Headquarters
New Zealand Defence Force
Defence House
Private Bag 39997
Wellington Mail Centre
Lower Hutt 5045
New Zealand

OIA-2025-5613

8th January 2026

[redacted]

Dear [redacted]

I refer to your email of 4 December 2025 requesting, under the Official Information Act 1982 (OIA):

> *Any and all information or records about a hino Gt11-18 firetruck with the number plate NO186, supplied by Mills-tui to the NZ Army around 1987.*
>
> *Any and all operating manuals/user manuals for the above series of vehicles. Including gear lists or standard equipment carried by this series of vehicles.*
>
> *Any and all maintenance/workshop manuals for the above series of vehicles. Including electrical diagrams.*
>
> *Any records related to the PTO winch mounted on the rear of the above mentioned vehicle.*

NO186 was purchased as part of the Rural Fire Appliance Medium (RFA (M)) vehicle fleet. The RFA (M) were a commercial off-the-shelf Hino GT11.18 4x4 cab and chassis with a purpose-built body, a 2700 litre water tank, self-recovery winch and locker units for fixed and unfixed accessories and components. It came with fire-fighting equipment included. They were introduced into service with the New Zealand Defence Force (NZDF) in 1988.

NO186 went through a mid-life refurbishment in 2001-2002, where it had the conventional pump equipment removed, and was fitted with the 100/50 Compressed Air Foam System (CAFS). The CAFS allowed the use of Class A and B Foam to extinguish aircraft, house, vehicle and scrub fires. The vehicle had its designation changed to a Type 2 RFA (M).

When being converted to a CAFS unit, it may also have had mounts for the Self Contained Breathing Apparatus (SCBA) sets, most likely in the side lockers.

The RFA (M) fleet was withdrawn from service (WFS) in July 2017. The following documents remained with the vehicles when put up for disposal:

- Manual Technical HINO Maintenance Guide, and
- Manual Technical HINO Truck Drivers

While documentation is normally destroyed as part of the WFS process, copies of relevant digital records are enclosed. NO186 was involved in an accident sometime in the early 2000s, but no further details regarding the accident were found.

You have the right, under section 28(3) of the OIA, to ask an Ombudsman to review this response to your request. Information about how to make a complaint is available at www.ombudsman.parliament.nz or freephone 0800 802 602.

Please note that responses to official information requests are proactively released where possible. This response to your request will be published shortly on the NZDF website, with your personal information removed.

Yours sincerely

GA Motley
Brigadier
Chief of Staff HQNZDF

Enclosures:
1. CAFS manual
2. Hino-CES equipment loadout
3. NO186 maintenance record

SERCO PROJECT ENGINEERING LTD.

C A F S

Compressed Air Foam Systems

SPEL
c/o Trentham Army Camp
Messines Avenue, Trentham.
New Zealand.

WHAT IS CAFS ?

Compressed Air Foam is beginning to make news all around the world in the rural and urban firefighting areas. The chief difference between compressed air foam and typical Class A foam is the manner in which the foam is created.

Most Class A foams are "low-energy". Low-energy foams are formed by aspirating the air into the foam at the nozzle. The reason these foams are called "low-energy" is that, after the air is aspirated into the stream, the resulting firestream has relative low velocity, or "energy". On the other hand, compressed air foams are considered "high-energy". Their air is supplied by an air compressor. This air compressor uses a significant amount of horsepower.

Air under pressure equal to the water pressure is pumped into the firestream, starting at the engine discharge. Since the air is being supplied under pressure, there is no energy lost at the nozzle for making foam. In fact, the foam starts forming in the hose near the discharge.

The friction of the hose liner and the tumbling forms a very fine bubble structure. The nozzle then simply discharges the product - with very little energy loss. Compressed air foam streams are characterised by excellent stream reach, due to their high energy at the nozzle.

Because of the way they are formed, compressed air foams have a superior structure to aspirated foams. The bubbles are smaller and uniform in size. Compressed air foams exhibit a much longer drain time than conventional foams, which have a random bubble structure and much larger bubbles. Drain time needs to be considered when making a decision to use foam as an attack tool or barrier.

Two drain times are usually discussed: the quarter drain time and the half drain time. Each term is a description of how fast a given amount of water will drop out of the bubble structure and become free.

Foam with a 45 second quarter drain time is one that drops 25% of its water in 45 seconds. A foam with a 45 second drain time may have a half drain time of 5 minutes.

Drain times are affected by just about everything: water hardness, solution ratio, nozzle type, etc. If the firefighter is going to attack the fire directly, a quick-draining "wet foam" is usually most desirable. If the goal is to construct a barrier, then a slow draining, wet foam is better.

A wet foam is more desirable for barrier work because it will provide a significant amount of water for fuel wetting as it quarter drains, while still retaining good structure and more available water. A CAFS unit can create quarter drains that on average are 10 times longer than those made with conventional aspirating nozzles.

Expansion ratio is an expression of how much air and water are in a foam. A 10-to-1 foam consists of 10 parts air to 1 part water. Most aspirating nozzles can only create one expansion ratio. The few that allow variability are still rather limited.

Compressed air systems can create a varied range of foam expansion ratios. This is possible because the operator uses valves to control the air supply and water supply. For instance, if an operator sets the system at 4.5 l/sec of water and 60 Cfm of air, a foam with an approximately 7.5-to- 1 expansion ratio will be created. If a 15-to-1 expansion ratio is desired, the operator would specify 2.25 l/sec of water and 60 Cfm of air.

Wetter foams (3-to-1) are also possible. In fact many times wet foams are tactically better than the drier ones.

WHAT TO DO WITH IT !

The chief use of Class A foams and compressed air foam is an interface structure defence. Both work well, and have been used for a significant period of time in various prescription burning programmes to prevent loss of sensitive or important resources within the fire perimeter. CAFS has an excellent record of use for perimeter holding at slash burns in Northern California, Oregon, Washington and Idaho.

The U.S Forest Service, Bureau of Land Management and state and private agencies are using this technology. CAFS has recently been successfully introduced into New Zealand and is being studied around the world for operational introduction.

Foams work very well in this environment because they are capable of raising fuel moisture to levels greatly in excess of the level of flame extinction-in some cases as much as 200 percent above critical moisture. When fuels are that wet, they simply will not burn.

Such effects are possible because Class A foams are some of the best available wetting agents. They are particularly effective at wetting unburned fuels, forcing water deep into the inner structure of the fuels. Approaching fire would have to expend great amounts of energy over a long time to dry them out enough to burn. Usually that doesn't happen, because the flame producing phase of the fire doesn't dry them in time to ignite them.

In order to wet down fuel in this manner, the water must have superior penetration, which is accomplished chemically by the Class A foam. And of cause, the water must remain in contact with the fuel surface long enough for penetration to occur.

Foaming water makes it to cling to the fuels due to increased viscosity. The foam will hang on to the fuels long enough for thorough wetting to occur.

Compressed air foams are the best product to perform such a task. They are much more dense than aspirated foams, allowing more water to be placed on the fuel without drop off occurring.

The compressed air-water mixture can be fine tuned to the job. For example, a wet foam can be applied to extremely dry fuels to gain moisture content, followed by drier, longer-draining foam to act as a barrier so the fuel won't dry out.

A product is presently under development at the National Foam Corporation that has the ability to retain water in its bubble structure for up to 72 hours. During preliminary testing, test fires have been ignited 48 hours after application of the foam. The fires were not able to penetrate the barrier-the foamed fuels were virtually untouched. And the were still wet after the foam was either removed or finally broken down. However keep in mind that a fire front can still spot over such a line. Still, excellent results are being achieved by burning away from such lines.

Another advantage to compressed air foam is that a hoseline filled with CAF is much lighter than a same size line filled with water or foam solution. In fact, the CAF line will usually float on a body of water. Since the air in compressed air foam has been supplied by a compressor built into the pumping system, and the air has been pumped in near the discharge port, the hose will be fill of foam. Foam has a considerable amount of air in it, so the hose will be much lighter than a conventional liquid-filled hose.

This feature allows personnel to more-easily position and use 38 mm and 45 mm hoselines in adverse terrain in the wildland. The ability to remain reasonably mobile with a larger-calibre hoseline is a key safety advantage over conventional firestream delivery methods. It also significantly reduces the physical stress on personnel.

In a typical scenario with conventional Class A foam and low-energy equipment, if personnel desire increased expansion ratios, they usually increase the solution ratio to somewhere near one percent. Then the foam that is created has a "dry look".

A compressed air foam system has the ability to make foams actually drier than any low-energy system, at solution ratios of 0.3% to 0.5%. This is a concentrate-user reduction of 50% to 60%.

Such cost savings can pay for the hardware costs of the air compressor in a CAF system in a five-to-ten year period.

Also, from an environmental standpoint, using less concentrate is a desirable objective. All Forest Service- approved agents have been tested, and show little detrimental effect to the ecosystem when used at solution ratios of 1% and below. However any methodology that can achieve the desired results with less concentrate should be strongly considered.

Compressed air foam makes and excellent firestream for fire attack. A CAF firestream has a very high knockdown capacity when compared to water or foam solution. Much current interest in compressed air foam is due to this ability.

A moderate flow rate (50 gpm) will knock down a considerable volume of fire. Unfortunately there are some who propose that such low flow rates are "all" you need. That's simply not true.

It is essential to use as high a flow rate as is required for a fire of the size that is being attacked. A 50 gpm compressed air foam firestream is generally very effective. But if the fire question is a 100 gpm fire, whether compressed air is used or not, the attack requires 100 gpm.

Some Fire Services have been using CAFS to combat structure fires. All of them report a significant reduction in knockdown time. There has also been an even larger reduction in the amount of water used during turn-over, salvage and damping down.

Several Fire Services in the USA in Idaho and Wyoming have conducted operations at significant fires and left only 10 to 20% of the amount of water damage considered to be normal. This analysis is confirmed by the insurance loss-adjusters who do damage assessments.

HOW TO MAKE IT

The mechanics of compressed air foam are fairly simplistic:-

* Create foam solution with a proportioner.

* Pump compressed air into discharge port.

* Foam will form in hose (or a mixer, if needed)

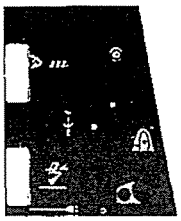
* Apply the foam

Recent improvements in equipment design have overcome problems with accomplishing the first three objectives listed above. Experiments with making foam in the above manner have taken place for over ten years. For the first seven years the systems were too unreliable and confusing to use for the operational firefighters in the field of operations. State-of-the-art foam proportioning systems, better equipment, more suitable air compressors and support parts. The end results is a system that was user friendly, predictable and reliable.

CONCLUSION

Compressed air foam systems are a definite technological advantage in firefighting and prescription burning that is becoming more and more available. Previous problems have been overcome to make the system eminently user-friendly.

If a compressed air system is for your service, then this is an operational and financial decision, but modern fire services, especially those with rural/urban interface firefighting would do well to investigate the advantages of CAFS.



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COMPRESSED AIR FOAM SYSTEM

USER REQUIREMENT

General.

Fire appliances fitted with CAFS systems should possess the following CAFS features when fitted with Type 1 – 3 portable CAF systems. Fixed and/or vehicle mounted systems will vary according to type and/or specification.

The NZ Defence Force is augmenting the extinguishing medium on the current fleet of Rural Fire Tankers, and in so doing issued this User Requirement to ensure essential compliance to enable NZDF to meet the obligations under the Acts, Rules and Regulations as is mandatory.

Output Performance

The output performance of the CAFS unit is to meet the following performance matrix from the type of unit as specified.

Type 1	280 L/min @ 700Kpa – Water discharge, Compressor @ Unload	
	135 L/min – 35 Cfm	}
	135 L/min – 990 Ccm	} Foam Discharge
Type 2	375 L/min @ 900Kpa – Water discharge, Compressor @ Unload	
	190 L/min – 50 Cfm	}
	190 L/min – 1420 Ccm	} Foam Discharge
Type 3	950 L/min @ 1050Kpa – Water discharge, Compressor @ Unload	
	450 L/min – 120 Cfm	}
	450 L/min – 3400 Ccm	} Foam Discharge

Water Inlet Supply

All appliances fitted with CAFS, Class A, Class B or any combinations, are to be fitted with a separate water supply inlet lines from the normal collector head type. This inlet is to feed hydrant supplied water directly into the tank via a manually operated gate valve. The tank contents indicator must be clearly visible to the operator.

The tank supply is then to feed the pump. All pipework must be able to flow the full capability of the pump.

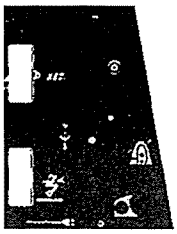
The tank is to incorporate a sediment trap and drain valve. It is also required to have readily accessible filters in the plumbing from the tank. Water is delivered to the CAFS Unit via direct tank/pump feed.

Concentrate Tanks

Concentrate tanks are to be of the following minimum capacity;

- Class A minimum 30 litres
- Class B minimum 40 litres

Concentrate supply to the foam proportioner is to be via the foam concentrate tank only.



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Concentrate Pump

Vehicles fitted with "Non removable" CAFS units are required to be fitted with hand operated foam concentrate pumps to refill the Class A and /or Class B foam tanks, separate from the foam proportioning system. A hand pump of sufficient capacity to cater for the 3% ratio of the Class B foam when matched to the capacity of the foam proportioner.

The pump is to be manually operated and have a pick-up tube connection for the concentrate.(Each station will supply their hand operated foam pump.) A discharge tube and a A-B change over valve is to be fitted to the pump with controls adjacent to the concentrate pump controls on Type 3 (only) CAFS Units.

A means of flushing the pick-up lines is to be used.

A site level tube is to be fitted to each units concentrate tank. If the concentrate is not visible inside the tank from the pump operators position, then periodic checks must be made when operating..

Notwithstanding the requirements above, the foam transfer pump is to have the capacity no less than 18 litres per minute.

It is not essential for "Removable" CAFS units to require foam concentrate pumps to refill the tanks; these can be done by the pour method or by a manual pump.(If desired)

Compressors

Compressors provided for use with CAFS systems shall be:

- Capable of achieving the target ratio of 8:1 air/water flow ratio for the design flow rate of the CAF system (Refer Specification).
- Capable of continuous operation at the output requirement
- Capable of automatically flowing the required ratio of air as determined by the flow of water
- Driven from the same power source as the pump.

The noise level must conform to the requirements of the Safety & Health in Employment legislation, and conform to the same requirements to that of the approved operational requirement for the appliance to which the CAF unit is to be fitted.

The compressor must be capable of supplying air only, during non CAFS operation.(Type 3 only)

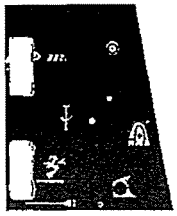
Air and water flow shall be calibrated in litres per minute and pressure in kilopascals.

Compressors are to be fitted with automatic pressure control relief systems.

Foam Induction

All systems must be capable of induction rate of 0.1% - 3% at the design flow rate of the CAF system.

Induction rates must be capable of being varied easily and with immediate results.



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COMPRESSED AIR FOAM SYSTEM

USER REQUIREMENT – Type 1 Unit

General.

The NZ Army requires to augment the extinguishing medium on the current fleet of RFA's and in so doing issued a User Requirement to ensure essential compliance to enable NZDF to meet the obligations under the Acts, Rules and Regulations as is mandatory.

Capabilities Required.

Output : 265 L/min – 35 Cfm
265 L/min – 990 Ccm

Engine : 24 hp engine minimum.

Water Pump: Centrifugal water pump with nylar impeller.

Compressor: 4 cylinder reciprocating air compressor of 35 Cfm (990 Ccm) capacity.

Drive : Poly chain drive compressor and water pump 12mm.

Primer : Jet priming system.

Foam System : Foam Pro 1601 Series

Pipework : Stainless steel and brass plumbing.

Auto synchronised pressure balancing system. Automatically maintains the air pressure within +/- 5% of the water pump pressure throughout the pressure range.

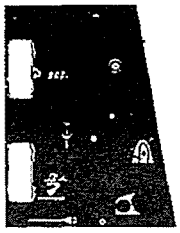
Output Requirements.

Essential Weight : Less than 130 kilograms

Essential Foam Usage Even rate from 0.2%

Essential Discharge Water – 265 L/min – Single Discharge

Essential Dicharge Foam – 990 Ccm – Single Discharge



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COMPRESSED AIR FOAM SYSTEM

USER REQUIREMENT – Type 2 Unit

General.

The NZ Army requires to augment the extinguishing medium on the current fleet of RFA's and in so doing issued a User Requirement to ensure essential compliance to enable NZDF to meet the obligations under the Acts, Rules and Regulations as is mandatory.

Capabilities Required.

Output : 450 L/min – 50 Cfm
450 L/min – 1420 Ccm

Engine : 24 hp Diesel engine

Water Pump: Centrifugal water pump with cast iron body and nylar impeller.

Compressor: Rotary screw air compressor of 50 Cfm (1420 Ccm) capacity.

Drive : Poly chain drive compressor and water pump 12mm.

Primer : Jet priming system.

Foam System : Foam Pro 1601 Series

Pipework : Stainless steel and brass plumbing.

Auto synchronised pressure balancing system. Automatically maintains the air pressure within +/- 5% of the water pump pressure throughout the pressure range.

Output Requirements.

Essential Weight : Less than 255 kilograms

Essential Foam Usage Even rate from 0.2%

Essential Discharge Water – 300 L/min – Single Discharge

Essential Dicharge Foam – 1400 Ccm – Single Discharge

PNEUMAX MODEL 100-50-DS

OPERATING INSTRUCTIONS

Check the following fluid levels daily or prior to starting unit:

- Engine oil
- Compressor system oil (oil level should be visible within the sump mounted sight glass)
- Foam concentrate
- Onboard water supply

MULTIPLE USES
The Pneumax modular compressed air foam unit can be operated in several pumping modes; water only, foam solution without compressed air, compressed air foam and compressed air only for support operations such as operating air tools, filling rescue air bags, etc. It is possible to pump foam solution from one discharge while pumping compressed air foam from another, or varying foam consistencies (expansion ratios) from different discharges simultaneously.

NOTE: Monitor engine and compressor instruments during and all operations.

WATER PUMPING OPERATIONS
All unit operations begin with pumping water. These steps must be followed for operations involving pumping water, foam solution, compressed air or compressed air foam.

Connect the hose(s) to the desired discharge(s).

Prior to starting the engine, the Auto Sync controls should be in the AUTO/UNLOAD positions, which allows the air compressor to "free wheel" without pumping air.

If pumping water from an onboard booster tank, fully open the tank to pump valve. If pumping from an overboard source, the tank to pump valve should be fully closed.

WATER PUMPING OPERATIONS (continued)

If so equipped. Turn on the main power switch to the CAFS unit.

To start the engine, open the Vernier throttle one to two counter-clockwise turns, move the ignition switch to the "ON" position, and push the start button to crank the engine, until it starts.

Throttle-up to desired pressure. If pump pressure is absent, it will be necessary to prime the pump utilizing the Pneumax Jet Primer. The Jet Primer utilizes compressed air from the onboard compressor system which is passed through a venturi, creating a vacuum within the water pump.

To prime, move the Auto Sync controls to the FIXED/RUN positions to build air pressure. Once air pressure has risen, move the Jet Primer air and vacuum valves to the open positions. The rush of air through the priming venturi will be audible. As water is drawn into the pump, some will be vented through the venturi and spill onto the ground. When the water discharge pressure gauge rises, the pump is primed.

After prime is achieved, close the Jet Primer air and vacuum valves. For water only operations, move the Auto Sync controls back to the AUTO/UNLOAD positions.

Open desired discharge valves and throttle-up to desired pressure.

FOAM SOLUTION OPERATIONS

Follow the instructions above for water pumping operations. Turn on the foam proportioner to inject foam concentrate into the water stream. Refer to the foam proportioner operation manual for instructions in the proper operation of the installed proportioning system.

COMPRESSED AIR FOAM OPERATIONS

Follow the instructions above for foam solution operations. Safe operations dictate the presence of foam concentrate in the water stream prior to the injection of compressed air. If foam concentrate is not present, a condition known as "slug Flow" will occur, where unmixed water and air is discharged through a nozzle in an erratic manner.

Discharge pressures for compressed air foam operations typically range between 90 and 130 PSI in a flow rate. Set water discharge pressure at the desired level

NOTE: Compressed air foam does not have the hydraulic characteristics of plain water or foam solution. Therefore, standard pump hydraulics practices do not apply to CAFS operations.

COMPRESSED AIR FOAM OPERATIONS (continued)

Move Auto Sync controls to the AUTO/RUN positions. Air pressure as shown on the air pressure gauge should rise to within plus or minus 5% of the water discharge pressure. The Auto Sync system will balance the air and water pressures throughout a range of 40 PSI up to 150 PSI.

Set proportioner at 0.3% - .06% for normal Class A combustibles. Proportioning rates are dictated by the type and brand of foam concentrate used and the tactical objective.

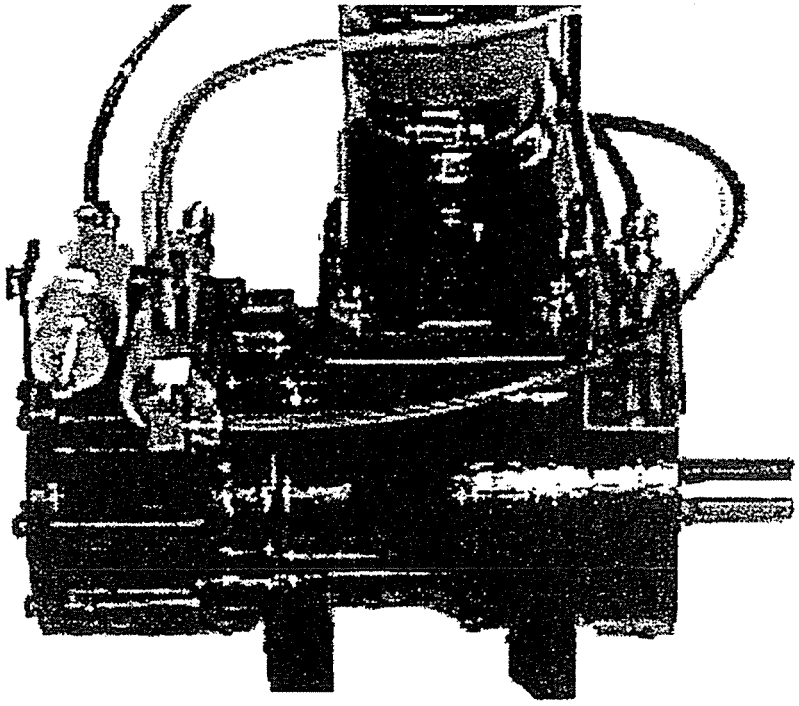
Open desired discharge valve(s) by pulling the "TEE" handle approximately 1-1/2" from the closed position. The foam expansion ratio is set by controlling the amount of foam solution entering the discharge stream. High solution flows restrict the amount of air admitted and result in lower expansion or "wet" foam. To produce higher expansion or "drier" foam, simply gate the discharge back to reduce the amount of solution admitted.

Fully open the air valve(s) to the desired discharge(s).

Foam is formed during the transition through the hose. To produce acceptable finished foam; sufficient hose length must be provided on the discharge. Refer to Table 1 for minimum hose lengths for CAFS operations.

WARNING: Nozzle reaction force is significantly increased at the time the nozzle valve is opened in compressed air foam operations. OPEN CAFS NOZZLES SLOWLY!

Operation and Maintenance
Pneumax/Rand CE55
Rotary Screw
Water Cooled Air Compressor



The air compressor used in this application is an oil flooded rotary screw type. Rotary screw compressors of this type are very common in industry. This type of compressor injects oil into itself. The oil is entrained in the air discharge form the compressor. The oil lubricates, seals, cools, and silences the compressor. The air/oil mixture is discharged into a sump tank where most of the oil separates from the air. The oil is sent via hydraulic hose to combination cooler-thermostat-filter unit. It is cooled to remove the heat of compression and friction heat, filtered, then sent to the oil injection port on the compressor. The cycle is then repeated.

The oil mist that remains in the airstream is recovered by an air/oil separator system. This system recovers the oil mist in a cartridge. The cartridge has a siphon tube to pick up the liquid and return it to the system through a port on the compressor.

The compressor's output is controlled by a modulating inlet valve. The inlet valve is opened and closed by a pressure sensing system.

A water system circulates water from the fire pump through the oil cooler and back to tank to cool the compressor. The compressor's oil thermostat is set at 175 degrees. The compressor's temperature should not exceed 220 degrees. If so, check for restrictions in the cooling water system or for low oil level in the reservoir.

The air compressor (air end) is mounted to a gearbox and driven by a flexible coupling. The same gearbox has the centrifugal pump mounted to it. The compressor and pump are always engaged.

Drawings and illustrations of the various components are included in the following pages.

1.	CE55	Air End, showing ports
2.	320448CE.1	Oil schematic, with connection labels
3.		Oil cooler/ thermostat/filter , with part numbers as assigned
4.	320550	Inlet valve, with part numbers as assigned
5.		Reservoir/Separator, with part numbers as assigned
6.	320444D	Auto Sync schematic, illustrated
7.	320443.1	Basic CAF Schematic

SERVICE AND MAINTENANCE

1. There is a sight gauge on the oil reservoir, visible through a hole on the pump panel. The oil level should be at ½ of the window. Check the oil on level ground, prior to system start up. If the system has been run wait 10 minutes for the oil to stabilize before trying to determine the level. The compressor uses hydraulic oil. The oil is classified by an ISO standard. An ISO 68 viscosity oil should be used. There are various trade names for such an oil. Many are sold as a "anti-wear" oil, and the manufacturer will call it AW-68. The oil is available at most oil distributors and through NAPA.

2. The oil should be changed after the first 30 hours of system operation. After that the oil should be changed yearly. There is a drain cap available at the bottom of the reservoir.

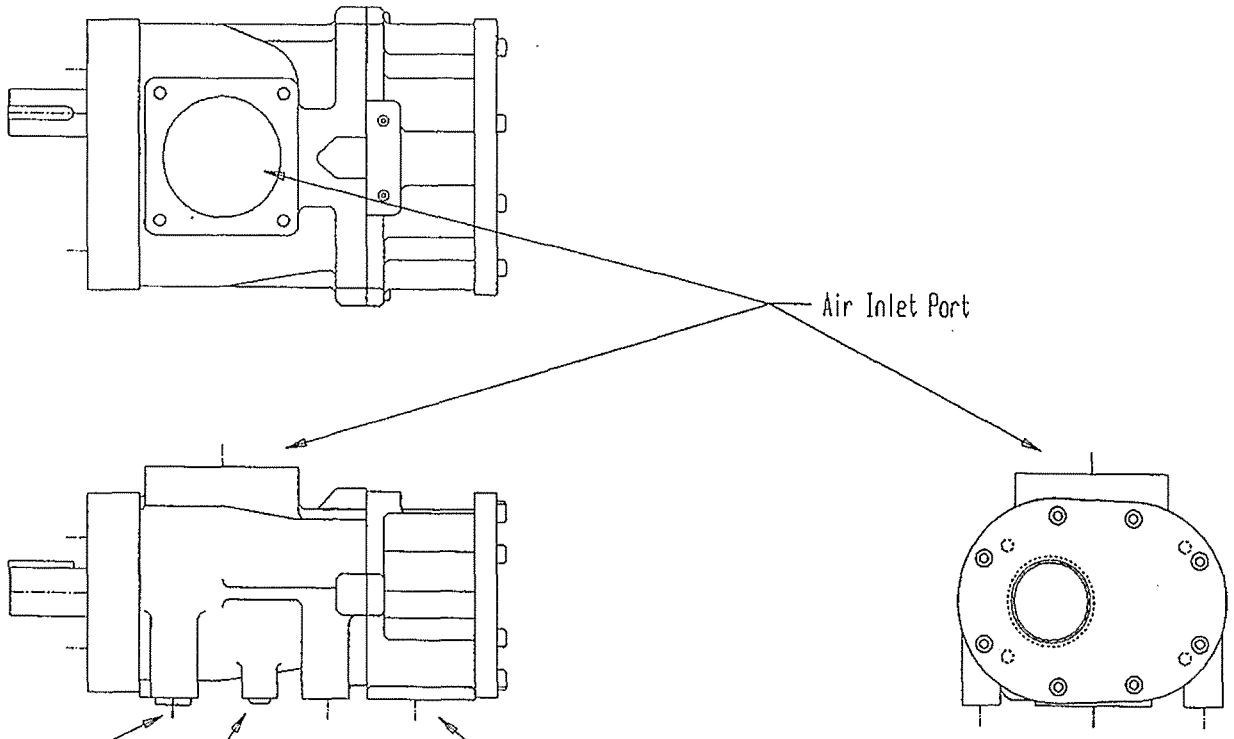
3. Change the oil filter at the same time as the oil is changed. The spin-on filter cartridge is a Donaldson hydraulic filter. The filter will interchange to several other common brands.

4. Inspect the air filter and clean as needed. The environment that the unit operates in will determine the frequency of air filter services.

5. Run the compressor for 2 minutes after changing the oil, then re-check the oil level.

6. Visually inspect the system periodically for signs of leaks. Check the flexible coupling for signs of excess wear.

7. Replace the oil / air separator cartridge every 24 months, or if the oil consumption of the unit suddenly increases. The increase will be caused by a hole or tear in the separator media allowing oil to carry through.



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A	CAG	03/07/97

NOTES:
1. DO NOT SCALE DRAWING.
2. NO BURRS PERMISSABLE
3. DECIMAL TOLERANCE +/- .063
4. ANGLE TOLERANCE +/- .500

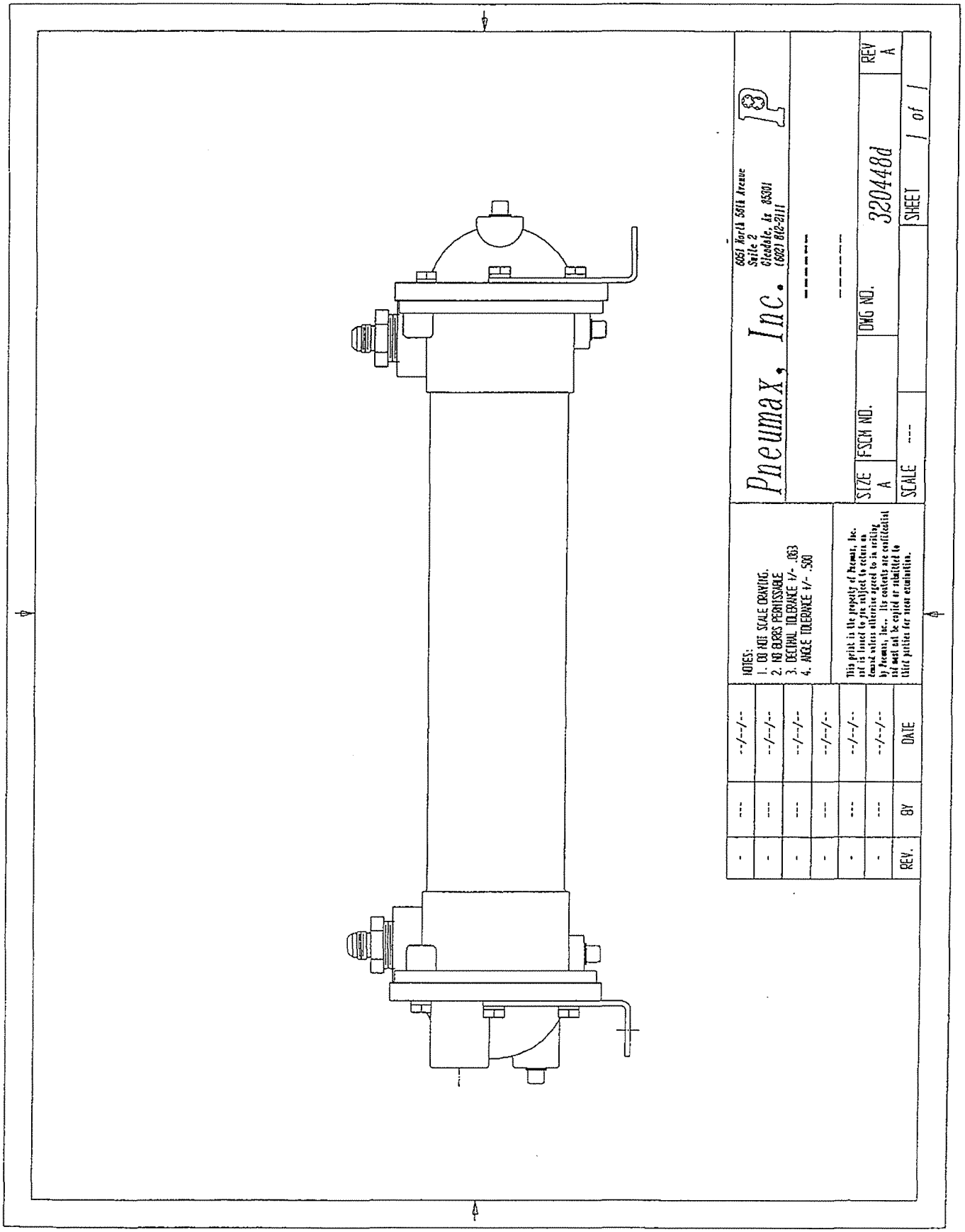
Pneumax, Inc.
6051 North 56th Avenue
Suite 2
Glendale, Az 85301
(602) 842-2111

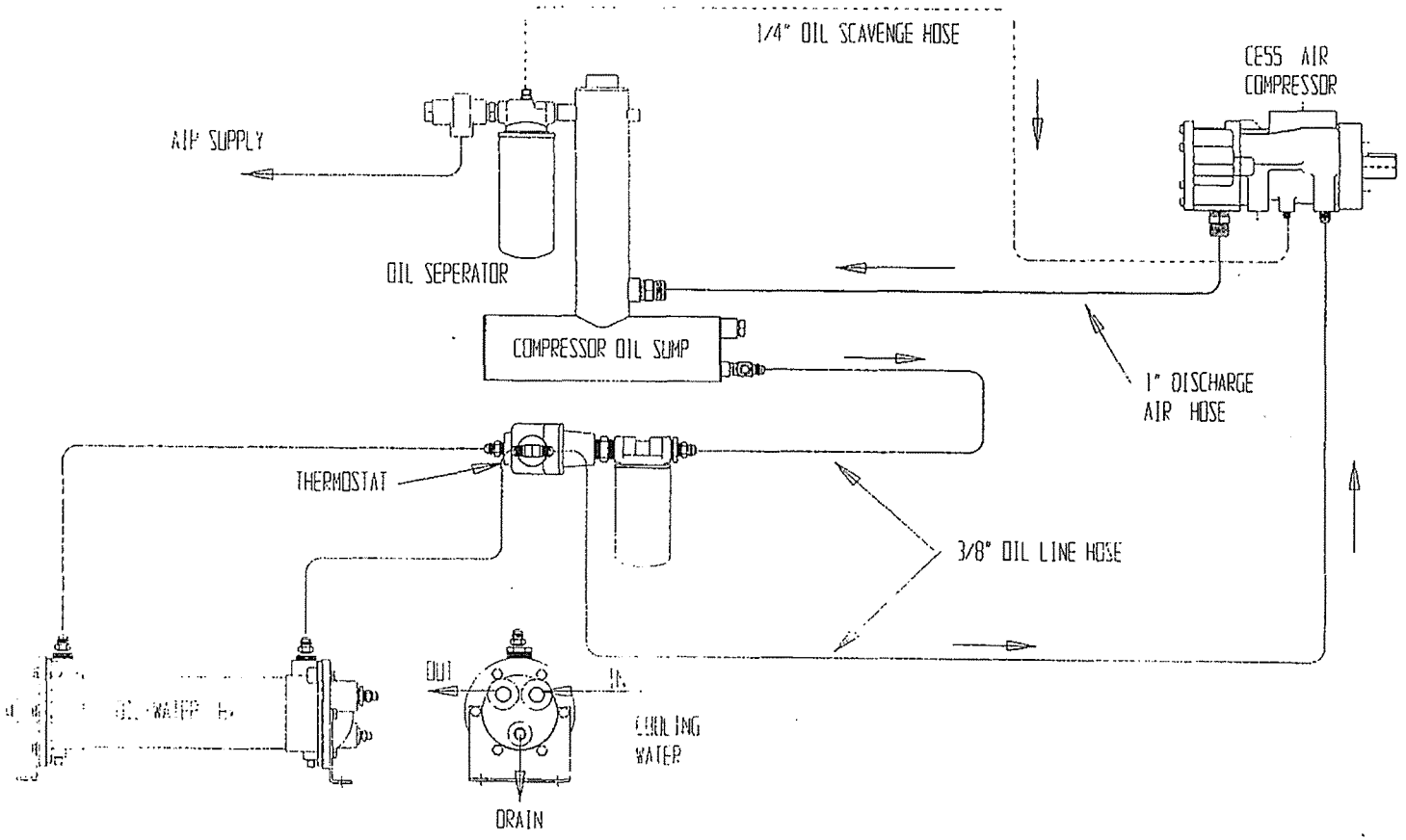
CE-55 RAND AIR END

SIZE	FSCM NO.	DWG NO.	REV
A			A

SCALE ---

SHEET 1 of 1





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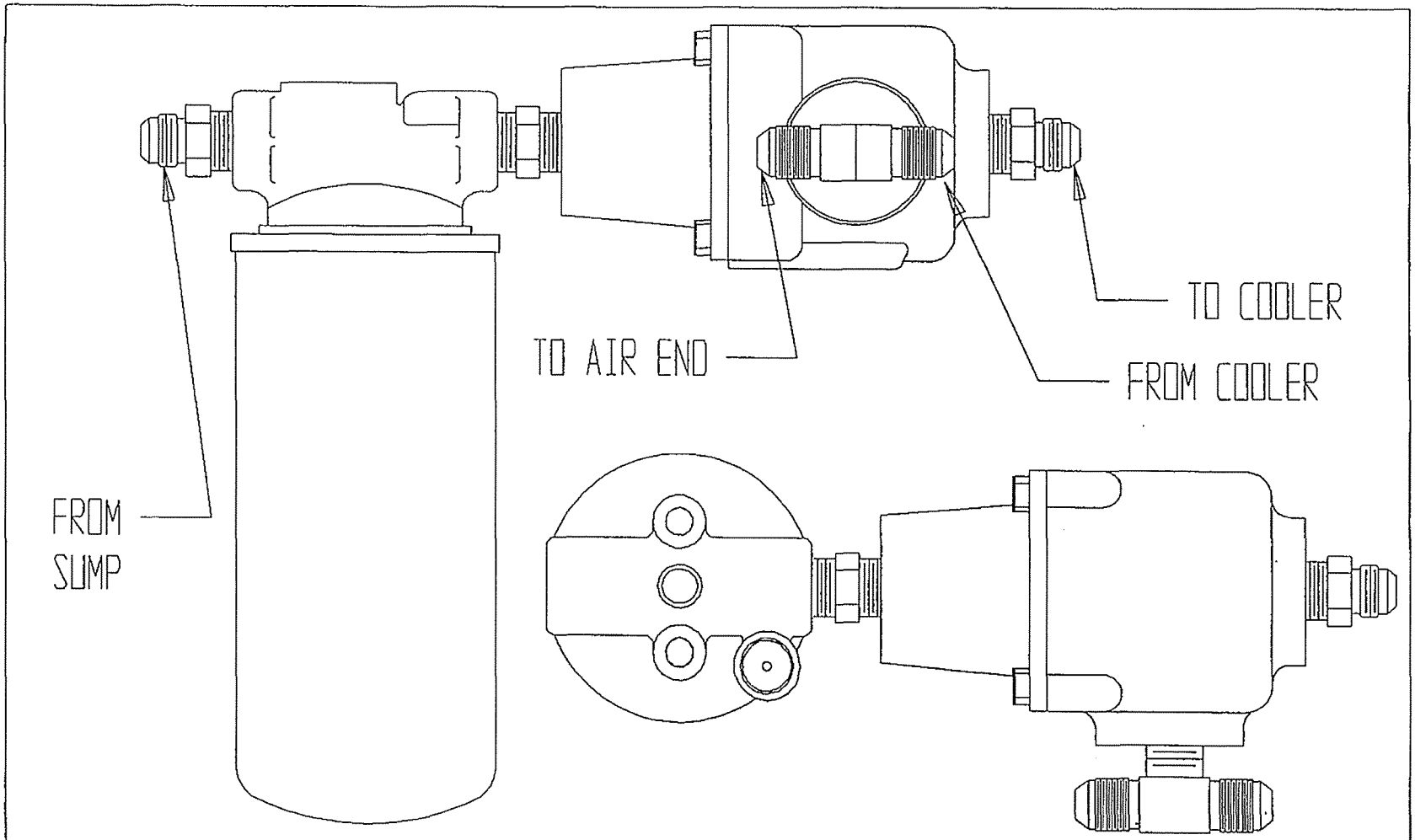
Pneumax, Inc.
8557 North 78th Avenue
Peoria, Az 85345
(602) 979-3398

HYDRAULIC SCHEMATIC
RAND CE55 / 100-50

SIZE	FSCM NO.	DWG NO.	REV
A		314002	--
SCALE ---		SHEET 1 of 1	



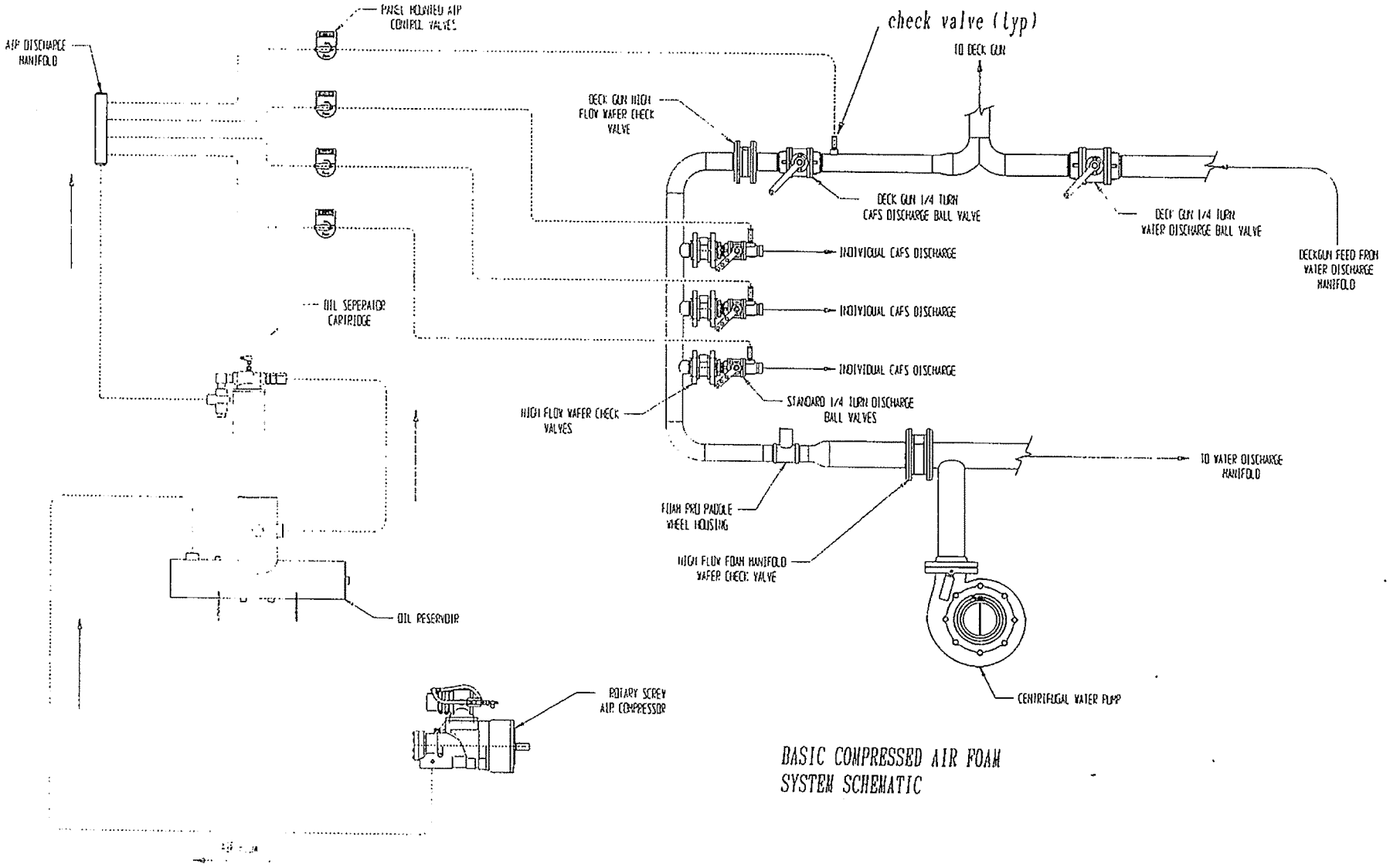
REV.	BY	DATE
-	---	--/--/--
-	---	--/--/--
-	---	--/--/--
-	---	--/--/--
B	DRY	06/09/99
A	CAG	--/--/--

NOTES:
1. DO NOT SCALE DRAWING.
2. NO BURRS PERMISSABLE
3. DECIMAL TOLERANCE +/- .061
4. ANGLE TOLERANCE +/- .500

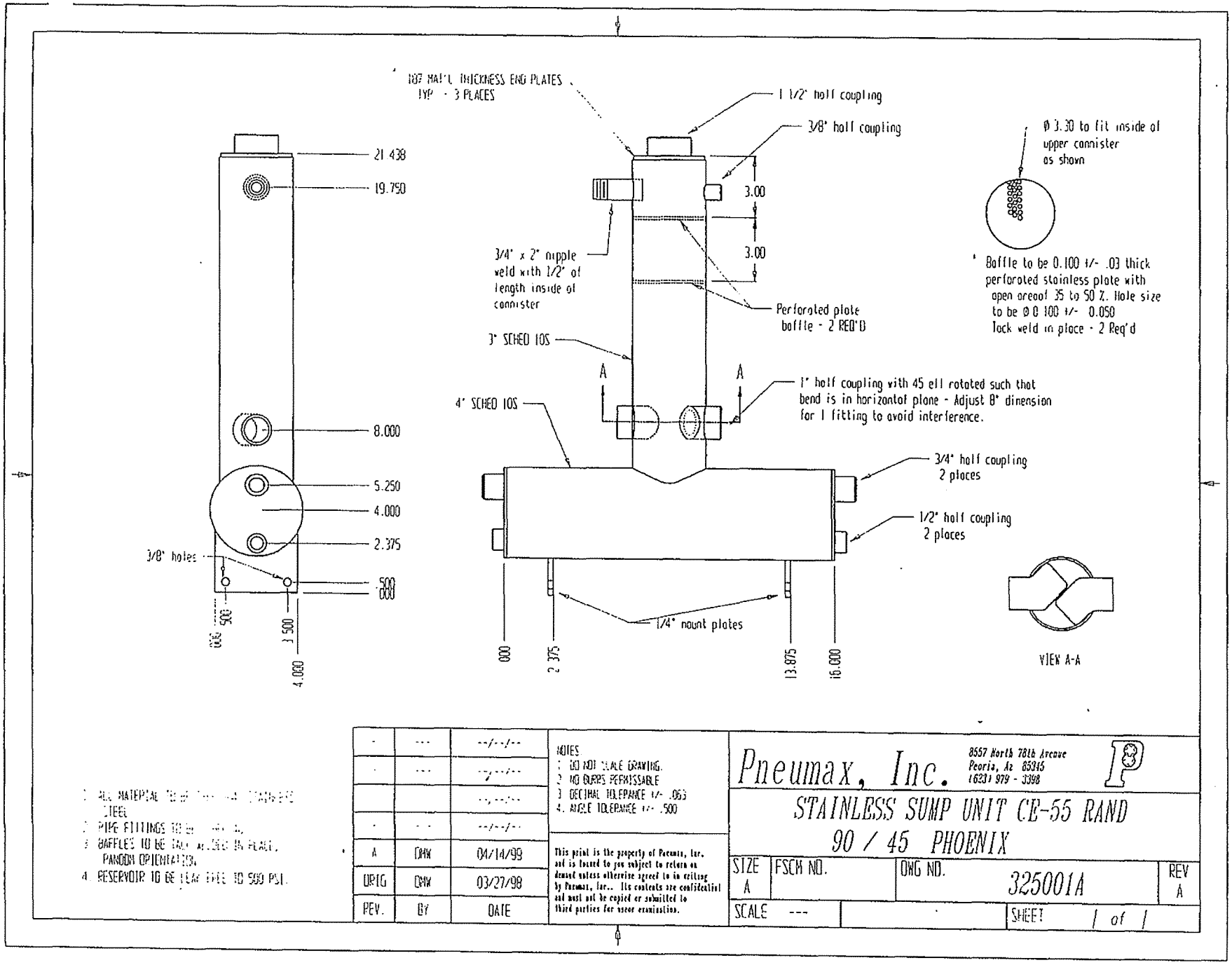
Pneumax, Inc.
6951 North 56th Treeve
Suite 2
Glendale, Az 85301
(602) 842-2111

Thermostat and Oil Filter
GHH Rand Air Compressor

SIZE	FSCM NO.	DWG NO.	REV
A		320444b1	B
SCALE ---		SHEET 1 of 1	



BASIC COMPRESSED AIR FOAM SYSTEM SCHEMATIC



1. ALL MATERIAL TO BE [illegible] STAINLESS STEEL
2. PIPE FITTINGS TO BE [illegible]
3. BAFFLES TO BE [illegible] IN PLACE. RANDOM ORIENTATION.
4. RESERVOIR TO BE LEAK FREE TO 500 PSI.

-	---	--/--/--
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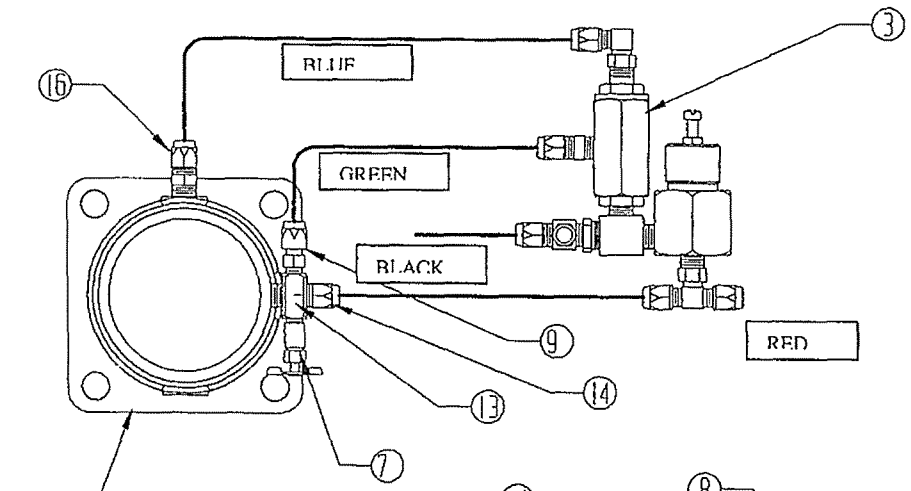
-	- -	--/--/--
A	DMW	04/14/99
ORIG	DMW	03/27/98
REV.	BY	DATE

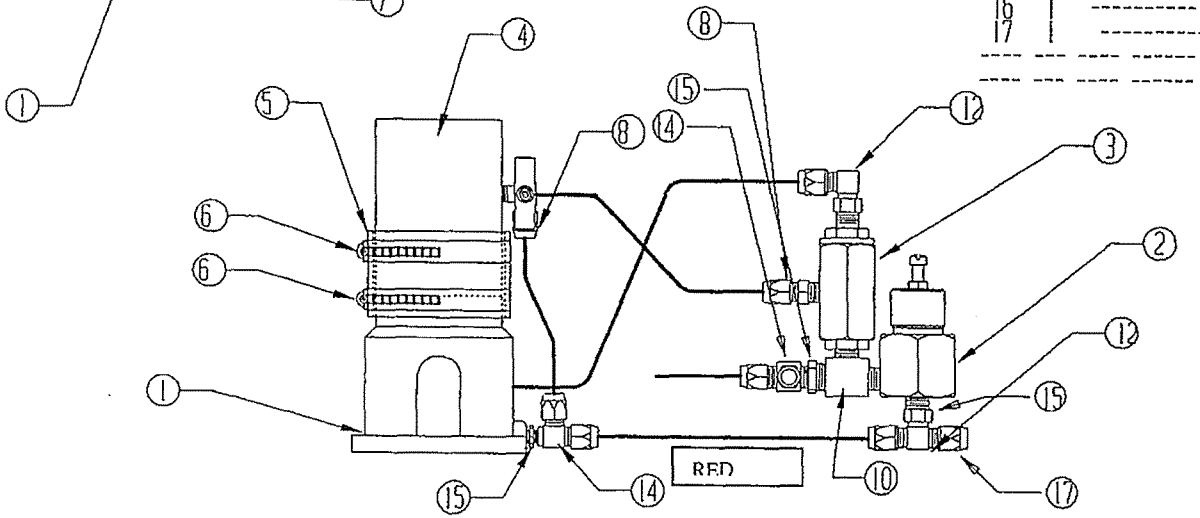
NOTES
1. DO NOT SCALE DRAWING.
2. NO BURRS PERMISSABLE
3. DECIMAL TOLERANCE +/- .063
4. ANGLE TOLERANCE +/- .500

Pneumax, Inc.
8557 North 78th Avenue
Peoria, Az 85345
(623) 979 - 3398

STAINLESS SUMP UNIT CE-55 RAND 90 / 45 PHOENIX

SIZE	FSCM NO.	DWG NO.	REV
A		325001A	A
SCALE ---			SHEET 1 of 1





ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	------	AIR-CON 1 3/4 AIR INLET
2	1	----------	AIR-CON PRESSURE CONTROL
3	1	----------	AIR-CON BLOWDOWN
4	1	----------	2.5"OD ALUM.TB 1/4" WALL 4" LNG
5	1	----------	2.5" ID RUBBER HOSE 2" LNG
6	2	----------	2.5" WORM CLAMP
7	1	----------	A555 NEEDLE VLV.COMP STR/WAY.
8	1	----------	1484 X 4 INSERT 1/4"
9	1	----------	1468X4M/MOD-1/16HOLE.FOR BD VLV
10	1	----------	TF3805X4F RUN TEE 1/4"
11	2	----------	1468X4X4M CONN 1/4"ABX1/4"PIPE
12	1	----------	1469X4X4M 90 EL.1/4"ABX1/4"PIPE
13	1	----------	3600X2M BRANCH TEE 1/8"
14	2	----------	1471X4M RUN TEE 1/4"ABX1/8"PIPE
15	3	----------	3220X4X2 BUSHING 1/4"1/8"PIPE
16	1	----------	1468X4 MALE CONNECTOR
17	1	----------	1472 x 4 BR. tee

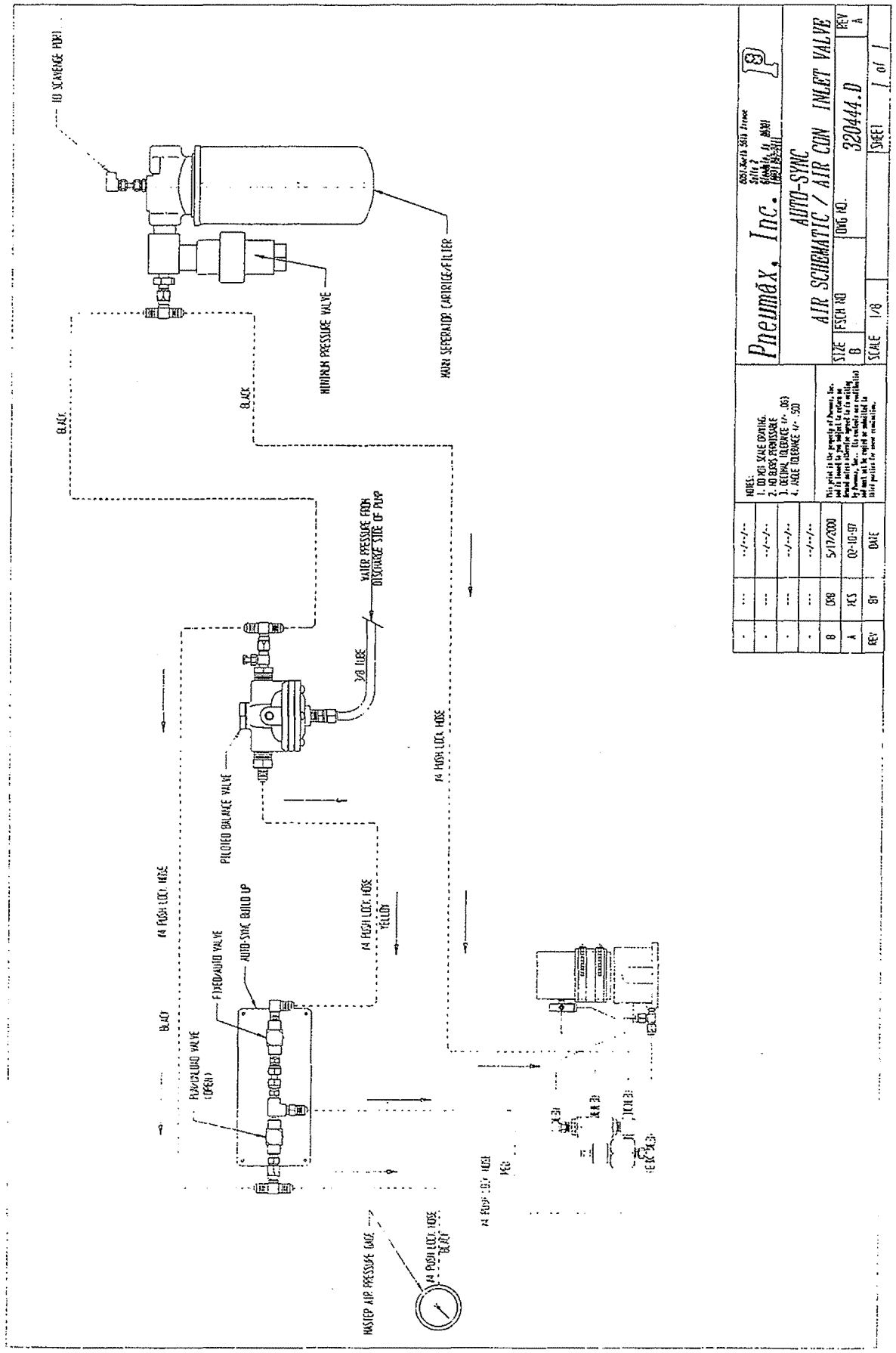
-	---	--/--/--
-	---	--/--/--
-	---	--/--/--
-	---	--/--/--
B	NCS	08/15/97
A	CAG	02/27/97
REV.	BY	DATE

NOTES:
1. DO NOT SCALE DRAWING.
2. NO BURRS PERMISSABLE
3. DECIMAL TOLERANCE +/- .063
4. ANGLE TOLERANCE +/- .500

Pneumax, Inc.
6051 North 56th Avenue
Suite 2
Glendale, Az 85301
(602) 842-2111

1 3/4 AIRCON INLET VALVE TUBING BUILD-UP
CE55 RAND AIR END

SIZE	FSCM NO.	DWG NO.	REV
A		320550	A
SCALE ---		SHEET 1 of 1	



Level	Text	Quantity
0	TRUCK,FIRE FIGHTING HINO, forest & rural	1
0.1	TRUCK, FIRE FIGHTING HINO	1
..2	WINCH, DRUM, VEHICLE MOUNTING	1
..2	ROPE,WIRE 6x31 stl core,30m lg,13mm dia	1
0.1	PUMP UNIT,CENTRIFUGL fire fighting,Wajax	1
..2	PUMP,WAJAX,FIRE FIGHTING:RURAL FIRE EQPT	1
..2	ENGINE, GASOLINE	1
..2	EXTINGUISHER,FIRE,D	1
..2	PACK PATROL TAN,Camelbak Trizip	1
..2	STRAINER,SUCTION 50mm BSP foot valve	1
..2	SPOUT,CAN,FLEXIBLE u/w CAN,FUEL plstc20L	1
...3	O-RING Buna N rbr,N70,51mm ID,u/w spout	1
..2	CAN,FUEL plstc,red tag for petrol,20L	1
...3	CAP ASSY,MFC sand,red tag for petrol	1
....4	CAP,CAN,GASOLINE sand,u/w 013375268	1
....4	TAG,MARKER red,for petrol,u/w200051665	1
....4	GASKET Viton,for petrol,3.2inOD	1
....4	FLANGE,CAN fuel,cap insert	1
...3	TAG,MARKER red,petrol,UN 1203	1
...3	CAN,FUEL,Plastic, 20lt	1
..2	COVER,ACCESS	1
..2	HOSE ASSEMBLY,NONMETALLIC 50mm x 2.4m	1
..2	LUBRICATING GUN PUSH OPERATED	1
..2	TOOL BOX,1 Tray,445x210x180mm	1
..2	SCREWDRIVER,Flat Tip,3 x 45mm	1
..2	ROLL,TOOLS AND ACCESSORIES:NYLON,305MM L	1
..2	SPARK PLUG TUBULAR SPANNER	1
..2	WRENCH,Double Open End,10x11mm	1
..2	WRENCH,Double Open End,12x13mm	1
0.1	PUMP UNIT fire,portable,Millenium 22	1
..2	PUMP UNIT fire,portable,Millennium 22	1
..2	BATTERY,STORAGE 12V,14AH,calciumlead aly	1
..2	CHARGER,BATTERY 12V,15A,#PC1201SR	1
..2	CARTRIDGE,AIR CLEANER paper element	1
..2	FILTER ELEMENT,INTAKE AIR CLEANER prefil	1
..2	FILTER ELEMENT FLUID (OIL)	1
..2	FILTER ELEMENT FLUID (FUEL)	1
..2	SPARK PLUG 16mm AF	1
..2	LAMP,INCANDESCENT 12V,5W	1
..2	EXTINGUISHER FIRE 1.0 kg dry,c/w bracket	1
..2	LIGHT,FLOOR 12V,worklamp,halogen	1
..2	TRIPOD,SEARCHLIGHT tubular steel	1
..2	CABLE ASSEMBLY 3m lg,2 pole plug ea end	1
..2	LAMP,INCANDESCENT 12V,55W	1
..2	SOCKET,SOCKET WRENCH spark plug,16mm	1
..2	WRENCH,SPANNER suction	2
..2	HANDLE,EXTENSION 330mm lg	2
..2	ROLL,TOOL,9 Pocket,Heavy Canvas	1
..2	CAN,FUEL plstc,red tag for petrol,20L	1

...3	CAP ASSY,MFC sand,red tag for petrol	1
....4	CAP,CAN,GASOLINE sand,u/w 013375268	1
....4	TAG,MARKER red,for petrol,u/w200051665	1
....4	GASKET Viton,for petrol,3.2inOD	1
....4	FLANGE,CAN fuel,cap insert	1
...3	TAG,MARKER red,petrol,UN 1203	1
...3	CAN,FUEL,Plastic, 20lt	1
..2	SPOUT,CAN,FLEXIBLE u/w CAN,FUEL plstc20L	1
...3	O-RING Buna N rbr,N70,51mm ID,u/w spout	1
..2	CAP,TUBE suction blank,4in	1
..2	HOSE ASSEMBLY,NONMETAL 2.5m lg,100mm id	2
..2	STRAINER ELEMENT,SEDIMENT inlet,conical	1
..2	STRAINER,SUCTION HOSE 100mm barrel	1
..2	STRAINER,SUCTION 4in,cane basket,w/skirt	1
..2	EARMUFF, Class 5, High Profile H10A	1
..2	COUPLING ASSY,adpt camlock,qk disc 70x50	1
..2	EXTINGUISHER FIRE 1.0 kg dry,c/w bracket	1
..2	JACK,HYDRAULIC,HAND:10 TON HYDRAULICALLY	1
..2	FOAM, TURBOJET NOZZLE AKRON766	1
..2	BRACKET,fire extinguisher	1
..2	ADAPTER, ND11	18
..2	ADAPTOR KIT, FORESTRY FIRE	1
..2	ADAPTOR,PIPELINE:41MM DOUBLE FEMALE ADAP	16
..2	JACKING BLOCK 275x265x43mm	1
..2	CRANK HANDLE FOR V8 ROVER	1
..2	SPOTLIGHT:	1
..2	HAMMER,Ball Pein, 225 gram (8oz) head	1
..2	SCREWDRIVER,Phillips,No2 x 100mm	1
..2	SCREWDRIVER,Flat Tip,4 x 75mm	1
..2	SCREWDRIVER,F/Tip,10x200mm Square Blade	1
..2	WRENCH,ADJUSTABLE,250mm (10in) lg	1
..2	WRENCH,Ring & Open End,10mm	1
..2	WRENCH,Ring & Open End,12mm	1
..2	WRENCH,SOCKET al,sgl skt,hydrant key&bar	1
..2	INFLATOR-GAUGE,pneumatic tyre,pressure	1
..2	MANUAL,TECHNICAL HINO TRUCK DRIVERS	1
..2	MANUAL,TECHNICAL HINO MAINTENANCE GUIDE	1
..2	PLIERS,SLIP JOINT,Straight Nose,150mm	1
..2	WRENCH,OPEN END,double head,22x24mm	1
..2	TOOL BOX,PORTABLE,11 3/4X6 1/2X1 3/8IN	1
..2	WRENCH,BOX:27mm AF,single end,6pt	1
..2	WRENCH,SOCKET:41mm hex,21mm sq,hub nut	1
..2	WRENCH,BOX:36mm AF,single end,6pt	1
..2	WRENCH,Double Open End,8x10mm	1
..2	WRENCH,OPEN END,double head,17x19mm	1
0.1	FIRST AID KIT VEHICULAR 10 PERS	1
...3	BAG, Plastic Green u/w Kits	1
...3	BAG, Vacuum Sealed, 300x400mm	1
...3	BANDAGE, Crepe, 15cm, Elastolite	4
...3	DRESSING, Strip, Fabric, 6.3cm x 1m	1

...3	BLANKET,Emergency, Silver, disposable	2
...3	GLOVES, Med Exam,Nitrile,XL	20
...3	BLADE, Surgical Knife, mini, sz 11	1
...3	SHIELD, Mouth to mouth resus, Disposable	2
...3	SAFETY PIN, Size 3, Singles	12
...3	SCISSORS, Bandage, Lister, 15cm	1
...3	BANDAGE,Triangular,calico 110x110x155cm	6
...3	TAPE, Adh, Strapping, 2.5cm x 9m Single	2
...3	TOWELETTE, Hand, Anti-Microbial, Sachet	10
...3	BAG, Plastic Green u/w Kits	1
...3	BAG, Vacuum Sealed, 300x400mm	1
...3	BANDAGE, Gauze, Comp, No 15, Sterile	4
...3	DRESSING, Burn, 2in x 6in, Water-Jel	2
...3	DRESSING, Burn, 4in x 4in, Water-Jel	2
...3	DRESSING,Comb,Sterile,20x30cm	6
...3	HAND GEL, Clinell,50ml,for KITS ONLY!	1
...3	SODIUM CHL, Irrigation, 0.9%, 30ml	5
...3	SWAB, Non Woven, 7.5cm , 5's, Sterile	5

Basic start date	Description	Functional Location
26/01/2015	Recover veh:	WAIOURU
2/05/2013	NO186 HINO TECH INSPECTION & SERVICE IF	WAIOURU
19/06/2013	NO186 HINO, BRAKE SYSTEM AIR LEAK	WAIOURU
15/05/2013	NO186 HINO BATTERIES NOT HOLD CHARGE	WAIOURU
27/05/2013	NO186 HINO ROOF FLAP REQUIRED	WAIOURU
15/07/2013	NO186 HINO. PRE COF AND INSPECTION.	WAIOURU
26/07/2013	NO186 HINO. REPLACE TWO SEATBELTS AND	WAIOURU
9/10/2013	NO186 HINO. CHECK CLUTCH AND ADJUST AS	WAIOURU
6/11/2013	NO186 HINO - REPLACE TYRES	WAIOURU
12/11/2013	NO186 HINO. REQUIRES SERVICE INSPECTION	WAIOURU
21/01/2014	NO186 HINO PRE COF INSPECTION AND COF	WAIOURU
11/08/2014	NO186 HINO. PRE COF AND INSPECTION 15/08	WAIOURU
6/10/2014	NO186 HINO VEHICLE HEATER NOT WORKING	WAIOURU
20/01/2015	NO186 HINO CALLOUT TO JUMP START SUNDAY	WAIOURU
3/11/2014	100/50 CAF UNIT. ANNUAL TEST AND SERVICE	WAIOURU
25/11/2014	NO186 HINO CARRY OUT SERVICE & ANNUAL	WAIOURU
18/03/2015	NO186 HINO R/H REAR INDICATOR TURNS ON	WAIOURU
16/01/2015	NO186 HINO PRE COF AND INSPECTION	WAIOURU
5/03/2015	NO186 HINO. L/H MIRROR GLASS CRACKED AND	WAIOURU
27/03/2015	NO186 HINO-HEAVY DUTY CLUTCH REPLACEMENT	WAIOURU
27/03/2015	NO186 HINO-MUFFLER/EXHAUST SYSTEM	WAIOURU
2/06/2015	NO186 HINO CARRY OUT ANNUAL SERVICE	WAIOURU
3/08/2015	NO186 HINO CARRY OUT 'B' SERVICE ON HINO	WAIOURU
9/10/2015	NO186 HINO CALL OUT LOSS OF GEARSHIFT	WAIOURU
12/10/2015	NO186 HINO CALL OUT AIR TANK SENSOR	WAIOURU
5/01/2016	CAF UNIT BELTS SLIPPING	WAIOURU
10/02/2016	NO186 HINO CARRY OUT SERVICE. PRE COF &	WAIOURU
8/08/2016	NO186 HINO REQUIRES 'C' SERVICE AND COF	LINTON
2/11/2016	NO186 HINO WILL NOT GO INTO REVERSE IF	LINTON
1/11/2005	HINO RFA, NO186 - REPAIR BRACKET & LATCH	BURNHAM
27/04/2006	HINO RFA, N0186 - BATTERY FAULTS	BURNHAM
8/05/2006	HINO RFA, NO186 - 'A' TYPE SERVICE	BURNHAM
30/05/2006	HINO RFA, NO186 - ELECTRICAL FAULT (COMS	BURNHAM
6/11/2006	HINO RFA, NO186 - 'B' SERVICE	BURNHAM
17/04/2007	HINO RFA, NO186 - EXHAUST FAULT	BURNHAM
23/04/2007	HINO RFA, NO186 - AIR LEAKS	BURNHAM
9/05/2007	HINO RFA, NO186 - 'C' TYPE SERVICE	BURNHAM
26/06/2007	HINO RFA, NO186 - WINCH, LIGHTS	BURNHAM
18/09/2007	HINO RFA, NO186 - ACCIDENT DAMAGE (ROLL)	BURNHAM
27/03/2008	HINO RFA, NO186 - FRONT WHEEL BEARINGS	BURNHAM
27/06/2008	HINO RFA, NO186 - CHARGING FAULT	BURNHAM
7/05/2008	HINO RFA, No186 - CAF UNIT FAULTY	BURNHAM
3/06/2008	HINO RFA, NO186 - Req 'B' service	BURNHAM
30/09/2008	HINO RFA, NO186 - REMOVE LIGHTBOX TORCH	BURNHAM
23/10/2008	HINO RFA, NO186 - DAMAGED LIGHTS	BURNHAM
17/11/2008	HINO RFA, NO186 -TANK TO PUMP BALL VALVE	BURNHAM
25/11/2008	HINO RFA, NO186 - SERVICE DUE	BURNHAM
28/01/2009	HINO RFA, NO186 - BEACON SWITCH FAULTS	BURNHAM
2/02/2009	HINO RFA, NO186 - ELECTRICAL CERTIFICATE	BURNHAM
18/03/2009	HINO RFA, NO186 - CAF UNIT FAULTY	BURNHAM
5/05/2009	HINO RFA, NO186 - INDICATOR FAULT	BURNHAM
3/06/2009	HINO RFA, NO186 - SERVICE DUE	BURNHAM
6/10/2009	HINO RFA, NO186 - BRAKES, EXH, COF FAULT	BURNHAM
28/09/2009	HINO RFA, NO186 - SPEEDO FAULTY, EXHAUST	BURNHAM
21/10/2009	HINO RFA, NO186 - TANK LEVEL LIGHTS	BURNHAM

9/04/2010	HINO, NO186 - EXHAUST BRAKE, PRE-COF	BURNHAM
14/05/2010	HINO RFA, NO186 - CHECK CHARGING SYSTEM	BURNHAM
23/06/2010	HINO RFA, NO186 - 'B' SERVICE REQUIRED A	BURNHAM
27/08/2010	HINO RFA, NO186 - BA LOCKER STAY BROKEN	BURNHAM
6/12/2010	HINO RFA, NO186 - SNAPPED R/R WHEEL STUD	BURNHAM
18/01/2011	HINO RFA, NO186 - SERVICE, PRE-COF	BURNHAM
25/03/2011	HINO RFA, NO186 - BA CRADLE GAS RAM U/S	BURNHAM
18/07/2011	HINO RFA, NO186 - SERVICE, PRE-COF	BURNHAM
1/09/2011	HINO RFA, NO186 - LOW AIR BUZZER FAULTY	BURNHAM
14/11/2011	HINO RFA, NO186 - MOTOROLA RADIO FAULT	BURNHAM
5/12/2011	HINO RFA, NO186 - WINDSCREEN WIPERS U/S	BURNHAM
17/01/2012	HINO RFA, NO186 - SERVICE, L/F HUB LEAK	BURNHAM
28/03/2012	HINO RFA, NO186 - NO DRIVE (CLUTCH?)	BURNHAM
20/07/2012	HINO RFA, NO186 - SERVICE & PRE-COF	BURNHAM
15/01/2013	Repair or replace rear tail gate &	BURNHAM
24/11/2012	FIRE EQUIPMENT ANNUAL OUTPUT TESTS	BURNHAM
1/02/2013	HINO RFA, NO186 - SERVICE, COF	BURNHAM
15/03/2013	HINO RFA, NO186 - ELECTRICAL CERT	BURNHAM
15/03/2013	NO186 - DAMAGED R/R SPOTLIGHT	BURNHAM
24/11/2006	HINO RFA, NO186 - CAF UNIT EXHAUST FAULT	BURNHAM
20/06/2011	NO186 -FIT QTY 2 TORCH MOUNTING BRACKETS	BURNHAM
5/10/2012	NO186 - SECURE DRIVERS STEP	BURNHAM
15/03/2013	NO186 - CHANGE BA CYLINDER BRACKETS	BURNHAM
16/04/2008	NO186 - NO POWER TO RADIOS	BURNHAM
5/11/2008	NO186 - FAULT WITH STARTER MOTOR	BURNHAM
5/11/2008	NO186 - CAF UNIT EXHAUST FLAP CAME OFF	BURNHAM
14/06/2010	NO186 - ISOLATOR SWITCH FUSE HOLDER U/S	BURNHAM
12/07/2010	NO186 - GLOWPLUG WARNING LIGHT	BURNHAM
21/02/2012	HINO RFA, NO186 - CLUTCH FAULT	BURNHAM
28/10/2015	NO186 - Replace isolation switch	WAIOURU
18/09/2006	NO186 - REPAIR/REPLACE SEAT COVERS	BURNHAM
5/09/2008	HINO RFA, NO186 - UNABLE TO SELECT GEARS	BURNHAM
12/02/2009	NO186 - GEAR LINKAGE FAULT	BURNHAM
25/02/2009	HINO RFA, NO186 - LOW AIR BUZZER FAULT	BURNHAM
5/02/2009	NO186 - UNABLE TO SELECT GEARS	BURNHAM
16/12/2009	NO186 - GEAR SELECTOR FAULT	BURNHAM
5/11/2015	NO186 - Alternator cable has come away	WAIOURU
6/09/2017	NO186 Preparation For Disposal	TRENTHAM