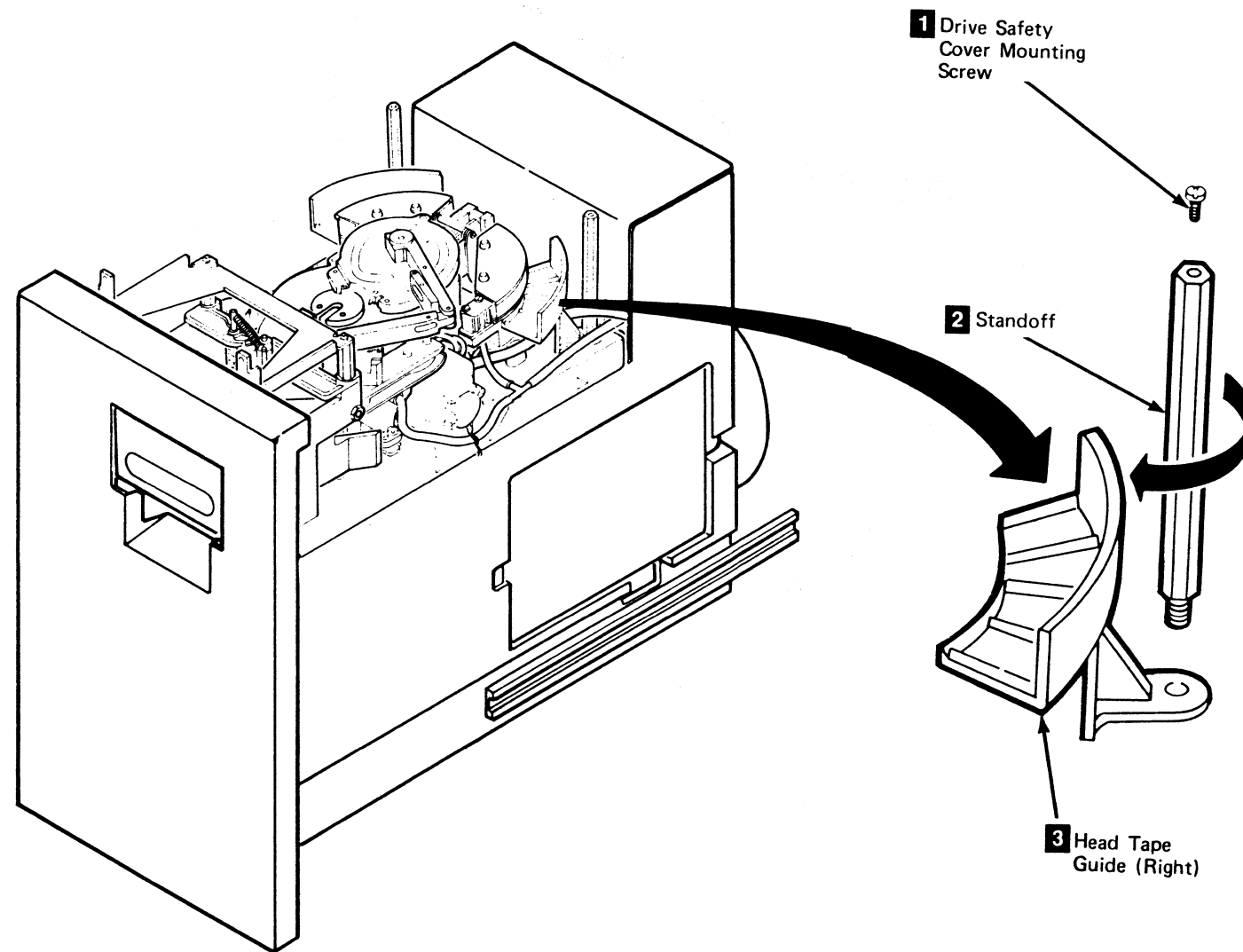
3. Unscrew and remove the standoff **2** from the baseplate.
4. Remove the head tape guide (right) **3**.

Replacing the Head Tape Guide (Right)

1. Place the tape guide (right) **3** into position next to the head guide.
2. Install the standoff **2** but do not tighten.
3. Push the tape guide (right) against the casting and tighten the standoff **2**.

Note: The relationship of the tape guide to flange may vary. See the illustrations for the acceptable positions.

4. Install the drive safety cover mounting screw **1** in the standoff **2**.
5. Install the drive safety cover using the drive safety mounting screws **1** and close the drive drawer (see CARR-DR 2-5).
6. Go to CARR-DR 8 for the procedure to **power on** the drive.



FRU230 Tension Transducer Tape Guide Removal and Replacement Procedure

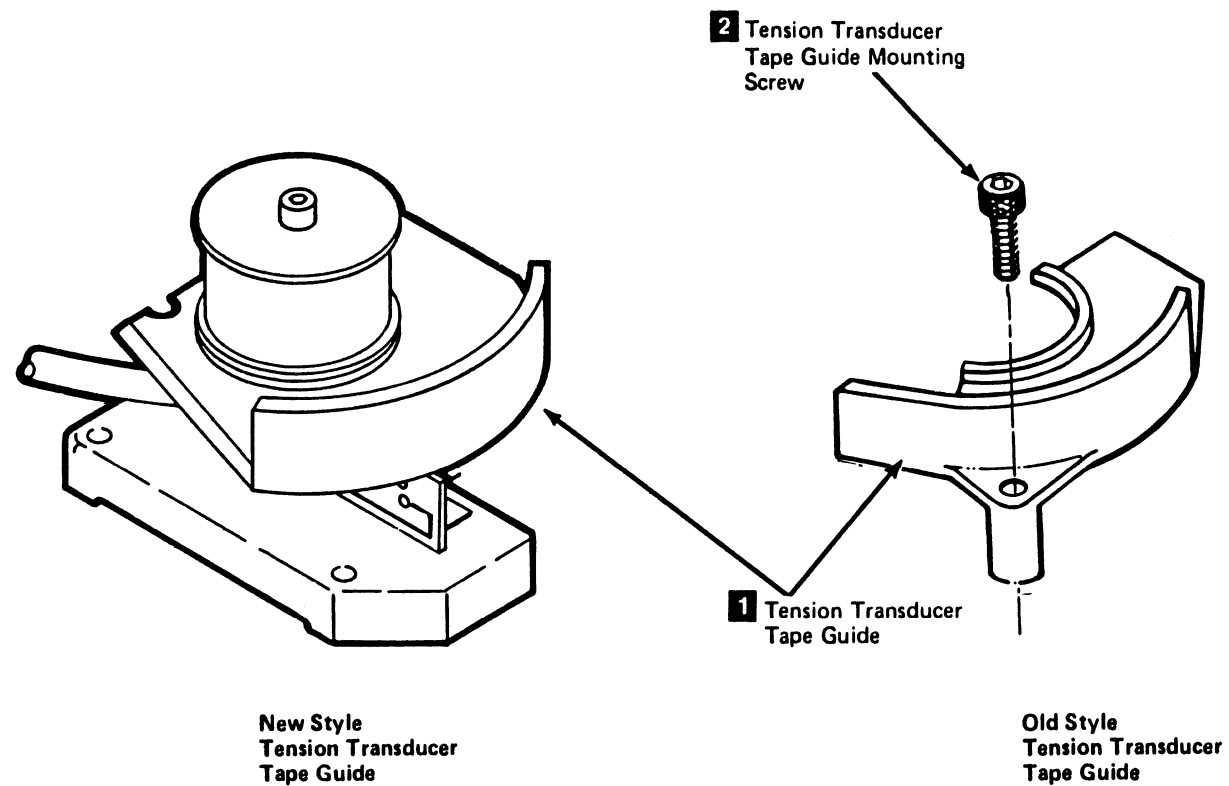
This page contains the steps needed to remove and replace the tension transducer in the drive.

Note: This FRU can be removed and replaced without affecting the other drive by removing power from the failing drive with the Drive Power On/Off switch.

Removing the Tension Transducer Tape Guide

1. Go to CARR-DR 8 for the procedure to **power off** the drive.
2. Open the drive drawer and remove the drive safety cover (see CARR-DR 2-5).

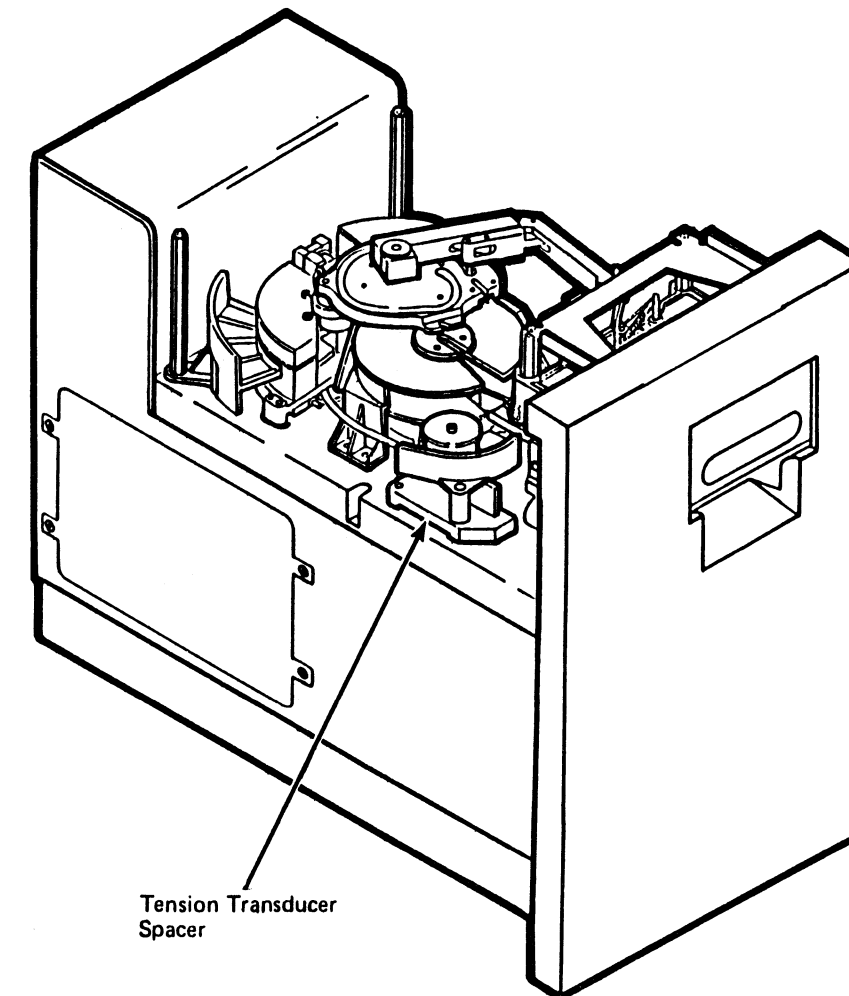
3. Compare the tension transducer in the affected drive with the figures on this page to determine if the drive has the old style or new style tension transducer tape guide.
4. If the drive has the new style tension transducer tape guide, go to CARR-DR 140 for the tension transducer removal and replacement procedure.
5. If the drive has the old style tension transducer tape guide, proceed as follows:
 - a. Remove the tension transducer tape guide mounting screw **2**.
 - b. Remove the tension transducer tape guide **1** from the drive.



Replacing the Tension Transducer Tape Guide

1. Compare the tension transducer in the affected drive with the figures on this page to determine if the drive has the old style or new style tension transducer tape guide.
2. If the replacement part is the new style tension transducer tape guide, go to CARR-DR 140 for the tension transducer replacement procedure.

3. If the replacement part is the old style tension transducer tape guide, proceed as follows:
 - a. Position the tension transducer tape guide **1** in the drive.
 - b. Replace the tension transducer tape guide mounting screw **2**.
 - c. Install the drive safety cover (see CARR-DR 2-5).Close the drive drawer.
4. Go to CARR-DR 8 for the procedure to **power on** the drive.



This page contains the steps needed to remove and replace the center tape guide **3**. You must remove the tension transducer tape guide **6** from the drive.

Note: This FRU can be removed and replaced without affecting the other drive by removing power from the failing drive with the Drive Power On/Off switch.

Removing the Center Tape Guide

1. Go to CARR-DR 8 for the procedure to *power off* the drive.
2. Open the drive drawer and remove the drive safety cover (see CARR-DR 2-5).
3. Remove the tension transducer tape guide mounting screw **5** and remove the tension transducer tape guide **6** (see CARR-DR 140 and CARR-DR 2300).

The machine reel tape guide has a pin which is inserted into the center tape guide.
4. Separate the machine reel tape guide pin **2** from the center tape guide **3** by lifting up on the end of the machine reel tape guide **1**.
5. Remove the mounting screw **4** and the center tape guide from the drive.

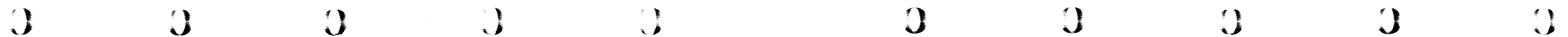
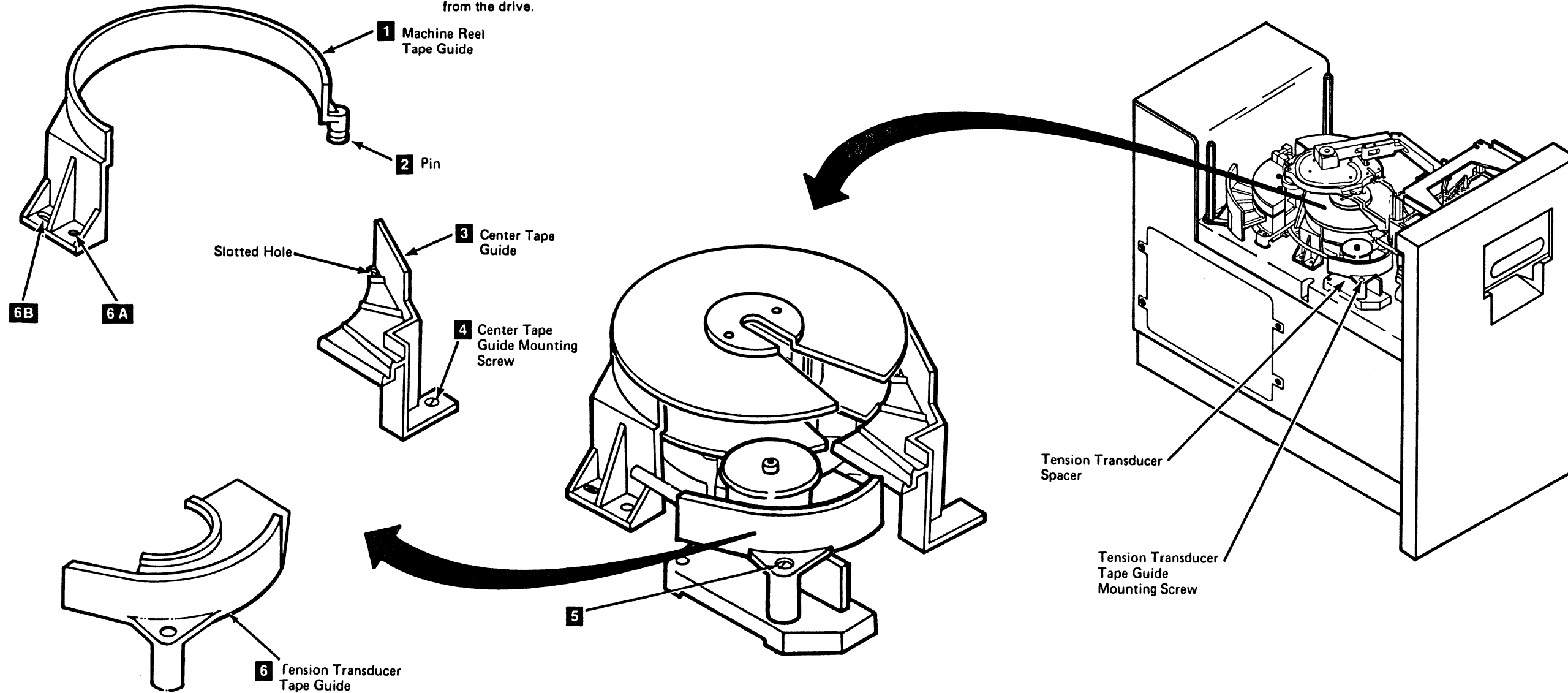
Replacing the Center Tape Guide

Warning:

The machine reel tape guide (FRU227) and the tape center guide (FRU231) are sequence sensitive and must be installed in the correct order for correct adjustment.

1. Place the center tape guide **3** in position on the baseplate and install the mounting screw **4**, loosely.
2. Press the guide pin **2** on the machine reel tape guide **1** into the slotted hole in the center tape guide **3**.

3. Loosen the machine reel tape guide mounting screws.
4. Tighten the center tape guide mounting screw **4**.
5. Tighten the machine reel tape guide mounting screws, first **6A** and then **6B**.
6. Install the tension transducer tape guide mounting screw **5** and the tension transducer tape guide **6** (see CARR-DR 140 and CARR-DR 2300).
7. Install the drive safety cover (see CARR-DR 2-5).
8. Go to CARR-DR 8 for the procedure to *power on* the drive.



FRU232 Cartridge Removal/Replacement Information

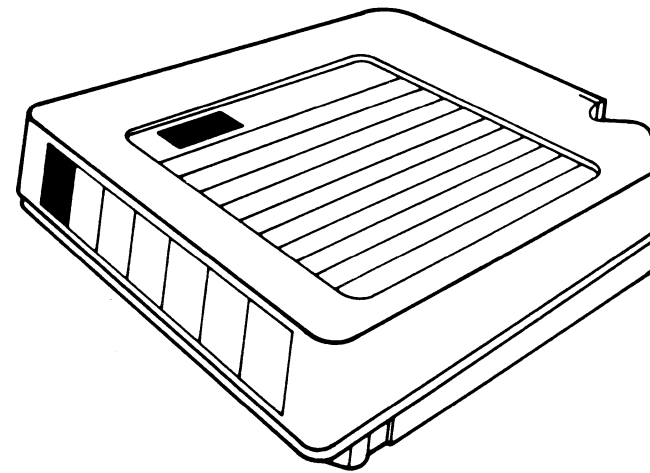
Drive **CARR-DR 2320**

About the Cartridge

The cartridge is a customer owned FRU.

If the cartridge is suspected, try the cartridge on another drive, or try a known good cartridge on the failing drive.

Further cartridge repair information can be found in the CART section of the maintenance information.



Tape Unit With BM 6460006 (see CARR-DR 9)

This page contains the steps needed to remove the air pressure test hose assembly from the tape unit. The removal is from the front of the tape unit.

Since there is only one air pressure test hose assembly in a tape unit, it is necessary that both drives be available for service.

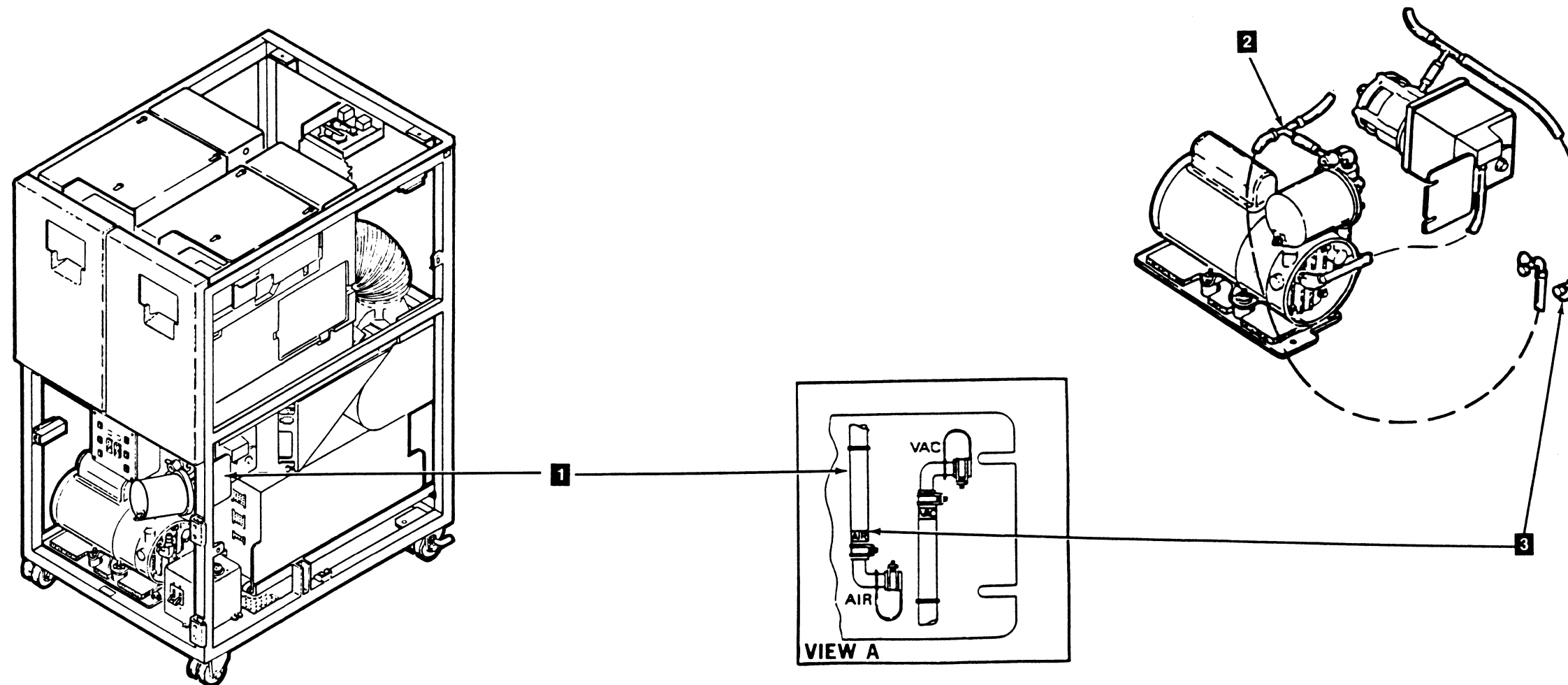
Note: This FRU can be removed and replaced without affecting the other tape units by removing power from the failing tape unit with the ac power circuit breaker.

Removing the Air Pressure Test Hose Assembly

1. Go to CARR-DR 8 for the procedure to *power off* the tape unit.
2. Remove the front safety cover (see CARR-DR 2-1).
3. Remove the test hose assembly from the mounting bracket **1**.
4. Disconnect the tape unit air pressure hose from the tee **2**.
5. Remove the air pressure test hose assembly **3** from the tape unit.

Replacing the Air Pressure Test Hose Assembly

1. Position the air pressure test hose assembly **3** in the tape unit.
2. Connect the air pressure test hose assembly **3** to the regulator output port tee **2**.
3. Insert the test port end of the air pressure test hose assembly into the retainer on the mounting bracket **1**.
4. Replace the tape unit front safety cover (see CARR-DR 2-2).
5. Go to CARR-DR 8 for the procedure to *power on* the tape unit.



FRU263 Vacuum Test Hose Assembly Removal and Replacement Procedure

Drive CARR-DR 2630

Tape Unit With BM 6460006 (see CARR-DR 9)

This page contains the steps needed to remove the vacuum test hose assembly from the tape unit. The removal is from the front of the tape unit.

Since there is only one vacuum test hose assembly in a tape unit, it is necessary that both drives be available for service.

Note: This FRU can be removed and replaced without affecting the other tape units by removing power from the failing tape unit with the ac power circuit breaker.

cb

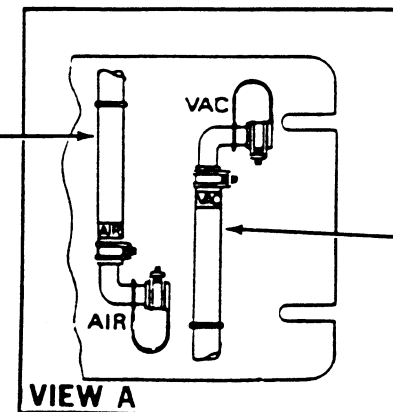
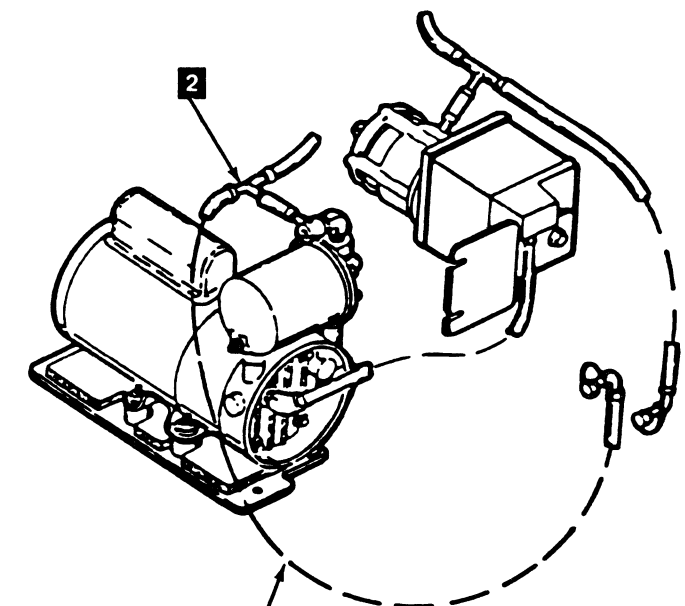
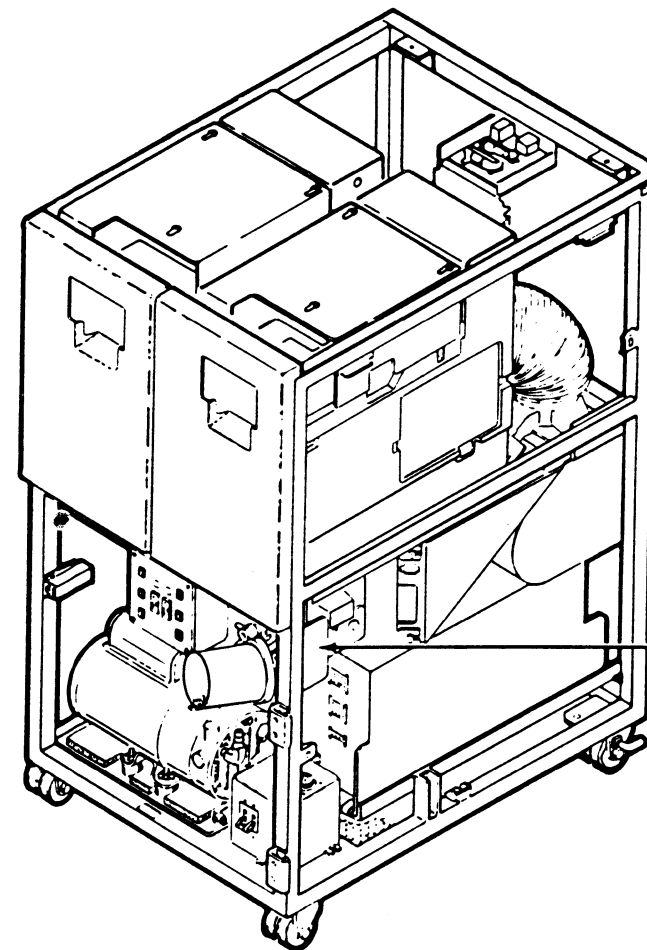
Removing the Vacuum Test Hose Assembly

1. Go to CARR-DR 8 for the procedure to **power off** the tape unit.
2. Remove the front safety cover (see CARR-DR 2-1).
3. Remove the test hose assembly from the mounting bracket **1**.
4. Disconnect the tape unit vacuum test hose assembly **3** from the tee **2** at the venturi.

cb

Replacing the Vacuum Test Hose Assembly

1. Position the vacuum test hose assembly **3** in the tape unit.
2. Connect the vacuum test hose assembly **3** to the tee **2** at the venturi.
3. Insert the test port end of the vacuum test hose assembly into the retainer on the mounting bracket **1**.
4. Replace the tape unit front safety cover (see CARR-DR 2-2).
5. Go to CARR-DR 8 for the procedure to **power on** the tape unit.



FRU269 Interposer Cable and Connector Removal and Replacement Procedure

Drive **CARR-DR 2690**

Tape Unit Without BM 6460006 (see CARR-DR 9)

Some drives have an interposer cable (FRU 269) installed as part of the dc power distribution cable (drive internal). This cable connects into the power amplifier board (at position PA-J8) and has two connectors. One connector goes to the new style drive thermal switch (mounted on the logic board left card guide). The other connector is mounted on the inside of the access hole for the file reel motor. This page contains the steps needed to remove and replace the interposer cable in the drive.

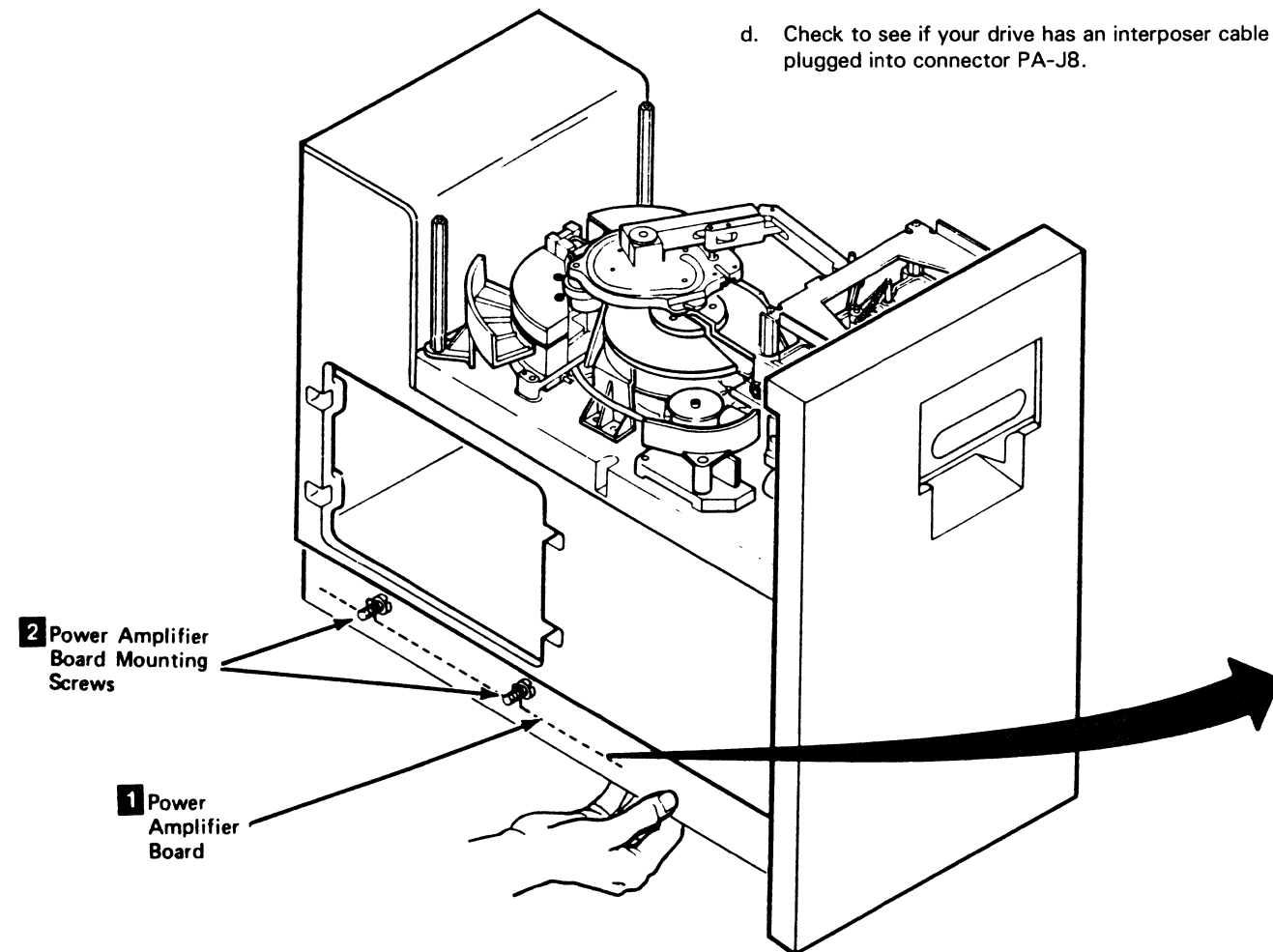
Removing the Interposer Cable and Connector

1. Go to CARR-DR 8 for the procedure to **power off** the drive.

Since some drives may not have an interposer cable **3** installed you must check the cable wiring of your drive.

Note: Connector PA-J8 **4** (on the power amplifier board) is engineering change (EC) sensitive. Check the level of your drive as follows:

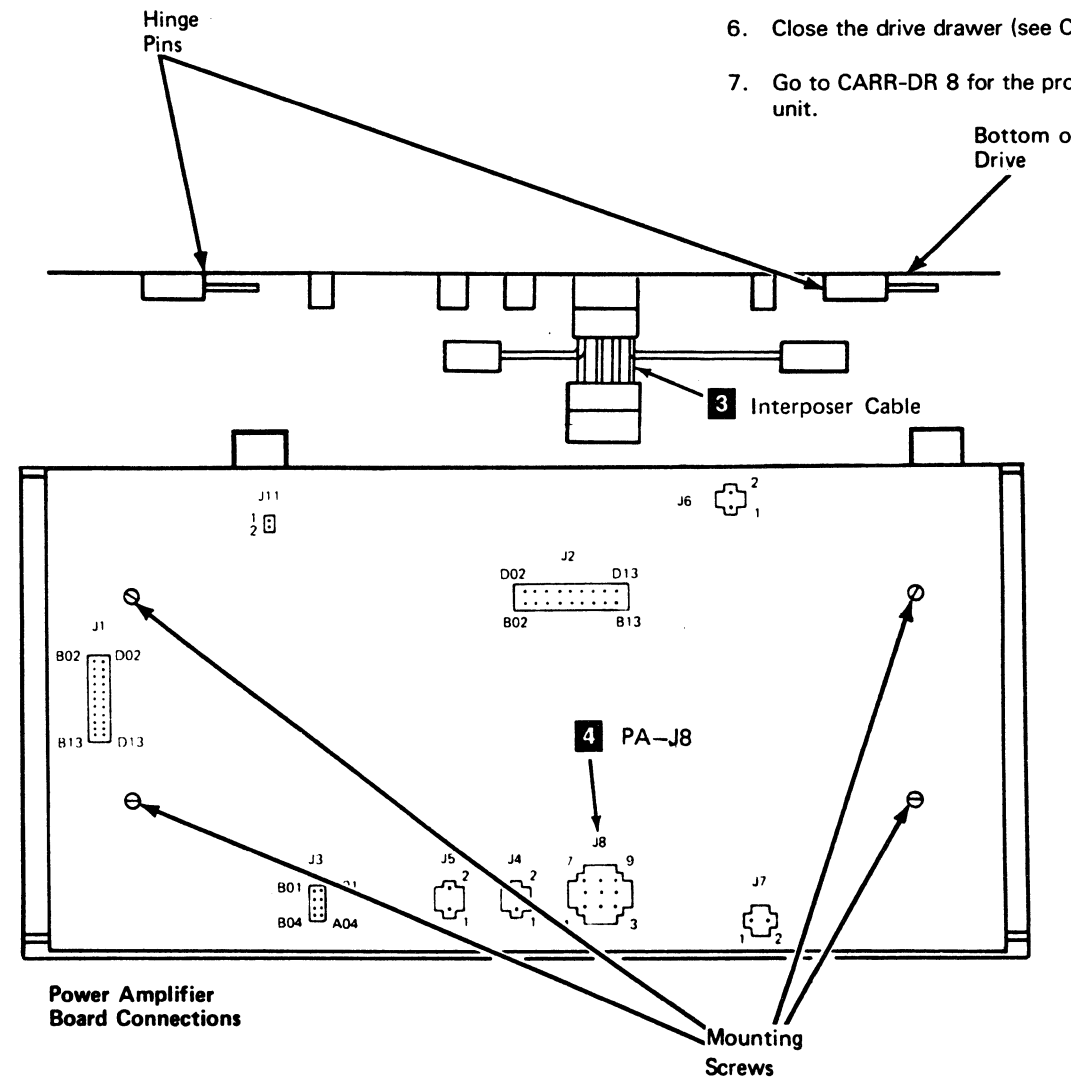
- a. Open the drive drawer (see CARR-DR 2-5).
- b. Support the power amplifier board **1** with one hand, and with the other hand remove the two screws **2** holding the power amplifier board in position.
- c. Lower the amplifier board slowly. (The board is hinged.)
- d. Check to see if your drive has an interposer cable plugged into connector PA-J8.



2. If your drive does not have an interposer cable installed, return to the procedure that sent you here.
3. If your drive does have an interposer cable installed, disconnect the dc power distribution cable (drive internal) from the interposer cable connector.
4. Remove the PA-J8 connector from the power amplifier board and remove the connector from inside the front of the drive drawer (at the access hole for the cartridge drive motor).
5. Remove the connectors from the interposer cable to the drive thermal switch.
6. Remove the interposer cable from the drive (through the bottom of the drive drawer).

Replacing the Interposer Cable and Connector

1. Install the replacement cable in the drive as follows:
 - **From the bottom of the drive drawer**, plug the connector of the interposer cable **3** into the power amplifier board (in position PA-J8 **4**).
2. Mount the connector inside the front of the drive drawer (at the access hold for the reel drive motor).
3. Plug the connectors from the interposer cable to the drive thermal switch.
4. Replace the PA-P8 connector from the dc distribution cable (drive internal) into the interposer connector (plugged into the power amplifier board in position PA-J8).
5. Pivot the power amplifier board **1** into position and install the two mounting screws **2**.
6. Close the drive drawer (see CARR-DR 2-5).
7. Go to CARR-DR 8 for the procedure to **Power On** the tape unit.



FRU277 Read/Write Head Compliant Guide Removal and Replacement Procedure

Drive **CARR-DR 2770**

You have been directed to this page to replace FRU277 (Read/Write Head Compliant Guides). Before starting this procedure, ensure that you have two of part number 6315584 (compliant guide) on hand for the replacement procedure.

Warning: Do not bend the new compliant guide. Handle carefully, this is a delicate part.

This page contains the steps needed to remove and replace the drive-read/write-head compliant guides.

Note: This FRU can be removed and replaced without affecting the other drive by removing power from the failing drive with the Drive Power On/Off switch.

There are two compliant guides on the read/write head assembly, one on the left guide bearing 1, and one on the right guide bearing 5. The compliant guides are replaced as a pair.

Removing the Compliant Guide

1. Go to CARR-DR 8 for the procedure to power off the drive.
2. Open the drive drawer and remove the drive drawer safety cover (see CARR-DR 2-5).

Warning: Ensure that you do not scratch or hit the read/write head with your tools while working in the area.

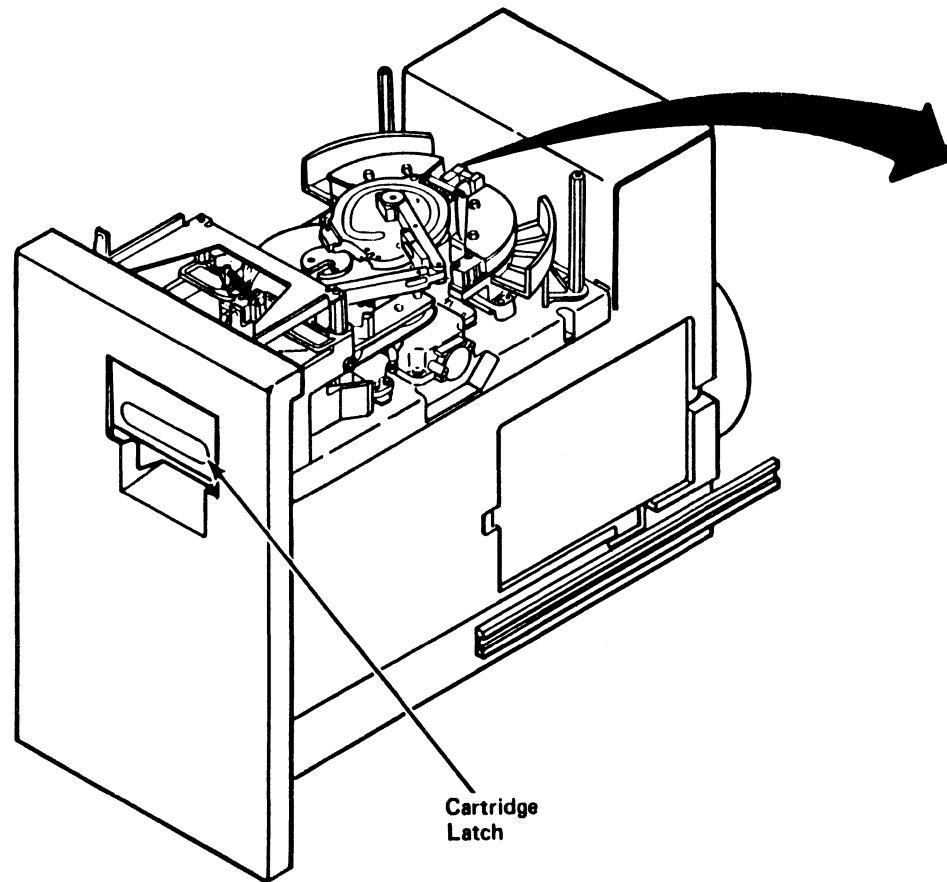
3. Start with the left compliant guide.
4. Using an Allen wrench, remove the two mounting screws 3 from the guide top cover 2. Save the two mounting screws 3 for the replacement procedure.
5. Remove the guide top cover 2 and save it for the replacement procedure.

6. Remove the compliant guide 4 from the locating pins and discard.

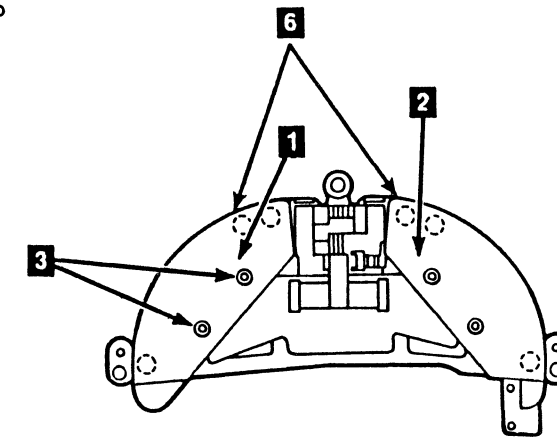
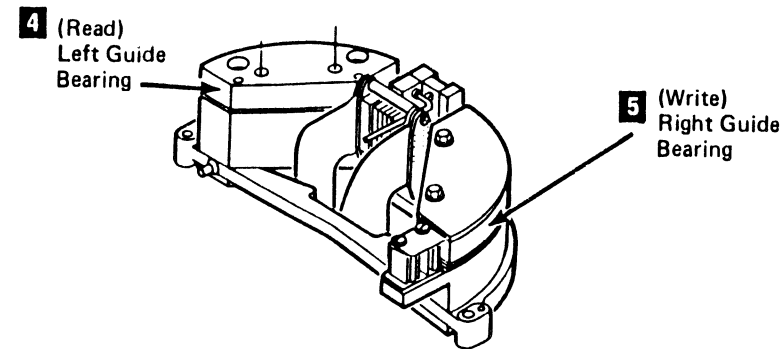
Replacing the Compliant Guide

1. Install the new compliant guide (with the locating slot on the right) 4 on the locating pins. Ensure the compliant guide is fully seated on the locating pins.
2. Install the guide top cover 2 (with the locating slot on the right) on the locating pins. Ensure the compliant guide is not moved when installing the guide top cover.
3. Replace the guide top cover mounting screws 3. Ensure that both screws are snug (finger tight).
4. Place the long end of the Allen wrench into the mounting screw socket head and tighten each screw one-eighth to one-fourth of a turn.

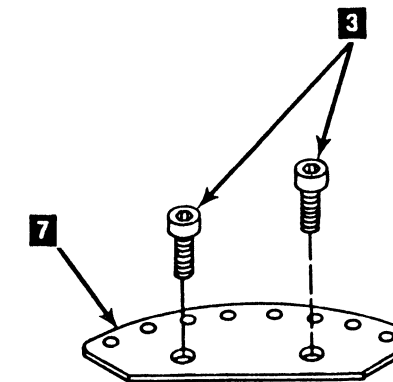
5. Repeat this removal and replacement procedure for the right compliant guide.
6. Go to CARR-DR 130 and do the "Head, Decoupler, and Cleaner Block Cleaning Procedure"; return here when finished.
7. Install the drive drawer cover (see CARR-DR 2-5) and close the drive drawer.
8. Go to CARR-DR 8 for the procedure to power on the drive.



Cartridge Latch



Model B11
Head and Guide Assembly
Top View



Model B22
Compliant Guide

Notes

Notes CARR-DR 2775

Notes CARR-DR 2775

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FRU281 Loader Control Card Removal and Replacement Procedure

Drive CARR-DR 2810

This page contains the steps needed to remove and replace the logic card from the automatic cartridge loader. The other drive is not affected when the logic card is removed or replaced.

Warning: Some parts handled during this procedure are sensitive to electrostatic discharge (ESD), see CARR-DR 1-9 for "Instructions for Working with ESD Sensitive Parts."

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Note: This FRU can be removed and replaced without affecting the other drive by removing power from the failing drive with the Drive Power On/Off switch.

Removing the Loader Control Card

1. Go to CARR-DR 8 for the procedure to **power off** the drive.
2. Open the drive drawer.
3. Unlock the two quarter-turn fasteners **1** at the bottom of the hinged part of the front cover.
4. Raise the front cover.

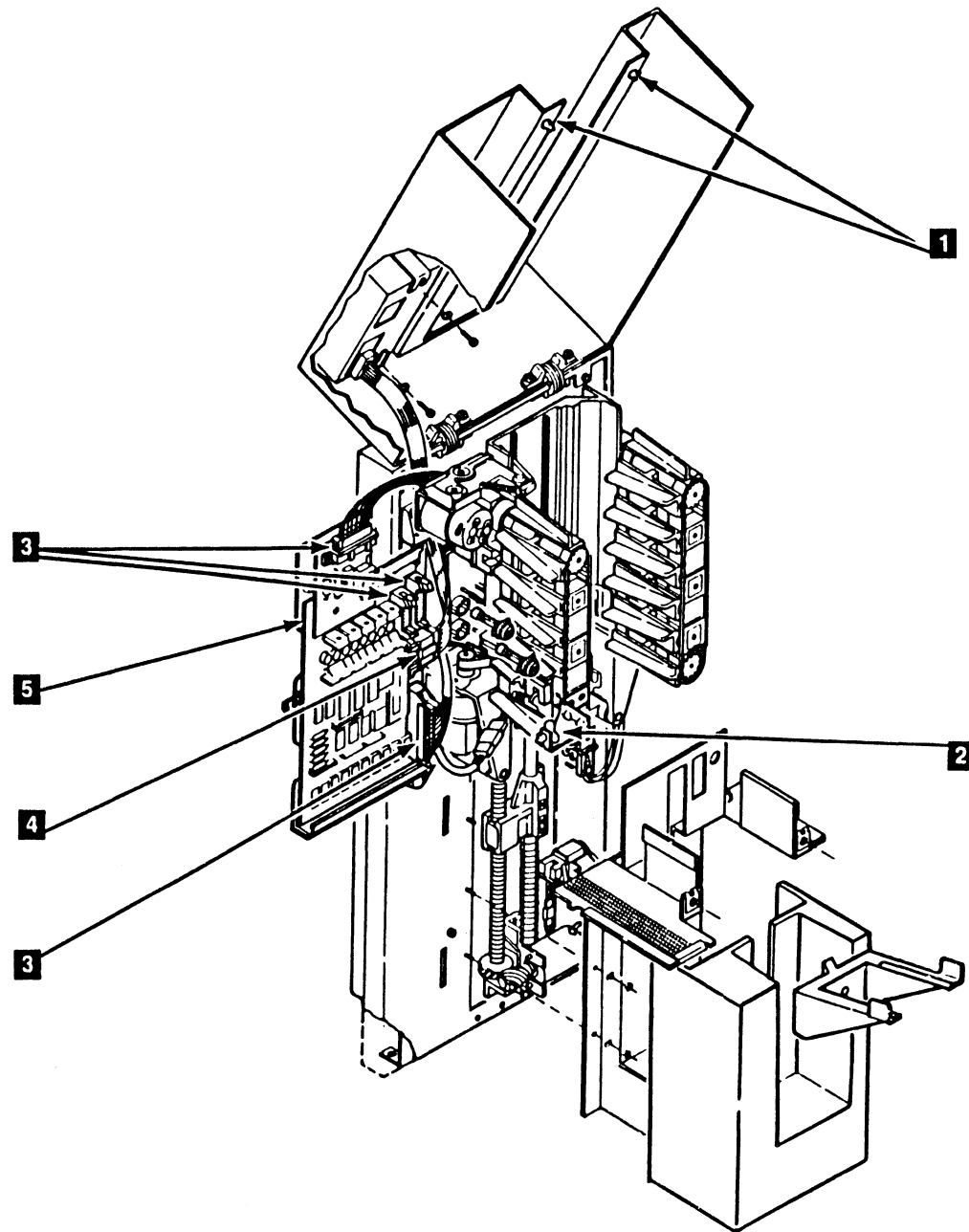
the top part of the front cover is hinged at the top.
5. Disconnect the power cable **4** from the control card.
6. Unlock the quarter-turn fastener **2** at the front of the control card gate and swing out the gate.
7. Disconnect the signal cables **3** from the control card.
8. Gently, but firmly, grasp the control card **5** and pull it toward you and out of the upper and lower card guides.

Replacing the Loader Control Card

1. Place the control card **5** in the upper and lower card guides and gently, but firmly, push the control card into position (all the way in past the quarter-turn opening).
2. Connect the signal cables **3** to the control card.
3. Close the control card gate and lock the quarter-turn fastener **2**.

Make sure no cables are binding or pinching.
4. Connect the power cable **4** to the control card.
5. Lower the front cover and lock the two quarter-turn fasteners **1**.

Make sure there are no cables outside the cover and that none are being pinched.
6. Close the drive drawer.
7. Go to CARR-DR 8 for the procedure to **power on** the drive.



This page contains the steps needed to remove and replace the load assembly.

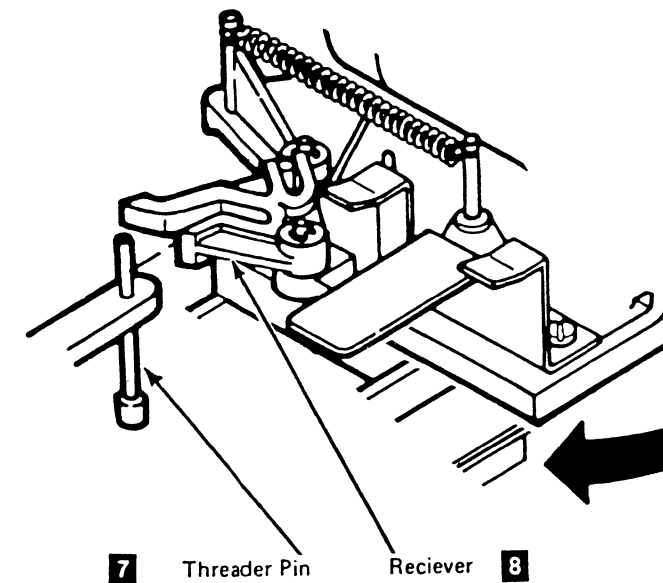
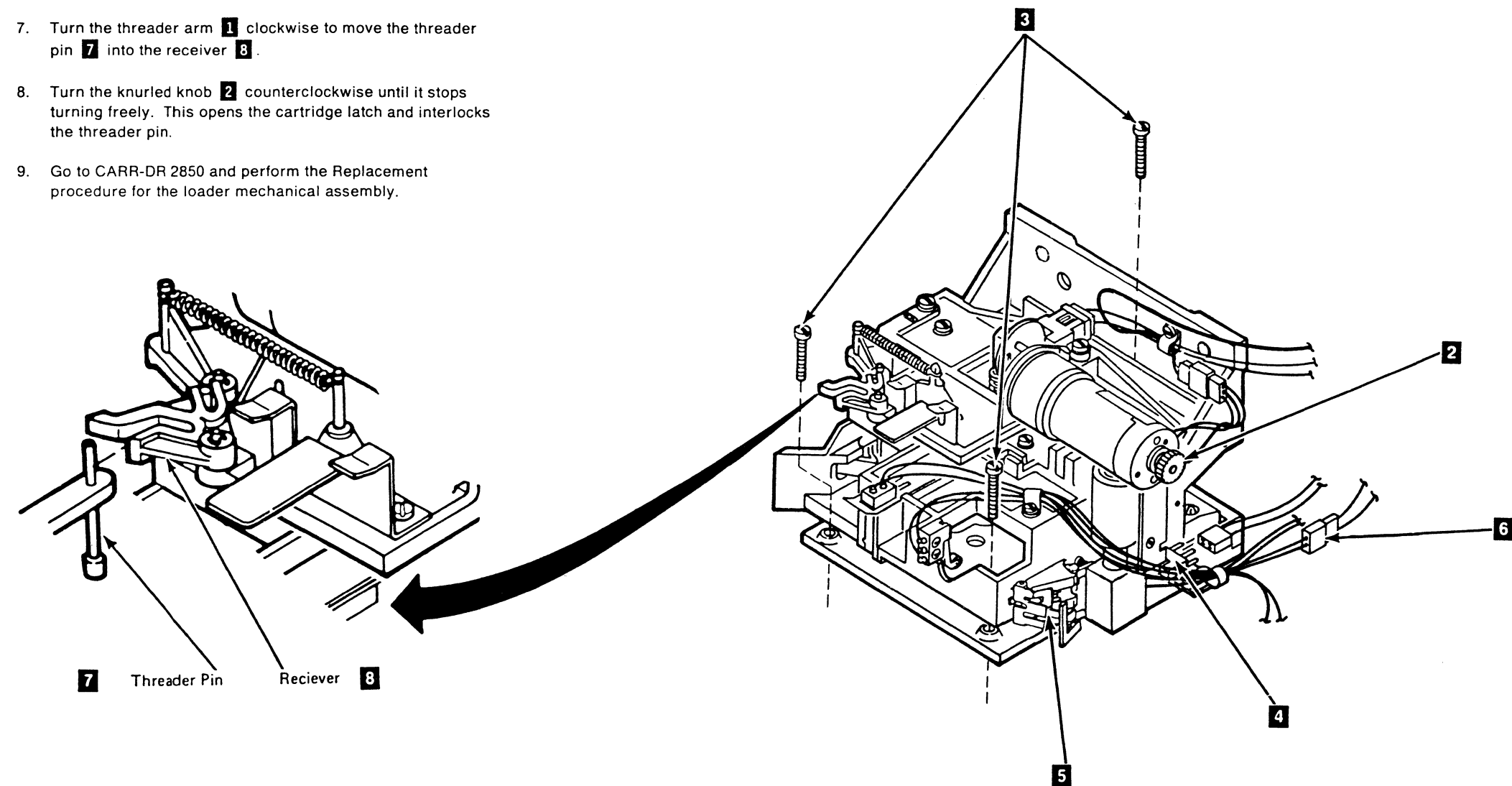
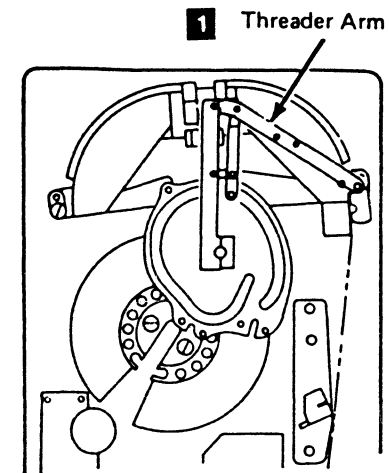
Note: This FRU can be removed and replaced without affecting the other drive by removing power from the failing drive with the Drive Power On/Off switch.

Removing the Load Assembly (From the Drive)

1. Go to CARR-DR 2850 and perform the Removal procedure of the loader mechanical assembly, and when completed, return to step 2.
2. Turn the knurled knob **2** clockwise until the knob stops. This releases the threader pin from the interlock.
3. Turn the threader arm counterclockwise to move the threader arm **1** to the position shown (the 12 o'clock position). This moves the arm out of the way and may prevent the arm from being broken.
4. Remove the cable clamps from the load assembly.
5. Disconnect the file protect switch cable connector P3/J3 **6**.
6. Unplug the cartridge present sensor cable from the sensor **5**.
7. Unplug the cartridge latched sensor cable from the sensor **4**.
8. Remove the three load assembly holding screws **3** to the drive base; lift the load assembly from the drive base.

Replacing the Load Assembly (To the Drive)

1. Place the load assembly on the drive and install the three load assembly holding screws **3**.
2. Connect the cartridge latched sensor cable to the cartridge latched sensor **4**.
3. Connect the cartridge present sensor cable to the cartridge present sensor **5**.
4. Connect the file protect switch cable connector P3/J3 **6**.
5. Install the cable clamps.
6. Ensure that the load assembly is at the lowest point by turning the knurled knob clockwise until the knob stops turning freely. This permits the threader arm to engage the interlock and receiver.
7. Turn the threader arm **1** clockwise to move the threader pin **7** into the receiver **8**.
8. Turn the knurled knob **2** counterclockwise until it stops turning freely. This opens the cartridge latch and interlocks the threader pin.
9. Go to CARR-DR 2850 and perform the Replacement procedure for the loader mechanical assembly.



FRU283 Load Motor Removal and Replacement Procedure

This page contains the steps needed to remove and replace the load motor.

Note: This FRU can be removed and replaced without affecting the other drive by removing power from the failing drive with the Drive Power On/Off switch.

Removing the Load Motor

1. Go to CARR-DR 8 for the procedure to **power off** the drive.
2. Open the drive drawer and remove the drive drawer safety cover. See CARR-DR 2-5.
3. Disconnect the load motor connector P **4**.
4. Disconnect the load complete sensor cable connector B **6** and remove the cable clamp.
5. Turn the knurled knob **10** clockwise until it stops turning freely. This permits the threader arm to be disengaged from the interlock.
6. Turn the threader arm counterclockwise to move the threader arm **2** to the position shown (the 12 o'clock position). This moves the arm out of the way and may prevent the arm from being broken.
7. Remove the "C" clip **7** from the upper end of the connecting rod.
8. Remove the two screws **3** from the load motor bridge assembly and remove the bridge assembly from its locating pins. Be careful not to break the connecting rod.
Note: Be careful not to lose the plastic bushings under the mounting screws.
9. Remove the holding screw and remove the load complete sensor **12**.
10. Loosen the crank arm set screw **8**. Slide the crank arm off the motor shaft.
11. Remove the three motor holding screws **9** and remove the motor.

Replacing the Load Motor

1. Install the motor on the load motor bridge assembly with the voltage connector **4** positioned as shown in the drawing. Install and tighten the three mounting screws **9**.
2. Install the crank arm **5** on the motor shaft and tighten the set screw **8**.
3. While ensuring that the crank arm flag is centered in the load motor complete sensor **12**, install the sensor and tighten the holding screw.

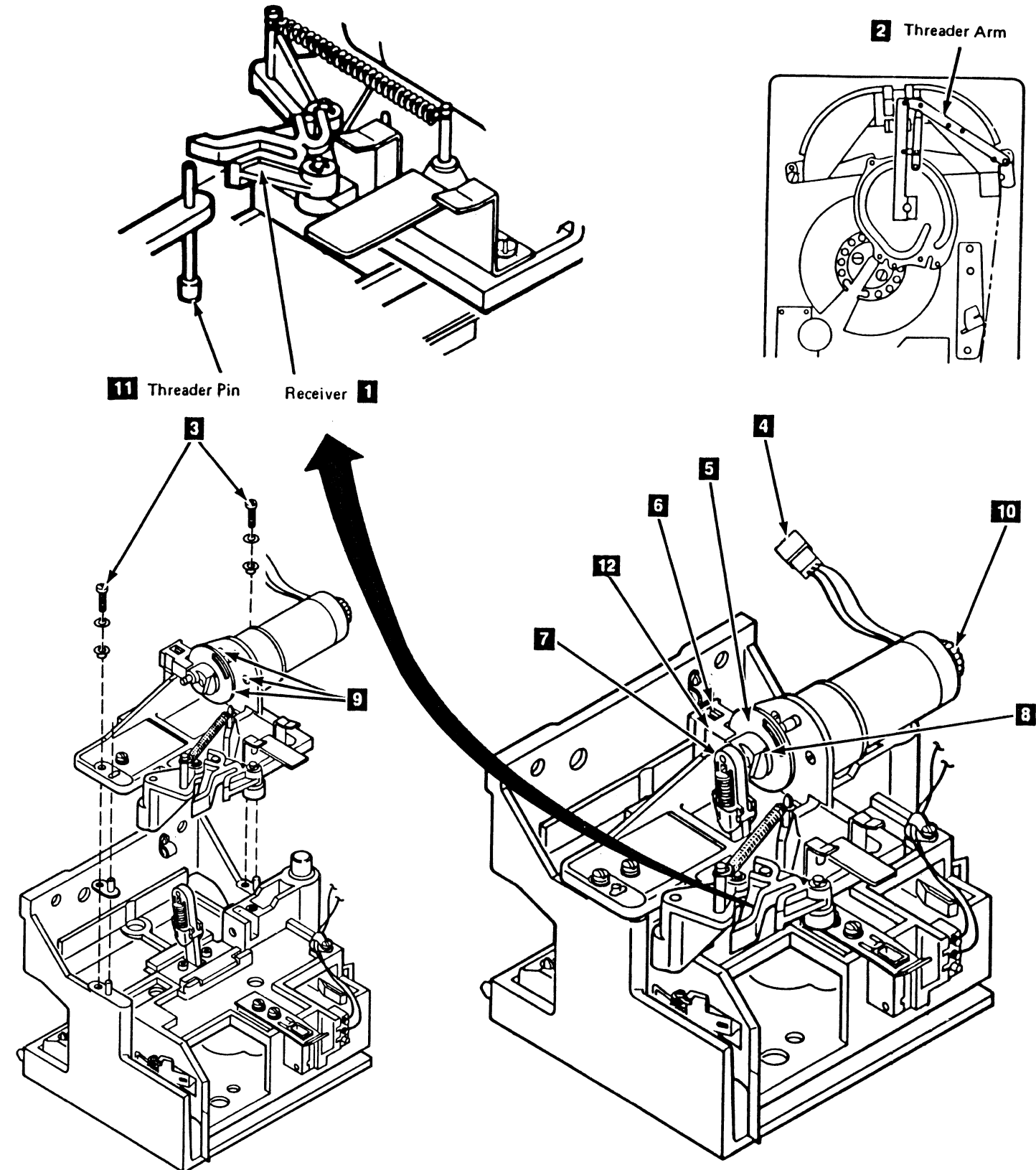
Note: Make sure the connecting rod does not bind.

4. Place the bridge assembly on its locating pins and at the same time ensure the crank arm shaft is in the connecting rod. Install the bridge assembly mounting screws **3**.

Note: Make sure the plastic bushings are in place under the mounting screws.

5. Install the "C" clip **7** on the motor shaft.
6. Connect the load motor complete cable connector B **6** and install the cable clamp.
7. Connect the load motor connector P **4**.
8. Turn the threader arm **2** clockwise to return the arm to the home position (receiver **1** and threader pin **11** engaged).
9. Turn the knurled knob **10** counterclockwise until it stops turning freely (load assembly in the up position).
10. Install the drive drawer safety cover and close the drive drawer. See CARR-DR 2-5.
11. Go to CARR-DR 8 for the procedure to **power on** the drive.

Drive **CARR-DR 2830**



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FRU284 Load Complete Sensor Removal and Replacement Procedure

Drive CARR-DR 2840

This page contains the steps needed to remove and replace the load complete sensor.

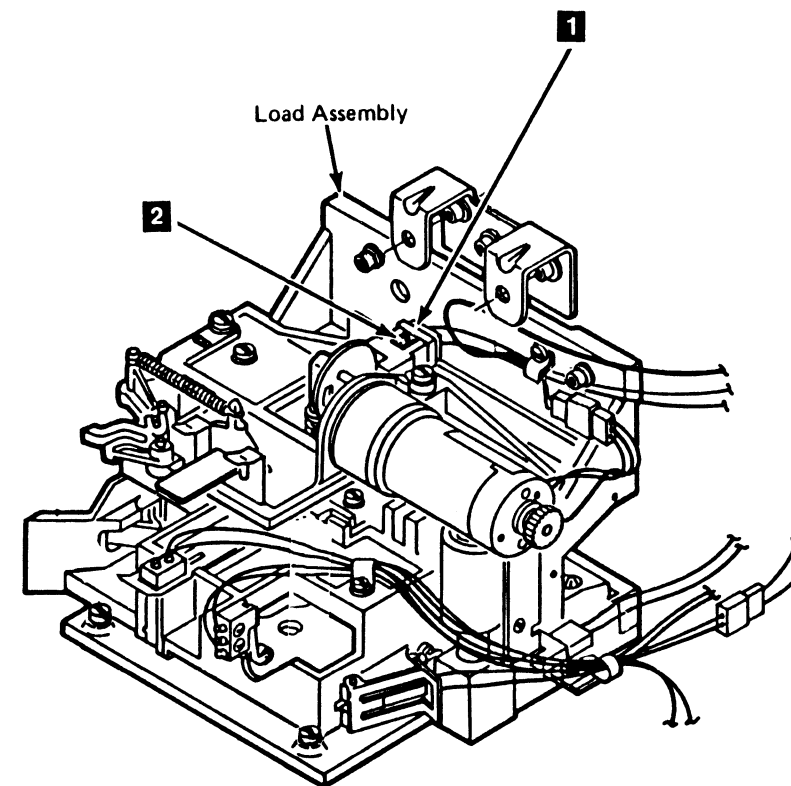
Note: This FRU can be removed and replaced without affecting the other drive by removing power from the failing drive with the Drive Power On/Off switch.

Removing the Load Complete Sensor

1. Go to CARR-DR 8 for the procedure to **power off** the drive.
2. Open the drive drawer and remove the drive drawer safety cover. See CARR-DR 2-5.
3. Disconnect the load complete sensor cable connector B **1**.
4. Remove the holding screw and remove the load complete sensor **2**.

Replacing the Load Complete Sensor

1. While ensuring that the crank arm flag is centered in the load motor complete sensor **2**, install the sensor and tighten the holding screw.
2. Connect the load complete cable connector B **1**.
3. Install the drive drawer safety cover and close the drive drawer. See CARR-DR 2-5.
4. Go to CARR-DR 8 for the procedure to **power on** the drive.



FRU285 Loader Mechanical Assembly Removal and Replacement Procedure

This page contains the steps needed to remove and replace the loader mechanical assembly.

Note: This FRU can be removed and replaced without affecting the other drive by removing power from the failing drive with the Drive Power On/Off switch.

Removing the Loader Mechanical Asm.

1. Go to CARR-DR 8 for the procedure to **power off** the drive.
2. Open the drive drawer and remove the drive drawer safety cover. See CARR-DR 2-5.
3. Disconnect the following from the load assembly:
 - Load motor connector P **14** and cable clamp
 - Load motor complete sensor connector B **15**
 - Cartridge latched signal connector P5/J5 **25**
 - Cartridge feed complete sensor connector A **19** and cable clamp.
4. Unlock the two quarter-turn fasteners **8** at the bottom of the hinged part of the front cover and raise the front cover.

The top part of the front cover is hinged.

Note: There is one mounting screw that can only be accessed from inside the loader assembly (front right). The other two mounting screws can be accessed from the load assembly side.

5. Disconnect the drive power cable at P3 **6** and the two fuse holders, noting the location of the wires for installation at a later time.
6. Unlock the quarter-turn fastener **10** at the front of the loader control card gate and swing out the gate.
7. Disconnect the drive signal cable P1 **7**.
8. Close the loader control card gate and lock the quarter-turn fastener **10**.

9. Remove the two screws **12** (six flute) securing the tray **11**. Retain the tray and mounting screws for later use.
 10. Remove the one mounting screw **9** to the bottom of the load assembly.
 11. Lower the top part of the front cover and lock the two quarter-turn fasteners **8**.
- CAUTION**
Be sure you have a strong grip on the loader assembly before removing the two screws.
12. Remove the two mounting screws **16** at the top of the load assembly and remove the loader mechanical assembly.

Replacing the Loader Mechanical Asm.

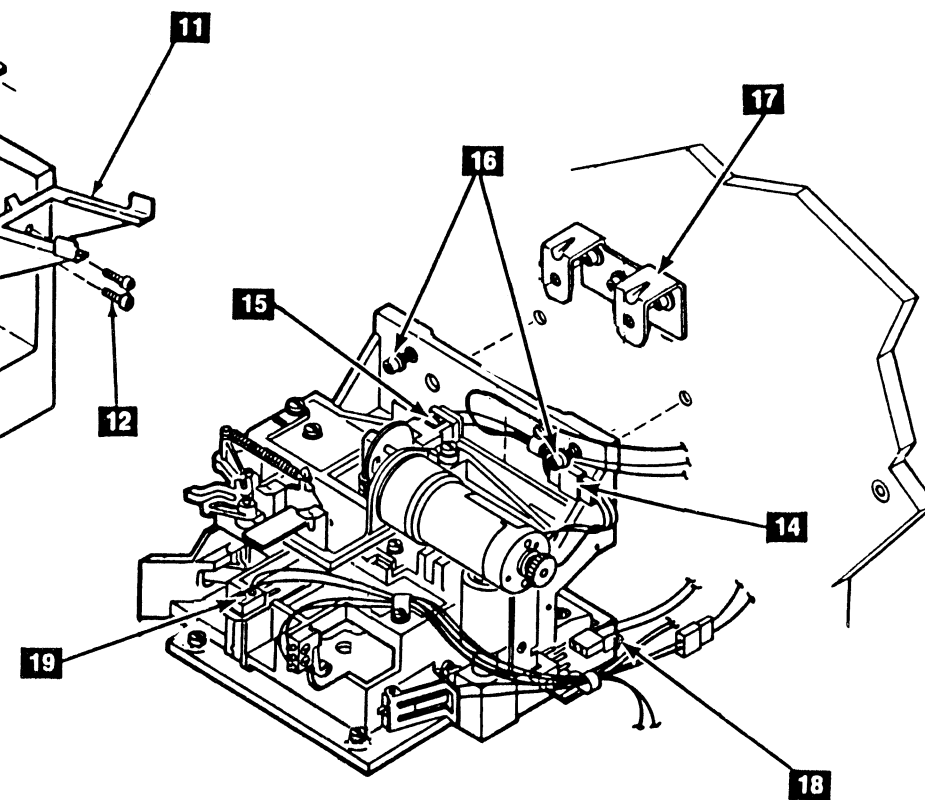
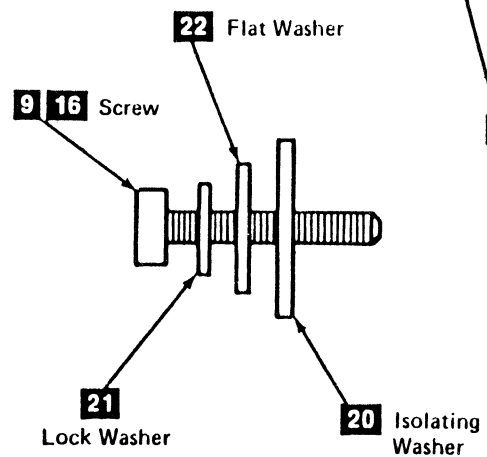
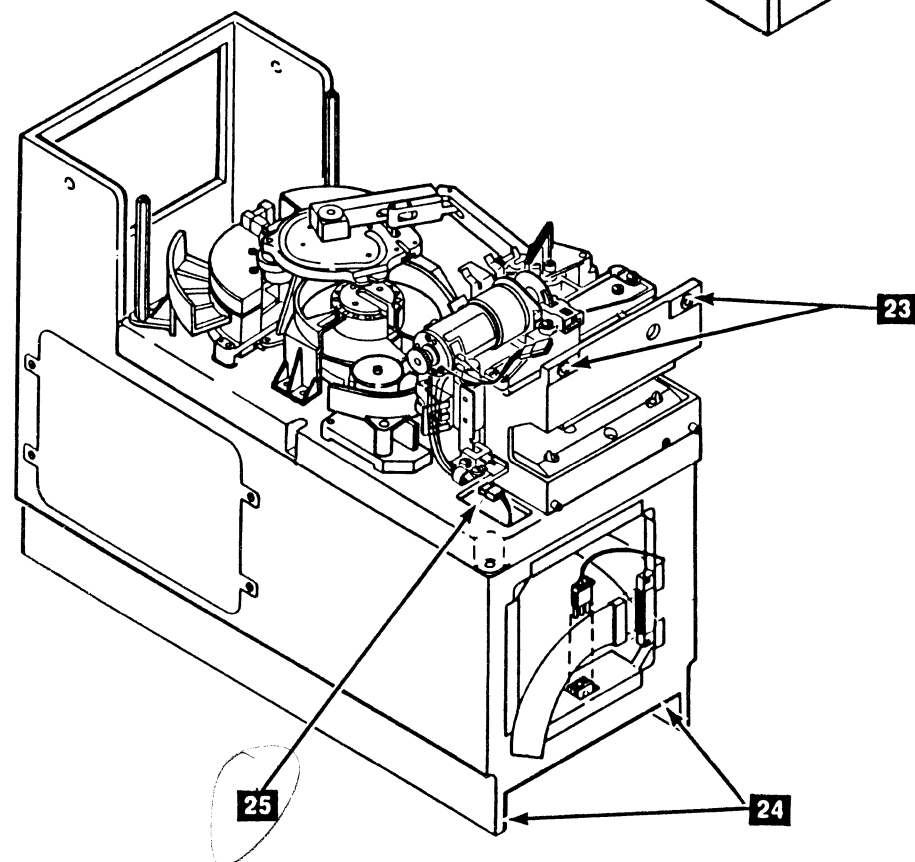
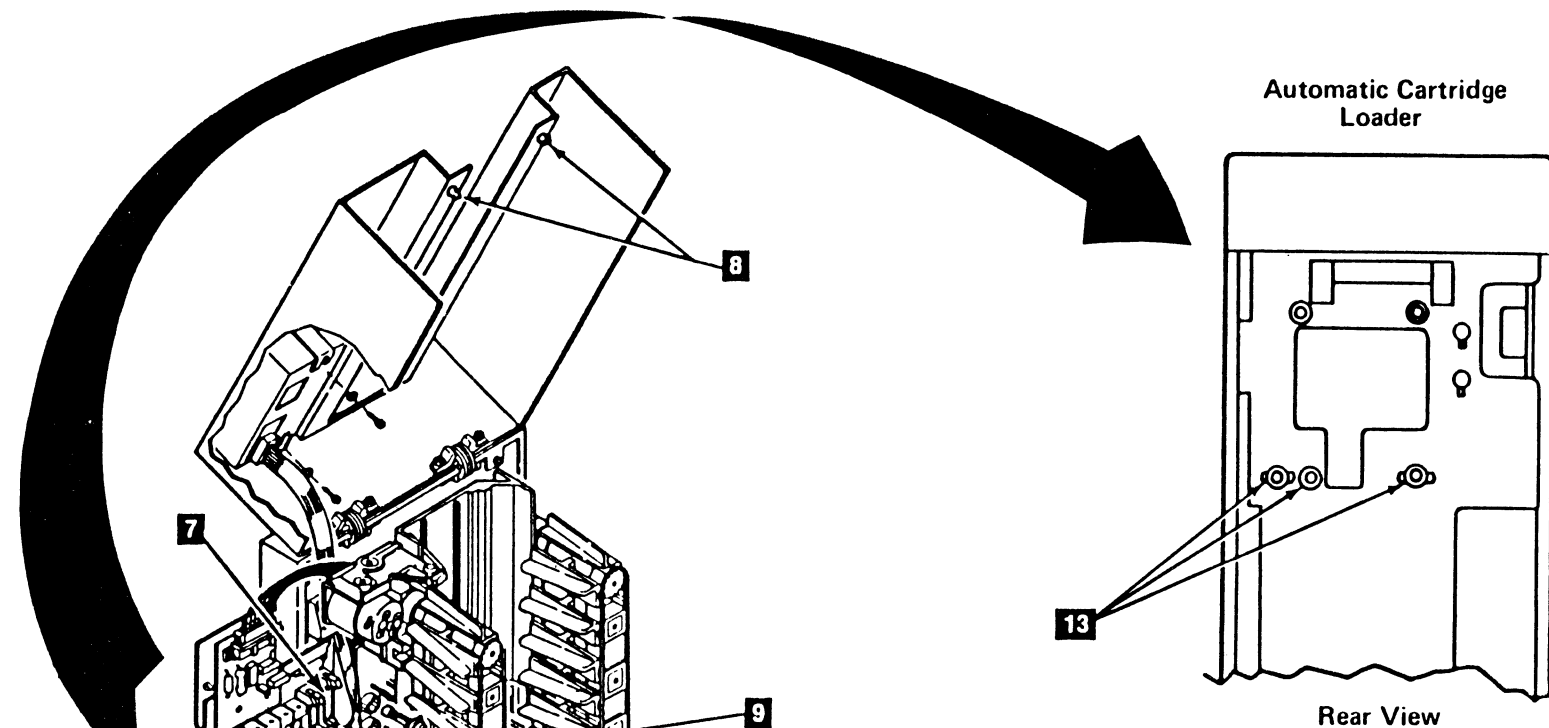
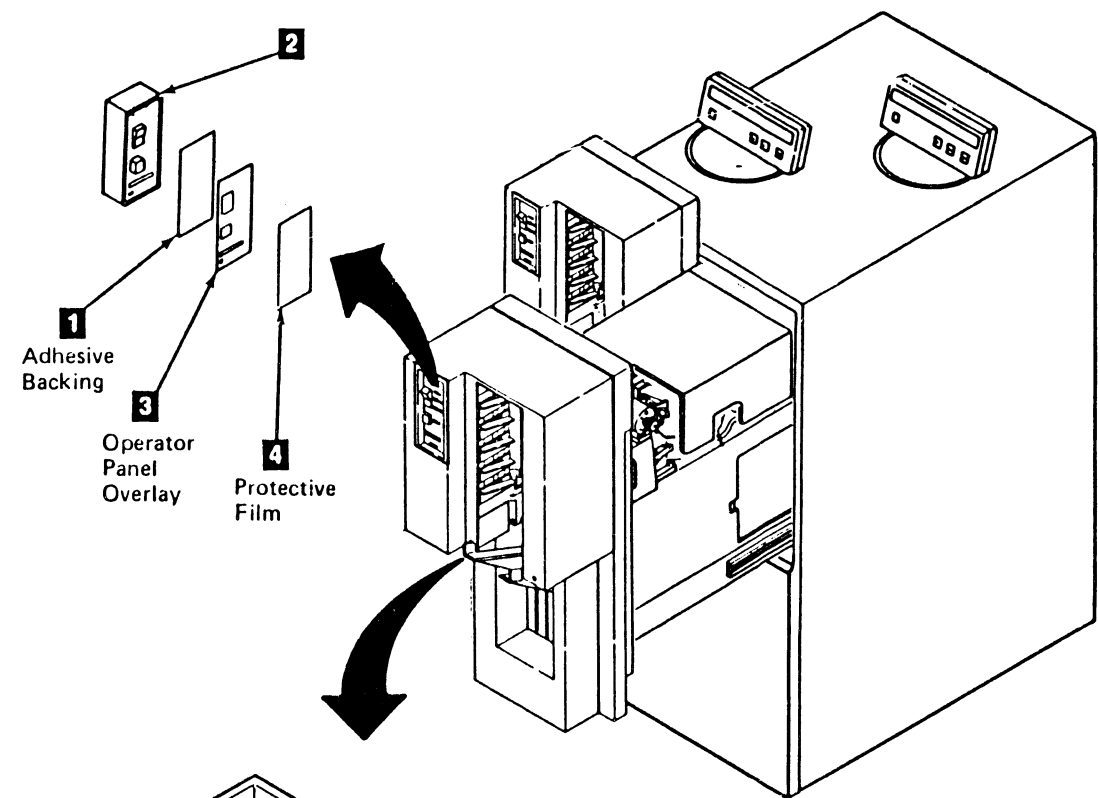
1. Verify that the two isolating bushings **23** are installed on the front of the loader assembly.
2. Verify that the three isolating bushings **13** are installed on the back of the automatic cartridge loader.
3. Route cables to ensure they will not be pinched during the installation of the automatic cartridge loader.
4. Lift the automatic cartridge loader onto the load assembly so the support bracket **17** is located over the front top surface of the load assembly. The bracket provides support for the automatic cartridge loader.
5. The bottom of the automatic cartridge loader is similar to the drive cover and can be held by either two screws or by two pins.
6. If your drive has pins **24**, guide the pins into the holes **5** of the cover and at the same time, lift the automatic cartridge loader over the locating pins **18** on the load assembly.
7. Do not excessively tighten the screws securing the automatic cartridge loader. Excessive tightening of the screws will crack the isolating washer.

Secure the automatic cartridge loader to the load assembly from the back, using the screws **16**, isolating washer **20**, flat washer **22**, and lockwasher **21**. The screws, isolating washer, flat washer, and lockwasher must be installed in the order shown on the following page.

8. If not already removed, remove the two screws **12** (six flute) securing the tray **11**. Retain the tray and mounting screws for later use.
9. Install the screw **9**, isolating washer **20**, flat washer **22**, and lockwasher **21** from the front and secure. The screw, isolating washer, flat washer, and lockwasher must be installed in the order shown on the following page.
10. If your drive has the two screws at the bottom, install the two screws.
11. Connect the drive power cable at P3 **6** and the two fuse holders. Ensure the proper wires are installed on the correct fuse holder.
12. Unlock the quarter-turn fastener **10** at the front of the loader control card gate and swing out the gate.
13. Connect the drive signal cable P1 **7**.
14. Close the loader control card gate and lock the quarter-turn fastener **10**.
15. Lower the front cover, being careful no cables are pinched, and lock the two quarter-turn fasteners **8**.
16. Install the tray **11** removed earlier using the two screws **12**.
17. Connect the following to the load assembly:
 - Load motor connector P **14** and install the cable clamp.
 - Load motor complete sensor connector B **15** and install the cable clamp.
 - Cartridge latched signal connector P5/J5 **25**.
 - Cartridge feed complete sensor connector A **19** and install the cable clamp.
18. If you are replacing a loader mechanical assembly that had been previously installed, go to step 22.

Drive CARR-DR 2850

19. If you are installing a new loader mechanical assembly, select the operator panel overlay **3** from the overlay group supplied. The language should be the same as the tape unit.
20. Peel the adhesive protective backing **1** from the overlay and install on the front face of the operator panel **2**.
21. Remove the protective film **4** on the front face of the overlay after the overlay has been attached to the operator panel.
22. Install the drive drawer safety cover and close the drive drawer. See CARR-DR 2-5.
23. Go to CARR-DR 8 for the procedure to **power on** the drive.



This page contains the steps needed to remove and replace the loader signal and power cables.

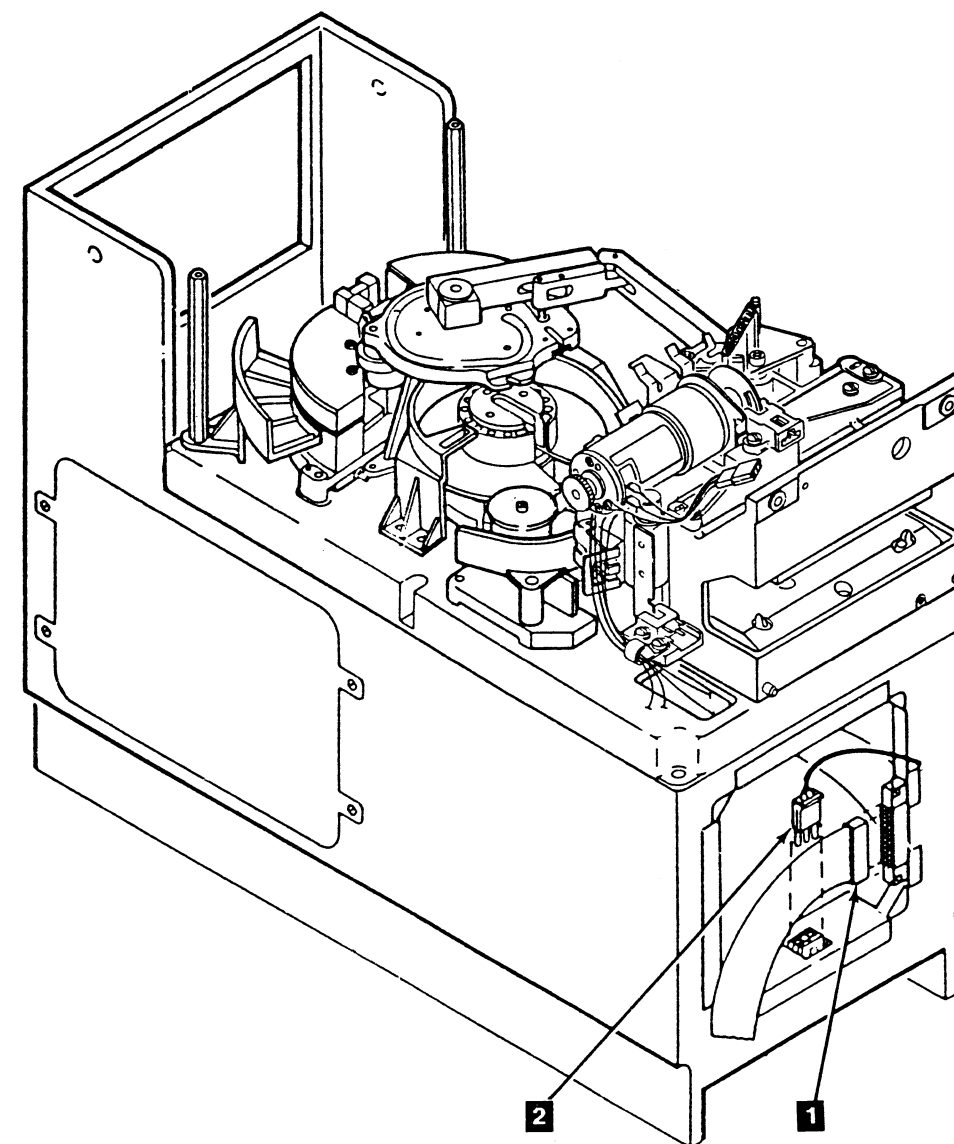
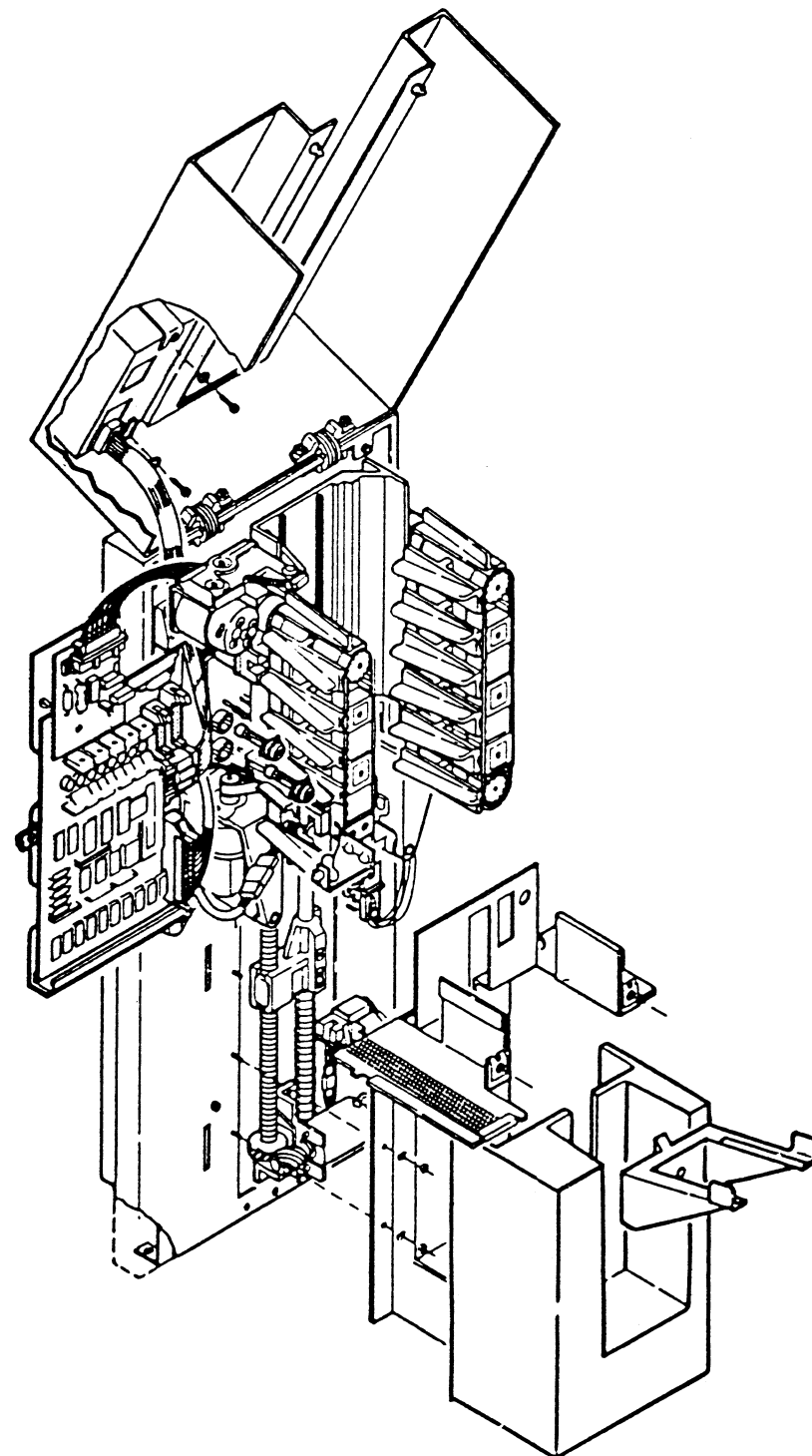
Note: This FRU can be removed and replaced without affecting the other drive by removing power from the failing drive with the Drive Power On/Off switch.

Removing the Loader Cables

1. Go to CARR 2850 and perform the Removal procedure of the loader mechanical assembly.
2. If you are here to remove the power cable, go to step 3. Remove the lower end of the loader signal cable **1** TU-D0/1-P1-P1. End of the removal.
3. Remove the lower end of the loader power cable **2** TU-D0/1-P1-P6.

Replacing the Loader Cables

1. If you are here to install the loader power cable go to step 2. Install the drive end of the loader signal cable **1** TU-D0/1-P1-P1. Go to step 3.
2. Install the drive end of the loader power cable **2** TU-D0/1-P1-P6.
3. Go to CARR 2850 and perform the Replacement procedure for the loader mechanical assembly.



FRU288 and 299 Loader Fuse Removal and Replacement Procedure

Drive CARR-DR 2880

This page contains the steps needed to remove and replace either loader fuse; +24V dc or +5V dc.

Note: This FRU can be removed and replaced without affecting the other drive by removing power from the failing drive with the Drive Power On/Off switch.

Removing the Loader Fuse

1. Go to CARR-DR 8 for the procedure to **power off** the drive.
2. Open the drive drawer.
3. Unlock the two quarter-turn fasteners **1** at the bottom of the hinged part of the front cover.

4. Raise the front cover.

The top part of the front cover is hinged.

5. Unlock the quarter-turn fastener **2** at the front of the control card gate and swing out the gate.
6. Locate the fuse to be exchanged **3**.
7. While pressing in on the fuse holder cap rotate it one quarter-turn to the left and remove the defective fuse from the holder **3**.

Note: Observe the fuse value.

Replacing the Loader Fuse

Note: Make sure you have the correct fuse to install.

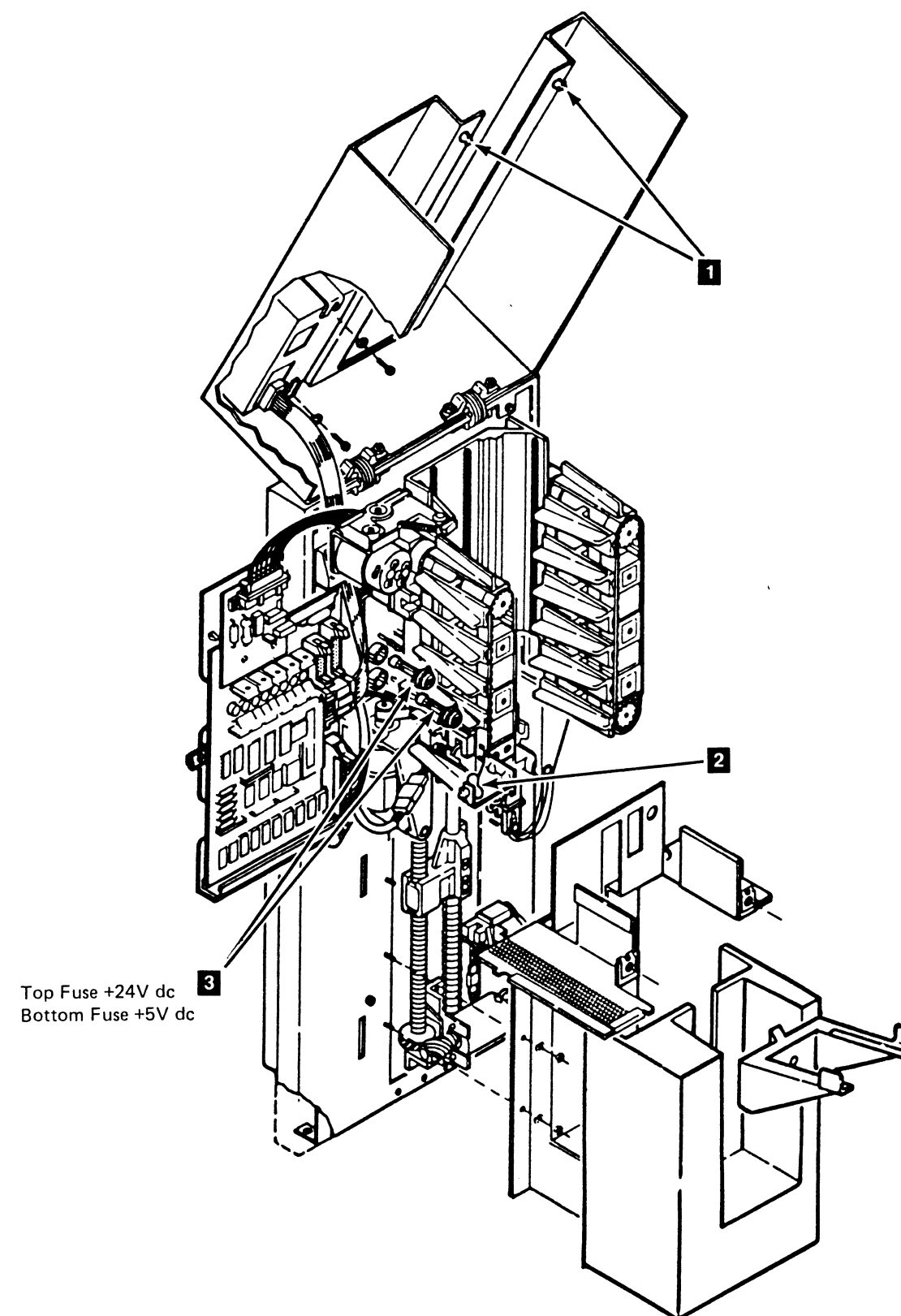
1. Install the correct fuse into the fuse holder **3**.
2. Press in on the cap and rotate it one quarter-turn to the right.
3. Close the control card gate and lock the quarter-turn fastener **2**.

Make sure no cables are binding or pinching.

4. Lower the front cover and lock the two quarter-turn fasteners **1**.

Make sure there are no cables outside the cover and that none are being pinched.

5. Close the drive drawer.
6. Go to CARR-DR 8 for the procedure to **power on** the drive.



FRU289 Stack Low Position Sensor Removal and Replacement Procedure

Drive CARR-DR 2890

This page contains the steps needed to remove and replace the stack low position sensor.

Note: This FRU can be removed and replaced without affecting the other drive by removing power from the failing drive with the Drive Power On/Off switch.

Removing the Stack Low Position Sensor

1. Go to CARR-DR 8 for the procedure to **power off** the drive.
2. Open the drive drawer.
3. Unlock the two quarter-turn fasteners **1** at the bottom of the hinged part of the of the front cover.
4. Raise the front cover.

The top part of the front cover is hinged.

5. Remove the front tray **3** by removing the two screws.

Note: Be sure you do not lose the screws and washers.

6. Remove the lower decorative cover **4** by pushing in on the sides and pulling straight out. It is held by tabs only.
7. Remove the output stack assembly cover holding nuts, washers, and springs **6** and remove the output stack assembly cover **5**. Note the location of the two springs for replacement.
8. Disconnect the output stack low position sensor connector H **2**; pull out the sensor **7** and discard.

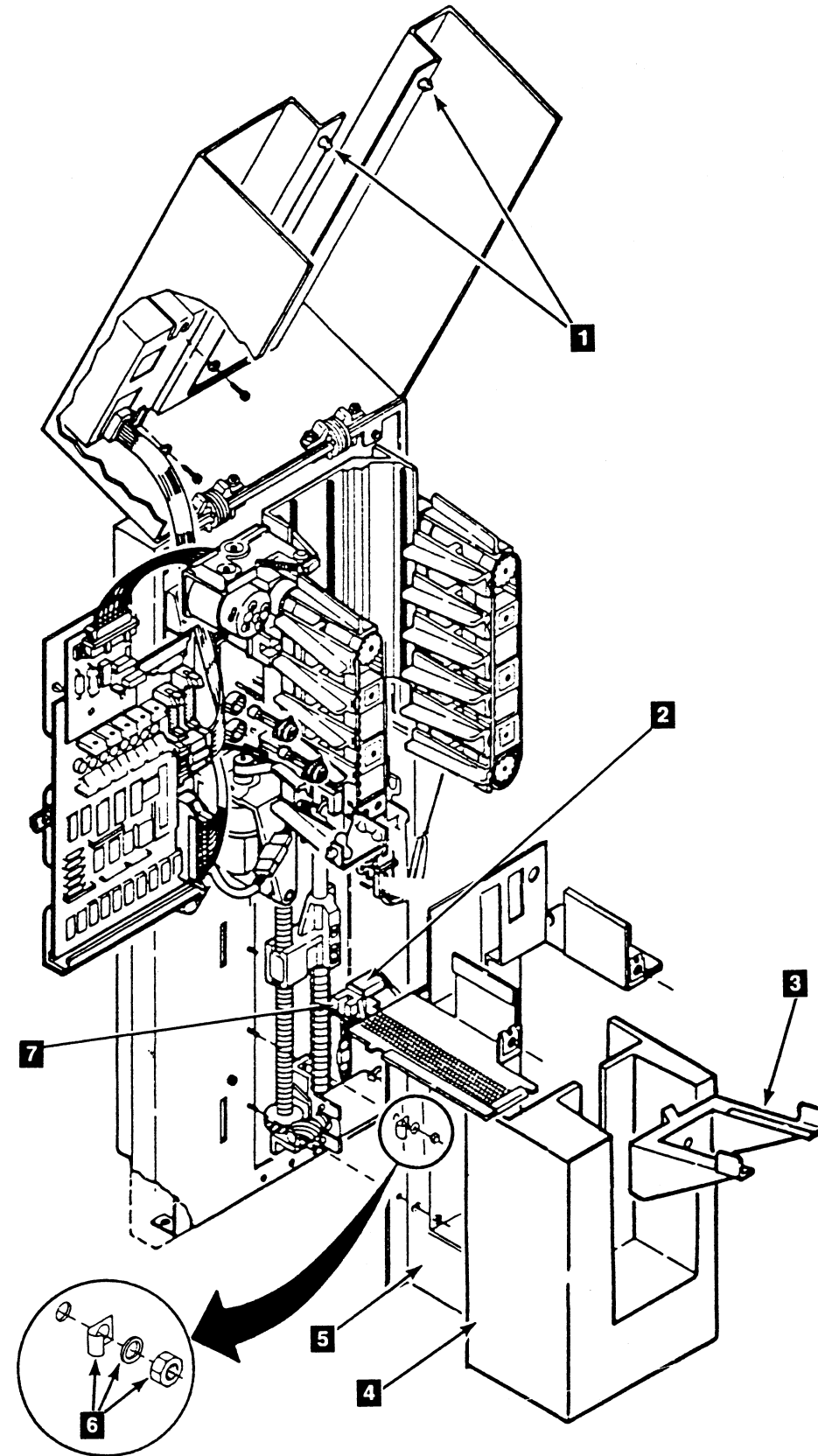
Note: A gentle rocking motion while pulling on the sensor assembly will release the split sensor posts from the metal casting.

Replacing the Stack Low Position Sensor

1. Install the new sensor **7** and connect the sensor cable H **2**.
2. Install the output stack assembly cover **5** using the nuts, washers, and springs **6** removed earlier.

Note: Make sure when you install the two springs that the curve of the spring faces toward the decorative cover.

3. Install the lower decorative cover **4** by inserting the cover tabs in their respective slots and pushing on the cover.
4. Install the front tray **3**.
5. Lower the front cover, being careful no cables are pinched, and lock the two quarter-turn fasteners **1**.
6. Close the drive drawer.
7. Go to CARR-DR 8 for the procedure to **power on** the drive.



This page contains the steps needed to remove and replace the stack low position sensor.

Note: This FRU can be removed and replaced without affecting the other drive by removing power from the failing drive with the Drive Power On/Off switch.

Removing the Stack Low Position Sensor

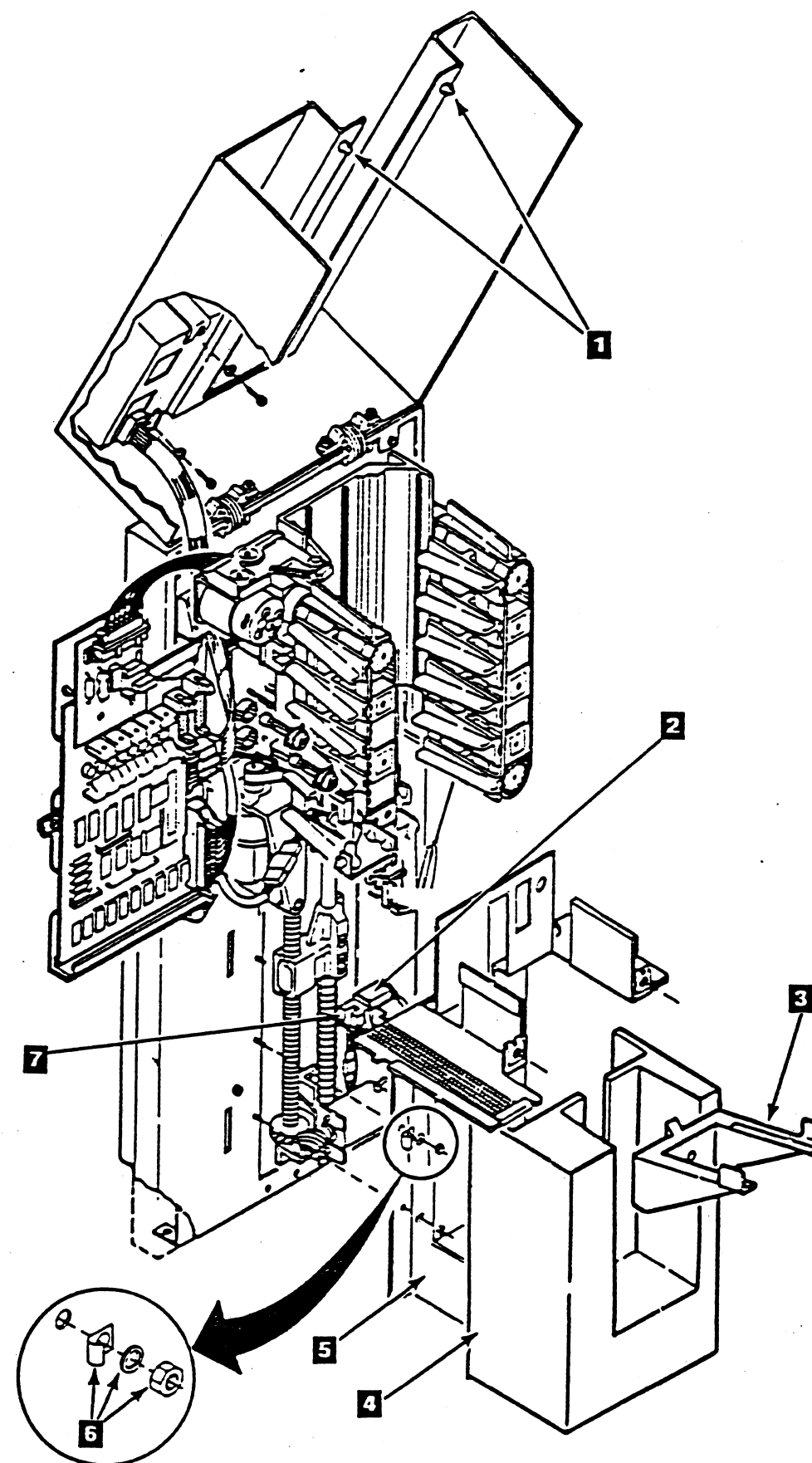
1. Go to CARR-DR 8 for the procedure to *power off* the drive.
2. Open the drive drawer.
3. Unlock the two quarter-turn fasteners **1** at the bottom of the hinged part of the front cover.
4. Raise the front cover.
The top part of the front cover is hinged.
5. Remove the front tray **3** by removing the two screws.
Note: Be sure you do not lose the screws and washers.
6. Remove the lower decorative cover **4** by pushing in on the sides and pulling straight out. It is held by tabs only.
7. Remove the output stack assembly cover holding nuts, washers, and springs **6** and remove the output stack assembly cover **5**. Note the location of the two springs for replacement.
8. Disconnect the output stack low position sensor connector H **2**; pull out the sensor **7** and discard.

Note: Washers and/or springs **6** may not be present.

Note: A gentle rocking motion while pulling on the sensor assembly will release the split sensor posts from the metal casting.

Replacing the Stack Low Position Sensor

1. Install the new sensor **7** and connect the sensor cable H **2**.
2. Install the output stack assembly cover **5** using the nuts, washers, and springs **6** removed earlier.
Note: Make sure when you install the two springs that the curve of the spring faces toward the decorative cover.
3. Install the lower decorative cover **4** by inserting the cover tabs in their respective slots and pushing on the cover.
4. Install the front tray **3**.
5. Lower the front cover, being careful no cables are pinched, and lock the two quarter-turn fasteners **1**.
6. Close the drive drawer.
7. Go to CARR-DR 8 for the procedure to *power on* the drive.



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FRU290 Input Stack Assembly Removal and Replacement Procedure

Drive CARR-DR 2900

This page contains the steps needed to remove and replace the input stack assembly.

Note: This FRU can be removed and replaced without affecting the other drive by removing power from the failing drive with the Drive Power On/Off switch.

Removing the Input Stack Assembly

1. Go to CARR-DR 8 for the procedure to **power off** the drive.
2. Open the drive drawer.
3. Unlock the two quarter-turn fasteners **1** at the bottom of the hinged part of the front cover.
4. Raise the front cover.

The top part of the front cover is hinged.
5. Unlock the quarter-turn fastener **5** at the front of the loader control card gate and swing out the gate.
6. Disconnect the cartridge staged sensor cable K **7** from the sensor.
7. Disconnect the input complete sensor jumper cable J **4** from the sensor.
8. Disconnect the cartridge in stack sensor cable C **3** from the sensor.
9. Disconnect the input drive motor cable Q **2**.

CAUTION

Make sure you have a strong grip on the input stack assembly before removing the screw.

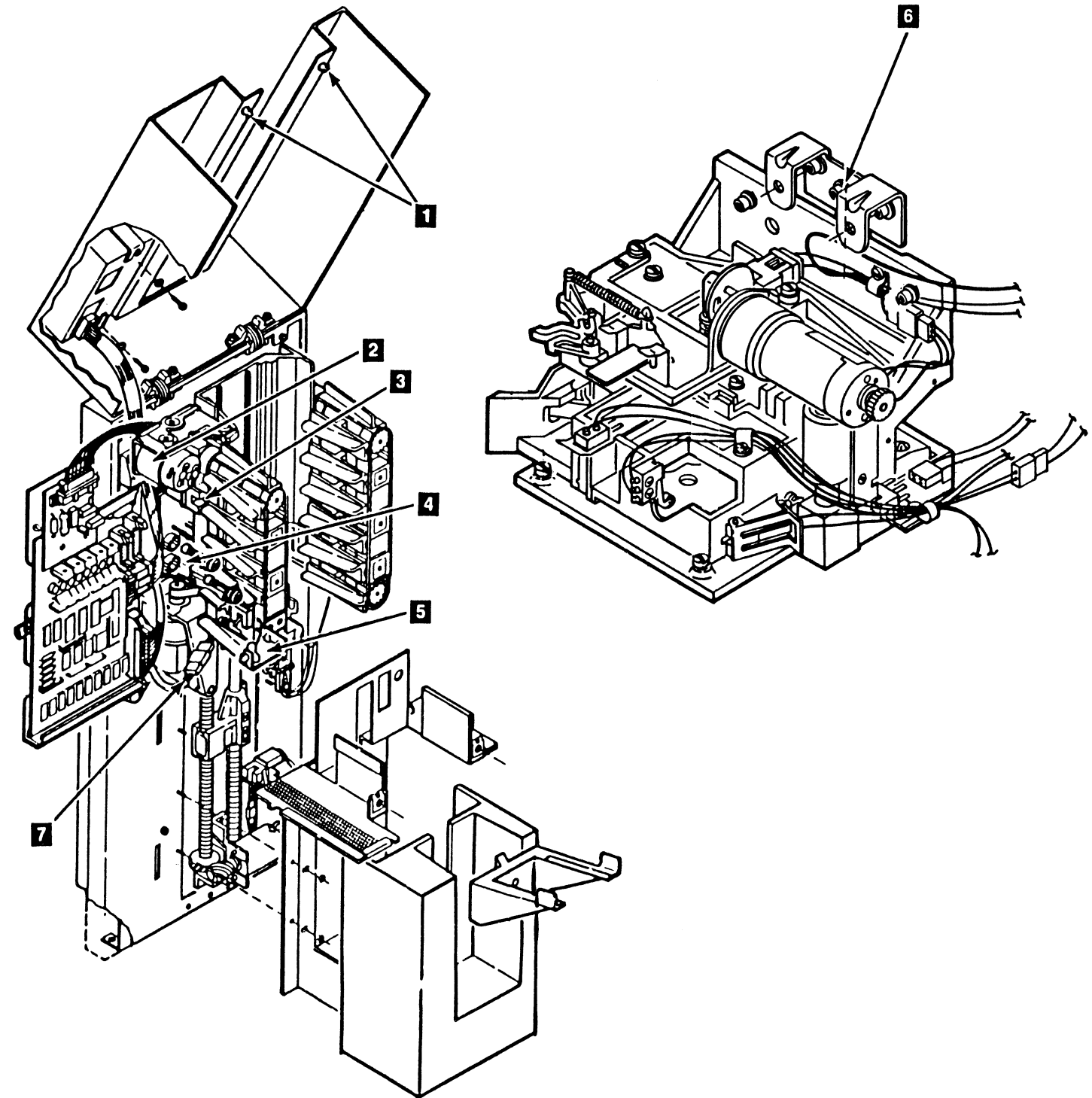
10. Remove the one holding screw **6** from the input stack assembly. Remove the input stack assembly from its two locating pins.

Replacing the Input Stack Assembly

1. Place the Input stack assembly on its two locating pins, and while holding the assembly with one hand install the one holding screw **6**.
2. Connect the cartridge staged sensor cable K **7** to sensor.
3. Connect the Input complete sensor cable J **4** to the sensor.
4. Connect the cartridge in stack sensor cable C **3** to the sensor.
5. Connect the input drive motor cable Q **2**.
6. Close the control card gate and lock the quarter-turn fastener **5**.

Make sure no cables are binding or pinching.
7. Lower the front cover and lock the two quarter-turn fasteners **1**.

Make sure there are no cables outside the cover and that none are being pinched.
8. Close the drive drawer.
9. Go to CARR-DR 8 for the procedure to **power on** the drive.



FRU291 Cartridge In Stack Sensor Removal and Replacement Procedure

Drive CARR-DR 2910

This page contains the steps needed to remove and replace the cartridge in stack sensor.

Note: This FRU can be removed and replaced without affecting the other drive by removing power from the failing drive with the Drive Power On/Off switch.

Removing the Cartridge In Stack Sensor

1. Go to CARR-DR 8 for the procedure to **power off** the drive.
2. Open the drive drawer.
3. Unlock the two quarter-turn fasteners **1** at the bottom of the hinged part of the front cover.
4. Raise the front cover.

The top part of the front cover is hinged.
5. Unlock the quarter-turn fastener **3** at the front of the control card gate and swing out the gate.
6. Remove one input sensor holding screw and remove the sensor **2** from its locating pin.
7. Disconnect the cartridge in stack sensor cable C **4**.

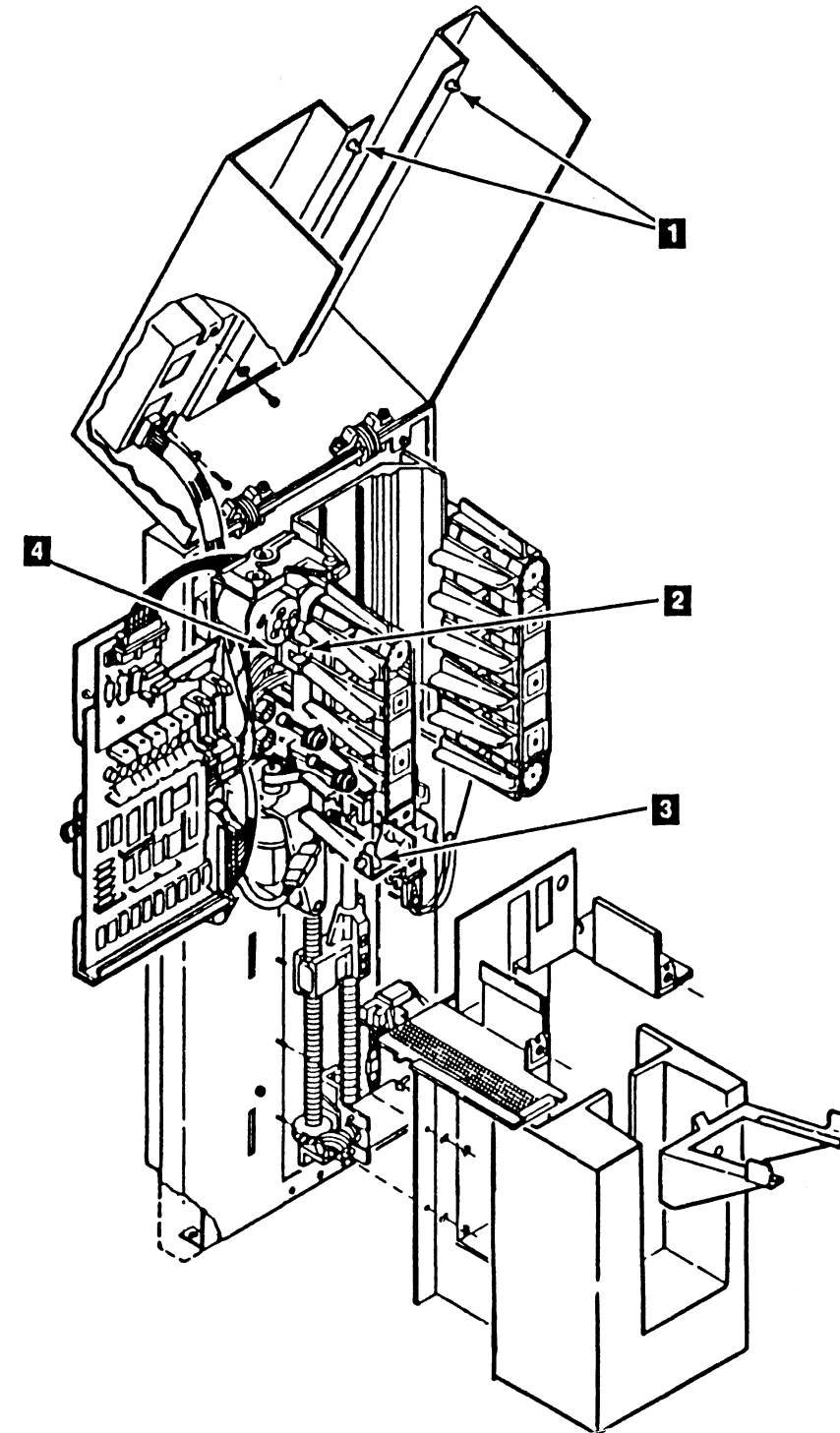
Replacing the Cartridge In Stack Sensor

1. Connect the sensor cable C **4** to the sensor.
2. Install the sensor **2** onto its locating pin. Use the screw and washer removed earlier to fasten the sensor.

Make sure no cables are binding or pinching.
3. Close the control card gate and lock the quarter-turn fastener **3**.

Make sure there are no cables outside the cover and that none are being pinched.
4. Lower the top part of the front cover and lock the two quarter-turn fasteners **1**.

Make sure there are no cables outside the cover and that none are being pinched.
5. Close the drive drawer.
6. Go to CARR-DR 8 for the procedure to **power on** the drive.



FRU292 Cartridge Staged Sensor Removal and Replacement Procedure

This page contains the steps needed to remove and replace the cartridge staged sensor **4**.

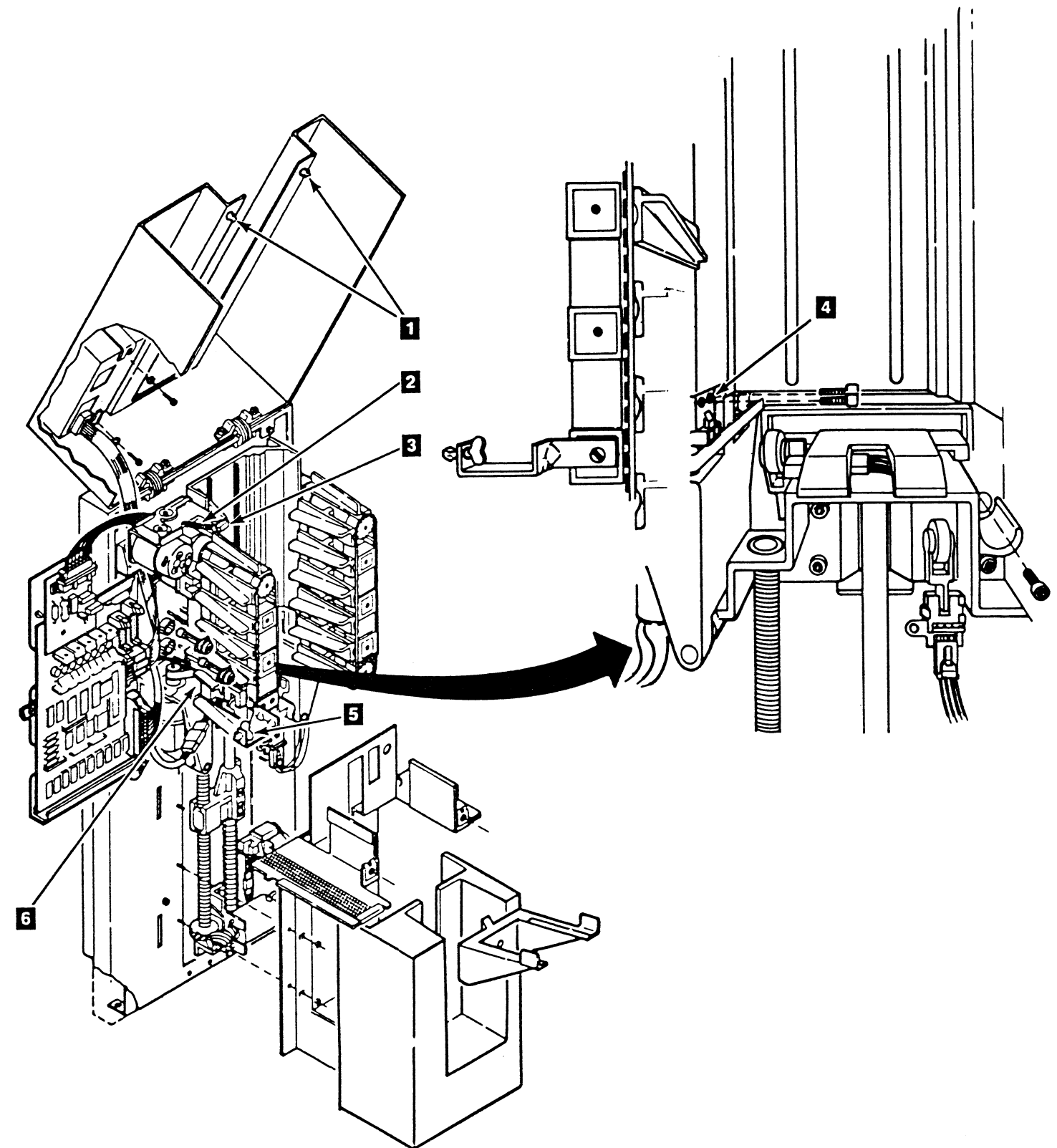
Note: This FRU can be removed and replaced without affecting the other drive by removing power from the failing drive with the Drive Power On/Off switch.

Removing the Cartridge Staged Sensor

1. Go to CARR-DR 8 for the procedure to **power off** the drive.
2. Open the drive drawer.
3. Unlock the two quarter-turn fasteners **1** at the bottom of the hinged part of the front cover.
4. Raise the front cover.
The top part of front cover is hinged.
5. Unlock the quarter-turn fastener **5** at the front of the loader control card gate and swing out the gate.
6. Remove the spring **2** from the arm at the top of the switch actuator **3**. Leave it attached to the casting at the other end.
7. While holding the switch actuator with one hand, remove the two alien screws **4** from the bearing block at the bottom of the switch actuator.
8. Remove the bearing block, cartridge staged sensor, and switch actuator.
9. Disconnect the cartridge staged sensor cable from the sensor **6** cable connector K.
10. Remove the cartridge staged sensor **6** from the bearing block by removing the screw.

Replacing the Cartridge Staged Sensor

1. Place the new sensor so the yellow wire of the sensor is toward the front of the machine when the sensor is installed.
2. Install the new sensor on the bearing block with the screw removed earlier.
3. Install the switch actuator **3** by inserting the top pivot into the bushing on the casting.
4. While holding the switch actuator **3** with one hand, install the bearing block and sensor **6** using the alien screws **4** removed earlier.
5. Attach the switch actuator spring **2** to the switch actuator arm.
6. If the actuator arm binds, loosen the screw **4** and adjust the pivot.
7. Connect the sensor cable K to the sensor **6**.
8. Close the control card gate and lock the quarter-turn fastener **5**.
Make sure no cables are binding or pinching.
9. Lower the front cover, being careful no cables are pinched, and lock the two quarter-turn fasteners **1**.
10. Close the drive drawer.
11. Go to CARR-DR 8 for the procedure to **power on** the drive.



Drive **CARR-DR 2920**

FRU293 Left Input Rail Assembly Removal and Replacement Procedure

This page contains the steps needed to remove and replace the left input rail assembly.

Note: This FRU can be removed and replaced without affecting the other drive by removing power from the failing drive with the Drive Power On/Off switch.

Removing the Left Input Rail Assembly

1. Go to CARR-DR 2900 and perform the Removal procedure for the input stack assembly, and when completed return to step 4.
2. Remove the three holding screws and washers **4** from the back of the left input rail assembly **2**.
3. Grasp the rail assembly and pull straight out. The left input rail coupling and the stack coupling **1** slide apart.

Replacing the Left Rail Input Rail Assembly

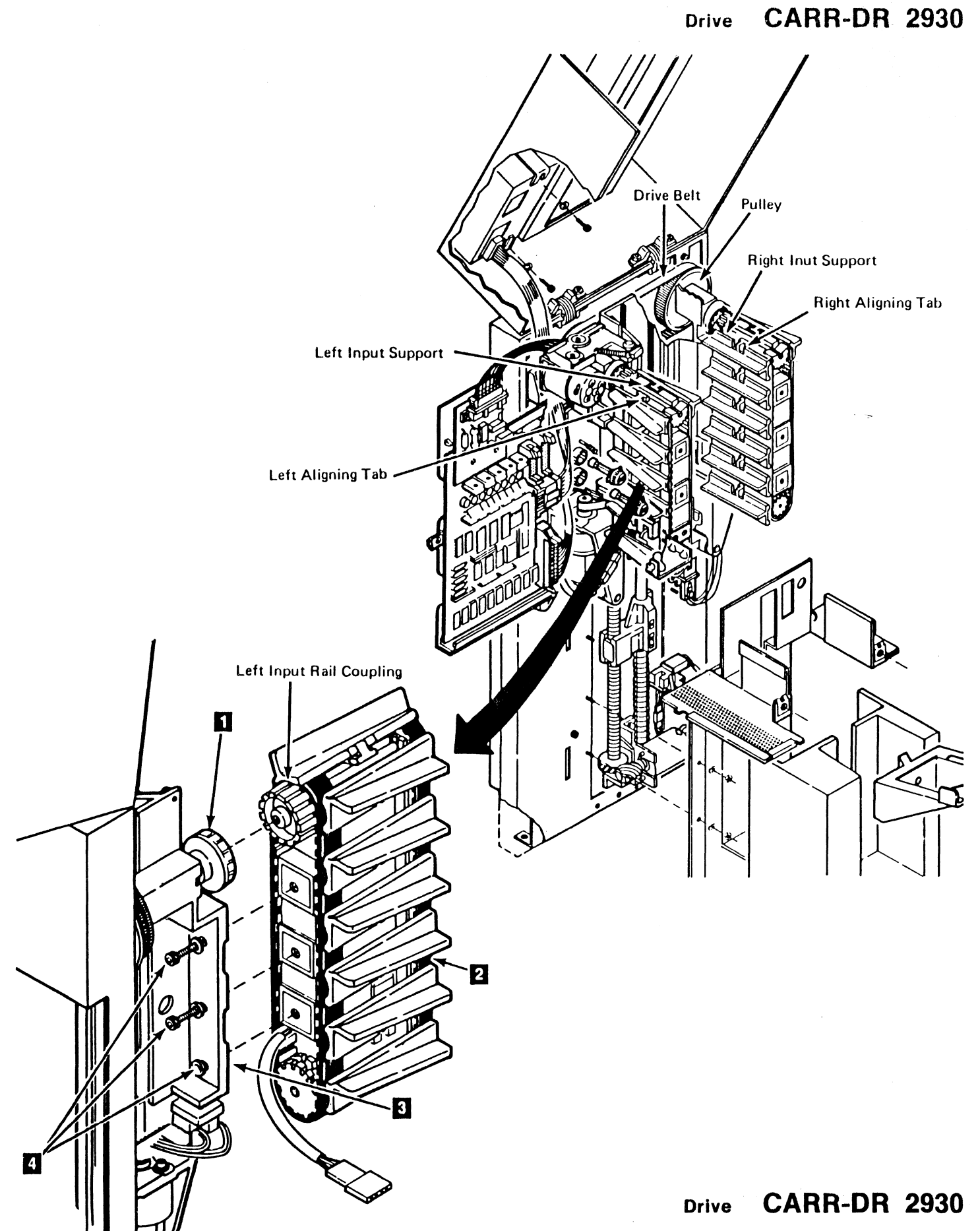
1. Place the left rail coupling into the input stack coupling **1** (it slides in with the bottom of the left input rail assembly angled to the left).
2. Swing the bottom part of the input rail assembly to the right until it is stopped by the stop pin **3**.
3. Install the three holding screws and washers **4** in the back of the left input rail assembly **2** and tighten.
4. Align the left and right input supports so they are at the same height. The aligning tab in the center of the top inside input support should be even with the top of the guide on both sides.

To align them, slip the drive belt off the pulley behind the right input rail and rotate the pulley until both tabs are lined up within 1 mm (0.04 in.). Slide the belt back onto the pulley, being careful not to change the alignment.
5. Go to CARR-DR 2900 and perform the Replacement procedure for the input stack assembly, and when completed return to step 6.

Aligning the Left and Right Rails

1. Align the left and right input supports so they are at the same height. The aligning tab in the center of the top inside support should be even with the top of the guide on both sides.

To align these, slip the drive belt off the pulley (behind the right input rail) and turn the pulley until both tabs are lined up within 1 mm (0.04 in.). Slide the belt back onto the pulley, being careful not to change the alignment.
2. Return to the procedure that sent you here. If you were sent here by the MD, return to the MD and press the Enter key.



Drive CARR-DR 2930

FRU294 Right Input Rail Assembly Removal and Replacement Procedure

This page contains the steps needed to remove and replace the right input rail assembly.

Note: This FRU can be removed and replaced without affecting the other drive by removing power from the failing drive with the Drive Power On/Off switch.

Removing the Right Input Rail Assembly

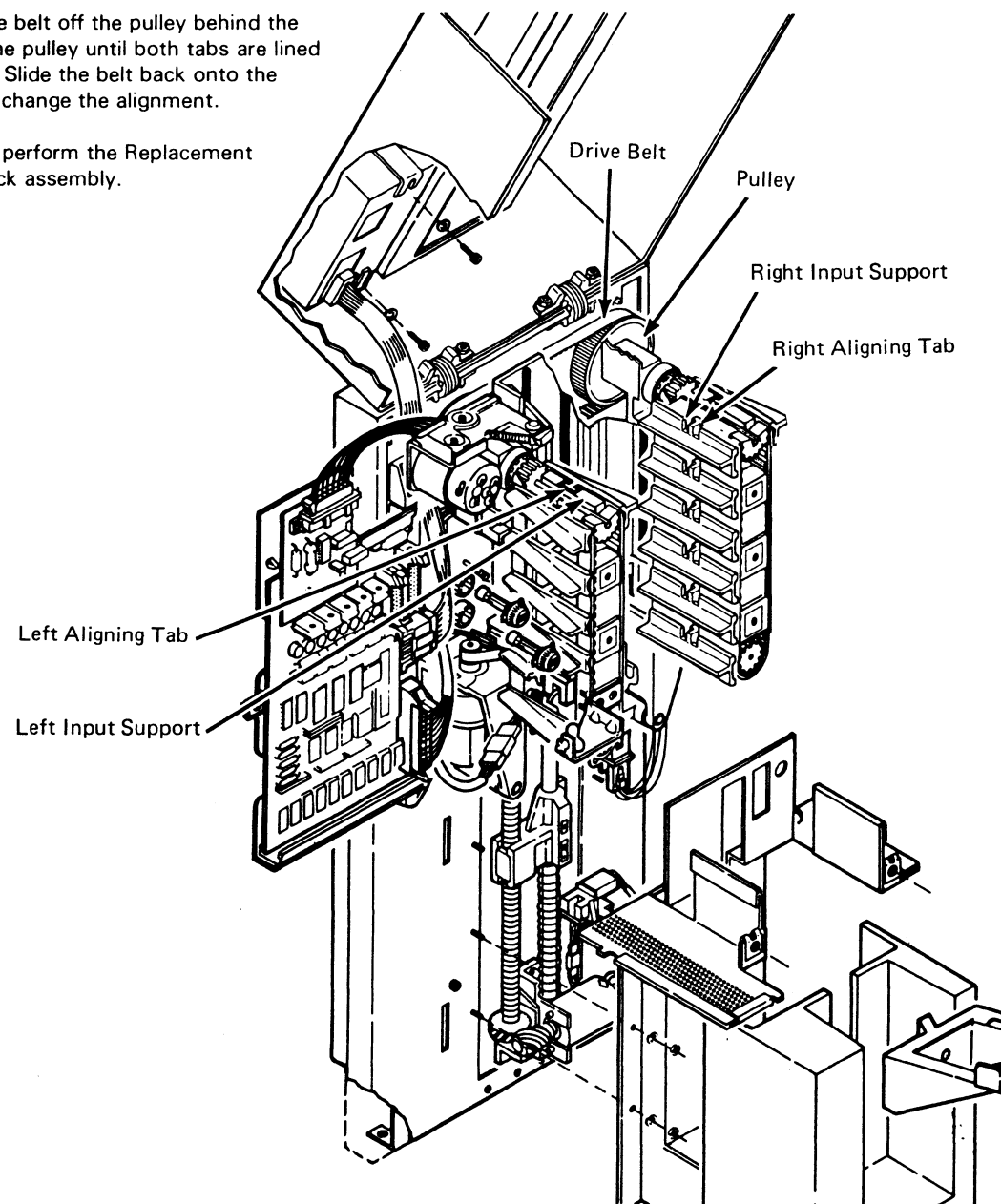
1. Go to CARR-DR 2900 and perform the Removal procedure for the input stack assembly, and when completed return to step 4.
2. Remove the three holding screws and washers **2** from the back of the right input rail assembly **4**.
3. Grasp the rail assembly and pull straight out. The right input rail coupling and the stack coupling **1** slide apart.

Replacing the Right Rail Input Rail Assembly

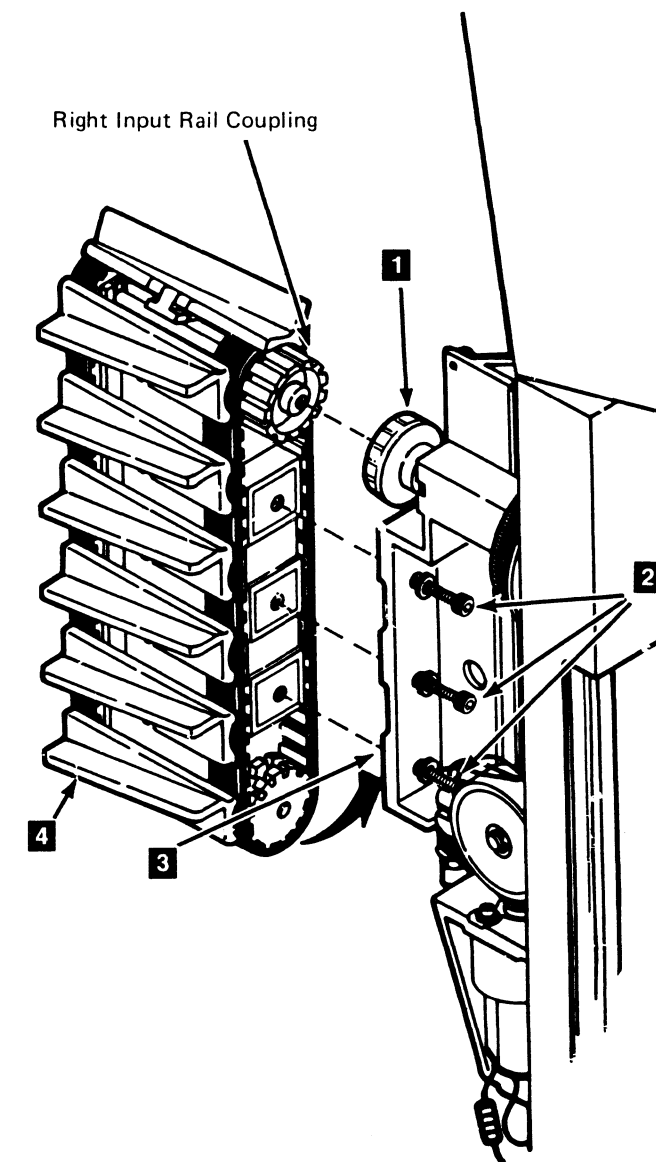
1. Place the right rail coupling into the input stack coupling **1** (it slides in with the bottom of the left input rail assembly angled to the right).
2. Swing the bottom part of the input rail assembly to the left until it is stopped by the stop pin **3**.
3. Install the three holding screws and washers **2** in the back of the right input rail assembly **4** and tighten.
4. Align the left and right input supports so they are at the same height. The aligning tab in the center of the top inside input support should be even with the top of the guide on both sides.

To align them, slip the drive belt off the pulley behind the right input rail and rotate the pulley until both tabs are lined up within 1 mm (0.04 in.). Slide the belt back onto the pulley, being careful not to change the alignment.

5. Go to CARR-DR 2900 and perform the Replacement procedure for the input stack assembly.



Drive CARR-DR 2940



FRU295 Feed Assembly Removal and Replacement Procedure

Drive CARR-DR 2950

This page contains the steps needed to remove and replace the feed assembly.

Note: This FRU can be removed and replaced without affecting the other drive by removing power from the failing drive with the Drive Power On/Off switch.

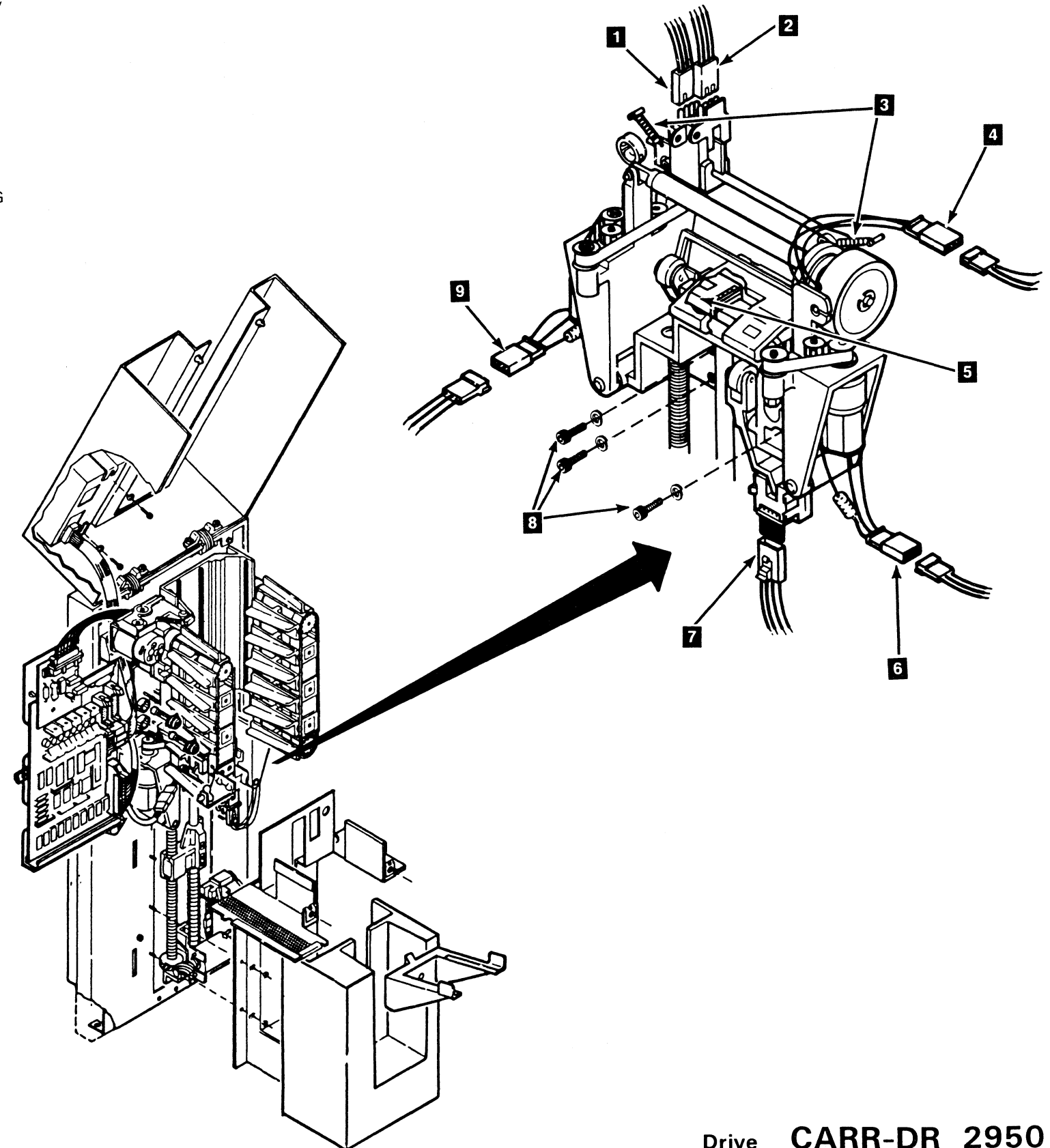
Removing the Feed Assembly

1. Go to CARR-DR 2900 and perform the Removal procedure for the input stack assembly, and when completed return to step 2.
2. Go to CARR-DR 2970 and perform the Removal procedure for the output stack assembly, and when completed return to step 3.
3. Disconnect the track feed sensor connector D **1**.
4. Disconnect the track closed sensor connector E **2**.
5. Disconnect the left L **9** and the right N **6** cartridge feed motor connectors.
6. Disconnect the feed solenoid connector M **4**.
7. Disconnect the stack up position sensor connector G **7**.
8. Disconnect the left and right solenoid springs **3** at the pins.
9. Remove the three feed assembly holding screws **8**. Carefully remove the feed assembly from the front and disconnect the extract complete sensor connector F **5**.

Replacing the Feed Assembly

1. When installing a new feed assembly, ensure that the left and right solenoid springs **3** from the old feed assembly have been installed on the new feed assembly.
2. Connect the extract complete sensor connector F **5**.
3. Install the feed assembly from the front using the three holding screws **8** removed earlier.
4. Connect the left and right solenoid springs **3**.
5. Connect the output stack up position sensor connector G **7**.
6. Connect the feed solenoid connector M **4**.
7. Connect the left L **9** and the right N **6** cartridge feed motor connectors.
8. Connect the track closed sensor connector E **2**.
9. Connect the track feed sensor connector D **1**.
10. Go to CARR-DR 2970 and perform the Replacement procedure for the output stack assembly, and when completed return to step 10.
11. Go to CARR-DR 2900 and perform the Replacement procedure for the input stack assembly.

Note: Do not power up or close the drive drawer as instructed until the following step has been performed.



This page contains the steps needed to remove and replace the output stack sensor.

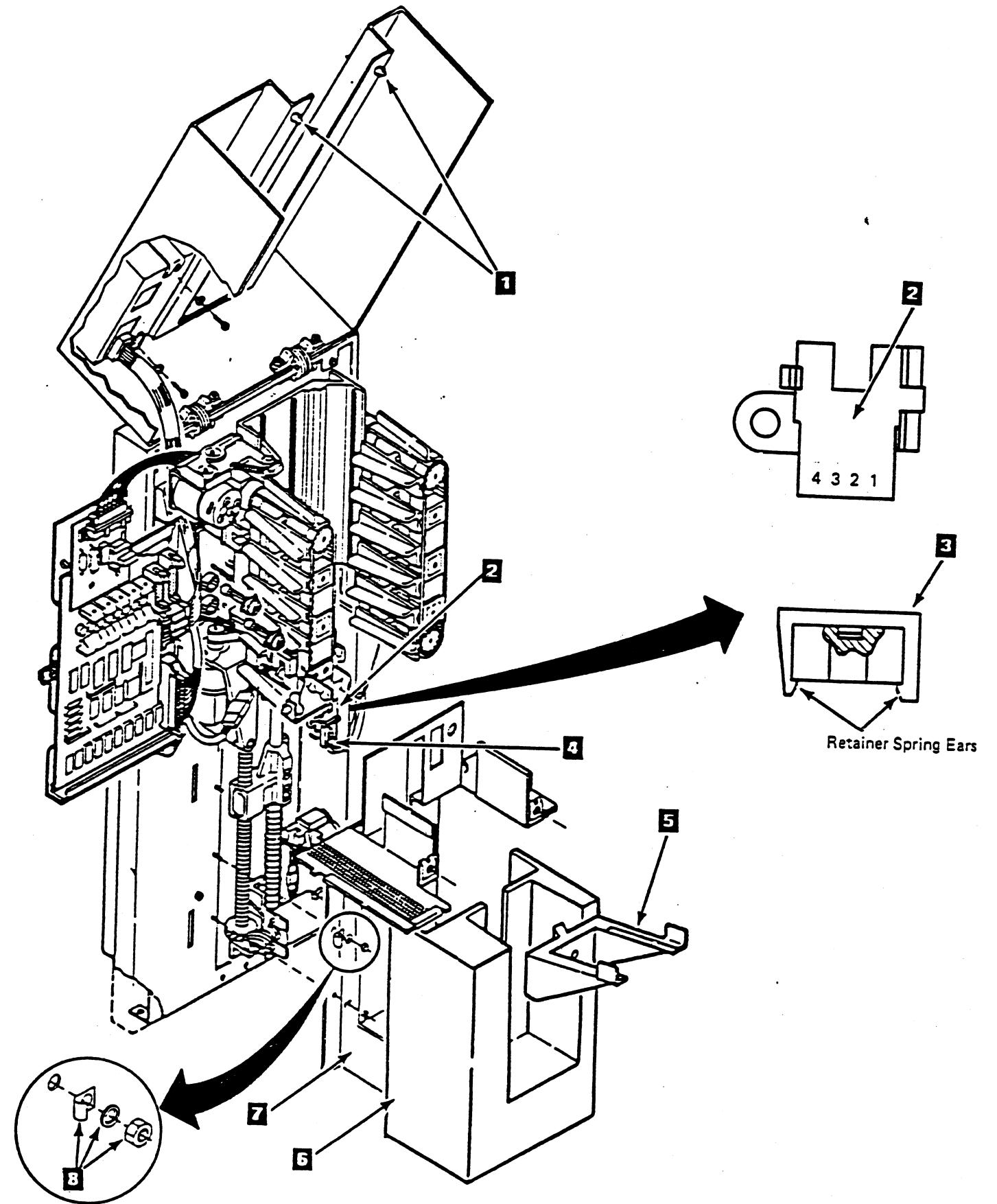
Note: This FRU can be removed and replaced without affecting the other drive by removing power from the failing drive with the Drive Power On/Off switch.

Removing the Stack Up Position Sensor

1. Go to CARR-DR 8 for the procedure to *power off* the drive.
2. Unlock the two quarter-turn fasteners **1** at the bottom of the hinged part of the front cover.
3. Raise the front cover.
The top part of the front cover is hinged.
4. Remove the front tray **5** by removing the two screws.
Note: Be sure you do not lose the screws and washers.
5. Remove the lower decorative cover **6** by pushing in on the sides and pulling straight out. It is held by tabs only.
6. Remove the output stack assembly cover holding nuts, washers, and springs **8** and remove the output stack assembly cover **7**. Note the location of the two springs for replacement.
Note: Washers and/or springs **8** may not be present.
7. Remove the stack up position sensor by springing open the retainer ears on each side of the holder **3** and lifting out the sensor **2**.
Do not remove the lock star washers that holds the sensor holder.
8. Disconnect the stack up position sensor cable G **4**.

Replacing the Output Stack Sensor

1. Install the new stack up position sensor **2** into the sensor holder **3** and connect the sensor cable G **4**.
2. Install the output stack assembly cover **7** using the nuts, washers, and springs **8** removed earlier.
Note: Make sure when you install the two springs that the curve of the spring faces toward the decorative cover.
3. Install the lower decorative cover **6** by inserting the cover tabs in their respective slots and pushing the cover on.
4. Install the front tray **5**.
5. Lower the top part of the front cover and lock the two quarter-turn fasteners **1**.
Make sure there are no cables outside the cover and that none are being pinched.
6. Go to CARR-DR 8 for the procedure to *power on* the drive.



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FRU296 Output Stack Up Position Sensor Removal and Replacement Procedure

Drive CARR-DR 2960

This page contains the steps needed to remove and replace the output stack sensor.

Note: This FRU can be removed and replaced without affecting the other drive by removing power from the failing drive with the Drive Power On/Off switch.

Removing the Stack Up Position Sensor

1. Go to CARR-DR 8 for the procedure to **power off** the drive.
2. Unlock the two quarter-turn fasteners **1** at the bottom of the hinged part of the front cover.

3. Raise the front cover.

The top part of the front cover is hinged.

4. Remove the front tray **5** by removing the two screws.

Note: Be sure you do not lose the screws and washers.

5. Remove the lower decorative cover **6** by pushing in on the sides and pulling straight out. It is held by tabs only.

6. Remove the output stack assembly cover holding nuts, washers, and springs **8** and remove the output stack assembly cover **7**. Note the location of the two springs for replacement.

7. Remove the stack up position sensor by springing open the retainer ears on each side of the holder **3** and lifting out the sensor **2**.

Do not remove the lock star washers that holds the sensor holder.

8. Disconnect the stack up position sensor cable G **4**.

Replacing the Output Stack Sensor

1. Install the new stack up position sensor **2** into the sensor holder **3** and connect the sensor cable G **4**.
2. Install the output stack assembly cover **7** using the nuts, washers, and springs **8** removed earlier.

Note: Make sure when you install the two springs that the curve of the spring faces toward the decorative cover.

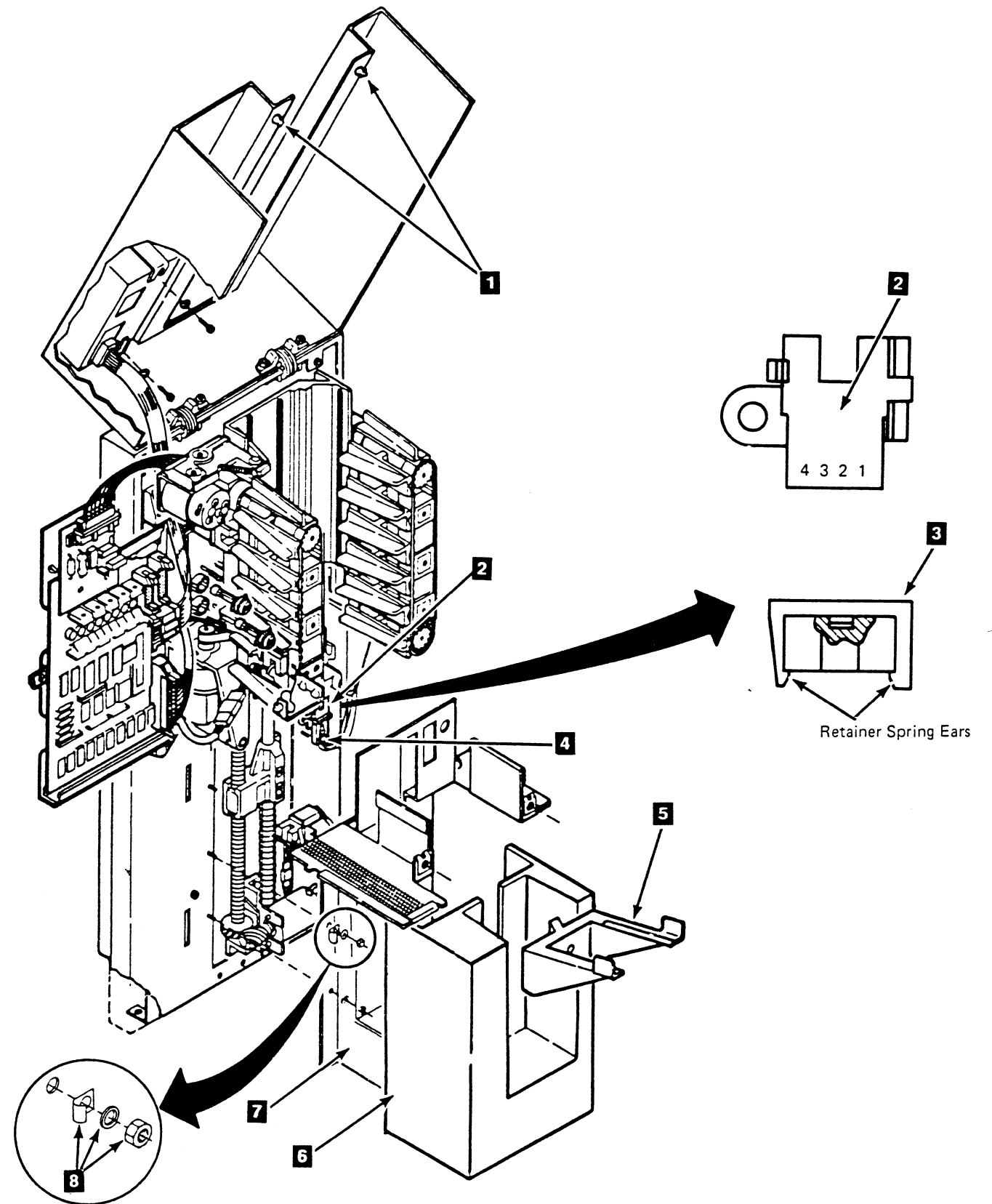
3. Install the lower decorative cover **6** by inserting the cover tabs in their respective slots and pushing the cover on.

4. Install the front tray **5**.

5. Lower the top part of the front cover and lock the two quarter-turn fasteners **1**.

Make sure there are no cables outside the cover and that none are being pinched.

6. Go to CARR-DR 8 for the procedure to **power on** the drive.



FRU297 Output Stack Assembly Removal and Replacement Procedure

This page contains the steps needed to remove and replace the output stack assembly.

Note: This FRU can be removed and replaced without affecting the other drive by removing power from the failing drive with the Drive Power On/Off switch.

Removing the Output Stack Assembly

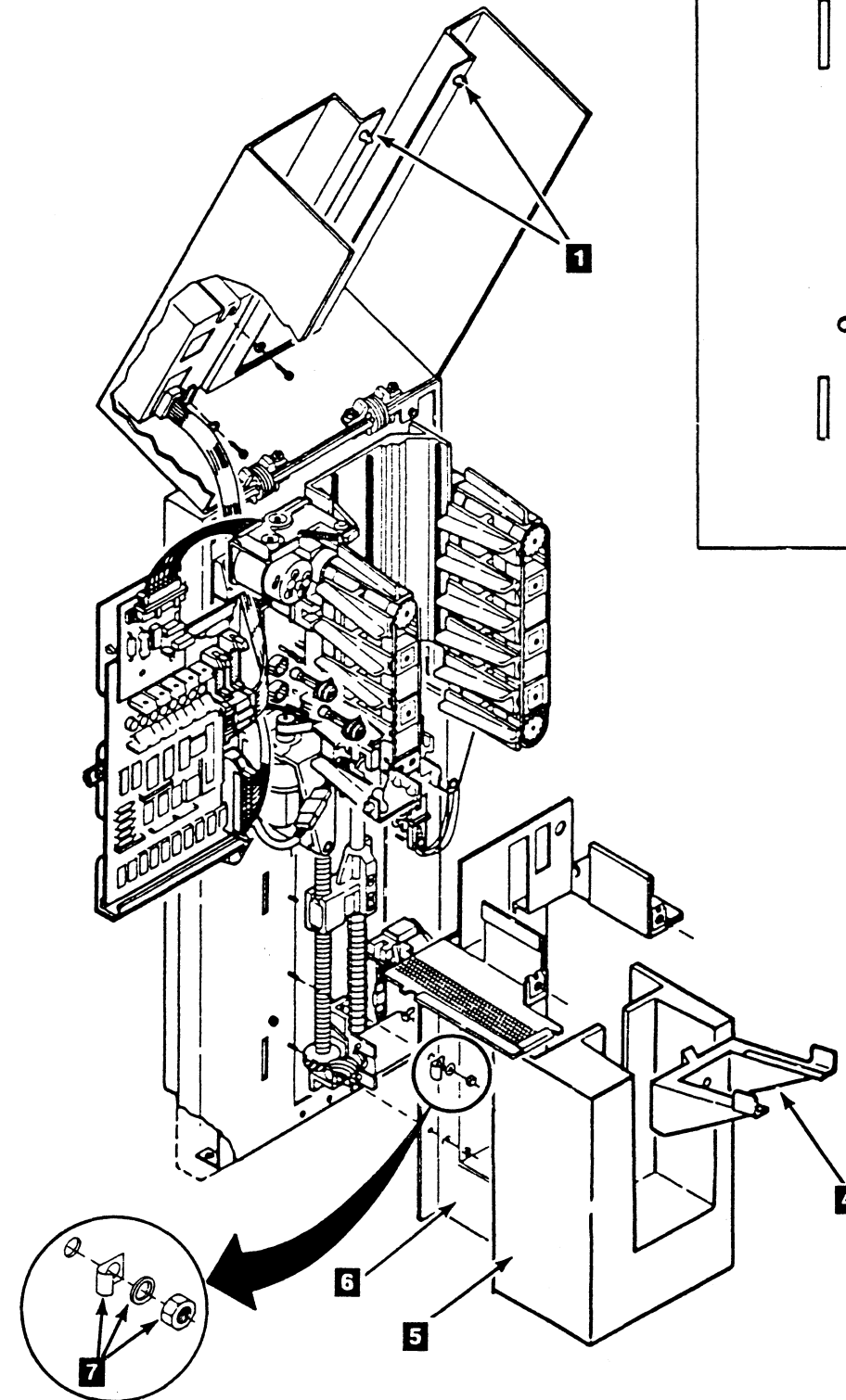
- Go to CARR-DR 8 for the procedure to **power off** the drive.
- Unlock the two quarter-turn fasteners **1** at the bottom of the hinged part of the front cover.
- Raise the front cover.
The top part of the front cover is hinged.
- Remove the front tray **4** by removing the two screws.
Note: Be sure you do not lose the screws and washers.
- Remove the lower decorative cover **5** by pushing in on the sides and pulling straight out. It is held by tabs only.
- Remove the output stack assembly cover holding nuts, washers, and springs **7** and remove the output stack assembly cover **6**. Note the position of the two springs.
- Disconnect the output stack assembly motor cable connector R **3**.
- Remove the three output stack assembly holding screws **2**.
Note: You should be able to remove the lower part of the assembly from the two locating pins using finger pressure.
- Once the lower part of the output stack assembly is away from the locating pins pull down on the output assembly. This removes the lead screw bearing and shaft from their respective cavities in the feed assembly.

The output stack assembly consists of:

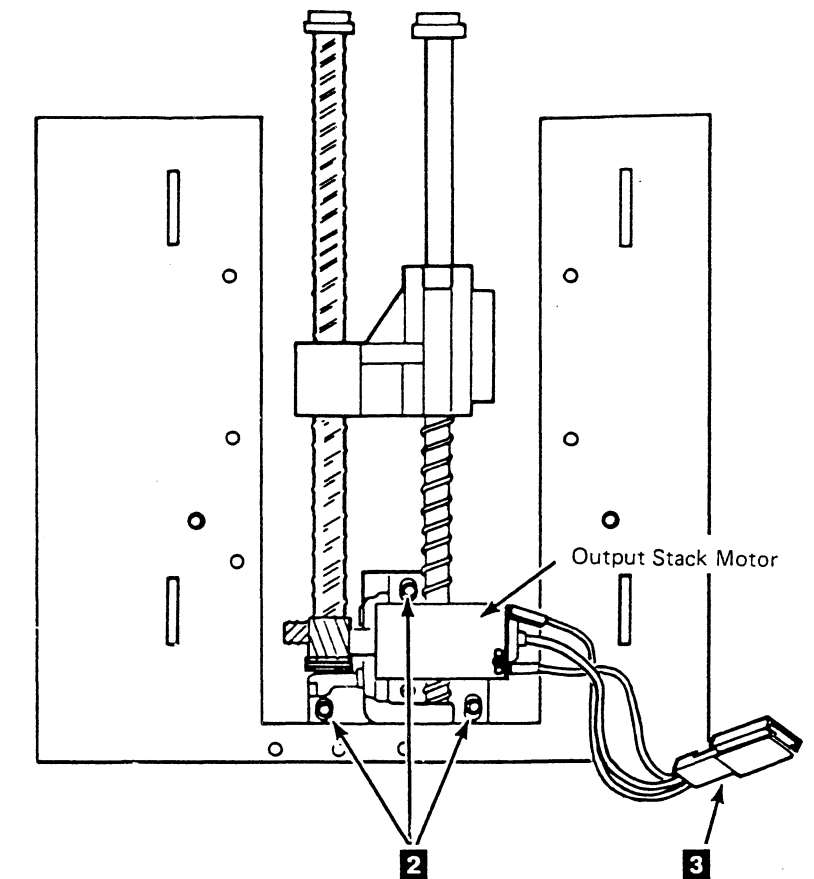
- The cartridge tray casting.
- The lead screw, bearing, and lead screw gear.
- The shaft and compression spring.
- The output stack motor.

Replacing the Output Stack Assembly

- Install the new output stack assembly by inserting the lead screw bearing and shaft into their respective cavities in the feed assembly and push upward. At the same time push in on the lower part of the assembly and place it on the locating pins.
Note: Make sure that the lead screw does not bind.
- To remove excess end play on the lead screw and shaft, push up on the output assembly while installing the three holding screw **2**.
Note: Make sure when you install the two springs that the curve of the spring faces toward the decorative cover.
- Connect the output stack assembly motor cable connector R **3**.
- Install the output stack assembly cover **6** using the nuts, washers, and two springs **7** removed earlier.
- Install the lower decorative cover **5** by inserting the cover tabs in their respective slots and pushing on the cover.
- Install the front tray **4** using the screws and washers removed earlier.
- Lower the top part of the front cover and lock the two quarter-turn fasteners **1**.
Note: Make sure there are no cables outside the cover and that none are being pinched.
- Go to CARR-DR 8 for the procedure to **power on** the drive.



Drive CARR-DR 2970



FRU297 Output Stack Assembly Removal and Replacement Procedure

This page contains the steps needed to remove and replace the output stack assembly.

Note: This FRU can be removed and replaced without affecting the other drive by removing power from the failing drive with the Drive Power On/Off switch.

Removing the Output Stack Assembly

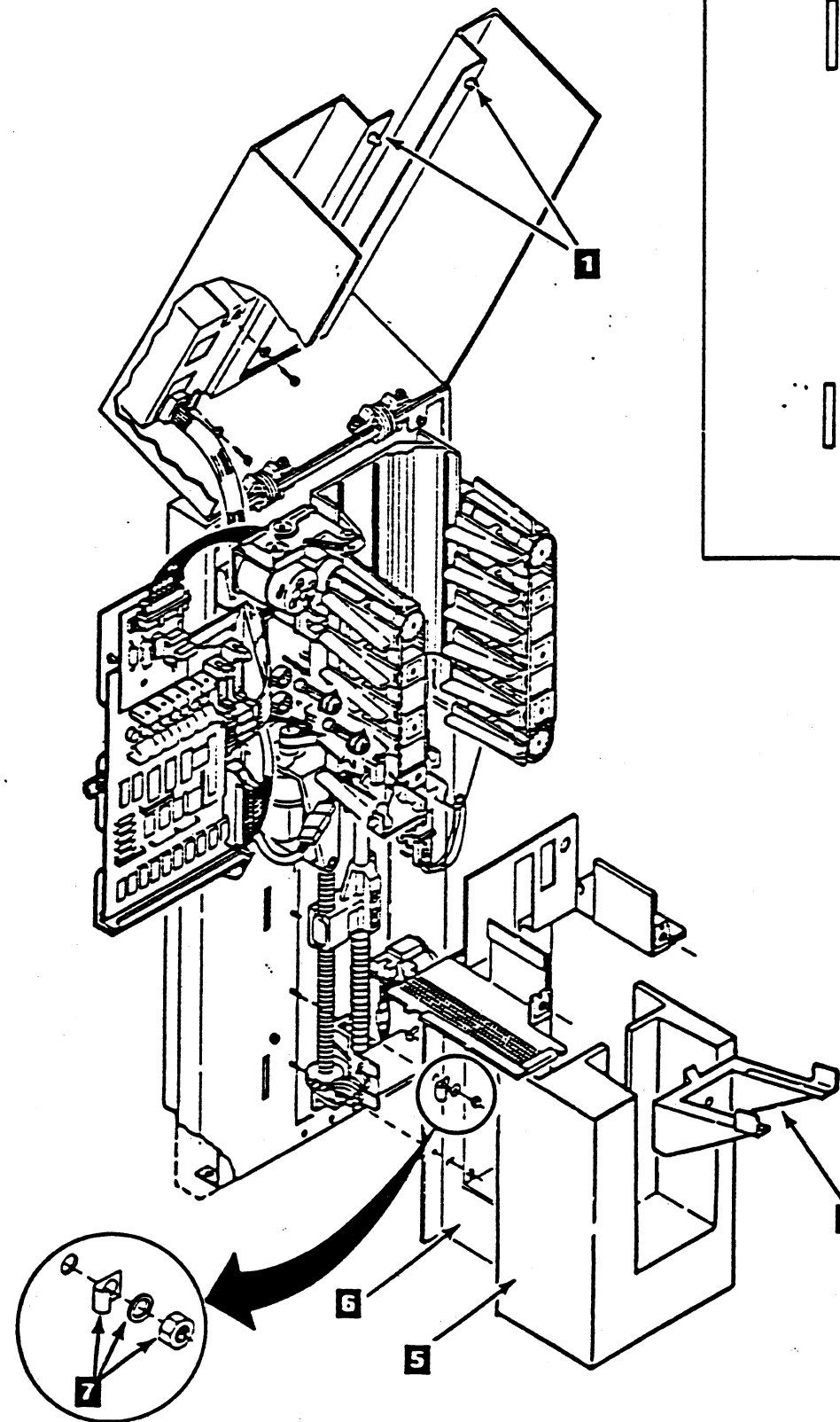
1. Go to CARR-DR 8 for the procedure to *power off* the drive.
2. Unlock the two quarter-turn fasteners **1** at the bottom of the hinged part of the of the front cover.
3. Raise the front cover.
The top part of the front cover is hinged.
4. Remove the front tray **4** by removing the two screws.
Note: Be sure you do not lose the screws and washers.
5. Remove the lower decorative cover **5** by pushing in on the sides and pulling straight out. It is held by tabs only.
6. Remove the output stack assembly cover holding nuts, washers, and springs **7** and remove the output stack assembly cover **6**. Note the position of the two springs.
Note: Washers and/or springs **7** may not be present.
7. Disconnect the output stack assembly motor cable connector R **3**.
8. Remove the three output stack assembly holding screws **2**.
Note: You should be able to remove the lower part of the assembly from the two locating pins using finger pressure.
9. Once the lower part of the output stack assembly is away from the locating pins pull down on the output assembly. This removes the lead screw bearing and shaft from their respective cavities in the feed assembly.

The output stack assembly consists of:

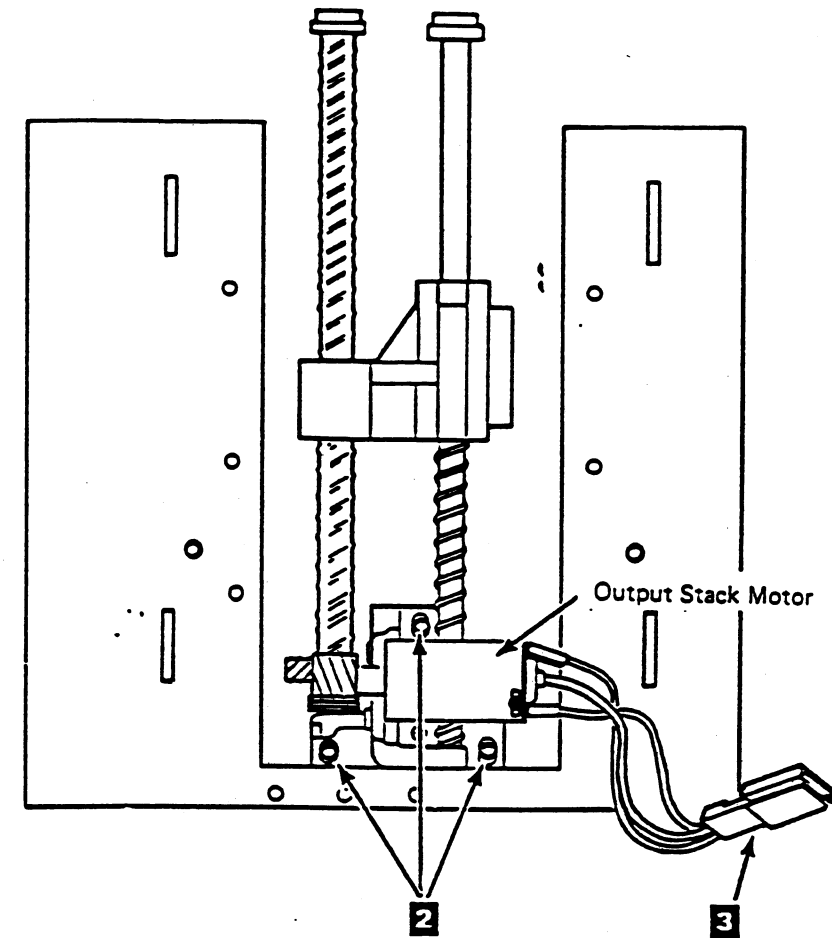
- The cartridge tray casting.
- The lead screw, bearing, and lead screw gear.
- The shaft and compression spring.
- The output stack motor.

Replacing the Output Stack Assembly

1. Install the new output stack assembly by inserting the lead screw bearing and shaft into their respective cavities in the feed assembly and push upward. At the same time push in on the lower part of the assembly and place it on the locating pins.
2. To remove excess end play on the lead screw and shaft, push up on the output assembly while installing the three holding screw **2**.
Note: Make sure that the lead screw does not bind.
3. Connect the output stack assembly motor cable connector R **3**.
4. Install the output stack assembly cover **6** using the nuts, washers, and two springs **7** removed earlier.
Note: Make sure when you install the two springs that the curve of the spring faces toward the decorative cover.
5. Install the lower decorative cover **5** by inserting the cover tabs in their respective slots and pushing on the cover.
6. Install the front tray **4** using the screws and washers removed earlier.
7. Lower the top part of the front cover and lock the two quarter-turn fasteners **1**.
Note: Make sure there are no cables outside the cover and that none are being pinched.
8. Go to CARR-DR 8 for the procedure to *power on* the drive.



Drive CARR-DR 2970



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FRU298 Loader Operator Panel Removal and Replacement Procedure

Drive CARR-DR 2980

This page contains the steps needed to remove and replace the loader operator panel.

Note: This FRU can be removed and replaced without affecting the other drive by removing power from the failing drive with the Drive Power On/Off switch.

Removing the Loader Operator Panel

1. Go to CARR-DR 8 for the procedure to **power off** the drive.
2. Open the drive drawer.
3. Unlock the two quarter-turn fasteners **1** at the bottom of the hinged part of the front cover.
4. Raise the front cover.

Note: The top part of the front cover is hinged.

5. Unlock the quarter-turn fastener **7** at the front of the loader control card gate and swing out the gate.
6. Disconnect the operator panel cable **8** from the loader control card AL-D0/1-CC-J5 and remove the cable. Note the cable routing for later replacement.

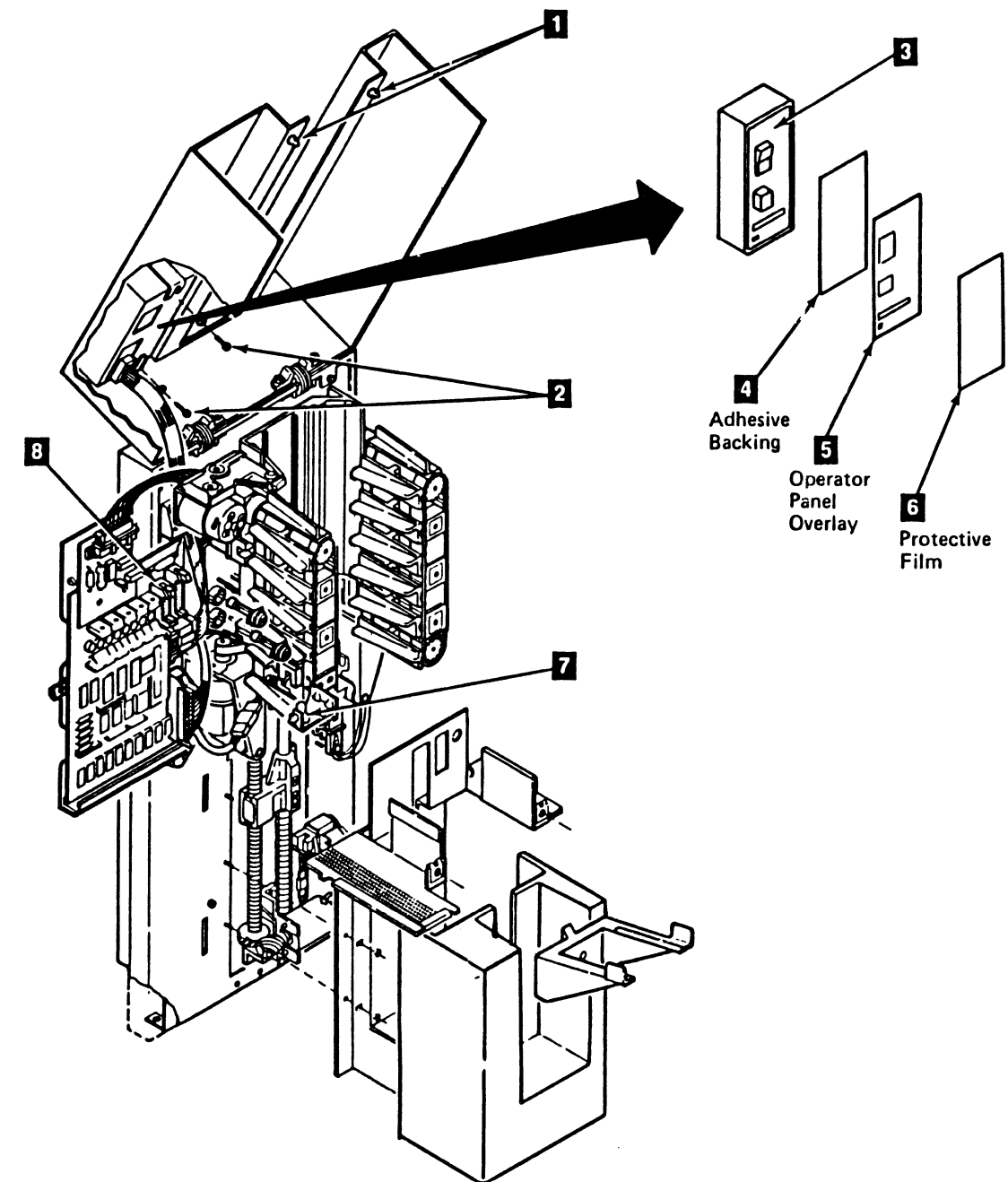
Warning: Be careful not to damage the cable end or other components.

7. Hold the operator panel with one hand and remove the two allen head holding screws **2**. Be careful not to lose the screws and washers.

The operator panel is removed through the front of the cover.

Replacing the Loader Operator Panel

1. Place the operator panel in the front cover opening and reinstall the two allen head holding screws **2**.
2. Route the cable to the loader control card behind the input station as noted earlier in the Removal procedure.
3. Connect the operator panel cable **8** to the loader control card AL-D0/1-CC-J5.
4. Close the loader control card gate and lock the quarter-turn fastener **7**.
5. Lower the front cover and lock the two quarter-turn fasteners **1**.
Make sure there are no cables outside the cover and that none are being pinched.
6. Select the operator panel overlay **5** from the overlay group supplied. The language should be the same as the tape unit.
7. Peel the adhesive protective backing **4** from the overlay and install on the front face of the operator panel **3**.
8. Remove the protective film **6** on the front face of the overlay after the overlay has been attached to the operator panel.
9. Close the drive drawer.
10. Go to CARR-DR 8 for the procedure to **power on** the drive.



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This page contains the steps needed to remove and replace the feed assembly motors.

Note: This FRU can be removed and replaced without affecting the other drive by removing power from the failing drive with the Drive Power On/Off switch.

Removing the Feed Assembly Motors

1. Go to CARR-DR 2900 and perform the Removal procedure for the input stack assembly, and when completed return to step 2.

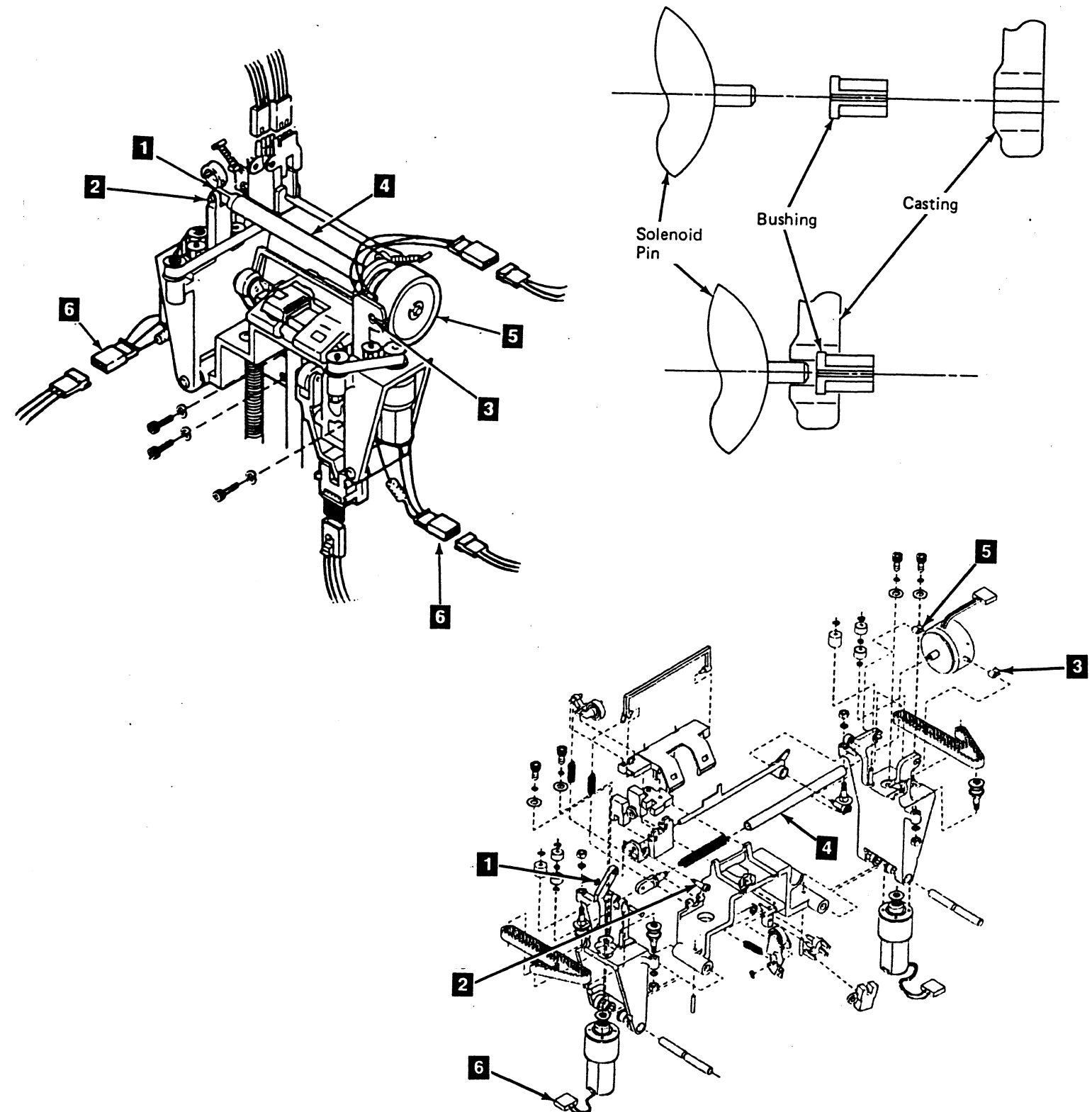
Note: Go to Step 6 for the left motor removal procedure.

2. Remove retainer **1** from the pivot pin. Remove the pivot pin **2** and set aside for re-installation in a later step.
3. Before removing solenoid pivot bushings, note the way they are installed. Remove solenoid pivot bushing **3** from the side of the solenoid that is away from the machine casting. The bushing must be replaced by new bushings.
4. Remove the solenoid assembly by lifting the end of the tube **4** and moving it away from the machine.
5. Remove the remaining solenoid pivot bushing **5** and discard.
6. Unplug the power connector **6**.
7. Remove the motor. Each motor is held in place by 2 metric-cap socket head screws. The screws will be reused.

Replacing the Feed Assembly

1. When installing new motors, ensure the belts are properly engaged on the pulleys. Use the screws removed in Step 7, "Removing the Feed Assembly Motors". Ensure the motor is snug, but not tight as the motor will have to be moved to adjust belt tension. Do not connect the motor power connector at this time.
 2. For those tape units with B/M 6460006, open the drive unit rear cover; for those tape units without B/M 6460006, remove the front safety cover and the grounding strap, if present. Plug the power jumper cord (P/N 13F8410) into test jack J9 if this is a deck 1 or test jack J8 if this is a deck 2.
 3. Plug the motor into the power jumper cable.
 4. Set your amp meter to read 50 milliamps.
 5. Plug the meter leads into the power jumper to complete the circuit.
 6. Ensure that the motor is running in the unload direction. If necessary reverse the polarity of the motor plug connector into the power jumper.
 7. Adjust the belt tension by moving the motor to obtain a reading of 50 milliamps + 5 milliamps. Tighten the motor mounting screws.
 8. If this is the first motor, unplug the power jumper cable from the motor and plug the second motor connector into the power jumper cable and repeat steps 6 and 7.
- Note:** If installing the left motor, proceed directly to step 11.

9. Partially install the rear bushing so that it extends to the back half of the casting as shown in Figure 1. Reinstall the solenoid by lifting the end of the tube and moving it toward the machine. Replace the front bushing by pinching the bushing so that it passes thru the casting as shown in Figure 1. Insure that both of the bushings are correctly seated with the tabs locking the bushings in place. See Figure 1 for proper orientation.
 10. Replace the pivot pin which was removed earlier. Secure the pivot pin with a new retainer.
 11. Remove the power jumper and connect the motors into their correct power source.
 12. For tape units without B/M 6460006, replace the front safety cover and grounding strap, if present.
- Note:** Do not power up or close the drive drawer until the following step has been performed.
13. Go to CARR-DR 2900 and perform the replacement procedure for the input stack assembly.



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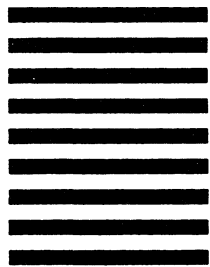


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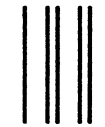
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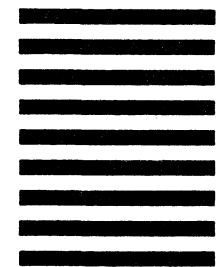


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