

# MEMORANDUM

[This is an internal memo from a plant of a major auto manufacturer.]

Date: October 13, 1992

Subject: Militec - 1 Synthetic Metal Conditioner

On Saturday, October 3, 1992 at approximately 0330 during 3rd shift's running of the High Speed Final Assembly Machine a gear drive unit stopped turning. The gear drive unit drives the timed input metering screws that feed insulator assemblies into the High Speed Final Assembly Machine. The entire operation was down.

Machine repair removed the drive unit, took it apart, and found no oil in the unit. The driven gear was worn away completely as would be expected under these conditions of no lubrication.

I was called at 0600. By 0700 we knew for certain there was no spare drive unit and no spare internal parts for the unit. The vendor was called and the tool room consulted. The tool room did not have the correct hob to cut the proper tooth form, couldn't make the gear.

LeRoy continued contact with the vendor. The best they could do was a set of gears close to what we needed, not right, close only. We took them! The un-matched set was assembled into the drive unit with new bearings and seals.

Sunday morning October 4, 1992 the machine was back together and timed correctly. The only problem was after about 20 minutes run time the gear drive unit was so hot we couldn't touch it! My estimate is the outside case of the drive unit was reaching temperatures of 175°F to 190°F. We let it cool until we could touch it (approximately 115°F to 120°F). I asked the machine repairman to add some MILITEC. He put in approximately 1 1/2 oz. adding it to the existing mobil R46-2 or R21 gear oil which I would estimate is 1 1/2 pints.

We ran the equipment again for maybe 30 minutes and the gear drive temperature was holding about the same, (approximately 115°F to 120°F). The repairman continued running the equipment after I had gone home, no temperature increase. The drive unit is still running fine.

The extreme pressure caused by the un-matched gear angle creates heat and wear very quickly. The pressure is so great that the lubricant is squeezed out from between the contact surfaces.

The initial running in of the gears may have helped them to seat in, run in, or wear in to better match each other. This would be true only up to a point approaching destruction. Point is, the big change took place with the additive, MILITEC.

Everyday I've checked this gear drive unit. The unit runs fine at approximately 95°F to 100°F now.

This may not be a controlled test, but we have no intentions of draining this oil to find out what happens. We also have no plan to replace this expensive gear box with the spare (when it arrives) for no good reason.

Product/Process Engineer - High Speed Final Assembly