

NOTES:

- APPLICABLE STANDARDS/SPECIFICATIONS:
 - MIL-STD-1208
 - ASME Y14.5M-1994
- CABLE:
 - CABLE TYPE 1, CLASS 2, CONSTRUCTION 4, EXTRA IMPROVED PLAINSTEEL, GALVANIZED MINIMUM .375 INCH DIA. IAW RR-W-418, 180 FEET MINIMUM, LUBRICATED WITH AMSOIL MP-HO (HEAVY DUTY METAL PROTECTOR) AND INSTALLED ON WINCH DRUM IN DIRECTION SHOWN
- CABLE, HOOK, FASTENERS AND SWAGED SLEEVE ASSEMBLED SHALL WITHSTAND A MINIMUM PULL OF 14,400 LB WITHOUT SEPARATION OF ASSEMBLY OR DEFORMATION OF HOOK
- SHALL BE FREE OF BURRS AND SHARP EDGES
- THE WINCH ASSEMBLY SHALL BE COMPATIBLE WITH HYDRAULIC FLUID IAW 6M-6297M
- HYDRAULIC MOTOR SHALL BE COMPATIBLE WITH AND FUNCTION WHEN SUBJECTED TO LOAD TEMPERATURES OF -40 TO 250 °F (-40.0 TO +121.1 °C) WITHOUT LEAKAGE
- CONNECTORS SHALL MATE WITH 12469992
- FINISH:
 - FINISH SHALL BE IAW DRAWING 12469113, TOPCOAT COLOR SHALL BE BLACK 37030
 - ALTERNATE FINISH: PRIMER IAW MIL-P-53022, TYPE I, TOPCOAT IAW MIL-C-46168, TYPE II, COLOR SHALL BE BLACK 37030
 - FINISH: CLEAN AND TREAT TYPE 1 IAW IT-C-490, APPLY ELECTRODEPOSITION PRIMER IAW MIL-P-53084, DRY FILM THICKNESS .9 TO 1.5 MILS, APPLY EPOXY TYPE POWDER COAT WHICH MEETS THE PERFORMANCE REQUIREMENTS OF TYPE 1, CLASS 3, MIL-PRF-24712 DRY FILM THICKNESS 4 TO 8 MILS, TOPCOAT, BLACK 37030, IAW MIL-C-46168 OR MIL-C-53039, DRY FILM THICKNESS 1.8 MILS MINIMUM
- FINISH:
 - FINISH IAW 12369001 EXCEPT TOPCOAT COLOR SHALL BE BLACK 37030
 - ALTERNATE FINISH: PRIMER IAW MIL-P-53022, TYPE I, TOPCOAT IAW MIL-C-46168, TYPE II, COLOR SHALL BE BLACK 37030
- FINISH:
 - FINISH SHALL BE IAW DRAWING 12369001, TOPCOAT COLOR SHALL BE BLACK 37030
 - ALTERNATE FINISH: ANODIZE IAW MIL-A-8625, TYPE II, CLASS 2, COLOR BLACK
- DIMENSIONAL LIMITS APPLY WITHOUT PAINT
- ITEM IDENTIFICATION: METAL STAMP THE FOLLOWING MARKINGS IAW MIL-STD-130 1920750CN12480535 MFR: MANUFACTURER'S CAGE CODE
- PERFORMANCE REQUIREMENTS: ALL PERFORMANCE REQUIREMENTS SHALL BE INITIATED WITH WINCH ASSEMBLY SEALED TO PREVENT CONTAMINATION FROM DUST, OIL AND WATER AND START WITH 5 WRAPS OF WIRE ROPE ON THE DRIVE DRUM. RATED LAYER LOAD REQUIREMENTS SHALL START ON THE THIRD WRAP OF THE TESTED LAYER. ALSO, THE TIMING OF THE WINCH SHALL NOT BE AFFECTED IF THE WIRE CABLE BECOMES CROSSED WRAPPED. AT THAT TIME, THE WINCH SHALL BE STOPPED AND THE CABLE SHALL BE ADJUSTED BEFORE CONTINUING WITH REMAINING TIME
 - HOT TEMPERATURE REQUIREMENT (LOW GEAR): THE WINCH ASSEMBLY SHALL BE CAPABLE OF PULLING A MINIMUM LOAD OF 9,000 LB. ON FIRST LAYER FOR A MINIMUM DISTANCE OF 12 FEET WITHOUT STOPPING. THE WINCH SHALL BE CAPABLE OF PULLING A MINIMUM LOAD OF 4,000 LB FOR 55 FEET AT A MINIMUM AMBIENT TEMPERATURE OF 125 °F (51.7 °C) DURING TEST. OIL TEMPERATURE MAY BE COOLED TO 200 °F (93.3 °C) IF REQUIRED
 - COLD TEMPERATURE REQUIREMENT (LOW GEAR): THE WINCH ASSEMBLY SHALL BE CAPABLE OF PULLING A MINIMUM LOAD OF 9,000 LB. ON THE FIRST LAYER FOR A MINIMUM DISTANCE OF 12 FEET, THEN WITHOUT STOPPING, WINCH SHALL BE CAPABLE OF PULLING A MINIMUM LOAD OF 4,000 LB FOR 55 FEET AT A MAXIMUM AMBIENT TEMPERATURE OF -40 °F (-40 °C)
 - FUNCTIONAL REQUIREMENT (LOW GEAR): THE WINCH ASSEMBLY SHALL BE OPERATED WITH A 24-28 VDC ELECTRICAL POWER SOURCE AND A 1.5 GPM (1300 PSI) MINIMUM TO 4 GPM (1500 PSI) MAXIMUM HYDRAULIC POWER SOURCE. WINCH SHALL BE CAPABLE OF CONTINUOUSLY PULLING A MINIMUM LINE LOAD OF 9,000 LB FOR A MINIMUM DISTANCE OF 55 FEET, WITHIN A MAXIMUM TIME PERIOD OF 20 MINUTES AT AN AMBIENT TEMPERATURE 60 TO 90 °F (15.6 TO 32.2 °C)
 - DURABILITY REQUIREMENTS (LOW GEAR): THE WINCH ASSEMBLY SHALL BE CAPABLE OF COMPLETING A MINIMUM OF 50 DURABILITY CYCLES. ONE CYCLE SHALL BE DEFINED AS FOLLOWS: THE WINCH ASSEMBLY SHALL PULL A MINIMUM LOAD OF 4,000 LB A MINIMUM DISTANCE OF 50 FEET WITHIN A MAXIMUM TIME PERIOD OF 20 MINUTES, AT AN AMBIENT TEMPERATURE 60 TO 90 °F (15.6 TO 32.2 °C). AT THE START AND EVERY 10 CYCLES, CHECK CABLE FOR WEAR
 - RATED LAYER LOAD REQUIREMENTS: THE WINCH ASSEMBLY SHALL BE CAPABLE OF CONTINUOUSLY PULLING EACH LAYER OF WIRE ROPE AT THE RATED LAYER LINE LOAD AS SPECIFIED IN THE TABLE BELOW:

LOW GEAR				
LAYER NUMBER	1	2	3	4
MIN RATED LINE LOAD (LB)	9000	7500	6100	5000
ROPE CAPACITY (FT)	17	20	24	28
MAX LOAD/STALL (LB)	10500	9200	7900	6500
MAX AMP DRAW	2	2	2	2

HIGH GEAR				
LAYER NUMBER	1	2	3	4
MIN RATED LINE PULL (LB)	1200	1100	1000	800
ROPE CAPACITY (FT)	17	20	24	28
MAX LOAD/STALL (LB)	1700	1600	1450	1400
MAX AMP DRAW	2	2	2	2

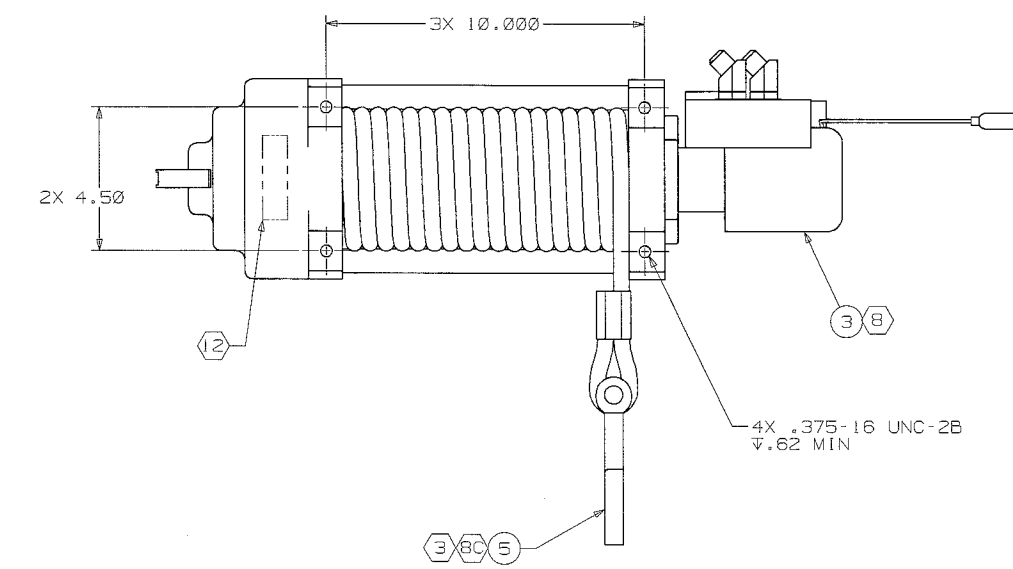
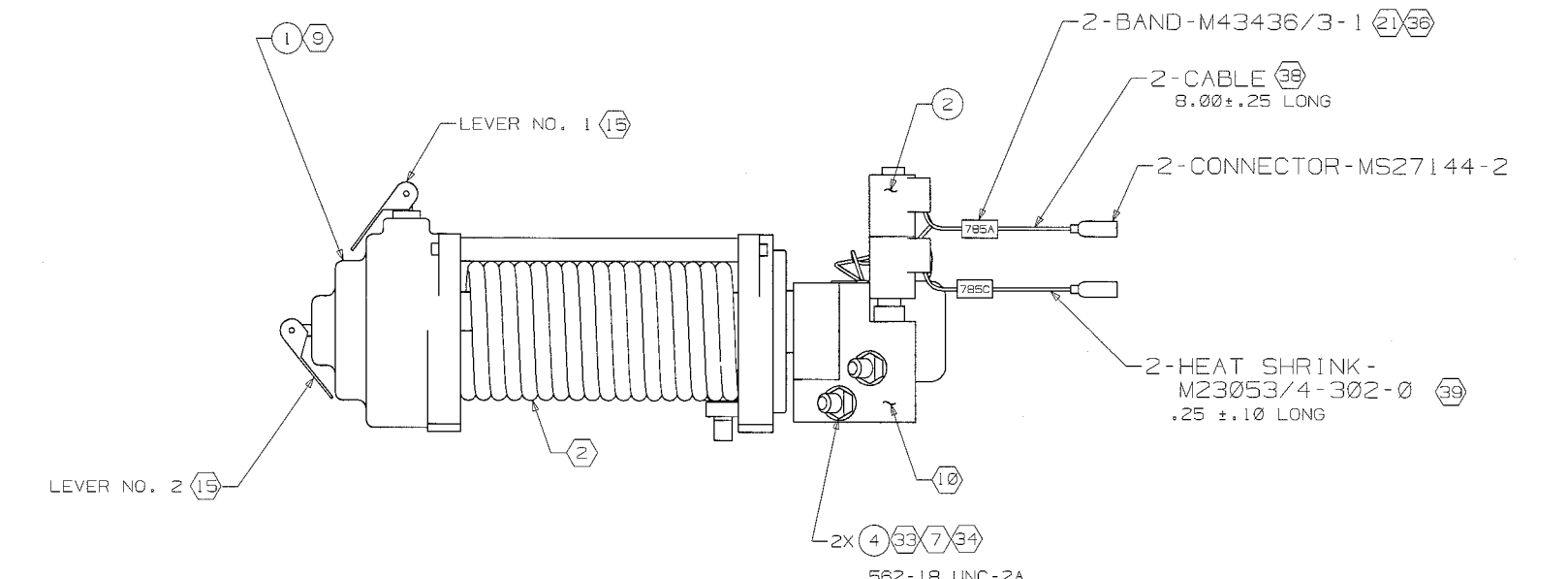
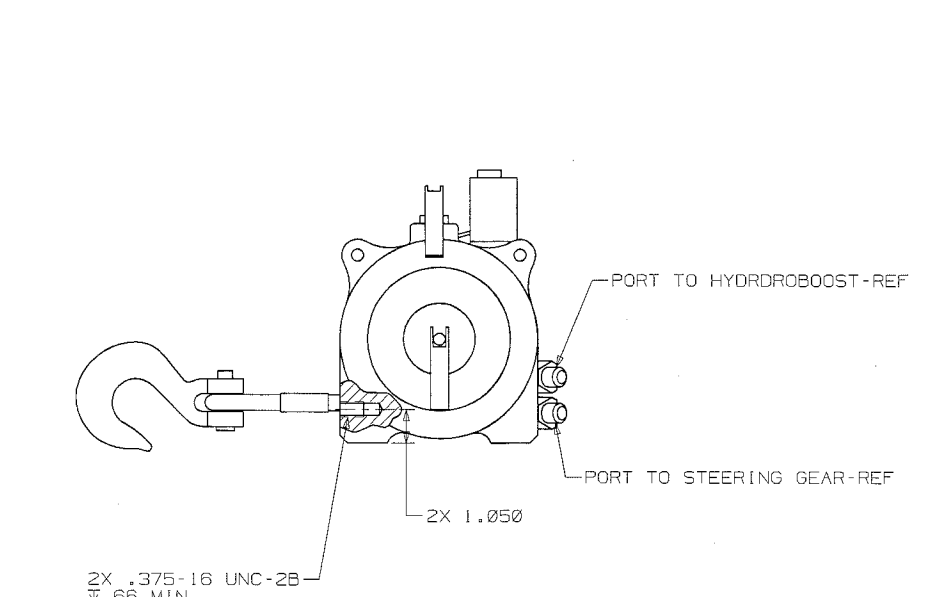
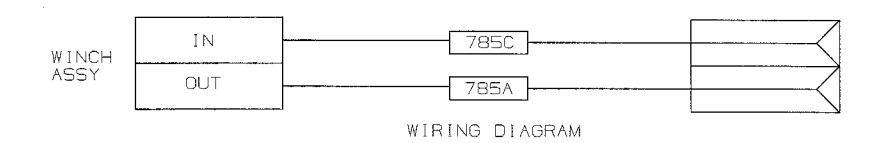
- FUNCTIONAL REQUIREMENT (HIGH GEAR): THE WINCH ASSEMBLY SHALL BE OPERATED WITH A 24-28 VDC ELECTRICAL POWER SOURCE AND A 1.5 GPM (1300 PSI) MINIMUM TO 4 GPM (1500 PSI) MAXIMUM HYDRAULIC POWER SOURCE. WINCH SHALL BE CAPABLE OF CONTINUOUSLY PULLING A MINIMUM LINE LOAD OF 9000 LB FOR A MINIMUM DISTANCE OF 55 FEET WITHIN A MAXIMUM TIME PERIOD OF 5 MINUTE, AT AMBIENT TEMPERATURE BETWEEN 60 TO 90 °F (15.6 TO 32.2 °C)
- DURABILITY REQUIREMENTS (HIGH GEAR): THE WINCH ASSEMBLY SHALL BE CAPABLE OF COMPLETING A MINIMUM OF 50 DURABILITY CYCLES. ONE CYCLE DEFINED AS FOLLOWS: THE WINCH ASSEMBLY SHALL PULL A MINIMUM LOAD OF 4,000 LB A MINIMUM DISTANCE OF 50 FEET WITHIN A MAXIMUM TIME PERIOD OF 5 MINUTES AT AN AMBIENT TEMPERATURE BETWEEN 60 TO 90 °F (15.6 TO 32.2 °C). AT THE START AND EVERY 10 CYCLES, CHECK CABLE FOR WEAR
- THE WINCH SHALL BE EQUIPPED WITH TWO SPEED (GEARING) SETTINGS (LOW AND HIGH). THE WINCH SHALL ALSO BE EQUIPPED WITH A LOCKING AND FREE SPOOL SETTING
- THE HANDLE'S WHICH ENGAGE AND DISENGAGE THE WINCH SETTINGS, SHALL BE PERMANENTLY STAMPED IAW MIL-STD-130, WITH THE WORDS (LOW, HIGH AND FREE). WHEN LEVERS ARE ENGAGED IN POSITIONS, AS NOTED IN TABLE BELOW, WINCH SHALL OPERATE AS INDICATED IN MODE COLUMN BELOW:

LEVER #1	LEVER #2	MODE
FREE	FREE	FREE SPOOL
LOW	HIGH	LOCK
LOW	FREE	LOW GEAR
FREE	HIGH	HIGH GEAR

 WHEN THE LOCK MODE IS ENGAGED, THE DRUM SHALL NOT ROTATE WITH A 14,400 LB MAXIMUM LOAD APPLIED
- SUBMERGENCE REQUIREMENT: THE WINCH SOLENOID ASSEMBLY SHALL MEET THE REQUIREMENTS OF MIL-STD-1184, TYPE II, CLASS 2, TEST METHOD 100
- THE ASSEMBLY SHALL HAVE WIRING THAT CONFORMS TO MIL-STD-339, SECTION 800
- THE WINCH SOLENOIDS SHALL BE POWERED BY A 24-28 VDC POWER SOURCE. A HYDRAULIC PUMP SHALL PROVIDE 1300 PSI MINIMUM PRESSURE AT 1.5 GPM MINIMUM FLOW TO THE HYDRAULIC MOTOR, AND A MAXIMUM OF 4.0 GPM AND 1500 PSI
- THIS DRAWING IS NOT INTENDED TO LIMIT CONSTRUCTION TO FEATURES OTHER THAN AS SHOWN HEREON BY DIMENSIONS, NOTATIONS AND REFERENCE DOCUMENTS
- HARNESS ASSEMBLY LEADS, FUNCTIONAL LENGTH LOCATIONS
- IAW MIL-B-43436/3
- EACH CIRCUIT SHALL BE 100% TESTED FOR CONTINUITY (OPERATIONAL ONLY)
- MECHANICAL STRENGTH REQUIREMENT (PULL TEST): CRIMP-TYPE, SOLDERLESS ELECTRICAL CONDUCTORS (CABLE) SHALL WITHSTAND THE FOLLOWING PULL STRENGTH NO. 18 WIRE SIZE - 28 LB MINIMUM CONTINUITY SHALL BE TESTED AFTER EACH SPECIFIED PULL REQUIREMENT. LOSS OF CONTINUITY SHALL BE CAUSE FOR REJECTION
- CONTROL METHODS FOR MAJOR CHARACTERISTIC(S):
 - STATISTICAL PROCESS CONTROL (SPC): MAJOR CHARACTERISTICS SHALL MAINTAIN A Cpk INDEX EQUAL TO OR GREATER THAN 1.0 FOR VARIABLES OR A NINETY-NINE AND NINE HUNDRED NINETY THOUSANDTHS PERCENT (99.994%) PROCESS AVERAGE RATE OF ACCEPTANCE FOR ATTRIBUTES
 - ALTERNATIVE CONTROL METHODS:
 - ONE HUNDRED PERCENT (100%) INSPECTION OR TEST OF THE MAJOR CHARACTERISTIC(S)
 - AN ALTERNATIVE CONTROL METHOD APPROVED BY THE PROCURING CONTRACTING OFFICER'S REPRESENTATIVE SUCH AS: DESIGN OF EXPERIMENT (DOE) OR PROCESS CAPABILITY STUDY (PCS)
- THE SYMBOL THAT DESIGNATES A MAJOR CHARACTERISTIC IS THE HEXAGON WITH THE LETTER M
- INITIAL PRODUCTION INSPECTION (IPI):
 - COMPLETE DIMENSIONAL AND TOLERANCE VERIFICATION
 - COMPLETE PERFORMANCE VERIFICATION OF NOTED TEST REQUIREMENTS. SEE NOTE 3, 6, 13C, 13D, 13E, 13F, 13G, 13H, 13I, 13J, TEST SAMPLES, TEST SEQUENCE SHALL BE IAW TABLE 1
 - MATERIAL/FINISH CERTIFICATION VERIFICATION
 - COMPLETE VERIFICATION OF ALL NOTES, INCLUDING TITLE BLOCK, IDENTIFICATION INFORMATION, AND CERTIFICATION OF NOTES 13A AND 13B
- PRODUCTION QUALITY CONTROL REQUIREMENTS: TEST 1 UNIT EVERY 1250 PRODUCED OR A FRACTION THEREOF TO ASSURE CONTROL OF THE PART, LOT OR BATCH REQUIREMENTS. VERIFY DRAWING NOTES 3, 13C, 13F, AND 15
- PRODUCTION QUALITY CONTROL REQUIREMENTS: TEST 2 UNITS FOR EACH CRIMPING TOOL USED PER PRODUCTION SHIFT, TO ASSURE CONTROL OF THE PART, LOT OF BATCH REQUIREMENTS. VERIFY DRAWING NOTE 23
- TEST SAMPLE FAILURE: FAILURE OF ANY TEST SAMPLE SHALL BE CAUSE FOR REJECTION OF THE ENTIRE REPRESENTATIVE PRODUCTION LOT. ITEMS SHALL NOT BE PRESENTED FOR ACCEPTANCE AFTER A FAILURE UNIT. CORRECTIVE ACTION HAS ELIMINATED THE DEFECT AND ROOT CAUSE OF THE FAILURE

- THE CONTROL METHOD SELECTED FOR ALL REMAINING CHARACTERISTICS SHALL BE AT THE MANUFACTURER'S DISCRETION, REGARDLESS OF THE METHOD USED, CONTROL SHALL BE ADEQUATE TO MAINTAIN CONFORMANCE TO DRAWING REQUIREMENTS
- IDENTIFICATION OF THE APPROVED ITEMS HEREON IS NOT TO BE CONSTRUED AS A GUARANTEE OF PRESENT OR CONTINUED AVAILABILITY
- ONLY ITEMS DESCRIBED ON THIS DRAWING ARE APPROVED FOR USE IN THE APPLICATIONS SPECIFIED HEREON. A SUBSTITUTE ITEM SHALL NOT BE USED WITHOUT PRIOR APPROVAL BY THE COGNIZANT DESIGN ACTIVITY
- 37" ±1" FLARE FITTING
 - STEEL WITH COATINGS IAW DRAWING 12469117
 - ALTERNATE FINISH MATERIAL: STAINLESS STEEL IAW ASTM A314
- HYDRAULIC SYSTEM SHALL BE CLEAN AND FREE OF FOREIGN SUBSTANCES AND PROTECTED BY CLOSURES MEETING THE REQUIREMENTS OF NAS847
- IN CASE OF CONFLICTING SPECIFICATIONS BETWEEN THOSE DEPICTED ON THIS DRAWING AND THOSE PROVIDED BY MANUFACTURER'S DRAWINGS/HARDWARE, THE REQUIREMENTS OF THIS DRAWING SHALL TAKE PRECEDENCE
- APPLY CIRCUIT NUMBER IAW MIL-STD-130
- COMPLETENESS OF ASSEMBLY
- 18 AWG STRANDED; 125°C; TYPE X-LINK BLACK COLOR
- IAW AMS-DTL-23053

TABLE 1	
SAMPLE NUMBER	TEST SEQUENCE (IDWG NOTE)
#1	LOW GEAR FUNCTIONAL TEST (NOTE 13.C), HIGH GEAR FUNCTIONAL TEST (NOTE 13.F), LOW GEAR DURABILITY TEST (NOTE 13.D), HIGH GEAR DURABILITY TEST (NOTE 13.G), FREE SPOOL AND MAXIMUM LOAD LOCK (PROOF LOAD) TESTS (NOTES 3 AND 15)
#2	LOW GEAR FUNCTIONAL TEST (NOTE 13.C), HIGH GEAR FUNCTIONAL TEST (NOTE 13.F), LOW GEAR AND HIGH GEAR RATED LAYER LOAD TEST (NOTE 13.E)
#3	WINCH ASSEMBLY SHALL BE INSPECTED TO ALL REMAINING DRAWING REQUIREMENTS. SOLENOID ASSEMBLY SHALL BE SUBJECTED TO SUBMERGENCE TEST (NOTE 16)



PARTS LIST			
FIND NO.	QTY	VENDOR PART NO.	NOMENCLATURE
5	1	993-19-50225	HOOK AND CABLE
4	2	2061-8-65	45° ELBOW, FITTING
3	1	993-97-50271	MOTOR
2	1	993-0265	VALVE ASSY W/SOLENOIDS
1	1	993-75-50250	WINCH BODY

APPROVED SOURCES OF SUPPLY			
PART NO.	ADDRESS	VENDOR CAGE CODE PART NO.	ITEM IDENTIFICATION
12480535	MILE MARKER INC 1450 SW 13th COURT POMANO BEACH, FL 33069	06287 993-75-50050CV	1920750CN12480535 MFR-06287

SOURCE CONTROL DRAWING				PART NO. 12480535	
DATE	BY	REVISION	DESCRIPTION	DATE	BY
12480535	M1113	DESIGN REVISION/ISSUE	DESIGN APPROVAL	02	MR
		ISSUE ON	DESIGN APPROVAL	02	MR
		APPLICATION	DESIGN APPROVAL	02	MR

U.S. ARMY TANK-AUTOMOTIVE COMMAND
WARREN, MICHIGAN 48397-5000

AM General Corp

WINCH AND MOTOR ASSEMBLY

12480535

SCALE 1/2" UNIT BY