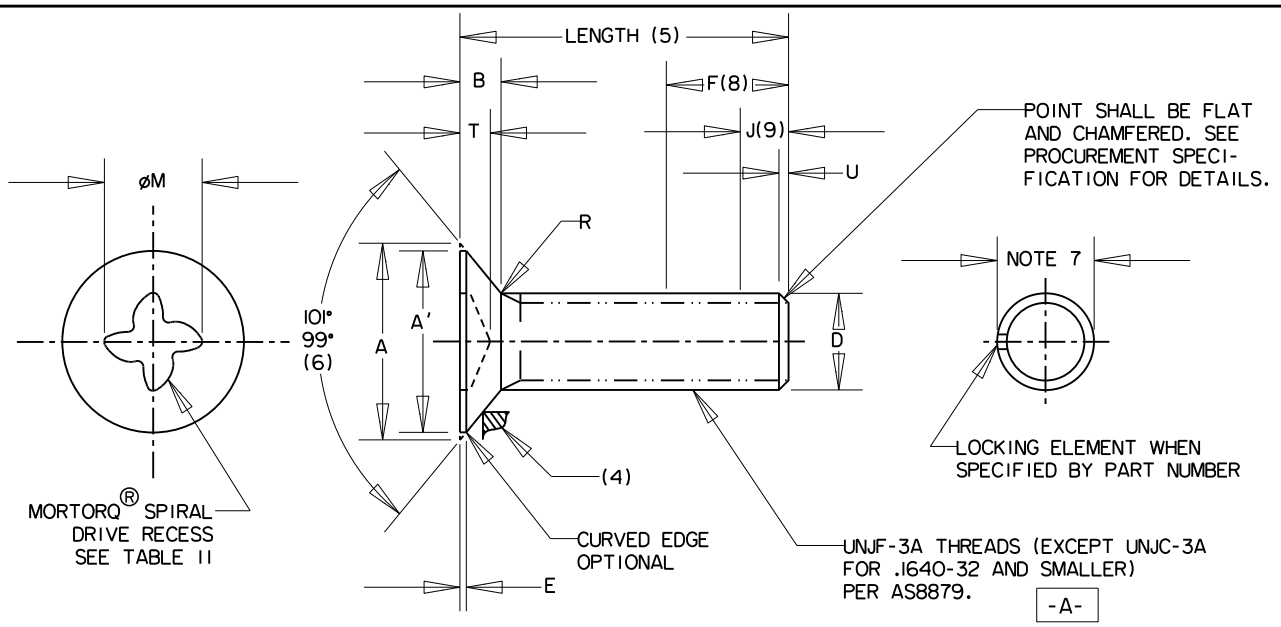

CONCENTRICITY: øM OF RECESS TO PITCH DIAM. WITHIN .010" FOR -4 AND BELOW. WITHIN .015" FOR -5 AND ABOVE.

HEAD MARKING SHALL BE DEPRESSED (.010 MAX) AND ARRANGED AS FOLLOWS:

MARK WITH BASIC PART NUMBER ("PMT" OPTIONAL) EXCEPT MARK .1120-40 SIZE WITH "4", .1380-32 SIZE WITH "6", .1640-32 SIZE WITH "8", AND OPTIONAL .1900-32 SIZE WITH "10". THESE SIZES ALSO TO BE MARKED "C" FOR A286 OR "W" FOR WASPALOY OR "N" FOR INCONEL 718.

MARK WITH MANUFACTURER'S SYMBOL OR TRADEMARK (SYMBOL LOCATION OPTIONAL IN ANY SECTOR) LENGTH DASH NUMBER AND "L" OR "P" WHEN APPLICABLE. (SEE NOTE 11)
"L" IDENTIFIES SCREWS WITH OPTIONAL LOCKING ELEMENT.
"P" IDENTIFIES SCREWS WITH PATCH TYPE LOCKING ELEMENT ONLY.

MARK WITH RECESS DASH NUMBER, ENCIRCLED. RECESS NUMBER SHOULD BE APPROXIMATELY 25% LARGER THAN OTHER NUMERALS IN HEAD MARKING.

TABLE I - DIMENSIONS

ø DASH NUMBER	THREAD SIZE	NOTE 3 MAX. øA	NOTE 3 ABSOLUTE MIN. øA'	NOTE 3 MAX. B	MAX. øD	MAX. E	NOTE 8 F	NOTE 9 J	RADIUS R	MAX. U	RECESS SIZE
-04	.1120-40	.226	.193	.044	.112	.010	.125	.075	.012 .002	.031	MT-00
-06	.1380-32	.280	.246	.061	.138	.010	.156	.094		.039	MT-00
-08	.1640-32	.331	.296	.072	.164	.012			.020 .010		MT-0
-3	.1900-32	.381	.338	.082	.190	.015					MT-1
-4	.2500-28	.508	.456	.111	.250	.018	.178	.107		.045	MT-1
-5	.3125-24	.635	.575	.138	.312	.021	.208	.125	.025 .010	.052	MT-2
-6	.3750-24	.763	.692	.166	.375	.025			.030 .015		MT-3

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REVISION	
1/ AUTOCAD UPDATE	08-18-04
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TITLE: SCREW 100° FLAT HD., FULL THREAD MORTORQ® SPIRAL DRIVE, A286 CRES, WASPALOY AND INCONEL 718 SELF-LOCKING AND NON-LOCKING

DRAWN	DATE	DRAWING NUMBER
G. LaMONICA	07-28-04	PMT-738
CHECKED: G. LaMONICA	DATE 03-13-06	SHEET 1 OF 4

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TABLE II - RECESS DIMENSIONS

ø DASH NUMBER	THREAD SIZE	RECESS SIZE	T MAX. REF.	øM REF.	GAGE PENETRATION		TORQUE IN-LBS MIN (10)	RAISED METAL MAX (10)	TENSILE STRENGTH LBS. A286	TENSILE STRENGTH LBS. WASPALOY	TENSILE STRENGTH LBS. INCONEL 718
					MAX.	MIN.					
-04	.1120-40	MT-00	.045	.1210	.022	.015	13	.005	830	1,104	T.B.D.
-06	.1380-32	MT-00	.052	.1210	.030	.021	30	.005	1,260	1,662	T.B.D.
-08	.1640-32	MT-0	.065	.1704	.032	.023	50	.005	1,950	2,542	T.B.D.
-3	.1900-32	MT-1	.078	.2405	.027	.020	60	.005	2,860	3,610	3,510
-4	.2500-28	MT-1	.095	.2405	.047	.038	140	.005	5,820	6,539	6,260
-5	.3125-24	MT-2	.117	.3080	.055	.046	220	.005	9,260	10,416	9,600
-6	.3750-24	MT-3	.142	.3537	.070	.061	520	.006	14,000	15,687	14,700

TABLE III

	DASH NUMBER FOR PREFERED LENGTH																					
DASH NO.	3	4	5	6	7	8	9	10	11	12	13	14	15	16	18	20	22	24	26	28	30	32	34 TO 96
LENGTH	.19	.25	.31	.38	.44	.50	.56	.62	.69	.75	.81	.88	.94	1.00	1.12	1.25	1.38	1.50	1.62	1.75	1.88	2.00	2.12 TO 6.00
LENGTH TOL.	+.00 -.03														+.00 -.06								+.00 -.09

MATERIAL: UNS N07001 (WASPALOY) HEAT RESISTANT ALLOY WITH COMPOSITION PER AMS 5708 OR DTD5639 OR EN2959 OR EN3220
A286 CORROSION RESISTANT STEEL WITH COMPOSITION PER AMS 5731 OR AMS 5737.
LOCKING ELEMENT- PLASTIC PER MIL-DTL-18240 AND QPL-18240.
NICKEL ALLOY (INCONEL 718) PER DTD5638 OR EN2952 OR EN3219 OR AMS5662.

HEAT TREAT: WASPALOY 175 KSI MINIMUM ULTIMATE TENSILE. HEAT TREAT; IF HOT FORMED, THE FORGING TEMPERATURE SHALL NOT EXCEED 1150°C AND SHALL BE AIR COOLED. PRIOR TO MACHINING, THE HEADED BLANKS SHALL BE SOLUTION HEAT TREATED AT A TEMPERATURE IN THE RANGE 1020 TO 1080°C FOR 1 TO 4 HOURS AND AIR COOLED OR FASTER. FINAL HEAT TREATMENT SHALL BE CARRIED AFTER COMPLETION OF MACHINING AND THREAD ROLLING. THE PARTS SHALL BE STABILISED AT 850°C+/-10°C FOR 4 HOURS AND AIR COOLED OR FASTER TO ROOM TEMPERATURE, THEN PRECIPITATION HEAT TREATED AT A TEMPERATURE OF 760°C+/-10°C FOR 16 HOURS IN AIR, ARGON OR EQUIVALENT AND COOLED TO ROOM TEMPERATURE IN AIR OR FASTER.

A286 CRES 160 KSI MINIMUM ULTIMATE TENSILE.

NICKEL ALLOY (INCONEL 718) 220 KSI MINIMUM ULTIMATE TENSILE.

FINISH:
UNPLATED SCREWS - PASSIVATE TO MEET REQUIREMENTS OF NAS4003.
PLATED SCREWS - CADMIUM PLATE PER AMS-QQ-P-416, TYPE II, CLASS 2. EMBRITTLEMENT TEST PER QQ-P-416 DOES NOT APPLY. CADMIUM PLATED A286 CRES SCREWS SHALL BE IDENTIFIED WITH GREEN DYE OR PAINT ON THE THREAD END. MAXIMUM COVERAGE MAY INCLUDE THE CHAMFER PLUS ONE COMPLETE THREAD.
COATED SCREWS - ALUMINUM COATING PER NAS4006.

CODE: BASIC PART NUMBER = NON-LOCKING, PLATED SCREW.
FIRST DASH NUMBER INDICATES DIAMETER. SEE TABLE I AND II.
SECOND DASH NUMBER INDICATES LENGTH IN .0625 INCREMENTS (ROUNDED TO TWO DECIMAL PLACES). SEE TABLE III FOR TABULATIONS OF LENGTH DIMENSIONS. USE OF .25 INCH INCREMENTS IS RECOMMENDED FOR SCREWS OVER 3 INCHES LONG. INTERMEDIATE OR LONGER LENGTHS MAY BE SPECIFIED BY USE OF WHOLE DASH NUMBER ONLY.
ADD "A" AFTER DIAMETER DASH NUMBER FOR ALUMINUM COATED SCREWS. MAY BE USED WITH "L" OR "P" CODE.
ADD "L" AFTER DIAMETER DASH NUMBER FOR SELF-LOCKING SCREWS, OPTIONAL CONFIGURATION. DO NOT USE WITH "P" CODE.
ADD "U" AFTER DIAMETER DASH NUMBER FOR UNPLATED SCREWS. MAY BE USED WITH "L" OR "P" CODE.
ADD "P" AFTER DIAMETER DASH NUMBER FOR SELF-LOCKING SCREWS, PATCH TYPE LOCKING ELEMENT. DO NOT USE WITH "L" CODE.
WHEN MULTIPLE LETTER CODES ARE USED, SEQUENCE MUST BE IN ALPHABETICAL ORDER.
ADD "W" IN PLACE OF FIRST DASH TO INDICATE N07001 (WASPALOY) MATERIAL
ADD "N" IN PLACE OF FIRST DASH TO INDICATE NICKEL ALLOY INCONEL 718.

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6/ REVISED 05-01-09
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EXAMPLE OF PART NUMBER:

PMT738N3-10 = SCREW, .1900-32 THREAD, .62 LENGTH, NON LOCKING, INCONEL 718
PMT738W3-10 = SCREW, .1900-32 THREAD, .62 LENGTH, NON LOCKING, WASPALOY PER UNS N07001
PMT738-3-10 = SCREW, .1900-32 THREAD, .62 LENGTH, NON-LOCKING, PLATED.
PMT738-3A10 = SCREW, .1900-32 THREAD, .62 LENGTH, NON-LOCKING, ALUMINUM COATED.
PMT738-3L10 = SCREW, .1900-32 THREAD, .62 LENGTH, SELF-LOCKING, OPTIONAL CONFIGURATION, PLATED.
PMT738-3LU10 = SCREW, .1900-32 THREAD, .62 LENGTH, SELF-LOCKING, OPTIONAL CONFIGURATION, UNPLATED.
PMT738-3PU10 = SCREW, .1900-32 THREAD, .62 LENGTH, SELF-LOCKING, PATCH TYPE, UNPLATED.

NOTES:

(1) DIAMETER OF UNTHREADED PORTION OF SCREW SHALL NOT BE LESS THAN MINIMUM PITCH DIAMETER NOR MORE THAN MAXIMUM MAJOR DIAMETER OF THREAD.

(2) DASH 3 LENGTH IS NOT PRACTICAL FOR SIZE .1900-32 AND LARGER. DASH 4 IS NOT PRACTICAL FOR SIZE .2500-28 AND LARGER. DASH 5 LENGTH IS NOT PRACTICAL FOR SIZES .3125-24 AND .3750-24.

(3) DIMENSIONS A, A', AND B ARE INCLUDED FOR ENGINEERING REFERENCE ONLY AND ARE NOT TO BE USED FOR INSPECTION.

(4) FLUSHNESS GAGE PROTRUSION SHALL BE INSPECTED PER NAS9800.

(5) SCREWS LESS THAN 2 DIAMETERS IN LENGTH - COMPLETE THREADS SHALL EXTEND TO WITHIN 2 PITCHES OF BEARING SURFACE OF HEAD AND INCOMPLETE THREADS MAY EXTEND UP TO BEARING SURFACE.

SCREWS 2 DIAMETERS THRU 2 INCHES IN LENGTH - COMPLETE THREADS SHALL EXTEND TO WITHIN 2 PITCHES OF TANGENCY OF "R" AND INCOMPLETE THREADS MAY EXTEND UP TO "R" FILLET AREA.

SCREWS LONGER THAN 2 INCHES - COMPLETE THREADS SHALL EXTEND A MINIMUM OF 1.75 INCHES FROM END OF SCREW AND INCOMPLETE THREADS MAY EXTEND UP TO "R" FILLET AREA.

INCOMPLETE THREADS - SEE NAS4003.

(6) CONCENTICITY: CONICAL SURFACE OF HEAD TO THREAD PITCH DIAMETER WITHIN .005 FIM.

(7) PROTRUSION OF LOCKING ELEMENTS SHALL BE CONTROLLED SO THAT IT WILL PASS FREELY OR WITH FINGER PRESSURE THROUGH A RING GAGE WITH DIAMETER OF .010 (+.001, -.000) GREATER THAN MAXIMUM MAJOR DIAMETER OF SCREW THREAD.

(8) "F" MINIMUM (5 THREAD PITCHES) = REGION OF MINIMUM ENGAGEMENT WITH FEMALE THREAD REQUIRED TO MEET MIL-DTL-18240 REQUIREMENTS. LOCKING ELEMENT WITHIN "F" REGION MUST DEVELOP REQUIRED TORQUE WHEN TESTED PER MIL-DTL-18240.

(9) FOR EASE OF STARTING, LOCKING ELEMENT SHALL NOT BE EFFECTIVE IN "J" AREA (3 THREAD PITCHES).

(10) MORTORQ SPIRAL DRIVE SCREW SHALL WITHSTAND MINIMUM TORQUE VALUES LISTED IN TABLE II WITHOUT DAMAGE TO RECESS OR DRIVER. SCREW RECESS SHALL BE TORQUE TESTED IN BOTH INSTALLATION AND REMOVAL DIRECTIONS. APPLY TABULATED TORQUE IN CW DIRECTION WITH MAXIMUM END LOAD OF 20 POUNDS. PARTS ARE ACCEPTABLE IF RAISED METAL AT EDGE OF RECESS DOES NOT EXCEED TABULATED VALUES. APPLY TABULATED TORQUE IN CCW DIRECTION WITH MAXIMUM END LOAD OF 40 POUNDS. PARTS ARE ACCEPTABLE IF TORQUE IS ATTAINED WITHOUT RESTRICTION ON RAISED METAL.

(11) "A" ALUMINUM COATED AND "U" UNPLATED CODES NEED NOT APPEAR ON THE HEAD OF THE SCREW.

(12) MAGNETIC PERMEABILITY SHALL BE LESS THAN 2.0 (AIR = 1.0) FOR FIELD STRENGTH H = 200 OERSTEDS USING A MAGNETIC PERMEABILITY INDICATOR PER ASTM A342/A 342M, TEST METHOD 3.

(13) DIMENSIONS TO BE MET AFTER PLATING.

(14) DIMENSIONS ARE IN INCHES.

SURFACE ROUGHNESS:

(PER ASME B46.1) BEARING SURFACE OF THE HEAD, THREAD FLANKS AND THREAD ROOT 32 MICRO INCHES RA
OTHER SURFACES 125 MICRO INCHES RA.

PROCUREMENT SPECIFICATION:

FOR A286 MATERIAL FASTENERS: NAS4003, EXCEPT AS NOTED. COLD WORK OF HEAD TO SHANK FILLET IS NOT REQUIRED.
LOCKING ELEMENT FOR SELF-LOCKING SCREWS: PER NASM15981 AND MIL-DTL-18240. ANY TYPE OF CONFIGURATION IS OPTIONAL WHEN "L" CODE IS SPECIFIED. PATCH TYPE LOCKING ELEMENT (WITH NO METAL REMOVED) IS REQUIRED WHEN "P" CODE IS SPECIFIED. LOCKING ELEMENT MUST BE SUPPLIED BY A QUALIFIED SOURCE LISTED IN QPL18240. SHIPPING NOTICE SHOULD IDENTIFY THE SUPPLIER OF SCREW AND LOCKING ELEMENT SEPARATELY. RECESS TORQUE VALUES SHALL NOT APPLY.
FOR INCONEL 718 MATERIAL FASTENERS NAS4008 EXCEPT AS NOTED
FOR WASPALOY MATERIAL FASTENERS TSI21 EXCEPT AS NOTED

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ROLLS-ROYCE APPROVED SOURCES OF MORTORQ® PMT-738 BOLTS
ADDITIONAL SOURCES FOR OTHER END USERS AVAILABLE FROM PHILLIPS SCREW COMPANY UPON REQUEST

APPROVED SOURCES OF SUPPLY	ADDRESS	IDENTITY CODE	WASPALOY APPROVAL	INCONEL 718 APPROVAL
A F FASTENERS, LTD	UNIT 14-15 GLOSSOP BROOK BUSINESS PARK GLOSSOP DERBYSHIRE SK13 7AJ ENGLAND	J	N	N
ALCOA, REDDITCH	CROSSGATE ROAD PARK FARM, REDDITCH WORCESTERSHIRE B98 7TD ENGLAND		Y	Y
SPS TECHNOLOGIES, LTD T. J. BROOKS DIV.	191 BARKBY ROAD TROON INDUSTRIAL AREA LEICESTER LE4 9HX ENGLAND	TBJ	Y	Y
MONOGRAM AEROSPACE FASTENERS	3423 SOUTH GARFIELD AVENUE P.O. BOX 6847 LOS ANGELES, CA 90022-0547	MI	N	N
ALCOA FASTENING SYSTEMS CITY OF INDUSTRY AEROSPACE PRODUCTS	135 N. UNRUH AVE. CITY OF INDUSTRY, CA 91744	Vs	Y	Y
LINREAD NORTHBRIDGE LEICESTER	VIKING ROAD WIGSTON, LEICESTER ENGLAND LE18 2BL UK	NB	Y	Y
HEARTLAND PRECISION FASTENERS	301 PRAIRIE VILLAGE DRIVE NEW CENTURY KANSAS 66031		N	N

NOTE: ANY PRODUCTION OF PMT-738 SERIES FASTENERS IN A MATERIAL OR DIAMETER NOT PREVIOUSLY APPROVED BY PHILLIPS SCREW COMPANY MUST HAVE FIRST ARTICLE SAMPLES SUBMITTED TO PHILLIPS SCREW FOR QUALIFICATION AND APPROVAL PRIOR TO SHIPMENT TO THE CUSTOMER.

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