



**STATE OF CALIFORNIA
EXHIBIT 11.31, CLASS A, B, C & E
BUS, PARATRANSIT QUESTIONNAIRE**

23-19TQ2

NOTES: The bidder shall complete this questionnaire in full for each proposed product and shall submit all questionnaires with the bid. (Bidders will need to make copies of this form if more than one vehicle Class or fuel system is offered.)

Name of bidder: Creative Bus Sales Date: Revised 8/17/2016

Name of Bus Manufacturer: Starcraft Bus Bus Manufacturer ISO 9001(latest) certified:
 Yes: X No: _____
 Vehicle Class: A: X B: _____ C: _____ E: _____ Fuel Type: CNG: _____ Diesel: _____ Gas: X
 Bus Year, Make and Model: 2016 Starcraft Starlite Chassis Year, Make & Model: 2016 Ford E-350
 Bus Model ALTOONA Tested: _____ Bus Model Rollover Tested (FMVSS 220):
 Yes: X No: _____ Pending: _____ Yes: X No: _____

Is Altoona Test report available on Altoona website, Yes: X, No: _____ altoonabustest.psu.edu/buses/299
altoonabustest.psu.edu/buses/109

Note: A report from the Federal Transit Administration (FTA) that matches the Make/Model on this questionnaire or a web link to the Altoona testing web site that matches on the Make/Model on this questionnaire shall be included in the bid as Exhibit 11.28, Altoona Bus Testing. [See Exhibit 11.38](#)

The sections referred to in this questionnaire correspond to specification 2310-3075 (Class A, B, C) and 2310-3082 (Class E) see below:

3.1.		
What is the number of wheelchair positions?	<u>2</u>	each
What is the number of ambulatory passenger (track mounted) seat positions for "rear lift" bus?	<u>8</u>	each
What is the Gross Vehicle Weight Rating (GVWR)?	<u>11,500</u>	pounds
What is the chassis wheelbase?	<u>138</u>	inches
What is the "clear" front entrance door height?	<u>79"</u>	inches
What is the "clear" front entrance door width for bus?	<u>30"</u>	inches
What is the engine HP and Torque?	Horse Power <u>305</u> Torque <u>420</u>	HP lb-ft
3.5 Is the Engine certified by CARB to operate on Highway in State of California? Engine family name: <u>FFMXE06.8AFA</u> , CARB certificate Should be provided.	Yes <u>X</u>	No _____

3.8 Does the ground load rating of the front and rear springs equal or exceed the GVWR of the vehicle? Front: Rear:	Yes <input checked="" type="checkbox"/> _____ <u>5,000</u> <u>7,800</u>	No _____ pounds pounds
3.13 Is the chassis equipped with seven OEM, steel-belted, radial-ply tires of equal size and rating with the combined load rating of the tires equal or exceeding the GVWR of the vehicle? Tire Size: <u>LT 225/75R 16</u> Tire Load Rating: <u>E</u>	Yes <input checked="" type="checkbox"/> _____ <u>2,680 Single</u> <u>2,470 Dual</u>	No _____ pounds
3.14 Is the chassis equipped with an OEM front bumper? Is the chassis equipped with an energy absorbing rear bumper with a reverse assistance system integrated into the bumper? Bumper Brand/Model: <u>Romeo RIM</u> Reverse Assistance Sys Brand/Model: <u>Intermotive Hawkeye</u> <i>Bidder should submit descriptive literature (unless the reference Brand/Model is bid)</i>	Yes <input checked="" type="checkbox"/> _____ Yes <input checked="" type="checkbox"/> _____ Yes <input checked="" type="checkbox"/> _____	No _____ No _____ No _____
3.15 What is the Gross Axle Weight Rating (GAWR)? Front Axle Rear Axle	<u>5,000</u> <u>7,800</u>	pounds pounds
3.16 Is protective metal guard for drive shaft provided?	Yes <input checked="" type="checkbox"/> _____	No _____
3.18 Is the vehicle equipped with two rearview mirrors What is the brand and model of mirror? <u>Velvac 2020SS</u>	Yes <input checked="" type="checkbox"/> _____	No _____
3.19 Is the bus equipped with a 12-volt electrical system compliant to section 3.19?	Yes <input checked="" type="checkbox"/> _____	No _____
3.19.2 What is the alternator voltage? Is the bus equipped with a fast idle system? Brand/ Model: <u>Intermotive Gateway #505 F</u>	225 Amps / 12v Yes <input checked="" type="checkbox"/> _____	volts No _____
3.19.3 Is the bus equipped with Light-Emitting Diode (LED) lights compliant to section 3.19.3. Brand/Model: <u>Optronics LED</u>	Yes <input checked="" type="checkbox"/> _____	No _____
3.19.4 Is bus equipped with additional lights requirements compliant to section 3.19.4?	Yes <input checked="" type="checkbox"/> _____	No _____
3.19.5 Is the bus equipped with two maximum-capacity chassis OEM batteries? Rating #1 <u>750</u> CCA, #2 <u>750</u> CCA	Yes <input checked="" type="checkbox"/> _____	No _____
3.19.6 Is the bus equipped with a locking, weather-protected, sliding-type battery tray compliant to section 3.19.6?	Yes <input checked="" type="checkbox"/> _____	No _____
3.20 What is the size of the fuel tank? Is fuel tank compliant with CARB standards?	<u>40</u> Yes <input checked="" type="checkbox"/> _____	Gallons No _____

<p>3.23 Is the bus equipped with a back-up alarm compliant to section 3.21 Brand/Model: <u>ECCO 575</u> <i>Bidder should submit descriptive literature (unless the reference Brand/Model is bid)</i></p>	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
<p>3.26 Is the seating compliant to section 3.26? What is the Make and Name/Number of the vinyl seat material? <u>Docket 90 Vinyl (Freedman Level 4)</u> e) What is the hip to knee spacing? f) What is the aisle spacing? h) Is the bus equipped with passenger seats in compliance with Section 3.26h. <i>Bidder should submit descriptive literature (unless the reference Brand/Model is bid)</i></p>	Yes <input checked="" type="checkbox"/> <u>27" Min</u> <u>22"</u> Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/> inches inches No <input type="checkbox"/>
<p>i) Is the bus equipped with a driver seat in compliance with Section 3.26i Brand/Model: <u>Recaro SHS</u> <i>Bidder should submit descriptive literature (unless the reference Brand/Model is bid)</i></p>	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
<p>3.27 What is the thickness of the plywood? Is the floor surface covered with minimum 2.2 millimeter thick, highly resilient PVC flooring in compliance with section 3.27? Brand/Model: <u>Altro Transflor</u> 3.27 Is the flooring installation and adhesion compliant with Section? 3.27 What type of flooring adhesive will be provided on the bus? Brand/Model: <u>Natcon Spider Glue / Nitro</u> <i>Bidder should submit descriptive literature (unless the reference Brand/Model is bid)</i></p>	<u>5/8"</u> Yes <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/>	Inches No <input type="checkbox"/> No <input type="checkbox"/>
<p>3.28 Is the bus equipped with rear emergency window compliant with Section 3.28?</p>	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
<p>3.29 Is the bus equipped with an electric front entrance door compliant to section 3.29? Brand/Model: <u>A&M Systems / Electric</u> <i>Bidder should submit descriptive literature (unless the reference Brand/Model is bid)</i></p>	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
<p>3.30 Is the bus equipped with entry steps compliant to section 3.30? What are the step dimensions (Step riser height X Depth)? What is the dimension of the bottom step tread from the ground unloaded? Are steps vertical? If not, what is the usable step area?</p>	Yes <input checked="" type="checkbox"/> <u>9.5" x 9.5"</u> <u>12" Max</u> Yes <input checked="" type="checkbox"/> _____	No <input type="checkbox"/> inches inches No <input type="checkbox"/> inches

3.31 Is the bus equipped with a driver's side running board compliant to section 3.31? What is the depth of the running board?	Yes <u> X </u> <u> 12" </u>	No _____ inches
3.32 What type of material is used to fabricate the handrails? Material What is the length of the handrail?	<u>Stainless Steel</u> <u> 30" Min </u>	inches
3.35 Is the bus equipped with insulation compliant to section 3.35?	Yes <u> X </u>	No _____
3.37 Is the bus equipped with an exterior front one piece cap compliant to section 3.37?	Yes <u> X </u>	No _____
3.38 Is the bus equipped with an undercoating compliant to section 3.38? Brand/Model: <u> BASF Degacoat </u>	Yes <u> X </u>	No _____
3.39 Is wheel housings made of minimum 14 Gauge galvanized steel or stainless steel compliant to section 3.39?	Yes <u> X </u>	No _____
3.40 Is the bus equipped with an OEM integral front air conditioner and An auxiliary rear air conditioner compliant to section 3.40? What is the auxiliary rear air conditioner output? Make/Model <u> Trans Air TA-71HP2C Super 10 / #16 Suction </u> <i>Bidder should submit descriptive literature.</i>	Yes <u> X </u> <u> 32,190 </u>	No _____ <u> SAE BTU </u>
3.41 Is the bus equipped with front-mounted, integral high-output heater and a rear floor high-output auxiliary heater mounted behind the rear wheel housing or under a rear fixed seat compliant to section 3.41? Class A auxiliary heater: <u> 35,000 </u> BTU, Make/Model: <u> Pro-Air 435 </u> Class B and C auxiliary heater : _____ BTU, Make/Model _____ Class E Auxiliary Heater: _____ BTU, Make/Model _____ <i>Bidder should submit descriptive literature.</i>	Yes <u> X </u>	No _____
3.42 Is the bus equipped with a mobility aid lift compliant to section 3.42? Brand/Model: <u> Braun Century NCL919FIBHB-2 </u> <i>Bidder should submit descriptive literature.</i>	Yes <u> X </u>	No _____
3.43 Is the bus equipped with controls for the lift that interlock with Emergency brakes and transmission compliant to section 3.43? Brand/Model: <u> Intermotive Gateway #505-F </u>	Yes <u> X </u>	No _____
3.44 Is the bus equipped with side lift entry doors compliant to section 3.44?	Yes <u> X </u>	No _____
3.45 Is the bus equipped with a device to prevent starting the vehicle in neutral? Brand/Model: <u> Intermotive PCOM #501B </u> Bidder should submit descriptive literature (unless the reference Brand/Model is bid)	Yes <u> X </u>	No _____

3.46 Is the bus equipped with mobility aid security and occupant restraint systems compliant to section 3.46? Brand/Model: <u>Q'Straint QRT-360</u>	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
3.47 Is web cutter provided compliant to section 3.47a? Is torso pad provided compliant to section 3.47b? Is closeable box provided compliant to section 3.47c1? Is Secured container provided for storage of straps, pads etc. Compliant to section 3.47c2?	Yes <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/> No <input type="checkbox"/> No <input type="checkbox"/> No <input type="checkbox"/>
3.48 Is 5 lb fire extinguisher provided compliant to section 3.48a? Is 16-unit First aid kit provided compliant to section 3.48b? Is reflective triangles provided compliant to section 3.48c? Is bus equipped with a passenger viewing mirror compliant to section 3.48d? Brand/Model: <u>Rosco 609</u> <i>Bidder should submit descriptive literature for mirror (unless the Reference Brand/Model is bid).</i> Is bus equipped with a two-way antenna prep compliant to section 3.48e? Is blood borne pathogen kit provided compliant to section 3.48f? Is retractable coat hook provided compliant to section 3.48g?	Yes <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/> No <input type="checkbox"/> No <input type="checkbox"/> No <input type="checkbox"/> No <input type="checkbox"/> No <input type="checkbox"/>
3.50 What is the CNG tank capacity (total)? Does fuel tank comply with FMVSS 304 and ANSI NGV2-2007 Manufacturer of CNG conversion: _____ Installer of CNG conversion: _____ Is CNG conversion system approved by CARB?	<u>N/A</u> Yes <input type="checkbox"/> Yes <input type="checkbox"/>	GGE No <input type="checkbox"/> No <input type="checkbox"/>

Class A - Gasoline (Exhibit 11.31)

California Environmental Protection Agency

OID Air Resources Board

FORD MOTOR COMPANY

EXECUTIVE ORDER A-010-1869
New Engines for Diesel or Incomplete
Medium-Duty Vehicles

Pursuant to the authority vested in the Air Resources Board by Health and Safety Code Division 26, Part 5, Chapter 2; and pursuant to the authority vested in the undersigned by Health and Safety Code Sections 39515 and 39516 and Executive Order G-14-012;

IT IS ORDERED AND RESOLVED: The engine and emission control systems produced by the manufacturer are certified as described below for use in diesel or incomplete medium-duty vehicles with a manufacturer's GVWR from 8501 to 14000 pounds. Production engines shall be in all material respects the same as those for which certification is granted.

MODEL YEAR	ENGINE FAMILY	EMISSION STD CATEGORY ²	FUEL TYPE ¹		STANDARDS & TEST PROCEDURE	ENGINE SIZES (L)	ECS & SPECIAL FEATURES ³	OBD COMPLIANCE
			Gasoline					
2015	FFMXE06.8AFA	ULEV			Otto	6.8	SFI, H025, 2WR-H025, TWC	OBD (P)
ENGINE MODELS / CODES (rated power, in hp)								080 COMPLIANCE
E350 Incomplete / DE418Q05, DE418R05, DE418505 (305 for all codes)								OBD (P)
*								*

* =not applicable; GVWR-gross vehicle weight rating; 13 CCR xyz=Title 13, California Code of Regulations, Section xyz; 40 CFR 86.abc=Title 40, Code of Federal Regulations, Section 86.abc; L=liter; hp=horsepower; kw=kilowatt;
¹ CNG/LNG=compressed/liquefied natural gas; LPG=liquefied petroleum gas; E85=85% ethanol fuel; MF=multi fuel a.k.a BF=bi fuel; DF=dual fuel; FF=flexible fuel;
² SULEV / ULEV / LEV=super ultra / ultra / low emission vehicle;
³ ECS=emission control system; TWC/OC=three-way/oxidizing catalyst; WU (prefix) =warm-up catalyst; DPF=diesel particulate filter; H02S/02S=heated/oxygen sensor; HAFS/AFS=heated/air-fuel-ratio sensor (a.k.a., universal or linear oxygen sensor); WR-H02S=wide range oxygen sensor; TBI=throttle body fuel injection; SFI/MFI=sequential/multi port fuel injection; DGI=direct gasoline injection; GCARB=gaseous carburetor; IDI/DDI=indirect/direct diesel injection; TC/SC=turbo/super charger; CAC=charge air cooler; EGR=exhaust gas recirculation; PAIR/AIR=pulsed/secondary air injection; SPL=smoke puff limiter; OBD(F) / (P) / (\$) =full / partial / partial with a fine / on-board diagnostic; ECM/PCM=engine/powertrain control module; EM=engine modification; 2 (prefix)=parallel; (2) (suffix)=in series; (2004may26)

Following are: 1) the FTP exhaust emission standards or family emission limit(s) as applicable under 13 CCR 1956.8; 2) the SET and NTE limits under the applicable California exhaust emission standards and test procedures for heavy-duty diesel engines and vehicles (Test Procedures); and 3) the corresponding certification levels, in g/bhp-hr, for this engine family. "Diesel" CO, SET and NTE certification compliance may have been demonstrated by the manufacturer as provided under the applicable Test Procedures in lieu of testing. (For dual- and flexible-fueled engines, the CERT values in brackets [] are those when tested on conventional test fuel.)⁴

	NMHC		NOx		NMHC+NOx		CO		PM		HCHO	
	FTP	SET	FTP	SET	FTP	SET	FTP	SET	FTP	SET	FTP	SET
STD	0.14	*	0.20	*	*	*	14.4	*	0.01	*	0.01	
CERT	0.10	*	0.15	*	*	*	7.0	*	0.001	*	0.000	*
NTE		*		*		*		*		*		*

⁴ g/bhp-hr=grams per brake horsepower-hour; FTP=Federal Test Procedure; SET=Supplemental Emissions Testing; NTE=Not-to-Exceed emission limit; STD=standard or emission test cap; FEL=family emission limit; CERT=certification level; NMHC/HC=non-methane/hydrocarbon; NOx=oxides of nitrogen; CO=carbon monoxide; PM=particulate matter; HCHO=formaldehyde;

BE IT FURTHER RESOLVED: The listed engine models have been certified to the optional emission standards and test procedures in 13 CCR 1956.8 applicable to diesel or incomplete medium-duty vehicles with a GVWR from 8501 to 14000 pounds and, therefore, shall be subject to 13 CCR 2139(c) (in-use testing of engines certified for use in diesel or incomplete medium-duty vehicles with a 8501-14000 pound GVWR).

BE IT FURTHER RESOLVED: For the listed engine models the manufacturer has submitted the materials to demonstrate certification compliance with 13 CCR 1965 (emission control labels), 13 CCR 1968.2 (on-board diagnostic, full or partial compliance), and 13 CCR 2035 et seq. (emission control warranty).

Engines certified under this Executive Order must conform to all applicable California emission regulations.

The Bureau of Automotive Repair will be notified by copy of this Executive Order.

Executed at El Monte, California on this 2 day of December 2014.



Annette Hebert, Chief
Emissions Compliance, Automotive Regulations and Science Division

CalTrans CLASS A System Components

TA71HP2C Super 10 #16 Suction

TA71 HP Evaporator

P/N 2022076-34



SC2 Condenser

P/N 301832-01



Compressor | Engine Mount & Drive Kit

P/N 512226 10 CID Compressor,
P/N 4013524-01 Compressor Mount Kit,
P/N 4012708 Alternator Mount Kit



Basic II PCB Controls

P/N 5031451



SAE-J2064 Hose & Fitting System

P/N 5031475 Fitting Kit, P/N 311026 #8 Hose,
P/N 311027 #10 Hose, P/N 311034 #16 Hose



School & Commercial Bus Climate Control Design | Manufacture | Install | Service

Trans/Air Manufacturing Corporation is an ISO 9001 registered firm committed to providing world class climate control products and services to the bus and commercial vehicle markets.



CalTrans CLASS A System Specifications

TA71HP2C Super 10 #16 Suction

System BTU/hr (without dash): 32K SAE / 54K IMACA

Dash unit: 15K SAE / 24K IMACA

System BTU/hr (with dash): 47K SAE / 78K IMACA

A complete Trans/Air system consisting of (1) TA71 High Performance Evaporator, (1) SC2 Skirt Mount Condenser, and (1) 10 cid Compressor with #16 suction line, installed separately from the OEM chassis compressor & dash evaporator with Basic Controls and a Trans/Air supplied mount kit.

Quality System: Trans/Air Manufacturing is registered to ISO 9001:2008 by an accredited auditor.

Evaporator: **TA71HP**
 Capacity: 32,190 (SAE) to 53,512 (IMACA) Btu/hr
 Cooling Coil: Advanced aluminum fins on 3/8" internally enhanced copper tubing
 Expansion Valve: Externally equalized thermostatic type
 Blower Assembly: (1) blower with double wheels and dual inlets
 Total Blower Air Flow: 797 ft³/min @ 0 Static (1354 m³/hr @ 0 Static)
 Motors: Ultra high performance double shaft, permanent magnet
 Amperage: 9.2 A @ 13.5 Vdc / 4.6 A @ 27 Vdc
 Housing: Galvanized steel with aluminum or ABS cover
 Specification: All interior components shall meet FMVSS 302 for fire retardant specifications.

Condenser: **SC2 Microchannel** (Skirt Mount)
 Capacity: 58,280 (SAE) to 71,231 (IMACA) Btu/hr
 Condenser Coil: Aluminum microchannel (480 in² face area)
 Fan Assembly: (2) low profile, surface mounted 14 in diameter fans
 Motor Type: Closed, permanent magnet w/ball bearings
 Amperage: 19.5 A @ 13.5 Vdc / 9.8 A @ 27 Vdc
 Total Fan Air Flow: 2666 ft³/min @ 0 static (4530 m³/hr @ 0 Static)
 Filter Drier: 16 in³, R-134A compatible
 Sight Glass: At back of coil
 Cond Housing: Powder-coated galvanized steel

Electrical Controls: **Basic II**
 Fan Controls: 3 speed rotary switch @ driver
 Temp Controls: Rotary manual switch @ driver
 Protection: Fused main power distribution with individually fused motor.
 Wiring: Color, number and or function coded every six inches in fire retardant loom.
 Specification: All wiring automotive standard per SAE J1292 electrical specifications.

Hose/Fittings: **Trans/Air SAE J2064:**
 Fittings: Steel with corrosion resistive coating, (2) grooves, and stainless steel clips.
 Hose: Type C with Butyl cover, Poly-amide barrier, rubber lining.
 Specification: Exceeds SAE J2064 hose fitting integrity specification.

Compressor: **10 CID**
 Protection: High/low pressure switches.
 Specification: Mounts shall meet SAE J637 belt alignment specifications.

Warranty: **3 years**
 Mileage: Unlimited
 Inception: Date of in-service
 Coverage: All components and installation if installation is provided by Trans/Air.

School & Commercial Bus Climate Control Design | Manufacture | Install | Service

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ISO 9001:2008
FM 39947

CalTrans CLASS A System Service Parts List

TA71HP2C Super 10 #16 Suction

Evaporator	2022076-34	Evaporator, TA71 - Lines Left, w/o Heat, Gray, High Output Blower
	412060	Blower Assy, 12V
	210042	Expansion Valve, 4 Ton
	2021097	Coil Assembly, Evaporator (includes 210042 Expansion Valve)
	111164	Resistor, .6 Ohm, 3 Tap
	111154	Switch, High Pressure
	111155	Switch, Low Pressure
	915057	Filter, Air Inlet
	413012	Louver
	110043	Fuse, ATC-20, Blade Type
	413015	Deflector, Air

Condenser	301832-01	Condenser, SC2
	301825	Coil, Condenser, SC3, Micro Channel
	2160089	Fan Assembly, 14" Puller, 12V
	212021	Filter Drier w/Sight Glass
	301800-01	Screen Assy, 2-Fan, Black
	110050-20	Fuse, Mini, 20Amp

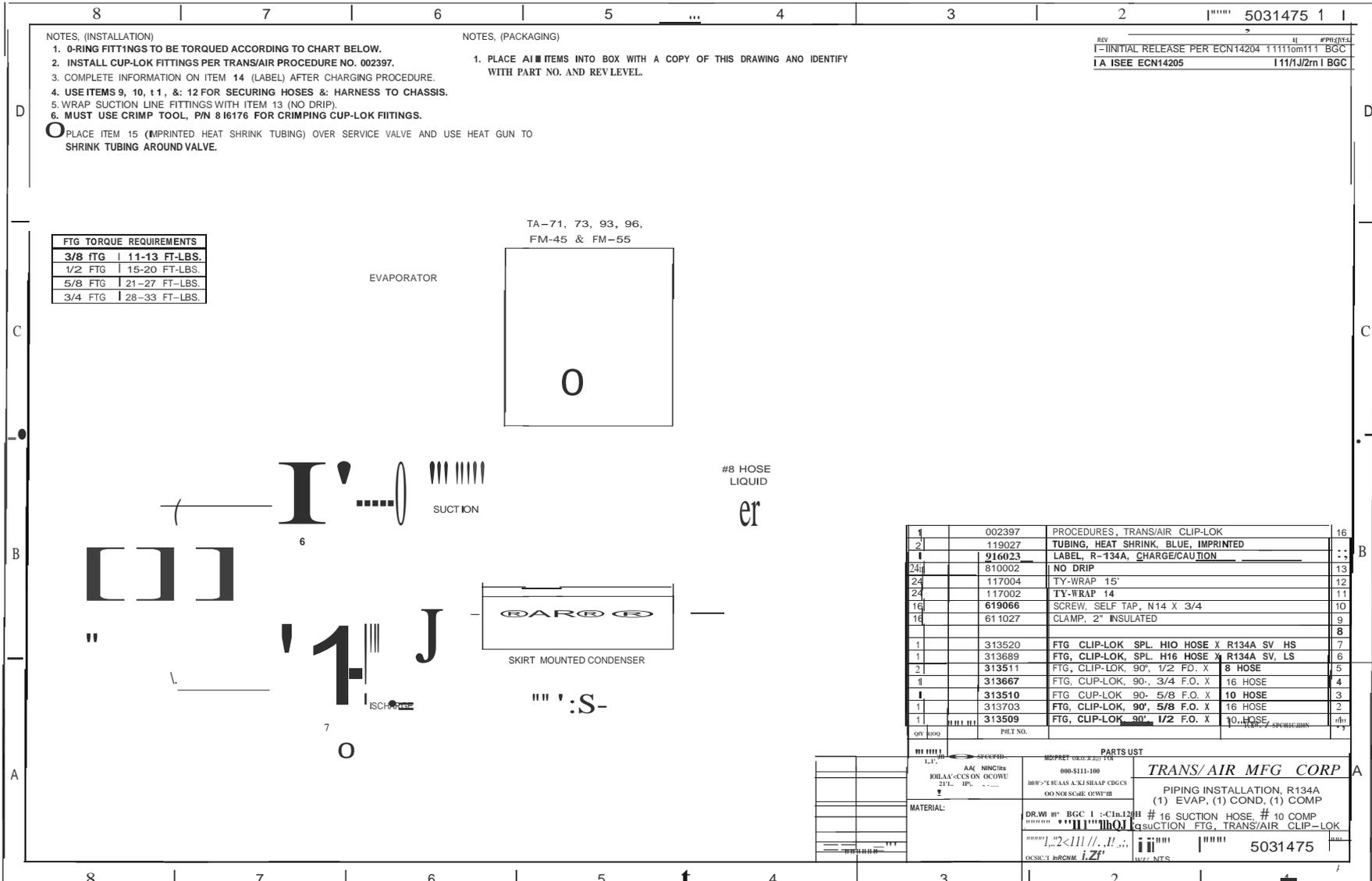
Hose & Fittings	5031475	Piping for #16 hose
	311026	Hose, #8, Refrigerant
	311027	Hose, #10, Refrigerant
	311034	Hose, #16, Refrigerant
	313703	Fitting, Clip-Lok, 90°, 5/8 F.O. x #16 Hose
	313687	Fitting, Clip-Lok, 90°, 3/4 FO x #16Hose
	313689	Fitting, Clip-Lok, Splice, Inline Access, #16Hose
	313511	Fitting, Clip-Lok, 90°, 1/2 FO x #8 Hose
	313520	Fitting, Clip-Lok, Splice Incline Access #10
	313510	Fitting, Clip-Lok, 90°, 5/8 FO x #10Hose
	313509	Fitting, Clip-Lok, 90°, 1/2 FO x #10Hose

Electrical & Cable	5031451	Basic II PCB Electrical
	701567	Relay Board Assembly, Basic II PCB, Mate-N-Lok Connector
	701401	Fuse Holder Assy, MIDI, Bolt-On, 40A
	610008	Knob, Black, ABS, Wht Pointer, .250 Spring Index Position 1
	111051	Thermostat, Rotary
	113006	Switch, Rotary, 4 Position

Compressor	512226	Compressor, QP7H15, PV8, Pad-Style
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Engine Mount & Drive Kit	4013524-01	Mount Kit, 6.8L Ford Cutaway, 10 CID
	7155061360	Belt, Poly-V, 6K Groove, 136.0" OEL
	31987606	Hose, 90°, 5/8 x 3/4 x 25" Lg
	711048	Idler Pulley, 6K Groove, 76MM Pitch
	711041	Idler, Backside, Dia 76MM
	4012675	Mount Bracket, Ford 6.8L Cutaway

CalTrans CLASS A Fitting Kit Schematic (1 of 1)



NOTES, (INSTALLATION)

1. O-RING FITTINGS TO BE TORQUED ACCORDING TO CHART BELOW.
2. INSTALL CUP-LOK FITTINGS PER TRANS/AIR PROCEDURE NO. 002397.
3. COMPLETE INFORMATION ON ITEM 14 (LABEL) AFTER CHARGING PROCEDURE.
4. USE ITEMS 9, 10, 11, & 12 FOR SECURING HOSES & HARNESS TO CHASSIS.
5. WRAP SUCTION LINE FITTINGS WITH ITEM 13 (NO DRIP).
6. MUST USE CRIMP TOOL, P/N 816176 FOR CRIMPING CUP-LOK FITTINGS.

○ PLACE ITEM 15 (IMPRINTED HEAT SHRINK TUBING) OVER SERVICE VALVE AND USE HEAT GUN TO SHRINK TUBING AROUND VALVE.

NOTES, (PACKAGING)

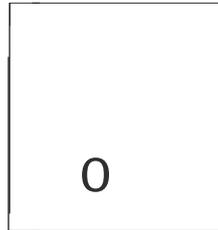
1. PLACE ALL ITEMS INTO BOX WITH A COPY OF THIS DRAWING AND IDENTIFY WITH PART NO. AND REV LEVEL.

REV	DESCRIPTION	DATE	BY
1	INITIAL RELEASE PER ECN14204	111110m111	BGC
1	ISEE ECN14205	1111/J2m1	BGC

FTG TORQUE REQUIREMENTS	
3/8 FTG	11-13 FT-LBS.
1/2 FTG	15-20 FT-LBS.
5/8 FTG	21-27 FT-LBS.
3/4 FTG	28-33 FT-LBS.

TA-71, 73, 93, 96,
FM-45 & FM-55

EVAPORATOR



#8 HOSE LIQUID

er

SUCTION

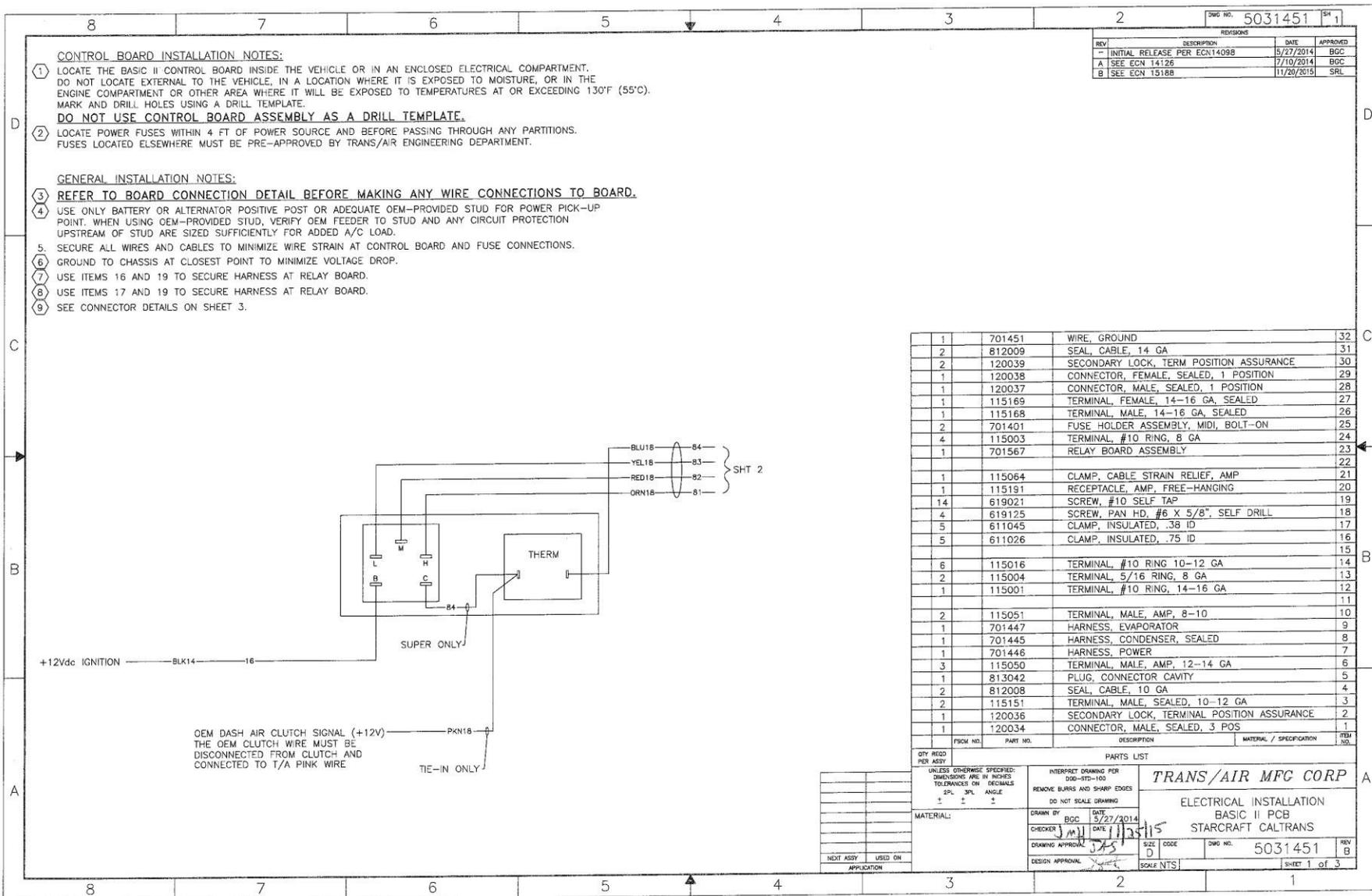


SKIRT MOUNTED CONDENSER

QTY	KIT NO.	PART NO.	DESCRIPTION	REV
1		002397	PROCEDURES, TRANS/AIR CLIP-LOK	16
2		119027	TUBING, HEAT SHRINK, BLUE, IMPRINTED	13
1		916023	LABEL, R-134A, CHARGE/CAUTION	13
24		810002	NO DRIP	12
24		117004	TY-WRAP 15'	11
24		117002	TY-WRAP 14'	9
16		619066	SCREW, SELF TAP, N14 X 3/4	10
16		611027	CLAMP, 2" INSULATED	8
1		313520	FTG CLIP-LOK SPL. HIO HOSE X R134A SV HS	7
1		313689	FTG, CLIP-LOK, SPL. H16 HOSE X R134A SV, LS	6
2		313511	FTG, CLIP-LOK, 90°, 1/2 F.O. X 8 HOSE	5
1		313667	FTG, CUP-LOK, 90°, 3/4 F.O. X 16 HOSE	4
1		313510	FTG CUP-LOK 90- 5/8 F.O. X 10 HOSE	3
1		313703	FTG, CLIP-LOK, 90°, 5/8 F.O. X 16 HOSE	2
1		313509	FTG, CLIP-LOK 90° 1/2 F.O. X 10 HOSE	1

PARTS LIST	
000-5111-100	TRANS/AIR MFG CORP
PIPING INSTALLATION, R134A	
(1) EVAP, (1) COND, (1) COMP	
# 16 SUCTION HOSE # 10 COMP	
SUCTION FTG. TRANS/AIR CLIP-LOK	
5031475	

CalTrans CLASS A Basic II PCB Controls Schematic (1 of 3)

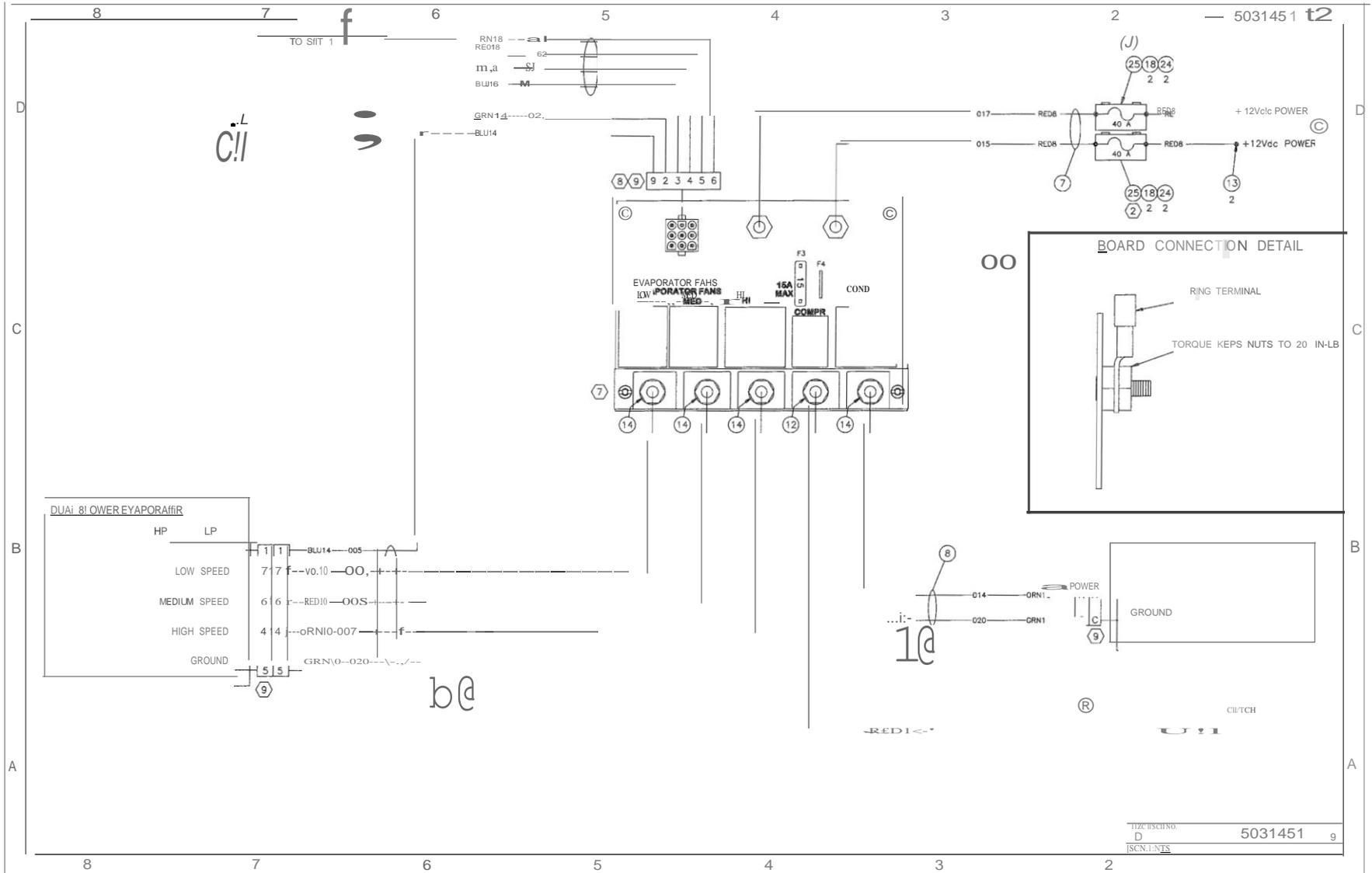


REV		DESCRIPTION	DATE	APPROVED
-	INITIAL RELEASE	PER ECN1409B	5/27/2014	BGC
A	SEE ECN 14126		7/10/2014	BGC
B	SEE ECN 15188		11/20/2015	SRL

QTY	PCSV NO.	PART NO.	DESCRIPTION	MATERIAL / SPECIFICATION	ITEM NO.
1	701451		WIRE, GROUND		32
2	812009		SEAL, CABLE, 14 GA		31
2	120039		SECONDARY LOCK, TERM POSITION ASSURANCE		30
1	120038		CONNECTOR, FEMALE, SEALED, 1 POSITION		29
1	120037		CONNECTOR, MALE, SEALED, 1 POSITION		28
1	115169		TERMINAL, FEMALE, 14-16 GA, SEALED		27
1	115168		TERMINAL, MALE, 14-16 GA, SEALED		26
2	701401		FUSE HOLDER ASSEMBLY, MIDI, BOLT-ON		25
4	115003		TERMINAL, #10 RING, 8 GA		24
1	701567		RELAY BOARD ASSEMBLY		23
					22
1	115064		CLAMP, CABLE STRAIN RELIEF, AMP		21
1	115191		RECEPTACLE, AMP, FREE-HANGING		20
14	619021		SCREW, #10 SELF TAP		19
4	619125		SCREW, PAN HD, #6 X 5/8", SELF DRILL		18
5	611045		CLAMP, INSULATED, .38 ID		17
5	611026		CLAMP, INSULATED, .75 ID		16
					15
6	115016		TERMINAL, #10 RING 10-12 GA		14
2	115004		TERMINAL, 5/16 RING, 8 GA		13
1	115001		TERMINAL, #10 RING, 14-16 GA		12
					11
2	115051		TERMINAL, MALE, AMP, 8-10		10
1	701447		HARNESS, EVAPORATOR		9
1	701445		HARNESS, CONDENSER, SEALED		8
1	701446		HARNESS, POWER		7
3	115050		TERMINAL, MALE, AMP, 12-14 GA		6
1	813042		PLUG, CONNECTOR CAVITY		5
2	812008		SEAL, CABLE, 10 GA		4
2	115151		TERMINAL, MALE, SEALED, 10-12 GA		3
1	120036		SECONDARY LOCK, TERMINAL POSITION ASSURANCE		2
1	120034		CONNECTOR, MALE, SEALED, 3 POS		1

UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES ON DECIMALS .2PL .3PL ANGLE ± ± ±	INTERPRET DRAWING PER DOD-STD-100 REMOVE BURRS AND SHARP EDGES DO NOT SCALE DRAWING	TRANS/AIR MFG CORP ELECTRICAL INSTALLATION BASIC II PCB STARCRAFT CALTRANS
MATERIAL: NEXT ASSY USED ON APPLICATION	DRAWN BY: BGC CHECKER: M.J. DATE: 5/27/2014 DATE: 1/28/15	DWG NO. 5031451 REV B SHEET 1 of 3

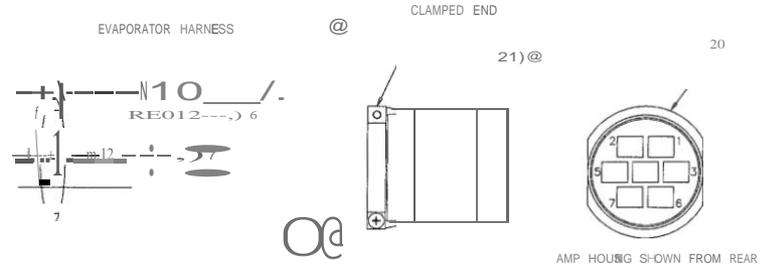
CalTrans CLASS A Basic II PCB Controls Schematic (2 of 3)



CalTrans CLASS A Basic II PCB Controls Schematic (3 of 3)

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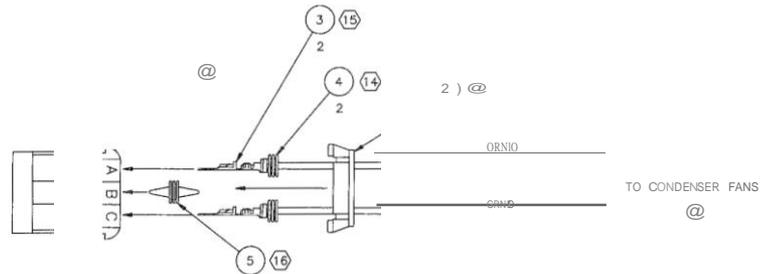
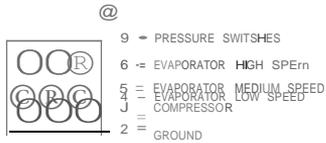
- @ CRIMP MALE TERMINALS TO EVAPORATOR LEADS. USE CRIMP TOOL, AMP P/N HHHT 90384-1 FOR 10 GA, AND AMP P/N 90382-2 FOR 14 GA.
- @ SLIDE CLAMPED END OF ITEM 21, CABLE STRAIN RELIEF CLAMP, OVER EVAPORATOR LEADS SO THAT THE THREADS IN PLACE. SCREW ITEM 21 TIGHTLY ON TO RECEPTACLE HOUSING, THEN TIGHTEN CLAMP AROUND EVAPORATOR LEADS. FACE THE TERMINALS AS SHOWN. INSERT TERMINALS INTO SPECIFIED POSITIONS ON RECEPTACLE HOUSING AND SNAP.
- @ REMOVE CUN CONNECTOR BETWEEN POWER LEADS OF CONDENSER HARNESS TO RELAY BOARD AND
- @ CONNECT FAN HARNESS LEADS TO THE MALE HALF OF THE CONNECTOR AS SHOWN. CONDENSER HARNESS TO FANS, DISCONNECT GROUND LEADS AND REMOVE RING TERMINALS.



- @ INSERT CABLE LEADS THROUGH CABLE SEAL AS SHOWN. KEEP INSULATION FLUSH WITH EDGE OF SEAL.
- @ CRIMP TERMINAL TO STRIPPED LEADS FIRST, THEN CRIMP SEAL RETAINING TABS. FOR BEST RESULTS, USE HAND TOOL, P/N 816155 (PURCHASED SEPARATELY) FOR CRIMPING TERMINALS ON CONDENSER HARNESS. USE HAND TOOL, P/N 816158 (PURCHASED SEPARATELY) FOR CRIMPING TERMINALS ON COMPRESSOR HARNESS.
- @ INSERT PLUG INTO CENTER POSITION OF CONNECTOR AS SHOWN.

INTERNAL EVAPORATOR HARNESS

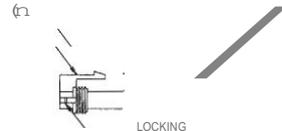
- @ SLIDE SECONDARY LOCK AROUND CABLE LEADS AS SHOWN AND CLIP ONTO TABS OF CONNECTORS (LABELED LOCKING TABS) SECURELY TO KEEP PLUGS AND TERMINALS IN PLACE.
- @ POSITION NUMBERS OF THE CONNECTIVITY CONNECTOR ON PCS AND CORRESPONDING SIGNALS.



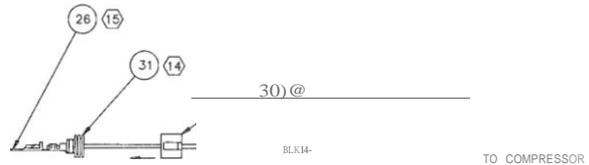
ih301 @ 317

FROM RELAY BOARD

REDI4



COMPRESSOR HARNESS



8 7 6 5 4 3 2

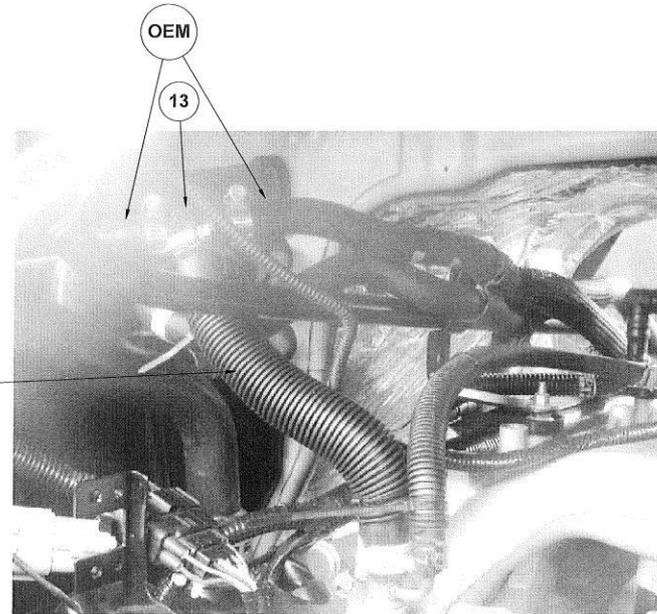
CalTrans CLASS A Engine Mount & Drive Kit (1 of 2)

DWG NO. **4013524** SHEET **1**

REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED
-	SEE ECR 16167	10/9/2015	DJF
A	ECR 16016	1/19/2016	DJF
B	ECN 16123	3/30/2016	DJF

NOTES:

- DISCONNECT BATTERY.
- DRAIN RADIATOR.
- REMOVE AIR CLEANER AND INTAKE HOSE.
- REMOVE OEM BELT AND OEM ALTERNATOR. SAVE HARDWARE AS IT MAY BE USED FOR NEW ALTERNATOR INSTALLATION.
- MODIFY HEATER HOSES AS SHOWN WITH SUPPLIED HOSES AND FITTINGS. CUT OUT THE OEM TEE AND REPLACE WITH THE SUPPLIED FITTING. CUT BOTH SUPPLIED HOSES LEAVING APPROXIMATELY 1" OF STRAIGHT HOSE AFTER THE ELBOW. ATTACH WITH SUPPLIED CLAMP.
- PUT LOOM ON HEATER HOSE AND SECURE WITH TYRAP AS SHOWN.
- INSTALL GROOVED IDLER USING INDICATED HARDWARE. IF INSTALLING KIT -02, REPLACE OEM IDLER WITH SUPPLIED BACKSIDE IDLER AS SHOWN. USE THREADLOCK.
- INSTALL MOUNT USING INDICATED BOLTS AND WASHERS. USE THREADLOCK. USE CLAMP PROVIDED TO SECURE ALTERNATOR CABLE TO THE MOUNT TO PREVENT THE CABLE FROM BEING PINCHED BETWEEN THE MOUNT AND ANY ENGINE COMPONENTS AS SHOWN ON SHEET 2.
- BOLT PLATE AND FITTINGS TO COMPRESSOR USING INDICATED BOLT AND WASHER. USE THREADLOCK. INSTALL SUCTION AND DISCHARGE HOSES.
- LIGHTLY TAP DOWEL BUSHINGS INTO MOUNT. INSTALL COMPRESSOR USING INDICATED BOLTS AND WASHERS. USE THREADLOCK.
- INSTALL ALTERNATOR ON MOUNT USING HARDWARE SUPPLIED IN ALTERNATOR MOUNT KIT. USE THREADLOCK.
- INSTALL BELT IN REAR 6 GROOVES OF COMPRESSOR.
- REINSTALL AIR CLEANER AND INTAKE HOSE.
- APPLY BELT ROUTING LABEL TO ENGINE COMPARTMENT. THE SURFACE MUST BE VISIBLE AND FREE OF DIRT AND OIL.



14

OEM

13

TORQUE SPECS	
6mm GR8.8 - 7 ft-lb	
6mm GR10.9 - 9 ft-lb	
8mm GR8.8 - 18 ft-lb	
8mm GR10.9 - 23 ft-lb	
10mm GR8.8 - 30 ft-lb	
10mm GR10.9 - 45 ft-lb	
12mm GR8.8 - 65 ft-lb	
12mm GR10.9 - 75 ft-lb	
12mm GR12.9 - 95 ft-lb	
.375"-16 GR5 - 30 ft-lb	
.375"-16 GR8 - 40 ft-lb	
.438"-14 GR5 - 45 ft-lb	
.438"-14 GR8 - 65 ft-lb	
.500"-20 GR5 - 75 ft-lb	
.500"-20 GR8 - 110 ft-lb	

-01: 10 CID
-02: 13 CID

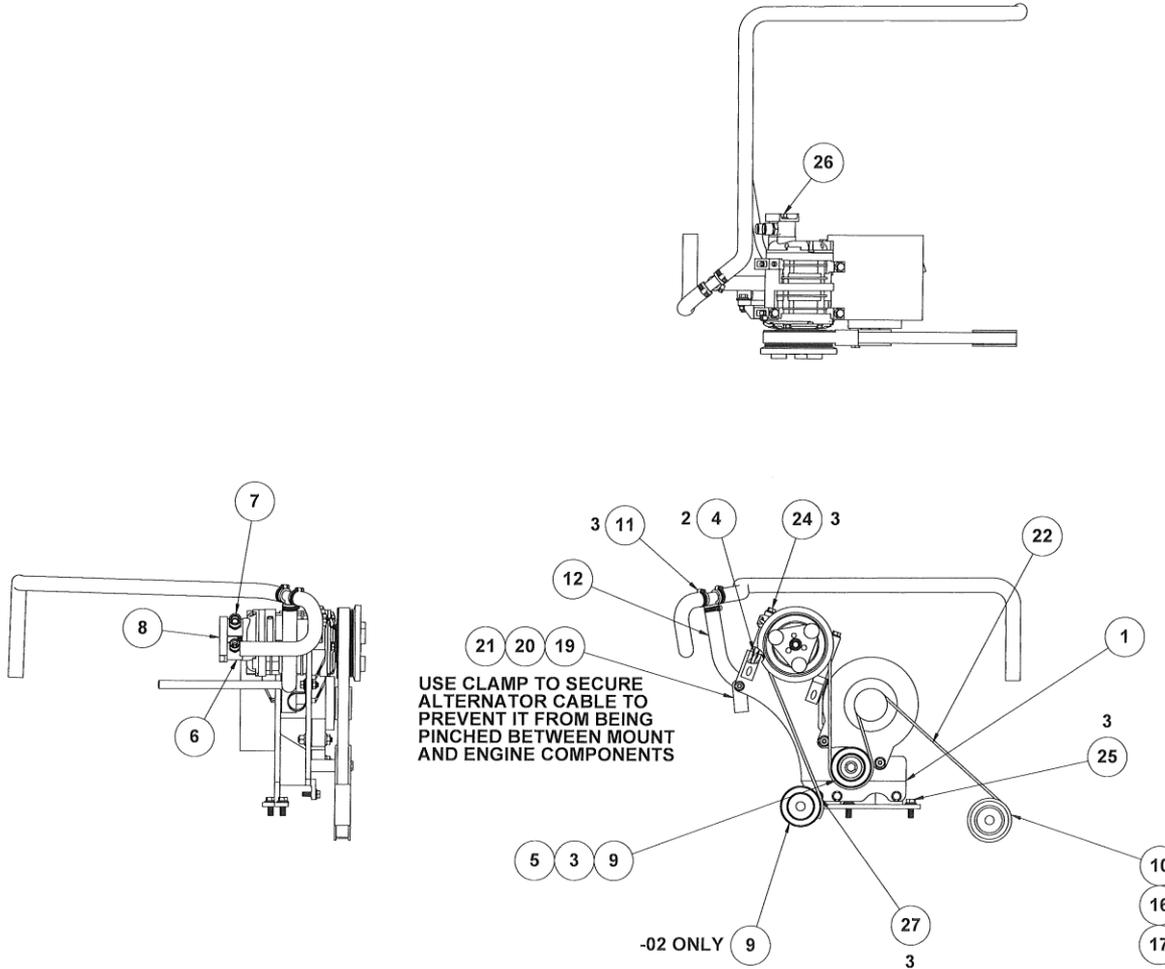
3	3	616483	BOLT, HEX HD FLANGE, M8-1.25 X 25MM GR10.9	27
1	1	616442	BOLT, HEX HD FLANGE, M10-1.50 X 50MM, GR10.9	26
3	3	616481	BOLT, HEX HD FLANGE, M10-1.50 X 25MM, GR10.9	25
3	3	616439	BOLT, HEX HD FLANGE, M8 X 1.25P X 100MM, GR 10.9	24
1	1	916178	LABEL, BELT ROUTING, FORD 5.4L	23
1	1	7156061360	BELT, POLY-V, 6K GROOVE, 136.0"	22
1	1	616384	BOLT, HEX HD FLANGE, M8 X 1.25P X 25MM, GR 8.8	21
1	1	618092	NUT, HEX FLANGE, LOCK, M8-1.25	20
1	1	611033	CLAMP, INSULATED, 1 - 1/4" ID	19
1	1	611063	CLAMP, SPRING HOSE, 1 1/16"	18
1	1	711035	BOLT W WASHER, HEX HD, 8MM X 1.25 X 1.41"	17
2	2	911009	THREADLOCK, REMOVABLE	16
4	4	117003	TYRAP, 3.75	15
1ft	1ft	119015	LOOM, PLASTIC, 1.00", SLIT, HIGH TEMP	14
1	1	316111	FITTING, TEE, 5/8 X 5/8 X 5/8 BARB	13
1	1	31987606	HOSE, 90, 5/8" X 3/4" X 25"	12
3	3	611062	CLAMP, SPRING HOSE, 15/16"	11
1	1	711048	IDLER PULLEY, 6K-GROOVE, 76MM PITCH	10
2	1	711041	PULLEY, BACKSIDE, 76MM X 30.9MM WIDE	9
1	1	501262	PLATE, FITTING PAD	8
1	1	313455	FITTING, PAD BLOCK, STR, #10 MIO	7
1	1	313454	FITTING, PAD BLOCK, STR, #8 MIO	6
1	1	616449	BOLT, HEX HD FLANGE, M10-1.50 X 30MM, GR10.9	5
2	2	517068	BUSHING, DOWEL, 8MM X 13MM LONG	4
1	1	4013379	BUSHING, IDLER PULLEY, SINGLE 6303 BEARING	3
				2
1	1	4012675	MOUNT, FORD 5.4L CUTAWAY	1

QTY REQD PER Assy	PART NUMBER	DESCRIPTION	ITEM NO.
PARTS LIST			
UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES ON DECIMALS		INTERPRET DRAWING PER ISO-810:100	
.31, .3PL, ANGLE		REMOVE BURRS AND SHARP EDGES	
.03 ± .010 ± .1"		DO NOT SCALE DRAWING	
MATERIAL:		DRAWN BY DJF DATE 10/9/2015	
CHECKER J.M.H. DATE 3/11/16		DRAWING APPROVAL [Signature]	
DESIGN APPROVAL [Signature]		SIZE D	CODE
FINAL	USED ON	DWG NO. 4013524	REV B
APPLICATION		SCALE 1:4	SHEET 1 OF 2

TRANS/AIR MFG CORP
MOUNT KIT, FORD CUTAWAY

CalTrans CLASS A Engine Mount & Drive Kit (2 of 2)

DWG NO. 4013524 REV 2



SIZE D	FSCM NO.	DWG NO. 4013524	REV B
SCALE 1:2	SHEET 2 OF 2		1