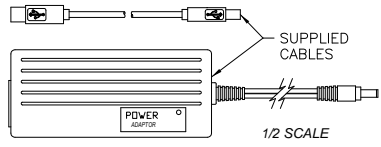
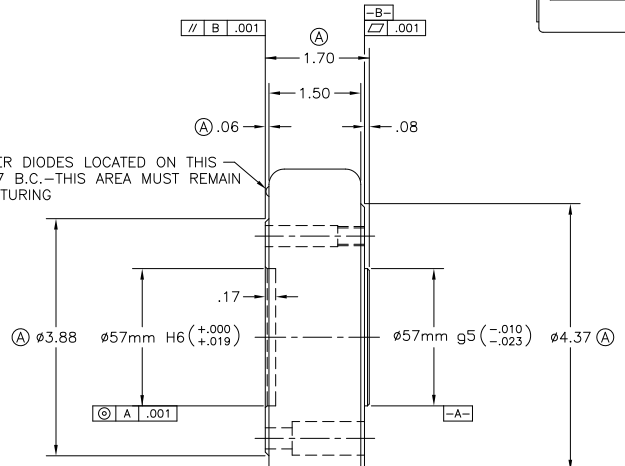


∩	FLATNESS OF A SURFACE	⊥	PERPENDICULARITY
∥	STRAIGHTNESS OF A LINE	∥	PARALLELISM
⊙	ROUNDNESS	∠	ANGULARITY
⊘	CYLINDRICITY	⊘	CIRCULAR RUNOUT
⊘	PROFILE OF A SURFACE	⊘	TOTAL RUNOUT
⊘	PROFILE OF A LINE	⊕	TRUE POSITION
⊘	SYMMETRY	⊙	CONCENTRICITY

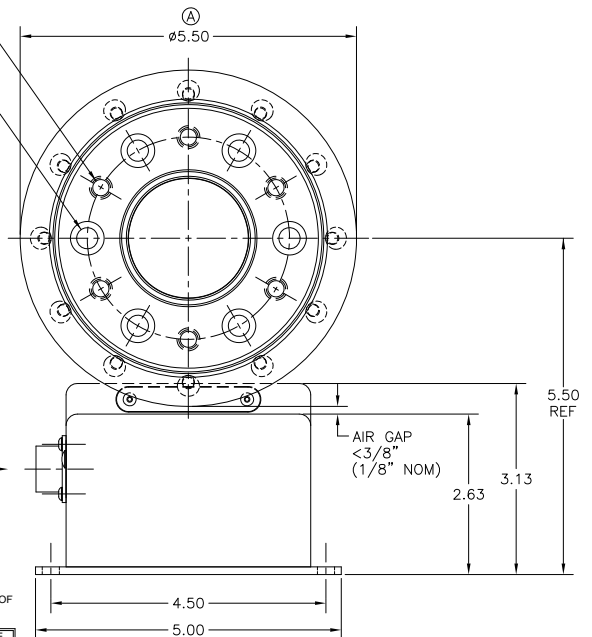


REV	DESCRIPTION	BY	DATE	CHK	ENG	REL	DATE
-	REL FOR PRODUCTION	-	-	-	-	-	1-9-12
A	Ø5.50 WAS Ø6.63; Ø3.88 WAS Ø4.75; Ø4.37 WAS Ø5.36; 1.70 WAS 1.84; .06 WAS .17; M8 TAP-11mm DEEP WAS 20mm DEEP; 14mm C'BORE-30mm DEEP WAS 31mm DEEP; MAX RPM WAS 15,000; APPROX. ELEMENT WEIGHT ADDED	GMC	1-16-12				-

IR TRANSMITTER DIODES LOCATED ON THIS SIDE AT Ø4.77 B.C.-THIS AREA MUST REMAIN CLEAR OF FIXTURING



- Ⓐ M8 X 1.25mm TAP-11mm DEEP CLEARANCE HOLE FROM OPP SIDE AS SHOWN IN VIEW 'A' 6 HOLES EQUALLY SPACED AS SHOWN ON A Ø84mm (3.307 IN.) B.C. TORQUE TO 32 Nm
- Ⓐ Ø8.8mm DRILL THRU
- Ⓐ Ø14mm C'BORE-30mm DEEP 6 PLACES EQUALLY SPACED AS SHOWN ON A Ø84mm (3.307 IN.) B.C.



10 PIN CONN PIN CODE	
PIN	FUNCTION
A	+12V
B	COMMON
C	DATA A
D	DATA B
E	SHUNT A
F	SHUNT B
G	DO NOT CONNECT
H	CONNECT
J	COMMON (SECONDARY)**
K	+12V (SECONDARY)**

15 PIN CONN PIN CODE	
PIN	FUNCTION
1	+12V
2	DATA A
3	DATA B
4	COMMON
5	SHUNT A
6	DO NOT CONNECT
7	DO NOT CONNECT
8	COMMON (SECONDARY)**
9	SHUNT B
10	+12V (SECONDARY)**
11	
12	
13	
14	
15	DO NOT CONNECT

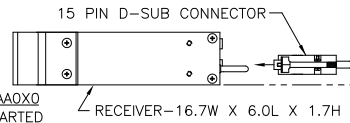
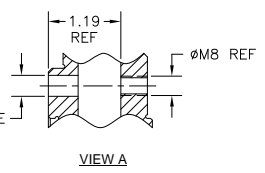
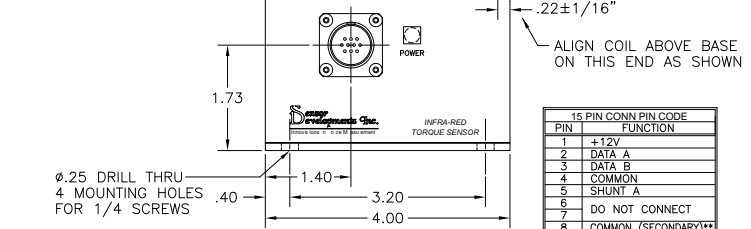
SHUNT 9 PIN CONN PIN CODE	
PIN	FUNCTION
1	+5V
2	SHUNT HIGH+
3	SHUNT HIGH-
4	SHUNT LOW+
5	SHUNT LOW-
6	SHUNT POLARITY+
7	SHUNT POLARITY-
8	GND
9	GND

FREQ. 9 PIN CONN PIN CODE	
PIN	FUNCTION
1	N/C
2	N/C
3	GND
4	N/C
5	N/C
6	FREQ B
7	ERROR RELAY N.O.
8	ERROR RELAY N.O.
9	FREQ A

ANALOG 9 PIN CONN PIN CODE	
PIN	FUNCTION
1	VOLTAGE +SIG
2	CURRENT mA SOURCE
3	N/C
4	CURRENT mA SINK
5	VOLTAGE -SIG
6	N/C
7	ERROR RELAY N.O.
8	ERROR RELAY N.O.
9	N/C

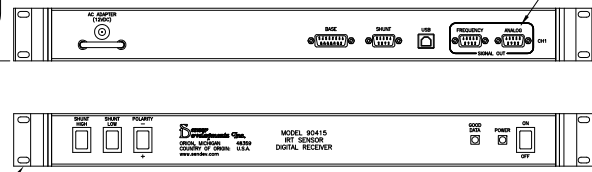
NOTE ERROR RELAY CONTACTS ARE SHARED BETWEEN RESPECTIVE PINS OF FREQUENCY & ANALOG CONNECTORS

NOTE: MECHANICAL SHIELDING IS RECOMMENDED AROUND ROTATING COMPONENTS



SPECIFICATIONS MODEL: 90415-0AX-AA0X0
 CAPACITY - TORQUE _____ CHARTED
 OVERLOAD CAPACITY (%F.S. CAPACITY) _____ 150
 SOFTWARE SELECTABLE OUTPUTS NOM., F.S.
 ±5V, ±10V, 2.5±2.5V, 12±8mA (4-20mA)
 10KHz±5KHz, 60KHz±20KHz, 60KHz±30KHz
 BALANCE (MECHANICAL) _____ G 2.5 @ 3,000 RPM
 ACCURACY (%F.S. OUTPUT) _____ .05%
 RESOLUTION _____ 16 BIT
 MAX RPM _____ 6,000 (A)
 SENSOR MATERIAL _____ STEEL
 ELEMENT WEIGHT (APPROX.) _____ 5.0 LBS. (1.9Kg) (A)

90415-0AX-AA0G0	8	100 FT
90415-0AX-AA0F0	8	70 FT
90415-0AX-AA0E0	8	90 FT
90415-0AX-AA0D0	6	25 FT
90415-0AX-AA0C0	8	80 FT
90415-0AX-AA0B0	8	60 FT
90415-0AX-AA0A0	6	20 FT
MODEL NO.	A	B
CABLE LENGTH OPTION		



RACK MOUNT BRACKET REF VIEW Z 1/2 SCALE

90415-0AB-AA0X0	200	(1,770)
90415-0AA-AA0X0	100	(885)
MODEL NO.	Nm	IN. LBS.
CAPACITY OPTION		

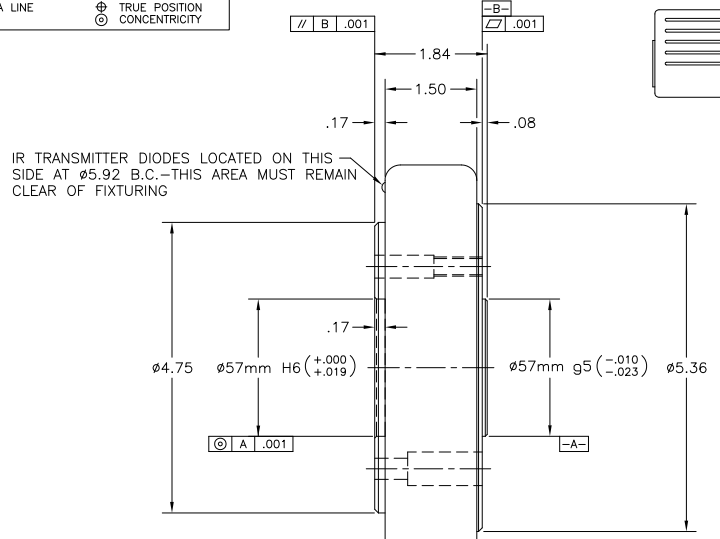
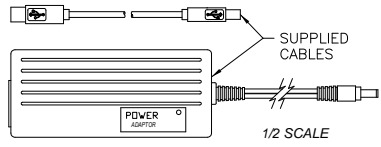
**FOR 8 COND CABLE TYPE ONLY

POLARITY: C.W. TORQUE UPSCALE
 ASSEMBLY DWG REF: 20929D0-*
 *-INDICATES CURRENT REV

INSTALLATION		CHECKED BY	
FINISH	SCALE	DATE	DATE
MODEL: 90415-0AX-AA0X0	FULL	D.S.	D.S.
MATRL.		DRAWN BY	GMC
		DATE	1-6-12
UNLESS OTHERWISE SPECIFIED DIM'S ARE IN INCHES		D.E. REVIEW	
.XX ±.03 .XXX ±.01 .XXXX ±.005 ANG. ±.5°		BY	DATE
		DRAWING NUMBER	20930D0-A

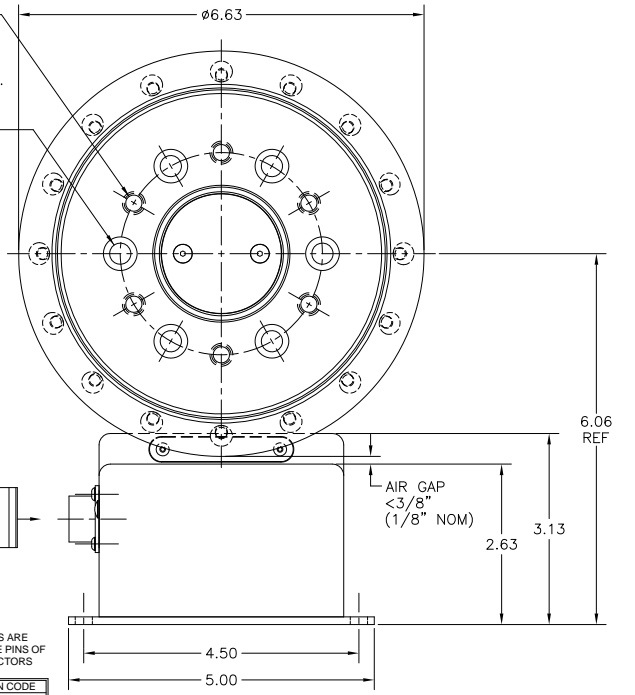
- \square FLATNESS OF A SURFACE
- \square STRAIGHTNESS OF A LINE
- \circ ROUNDNESS
- \circ CYLINDRICALITY
- \circ PROFILE OF A SURFACE
- \circ PROFILE OF A LINE
- \circ SYMMETRY
- \perp PERPENDICULARITY
- \parallel PARALLELISM
- \angle ANGULARITY
- \curvearrowright CIRCULAR RUNOUT
- \curvearrowright TOTAL RUNOUT
- \oplus TRUE POSITION
- \odot CONCENTRICITY

REV	DESCRIPTION	BY	DATE	CHK	ENG	REL	DATE
-	REL. FOR PRODUCTION	-	-	-	-	-	-



M8 X 1.25mm TAP—20mm DEEP CLEARANCE HOLE FROM OPP SIDE AS SHOWN IN VIEW 'A'
 6 HOLES EQUALLY SPACED AS SHOWN ON A Ø84mm (3.307 IN.) B.C. TORQUE TO 32 Nm

Ø8.8mm DRILL THRU
 Ø14mm C'BORE—31mm DEEP 6 PLACES EQUALLY SPACED AS SHOWN ON A Ø84mm (3.307 IN.) B.C.



PIN	PIN CODE	FUNCTION
A	+12V	
B	COMMON	
C	DATA A	
D	DATA B	
E	SHUNT A	
F	SHUNT B	
G	DO NOT CONNECT	
H	CONNECT	
J	COMMON (SECONDARY)**	
K	+12V (SECONDARY)**	

PT06E-12-10S CONNECTOR

A COND CABLE - B FT

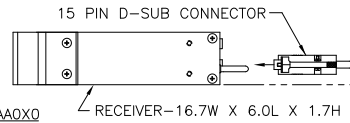
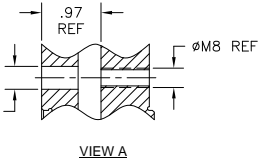
NOTE: ERROR RELAY CONTACTS ARE SHARED BETWEEN RESPECTIVE PINS OF FREQUENCY & ANALOG CONNECTORS

NOTE: MECHANICAL SHIELDING IS RECOMMENDED AROUND ROTATING COMPONENTS

PIN	FUNCTION
1	+12V
2	DATA A
3	DATA B
4	COMMON
5	SHUNT A
6	DO NOT CONNECT
7	DO NOT CONNECT
8	COMMON (SECONDARY)**
9	SHUNT B
10	+12V (SECONDARY)**
11	
12	
13	
14	
15	

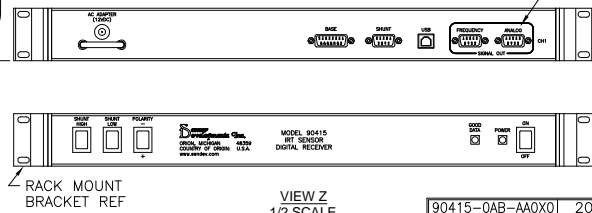
SHUNT 9 PIN CONN PIN CODE	FREQ. 9 PIN CONN PIN CODE	ANALOG 9 PIN CONN PIN CODE
PIN 1	N/C	FUNCTION
2	N/C	1 VOLTAGE +SIG
3	N/C	2 CURRENT mA SOURCE
4	N/C	3 N/C
5	N/C	4 CURRENT mA SINK
6	FREQ B	5 VOLTAGE -SIG
7	SHUNT POLARITY+	6 N/C
8	GND	7 ERROR RELAY N.O.
9	GND	8 ERROR RELAY N.O.
		9 N/C

(3) 9 PIN D-SUB CONNECTOR MATING CONNECTORS SUPPLIED



- SPECIFICATIONS**
- MODEL: 90415-0AX-AA0X0
 - CAPACITY - TORQUE CHARTED
 - OVERLOAD CAPACITY (%F.S. CAPACITY) 150
 - SOFTWARE SELECTABLE OUTPUTS NOM, F.S.
 - ±5V, ±10V, 2.5±2.5V, 12±8mA (4-20mA)
 - 10KHz±5KHz, 60KHz±20KHz, 60KHz±30KHz
 - BALANCE (MECHANICAL) G 2.5 @ 3,000 RPM
 - ACCURACY (%F.S. OUTPUT) .05%
 - RESOLUTION 16 BIT
 - MAX RPM 15,000
 - SENSOR MATERIAL STEEL

90415-0AX-AA0G0	8	100 FT
90415-0AX-AA0F0	8	70 FT
90415-0AX-AA0E0	8	90 FT
90415-0AX-AA0D0	6	25 FT
90415-0AX-AA0C0	8	80 FT
90415-0AX-AA0B0	8	60 FT
90415-0AX-AA0A0	6	20 FT
MODEL NO.	A	B
CABLE LENGTH OPTION		



90415-0AB-AA0X0	200	(1,770)
90415-0AA-AA0X0	100	(885)
MODEL NO.	Nm	IN. LBS.
CAPACITY OPTION		

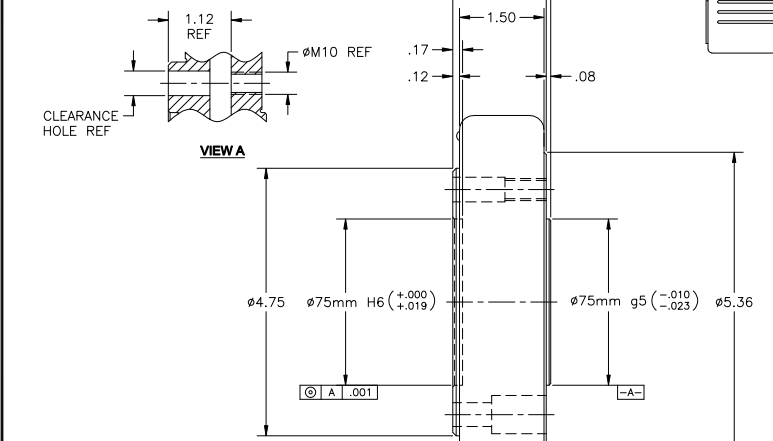
**FOR 8 COND CABLE TYPE ONLY

POLARITY: C.W. TORQUE UPSCALE
 ASSEMBLY DWG REF: 20929D0-*
 *-INDICATES CURRENT REV

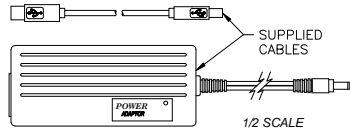
INSTALLATION				CHECKED BY	
FINISH	SCALE	FULL	PROJECT	ENG.	
			MODEL: 90415-0AX-AA0X0	PROJ. ENG.	
			DATE	1-6-12	
UNLESS OTHERWISE SPECIFIED DIM'S ARE IN INCHES			D.E. REVIEW		
XX ±.03 X.XX ±.01 X.XXX ±.005 ANG. ±.5°			BY DATE		
				DRAWING NUMBER	
				20930D0-0	

	FLATNESS OF A SURFACE		PERPENDICULARITY
	STRAIGHTNESS OF A LINE		PARALLELISM
	ROUNDNESS		ANGULARITY
	CYLINDRICITY		CIRCULAR RUNOUT
	PROFILE OF A SURFACE		TOTAL RUNOUT
	SYMMETRY		TRUE POSITION
			CONCENTRICITY

REV	DESCRIPTION	BY	DATE	CHK	ENG	REL	DATE
-	I REL FOR PRODUCTION	-	-	-	-	-	9-14-11
A	CAPACITY CHARTED	GMC	2-6-12	DS	DS		2-10-12

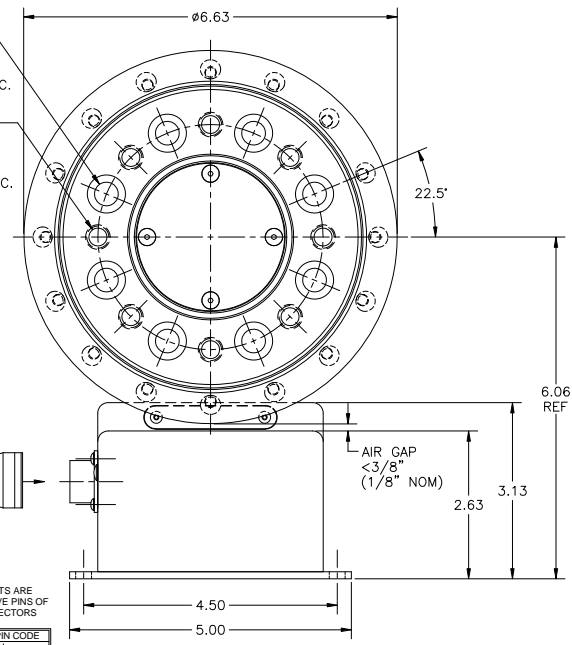


IR TRANSMITTER DIODES LOCATED ON THIS SIDE AT 05.92 B.C.—THIS AREA MUST REMAIN CLEAR OF FIXTURING



0.8mm DRILL THRU
0.17.3mm C'BORE—25mm DEEP
8 PLACES EQUALLY SPACED
AS SHOWN ON A 0.101.5mm (3.996 IN.) B.C.

M10 X 1.5mm TAP—14mm DEEP
CLEARANCE HOLE FROM OPP SIDE
AS SHOWN IN VIEW 'A'
8 HOLES EQUALLY SPACED
AS SHOWN ON A 0.101.5mm (3.996 IN.) B.C.
TORQUE TO 65 Nm



PIN	FUNCTION
A	+12V
B	COMMON
C	DATA A
D	DATA B
E	SHUNT A
F	SHUNT B
G	DO NOT CONNECT
H	COMMON (SECONDARY)**
J	+12V
K	(SECONDARY)**

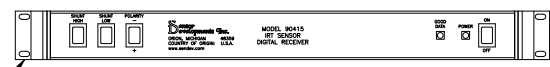
PIN	FUNCTION
1	+12V
2	DATA A
3	DATA B
4	COMMON
5	SHUNT A
6	DO NOT CONNECT
7	COMMON (SECONDARY)**
8	COMMON (SECONDARY)**
9	SHUNT B
10	+12V (SECONDARY)**
11	DO NOT CONNECT
12	DO NOT CONNECT
13	DO NOT CONNECT
14	DO NOT CONNECT
15	DO NOT CONNECT

SHUNT 9 PIN CONN PIN CODE		FREQ. 9 PIN CONN PIN CODE		ANALOG 9 PIN CONN PIN CODE	
PIN	FUNCTION	PIN	FUNCTION	PIN	FUNCTION
1	+5V	1	N/C	1	VOLTAGE +SIG
2	SHUNT HIGH+	2	N/C	2	CURRENT mA SOURCE
3	SHUNT HIGH-	3	GND	3	N/C
4	SHUNT LOW+	4	N/C	4	CURRENT mA SINK
5	SHUNT LOW-	5	N/C	5	VOLTAGE -SIG
6	SHUNT POLARITY+	6	FREQ B	6	N/C
7	SHUNT POLARITY-	7	ERROR RELAY N.O.	7	ERROR RELAY N.O.
8	GND	8	ERROR RELAY N.O.	8	ERROR RELAY N.O.
9	GND	9	FREQ A	9	N/C

90415-0AC-AA0X0	1,000	(8,500)
90415-00S-AA0X0	500	(4,425)
MODEL NO.	Nm	IN. LBS.
CAPACITY OPTION		

SPECIFICATIONS MODEL: 90415-OXX-AA0X0
CAPACITY - TORQUE CHARTED
OVERLOAD CAPACITY (%F.S. CAPACITY) 150
SOFTWARE SELECTABLE OUTPUTS NOM., F.S.
±5V, ±10V, 2.5±2.5V, 12±8mA (4-20mA)
10KHz±5KHz, 60KHz±20KHz, 60KHz±30KHz
BALANCE (MECHANICAL) G 2.5 @ 3,000 RPM
ACCURACY (%F.S. OUTPUT) .05%
RESOLUTION 16 BIT
MAX RPM 15,000
SENSOR MATERIAL STEEL
ELEMENT WEIGHT (APPROX.) 6.0 LBS.

90415-OXX-AA0G0	8	100 FT
90415-OXX-AA0F0	8	70 FT
90415-OXX-AA0E0	8	90 FT
90415-OXX-AA0D0	6	25 FT
90415-OXX-AA0C0	8	80 FT
90415-OXX-AA0B0	8	60 FT
90415-OXX-AA0A0	6	20 FT
MODEL NO.	A	B
CABLE LENGTH OPTION		



POLARITY: C.W. TORQUE UPSHALE
ASSEMBLY DWG REF: 20848D0-*
*-INDICATES CURRENT REV

INSTALLATION		CHECKED BY	
MODEL: 90415-OXX-AA0X0		D.S.	
FINISH	SCALE FULL	PROJ. ENG.	D.S.
MATL.	SCALE FULL	DRAWN BY	GMC
UNLESS OTHERWISE SPECIFIED DIM'S ARE IN INCHES		DATE	9-13-11
X.X ±0.3 X.XX ±0.1 X.XXX ±0.05 ANG. ±.5°		D.E. REVIEW	
		BY	DATE
		DRAWING NUMBER	
			20849D0-A

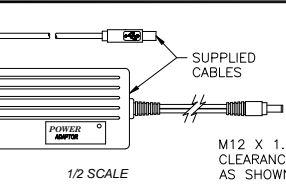
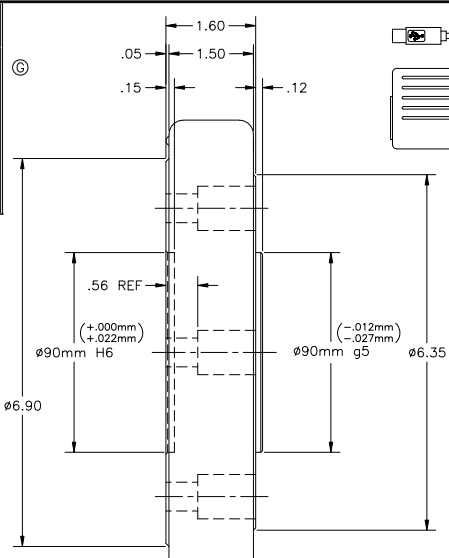
**FOR 8 COND CABLE TYPE ONLY

EXTRANEIOUS LOAD EQUATION (MAX. STRESS)

$$\sigma_{(MAX)} = aF_x + bF_y + cF_z + dM_x + eM_y + fM_z$$

$\sigma_{(MAX)} = 40,000\text{psi DYNAMIC OR } 80,000\text{psi STATIC}$

ACTIVE END

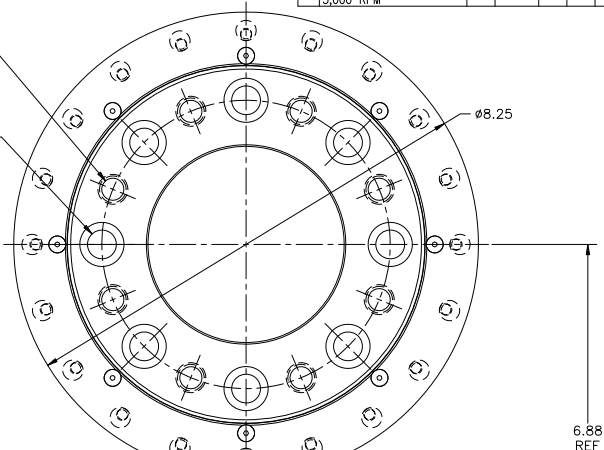


MODEL NO.	EXTRANEIOUS LOAD VALUES				SPRING RATES (#/IN OR IN #/RAD x 10 ⁶)		
	a=b	c	d=e	f	Kx=Ky	Kz	KMx=KMz
90415-00F	3.23	1.15	1.93	1.61	13.2	68.6	52.9 40.7

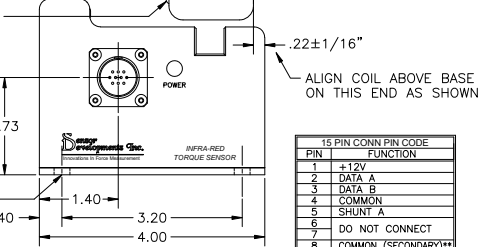
REV	DESCRIPTION	BY	DATE	CHK	ENG	REL DATE
D	90415-00Z-AAOX0 ADDED	GMC	12-20-11	-	-	12-20-11
E	90415-0AL-AAOX0 ADDED	GMC	7-6-12	DS	DS	7-12-12
F	90415-0XX-AAOX0 ADDED	GMC	1-25-14	-	-	3-25-14
G	MAX STRESS PFS REVISED	GMC	7-14-14	DS	DS	3-24-15
H	BASE ASSY REV'D	GMC	3-24-15	-	-	-
I	62.5 @ 7,000 RPM WAS	GMC	4-12-16	-	-	-
	3,000 RPM					

M12 X 1.75mm TAP-14mm DEEP CLEARANCE HOLE FROM OPP SIDE AS SHOWN IN VIEW 'A'
 8 PLACES EQUALLY SPACED AS SHOWN ON A Ø130mm (5.118 IN.) B.C.
 TORQUE TO 110Nm

Ø13mm DRILL THRU
 Ø20mm C'BORE-26mm DEEP
 8 PLACES EQUALLY SPACED AS SHOWN ON A Ø130mm (5.118 IN.) B.C.
 TORQUE TO 110Nm



IR TRANSMITTER DIODES LOCATED ON THIS SIDE AT A Ø7.54 B.C.- THIS AREA MUST REMAIN CLEAR OF FIXTURING

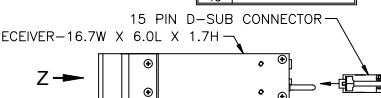
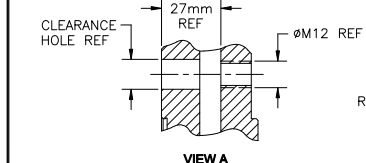


PIN	FUNCTION
1	+12V
2	DATA A
3	DATA B
4	COMMON
5	SHUNT A
6	DO NOT CONNECT
7	COMMON (SECONDARY)**
8	SHUNT B
9	+12V (SECONDARY)**
10	DO NOT CONNECT
11	
12	
13	DO NOT CONNECT
14	
15	

PIN	FUNCTION
A	+12V
B	COMMON
C	DATA A
D	DATA B
E	SHUNT A
F	SHUNT B
G	DO NOT CONNECT
H	DO NOT CONNECT
J	(SECONDARY)**
K	(SECONDARY)**

SHUNT 9 PIN CONN PIN CODE		FREQ. 9 PIN CONN PIN CODE		ANALOG 9 PIN CONN PIN CODE	
PIN	FUNCTION	PIN	FUNCTION	PIN	FUNCTION
1	+5V	1	N/C	1	VOLTAGE +SIG
2	SHUNT HIGH+	2	N/C	2	CURRENT mA SOURCE
3	SHUNT HIGH-	3	GND	3	N/C
4	SHUNT LOW+	4	N/C	4	CURRENT mA SINK
5	SHUNT LOW-	5	N/C	5	VOLTAGE -SIG
6	SHUNT POLARITY+	6	FREQ B	6	N/C
7	SHUNT POLARITY-	7	ERROR RELAY N.O.	7	ERROR RELAY N.O.
8	GND	8	ERROR RELAY N.C.	8	ERROR RELAY N.C.
9	GND	9	FREQ A	9	N/C

NOTE: ERROR RELAY CONTACTS ARE SHARED BETWEEN RESPECTIVE PINS OF FREQUENCY & ANALOG CONNECTORS



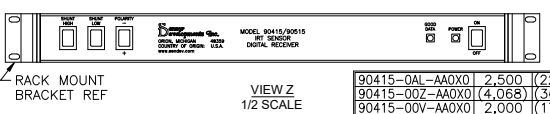
SPECIFICATIONS MODEL: 90415-OXX-AAOX0

CAPACITY -TORQUE F.S. _____ CHARTED
 OVERLOAD CAPACITY (%F.S.) _____ 150
 SOFTWARE SELECTABLE OUTPUTS NOM. F.S.
 ±5V, ±10V, 2.5±2.5V, 12±8mA (4-20mA)
 10kHz±5kHz, 60kHz±20kHz, 60kHz±30kHz

BALANCE (MECHANICAL) _____
 ACCURACY (%F.S. OUTPUT) _____ .05%
 RESOLUTION _____ 16 BIT
 MAX RPM _____ 7,000
 SENSOR MATERIAL _____ STEEL

MODEL NO.	A	B
90415-OXX-AAO0	6	40 FT
90415-OXX-AAO00	6	10 FT
90415-OXX-AAO0J	8	150 FT
90415-OXX-AAO0G	8	100 FT
90415-OXX-AAO0F	8	70 FT
90415-OXX-AAO0E	8	90 FT
90415-OXX-AAO0D	6	25 FT
90415-OXX-AAO0C	8	80 FT
90415-OXX-AAO0B	8	60 FT
90415-OXX-AAO0A	6	20 FT

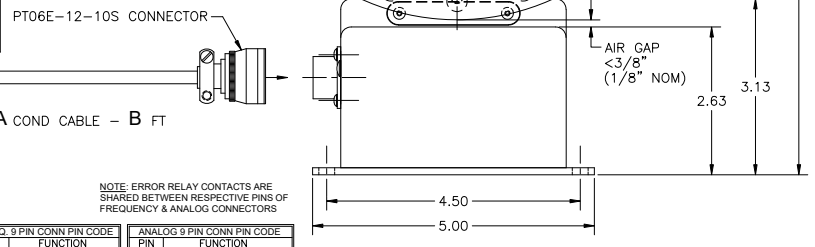
CABLE LENGTH OPTION **FOR 8 COND CABLE TYPE ONLY



RACK MOUNT BRACKET REF

MODEL NO.	Nm	IN. LBS. FT.	LBS.
90415-0AL-AAOX0	2,500	(22,100)	(1,842)
90415-00Z-AAOX0	(4,068)	(36,000)	3,000
90415-00V-AAOX0	2,000	(17,700)	(1,475)
90415-00F-AAOX0	3,000	(26,550)	(2,212)

CAPACITY OPTION



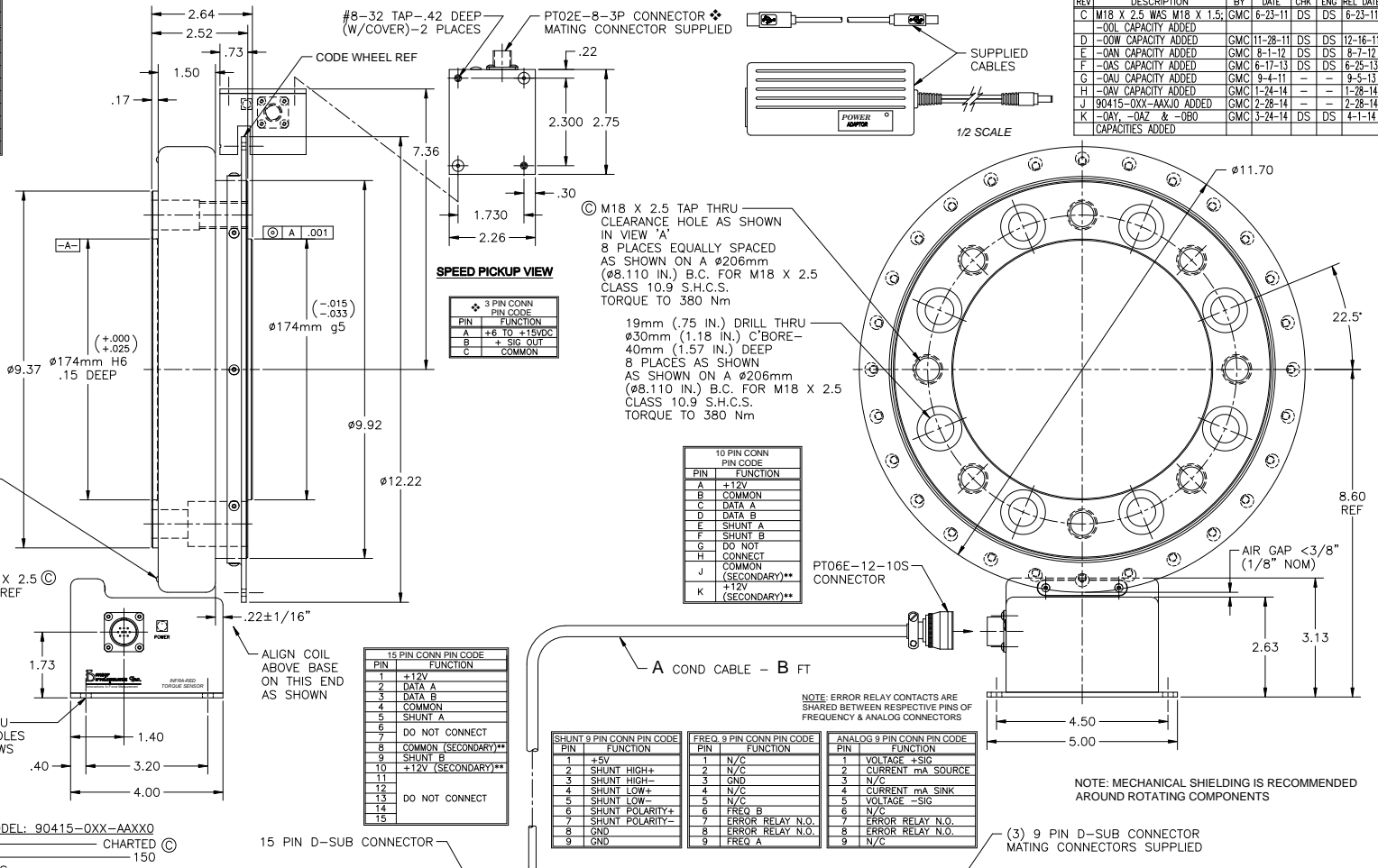
NOTE: MECHANICAL SHIELDING IS RECOMMENDED AROUND ROTATING COMPONENTS

POLARITY: C.W. TORQUE UPSCALE
 ASSEMBLY DWG REF: 20651D0-*

INSTALLATION		CHECKED BY	
MODEL: 90415-OXX-AAOX0		D.S.	
FINISH	SCALE	PROJ. ENG.	D.S.
	FULL		
DRAWN BY		DATE	
GMC		10-14-10	
MTRL.		D.E. REVIEW	
		BY	
UNLESS OTHERWISE SPECIFIED DIM'S ARE IN INCHES		DATE	
X.X ±0.3 X.X ±0.1 X.XXX ±0.05 ANG. ±.5°		DRAWING NUMBER	
		20652D0-H	

CAPACITY OPTION			
MODEL NO.	Nm	FT. LBS.	IN. LBS.
90415-00D-AAXX0	8,000	(3,700)	(44,250)
90415-00I-AAXX0	6,800	5,000	(60,000)
90415-00W-AAXX0	4,000	(2,950)	(35,400)
90415-00N-AAXX0	15,000	(11,100)	(133,000)
90415-00S-AAXX0	22,600	(16,666)	200,000
90415-00U-AAXX0	10,000	(7,400)	(88,500)
90415-00V-AAXX0	20,000	(14,750)	(177,000)
90415-00Y-AAXX0	4,500	(3,333)	(40,000)
90415-00Z-AAXX0	6,000	(4,417)	(53,000)
90415-000-AAXX0	12,000	(8,833)	(106,000)

REV	DESCRIPTION	BY	DATE	CHK	ENG	REL DATE
C	M18 X 2.5 WAS M18 X 1.5;	GMC	6-23-11	DS	DS	6-23-11
D	-00L CAPACITY ADDED					
E	-00W CAPACITY ADDED	GMC	11-28-11	DS	DS	12-16-11
F	-00N CAPACITY ADDED	GMC	8-1-12	DS	DS	8-7-12
G	-00S CAPACITY ADDED	GMC	6-17-13	DS	DS	6-25-13
H	-00U CAPACITY ADDED	GMC	9-4-11			9-5-13
I	-00V CAPACITY ADDED	GMC	1-24-14			1-28-14
J	90415-00X-AAXX0 ADDED	GMC	2-28-14			2-28-14
K	-00Y, -00Z & -000 CAPACITIES ADDED	GMC	3-24-14	DS	DS	4-1-14



SPECIFICATIONS MODEL: 90415-0XX-AAXX0

CAPACITY - TORQUE _____ CHARTED

OVERLOAD CAPACITY (%F.S.) _____ 150

SOFTWARE SELECTABLE OUTPUTS NOM. F.S.:

±5V, ±10V, 2.5±2.5V, 12±8mA (4-20mA), 10kHz±5kHz, 60kHz±20kHz, 60kHz±30kHz

BALANCE (MECHANICAL) _____ G 2.5 @ 3,000 RPM

ACCURACY (%F.S. OUTPUT) _____ .05%

RESOLUTION _____ 16 BIT

MAX RPM _____ 6,000

SPEED PICKUP OPTION (MODEL: 90415-0XX-AABX0)

POWER SUPPLY _____ 6 TO 15VDC

OUTPUT CONFIGURATION — OPEN DRAIN W/470 OHM PULL-UP RESISTOR TO POWER SUPPLY

OPERATIONAL SPEED _____ 100 TO 6,000 RPM

RESOLUTION _____ 180 PPR

MODEL NO.	A	B
90415-0XX-AAXX0	8	150 FT
90415-0XX-AAXG0	8	100 FT
90415-0XX-AAXF0	8	70 FT
90415-0XX-AAXE0	8	90 FT
90415-0XX-AAXD0	8	25 FT
90415-0XX-AAXC0	8	80 FT
90415-0XX-AAXB0	8	60 FT
90415-0XX-AAXA0	6	20 FT

MODEL NO. _____ A _____ B _____

CABLE LENGTH OPTION

RECEIVER-16.7W X 6.0L X 1.7H

RACK MOUNT BRACKET REF

**FOR 8 COND CABLE TYPE ONLY

INSTALLATION

MODEL: 90415-0XX-AAXX0

FINISH _____ SCALE 3/4

MATL. _____ DATE 5-11-10

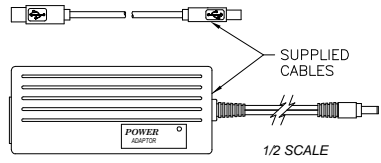
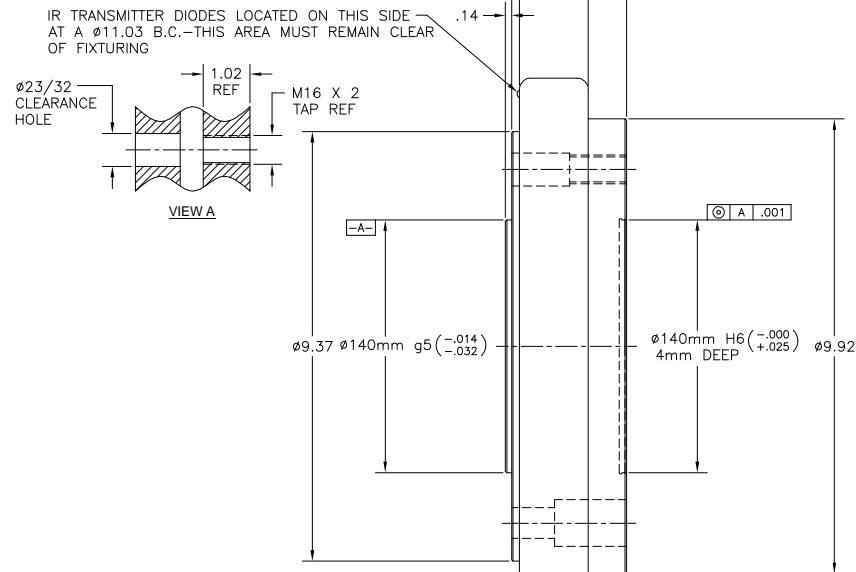
UNLESS OTHERWISE SPECIFIED DIM'S ARE IN INCHES
X.X ±.03 X.XX ±.01 X.XXX ±.005 ANG. ±.5°

POLARITY: C.W. TORQUE UPSCALE
ASSEMBLY DWG REF: 20541D0-*
*- INDICATES CURRENT REV

CHECKED BY D.S.
PROJ. ENG. D.S.
DRAWN BY GMC
DATE 5-11-10
D.E. REVIEW
DATE _____
DRAWING NUMBER
20542D0-K

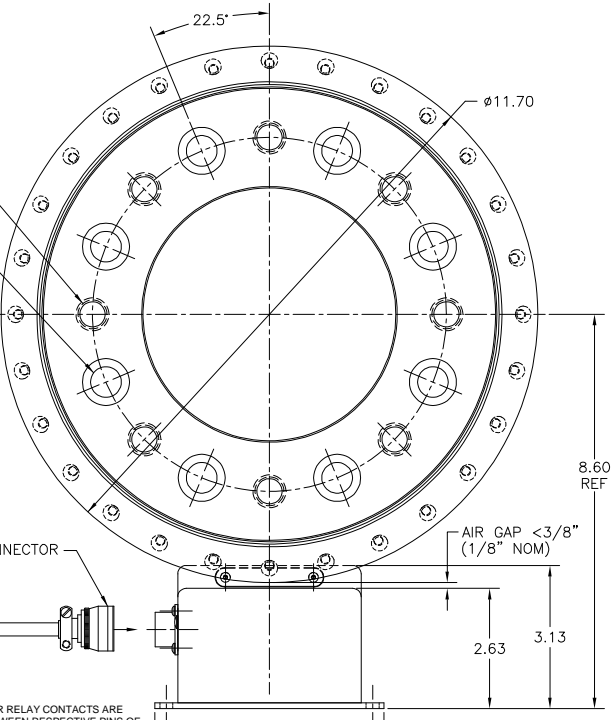
□	FLATNESS OF A SURFACE	⊥	PERPENDICULARITY
○	STRAIGHTNESS OF A LINE	//	PARALLELISM
⌒	ROUNDNESS	∠	ANGULARITY
⊘	CYLINDRICITY	⊙	CIRCULAR RUNOUT
⊖	PROFILE OF A SURFACE	⊕	TOTAL RUNOUT
⊖	PROFILE OF A LINE	⊕	TRUE POSITION
⊖	SYMMETRY	⊕	CONCENTRICITY

REV	DESCRIPTION	BY	DATE	CHK	ENG	REL	DATE
-	REL. FOR PRODUCTION	-	-	-	-	-	-



M16 X 2 TAP THRU CLEARANCE HOLE AS SHOWN IN VIEW 'A'
8 PLACES EQUALLY SPACED AS SHOWN ON A Ø196mm (Ø7.717 IN.) B.C. FOR M16 X 2 CLASS 10.9 S.H.C.S. TORQUE TO 350 Nm

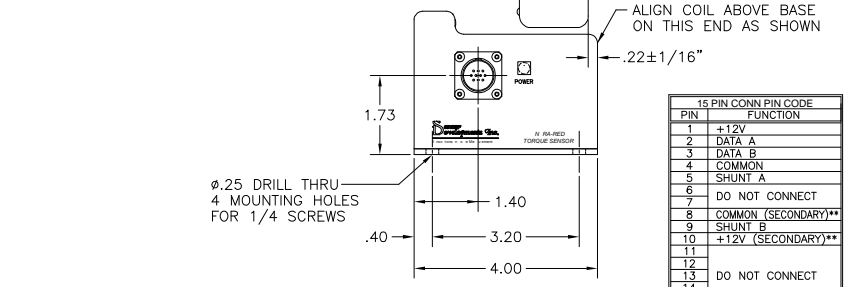
17mm (.67 IN.) DRILL THRU Ø26mm (1.02 IN.) C'BORE-40mm (1.57 IN.) DEEP 8 PLACES AS SHOWN AS SHOWN ON A Ø196mm (Ø7.717 IN.) B.C. FOR M16 X 2 CLASS 10.9 S.H.C.S. TORQUE TO 350 Nm



10 PIN CONN PIN CODE	
PIN	FUNCTION
A	+12V
B	COMMON
C	DATA A
D	DATA B
E	SHUNT A
F	SHUNT B
G	DO NOT CONNECT
H	CONNECT
J	COMMON (SECONDARY)**
K	+12V (SECONDARY)**

15 PIN CONN PIN CODE	
PIN	FUNCTION
1	+12V
2	DATA A
3	DATA B
4	COMMON
5	SHUNT A
6	DO NOT CONNECT
7	COMMON (SECONDARY)**
9	SHUNT B
10	+12V (SECONDARY)**
11	
12	
13	
14	
15	DO NOT CONNECT

SHUNT 9 PIN CONN PIN CODE		FREQ. 9 PIN CONN PIN CODE		ANALOG 9 PIN CONN PIN CODE	
PIN	FUNCTION	PIN	FUNCTION	PIN	FUNCTION
1	+5V	1	N/C	1	VOLTAGE +SIG
2	SHUNT HIGH+	2	N/C	2	CURRENT mA SOURCE
3	SHUNT HIGH-	3	GND	3	N/C
4	SHUNT LOW+	4	N/C	4	CURRENT mA SINK
5	SHUNT LOW-	5	N/C	5	VOLTAGE -SIG
6	SHUNT POLARITY+	6	FREQ B	6	N/C
7	SHUNT POLARITY-	7	ERROR RELAY N.O.	7	ERROR RELAY N.O.
8	GND	8	ERROR RELAY N.O.	8	ERROR RELAY N.O.
9	GND	9	FREQ A	9	N/C



SPECIFICATIONS MODEL: 90415-00J-AA0X0

CAPACITY TORQUE Nm (FT. LBS.) F.S. 12,000 (8,800)

OVERLOAD CAPACITY (%F.S.) 150

SOFTWARE SELECTABLE OUTPUTS NOM. F.S.:

±5V, ±10V, 2.5±2.5V, 12±8mA (4-20mA), 10KHz±5KHz, 60KHz±20KHz, 60KHz±30KHz

BALANCE (MECHANICAL) G 2.5 @ 3,000 RPM

ACCURACY (%F.S. OUTPUT) .10%

RESOLUTION 16 BIT

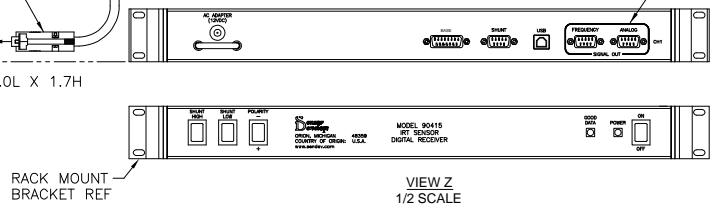
MAX RPM 6,000

RECEIVER-16.7W X 6.0L X 1.7H
**FOR 8 COND CABLE TYPE ONLY

90415-00J-AA0E0	8	90 FT
90415-00J-AA0D0	6	25 FT
90415-00J-AA0C0	8	80 FT
90415-00J-AA0B0	8	60 FT
90415-00J-AA0A0	6	20 FT

MODEL NO. A B

CABLE LENGTH OPTION

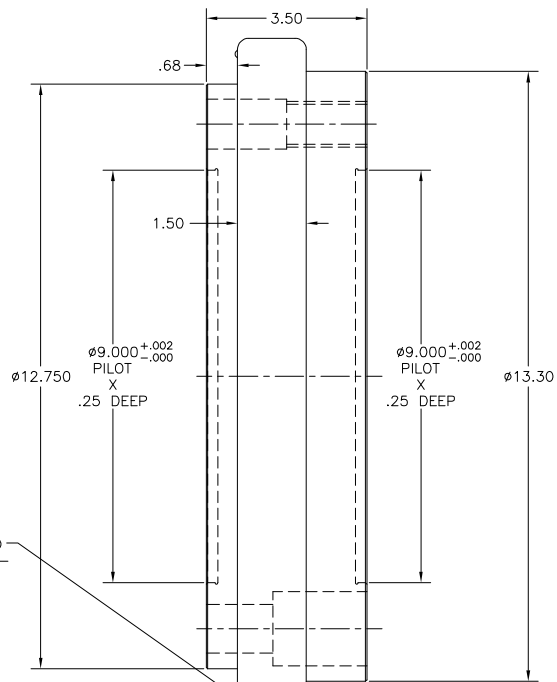


NOTE: MECHANICAL SHIELDING IS RECOMMENDED AROUND ROTATING COMPONENTS

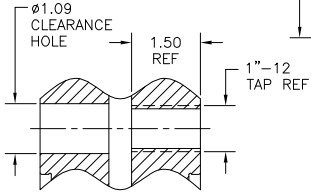
POLARITY: C.W. TORQUE UPSCALE ASSEMBLY DWG REF: 2068800-* *-INDICATES CURRENT REV

INSTALLATION		CHECKED BY	
MODEL: 90415-00J-AA0X0		PROJ. ENG.	
FINISH	SCALE 3/4	DRAWN BY	GMC
MATRL.	DATE 1-14-11	DATE	
UNLESS OTHERWISE SPECIFIED DIM'S ARE IN INCHES		D.E. REVIEW	
XX ±.03 XX ±.01 X.XXX ±.005 ANG. ±.5°		BY	DATE
		DRAWING NUMBER	20689D0-0

MODEL NO.	CAPACITY
90415-00G-AA0X0	10,000 FT. LBS. (13kNm)
90415-00H-AA0X0	15,000 FT. LBS. (20kNm)

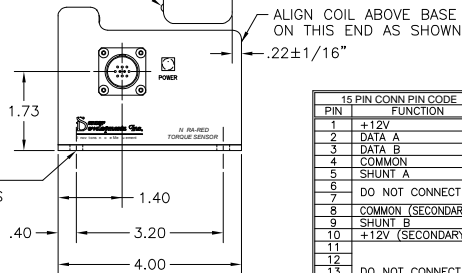


IR TRANSMITTER DIODES LOCATED ON THIS SIDE AT A Ø13.94 B.C.- THIS AREA MUST REMAIN CLEAR OF FIXTURING



VIEW A

Ø.25 DRILL THRU
4 MOUNTING HOLES FOR 1/4 SCREWS



PIN	FUNCTION
1	+12V
2	DATA A
3	DATA B
4	COMMON
5	SHUNT A
6	DO NOT CONNECT
7	COMMON (SECONDARY)**
8	SHUNT B
9	+12V (SECONDARY)**
10	
11	
12	
13	
14	
15	DO NOT CONNECT

15 PIN D-SUB CONNECTOR

Z

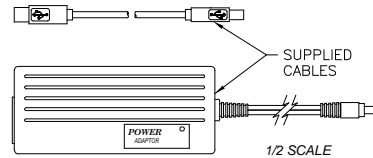
SPECIFICATIONS MODEL: 90415-00X-AA0X0
CAPACITY TORQUE Nm (IN. LBS.) F.S. CHARTED
OVERLOAD CAPACITY (%F.S.) 150
SOFTWARE SELECTABLE OUTPUTS NOM., F.S.:
±5V, ±10V, 2.5±2.5V, 12±8mA (4-20mA),
10KHz±5KHz, 60KHz±20KHz, 60KHz±30KHz
BALANCE (MECHANICAL) G 2.5 @ 3,000 RPM
ACCURACY (%F.S. OUTPUT) .10%
RESOLUTION 16 BIT
MAX RPM 3,000

RECEIVER-16.7W X 6.0L X 1.7H
**FOR 8 COND CABLE TYPE ONLY

90415-00X-AA0E0	8	90 FT
90415-00X-AA0D0	6	25 FT
90415-00X-AA0C0	8	80 FT
90415-00X-AA0B0	8	60 FT
90415-00X-AA0A0	6	20 FT

MODEL NO. A B
CABLE LENGTH OPTION

RACK MOUNT
BRACKET REF



1"-12 TAP THRU CLEARANCE HOLE AS SHOWN IN VIEW 'A'
8 PLACES EQUALLY SPACED AS SHOWN ON A Ø11.000 B.C. FOR 1"-12 GRADE 8 S.H.C.S. TORQUE TO 900 FT. LBS.

1.06 DRILL THRU Ø1.62 C'BORE-2.07 DEEP
8 PLACES AS SHOWN AS SHOWN ON A Ø11.000 B.C. FOR 1"-12 GRADE 8 S.H.C.S. TORQUE TO 900 FT. LBS.

PIN	FUNCTION
A	+12V
B	COMMON
C	DATA A
D	DATA B
E	SHUNT A
F	SHUNT B
G	DO NOT CONNECT
H	CONNECT
J	COMMON (SECONDARY)**
K	+12V (SECONDARY)**

PT06E-12-10S CONNECTOR

A COND CABLE - B FT

NOTE: ERROR RELAY CONTACTS ARE SHARED BETWEEN RESPECTIVE PINS OF FREQUENCY & ANALOG CONNECTORS

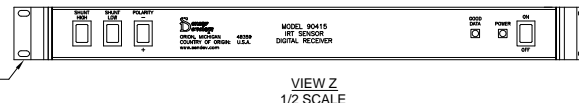
PIN	FUNCTION	PIN	FUNCTION	PIN	FUNCTION
1	+5V	1	N/C	1	VOLTAGE +SIG
2	SHUNT HIGH+	2	N/C	2	CURRENT mA SOURCE
3	SHUNT HIGH-	3	GND	3	N/C
4	SHUNT LOW+	4	N/C	4	CURRENT mA SINK
5	SHUNT LOW-	5	N/C	5	VOLTAGE -SIG
6	SHUNT POLARITY+	6	FREQ B	6	N/C
7	SHUNT POLARITY-	7	ERROR RELAY N.O.	7	ERROR RELAY N.O.
8	GND	8	ERROR RELAY N.O.	8	ERROR RELAY N.O.
9	GND	9	FREQ A	9	N/C

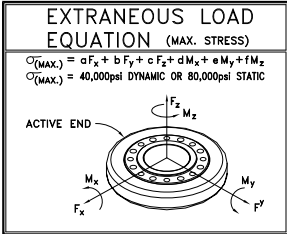
(3) 9 PIN D-SUB CONNECTOR MATING CONNECTORS SUPPLIED

NOTE: MECHANICAL SHIELDING IS RECOMMENDED AROUND ROTATING COMPONENTS

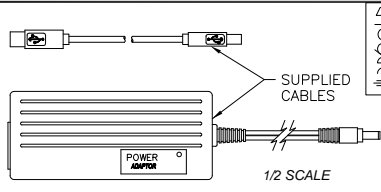
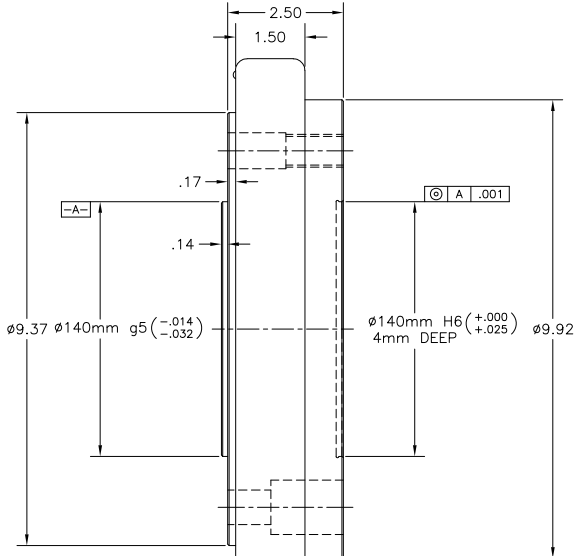
POLARITY: C.W. TORQUE UPSCALE
ASSEMBLY DWG REF: 20685D0-*
*-INDICATES CURRENT REV

INSTALLATION		CHECKED BY
MODEL: 90415-00X-AA0X0		PROJ. ENG.
FINISH	SCALE 3/4	DRAWN BY GMC
MATRL.	DATE 1-11-11	
UNLESS OTHERWISE SPECIFIED DIM'S ARE IN INCHES XX ±.03 X.XX ±.01 X.XXX ±.005 ANG. ±.5°		D.E. REVIEW
		BY DATE
		DRAWING NUMBER
		20686D0-0





MODEL NO.	EXTRANEOUS LOAD VALUES				SPRING RATES (#/IN OR IN #/RAD x 10 ⁶)			
	a=b	c	d=e	f	Kx=Ky	Kz	KMx=KMy	KMz
90415-00J	1.46	.44	.37	.31	26.4	137	404	310
90415-0AD	2.34	.71	.58	.48	16.5	85.6	258	198
90415-0AM	1.46	.44	.37	.31	26.4	137	404	310

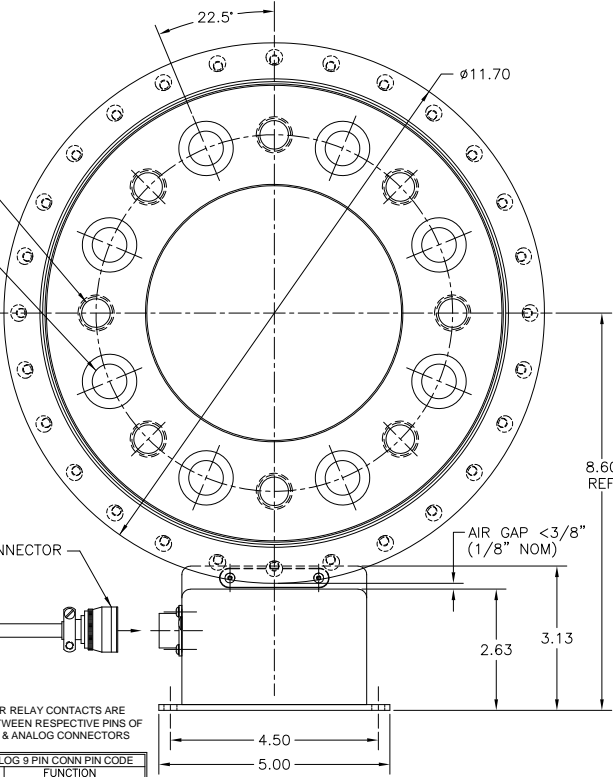


- FLATNESS OF A SURFACE
- STRAIGHTNESS OF A LINE
- ROUNDNESS
- CYLINDRICITY
- PROFILE OF A SURFACE
- PROFILE OF A LINE
- SYMMETRY
- PERPENDICULARITY
- PARALLELISM
- ANGULARITY
- CIRCULAR RUNOUT
- TOTAL RUNOUT
- TRUE POSITION
- CONCENTRICITY

REV	DESCRIPTION	BY	DATE	CHK	ENG	REL DATE
B	EXT. LOAD & SPRING RATE VALUES REV'D; CAPACITY CHARTED	GMC	2-3-12	DS	DS	12-14-12
C	90415-0AM-AAOX0 ADDED	GMC	7-6-12	DS	DS	12-12-12

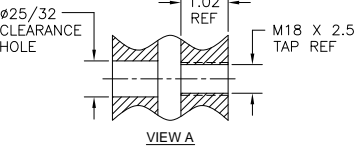
M18 X 2.5 TAP THRU CLEARANCE HOLE AS SHOWN IN VIEW 'A'
8 PLACES EQUALLY SPACED AS SHOWN ON A ϕ 196mm (ϕ 7.717 IN.) B.C. FOR M18 X 2.5 CLASS 10.9 OR 12.9 S.H.C.S. TORQUE TO 500 Nm

19mm (.75 IN.) DRILL THRU ϕ 30mm (1.18 IN.) C'BORE-40mm (1.57 IN.) DEEP
8 PLACES AS SHOWN AS SHOWN ON A ϕ 196mm (ϕ 7.717 IN.) B.C. FOR M18 X 2.5 CLASS 10.9 OR 12.9 S.H.C.S. TORQUE TO 500 Nm



IR TRANSMITTER DIODES LOCATED ON THIS SIDE AT A ϕ 11.03 B.C.-THIS AREA MUST REMAIN CLEAR OF FIXTURING

ALIGN COIL ABOVE BASE ON THIS END AS SHOWN



PIN	FUNCTION
1	+12V
2	DATA A
3	DATA B
4	COMMON
5	SHUNT A
6	DO NOT CONNECT
7	COMMON (SECONDARY)**
8	SHUNT B
9	+12V (SECONDARY)**
10	DO NOT CONNECT
11	DO NOT CONNECT
12	DO NOT CONNECT
13	DO NOT CONNECT
14	DO NOT CONNECT
15	DO NOT CONNECT

PIN	FUNCTION
A	+12V
B	COMMON
C	DATA A
D	DATA B
E	SHUNT A
F	SHUNT B
G	DO NOT CONNECT
H	DO NOT CONNECT
J	COMMON (SECONDARY)**
K	+12V (SECONDARY)**

SHUNT 9 PIN CONN PIN CODE	FREQ. 9 PIN CONN PIN CODE	ANALOG 9 PIN CONN PIN CODE			
PIN	FUNCTION	PIN	FUNCTION	PIN	FUNCTION
1	+5V	1	N/C	1	VOLTAGE +SIG
2	SHUNT HIGH+	2	N/C	2	CURRENT mA SOURCE
3	SHUNT HIGH-	3	GND	3	N/C
4	SHUNT LOW+	4	N/C	4	CURRENT mA SINK
5	SHUNT LOW-	5	N/C	5	VOLTAGE -SIG
6	SHUNT POLARITY+	6	FREQ B	6	N/C
7	SHUNT POLARITY-	7	ERROR RELAY N.O.	7	ERROR RELAY N.O.
8	GND	8	ERROR RELAY N.O.	8	ERROR RELAY N.O.
9	GND	9	FREQ A	9	N/C

NOTE: ERROR RELAY CONTACTS ARE SHARED BETWEEN RESPECTIVE PINS OF FREQUENCY & ANALOG CONNECTORS

NOTE: MECHANICAL SHIELDING IS RECOMMENDED AROUND ROTATING COMPONENTS

(3) 9 PIN D-SUB CONNECTOR MATING CONNECTORS SUPPLIED

SPECIFICATIONS MODEL: 90415-0XX-AAOX0

CAPACITY-TORQUE F.S. _____ CHARTED

OVERLOAD CAPACITY (%F.S.) _____ 150

SOFTWARE SELECTABLE OUTPUTS NOM., F.S.:

$\pm 5V$, $\pm 10V$, $2.5 \pm 2.5V$, $12 \pm 8mA$ (4-20mA), $10kHz \pm 5kHz$, $60kHz \pm 20kHz$, $60kHz \pm 30kHz$

BALANCE (MECHANICAL) _____ G 2.5 @ 3,000 RPM

ACCURACY (%F.S. OUTPUT) _____ .10%

RESOLUTION _____ 16 BIT

MAX RPM _____ 6,000

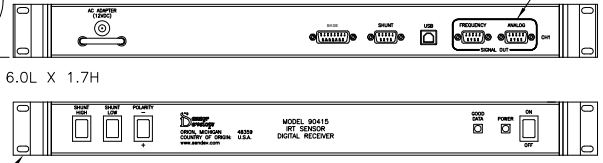
MODEL NO.	Nm	IN. LBS.
90415-0AM-AAOX0	15,000	(133,000)
90415-0AD-AAOX0	10,000	(88,500)
90415-00J-AAOX0	15,818	140,000

MODEL NO.	A	B
90415-0XX-AA0G0	8	100 FT
90415-0XX-AA0F0	8	70 FT
90415-0XX-AA0E0	8	90 FT
90415-0XX-AA0D0	6	25 FT
90415-0XX-AA0C0	8	80 FT
90415-0XX-AA0B0	8	60 FT
90415-0XX-AA0A0	6	20 FT

RECEIVER-16.7W X 6.0L X 1.7H

RACK MOUNT BRACKET REF

**FOR 8 COND CABLE TYPE ONLY



VIEW Z
1/2 SCALE

POLARITY: C.W. TORQUE UPSCALE
ASSEMBLY DWG REF: 20688D0-*
*-INDICATES CURRENT REV

INSTALLATION		CHECKED BY	D.S.
MODEL: 90415-0XX-AAOX0	SCALE 3/4	PROJ. ENG.	D.S.
FINISH		DRAWN BY	GMC
MATRL		DATE	1-14-11
UNLESS OTHERWISE SPECIFIED DIM'S ARE IN INCHES		D.E. REVIEW	
X.X \pm 0.3 X.XX \pm 0.1 X.XXX \pm 0.05 ANG. \pm 5'		BY DATE	
		DRAWING NUMBER	20689D0-C