VERSION 1.0

APRIL 20, 2017

TUNGSTEN REGRIND PROCESS

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TUNGSTEN REGRIND PROCESS

PURPOSE

The tungsten regrind process that the engineering manager had us look at was operator dependent. What we mean by that is that they have to set the angle of the diamond wheel on the side to the specific degree that they want the tungsten to be ground too. Jason Carnahan (engineering manager) had suspicion of all the shifts running their tungsten to +-2 degree over the recommended specification by the welding supplier. By making the regrind process not having to adjust the depth and the angle of the regrind they will see a decrease in scrap by having the tungsten being set to the correct recommended specification every time and very little variance in between each pieces of tungsten. The purpose for the project was to reduce scrap from coming off these three lines by creating a stable regrind process to be followed.

INITIAL SPECIFICATIONS

Jason walked us into the MetLAB where he showed us where the diamond grinder was located at inside the factory. Once he showed us where it is he then grabbed a piece of the tungsten that had already been used and ran us through the process that the team member was instructed to do. He had to manually adjust the angle on the side of the diamond grinder wheel to the correct angle so that the angle was correctly made the block that they were using had three different holes for the three different diameters that get regrinded in the plant. After he made the correct angle, he then measured it and if it wasn't the close to the angle he had to then put it back in after readjusting the angle on the side. Once the correct angle was created he then moved onto creating the flat. The depth gage was similar to the angle tool which they both had three holes for the three different diameters. He created the depth after inserting it into the correct diameter hole then he applied pressure to the tungsten to create the flat on the end of the tungsten. Once completed he then pulled it out then measured it and repeated it one more time until creating the correct flat on the end of the tungsten.

We were to create a block that sets the angle and can't be changed like their original process. He wanted the team member to be able to just insert the tungsten into the block and put light pressure onto the tungsten and it would be the correct measurement so that they wouldn't have to use more of their time spending redoing the regrind. A second block needed to be created so the depth is set by inserting the piece of tungsten into the hole and since the angle is already created it will just touch the wheel just enough to create the correct amount of depth on the first try. The tungsten would not be able to touch the wheel anymore since there is no point anymore on the piece of tungsten. A third piece was wanted just like the original process where this piece was just used to mount the angle tool to the diamond grinder and ensure it was in place.

OVERALL COST

B & B MACHINE & REPAIR,INC

9455 W Gilbert Lake Road Cromwell 46732

PHONE 260-856-4070 FAX 260-856-4072 CELL 260-564-4070

FAX ATTENTION Tyler Bolinger

TO:	TENNECO AUTOMOTIVE	FROM:	KEITH BARCLAY
FAX:	260-894-9494	PAGES:	1 OF 1
PHONE:		DATE:	1/6/2015
EXT:		CC:	

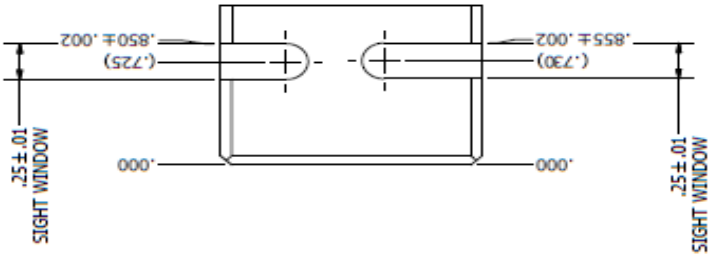
QUOTE EXPIRES TEN DAYS FROM DATE OF QUOTE

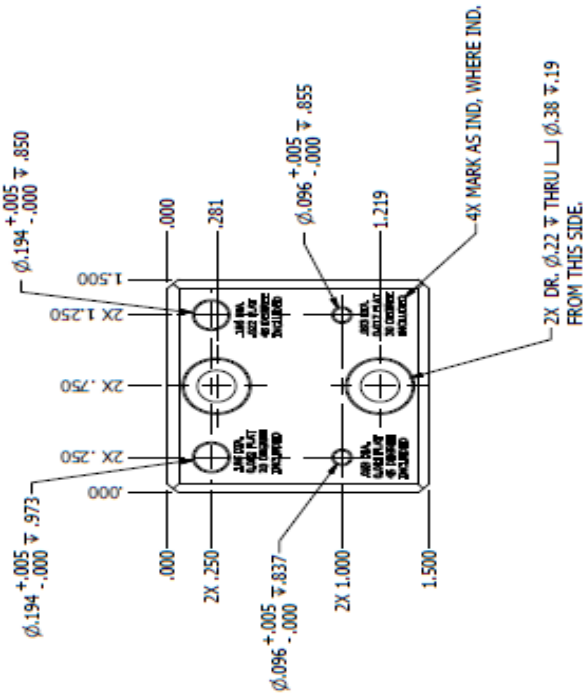
COMMENTS: QUOTE # 5092

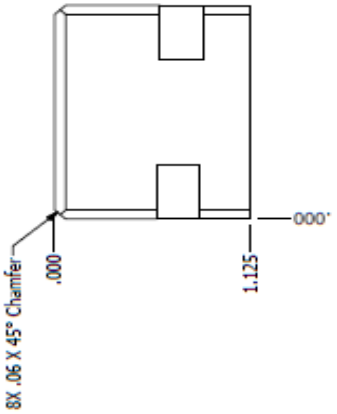
Tungston Holder insert stationary	$ 750.00	ea
Tunston new mount	$ 275.00	ea
Tunston depth gage	$ 475.00	ea

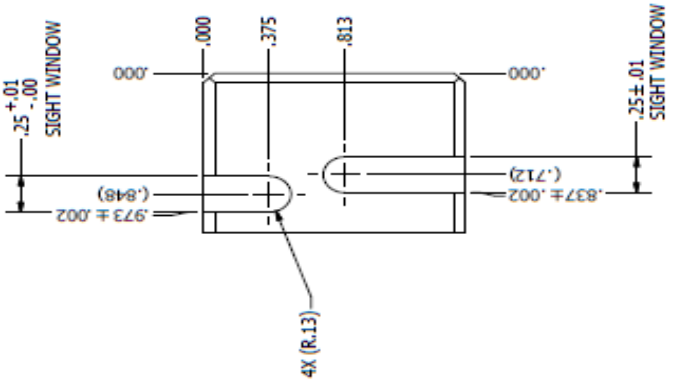
Above is the quote for the tooling that was received two weeks after ordering. The total for the tooling was $1500 for all three pieces including shipping to the plant. Once we received the quote from Keith in email, we had to put a purchase requisition into their system for the tooling to be paid for by the accounting department. The expected life for this tooling should last Tenneco 6-8 years and then the depth gage and angle gage would be replaced just depending on the amount of use.

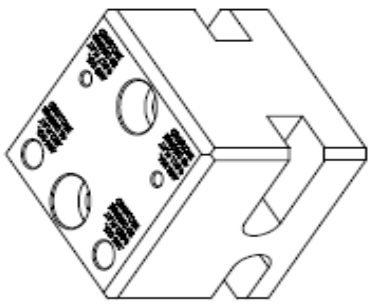
FABRICATION











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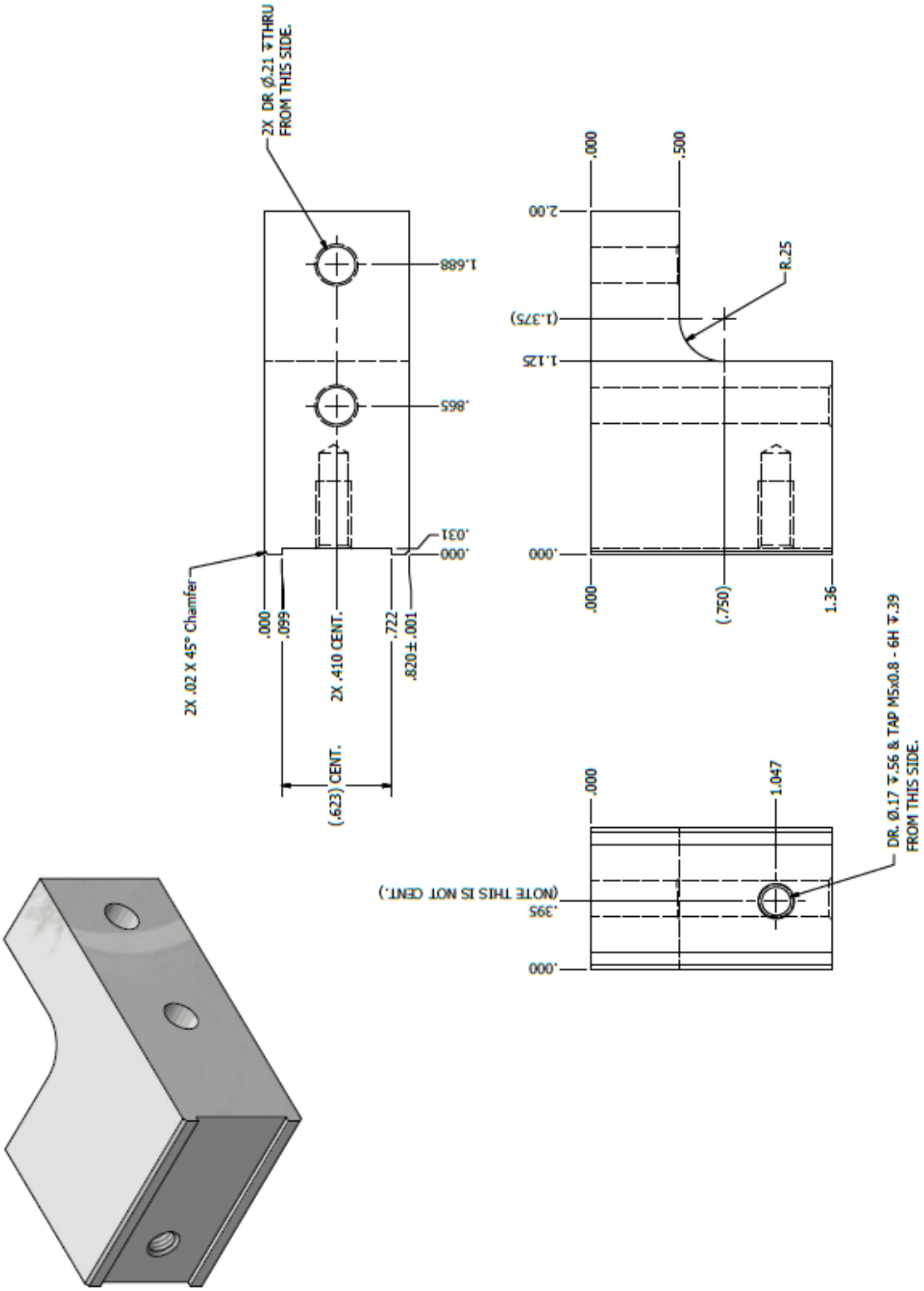
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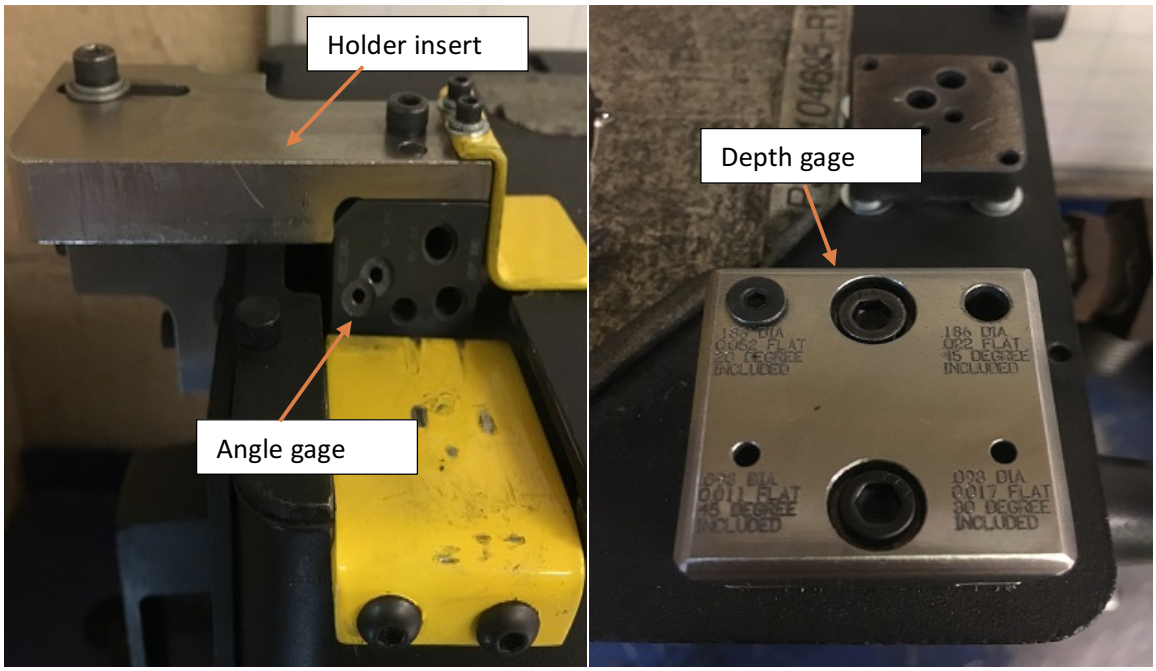
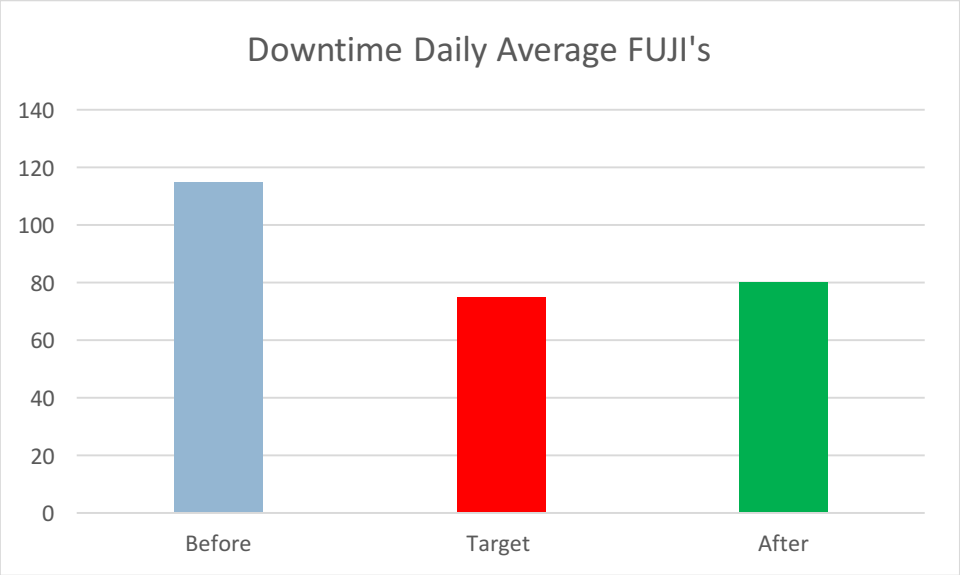
The tools were made at B & B, we received them back after two weeks of ordering the tooling. Once the tools came in we inspected them visually to see if they were what we wanted and they were. We had them etch by each whole the specification of each whole that calls the angle and whish size diameter to insert into each of the wholes. The only fabrication that we had to actually do to our tooling that was received was take the old tooling off by removing the four bolts that were used to secure them to the diamond grinder. Once the old tooling was removed, we used the same screws that were just removed to secure the new tooling to the diamond grinder and ensured that everything fit correctly and flush.

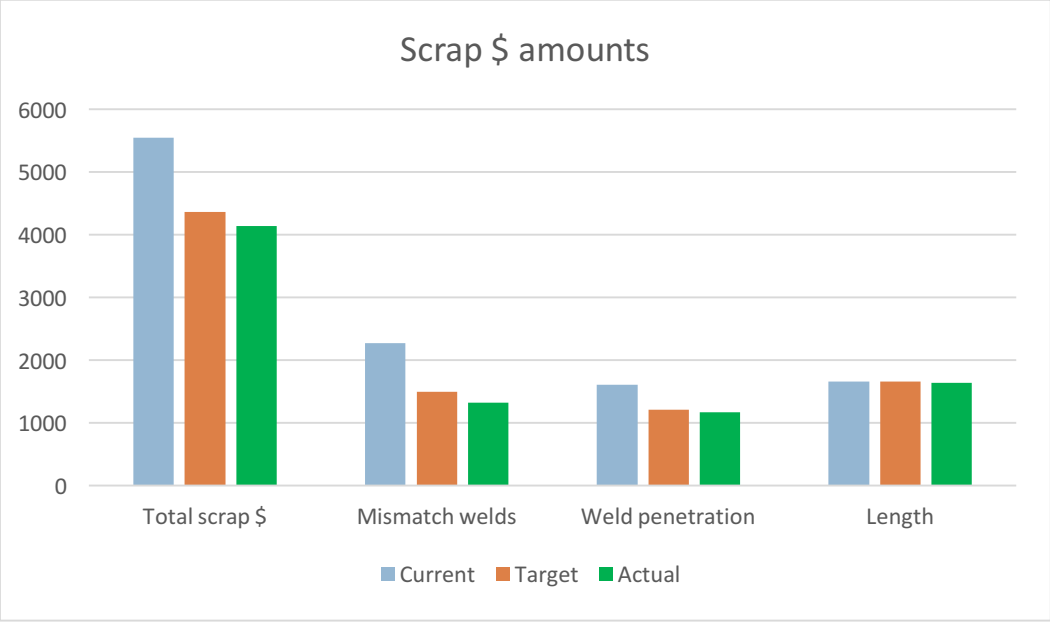


TEST RESULTS

When we first looked at the average of daily downtime minutes per day was 115 minutes that were logged into the system over the last month. The hourly rate is 55 part per hour on each of the FUJI machines and we have three machines total. However, the catch is 55 parts per hour times two because each of our machines spits out a part on both sides. There is an A & B side of each machine; the total hourly rate put into the basket is 110 parts per hour. The total of 1000 blanks for the FUJI's is $7109.54 so to get the total for an individual shell we just divided that by 1000 and got $7.11 per shell By moving the tungsten regrind station into the crib, it has reduced downtime by 35 minutes a day on average. We had a target of reducing downtime to 75 minutes a day and recorded 80 minutes a day of downtime. The operators now at the beginning of their shifts grab four pieces of tungsten (2 for each plasma welder). The operator usually changes out the piece of tungsten at midshift or every 220 parts, two pieces of the tungsten will be enough to last them all day.



Below shows the total of the top three scrap codes that came through the FUJI lines in March. We set some targets that we thought would be able to achieve once the new grinding process is started due to increased repeatability of the quality of the grind. We wanted to reduce mismatch welds by 33% and wanted to reduce weld penetration by 25%. The mismatch weld will be taken care of by the consistency of the angle all the way around the piece of Tungsten. Most of this scrap is created by the original setup of putting a new piece of tungsten in the plasma welder. To reduce the weld penetration scrap this will be taken care of by ensuring that the depth of the flat on the end of the tungsten is the right amount! By moving this regrind process into the crib, we created a controlled and standardized process to be followed. There is only three crib attendants for all three shifts (1 per shift). By the data below it shows that they are produce consistent, repeatable tungsten grind angles and flats, which will reduced variability in FUJI weld and lower scrap. Notice below that the length of the weld stayed pretty close throughout the month. That is all from setting the roll form up for the new batch of blanks.



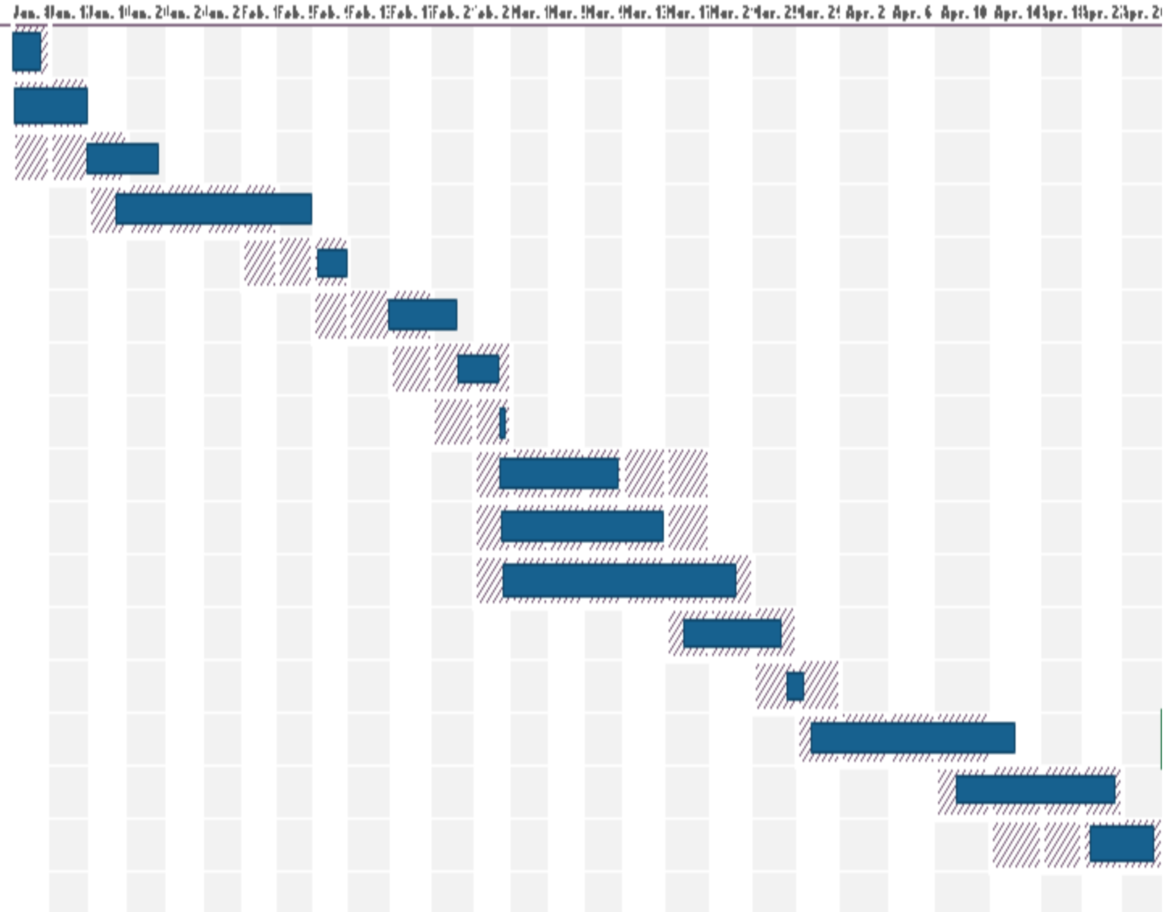
Gantt Chart

Jaron Strale, Tyler Ballinger, Al Alexander

Period Highlight 1 | Plan Duration | Actual Start

ACTIVITY	PLAN START	PLAN DURATION	ACTUAL START	ACTUAL DURATION	PERCENT COMPLETE
Form Team	Jan. 8	Jan. 8	Jan. 7	Jan. 8	100%
Select Topic	Jan. 8	Jan. 10	Jan. 8	Jan. 12	100%
Write Proposal	Jan. 8	Jan. 17	Jan. 12	Jan. 19	100%
Complete Drawings	Jan. 17	Feb. 3	Jan. 15	Feb. 5	100%
Order Tooling	Feb. 3	Feb. 10	Feb. 6	Feb. 9	100%
Write Progress Report #1	Feb. 11	Feb. 16	Feb. 13	Feb. 19	100%
Record the Old Data	Feb. 16	Feb. 23	Feb. 19	Feb. 23	100%
Receive Tooling	Feb. 23	Feb. 23	Feb. 24	Feb. 24	100%
Assemble Tooling	Feb. 23	Mar. 17	Feb. 24	Mar. 8	100%
Write Standardized	Feb. 23	17-Mar	Feb. 24	Mar. 13	100%
Write PR 2	Feb. 23	Mar. 19	Feb. 24	Mar. 19	100%
Train Crib attedants (3	Mar. 19	Mar. 22	Mar. 19	Mar. 24	100%
Move tooling inside of crib	Mar. 27	Mar. 27	Mar. 27	Mar. 27	100%
Record New Data	Mar. 27	10-Apr	Mar. 27	Apr. 12	100%
Write FR #1	Apr. 10	Apr. 22	Apr. 12	Apr. 21	100%
Presentation	Apr. 18	Apr. 24	Apr. 19	Apr. 24	

PERIODS



CONCLUSION

After implementing the new regrind process, we looked at the data for one month. The data shows that the process reduced scrap by $1400 a month and estimated $17,000 a year in scrap. We averaged 35 minutes less of downtime a day, which shows that we can produce 38 parts extra a day. The 38 parts extra a day calculates to an extra production of $270 dollars a day per line.

BIBLIOGRAPHY

Diamond ground products. 2651 Lavery Court, Newbury Park, California 91320. 805-498-3837. www.diamondground.com.

Tenneco Automotive. 1490 Gerber St, Ligonier, Indiana 46767. 260-894-9400. www.tenneco.com.

B & B machine & repair. 9455 W Gilbert Lake Road, Cromwell, Indiana 46732. 260-856-9494.