



SCOTE Hardware Updates May 21, 2015

Hind Abi-Akar
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1K/1N Water Pump, 04/22/2015, 05/21/2015

- MP Pumps (Cat preferred pump supplier) identified electric motor driven pump replacement.
 - **Cat recommended:** MP Part number: 30885, CF1PMP SS 3-3 56C 6.0 T-2100, stainless steel pump, 3hp e phase; 230/460 VAC motor
 - 1Y0633, Pulley- **labs can make this part** (machine shops) for replacement if current pump needs to be supported
 - **Print:** needed for labs that continue the use of the current pump:
 - Key dimensions; information letters on TMC
 - Procedure will call the “water pump part number or equivalent”
 - **Proposed resolution:** Labs to order pump directly from the supplier
 - Modify procedure to reflect the new pump as an optional replacement as long as the labs meet the specifications (specify the parameters)
 - Fluid flow parameters:

Water pump parts

1Y0456	PUMP A
1Y0509	PUMP GROUP
1Y0461	IMPELLER
1Y0459	SHAFT
1Y0633	PULLEY

Propose at SP meeting



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1K/1N Coolant Heat Exchanger, 4/22/2014

- Current heat exchanger core is Modine 7B-5946 (?). This part is no longer available.
- Based on current parameters, Modine is in the process of identifying a replacement
 - No testing will be conducted -
- **Next Steps: Options:**
- 1- [Replace with a shell and tube that provides the same parameters. The labs will identify the replacement?](#)
- 2- Modine to identify full replacement: Heat exchanger to be ordered directly from the supplier
 - Modify procedure to reflect the new pump and specify the parameters
 - Option 2: Heat exchanger parameters:

- Coolant inlet temperature: 88°C
- Coolant outlet temperature: 93°C
- Coolant flow: 65 l/min
- All temperatures to be held within $\pm 1^\circ \text{C}$
- Process water inlet temperature: 27°C – can vary per lab
- Coolant pressure drop: 1.5 kPa maximum
- Process water pressure: 335 kPa

Heat exchanger part numbers

7B5946	CORE
7B8560	BODY
7B8561	COVER
5B8971	TANK - TOP
1Y7538	TANK - BOTTOM
5B8993	COVER
5B8994	GASKET
5B9762	GASKET
5B9676	GASKET
1Y7190	COVER
6B0204	GASKET
1Y7443	COVER



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Heat Exchanger Information, 5/21/2015

Options:

Labs to order: Shell & tube that provides same parameters as entire current heat exchanger
Labs to order: replacement directly from Modine (Modine P/N)
Direct order from Industrial Radiator Inc (see below) (SO277026 – reference # for TIR)

Propose at SP meeting

Point of Contact:
Rusty Dodd
Phone: 210-666-5500
Fax: 210-666-6800
Texas Industrial Radiator Incorporated
5314 IH10 East
San Antonio Texas, 78219

Rusty said he can have the heat exchangers made using the current heat exchanger he already has.
If we can supply blue prints that would be helpful but not necessary.
If you have pressure specs that would also be helpful.
Anything we can supply would be better for him.

There is no minimum order. Once they start making them you could order one or twenty.

During our conversation I mentioned that he would have to be approved by Caterpillar as a vender. He said he was already a Caterpillar approved vender.

Thanks,
Manuel. Leos
Intertek Automotive Research



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1K/1N Oil Pump

- Cat identified supplier for current pump replacement
 - Plan to have the pump at Cat Parts distribution system
 - P/N: 1Y0667, 4B0559, 4B0560, 4B0570

Timeline:

Full pump assembly 1Y0667

20 should be enough for ~ 10 years

Have to determine the right approach to stock this part for a long time

Request TEI to hold?

Action: labs send estimates of the volumes of the four parts

Oil pump parts

1Y0667	Pump
4B0559	GEAR (DRIVE) 10 TEETH
4B0560	GEAR (IDLER) 10 TEETH
4B0570	BODY
1Y7558	ADAPTER
1Y0668	BODY



Other 1K/1N parts

- 1Y0564, rocker arm shaft: will set a plan in motion (3-4 months timeline – needed by Sept 1st)
- 1Y0609, Bracket: available through the system (8 available)
- 4N5614, Rocker Arm: Available (large volumes).

1N liner porosity: some liners appeared of high porosity (pepper like) and surface roughness is higher. *Porosity is key component*

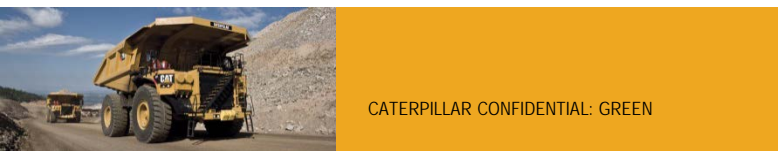
Bob will verify their last batch and send information: need information

Ra has been higher recently than the past (now in the 30s not the 20s as before) *(Ra may not be as important – porosity and oil retention (valley volume))*

1N liner availability: no issues with the supply. Orders will be fulfilled

Other parts? Crank shafts?

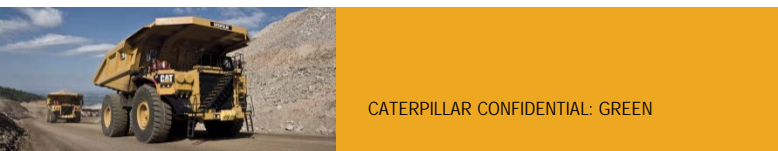
Bracket 1Y0698 – not available



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1P/1R liners, 5-21-2015

- New 1P liners, 1Y3997:
 - Liner test finalized. Will work with Surveillance panel to determine next steps. Set up a meeting soon.
 - Liners available for testing
 - If accepted, process to release the liners will commence
- Status:
 - New supplier, improved casting for consistency
 - New Surface roughness and porosity measurements techniques (baseline was liners from the 2012 vintage)
 - Currently, 60 total batch (need to be packaged and made available; potentially by end of June).
 - Can ship/send liners for the Ref tests



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C13 Aeration test Gaskets

- Oil Pan and Valve Cover solutions:
 - Si free Fiber gasket: working on availability in the system.
 - May be 2 - 3 months
 - New part numbers. Have to be required only for the aeration test
 - steel spacer
 - Will make the prints available for the labs to make in-house
 - Al will be recommended
- Front cover seal
 - Cannot replace with fiber gaskets.
 - Can we use the current part?
 - Are there other options to reduce Si leaching from this gasket?

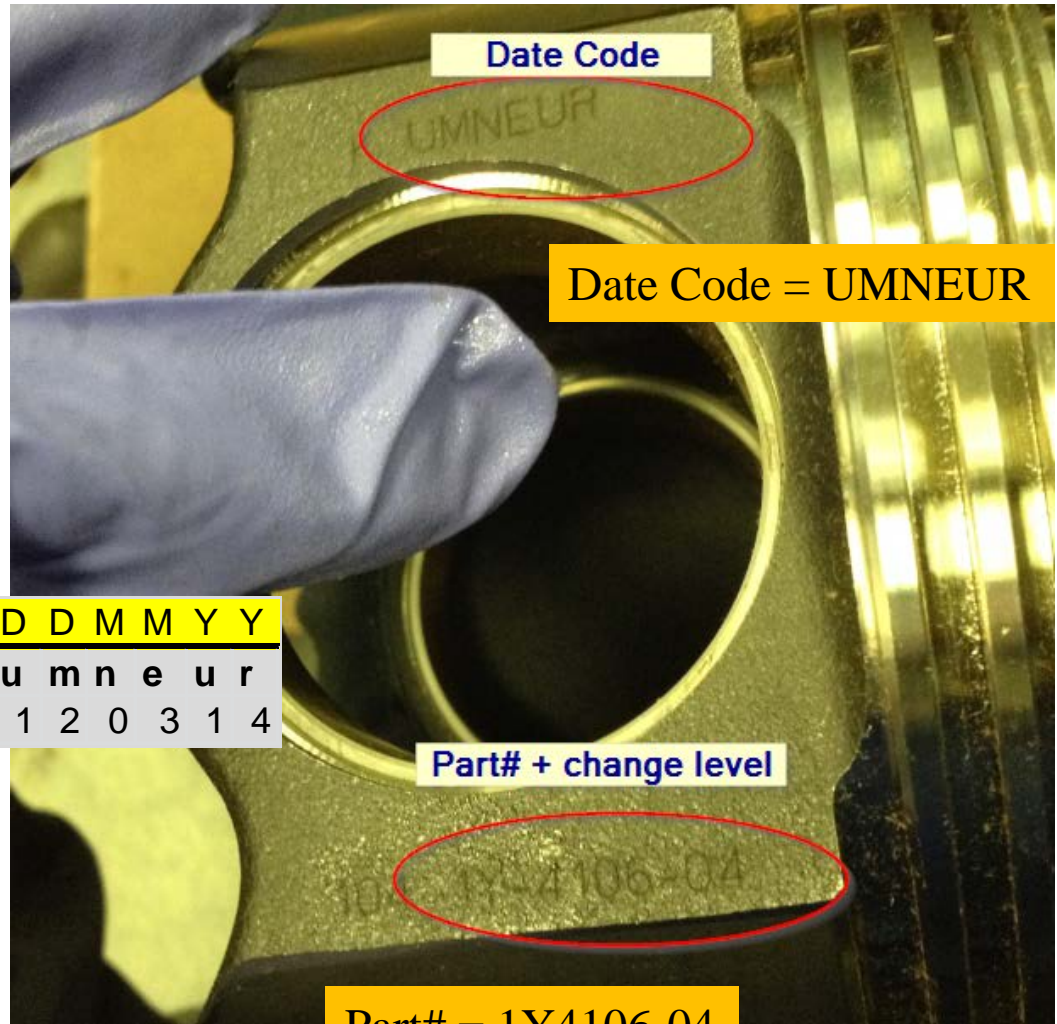
Options for front cover seal:
Reuse the gasket
Reuse a gasket from standard C13 test
May passivate quickly during engine break-in

20 gaskets can support ~1200 tests?
Potentially order 50 gaskets



C13 Piston Part Number Identification

See the following date code and part# information on the C13 steel piston. The date code is the **NUMERALKOD** utilized by CAT to trace the date of manufacture.



NUMERALKOD Translation into Date	D	D	M	M	Y	Y
Enter NUMERALKOD HERE ->>>>	u	m	n	e	u	r
Resultant Date Code	1	2	0	3	1	4

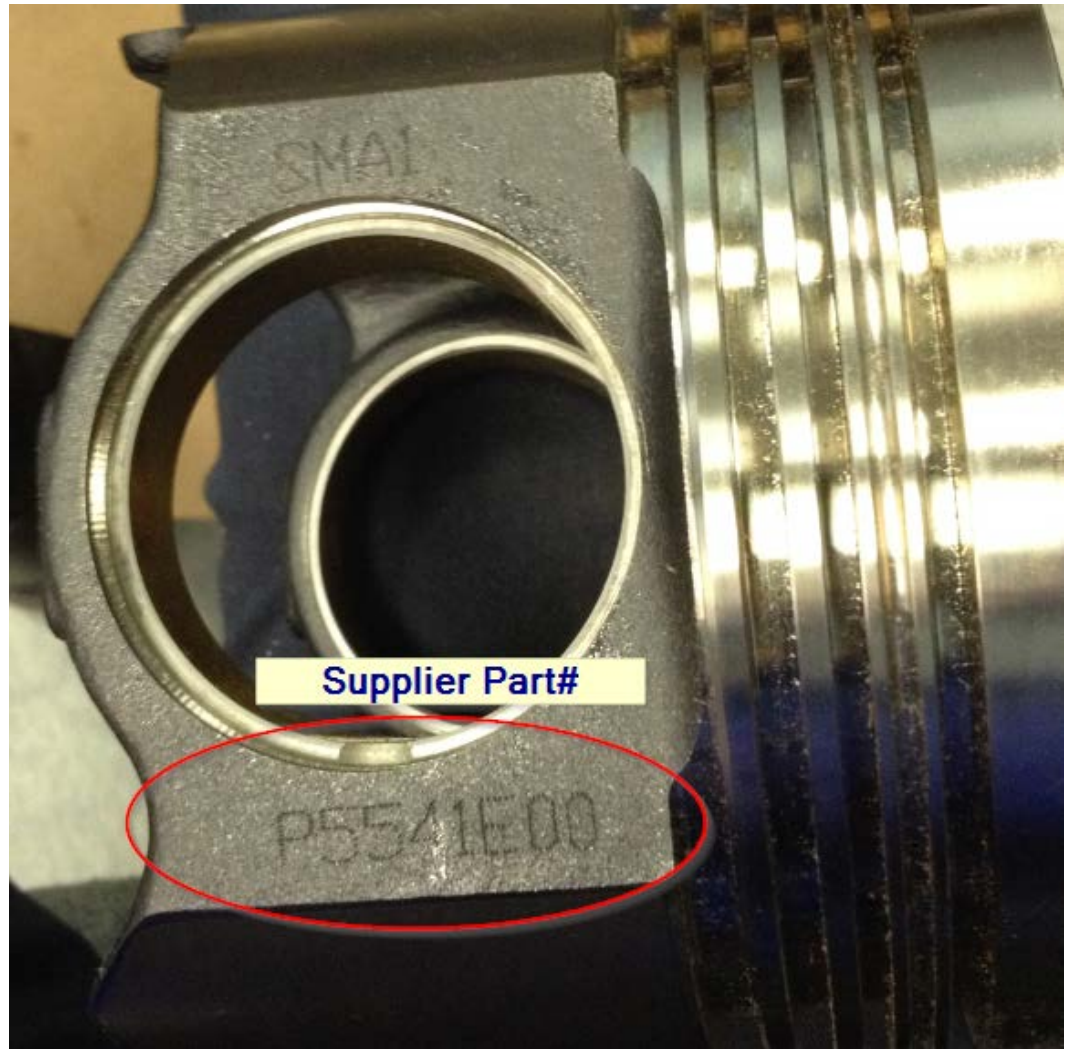
N	U	M	E	R	A	L	K	O	D
0	1	2	3	4	5	6	7	8	9



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C13 Piston Part Number Identification

This is the supplier part number.



Ring Part Number Identification

Ring batch code.

Rings are marked individually with laser marking on the ring top flank

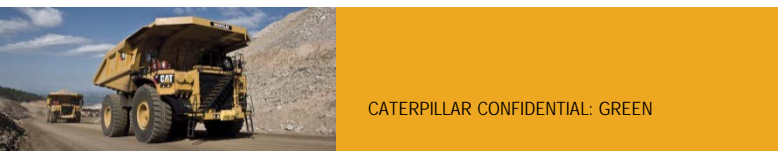


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C13 liner identification

- Liner identification is dot matrix etched on the bottom of the liners.
 - Hard to read: need a solution
 - Cat: will look into laser etching to allow ease of identification for tracking
 - Look for options to make the identification easy to read: QR code?



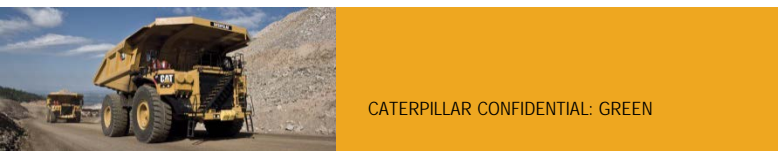
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Piston rusting, 5-22-2013

- Verifying the process to ensure appropriate RP
 - New pistons are with the right RP
 - Ensure that Cat stocked parts are of the right RPs
 - Use the same process for liners and rings.

New actions

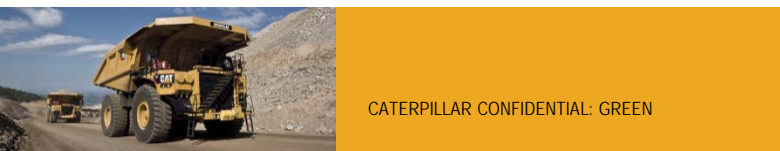
- C13 part number differences - inspect /verify
- SV: 1K severity analysis similar to 1N



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Resolved Parts

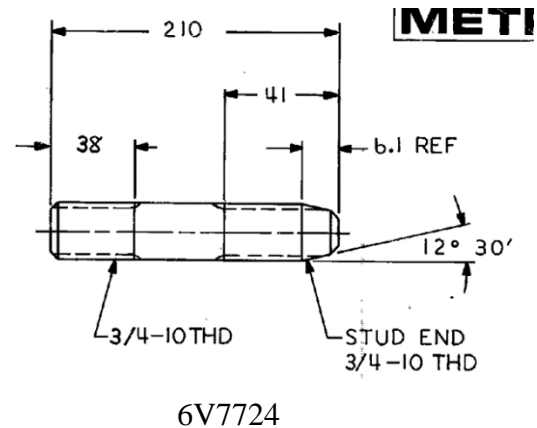
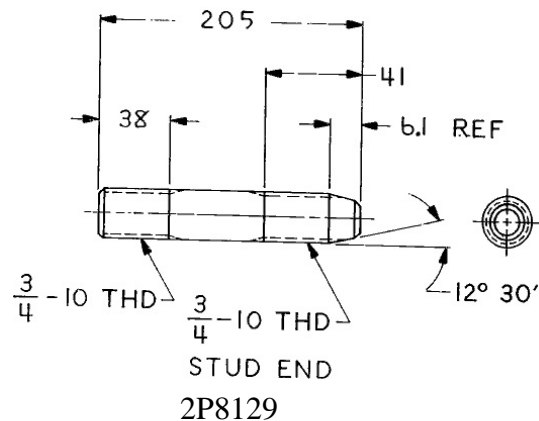
- Parts with identified replacement parts



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Other parts

- 1A0607, Gear, Governor: New supplier identified
 - Process to stock the part in Cat Distribution System initiated
 - ? How many are needed? 20 pieces for the next 10 years
- 1Y0088 (Gasket) and 2A2698 (Pin): no trace in our systems
 - Possible misspelled Part numbers? [Actual #s: 1Y1988 \(available\)](#) ; [and 2A2968](#)
 - Otherwise: need the parts to make alternatives
- 1Y0601, Gasket: **Available (4/28/15)**
- 2P8129, stud, Cly blk-jug mounting: alternative identified: 6V7724
 - Will require a washer to compensate for the length

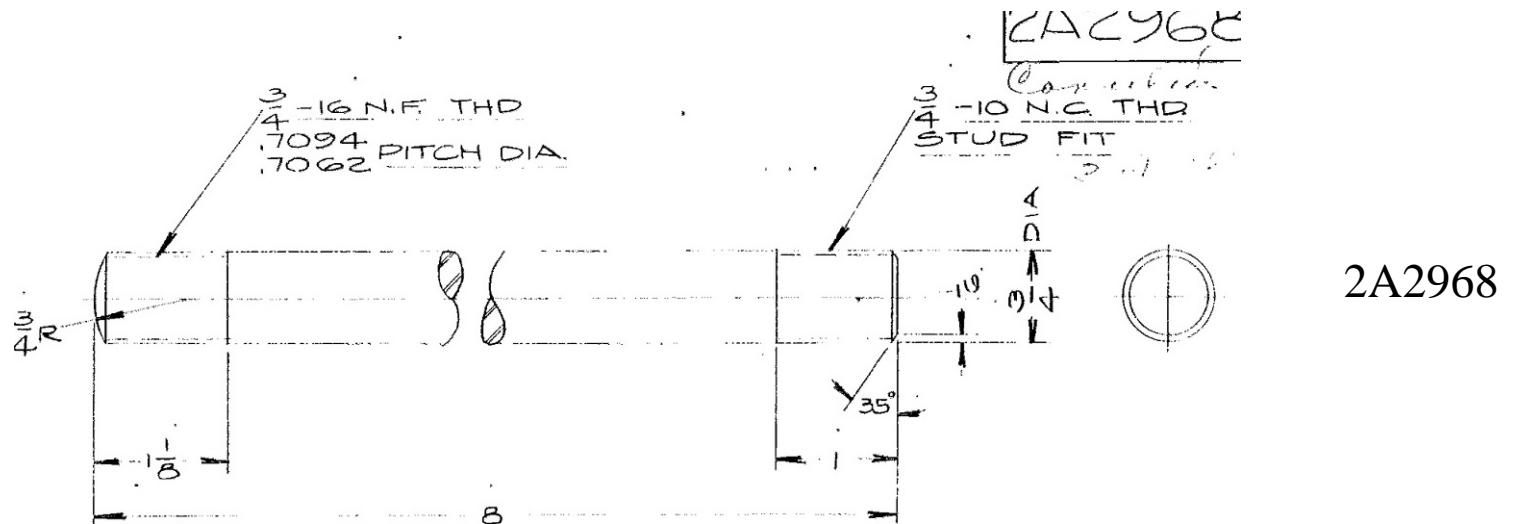
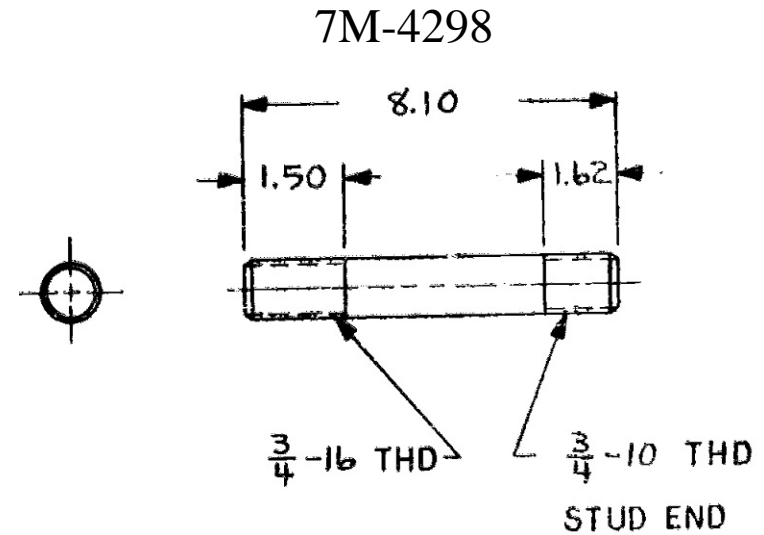


5 mm longer
 Washer can be added
 under the nut
 Or one of the ends
 machine-turned shorter



Pin replacements

- Replacement for 2A2968
 - Two options: 7M-4298 or 6V-7724 (proposed as replacement for 2P-8129 also)
 - Material and heat treatment is the same or similar
 - Both have slight differences in the overall length and in the length of the thread depth on both ends.
 - Action: labs to confirm based on the dimensions given that the replacements work and identify preferred



1P Timing Sensor

- Timing sensor 1Y3859 could not be made available. Alternative solution described below
 - **Next Steps:** Issue resolved
 - use the modified sensor as described

From: Larch, William
Sent: Wednesday, July 31, 2013 9:59 AM
To: Campbell, Bob
Cc: Stevens, Andrew
Subject: Cat 1P timing sensor

Hi Bob,

Back in 2010 I worked with Kevin Daly concerning timing sensors for the Cat 1P. I have included the part number we have been using since. I also checked with my local vendor and it is still a good part number.

The old part number was 1Y3859. The new part number is 266-8576. With this new sensor 2 other parts are going to be required. The first part number is 8T-8730 and I need 3 for each sensor. The next number is 155-2260. It is a plug. The pins and plug are needed to fit the 1P wiring harness.

We cut the lock nut in half to allow for proper insertion of the sensor into the bore. Otherwise the sensor is too far from the gear train to pick up a signal. The sensor is threaded into the bore with the gear at its high point until it slightly makes contact. Then it is backed out one revolution and locked with the nut.

Hope this helps!

Please feel free to call me with any questions.

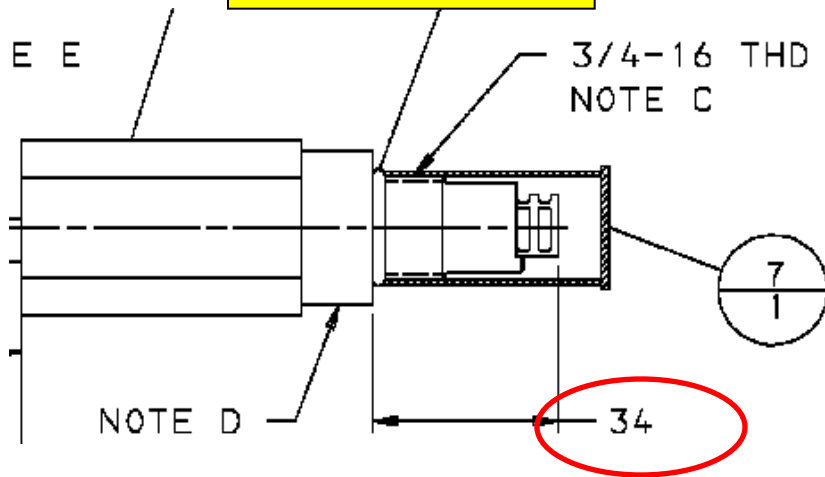


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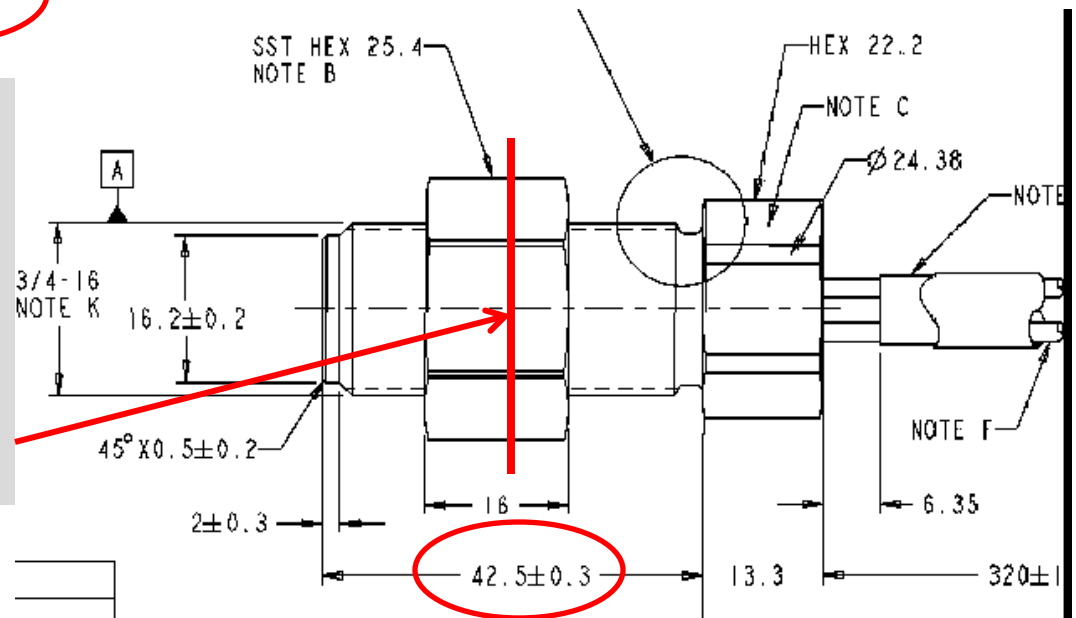
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1P Timing Sensor Replacement

1Y3859 Sensor



266-8576 Sensor



The original 1Y3859 sensor was 34mm to the sensor tip. The new sensor is shorter with the existing lock nut 42.5-16 = 26.5mm. Therefore, the lock nut needs to be cut in half in order to allow the sensor to be inserted to the right depth.

