Detroit Diesel Allison
Division of General Motors Corporation

COO-4867-6

EDR 10195

GAS TURBINE ENGINES AND TRANSMISSIONS FOR BUS DEMONSTRATION PROGRAMS

Technical Status Report
for Period 31 October 1979 - 31 January 1980

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DISCLAIMER

Introduction

This technical status report is to fulfill the contractual requirements of Contract DE-AC02-78CS54867. This quarterly status report covers the period from 31 October 1979 through 31 January 1980 and is a summary of DDA activities for the effort performed on the procurement and delivery of eleven (11) Allison GT 404-4 gas turbine engines and five (5) HT740CT and six (6) V730CT Allison automatic transmissions and the required associated software.

The contract requires the delivery of eleven (11) Allison GT 404-4 Industrial Gas Turbine Engines and five (5) HT740CT and six (6) V730CT Allison Automatic Transmissions for the Greyhound and Transit Coaches, respectively. In addition, software items such as cost reports, technical reports, installation drawings, acceptance test data and parts lists are required.

Ceramic regenerators have been incorporated in the build configuration for the last four (4) Transit Coach engines. This was decided by the DOE at a meeting in Washington, D.C. on March 28, 1979 with representatives from DDA, NASA/LeRC, JPL & Booz-Allen & Hamilton and was based upon concern for low metal regenerator life in the Transit Coach environment. The Transit Coach duty cycle imposes a significantly higher number of accelerations (temperature excursions) on the engine per unit of operating time when compared with other vehicle cycles.

The five (5) Greyhound Coach engines and the first two (2) Transit Coach engines were built in the all-metal configuration. The all-metal Transit Coach engines will be used to verify the coach installation design, power package to vehicle interface systems performance, and overall vehicle operation, but are expected to be converted to the ceramic regenerator configuration prior to commencing revenue service operation.

The Master Schedules for this program are attached. The schedules reflect revised delivery dates for the engine/transmission power packages. This has resulted from parts procurement problems, both late deliveries and poor quality. Also, because of these delays, the DOE recommended a change in the engine build sequence to alternate between Greyhound and Transit Coach engines, rather than complete the Greyhound build first. The schedules reflect deliveries completed and the build sequence for the remaining engines.

Status

The five (5) Greyhound Coach GT 404-4 engine/HT740CT transmission power packages, and four (4) of the six (6) GT 404-4 engine/V730CT transmission power packs for Transit Coach have been delivered. Of the four(4) Transit Coach engines delivered, the last two (2) are configured with ceramic regenerator hardware.

Assembly and acceptance testing for the five (5) HT740CT transmissions and the six (6) V730CT transmissions have been completed.

The HT740CT transmissions were configured with second gear start in drive range instead of first gear start as employed previously. This change was considered to be a product improvement (eliminate harsh 2-1 downshift for

improved passenger comfort) and is consistent with the selective introduction and evaluation of the modified diesel version transmissions in the Greyhound fleet. However, during road evaluation of the first Greyhound Coach power package (T5/30576) in Coach 5992, it became evident that vehicle acceleration was unacceptable due to the combined effect of 2nd gear start and the inherent acceleration lag of the engine. Satisfactory vehicle performance comparable with diesel equipped coaches was restored through transmission modification for first gear start in drive range and elevated engine gasifier speed in gear.

Power package deliveries completed to date are summarized below.

Greyhound Coach Engine/Transmission	Date Shipped
Engine S/N T5/HT740CT S/N 30576	6-19-79
Engine S/N T6/HT740CT S/N 29804	7-12-79
Engine S/N T7/HT740CT S/N 30579	8-3-79
Engine S/N T8	9-19-79
Engine S/N T9	10-25-79
/HT740CT S/N 30575	9-10-79*
/HT740CT S/N 30578	9-10-79*

* shipped in advance of mating engines since needed by Greyhound to replace units requiring first gear start modification.

Transit Coach Engine/Transmission	Date Shipped
Engine S/N T11/V730CT S/N 11121	8-7-79
Engine S/N T12/V730CT S/N 11561	8-31-79
Engine S/N T13/V730CT S/N 11489	10-23-79
Engine S/N T14/V730CT S/N 11564	12-14-79

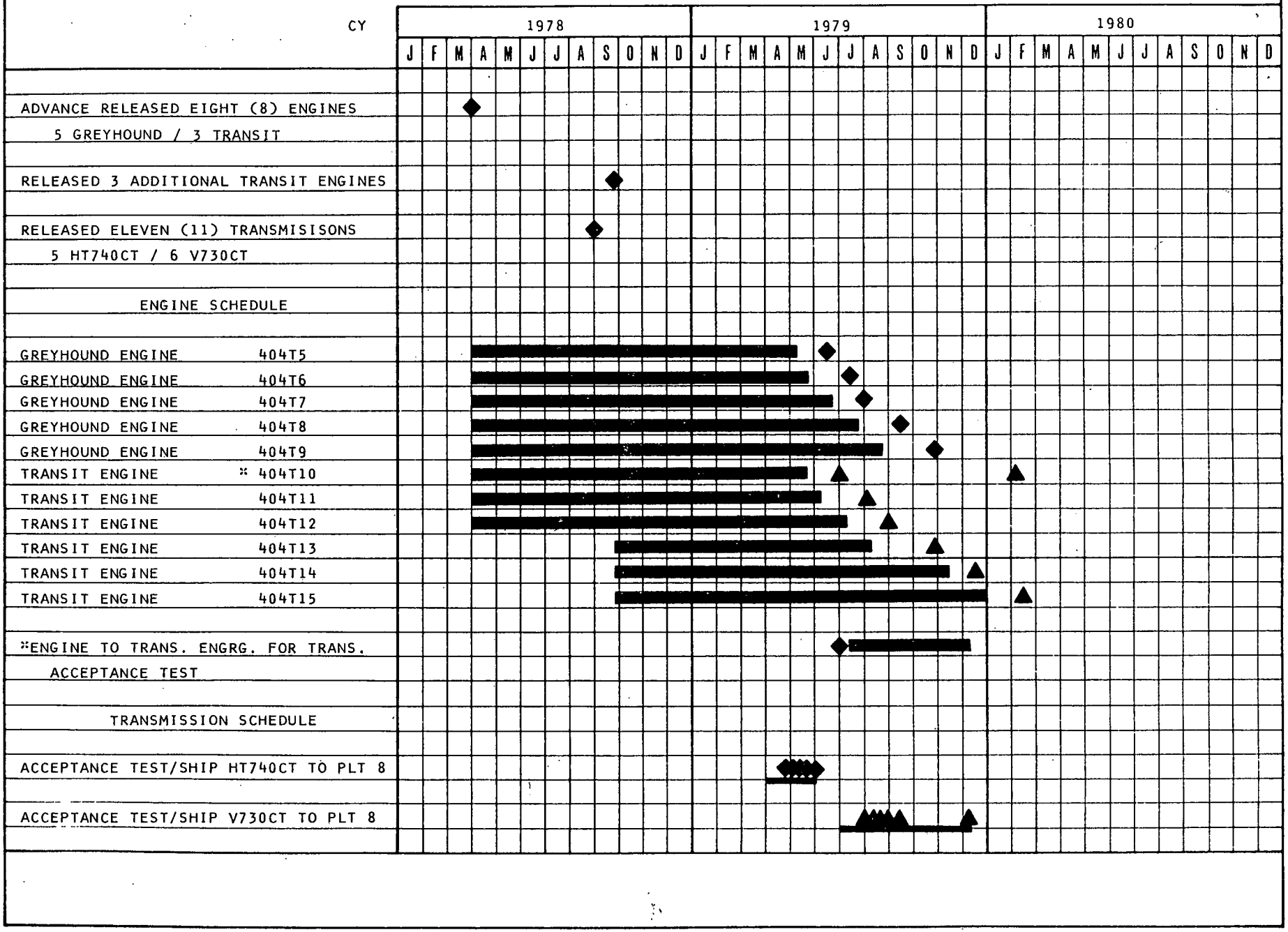
Engine S/N T10 was refurbished after completing the acceptance testing of the six (6) V730CT transmissions. Acceptance testing of the engine is in progress and delivery is expected early in February 1980.

Assembly of Transit Coach engine S/N T15 is in progress. Delivery is anticipated by mid February 1980. With the shipment of this power package, hardware contract requirements will be completed.

The Monthly Cost Report for January 1980 is being submitted under separate cover. The Monthly Cost Reports for October 1978 through December 1979 were delivered to the DOE on schedule.

The acceptance test data and parts lists for the delivered engines and transmissions are being submitted under separate cover as deliveries are completed.

DOE ENGINE/TRANSMISSION HARDWARE PROGRAM SCHEDULE



DOE ENGINE/TRANSMISSION HARDWARE PROGRAM SCHEDULE