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Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Air Force **Date:** May 2021

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0207268F / <i>Aircraft Engine Component Improvement Program</i>
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COST (\$ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
Total Program Element	-	108.446	125.666	103.715	0.000	103.715	-	-	-	-	-	-
671012: <i>Aircraft Engine Component Improvement Program</i>	-	75.283	98.104	75.754	0.000	75.754	-	-	-	-	-	-
675365: <i>F135 Aircraft Engine Component Improvement Program</i>	-	33.163	27.562	27.961	0.000	27.961	-	-	-	-	-	-

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. Past investments have reduced warfighter Class A rates and decreased Engine Related Loss of Aircraft (ERLOA) and generated significant returns on investments. Significant new tasks for this year support increasing reliability and maintainability of the B-52 aircraft/TF33 engine, correcting the #1 removal driver for the TF34 engine to achieve LCC of 24M and eliminating a safety concern with cracked header on the F119 engine.

Engine CIP provides the only means to develop/address solutions to safety issues, obsolescence, reliability, availability, maintainability and affordability driven by changes in aircraft operational parameters, missions, usage or age. It also serves as the primary vehicle implement emerging technology solutions to resolve these issues.

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 WEAPON SYSTEM capability. The use of such programs 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.

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B. Program Change Summary (\$ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Previous President's Budget	112.505	95.896	116.818	0.000	116.818
Current President's Budget	108.446	125.666	103.715	0.000	103.715
Total Adjustments	-4.059	29.770	-13.103	0.000	-13.103
• 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	0.000	29.770			
• SBIR/STTR Transfer	-4.059	0.000			
• Other Adjustments	0.000	0.000	-13.103	0.000	-13.103

Change Summary Explanation

FY20 decrease of -\$4.059M due to a SBIR reduction

FY21 increase of +\$29.770 for Congressional Add for program increase

FY 22 funding request was reduced by -\$6M to account for F-35 Engine CIP efforts being early to need; the funding request was reduced by -\$5.538 million to account for the availability of prior year execution balances.

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Exhibit R-2A, RDT&E Project Justification: PB 2022 Air Force										Date: May 2021		
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 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
671012: Aircraft Engine Component Improvement Program	-	75.283	98.104	75.754	0.000	75.754	-	-	-	-	-	-
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. Significant new tasks for this year support increasing reliability and maintainability of the B-52 aircraft/TF33 engine, correcting the #1 removal driver for the TF34 engine to achieve LCC of 24M and eliminating a safety concern with cracked header on the F119 engine.

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-22, F-16, and F-15 aircraft.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2020	FY 2021	FY 2022
Title: F100 Aircraft Engine Component Improvement Program	8.115	10.145	9.232
<p>Description: The F100-220 and F100-229 Engine CIP provides critical developmental engineering support for approximately 3908 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.</p> <p>FY 2021 Plans:</p>			

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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 2020	FY 2021	FY 2022
<p>F100-220 and F100-229:</p> <ul style="list-style-type: none"> - Will execute 28+ 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. <p>FY 2022 Plans:</p> <p>F100-220 and F100-229:</p> <ul style="list-style-type: none"> - 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. <p>FY 2021 to FY 2022 Increase/Decrease Statement:</p> <p>Decrease due to funding decrease in FY22.</p>				
<p>Title: F110 Aircraft Engine Component Improvement Program</p> <p>Description: The F101, F110-100, F110-129, F118-100, and F118-101 Engine CIP provides critical developmental engineering support for approximately 2845 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.</p> <p>FY 2021 Plans:</p> <p>F101, F110-100, F110-129, F118-100, and F118-101:</p> <ul style="list-style-type: none"> - Will execute 31+ 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. 		15.142	15.557	16.080

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2022 Air Force		Date: May 2021		
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 2020	FY 2021	FY 2022
<p>- 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.</p> <p>- Funds may be used to address emerging and short-notice Diminishing Manufacturing Sources and Material Shortages (DMSMS) issues.</p> <p>FY 2022 Plans: F101, F110-100, F110-129, F118-100, and F118-101:</p> <p>- Will execute 45+ tasks. The budget will address engine issues associated with the B1, B-2, F-15, F-16, and U-2 aircraft.</p> <p>- Address safety of flight, engine component redesign, repair/rework procedures, engine maturation and life limit/mission analysis.</p> <p>- Validate redesigned parts and new repair procedures.</p> <p>- 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.</p> <p>- Funds may be used to address emerging and short-notice Diminishing Manufacturing Sources and Material Shortages (DMSMS) issues.</p> <p>FY 2021 to FY 2022 Increase/Decrease Statement: Increase due to requirement increase in FY22.</p>				
<p>Title: F119 Aircraft Engine Component Improvement Program</p> <p>Description: The F119 Engine CIP provides critical developmental engineering support for approximately 471 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.</p> <p>FY 2021 Plans: F119:</p> <p>- Will execute 28+ tasks. The budget will address engine issues associated with the F-22 aircraft.</p> <p>- Address engine component redesign, repair/rework procedures, engine maturation and life limit/mission analysis.</p> <p>- Validate redesigned parts and new repair procedures.</p> <p>- 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.</p> <p>- Funds may be used to address emerging and short-notice Diminishing Manufacturing Sources and Material Shortages (DMSMS) issues.</p> <p>FY 2022 Plans:</p>		26.553	26.559	27.035

UNCLASSIFIED

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2020	FY 2021	FY 2022
<p>F119:</p> <ul style="list-style-type: none"> - 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. <p>FY 2021 to FY 2022 Increase/Decrease Statement: Increase due to requirement increase in FY22.</p>				
<p>Title: Other Aircraft Engine Component Improvement Program</p> <p>Description: The Other Engines (e.g., TF33, TF34, T53, T56, T700, T400, J85, F107, APUs) CIP provides critical developmental engineering support for approximately 8000+ 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.</p> <p>FY 2021 Plans: Other Engines (e.g., TF33, TF34, T53, T56, T700, T400, J85, APUs, F107):</p> <ul style="list-style-type: none"> - Will execute 40+ tasks. The budget will address engine issues associated with the C-130, T38, UH-1N, UH/MH-60/60G, A-10, B-52, AWACS, and JSTARS 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. -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 <p>FY 2022 Plans: Other Engines (e.g., TF33, TF34, T53, T56, T700, T400, J85, APUs, F107):</p>		25.473	45.843	23.407

UNCLASSIFIED

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2020	FY 2021	FY 2022
<ul style="list-style-type: none"> - 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, AWACS, and JSTARS 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. -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 <p>FY 2021 to FY 2022 Increase/Decrease Statement: Decrease due to funding decrease in FY22.</p>			
Accomplishments/Planned Programs Subtotals	75.283	98.104	75.754

C. Other Program Funding Summary (\$ in Millions)										
<u>Line Item</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022 Base</u>	<u>FY 2022 OCO</u>	<u>FY 2022 Total</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>Cost To Complete Total Cost</u>
• RDTE 07 0205633N: <i>Aviation Improvements</i>	-	-	-	-	-	-	-	-	-	-

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.

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Air Force												Date: May 2021			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)						Project (Number/Name)					
3600 / 7				PE 0207268F / Aircraft Engine Component Improvement Program						671012 / Aircraft Engine Component Improvement Program					
Product Development (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Product Development	C/CPAF	Not specified. : TBD	-	-		-		0.000		-		0.000	-	-	-
Aircraft Engine CIP: Develop aircraft engine improvements - F110/F101/F118	SS/CPFF	GE : Evendale, OH	-	15.142	Dec 2019	15.557	Dec 2020	16.080	Dec 2021	-		16.080	-	-	-
Aircraft Engine CIP: Develop aircraft engine improvements-F100/F119/TF33/T400	SS/CPFF	Pratt & Whitney : Hartford, CT	-	40.194	Dec 2019	44.470	Dec 2020	36.267	Dec 2021	-		36.267	-	-	-
Aircraft Engine CIP: Develop aircraft engine improvements-TF34/J85/T700	SS/CPFF	GE : Lynn, MA	-	6.085	Dec 2019	7.441	Dec 2020	5.663	Dec 2021	-		5.663	-	-	-
Aircraft Engine CIP: Develop aircraft engine improvements-T56	SS/CPFF	Rolls Royce : Indianapolis, IN	-	1.495	Dec 2019	1.641	Dec 2020	1.637	Dec 2021	-		1.637	-	-	-
Aircraft Engine CIP: Develop aircraft auxiliary power unit improvements/T53	SS/CPFF	Honeywell : Phoenix, AZ	-	4.018	Dec 2019	0.887	Dec 2020	4.965	Dec 2021	-		4.965	-	-	-
Aircraft Engine CIP: Develop engine improvements-F107-Agilis	SS/FP	Agilis : Palm Beach Gardens, FL	-	0.029	Dec 2019	0.000	Dec 2020	0.031	Dec 2021	-		0.031	-	-	-
Aircraft Engine CIP: Develop engine improvements-F107-Florida Turbine Technologies (FTT)	SS/FP	FTT : Jupiter, FL	-	0.370	Dec 2019	0.000	Dec 2020	0.406	Dec 2021	-		0.406	-	-	-
Subtotal			-	67.333		69.996		65.049		-		65.049	-	-	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Air Force **Date:** May 2021

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
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Support (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Support	C/CPAF	Not specified. : TBD	-	-		-		0.000		-		0.000	-	-	-
Aircraft Engine CIP: Non-OEM CIP Tasks	Various	Various : Various	-	1.773	Dec 2019	1.474	Dec 2020	1.942	Dec 2021	-		1.942	-	-	-
Subtotal			-	1.773		1.474		1.942		-		1.942	-	-	N/A

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

Test and Evaluation (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Test and Evaluation	C/CPAF	Not specified. : TBD	-	-		-		0.000		-		0.000	-	-	-
Aircraft Engine CIP: Ground test and validate engine improvements	PO	AEDC : Arnold AFB, TN	-	0.241	Dec 2019	7.550	Dec 2020	2.263	Dec 2021	-		2.263	-	-	-
Subtotal			-	0.241		7.550		2.263		-		2.263	-	-	N/A

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

Management Services (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Management Services	C/CPAF	Not specified. : TBD	-	-		-		0.000		-		0.000	-	-	-
Aircraft Engine CIP: PMA	Various	Various : Various	-	2.406	Dec 2019	5.584	Dec 2020	2.634	Dec 2021	-		2.634	-	-	-
Aircraft Engine CIP: In House Support/Misc	Various	Various : Various	-	3.530	Dec 2019	13.500	Dec 2020	3.866	Dec 2021	-		3.866	-	-	-
Subtotal			-	5.936		19.084		6.500		-		6.500	-	-	N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Air Force **Date:** May 2021

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
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Management Services (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			

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

	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	75.283	98.104	75.754	-	75.754	-	-	N/A

Remarks

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Air Force		Date: May 2021
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

FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
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 Legacy Activities	
F-100 Engine CIP activities	
F-110 Engine CIP Activities	
F-119 Engine CIP Activities	
Other Legacy Engine CIP Activities	

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Air Force		Date: May 2021
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

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>CIP Legacy Activities</i>				
F-100 Engine CIP activities	1	2020	1	2024
F-110 Engine CIP Activities	1	2020	1	2024
F-119 Engine CIP Activities	1	2020	1	2024
Other Legacy Engine CIP Activities	1	2020	1	2024

Note

Traditional schedule does not lend itself to Engine CIP activities. Schedule not showing past Q1FY24 as funding is currently zeroed out for FY24+.

UNCLASSIFIED

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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 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
675365: F135 Aircraft Engine Component Improvement Program	-	33.163	27.562	27.961	0.000	27.961	-	-	-	-	-	-
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.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2020	FY 2021	FY 2022
Title: F135 Aircraft Engine Improvement Program	33.163	27.562	27.961
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 2021 Plans:			
- Execute approximately 68+ 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.			

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Exhibit R-2A, RDT&E Project Justification: PB 2022 Air Force		Date: May 2021
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 2020	FY 2021	FY 2022
- Funds may be used to address emerging and short-notice Diminishing Manufacturing Sources and Material Shortages (DMSMS) issues. FY 2022 Plans: - Execute approximately 80+ 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 2021 to FY 2022 Increase/Decrease Statement: Increase due to funding increase in FY22.			
Accomplishments/Planned Programs Subtotals	33.163	27.562	27.961

C. Other Program Funding Summary (\$ in Millions)										
<u>Line Item</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u> <u>Base</u>	<u>FY 2022</u> <u>OCO</u>	<u>FY 2022</u> <u>Total</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>Cost To Complete</u> <u>Total Cost</u>
• RDTE 07 0205633N: <i>Aviation Improvements</i>	-	-	-	-	-	-	-	-	-	-

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.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Air Force **Date:** May 2021

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
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Product Development (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Product Development	C/CPAF	Not specified. : TBD	-	-		-		0.000		-		0.000	-	-	-
Aircraft Engine CIP: Develop F135 engine improvements	SS/CPFF	Pratt & Whitney : Hartford, CT	-	32.761	Jan 2020	22.601	Jan 2021	22.855	Jan 2022	-		22.855	-	-	-
Subtotal			-	32.761		22.601		22.855		-		22.855	-	-	N/A

Test and Evaluation (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Test and Evaluation	C/CPAF	Not specified. : TBD	-	-		-		0.000		-		0.000	-	-	-
Aircraft Engine CIP: Ground test and validate engine improvements	PO	AEDC : Arnold AFB, TN	-	0.000		4.685	Dec 2020	4.822	Dec 2021	-		4.822	-	-	-
Subtotal			-	0.000		4.685		4.822		-		4.822	-	-	N/A

Management Services (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Management Services	C/CPAF	Not specified. : TBD	-	-		-		0.000		-		0.000	-	-	-
Aircraft Engine CIP: PMA	Various	Various : Various	-	0.402	Oct 2019	0.276	Oct 2020	0.284	Oct 2021	-		0.284	-	-	-
Subtotal			-	0.402		0.276		0.284		-		0.284	-	-	N/A

Remarks

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

	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals		-	33.163	27.562	27.961	27.961	-	-	N/A

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Exhibit R-4, RDT&E Schedule Profile: PB 2022 Air Force		Date: May 2021
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 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
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	

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Exhibit R-4A, RDT&E Schedule Details: PB 2022 Air Force		Date: May 2021
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

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
CIP JSF Activities				
F-135 Engine CIP Tasks	1	2020	1	2024

Note
Schedule not showing past Q1FY24 as funding is currently zeroed out for FY24+.