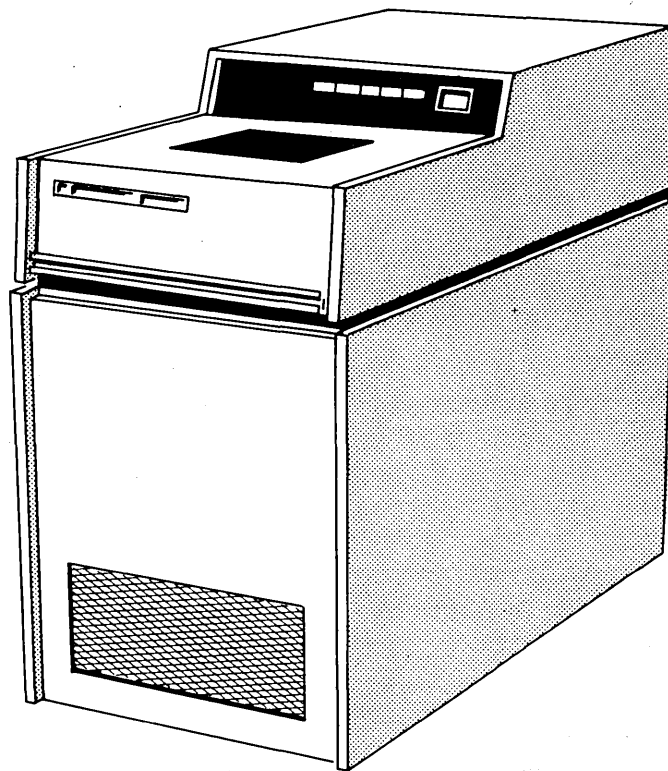

**CONTROL DATA®
BR3D4 DISK STORAGE UNIT**



MAINTENANCE MANUAL

PREFACE

This manual has been prepared for customer engineers and other technical personnel directly involved with maintaining the disk storage unit (drive):

Maintenance information is provided by five sections in this manual. Section numbers and a brief description of their contents are listed below.

Section 1 - Installation and Checkout.
Provides information on preparing the drive for initial use: unpacking, power/signal cabling, and initial checkout.

Section 2 - Preventive Maintenance.
Provides detailed procedures on maintaining the equipment.

Section 3 - Corrective Maintenance. Provides check/adjustment and replacement information for various components and assemblies in the device.

Section 4 - Diagrams. Contains logic diagrams and assembly schematics.

Section 5 - Wire Lists. Provides documentation on wiring for logic and mechanical assemblies.

Manuals applicable to the BR3D4 Disk Storage Unit are as follows:

Publication No.	Title
83313100	Maintenance
83313200	Reference
83313300	Parts Data

○

○

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SECTION 1

INSTALLATION AND CHECKOUT



INTRODUCTION

This section contains a listing of the steps involved in unpacking each unit. For air shipment, each unit is covered with a plastic dust shield enclosed within an outer corrugated fiberboard carton and then strapped to a wooden pallet. For domestic surface shipment, each unit is packaged in the same manner as for air shipment but is not placed on a wooden pallet. This permits each unit to be moved about on its own casters.

INSPECTION

When uncrating the units, inspect each carton for possible shipping damage. All claims for this type of damage should be filed with the carrier involved. Most crating materials may be reused if reasonable care is taken while uncrating. When uncrating is complete, check off all parts listed in the Shipping Bill accompanying the equipment. Discrepancies, missing items, damaged equipment, etc., should be reported to the CDC Account Sales Representative responsible for the equipment.

UNCRATING

1. Remove external packing material.

WARNING

Use care when cutting straps as they may whip when cut.

2. Remove polypropylene straps securing unit to skid and remove dust shield.

WARNING

The DSU weighs approximately 750 lbs when crated. To prevent injury to personnel or damage to unit, use Rol-a-Lifts or equivalent to remove unit from pallet.

3. Remove unit from skid.
4. Remove filler tubes from top of pack cover glass. Remove material (if any) contained inside tubes.

NOTE

The pack cover is locked in place by a manually operated latch. Open cover by pulling upward on latch until clear of catch (see Figure 1-1).

5. Lift pack cover.

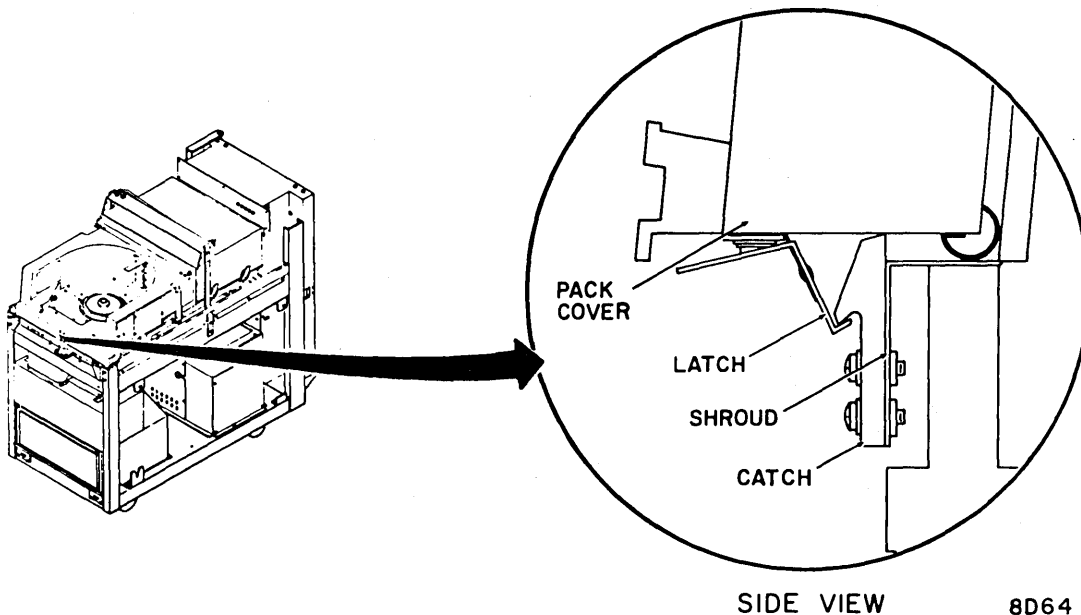


Figure 1-1. Pack Cover Latch

6. Remove logic chassis-to-frame retainer.
7. Swing logic chassis out.
8. Remove all material shipped inside unit.
9. Remove actuator shroud (see Figure 1-2).
10. Remove front panel.
11. Remove side skins (if installed).
12. Remove front deck hold-down bolts - two places (see Figure 1-3).
13. Remove shipping hardware holding spindle motor plate (see Figure 1-4).
14. Remove rear deck hold-down bolts - two places. These bolts are identified by plastic plugs. Replace plugs after removing hold-down bolts.
15. Remove actuator tie-back cord.
16. Remove logic chassis access cover and check all modules for proper seating. Replace access cover.
17. Replace actuator shroud.

18. Thoroughly vacuum clean unit.
19. Replace front panel.
20. Replace side skins.
21. Reposition pack cover.
22. Swing logic chassis to closed position.

LEVELING PAD INSTALLATION

Install leveling pads on each unit as follows:

1. Remove floor panel and roll cabinet so that one corner hangs over opening floor.
2. Working from opening, install leveling pad in bottom of unit and screw in until pad clears floor.
3. Repeat steps 1 and 2 for remaining pads.

INSTALLATION REQUIREMENTS

Site space and environmental requirements are listed in Table 1-1.

Figure 1-5 illustrates recommended clearances required for maintenance.

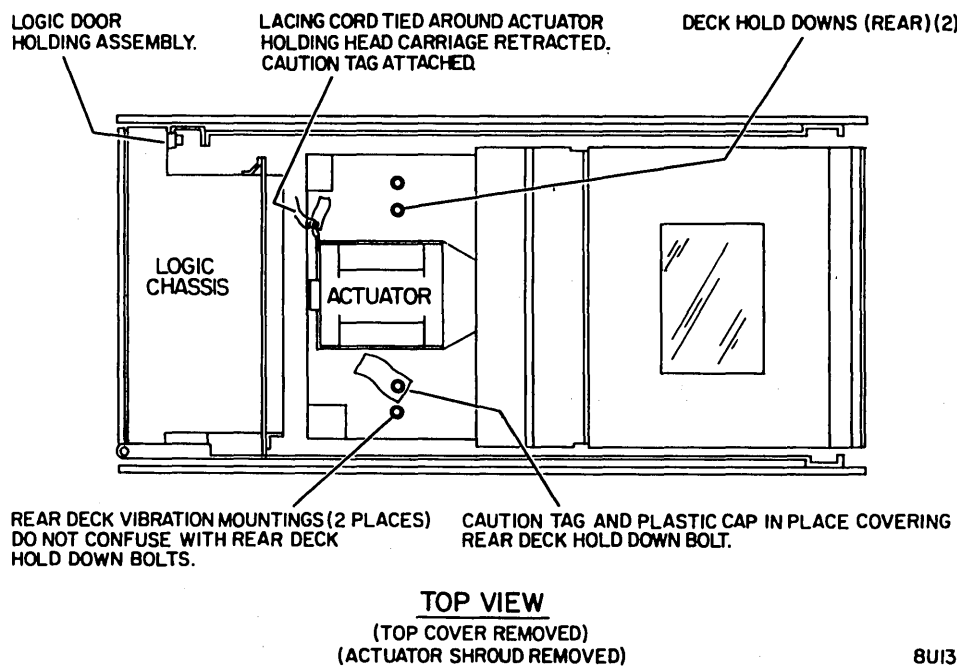
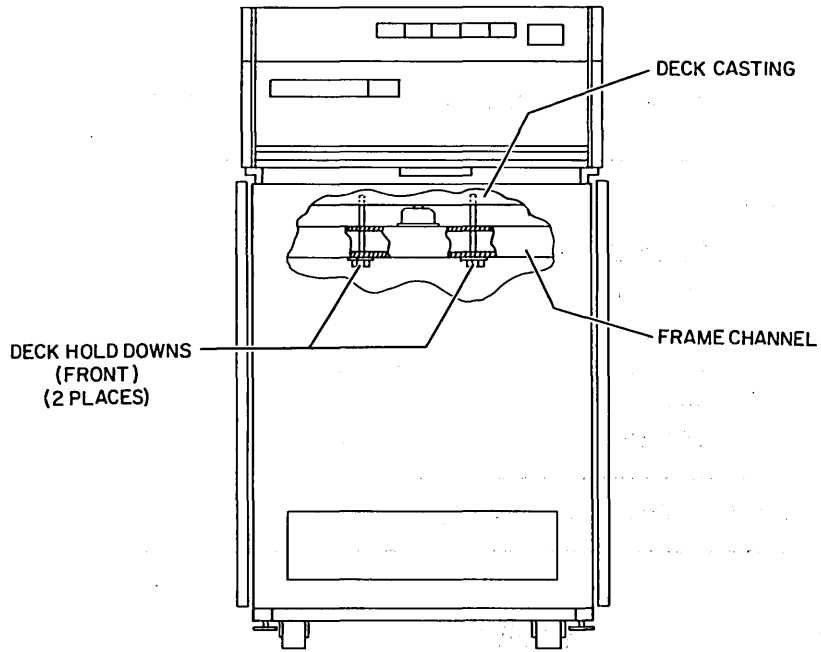


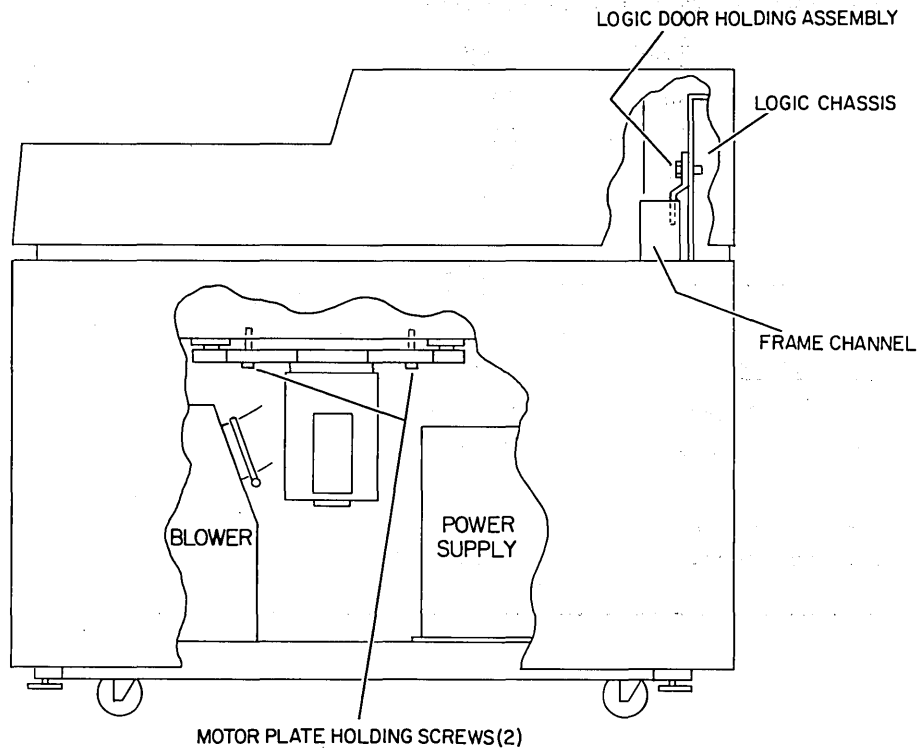
Figure 1-2. Drive-Top View



FRONT VIEW

8U12

Figure 1-3. Drive - Front View



RIGHT SIDE VIEW

8U11

Figure 1-4. Drive - Right Side View

TABLE 1-1. INSTALLATION SPECIFICATIONS

PHYSICAL (Approximate)				
<u>Size</u>	<u>Uncrated</u>	<u>Crated (Van)</u>		<u>Crated (Air)</u>
Height	39.5 in.	42 in.		46 in.
Width	22 in.	27 in.		27 in.
Depth	44.5 in.	48 in.		48 in.
Volume	---	31.5 ft ³		34.5 ft ³
Weight	660 lbs.	700 lbs.		740 lbs.

ENVIRONMENT: Refer to Publication Number 83313200				
---	--	--	--	--

POWER				
Consumption	<u>Standby</u>		<u>Accessing</u>	
	<u>60 Hz</u>	<u>50 Hz</u>	<u>60 Hz</u>	<u>50 Hz</u>
Amps/Phase	2.0	2.5	8.0	8.5
True Power (KW)	0.4	0.5	1.2	1.3
Power Factor	0.9	0.9	0.7	0.6
BTU/Hour	1400	1750	4200	4500

Starting Current (Approximate and Non-Linear)		
<u>Time</u>	<u>208V</u>	<u>220V</u>
0-6 sec.	38	40
6-8 sec.	38	25
8-10 sec.	20	12
10-12 sec.	12	8
12-14 sec.	8	--

Power Connector			
	<u>Description</u>	<u>Connector</u>	<u>Mating Receptacle</u>
50 Hz	5-pole, 30 amp	CDC 17634300	CDC 17810700
	220 vac, 3-phase	Hubble 45115	Hubble 45135
60 Hz	5-pole, 20 amp	CDC 15005400	CDC 15006200
	208 vac, 3-phase	Hubble 2511	Hubble 2514

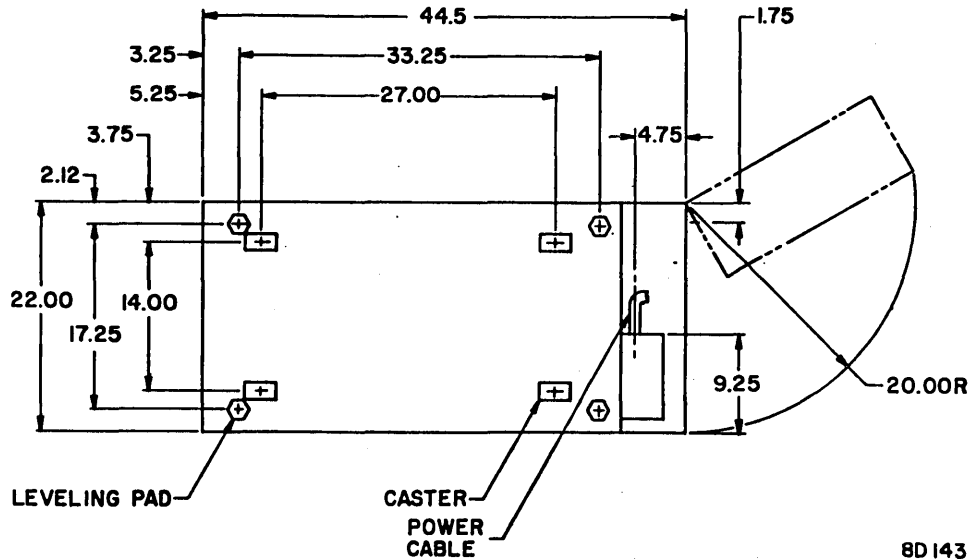


Figure 1-5. Space Requirements

LEVELING AND ALIGNING

1. Turn down leveling pads until casters are completely off of floor.
2. Place spirit level on main deck so ends of level point to front and rear of deck.
3. Adjust leveling pads until surface is horizontal within three angular degrees.
4. Place spirit level on main deck so ends of level point toward sides.
5. Adjust leveling pads until surface is horizontal within three angular degrees.
6. Repeat procedure until main deck is horizontal within three angular degrees regardless of spirit level orientation.

POWER WIRING

SITE ELECTRICAL REQUIREMENTS

General Requirements

Drive power requirements are listed in Publication Number 83313200.

Power System Grounding Requirements

The site ac power system must have provisions for correct equipment safety grounding. All of the following conditions must be met:

1. The branch circuit supplying ac power to the drive must have safety ground provisions. Therefore, this circuit must include an insulated grounding conductor that is identical to the grounded and ungrounded branch circuit conductors. The insulated grounding conductor shall show either a green color or green with a yellow strip.
2. The grounding conductor specified in step 1 is to be grounded at the service equipment.
3. All power receptacles (including convenience outlets for oscilloscopes and other test equipment) must be at a common ground potential to prevent shock hazards if two equipments are touched simultaneously. Therefore, all attachment-plug receptacles in the vicinity of the drive are to be of the grounding type; furthermore, the grounding conductors serving these receptacles are to be connected to the same grounding conductor that serves the drive.

SYSTEM GROUNDING

The controller and its attached drives must be connected to earth ground. The permissible grounding schemes, listed in preferred order, are:

1. Controller and drives connected to qualified site floor ground. A qualified ground would be a floor grid where the horizontal and vertical members of the grid are mechanically secure and have ground straps or their equivalent joining them to assure a constant ground potential. In turn, the grid must be connected to earth ground. An alternate qualified floor ground is a grounding grid or grounding bus system provided under the false floor.
2. Controller and drives connected to otherwise qualified floor grid, except that floor grid is isolated from earth ground. In this case, controller is then connected to earth ground to ground the system.
3. No site floor grid available: controller and drives connected to each other in a daisy chain configuration. Controller connected to earth ground.

Floor Grid Available

If a floor grid is available (schemes 1 or 2), each drive is to be individually connected to the floor grid. Ground each drive as follows:

1. Open logic chassis.
2. Grounding block is mounted at the bottom end of unit, next to I/O panel. Route braided strap with free end into floor cutout.
3. Drill 11/32-inch hole in grid.
4. Secure strap lug to grid using screw (P/N 17901524) and lockwasher (P/N 10126403). Lockwasher goes under terminal lug.

Floor Grid Not Available

If a floor grid is not available, all of the drives must be connected to the controller in a daisy chain grounding configuration. In turn, the controller must be connected to earth ground.

The ground connections are via flat braided shielding (P/N 93267009). Cut this shield-

ing to the lengths required to go from drive to drive, drive to controller, and controller to earth ground. Crimp and solder a terminal lug (P/N 40125601) to the end of each strap.

Earth ground at the site may be available at the main power distribution panel (if it is connected to building ground), at the steel plate in contact with the masonry below the panel (if the panel is not connected to earth ground), or to an earth ground bus. Connect one end of a prepared ground strap to the available ground.

Connect remainder of grounds as follows:

1. Open logic chassis.
2. Grounding block is mounted at the bottom end of unit, next to I/O panel. Loosen grounding block screw that secures 3-foot length of ground strap (other end of this strap is not connected). Remove ground strap.
3. Attach two ground straps to this screw. One strap will go to each of the two closest drives. Tighten screws.
4. Repeat step 3 for remaining drives. Drive closest to controller is to be connected to controller ground.
5. Connect controller to earth ground.

AC POWER CONNECTIONS

Each drive receives its ac power via a 6 foot cable. This cable originates from the UNIT POWER circuit breaker located in the AC breaker box at the rear of the drive.

Although each drive receives three-phase input power at the UNIT POWER circuit breaker, only two phases are used per drive. All motors are single-phase, connected phase-to-phase. (Phase-to-Neutral on 50 Hz drives.)

In order to balance the power line load, phases are rotated from drive-to-drive. The first drive is connected between phases A and B, the second between phases A and C, with the third between phases B and C. Therefore, each group of three drives presents a balanced load while operating.

Phasing is controlled by connecting wires to the UNIT POWER circuit breaker. Phase assignments are as follows:

- X - Phase A (black)
- Z - Phase B (red)
- Y - Phase C (orange)
- N - Neutral (white)
- G - Ground (green)

The green wire is safety ground. It is not to be used as neutral as it is not a current carrying ground. This wire connects to a lug inside the UNIT POWER circuit breaker box. Make sure that this is a secure connection.

SIGNAL CABLING

Each drive communicates with a controller by means of two interconnecting cables. System cables are illustrated in Figure 1-6. Signal functions are listed in Table 1-2.

CAUTION

When installing I/O cables, alternately tighten connector jackscrews or connector damage may result.

The I/O connectors are located on the frame below the logic chassis.

UNIT ID SELECTION

The drive is assigned the desired physical unit identification by installing jumper wires across auxiliary connector A2JD90 at the bottom of the logic chassis (wire wrap side). Figure 1-7 shows the bit assignments

of the pins and the jumpering scheme to assign mechanism ID-C to the drive.

INITIAL CHECKOUT AND STARTUP

This procedure assumes that all of the preceding procedures have been completed. Before performing this procedure, become familiar with the safety precautions and maintenance preliminary conditions specified in Section 3. Proceed as follows:

1. Inspect read/write heads and track servo head as specified in Preventive Maintenance portion of Section 2.

CAUTION

Bearing damage can occur if alcohol runs into spindle.

2. Wipe spindle clean with media cleaning solution dampened gauze.
3. Using vacuum cleaner, remove dust or dirt from interior of shroud and cabinet.

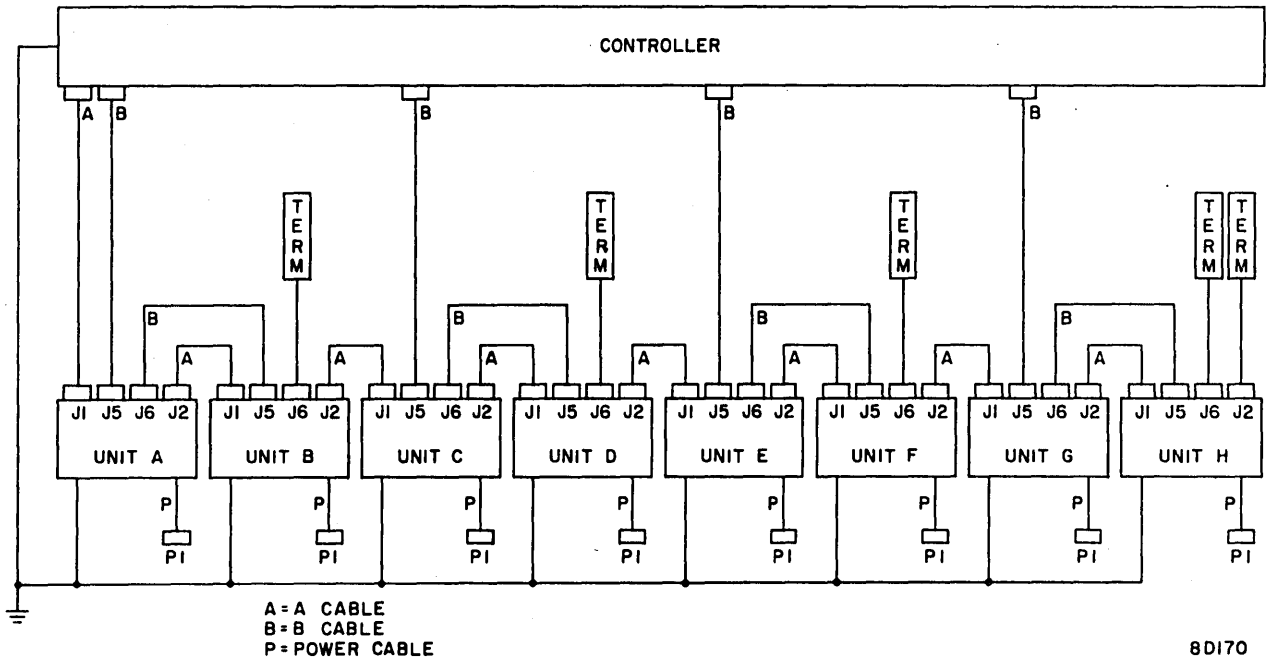
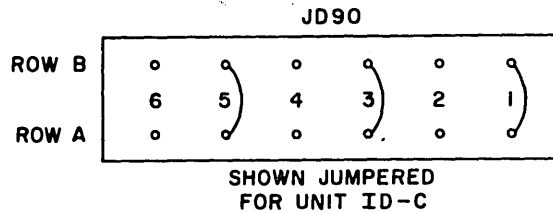
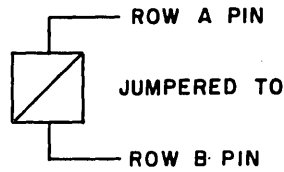


Figure 1-6. System Cabling

TABLE 1.2. INPUT/OUTPUT CONNECTOR PIN ASSIGNMENT

Signal Name	DSU Connector		Signal Direction	
	Signal	Ground	From	To
METERING IN A	BB	AX	Drive	Controller
METERING IN B	BC	AY	Drive	Controller
DRIVE SEL BUS B2 2 ⁵	AL	AF	Drive	Controller
DRIVE SEL BUS B3 2 ⁴	AM	AH	Drive	Controller
DRIVE SEL BUS B4 2 ³	AT	AN	Drive	Controller
DRIVE SEL BUS B5 2 ²	AU	AP	Drive	Controller
DRIVE SEL BUS B6 2 ¹	AV	AR	Drive	Controller
DRIVE SEL BUS B7 2 ⁰	AW	AS	Drive	Controller
TAG VALID	BE	BA	Drive	Controller
DEVICE CHECK	BD	AZ	Drive	Controller
CTRL BUS IN B0 2 ⁷	\bar{s}	\bar{n}	Drive	Controller
CTRL BUS IN B1 2 ⁶	\bar{t}	\bar{p}	Drive	Controller
CTRL BUS IN B2 2 ⁵	\bar{u}	\bar{q}	Drive	Controller
CTRL BUS IN B3 2 ⁴	\bar{z}	\bar{v}	Drive	Controller
CTRL BUS IN B4 2 ³	AA	\bar{w}	Drive	Controller
CTRL BUS IN B5 2 ²	AB	\bar{x}	Drive	Controller
CTRL BUS IN B6 2 ¹	AC	\bar{y}	Drive	Controller
CTRL BUS IN B7 2 ⁰	AJ	AD	Drive	Controller
CTRL BUS PARITY	AK	AE	Drive	Controller
MOD SEL GATE	\bar{k}	\bar{g}	Controller	Drive
TAG BUS B1 2 ⁰	E	A	Controller	Drive
TAG BUS B2 2 ¹	F	B	Controller	Drive
TAG BUS B4 2 ²	H	C	Controller	Drive
TAG BUS B8 2 ³	J	D	Controller	Drive
TAG BUS PARITY	P	K	Controller	Drive
TAG GATE	R	L	Controller	Drive
CTRL BUS OUT B0 2 ⁷	S	M	Controller	Drive
CTRL BUS OUT B1 2 ⁶	T	N	Controller	Drive
CTRL BUS OUT B2 2 ⁵	Y	U	Controller	Drive
CTRL BUS OUT B3 2 ⁴	Z	V	Controller	Drive
CTRL BUS OUT B4 2 ³	\bar{a}	W	Controller	Drive
CTRL BUS OUT B5 2 ²	\bar{b}	X	Controller	Drive
CTRL BUS OUT B6 2 ¹	\bar{h}	\bar{c}	Controller	Drive
CTRL BUS OUT B7 2 ⁰	\bar{i}	\bar{d}	Controller	Drive
CTRL BUS OUT PARITY	\bar{j}	\bar{f}	Controller	Drive
SEQUENCE MOTOR START	CK	CP	Controller	Drive
SEQUENCE MOTOR HOLD	CL	CR	Controller	Drive
POWER ON SEQ COMPLETE	CM	CS	Drive	Controller
NOT USED	CC	CH	Drive	Controller
+24 VDC	CJ	CN	Controller	Drive

UNIT ID	ID BIT ASSIGNMENT		
A	1 1	2 2	3 3
B	2 2	3 3	4 4
C	1 1	3 3	5 5
D	3 3	4 4	5 5
E	1 1	2 2	6 6
F	2 2	4 4	6 6
G	1 1	5 5	6 6
H	4 4	5 5	6 6



8D171

Figure 1-7. Unit Identification Assignment

CAUTION

The CE disk pack contains specially recorded tracks of data. Extreme care must be taken so that this data is not modified or destroyed.

4. Install CE disk pack.
5. Open cabinet rear door. Verify that all logic chassis cards are firmly seated in their connectors. Check all miscellaneous connectors to see that they are properly seated.
6. Open top cover and remove deck cover.
7. Check that logic cards next to positioner assembly are firmly seated. Check that head connectors are properly seated.
8. Turn off UNIT POWER circuit breaker.
9. Turn off all power supply circuit breakers.
10. Verify that drive is connected to external power source and that external breaker (if any) is on.

11. Turn on UNIT POWER circuit breaker. Blower motor begins to operate.
12. Turn on all remaining power supply circuit breakers. Power supply elapsed time meter starts.

NOTE

- Only one drive should be accelerating the pack at a time. The second drive may be started after the first drive reaches operating speed (approximately 20 seconds).
13. Check all output voltages for nominal settings.
 14. Press Operator panel START switch.
 15. Spindle drive motor and first seek interlock motor start.
 16. Actuator drives carriage forward to load heads (after 15-second First Seek Interlock delay).

17. Actuator moves heads to track 00 and Physical Unit Identification indicator on operator panel lights.
18. Check head/arm alignment. If necessary, perform Head/Arm Alignment procedure in Corrective Maintenance section.

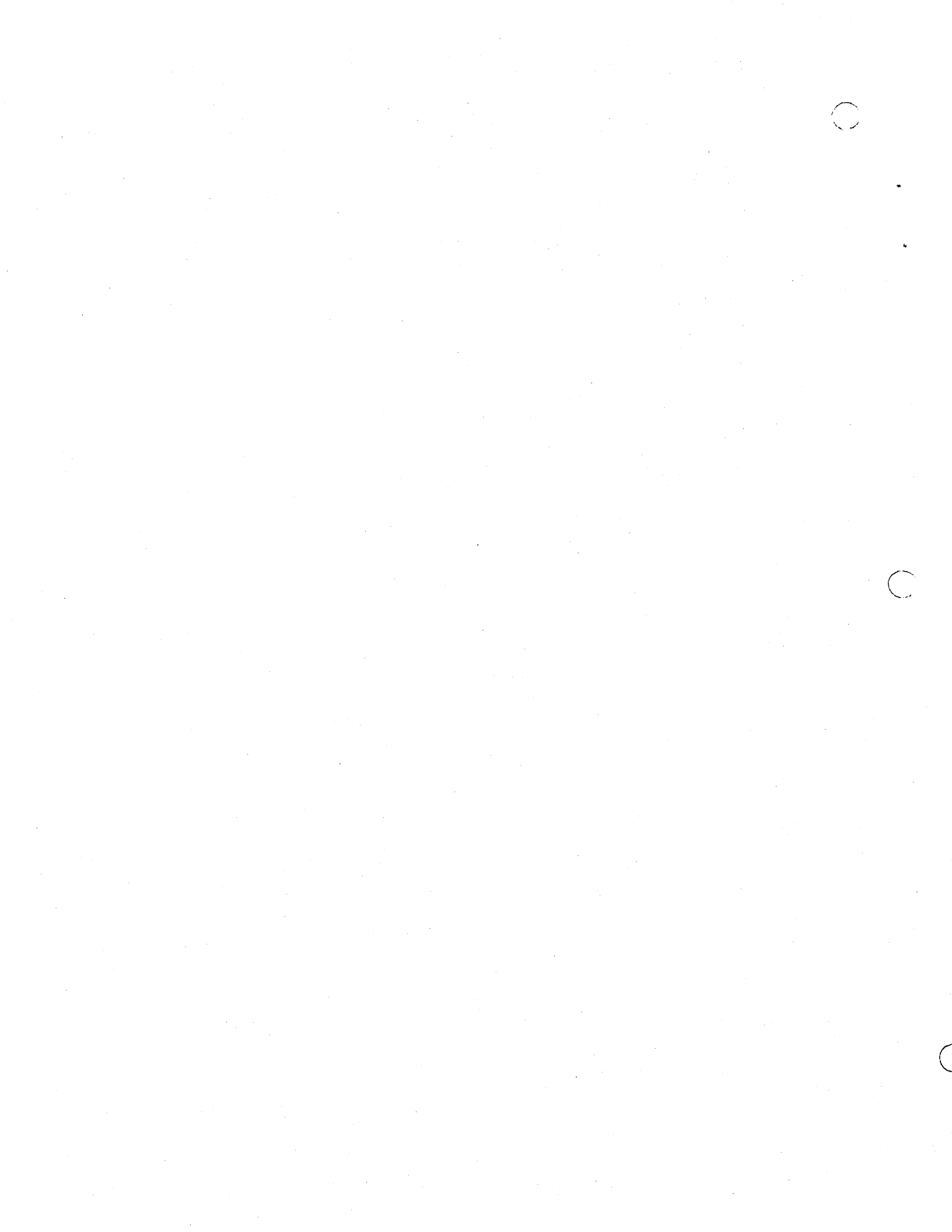
WARNING

If unit fails to power down, refer to Power Application procedure in Operation section of Reference manual.

19. To stop spindle motor, press operator panel START switch. To remove power to drive, turn off UNIT POWER circuit breaker.

SECTION 2

PREVENTIVE MAINTENANCE



INTRODUCTION

Performance of the drive is dependent on the proper and timely execution of a preventive maintenance routine. Such a routine is provided by the Preventive Maintenance Index (Table 2-1).

The index consists of six levels based on a calendar period or hours of operation (whichever comes first). The power supply elapsed time meter keeps a cumulative record of hours of operation. Perform preventive maintenance in accordance with the indication of this meter. The Procedure column, Table 2-1, lists the title of the paragraph containing the required instructions.

The following levels of scheduled preventive maintenance are required:

- Level 1 - Weekly or 150 hours (no preventive maintenance scheduled)
- Level 2 - Monthly or 500 hours (no preventive maintenance scheduled)
- Level 3 - Quarterly or 1,500 hours
- Level 4 - Semiannually or 3,000 hours
- Level 5 - Annually or 6,000 hours (no preventive maintenance scheduled)
- Level 6 - Biennially or 9,000 hours

TABLE 2-1. PREVENTIVE MAINTENANCE INDEX

Level	Estimated Time (Min)	Procedure
3	10	Inspect actuator assembly
3	1	Clean pack cover glass
3	10	Clean primary filter*
3	2	Check power supply outputs
3	10	Inspect servo and read/write heads
4	1	Clean shroud and spindle
4	120	Check head/arm alignment
4	2	Clean and lubricate lock-shaft
4	5	Clean carriage rails and bearings
6	20	Replace absolute filter*

*Intervals are maximum times. Preventive maintenance may be required more frequently depending on dust contamination level of operating area.

MAINTENANCE MATERIALS

The materials used in the procedures of this section are listed below:

<u>Material</u>	<u>Source</u>
Filter Coat	CDC* 12210958
Gauze, Lint-Free	CDC 12209713
Lubricant Paste	CDC 95016101
Media Cleaning Solution	CDC 95033502
Plastic Spatulas (or wooden tongue depressor)	Commercially available
Tape, Adhesive	Commercially available

*CDC® is a registered trademark of Control Data Corporation.

LEVEL 3 MAINTENANCE PROCEDURES

INSPECT ACTUATOR ASSEMBLY

1. Raise cabinet top cover.
2. Remove deck cover.
3. Inspect entire actuator for presence of dust and other foreign materials. Pay particular attention to following areas:
 - a. Circular cutout in face of magnet assembly (receives voice coil).
 - b. Rail surfaces (particularly horizontal surfaces) of carriage track on which carriage and bearing assembly travels.
4. Use lint-free gauze dampened with media cleaning solution (not soaked) to remove deposits or attracted particles. Refer to Clean Carriage Rails and Bearings procedure.

CLEAN PACK COVER GLASS

Use a lint-free gauze dampened (not soaked) with media cleaning solution to remove smudges and deposits from the glass in the pack cover.

CLEAN PRIMARY FILTER

1. Remove air filter from bottom of blower assembly at front of cabinet (Figure 2-1) by lifting upward on

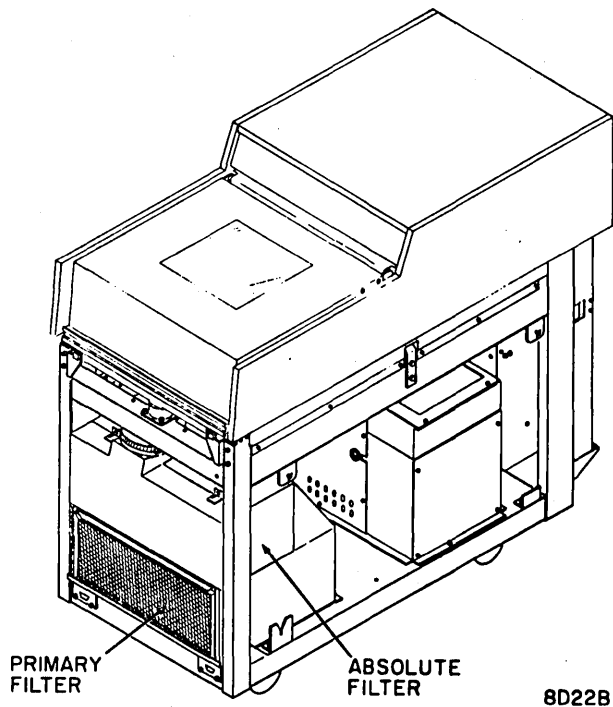


Figure 2-1. Cabinet Filters

filter to compress upper channel gasket so that bottom edge of filter clears retaining trough. Pull bottom of filter out then lower filter.

2. Agitate filter in mild detergent solution. Rinse in reverse direction with a low-pressure nozzle.
3. Shake any excess water from filters and allow filters to dry before proceeding.
4. Spray filters thoroughly with Filter Coat and install in unit.

CHECK POWER SUPPLY OUTPUTS

1. Open cabinet rear door.
2. Start spindle motor and allow read/write heads to load.
3. Command a 32-track repeat seek (32 tracks forward and 32 tracks reverse continuously) starting at track 0.
4. Use an AC/DC volt/ohmmeter to measure output voltages at corresponding test jacks on logic chassis test point panel.

- a. Measure +5v. Does meter read +5.10 (± 0.05) volts?
 - No → Release inner surface or rear door. Adjust potentiometer shaft on edge of +5v regulator card.
 - Yes ↓
 - b. Measure -5v. Does meter read -5.10 (± 0.05) volts?
 - No → Adjust potentiometer shaft on edge of -5v regulator card.
 - Yes ↓
- Procedure completed.

INSPECT SERVO AND READ/WRITE HEADS

1. Stop spindle motor, open cabinet top cover and remove deck cover.

NOTE

Use a suitably bright and directional light during the following steps.

2. Inspect heads as follows (carriage must remain fully retracted):

CAUTION

Do not smoke while inspecting. Use extreme care not to damage heads with dental mirror. Gimbal spring (holds head on end of floating arm) is most liable to be damaged. If gimbal spring is permanently bent, entire head/arm assembly must be replaced.

- a. Use dental mirror to inspect face of each head for reddish-brown oxide deposits. Clean a head only if deposits exist (see step 3).
 - b. If scratches are found, refer to Head Replacement Criteria paragraph.
3. Clean heads (only if required) as follows:

CAUTION

Do not smoke while cleaning. Do not touch a head face with fingers. When cleaning or buffering, always move tongue depressor perpendicular to length of head/arm assembly. Do not leave residue on head faces. Trapped residual particles can result in the loss of a head and/or a scored disk.

- a. If oxide deposits are found, use lint-free gauze on a wooden tongue depressor to lightly dry-buff head face. Check associated pack surface for cleanliness and/or damage. If deposits are removed, cleaning is completed.
- b. If oxide deposits are not removed, dampen (do not soak) gauze with media cleaning solution and wipe head face. If deposits are removed, use dry gauze to lightly buff head face.
- c. If oxide deposits are not removed in step b, refer to Corrective Maintenance section. Remove head/arm assembly from carriage and repeat step b.
- d. If oxide deposits still remain, install a new head/arm assembly.

5. Apply a thin coat of Lubricant paste to threads.
6. Check for free movement of lockshaft by depressing and checking that it freely returns to its original position.

CLEAN CARRIAGE RAILS AND BEARINGS

1. Set UNIT POWER circuit breaker to OFF.
2. Remove disk pack.
3. Open top cover and remove deck cover.
4. Clean rails and bearing surfaces (Figure 2-2) with lint-free gauze that is slightly dampened with media cleaning solution. It is necessary to manually move carriage to gain access to all surfaces. Install head cam tool per Head Cam Tool Installation procedure, Section 3.

LEVEL 4 MAINTENANCE PROCEDURES

CLEAN SHROUD AND SPINDLE

1. Stop spindle motor.
2. Open pack cover.

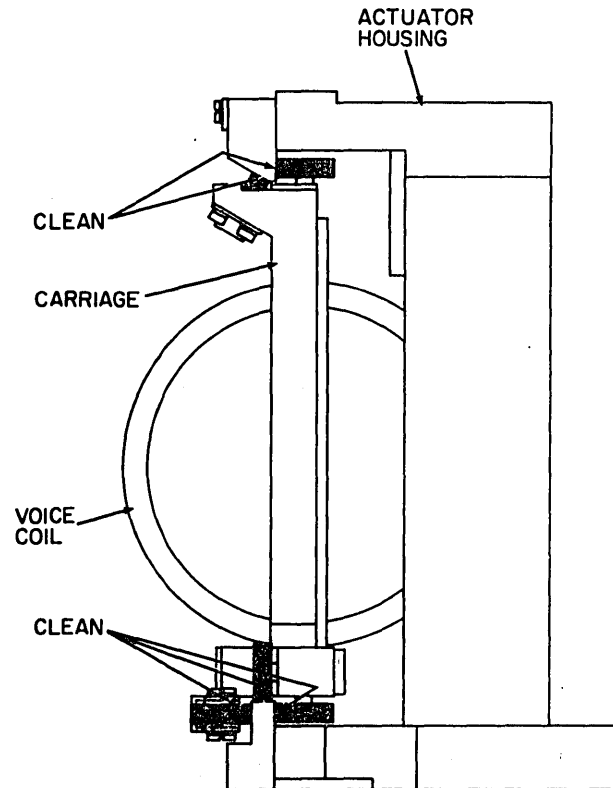
CAUTION

Keep any disk pack at least three inches away from any part of the magnet assembly.

3. Remove disk pack.
4. Clean shroud with a lint-free gauze that is slightly dampened with media cleaning solution. Wipe shroud to remove all dirt and smudges. Thoroughly wipe spindle surface.
5. After cleaning shroud, use a wad of adhesive-type tape and pick up any particles that were not picked up with gauze. Make certain that all particles are removed from interior of shroud.

CLEAN AND LUBRICATE LOCKSHAFT

1. Stop spindle motor.
2. Open pack cover.
3. Remove disk pack.
4. Use lint-free gauze and a brush or sharp instrument to clean lockshaft threads on top end of spindle.



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Figure 2-2. Carriage Rails and Bearings

5. Wipe rails and bearing surfaces with dry gauze.
6. Check for cleanliness by manually moving carriage through operating range. If any slight resistance to free rolling is encountered, repeat steps 4 and 5.

LEVEL 6 MAINTENANCE PROCEDURES

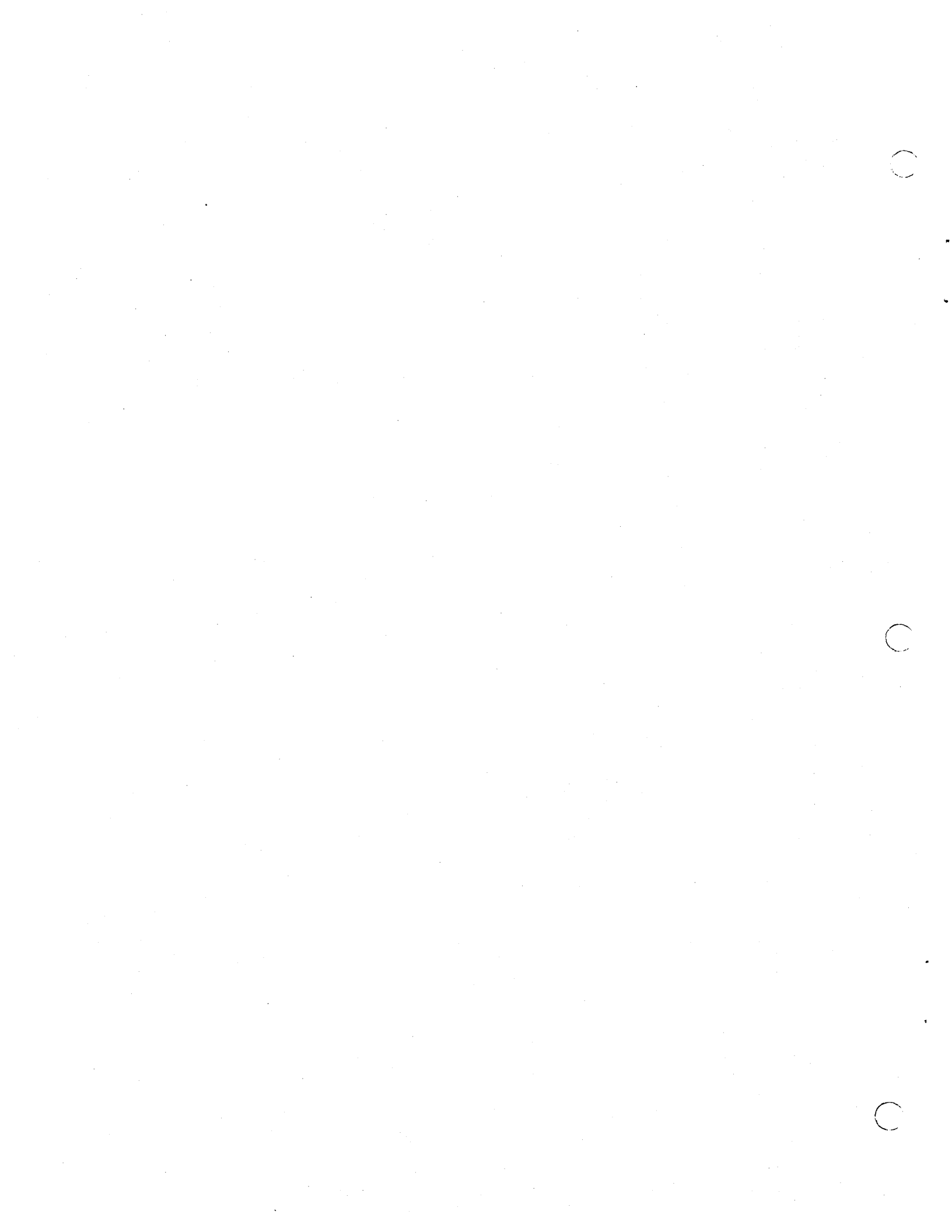
REPLACE ABSOLUTE FILTER

1. Stop spindle motor.
2. Remove disk pack.
3. Set UNIT POWER circuit breaker to OFF.
4. Remove cabinet from panel.

5. Refer to Clean Primary Filter procedure and clean primary filter (do not install primary filter until instructed to).
6. Remove nuts from two tie bolts above filter and two screws at bottom of output plenum. Remove tie bolts.
7. Swing air plenum up and remove absolute filter.
8. Install replacement absolute filter and air plenum.
9. Secure filter and plenum with four nuts and four tie bolts.
10. Install primary filter.
11. Install cabinet front panel.
12. Set UNIT POWER circuit breaker to ON. Allow blower to purge unit for two minutes.

SECTION 3

CORRECTIVE MAINTENANCE



SCOPE

This section contains the instructions for drive maintenance. The information is provided in the form of Electrical Checks and Adjustments, and Mechanical Corrective Maintenance.

SAFETY PRECAUTIONS

Observe the following safety precautions at all times. Failure to do so may cause equipment damage and/or personal injury.

1. Use care while working with power system. Line ac voltages are present at ALTBl (below UNIT POWER circuit breaker) and inside power supply.
2. Keep hands away from positioner during seek operations or when reconnecting leads to voice coil. (Under certain conditions, emergency retract voltage may be present, causing sudden reverse motion and head unloading.)
3. Use caution while working near heads. If heads are touched, fingerprints can damage them. Clean heads immediately if they are touched.
4. Keep front cover closed unless it must be open for maintenance. This prevents entrance of dust into pack area.
5. Keep all watches, disk packs, meters, and other test equipment at least two feet away from voice coil magnet (with deck cover off).
6. Do not use customer disk pack. Otherwise, customer data may be destroyed.
7. Do not use CE alignment disk pack unless specifically directed. These packs contain prerecorded alignment data that can be destroyed if the procedure requires the drive to write. These alignment tracks cannot be generated in the field.
8. If unit fails to power down when START switch is pressed, disconnect yellow leadwire to voice coil and manually retract heads before troubleshooting malfunction.

MAINTENANCE PRELIMINARY CONDITIONS

OFFLINE OPERATIONS

Certain procedures require execution of operational commands (seek, read, etc.). These commands may be derived by means of the Field Test Unit.

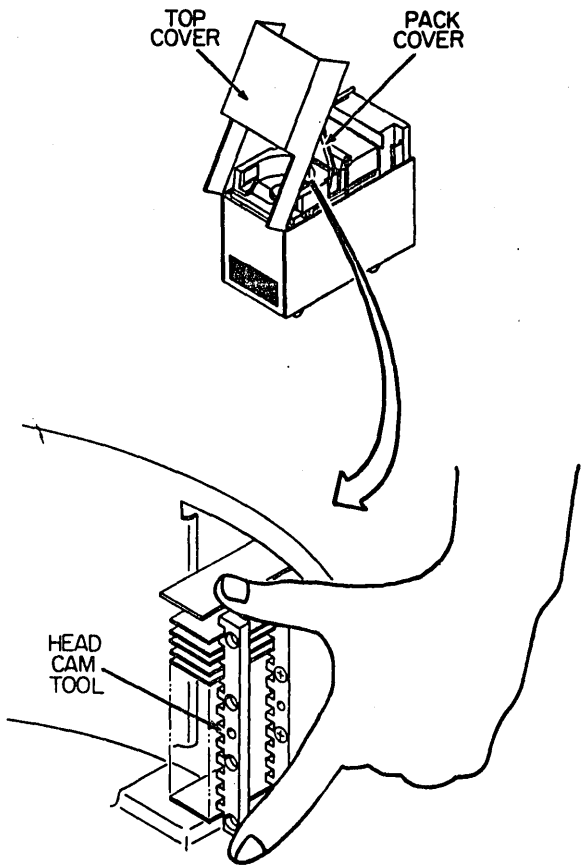
Manual operation of the positioner is possible if the yellow lead is disconnected from the voice coil. Observe the following safety precautions during manual operation:

1. Before moving carriage to load heads (without disk pack installed), install head cam tool per Manually Positioning Carriage procedure.
2. Before turning off power, or if power to spindle motor is lost, immediately retract carriage. Otherwise heads will crash when disk speed is insufficient to permit heads to fly.
3. Before reconnecting yellow lead, make sure fingers are clear of positioner. Rapid positioner movement will occur if difference counter contains a value other than 1023 or if an emergency retract condition exists.

MANUALLY POSITIONING CARRIAGE

Manually positioning the carriage (with power off and disk pack removed) requires installation of the head cam tool.

1. Open pack cover and remove disk pack.
2. Close pack cover.
3. Open top cover and remove deck cover.
4. Open pack cover.
5. Remove voice coil yellow lead wire.
6. Position head cam tool against head cam mounted on actuator (Figure 3-1) using one hand.
7. With other hand, move carriage forward until head/arm assemblies enter and begin to grasp tips of head cam tool, while moving tool along with forward movement of head/arm assemblies. When head/arm assembly securely holds head cam tool, release tool. Carriage is now free to move without damaging R/W heads.
8. To remove head cam tool, grasp head cam tool and retract carriage until head/arm assemblies release tool. Remove tool.
9. Connect voice coil yellow leadwire.
10. Install deck cover.
11. Close pack and top covers.



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Figure 3-1. Head Cam Tool Installation

MAINTENANCE TOOLS AND MATERIALS

The tools, test equipment, and materials recommended for drive maintenance are listed in Table 3-1.

TABLE 3-1. MAINTENANCE TOOLS AND MATERIALS

Description	Part Number
Actuator Stop Adjustment Tool	CDC® 87008000*
Adapter (3/16 Hex to 1/4 Sq)	CDC 12262582
Ball Ended Hex Driver (3/16 Hex)	CDC 12263201
Belt Tension Gauge	CDC 87390400
Card Extender (Half-Size)	CDC 54099700

*CDC® is a registered trademark of Control Data Corporation.

TABLE 3-1. MAINTENANCE TOOLS AND MATERIALS (CONT'D)

Description	Part Number
Card Extender (Full-Size)	CDC 54109700
Card Extraction Tool	CDC 87399200
Carriage Alignment Arm	CDC 87007900
Carriage Alignment Ring	CDC 87389800
CE Disk Pack	CDC 70430001
Chip Extender-Chip Cliplog	CDC 12212196
Grease, Silicone	CDC 95109000
Head Adjustment Tool	CDC 75009100
Head Cam	CDC 75212300
Head Installation & Removal Tool	CDC 73678500
Hex Key, 1/8 inch	CDC 73228100
Lever Force Gage (5-15 grams)	CDC 94363200
Lever Force Gage (20-100 grams)	CDC 94363201
Loctite, Grade C	Loctite Corp.
Loctite Primer, Grade N	Loctite Corp.
Multi-Voltmeter (Null Meter)	CDC 73576400
Non-Metallic Feeler Gage, 0.005 in.	CDC 12205600
Nutdriver, Hollow Stem	Excelite #6
Oscilloscope, Dual Trace	Tektronix 454 or equivalent
Oscilloscope Hood	Tektronix 016-0083-00
Pin Straightener	CDC 87369400
Push-Pull Gage	CDC 12210836
Rail Adjustment Tool	CDC 87053600
Removal Tool, 20-30 Gage	CDC 12259183
Scope Probe Tip (Hatchet Type)	CDC 12212885
Shim Assortment (used for carriage stop adjustment when replacing actuator)	CDC 75039400
Spindle Adjustment Tool	CDC 87059900
Torque Screwdriver	CDC 12218425
Torque Screwdriver Bit	CDC 87016701
Torque Wrench, 1/4 inch	CDC 12263205
Volt/ohmmeter	Ballantine 345 or equivalent digital voltmeter
Wire Wrap Bit, 30 Gage	CDC 12218402
Wire Wrap Gun, Electric	CDC 12259111
Wire Wrap Sleeve, 30 Gage	CDC 12218403

ELECTRICAL CHECKS AND ADJUSTMENTS

INTRODUCTION

The electrical adjustments should be performed prior to replacing any parts. This ensures that apparent malfunctions are not caused simply by misadjustments. Also, these procedures should be performed whenever logic cards or other electrical components are repaired or replaced.

These adjustments are divided into

- Power System - power supply voltages and power sequencing.
- Servo System - the parts involved in moving the positioner to the selected cylinder.
- Miscellaneous Logic - the remaining logic in the drive not directly applicable to the two systems listed above.

Before performing any of these procedures, be thoroughly familiar with the safety precautions and preliminary conditions specified earlier in this section.

POWER SYSTEM CHECKS

Introduction

The power system test procedure has been subdivided into subchecks to permit trouble analysis and checkout of specific system functions. The first test, Sequencing Functional Check, provides a quick check of power supply sequencing. It does not, however, check all capabilities. For a complete power supply checkout, perform all tests.

Figure 3-2 is a troubleshooting guide that will assist in isolating malfunctions. Locations of parts within the AC power supply are illustrated in Figure 3-3. Locations of parts within the DC power supply are illustrated in Figure 3-4.

CAUTION

Unless otherwise specified, sequence power from the controller should be off when performing any of these tests.

Sequencing Function Checks

This procedure provides a quick check of the power supply sequencing. For a complete check of all power supply capabilities, in-

cluding interlocks and data protection, perform all of the remaining power supply tests. Proceed as follows:

1. Load disk pack and close cover.
2. Turn off all power supply circuit breakers.
3. Set LOCAL/REMOTE switch to REMOTE.
4. Open top cover from rear.
5. Disconnect yellow lead from voice coil.
6. Verify that UNIT POWER circuit breaker is on.
7. Check if blower motor is operating. If not, check:
 - a. Site ac power available at ALTBl.
 - b. UNIT POWER circuit breaker.
 - c. Line terminals of AlP2.
8. Check that +20Y indicator on DC panel lights. If not, check for +22v at A2TB1-1 (terminal board on back of logic chassis). If present, bulb is defective. If absent, check +20Y fuses. If fuses are good, check dc power panel AlCR7-10+.
9. Turn on +5 and -5 volt circuit breakers.
10. Set LOCAL/REMOTE switch to LOCAL. Check that MAINTENANCE indicator on operator panel lights. If not:
 - a. Measure from +5 test point on maintenance panel to ground. If +5v present, proceed directly to step f; if absent, proceed to step b.
 - b. Turn on ±20 circuit breakers on power supply. Measure these voltages from their respective test points on maintenance panel to ground. If +20v, -20v, and -5v are all absent, ac power panel Al and related rectifiers are not supplying dc voltages. Proceed to step c. If any voltages are present, proceed to step g.
 - c. Measure from AlQ1 terminal 3 to ground. If not +20v, relay K1 is not energized, (it should be). Proceed to step d if voltage is present.

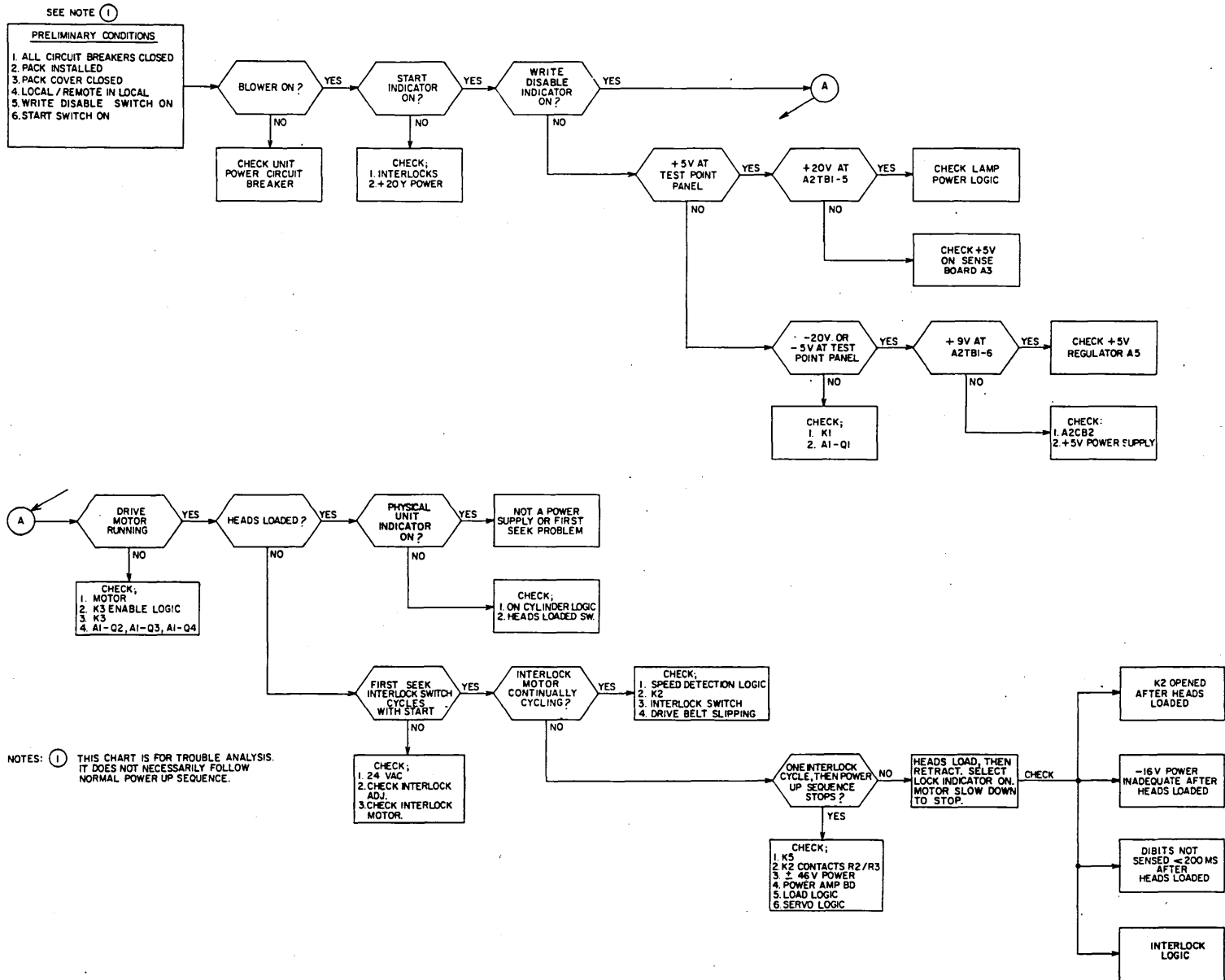


Figure 3-2. Power Sequencing Trouble Analysis Chart

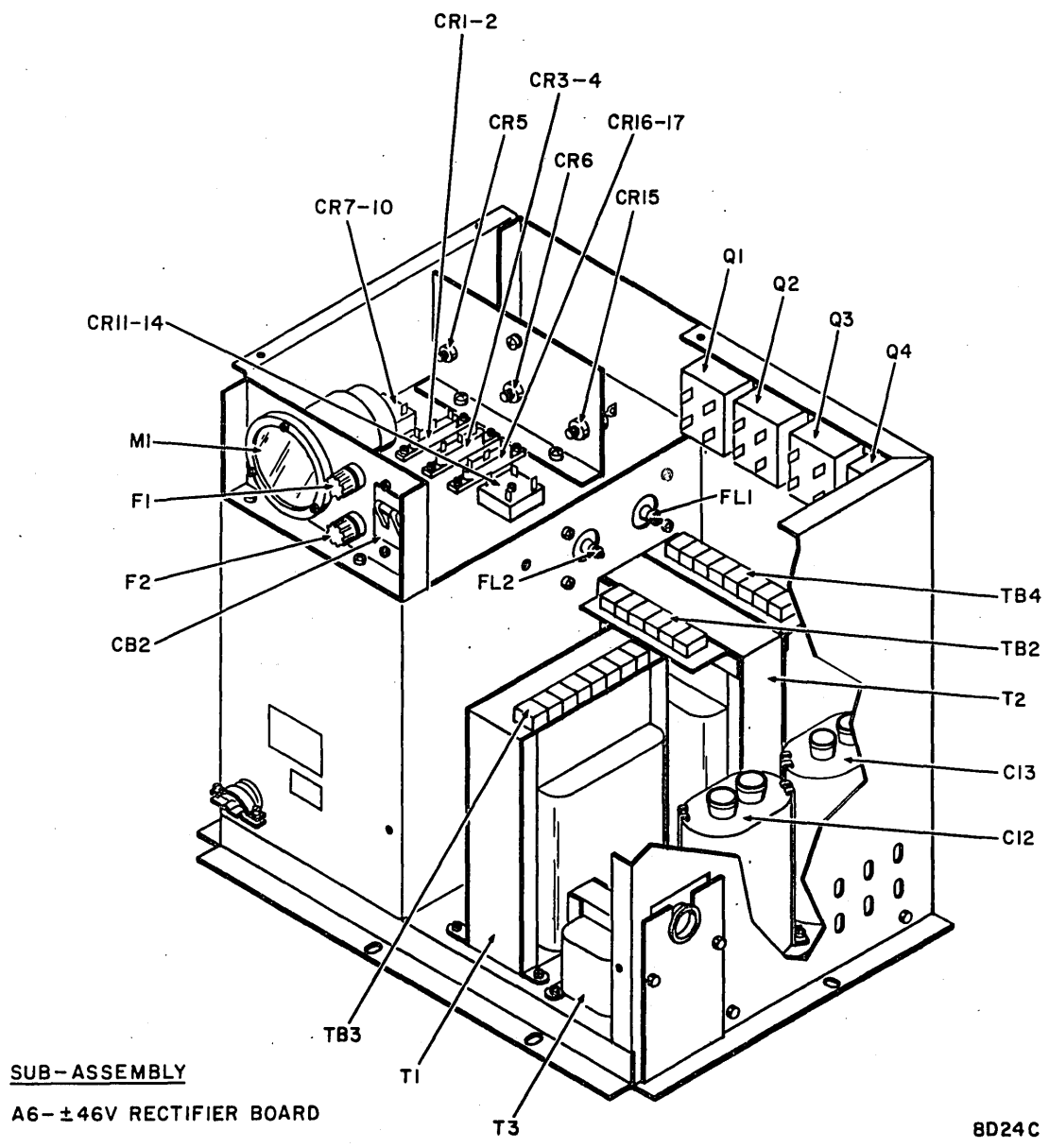


Figure 3-3. AC Power Supply Locator (A1 Power Supply)

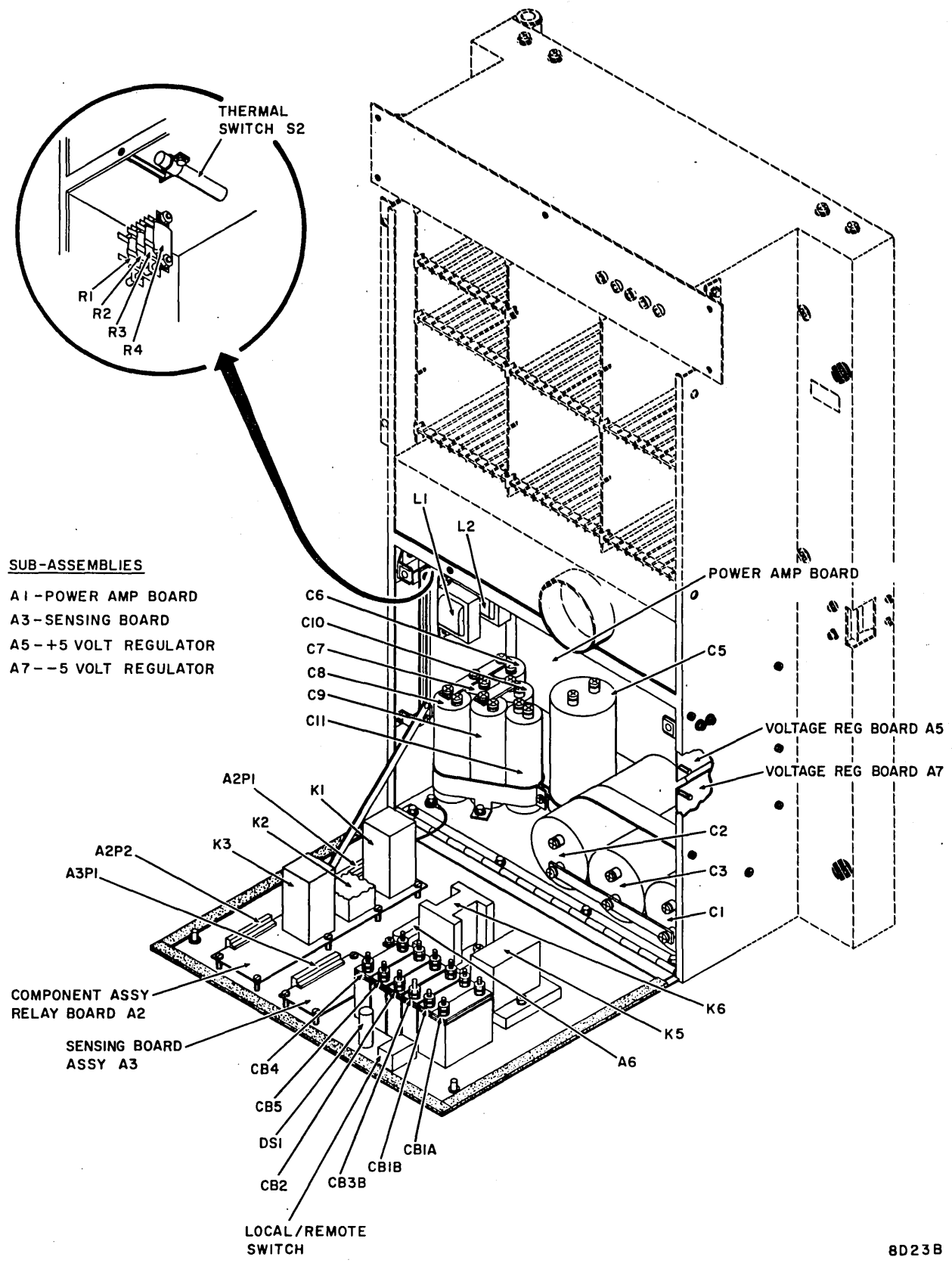


Figure 3-4. DC Power Supply Locator (A2 Power Supply)

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- d. Measure resistance from AlQ1-4 to ground. If not zero ohms, interlock wiring from ±5 circuit breakers is open or circuit breaker auxiliary contacts are defective. Proceed to step e.
 - e. Measure voltage across pins 1 and 2 of AlQ1. If not less than about 2v ac, AlQ1 is faulty (it should be acting as a closed switch). Otherwise, check ALT2 and its associated components.
 - f. This step applies if +5v is present in step a. Problem is caused by lack of operator panel lamp power. Measure from A2TB1-5 to ground. If +20v, check lamp driver logic. If not +20v, sensing board A2A3 (+5v sense) is not supplying power to lamps on operator panel; perform Data Protection Sensing Check.
 - g. This step applies if voltage other than +5v could be measured in step b. Problem is lack of +5v. Measure from A2TB1-3 to ground. If voltage is not +9v, check ALT2-8 for +9v; if absent, CR5, CR6 OR T2 may be suspected. If +9v is present at A2TB1-3, regulator A2A3 is faulty.
11. Turn on remaining circuit breakers.

NOTE

If any of the following conditions are not met, refer to Sequencing Safety Check for troubleshooting information.

12. Press START switch. If it does not light, check interlocks. Observe that the following occur:
 - a. Spindle motor starts.
 - b. First Seek Interlock motor starts.
13. After about 15 seconds, interlock motor must complete one revolution and stop. (When START was pressed, interlock motor may have been partially through one cycle because of other checks. This could cause two motor revolutions before motor stops or else drive belt may be slipping.)
14. Manually move actuator forward until heads loaded switch transfers.

15. Fully load heads on pack, then position them near ramp.
16. Reconnect yellow lead to voice coil. It should not retract. If it does, perform Data Protection Sensing Check. (Retract relay K5 is de-energized, causing emergency retract condition.)
17. Turn off UNIT POWER circuit breaker. Carriage must immediately retract (simulated emergency retract condition). If not, immediately retract heads manually to prevent them from crashing as spindle motor slows. Check retract relay K5 for sticking and check actuator for open coil or broken straps.

Output Voltages Check

Perform the following check with the drive performing continuous 32-track seeks. The ±5v power is adjusted in the Preventive Maintenance procedure. The ±20v, ±20Y, and ±46 voltages are not adjustable. With the exception of the ±46v and ±20Y power, all measurements should be made by connecting a voltmeter between the applicable test point and ground on the test point panel.

1. +20 (+2.4, -0.2) vdc.
2. -20 (-2.4, +0.2) vdc.
3. +5 (±0.05) vdc.
4. -5 (±0.05) vdc.
5. Measure +20Y by connecting positive lead to A2TB1-5 to ground. It must be +22 (±2.0) vdc. This terminal board is on the wire wrap side of the logic chassis.
6. Measure ±46 vdc at TB1 on the back of power amplifier assembly A1. Ground is available on A2ALT1-6.
 - a. +46 (±2) vdc at A2ALT1-2.
 - b. -46 (±2) vdc at A2ALT1-10.

Interlock Switches Check

This procedure verifies that the power interlock is functioning. The pack need not be installed. Proceed as follows:

1. Set LOCAL/REMOTE switch on power supply to REMOTE.

2. Turn on all circuit breakers.
3. Close all covers.

NOTE

Interlocks may be checked by three test points on terminal board (A2TB1) of wire wrap side of the logic chassis. These test points will be at ground potential if the following conditions are met:

- a. A2TB2-15 if circuit breakers auxiliary contacts are closed.
 - b. A2TB1-10 if condition a is met and if pack cover is closed.
 - c. A2TB1-14 if condition b is met and START switch is on.
4. Press START switch. Indicator must light; if not, check interlock test points specified in preceding note. If they are all at ground, remove lens and lamp; check socket for +20v and ground.
 5. Open pack cover. START indicator must go out; if not, pack cover interlock may be defective.
 6. Close cover and note that START indicator lights again.

Sequencing Safety Checks

This procedure verifies that the power sequencing interlocks and logic are functioning correctly. Start this procedure without a pack installed. Proceed as follows:

1. Open top cover from rear.
2. Remove deck cover.
3. Disconnect yellow lead from voice coil.
4. Turn on all circuit breakers.
5. Press (to light indicator) START switch.
6. Set LOCAL/REMOTE switch on power supply to LOCAL. Observe the following:
 - a. Drive motor does not start. If it does, check Pack On switch. If switch is not misadjusted or defective, proceed to step b.
 - b. If motor relay K3 is energized, logic is defective. (Motor must not start with pack off.)

7. Press (to extinguish) START.
8. Install pack and close cover.
9. Press (to light) START switch. Observe effects specified in steps 10 and 11.
10. Spindle motor must start. If not:
 - a. Check for ground at logic pin B12-9A. If at +20v, logic is faulty. If at ground, wiring or +5v sense of sensing board A1A3 is faulty. (The +5v sense is required to pull relays K2 and K3.
 - b. Check if relay K3 is energized. If motor is humming (trying to start), measure voltage across pins 1 and 2 of A1Q4. It should be low (about 1v); if high (about 100 vac), A1Q4 is defective or motor start capacitor is faulty.

If motor is not trying to start, check pins 1 and 2 or A1Q2 and A1Q3; they should also have low voltage drop. If all voltages are correct, motor may be faulty.
11. First seek interlock motor must start (with 15 seconds required for full motor cycle). If not:
 - a. Check A2TB4-8 for 24 vac to ground.
 - b. Check contacts of K2, K3, and interlock switch.
 - c. While performing previous checks, motor may have rotated partially through its cycle. It may first complete this partial cycle before beginning full cycle. If two cycles are required, the motor drive belt may be slipping (interlock motor cycles continue until speed enables relay K2).
12. After First Seek Interlock motor completes one cycle (15 seconds), it must stop. If not:
 - a. Speed detection logic may be faulty.
 - b. Relay K2 or interlock switch may be faulty.
 - c. If two or more cycles are required, malfunctions could be caused by drive belt slippage or low line voltage. Also, A1Q4 could be shorted, not allowing motor to attain full speed.

Motor will eventually become overheated, tripping DRIVE MOTOR circuit breaker. Normally, speed is attained before completion of first seek interlock cycle delay. This energizes K2 which, in turn, energizes Retract relay K5. If not up to speed before completion of first seek interlock cycle, speed detection enable is disabled by Speed Enable FF. K2 remains de-energized and another first seek interlock delay starts. Heads cannot load during first seek interlock delay.

13. When up to speed, manually move actuator forward until heads loaded switch transfers. Relay K6 must be energized. If not, switch is faulty or misadjusted.
14. Press (to extinguish) START switch. Motor must not stop because heads are still loaded. If it does, immediately retract heads to prevent crashing and check logic.
15. Move actuator to reverse stop. Observe that pack stops.
16. Reconnect yellow lead to voice coil.

Data Protection Sensing Check

This procedure verifies that the sensing function of board A1A3 is functioning to prevent writing capability during an emergency retract. It also checks the voltage and current fault detection. An emergency retract condition is also generated. With a pack installed, proceed as follows:

1. Open top cover.
2. Remove deck cover.
3. Disconnect yellow lead from voice coil.
4. Turn on all circuit breakers.
5. If necessary, press (to extinguish) START switch.

NOTE

While performing steps 6 and 7, observe operator panel indicators.

6. Set LOCAL/REMOTE switch to LOCAL. Indicators must not blink except for unit Number Indicator. Drive motor must not jerk.

7. Set LOCAL/REMOTE switch back to REMOTE. Indicators must not blink and drive motor must not jerk. If conditions of steps 6 and 7 are not met:

- a. Check transistors Q4, Q5, and Q7 (along with their associated circuitry) on board A2A3. This is +5v sense function. Lamp drivers and K3 also receive power from +5v sense circuit.
- b. If +9.7v power drops, this circuit should drop K3 power, to prevent write power during emergency retracts, before remainder of dc power decays.

8. Set LOCAL/REMOTE switch to LOCAL to enable dc power.

9. Discharge emergency retract capacitor by temporarily touching voice coil yellow lead to voice coil terminal. Make sure leadwire is disconnected.

CAUTION

While performing following step 10, move heads forward far enough to cause heads loaded switch to transfer, but not far enough so that heads contact each other. Otherwise, heads will be damaged.

10. Move actuator forward until heads load.
11. Fully retract heads.
12. Observe that SELECT LOCK indicator is on. It should be caused by current and -volt faults.
 - a. Current fault is result of write driving circuitry sensing that heads loaded switch is transferred and that write voltage (+20v) is off because Speed relay K2 is de-energized.
 - b. -Volt fault is sensed by A2A3-Q1 because heads are loaded and -16 volt emergency retract voltage is inadequate when switch first closes.
13. Reconnect yellow lead to voice coil.
14. Press SELECT LOCK switch to clear error.
15. Load disk pack. Press START to allow normal power-up first seek.

16. Turn off UNIT POWER circuit breaker. Observe that carriage immediately retracts. This is emergency retract function provided by A2C2 and normally-closed contacts of Retract relay K5.

Normal Retract Check

This procedure verifies that the sensing function of board A2A3 is functioning to allow the actuator to retract at the normal controlled velocity when system sequence power is dropped. A pack need not be installed. Proceed as follows:

1. Open top cover.
2. Set LOCAL/REMOTE switch to REMOTE.
3. Remove deck cover.
4. Make sure voice coil yellow lead is connected to its proper terminal.

CAUTION

While performing following step 5, move heads forward far enough to cause heads loaded switch to transfer, but not far enough so that heads contact each other. Otherwise, heads will be damaged.

5. Move actuator forward until heads load. An immediate hold back force should be encountered. If not:
 - a. Check for +5v at logic chassis test point panel. If absent, proceed to step b; if present, proceed to step c.
 - b. Check Q3 and its associated components on sensing board A2A3. This transistor holds 5v power on during a normal retract until the heads unload.
 - c. Fault is caused by K6 malfunctioning. When heads loaded switch transfers, K6 relay should charge retract capacitor A2C2 to -16v.

Speed Backup Check

This procedure verifies that the heads cannot load until speed is attained. This function is normally under logic control; however, if the primary speed detection logic fails, the speed backup should also prevent the heads from loading onto a slow pack. Proceed as follows:

1. Set LOCAL/REMOTE switch on power supply to REMOTE.
2. Verify that +20V indicator is on.
3. Open dc power supply front panel.
4. Remove protective cover from speed relay K2.

CAUTION

Perform step 5 gently to prevent damage to relay contacts.

5. Press K2 clapper. Verify that retract relay K5 does not energize. If it does:
 - a. Check A2A3P1-13 (drive motor interlock to sensing board A2A3). If not ground, motor centrifugal switch is malfunctioning. This switch should remain closed (providing ground) until motor speed exceeds about 2,000 rpm.
 - b. If test point in step a is ground, check Q6 and Q2 and their associated circuitry on board A2A3.
6. Replace relay K2 relay cover.
7. Close dc power supply.

SERVO SYSTEM CHECKS

Figure 3-5 is a simplified diagram of the servo subsystem. This illustration indicates the primary test points used for checking and aligning the servo loop along with a brief explanation of the various signals, their test points, and the applicable check-out procedure. Servo test point waveforms for various seek lengths are shown in Figure 3-6.

General Checkout Criteria

Of the procedures listed in Figure 3-5, only the procedures listed below are adjustments. The remainder are checks to verify proper operation.

- Velocity Gain Adjustment
- Coarse Position Gain Adjustment
- Integrator Gain Adjustment
- Fine Position Offset Adjustment

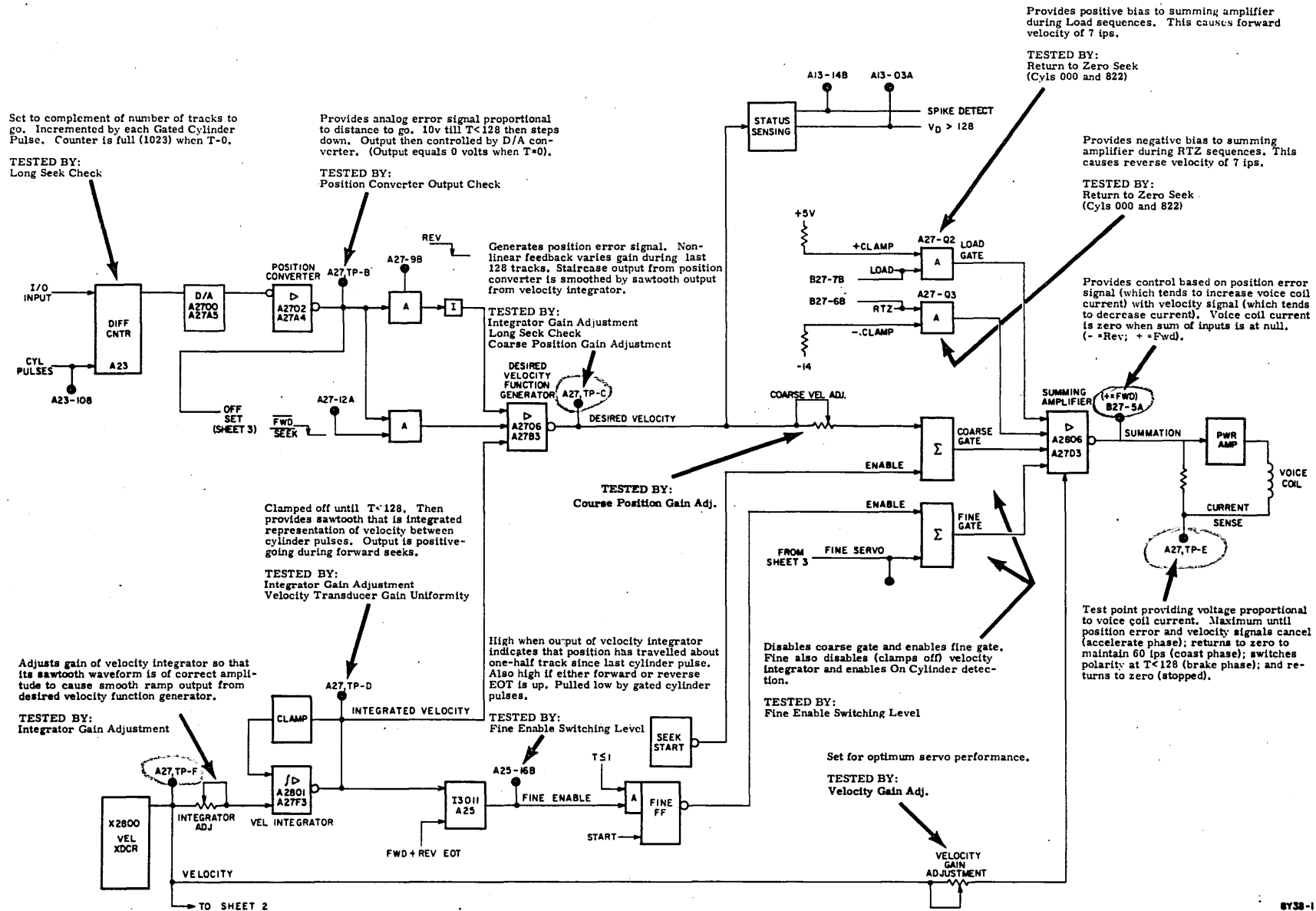


Figure 3-5. Servo System Test Points (Sheet 1 of 3)

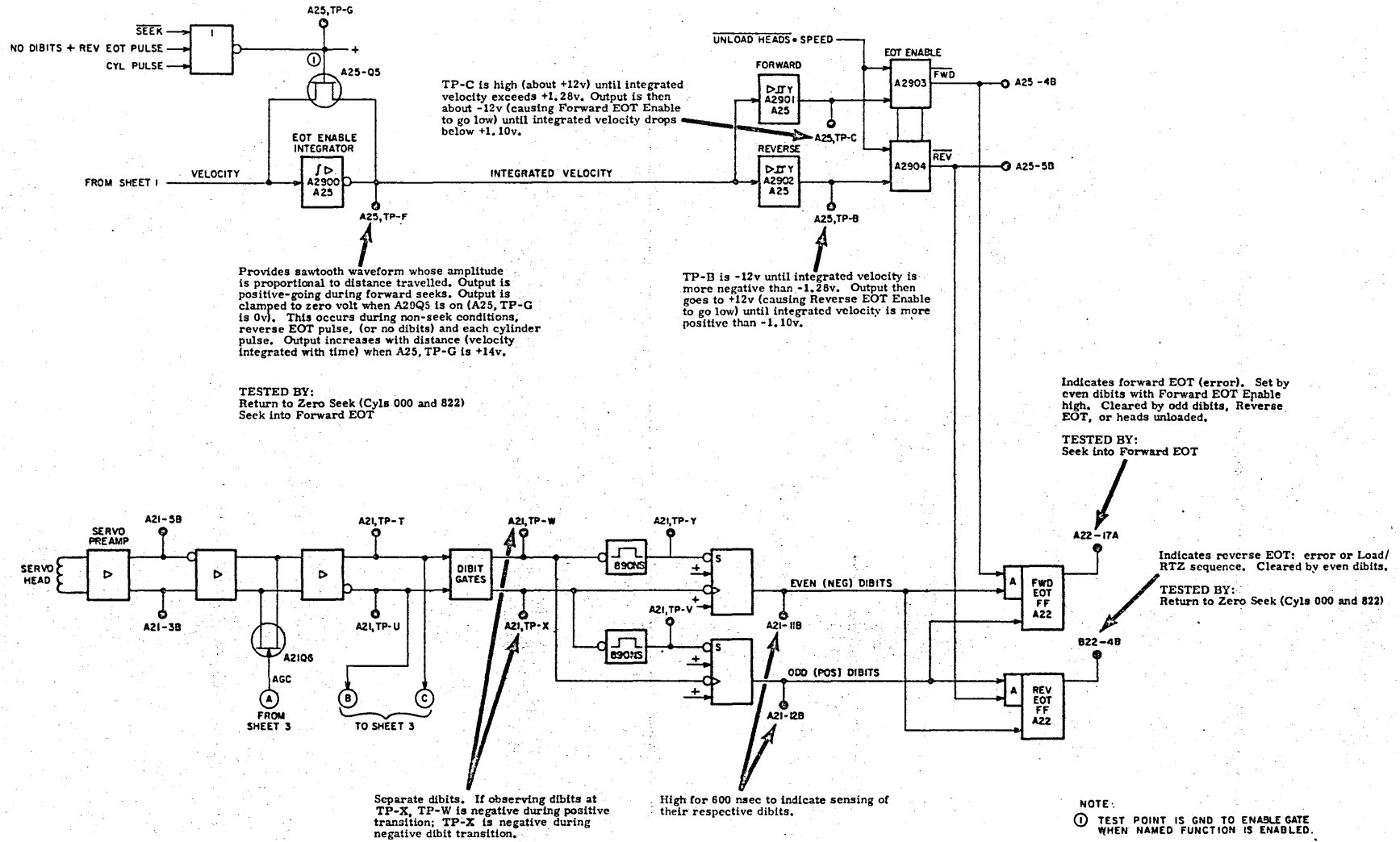


Figure 3-5. Servo System Test Points (Sheet 2 of 3)

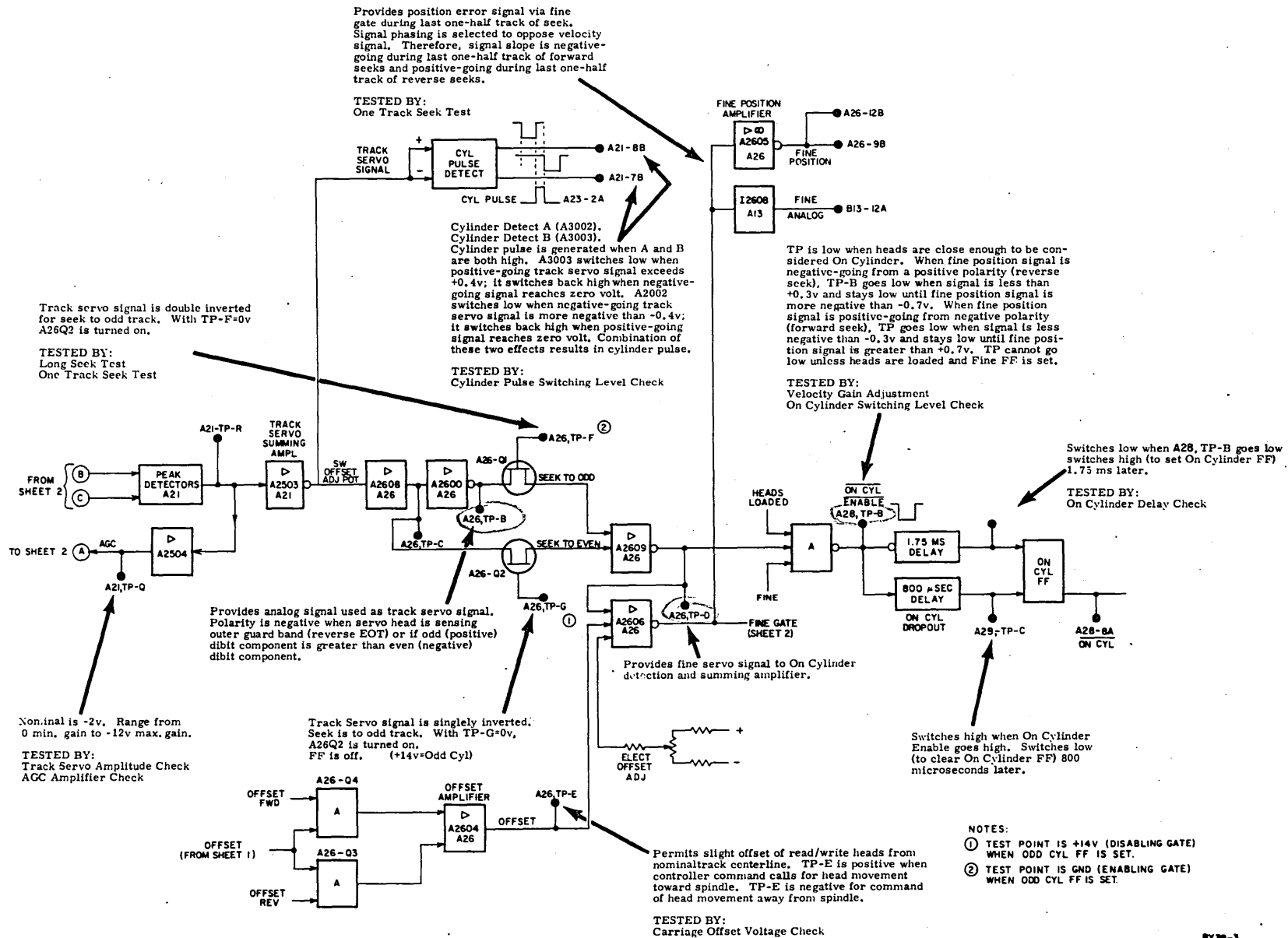
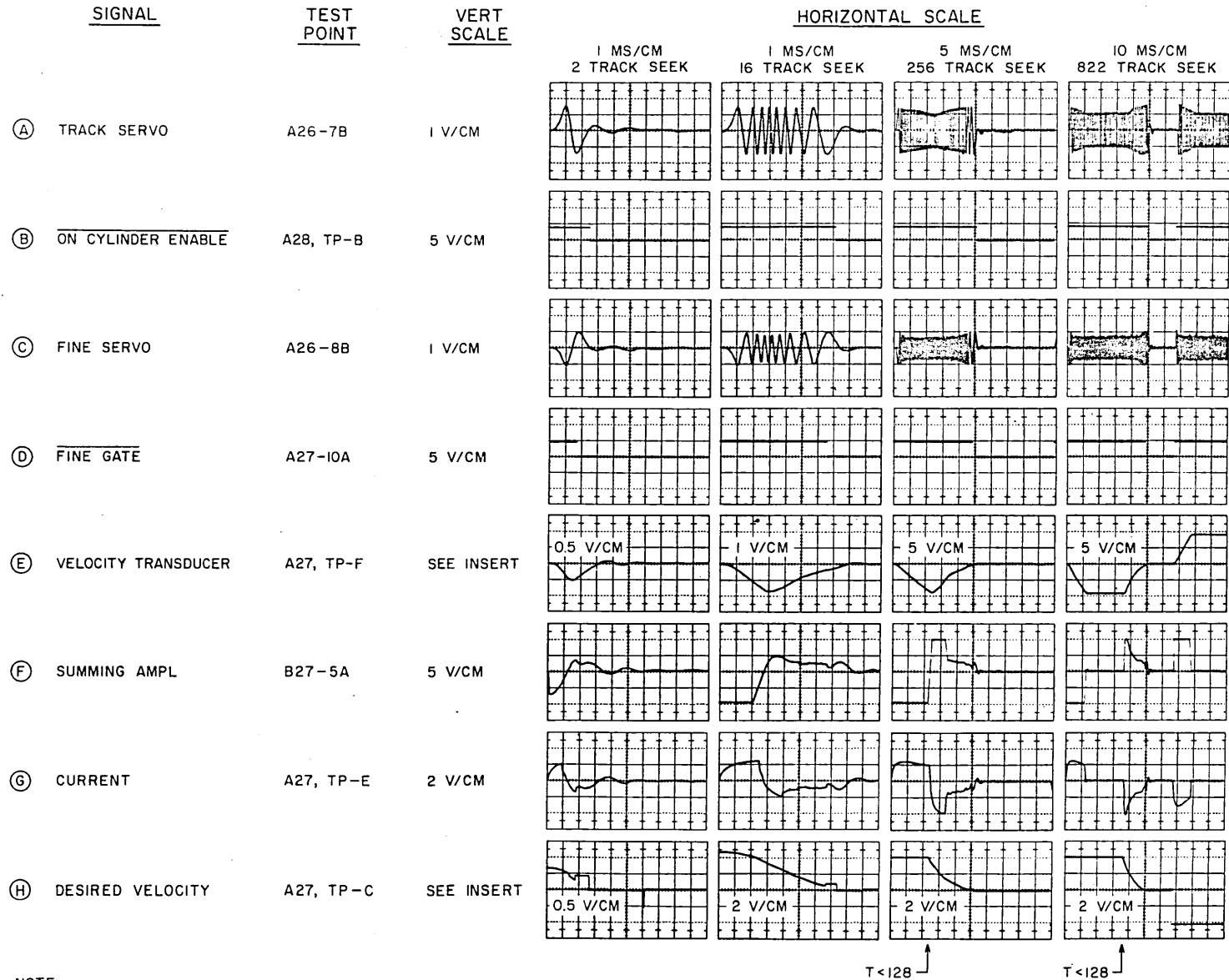


Figure 3-5. Servo System Test Points (Sheet 3 of 3)



NOTE:

1. SYNC (-) ON FORWARD SEEK (A27-12A)

T < 128

T < 128

8W6A

Figure 3-6. Forward Seek Waveforms

Because the subsystem is a closed loop servo, all of the signals are interacting. Therefore, misadjustments may cause seek difficulties that appear to be hardware malfunctions. Check all adjustments before initiating detailed trouble analysis procedures. All adjustments should be checked if any servo loop cards have been replaced. All adjustments must be made on a thermally stable unit with all panels and covers installed. For thermal stabilization, perform 15 minutes of 256-track repeat seeks.

Velocity Gain Adjustment

This procedure adjusts the gain of the velocity signal applied to the summing amplifier. The concept of this procedure is to adjust for track following capabilities.

1. Make sure all panels are installed and all covers closed.
2. Start spindle and allow heads to load.

NOTE

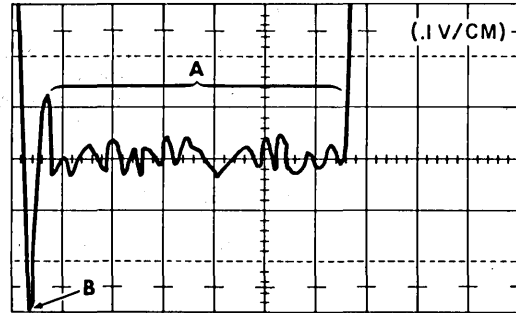
Perform 15 minutes of 256-track repeat seeks for thermal stabilization.

3. Enable square wave generator by connecting a wire from A26-01A to A26-16B.

NOTE

No FTU is required for this adjustment since all work is done at cylinder 00.

4. Sync scope on positive edge of A26, TP-Y (square wave generator).
5. Connect scope vertical to A26, TP-D (Fine Position, A2609). Set horizontal sweep to 5 ms/cm.
6. Adjust vertical position knob on scope to move trace up until area "A" in Figure 3-7 is centered on middle graduation on scope.
7. Adjust velocity gain pot (middle pot) on A27 until first overshoot (point "B" on Figure 3-7) is between 2 and 3 cm (200 to 300 mv) below center graduation on scope.
8. Adjust vertical position knob on scope to move scope trace down until area "C" (Figure 3-8) is centered on middle graduation on scope. The



8W7

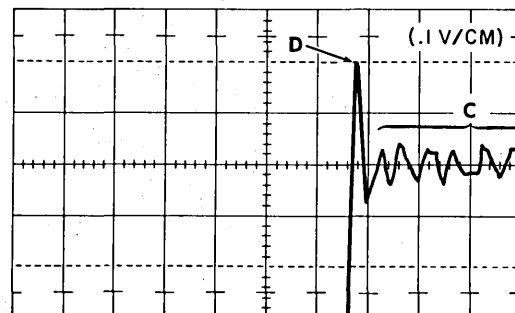
Figure 3-7. Velocity Gain Waveform (Preliminary)

first overshoot (point "D") must be between 2 and 3 cm (200 to 300 mv) above the center graduation on the scope. If scope trace is too high or too low, readjust velocity gain pot so that both positive (point "D", Figure 3-8) and negative (point "B", Figure 3-7) overshoots have at least an 80% occurrence within 200 to 300 mv.

9. When adjustment is complete, remove wire used to enable square wave generator.
10. Perform Coarse Position Gain Adjustment immediately.

Coarse Positions Gain Adjustment

1. Command a 256-track continuous seek. Each seek must be followed by a R/W function of at least one track.



8W8

Figure 3-8. Velocity Gain Waveform (Final)

NOTE

If smoothness checks causes faults, perform integration adjustment first, or ground A13-14B until the coarse gain and integrator are both adjusted.

2. Sync negative on A27-12A.
3. Connect oscilloscope to A26,TP-D and A27,TP-E.
4. Set Horizontal sweep to 10 ms/cm magnified by 5.
5. Adjust coarse position gain (top pot) on A27 so that point A (Figure 3-9) lies between the 14th and 15th negative pulses. Allow the drive to access at this adjustment for 1 minute to allow temperature stabilization. Readjust if necessary.
6. Proceed to Integrator Gain Adjustment and then return to this adjustment. Repeat until both adjustments meet their respective limits.

Integrator Gain Check and Adjustment

This procedure must always be done in conjunction with the Coarse Position Gain Adjustment.

1. Command 128-track continuous seeks between cylinder 000 and 128.
2. Sync negative on A27-11A.

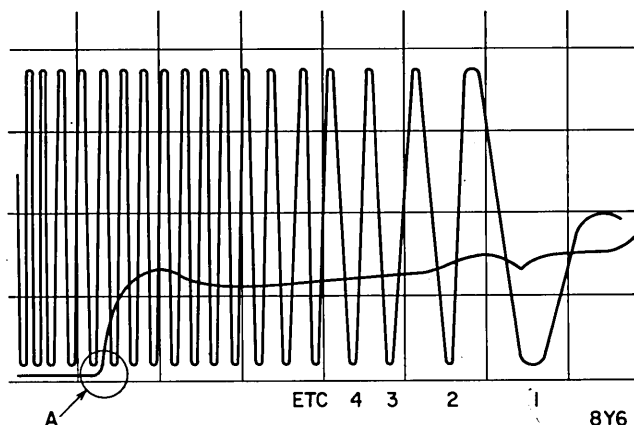


Figure 3-9. Coarse Position Gain Waveform

3. Connect oscilloscope to A27,TP-C (observe both positive and negative wave shapes).
4. Set horizontal sweep to 15 ms/cm magnified by 5.
5. Check continuity at point marked on Figure 3-10 for less than 30 mv. (If Coarse Position Gain Adjustment was performed previously it is not necessary to repeat the test.)
6. Adjust integrator gain pot (bottom pot) on A27 until discontinuity at the point marked on Figure 3-10 is at a minimum. This minimum must be less than 30 mv.
7. Proceed to Coarse Position Gain Adjustment procedure.

Servo Margin Test

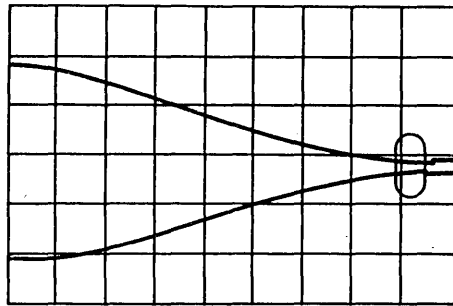
This procedure is intended to be a troubleshooting aid and not an adjustment procedure. Perform this test after adjusting the velocity gain, coarse position gain, and integrator gain.

1. Adjust coarse position gain (top pot on A27) so that point A (Figure 3-9) lies on 7th pulse.
2. Perform five minutes of random access seeks (no read/write function). No access errors should occur.
3. Access errors indicate:
 - a. Velocity gain misadjusted.
 - b. Velocity transducer defective. (Excessive velocity drift causes point A on Figure 3-9 to drift to first pulse.)
 - c. Defective servo cards (MRV or MSV).
 - d. Defective servo head.
4. Readjust coarse position gain (top pot on A27) so that point A (Figure 3-9) lies between 14th and 15th negative pulses.

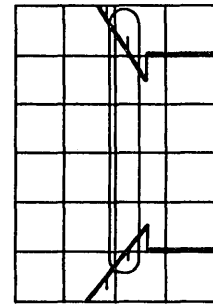
On Cylinder Delay Check

This procedure is intended as a useful troubleshooting aid and is not an adjustment.

1. Command a one-track continuous seek.
2. Connect oscilloscope to A28,TP-B and A28-8B.



A27, TP-C
2V/CM 0.2V/CM



8R18

Figure 3-10. Velocity Integrator Waveforms

3. Sync positive on A28,TP-B and measure time A28,TP-B is a logical 1 (4.75 ±0.5 ms).
4. Sync positive on A28,TP-B and measure time A28-8B is a logical 0 (7.0 ±1.0 ms).

Fine Position Test

NOTE

Runout is the degree to which a rotating object rotates off center. Too much runout causes the object to wobble or vibrate.

This test checks the track following capability of the drive and runout of the spindle. Runout of the pack and spindle are additive, therefore a pack with known characteristics must be used (preferably a CE pack).

1. Load heads.
2. Sync positive on Index B11-12B (X3401).
3. Connect oscilloscope to A26-TPD (Fine Position Signal). Set sweep rate to 2 ms/div.
4. Perform direct seek to cylinder 200.

NOTE

The signal measured in step 4 is the 60 Hz component of the displayed waveform. The waveform in Figure 3-11 is typical and may vary from drive to drive.

5. Observe waveform on scope. The average peak-to-peak value of the

observed waveform should not exceed the requirements of Figure 3-11. If value exceeds requirements, go to step 8. If value is within requirements, go to step 6.

6. Remove pack, rotate pack 90 degrees and install pack.
7. Observe waveform on scope. The average peak-to-peak value should not exceed requirements of Figure 3-11. If value exceeds requirements, go to step 11. If within requirements, go to step 8.
8. Observe waveform on scope to determine where Fine Position signal synchronizes with Index.
9. Remove pack, rotate pack 90 degrees and install pack.

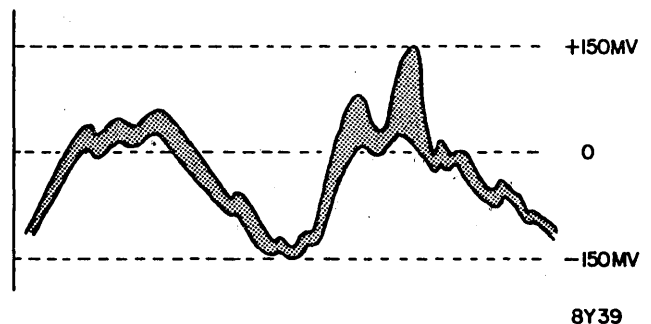


Figure 3-11. Fine Position Gain Waveform

NOTE

The point at which Index and the Fine Position signal synchronizes may be different from pack to pack. However, the sync point must be the same for the pack under test, no matter how many times the pack is removed, rotated, and installed on the spindle.

10. Observe waveform on scope to determine where Fine Position signal synchronizes with Index. If sync point coincides with sync point determined in step 8, go to step 11. If not, go to step 12.
11. Check waveform amplitude requirements of Figure 3-11. If observed waveform exceeds limits, the problem is too much pack runout. Replace pack with a known good pack and repeat this procedure. If waveform is now within limits, test is complete.
12. If unable to get waveform to synchronize on Index at same position of waveform by rotating pack, problem is a defective spindle or servo head. Replace servo head or spindle and retest.

Fine Position Offset Check and Adjustment

1. Connect FTU to drive.
2. Mount CE pack P/N 70430001 in drive.
3. Press WRITE DISABLE switch.
4. Press (to light) START switch.

NOTE

Perform 15 minutes of 256-track repeat seeks for thermal stabilization.

5. Command a direct seek (access only) to cylinder 8. Set Read/Write-Servo switch on FTU to Servo position. Set P-N switch on FTU first to P position (note meter reading) then to N position (note meter reading). Subtract N from P algebraically.
6. Record meter reading with the POS/NEG switch in the P position.
7. Record meter reading with the POS/NEG switch in the N position.
8. Calculate (P-N) value. Determine and note the direction of error by pushing lightly on the carriage while

watching the meter. POS/NEG meter readings will converge as zero error is approached.

9. Repeat steps 6 through 8 to calculate P-N value for cylinder 490, 491, 8 and 800. The drive will meet the following requirements.
 - a. P-N reading at track 490 (20 mv max.).
 - b. P-N reading at track 491 (20 mv max.).
 - c. P-N reading at track 8 (20 mv max.).
 - d. P-N reading at track 800 (20 mv max.).
 - e. Even/Odd track error at track 490/491 (20 mv max.).

EXAMPLE: Add reading at 490 to reading at 491 if directions are unlike to obtain step e value.

491	10R	
490	15F	25 mv

or Subtract reading at 490 from reading at 491 if directions are like to obtain step e value.

491	40F	
490	25F	15 mv

10. Perform the following adjustments at cylinder 490 only if the requirements in step 9 were not met.
 - a. Seek to cylinder 490. Calculate P-N readings and record error and direction of error.
 - b. Seek to cylinder 491. Calculate P-N readings and record error and direction of error.
 - c. Adjust bottom pot on A26 so that error (calculated in a and b) on tracks 490 and 491 are of equal amplitude and opposite direction.
 - d. Adjust top pot on A26 so that error in step c on tracks 490 and 491 is less than 2 mv.

Seek Timing Checks

The seek timing checks verify correct over-all loop operations. These tests are not necessarily requirements. Failure to pass

any of these tests, however, indicate potential degraded performance that may cause difficulties at a later time.

Long Seek Test

1. Connect oscilloscope to A28-8A (On Cylinder, I3108).
2. Sync positive internal.
3. Command continuous 823-track seeks.
4. Waveform must be "1" for 55 ms maximum.

One Track Seek Test

1. Connect oscilloscope to A28-8A (On Cylinder, I3108).
2. Sync positive internal.
3. Command continuous one-track seeks.
4. Observe waveform through at least 80 tracks of seek. Waveform from start of seek (starting at "1") until it goes to "0" must be 6 to 10 ms.

Return to Zero Seek from Cylinder 000

1. Connect oscilloscope to A28-8A (On Cylinder, I3108).
2. Sync positive internal.
3. Command direct seek to cylinder 000.
4. Command RTZ. Waveform must be "1" for 15 (± 5) ms.

Return to Zero Seek from Cylinder 822

1. Connect oscilloscope to A28-8A (On Cylinder, I3108).
2. Sync positive internal.
3. Command direct seek to cylinder 822.
4. Command RTZ. Waveform must be "1" for 300 (± 50) ms.

Seek Into Forward EOT

1. Connect oscilloscope to A28-8A (On Cylinder, I3108).
2. Sync positive internal.
3. Command direct seek to cylinder 822.

4. Command one-track forward seeks.
5. Waveform must be "1" for 20 (± 5) ms.
6. Command RTZS to clear error.

Velocity Transducer Linearity Test

1. Connect channel A of oscilloscope to A27,TP-F (Velocity Feedback,A2801). Connect channel B to A27,TP-D (Velocity Integrator, A2803).
2. Sync negative external on A22-7B (Forward).
3. Command a one-track repeat seek between tracks 000 and 001.
4. Note approximate location of integrator peak with respect to position of velocity peak.
5. Repeat test between tracks 821 and 822. Timing relationship of step 4 should be approximately the same as step 5.

Track Servo Logic Checks

These tests check the logic associated with the track servo. The tests are applicable only if the adjustments could not be made or if troubleshooting a malfunctioning drive.

Track Servo Amplitude Check

This test checks the amplitude of the track servo signal output of the servo preamp.

1. Disconnect voice coil yellow lead-wire.
2. Manually load heads with pack up to speed.
3. Connect oscilloscope channel A vertical input to B21-3B; channel B to B21-5B. (Track Servo preamp output.)
4. Invert channel A and add algebraically. Sync internal.
5. Move carriage and monitor maximum signal points (between tracks).
6. Peak-to-peak amplitude of waveform must be 2.0 (± 1.0) volts.

AGC Amplifier Check

This test verifies that AGC amplifier and the AGC voltage are working correctly.

1. Disconnect voice coil yellow leadwire.
2. Manually load heads with pack up to speed.
3. Extend A21.
4. Connect oscilloscope channel A vertical input to A21,TP-T; channel B to A21,TP-U.
5. Invert channel A and add algebraically. Sync internal.
6. Observe waveform similar to Figure 3-12. Move carriage to position near cylinder 000 so that horns (one set positive, other set negative) are of equal amplitude. Carriage is now on cylinder. Peak-to-peak voltage must be 1.0 (± 0.25) volt.

Cylinder Pulse Switching Level Check

It is not necessary to perform the remainder of the procedure if the requirements of steps 1 through 4 are met.

1. Sync external negative on A22-7B (Forward).
2. Connect oscilloscope vertical input to A23-2A (Cylinder Pulses, I3007).
3. Command continuous 4-track seeks. Check for series of positive-going 10 μ sec cylinder pulses. (Depending on system alignment, last pulse may be 1.2 μ sec.)
4. Command continuous seeks of varying lengths. Verify that pulses are consistently generated during long seek lengths. (Track servo signal amplitude decreases with increasing velocity.) Proceed to step 5 if requirements of steps 3 or 4 are not met.

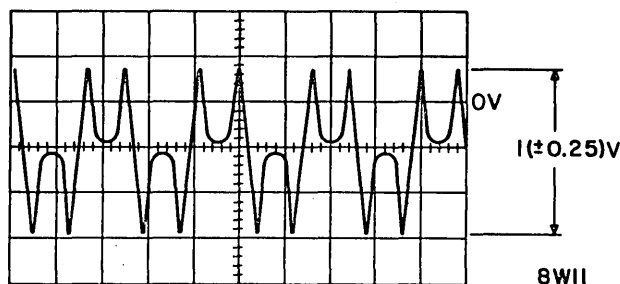


Figure 3-12. Track Servo Amplitude

5. Connect oscilloscope vertical input to A26,TP-B (Track Servo Signal).
6. Sync negative on A21-8B (Cylinder Detect A).

NOTE

The following steps may be accomplished by moving positioner manually with voice coil yellow leadwire disconnected or by commanding 3-track continuous seeks.

7. Check that servo signal is +0.4 (± 0.1) volt at beginning of sweep.
8. Sync positive. Check that servo signal is 0 (± 0.1) volt at beginning of sweep.
9. Sync positive on A21-7B (Cylinder Detect B, A3002). Check that servo signal is 0 (± 0.1) volt at beginning of sweep.
10. Sync negative. Check that servo signal is -0.4 (± 0.1) volt at beginning of sweep.
11. If requirement of steps 7 through 10 are met, extend A23 and check delay X3001.

On Cylinder Switching Level Check

This procedure verifies that On Cylinder is enabled when the fine position signal approaches null with the Fine FF set.

1. Disconnect yellow leadwire from voice coil.
2. Manually load heads with pack up to speed.
3. Connect oscilloscope to A26,TP-D (Fine Position, A2601).
4. Sync positive on A28,TP-B (On Cylinder Enable).
5. Calibrate scope to ground.
6. Slowly move carriage manually (take care not to enter either EOT area as this disables the level detection). Two erratic horizontal waveforms will be displayed. Check that waveforms at beginning of track are +0.70 (± 0.05) volt and -0.70 (± 0.05) volt.
7. Sync negative and recalibrate trace to ground.

- Slowly move carriage manually (take care not to enter either EOT area as this disables the level detection). Check that horizontal waveforms at beginning of sweep are $+0.30 (\pm 0.05)$ and $-0.30 (\pm 0.05)$ volt.

Velocity Logic Checks

These tests check the logic associated with the desired velocity logic. The tests are applicable only if the adjustment could not be made or if troubleshooting a malfunctioning drive.

Position Converter Output Check

The Position Converter Output should be clamped until $T < 128$. The remaining tracks of the seek are under control of the D/A converter.

- Command continuous 192-track seeks.
- Connect channel A to A27, TP-B (D/A Converter output, A2702).
- Sync negative on A22-7B (Forward, I1911). Set sweep time to 1 ms/cm.
- Observe waveforms similar to Figure 3-13.
- At $T=128$ DA output is 10 volts. It then steps down with each track to control converter output.

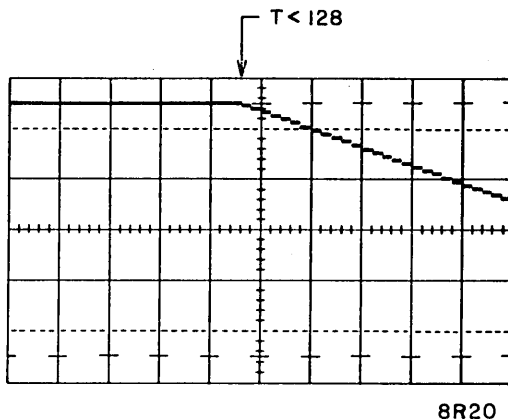


Figure 3-13. Position Converter Output Waveform

Velocity Transducer Gain Uniformity

- Command 822-track continuous seeks.
- Sync positive on B23-5B ($T < 128, I2437$).
- Connect oscilloscope vertical input to A27, TP-D (Integrated Velocity, A2803).
- Observe waveform similar to Figure 3-14. Adjust triggering controls to observe both negative and positive ramps. Ramps represent integrated velocity sawtooth during last 127 tracks of seek. Positive ramps are forward seek; negative ramps are reverse seek.
- Check voltages of next to last position and negative ramps. Their amplitudes must be $2.0 (\pm 0.2)$ volts. Also, these voltages shall be equal (the difference of their absolute values) within 0.3 volt. If not:
 - Perform Integrator Gain Adjustment.
 - Repeat this procedure. If it still fails, replace velocity transducer.

Fine Enable Switching Level

This procedure verifies that fine enable switches in at the proper level. This signal, along with $T < 1$, should set the Fine FF.

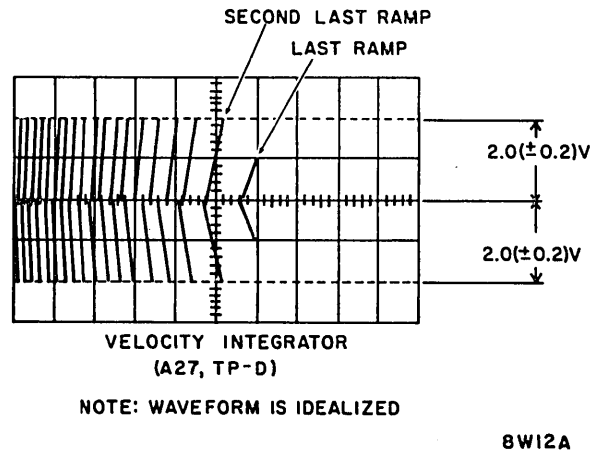


Figure 3-14. Velocity Transducer Gain Uniformity Waveform

1. Load heads and command continuous one-track seeks.
2. Sync negative on A22-7B (Forward).
3. Connect channel A to A27-10A (Fine, K2800).
4. Connect channel B to A27-TP-D (Integrated Velocity, A2803).
5. Check that Fine switches to 0v when integrated velocity signal is 0.90 (± 0.10) volts. See Figure 3-15.
6. Sync positive on A27-12A and repeat procedure.

MISCELLANEOUS LOGIC CHECKOUT

Clock/Index Timing

This procedure verifies correct operation of the 806 kHz clock and the Index timing. Proceed as follows with a pack installed.

1. Load heads.
2. Connect oscilloscope channel A to B10-11B (Odd + Even Dibits).
3. Connect oscilloscope channel B to B10-9B (806 kHz Pulses).
4. Observe that waveforms are synchronous. (Dibits are not present during Index detection portion of disk.) If not, check clock circuit at B10.
5. Connect oscilloscope to B11-12B (Index). Observe that signal is "1" for 2 μ sec (± 0.5). If not, check Index Detection circuit at A11.

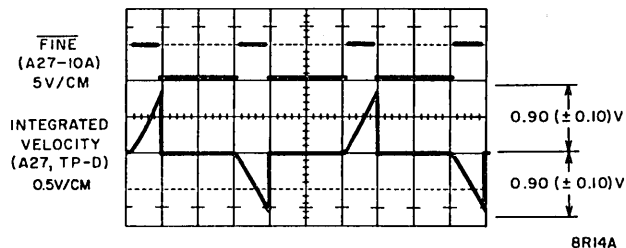


Figure 3-15. Fine Enable Switching Level Waveform

Start/Stop Time

This procedure verifies correct operation of the spindle drive motor and hysteresis brake. Use a stopwatch or wristwatch with sweep second hand. With a pack installed and all covers closed, proceed as follows:

1. Connect oscilloscope to back panel pin B12-6A (Up to Speed, Z800). Sync positive internal.
2. Press START switch and start timer. Observe the following results:
 - a. Up to Speed should be "1" in 10 (± 5) seconds.
 - b. Heads should load when first seek interlock cycle is completed in 15 (± 2) seconds.
3. Press START switch. Pack should come to complete stop in less than 20 seconds.

Speed Sensing

This procedure verifies correct operation of the speed detection function. Proceed as follows with a pack installed.

1. Load heads.
2. Connect oscilloscope to back panel pin B12-7B (Speed Transducer Output). Sync negative internal. Calibrate scope trace to ground.

NOTE

Observed waveform in following step must first go positive, then negative with respect to ground. If not, check sensor wiring.

3. Observe waveform on oscilloscope. Signal should be 4 to 7v peak-to-peak. If not, check sensor gap as directed in Speed Sensor Assembly Check and Adjustment procedure in Corrective Maintenance section.
4. Connect oscilloscope to A12-TPG (Speed pulses, X800). Sync positive internal.
5. Observe that signal is "1" for 55 (± 14) μ sec.

Power Up Clear

This procedure verifies that the internal Master Clear is operational during startup conditions. A pack need not be installed.

1. Turn off UNIT POWER circuit breaker.
2. Connect oscilloscope channel A to +5 test point on logic chassis maintenance panel. Sync positive internal.
3. Connect oscilloscope channel B to back panel pin D18-12A (Power Up Blanking, I701).
4. Turn on UNIT POWER circuit breaker while observing oscilloscope.
 - a. Channel A (+5v) should reach +4.5v within 100 ms. If not, check power supply and regulator A2A2.
 - b. Channel B pulse width ("1") should be 150 (+50) ms. If not, check delay D700 on card at C18.

MECHANICAL CORRECTIVE MAINTENANCE

ACTUATOR REPLACEMENT

CAUTION

The magnetic field generated by the magnet assembly is very strong. Permanent watch damage will occur if brought near magnet.

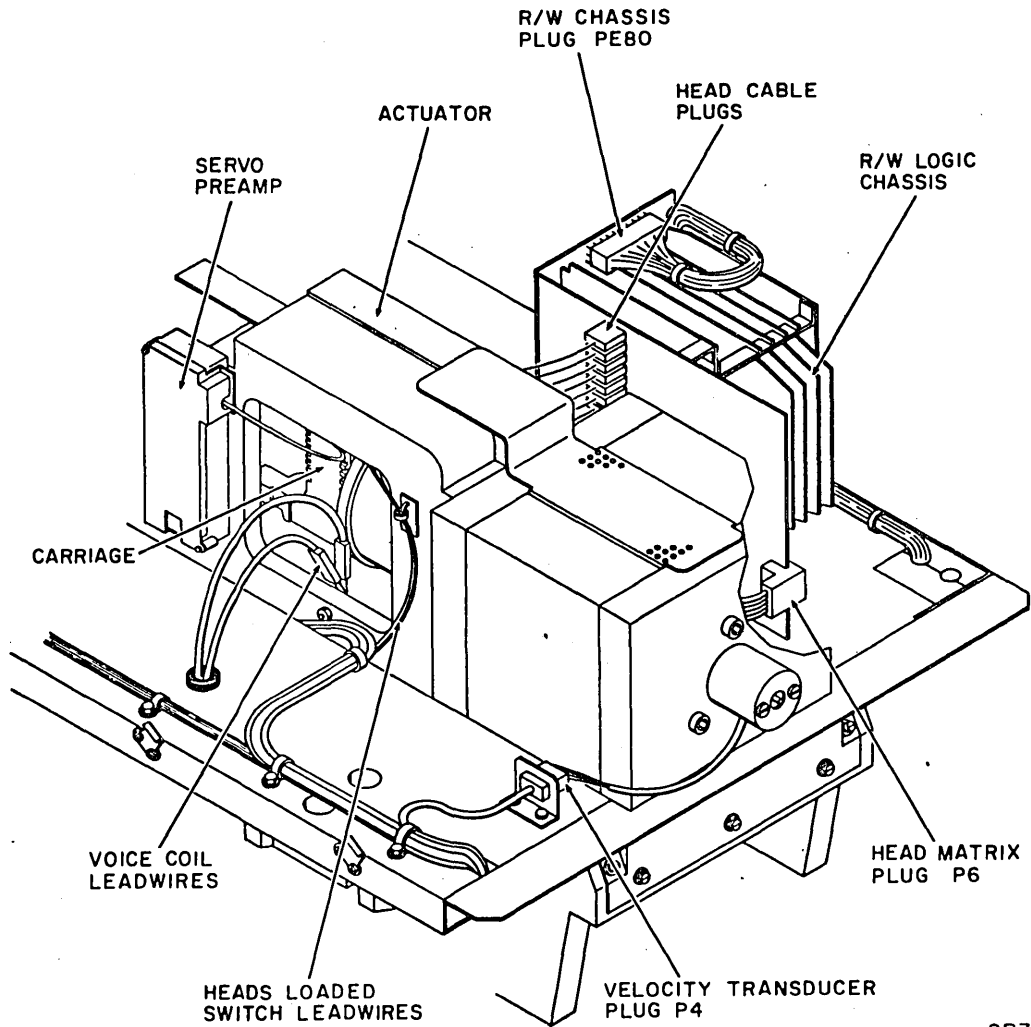
1. Set UNIT POWER circuit breaker to OFF.
2. Remove disk pack.
3. Refer to Side Panel Removal/Installation procedure and remove right (viewed facing drive front) side panel.
4. Open cabinet top cover.
5. Remove deck top cover.
6. Make note of voice coil leadwire connection scheme and disconnect leadwires.
7. Remove velocity transducer plug P4.
8. Leadwires to heads loaded switch are fastened to actuator side with a cable tie. Cut cable tie to free leadwires.

9. Make note of heads loaded switch leadwire connection scheme. Disconnect leadwires.
10. Remove two screws securing servo preamp housing cover (Figure 3-16). Remove and set cover aside.
11. Disconnect servo head plug and servo output plug P8 from servo preamp circuit board. Write "SERVO" on servo head plug.
12. Remove head cable plugs from card E0 (mark each plug in sequence removed from top plug "0" to last plug "17").
13. Remove head/arm assemblies starting at top of carriage (refer to Head/Arm Replacement procedure).
14. Refer to Velocity Transducer Replacement procedure and remove velocity transducer.
15. Remove two screws securing forward stop plate to stop mount (Figure 3-17).
16. Remove screw securing actuator to magnet assembly.
17. Remove three screws (under deck) securing magnet assembly to deck (screw above motor mounting plate cannot be completely removed, allow screw to rest on motor mounting plate).
18. Fully extend carriage.

CAUTION

When removing magnet assembly, use care not to damage voice coil. Do not place magnet on or near any metal because it will be almost impossible to separate the two. Preferably place magnet on a wooden table, free of any metal filings or other metallic objects.

19. Remove magnet assembly from deck by sliding assembly straight back from voice coil.
20. Loosen two screws holding heads loaded switch bracket and remove switch.
21. Remove nut and screw holding flexible conductor to actuator housing. Back carriage out of actuator housing.
22. Using 3/16 inch ball ended hex driver, remove five screws and washers securing actuator to deck.



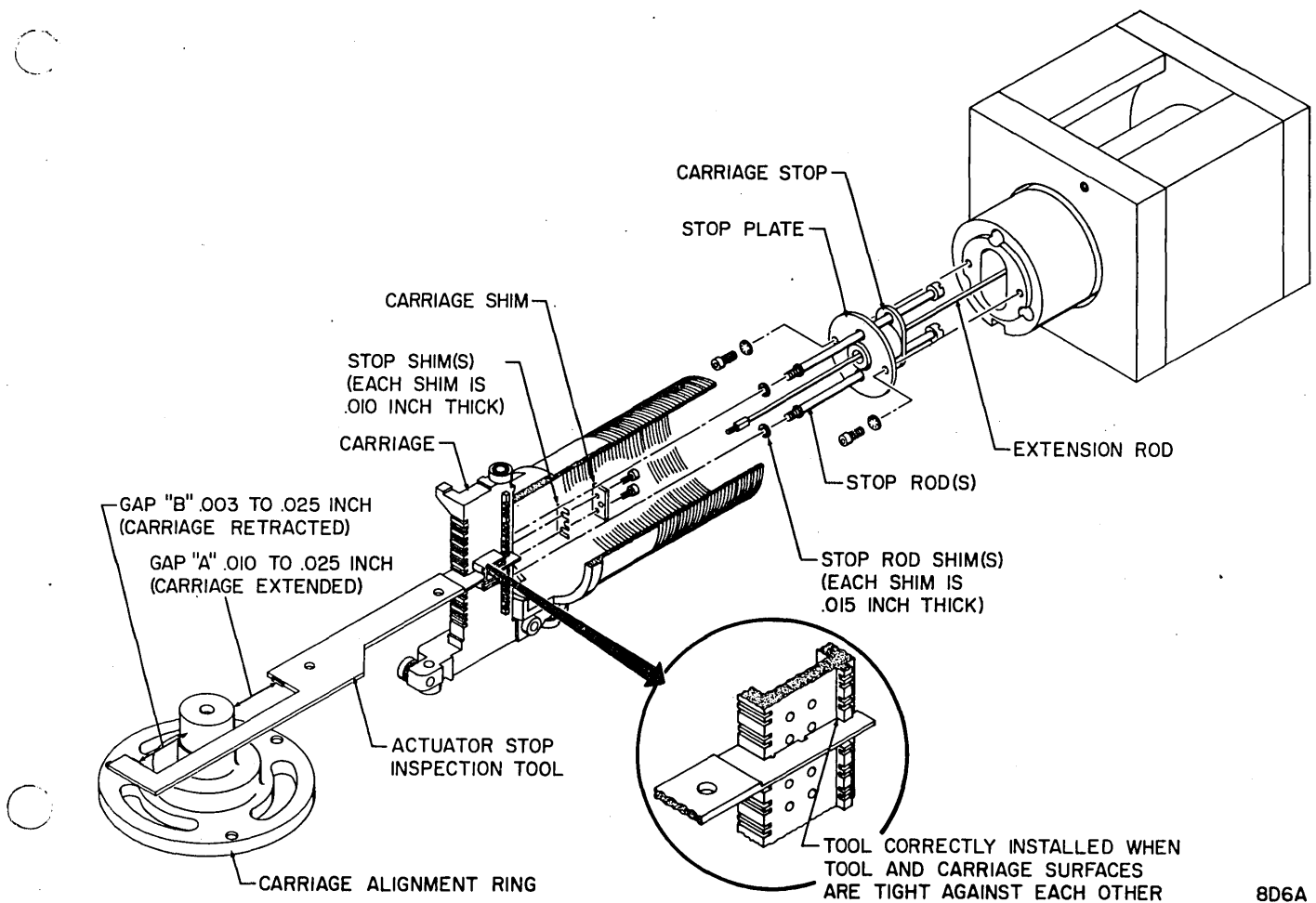
8R7

Figure 3-16. Main Deck Topside

NOTE

The actuator is mounted on a dowel pin. Lift actuator off dowel pin, and pull back to remove.

23. Remove actuator assembly to a clean work area.
24. Remove two screws securing servo preamp housing assembly to actuator. Remove and install servo preamp housing on replacement actuator.
25. Refer to Figure 3-17 and inspect replacement actuator for presence of stop rod shims. If no shims were installed, proceed to step 26. If shims are installed, proceed to step 28.
26. Remove stop rods and install two stop rod shims (from shim assortment, see Table 3-1) on each stop rod.
27. Apply one drop of Loctite, Grade C, to threads of each stop rod. Secure stop rods to carriage assembly.
28. Remove screw and nut securing flexible conductor to replacement actuator housing and back carriage out of housing.
29. Install replacement actuator housing on deck. Use five screws to loosely secure actuator to deck. Visually center front screw in its hole by rotating housing on its dowel pin. Torque five screws to 60 in-lbs. using torque wrench, hex bit, and hex bit socket.



8D6A

Figure 3-17. Carriage Stop Adjustment

CAUTION

Do not loosen any of the socket head screws securing rails to actuator housing. The rails can only be adjusted at the factory.

30. Clean feet of rail adjustment tool and pads of deck. Place rail adjustment tool on deck (Figure 3-18) and measure flatness of top of lower rail as follows:

- a. Move indicator from 0.38 inch in front of front screw back to front eccentric (Figure 3-19). Total deviation must not exceed three small divisions (0.000060 inch).

- b. Move indicator from 1.25 inch in front of rear eccentric to 1.0 inch in back of rear eccentric. Total deviation must not exceed three small divisions (0.000060 in.).

If requirements are met, proceed to step 32. If not, proceed to step 31.

31. If either or both requirements are not met, adjust as follows:
 - a. Remove tool and loosen lock nut on eccentric that requires adjustment (both if necessary).
 - b. Replace rail tool and turn eccentric with a screwdriver to adjust flatness. Repeat for other eccentric if required.

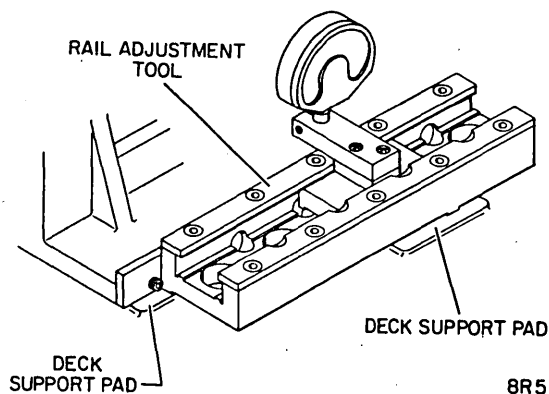
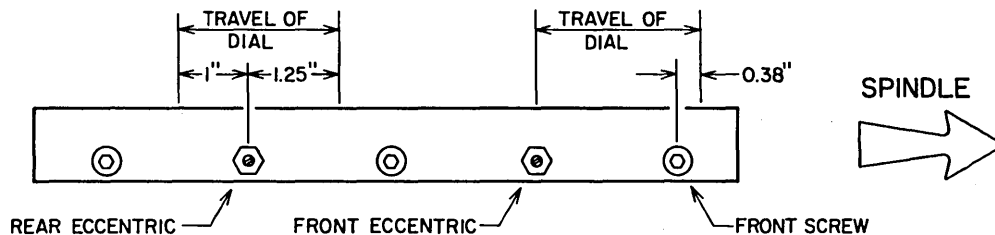


Figure 3-18. Rail Adjustment Tool

- c. When rail is adjusted to meet requirements of step 30, remove tool and tighten lock nuts to 28 in.-lbs. Recheck flatness with tool.
32. Clean actuator rails and carriage bearings per Section 2.
 33. Install carriage into actuator housing from rear and attach flexible conductor to housing with insulated screw and nut (nut on outside of housing).
 34. Attach heads loaded switch to housing with two screws.
 35. Install magnet assembly to deck. Loosely secure magnet to deck using three screws.
 36. Install two screws to secure stop plate.

37. Loosely install screw through top of actuator into magnet assembly. Move voice coil in and out of magnet making sure voice coil is not contacting magnet assembly, then tighten screw to 60 (± 3) in.-lbs. Insert 0.005 inch non-metallic feeler gage between coil and magnet to ensure 0.005 inch gap around coil, then tighten three screws between magnet and deck to 30 (± 1) in.-lbs. Recheck 0.005 inch gap around coil.
38. Connect heads loaded switch leadwires. Secure leadwires to actuator side using cable tie through metal plate.
39. Perform Heads Loaded Switch Adjustment procedure.
40. Install velocity transducer per Velocity Transducer Replacement procedure.
41. Connect velocity transducer cable plug P4 (Figure 3-16).
42. Install all heads except head 10 (refer to Head/Arm Replacement procedure).
43. Perform Carriage/Spindle Alignment and Stop Check. Install head 10.
44. Connect voice coil leadwires.
45. Connect servo output plug P8 to servo preamp circuit board.
46. Install servo preamp housing cover using two screws.
47. Perform Servo System Checks and Adjustment.
48. Perform Head/Arm Adjustment procedure.



8R6

Figure 3-19. Lower Rail Adjustment Eccentrics

49. Install deck top cover.
50. Close cabinet top cover.

**BRAKE BELT (V-BELT)
S/C 10 WITHOUT PE39280 AND BELOW**

Adjustment:

The brake belt adjustment procedure consists of gaining access to (and a clear view of) the adjustment screw and nut; making proper adjustment; and carefully checking for tension, travel, and freedom of movement.

NOTE

The brake belt adjustment procedure is critical to satisfactory brake performance. A minor misadjustment can result in marginal braking action and early brake belt failure. To ensure proper adjustment, a visual inspection must be made.

1. Set UNIT POWER circuit breaker to OFF.
2. Open cabinet rear door.

NOTE

It is possible to complete this adjustment procedure without turning the pulley cover/logic hose shield; however, the adjustment nut can be seen more conveniently with the cover shield out of the way.

3. On units having a brake pulley cover/logic hose shield, remove the left screw and loosen the screw on the right. Swing the cover/shield down and out of the way.
4. Visually inspect the brake belt for; frayed edges, glazed or worn spots or deformed cross section, or cracks (especially on inner side of V-belt).

If any of these signs of wear are present, replace the belt according to the Brake Belt Replacement procedure.

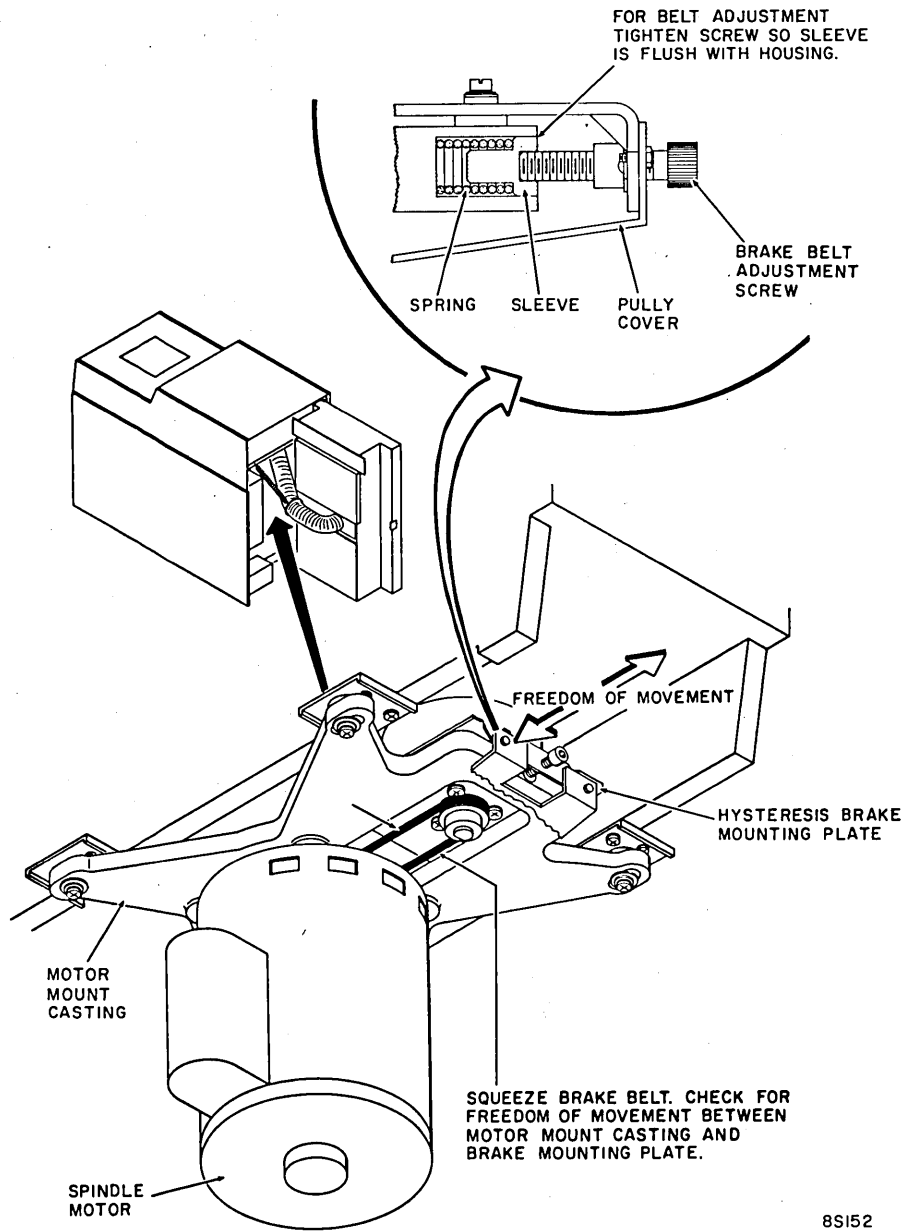
5. With the aid of a mirror, locate the sleeve on the end of the brake belt adjustment screw (refer to Figure 3-19). Position the sleeve (by turning the adjustment screw) so that the back side of the sleeve is flush with the surface of the motor mount casting at the lowest point. The sleeve should neither protrude outside the spring cavity in the casting, nor should it be driven into

the casting far enough to fully compress the spring. Notice that because of the rounded edges of the casting, the sleeve may appear to be below the casting surface when it is correctly adjusted. Special attention is required to ensure that the sleeve is flush with the lowest point of the curved surface around the spring cavity.

6. Check that the brake mounting plate is free to move on its mounting hardware. Grasp the brake mounting plate and apply a back and forth motion while watching for motion between the brake mounting plate and its mounting hardware. If the plate is not free, loosen one or more screws, as necessary, to relieve the binding.
7. To check that the brake belt adjustment tension spring has not been fully compressed, grasp the two halves of the brake belt and squeeze them toward one another (refer to Figure 3-20), while watching for movement (1/16 to 1/8 inch) of the brake plate toward the spindle motor. If there is no noticeable motion it is probably because the adjustment spring has been fully compressed (assuming step 6 has been successfully completed). Back out the adjustment screw (turn screw counterclockwise) enough to get 1/32 inch of brake plate movement. Recheck steps 5, 6, and 7.
8. Replace the pulley cover/logic hose shield, close the door, and turn UNIT POWER circuit breaker to ON.

Replacement

1. Set UNIT POWER circuit breaker to OFF.
2. Remove disk pack.
3. Remove drive belt (flat belt) from spindle motor pulley by moving spindle motor forward and raising belt clear of drive pulley. Allow belt to remain around spindle pulley.
4. Turn brake belt adjustment screw (Figure 3-20) counterclockwise to relieve tension on brake belt. Remove belt from hysteresis brake pulley.
5. Remove brake belt from drive motor pulley.



8S152

Figure 3-20. Brake Belt Adjustment

6. Install replacement belt on drive motor pulley and loop other end over hysteresis brake pulley.
7. Perform Brake Belt Adjustment procedure.

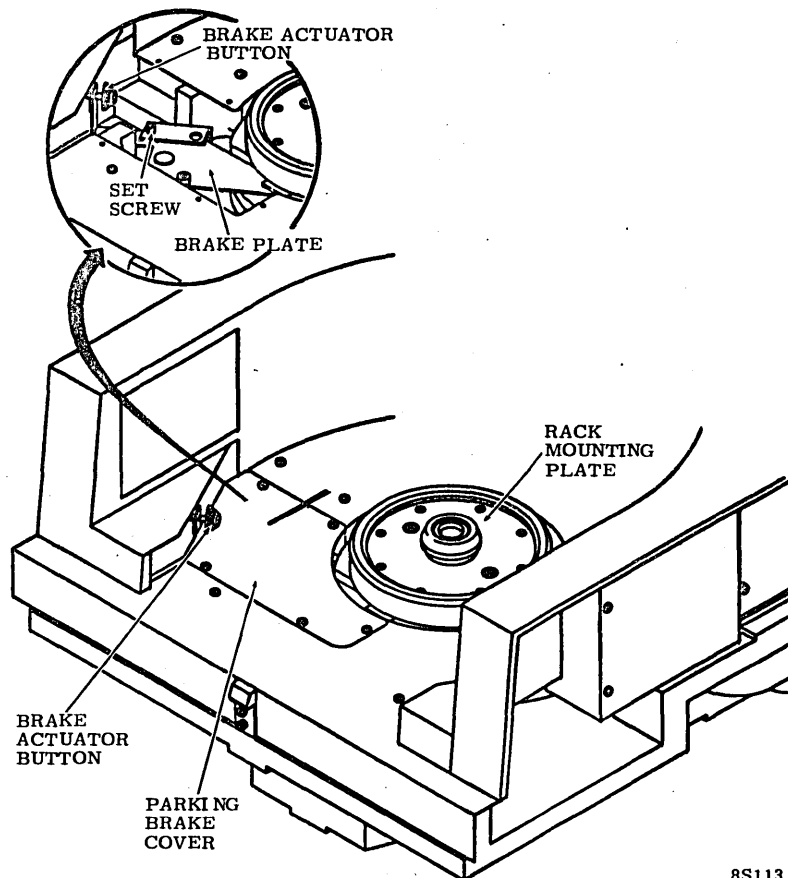
BRAKE PAWL ASSEMBLY

Check

1. With parking brake cover (Figure 3-21) in place, check that clearance between brake tooth and flat surface on underside of pack mounting plate is 0.005-0.020 inch.
2. Check that distance between spindle centerline and brake actuator button is 7.112 (± 0.005) inches.

Adjustment

1. Set UNIT POWER circuit breaker to OFF.
2. Remove disk pack.
3. Rotate spindle to a position where the brake tooth is not under a notch in the pack mounting plate (Figure 3-21).
4. Check distance between brake tooth and pack mounting plate with a feeler gauge. Distance should be 0.010 (± 0.002) inch. If necessary, adjust as follows:
 - a. Remove brake access cover.



8S113

Figure 3-21. Brake Plate Replacement

- b. Adjust set screw counterclockwise to increase distance or clockwise to decrease distance.

5. Install disk pack.

Replacement

1. Stop drive motor.
2. Remove disk pack. Leave pack cover open.
3. Remove five screws securing parking brake cover to shroud.
4. Remove two screws securing brake plate assembly and springs to deck casting.
5. Install replacement brake plate assembly to deck casting with two screws and springs (Figure 3-21).
6. Perform Brake Pawl Assembly Adjustment procedure.
7. Install disk pack and close pack cover.

CARRIAGE ASSEMBLY

Carriage/Spindle Alignment

The carriage assembly is properly aligned when carriage motion is along a radial line from the axis of rotation of the spindle assembly. The following adjustment is required whenever the five screws securing the actuator housing to the deck casting are loosened, or if the spindle assembly is loosened from the deck casting.

1. Set UNIT POWER circuit breaker to OFF.
2. Refer to Head/Arm Replacement procedure and remove head number 10.
3. Install carriage alignment arm on carriage at head 10 position.
4. Torque head/arm clamp screw, clamp plate, washers, and alignment arm to 4 inch-pounds.
5. Install head cam tool.
6. Install carriage alignment ring on spindle.
7. Slowly extend carriage until carriage alignment arm and ring are approximately aligned as shown in Figure 3-22.

CAUTION

The carriage is aligned by moving the spindle. The five bolts securing the actuator to the deck are not to be loosened.

8. Check that clearance between ring and arm tools is as specified in Figure 3-22.
9. Loosen three bolts securing the spindle assembly to deck.

NOTE

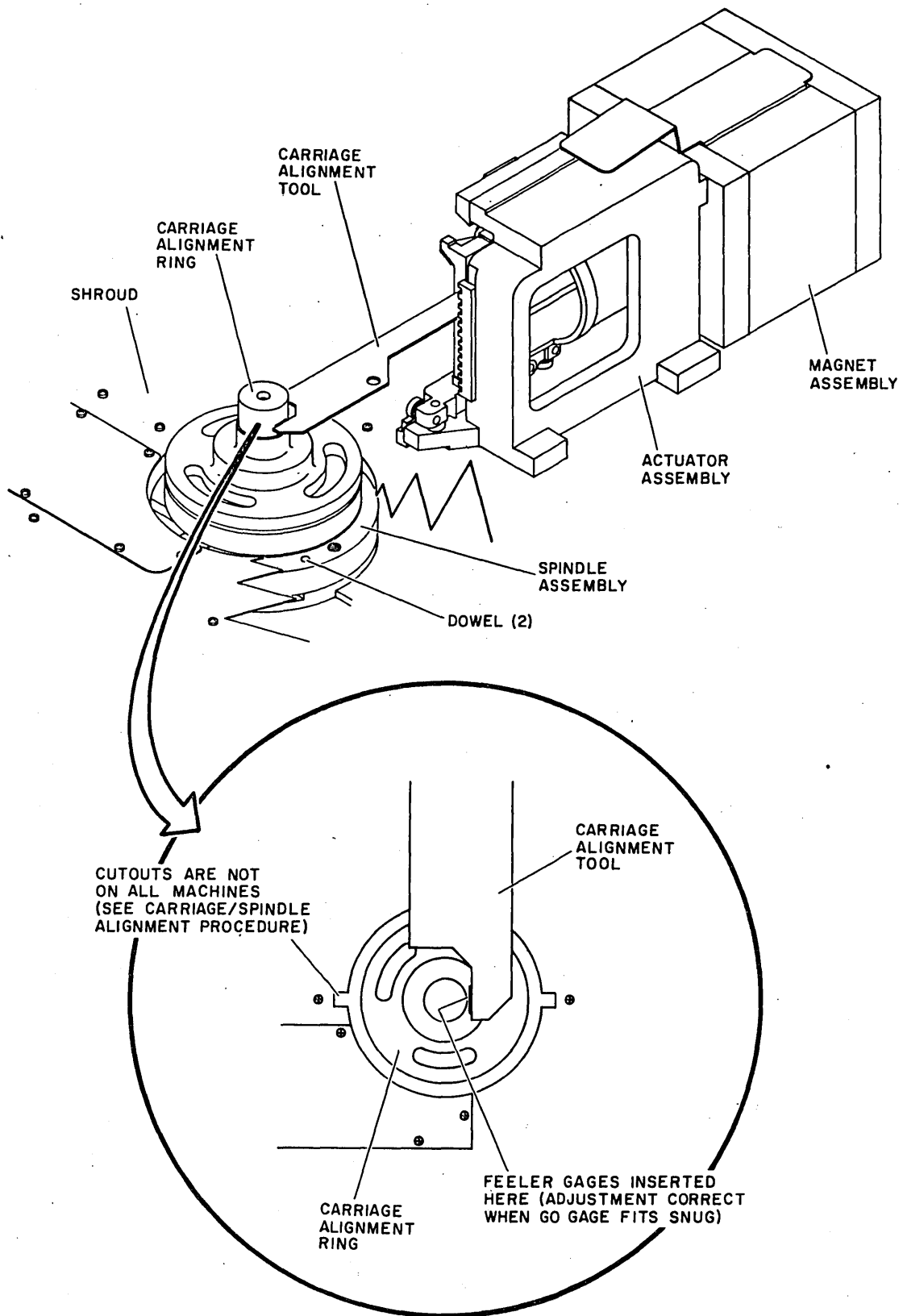
On units having cutouts in shroud (see Figure 3-22) proceed to step 10. On units not having cutouts, proceed to step 11.

10. Using spindle adjustment tool, move the spindle to obtain the clearance specified in Figure 3-22. If this clearance is obtained proceed to step 12. However, if it is too far out of adjustment to be corrected in this manner, proceed to step 13.
11. Using a plastic face hammer, lightly tap spindle housing (beneath deck) to move spindle assembly. If requirements of Figure 3-22 are met, proceed to step 12. However, if it is too far out of adjustment, proceed to step 13.
12. Tighten the three spindle screws and recheck clearance. If incorrect, repeat steps 10 or 11 (as applicable): When the clearance is correct, proceed to step 20.
13. Move the spindle until the dowelpins are centered in the spindle slots.
14. Loosen the three screws securing the actuator housing to the deck.
15. Loosen the three screws securing the magnet to the deck.

NOTE

The actuator housing pivots on a pin located in its base and just forward of the magnet assembly. Pivoting motion is tangential to spindle.

16. Rotate the actuator to obtain the clearance specified in Figure 3-22.
17. Torque (using 55 to 60 inch-pounds) the three screws securing the actuator housing.



8S156

Figure 3-22. Carriage Alignment

18. Tighten the three screws securing the magnet.
19. Recheck the clearance and fine adjust as instructed in step 10 or 11 (as applicable).
20. Retract carriage. Remove head cam tool and carriage alignment arm.
21. Remove carriage alignment ring.
22. Refer to Head/Arm Replacement procedure and install head removed in step 2.
23. Perform Head/Arm Adjustment procedure.
24. Inspect read/write heads according to procedures in Preventive Maintenance section, clean heads if necessary.
11. Fully retract carriage and hold securely in place.
12. Using a plastic feeler gage, measure gap "B" shown in Figure 3-17. If requirements are not met, perform Carriage Retracted Stop Adjustment procedure.
13. Remove carriage alignment tool from spindle.
14. Remove head cam tool.
15. Remove actuator stop inspection tool.
16. Refer to Head/Arm Installation procedure and install head removed in step 5.
17. Perform Head/Arm Alignment procedure on head removed and heads above and below it.

Stop Check

1. Stop drive motor.
2. Remove disk pack.
3. Open cabinet top and pack cover.
4. Remove deck top cover.
5. Refer to Head/Arm Replacement procedure and remove head 7.
6. Install carriage alignment ring on spindle assembly.

NOTE

When installing actuator stop inspection tool, hold tool tight against back carriage stop until secured in place (Figure 3-17).

7. Install actuator forward inspection tool on carriage in head position 7. Secure tool with head clamping hardware.
8. Install head cam tool (refer to Manually Positioning Carriage procedure).
9. Fully extend carriage and hold securely in place.
10. Using plastic feeler gage, measure gap "A" shown in Figure 3-17. If requirements are not met, perform Carriage Extended Stop Adjustment procedure.

Carriage Extend Stop Adjustment

1. Perform steps 1 through 8 of Stop Check procedure.
2. Refer to Actuator Replacement procedure and remove magnet assembly.

NOTE

Each stop rod shim is 0.015 inch thick. Determine the quantity of shims to be added or removed before removing stop rods.

3. Using a screwdriver, remove each stop rod (Figure 3-17).

NOTE

Remove or replace an equal number of shims on each stop rod.

4. Add or remove stop rod shims as required for each stop rod.
5. Apply one drop of Loctite, Grade C, to the threads of each stop rod.
6. Install stop rods and tighten in place.
7. Refer to Actuator Replacement procedure and install magnet assembly.
8. Perform Carriage/Spindle Alignment procedure.
9. Perform Stop Check procedure.

Carriage Retracted Stop Adjustment

1. Perform steps 1 through 8 of Stop Check procedure.

NOTE

Each stop shim is .010 inch thick. Determine the quantity of shims to be added or removed before removing screws that secure carriage shim.

2. Remove two screws securing carriage shim (Figure 3-17).
3. Add or remove stop shims as required.
4. Apply one drop of Loctite, Grade C, to the threads of each screw used to secure carriage shim.
5. Install two screws through carriage shim and stop shims into carriage. Tighten screws.
6. Perform Stop Check procedure.

COIL ASSEMBLY REPLACEMENT

1. Refer to Actuator Replacement procedure and follow instructions to remove magnet assembly.
2. Remove insulated screws that secure flexible conductor assembly to actuator housing and to carriage.
3. Remove three screws securing coil assembly to carriage. Remove coil and flexible conductor assembly from unit.
4. Remove flexible conductor connection from coil lead and attach to the same lead on replacement coil.
5. Install replacement coil and flexible conductor assembly in unit and secure it to carriage with three screws.
6. Replace insulated screws removed in step 2 ensuring that backing plate and coil lead wires are installed correctly.
7. Refer to Actuator Replacement procedure and install and align magnet assembly. Follow all remaining steps in actuator replacement procedure.

FIRST SEEK INTERLOCK ASSEMBLY

The timing motor cam and the interlock switch are the only adjustable part of the first seek interlock assembly. Cam adjustment is performed during motor replacement and should not require further adjustment. Adjust the interlock switch as required.

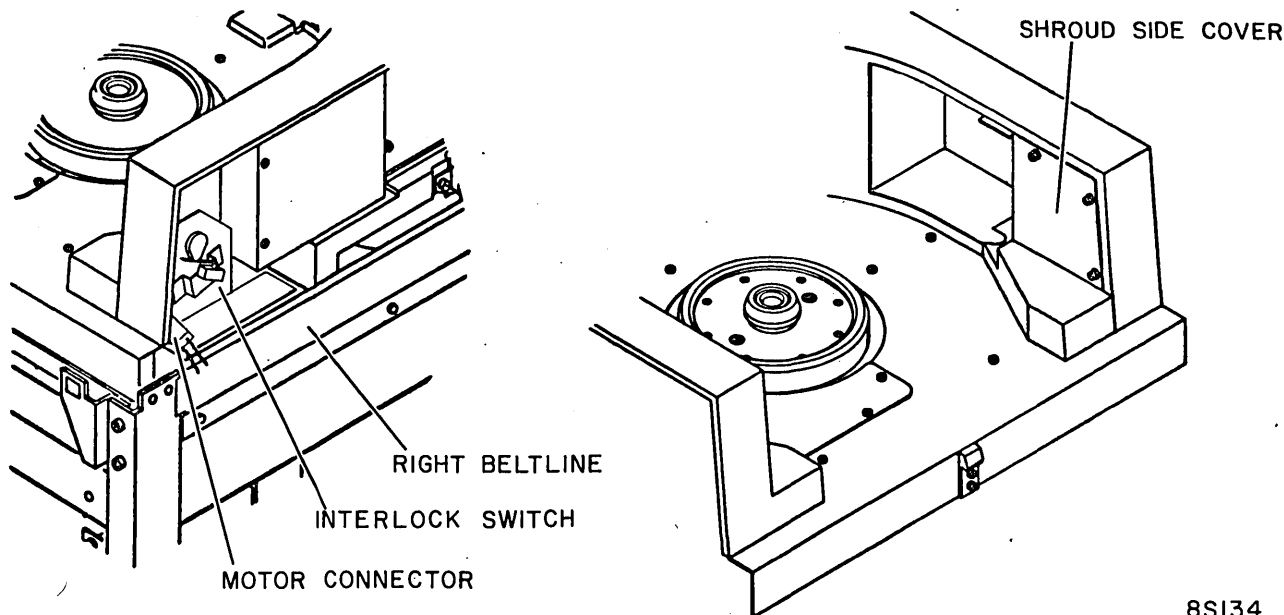
Check

This procedure verifies correct operation of the first seek interlock assembly. Use a stopwatch or wristwatch with sweep second hand. With a pack installed and all covers closed, proceed as follows:

1. Set the LOCAL/REMOTE switch to LOCAL.
2. Set UNIT POWER circuit breaker to ON.
3. While observing Physical Unit Identification indicator, press START switch and start timer. Indicator should light after about 15 seconds. If longer than about 17 seconds, check the following:
 - Timing motor cam adjustment
 - Interlock switch adjustment
 - Logic card at location A12

Assembly Replacement

1. Set UNIT POWER circuit breaker to OFF.
2. Open pack cover.
3. Remove disk pack.
4. Open top cover.
5. Disconnect timing motor cable plug (Figure 3-23).
6. Identify and disconnect interlock switch leadwires.
7. Remove two screws and washers securing interlock assembly to deck (Figure 3-23).
8. Slide assembly away from spindle while pulling assembly upwards through opening in shroud. Remove assembly from drive.



8S134

Figure 3-23. First Seek Interlock Assembly

9. Connect timing motor cable plug to replacement interlock assembly.
10. Connect interlock switch leadwires.
11. Install replacement interlock assembly on deck. Secure assembly to deck using two screws and washers.
12. Perform First Seek Interlock Check procedure.

5. Install cam on motor shaft as shown in Figure 3-24. Adjust cam on shaft to get maximum contact with switch actuator arm. Tighten setscrews in cam.

NOTE

Bend capacitor leads midway between solder joint and where lead goes into capacitor body.

Motor Replacement

1. Perform steps 1 through 8 of First Seek Interlock Assembly procedure then go to next step.
2. Loosen two setscrews securing cam to motor shaft.
3. Remove two screws, washers, and nuts securing the timing motor (and 4-lug terminal strip) to the mounting bracket (Figure 3-24). Remove motor and terminal strip.
4. Install replacement timing motor and terminal strip on mounting bracket as shown in Figure 3-24. Secure motor and terminal strip using two screws, washers, and nuts.

6. Using a needlenose pliers, bend capacitor leads on terminal strip as shown in Figure 3-24.
7. Perform steps 9 through 12 of First Seek Interlock Assembly Replacement procedure.

Switch Adjustment

1. Set UNIT POWER circuit breaker to OFF.
2. Open cabinet top cover.
3. Using a number 4 nutdriver, loosen the two nuts securing switch mounting bracket (Figure 3-24) to assembly bracket.

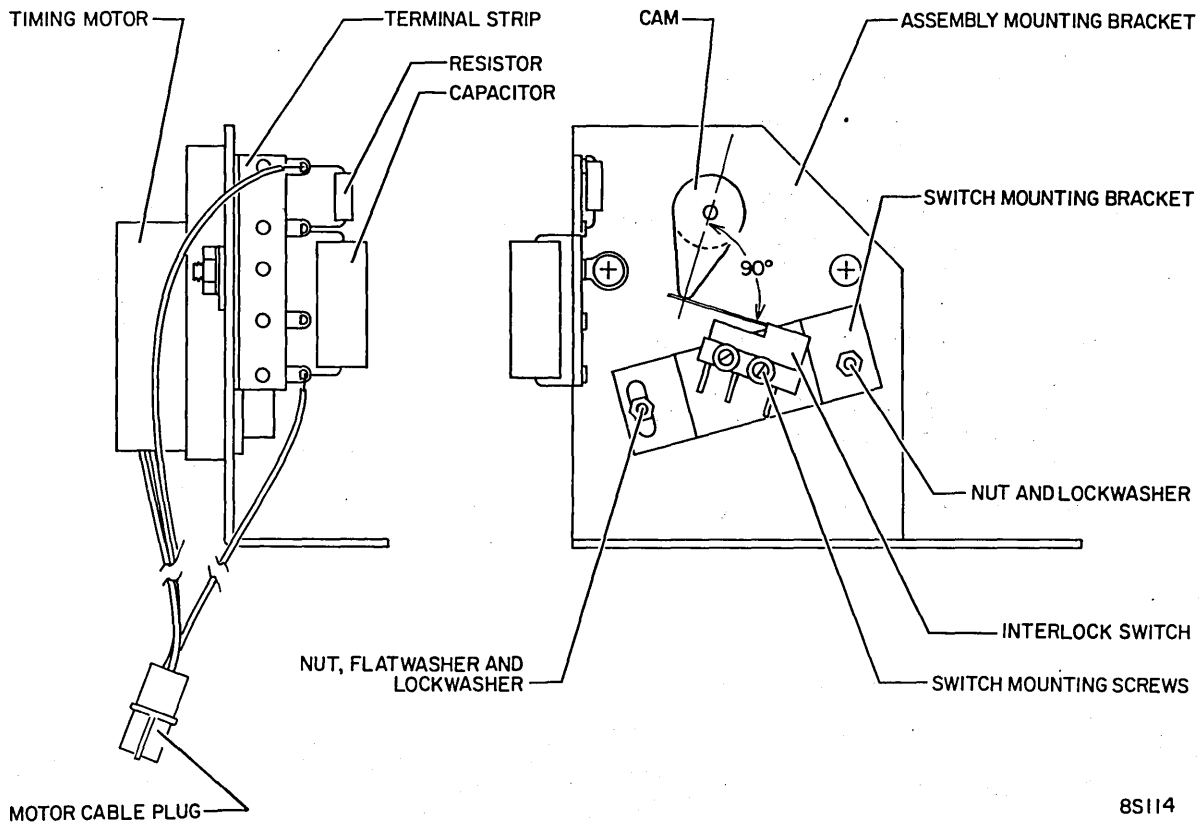


Figure 3-24. Timing Motor/Switch Replacement

4. Adjust switch mounting bracket so the switch activates when the timing motor cam is tangent with the switch actuator arm (Figure 3-24). Tighten the left nut (nut that is on adjustment slot in bracket) first, then tighten right nut.
5. Perform Interlock Switch Check procedure.
5. Position replacement switch on switch mounting bracket as shown in Figure 3-24. Secure switch using two screws and washers.
6. Perform Switch Adjustment procedure.

Switch Replacement

1. Set UNIT POWER circuit breaker to OFF.
2. Open top cover.
3. Identify and mark leadwires to interlock switch. Disconnect leadwire at switch terminals.
4. Remove two screws and washers securing switch to switch mounting bracket. Remove switch.

DRIVE BELT

Adjustment

1. Set UNIT POWER circuit breaker to OFF.
2. Open cabinet front panel.

NOTE

- While inspecting drive belt, also inspect brake belt. If required, replace brake belt per Brake Belt Replacement procedure.
3. Inspect drive belt for cracks or worn spots. If required, replace belt per Drive Belt Replacement procedure.

4. Open cabinet rear door.
5. Locate drive belt tension idler springs (Figure 3-25). Check both springs for correct adjustment as explained in step 6.
6. Length between idler spring posts must be 5.42 (± 0.12) inch. If adjustment is required, proceed to step 7, if not, proceed to step 9.
7. Loosen two screws securing idler spring adjustment bracket to deck.
8. Reposition idler spring bracket and spring until requirements are met. Tighten screws and recheck requirements.
9. Close cabinet rear door.
10. Close cabinet front panel.

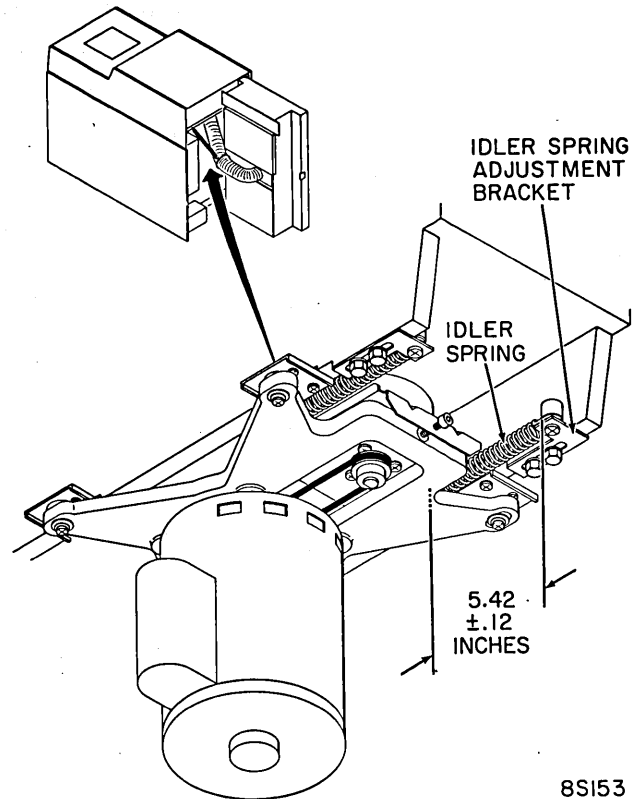
Replacement

1. Set UNIT POWER circuit breaker to OFF.
2. Remove disk pack.
3. Disconnect speed sensor plug P3.
4. Remove static ground spring leadwire from deck casting.
5. Make note of pack sensor switch leadwire connection scheme and disconnect leadwires at switch.

NOTE

Use care when removing drive belt not to damage pack sensor switch or static ground spring.

6. Remove idler springs.
7. Move drive motor toward spindle assembly and remove drive belt from drive motor pulley, then from spindle pulley. Remove belt from unit.
8. Install replacement belt around spindle pulley.
9. Move drive motor toward spindle assembly and slip drive belt around drive motor pulley.
10. Reconnect speed sensor plug P3, pack sensor switch leadwires and static ground spring leadwires.
11. Perform Drive Belt Adjustment procedure.



8S153

Figure 3-25. Drive Belt Adjustment

DRIVE MOTOR REPLACEMENT S/C 10 WITH PE39280B AND ABOVE

1. Stop spindle motor.
2. Remove disk pack.
3. Set UNIT POWER circuit breaker to OFF.
4. Remove idler springs.
5. Move drive motor towards spindle assembly and slip drive belt off drive motor pulley.
6. Disconnect drive motor cable plug-P7.
7. Disconnect hysteresis brake cable plug P2, speed sensor plug-P3, and pack on switch connector.

CAUTION

Do not support motor and brake assembly on hysteresis brake cup.

8. Support drive motor and brake assembly from below and remove four screws holding drive motor to motor mount. Note that there are two long and two short screws. (Refer to Figure 3-25.1)

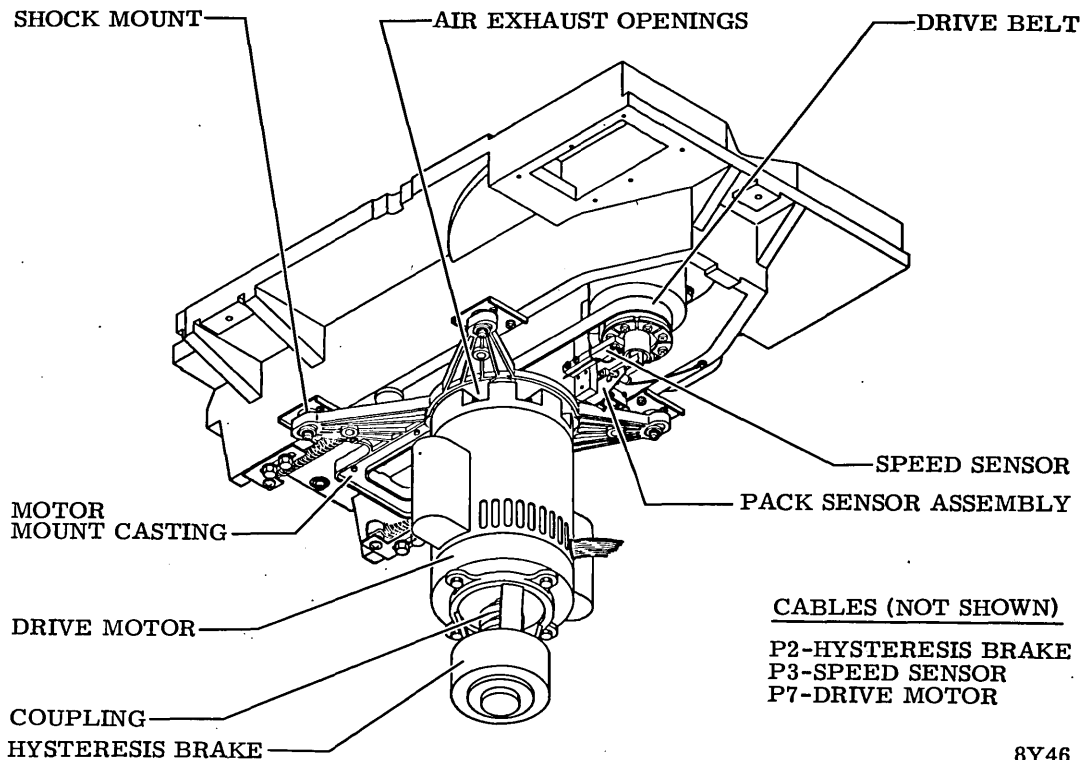


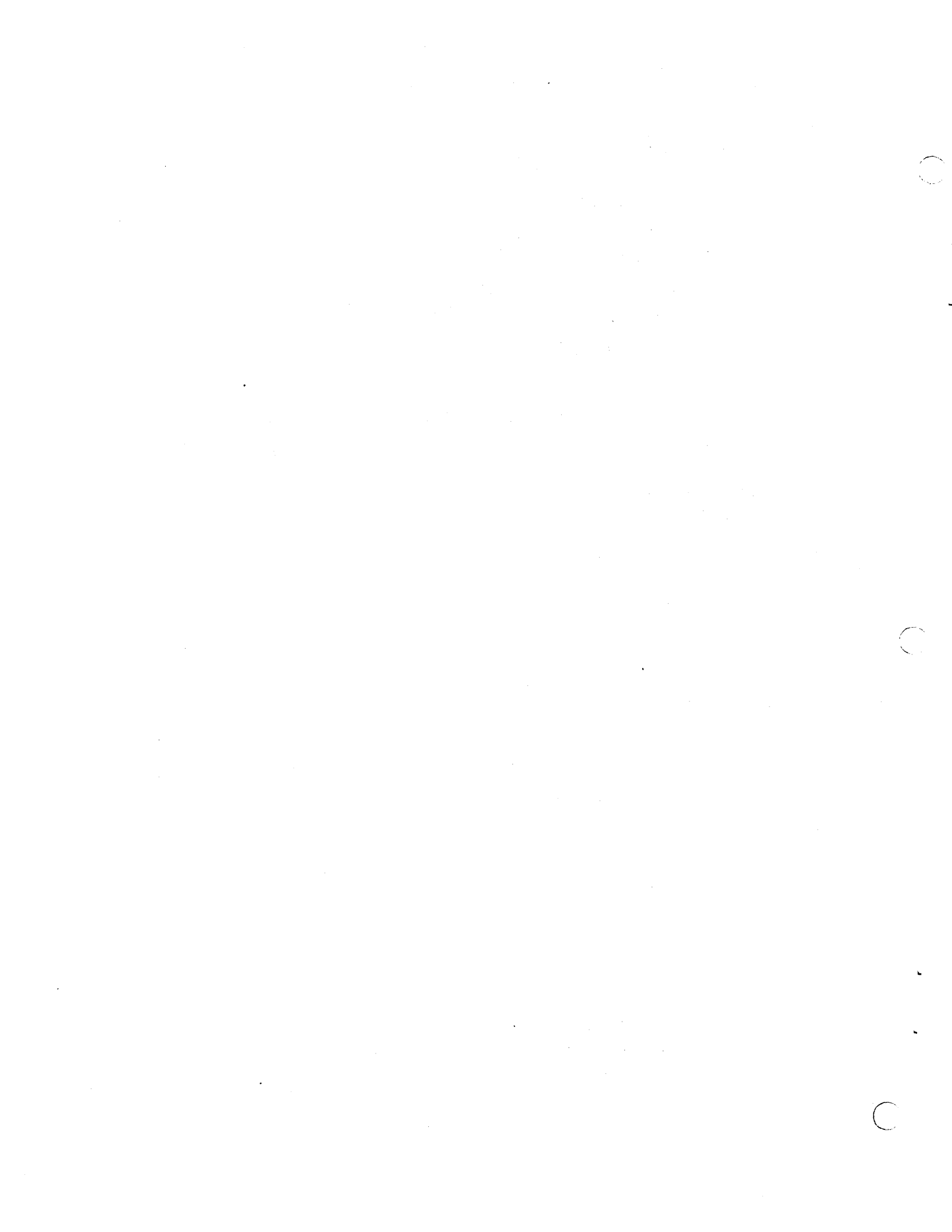
Figure 3-25.1. Drive Motor Replacement
S/C 11 and Above With PE39280B

8Y46

9. Loosen both setscrews in drive motor pulley. Remove pulley.
10. Remove hysteresis brake assembly as described in Hysteresis Brake Replacement procedure.
11. Install hysteresis brake assembly on replacement drive motor as described in Hysteresis Brake Replacement procedure.
12. Slide drive motor pulley on replacement drive motor shaft until it is 0.56 (± 0.02) inch from drive motor end bell. Tighten both set screws.
13. Support replacement drive motor from below and install on motor mount casting (orient air exhaust openings towards air supply). Secure drive motor to motor mount casting using two long and two short screws in their respective locations.
14. Position drive belt around spindle pulley, and slip other end of belt around drive motor pulley. Visually confirm that drive motor pulley is aligned with spindle pulley.
15. Replace idler springs.
16. Connect drive motor cable plug-P7.
17. Connect hysteresis brake cable plug-P2.
18. Set UNIT POWER circuit breaker to ON.
19. Install a scratch pack.
20. Start spindle motor. Observe drive motor for proper operation.
21. Stop drive motor.
22. Remove disk pack.

**DRIVE MOTOR REPLACEMENT
S/C 10 WITHOUT PE39280B AND BELOW**

1. Stop drive motor.
2. Remove disk pack.
3. Set UNIT POWER circuit breaker to OFF.
4. Remove idler springs.
5. Move drive motor towards spindle assembly and slip drive belt off drive motor pulley.
6. Disconnect drive motor cable plug P7.
7. Disconnect hysteresis brake cable plug P2.
8. Support drive motor from below and remove four screws (note how washers and bushing comes off each screw) and washers securing motor mount casting to shock mounts. Remove drive motor and motor mount casting from drive.



9. Turn hysteresis brake adjustment screw counterclockwise to relieve tension on brake belt. Slip brake belt off hysteresis brake pulley and then off drive motor pulley.
10. Remove four screws securing drive motor to motor mount casting. Remove drive motor.
11. Loosen both setscrews in drive motor pulley. Remove pulley.
12. Position pulley adjustment tool on motor as shown in Figure 3-26.
13. Slide drive motor pulley on replacement drive motor shaft until it contacts pulley adjustment tool. Tighten both setscrews.
14. Install replacement drive motor on motor mount casting (orient air exhaust openings towards hysteresis brake). Secure drive motor to motor mount casting with four screws.
15. Slip brake belt around drive motor pulley (make sure belt is seated properly on pulley). Slip other end of belt around hysteresis brake pulley.

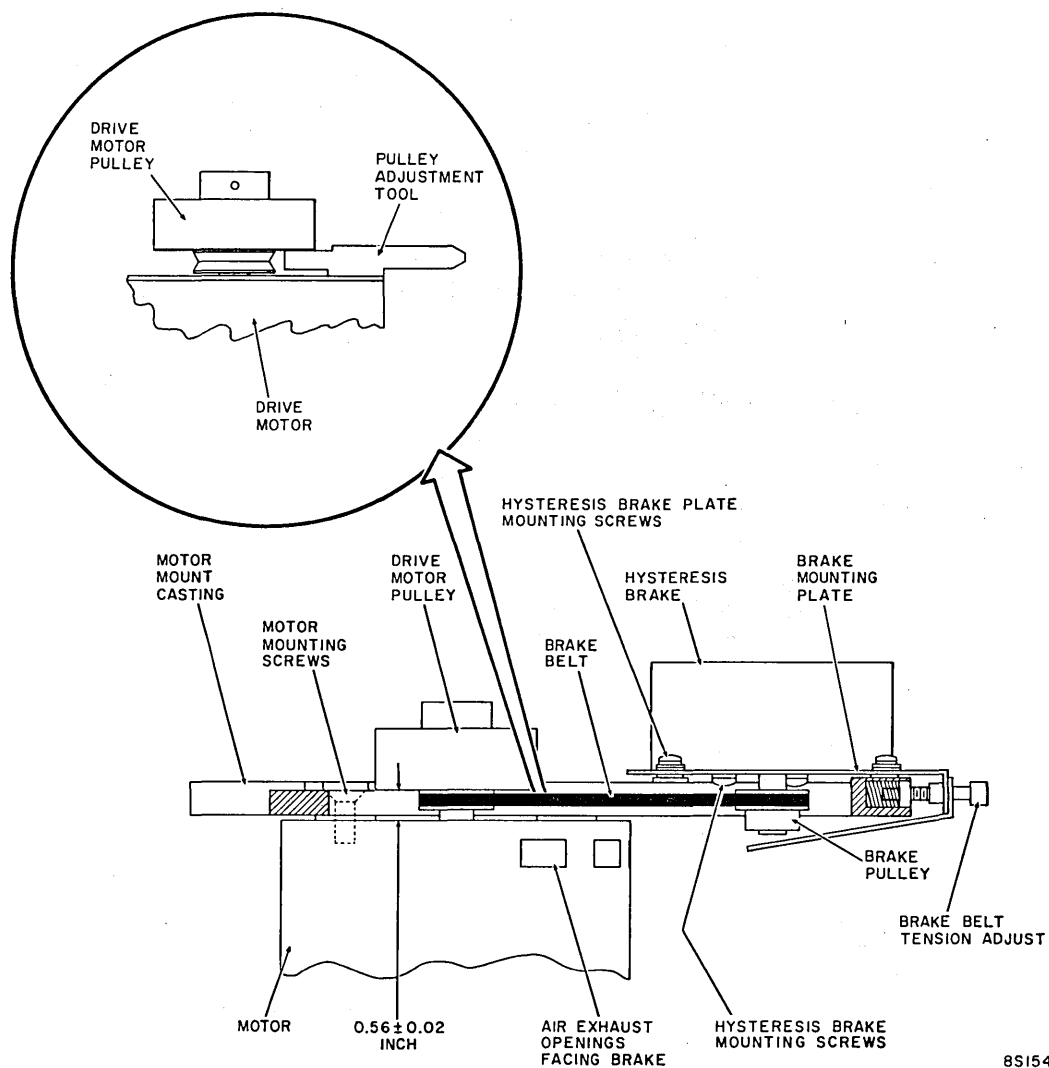


Figure 3-26. Motor and Brake Assembly
S/C 10 Without PE39280B & Below

16. Perform Brake Belt Adjustment procedure.
17. Assemble four screws, washers, and bushings. Lay screws at bottom of drive cabinet so they will be close at hand when installing drive motor casting.

NOTE

Over tightening screws in step 18 will restrict freedom of movement between motor mount casting and deck.

18. Support drive motor from below and position motor mount casting below deck on shock mounts (Figure 3-27). Secure motor mounting casting to shock mounts with four screws, washers, and bushings prepared in step 17.
19. Position drive belt around spindle pulley, slip other end of belt around drive motor pulley.
20. Replace idler springs.
21. Connect drive motor cable plug P7.

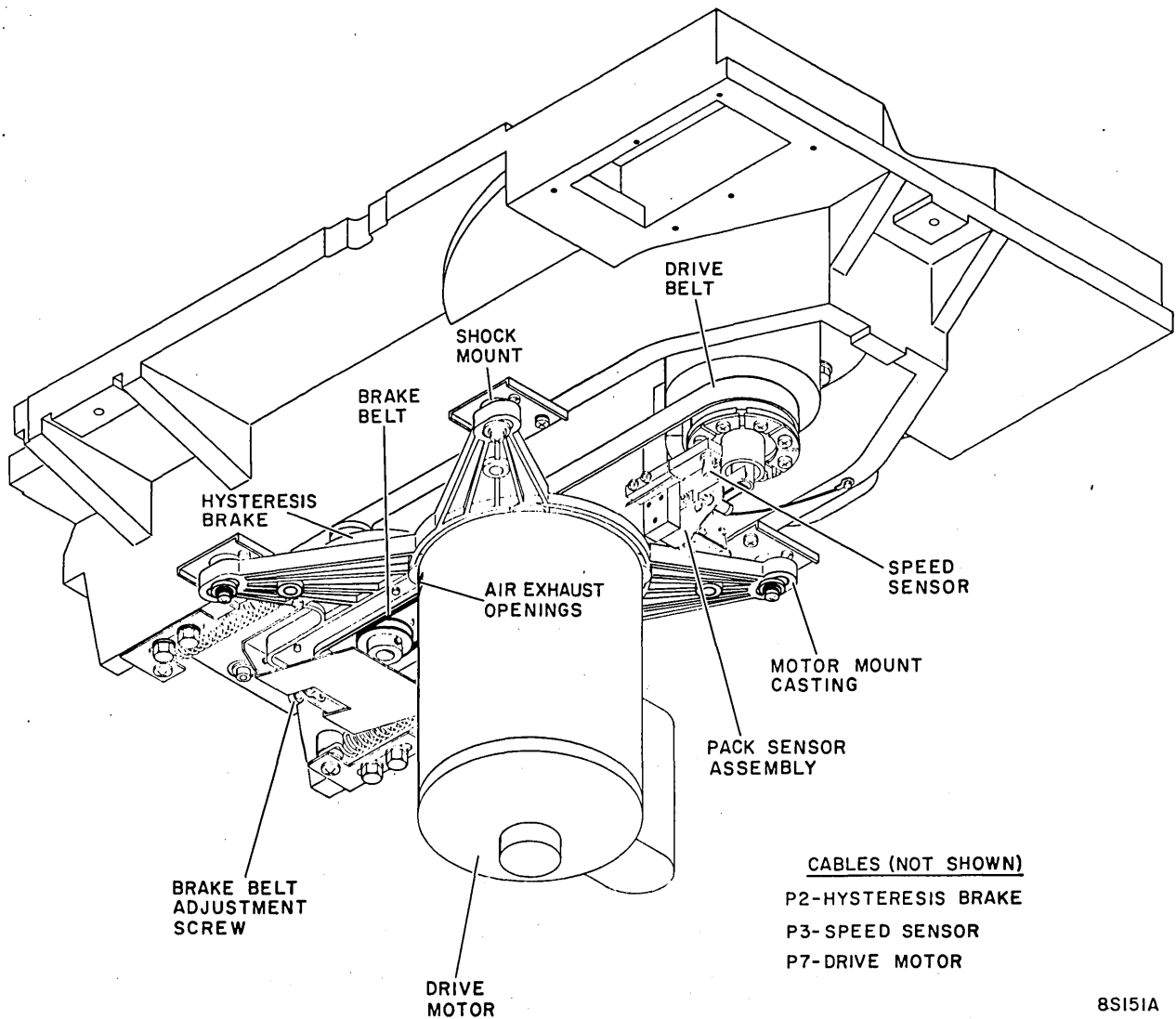


Figure 3-27. Deck Assembly Bottom Side

22. Connect hysteresis brake cable plug P2.
23. Set UNIT POWER circuit breaker to ON.
24. Install a scratch pack.
25. Start spindle motor. Observe drive motor for proper operation.
26. Stop drive motor.
27. Remove disk pack.

HEAD/ARM ASSEMBLIES

Head/Arm Replacement Criteria

The head/arm assemblies are designed so that they should not require replacement if given proper preventive maintenance and care. A head/arm requires replacement if any of the following conditions exist:

1. Consistent oxide buildup on head indicating repeated head/disk impact.
2. Appreciable oxide buildup located primarily on edge of ferrite insert.
3. Oxide or wear over 1/2 of head face surface.
4. Head is scratched over 1/2 of head face surface.
5. Concentric scratches on disk surface. Inspect head for imbedded particles.
6. Audible ping indicating that head is hitting disk surface.

Head/Arm Replacement

1. Set UNIT POWER circuit breaker to OFF.
2. Remove disk pack.
3. Open cabinet top cover.
4. Remove deck top cover.
5. Remove head cable plate (Figure 3-28).
6. Refer to Figure 3-29 and determine location of faulty head/arm assembly.
7. Carefully remove head cable for faulty head from head cable clamp (Figure 3-29) and disconnect related head cable plug at card E00.

8. Refer to Figure 3-30 and slide head installation and removal tool on outer edge of faulty head/arm assembly.
9. Remove clamp plate securing faulty head/arm assembly to carriage (Figure 3-29).

CAUTION

Observe the following precautions during remainder of procedure.

- a. Do not touch head face. Damage to gimbal springs may result.
- b. Use minimum force when overriding assemblies tendency to unflex. Unnecessary force can damage assembly.
- c. Use care when installing or removing an assembly. If assembly is allowed to unflex, damage to itself or to an adjacent assembly may result.
- d. Keep all contact with adjacent head/arms to a minimum. This will save alignment time later.

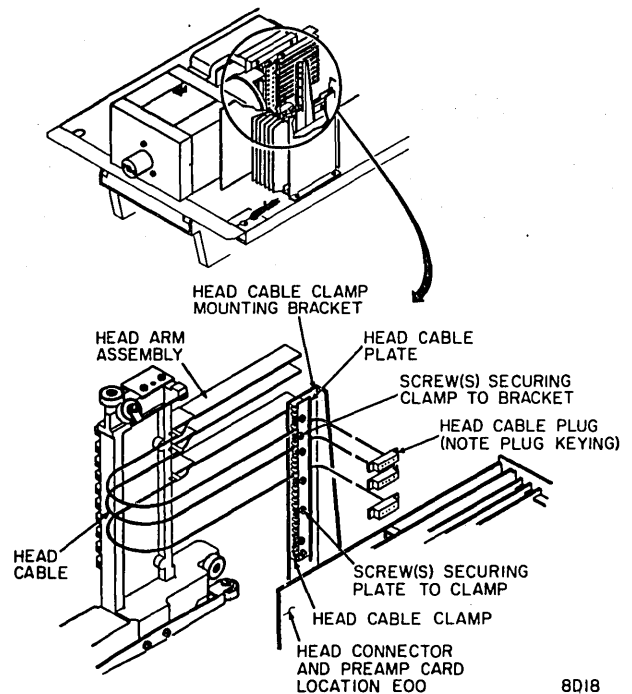


Figure 3-28. Head Cable Clamping/Connecting

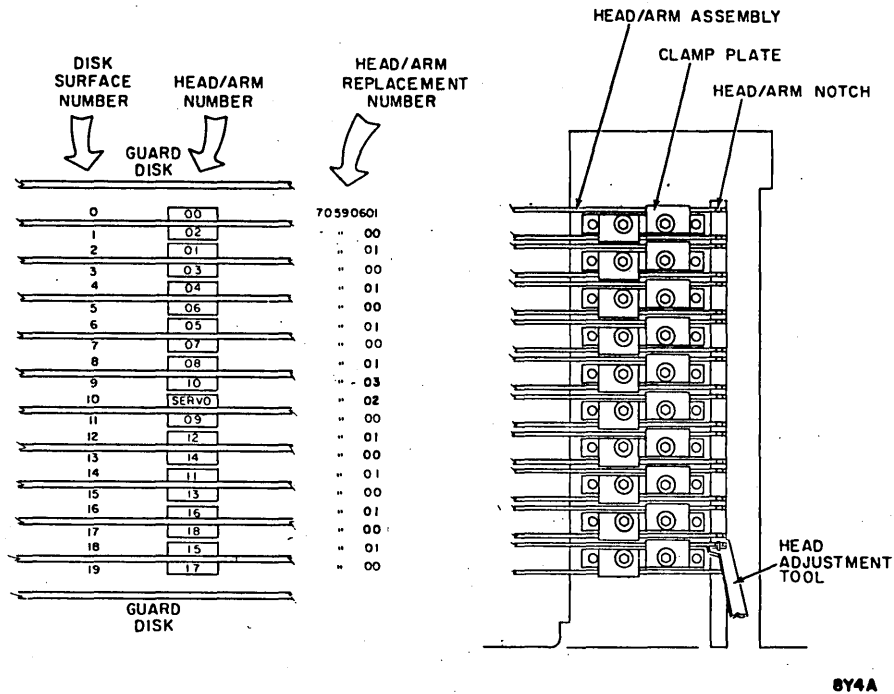


Figure 3-29. Head/Arm Assembly Identification

10. Grasp carriage end of head/arm assembly (Figure 3-30) between thumb and forefinger.
11. Grasp other end of assembly (avoid head face) between thumb and forefinger of other hand. Carefully remove assembly from carriage and head cam.
12. Slip installation and removal tool off head/arm and set head/arm aside.
13. Carefully flex replacement head/arm (see Figure 3-29 for head/arm assembly part numbers) until straight and slip head installation tool on head/arm as shown in Figure 3-30.
14. Guide head and tool through head cam and toward carriage. Engage carriage end of assembly and receiving slot in carriage.
15. Visually align free end of assembly with adjacent assemblies.
16. Carefully slip head installation tool free of head/arm assembly.
17. Install head/arm clamp plate. Torque clamp plate screws to 4 inch-pounds.

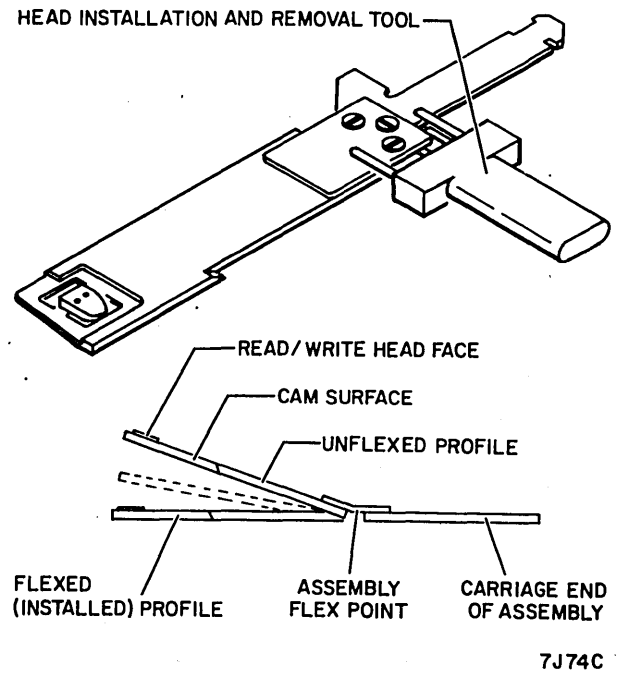


Figure 3-30. Head/Arm Installation and Removal

18. Install head cable in cable clamp (Figure 3-29). Make sure cable is oriented similarly to adjacent cables.
19. Install head cable plate.
20. Connect head cable plug to logic card E00.
21. Perform Head/Arm Alignment procedure on replaced head and on heads immediately above and below it.

Head/Arm Alignment

Head/arm alignment is performed by using the Field Test Unit (FTU) or by using microprogram diagnostic routines and a controller. The following procedure uses the FTU for alignment operation. Refer to the FTU Maintenance manual for installation and familiarization of tester operation.

Refer to Controller manual for head alignment procedure using microprogram diagnostics.

The CE disk pack and FTU must be temperature stabilized before the following procedure is performed. Pack, drive, and FTU must be in the same temperature environment for a minimum 60 minute period immediately preceding head alignment. In addition, the CE pack must be purged on a drive a minimum of 30 minutes and the FTU must be plugged into the drive, under maintenance, a minimum of 10 minutes before performing head alignment procedure.

NOTE

If head alignment is being performed on more than one drive, the CE pack needs only a 15 minute purge per drive after head alignment has been performed on the preceding drive.

With the CE pack and the FTU installed on the drive and environmental stabilization requirements met, perform the following procedure:

CAUTION

The CE disk pack contains specially recorded tracks of data. Extreme care must be taken so that this data is not modified or destroyed.

1. Actuate WRITE DISABLE switch on the drive control panel so that the switch is illuminated.

2. Set up FTU switches as follows:
 - a. METER RANGE; OFF
 - b. R/W-SERVO; SERVO
 - c. CHECK STOP/RUN; RUN
 - d. ON LINE/OFF LINE; OFF LINE
 - e. All BUS IN switches; OFF (down position)
 - f. All TAG switches; OFF (down position)
 - g. ERROR STOP/OVERRIDE; OVERRIDE
 - h. ACC-R/W; R/W
 - i. REP/SING; SING
 - j. START/STOP; STOP
 - k. READ/WRITE; READ
 - l. DIR/SEQ; DIR
 - m. LOAD UNIT/CAR/READ HEAD; CAR
 - n. Actuate MASTER RESET switch
 - o. Actuate RTZ switch

NOTE

An oscilloscope may be connected to the DIBITS test point to monitor dibits during CE alignment.

3. Install a logic plug.
4. Select Tag 13 (TAG switches 8, 4, and 1-up; TAG switch 2- down).
5. Select Bus Out Bit 1 (BUS OUT switch 64- up; all other BUS OUT switches-down).
6. LOAD UNIT/CAR/READ HEAD switch to LOAD UNIT.
7. LOAD UNIT/CAR/READ HEAD switch to CAR.
8. Return all TAG and BUS OUT switches to down position.
9. START/STOP switch to START, then return switch to STOP position. Actuator should now be at track 0.

NOTE

Transferring Diag Mode 4 (steps 4 and 5) followed by a Read command, locks a Read command and a select head in the drive.

10. ACC-R/W switch to ACC.

11. Using the FTU, perform a repeated, direct seek between tracks 240 and 245 for a minimum of 30 seconds.
12. Stop actuator movement by placing START/STOP switch to STOP. If actuator stopped on track 245, continue with step 14. If actuator stopped on track 240, continue with step 13.
13. Place the REP/SING switch in the SING position. Then place START/STOP switch in START position. After actuator has moved to track 245, place START/STOP switch in STOP position.
14. R/W-SERVO switch to SERVO.
15. METER RANGE switch to 100.
16. Calculate the offset via the following formula:

$$(P) - (N) = \text{OFFSET}$$

P is the meter reading with the POS/NEG switch in the POS position. N is the meter reading with the POS/NEG switch in the NEG position. Meter readings to the right of zero are positive. Meter readings to the left of zero are negative.

EXAMPLE:

 1. $P=20, N=15; (P) - (N) = (20) - (15) = 5$
 2. $P=20, N=-15; (P) - (N) - (20) = (-15) = 35$
17. If the offset of step 16 is greater than 50 microinches, a problem exists in the servo section of the drive and must be corrected before continuing the head alignment procedure.
18. Select (Tag 5) (TAG switches 4 and 1- up; TAG switches 8 and 2- down).
19. Select Bus Out Bit 4 (BUS OUT switch 8- up; all other BUS OUT switches- down).
20. LOAD UNIT/CAR/READ HEAD switch to LOAD UNIT.
21. R/W-SERVO switch to R/W.
22. Calculate offset (as in step 16).
23. If offset is greater than 150 microinches, adjust head so offset is less than 50 microinches.
24. Actuate ADV HAR switch. The BUS IN indicators now indicate the next head has been selected.
25. Repeat steps 22, 23 and 24 for all heads (0 through 18).
26. LOAD UNIT/CAR/READ HEAD switch to CAR.
27. METER RANGE switch to OFF.
28. If any head was adjusted continue with step 29. If no heads were adjusted proceed with step 31.
29. Unload and load heads a minimum of two times.
30. Repeat steps 2 through 28 with the following exceptions: if a head was adjusted at any time during this procedure, the specification for necessity of adjustment in step 23 becomes 75 microinches (instead of 150 microinches).
31. Actuate MASTER RESET switch.
32. Actuate RTZ switch.
33. Stop drive and remove CE disk pack and FTU.

HEADS LOADED SWITCH

Adjustment

1. Set UNIT POWER circuit breaker to OFF.
2. Remove disk pack.
3. Open cabinet top cover and remove disk cover.
4. Make note of heads loaded switch leadwire connection scheme and disconnect leadwires.
5. Connect a multimeter (set to Rx1) across switch leadwire terminals.

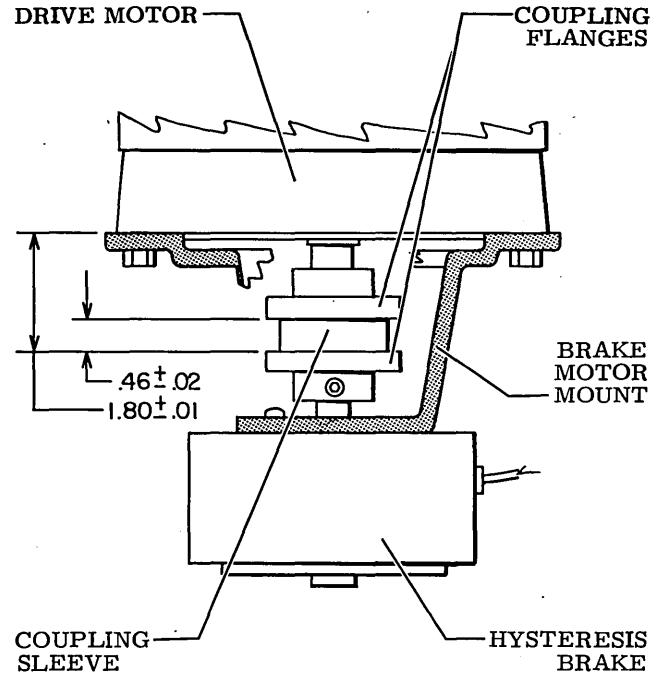
CAUTION

- Do not move carriage so far as to cause heads to load. Switch transfer will occur before head loading.
6. Carefully move carriage about one-half inch forward from retracted stop.

7. Slowly retract carriage. Stop carriage at point where switch transfer occurs.
8. Using a steel scale, measure distance that carriage travels before contacting retracted stop. Switch transfer must occur when carriage is between 0.100 and 0.180 inch of encountering retracted stop.
9. If requirement is not met, loosen two screws securing switch mounting bracket to actuator housing. Reposition switch and bracket until requirement is met and tighten screws.
10. Remove multimeter and connect heads loaded switch leadwires.
11. Install deck top cover.
12. Close cabinet top cover.

Replacement

No special instructions are required for removal and replacement except, when replacing switch, use one drop of Loctite, Grade C, on threads of each screw securing switch to mounting bracket. Perform Heads Loaded Switch Adjustment procedure following switch replacement.

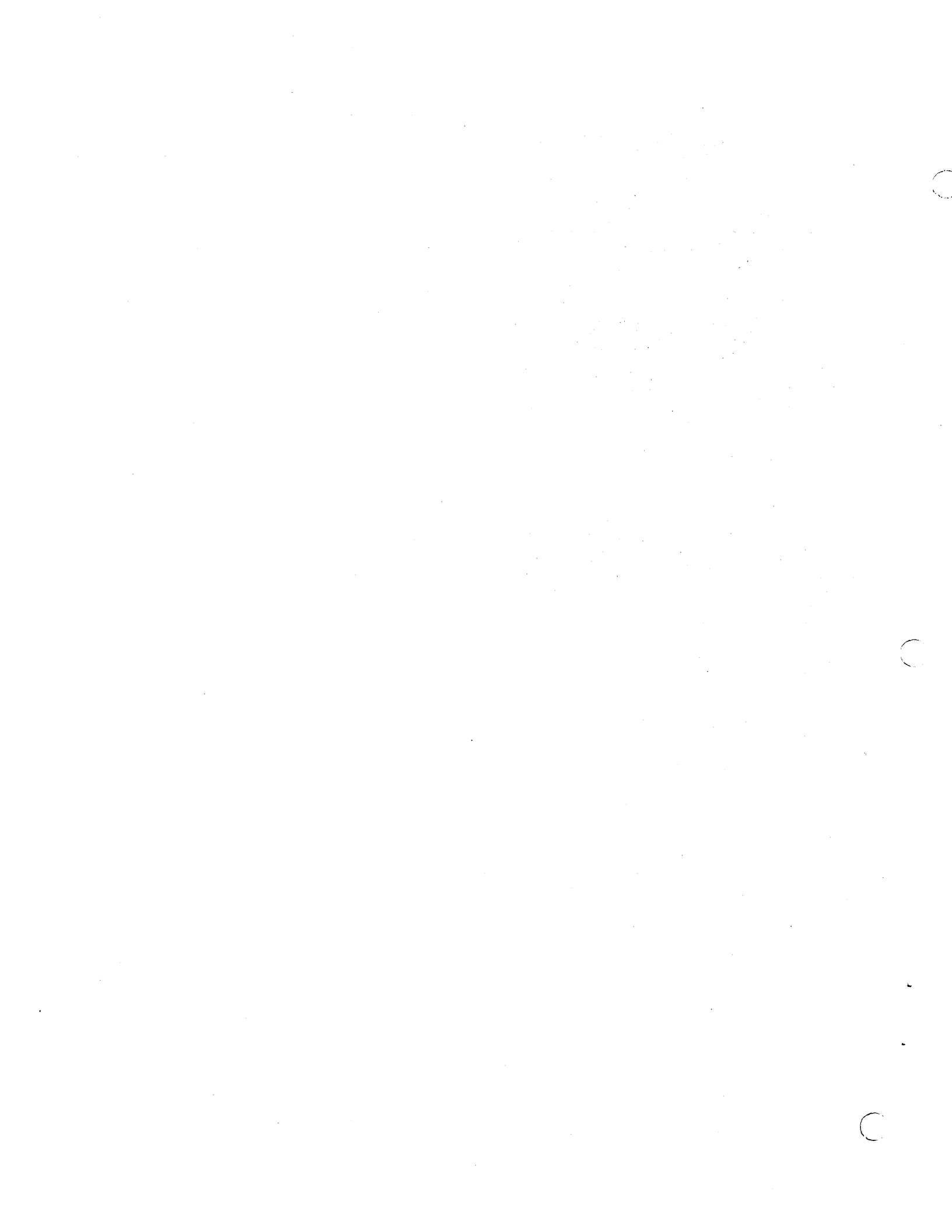


8Y52

Figure 3-30.1. Hysteresis Brake Replacement
S/C 10 With PE39280B & Above

HYSTERESIS BRAKE REPLACEMENT S/C 10 WITH PE39280B AND ABOVE

1. Stop spindle motor.
2. Set UNIT POWER circuit breaker to OFF.
3. Remove side panel of drive, or if drive is in line, remove front panel and air supply.
4. Disconnect hysteresis brake cable-P2.
5. Remove four screws attaching hysteresis brake assembly to drive motor.
6. Remove hysteresis brake assembly, observing orientation of brake power cable.
7. Remove rubber coupling sleeve. Refer to Figure 3-30.1.
8. Loosen two set screws securing coupling flange to hysteresis brake shaft. Remove flange.
9. Remove three screws attaching hysteresis brake to brake motor mount and remove brake.
10. If necessary to remove flange from drive motor shaft, loosen two set screws and slide off.
11. Install replacement hysteresis brake on brake motor mount with three screws.
12. Install coupling flange on hysteresis brake shaft to meet the requirements of figure 3-30.1. Tighten two set screws.
13. Loosely install coupling flange on motor shaft.



14. Install rubber coupling sleeve.
15. Install hysteresis brake assembly on drive motor using four screws. (Orient brake power cable to connect to P2).
16. Tighten set screws in coupling flange on motor shaft so that flange position meets the requirements of Figure 3-30.1.
17. Connect hysteresis brake cable-P2.
18. Install air supply and front panel.
19. Perform Power Down check.

HYSTERESIS BRAKE REPLACEMENT S/C 10 WITHOUT PE39280 AND BELOW

NOTE

The drive motor mount casting may have to be loosened in order to remove brake.

1. Set UNIT POWER circuit breaker to OFF.
2. Open cabinet rear door.
3. Remove idler springs.
4. Move drive motor towards spindle assembly and slip drive belt off drive motor pulley.
5. Disconnect hysteresis brake cable P2.
6. Turn brake belt adjustment screw counterclockwise to relieve tension on brake belt (Figure 3-26).
7. Slip brake belt off brake and drive pulleys.
8. Loosen setscrew securing brake pulley to brake shaft. Remove pulley and check condition of groove.
9. Remove faulty hysteresis brake.

10. Install replacement hysteresis brake to brake mounting plate with three screws and washers.
11. Apply one drop of Loctite, Grade N to pulley setscrew threads.

NOTE

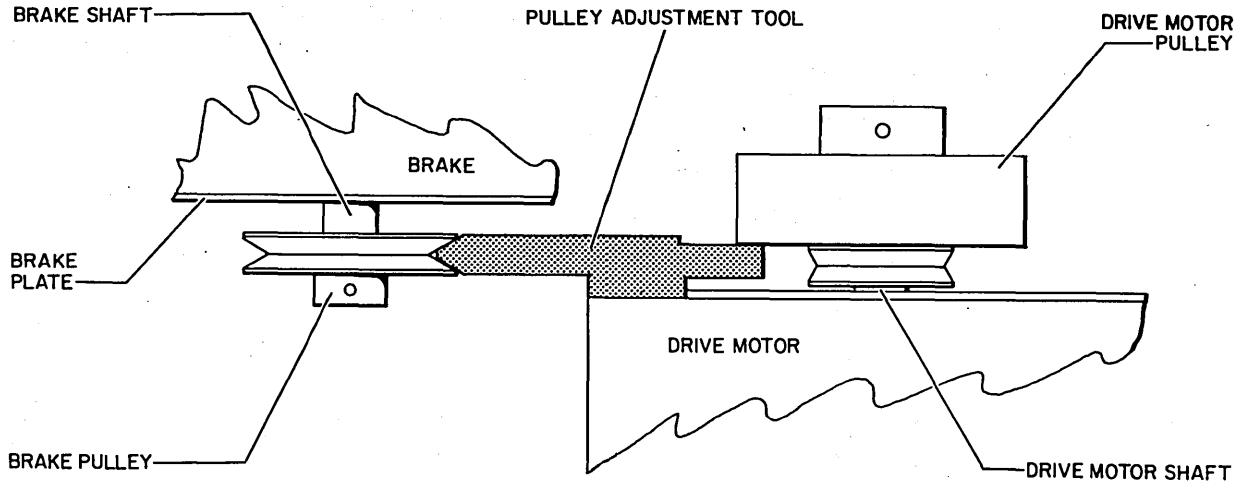
It may be necessary to loosen (turn counterclockwise) the brake belt adjustment screw to allow pulling brake back far enough to perform steps 12 through 14.

12. Pull brake back and slide pulley on brakeshaft but do not tighten setscrews.
13. Hold pulley adjustment block in position shown in Figure 3-31. Push brake forward and adjust pulley on brakeshaft until adjustment tool seats in groove of pulley.
14. When they are mated as shown in Figure 3-31, the pulley is aligned. Tighten setscrew and remove pulley alignment tool.

NOTE

In step 15 always use new belt and ensure that brake is far enough forward that belt can be replaced without riding it onto pulley.

15. Replace brake belt on drive pulley ensuring that it is seated properly. Slip other end of belt over brake pulley.
16. Position drive belt around spindle pulley and slip other end of belt around drive motor pulley.
17. Replace idler springs.
18. Connect hysteresis brake cable plug P2.
19. Perform Brake Belt Adjustment procedure.



8S155

Figure 3-31. Brake Pulley Adjustment
S/C 10 Without PE39280B.

PACK SENSOR SWITCH

Check

1. Stop spindle motor.
2. Remove disk pack.
3. Set UNIT POWER circuit breaker to OFF.
4. Remove cabinet front panel.
5. Identify pack sensor switch leadwires (Figure 3-32). Disconnect leadwires at switch.
6. Connect a multimeter (set to Rx1) across switch terminals.
7. Install a disk pack. Multimeter should indicate 0 ohms.
8. Remove disk pack. Multimeter should indicate infinity.
9. If requirements of steps 7 and 8 are not met, perform Pack Sensor Switch Adjustment procedure. If requirements are met, go to step 10.
10. Disconnect multimeter leadwires.
11. Connect pack sensor switch leadwires to pack sensor switch terminals.
12. Install cabinet front panel.

Adjustment

1. Press (to extinguish light) START switch.
2. Install a disk pack.
3. Set UNIT POWER circuit breaker to OFF.
4. Refer to Side Panel Removal/Installation procedure and remove right (viewed from front) side panel.
5. Identify pack sensor switch leadwires (Figure 3-32). Disconnect wires at switch terminals.
6. Dimension between actuator arm and lockshaft must be as specified in Figure 3-32. If dimension is as specified, go to step 10. If adjustment is required, go to step 7.
7. Loosen mounting plate adjustment screw (Figure 3-32).
8. Loosen two screws securing ground spring mounting bracket to switch mount.
9. Position mounting plate until dimension between actuator arm and lockshaft is as specified in Figure 3-32. Tighten screws.

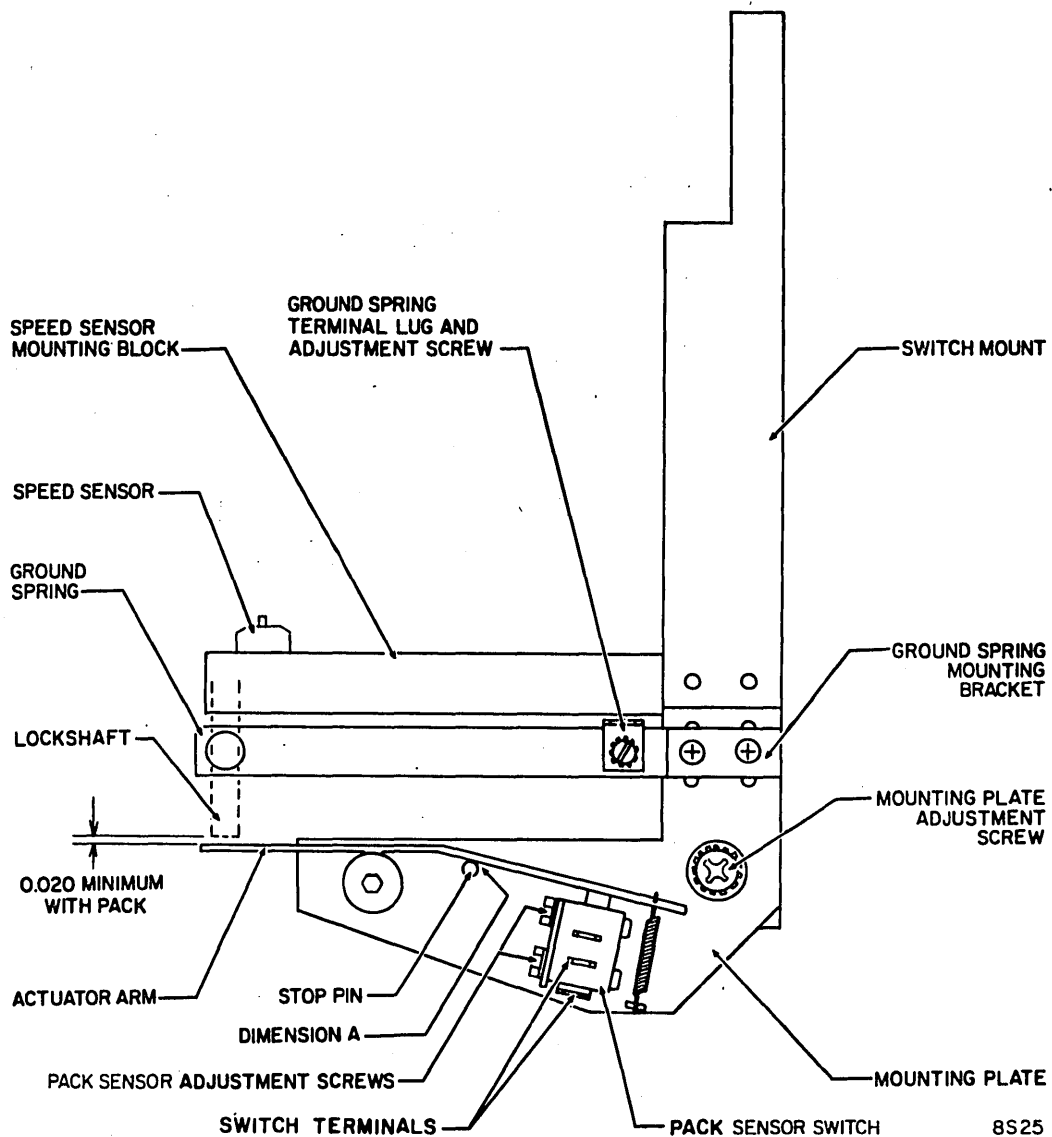


Figure 3-32. Pack Sensor Assembly

10. Connect a multimeter (set to Rx1) to pack sensor switch terminals (Figure 3-32). Meter must indicate 0 ohms. If correct go to step 12, if not go to step 11.
11. Loosen pack sensor switch adjustment screws and position switch until multimeter just indicates 0 ohms. Tighten screws.
12. Insert an .011 inch thick feeler gage between actuator arm and stop pin (dimension A of Figure 3-32).
13. Multimeter must indicate infinity. If not, go to step 14. If correct, remove feeler gage and go to step 17.
14. Loosen pack sensor switch adjustment screws and position switch until multimeter just indicates infinity. Tighten screws.
15. Remove feeler gage. Multimeter must indicate 0 ohms. If correct, go to step 16. If not, repeat procedure starting at step 11.

16. If pack sensor switch was repositioned, perform step 5 and if further adjustments are required repeat entire adjustment procedure. If requirements of step 5 are met, go to step 17.
17. Disconnect multimeter from switch terminals.
18. Connect pack sensor switch leadwires to switch terminals.
19. Perform Ground Spring Adjustment procedure if mounting plate screws were loosened.
20. Install side panel.

Replacement

1. Stop spindle motor.
2. Remove disk pack.
3. Set UNIT POWER circuit breaker to OFF.
4. Refer to Side Panel Removal/Installation procedure and remove right (viewed from front) side panel.
5. Identify pack sensor switch leadwires. Disconnect wires at switch (Figure 3-32).
6. Remove two screws; washers and nuts securing switch to mounting plate bracket. Remove faulty switch.
7. Install replacement switch to mounting plate bracket using two screws, washers, and nuts. Do not tighten screws.
8. Perform Pack Sensor Switch Adjustment procedure.

SERVO PREAMP PC BOARD REPLACEMENT

1. Stop drive motor.
2. Remove disk pack.
3. Open top cover and remove deck cover.
4. Remove four screws securing right shroud side cover.
5. Remove two screws securing servo preamp cover (Figure 3-16). Remove cover.

6. Disconnect servo head cable plug and output plug P8 from servo preamp board.
7. Remove two socket head screws inside preamp housing. Remove preamp housing from unit.
8. Remove two screws securing faulty preamp circuit board to preamp housing.
9. Install replacement preamp circuit board to preamp housing with two hex head screws. Tighten screws.
10. Install preamp housing on actuator using two socket head screws. Tighten screws.
11. Connect servo head cable plug and output plug P8 to preamp circuit board.
12. Using two screws, secure preamp housing cover to preamp housing. Tighten screws.
13. Install right shroud side cover using four screws. Tighten screws.
14. Install deck cover and close top cover.

SIDE PANEL REMOVAL/INSTALLATION

1. Set UNIT POWER circuit breaker to OFF.
2. Remove disk pack.
3. Release two turnlock fasteners securing cabinet front panel. Remove and set panel aside.
4. Lower two leveling jackscrews in front base of cabinet until casters contact floor.
5. Open cabinet rear door.
6. Lower two leveling jackscrews in rear base of cabinet until casters contact floor. Close cabinet rear door.

CAUTION

- Use care when wheeling drive cabinet out of line so that input/output cables and connectors are not damaged.
7. Roll drive clear of adjacent units.

8. Open cabinet rear door.
 9. Release two quarter-turn fasteners securing panel side cover. Disconnect side panel ground wire. Remove and set panel aside.
 10. Install side panel and return unit to normal operating position by reversing steps 1 through 9.
2. Remove disk pack.
 3. Use feeler gage to check that gap between sensor tip and pin is 0.023 ± 0.003 inch (Figure 3-33).
 4. If requirement of step 3 is not met, adjust speed sensor as follows:
 - a. Check speed sensor lateral alignment per requirements of Figure 3-33. If required, loosen mounting block adjustment screws and position assembly. Tighten screws.
 - b. Loosen locknut on speed sensor assembly.

SPEED SENSOR ASSEMBLY

Adjustment

1. Set UNIT POWER circuit breaker to OFF.

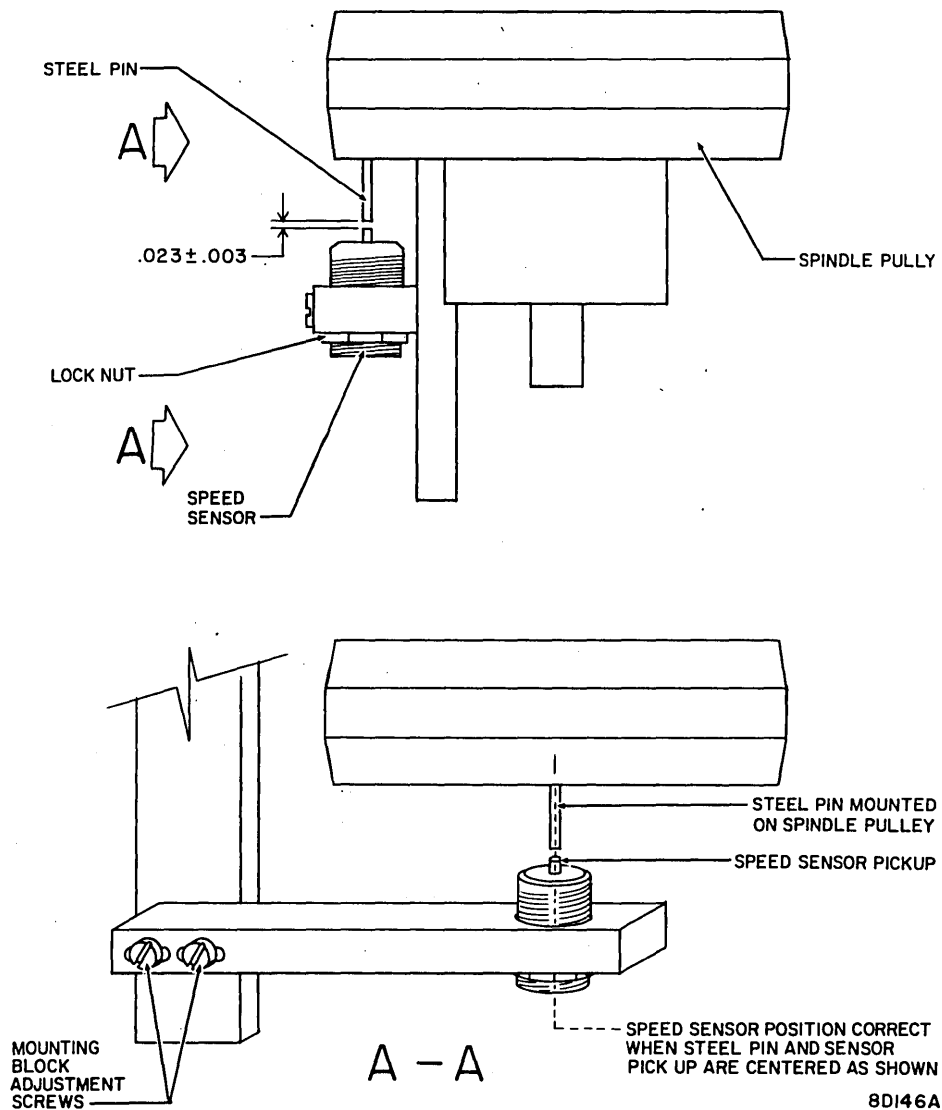


Figure 3-33. Speed Sensor Adjustment

- c. Adjust sensor assembly (clockwise rotation closes gap, counterclockwise rotation widens gap) as required.

CAUTION

Do not over tighten locknut in next step.

- d. Torque locknut to 5 (± 1) inch-pounds.
 - e. Recheck dimension of gap.
5. Perform Speed Sensing procedure of Miscellaneous Logic Checkout.

Replacement

1. Set UNIT POWER circuit breaker to OFF.
2. Disconnect speed sensor cable plug P3.
3. Cut cable tie securing speed sensor leadwires to speed sensor mounting bracket.
4. Loosen locknut on faulty speed sensor assembly (Figure 3-33). Remove assembly from unit.
5. Install replacement speed sensor on speed sensor mounting bracket.
6. Perform step 4 of Speed Sensor Adjustment procedure.

CAUTION

Do not over tighten locknut when performing step 7.

7. Torque locknut to 5 (± 1) inch-pounds. Recheck gap.
8. Connect speed sensor cable plug P3.
9. Secure speed sensor leadwires to mounting bracket with two cable ties.
10. Perform Speed Sensing procedure described in Miscellaneous Logic Checkout.

SPINDLE AND LOCKSHAFT ASSEMBLY

Field repair of this assembly is limited to replacing the lockshaft. If replacing lockshaft does not correct problem, replace entire spindle assembly. Return faulty assembly to factory.

Lockshaft Replacement

1. Stop spindle motor.
2. Remove disk pack.
3. Set UNIT POWER circuit breaker to OFF.
4. Refer to Side Panel Removal/Installation procedure and remove either side panel.
5. Disconnect ground spring leadwires.
6. Identify leadwires to pack sensor switch.
7. Remove two screws securing ground spring mounting block to switch mounting block.
8. Remove mounting plate adjustment screw (Figure 3-32). Remove mounting plate.

NOTE

In the following step do not remove retaining ring securing springs in spindle assembly (this is retaining ring located behind flat washer removed in next step).

9. Remove retaining ring and flat washer from lower end of lockshaft.
10. Carefully raise faulty lockshaft out of top of spindle assembly.
11. Lower replacement lockshaft into top of spindle assembly.

CAUTION

Before proceeding, make certain that lockshaft is free to move downward against internal spring force. Lockshaft must be free and not bind.

12. Install flat washer and retaining ring on lower end of lockshaft.
13. Position mounting plate on switch mount as shown in Figure 3-32 and loosely secure plate to mount with mounting plate adjustment screw.

NOTE

Position ground spring mounting bracket so that contact on end of spring is contacting lockshaft.

14. Position ground spring mounting block on switch mounting block (Figure 3-32) and loosely secure block with two screws.

15. Perform Pack Sensor Switch Adjustment procedure.
16. Perform Static Ground Spring Adjustment procedure.

Spindle and Lockshaft Replacement

1. Stop spindle motor.
2. Remove disk pack.
3. Set UNIT POWER circuit breaker to OFF.
4. Refer to Side Panel Removal/Installation procedure and remove either side panel.
5. Identify leadwires to pack sensor switch and ground spring. Disconnect leadwires.
6. Disconnect speed sensor cable plug P3.
7. Move motor mounting plate towards spindle to relieve drive belt tension. Remove belt from drive motor pulley. Release motor mounting plate.
8. Remove drive belt from spindle pulley.
9. Open cabinet pack access cover.
10. Remove five screws securing brake cover to shroud (Figure 3-21). Remove brake cover.

NOTE

- While removing assembly in next step observe mounting technique used to secure brake plate assembly to deck.
11. Remove two screws securing brake plate assembly to deck casting (Figure 3-21). Remove and set assembly aside.
 12. Remove three screws (under deck) securing spindle assembly to deck.
 13. Grasp spindle drive pulley and alternately push and pull on assembly while applying upward force to free spindle assembly from two round pins driven through spindle flange and into deck.
 14. Lift spindle assembly up away from deck being careful not to damage shroud.

15. Place replacement spindle assembly on deck (orient flat surface on side of spindle assembly towards drive motor). Position spindle assembly on pins protruding from deck and press down on spindle so that pins begin entering spindle.

NOTE

Tighten spindle down evenly over pins, keeping spindle bottom surface parallel to deck surface.

16. Install three screws and washers to secure spindle to deck. Tighten screws so that lateral movement of the spindle is possible.
17. Install drive belt on spindle pulley.
18. Move drive motor mounting plate towards spindle assembly and slip drive belt around drive motor pulley.
19. Position pack sensor assembly on spindle assembly as shown in Figure 3-27.

NOTE

Before tightening screws in next step, position pack sensor assembly as close as possible to the dimensions shown in Figure 3-32 and 3-33. Doing this will minimize adjustment required after assembly is secured to the spindle.

20. Secure pack sensor assembly to spindle assembly with two screws. Tighten screws.
21. Secure brake plate assembly to deck using two screws and related brake plate hardware.
22. Install brake plate cover to shroud using five screws. Tighten screws.
23. Connect ground spring and pack sensor switch leadwires.
24. Connect speed sensor cable plug P3.
25. Perform the following procedures:
 - a. Pack Sensor Switch Adjustment
 - b. Static Ground Spring Adjustment
 - c. Speed Sensor Adjustment
 - d. Carriage/Spindle Alignment
 - e. Head/Arm Alignment

STATIC GROUND SPRING

Adjustment

1. Set UNIT POWER circuit breaker to OFF.
2. Remove disk pack.
3. Refer to Side Panel Removal/Installation procedure and remove left (viewed from front) side panel.
4. Visually check that ground spring is approximately centered on lockshaft (Figure 3-32).
5. If required, loosen screw securing ground spring to mounting bracket and center spring as required. Tighten screw.
6. Place a .002-.005 inch non-metallic feeler gage between ground spring and lockshaft.
7. Hook a push-pull gage to outer end of ground spring.
8. Force (applied perpendicular to spring) required to allow feeler gage to fall free should be 125 (± 25) grams.
9. If required, carefully bend spring to adjust spring tension.
10. Install side panel per Side Panel Removal/Installation procedure.

Replacement

1. Set UNIT POWER circuit breaker to OFF.
2. Remove disk pack.
3. Refer to Side Panel Removal/Installation procedure and remove left (viewed from front) side panel.
4. Remove static ground spring leadwire.
5. Remove screw, nut, three washers, terminal lug and ground spring from contact mounting bracket (Figure 3-32).
6. Install replacement ground spring on contact mounting bracket using one screw, one nut, three washers, and terminal lug.
7. Perform Static Ground Spring Adjustment procedure.

8. Connect ground spring leadwire.
9. Install side panel per Side Panel Removal/Installation procedure.

VELOCITY TRANSDUCER OR MAGNET REPLACEMENT

1. Set UNIT POWER circuit breaker to OFF.
2. Remove disk pack.
3. Open cabinet top cover.
4. Remove deck top cover.
5. Disconnect velocity transducer cable plug P4 (Figure 3-34).
6. Remove two screws and washers securing velocity transducer end cap to magnet assembly. Retain cap, screws, and spring (located inside cap).

CAUTION

Use care in the following steps so that extension rod is not damaged.

7. Unthread extension rod at point where it enters rear of head/arm receiver.
8. Carefully pull transducer magnet and extension rod out of cap end of transducer coil/housing.

NOTE

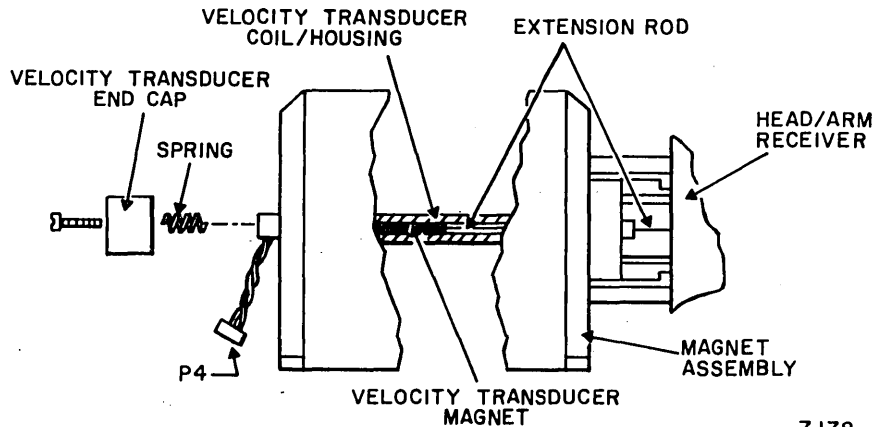
Omit steps 9 and 14 if only the magnet is being replaced.

9. Remove transducer coil/housing from magnet assembly.

CAUTION

Replacement velocity transducer magnet can be rendered unuseable if it comes in contact with a ferro magnet object. Assembly must be moved out of magnet at least 18 inches before changing direction. New assembly must not approach the magnet closer than 18 inches except from center rear. Do not place transducer magnet on any metal surface.

10. Carefully remove replacement transducer magnet from shipping container.
11. Place replacement magnet alongside old magnet to determine correct



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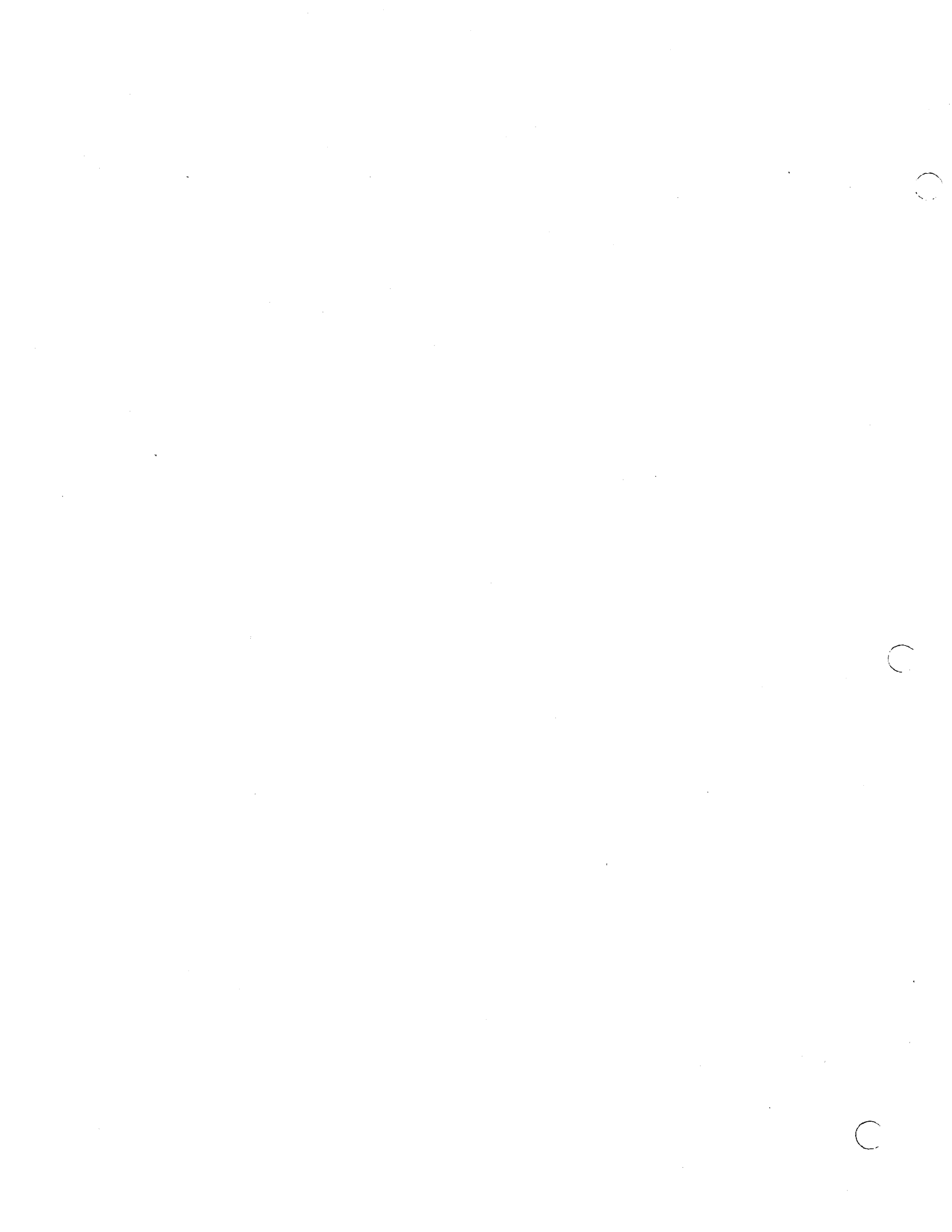
Figure 3-34. Velocity Transducer Replacement

12. Carefully unthread extension rod from old transducer magnet. Moderate force may be required since Loctite is on rod threads.
13. Apply one drop of Loctite, Grade C, to extension rod threads that mate with transducer magnet. Observing polarity that was determined in step 11, thread rod into end of new transducer magnet.
14. Slide replacement transducer coil/housing into magnet assembly.
15. Insert free end of extension rod into bore of coil/housing. Slide assembly into coil/housing until threads of extension rod are visible behind head/arm receiver.
16. Apply one drop of Loctite, Grade C, to extension rod threads. Using a pliers and only moderate force, install extension rod in head/arm receiver.
17. Install head cam tool and fully extend carriage.
18. Assemble spring and transducer end cap to magnet assembly using two screws and washers.
19. Connect velocity transducer plug P4.

NOTE

Transducer polarity is correct when A27, TP-F swings in negative direction while actuator is manually moved in forward direction.

20. Remove head cam tool.
21. Perform Integrator Gain Check and Adjustment procedure.
22. Perform Velocity Transducer Gain Uniformity procedure (Velocity Logic Checks).
23. Perform Velocity Gain Adjustment procedure.



SECTION 4

DIAGRAMS

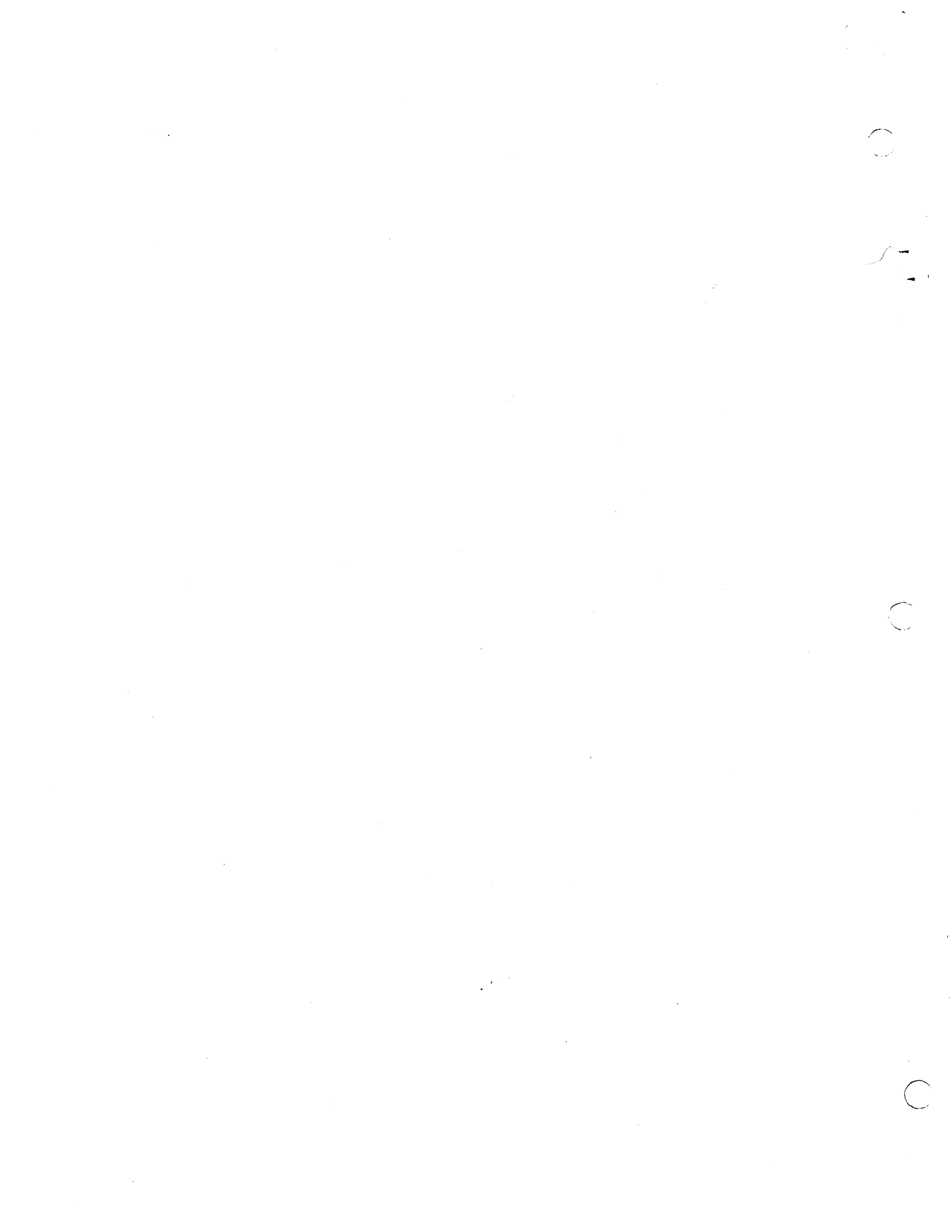


INTRODUCTION

This section contains diagrams that logically describe the drive in terms of the functions which the unit performs and schematics that show the wiring of the various assemblies. Descriptive material for integrated and discrete component circuits is located in Sections 4, 5, and 6 of the Reference manual (Publication No. 83313200). Flow charts,

simplified circuits, and timing diagrams are located in the same manual.

Logic sheets 1 and 2 and sheet 1 of all assembly schematics (located at end of section) are not included in this manual. They are for factory use only.



		IF TAG OUT DECODE IS								AND BUS OUT IS								DRIVE PLACES ON BUS IN							
		BIT								BIT															
		0	1	2	3	4	5	6	7	0	1	2	3	4	5	6	7								
D	NAME																								
	DECODE																								
	TRANSMIT SECTOR	1	64	32	16	8	4	2	1	HIGH SIDE OF SECTOR	64	32	16	8	4	2	1								
	POLL DEVICES ①	2	---							SERVICE	---														
	TRANSMIT MODULE ADDRESS	3	---							SERVICE	4	2	1	---											
	REQUEST STATUS ②	4	SIMULATE EVEN DIBIT	SIMULATE FWD EOT ENABLE	SIMULATE REV EOT ENABLE	SIMULATE VELOCITY	BLANK OR CYL	SIMULATE FINE ENABLE	INHIBIT UNLOAD MDS SIMULATE MDS LOADED	INDEX ERROR	OFFSET ACTIVE	SEEK INCOMPLETE	SEEK COMPLETE	ON LINE	ATTENTION	BUSY	RECORD SEARCH IN PROGRESS								
	REQUEST ADDRESS	5	---							READ DIFF CNTR	---	---	---	---	---	---	---								
	TRANSMIT CYLINDER ADDRESS	6	128	64	32	16	8	4	2	1	128 OFFSET	64 SIGN CHANGE	32	16	8	4	2	1							
	TRANSMIT HEAD ADDRESS	7	CAR 512	CAR 256	---				---	---	---	---	---	---	---	---	---								
	TRANSMIT DIFFERENCE	8	128	64	32	16	8	4	2	1	CAR 512	CAR 256	---				---	---	---						
	TRANSMIT OFFSET ③	9	REVERSE OFFSET	SIGN CHANGE	---				---	---	---	---	---	---	---	---	---								
	TRANSMIT CONTROL 1	10	METERING IN B		OFFSET START	SEEK START	REZERO START	RESET HAR	CONTROL RESET	INTERRUPT RESET	128	64	32	16	8	4	2	1							
	TRANSMIT CONTROL 2	11	DIFF 512	DIFF 256	SET HIGH DIFF	RESET DIFF	REVERSE	---		---	HIGH SIDE OF SECTOR	64	32	16	8	4	2	1							
OPERATE	12	WRITE AM	AM SEARCH	HEAD SELECT	HEAD ADVANCE	WRITE	READ	SAVE SECTOR	---	128	64	32	16	8	4	2	1								
REQUEST DIAGNOSTIC SENSE	13	SERVO POINTS		---				---	---	---	REVERSE OFFSET	SIGN CHANGE	---				---	---	---						
REFER TO TABLE ON SHEET 4 FOR DEFINITIONS	14	MONITOR MODE 8 & DIAG		---				---	---	---	SAME BYTE AS TAG DECODE 4														
MODE & DIAGNOSTIC CONTROL	15	DIAG MODE 4	DIAG MODE 2	DIAG MODE 1	BLOCK PARITY	MONITOR MODE 4	MONITOR MODE 2	MONITOR MODE 1	---	DIFF 512	DIFF 256	---		REV	---										

NOTES
 ① INTERRUPT CONDITIONS ARE:
 A ATTENTION LATCH ON
 B SEEK COMPLETE
 C SEEK INCOMPLETE
 D RECORD READY
 ② BUS OUT BITS SIGNIFICANT ONLY WITH DIAG MODE 2 SET
 ③ TRANSMIT OFFSET MUST PRECEDE OFFSET START (TAG 9, BIT 2)
 4. ALL TAGS EXCEPT 2 AND 3 REQUIRE PREVIOUS SELECTION

NORMANDALE DIVISION	TAG / BUS DECODES		DOC NO HPDE 7596	CD A	REV A
	CODE IDENT 19333	SHEET 3	PAGE		

MONITOR MODES

STATE	MODE					BUS IN BIT	
	NUMBER	1	2	4	6		7
	NAME	REZERO	SEEK	HEAD LOAD	READ		WRITE
	SET BY MAND OR BY	RTZ COMMAND	GATED SEEK START	FIRST SEEK INTERLOCK START	READ COMMAND		WRITE COMMAND
RESET BY	SEEK COMP • STATE 7	SEEK COMP • STATE 5	SEEK COMP • STATE 6	NOT READ • STATE 4	NOT WRITE • STATE 3		
1	RTZ FF	SEEK FF	MOTOR START COMMAND	GATED READ GATE	WRITE GATE	7	
2	T=0 • EVEN CYLINDER	FORWARD/REVERSE DRIVE	SPEED	STATE 1 • READ GATE	WRITE DATA PULSE	6	
3	REVERSE EOT ENABLE	VELOCITY DETECTED	FIRST SEEK INTERLOCK COMPLETE	DATA ENABLE (BOB 2)	WRITE CURRENT	5	
4	REVERSE EOT	STATE 3 • NO FORWARD/REVERSE DRIVE	LOAD HEADS COMMAND	STATE 3 • DATA ENABLE (BOB 2)	WRITE • OFFSET ①	4	
5	LOAD	STATE 4 • ON CYLINDER	FWD EOT ENABLE • HEADS LOADED		AC TRANSITIONS • ADDRESS MARK ①	3	
6	STATE 5 • CYLINDER PULSE		REVERSE EOT		READ • WRITE ①	2	
7	STATE 6 • ON CYLINDER	SPIKE DETECT ①	STATE 6 • CYL PULSES		(WRITE) (NO SELECTED + ON CYL + EOC) ①	1	
8			ON CYLINDER	MULTIPLE HEAD + CURRENT ①	MULTIPLE HEAD + CURRENT ①	0	

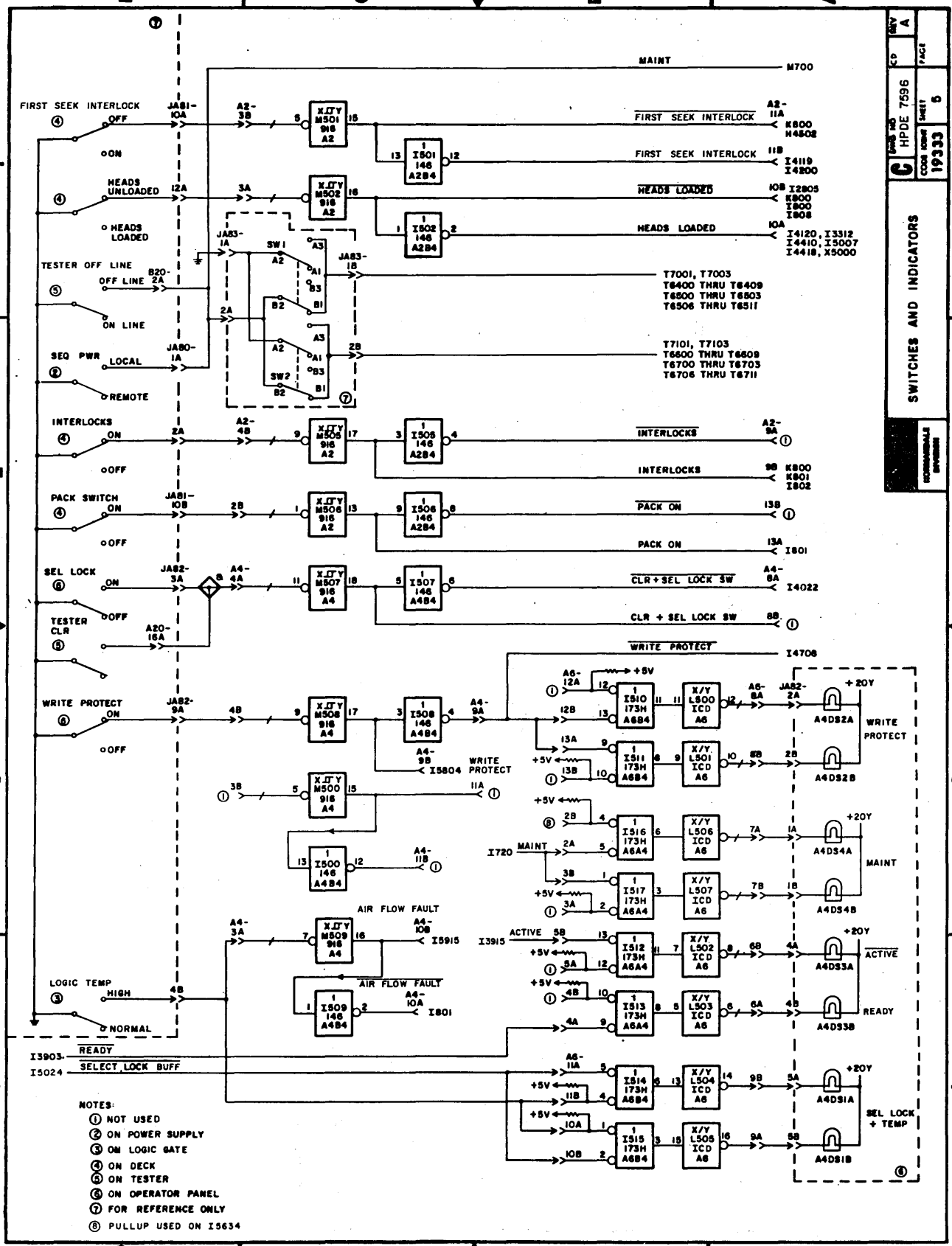
NORMAL
PROGRESSION



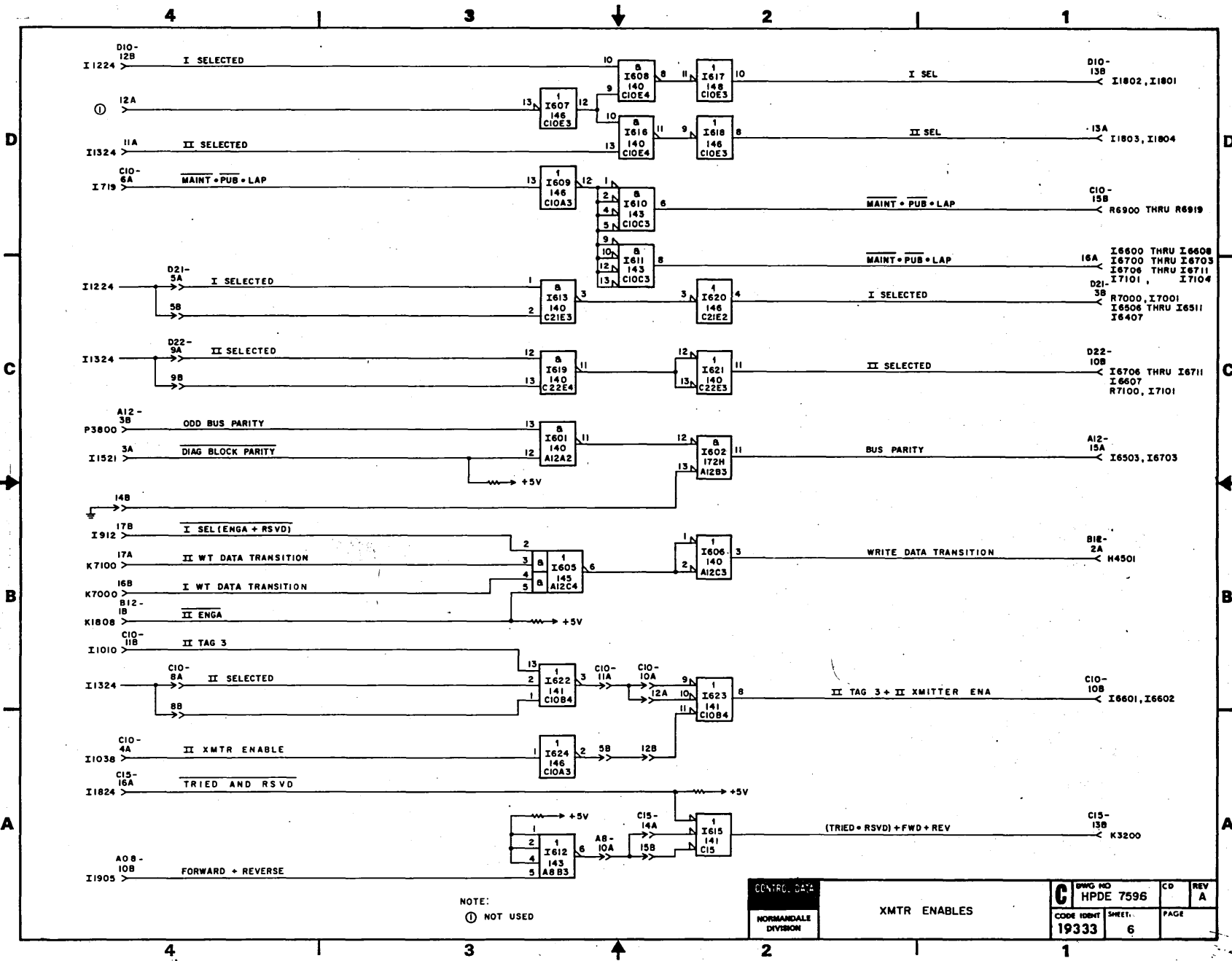
MONITOR
LATCHES

NOTE:
① FAULT CONDITIONS

NORMANDALE DIVISION	MONITOR STATE CONDITIONS (TAG 13)		DWG NO HPDE 7596	CD REV A
	CODE IDENT 19333	SHEET 4	PAGE	

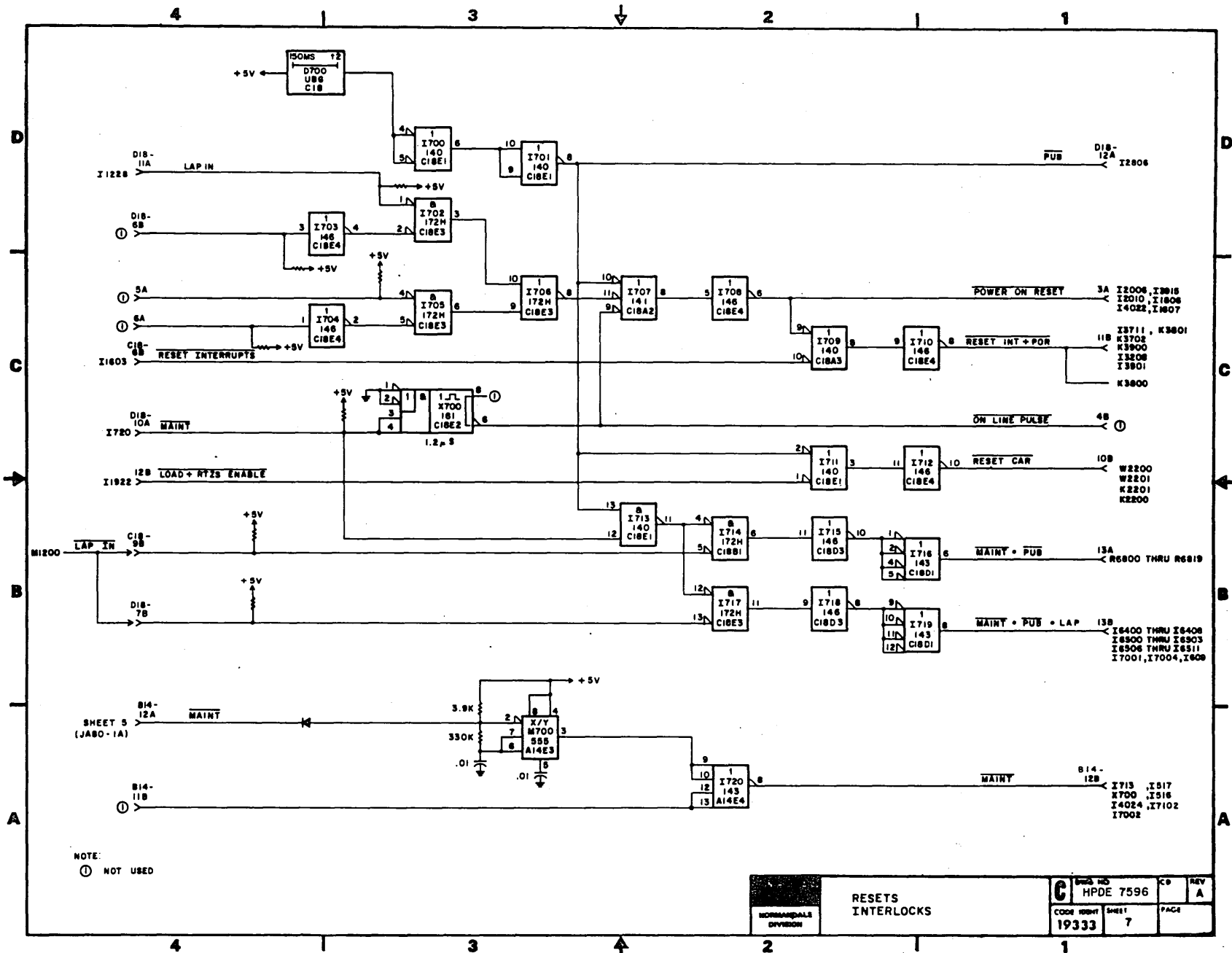


- NOTES:
- ① NOT USED
 - ② ON POWER SUPPLY
 - ③ ON LOGIC GATE
 - ④ ON DECK
 - ⑤ ON TESTER
 - ⑥ ON OPERATOR PANEL
 - ⑦ FOR REFERENCE ONLY
 - ⑧ PULLUP USED ON I5634



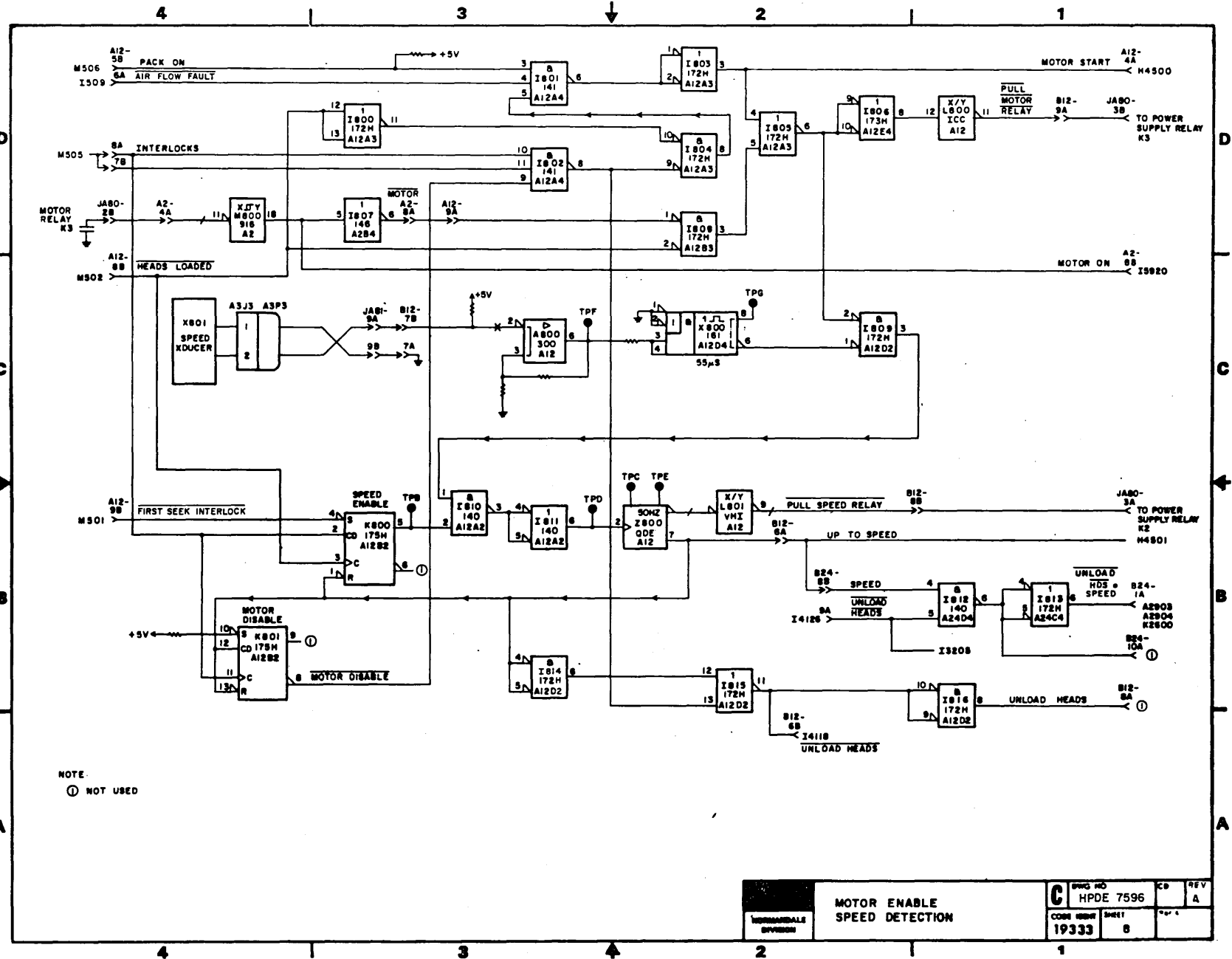
NOTE:
① NOT USED

CONTROL DATA		C	DWG NO HPDE 7596	CD	REV
NORMANDEALE DIVISION				19333	6
XMTR ENABLES		SHEET	PAGE		



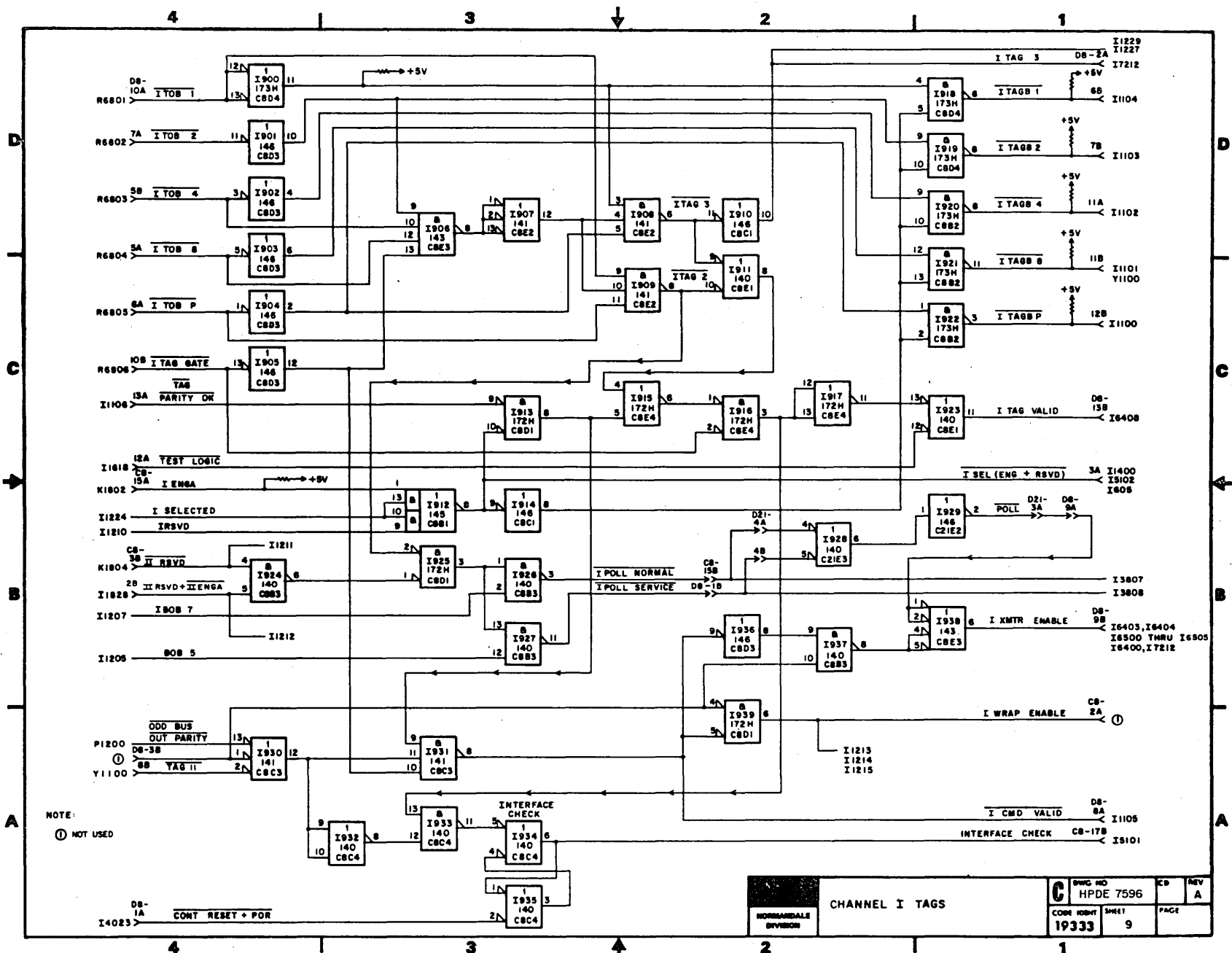
NOTE:
 ① NOT USED

NORMANVILLE DIVISION	RESETS INTERLOCKS		C	REV NO	CD	REV
	CODE	SHEET		HPDE 7596		
				19333		7



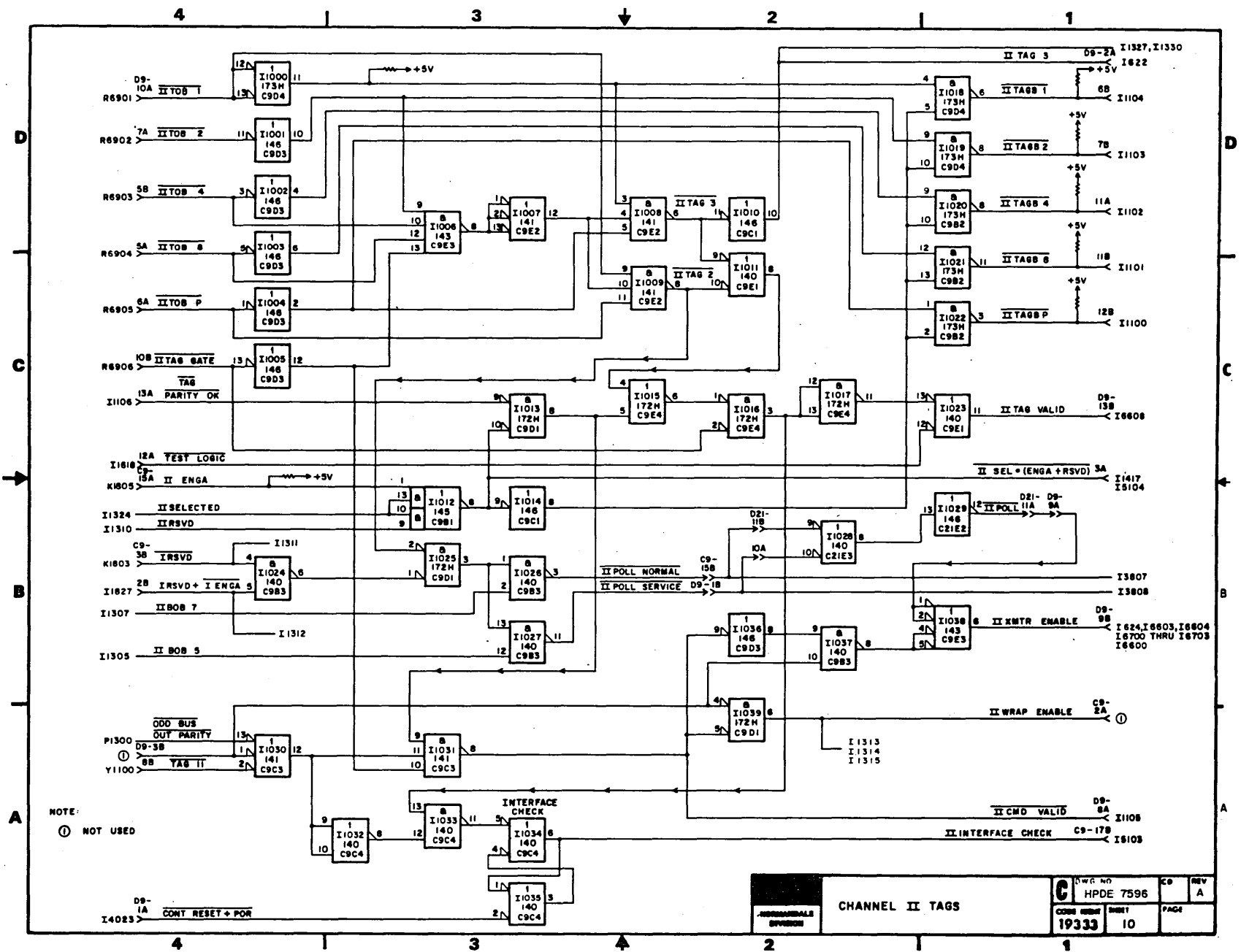
NOTE
 (1) NOT USED

19333 SHEET 8	HPDE 7596 CODE	REV A
	MOTOR ENABLE SPEED DETECTION	



NOTE:
 ⓪ NOT USED

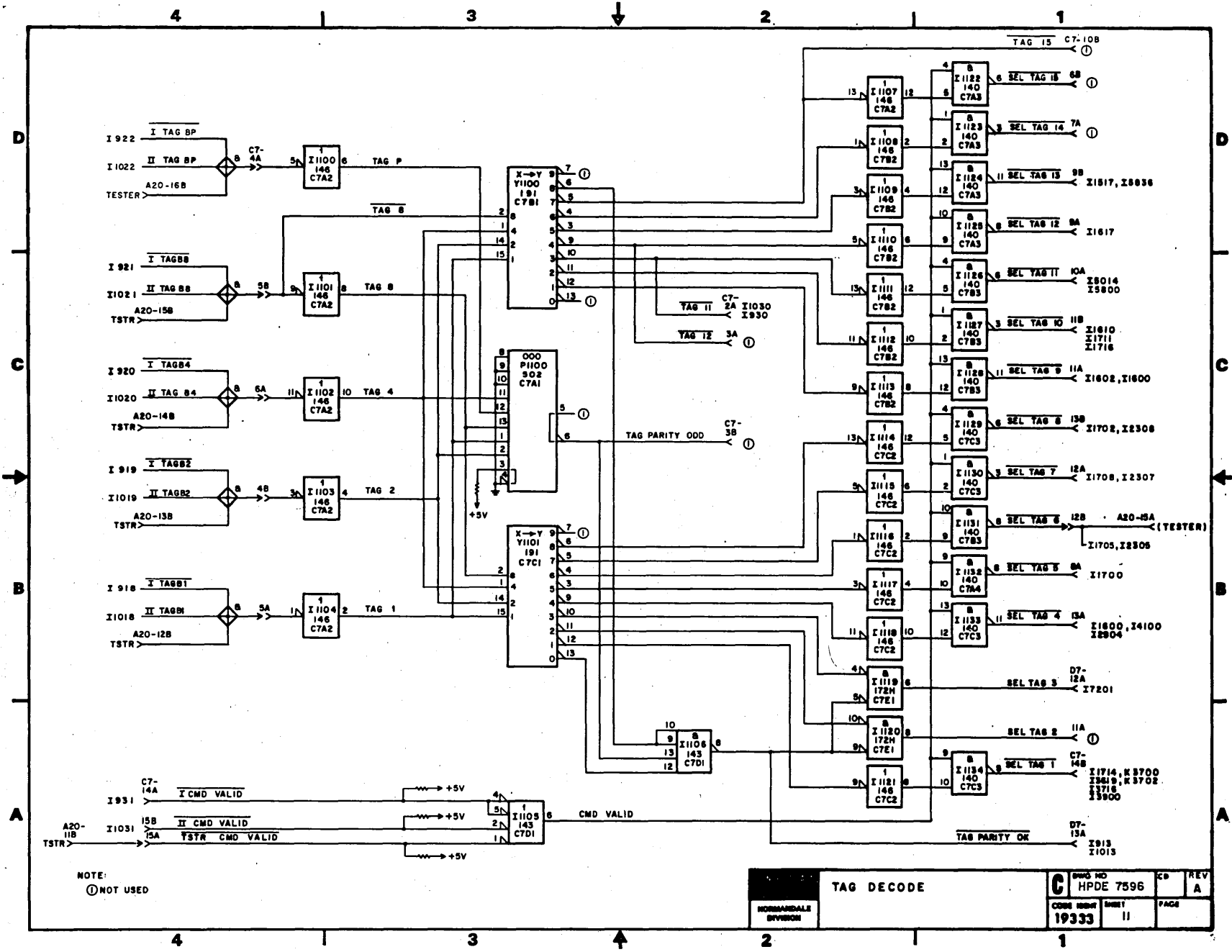
NORMANDEALE DIVISION	CHANNEL I TAGS		C PWC NO HPDE 7596	CD INV A
	CODE 19333	SHEET 9	PAGE	9



NOTE:
 (O) NOT USED

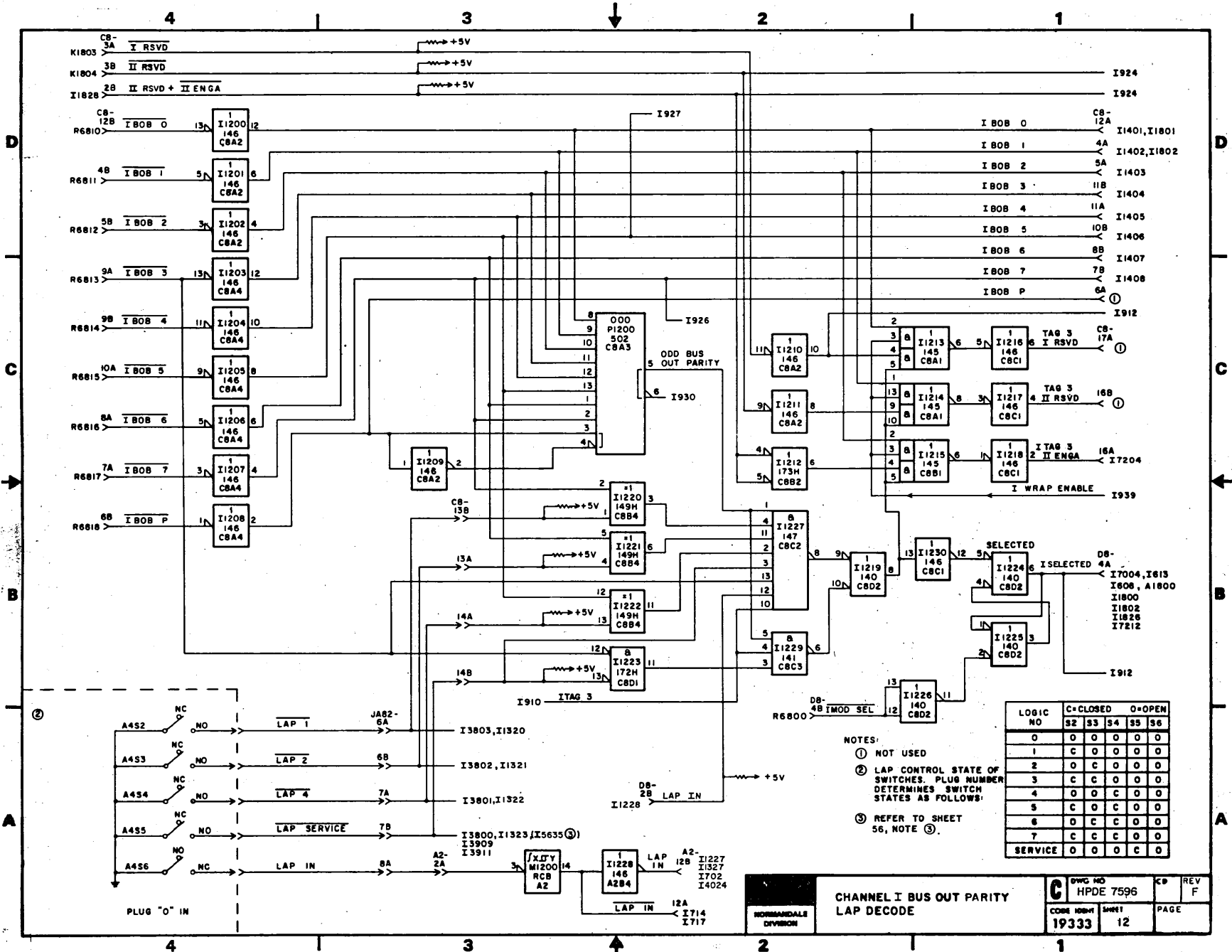
D9-1A CONT RESET + POR
 I1023

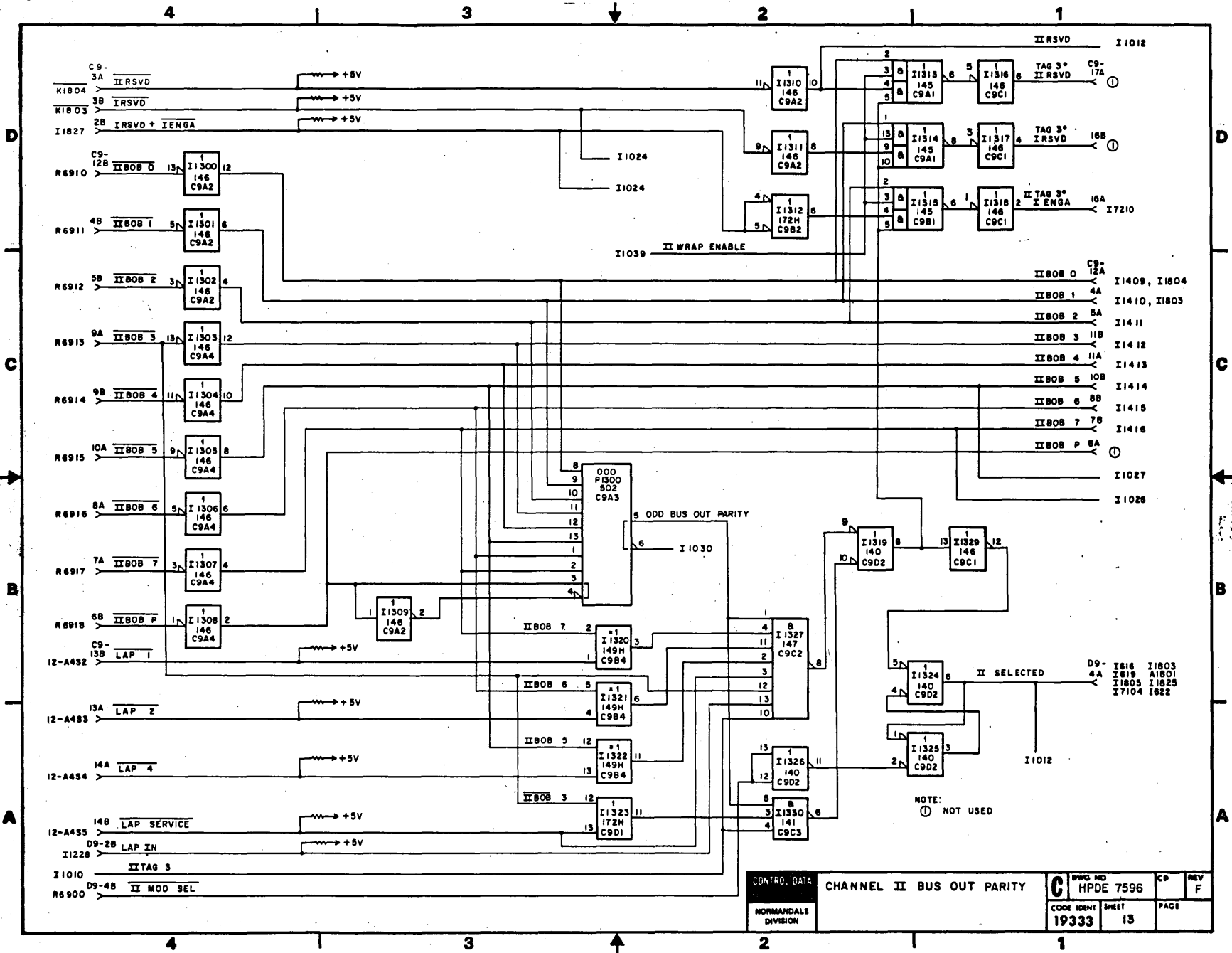
REVISIONS	DATE	REV
	HPDE 7596	A
C	DWG NO	CN
19333	HPDE 7596	REV
	FIGURE	A
	SHEET	
	10	
	PAGE	



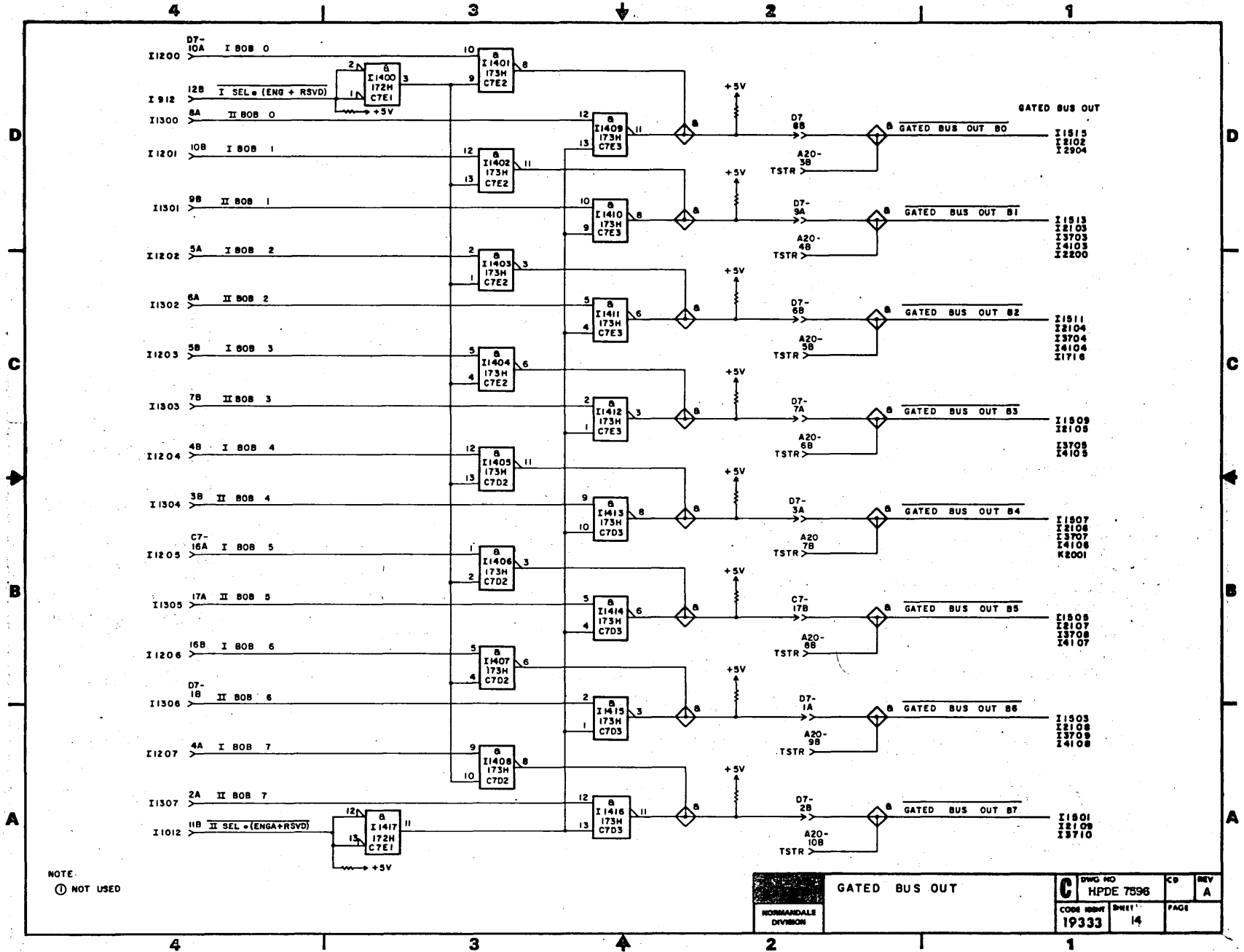
NOTE:
 ○ NOT USED

NORMAN DALE DIVISION	TAG DECODE		C	REV	A
	HPDE 7596	CD		11	
19333			CODE	11	PAGE



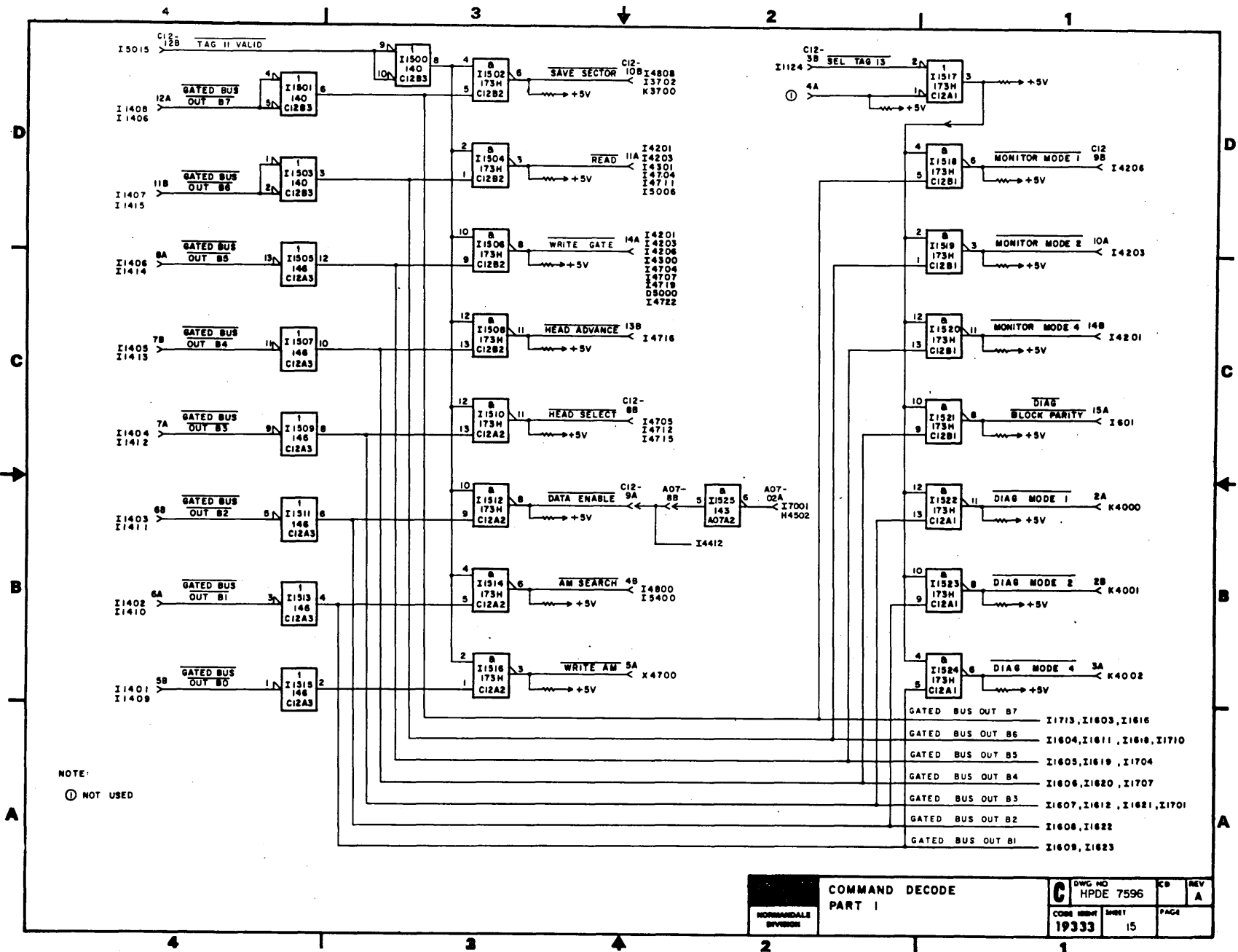


CONTR. DATA	CHANNEL II BUS OUT PARITY	DRWG NO HPDE 7596	CD	REV F
NORMANDEALE DIVISION		CODE IDENT 19333	SHEET 13	PAGE



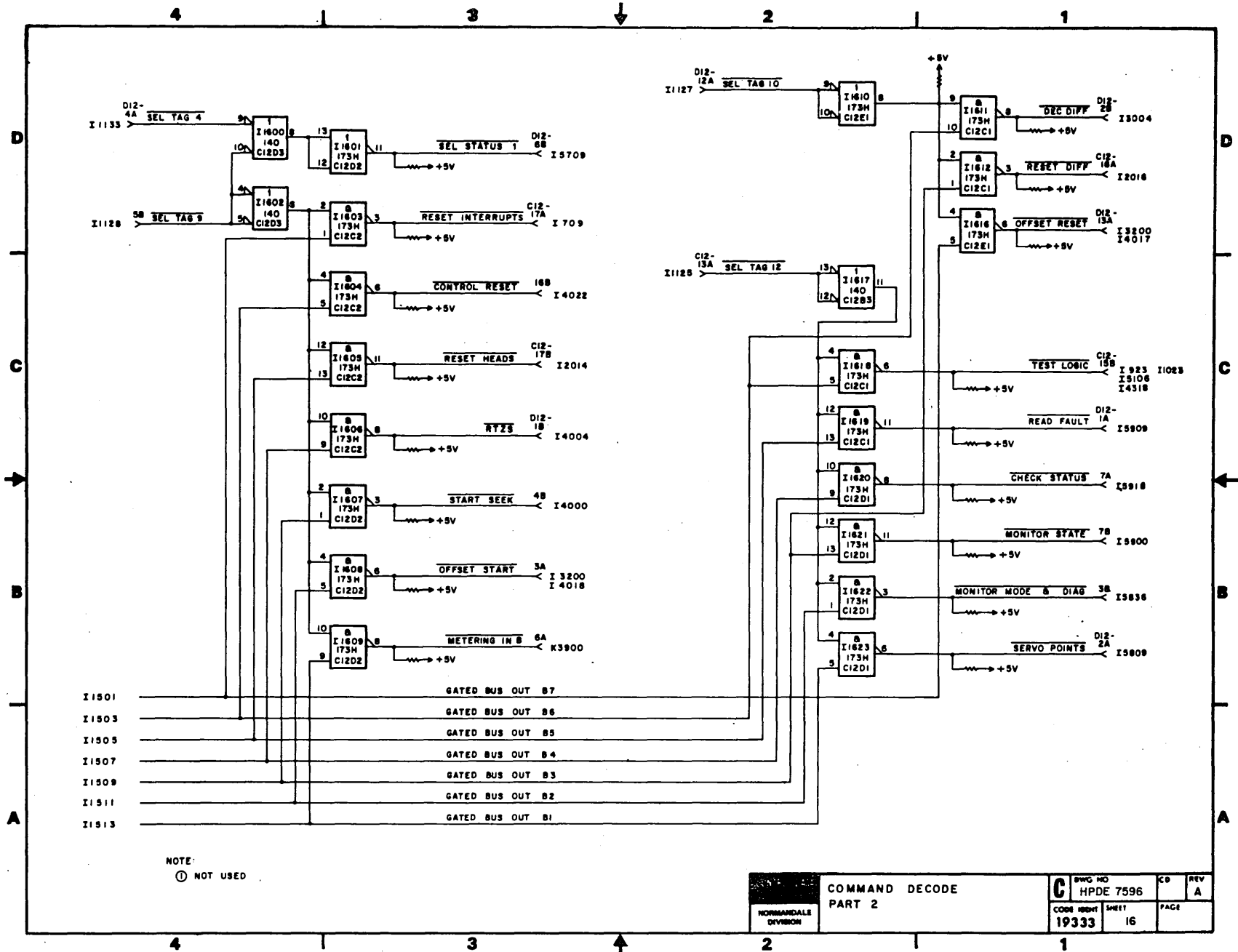
NOTE:
⊙ NOT USED

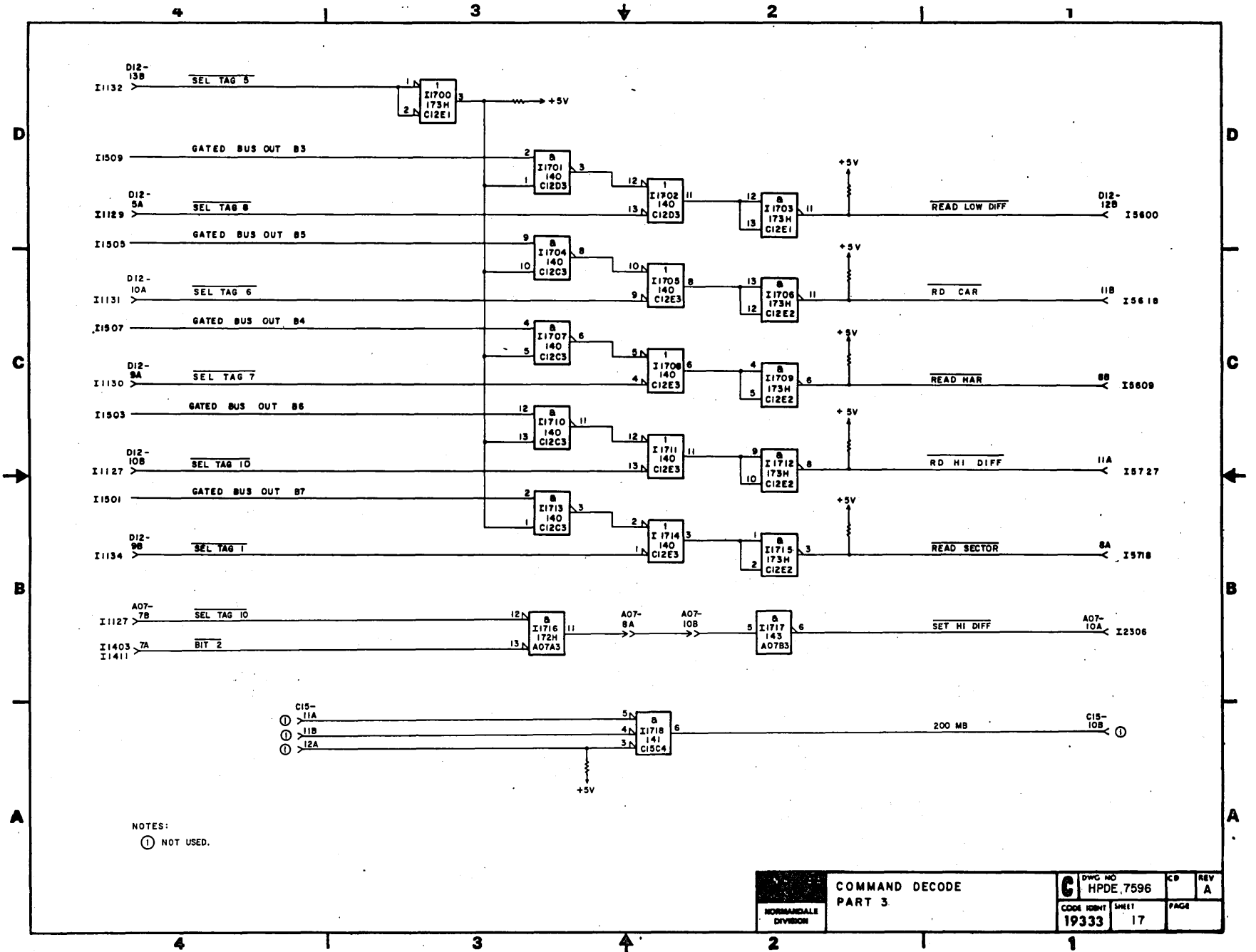
NORMANDEALE DIVISION	GATED BUS OUT		CDG NO HPDE 7596	CD A	REV A
	CODE 19333	SHEET 14	PAGE		



NOTE:
 (1) NOT USED

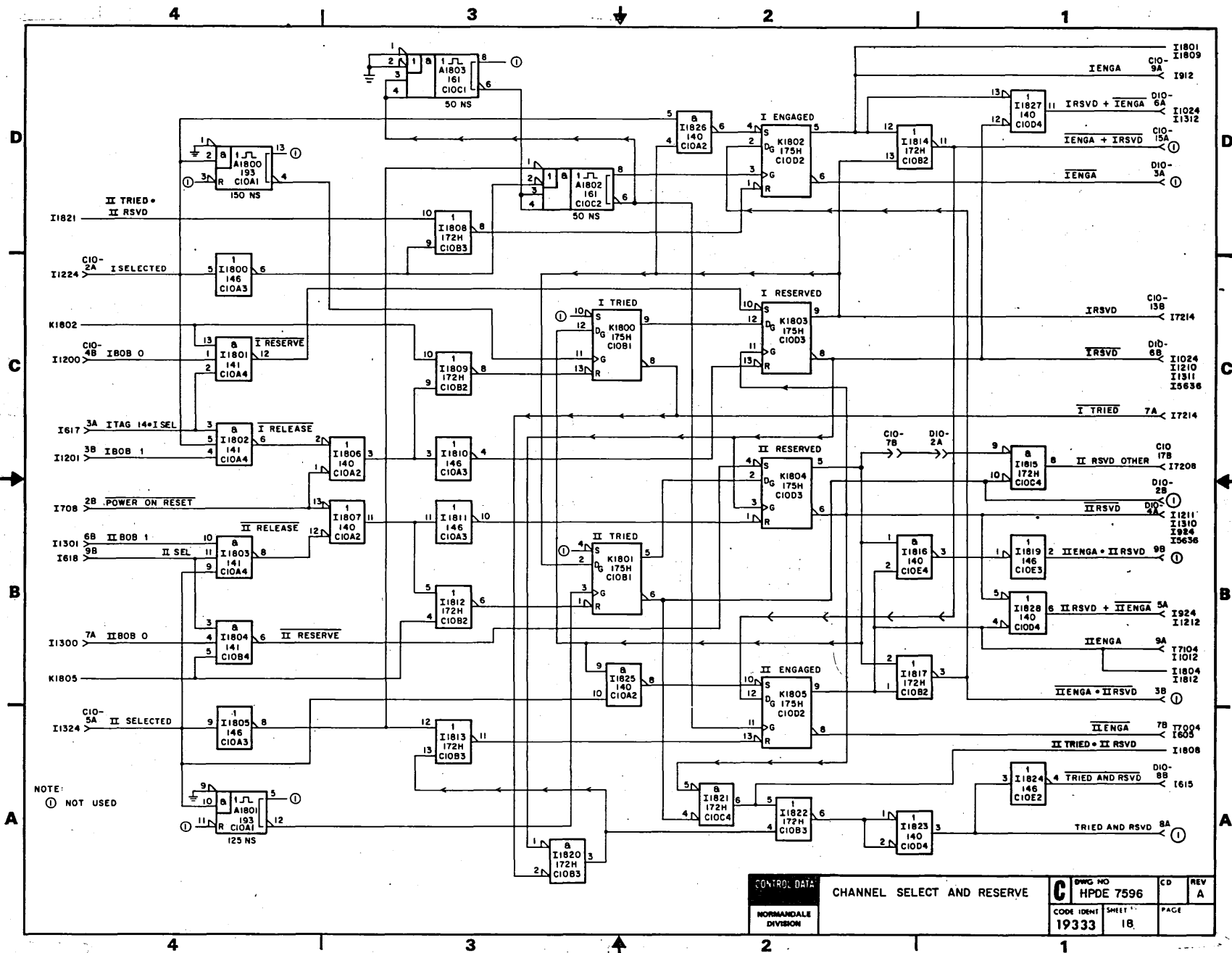
NONMILITARY DIVISION	COMMAND DECODE PART I		C	DWC NO	REV
				HPDE 7596	A
		CODE	REV	PAGE	
		19333	15		





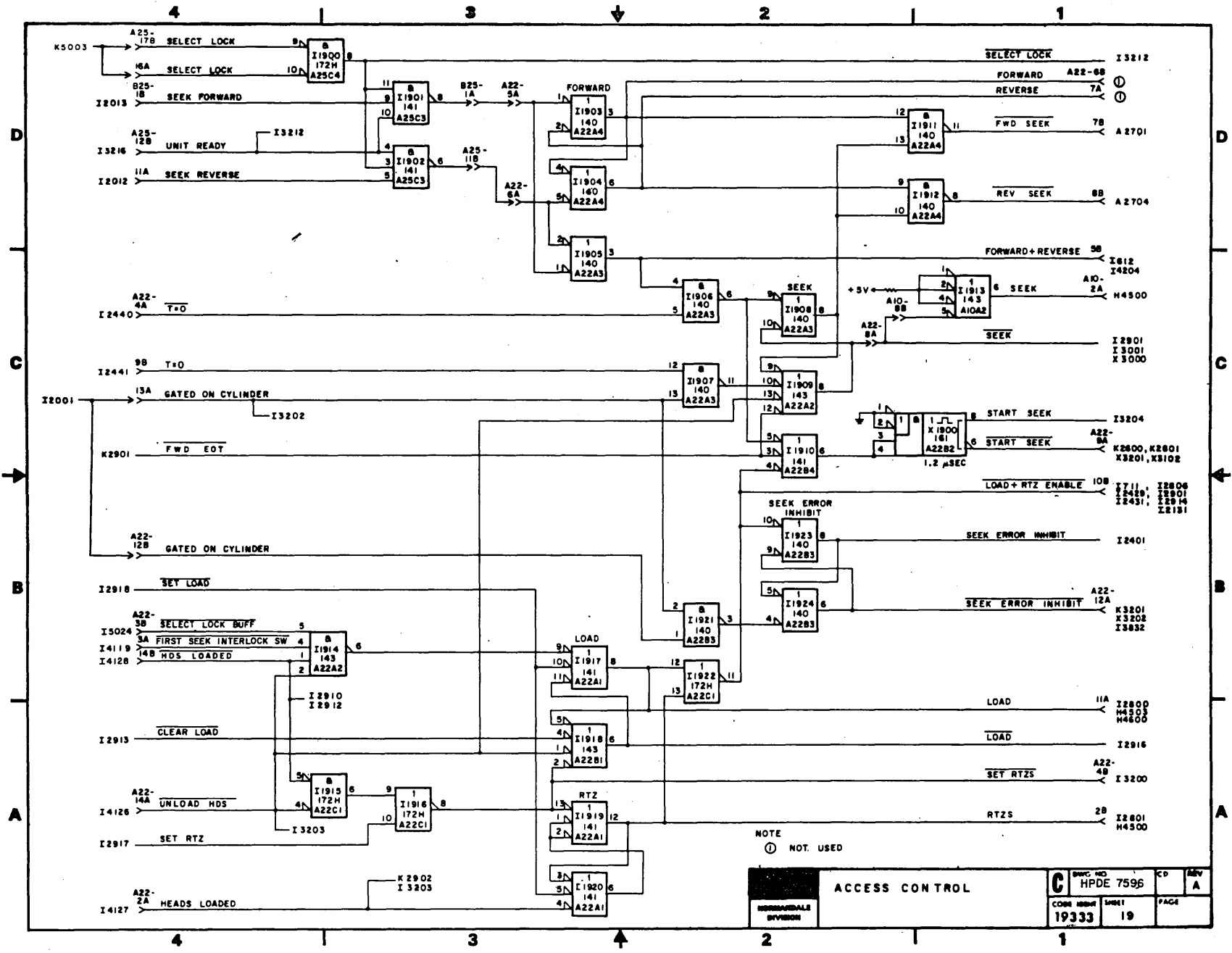
NOTES:
 (1) NOT USED.

MORRISDALE DIVISION		COMMAND DECODE PART 3		DWC NO HPDE.7596	CD A	REV A
		19333	SHEET 17	PAGE		



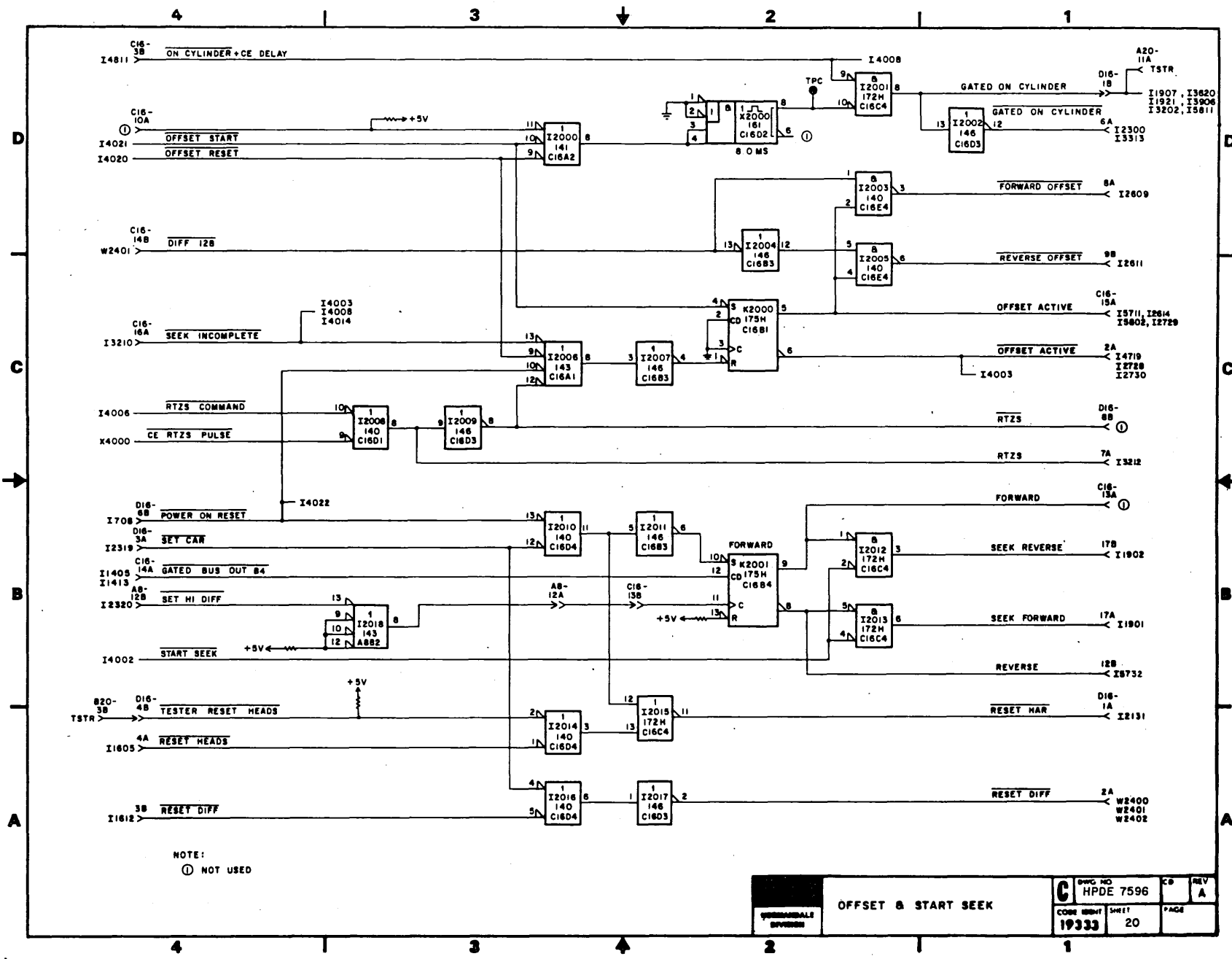
NOTE:
① NOT USED

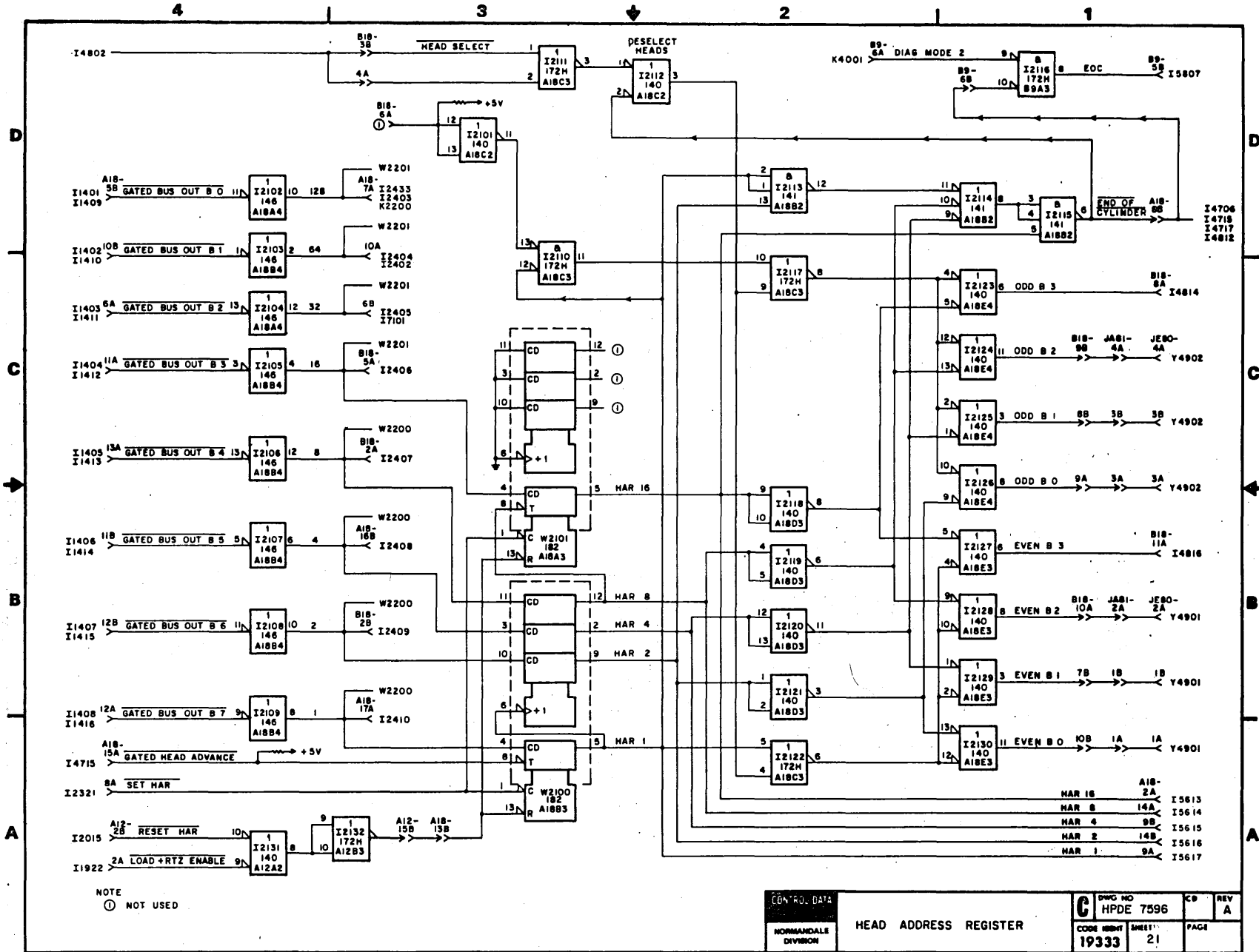
CONTROL DATA		CHANNEL SELECT AND RESERVE		C DWG NO HPDE 7596		CD	REV A
NORMANDALE DIVISION		CODE IDENT 19333	SHEET 18	PAGE			



NOTE
 (1) NOT USED

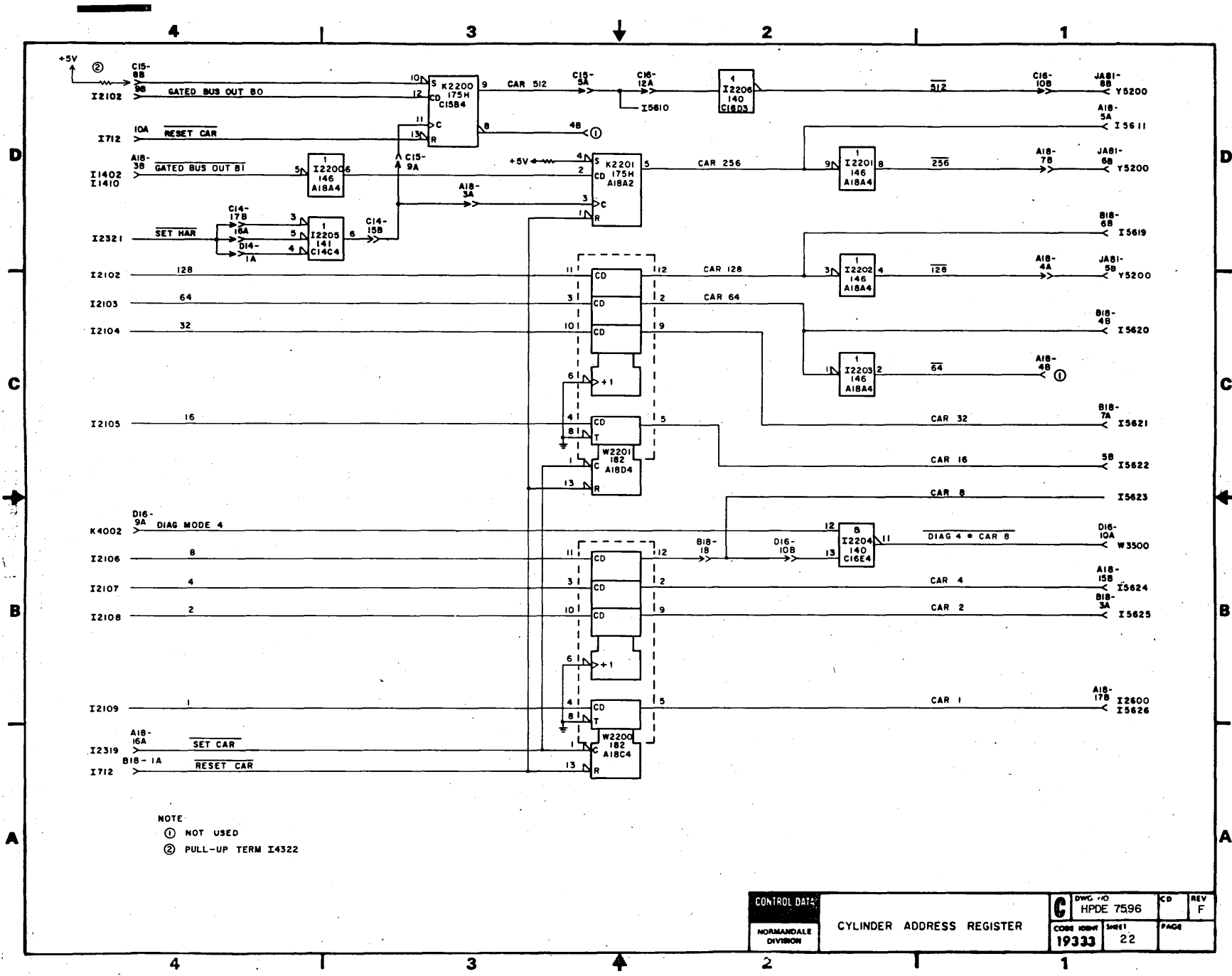
ACCESS CONTROL		C	DWG. NO. HPDE 7596	CD	REV A
CORPORATION	DIVISION	CODE	19333	SHEET	19
		PAGE			





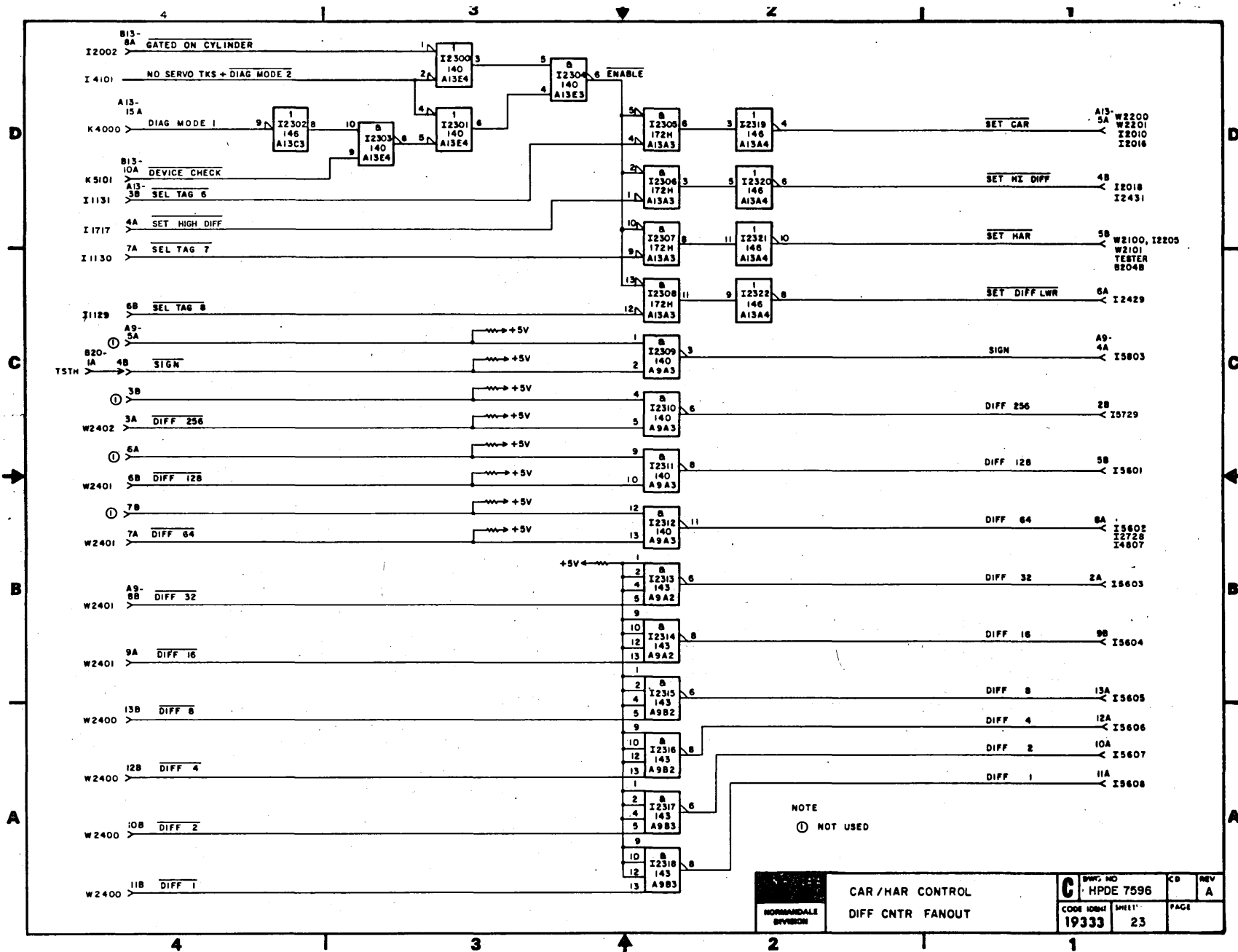
NOTE
① NOT USED

CONTRL DATA	C DWG NO HPDE 7596		CD	REV
	NORMANDE DIVISION		19333	A
HEAD ADDRESS REGISTER		SHEET	PAGE	
		21		

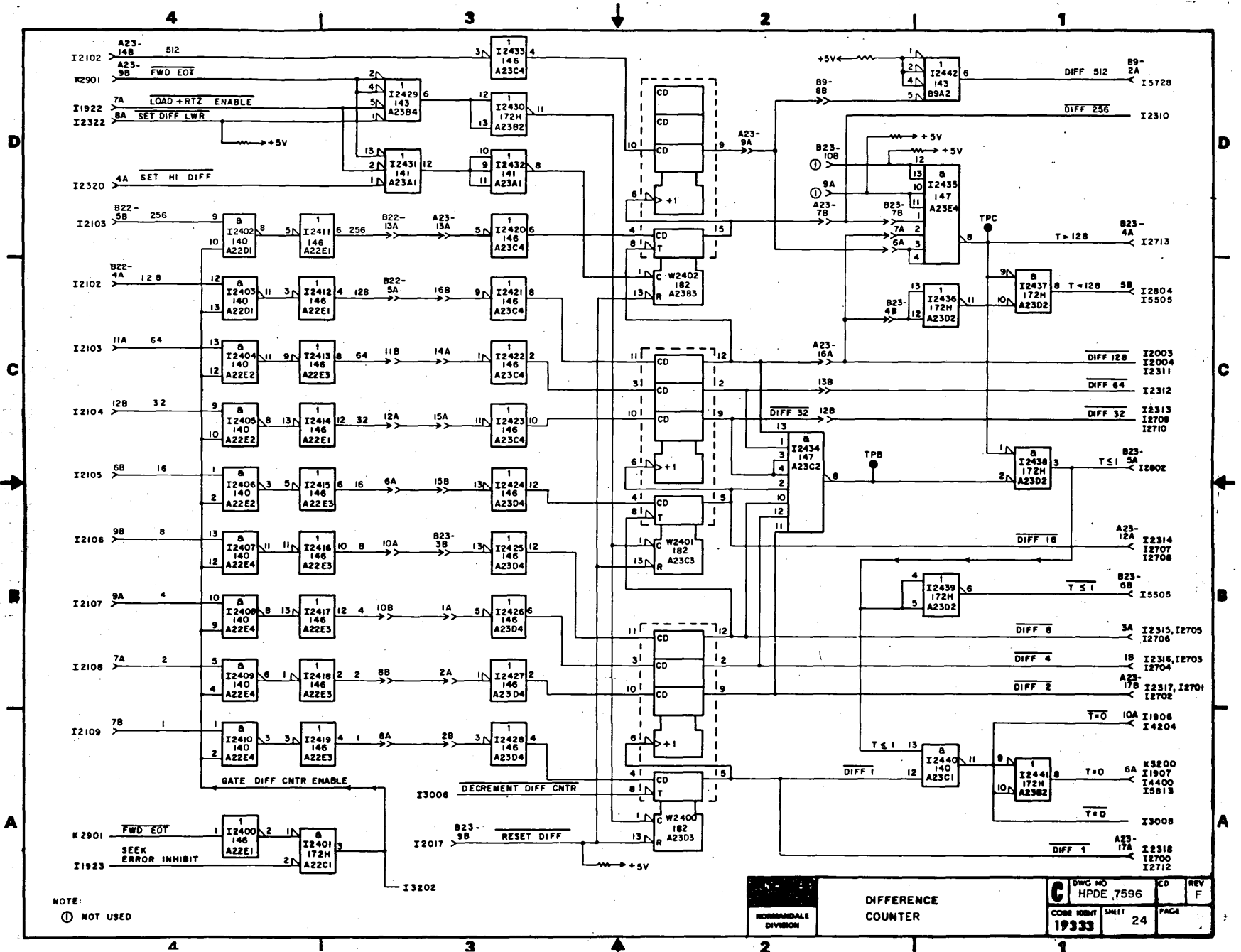


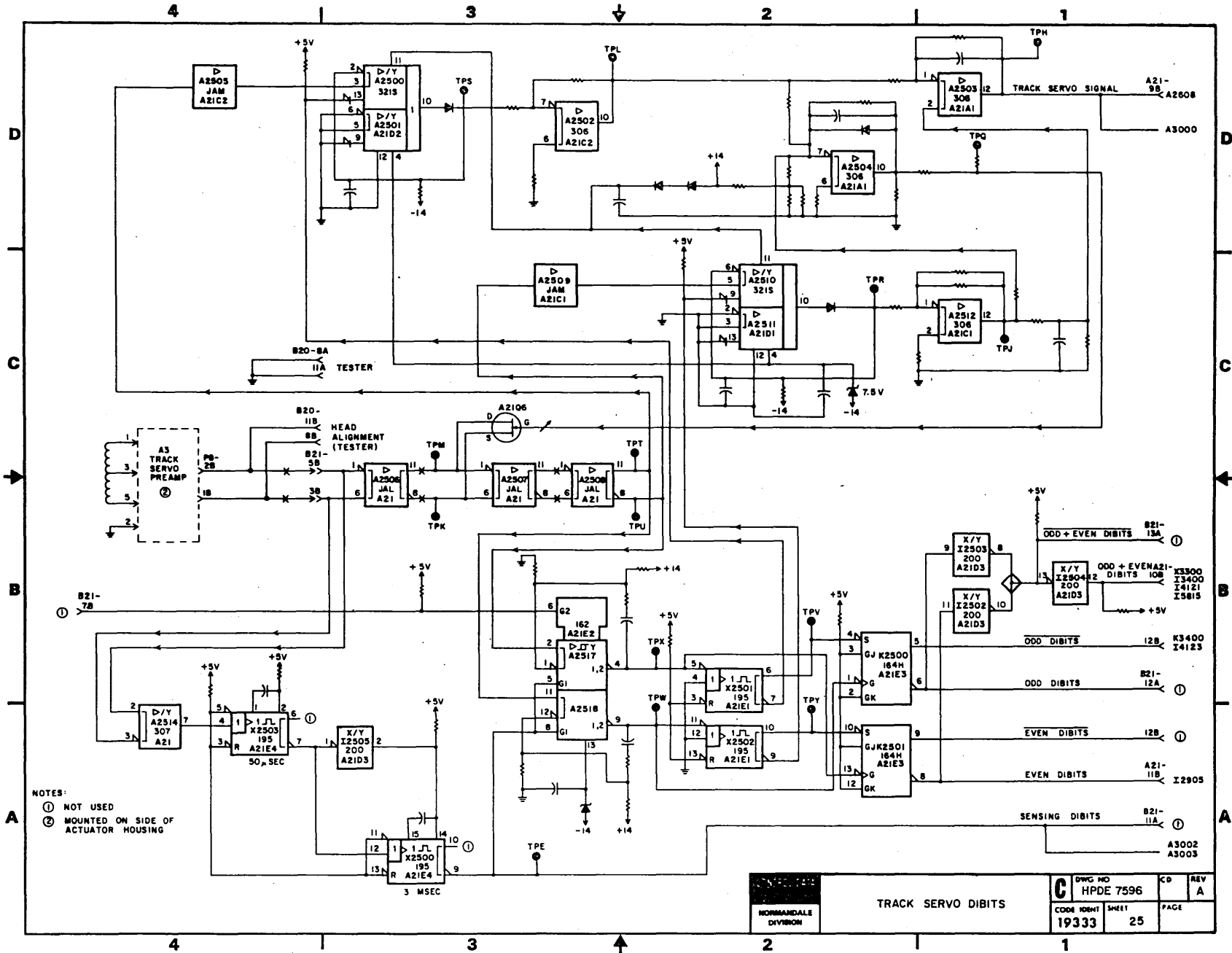
NOTE
 ① NOT USED
 ② PULL-UP TERM I4322

CONTROL DATA		DWG. NO. HPDE 7596	CD	REV F
NORMANDEALE DIVISION		CODE 19333	SHEET 22	PAGE



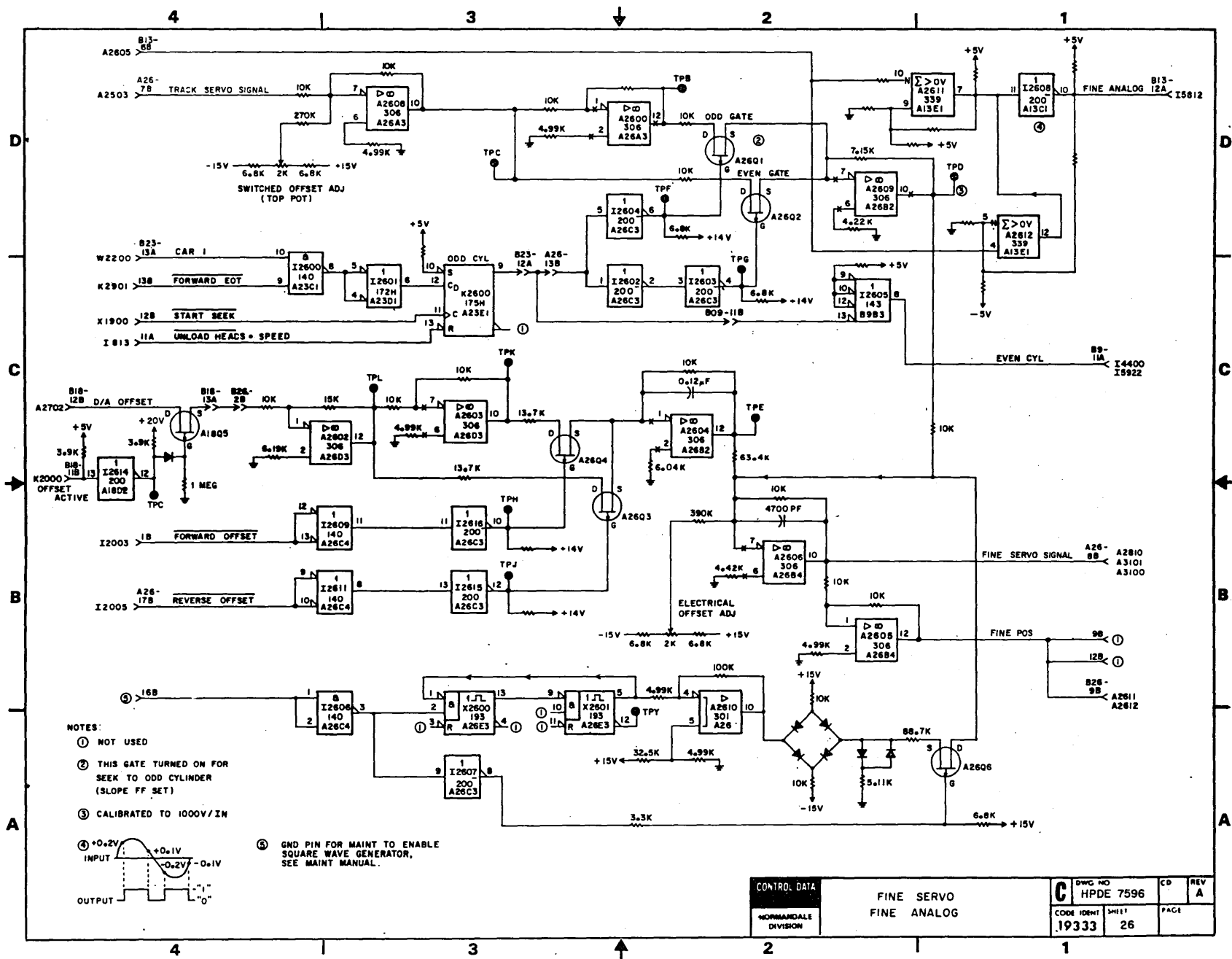
NORMAN DALE DIVISION	CAR / HAR CONTROL		C	DRW. NO	CD	REV
	DIFF CNTR FANOUT			HPDE 7596		
	CODE IDENT	SHEET	PAGE			
	19333	23				



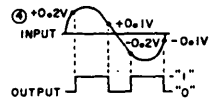


NOTES:
 ① NOT USED
 ② MOUNTED ON SIDE OF ACTUATOR HOUSING

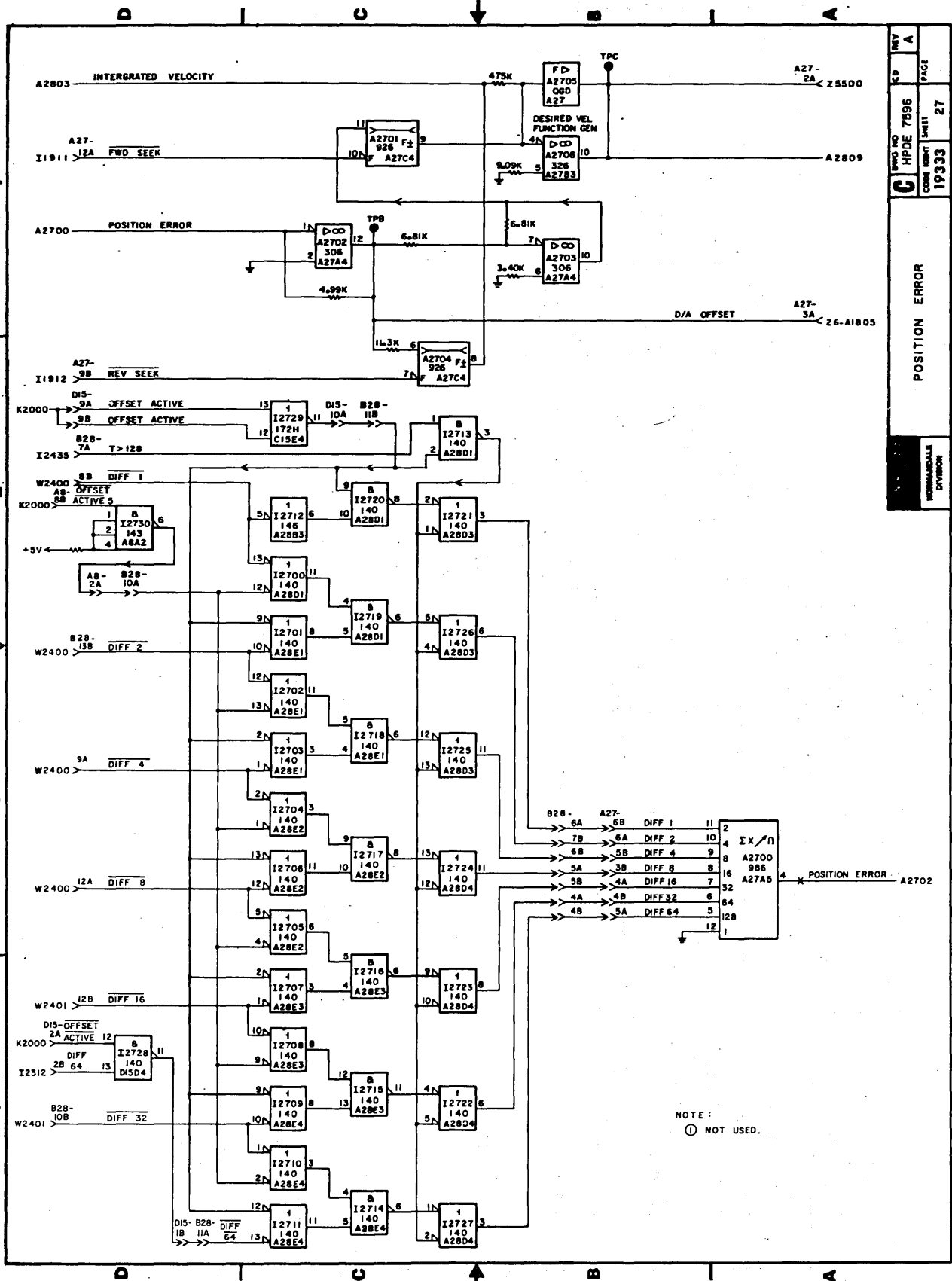
NORMANDALE DIVISION	TRACK SERVO DIGITS		DWG NO HPDE 7596	CD A	REV A
	CODE IDENT 19333	SHEET 25	PAGE		



NOTES:

- ① NOT USED
- ② THIS GATE TURNED ON FOR SEEK TO ODD CYLINDER (SLOPE FF SET)
- ③ CALIBRATED TO 1000V/IN
- ④  INPUT: +0.2V, -0.2V; OUTPUT: +0.4V, -0.4V
- ⑤ GND PIN FOR MAINT TO ENABLE SQUARE WAVE GENERATOR, SEE MAINT MANUAL.

CONTROL DATA		FINE SERVO		CD	REV
NORMANDALE DIVISION		FINE ANALOG			
HPDE 7596		CODE IDENT	SHEET	PAGE	
19333		26			

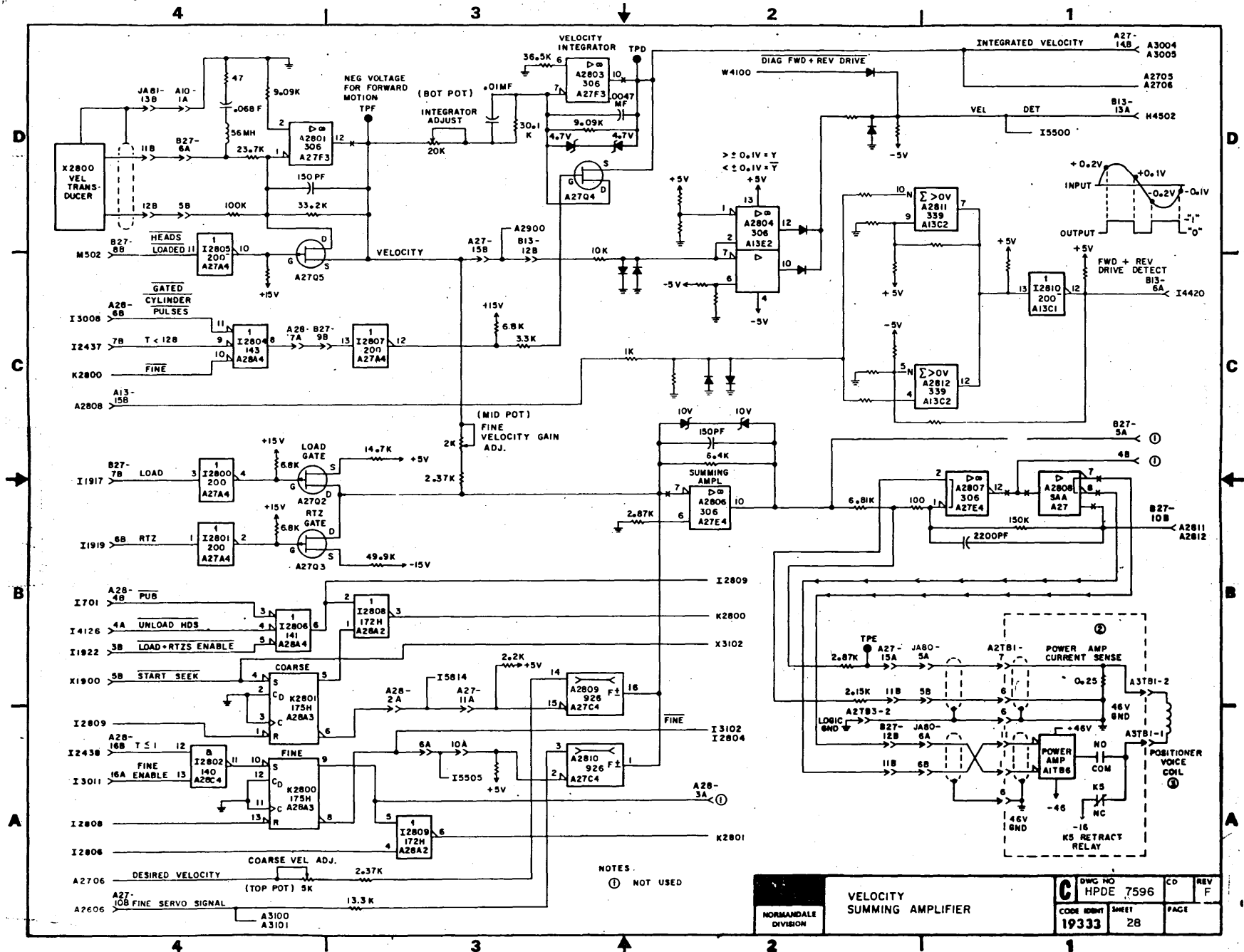


REV NO	REV	PAGE
C	A	27
HPDE 7596		
CODE SHEET		
19333		

POSITION ERROR

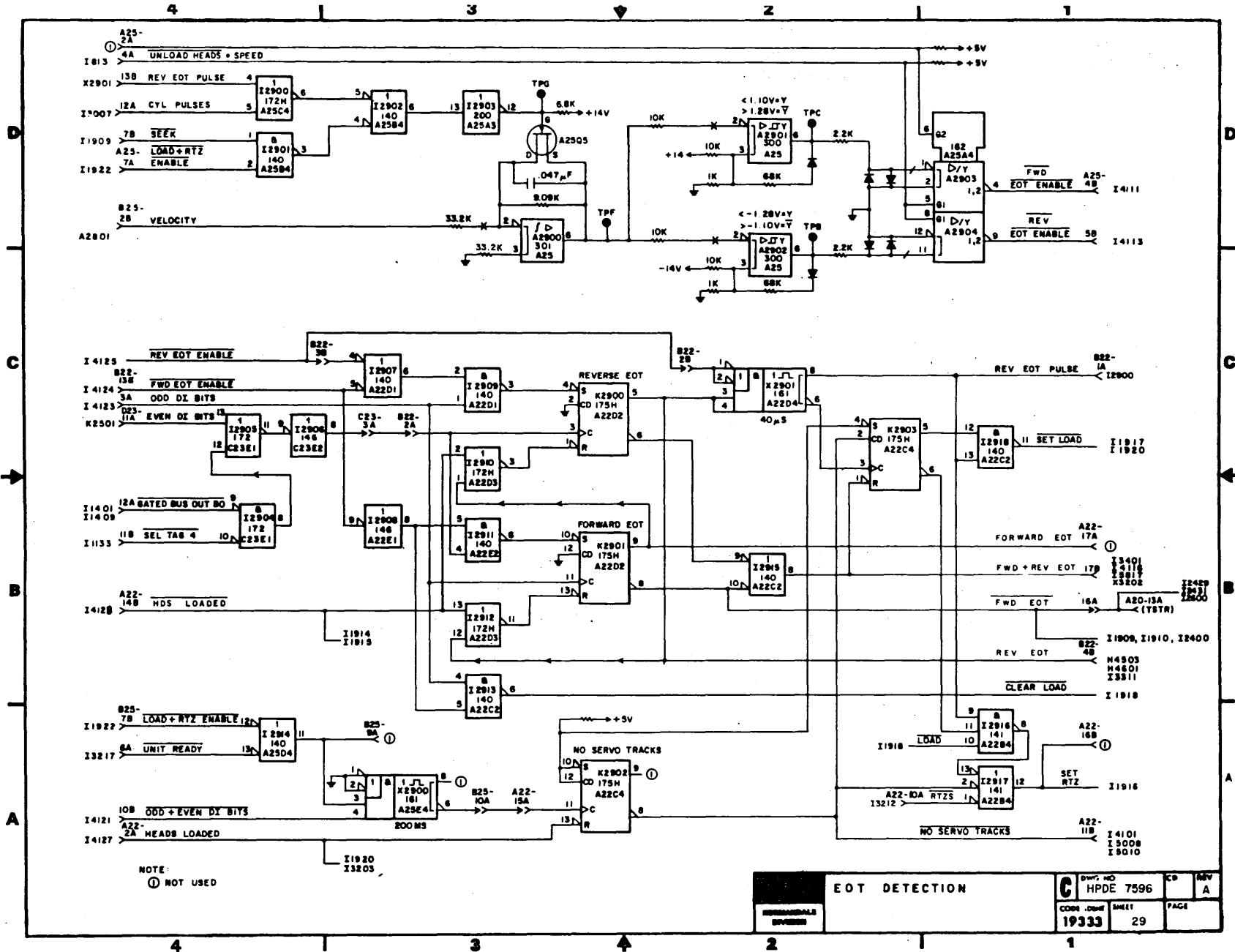
NORMANDALE DIVISION

NOTE:
 (1) NOT USED.



NOTES:
 ⓪ NOT USED

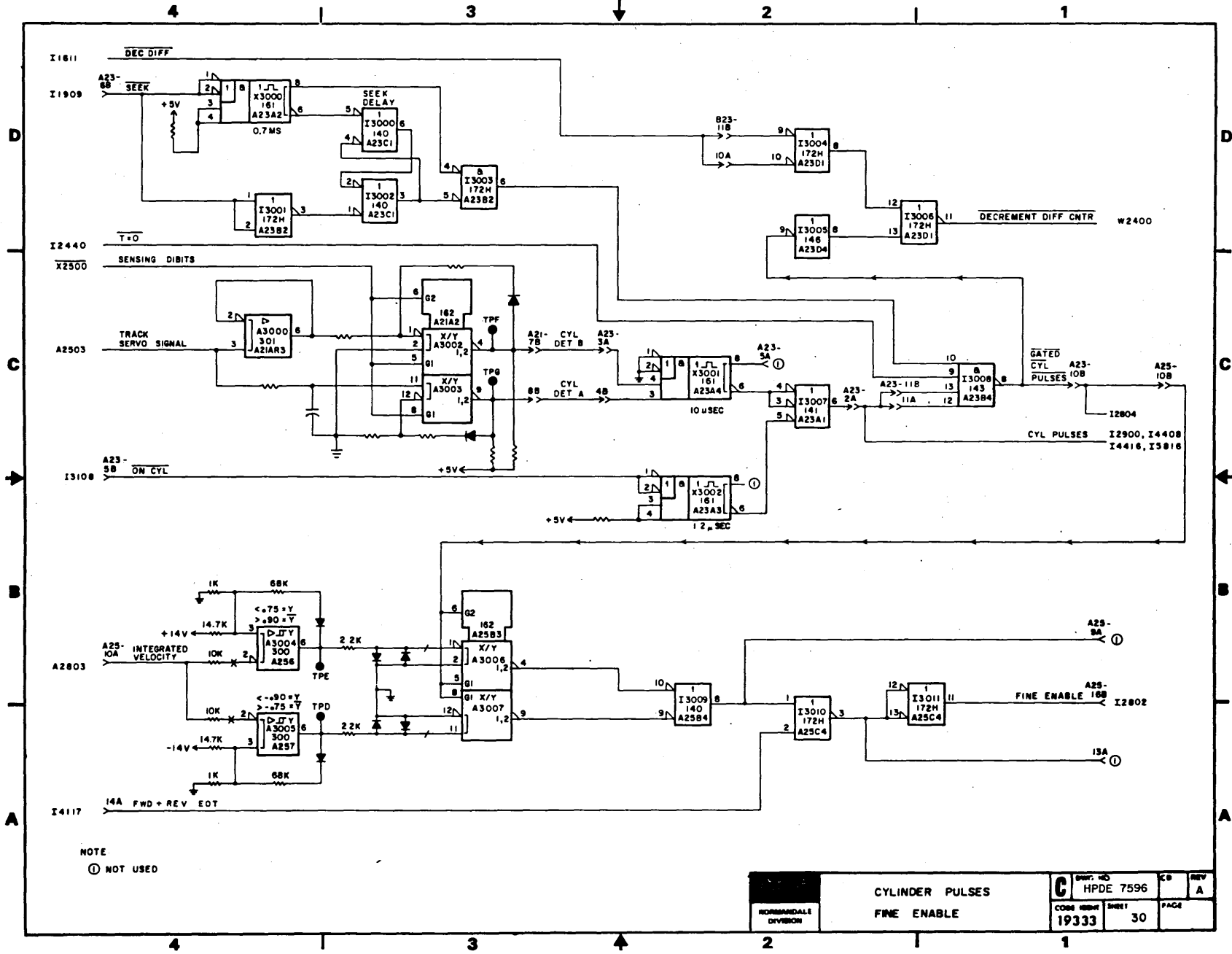
NONMANDALE DIVISION	VELOCITY SUMMING AMPLIFIER	C DWG NO HPDE 7596 CODE 8001 19333	CD	REV
	SHEET 28		PAGE	F



NOTE: (1) NOT USED

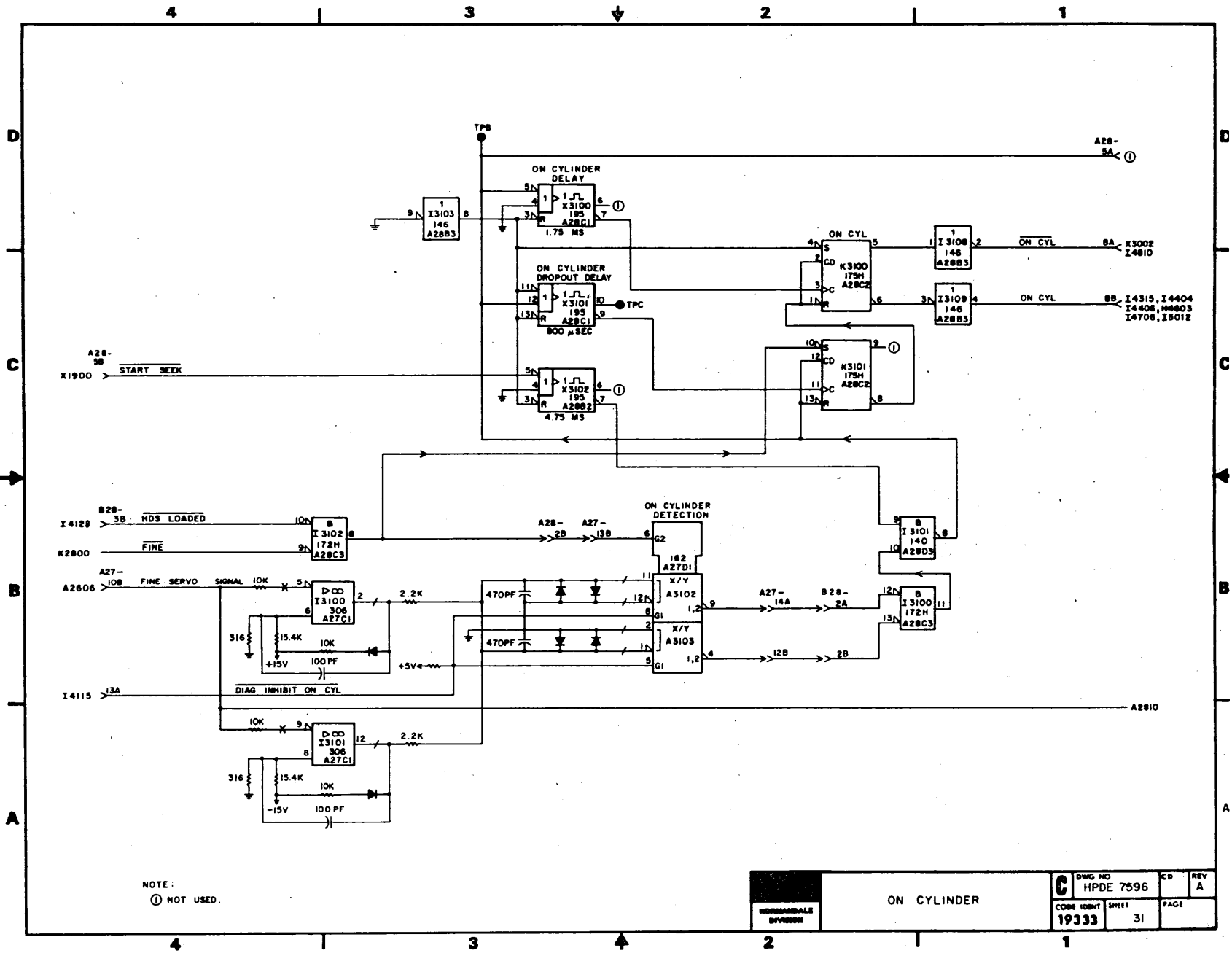
EOT DETECTION

C	REV. NO	HPDE	7596	CD	REV	A
	CODE	DATE	SHEET	PAGE		
	19333		29			



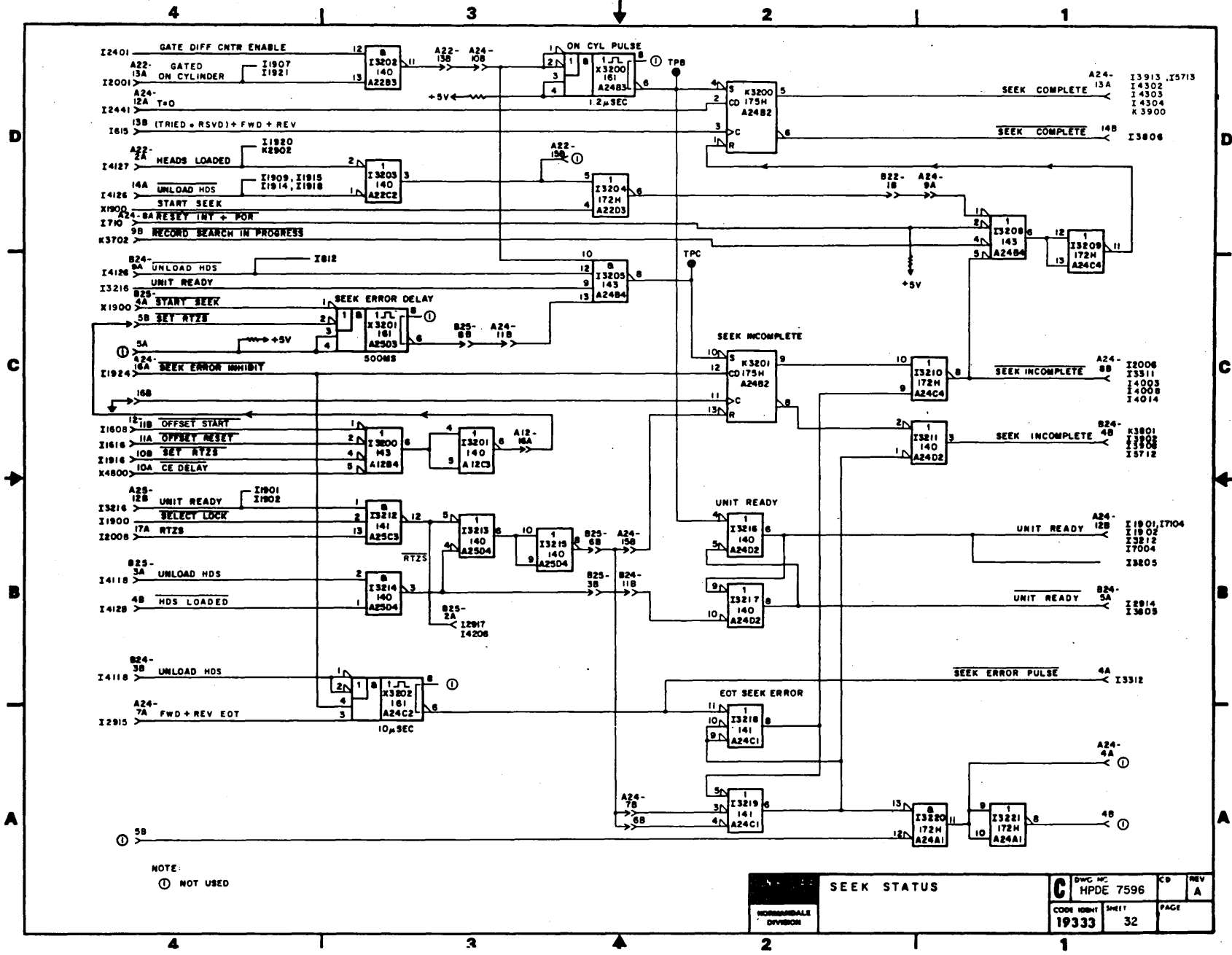
NOTE
① NOT USED

NORMANDEALE DIVISION	CYLINDER PULSES		REV. NO.	PAGE
	FINE ENABLE		HPDE 7596	
	19333	30		A



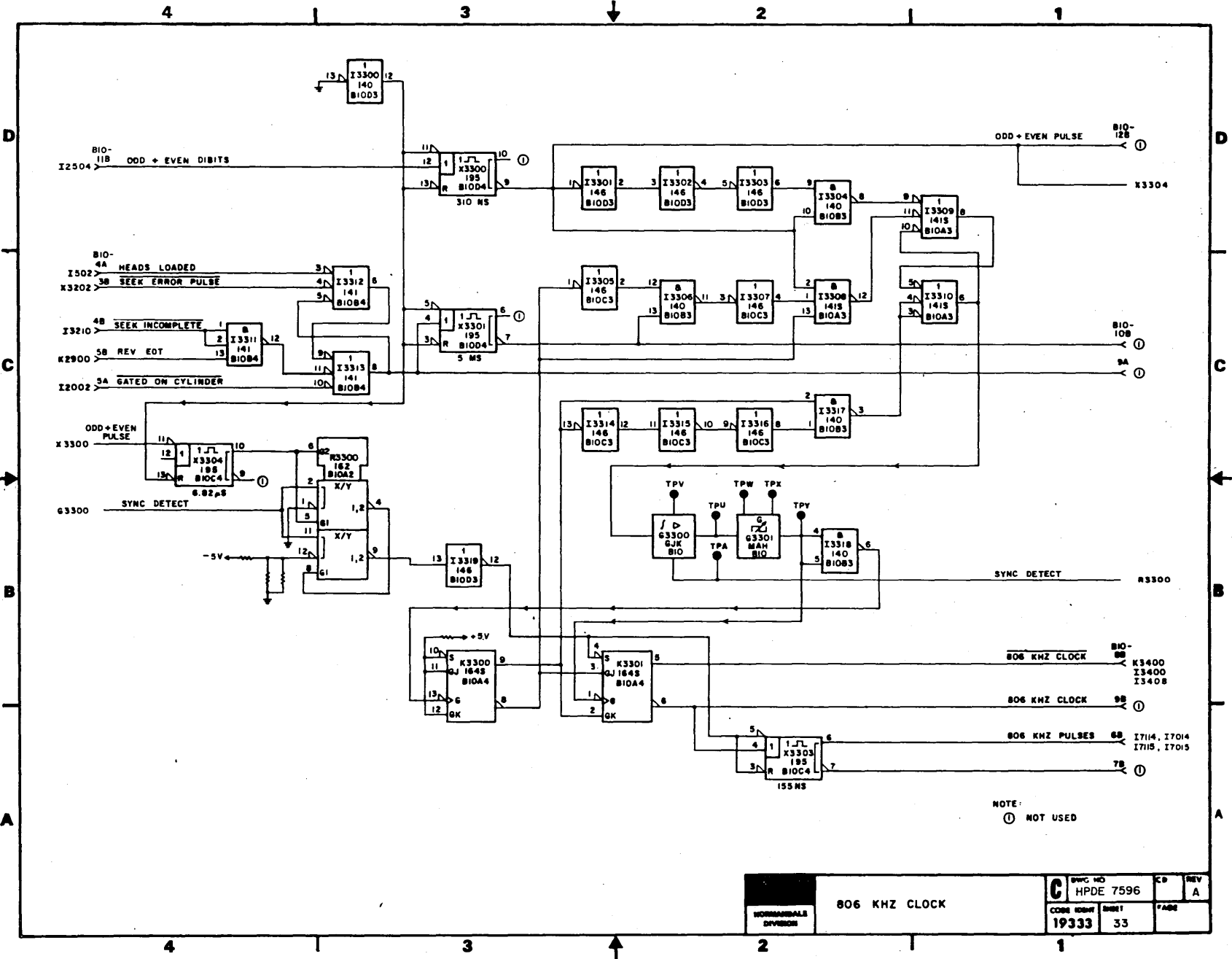
NOTE:
 ① NOT USED.

NORMANALE DIVISION	ON CYLINDER		C DWG NO HPDE 7596	CD REV A
	CODE IDENT SHEET 19333	PAGE 31		



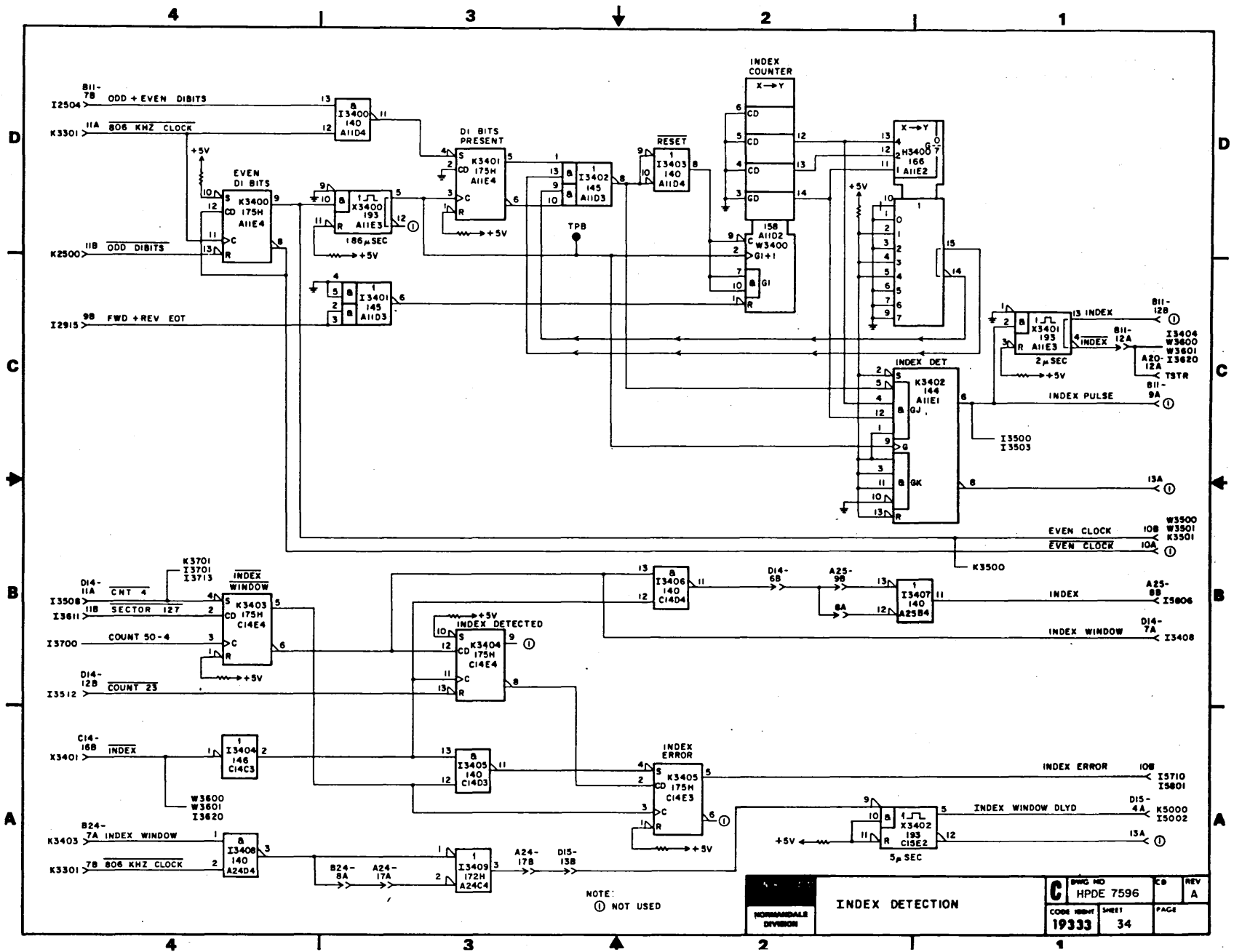
NOTE:
 ⊙ NOT USED

SEEK STATUS		DWC INC	CD	REV
		HPDE 7596		A
NORMANBALE DIVISION		CODE 19333	SHEET 32	PAGE



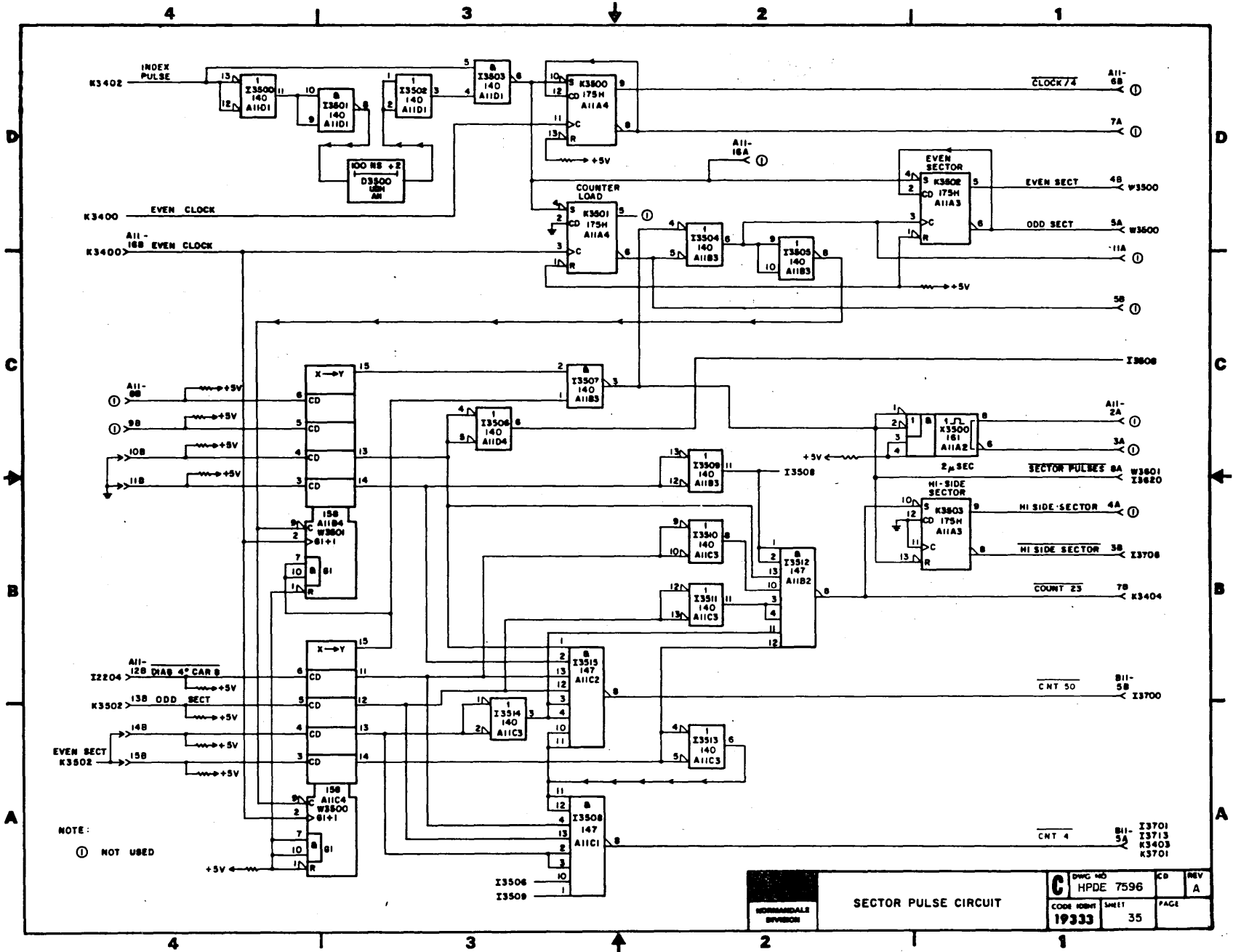
NOTE:
(1) NOT USED

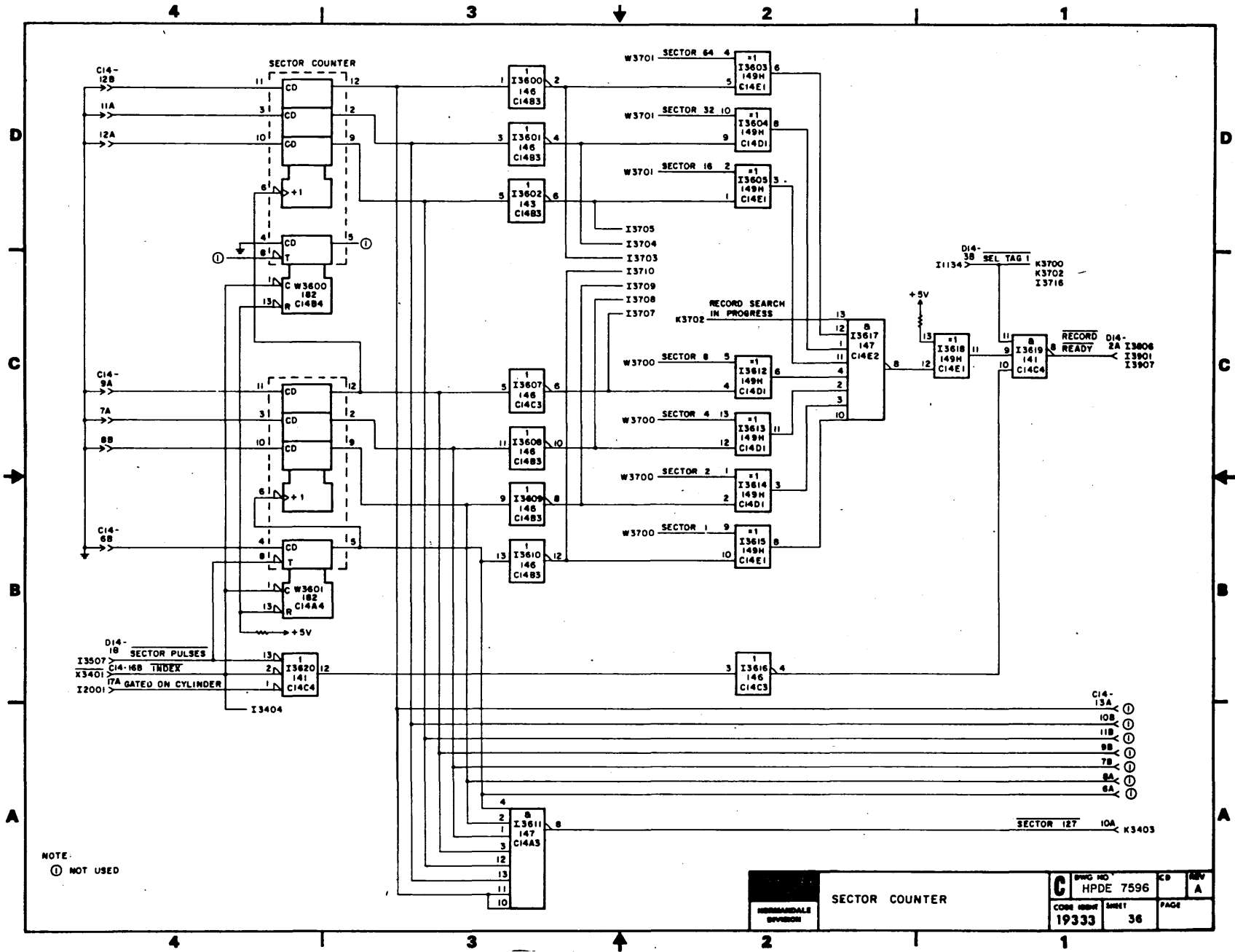
WORMHOLE DIVISION	806 KHZ CLOCK		C DWG NO HPDE 7596	CD REV A
	CODE IDENT 19333	SHEET 33	PAGE	

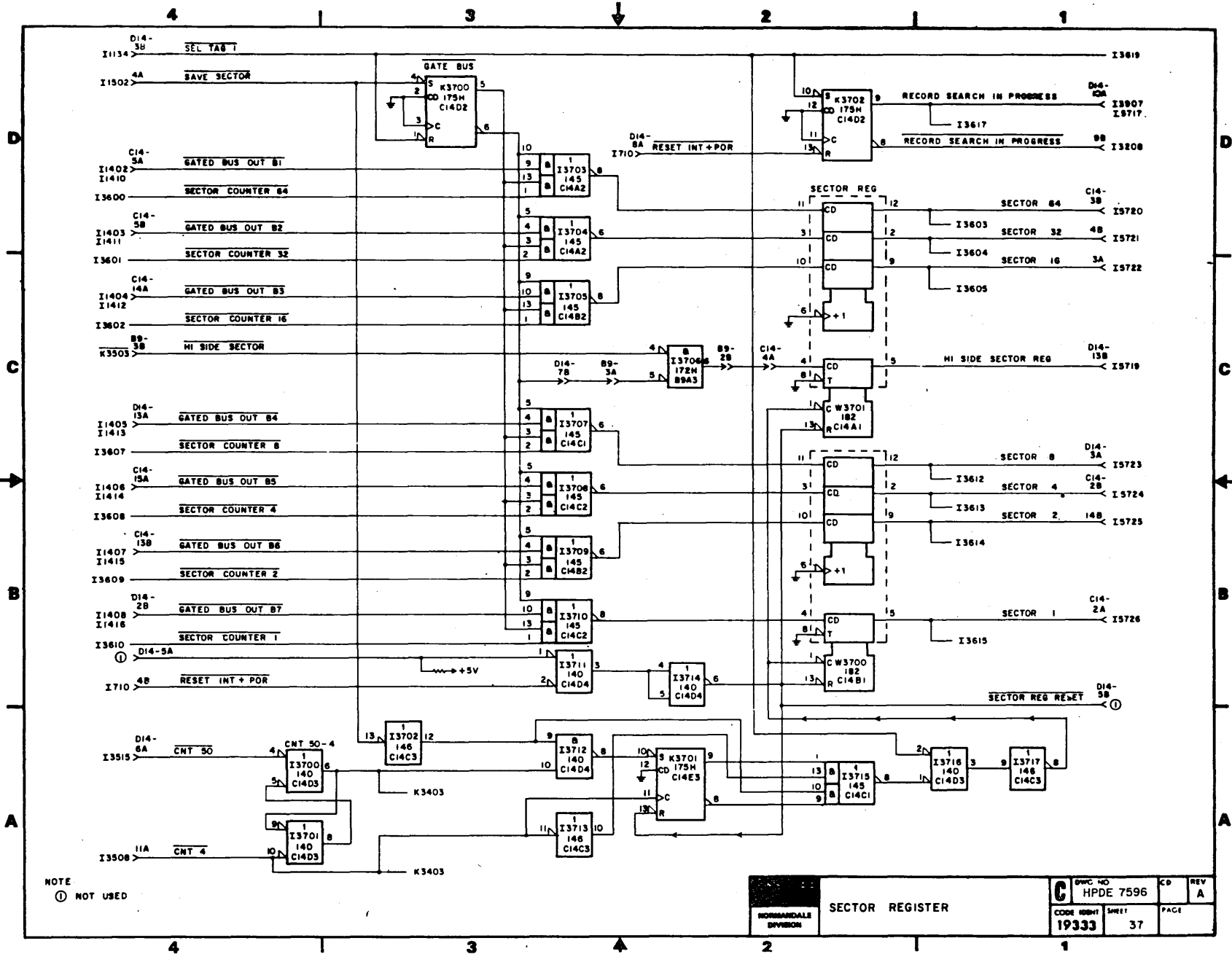


NOTE:
 ① NOT USED

NORMANVILLE DIVISION	INDEX DETECTION		C	DWG NO HPDE 7596	CD	REV A
	19333	34	C	CODE IDENT 19333	SHEET 34	PAGE A

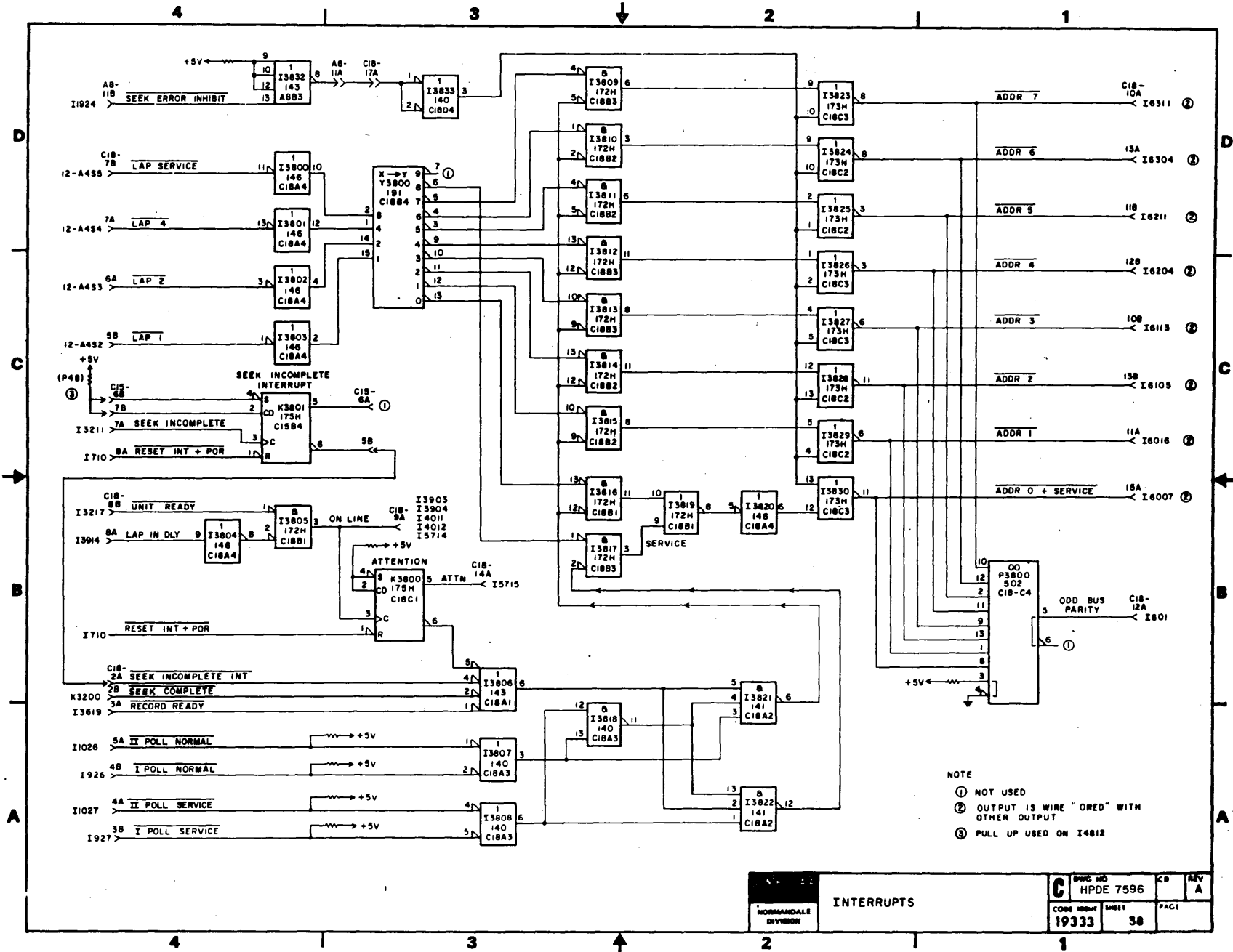






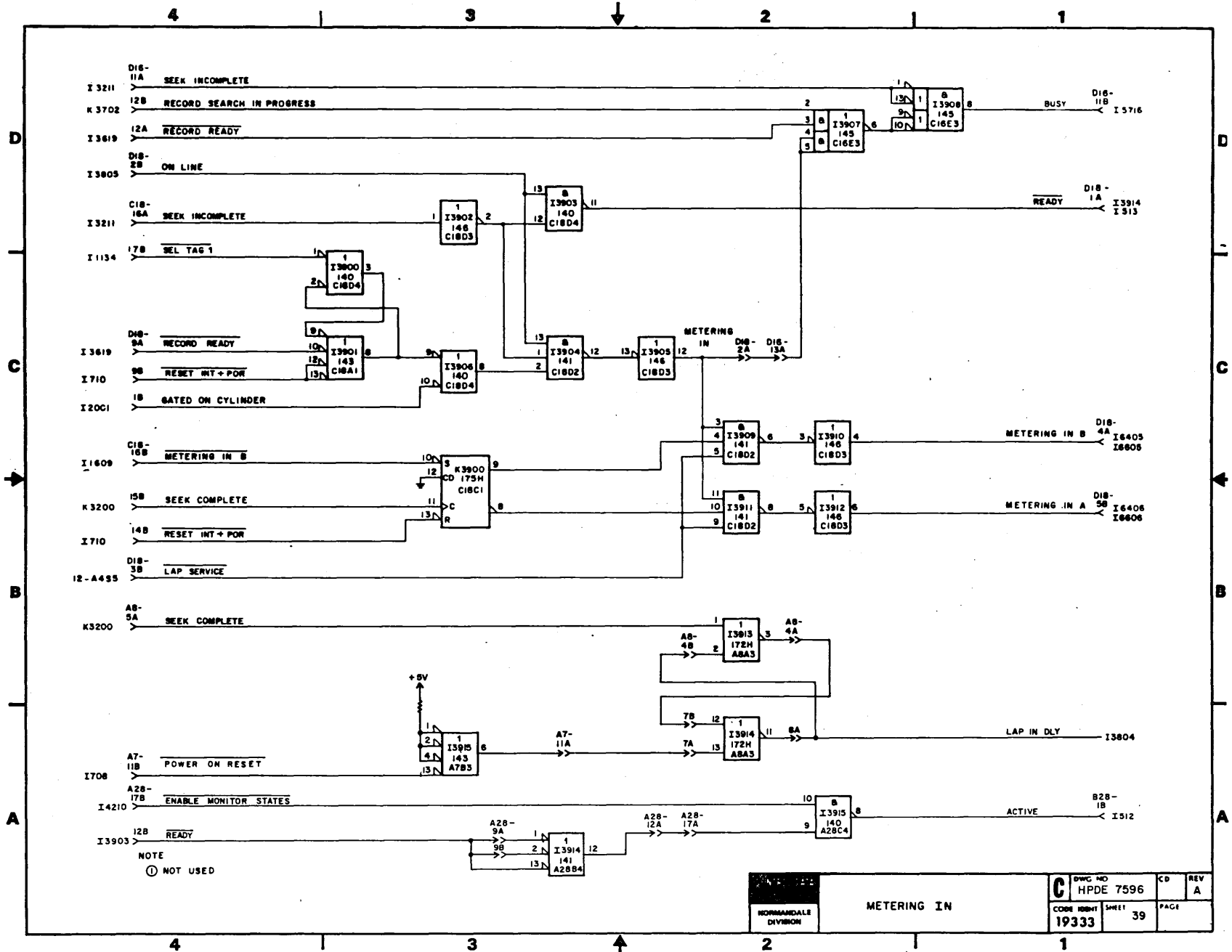
NOTE
① NOT USED

NORANDA DIVISION	SECTOR REGISTER		C D W 7596 HPDE 7596	CD REV A
	CODE 19333	SHEET 37	PAGE	

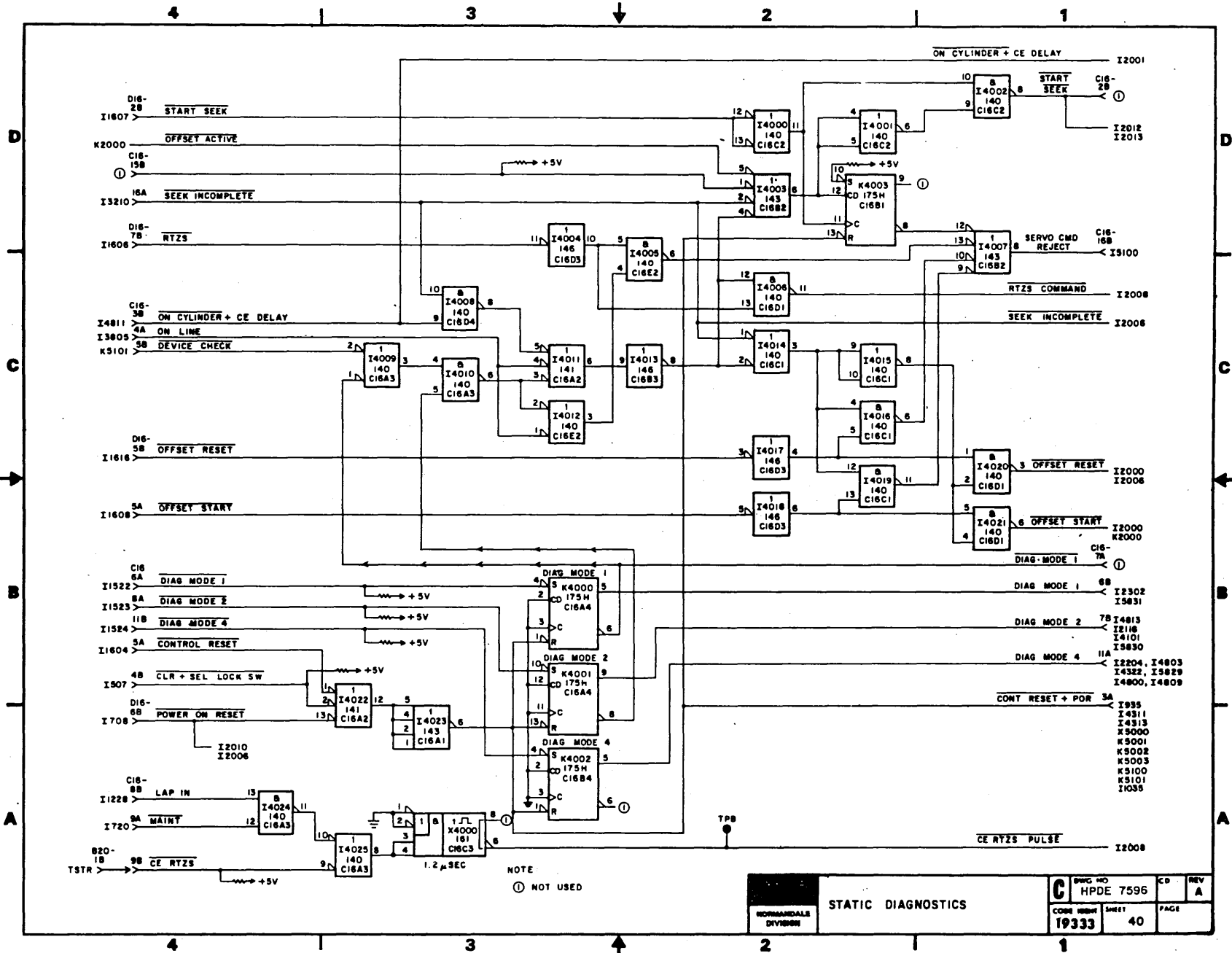


NOTE
 ① NOT USED
 ② OUTPUT IS WIRE "ORED" WITH OTHER OUTPUT
 ③ PULL UP USED ON I4812

NORMANDALE DIVISION	INTERRUPTS		C	HPDE 7596	CD	REV
	19333	38		PAGE	A	

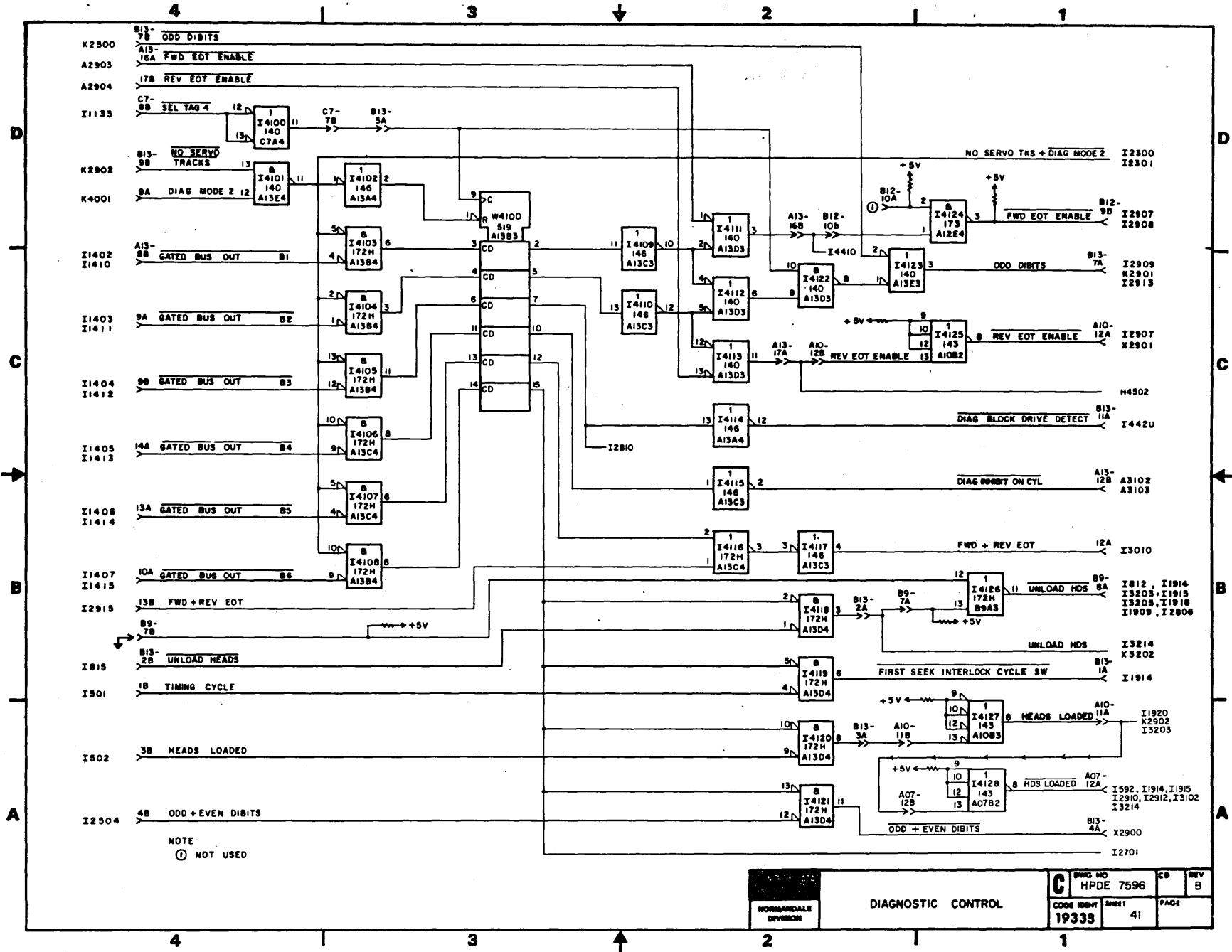


NORMAN DALE DIVISION	METERING IN		DWG NO HPDE 7596	CD A	REV A
	CODE 19333	SHEET 39	PAGE		



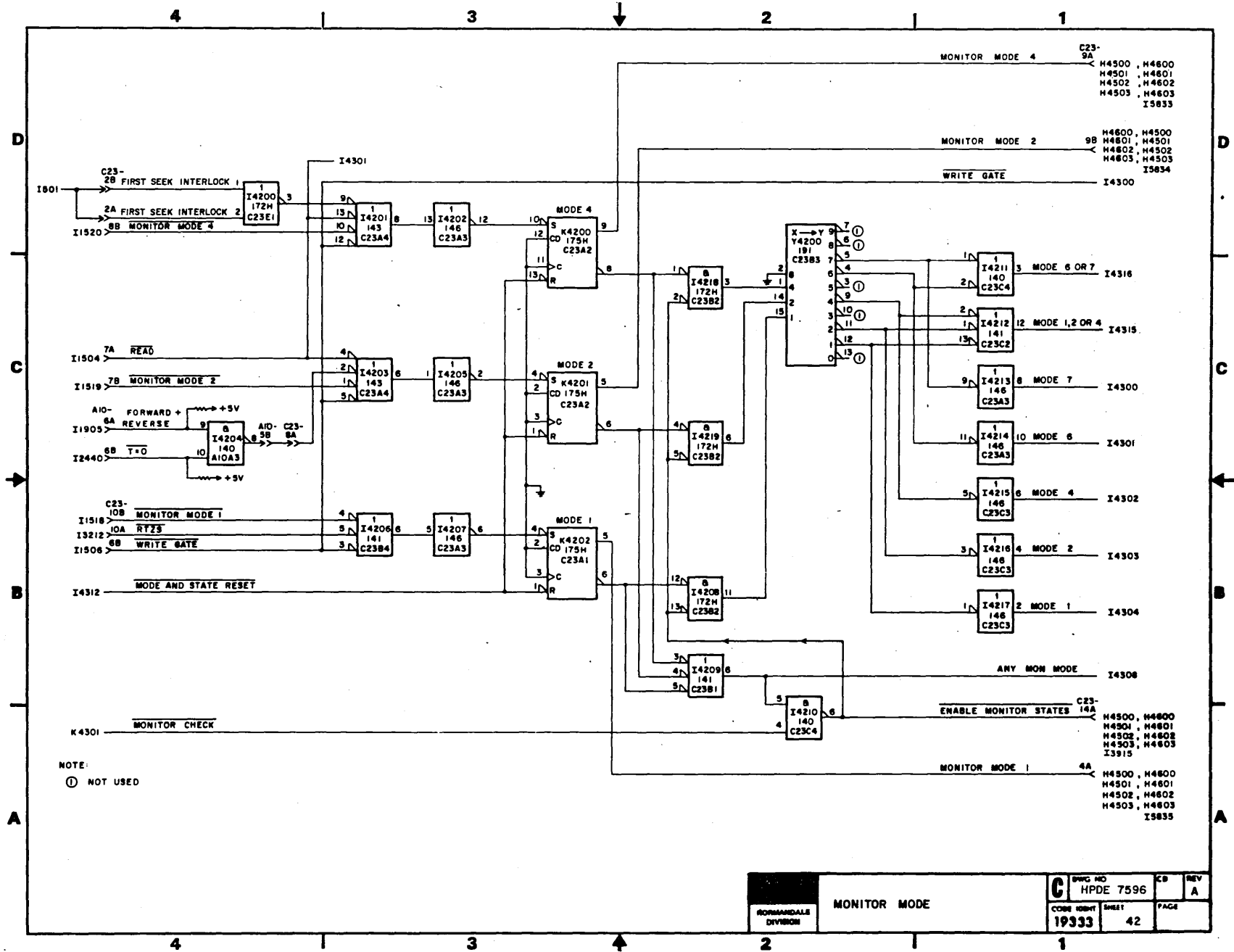
NOTE
 ① NOT USED

HPD/DALE DIVISION		STATIC DIAGNOSTICS		CD REV A
C CODE NO 19333	HPD NO HPDE 7596	SHEET 40	PAGE	REV A



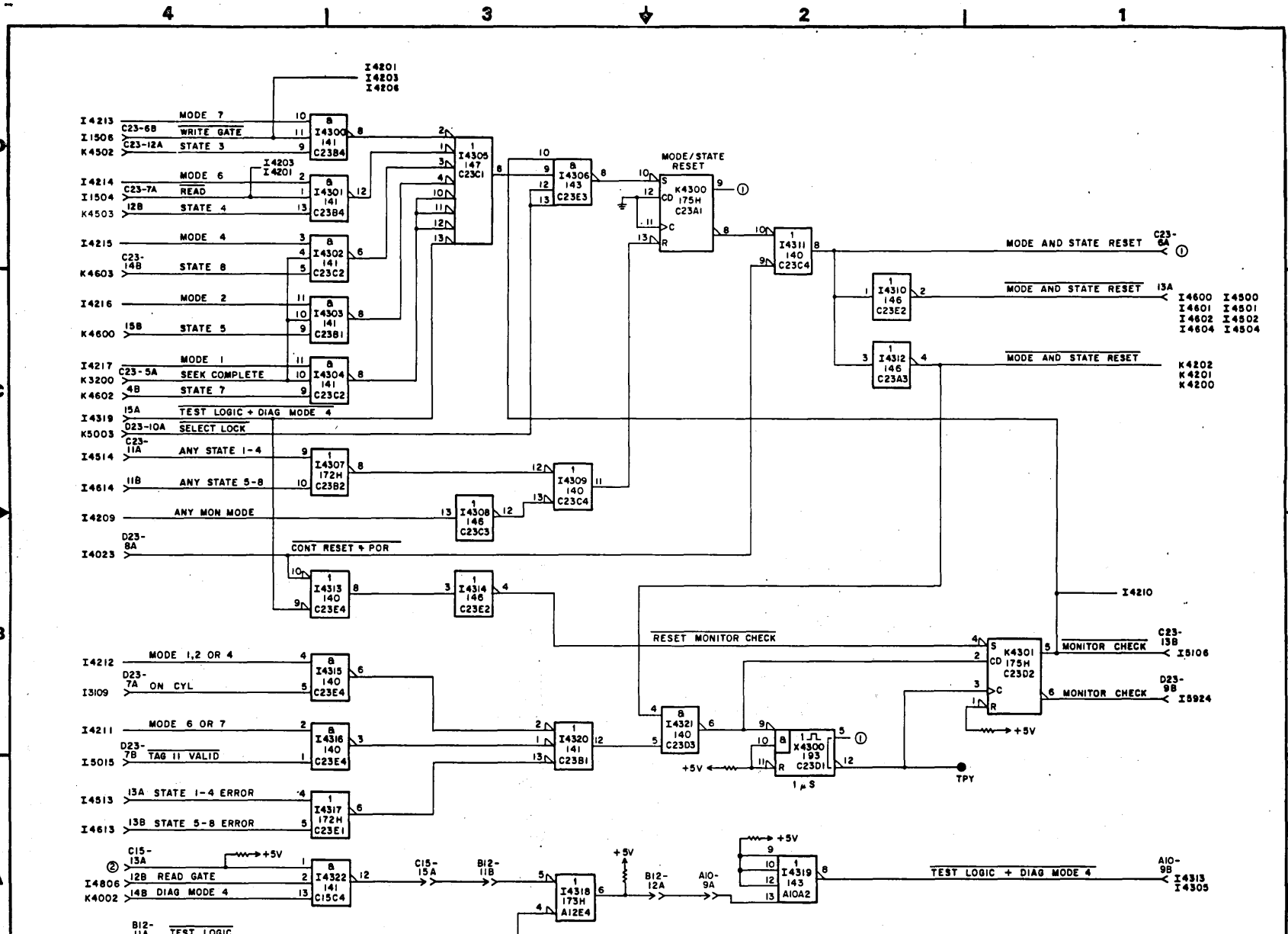
NOTE
 (1) NOT USED

NORMANDEALE DIVISION	DIAGNOSTIC CONTROL		C DWG NO HPDE 7596	CD REV B
	CODE IDENT 19333	SHEET 41	PAGE	



NOTE:
 ① NOT USED

NORMANDALE DIVISION	MONITOR MODE	DRWG NO	CD	REV
		HPDE 7596		A
		CODE IDENT	SHEET	PAGE
		19333	42	



NOTE:
 ① NOT USED
 ② PULL-UP FOR TERM K2200

CONTROL DATA		MODE/STATE RESET MONITOR CHECK		DWG NO	CD	REV
NORMANDALE DIVISION				C	HPDE	F
				19333	43	
				PAGE		

4 1 3 2 1

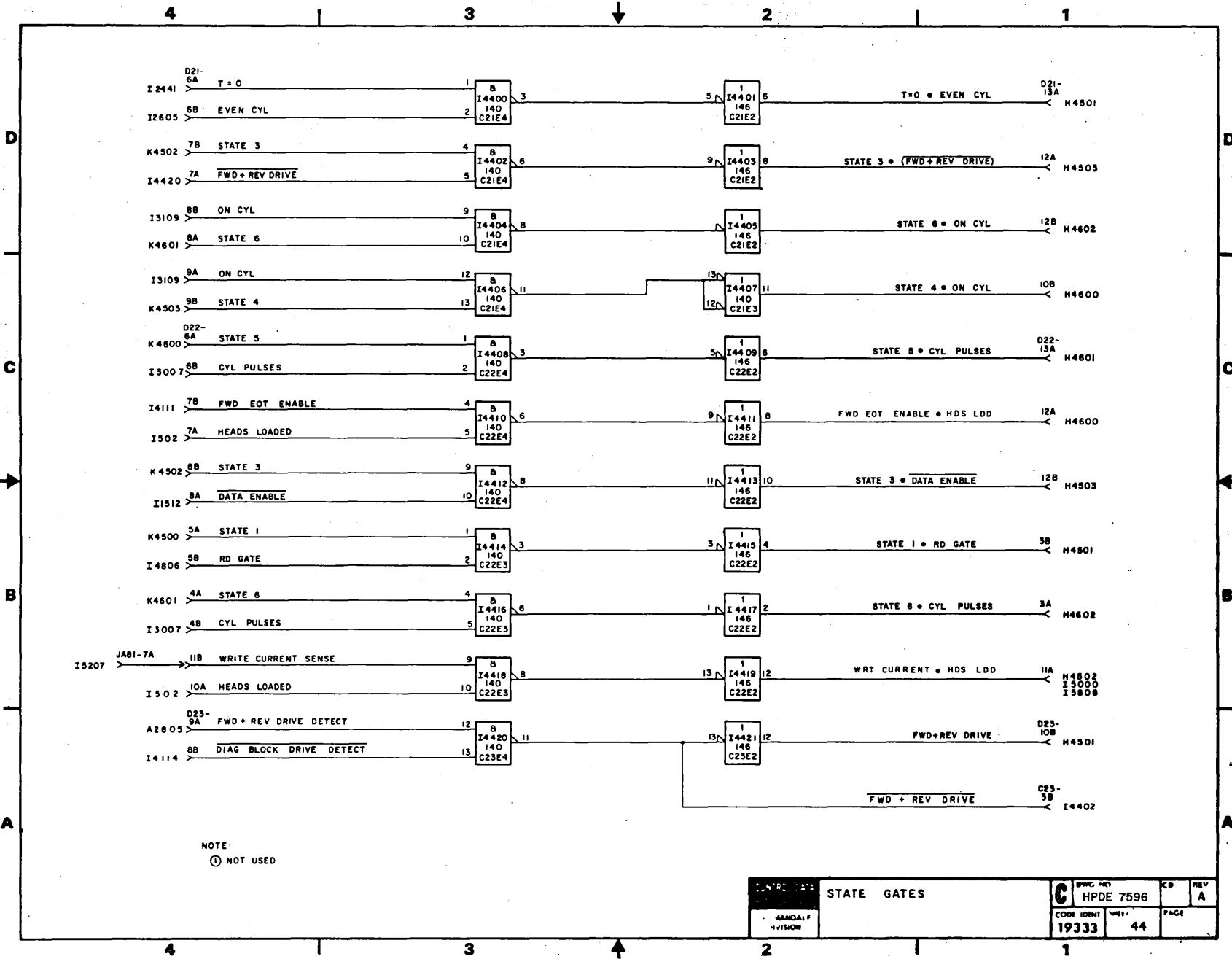
D

C

B

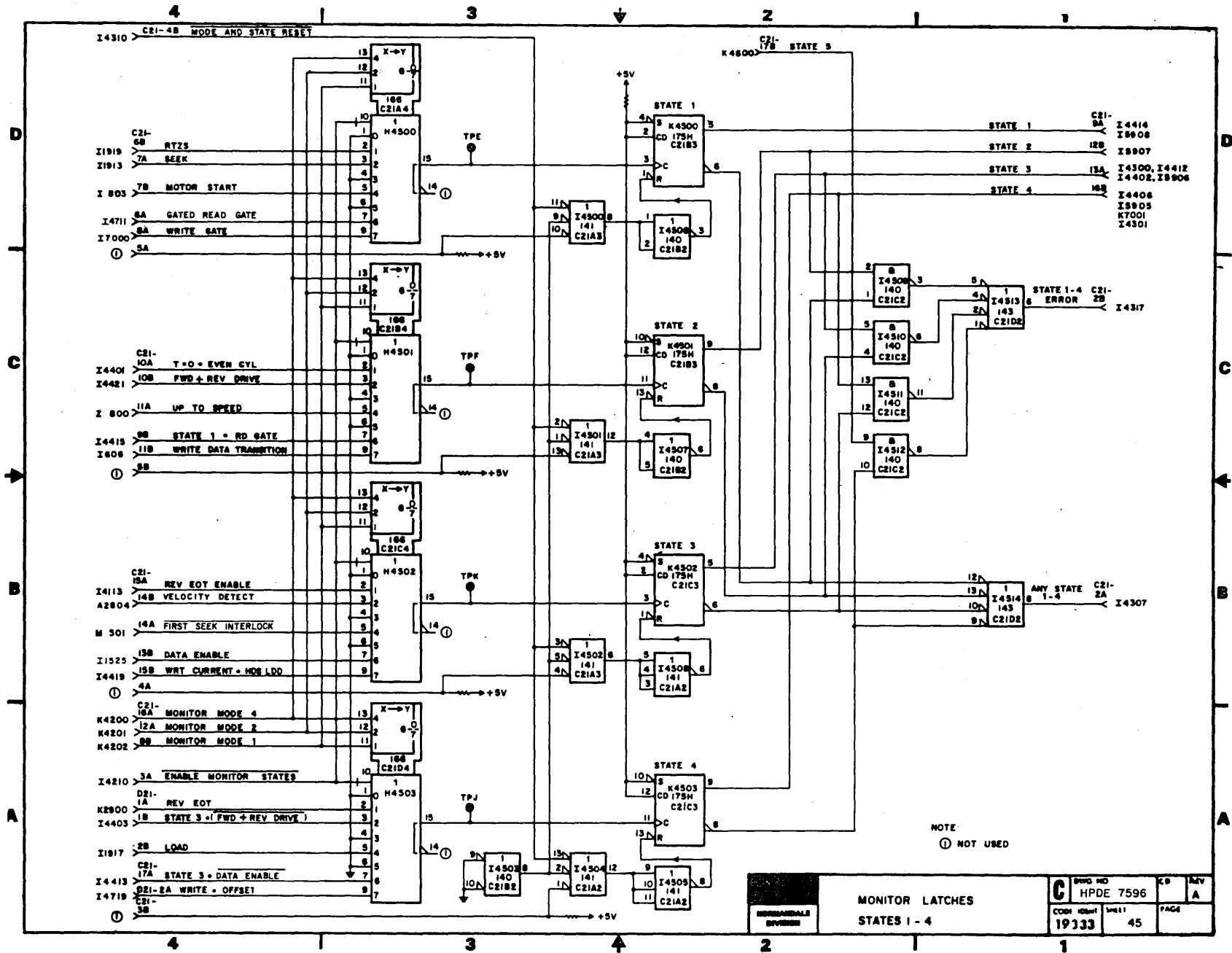
A

4 1 3 2 1



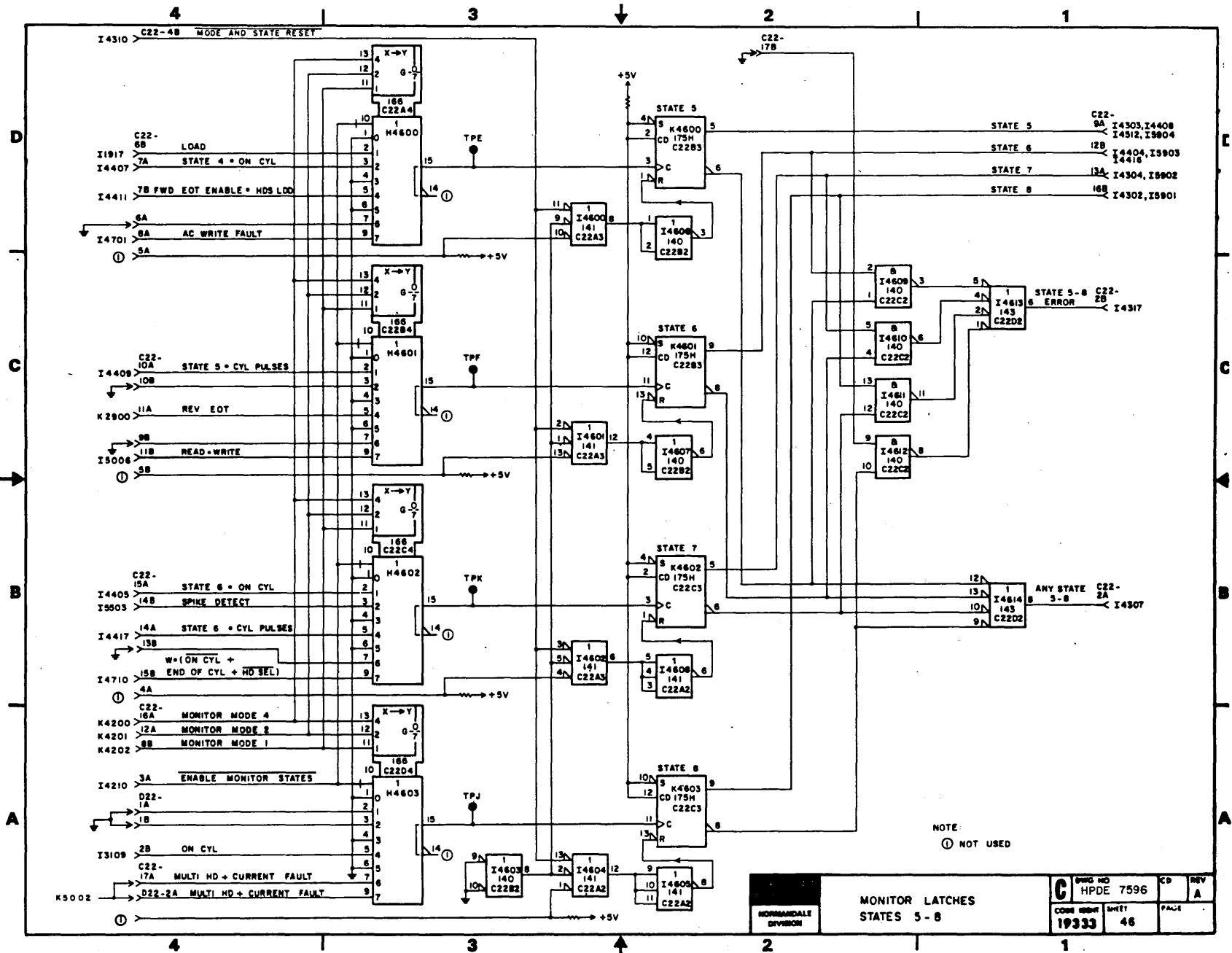
NOTE:
 (1) NOT USED

CONTROL		STATE GATES		DWG NO HPDE 7596		CD	REV A
MANDALF DIVISION		CODE IDENT 19333	REV 44	PAGE			



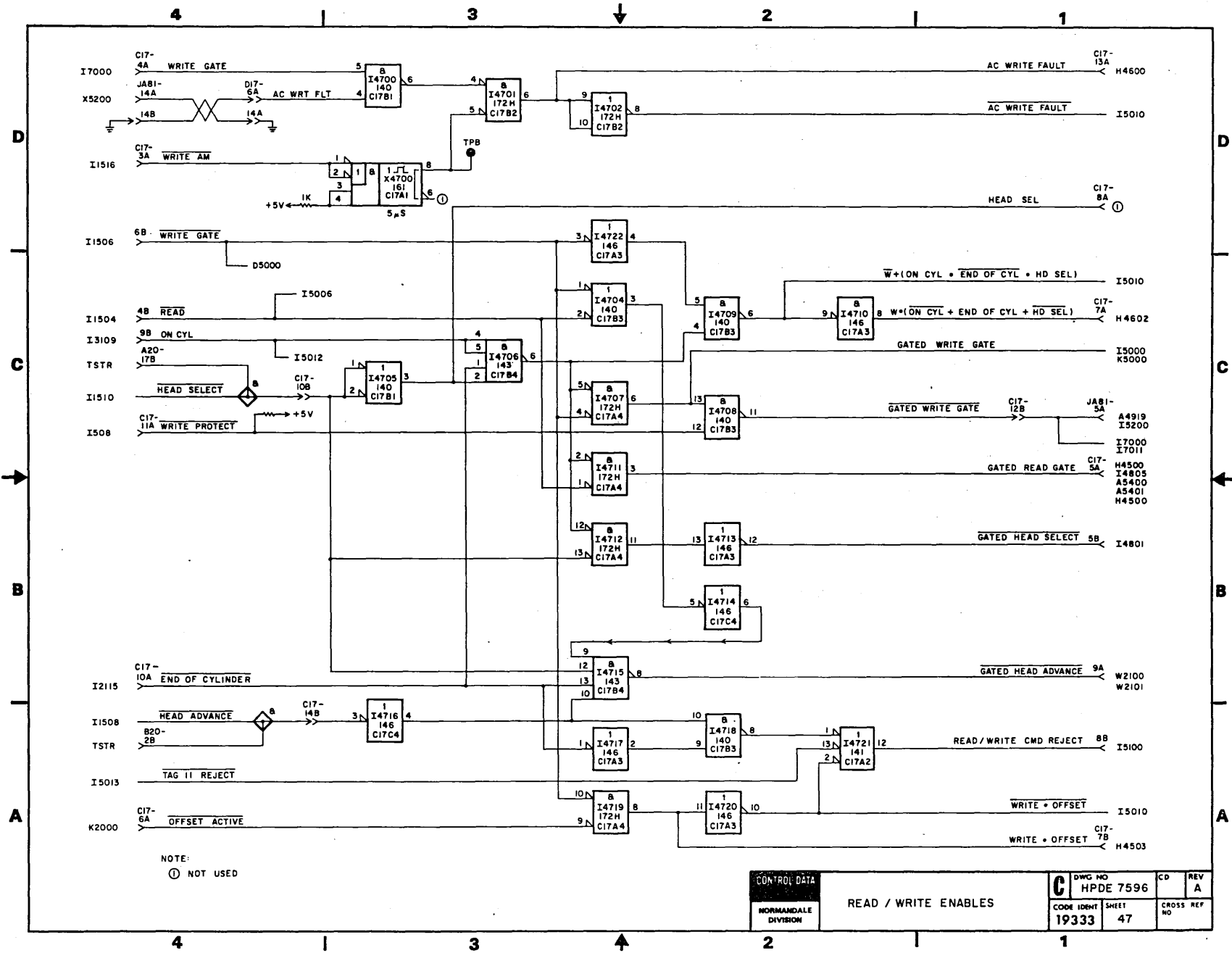
NOTE:
⊙ NOT USED

REPRODUCIBLE BY PERMISSION	MONITOR LATCHES		C DRAWING NO. HPDE 7596	CB REV A
	STATES 1 - 4			

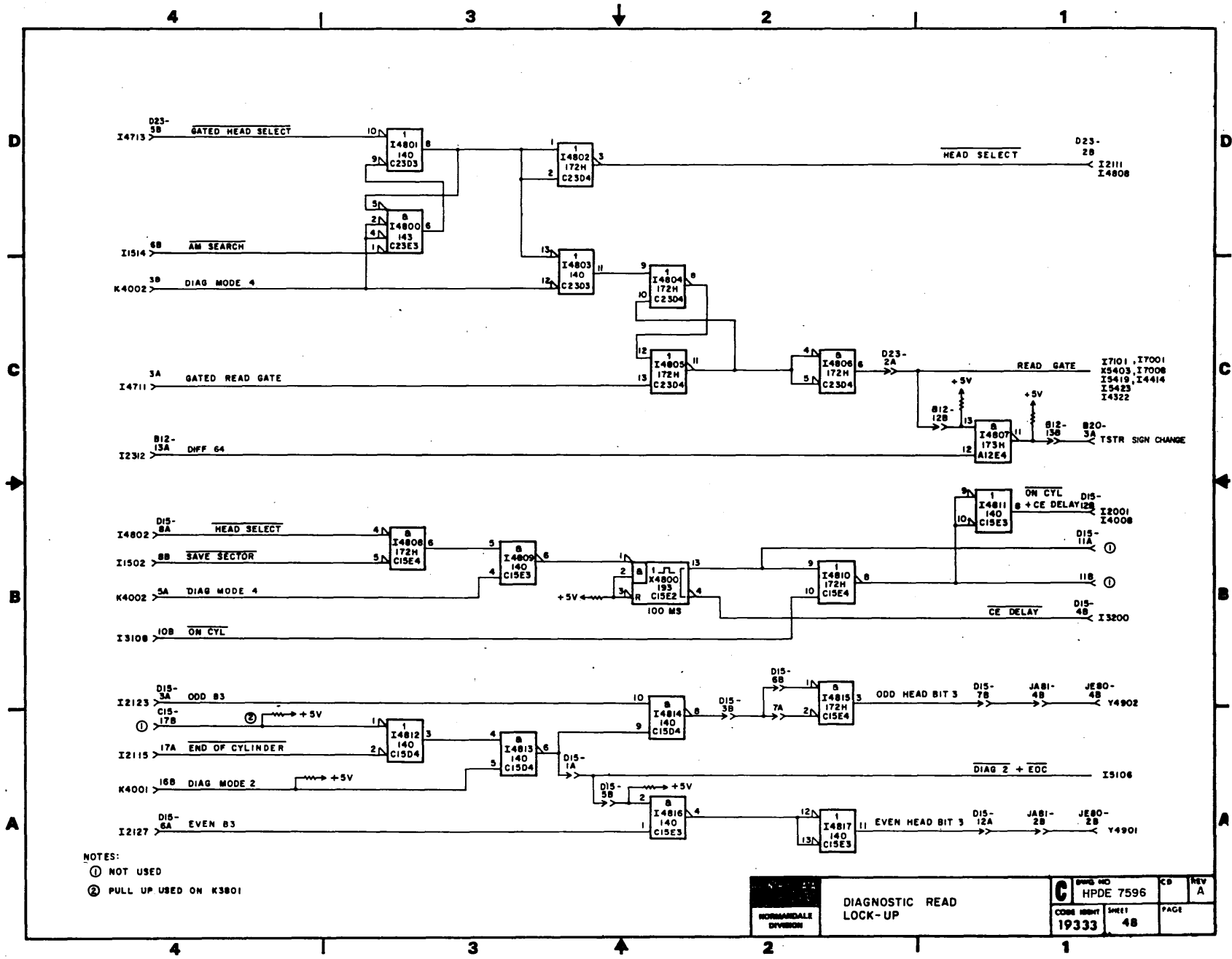


NOTE:
⊙ NOT USED

NORMAN DALE DIVISION	MONITOR LATCHES STATES 5-8		HPD NO HPDE 7596	CD	REV A
	CODE INSTR 19333	SHEET 46	DATE	PAGE	

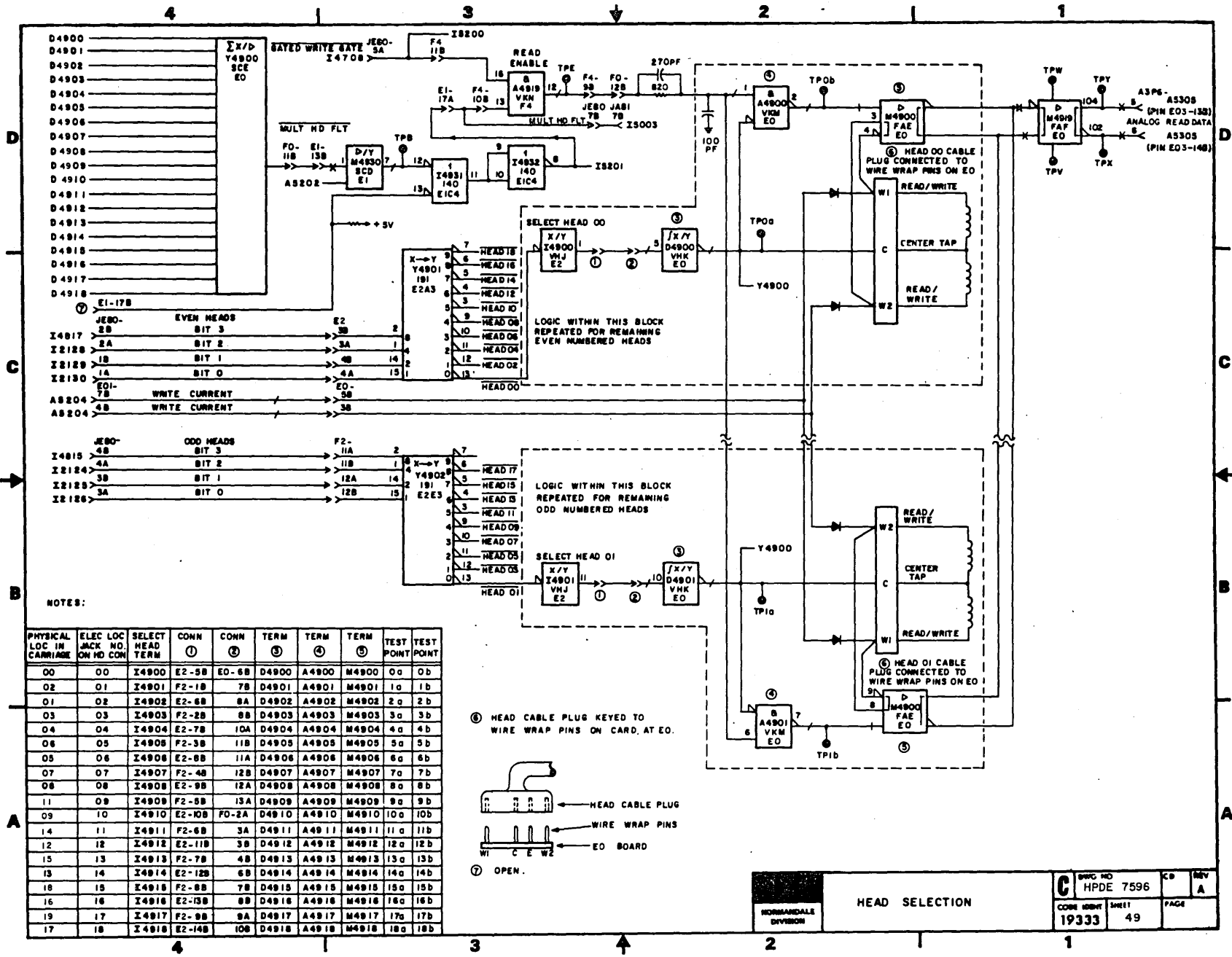


CONTROL DATA		DWG NO	CD	REV
NORMANDEALE DIVISION		HPDE 7596		A
READ / WRITE ENABLES		CODE IDENT	SHEET	CROSS REF
		19333	47	



NOTES:
 ① NOT USED
 ② PULL UP USED ON K3801

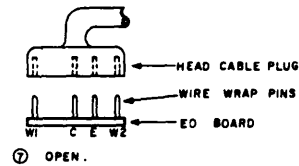
NORMAN DALE DIVISION	DIAGNOSTIC READ LOCK-UP			PART NO HPDE 7596	CB REV A
	CODE MNT 19333	SHEET 48	PAGE		



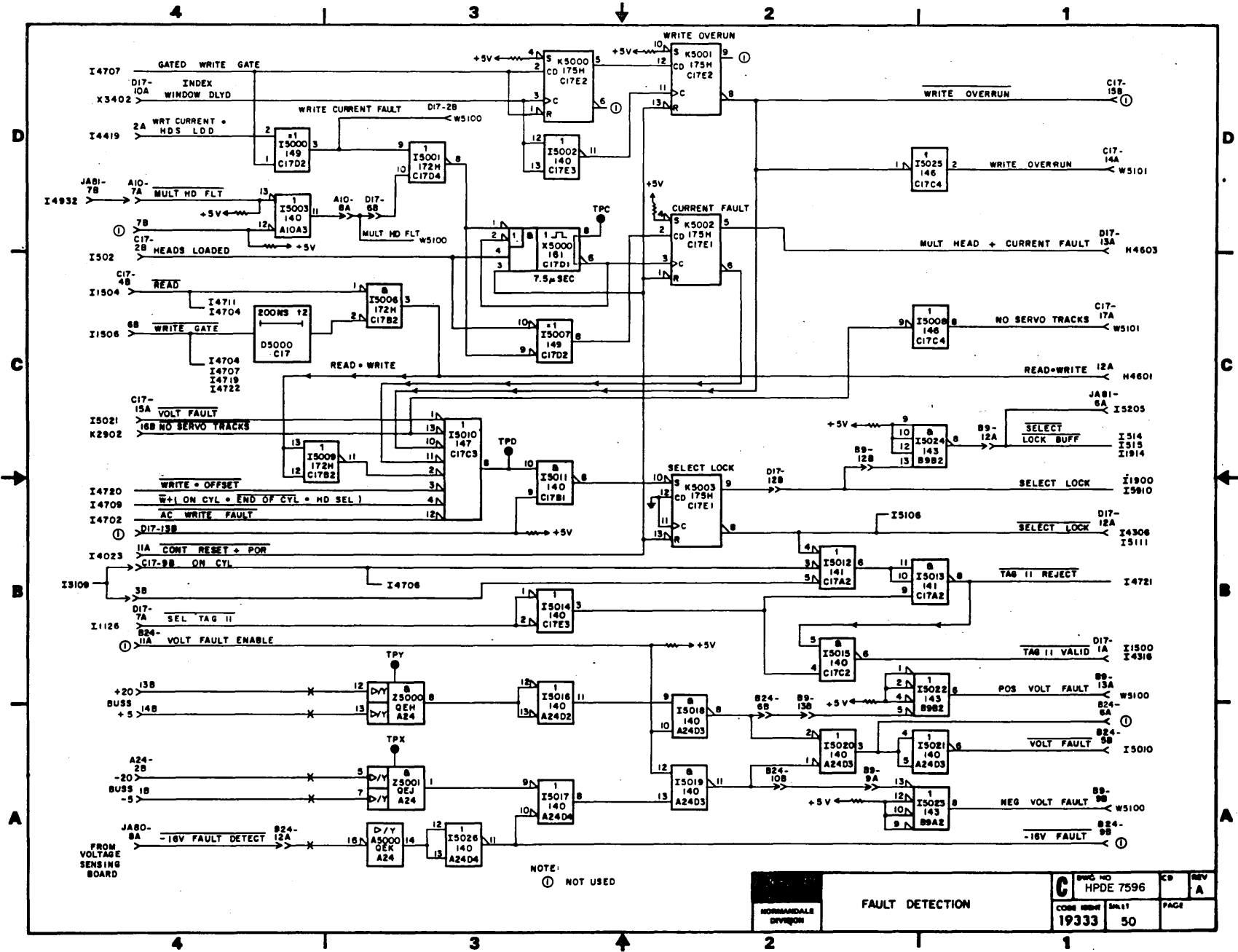
NOTES:

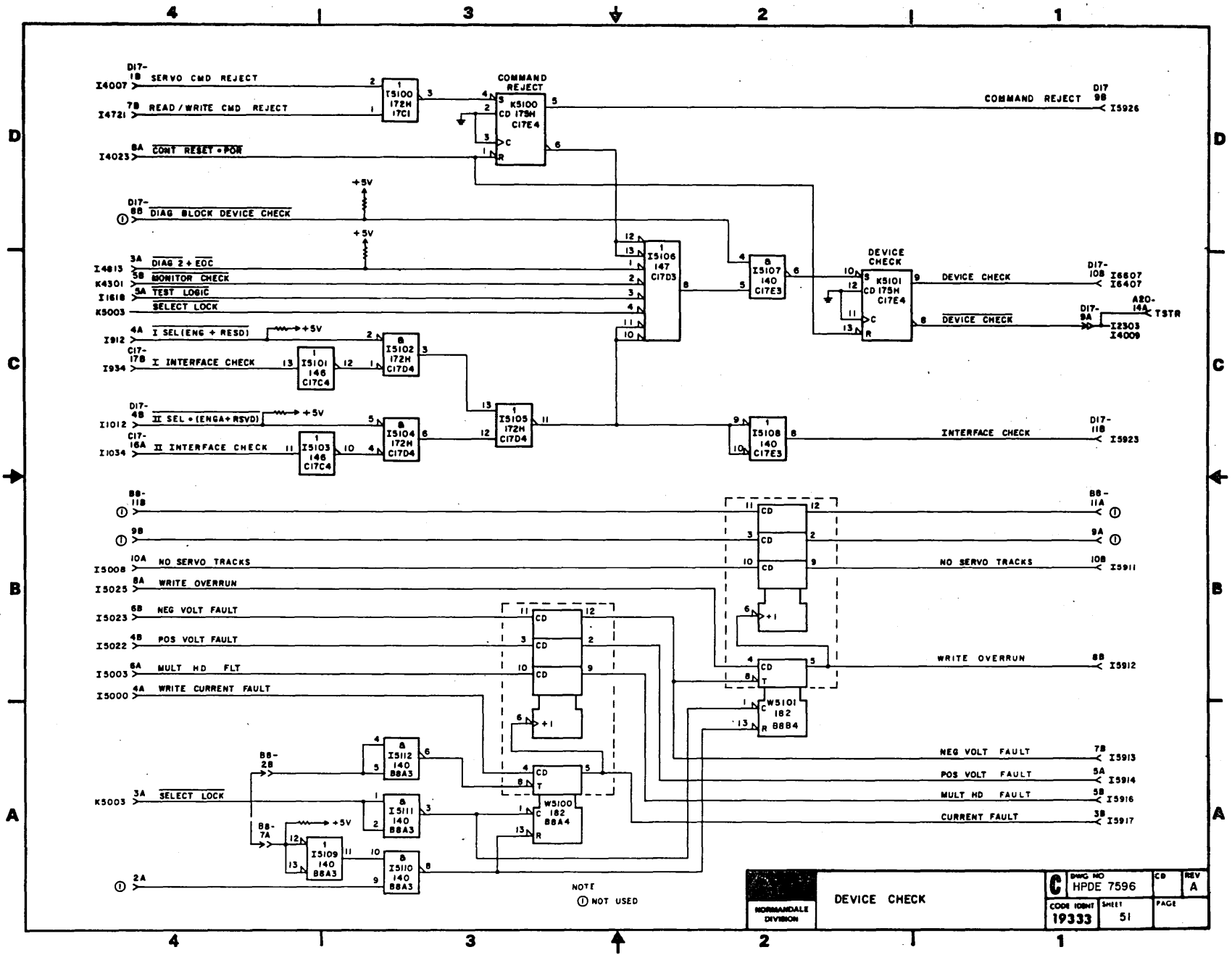
PHYSICAL LOC IN CARRIAGE	ELEC JACK NO. ON HD CON	SELECT HEAD TERM	CONN ①	CONN ②	TERM ③	TERM ④	TERM ⑤	TEST POINT	TEST POINT
00	00	I4900	E2-5B	EO-6B	D4900	A4900	M4900	0a	0b
02	01	I4901	F2-1B	7B	D4901	A4901	M4901	1a	1b
01	02	I4902	E2-6B	8A	D4902	A4902	M4902	2a	2b
03	03	I4903	F2-2B	8B	D4903	A4903	M4903	3a	3b
04	04	I4904	E2-7B	10A	D4904	A4904	M4904	4a	4b
06	05	I4905	F2-3B	11B	D4905	A4905	M4905	5a	5b
05	06	I4906	E2-8B	11A	D4906	A4906	M4906	6a	6b
07	07	I4907	F2-4B	12B	D4907	A4907	M4907	7a	7b
08	08	I4908	E2-9B	12A	D4908	A4908	M4908	8a	8b
11	09	I4909	F2-5B	13A	D4909	A4909	M4909	9a	9b
09	10	I4910	E2-10B	FD-2A	D4910	A4910	M4910	10a	10b
14	11	I4911	F2-6B	3A	D4911	A4911	M4911	11a	11b
12	12	I4912	E2-11B	3B	D4912	A4912	M4912	12a	12b
15	13	I4913	F2-7B	4B	D4913	A4913	M4913	13a	13b
13	14	I4914	E2-12B	6B	D4914	A4914	M4914	14a	14b
18	15	I4915	F2-8B	7B	D4915	A4915	M4915	15a	15b
16	16	I4916	E2-13B	8B	D4916	A4916	M4916	16a	16b
19	17	I4917	F2-9B	9A	D4917	A4917	M4917	17a	17b
17	18	I4918	E2-14B	10B	D4918	A4918	M4918	18a	18b

① HEAD CABLE PLUG KEYED TO WIRE WRAP PINS ON CARD, AT EO.



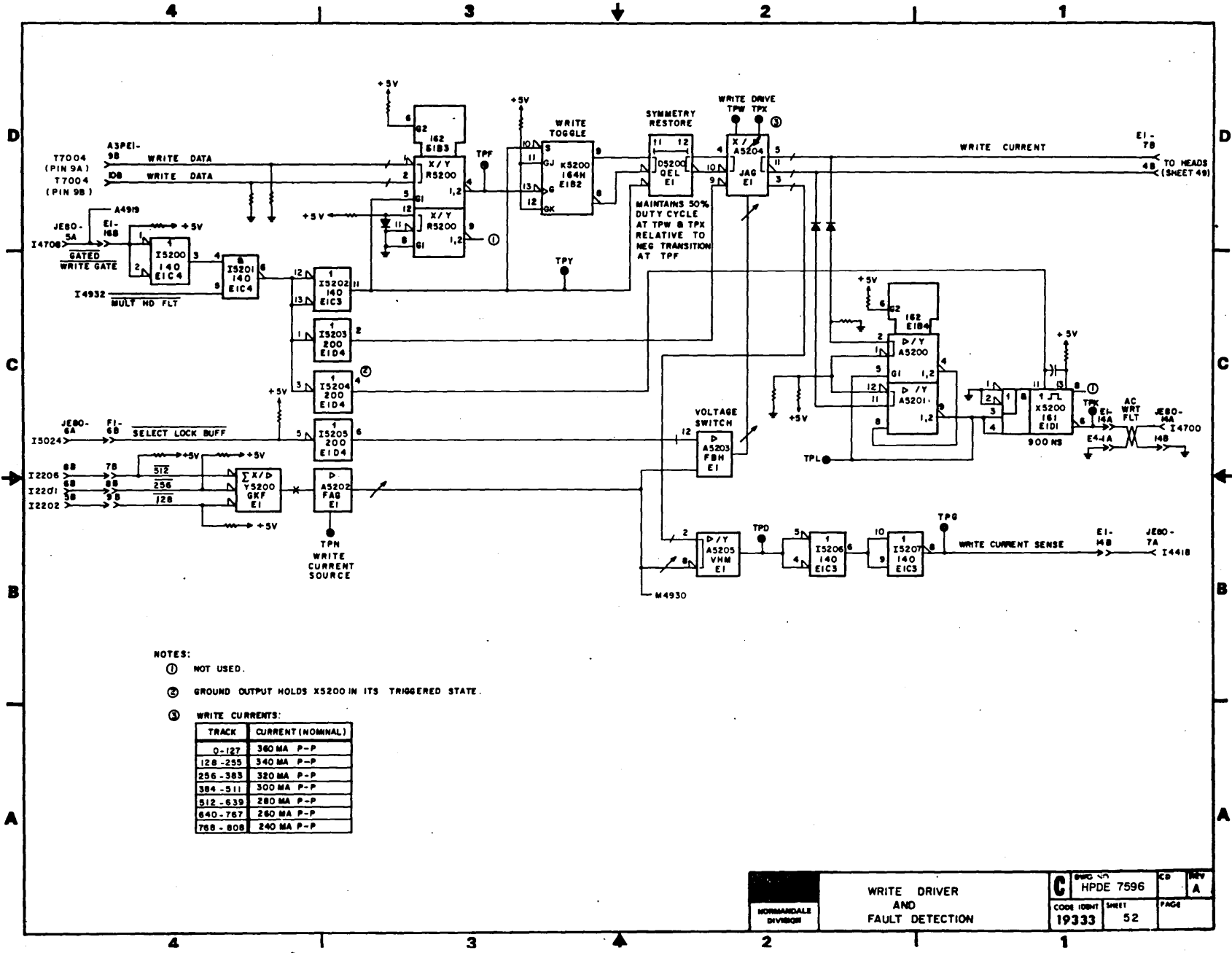
NORMAN DALE DIVISION	HEAD SELECTION		C	HW NO	CD	REV
				HPDE 7596		
			CODE	SWIT	PAGE	
			19333	49		





NOTE
① NOT USED

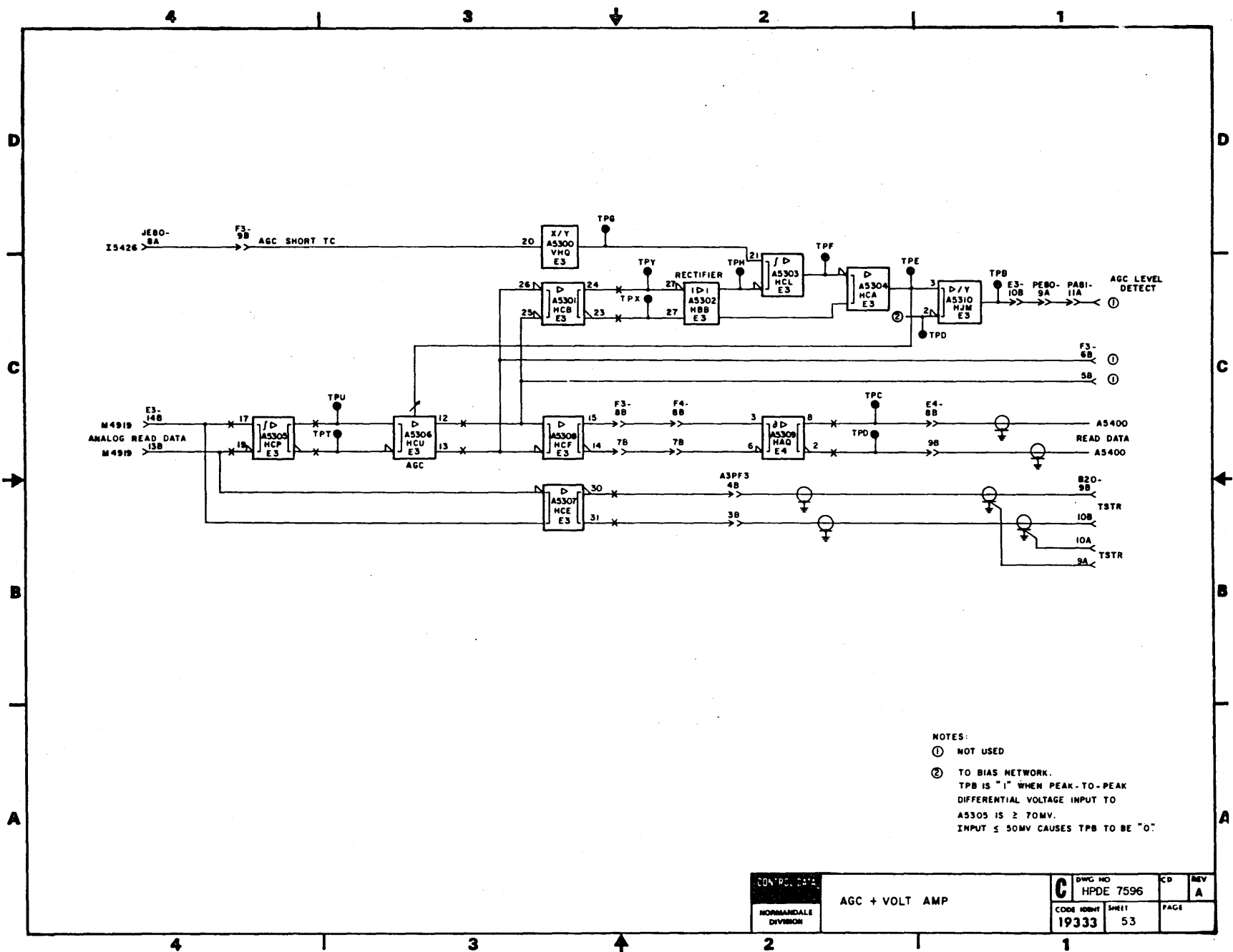
NORMANDALE DIVISION	DEVICE CHECK		C DWG NO HPDE 7596	CD	REV A
	CODE IDENT 19333	SHEET 51	PAGE		



- NOTES:
- ① NOT USED.
 - ② GROUND OUTPUT HOLDS X5200 IN ITS TRIGGERED STATE.
 - ③ WRITE CURRENTS:

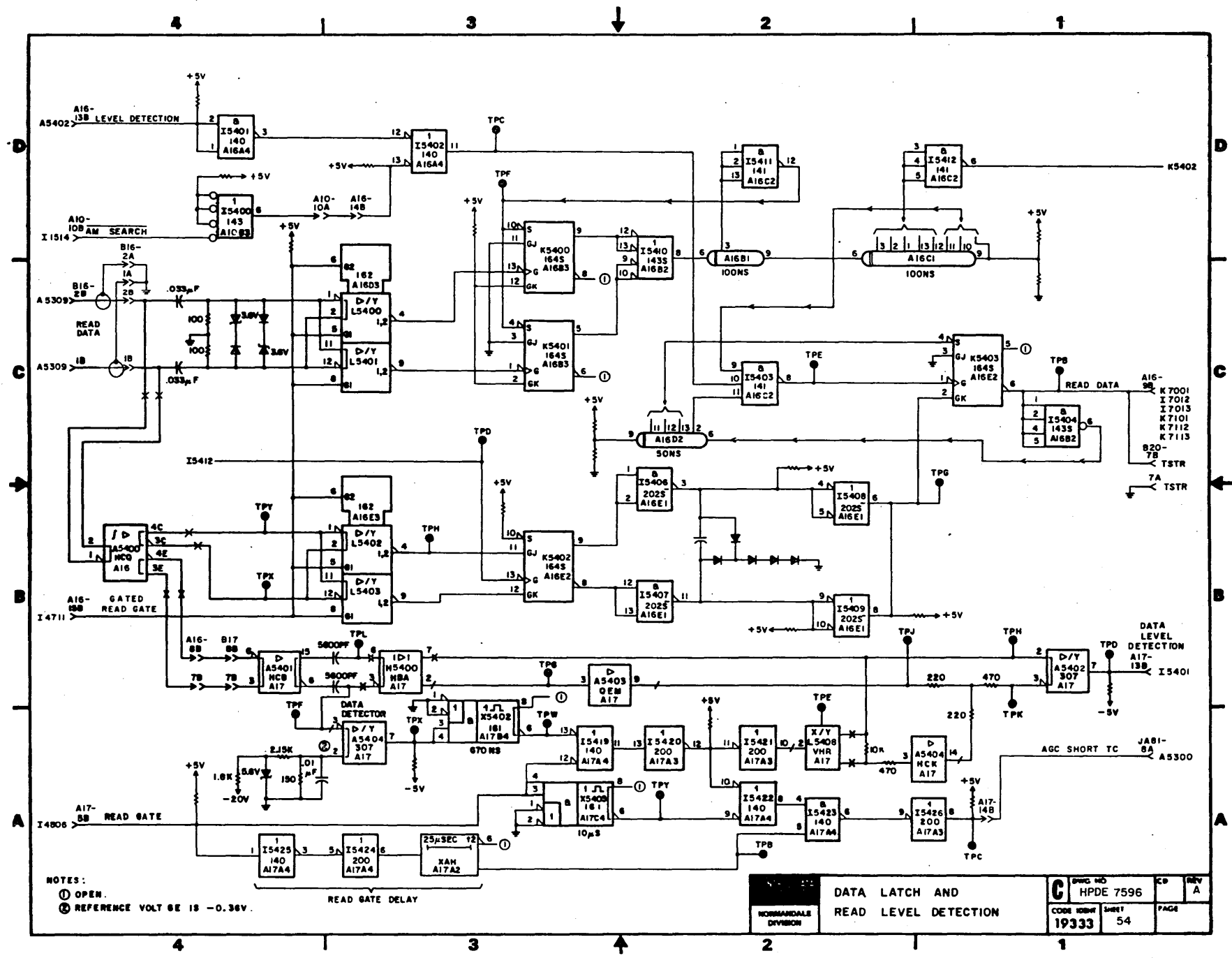
TRACK	CURRENT (NOMINAL)
0-127	360 MA P-P
128-255	340 MA P-P
256-383	320 MA P-P
384-511	300 MA P-P
512-639	280 MA P-P
640-767	260 MA P-P
768-808	240 MA P-P

NORMAN DALE DIVISION	WRITE DRIVER AND FAULT DETECTION		C HPDE 7596	CD A
	19333	SHEET 52		



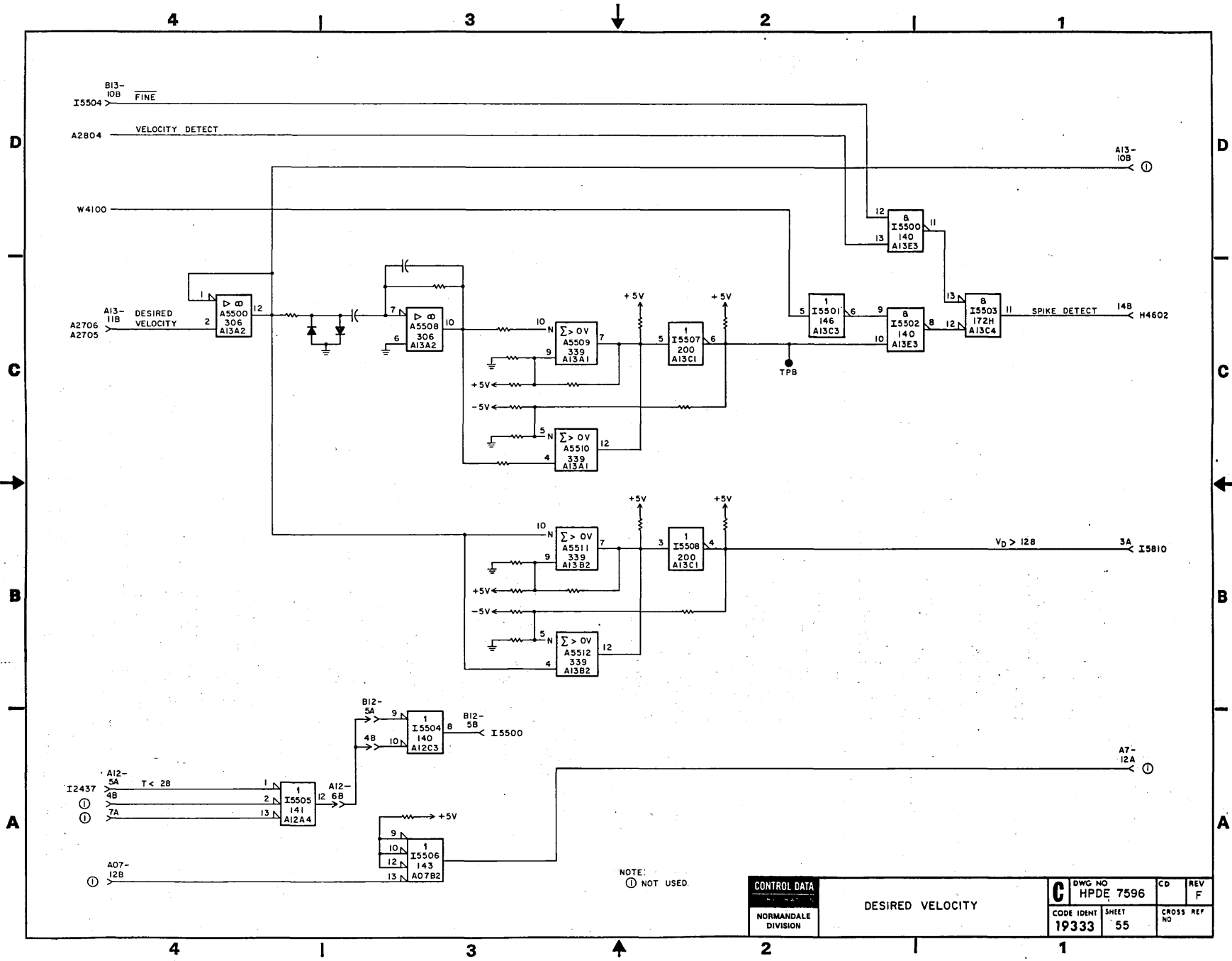
NOTES:
 ① NOT USED
 ② TO BIAS NETWORK.
 TPB IS "1" WHEN PEAK-TO-PEAK
 DIFFERENTIAL VOLTAGE INPUT TO
 A5305 IS ≥ 70 MV.
 INPUT ≤ 50 MV CAUSES TPB TO BE "0"

CONTR. DATA		DWG NO HPDE 7596	CD	REV
NORMANDALE DIVISION				A
AGC + VOLT AMP		CODE IDENT 19333	SHEET 53	PAGE



NOTES:
① OPEN.
② REFERENCE VOLT 6E 18 -0.36V.

NORMANDALE DIVISION	DATA LATCH AND READ LEVEL DETECTION		DRWG NO HPDE 7596	CD A	REV A
			CODE IDENT 19333	SHEET 54	PAGE

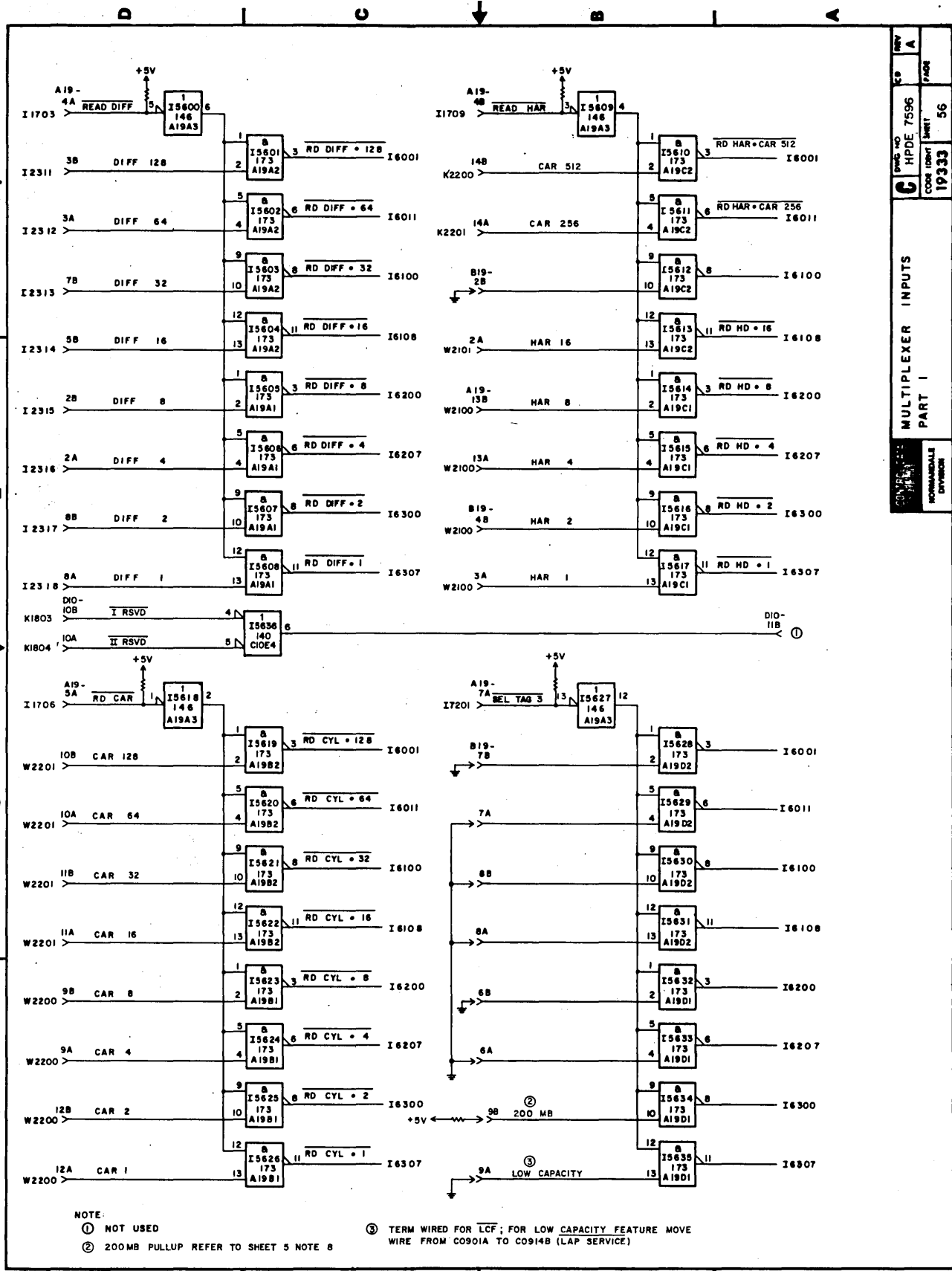


NOTE:
⓪ NOT USED.

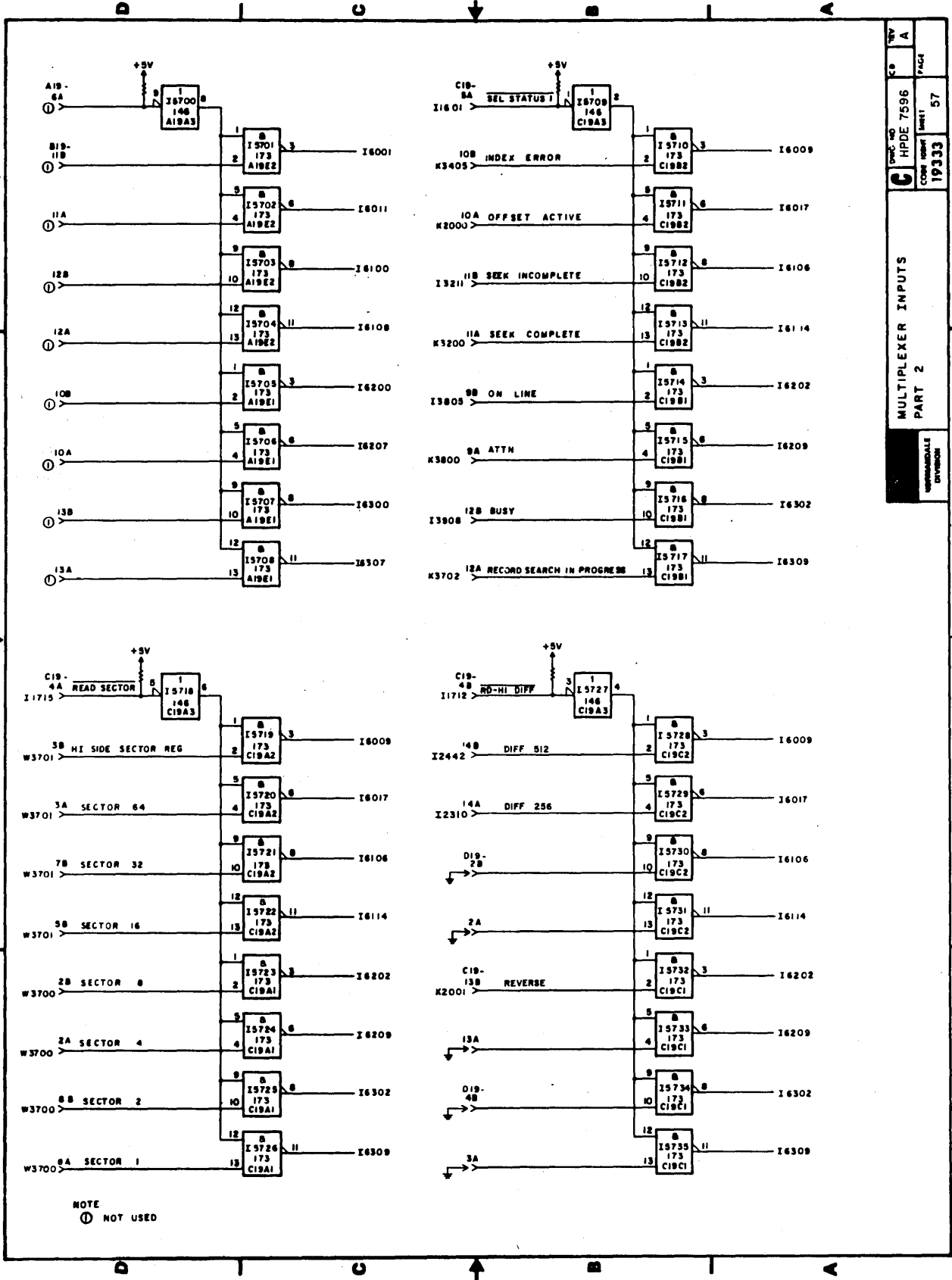
CONTROL DATA
NORMANDE DIVISION

DESIRED VELOCITY

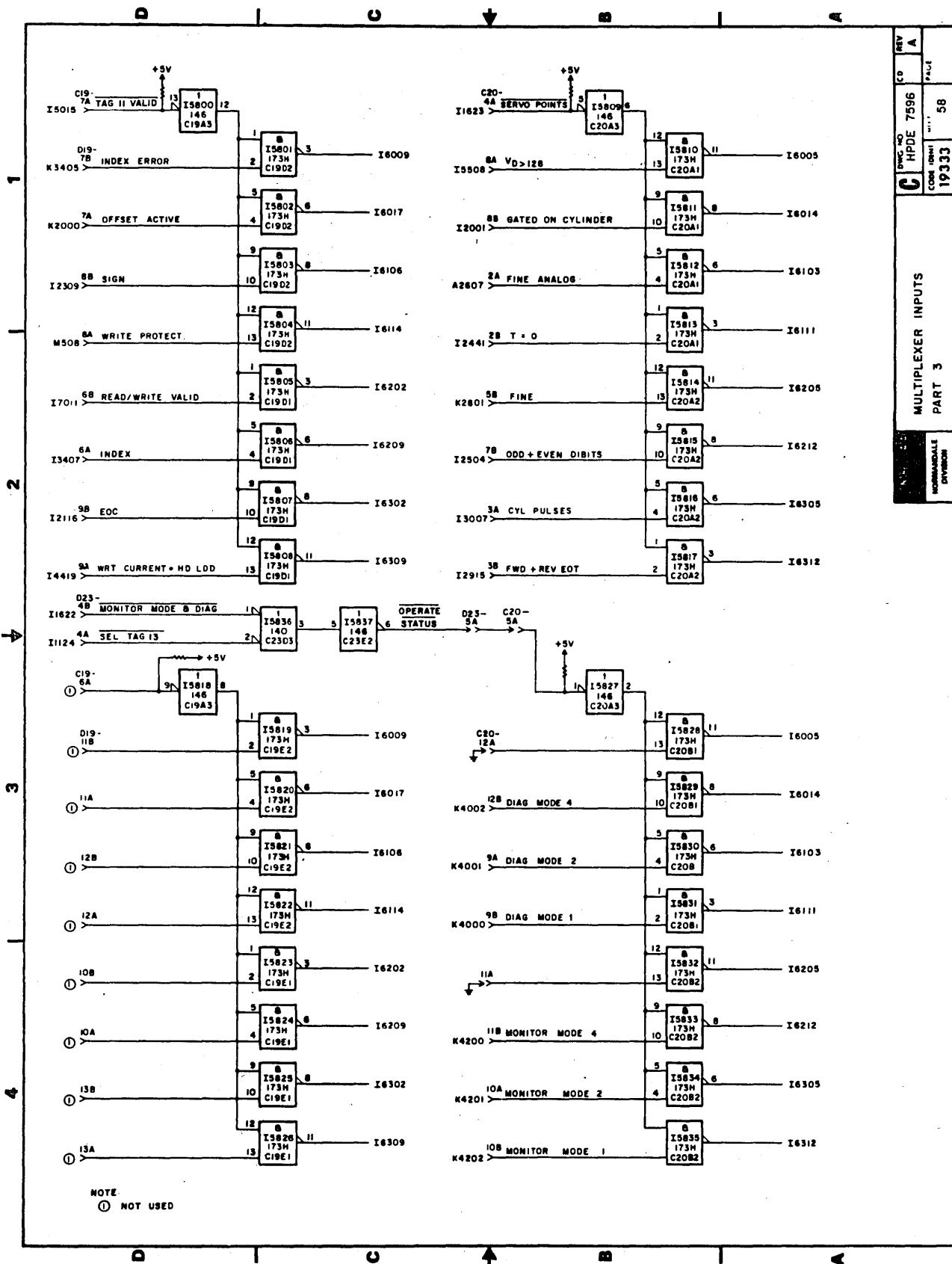
C	DWG NO	HPDE 7596	CD	REV
	CODE IDENT	19333	SHEET	55
			CROSS REF	NO



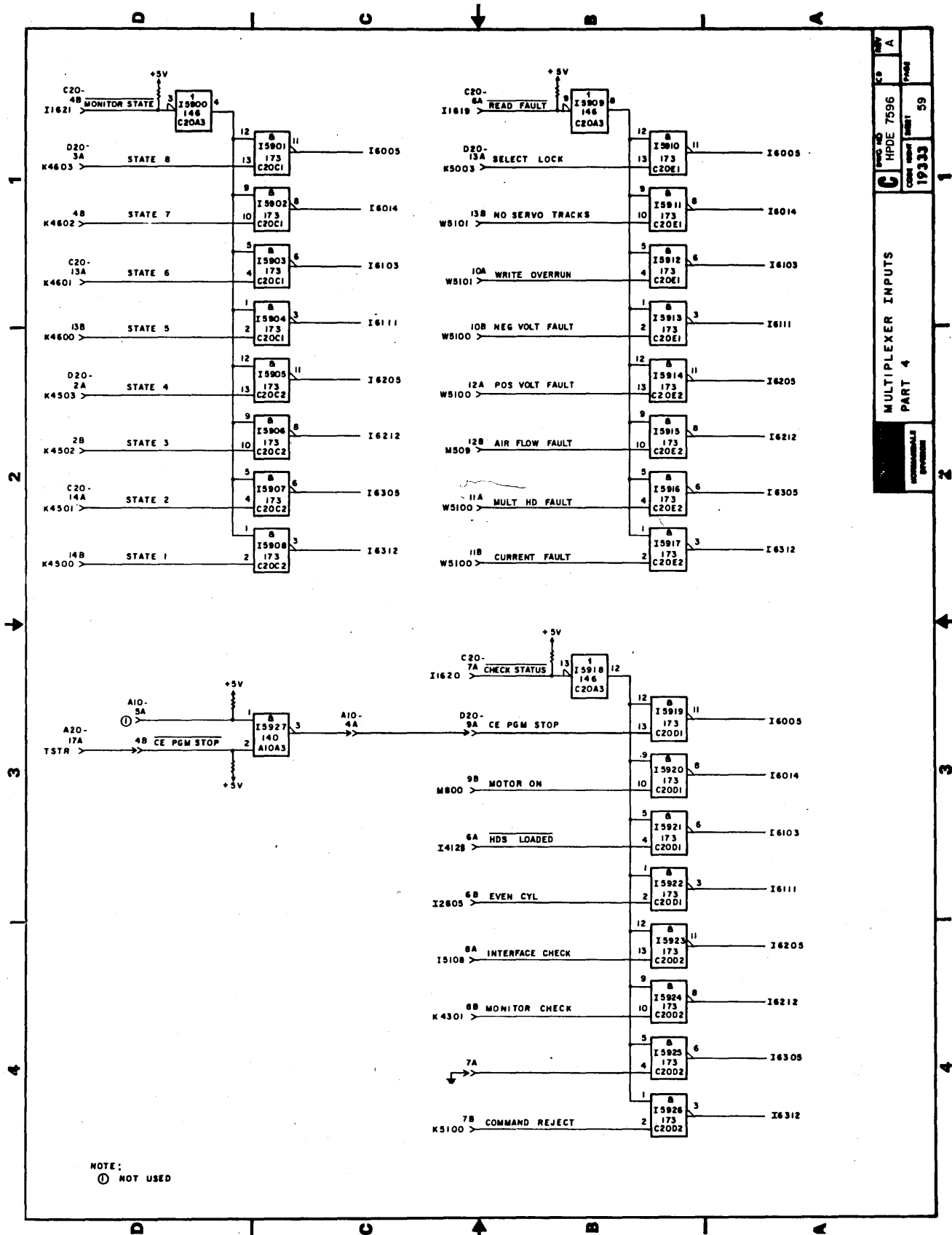
REV	A
CD	56
HPDE NO	HPDE 7596
CODE IDENT	19333
MULTIPLEXER INPUTS PART 1	
CONTRACT NO.	NON-MILITARY EXTENSION



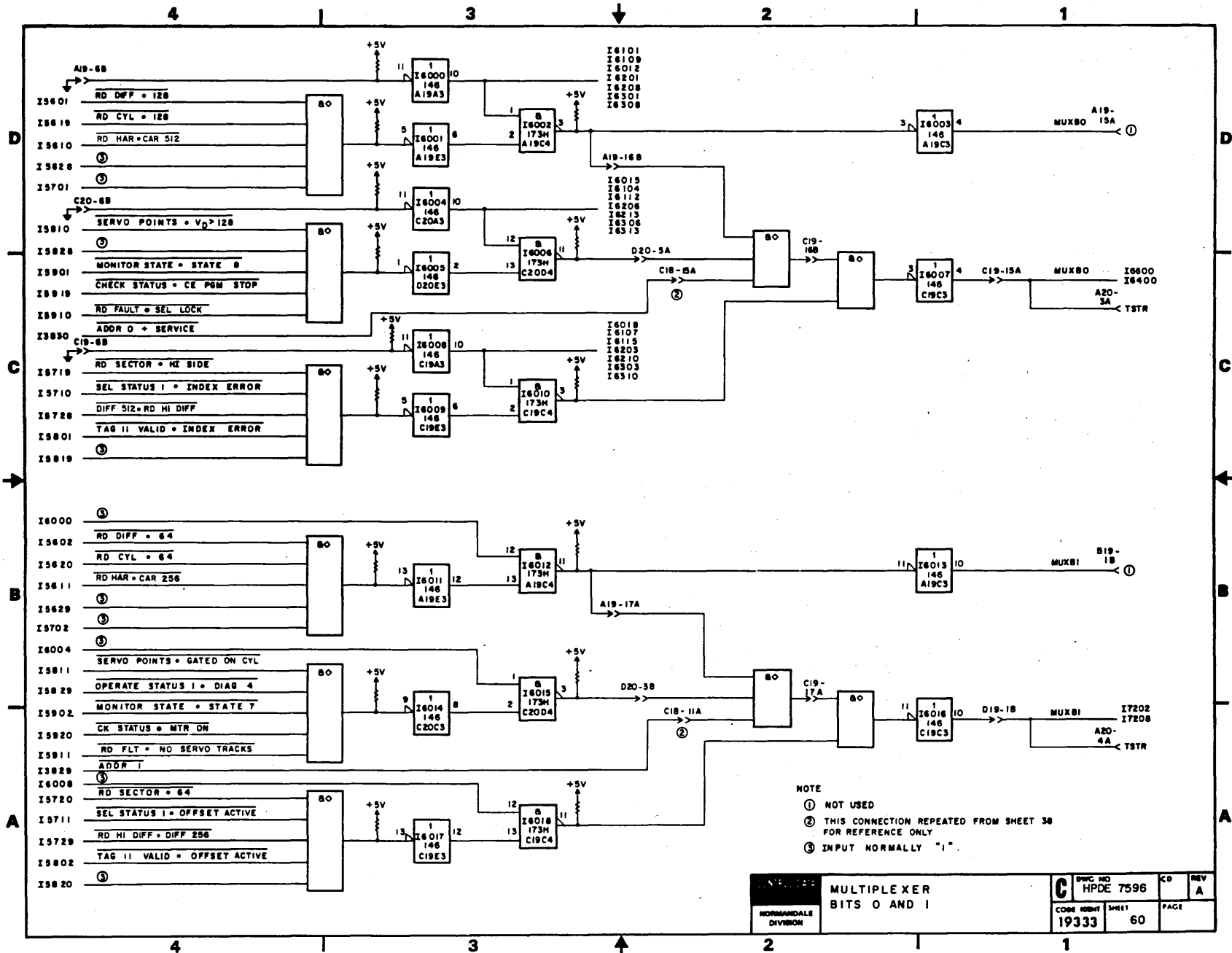
REV A
 HPDE 7596
 19333
 57
 MULTIPLEXER INPUTS
 PART 2
 UNREPRODUCIBLE
 DIVISION



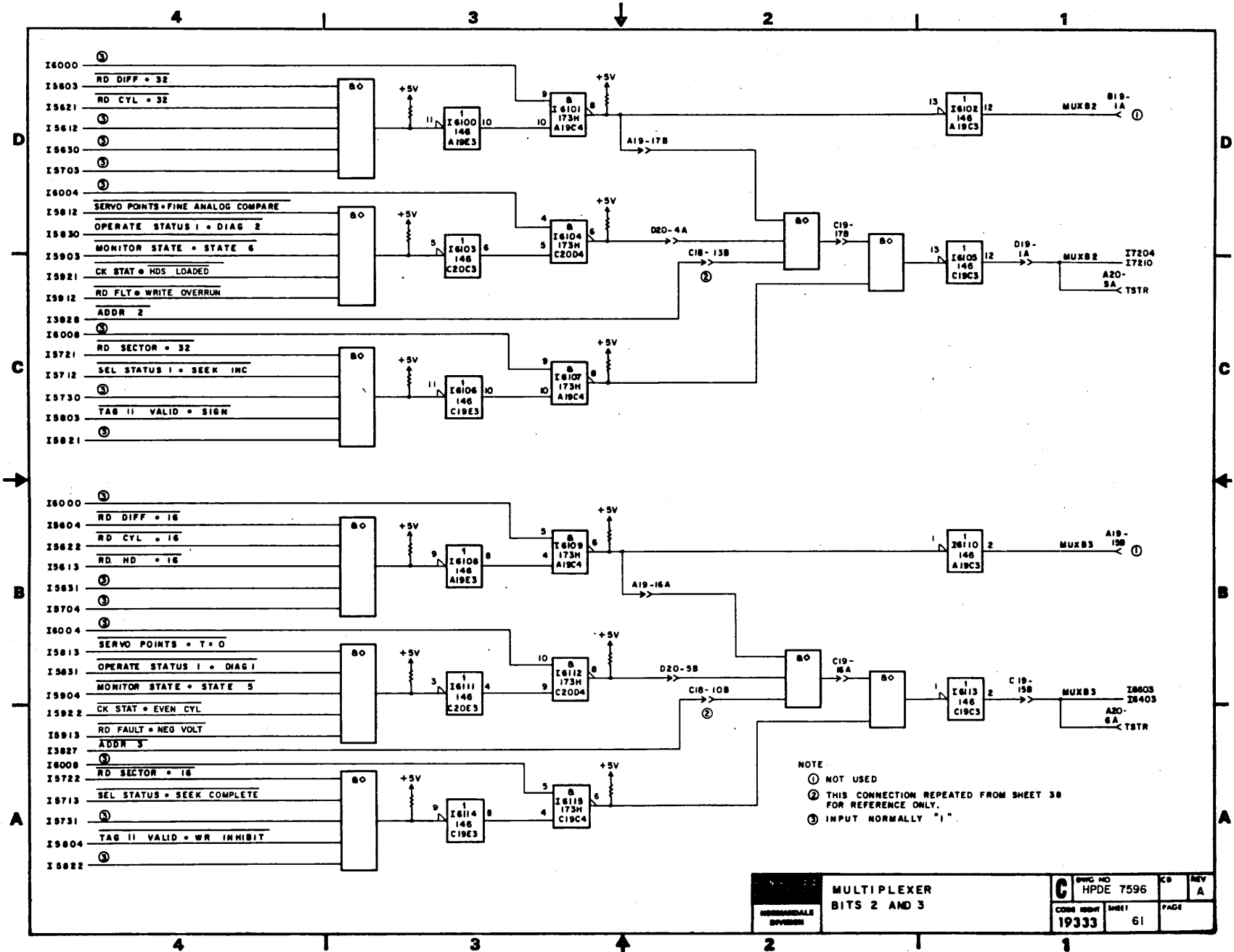
REV	A
CD	
DWG. NO.	HPDE 7596
DATE	
COPIES MADE	19333
	58
MULTIPLEXER INPUTS PART 3	
HARRIS CORPORATION DIVISION	



HPDE 7596
 19333
 MULTIPLEXER INPUTS
 PART 4
 59

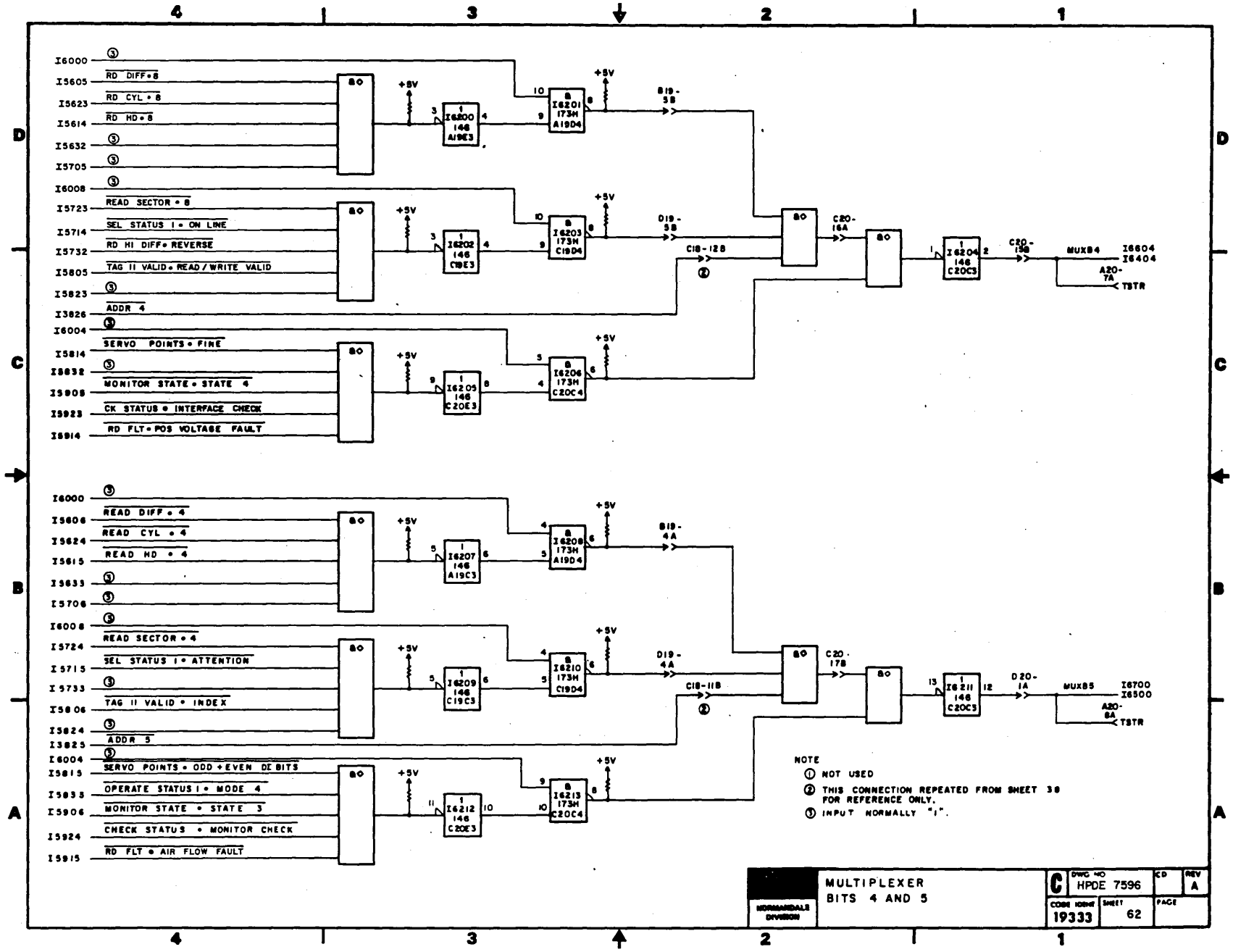


NORMANDALE DIVISION	MULTIPLEXER BITS 0 AND 1		CD REV A
	C CODE NO 19333	HPDE SHEET 60	

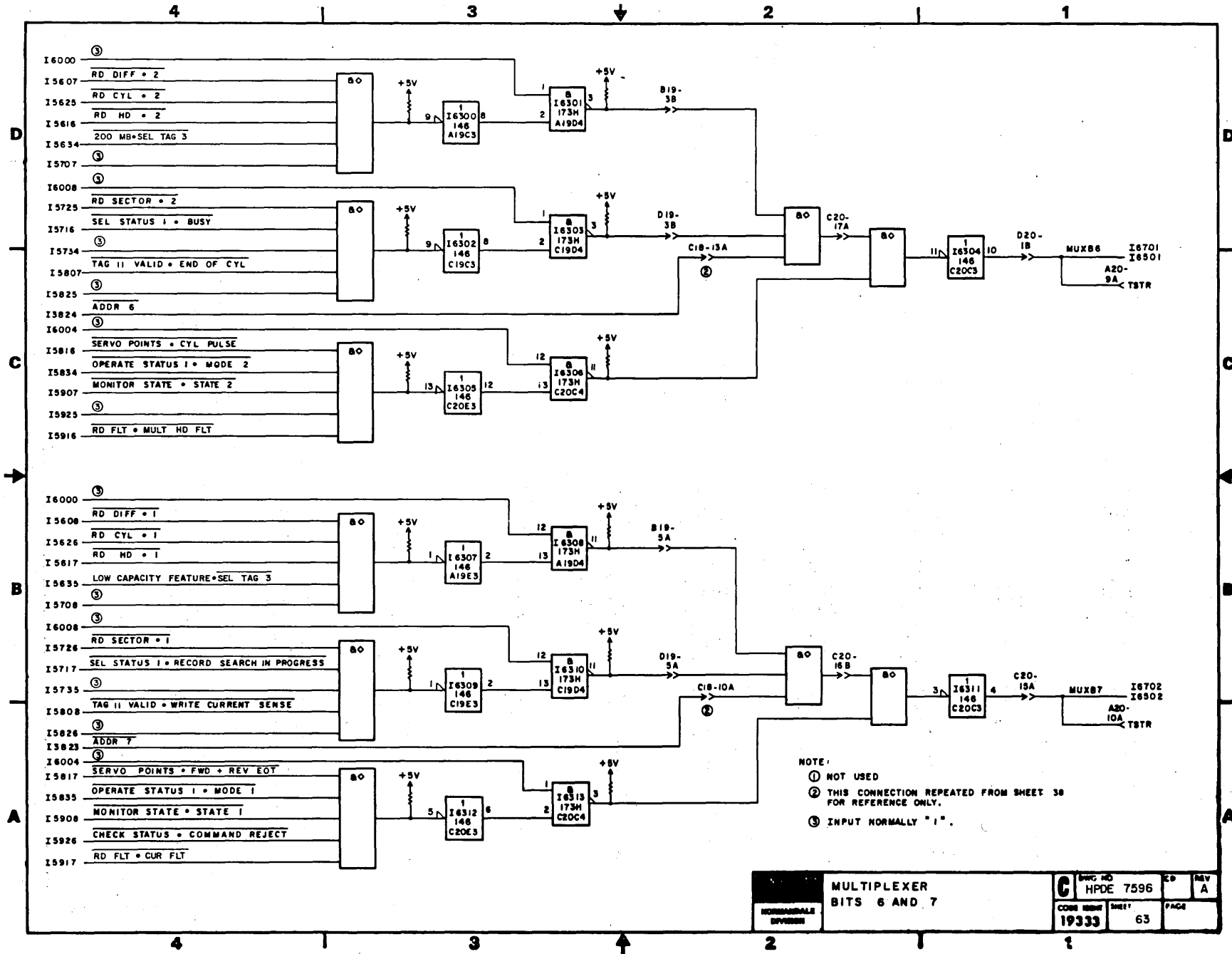


NOTE
 ① NOT USED
 ② THIS CONNECTION REPEATED FROM SHEET 38 FOR REFERENCE ONLY.
 ③ INPUT NORMALLY "1".

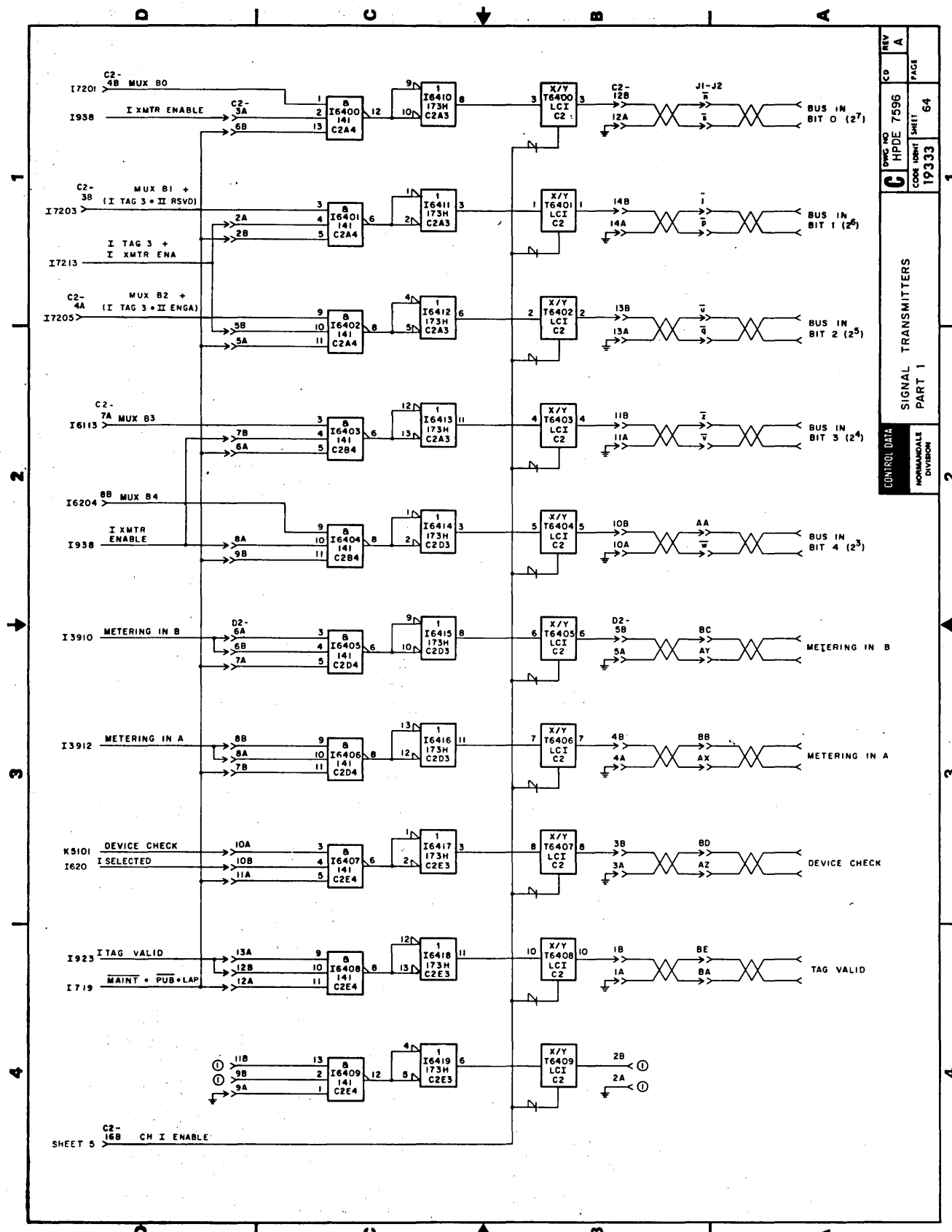
MULTIPLEXER BITS 2 AND 3	C	DWG NO HPDE 7596	CD REV A
	CORR REV 19333	SHEET 61	PAGE



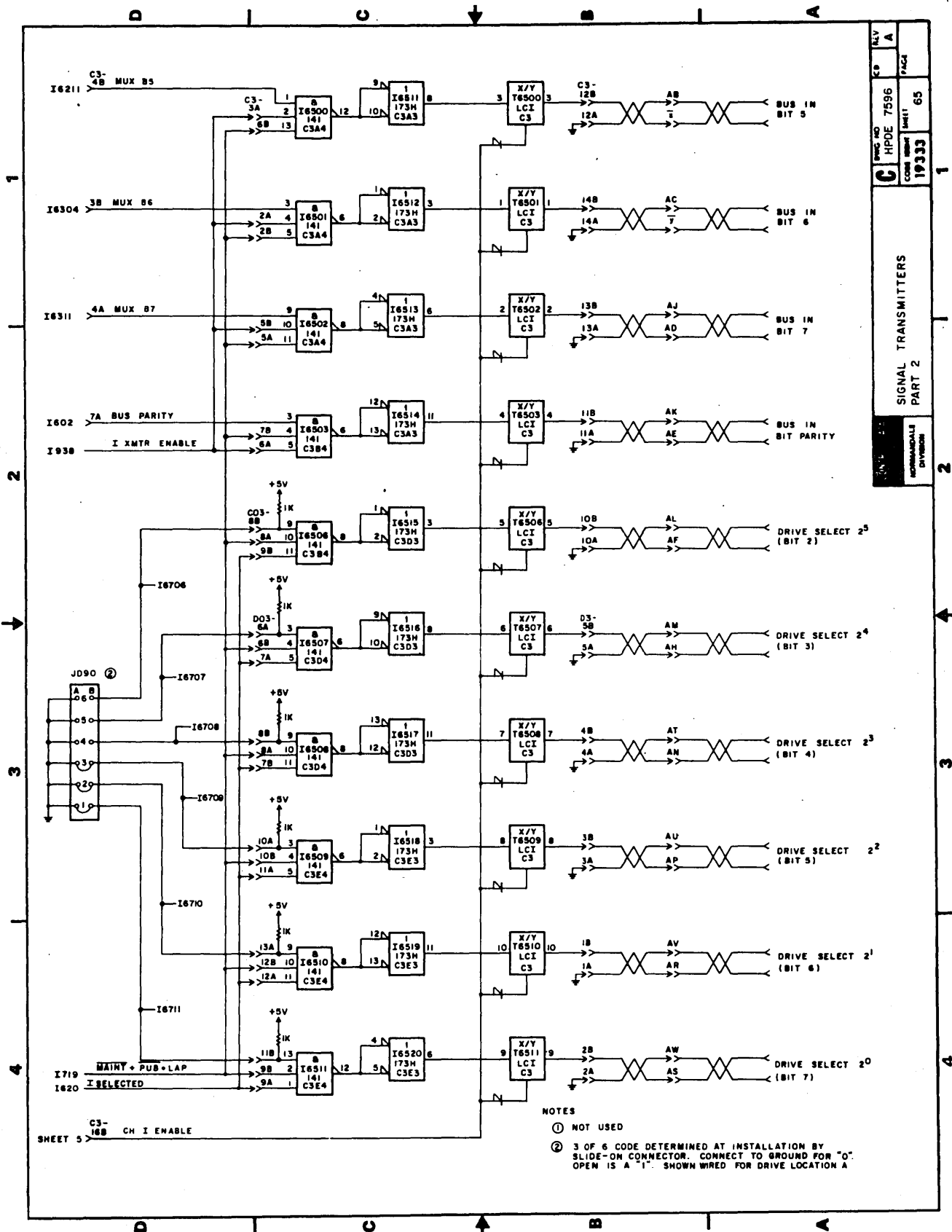
NORMANDALE DIVISION	MULTIPLEXER BITS 4 AND 5		DWG NO HPDE 7596	CD REV A
	CODE 108W 19333	SHEET 62	PAGE	



NORMANDALE DIVISION	MULTIPLEXER BITS 6 AND 7		C	HW NO	CD	REV
	19333	63		HPDE 7596		A
				CODE		PAGE

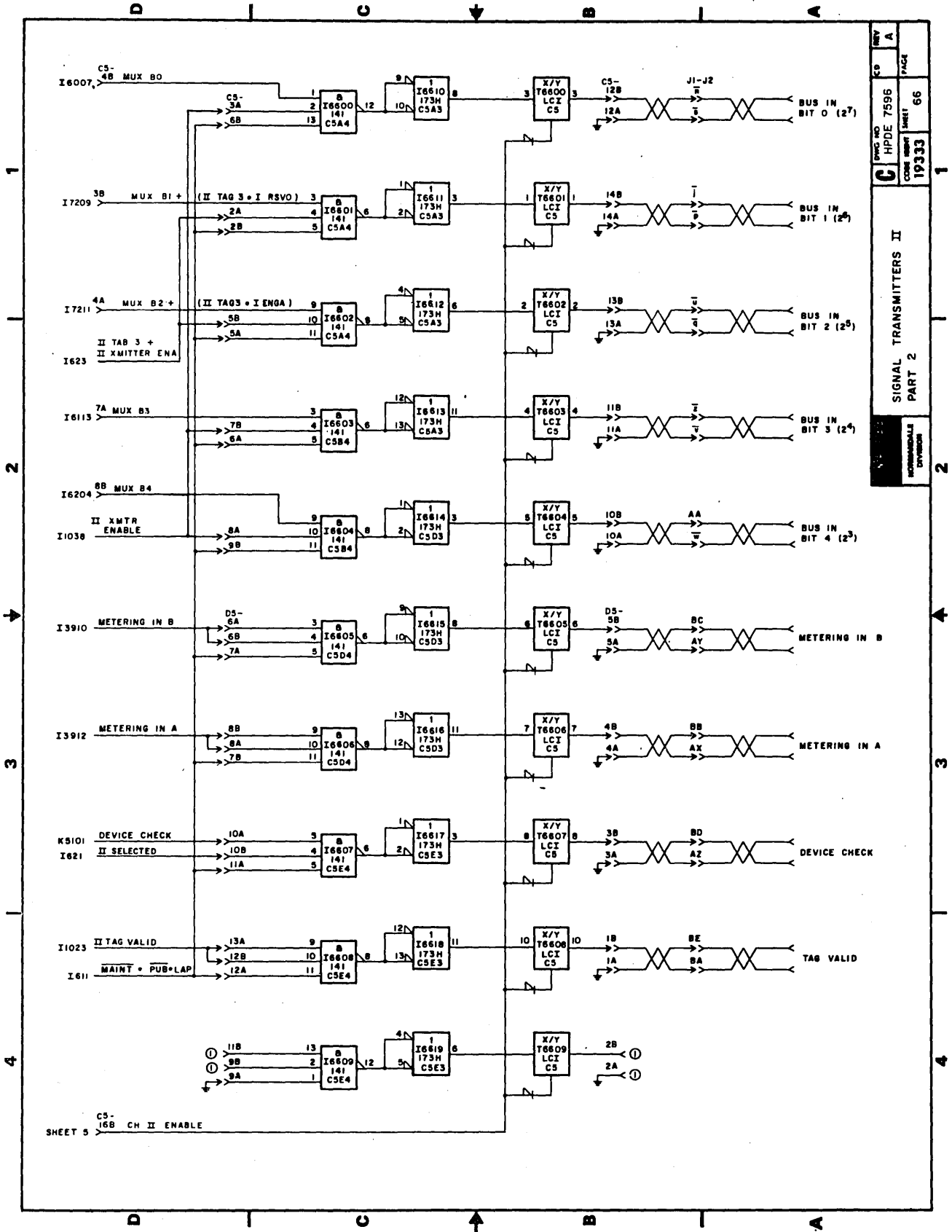


CD	REV	A
HPDE	7596	PAGE
19333	64	64
SIGNAL TRANSMITTERS		
PART 1		
CONTROL DATA		
NORMANVILLE DIVISION		

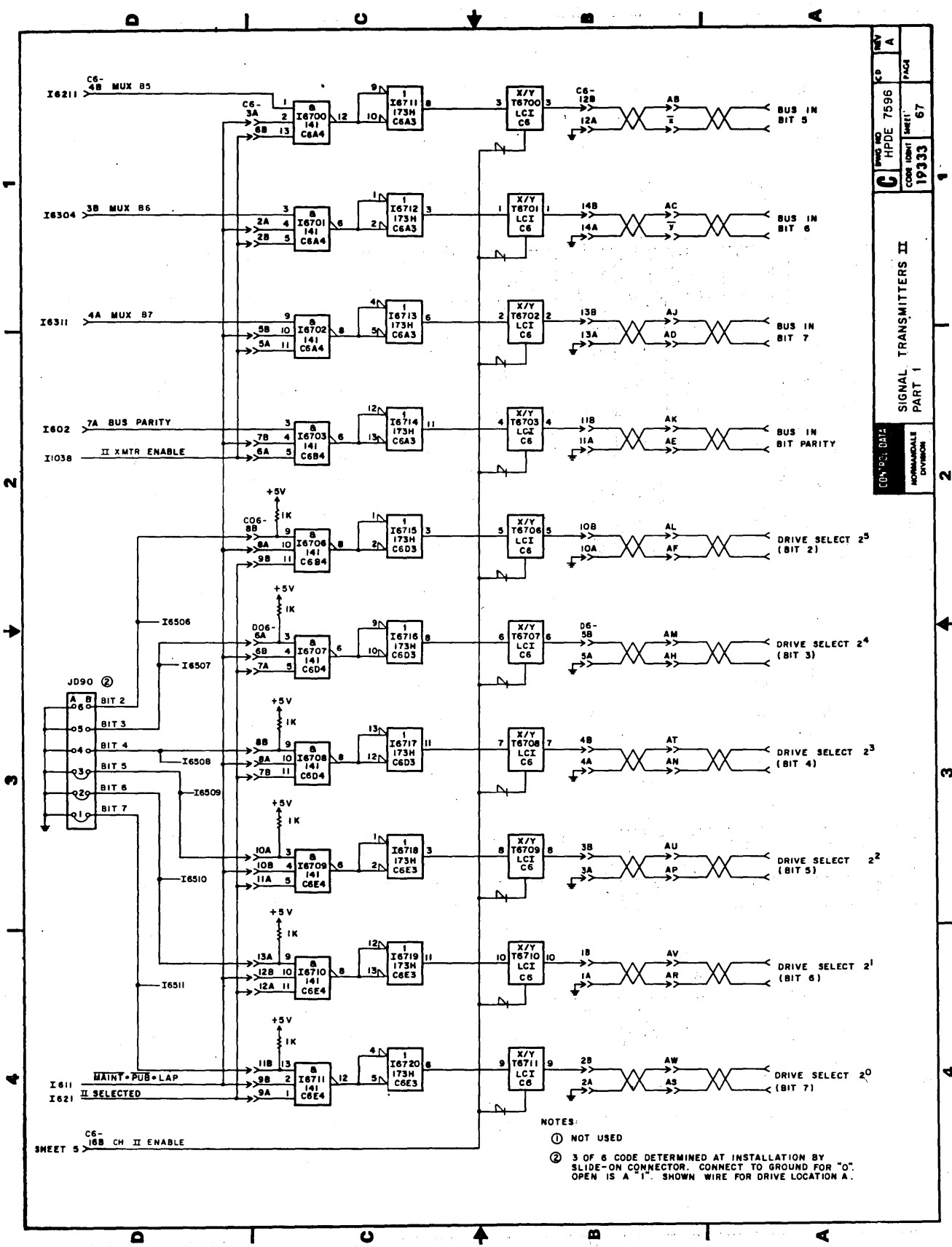


REV	REV	REV
65	65	65
HPDE 7596	HPDE 7596	HPDE 7596
19333	19333	19333
SIGNAL TRANSMITTERS PART 2		

NOTES
 (1) NOT USED
 (2) 3 OF 6 CODE DETERMINED AT INSTALLATION BY SLIDE-ON CONNECTOR. CONNECT TO GROUND FOR "0". OPEN IS A "1". SHOWN WIRED FOR DRIVE LOCATION A

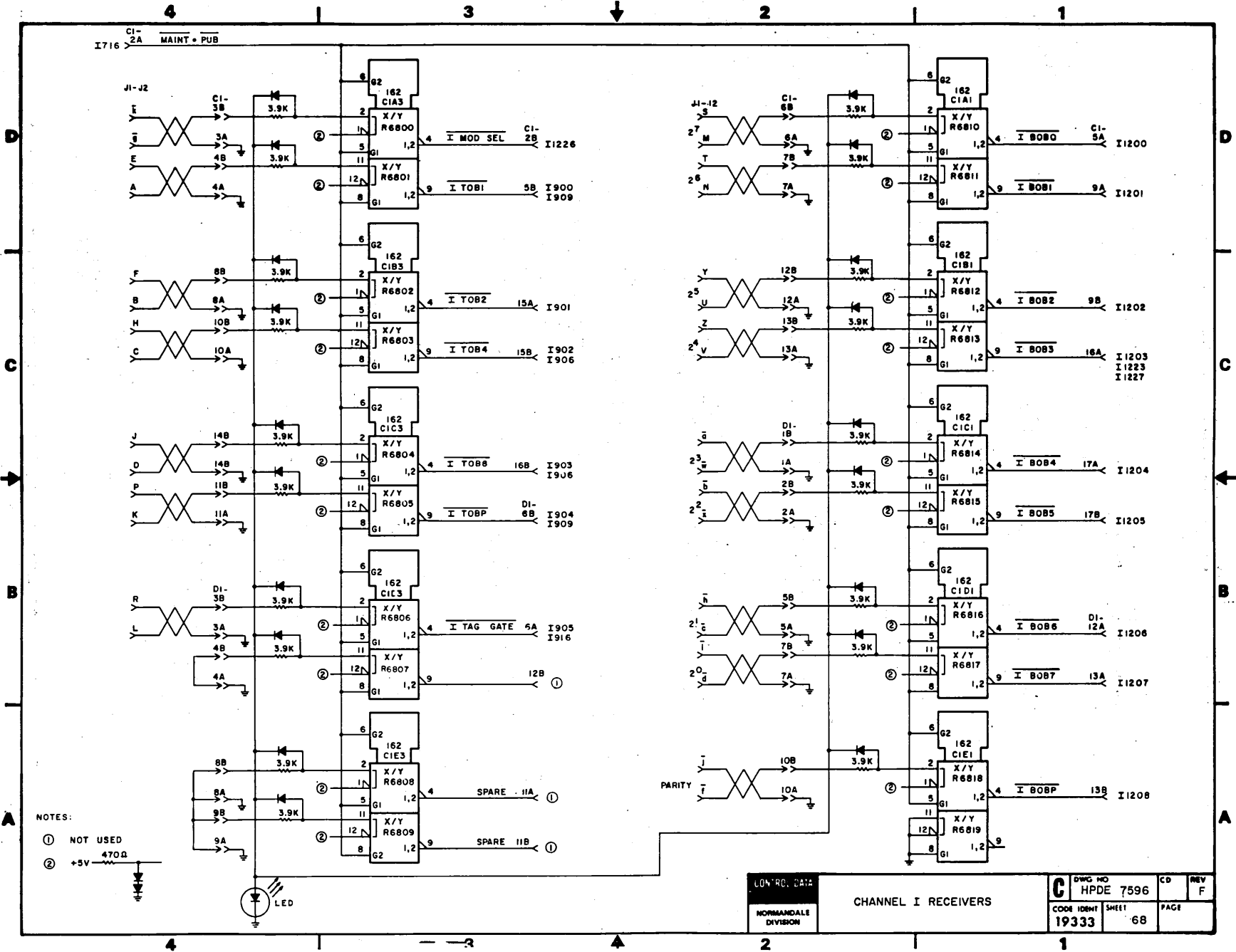


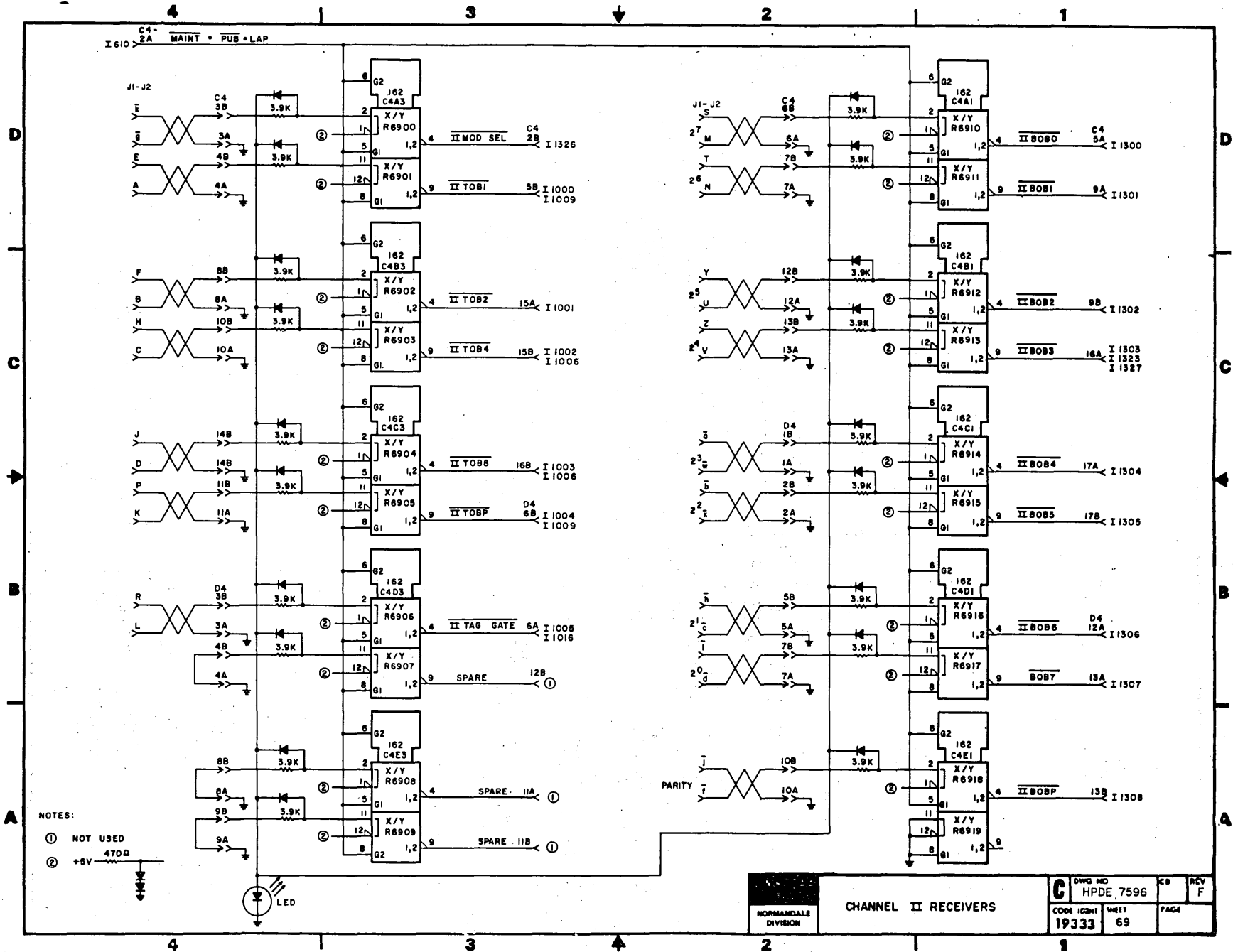
REV	A
CS	66
HPDC NO	HPDE 7596
COMP. SHEET	Sheet 1
19333	66
SIGNAL TRANSMITTERS II	
PART 2	
NON-REMEDIABLE	
DISPOSABLE	



REV	A
CD	
HPDE	7596
FORM NO	C
DATE	1933
PAGE	67
SIGNAL TRANSMITTERS II	
PART 1	
CONV. DATE	
FORM NO	
DATE	
DIVISION	

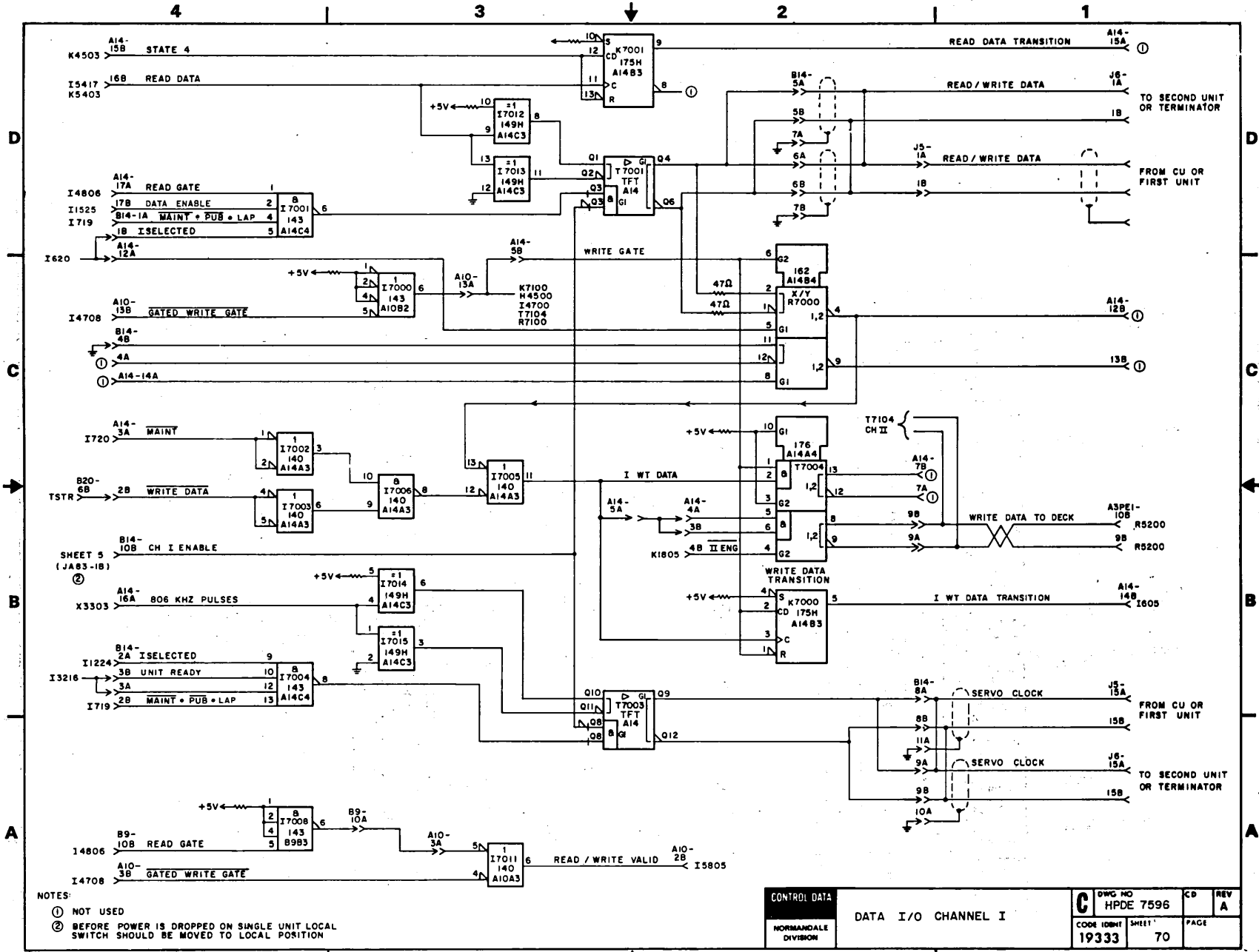
NOTES:
 ① NOT USED
 ② 3 OF 8 CODE DETERMINED AT INSTALLATION BY SLIDE-ON CONNECTOR. CONNECT TO GROUND FOR "0". OPEN IS A "1". SHOWN WIRE FOR DRIVE LOCATION A.





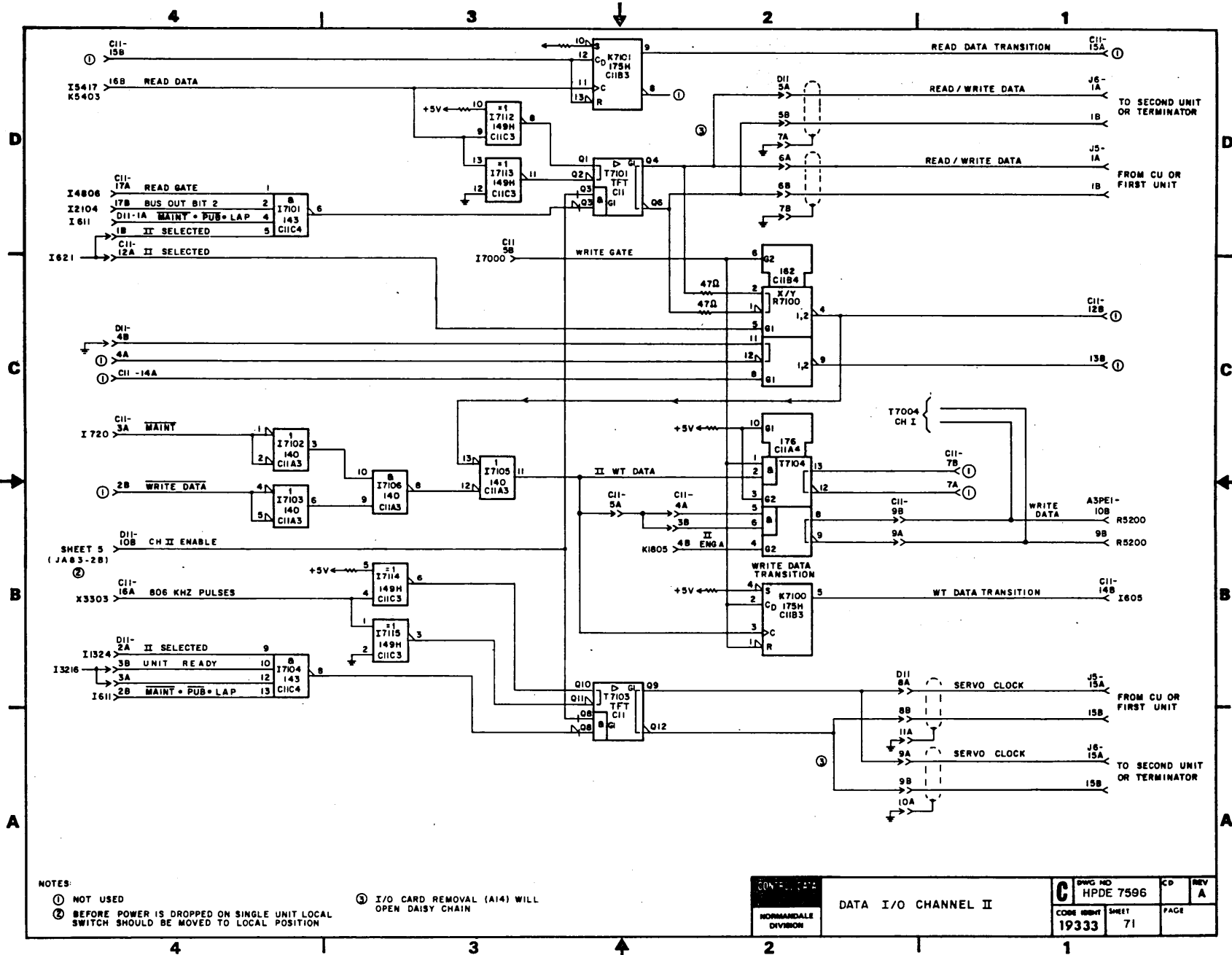
NOTES:
 ① NOT USED
 470Ω
 ② +5V

NORMANDEALE DIVISION	CHANNEL II RECEIVERS		C	DWG NO	CD	REV
				HPDE 7596		F
			CODE 1281	19333	69	PAGE



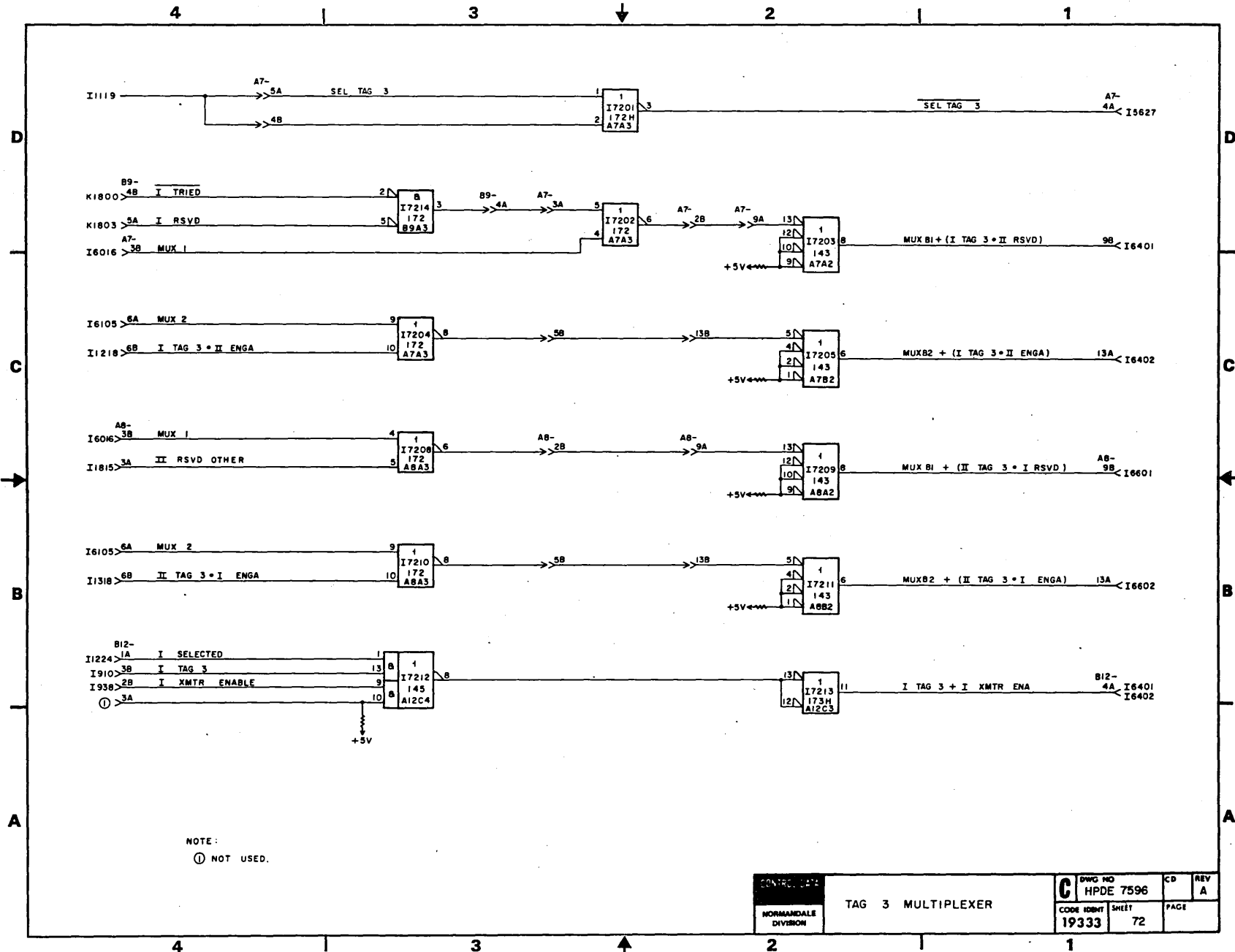
NOTES:
 ① NOT USED
 ② BEFORE POWER IS DROPPED ON SINGLE UNIT LOCAL SWITCH SHOULD BE MOVED TO LOCAL POSITION

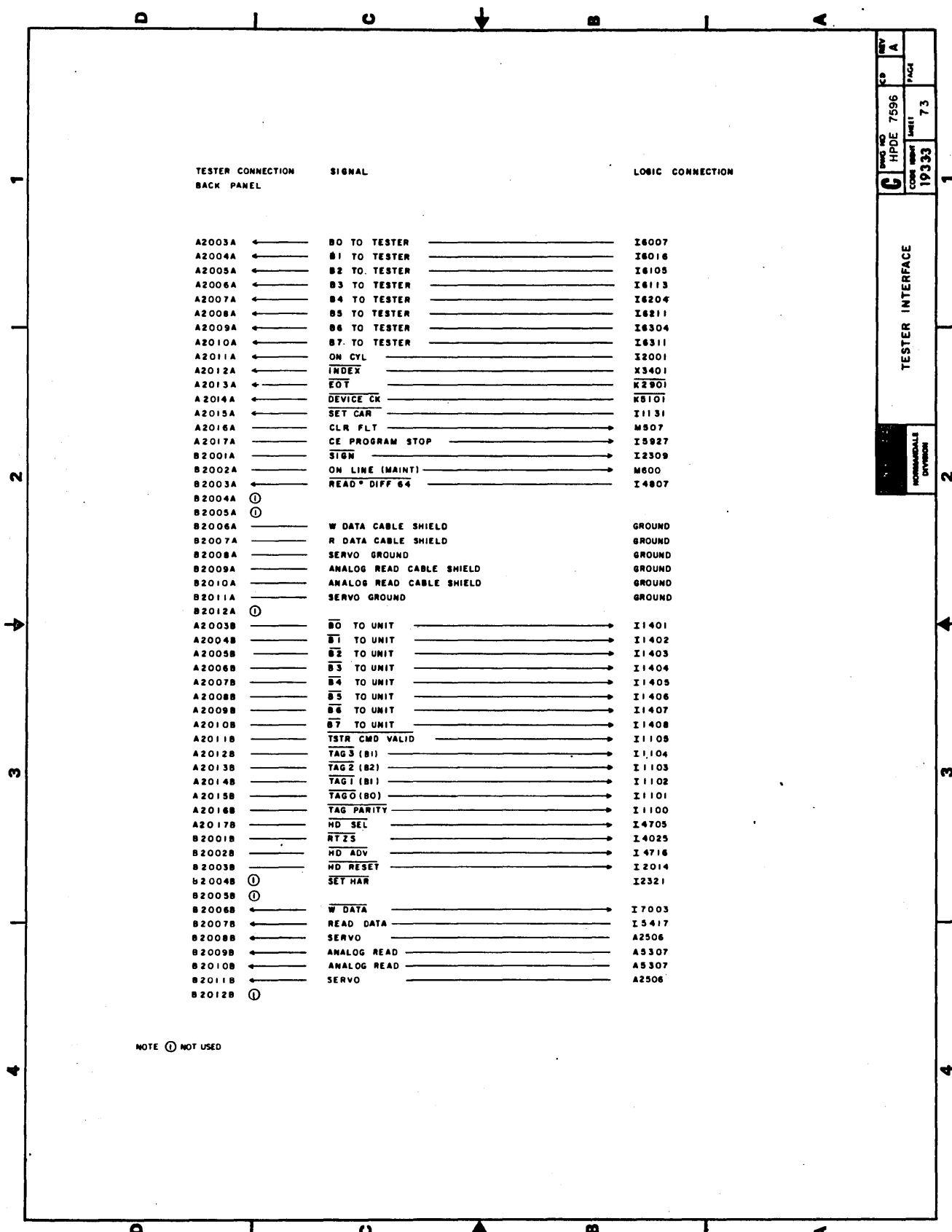
CONTROL DATA		C	DWG NO	CD	REV
NORMANDALE DIVISION			HPDE 7596		A
		CODE IDENT	SHEET	PAGE	
		19333	70		



NOTES:
 ① NOT USED
 ② BEFORE POWER IS DROPPED ON SINGLE UNIT LOCAL SWITCH SHOULD BE MOVED TO LOCAL POSITION
 ③ I/O CARD REMOVAL (A14) WILL OPEN DAISY CHAIN

CONTROL	DATA I/O CHANNEL II	HPD NO HPDE 7596	CD REV A
NORMANDELL DIVISION		CODE UNIT 19333	SHEET 71





TESTER CONNECTION
BACK PANEL

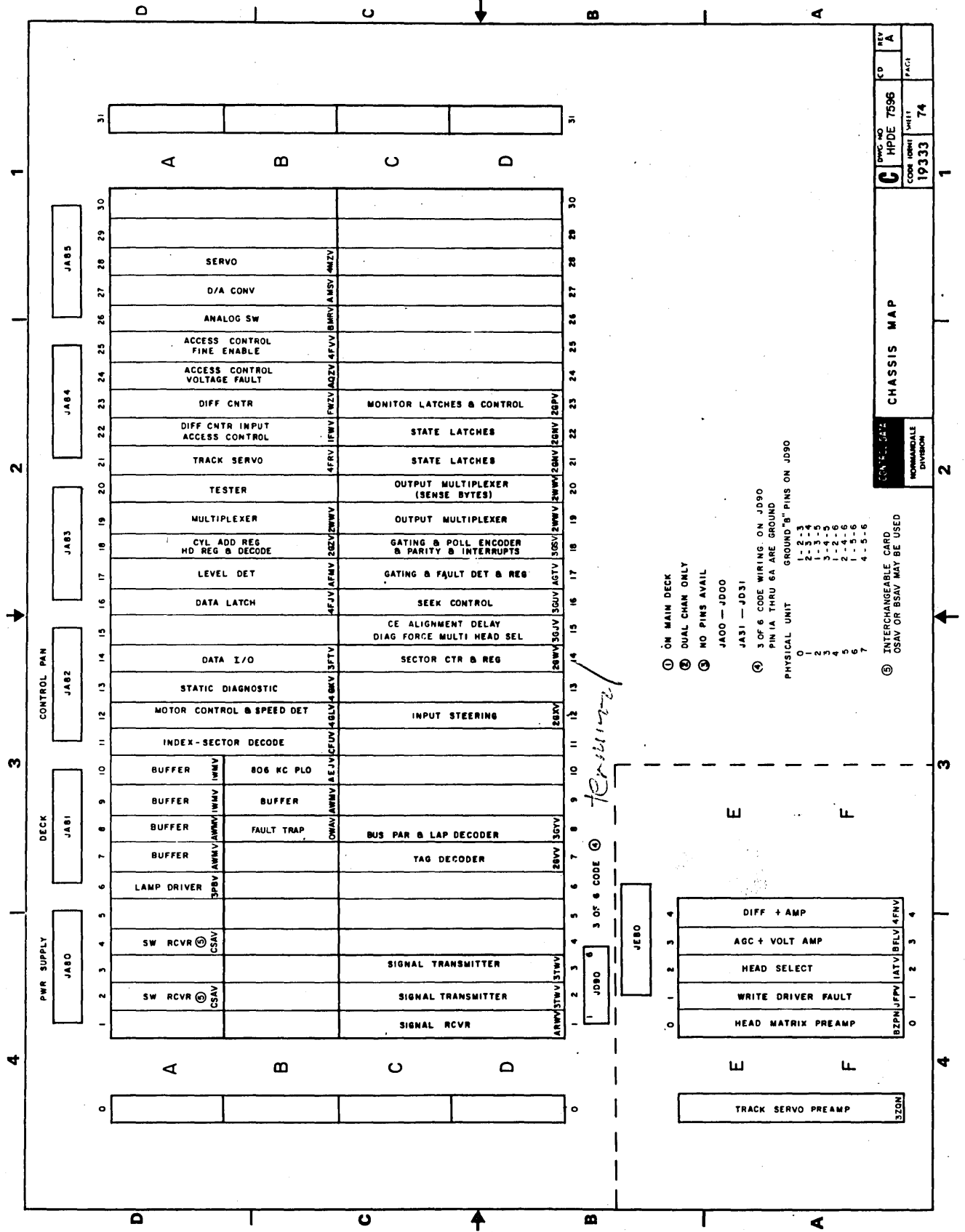
SIGNAL

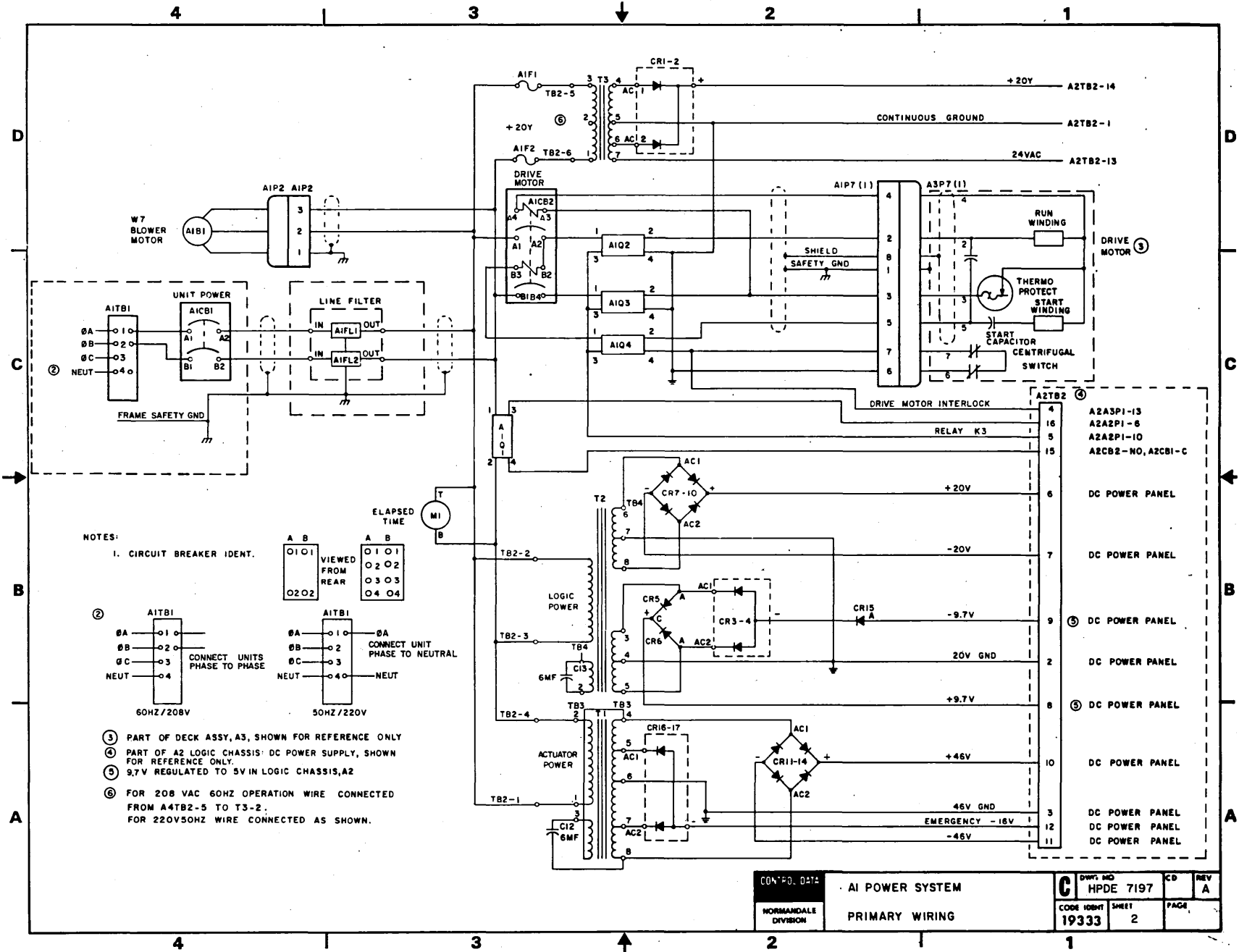
LOGIC CONNECTION

A2003A	←	B0 TO TESTER	_____	I6007
A2004A	←	B1 TO TESTER	_____	I6016
A2005A	←	B2 TO TESTER	_____	I6105
A2006A	←	B3 TO TESTER	_____	I6113
A2007A	←	B4 TO TESTER	_____	I6204
A2008A	←	B5 TO TESTER	_____	I6211
A2009A	←	B6 TO TESTER	_____	I6304
A2010A	←	B7 TO TESTER	_____	I6311
A2011A	←	ON CYL	_____	I2001
A2012A	←	INDEX	_____	X3401
A2013A	←	EDT	_____	K2901
A2014A	←	DEVICE CK	_____	KB101
A2015A	←	SET CAR	_____	I1131
A2016A	←	CLR FLT	_____	M507
A2017A	←	CE PROGRAM STOP	_____	I5927
B2001A	←	SIGN	_____	I2309
B2002A	←	ON LINE (MAINT)	_____	M600
B2003A	←	READ* DIFF 64	_____	I4807
B2004A	⓪			
B2005A	⓪			
B2006A	←	W DATA CABLE SHIELD	_____	GROUND
B2007A	←	R DATA CABLE SHIELD	_____	GROUND
B2008A	←	SERVO GROUND	_____	GROUND
B2009A	←	ANALOG READ CABLE SHIELD	_____	GROUND
B2010A	←	ANALOG READ CABLE SHIELD	_____	GROUND
B2011A	←	SERVO GROUND	_____	GROUND
B2012A	⓪			
A2003B	←	B0 TO UNIT	_____	I1401
A2004B	←	B1 TO UNIT	_____	I1402
A2005B	←	B2 TO UNIT	_____	I1403
A2006B	←	B3 TO UNIT	_____	I1404
A2007B	←	B4 TO UNIT	_____	I1405
A2008B	←	B5 TO UNIT	_____	I1406
A2009B	←	B6 TO UNIT	_____	I1407
A2010B	←	B7 TO UNIT	_____	I1408
A2011B	←	TSTR CMD VALID	_____	I1108
A2012B	←	TAG 3 (B1)	_____	I1104
A2013B	←	TAG 2 (B2)	_____	I1103
A2014B	←	TAG 1 (B1)	_____	I1102
A2015B	←	TAG 0 (B0)	_____	I1101
A2016B	←	TAG PARITY	_____	I1100
A2017B	←	HD SEL	_____	I4705
B2001B	←	RT ZS	_____	I4025
B2002B	←	HD ADV	_____	I4716
B2003B	←	HD RESET	_____	I2014
B2004B	⓪	SET HAR	_____	I2321
B2005B	⓪			
B2006B	←	W DATA	_____	I7003
B2007B	←	READ DATA	_____	I5417
B2008B	←	SERVO	_____	A2506
B2009B	←	ANALOG READ	_____	A5307
B2010B	←	ANALOG READ	_____	A5307
B2011B	←	SERVO	_____	A2506
B2012B	⓪			

NOTE ⓪ NOT USED

FIG. NO.	HPDE 7596
CP	A
CORE SHEET	19333
SHEET	73
PAGE	
TESTER INTERFACE	
NORMANVILLE DIVISION	





NOTES:

1. CIRCUIT BREAKER IDENT.

A	B	01 01	01 01
		02 02	02 02
		03 03	03 03
		04 04	04 04

VIEWED FROM REAR
2.

6A	01	CONNECT UNITS PHASE TO PHASE
6B	02	
6C	03	
NEUT	04	

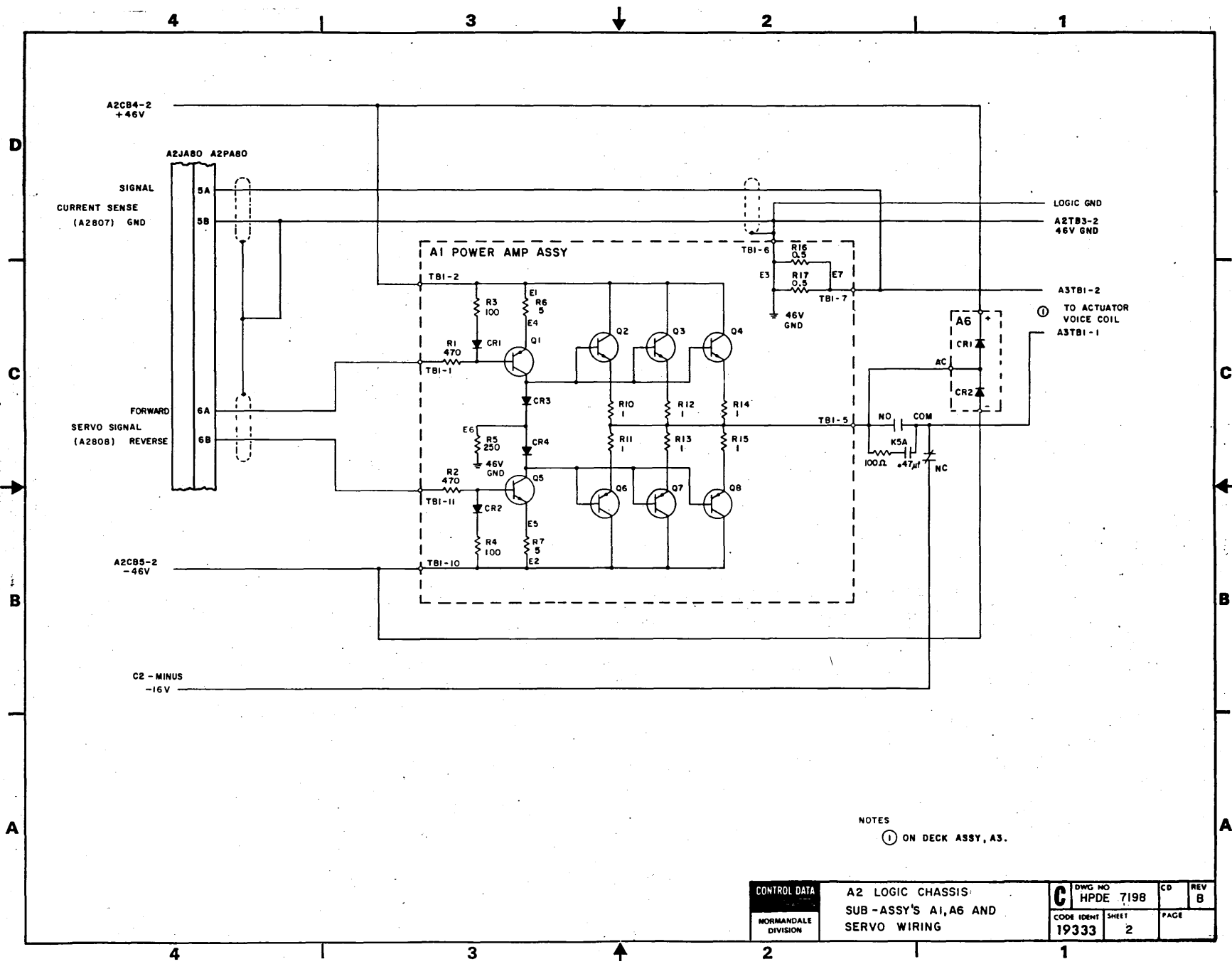
60HZ/208V

6A	01	CONNECT UNIT PHASE TO NEUTRAL
6B	02	
6C	03	
NEUT	04	

50HZ/220V
3. PART OF DECK ASSY, A3, SHOWN FOR REFERENCE ONLY
4. PART OF A2 LOGIC CHASSIS: DC POWER SUPPLY, SHOWN FOR REFERENCE ONLY
5. 9.7V REGULATED TO 5V IN LOGIC CHASSIS, A2
6. FOR 208 VAC 60HZ OPERATION WIRE CONNECTED FROM A4TB2-5 TO T3-2. FOR 220V50HZ WIRE CONNECTED AS SHOWN.

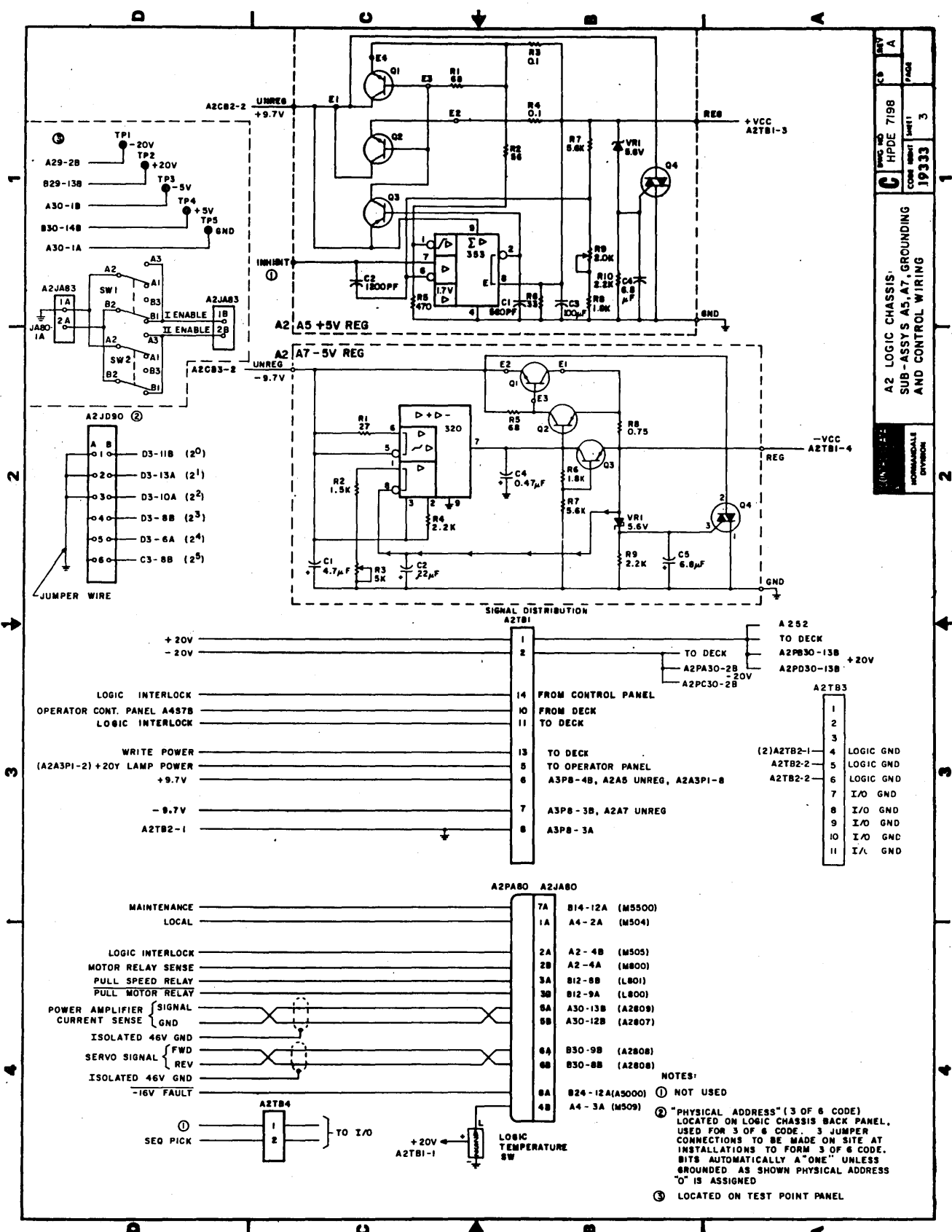
CON'NO. 0-14 AI POWER SYSTEM
 NORMANDALE DIVISION PRIMARY WIRING

C	DWG. NO.	HPDE 7197	CD	REV
	CODE IDENT.	19333	SHEET	2
			PAGE	A

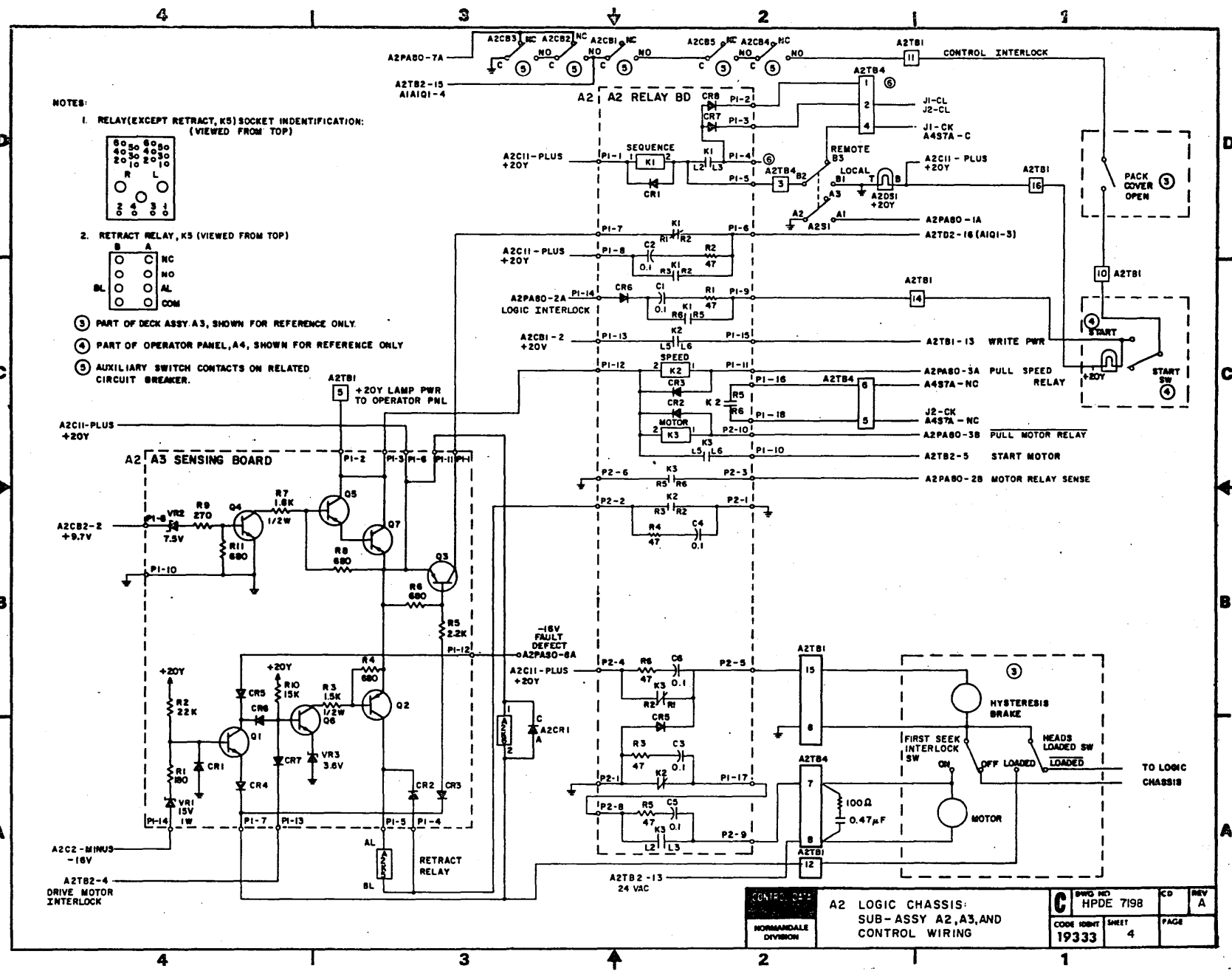


NOTES
 (1) ON DECK ASSY, A3.

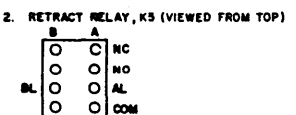
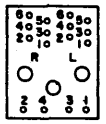
CONTROL DATA		A2 LOGIC CHASSIS: SUB-ASSY'S A1, A6 AND SERVO WIRING		DWG NO HPDE 7198	CD REV B
NORMAN DALE DIVISION		CODE IDENT 19333	SHEET 2	PAGE	



A2 LOGIC CHASSIS
 SUB-ASSY A5, A7, GROUNDING
 AND CONTROL WIRING
 HPDE 7198
 CODE SHEET 1 of 11
 19333
 3
 NORMALS
 DIVISION

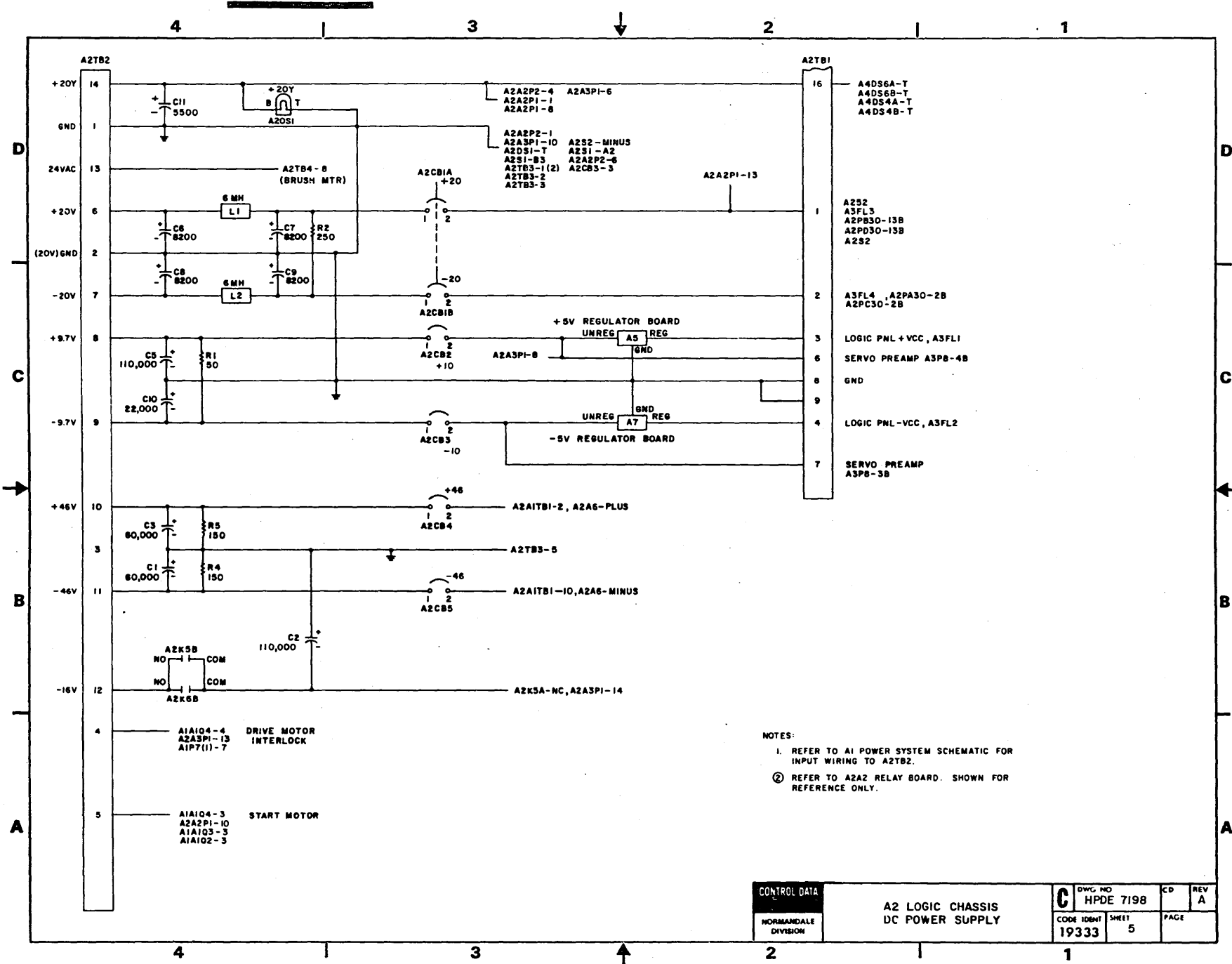


NOTES:
 1. RELAY (EXCEPT RETRACT, K5) SOCKET IDENTIFICATION:
 (VIEWED FROM TOP)



- ③ PART OF DECK ASSY. A3, SHOWN FOR REFERENCE ONLY.
- ④ PART OF OPERATOR PANEL, A4, SHOWN FOR REFERENCE ONLY
- ⑤ AUXILIARY SWITCH CONTACTS ON RELATED CIRCUIT BREAKER.

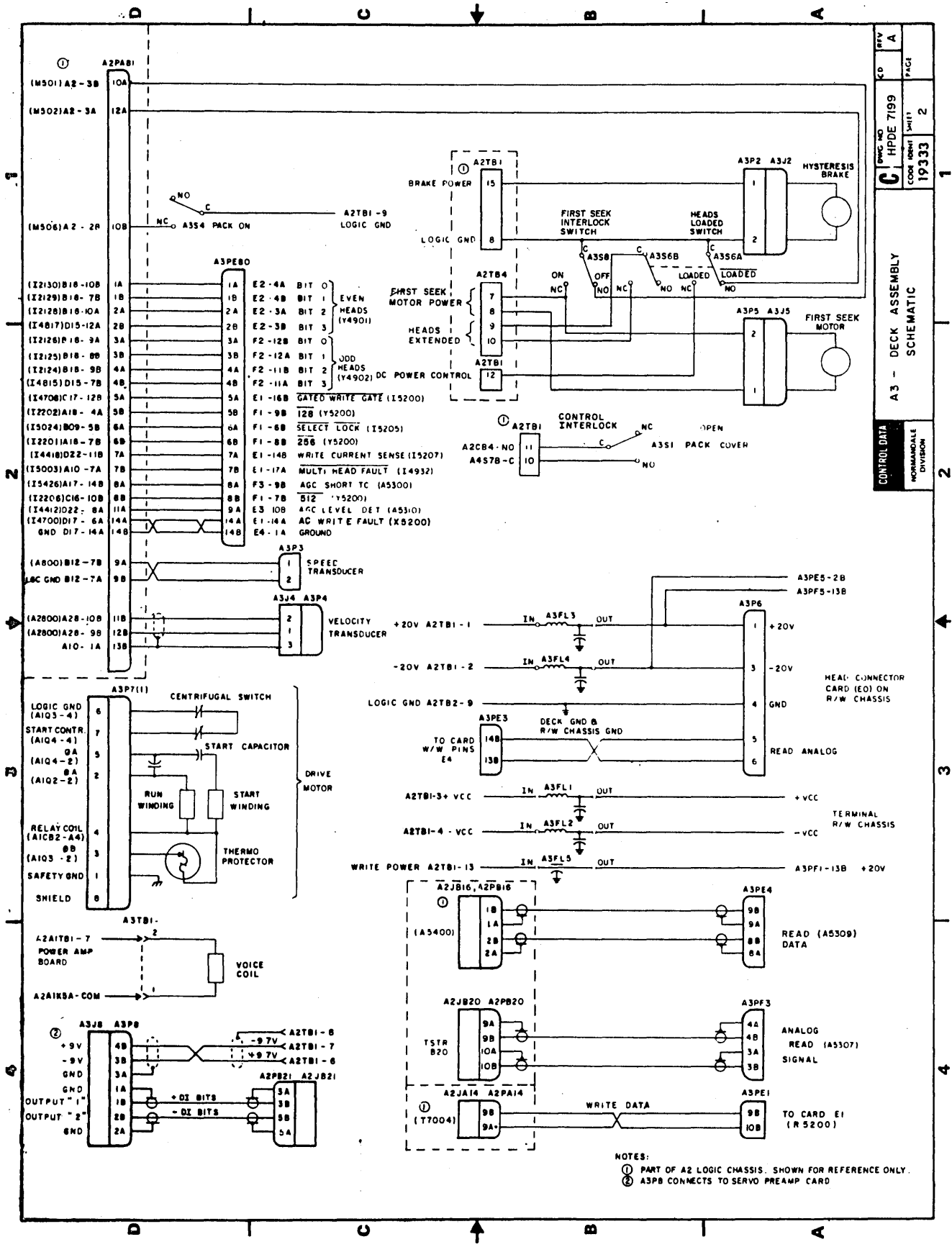
CONTROL DIVISION		A2 LOGIC CHASSIS: SUB-ASSY A2, A3, AND CONTROL WIRING		CD	REV
NORMANDALE DIVISION				HPDE 7198	A
CODE	IDENT	SHEET	PAGE		
19333		4			



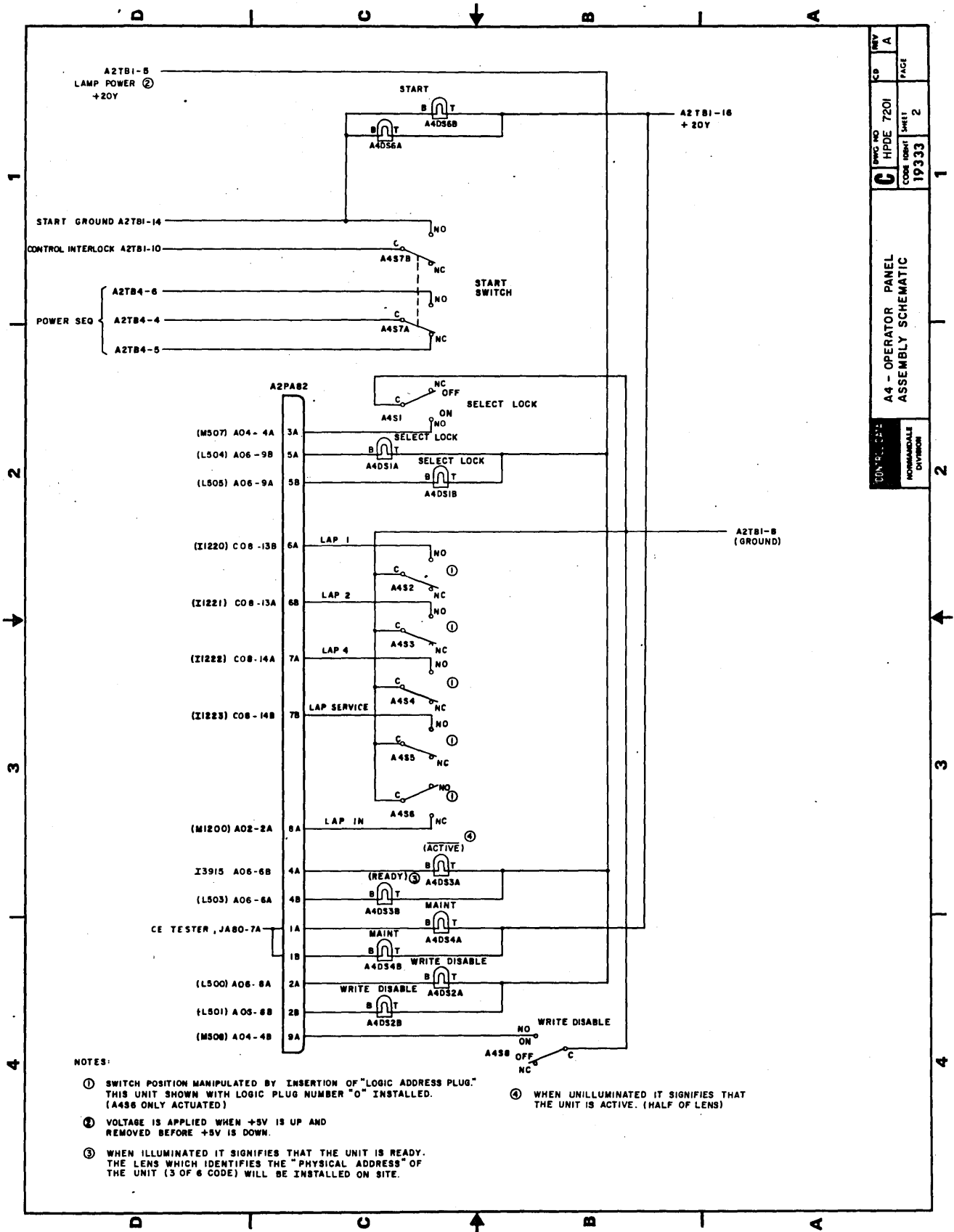
NOTES:
 1. REFER TO A1 POWER SYSTEM SCHEMATIC FOR INPUT WIRING TO A2TB2.
 2. REFER TO A2A2 RELAY BOARD. SHOWN FOR REFERENCE ONLY.

CONTROL DATA NORMAN DALE DIVISION	A2 LOGIC CHASSIS DC POWER SUPPLY		DWG NO HPDE 7198	CD A	REV A
	CODE IDENT 19333	SHEET 5	PAGE		

A3 - DECK ASSEMBLY
 SCHEMATIC

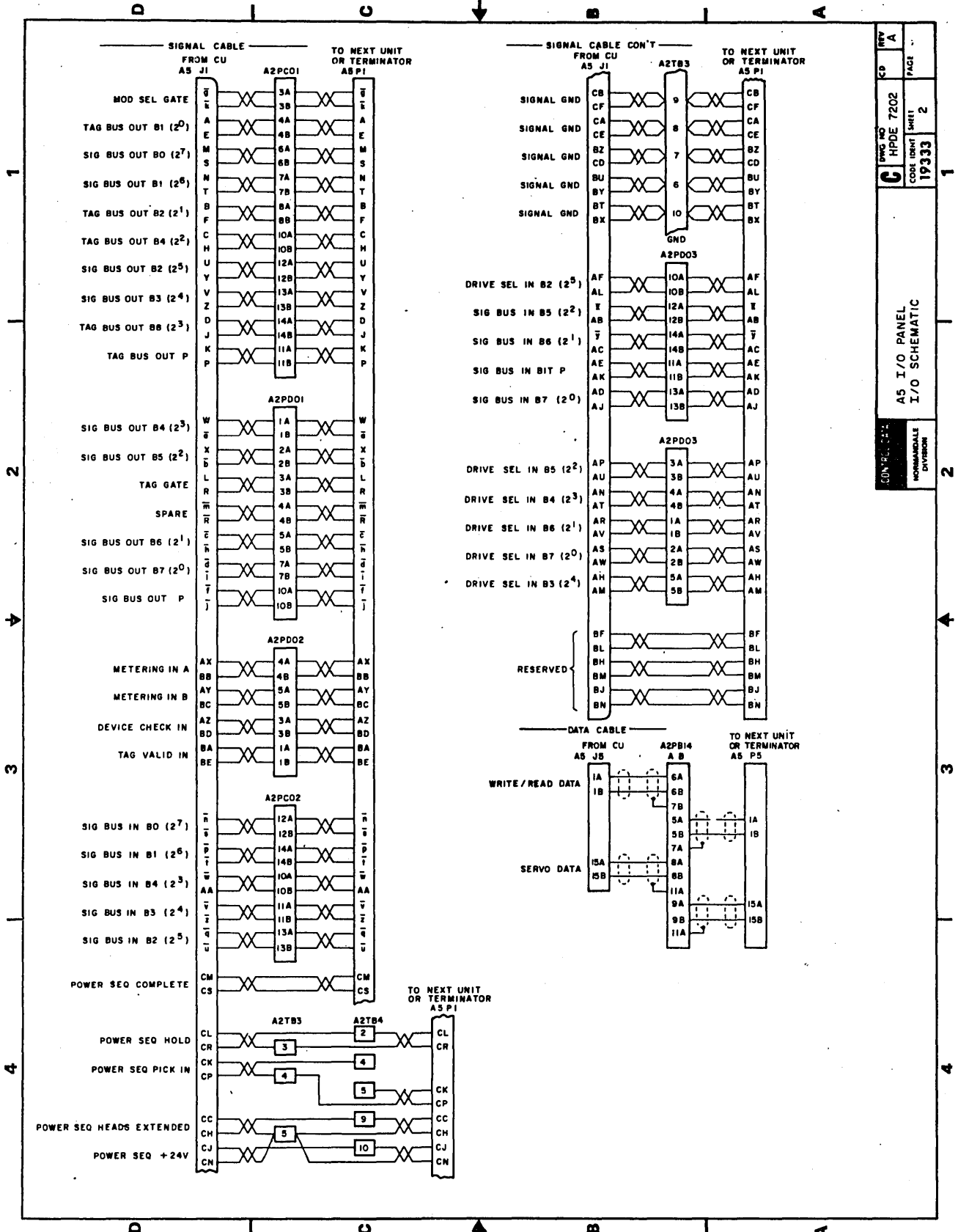


NOTES:
 ① PART OF A2 LOGIC CHASSIS. SHOWN FOR REFERENCE ONLY.
 ② A3PB CONNECTS TO SERVO PREAMP CARD



REV	A
CD	
FIG NO	HPDE 7201
CODE IDENT	19333
DATE	19333
PAGE	2
A4 - OPERATOR PANEL ASSEMBLY SCHEMATIC	
NORMANVILLE DIVISION	

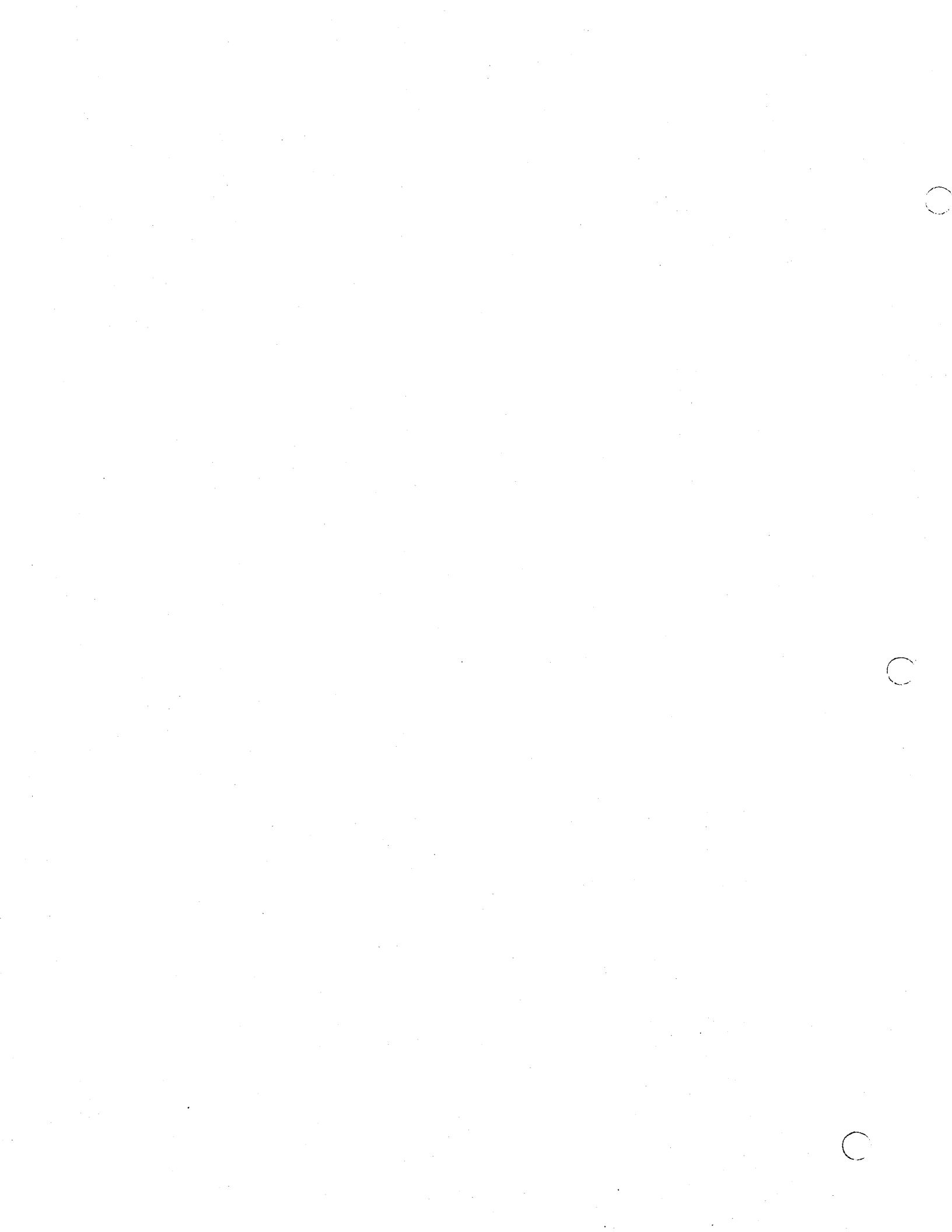
- NOTES:
- ① SWITCH POSITION MANIPULATED BY INSERTION OF "LOGIC ADDRESS PLUG." THIS UNIT SHOWN WITH LOGIC PLUG NUMBER "0" INSTALLED. (A4S6 ONLY ACTUATED)
 - ② VOLTAGE IS APPLIED WHEN +5V IS UP AND REMOVED BEFORE +5V IS DOWN.
 - ③ WHEN ILLUMINATED IT SIGNIFIES THAT THE UNIT IS READY. THE LENS WHICH IDENTIFIES THE "PHYSICAL ADDRESS" OF THE UNIT (3 OF 6 CODE) WILL BE INSTALLED ON SITE.
 - ④ WHEN UNILLUMINATED IT SIGNIFIES THAT THE UNIT IS ACTIVE. (HALF OF LENS)



REV	A
CD	
HPDE	7202
CODE IDENT SHEET	2
19333	2
A5 I/O PANEL I/O SCHEMATIC	
NON-MAINTENANCE DIVISION	

SECTION 5

WIRE LISTS



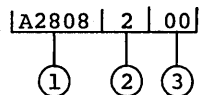
INTRODUCTION

Wire lists are divided into two basic categories; wire wrap wire lists and non-logic wire lists.

WIRE WRAP WIRE LISTS

Wire wrap wire lists provide wire origin/destination information for the logic back panel and the R/W pin and guide assembly.

Wires are referenced by logic term origin. The signal name is decoded as follows:



- ① A2808; is the logic term of the inverter, multiplexer, op-amp, etc., found in the logic diagrams.
- ② 2; denotes the various outputs of the same logic term.
- ③ 00; indicates daisy chain order of wires that go to various destinations from a single logic term.

Signal names that begin with a numeral, are miscellaneous wires. These wires generally

originate at some point other than a logic term (switch, bus, test point, etc.).

Z level denotes the vertical position of a wire on a pin relative to the wire wrap board. Two vertical positions are possible. A numeral 1 in this column indicates the wire is closest to the wire wrap board. A numeral 2 indicates the wire is farthest from the wire wrap board. Both ends of a wire are always at the same Z level.

NON-LOGIC WIRE LISTS

Non-Logic wire lists provide wire origin/destination information for harness assemblies and various panels.

The number identification is used to sequence the wire list and provide engineering reference for change order activity.

Wire color coding is as follows:

0 - Black	5 - Green
1 - Brown	6 - Blue
2 - Red	7 - Violet
3 - Orange	8 - Gray
4 - Yellow	9 - White

In multi-digit color codes, the first digit denotes base color and the remaining digits denote tracer colors.

TITLE LOGIC WIRE WRAP (REF: 76033508)			WL	DOCUMENT NO. HPDE 7335	SHEET NO. 1 OF 68	REV. H
LINE NO.	SIGNAL NAME OR NUMBER IDENTIFICATION	ORIGIN	DESTINATION	WIRE COLOR	Z LEVEL	
1	50007 00	A0202A	JA8208A		1	
2	400001 00PKSW	A0202B	JA8110B		1	
3	400021 00HDL	A0203A	JA8112A		1	
4	400011 00BCYC	A0203B	JA8110A		1	
5	300031 00	A0204A	JA8002B		1	
6	300081 001TKL	A0204B	JA8002A		1	
7	I08071 00	A0208A	A1209A		1	
8	M08001 00	A0208B	A0510A		2	
9	M08001 00	A0208B	D2009B		1	
10	I05051 01	A0209A	A0512B		2	
11	I05051 00	A0209A	D2007A		1	
12	M05051 00	A0209B	A1208A		1	
13	I05021 02	A0210A	D2207A		2	
14	I05021 00	A0210A	B1004A		1	
15	M05021 00	A0210B	A1208B		1	
16	M05011 02	A0211A	A0505B		2	
17	M05011 00	A0211A	A1209B		1	
18	I05011 01	A0211B	C2302A		2	
19	I05011 02	A0211B	B1301B		1	
20	M12001 00	A0212A	C1809B		1	
21	I12281 00	A0212B	D0802B		1	
22	M05061 00	A0213A	A1205B		1	
23	300211 00	A0401A	JA8014A		1	
24	300011 01	A0403A	A0611B		2	
25	300011 00	A0403A	JA8004B		1	
26	300201 00	A0403B	JA8014B		1	
27	800040 00	A0404A	A2016A		2	
28	800040 01	A0404A	JA8203A		1	
29	500002 00	A0404B	JA8209A		1	
30	I05071 01	A0408A	A0506A		2	
31	I05071 00	A0408A	C1604B		1	
32	I05081 00	A0409A	A0612B		1	
33	M05081 00	A0409B	D1908A		1	
34	I05091 00	A0410A	A1206A		1	

KØR-0542

TITLE			WL	DOCUMENT NO.	SHEET NO.	REV.
LOGIC WIRE WRAP				HPDE 7335	2	H
LINE NO.	SIGNAL NAME OR NUMBER IDENTIFICATION	ORIGIN	DESTINATION	WIRE COLOR	Z LEVEL	
1	M05091 00	A0410B	D2012B		1	
2	M05001 00	A0411A	A0503A		1	
3	X73011 00	A0414B	A0513B		1	
4	I73051 00	A0502B	A0504B		1	
5	M05001 00	A0503A	A0411A		1	
6	X08011 01	A0503B	B1207B		2	
7	I08161 01	A0504A	B1208A		1	
8	I73051 00	A0504B	A0502B		1	
9	M05011 02	A0505B	A0211A		2	
10	I05071 01	A0506A	A0408A		2	
11	I07011 01	A0506B	A2804B		2	
12	M05051 01	A0507A	A1207B		1	
13	M05051 02	A0507A	A0512A		2	
14	I73021 00	A0509A	A0511B		1	
15	M08001 00	A0510A	A0208B		2	
16	I73021 00	A0511B	A0509A		1	
17	M05051 02	A0512A	A0507A		2	
18	I05051 01	A0512B	A0209A		2	
19	X73001 00	A0513A	A0514B		1	
20	X73011 00	A0513B	A0414B		1	
21	X73001 00	A0514B	A0513A		1	
22	I07201 04	A0602A	B1412B		2	
23	I07201 05	A0602A	A0603B		1	
24	I56340	A0602B	B1909B		1	
25	I07201 05	A0603B	A0602A		1	
26						
27						
28	I39031 00	A0605B	A0604A		1	
29	L05031 00	A0606A	JA8204B		1	
30	L05021 00	A0606B	JA8204A		1	
31	L05061 00	A0607A	JA8201A		1	
32	L05071 00	A0607B	JA8201B		1	
33	L05001 00	A0608A	JA8202A		1	
34	L05011 00	A0608B	JA8202B		1	

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TITLE LOGIC WIRE WRAP (REF: 76033500)			WL	DOCUMENT NO. HPDE 7335	SHEET NO. 3	REV. A
LINE NO.	SIGNAL NAME OR NUMBER IDENTIFICATION	ORIGIN	DESTINATION	WIRE COLOR	Z LEVEL	
1	L05051 00	A0609A	JA8205B		1	
2	L05041 00	A0609B	JA8205A		1	
3	300011 02	A0610A	A0611B		1	
4	I50241 03	A0610B	JA8106A		2	
5	I50241 02	A0610B	A0611A		1	
6	I50241 02	A0611A	A0610B		1	
7	I50241 01	A0611A	A2203B		2	
8	300011 02	A0611B	A0610A		1	
9	300011 01	A0611B	A0403A		2	
10	I05081 01	A0612B	A0613A		2	
11	I05081 00	A0612B	A0409A		1	
12	I05081 02	A0613A	C1711A		1	
13	I05081 01	A0613A	A0612B		2	
14	I15251 00	A0702A	A1417B		1	
15	I72021 00	A0702B	A0709A		1	
16	I72141 00	A0703A	B0904A		1	
17	I60161 01	A0703B	A2004A		2	
18	I60161 02	A0703B	A0803B		1	
19	I72011 00	A0704A	A1907A		1	
20	I11191 02	A0704B	A0705A		2	
21	I11191 00	A0704B	D0712A		1	
22	I11191 02	A0705A	A0704B		2	
23	I72041 00	A0705B	A0713B		1	
24	I61051 02	A0706A	A0806A		1	
25	I61051 01	A0706A	A2005A		2	
26	I12181 00	A0706B	C0816A		1	
27	I14111 00	A0707A	C1405B		1	
	I11271 01	A0707B	D1210B		1	
28	I17161	A0708A	A0710B		1	
	I15121	A0708B	C1209A		2	
29	I72021 00	A0709A	A0702B		1	
	I72031 00	A0709B	C0203B		1	
30	I17171	A0710A	A1304A		1	
	I17161	A0710B	A0708B		1	
31	I39151 00	A0711A	A0807A		1	
	I07081 02	A0711B	D1606B		2	
32	I41281	A0712A	A2214B		1	
	I41271 01	A0712B	A1011A		2	
33	I72051 00	A0713A	C0204A		1	
	I72041 00	A0713B	A0705B		1	
34	I27301 00	A0802A	B2810A		1	

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TITLE			WL	DOCUMENT NO.	SHEET NO.	REV.
LOGIC WIRE WRAP (REF: 76033500)				HPDE 7335	4	A
LINE NO.	SIGNAL NAME OR NUMBER IDENTIFICATION	ORIGIN	DESTINATION	WIRE COLOR	Z LEVEL	
1	I72081 00	A0802B	A0809A		1	
2	I18151 00	A0803A	C1017B		1	
3	I60161 02	A0803B	A0703B		1	
4	I39131 00	A0804A	A0807B		1	
5	I39141 00	A0804B	A0808A		1	
6	I39141 01	A0804B	C1808A		2	
7	K32001 03	A0805A	C1911A		1	
8	I72101 00	A0805B	A0813B		1	
9	I61051 02	A0806A	A0706A		1	
10	I13181 00	A0806B	C0916A		1	
11	I39151 00	A0807A	A0711A		1	
12	I39131 00	A0807B	A0804A		1	
13	I39141 00	A0808A	A0804B		1	
14	K20002 02	A0808B	D1502A		2	
15	I72081 00	A0809A	A0802B		1	
16	I72091 00	A0809B	C0503B		1	
17	I06121 00	A0810A	C1514A		1	
18	I19051 00	A0810B	A2205B		1	
19	I38321 00	A0811A	C1817A		1	
20	I19241 01	A0811B	A2212A		2	
21	I20181 00	A0812A	C1613B		1	
22	I23201 01	A0812B	A1304B		1	
23	I72111 00	A0813B	C0504A		1	
24	I72101 00	A0813B	A0805B		1	
25						
26	I23131 00	A0902A	A1907B		1	
27	I23101 00	A0902B	D1903A		1	
28	W24021 01	A0903A	A2307B		2	
29	I23091 00	A0904A	D1908B		1	
30	800060 00	A0904B	B2001A		1	
31	I23111 00	A0905B	A1903B		1	
32						
33	W24014 02	A0906B	C1614B		1	
34	W24013 00	A0907A	A2313B		1	

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TITLE			WL	DOCUMENT NO.	SHEET NO.	REV.
LOGIC WIRE WRAP (REF: 76033500)				HPDE 7335	5	A
LINE NO.	SIGNAL NAME OR NUMBER IDENTIFICATION	ORIGIN	DESTINATION	WIRE COLOR	Z LEVEL	
1	I23121 00	A0908A	A1903A		1	
2	I23121 W24012 00	A0908A A0908B	D1502B A2312B		2 1	
3	W24011 01	A0909A	A2312A		1	
4	I23141 00	A0909B	A1905B		1	
5	I23171 00	A0910A	A1908B		1	
6	W24002 01	A0910B	A2317B		1	
7	I23181 00	A0911A	A1908A		1	
8	W24001 01	A0911B	A2317A		2	
9	I23161 00	A0912A	A1902A		1	
10	W24003 01	A0912B	B2301B		1	
11	I23151 00	A0913A	A1902B		1	
12	W24004 01	A0913B	B2303A		1	
13	400051 00	A1001A	JA8113B		1	
14	I19131 00	A1002A	C2107A		1	
15	I70111 00	A1002B	D1906B		1	
16	I70081 00	A1003A	B0910A		1	
17	I47081 02	A1003B	C1712B		2	
18	I59271 00	A1004A	D2009A		1	
19	999800 00	A1004B	A2017A		1	
20	I42041 00	A1005B	C2308A		1	
21	I19051 01	A1006A	A2205B		2	
22	I24401 01	A1006B	A2204A		2	
23	I49321 00	A1007A	JA8107B		1	
24	I50031 00	A1008A	D1706B		1	
25	I50031 01	A1008A	B0806A		2	
26	I19091 02	A1008B	A2507B		1	
27	I43181 00	A1009A	B1212A		1	
28	I43191 00	A1009B	C2315A		1	
29	I54001 00	A1010A	A1614B		1	
30	I15141 00	A1010B	C1204B		1	
31	I41271 00	A1011A	A2202A		1	
32	I41271 01	A1011A	A0712B		2	
33	I41201 00	A1011B	B1303A		1	
34	I41251 00	A1012A	B2203B		2	

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TITLE			WL	DOCUMENT NO.	SHEET NO.	REV.
LOGIC WIRE WRAP				HPDE 7335	6	H
LINE NO.	SIGNAL NAME OR NUMBER IDENTIFICATION	ORIGIN	DESTINATION	WIRE COLOR	Z LEVEL	
1	I41131 00	A1012B	A1317A		2	
2	I70001 00	A1013A	C1704A		1	
3	I70001 02	A1013A	A1405B		2	
4	I47081 01	A1013B	JA8105A		2	
5	I47081 00	A1013B	C1712B		1	
6	200031 00	A1101A	A1110B		1	
7	K35032 00	A1103B	B0903B		1	
8	K35021 01	A1104B	A1115B		1	
9	K35022 00	A1105A	A1113B		1	
10	I35121 00	A1107B	D1412B		1	
11	I35071 00	A1108A	D14101B		1	
12	200031 01	A1110B	A1111B		2	
13	200031 00	A1110B	A1101A		1	
14	200031 01	A1111B	A1110B		2	
15	I22041 00	A1112B	D1610A		1	
16	K35022 00	A1113B	A1105A		1	
17	K35021 00	A1114B	A1115B		2	
18	K35021 01	A1115B	A1104B		1	
19	K35021 00	A1115B	A1114B		2	
20	K34001 00	A1116B	B1110B		1	
21	I19221 05	A1202A	A2210B		2	
22	I20151 00	A1202B	D1601A		1	
23	I15211 00	A1203A	C1215A		1	
24	P38001 00	A1203B	C1812A		1	
25	I08031 00	A1204A	C2107B		1	
26	I2439	A1204B	B2306B		1	
27	I2437	A1205A	B2305B		2	
28	M05061 00	A1205B	A0213A		1	
29	I05091 00	A1206A	A0410A		1	
30	I5505	A1206B	B1204B		1	
31	K2800	A1207A	A2806A		2	
32	M05051 03	A1207B	A1208A		2	
33	M05051 01	A1207B	A0507A		1	
34	M05051 03	A1208A	A1207B		2	

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TITLE		WL	DOCUMENT NO.	SHEET NO.	REV.
LOGIC WIRE WRAP (REF: 76033500)			HPDE 7335	7	A
LINE NO.	SIGNAL NAME OR NUMBER IDENTIFICATION	ORIGIN	DESTINATION	WIRE COLOR	Z LEVEL
1	M05051 00	A1208A	A0209B		1
2	M05021 01	A1208B	B2708B		2
3	M05021 00	A1208B	A0210B		1
4	I08071 00	A1209A	A0208A		1
5	M05011 00	A1209B	A0211A		1
6	M05011 01	A1209B	C2114A		2
7	X48002 00	A1210A	D1504B		1
8	I19161 00	A1210B	A2204B		1
9	I16161 01	A1211A	D1605B		2
10	I16081 01	A1211B	D1605A		2
11	200701 00GND	A1214B	B1214A		1
12	I06021 00	A1215A	C0307A		2
13	I21321 00	A1215B	A1813B		1
14	I32011 00	A1216A	B2505B		1
15	K70001 00	A1216B	A1414B		1
16	K71001 00	A1217A	C1114B		1
17	I09121 02	A1217B	D0712B		2
18	A55111 00	A1303A	C2008A		1
19	I11311 00	A1303B	C0712B		1
20	I11311 02	A1303B	D1210A		2
21	I17171	A1304A	A0710A		1
22	I23201 00	A1304B	A2304A		2
23	I23201 01	A1304B	A0812B		1
24	I23191 00	A1305A	A1816A		1
25	I23211 00	A1305B	A1808A		1
26	I23211 03	A1305B	C1417B		2
27	I23221 00	A1306A	A2308A		1
28	I11291 01	A1306B	D1205A		2
29	I11301 01	A1307A	C0712A		2
30	I14021 04	A1308B	A2004B		2
31	I14031 04	A1309A	A2005B		2
32					
33	I14041 04	A1309B	A1811A		1
34	I14071 04	A1310A	A2009B		2

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TITLE			WL	DOCUMENT NO.	SHEET NO.	REV.
LOGIC WIRE WRAP (REF: 76033500)				HPDE 7335	8	A
LINE NO.	SIGNAL NAME OR NUMBER IDENTIFICATION	ORIGIN	DESTINATION	WIRE COLOR	Z LEVEL	
1	A27061 00	A1311B	A2702A		1	
2	I41171 00	A1312A	A2514A		1	
3	I41151 00	A1312B	A2713A		1	
4	I14061 04	A1313A	A2008B		2	
5	I29151 01	A1313B	A2407A		2	
6	I14051 04	A1314A	A2007B		2	
7	I55031 00	A1314B	C2214B		1	
8	K40001 01	A1315A	C1606B		2	
9	A28083 00	A1315B	B2710B		1	
10	A29031 00	A1316A	A2504B		1	
11	I41111 00	A1316B	B1210B		1	
12	I41131 01	A1317A	C2115A		1	
13	I41131 00	A1317A	A1012B		2	
14	A29041 00	A1317B	A2505B		1	
15	201001 00GND	A1401A	B1404B		1	
16	800050 00	A1402B	B2006B		1	
17	I07201 00	A1403A	B1412B		1	
18	I07201 01	A1403A	C1609A		2	
19	I70051 01	A1403B	A1404A		2	
20	I70051 01	A1404A	A1403B		2	
21	I70051 00	A1404A	A1405A		1	
22	K18052 01	A1404B	B1201B		2	
23	I70051 00	A1405A	A1404A		1	
24	I70001 03	A1405B	C1105B		1	
25	I70001 02	A1405B	A1013A		2	
26	I70042 00	A1409A	C1109A		1	
27	I70041 00	A1409B	C1109B		1	
28	I06201 08	A1412A	B1401B		1	
29	K70001 00	A1414B	A1216B		1	
30	K45031 02	A1415B	C2116B		2	
31	X33031 01	A1416A	C1116A		2	
32	X33031 00	A1416A	B1006B		1	
33	I54171 01	A1416B	A1609B		2	
34	I48061 05	A1417A	C1117A		2	

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TITLE			WL	DOCUMENT NO.	SHEET NO.	REV.
LOGIC WIRE WRAP (REF: 76033500)				HPDE 7335	9	A
LINE NO.	SIGNAL NAME OR NUMBER IDENTIFICATION	ORIGIN	DESTINATION	WIRE COLOR	Z LEVEL	
1	I48061 04	A1417A	C1512B		1	
2	I15251	A1417B	C2113B		2	
3	I15251	A1417B	A0702A		1	
4	300131 00GND	A1601A	JA8301A		1	
5	I54171 00	A1609B	B2007B		1	
6	I54171 01	A1609B	A1416B		2	
7	A54021 00	A1613B	A1713B		1	
8	I54001 00	A1614B	A1010A		1	
9	I47111 02	A1615B	D2303A		2	
10	I48061 00	A1705B	D2302A		1	
11	I48061 01	A1705B	B0910B		2	
12	A54021 00	A1713B	A1613B		1	
13	I54261 00	A1714B	JA8108A		1	
14	W21011 00	A1802A	B1902A		1	
15	I22051 01	A1803A	C1509A		2	
16	I14021	A1803B	C1405A		1	
17	I22021 00	A1804A	JA8105B		1	
18	K22011 00	A1805A	B1902B		1	
19	I14011 03	A1805B	A2003B		2	
20	I14031 03	A1806A	A2005B		1	
21	I14031 01	A1806A	C1206B		2	
22	I21041 00	A1806B	B2212B		1	
23	I21021	A1807A	A2314B		2	
24	I21021 00	A1807A	B2204A		1	
25	I22011 00	A1807B	JA8106B		1	
26	I23211 02	A1808A	B2004B		2	
27	I23211 00	A1808A	A1305B		1	
28	I21151 01	A1808B	B0906B		2	
29	I21151 00	A1808B	C1710A		1	
30	W21001 00	A1809A	B1903A		1	
31	W21003 00	A1809B	A1913A		1	
32	I21031 00	A1810A	B2211A		1	
33	I21031	A1810A	B2205B		2	
34	I14021 03	A1810B	A2004B		1	
	I14021 01	A1810B	C1206A		2	

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TITLE LOGIC WIRE WRAP (REF: 76033500)			WL	DOCUMENT NO. HPDE 7335	SHEET NO. 10	REV. A
LINE NO.	SIGNAL NAME OR NUMBER IDENTIFICATION	ORIGIN	DESTINATION	WIRE COLOR	Z LEVEL	
1	I14041 04	A1811A	A1309B		1	
2	I14041 03	A1811A	A2006B		2	
3	I14061 01	A1811B	C1208A		2	
4	I14061 02	A1811B	A2008B		1	
5	I14081 01	A1812A	C1212A		2	
6	I14081 03	A1812A	A2010B		1	
7	I14071 03	A1812B	A2009B		1	
8	I14071 01	A1812B	C1211B		2	
9	I14051 03	A1813A	A2007B		1	
10	I14051 01	A1813A	C1207B		2	
11	I21321 00	A1813B	A1215B		1	
12	W21004 00	A1814A	A1913B		1	
13	W21002 00	A1814B	B1904B		1	
14	I47151 00	A1815A	C1709A		1	
15	W22003 00	A1815B	A1909A		1	
16	I23191 00	A1816A	A1305A		1	
17	I23191 01	A1816A	D1603A		2	
18	I21071 00	A1816B	B2209A		1	
19	I21091 00	A1817A	B2207B		1	
20	W22001 00	A1817B	A1912A		1	
21	200191 00GND	A1901A	A1906B		1	
22	I23161 00	A1902A	A0912A		1	
23	I23151 00	A1902B	A0913A		1	
24	I23121 00	A1903A	A0908A		1	
25	I23111 00	A1903B	A0905B		1	
26	I17031 00	A1904A	D1212B		1	
27	I17091 00	A1904B	D1208B		1	
28	I17061 00	A1905A	D1211B		1	
29	I23141 00	A1905B	A0909B		1	
30	200191 00GND	A1906B	A1901A		1	
31	I72011 00	A1907A	A0704A		1	
32						
33	I23131	A1907B	A0902A		1	
34	I23181 00	A1908A	A0911A		1	

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TITLE			WL	DOCUMENT NO.	SHEET NO.	REV.
LOGIC WIRE WRAP (REF: 76033500)				HPDE 7335	11	A
LINE NO.	SIGNAL NAME OR NUMBER IDENTIFICATION	ORIGIN	DESTINATION	WIRE COLOR	Z LEVEL	
1	I23171 00	A1908B	A0910A		1	
2	W22003 00	A1909A	A1815B		1	
3	W22004 00	A1909B	B1801B		1	
4	W22013 00	A1910A	B1804B		1	
5	W22014 00	A1910B	B1806B		1	
6	W22011 00	A1911A	B1805B		1	
7	W22012 00	A1911B	B1807A		1	
8	W22001 01	A1912A	B2313A		2	
9	W22001 00	A1912A	A1817B		1	
10	W22002 00	A1912B	B1803A		1	
11	W21003 00	A1913A	A1809B		1	
12	W21004 00	A1913B	A1814A		1	
13	K22011	A1914A	A1805A		1	
14	K22001 00	A1914A	C1505A		1	
15	I61091 00	A1916A	C1810B		1	
16	I60021 00	A1916B	C1815A		1	
17	I60121 00	A1917A	C1811A		1	
18	I61011 00	A1917B	C1813B		1	
19	I60071 01	A2003A	C0204B		2	
20	I60071 00	A2003A	C1915A		1	
21	I14011 02	A2003B	D2312A		1	
22	I14011 03	A2003B	A1805B		2	
23	I60161 01	A2004A	A0703B		2	
24	I60161 00	A2004A	D1901B		1	
25	I14021 03	A2004B	A1810B		1	
26	I14021 04	A2004B	A1308B		2	
27	I61051 00	A2005A	D1901A		1	
28	I61051 01	A2005A	A0706A		2	
29	I14031 04	A2005B	A1309A		2	
30	I14031 03	A2005B	A1806A		1	
31	I61131 01	A2006A	C0207A		2	
32	I61131 00	A2006A	C1915B		1	
33	I14041 02	A2006B	C1414A		1	
34	I14041 03	A2006B	A1811A		2	

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TITLE			WL	DOCUMENT NO.	SHEET NO.	REV.
LOGIC WIRE WRAP (REF: 76033500)				HPDE 7335	12	A
LINE NO.	SIGNAL NAME OR NUMBER IDENTIFICATION	ORIGIN	DESTINATION	WIRE COLOR	Z LEVEL	
1	I62041 00	A2007A	C2015B		1	
2	I62041 01	A2007A	C0208B		2	
3	I14051 03	A2007B	A1813A		1	
4	I14051 04	A2007B	A1314A		2	
5	I62111 00	A2008A	D2001A		1	
6	I62111 01	A2008A	C0304B		2	
7	I14061 02	A2008B	A1811B		1	
8	I14061 04	A2008B	A1313A		2	
9	I63041 00	A2009A	D2001B		1	
10	I63041 01	A2009A	C0303B		2	
11	I14071 03	A2009B	A1812B		1	
12	I14071 04	A2009B	A1310A		2	
13	I63111 01	A2010A	C0304A		2	
14	I63111 00	A2010A	C2015A		1	
15	I14081 03	A2010B	A1812A		1	
16	I20011 03	A2011A	A2213A		1	
17	I20011 04	A2011A	A2212B		2	
18	800010 00	A2011B	C0715A		1	
19	X34012 01	A2012A	B1112A		2	
20	I09181 01	A2012B	C0705A		2	
21	K29012 00	A2013A	A2216A		2	
22	I09191 01	A2013B	C0704B		2	
23	K51012 02	A2014A	D1709A		2	
24	I09201 01	A2014B	C0706A		2	
25	I11311 01	A2015A	C0712B		2	
26	I09211 01	A2015B	C0705B		2	
27	800040 00	A2016A	A0404A		2	
28	I09221 01	A2016B	C0704A		2	
29	999800 00	A2017A	A1004B		1	
30	I15101 01	A2017B	C1710B		2	
31	A30021 00	A2107B	A2303A		1	
32	A30031 00	A2108B	A2304B		1	
33	A25031 00	A2109B	A2607B		1	
34	I25041 00	A2110B	B1107B		1	

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TITLE LOGIC WIRE WRAP (REF: 76033500)			WL	DOCUMENT NO. HPDE 7335	SHEET NO. 13	REV. A
LINE NO.	SIGNAL NAME OR NUMBER IDENTIFICATION	ORIGIN	DESTINATION	WIRE COLOR	Z LEVEL	
1	I25041 02	A2110B	B1304B		2	
2	K25012 00	A2111B	D2311A		2	
3	K25001 00	A2112B	B1111B		1	
4	I41271 00	A2202A	A1011A		1	
5	I19191 00	A2202B	B2706B		1	
6	I19191 01	A2202B	C2106B		2	
7	I41191 00	A2203A	B1301A		1	
8	I50241 00	A2203B	B0912A		1	
9	I50241 01	A2203B	A0611A		2	
10	I24401 00	A2204A	A2310A		1	
11	I24401 01	A2204A	A1006B		2	
12	I19161 00	A2204B	A1210B		1	
13	I19011 00	A2205A	B2501A		1	
14	I19051 01	A2205B	A1006A		2	
15	I19051 00	A2205B	A0810B		1	
16	I19021 00	A2206A	A2511B		1	
17	I19111 00	A2207B	A2712A		1	
18	I19091 00	A2208A	A2306B		1	
19	I19121 00	A2208B	A2709B		1	
20	X19002 00	A2209A	B2312B		1	
21	I24411 03	A2209B	A2412A		2	
22	I24411 00	A2209B	A2306A		1	
23	I32121 00	A2210A	B2502A		1	
24	I19221 05	A2210B	A1202A		2	
25	I19221 00	A2210B	A2307A		1	
26	I19171 01	A2211A	D2102B		2	
27	I19171 00	A2211A	B2707B		1	
28	K29022 00	A2211B	C1716B		1	
29	K29022 01	A2211B	B1309B		2	
30	I19241 01	A2212A	A0811B		2	
31	I19241 00	A2212A	A2416A		1	
32	I20011 04	A2212B	A2011A		2	
33	I20011 03	A2213A	A2011A		1	
34	I20011 01	A2213A	D1801B		2	

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TITLE LOGIC WIRE WRAP (REF: 76033500)			WL	DOCUMENT NO. HPDE 7335	SHEET NO. 14	REV. A
LINE NO.	SIGNAL NAME OR NUMBER IDENTIFICATION	ORIGIN	DESTINATION	WIRE COLOR	Z LEVEL	
1	I32021 00	A2213B	A2410B		1	
2	I41261 00	A2214A	B0908A		1	
3	I41261 01	A2214A	B2409A		2	
4	I41281	A2214B	A0712A		1	
5	I41201 03	A2214B	B2504B		2	
6	X29001 00	A2215A	B2510A		1	
7	K29012 00	A2216A	A2013A		2	
8	K29012 01	A2216A	A2309B		1	
9	I29151 00	A2217B	A2407A		1	
10	I29151 02	A2217B	C2003B		2	
11	I30071 05	A2302A	C2003A		2	
12	I30071 00	A2302A	A2311A		1	
13	A30021 00	A2303A	A2107B		1	
14	I23201 00	A2304A	A1304B		2	
15	A30031 00	A2304B	A2108B		1	
16	I31081 00	A2305B	A2808A		1	
17	I31081 01	A2305B	D1510B		2	
18	I24411 00	A2306A	A2209B		1	
19	I19091 01	A2306B	A2507B		2	
20	I19091 00	A2306B	A2208A		1	
21	I19221 00	A2307A	A2210B		1	
22	I19221 01	A2307A	A2507A		2	
23	W24021 00	A2307B	B2307B		1	
24	W24021 01	A2307B	A0903A		2	
25	I23221 00	A2308A	A1306A		1	
26	W24022 00	A2309A	B2306A		1	
27	K29012 01	A2309B	A2216A		1	
28	K29012 02	A2309B	B2313B		2	
29	I24401 00	A2310A	A2204A		1	
30	I30081 00	A2310B	A2510B		1	
31	I30071 00	A2311A	A2302A		1	
32	I30071 01	A2311A	A2311B		2	
33	I30071 01	A2311B	A2311A		2	
34	I30071 02	A2311B	A2512A		1	

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TITLE LOGIC WIRE WRAP (REF: 76033500)			WL	DOCUMENT NO. HPDE 7335	SHEET NO. 15	REV. A
LINE NO.	SIGNAL NAME OR NUMBER IDENTIFICATION	ORIGIN	DESTINATION	WIRE COLOR	Z LEVEL	
1	W24011 00	A2312A	B2812B		2	
2	W24011 01	A2312A	A0909A		1	
3	W24013	A2312B	B2810B		2	
4	W24012 00	A2312B	A0908B		1	
5	I24111	A2313A	B2213A		1	
6	W24013 00	A2313B	A0907A		1	
7	I24131 00	A2314A	B2211B		1	
8	I24021	A2314B	I1807A		2	
9	I24141 00	A2315A	B2212A		1	
10	I24151 00	A2315B	B2206A		1	
11	W24014 00	A2316A	B2307A		1	
12	W24014 01	A2316A	C1614B		2	
13	I24121 00	A2316B	B2205A		1	
14	W24001 00	A2317A	B2808B		1	
15	W24001 01	A2317A	A0911B		2	
16	W24002 01	A2317B	A0910B		1	
17	W24002 00	A2317B	B2813B		2	
18	I32151 00	A2406B	B2506B		1	
19	I32151 01	A2406B	A2407B		2	
20	I29151 00	A2407A	A2217B		1	
21	I29151 01	A2407A	A1313B		2	
22	I32151 01	A2407B	A2406B		2	
23	I32151 02	A2407B	A2415B		1	
24	I07101 03	A2408A	C1814B		2	
25	I32101 02	A2408B	B1004B		2	
26	I32101 00	A2408B	C1616A		1	
27	I32041 00	A2409A	B2201B		1	
28	K37022 00	A2409B	D1409B		1	
29	I32021 00	A2410B	A2213B		1	
30	X32011 00	A2411B	B2508B		1	
31	I24411 03	A2412A	A2209B		2	
32	I24411 02	A2412A	C2002B		1	
33	I32161 00	A2412B	A2512B		1	
34	I32161 01	A2412B	B1403A		2	

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TITLE			WL	DOCUMENT NO.	SHEET NO.	REV.
LOGIC WIRE WRAP (REF: 76033500)				HPDE 7335	16	A
LINE NO.	SIGNAL NAME OR NUMBER IDENTIFICATION	ORIGIN	DESTINATION	WIRE COLOR	Z LEVEL	
1	K32001 00	A2413A	C1815B		2	
2	I06151 00	A2413B	C1513B		1	
3	K32002 00	A2414B	C1802B		1	
4	I32151 02	A2415B	A2407B		1	
5	I19241 00	A2416A	A2212A		1	
6	200001 00	A2416B	B2414A		1	
7	I34081 00	A2417A	B2408A		1	
8	I34091 00	A2417B	D1513B		1	
9	I08131 01	A2504A	B2311A		2	
10	I08131 00	A2504A	B2401A		1	
11	A29031 00	A2504B	A1316A		1	
12	I29041 00	A2505B	A1317B		1	
13	I19221 02	A2507A	B2507B		1	
14	I19221 01	A2507A	A2307A		2	
15	I19091 01	A2507B	A2306B		2	
16	I19091 02	A2507B	A1008B		1	
17	I34061 01	A2508A	A2509B		2	
18	I34072 01	A2508B	D1906A		1	
19	I34061 01	A2509B	A2508A		2	
20	I34061 00	A2509B	D1406B		1	
21	A28031 00	A2510A	A2714B		1	
22	I30081 01	A2510B	A2806B		2	
23	I30081 00	A2510B	A2310B		1	
24	I20121 00	A2511A	C1617B		1	
25	I19021 00	A2511B	A2206A		1	
26	I30071 02	A2512A	A2311B		1	
27	I32161 00	A2512B	A2412B		1	
28	X29011 00	A2513B	B2201A		1	
29	I41171 00	A2514A	A1312A		1	
30	K50031 02	A2516A	A2517B		1	
31	K50031 01	A2516A	D2013A		2	
32	I30111 00	A2516B	A2816A		1	
33	I20081 00	A2517A	D1607A		1	
34	K50031 02	A2517B	A2516A		1	

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TITLE			WL	DOCUMENT NO.	SHEET NO.	REV.
LOGIC WIRE WRAP (REF: 76033500)				HPDE 7335	17	A
LINE NO.	SIGNAL NAME OR NUMBER IDENTIFICATION	ORIGIN	DESTINATION	WIRE COLOR	Z LEVEL	
1	K50031 03	A2517B	B0912B		2	
2	A25031 00	A2607B	A2109B		1	
3	A26061 00	A2608B	A2710B		1	
4	K26001 01	A2613B	B0911B		2	
5	K26001 00	A2613B	B2312A		1	
6	I20051 00	A2617B	D1609B		1	
7	A27061 00	A2702A	A1311B		1	
8	A27021 00	A2703A	B1812B		1	
9	I27241 00	A2703B	B2805A		2	
10	I27231 00	A2704A	B2805B		1	
11	I27221 00	A2704B	B2084A		1	
12	I27271 00	A2705A	B2804B		1	
13						
14	I27251 00	A2705B	B2806B		1	
15	I27261 00	A2706A	B2807B		1	
16	I27211 00	A2706B	B2806A		1	
17	I19121 00	A2709B	A2208B		1	
18						
19	K28002 00	A2710A	A2806A		1	
20	A26061 00	A2710B	A2608B		1	
21	K28012 01	A2711A	A2802A		2	
22	300051 001SN	A2711B	JA8005B		1	
23	I19111 00	A2712A	A2207B		1	
24	A31031 00	A2712B	B2802B		1	
25	I41151 00	A2713A	A1312B		1	
26	I31021 00	A2713B	A2802B		1	
27	A31021 00	A2714A	B2802A		1	
28	A28031 00	A2714B	A2510A		1	
29	300041 001SN	A2715A	JA8005A		1	
30	A28011 00	A2715B	B1312B		2	
31	K28012 01	A2802A	A2711A		2	
32	K28012 00	A2802A	C2005B		1	
33	I31021 00	A2802B	A2713B		1	
34	I19221 03	A2803B	B2507B		2	

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TITLE			WL	DOCUMENT NO.	SHEET NO.	REV.
LOGIC WIRE WRAP				HPDE 7335	18	H
LINE NO.	SIGNAL NAME OR NUMBER IDENTIFICATION	ORIGIN	DESTINATION	WIRE COLOR	Z LEVEL	
1	I19221 04	A2083B	C1812B		1	
2	I41261 02	A2804A	B2409A		1	
3	I07011 01	A2804B	A0506B		2	
4	I07011 00	A2804B	D1812A		1	
5	X19002 02	A2085B	B2504A		1	
6	K2800 K28002 00	A2806A A2806A	A1207A A2710A		2 1	
7	I30081 01	A2806B	A2510B		2	
8	I28041 00	A2807A	B2709B		1	
9	I24371 00	A2807B	B2305B		1	
10	I31081 00	A2808A	A2305B		1	
11	I31091 00	A2808B	D2202B		1	
12	I39081 03 I39141 00	A2809A A2812A	A2809B A2817A		2 1	
13	I39031 02 I30111 00	A2812A A2816A	A2809A A2516B		1 1	
14	I24381 00 500009 00	A2816B B0802B	B2305A B2305A		1 1	
15	K50032 01	B0803A	D1712A		2	
16	W51001	B0803B	D2011B		1	
17	I50001 00	B0804A	D1702B		1	
18	I50221 00	B0804B	B0913A		1	
19	W51003 00	B0805A	D2012A		1	
20	W51002 00	B0805B	D2011A		1	
21	I50031 01	B0806A	A1008A		2	
22	I50231 00	B0806B	B0909B		1	
23	500009 00	B0807A	B0802B		1	
24	W51004 00	B0807B	D2010B		1	
25	I50251 00	B0808A	C1714A		1	
26	W51011	B0808B	D2010A		1	
27	I50081 00	B0810A	C1717A		1	
28	W51012 00	B0810B	D2013B		1	
29	I24421 00	B0902A	D1904B		1	
30	I37061 00	B0902B	C1404A		1	
31	K37002 00	B0903A	D1407B		1	
32	K35032 00	B0903B	A1103B		1	
33	I72141 00	B0904A	A0703A		1	
34	K18002 00	B0904B	D1007A		1	

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TITLE			WL	DOCUMENT NO.	SHEET NO.	REV.
LOGIC WIRE WRAP (REF: 76033500)				HPDE 7335	19	A
LINE NO.	SIGNAL NAME OR NUMBER IDENTIFICATION	ORIGIN	DESTINATION	WIRE COLOR	Z LEVEL	
1	K18031 00	B0905A	C1013B		1	
2	I21161 00	B0905B	D1909B		1	
3	K40011 03	B0906A	C1516B		1	
4	K40011 02	B0906A	B1309A		2	
5	I21151 01	B0906B	A1808B		2	
6	I21151 02	B0906B	C1517A		1	
7	I41181 02	B0907A	B1302A		2	
8	200601 00GND	B0907B	B0914A		1	
9	I41261 00	B0908A	A2214A		1	
10	W24022 01	B0908B	B2306A		2	
11	I50191 00	B0909A	B2410B		1	
12	I50231 00	B0909B	B0806B		1	
13	I70081 00	B0910A	A1003A		1	
14	I48061 01	B0910B	A1705B		2	
15	I48061 02	B0910B	B1212B		1	
16	I26051 00	B0911A	D2006B		1	
17	K26001 01	B0911B	A2613B		2	
18	I50241 00	B0912A	A2203B		1	
19	K50031 03	B0912B	A2517B		2	
20	I50221 00	B0913A	B0804B		1	
21	I50181 00	B0913B	B2406B		1	
22	200601 00GND	B0914A	B0907B		1	
23	X32021 00	B1003B	B2404A		1	
24	I05021 00	B1004A	A0210A		1	
25	I05021 01	B1004A	B1303B		2	
26	I32101 02	B1004B	A2408B		2	
27	I20021 01	B1005A	B1308A		2	
28	K29001 02	B1005B	B2204B		2	
29	X33031 00	B1006B	A1416A		1	
30	K33011 00	B1008B	B1111A		1	
31	I25041 01	B1011B	B1107B		2	
32	I25041 03	B1011B	C2007B		1	
33	I35081 00	B1105A	D1411A		1	
34	I35151 00	B1105B	D1406A		1	

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TITLE			WL	DOCUMENT NO.	SHEET NO.	REV.
LOGIC WIRE WRAP				HPDE 7334	20	H
LINE NO.	SIGNAL NAME OR NUMBER IDENTIFICATION	ORIGIN	DESTINATION	WIRE COLOR	Z LEVEL	
1	I25041 00	B1107B	A2110B		1	
2	I25041 01	B1107B	B1011B		2	
3	I29151 03	B1109B	C2003B		1	
4	K34001 00	B1110B	A11116B		1	
5	K33011 01	B1111A	B2407B		2	
6	K33011 00	B1111A	B1008B		1	
7	K25001 01	B1111B	B1307B		2	
8	K25001 00	B1111B	A2112B		1	
9	X34012 00	B1112A	C1416B		1	
10	X34012 01	B1112A	A2012A		2	
11	I12241 05	B1201A	D0804A		2	
12	K18052 00	B1201B	D1007B		1	
13	K18052 01	B1201B	A1404B		2	
14	I06061 00	B1202A	C2111B		1	
15	I09381 07	B1202B	C0203A		2	
16	I09381 06	B1202B	C0208A		1	
17	I09101 00	B1203B	D0802A		1	
18	I72131 00	B1204A	C0205B		1	
19	I5505	B1204B	B1205A		2	
20	I5505	B1204B	B1206B		1	
21	I5505	B1205A	B1204B		2	
22	I5504	B1205B	B1310B		1	
23	Z08001 01	B1206A	C2111A		2	
24	Z08001 00	B1206A	B2408B		1	
25	I08151 00	B1206B	B1302B		1	
26	200021 00	B1207A	JA8109B		1	
27	X08011 01	B1207B	A0503B		2	
28	X08011 00	B1207B	JA8109A		1	
29	I08161 01	B1208A	A0504A		1	
30	L08011 00	B1208B	JA8003A		1	
31	L08001 00	B1209A	JA8003B		1	
32	I41241 00	B1209B	B2213B		1	
33	I41111 00	B1210B	A1316B		1	
34	I41111 01	B1210B	D2207B		2	

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TITLE			WL	DOCUMENT NO.	SHEET NO.	REV.
LOGIC WIRE WRAP				HPDE 7335	21	H
LINE NO.	SIGNAL NAME OR NUMBER IDENTIFICATION	ORIGIN	DESTINATION	WIRE COLOR	Z LEVEL	
1	I16181 02	B1211A	D0812A		1	
2	I16181 01	B1211A	C1215B		2	
3	I43221 00	B1211B	C1515A		1	
4	I43181 00	B1212A	A1009A		1	
5	I48061 02	B1212B	B0910B		1	
6	I48061 03	B1212B	C1512B		2	
7	I23131	B1213A	D1502B		1	
8	I48071 00	B1213B	B2003A		1	
9	200701 00GND	B1214A	A1214B		1	
10	I41191 00	B1301A	A2203A		1	
11	I05011 02	B1301B	A0211B		1	
12	I41181 00	B1302A	B2403B		1	
13	I41181 02	B1302A	B0907A		2	
14	I08151 00	B1302B	B1206B		1	
15	I41201 00	B1303A	A1011B		1	
16	I05021 01	B1303B	B1004A		2	
17	I41211 00	B1304A	B2510B		1	
18	I25041 02	B1304B	A2110B		2	
19	I41001 00	B1305A	C0707B		1	
20	A28051 00	B1306A	D2309A		1	
21	A26051 00	B1306B	B2609B		1	
22	I41231 00	B1307A	B2203A		1	
23	K25001 01	B1307B	B1111B		2	
24	I20021 01	B1308A	B1005A		2	
25	I20021 00	B1308A	D1606A		1	
26						
27	K40011 02	B1309A	B0906A		2	
28	K29022 01	B1309B	A2211B		2	
29	K51012 01	B1310A	C1605B		2	
30	I5504	B1310B	A1205B		1	
31	I41141 00	B1311A	D2308B		1	
32	A26071 00	B1312A	C2002A		1	
33	A28011 00	B1312B	C2715B		2	
34	A28011 01	B1312B	B2502B		1	

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TITLE			WL	DOCUMENT NO.	SHEET NO.	REV.
LOGIC WIRE WRAP (REF: 76033500)				HPDE 7335	22	A
LINE NO.	SIGNAL NAME OR NUMBER IDENTIFICATION	ORIGIN	DESTINATION	WIRE COLOR	Z LEVEL	
1	A28041 00	B1313A	C2114B		1	
2	I07191 20	B1401A	B1402B		1	
3	I07191 21	B1401A	C1006A		2	
4	I06201 07	B1401B	D0210B		2	
5	I06201 08	B1401B	A1412A		1	
6	I12241 01	B1402A	C1002A		2	
7	I12241 00	B1402A	D0804A		1	
8	I07191 19	B1402B	C0206B		2	
9	I07191 20	B1402B	B1401A		1	
10	I32161 02	B1403A	B1403B		1	
11	I32161 01	B1403A	A2412B		2	
12	I32161 02	B1403B	B1403A		1	
13	I32161 03	B1403B	D1103B		2	
14	201001 00GND	B1404B	A1401A		1	
15	T70011 00	B1405A	B1406A		1	
16	T70012 00	B1405B	B1406B		1	
17	T70011 00	B1406A	B1405A		1	
18	T70012 00	B1406B	B1405B		1	
19	T70031 00	B1408A	B1409A		1	
20	T70032 00	B1408B	B1409B		1	
21	T70031 00	B1409A	B1408A		1	
22	T70032 00	B1409B	B1408B		1	
23	300121 01	B1410B	C0216B		2	
24	300121 00	B1410B	JA8301B		1	
25	300001 02	B1412A	JA8302A		1	
26	300001 00	B1412A	B2002A		2	
27	I07201 00	B1412B	A1403A		1	
28	I07201 04	B1412B	A0602A		2	
29	A54091 00	B1607B	B1707B		1	
30	A54092 00	B1608B	B1708B		1	
31	A54091 00	B1707B	B1607B		1	
32	A54092 00	B1708B	B1608B		1	
33	I07121 00	B1801A	D1810B		1	
34	W22004 01	B1801B	D1610B		2	

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TITLE			WL	DOCUMENT NO.	SHEET NO.	REV.
LOGIC WIRE WRAP				HPDE 7335	23	H
LINE NO.	SIGNAL NAME OR NUMBER IDENTIFICATION	ORIGIN	DESTINATION	WIRE COLOR	Z LEVEL	
1	W22004 00	B1801B	A1909B		1	
2	I21061 00	B1802A	B2209B		1	
3	I21081 00	B1802B	B2207A		1	
4	W22002 00	B1803A	A1912B		1	
5	I48021 00	B1803B	B1804A		2	
6	I48021 01	B1803B	B2302B		1	
7	I48021 00	B1804A	B1803B		2	
8	W22013 00	B1804B	A1910A		1	
9	I21051 00	B1805A	B2206B		1	
10	W22011 00	B1805B	A1911A		1	
11	W22014 00	B1806B	A1910B		1	
12	W22012 00	B1807A	A1911B		1	
13	I21291 00	B1807B	JA101B		1	
14	I21231 00	B1808A	D1503A		1	
15	I21251 00	B1808B	JA8103B		1	
16	I21261 00	B1804A	JA8103A		1	
17	I21241 00	B1809B	JA8104A		1	
18	I21281 00	B1810A	JA8102A		1	
19	I21301 00	B1810B	JA8101A		1	
20	I21271 00	B1811A	D1506A		2	
21	K20001 03	B1811B	D1509A		1	
22	K20001 04	B1811B	D1509B		2	
23	A27021 00	B1812B	A2703A		1	
24	A1801S 00	B1813A	B2602B		1	
25						
26	W21011 00	B1902A	A1802A		1	
27	201006 GND 201006 05GND	B1902B B1902B	B1907B B1914A		1 2	
28	W21001 00	B1903A	A1809A		1	
29	I63011 00	B1903B	C1813A		1	
30	I62081 00	B1904A	C1811B		1	
31	W21002 00	B1904B	A1814B		1	
32	I63081 00	B1905A	C1810A		1	
33	I62011 00	B1905B	C1812B		1	
34	201006 01GND	B1906A	B1908A		1	

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TITLE			WL	DOCUMENT NO.	SHEET NO.	REV.
LOGIC WIRE WRAP				HPDE 7335	24	H
LINE NO.	SIGNAL NAME OR NUMBER IDENTIFICATION	ORIGIN	DESTINATION	WIRE COLOR	Z LEVEL	
1	201006 02GND	B1906A	B1907A		2	
2	201006 05GND	B1906B	B1901A		1	
3	201006 00GND	B1906B	B1908A		2	
	201006 04GND	B1907A	B1908B		1	
4	201006 02GND	B1907A	B1906A		2	
5	201006 GND	B1907B	B1902B		1	
6	201006 06GND	B1907B	B1908B		2	
7	201006 06GND	B1908A	B1906B		2	
	201006 01GND	B1908A	B1906A		1	
8	201006 00GND	B1908A	B1901A		2	
9						
10	201006 04GND	B1908B	B1907A		1	
11	201006 06GND	B1908B	B1907B		2	
12	I56350	B1909A	C0901A		1	
13	I56340	B1909B	A0602B		1	
14	201006 05GND	B1914A	B1902B		2	
	800060 00	B2001A	A0904B		1	
15	800020 00	B2001B	C1609B		1	
16	300001 00	B2002A	B1412A		2	
17	300001 01	B2002A	JA8001A		1	
18	I15081 01	B2002B	C1714B		2	
19	I48071 00	B2003A	B1213B		1	
20	800030 00	B2003B	D1604B		1	
21	I23211 02	B2004B	A1808A		2	
22	200501 04	B2006A	B2007A		2	
23	200501 05	B2006A	B2011A		1	
24	800050 00	B2006B	A1402B		1	
25	200501 04	B2007A	B2006A		2	
26	200501 00GND	B2007A	B2009A		1	
27	I54171 02	B2007B	C1116B		2	
28	I54171 00	B2007B	A1609B		1	
29	200501 02	B2008A	B2010A		1	
30	200501 03	B2008A	B2014A		2	
31	800070 00	B2008B	B2103B		1	
32	200501 01	B2009A	B2010A		2	
33	200501 00GND	B2009A	B2007A		1	
34	200501 02	B2010A	B2008A		1	

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TITLE			WL	DOCUMENT NO.	SHEET NO.	REV.
LOGIC WIRE WRAP (REF: 76033500)				HPDE 7335	25	A
LINE NO.	SIGNAL NAME OR NUMBER IDENTIFICATION	ORIGIN	DESTINATION	WIRE COLOR	Z LEVEL	
1	200501 01	B2010A	B2009A		2	
2	200501 05	B2011A	B2006A		1	
3	800080 00	B2011B	B2105B		1	
4	200501 03	B2014A	B2008A		2	
5	800070 00	B2103B	B2008B		1	
6	800080 00	B2105B	B2011B		1	
7	X29011 00	B2201A	A2513B		1	
8	I32041 00	B2201B	A2409A		1	
9	I29061 00	B2202A	C2303A		1	
10	I41251 01	B2202B	B2203B		1	
11	I41231 00	B2203A	B1307A		1	
12	I41251 00	B2203B	A1012A		2	
13	I41251 01	B2203B	B2202B		1	
14	I21021 I21021 00	B2204A B2204A	C1509B A1807A		2 1	
15	K29001 01	B2204B	D2101A		1	
16	K29001 02	B2204B	B1005B		2	
17	I24121 00	B2205A	A2316B		1	
18	I21031 I24151 00	B2205B B2206A	A1810A A2315B		2 1	
19	I21051 00	B2206B	B1805A		1	
20	I21081 00	B2207A	B1802B		1	
21	I21091 00	B2207B	A1817A		1	
22	I24191 00	B2208A	B2302B		1	
23	I24181 00	B2208B	B2302A		1	
24	I21071 00	B2209A	A1816B		1	
25	I21061 00	B2209B	B1802A		1	
26	I24161 00	B2210A	B2303B		1	
27	I24171 00	B2210B	B2301A		1	
28	I21031 00	B2211A	A1810A		1	
29	I21031 01	B2211A	C1509B		2	
30	I24131 00	B2211B	A2314A		1	
31	I24141 00	B2212A	A2315A		1	
32	I21041 01 I21041 00	B2212B B2212B	C1117B A1806B		2 1	
33	I24111 I41241 00	B2213A B2213B	A2313A B1209B		1 1	
34	I24171 00	B2301A	B2210B		1	

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TITLE			WL	DOCUMENT NO.	SHEET NO.	REV.
LOGIC WIRE WRAP				HPDE 7335	26	H
LINE NO.	SIGNAL NAME OR NUMBER IDENTIFICATION	ORIGIN	DESTINATION	WIRE COLOR	Z LEVEL	
1	W24003 00	B2301B	B2809A		2	
2	W24003 01	B2301B	A0912B		1	
3						
4	I24181 00	B2302A	B2208B		1	
5	I24191 00	B2302B	B2208A		1	
6	I24191 01	B2302B	A2313A		2	
7	W24004 01	B2303A	A0913B		1	
8	W24004 00	B2303A	B2812A		2	
9	I24161 00	B2303B	B2210A		1	
10	I24351 00	B2304A	B2807A		1	
11	W24014 04	B2304B	B2307A		2	
12	I24381 00	B2305A	A2816B		1	
13	I2437 I24371 00	B2305B B2305B	A1205A A2807B		2 1	
14	W24022 01	B2306A	B0908B		2	
15	W24022 00	B2306A	A2309A		1	
16	I2439	B2306B	A1204B		1	
17	W24014 00	B2307A	A2316A		1	
18	W24014 04	B2307A	B2304B		2	
19	W24021 00	B2307B	A2307B		1	
20	I20171 00	B2309B	D1602A		1	
21	I16111 01	B2310A	B2311B		2	
22	I08131 01	B2311A	A2504A		2	
23	I16111 01	B2311B	B2310A		2	
24	I16111 00	B2311B	D1202B		1	
25	K26001 00	B2312A	A2613B		1	
26	X19002 01	B2312B	B2504A		2	
27	X19002 00	B2312B	A2209A		1	
28	W22001 01	B2313A	A1912A		2	
29	K29012 02	B2313B	A2309B		2	
30	I08131 00	B2401A	A2504A		1	
31	I41181 01	B2403B	B2503A		2	
32	I41181 00	B2403B	B1302A		1	
33	X32021 00	B2404A	B1003B		1	
34						

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TITLE			WL	DOCUMENT NO.	SHEET NO.	REV.
LOGIC WIRE WRAP (REF: 76033500)				HPDE 7335	27	A
LINE NO.	SIGNAL NAME OR NUMBER IDENTIFICATION	ORIGIN	DESTINATION	WIRE COLOR	Z LEVEL	
1	I32111 00	B2404B	D1611A		1	
2	I32171 00	B2405A	B2506A		1	
3	I50211 00	B2405B	C1715A		1	
4	I50181 00	B2406B	B0913B		1	
5	K34032 00	B2407A	D1407A		1	
6	K33011 01	B2407B	B1111A		2	
7	I34081 00	B2408A	A2417A		1	
8	Z08001 00	B2408B	B1206A		1	
9	I41261 02	B2409A	A2084A		1	
10	I41261 01	B2409A	A2214A		2	
11	I50191 00	B2410B	B0909A		1	
12	I32141 00	B2411B	B2503B		1	
13	300061 00	B2412A	JA8008A		1	
14	200001 00	B2414A	A2416B		1	
15	I19011 00	B2501A	A2205A		1	
16	I20131 00	B2501B	C1617A		1	
17	I32121 00	B2502A	A2210A		1	
18	I32121 01	B2502A	C2310A		2	
19	A28011 01	B2502B	B1312B		1	
20	I41181 01	B2503A	B2403B		2	
21	I32141 00	B2503B	B2411B		1	
22	X19002 02	B2504A	A2805B		1	
23	X19002 01	B2504A	B2312B		2	
24	I41201 03	B2504B	A2214B		2	
25	I41201 04	B2504B	B2803B		1	
26	I32011 00	B2505B	A1216A		1	
27	I32171 00	B2506A	B2405A		1	
28	I32171 01	B2506A	C1808B		2	
29	I32151 00	B2506B	A2406B		1	
30	I19221 02	B2507B	A2507A		1	
31	I19221 03	B2507B	A2803B		2	
32	X32011 00	B2508B	A2411B		1	
33	X29001 00	B2510A	A2215A		1	
34	I41211 00	B2510B	B1304A		1	

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TITLE			WL	DOCUMENT NO.	SHEET NO.	REV.
LOGIC WIRE WRAP (REF: 76033500)				HPDE 7335	28	A
LINE NO.	SIGNAL NAME OR NUMBER IDENTIFICATION	ORIGIN	DESTINATION	WIRE COLOR	Z LEVEL	
1	I41211 00 I20031 00	B2510B B2601B	B1304A D1608A		1 1	
2	A18015 00	B2602B	B1813A		1	
3	A26051 00	B2609B	B1306B		1	
4	X28002 00	B2705B	JA8112B		1	
5	X28001 00	B2706A	JA8111B		1	
6	I19191 00	B2706B	A2202B		1	
7	I19171 00	B2707B	A2211A		1	
8	M05021 01	B2708B	A1208B		2	
9	I28041 00	B2709B	A2807A		1	
10	A28083 00	B2710B	A1315B		1	
11	A28081 00	B2711B	JA8006B		1	
12	A28082 00	B2712B	JA8006A		1	
13	I39151 00 A31021 00	B2801B B2802A	A0605B A2714A		1 1	
14	A31031 00	B2802B	A2712B		1	
15	I41201 04	B2803B	B2504B		1	
16	I41201 I27221 00	B2803B B2804A	D2006A A2704B		2 1	
17	I27271 00	B2804B	A2705A		1	
18	I27241 00	B2805A	A2703B		2	
19	I27231 00	B2805B	A2704A		1	
20	I27211 00	B2806A	A2706B		1	
21	I27251 00	B2806B	A2705B		1	
22	I24351 00	B2807A	B2304A		1	
23	I27261 00	B2807B	A2706A		1	
24	W24001 00	B2808B	A2317A		1	
25	W24003 00	B2809A	B2301B		2	
26	I27301 00	B2810A	A0802A		1	
27	W24013 01	B2810B	A2312B		2	
28	I27281 00	B2811A	D1501B		1	
29	I27291 00	B2811B	D1510A		1	
30	W24004 00	B2812A	B2303A		2	
31	W24011 00	B2812B	A2312A		2	
32	W24002 00	B2813B	A2317B		2	
33	I07161 00	C0102A	D1813A		1	
34	R68001 00	C0102B	D0804B		1	

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TITLE			WL	DOCUMENT NO.	SHEET NO.	REV.
LOGIC WIRE WRAP (REF: 76033500)				HPDE 7335	29	A
LINE NO.	SIGNAL NAME OR NUMBER IDENTIFICATION	ORIGIN	DESTINATION	WIRE COLOR	Z LEVEL	
1	R68001 00 R68101 00	C0102B C0105A	D0804B C0812B		1 1	
2	R68011 00	C0105B	D0810A		1	
3	R68111 00	C0109A	C0804B		1	
4	R68121 00	C0109B	C0805B		1	
5	R68021 00	C0115A	D0807A		1	
6	R68031 00	C0115B	D0805B		1	
7	R68131 00	C0116A	C0809A		1	
8	R68041 00	C0116B	D0805A		1	
9	R68141 00	C0117A	C0809B		1	
10	R68151 00	C0117B	C0810A		1	
11	I72131 01	C0202A	C0205B		2	
12	I07191 17	C0202B	C0205A		2	
13	I07191 18	C0202B	C0206B		1	
14	I09381 07	C0203A	B1202B		2	
15	I72031 00	C0203B	A0709B		1	
16	I72051 00	C0204A	A0713A		1	
17	I60071 01	C0204B	A2003A		2	
18	I60071 02	C0204B	C0504B		1	
19	I07191 17	C0205A	C0202B		2	
20	I07191 16	C0205A	C0206A		1	
21	I72131 00	C0205B	B1204A		1	
22	I72131 01	C0205B	C0202A		2	
23	I07191 16	C0206A	C0205A		1	
24	I07191 15	C0206A	C0209B		2	
25	I07191 19	C0206B	B1402B		2	
26	I07191 18	C0206B	C0202B		1	
27	I61131 01	C0207A	A2006A		2	
28	I09381 04	C0207B	C0302A		1	
29	I09381 05	C0207B	C0208A		2	
30	I09381 06	C0208A	B1202B		1	
31	I09381 05	C0208A	C0207B		2	
32	I62041 01	C0208B	A2007A		2	
33	I07191 15	C0209B	C0206A		2	
34	I07191 14	C0209B	D0207A		1	

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TITLE			WL	DOCUMENT NO.	SHEET NO.	REV.
LOGIC WIRE WRAP (REF: 76033500)				HPDE 7335	30	A
LINE NO.	SIGNAL NAME OR NUMBER IDENTIFICATION	ORIGIN	DESTINATION	WIRE COLOR	Z LEVEL	
1	300121 01	C0216B	B1410B		2	
2	300121 02	C0216B	C0316B		1	
3	I09381 03	C0302A	C0303A		2	
4	I09381 04	C0302A	C0207B		1	
5	I07191 02	C0302B	C0305A		1	
6	I07191 03	C0302B	C0306B		2	
7	I09381 03	C0303A	C0302A		2	
8	I09381 02	C0303A	C0305B		1	
9	I63041 01	C0303B	A2009A		2	
10	I63111 01	C0304A	A2010A		2	
11	I62111 01	C0304B	A2008A		2	
12	I07191 01	C0305A	C0307B		2	
13	I07191 02	C0305A	C0302B		1	
14	I09381 02	C0305B	C0303A		1	
15	I09381 01	C0305B	C0306A		2	
16	I09381 01	C0306A	C0305B		2	
17	I09381 00	C0306A	D0809B		1	
18	I07191 03	C0306B	C0302B		2	
19	I07191 04	C0306B	D0309B		1	
20	I06021 00	C0307A	A1215A		2	
21	I06021 01	C0307A	C0607A		1	
22	I07191 00	C0307B	D1813B		1	
23	I07191 01	C0307B	C0305A		2	
24	I07191 10	C0308A	D0212A		1	
25	I07191 09	C0308A	D0306B		2	
26	DRIVES EL600	C0308B	JD9006B		1	
27	DRIVES EL601	C0308B	C0608B		2	
28	I06201 05	C0309B	D0307A		2	
29	I06201 06	C0309B	D0210B		1	
30	300121 02	C0316B	C0216B		1	
31	I06101 00	C0402A	C1015B		1	
32	R69001 00	C0402B	D0904B		1	
33	R69101 00	C0405A	C0912B		1	
34	R69011 00	C0405B	D0910A		1	

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TITLE			WL	DOCUMENT NO.	SHEET NO.	REV.
LOGIC WIRE WRAP (REF: 76033500)				HPDE 7335	31	A
LINE NO.	SIGNAL NAME OR NUMBER IDENTIFICATION	ORIGIN	DESTINATION	WIRE COLOR	Z LEVEL	
1	R69111 00	C0409A	C0904B		1	
2	R69121 00	C0409B	C0905B		1	
3	R69021 00	C0415A	D0907A		1	
4	R69031 00	C0415B	D0905B		1	
5						
6	R69041 00	C0416B	D0905A		1	
7	R69141 00	C0417A	C0909B		1	
8	R69151 00	C0417B	C0910A		1	
9	I06231 01	C0502A	C0505B		2	
10	I06111 07	C0502B	C0505A		2	
11	I06111 08	C0502B	C0506B		1	
12	I10381 07	C0503A	C0606B		2	
13	I72091 00	C0503B	A0809B		1	
14	I72111 00	C0504A	A0813A		1	
15	I60071 02	C0504B	C0204B		1	
16	I06111 07	C0505A	C0502B		2	
17	I06111 06	C0505A	C0506A		1	
18	I06231 00	C0505B	C1010B		1	
19	I06231 01	C0505B	C0502A		2	
20	I06111 06	C0506A	C0505A		1	
21	I06111 05	C0506A	C0509B		2	
22	I06111 08	C0506B	C0502B		1	
23	I06111 09	C0506B	D0609B		2	
24	I61131 02	C0507A	C1915B		2	
25	I10381 03	C0507B	C0606A		2	
26	I10381 02	C0507B	C0508A		1	
27	I10381 02	C0508A	C0507B		1	
28	I10381 01	C0508A	C1004A		2	
29	I62041 02	C0508B	C2015B		2	
30	I06111 05	C0509B	C0506A		2	
31	I06111 04	C0509B	D0507A		1	
32	300071 01	C0516B	D1110B		2	
33	300071 02	C0516B	C0616B		1	
34	I06111 17	C0602A	C0605B		2	

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TITLE			WL	DOCUMENT NO.	SHEET NO.	REV.
LOGIC WIRE WRAP (REF: 76033500)				HPDE 7335	32	A
LINE NO.	SIGNAL NAME OR NUMBER IDENTIFICATION	ORIGIN	DESTINATION	WIRE COLOR	Z LEVEL	
1	I06111 18	C0602A	C0603A		1	
2	I10381 06	C0602B	C0606B		1	
3	I10381 05	C0602B	C0605A		2	
4	I06111 18	C0603A	C0602A		1	
5	I06111 19	C0603A	D1101A		2	
6	I63041 02	C0603B	D2001B		2	
7	I63111 02	C0604A	C2015A		2	
8	I62111 02	C0604B	D2001A		2	
9	I10381 05	C0605A	C0602B		2	
10	I10381 04	C0605A	C0606A		1	
11	I06111 16	C0605B	C0607B		1	
12	I06111 17	C0605B	C0602A		2	
13	I10381 04	C0606A	C0605A		1	
14	I10381 03	C0606A	C0507B		2	
15	I10381 07	C0606B	C0503A		2	
16	I10381 06	C0606B	C0602B		1	
17	I06021 01	C0607A	C0307A		1	
18	I06111 16	C0607B	C0605B		1	
19	I06111 15	C0607B	C0608A		2	
20	I06111 14	C0608A	D0606B		1	
21	I06111 15	C0608A	C0607B		2	
22	DRIVES EL601	C0608B	C0308B		2	
23	I06211 06	C0609B	D0510B		1	
24	I06211 05	C0609B	D0607A		2	
25	300071 02	C0616B	C0516B		1	
26	Y11006 00	C0702A	D0808B		1	
27	I09221 01	C0704A	A2016B		2	
28	I09221 00	C0704A	D0812B		1	
29	I09191 00	C0704B	D0807B		1	
30	I09191 01	C0704B	A2013B		2	
31	I09818 01	C0705A	A2012B		2	
32	I09181 00	C0705A	D0806B		1	
33	I09211 01	C0705B	A2015B		2	
34	I09211 00	C0705B	D0811B		1	

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TITLE		WL	DOCUMENT NO.	SHEET NO.	REV.
LOGIC WIRE WRAP (REF: 76033500)			HPDE 7335	33	A
LINE NO.	SIGNAL NAME OR NUMBER IDENTIFICATION	ORIGIN	DESTINATION	WIRE COLOR	Z LEVEL
1	I09201 01	C0706A	A2014B		2
2	I09201 00	C0706A	D0811A		1
3					
4					
5					
6	I41001 00	C0707B	B1305A		1
7	I11321 00	C0708A	D1213B		1
8	I11331 01	C0708B	C0713A		2
9	I11331 02	C0708B	D2311B		1
10	I11251 00	C0709A	C1213A		1
11	I11241 00	C0709B	C1203B		1
12	I11261 00	C0710A	D1707A		1
13	I11281 00	C0711A	D1205B		1
14	I11271 00	C0711B	D1212A		1
15	I11301 00	C0712A	D1209A		1
16	I11301 01	C0712A	A1307A		2
17	I11311 01	C0712B	A2015A		2
18	I11311 00	C0712B	A1303B		1
19	I11331 00	C0713A	D1204A		1
20	I11331 01	C0713A	C0708B		2
21	I11291 00	C0713B	D1205A		1
22	I09311 00	C0714A	D0808A		1
23	I11341 00	C0714B	D1209B		1
24	800010 00	C0715A	A2011B		1
25	I10311 00	C0715B	D0908A		1
26	I12051 00	C0716A	C0810B		1
27	I12061 00	C0716B	C0808B		1
28	I13051 00	C0717A	C0910B		1
29	I14061 00	C0717B	C1208A		1
30	I14061 03	C0717B	C1415A		2
31	I18281 00	C0802B	D1005A		1
32	K18032 00	C0803A	D1006B		1
33	K18032 01	C0803A	C0903B		2
34	K18042 01	C0803B	C0903A		2

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TITLE			WL	DOCUMENT NO.	SHEET NO.	REV.
LOGIC WIRE WRAP				HPDE 7335	34	H
LINE NO.	SIGNAL NAME OR NUMBER IDENTIFICATION	ORIGIN	DESTINATION	WIRE COLOR	Z LEVEL	
1	K18042 00	C0803B	D1004A		1	
2	I12011 01	C0804A	C1003B		2	
3	I12011 00	C0804A	D0710B		1	
4	R68111 00	C0804B	C0109A		1	
5	I12021 00	C0805A	D0705A		1	
6	R68121 00	C0805B	C0109B		1	
7	R68181 00	C0806B	D0113B		1	
8	R68171 00	C0807A	D0113A		1	
9	I12071 00	C0807B	D0704A		1	
10	R68161 00	C0808A	D0112A		1	
11	I12061 00	C0808B	C0716B		1	
12	R68131 00	C0809A	C0116A		1	
13	R68141 00	C0809B	C0117A		1	
14						
15	R68151 00	C0810A	C0117B		1	
16	I12051 00	C0810B	C0716A		1	
17	I12041 00	C0811A	D0704B		1	
18	I12031 00	C0811B	D0705B		1	
19	I12001 00	C0812A	D0710A		1	
20	I12001 01	C0812A	C1004B		2	
21	R68101 00	C0812B	C0105A		1	
22	500004 01	C0813A	C1806A		2	
23	500004 00	C0813A	JA8206B		1	
24	500003 01	C0813B	C1805B		2	
25	500003 00	C0813B	JA8206A		1	
26	500005 01	C0814A	C1807A		2	
27	500005 00	C0814A	JA8207A		1	
28	500006 03	C0814B	C1807B		2	
29	500006 00	C0814B	JA8207B		1	
30	K18021 00	C0815A	C1009A		1	
31	I09261 00	C0815B	C1804B		1	
32	I12181 00	C0816A	A0706B		1	
33	I09341 00	C0817B	C1717B		1	
34	I56350 I18271 00	C0901A C0902B	B1909A D1006A		1 1	

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TITLE			WL	DOCUMENT NO.	SHEET NO.	REV.
LOGIC WIRE WRAP (REF: 76033500)				HPDE 7335	35	A
LINE NO.	SIGNAL NAME OR NUMBER IDENTIFICATION	ORIGIN	DESTINATION	WIRE COLOR	Z LEVEL	
1	K18042 01	C0903A	C0803B		2	
2	K18032 01	C0903B	C0803A		2	
3	I13011 01	C0904A	C1006B		2	
4	I13011 00	C0904A	D0709B		1	
5	R69111 00	C0904B	C0409A		1	
6	I13021 00	C0905A	D0706A		1	
7	R69121 00	C0905B	C0409B		1	
8	R69181 00	C0906B	D0413B		1	
9	R69171 00	C0907A	D0413A		1	
10	I13071 00	C0907B	D0702A		1	
11	R69161 00	C0908A	D0412A		1	
12	I13061 00	C0908B	D0701B		1	
13						
14	R69141 00	C0909B	C0417A		1	
15						
16	R69151 00	C0910A	C0417B		1	
17	I13051 00	C0910B	C0717A		1	
18	I13041 00	C0911A	D0703B		1	
19	I13031 00	C0911B	D0707B		1	
20	I13001 01	C0912A	C1007A		2	
21	I13001 00	C0912A	D0708A		1	
22	R69101 00	C0912B	C0405A		1	
23	500004 02	C0913A	JA8206B		2	
24	500003 02	C0913B	JA8206A		2	1
25	500005 02	C0914A	JA8207A		2	
26	500006 01	C0914B	JA8207B		2	
27	K18051 01	C0915A	C1104B		2	
28	K18051 00	C0915A	D1009A		1	
29	I10261 00	C0915B	D2111B		1	
30	I13181 00	C0916A	A0806B		1	
31	I10341 00	C0917B	C1716A		1	
32	I12241 02	C1002A	D1012B		1	
33	I12241 01	C1002A	B1402A		2	
34	I07081 01	C1002B	D1803A		2	

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TITLE			WL	DOCUMENT NO.	SHEET NO.	REV.
LOGIC WIRE WRAP (REF: 76033500)				HPDE 7335	36	A
LINE NO.	SIGNAL NAME OR NUMBER IDENTIFICATION	ORIGIN	DESTINATION	WIRE COLOR	Z LEVEL	
1	I06171 00	C1003A	D1013B		1	
2	I12011 01	C1003B	C0804A		2	
3	I10381 01	C1004A	C0508A		2	
4	I10381 00	C1004A	D0909B		1	
5	I12001 01	C1004B	C0812A		2	
6	I13241 00	C1005A	D0904A		1	
7	I13241 04	C1005A	D1011A		2	
8	I06241 00	C1005B	C1012B		1	
9	I07191 21	C1006A	B1401A		2	
10	I13011 01	C1006B	C0904A		2	
11	I13001 01	C1007A	C0912A		2	
12	K18041 00	C1007B	D1002A		1	
13	I13241 06	C1008A	C1008B		1	
14	I13241 05	C1008A	D1102A		2	
15	I13241 06	C1008B	C1008A		1	
16	K18021 00	C1009A	C0815A		1	
17	I06181 00	C1009B	C1013A		1	
18	I06221 00	C1010A	C1011A		1	
19	I06231 00	C1010B	C0505B		1	
20	I06221 00	C1011A	C1010A		1	
21	I06221 01	C1011A	C1012A		2	
22	I10101 00	C1011B	D0902A		1	
23	I06221 01	C1012A	C1011A		2	
24	I06241 00	C1012B	C1005B		1	
25	K18031 00	C1013B	B0905A		1	
26	I06101 00	C1015B	C0402A		1	
27	I06111 00	C1016A	D0512A		1	
28	I18151 00	C1017B	A0803A		1	
29	I07201 03	C1103A	D1810A		2	
30	I71051 01	C1103B	C1104A		2	
31	I71051 01	C1104A	C1103B		2	
32	I71051 00	C1104A	C1105A		1	
33	K18051 01	C1104B	C0915A		2	
34	I71051 00	C1105A	C1104A		1	

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TITLE			WL	DOCUMENT NO.	SHEET NO.	REV.
LOGIC WIRE WRAP (REF: 76033500)				HPDE 7335	37	A
LINE NO.	SIGNAL NAME OR NUMBER IDENTIFICATION	ORIGIN	DESTINATION	WIRE COLOR	Z LEVEL	
1	I70001 03	C1105B	A1405B		1	
2	T70042 00	C1109A	A1409A		1	
3	T70041 00	C1109B	A1409B		1	
4	I06211 08	C1112A	D1101B		1	
5	K71001 00	C1114B	A1217A		1	
6	X33031 01	C1116A	A1416A		2	
7	I54171 02	C1116B	B2007B		2	
8	I48061 05	C1117A	A1417A		2	
9						
10	I31050 01	C1117B	B2212B		2	
11	I15221 00	C1202A	C1606A		1	
12	I15231 00	C1202B	C1608A		1	
13	I15241 00	C1203A	C1611B		1	
14	I11241 00	C1203B	C0709B		1	
15	I11241 01	C1203B	D2304A		2	
16	I15141 01	C1204B	D2306B		2	
17	I15141 00	C1204B	A1010B		1	
18	I15161 00	C1205A	C1703A		1	
19	I14011 00	C1205B	D0708B		1	
20	I14011 01	C1205B	D2312A		2	
21	I14021 00	C1206A	D0709A		1	
22	I14021 01	C1206A	A1810B		2	
23	I14031 00	C1206B	D0706B		1	
24	I14031 01	C1206B	A1806A		2	
25	I14041 00	C1207A	D0707A		1	
26	I14041 01	C1207A	C1414A		2	
27	I14051 00	C1207B	D0703A		1	
28	I14051 01	C1207B	A1813A		2	
29	I14061 01	C1208A	A1811B		2	
30	I14061 00	C1208A	C0717B		1	
31	I15101 00	C1208B	C1710B		1	
32	I15121 00	C1209A	A0708B		2	
	I15121 00	C1209A	D2208A		1	
33	I15181 00	C1209B	C2310B		1	
34	I15191 00	C1210A	C2307B		1	

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TITLE			WL	DOCUMENT NO.	SHEET NO.	REV.
LOGIC WIRE WRAP (REF: 76033500)				HPDE 7335	38	A
LINE NO.	SIGNAL NAME OR NUMBER IDENTIFICATION	ORIGIN	DESTINATION	WIRE COLOR	Z LEVEL	
1	I15021 00	C1210B	D1404A		1	
2	I15021 01	C1210B	D1508B		2	
3	I15041 00	C1211A	C1704B		1	
4	I14071 01	C1211B	A1812B		2	
5	I14071 00	C1211B	D0701A		1	
6	I14081 00	C1212A	D0702B		1	
7	I14081 01	C1212A	A1812A		2	
8	I50151 00	C1212B	D1701A		1	
9	I50151 01	C1212B	C1907A		2	
10	I11251 00	C1213A	C0709A		1	
11	I15081 00	C1213B	C1714B		1	
12	I15061 00	C1214A	C1706B		1	
13	I15201 00	C1214B	C2308B		1	
14	I15211 00	C1215A	A1203A		1	
15	I16181 00	C1215B	D1705A		1	
16	I16181 01	C1215B	B1211A		1	
17	I16121 00	C1216A	D1603B		1	
18	I16041 00	C1216B	C1605A		1	
19	I16031 00	C1217A	C1806B		1	
20	I16051 00	C1217B	D1604A		1	
21	200061 06GND	C1401A	C1412B		1	
22	W37001 00	C1402A	C1908A		1	
23	W37003 00	C1402B	C1902A		1	
24	W37012 00	C1403A	C1905B		1	
25	W37014 00	C1403B	C1903A		1	
26	I37061 00	C1404A	B0902B		1	
27	W37013 00	C1404B	C1907B		1	
28	I14021 02	C1405A	D0709A		2	
29	I14021	C1405A	A1803B		1	
	I14031 02	C1405B	D0706B		2	
30	I14111 00	C1405B	A0707A		1	
	200061 00GND	C1406B	C1407A		1	
31	200061 00GND	C1407A	C1406B		1	
32	200061 01GND	C1407A	C1408B		2	
33	200061 02GND	C1408B	C1409A		1	
34	200061 01GND	C1408B	C1407A		2	

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TITLE			WL	DOCUMENT NO.	SHEET NO.	REV.
LOGIC WIRE WRAP				HPDE 7335	39	H
LINE NO.	SIGNAL NAME OR NUMBER IDENTIFICATION		ORIGIN	DESTINATION	WIRE COLOR	Z LEVEL
1	200061	03GND	C1409A	C1411A		2
2	200061	02GND	C1409A	D1408B		1
3	I36111	00	C1410A	D1411B		1
4	200061	04GND	C1411A	C1412A		1
5	200061	03GND	C1411A	C1409A		2
6	200061	04GND	C1412A	C1411A		1
7	200061	05GND	C1412A	C1412B		2
8	200061	05GND	C1412B	C1412A		2
9	200061	06GND	C1412B	C1401A		1
10	I14071	02	C1413B	D0701A		2
11	I14041	02	C1414A	A2006B		1
12	I14041	01	C1414A	C1207A		2
13	W37002	00	C1414B	C1908B		1
14	I14061	03	C1415A	C0717B		2
15	I22051	00	C1415B	C1509A		1
16	I23211	05	C1416A	C1417B		1
17	I23211	04	C1416A	C1401A		2
18	X34012	00	C1416B	B1112A		1
19	I20011	05	C1417A	C2008B		1
20	I20011	02	C1417A	D1601B		2
21	I24211	05	C1417B	C1416A		1
22	I23211	03	C1417B	A1305B		2
23	K22001	01	C1505A	C1612A		2
24	K22001		C1505A	A1914B		1
25	K38012	00	C1505B	C1802A		1
26	600001	00	C1506B	C1517B		1
27	600001	01	C1506B	C1507B		2
28	I32111	03	C1507A	C1816A		2
29	600001	01	C1507B	C1506B		2
30	I07101	05	C1508A	D1809B		1
	K2200		C1508B	C1513A		1
31	I22051	01	C1509A	A1803A		2
	I22051	00	C1509A	C1415B		1
32	I122021		C1509B	B2204A		2
	I07121	01	C1510A	D1810B		2
33	500006	01	C1510B	B1909B		1
34						

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TITLE			WL	DOCUMENT NO.	SHEET NO.	REV.
LOGIC WIRE WRAP				HPDE 7335	40	H
LINE NO.	SIGNAL NAME OR NUMBER IDENTIFICATION	ORIGIN	DESTINATION	WIRE COLOR	Z LEVEL	
1	I48061 04	C1512B	A1417A		1	
2	I48061 03	C1512B	B1212B		2	
3	K2200 I06151 00	C1513A C1513B	C1508B A2413B		1 1	
4	I06121 01	C1514A	C1515B		2	
5	I06121 00	C1514A	A0810A		1	
6	K40021 04	C1514B	D1505A		2	
7	I43221 00	C1515A	B1211B		1	
8	I06121 01	C1515B	C1514A		2	
9	I18241 00	C1516A	D1008B		1	
10	K40011 01	C1516B	C2009A		2	
11	K40011 03	C1516B	B0906A		1	
12	I21151 02	C1517A	B0906B		1	
13	600001 00	C1517B	C1506B		1	
14	K20002 00	C1602A	C1706A		2	
15	K20002 01	C1602A	C1502A		1	
16	I40231 00	C1603A	D1708A		1	
17	I48111 00	C1603B	D1512B		1	
18	I38051 02	C1604A	C1909B		1	
19	I05071 00	C1604B	A0408A		1	
20	I16041 00	C1605A	C1216B		1	
21	K51012 01	C1605B	B1310A		2	
22	K51012 00	C1605B	D1709A		1	
23	I15221 00	C1606A	C1202A		1	
24	K40001 00	C1606B	C2009B		1	
25	K40001 01	C1606B	A1315A		2	
26	K40011 00	C1607B	C2009A		1	
27	I15231 00	C1608A	C1202B		1	
28	I12281 01	C1608B	D0802B		2	
29	I12281 03 I07201 01	C1608B C1609A	D0902B A1403A		1 2	
30	I07201 02	C1609A	D1810A		1	
31	800020 00	C1609B	B2001B		1	
32	I22061 00	C1610B	JA8108B		1	
33	K40021 00	C1611A	D1609A		1	
34	K40021 01	C1611A	C2012B		2	

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TITLE			WL	DOCUMENT NO.	SHEET NO.	REV.
LOGIC WIRE WRAP (REF: 76033500)				HPDE 7335	41	A
LINE NO.	SIGNAL NAME OR NUMBER IDENTIFICATION	ORIGIN	DESTINATION	WIRE COLOR	Z LEVEL	
1	I15241 00	C1611B	C1203A		1	
2	K22001 01	C1612A	C1505A		2	
3	K20012	C1612B	C1913B		1	
4	I20181 00	C1613B	A0812A		1	
5	I14051	C1614A	D1413A		1	
6	W24014 02	C1614B	A0906B		1	
7	W24014 01	C1614B	A2316A		2	
8	K20001 02	C1615A	D1509A		2	
9	K20001 00	C1615A	C1910A		1	
10	I32101 00	C1616A	A2408B		1	
11	I40071 00	C1616B	D1701B		1	
12	I20131 00	C1617A	B2501B		1	
13	I20121 00	C1617B	A2511A		1	
14	I05021 04	C1702B	D2210A		2	
15	I05021 03	C1702B	D2207A		1	
16	I15161 00	C1703A	C1205A		1	
17	I31091 05	C1703B	D2307A		2	
18	I70001 00	C1704A	A1013A		1	
19	I70001 01	C1704A	C2108A		2	
20	I15041 01	C1704B	C2307A		2	
21	I15041 00	C1704B	C1211A		1	
22	I47111 01	C1705A	C2106A		2	
23	I47111 00	C1705A	D2303A		1	
24	I47131 00	C1705B	D2305B		1	
25	K20002 00	C1706A	C1602A		2	
26	I15061 00	C1706B	C1214A		1	
27	I15061 01	C1706B	C2306B		2	
28	I47101 00	C1707A	C2215B		1	
29	I47191 00	C1707B	D2102A		1	
30	I47211 00	C1708B	D1707B		1	
31	I47151 00	C1709A	A1815A		1	
32	I31091 03	C1709B	D2108B		2	
33	I31091 04	C1704B	D2307A		1	
34	I21151 00	C1710A	A1808B		1	

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TITLE			WL	DOCUMENT NO.	SHEET NO.	REV.
LOGIC WIRE WRAP (REF: 76033500)				HPDE 7335	42	A
LINE NO.	SIGNAL NAME OR NUMBER IDENTIFICATION	ORIGIN	DESTINATION	WIRE COLOR	Z LEVEL	
1	I15101 01	C1710B	A2017B		2	
2	I15101 00	C1710B	C1208B		1	
3	I05081 02	C1711A	A0613A		1	
4	I50061 00	C1712A	C2211B		1	
5	I47081 02	C1712B	A1003B		2	
6	I47081 00	C1712B	A1013B		1	
7	I47011 00	C1713A	C2208A		1	
8	I50251 00	C1714A	B0808A		1	
9	I15081 01	C1714B	B2002B		2	
10	I15081 00	C1714B	C1213B		1	
11	I50211 00	C1715A	B2405B		1	
12	I10341 00	C1716A	C0917B		1	
13	K29022 00	C1716B	A2211B		1	
14	I50081 00	C1717A	B0810A		1	
15	I09341 00	C1717B	C0817B		1	
16	K38012 00	C1802A	C1505B		1	
17	K32002 00	C1802B	A2414B		1	
18	I36191 00	C1803A	D1402A		1	
19	I36191 01	C1803A	D1809A		2	
20	I09271 01	C1803B	D2104B		2	
21	I09271 00	C1803B	D0801B		1	
22	I10271 01	C1804A	D2110A		2	
23	I09261 01	C1804B	D2104A		2	
24	I09261 00	C1804B	C0815B		1	
25	I10261 01	C1805A	D2111B		2	
26	500003 01	C1805B	C0813B		2	
27	500004 01	C1806A	C0813A		2	
28	I16031 00	C1806B	C1217A		1	
29	500005 01	C1807A	C0814A		2	
30	500006 03	C1807B	C0814B		2	
31	500006 02	C1807B	D1803B		1	
32	I39141 01	C1808A	A0804B		2	
33	I32171 01	C1808B	B2506A		2	
34	I38051 00	C1809A	D1802B		1	

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TITLE			WL	DOCUMENT NO.	SHEET NO.	REV.
LOGIC WIRE WRAP (REF: 76033500)				HPDE 7335	43	A
LINE NO.	SIGNAL NAME OR NUMBER IDENTIFICATION	ORIGIN	DESTINATION	WIRE COLOR	Z LEVEL	
1	M12001 01	C1809B	D1807B		2	
2	M12001 00	C1809B	A0212A		1	
3	I63081 01	C1810A	C2016B		2	
4	I63081 00	C1810A	B1905A		1	
5	I61091 00	C1810B	A1916A		1	
6	I61091 01	C1810B	C1916A		2	
7	I60121 01	C1811A	C1917A		2	
8	I60121 00	C1811A	A1917A		1	
9	I62081 01	C1811B	C2017B		2	
10	I62081 00	C1811B	B1904A		1	
11	P38001 00	C1812A	A1203B		1	
12	I62011 00	C1812B	B1905B		1	
13	I62011 01	C1812B	C2016A		2	
14	I63011 01	C1813A	C2017A		2	
15	I63011 00	C1813A	B1903B		1	
16	I61011 01	C1813B	C1917B		2	
17	I61011 00	C1813B	A1917B		1	
18	K38001 00	C1814A	C1909A		1	
19	I07101 02	C1814B	D1408A		1	
20	I07101 03	C1814B	A2408A		2	
21	I60021 00	C1815A	A1916B		1	
22	I60021 01	C1815A	C1916B		2	
23	K32001 00	C1815B	A2413A		2	
24	K32001 01	C1815B	C2305A		1	
25	I32111 02	C1816A	C1911B		1	
26	I32111 03	C1816A	C1507A		2	
27	I16091 00	C1816B	D1206A		1	
28	I38321 00	C1817A	A0811A		1	
29	I11341 02	C1817B	D1403B		1	
30	200171 00GND	C1901A	C1906B		1	
31	W37003 00	C1902A	C1402B		1	
32	W37004 00	C1902B	D1403A		1	
33	W37014 00	C1903A	C1403B		1	
34	W37011 00	C1903B	D1413B		1	

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TITLE			WL	DOCUMENT NO.	SHEET NO.	REV.
LOGIC WIRE WRAP (REF: 76033500)				HPDE 7335	44	A
LINE NO.	SIGNAL NAME OR NUMBER IDENTIFICATION	ORIGIN	DESTINATION	WIRE COLOR	Z LEVEL	
1	I17151 00	C1904A	D1208A		1	
2	I17121 00	C1904B	D1211A		1	
3	I16011 00	C1905A	D1206B		1	
4	W37012 00	C1905B	C1403A		1	
5	200171 00GND	C1906B	C1901A		1	
6	I50151 01	C1907A	C1212B		2	
7	I50151 02	C1907A	D2307B		1	
8	W37013 00	C1907B	C1404B		1	
9	W37001 00	C1908A	C1402A		1	
10	W37002 00	C1908B	C1414B		1	
11	K38001 00	C1909A	C1814A		1	
12	I38051 01	C1909B	D1802B		2	
13	I38051 02	C1909B	C1604A		1	
14	K20001 01	C1910A	D1097A		2	
15	K20001 00	C1910A	C1615A		1	
16	K34051 00	C1910B	D1410B		1	
17	K32001 03	C1911A	A0805A		1	
18	K32001 02	C1911A	C2305A		2	
19	I32111 02	C1911B	C1816A		1	
20	I32111 01	C1911B	D1611A		2	
21	K37021 00	C1912A	D1410A		1	
22	I39081 00	C1912B	D1611B		1	
23	200201 03GND	C1913A	D1902A		2	
24	200201	C1913A	D1903A		1	
25	K20012 00	C1913B	C1612B		1	
26	I23101 00	C1914A	A0902B		1	
27	I24421	C1914B	B0902A		1	
28	I60071 00	C1915A	A2003A		1	
29	I61131 00	C1915B	A2006A		1	
30	I61131 02	C1915B	C0507A		2	
31	I61091 01	C1916A	C1810B		2	
32	I61091 02	C1916A	D2005B		1	
33	I60021 02	C1916B	D2005A		1	
34	I60021 01	C1916B	C1815A		2	

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TITLE			WL	DOCUMENT NO.	SHEET NO.	REV.
LOGIC WIRE WRAP (REF: 76033500)				HPDE 7335	45	A
LINE NO.	SIGNAL NAME OR NUMBER IDENTIFICATION	ORIGIN	DESTINATION	WIRE COLOR	Z LEVEL	
1	I60121 02	C1917A	D2003B		1	
2	I60121 01	C1917A	C1811A		2	
3	I61011 01	C1917B	C1813B		2	
4	I61011 02	C1917B	D2004A		1	
5	200181 00GND	C2001A	C2006B		2	
6	200081 00GND	C2001A	C2011A		1	
7	A26071 00	C2002A	B1312A		1	
8	I24411 02	C2002B	A2412A		1	
9	I24411 01	C2002B	D2106A		2	
10	I30071 03	C2003A	D2206B		1	
11	I30071 05	C2003A	A2302A		2	
12	I29151 03	C2003B	B1109B		1	
13	I29151 02	C2003B	A2217B		2	
14	I16231 00	C2004A	D1202A		1	
15	I16211 00	C2004B	D1207B		1	
16	I58371 00	C2005A	D2305A		1	
17	K28012 00	C2005B	A2802A		1	
18	I16191 00	C2006A	D1201A		1	
19	200181 00GND	C2006B	C2001A		2	
20	I16201 00	C2007A	D1207A		1	
21	I25041 03	C2007B	B1011B		1	
22	A55111 00	C2008A	A1303A		1	
23	I20011 05	C2008B	C1417A		1	
24	K40011 00	C2009A	C1607B		1	
25	K40011 01	C2009A	C1516B		2	
26	K40001 00	C2009B	C1606B		1	
27	K42011 02	C2010A	C2112A		1	
28	K42021 02	C2010B	C2108B		1	
29	200081 00GND	C2011A	C2001A		1	
30	200081 01GND	C2011A	C2012A		2	
31	K42001 02	C2011B	C2116A		1	
32	200081 01GND	C2012A	C2011A		2	
33	K40021 03	C2012B	D1505A		1	
34	K40021 01	C2012B	C1611A		2	

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TITLE			WL	DOCUMENT NO.	SHEET NO.	REV.
LOGIC WIRE WRAP (REF: 76033500)				HPDE 7335	46	A
LINE NO.	SIGNAL NAME OR NUMBER IDENTIFICATION	ORIGIN	DESTINATION	WIRE COLOR	Z LEVEL	
1	K46011 01	C2013A	D2108A		2	
2	K46011 02	C2013A	D2204A		1	
3	K46001 00	C2013B	C2117B		1	
4	K45011 00	C2014A	C2112B		1	
5	K45001 01	C2014B	C2109A		1	
6	I63111 00	C2015A	A2010A		1	
7	I63111 02	C2015A	C0604A		2	
8	I62041 02	C2015B	C0508B		2	
9	I62041 00	C2015B	A2007A		1	
10	I62011 01	C2016A	C1812B		2	
11	I62011 02	C2016A	D1905B		1	
12	I63081 02	C2016B	D1905A		1	
13	I63081 01	C2016B	C1810A		2	
14	I63011 02	C2017A	D1903B		1	
15	I63011 01	C2017A	C1813A		2	
16	I62081 01	C2017B	C1811B		2	
17	I62081 02	C2017B	D1904A		1	
18	I45141 00	C2102A	C2311A		1	
19	I45131 00	C2102B	D2313A		1	
20	I42101 01	C2103A	C2203A		2	
21	I43101 01	C2104B	C2204B		2	
22	I47111 01	C2106A	C1705A		2	
23	I19191 01	C2106B	A2202B		2	
24	I19131 00	C2107A	A1002A		1	
25	I08031 00	C2107B	A1204A		1	
26	I70001 01	C2108A	C1704A		2	
27	K42021 01	C2108B	C2208B		2	
28	K42021 02	C2108B	C2010B		1	
29	K45001 00	C2109A	D2205A		2	
30	K45001 01	C2109A	C2014B		1	
31	I44151 00	C2109B	D2203B		1	
32	I44011 00	C2110A	D2113A		1	
33	I44211 00	C2110B	D2310B		1	
34	Z08001 01	C2111A	B1206A		2	

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TITLE			WL	DOCUMENT NO.	SHEET NO.	REV.
LOGIC WIRE WRAP (REF: 76033500)				HPDE 7335	47	A
LINE NO.	SIGNAL NAME OR NUMBER IDENTIFICATION	ORIGIN	DESTINATION	WIRE COLOR	Z LEVEL	
1	I06061 00	C2111B	B1202A		1	
2	K42011 01	C2112A	C2212A		2	
3	K42011 02	C2112A	C2010A		1	
4	K45011 00	C2112B	C2014A		1	
5	K45021 00	C2113A	C2312A		1	
6		C2113B			2	
7	M05011 01	C2114A	A1209B		2	
8	A28041 00	C2114B	B1313A		1	
9	I41131 01	C2115A	A1317A		1	
10	I44191 00	C2115B	D2211A		1	
11	K42001 01	C2116A	C2216A		2	
12	K42001 02	C2116A	C2011B		1	
13	K45031 00	C2116B	D2109B		1	
14	K45031 02	C2116B	A1415B		2	
15	I44131 00	C2117A	D2212B		1	
16	K46001 01	C2117B	C2209A		2	
17	K46001 00	C2117B	C2013B		1	
18	200901 00GND	C2201A	C2213B		1	
19	I46141 00	C2202A	C2311B		1	
20	I46131 00	C2202B	D2313B		1	
21	I42101 00	C2203A	C2314A		1	
22	I42101 01	C2203A	C2103A		2	
23	I43101 00	C2204B	C2313A		1	
24	I43101 01	C2204B	C2104B		2	
25	200901 01GND	C2206A	C2213B		2	
26	I19171 02	C2206B	D2102B		1	
27	I44071 00	C2207A	D2110B		1	
28	I44111 00	C2207B	D2212A		1	
29	I47011 00	C2208A	C1713A		1	
30	K42021 01	C2208B	C2108B		2	
31	K42021 00	C2208B	C2304A		1	
32	K46001 02	C2209A	C2315B		1	
33	K46001 01	C2209A	C2117B		2	
34	200301 04GND	C2209B	C2217B		2	

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TITLE		WL	DOCUMENT NO.	SHEET NO.	REV.
LOGIC WIRE WRAP (REF: 76033500)			HPDE 7335	48	A
LINE NO.	SIGNAL NAME OR NUMBER IDENTIFICATION	ORIGIN	DESTINATION	WIRE COLOR	Z LEVEL
1	I44091 00	C2210A	D2213A		1
2	200301 00GND	C2210B	C2217B		1
3	200301 01GND	C2210B	D2201A		2
4	K29001 00	C2211A	D2101A		2
5	I50061 00	C2211B	C1712A		1
6	K42011 01	C2212A	C2112A		2
7	K42011 00	C2212A	C2309B		1
8	K46011 00	C2212B	D2108A		1
9	K46021 00	C2213A	C2304B		1
10	200901 00GND	C2213B	C2201A		1
11	200901 01GND	C2213B	C2206A		2
12	I44171 00	C2214A	D2203A		1
13	I55031 00	C2214B	A1314B		1
14	I44051 00	C2215A	D2112B		1
15	I47101 00	C2215B	C1707A		1
16	K42001 01	C2216A	C2116A		2
17	K42001 00	C2216A	C2309A		1
18	K46031 00	C2216B	C2314B		1
19	K50021 01	C2217A	D2202A		2
20	200301 04GND	C2217B	C2209B		2
21	200301 00GND	C2217B	C2210B		1
22	I05011 01	C2302A	A0211B		2
23	I05011 00	C2302A	C2302B		1
24	I05011 00	C2302B	C2302A		1
25	I29061 00	C2303A	B2202A		1
26	I44201 00	C2303B	D2107A		1
27	K42021 00	C2304A	C2208B		1
28	K46021 00	C2304B	C2213A		1
29	K46021 01	C2304B	D2004B		2
30	K32001 01	C2305A	C1815B		1
31	K32001 02	C2305A	C1911A		2
32	I15061 01	C2306B	C1706B		2
33	I15041 01	C2307A	C1704B		2
34	I15191 00	C2307B	C1210A		1

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TITLE			WL	DOCUMENT NO.	SHEET NO.	REV.
LOGIC WIRE WRAP (REF: 76033500)				HPDE 7335	49	A
LINE NO.	SIGNAL NAME OR NUMBER IDENTIFICATION	ORIGIN	DESTINATION	WIRE COLOR	Z LEVEL	
1	I42041 00	C2308A	A1005B		1	
2	I15201 00	C2308B	C1214B		1	
3	K42001 00	C2309A	C2216A		1	
4	K42011 00	C2309B	C2212A		1	
5	I32121 01	C2310A	B2502A		2	
6	I15181 00	C2310B	C1209B		1	
7	I45141 00	C2311A	C2102A		1	
8	I46141 00	C2311B	C2202A		1	
9	K45021 01	C2312A	D2002B		2	
10	K45021 00	C2312A	C2113A		1	
11	K45031 03	C2312B	D2002A		1	
12	I43101 00	C2313A	C2204B		1	
13	K43011 00	C2313B	D1705B		1	
14	I42101 00	C2314A	C2203A		1	
15	I42101 02	C2314A	A2817B		2	
15	K46031 00	C2314B	C2216B		1	
16	K46031 01	C2314B	D2003A		2	
17	I43191 00	C2315A	A1009B		1	
18	K46001 03	C2315B	D2206A		2	
19	K46001 02	C2315B	C2209A		1	
20	300151 00	D0104A	D0104B		1	
21	300151 00	D0104B	D0104A		1	
22	R68061 00	D0106A	D0810B		1	
23	R68051 00	D0106B	D0806A		2	
24	300091 00GND	D0108A	D0108B		1	
25	300091 00GND	D0108B	D0108A		1	
26	300101 00GND	D0109A	D0109B		1	
27	300101 00GND	D0109B	D0109A		1	
28	R68161 00	D0112A	C0808A		1	
29	R68171 00	D0113A	C0807A		1	
30	R68181 00	D0113B	C0806B		1	
31	200007 00	D0201A	D0209A		1	
32	I39101 00	D0206A	D1804A		1	
33	I39101 01	D0206A	D0206B		2	
34	I39101 00	D0206A	D1804A		1	

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TITLE			WL	DOCUMENT NO.	SHEET NO.	REV.
LOGIC WIRE WRAP (REF: 76033500)				HPDE 7335	50	A
LINE NO.	SIGNAL NAME OR NUMBER IDENTIFICATION	ORIGIN	DESTINATION	WIRE COLOR	Z LEVEL	
1	I39101 01	D0206B	D0206A		2	
2	I39101 02 I07191 13	D0206B D0207A	D0506A D0207B		1 2	
3	I07191 14	D0207A	C0209B		1	
4	I07191 13	D0207B	D0207A		2	
5	I07191 12	D0207B	D0211A		1	
6	I39121 01	D0208A	D0208B		1	
7	I39121 02	D0208A	D0508B		2	
8	I39121 01	D0208B	D0208A		1	
9	I39121 00	D0208B	D1805B		2	
10	200007 00	D0209A	D0201A		1	
11	K51011 00	D0210A	D1710B		1	
12	I06201 06	D0210B	C0309B		1	
13	I06201 07	D0210B	B1401B		2	
14	I07191 11	D0211A	D0212A		2	
15	I07191 12	D0211A	D0207B		1	
16	I07191 10	D0212A	C0308A		1	
17	I07191 11	D0212A	D0211A		2	
18	I09231 01	D0212B	D0213A		2	
19	I09231 00	D0213A	D0813B		1	
20	I09231 01	D0213A	D0212B		2	
21	DRIVES EL500	D0306A	JD9005B		1	
22	DRIVES EL501	D0306A	D0606A		2	
23	I07191 08	D0306B	D0308A		1	
24	I07191 09	D0306B	C0308A		2	
25	I06201 04	D0307A	D0307B		1	
26	I06201 05	D0307A	C0309B		2	
27	I06201 04	D0307B	D0307A		1	
28	I06201 03	D0307B	D0309A		2	
29	I07191 07	D0308A	D0310B		2	
30	I07191 08	D0308A	D0306B		1	
31	DRIVES EL400	D0308B	JD9004B		1	
32	DRIVES EL401	D0308B	D0608B		2	
33	I06201 02	D0309A	D0311A		1	
34	I06201 03	D0309A	D0307B		2	

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TITLE			WL	DOCUMENT NO.	SHEET NO.	REV.
LOGIC WIRE WRAP (REF: 76033500)				HPDE 7335	51	A
LINE NO.	SIGNAL NAME OR NUMBER IDENTIFICATION	ORIGIN	DESTINATION	WIRE COLOR	Z LEVEL	
1	I07191 05	D0309B	D0312B		2	
2	I07191 04	D0309B	C0306B		1	
3	DRIVES EL300	D0310A	JD9003B		1	
4	DRIVES EL301	D0310A	D0610A		2	
5	I07191 07	D0310B	D0308A		2	
6	I07191 06	D0310B	D0312B		1	
7	I06201 02	D0311A	D0309A		1	
8	I06201 01	D0311A	D0312A		2	
9	DRIVES EL100	D0311B	JD9001B		1	
10	DRIVES EL101	D0311B	D0611B		2	
11	I06201 00	D0312A	D2103B		1	
12	I06201 01	D0312A	D0311A		2	
13	I07191 06	D0312B	D0310B		1	
14	I07191 05	D0312B	D0309B		2	
15	DRIVES EL200	D0313A	JD9002B		1	
16	DRIVES EL201	D0313A	D0613A		2	
17	300161 00	D0404A	D0404B		1	
18	300161 00	D0404B	D0404A		1	
19	R69061 00	D0406A	D0910B		1	
20	R69051 00	D0406B	D0906A		1	
21	201009 00	D0408A	D0408B		1	
22	201009 00	D0408B	D0408A		1	
23	201009 01	D0409A	D0409B		2	
24	201009 01	D0409B	D0409A		2	
25	R69161 00	D0412A	C0908A		1	
26	R69171 00	D0413A	C0907A		1	
27	R69181 00	D0413B	C0906B		1	
28	200161 05GND	D0414A	JD4906A		2	
29	I39101 03	D0506A	D0506B		2	
30	I39101 02	D0506A	D0206B		1	
31	I39101 03	D0506B	D0506A		2	
32	I06111 03	D0507A	D0507B		2	
33	I06111 04	D0507A	C0509B		1	
34	I06111 02	D0507B	D0511A		1	

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TITLE			WL	DOCUMENT NO.	SHEET NO.	REV.
LOGIC WIRE WRAP (REF: 76033500)				HPDE 7335	52	A
LINE NO.	SIGNAL NAME OR NUMBER IDENTIFICATION	ORIGIN	DESTINATION	WIRE COLOR	Z LEVEL	
1	I06111 03	D0507B	D0507A		2	
2	I39121 03	D0508A	D0508B		1	
3	I39121 02	D0508B	D0208A		2	
4	I39121 03	D0508B	D0508A		1	
5	200008 00	D0509A	D0514A		1	
6	K51011 01	D0510A	D1710B		2	
7	I06211 06	D0510B	C0609B		1	
8	I06111 07	D0510B	D1101B		2	
9	I06111 01	D0511A	D0512A		2	
10	I06111 02	D0511A	D0507B		1	
11	I06111 00	D0512A	C1016A		1	
12	I06111 01	D0512A	D0511A		2	
13	I10231 01	D0512B	D0513A		2	
14	I10231 00	D0513A	D0913B		1	
15	I10231 01	D0513A	D0512B		2	
16	200008 00	D0514A	D0509A		1	
17	DRIVES EL501	D0606A	D0306A		2	
18	I06111 14	D0606B	C0608A		1	
19	I06111 13	D0606B	D0608A		2	
20	I06211 04	D0607A	D0607B		1	
21	I06211 05	D0607A	C0609B		2	
22	I06211 04	D0607B	D0607A		1	
23	I06211 03	D0607B	D0609A		2	
24	I06111 13	D0608A	D0606B		2	
25	I06111 12	D0608A	D0610B		1	
26	DRIVES EL401	D0608B	D0308B		2	
27	I06211 03	D0609A	D0607B		2	
28	I06211 02	D0609A	D0611A		1	
29	I06111 10	D0609B	D0612B		1	
30	I06111 09	D0609B	C0506B		2	
31	DRIVES EL301	D0610A	D0310A		2	
32	I06111 11	D0610B	D0612B		2	
33	I06111 12	D0610B	D0608A		1	
34	I06211 01	D0611A	D0612A		2	

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TITLE			WL	DOCUMENT NO.	SHEET NO.	REV.
LOGIC WIRE WRAP (REF: 76033500)				HPDE 7335	53	A
LINE NO.	SIGNAL NAME OR NUMBER IDENTIFICATION	ORIGIN	DESTINATION	WIRE COLOR	Z LEVEL	
1	I06211 02	D0611A	D0609A		1	
2	DRIVES EL101	D0611B	D0311B		2	
3	I06211 01	D0612A	D0611A		2	
4	I06211 00	D0612A	D2210B		1	
5	I06111 11	D0612B	D0610B		2	
6	I06111 10	D0612B	D0609B		1	
7	DRIVES EL201	D0613A	D0313A		2	
8	I14071 02	D0701A	C1413B		2	
9	I14071 00	D0701A	C1211B		1	
10	I13061 00	D0701B	C0908B		1	
11	I13071 00	D0702A	C0907B		1	
12	I14081 02	D0702B	D1402B		2	
13	I14081 00	D0702B	C1212A		1	
14	I14051 00	D0703A	C1207B		1	
15	I14051 02	D0703A	D1413A		2	
16	I13041 00	D0703B	C0911A		1	
17	I12071 00	D0704A	C0807B		1	
18	I12041 00	D0704B	C0811A		1	
19	I12021 00	D0705A	C0805A		1	
20	I12031 00	D0705B	C0811B		1	
21	I13021 00	D0706A	C0905A		1	
22	I14031 02	D0706B	C1405B		2	
23	I14031 00	D0706B	C1206B		1	
24	I14041 00	D0707A	C1207A		1	
25	I13031 00	D0707B	C0911B		1	
26	I13001 00	D0708A	C0912A		1	
27	I14011 00	D0708B	C1205B		1	
28						
29	I14021 02	D0709A	C1405A		2	
30	I14021 00	D0709A	C1206A		1	
31	I13011 00	D0709B	C0904A		1	
32	I12001 00	D0710A	C0812A		1	
33	I12011 00	D0710B	C0804A		1	
34	I10121 00	D0711B	D0903A		1	

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TITLE			WL	DOCUMENT NO.	SHEET NO.	REV.
LOGIC WIRE WRAP (REF: 76033500)				HPDE 7335	54	A
LINE NO.	SIGNAL NAME OR NUMBER IDENTIFICATION	ORIGIN	DESTINATION	WIRE COLOR	Z LEVEL	
1	I11191 00	D0712A	A0704B		1	
2	I09121 02	D0712B	A1217B		2	
3	I09121 00	D0712B	D0803A		1	
4	I11061 00	D0713A	D0813A		1	
5	I40231 03	D0801A	D2308A		2	
6	I40231 02	D0801A	D1711A		1	
7	I09271 00	D0801B	C1803B		1	
8	I09101 00	D0802A	B1203B		1	
9	I12281 00	D0802B	A0212B		1	
	I12281 01	D0802B	C1608B		2	
10	I09121 01	D0803A	D1704A		2	
11	I09121 00	D0803A	D0712B		1	
12	I12241 00	D0804A	B1402A		1	
13	I12241 05	D0804A	B1201A		2	
14	R68001 00	D0804B	C0102B		1	
15	R68041 00	D0805A	C0116B		1	
16	R68031 00	D0805B	C0115B		1	
17	R68051 00	D0806A	D0106B		2	
18	I09181 00	D0806B	C0705A		1	
19	I09181 02	D0806B	D0906B		2	
20	R68021 00	D0807A	C0115A		1	
21	I09191 00	D0807B	C0704B		1	
22	I09191 02	D0807B	D0907B		2	
23	I09311 00	D0808A	C0714A		1	
24	Y11006 00	D0808B	C0702A		1	
25	Y11006 01	D0808B	D0908B		2	
26	I09291 00	D0809A	D2103A		1	
27	I09381 00	D0809B	C0306A		1	
28	R68011 00	D0810A	C0105B		1	
29	R68061 00	D0810B	D0106A		1	
30	I09201 02	D0811A	D0911A		2	
31	I09201 00	D0811A	C0706A		1	
32	I09211 00	D0811B	C0705B		1	
33	I09211 02	D0811B	D0911B		2	
34	I16181 02	D0812A	B1211A		1	

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TITLE			WL	DOCUMENT NO.	SHEET NO.	REV.
LOGIC WIRE WRAP				HPDE 7335	55	H
LINE NO.	SIGNAL NAME OR NUMBER IDENTIFICATION	ORIGIN	DESTINATION	WIRE COLOR	Z LEVEL	
1	I16181 03	D0812A	D0912A		2	
2	I09221 00	D0812B	C0704A		1	
3	I09221 02	D0812B	D0912B		2	
4	I11061 00	D0813A	D0713A		1	
5	I11061 01	D0813A	D0913A		2	
6	I09231 00	D0813B	D0213A		1	
7	I40231 04	D0901A	D2308A		1	
8	I10271 00	D0901B	D2110A		1	
9	I10101 00	D0902A	C1011B		1	
10	I12281 03	D0902B	C1608B		1	
11	I12281 02 I10121 01	D0902B D0903A	D1811A D1704B		2 2	
12	I10121 00	D0903A	D0711B		1	
13	I13241 00	D0904A	C1005A		1	
14	R69001 00	D0904B	C0402B		1	
15	R69041 00	D0905A	C0416B		1	
16	R69031 00	D0905B	C0415B		1	
17	R69051 00	D0906A	D0406B		1	
18	I09181 02	D0906B	D0806B		2	
19	R69021 00	D0907A	C0415A		1	
20	I09191 02	D0907B	D0807B		2	
21	I10311 00	D0908A	C0715B		1	
22	Y11006 01	D0908B	D0808B		2	
23	I10291 00	D0909A	D2111A		1	
24	I10381 00	D0909B	C1004A		1	
25	R69011 00	D0910A	C0405B		1	
26	R69061 00	D0910B	D0406A		1	
27	I09201 02	D0911A	D0811A		2	
28	I09211 02	D0911B	D0811B		2	
29	I16181 03	D0912A	D0812A		2	
30	I09221 02	D0912B	D0812B		2	
31	I11061 01	D0913A	D0813A		2	
32	I10231 00	D0913B	D0513A		1	
33	K18041 00	D1002A	C1007B		1	
34	K18042 02	D1004A	D1010A		2	

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TITLE			WL	DOCUMENT NO.	SHEET NO.	REV.
LOGIC WIRE WRAP (REF: 76033500)				HPDE 7335	56	A
LINE NO.	SIGNAL NAME OR NUMBER IDENTIFICATION	ORIGIN	DESTINATION	WIRE COLOR	Z LEVEL	
1	K18042 00	D1004A	C0803A		1	
2	K18042 02	D1004A	D1010A		2	
	I18281 00	D1005A	C0802B		1	
3	I18271 00	D1006A	C0902B		1	
4	K18032 02	D1006B	D1010B		2	
5	K18032 00	D1006B	C0803A		1	
6	K18002 00	D1007A	D0904B		1	
7	K18052 00	D1007B	D1201B		1	
8	I18241 00	D1008B	C1516A		1	
9	K18051 00	D1009A	C0915A		1	
10	K18042 02	D1010A	D1004A		2	
11	K18032 02	D1010B	D1006B		2	
12	I13241 03	D1011A	D2209B		1	
13	I13241 04	D1011A	C1005A		2	
14						
15						
16	I12241 02	D1012B	C1002A		1	
17	I12241 03	D1012B	D2105A		2	
18	I06181 00	D1013A	C1009B		1	
19	I06171 00	D1013B	C1003A		1	
20	I06111 19	D1101A	C0603A		2	
21	I06111 20	D1101A	D1102B		1	
22	I06211 08	D1101B	C1112A		1	
23	I06211 07	D1101B	D0510B		2	
24	I13241 05	D1102A	C1008A		2	
25	I13241 01	D1102A	D2209A		1	
26	I06111 20	D1102B	D1101A		1	
27	I32161 04	D1103A	D1103B		1	
28	I32161 03	D1103B	B1403B		2	
29	I32161 04	D1103B	D1103A		1	
30	201010 04	D1104B	D1114A		1	
31	T71011 00	D1105A	D1106A		1	
32	T71012 00	D1105B	D1106B		1	
33	T71011 00	D1106A	D1105A		1	
34	T71012 00	D1106B	D1105B		1	

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TITLE			WL	DOCUMENT NO.	SHEET NO.	REV.
LOGIC WIRE WRAP (REF: 76033500)				HPDE 7335	57	A
LINE NO.	SIGNAL NAME OR NUMBER IDENTIFICATION	ORIGIN	DESTINATION	WIRE COLOR	Z LEVEL	
1	T71031 00	D1108A	D1109A		1	
2	T71032 00	D1108B	D1109B		1	
3	T71031 00	D1109A	D1108A		1	
4	T71032 00	D1109B	D1108B		1	
5	300071 01	D1110B	C0516B		2	
6	300071 00	D1110B	JA8302B		1	
7	201010 04	D1114A	D1104B		1	
8	I16191 00	D1201A	C2006A		1	
9	I16061 00	D1201B	D1607B		1	
10	I16231 00	D1202A	C2004A		1	
11	I16111 00	D1202B	B2311B		1	
12	I16081 00	D1203A	D1605A		1	
13	I16221 00	D1203B	D2304B		1	
14	I11331 00	D1204A	C0713A		1	
15	I16071 00	D1204B	D1602B		1	
16	I11291 00	D1205A	C0713B		1	
17	I11291 01	D1205A	A1306B		2	
18	I11281 00	D1205B	C0711A		1	
19	I16091 00	D1206A	C1816B		1	
20	I16011 00	D1206B	C1905A		1	
21	I16201 00	D1207A	C2007A		1	
22	I16211 00	D1207B	C2004B		1	
23	I17151 00	D1208A	C1904A		1	
24	I17091 00	D1208B	A1904B		1	
25	I11301 00	D1209A	C0712A		1	
26	I11341 00	D1209B	C0714B		1	
27	I11341 01	D1209B	D1403B		2	
28	I11311 02	D1210A	A1303B		2	
29	I11271 00	D1210B	A0707B		1	
	I11271 01	D1210B	A0707B		1	
30	I17121 00	D1211A	C1904B		1	
31	I17061 00	D1211B	A1905A		1	
32	I11271 00	D1212A	D1210B		2	
	I11271 00	D1212A	C0711B		1	
33	I17031 00	D1212B	A1904A		1	
34	I16161 00	D1213A	D1605B		1	

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TITLE			WL	DOCUMENT NO.	SHEET NO.	REV.
LOGIC WIRE WRAP (REF: 76033500)				HPDE 7335	58	A
LINE NO.	SIGNAL NAME OR NUMBER IDENTIFICATION	ORIGIN	DESTINATION	WIRE COLOR	Z LEVEL	
1	I11321 00	D1213B	C0708A		1	
2	I23211 04	D1401A	C1416A		2	
3	I35071 00	D1401B	A1108A		1	
4	I36191 02	D1402A	D1612A		2	
5	I36191 00	D1402A	C1803A		1	
6	I14081 02	D1402B	D0702B		2	
7	W37004 00	D1403A	C1902B		1	
8	I11341 02	D1403B	C1817B		1	
9	I11341 01	D1403B	D1209B		2	
10	I15021 00	D1404A	C1210B		1	
11	I07101 01	D1404B	D1408A		2	
12	I07101 00	D1404B	D1811B		1	
13	I35151 00	D1406A	B1105B		1	
14	I34061 00	D1406B	A2509B		1	
15	K34032 00	D1407A	B2407A		1	
16	K37002 00	D1407B	B0903A		1	
17	I07101 01	D1408A	D1404B		2	
18	I07101 02	D1408A	C1814B		1	
19	K37022 00	D1409B	A2409B		1	
20	K37021 00	D1410A	C1912A		1	
21	K37021 01	D1410A	D1612B		2	
22	K34051 01	D1410B	D1907B		2	
23	K34051 00	D1410B	C1910B		1	
24	I35081 00	D1411A	B1105A		1	
25	I36111 00	D1411B	C1410A		1	
26	I35121 00	D1412B	A1107B		1	
27	I14051 02	D1413A	D0703A		2	
28	I14051 W37011 00	D1413A D1413B	C1614A C1903B		1 1	
29	I48131 00	D1501A	D1505B		1	
30	I27281 00	D1501B	B2811A		1	
31	K20002 01	D1502A	C1602A		1	
32	K20002 02	D1502A	A0808B		2	
33	I23121 I23121	D1502B D1502B	A0908A B1213A		2 1	
34	I21231 00	D1503A	B1808A		1	

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TITLE			WL	DOCUMENT NO.	SHEET NO.	REV.
LOGIC WIRE WRAP (REF: 76033500)				HPDE 7335	59	A
LINE NO.	SIGNAL NAME OR NUMBER IDENTIFICATION	ORIGIN	DESTINATION	WIRE COLOR	Z LEVEL	
1	I48141 00	D1503B	D1507A		1	
2	X34021 00	D1504A	D1710A		1	
3	X48002 00	D1504B	A1210A		1	
4	K40021 03	D1505A	C2012B		1	
5	K40021 04	D1505A	C1514B		2	
6	I48131 01	D1505B	D1703A		2	
7	I48131 00	D1505B	D1501A		1	
8	I21271 00	D1506A	B1811A		2	
9	I48141 01	D1506B	D1507A		2	
10	I48141 00	D1507A	D1503B		1	
11	I48141 01	D1507A	D1506B		2	
12	I48151 00	D1507B	JA8104B		1	
13	I48021 02	D1508A	D2302B		2	
14	I15021 01	D1508B	C1210B		2	
15	K20001 03	D1509A	B1811B		1	
16	K20001 02	D1509A	C1615A		2	
17	K20001 04	D1509B	B1811B		2	
18	I27291 00	D1510A	B2811B		1	
19	I31081 01	D1510B	A2305B		2	
20	I48171 00	D1512A	JA8102B		2	
21	I48111 00	D1512B	C1603B		1	
22	I34091 00	D1513B	A2417B		1	
23	I20151 00	D1601A	A1202B		1	
24	I20011 00	D1601B	D1801B		1	
25	I20011 02	D1601B	C1417A		2	
26	I20171 00	D1602A	B2309B		1	
27	I16071 00	D1602B	D1204B		1	
28	I23191 01	D1603A	A1816A		2	
29	I16121 00	D1603B	C1216A		1	
30	I16051 00	D1604A	C1217B		1	
31	800030 00	D1604B	B2003B		1	
32	I16081 00	D1605A	D1203A		1	
33	I16081 01	D1605A	A1211B		2	
34	I16161 00	D1605B	D1213A		1	

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TITLE			WL	DOCUMENT NO.	SHEET NO.	REV.
LOGIC WIRE WRAP (REF: 76033500)				HPDE 7335	60	A
LINE NO.	SIGNAL NAME OR NUMBER IDENTIFICATION	ORIGIN	DESTINATION	WIRE COLOR	Z LEVEL	
1	I16161 01	D1605B	A1211A		2	
2	I20021 00	D1606A	B1308A		1	
3	I07081 00	D1606B	D1803A		1	
4	I07081 02	D1606B	A0711B		2	
5	I20081 00	D1607A	A2517A		1	
6	I16061 00	D1607B	D1201B		1	
7	I20031 00	D1608A	B2601B		1	
8	K40021 00	D1609A	C1611A		1	
9	K40021 02	D1609A	D2303B		2	
10	I20051 00	D1609B	A2617B		1	
11	I22041 00	D1610A	A1112B		1	
12	W22004 01	D1610B	B1801B		2	
13	I32111 00	D1611A	B2404B		1	
14	I32111 01	D1611A	C1911B		2	
15	I39081 00	D1611B	C1912B		1	
16	I36191 02	D1612A	D1402A		2	
17	K37021 01	D1612B	D1410A		2	
18	I39051 00	D1613A	D1802A		1	
19	I50151 00	D1701A	C1212B		1	
20	I40071 00	D1701B	C1616B		1	
21	I44191 01	D1702A	D1909A		1	
22	I50001 00	D1702B	B0804A		1	
23	I48131 01	D1703A	D1505B		2	
24	I09121 01	D1704A	D0803A		2	
25	I10121 01	D1704B	D0903A		2	
26	I16181 00	D1705A	C1215B		1	
27	K43011 00	D1705B	C2313B		1	
28	X52001 00	D1706A	JA8114A		1	
29	I50031 00	D1706B	A1008A		1	
30	I11261 00	D1707A	C0710A		1	
31	I47211 00	D1707B	C1708B		1	
32	I40231 00	D1708A	C1603A		1	
33	I40231 01	D1708A	D1711A		2	
34	K51012 00	D1700A	C1605B		1	

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TITLE			WL	DOCUMENT NO.	SHEET NO.	REV.
LOGIC WIRE WRAP				HPDE 7335	61	H
LINE NO.	SIGNAL NAME OR NUMBER IDENTIFICATION	ORIGIN	DESTINATION	WIRE COLOR	Z LEVEL	
1	K51012 02	D1709A	A2014A		2	
2	K51001 00	D1709B	D2007B		1	
3	X34021 00	D1710A	D1504A		1	
4	K51011 01	D1710B	D0510A		2	
5	K51011 00	D1710B	D0210A		1	
6	I40231 01	D1711A	D1708A		2	
7	I40231 02	D1711A	D0801A		1	
8	I51081 00	D1711B	D2008A		1	
9	K50032 01	D1712A	B0803A		2	
10	K50032 00	D1712A	D2310A		1	
11	K50031 00	D1712B	D2013A		1	
12	K50021 00	D1713A	D2202A		1	
13	200151 00GND	D1714A	JA8114B		1	
14	I39031 00	D1801A	A0604A		1	
15	I39031 01	D1801A	A2812B		2	
15	I20011 00	D1801B	D1601B		1	
16	I20011 01	D1801B	A2213A		2	
17	I39051 00	D1802A	D1613A		1	
18	I38051 01	D1802B	C1909B		2	
19	I38051 00	D1802B	C1809A		1	
20	I07081 01	D1803A	C1002B		2	
21	I07081 00	D1803A	C1606B		1	
22	500006 02	D1803B	D1807B		1	
23	I39101 00	D1804A	D0206A		1	
24	I39121 00	D1805B	D0208B		2	
25	M12001 01	D1807B	C1809B		2	
26	I36191 01	D1809A	C1803A		2	
27	I07101 05	D1809B	C1508A		1	
28	I07101 04	D1809B	D1811B		2	
29	I07201 03	D1810A	C1103A		2	
30	I07201 02	D1810A	C1609A		1	
31	I07121 00	D1810B	B1801A		1	
32	I07121 01	D1810B	C1510A		2	
33	I12281 02	D1811A	D0902B		2	
34						

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TITLE			WL	DOCUMENT NO.	SHEET NO.	REV.
LOGIC WIRE WRAP (REF: 76033500)				HPDE 7335	62	A
LINE NO.	SIGNAL NAME OR NUMBER IDENTIFICATION	ORIGIN	DESTINATION	WIRE COLOR	Z LEVEL	
1	I07101 04	D1811B	D1809B		2	
2	I07101 00	D1811B	D1404B		1	
3	I07011 00	D1812A	A2804B		1	
4	I19221 04	D1812B	A2803B		1	
5	I07161 00	D1813A	C0102A		1	
6	I07191 00	D1813B	C0307B		1	
7	I61051 00	D1901A	A2005A		1	
8	I60161 00	D1901B	A2004A		1	
9	200201 02	D1902A	D1914A		1	
10	200201 03GND	D1902A	C1913A		2	
11	200201 01GND	D1902B	D1914A		2	
12	200201 GND	D1902B	D1914B		1	
13	200201 GND	D1903A	D1904B		2	
	200201 GND	D1903A	C1913A		1	
14	I63011 02	D1903B	C2017A		1	
15	I62081 02	D1904A	C2017B		1	
16	200201 GND	D1904B	D1902B		1	
	200201 GND	D1904B	D1903A		2	
17	I63081 02	D1905A	C2016B		1	
18	I62011 02	D1905B	C2016A		1	
19	I34072 01	D1906A	A2508B		1	
20	I70111 00	D1906B	A1002B		1	
21	K20001 01	D1907A	C1910A		2	
22	K34051 01	D1907B	D1410B		2	
23	M05081 00	D1908A	A0409B		1	
24	I23091 00	D1908B	A0904A		1	
25	I44191 02	D1909A	D2211A		2	
26	I44191 01	D1909A	D1702A		1	
27	I21161 00	D1909B	B0905B		1	
28	200201 02	D1914A	D1902A		1	
29	200201 01GND	D1914A	D1902B		2	
30	I62111 00	D2001A	A2008A		1	
31	I62111 02	D2001A	C0604B		2	
32	I63041 02	D2001B	C0603B		2	
33	I63041 00	D2001B	A2009A		1	
34	K45031 01	D2002A	D2109B		2	

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TITLE			WL	DOCUMENT NO.	SHEET NO.	REV.
LOGIC WIRE WRAP (REF: 76033500)				HPDE 7335	63	A
LINE NO.	SIGNAL NAME OR NUMBER IDENTIFICATION	ORIGIN	DESTINATION	WIRE COLOR	Z LEVEL	
1	K45031 03	D2002A	C2312B		1	
2	K45021 01	D2002B	C2312A		2	
3	K45021 02	D2002B	D2107B		1	
4	K46031 01	D2003A	C2314B		2	
5	I60121 02	D2003B	C1917A		1	
6	I61011 02	D2004A	C1917B		1	
7	K46021 01	D2004B	C2304B		2	
8	I60021 02	D2005A	C1916B		1	
9	I61091 02	D2005B	C1916A		1	
10	I41201	D2006A	B2803B		2	
11	I26051 00	D2006B	B0911A		1	
	I26051 01	D2006B	D2106A		2	
12	I05051 00	D2007A	A0209A		1	
13	K51001 00	D2007B	D1709B		1	
14	I51081 00	D2008A	D1711B		1	
15	K43012 00	D2008B	D2309B		1	
16	I59271 00	D2009A	A1004A		1	
17	M08001 00	D2009B	A0208B		1	
18	W51011	D2010A	B0808B		1	
19	W51004 00	D2010B	B0807B		1	
20	W51002	D2011A	B0805B		1	
21	W51001	D2011B	B0803B		1	
22						
23						
24	W51003 00	D2012A	B0805A		1	
25	M05091	D2012B	A0410B		1	
26	K50031 00	D2013A	D1712B		1	
27	K50031 01	D2013A	A2516A		2	
28	W51012 00	D2013B	B0810B		1	
29	K29001 00	D2101A	C2211A		2	
30	K29001 01	D2101A	B2204B		1	
31	I44031 00	D2101B	D2112A		1	
32	I37191 00	D2102A	C1707B		1	
33	I19171 02	D2102B	C2206B		1	
34	I19171 01	D2102B	A2211A		2	

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TITLE			WL	DOCUMENT NO.	SHEET NO.	REV.
LOGIC WIRE WRAP (REF: 76033500)				HPDE 7335	64	A
LINE NO.	SIGNAL NAME OR NUMBER IDENTIFICATION	ORIGIN	DESTINATION	WIRE COLOR	Z LEVEL	
1	I09291 00	D2103A	D0809A		1	
2	I06201 00	D2103B	D0312A		1	
3	I09261 01	D2104A	C1804B		2	
4	I09271 01	D2104B	C1803B		2	
5	I12241 04	D2105A	D2105B		1	
6	I12241 03	D2105A	D1012B		2	
7	I12241 04	D2105B	D2105A		1	
8	I24411 01	D2106A	C2002B		2	
9	I26051 01	D2106B	D2006B		2	
10	I44201 00	D2107A	C2303B		1	
11	K45021 03	D2107B	D2208B		2	
12	K45021 02	D2107B	D2002B		1	
13	K46011 01	D2108A	C2013A		2	
14	K46011 00	D2108A	C2212B		1	
15	I31091 02	D2108B	D2109A		1	
16	I31091 03	D2108B	C1709B		2	
17	I31091 01	D2109A	D2202B		2	
18	I31091 02	D2109A	D2108B		1	
19	K45031 01	D2109B	D2002A		2	
20	K45031 00	D2109B	C2116B		1	
21	I10271 00	D2110A	D0901B		1	
22	I10271 01	D2110A	C1804A		2	
23	I44071 00	D2110B	C2207A		1	
24	I10291 00	D2111A	D0909A		1	
25	I10261 01	D2111B	C1805A		2	
26	I10261 00	D2111B	C0915B		1	
27	I44031 00	D2112A	D2101B		1	
28	I44051 00	D2112B	C2215A		1	
29	I44011 00	D2113A	C2110A		1	
30	200301 02GND	D2201A	D2201B		1	
31	200301 01GND	D2201A	C2210B		2	
32	200301 02GND	D2201B	D2201A		1	
33	200301 03GND	D2201B	D2214A		2	
34	K50021 01	D2202A	C2217A		2	

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TITLE			WL	DOCUMENT NO.	SHEET NO.	REV.
LOGIC WIRE WRAP (REF: 76033500)				HPDE 7335	65	A
LINE NO.	SIGNAL NAME OR NUMBER IDENTIFICATION	ORIGIN	DESTINATION	WIRE COLOR	Z LEVEL	
1	K50021 00	D2202A	D1713A		1	
2	I31091 01	D2202B	D2109A		2	
3	I31091 00	D2202B	A2808B		1	
4	I44171 00	D2203A	C2214A		1	
5	I44151 00	D2203B	C2109B		1	
6	K46011 02	D2204A	C2013A		1	
7	I30071 04	D2204B	D2206B		2	
8	K45001 00	D2205A	C2109A		2	
9	I48061 06	D2205B	D2302A		2	
10	K46001 03	D2206A	C2315B		2	
11	I30071 04	D2206B	D2204B		2	
12	I30071 03	D2206B	C2203A		1	
13	I05021 02	D2207A	A0210A		2	
14	I05021 03	D2207A	C1702B		1	
15	I41111 01	D2207B	B1210B		2	
16	I15121 00	D2208A	C1209A		1	
17	K45021 03	D2208B	D2107B		2	
18	I13241 02	D2209A	D2209B		2	
19	I13241 01	D2209A	D1102A		1	
20	I13241 03	D2209B	D1011A		1	
21	I13241 02	D2209B	D2209A		2	
22	I05021 04	D2210A	C1702B		2	
23	I06211 00	D2210B	D0612A		1	
24	I44191 00	D2211A	C2115B		1	
25	I44191 02	D2211A	D1909A		2	
26	I52071 00	D2211B	JA8107A		1	
27	I44111 00	D2212A	C2207B		1	
28	I44131 00	D2212B	C2117A		1	
29	I44091 00	D2213A	C2210A		1	
30	200301 03GND	D2214A	D2201B		2	
31	I48061 00	D2302A	A1705B		1	
32	I48061 06	D2302A	D2205B		2	
33	I48021 02	D2302B	D1508A		2	
34	I48021 01	D2302B	B1803B		1	

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TITLE			WL	DOCUMENT NO.	SHEET NO.	REV.
LOGIC WIRE WRAP (REF: 76033500)				HPDE 7335	66	A
LINE NO.	SIGNAL NAME OR NUMBER IDENTIFICATION	ORIGIN	DESTINATION	WIRE COLOR	Z LEVEL	
1	I47111 02	D2303A	A1615B		2	
2	I47111 00	D2303A	C1705A		1	
3	K40021 02	D2303B	D1609A		2	
4	I11241 01	D2304A	C1203B		2	
5	I16221 00	D2304B	D1203B		1	
6	I58371 00	D2305A	C2005A		1	
7	I47131 00	D2305B	C1705B		1	
8	I15141 01	D2306B	C1204B		2	
9	I31091 05	D2307A	C1703B		2	
10	I31091 04	D2307A	C1709B		1	
11	I50151 02	D2307B	C1907A		1	
12	I40231 03	D2308A	D0801A		2	
13	I40231 04	D2308A	D0901A		1	
14	I41141 00	D2308B	B1311A		1	
15	A28051 00	D2309A	B1306A		1	
16	K43012 00	D2309B	D2008B		1	
17	K50032 00	D2310A	D1712A		1	
18	I44211 00	D2310B	C2110B		1	
19	K25012 00	D2311A	A2111B		2	
20	I11331 02	D2311B	C0708B		1	
21	I14011 02	D2312A	A2003B		1	
22	I14011 01	D2312A	C1205B		2	
23	I45131 00	D2313A	C2102B		1	
24	I46131 00	D2313B	C2202B		1	
25	300001 01	JA8001A	B2002A		1	
26	300081 001TLK	JA8002A	A0204B		1	
27	300031 00	JA8002B	A0204A		1	
28	L08011 00	JA8003A	B1208B		1	
29	L08001 00	JA8003B	B1209A		1	
30	300011 00	JA8004B	A0403A		1	
31	300041 001SN	JA8005A	A2715A		1	
32	300051 001SN	JA8005B	A2711B		1	
33	A28082 00	JA8006A	B2712B		1	
34	A28081 00	JA8006B	B2711B		1	

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TITLE			WL	DOCUMENT NO.	SHEET NO.	REV.
LOGIC WIRE WRAP (REF: 76033500)				HPDE 7335	67	A
LINE NO.	SIGNAL NAME OR NUMBER IDENTIFICATION	ORIGIN	DESTINATION	WIRE COLOR	Z LEVEL	
1	300061 00	JA8008A	B2412A		1	
2	300211 00	JA8014A	A0401A		1	
3	300201 00	JA8014B	A0403B		1	
4	I21301 00	JA8101A	B1810B		1	
5	I21291 00	JA8101B	B1807B		1	
6	I21281 00	JA8102A	B1810A		1	
7	I48171 00	JA8102B	D1512A		2	
8	I21261 00	JA8103A	B1809A		1	
9	I21251 00	JA8103B	B1808B		1	
10	I21241 00	JA8104A	B1809B		1	
11	I48151 00	JA8104B	D1507B		1	
12	I47081 01	JA8105A	A1013B		2	
13	I22021 00	JA8105B	A1804A		1	
14	I50241 03	JA8106A	A0610B		2	
15	I22011 00	JA8106B	A1807B		1	
16	I52071 00	JA8107A	D2211B		1	
17	I49321 00	JA8107B	A1007A		1	
18	I54261 00	JA8108A	A1714B		1	
19	I22061 00	JA8108B	C1610B		1	
20	X08011 00	JA8109A	B1207B		1	
21	200021 00	JA8109B	B1207A		1	
22	400011 00BCYC	JA8110A	A0203B		1	
23	400001 00PKSW	JA8110B	A0202B		1	
24	X28001 00	JA8111B	B2706A		1	
25	400021 00HDLD	JA8112A	A0203A		1	
26	X28002 00	JA8112B	B2705B		1	
27	400051 00	JA8113B	A1001A		1	
28	X52001 00	JA8114A	D1706A		1	
29	200151 00GND	JA8114B	D1714A		1	
30	L05061 00	JA8201A	A0607A		1	
31	L05071 00	JA8201B	A0607B		1	
32	L05001 00	JA8202A	A0608A		1	
33	L05011 00	JA8202B	A0608B		1	
34	800040 01	JA8203A	A0404A		1	

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TITLE			WL	DOCUMENT NO.	SHEET NO.	REV.
LOGIC WIRE WRAP (REF: 76033500)				HPDE 7335	68	A
LINE NO.	SIGNAL NAME OR NUMBER IDENTIFICATION	ORIGIN	DESTINATION	WIRE COLOR	Z LEVEL	
1	L05021 00	JA8204A	A0606B		1	
2	L05031 00	JA8204B	A0606A		1	
3	L05041 00	JA8205A	A0609B		1	
4	L05051 00	JA8205B	A0609A		1	
5	500003 02	JA8206A	C0913B		2	
6	500003 00	JA8206A	C0813B		1	
7	500004 02	JA8206B	C0913A		2	
8	500004 00	JA8206B	C0813A		1	
9	500005 00	JA8207A	C0814A		1	
10	500005 02	JA8207A	C0914A		2	
11	500006 00	JA8207B	C0814B		1	
12	500006 01	JA8207B	C0914B		2	
13	500007 00	JA8208A	A0202A		1	
14	500002 00	JA8209A	A0404B		1	
15	300131 00GND	JA8301A	A1601A		1	
16	300121 00	JA8301B	B1410B		1	
17	300001 02	JA8302A	B1412A		1	
18	300071 00	JA8302B	D1110B		1	
19	200161 00GND	JD9001A	JD9002A		1	
20	DRIVES EL100	JD9001B	D0311B		1	
21	200161 00GND	JD9002A	JD9001A		1	
22	200161 01GND	JD9002A	JD9003A		2	
23	DRIVES EL200	JD9002B	D0313A		1	
24	200161 01GND	JD9003A	JD9002A		2	
25	200161 02GND	JD9003A	JD9004A		1	
26	DRIVES EL300	JD9003B	D0310A		1	
27	200161 02GND	JD9004A	JD9003A		1	
28	200161 03GND	JD9004A	JD9005A		2	
29	DRIVES EL400	JD9004B	D0308B		1	
30	200161 03GND	JD9005A	JD9004A		2	
31	200161 04GND	JD9005A	JD9006A		1	
32	DRIVES EL500	JD9005B	D0306A		1	
33	200161 04GND	JD9006A	JD9005A		1	
34	200161 05GND DRIVES EL600	JD9006A JD9006B	D0414A C0308B		2 1	

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TITLE		WL	DOCUMENT NO.	SHEET NO.	REV.
READ/WRITE WIRE WRAP (REF: 76509700)			HPDE 7097	1 of 2	A
LINE NO.	SIGNAL NAME OR NUMBER IDENTIFICATION	ORIGIN	DESTINATION	WIRE COLOR	Z LEVEL
1	A5310	E0310B	JE8009A		1
2	I2123	F0211A	JE8004B		1
3	I2124	F0211B	JE8004A		1
4	I2125	F0212A	JE8003B		1
5	I2126	F0212B	JE8003A		1
6	I2127	E0203B	JE8002B		1
7	I2128	E0203A	JE8002A		1
8	I2129	E0204B	JE8001B		1
9	I2130	E0204A	JE8001A		1
10	I4708	F0411B	JE8005A		2
11	I5426	F0309B	JE8008A		1
12	10000	E0401A	JE8014B		1
13	A4919	F0012B	F0409B		1
14	A52041	E0005B	E0107B		1
15	A52042	E0003B	E0104B		1
16	A53022	F0307B	F0407B		1
17	A53081	F0308B	F0408B		1
18	I2201	F0107B	JE8008B		1
19	I2202	F0108B	JE8006B		1
20	I2203	F0109B	JE8005B		1
21	I4708	E0116B	JE8005A		1
22	I4900	E0006B	E0205B		1
23	I4901	E0007B	F0201B		1
24	I4902	E0008A	E0206B		1
25	I4903	E0008B	F0202B		1
26	I4904	E0010A	E0207B		1
27	I4905	E0011B	F0203B		1
28	I4906	E0011A	E0208B		1
29	I4907	E0012B	F0204B		1
30	I4908	E0012A	E0209B		1
31	I4909	E0013A	F0205B		1
32	I4910	E0210B	F0002A		1
33	I4911	F0003A	F0206B		1
34	I4912	E0211B	F0003B		1

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TITLE			WL	DOCUMENT NO.	SHEET NO.	REV.
READ/WRITE WIRE WRAP				HPDE 7097	2	A
LINE NO.	SIGNAL NAME OR NUMBER IDENTIFICATION	ORIGIN	DESTINATION	WIRE COLOR	Z LEVEL	
1	I4913	F0004B	F0207B		1	
2	I4914	E0212B	F0006B		1	
3	I4915	F0007B	F0208B		1	
4	I4916	E0213B	F0008B		1	
5	I4917	F0009A	F0209B		1	
6	I4918	E0214B	F0010B		1	
7	I4932	E0117A	F0410B		1	
8	I4932	E0117A	JE8007B		2	
9	I5207	E0114B	JE8007A		1	
10	K50032	F0106B	JE8006A		1	
11	X5200	E0114A	JE8014A		1	
12	Y4900	E0113B	F0011B		1	
13	300001 +20	F0113B	JE8100A		1	
14						
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TITLE				WL	DOCUMENT NO.	SHEET NO.	REV.
LOGIC HARNESS (REF: 76505609)					HPDE 7056-9	1 OF 5	P
LINE NO.	SIGNAL NAME OR NUMBER IDENTIFICATION	ORIGIN	DESTINATION	WIRE COLOR	Z LEVEL		
1		A2TB2 14	A2C11 +	2			
2		A2TB2 1	A2C11 -	0			
3		A2CB2 2	A2TB1 6	2			
4		A2A2P1 17	A2A2P2 8	4			
5		A2A2P2 9	A2TB4 7	4			
6							
7		A2TB2 13	A2TB4 8	4			
8		A2TB2 6	A2C6 +	2			
9							
10		A2TB2 2	A2C6 -	0			
11		A2TB2 2	A2TB3 5	6			
12		A2TB2 1	A2TB3 4	6			
13		A2TB2 7	A2C8 -	6			
14		A2PA80 1B	DEAD END	0			
15		A2TB2 8	A2C5 +	2			
16		A2C5 +	A2R1 T	2			
17		A2C5 +	A2CB2 1	2			
18		A2TB2 9	A2C10 -	6			
19		A2C10 -	A2R1 B	6			
20		A2C10 -	A2CB3 1	6			
21		A2TB2 10	A2C3 +	2			
22		A2C3 +	A2R5 T	2			
23		A2C3 +	A2CB4 1	2			
24		A2TB3 5	A2C3 -	0			
25							
26		A2C3 -	A2R5 B	0			
27		A2C1 +	A2R4 T	0			
28							
29		A2C2 +	A2A1TB1 6	0			
30		A2TB2 11	A2C1 -	6			
31		A2C1 -	A2R4 B	6			
32		A2C1 -	A2CB5 1	6			
33		A2TB2 12	A2K5B NO	6			
34		A2TB2 12	A2K6 NO	6			

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TITLE				WL	DOCUMENT NO.	SHEET NO.	REV.
LOGIC HARNESS					HPDE 7056-9	2	P
LINE NO.	SIGNAL NAME OR NUMBER IDENTIFICATION	ORIGIN	DESTINATION	WIRE COLOR	Z LEVEL		
1		A2TB1 8	A2A2P2 16	0			
2							
3		A2TB2 5	A2A2P1 10	2			
4		A2TB2 16	A2A2P1 6	2			
5		A2L1 2	A2C7 +	2			
6		A2R2 T	A2L1 2	2			
7		A2CB1A 1	A2C7 +	2			
8		A2TB2 3	A2TB3 4				
9		A2CB1A 2	A2A2P1 13	2			
10		A2CB1A 2	A2TB1 1	2			
11		A2TB1 1	A2PB30 13B	2			
12		A2TB1 1	DEAD END	2			
13		A2L2 2	A2C9 -	6			
14		A2R2 B	A2L2 2	6			
15		A2CB1B 1	A2C9 -	6			
16		A2CB1B 2	A2TB1 2	6			
17		A2TB1 2	A2PA30 2B	6			
18		A2TB1 2	DEAD END	6			
19		A2CB2 2	A2A5 UN-REG	2			
20		A2CB2 2	A2A3P1 8	2			
21		A2CB3 2	A2A7 UN-REG	6			
22		A2CB3 2	A2TB1 7	6			
23		A2TB2 2	A2TB3 6	0			
24		A2TB2 4	A2A3P1 13	4			
25		A2CB4 2	A2A1TB1 2	2			
26		A2CB4 2	A2A6 +	2			
27		A2CB5 2	A2A1TB1 10	6			
28		A2CB5 2	A2A6 -	6			
29		A2K6 C	A2C2 -	6			
30		A2K5B C	A2C2 -	6			
31		A2C2 -	A2K5A NC	6			
32		A2C2 -	A2A3P1 14	6			
33		A2A5 REG	A2TB1 3	2			
34		A2TB1 3	LOGIC Vcc+ TOP	2			

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TITLE			WL	DOCUMENT NO.	SHEET NO.	REV.
LOGIC HARNESS				HPDE 7056-9	3	P
LINE NO.	SIGNAL NAME OR NUMBER IDENTIFICATION	ORIGIN	DESTINATION	WIRE COLOR	Z LEVEL	
1		A2A7 REG	A2TB1	4	6	
2		A2TB1 4	LOGIC BOT-	Vcc- TOM	6	
3		A2TB1 4	LOGIC BOT-	Vcc- TOM	6	
4		A2TB1 3	LOGIC Vcc+	TOP	2	
5						
6		A2A2P2 4	A2C11	+	2	
7		A2A2P1 1	A2C11	+	2	
8		A2A2P1 8	A2C11	+	2	
9		A2A3P1 6	A2C11	+	2	
10		A2DS1 B	A2C11	+	2	
11		A2C11 +	A2TB1-16		2	
12		A2DS1 B	DEAD END		2	
13		A2C11 -	A2C8	+	0	
14						
15		A2TB1 8	A2A2P2	6	0	
16		A2TB1 8	A2S2		0	
17		A2TB1 8	A2A3P1	10	0	
18		A2TB1 8	A2A2P2	1	0	
19		A2TB1 9	A2CB3	3	0	
20		A2TB1 9	A2S1	A2	0	
21		A2TB1 9	A2DS1	T	0	
22		A2TB1 9	A2S1	B1	0	
23		A2C6 +	A2L1	1	2	
24		A2S1 C3	A2TB4	9	2	
25		A2S1 C2	A2TB4	1	2	
26		A2C7 -	A2C9	+	0	
27		A2C9 +	A2C5	-	0	
28						
29		A2TB2 1	A2A5	GND	0	
30		A2TB2 1	A2A7	GND	0	
31		A2C8 -	A2L2	1	6	
32						
33						
34		A2C8 +	A2TB1	9	0	

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TITLE				WL	DOCUMENT NO.	SHEET NO.	REV.
LOGIC HARNESS					HPDE 7056-9	4	P
LINE NO.	SIGNAL NAME OR NUMBER IDENTIFICATION	ORIGIN	DESTINATION	WIRE COLOR	Z LEVEL		
1		A2A3P1 7	A2TB1 12	0			
2		A2K6 2	A2TB1 12	0			
3		DEAD END	A2TB1 8	0			
4		A2A3P1 5	A2K5 AL	2			
5		A2K5 BL	A2A3P1 4	0			
6		A2K5 BL	A2A2P2 2	0			
7		A2A3P1 2	A2TB1 5	2			
8		A2A3P1 3	A2A2P1 12	2			
9		A2A3P1 11	A2K6 1	2			
10		A2TB1 5	A2PA80 8B	2			
11		A2A3P1 1	A2A2P1 7	2			
12		A2A3P1 12	A2PA80 8A	6			
13							
14							
15		A2A2P2 5	A2TB1 15	4			
16		A2A2P2 3	A2PA80 2B	0			
17		A2A2P1 5	A2TB4 3	0			
18		A2TB4 3	A2S1 B2	0			
19		A2A2P1 3	A2TB4 2	0			
20		DEAD END	A2TB4 4	2			
21		A2TB4 4	A2S1 B3				
22		DEAD END 2	A2TB4 1	0			
23		A2A2P1 18	A2TB4 5	2			
24		A2A2P1 16	A2TB4 6	2			
25		A2A2P1 11	A2PA80 3A	0			
26		A2A2P2 10	A2PA80 3B	0			
27		A2A2P1 9	A2TB1 14	0			
28		A2A2P1 14	A2PA80 2A	4			
29		A2A2P1 15	A2TB1 13	2			
30							
31		A2CB1 3	A2TB2 15	0			
32		A2S1 A1	A2PA80 1A	4			
33		DEAD END	A2PA80 7B	0			
34		A2CB3 4	A2CB2 4	0			

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TITLE			WL	DOCUMENT NO.	SHEET NO.	REV.
LOGIC HARNESS				HPDE 7056-9	5	P
LINE NO.	SIGNAL NAME OR NUMBER IDENTIFICATION	ORIGIN	DESTINATION	WIRE COLOR	Z LEVEL	
1		A2CB3 4	A2PA80 7A	0		
2		A2CB3 5	A2CB2 3	0		
3		A2CB2 5	A2CB1 3	0		
4		A2CB1 5	A2CB5 3	0		
5		A2CB5 5	A2CB4 3	0		
6		A2CB4 5	A2TB1 11	0		
7		A2S2 L	A2PA80 4B	4		
8		A2S2 +	A2TB1 1	2		
9						
10		A2PA80 5A	A2A1TB1 7	9		
11		A2PA80 5B	A2A1TB1 6	0		
12			A2A1TB1 6	SHLD		
13						
14			A2A1TB1 6	SHLD		
15		A2PA80 6A	A2A1TB1 1	9		
16		A2PA80 6B	A2A1TB1 11	0		
17		A2TB4 9	DEAD END	0		
18		A2A6 AC	A2A1TB1 5	4		
19		A2A1TB1 5	A2K5A NO	4		
20		A2TB3 4	LOGIC GND	0		
21		A2TB3 5	LOGIC GND	0		
22		A2TB3 6	LOGIC GND	0		
23		A2TB3 4	LOGIC GND	0		
24		A2TB4 10	A2PA80 4A	0		
25		A2ATB1 6	LOGIC GND	0		
26						
27						
28						
29						
30						
31						
32						
33						
34						

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TITLE DECK HARNESS (REF: 76032009)				WL	DOCUMENT NO. HPDE 7320-9	SHEET NO. 1 OF 3	REV. D
LINE NO.	SIGNAL NAME OR NUMBER IDENTIFICATION	ORIGIN	DESTINATION	WIRE COLOR	Z LEVEL		
1		A3P2 1	A2TB1 15	4			
2		A3S8 C	A3S6 C	0			
3		A3S6A C	A3P2 2	0			
4		A3P2 2	A2TB1 8	0			
5		A3S8 NC	A3P5 2	4			
6		A3P5 2	A2TB4 7	4			
7		A3P5 1	A2TB4 8	4			
8		A3S6A NC	A2TB1 12	4			
9		A3S8 NO	A2PA81 10A	0			
10		A3S6A NO	A2PA81 12A	4			
11		A3S4 C	A2TB1 9	0			
12		A3S4 NO	A2PA81 10B	0			
13		A3S1 C	A2TB1 11	0			
14		A3S1 NO	A2TB1 10	0			
15		A3PE80 9B	A2PA80 13B	4			
16							
17							
18							
19		A3S6B-C	A2TB4 9	4			
20		A3S6B-NC	A2TB4 10	4			
21		A3PE80 1A	A2PA81 1A	4			
22		↑ 1B	↑ 1B	↑			
23		2A	2A				
24		2B	2B				
25		3A	3A				
26		3B	3B				
27		4A	4A				
28		4B	4B				
29		5A	5A				
30		5B	5B				
31		6A	6A				
32		6B	6B				
33		↓ 7A	↓ 7A	↓			
34		A3PE80 7B	A2PA81 7B	4			

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TITLE DECK HARNESS				WL	DOCUMENT NO. HPDE 7320-9	SHEET NO. 2	REV. D
LINE NO.	SIGNAL NAME OR NUMBER IDENTIFICATION	ORIGIN	DESTINATION	WIRE COLOR	Z LEVEL		
1		A3PE80 8A	A2PA81 8A	4			
2		A3PE80 8B	A2PA81 8B				
3		A3PE80 9A	A2PA81 11A	4			
4							
5		A3PE80 14A	A2PA81 14A	4			
6		A3PE80 14B	A2PA81 14B	0			
7							
8		A3P3-1	A2PA81 9B	0			
9		A3P3-2	A2PA81 9A	4			
10							
11		A3J4 1	A2PA81 12B	9			
12		A3J4 2	A2PA81 11B	0			
13		A3J4 3	A2PA81 13B	SHLD			
14		A3TB1 1	A2K5A C	4			
15		A3TB1 2	A2A1TB1 7	1			
16							
17		A3P8 4B	A2TB1 6	9			
18		A3P8 3B	A2TB1 7	0			
19		A3P8 3A	A2TB1 8	SHLD			
20							
21		A3P8 1B	A2PB21-3B	CENTER			
22		A3P8 1A	A2PB21-3A	SHLD			
23							
24		A3P8 2B	A2PB21-5B	CENTER			
25		A3P8 2A	A2PB21-5A	SHLD			
26							
27		A3PE1 9B	A2PA14 9A	0			
28		A3PE1 10B	A2PA14 9B	4			
29		A3P6 1	A3FL3 OUT	2			
30							
31		A3P6 3	A3FL4 OUT	6			
32							
33		A3P6 4	A2TB1 9	0			
34							

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TITLE				WL	DOCUMENT NO.	SHEET NO.	REV.
DECK HARNESS					HPDE 7320-9	3	D
LINE NO.	SIGNAL NAME OR NUMBER IDENTIFICATION	ORIGIN	DESTINATION	WIRE COLOR	Z LEVEL		
1		A3P6 5	A3PE3 13B	4			
2		A3P6 6	A3PE3 14B	0			
3							
4							
5							
6		A3PE80 10A	A2PA80 13A	4			
7		A3FL1 IN	A2TB1 3	2			
8		A3FL2 IN	A2TB1 4	6			
9		A3FL3 IN	A2TB1 1	2			
10		A3FL4 IN	A2TB1 2	6			
11		A3FL5 IN	A2TB1 13	2			
12							
13		A3PE4-9B	A2PB16-1B	COND			
14		A3PE4-9A	A2PB16-1A	SHLD			
15							
16		A3PE4-8B	A2PB16-2B	COND			
17		A3PE4-8A	A2PB16-2A	SHLD			
18							
19		A3PF3 4A	A2PB20 9A	SHLD			
20		A3PF3 4B	A2PB20 9B	COND			
21		A3PF3 3A	A2PB20 10A	SHLD			
22		A3PF3 3B	A2PB20 10B	COND			
23		DECK GND	MAIN FRAME GND WHITE BLOCK	47			
24		R/W PANEL GND	DECK GND	38, 40			
25		A2TB4 9	DEAD END	0			
26		A2TB1 5	DEAD END	4			
27		A2PA80 14A	A3S11 C	0			
28		A2PA80 14B	A3S11 NO	4			
29							
30							
31							
32							
33							
34							

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TITLE				WL	DOCUMENT NO.	SHEET NO.	REV.
CONTROL PANEL (W-8) (REF: 76505400)					HPDE 7054	1 of 2	B
LINE NO.	SIGNAL NAME OR NUMBER IDENTIFICATION	ORIGIN	DESTINATION	WIRE COLOR	Z LEVEL		
1	1	A4DS6A T	A4DS6B T	2			
2	2	A4DS6A T	A2TB1 16	2			
3	3						
4	4	A4DS6A B	A4DS6B B	0			
5	5	A2TB1 14	A4DS6B B	0			
6	6	A2TB1 10	A4S7B C	0			
7	7	A4S7A NO	A2TB4 6	0			
8	8	A4S8 C	A4S1 C	0			
9	9	A2TB1 10	A4S7B C	0			
10	10	A4S1 C	A4S2 C	0			
11	11	A4S3 C	A4S2 C	0			
12	12	A4S4 C	A4S4 C	0			
13	13	A4S5 C	A4S4 C	0			
14	14	A4S5 C	A4S6 C	0			
15	15	A2TB1 8	A4S6 C	0			
16	16	A2TB1 5	A4DS1A T	2			
17	17	A4DS1B T	A4DS1A T	2			
18	18	A4DS1B T	A4DS3A T	2			
19	19	A4DS3B T	A4DS3A T	2			
20	20	A4DS3B T	A4DS2A T	2			
21	21	A4DS2A T	A4DS2B T	2			
22	22	A4DS4A T	A4DS4B T	2			
23	23	A4DS4A T	A4DS6B T	2			
24	24	A4S1 NO	A2PA82 3A	4			
25	25	A4DS1A B	A2PA82 5A	4			
26	26	A4DS1B B	A2PA82 5B	4			
27	27	A4S2 NO	A2PA82 6A	4			
28	28	A4S3 NO	A2PA82 6B	4			
29	29	A4S4 NO	A2PA82 7A	4			
30	30	A4S5 NO	A2PA82 7B	4			
31	31	A4S6 NC	A2PA82 8A	4			
32	32	A4DS3A B	A2PA82 4A	4			
33	33	A4DS3B B	A2PA82 4B	4			
34	34	A4DS4A B	A2PA82 1A	4			

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TITLE				WL	DOCUMENT NO.	SHEET NO.	REV.
CONTROL PANEL (W-8)					HPDE 7054	2	B
LINE NO.	SIGNAL NAME OR NUMBER IDENTIFICATION	ORIGIN	DESTINATION	WIRE COLOR	Z LEVEL		
1	35	A4DS4B B	A2PA82 1B	4			
2	36	A4DS2A B	A2PA82 2A	4			
3	37	A4DS2B B	A2PA82 2B	4			
4	38	A4S8 NO	A2PA82 9A	4			
5	39	A2TB4 4	A4S7A C	0			
6	40	A2TB4 5	A4S7A NC	0			
7	41	A2TB1 14	A4S7B NO	0			
8	42	A2TB1 14	A4S7B NO	0			
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							
31							
32							
33							
34							

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TITLE		I/O PANEL (REF: 76511100)		WL	DOCUMENT NO.	SHEET NO.	REV.
					HPDE 7111	1 of 9	C
LINE NO.	SIGNAL NAME OR NUMBER IDENTIFICATION	ORIGIN	DESTINATION	WIRE COLOR	Z LEVEL		
1	1						
2	1A	A5J1	\bar{G} PC01 3A	0			
3	1B	A5J1	\bar{K} PC01 3B	4			
4	2						
5	2A	A5J2	\bar{G} PC01 3A	0			
6	2B	A5J2	\bar{K} PC01 3B	4			
7	3						
8	3A	A5J1	A PC01 4A	0			
9	3B	A5J1	E PC01 4B	4			
10	4						
11	4A	A5J2	A PC01 4A	0			
12	4B	A5J2	E PC01 4B	4			
13	5						
14	5A	A5J1	M PC01 6A	0			
15	5B	A5J1	S PC01 6B	4			
16	6						
17	6A	A5J2	M PC01 6A	0			
18	6B	A5J2	S PC01 6B	4			
19	7						
20	7A	A5J1	N PC01 7A	0			
21	7B	A5J1	T PC01 7B	4			
22	8						
23	8A	A5J2	N PC01 7A	0			
24	8B	A5J2	T PC01 7B	4			
25	9						
26	9A	A5J1	B PC01 8A	0			
27	9B	A5J1	F PC01 8B	4			
28	10						
29	10A	A5J2	B PC01 8A	0			
30	10B	A5J2	F PC01 8A	4			
31	11						
32	11A	A5J1	C PC01 10A	0			
33	11B	A5J1	H PC01 10B	4			
34							

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TITLE			WL	DOCUMENT NO.	SHEET NO.	REV.
I/O PANEL				HPDE 7111	2	C
LINE NO.	SIGNAL NAME OR NUMBER IDENTIFICATION	ORIGIN	DESTINATION	WIRE COLOR	Z LEVEL	
1	12					
2	12A	A5J2 C	PC01 10A	0		
3	12B	A5J2 H	PC01 10B	4		
4	13					
5	13A	A5J1 U	PC01 12A	0		
6	13B	A5J1 Y	PC01 12B	4		
7	14					
8	14A	A5J2 U	PC01 12A	0		
9	14B	A5J2 Y	PC01 12B	4		
10	15					
11	15A	A5J1 V	PC01 13A	0		
12	15B	A5J1 Z	PC01 13B	4		
13	16					
14	16A	A5J2 V	PC01 13A	0		
15	16B	A5J2 Z	PC01 13B	4		
16	17					
17	17A	A5J1 D	PC01 14A	0		
18	17B	A5J1 J	PC01 14B	4		
19	18					
20	18A	A5J2 D	PC01 14A	0		
21	18B	A5J2 J	PC01 14B	4		
22	19					
23	19A	A5J1 K	PC01 11A	0		
24	19B	A5J1 P	PC01 11B	4		
25	20					
26	20A	A5J2 K	PC01 11A	0		
27	20B	A5J2 P	PC01 11B	4		
28	21					
29	21A	A5J1 W	PD01 1A	0		
30	21B	A5J1 \bar{A}	PD01 1B	4		
31	22					
32	22A	A5J2 W	PD01 1A	0		
33	22B	A5J2 \bar{A}	PD01 1B	4		
34						

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TITLE			WL	DOCUMENT NO.	SHEET NO.	REV.
I/O PANEL				HPDE 7111	3	C
LINE NO.	SIGNAL NAME OR NUMBER IDENTIFICATION	ORIGIN	DESTINATION	WIRE COLOR	Z LEVEL	
1	23					
2	23A	A5J1 X	PD01 2A	0		
3	23B	A5J1 \bar{B}	PD01 2B	4		
4	24					
5	24A	A5J2 X	PD01 2A	0		
6	24B	A5J2 \bar{B}	PD01 2B	4		
7	25					
8	25A	A5J1 L	PD01 3A	0		
9	25B	A5J1 R	PD01 3B	4		
10	26					
11	26A	A5J2 L	PD01 3A	0		
12	26B	A5J2 R	PD01 3B	4		
13	27					
14	27A	A5J1 \bar{M}	PD01 4A	0		
15	27B	A5J1 \bar{R}	PD01 4B	4		
16	28					
17	28A	A5J2 \bar{M}	PD01 4A	0		
18	28B	A5J2 \bar{R}	PD01 4B	4		
19	29					
20	29A	A5J1 \bar{C}	PD01 5A	0		
21	29B	A5J1 \bar{H}	PD01 5B	4		
22	30					
23	30A	A5J2 \bar{C}	PD01 5A	0		
24	30B	A5J2 \bar{H}	PD01 5B	4		
25	31					
26	31A	A5J1 \bar{D}	PD01 7A	0		
27	31B	A5J1 \bar{I}	PD01 7B	4		
28	32					
29	32A	A5J2 \bar{D}	PD01 7A	0		
30	32B	A5J2 \bar{I}	PD01 7B	4		
31	33					
32	33A	A5J1 \bar{F}	PD01 10A	0		
33	33B	A5J1 \bar{J}	PD01 10B	4		
34						

TITLE		WL	DOCUMENT NO.		SHEET NO.		REV.
I/O PANEL			HPDE 7111		4		C
LINE NO.	SIGNAL NAME OR NUMBER IDENTIFICATION	ORIGIN	DESTINATION		WIRE COLOR	Z LEVEL	
1	34						
2	34A	A5J2	F̄	PD01 10A	0		
3	34B	A5J2	J̄	PD01 10B	4		
4	35						
5	35A	A5J1	N̄	PC02 12A	0		
6	35B	A5J1	S̄	PC02 12B	4		
7	36						
8	36A	A5J2	N̄	PC02 12A	0		
9	36B	A5J2	S̄	PC02 12B	4		
10	37						
11	37A	A5J1	P̄	PC02 14A	0		
12	37B	A5J1	T̄	PC02 14B	4		
13	38						
14	38A	A5J2	P̄	PC02 14A	0		
15	38B	A5J2	T̄	PC02 14B	4		
16	39						
17	39A	A5J1	W̄	PC02 10A	0		
18	39B	A5J1	AA	PC02 10B	4		
19	40						
20	40A	A5J2	W̄	PC02 10A	0		
21	40B	A5J2	AA	PC02 10B	4		
22	41						
23	41A	A5J1	V̄	PC02 11A	0		
24	41B	A5J1	Z̄	PC02 11B	4		
25	42						
26	42A	A5J2	V̄	PC02 11A	0		
27	42B	A5J2	Z̄	PC02 11B	4		
28	43						
29	43A	A5J1	Ō	PC02 13A	0		
30	43B	A5J1	Ū	PC02 13B	4		
31	44						
32	44A	A5J2	Ō	PC02 13A	0		
33	44B	A5J2	Ū	PC02 13B	4		
34							

TITLE I/O PANEL			WL	DOCUMENT NO. HPDE 7111	SHEET NO. 5	REV. C
LINE NO.	SIGNAL NAME OR NUMBER IDENTIFICATION	ORIGIN	DESTINATION		WIRE COLOR	Z LEVEL
1	45					
2	45A	A5J1 AX	PD02	4A	0	
3	45B	A5J1 BB	PD02	4B	4	
4	46					
5	46A	A5J2 AX	PD02	4A	0	
6	46B	A5J2 BB	PD02	4B	4	
7	47					
8	47A	A5J1 AY	PD02	5A	0	
9	47B	A5J1 BC	PD02	5B	4	
10	48					
11	48A	A5J2 AY	PD02	5A	0	
12	48B	A5J2 BC	PD02	5B	4	
13	49					
14	49A	A5J1 AZ	PD02	3A	0	
15	49B	A5J1 BD	PD02	3B	4	
16	50					
17	50A	A5J2 AZ	PD02	3A	0	
18	50B	A5J2 BD	PD02	3B	4	
19	51					
20	51A	A5J1 BA	PD02	1A	0	
21	51B	A5J1 BE	PD02	1B	4	
22	52					
23	52A	A5J2 BA	PD02	1A	0	
24	52B	A5J2 BE	PD02	1B	4	
25	53					
26	53A	A5J1 AF	PC03	10A	0	
27	53B	A5J1 AL	PC03	10B	4	
28	54					
29	54A	A5J2 AF	PC03	10A	0	
30	54B	A5J2 AL	PC03	10B	4	
31	55					
32	55A	A5J1 \bar{X}	PC03	12A	0	
33	55B	A5J1 AB	PC03	12B	4	
34						

TITLE			WL	DOCUMENT NO.	SHEET NO.	REV.
I/O PANEL				HPDE 7111	6	C
LINE NO.	SIGNAL NAME OR NUMBER IDENTIFICATION	ORIGIN	DESTINATION	WIRE COLOR	Z LEVEL	
1	56					
2	56A	A5J2 X	PC03 12A	0		
3	56B	A5J2 AB	PC03 12B	4		
4	57					
5	57A	A5J1 Y	PC03 14A	0		
6	57B	A5J1 AC	PC03 14B	4		
7	58					
8	58A	A5J2 Y	PC03 14A	0		
9	58B	A5J2 AC	PC03 14B	4		
10	59					
11	59A	A5J1 AE	PC03 11A	0		
12	59B	A5J1 AK	PC03 11B	4		
13	60					
14	60A	A5J2 AE	PC03 11A	0		
15	60B	A5J2 AK	PC03 11B	4		
16	61					
17	61A	A5J1 AD	PC03 13A	0		
18	61B	A5J1 AJ	PC03 13B	4		
19	62					
20	62A	A5J2 AD	PC03 13A	0		
21	62B	A5J2 AJ	PC033 13B	4		
22	63					
23	63A	A5J1 AP	PD03 3A	0		
24	63B	A5J1 AU	PD03 3B	4		
25	64					
26	64A	A5J2 AP	PD03 3A	0		
27	64B	A5J2 AU	PD03 3B	4		
28	65					
29	65A	A5J1 AN	PD03 4A	0		
30	65B	A5J1 AT	PD03 4B	4		
31	66					
32	66A	A5J2 AN	PD03 4A	0		
33	66B	A5J2 AT	PD03 4B	4		
34						

TITLE			WL	DOCUMENT NO.	SHEET NO.	REV.
I/O PANEL				HPDE 7111	7	C
LINE NO.	SIGNAL NAME OR NUMBER IDENTIFICATION	ORIGIN	DESTINATION	WIRE COLOR	Z LEVEL	
1	67					
2	67A	A5J1 AR	PD03 1A	0		
3	67B	A5J1 AV	PD03 1B	4		
4	68					
5	68A	A5J2 AR	PD03 1A	0		
6	68B	A5J2 AV	PD03 1B	4		
7	69					
8	69A	A5J1 AS	PD03 2A	0		
9	69B	A5J1 AW	PD03 2B	4		
10	70					
11	70A	A5J2 AS	PD03 2A	0		
12	70B	A5J2 AW	PD03 2B	4		
13	71					
14	71A	A5J1 AH	PD03 5A	0		
15	71B	A5J1 AM	PD03 5B	4		
16	72					
17	72A	A5J2 AH	PD03 5A	0		
18	72B	A5J2 AM	PD03 5B	4		
19	73					
20	73A	A5J1 CM	A5J2 CM	0		
21	73B	A5J1 CS	A5J2 CS	4		
22	74					
23	74A	A5J1 CL	A2TB4 2	0		
24	74B	A5J1 CR	A2TB3 3	4		
25	75					
26	75A	A5J2 CL	A2TB4 2	0		
27	75B	A5J2 CR	A2TB3 3	4		
28	76					
29	76A	A5J1 CK	A2TB4 4	0		
30	76B	A5J1 CP	A2TB3 4	4		
31	77					
32	77A	A5J2 CK	A2TB4 5	0		
33	77B	A5J2 CP	A2TB3 4	4		
34						

TITLE				WL	DOCUMENT NO.	SHEET NO.	REV.
I/O PANEL					HPDE 7111	8	C
LINE NO.	SIGNAL NAME OR NUMBER IDENTIFICATION	ORIGIN		DESTINATION		WIRE COLOR	Z LEVEL
1	78						
2	78A	A5J1	CC	A2TB4	1	0	
3	78B	A5J1	CH	A2TB3	5	4	
4	79						
5	79A	A5J2	CC	A2TB4	1	0	
6	79B	A5J2	CH	A2TB3	5	4	
7	80						
8	80A	A5J1	CJ	A2TB4	10	0	
9	80B	A5J1	CN	A2TB3	5	4	
10	81						
11	81A	A5J2	CJ	A2TB4	10	0	
12	81B	A5J2	CN	A2TB3	5	4	
13	82						
14	82A	A5J1	CB	A2TB3	9	0	
15	82B	A5J1	CF	A2TB3	9	4	
16	83						
17	83A	A5J2	CB	A2TB3	9	0	
18	83B	A5J2	CF	A2TB3	9	4	
19	84						
20	84A	A5J1	CA	A2TB3	8	0	
21	84B	A5J1	CE	A2TB3	8	4	
22	85						
23	85A	A5J2	CA	A2TB3	8	0	
24	85B	A5J2	CE	A2TB3	8	4	
25	86						
26	86A	A5J1	BZ	A2TB3	7	0	
27	86B	A5J1	CD	A2TB3	7	4	
28	87						
29	87A	A5J2	BZ	A2TB3	7	0	
30	87B	A5J2	CD	A2TB3	7	4	
31	88						
32	88A	A5J1	BU	A2TB3	6	0	
33	88B	A5J1	BY	A2TB3	6	4	
34							

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TITLE		WL		DOCUMENT NO.	SHEET NO.		REV.
I/O PANEL				HPDE 7111	9		C
LINE NO.	SIGNAL NAME OR NUMBER IDENTIFICATION	ORIGIN		DESTINATION		WIRE COLOR	Z LEVEL
1	89						
2	89A	A5J2	BU	A2TB3	6	0	
3	89B	A5J2	BY	A2TB3	6	4	
4	90						
5	90A	A5J1	BT	A2TB3	10	0	
6	90B	A5J1	BX	A2TB3	10	4	
7	91						
8	91A	A5J2	BT	A2TB3	10	0	
9	91B	A5J2	BX	A2TB3	10	4	
10	100						
11	100A	A5J1	BF	A5J2	BF	0	
12	100B	A5J1	BL	A5J2	BL	4	
13	101						
14	101A	A5J1	BH	A5J2	BH	0	
15	101B	A5J1	BM	A5J2	BM	4	
16	102						
17	102A	A5J1	BJ	A5J2	BJ	0	
18	102B	A5J1	BN	A5J2	BN	4	
19							
20							
21							
22							
23							
24							
25							
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34							

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TITLE				WL	DOCUMENT NO.	SHEET NO.	REV.
AC HARNESS (REF: 76474702)					HPDE 7747-2	1 OF 3	J
LINE NO.	SIGNAL NAME OR NUMBER IDENTIFICATION	ORIGIN	DESTINATION	WIRE COLOR	Z LEVEL		
1	1						
2	2						
3	3						
4	4						
5	5						
6	6						
7	7						
8	8						
9	9						
10	10	A1FL1 OUT	A1CB2 A1	1			
11	11	A1CB2 A1	A1M1 T	1			
12	12	A1CB2 A1	A1XF1 IN	1			
13	13	A1CB2 A1	A1TB2 2	1			
14	14	A1CB2 1	A1TB3 1	1			
15	15	A1CB2 B1	A1XF2 IN	1			
16	16	A1CB2 B1	A1Q1 1	1			
17	17	A1FL2 OUT	A1CB2 B1	1			
18	18						
19	19	A1XF1 OUT	A1TB2 5	1			
20	20	A1XF2 OUT	A1TB2 6	1			
21	21	A1CB2 A2	A1Q2 1	1			
22	22	A1CB2 B3	A1Q4 1	1			
23	23	A1Q1 2	A1TB2 3	1			
24	24	A1M1 B	A1TB2 4	1			
25	25	A1TB3 2	A1TB2 4	1			
26	26	A1CB2 B4	A1Q3 1	1			
27	27	A1CB2 A3	A1Q3 2	1			
28	28						
29	29						
30	30						
31	31	A1CB2 A4	A1P7 (1) 4	1			
32	32	A1CB2 A3	A1P7 (1) 3	1			
33	33	A1Q2 2	A1P7 (1) 2	1			
34	34	A1Q4 2	A1P7 (1) 5	1			

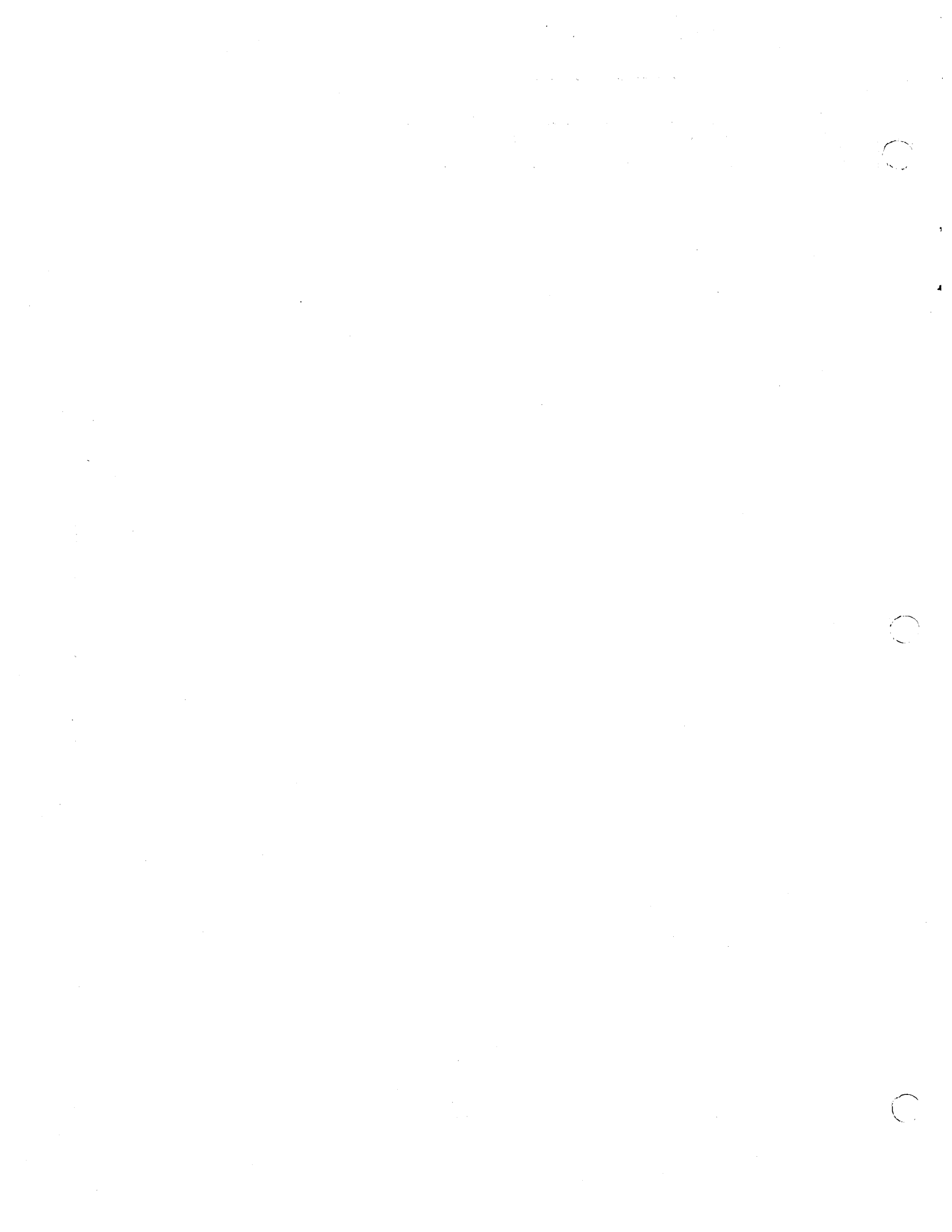
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TITLE				WL	DOCUMENT NO.	SHEET NO.	REV.
AC HARNESS					HPDE 7747-2	2	J
LINE NO.	SIGNAL NAME OR NUMBER IDENTIFICATION	ORIGIN		DESTINATION		WIRE COLOR	Z LEVEL
1	35	SAFETY	GND	A1P7 (1)	1	54	
2	36	SAFETY	GND	A1P7 (1)	8	5	
3	37						
4	38						
5	39						
6	40	A1TB2	5	*			*A1T3-2(60 Hz) A1T3-3(50 Hz)
7	41	A1TB2	6	A1T3	1	1	
8	42						
9	43						
10	44						
11	44A	A1FL1	OUT	A1P2	2	1	
12	44B	A1FL2	OUT	A1P2	3	1	
13	44C	A1P2	1	A1FL1	GND	SHLD	
14	45						
15	46						
16	47						
17	48						
18	49						
19	50	SAFETY A1 GND		SAFETY A2 GND		54	
20	51	A1Q4	4	A2TB2	4	4	
21	52	A1Q2	3	A2TB2	5	2	
22	53	A1Q3	3	A1Q2	3	2	
23	54	A1Q4	3	A1Q3	3	2	
24	55	A1Q1	3	A2TB2	16	2	
25	56	A1Q1	4	A2TB2	15	0	
26	57	A1CR7-10	+	A2TB2	6	2	
27	58	A1TB4	7	A1TB4	4	0	
28	59	A1TB4	4	A2TB2	2	0	
29	60	A1CR7-10	-	A2TB2	7	6	
30	61	A1CR5-6	C	A2TB2	8	2	
31	62	A1CR15	A	A2TB2	9	6	
32	63	A1CR11-14	+	A2TB2	10	2	
33	64	A1TB3	6	A2TB2	3	0	
34	65	A1CR11-14	-	A2TB2	11	6	

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TITLE		AC HARNESS		WL	DOCUMENT NO.	SHEET NO.	REV.
					HPDE 7747-2	3	J
LINE NO.	SIGNAL NAME OR NUMBER IDENTIFICATION	ORIGIN	DESTINATION	WIRE COLOR	Z LEVEL		
1	66	A1CR16-17 -	A2TB2 12	6			
2	67	A1Q4 4	A1P7 (1) 7	4			
3	68	A1Q3 4	A1P7 (1) 6	0			
4	69	A1TB3 5	A1CR16-17 AC1	4			
5	70	A1TB3 7	A1CR16-17 AC2	4			
6	71	A1T3 4	A1CR1-2 AC1	4			
7	72	A1T3 6	A1CR1-2 AC2	4			
8	73	A1TB3 3	A1C12 T	4			
9	74	A1TB3 8	A1C12 B	4			
10	75	A1C12 B	A1CR11-14 AC2	4			
11	76	A1TB4 3	A1CR5 A	4			
12	77	A1TB3 4	A1CR11-14 AC1	4			
13	78	A1TB4 5	A1CR6 A	4			
14	79	A1TB4 1	A1C13 T	4			
15	80	A1TB4 2	A1C13 B	4			
16	81	A1CR6 A	A1CR3-4 AC2	4			
17	82	A1CR5 A	A1CR3-4 AC1	4			
18	83	A1CR3-4 -	A1CR15 C	6			
19	84	A1TB4 6	A1CR7-10 AC1	4			
20	85	A1TB4 8	A1CR7-10 AC2	4			
21	86	A1CR1-2 +	A2TB2 14	2			
22	87	A1T3 5	A2TB2 1	0			
23	88	A1Q2 4	A1T3 5	0			
24	89	A1Q3 4	A1Q2 4	0			
25	90	A1T3 7	A2TB2 13	4			
26	91	DEAD END	A2TB2 2	0			
27	92	DEAD END	A2TB4 10	0			
28							
29							
30							
31							
32							
33							
34							

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COMMENT SHEET

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(2) DEPARTMENT OR ATTENTION OF
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(4) CITY AND STATE

Manual Information

(From Revision Record)

(5) MANUAL TITLE	
(6) PUBLICATION NO.	(7) REVISION
(8) FCO'S INCORPORATED INTO MANUAL	

Equipment Information

(From Equipment Nameplate & FCO Log)

(9) EQUIPMENT NO. AND DESCRIPTION
(10) SERIES CODE
(11) FCO'S INCORPORATED INTO EQUIPMENT

Comments

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