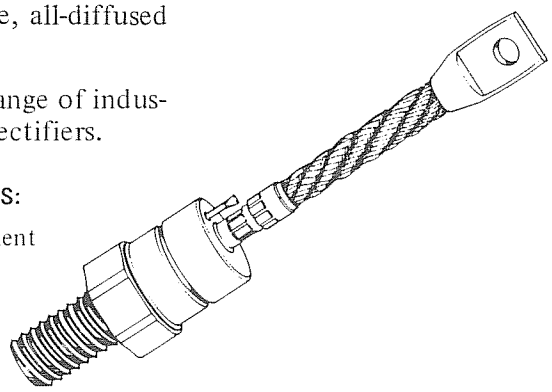
High Power Silicon Rectifier

1500 Volts 250A Avg.

1N3735-44
A190

The A190 (1N3735 Series) is General Electric's highly reliable, all-diffused Pic-Pac[4] 250 ampere silicon rectifier diode.

This series of rectifier diodes is particularly suited to a wide range of industrial applications, expecially those requiring high performance rectifiers.



FEATURES:

- Thermal Fatigue Resistant Pic-Pac[4] Construction
- Cathode Strain Buffer
- Soft Recovery
- 1500 Volt V_{RRM}
- Rugged Hermetic Package

TYPICAL APPLICATIONS:

- Transportation Equipment
- DC Motor Control
- DC Power Supplies
- Battery Vehicles

MAXIMUM ALLOWABLE RATINGS AND SPECIFICATIONS

TYPES*		REPETITIVE PEAK[1] REVERSE VOLTAGE V_{RRM} T_J = -40°C to +200°C	NON-REPETITIVE[2] PEAK REVERSE VOLTAGE, V_{RSM} T_J = 25°C to +200°C	DC REVERSE[3] VOLTAGE, V_R T_J = -40°C to +200°C	REPETITIVE PEAK REVERSE CURRENT I_{RRM} @ V_{RRM} T_J = 200°C
A190A	1N3735	100 Volts	200 Volts	100 Volts	100 Volts
A190B	1N3736	200	300	300	200
A190C	1N3737	300	400	300	300
A190D	1N3738	400	525	400	400
A190E	1N3739	500	650	500	500
A190M	1N3740	600	800	600	600
A190S	–	700	925	700	700
A190N	1N3741	800	1050	800	800
A190T	–	900	1175	900	900
A190P	1N3742	1000	1300	1000	1000
A190PA	–	1100	1400	1100	1100
A190PB	1N3743	1200	1500	1200	1200
A190PC	–	1300	1600	1300	1300
A190PD	1N3744	1400	1700	1400	1400
A190PE	–	1500	1800	1800	1500

*Models listed are stud cathode (forward polarity) types. Specify A190R- for stud anode (reverse polarity) types. Ratings and specifications are for frequencies from 50 to 400 Hz, except where noted otherwise.

Average Forward Current, $I_{F(AV)}$ (T_C = +144°C, Single-Phase, Half Sine Wave) . . . . . 250 Amperes
Peak One-Cycle Surge (Non-Repetitive), Forward Current, I_{FSM} . . . . . 6500 Amperes
Minimum I^2t Rating (See Curve 4), t ⩾ 1 msec. (Non-Repetitive) . . . . . 55,000 (RMS Ampere)^2 Seconds
Peak Forward Voltage Drop, V_{FM} (T_C = +144°C, $I_{F(AV)}$ = 250 Amps. Average, 785 Amps. Peak) . . . . . 1.3 Volts
Thermal Resistance, $R_{\theta JC}$ (DC) . . . . . .0.18°C/Watt
1ϕ & 3ϕ (50 to 400 Hz) . . . . . .0.24°C/Watt
6ϕ (50 to 400 Hz) . . . . . .0.30°C/Watt
Storage Temperature, T_{stg} . . . . . -40°C to +200°C
Operating Junction Temperature, T_J . . . . . -40°C to +200°C
Stud Torque (See Mounting Guide) . . . . . 275 Lb-in (Min.), 325 Lb-in (Max.)
31 N-m (Min.), 36.7 N-m (Max.)

NOTES:

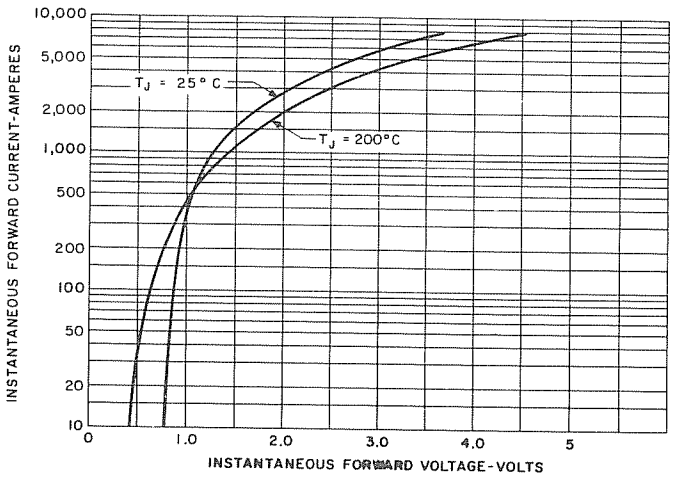
[1] Assumes a heatsink thermal resistance of less than 2.0°C/watt.

[2] Non-repetitive voltage and current ratings, as contrasted to repetitive ratings, apply for occasional or unpredictable overloads. For example, the forward surge current ratings are non-repetitive ratings that are used in fault coordination work.

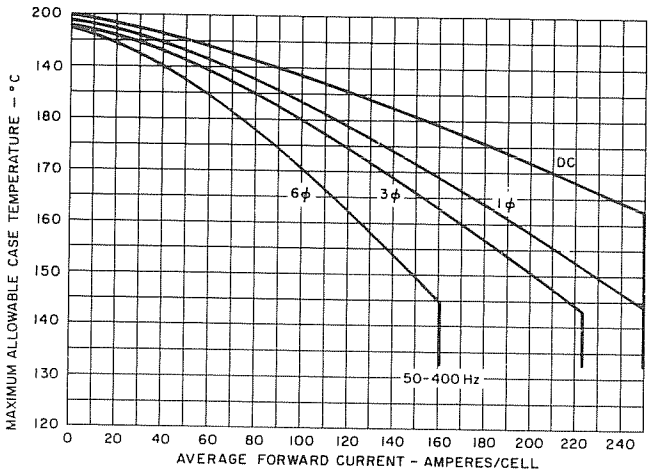
[3] Assumes a heatsink thermal resistance of less than 1.0°C/watt.

[4] "Pic-Pac" is an acronym for Pressure Internal Contact Package.

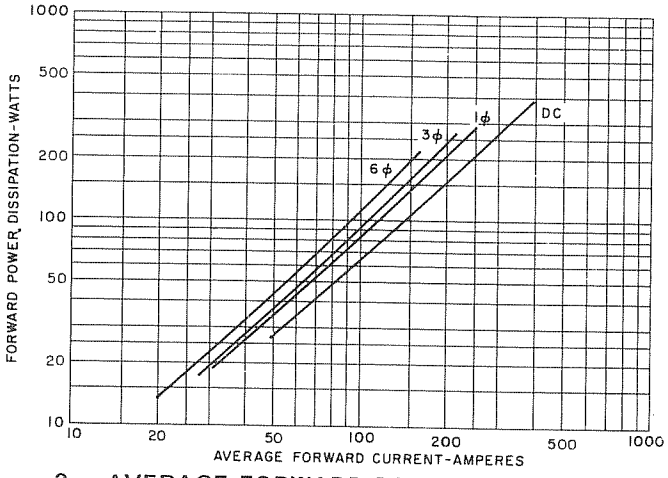
DEVICE SPECIFICATIONS



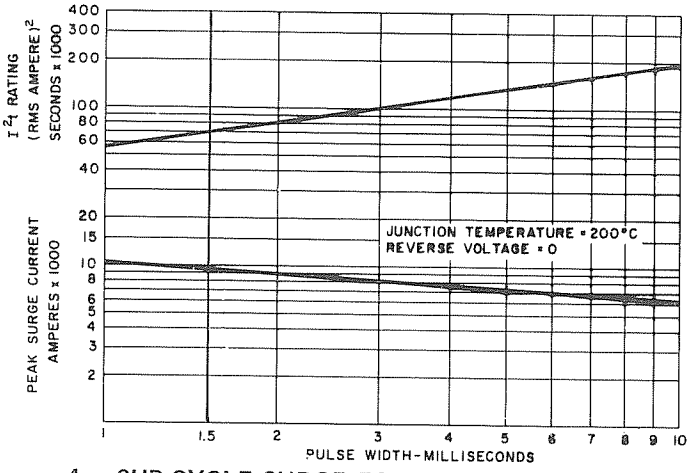
1. MAXIMUM FORWARD CHARACTERISTICS



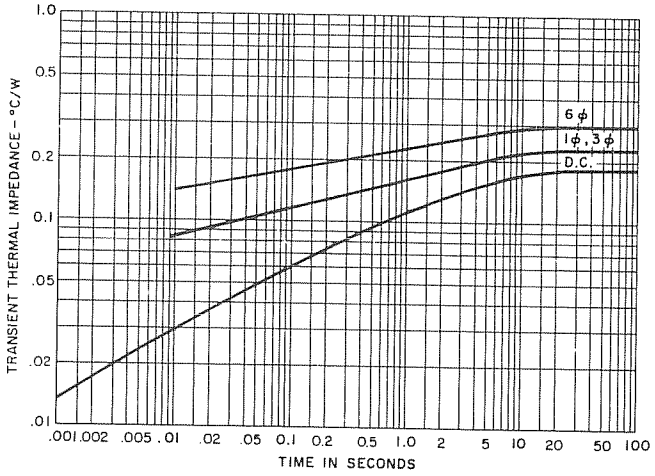
2. MAXIMUM CASE TEMPERATURE VS. AVERAGE FORWARD CURRENT



3. AVERAGE FORWARD POWER DISSIPATION VS. AVERAGE FORWARD CURRENT

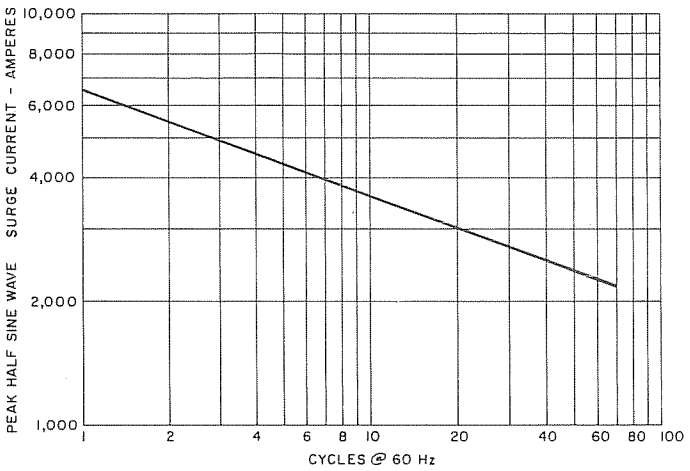


4. SUB-CYCLE SURGE FORWARD CURRENT AND I^2t RATING VS. PULSE TIME FOLLOWING RATED LOAD CONDITIONS



5. TRANSIENT THERMAL IMPEDANCE – JUNCTION-TO-CASE

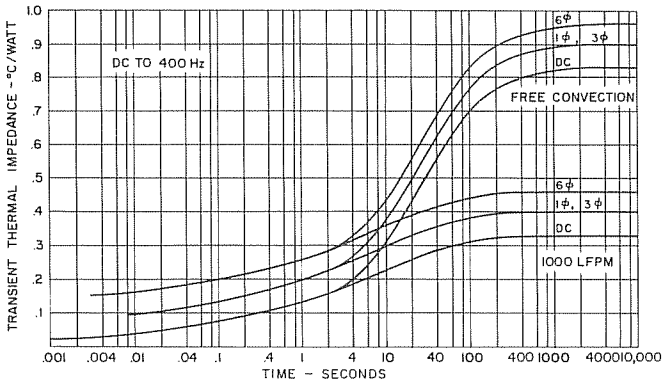
DEVICE SPECIFICATIONS



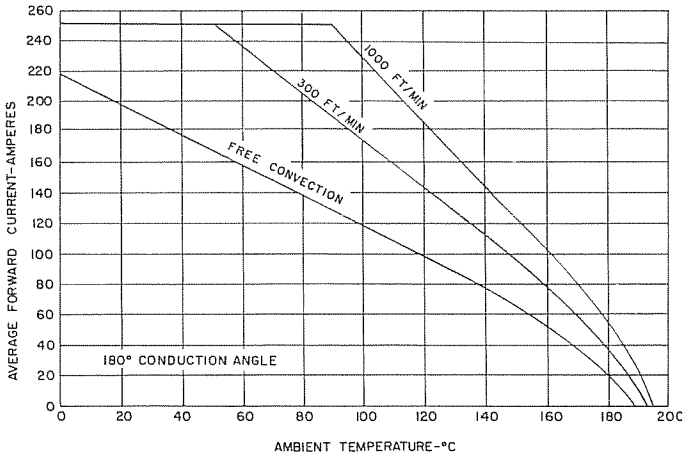
6. MAXIMUM SURGE CURRENT FOLLOWING RATED LOAD CONDITIONS

MAXIMUM CIRCUIT RATINGS

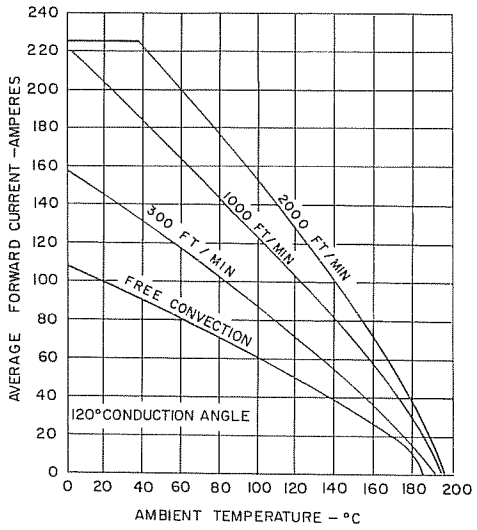
DEVICE MOUNTED ON A 5" x 5" x 6" ALUMINUM EXTRUSION (GE#15)



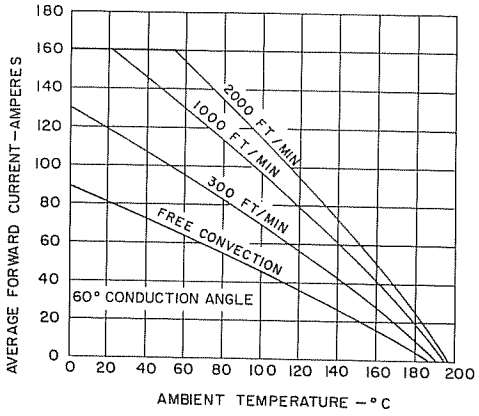
7. TRANSIENT THERMAL IMPEDANCE – JUNCTION-TO-AMBIENT



8. SINGLE-PHASE, HALF-WAVE FORWARD CURRENT VS. AMBIENT TEMPERATURE

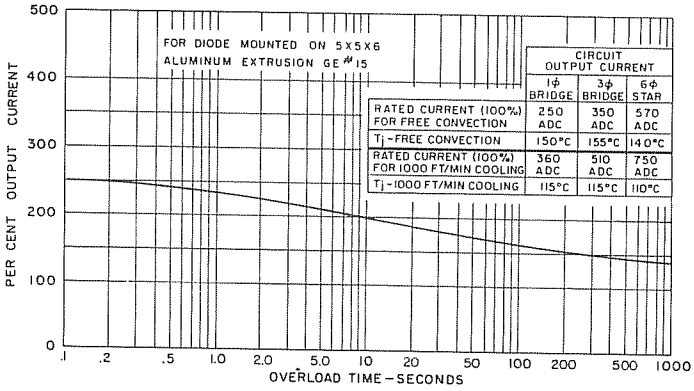


9. THREE-PHASE FORWARD CURRENT VS. AMBIENT TEMPERATURE



10. SIX-PHASE FORWARD CURRENT VS. AMBIENT TEMPERATURE

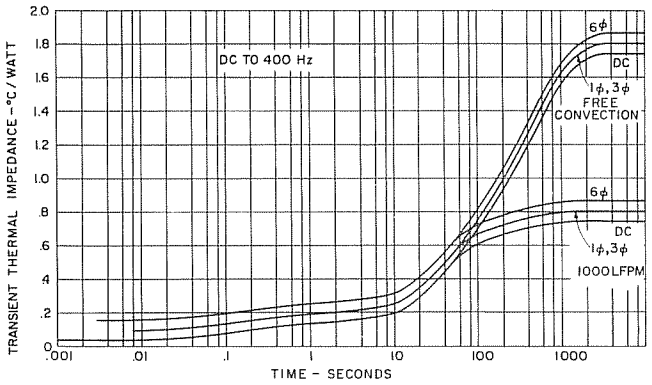
RECURRENT OVERLOAD RATINGS



11. REPETITIVE OVERLOAD CURVE MEETING NEMA STANDARDS FOR "General Purpose Rectifier Equipments Under 100 KW" AT 40°C AMBIENT (For Overload Conditions Other Than As Shown, Refer To Application Note 200.9)

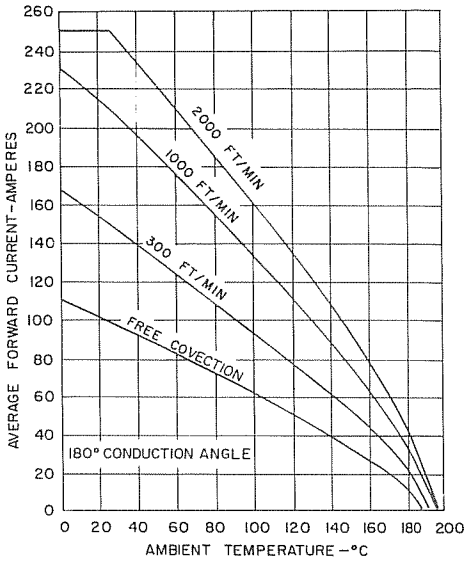
MAXIMUM CIRCUIT RATINGS

DEVICE MOUNTED ON A 7" x 7" x 3/8" ALUMINUM FIN (GE #13) OR A 7" x 7" x 1/4" COPPER FIN
MINIMUM FIN SPACING 1 INCH FINS MOUNTED VERTICALLY OR PARALLEL TO FORCED AIR FLOW

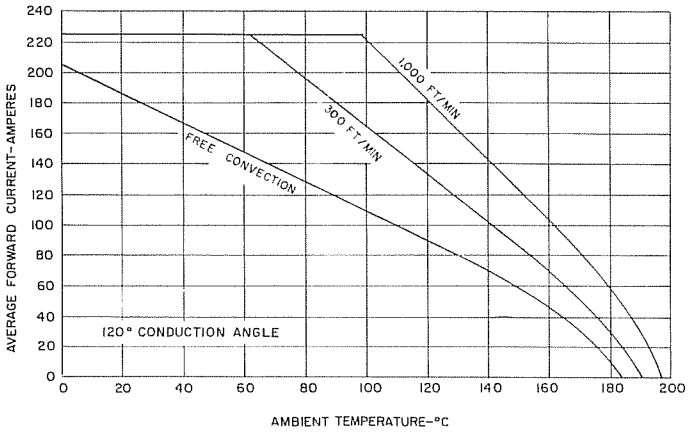


8. TRANSIENT THERMAL IMPEDANCE - JUNCTION TO AMBIENT

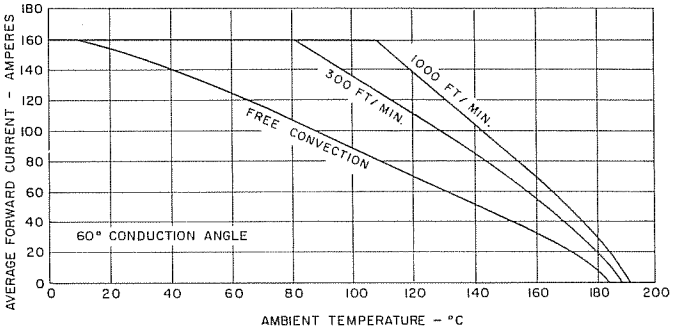
12. TRANSIENT THERMAL IMPEDANCE – JUNCTION-TO-AMBIENT



13. SINGLE-PHASE, HALF-WAVE FORWARD CURRENT VS. AMBIENT TEMPERATURE



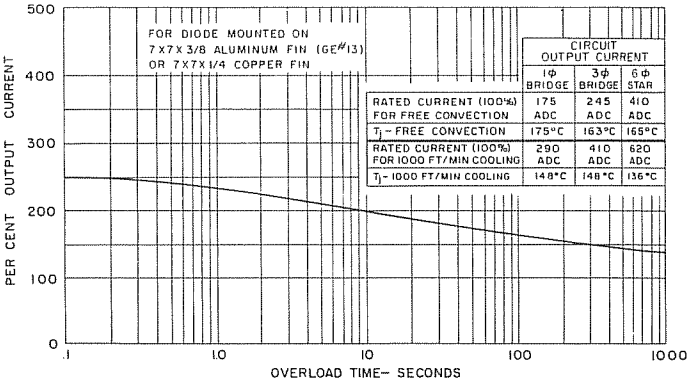
14. THREE-PHASE FORWARD CURRENT VS. AMBIENT TEMPERATURE



15. SIX-PHASE FORWARD CURRENT VS. AMBIENT TEMPERATURE

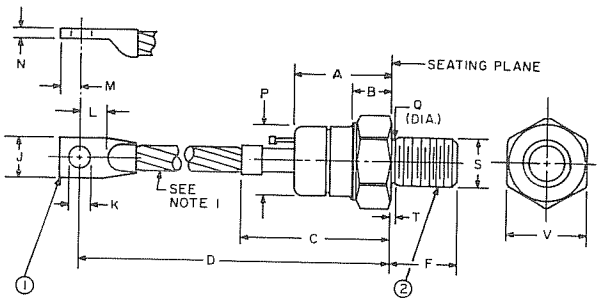
REPETITIVE OVERLOAD RATINGS

16. REPETITIVE OVERLOAD CURVE MEETING NEMA STANDARDS FOR "General Purpose Rectifier Equipments Under 100 KW" AT 40°C AMBIENT (For Overload Conditions Other Than As Shown, Refer To Application Note 200.9)



	CIRCUIT OUTPUT CURRENT		
	1φ BRIDGE	3φ BRIDGE	6φ STAR
RATED CURRENT (100%) FOR FREE CONVECTION	175 ADC	245 ADC	410 ADC
T_j - FREE CONVECTION	175°C	163°C	165°C
RATED CURRENT (100%) FOR 1000 FT/MIN COOLING	290 ADC	410 ADC	620 ADC
T_j - 1000 FT/MIN COOLING	148°C	148°C	136°C

OUTLINE DRAWING



MODEL	TERMINAL 1	TERMINAL 2	S THREAD SIZE
A190 FORWARD POLARITY	ANODE	CATHODE	3/4 – 16 UNF – 2A
A190R REVERSE POLARITY	CATHODE	ANODE	

TABLE OF DIMENSIONS
Conversion Table

SYM.	DECIMAL INCHES MIN.	DECIMAL INCHES MAX.	METRIC MM MIN.	METRIC MM MAX.	NOTES
A	1.450	1.550	36.83	39.37	
B	.500	.750	12.70	19.05	
C	2.300	2.500	58.42	63.50	
D	5.300	5.700	134.62	144.78	
F	.797	.827	20.24	21.01	
J	.665	.755	16.89	19.18	
K	.322	.333	8.17	8.46	
L	.437	–	11.99	–	
M	.325	.360	8.25	9.14	
N	.155	.170	–	–	
P	1.060	1.100	26.92	27.94	
Q	.660	.749	16.76	19.02	
T	–	.156	–	3.96	3
V	1.240	1.250	31.49	31.75	

NOTES:
1. Flexible Copper Lead.
2. One Nut and One Lockwasher Supplied With Each Unit. Material of Hardware is Steel, Cad Plated.
3. "T" Dimension is Area of Unthreaded Portion. Complete Threads are Within 2.5 Threads of Seating Plane.
4. Angular Orientation of Terminals is Undefined.

MOUNTING INSTRUCTIONS

Following these installation instructions will result in a rectifier diode-to-heatsink contact thermal resistance of 0.08°C/watt or less.

1. Be sure mounting surface is clean and flat within .001 inch/inch.
2. Mounting hole diameter should not exceed the outside diameter of the rectifier diode stud by more than 1/16 inch, and should be deburred.
3. Use Dow Corning's DC3, 4, 340 or 640 or GE G322L or equivalent, on mounting surfaces that come in contact with the heatsink.
4. Use only hardware furnished with each rectifier diode.
5. Tighten with a torque wrench, from nut side, to 300 lb-in.