Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Air Force											Date: February 2020	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0207268F / *Aircraft Engine Component Improvement Program*							
COST ($ in Millions)	**Prior Years**	**FY 2019**	**FY 2020**	**FY 2021 Base**	**FY 2021 OCO**	**FY 2021 Total**	**FY 2022**	**FY 2023**	**FY 2024**	**FY 2025**	**Cost To Complete**	**Total Cost**
Total Program Element	-	116.808	112.505	95.896	0.000	95.896	116.818	118.909	0.000	0.000	Continuing	Continuing
671012: *Aircraft Engine Component Improvement Program*	-	85.419	79.342	68.334	0.000	68.334	82.433	83.908	0.000	0.000	Continuing	Continuing
675365: *F135 Aircraft Engine Component Improvement Program*	-	31.389	33.163	27.562	0.000	27.562	34.385	35.001	0.000	0.000	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Aircraft Engine Component Improvement Program (CIP) provides the only source of critical sustaining engineering support for in-service Air Force engines to maintain flight safety (highest priority) to correct deficiencies, improve system operational readiness (OR) and reliability & maintainability (R&M), reduce engine Life Cycle Cost (LCC), and sustain engines throughout their service life.

Changes in aircraft operational parameters caused by changing missions and tasks accelerate new engine problems; Engine CIP provides the means to develop fixes for these problems. Engine CIP funding is driven by field events and types/maturity of engines, not by the total engine quantity. The program starts with government acceptance of the first procurement-funded engine and continues over the engine's life, gradually decreasing to a minimum level (safety/depot repairs) sufficient to keep older engines operational. Engine CIP testing identifies and fixes engine-related problems ahead of operational impacts. R&M related Engine CIP efforts significantly reduce out year Operations and Maintenance (O&M) and spares costs.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver CIP Program weapon system capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program element 0605831F.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Air Force					Date: February 2020
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*		**R-1 Program Element (Number/Name)** PE 0207268F / *Aircraft Engine Component Improvement Program*			
B. Program Change Summary ($ in Millions)	**FY 2019**	**FY 2020**	**FY 2021 Base**	**FY 2021 OCO**	**FY 2021 Total**
Previous President's Budget	121.203	112.505	114.617	0.000	114.617
Current President's Budget	116.808	112.505	95.896	0.000	95.896
Total Adjustments	-4.395	0.000	-18.721	0.000	-18.721
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	-0.076	0.000			
• SBIR/STTR Transfer	-4.347	0.000			
• Other Adjustments	0.028	0.000	-18.721	0.000	-18.721

Change Summary Explanation

The FY21 -$18.721M adjustment is based on prior year execution.

Exhibit R-2A, RDT&E Project Justification: PB 2021 Air Force			Date: February 2020
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207268F / *Aircraft Engine Component Improvement Program*	Project (Number/Name) 671012 / *Aircraft Engine Component Improvement Program*	

COST ($ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
671012: *Aircraft Engine Component Improvement Program*	-	85.419	79.342	68.334	0.000	68.334	82.433	83.908	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Aircraft Engine Component Improvement Program (CIP) provides the only source of critical sustaining engineering support for in-service Air Force engines to maintain flight safety (highest priority) to correct deficiencies, improve system operational readiness (OR) and reliability & maintainability (R&M), reduce engine Life Cycle Cost (LCC), and sustain engines throughout their service life. Engine CIP directly addresses engine related causes to aircraft Non-Mission-Capability rates.

Changes in aircraft operational parameters and/or missions and task missions and tasks accelerating the discovery of new engine issues and the need to resolve issues; Engine CIP provides the only means to develop fixes for these problems. Engine CIP funding is driven by field events and types/maturity of engines, not by the total engine quantity. The program starts with government acceptance of the first procurement-funded engine and continues over the engine's life, gradually decreasing to a minimum level (safety/depot repairs) sufficient to keep older engines operational. Engine CIP testing identifies and fixes engine-related problems ahead of operational impacts. R&M related Engine CIP efforts significantly reduce out year Operations and Maintenance (O&M) and replacement spares costs.

Service-related engine deficiencies occur throughout the engine lifecycle. Given the uncertainty with regard to the number and timing of engine-related deficiencies, it is essential for the USAF to have adequate engineering capability, test capacity to rapidly respond to problems as they occur and absolutely paramount to reach SecDef directed 80% mission capability rate for F-35, F-22, F-16, and F-15 aircraft.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver the CIP Program weapon system capability. The use of such
program funds would be in addition to the civilian pay expenses budgeted in program element 0605831F.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
Title: F100 Aircraft Engine Component Improvement Program	10.680	9.920	8.544
Description: The F100-220 and F100-229 Engine CIP provides critical developmental engineering support for approximately 4085 engines (including foreign military sales [FMS]) to maintain flight safety (highest priority), to address parts obsolescence, to improve system operational readiness (OR) and reliability & maintainability (R&M), to reduce engine Life Cycle Cost (LCC), in order for engines to be sustainable throughout their service life. Funds may be used to address emerging and short-notice Diminishing Manufacturing Sources and Material Shortages (DMSMS) issues.			

Exhibit R-2A, RDT&E Project Justification: PB 2021 Air Force		Date: February 2020
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0207268F / *Aircraft Engine Component Improvement Program*	**Project (Number/Name)** 671012 / *Aircraft Engine Component Improvement Program*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
FY 2020 Plans: F100-220 and F100-229: - Will execute 35+ tasks. Budget will address engine issues associated with the F-15 and F-16 aircraft. - Address engine component redesign, repair/rework procedures, engine maturation and life limit/mission analysis. - Validate redesigned parts and new repair procedures. - Maintain engine flight safety, address obsolescence deficiencies, improved system operational readiness (OR) and reliability & maintainability (R&M), reduced engine life cycle costs (LCC), and sustain engines throughout their service life. - Funds may be used to address emerging and short-notice Diminishing Manufacturing Sources and Material Shortages (DMSMS) issues. ***FY 2021 Plans:*** F100-220 and F100-229: - Will execute 35+ tasks. Budget will address engine issues associated with the F-15 and F-16 aircraft. - Address engine component redesign, repair/rework procedures, engine maturation and life limit/mission analysis. - Validate redesigned parts and new repair procedures. - Maintain engine flight safety, address obsolescence deficiencies, improved system operational readiness (OR) and reliability & maintainability (R&M), reduced engine life cycle costs (LCC), and sustain engines throughout their service life. - Funds may be used to address emerging and short-notice Diminishing Manufacturing Sources and Material Shortages (DMSMS) issues. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** FY21 decrease due to reduction of FY21 budget to reflect early to need execution and re-phased in out years.			
Title: F110 Aircraft Engine Component Improvement Program ***Description:*** The F101, F110-100, F110-129, F118-100, and F118-101 Engine CIP provides critical developmental engineering support for approximately 2732 engines (including foreign military sales [FMS]) to maintain flight safety (highest priority), to address parts obsolescence, to improve system operational readiness (OR) and reliability & maintainability (R&M), to reduce engine Life Cycle Cost (LCC), and to sustain engines throughout their service life. Funds may be used to address emerging and short-notice Diminishing Manufacturing Sources and Material Shortages (DMSMS) issues. ***FY 2020 Plans:*** F101, F110-100, F110-129, F118-100, and F118-101: - Will execute 45+ tasks. The budget will address engine issues associated with the B1, B-2, F-15, F-16, and U-2 aircraft. - Address safety of flight, engine component redesign, repair/rework procedures, engine maturation and life limit/mission analysis. - Validate redesigned parts and new repair procedures.	15.432	14.334	12.345

Exhibit R-2A, RDT&E Project Justification: PB 2021 Air Force		Date: February 2020
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0207268F / *Aircraft Engine Component Improvement Program*	**Project (Number/Name)** 671012 / *Aircraft Engine Component Improvement Program*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
- Maintain engine flight safety, address obsolescence deficiencies, improved system operational readiness (OR) and reliability & maintainability (R&M), reduced engine life cycle costs (LCC), and sustain engines throughout their service life. - Funds may be used to address emerging and short-notice Diminishing Manufacturing Sources and Material Shortages (DMSMS) issues. ***FY 2021 Plans:*** F101, F110-100, F110-129, F118-100, and F118-101: - Will execute 45+ tasks. The budget will address engine issues associated with the B1, B-2, F-15, F-16, and U-2 aircraft. - Address safety of flight, engine component redesign, repair/rework procedures, engine maturation and life limit/mission analysis. - Validate redesigned parts and new repair procedures. - Maintain engine flight safety, address obsolescence deficiencies, improved system operational readiness (OR) and reliability & maintainability (R&M), reduced engine life cycle costs (LCC), and sustain engines throughout their service life. - Funds may be used to address emerging and short-notice Diminishing Manufacturing Sources and Material Shortages (DMSMS) issues. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** FY21 decrease due to reduction of FY21 budget to reflect early to need execution and re-phased in out years.			
Title: F119 Aircraft Engine Component Improvement Program ***Description:*** The F119 Engine CIP provides critical developmental engineering support for approximately 475 engines to maintain flight safety (highest priority), to address parts obsolescence, to improve system operational readiness (OR) and reliability & maintainability (R&M), to reduce engine Life Cycle Cost (LCC), and to sustain engines throughout their service life. Funds may be used to address emerging and short-notice Diminishing Manufacturing Sources and Material Shortages (DMSMS) issues. ***FY 2020 Plans:*** F119: - Will execute 35+ tasks. The budget will address engine issues associated with the F-22 aircraft. - Address engine component redesign, repair/rework procedures, engine maturation and life limit/mission analysis. - Validate redesigned parts and new repair procedures. - Maintain engine flight safety, address obsolescence deficiencies, improved system operational readiness (OR) and reliability & maintainability (R&M), reduced engine life cycle costs (LCC), and sustain engines throughout their service life. - Funds may be used to address emerging and short-notice Diminishing Manufacturing Sources and Material Shortages (DMSMS) issues. ***FY 2021 Plans:***	28.915	24.338	20.536

Exhibit R-2A, RDT&E Project Justification: PB 2021 Air Force		Date: February 2020
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0207268F / *Aircraft Engine Component Improvement Program*	**Project (Number/Name)** 671012 / *Aircraft Engine Component Improvement Program*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
F119: - Will execute 35+ tasks. The budget will address engine issues associated with the F-22 aircraft. - Address engine component redesign, repair/rework procedures, engine maturation and life limit/mission analysis. - Validate redesigned parts and new repair procedures. - Maintain engine flight safety, address obsolescence deficiencies, improved system operational readiness (OR) and reliability & maintainability (R&M), reduced engine life cycle costs (LCC), and sustain engines throughout their service life. - Funds may be used to address emerging and short-notice Diminishing Manufacturing Sources and Material Shortages (DMSMS) issues. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** FY21 decrease due to reduction of FY21 budget to reflect early to need execution and re-phased in out years.			
Title: Other Aircraft Engine Component Improvement Program ***Description:*** The Other Engines (e.g., T56, T700, T400, J85, F107, APUs) CIP provides critical developmental engineering support for approximately 13000 engines (including foreign military sales [FMS]) to maintain flight safety (highest priority), to address parts obsolescence, to improve system operational readiness (OR) and reliability & maintainability (R&M), to reduce engine Life Cycle Cost (LCC), and to sustain engines throughout their service life. Funds may be used to address emerging and short-notice Diminishing Manufacturing Sources and Material Shortages (DMSMS) issues. ***FY 2020 Plans:*** Other Engines (e.g., T56, T700, T400, J85, APUs, F107, TF-34, TF-33): - Will execute 65+ tasks. The budget will address engine issues associated with the C-130, T38, UH-1N, UH/MH-60/60G, A-10, B-52 aircraft, cruise missiles and aircraft APUs. - Address engine component redesign, repair/rework procedures, engine maturation and life limit/mission analysis. - Validate redesigned parts and new repair procedures. - Maintain engine flight safety, address obsolescence deficiencies, improved system operational readiness (OR) and reliability & maintainability (R&M), reduced engine life cycle costs (LCC), and sustain engines throughout their service life. - Funds may be used to address emerging and short-notice Diminishing Manufacturing Sources and Material Shortages (DMSMS) issues. - Funds will also be used to stand up any new Engine CIP TMS programs ***FY 2021 Plans:*** Other Engines (e.g., T56, T700, T400, J85, APUs, F107, TF-34, TF-33): - Will execute 65+ tasks. The budget will address engine issues associated with the C-130, T38, UH-1N, UH/MH-60/60G, A-10, B-52 aircraft, cruise missiles and aircraft APUs.	30.392	30.750	26.909

Exhibit R-2A, RDT&E Project Justification: PB 2021 Air Force		Date: February 2020
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0207268F / *Aircraft Engine Component Improvement Program*	**Project (Number/Name)** 671012 / *Aircraft Engine Component Improvement Program*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
- Address engine component redesign, repair/rework procedures, engine maturation and life limit/mission analysis. - Validate redesigned parts and new repair procedures. -Address issues leading to increased UERs and decreased flight safety. - Maintain engine flight safety, address obsolescence deficiencies, improved system operational readiness (OR) and reliability & maintainability (R&M), reduced engine life cycle costs (LCC), and sustain engines throughout their service life. - Funds may be used to address emerging and short-notice Diminishing Manufacturing Sources and Material Shortages (DMSMS) issues. - Funds will also be used to stand up any new Engine CIP TMS programs ***FY 2020 to FY 2021 Increase/Decrease Statement:*** FY21 decrease due to reduction of FY21 budget to reflect early to need execution and re-phased in out years.			
Accomplishments/Planned Programs Subtotals	85.419	79.342	68.334

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• RDTE 07 0205633N: *Aviation Improvements*	2.025	-	-	-	-	-	-	-	-	Continuing	Continuing

Remarks

Other APPN RELATED ACTIVITIES

(U) - PEs 0203752A and 0205633N, Army/Navy Aircraft Engine CIPs

D. Acquisition Strategy

Sole Source Indefinite Delivery/Indefinite Quantity (IDIQ) contracts to 3 Original Equipment Manufacturers (OEMs), and DoD agencies with a 5-year ordering period and 7-year delivery period. Supports multiple tasks to accomplish CIP for more than 23 engine models.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Air Force		Date: February 2020
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0207268F / *Aircraft Engine Component Improvement Program*	**Project (Number/Name)** 671012 / *Aircraft Engine Component Improvement Program*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Product Development	C/CPAF	Not specified. : TBD	-	-		-		-		-		-	Continuing	Continuing	-
Aircraft Engine CIP:Develop aircraft engine improvements - F110/F101/F118	SS/CPFF	GE : Evendale, OH	-	15.432	Dec 2018	14.334	Dec 2019	12.345	Dec 2020	-		12.345	Continuing	Continuing	-
Aircraft Engine CIP: Develop aircraft engine improvements-F100/F119/ TF33/T400	SS/CPFF	Pratt & Whitney : Hartford, CT	-	45.421	Dec 2018	39.670	Dec 2019	33.740	Dec 2020	-		33.740	Continuing	Continuing	-
Aircraft Engine CIP: Develop aircraft engine improvements-TF34/J85/ T700	SS/CPFF	GE : Lynn, MA	-	4.047	Dec 2018	3.759	Dec 2019	3.238	Dec 2020	-		3.238	Continuing	Continuing	-
Aircraft Engine CIP: Develop aircraft engine improvements-T56	SS/CPFF	Rolls Royce : Indianapolis, IN	-	2.330	Dec 2018	2.164	Dec 2019	1.864	Dec 2020	-		1.864	Continuing	Continuing	-
Aircraft Engine CIP: Develop aircraft auxiliary power unit improvements/ T53	SS/CPFF	Honeywell : Phoenix, AZ	-	6.023	Dec 2018	5.595	Dec 2019	4.818	Dec 2020	-		4.818	Continuing	Continuing	-
Aircraft Engine CIP: Develop engine improvements-F107-Teledyne	SS/CPFF	Teledyne : Toledo, OH	-	2.261	Dec 2018	2.100	Dec 2019	1.809	Dec 2020	-		1.809	Continuing	Continuing	-
Aircraft Engine CIP: Develop engine improvements-F107-Williams	SS/CPFF	Willams : Walled Lake, MI	-	0.050	Dec 2018	0.046	Dec 2019	0.040	Dec 2020	-		0.040	Continuing	Continuing	-
		Subtotal	-	75.564		67.668		57.854		-		57.854	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Air Force			Date: February 2020
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0207268F / *Aircraft Engine Component Improvement Program*	**Project (Number/Name)** 671012 / *Aircraft Engine Component Improvement Program*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Support	C/CPAF	Not specified. : TBD	-	-		-		-		-		-	Continuing	Continuing	-
Aircraft Engine CIP: Non-OEM CIP Tasks	Various	Various : Various	-	3.344	Oct 2018	3.106	Dec 2019	2.675	Dec 2020	-		2.675	Continuing	Continuing	-
		Subtotal	-	3.344		3.106		2.675		-		2.675	Continuing	Continuing	N/A

Remarks

Non-OEM CIP Tasks refer to work in support of Engine CIP.

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test and Evaluation	C/CPAF	Not specified. : TBD	-	-		-		-		-		-	Continuing	Continuing	-
Aircraft Engine CIP: Ground test and validate engine improvements	PO	AEDC : Arnold AFB, TN	-	0.000		2.520	Dec 2019	2.596	Dec 2020	-		2.596	Continuing	Continuing	-
		Subtotal	-	0.000		2.520		2.596		-		2.596	Continuing	Continuing	N/A

Remarks

Fuel costs for contractor-performed T&E are included in the applicable contract.

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Management Services	C/CPAF	Not specified. : TBD	-	-		-		-		-		-	Continuing	Continuing	-
Aircraft Engine CIP: PMA	Various	Various : Various	-	2.092	Oct 2018	1.943	Dec 2019	1.674	Dec 2020	-		1.674	Continuing	Continuing	-
Aircraft Engine CIP: In House Support/Misc	Various	Various : Various	-	4.419	Oct 2018	4.105	Dec 2019	3.535	Dec 2020	-		3.535	Continuing	Continuing	-
		Subtotal	-	6.511		6.048		5.209		-		5.209	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Air Force		Date: February 2020
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0207268F / *Aircraft Engine Component Improvement Program*	**Project (Number/Name)** 671012 / *Aircraft Engine Component Improvement Program*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Remarks															
PMA Description: Program Management support, travel, and A&AS.															

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	85.419		79.342		68.334		-		68.334	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Air Force		Date: February 2020
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0207268F / *Aircraft Engine Component Improvement Program*	**Project (Number/Name)** 671012 / *Aircraft Engine Component Improvement Program*

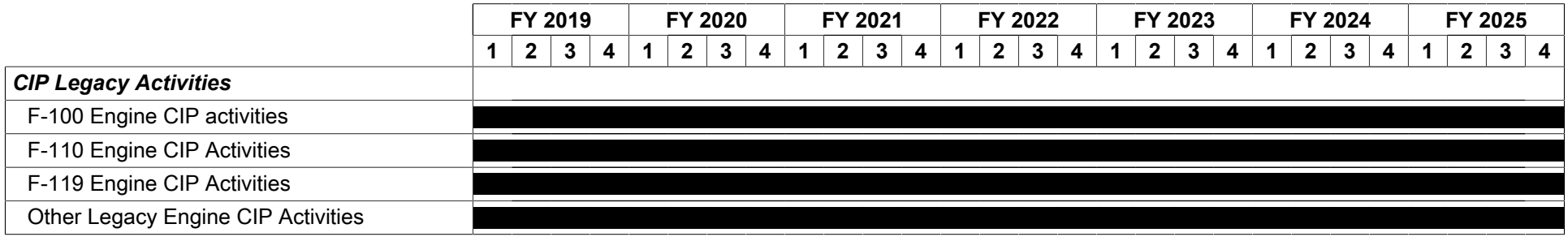

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Air Force		Date: February 2020
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0207268F / *Aircraft Engine Component Improvement Program*	**Project (Number/Name)** 671012 / *Aircraft Engine Component Improvement Program*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
CIP Legacy Activities				
F-100 Engine CIP activities	1	2019	4	2025
F-110 Engine CIP Activities	1	2019	4	2025
F-119 Engine CIP Activities	1	2019	4	2025
Other Legacy Engine CIP Activities	1	2019	4	2025

Note

Traditional schedule does not lend itself to Engine CIP activities.

Exhibit R-2A, RDT&E Project Justification: PB 2021 Air Force			Date: February 2020
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207268F / *Aircraft Engine Component Improvement Program*	Project (Number/Name) 675365 / *F135 Aircraft Engine Component Improvement Program*	

COST ($ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
675365: *F135 Aircraft Engine Component Improvement Program*	-	31.389	33.163	27.562	0.000	27.562	34.385	35.001	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The F135 Aircraft Engine Component Improvement Program (CIP) supports F-35 single-engine fighter propulsion system. It provides the only source of critical developmental engineering support for the F135 propulsion system. F135 CIP maintains flight safety (highest priority), corrects service revealed deficiencies, improves system Operational Readiness (OR) and Reliability & Maintainability (R&M), reduces propulsion system Life Cycle Cost (LCC), and sustains the propulsion system throughout its service life. Historically, aircraft systems change missions, tactics, and environment (including new fuels) and meet changing threats throughout their lives. New technical problems can develop in the propulsion system through actual use and the F135 CIP provides the means to develop fixes for these problems. F135 CIP funding is driven by field events and type/maturity of the propulsion system, not by the total quantity of engines. The program starts with government acceptance of the first procurement-funded engine and continues over the propulsion system's life, gradually decreasing to a minimum level (safety/depot repairs) sufficient to keep older engines operational. F135 CIP, through "Lead the Fleet" operational use and accelerated mission testing, identifies and fixes propulsion-related problems ahead of operational impacts. F135 CIP ensures continued improvements in R&M, which reduce out year support costs. Historically, R&M related CIP efforts significantly reduce out year O&M and spares costs.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver CIP Program weapon system capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program element 0605831F

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
Title: F135 Aircraft Engine Improvement Program	31.389	33.163	27.562
Description: The Aircraft Engine Component Improvement Program (CIP) provides the only source of critical developmental engineering support for F-35 propulsion systems to maintain flight safety (highest priority) for this single-engine fighter, correct service revealed deficiencies, improve system operational readiness (OR) and reliability & maintainability (R&M), reduce engine Life Cycle Cost (LCC), and sustain engines throughout their service life. Funds may be used to address emerging and short-notice Diminishing Manufacturing Sources and Material Shortages (DMSMS) issues. ***FY 2020 Plans:*** - Execute approximately 35+ AF-funded F135 engine tasks supporting F-35 flying operations. - Conduct accelerated mission test and analytical condition inspection. - Address safety of flight, engine component redesign, repair/rework procedures and life limit/mission analysis.			

Exhibit R-2A, RDT&E Project Justification: PB 2021 Air Force		Date: February 2020
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0207268F / *Aircraft Engine Component Improvement Program*	**Project (Number/Name)** 675365 / *F135 Aircraft Engine Component Improvement Program*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
- Validate redesigned parts and new repair procedures. - Maintain/improve engine flight safety, improve system operational readiness and reliability & maintainability, reduce engine life cycle cost, and sustain engine throughout service life. - Funds may be used to address emerging and short-notice Diminishing Manufacturing Sources and Material Shortages (DMSMS) issues. ***FY 2021 Plans:*** - Execute approximately 35+ AF-funded F135 engine tasks supporting F-35 flying operations. - Conduct accelerated mission test and analytical condition inspection. - Address safety of flight, engine component redesign, repair/rework procedures and life limit/mission analysis. - Validate redesigned parts and new repair procedures. - Maintain/improve engine flight safety, improve system operational readiness and reliability & maintainability, reduce engine life cycle cost, and sustain engine throughout service life. - Funds may be used to address emerging and short-notice Diminishing Manufacturing Sources and Material Shortages (DMSMS) issues. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** FY21 decrease due to reduction of FY21 budget to reflect early to need execution and re-phased in out years.			
Accomplishments/Planned Programs Subtotals	31.389	33.163	27.562

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• RDTE 07 0205633N: *Aviation Improvements*	-	-	-	-	-	-	-	-	-		

Remarks

Program Element 0205633N provides US Navy funding support for the F135 propulsion system.

D. Acquisition Strategy

Contracts within this program are projected to be awarded sole source to engine manufacturer. F-135 Engine CIP tasks are generally assigned to the original engine manufacturer based on available funding and prioritization of candidates.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Air Force			Date: February 2020
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0207268F / *Aircraft Engine Component Improvement Program*	**Project (Number/Name)** 675365 / *F135 Aircraft Engine Component Improvement Program*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Product Development	C/CPAF	Not specified. : TBD	-	-		-		-		-		-	Continuing	Continuing	-
Aircraft Engine CIP: Develop F135 engine improvements	SS/CPFF	Pratt & Whitney : Hartford, CT	-	25.838	Jan 2019	25.929	Jan 2020	22.688	Jan 2021	-		22.688	Continuing	Continuing	-
		Subtotal	-	25.838		25.929		22.688		-		22.688	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test and Evaluation	C/CPAF	Not specified. : TBD	-	-		-		-		-		-	Continuing	Continuing	-
Aircraft Engine CIP: Ground test and validate engine improvements	PO	AEDC : Arnold AFB, TN	-	5.266	Oct 2018	6.875	Oct 2019	4.624	Oct 2020	-		4.624	Continuing	Continuing	-
		Subtotal	-	5.266		6.875		4.624		-		4.624	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Management Services	C/CPAF	Not specified. : TBD	-	-		-		-		-		-	Continuing	Continuing	-
Aircraft Engine CIP: PMA	Various	Various : Various	-	0.285	Oct 2018	0.359	Oct 2019	0.250	Oct 2020	-		0.250	Continuing	Continuing	-
		Subtotal	-	0.285		0.359		0.250		-		0.250	Continuing	Continuing	N/A

Remarks

PMA Description: Program Management support, travel, and A&AS.

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	31.389		33.163		27.562		-		27.562	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Air Force			Date: February 2020
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207268F / *Aircraft Engine Component Improvement Program*	Project (Number/Name) 675365 / *F135 Aircraft Engine Component Improvement Program*	

	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Air Force		Date: February 2020
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0207268F / *Aircraft Engine Component Improvement Program*	**Project (Number/Name)** 675365 / *F135 Aircraft Engine Component Improvement Program*

	FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
CIP JSF Activities																												
F-135 Engine CIP Tasks																												

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Air Force		Date: February 2020
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0207268F / *Aircraft Engine Component Improvement Program*	**Project (Number/Name)** 675365 / *F135 Aircraft Engine Component Improvement Program*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
CIP JSF Activities				
F-135 Engine CIP Tasks	1	2019	4	2025